

# Metasys System Online Help PDF

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# Welcome

Welcome to the Metasys® system Help. This Help system contains user information for the Metasys software. This section describes the organization of the Help system and offers tips for using it effectively. For information on using Metasys software, start with the [Site Management Portal User Interface](#) section.

If you have configured the database and read this Help topic and still do not know where to start, see the [Getting Started](#) section. See the [System Overview](#) section for a brief overview of system components that contain Help. For other documentation related to the Metasys system, see the [Related Documentation](#) section.

## Getting Started

What if you only need to use a few selected features of the Metasys system? Or, what if you're not sure where to start exploring the network?

Start here.

You probably want to [see details about something on your network](#) and maybe [edit it](#) or [command it](#) for optimum network performance. The hours of operation for your building might change, and you may need to edit a [schedule](#) or [create exceptions](#) for days when the schedule deviates from normal.

You might also need to [create trends, alarms, or totalizations](#) for something on your network. And, you may want to [create reports](#) containing this data to check the history of your system. To select which items you would like to see presented in the navigation tree, [create a new user view](#).

For basic user information ([moving through the items in the tree](#)), see the [Site Management Portal User Interface](#) section. For graphics information, see [User Graphics Tool \(UGT\)](#) and [Graphics+](#) sections.

## Related Documentation

Use the following table to find information available outside this Help system:

**Table 1: Related Documentation**

For More Information On	See Document	LIT or Part Number
Metasys System	<i>Metasys System Configuration Guide</i> <b>Note:</b> This document replaces the Metasys System Extended Architecture Overview Technical Bulletin (LIT-1201527)	LIT-12011832
Metasys System Terms and Acronyms	<i>Metasys System Extended Architecture Glossary Technical Bulletin</i>	LIT-1201612
How to use the Metasys Launcher	<i>Launcher Help</i>	LIT-12011742
Network Information Including Internet Security Risks	<i>Network and IT Considerations for the IT Professional Technical Bulletin</i>	LIT-1201578
	<i>Network and IT Guidance for the BAS Professional Technical Bulletin</i>	LIT-12011279
Application and Data Server (ADS), Extended Application and Data Server (ADX), and System Configuration Tool (SCT) Installation and Upgrade	<i>ADS, ADX, and SCT Installation and Upgrade Instructions Wizard<sup>1</sup></i>	LIT-12011521
Configuration of an ADS/ADX Within the Metasys System.  This document includes information on configuration of an ADS/ADX Site Director, repositories, time synchronization, printing, and dial-up connections	<i>ADS/ADX Commissioning Guide</i>	LIT-1201645
How to Set Up Time Management on the Metasys System	<i>ADS/ADX Commissioning Guide</i>	LIT-1201645
	<i>NAE Commissioning Guide</i>	LIT-1201519
How to Configure the Split ADX	<i>ADS/ADX Commissioning Guide</i>	LIT-1201645

**Table 1: Related Documentation**

<b>For More Information On</b>	<b>See Document</b>	<b>LIT or Part Number</b>
License Information for the Metasys system	<i>Metasys System Extended Architecture License Information</i>	Part No. 24-10067-1
Licensing for the ADS/ADX, Export Utility, and Advanced Graphics Application Software	<i>Software License Activator Technical Bulletin</i>	LIT-1201654
Installation of Export Utility Software	<i>Export Utility Installation Instructions</i>	LIT-12011527
Use of the Export Utility to Extract Historical Data to Formats Such as Microsoft® Excel and Access	<i>Export Utility Help</i>	LIT-120952 <sup>2</sup>
Installation of the Advanced Graphics Application and SVG Viewer	<i>Advanced Graphics Application Installation Instructions</i>	LIT-12011525
Configuration and Use of the Advanced Graphics Application to Create Graphics with Dynamic Capabilities	<i>Advanced Graphics Application Help</i>	LIT-1201850 <sup>2</sup>
Installation of the Graphic Generation Tool	<i>Graphic Generation Tool Installation Instructions</i>	LIT-12011685
Configuration and Use of the Graphic Generation Tool to Create Graphics+ Files	<i>Graphic Generation Tool Help</i>	LIT-12011697 <sup>2</sup>
Use of Graphics+ Files at the Site Director	<i>Graphics+ Runtime Help</i>	LIT-12011708 <sup>2</sup>
Use of the SCT regarding offline archive databases setup and basic setup of an N2 network online	<i>SCT Technical Bulletin</i>	LIT-1201534
How to Create and Edit Users and Roles, Configure User Profiles, Assign System Access Permissions, Assign All Items Navigation View Permissions, and Unlock User Accounts	<i>Security Administrator System Technical Bulletin</i>	LIT-1201528
Metasys for Validated Environments (MVE), Extended Architecture	<i>Metasys for Validated Environments, Extended Architecture Technical Bulletin</i>	LIT-12011327
How to Install the NAE55 and NIE55	<i>NAE55/NIE55 Installation Instructions</i>	Part No. 24-10051-0
How to Install the NAE35 and the NAE45	<i>NAE35/NAE45 Installation Instructions</i>	Part No. 24-10050-6
How to Install the NxE85	<i>NxE85 Installation Instructions</i>	LIT-12011530
How to Commission the LCS85	<i>LCS85 Commissioning Guide</i>	LIT-12011568
How to Set Up an Network Automation Engine (NAE) for Network Connectivity, and How to Set the Basic NAE Parameters, Including the Serial Printer Dynamic Data Access (DDA)	<i>NAE Commissioning Guide</i>	LIT-1201519
How to Set Up and Commission an NAE85/NIE85	<i>NxE85 Commissioning Guide</i>	LIT-12011044
How to Install and Use the NAE/Network Integration Engine (NIE) Update Tool	<i>NAE/NIE Update Tool Technical Bulletin</i>	LIT-12011524
How to Install and Use the NAE Configuration Tool	<i>NxE Information and Configuration Tool Technical Bulletin</i>	LIT-1201990
NAE55 Compliance with ANSI/ASHRAE Standard 135-2008, BACnet® Protocol  This document includes the Protocol Implementation Conformance Statement (PICS) and BACnet Interoperability Building Blocks (BIBBs) for the NAE55.	<i>NAE/NCE Protocol Implementation Conformance Statement Technical Bulletin</i>	LIT-1201532

**Table 1: Related Documentation**

For More Information On	See Document	LIT or Part Number
<b>NIE Compliance with ANSI/ASHRAE Standard 135-2008, BACnet Protocol.</b> This document includes the PICS and BIBBs for the NIE.	<i>NIE Series Protocol Implementation Conformance Statement Technical Bulletin</i>	LIT-1201672
<b>How to Install and Use the Metasys system Extended Architecture Remote Access Application for Dial-Up Connections</b>	<i>Metasys System Extended Architecture Remote Access Installation Instructions</i>	LIT-12011528
<b>How to Use Web Service Technology for Secure Access to the Metasys System</b>	<i>Metasys System Extended Architecture Secure Data Access DLL Technical Bulletin</i>	LIT-1201663
<b>The Concepts and Procedures to Perform an N1 Migration with an NIE</b>	<i>N1 Migration with NIE Technical Bulletin</i>	LIT-1201535
<b>How to Integrate an N2 Network in the Metasys System with the NAE</b>	<i>N2 Integration with the NAE Technical Bulletin</i>	LIT-1201683
<b>How to Set Up an NAE55 as a BACnet System Integrator in a Metasys System Network</b>	<i>BACnet Controller Integration with NAE/NCE Technical Bulletin</i>	LIT-1201531
<b>How to Set Up an NAE as a LONWORKS® Network Integrator</b>	<i>LONWORKS Network Integration with NAE and LCS Technical Bulletin</i>	LIT-1201668
<b>The Operation of and Setting up Metasys System Demand Limiting and Load Rolling</b>	<i>DLLR Technical Bulletin</i>	LIT-12011288
<b>Metasys Advanced Reporting System and Energy Essentials</b>	<i>Metasys Advanced Reporting System Help</i>	LIT-12011312 <sup>2</sup>
<b>How to Install the Metasys Advanced Reporting System</b>	<i>ADS, ADX, and SCT Installation and Upgrade Instructions Wizard</i> <sup>1</sup>	LIT-12011521
<b>How to install Energy Essentials</b>	<i>Energy Essentials Installation Instructions</i>	LIT-12011539
<b>How to Configure the Metasys Advanced Reporting System</b>	<i>ADS/ADX Commissioning Guide</i>	LIT-1201645
<b>How to Configure Microsoft SQL Server Report Services to Work with the Metasys Advanced Reporting System</b>	<i>ADS/ADX Commissioning Guide</i>	LIT-1201645
<b>Master-Slave/Token-Passing (MS/TP) Communications and Field Controllers</b>	<i>MS/TP Communications Bus Technical Bulletin</i>	LIT-12011034

1 Use the wizard to generate instructions specific to your system.

2 This LIT number represents a print-friendly version of the Help.

## System Overview

The major components of the Metasys system are:

**Engine:** The term *engine* is used in the Metasys system to describe a family of devices, including the NAE, NIE, and Network Control Engine (NCE):

- The **NAE** is a Web-enabled, Ethernet-based supervisory controller that monitors and supervises networks of field-level building automation devices that typically control HVAC equipment; lighting; security; fire; and building access. The NAE provides features including alarm and event management, trending, archiving, energy management, scheduling, and password protection through its embedded Site Management Portal. Different models and options support various communications protocols including BACnet over IP, BACnet MS/TP, N2 Bus, N2, and LONWORKS network devices. The NAE55 Series supports a comprehensive set of supervisory features and functions for large facilities and technically advanced buildings and complexes. The NAE35 and NAE45 Series extend the power of the NAE to the smaller buildings (or small areas of larger buildings) and

enables the wider distribution of supervisory functions in larger facilities. The NAE85 supports large BACnet/IP integrations.

- The **NCE** combines the network supervisor capabilities and IP network connectivity of an NAE with the Input/Output (I/O) point connectivity and direct digital control capabilities of a Metasys Field Equipment Controller (FEC). The NCE provides a cost-effective solution designed for central plants and large built-up air handler applications. All NCE models provide IP Ethernet network connectivity, the Site Management Portal, and the network supervisory functions featured on network automation engines, including the BACnet IP integration. Depending on the model, an NCE supports either a BACnet MS/TP trunk, an N2 Bus trunk, or a LONWORKS Network trunk.
- The **NIE** is a Web-enabled supervisory controller for integration of Metasys N1 Networks. The NIE is a specialized version of the NAE and is designed to provide for the migration of existing N1 networks into the Metasys system. The NIE provides the same Site Management Portal as the NAE. Unlike the NAE, the NIE does not support integration of BACnet MS/TP or BACnet IP, N2, and LONWORKS networks. Two models of the NIE are available. The NIE55 supports smaller N1 networks, while the NIE85 supports large N1 integrations.

**ADS/ADX (Server):** The Application and Data Server is a software package that provides long-term storage of alarm and event messages, trend data, and user transactions. The ADS/ADX typically coordinates multiple user access from Web browsers to the network. The Extended Application and Data Server provides extended user access and historical data storage capabilities. An ADS/ADX provides access to the user interface and may serve as the location for user graphics.

The ADX can also be installed in a split configuration with the ADX software/user interface on one computer (the Web/Application server computer) and the historical trend data on another computer (the Database server computer).

**SCT:** The System Configuration Tool assists in all phases of engineering, installing, and commissioning of devices that make up the Metasys system. The SCT can be used offline to create archive databases that can be downloaded to an Engine or Server. The SCT also allows you to upload and archive databases that were created or edited online from an Engine or Server. Using the SCT, you can view and configure multiple sites in one archive.

Starting at Release 6.0, SCT allows you to maintain both 5.2 and 6.0 engines in the site's archive. The Site Director for the archive has to be upgraded to 6.0, but all non-Site Director engines for the site can be left at 5.2 and can still be modified offline in SCT and downloaded at Release 5.2. Within the site's archive, a mix of 5.2 and 6.0 engines can be maintained.

The SCT has the same look and feel as the Engine and Server Site Management Portal. The SCT also provides a Simulation feature, which allows you to simulate a functioning Engine and test the database's control logic prior to downloading it.

Metasys system configuration requires that you define a single device as the Site Director. The Site Director device may be a network engine or server (ADS/ADX), and its primary role is to coordinate multiple user access from the Web browser to the network. If an ADS/ADX exists in the system, it is defined as the Site Director automatically. When communicating directly to Metasys system servers or network engines, you are in the online mode. For information on the online, offline, and simulation modes of operation, see the [modes](#) section.

## **Printing the Help**

### **Printing Specific Help Topics**

To print a specific Help topic:

1. Click the Print button in the Help or click the Options button and select Print.
2. If the Contents tab is currently active, choose between printing the selected topic only or the selected heading and all sub-topics. The content prints.

If another tab is active, select a printer and the Help prints the current content displayed on the right side.

**Note:** Information in drop-down lists prints only if you have the list open on the screen. Popup content does not print in the popup window.

## Printing the Entire Help System

The entire Help system is available for printing in Adobe® PDF format.

To print the entire Help system:

1. If necessary, download Adobe Reader (required to view the PDF file) from the [Adobe Reader site](#).
2. Go to the [QuickLIT Product Information Web site](#) or insert the QuickLIT CD.
3. In the tree on the left, browse to Metasys System > General System Information.
4. On the right side of the window, click Metasys System Help. The Help PDF opens in Adobe Reader.
5. On the File menu of Adobe Reader, select Print.

**Note:** This file is large (approximately 700 pages). Allow plenty of time for downloading and printing.

# Site Management Portal User Interface

You can interact with the entire Metasys system from any location running a supported web browser. Microsoft Internet Explorer Version 8.0 or 9.0 are recommended. Other browsers, such as Apple Safari, Mozilla Firefox, or Google Chrome may also be used but are not fully supported. After you log on to the Metasys system, you are able to perform the following operations:

**Note:** The term Site Management Portal (SMP) refers to the user interface of the online Metasys engines and servers as well as the offline System Configuration Tool (SCT), unless otherwise indicated.

- [navigate through the system](#)
- [create user views](#)
- [create summary definitions and tailored summaries](#)
- [manage events](#)
- [record and display trend data](#)
- [diagnose network and device communication problems](#)
- [monitor and command systems and points](#)
- [edit or modify items](#)
- [schedule activities](#)
- [create and view graphics](#)
- [create, simulate, and activate control system logic](#)

For more information on the specific features of your Metasys system, see the features listed in the table of contents in this Help file. For more information on menus, see [Menus](#).

For information on the Ready Access Portal UI, refer to the Ready Access Portal *Help* (LIT-12011342).

## Site Management Portal User Interface Concepts

### Launcher

In previous versions of the Metasys system, the Site Management Portal (SMP) and the SCT required the installation of a public Java Runtime Engine (JRE) on the local client computer. Starting at Release 6.0, the Metasys system no longer relies on the public Java Runtime Engine (JRE). A user installs a new application called the Launcher, which supports a private internal JRE that is not exposed to possible security risks.

The Launcher manages a list of all supervisory engines, ADS/ADX servers, and SCT computers at your facility. You can also add the Ready Access Portal, Metasys Advanced Reporting System, and any web address to its managed list of web sites. You can access any release of the Metasys system with the Launcher, but opening the SMP or SCT UI at Release 5.2 or earlier requires the public JRE on the client computer.

To install the Launcher application:

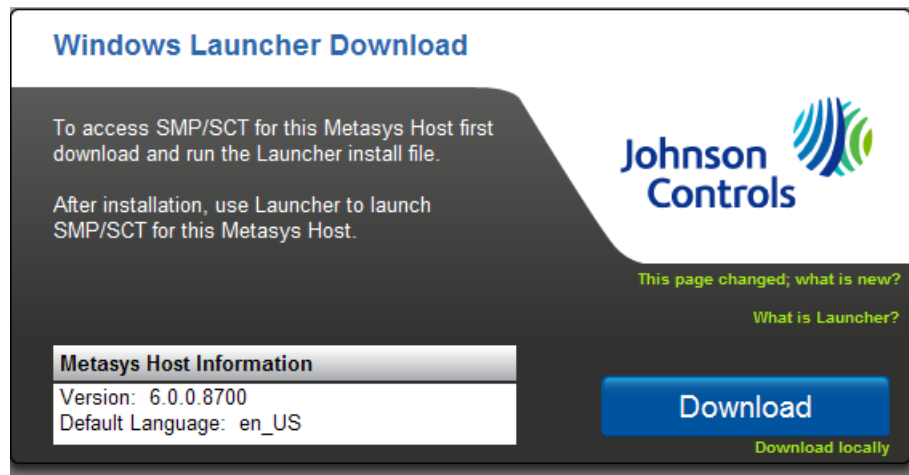
1. Open your web browser and enter the URL for the Site Management Portal. Examples:

<http://MAIN-ADX1/metasys>

<http://10.10.15.100/metasys>

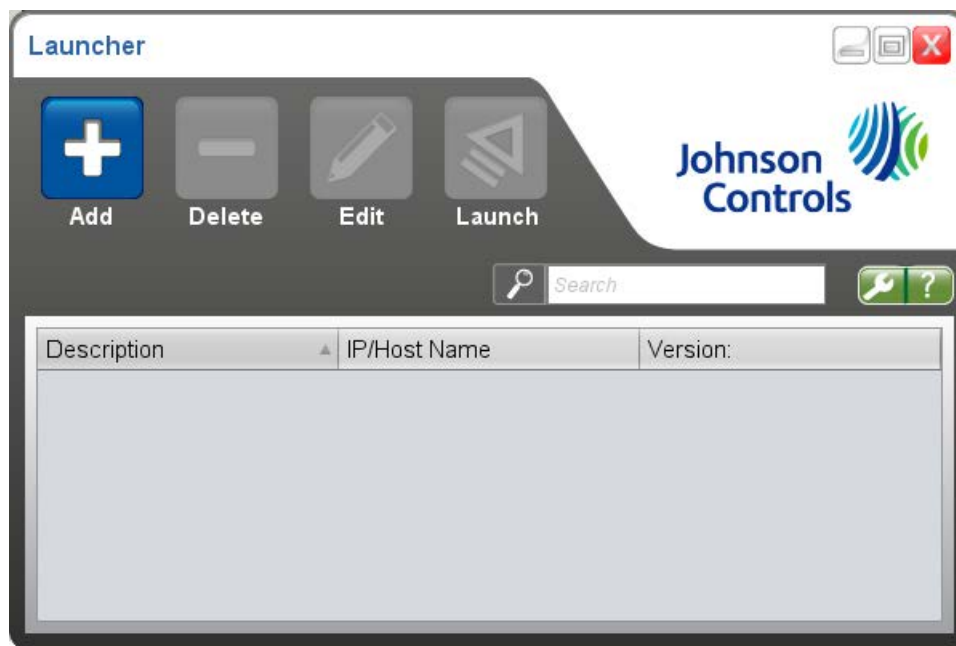
The Windows Launcher Download screen appears ([Figure 1](#)).

**Figure 1: Windows Launcher Download Screen**



2. Click Download or Download locally if Internet access is unavailable or the Download option fails. The File Download - Security Warning dialog box appears asking if you want to run or save the Launcher.msi file.
3. Click Run. The Launcher installation file is downloaded to your computer.
4. After the 26 Mb file is downloaded, another Security Warning dialog box appears. Click Run to start the installation. The Johnson Controls Launcher 1.0 Setup wizard appears.
5. Click Next and follow the steps in the Launcher Setup wizard to complete the installation. For details, refer to the *Launcher Installation Instructions (LIT-12011783)*.
6. After installation, close the web browser. By default, the Launcher screen appears after installation (*Figure 2*).
7. Refer to the *Adding a New SMP or SCT Device Profile* and *Adding a New Other Profile* sections of the Launcher *Help (LIT-12011742)* for instructions on how to manage a list of all engines, ADS/X, SCT, Ready Access Portal, Metasys Advanced Reporting System, or any generic Web site links that require a login.

**Figure 2: Launcher**





## Login

**Note:** We strongly advise that you do not access the Metasys Site Management Portal UI from a computer running a server class operating system. By default, Windows Internet Explorer Enhanced Security Configuration is enabled on server class operating systems and may block the Launcher download page from which you install the Launcher application for access to the Site Management Portal. Open the Site Management Portal UI from a computer that is not running a server class OS.

The Metasys system supports Active Directory® service and single sign-on (SSO). Therefore, when you launch the device that is configured as the Site Director of the extended Metasys network, three possible login scenarios occur:

- If the Active Directory service feature is disabled, the Metasys login screen appears. Enter your Metasys user name and password to gain access to the Metasys Site Management Portal (SMP) user interface.
- If the Active Directory service and SSO features are enabled and you are logged in to your Windows desktop as an Active Directory service user with access to the Metasys system, the login screen does not appear and you automatically have access to the Metasys SMP user interface.
- If the Active Directory service feature is enabled, but you are not logged in to your Windows desktop as an Active Directory service user with access to the Metasys system (or if the Active Directory service feature is enabled and SSO is disabled), the login screen appears. From that screen, you can access the Metasys system by entering your Metasys user name and password, and by selecting Metasys Local from the Login To drop-down menu; or by entering an Active Directory service user name and password, and by selecting the Active Directory service domain from the Login To drop-down menu.

The first time you log on to the site or device, the Metasys Terms and Conditions appear. Scroll through and read the entire Terms and Conditions text. If you agree with the terms, click Accept at the end of the text. If you do not agree, click Cancel to return to the login screen.

A progress bar appears to show the status of the login.

**Note:** If the Site Director is not available, you may want to directly connect to an Engine device. In this scenario, Active Directory service login is not supported (both automatic login and user name/password login), and you must use a Metasys user name and password to connect. The security configuration for an Engine device may be set up differently than in the Site Director.

### ***Department of Defense Enhancements***

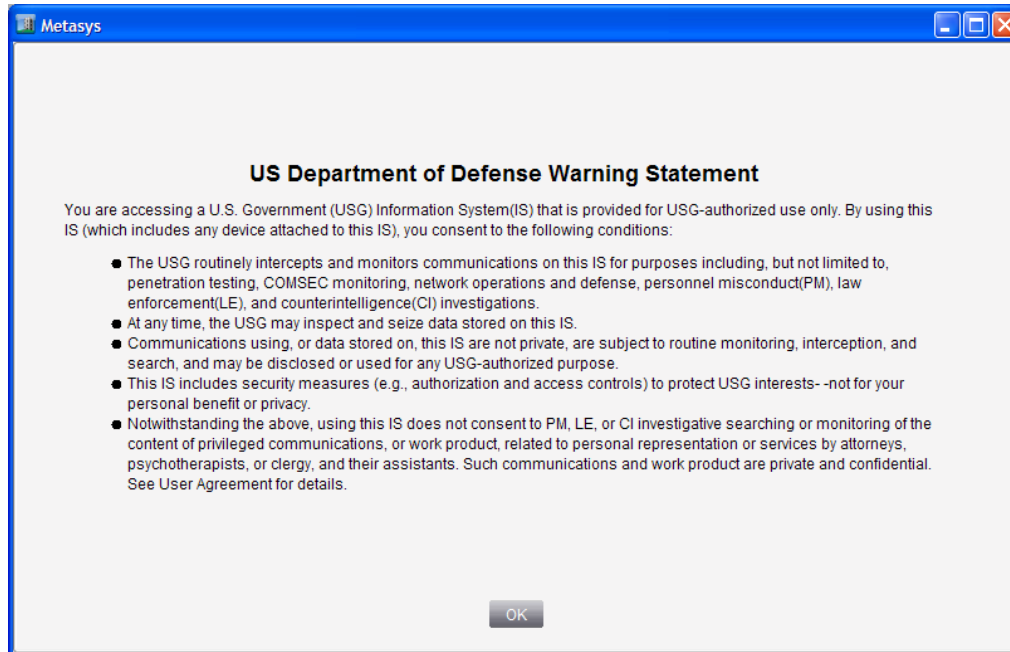
During ADS/ADX installation, a US Department of Defense (DoD) Banner option is available. If the DoD Banner was selected, a special log-in feature is enabled that satisfies the requirements for a mandated DoD Information Assurance Certification and Accreditation Process (DIACAP). The DoD Banner option includes three enhancements:

- appearance of a custom Department of Defense banner before log in
- record of the last logged in user
- record of IP address for each valid and invalid user logon attempt

### **Department of Defense Banner**

A custom DoD warning statement ([Figure 3](#)) appears each time you access the Site Management Portal.

**Figure 3: United States DoD Warning Statement**



The statement contains information critical to any Metasys user accessing the BAS at a Department of Defense facility. You must click OK to consent to the statement before reaching the login screen. The standard Metasys system login screen appears after you click OK. If the Active Directory service and SSO features are enabled, Active Directory logs you in without asking for the user name and password.

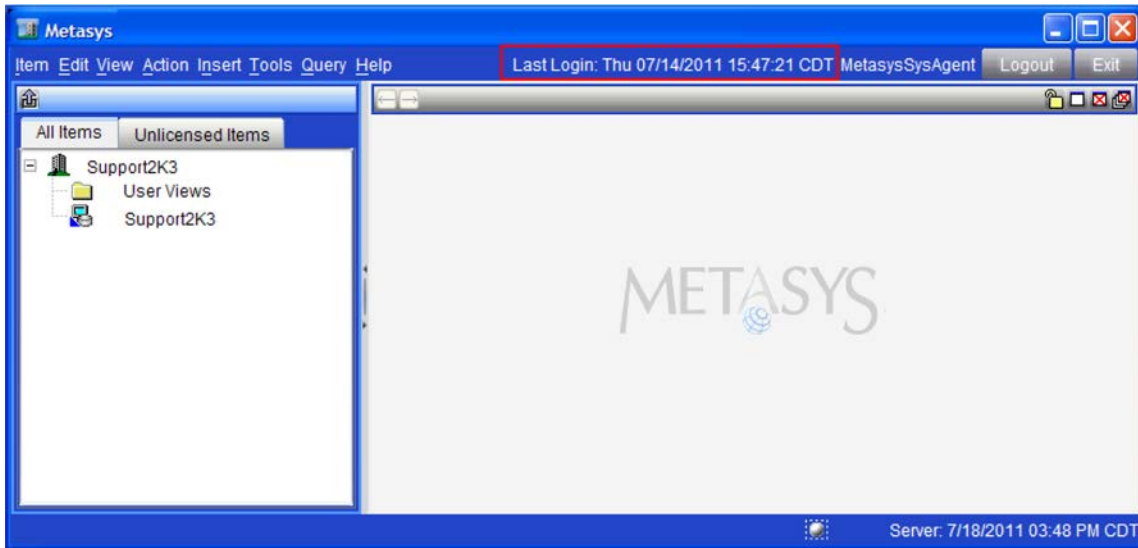
When the Metasys system login screen appears, you have up to 30 seconds to login. If 30 seconds passes with no login activity, the login screen clears and the DoD banner screen returns. The banner also reappears after you log off the Metasys system or the system logs you off because of user inactivity.

#### **Last Login Information**

With the DoD enhancements in place, the main screen of the SMP user interface indicates the last time and date that the user successfully logged in ([Figure 4](#)). If the user has never logged in, Never appears in the Last Login field.

**Note:** This feature only applies if the Site Director is an ADS/ADX.

**Figure 4: Last Logged in User**



**Record of User Access with IP Address**

With the DoD enhancements in place, the Audit Viewer in the Metasys software records each change that occurs in the Metasys system. The User column in the Audit Viewer records the name of each user who logged in (authorized user) or tried to log in (unauthorized user). The Post Value column records the IP address of the client computer used to access the Metasys system. See [Figure 5](#).

**Figure 5: Users and IP Addresses Recorded by Audit Viewer**

The screenshot shows the 'Audit Viewer' window with a table of audit events. The table has columns for 'When', 'User', 'Description', and 'Post Value'. Two rows are highlighted with red boxes: one for a successful login by 'MetasysSysAgent' from IP '127.0.0.1' and another for a failed login by 'Metasysysysa' from IP '10.9.117.195'.

When	User	Description	Post Value
6/10/2011 10:34:38 AM CDT	MetasysSysAgent	User Login Successful	127.0.0.1
6/10/2011 12:52:26 PM CDT		Startup	
6/10/2011 12:52:26 PM CDT	IntraComputer	User Password Changed	I... IntraComputer
6/10/2011 01:02:54 PM CDT	MetasysSysAgent	User accepts Terms and Con...	
6/10/2011 01:19:43 PM CDT		Startup	
6/10/2011 01:16:31 PM CDT	MetasysSysAgent	User Login Successful	10.9.117.195
6/10/2011 01:02:47 PM CDT	MetasysSysAgent	User Login Successful	
6/10/2011 01:42:34 PM CDT	MetasysSysAgent	User Login Successful	
6/11/2011 12:03:54 AM CDT	IntraComputer	User Password Changed	I... IntraComputer
6/13/2011 12:00:18 AM CDT	IntraComputer	User Password Changed	I... IntraComputer
6/14/2011 10:38:00 AM CDT	MetasysSysAgent	User Logout	
6/14/2011 10:38:51 AM CDT	Metasysysysa	User Login Failed	10.9.117.195
6/14/2011 10:48:11 AM CDT	MetasysSysAgent	User Property Changed	
6/14/2011 10:48:42 AM CDT	BasicSysAgent	User Logout	
6/14/2011 10:51:12 AM CDT	MetasysSysAgent	User Logout	
6/14/2011 10:51:56 AM CDT	MetasysSysAgent	User Login Successful	10.9.117.195
6/14/2011 10:49:17 AM CDT	MetasysSysAgent	User Login Successful	10.9.117.195

## Metasys Modes

Metasys software can operate in three different modes: online (Site Management Portal UI), offline using the SCT, and Simulation (SCT). When you are connected to the Engine or ADS/ADX, you can perform online mode operational activities such as monitoring and commanding. When you are connected to the SCT only, you can perform offline mode system configuration tasks such as configuring point objects and features. The SCT has the ability to simulate custom logic programs in the Logic Connector Tool (LCT) in Simulation mode.

### Online Mode

When you are connected to the Engine or ADS/ADX, you can perform online operational activities such as [monitoring and commanding](#) equipment. You can also perform online database configuration activities, such as defining field controllers or adding points. This function is referred to as online mode or online Site Management Portal (SMP) UI. The online mode is available to users with the Access Type of Standard Access or Basic Access. See the [Access Types](#) section.

Any changes you make to the system configuration are made online to the system and need to be [uploaded](#) to be stored in the archive database.

### Offline Mode

SCT is a standalone software program installed on a PC, including the ADS/ADX server, that allows you to configure the servers and network engines without being connected to the live Metasys system server and network engines; this function is called the offline mode. In offline (system configuration) mode, use SCT to set up the system database. You must load configuration changes created in offline mode to the Engine for the settings to take effect. See [Database Uploading, Downloading, Upgrading Device and Synchronization](#).

Two features are available only with SCT: [ActionQ](#) and [Database Uploading, Downloading, Upgrading Device and Synchronization](#). You can only add servers and network engines in offline mode. [Simulation](#) mode can be started only using SCT.

The offline mode is available to users with the Access Type of Standard Access. See the [Access Types](#) section.

### Simulation Mode

The SCT can simulate custom logic in the LCT. In Simulation mode, the LCT establishes a connection to a simulated device and accesses simulated data. Simulation mode can only be started from offline mode. Simulation mode allows you to experiment with the configuration and settings before you load it into the Engine. Simulation is not available on the ADS/ADX.

The simulation mode is available to users with the Access Type of Standard Access. See the [Access Types](#) section.

See the [Simulation](#) section for more information.

## Access Types

Metasys system administrators determine the type of access a user has to the Metasys system through user accounts in the Security Administrator tool. There are three access types: Standard Access, Basic Access, and Tenant Access.

### Standard Access

Standard Access allows the Metasys local system user or Active Directory service user to access all authorized features of the online Site Management Portal (SMP) UI and the SCT.

**Note:** If you have Standard Access and the Advanced Reporting privilege, you can use the Metasys Advanced Reporting System.

### Basic Access

Basic Access provides users with access to a limited set of user interface capabilities based on their assigned permissions. Basic Access allows the Metasys local system user or Active Directory service user to access only authorized features of the online Site Management Portal (SMP) UI. Typically, a Basic Access user is not allowed to make any configuration changes. Metasys system administrators can also assign the Basic Access type to Active Directory service users who have been added to the Metasys system. Basic Access meets the user interface requirements for most building operators.

## Tenant Access

Tenant Access allows the local user to access a single dashboard view as defined by a system administrator in the Ready Access Portal UI.

## Screen Layout and Frames

The screen contains four frames and provides a consistent look and feel in every *mode* (online, offline, or simulation). Your access to certain features depends on the mode in which you are operating and your assigned *access type* and privileges.

**Note:** If the navigation frame or a display frame is active, the header bar of the active frame or pane is highlighted. The Menu and Status frames are not highlighted even when you click in them.

**Figure 6: Basic Screen Layout**

The screenshot displays the Metasys software interface. The menu bar at the top includes 'Item', 'Edit', 'View', 'Action', 'Insert', 'Tools', 'Query', and 'Help'. The left navigation pane shows a tree structure with categories like 'Administration', 'Summary Definitions', 'User Views', and 'DoD-NAE-3'. The main content area is divided into several frames. The top frame, titled 'DoD ADX', shows a table with columns 'Attribute' and 'Value'. The bottom frame, titled 'Engine Summaries', shows a table with columns 'Engine Name', 'Description', 'Model', 'Status', 'ADS Repository', and 'L'. The status bar at the bottom indicates 'All Alarms Snoozed.' and 'Server: 8/27/2009 01:29 PM CDT'.

Attribute	Value
Object Name	DoD ADX
Description	
Object Type	ADS
Object Category	System
Version	12.0
Model Name	ADS

Engine Name	Description	Model	Status	ADS Repository	L
DoD-NAE-3	N2 Rack with N2 Trunk	MS-NAE5510-1	Operational	159.222.6.149	Thu
DoD-NCE-1	NCE with MSTP trunk	MS-NCE2567-0	Operational	159.222.6.149	Thu
DoD-NAE-1	NAE55 with MSTP N2 and LON trunks	MS-NAE5520-1	Operational	159.222.6.149	Thu
DoD-NAE-2	NAE with MSTP and BACnet IP	MS-NAE4510-2	Operational	159.222.6.149	Thu

**Table 2: Site Management Portal (SMP)UI Screen Frames**

Number	Name	Description
1	Menu	Displays the menu bar and the logged-in user name together with the previous time and date that he logged in (in this case, MetasysSysAgent logged in on Thursday, March 22, 2012 at 11:13:22 CST). Active Directory service user names display as the fully qualified user name (for example, user@engineering.jci.com).  For more information on menus, see <a href="#">Menus</a> . <a href="#">Log out</a> or <a href="#">exit</a> from the system using buttons in the menu frame.
2	Display	Presents data or information in the user-selected <a href="#">panel layout</a> . In the example above, the Display Frame contains two Display Panels. The top Display Panel shows information about the Site Director named DoD ADX (the device is selected in the navigation tree and the name of the device appears at the top of the Display Panel). The bottom Display Panel contains a Tailored Summary called Engine Summaries associated with the Configuration and Diagnostics <a href="#">Display Frame user navigation tree</a> . See the section for more information on the Display Frame.
3	Navigation	Displays navigation trees that organize items in the system. The All Items tree generates automatically when you configure the system database. You can create one or several <a href="#">user navigation trees</a> (also referred to as user views) for defining your own navigation concept.  For more information on the navigation tree, see the <a href="#">Navigation Tree</a> section.
4	Status	Displays information about current user actions and the current time/time zone of the server that you are logged into (supervisory device or Site Director). <a href="#">Status bar icons</a> indicate system status. In the screen above, the status bar indicates that all alarms are snoozed.

## Navigation Tree


The navigation frame can display several navigation trees in online mode (Standard Access or Basic Access). The All Items navigation tree is generated during system configuration and represents the network layout of your system. You can add additional [user-defined navigation trees](#) (also referred to as user views) that provide navigation capabilities for viewing particular parts of your system.

**Note:** The navigation trees that appear for a particular user, including the All Items tree, are defined by the system administrator when the user's access permissions are created.

Navigation trees support standard browsing concepts such as the plus sign (+) for expanding [items](#) in the tree and the minus sign (-) for collapsing or hiding items in the tree. The maximum number of items that you can nest under an item in the All Items tree is 7. User-defined trees have no restrictions on the number of nested items.

To see more details on an item in the navigation tree, drag and drop the item or double-click the item in the navigation tree. The navigation frame also supports scroll bars and both right-click and left-click options.

You can display User Views as either a set of tabs (default) or a drop-down list. This interface helps with large jobs that have many User Views, as the tabs can occupy a large percentage of the viewable navigation screen area. Configure the Default navigation display in the General Display Settings on the [Display Settings Tab](#) of the Metasys Preferences.

Click the  button to detach the navigation [frame](#). You can minimize and maximize the navigation frame, but if you click the X button, the frame is restored to its default position.








## Items

The Metasys system uses the term item as a generic reference to an object or selection in the [Navigation Tree](#). Items in the All Items navigation tree include the site, devices, control systems (logic), graphics, objects, integrations, schedules, files, trend studies, field points, [user-defined navigation trees](#), and other system data. Each item can have another item under it, and so on as the system hierarchy continues. Items have right-click [pop-up menus](#) that provide commanding and viewing options. A symbol represents each item in the navigation tree, and [status symbols](#) indicate the status of each item.

### Status Symbols

Status symbols show the status of items in the system on the user interface. For example, these status symbols appear in the navigation tree, in a column on Summary views, and in a column on the Global Search Viewer's Search Results table. The following table shows examples of the status indicators and the *mode* in which they may appear.

**Table 3: Status Indicators**

Indicator	Indicator Description	Status	Mode <sup>1,2</sup>
	Red Exclamation Point	<b>Alarm:</b> Item (or an item under this item in the tree) is in an alarm state.	Online
	Blue Exclamation Point	<b>Warning:</b> Item (or an item under this item in the tree) is in a warning state.	Online
	Red Exclamation Point and Red Question Mark	<b>Unreliable Alarm:</b> Item (or an item under this item in the tree) may be in alarm which is in an unreliable state.  <b>Note:</b> The Unreliable Alarm icon appears when the alarm state of the object is Unreliable, and only applies to objects that have alarming defined through an alarm extension, intrinsic alarming, or an event enrollment object. If the object's Reliability attribute causes its Status to be Unreliable, but the object does not have alarming defined, its Alarm State is Normal and the icon is not shown.	Online
	Red X	<b>Offline:</b> Item is offline  <b>Note:</b> Field devices with the Disable Automatic Alarming attribute set to True display a red X when they are offline. See the appropriate object in the <a href="#">Object Help</a> for details on this attribute.  <b>Note:</b> When an Sensor/Actuator (SA) Bus device, for example, an Input/Output Module (IOM) or sensor, goes offline, an alarm is generated and the device is identified in the Site Management Portal (SMP) UI by the red exclamation point instead of the red X.	Online
	Blue X	<b>Communications Error:</b> Unable to read item status - error occurred when attempting to retrieve the item's current state	Online
	Green Arrow	Item has been edited since it was last loaded to the Engine.	Offline
	Blue Triangle	<b>Local Site Director:</b> Device is the Local Site Director.	Online Offline

1 In Simulation mode, status indicators only appear in the Summary views in the display frame. The indicators do not appear in the navigation tree in this mode.

2 Online mode includes both Standard Access and Basic Access types unless noted otherwise. If the items under an item have different states, the parent item displays only the icon for the state of highest priority (of Unreliable Alarm, Alarm, and Warning states). Unreliable Alarm is the highest priority, followed by Alarm and Warning.

### User-Defined Navigation Trees

User-defined navigation trees (also referred to as user views, user navigation views, and user-defined trees) allow you to organize items and folders for specific users or functions.

See the [User Views](#) section for details on user views.

### Unlicensed Items Trees

An Unlicensed Items Tree appears and becomes the default tree if your Metasys system contains unlicensed ADS/ADX software. If you license the software and refresh the tabs, the Unlicensed Items Tree disappears.

## Display Frame

The Display Frame can be divided into up to four display panels. When viewing an item in a [display panel](#), the name, status, and default attribute (usually the present value) of the item you display appear at the top of the display panel. Each display panel can contain different [tabs](#), depending on the item selected from the navigation tree, and each tab shows different information. Dynamic attributes displayed in a panel automatically refresh when changes are detected.

The default display panel is the first empty panel or last unlocked panel if all displayed panels are filled. Display panels are locked while in Edit mode, or may be locked using the Lock button of the selected display panel. If all available panels are locked, you cannot display an additional item in any of the display panels.

You can resize each display panel by dragging its borders, or using an available splitter bar. With some items, an Edit button appears (except in Simulation [mode](#)), allowing you to edit the item's configuration [attributes](#). Editing in online mode with Basic Access is limited to Schedules and Calendars, and no Edit button appears for any other items.

You can drag and drop items into a display panel and navigate among them using the Back and Forward display panel [buttons](#). The display panel holds a maximum history of five items.

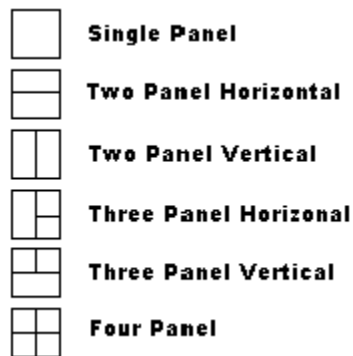
If you run any of the predefined [reports](#) found in the [Query Menu](#), the result of the query appear in an available panel in a spreadsheet format. Sort the report results by clicking on the column heading, and resize columns by dragging column borders. When you scroll down through the column, the headers remain visible.

The data presented in a report comes from a snapshot of the system at the time you request the report. The displayed data does not automatically refresh and does not support an Edit mode. You can manually refresh the report through the [Action Menu](#).

## Display Frame Layout

The user interface allows you to define your own display frame layout. Six options are available:

**Figure 7: Panel Layout Options**



To change the way the panels are arranged, see [Changing the Display Panel Layout](#). If you have a multi-panel display and you change to a layout with fewer panels, the locked items/newest items in the view stay, depending on how many panes are available in the new layout. The other panels close (they do not reappear if you switch back to the multi-pane view).

To resize the panels, drag the borders of the panel until it reaches the desired size. To make one panel (in a multi-panel arrangement) take up the entire Display frame temporarily, click the [maximize button](#). To restore a maximized panel in a multi-pane view, click the restore button. A panel can also be maximized/restored by double clicking its header bar.

### Display Panel Tabs

Each display panel contains tabs that vary depending on the item displayed.

For example, most of the point objects, such as the Outdoor Air Temperature (OAT) contain the following tabs:



**Table 4: Tabs**

Tab	Description
<b>Alarm</b>	Becomes available when you define an Alarm <i>Extension</i> for a point. The New and Delete buttons allow you to add or delete Alarm Extensions for the point. The Basic and Advanced radio <i>buttons</i> allow you to filter the attribute display in this tab. The Edit button allows you to change configurable attributes.
<b>Focus</b>	Becomes available when you define a point object. The Focus tab shows operation attributes available for the object type to which the object belongs. Please note that the Basic and Advanced radio <i>buttons</i> allow you to filter the attribute display in this tab. The Edit button allows you to change configurable attributes.
<b>Hardware</b>	Becomes available when you define a point object that has a reference to a physical input or output. The Hardware tab shows hardware-related attributes available for the object type to which the point object belongs.
<b>BACnet Alarm</b>	Becomes available when you define a BACnet intrinsic alarm for a point. The <i>Intrinsic Alarming Defined</i> attribute is explained in <i>Trend Extension Attributes</i> section. The BACnet Alarm tab shows BACnet Alarm-related attributes available for the object type to which the point object belongs. The Basic and Advanced radio <i>buttons</i> allow you to filter the attribute display in this tab. The Edit button allows you to change configurable attributes.
<b>Totalization</b>	Becomes available when you create a Totalizer <i>Extension</i> . New and Delete buttons allow you to add or delete Totalization Extensions for the point. The Edit button allows you to change configurable attributes.
<b>Trend</b>	Becomes available when you create a Trend <i>Extension</i> for a point object. New and Delete buttons allow you to add or delete Trend Extensions for the point. The Chart view allows you to view data samples in a graphical format and retrieve new trend data. The Table view of the Trend Extension allows you to view the trend's data samples in a table format. The Definition view of the Trend Extension allows you to view and edit the attributes of the trend extension object.
<b>Averaging</b>	Becomes available when you create an Averaging <i>Extension</i> for a point object. The New button allow you to add Averaging Extensions for the point.
<b>Load</b>	Becomes available when you create a Load <i>Extension</i> for a point object. The New button allow you to add Load Extensions for the point.

Other items may contain fewer or more tabs. For example, the item representing the Engine/ADS/ADX contains the following tabs:









- Focus
- Summary
- Diagnostic
- Communication
- Network
- Email
- Pager
- SNMP
- Alarm
- Trend
- Printer

For information on the tabs available in the system, see the [Object and Feature Tabs](#) section.

### **Display Panel Buttons**

[Table 5](#) shows the display panel buttons.

**Table 5: Display Panel Buttons**

Button	Description
	<p>Allows you to edit attributes for the displayed item. The values you can edit vary depending on the displayed item. Select the Save button to save your changes.</p> <p><b>Note:</b> This button does not appear in Simulation <i>mode</i>.</p> <p><b>Note:</b> This button does not appear if the user has Basic Access <i>mode</i> permission. It appears grayed out if the user has Standard Access <i>mode</i>, but does not have Modify Items permission for the object being viewed.</p> <p><b>Note:</b> The term edit refers to changing items using the Edit button. See the <a href="#">Editing Items</a> section. The term modify refers to changing items using the Modify menu item and the Modify dialog box. See the <a href="#">Modify Dialog</a> section.</p>
	Displays the content previously displayed in that panel. Each panel can have a display history of up to 5 items.
	Displays the content of the next panel saved in the history.
	Locks the selected display panel (prevents another item from being dropped in this panel and overwriting it). A locked panel can be resized. This button toggles between locked and unlocked.
	Maximizes the active panel to the full size of the Display Frame. You can also maximize the pane by double clicking the header bar. The other panels reappear if you click the restore button.
	Restores the panels to their original size and position. You can also restore the pane by double clicking the header bar.
	Closes just the currently displayed view in the display panel.
	Closes all of the views in the display panel (including views stored in history).
<input type="radio"/> Basic	Displays commonly used information about the displayed item.
<input type="radio"/> Advanced	Displays all the information the system contains pertaining to the displayed item.

## Tailored Summaries

Tailored Summaries appear in the display frame, and allow you to view, command, and modify large quantities of similar data in a tabular format. Tailored summaries are essentially summary views of Metasys system items. For more information on this feature, see the [Tailored Summaries](#) section.

## Alarms Window

The Alarms Window (also referred to as Metasys - Events or Alarm Bar) displays the newest, highest priority alarm message. Only alarms defined in the Fault Ack Required and Normal Ack Required attributes of the [alarm extension](#) or the BACnet alarm definitions are eligible to appear in the Alarms Window. In addition, only those alarms for which you have the Manage Item Events category-based permission appear in the Alarms Window. The alarm message includes the name of the item in alarm, the current status, date and time when the alarm occurred, [alarm priority](#), the present value of the item, and a description related to the alarm condition (if applicable). The color of the Alarms Window is based on the Alarm's Priority level and is configured on the [Alarm Settings Tab](#) of the Metasys Preferences.

The number of alarm messages that require acknowledgement appear above the View Item button. Use the Alarms Window [buttons](#) to perform actions related to the displayed alarm message. For more information on alarms and events, see [Alarm and Event Management](#). When no alarm messages need acknowledgement (or all alarms are snoozed), the Alarms Window disappears. No matter which mode the system is in, you can minimize the window, but it automatically restores itself if a new alarm occurs.

In an Engine that is not the Site Director, acknowledged or discarded alarm and event messages do not appear acknowledged or discarded in the ADS/ADX.

To enable or disable the display of the Alarms Window, see [Enabling or Disabling Alarm Pop-ups](#).

To have an audible sound notify users of changes occurring in the Alarms Window, select User Profile from the Tools menu, check Enable Audible Alarm, and click OK. However, a user with administrator rights must use the Security Administrator Tool to set this property for any Active Directory service users who were added to the Metasys system. Make sure the Windows® operating system audio controls are not muted and the volume is loud enough to hear. An audible alarm sounds as long as an alarm is detected (if alarms are not snoozed or at least one unacknowledged alarm is pending for the logged-in user). The alarm sound interval (15 seconds by default) is configurable from the [Preferences](#) dialog box.

The Alarms Window does not appear when you are using the SCT in offline (configuration) [mode](#).

The current navigation view does not limit or affect the Alarm notification, only the user's permissions for managing item events can. Therefore, it is possible for a user to receive an alarm for an item that does not exist in the currently displayed navigation view.

## Alarms Window Buttons

The Alarms Window (also referred to as Metasys - Events or Alarm Bar) contains buttons to acknowledge, snooze, view, and discard alarm messages.

**Table 6: Alarms Window Buttons**




Button Text	Description
<b>Ack</b>	Acknowledges events and stops the event from appearing on the Alarms Window.
<b>Snooze</b>	Sends the currently displayed alarm message away for 5 minutes, allowing any pending next highest events to appear in the Alarms Window. After 5 minutes, the alarm appears in the Alarms Window again (if it is the highest priority event). To change the amount of time the Alarms Window snoozes, see <a href="#">Engine Device Object</a> .
<b>Snooze All</b>	Puts the entire Alarms Window to sleep for 5 minutes. For the next 5 minutes, the Alarms Window disappears, even if high priority alarms or events occur. To change the amount of time the Alarms Window snoozes, see <a href="#">Engine Device Object</a> .
<b>View Item</b>	Shows the Focus <a href="#">tab</a> of the object in alarm in the Display Frame.
<b>View Graphic</b>	Displays the graphic associated with the <a href="#">alarm extension</a> of the item in alarm in the available display frame. This button is displayed only if a graphic has been defined for the object.
<b>Discard</b>	Deletes the alarm with acknowledgement.
<b>Minimize</b>	Minimizes the Alarms Window to the Windows task bar. If a new alarm occurs, the Alarms Window appears again as the top window.

For more information on alarm and event management, see the [Alarm and Event Management](#) section.

## Status Bar Icons

Icons in the Status bar indicate system activity ([Table 7](#)).

**Table 7: Status Bar Icons/Text**

Icon/Text	Description
	This icon appears if the Metasys software is sending or receiving view data to or from the ADS/ADX/Engine.
	This icon appears when diagnostic information for the Metasys system user interface is available. If you click this icon, the User Interface <a href="#">Diagnostics window</a> appears.
	This icon appears white if no events are currently in the <a href="#">Alarms Window</a> . When this icon is flashing red, the Alarms Window contains events. If you click the icon, the Alarms Window appears in front of the other windows. A dashed box appears around this icon when the alarm pop-ups are disabled. If you click the icon, alarm pop-ups are automatically re-enabled, and the Alarms Window appears if applicable.
<b>Time Zone/Date/Time</b>	The status bar of the Site Management Portal (SMP) UI displays the date, time, and time zone of the device to which you are logged-in. Due to the time it takes to retrieve the time from the device, the status bar time may lag slightly behind the device's actual time. If the device reports an unsupported time zone, the SMP UI defaults to .

## User Interface Diagnostics Window

The User Interface Diagnostics window reports conditions within the system that may affect the operation of the user interface, but which require no immediate user acknowledgment or action. When the Metasys system logs a diagnostic message to the UI Diagnostics window, it includes the time when the condition was detected. Diagnostic messages are logged to the UI Diagnostics window for various reasons, including the following:

- An attempt to connect to a device on the Metasys network failed.
- The device you are logged into is temporarily busy and cannot provide updated data.
- The data provided by the device is in an invalid format such as non-XML.
- An unexpected event occurred in the user interface.

When the system detects any of the above conditions, a new diagnostic message appears at the bottom of the message list. Whenever the UI Diagnostics window is open (even if cleared), an *icon* appears in the status bar. When the user clicks on the UI Diagnostics icon, the UI Diagnostics window moves to the front of all other windows. If the UI Diagnostics window is closed, it opens automatically when a new diagnostics message is logged. Click Clear to clear the window contents without closing the window.

Click Close to close the window.

## Viewing Item Data

Item data is the information associated with an *item* such as the attributes of an object. Access the information associated with an item by viewing it in a *display frame*. See the *Displaying Information About an Item* section for more information.

## Reports

Use the predefined report feature to query a single Engine, multiple Engines, or the entire site (all Engines on the site) for alarm, offline, disabled, and override conditions. To generate a report, select one or multiple Engines or the site in the navigation tree and select the desired report from the *Query Menu*. The query executes for the selected Engine or site. When you select multiple Engines or the site in the navigation tree, the report feature queries each supervisory device and combines the results in one report.

Do not confuse these predefined reports (alarm, offline, disabled, and override) with the Scheduled Reports option available in the Query menu. For information on scheduled reports, see the *Scheduled Reports* section. For information on the Global Search and Object List options, see the *Global Search* section.

The query results in a report in the display panel. The report shows the time the query was initiated, the report status, and the report results. The stop button allows you to cancel a running query at any time. The Copy button allows you to copy the report content to the clipboard. The figure below shows an example of an Offline Report. See the *Running Reports* topic for information on how to run a query.

**Figure 8: Offline Report Screen**

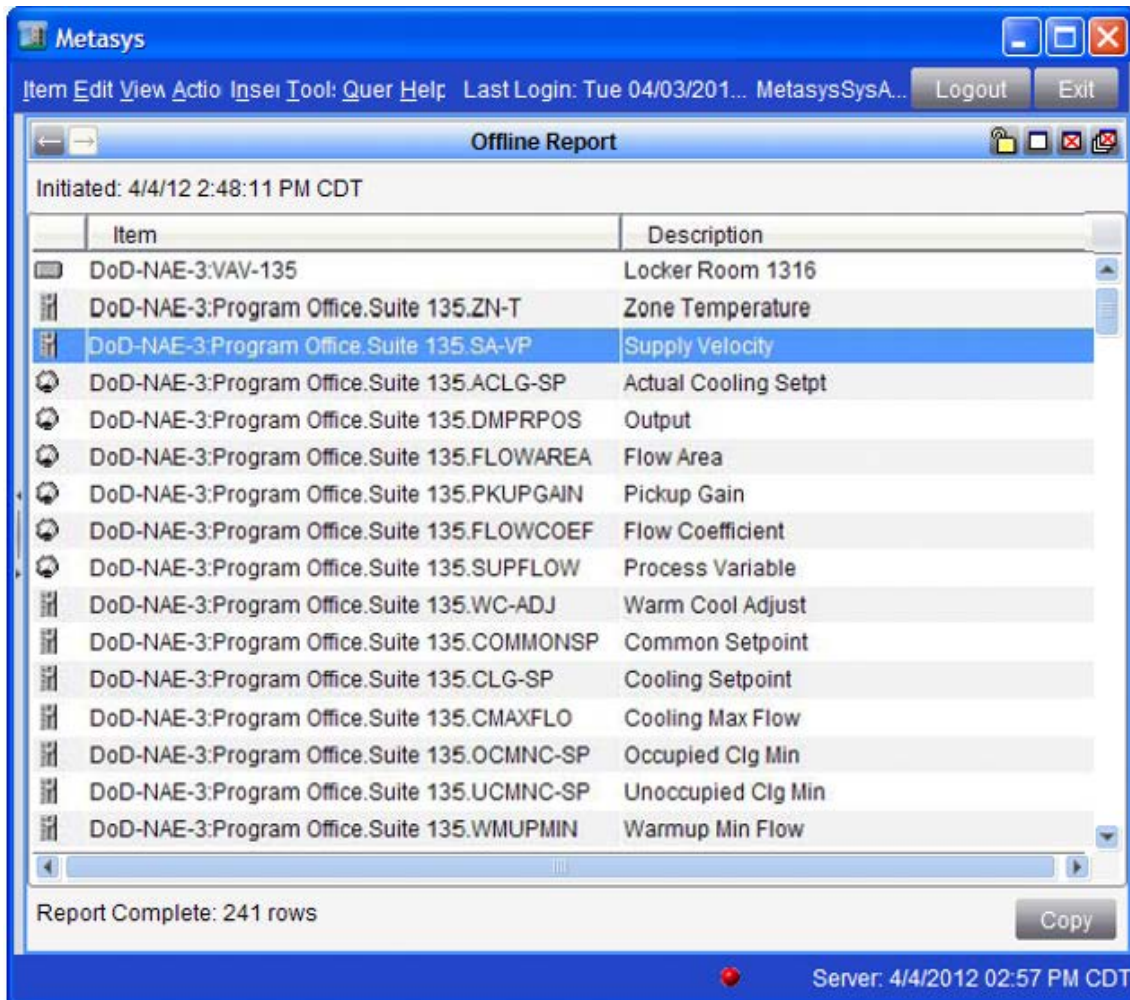


Table 8 describes the information provided by each report.

**Table 8: Reports**

Report	Description
<b>Alarm</b>	Lists all <i>items</i> in alarm state in the selected site or devices. For each item in alarm state, the report displays the item type icon, item name, item description, alarm type, and the value of the item when it entered alarm state.
<b>Offline</b>	Lists all items in offline state in the selected site or devices. For each offline item, the report displays the item type icon, item name, and item description.
<b>Disabled</b>	Lists all disabled items in the selected site or devices. For each disabled item, the report displays the item type icon, item name, and item description.

**Table 8: Reports**

Report	Description
<b>Operator Override</b>	Lists all items currently overridden by the operator.  For each overridden item, the report displays the item type icon, item name, status, item description, and the current value of the item. See the status column to determine whether an operator overridden item should be released.
<b>Supervisory Override</b>	Lists all items currently overridden by the supervisory device.  For each overridden item, the report displays the item type icon, item name, status, item description, and the current value of the item. See the status column to determine whether a supervisory overridden item should be released.

## Commands

Use commands to force an item to perform a specific action. For example, ON and OFF commands for a *binary output* make a fan run or stop, and the Enable and Disable commands in the *Trend extension* start and stop the collection of samples.

For information on which commands an item supports, see the appropriate topic in the *Object Help*.

For information on how to send a command to a single item, see *Commanding an Item* in the *Commands Dialog* section.

For information on sending a command to multiple items, see *Commanding Multiple Items (Global Command)* in the *Commands Dialog* section.

## Pop-up Menus

Pop-up menus provide an efficient way to quickly access important *item* information. Pop-up menus are also referred to as right-click menus. To access pop-up menus, *right-click* an item in the navigation tree. Content of the menu depends on the type of selected item and your level of authorization. For example, point object pop-up menus usually show the options View, Command, and Show Extensions. For Engines, pop-ups usually show View, Event Viewer, Audit Viewer, Commands, Show Extensions, Alarm Report, Offline Report, Disabled Report, Operator Override Report, Supervisory Override Report, and Remove from Site.

## Timed Inactivity Logout

Timed logout automatically logs you out of the Metasys system after a predefined time of inactivity. The system closes open databases, discards unsaved changes and view settings, and logs out the user. Users who logged in with a Metasys user name, and users who were automatically logged in via Active Directory service see the login screen at timed logout. If this system has the DoD Banner option installed, the DoD banner screen appears at timed logout.

If an Active Directory service user wants to access the Metasys system again through automatic login, close the login screen and navigate to the Metasys URL. Otherwise, you can enter your Active Directory service user name and password and select your Active Directory service domain at the login screen to regain access to the Metasys system. Use the Security Administrator System to set this and other security features.

When the DoD banner screen appears at timed logout, you must click OK to consent to the statement before returning to the login screen. The login screen waits 30 seconds for you to enter your credentials. If 30 seconds pass with no login activity, the login screen clears and the DoD banner screen returns.

## Electronic Signatures and Annotations for MVE Only

MVE sites have settings in the *Site Object* for enabling annotation and electronic signature functionality. You can set the MVE site to require only annotations, only electronic signatures, both annotations and signatures, or neither annotations nor signatures. Non-MVE sites may optionally define and use annotations; however, electronic signatures are specific to MVE sites.

When enabled, electronic signatures challenge users whenever they attempt to make a change to the system. Before the system performs the user's request, they must supply a signature and state a reason for the change. The mechanism the Metasys system uses for expressing that signature is a reauthentication challenge, in which users must reenter the password they used to log onto the Metasys system using either their Metasys password or their Active Directory service password. This process is recognized as an electronic signature.

In addition to collecting the electronic signature, the Metasys system may also require the user to enter or select an annotation. Annotations are statements that further describe the change being requested. After the password is verified and an annotation is selected, the user request is performed.

You can configure electronic signatures and annotations at the device and object levels. You cannot delete annotations on an MVE site. For information on enabling these settings, see [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#). For additional information, refer to the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

## Site Management Portal User Interface Steps

### Changing the Display Panel Layout

To change the Display Panel layout, on the View menu, select Panel Layout and choose one of the six [layouts](#).

### Acknowledging, Snoozing, and Discarding Events

To acknowledge, snooze, and discard events, click the appropriate button on the [Alarms Window](#) (also referred to as Metasys - Events or Alarm Bar).

**Note:** You also can view the item or associated graphic.

**Note:** You also may use the [Event Viewer](#) to view and take action on events. See [Alarm and Event Management](#) for more information about the Alarm and Event feature.



### Enabling or Disabling Alarm Pop-ups

The Alarms Window is also referred to as Metasys - Events or Alarm Bar.

To enable the alarm pop-ups feature of the Alarms Window, select the Enable Alarm Pop-Ups check box from the View menu.

To disable the alarm pop-ups feature of the Alarms Window, remove the selection from the Enable Alarm Pop-Ups check box from the View menu.

**Note:** You can perform this task only if you have permission to disable the alarm pop-ups feature.

**Note:** A dashed box appears around the alarm status bar icon,  / , when the alarm pop-ups are disabled. If you click the icon, alarm pop-ups are automatically re-enabled, and the Alarms Window appears if applicable.

**Note:** By default, alarm pop-ups are enabled every time you log into the system.

### Running Reports

You must be in online [mode](#) to run a report. Follow the steps in this procedure to run one of the predefined reports (alarm, offline, disabled, operator override, and supervisory override). To schedule a report on an ADS/ADX, see [Creating a New Scheduled Report](#) in the [Scheduled Reports](#) section.

To run a [report](#):

1. Select the single supervisory device (Engine or ADS/ADX), multiple supervisory devices, or the entire site in the navigation tree that you want to query.
2. From the menu bar, click Query and select the type of report you want to run (Alarm Report, Offline Report, Disabled Report, Operator Override Report, or Supervisory Override Report). The Report Viewer appears in the default display panel.

**Note:** If you did not select a supervisory device or site, a message box appears. Click OK, select a supervisory device or site, and repeat [Step 2](#).

3. View the results of the report.

## Printing

1. Select the [Navigation Tree](#) or [display panel](#) you wish to print.

**Note:** You must select either the navigation tree or a display panel to enable Print. If you selected a display panel, the entire contents of the visible display panel prints out. If you selected the navigation tree, all visible parts of the tree print out (even parts of the tree that you need to scroll to view). Collapsed parts of the tree (not visible in the tree) do not print. You cannot print the contents of the [Alarms Window](#).

2. Select Page Setup from the Item Menu if you wish to change the paper, orientation, or margin size. Click OK when done.
3. Select Print Preview from the Item Menu to see what the printout looks like. Click Print or click OK and go on to [Step 4](#).
4. On the [Item Menu](#), select Print.

**Note:** If the panel you selected is not printable, Print is disabled.

## Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE

For sites with MVE installed, configure the following attributes in the Site object for MVE annotations and electronic signatures:

- [Annotation Include](#)
- [Annotation Exclude](#)
- [Annotation Alarm Priority Threshold](#)
- [Signature Include](#)
- [Signature Exclude](#)
- [Signature Alarm Priority Threshold](#)

These settings appear only on MVE sites. See the [Site Object](#) section for details on these attributes.

You can require annotations, electronic signatures, both, or neither on an MVE site. Non-MVE sites may optionally define and use annotations; however, electronic signatures are specific to MVE sites. For information on annotation and electronic signature preferences, see [Annotation Settings Tab](#) and [Electronic Signature Settings Tab](#) in the [Preferences](#) section. Also see [Audit Message Annotations](#) in [Audit Trails](#) for information on the fields in an annotation.

For additional information, refer to the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

## Working with Items

In addition to the procedures in this section, see also [Creating items](#) and [Exiting](#).

### Navigating to an Item

To navigate to and select an item, click the plus (+) and minus (-) signs in the [Navigation Tree](#) to expand and collapse folders until the desired item appears on the tree.

**Note:** Use the Ctrl or Shift key to select multiple items.

**Note:** For information about how to display information about the item, see the [Displaying Information About an Item](#) section.

### Displaying Information About an Item

To display information about an item you selected in the navigation tree:

Do one of the following and click the desired [tab](#):

- Drag and drop the item from the navigation tree into a [display panel](#).
- Select an item in the navigation tree, open the [View Menu](#) and click Selected Item. The data displays in the default display frame.



- Double-click the item in the navigation tree; it displays in the default display panel.
- Right-click an item in the navigation tree or a feature in the display panel (such as Global Search or a Tailored Summary) and select View.

**Note:** When you display information in a panel that already contains data, the older data is replaced and added to the panel history. To access up to five previously displayed items in the panel history, click the back [button](#) in the display panel.

**Note:** If all available panels are locked and you try to display information about an item, a message appears stating that all panels are locked. Click OK and unlock a panel to display other item information.

### **Editing Items**

**Note:** To edit items in the User Graphics Tool (UGT), see [User Graphics Tool \(UGT\)](#).

**Note:** In online mode with [Basic Access](#), you can edit only the Schedule and Calendar objects.

**Note:** The term edit refers to changing items using the Edit button as described in this procedure. The term modify refers to changing items using the Modify menu item and the Modify dialog box. See the [Modify Dialog](#) section.

To edit the attributes of an item:

1. View the details of the item in a [display panel](#).
2. Select the desired item [tab](#) (for example, Focus).

**Note:** Some items contain an Advanced radio button. If you select this button, additional attributes appear.

3. Click Edit.
4. Edit the attributes as needed.

**Note:** If you place your cursor over an edit field, the ToolTip provides information about the valid format or range for that value. ToolTips also appear for strings.

5. Click Save.

For information on using the Modify dialog box to modify single or multiple items, see the [Modify Dialog](#) section.

### **Commanding Items**

**Note:** You must be in online [mode](#) to issue commands to items.

To send a command to an item in a graphic, see the [User Graphics Tool \(UGT\)](#) section.

To send a command to a single item, see [Commanding an Item](#) in the [Commands Dialog](#) section.

To send a command to multiple items, see [Commanding Multiple Items \(Global Command\)](#) in the [Commands Dialog](#) section.

### **Annotating Objects/Items**

**Note:** In online mode with Basic Access, you cannot add an annotation to an object or item.

This feature allows you to enter follow-up comments for actions taken on this object or item, such as what the user did to fix a problem, what was fixed, or when an override was released.

To annotate objects/items:

1. Select the object/item to annotate in the navigation tree (All Items or User View).

**Note:** You cannot add an annotation for a folder.

2. On the Action menu, select Add Annotation.
3. Select or type annotation text. Annotation text can be from 1 to 255 characters.

**Note:** The Predefined Annotations List on the Add Annotation dialog box contains annotations saved in your system preferences. If you have not defined annotations in your system preferences, the drop-down list is empty.

4. Click OK to save the annotation.

See [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#).

### **Viewing Annotations for Objects/Items**

To view annotations for objects/items:

1. Select the object/item to view in the navigation tree (All Items or User View).

**Note:** Folders cannot have annotations.

2. On the Action menu, select View Annotations.

See [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#).

### **Deleting Objects/Items**

**Note:** In online mode with [Basic Access](#), you can delete only Schedule and Calendar objects.

To delete objects/items:

1. Select the object/item you want to delete in the All Items navigation tree. This option is not available in user views.
2. On the Edit menu, select Delete Items.

**Note:** You cannot select an object/item in the display frame and delete it from the system. You can only delete objects/items by selecting them in the navigation tree.

**Note:** After deleting objects/items in the online mode, perform an [upload](#) to store the updated system configuration in the archive. After deleting objects/items in offline mode using the SCT, perform a download to update the online configuration of the device.

**Note:** For information on removing offline devices from the Site Director device list, see the [Action Menu, Remove From Site](#) section.

### **Logging Out**

Save changes before logging out. Logging out closes all open windows (except the login screen and Help) associated with the session, including the Alarms Window. If your system is configured with a timed logout, the system times out after a specific period of [inactivity](#). For more information on exiting, see [Exiting](#).

To log out, click the Logout button in the [menu bar](#).

If you are an Active Directory service user who accessed the Metasys system via automatic login and want to access the Metasys system again in the same manner, close the login screen and navigate to the Metasys URL. Otherwise, you can enter your Active Directory service user name and password and select your Active Directory service domain at the login screen to regain access to the Metasys system.

**Note:** If you are currently editing an object/item in a display panel, the Metasys software aborts the logout process and displays a dialog box notifying you that you cannot exit or log out while in Edit mode. You must exit Edit mode by saving or cancelling your changes before you can log out of the application.

### **Exiting**

Save changes before exiting. Exiting closes all open windows (except the Help) associated with the session, including the Alarms Window, and login screen. For more information on logging out, see the [Logging Out](#) topic.

To exit, click the Exit button in the menu bar.

**Note:** If you are currently editing an object/item in a display panel, the Metasys software aborts the exit process and displays a dialog box notifying you that you cannot exit or log out while in Edit mode. You must exit Edit mode by saving or cancelling your changes before you can exit the application.

# Preferences

The Metasys system provides customized preferences for the UI. The preferences allow you to configure how the UI behaves, including the sounds and colors, the startup views, alarm priorities, and the ability to add links to external applications that can be accessed from within the UI.

Some of the preferences defined in the Metasys Preferences dialog box also apply to the Ready Access Portal UI. The [Metasys Preferences Dialog Box](#) section calls out such preferences.

**Note:** Preferences do not persist after an upgrade unless you take manual steps to save the settings before you begin a system upgrade. Refer to the *ADS/ADX Commissioning Guide (LIT-1201645)* or the *NAE Commissioning Guide (LIT-1201519)* for details.

## Preferences Concepts

### System and User Preferences

Preferences are divided into two categories: system preferences and user preferences.

#### System Preferences

System preferences apply to all users who log in to the site or device. System preferences affect the performance and operation of the system and require authorization to configure. Changes to the audible alarm notification is an example of a system preference.

Only the users defined in the [Users Authorized to Edit System Preferences](#) section are authorized to configure system preferences.

To synchronize system preferences within a site or to reuse the system preferences on another site, refer to the *Configuring and Managing Preferences* appendix of the *NAE Commissioning Guide (LIT-1201519)* or *ADS/ADX Commissioning Guide (LIT-1201645)*.

#### User Preferences

User preferences apply to a specific Metasys system user. User preferences define how the information is displayed in the UI, and do not affect the operation for other users of the system. The colors and marker styles of a trend display are examples of user preferences.

To synchronize user preferences within a site or to reuse the user preferences on another site, refer to the *Configuring and Managing Preferences* appendix of the *NAE Commissioning Guide (LIT-1201519)* or *ADS/ADX Commissioning Guide (LIT-1201645)*.

### Users Authorized to Edit System Preferences

Any user whose account is assigned to the Administrator role is authorized to configure system preferences.

### Metasys Preferences Dialog Box

The Metasys Preferences dialog box is accessed through the Tools menu (Configure Preferences) and allows you to configure system and user preferences. Users authorized to edit system preferences can edit all preference fields using the Metasys Preferences dialog box. See [Users Authorized to Edit System Preferences](#). Unauthorized users can edit only user preferences.

Some of the preferences defined in the Metasys Preferences dialog box also apply to the Ready Access Portal UI. The following table calls out the tabs with such preferences. See the specific tab section for details.

Click the tab name in the table for a description of the Metasys Preferences tabs. For more information on the modes of operation, see [Metasys Modes](#). The Authorization Required column means you must be authorized to edit some or all of the preferences located on that tab.

**Table 9: Metasys Preferences Dialog Box Tabs**

Tab	Mode Visible In				Applies to Ready Access Portal UI	Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline SCT	Simulation <sup>1</sup>		
<a href="#">Information Tab</a>	X	X	X			
<a href="#">Alarm Settings Tab</a>	X	X			X	X
<a href="#">Trend Settings Tab</a>	X	X				
<a href="#">Graphic Settings Tab</a>	X	X	X		X	X
<a href="#">Display Settings Tab</a>	X	X	X <sup>2</sup>		X	X
<a href="#">Applications Tab</a>	X	X	X			
<a href="#">Electronic Signature Settings Tab<sup>3</sup></a>	X	X				
<a href="#">Annotation Settings Tab</a>	X	X				

1 Simulation mode uses the default preferences. Preferences are not configurable in Simulation mode.

2 Only settings that apply to the SCT are available.

3 This tab appears only for MVE installations.

**Information Tab**

The Information tab displays messages regarding the current state of the preferences. This tab does not contain configurable preferences.

**Alarm Settings Tab**

The Alarm Settings tab allows you to configure up to 10 alarm priority groups, each with a unique sound and a unique color. The groups are based on the priority of the alarm. The Alarm Settings tab also allows you to specify the alarm sound interval. The alarm settings are system settings and therefore can be edited only by [Users Authorized to Edit System Preferences](#).

These alarm settings apply to the Site Management Portal UI (online mode). The alarm color preferences also apply to the Ready Access Portal UI.

The alarm sound files can be Audio (.au) or Wave (.wav) files.

Alarm sound files must be placed manually into the audio folder. Refer to the *Configuring and Managing Preferences* appendix of the *NAE Commissioning Guide (LIT-1201519)* or *ADS/ADX Commissioning Guide (LIT-1201645)* for details. The Metasys system validates that the audio file exists on the device and is in a supported format. If the audio file does not exist or is not a supported format, the UI marks the audio file red. If the specified sound file for a particular range of alarm priorities is missing, the UI uses the default system beep for those alarm priorities. The UI uses the specified sound files for other alarm priorities if their sound files exist.

The Alarm Settings tab controls the sounds made by the Metasys system when an alarm is received; however, the sound settings of the client computer control the volume of the audible alarms.

**Note:** The client computer can only play sound files if a sound card is installed on it. If the UI does not detect an installed sound card, it uses the default system beep, regardless of whether sound files are specified and available.

**Note:** To hear alarm notifications, you must also have Enable Audio Alarm selected in your [User Profile](#).

The following table describes the attributes of the Alarm Settings tab.

**Table 10: Alarm Settings Tab**

Field Name	Description
<b>Alarm Sound Interval</b>	Sets the audible alarm beeping time delay in seconds.
<b>Use Default System Beep</b>	Specifies whether the system uses sound files with the four level alarming feature or the system uses the default system beep.
<b>Event viewer uses translucent colors</b>	When true, the event viewer displays the event with a background color that is a slightly translucent version of the color specified for the priority level. The color that appears in the Alarm window is not affected by this field.
<b>Insert Button<sup>1</sup></b>	Allows you to add and define up to 10 total priority levels.
<b>Delete Button</b>	Allows you to remove priority levels.
<b>Priority</b>	<p>Indicates the range of priorities of each priority level. The number of priorities is adjustable, but in each case, the first priority begins at 0 and the next range begins one number higher than where the previous range stopped, up to 255.</p> <p>For example, the following describes the priority ranges if you had 4 priority levels:</p> <ul style="list-style-type: none"> <li>• The Level 1 range starts at priority 0 and ends at the number configured here. The default Level 1 range is 0–39.</li> <li>• The Level 2 range starts at priority Level 1 + 1 (39 + 1 = 40) and ends at the number configured here. The default Level 2 range is 40–79.</li> <li>• The Level 3 range starts at priority Level 2 + 1 (79 + 1 = 80) and ends at the number configured here. The default Level 3 range is 80–139.</li> <li>• The Level 4 range starts at priority Level 3 + 1 (139 + 1 = 140) and ends at the number configured here. The default Level 4 range is 140–255.</li> </ul>
<b>Audio File<sup>1,2</sup></b>	Indicates the sound file that plays for each priority level when an alarm comes in. The default files for levels 1 through 4 are alarm1.wav, alarm2.wav, alarm3.wav, and alarm4.wav, respectively.
<b>Color</b>	Allows you to customize the background color and text color for each priority level. The color you specify here appears in the alarms window and in the event viewer.


1 If you click the Insert button, you can add priority levels. In this case, you can have more than four priority levels.

2 The sound files on a device are only used by the UI when you are directly logged in to that device. If a sound file is missing from the device, the Metasys system uses the default system beep in its place.



**Trend Settings Tab**

The Trend Settings tab allows you to configure the number of trends to display, the number of samples to display, and other trending chart options. The following table describes the attributes of the Trend Settings tab.

**Table 11: Trend Settings Tab**

Field Name	Description
<b>Maximum samples to display</b>	Indicates the maximum number of new and historical trend samples shown in a Trend Display or Trend Study. This attribute allows you to reduce the amount of memory used by the UI for each trend. The range is 100–6,000. The default value is 6,000.
<b>Number of initial visible trends</b>	Indicates the initial number of trends that are marked Visible within the Trend Viewer or Trend Study. The range is from 1 to the value of the Maximum number of visible trends attribute. The default value is 6.
<b>Maximum number of visible trends</b>	Indicates the maximum number of trends that can be marked Visible within the Trend Viewer or Trend Study. The range is from 1 to 10. The default value is 10.
<b>Default chart background color</b>	<p>Indicates the default background color of trend charts. The default color is light gray.</p> <p>Click  to access the Select a Color dialog box. The Select a Color dialog box allows you to select a custom color from three color palettes and to preview the color for the attribute.</p>

**Table 11: Trend Settings Tab**


Field Name	Description
<b>Default chart grid color</b>	Indicates the default color of the grid lines of trend charts. The default color is white.  Click  to access the Select a Color dialog box. The Select a Color dialog box allows you to select a custom color from three color palettes and to preview the color for the attribute.
<b>Default line style</b>	Allows you to select what type of gridlines appear on the chart. You can choose: None, X and Y, X Only, and Y Only. The default value is None.
<b>Legend initially collapsed</b>	Indicates whether the trend legend is collapsed when the Trend Viewer or a Trend Study is initially opened. This attribute allows you to maximize screen space for viewing trend charts. The default value is False.
<b>Line</b>	Indicates the line on the chart to which the settings apply.
<b>Line Color</b>	Allows you to customize the color of the line.  Click  to access the Select a Color dialog box. The Select a Color dialog box allows you to select a custom color from three color palettes and to preview the color for the attribute.
<b>Line Marker</b>	Opens a drop-down menu and allows you to select a marker type for the line.

**Graphic Settings Tab**

The Graphic Settings tab allows you to configure the status colors, fan colors, and state colors that appear in standard and dynamic graphics, along with alarm flashing settings. These settings apply to the Site Management Portal UI (online mode), SCT, and the Ready Access Portal UI. The status color settings may also be used by summaries or other views (Tailored Summaries, for example), to provide a consistent indication of an object's status.

The following table describes the attributes of the Graphic Settings tab.

**Table 12: Graphic Settings Tab**

Field Names/Attribute	Description
	Click this button to access the Select a Color dialog box. The Select a Color dialog box allows you to select a custom color from three color palettes and to preview the color for the attribute.
<b>Status Colors</b>	The Status Colors apply to value boxes, cells in Tailored Summaries, basic shapes (circle, triangle, and square), and the Room Status symbol used in floor plan based graphics. See the <a href="#">Analog Alarm Extension</a> for details on how these states are calculated.
<b>Normal</b>	Specifies the color used to indicate a status of Normal. The default color is white: RGB(255,255,255).
<b>Out of Service</b>	Specifies the color used to indicate a status of Out of Service. The default color is light brown: RGB(153,79,12).
<b>Overridden</b>	Specifies the color used to indicate a status of Overridden. The default color is orange: RGB(255,142,25).
<b>Trouble/Warning</b>	Specifies the color used to indicate a status of Trouble, Low Warning, High Warning, or Sensor/Actuator Bus (SAB) Device Warning. The default color is yellow: RGB(255,255,0).
<b>Offline</b>	Specifies the color used to indicate a status of Offline. The default color is black: RGB(0,0,0).
<b>Value Inaccessible</b>	Specifies the color used to indicate a status of an inaccessible value (for example, communications failed). The default color is gray: RGB(190,190,190).
<b>Alarm</b>	Specifies the color used to indicate a status of High Alarm, Low Alarm, Alarm, or SAB Device Alarm. The default color is red: RGB(255,0,0).
<b>Above Setpoint</b>	Specifies the color used to indicate a status of Above Setpoint. The default color is pink: RGB(191,0,95).
<b>Below Setpoint</b>	Specifies the color used to indicate a status of Below Setpoint. The default color is blue: RGB(0,0,255).
<b>Unoccupied</b>	Specifies the color used to indicate an Unoccupied status. The default color is dark gray: RGB(150,150,150).

**Table 12: Graphic Settings Tab**

<b>Field Names/Attribute</b>	<b>Description</b>
<b>Fan Status</b>	The Fan Status colors allow you to customize the fan status color of the attribute that appears in system graphics. The Fan Status colors apply only to fans.
<b>Stopped</b>	Defines the background color used for a fan symbol when its bound object's value indicates the fan is stopped.  Stopped is defined as State 0 (for binary/multistate objects) or as zero (for analog objects).  The default color is red: RGB(255,0,0).
<b>Running</b>	Defines the background color used for a fan symbol when its bound object's value indicates the fan is running.  Running is defined as State 1+ (for binary/multistate objects) or as non-zero (for analog objects).  The default color is green: RGB(0,153,51).
<b>Default State Colors</b>	The Default State Colors settings allow you to customize the default state color of the attribute that appears in system graphics. The Default State Colors apply to basic shapes (circle, triangle, square) that are bound to a binary/multistate object. These default state colors can be changed for each shape after it is added to a graphic.
<b>State 0</b>	Specifies the color used for the State 0 setting of a dynamic graphic symbol. The default color is white: RGB(255,255,255).
<b>State 1</b>	Specifies the color used for the State 1 setting of a dynamic graphic symbol. The default color is green: RGB(0,153,51).
<b>State 2</b>	Specifies the color used for the State 2 setting of a dynamic graphic symbol. The default color is red: RGB(255,0,0).
<b>State 3</b>	Specifies the color used for the State 3 setting of a dynamic graphic symbol. The default color is blue: RGB(0,0,255).
<b>All Other States</b>	Specifies the color used for the All Other States setting of a dynamic graphic symbol. The default color is light gray: RGB(204,204,204).
<b>Simple Symbol Flash Settings</b>	The Simple Symbol Flash settings allow you to customize simple UGT shapes (such as circles and squares) to flash when their bound object is in alarm.
<b>Flash Type</b>	Defines the type of flashing applied to basic shape symbols: <ul style="list-style-type: none"> <li>• Disabled (No Flashing)</li> <li>• State Color/Alarm Color (Flashes between the State Color and Alarm Color)</li> <li>• State Color/Alternate Color (Flashes between the State Color and Alternate Color)</li> </ul> The default value is 0: Disabled (No Flashing).
<b>Alternate Flash Color</b>	Defines the color used when flashing between the current color and an alternate flash color. The default color is white: RGB(255,255,255).
<b>Flash Rate</b>	Defines the flash rate for graphics symbol flashing. The range is from 100 to 1,000 ms. The default value is 250 ms.

**Display Settings Tab**

The Display Settings tab allows you to configure other properties related to the UI display. These settings apply to the Site Management Portal UI (online mode) and the SCT. In addition, the New entry timeframe setting applies to the Ready Access Portal UI.


The following table describes the attributes of the Display Settings tab.

**Table 13: Display Settings Tab**

Field Name	Description
<b>View Settings</b>	
<b>Server time synchronization interval</b>	Specifies how often (in minutes) the local time is synchronized with the server time. The range is 5–60 minutes. The default value is 30 minutes.
<b>Hide unauthorized commands</b>	Indicates whether the Command window hides the unauthorized commands for the logged in user. The default value is False, in which case the unauthorized commands are grayed out.
<b>New entry timeframe</b>	Indicates the amount of time audits/events are considered new (based on their time of occurrence in the Metasys system). The default value is 15 minutes. New audits/events are marked with a blue star in the Event Viewer and Audit Viewer.
<b>Maximum results in global search</b>	Indicates the maximum number of rows displayed in the Global Search results view if the Site Director is an NAE. The range is 10–500 and the default value is 100.  In the Site Director is an ADS/ADX, the range is 10–2,000 and the default value of 1,000.  <b>Note:</b> Increasing the number of results in global search may have a negative impact on performance.
<b>Print Settings</b>	
<b>Default paper size</b>	Specifies the default paper size (Letter or A4) to be used for printing. The default value is Letter.
<b>General Display Settings</b>	
<b>Default to Advanced View</b>	Indicates whether the Advanced View is the default view when opening an item in the display panel or a wizard. The default value is False.  If the user is not authorized to access the Advanced View, the Advanced View is not shown.
<b>Extended Labels enabled on Login</b>	Indicates whether extended labels are displayed in the navigation tree on login. The default value is False.
<b>Default command set</b>	Specifies which types of commands are shown by default when the Command window opens. The options are All Commands (default), Primary Commands, Secondary Commands, and Alarming Commands.  <b>Note:</b> We recommend using Primary Commands as the default command set to reduce errors by lower level operators.
<b>Default schedule display</b>	Indicates the initial display mode shown in the scheduling feature: <ul style="list-style-type: none"> <li>• Today's Schedule (default)</li> <li>• Weekly Schedule</li> <li>• Exception Schedule</li> <li>• Scheduled Items</li> </ul>
<b>Default navigation display</b>	Specifies the User View navigation display as either a set of tabs (Tabbed) or a drop-down list (List). The default is Tabbed.  <b>Note:</b> List is recommended if the system has many user views, as this takes up less space in the navigation tree pane.
<b>Collapse navigation frame on login</b>	Specifies that upon login, the navigation tree collapses to the left (True or False). The default is False.




**Table 13: Display Settings Tab**

Field Name	Description
Default display panel layout	Specifies the <i>Display Frame Layout</i> that is displayed at login. The default panel layout is Single Panel.
Startup item 1–4	<p>Defines up to four startup views, which are automatically displayed at login. The number of views that can be displayed is based on the Default display panel layout.</p> <p><b>Note:</b> Aliased graphics do not display properly if selected as a startup item. Specify the main graphic instead.</p> <p>Click  to access the Select Item dialog box. Select the item you want to appear in the panel upon login and click OK.</p> <p><b>Note:</b> Login time is increased when startup views are specified.</p>

**Applications Tab**

The Applications tab allows you to specify links to external applications, such as a spreadsheet or Microsoft Word document, that can be launched from the Tools menu or from within graphics. The following table describes the attributes of the Applications tab.

**Table 14: Applications Tab**

Field Name	Description
Add button	<p>Allows you to add a new external application that can be accessed from within the Site Management Portal (SMP) UI. Once you click Add, the lower pane allows you to enter application information. If you are authorized to change system preferences, an Add Application dialog box appears first and allows you to specify whether the application is to be a system or user preference.</p> <p><b>Note:</b> If you are not authorized to change system preferences, the application is automatically added as a user preference.</p> <p>For more information, see <i>System and User Preferences</i>.</p>
Remove button	Removes the selected application from the list.
Application Name	Enter the name of the application as you want it to appear on the Tools menu or within graphics.
Application Path	<p>Enter the full path of the application, including the command line arguments. The path is based on the local file system (where you are browsing from), not on the path of the device you are logged in to. The application path can also use any mapped network drives.</p> <p>Click  to access a Browse dialog box and select the application and path.</p> <p>To launch a specific file, select the path to the application that opens the file, followed by a space and the path to the specific file in quotation marks. Use the following format:</p> <p>C:\Application Path\Application.exe "C:\filename path\filename.extension"</p> <p>For example, to launch a Microsoft Word document named Worksheet_01:</p> <p>C:\Program Files\Microsoft Office\OFFICE11\WINWORD.EXE "C:\Documents and Settings\username\Desktop\Worksheet_01.doc"</p> <p><b>Note:</b> The Application you add is specific to the computer you are using when you add it. The application may not launch from a different computer unless the application exists on that computer in the same location.</p>
Tools Menu	<p>Indicates whether the application appears on the Tools menu in the SMP UI. Select True (default) to have the application appear on the Tools menu. Select False if you do not want it to appear on the Tools menu. See <i>Tools Menu</i>.</p> <p><b>Note:</b> You must log off the SMP UI and then log back on for new items to appear in the Tools menu.</p>

**Table 14: Applications Tab**

Field Name	Description
<b>Graphics</b>	Indicates whether the application can be hyperlinked to and launched by a button in a standard graphic. The application name you specify appears on the Hyperlink Information Application drop-down menu for buttons in graphics. See <a href="#">Buttons</a> . Select True to enable this functionality. Select False (default) if you do not want the application to be available for graphics.  <b>Note:</b> This hyperlink capability is supported in the <a href="#">Graphics+</a> as well as the <a href="#">User Graphics Tool (UGT)</a> .
<b>Mnemonic</b>	Allows the application to be launched from a navigation key.  For example, if you add the Calculator to the Tools menu and specify the letter C as the mnemonic, you can access the Calculator in the following way:  From the SMP UI, press Alt+T to access the Tools menu. Press C to highlight Change Password. Press C again to highlight the Calculator application. Press Enter to start the Calculator application.
<b>Type</b>	Specifies whether the application is available for the system or the user. This is specified when you first click Add to add a new application to the list. Once specified, this attribute cannot be changed.

**Electronic Signature Settings Tab**

The Electronic Signature Settings tab appears only for MVE installations. This tab allows you to define reasons for electronic signature requirements.

MVE sites have settings in the [Site Object](#) for enabling annotation and electronic signature functionality. You can set the MVE site to require only annotations, only electronic signatures, both annotations and signatures, or neither annotations nor signatures. Non-MVE sites may optionally define and use annotations; however, electronic signatures are specific to MVE sites.

You can configure electronic signatures at the device and object levels. [Table 15](#) describes the attributes of the Electronic Signature Settings tab.

**Table 15: Electronic Signature Settings Tab**

Field Name	Description
<b>Reason Text</b>	Enter a new reason for electronic signature requirement, to be added to the list of predefined reasons. The text can be from 1 to 255 characters in length. Click Add to save the new reason.  Predefined reasons are Approval, Author, Required, Cause, and Operator Action. These reasons can be edited or deleted.
<b>Predefined Reason List</b>	Displays the list of predefined reasons. Select a reason and click Delete to remove the reason from the list. The Move Up and Move Down buttons allow you to reorder the list.

For additional information, refer to the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

**Annotation Settings Tab**

The Annotations Settings tab allows you to define customized annotations to select when acknowledging and discarding events.

MVE sites have settings in the [Site Object](#) for enabling annotation (and electronic signature) functionality. You can set the MVE site to require only annotations, only electronic signatures, both annotations and signatures, or neither annotations nor signatures. Non-MVE sites may optionally define and use annotations; however, electronic signatures are specific to MVE sites.

We recommend that you define custom annotations specific to your needs, in addition to the predefined annotations. When the new Annotation Settings are saved in an MVE system, the new annotation selections are available to users when they electronically sign for changes.

You can configure annotations at the device and object levels. See [Audit Message Annotations](#) in [Audit Trail](#) for details on annotation fields. Also see [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#).

Table 16 describes the attributes of the Annotation Settings tab.

**Table 16: Annotation Settings Tab**

Field Name	Description
<b>Annotation Text</b>	Enter a new annotation to be added to the list of predefined annotations. The text can be from 1 to 255 characters in length. Click Add to save the new annotation.  Predefined annotations can be edited or deleted.
<b>Predefined Annotation List</b>	Displays the list of predefined annotations. Select a reason and click Delete to remove the annotation from the list. The Move Up and Move Down buttons allow you to reorder the list.

For additional information, refer to the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

# Menus

The menu layout is the same in the Online, Offline, and Simulation modes. The mode of operation determines which items appear in the menus. For more information on the modes of operation, see [Metasys Modes](#).

## Menu Concepts

### Metasys Modes

See the [Metasys Modes](#) topic in the [Site Management Portal User Interface](#) section.

### Authorized Menu Items

Access to particular menu items not only depends on the mode of operation ([Metasys Modes](#)), but also on the defined System Security and Authorization (Access Control) that provides users with appropriate levels of access to the Metasys system. Use the Security Administrator System to set Authorization and System Security.

In each menu table, a check in the Authorization Required column means you must be authorized to perform that action for that particular item. See the table in the [Item Menu](#) section.

### Item Menu

Click the menu item below for a description of the menu item. For more information on the modes of operation, see [Metasys Modes](#). For a description of the Authorized Required column, see [Authorized Menu Items](#).

Table 17: Item Menu

Menu Item	Mode Visible In				Authorization Required <sup>1</sup>
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">New Archive</a> Ctrl+N			X		
<a href="#">Open Archive</a> Ctrl+O			X		
<a href="#">Close Archive</a> Ctrl+F4			X		
<a href="#">Create Archive Copy</a>			X		
<a href="#">Delete Archive</a>			X		
<a href="#">Export Item</a>			X		
<a href="#">Import Item</a>			X		
<a href="#">Page Setup</a>	X	X	X	X	
<a href="#">Print Preview</a>	X	X	X	X	
<a href="#">Print</a> Ctrl+P	X	X	X	X	

<sup>1</sup> System Access-Based Privileges gives users with Standard Access the following privileges: Access to SCT, Configure and Simulate using the SCT, Passthru mode, and Import Integration. Gives Users with Basic Access permission to use Passthru mode. Basic Access and Tenant Access users do not have access to the SCT.

### Close Archive

**Menu Selection:** Item > Close Archive

Closes an open archive in the SCT.

### Edit Menu

Click the menu item below for a description of the menu item. For more information on the modes of operation, see [Metasys Modes](#). For a description of the Authorized Required column, see [Authorized Menu Items](#).

**Table 18: Edit Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Copy</a> Ctrl+C			X		
<a href="#">Paste</a> Ctrl+V			X		
<a href="#">Delete Items</a> Delete	X	X <sup>1</sup>	X		X

1 When in online mode with Basic Access, you can delete only Schedule and Calendar objects.

**Copy**

**Menu Selection:** Edit > Copy

Copies the selected item to the clipboard in the SCT.

For details on copying and pasting items, see [Paste Item Wizard](#).

**Paste**

**Menu Selection:** Edit > Paste

Pastes the clipboard contents to the user-specified location in the SCT.

For details on copying and pasting items, see [Paste Item Wizard](#).

**Delete Items**

**Menu Selection:** Edit > Delete Items

Deletes (removes) one or more items selected in the All Items navigation tree from the site.

For details on deleting items, see [Deleting Objects/Items](#).

**View Menu**

Click the menu item below for a description of the menu item. For more information on the modes of operation, see [Metasys Modes](#). For a description of the Authorized Required column, see [Authorized Menu Items](#).

**Table 19: View Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Selected Item</a>	X	X	X	X	
<a href="#">Event Viewer</a>	X	X		X	X
<a href="#">Audit Viewer</a>	X				X
<a href="#">Trend Viewer</a>	X	X		X	
<a href="#">Scheduled Reports<sup>1</sup></a>	X				
<a href="#">ActionQ</a>			X		
<a href="#">Change Results</a>	X	X	X	X	
<a href="#">Upgrade Log</a>			X		
<a href="#">Extended Labels</a>	X	X	X	X	
<a href="#">Product Version Labels</a>			X		
<a href="#">Validation Labels/Settings<sup>2</sup></a>	X	X	X	X	

**Table 19: View Menu**

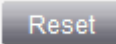
Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<i>Enable Alarm Pop-Ups</i>	X	X		X	
<i>Panel Layout</i>	X	X	X	X	
Single Panel	X	X	X	X	
Two Panel Horizontal	X	X	X	X	
Two Panel Vertical	X	X	X	X	
Three Panel Horizontal	X	X	X	X	
Three Panel Vertical	X	X	X	X	
Four Panel	X	X	X	X	

1 Available on the ADS/ADX only.

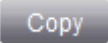
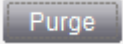
2 This selection is Validation Labels in the online UI (MVE only) and Validation Settings in the SCT UI.

**Upgrade Log**

**Menu Selection:** View > Upgrade Log

Use this viewer to see the results of archive database upgrade activities. The Upgrade Log View in the SCT displays log message types that are selected from the type options (Information, Warning and/or Error). A valid time range is selected in the Date Range area and can be reset by pressing the  button. Available archives can be selected in the Archives area.

The entries are displayed in table format with type, date, archive, version, message, and source columns. Warning entries are highlighted in yellow and errors entries are highlighted in red. To sort the rows in ascending or descending order, click the column headings. Highlight and double-click an entry to bring up the View Upgrade Log Entry dialog box. Navigational arrows allow you to navigate through entries forward and backward and from beginning to end.

Click the  button to copy one or more selected entries; copied entries can be pasted into Excel, WordPad or other similar application. Click the  button to delete selected entries in the upgrade log. Before purging entries, a dialog box appears warning you that this option clears all entries in the upgrade log and cannot be undone.

To refresh the upgrade log view, right-click the panel header and click Refresh; or click the Action menu and click Refresh. Refresh also expands any columns that are not accommodating the text within.

**Extended Labels**

**Menu Selection:** View > Extended Labels (select the check box)

Toggles the display of the item labels in the All Items navigation tree or user navigation tree from standard to extended. An extended label shows the BACnet object name that was defined when the object was initially created in braces next to the standard label. This is the name used in the object's Fully Qualified Reference. The Metasys object name may be the same as the BACnet object name, or it may have been edited as a label that is more recognizable to the user.

Example:

Standard Label = N2 Trunk1

Extended Label = N2 Trunk1{N2-1}

**Product Version Labels**

**Menu Selection:** View > Product Version Labels (select the check box)

Toggles the display of the item labels in the All Items navigation tree or user navigation tree from standard to product version. A product version label shows the software revision of servers and engines in parentheses next to the standard label.

Example:

Standard Label = NAE-Building-1

Extended Label = NAE-Building-1 (6.0)

**Note:** Starting at Release 6.0, SCT allows you to maintain both 5.2 and 6.0 Engines in the sites archive. The Site Director for the archive has to be upgraded to 6.0, but all non-Site Director engines for the site can be left at 5.2 and can still be modified offline in the SCT and downloaded at Release 5.2.

### Enable Alarm Pop-Ups

**Menu Selection:** View > Enable Alarm Pop-Ups (select the check box to enable/disable alarm pop-ups)

For the current user session, this item determines if the pop-up Alarms Window (also referred to as Metasys - Events or Alarm Bar) automatically displays when an alarm is detected.

Clicking the alarm icon in the status bar re-enables alarm pop-ups and displays the current alarm, if any.

If you disable the alarm pop-up window and you have the audible alarm option enabled, the audible alarm sounds when an alarm is detected. See the [Alarms Window](#) section in the [Site Management Portal User Interface](#).

### Validation Labels/Settings

**Menu Selection:** View > Validation Labels (in the online UI), View > Validation Settings (in the SCT UI) (select the check box)

In the SCT, this setting toggles the display of the item labels in the All Items navigation tree or user navigation tree to show extra label information for MVE. When selected, this menu item also displays the Validation Settings attribute section for objects on the Focus/Configuration tab.

This setting has no effect in the online UI (the validation labels are always visible).

### Action Menu

In addition to the four [modes](#) of operation that determine the items appearing in menus, the Action menu is context specific. Different item specific options appear in the Action menu based on what is currently selected in the navigation tree. Also, different feature specific options appear in the Action menu based on the active [panel](#) or feature displayed in the selected [display panel](#).

The following table lists the menu items for the Action menu. For details on which options appear with certain items or features selected, see:

- [Action Menu - Item Specific](#)
- [Action Menu - Feature Specific](#)

Click one of the following menu items for a description of the menu item. For more information on the modes of operation, see [Metasys Modes](#). For a description of the Authorized Required column, see [Authorized Menu Items](#).

**Table 20: Action Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Command<sup>1</sup></a>	X	X		X	
<a href="#">Modify<sup>2</sup></a>	X		X		
<a href="#">Import Definition<sup>3</sup></a>	X		X		
<a href="#">Export Definition<sup>3</sup></a>	X		X		

**Table 20: Action Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Show Extensions</a>	X		X	X	X
<a href="#">Start Simulation</a>			X		
<a href="#">Rename</a>			X		
<a href="#">View Annotations<sup>4</sup></a>	X				
<a href="#">Add Annotation<sup>4</sup></a>	X				X
<a href="#">Refresh</a>	X	X	X	X	
<a href="#">Refresh Current Tab</a>	X	X	X	X	
<a href="#">Refresh All Tabs</a>	X	X	X	X	
<a href="#">Ack</a>	X			X	X
<a href="#">Discard</a>	X			X	X
<a href="#">Import Integration</a>	X		X		X
<a href="#">Remove From Site</a>	X				X

1 The commands in the Command dialog require authorization.

2 The attributes in the [Modify](#) dialog require authorization.

3 Available for the Summary Definitions folder in the All Items tree.

4 Available on the ADS/ADX only.

### **Rename**

**Menu Selection:** Action > Rename

Renames the selected Engine device in the SCT.

**Note:** When renaming an ADS/ADX, the name must match the host name of the PC on which the ADS/ADX will be installed.

**Note:** This rename option may take a while to complete because it changes the database references to the device.

### **View Annotations**

**Menu Selection:** Action > View Annotations

Displays the existing annotations for the selected item in the [Audit Viewer](#), [Event Viewer](#), Tailored Summary, Global Search results, Navigation Tree, and so on.

### **Add Annotation**

**Menu Selection:** Action > Add Annotations

Adds an annotation for the selected item in the [Audit Viewer](#), [Event Viewer](#), Tailored Summary, Global Search results, Navigation Tree, and so on.

### **Discard**

**Menu Selection:** Action > Discard

Clears selected entries from the audit log when the [Audit Viewer](#) is displayed.

### **Refresh**

**Menu Selection:** Action > Refresh

Refreshes the data displayed in the active [frame or panel](#) in the Event Viewer, Audit Viewer, Trend Viewer, and Scheduled Reports.



**Refresh Current Tab**

**Menu Selection:** Action > Refresh Current Tab

Refreshes the data displayed in the current tab of the active [frame or panel](#).

**Refresh All Tabs**

**Menu Selection:** Action > Refresh All Tabs

Refreshes the data displayed in all tabs of the active [display panel or the navigation frame](#).

**Ack**

**Menu Selection:** Action > Ack

Acknowledges the selected event(s) currently displayed in the [Event Viewer](#).

**Discard**

**Menu Selection:** Action > Discard

Discards the selected event(s) currently displayed in the [Event Viewer](#). Discards selected entries from the audit log when the [Audit Viewer](#) is displayed.

**Import Definition**

**Menu Selection:** Action > Import Definition

This command imports the pre-built summary definition that is stored on the computer and is only available when the Summary Definitions folder is selected in the All Items tree. After importing a [definition](#), the imported Summary Definitions appear in the Summary Definitions folder in the All Items tree.

**Note:** You also can import Summary Definitions that were previously exported. See the [Exporting a Summary Definition](#) section.

**Export Definition**

**Menu Selection:** Action > Export Definition

This command exports the summary definition that is stored in the Summary Definitions folder in the All Items tree to a location on the computer. You can now share the [Summary Definition](#) with others and import it to other sites as desired.

**Note:** If you import the Summary Definition to another site, you may need to update the key data references. See [Importing a Summary Definition](#) for more information.

**Import Integration**

**Menu Selection:** Action > Import Integration

This command is only available when an Integration under an engine is selected in the All Items tree. After adding an [Integration](#), you can select the integration in the navigation tree and use this menu selection to add existing devices and points under the integration.

**Remove From Site**

**Menu Selection:** Action > Remove From Site

Removes (deletes) the selected Engine device or ADS/ADX server from the Site. The selected Engine or ADS/ADX must be offline to use this option. You also can remove a device from the site in a Tailored Summary with Engine device data.

**Action Menu - Item Specific**

The following table describes the different menu items that appear in the Action menu based on what is currently selected in the navigation tree. Click each item for a description. For more information on the modes of operation, see [Metasys Modes](#).

**Table 21: Action Menu - Item Specific**

Item <sup>1</sup>	Contents In Mode			
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation
<i>ADS Device Object</i>	<ul style="list-style-type: none"> <li>• Modify</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Remove From Site</li> </ul>	<ul style="list-style-type: none"> <li>• Add Annotation</li> <li>• View Annotations</li> </ul>	<ul style="list-style-type: none"> <li>• Modify</li> <li>• Rename</li> </ul>	
<i>Integration</i>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Modify</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Show Extensions</li> <li>• Import Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Add Annotation</li> <li>• View Annotations</li> </ul>	<ul style="list-style-type: none"> <li>• Modify</li> <li>• Show Extensions</li> <li>• Import Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Show Extensions</li> </ul>
<i>Site Object</i>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Add Annotation</li> <li>• View Annotations</li> </ul>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Add Annotation</li> <li>• View Annotations</li> </ul>		<ul style="list-style-type: none"> <li>• Command</li> </ul>
<b>Supervisory Device (<i>Engine</i>)</b>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Modify</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Show Extensions</li> <li>• Remove From Site</li> </ul>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Add Annotation</li> <li>• View Annotations</li> </ul>	<ul style="list-style-type: none"> <li>• Modify</li> <li>• Show Extensions</li> <li>• Start Simulation</li> <li>• Rename</li> </ul>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Show Extensions</li> </ul>
<b>All Other Objects</b>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Modify</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Show Extensions</li> </ul>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Modify<sup>2</sup></li> <li>• Add Annotation</li> <li>• View Annotations</li> </ul>	<ul style="list-style-type: none"> <li>• Modify</li> <li>• Show Extensions</li> </ul>	<ul style="list-style-type: none"> <li>• Command</li> <li>• Show Extensions</li> </ul>

1 The Refresh Current Tab and Refresh All Tabs menu items appear in the Action menu for all of these items.

2 Available for only Schedule and Calendar objects.

**Action Menu - Feature Specific**

The following table describes the different menu items that appear in the Action menu based on the active *panel* or feature displayed in the selected *display panel*. Click each active panel or feature for a description. For more information on the modes of operation, see *Metasys Modes*.

**Table 22: Action Menu - Feature Specific**

Active Panel/Feature <sup>1</sup>	Contents In Mode			
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation
<i>Event Viewer</i>	<ul style="list-style-type: none"> <li>Refresh</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> <li>Ack</li> <li>Discard</li> </ul>	<ul style="list-style-type: none"> <li>Refresh</li> </ul>		<ul style="list-style-type: none"> <li>Refresh</li> </ul>
<i>Audit Viewer</i>	<ul style="list-style-type: none"> <li>Refresh</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> <li>Clear Audit Log</li> </ul>			<ul style="list-style-type: none"> <li>Refresh</li> <li>Clear Audit Log</li> </ul>
<i>ActionQ</i>			<ul style="list-style-type: none"> <li>Refresh</li> </ul>	
<i>Scheduled Reports</i> <sup>2</sup>	<ul style="list-style-type: none"> <li>Refresh</li> </ul>			
<i>Tailored Summary</i> <sup>3</sup>	<ul style="list-style-type: none"> <li>Command</li> <li>Modify</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> <li>Show Extensions</li> <li>Remove From Site<sup>4</sup></li> <li>Import Integration<sup>5</sup></li> </ul>	<ul style="list-style-type: none"> <li>Command</li> <li>Modify</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> </ul>		
<i>Trend Viewer</i>	<ul style="list-style-type: none"> <li>Refresh</li> <li>Command</li> </ul>	<ul style="list-style-type: none"> <li>Refresh</li> <li>Command</li> </ul>		<ul style="list-style-type: none"> <li>Refresh</li> <li>Command</li> </ul>
<i>Global Search Viewer</i>	<ul style="list-style-type: none"> <li>Refresh</li> </ul>	<ul style="list-style-type: none"> <li>Refresh</li> </ul>		<ul style="list-style-type: none"> <li>Refresh</li> </ul>
<i>Change Results Viewer</i> <sup>6</sup>				

1 The Refresh, Refresh Current Tab, and Refresh All Tabs menu items appear in the Action menu for all other features or active panels.

2 Available on the ADS/ADX only.

3 The menu options available are item specific (that is, they depend on the type of item selected in the *Tailored Summary* table and Key Data table).

4 Available for an Engine only.

5 Available for a Tailored Summary with trunk/integration data (for example, trunk diagnostics).

6 There are no Action menu options for this *feature* .

## Insert Menu

Click one of the following menu items for a description of the menu item. For more information on the modes of operation, see *Metasys Modes*. For a description of the Authorized Required column, see *Authorized Menu Items*.

**Table 23: Insert Menu**

Menu Item	Mode Visible In				Authorization Required <sup>1</sup>
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Site</a>			X		X
<a href="#">Supervisory Device</a>			X		X
<a href="#">Metasys Server</a>			X		X
<a href="#">Integration</a>	X		X		X
<a href="#">Field Device</a>	X		X		X
<a href="#">Field Point</a>	X		X		X
<a href="#">Folder</a>	X		X		X
<a href="#">Control System</a>	X		X		X
<a href="#">Object</a>	X	X <sup>2</sup>	X		X
<a href="#">Graphic</a>	X		X		X
<a href="#">Trend Study</a>	X		X		X
<a href="#">User View</a>	X		X		X
<a href="#">Summary Definition</a>	X		X		X

1 System Access-Based Privileges gives users with Standard Access the following privileges: Access to SCT, Configure and Simulate using the SCT, Passthu mode, and Import Integration. Gives Users with Basic Access permission to use Passthu mode. Basic Access and Tenant Access users do not have access to the SCT.

2 In online mode with Basic Access, the Insert Object wizard is limited to the Schedule and Calendar objects.

## Tools Menu

Click one of the following menu items for a description of the menu item. For more information on the modes of operation, see [Metasys Modes](#). For a description of the Authorized Required column, see [Authorized Menu Items](#).

**Table 24: Tools Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">User Profile</a>	X	X	X		X
<a href="#">Change Password</a>	X	X	X		X
<a href="#">Administrator</a>	X	X	X		X
<a href="#">Configure Preferences</a>	X	X	X		
<a href="#">All Items Organizer</a>	X		X		X
<a href="#">Database</a>			X		
<a href="#">Create Backup</a>			X		
<a href="#">Restore Backup</a>			X		
<a href="#">Re-index</a>			X		
<a href="#">Manage Archive</a>			X		
<a href="#">Field Device Tools<sup>1</sup></a>	X	X	X		X
<a href="#">HVAC PRO (N2)</a>	X	X	X		X

**Table 24: Tools Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
GX-9100 (N2)	X	X	X		X
XTM Configuration (N2)	X	X	X		X
DX Commissioning (N2)	X	X	X		X
N2 Device Loader (N2)	X	X	X		X
CCT (MSTP) <sup>2</sup>	X	X	X		X
<a href="#">Security Copy</a>			X		
<a href="#">Diagnostics</a>			X		
<a href="#">Archive Reports</a>			X		
Other Applications as Specified in <a href="#">Configure Preferences</a>	X	X	X		

1 The [Field Device Tools](#) menu selection replaces the N2 Tools menu selection available at Release 2.0 and earlier.

2 To use the Controller Configuration Tool (CCT) in Ethernet passthru mode, open CCT from the Tools > Field Device Tools > CCT (MS/TP) menu option.

### **User Profile**

**Menu Selection:** Tools > User Profile

Launches the current user's properties for managing the user's language, default navigation view, and other profile settings.

### **Change Password**

**Menu Selection:** Tools > Change Password

Changes the current user's password. The password you select must meet the requirements for complex passwords. For details, refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)*.

### **Administrator**

**Menu Selection:** Tools > Administrator

Launches the Security Administrator System. This menu item is only available for users in the ADMINISTRATOR role. Within the Security Administrator System, Administrators manage user accounts by creating roles/profiles; setting user passwords; assigning category-based, system-level, and navigation view permissions/access; and performing other duties. For details, see [Related Documentation](#).

### **Configure Preferences**

**Menu Selection:** Tools > Configure Preferences

Launches the Metasys [Preferences](#) dialog box.

The Metasys system provides customized preferences for the UI. The preferences allow you to configure how the UI behaves, including the sounds and colors, the startup view, and the ability to add links to external applications that can be accessed from within the UI.

### **All Items Organizer**

**Menu Selection:** Tools > All Items Organizer

Launches the Metasys All Items Organizer.

Allows an authorized user to specify the order of any items in the All Items tree. The user can order all devices below the site (for example, NxEs) and nodes within devices.

On a device (Release 5.2 or later) that is not a site director, the user can order the items within that device only. You cannot order nodes within devices at Releases earlier than 5.2.

**Create Backup**

**Menu Selection:** Tools > Database > Create Backup

Creates a backup file for the active archive database. If needed, the archive database can be restored using the Tools > Database > Restore Backup menu option. See the [Restore Archive Wizard](#).

The backup file is always named <archive>.backup, where <archive> is the name of the open archive visible at the top of the SCT navigation tree. Do not rename the backup file (renaming a backup file causes a subsequent restore to fail). To save different versions, copy the backup file to different subdirectories.

The default path is one of the following:

Windows XP® Operating System (OS): C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\DatabaseFiles

Windows 7 OS and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\DatabaseFiles)

**Re-index**

**Menu Selection:** Tools > Database > Re-index

Using the Re-index feature improves SCT performance against large archive databases. The Re-index feature removes fragmentation from the archive database. A clock appears during the re-indexing process.

**Note:** Re-index works against any size archive and is especially recommended for sites containing more than 100 NxEs.

**Archive Reports**

**Menu Selection:** Tools > Diagnostics > Archive Reports

Launches the two-tab Archive Report window in the SCT. Each tab generates a different archive report. The Statistics tab generates a .csv file of statistical archive data from the archive(s) selected in the archive list. The References tab generates a .csv file of unbound reference data from the archive(s) selected in the archive list.

**Query Menu**

Click one of the following menu items for a description of the menu item. For more information on the modes of operation, see [Metasys Modes](#). For a description of the Authorized Required column, see [Authorized Menu Items](#).

**Table 25: Query Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Alarm Report<sup>1</sup></a>	X	X		X	
<a href="#">Offline Report<sup>1</sup></a>	X	X		X	
<a href="#">Disabled Report<sup>1</sup></a>	X	X		X	
<a href="#">Operator Override Report<sup>1</sup></a>	X	X		X	
<a href="#">Supervisory Override Report<sup>1</sup></a>	X	X		X	
<a href="#">Global Search</a>	X	X			
<a href="#">Open Object List<sup>2</sup></a>	X	X			

**Table 25: Query Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Save Object List<sup>2</sup></a>	X	X			
<a href="#">Delete Object List<sup>2</sup></a>	X	X			
<a href="#">New Scheduled Report<sup>3</sup></a>	X				X

1 The content of this [report](#) is filtered based on authorization.

2 Available on the [Site Director](#) only.

3 Available on the [ADS/ADX](#) only.

## Help Menu

Click one of the following menu items for a description of the menu item. For more information on the modes of operation, see [Metasys Modes](#). For a description of the Authorized Required column, see [Authorized Menu Items](#).

**Table 26: Help Menu**

Menu Item	Mode Visible In				Authorization Required
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation	
<a href="#">Metasys Help F1</a>	X	X	X	X	
<a href="#">Metasys Graphics Help</a>	X	X	X	X	
<a href="#">About Metasys</a>	X	X	X	X	

### **Metasys Help**

**Menu Selection:** Help > Metasys Help

Launches the Metasys system *Help*.

### **Metasys Graphics Help**

**Menu Selection:** Help > Metasys Graphics Help

Launches the Metasys Graphics+ Runtime *Help*.

### **About Metasys**

**Menu Selection:** Help > About Metasys

Displays the Metasys software version, Graphics+ runtime software version, copyright, current user name, URL connection, and maximum runtime memory information for the Metasys system. The Maximum Runtime Memory indicates how much memory is set for Java technology as a means of troubleshooting Java problems. The default Maximum Runtime Memory is 989 MB. Click the Terms & Conditions button to view terms and conditions information.

## Right-Click Menus

The contents of the menus vary depending on the item or feature selected. The contents are either feature-specific based on the active panel or item-specific based on the selected item in the navigation tree.

For details on how to access right-click menu items using the equivalent menu bar selection, see [Right-Click Menus and Menu Bar Equivalents](#).

### **Right-Click Menus - Item Specific**

Click one of the following items below for a description of the item. For more information on the modes of operation, see [Metasys Modes](#).

**Table 27: Right-Click Menus - Item Specific**

Item	Contents In Mode			
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation
<i>Folder</i>	<ul style="list-style-type: none"> <li>View</li> <li>Modify</li> <li>Import Definition<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Import Definition<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Edit                             <ul style="list-style-type: none"> <li>- Copy Ctrl+C</li> <li>- Paste Ctrl+V</li> <li>- Delete Items</li> </ul> </li> <li>Modify</li> <li>Import Definition<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>View</li> </ul>
<i>ADS</i>	<ul style="list-style-type: none"> <li>View</li> <li>Modify</li> <li>Command</li> <li>Event Viewer</li> <li>Audit Viewer</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Event Viewer</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Edit                             <ul style="list-style-type: none"> <li>- Copy Ctrl+C</li> <li>- Paste Ctrl+V</li> <li>- Delete Items</li> </ul> </li> <li>Modify</li> <li>Rename</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Event Viewer</li> </ul>
<i>User Views</i>	<ul style="list-style-type: none"> <li>View</li> <li>Modify</li> </ul>	<ul style="list-style-type: none"> <li>View</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Modify</li> <li>Copy Ctrl+C</li> <li>Delete Items</li> </ul>	<ul style="list-style-type: none"> <li>View</li> </ul>
<i>Site</i>	<ul style="list-style-type: none"> <li>View</li> <li>Command</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Command</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Paste Ctrl+V</li> <li>Delete Items</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Command</li> </ul>
<b>Supervisory Device (Engine)</b>	<ul style="list-style-type: none"> <li>View</li> <li>Event Viewer</li> <li>Audit Viewer</li> <li>Command</li> <li>Modify</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> <li>Show Extensions</li> <li>Alarm Report</li> <li>Offline Report</li> <li>Disabled Report</li> <li>Operator Override Report</li> <li>Supervisory Override Report</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Event Viewer</li> <li>Command</li> <li>Alarm Report</li> <li>Offline Report</li> <li>Disabled Report</li> <li>Operator Override Report</li> <li>Supervisory Override Report</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Edit                             <ul style="list-style-type: none"> <li>- Copy Ctrl+C</li> <li>- Paste Ctrl+V</li> <li>- Delete Items</li> </ul> </li> <li>Modify</li> <li>Rename</li> <li>Show Extensions</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Event Viewer</li> <li>Command</li> <li>Show Extensions</li> <li>Alarm Report</li> <li>Offline Report</li> <li>Disabled Report</li> <li>Operator Override Report</li> <li>Supervisory Override Report</li> </ul>



**Table 27: Right-Click Menus - Item Specific**

Item	Contents In Mode			
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation
<b>Summary Definition Object</b>	<ul style="list-style-type: none"> <li>View</li> <li>Modify</li> <li>Export Definition</li> </ul>	<ul style="list-style-type: none"> <li>View</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Modify</li> <li>Copy Ctrl+C</li> <li>Delete Items</li> <li>Export Definition</li> </ul>	<ul style="list-style-type: none"> <li>View</li> </ul>
<b>All Other Objects<sup>3</sup></b>	<ul style="list-style-type: none"> <li>View</li> <li>Command</li> <li>Modify</li> <li>Show Extensions</li> <li>Add Annotation<sup>2</sup></li> <li>View Annotations<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Command</li> <li>Modify<sup>4</sup></li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Edit                             <ul style="list-style-type: none"> <li>- Copy Ctrl+C</li> <li>- Paste Ctrl+V</li> <li>- Delete Items</li> </ul> </li> <li>Modify</li> <li>Show Extensions</li> </ul>	<ul style="list-style-type: none"> <li>View</li> <li>Command</li> <li>Show Extensions</li> </ul>

1 Available for the Summary Definitions folder in the All Items tree.

2 Available on the ADS/ADX only.

3 For Trend or other extensions, the View and Show Extensions menu items display for the parent item, not for the extension itself.

4 Available for only Schedule and Calendar objects.

**Right-Click Menus - Feature Specific**

Click one of the following active panels or features for a description of the active panel or feature. For more information on the modes of operation, see .

**Table 28: Right-Click Menus - Feature Specific**

Active Panel/Feature	Contents In Mode			
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation
<b>Audit Viewer</b>	<ul style="list-style-type: none"> <li>Refresh</li> <li>Discard</li> <li>Add Annotation</li> </ul>			
<b>Event Viewer</b>	<ul style="list-style-type: none"> <li>Refresh</li> <li>Discard</li> <li>Ack</li> <li>View Item</li> <li>Add Annotation</li> </ul>	<ul style="list-style-type: none"> <li>Refresh</li> <li>View Item</li> </ul>		<ul style="list-style-type: none"> <li>Refresh</li> <li>Discard</li> <li>Ack</li> <li>View Item</li> </ul>
<b>Report Viewer</b>	<ul style="list-style-type: none"> <li>Refresh</li> <li>View</li> </ul>	<ul style="list-style-type: none"> <li>Refresh</li> <li>View</li> </ul>		<ul style="list-style-type: none"> <li>Refresh</li> <li>View</li> </ul>

**Table 28: Right-Click Menus - Feature Specific**

Active Panel/Feature	Contents In Mode			
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation
<i>Global Search Viewer</i>	<ul style="list-style-type: none"> <li>• Refresh</li> <li>• Open Object List</li> <li>• Save Object List</li> <li>• View</li> <li>• Command</li> <li>• Modify</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Show Extensions</li> </ul>	<ul style="list-style-type: none"> <li>• Refresh</li> <li>• Open Object List</li> <li>• Save Object List</li> <li>• View</li> <li>• Command</li> </ul>		
<i>Change Results Viewer</i>				
<i>All Items Organizer</i>	<ul style="list-style-type: none"> <li>• Refresh</li> <li>• Move Up</li> <li>• Move Down</li> <li>• Sort Ascending</li> <li>• Sort Descending</li> </ul>		<ul style="list-style-type: none"> <li>• Refresh</li> <li>• Move Up</li> <li>• Move Down</li> <li>• Sort Ascending</li> <li>• Sort Descending</li> </ul>	
<i>Tailored Summaries</i>	<ul style="list-style-type: none"> <li>• Refresh Current Tab'</li> <li>• Refresh all Tabs'</li> <li>• View</li> <li>• Event Viewer</li> <li>• Audit Viewer</li> <li>• Command</li> <li>• Modify</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Show Extensions</li> <li>• Alarm Report</li> <li>• Offline Report</li> <li>• Disabled Report</li> <li>• Operator Override Report</li> <li>• Supervisory Override Report</li> <li>• Import Integration</li> </ul>	<ul style="list-style-type: none"> <li>• View</li> <li>• Event Viewer</li> <li>• Command</li> <li>• Modify</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Alarm Report</li> <li>• Offline Report</li> <li>• Disabled Report</li> <li>• Operator Override Report</li> <li>• Supervisory Override Report</li> </ul>		

**Table 28: Right-Click Menus - Feature Specific**

Active Panel/Feature	Contents In Mode			
	Online (Standard Access)	Online (Basic Access)	Offline (SCT)	Simulation
<i>Trend Viewer</i>	<ul style="list-style-type: none"> <li>• Refresh<sup>1</sup></li> <li>• View</li> <li>• Command</li> <li>• Modify</li> <li>• Event Viewer</li> <li>• Audit Viewer</li> <li>• Add Annotation</li> <li>• View Annotations</li> <li>• Background Color</li> <li>• Y-Axis Scale</li> <li>• X-Axis Scale</li> <li>• Gridlines                             <ul style="list-style-type: none"> <li>- None</li> <li>- X and Y</li> <li>- X Only</li> <li>- Y Only</li> </ul> </li> <li>• Chart Type                             <ul style="list-style-type: none"> <li>- Points Line</li> <li>- Area</li> <li>- Bar</li> <li>- Points</li> <li>- Line</li> </ul> </li> <li>• Stacked Y-Axis</li> </ul>	<ul style="list-style-type: none"> <li>• Refresh<sup>1</sup></li> <li>• View</li> <li>• Command</li> <li>• Background Color</li> <li>• Y-Axis Scale</li> <li>• X-Axis Scale</li> <li>• Gridlines                             <ul style="list-style-type: none"> <li>- None</li> <li>- X and Y</li> <li>- X Only</li> <li>- Y Only</li> </ul> </li> <li>• Chart Type                             <ul style="list-style-type: none"> <li>- Points Line</li> <li>- Area</li> <li>- Bar</li> <li>- Points</li> <li>- Line</li> </ul> </li> <li>• Stacked Y-Axis</li> </ul>		<ul style="list-style-type: none"> <li>• Refresh<sup>1</sup></li> <li>• View</li> <li>• Command</li> <li>• Background Color</li> <li>• Y-Axis Scale</li> <li>• X-Axis Scale</li> <li>• Gridlines                             <ul style="list-style-type: none"> <li>- None</li> <li>- X and Y</li> <li>- X Only</li> <li>- Y Only</li> </ul> </li> <li>• Chart Type                             <ul style="list-style-type: none"> <li>- Points Line</li> <li>- Area</li> <li>- Bar</li> <li>- Points</li> <li>- Line</li> </ul> </li> <li>• Stacked Y-Axis</li> </ul>
<b>Tabbed Item Viewer</b> <i>(Display Panel Tabs)</i>	<ul style="list-style-type: none"> <li>• Modify</li> <li>• Refresh Current Tab</li> <li>• Refresh All Tabs</li> <li>• Command</li> <li>• Show Extensions</li> </ul>	<ul style="list-style-type: none"> <li>• Refresh Current Tab</li> <li>• Refresh All Tabs</li> <li>• Command</li> </ul>	<ul style="list-style-type: none"> <li>• Modify</li> <li>• Refresh Current Tab</li> <li>• Refresh All Tabs</li> <li>• Show Extensions</li> </ul>	<ul style="list-style-type: none"> <li>• Refresh Current Tab</li> <li>• Refresh All Tabs</li> <li>• Command</li> <li>• Show Extensions</li> </ul>

- 1 The View, Commands, and Show Extensions menu items are item specific.
- 2 With the header of the display panel selected.
- 3 Available on the ADS/ADX only.
- 4 With an item in the report, Legend, Trend Items table, or results table selected.
- 5 The menu options available are item specific (that is, they depend on the type of item selected in the Tailored Summary table and Key Data table).
- 6 Available for an Engine only.
- 7 Available for a Tailored Summary with trunk/integration data (for example, trunk diagnostics).
- 8 With an item in the Legend selected.
- 9 With the Chart selected.

### Right-Click Menus and Menu Bar Equivalents

The following table shows the menu items that may appear in a right-click menu and their equivalent in the menu bar.

**Table 29: Right-Click Menus and Menu Bar Equivalents**

<b>Right-Click Menu Item</b>	<b>=</b>	<b>Menu Bar Item</b>
<b>Audit Viewer</b>	=	<i>View</i> > Audit Viewer
<b>Command</b>	=	<i>Action</i> > Command
<b>Modify</b>	=	<i>Action</i> > Modify
<b>Edit</b>		
<b>Copy</b>	=	<i>Edit</i> > Copy
<b>Paste</b>	=	<i>Edit</i> > Paste
<b>Delete Items</b>	=	<i>Edit</i> > Delete Items
<b>Event Viewer</b>	=	<i>View</i> > Event Viewer
<b>Alarm Report</b>	=	<i>Query</i> > Alarm Report
<b>Offline Report</b>	=	<i>Query</i> > Offline Report
<b>Disabled Report</b>	=	<i>Query</i> > Disabled Report
<b>Override Report</b>	=	<i>Query</i> > Override Report
<b>Show Extensions</b>	=	<i>Action</i> > Show Extensions
<b>Refresh</b>	=	<i>Action</i> > Refresh
<b>Refresh All Tabs</b>	=	<i>Action</i> > Refresh All Tabs
<b>Refresh Current Tab</b>	=	<i>Action</i> > Refresh Current Tab
<b>View</b>	=	<i>View</i> > Selected Item
<b>Rename</b>	=	<i>Action</i> > Rename
<b>Remove From Site</b>	=	<i>Action</i> > Remove From Site
<b>Add Annotation</b>	=	<i>Action</i> > Add Annotation
<b>View Annotations</b>	=	<i>Action</i> > View Annotations

# Wizards

Wizards make complex tasks easy and guide you through creating and configuring objects and features. A wizard typically consists of a series of steps, each corresponding to a screen presented to the user.

A wizard may appear when you select an option from the Insert menu and when you prompt certain actions such as copying and pasting an item in the [Navigation Tree](#). For example, a wizard appears when you select Object from the Insert menu. Wizards that are available in different modes (for example, any combination of online, offline, or simulation) appear the same.

## Wizards Concepts

### Types of Wizards

The following table lists the wizards in the system.

**Table 30: Types of Wizards**

<a href="#">New Archive Wizard</a> (SCT only)	<a href="#">Insert Object - Event Enrollment</a>
<a href="#">Open Archive Wizard</a> (SCT only)	<a href="#">Insert Object - Generator Load Control</a>
<a href="#">Copy Archive Wizard</a> (SCT only)	<a href="#">Insert Object - Global Data</a>
<a href="#">Delete Archive Wizard</a> (SCT only)	<a href="#">Insert Object - Group</a>
<a href="#">Export Archive Wizard</a> (SCT only)	<a href="#">Insert Object - Interlock</a>
<a href="#">Import Wizard</a> (SCT only)	<a href="#">Insert Object - Loop</a>
<a href="#">Extension Wizard</a> (SCT only)	<a href="#">Insert Object - MV</a>
<a href="#">Insert Site Wizard</a> (SCT only)	<a href="#">Insert Object - Multiple Command</a>
<a href="#">Insert Supervisory Device Wizard</a> (SCT only)	<a href="#">Insert Object - Notification</a>
<a href="#">Insert Metasys Server Wizard</a> (SCT only)	<a href="#">Insert Object - Optimal Start</a>
<a href="#">Insert Integration Wizard</a>	<a href="#">Insert Object - Pulse Meter</a>
<a href="#">Insert Control System Wizard</a>	<a href="#">Insert Object - Schedule</a>
<a href="#">Insert Object - AV</a>	<a href="#">Insert Object - Signal Select</a>
<a href="#">Insert Object - Accumulator</a>	<a href="#">Insert Object - Solar Clock</a>
<a href="#">Insert Object - Auto Shutdown</a>	<a href="#">Insert Graphic Wizard</a>
<a href="#">Insert Object - BV</a>	<a href="#">Insert Trend Study Wizard</a>
<a href="#">Insert Object - Calendar</a>	<a href="#">Create New User View Wizard</a>
<a href="#">Insert Object - DLLR</a>	<a href="#">Create New Summary Definition Wizard</a>
<a href="#">Insert Object - Data Broadcast</a>	<a href="#">Restore Archive Wizard</a>
<a href="#">Insert Object - Electric Demand Control</a>	<a href="#">Manage Archive Wizard</a>
<a href="#">Insert Object - Electric Demand Monitoring</a>	<a href="#">Passthru Wizard</a>
<a href="#">Insert Field Device Wizard</a>	<a href="#">Security Copy Wizard</a>
<a href="#">Insert Point Wizard</a>	<a href="#">Paste Item Wizard</a>
<a href="#">Insert Folder Wizard</a>	

### Wizard Navigation Buttons

The buttons in [Table 31](#) are common to most of the wizards and allow you to move through wizard screens.

**Table 31: Common Wizard Navigation Buttons**

Button	Description
Cancel	Closes the wizard without saving any data. This button is always active.
< Back	Takes you back one screen in the wizard. This may not be the last screen viewed, since you can move between screens. This button is active on all screens except the first.

**Table 31: Common Wizard Navigation Buttons**

Button	Description
<b>Next &gt;</b>	Takes you to the next screen in the wizard. If the current screen requires user input or you are on the last screen in the wizard, the Next button is disabled.
<b>Last</b>	If available, presents a summary screen for the wizard. If your input is required in any previous screen, the Last button is disabled. The Last button takes the user to the last wizard screen, which is the summary screen. Once the summary screen is displayed, the Last button is replaced by the Finish button.
<b>Finish</b>	Exits the wizard and saves the data. Selecting Finish is the normal method of exiting a completed wizard. If any prior screens require your input, this button is disabled. If a wizard has a summary screen, the Finish button is not available until the summary screen is displayed.

## Wizards Steps

### Creating Items with Wizards

- Select the item to create. The corresponding wizard appears. If more than one type of item is available, select the desired type. Click Next.
  - Menu Selection:** Action > Show Extensions  
 Launches the [Extension Wizard](#) to create extensions to objects that support them.
  - Menu Selection:** Tools > Manage Archive  
 Launches the [Manage Archive Wizard](#) within SCT. The following options are available within the archive databases, Upload from Device, Download to Device, Synchronize and Upgrade Device.
  - Menu Selection:** Tools > Security Copy  
 Launches the [Security Copy Wizard](#) within SCT.
  - Menu Selection:** Tools > Database  
 Launches the [Restore Archive Wizard](#), in the SCT.
  - Menu Selection:** Insert > Site, Supervisory Device, Metasys Server, Integration, Field Device, Field Point, Folder, Control System, Object, Graphic, Trend Study, User View, and Definition Summary  
 Launches the Site, Supervisory Device, Metasys Server, Integration, Field Device, Field Point, Folder, Control System, Object, Graphic, Trend Study, User View, and Definition Summary Wizards individually, in the SCT to add new objects.
  - Menu Selection:** Insert > Integration, Field Device, Field Point, Folder, Control System, Object, Graphic, Trend Study, User View, and Definition Summary  
 Launches the Integration, Field Device, Field Point, Folder, Control System, Object, Graphic, Trend Study, User View, and Definition Summary Wizards individually, to add new objects.
- Select the destination for the new item and click Next.
 

**Note:** All items appear in the wizard, not just valid destinations. When you click an item that is not a valid destination for the item being added, an error message appears on the right side of the wizard and the Next button is disabled.

**Note:** Items in the navigation tree load on a per device basis instead of all at once. When you click a device for the first time, an hourglass cursor appears while the device's child items load in the navigation tree. This functionality saves time on large sites as it allows you to load only the data for the desired devices.
- Complete the information on the wizard screens, using the [navigation buttons](#) to move through the screens. The screens vary depending on the item you are creating. See the [Using Wizards](#) section for information specific to each wizard.
- Select Finish on the summary page to create the item. If an error occurs, a message displays and the wizard returns to the summary page. If the item supports extensions, the [Extension Wizard](#) displays after the item is successfully created.

## Using Wizards

Click the wizard type in the [Types of Wizards](#) table or browse the following topics for information on using wizards, including:

- [menu](#) selections for accessing each wizard
- descriptions
- tips
- related information

### **New Archive Wizard**

**Menu Selection:** Item > New Archive

Creates a new archive database in the SCT.

**Tip:** The Create Site dialog box appears after creating the new archive asking if you want to create a site in the new archive. Selecting Yes invokes the Insert Site wizard.

See [Insert Site Wizard](#).

### **Open Archive Wizard**

**Menu Selection:** Item > Open Archive

Opens an existing archive database in the SCT.

Archives appear locked when someone else is accessing that archive. If a user has an archive open and closes the UI incorrectly (not clicking the Exit or Logout button), the database will appear locked to all users with a different username/password. To reverse the lock, a user with the same username/password as the user who closed the UI incorrectly must open that archive, then close the UI properly.

### **Copy Archive Wizard**

**Menu Selection:** Item > Create Archive Copy

Creates a copy of the existing and currently open archive database in the SCT.

The copy is intended as a second backup in case the original backup file is deleted. Do not rename the backup file because the file does not restore properly using a different name (it is case sensitive). If you want to rename a backup file, create a copy of the archive and give it the new name before you create a backup. You cannot rename the backup after it is created.

### **Delete Archive Wizard**

**Menu Selection:** Item > Delete Archive

Removes (deletes) an existing archive database from the SCT.

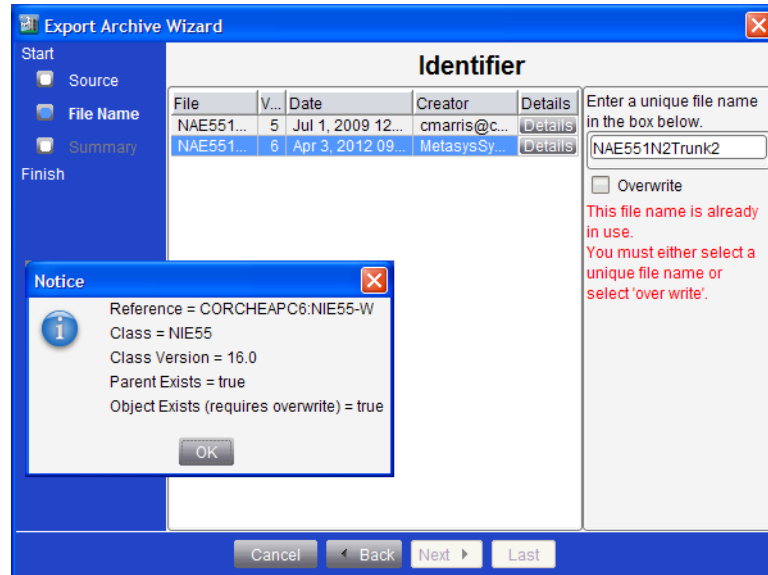
### **Export Archive Wizard**

**Menu Selection:** Item > Export Item

In the SCT, exports the selected item and its child objects displayed beneath it in the navigation tree in the source selection. The items can be imported into another archive database, see the [Import Wizard](#) section for more information.

1. Select the item in the navigation tree in the Source selection.
2. In the File Name selection, add a new file name or select an existing file name of the file to which the data will export and check the Overwrite check box.

**Figure 9: Export Archive Wizard**



The exported data file is stored in the following default directory:

- Windows XP OS: C:\Documents and Settings\All Users\ApplicationData\Johnson Controls\MetasysIII\DatabaseFiles
- Windows 7 OS and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\DatabaseFiles)

Click the Details button for a Notice Information dialog box which displays the Reference, Class, Class Version, Parent Exists and Objects Exists information.

3. In the Summary Selection click Finish to confirm the export configuration information.

### **Import Wizard**

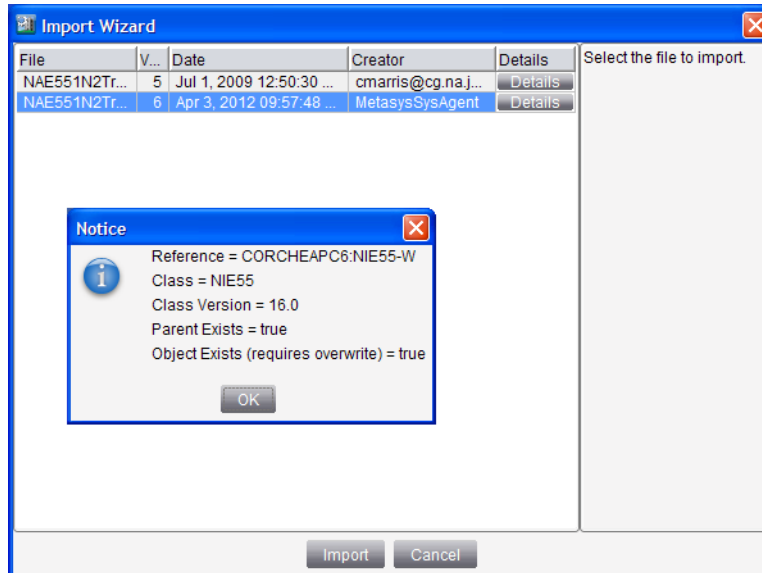
**Menu Selection:** Item > Import Item

In the SCT, imports a previously exported archive file, to overwrite the selected item and its child objects displayed beneath it in the navigation tree into the currently open archive database. See the [Export Archive Wizard](#).

1. Select the item and its child objects displayed beneath it the navigation tree in the Site Management Portal UI, select Item > Import Item.
2. The import Wizard dialog box appears, select the file to import and click Import.



**Figure 10: Import Archive Wizard**



An exported data file must be stored in the default directory:

- Windows XP OS: C:\Documents and Settings\All Users\ApplicationData\Johnson Controls\MetasysIII\DatabaseFiles
- Windows 7 OS, and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\DatabaseFiles)

Click the Details button for the Notice Information dialog box which displays the Reference, Class, Class Version, Parent Exists and Objects Exists information.

3. A Verify Overwrite dialog box appears to confirm overwriting the selected item and its child object in the navigation tree.

**Note:** Importing a Site Director device into a database with existing User Views is not supported and may cause loss of User View data.

### **Extension Wizard**

**Note:** You cannot add or delete extensions in *Simulation mode*.

**Menu Selection:** Actions > Show Extensions (menu option is available only when an item that supports extensions is selected)

Adds features, such as trending, alarming, averaging, loading and totalization, to an item. Extension types include:

- **Resource File** - Adds a resource file to a field device or integration, if supported.
- **Trend** - Adds trending capabilities to an item.
- **Totalization** - Adds totalization capabilities to an item.  
**Note:** Select either the Event Totalization or Runtime Totalization radio button if they appear on the right side of the Select Attribute screen of this wizard. If these selections do not appear, the attribute you selected uses Analog Totalization.
- **Alarm** - Adds attributes for generating alarm and event messages to an item. See the *Alarm and Event Management* feature for information.
- **Averaging** - Adds averaging capabilities to an item.
- **Load** - Adds the load capability of the Energy Management feature. You can add only one load extension to an object.

See the *Extensions* section.

### ***Insert Site Wizard***

**Menu Selection:** Insert > Site

Inserts a site into the archive database in the SCT.

**Tip:** The Create Device? dialog box appears after inserting a site asking if you want to create a device in the site. Selecting Supervisory Device and clicking OK invokes the Insert Device wizard. Selecting Metasys Server and clicking OK invokes the Insert Metasys Server wizard. Select None and OK if you do not want to add a device at this time.

See one of the following sections for more information:

- [Related Documentation](#)
- [Site Object](#)

### ***Insert Supervisory Device Wizard***

**Menu Selection:** Insert > Supervisory Device

Inserts a supervisory device: NAE35, NAE45, NAE451L, NAE55, NAE85, NCE25, NIE55, or NIE85 into the archive database in the SCT.

**Note:** When inserting an NIE29 device, select NCE25. When inserting an NIE39 device, select NAE35. When inserting an NIE49 device, select NAE45.

**Note:** Some products/models mentioned in this document are available only to specific markets. Refer to the *Application and Data Server (ADS) Lite for Europe (E) Product Bulletin (LIT-12011690)* and the *Application and Data Server (ADS) Lite for Asia (A) System Product Bulletin (LIT-12011694)* for availability.

On the Configure screen of this wizard, click any tabs that may appear for further device configuration.

See one of the following sections for more information:

- [Related Documentation](#)
- [Alarm and Event Management](#)
- [Engine Device Object](#)

### ***Insert Metasys Server Wizard***

**Menu Selection:** Insert > Metasys Server

Inserts a Metasys server (ADS/ADX, ADS-L-A, ADS-L-E) into the archive database in the SCT.

**Note:** Some products/models mentioned in this document are available only to specific markets. Refer to the *Application and Data Server (ADS) Lite for Europe (E) Product Bulletin (LIT-12011690)* and the *Application and Data Server (ADS) Lite for Asia (A) System Product Bulletin (LIT-12011694)* for availability.

**Tip:** The first Metasys server you add to the site becomes the Site Director. The Site Director coordinates all Web browser communication to the Metasys network. You can only have one Site Director per site. Any subsequent Metasys servers are primarily used for archiving historical data.

**Tip:** On the Configure screen, select each tab for further configuration options.

See one of the following sections for more information:

- [Alarm and Event Management](#)
- [ADS Device Object](#)

### ***Insert Integration Wizard***

**Menu Selection:** Insert > Integration

Integrates the following types of buses or networks into the **NAE, NIE, or NCE:**

- **BACnet** - Inserts a BACnet integration into the NAE or NCE.
- **Field Bus** - Inserts an MS/TP network integration for the NAE or NCE.

- **LON Trunk** - Inserts a LONWORKS network into the NAE or NCE.
- **N1 Migration** - Inserts an N1 Migration trunk into the NIE.  
**Note:** Be sure to configure the Network Name attribute of the N1 Migration. Once you insert the N1 Migration, you cannot edit the Network Name attribute. The workaround is to delete the existing N1 Migration and insert a new N1 Migration ensuring you enter the desired Network Name before completing the Insert Integration Wizard.
- **N2 Trunk** - Inserts an N2 trunk into the NAE or NCE.
- **VND Integration** - Inserts a vendor integration into the NAE, NIE or NCE.
- **Wireless Supervisor** - Inserts a Wireless Sensor System integration into the system. (You can have only one Wireless Integration per NAE or NCE.)
- **XL5K Integration** Inserts a Honeywell Excel 5000 (XL-5000) network integration for the NIE. (You can have only one XL5K Integration object per NIE.) - Inserts a Honeywell Excel 5000 (XL-5000) network integration for the NIE. (You can have only one XL5K Integration object per NIE.)

**Tip:** Select the Hardware tab (if it appears) on the Configure screen for further configuration.

After adding an integration, you can select the integration in the navigation tree and click Action > Import Integration to add existing devices and points under the integration.

See one of the following sections for more information:

- [Related Documentation](#)
- [N2 Master Datalink Object \(N2 Trunk\)](#)
- [BACnet Integration Object](#)
- [MS/TP Field Bus Integration Object](#)
- [LON Integration Object](#)
- [N1 Migration Object](#)
- [VND Integration Object](#)
- [Wireless Receiver Supervisor Object](#)
- [XL5K Integration Object](#)

### **Insert Field Device Wizard**

**Menu Selection:** Insert > Field Device

Inserts one of the following types of field device objects under the selected integration:

- **BACnet Integration** - [BACnet Integration Object](#) (Non-FEC BACnet Device)
- **MS/TP Field Bus Integration** - [MS/TP Field Device Object](#) (FEC Family BACnet Device) [BACnet Device Object](#) (Non-FEC BACnet Device)
- **LONWORKS Network Integration (LON Trunk)** - [LON Controller Object](#)
- **N1 Migration** - [N1 Migration Object](#)
- **N2 Integration (N2 Trunk)** - [N2 Controller Object](#) (for example, AHU and VMA)
- **VND Controller (Vendor)** - 3rd party vendor controller, offered through Systems Integrations Services (SIS)
- **Wireless Supervisor Integration** - [Wireless Receiver Object](#)
- **XL5K (Excel 5000/XL-5000) Integration** - Honeywell XL5000 Controller Object

To insert a field device select the menu selection:

1. In the Destination selection, select the parent item for your new item.
2. In the Definition selection:

- a. Select Assisted Device Definition and click the Invoke Auto Discovery button to discover existing controllers or devices on the network. This is available in the Site Management Portal (SMP) only.

**Note:** In the Wizard Auto Detect Utility window, if **Results are from a previous discovery** appears next to the Close button, the displayed results are from the last time a discovery was run. These cached results may not reflect all items currently on the network. To clear the old results and perform a new auto discovery, click Restart. Click any column header to sort discovered devices.

- b. Select Manual Device Definition and select the desired address from the menu.

3. In the Identifier selection, enter a unique identifier.

4. In the Configure selection, click any tabs that may appear for further device configuration.

5. Click Finish to confirm the field device configuration.

**Note:** If the navigation tree does not automatically update for defined points after adding a field device using Auto Discovery (+ sign appears next to device in tree) select Refresh All Tabs on the Action Menu to update.

See one of the following sections for more information:

- [Related Documentation](#)
- [N2 Master Datalink Object \(N2 Trunk\)](#)
- [BACnet Integration Object](#)
- [MS/TP Field Bus Integration Object](#)
- [LON Integration Object](#)
- [N1 Migration Object](#)
- [VND Controller](#)
- [Wireless Receiver Object](#)
- [XL5K Integration Object](#)

### **Insert Point Wizard**

**Menu Selection:** Insert > Field Point

Inserts one of the following types of field points into a field device under an integration:

- **N2 Trunk**

[Analog Input Object \(AI\)](#), [Analog Output Object \(AO\)](#), [Accumulator Objects](#), [Binary Input Object \(BI\)](#), [Binary Output Object \(BO\)](#), [Multistate Input Object \(MI\)](#), [Multistate Output Object \(MO\)](#)

- **BACnet**

All field points listed for the N2 trunk plus [Analog Value Object \(AV\)](#), [Averaging Extensions](#), [Binary Value Object \(BV\)](#), [Calendar Object](#), [Electric Demand Control Object](#), [Electric Demand Monitoring Object](#), [Event Enrollment Object](#), [Generator Load Control Object](#), [Group Object](#), [Life Safety Point Object](#), [Life Safety Zone Object](#), [Multistate Value Object \(MV\)](#), [Notification Class Object](#), [Schedule Object](#), [Trend Log](#)

- **MS/TP Field Bus Integration**

[Accumulator Objects](#), [Analog Input Object \(AI\)](#), [Analog Output Object \(AO\)](#), [Analog Value Object \(AV\)](#), [Binary Input Object \(BI\)](#), [Binary Output Object \(BO\)](#), [Binary Value Object \(BV\)](#), [Multistate Value Object \(MV\)](#), [Calendar Object](#), [Schedule Object](#), [Notification Class Object](#), [Trend Log](#)

- **LON Trunk**

[Analog Input Object \(AI\)](#), [Analog Output Object \(AO\)](#), [Accumulator Objects](#), [Binary Input Object \(BI\)](#), [Binary Output Object \(BO\)](#), [Multistate Input Object \(MI\)](#), [Multistate Output Object \(MO\)](#), [Generic Integration Object \(GIO\)](#)

**Note:** You can no longer manually add a GIO to a LON trunk; however, the GIO is still supported in existing databases, even after upgrading to the next software release.

- **N1 Migration**

All field points listed for the N2 trunk plus [Generic Integration Object](#) (GIO) and [N1 PID Loop Object](#).

- **VND Integration (Vendor)**

[Analog Input Object](#) (AI), [Analog Output Object](#) (AO), [Accumulator Objects](#), [Binary Input Object](#) (BI), [Binary Output Object](#) (BO), [Multistate Input Object](#) (MI), [Multistate Output Object](#) (MO)

- **Wireless Supervisor Integration**

[Wireless Sensor Object](#)

- **XL5K (Excel 5000/XL-5000) Integration**

[XL5K Integration Object](#)

**Tip:** On the Select Definition Mode screen, select Assisted Point Definition to automatically discover existing points on the network.

**Tip:** Or on the Select Definition Mode screen, select Manual Point Definition.

**Tip:** When adding a LONWORKS point manually, the Target Reference appears blank. Manually type the path for the Target Reference (path into the controller for the data being mapped by the object) in the text box on the Select Data Source screen.

**Tip:** Select the Hardware tab on the Configure screen for further configuration.

See one of the following sections for more information:

- [Related Documentation](#)
- [N2 Master Datalink Object \(N2 Trunk\)](#)
- [BACnet Integration Object](#)
- [MS/TP Field Bus Integration Object](#)
- [LON Integration Object](#)
- [N1 Migration Object](#)
- [VND Integration Object](#)
- [Wireless Sensor Object](#)
- [XL5K Integration Object](#)

### ***Insert Folder Wizard***

**Menu Selection:** Insert > Folder

Inserts a folder into the navigation tree of the system for grouping and categorizing items and information in the navigation tree.

See the [Folder](#) object section for more information.

### ***Insert Control System Wizard***

**Menu Selection:** Insert > Control System

Inserts a control system into the site. See [Logic Connector Tool \(LCT\)](#) for more information on control systems and the Logic Connector Tool.

### ***Insert Object Wizard***

The Insert Object wizard inserts one of the following object types:

- **Insert Object - AV**

**Menu Selection:** Insert > Object

Inserts an [Analog Value Object](#) into the site.

- **Insert Object - Accumulator**


**Menu Selection:** Insert > Object

Inserts a Flex Accumulator object into the site. See [Accumulator Objects](#).

- **Insert Object - Auto Shutdown**

**Menu Selection:** Insert > Object

Inserts an [Auto Shutdown Object](#) into the site.

**Note:** On the Configure screen, click the  button to select an object from the Select Item dialog box. Then select the desired Control attribute from the drop-down menu.

- **Insert Object - BV**

**Menu Selection:** Insert > Object

Inserts a [Binary Value Object](#) into the site.

- **Insert Object - Calendar**

**Menu Selection:** Insert > Object

Inserts a [Calendar Object](#) into the site.

See [Scheduling](#) for more information on applying scheduling capabilities.

- **Insert Object - DLLR**


**Menu Selection:** Insert > Object

Inserts a DLLR Object into the site.

- **Insert Object - Data Broadcast**

**Menu Selection:** Insert > Object

Inserts a [Data Broadcast Object](#) into the site.

**Note:** On the Configure screen, click the  button to select the input reference object from the Select Item dialog box. Then select the desired attribute to reference from the drop-down menu.

- **Insert Object - Electric Demand Control**

**Menu Selection:** Insert > Object

Inserts an Electric Demand Control object into the site. See the [IEIEJ BACnet System Objects](#) section for information.

- **Insert Object - Electric Demand Monitoring**

**Menu Selection:** Insert > Object

Inserts an Electric Demand Monitoring object into the site. See the [IEIEJ BACnet System Objects](#) section for information.

- **Insert Object - Event Enrollment**

**Menu Selection:** Insert > Object

Inserts an [Event Enrollment Object](#) into the site.

See [Event Enrollment Configuration Examples](#) for examples on how to configure this object.

- **Insert Object - Generator Load Control**

**Menu Selection:** Insert > Object

Inserts an Generator Load Control object into the site. See the [IEIEJ BACnet System Objects](#) section for information.

- **Insert Object - Global Data**

**Menu Selection:** Insert > Object

Inserts a *Global Data Sharing Object* into the site.

- **Insert Object - Group**

**Menu Selection:** Insert > Object

Inserts a *Group Object* into the site.

**Note:** Click the Add button to select the items belonging to this group from the Select Item dialog box.

**Note:** Click the item in the group list and use the up and down arrows to move the item in the list.

**Note:** Click the item in the group list and click Remove to remove the item from the group.

- **Insert Object - Interlock**

**Menu Selection:** Insert > Object

Inserts an *Interlock Object* into the site.

**Note:** On the Configure screen, click the Interlock Definition and Action Tables tabs for further configuration.

**Tips** for the Interlock Definition tab of the Configure screen:

- Click the Add button to add items to the list from the Select Item dialog box.
- Click the check box next to an item in the list and click Delete to remove the item from the list.
- Select the type of logic to use for the items in the list from the Logic menu. See the *Interlock Object's Logic* attribute description for the types of logic.

**Tips** for the Action Tables tab of the Configure screen:

- Check the **All Commands Priority** check box if you wish to use the same priority for all commands in the action tables. Clear the **All Commands Priority** check box to enable individual priority selection for the commands in the action tables.
- For the **Actions for Condition: True** and **Actions for Condition: False** tables, click the Add button to add items to the table from the Select Item dialog box.
- For the **Actions for Condition: True** and **Actions for Condition: False** sections, click the check box next to an item in the table and click Delete if you want to remove the item from the table.

- **Insert Object - Loop**

**Menu Selection:** Insert > Object

Inserts a *Loop Object* into the site.

- **Insert Object - MV**

**Menu Selection:** Insert > Object

Inserts a *Multistate Value Object* into the site.

- **Insert Object - Multiple Command**

**Menu Selection:** Insert > Object

Inserts a *Multiple Command Object* into the site.

**Note:** On the Configure screen, click the Action Tables tab for further configuration.

**Note:** Select or enter the desired value for the Relinquish Default. Edit the States Text and Number of States attributes on the Focus tab.

**Note:** Check the **All Commands Priority** check box if you wish to use the same priority for all commands. Clear the **All Commands Priority** check box to enable individual priority selection for the commands.

**Note:** For each of the **Actions for Condition (State 0 - State N)** tables, click the Add button to add items to the table from the Select Item navigation tree.

**Note:** For each of the **Actions for Condition (State 0 - State N)** tables, click the check box next to an item in the table and click Delete to remove the item from the table.

See the [Multiple Command Object](#) section for more information.

- **Insert Object - Notification**

**Menu Selection:** Insert > Object

Inserts a [Notification Class Object](#) into the site.

**Note:** On the Configure screen, click the Recipient List tab for further configuration.

**Note:** Click the Add button to add a BACnet device as a recipient item to the list. The Notification Recipient dialog box appears. See the Tips for the Notification Recipient section that follows.

**Note:** Click the check box next to an item in the list and click Remove if you want to remove the item from the list.

**Note:** Click the check box next to an item in the list and click Details to view that item's Notification Recipient dialog box information.

**Note:** Select an item in the list and use the up and down arrows to change the order of the item in the list.

**Tips** for the Notification Recipient:


- To send a notification to a specific BACnet device, select the OID radio button and enter the object identifier for that device in the Device OID box. Enter the Process ID.
- To send a notification to a specific address, select the Address radio button and enter the IP Address, Network Number, UDP Port, and Process ID. See the Recipient List attribute of the Notification Class object for details.
- Select the check boxes for the days that the notifications should be sent. To define the times when the notification is active, slide the arrows on the time bar to define Start and Stop times.

For more information, see the [BACnet Integration Object](#) and [Alarm and Event Management for Metasys Systems Integrated with BACnet Devices](#).

- **Insert Object - Optimal Start**

**Menu Selection:** Insert > Object

Inserts an [Optimal Start Object](#) into the site.

**Note:** On the Configure screen, click the  button to select the object from the Select Item dialog box and then select the desired attribute for the Cooling Setpoint, Heating Setpoint, and Zone Temperature.

- **Insert Object - Pulse Meter**

**Menu Selection:** Insert > Object

Inserts a [Pulse Meter Object](#) into the site.

- **Insert Object - Schedule**

**Menu Selection:** Insert > Object

Inserts a [Schedule Object](#) into the site.

See [Scheduling](#).

- **Insert Object - Signal Select**

**Menu Selection:** Insert > Object

Inserts a [Signal Select Object](#) into the site.

- | • **Insert Object - Solar Clock**



**Menu Selection:** Insert > Object

Inserts a [Solar Clock Object](#) into the site.

### ***Insert Graphic Wizard***



**Menu Selection:** Insert > Graphic

Inserts a graphic into the site. See the [User Graphics Tool \(UGT\)](#) section for more information on how to generate graphics with the User Graphics Tool.

### ***Insert Trend Study Wizard***

**Menu Selection:** Insert > Trend Study

Inserts a trend study into the site.

**Tip:** With the Trend Study tab selected on the Configure Screen, select the  or  button to add or delete trend items.

**Tip:** Select the Configuration tab on the Configure screen for further configuration.

See one of the following sections for more information:

- [Trend Studies](#)
- [Trend Extensions](#)

### ***Create New User View Wizard***

**Menu Selection:** Insert > User View

Inserts a user navigation view (also referred to as user view, user-defined navigation tree, and user-defined tree) item into the All Items navigation tree. In online mode, the user view appears as a separate tab in addition to the All Items navigation tree if the user has permission for the user view. In online and offline modes, the user view appears in the User Views folder under the Site in the All Items tree.

Assign permissions to user views using the Security Administrator System in the online mode. You cannot assign permissions to user views in the SCT.

See the [User Views](#) section for more information on user views.

**Tip:** On the Configure screen, click the Configuration tab for further configuration.

### ***Create New Summary Definition Wizard***

**Menu Selection:** Insert > Summary Definition

Inserts a Summary Definition into the system. The Summary Definition object is used by the Tailored Summary feature. See the [Summary Definition Object](#) and the [Tailored Summaries](#) sections for more information on this object and feature.

### ***Restore Archive Wizard***

**Menu Selection:** Tools > Database > Restore Backup

Restores a backup (archive) database that was created using the Tools > Database > Create Backup menu option in the SCT.

The default path is:

- Windows XP OS: C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\DatabaseFiles
- Windows 7 OS and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\DatabaseFiles).

### ***Manage Archive Wizard***

**Menu Selection:** Tools > Manage Archive

Uploads, downloads, upgrades devices or synchronizes databases. See [Database Uploading](#), [Downloading](#), [Upgrading Device and Synchronization](#) for more information on the Load process in the SCT.

### ***Passthru Wizard***

**Modes:** Available in online and offline [modes](#) only

**Menu Selection:** Tools > Field Device Tools

Accesses tools such as HVAC PRO, GX-9100, XTM Configurator, DX Commissioning, N2 Device Loader, and CCT.

**Note:** The Field Device Tools menu selection replaces the N2 Tools menu selection available at Release 2.0 and earlier.

**Tip:** You must have N2 Tools and the SCT installed on the same PC that is running Passthru with HVAC PRO, GX-9100, XTM Configurator, DX Commissioning, or N2 Device Loader passthru.

**Tip:** You must have CCT and the SCT installed on the same computer that is running the CCT passthru. To use the CCT in Ethernet passthru mode, open CCT from the Tools > Field Device Tools > CCT (MSTP) menu option.

**Tip:** The Passthru wizard does not always appear when you are connected to the NAE or ADS/ADX online if you are already logged on to the site. The selected tool loads automatically after selecting it from the Tools menu.

**Tip:** On the Passthru Site Login screen of the wizard, enter your username and password as defined by your User Profile. By default, your username and password should automatically appear. If desired, click Test Login to check if your login parameters are valid to access the tools.

### ***Security Copy Wizard***

**Menu Selection:** Tools > Security Copy

Restores the security database. See the [Security Copy](#) section for more information.

### ***Paste Item Wizard***

**Menu Selection:** Edit > Copy, then Edit > Paste

Copies an item from the navigation tree such as an AV object, field device, or supervisory device and pastes it into another location in the navigation tree in the SCT.

**Tip:** You can copy an item and paste it into another equivalent node in the navigation tree or you can copy an item and paste it into the same node on the tree, but you must select a new name for the item. For example, you can copy an NAE from Site 1 and paste it into Site 1 or Site 2 if you rename it NAE 2. You cannot paste an NAE under an NAE, field device, or object (you must paste it under a Site).

**Tip:** When you copy and paste a field point, the new point automatically receives a unique hardware address.

**Tip:** You can copy a user view and paste it into another site. For example, use this option when adding an ADS to a site that previously had an engine defined as Site Director.

# Extensions

Extensions add features, such as trending, alarming, and totalization, to an item.

Click one of the following for more information on extensions:

- For information on searching for extensions, see the [Global Search](#) section.
- For information on commanding extensions, see [Commanding Extensions](#).
- For more information on managing extension attributes as part of a tailored summary, see the [Summary Definition Object](#) section.

## Alarm Extensions

Alarm extensions monitor an attribute of an object and send alarms using the [Alarm and Event Management](#) feature. There are two types of alarm extensions, [Analog Alarm](#) and [Multistate Alarm](#). Use the Analog Alarm extension to monitor attributes with real values. Use the Multistate Alarm extension to monitor attributes with True or False, or Multistate data types.

For general information on Metasys system objects, see the [Object Help](#) section.

## Alarm Extensions Concepts

### Analog Alarm Extension

The Analog Alarm extension adds the alarming capability for attributes with real values, such as the Present Value of an [Analog Input Object](#). This extension detects an alarm based on up to four limits and can be configured to report that alarm. It also sets the Alarm State attribute of the object to which it is added. The Analog Alarm Extension is also used in conjunction with the Graphic Setting Preferences which are used to establish color choices for alarm conditions in graphics.

For example, you can configure the Analog Alarm extension to issue an alarm if the temperature in a room falls below 15.6°C (60°F).

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the Analog Alarm extension, see [Analog Alarm Attributes](#).

### Multistate Alarm Extension

The Multistate Alarm extension adds the alarming capability for an attribute with True or False, or Multistate data types, such as the Present Value of a [Binary Input Object](#).

The Multistate Alarm extension detects the alarm with respect to a difference from a defined normal state and sets the Alarm State attribute of the object to which it is added. In addition, you can configure the Multistate Alarm extension to report alarms and True or False and/or Multistate events.

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the Multistate Alarm extension, see [Multistate Alarm Attributes](#).

### Normal State

Normal state occurs when the alarm extension is in an acceptable, expected condition, as indicated by the attribute point to which it is added.

### Warning State

Warning state occurs when the analog alarm extension transitions from Normal into the high or low warning conditions.

### Alarm State

Alarm state occurs when the extension transitions into the high alarm, low alarm, or unreliable conditions.

### AO/BO Feedback

The Alarm extensions provide feedback in points to prevent the detection of alarm conditions that are really false alarms. For the [Analog Alarm Extension](#), this feedback is done through the configuration of the [Setpoint Reference](#) attribute. For the [Multistate Alarm Extension](#), this feedback is done through the configuration of the [Command Reference](#) attribute. When you reference other attributes using the Setpoint Reference or Command Reference attributes, the alarm analysis works differently.

### Analog Points:

For example, add an Analog Alarm extension to an *Analog Input Object* (zone temperature). Define the *Present Value* of the Analog Input Object as the *Input Reference* and define the *Present Value* of an *Analog Output Object* (setpoint) as the *Setpoint Reference* of the Analog Alarm extension.

If you edit the Setpoint ( *Present Value* attribute of the *Analog Output Object*), the *Warning Reference* attribute of the Analog Alarm extension of the Zone Temperature *Analog Input Object* changes to the same value. The *Reference Delay Time* of the Analog Alarm extension resets at this same time, preventing a false alarm condition from being detected.

### Binary or Multistate Points:

For example, add a Multistate Alarm extension to a *Binary Input Object* or *Multistate Input Object*. Define the *Present Value* of a Binary Input (fan status) or Multistate Input as the *Input Reference*, and define the *Present Value* of a *Binary Output Object* (command state) or *Multistate Output Object* as the *Command Reference* of the Multistate Alarm extension.

If you edit the Command State ( *Present Value* attribute of the *Binary Output Object* or *Multistate Output Object*), the *Normal State* attribute of the Multistate Alarm extension of the Fan Status *Binary Input Object* or *Multistate Input Object* changes to the same value. The *Reference Delay Time* of the Multistate Alarm extension resets at this same time, preventing a false alarm condition from being detected.

### Delay Timer Interaction

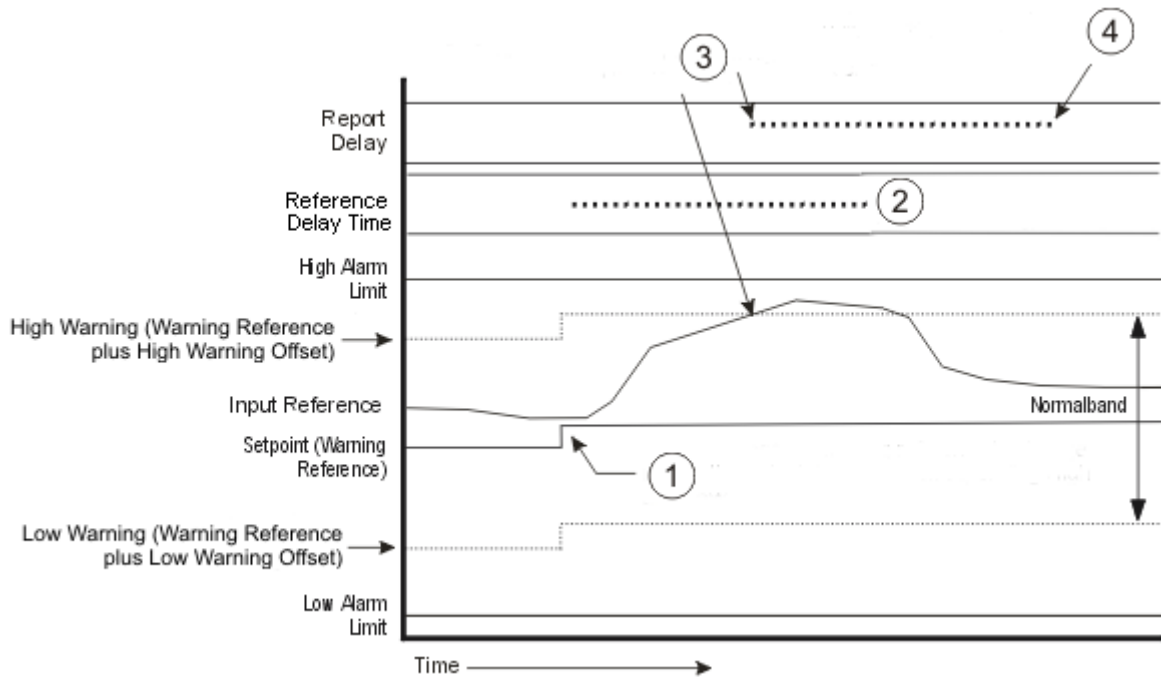
There are two timers used to delay the analysis or reporting of an alarm. These timers are used to allow normal functions to occur before an object's behavior appears abnormal and generates an alarm. The first timer is the **Alarm State: Reference Delay Timer**, which allows a preset amount of time to pass between commanding an object and making sure that the commanded object has obeyed the command before considering an alarm condition to be present. The second timer is the **Alarm State: Report Delay Timer**, which prevents the analysis of an object's condition until the preset time has passed after that object has appeared to obey a command.

The length of the reference delay time is a combination of the reference delay time and the report delay time settings. If you change the warning reference, both delays go active and if the reference delay time is greater than or equal to the report delay time, then the total delay is the sum of both timer settings; however, if the reference delay time is less than the report delay time, then the delay is equal to the report delay time setting.

The delay timers of the alarm extensions interact as follows:

**Note:** If no Warning Limits are defined, the Reference Delay Time and Reference Delay Timer Active attributes do not apply.

**Figure 11: Delay Timer Interaction**



Callout	Name	User Action
1	Warning reference command	Commands the Warning reference to change, moves the setpoint and the corresponding High and Low warnings.
2	Reference Delay Timer	Interval starts when the Warning Reference changes.
3	Report Delay Interval	Starts if high or low warning is exceeded.
4	After Report Delay Interval	Input reference is analyzed for alarm conditions.

See the [Multistate Alarm Delays Examples](#) section.

See the [Analog Alarm Attributes](#) and the [Multistate Alarm Attributes](#) for more information.

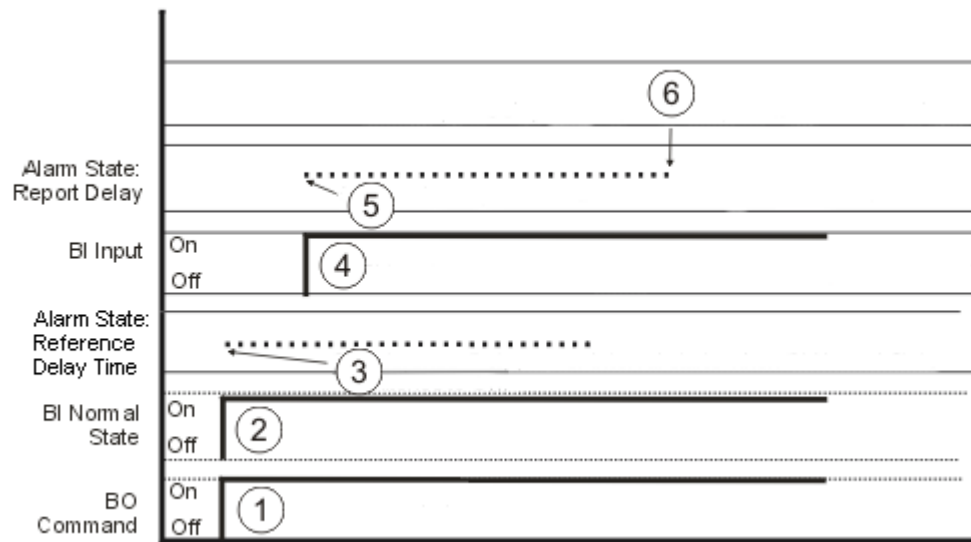
### **Multistate Alarm Delays Examples**

When attaching alarm extensions to Binary objects, we recommend that the Alarm extension be attached to a [Binary Input Object](#) (BI). When the [Binary Output Object](#) (BO) is commanded On, the command is seen by the command reference of the BI. This triggers the Alarm State: Reference Delay Timer and changes the Normal state of the associated BI. The Reference: Input of the BI should change to match the new Normal state during the time set by the Alarm State: Reference Delay Timer. If it does not, the BI immediately goes into Alarm upon expiration of the Reference Delay Time. If the BI Reference: Input does change to match the new Normal state, then the Alarm State: Report Delay Timer starts. The Alarm State: Report Delay time does not delay delivery of a previously generated report. It delays the analysis of the BI object for an alarm condition until the Report Delay time has passed. Once the Report Delay time passes, the BI is analyzed for Alarm conditions.

For example, with a BO controlling a fan and a BI with an Alarm Extension set using the BO as an Input reference, two possible conditions are affected by the Alarm State delay timers:

1. **Fan On and Operating Normally** - In the following figure, a fan has been commanded On and is operating normally. In this case, when the BO commands the Fan On, the Normal State of the BI changes to On and the Reference Delay Time starts. Within the interval set by the Reference Delay Time, the Input Reference of the BI changes to On and the Report Delay time starts. After the Reference Delay Time and Report Delay Time have passed, the BI is analyzed for Alarm conditions.

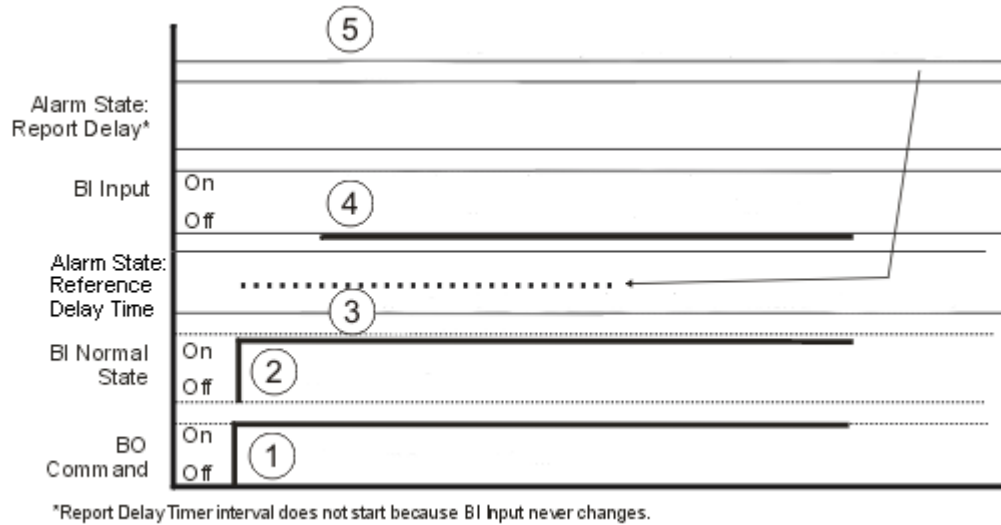
**Figure 12: Fan On and Operating Normally**



Callout	Name	User Action
1	BO Command	Fan is commanded On from BO.
2	BI Normal State	BI Normal State switches to On.
3	Alarm State: Reference Delay Timer	Reference Delay Timer interval starts when BI Normal State switches to On.
4	BI Input	BI Input switches On during the Reference Delay Timer interval.
5	Alarm State: Report Delay	Report Delay interval starts when BI Input switches to On.
6	After Report Delay Interval	BI is analyzed for alarm conditions.

- Fan Is Commanded On but the Fan Is Not Working** - In the following figure, the fan is commanded on but does not turn on due to a problem. In this case, the BO commands the Fan On, the Normal State of the BI changes to On, and the Reference Delay Time starts. However, the Input Reference of the BI never changes to On because the Fan does not turn on. Therefore, the Alarm State: Report Delay Timer never starts. After the interval set by the Alarm State: Reference Delay Time, the BI goes into an Alarm condition.

**Figure 13: Fan Is Commanded On but the Fan Is Not Working**



Callout	Name	User Action
1	BO Command	Fan is commanded On from BO.
2	BI Normal State	BI Normal State switches to On.
3	Alarm State: Reference Delay Timer	Reference Delay Timer interval starts when BI Normal State switches to On.
4	BI Input	BI Input does not turn On during the Reference Delay Timer interval due to problem with Fan.
5	Alarm State: Report Delay	After Reference Delay Timer interval. BI is analyzed and goes into Alarm.

### Analog Alarm Attributes

The [Analog Alarm Extension](#) contains attributes common to Metasys system objects. For details, see [Common Object Attributes](#).

The following table lists the attributes specific to the Analog Alarm extension. The list of Attribute names are displayed in the Focus Window of the Site Management Portal view of the Alarm Extension. Click the attribute name in the table for a description of the attribute.

**Note:** Also, see [Status](#).

**Table 32: Analog Alarm Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range	Tailored Summary Pick <sup>2</sup>	Global Modify <sup>3</sup>	SCT Configuration Attribute <sup>4</sup>
<b>Reference</b>							
Name						Y	Y
Description							Y
Object Type							Y

**Table 32: Analog Alarm Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/ Options/Range	Tailored Summary Pick <sup>2</sup>	Global Modify <sup>3</sup>	SCT Configuration Attribute <sup>4</sup>
<i>Present Value</i>	One value from a set	DR	Normal	Normal, Low Warning, High Warning, Low Alarm, High Alarm			
<i>Input</i>	Real value						
<b>Alarm State</b>							
<i>Event Enable</i>	True or False	CW	True			Y	Y
<i>Report Delay Active</i>	True or False	CW	False		Y		
<i>Report Delay</i>	Number	CW	0	0–65,535 seconds	Y	Y	Y
<b>Status</b>							
<b>Enabled</b>							Y
<i>Reliability</i>	Multistate		Input Unreliable	See <i>Reliability</i> . Uses Reliability (Set 503).			
<b>Time</b>							
<i>Date</i>	Date						
<b>Error Log</b>							
<b>Alarm/Warning Thresholds</b>							
<i>High Alarm Limit</i>	Attribute Reference		Null		Y	Y	Y
<i>High Alarm Limit</i>	Real value	CNW					
<i>Cooling Setpoint</i>	Number		Null				
<i>Heating Setpoint</i>	Number		Null				
<i>Low Alarm Limit</i>	Real value	CNW			Y	Y	Y
<b>Single Setpoint Mode</b>							
<i>Setpoint Reference</i>	Attribute Reference	CW	Null		Y	Y	Y
<i>Warning Reference</i>	Real value	CW	0.00		Y	Y	Y
<b>Heating/Cooling Setpoint Mode</b>							
<i>Cooling Setpoint Reference</i>	Attribute Reference		Null		Y	Y	Y
<i>Heating Setpoint Reference</i>	Attribute Reference		Null		Y	Y	Y
<i>Occupancy Reference</i>	Attribute Reference		Null		Y	Y	Y
<i>Unoccupied State</i>	Multistate	CW	1	Set redirected to Unoccupied_Set Attribute	Y	Y	Y
<b>Engineering Values</b>							



**Table 32: Analog Alarm Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/ Options/Range	Tailored Summary Pick <sup>2</sup>	Global Modify <sup>3</sup>	SCT Configuration Attribute <sup>4</sup>
Item Reference							
Version							
<i>Input Reference</i>	Attribute reference	C					
<i>Differential</i>	Real value	CW	0.00	Positive value	Y	Y	Y
<i>High Warning Offset</i>	Real value	CNW		Positive value	Y	Y	Y
<i>Low Warning Offset</i>	Real value	CNW		Positive value	Y	Y	Y
<i>Reference Delay Timer Active</i>	True or False		False		Y		Y
<i>Reference Delay Time</i>	Number	CW	0	0–65,535 seconds	Y	Y	Y
<b>Alarm Setup</b>							
<i>Alarm Ack Pending</i>	True or False		False	Ack not pending, Ack pending	Y		
<i>Alarm Ack Required</i>	True or False	CW	False	Ack not required, Ack required	Y	Y	Y
<i>Alarm Time</i>	Time				Y		
<i>Alarm Date</i>	Date				Y		
<i>Alarm Priority</i>	Number	CW	70	See <i>Event Priority</i> .	Y	Y	Y
<i>Warning Ack Pending</i>	True or False		False	Ack not pending, Ack pending	Y		
<i>Warning Ack Required</i>	True or False	CW	False	Ack not required, Ack required	Y	Y	Y
<i>Warning Time</i>	Time				Y		
<i>Warning Date</i>	Date				Y		
<i>Warning Priority</i>	Number	CW	120	See <i>Event Priority</i> .	Y	Y	Y
<i>Normal Ack Pending</i>	True or False		False	Ack not pending, Ack pending	Y		
<i>Normal Ack Required</i>	True or False	CW	False	Ack not required, Ack required	Y	Y	Y
<i>Normal Time</i>	Time				Y		
<i>Normal Date</i>	Date				Y		
<i>Normal Priority</i>	Number	CW	200	See <i>Event Priority</i> .	Y	Y	Y
<i>Alarm Message Text</i>	Text	CNW			Y	Y	Y
<i>Graphic</i>	Object Reference	CNW	Null	Object Type = Graphic		Y	Y
<i>Graphic Alias</i>	Text	CW		Maximum 256 characters		Y	Y
<b>BACnet</b>							
<i>Object Name</i>							

**Table 32: Analog Alarm Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/ Options/Range	Tailored Summary Pick <sup>2</sup>	Global Modify <sup>3</sup>	SCT Configuration Attribute <sup>4</sup>
Username is BACnet Object Name							Y
Object Identifier							Y

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Extension's Reliability, W - Writable

2 Y - Can be used in the Tailored Summary User View. See the [Defining User Views with Summary Definitions](#) section for information about recommended groupings of Summary Definitions in a Tailored Summary.

3 Y - Can be mass edited from a Tailored Summary or Global Search Results.

4 Y - Viewable in SCT Alarm Extension Focus Window.

### **Analog Alarm Extension Attribute Details**

#### **Alarm Ack Pending**

Indicates whether an event concerning a transition into the Alarm state is waiting for acknowledgement.

Back to [Analog Alarm Attributes](#).

#### **Alarm Ack Required**

Indicates whether a transition into the Alarm state creates a message that requires acknowledgement.

Back to [Analog Alarm Attributes](#).

#### **Alarm Date**

Indicates the last date this extension transitioned into the Alarm state. Each time this transition occurs, a message is created and this date is updated.

Back to [Analog Alarm Attributes](#).

#### **Alarm Message Text**

Indicates the text you assigned to give further information in the event of an alarm. Only status changes to an alarm state add the alarm message text reference.

Back to [Analog Alarm Attributes](#).

#### **Alarm Priority**

Indicates the priority assigned to the Alarm state.

Back to [Analog Alarm Attributes](#).

#### **Alarm Time**

Indicates the last time this extension transitioned into the Alarm state. Each time this transition occurs, a message is created and this time is updated.

Back to [Analog Alarm Attributes](#).

#### **Cooling Setpoint**

Indicates the actual monitored Cooling Setpoint value based on the [Setpoint Reference](#) mapping. You can either define the Cooling Setpoint and [High Alarm Limit](#) or the [Setpoint Reference](#).

Back to [Analog Alarm Attributes](#).

#### **Cooling Setpoint Reference**

When specified, indicates the Above Setpoint limit. You must define both the Cooling Setpoint Reference and [Heating Setpoint Reference](#), or leave both blank. If the Cooling Setpoint Reference is defined, the High Warning Offset is added to the Cooling Setpoint Reference value to calculate the High Warning Limit.

The Heating and Cooling Setpoint References are typically mapped to the Actual Heating and Cooling Setpoints created for all FEC based VAV and Terminal Unit control applications. The High and Low Warning Offsets are added to these references to calculate the High and Low Warning Limits. These reference points are used in conjunction with the Room Control Module Graphics Symbol to provide indication of above and below setpoint conditions.

Back to [Analog Alarm Attributes](#).

#### **Date**

Indicates the date of the last change in the [Present Value](#) or [Reliability](#) reported by this extension.

Back to [Analog Alarm Attributes](#).

#### **Differential**

Indicates that if the [Input](#) is in [High Alarm Limit](#) (or [High Warning Offset](#)), it must decrease by a value of the Differential before the extension returns to High Warning (or Normal). If the Input is in [Low Alarm Limit](#) (or [Low Warning Offset](#)), it must increase by the Differential before the extension returns to Low Warning (or Normal). This Differential prevents nuisance alarms due to a value that is cycling near an alarm (or warning) limit.

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#### **Event Enable**

Determines if an alarm condition is reported back to the event viewer and if alarm pop-ups are created.

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#### **Graphic**

Indicates the graphic associated with the extension.

**Note:** Do not set the Graphic attribute for an alarm extension to an aliased graphic. Aliased graphics do not display properly when displayed from the Alarms Window or Event Viewer.

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#### **Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this extension or the controller containing this extension.

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#### **Heating Setpoint**

The Heating and Cooling Setpoint References are typically mapped to the Actual Heating and Cooling Setpoints created for all FEC based VAV and Terminal Unit control applications. The High and Low Warning Offsets are added to these references to calculate the High and Low Warning Limits. These reference points are used in conjunction with the Room Control Module Graphics Symbol to provide indication of above and below setpoint conditions.

You can either define the [Cooling Setpoint](#) and [Low Alarm Limit](#) or the [Setpoint Reference](#).

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#### **Heating Setpoint Reference**

Indicates the value of the Below Setpoint limit. You must define both the [Cooling Setpoint Reference](#) and Heating Setpoint Reference, or leave both blank.

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#### **High Alarm Limit**

Specifies the actual High Alarm Limit. If blank, the limit is not used.

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**High Warning Offset**

Indicates the value added to the [Warning Reference](#) or [Setpoint Reference](#) variable to determine the actual High Warning Limit. If blank, the offset is not used and warning analysis is disabled. Both the High Warning Offset and [Low Warning Offset](#) must be defined, or both must be blank.

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**Input**

Indicates the last value received from the [Input Reference](#).

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**Input Reference**

Specifies the object and attribute monitored by this alarm extension. The reliability of the Input Reference is monitored and sets the [Reliability](#) attribute of this extension. It also can be reported in an alarm message.

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**Low Alarm Limit**

Specifies the actual Low Alarm Limit. If blank, the limit is not used.

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**Low Warning Offset**

Indicates the value subtracted from the [Warning Reference](#) or [Setpoint Reference](#) variable to determine the actual Low Warning limit. If blank, the offset is not used and warning analysis is disabled. Both the [High Warning Offset](#) and Low Warning Offset must be defined, or both must be blank.

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**Normal Ack Pending**

Indicates if an event in transition to the Normal state is awaiting acknowledgement.

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**Normal Ack Required**

Indicates whether a transition into the Normal state creates a message that requires acknowledgement.

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**Normal Date**

Indicates the last date this extension transitioned into the Normal state.

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**Normal Priority**

Indicates the priority assigned to the Normal state.

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**Normal Time**

Indicates the last time this extension transitioned into the Normal state. Each time this transition occurs, a message is created and this time is updated.

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**Occupancy Reference**

When mapped, provides a specific graphic preference color indication of a zone's occupancy status. When the reference is in an unoccupied state, warning states are not displayed; only alarm states are displayed. This capability is typically used in conjunction with the Room Status symbol graphic floorplan.

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### **Present Value**

Represents the current value of the extension.

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### **Reference Delay Time**

Specifies the amount of time that the Input has to move within the Warning Limits after a Warning Reference change before the object reports the warning. The Normal state is reported until the Reference Delay Time expires. If the Reference Delay Time is changed, any current timer is cancelled and reset to the new Reference Delay Time.

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### **Reference Delay Timer Active**

The Reference Delay Timer Active is True while the alarm extension waits for the Input value to respond to the Warning Reference change.

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### **Reliability**

Indicates the Reliability of the Analog Alarm extension. Reliability changes due to communication errors between the Analog Alarm extension and the Input Reference or Setpoint Reference. When unreliable due to communication problems, any further execution of the main logic of the Analog Alarm extension is cancelled and no report is issued.

The reliability also indicates when the [Input](#) or Setpoint Reference becomes unreliable. When reliability changes due to the Input being unreliable, an event is issued if reporting is enabled. The exception is Comm Loss reliability, which results in the same behavior as the communication problems described above.

If a Setpoint Reference, High Alarm Limit, and Low Alarm Limit are defined, and the setpoint's value is outside of the range defined by the limits, then the Analog Alarm becomes unreliable and an event message is generated (if reporting is enabled).

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### **Report Delay**

Indicates the number of seconds that the extension waits before generating a warning or alarm after the Input value moves outside of the Heating or Cooling Setpoint or warning limit. This condition applies only to changes from the Normal state. After this time, the Input value is reevaluated. If the value is still outside the limit, a report generates. The Report Delay does not apply to High or Low Alarms, which are reported immediately.

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### **Report Delay Active**

The Report Delay Active is True while the alarm extension waits for the alarm or warning to stabilize.

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### **Setpoint Reference**

A Setpoint Reference or [Warning Reference](#) is established for controllers that only provide a Single Setpoint value. The value established by either one of these references is used in conjunction with the [High Warning Offset](#) and [Low Warning Offset](#) to establish the High Alarm Warning Limit and Low Alarm Warning Limit.

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### **Status**

The [Common Object Attributes](#) section details this attribute. Of the three states that can be assumed by this attribute (Disabled, Unreliable, and Normal), two of these, Disabled and Normal, are managed outside the scope of this extension. A complete list of relevant states follows (listed in hierarchical order from highest to lowest):

- **Disabled:** Enabled attribute value is False.
- **Unreliable:** Reliability attribute is not reliable.
- **Normal:** Expected operating condition.

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#### **Time**

Indicates the time of the last change in the [Present Value](#) or [Reliability](#) reported by this extension.

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#### **Unoccupied State**

Indicates the value of the Occupancy Reference (if defined), that is considered the Unoccupied State.

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#### **Unoccupied State Set**

Indicates the set used to select the Unoccupied State. If Occupancy Reference is defined, the Unoccupied State Set uses the same value.

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#### **Warning Ack Pending**

Indicates whether an event concerning a transition into the Warning state is waiting for acknowledgement.

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#### **Warning Ack Required**

Indicates whether a transition into the Warning state creates a message that requires acknowledgement.

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#### **Warning Date**

Indicates the last date this extension transitioned into the Warning state. Each time this transition occurs, a message is created and this date is updated.

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#### **Warning Priority**

Indicates the priority assigned to the Warning state.

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#### **Warning Reference**

A [Setpoint Reference](#) or [Warning Reference](#) is established for controllers that only provide a Single Setpoint value. The value established by either one of these references is used in conjunction with the [High Warning Offset](#) and [Low Warning Offset](#) to establish the High and Low Warning limits.

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#### **Warning Time**

Indicates the last time this extension transitioned into the Warning state. Each time this transition occurs, a message is created and this time is updated.

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#### **Analog Alarm Extension Examples**

The Analog Alarm extension adds the alarming capability for attributes with real values, such as the Present Value of an Analog Input Object. This extension detects an alarm in two different modes: the Single Setpoint method, or the Cooling/Heating Setpoint Method.

#### **Single Setpoint Mode**

The **Single Setpoint Mode** uses up to four configurable limits to report an alarm. This method also sets the Alarm State attribute of the object to which it is added. You can configure Single Setpoint Mode using either a mapped setpoint reference or a fixed number set in the warning reference. For example, you can configure the Analog Alarm extension to issue an alarm if the temperature in a room falls below 15.6°C (60°F).

The Analog Alarm Object determines its new alarm state based upon receipt of a change. The new alarm state is based on the:

- Newly reported value and reliability
- Current alarm state (present value)
- Differential
- Defined alarm and warning limits.

Once you set the High and Low Alarm Limits, the High Warning Limit is calculated by adding the High Warning Offset to the Cooling Setpoint Reference Value. The Low Warning Limit is calculated by subtracting the Low Warning Offset from the Heating Setpoint Reference Value.

- Value reported by the Setpoint Reference (if defined) written to Warning Reference Value
- Delay Timer Active
- Reference Delay Timer Active

**Figure 14: Single Setpoint Mode**

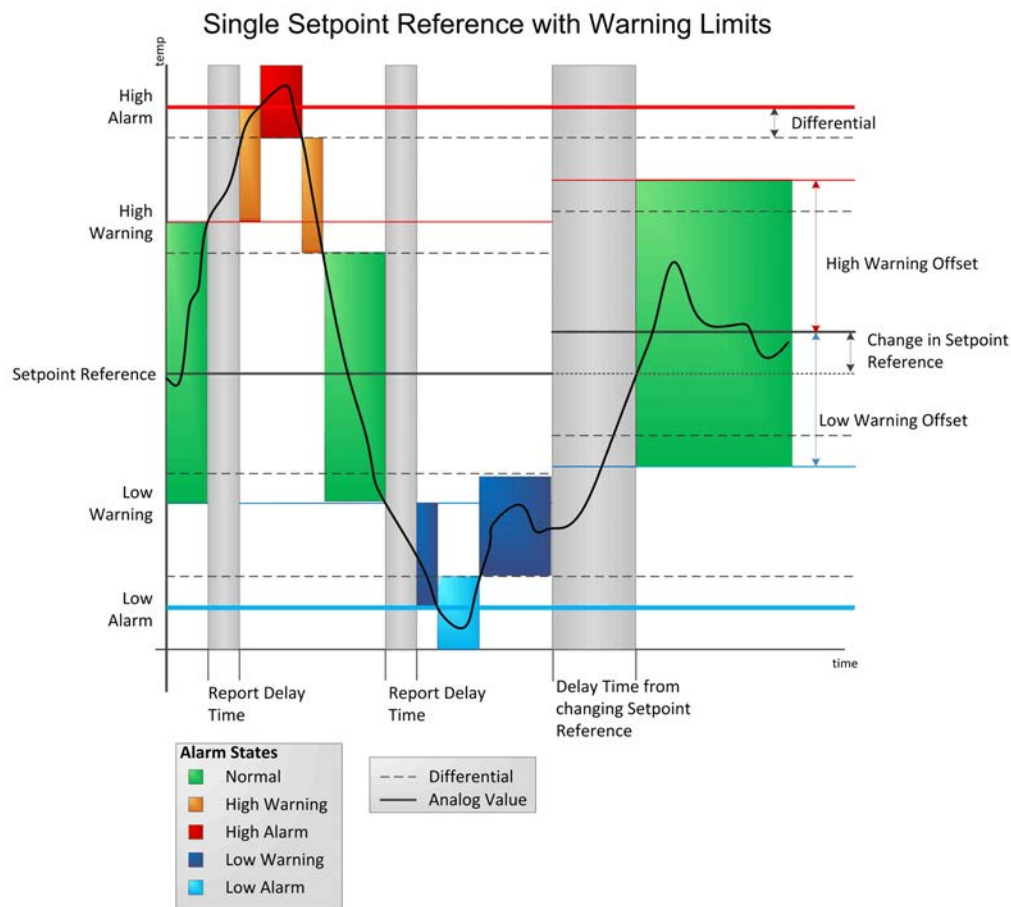


Figure 14 shows the Present Value of the Analog Alarm as it changes.

The Delay Time period begins when the Warning Reference changes. The Input Value is not calculated during this time. The Input is normal at the end of the Reference Delay Time, so the Present Value stays normal.

The Report Delay period begins when the Present Value transitions to any state from the Normal state, or the value of the Command Reference changes. Transitions to and from states other than Normal are reported immediately.

## Cooling/Heating Setpoint Mode

Using the [Cooling/Heating Setpoint Mode](#), the object calculates up to seven different statuses based on the Cooling Setpoint Reference and the Heating Setpoint Reference. You can also define an optional Occupancy Reference to suppress the status of the extension and display an unoccupied status indication color unless there is a high or low alarm.

**Figure 15: Cooling/Heating Setpoint Mode**

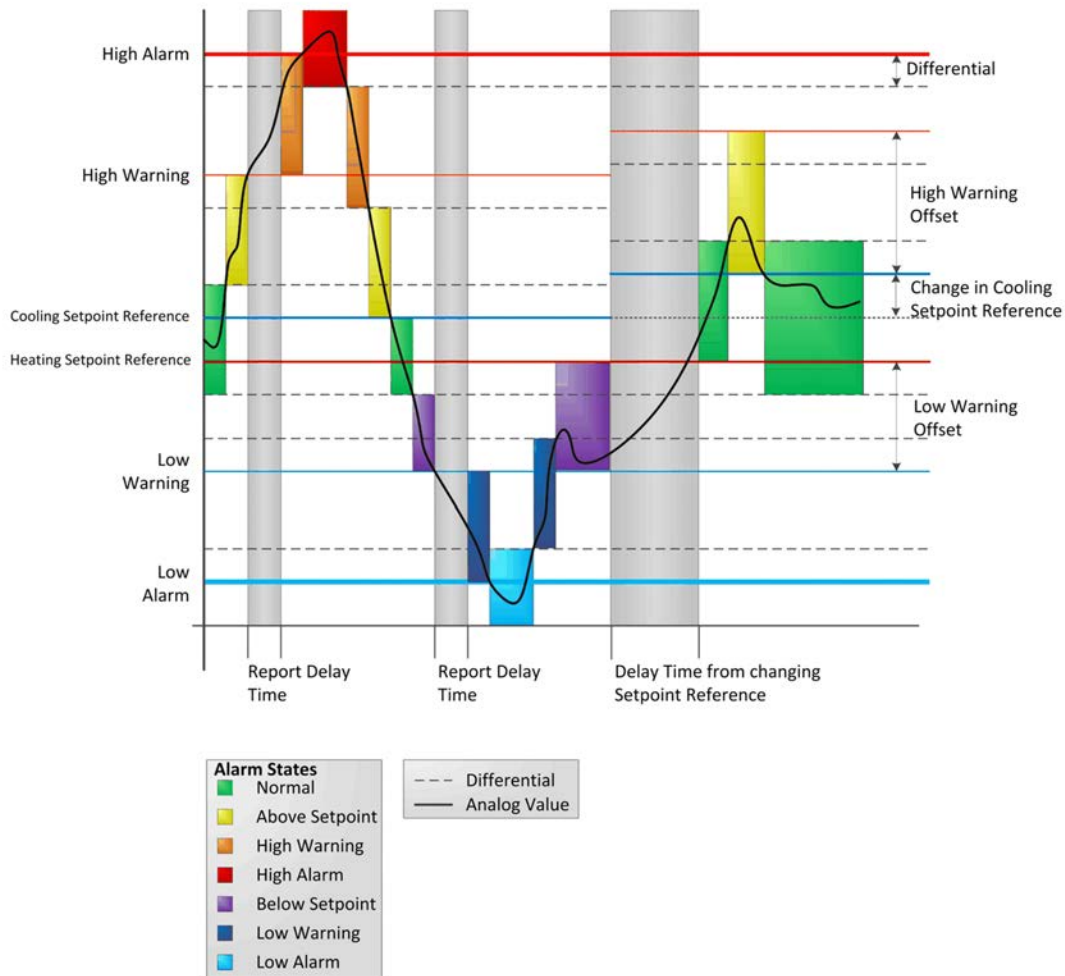


Figure 15 shows the Present Value of the Analog Alarm as it changes.

The Delay Time period starts when the Cooling Setpoint Reference or Heating Setpoint Reference value changes. Since at the end of the Reference Delay Time the Input is in Low Warning state, the Present Value is in a Low Warning state.

The Report Delay period starts when the Present Value transitions to any Alarm or Warning state from a Normal, Above Setpoint or Below Setpoint state, or if the value of the Command Reference changes. All other State Transitions are reported immediately.

## Multistate Alarm Attributes

The [Multistate Alarm Extension](#) contains attributes common to Metasys system objects. For details, see the [Common Object Attributes](#).

The following table lists the attributes specific to the Multistate Alarm extension. Click the attribute name in the table for a description of the attribute.



Note: Also, see [Status](#).

**Table 33: Multistate Alarm Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Alarm Ack Pending</a>	True or False		False	Ack not pending, Ack pending
<a href="#">Alarm Ack Required</a>	True or False	CW	False	Ack not required, Ack required
<a href="#">Alarm Date</a>	Date			
<a href="#">Alarm Message Text</a>	Text	CNW		
<a href="#">Alarm Priority</a>	Number	CW	70	See <a href="#">Event Priority</a> .
<a href="#">Alarm Time</a>	Time			
<a href="#">Alarm Values</a>	Text	CW		
<a href="#">Capture Changes</a>	True or False		False	
<a href="#">Command Reference</a>	Attribute Reference	CW		See <a href="#">Command Reference</a> .
<a href="#">Date</a>	Date			
<a href="#">Event Enable</a>	True or False	CW	True	
<a href="#">Graphic</a>	Object Reference	CNW	Null	Object Type = Graphic
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">Input</a>	Real value			Derived from <a href="#">Input Reference</a> , the object to which the Multistate Alarm extension has been attached.
<a href="#">Input Reference</a>	Attribute Reference	C		
<a href="#">Normal Ack Pending</a>	True or False		False	Ack not pending, Ack pending
<a href="#">Normal Ack Required</a>	True or False	CW	False	Ack not required, Ack required
<a href="#">Normal Date</a>	Date			
<a href="#">Normal Priority</a>	Number	CW	200	See <a href="#">Event Priority</a> .
<a href="#">Normal Time</a>	Time			
<a href="#">Normal State</a>	One type from set	CW	State 0	Derived from <a href="#">Input Reference</a> , the object to which the Multistate Alarm extension has been attached.
<a href="#">Present Value</a>	One value from a set	DR	Normal	Normal, Alarm, Hold
<a href="#">Reference Delay Time</a>	Number	CW	0	0–65,535 seconds
<a href="#">Reference Delay Timer Active</a>	True or False		False	
<a href="#">Reliability</a>	Multistate		Input Unreliable	See <a href="#">Reliability</a> . Uses Reliability (Set 503).
<a href="#">Report Delay</a>	Number	CW	0	0–65,535 seconds
<a href="#">Report Delay Active</a>	True or False	CW	False	
<a href="#">Alarm Time</a>	Time			

<sup>1</sup> C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Extension's Reliability, W - Writable

### **Multistate Alarm Extension Attribute Details**

#### **Alarm Ack Pending**

Indicates whether an event concerning a transition into the Alarm state is waiting to be acknowledged.

Back to [Multistate Alarm Attributes](#).

**Alarm Ack Required**

Indicates whether a transition into the Alarm state creates a message that requires acknowledgement.

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**Alarm Date**

Indicates the last date this extension transitioned into the Alarm state. Each time this transition occurs, a message is created and this date is updated.

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**Alarm Message Text**

Indicates the text you assigned to give further information in the event of an alarm. Only status changes to an alarm state cause the alarm message text reference to be added.

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**Alarm Priority**

Indicates the priority assigned to the Alarm state.

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**Alarm Time**

Indicates the last time this extension transitioned into the Alarm state. Each time this transition occurs, a message is created and this time is updated.

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**Alarm Values**

Associates an alarm state with a specific priority and text. Multiple states can be defined for each alarm, but each state must be unique and no state can be set to the current alarm extension normal state. The text and priority are customizable. Alarm Priority and Alarm Message Text are used as defaults when custom text and priority values are not defined.

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**Capture Changes**

If True, this attribute forces an event notification to be generated for each change of the object input state. If the input goes from one alarm state to another alarm state or back to normal, an event notification is generated.

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**Command Reference**

If specified, the value of this referenced attribute is treated as the normal state by the alarm extension. The normal state then follows a feedback value.

For example, define the Present Value of a [Binary Input Object](#) (fan status) as the Input Reference and define the Present Value of a [Binary Output Object](#) (command state) as the Command Reference.

For more information on how this attribute works with regard to AO/BO point feedback, see [AO/BO Feedback](#).

Back to [Multistate Alarm Attributes](#).

**Date**

Indicates the date of the last reported condition.

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**Event Enable**

Indicates that this value must be True for the extension to report a warning message.

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**Graphic**

Indicates the graphic associated with the extension.

**Note:** Do not set the Graphic attribute for an alarm extension to an aliased graphic. Aliased graphics do not display properly when displayed from the Alarms Window or Event Viewer.

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**Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this extension or the controller containing this extension.

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**Input**

Indicates the multistate value processed for alarms by the extension as defined by the [Input Reference](#). The value of the Input is compared to the [Normal State](#).

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**Input Reference**

Specifies the object and attribute monitored by this alarm extension. The last value received from [Input Reference](#) is written to the [Input](#) attribute. The reliability of the Input Reference is monitored and sets the [Reliability](#) attribute to this extension. It is also reported in an alarm message.

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**Normal Ack Pending**

Indicates whether an event concerning a transition into the Alarm state is waiting to be acknowledged.

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**Normal Ack Required**

Indicates whether a transition into the Normal state creates a message that requires acknowledgement.

Back to [Multistate Alarm Attributes](#).

**Normal Date**

Indicates the last date this extension transitioned into the Normal state. Each time this transition occurs, a message is created and this date is updated.

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**Normal Priority**

Indicates the priority assigned to the Normal state.

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**Normal Time**

Indicates the last time this extension transitioned into the Normal state. Each time this transition occurs a message is created and this time is updated.

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**Normal State**

Indicates the attribute value to which the [Input](#) is compared. If the Input value is different from the Normal State, an alarm state occurs.

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**Present Value**

Represents the current value of the extension.

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### Reference Delay Time

Specifies the feedback delay in seconds. The purpose of the Reference Delay Time is to allow time for equipment to start or stop before the status is compared to the command.

When a [Binary Output Object](#) (BO) (supply fan command) is commanded On, the Normal State for the associated [Binary Input Object](#) (BI) (supply fan status) alarm extension is also On. After the Reference Delay Time, the current state of the BI is compared to the Normal State. If the BI is still Off, an alarm is detected. The Reference Delay Time is also used when the BO is commanded Off.

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### Reference Delay Timer Active

The Reference Delay Timer Active is True while the alarm extension waits for the equipment to start or stop.

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### Reliability

Indicates the reliability of the Multistate Alarm extension. Reliability changes due to communication errors between the Multistate Alarm extension and the [Input Reference](#) or [Command Reference](#). When unreliable due to communication problems, any further execution of the main logic of the Multistate Alarm extension is cancelled and no report is issued.

The reliability also indicates when the [Input](#) or Command Reference becomes unreliable. When reliability changes due to the Input being unreliable, an event is issued if reporting is enabled. The only exception is Comm Loss reliability, which results in the same behavior as the communication problems described above.

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### Report Delay

Indicates the delay between detecting an alarm and actually reporting the alarm. The purpose of this delay is to make sure that the alarm is stable. If a status feedback device is fluctuating, an alarm is detected numerous times. The alarm must be True at the end of the duration of the Report Delay before the alarm is reported.

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### Report Delay Active

The Report Delay Active is True while the alarm extension waits for the alarm to stabilize.

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### Status

The [Common Object Attributes](#) section details this attribute. A list of relevant states follows (listed in hierarchical order from highest to lowest):

- **Disabled:** Enabled attribute value is False.
- **Unreliable:** [Reliability](#) attribute is not reliable.
- **Normal:** Expected operating condition.

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### Time

Indicates the time of the last reported condition.

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### Alarm Commands

The following table lists the commands supported by the [Alarm Extensions](#). Click the command name for a description of the command.

**Table 34: Alarm Extension Commands**

Command Name	Parameters
<a href="#">Cancel Delay Time</a>	
<a href="#">Alarm Commands</a>	

### **Alarm Command Details**

#### **Cancel Delay Time**

Cancels Reference Delay Timer if active. Cancelling the delay time on an Alarm extension causes a warning if the value is in this state.

Back to [Alarm Commands](#).

#### **Cancel Report Delay**

Cancels the Report Delay Timer if active. Cancelling the report delay time on an Alarm extension causes a warning or alarm if the value is in this state.

Back to [Alarm Commands](#).

### **Totalization Extensions**

Totalization Extensions track an attribute over time. There are three types of totalization extensions:

- [Analog Totalization](#) - Tracks and records analog attribute values over time.
- [Event Totalization](#) - Tracks the number of events/transitions of an attribute over time.
- [Runtime Totalization](#) - Tracks the total time that an attribute resides in a specified state.

For general information on Metasys system objects, see the [Object Help](#) section.

For more information on managing time in the Metasys system, see the NAE and ADS commissioning documents listed in the [Related Documentation](#) table in the [Welcome](#) section.

### **Totalization Extensions Concepts**

#### **Analog Totalization**

The Analog Totalization extension tracks and records the usage of any consumable monitored through an analog attribute. Some examples of consumables include electricity, gas, steam, and chilled water.

These three essential parameters determine the Analog Totalization extension's mode of operation:

- the [Input Reference](#) to be monitored
- the [Timebase](#) on which the computation is based
- the [Low CutOff Value](#) that the input must meet or exceed

Use the Analog Totalization extension to determine the usage of the given consumable. For example, you can determine the amount of gas or steam used by the facility for a given month. Also, use Analog Totalization to determine how many kilowatt/hours were used in a week or to totalize a calculated value (for instance, degree days).

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the Analog Totalization extension, see [Analog Totalization Attributes](#).

#### **Event Totalization**

The Event Totalization extension tracks the number of binary events or pulses over time, meaning it counts the number of transitions that occur at an input reference. Unlike other types of totalization, event totalization increases the value each time the event occurs, instead of calculating the value once each minute.

These three essential parameters determine the Event Totalization extension's mode of operation:

- the [Input Reference](#) to be monitored
- the types of [Transitions](#) or events to be recorded
- the [Value Per Pulse](#) (event) to be recorded

You can use this extension to determine the number of changes in an input value, which may be helpful in maintaining and monitoring equipment. For example, use Event Totalization to determine how many times a motor started, how often a sensor was in alarm, or how many cars entered a parking lot.

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the Event Totalization extension, see [Event Totalization Attributes](#).

### Runtime Totalization

The Runtime Totalization extension tracks the time that elapses while a designated input, such as a binary or multistate value, matches a specified state.

These two essential parameters determine the Runtime Totalization extension's mode of operation:

- the [Input Reference](#) being monitored
- the [Reference](#) (state) that identifies active runtime

Use this extension to track the amount of time that a piece of equipment, such as a fan or a pump, is operational. This extension also determines the amount of time a point is in alarm or the runtime of fixed loads (such as lighting) for energy consumption and tenant billing.

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the Runtime Totalization extension, see [Runtime Totalization Attributes](#).

### Analog Totalization Attributes

The [Analog Totalization](#) extension contains attributes common to Metasys system objects. For details, see [Common Object Attributes](#).

The following table lists the attributes specific to the Analog Totalization extension. Click the attribute name in the table for a description of the attribute.

**Note:** Also, see [Status](#).

**Table 35: Analog Totalization Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Display Precision</a>	One value from a set	CW	10ths	Uses Display Precision (Set 0)
<a href="#">Executing</a>	One type from a set		Active	See <a href="#">Executing</a> . Active Totalize Limit Inactive
<a href="#">Input Reference</a>	Attribute reference	C		
<a href="#">Low CutOff Value</a>	Real value	CW		
<a href="#">Present Value</a>	Real value	CDRW		
<a href="#">Reliability</a>	One value from a set		Reliable	Uses Reliability (Set 503)
<a href="#">Reset<sup>2</sup></a>	True or False	W	False	False True
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			

**Table 35: Analog Totalization Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Rollover</a>	True or False	CW	False	False True
<a href="#">Rollover Count</a>	Number		0	0–4,294,967,295
<a href="#">Scale Factor</a>	Real value	CW	1.0	Minimum Value > 0
<a href="#">Timebase</a>	One type from a set	CW	Hours	Seconds Minutes Hours
<a href="#">Totalize Limit</a>	Real value	CNW		Limit > 0
<a href="#">Units</a>	One value from a set	CW		IP SI
<a href="#">Value Before Reset</a>	Real value			

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Extension's Reliability, W - Writable

2 This attribute does not appear in a view, but may be scheduled, trended, and so on.

### **Analog Totalization Extension Attribute Details**

#### **Display Precision**

Indicates the rounded position and the number of decimal places to display for this extension.

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#### **Executing**

Reflects the status of this extension.

- **Active:** The extension is calculating and has not reached the [Totalize Limit](#).
- **Totalize Limit:** The extension has reached the limit and has stopped calculating because [Rollover](#) is set to False.
- **Inactive:** The extension is unreliable or disabled and is not calculating.

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#### **Input Reference**

Specifies the object and attribute monitored by this extension. If this attribute is unreliable or falls below the [Low CutOff Value](#), totalization is temporarily suspended.

Back to [Analog Totalization Attributes](#).

#### **Low CutOff Value**

Defines a minimum input value: Values beneath this minimum input value are not totalized. This attribute eliminates sensor errors associated with the low readings of flow sensors.

Back to [Analog Totalization Attributes](#).

#### **Present Value**

Represents the current value of the extension.

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#### **Reliability**

Represents the reliability of the [Present Value](#). If the [Input Reference](#) becomes unreliable, the totalization extension monitoring the input becomes unreliable.

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**Reset**

Forces the extension into a reset condition. (Terminates any ongoing calculations, restores the *Present Value* to initial state, and, for each triggerable attribute, forces a COV report.)

This attribute does not appear in a view, but may be scheduled, trended, and so on.

Back to [Analog Totalization Attributes](#).

**Reset Date**

Represents the date of the last *Reset* condition of the extension.

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**Reset Time**

Represents the time of the last *Reset* condition of the extension.

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**Rollover**

Defines the special action the totalization extension must take when the *Present Value* reaches the *Totalize Limit* value. If the *Rollover* attribute is set to False, the Analog Totalization extension ceases further operation when the Present Value equals or exceeds the Totalize Limit value. If it is True, it resets the present Value to 0.0 and resumes a new cycle of totalization.

Back to [Analog Totalization Attributes](#).

**Rollover Count**

When the *Rollover* attribute is True, this value increases each time *Present Value* reaches a value equal to or greater than the *Totalize Limit* value.

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**Scale Factor**

Indicates the value used to scale the totalized value to either a larger or smaller value than otherwise results.

Back to [Analog Totalization Attributes](#).

**Status**

The [Common Object Attributes](#) section details this attribute. Of the three states that can be assumed by this attribute (Disabled, Unreliable, and Normal), two of these, Disabled and Normal, are managed outside the scope of this extension. A complete list of relevant states follows (listed in hierarchical order from highest to lowest):

- **Disabled:** Enabled attribute value is False.
- **Unreliable:** *Reliability* attribute is not reliable.
- **Normal:** Expected operating condition.

Back to [Analog Totalization Attributes](#).

**Timebase**

Establishes the time frame on which the calculated totalization value is based.

Back to [Analog Totalization Attributes](#).

**Totalize Limit**

Defines a threshold value that the *Present Value* must meet or exceed for the totalization extension to take special action. When the *Rollover* attribute is set to False, the totalization process ceases further operation. When it is set to True, Present Value is cleared to 0, and the totalization process starts over.

Back to [Analog Totalization Attributes](#).

**Units**

Indicates the measurement units of this extension.

Back to [Analog Totalization Attributes](#).



### Value Before Reset

Indicates the value of the [Present Value](#) at the time of the last reset operation.

Back to [Analog Totalization Attributes](#).

### Event Totalization Attributes

The [Event Totalization](#) extension contains attributes common to Metasys system objects. For details, see [Common Object Attributes](#).

The following table lists the attributes specific to the Event Totalization extension. Click the attribute name in the table for a description of the attribute.

**Note:** Also, see [Status](#).

**Table 36: Event Totalization Attributes**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Display Precision</a>	One value from a set	CW	1s	Uses Display Precision (Set 0).
<a href="#">Executing</a>	One type from a set		Active	See <a href="#">Executing</a> . Active Totalize Limit Inactive
<a href="#">Input Reference</a>	Attribute reference	C		
<a href="#">Present Value</a>	Real value	CDRW		
<a href="#">Reference</a>	One type from a set	CW	State 0	<a href="#">States Text</a> attribute identifies the enumeration set for this attribute.
<a href="#">Reliability</a>	One value from a set		Reliable	Uses Reliability (Set 503).
<a href="#">Reset<sup>2</sup></a>	True or False	W	False	False True
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Rollover</a>	True or False	CW	False	False True
<a href="#">Rollover Count</a>	Number	RW	0	0–4,294,967,295
<a href="#">Scale Factor</a>	Real value	CW	1.0	Minimum Value > 0
<a href="#">States Text<sup>2</sup></a>	One type from a set	CW	States	See <a href="#">States Text</a> .
<a href="#">Totalize Limit</a>	Real value	CNW		
<a href="#">Transition</a>	One type from a set	CW	Entering State	Entering State Count All
<a href="#">Units</a>	One value from a set	CW		IP SI
<a href="#">Value Before Reset</a>	Real value			
<a href="#">Value Per Pulse</a>	Real value	CW	1	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Extension's Reliability, W - Writable

2 This attribute does not appear in a view, but may be scheduled, trended, and so on.

## **Event Totalization Extension Attribute Details**

### **Display Precision**

Indicates the rounded position and the number of decimal places to display for this extension.

Back to [Event Totalization Attributes](#).

### **Executing**

Reflects the status of this extension.

- **Active:** The extension is calculating and has not reached the [Totalize Limit](#).
- **Totalize Limit:** The extension has reached the limit and has stopped calculating because [Rollover](#) is set to False.
- **Inactive:** The extension is unreliable or disabled and is not calculating.

Back to [Event Totalization Attributes](#).

### **Input Reference**

Specifies the object and attribute totalized by this extension. If this attribute is unreliable, totalization is temporarily suspended.

Back to [Event Totalization Attributes](#).

### **Present Value**

Represents the current value of the extension.

Back to [Event Totalization Attributes](#).

### **Reference**

Defines the value that is processed for totalization by the extension as defined in the [Input Reference](#) attribute.

Back to [Event Totalization Attributes](#).

### **Reliability**

Represents the reliability of the [Present Value](#). If the [Input Reference](#) becomes unreliable, the totalization extension monitoring the input becomes unreliable.

Back to [Event Totalization Attributes](#).

### **Reset**

Forces the extension into a reset condition. (Terminates any ongoing calculations, restores the [Present Value](#) to initial state, and for each triggerable attribute, forces a Change of Value (COV) report.)

This attribute does not appear in a view, but may be scheduled, trended, and so on.

Back to [Event Totalization Attributes](#).

### **Reset Date**

Represents the date of the last [Reset](#) condition of the extension.

Back to [Event Totalization Attributes](#).

### **Reset Time**

Represents the time of the last [Reset](#) condition of the extension.

Back to [Event Totalization Attributes](#).

### **Rollover**

Defines the special action the totalization extension takes when the [Present Value](#) reaches the [Totalize Limit](#) value. If the Rollover attribute is set to False, the Runtime Totalization extension ceases further operation when the Present Value equals or exceeds the Totalize Limit value. If the attribute is set to True, it resets the present Value to 0.0 and resume a new cycle of totalization.

Back to [Event Totalization Attributes](#).

### **Rollover Count**

When the *Rollover* attribute is True, this value increases each time *Present Value* reaches a value equal to or greater than the *Totalize Limit* value.

Back to [Event Totalization Attributes](#).

### **Scale Factor**

Indicates the value used to scale the totalized value to either a larger or smaller value than would otherwise result.

Back to [Event Totalization Attributes](#).

### **States Text**

Indicates the displayed strings for the *Present Value*.

This attribute does not appear in a view, but may be scheduled, trended, and so on.

Back to [Event Totalization Attributes](#).

### **Status**

The *Common Object Attributes* section details this attribute. A list of relevant states follows (listed in hierarchical order from highest to lowest):

- **Disabled:** Enabled attribute value is False.
- **Unreliable:** *Reliability* attribute is not reliable.
- **Normal:** Expected operating condition.

Back to [Event Totalization Attributes](#).

### **Totalize Limit**

Defines a threshold value the *Present Value* must meet or exceed for the totalization extension to take special action. When the *Rollover* attribute is set to False, the totalization process ceases further operation. When it is set to True, Present Value is cleared to 0, and the totalization process starts over.

Back to [Event Totalization Attributes](#).

### **Transition**

Describes the behaviors of the transitions to be counted. If the value is 0, it counts the transition of entering a given reference. If the value is 1, it counts all state transitions.

Back to [Event Totalization Attributes](#).

### **Units**

Indicates the measurement units of this extension.

Back to [Event Totalization Attributes](#).

### **Value Before Reset**

Indicates the value of the *Present Value* at the time of the last reset operation.

Back to [Event Totalization Attributes](#).

### **Value Per Pulse**

Indicates the unit value of the *Input Reference* for pulse totalization. For the event totalization, the value is 1.

Back to [Event Totalization Attributes](#).

## **Runtime Totalization Attributes**

The *Runtime Totalization* extension contains attributes common to Metasys system objects. For details, see [Common Object Attributes](#).

The following table lists the attributes specific to the Runtime Totalization extension. Click the attribute name in the table for a description of the attribute.

**Note:** Also, see [Status](#).

**Table 37: Runtime Totalization Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Display Precision</a>	One value from a set	CW	10ths	Uses Display Precision (Set 0).
<a href="#">Executing</a>	One type from a set		Active	See <a href="#">Executing</a> . Active Totalize Limit Inactive
<a href="#">Input Reference</a>	Attribute reference	C		
<a href="#">Present Value</a>	Real value	CDRW		
<a href="#">Reference</a>	One type from a set	CW	State 1	<a href="#">States Text</a> attribute identifies the enumeration set for this attribute.
<a href="#">Reliability</a>	One value from a set		Reliable	Uses Reliability (Set 503).
<a href="#">Reset<sup>2</sup></a>	True or False	W	False	False True
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Rollover</a>	True or False	CW	False	False True
<a href="#">Rollover Count</a>	Number	RW	0	0–4,294,967,295
<a href="#">States Text<sup>2</sup></a>	One type from a set	CW	States	See <a href="#">States Text</a> .
<a href="#">Timebase</a>	One type from a set	CW	Hours	Seconds, minutes, hours, days
<a href="#">Totalize Limit</a>	Real value	CNW	Hours	
<a href="#">Units</a>	One value from a set	CW	No Units	
<a href="#">Value Before Reset</a>	Real value			

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Extension's Reliability, W - Writable

2 This attribute does not appear in a view, but may be scheduled, trended, and so on.

### **Runtime Totalization Extension Attribute Details**

#### **Display Precision**

Indicates the rounded position and the number of decimal places to display for this extension.

Back to [Runtime Totalization Attributes](#).

#### **Executing**

Indicates the execution status of this extension:

- **Active:** The extension is calculating and has not reached the [Totalize Limit](#).
- **Totalize Limit:** The extension has reached the limit and has stopped calculating because [Rollover](#) is set to False.
- **Inactive:** The extension is unreliable or disabled and is not calculating.

Back to [Runtime Totalization Attributes](#).

#### **Input Reference**

Specifies the object and attribute totalized by this extension. If this attribute is unreliable or changes from the Reference (state) to another state, totalization is temporarily suspended.

Back to [Runtime Totalization Attributes](#).

**Present Value**

Represents the current value of the extension.

Back to [Runtime Totalization Attributes](#).

**Reference**

Defines the value that is processed for totalization by the extension as defined in the [Input Reference](#) attribute.

Back to [Runtime Totalization Attributes](#).

**Reliability**

Represents the reliability of the [Present Value](#). If the [Input Reference](#) becomes unreliable, the totalization extension monitoring the input becomes unreliable.

Back to [Runtime Totalization Attributes](#).

**Reset**

Forces the extension into a reset condition. (Terminates any ongoing calculations, restores the [Present Value](#) to initial state, and for each triggerable attribute, forces a COV report.)

This attribute does not appear in a view, but may be scheduled, trended, and so on.

Back to [Runtime Totalization Attributes](#).

**Reset Date**

Represents the date of the last [Reset](#) condition of the extension.

Back to [Runtime Totalization Attributes](#).

**Reset Time**

Represents the time of the last [Reset](#) condition of the extension.

Back to [Runtime Totalization Attributes](#).

**Rollover**

Defines the special action the totalization extension takes when the [Present Value](#) reaches the [Totalize Limit](#) value. If the [Rollover](#) attribute is set to False, the Runtime Totalization extension ceases further operation when the Present Value equals or exceeds the Totalize Limit value. If it is True, it resets the present Value to 0.0 and resumes a new cycle of totalization.

Back to [Runtime Totalization Attributes](#).

**Rollover Count**

When the [Rollover](#) attribute is True, this value is incremented each time the [Present Value](#) reaches a value equal to or greater than the [Totalize Limit](#) value.

Back to [Runtime Totalization Attributes](#).

**States Text**

Indicates the displayed strings for the [Present Value](#).

This attribute does not appear in a view, but may be scheduled, trended, and so on.

Back to [Runtime Totalization Attributes](#).

**Status**

The [Common Object Attributes](#) section details this attribute. A list of relevant states follows (listed in hierarchical order from highest to lowest):

- **Disabled:** Enabled attribute value is False.
- **Unreliable:** [Reliability](#) attribute is not reliable.
- **Normal:** Expected operating condition.

Back to [Runtime Totalization Attributes](#).

**Timebase**

Establishes the time frame on which the calculated totalization value is based.

Back to [Runtime Totalization Attributes](#).

**Totalize Limit**

Defines a threshold value the *Present Value* must meet or exceed for the totalization extension to take special action. When the *Rollover* attribute is set to False, the totalization process ceases further operation. When it is set to True, Present Value is cleared to 0, and the totalization process starts over.

Back to [Runtime Totalization Attributes](#).

**Units**

Indicates the measurement units of the *Present Value*, *Totalize Limit*, and *Value Before Reset* attributes.

Back to [Runtime Totalization Attributes](#).

**Value Before Reset**

Indicates the value of the *Present Value* at the time of the last reset operation.

Back to [Runtime Totalization Attributes](#).

**Totalization Commands**

The following table lists the commands supported by the *Totalization Extensions*. Click the command name for a description of the command.

**Table 38: Totalization Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Reset</a>	
<a href="#">Reset Rollover</a>	Access level = Supervise

**Totalization Extension Command Details****Disable**

Locks out all outputs and prevents functionality of the Totalization extension and temporarily suspends totalization.

Back to [Totalization Commands](#).

**Enable**

Forces a [Reset](#) on the Totalization extension and returns it to normal operation.

Back to [Totalization Commands](#).

**Reset**

Terminates any ongoing calculations, restores the present value to its initial state, creates a reset date and time stamp; and for each triggerable attribute, forces a COV report.

Back to [Totalization Commands](#).

**Reset Rollover**

Resets the Rollover Count attribute.

Back to [Totalization Commands](#).

## Trend Extensions

The Trend Extension monitors and records the changes in the behavior of an individual attribute over time, thereby assisting you with diagnosing various system-wide behavioral characteristics. The Trend extension collects sample values at timed intervals or only upon changes in the given value. Trend data is still collected if the object is unreliable. The Trend extension continues to log data using the previous value preceded by ???.

For example, use a Trend extension to collect data from the Analog Input object of a controller on the N2 Bus, which reports information such as outdoor air temperature or room air temperature.

Trend extensions are different from [Trend Studies](#) because Trend Studies query both the ADS and Engine for historical data (Trend Extensions query only the Engine).

**Note:** Although multiple trend extensions can be added to an object on an NxE, these extensions will be combined as a single trend if sent to an Historical Data Repository. This may not yield the expected result. To use multiple trends on a single object in an Historical Data Repository, create duplicate AV or BV objects that map to the point in question, then create a new trend on the parallel AV or BV.

For trend performance information, refer to the *Metasys System Extended Architecture Overview Technical Bulletin (LIT-1201527)*.




For general information on Metasys system objects, see the [Object Help](#) section.

## Trend Extensions Concepts

### Views

There are three views in the Trend Extension: Chart View, Table View, and Definition View.










**Table 39: Views**

Button	View	Description
	Chart View	Allows you to view trend data in a chart format.
	Table View	Allows you to view trend data in a table format.
	Definition View	Allows you to view the trend extension attributes.

### Trend Extension Chart View

The Chart view allows you to view data samples in a graphical format and retrieve new trend data. You can zoom, unzoom, and pan within the Chart view. You can also specify the X-axis and Y-axis ranges.

**Table 40: Chart View**

Button	Name	Description
	<b>Update</b>	<p>When initially displayed, the Trend Extension view shows the data samples currently in the local trend buffer. Click the Update button to retrieve and display new data samples (for example, any trend buffer data later than the currently displayed samples). The Update button adds the new samples to the display without removing the old samples.</p> <p><b>Note:</b> Gaps may appear in the data if the trend buffer has rolled over since the last update. If you wish to clear the Trend Extension view and re-display only those samples currently in the trend buffer, use the Refresh Current Tab menu option (right-click or Action menu).</p>
 <b>(Zoom)</b>  <b>(Normal)</b>	<b>Zoom</b>	<p>Toggles the mouse behavior for the chart between zoom mode and normal mode.</p> <p>While in zoom mode:</p> <ul style="list-style-type: none"> <li>• drag the mouse over an area of the chart to zoom in on that area.</li> <li>• click Zoom to exit zoom mode and restore the mouse to normal mode.</li> <li>• left-click to zoom out one level.</li> </ul> <p>When you exit zoom mode, the chart remains at the current zoom level. Use the <a href="#">Restore</a> button to fully zoom out on the chart.</p> <p><b>Note:</b> You cannot pan while the mouse is in zoom mode.</p> <p><b>Note:</b> You can also zoom and unzoom in normal mode by using the Shift key and the mouse. To zoom, hold the Shift key down while dragging the mouse across the chart. To zoom out one level, left-click the mouse while holding the shift key down.</p>
	<b>Restore</b>	Allows you to return to an unzoomed view and switches the mouse back to normal mode if the chart's zoom mode is active.
	<b>Pan</b>	Allows you to pan the view of the chart vertically or horizontally by dragging the mouse across a zoomed chart. Panning is not available for unzoomed charts or when zoom mode is active. To pan left or right, drag the mouse over the X-axis. To pan up or down, drag the mouse over the Y-axis.
	<b>Points Line</b>	Displays the data using lines and point markers. This is the default.
	<b>Area</b>	Displays the data using an area chart.
	<b>Bar</b>	<p>Displays the data using a bar chart.</p> <p><b>Note:</b> Only use the bar chart when the number of data samples can reasonably be expected to display as bars. If too many data samples exist when you click this option, the display becomes unstable and fails to properly update the screen. To recover, select any other display option.</p>
	<b>Points</b>	Displays the data using markers, with no lines.
	<b>Line</b>	Displays the data using lines, with no markers.

**Chart Right-Click Menu**

You can access a right-click menu from the Chart view. Place your cursor in the chart and right-click in the panel to display the menu.




**Table 41: Chart View Right-Click Menu**

Menu Item	Description
Background Color	Opens the Select a Color dialog box and allows you to configure the background color.
Gridlines	Allows you to select what type of gridlines to appear on the chart. You can choose: None, X and Y, X Only, and Y Only.
Chart Type	Allows you to select what type of chart to display. You can choose: Points Line, Area, Bar, Points, and Line.

**Trend Extension Table View**

The Table view of the Trend extension allows you to view the trend's data samples in a table format. You can copy the trend data to the clipboard for pasting into other applications such as Microsoft Excel.

**Table 42: Table View**

Button/Field	Name	Description
	Update	When initially displayed, the Trend Extension view shows the data samples currently in the local trend buffer. Click the Update button to retrieve and display new data samples (for example, any trend buffer data later than the currently displayed samples). The Update button adds the new samples to the display without removing the old samples.  <b>Note:</b> Gaps may appear in the data if the trend buffer has rolled over since the last update. If you wish to clear the Trend Extension view and re-display only those samples currently in the trend buffer, use the Refresh Current tab menu option (right-click or Action menu).
Copy To Clipboard	Copy to Clipboard	Allows you to copy selected trend data to the system clipboard for pasting into other applications such as Microsoft Excel.  You can also use Ctrl + C to copy data.

**Trend Extension Definition View**

The Definition view of the Trend Extension allows you to view and edit the attributes of the trend extension object. For more information on the Definition view attributes, see the [Trend Extension Attributes](#) section.

**Trend Buffer**

The trend buffers reside in the NAE and store the trend samples for the NAE. The number of samples stored in each individual trend buffer is user-configurable (see [Trend Extension Attributes](#)). When the buffer gets full, you can choose to have the new trends overwrite the old ones or to have the trending stop. Whether the trends are overwritten or trending stops, you can configure the system to issue an alarm when the buffer gets full. You can also configure to transfer samples to a configured ADS.

[Table 43](#) shows the relationship between the buffer size and the sample interval. Determine the sample interval, in seconds, by converting minutes to seconds. Determine the buffer size by examining the interval, in seconds, against the desired time period size to retain data.

**Table 43: Buffer Size and Sample Interval Relationship**

Interval (Min.)	Interval (Sec.)	Buffer for Previous Time Period							
		1 Hr.	2 Hrs.	4 Hrs.	8 Hrs.	16 Hrs.	1 Day	2 Days	3 Days
1	60	60	120	240	480	960	1,440	2,880	4,320
2	120	30	60	120	240	480	720	1,440	2,160

**Table 43: Buffer Size and Sample Interval Relationship**

Interval (Min.)	Interval (Sec.)	Buffer for Previous Time Period							
		1 Hr.	2 Hrs.	4 Hrs.	8 Hrs.	16 Hrs.	1 Day	2 Days	3 Days
5	300	12	24	48	96	192	288	576	864
10	600	6	12	24	48	96	144	288	432
15	900	4	8	16	32	64	96	192	288
30	1,800	2	4	8	16	32	48	96	144
60	3,600	1	2	4	8	16	24	48	72
120	7,200		1	2	4	8	12	24	36

**Trend Sampling**

Trend sampling for the trend buffer occurs periodically (samples taken after a set time expires) if you set the [Sample Interval](#) to a value higher than zero. To sample based on COV reporting of the object, set the Sample Interval attribute to zero. You can stop or start sampling manually (using the [Enable](#) or [Disable](#) command) or control the start and stop with [Interlocking a Trend Extension](#) or scheduling (see [Trend Scheduling](#)). With interlocking, the trend samples are taken when a defined event occurs. If you use the scheduling feature, trend samples are taken at certain times on certain days.

**Trend Extension Attributes**

[Alarm Extensions](#) contains attributes common to Metasys system objects. For details, see [Common Object Attributes](#).

The following table lists the attributes specific to the Trend extension. Click the attribute name in the table for a description of the attribute.

**Table 44: Trend Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Acked Transitions</a>	Series of True or False states	CW	False, False, False	
<a href="#">Buffer Size</a>	Number	C	144	1–5,000
<a href="#">Buffer State</a>	One state from a set		Operational	Operational, Buffer Full
<a href="#">Client COV Increment</a>	Real value	CW		
<a href="#">COV Resubsc Interval</a>	Number	CW	3,600	Units = Seconds
<a href="#">Event Enable</a>	Series of True or False states	CW	True, False	
<a href="#">Event State</a>	One state from a set			Normal, Fault
<a href="#">Event Time Stamps</a>	Set of values			
<a href="#">Input Reference</a>	Attribute reference	C		
<a href="#">Intrinsic Alarming Defined</a>	True or False	CW	False	
<a href="#">Last Notify Record</a>	Number		0	
<a href="#">Log Enable</a>	True or False	CW	False	
<a href="#">Logging Type</a>	One type from a set		Polled	Polled, COV, Trigger
<a href="#">Log Interval</a>	Number	CW	60,000	Units = 100ths of a second
<a href="#">Notification Class</a>	Number	CW	1	
<a href="#">Notification Object Reference</a>	Object reference	CW		Limited to Notification Class on the same device.

**Table 44: Trend Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Notify Threshold</a>	Number	CW	130 (90% of Buffer Size)	
<a href="#">Notify Type</a>	One type from a set	CW	Events	
<a href="#">Record Count</a>	Number	CDW	0	0–5,000 See <a href="#">Record Count</a> .
<a href="#">Records Since Notify</a>	Number		0	
<a href="#">Repository Enabled</a>	True or False	CW	False	
<a href="#">Sample Interval</a>	Number	CW	600	0–604,800 Units = Seconds See <a href="#">Sample Interval</a> .
<a href="#">Samples Not Sent to ADS</a>	Number		0	0–5,000
<a href="#">Start Time</a>	Date/Time	CW		
<a href="#">Status Flags</a>	Series of True or False states			
<a href="#">Stop Time</a>	Date/Time	CW		
<a href="#">Stop When Full</a>	True or False	CW	False	See <a href="#">Stop When Full</a> .
<a href="#">Total Record Count</a>	Number			
<a href="#">Transfer Setpoint</a>	Number	CW	130 (90% of Buffer Size)	1–5,000
<a href="#">Trigger</a>	True or False	CW		

1 C - Configurable, D - Default Attribute for Display, W - Writable

**Trend Extension Attribute Details**

**Acked Transitions**

Conveys three separate flags that each indicate if the most recent To Offnormal, To Fault, or To Normal event transitions have been acknowledged (if the transition requires acknowledgement).

Back to [Trend Extension Attributes](#).

**Buffer Size**

Specifies the maximum number of records the buffer may hold.

Back to [Trend Extension Attributes](#).

**Buffer State**

Indicates whether the buffer is full or operational when the [Stop When Full](#) attribute is set to False.

Back to [Trend Extension Attributes](#).

**Client COV Increment**

Specifies the increment used to determine that a change of value occurred (when this trend object collects data by COV). If the referenced object and attribute support COV reporting, then this attribute may have a Null value. In this case, the value of the trended object for COV increment is used. This value only applies to trended values of the real value (floating point) type.

Back to [Trend Extension Attributes](#).

### **COV Resubsc Interval**

Specifies the number of seconds between COV resubscriptions (when this trend object collects data by COV). This attribute is only used when the trended object is a BACnet Integration point on the IP network. The Subscribe COV requests specify twice during this interval for the actual subscription. The first subscription is issued when the trend object begins operation or when enabled.

Back to [Trend Extension Attributes](#).

### **Event Enable**

Determines whether notifications are enabled for To Fault and To Normal events. A To Normal transition occurs when the value of the [Records Since Notify](#) attribute is equal to or greater than the value of the [Notify Threshold](#) attribute. A To Fault transition occurs when an attempted COV subscription fails. The To Normal transition must be enabled and set by default. The Read and write methods ensure that this value cannot be set to False.

Back to [Trend Extension Attributes](#).

### **Event State**

Determines whether an active event state is associated with this extension. The value is set to Normal when there is no intrinsic alarming defined for this object. If intrinsic alarming is enabled (Enable Intrinsic Alarms = True), then this value is either Normal or Fault (problem occurred with the object subscribing for Change of Value [COV]s). This attribute appears on the view when the site is defined as a BACnet site.

Back to [Trend Extension Attributes](#).

### **Event Time Stamps**

Conveys the times of the last event notifications for To Offnormal, To Fault, and To Normal events. Time stamps of type Time or Date have FF if no event notification of that type has generated since the object was created.

Back to [Trend Extension Attributes](#).

### **Input Reference**

Defines the attribute of the object being sampled. This attribute is used for consistent references to an object or attribute. The Input Reference and the name of the object and attribute you want to trend must match exactly.

Back to [Trend Extension Attributes](#).

### **Intrinsic Alarming Defined**

Enables (True) or disables (False) BACnet intrinsic alarming for this object. When disabled, writing to any of the intrinsic alarming attributes returns a Write\_Access\_Denied error. When disabled, reading the intrinsic alarming attributes returns the default value of each attribute.

Back to [Trend Extension Attributes](#).

### **Last Notify Record**

Indicates the sequence number associated with the most recently collected record whose collection triggered a notification (that is, it caused the value of the [Records Since Notify](#) attribute to be equal to or greater than the value of the [Notify Threshold](#) attribute). If no notification has occurred since logging began, the value of this attribute is 0.

Back to [Trend Extension Attributes](#).

### **Log Enable**

Indicates and controls whether (True) or not (False) logging is enabled.

Back to [Trend Extension Attributes](#).

### **Logging Type**

Specifies the method for which the referenced property is logged (Polled, Change of Value [COV] , or Trigger).

Back to [Trend Extension Attributes](#).

**Log Interval**

Specifies the periodic time in seconds for which the referenced property is logged.

Back to [Trend Extension Attributes](#).

**Notification Class**

Specifies the notification class used for handling and generating event notifications for this object. Notification occurs based on the value of the Records Since Notification attribute. The Notification Class attribute implicitly refers to a Notification Class object that has a Notification Class property with the same value. If the class number references a non-existent Notification object, no Notification occurs.

When the Notification Class attribute is written online, the Notification Object Reference is updated to the Object Reference of the Notification Class object with that instance number, if found. If the Notification Class object for a Johnson Controls® proprietary object is not found, the reference is left blank.

If both the Notification Object Reference and the Notification Class attributes are written simultaneously online (or both are configured and downloaded), the Notification Class attribute value is set to the value that was written to the Notification Object Reference, and the Notification Class value in the write message is ignored.

Back to [Trend Extension Attributes](#).

**Notification Object Reference**

Specifies the Notification Class object used to route alarms for the object being configured (via tree selection). When the Notification Object Reference is written, the value of the Notification Class attribute is updated to reflect the referenced object's instance number. The value of the Notification Object Reference attribute is restricted to Notification Class objects on the same device as the alarming object. Validation only occurs during a write, not during a create (the download does not fail).

Back to [Trend Extension Attributes](#).

**Notify Threshold**

Indicates when notification occurs based on the value of the Records Since Notification attribute.

Back to [Trend Extension Attributes](#).

**Notify Type**

Conveys if the notifications generated by the object are Events or Alarms. This attribute is required if the object supports intrinsic reporting.

Back to [Trend Extension Attributes](#).

**Record Count**

Represents the number of samples recorded since the creation of the trend extension or the last time the buffer was cleared, when the [Stop When Full](#) attribute is set to True.

Represents the position of the next sample recorded, when the Stop When Full attribute is set to False.

A value of zero for this attribute deletes all records in the log buffer and resets [Samples Not Sent to ADS](#) and [Total Record Count](#) to zero. If the buffer overflows, the Record Count resets to zero.

Back to [Trend Extension Attributes](#).

**Records Since Notify**

Indicates the number of records collected since the last notification occurred or since logging began if no notification occurred.

Back to [Trend Extension Attributes](#).

**Repository Enabled**

Enables transferring of the trend sample data to the ADS/ADX when this attribute is set to True and the buffer fills to the level specified by the [Transfer Setpoint](#) attribute.

**Note:** If you create multiple trend extensions on a single point and send it to an Historical Data Repository, then setting Repository Enabled to true will cause the Trend Viewer and/or Trend Study to display a combination of 15 minute and 1 minute samples. If Repository enabled is set to False then the Trend viewer displays only the data from the selected Trend Extension. To use multiple trends on a single object in an Historical Data Repository, create duplicate AV or BV objects that map to the point in question, then create a new trend on the parallel AV or BV.

Back to [Trend Extension Attributes](#).

### Sample Interval

Specifies the periodic time in seconds for which the referenced property is logged. If this attribute is zero, samples are recorded using COV reporting.

**Note:** If you want to takes samples on a COV, set the value of this attribute to 0 seconds.

**Note:** Otherwise, configure the Sample Interval at 60 seconds or higher to prevent loss of trend data and reduction in performance of the Engine and ADS/ADX devices that receive samples from the configured trend.

Back to [Trend Extension Attributes](#).

### Samples Not Sent to ADS

Represents the total number of samples requiring delivery to the ADS/ADX repository during the next transfer.

Back to [Trend Extension Attributes](#).

### Start Time

Specifies the time and date to enable logging when the Enable attribute is set to True. If the Start Time contains any wildcard values, then the conditions to enable logging based on time are ignored. When the Trend object is inactive due to the current time being outside of the Start Time or Stop Time, the Status attribute reflects this state (assuming it is the highest priority status). If you define a [Stop Time](#) that is before the Start Time, the Trend object is disabled.

Back to [Trend Extension Attributes](#).

### Status Flags

Indicates the general status of the object in BACnet terms and contains four independent states.

The four flags are:

- **In Alarm** - False if the Event State attribute value is Normal; otherwise, the In Alarm flag is True. (Set only by BACnet Intrinsic Alarming.)
- **Fault** - True (1) if the Reliability attribute is **not** reliable; otherwise, the Fault flag is False.
- **Overridden** - Overridden flag is True if the Present Value is overridden from the hardware source level.
- **Out of Service** - Out of Service flag is True if the Out of Service attribute value is True; otherwise, the Out of Service flag is False.

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### Stop Time

Specifies the time and date to disable logging. If the Stop Time contains any wildcard values, then the conditions to disable logging based on time are ignored. Logging is disable if the Stop Time is prior to the Start Time. When the Trend object is inactive due to the current time being outside of the Start Time or Stop Time, the Status attribute reflects this state (assuming it is the highest priority status). A change in the active/inactive state due to the Start Time/Stop Time value has no impact on the Enable attribute. If the Trend object was disabled due to the Stop Time, the Trend object attempts to send the trend samples to the server. If you define a Stop Time that is before the [Start Time](#), the Trend object is disabled.

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### Stop When Full

Specifies whether logging ceases when the buffer is full. When set to True, logging ceases and all accumulated samples remain in the buffer.

When set to False, logging continues. If the [Repository Enabled](#) attribute is set to False, the previously recorded samples are overwritten. If the Repository Enabled attribute is set to True and the buffer fills to the level specified by the [Transfer Setpoint](#) attribute, the previously recorded samples are sent to the ADS/ADX. The buffer must be cleared for logging to continue.

Back to [Trend Extension Attributes](#).

**Total Record Count**

Represents the total number of records collected by the Trend Extension since creation. When the value of Total Record Count reaches its maximum possible value of 0xFFFFFFFF, the next value it takes is zero. Once this value has wrapped to zero, its semantic value (the total number of records collected) is lost, but its use in generating notifications remains.

Back to [Trend Extension Attributes](#).

**Transfer Setpoint**

Represents the amount of buffer memory (in number of samples) that must fill before the trend extension requests a transfer of the current samples to the ADS/ADX for permanent storage. The value cannot be greater than the buffer size when Repository Enabled is true.

Back to [Trend Extension Attributes](#).

**Trigger**

Causes the collection of data when changed from False to True, Enable is set to True, and the trend is within the Start/Stop times. When data collection completes, this attribute resets to False. This attribute does not trigger Johnson Controls COVs.

Back to [Trend Extension Attributes](#).

**Trend Extension Commands**

The following table lists the commands supported by [Trend Extensions](#). Click the command name for a description of the command.

**Table 45: Trend Extension Commands**

Command Name	Parameters
<a href="#">Clear</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Execute</a>	
<a href="#">Route</a>	

**Trend Extension Command Details**

**Clear**

Clears all samples in the buffer.

Back to [Trend Extension Commands](#).

**Disable**

Stops collection of samples.

Back to [Trend Extension Commands](#).

**Enable**

Resumes collection of samples.

Back to [Trend Extension Commands](#).

## Execute

Takes a single sample.

Back to [Trend Extension Commands](#).

## Route

Routes all trends that have not been previously sent to the ADS/ADX, if defined.

Back to [Trend Extension Commands](#).

## Load Extensions

The Energy Management feature consists of two major components: one Demand Limiting/Load Rolling (DL/LR) object, and one or more Load extensions. A Load extension is added to an output object (only one load extension per object) to specify that the object should be controlled by Energy Management. Each Load extension object is configured with the load (energy) rating of its output, and the attribute value or state to write to its output object when the Load object is shed.

The DLLR object determines how much energy needs to be reduced, based on its configuration and the energy rate from a meter, if the demand limiting strategy is defined. The DLLR object orders as many Loads as needed to shed to reduce the energy usage by the required amount. The Loads can be on the same supervisory device as the DLLR object, or on another supervisory device, but must be within the same site. Each shed Load writes its configured Output Shed Command attribute value to the Present Value attribute of its output, which decreases energy usage.

For information on the features and operation of DLLR, refer to the *DLLR Technical Bulletin (LIT-12011288)*.

The [Demand Limiting/Load Rolling \(DLLR\) Object](#) chapter contains information relevant to the DLLR Object.

## Load Extension Attributes

There are three types of Load Extension objects: Binary, Multistate, and Analog. The following table describes the attributes of these objects.

**Table 46: Load Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Active Timer</a>	One type from a set		None	Active Timer set
<a href="#">Actual Shed Level</a>	Number		0	
<a href="#">Alarm Reference for Ineligibility</a>	Object Reference	CNW		
<a href="#">Comfort Override</a>	One type from a set	CW	Inactive	Comfort Override set
<a href="#">Current Available Energy Savings</a>				
<a href="#">Display Precision</a>	One value from a set	CW	10ths	Uses Display Precision (Set 0).
<a href="#">Display Reference</a>	One value from a set	CW		Synchronized to the output object's Display Precision.
<a href="#">Duty Window</a>	Number	W	0	1–65,535
<a href="#">Eligibility</a>	One type from a set			Load Eligibility set
<a href="#">Event State</a>	One state from a set			Normal, Fault
<a href="#">Expected Shed Level</a>	Number		0	
<a href="#">Input Reference</a>	Attribute reference	C		
<a href="#">Last Shed Date</a>	Date			
<a href="#">Last Shed Time</a>	Time			
<a href="#">Load Locked</a>	True or False	W	False	



**Table 46: Load Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Load Priority</a>	Number	CW	10	1–10
<a href="#">Load Rating</a>	Array of structures	CW		
<a href="#">Log Enable</a>	True or False	W	True	
<a href="#">Maximum Shed Time</a>	Number	CNW	15	1–65,535 Undefined = 65,535 Units = Minutes
<a href="#">Minimum Release Time</a>	Number	CW	5	1–65,535 Units = Minutes
<a href="#">Minimum Shed Time</a>	Number	CW	5	1–65,535 Units = Minutes
<a href="#">On Release</a>	One type from a set	CW	Release Immediately	Comfort Override Type set
<a href="#">Output Shed Command</a>	One type from a set			Set is specified by output's States Text attribute.
<a href="#">Present Value</a>	One state from a set		Inactive	Uses BACnet Shed State set.
<a href="#">Rate Units</a>	One type from a set	CW	kW	Units set
<a href="#">Reliability</a>	One value from a set		Reliable	Uses Reliability (Set 503).
<a href="#">Requested Shed Level</a>	Number	W	0	1–65,535
<a href="#">Shed Command</a>	One type from a set	W	None	Shed Command set
<a href="#">Shed Duration</a>	Number	W	0	1–65,535
<a href="#">Shed Level Descriptions</a>	Array		Shed All Load	Uses Shed Level Descriptions set.
<a href="#">Shed Levels</a>	Array	CW	1	1–65,535
<a href="#">Shed Status</a>	One type from a set		Released	Shed Status set
<a href="#">Shed Ineligibility</a>	One type from a set			Load Ineligibility set
<a href="#">Shed Strategy</a>	One type from a set	CW	0	Shed Strategy set
<a href="#">Time Remaining</a>	Number	CW		
<a href="#">Start Time</a>	Structure	W		BACnet Date Time structure
<a href="#">Status Flags</a>	Series of True or False values		False, False, False, False	In Alarm, Fault, Overridden, Out of Service
<a href="#">Units</a>	One value from a set	CW		IP SI

<sup>1</sup> C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

### **Load Extension Attribute Details**

#### **Active Timer**

Indicates which Load timer is in effect: Minimum Shed, Maximum Shed, Minimum Release, or None. The Time Remaining attribute indicates how much time remains for the active timer.

Back to [Load Extension Attributes](#).

### **Actual Shed Level**

Indicates the level of power shed when a shed request is active. When the Present Value attribute value is Shed Compliant, the Actual Shed Level equals the value of the Shed Levels array element; otherwise, it equals zero (0).

Back to [Load Extension Attributes](#).

### **Alarm Reference for Ineligibility**

Prevents the Load from being shed if the reference is in alarm. This is an optional reference to an object that can be set to any object, including the output object. For example, if the referenced object is a room temperature sensor, and the object goes into alarm (a room becomes too warm), it prevents the supply fan (the Load object) from being shed. If the Load object is already shed when the referenced object goes into alarm, the shed expires as it would normally but cannot be shed again until the referenced object exits the alarm state.

Back to [Load Extension Attributes](#).

### **Comfort Override**

Configures the Comfort Override command behavior for this load. From time to time, you may need to override a load to turn on lights in a normally empty conference room or provide more airflow to a zone. The Comfort Override command is meant for this purpose. You can issue this command directly from DLLR's Load Summary to release loads if they are shed, and prevent them from being shed. The load cannot be shed again until the Release Comfort Override is issued.

This attribute can be set to the following values:

- **Inactive** - No comfort override is in effect.
- **Override And Release Immediately** - Comfort overrides the Load immediately and prevents it from being shed. If the Load is currently shed, the output write is immediately released.
- **Override But Release After Timer Expires** - Comfort overrides the Load immediately and prevents it from being shed. If the Load is currently shed, the output write is released after the Load's Minimum Shed Time expires. If the Minimum Shed Time has already expired when the command is issued, the output write is immediately released.

This attribute is synchronized to the Comfort Override/Release Comfort commands.

Back to [Load Extension Attributes](#).

### **Current Available Energy Savings**

Indicates how much energy would be saved if the Load were shed now.

Back to [Load Extension Attributes](#).

### **Display Precision**

Indicates the rounded position and the number of decimal places to display for this extension.

Back to [Load Extension Attributes](#).

### **Display Reference**

Indicates the current display precision of the load's output object.

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### **Duty Window**

Indicates the time window for determining shed compliance.

Back to [Load Extension Attributes](#).

### **Eligibility**

Indicates to DLLR whether the Load can be shed and identifies for which strategy or strategies (DL, LR, or both) it can be shed.

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### Event State

Determines whether an active event state is associated with this extension. The value is set to Normal when there is no intrinsic alarming defined for this object. If intrinsic alarming is enabled (Enable Intrinsic Alarms = True), then this value is either Normal or Fault (problem occurred with the object subscribing for COVs). This attribute appears on the view when the site is defined as a BACnet site.

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### Expected Shed Level

Indicates the level of power that the Load object expects to shed when a shed request is active or pending. When the Present Value attribute value is Shed Request Pending or Shed Compliant, the Expected Shed Level equals the value of the Shed Levels array element; otherwise, it equals zero (0).

Back to [Load Extension Attributes](#).

### Input Reference

Specifies the object and attribute monitored by this extension. The reliability of the Input Reference is monitored and sets the Reliability attribute of this extension.

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### Last Shed Date

Indicates the date on which the Load was last shed (since download).

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### Last Shed Time

Indicates the time at which the load was last shed (since download).

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### Load Locked

Specifies whether the Load is locked. A Load that is locked while released cannot be shed until the Load lock is released. A Load that is locked while shed remains shed until the Load lock is released. This attribute is synchronized with the Lock/Unlock commands.

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### Load Priority

Indicates how critical the Load's output is and determines the order in which loads are shed. You can define up to 10 load priorities: Priority 1 through Priority 10. Loads at Priority 10 are first to shed; loads at Priority 1 are the last to shed. The configured Load Priority is shown with the load on the DLLR object's Load Summary. The shedding order is from top to bottom as listed in the Load Summary when the Load Priority column is sorted with the lowest priority loads listed first.

**Note:** Even though the capacity for 10 priority levels is provided, you can implement fewer than 10 levels; for example, Priority 1 through Priority 4, with Priority 4 loads shed first, and Priority 1 loads shed last.

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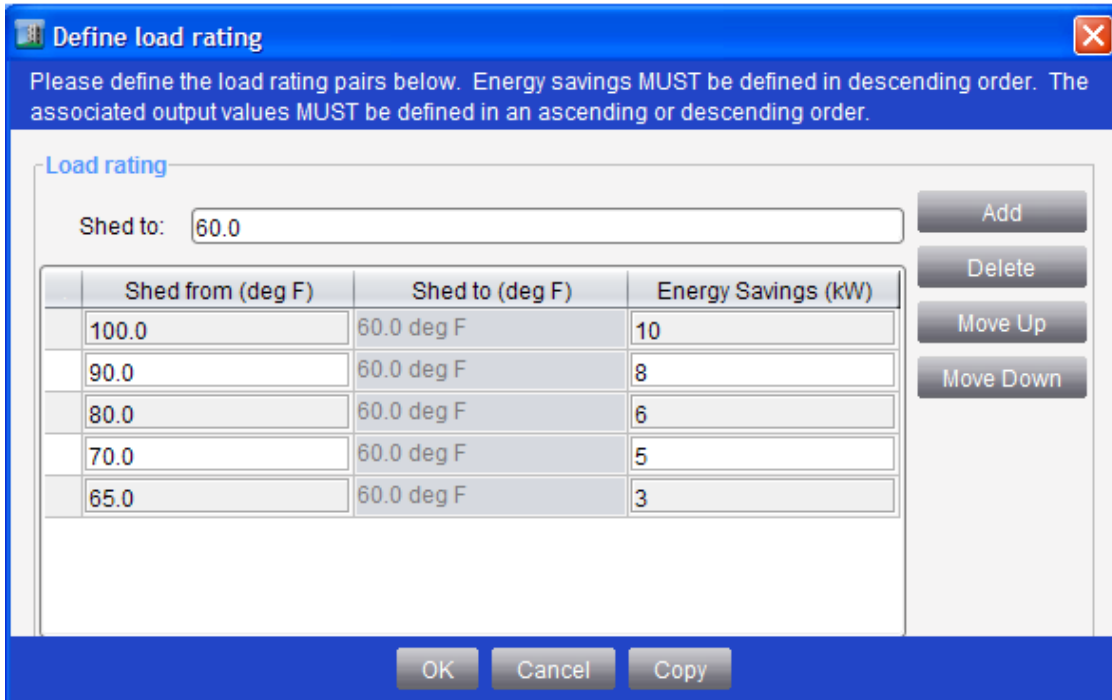
### Load Rating

Defines how much energy is saved when the Load is shed. This attribute specifies the information that DLLR needs to control the load. This includes a **Shed to** value, the value to which DLLR commands the output when the load is shed. Also required is at least one **Shed from/Energy Savings** pair, which indicates the amount of energy that would be saved when the output is commanded from the Shed From value to the Shed To value. For binary outputs, only one Shed From/Energy Savings pair is needed, since it can have only two possible states (Shed To and Shed From). For multistate and analog output objects, there can be multiple Shed From/Energy Savings pairs, since they can have many possible values, and differing amounts of energy might be saved depending on the value the output had when the shed occurred. The option for adding multiple load ratings helps improve the accuracy of the shed process.

**Note:** Enter Energy Savings amounts in decreasing order, with the highest amount listed first. Enter the same Shed to value in all rows.

Consider an example of a fan that should be shed to 60%. The first Shed from entry is 100%, because the most energy would be saved when shedding from this state. The second Shed from entry is 90%, the third entry is 80%, and so on. The entries might look like this:

**Figure 16: Define Load Rating**



Also, consider an example of a three-speed fan that can have the following states: High, Medium, Low, and Off. The operator decides to set the fan to Low when the Load is shed. In this case, the first Shed from entry is High because the most energy would be saved when shedding from this state. The second Shed from entry is Medium. A Shed from entry for Off is not required because no energy is saved by shedding from Off to Low. The entries might look like this:

**Table 47: Load Rating Entries**

Shed From	Shed To	Energy Savings
High	Low	5.0 kW
Medium	Low	3.2 kW

Back to [Load Extension Attributes](#).

**Log Enable**

Indicates whether the Load object responds to shed requests.

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**Maximum Shed Time**

Specifies the maximum number of minutes that a load can be shed before it is automatically released. If the Maximum Shed Time value is not defined, the default value of 65,535 is used. The range is 0 to 65,535 minutes. It is possible for the Load to be released before this time. A Load does not remain shed longer than the maximum shed time unless the load has been locked shed.

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**Minimum Release Time**

Specifies the minimum number of minutes that a load must be released from shed before it can be shed again. Although DLLR does not shed a load before this time expires, a load can be manually shed before this value expires.

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**Minimum Shed Time**

Specifies the minimum number of minutes that a load must be shed before it can be automatically released. A load can be manually released before this value expires.

Back to [Load Extension Attributes](#).

**On Release**

Specifies how soon the Load should be released when a Release Load command is issued or when the Shed command attribute is set to Release. If this attribute is set to Release Immediately, the load releases immediately even if its Minimum Shed Timer is active. If this attribute is set to Release After Timer Expires, the load remains shed until the Minimum Shed Time expires. If a release is issued but the Load remains shed until the Minimum Shed Time expires, the Load's Shed Status attribute indicates this using one of the following states. The state that is used depends on whether the Load was shed for demand limiting or load rolling.

- **Shed For DL** - Release Issued
- **Shed For LR** - Release Issued

Back to [Load Extension Attributes](#).

**Output Shed Command**

The state that is written to the output's Present Value attribute when the Load is shed. DLLR does not shed the Load if the output's Present Value equals the Output Shed Command value, as no energy would be saved.

Back to [Load Extension Attributes](#).

**Present Value**

Indicates the current Load shedding state of the Load object.

Back to [Load Extension Attributes](#).

**Rate Units**

Specifies the energy units used for the Load Rating Energy Savings display.

Back to [Load Extension Attributes](#).

**Reliability**

Represents the reliability of the Present Value. If the Input Reference goes unreliable, the extension monitoring the input goes unreliable.

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**Requested Shed Level**

Controls the desired level of Load shedding for one shed. Specifying a value greater than the value configured in the Shed Levels attribute sheds to the Shed Levels value. Specifying a value less than the value configured in the Shed Levels attribute (such as zero) cancels a shed.

The DLLR object writes this attribute to one, and sheds the Load object. Once the shed completes, the Load object resets this value to zero.

If the Load object sheds via a non BACnet method, such as the Shed command, the Load sets this attribute to one, and returns it to zero after the shed completes.

Back to [Load Extension Attributes](#).

### **Shed Command**

Indicates the current shed/release state of the Load. This attribute also offers the option of shedding or releasing a Load.

- **Release** - Releases the Load. The On Release attribute determines when the Load is released. If the Load is already released, there is no change.
- **Shed** - Immediately sheds a released Load regardless of its Minimum On Time. If the Load is already shed, there is no change.

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### **Shed Duration**

Indicates the number of minutes to shed the Load. Writing this attribute to a value less than the current time minus the Start Time attribute value cancels a shed.

The DLLR object sets this attribute to shed the load. After the shed completes, the Load sets it to zero.

If the Load object sheds via a non BACnet method, such as the Shed command or Shed Command attribute, it sets this value to the Max Shed Time and returns it to zero when the shed completes. If no Max Shed Time is defined, the Load sets this value to its maximum value (0xFFFF), which is the maximum number of minutes that a Load can shed without being locked shed.

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### **Shed Level Descriptions**

Provides a description of the shed level supported by the Load object.

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### **Shed Levels**

Specifies the shed levels used for the Requested Shed Level attribute. Set this attribute to a value of one (1) for the DLLR to automatically shed the Load. If this attribute is set to another value, the DLLR does not shed or release the Load; although the Load can be shed and released manually or by another feature, and is automatically released upon expiration of its Maximum Shed Time, unless the Load is locked shed.

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### **Shed Status**

Indicates if the Load is shed or released, and, if shed, which strategy was used to shed the Load (DL or LR).

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### **Shed Ineligibility**

Indicates whether a load is eligible to be shed at the current time, and, if ineligible, the cause of ineligibility.

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### **Shed Strategy**

Indicates which strategy is permitted to shed the Load (DL, LR, or both).

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### **Time Remaining**

Indicates how much longer a Load timer is in effect. The [Active Timer](#) attribute indicates which timer is in effect.

Back to [Load Extension Attributes](#).

### **Start Time**

Indicates the date and time that the Load sheds. Writing this attribute to a wildcard releases a shed load.

The DLLR object sets this attribute to shed the Load. Once the shed completes, the Load object sets the value to date and time wildcards (NONE\_FFFF).

If the Load object sheds via a non BACnet method, such as the Shed command, it sets this attribute to the current time, and returns it to NONE\_FFFF after the shed completes.

Back to [Load Extension Attributes](#).

### Status Flags

Indicates the general status of the object in BACnet terms and contains four independent states.

The four flags are:

- **In Alarm** - False if the Event State attribute value is Normal; otherwise, the In Alarm flag is True. (Set only by BACnet Intrinsic Alarming.)
- **Fault** - True (1) if the Reliability attribute is **not** reliable; otherwise, the Fault flag is False.
- **Overridden** - Overridden flag is True if the Present Value is overridden from the hardware source level.
- **Out of Service** - Out of Service flag is True if the Out of Service attribute value is True; otherwise, the Out of Service flag is False.

Back to [Load Extension Attributes](#).

### Units

Indicates the measurement units of this extension.

Back to [Load Extension Attributes](#).

### Load Commanding

Objects with a Load extension and intended for use with the DLLR feature permit the following operator or scheduled commands.

**Table 48: Commands Available to Load Objects**

Command	Parameters	Description
<b>Shed</b>	Type <sup>1</sup> Percent, Level, or Amount Value New shed value	Sheds the load immediately. The output is written at priority 13 (LR) if the load's Shed Strategy is set to Load Rolling Only. Otherwise, it is written at priority 11 (DL). When this command is issued, the output is commanded regardless of whether DLLR is in Shed or Monitor Only mode.
<b>Release Load</b>	None	Releases the load, which releases the command at the priority at which it was previously written by the shed command (11 or 13). The On Release attribute defined in the Load object determines whether the release occurs immediately when the command is issued, or waits for the Minimum Shed timer to expire.
<b>Comfort Override</b>	Release Immediately Release After Timer Expires	Releases a shed load that is resulting in occupant discomfort. This command releases the shed and prevents a future shed until the Release Comfort Override command is issued. You can either select to release the load immediately when the command is issued, or only after the Minimum Shed Timer expires. The default if no parameter is selected is to release the load immediately.
<b>Release Comfort Override</b>	None	Releases the Comfort Override command and allows the load to be shed.
<b>Lock</b>	None	Locks the load in its current shed or released state. The load remains in this state until an Unlock (or Disable) command is issued.
<b>Unlock</b>	None	Releases a Lock command. If the load was locked shed and its Maximum Shed Time expired, it now releases.

**Table 48: Commands Available to Load Objects**

Command	Parameters	Description
Disable	None	Disables the load, which causes it to release its output command immediately if it is shed, and clears any Lock or Comfort Override commands that have been issued. While disabled, the load is not eligible to be shed.
Enable	None	Enables the load, which permits it to be controlled by DLLR.

1 Select only the Level command and use the default value of 1. The Percent and Amount command options are intended for future use.

### Load Command Interactions

[Table 49](#) illustrates command interactions that pertain to Load objects.

**Table 49: Load Command Interactions**

Load Command(s) Currently in Effect	Load Command Not Allowed	Explanation
Shed	Shed	Load cannot be shed because it is already shed.
Shed + Locked	Comfort Override or Release Load	Lock must be removed with Unlock command.
Comfort Override	Shed	Comfort Override must be released with Release Comfort Override command.
Released + Locked	Shed	Lock must be removed with Unlock command.
Released + Locked and Comfort Override	Shed	Comfort Override must be released with Release Comfort Override command.  Lock must be removed with Unlock command.

## Resource File Extensions

The Resource File extension represents an actual physical file that gets placed in the System Configuration Tool's database or in the file system (*Flash Memory* of an Engine device). The resource file is an extension of another object called the parent object. The parent objects for Resource File extensions can be field devices.

After completing the , the wizard prompts you to add a resource file extension. The resource file extension allows you to define the attributes representing a defined resource file and allows you to populate resource files for integrations. For example, you can define a set of resource files to support communication with field devices. The resource file notifies its parent object when any changes are made to the extension.

**Note:** When using an HVAC PRO file as a resource file, be sure you use the long print file format because it provides the Metasys system with more information than the short print file format. For example, the long print file format imports the units of measure while the short print file format uses defaults based on the HVAC PRO units setting. For analog values, it uses the default units of Deg F or Deg C (based on the Metric versus English units specified in the PRN file). If you use a short form PRN file, the User Interface displays a warning message stating that you have selected a short format PRN file that does not contain units information. The warning message indicates that the Metasys system uses the default setting which may not match the original units.

For more information on resource file extensions, see [Resource File Attributes](#).

For general information on Metasys system objects, see the [Object Help](#) section.



## Resource File Attributes

[Resource File Extensions](#) contain attributes common to Metasys system objects. For details, see [Common Object Attributes](#).

The following table lists the attributes specific to the Resource File extension. Click the attribute name in the table for a description of the attribute.

**Table 50: Resource File Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Date</a>	Date	C		
<a href="#">File Name</a>	Set of related values	C		Category = File See the <a href="#">File Name</a> section.
<a href="#">File Size</a>	Number	C	0	Units = Bytes
<a href="#">Information</a>	Text	CW		Size = 80 Category = Default
<a href="#">Time</a>	Time	C		

<sup>1</sup> C - Configurable, N - Value Not Required, W - Writable

### Resource File Extension Attribute Details

#### Date

Indicates the modified date as read from the selected file.

Back to [Resource File Attributes](#).

#### File Name

The following table Indicates the file containing resources located within the host computer. Click the element name in the table for a description of the element of the File Name attribute.

**Table 51: Resource File - File Name Elements**

Element Name	Data Type	Initial Value	Values/Options/Range
<a href="#">Exportable</a>	True or False	False	Available in a future release
<a href="#">Object References</a>	Object reference		
<a href="#">References</a>	True or False	False	
<a href="#">Relative Path</a>	Text		Size = 100 Category = Default

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#### File Name: Exportable

Indicates whether you can export the file. If True, you can export the file. If False, you cannot export the file. This element of the File Name attribute is to be available in a future release.

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Back to [Resource File Attributes](#).

#### File Name: Object References

Indicates the object references embedded in the file.

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#### File Name: References

Indicates whether the file has references. If True, the file has references. If False, the file has no references.

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Back to [Resource File Attributes](#).

#### **File Name: Relative Path**

Indicates the file name of the file relative to the directory containing the MOI file for the device.

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Back to [Resource File Attributes](#).

#### **File Size**

Indicates the size, in bytes, as read from the selected file.

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#### **Information**

Indicates the text you assigned to provide further information about the resource file. This attribute can be written to from an integration server after reading the resource file.

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#### **Time**

Indicates the modified time as read from the selected file.

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## **Averaging Extensions**

The Averaging extension calculates the average, minimum, and maximum value of an attribute over a specific interval (for example, space temperature over 24 hours). The extension is able to sample Boolean, Integer, Unsigned, Enumerated, or Float attribute value types for any extendable objects within a BACnet device.

For more information on averaging extensions, see [Averaging Attributes](#).

For general information on Metasys system objects, see the [Object Help](#) section.

## **Averaging Attributes**

Averaging Extensions contain attributes common to Metasys system objects. For details, see [Common Object Attributes](#).

The following table lists the attributes specific to the Averaging extension. Click the attribute name in the table for a description of the attribute.

**Table 52: Averaging Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Average Value<sup>2</sup></a>	Real value	DR	NaN	Units of the extended attribute
<a href="#">Attempted Samples<sup>3</sup></a>	Number	W		The only acceptable value that can be written to this property is zero using the Clear command.
<a href="#">COV Increment<sup>4</sup></a>	Real value	CW	0.01	Any value > 0 Floating point value of the Display Precision.
<a href="#">Display Precision<sup>4</sup></a>	One value from a set	CW	100ths	Uses Display Precision (Set 0).
<a href="#">Input Reference</a>	Attribute reference	C		
<a href="#">Maximum Value<sup>2</sup></a>	Real value	R	-INF	Units of the extended attribute

**Table 52: Averaging Extension Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Max Value Timestamp</a>	Date and time		Invalid DateTime	If Average Value, Minimum Value, or Maximum Value is Unreliable, the timestamp is Undefined.
<a href="#">Minimum Value<sup>2</sup></a>	Real value	R	INF	Units of the extended attribute
<a href="#">Min Value Timestamp</a>	Date and time		Invalid DateTime	If Average Value, Minimum Value, or Maximum Value is Unreliable, the timestamp is Undefined.
<a href="#">Object Property Ref</a>	Set of related values			
<a href="#">Reliability<sup>4</sup></a>	One value from a set		Reliable	Uses Reliability (Set 503).
<a href="#">Units<sup>4</sup></a>	One value from a set		No Units	Units of the extended attribute
<a href="#">Valid Samples</a>	Number			
<a href="#">Window Interval<sup>3</sup></a>	Number	CW	3,600	Units = seconds Range: 900–360,060
<a href="#">Window Samples<sup>3</sup></a>	Number	CW	15	Range: 2–200

1 C - Configurable, D - Default Attribute for Display, W - Writable, R - Affected by Extension's Reliability

2 If any of these variables are Unreliable and a BACnet read is performed on these attributes, the values returned are NaN, -INF, and INF for Average Value, Minimum Value, and Maximum Value. If these values are Unreliable and a BACnet read is not performed, the attributes return zero.

3 If written or changed, all samples in the sampling buffer become invalid (set to zero, NaN, -INF, or INF), which makes them Undefined for the UI.

4 This attribute does not appear in a view, but may be scheduled, trended, and so on.

### **Averaging Extension Attribute Details**

#### **Average Value**

Indicates the sum of all valid samples in the sampling buffer divided by the number of samples in the buffer. This attribute is set to NaN with its [Reliability](#) set to Unreliable until a sample is taken and [Attempted Samples](#), [Window Samples](#), or [Window Interval](#) is written.

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#### **Attempted Samples**

Indicates the total number of samples in the buffer. The only acceptable number that can be written to this attribute is zero. After [Window Samples](#) or [Window Interval](#) is written, until a sample is taken, this attribute is set to zero.

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#### **COV Increment**

Specifies the minimum change in Present Value required for the object to report a change in the [Average Value](#), [Minimum Value](#), and [Maximum Value](#) attributes.

This attribute does not appear in a view, but may be scheduled, trended, and so on.

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#### **Display Precision**

Defines the decimal rounding and the decimal places to display for the Present Value and associated attributes. [Average Value](#), [Minimum Value](#), and [Maximum Value](#) use the same display precision.

This attribute does not appear in a view, but may be scheduled, trended, and so on.

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### **Input Reference**

Defines the object and attribute pair to be sampled. The sampled object must be on the same device as the Averaging object.

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### **Maximum Value**

Indicates the highest value of the valid samples in the buffer. After [Attempted Samples](#), [Window Samples](#), or [Window Interval](#) is written, until a sample is taken, this attribute is set to -INF with its [Reliability](#) set to Unreliable.

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### **Max Value Timestamp**

Indicates the date and time that the Maximum Value has changed in the sampling buffer.

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### **Minimum Value**

Indicates the lowest value of the valid samples in the buffer. After [Attempted Samples](#), [Window Samples](#), or [Window Interval](#) is written, until a sample is taken, this attribute is set to -INF with its [Reliability](#) set to Unreliable.

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### **Min Value Timestamp**

Indicates the date and time that the Minimum Value has changed in the sampling buffer.

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### **Object Property Ref**

Designates the particular object and attribute referenced by the Averaging object. This is a BACnet Device Property Reference structure type attribute that specifies bind information from the object/attribute defined by the [Input Reference](#) attribute. The binding information consists of the Device Identifier, Object Identifier, Array Index, and Property Identifier of the trended property. An on-box object returns nothing for the Device Identifier. The Device Object configures this attribute during object creation. Changing Object Property Ref may change Input Ref, and changing Input Ref may change Object Property Ref. Since Object Property Ref is based on Input Ref, and Input Ref does not support Array Index, Object Property Ref does not support Array Index either.

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### **Reliability**

Indicates whether the Average Value, Minimum Value, and Maximum Value attributes are Unreliable. After [Attempted Samples](#), [Window Samples](#), or [Window Interval](#) is written, until a sample is taken, this attribute is set to Unreliable.

This attribute does not appear in a view, but may be scheduled, trended, and so on.

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### **Units**

Indicates the units of the mapped attribute of the extended object. [Average Value](#), [Minimum Value](#), and [Maximum Value](#) use the same units.

This attribute does not appear in a view, but may be scheduled, trended, and so on.

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### **Valid Samples**

Indicates the number of samples in the sampling buffer that are valid. A sample is marked invalid if a read error occurs when reading requested attributes from the host object. The number of invalid samples can be determined by subtracting Valid Samples from [Attempted Samples](#). If the difference is greater than zero, it indicates an error during sample collection. After [Attempted Samples](#), [Window Samples](#), or [Window Interval](#) is written, until a sample is taken, this attribute is set to zero.

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## Window Interval

Indicates the period of time in seconds over which the Minimum Value, Maximum Value, and Average Value are calculated. Samples are taken at a specific sample rate, which cannot be less than 4 seconds. The sample rate is calculated by dividing the Window Interval by the number of samples as defined in the Window Samples attribute. The default value is 3,600 seconds.

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## Window Samples

Indicates the number of samples to be taken during the Window Interval and saved to the local sampling buffer. A maximum of 200 samples can be saved. After reaching the limit, the oldest samples in the buffer are overwritten with the newest samples. If the sampling rate is not a whole number, it is rounded up to the nearest integer.

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## Averaging Commands

The following table lists the commands supported by the [Averaging Extensions](#). Click the command name for a description of the command.

**Table 53: Averaging Extension Commands**

Command Name	Parameters
<a href="#">Enable</a>	
<a href="#">Disable</a>	
<a href="#">Clear</a>	

### Averaging Command Details

#### Enable

Clears the sampling buffer and restarts the sampling process. This command has the same effect as the Clear command.

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#### Disable

Stops the sampling process.

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#### Clear

Writes zero to the [Attempted Samples](#) attribute, clears the sampling buffer, and restarts the sampling process. This command has the same effect as the Enable command.

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## Extensions Steps

### Creating Extensions

**Note:** You cannot create an extension in online mode with [Basic Access](#).  
You can add only one load extension to an object.

To create extensions:

1. Select the item from the [Navigation Tree](#) and select Show Extensions from the [Action Menu](#).

**Note:** Alternatively, you can create extensions when prompted upon completion of a wizard, or when the item is in the [Display Frame](#) by selecting the tab for the extension and clicking new.

2. Select New for the type of extension that you want to create. The corresponding [Extension Wizard](#) appears.
3. Select the attribute that you want to associate with the item.

4. Complete the information on the wizard screens. The screens vary depending on the type of extension you are creating. See the [Wizards](#) section for help on using wizards.
5. Select Finish on the summary page to create the extension.

## Viewing Extensions

To view extensions:

1. Drag and drop the object into the [Display Frame](#).
2. Click the tab along the top for the desired extension.

## Editing Extensions

**Note:** You cannot edit an extension in online mode with [Basic Access](#).

To edit extensions:

1. [View the extension](#).
2. Select the tab for the extension.
3. Select the extension you want to edit.

**Note:** For trend extensions, make sure you select the Definition View button to display the trend's attributes.

4. Click Edit.
5. Make your changes.
6. Click Save.

## Copying and Pasting Extensions

**Note:** You can perform this procedure only in the System Configuration Tool ([Offline Mode](#)). You must first create extensions before you can copy and paste them from one item to another. See [Creating Extensions](#) for details on how to create extensions.

To copy and paste existing extensions:

1. Select the item from the [Navigation Tree](#) that contains the existing extensions that you want to copy, and select Show Extensions from the [Action Menu](#). The Extension wizard appears.

**Note:** Alternatively, you can right-click the item in the navigation tree and select Show Extensions from the menu that appears.

2. Select the check box for one or more of the existing extensions that you want to copy.
3. Click Copy Checked Extensions.
4. Click Done.
5. Select the item from the navigation tree that you want to receive the copied extensions, and select Paste from the [Edit Menu](#).

**Note:** Alternatively, you can right-click on the item in the navigation tree and select Edit > Paste from the menu that appears.

When you paste an extension, the extension retains the name of the copied extension and appends it with a number.

## Deleting Extensions

**Note:** You cannot delete an extension in online mode with [Basic Access](#).

**Note:** For a trend extension that is configured to automatically transfer data to an ADS/ADX (Repository Enabled = True), be sure to route unforwarded data to the ADS/ADX before deleting the trend extension. If you do not, unforwarded trend data is lost.

1. To delete extensions (using the [Navigation Tree](#)):
  - a. Select the item from the navigation tree and select Show Extensions from the Action menu.
  - b. Select the check box of the extension you want to delete.

- c. Click delete.
2. To delete extensions (when the item is in the *Display Frame*):
  - a. [View the extension](#).
  - b. Select the tab for the extension.
  - c. Select the extension.
  - d. Click Delete.

## Searching for Extensions

You can search for Alarm, Trend, or Totalization extensions using the [Global Search](#) feature. This allows you to find up to 100 extension objects and view their current values.

## Commanding Extensions

You can command Alarm, Trend, or Totalization extensions from an Extension View or from the Global Search Viewer. You can also command Trend extensions from a Trend Viewer or Trend Study view.

### **Single Extension**

To command a single extension object:

1. Right-click the extension object you wish to command.
2. Select Commands from the right-click menu. The Commands dialog box appears.
3. Choose the command to send.
4. Click Send.

See the [Commands Dialog](#) section for more information.

### **Multiple Extension**

To command multiple extension objects together (Global Commanding):

1. Use the Global Search feature to find the extension objects (Alarm, Trend, or Totalization). You may also open a saved Object List containing extension objects. See [Interlocking a Trend Extension](#) for more information.
2. Select the extensions you wish to command (must be of the same type).
3. Select Commands from the Action menu. The Global Commands dialog box appears.
4. Choose the command to send.
5. Click Send.

See the [Commands Dialog](#) section for more information.

## Interlocking a Trend Extension

To interlock a Trend Extension:

1. Create a trend extension. See the [Creating Extensions](#) and the [Trend Extensions](#) sections for information.
2. Create an [Insert Object - Interlock](#) that references the trend extension. See the Insert [Insert Object - Interlock](#) section.

# User Views

User views (user-defined navigation trees) contain references to selected items found in the All Items navigation tree (the default navigation tree). For example, you could create a user navigation tree with all the AIs grouped together, or a navigation tree that contains only points for a certain area of a building. User views are useful for restricting access for certain users and grouping commonly used items/graphics together. User Views are necessary to apply the Ready Access Portal UI, as only User Views assigned to individuals are visible from this UI. You can use the user view edit capabilities to easily consolidate small user views into a larger view, or to break large user views into multiple smaller views. Specify the User View navigation display as either a set of tabs (Tabbed) or a drop-down list (List) in the Default navigation display preference in the [Display Settings Tab](#) in the [Preferences](#) section. We recommend list view if the system has many user views, as list view takes up less space in the navigation tree pane. User views provide a mechanism for viewing Tailored Summaries. See the [User Views with Tailored Summaries](#) and the [Tailored Summaries](#) sections for more information.

User views are easy to create. The system supports drag-and-drop functionality of items from the Global Search Results table to add them as references in a User View. To do this, view both the Global Search Viewer and the User View in the display frame (using a multiple panel view). Click Edit in the User View. Then drag the desired items from the Search Results table to the User View. The system also supports drag-and-drop functionality to add references to items from the navigation frame (User View [online] or All Items tree) to a User View in Edit mode. In addition, to add an entire tree (only from the navigation frame) to a User View, press the Ctrl key and drag and drop the tree to a User View in Edit mode.

For more information on the wizard used to create a user view, see the [Create New User View Wizard](#) section. For more information on the object created by this wizard, see [User Navigation Tree](#).

The Security Administrator System allows administrators to assign user view permissions to specific users (in the Online UI only). For information on the Security Administrator System, see [Related Documentation](#).

## User Views Concepts

### User View Behavior by Mode

User views appear and function differently, depending on what *mode* you are in ([Table 54](#)).

**Table 54: User Views in Modes**

Mode	Location in UI	Behavior Notes
Offline (SCT)	<ul style="list-style-type: none"><li>User Views folder in the All Items navigation tree</li></ul>	<ul style="list-style-type: none"><li>create, edit, and delete user views</li><li>copy and paste user views</li><li>drag and drop the user view into the Display frame for editing</li></ul>
Online (Basic Access)	<ul style="list-style-type: none"><li>User Views folder in the All Items navigation tree</li><li>User View tab</li><li>Security Administrator System</li></ul>	<ul style="list-style-type: none"><li>drag and drop the user view into the Display frame for viewing</li><li>click a user view tab to display the user view as an actual tree in the navigation frame. In this tree, you can view and navigate to items.</li><li>assign permissions to the user views (via Security Administrator System)</li></ul>



**Table 54: User Views in Modes**

Mode	Location in UI	Behavior Notes
<b>Online (Standard Access)</b>	<ul style="list-style-type: none"> <li>User Views folder in the All Items navigation tree</li> <li>User View tab</li> <li>Security Administrator System</li> </ul>	<ul style="list-style-type: none"> <li>create, edit, and delete user views</li> <li>drag and drop the user view into the Display frame for editing</li> <li>click a user view tab to display the user view as an actual tree in the navigation frame. In this tree, you can view and navigate to items.</li> <li>assign permissions to the user views (via Security Administrator System)</li> </ul>
<b>Simulation</b>	<ul style="list-style-type: none"> <li>User Views folder in the All Items navigation tree</li> </ul>	

## User View Authorization

User view authorization is based on the security privileges assigned to your user account by a Metasys Administrator. Authorization uses navigation permissions and category-based permissions.

Your navigation permissions determine which user views display in the navigation frame of the online UI. Only the user views assigned to you or your assigned security roles appear. When a user view is created online, navigation permissions for the view are automatically assigned to the user who created the view. When a user view is created offline in the SCT and then downloaded to the site, no navigation permissions are assigned. In this case, the user view does not display in the navigation frame for any users. The Metasys system Administrator must assign permissions to all users and/or roles requiring the navigation view.

Your category-based permissions determine if you are allowed to create, view, edit, or delete a user view from a particular object category (for example, HVAC). Category-based permissions are separate from navigation permissions.

**Note:** A User View can contain objects assigned to categories that a user does not have permissions for. In this case, the objects will appear in the User View navigation tree, but the user will be unable to access any information from these objects.



Alarm notification is not limited or affected by the current user view, only by the user's permissions for managing item events. Therefore, it is possible for a user to receive an alarm for an item that does not exist in the currently displayed user view.

For more information on assigning permissions for navigation views, see [Related Documentation](#).

## User View Structure

User views provide graphical, functional, and geographical organizations of your Metasys system. For example, you might create a user view comprised only of nested references to graphics. Or you may organize your user view with separate levels for campus, building, floor, room, and so on. You may even create a separate user view for each user, to provide that user a focused view into the system or to restrict the user's access.

The structure, or hierarchy, of a user view is based on the following general rules:

- User view folders  (folders created in the user view) may contain any number of additional child folders or other references. For example, you can add multiple Summary Definition objects for the Tailored Summary feature to a user view folder.
- When you add a reference to a folder  from the All Items view into a user view, you cannot nest anything under it.
- Graphic references may contain any number of additional graphic references.
- With the exception of graphics, references may only be nested under user view folders (that is, a non-graphic reference cannot be a child of a reference). References do not need to be nested to exist in the User View.
- Any item may be referenced any number of times within the user view hierarchy.
- When creating user views for the Ready Access Portal UI, keep in mind that Ready Access Portal users navigate their site using only user views.











- To take advantage of the alert filtering capabilities in the Ready Access Portal UI, create a dedicated user view to use with only the alert filters. For example, add folders with an Engine under each folder that is named for the location the Engine serves.
- In the Ready Access Portal UI, add the device and schedules in a user view so that the link for a device summary works, and a selected schedule appears in a summary function.

## Tree View Tab

The Tree View tab appears when you are adding a user view with the [Create New User View Wizard](#) or when you display an existing user view for editing.

[Table 55](#) shows the buttons in the Tree View tab and when to use them. All the functions represented by buttons in [Table 55](#) are also accessible via the right-click menu. [Table 56](#) describes the functionality available in the Tree View tab.

**Table 55: Tree View Tab Buttons/Right-Click Menu**

Button Icon	Button Name	Description
	Add Reference(s)	Adds one or more items to the user view. When you add a reference to an item that has children in the navigation tree, the children are not included in the user view.
	Add Tree(s)	Adds an entire user view, an entire folder hierarchy, or single item reference to a user view. When you add an item using this button, you add the item and all of its children to the user view.
	New Folder	Creates a new folder in the user view. Use this button to add a folder to a user view.
	Find and Replace	Repairs or updates site, Engine, or ADS/ADX identifiers in the references of items stored in the user view. The references are used to identify the items in the view, and updates from this feature do not affect the items themselves. You cannot use this feature to find and replace field device identifiers within references. See <a href="#">Find and Replace</a> .
	Remove	Removes anything you select from the user view. The Remove button removes not only what you select, but all children of the item you select.
	Move Up	Moves a selected user view item up in the user view. This button changes the order of items in the navigation tree but does not nest items. See Drag and Drop in the <a href="#">Table 56</a> .
	Move Down	Moves a selected user view item down in the user view. This button changes the order of items in the navigation tree but does not nest items. See Drag and Drop in the <a href="#">Table 56</a> .
	Sort Ascending	Sorts the items in the user view in ascending, alphanumeric order. You can sort items at any level in the user view (for example, the folders directly under the User View or the contents of a folder). The items are sorted only one level down (not subsequent levels).
	Sort Descending	Sorts the items in the user view in descending, alphanumeric order. You can sort items at any level in the user view (for example, the folders directly under the User View or the contents of a folder). The items are sorted only one level down (not subsequent levels).
	Edit Label	Changes the label used for an item within a specific user view. Changing the label for an item in the user view does not affect the item's Name attribute or reference, and does not affect the label used for other occurrences of the item in the same or other user views.  To change the label for an item, triple-click the item or right-click the item and select Rename.

**Table 56: Tree View Tab Functionality**

Functionality	Description
<b>Ctrl/Shift Keys</b>	Selects multiple items in the Select Item dialog box, which is displayed when you click Add Reference or Add Tree.
<b>Drag and Drop</b>	Moves the selected reference or folder, and its nested items, to a new location within the user view. When you are dragging an item to a collapsed folder, hover the mouse pointer over the collapsed folder for a moment and it automatically expands. To change the order in which items appear within a parent folder or under a graphic, see Move Up and Move Down in <a href="#">Table 55</a> .  <b>Note:</b> You can drag and drop objects from the all items tree or any other user view into the user view you are editing. When you drag/drop an object with children, only the parent object is added to the user view.

## Find and Replace

The Find and Replace button appears on the [Tree View Tab](#). You can use the Find and Replace option after renaming a site/device to update references to the new site/device name. This feature resolves any references that may have become broken due to the name change ([Table 57](#)).

**Table 57: Search Options**

Button	Description
<b>Full Reference</b>	Updates the first occurrence of the specified text in all references with the replacement (Replace with) text. Enter the reference text and the new text and click Find. A list of references is generated. Click Replace All to update all references, or select a reference and click Replace to update a reference individually.
<b>Site Name Only</b>	Updates the site identifier in all references to the site name where the user navigation view resides. This value comes from the user navigation view's full reference and is not editable in this dialog box. Click Find. A list of references is generated. Click Replace All to update all references, or select a reference and click Replace to update a reference individually.
<b>Device Name Only</b>	Replaces the Engine or ADS/ADX device identifier in item references with a different device identifier. All Device Names is entered by default, but you can specify a specific device name if desired. Enter the new name and click Find. A list of references is generated. Click Replace All to update all references, or select a reference and click Replace to update a reference individually. The device identifier updates in the references for the selected item and its children.

You also can use the Find and Replace option in online mode to quickly duplicate user view hierarchies for supervisory devices with similar configurations.

**Note:** The Select Item dialog box contains the set of views that appear in your navigation frame. Because user views do not appear in the navigation frame in the SCT, these steps work only in online mode.

For example, perhaps you have several Network Automation Engines (NAEs)s on your site that have the same set of N2 controllers and field points under their N2 trunks. You can create a user view to group your field devices and field points for NAE-1 into a logical system-based or geographical hierarchy. You can then duplicate the NAE-1 user view to create the same references and hierarchy for NAE-2.

Follow these steps:

1. [Create a user view](#) referencing NAE-1 items (for example, field devices and/or field points), organizing the items in folders as desired.
2. Refresh all tabs in the navigation frame to update the navigation views displayed in the UI.
3. Create and edit a new user view for NAE-2, or edit the user view you created for NAE-1.
4. Add items to the new NAE-2 user view.
  - a. Click Add Trees (see [Table 55](#)) to display the Select Item dialog box.
  - b. In the dialog box, select the tab for the user view you created for NAE-1.

- c. Select the items you wish to duplicate (choose the root node to duplicate the entire navigation view).
  - d. Click OK. The Select Item dialog box closes, and the selected items and their children appear in the NAE-2 user view.
5. Use the Find and Replace feature (Device Name Only in the [Table 57](#)) to replace the NAE-1 identifier with NAE-2 in the references for the duplicated items.
  6. Save your changes when finished.

## User Views with Tailored Summaries

The Tailored Summary feature relies on the User View feature to provide a mechanism for viewing Tailored Summaries. After defining Summary Definition objects, add them to a folder in the User View through the All Items tree. Then view the Tailored Summary through the User View (that is, view the User View folder to display the Tailored Summary). See the [User View Editor](#), [Workflow](#), and [Defining User Views with Summary Definitions](#) topics in the [Tailored Summaries](#) section.

## User Views Steps

### Creating a User View

See [User View Authorization](#) for details on the user view permissions.

**Note:** You cannot create, edit, or delete a user view in online mode with [Basic Access](#).

To create a user view:

1. On the Insert menu, click User View.
2. Follow the [wizard](#) instructions. See [Create New User View Wizard](#) for information on the wizard. See [Table 55](#) and [Table 56](#) for details on using the Tree View tab.

### Editing a User View

**Note:** You cannot create, edit, or delete a user view in online mode with [Basic Access](#).

To edit a user view:

1. Browse to the user view (in either the User Views folder in the All Items navigation tree or by selecting the user view tab).
2. Double-click the user view. The user view editor appears in the Display frame.
3. Click Edit and work with the user view as follows:
  - Use the New Folder button to add a folder.
  - Use the Add Reference(s) and Add Tree(s) buttons to add references to items.
  - Use drag-and-drop functionality to add references to items from the navigation frame (User View [online] or All Items tree) to a User View in Edit mode.
  - Use drag-and-drop functionality to add references to items in a User View from the Global Search Results table. View both the Global Search Viewer and the User View in the display frame (using a multiple panel view). Click Edit in the User View. Then drag the desired items from the Search Results table to the User View.
  - Press the Ctrl key and drag and drop a tree (only from the navigation frame) to a User View in Edit mode to add an entire tree to the User View. This functionality does not apply to the Global Search Results table.
  - Select one or more items and use the Remove button to remove items.
  - Sort the items in the user view using the Sort Ascending and Sort Descending buttons.
  - Use the Move Up and Move Down buttons to reorganize the order of the items.
  - Use the Edit Label button to rename items.
  - Use the Find and Replace button to resolve broken references after changing the Site Director or to duplicate user view hierarchies for supervisory devices with similar configurations. For details, see [Find and Replace](#).

For information on the buttons and functionality in the Tree View tab, see the [Tree View Tab](#) section.

For information on the attributes in the Focus tab, see the [Summary Definition Object](#).

4. Click Save when finished.

## Deleting a User View

**Note:** You cannot create, edit, or delete a user view in online mode with [Basic Access](#).

To delete a user view:

1. Select the user view in the User Views folder of the All Items navigation tree.
2. On the Edit menu, select Delete Items.
3. Click Yes to confirm deletion. The user view disappears.

## Consolidating User Views

You can consolidate multiple small user views into one larger user view.

**Note:** You must be in online mode to consolidate user views.

To consolidate user views:

1. [Create](#) a new user view, or [edit](#) an existing user view. This is the user view to which you add other views to consolidate them.
2. With the user view in Edit mode, select the location (root or existing folder) where you would like to add the contents of another user view.
3. Click Add Tree. The Select Item dialog box appears.
4. In the Select Item dialog box, select the tab for the user view you would like to add.
5. Select the root node of the user view you would like to add.
6. Click OK.

**Note:** You also can press the Ctrl key and drag and drop a tree (only from the navigation frame) to a User View in Edit mode to add an entire tree to the User View.

A new folder, which contains the contents of the user view you selected, appears in the user view you are editing. If you would like to rename the folder or move the children to another location within the user view, see [Table 56](#).

7. Repeat [Step 1](#) through [Step 6](#) if you would like to consolidate other user views into the user view you are editing.
8. When you are finished consolidating user views, click Save.
9. Refresh the tabs in the navigation frame and [delete](#) any user views you no longer need.
10. Have a Metasys system Administrator adjust the navigation permissions for the consolidated user view (if necessary).

## Breaking Up User Views

You can break up a large user view into several smaller views.

**Note:** You must be in online mode to break up user views.

To break user views:

1. [Create](#) a new user view, or [edit](#) an existing user view.
2. Click Add Tree. The Select Item dialog box appears.
3. In the Select Item dialog box, select the tab for the user view you would like to break into several smaller views.
4. Select the items from the large user view you would like to add to the new smaller view.
5. Click OK.

**Note:** You also can press the Ctrl key and drag and drop a tree (only from the navigation frame) to a User View in Edit mode to add an entire tree to the User View.

The items you selected and their children appear in the new user view. If you would like to rename the folder or move the children to another location within the user view, see [Table 56](#).

6. Repeat [Step 2](#) through [Step 5](#) if you want to move more content from the large user view to the new smaller user view.
7. When you are finished with this new smaller user view, click Save.
8. Repeat [Step 1](#) through [Step 1](#) to create additional smaller user views with content from the large user view.
9. Refresh the tabs in the navigation frame and review the user views to make sure they contain the correct items. [Edit](#) the new smaller user views as necessary.

Edit the large user view and remove the items that are now located in the new smaller views, if desired.

10. Refresh the tabs in the navigation frame.
11. Have a Metasys system Administrator adjust the navigation permissions for the consolidated user view (if necessary).

## Tailored Summaries

Tailored Summaries allow you to view, command, and modify large quantities of similar data in a tabular format. Tailored summaries are essentially summary views of Metasys system items where the rows and columns of the summary are tailored to contain information of interest. Similar data, for example, may be all VAV boxes on a floor of a building, showing current temperatures, setpoints, flows, and minimum/maximum settings. This feature allows you to quickly analyze the operation of your facility.

The Summary Definition object is an integral part of the Tailored Summary feature. It allows you to view and edit the columns and key data values used in a Tailored Summary based user view. The contents of the user view folders are the rows in the Tailored Summary. [Figure 17](#) illustrates the interaction between the user view, Summary Definition object, and the Tailored Summary.

**Figure 17: User View, Summary Definition, and Tailored Summary Interaction**

The figure illustrates the interaction between three components: User View, Summary Definition Object, and Tailored Summary.

**User View (Tree View):** Shows a hierarchical structure under 'HVAC'. The 'VAV Boxes - VMA 1400s' folder is selected, containing 'Monitoring - VMA1400' and 'Configuration - VMA1400 Flow'.

**Summary Definition Object:** Shows configuration for the 'Monitoring - VMA1400' object. The 'Label' is set to 'Controller'. The 'Columns' section defines the data to be displayed in the Tailored Summary table.

Column Heading	Zone Temperature	Supply Temperature	Setpoint	Flow	Flow Setpoint
Child Item	*ZN-T	*BOXSA-T			
Attribute	Default	Default			

**Tailored Summary:** Shows the resulting table of data for the selected Summary Definition object.

Controller	Zone Temperature	Supply Temperature	Setpoint	Flow	Flow Setpoint
VAV-111	72.9 deg F	56.2 deg F	88.0 deg F	88 cfm	250 cfm
VAV-113	73 deg F	---	72.0 deg F	88 cfm	250 cfm
VAV-115	73 deg F	0.0 deg F	72.0 deg F	88 cfm	250 cfm
VAV-117	72.9 deg F	---	72.0 deg F	88 cfm	250 cfm
VAV-121	72.9 deg F	---	72.0 deg F	88 cfm	250 cfm
VAV-123	72.9 deg F	---	72.0 deg F	88 cfm	250 cfm

In this example, a user view named HVAC contains a folder named VAV Boxes - VMA 1400s. In the VAV Boxes folder are two Summary Definition objects named Monitoring - VMA1400 and Configuration - VMA1400 Flow. The VAV Boxes folder also has item references to several VAVs in the system.

In the Tailored Summary, the Monitoring - VMA1400 Summary Definition object is selected, and its data appears in the view. The referenced VAVs appear as rows in the table. The Label defined in the Summary Definition object appears as the column heading named Controller for the referenced VAV items in the Tailored Summary. The columns defined in the Summary Definition object (for example, Zone Temperature and Supply Temperature) appear as columns in the Tailored Summary view. The Key Data in the Tailored Summary is defined in the Focus view of the Summary Definition object.

See the [Tailored Summary User Interfaces](#) for details on the views described in this example.

For more information and attribute details on the Summary Definition object, see the [Summary Definition Object](#) section.

For information on user views, see the [User Views](#) and [User Navigation Tree](#) sections.

You can create and edit Summary Definition objects for the Tailored Summary feature in the SCT or the online Site Management Portal UI for the Site Director, but you must be in the online Site Management Portal UI or the Ready Access Portal UI to view the Tailored Summary.

The Tailored Summary feature requires minimal memory for the Summary Definition objects; however, the objects do increase the object count.

## Tailored Summary Concepts

### Tailored Summary User Interfaces

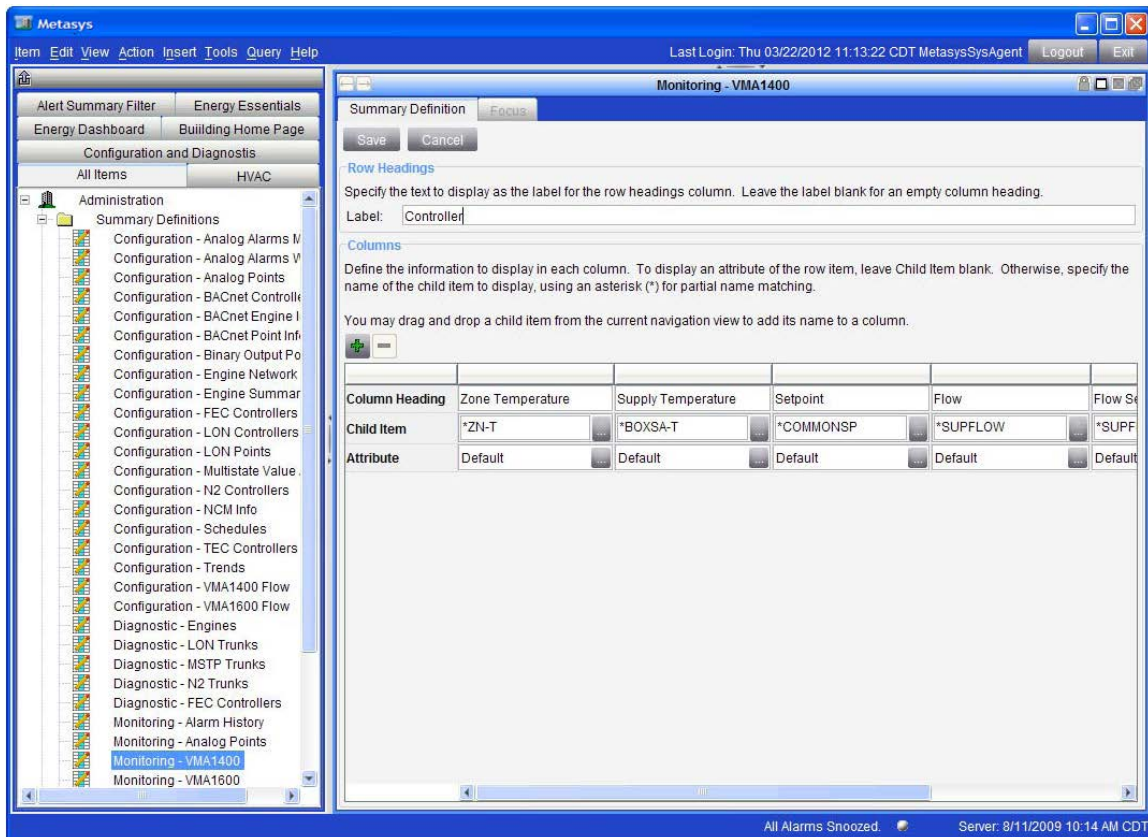
#### Summary Definition Editor

On a Site Director, the Summary Definition Editor allows you to define and edit a Summary Definition object. The Summary Definition Editor appears when you view a Summary Definition object. Summary Definition objects always reside on a Site Director in the Summary Definitions folder of the All Items tree (that is, you cannot put a Summary Definition object in another location).

#### Summary Definition Tab





The Summary Definition Editor's Summary Definition tab allows you to define the table that appears in the Tailored Summary view.

Figure 18: Summary Definition Editor - Summary Definition Tab





**Table 58: Summary Definition Editor - Summary Definition Tab**

Button/Field	Description
Label	Defines the label to display in the first column (that is, the row header column) in a Tailored Summary. The label is limited to a maximum of 50 characters. This field also can be left blank.
 <b>Add/Plus</b>	Allows you to add a column at the end of the column configuration table. <b>Note:</b> You can define up to a maximum of 7 columns. This button is disabled if 7 columns already exist.
 <b>Remove/Minus</b>	Allows you to remove the currently selected column from the column configuration table. <b>Note:</b> To select a column, click the column's header. You must define a minimum of at least one column.
<b>Column Configuration Table</b>	Provides configuration of the columns that appear in the Tailored Summary: <ul style="list-style-type: none"> <li>• <b>Column Heading</b> - Defines the name of the column header. The name can have a maximum of 50 characters.</li> <li>• <b>Child Item</b> - Indicates the item for which the column data is retrieved based on its item name attribute. You can use the Select Item dialog box to pick a name, or type in the text box. The name must match a user-specified pattern (such as ZN-* or ZN-T, Zone-T). You can define an unlimited amount of wildcards<sup>1</sup>. The first item found that matches this item name pattern appears in the Tailored Summary view column. To display an attribute of the row item, leave this field blank. Otherwise, specify the name of the child item to display.</li> <li>• <b>Attribute</b> - Defines the attribute information for the column. To display the default attribute, no change is required (that is, leave the Attribute box set to Default). The attributes are grouped into categories for easy selection. To specify an attribute, select a category in the Attribute Filter section of the Select Column Attribute dialog, and then select the desired attribute from the list.</li> </ul> <p><b>Note:</b> To change the order of the columns, select a column and drag it to the desired placement.</p> <p><b>Note:</b> When you display a Tailored Summary (see <a href="#">Viewing a Tailored Summary</a>), the system searches for data within all levels of a field device (VMA, for example). For all other objects (NAE, for example), the system searches for data only one level down (not subsequent levels).</p>
 <b>Browse (Child Item)</b>	Opens the Select Item dialog box for specification of the item name. <b>Note:</b> This dialog box provides an easy way to fill in the item name of a child item. It does not mean that the selected item displays in that column.
 <b>Browse (Attribute)</b>	Opens the Select Column Attribute dialog box for selection of the attribute to display in the column of the table. This process is necessary only when selecting an attribute other than the default attribute.  This dialog box has two list boxes to aid in selection: <ul style="list-style-type: none"> <li>• <b>Attribute Filter</b> - Allows you to filter the items appearing in the Attribute list using common attribute categories. If you filter on Alarms, for example, the supported alarm attributes appear in the list for selection.</li> <li>• <b>Attribute</b> - Lists the available attributes for selection.</li> </ul> <p><b>Note:</b> To display the default attribute of the row item, leave the Attribute box set to Default (Attribute Filter: Common Attributes and Attribute: Default).</p> <p>For an example of the attributes available for display in the Tailored Summary feature, see the <a href="#">Tailored Summary Attributes</a> section.</p>

<sup>1</sup> Use the asterisk (\*) wildcard for partial name matching (for example, ZN-T\* finds items named ZN-T and ZN-Temp).  
Use a comma (,) to separate the wildcard search criteria (for example, ZN-T, Zone-T finds items named ZN-T or items named Zone-T).

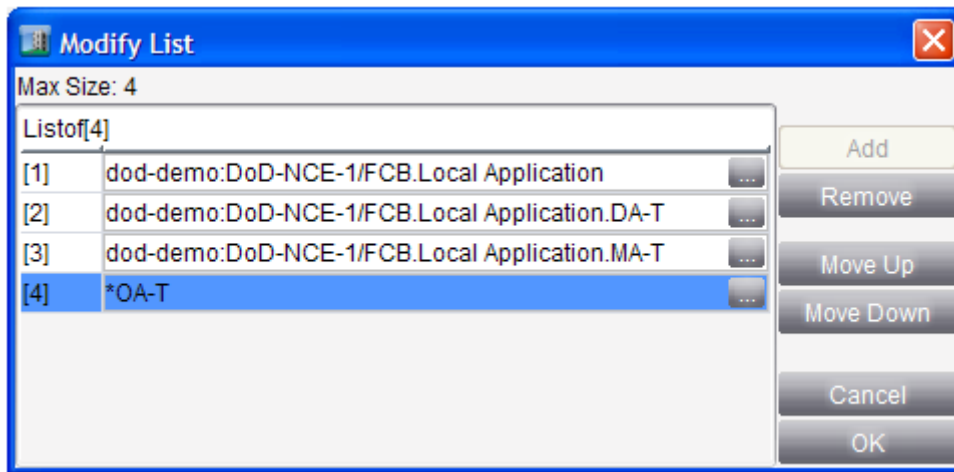
Use the Backslash(\) wildcard to indicate a character does not have a special meaning (for example, ZN\\*T, ZN\, T, ZN\\T finds items named ZN\*T, ZN, T, and ZN\T).

**Focus Tab**


The Summary Definition Editor’s Focus tab allows you to define the Key Data that appears outside the main table in the Tailored Summary view, as well as other common Metasys object attributes. To define Key Data, click the Browse button of the Key Data attribute on the Focus tab. This action opens the Modify List dialog box.

The Object Name attribute on the Focus tab provides the name shown in the Summary Definition folder in the All Items tree. For information on the other Summary Definition Focus tab attributes, see the [Summary Definition Object](#) section.

**Figure 19: Modify List Dialog Box**



**Table 59: Modify List Dialog Box**

Button/Field	Description
<b>Key Data List (Listof[x])</b>	Displays the added Key Data items. You can use the Select Item dialog box to pick the Key Data item, or type in the text box. You also can use wildcards (asterisks * only), where the system searches for the matching item in the user view folder. You can define up to 4 Key Data items. <b>Note:</b> The default attribute of the Key Data item appears in the Key Data table of the Tailored Summary view.
 <b>Browse</b>	Opens the Select Item dialog box for selection of the Key Data item.
<b>Add</b>	Adds an undefined item to the Key Data list.
<b>Remove</b>	Removes the currently selected item from the Key Data list.
<b>Move Up</b>	Moves the currently selected item up one place in the Key Data list.
<b>Move Down</b>	Moves the currently selected item down one place in the Key Data list.
<b>Cancel</b>	Closes the dialog box without accepting the changes.
<b>OK</b>	Accepts the changes and closes the dialog box.

**Create New Summary Definition Wizard**

Use the Create New Summary Definition Wizard to create a Summary Definition object from scratch. Access this wizard using the Summary Definition option of the Insert menu.

**Table 60: Create New Summary Definition Wizard**

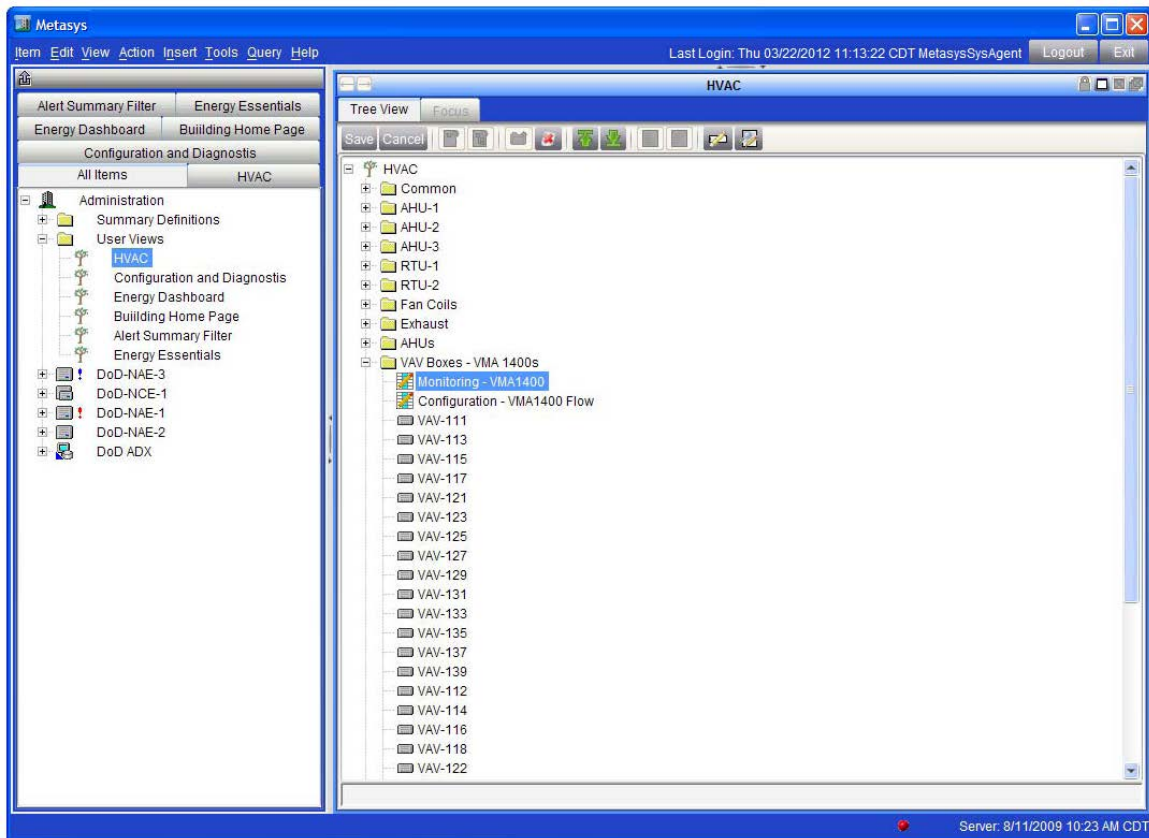
Screen	Description
Identifier	Allows you to enter a name for the Summary Definition object.
Configure	Allows you to define the data of the Summary Definition and Configuration tabs. <b>Note:</b> The Configuration tab in this wizard contains the same data as the Focus tab of the <a href="#">Summary Definition Editor</a> .  See the <a href="#">Editing an Existing Summary Definition</a> and <a href="#">Defining Key Data</a> sections for details on how to edit these items.
Summary	Displays the summary data of the Summary Definition object.

**User View Editor**

The Tailored Summary feature relies on the User View feature to provide a mechanism for viewing Tailored Summaries. See the [Workflow](#) section for details.

The following figure shows the User View Editor configured with folders holding specific Summary Definition objects and references.

**Figure 20: User View - Tree View Tab**



For more information on User Views, see the [User Views](#) and [Defining User Views with Summary Definitions](#) sections.

**Tailored Summary View**

The data that appears in the Tailored Summary view is the result of analysis based on the row and column definition of the Summary Definition object. Access the Tailored Summary view by viewing the associated User View folder containing the Summary Definition object(s) and references. The Tailored Summary view allows you to view, command, or modify the data. The Tailored Summary view is only available in the online Site Management Portal UI for the Site Director, or in the Ready Access Portal UI.

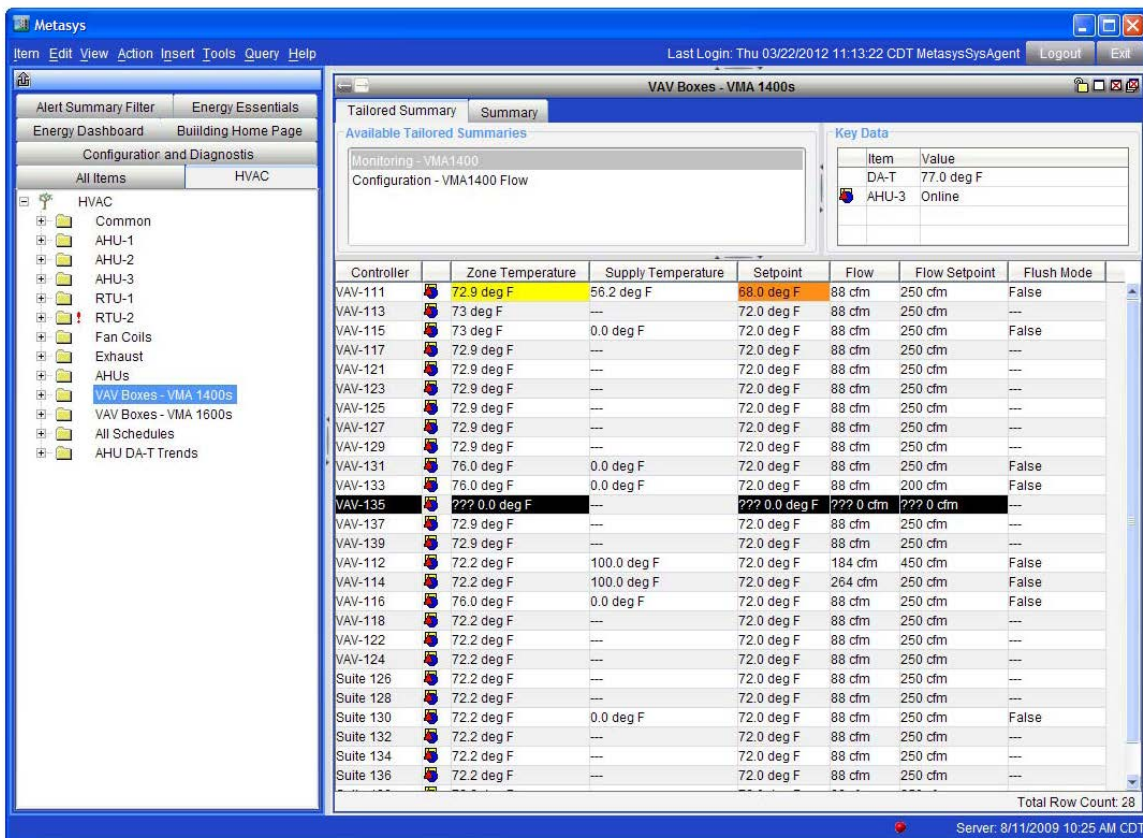
The items in the Key Data and Tailored Summary tables use the graphic status colors defined by the preferences. See [Graphic Settings Tab](#) in the [Preferences](#) section.

**Guidelines and tips:**

- A Tailored Summary cannot display more than 100 rows. The view automatically stops loading the data once the 100 row limit is reached. A message appears at the bottom of the view to indicate that the first 100 items are displayed.
- Items must be mapped (for example, appear in the All Items tree) to appear in the Tailored Summary.
- If the search does not find a match for an item, or the defined attribute does not apply to the item found, dashes (---) appear in the Tailored Summary.
- Wireless TECs do not appear in a Tailored Summary (that is, this feature cannot use Wireless TECs as rows in the Tailored Summary).
- The Tailored Summary feature displays data from engines at Release 2.2 or later.
- IP addresses for devices not upgraded to Release 5.0 appear differently within Tailored Summaries in the Site Management Portal UI than in the Ready Access Portal UI; this is expected behavior. IP addresses for devices not upgraded to Release 5.0 appear as the appropriate value when viewed in the Site Management Portal UI Tailored Summaries. When you view a Tailored Summary in the Ready Access Portal UI, the value shown for IP addresses of devices prior to Release 5.0 is (Complex). IP addresses for devices that are running Release 5.0 display correctly.

The following figure shows a Tailored Summary view with two Summary Definitions and two Key Data items. Notice the items with alarm conditions appear with the graphic status colors defined in the System Preferences.

**Figure 21: Tailored Summary Tab**



**Table 61: Tailored Summary Tab**

Field	Description
<b>Available Tailored Summaries List Box</b>	Lists the available Tailored Summaries to view (that is, the list of Summary Definitions that appear directly within the selected user view folder).
<b>Key Data Table</b>	Displays the default attribute value of the defined Key Data items.  See the <a href="#">Using a Tailored Summary</a> section for the actions you can take on the Key Data table (such as view, command, and modify).
<b>Tailored Summary Table</b>	Displays the attribute value data according to the configuration of the selected Summary Definition.  The list of user view items appears in the first column (row header column) with the following exceptions: <ul style="list-style-type: none"><li>• folders and user view folders do not appear</li><li>• Summary Definition objects do not appear</li></ul> The data appears in the other columns.  See the <a href="#">Using a Tailored Summary</a> section for the actions you can take on the Tailored Summary table (such as view, command/global command, and modify/global modify).

## Workflow

The following diagram shows a high-level workflow for creating and using Tailored Summaries. See the steps following the diagram for more detailed workflow information.

**Figure 22: Tailored Summary Workflow**

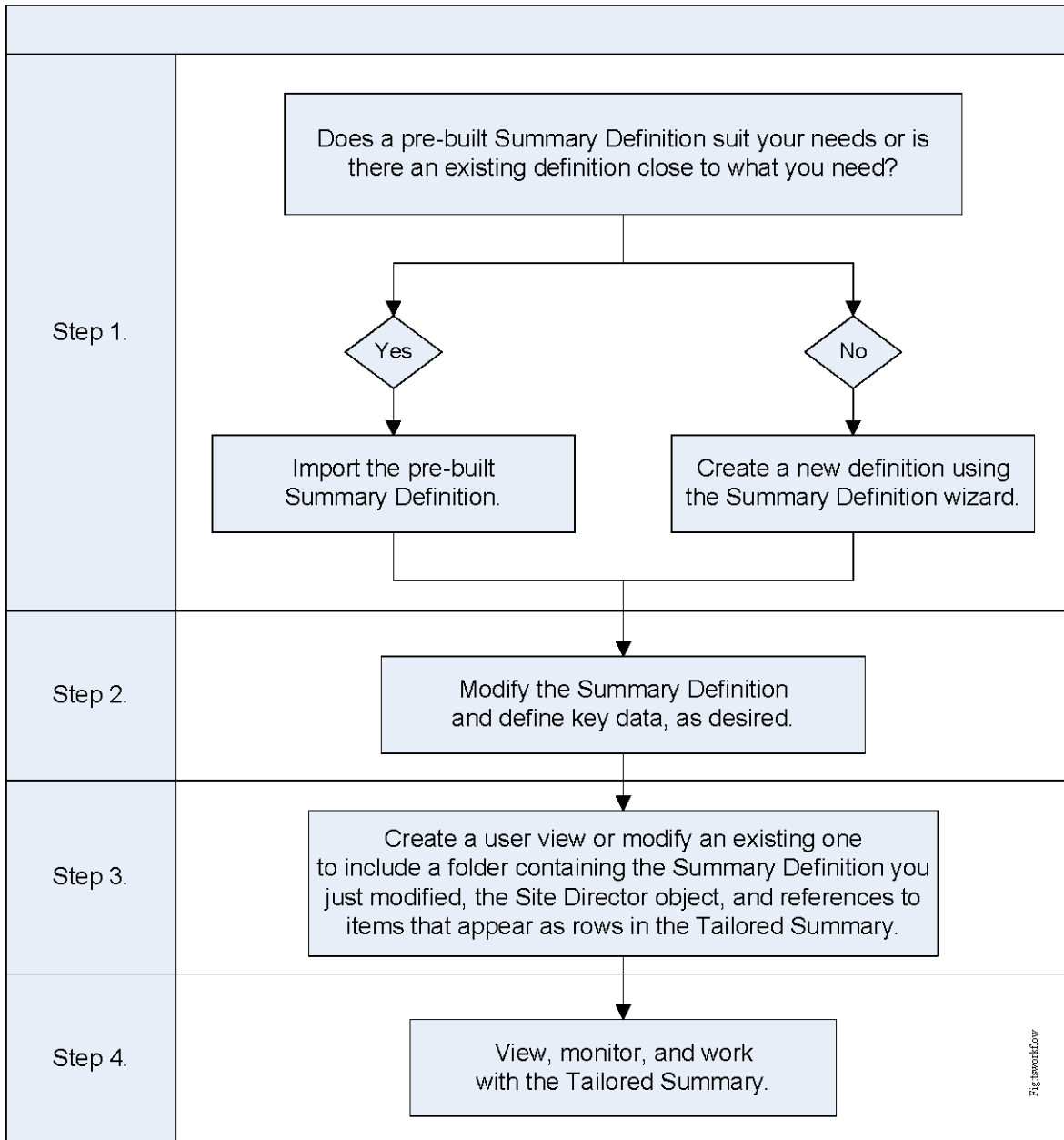


Fig. 22-10-10

The workflow for creating and using Tailored Summaries is as follows:

1. Import the pre-built Summary Definitions. See [Importing a Summary Definition](#) for procedural details and the location to access the pre-built Summary Definitions. Once imported, the Summary Definitions appear in the Summary Definitions folder in the All Items tree.

OR

Create a new Summary Definition using the Summary Definition wizard ([Creating a New Summary Definition](#)).

**Note:** We recommend editing a pre-built Summary Definition similar to what you need. You may want to use the same Summary Definition as the basis for slightly different groups of items (for example, a VAV with two Air Handling Unit (AHU)s having different key data). Copy the existing Summary Definition to create the new Summary Definitions. See the [Reusing an Existing Summary Definition for Different Key Data](#) section.

2. Edit the Summary Definitions and define key data, if desired ([Editing an Existing Summary Definition](#)):
  - a. View a Summary Definition by double-clicking it in the Summary Definitions folder of the All Items tree.
  - b. On Summary Definition tab, click Edit. Make the necessary changes and click Save.
  - c. On Focus tab, click Edit. Make the necessary changes (for example, define the Key Data following the instructions in [Defining Key Data](#)), and click Save.
3. Create a user view or edit an existing one ([Defining User Views with Summary Definitions](#)):
  - a. Drag and drop the Summary Definitions from the Summary Definitions folder in the All Items tree to a folder (for example, a Summary Definitions folder) in the user view (or use the user view editor's add reference option).
  - b. Drag and drop the Site Director object and items to reference (for example, supervisory devices or points) from the All Items tree or from the global search results table to the folder in the user view (or use the user view editor's add reference option). The referenced items appear as rows in the Tailored Summary.
4. View the Tailored Summary ([Viewing a Tailored Summary](#) and [Using a Tailored Summary](#)):
  - a. Click the user view tab in the navigation pane. If the desired tab is already selected, refresh the tab.
  - b. Double-click the folder containing the Summary Definitions and devices (for example, the Summary Definitions folder). The Tailored Summary appears in the display panel.
  - c. Click the Tailored Summary you want to view in the Available Tailored Summaries list box if more than one Summary Definition appears in the list. By default, the first authorized Summary Definition in the list is automatically selected.
  - d. View the key data and the table data. Use the right-click menu options to command, modify, or otherwise work with the data.

## Summary Definitions Library

A set of pre-built Summary Definitions are provided on the SCT installation media and the Johnson Controls Branch Purchase Package (BPP). You can save these files to your computer or access them from the SCT installation media or BPP DVD. To use the pre-built Summary Definitions, import the pre-built Summary Definition files into your site. For details, see [Importing a Summary Definition](#).

The pre-built Summary Definitions are designed to meet the needs of the users based on common tasks and functions. The Summary Definitions fit into the following main categories: Configuration, Diagnostics, and Monitoring (HVAC). The Device and Network Diagnostics definitions are intended for Site Administrators. Mechanical Equipment definitions with links to graphics and Key Point definitions are useful for Service Professionals.

The following table lists and describes the pre-built definitions, including the definition name, default columns (appear in English only), and overview description indicating typical rows, key data, and other useful information. Click an attribute under Default Columns to view its description.

**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<b>Config - Analog Alarms Main</b>	<p>Displays analog alarm configuration data. The typical rows for this Summary Definition include any key analog points (for example, key zone or discharge air temperatures, key static pressures, and so on) that have alarm, trend, and averaging extensions.<sup>1</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Alarm History</li> <li>• Monitoring - Analog Points</li> <li>• Config - Analog Points</li> <li>• Config - Trends</li> <li>• Config - Analog Alarms Warning</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Present Value</a></li> <li>• <a href="#">Alarm Priority</a></li> <li>• <a href="#">Differential</a></li> <li>• <a href="#">Low Alarm Limit</a></li> <li>• <a href="#">High Alarm Limit</a></li> <li>• <a href="#">Alarm Ack Required</a></li> <li>• <a href="#">Normal Ack Required</a></li> </ul>
<b>Config - Analog Alarms Refs</b>	<p>Displays the Setpoint and Occupancy References in the alarm extension. These points are used to configure the behavior of a Room Control Module symbol.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Alarm History</li> <li>• Monitoring - Analog Points</li> <li>• Config - Analog Alarms Main</li> <li>• Config - Analog Alarms Warning</li> <li>• Config - Trends</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Present Value</a></li> <li>• <a href="#">Unoccupied State</a></li> <li>• <a href="#">Occupancy Reference</a></li> <li>• <a href="#">Cooling Setpoint Reference</a></li> <li>• <a href="#">Heating Setpoint Reference</a></li> </ul>
<b>Config - Analog Alarms Warning</b>	<p>Displays the warning alarm configuration data. The typical rows for this Summary Definition include any key analog points (for example, key zone or discharge air temperatures, key static pressures, and so on) that have alarm, trend, and averaging extensions.<sup>1</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Alarm History</li> <li>• Monitoring - Analog Points</li> <li>• Config - Analog Points</li> <li>• Config - Trends</li> <li>• Config - Analog Alarms Main</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Present Value</a></li> <li>• <a href="#">Warning Priority</a></li> <li>• <a href="#">Low Warning Offset</a></li> <li>• <a href="#">High Warning Offset</a></li> <li>• <a href="#">Warning Reference</a></li> <li>• <a href="#">Warning Ack Required</a></li> <li>• <a href="#">Report Delay</a></li> </ul>
<b>Config - Analog Points</b>	<p>Displays the key attributes of an analog point that may require modifying using the Global Modify feature or commanding using a Global Command (see <a href="#">Modify Dialog</a> and <a href="#">Commands Dialog</a>). The typical rows are any key analog points (for example, key zone or discharge air temperatures, key static pressures, and so on).</p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Alarm History</li> <li>• Monitoring - Analog Points</li> <li>• Config - Analog Alarms Main</li> <li>• Config - Analog Alarms Warning</li> <li>• Config - Trends</li> <li>• Config - BACnet Point Info</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Present Value</a></li> <li>• <a href="#">Device Type</a></li> <li>• <a href="#">Min Value</a></li> <li>• <a href="#">Max Value</a></li> <li>• <a href="#">COV Increment</a></li> <li>• <a href="#">Out of Service</a></li> <li>• <a href="#">Relinquish Default</a></li> </ul>



**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<b>Config - BACnet Controller Info</b>	<p>Displays the key network configuration attributes of any FEC controllers.<sup>2</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Config - FEC Controllers</li> <li>• Diag - FEC Controllers</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">BACnet Object Name</a></li> <li>• <a href="#">Model Name</a></li> <li>• <a href="#">Description</a></li> <li>• <a href="#">Object Identifier</a></li> <li>• <a href="#">Instance Number</a></li> </ul>
<b>Config - BACnet Engine Info</b>	<p>Displays the key BACnet configuration attributes of any NxEs.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Config - Engine Summary</li> <li>• Config - Engine Network Info</li> <li>• Diag - Engines</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">BACnet Object Name</a></li> <li>• Model ( <a href="#">Model Name</a> )</li> <li>• <a href="#">Network Address</a></li> <li>• <a href="#">BACnet IP Port</a></li> <li>• <a href="#">Object Identifier</a></li> </ul>
<b>Config - BACnet Point Info</b>	<p>Displays the key BACnet configuration attributes of any points on an FEC controller.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Alarm History</li> <li>• Monitoring - Analog Points</li> <li>• Config - Analog Alarms Main</li> <li>• Config - Analog Alarms Warning</li> <li>• Config - Trends</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Present Value</a></li> <li>• <a href="#">BACnet Object Name</a></li> <li>• <a href="#">Object Identifier</a></li> <li>• <a href="#">Intrinsic Alarming Defined</a></li> </ul>
<b>Config - Binary Output Points</b>	<p>Displays binary output configuration data. The typical rows are any key output points (for example, fans or pump commands).</p> <p>You can modify the attributes from the Tailored Summary view using the Global Modify feature. See the <a href="#">Modify Dialog</a> section.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definition:</p> <ul style="list-style-type: none"> <li>• Config - BACnet Point Information</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Present Value</a></li> <li>• <a href="#">Min On Time</a></li> <li>• <a href="#">Min Off Time</a></li> <li>• <a href="#">Heavy Equip Delay</a></li> <li>• <a href="#">Out of Service</a></li> <li>• <a href="#">Relinquish Default</a></li> <li>• <a href="#">Device Type</a></li> </ul>
<b>Config - Engines Network Info</b> <a href="#">MAC Address</a>	<p>Displays the key network configuration attributes of any NxEs.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Config - Engine Summary</li> <li>• Config- BACnet Engine Info</li> <li>• Diag - Engines</li> </ul>	<ul style="list-style-type: none"> <li>• Model ( <a href="#">Model Name</a> )</li> <li>• <a href="#">Status</a></li> <li>• <a href="#">Version</a></li> <li>• <a href="#">IP Address</a></li> <li>• <a href="#">IP Mask</a></li> <li>• <a href="#">Ethernet MAC Address</a></li> <li>• <a href="#">DHCP Enabled</a></li> </ul>
<b>Config - Engine Summary</b>	<p>Displays the key configuration attributes of any NxEs.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Config - Engine Network Info</li> <li>• Config - BACnet Engine Info</li> <li>• Diag - Engines</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Description</a></li> <li>• Model ( <a href="#">Model Name</a> )</li> <li>• <a href="#">Status</a></li> <li>• <a href="#">ADS Repository</a></li> <li>• Last Archive ( <a href="#">Archive Date</a> )</li> <li>• <a href="#">Local Time</a></li> <li>• <a href="#">Local Date</a></li> </ul>

**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<b>Config - FEC Controllers</b>	<p>Displays the key network configuration attributes of any FEC controllers.<sup>2</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Config - BACnet Controller Info</li> <li>• Diag - FEC Controllers</li> </ul>	<ul style="list-style-type: none"> <li>• Model (<i>Model Name</i>)</li> <li>• <i>Status</i></li> <li>• <i>Description</i></li> <li>• <i>Version</i></li> <li>• Address (<i>MAC Address</i>)</li> <li>• <i>Trunk Number</i></li> <li>• Auto Alarm (<i>Disable Automatic Alarming</i>)</li> </ul>
<b>Config - LON Controllers</b>	<p>Displays the key network configuration attributes of any LONWORKS controllers.<sup>2</sup></p>	<ul style="list-style-type: none"> <li>• <i>Status</i></li> <li>• <i>Description</i></li> <li>• <i>Neuron ID</i></li> <li>• <i>Program ID</i></li> <li>• <i>DSN 1</i></li> <li>• <i>XIF Present</i></li> <li>• <i>Message Retry Count</i></li> </ul>
<b>Config - LON Points</b>	<p>Displays the key configuration attributes of any points in a LONWORKS based controller.</p>	<ul style="list-style-type: none"> <li>• <i>Present Value</i></li> <li>• <i>Interface Value</i></li> <li>• <i>Field Units</i></li> <li>• <i>Manual Control</i></li> <li>• <i>Update Interval</i></li> <li>• <i>Target Reference</i></li> <li>• <i>Priority</i></li> </ul>
<b>Config - Multistate Value Alarms</b>	<p>Displays multistate alarm configuration data. The typical rows are any key multistate points (for example, modes of operation, fan status, and so on) that have alarm, trend, and averaging extensions.<sup>1</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Alarm History</li> <li>• Config - Trends</li> <li>• Config - BACnet Point Information</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Present Value</i></li> <li>• <i>Normal State</i></li> <li>• <i>Alarm Priority</i></li> <li>• <i>Capture Changes</i></li> <li>• <i>Report Delay</i></li> <li>• <i>Report Delay Active</i></li> <li>• <i>Alarm Message Text</i></li> </ul>
<b>Config - N2 Controllers</b>	<p>Displays the key network configuration attributes of any N2 controllers.<sup>2</sup></p>	<ul style="list-style-type: none"> <li>• <i>Status</i></li> <li>• <i>Description</i></li> <li>• <i>Controller Type</i></li> <li>• <i>Trunk Number</i></li> <li>• Auto Alarm (<i>Disable Automatic Alarming</i>)</li> <li>• <i>Item Reference</i></li> <li>• <i>Version</i></li> </ul>

**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<b>Config - NCM Info</b>	Displays the key configuration attributes of any Network Control Module (NCM)s. The NCMs are integrated with an NIE.	<ul style="list-style-type: none"> <li>Name ( <i>NCM Name</i> )</li> <li><i>Status</i></li> <li><i>Gate Number</i></li> <li><i>Network Name</i></li> <li><i>Node Number</i></li> <li><i>Object Count</i></li> <li><i>Poll Delay</i></li> </ul>
<b>Config - Schedules</b>	<p>Displays the key configuration information and current status about the listed schedule objects.</p> <p>You can use the Global Command feature to enable or disable all the schedules in the Tailored Summary view.</p> <p>See the <a href="#">Commands Dialog</a> section.</p> <p>You also can use this Summary Definition for features other than schedules.</p>	<ul style="list-style-type: none"> <li><i>Description</i></li> <li>Present <i>Value</i></li> <li><i>Enabled</i></li> <li><i>Item Reference</i></li> <li><i>Object Category</i></li> </ul>
<b>Config - TEC Controllers</b>	<p>Displays the key network configuration attributes of any TEC controllers.<sup>2</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definition:</p> <ul style="list-style-type: none"> <li>Config - BACnet Controller Info</li> </ul>	<ul style="list-style-type: none"> <li>Model (<i>Model Name</i>)</li> <li><i>Status</i></li> <li><i>Version</i></li> <li>Auto Alarm ( <i>Disable Automatic Alarming Disable Automatic Alarming</i> )</li> </ul>
<b>Config - Trends</b>	<p>Displays the trend extension configuration data. The typical rows are any key analog points (for example, Energy Essentials meter points, key zone or discharge air temperatures, key static pressures, and so on) that have trend and averaging extensions.<sup>1</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>Monitoring - Alarm History</li> <li>Monitoring - Analog Points</li> <li>Config - Analog Points</li> <li>Config - Analog Alarms Main</li> <li>Config - Analog Alarms Warning</li> </ul>	<ul style="list-style-type: none"> <li><i>Present Value</i></li> <li><i>Description</i></li> <li><i>Buffer State</i></li> <li><i>Log Enable</i></li> <li><i>Repository Enabled</i></li> <li><i>Sample Interval</i></li> <li><i>Transfer Setpoint</i></li> </ul>
<b>Diag - Engines</b>	<p>Displays the key diagnostic attributes of any NxEs.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>Config - Engine Summary</li> <li>Config - BACnet Engine Info</li> <li>Config - Engine Network Info</li> </ul>	<ul style="list-style-type: none"> <li><i>CPU Usage</i></li> <li><i>Battery Condition</i></li> <li>% Flash Utilized ( <i>Flash Usage</i> )</li> <li><i>Estimated Flash Available</i></li> <li>% Memory Utilized ( <i>Memory Usage</i> )</li> <li><i>Object Count</i></li> <li><i>Board Temperature</i></li> </ul>

**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<b>Diag - FEC Controllers</b>	Displays the key diagnostic attributes of any FEC controllers. <sup>2</sup> This Summary Definition is typically used in a user view with the following Summary Definitions: <ul style="list-style-type: none"> <li>• Config - FEC Controllers</li> <li>• Config - BACnet Controller Info</li> </ul>	<ul style="list-style-type: none"> <li>• Model (<i>Model Name</i>)</li> <li>• <i>Status</i></li> <li>• <i>Memory Usage Memory Usage</i></li> <li>• <i>CPU Usage CPU Usage</i></li> <li>• <i>Object Count</i></li> <li>• <i>Object Memory Usage</i></li> <li>• <i>Flash Usage</i></li> </ul>
<b>Diag - LON Trunks</b>	Displays the key diagnostic attributes of this communication trunk's Diagnostic tab. <sup>3</sup>	<ul style="list-style-type: none"> <li>• <i>Lost Messages</i></li> <li>• <i>Missed Messages</i></li> <li>• <i>Transmit Errors</i></li> <li>• <i>Transmits Per Minute</i></li> <li>• <i>Transaction Timeouts</i></li> </ul>
<b>Diag - MSTP Trunks</b>	Displays the key diagnostic attributes of this communication trunk's Diagnostic tab. <sup>3</sup>	<ul style="list-style-type: none"> <li>• <i>Bus Health Index</i></li> <li>• <i>Bus Performance Index</i></li> <li>• <i>Data CRC Errors</i></li> <li>• <i>Framing Errors</i></li> <li>• <i>Token Loop Time</i></li> <li>• <i>Lost Token</i></li> <li>• <i>Buffer Overflows</i></li> </ul>
<b>Diag - N2 Trunks</b>	Displays the key diagnostic attributes of this communication trunk's Diagnostic tab. <sup>3</sup>	<ul style="list-style-type: none"> <li>• <i>Command Count</i></li> <li>• <i>Message Timeout</i></li> <li>• Acknowledgement Errors (<i>NAK Errors</i>)</li> <li>• <i>Offline Occurrences</i></li> <li>• <i>Poll Scan Time</i></li> <li>• <i>Retries</i></li> <li>• <i>Transmits Per Minute</i></li> </ul>

**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<p><b>Diag - VAV Box Error Analysis</b></p>	<p>Displays the occupied zone temperature status (ZNT-State) value along with the absolute error values from all of the possible output controllers (for example, CLG-ABSERROR, HTG-ABSERROR, or SAFLOW-ABSERROR). Allows you to easily compare Exponentially-Weighted Moving Average (EWMA) to identify devices with poor relative performance.</p> <p>The rows for this Summary Definition are the VAV controllers associated with an air handling system. The absolute error columns indicate all the possible values available. We recommend you remove columns not needed for your specific application.</p> <p><b>Note:</b> Depending on the module instance used by your application, the attributes used for each column may differ. Refer to the <i>Output Controller</i> chapter of the CCT Help (LIT-12011147) for details.</p> <p>When using this Summary Definition, first observe the value in the Current State column. Then refer to the other columns as appropriate. For example, if the Current State column indicates that cooling is taking place, refer to the cooling error columns for more details on the cooling process.</p> <p>This Summary Definition is typically packaged in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - VMA1600 Overview</li> <li>• Monitoring - VMA1600 Flow</li> <li>• Diagnostic - VAV Box Effort Analysis</li> <li>• Configuration - FEC Controllers</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Description</a></li> <li>• Current State (ZNT-State)</li> <li>• Zone Temp Prmy Clg Error</li> <li>• Zone Temp Box Htg Error</li> <li>• Box Htg Output Error</li> <li>• Supp Htg Output Error</li> <li>• Supply Flow Error</li> </ul>
<p><b>Diag - VAV Box Effort Analysis</b></p>	<p>Displays the occupied zone temperature status (ZNT-State) value along with the absolute effort values from all of the possible output controllers (for example, CLG-ABSEFFORT, HTG-ABSEFFORT, or SAFLOW-ABSEFFORT). Allows you to easily compare EWMA to identify devices with poor relative performance.</p> <p>The rows for this Summary Definition are the VAV controllers associated with an air handling system. The absolute error columns indicate all possible values available. We recommend you remove columns not needed for your specific application. Keep in mind that the only one absolute error column is active at any point in time based on the present value of ZNT-State.</p> <p><b>Note:</b> Depending on the module instance used by your application, the attributes used for each column may differ. Refer to the <i>Output Controller</i> chapter of the CCT Help (LIT-12011147) for details.</p> <p>This Summary Definition is typically packaged in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - VMA 1600 Overview</li> <li>• Monitoring - VMA1600 Flow</li> <li>• Diag - VAV Box Error Analysis</li> <li>• Config - FEC Controllers</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Description</a> <a href="#">Description</a></li> <li>• Current State (ZNT-State)</li> <li>• Zone Temp Prmy Clg Effort</li> <li>• Zone Temp Box Htg Effort</li> <li>• Box Htg Output Effort</li> <li>• Supp Htg Output Effort</li> <li>• Supply Flow Effort</li> </ul>

**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<p><b>Monitoring - AHUs</b></p>	<p>Displays the key point information based on standard naming conventions for a Mixed Air Single Duct systems. The rows for this Summary Definition are FEC or TEC series controllers.<sup>2</sup></p> <p>Key data from the associated central plant systems or weather data is typically added to unique instances of this Summary Definition.</p>	<ul style="list-style-type: none"> <li>• Supply Fan Status</li> <li>• Return Fan Status</li> <li>• Mixed Air Temp</li> <li>• Zone Temp</li> <li>• Discharge Temp</li> <li>• Cooling Command</li> <li>• Heating Output</li> </ul>
<p><b>Monitoring - Alarm History</b></p>	<p>Displays the current key status information of analog points along with the date and time that the last alarm and return to normal transitions occurred. The typical rows for this Summary Definition include any key analog points (for example, key zone or discharge air temperatures, key static pressures, and so on) that have alarm, trend, and averaging extensions.<sup>1</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Analog Points</li> <li>• Config - Analog Points</li> <li>• Config - Analog Alarms Main</li> <li>• Config - Analog Alarms Warning</li> <li>• Config - Trends</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Present Value</i></li> <li>• <i>Alarm Ack Pending</i></li> <li>• <i>Alarm Ack Required</i></li> <li>• Late <i>Alarm Date</i></li> <li>• Back to <i>Normal Date</i></li> <li>• Last <i>Alarm Time</i></li> <li>• Back to <i>Normal Time</i></li> </ul>
<p><b>Monitoring - Analog Points</b></p>	<p>Displays the minimum/maximum/average values from the averaging extension and the key description attributes for the item's Focus tab. The typical rows for this Summary Definition include any key analog points (for example, key zone or discharge air temperatures, key static pressures, and so on) that have alarm, trend, and averaging extensions.<sup>1</sup></p> <p>This Summary Definition is typically used in a user view with the following Summary Definitions:</p> <ul style="list-style-type: none"> <li>• Monitoring - Alarm History</li> <li>• Config - Analog Points</li> <li>• Config - Analog Alarms Main</li> <li>• Config - Analog Alarms Warning</li> <li>• Config - Trends</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Present Value</i></li> <li>• Averaging Value (<i>Average Value</i>)</li> <li>• Min Value (<i>Minimum Value</i>)</li> <li>• Max Value (<i>Maximum Value</i>)</li> <li>• <i>Reliability</i></li> <li>• <i>Item Reference</i></li> </ul>

**Table 62: Pre-Built Tailored Summary Library**

Summary Definition Name	Description	Default Columns
<b>Monitoring - VMA1400 Flow</b>	<p>Displays the key flow setup and monitoring information for a typical single duct, pressure independent VAV Box application. The rows for this Summary Definition are VMA14 controllers that are associated with an air handling system.<sup>2</sup></p> <p>Key data from the associated air handling system is typically added to unique instances of this Summary Definition.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definition:</p> <ul style="list-style-type: none"> <li>• Config - VMA 1400 Overview</li> </ul>	<ul style="list-style-type: none"> <li>• Box Area</li> <li>• Pickup Gain</li> <li>• Flow</li> <li>• Cooling Max Flow Setpoint</li> <li>• Cooling Min Flow Setpoint</li> <li>• Heating Flow Setpoint</li> </ul>
<b>Monitoring - VMA1600 Flow</b>	<p>Displays the key flow setup and monitoring information for a typical single duct, pressure independent VAV Box application. The rows for this Summary Definition are VMA16 controllers that are associated with an air handling system.<sup>2</sup></p> <p>Key data from the associated air handling system is typically added to unique instances of this Summary Definition.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definition:</p> <ul style="list-style-type: none"> <li>• Config - VMA 1600 Overview</li> </ul>	<ul style="list-style-type: none"> <li>• Box Area</li> <li>• Pickup Gain</li> <li>• Flow</li> <li>• Cooling Max Flow Setpoint</li> <li>• Cooling Min Flow Setpoint</li> <li>• Heating Flow Setpoint</li> </ul>
<b>Monitoring - VMA1400 Overview</b>	<p>Displays the key point information for a typical single duct, pressure independent VAV Box application. The rows for this Summary Definition are VMA14 controllers that are associated with an air handling system.<sup>2</sup></p> <p>Key data from the associated air handling system is typically added to unique instances of this Summary Definition.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definition:</p> <ul style="list-style-type: none"> <li>• Config - VMA 1400 Flow</li> </ul>	<ul style="list-style-type: none"> <li>• Zone Temperature</li> <li>• Supply Temperature</li> <li>• Setpoint</li> <li>• Flow</li> <li>• Flow Setpoint</li> </ul>
<b>Monitoring - VMA1600 Overview</b>	<p>Displays the key point information for a typical single duct, pressure independent VAV Box application. The rows for this Summary Definition are VMA16 controllers that are associated with an air handling system.<sup>2</sup></p> <p>Key data from the associated air handling system is typically added to unique instances of this Summary Definition.</p> <p>This Summary Definition is typically used in a user view with the following Summary Definition:</p> <ul style="list-style-type: none"> <li>• Config - VMA 1600 Flow</li> </ul>	<ul style="list-style-type: none"> <li>• Zone Temperature</li> <li>• Supply Temperature</li> <li>• Setpoint</li> <li>• Flow</li> <li>• Flow Setpoint</li> <li>• Damper Output</li> <li>• Heating Output</li> </ul>

1 The Name attribute of alarm, trend, or averaging extensions must be unique across all extensions on the item (that is, the alarm and trend item extensions cannot both have a Name attribute of Present Value). You can modify the Name attributes from the Tailored Summary view using the Global Modify feature. See the [Modify Dialog](#) section.

2 You can use the Global Modify feature to add an associated graphic to all the device objects. See the [Modify Dialog](#) section.

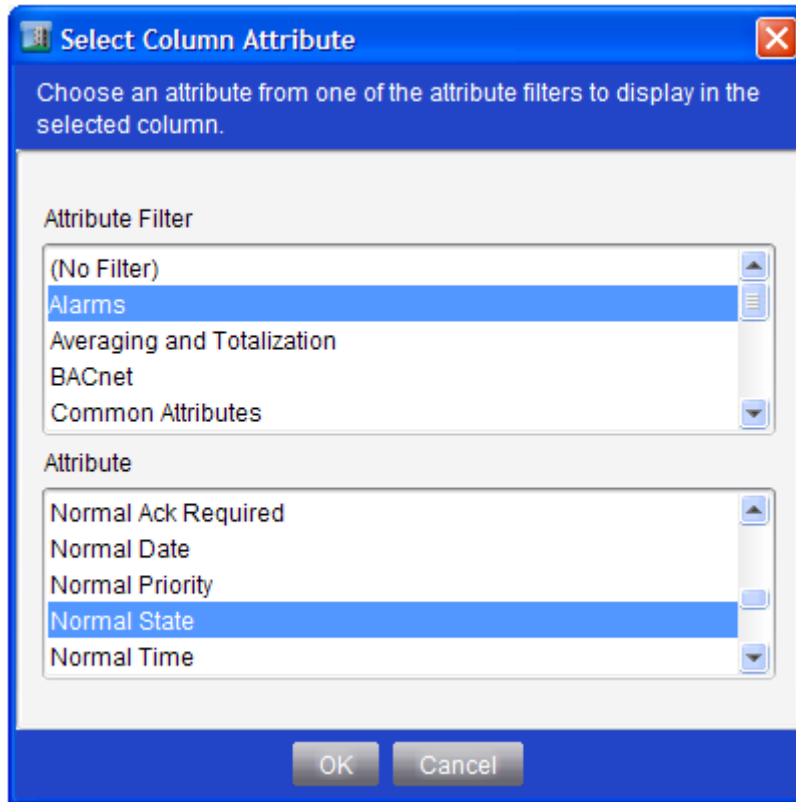
3 You can use the Global Command feature to send Clear Statistics and Latch Statistics from the Tailored Summary view to capture the most current diagnostic information. See the [Commands Dialog](#) section.

## Tailored Summary Attributes

The Select Column Attribute dialog box allows you to select the attributes to display in the Tailored Summary columns. See the [Editing an Existing Summary Definition](#) section for details on accessing and using this dialog box.

You can filter the available attributes by category using the Attribute Filter list box. The attributes of that category appear in the Attribute list box. If you filter on Alarms, for example, the alarm attributes appear in the list for selection.

**Figure 23: Select Column Attribute Dialog Box**



The following table lists examples of the attributes available for display in the Tailored Summary feature according to the attribute filter.

**Note:** Click an attribute in the table to view its description. For information on other attributes that do not appear in this table, search for the attribute using the Help system's Search function, or search within the PDF of the Help system.

**Table 63: Example Tailored Summary Attributes**

Attribute Filter	Example Attributes
<b>Alarms</b>	<ul style="list-style-type: none"> <li>• <a href="#">Alarm Message Text</a></li> <li>• <a href="#">Alarm Priority</a></li> <li>• <a href="#">High Alarm Limit</a></li> <li>• <a href="#">Low Alarm Limit</a></li> </ul>
<b>Averaging and Totalization</b>	<ul style="list-style-type: none"> <li>• <a href="#">Average Value</a></li> <li>• <a href="#">Minimum Value</a></li> <li>• <a href="#">Maximum Value</a></li> <li>• <a href="#">Totalize Limit</a></li> </ul>
<b>BACnet</b>	<ul style="list-style-type: none"> <li>• <a href="#">BACnet IP Port</a></li> <li>• <a href="#">Instance Number</a></li> <li>• <a href="#">Intrinsic Alarming Defined</a></li> <li>• <a href="#">Object Name</a></li> </ul>



**Table 63: Example Tailored Summary Attributes**

Attribute Filter	Example Attributes
Common Attributes	<ul style="list-style-type: none"> <li>• <i>Alarm State</i></li> <li>• <i>Object Category</i></li> <li>• <i>Present Value</i></li> <li>• <i>Status</i></li> </ul>
Field Devices (General)	<ul style="list-style-type: none"> <li>• <i>Disable Automatic Alarming</i></li> <li>• <i>Offline</i></li> </ul>
Field Devices (LON)	<ul style="list-style-type: none"> <li>• <i>DSN 1</i></li> <li>• <i>Neuron ID</i></li> <li>• <i>Program ID</i></li> <li>• <i>XIF Present</i></li> </ul>
Field Devices (MSTP)	<ul style="list-style-type: none"> <li>• <i>Memory Usage</i></li> <li>• <i>Memory Usage</i></li> <li>• <i>Object Count</i></li> <li>• <i>Trunk Number</i></li> </ul>
Field Devices (N1)	<ul style="list-style-type: none"> <li>• <i>Device Status</i></li> <li>• <i>NCM Name</i></li> <li>• <i>Object Count</i></li> <li>• <i>Poll Delay</i></li> </ul>
Field Devices (N2)	<ul style="list-style-type: none"> <li>• <i>Controller Type</i></li> <li>• <i>Trunk Number</i></li> </ul>
Field Points (General)	<ul style="list-style-type: none"> <li>• <i>Device Type</i></li> <li>• <i>Max Value</i></li> <li>• <i>Min Value</i></li> <li>• <i>Out of Service</i></li> </ul>
Field Points (LON)	<ul style="list-style-type: none"> <li>• <i>Command Status Mapping Table</i></li> <li>• <i>Interface Value</i></li> <li>• <i>Target Reference</i></li> <li>• <i>Update Interval</i></li> </ul>
Field Points (N1)	<ul style="list-style-type: none"> <li>• <i>Feedback</i></li> <li>• <i>Setpoint</i></li> <li>• Value: <i>Present Value (Value)</i></li> <li>•</li> </ul>
Integrations (MSTP)	<ul style="list-style-type: none"> <li>• <i>APDU Retries</i></li> <li>• <i>Buffer Overflows</i></li> <li>• <i>Bus Health Index</i></li> <li>• <i>Bus Performance Index</i></li> </ul>
Integrations (LON)	<ul style="list-style-type: none"> <li>• <i>Missed Messages</i></li> <li>• <i>Transmit Errors</i></li> <li>• <i>Transaction Timeouts</i></li> <li>• <i>Transmits Per Minute</i></li> </ul>

**Table 63: Example Tailored Summary Attributes**

Attribute Filter	Example Attributes
Integrations (N2)	<ul style="list-style-type: none"> <li>• <i>Command Count</i></li> <li>• <i>Message Timeout</i></li> <li>• <i>NAK Errors</i></li> <li>• <i>Transmits Per Minute</i></li> </ul>
Supervisory Devices	<ul style="list-style-type: none"> <li>• <i>ADS Repository</i></li> <li>• <i>IP Address</i></li> <li>• <i>Model Name</i></li> <li>• <i>Object Count</i></li> </ul>
Trends	<ul style="list-style-type: none"> <li>• <i>Buffer State</i></li> <li>• <i>Log Enable</i></li> <li>• <i>Sample Interval</i></li> <li>• <i>Transfer Setpoint</i></li> </ul>

## Tailored Summary Steps

### Importing a Summary Definition

**Note:** You can perform this task in SCT or the online Site Management Portal UI for the Site Director.

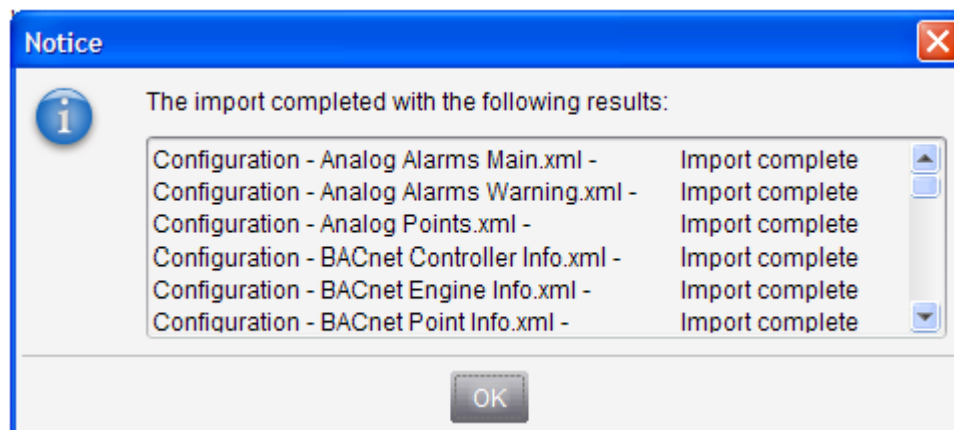
1. In the All Items tree, right-click the Summary Definitions folder and select Import Definition. The Import dialog box appears.
2. Browse to the location on the computer where the Summary Definitions are stored.

**Note:** The pre-built Summary Definitions are provided on the SCT installation media and the Johnson Controls BPP. You can save these files to your computer or access them from the SCT installation media or BPP DVD.

**Note:** You also can import Summary Definitions that were previously exported. See the [Exporting a Summary Definition](#) section.

3. Select one or more Summary Definitions to import.
4. Click Import. The Notice dialog box appears, indicating the results of the import after all imports complete.

**Figure 24: Notice Dialog Box**



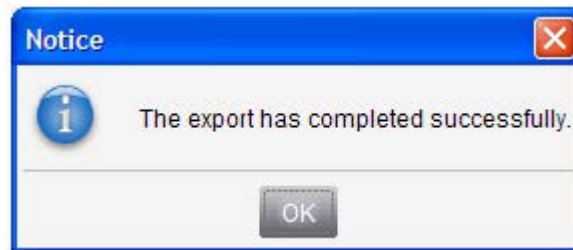
5. Click OK. The imported Summary Definitions appear in the Summary Definitions folder in the All Items tree.

### Exporting a Summary Definition

**Note:** You can perform this task in SCT or the online Site Management Portal UI for the Site Director.

1. In the Summary Definitions folder of the All Items tree, right-click the Summary Definition and select Export. The Export dialog box appears.
2. Browse to the location on the computer to store the Summary Definition.
3. Click Export. The Notice dialog box appears, indicating the results of the export.

**Figure 25: Notice Dialog Box**





4. Click OK.

**Note:** You can now share the Summary Definition with others and import it to other sites as desired. If you import the Summary Definition to another site, you may need to update the key data references.

### Editing an Existing Summary Definition

**Note:** You can perform this task in SCT or the online Site Management Portal UI for the Site Director.

**Note:** See the [Summary Definition Editor](#) and [Summary Definition Object](#) sections for information on the editor and attributes appearing on the Summary Definition.

1. In the Summary Definitions folder of the All Items tree, double-click the Summary Definition. The Summary Definition appears in the display panel.
  2. On the Summary Definition tab, click Edit.
  3. In the Label text box, enter the text to display as the label for the row header column (that is, the first column that contains the user view items). Leave the label blank for an empty heading.
  4. Add, remove, and rearrange columns in the table:
    - Click the Add/Plus  button to add a column at the end of the column configuration table.
    - Select a column by clicking the column header and click the Remove/Minus  button to remove it from the table.
    - To change the order of the columns, select a column and drag it to the desired placement.
- Note:** You can define up to a maximum of seven columns. The Add button is disabled if seven columns already exist. You must define a minimum of at least one column.
5. In the Column Heading text box, enter the text to display as the label for the column header (maximum of 50 characters).
  6. In the Child Item text box, leave this field blank to display an attribute of the row item, or add a child item name using any of the following methods:
    - Enter the name of the child item to display.
    - Select an item in the All Items tree, user view, or other view (for example, global search results table) and drag it to the Child Item text box. This functionality is not available in the Create New Summary Definition Wizard.
    - Click the browse button. The Select Item dialog box appears. Select an item name and click OK.

**Note:** The child item is just an item name, not a Fully Qualified Reference (FQR).

**Note:** You can define an unlimited number of item names in a comma-delimited list.

**Note:** You can define an unlimited amount of wildcards. The first item found that matches this item name pattern is displayed in the Tailored Summary view column. See the table footnote in the [Summary Definition Tab](#) section for more information on wildcards.

**Note:** In previous releases, the Name attribute of extensions was typically labeled Present Value. When you create an extension at Release 5.0 and later, the Name attribute automatically includes the extension type in the label (for example, Alarm - JCI System Status or Trend - Memory Usage).

If you select the Name attribute of an alarm or trend extension created at a previous release for the attribute, we recommend renaming the Name attribute to indicate the type of extension so that it is apparent in the Tailored Summary view (for example, Present Value versus Alarm - Present Value or Trend - Present Value). Perform a global search and global modification to add Alarm or Trend to the name; then define the Tailored Summary Child Item as \*Alarm\* or \*Trend\* (see [Global Search and Modify Dialog](#)).

Another option is to add \*Present Value\* as a filter to the Child Items in the summary definition. This option makes the existing trend extension names compatible if the default name of Present Value was used. This option is a quick modification to the summary definition only so the existing trend extensions do not require modification.

7. In the Attribute text box, select the attribute to display as follows (only when selecting an attribute other than the default attribute):
  - a. Click the browse button. The Select Column Attribute dialog box appears.
  - b. In the Attribute Filter list box, select a filter category. The attributes of that type appear in the Attribute list box. If you filter on Alarm, for example, the alarm attributes appear in the list for selection.
  - c. In the Attribute list box, select an attribute.
  - d. Click OK.

**Note:** To display the default attribute of the row item, leave the Attribute box set to Default (Attribute Filter: Common Attributes and Attribute: Default).

**Note:** See the [Tailored Summary Attributes](#) section for more information on this dialog box and examples.

8. Click Save.
9. On the Focus tab, click Edit.
10. Make the necessary attribute changes (for example, define the Key Data following the instructions in [Defining Key Data](#)).
11. Click Save.

## Defining Key Data

**Note:** You can perform this task in SCT or the online Site Management Portal UI for the Site Director.

**Note:** See the [Focus Tab](#) and [Summary Definition Object](#) sections for information on the Key Data attribute of the Summary Definition.

1. In the Summary Definitions folder of the All Items tree, right-click the Summary Definition and click View. The Summary Definition appears in the display panel.
2. On the Focus tab, click Edit.
3. In the Key Data list box, click the browse button. The Modify List dialog box appears ([Figure 19](#)).
4. Add Key Data as follows:
  - a. Click Add. An undefined item appears in the list.
  - b. Click the Browse button of the item. The Select Item dialog box appears.
  - c. Select an item.
  - d. Click OK.

**Note:** You also can type in the text box and use wildcards (asterisks \* only) to search for the item within the user view folder.

**Note:** You can define up to 4 Key Data items.

5. Select an item and click Remove to delete the item from the Key Data list.
6. Select an item and click Move Up or Move Down to rearrange the order the items appear in the list.
7. Click OK.
8. Click Save.

### Creating a New Summary Definition

**Note:** You can perform this task in SCT or the online Site Management Portal UI for the Site Director.

1. From the Insert menu, select Summary Definition. The Create New Summary Definition Wizard appears.
2. On the Identifier screen, enter a name for the Summary Definition.
3. Click Next.
4. On the Configure screen, define the data of the Summary Definition and Configuration tabs. See the [Editing an Existing Summary Definition](#) and [Defining Key Data](#) sections for details on how to edit these items.
5. Click Next.
6. On the Summary screen, click Finish. The new Summary Definition appears in the Summary Definitions folder of the All Items tree.

### Defining User Views with Summary Definitions

See the [Creating a User View](#) or [Editing a User View](#) topics in the [User Views](#) section for instructions on how to perform the task in this procedure.

1. Create a user view or edit an existing one (for example, an HVAC user view).
2. Add a folder to the user view to hold the Summary Definitions. For example, add a Summary Definitions folder, or a folder named according to function (such as VAV Boxes - VMA1400s, Key Point Information, Engines, or MSTP Trunk Diagnostics).
3. Drag and drop the definitions from the Summary Definitions folder in the All Items tree to the folder you created in the user view (or use the user view editor's add reference option).
4. Drag and drop the items to reference (for example, supervisory devices or points) from the All Items tree or from the global search results table to the folder in the user view (or use the user view editor's add reference option).
5. Save the user view.

### Viewing a Tailored Summary

**Note:** You can perform this task in the online Site Management Portal UI for the Site Director. For information on viewing a Tailored Summary in the Ready Access Portal UI, refer to the Ready Access Portal [Help](#).

1. Click the desired user view tab in the navigation pane.
2. Double-click the user view folder containing the Summary Definition(s) and referenced items (for example, the Summary Definitions folder). The Tailored Summary appears in the display panel. See the [Tailored Summary View](#) section for a description of this UI.

**Note:** If the user view does not contain a Summary Definition, only the standard Summary appears.

3. Click the Tailored Summary you want to view from the Available Tailored Summaries list box if more than one Summary Definition appears in the list. By default, the first authorized Summary Definition in the list is automatically selected.
4. View the key data and the table data.
5. Use the right-click menu options to command, modify, or otherwise work with the data. See [Using a Tailored Summary](#).

### Using a Tailored Summary

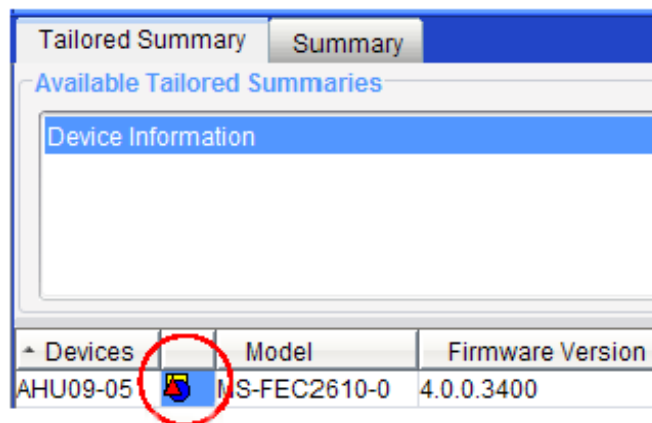
**Note:** You can perform this task in the online Site Management Portal UI for the Site Director. For information on using a Tailored Summary in the Ready Access Portal UI, refer to the Ready Access Portal [Help](#).

1. View the Tailored Summary as described in the [Viewing a Tailored Summary](#) section.

2. Work with the **Tailored Summary table** as follows:

- To issue commands, select one or more items (that is, select the table cells), then right-click and select Command. To command all items in a column, right-click the column header and select Command. See the [Commands Dialog](#) section for details. For example, use this process to send an operator override command to multiple items.
- To make modifications, select one or more items, then right-click and select Modify. To modify all items in a column, right-click the column header and select Modify. See the [Modify Dialog](#) section for details. For example, use this process to change the Object Category for multiple items.
- To view an item, select an item and right-click and select View. The item appears in the display panel.
- To resize a column, place the cursor between the column headers so that the cursor has double-sided arrows (↔). Click and drag the column to the desired width.
- To sort the column data alphanumerically, click a column header. Click the column header again to sort in the reverse order.
- To rearrange the order of the columns while viewing the Tailored Summary, select a column header and use drag-and-drop functionality to move it to the desired location.
- To keep a snapshot of the Tailored Summary's data for later comparison, select and copy the table data. Then paste it into a program such as Microsoft Excel. Use the keyboard shortcuts Ctrl A, Ctrl C, and Ctrl V.
- To view a graphic associated with field controller, double-click the graphic icon that appears in the second column of the table (by default). The graphic appears in the display panel.

**Figure 26: Viewing a Graphic from a Tailored Summary**



- To link a graphic to multiple field controllers, select the field controllers, then right-click and select Modify. The Global Modify dialog box appears. Edit the Graphic and Graphic Alias attributes as desired and click Send. This procedure applies only to field controllers. See [Performing a Global Modify](#) in the [Modify Dialog](#) section for details.

3. Work with the **Key Data table** as follows:

- To issue a command, select one item and right-click and select Command. See the [Commands Dialog](#) section.
- To make modifications to an item, select one item and right-click and select Modify. See the [Modify Dialog](#) section for details.
- To view an item, select one item and right-click and select View. The item appears in the display panel.
- To resize a column, place the cursor between the column headers so that the cursor has double-sided arrows (↔). Click and drag the column to the desired width.
- To rearrange the order of the columns, select a column header and use drag-and-drop functionality to move it to the desired location.

- To view a graphic associated with a field controller, double-click the graphic icon that appears in the first column of the table (by default). The graphic appears in the display panel.
- To link a graphic to a field controller, select the field controller, then right-click and select Modify. The Modify dialog box appears. Edit the Graphic and Graphic Alias attributes as desired and click Send. This procedure applies only to field controllers. See the [Modify Dialog](#) section for details.

**Note:** You cannot perform global commands/modifications or sort the data in the Key Data table.

### Retaining Summary Definitions when Changing the Site Director

1. Export the Summary Definitions. See [Exporting a Summary Definition](#).
2. Promote or demote the Site Director.
3. Import the Summary Definitions. See [Importing a Summary Definition](#).
4. Add the Summary Definitions to the user view folder. See [Defining User Views with Summary Definitions](#).
5. Fix the references in the Key Data, if needed. See [Defining Key Data](#).

### Reusing an Existing Summary Definition for Different Key Data

Use this procedure if the key data is the only thing that is different between two different views (for example, establishing the key data for individual Air Handlers with their associated VAV boxes).

1. Export an existing Summary Definition. See the [Exporting a Summary Definition](#) section.
2. Rename the Summary Definition.
3. Import the renamed Summary Definition. See the [Importing a Summary Definition](#) section.
4. Make the necessary Object Name and Key Data changes. See the [Defining Key Data](#) section.
5. Add the Summary Definition to the desired user view. See the [Defining User Views with Summary Definitions](#) section.

## Tailored Summary Troubleshooting

**Table 64: Tailored Summary Troubleshooting**

Problem	Solution
In the Tailored Summary view, the child item does not display data from an object after editing its Object Name attribute.	If you change the Object Name attribute of an object after configuring the Summary Definition object, the link to the Child Item breaks. Change the Child Item wildcards in the Summary Definition object to match the new Object Name attribute.
You attempt to create a link to a Tailored Summary from a graphic but are unsuccessful.	<p>Links to a Tailored Summary from a graphic are supported only in conjunction with the Ready Access Portal software. Linking to a specific Tailored Summary only using the Site Management Portal UI is not supported at this time.</p> <p>To create a graphic link to a Tailored Summary:</p> <ol style="list-style-type: none"> <li>1. Log on to the Ready Access Portal UI.</li> <li>2. View a Tailored Summary in the Ready Access Portal UI.</li> <li>3. Copy the URL for the Tailored Summary view.</li> <li>4. Log on to the Site Management Portal UI.</li> <li>5. Open the graphic where you want to create the link.</li> <li>6. Add a button and link it to the URL of the Tailored Summary in the Ready Access Portal UI.</li> </ol> <p>When you click the button, the Ready Access Portal UI will open and display the Tailored Summary.</p>

**Table 64: Tailored Summary Troubleshooting**

<b>Problem</b>	<b>Solution</b>
<b>With a Release 5.0 NAE45 Site Director, points in a Tailored Summary display slowly and may time out.</b>	This issue was resolved in Release 5.1. If this delay is problematic, we recommend you upgrade to Release 5.1 or later.
<b>When running a Tailored Summary, User Views with large point counts display red Xs.</b>	On a summary view with more than 500 objects from a single NxE, you may occasionally see red Xs if the device is busy. As the view continues to update data, the red Xs disappear.



# Global Search

The Global Search feature allows you to search the Metasys system for multiple items that meet specific criteria based on naming and object type. The global search provides you with the ability to manage lists of objects, which can be used by other features for commanding, trending, reporting, modification, and object selection. For example, you could create a list of all discharge air temperatures for the AHUs in a building. This feature is especially helpful in the creation of User Views and Summary Definitions as you can use drag-and-drop functionality to add items from the search results to these features. The Global Search feature is not available in the SCT.

See [Using Global Commands with the Global Search](#) in the [Commands Dialog](#) section and [Using Global Modify with Global Search](#) in the [Modify Dialog](#) section for steps on using these features together.

For information on backing up object lists before an upgrade, refer to the [Preferences](#) appendix in the [NAE Commissioning Guide \(LIT-1201519\)](#) or the [ADS/ADX Commissioning Guide \(LIT-1201645\)](#).

## Global Search Concepts

### Global Search Overview

The Global Search feature allows you to search for objects from an entire site or from a portion of a site (for example, one or more trunks or devices). The Global Search Viewer offers the ability to add and remove items from the search scope and search by object name and type. During a search, the items found appear in the results table immediately, and the status bar shows which location is currently being searched. The status bar also shows the number of items found.

With the Global Search feature, you can view information about multiple items at once. You can create different groups of objects and save them as object lists for later use. The Global Search Viewer lets you view summary data for multiple objects, and allows multiple selection for Global Commanding and Global Modifying.

See the [Global Search Viewer Screen](#) and [Object List](#) sections.

### Global Search Viewer Screen

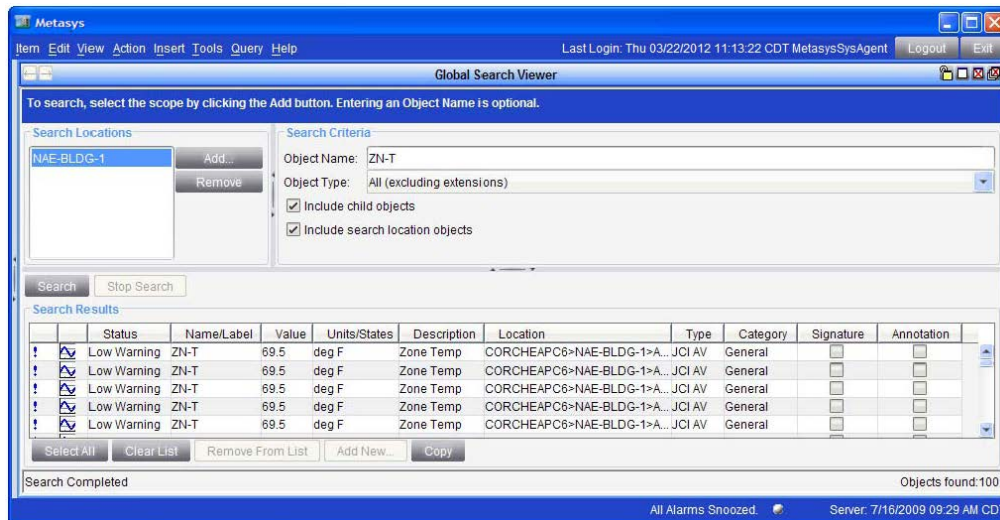
The Global Search Viewer allows you to perform a global search for like objects in your Metasys system. You can access the Global Search Viewer from the [Query Menu](#) by selecting Global Search. The Global Search Viewer opens in the [Display Frame](#) of the Metasys system Site Management Portal.

You can have multiple Global Search Viewers open, but can only initiate one search at a time within the same UI. If you try to start another search in the same UI, an error message appears stating you must either stop the search in progress, or wait until it completes before initiating another search.

By default, the Global Search feature supports a maximum of 500 items displayed in a Global Search Viewer. You can set the query results in the User Preferences on an ADS/ADX to a maximum of 2,000; however, after displaying 500 results, the values do not dynamically update. If an NxE is the Site Director, you can set the query results to a maximum of 500. If the search results reach the maximum number of items, a message appears stating the current search is too broad and you should change the search criteria to narrow the search and try again.

**Note:** On an NxE with more than 500 items, the Global Search may display red Xs and the message **Value cannot be read**. As the view continues to update data, the red Xs disappear. However, once the search reaches 500, results data updates are disabled and the red Xs remain.

**Figure 27: Global Search Viewer Screen**



**Table 65: Global Search Viewer Screen Components**

Screen Area/Item	Description
<b>Instructions Area</b>	Provides tips to help you perform a search.
<b>Search Locations List Box</b>	Lists the parts of the Metasys system navigation view you selected to search.  When you initially invoke the Global Search feature, any items currently selected in the navigation view appear in the Search Locations list box. If no items are selected in the navigation view, the box appears blank. Make or change selections using the Add and Remove buttons.
<b>Add Button</b>	Opens the Select Item dialog box and allows you to select the parts of the system you want to search. You can select items from available views (All Items tab or User View tabs) depending on your user authorization.  You can search the entire site, one or more devices, one or more trunks on a device, one or more User Views, and so on. Use the Ctrl or Shift keys when clicking to select multiple items. After completing the dialog box, the items you selected appear in the Select Scope box.
<b>Remove Button</b>	Removes selected items from the Search Locations list box.
<b>Object Name Box</b>	Allows you to type the full or partial name of the object you want to find. You can leave it blank for a more expansive search. You also can use one or more wildcards (* or ?) to aid in your search.  Wildcard Examples: <ul style="list-style-type: none"> <li>• LCP-2*</li> <li>• ZN-T*</li> <li>• OCC-S*</li> <li>• N?E* (searches for all items named NAE*, NIE*, and so on)</li> </ul> <p>The object name search is not case-sensitive.</p> <p>The search looks at the Name attribute. For searches against user navigation views, the search also considers the user-defined label assigned to the item within that particular navigation view, and includes the item if its Name attribute or its label matches the search criteria for object name.</p>

**Table 65: Global Search Viewer Screen Components**

Screen Area/Item	Description
<b>Object Type Drop-Down List</b>	Allows you to select a specific type of object to search for or to search for all object types. Options include: <ul style="list-style-type: none"> <li>• All (excluding extensions)</li> <li>• Trend Extensions</li> <li>• Totalization Extensions</li> <li>• Alarm Extensions</li> <li>• Schedules</li> <li>• Calendars</li> <li>• Field Devices</li> <li>• Field Points</li> </ul>
<b>Include child objects Check Box</b>	Includes all child objects of any items found when searching the Search Locations. That is, it includes the nested child objects.
<b>Include search location objects Check Box</b>	Includes the location items in the search results (if they meet the search criteria), as well as any items found when searching in those locations.  For example, if you initiate a search on an N2 Trunk named <b>N2 Trunk 1</b> to search for all objects named <b>*2*</b> , and you check <b>Include search location objects</b> , the results include the N2 Trunk in the results. If you do not check the option, the search results only include items under the N2 Trunk (along with their child objects, if the <b>Include child objects</b> option was checked), and will <b>not</b> include the N2 Trunk itself.
<b>Search Button</b>	Begins the search.
<b>Stop Search Button</b>	Cancels a search in progress and no more new objects appear in the Search Results table.
<b>Search Results Table</b>	Displays the results of the search (object list). <ul style="list-style-type: none"> <li>• Dynamic data in this table automatically refreshes periodically. The refresh rate depends on the platform to which you are logged in.</li> <li>• If you select an item in the Search Results and place your cursor over it within each column, tooltips appear providing more information, if available.</li> <li>• Any data that does not fit within the columns is identified by an ellipsis (...). You can resize the column or place your cursor over the table cell to see its tooltip text.</li> <li>• If the search finds an object in more than one location (for example, in the All Items navigation view and in a user navigation view), the object is listed twice in the Search Results Table. If the same location is searched a second time, or if search locations overlap, the object is not repeated in the table. Items are only repeated in the table if their location differs.</li> </ul> <p>See the <a href="#">Working with Search Results</a> section for more information on manipulating and using the table data.</p>
<b>Status Icon Column</b>	Displays the icon of the object's current status as defined by its Status attribute.
<b>Icon Column</b>	Displays the icon of the object as it appears in the navigation tree.
<b>Status Column</b>	Displays the object's current status as defined by its Status attribute.
<b>Name/Label Column</b>	Displays the object's name as defined by its Name attribute. The object's full reference identifier appears in a tooltip when the cursor is placed over the name.
<b>Value Column</b>	Displays the object's value as defined by its default attribute (generally, the Present Value attribute).
<b>Units/States Column</b>	Displays the Units attribute data for analog objects, Number of States attribute data for multistate objects, and appears blank for all other objects.
<b>Description Column</b>	Displays the data defined in the object's Description attribute.
<b>Location Column</b>	Displays the object's context, specifically its location within a particular navigation view.
<b>Type Column</b>	Displays the object's type (for example, NAE55).

**Table 65: Global Search Viewer Screen Components**

Screen Area/Item	Description
<b>Category</b>	Displays the object's category as defined by its Object Category attribute (for example, General).
<b>Signature</b>	Indicates whether a signature is associated with the object.
<b>Annotation</b>	Indicates whether an annotation is associated with the object.
<b>Select All</b>	Selects all rows in the Search Results table.
<b>Clear List</b>	Removes all of the objects from the Search Results table.
<b>Remove From List</b>	Removes selected objects from the Search Results table.
<b>Add New</b>	Allows you to manually add one or more objects to existing search results (where the added objects append to the bottom of the existing Search Results table).
<b>Copy to Clipboard</b>	Copies the selected search results in a tab-delimited format to the Clipboard for pasting into other applications such as Microsoft Excel or Word.
<b>Status Bar</b>	Displays the current location being searched while the search is in progress, the status of the search, and the number of objects found.

## Object List

The objects listed in the Search Results table make up an object list. You can save an object list for future viewing and commanding. You can open an existing object list in the Global Search Viewer if you want to access the same search results without having to perform the search again. You also can open object lists for use by other features such as the Trend Viewer, Scheduled Reports, Global Commands, and Global Modify. Object lists provide easy object selection for these features.

When you save an object list, it is saved on the Site Director. Sorting order is not saved in the object list. For information on working with and using object lists, see the [Working with Search Results](#), [Saving an Object List](#), [Opening an Object List](#), and [Deleting an Object List](#) sections. Also, see the [Trend Viewer](#), [Scheduled Reports](#), [Commands Dialog](#), and [Modify Dialog](#) sections.

The object lists are not saved during a backup of the database, and are deleted during a restore. The files must be manually saved and restored in order to retain saved lists.

On the ADS/ADX, the files are stored at:

- Windows XP OS and Windows Server® 2003 OS: C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\File Transfer\Object Lists
- Windows 7 OS, and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\File Transfer\Object Lists).

On the engines, use Remote Desktop within the NxE Information and Configuration Tool (NCT) to access the files. For information on backing up object lists, refer to the *Preferences* appendix in the *NAE Commissioning Guide (LIT-1201519)* or the *ADS/ADX Commissioning Guide (LIT-1201645)*.

## Global Search Steps

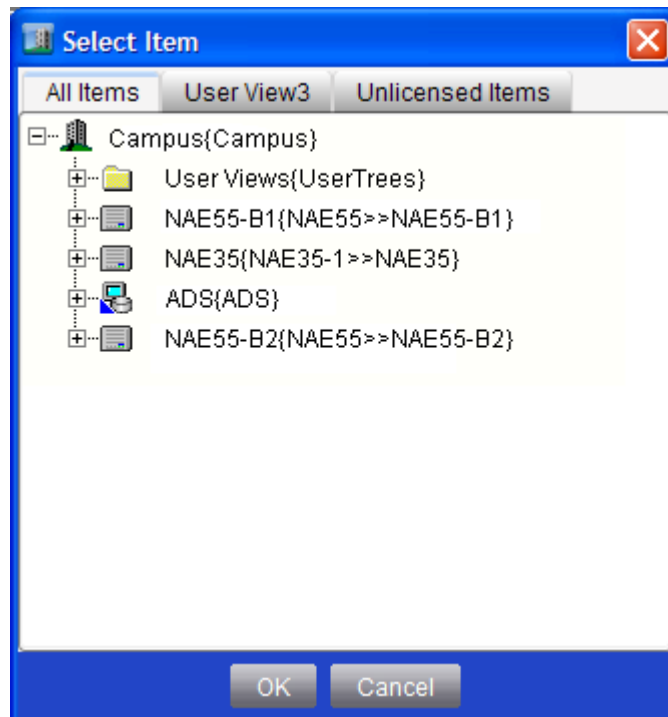
### Performing a Global Search

**Note:** When initiating a global search, especially after restarting the ADS/ADX, the operation may timeout. This is most likely to occur when CPU usage is high.

To perform a global search:

1. From the [Query Menu](#), select Global Search. The Global Search Viewer appears in a display panel. Any items currently selected in the navigation view appear in the Search Locations list box.
2. In the Search Locations section, click Add. The Select Item dialog box appears.

**Figure 28: Select Item Dialog Box**



3. Select the part of the system that you want to search from the available tabs (All Items tab or User View tabs) depending on your user authorization. You can search the entire site, the All Items navigation tree, a User View, one or more devices, one or more trunks on a device, and so on. Use the Ctrl or Shift keys when clicking to select multiple items.

**Note:** Selecting a User View object from the All Items tab does not search that User View's contents. You must select the root of the User View from its tab.

4. Click OK.

**Note:** To remove items from the Search Locations box, select the item and click Remove.

5. Select the Include child objects check box if you want to include all child objects of any items found when searching the Search Locations.
6. Select the Include search location objects check box if you want to include the Search Locations in the results.
7. In the Object Name box, type the full or partial name of the object you want to find or leave it blank. You can use one or more wildcards (\* or ?) to aid in your search (for example, N?E\*). The object name search is not case-sensitive.
8. From the Object Type menu, select the type of object to search or select All (excluding extensions).
9. Click Search. The search begins and the Search Results table fills with any matching object information. When finished, the status section displays Search Completed and the number of objects found.

**Note:** If you rename an object, you must remove the old name from the Search Locations list before the object can appear in the results list under its new name.

See the [Working with Search Results](#) section.

### Stopping a Search

To stop a running search, click Stop Search.

## Working with Search Results

### **Selecting Objects in the Search Results**

To select objects in the search results, click an individual object in the Search Results table or use the Ctrl or Shift keys when clicking to select multiple items.

To select all of the search results, click Select All.

**Note:** You also can click and drag your cursor over objects in the Search Results table to select objects that appear consecutively.

**Note:** You can use drag-and-drop functionality to add items from the Global Search Results table to a User View or Summary Definition. View both the Global Search Viewer and the User View or Summary Definition in the display frame (using a multiple panel view). Click Edit in the User View or Summary Definition. Then drag the desired items from the Search Results table to the User View or Summary Definition.

**Note:** You also can drag an item from the Global Search Results table and drop it into an empty display panel to view the item.

### **Removing Objects from the Search Results**

1. Click an individual object in the Search Results table or use the Ctrl or Shift keys when clicking to select multiple items.
2. Click Remove From List. The Confirm Delete dialog box appears asking if you want to delete the selected item from the list.
3. Click Yes.

**Note:** You also can use the Delete key to remove selected objects from the Search Results table.

### **Clearing All Search Results**

1. Click Clear List. The Confirm Delete dialog box appears asking if you want to delete all the items from the list.
2. Click Yes.

### **Manually Adding Objects to Existing Search Results**

**Note:** The added objects append to the bottom of the existing Search Results table.

1. Click Add New. The Select Item dialog box appears.
2. Select the object to add to the search results. Use the Ctrl or Shift keys when clicking to select multiple items.
3. Click OK.

### **Adding New Search Results to Existing Search Results**


To add new search results to existing search results (where the results of the new search append to the bottom of the existing Search Results table):

1. In the Search Locations box, remove the existing location, if desired, by selecting it and clicking Remove. The existing search results remain in the Search Results table.
2. Perform [Step 2](#) through [Step 9](#) in the [Performing a Global Search](#) section to add the new search criteria and execute the search. The results appear at the bottom of the Search Results table.

### **Sorting Search Results**

To sort search results, click the heading of the desired column. The results sort and a small red triangle appears indicating the order of the sort (ascending or descending). Click the column heading again to change the sort order.

### **Expanding and Collapsing the Global Search Viewer Display Areas**

To expand and collapse the Search Locations, Search Criteria, and Search Results table display areas of the Global Search Viewer, click one of the splitter bar arrows  located between the display areas to show and hide the section. Continue to click until the desired display is achieved.

### **Reordering Columns in the Search Results Table**

To reorder the columns in the Search Results table, drag the heading of the column to the desired location.

### **Printing the Search Results Table**

To print the Search Results table (object list), follow the [Printing](#) instructions in the [Site Management Portal User Interface](#) section.

**Note:** You also can use the Scheduled Reports feature to run reports and print object lists. See the [Scheduled Reports](#) section.

### **Commanding Objects in the Search Results Table**

To command objects in the Search Results table (object list):

1. Select one or more objects following the instructions in the [Selecting Objects in the Search Results](#) section.
2. If you selected one object, right-click and select Commands. The Command dialog box appears. Follow the [Commanding Items](#) instructions in the [Site Management Portal User Interface](#) section.

If you selected two or more objects, right-click and select Commands. The Global Commands dialog box appears. See the [Commands Dialog](#) section.

### **Modifying Objects in the Search Results Table**

1. Select one or more objects following the instructions in the [Selecting Objects in the Search Results](#) section.
2. If you selected one object, right-click and select Modify. The Modify dialog box appears. Follow the [Editing Items](#) instructions in the [Site Management Portal User Interface](#) section.

If you selected two or more objects, right-click and select Modify. The Global Modify dialog box appears. See the [Modify Dialog](#) section.

### **Copying Search Results to the Clipboard**

1. Select the desired results according to the [Selecting Objects in the Search Results](#) section.
2. Click Copy to Clipboard.

**Note:** You also can use Ctrl-C to copy the data.

3. Open the program to paste the results (for example, Microsoft Excel or Word).
4. Paste the results according the program's conventions (generally, Edit > Paste).

### **Saving an Object List**

To save an object list (objects appearing in the Search Results table):

1. From the [Query Menu](#), select Save Object List, or right-click the Global Search Viewer title bar and select Save Object List. The Save Object List dialog box appears.
2. In the Name box, enter a unique name for the object list. This name must be unique, otherwise you risk overwriting an existing object list.
3. In the Category list, select All or select the desired category (for example, General, Security, and Lighting) to which you want to save the list. You only can save to authorized categories based on your user rights defined in the Security Administrator system.

**Note:** If you select a specific category, the object list is available for use or modification only by users with the proper authorization for that category. If you select All, all users can access the object list, including the ability to open, modify, or delete the list.

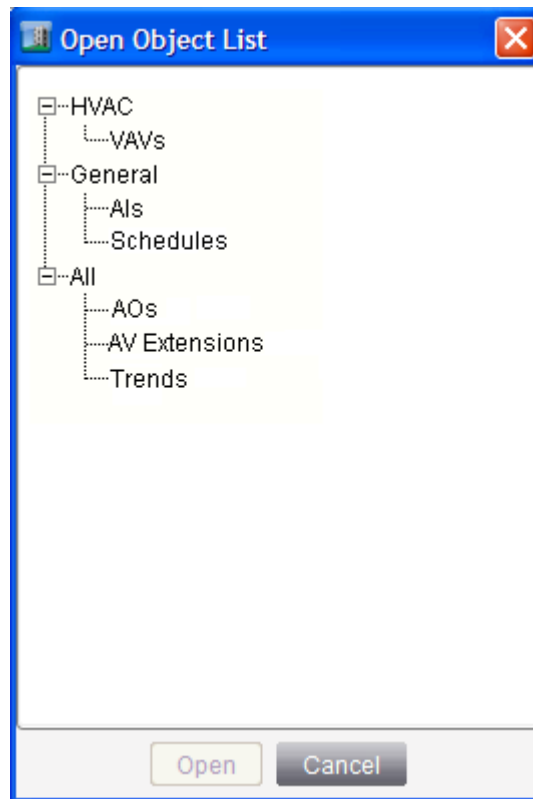
4. Click Save. The object list is saved on the Site Director.

**Note:** Sorting order is not saved in the object list.

### **Opening an Object List**

1. From the [Query Menu](#), select Open Object List, or right-click the Global Search Viewer title bar and select Open Object List. The Open Object List dialog box appears.

**Figure 29: Open Object List Dialog Box**



2. Select the desired object list to open. You can only open object lists under All, and under categories for which you have View access.
3. Click Open. The Global Search Viewer appears in the display panel with the search criteria and the object list filling the Search Results table.

**Note:** Objects that are renamed in the UI after an object list is saved do not reflect the new name in the object list until the object list is re-saved.

### **Modifying an Object List**

See the procedures in the [Working with Search Results](#) section.

### **Deleting an Object List**

1. From the [Query Menu](#), select Delete Object List. The Delete Object List dialog box appears.
2. Select the desired object list to delete from the tree. Use the Ctrl or Shift keys when clicking to select multiple object lists. You can only delete object lists under All, and under categories for which you have authorization based on your user rights defined in the Security Administrator system.
3. Click Delete.



# Commands Dialog

The Commands dialog box allows you to send a command to a single item (single command feature) or to multiple items at once (global commands feature). You can open the Global Search Viewer or a Tailored Summary, for example, in a display panel and select one or more items from the table to command. For example, you could send a command to open all the reheat valves on VAV boxes so the balancer can balance the hot water system in your facility.

The single command feature uses the Commands dialog box. The global commands feature uses the Global Commands dialog box for sending commands and uses the Change Results Viewer for viewing, saving, and printing the sent global commands.

For information on the Change Results Viewer and how to use it, see the [Change Results Viewer](#) section. The Change Results Viewer is used by both the Global Modify and the Global Commands features.

See [Using Global Commands with the Global Search](#) in this section for steps on using the Global Search and Global Commands features together.

## Commands Dialog Concepts

### Commands Overview

You can send a command by selecting one or more Metasys system objects (items) in the navigation tree or in the display panel. For example, you can open the Global Search Viewer in a display panel and select one or multiple items from the Search Results table to command. See [Commanding Objects in the Search Results Table](#) in the [Global Search](#) section.

For the global commands feature, the Change Results Viewer displays the results of all global commands sent during the current user session. The viewer includes information such as change type, time, status, item name, and parameter. You can save the results to a text file or print the results if you wish to review them at a later time. The Change Results Viewer provides the option to copy one or more result entries to the clipboard for pasting into other applications such as Microsoft Excel or Word. You also can sort the results table data in ascending or descending order, and resize and reorganize the columns to suit your needs.

Once you log out of the Metasys system, the current user session closes and the items in the Change Results Viewer are permanently cleared.

See the [Commands Dialog Box](#), [Global Commands Dialog Box](#), and [Change Results Viewer](#) sections.

### Commands Dialog Box

The Commands dialog box allows you to configure and send a command to a single item in the Metasys system. You can access the Commands dialog box from the [Action Menu](#) by selecting Commands. You also can access the Commands dialog box from the right-click menu (in supported views).

**Note:** Commands issued through the Commands dialog box are not shown in the [Change Results Viewer](#).

**Table 66: Commands Dialog Box Components**

Screen Area/Item	Description
Instructions Area	Provides tips to help you send a command.
Show Command Set Drop-Down Menu	Allows you to filter the commands shown in the commands list by: <ul style="list-style-type: none"><li>• <b>All Commands:</b> Shows all commands for the item.</li><li>• <b>Primary Commands:</b> Shows the commonly used commands for the item. Selecting this setting shows only the Archive, Reset Device, and Route Samples commands.</li><li>• <b>Secondary Commands:</b> Shows the less commonly used commands for the item. Selecting this setting shows only the Change Audit Enabled Class Level, and Update Flash Usage commands.</li></ul> <p><b>Note:</b> User Preferences determines the default setting.</p>

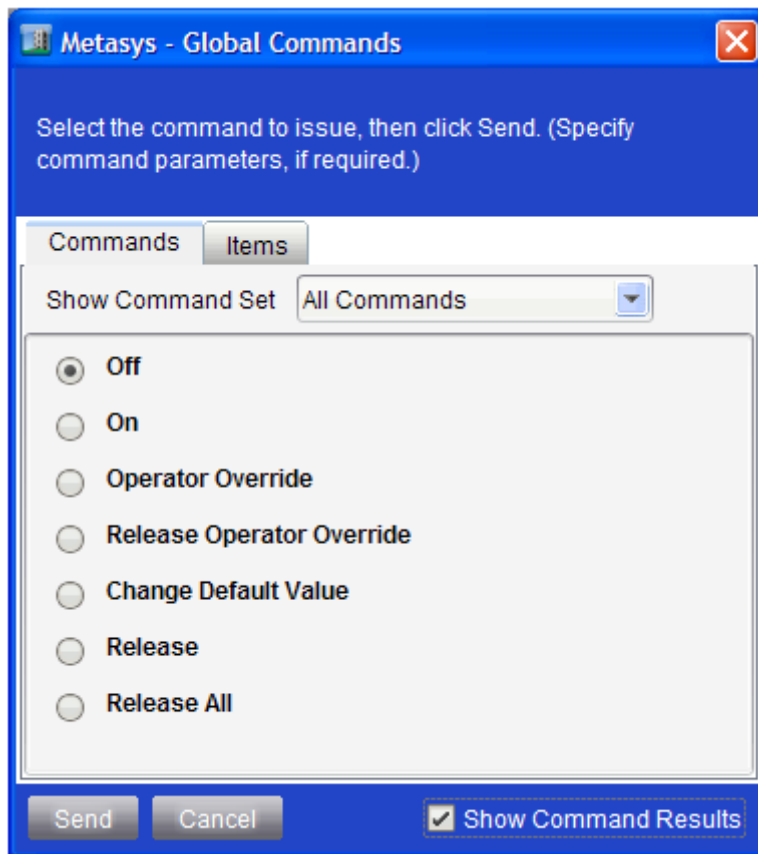
**Table 66: Commands Dialog Box Components**

Screen Area/Item	Description
Commands List	Displays the list of commands available for the selected item. Unauthorized commands are either grayed out (disabled) or not shown (hidden), depending on user preference settings. The default is grayed out. For commands that require parameter values, the fields appear after selecting the command.
Send	Sends the selected command to the object/item. All commands are sent at the default priority for the command.
Cancel	Closes the Commands dialog box without sending the command.

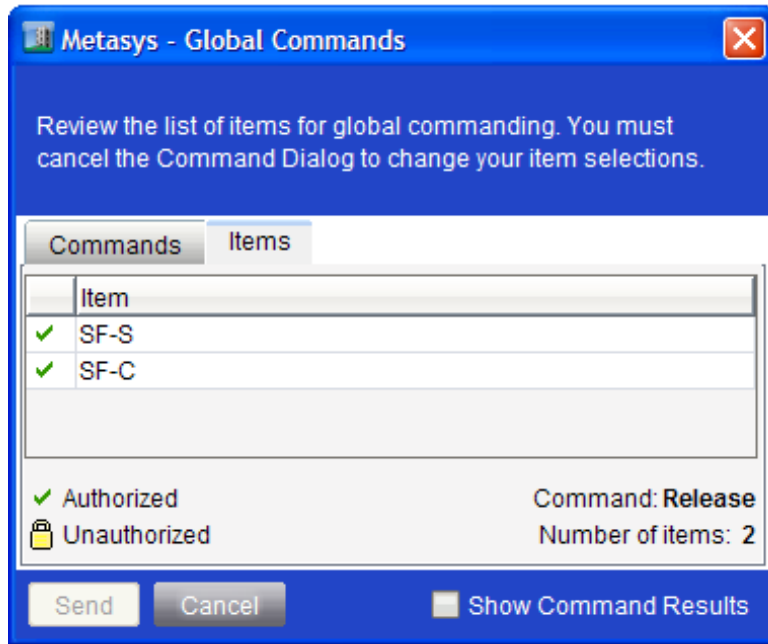
### Global Commands Dialog Box

The Global Commands dialog box allows you to configure and send a command to multiple items in the Metasys system. You can access the Global Commands dialog box from the [Action Menu](#) by selecting Commands. However, you must have more than one object selected in the navigation tree or the display panel to open the Global Commands dialog box. You also can access the Global Commands dialog box from the right-click menu (in supported views).

**Figure 30: Global Commands Dialog Box - Commands Tab**



**Figure 31: Global Commands Dialog Box - Items Tab**



**Table 67: Global Commands Dialog Box Components**

Screen Area/Item	Description
<b>Instructions Area</b>	Provides tips to help you send a global command.
<b>Commands Tab: Show Command Set Drop-Down Menu</b>	<p>Allows you to filter the commands shown in the commands list by:</p> <ul style="list-style-type: none"> <li>• <b>All Commands:</b> Shows all commands for the item.</li> <li>• <b>Primary Commands:</b> Shows the commonly used commands for the item. Selected this setting shows only the Off, On, Operator Override, Release Operator Override, and Change Default Value commands.</li> <li>• <b>Secondary Commands:</b> Shows the less commonly used commands for the item. Selecting this setting shows only the Release and Release All commands.</li> </ul> <p><b>Note:</b> User Preferences determines the default setting.</p>
<b>Commands Tab: Commands List</b>	Displays the list of commands available for the selected items. Unauthorized commands are either grayed out (disabled) or not shown (hidden), depending on user preference settings. The default is grayed out. For commands that require parameter values, the fields appear after selecting the command.
<b>Items Tab</b>	<p>Lists the selected items in table format and indicates:</p> <ul style="list-style-type: none"> <li>• if you are authorized/unauthorized to send the command to the items</li> <li>• the command to be sent</li> <li>• the number of items to be commanded</li> </ul>
<b>Send</b>	Sends the selected command to the objects listed in the Items tab. All commands are sent at the default priority for the command.
<b>Cancel</b>	Closes the Global Commands dialog box without sending the command.
<b>Show Command Results</b>	When selected, displays the Change Results Viewer in the display panel after clicking Send.

## Global Command Support

The following table lists the objects that can be commanded using the global command feature, and the available commands.

**Table 68: Global Command Support**

Object <sup>1</sup>	Commands
<i>Accumulator Objects</i>	<ul style="list-style-type: none"> <li>• Present Value</li> </ul>
<i>Alarm Extensions</i>	<ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> <li>• Cancel Delay Time</li> <li>• Cancel Report Delay</li> </ul>
<i>Analog Input Object</i>	<ul style="list-style-type: none"> <li>• In Service</li> <li>• Out of Service</li> </ul>
<i>Analog Output Object</i>	<ul style="list-style-type: none"> <li>• Release All</li> <li>• Release</li> <li>• Operator Override</li> <li>• Release Operator Override</li> <li>• Adjust</li> <li>• Setpoint (N2 AO only)</li> </ul>
<i>Analog Value Object</i>	<ul style="list-style-type: none"> <li>• Release All</li> <li>• Release</li> <li>• Operator Override</li> <li>• Release Operator Override</li> <li>• Adjust</li> <li>• Change Default Value (MS/TP FEC/FAC AV only)</li> </ul>
<i>Binary Input Object</i>	<ul style="list-style-type: none"> <li>• In Service</li> <li>• Out of Service</li> </ul>
<i>Binary Output Object</i>	<ul style="list-style-type: none"> <li>• Release All</li> <li>• Release</li> <li>• Operator Override</li> <li>• Release Operator Override</li> <li>• State Commands<sup>2</sup></li> </ul>
<i>Binary Value Object</i>	<ul style="list-style-type: none"> <li>• Release All</li> <li>• Release</li> <li>• Operator Override</li> <li>• Release Operator Override</li> <li>• State Commands<sup>2</sup></li> <li>• Change Default Value (MS/TP FEC/FAC BV only)</li> </ul>
<i>Integration Objects<sup>3</sup></i>	<ul style="list-style-type: none"> <li>• Clear Statistics</li> <li>• Latch Statistics</li> </ul>
<i>Load Extensions</i>	<ul style="list-style-type: none"> <li>• Unlock</li> <li>• Lock</li> <li>• Shed</li> <li>• Release Load</li> <li>• Comfort Override</li> <li>• Release Comfort Override</li> <li>• Enable</li> <li>• Disable</li> </ul>

**Table 68: Global Command Support**

Object <sup>1</sup>	Commands
<i>Multiple Command Object</i>	<ul style="list-style-type: none"> <li>• Release All</li> <li>• Release</li> <li>• Operator Override</li> <li>• Release Operator Override</li> <li>• State Commands<sup>4</sup></li> <li>• Enable</li> <li>• Disable</li> </ul>
<i>Multistate Input Object</i>	<ul style="list-style-type: none"> <li>• In Service</li> <li>• Out of Service</li> </ul>
<i>Multistate Output Object</i>	<ul style="list-style-type: none"> <li>• Release All</li> <li>• Release</li> <li>• Operator Override</li> <li>• Release Operator Override</li> <li>• State Commands<sup>4</sup></li> </ul>
<i>Multistate Value Object</i>	<ul style="list-style-type: none"> <li>• Release All</li> <li>• Release</li> <li>• Operator Override</li> <li>• Release Operator Override</li> <li>• State Commands<sup>4</sup> MSV Mapper (MS/TP FEC MSV only):</li> <li>• Set State Command</li> <li>• Change Default Value</li> </ul>
<i>Optimal Start Object</i>	<ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
<i>Schedule Object<sup>5</sup></i>	<ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
<i>Trend Extensions</i>	<ul style="list-style-type: none"> <li>• Clear</li> <li>• Execute</li> <li>• Enable</li> <li>• Disable</li> <li>• Route</li> </ul>
<i>Totalization Extensions</i>	<ul style="list-style-type: none"> <li>• Reset</li> <li>• Enable</li> <li>• Disable</li> </ul>

1 You must select and command similar object types. For example, you cannot send a command to both alarm extensions and trend extensions at once. You need to command the alarm extensions and trend extensions separately.

2 For binary objects, state commands display as the generic State0 and State1 commands if the States Text attribute is different. If the States Text attribute is the same, then the specific states text is used (for example, On or Off).

3 Integrations include Field Bus, XL5K, N2 Trunk, Vendor Devices (VND), Wireless Supervisor, BACnet, and N1 Migration.

4 For multistate objects, state commands display as the generic State0 and State1 commands if the States Text attribute is different. If the States Text attribute is the same, then the specific states text is used (for example, On, Off, or Auto). In addition, you can command multistate items together only when the number of states matches.

5 This works only for schedules in the NxE, not the FAC.

## Commands Dialog Steps

### Commanding an Item

**Note:** You must be in online mode to issue commands to items.

To send a command to an item in a graphic, see the [User Graphics Tool \(UGT\)](#) section. To send a command to an item in a Graphics+ graphic, see the [Graphics+](#) section. To send a command to multiple items, see the [Commanding Multiple Items \(Global Command\)](#) section.

To command an item:

1. Select the item to command in the navigation tree or in the display panel.
2. From the [Action Menu](#), select Commands, or right-click and select Commands.
3. Filter the list of commands using the Show Command Set drop-down menu, if desired.
4. Select the command to issue.

**Note:** After selecting one of the available commands, you may be prompted to specify additional parameters for the command.

5. Click Send.

**Note:** If an error occurs while sending the command, the dialog box remains open.

### Commanding Multiple Items (Global Command)

This procedure sends a command to more than one item. For information on sending a command to a single item, see [Commands](#) in the [Site Management Portal User Interface](#) section.

To command multiple items (send a Global Command):

1. Select the desired, compatible objects in the navigation tree or in the display panel. Hold the Ctrl or Shift keys when clicking to select multiple items in the navigation tree, or use the selection conventions of the feature displayed in the display panel. For example, see [Commanding Objects in the Search Results Table](#) in the [Global Search](#) section.

**Note:** You must select and command similar object types. For example, you cannot send a command to both alarm extensions and trend extensions at once. You need to command the alarm extensions and trend extensions separately.

2. From the [Action Menu](#), select Commands, or right-click and select Commands. If you selected objects from the navigation tree, a Preparing Command Data box appears stating the authorization information for the selected objects is being retrieved. The Global Commands dialog box appears.

**Note:** If you click Cancel on the Preparing Command Data box, both it and the Global Commands dialog box close without issuing commands.

**Note:** If no commands are available for the selected objects or if you have selected incompatible object types, a dialog box appears stating so. Click OK. The Commands dialog box does not open. Go back to [Step 1](#).

3. On the Commands tab, filter the list of commands using the Show Command Set drop-down menu, if desired.
4. On the Commands tab, select the command to send to the objects.

**Note:** After selecting one of the available commands, you may be prompted to specify additional parameters for the command.

5. On the Items tab, review the list of objects to command.

**Note:** To change the objects in this list, click Cancel and go back to [Step 1](#).

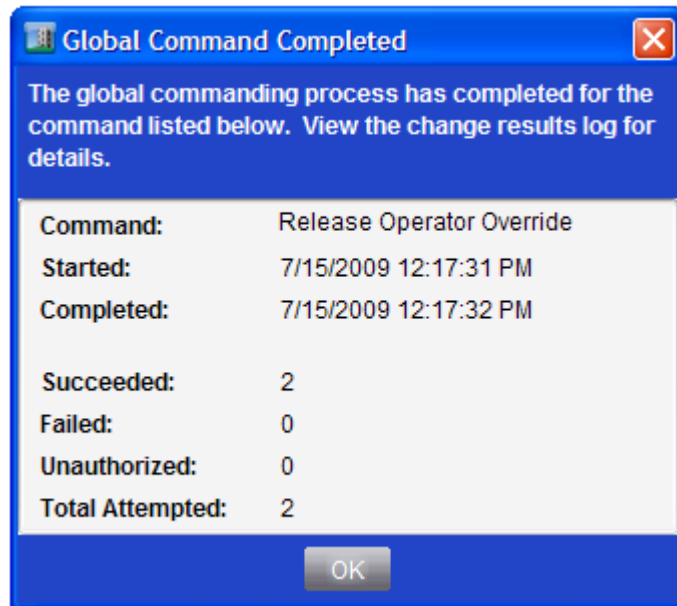
6. Select the Show Command Results check box to display the Change Results Viewer after issuing the command.
7. Click Send. The command is sent to the selected objects and the Change Results Viewer appears if you selected the Show Command Results check box.

**Note:** If you are not authorized to send a global command to one or more objects, a dialog box appears stating the command will not be sent to unauthorized objects. Click Yes to continue to send the command to the authorized objects. Click No to return to the Command dialog box without sending the command to any objects. Click Cancel to close the Command dialog box without sending the command to any objects. Your system access and category-based privileges set in the Security Administrator System determine your authorization.

After the command has been sent to all selected items, the Global Command Completed dialog box appears indicating:

- the command sent
- the date/time the command started and completed
- the number of successful/failed commands
- if any commands were not sent because they were unauthorized
- the total commands attempted

**Figure 32: Global Command Completed Dialog Box**



8. Click OK.

See [Working with the Change Results Viewer](#) in the [Change Results Viewer](#) section.

## Using Global Commands with the Global Search

To use Global Commands with the Global Search:

1. Perform a global search according to the [Performing a Global Search](#) procedure in the [Global Search](#) section. For example, search for alarms that you plan to command.
2. Save the object list if this is a common search (for example, you plan to command the alarms or review their status often). See [Working with Search Results](#) and [Saving an Object List](#) in the [Global Search](#) section.
3. Select the items in search results table and send a global command (for example, enable or disable alarms) according to the instructions in the [Commanding Multiple Items \(Global Command\)](#) section.

**Note:** In addition to these options, you can perform a global modification on items in the object list. Select and right-click the items, and modify them as desired. See the [Modify Dialog](#) section.



# Modify Dialog

**Note:** The term edit refers to changing items using the Edit button. See [Editing Items](#) in the [Site Management Portal User Interface](#) section. The term modify refers to changing items using the Modify menu item and the Modify dialog box as described in this section.

The Modify dialog box allows you to modify attributes of a single item (single modify feature) or multiple items at once (global modify feature). You can open the Global Search Viewer or a Tailored Summary, for example, in a display panel and select one or more items from the table to modify. For example, you could send a modification to change the Object Category of all VAV boxes in your facility from General to HVAC. Only attributes common to all items being modified appear in the Global Modify dialog box.

The single modify feature uses the Modify dialog box. The global modify feature uses the Global Modify dialog box for sending modifications and uses the Change Results Viewer for viewing, saving, and printing the sent global modifications.

For information on the Change Results Viewer and how to use it, see the [Change Results Viewer](#) section. The Change Results Viewer is used by both the Global Modify and the Global Commands features.

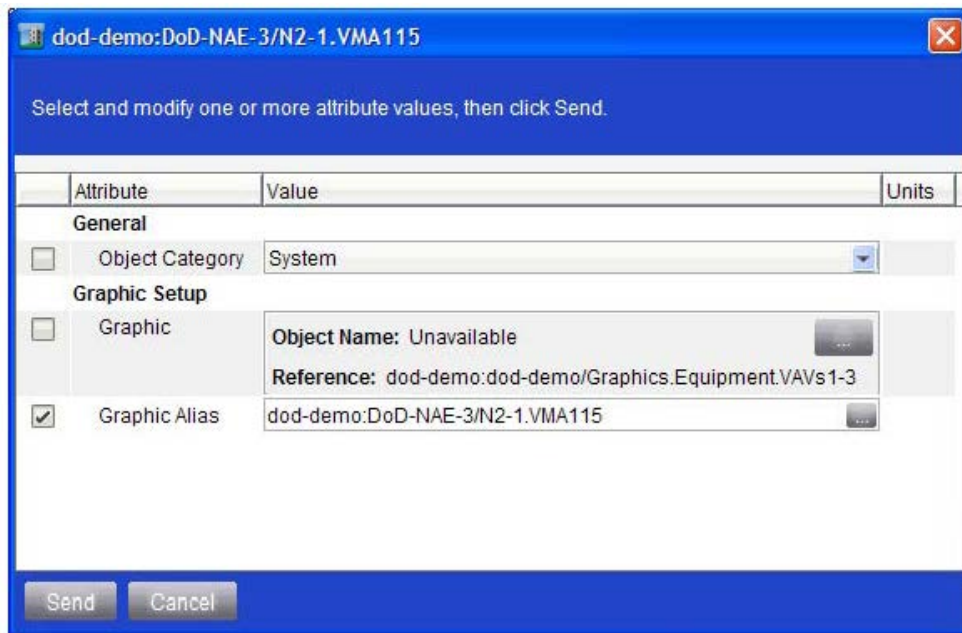
See [Using Global Modify with Global Search](#) in this section for steps on using the Global Search and Global Modify features together.

## Single and Global Item Modify Concepts

### Modify Dialog Box

The Modify dialog box allows you to modify attributes of a single item in the Metasys system. You can access the Modify dialog box for the selected item by selecting the Modify menu option from the [Action Menu](#) or the right-click menu. The attributes shown in the modify box are different for different object types.

Figure 33: Modify Dialog Box



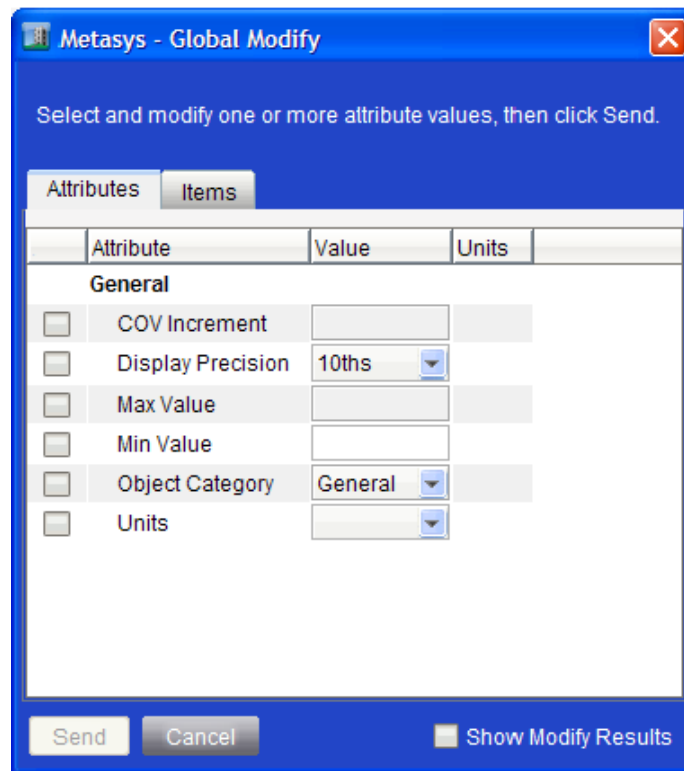
**Table 69: Modify Dialog Box Components**

Screen Area/Item	Description
Instructions Area	Provides tips to help you send a modification.
Attributes Table	Displays the list of attributes available to modify for the selected item. Unauthorized modifications are disabled. Attribute value fields appear after the attribute name.  The check box next to an attribute is automatically selected when you make a modification in its value field. Modifications are sent for only the selected (checked) attributes.
Send	Sends the selected modifications to the object/item.
Cancel	Closes the Modify dialog box without sending the changes.

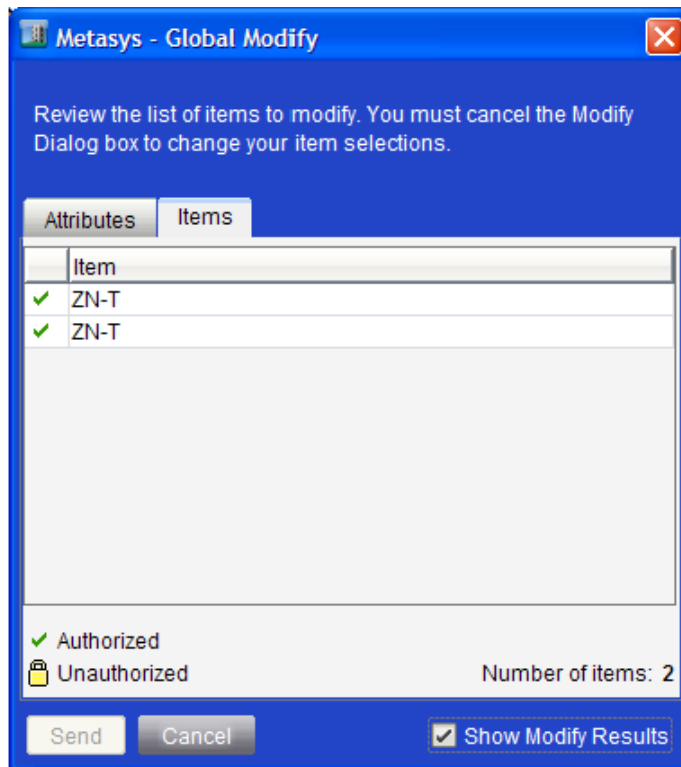
### Global Modify Dialog Box

The Global Modify dialog box allows you to modify common attributes of multiple items in the Metasys system. You can access the Global Modify dialog box for the selected items by selecting the Modify menu option from the [Action Menu](#) or the right-click menu.

**Figure 34: Global Modify Dialog Box - Attributes Tab**



**Figure 35: Global Modify Dialog Box - Items Tab**



**Table 70: Global Modify Dialog Box Components**

Screen Area/Item	Description
<b>Instructions Area</b>	Provides tips to help you send global modifications.
<b>Attributes Tab</b>	Displays the list of common attributes available to modify for the selected items. Unauthorized modifications are disabled. Attribute value fields appear after the attribute name.  The check box next to an attribute is automatically selected when you make a modification in its value field. Modifications are sent for only the selected (checked) attributes.
<b>Items Tab</b>	Lists the selected items in table format and indicates: <ul style="list-style-type: none"> <li>• if you are authorized/unauthorized to modify the items</li> <li>• the number of items to be modified</li> </ul>
<b>Send</b>	Sends the selected modification to the objects/items listed in the Items tab.
<b>Cancel</b>	Closes the Global Modify dialog box without sending the changes.
<b>Show Modify Results</b>	Displays the Change Results Viewer in the display panel after clicking Send (when this box is checked).

### Modify Attributes

The following table lists the attribute groupings and examples of the attributes available for modification.

**Table 71: Modify Attributes**

Attribute Grouping	Example Attributes
General	<ul style="list-style-type: none"> <li>• <a href="#">COV Increment</a></li> <li>• <a href="#">Display Precision</a></li> <li>• <a href="#">Object Category</a></li> <li>• <a href="#">Units</a></li> </ul>
BACnet Intrinsic Alarming	<ul style="list-style-type: none"> <li>• <a href="#">BACnet Deadband</a></li> <li>• <a href="#">High Limit</a></li> <li>• <a href="#">Low Limit</a></li> </ul>
Alarm Values	<ul style="list-style-type: none"> <li>• <a href="#">Differential</a></li> <li>• <a href="#">High Alarm Limit</a></li> <li>• <a href="#">Low Alarm Limit</a></li> </ul>
Alarm Setup	<ul style="list-style-type: none"> <li>• <a href="#">Alarm Ack Required</a></li> <li>• <a href="#">Alarm Message Text</a></li> <li>• <a href="#">Alarm Priority</a></li> <li>• <a href="#">Event Enable</a></li> </ul>
Graphic Setup	<ul style="list-style-type: none"> <li>• <a href="#">Graphic</a></li> <li>• <a href="#">Graphic Alias</a></li> </ul>

## Modify Dialog Steps

### Modifying a Single Item

For information on editing an item using the Edit button in the display panel, see [Editing Items](#) in the [Site Management Portal User Interface](#) section.

This procedure is for modifying a single item. To modify multiple items, see [Performing a Global Modify](#).

You can modify an item from the navigation tree, display panel view (for example, Tailored Summary view), or Global Search Results table.

To modify a single item:

1. Select and right-click a single item in the navigation tree, display panel view, or global search results. Select the Modify menu item. Or, select a single item and select the Modify command from the Action menu. The Modify dialog box appears.
2. Make changes to one or more attributes as desired.
3. Click Send.

**Note:** You cannot use the modify feature to modify items that reside on a Release 2.2 or earlier device. If you attempt to modify Release 2.2 or earlier items, one of the following errors appears: **Object does not exist** or **One or more attribute modifications failed** error appears.

### Performing a Global Modify

For information on editing an item using the Edit button in the display panel, see [Editing Items](#) in the [Site Management Portal User Interface](#) section.

This procedure is for modifying more than one item in a single operation. To modify a single item, see [Modifying a Single Item](#).

You can globally modify items online and in the SCT.

You can perform a global modification on items from the navigation tree, display panel view (for example, Tailored Summary view), or Global Search Results table.

**Note:** Once sent, you cannot undo a global modification; however, you can send another global modification to readjust values as needed.

To perform a Global Modify:

1. Select multiple items in the navigation tree, display panel view, or global search results. Right-click the items and select the Modify menu item. The Global Modify dialog box appears.

**Note:** The Items tab lists the selected items and your permissions to modify them.

2. On the Attributes tab, make changes to one or more attributes as desired.
3. Select the Show Modify Results check box to display the results of the modifications, if desired.
4. Click Send. If you selected to view results, the Change Results Viewer appears in a display panel. The Change Results Viewer has options to copy the results, save the results to a file, and clear the results.

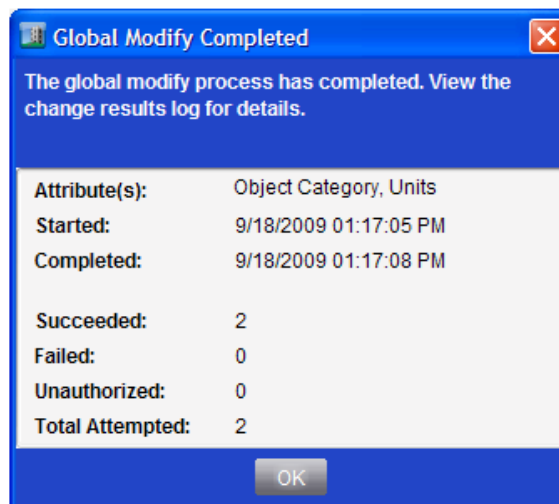
**Note:** If you are not authorized to send a global modification to one or more objects, a dialog box appears stating the modification can not be sent to unauthorized objects. Click Yes to continue to send the modification to the authorized objects. Click No to return to the Modify dialog box without sending the modification to any objects. Click Cancel to close the Modify dialog box without sending the modification to any objects. Your system access and category-based privileges set in the Security Administrator System determine your authorization.

**Note:** On an MVE site, you are prompted to authorize this action (only once) with the defined annotation and/or electronic signature requirements.

After the modification has been sent to all selected items, the Global Modify Completed dialog box appears indicating:

- the attributes that were modified (appears in a comma delimited list)
- the date/time the modification started and completed
- the number of successful/failed modifications
- if any modifications were not sent because they were unauthorized
- the total modifications attempted

**Figure 36: Global Modify Completed Dialog Box**



5. Click OK.

**Note:** You cannot use the modify feature to modify items that reside on a Release 2.2 or earlier device. If you attempt to modify Release 2.2 or earlier items, one of the following errors appears: **Object does not exist** or **One or more attribute modifications failed**.

See [Working with the Change Results Viewer](#) in the [Change Results Viewer](#) section.

## Using Global Modify with Global Search

To use Global Modify with Global Search:

1. Perform a global search according to the [Performing a Global Search](#) procedure in the [Global Search](#) section. For example, search for alarms that you plan to modify.
2. Save the object list if this is a common search (for example, you plan to modify the alarms or review their status often). See [Working with Search Results](#) and [Saving an Object List](#) in the [Global Search](#) section.
3. Select the items in the search results and send a global modify according to the instructions in the [Performing a Global Modify](#) section.

**Note:** In addition to these options, you can perform a global command on items in the search results. Select and right-click the items, and command them as desired. See the [Commands Dialog](#) section.

# Change Results Viewer

The Change Results Viewer allows you to view, save, and print the results of global commands and global modifications sent using the Global Commands and Global Modify features. See the [Commands Dialog](#) and [Modify Dialog](#) sections for information on these features.

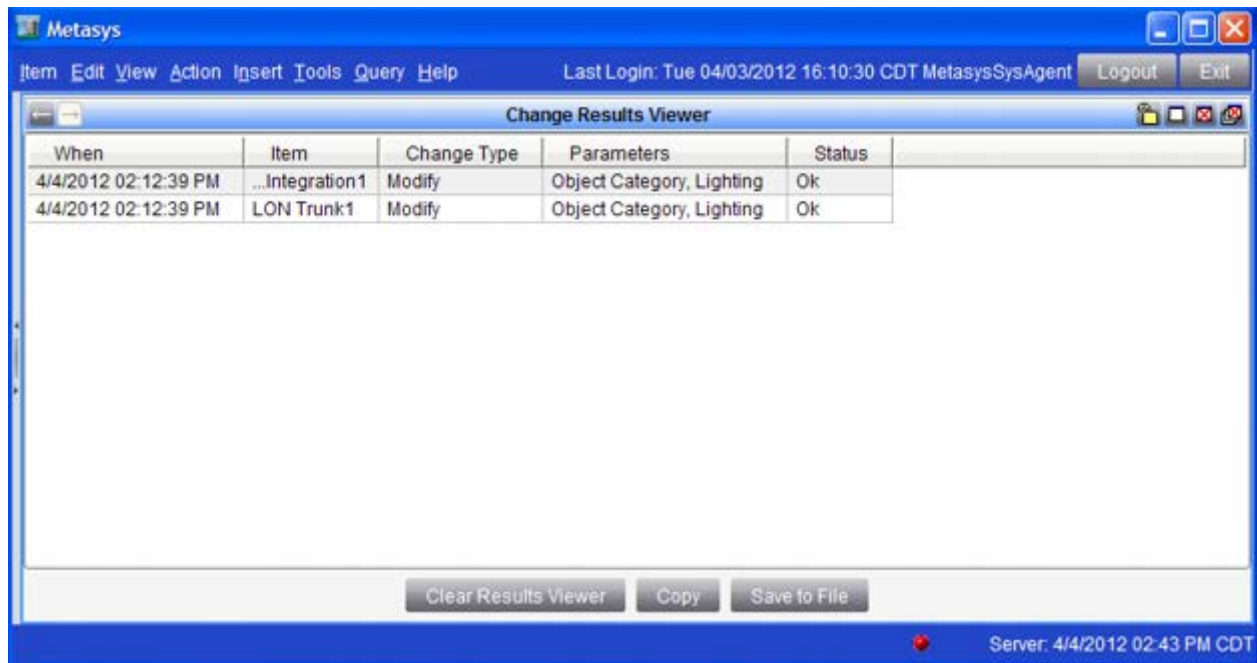
## Change Results Viewer Concepts

### Change Results Viewer Overview

The Change Results Viewer displays the result entries for the global commands and global modifications sent during the current user session. You can access the Change Results Viewer by selecting Change Results from the [View Menu](#).

**Note:** The Change Results Viewer screen is available for global commands and global modifications only. Single object commands and modifications do not appear in the Change Results Viewer.

**Figure 37: Change Results Viewer Screen**



**Table 72: Change Results Viewer Screen Components**

Column/Button	Description
<b>Change Results Table</b>	<p>Displays the results of all global commands/modifications sent during the current user session.</p> <p>If you select an item in the table and place your cursor over it within each column, tooltips appear providing more information, if available.</p> <p>Any data that does not fit within the columns is identified by an ellipse (...). You can resize the column or place your cursor over the table cell to see its tooltip text.</p> <p>If you send another global command/modification at a later time during the current user session, the result entries are added to any existing result entries from prior commands/modifications sent during the session.</p> <p>The most recent entry appears at the top of this table by default. If desired, you can sort the results.</p> <p>See the <a href="#">Working with the Change Results Viewer</a> section for more information on manipulating and using the table data.</p>
<b>When</b>	Displays the date and time the command/modification was sent.
<b>Item</b>	Displays the name of the object to which the command/modification was sent. The object's full reference identifier appears in a tooltip when you place the cursor over the name.
<b>Change Type</b>	Displays the type of command/modification sent.
<b>Parameters</b>	Displays the list of parameters for the command/modification that was sent. For example, for a Release command, an attribute and priority such as Present Value, 15 (Scheduling) appear in the Parameters column.
<b>Status</b>	<p>Displays the status of the command/modification that was sent (for example, OK or an explanation of failure).</p> <p><b>Note:</b> An OK status for a command indicates the supervisory device validated and accepted the command, but does not necessarily indicate the command executed successfully. There may be cases where the command is accepted, but fails execution. For example, a Route command to a trend extension may be accepted by the supervisory device with a status of OK, but if the actual routing of the trend data fails due to the ADS offline or other error, the failure is noted in the Audit log at that point in time.</p> <p><b>Note:</b> An OK status for a modification indicates the modification executed successfully.</p>
<b>Clear Results Viewer</b>	Deletes all the entries from the Change Results Viewer and adds an entry to indicate when it cleared those entries.
<b>Copy</b>	Copies the selected change results to the Clipboard for pasting into other applications such as Microsoft Excel or Word.
<b>Save to File</b>	Saves the current content of the change results table to a text file.

## Change Results Viewer Steps

### Working with the Change Results Viewer

#### Displaying the Change Results Viewer

To display the Change Results Viewer, select Change Results from the [View Menu](#). The Change Results Viewer appears in the display panel.

**Note:** If no global commands/modifications were issued during the current user session, the Change Results Viewer appears with a message stating **No global commands or modifications have been issued within the current session.**

#### Selecting Entries in the Change Results Viewer

To select entries in the Change Results Viewer, click an individual entry in the change results table or use the Ctrl or Shift keys when clicking to select multiple entries.



**Note:** You also can click and drag your cursor over entries in the change results table to select entries that appear consecutively. With an entry in the change results table selected, you can press Ctrl+A to select all entries.

#### **Sorting Change Results in the Change Results Viewer**

To sort change results in the Change Results Viewer, click the heading of the desired column in the change results table. The results sort and a small arrow appears indicating the order of the sort (ascending or descending). Click the column heading again to change the sort order.

#### **Reordering Columns in the Change Results Viewer**

To reorder the columns in the Change Results Viewer, drag the heading of the column to the desired location.

#### **Printing the Change Results**

To print the contents of the Change Results Viewer, follow the [Printing](#) instructions in the [Site Management Portal User Interface](#) section.

#### **Saving Change Results to File**

To save the contents of the Change Results Viewer to a file:

1. Click Save to File. The Save dialog box appears.
2. Specify the desired location to save the results.

**Note:** The default name for the text file is ChangeResultsLog.txt. You can change the name as you wish to further identify these results, or to prevent overwriting previously saved results.

3. Click Save.

#### **Copying Change Results to the Clipboard**

To copy change results in the Change Results Viewer to the clipboard:

1. Select the desired results according to the [Selecting Entries in the Change Results Viewer](#) section.
2. Click Copy.

**Note:** You also can use Ctrl+C to copy the data.

3. Open the program to paste the results (for example, Microsoft Excel or Word).
4. Paste the results according the program's conventions (generally, Edit > Paste or Ctrl+V).

#### **Clearing the Change Results Viewer**

If the size of the results log becomes too large, the Global Command or Global Modify feature prompts you to clear the change results.

To clear all change results in the Change Results Viewer:

1. Click Clear Results Viewer. A dialog box appears asking if you want to permanently clear all command results.
2. Click Yes.

# Alarm and Event Management

The alarm and event feature provides event management for the Metasys system. This feature allows you to configure the detection of alarm conditions and the routing of event messages to destinations such as an e-mail account or pager for acknowledgement. The [Alarms Window](#) displays event messages in a *prioritized* order and allows you to respond to the alarms. The [Event Viewer](#) provides the functionality to retrieve and examine event messages stored in an *event repository*.

For information on alarm and event management for Metasys systems integrated with BACnet devices, see the [Alarm and Event Management for Metasys Systems Integrated with BACnet Devices](#) topics.

## Alarm and Event Management Concepts

### Alarm and Event Management Overview

An event is a notification of a state change of an *item* in the system. When a value in an Advanced Application Field Equipment Controller (FAC), Engine, or ADS/ADX deviates from its normal operating condition, such as exceeding a high limit or failing to respond to a command within a specified time period, the system detects a change of state and the FAC, Engine, or ADS/ADX generates an event message.

When an FAC generates an event message, it temporarily stores the event message in its Event Log. It also immediately forwards the event message to the Engine to which it is connected. When an Engine generates an event message, it temporarily stores the message in its local event repository. When an ADS/ADX generates an event message, it permanently stores the message in its ADS/ADX event repository. You can send event messages stored in the local event repository of an Engine to the event repository of an ADS/ADX for permanent storage by defining an ADS/ADX event repository as the *default destination*. Also, you can route event messages to other destinations such as a pager or an e-mail account. For more information, see the [Event Repositories](#) and [Event Message Routing, Filtering, and Destinations](#) sections.

For sites with MVE installed, configure the following attributes in the [Site Object](#):

- [Annotation Include](#)
- [Annotation Exclude](#)
- [Annotation Alarm Priority Threshold](#)
- [Signature Include](#)
- [Signature Exclude](#)
- [Signature Alarm Priority Threshold](#)

These settings apply to only MVE sites, and enable the MVE required annotations and electronic signature for event messages. You can apply these settings at the site level or down to the object level as needed. You can define the settings to require an electronic signature, an annotation, neither, or both. When both options are required, and a user acknowledges or discards an event message, they are prompted to reauthenticate and enter a reason and annotation for the action. The user's logon name, date and time of signature, and the reason for signature are saved as part of the annotation. You cannot delete annotations on an MVE site.

Non-MVE sites may optionally define and use annotations; however, electronic signatures are specific to MVE sites.

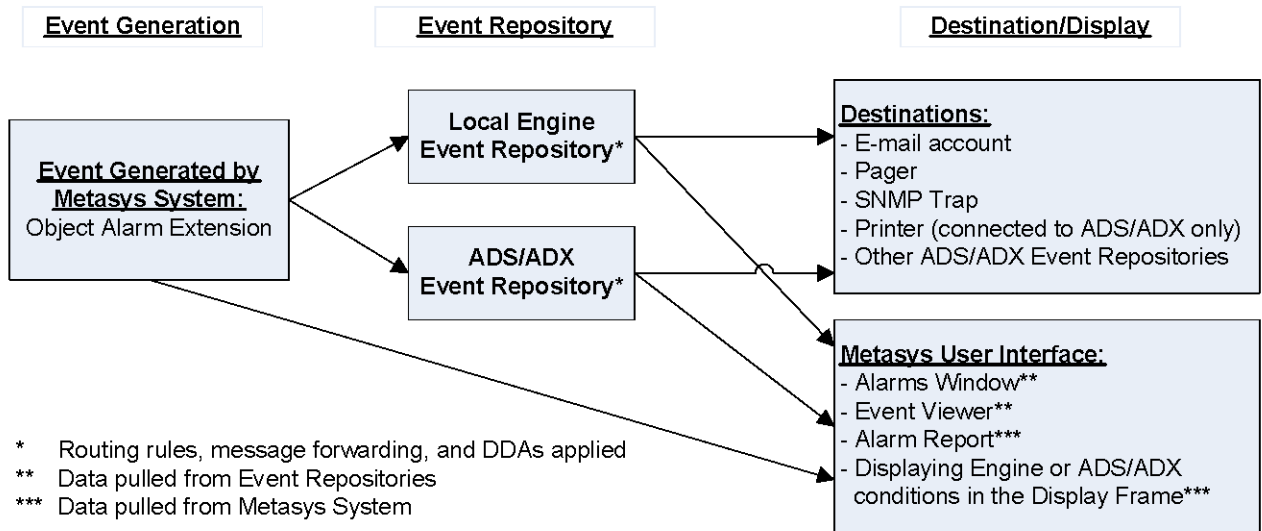
See [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) in the [Site Management Portal User Interface](#) section. For additional information, refer to the [Metasys for Validated Environments, Extended Architecture Technical Bulletin \(LIT-12011327\)](#).

The [Alarms Window](#) and [Event Viewer](#) allow you to examine and respond to event messages. The Alarms Window displays event messages one at a time in a *prioritized* order and allows you to respond to the newest alarm first. The Event Viewer displays all of the event messages stored in the event repository of the currently selected device. In addition, Alarm [Reports](#) allow you to query for alarm conditions in the Metasys system online and provide a list of items that are currently in an alarm condition.

**Note:** The current navigation view does not limit or affect the alarm notification; only the user's permissions for managing item events can. Therefore, it is possible for a user to receive an alarm for an item that does not exist in the currently displayed navigation view.

The following figure shows the flow of event messages through the Metasys system.

**Figure 38: Event Message Flow**



For information on how to configure and route event messages for Metasys systems integrated with BACnet devices, see the [Alarm and Event Management for Metasys Systems Integrated with BACnet Devices](#) topics.

## Alarm Extensions

Using object [alarm extensions](#) is a very easy method for configuring the detection of alarm conditions. To configure the values that determine alarm condition detection, use the Alarm [Extension Wizard](#) that appears after creating an object using the [Insert Object Wizard](#). You also can add alarm extensions after you create an object by selecting it in the navigation tree and selecting Show Extensions from the [Action Menu](#). You cannot add, edit, or delete alarm extensions in online mode with [Basic Access](#).

Use alarm extensions to define the values for the high/low warning and high/low alarm conditions for [Analog Input Object](#), [Analog Output Object](#), and [Analog Value Object](#). For a complete list of Analog Alarm extension attributes, see [Analog Alarm Attributes](#).

Also, use alarm extensions to define the values for the alarm and trouble conditions for [Binary Input Object](#), [Binary Output Object](#), [Binary Value Object](#), [Multistate Input Object](#), [Multistate Output Object](#), and [Multistate Value Object](#). For a complete list of Multistate Alarm extension attributes, see [Multistate Alarm Attributes](#).

In addition, you can use alarm extensions to define the following conditions:

- alarm state parameters such as Event Enable, Delay Time, and Report Delay
- alarm setup parameters such as Acknowledgment Required, Alarm Message Text, and associated Graphics

Devices with the Disable Automatic Alarming attribute set to True do not produce an alarm but indicate they are offline in the navigation tree with a red X. See the appropriate object in the [Object Help](#) for details on this attribute. This attribute does not affect alarm extensions.

The Enable Alarms and Disable Alarms commands affect any and all alarm extensions defined for an object.

For more details on configuring alarm extensions, see [Creating Extensions](#), [Alarm Extensions](#), and the Help section for the selected [object](#).

After using alarm extensions to configure the detection of alarm conditions, you must configure the routing, filtering, and format of event messages from Engine or ADS/ADX to the desired destinations. For more information on filtering or routing events messages, click one of the following section names:

- [Event Message Routing, Filtering, and Destinations](#)
- [Configuring Destination Delivery Agents \(DDAs\)](#)

- [Applying Filters for Routing Event Messages to Destinations](#)
- [Configuring Event Message Format](#)

For information on AO/BO feedback, see [AO/BO Feedback](#).

## Event Repositories

The Metasys system has three event repositories for storing event messages:

**Table 73: Event Repositories**

Type	Description
<b>Local (Engine) Event Repository</b>	<ul style="list-style-type: none"> <li>• Provides temporary storage for event messages on the Engine.</li> <li>• Allows the event messages stored in the local Engine event repository to appear in the Event Viewer and Alarms Window.</li> <li>• Sends event messages from the local Engine event repository to the defined <a href="#">Default Destination</a>.</li> </ul>
<b>ADS/ADX Event Repository</b>	<ul style="list-style-type: none"> <li>• Provides permanent storage for event messages on the ADS/ADX platform.</li> <li>• Event messages generated on an ADS/ADX platform are placed directly into the ADS/ADX event repository.</li> <li>• Allows the event messages stored in the ADS/ADX event repository to appear in the Event Viewer and Alarms Window.</li> <li>• Receives event messages from multiple local Engine event repositories and provides permanent storage for the event messages. The ADS/ADX event repository is usually defined as the <a href="#">Default Destination</a> for event messages from local Engine event repositories.</li> <li>• Provides the option to send event messages from a single ADS/ADX event repository to one or more ADS/ADX event repositories for permanent storage. See the <a href="#">Configuring an ADS/ADX Event Repository</a> section for details.</li> </ul>
<b>FAC's Event Log</b>	<ul style="list-style-type: none"> <li>• Event logs are only viewable in the CCT. Configure the Advanced tab to work with Advanced Application Field Equipment Controllers (FACs) to record events via events logs. See <i>Working with the Advanced Tab</i> in the CCT Help (LIT-12011147).</li> <li>• The CCT can be set up to send event notifications from the FAC event logs to other devices. See <i>Setting up Device Notification</i> in the CCT Help (LIT-12011147).</li> </ul>

For information on configuring the event repositories, click one of the following section names:

- [Configuring an Engine Event Repository](#)
- [Configuring an ADS/ADX Event Repository](#)

A Database Timeout Error can occur when viewing events if the repository contains too many events to be filtered before the system times out (typically, one million events). To prevent this error, you should backup and purge event records from the repository (JCIEvents) using the Metasys Database Manager on a regular basis.

## Default Destination

You can define an ADS/ADX [repository](#) as a Default Destination for each Engine where event messages are sent under certain conditions and permanently stored:

- If the Default Destination is an ADS/ADX that has a LAN connection (as defined by the [Engine Device Object's ADS Connection Type](#) attribute or the [Site Object's Default ADS Connection Type](#) attribute), event messages generated by the Engine are sent to the ADS/ADX as they occur.
- If the Default Destination is an ADS/ADX that has a Dial connection, event messages generated by the Engine are sent to the ADS/ADX when the local event repository is 90% full (NAE object's [Alarm Repository Size](#) attribute), at the user-defined time (NAE object's [ADS Delivery Time](#) attribute), or when the event priority exceeds the user-defined level (NAE object's [ADS Priority Threshold](#) attribute).

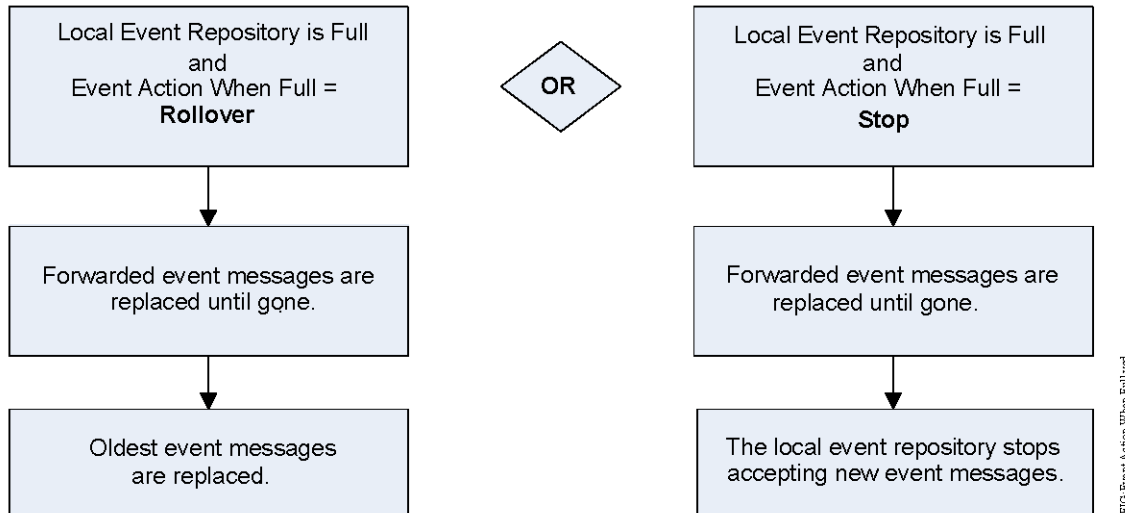
See the [Site Object](#) and [Engine Device Object ADS Connection Type](#) sections for information on these attributes.

For information on how to define a Default Destination, see the [Configuring an Engine Event Repository](#) section.

If you have not defined a Default Destination when the Engine local event repository is 100% full, the local event repository either replaces the oldest messages (rollover) with new messages or stops recording events according to the *Event Action When Full* attribute configuration.

Event message rollover begins or replacement stops only when the total number of nonforwarded event messages reaches the size defined by the Event Repository Size attribute. In other words, once the local event repository reaches the defined size, new event messages continue to enter the local event repository replacing forwarded messages until all forwarded messages are gone. The following figure illustrates the Event Action When Full when set to Rollover or when set to Stop.

**Figure 39: Event Action When Full**



If you have defined a Default Destination and the Event Action When Full attribute is set to Stop, the event messages do not stop rolling over as long as forwarding is successful. This situation occurs because event messages are forwarded to the Default Destination when new event messages are received, and the forwarded messages are automatically replaced. The local event repository does not fill up with nonforwarded event messages and, therefore, does not stop accepting new event messages.

If an event repository is full when a new event occurs, the following rules apply:

1. Events forwarded to an ADS Event Repository are always removed before events – not forwarded.
2. The lowest priority event with the oldest time stamp and Acknowledge Required set to false is replaced first.
3. If the event about to be created is of higher priority than at least one event in the repository, the event with the oldest time stamp and lowest priority is replaced.
4. If all events are of the same priority, the event with the oldest time stamp is replaced.
5. If the event about to be created is of a lower priority than all other events in the Event Repository, no event is replaced and the new event is discarded. In this situation, the new event does not cause the Alarm Window to appear, or any other Destination Delivery Agent (DDA) action to take place.

**Note:** The local repository for alarms in the NAE is set to rollover at 1000 alarms automatically if the alarms meet the above requirements.

**Note:** You can define only one ADS/ADX Repository as the Default Destination for an Engine; however, different Engines can have different ADS/ADX Repositories defined as their Default Destination.

You can forward event messages from one ADS/ADX to other ADS/ADXs on the same site. For details, see the *Configuring an ADS/ADX Event Repository* section.

## Event Viewer and Event Messages

The Event Viewer displays the event messages from the event repository of the currently selected device in your system and allows you to acknowledge and discard the event messages. See [Launching the Event Viewer](#).

**Note:** In an Engine that is not the Site Director, acknowledged or discarded alarm and event messages do not appear acknowledged or discarded in the ADS/ADX.

You can only view the event messages from one event repository of one device at a time. The window displays 1,000 messages per page.

If you are viewing the contents of a local Engine event repository, the event messages shown come from that Engine only.

If you are viewing the contents of a local Engine event repository of an Engine device designated as the Site Director, the event messages shown come from that Engine local event repository only.

If you are viewing the contents of an ADS/ADX event repository, the event messages shown come from that ADS/ADX event repository only. An ADS/ADX event repository may contain event messages that have been routed from other Engine or ADS/ADX devices but does not display the contents of multiple repositories.

**Note:** You can define an event repository as a [Default Destination](#) so it receives event messages from other event repositories. You can forward event messages from one ADS/ADX event repository to other ADS/ADX event repositories. See [ADS/ADX Event Message Forwarding](#).

When viewing an ADS/ADX device, the system applies a standard filter to the Event Viewer when it is first opened. This filter allows you to see all events that you have permission to view.

You can use custom filters when viewing the ADS/ADX device to narrow the list of events to only those that meet specific criteria. Custom filters query the entire ADS/ADX database, not just the list of events that appears on the screen. You can filter events by any combination of Date/Time, Priority Range, Alarm Type, Item Category, Requires Acknowledgement, User, Acknowledged, and/or Discarded. New events appear in the list only if they meet all criteria specified in the filter. You cannot save custom filters.

You can print the event messages displayed in the Event Viewer at any printer connected to the computer running the Web-based Metasys user interface. For information on how to do this, see [Printing the Event Messages Displayed in the Event Viewer](#).








For information on the Alarms Window, see [Alarms Window](#).

The following table describes the format of the event message (and corresponding buttons and fields) as displayed in the Event Viewer.


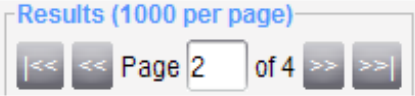
**Table 74: Event Message Format**

Item/Column	Description
<b>Selected Device (Engines Only)</b>	Indicates the device for which the Event Viewer is displayed. The device name appears on the left side of the Event Viewer above the table only for Engine devices.  This field corresponds to the selection made in the Device Selection Dialog box. See <a href="#">Launching the Event Viewer</a> .
<b>Event Count (Engines Only)</b>	Indicates the number of event messages that currently appear in the Event Viewer. The Event Count appears on the right side of the Event Viewer above the table only for Engine devices.
<b>Standard Filter Radio Button (ADS/ADX Only)</b>	Indicates that standard filtering is applied to the Event Viewer for the selected ADS/ADX. This filter information appears on the right side of the Event Viewer above the table. The count of entries that apply to this filter appears in parentheses next to the radio button.
<b>Custom Filter Radio Button (ADS/ADX Only)</b>	Indicates that custom filtering is applied to the Event Viewer for the selected ADS/ADX. This filter information appears on the right side of the Event Viewer above the table. The count of entries that apply to this filter appears in parenthesis next to the radio button.

**Table 74: Event Message Format**

Item/Column	Description
<b>Custom Filter Table (ADS/ADX Only)</b>	<p>Allows you to apply custom filtering to the Event Viewer when the Custom Filter radio button is selected. This table appears but is not active when the Standard Filter radio button is selected. You may need to adjust the slider bar to show the Custom Filter table.</p> <p>The buttons for this table are:</p> <ul style="list-style-type: none"> <li>• Add - adds a filter using the Add Filter dialog box</li> <li>• Remove - removes the selected filter</li> <li>• Apply - queries the ADS/ADX database and displays the resultant event messages</li> </ul> <p>See <a href="#">Creating a Custom Filter for the Event Viewer (ADS/ADX Only)</a>.</p>
<b>Status Icons</b>	<p>Displays an icon indicating the status of the event message:</p> <p> - event message is new (that is, the message has occurred in the system within the new entry timeframe)</p> <p><b>Note:</b> See <a href="#">Display Settings Tab</a> in the <a href="#">Preferences</a> section for information on changing the amount of time event messages are considered new using the New entry timeframe preference (default value = 15 minutes).</p> <p> - event message does not require acknowledgement. A red X through this icon indicates that the message has been discarded.</p> <p> - event message requires acknowledgement. A red X through this icon indicates that the message has been discarded.</p> <p> - event message has one annotation</p> <p> - event message has more than one annotation</p> <p> - event message has an associated graphic</p> <p> - event message has an electronic signature</p>
<b>Type</b>	<p>Displays the status of the <i>item</i> associated with the event message:</p> <ul style="list-style-type: none"> <li>• Normal</li> <li>• Low Warning/High Warning/Warning</li> <li>• Low Alarm/High Alarm/Alarm</li> <li>• Trouble</li> <li>• Status</li> <li>• Offline</li> <li>• Unreliable</li> <li>• [Blank] - none of the above status types apply.</li> </ul>
<b>Priority</b>	<p>Indicates the priority of the event. See <a href="#">Event Priority</a>. A lower priority number indicates event messages of higher importance.</p>
<b>When</b>	<p>Displays the date and time that the event message was generated. The date and time format is defined by the Language selected in the User Profile (User Profile tab of the Security Administrator System).</p>
<b>Item</b>	<p>Displays the Name of the item that generated the event message. An item name is the label displayed for the selected item in the All Items navigation tree (for example, AV1, NAE2, or Schedule1). Be sure you define relatively unique item names if you plan to use printed lists of the event messages of the Event Viewer.</p>
<b>Value</b>	<p>Displays the Present Value and engineering units, if applicable, of the associated item at the time the event message was generated.</p>
<b>Description</b>	<p>Displays the text defined by the Description attribute for the item that generated the event message. Be sure you define relatively unique descriptions if you plan to use printed lists of the event messages of the Event Viewer.</p>

**Table 74: Event Message Format**

Item/Column	Description
Text	Displays the text defined by the Alarm Message Text attribute of the alarm extension for the state of the item associated with the event message, if applicable.
	Specifies the column of data used to sort the event messages currently displayed in the Event Viewer (ascending or descending order).
Paging Controls (ADS/ADX Only)	<p>Allows you to navigate through the pages of event messages in the Event Viewer. Use the buttons to go to the first page, previous page, next page, or last page. Type a page number in the text box and press the enter key to jump directly to a specific page.</p> 
Ack Button	Acknowledges the selected event messages. See <a href="#">Acknowledging Event Messages</a> .
Discard Button	Removes the selected event messages from the Event Viewer. See <a href="#">Discarding Event Messages</a> . <b>Note:</b> In an Engine that is not the Site Director, acknowledged or discarded alarm and event messages do not appear acknowledged or discarded in the ADS/ADX.
Copy Button	<p>Copies the selected events to the Clipboard for pasting into other applications such as Microsoft Excel or Word.</p> <p>If nothing is selected in the Event Viewer when you click this button, all entries copy to the Clipboard. You can also use Ctrl A to select all and Ctrl C to copy to Clipboard.</p>

## Event Message Annotations

An annotation is a textual string associated with an [event message](#). All acknowledgements add an annotation to an event message. In addition, you can add annotations to an event message (in the ADS/ADX event repository only). You cannot edit an existing annotation. Instead, add a new annotation to the event message. You can also define custom annotations. See [Adding Annotations](#), [Viewing Annotations](#), and [Creating Annotations](#).

**Note:** On an Engine, you can view annotations but you cannot add them.


The following table describes the fields of an annotation dialog box.

**Table 75: Annotation Dialog Box Fields**

Field	Description
User	<b>When viewing annotations:</b> The User field appears under the Annotation Information section that displays the user ID of the person that added the annotation.
Date and Time	<p><b>When adding annotations:</b> Displays the date and time the event message was generated.</p> <p><b>When viewing annotations:</b> The first Date and Time field displays the date and time the event message was generated. The Date and Time field appearing under the Annotation Information section displays the date and time the annotation was added to the event message.</p> <p>The date and time format is defined by the Language selected in the User Profile (User Profile tab of the Security Administrator System).</p>
Item Reference	Indicates the complete Item Reference defined for the item that generated the event message.
Description	Displays the text defined by the Description attribute of the item that generated the event message.



**Table 75: Annotation Dialog Box Fields**

Field	Description
<b>Annotation</b>	Allows you to select from a list of predefined annotations or add a text string (annotation) of 1–255 characters that may be used to describe any operational tasks that should be performed to respond to the cause or condition that prompted the generation of the event message.
<b>Navigation Controls</b>	<p>Allows you to navigate through the annotations, if the event message has multiple annotations associated with it. Use the buttons to go to the first annotation, previous annotation, next annotation, or last annotation.</p> <p>The text box displays the number of the annotation being viewed. The Annotations feature automatically assigns a number to each annotation created. For example, if the event message has three annotations, the number appearing in this section can be 1, 2, or 3 depending on the annotation being viewed. Type a number in the text box and press the enter key to jump directly to a specific annotation.</p> 

### ADS/ADX Event Message Forwarding

You can forward event messages from one ADS/ADX to other ADS/ADXs on the same site. You also can forward event messages from an ADS/ADX on one site to an ADS/ADX defined as the Site Director on another site. After forwarding event messages from one site to another, you can configure the Site Director of the receiving site to forward the messages to the other ADS/ADXs on that site as desired.

See [Configuring an ADS/ADX Event Repository](#) for information on how to forward event messages from one ADS/ADX to other ADS/ADXs.

**Note:** When you forward event messages, the messages are sent (copied) to the ADS/ADX repository defined as the [Default Destination](#). The event messages are not removed from the ADS/ADX repository that sent the messages.

**Note:** Use message forwarding for notification purposes, not as a backup or archiving method. Use standard SQL practices for backup, archiving, or replication purposes.

### Event Message Routing, Filtering, and Destinations

The Metasys system alarm and event feature allows you to route Engine generated event messages to different devices that are defined as destinations. For each Engine and/or ADS/ADX, you can configure the routing and filtering of event messages using Destination Delivery Agents (DDAs). Supported destinations include pagers, printers, e-mail, and Network Management Systems that use SNMP traps. You can define DDAs by displaying the Engine or ADS/ADX and clicking on the desired DDA tab (Pager, for example).

**Note:** You cannot create, edit, or delete DDAs in online mode with [Basic Access](#).

For each Engine, you can configure the routing and filtering of event messages using the following DDAs:

- [E-mail](#)
- [Pager](#)
- [SNMP Trap](#)
- Serial Printer

**Note:** This DDA is enabled using Remote Desktop of a Site Director Engine and no attributes/tabs appear in the UI. This DDA is not available on the NAE35, NAE45, NCE25, or NIE59. Refer to the [NAE Commissioning Guide \(LIT-1201519\)](#) for details on this DDA.

For each ADS/ADX, you can configure the routing and filtering of event messages using the following DDAs:

- [E-mail](#)
- [Pager](#)

- [Printer](#)
- [SNMP Trap](#)

When configuring any of these DDAs, you can apply filters for routing specific event messages and define the format in which the event messages are displayed at the destination. See [Configuring Destination Delivery Agents \(DDAs\)](#) for information on how to route event messages to destinations. See [Configuring Event Message Format](#) to define the message delivery format.

Use filters to determine which event messages get routed to the defined Destination, such as a pager or e-mail account. For example, define a filter to route only the event messages that require acknowledgement by selecting Acknowledge Required == true.

For more information on filters, click the following section names:

- [Filtering Operators](#)
- [Filtering Options](#)
- [Filtering Examples](#)
- [Applying Filters for Routing Event Messages to Destinations](#)

See the [Event Message Routing Sample Scenario](#) section for a sample event message routing scenario.

See the [Related Documentation](#) table.

### Filtering Operators

The following table describes the Boolean operators used to configure the filters for routing event messages to destinations.

**Table 76: Operators**

Operator	Meaning
==	Equal To
!=	Not Equal To
<	Less Than
<=	Less Than or Equal To
>	Greater Than
>=	Greater Than or Equal To

**Note:** If you define multiple filters for a destination, the DDA combines all the criteria with an AND condition (all filter criteria must be met).

For more information on filters, click one of the following section names:

- [Filtering Options](#)
- [Filtering Examples](#)
- [Applying Filters for Routing Event Messages to Destinations](#)

Back to [Event Message Routing, Filtering, and Destinations](#).

### Filtering Options

You can apply filters to define which event messages are sent to specific destinations. For information on how to apply filters to event messages, see [Applying Filters for Routing Event Messages to Destinations](#). Use the following table as a guide to defining filters.

**Note:** If you define multiple filters for a destination, the DDA combines all the criteria with an AND condition (all filter criteria must be met).

**Table 77: Filters**

Item	Operator	Value
Item Category	==, !=	HVAC, Fire, Security, Services, Administrative, General, Lighting, Refrigeration, Critical Environment, Air Quality, Power, Energy, System, or Custom Value
Acknowledge Required	==, !=	true, false
Current Status	==, !=	Normal, Fault, Off Normal, High Limit, Low Limit, Low Warning, High Warning, Low Alarm, High Alarm, Alarm, Trouble, Status, Offline, Shutdown, Unreliable, Online, Unknown Previous State
Previous Status (status prior to the event)	==, !=	Normal, Fault, Off Normal, High Limit, Low Limit, Low Warning, High Warning, Low Alarm, High Alarm, Alarm, Trouble, Status, Offline, Shutdown, Unreliable, Online, Unknown Previous State
Priority	==, !=, <, <=, >, >=	Range 0–255 See <a href="#">Event Priority</a> .
Start Day of Week	==, !=, <, <=, >, >=	Monday through Sunday
Start Time	==, !=, <, <=, >, >=	The Time format is defined by the Language selected in the User Profile (User Profile tab of the Security Administrator System). Example: HH:MM:SS AM/PM format (12:15:00 PM) for English Language selection
End Day of Week	==, !=, <, <=, >, >=	Monday through Sunday
End Time	==, !=, <, <=, >, >=	The Time format is defined by the Language selected in the User Profile (User Profile tab of the Security Administrator System). Example: HH:MM:SS AM/PM format (12:15:00 PM) for English Language selection

For more information on filters, click the following section names:

- [Filtering Operators](#)
- [Filtering Examples](#)
- [Applying Filters for Routing Event Messages to Destinations](#)

Back to [Event Message Routing, Filtering, and Destinations](#).

### Filtering Examples

The following table provides examples of filters used by DDAs for routing event messages.

**Table 78: Filtering Examples**

Example	Meaning
Item Category != HVAC	The DDA routes all event messages to the defined destination except those from the HVAC category.
Acknowledge Required == true	The DDA routes only the event messages that require acknowledgement to the defined destination.
Current Status == Alarm	The DDA routes all event messages that were generated by objects in Alarm status to the defined destination.
Previous Status != Unknown Previous State	The DDA routes all event messages to the defined destination except those that were generated by objects in the unknown previous state.

**Table 78: Filtering Examples**

Example	Meaning
Priority <= 200	The DDA routes all event messages with an Event Priority equal to or less than 200 to the defined destination. See <a href="#">Event Priority</a> .
Start Day of Week >= Friday and Start Time >= 05:00:00 PM and End Day of Week <= Monday and End Time <= 06:00:00 AM	The DDA routes all event messages generated from 5:00:00 PM on Friday through 6:00:00 AM on Monday.  The Time format is defined by the Language selected in the User Profile (User Profile tab of the Security Administrator System).

**Applying Multiple Filters Example:**

If you define multiple filters for a destination, the DDA combines all the criteria with an AND condition (all filter criteria must be met).

If you want to define a set of filters for sending all High Alarm messages for your HVAC systems that have been defined with event priorities belonging to the Property Safety Group (Priority 40–79) and require acknowledgment at an e-mail destination, apply all the following filters under the E-mail tab of the Engine of ADS/ADX.

- Item Category == HVAC
- Current Status == High Alarm
- Priority >= 40
- Priority <= 79
- Acknowledge Required == true

For more information on filters, click the following section names:

- [Filtering Operators](#)
- [Filtering Options](#)
- [Applying Filters for Routing Event Messages to Destinations](#)

Back to [Event Message Routing, Filtering, and Destinations](#).

**E-mail**

You can configure e-mail addresses as destinations for event messages. The Email DDA supports standard Simple Mail Transfer Protocol (SMTP).

For information on how to configure an e-mail destination, see [Configuring Destination Delivery Agents \(DDAs\)](#).


**Note:** The procedure for configuring the Email DDA is the same for the NAE, NCE, NIE, ADS, and ADX.

For additional information, see one of the following sections:

- [Email Tab](#) in the [Object and Feature Tabs](#)
- [Engine Device Object](#) or [ADS Device Object](#)
- [Configuring Event Message Format](#) to configure how the event message appears at the e-mail destination

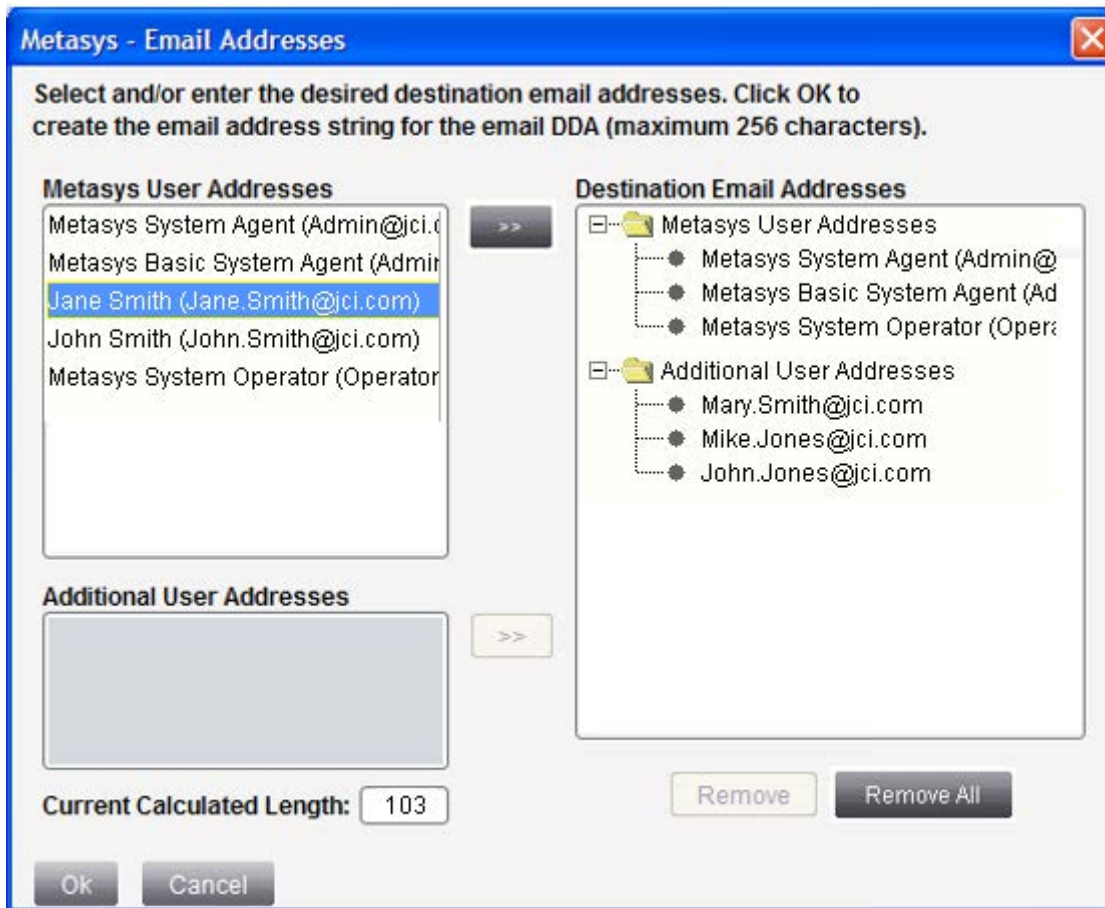
Back to [Event Message Routing, Filtering, and Destinations](#).

**E-mail Addresses in the Destination Configuration**

The Email Addresses attribute on the Email tab in the Destination Configuration of the device specifies the e-mail address of one or more recipients to receive alarm notification via e-mail. Click the  button next to the Email Address attribute to select e-mail addresses defined by the user accounts in the Security Administrator system.

You must use valid e-mail addresses, which are set up on an e-mail server, for the device to successfully send the alarms via e-mail.


**Figure 40: Email Addresses Dialog Box**



**Table 79: Email Addresses Dialog Box Components**

Field	Description
<b>Metasys User Addresses</b>	Displays the users defined in the Security Administrator System and their e-mail addresses. This information appears only for the device that you are currently accessing.
<b>Additional User Addresses</b>	Allows you to enter e-mail addresses not appearing in the Metasys User Addresses list. When entering more than one e-mail address, separate the addresses with a comma (John.Smith@jci.com,Jane.Smith@jci.com).
<b>Destination Email Addresses</b>	<p>Displays the Metasys User Addresses and Additional User Addresses that you selected or entered from the Metasys User Addresses and Additional User Addresses lists.</p> <p>You can expand or collapse the Metasys User Addresses folder and Additional User Addresses folder by clicking the + or - sign or by double-clicking the folders.</p> <p>If you right-click the Metasys User Addresses folder or Additional User Addresses folder, the following menu options appear:</p> <ul style="list-style-type: none"> <li>• <b>Sort-by Name:</b> Displays the users in alphabetical order by name. This option is available only for the Metasys User Addresses folder.</li> <li>• <b>Sort-by Email:</b> Displays the e-mail addresses in alphabetical order.</li> <li>• <b>Remove All:</b> Removes all users and e-mail addresses from the selected list.</li> </ul>

**Table 79: Email Addresses Dialog Box Components**

Field	Description
 <b>Add Button</b>	For the button next to the Metasys User Addresses list, adds the selected users and their e-mail addresses to the Destination Email Addresses list. For the button next to the Additional User Addresses lists, adds the e-mail addresses entered to the Destination Email Addresses list.
<b>Current Calculated Length</b>	Displays the number of characters in the e-mail address string. This number is calculated after clicking the Add button next to either the Metasys User Addresses list or the Additional User Addresses list. The maximum number of characters allowed for the e-mail address string is 256.
<b>Remove</b>	Removes the selected user and e-mail address from the Destination Email Addresses list. You also can select a user or e-mail address, right-click, and select Remove.
<b>Remove All</b>	Removes all users and e-mail addresses from the Destination Email Addresses list.

## Pager

You can configure one or more pagers as destinations for event messages. The Pager DDA supports standard Telelocator Alphanumeric Protocol (TAP).

For information on how to configure a pager destination, see [Configuring Destination Delivery Agents \(DDAs\)](#).

**Note:** The procedure for configuring the Pager DDA is the same for the NAE, NCE, NIE, ADS, and ADX.

For additional information, see the following:

- [Pager Tab](#) in the [Object and Feature Tabs](#)
- [Engine Device Object](#) or [ADS Device Object](#)
- [Configuring Event Message Format](#) to configure how the event message appears at the pager destination

**Note:** The event message format for pagers is very brief to conform to pager space limitations.

Back to [Event Message Routing, Filtering, and Destinations](#).

### Troubleshooting Tip:

Any modem initialization strings set in the Control Panel of an ADS/ADX are prefixed with **AT&**. Enter the initialization strings for the modem accordingly. Several safe, benign codes can be entered at the beginning of your string to prevent any improper initialization but must be re-entered if the ADS/ADX is restarted. The exact text of the string varies per modem. For example, for one U.S. Robotics® modem qualified with the Metasys system, enter M4S13=7S19=2.

### Troubleshooting Tip:

Occasionally, a pager message may contain extraneous junk characters. These characters may come from the paging service, appear as a result of interference, or appear when the pager battery is low.

To reduce the number of pager messages containing such characters, cycle power to the modem by unplugging the USB cable from the modem and any power adapters, if applicable. Wait 10 seconds, and then reconnect the USB cable and any power adapters.

## Printer

On the ADS/ADX platform, you can define any printer supported by Windows software as a destination for event messages, and a single DDA can print alarms on multiple printers. Printers connected to the ADS/ADX by parallel port or USB are supported, as well as IP-based network printers (if printers are set up with an IP address). This platform does not support Novell® NetWare printers. Printer support is the same for both the ADS and ADX.

To set up a printer on a split ADX, the printer must be accessible from the Web/Application server computer, as opposed to the Database server computer.

You can configure the ADS/ADX Printer DDA for single line printing for a tractor feed printer (also known as tractor feed printing, line printing, and dot matrix printer support). To set up a printer for single line printing for a tractor feed printer (no form feed/tractor printing mode), set the [ADS Device Object](#) Printer tab Line Out attribute to 0. By setting this attribute to 0, when an alarm is sent to the tractor feed printer, it prints the alarm text, and then advances a single line, thus waiting to print the next alarm.

**Note:** When using a tractor feed printer (without any form feeds), the Timeout, Printing Priority Threshold, Orientation, Font Face, and Font Size attributes are not used and any values set for them are ignored. You can set the Orientation, Font Face, Font Size, and line wrapping at the printer itself.

**Note:** Tractor feed printing is only intended for tractor feed printers. You may encounter abnormal behavior if you set the Line Out attribute to 0 for other type of printers, such as deskjet and laserjet printers.

For information on how to configure a printer destination on an ADS/ADX, see [Configuring Destination Delivery Agents \(DDAs\)](#).

For additional information on ADS/ADX Printer DDAs see the following:

- [Printer Tab](#) in the [Object and Feature Tabs](#)
- [Engine Device Object](#) or [ADS Device Object](#)
- [Configuring Event Message Format](#) to configure how the event message appears at the printer destination

On the NAE55/NIE55 and NAE85/NIE85 platform, you can use the Serial Printer DDA on the Site Director Engine to print event messages. This DDA is enabled using Remote Desktop and no attributes/tabs appear in the UI. This DDA is not available on the NAE35, NAE45, or NIE59. Refer to the [NAE Commissioning Guide \(LIT-1201519\)](#) for details on this DDA.

Back to [Event Message Routing, Filtering, and Destinations](#).

## SNMP Trap

You can configure a Simple Network Management Protocol (SNMP) Trap as a destination for event messages. The SNMP Trap DDA supports SNMP Versions 1, 2C, and 3.

For information on how to configure an SNMP Trap destination, see [Configuring Destination Delivery Agents \(DDAs\)](#).

**Note:** The procedure for configuring the SNMP Trap DDA is the same for the NAE, NIE, ADS, and ADX.

For additional information, see the following:

- [SNMP Tab](#) in the [Object and Feature Tabs](#)
- [Engine Device Object](#) or [ADS Device Object](#)
- [Configuring Event Message Format](#) to configure how the event message appears at the SNMP Trap destination

Back to [Event Message Routing, Filtering, and Destinations](#).

## Event Message Routing Sample Scenario

An Engine is configured to route all event messages to John Smith's (Building Operations Engineer) e-mail address and a set of selected event messages to his manager's (Building Operations Manager) pager.

The following configuration is required to make this scenario work:

Make sure the Engine is configured properly. See the [Related Documentation](#) table and the [Engine Device Object](#) section for information.

Make sure that object alarm extensions are configured for each object in the Engine that you want to detect alarm conditions. See the [Alarm Extensions](#) section for information.

Define an e-mail destination for John Smith's (Building Operations Engineer) e-mail address. See [Event Message Routing, Filtering, and Destinations, E-mail](#), and [Configuring Destination Delivery Agents \(DDAs\)](#).

Define a pager destination for John's manager's (Building Operations Manager) pager. See [Event Message Routing, Filtering, and Destinations, Pager](#), and [Configuring Destination Delivery Agents \(DDAs\)](#). Make sure you have defined the pager filters correctly.

Once the Engine detects an alarm condition and generates an event message, the Email DDA routes all unfiltered event messages to John Smith's e-mail address. The Pager DDA only routes the event messages that pass the defined pager filters to John's manager's pager.

### Event Priority

Indicates the importance of the event message and determines when the event message is displayed. Displaying the priority of the event messages in the Event Viewer allows the user to acknowledge event messages of higher importance before event messages of lower importance. The priority number associated with the event message falls within a range of 0–255. Event messages with a lower priority number are of a higher importance or are more critical than event messages with a higher priority number. You can route event messages based on priority.

**Note:** Using a consistent priority scheme makes sorting event messages based on priority in the Event Viewer easier.

**Note:** You can specify alarm notification sounds based on alarm priorities. See [Alarm Settings Tab](#).

### Life Safety Group (Priority 0–39)

**Table 80: Life Safety**

Priority	Recommended Use
5	Automatic Fire Alarm
8	Life Safety Process Alarm
11	Manual Fire Alarm
14	Other Higher Priority Life Safety
19	Medical Alarm
22	Hold Up and Duress Alarm
25	Panic Alarm
28	Life Safety Pre-Alarm Alert
31	Other Lower Priority Life Safety

### Property Safety Group (Priority 40–79)

**Table 81: Property Safety Group**

Priority	Recommended Use
45	Burglar Alarm and Forced Door Alarm
48	Security Alarm
51	Other Higher Priority Property Safety
60	Watchman Tour Alarm
63	Property Process Alarm
66	Door Held Open Alarm
69	Other Lower Priority Property Safety

### Supervisory and Trouble Group (Priority 80–139)

**Table 82: Supervisory and Trouble Group**

Priority	Recommended Use
85	Fire Supervision (Tamper)
88	Security Supervision (Tamper)
91	Other Supervisory
100	Fire Trouble (Equipment Failure)
103	Security and Burglar Trouble (Equipment Failure)



**Table 82: Supervisory and Trouble Group**

Priority	Recommended Use
106	Communication Equipment Failure Trouble
109	Process Trouble
112	Energy Alarm
115	Other Failure
124	Communication Equipment Warning Trouble
127	Early Warning Alert
130	Energy Warning
133	Other Warning

**Other Group (Priority 140–255)****Table 83: Other Group**

Priority	Recommended Use
145	Equipment and Industrial Supervision
148	Comfort Alarm
151	Miscellaneous Higher Priority Alerts
160	System Events
163	Miscellaneous Higher Priority Events
172	Life Safety Return to Normal
179	Property Safety Return to Normal
186	Supervisory and Trouble Return to Normal
189	Miscellaneous Return to Normal
198	System Status Active
201	Comfort Warning
204	Miscellaneous Lower Priority Events
213	System Status Normal
216	Comfort Normal
219	Test and Diagnostic Events
222	Miscellaneous

**Alarm and Event Steps****Configuring an Engine Event Repository**

To configure the local Engine Event Repository and the Default Destination:

1. View the desired Engine device. See [Viewing Item Data](#) for information on how to display an item.
2. Select the Focus tab and click the Advanced radio button to display additional item information.
3. Select Edit.
4. Scroll down to the Alarms and Site sections.
5. Edit the attributes in these sections as desired. Use the following table as a guide. See [Engine Device Object](#) for information about the attributes. The NAE Device attributes table contains Default Value and Values/Options/Range information for the attributes. Click on the attribute names in the table for descriptions.

**Table 84: Repository Configuration**

To Do This:	Edit This Engine Device Object Attribute:
Change the size of the local Engine repository	<a href="#">Alarm Repository Size</a>
Change the snooze time for the <a href="#">Alarms Window</a>	<a href="#">Alarm Snooze Time</a>
Designate an ADS/ADX repository as a Default Destination	<a href="#">ADS Repository</a>
Indicate the type of connection used by the ADS/ADX	<a href="#">ADS Connection Type</a>
Define a time to deliver event messages to the ADS/ADX	<a href="#">ADS Delivery Time</a>
Define the event message priority that triggers delivery to the ADS/ADX	<a href="#">ADS Priority Threshold</a>

**Note:** You can define only one repository as the [Default Destination](#) for an Engine. See [Event Repositories](#) for more information.

6. Click Save.

**Note:** If you want to define all local Engine repositories for the entire site at one time instead of individually, select the Site in the navigation tree and edit the following [Site Object](#) attributes (the Site attributes table contains Default Value and Values/Options/Range information for the attributes):

- [Default ADS Repository](#)
- [Default ADS Connection Type](#)
- [Default ADS Delivery Time](#)
- [Default ADS Priority Threshold](#)

### Configuring an ADS/ADX Event Repository

To configure an ADS/ADX Event Repository for forwarding event messages from one ADS/ADX to other ADS/ADXs:

1. View the desired ADS/ADX. See [Viewing Item Data](#) for information on how to display an item.
2. Select the Focus tab and click the Advanced radio button to display additional item information.
3. Select Edit.
4. Scroll down to the Repository Storage section.
5. Edit the [ADS Device Object's ADS Repositories](#) attribute. See the ADS/ADX attributes table for more information on this attribute or other ADS/ADX attributes, including their Default Value and Values/Options/Range information.
6. Click Save.

### Configuring Destination Delivery Agents (DDAs)

To provide consistency and easy configuration of DDAs, each DDA tab in the Metasys system user interface contains the same layout. Follow the instructions below when configuring any DDA. See [Event Message Routing, Filtering, and Destinations](#) for more information on DDAs.

On the NAE55/NIE55 and NAE85/NIE85 platform, you can use the Serial Printer DDA on the Site Director Engine to print event messages. This DDA is enabled using Remote Desktop, and no attributes/tabs appear in the UI. This DDA is not available on the NAE35, NAE45, or NIE59. Refer to the [NAE Commissioning Guide \(LIT-1201519\)](#) for details on this DDA.

**Note:** You cannot create, edit, or delete DDAs in online mode with [Basic Access](#).

To configure DDAs for routing event messages:

1. View the desired Engine or ADS/ADX device. See [Viewing Item Data](#) for information on how to display an item.
2. Select the tab for the desired destination type (such as, Pager).
3. Select Edit.
4. Edit the attributes in the Shared Configuration section.

**Note:** Skip to Step [Step 1](#) if you are configuring a Printer DDA.

**Note:** See the specific DDA tab in the [Object and Feature Tabs](#) for information on configuring attributes. Also, see the [Engine Device Object](#) or the [ADS Device Object](#) section for information on configuring Engine or ADS/ADX attributes, respectively.

5. In the Destinations section, select New to add a destination or click an existing destination.
6. Edit the parameters in the Destinations section.

For the Engine, see the following:

- [E-mail](#)
- [Pager](#)
- [SNMP Trap](#)

For the ADS/ADX, see the following:

- [E-mail](#)
- [Pager](#)
- [Printer](#)
- [SNMP Trap](#)

**Note:** See the specific DDA tab in the [Object and Feature Tabs](#) for information on configuring attributes. Also, see the [Engine Device Object](#) or the [ADS Device Object](#) section for information on configuring Engine or ADS/ADX attributes, respectively.

**Note:** If you are enabling an E-mail DDS on an ADS/ADX and the ADS/ADX computer is using Symantec Endpoint Protection, verify that the POP3/SMTP Scanner feature is not installed. If this feature is installed, e-mail alerts for the ADS/ADX are blocked. To uninstall the POP3/SMTP Scanner feature, open Control Panel and select Add/Remove Programs or Programs and Features. Locate Symantec Endpoint Protection in the list of installed programs and click Change. Navigate through the installation wizard until you reach the Custom Setup screen. Place an **X** next to the POP3/SMTP Scanner feature, then navigate the remaining wizard screens to remove this feature.

7. Repeat [Step 5](#) and [Step 6](#) if you want to configure this device to send event messages to more than one destination of that type. Add the desired amount of destinations. For example, to send event messages to two different pagers, create two separate destinations on the Pager tab.

**Note:** See [Applying Filters for Routing Event Messages to Destinations](#) for information on how to apply filters to route particular event messages to destinations.

**Note:** See [Configuring Event Message Format](#) for information on how to configure event message format.

8. To remove a destination, select the destination and click Delete.
9. Click Save.

## Applying Filters for Routing Event Messages to Destinations

1. View the desired Engine or ADS/ADX device. See [Viewing Item Data](#) for information on how to display an item.
2. Select the tab for the desired destination type (such as, Pager).
3. Select Edit.
4. Select the desired destination in the Destinations section.
5. Select New in the Filters section. The Filter dialog box appears.
6. Select the desired filter type from the Item drop-down menu. For more information and examples on filtering, see [Event Message Routing, Filtering, and Destinations](#).
7. Select the [operator](#) from the drop-down menu.
8. Select the desired value from the drop-down menu or type the value in the text box.
9. Click OK.
10. Repeat [Step 4](#) through [Step 9](#) to add more filters to that destination.

**Note:** If you define multiple filters for a destination, the DDA combines all the criteria with an AND condition (all filter criteria must be met).

11. Make changes to filters using the drop-down menus or text boxes.
12. To remove a filter, select the desired filter and click Delete.
13. Click Save.

## Configuring Event Message Format

1. View the desired Engine or ADS/ADX device. See [Viewing Item Data](#) for information on how to display an item.
2. Select the tab for the desired destination type (such as, Pager).
3. Select Edit.
4. Select the desired destination in the Destinations section.
5. Select the check boxes in the Format section to define which attribute information is included in the event message when delivered to that destination.

**Note:** For example, select Value and Units if you only want to display the Value and Units portion of the event message at the destination.

6. Click Save.

## Launching the Event Viewer

1. Select Event Viewer from the View menu. If you have more than one Engine or ADS/ADX on the site, a Device Selection Dialog box appears.
2. Select the device containing the [event repositories](#) with the event messages that you want to display in the Event Viewer.
3. Click OK. The Event Viewer appears in the display frame and displays the event messages from the event repository of the selected device. See [Event Viewer and Event Messages](#) for details.

**Note:** Alternatively, you can right-click the desired device in the navigation frame and select Event Viewer from the menu that appears.

## Acknowledging Event Messages

1. [Launch the Event Viewer](#).

2. Select one or more event messages.

**Note:** Use the Ctrl or Shift key to select multiple messages.

3. Click Ack.

**Note:** Alternatively, you can right-click and select Ack or you can acknowledge event messages in the [Alarms Window](#). See [Acknowledging, Snoozing, and Discarding Events](#) for details.

**Note:** In an Engine that is not the Site Director, acknowledged or discarded alarm and event messages do not appear acknowledged or discarded in the ADS/ADX.

**Note:** All acknowledgements add an annotation to the event message. See [Event Message Annotations](#).

**Note:** An electronic signature and/or annotation may be required when acknowledging an event.

## Discarding Event Messages

1. [Launch the Event Viewer](#).

2. Select one or more event messages.

**Note:** Use the Ctrl or Shift key to select multiple messages.

3. Click Discard.

**Note:** Alternatively, you can right-click and select Discard or you can discard event messages in the [Alarms Window](#). See [Acknowledging, Snoozing, and Discarding Events](#) for details.

**Note:** In an Engine that is not the Site Director, acknowledged or discarded alarm and event messages do not appear acknowledged or discarded in the ADS/ADX.

**Note:** An electronic signature and/or annotation may be required when discarding an event.

### Sorting the Event Message List

**Note:** When you sort the event message list, only those messages currently displayed on the screen sort. This feature does not sort all messages if you have multiple pages of event messages.

1. [Launch the Event Viewer](#).
2. Click the header of the column you want to use for sorting. An up or down arrow appears in the header of that column. Click the arrow to change the sorting order and the table reorganizes.

### Creating a Custom Filter for the Event Viewer (ADS/ADX Only)

1. [Launch the Event Viewer](#).
2. Click Custom Filter.
3. Click Add.
4. Select the criteria and the associated values for the filter and click OK. All criteria added to the custom filter table will make up the rules of the filter.
5. Click Apply to get the results of the custom filter.
6. To view the data without the custom filter, click Standard Filter.

### Printing the Event Messages Displayed in the Event Viewer

1. [Launch the Event Viewer](#).
2. Click anywhere in the Event Viewer.
3. Select Print from the [Item Menu](#). The event messages are printed in the order they appear in the Event Viewer.

### Launching the Focus View of the Item That Generated the Event Message

1. [Launch the Event Viewer](#).
2. Select an event message and choose Selected Item from the View menu, or right-click and select View Item.

**Note:** Some items, such as site level items, do not support this option because they do not have viewable information.

**Note:** Alternatively, you can launch the Focus view of the item that generated the event message in the [Alarms Window](#) by clicking on the [View Item button](#). See [Acknowledging, Snoozing, and Discarding Events](#) for details.

### Launching a Graphic Associated with an Event Message

1. [Launch the Event Viewer](#).
2. Double-click the graphic icon of an event message.

**Note:** Alternatively, you can launch a graphic associated with an event message in the [Alarms Window](#) by clicking the [View Graphic button](#). See [Acknowledging, Snoozing, and Discarding Events](#) for details.

### Adding Annotations

The annotation feature is not available on the local Engine event repository. You can add annotations to the ADS/ADX event repository only.

1. [Launch the Event Viewer](#).
2. Click on the event message.

3. Select Add Annotation from the Actions menu or right-click and select Add Annotation. The Add Annotation dialog box appears.

**Note:** The drop-down field on the Add Annotation dialog box contains predefined annotations from your system preferences. If you have not defined annotations in your system preferences, the drop-down list is empty.

4. Type the desired text in the message box.
5. Click OK.

## Creating Annotations

1. Select the Annotation Settings tab on the Metasys Preferences screen.
2. Enter annotation text. The text can be from 1 to 255 characters in length.
3. Click Add to save the new annotation.

**Note:** The annotations you create appear in the drop-down list on the Add Annotations dialog box. If you do not create any annotations, this list is blank.

## Viewing Annotations

You can view annotations from both the ADS/ADX and Engine event repository.

1. [Launch the Event Viewer.](#)
2. Click on the event message.
3. Select View Annotations from the Actions menu or right-click and select View Annotations. The View Annotations dialog box appears.

**Note:** Alternatively, you can double-click the annotation icon in the first column of the Event Viewer for the desired event message.

4. View the message. If multiple messages exist, use the navigation buttons to browse between event messages or to the first and last event message.
5. Click OK.

**Note:** A signed book icon is displayed in the event's associated Acknowledgement Annotation dialog.

# Alarm and Event Management for Metasys Systems Integrated with BACnet Devices

The Metasys system provides the option to use the [Alarm and Event](#) feature when integrating with BACnet devices (including the N30). You can send event messages generated by the Metasys system's Engine, FAC or ADS/ADX devices to BACnet devices. This alarming method uses the [Notification Class Object](#) and [Event Enrollment](#) or objects with [intrinsic alarming](#) to detect alarm conditions and route event messages from the Metasys system to BACnet devices.

For the alarm and event feature steps, see the Alarm and Event Management [Alarm and Event Steps](#) section.

For details on the attributes appearing on the BACnet Alarms tab, see [BACnet Alarm Tab](#) in the [Object and Feature Tabs](#) section.

For information on the BACnet Integration object, see the [BACnet Integration Object](#).

For information on alarm and event management for the Metasys system, see [Alarm and Event](#).

## Alarm and Event Management for Metasys Systems Integrated with BACnet Devices Concepts

### Metasys/BACnet Alarming Overview

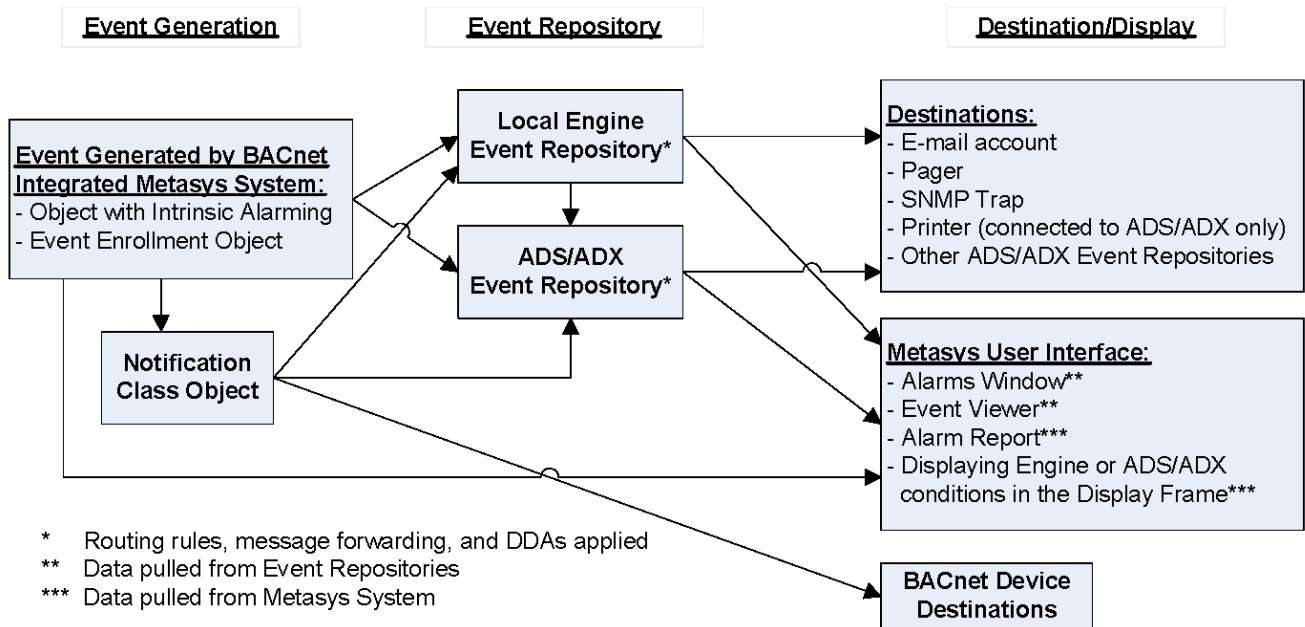
The Metasys system provides the functionality to use the [Alarm and Event](#) feature when integrating with BACnet devices (including the N30). You can configure the Metasys system's FAC, Engine or ADS/ADX devices to comply with the standard BACnet alarm and event services such as [intrinsic alarming](#), [Event Enrollment object alarming](#), and alarm routing using the [Notification Class Object](#). These optional alarming methods allow you to send alarm and event messages from the Metasys system to BACnet devices.

To use the alarm and event feature for Metasys systems that integrate BACnet devices, configure the Notification Class object, then reference that Notification Class object from the [Event Enrollment Object](#) or from an object with intrinsic alarming. The Notification Class object routes event messages from Event Enrollment objects or objects with intrinsic alarming to one or more BACnet device. Intrinsic alarming attributes, Event Enrollment objects, and Notification Class objects are fully compliant with the BACnet standard specifications and should be used if you want your Metasys system to send event messages to BACnet devices.

Event Messages routed through the Notification Class object to the Metasys system's event repositories can use the Alarm and Event features such as the [Event Viewer](#), [Alarms Window](#), Alarm [Reports](#), and [DDAs](#). To enable this functionality, you must set the Route to Metasys attribute to true in the Notification Class objects used. See [Configuring Metasys/BACnet Integration Alarming](#). See the Alarm and Event Management [Alarm and Event Steps](#) section for more information on the alarm and event feature.

The following figure shows the flow of event messages routed by the Notification Class object.

Figure 41: Event Message Flow



For details on configuring the detection of alarm conditions, the routing event messages to destinations, and the filtering and message formatting options, click one of the following:

- [Notification Class object and its attributes](#)
- [Event Enrollment object alarming](#)
- [intrinsic alarming](#)
- [event routing, filtering, and destinations](#)
- [event message format](#)

The [alarm extensions](#) method of alarming is easier to configure and provides greater flexibility and functionality for standard Metasys applications. Use alarm extensions for alarming if your system does not require integration with BACnet devices.

### BACnet Intrinsic Alarming

Intrinsic alarming is fully compliant with the BACnet standard specifications and should only be used when integrating with BACnet devices. Intrinsic alarming allows you to configure the detection of alarm conditions and the generation of event messages based on attributes (properties) within an object that is compliant with the standard BACnet objects, such as the High/Low alarm limits for analog objects and the alarm state for binary objects. The [Notification Class Object](#) routes the event message.

By default, objects do not have intrinsic alarming; however, you can add intrinsic alarming to an object by setting its **Intrinsic Alarming Defined** attribute to True. You can add intrinsic alarming when you create an object, or you can add intrinsic alarming to an existing object. You can also remove intrinsic alarming from an existing object by changing its **Intrinsic Alarming Defined** attribute to False. The **Intrinsic Alarming Defined** attribute is located under the BACnet heading in the Insert Object wizard and in the object's Focus view, which is accessible when you select the Advanced option for the display. When you set the **Intrinsic Alarming Defined** attribute to True, the BACnet Alarm tab appears the next time you view the object. The default alarming settings (for example, high and low limits) are used until you change the settings on the BACnet Alarm tab. When you set the **Intrinsic Alarming Defined** attribute to False, all intrinsic alarm settings configured through the BACnet Alarm tab are discarded and the alarming settings return to their default values. For more information on configuring intrinsic alarming in an object, see [Configuring Metasys/BACnet Integration Alarming](#).



To view the BACnet intrinsic alarming attributes of existing Metasys objects after they have been configured, [view the object](#) and click the BACnet Alarm tab. You can add alarm extensions to objects supporting intrinsic alarming.

The following Metasys objects are compliant with the standard BACnet objects and support BACnet intrinsic alarming:

- [Accumulator Objects](#)
- [Analog Input Object](#)
- [Analog Output Object](#)
- [Analog Value Object](#)
- [Binary Input Object](#)
- [Binary Output Object](#)
- [Binary Value Object](#)
- [Multistate Input Object](#)
- [Multistate Output Object](#)
- [Multistate Value Object](#)

Intrinsic alarming is only available on the above objects for your Metasys system if you set the [BACnet Site](#) attribute to True in the Site object. See the [Site Object](#) for information on configuring the Site object.

After configuring one or more objects with intrinsic alarming, you must configure at least one Notification Class object to define the routing of event messages to BACnet device destinations. Then you must reference the desired Notification Class object from the objects with intrinsic alarming. If you want the Notification Class object to route the event messages created by the objects with intrinsic alarming to the Metasys [Alarm and Event](#) feature, set the Notification Class object's Route to Metasys attribute to true.

In addition, you can add object [alarm extensions](#) to objects with intrinsic alarming if you want to route event messages to both BACnet device destinations and Metasys DDAs. For more information on DDAs, see [Event Message Routing, Filtering, and Destinations](#).

The Enable Alarms and Disable Alarms commands for objects using intrinsic alarming edit the Event Enable flags under Alarm State to prevent alarms.

You can configure intrinsic alarming online at the Site Management Portal UI or offline in the SCT. Intrinsic alarms for objects in an FAC can be defined using CCT or Site Management Portal, but not SCT. If defined with SMP, you must specify if the intrinsic alarm is to Use Remote Alarming as defined in the object's Focus tab. If true, then the intrinsic alarm parameters will be stored in the FAC. If false, the parameters will be stored in the Engine.

For details on the attributes appearing on the BACnet Alarms tab, see [BACnet Alarm Tab](#) in the [Object and Feature Tabs](#) section.

## BACnet Event Enrollment Object Alarming

The [Event Enrollment Object](#) is fully compliant with the BACnet standard specifications and should only be used when integrating with BACnet devices. The Event Enrollment object monitors the value of a single attribute and generates event messages based on the defined alarm conditions.

You can create an Event Enrollment object using the [Insert Object Wizard](#) and configure its attributes, or you can [view](#) an existing Event Enrollment object and edit its attributes. Event Enrollment objects are not supported by a FAC. Based on the defined event type, the Event Enrollment object generates event messages for different conditions monitored in the referenced object. See the Event Type attribute of the [Event Enrollment Object](#) and the [Event Enrollment Configuration Examples](#) for more information.

**Note:** Event Enrollment alarming is only available for your Metasys system if you set the [BACnet Site](#) attribute to true in the Site object. See the [Site Object](#) for information on configuring the Site object.

After configuring one or more Event Enrollment objects, you must configure at least one [Notification Class Object](#) to define the routing of event messages to BACnet device destinations. Then you must reference the desired Notification Class object from the Event Enrollment objects. If you want the Notification Class object to route the event messages created by the Event Enrollment objects to the Metasys [Alarm and Event](#) feature, set the Notification Class object's [Route to Metasys](#) attribute to true.

You can add object [alarm extensions](#) to Event Enrollment objects if you want to route event messages to Metasys DDAs. For more information on DDAs, see [Event Message Routing, Filtering, and Destinations](#).

The Enable Alarms and Disable Alarms commands for the Event Enrollment object alarming edit the Event Enable flags under Alarm State to prevent alarms.

Click one of the following for more information:

- [Event Enrollment Object](#) and its attributes
- event types used by the [Event Enrollment Object](#) ( [Event Type](#) attribute)
- [Event Enrollment Configuration Examples](#)

### Event Enrollment Configuration Examples

The alarm conditions monitored by the [Event Enrollment Object](#) are defined by the selected event type. Click the event types in the following list for configuration examples:

- [Event Enrollment Configuration Example - Change of Bitstring](#)
- [Event Enrollment Configuration Example - Change of State](#)
- [Event Enrollment Configuration Example - Change of Value Example 1](#) and [Event Enrollment Configuration Example - Change of Value Example 2](#)
- [Event Enrollment Configuration Example - Command Failure](#)
- [Event Enrollment Configuration Example - Floating Limit](#)
- [Event Enrollment Configuration Example - Out of Range](#)

#### Event Enrollment Configuration Example - Change of Bitstring

The following table is an example of how to configure an [Event Enrollment Object](#) using the Change of Bitstring event type. In this example, the Event Enrollment object references an [Analog Value Object](#) and generates an event message as defined by its Event Enable attribute when any of the AV's selected [Status Flags](#) attribute values change for a time period longer than the defined Time Delay. For more information on this event type, see the Event Enrollment object's [Event Type](#) attribute.

This table describes both the Configuration and Event tabs of the Configure screen of the Insert Object wizard with the Event Enrollment object selected.

**Table 85: Change of Bitstring Attributes**

Attributes	Value
<b>Focus/Configuration Tab:</b>	
<b>Name</b>	Event Enrollment1
<b>Description</b>	Status Change
<b>Object Type</b>	Event Enrollment
<b>Object Category</b>	HVAC
<b>Enabled</b>	true
<b>Event Enable</b>	To Off Normal
<b>Notify Type</b>	Alarm
<b>Notification Class</b>	4194001
<b>Alarm Message Text</b>	Change in Setpoint Status
<b>Execution Priority</b>	Normal

**Table 85: Change of Bitstring Attributes**

Attributes	Value
<b>Event Tab:</b>	
Input Reference	AV1: Status Flags
Delay Time (seconds)	10
Event Type	Change of bitstring
Mask	In Alarm - selected (true) Fault - selected (true) Overridden - not selected (false) Out of Service - not selected (false)
Values	In Alarm - selected (true) Fault - selected (true) Overridden - not selected (false) Out of Service - not selected (false)

**Event Enrollment Configuration Example - Change of State**

The following table is an example of how to configure an [Event Enrollment Object](#) using the Change of State event type. In this example, the Event Enrollment object references a [Multistate Value Object](#) and generates an event message as defined by its Event Enable attribute when the state of the MV's [Reliability](#) attribute changes for a time period longer than the defined Time Delay. For more information on this event type, see the Event Enrollment object's [Event Type](#) attribute.

**Note:** This table describes both the Configuration and Event tabs of the Configure screen of the Insert Object wizard with the Event Enrollment object selected.

**Table 86: Change of State Attributes**

Attribute	Value
<b>Focus/Configuration Tab:</b>	
Name	Event Enrollment1
Description	Feedback Reliability
Object Type	Event Enrollment
Object Category	HVAC
Enabled	true
Event Enable	To Off Normal
Notify Type	Alarm
Notification Class	4194001
Alarm Message Text	Feedback State
Execution Priority	Normal
<b>Event Tab:</b>	
Input Reference	MV1: Reliability
Delay Time (seconds)	0
Event Type	Change of state
Value	Unreliable

### Event Enrollment Configuration Example - Change of Value Example 1

The following table is an example of how to configure an [Event Enrollment Object](#) using the Change of Value event type. In this example, the Event Enrollment object references an [Analog Input Object](#) and generates an event message as defined by its Event Enable attribute when the value of the AI's [Present Value](#) attribute changes by more than the specified [COV Increment](#) for a time period longer than the defined Time Delay. For more information on this event type, see the Event Enrollment object's [Event Type](#) attribute.

**Note:** This table describes both the Configuration and Event tabs of the Configure screen of the Insert Object wizard with the Event Enrollment object selected.

See [Event Enrollment Configuration Example - Change of Value Example 2](#) for another example of how to configure the Event Enrollment object for the Change of Value event type.

**Table 87: Change of Value Attributes (Example 1)**

Attribute	Value
<b>Focus/Configuration Tab:</b>	
Name	Event Enrollment1
Description	Room Temp COV
Object Type	Event Enrollment
Object Category	HVAC
Enabled	true
Event Enable	To Normal
Notify Type	Alarm
Notification Class	4194001
Alarm Message Text	NW Conf. Room Temp
Execution Priority	Normal
<b>Event Tab:</b>	
Input Reference	AI1: Present Value
Delay Time (seconds)	120
Event Type	Change of value
COV Increment	3.0

### Event Enrollment Configuration Example - Change of Value Example 2

The following table is an example of how to configure an [Event Enrollment Object](#) using the Change of Value event type. In this example, the Event Enrollment object references an [Analog Value Object](#) and generates an event message as defined by its Event Enable attribute when the value of the AV's [Status Flags](#) attribute changes for a time period longer than the defined Time Delay. For more information on this event type, see the Event Enrollment object's [Event Type](#) attribute.

**Note:** This table describes both the Configuration and Event tabs of the Configure screen of the Insert Object wizard with the Event Enrollment object selected.

**Table 88: Change of Value Attributes (Example 2)**

Attribute	Value
<b>Focus/Configuration Tab:</b>	
Name	Event Enrollment1
Description	Status COV
Object Type	Event Enrollment
Object Category	HVAC

**Table 88: Change of Value Attributes (Example 2)**

Attribute	Value
Enabled	true
Event Enable	To Normal
Notify Type	Alarm
Notification Class	4194001
Alarm Message Text	Status Change in Feedback
Execution Priority	Normal
<b>Event Tab:</b>	
Input Reference	AV1: Status Flags
Delay Time (seconds)	30
Event Type	Change of value
Mask	In Alarm - selected (true) Fault - selected (true) Overridden - not selected (false) Out of Service - selected (true)

**Event Enrollment Configuration Example - Command Failure**

The following table is an example of how to configure an [Event Enrollment Object](#) using the Command Failure event type. In this example, the Event Enrollment object references a [Binary Value Object](#) and generates an event message as defined by its Event Enable attribute when a command to BV1's [Present Value](#) attribute is not accepted by the command target (BV2) after the defined Time Delay has expired. For more information on this event type, see the Event Enrollment object's [Event Type](#) attribute.

**Note:** This table describes both the Configuration and Event tabs of the Configure screen of the Insert Object wizard with the Event Enrollment object selected.

**Table 89: Command Failure Attributes**

Attribute	Value
<b>Focus/Configuration Tab:</b>	
Name	Event Enrollment1
Description	Fan Command Monitor
Object Type	Event Enrollment
Object Category	HVAC
Enabled	true
Event Enable	To Off Normal
Notify Type	Value
Notification Class	4194001
Alarm Message Text	BV1(Fan4) Command Failure
Execution Priority	Normal
<b>Event Tab:</b>	
Input Reference	BV1: Present Value
Delay Time (seconds)	60

**Table 89: Command Failure Attributes**

Attribute	Value
Event Type	Command Failure
Command Target	BV2: Present Value

**Event Enrollment Configuration Example - Floating Limit**

The following table is an example of how to configure an [Event Enrollment Object](#) using the Floating Limit event type. In this example, the Event Enrollment object references an [Analog Input Object](#) and generates an event message as defined by its Event Enable attribute when the value of the AI's [Present Value](#) attribute exceeds the defined setpoint plus the high or low differential limit values for a time period longer than the defined Time Delay. For more information on this event type, see the Event Enrollment object's [Event Type](#) attribute.

**Note:** This table describes both the Configuration and Event tabs of the Configure screen of the Insert Object wizard with the Event Enrollment object selected.

**Table 90: Floating Limit Attributes**

Attribute	Value
<b>Focus/Configuration Tab:</b>	
Name	Event Enrollment1
Description	Room Temp Monitor
Object Type	Event Enrollment
Object Category	HVAC
Enabled	true
Event Enable	To Off Normal
Notify Type	Alarm
Notification Class	4194001
Alarm Message Text	Room Temp Limit Exceeded
Execution Priority	Normal
<b>Event Tab:</b>	
Input Reference	AI1: Present Value
Delay Time (seconds)	120
Event Type	Floating Limit
Setpoint Reference	AV1: Present Value
Low Differential Limit	3.0
High Differential Limit	4.0
Deadband	1.5

**Event Enrollment Configuration Example - Out of Range**

The following table is an example of how to configure an [Event Enrollment Object](#) using the Out of Range event type. In this example, the Event Enrollment object references an [Analog Input Object](#) and generates an event message as defined by its Event Enable attribute when the value of the AI's [Present Value](#) attribute goes out of the user-defined low limit/high limit range for a time period longer than the defined Time Delay. For more information on this event type, see the Event Enrollment object's [Event Type](#) attribute.

**Note:** This table describes both the Configuration and Event tabs of the Configure screen of the Insert Object wizard with the Event Enrollment object selected.

**Table 91: Out of Range Attributes**

Attribute	Value
<b>Focus/Configuration Tab:</b>	
Name	Event Enrollment1
Description	Status Change
Object Type	Event Enrollment
Object Category	HVAC
Enabled	true
Event Enable	To off Normal
Notify Type	Alarm
Notification Class	4194001
Alarm Message Text	Room Temp Out of Range
Execution Priority	Normal
<b>Event Tab:</b>	
Input Reference	AI1: Present Value
Delay Time (seconds)	300
Event Type	Out of Range
Low Limit	66.0
High Limit	74.0
Deadband	2.0

## **Alarm and Event Management for Metasys Systems Integrated with BACnet Devices Steps**

### **Configuring Metasys/BACnet Integration Alarming**

The [BACnet Intrinsic Alarming](#) and [BACnet Event Enrollment Object Alarming](#) routing services are fully compliant with the BACnet standard specifications and should only be used when integrating your Metasys system with BACnet devices.

You can configure intrinsic alarming online at the Site Management Portal (SMP) UI or offline in the SCT. Intrinsic alarming for FAC objects can be defined with the SMP or off-line with CCT.

To configure Metasys/BACnet integration alarming:

1. Set the [BACnet Site](#) attribute to true in each [Site Object](#) representing a site that you want to use Metasys/BACnet Integration alarming.
2. For each NAE in the site using alarming integration, configure one or more Notification Class objects for routing event messages from Event Enrollment objects and/or objects with intrinsic alarming to BACnet device destinations. Be sure you reference the BACnet devices by adding them to the [Recipient List](#) of the Notification Class object. Identify a BACnet device by using either its network address or BACnet device identifier (OID).

**Note:** If you want to display alarm and event data from BACnet device destinations on the Metasys system [Alarms Window](#) and [Event Viewer](#), set the [Notification Class Object's](#) [Route to Metasys](#) attribute to true. The BACnet device must specify the NAE as a recipient for their alarms. To make the NAE an alarm recipient, configure a Notification Class object on the BACnet device. Alarms and acknowledgements from the BACnet device are incorporated into the Metasys alarming system. To route BACnet alarms from the N30 to the NAE, the N30 must be configured to use BACnet alarm routing. For information on how to do this, see the documentation of the BACnet device you are integrating.

**Note:** When the NAE receives an alarm from an NAE, it can be sent from the DDAs on the receiving NAE but can not be routed again from that NAE. If the alarms need to be routed from the NAE device, they should set the Use Remote Alarming to False for objects in the FAC.

3. Configure one or more [Event Enrollment Object](#) or objects that supports intrinsic alarming using the [Insert Object Wizard](#). See [BACnet Intrinsic Alarming](#) for a list of objects that support intrinsic alarming.

**Note:** For both types of these alarm generating objects, you must configure the Event Enrollment object's [Notification Object Reference](#) attribute to reference the Notification Class Object created in [Step 2](#). This reference represents the instance number of the Notification Class (value of its Object Identifier attribute). The Notification Class object and the alarming object must exist on the same device.

See [BACnet Intrinsic Alarming](#) for more information on intrinsic alarming.

See [BACnet Event Enrollment Object Alarming](#) for information on Event Enrollment alarming.

For more information on BACnet Integration, see the [BACnet Integration Object](#) and the [Related Documentation](#) table.



# Audit Trail

The Audit Trail feature generates audit messages and stores them in [Audit Repositories](#). An audit message contains information about a significant event on the Building Automation System (BAS). For audit purposes, a [significant event](#) is an action or occurrence on the system that should be recorded for later analysis of building operations. A new audit message is generated for each significant event on the BAS. The [Audit Viewer](#) displays the audit messages stored in an audit repository. You can access the Audit Viewer from the [View Menu](#) of the Metasys user interface in online [mode](#).

The Audit Trail provides a historical record of the audited events, such as creating or deleting [items](#), that have occurred within the system. By viewing audit messages, you can examine and analyze the actions that occurred in the system.

## Audit Trail Concepts

### Audit Trail Overview

The Audit Trail feature initiates an audit message when the system detects an [audited event](#) such as a user logging on or logging off of the Metasys system, commanding an item, or changing the configuration of a device. An [audit message](#) is stored in the [Audit Repositories](#) of the device that generated the audit message. When the local audit repository is full, you can send its audit messages to an ADS (ADX) repository defined as the [Default Destination](#) for permanent storage.

The [Audit Viewer](#) allows you to view audit messages stored in the audit repository of the selected device. You can determine how to [sort](#) and filter the audit messages that appear in the Audit Viewer as well as forward them to the defined default destination. You can add annotations to audit messages and view them when displayed on an ADS/ADX. You can also define customized annotations and add these custom annotations to audit messages.

For sites with MVE installed, configure the following attributes in the [Site Object](#):

- Annotation Include
- Annotation Exclude
- Signature Include
- Signature Exclude

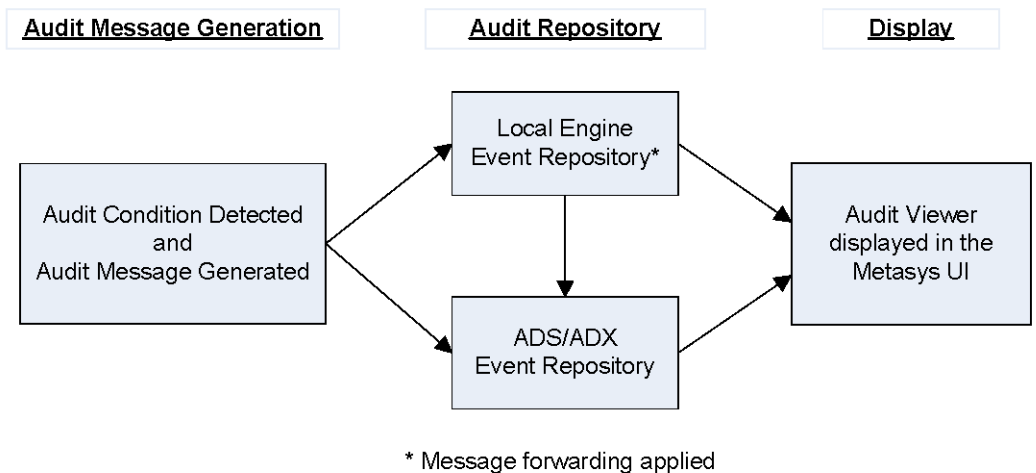
These settings are used by MVE sites to enable the MVE desired annotations and electronic signature for audit messages. You can apply these settings at the site level or down to the object level as needed. You can set the MVE site to require only annotations, only electronic signatures, both annotations and signatures, or neither annotations nor signatures. Non-MVE sites may optionally define and use annotations; however, electronic signatures are specific to MVE sites.

When both annotations and signatures are required, and a user acknowledges or discards an audit message, they are prompted to reauthenticate and enter a reason and annotation for the action. The user's logon name, date and time of signature, and the reason for signature are saved as part of the annotation. You cannot delete annotations on an MVE site.

See [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) in the [Site Management Portal User Interface](#) section. For additional information, refer to the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

[Figure 42](#) shows the flow of audit messages through the Metasys system.

**Figure 42: Audit Message Process**



### Audited Events

Audited events are significant events occurring in the system that trigger the Audit Trail feature to generate an *audit message*. The following table lists the features and corresponding actions that initiate the generation of audit messages. The following table also lists Audit Classes (Set 568) in which the actions belong. Click the feature name for more information about that feature.

**Note:** Do not confuse audited events with those associated with alarming. See *Alarm and Event Management* for details on alarming.

**Table 92: Audited Events**

Feature	Action Causing Audit Message
<a href="#">ActionQ</a>	each command issued, enabled, disabled, or deleted (Audit Class = User Action)
<b>Alarm and Event Management</b>	<p>By default, the ADS/ADX does not create an audit entry when you discard an event that originates on the ADS/ADX via the Alarms Window, Event Viewer, or via a BACnet device (Audit Class = User Action). To capture audit entries for these events would create an undue number of entries in the database.</p> <p><b>Note:</b> Engines do not create an audit entry when you discard events that originate on the engine. For details on changing this setting, refer to <i>Creating Audit Entries for Discarded Events</i> in the <i>NAE Commissioning Guide (LIT-1201519)</i>.</p> <p><b>Note:</b> Error messages returned by the Email DDA logged in the Audit Viewer appear in English only.</p>
<a href="#">Audit Trail</a>	<ul style="list-style-type: none"> <li>each command issued to clear the Audit Repository. See <a href="#">Clearing the Audit Repository</a>. (Audit Class = User Action)</li> <li>each command issued to discard an audit message or a group of audit messages (Audit Class = User Action)</li> <li>each command issued to change the Enabled Audit Level attribute in the <a href="#">Engine Device Object</a> or <a href="#">ADS Device Object</a> based on a system event, a user changing the time of day, or a user command</li> </ul> <p>See <a href="#">Configuring the Engine Audit Repository</a>. (Audit Class = User Action, Non-critical System Event, Critical System Event, Application, or Diagnostic)</p>
<a href="#">Diagnostics</a>	each errorlog listing problems with your Metasys system such as detected software or configuration errors (Audit Class = Diagnostic)

**Table 92: Audited Events**

Feature	Action Causing Audit Message
<a href="#">Trend Extensions</a> <a href="#">Trend Studies</a>	<ul style="list-style-type: none"> <li>each new trend extension created (Audit Class = User Action)</li> <li>each change to the trend routing configuration (Audit Class = User Action)</li> <li>each command issued to the trend extension (Audit Class = User Action)</li> <li>each change to trend views such as creating, deleting, or editing a trend view (Audit Class = User Action)</li> <li>each change to the Engine and ADS/ADX configuration (Audit Class = User Action)</li> </ul>
<a href="#">Scheduling</a>	<ul style="list-style-type: none"> <li>each item added to or removed from the schedule (Audit Class = User Action)</li> <li>each change to the key item or its scheduled attribute (Audit Class = User Action)</li> <li>each change to the effective period (Audit Class = User Action)</li> <li>each time the schedule is enabled or disabled (Audit Class = User Action or Application)</li> </ul>
<b>System Security</b>	<ul style="list-style-type: none"> <li>each successful and failed log on and log off attempt (Audit Class = User Action)</li> <li>each administrative action (Audit Class = User Action)</li> <li>each authentication failure (Audit Class = Application)</li> <li>each authorization failure (Audit Class = Application)</li> </ul>
<a href="#">User Graphics Tool (UGT)</a>	each command (Audit Class = User Action)
<b>Navigation Tree and Other Features</b>	<ul style="list-style-type: none"> <li>each user command (Audit Class = User Action)</li> <li>each change in item configuration such as adding, deleting, and editing an item (Audit Class = User Action)</li> <li>each controller upload, download, synchronization, and reset occurring in online mode. Audit messages are not generated for those actions in the SCT offline <i>mode</i>. (Audit Class = User Action, Application, Non-critical System Event, Critical System Event)</li> </ul>

## Audit Repositories

The following table describes the two types of audit repositories for storing audit messages in the Metasys system.

**Table 93: Audit Repositories**

Type	Description
<b>Local (Engine) Audit Repository</b>	<ul style="list-style-type: none"> <li>Provides temporary storage for audit messages on the Engine.</li> <li>Allows the audit messages stored in the Engine local audit repository to be displayed in the Audit Viewer.</li> <li>Forwards audit messages from the Engine local audit repository to the Default Destination. See <a href="#">Default Destination and Message Forwarding</a>.</li> </ul>
<b>ADS (ADX) Audit Repository</b>	<ul style="list-style-type: none"> <li>Provides permanent storage for audit messages on the ADS/ADX platform.</li> <li>Places audit messages generated on an ADS/ADX platform directly into the ADS (ADX) audit repository.</li> <li>Receives audit messages from multiple Engine local audit repositories and provides permanent storage for the audit messages. The ADS (ADX) audit repository is usually defined as the <i>default destination</i> for audit messages from Engine local audit repositories.</li> <li>Allows the audit messages stored in the ADS (ADX) audit repository to be displayed in the Audit Viewer.</li> </ul>

For information on configuring the Engine local audit repository and the default destination, click one of the following:

- [Configuring the Engine Audit Repository](#)
- [Forwarding Audit Messages to the Default Destination](#)

A Database Timeout Error can occur when viewing audit messages if the repository contains too many unfiltered audit messages before the system times out (typically, one million messages). To prevent this error, back-up and purge audit message records from the repository (JCIAuditTrails) using the Metasys Database Manager on a regular basis.

## Default Destination and Message Forwarding

The Default Destination defines where audit messages are sent when the Engine local audit repository is full, at a user-defined time (*ADS Delivery Time* attribute of Engine device), or when a user clicks the Forward Messages button in the Audit Viewer. Configure an ADS (ADX) Audit Repository as the Default Destination to permanently store audit messages. For information on how to define a default destination, see [Configuring the Engine Audit Repository](#).

When the *Audit Forwarding Threshold* is reached, all non-forwarded audits in the Local Audit Repository are forwarded to the defined ADS Repository.

To generate an alarm message when a Rollover or Stop condition occurs, set the *Audit Generate Alarm When Full* attribute in the Engine device to True. See [Configuring the Engine Audit Repository](#) and [Audit Repositories](#).

You can forward audit messages to the Default Destination from the Engine local audit repository by clicking the Forward Messages button in the Audit Viewer. See [Forwarding Audit Messages to the Default Destination](#).

**Note:** You cannot forward audit messages from an ADS (ADX) audit repository to another ADS (ADX) audit repository.

**Note:** You can define only one ADS (ADX) audit repository as the Default Destination for messages from an Engine local audit repository; however, different Engines can have different ADS (ADX) repositories defined as their Default Destination.

If you have not defined a Default Destination when the Engine local audit repository is 100% full, the local audit repository either replaces the oldest messages (rollover) with new messages or stops recording audits according to the *Audit Action When Full* attribute configuration.

Audit message rollover begins or replacement stops only when the total number of non-forwarded audit messages reaches the size defined by the *Audit Repository Size* attribute. In other words, once the local audit repository reaches the defined size, new audit messages continue to enter the local audit repository replacing forwarded messages until all forwarded messages are gone. The following figure illustrates the Audit Action When Full when set to Rollover or when set to Stop.

**Figure 43: Audit Action When Full**

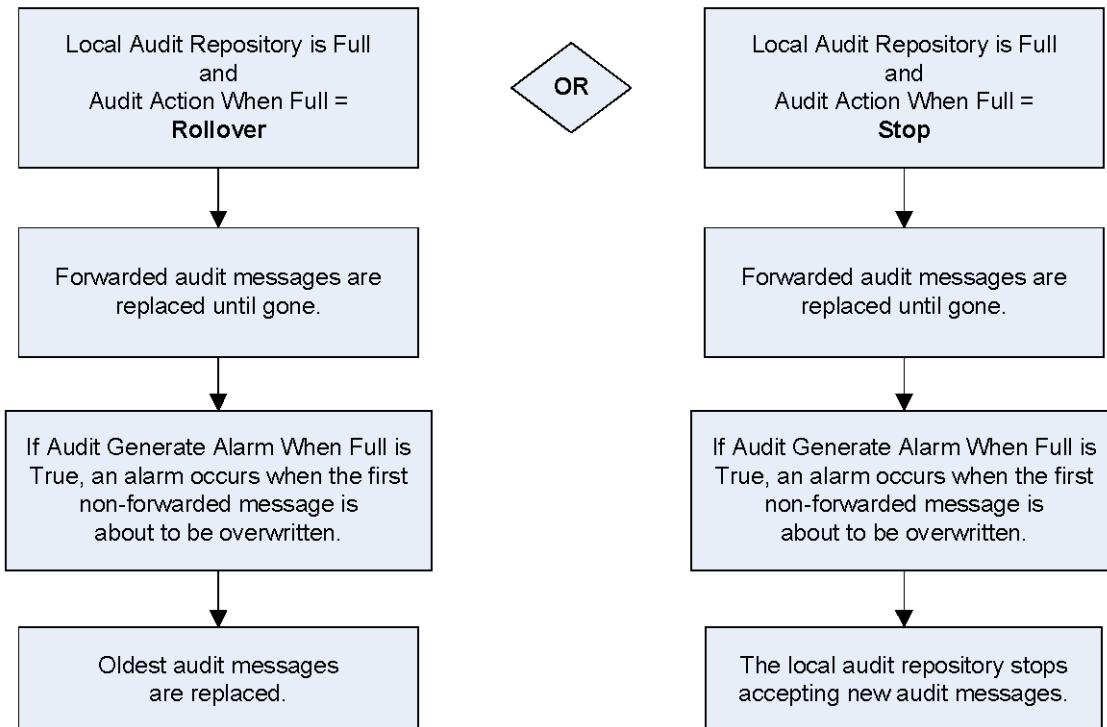


FIG. Audit Action When Full/Stop

If you have defined a Default Destination, the [Audit Forwarding Threshold](#) attribute is set to any percentage other than 100%, and the Audit Action When Full attribute is set to Stop; also the audit messages do not stop rolling over as long as forwarding is successful. This situation occurs because audit messages are forwarded to the Default Destination when new audit messages are received, and the forwarded messages are automatically replaced. The local audit repository does not fill up with non-forwarded audit messages and, therefore, no alarm is generated.

## Audit Message and Audit Viewer

The Audit Trail feature generates a new audit message for each significant event occurring on the system that contains data associated with the event. See [Audited Events](#). The Audit Viewer displays the audit messages residing in the [Audit Repositories](#) of the currently selected device and is accessible from the [View Menu](#) of the Metasys user interface in online [mode](#). The window displays 1,000 audit messages per page for an ADS/ADX, other engines are limited to a maximum of 500 audit messages per page. See [Launching the Audit Viewer](#).

You can only view the audit messages from one audit repository of one device at a time:

- If you are viewing the contents of an Engine local audit repository, the audit messages displayed come from that Engine only.
- If you are viewing the contents of a Engine local audit repository of an Engine device designated as the Site Director, the audit messages displayed come from that Engine local audit repository only.
- If you are viewing the contents of an ADS (ADX) audit repository, the audit messages displayed come from that ADS (ADX) audit repository only. An ADS (ADX) audit repository may contain audit messages that have been routed from other Engine or ADS/ADX devices, but the repository does not display the contents of multiple repositories.

**Note:** You can define an audit repository as a Default Destination, so it receives audit messages from other audit repositories. See [Default Destination and Message Forwarding](#).

When viewing an ADS/ADX device, a standard filter is applied to the Audit Viewer when it is first opened. This filter allows you to see all audit messages.






Custom filters can also be used when viewing the ADS/ADX device to narrow the list of audit messages to only those that meet specific criteria. Custom filters query the entire ADS/ADX database, not just the list of audit messages that appears on the screen. You can filter audit messages by any combination of Date/Time, User, Class Level, Action Type, and/or Discarded. New audit messages appear in the list only if they meet all criteria specified in the filter. Custom filters cannot be saved.

The following table describes the format of the audit message (and corresponding buttons and fields) as displayed in the Audit Viewer.


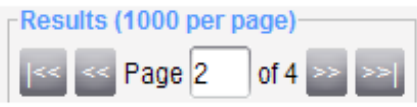
**Table 94: Audit Viewer**

Item/Column	Description
<b>Selected Device</b>	Indicates the device for which the Audit Viewer is displayed. The device name appears on the left side of the Audit Viewer above the table.  This field corresponds to the selection made in the Device Selection Dialog box. See <a href="#">Launching the Audit Viewer</a> .
<b>Audit Count (Engines Only)</b>	Indicates the number of audit messages that currently appear in the Audit Viewer. The Audit Count appears on the right side of the Audit Viewer above the table only for Engine devices.
<b>Standard Filter Radio Button (ADS/ADX Only)</b>	Indicates that standard filtering is applied to the Audit Viewer for the selected ADS/ADX. This filter information appears on the right side of the Audit Viewer above the table. The count of entries that apply to this filter appears in parenthesis next to the radio button.
<b>Custom Filter Radio Button (ADS/ADX Only)</b>	Indicates that custom filtering is applied to the Audit Viewer for the selected ADS/ADX. This filter information appears on the right side of the Audit Viewer above the table. The count of entries that apply to this filter appears in parenthesis next to the radio button.

**Table 94: Audit Viewer**

Item/Column	Description
<b>Custom Filter Table (ADS/ADX Only)</b>	<p>Allows you to apply custom filtering to the Audit Viewer when the Custom Filter radio button is selected. This table appears but is not active when the Standard Filter radio button is selected. You may need to adjust the slider bar to show the Custom Filter table.</p> <p>The buttons for this table are:</p> <ul style="list-style-type: none"> <li>•  - adds a filter using the Add Filter dialog box</li> <li>•  - removes the selected filter</li> <li>• Apply - queries the ADS/ADX database and displays the resultant audit messages</li> </ul> <p>See <a href="#">Creating a Custom Filter within the Audit Viewer (ADS/ADX Only)</a>.</p>
<b>Status Icons</b>	<p>Displays an icon indicating the status of the audit message:</p> <ul style="list-style-type: none"> <li>★ - audit message is new (that is, the message has occurred in the system within the new entry timeframe)</li> </ul> <p><b>Note:</b> See <a href="#">Display Settings Tab</a> in the <a href="#">Preferences</a> section for information on changing the amount of time audit messages are considered new using the New entry time frame preference (default value = 15 minutes).</p> <ul style="list-style-type: none"> <li> - audit message has one <a href="#">annotation</a></li> <li> - audit message has more than one annotation</li> <li> - audit message has an electronic signature</li> </ul>
<b>When</b>	<p>Displays the date and time that the audit message was generated. The date and time format is defined by the Language selected in the User Profile (User Profile tab section of the Security Administrator System).</p>
<b>Item</b>	<p>Displays the name of the item that generated the audit message. An item name is the label displayed for the selected item in the All Items navigation tree (for example, AV1, NAE2, or Schedule1). Be sure you define unique item names.</p>
<b>Class Level</b>	<p>Indicates the class in which the audit message belongs. For more information on Class Level, see the Enabled Audit Level attribute in the <a href="#">Engine Device Object</a> or <a href="#">ADS Device Object</a>.</p>
<b>Origin Application</b>	<p>Indicates the application that performed the action that generated the audit message. For example, the origin application may be the Alarm and Event, Trend, or Security feature.</p>
<b>User</b>	<p>Indicates the user associated with the action that initiated the audit message (for example, the person who changed a setpoint).</p>
<b>Action Type</b>	<p>Indicates the type of action that initiated the audit message.</p>
<b>Description</b>	<p>Provides the description of the action that generated the audit message. For example, Enabled appears in this column if you send an Enable command to an item. The description appearing in this column comes from the State, Mode, and Type Sets associated with the time that generated the audit message.</p> <p><b>Note:</b> If the Class Level is Non-Critical System Error or Diagnostics and the Action Type is Error, then the associated error string appears. If the Action Type is Command and there is no further definition of the type of command (for example, Operator Override, Adjust, etc.), then Description will show the value of the new command (for example, On or Off).</p>
<b>Previous Value</b>	<p>Indicates the value and engineering units, if applicable, of the item before performing the action that generated the audit message.</p>

**Table 94: Audit Viewer**

Item/Column	Description
<b>Post Value</b>	Indicates the value and engineering units, if applicable, of the item after performing the action that generated the audit message.  <b>Note:</b> If the Action Type is Command and there is no further definition of the type of command (for example, Operator Override, Adjust, etc.), then the actual post value will be shown in the Description column. If the Description is a User Login Successful or Failed, then the Post Value will show the IP address of the client PC from which the login attempt was made.
<b>Status</b>	Indicates the status of the item at the time the audit message was generated.
	Specifies the column of data used to sort the audit messages in the current Audit Viewer (ascending or descending order).
<b>Paging Controls (ADS/ADX Only)</b>	Allows you to navigate through the pages of audit messages in the Audit Viewer. Use the buttons to go to the first page, previous page, next page, or last page. Type a page number in the text box and press the enter key to jump directly to a specific page.  
<b>Forward Messages Button</b>	Sends audit messages from the Engine local audit repository to the Default Destination. See <a href="#">Forwarding Audit Messages to the Default Destination</a> .
<b>Discard Button</b>	Removes the selected audit messages from the Audit Viewer. See <a href="#">Discarding Audit Messages</a> .
<b>Copy Button</b>	Copies the selected audit messages to the Clipboard for pasting into other applications such as Microsoft Excel or Word.  When you click this button with nothing selected in the audit viewer, all entries are copied to the clipboard.  <b>Note:</b> You can also use Ctrl A to select all entries and Ctrl C to copy to the clipboard.

### Audit Message Annotations

An annotation is a textual string associated with an [audit message](#). You can view or add annotations from the ADS (ADX) audit repository only. You cannot edit an existing annotation. Instead, add a new annotation to the audit message. You can also define custom annotations. See [Adding Annotations](#), [Viewing Annotations](#), and [Creating Annotations](#).


**Note:** The annotation feature is not available on the Engine local audit repository.

The following table describes the fields of an annotation.

**Table 95: Audit Message Annotations**

Field	Description
<b>User</b>	When adding annotations, indicates the user ID of the person associated with the action that generated the audit message.  When viewing annotations, the first User field displayed indicates the user ID of the person associated with the action that generated the audit message. The User field displayed under the Annotation Information section indicates the user ID of the person that added the annotation.
<b>Date and Time</b>	When adding annotations, indicates the date and time the audit message was generated.  When viewing annotations, the first Date and Time field displayed indicates the date and time the audit message was generated. The Date and Time field displayed under the Annotation Information section indicates the date and time the annotation was added to the audit message. The date and time format is defined by the language selected in the User Profile (User Profile tab section of the Security Administrator System).
<b>Item Reference</b>	Indicates the complete Item Reference of the item associated with the audit message.

**Table 95: Audit Message Annotations**

Field	Description
<b>Description</b>	Provides the description of the action that generated the audit message. For example, Enabled appears in this field if you send an Enable command to an item. The descriptions come from the State, Mode, and Type Sets associated with the item that generated the audit message. <b>Note:</b> If the Class level is Non-Critical System Error or Diagnostics and the Action Type is Error, then an associated error string appears.
<b>Annotation</b>	Allows you to select from a list of predefined annotations or add or view a text string (annotation) of up to 254 characters describing the associated audit message.
<b>Navigation Controls</b>	<p>If the audit message has multiple annotations associated with it, allows you to navigate through the annotations. Use the buttons to go to the first annotation, previous annotation, next annotation, or last annotation.</p> <p>The text box displays the number of the annotation being viewed. The Annotations feature automatically assigns a number to each annotation created. For example, if the audit message has three annotations, the number being displayed in this section can be 1, 2, or 3 depending on the annotation being viewed. Type a number in the text box and press the enter key to jump directly to a specific annotation.</p> 

## Audit Trail Steps

### Configuring the Engine Audit Repository

To configure the Engine Audit Repository and the Default Destination:

1. View the desired Engine device. See [Displaying Information About an Item](#) for information on how to display an item.
2. Select the Focus tab, and click the Advanced radio button to display additional item information.
3. Select Edit.
4. Scroll down to the Audit Trail and Site sections.
5. Edit the attributes in these sections as desired. Use the table below as a guide. See the [Engine Device Object](#) chapter for information about the attributes. The Engine Device attributes table contains Default Value and Values/Options/Range information for the attributes. Click the attribute names in the table for descriptions.

**Table 96: Configuring the Engine Audit Repository**

To Do This:	Edit This Engine Attribute:
Change the size of the Engine local audit repository.	<a href="#">Audit Repository Size</a>
Designate an ADS/ADX repository as a Default Destination.	<a href="#">ADS Repository</a>
Define a time to deliver audit messages to the ADS/ADX.	<a href="#">ADS Delivery Time</a>
Define how full the audit repository must be before forwarding audit messages to the ADS/ADX.	<a href="#">Audit Forwarding Threshold</a>
Define if the Audit Trail feature overwrites existing audit messages or stops generating audit messages when the audit repository is full. <sup>1</sup>	<a href="#">Audit Action When Full</a>
Define if the Audit Trail feature should generate an alarm when the audit repository is full.	<a href="#">Audit Generate Alarm When Full</a>
Define which level of audit messages get added to the audit repository.	<a href="#">Enabled Audit Level</a>

<sup>1</sup> This action is only valid when the device is not set to forward data to an ADS/ADX. The stop/rollover option only applies when there is no forwarding to an external repository.

**Note:** You can define only one repository as the [Default Destination](#) for audit messages from an Engine audit repository. See [Audit Repositories](#) for more information.



6. Click Save.

**Note:** If you want to define all Engine local repositories for the entire site instead of individually, select the Site in the navigation tree and edit the following *Site Object* attributes. The Site object attributes table contains Default Value and Values/Options/Range information for the following attributes:

- [Default ADS Repository](#)
- [Default ADS Delivery Time](#)

## Launching the Audit Viewer

1. Select Audit Viewer from the [View Menu](#). If you have more than one Engine or ADS/ADX on the site, a Device Selection Dialog box appears.
2. Select the device containing the audit repository with the audit messages that you want to display in the Audit Viewer.
3. Click OK. The Audit Viewer appears in the display frame and displays the audit messages from the audit repository of the selected device. See [for details](#).

**Note:** Alternatively, you can right-click the desired device in the navigation frame and select Audit Viewer from the menu that appears.

## Adding Annotations

**Note:** You can add annotations from the ADS/ADX device only. Annotations are not forwarded between ADS/ADXs.

1. [Launch the Audit Viewer](#) by selecting the desired ADS/ADX from the Device Selection Dialog box.
2. Right-click the audit message, and select Add Annotation from the menu. Alternatively, you can select Add Annotation from the Actions menu. The Add Annotation dialog box appears.

**Note:** The drop-down list on the Add Annotation dialog box contains predefined annotations from your system preferences. If you have not defined annotations in your system preferences, the drop-down list is empty. See [Annotation Settings Tab](#) in [Preferences](#).

3. Type the desired text in the message box.
4. Click OK.

## Viewing Annotations

**Note:** You can view annotations from the ADS/ADX device only.

To view annotations:

1. [Launch the Audit Viewer](#) by selecting the desired ADS/ADX from the Device Selection dialog box.
2. Double-click the annotation *icon* in the first column of the Audit Viewer for the desired audit message. The View Annotations dialog box appears.

**Note:** To indicate that an audit message was electronically signed, a signed book icon appears in the first column of the Audit Viewer on a validated ADX on an MVE system.

**Note:** Alternatively, you can select View Annotations from the Actions menu or right-click the audit message and select View Annotations from the menu.

3. View the message.
4. Click OK.

## Creating Annotations

1. Select the Annotation Settings tab on the Metasys Preferences screen.
2. Enter annotation text. The text can be from 1 to 254 characters in length.
3. Click Add to save the annotation settings.

**Note:** The annotations you create appear in the drop-down list on the Add Annotations dialog box. If you do not create any annotations, this list is blank.

## Sorting the Audit Message List

1. [Launch the Audit Viewer.](#)
2. Click the header of the column in which you want to use as the sorting criteria. An up or down arrow appears in the header of the column. Click on the arrow to change the sorting order, and the table reorganizes.

## Creating a Custom Filter within the Audit Viewer (ADS/ADX Only)

1. [Launch the Audit Viewer.](#)
2. Click the Custom Filter radio button.
3. Click the Add button.
4. Select the criteria and the associated values for the filter and click OK. All criteria added to the custom filter table make up the rules of the filter.
5. Click Apply to get the results of the custom filter.
6. To view the data without the custom filter, click the Standard Filter radio button.

## Clearing the Audit Repository

1. [Launch the Audit Viewer](#) by selecting the desired Engine or ADS/ADX from the Device Selection Dialog box.
2. Click anywhere in the Audit Viewer.
3. Click Clear. All audit messages stored in that Audit Repository are cleared.

**Note:** If you want to permanently store audit messages, click the Forward Messages button before clicking Clear.

**Note:** For a validated ADX on an MVE system, an electronic signature with annotation is required before clearing the audit repository.

## Discarding Audit Messages

1. [Launch the Audit Viewer.](#)
2. Select one or more audit messages.

**Note:** For a validated ADX on an MVE system, an electronic signature with annotation is required before discarding an audit message.

3. Click Discard.

**Note:** When you discard audit messages from the repository, they are not automatically discarded from the originating device.

## Forwarding Audit Messages to the Default Destination

1. [Launch the Audit Viewer.](#)
2. Click Forward Messages. The messages are forwarded from the local audit repository to the defined Default Destination.

## Launching the Focus View of the Item That Generated the Audit Message

1. [Launch the Audit Viewer.](#)
2. Select an audit message and choose Selected Item from the View menu.

**Note:** Some items, such as site level items, do not support this option because they do not have viewable information.

# Scheduling

The scheduling feature allows you to automate routine functions such as changing the operating mode of a room from occupied to unoccupied for heating or cooling needs and helping perform *Energy Optimization* strategies. Each schedule consists of a list of weekly scheduled events as well as a list of exception events. Each event consists of a value to write to a list of Scheduled Items at a particular time. The event by default ends at midnight unless ended earlier. The scheduling feature's user interface provides a graphical view for configuring the schedule and displaying when events are scheduled to occur.

## Scheduling Concepts

### Calendar

The *Calendar Object* resides in an Engine or FAC and is the internal basis for the calendar functionality of the scheduling feature. *Create a Calendar* and use it to define a list of holidays or special events that can be used in multiple schedule objects to define different events that need to occur. The schedule executes an exception schedule based on the list of dates defined in the calendar. For example, use a calendar to define different building operations on days such as holidays when the building is not occupied.








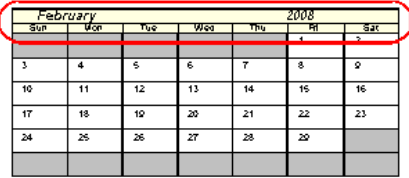
A *schedule* can reference calendars on any Engine or FAC on the site.

Use the calendar feature to:

- *create new calendars*
- **Note:** You cannot create a new Calendar in a FAC from SMP or CCT.
- edit existing calendars
- *copy and paste* a calendar to another device or item (offline mode), only in the NAE
- *toggle* the calendar view between a graphical, one-month view or 12-month view
- *enable or disable* a calendar
- *reference a global calendar*

The following table describes the functions of the Calendar View's buttons.

**Table 97: Calendar Button Functions**

Button	Function
	Opens Edit mode
	Shows the Date, Date Range, and Week and Day details of the calendar entries and allows you to create new entries or edit existing entries when in Edit mode.
 	Increases or decreases the currently displayed year by one year.
 	Increases or decreases the currently displayed month by one month.
	Returns the display to the current month.
	Toggles the calendar display between the 1-month view and 12-month view.

## Schedule

The *Schedule Object* resides in an Engine or FAC and is the internal basis for the Scheduling feature. [Create a Schedule](#) and use the Scheduling feature to define the items and times when the Schedule writes values to the referenced attributes of the *Scheduled Items*. Each schedule includes the following:

- a view of today's schedule that shows what actions the schedule is currently configured to perform today, including the Default Schedule Command. This view is not available in the SCT.
- a *weekly schedule* that uses events for each day (Monday through Sunday) to configure the times when the Schedule writes values to its referenced attributes (Scheduled Items)
- an *exception schedule* that uses events to configure exceptions to the weekly schedule (optional)
- a list of items that the schedule controls (referenced by the schedule, called *Scheduled Items*) (optional)
- an *effective period* that optionally allows you to activate/inactivate the schedule for a selected period of time

Use the scheduling feature to:



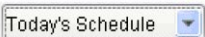
- [create new schedules](#)

**Note:** You cannot create a new Schedule in a FAC from SMP or CCT.

- edit existing schedules
- [add references to items for scheduling](#) to a schedule using a navigation tree of the site
- [delete references to items for scheduling](#) from a schedule
- [copy and paste](#) a schedule to another device or item (offline mode), only in Engines
- [enable or disable](#) a schedule, not in FAC
- [change the effective period](#) of a Schedule
- provide day/time inputs within control logic

The following tables describe the functions of the Schedule View's buttons and attributes and right-click menu.

**Table 98: Schedule Button Functions**

Button	Function
	Opens Edit mode
<b>Effective Period attribute</b>	Click the  button to open the Effective Period dialog box which allows you to specify the Effective Period. Wildcards (any) are also available options for Month, Day, Year or Day of Week fields.
<b>Schedule Output Type</b>	Binary, Analog, Multistate, Derived from Key Item - each of these choices will bring up unique choices in the Default Schedule Command and State Text Fields.
<b>Default Schedule Command</b>	Binary: Release option or a choice of Off and On Analog: Release option or a choice to input number Multistate: Release option or a choice of State 0 to State 31 Derived from Key Item: Release option or a choice of Off and On <b>Note:</b> If the Default Schedule Command is set to Release, the scheduling feature's control over the scheduled items ends. Release should only be used for the Default Schedule Command if the scheduled items support the Release command.
<b>States Text</b>	Lists the available states and allows you to specify the state of the selected event which are unique for each Schedule Output Type.
<b>Display Mode</b> 	Allows you to toggle between views: Today's Schedule, Weekly Schedule, Exception Schedule or Scheduled Items

**Table 99: Schedule Right-click Menu<sup>1</sup>**

Menu Option	Description
<b>Display Mode - Weekly Schedule</b>	
<b>Binary</b>	The States Text commands what the right-click menu will be. For example, toggle between Off-On, Off-Reset, Absent-Present, Active-Inactive, Alarm-Normal.
<b>Add Event(s)</b>	Opens the Add Event dialog box and allows you to add an event to the schedule.
<b>End Event</b>	Allows you to specify an event end time. The end time corresponds to the location of your mouse cursor when you opened the menu. Drag the end of the event to adjust the end time.
<b>Analog</b>	Right-click and choose between Add New Event or Modify Selected Event(s). Define New Event(s) allows you to add (Day, Days, Hours, Minutes and Value). Modify Events allows you to modify (Hours, Minutes and Value).
<b>Add Event(s)</b>	Opens the Add Event dialog box and allows you to add an event to the schedule.
<b>End Event</b>	Allows you to specify an event end time. The end time corresponds to the location of your mouse cursor when you opened the menu. Drag the end of the event to adjust the end time.
<b>Multistate</b>	The States Text commands what the right-click menu will be. For example, toggles between Not Operating, Normal Start, Heating, Cooling, Fan Only or Minimum DAT Control.
<b>Modify Selected Event(s)</b>	Opens the Modify Event dialog box and allows you change the times and value of the selected event. You can also double-click an event to access the Modify Event dialog box.
<b>Delete Selected Event(s)</b>	Deletes the selected event.
<b>Display Mode - Scheduled Items</b>	
<b>All Scheduled Output Types</b>	Choose between Key Data Type or Remove Item.

<sup>1</sup> This menu is accessible only when Edit mode is used.

### **Today's Schedule**

The scheduling feature includes a view called Today's Schedule. Today's Schedule is a read-only view that shows the schedule timeline for the current day. The timeline displays the projected schedule output that is written to the scheduled objects for the current day, combining the default Schedule Command with events from both the Weekly Schedule and Exception Schedule. Today's Schedule also displays a table of times and values, which details the changes in the schedule's output for the current day.

### **Weekly Schedule**

The scheduling feature has a weekly schedule that provides a schedule for each day of the week, Monday through Sunday. Each daily schedule begins at 00:00 and ends at midnight (the display reads 23:59). Each day consists of events that initiate the writing of values to the referenced attributes of the scheduled items based on the day of the week. For example, you can schedule a fan to start at 7:00 and stop at 22:00 on Mondays.

To edit the weekly schedule, double click or right-click on the weekly schedule. Right-click brings up the context menu (see [Table 99](#)).

### **Exception Schedule**

The exception schedule provides a list of exceptions to the [weekly schedule](#). Exceptions define a different set of events that supersede the events for particular days in the weekly schedule. An exception can be defined for a date, a date range, a week of the month and day of the week (week and day), or a reference to a Calendar. The following table contains information on the four types of exceptions. Wild cards can also be used to define exceptions; refer to [Wildcards](#) for more information.

**Table 100: Exception Types**

Exception Type	Description
<b>Date</b>	Occurs on a specific date.
<b>Date Range</b>	Occurs during a range of dates.
<b>Week and Day</b>	Occurs on certain weekdays during certain weeks of certain months. For example, the second Tuesday in any month or any Wednesday in June.
<b>Calendar Reference</b>	Occurs during all dates selected in the referenced <a href="#">calendar</a> . Associating an exception with a calendar allows you to reference a large number of dates.

**Note:** The N1 exception schedule only supports the Date exception (for example, to schedule the same exception 3 days in a row using an N1 Exception schedule requires the use of three separate date exception entries). Date range, week and day, and calendar reference exceptions are not supported.

Each exception can have one or more events that run during the exception time period. Recall the example in the [Schedule](#) topic where you scheduled a fan to start at 7:00 and stop at 22:00 on all Mondays. You can create a date type exception to this weekly schedule if you want the fan to start and stop at different times on a certain day. For example, you can create an exception for Monday, May 26, and define an Off event at the start of the day (00:00), an On event at 9:00 in the morning (instead of 7:00), and another Off event at 17:00 in the evening (instead of 22:00).

You can assign a **precedence** level (1–16, where 1 receives the highest precedence) to each exception, regardless of type, to determine the order of execution. If you define two or more exceptions for the same date, the exception with the highest precedence executes. For example, an exception with a precedence of 2 executes over an exception with a precedence of 8 if they are both defined for the same date.

If all exceptions for the same date have the same precedence, the exception that appears first in the exception list executes first; therefore, if you have multiple exceptions defined for one day, the exceptions apply by precedence level and then by the order of the items in the exception list.

Double clicking the exception schedule allows you to edit the exception schedule.

The JCI Exception Schedule attribute for the engine object (also an FAC mapped to an engine) allows you to set how long exception schedules are kept after the exception date has expired . The default value is Auto Delete 31 days. Two options, Auto Delete 7 days and Manual Delete are available for this attribute. See the [JCI Exception Schedule](#) attribute configuration in the [Engine Device Object](#) section for more information.

**Note:** Manual Delete is needed for locations like Japan where the local standards state that only the BACnet workstation can delete exception schedules.

## Events

An event describes the time when the scheduling feature writes user-defined values to the referenced item attributes ([Scheduled Items](#)). [Weekly schedules](#) and [exception schedules](#) use an event to define when the scheduling feature should change its output.

Each day of a weekly schedule and each exception day of an exception schedule has its own set of events. Days can have multiple events (for example, a start event and a stop event). When the time defined by an event arrives, the scheduling feature writes the value for the defined event to the referenced attribute of each item in the list of scheduled items. Unless specified to end earlier, all events end at midnight. If an event is ended before midnight, and no other events are scheduled, the scheduling feature writes the Default Schedule Command to the referenced item attributes. If the Default Schedule Command is set to Release, the scheduling feature's control over the scheduled items ends. Values are sent to the referenced attributes at priority 15.

**Note:** Release should only be used for the Default Schedule Command if the scheduled items support the Release command.

## Scheduled Items

Scheduled items are the objects/attributes that the event values are written to. A schedule can operate with an empty Scheduled Items list. The scheduling feature writes the defined value to the scheduled items at the time defined by an event. Schedules can reference any item that can be mapped into an Engine or ADS/ADX. Schedules defined in an FAC can reference items within that FAC even if not mapped to an Engine. [Adding items to a schedule](#) involves selecting the item and then selecting the attribute of the item that you want the schedule to change. At the times defined by an event, the schedule writes the defined values to the attribute (scheduled attribute) associated with each referenced item.

When there are no events active in the weekly schedule or exceptions, the schedule writes the Default Schedule Command to the referenced attributes. If the Default Schedule Command is set to Release, the schedule's control over the scheduled items ends.

**Note:** Release should only be used for the Default Schedule Command if the scheduled items support the Release command.

The table of scheduled items provides the Status Log entry for each scheduled item. The status log indicates any errors that occurred when the scheduling feature attempted to write values to the scheduled items.

A single schedule can only apply values of one data type to all items in its list of scheduled items; therefore, the first item in the Scheduled Items list becomes the key item. The key item determines the data type of the values that the schedule writes to the attributes of all scheduled items. See the following Example Scenario for a description of how scheduled items and the key item work.

### Example Scenario:

You can close a relay or switch to start a fan. If the relay is represented as a [Binary Output Object](#) in the Metasys system and you set the [Present Value](#) attribute of the Binary Output (BO) to On (1), the relay closes and starts the fan. To do this, add the BO to the Scheduled Items and then select Present Value as the scheduled attribute. See [Adding Scheduled Items](#) and the following figure.

**Figure 44: Table of Scheduled Items**

The first line is the key item.

Item Name	Scheduled Attribute
BO1	Present Value
AV1	Present Value

Suppose the BO in this scenario is the key item because it is the first item in the list of scheduled items and the Present Value attribute is the scheduled attribute. Because the Present Value attribute of a binary output has a value of 0 or 1, the schedule can only write 0 or 1 to the scheduled attributes of the items appearing below it in the list.

Suppose you add an [Analog Value Object](#) below the BO and select the [Present Value](#) attribute of the Analog Value (AV) as the scheduled attribute. Even though the Present Value attribute of an AV has a wide range of numeric values, only 0 (meaning Off) or 1 (meaning On) can be written to the AV attribute because the schedule writes values to all items in the list of scheduled items using the data type of the BO, which is the key item.

To change the key item, see [Editing Scheduled Events](#).

## Dates - Calendar Entry and Exception Schedule

You can use the following date formats for defining exceptions to the weekly schedules using [calendar](#) entries or [exception schedules](#):

- [Date](#)
- [Date Range](#)
- [Week and Day](#)

### **BACnet Clarification for Date Entries**

ASHRAE has published a BACnet addendum 135-2008 AC to restrict and clarify what is allowed in the format of calendar entries for single dates and range of date formats in the Calendar object and the exception schedule (the dates you do not want the Schedule to operate, such as holidays).

For a Calendar object Date entry, the entry can be either a specific date or a date pattern:

- a specific date has all fields filled with specific values, and the Day of Week should also have a specific value
- a date pattern has some of the fields with any (wildcard) present

For a Calendar object Date Range entry, the new rules restrict each part (start date and end date) to be one of the following:

- a fully specified date (all fields defined)
- a completely unspecified date (no fields defined - all fields [wildcards](#) [any])

**Note:** No partial wildcard fields for start date or end date are allowed in order to eliminate cases that could not be clearly interpreted and implemented.

**Note:** The Metasys system currently allows partial wildcard fields for start or end dates leading to unpredictable operation in some cases. You should follow the new BACnet rules and disallow these kinds of entries.

### **Date/Date Range**

You can use a single date or a range of dates when defining exceptions to weekly schedule. The following table describes the options available for defining a single date (January 1, 2010, for example) or range of dates (November 25, 2009 through November 26, 2009, for example) calendar or exception schedule entry.

**Table 101: Date/Date Range Format**

Menu	Options
Month	any, January through December, Odd (odd numbered months, 1 is January, 3 is March, and so on), Even (even numbered months, 2 is February, 4 is April, and so on)
Day	any, 1 through 31, Last (the last day of the month)
Year	any, 2006–2048
Day of Week	any, Monday through Sunday

**Tip:** If you specify a single date (that is, you define the day, month, and year), set the Day of Week to match the day of the week for the specified date. For example, November 26, 2009, is a Thursday, so you need to specify **Thursday**. If you specify Wednesday, the schedule is considered improperly configured. See [Data Consistency Checking](#).

**Note:** For exception schedule entries, you also need to define the Precedence at which the schedule executes the exception schedule.

### **Week and Day**

You can use a week and day entry when defining exceptions to the weekly schedule. The following table describes the options available for defining a week and day calendar or exception schedule entry (Saturday of the first week in May, for example). Any mixture of any ([wildcard](#)) and specified entries is allowed. Week and day entries apply to all years.



**Table 102: Week and Day Format**

Menu	Options
Month	any, January through December, Odd (odd numbered months, 1 is January, 3 is March, and so on), Even (even numbered months, 2 is February, 4 is April, and so on)
Week of Month	any 1 = Days 1 through 7 2 = Days 8 through 14 3 = Days 15 through 21 4 = Days 22 through 28 5 = Days 29 through 31 6 (Schedule object)/Last (Calendar object) = Last seven days of the month
Day of Week	any, Monday through Sunday

**Note:** For exception schedule entries, you also need to define the Precedence at which the schedule executes the exception schedule.

**Wildcards**

You can use wildcards to define specific calendar or exception schedule exceptions. Wildcards are the fields of an exception schedule or calendar entry date specified by the **any** selection. For example, an exception date of December 25, any year, and any day of week means the events defined in the exception schedule occur on December 25 of every year regardless of the events defined in the weekly schedule. To use wildcards, select **any** from the drop-down menu of the Exception Detail or Calendar Entry dialog box.

For exceptions, the wildcard part (field) of the date appears as **any** in the list of exceptions. For example, **December 25, any year Precedence 8** appears in the list of exceptions after saving the selections described in the following table for a single Date entry.

**Table 103: Schedule Wildcard Example - Single Date**

Parameter	Value
Month	December
Day	25
Year	any
Day of Week	any
Precedence	8

For calendars, the wildcard part (field) of the date appears as **any** in the calendar entries list. For example, **Month = February, Day = 2, Year = any** appears in the calendar entries list after saving the selections described in the following table for a single Date entry.

**Table 104: Calendar Wildcard Example - Single Date**

Parameter	Value
Month	February
Day	2
Year	any
Day of Week	any

You can use wildcards for the following types of exceptions and calendar entries:

- [Date](#)
- [Date Range](#)
- [Week and Day](#)

**Wildcards - Date**

For a single date, a *wildcard* opens a particular field to the full range of possible values for that field. The following table describes the meaning for each type of unspecified wildcard date field.

**Table 105: Unspecified Wildcard Date Field Meanings**

Unspecified Field	Meaning
Month	Every month
Day of Month	Every day of the month, unless a particular day of the week is specified by the Day of Week field
Year	Every year
Day of Week	Every day of the week, unless a particular day of the month is specified by the Day of Month field

The following table shows some sample wildcard dates and their meanings.

**Table 106: Sample Wildcard Date Meanings**

Month	Day of Month	Year	Day of Week	Meaning
any	01	any	any	The first day of every month, every year
Mar	05	any	any	March 5 of every year
Mar	05	2010	any	March 5 of 2010
Mar	any	2010	any	Every day in March 2010
any	any	any	any	Every day
any	any	any	Friday	Every Friday
any	any	2010	Friday	Every Friday in 2010
Mar	any	2010	Friday	Every Friday in March of 2010
Mar	12	2010	Friday	Only on Friday, March 12, 2010
Apr	13	any	Monday	Every April 13 that occurs on a Monday
Even	2	2010	any	The second of every even numbered month in 2010: February 2, April 2, June 2, August 2, and so on
any	last	2010	any	The last day of every month in 2010

**Wildcards - Date Range**

For a range of dates, the start date and end date can be fully specified dates (all fields defined). If the start date is a fully specified date, then the end date can be a completely unspecified date (all fields *wildcards* [any]). If the start date is a completely unspecified date (all fields *wildcards* [any]), then the end date must be a fully specified date.

The Day of Week must be set to match the day of the week for all specified dates. The following table shows some sample wildcard date ranges and their meanings.

**Table 107: Sample Wildcard Date Range Meanings**

Start Date				End Date				Meaning
Month	Day of Month	Year	Day of Week	Month	Day of Month	Year	Day of Week	
Aug	30	2012	Thursday	any	any	any	any	From Thursday, August 30, 2012 to any date
any	any	any	any	Jul	04	2012	Wednesday	Any date to Wednesday, July 4, 2012
Jan	1	2012	Sunday	April	30	2012	Monday	Sunday, January 1, 2012 to Monday, April 30, 2012

**Note:** No partial wildcard (any) fields for start date or end date are allowed in order to eliminate cases that could not be clearly interpreted and implemented. See [BACnet Clarification for Date Entries](#) section for more information.


### Wildcards - Week and Day

You can use [wildcards](#) for Week and Day entries. The Week and Day selection identifies a month, a week of the month, and a day of the week. The possible selections include **any** (every) as the week of the month, 1 (Days 1–7), 2 (Days 8–14), 3 (Days 15–21), 4 (Days 22–28), 5 (Days 29–31), and 6/Last (the Last seven days). The following table shows some sample wildcard week and day exceptions.

**Table 108: Sample Wildcard Week and Day Exceptions**

Month	Week of Month	Day of Week	Meaning
any	any	any	Every day of the year
any	1 Days 1–7	Monday	Monday of the first week of every month
Jan	any	Tuesday	Every Tuesday in January
Feb	2 Days 8–14	any	Every day of the week in the second week of February
any	any	Wednesday	Wednesday of every week of every month
Mar	any	any	Every day of every week in March
any	3 Days 15–21	any	Every day of the third week of every month
Apr	4 Days 22–28	Thursday	Thursday in the fourth week of April
any	5 Days 29–31	any	29th, 30th, and 31st (as applicable) of every month
Jun	6/Last Last seven days	Saturday	Saturday in the last seven days of June

### Effective Period

The effective period defines the active or inactive date range for a schedule (weekly and exception schedule). In Edit mode, the  button opens the Effective Period dialog box. By default, a schedule is always active.

For example, you can create two schedules with the same items/objects and configure one for the heating season and the other for the cooling season. Then you can [define the effective period](#) of the heating schedule from October through March and the cooling schedule from April through September of each year.

### Trend Scheduling

Use the Schedule feature to configure time and day periods for recording trend data for object trend extensions. In the schedule, add the trend extension to the Scheduled Items list and select the desired trend extension attribute. Make sure the trend extension is the Key Item in the Scheduled Items list. Then use the weekly schedule to define the days and times you want to record trend data for the selected object trend extension.

For more information on trend extensions and trending, see the examples below and click one of the following:

- [Extensions](#)
- [Trend Extensions](#)
- [Trend Studies](#)

For instructions on how to schedule a trend extension, see [Scheduling a Trend Extension](#).

#### Example 1:

To collect trend samples starting at 6:00 A.M. Monday through Friday and at 8:00 A.M. on Saturday and Sunday, and stopping trend collection at 8:00 P.M. on all days, configure a schedule as follows:

In the Scheduled Items list, add the desired object trend extension and select the trend extension's Log Enabled attribute as the Scheduled Attribute. Make sure the trend extension is the key item.

On the Weekly Schedule tab, set the Default Schedule Command to False and configure the event to begin and end according to the following table:

**Table 109: Example 1 - Event Configuration**

Time	Value
Monday - Friday/6:00 A.M. - 8:00 P.M. (06:00 - 20:00)	True
Saturday - Sunday/8:00 A.M. - 8:00 P.M. (08:00 - 20:00)	True

**Example 2:**

You may want to define how many trend samples are collected during specific periods of time. You can use a shorter trend sampling interval to collect more trend samples during the day when there is more activity in the building, and use a longer trend sampling interval to collect fewer trend samples at night when there is less activity in the building.

To take samples every 60 seconds from 6:00 A.M. to 6:00 P.M. Monday through Friday, every 600 seconds from 6:01 P.M. to 5:59 A.M. Monday through Friday, and every 600 seconds from 12:00 Midnight to 11:59 P.M. on Saturday and Sunday, configure a schedule as follows:

In the Scheduled Items list, add the desired object trend extension and select the trend extension's *Sample Interval* attribute as the Scheduled Attribute. Make sure the trend extension is the key item.

On the Weekly Schedule tab, set the Default Schedule Command to 600 seconds and configure the event to start and end according to the following table:

**Table 110: Example 2 - Event Configuration**

Time	Value
Monday - Friday/6:00 A.M. - 6:00 P.M. (06:00 - 18:00)	60 (seconds)

**Fast Clock**

A device (true for FAC devices as well) containing schedules activates the fast clock feature when the current date and time are changed in the device, the device restarts following a power failure or reset, or the device is put into simulation mode. The fast clock feature ensures the schedule and its associated scheduled items are in the correct state based on day and time of the device.

The fast clock evaluates the events scheduled for the current day from midnight to the current time, to find the last scheduled time and value for the current day. If the fast clock does not find any scheduled events, then the value associated with the latest time for the current day is used. Then the fast clock writes this value to all scheduled attributes of all items referenced by the schedule's list of *scheduled items*.

**Data Consistency Checking**

The exception schedule or calendar verifies the existence of exception and calendar dates and that the start date of a date range occurs earlier than the end date for schedules and calendars **when**:

Exception and calendar dates have all four fields defined and do not use wildcards (Month, Day of Month, Year, and Day of Week). For example, if you entered Monday, January 10, 2010, in the Exception Detail or Calendar Entry Detail dialog box, a warning message appears because January 10, 2010, is not a Monday.

Exception and calendar dates have Month, Day of Month, and Year defined and use a wildcard for the Day of Week field. For example, if you entered February 29, 2010, and **any** in the Day of Week field of the Exception Detail or Calendar Entry Detail dialog box, a warning message appears because there is no 29th day in February, 2010.

Exception and calendar date ranges have all fields of both the start and end dates defined. For example, if you entered a start date of Tuesday, July 2, 2010, and an end date of Monday, July 6, 2010, in the Exception Detail or Calendar Entry Detail dialog box, a warning message appears because July 2, 2010, is not a Tuesday.

Exception and calendar date ranges have Month, Day of Month, and Year defined and use a wildcard for the Day of Week field for both the start and end dates. For example, if you entered a start date of August 27, 2010, and **any** in the Day of Week field, and an end date of August 6, 2010, and **any** in the Day of Week field in the Exception Detail or Calendar Entry Detail dialog box, a warning message appears because the end date occurs before the start date.

Because the *Schedule* can reference *Calendars* residing in another device, the scheduling feature performs the following calendar reference verification:

If a schedule references a calendar in another device and that device goes offline, the schedule assumes that while the device is offline, the calendar's Present Value does not change. For example, a schedule residing on NAE1 refers to a calendar residing on NAE2 and the *Calendar Object's* Present Value attribute is True; however, if NAE2 is offline at midnight, the schedule assumes the calendar's Present Value changes to False at midnight. This means that the exception schedule is not active.

If a schedule refers to a calendar and that calendar is deleted, the schedule assumes the Calendar object Present Value is False and the exception schedule is not active.

When the date changes (at midnight), the daily schedule ends and the Schedule object executes the next day's regular schedule, exception schedule, or Default Schedule Command.

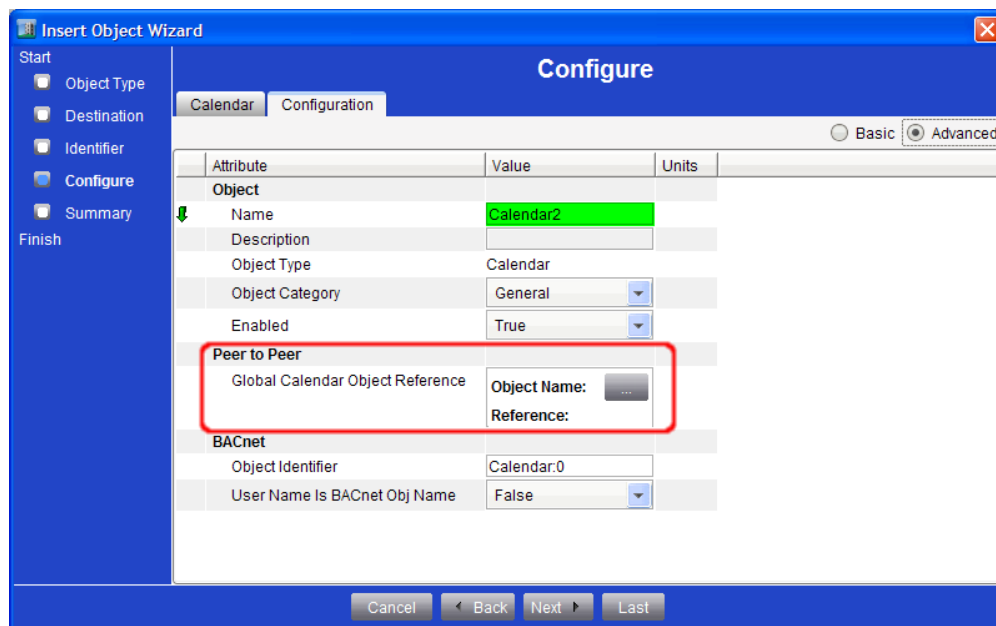
## Global Calendar

The Global Calendar allows you to make facility-wide changes to calendars, such as defining holidays. These changes are tedious if you need to edit many calendars. To solve this problem, you can reference a Global Calendar object in each FAC or NxE. When you edit the values of the Global Calendar object, the dates automatically download into all the local calendars.

To reference a Global Calendar object:

1. *To create a calendar object* - in the Configuration tab, click  to choose the Global Calendar Object Reference.

**Figure 45: Global Calendar Object Reference - Configuration Tab**





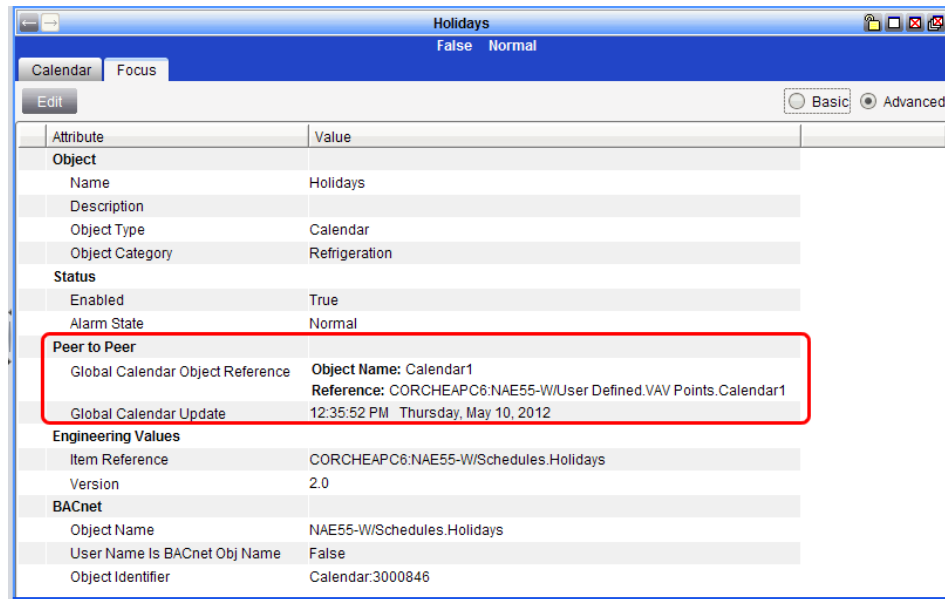
2. *To edit attributes of a calendar* - in the Advanced Focus tab, click  and click  to choose the Global Calendar Object Reference.
3. Click Save and the Configuration tab will add the date and time of the last Global Calendar Update.

Figure 46: Global Calendar Update



## Scheduling Steps

### Creating a Schedule or Calendar

**Note:** The procedure for creating a schedule or a calendar in offline mode (using SCT) is the same as the online procedure using the *Insert Object Wizard*. See *Metasys Modes* for more information about the modes of operation.

**Note:** You cannot create schedules or calendars in an FAC from SCT or SMP.

1. From the Insert menu, select Object... The Insert Object *Wizards* appears.
2. Select Schedule or Calendar and follow the Insert Object Wizard instructions.

**Note:** Add extensions to the schedule or calendar at the wizard prompt, if desired. See *Extensions*.

### Displaying an Existing Schedule or Calendar

To display an existing schedule or calendar, drag and drop the item from the navigation tree into a display frame or double-click the item in the navigation tree.

**Note:** Alternatively, you can right-click the item and select View from the menu that appears.

### Displaying Scheduled Events

1. *Display a Schedule*.
2. From the Display Mode drop down menu, select the view you want to see (Today's Schedule, Weekly Schedule, Exception Schedule, or Scheduled Items).
3. Place the cursor over a leading or trailing edge of a time bar segment. The time-of-day appears in 24-hour format in a small pop-up window.

### Adding Weekly Scheduled Events

1. *Display a Schedule*.
2. From the Display Mode drop down menu, select Weekly Schedule.
3. Click Edit.
4. Click the new (green plus) button or double-click a time bar segment and the Define New Event(s) dialog box appears.

**Note:** Alternatively, you can right-click a time bar segment and select Add Event(s). The Define New Event(s) dialog box allows you to define the new event for multiple days.

5. Select one or more days, the starting time (hour and minute), and a value for the event using the check boxes and drop-down menus and click OK.
6. Repeat [Step 4](#) through [Step 5](#) as necessary.
7. To specify an event end time, make sure no event is selected, right-click where you want the event to end and select End Event from the pop-up menu. Drag the end of the event to adjust the end time.
8. Click Save.

**Note:** Once you click Save, the schedule object goes into effect and writes the new value to the scheduled items if necessary.

## Editing Scheduled Events

1. [Display a Schedule](#).
2. From the Display Mode drop-down menu, select Weekly Schedule.
3. Click Edit.
4. Double-click the time bar segment. The Modify Event(s) dialog box appears.

**Note:** Alternatively, you can select and right-click the event on the time bar and select Modify Selected Event(s) from the menu.

5. Adjust the starting time (hour and minute) and value as desired for the event using the check boxes and drop-down menus and click OK.

**Note:** You can also change the value of an event by selecting and right-clicking the event and selecting a value from the menu, if the value type is Boolean (True/False), binary, or multistate with less than eight states.

**Note:** To specify an event end time, make sure no event is selected, right-click where you want the event to end, and select End Event from the pop-up menu. Once you specify an end time, you can drag the tail edge right or left to adjust the end time.

**Note:** You can adjust start times and end times of events by dragging the edges of the time bar segment to the right or left. When adjusting a time, a small pop-up window shows the digital time of day based on a 24-hour clock, and adjusts in 5-minute increments.

**Note:** You cannot drag the end of an event that ends at midnight. To do this, first right-click and select the End Event. Once the event ends prior to midnight, you can then drag to adjust the end time.

**Note:** If you have a gap in the schedule between two events, you can drag the edge of one to meet the edge of the other. Once you do, the events become locked together so that the second begins as soon as the first ends, the begin/end points move together, and the gap is removed from the schedule.

6. Repeat [Step 4](#) through [Step 5](#) as necessary.
7. Click Save.

**Note:** Once you click Save, the schedule object goes into effect and writes the new value to the scheduled object if necessary.

## Deleting Scheduled Events



1. [Display a Schedule](#).
2. From the Display Mode drop down menu, select Weekly Schedule.
3. Click Edit.
4. Select the event on the time bar and click the delete (red minus) button (or press the Delete key).

**Note:** Alternatively, you can select and right-click the event on the time bar and select Delete Selected Event(s) from the menu.

5. Repeat [Step 4](#) as necessary.
6. Click Save.


## Adding Exception Schedules

To add *exception schedules*:

1. [Display a Schedule](#).
2. From the Display Mode drop down menu, select Exception Schedule.
3. Click Edit.
4. Click the new (green plus) button to add exception schedules. The Exception Detail dialog box appears. You can add exception schedules to the list using one of the following exception types:
  - [Date/Date Range](#)
  - [Week and Day](#)
  - Calendar Reference
5. Select the radio button next to the type of exception. Depending on the type of exception date selected, a different set of drop-down menu options appears. The Calendar Reference exception type has a  button that brings up a dialog box for selecting a calendar.
6. Make your selections from the drop-down menus or for the Calendar Reference, click the  button and select a calendar from the Select Items dialog box and click OK.
7. Click OK on the Exception Detail dialog box.
8. Select the exception schedule in the exception list.
9. Click the new event (green plus) button above the time bar or right-click the time bar and select Add Event(s). The Define New Event(s) dialog box appears.
10. Select the starting time (hour and minute), and a value for the event using the check boxes and drop-down menus and click OK.
11. To specify an event end time, make sure no event is selected, right-click where you want the event to end and select End Event from the pop-up menu. Drag the end of the event to adjust the end time.
12. Repeat [Step 4](#) through [Step 11](#) as necessary.
13. Click Save.

**Note:** Once you click Save, the schedule object goes into effect and writes the new value to the scheduled items if necessary.

## Editing Exception Schedules

1. [Display a Schedule](#).
2. From the Display Mode drop-down menu, select Exception Schedule.
3. Click Edit.
4. Double-click the exception schedule. The Exception Details dialog box appears.
5. Make your modifications using the drop-down menus or for the calendar reference, click the  button and select a calendar from the Select Items dialog box and click OK.
6. Click OK on the Exception Details dialog box.
7. Select the exception schedule in the exception list.
8. Select and right-click the event in the time bar and select Modify Selected Event(s) from the menu. The Modify Event(s) dialog box appears.
9. Select the starting time (hour and minute), and a value for the event using the check boxes and drop-down menus and click OK.

**Note:** Alternatively, you can double-click an event to open the Modify Event(s) dialog box.



10. Repeat [Step 4](#) through [Step 9](#) as necessary.

**Note:** To change the value of an event, select and right-click an event and select a value from the menu.

11. Adjust the start and end times of events by dragging the edge of the event to the right or left.

12. Click Save.

**Note:** Once you click Save, the schedule object goes into effect and writes the new value to the scheduled object if necessary.

## Removing Exception Schedules

1. [Display a Schedule](#).

2. From the Display Mode drop down menu, select Exception Schedule.

3. Click Edit.

4. Select the exception in the exception list.

5. Click the delete (red minus) button (or press the Delete key).

6. Click Save.

## Adding Scheduled Items

1. [Display a Schedule](#).


2. From the Display Mode drop-down menu, select Scheduled Items.

3. Click Edit.

4. Click the add (green plus) button.

5. Select one or more items from the Select Item dialog box and click OK.

**Note:** To select multiple items, use the Control or Shift key.

6. The system automatically chooses the default attribute for each item you selected. To choose a different attribute, click the  button and select the attribute that you want to schedule.

7. Click Save.

**Note:** The first item in the list of scheduled items (Table of Scheduled Items) determines the data type used when the schedule writes values to the attributes of the scheduled item.

## Editing Scheduled Items


1. [Display a Schedule](#).

2. From the Display Mode drop-down menu, select Scheduled Items.

3. Click Edit.

4. Right-click the item name and select an option from the pop-up menu. For example, select make key item to promote the selected item to the [key item](#) of the schedule. When you add a key item, or choose the Make Key Item menu option for an item, the States Text (or Display Units) is updated to match the key item.

**Important:** When you add the first item to the Scheduled Items list, or if you promote an item to key item, the values in the scheduled events change to a default value if they are incompatible with the new key item. The default for numeric values is 0 or 0.0. The default for attributes that support multiple values is the first value available in the set of possible values (for example, False or Off). After changing the key item, we strongly recommend reviewing and adjusting the values for all events in the schedule as necessary.

5. The system automatically chooses the default attribute for each item you selected. To choose a different attribute, click the  button and select the attribute that you want to schedule. For example, selecting Present Value means that the schedule writes a value to the Present Value attribute of that item.


6. Click Save.

## Removing Scheduled Items

1. [Display a Schedule](#).

2. From the Display Mode drop-down menu, select Scheduled Items.
3. Click Edit.
4. Select the item name.
5. Click the remove (red minus) button or right-click and select remove object from the pop-up menu.

### Editing the Effective Period of a Schedule

1. [Display a Schedule](#).
2. On the Schedule tab, click Edit.
3. Click the  button of the Effective Period attribute. The Effective Period dialog box appears.
4. Select the start and end dates using the drop-down menus.
5. Click Apply.
6. Click OK.
7. Click Save.

### Creating a New Calendar Entry

1. [Display a Calendar](#).
2. Click Edit.
3. Click Entry Detail. The Calendar Entry Detail dialog box appears.
4. Click New.
5. Select the Date, Date Range, or Week and Day radio button. Depending on the type of entry selected, a different set of drop-down menu options appears.
6. Make your selections.
7. Click Apply.
8. Click OK.
9. Click Save.

**Note:** Alternatively, create date and date range calendar entries visually by selecting an individual calendar date or by selecting and dragging the mouse over a range of dates.

**Note:** Wildcard date entries appear with a contrasting blue background on the calendar and have an asterisk next to the date. Once you create a wildcard entry, visually selecting and deselecting it does not change the entry. To edit the entry, click Entry Detail on the calendar display frame.

### Editing a Calendar Entry

1. [Display a Calendar](#).
2. Click Edit.
3. Click Entry Detail. The Calendar Entry Detail dialog box appears.
4. Select the entry from the calendar entries list.
5. Use the drop-down menus to edit the entry.
6. Click Apply.
7. Click OK.
8. Click Save.

**Note:** Alternatively, edit Date and Date Range calendar entries visually by selecting an individual calendar date or by selecting and dragging the mouse over a range of dates.

**Note:** Wildcard date entries appear with a contrasting blue background on the calendar and have an asterisk next to the date. Once you create a wildcard entry, visually selecting and deselecting it does not change the entry. To edit the entry, click Entry Detail on the calendar display frame.

## Deleting a Calendar Entry

1. [Display a Calendar](#).
2. Click Edit.
3. Click Entry Detail. The Calendar Entry Detail dialog box appears.
4. Select the entry from the Calendar Entries list.
5. Click Delete.
6. Click OK.
7. Click Save.

**Note:** Alternatively, you can delete calendar entries visually by selecting the individual calendar date a second time or by selecting and dragging the mouse over the range of dates a second time. This method cancels the selection, thus deleting the entry.

## Toggleing Between Calendar Views

**Note:** The cursor turns into a hand when you place it over the header area of a calendar.

1. [Display a Calendar](#).
2. Place the cursor over the header of a calendar until it changes shape from an arrow to a hand and click. The view switches between 1-month and 12-month view.

## Editing the Attributes of a Schedule or Calendar

1. [Display a Schedule or Calendar](#).
2. Select the Focus tab.
3. Click Edit.
4. Make your modifications using the drop-down menus and text boxes. See the [Schedule Object](#) or [Calendar Object](#) for details about the attributes of these items. Select the Advanced radio button if needed.

**Note:** Selecting false in the Enabled drop-down menu of the Schedule disables (turns off) the schedule.

5. Click Save.

## Copying and Pasting a Schedule or Calendar (Offline Mode Only)

**Note:** This procedure is available only in [offline mode](#) (SCT).

**Note:** This function is not available for schedules/calendars in an FAC.

1. In offline mode, select the schedule or calendar from the navigation tree.
2. Select Copy from the Edit menu.
3. Select the desired destination for the copied schedule or calendar in the navigation tree.
4. Select Paste from the Edit menu. The Paste Object Wizard appears.
5. Edit the name of the schedule or calendar as desired and click Paste.

## Deleting a Schedule or Calendar

1. Select the schedule or calendar you want to delete in the navigation tree.
2. Select Delete Items from the Edit menu, or press the Delete key.

## Scheduling a Trend Extension

**Note:** See the [Trend Scheduling](#) topic for information and examples on scheduling trend extensions.

1. [Create a Schedule](#) or [display](#) the desired Schedule.
2. In the Scheduled Items list, add the desired object trend extension and the desired scheduled attribute. Follow the steps in the [Adding Scheduled Items](#) procedure. Make sure the trend extension is the key item. See [Trend Extensions](#) for information on the trend extension attributes you want to schedule.
3. On the Weekly Schedule tab, configure the events as desired. Follow the steps in the [Adding Weekly Scheduled Events](#) and [Editing Scheduled Events](#) procedures to schedule specific days and times to perform the defined trending capability.

4. Click Save.

### **Scheduling the Enabled Audit Level**

To schedule the Enabled Audit Level based on **time** using the Scheduling feature:

1. [Create a Schedule](#) or [display](#) the desired Schedule.
2. In the Scheduled Items tab, add the desired Engine or ADS/ADX and select the Enabled Audit Level attribute. Follow the steps in the [Adding Scheduled Items](#) procedure.
3. On the Weekly Schedule tab, configure the events as desired. Follow the steps in the [Adding Weekly Scheduled Events](#) and [Editing Scheduled Events](#) procedures to schedule specific days and times to change the Enabled Audit Level. See the [Engine Device Object](#) or [ADS Device Object](#)'s Enabled Audit Level attribute description for information on the levels you want to schedule.
4. Click Save.

### **Copying Events within the Weekly Schedule**

To copy the events from one day in the Weekly Schedule to one or more days in the same Weekly Schedule:

1. With the Weekly Schedule in Edit mode, left-click and highlight the name of the day whose events you want to copy.
2. Right-click the highlighted day and select Copy from the pop-up menu.
3. Left-click to highlight the name of the day (or days) where you want to copy the schedule.

**Note:** You can select multiple days by holding the Control or Shift key while selecting days.

4. Right-click the highlighted name of any target day and select Paste from the pop-up menu. The copied schedule overwrites the schedule for the selected day(s).

# Scheduled Reports

The Scheduled Reports feature provides a reporting service on an ADS/ADX Site Director. The ADS/ADX generates summary reports based on Object Lists and Report Schedules.

## **Scheduled Reports Concepts**

### **Scheduled Report**

A Scheduled Report consists of one Object List and one Report Schedule. You select the objects that appear on an Object List. Create and Save Object Lists to the Site Director using the [Global Search](#) feature. A Report Schedule specifies the day and time to run the report.

### **Object List**

An Object List is a list of objects you select. Object Lists are created and saved to the Site Director using the [Global Search](#) feature. See the [Object List](#) section in the Global Search section for more information.

### **Report Schedule**

The Report Schedule specifies the days and times a report is generated.

### **Report Output**

Scheduled reports generate files on the ADS/ADX that contain the actual report output. You can view the content of a report output file through the online UI using any compatible Web browser, but you must log on to the ADS/ADX Windows operating system and use Windows Explorer (or another software application) to browse to and delete/manage the files. Scheduled reports configured to be sent directly to printer on the ADS/ADX are printed in the system's default language.

To view the content of the Report Output file in the UI, use the Report Output Viewer. See [Report Output Viewer](#) for information on viewing the Scheduled Report output in the UI. To manage report output files, see [Accessing Report Output Files on the ADS/ADX](#).

### **Report Output Viewer**

The Report Output Viewer allows you to view the content of a Scheduled Report output file in the UI in the Report Output Viewer window. The Report Output Viewer displays output in any format (tab delimited, XML, and text) and is available via the [Scheduled Reports Viewer](#).

Each Report Output viewer window displays the content of a single report output file. You can have multiple Report Output viewers open simultaneously. To display the Report Output viewer, see [Viewing the Content of a Report Output File in the UI](#).

## **Scheduled Reports Overview**

Each scheduled report contains one or more properties (for example, Item Name and Status) of each item in an Object List. A report engine on the server runs the Scheduled Report at the specified times and saves it to a file in a standard location on the server. The report engine can also send the report output to a printer if specified.

There are two scheduled report screens: the [Create New Scheduled Report Screen](#) and the [Scheduled Reports Viewer](#) screen.

### **Create New Scheduled Report Screen**

The Create New Scheduled Report screen ([Figure 47](#)) allows you to configure new report information and associated schedule information. You can access the Create New Scheduled Report screen from the [Query Menu](#) by selecting New Scheduled Report.

**Figure 47: Create New Scheduled Report Screen**

Table 111 describes the fields in the Create New Scheduled Report screen.

**Table 111: Scheduled Reports**

Field	Description
<b>Report Name</b>	Allows you to enter a name for the report. Use a descriptive name so you can recognize the details by the name; for example, Weekly Building Two Status Report.
<b>Object List</b>	Allows you to select which object list to run the report against. For information on Object Lists, see <a href="#">Object List</a> in the <a href="#">Global Search</a> section.
<b>Report Format</b>	Allows you to select the report file format: Tab Delimited, XML, and Text. <ul style="list-style-type: none"> <li>• Tab Delimited: saves the report with an .txt extension. You can use the report with a spreadsheet application, such as Excel.</li> <li>• XML: saves the report with an .xml extension. You can use the report with an Internet browser, such as Internet Explorer.</li> <li>• Text: saves the report with an .txt extension. You can use the report with any text-viewing application, such as Wordpad.</li> </ul>
<b>Send To Printer</b>	Allows you to automatically send the report to the default printer of the ADS/ADX each time the report generates. The report first saves to a file on the server, then it is sent to the default printer. Scheduled reports configured to be sent directly to printer on the ADS/ADX are printed in the system's default language. For more information on configuring the default printer on the ADS/ADX, refer to the ADS documents listed in the <a href="#">Related Documentation</a> table in the <a href="#">Welcome</a> section.
<b>Run Report Now</b>	Allows you to run the report immediately.

**Table 111: Scheduled Reports**

Field	Description
<b>Schedule Report</b>	Allows you to schedule the report to run at one or more future times.
<b>Run This Report</b>	Allows you to select how often to generate the report. Selections include: One Time Only (default), Daily, Weekly, Monthly, and Yearly.
<b>Start Date</b>	Allows you to select the report start date.
<b>End Date</b>	Allows you to select the report end date.
<b>No End Date</b>	Allows you to configure the report to run indefinitely.
<b>Date Information</b>	Allows you to further configure the date information for when the scheduled report runs.
<b>Time Information</b>	Allows you to further configure the time information for when the scheduled report runs.

## Scheduled Reports Viewer

You can access the Scheduled Reports Viewer from the View Menu. The Scheduled Reports Viewer has three main screens/tabs.

**Table 112: Scheduled Reports Viewer Tabs**

Tab	Description
<b>Actions in Progress</b>	Allows you to monitor, enable/disable, reschedule, delete, and reschedule reports that are in progress or pending.
<b>Scheduled Actions</b>	Allows you to enable/disable, delete, edit, and run upcoming scheduled reports.
<b>Completed Actions</b>	Allows you to view the status of completed reports, reschedule reports, delete the status entries from the screen, and view the content Scheduled Report output file.

## Scheduled Reports Steps

### Creating a New Scheduled Report

To create a new scheduled report:

1. From the [Query Menu](#), select New Scheduled Report. The Metasys - New Scheduled Report screen appears.
2. Enter a Report Name.
3. Select an Object List.
4. Select a Report Format.
5. Select Send to Printer if you want to print the report.
6. Select either Run Report Now or Schedule Report.
7. From the Run This Report drop-down list, specify how often you want to run the report.
8. Enter a Start Date.
9. Enter an End Date.

**Note:** If you wish to run the report indefinitely, select No End Date.

10. Enter the Date Information if you schedule to run the report more than **One Time Only**.
11. Enter the time you want the report to run in the Time Information section.

**Note:** To repeat the schedule every X minutes, select the Repeat check box. Enter the interval (in minutes) to repeat and configure the time when this repeating interval ends. The range is 15 to 1,440 minutes. For an example, see the [Scheduling Scenarios](#) section.

12. Click Save.

**Note:** If you click Cancel, a Metasys - Report Changes Pending screen appears. Click Yes to save your changes. Click No to close the screen without saving your changes.

## Launching the Scheduled Reports Viewer

To launch the Scheduled Report Viewer, select Scheduled Reports from the [View Menu](#). The Scheduled Reports Viewer Screen appears.

## Editing an Existing Scheduled Report

To edit an existing scheduled report from the Scheduled Reports Viewer:

1. [Launch](#) the Scheduled Reports Viewer.
2. On the Scheduled Actions tab, select the report to edit.
3. Click Edit.
4. Make the necessary changes.
5. Click Save.

## Copying an Existing Report to a New Report

To copy an existing report to a new report:

1. [Launch](#) the Scheduled Reports Viewer.
2. Select the Scheduled Actions tab.
3. Select a report to copy.
4. Click Edit.
5. Click Copy to New Report. The Copy to a New Report dialog box appears.

**Note:** The Copy To a New Report button allows you to save an exact copy of the current report with a different name. Your new report appears in the Scheduled Actions tab in the Scheduled Reports Viewer.

6. Enter a new name and/or Object List.
7. Click OK. A message appears to indicate a successful copy. Your new report appears in the Scheduled Actions tab in the Scheduled Reports Viewer.

## Enabling/Disabling a Report

To enable or disable a report:

1. [Launch](#) the Scheduled Reports Viewer, and select either the Actions in Progress tab or the Scheduled Actions tab.
2. Click the report.
3. Click Enable or Disable.

## Rescheduling a Completed or In Progress Report

To reschedule a completed or in progress report:

1. [Launch](#) the Scheduled Reports Viewer and select the Completed Actions or Actions in Progress tab.
2. Click the report.
3. Click Reschedule. The Reschedule a Report screen appears.
4. Modify the date and time using the drop-down menus.
5. Click OK.

## Viewing the Status of a Report

To view the status of a report:

1. [Launch](#) the Scheduled Reports Viewer and select the Completed Actions tab.
2. Click the report.
3. Click View Status. The Scheduled Reports Status dialog box appears.
4. Verify the scheduled report has completed successfully.
5. Click OK.



## Deleting an Existing Scheduled Report

To delete an existing scheduled report:

1. [Launch](#) the Scheduled Report Viewer and select the Scheduled Actions tab.
2. Click one or more reports.
3. Click Delete. The Confirm Delete dialog box appears.
4. Click Yes to confirm the delete.

## Deleting a Completed Report Status Entry or an In Progress Report

To delete a completed report status entry or an in progress report:

1. [Launch](#) the Scheduled Reports Viewer and select the Completed Actions or Actions in Progress tab.
2. Click one or more reports.
3. Click Delete.

**Note:** The current Report Schedule is not affected. Deleting a completed report status entry or an in progress report only affects the instance of the report that is currently running or the completed status entry.

## Automatically Deleting Completed Report Status Entries

To automatically delete completed report status entries after a given amount of days:

1. [Launch](#) the Scheduled Reports Viewer and select the Completed Actions tab.
2. Enter the desired amount of days in the **Number of days after which entries will be automatically deleted (1–30)** text box.

**Note:** The Metasys User Interface supports a maximum of 500 entries displayed on each screen of the Scheduled Reports Viewer. Either configure the number of days between automatic deletion to ensure the number of entries remains less than 500 or periodically delete the entries manually.

## Accessing Report Output Files on the ADS/ADX

You may need to access report output files to view, delete, or use data from the report in other applications. To view the output in the UI, see [Viewing the Content of a Report Output File in the UI](#).

To access report output files on the ADS/ADX:

1. Log on to your ADS/ADX local Windows operating system.
2. Navigate to the correct report directory. The default directory of the report output files on the ADS/ADX Site Director is:
  - Windows XP OS: C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\File Transfer\Report Definitions
  - Windows 7 OS and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\File Transfer\Report Definitions.

To change the default directory of the report output files, see the [Changing the Report Output Directory Location](#) section.

**Note:** The directory name and report name are the same.

3. Select the report to view.
4. Open the report in the correct viewer.

**Note:** The correct viewer depends on the report type. For example, text in Notepad, XML in Internet Explorer®, and tab delimited in Excel.

**Note:** You may wish to periodically archive or delete report output files to avoid filling the ADS/ADX hard disk.

## Viewing the Content of a Report Output File in the UI

You can use the Report Output viewer to view the content of a report output file, copy the content to the clipboard, or save the content to a file on your local computer. To view the and manage the output files on the ADS/ADX, see [Accessing Report Output Files on the ADS/ADX](#).

To view the content of a Report Output file in the UI:

1. [Launch the Scheduled Reports Viewer](#).
2. On the Completed Actions tab, select the report for the output file you would like to view.  
**Note:** You can also double-click the report to view it in the Report Output Viewer window.
3. Click View Report. The Report Output Viewer window appears.  
**Note:** The View Report button is enabled only when a single report is selected. If no reports are selected, or more than one report is selected, the button is disabled.  
**Note:** To copy the content to the clipboard, click Copy to Clipboard. To save the content to a file on your computer, click Save to File.  
**Note:** If the report was not successful, an error message appears with this text:

**Figure 48: Unsuccessful Report Error Message**

The report output file does not exist or cannot be accessed.

4. Click Close when you are finished. All open Report Output Viewer windows close when you log out or exit the UI.

## Changing the Report Output Directory Location

The Scheduled Report output is saved to the following directory on the ADS/ADX Site Director computer by default:

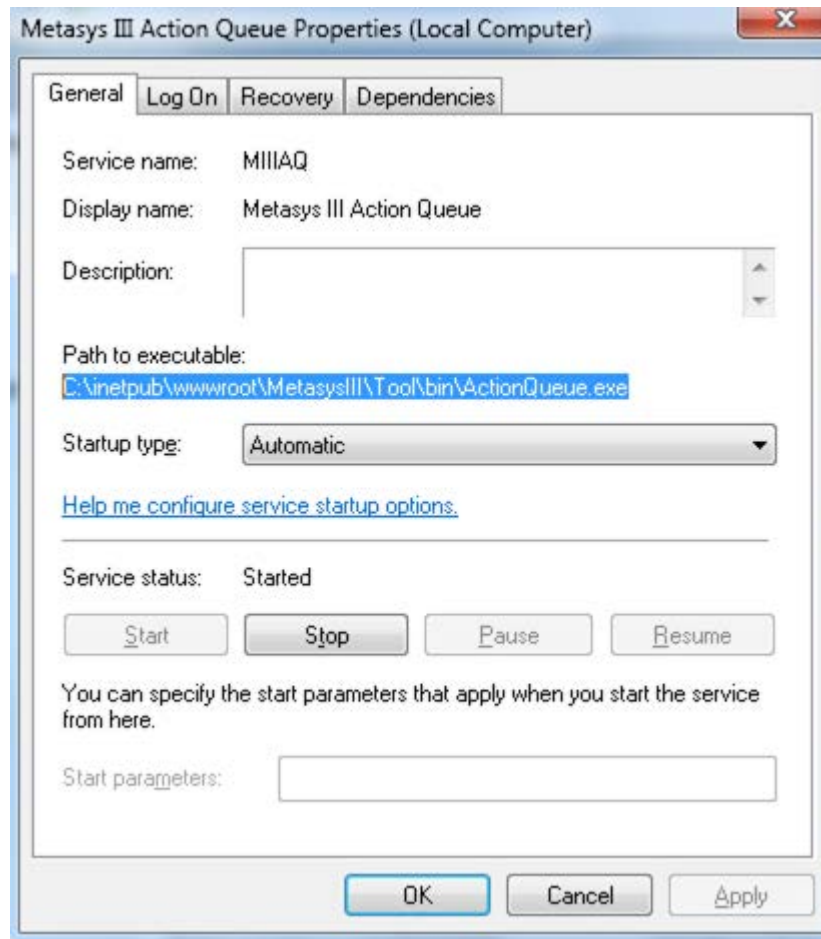
- Windows XP OS: C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\File Transfer\Report Definitions
- Windows 7 OS and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\File Transfer\Report Definitions.

Use this procedure if you want to change the location of the report output directory.

To change the Report Output directory location:

1. From the Control Panel of the ADS/ADX Site Director computer, select Administrative Tools > Services. The Services window appears.
2. Right-click the **Metasys III Action Queue** service and select Stop.
3. Right-click the **Metasys III Device Manager** service and select Stop.
4. Right-click the **Metasys III Action Queue** service and select Properties. The Metasys III Action Queue Properties dialog box appears.

**Figure 49: Metasys III Action Queue Properties Dialog Box**



5. Note the directory in the **Path to executable** text box (Figure 49), and use Windows Explorer to navigate to that directory.
6. Open the **ActionQueue.exe.config** file using a standard text editor, such as Notepad.
7. Locate the following line of text (Figure 50):

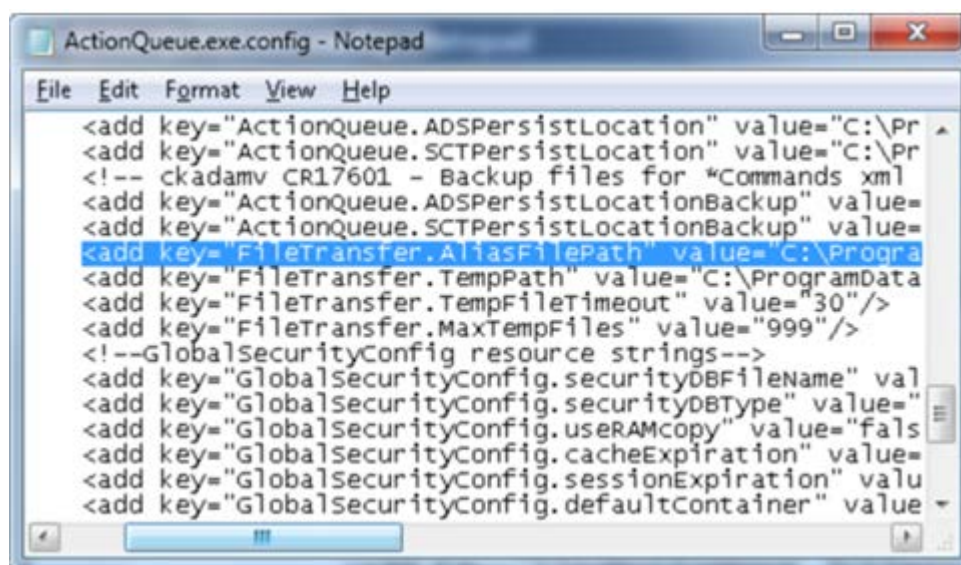
Windows XP OS and Windows Server 2003 OS:

```
<add key="FileTransfer.AliasFilePath" value="C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\FileTransfer\"/>
```

Windows 7 OS and Windows Server 2008 OS:

```
<add key="FileTransfer.AliasFilePath" value="C:\ProgramData\Johnson Controls\MetasysIII\FileTransfer\"/>
```

Figure 50: ActionQueue.exe.config File Text



8. Change the contents of the value section to the desired location of the report output. For example, to send report output to the C:\Metasys System directory, the line of text appears as follows:

```
<add key="FileTransfer.AliasFilePath" value="C:\Metasys System\" />
```

9. Save and close the ActionQueue.exe.config file.
10. Cut the Report Definitions subdirectory and its contents from one of the following locations:
  - Windows XP OS: C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\File Transfer\Report Definitions
  - Windows 7 OS and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\File Transfer\Report Definitions
11. Paste the files to the location defined in [Step 8](#) (for example, C:\Metasys System\Report Definitions).
12. Return to the Services window (see [Step 1](#) for the location).
13. Right-click the **Metasys III Device Manager** service and select Start.
14. Right-click the **Metasys III Action Queue** service and select Start.

## Scheduling Scenarios

Repeat Steps [Step 1–Step 1](#) in [Creating a Daily Report](#) section for all of the Scheduling Scenarios.

### Creating a Daily Report

To create a new report that runs every day at 8:00 A.M. with no end dates:

1. From the Query menu, select New Scheduled Report. The Create New Scheduled Report Dialog Box appears.
2. Enter a New Report name.
3. Select an Object List to run the report against.
4. Select a Report Format.
5. Select Schedule Report.
6. Select Run This Report Daily.
7. Verify the Start Date is set to today.
8. Select the No End Date check box.
9. In the Time Information section, configure the Run At time to 8:00 A.M.

**Note:** Do not configure Repeating Information.

10. Click Save.

### **Creating a Repeating Weekday Report**

To create a new report that runs every hour on weekdays between the hours of 11:00 A.M. and 1:00 P.M. with an end date of two months from today:

1. Repeat Steps [Step 1–Step 1](#) in [Creating a Daily Report](#).
2. Select Run This Report Weekly.
3. Verify the Start Date is set to today.
4. Configure the End Date to two months from today.
5. In the Date Information section, select the Mon - Fri check box.
6. In the Time Information section, configure the Run At time to 11:00 A.M.
7. Select the Repeat check box. The Until and Every fields enable.
8. Configure the Every field to 60 minutes.
9. Configure the Until field to 1:00 P.M.
10. Click Save.

### **Creating a Repeating Monthly Report**

To create a repeating monthly report that runs on the 15th and last day of every month at 8:00 A.M. with no end date:

1. Repeat Steps [Step 1–Step 1](#) in [Creating a Daily Report](#).
2. Select Run This Report Monthly.
3. Verify the Start Date is set to today.
4. Select the No End Date check box.
5. In the Date Information section, select 15 and Last (Ctrl + click).
6. In the Time Information section, configure the Run At time information to 8:00 A.M.
7. Click Save.

### **Creating a Repeating Yearly Report**

To create a repeating yearly report that runs on the last day of February:

1. Repeat Steps [Step 1–Step 1](#) in [Creating a Daily Report](#).
2. Select Run This Report Yearly.
3. Enter the Start Date.
4. Enter the End Date.
5. In the Date Information section, select Feb and Last from the drop-down menus.
6. In the Time Information section, configure the Run At time information.
7. Click Save.

**Note:** If it is a leap year, this report runs on February 29th; otherwise, it runs on February 28th.

**Create a Report to Run Immediately**

To create a new report to run immediately:

1. Repeat Steps [Step 1–Step 1](#) in [Creating a Daily Report](#).
2. Select Run Report Now.
3. Click Save.

# Trend Viewer

Use the Trend Viewer to display the trend data for an ad hoc selection of one or more items from a navigation tree or Global Search viewer. You may select any item type when initially displaying a Trend Viewer. However, the viewer only displays data for those items that are either of trend extension type (selectable from the Global Search viewer) or that have a defined trend extension. For items with more than one defined trend extension, only the first trend is displayed. Do not confuse the Trend Viewer with the Trend Study or a Trend Extension.

Once the Trend Viewer is displayed, you can use the Select Item dialog box to add additional trend items, including trends in an ADS historical database.

**Note:** Although multiple trend extensions can be added to an object on an NxE, these extensions will be combined as a single trend if sent to an Historical Data Repository. This may not yield the expected result. To use multiple trends on a single object in an Historical Data Repository, create duplicate AV or BV objects that map to the point in question, then create a new trend on the parallel AV or BV.

For information on trend extensions or trend studies, see the and sections.

For performance information on trends, refer to the *Metasys System Extended Architecture Overview Technical Bulletin (LIT-1201527)*.

## Trend Viewer Concepts

### Trend Viewer Overview

The Trend Viewer has three different views: [Trend Viewer Chart View](#), [Trend Viewer Table View](#) and [Trend Viewer Definition View](#). The Chart View and Table View allow you to see trend data in a variety of different formats. The Definition View allows you to configure how the data appears within the views.

The Trend Viewer can display the data for up to 10 trends. Although you can select up to 32 items to include in the Trend Viewer, you are limited to showing the data for a maximum of 10 trends in the Chart or Table views. The Trend Viewer lists the included items in the Chart Legend (Chart View), and in the Trend Items table (Definition View). Use the Chart Legend check boxes to choose which items should be shown or hidden. You can also display multiple Trend Viewers in the display panels of the user interface.




As you add items to the Trend Viewer, the trends for the new items are automatically shown up to the maximum number of 10. Once 10 items are shown, you are unable to choose additional trends to show until you hide one or more of the currently displayed trends. You can hide a trend by clearing the check box on the Chart Legend.

**Note:** Changes you make to the Trend Viewer, such as changes to how the chart appears, are only maintained while you are logged on to the Metasys system user interface. Changes apply to all new instances of Trend Viewer, within your user session. Changes do not affect existing Trend Viewers, Trend Study views, or Trend Extension views.

### Views

There are three views in the Trend Viewer: Chart View, Table View, and Definition View.












**Table 113: Views**

Button	View	Description
	Chart View	Allows you to view trend data in a chart format.
	Table View	Allows you to view trend data in a table format.
	Definition View	Allows you to view the trend viewer setup and display options.

### Trend Viewer Chart View

The Chart view allows you to view data samples in a graphical format and retrieve new trend data. You can zoom, unzoom, and pan within the chart. You can also specify the X-axis and Y-axis ranges. You can change the Y-axis type to view the chart using stacked Y-axis or a single Y-axis.

**Table 114: Chart View**

Button	Name	Description
	Update	Retrieves the most recent data samples for the displayed trends.
 (Zoom)  (Normal)	Zoom	<p>Toggles the mouse behavior for the chart between zoom mode and normal mode.</p> <p>While in zoom mode:</p> <ul style="list-style-type: none"> <li>• drag the mouse over an area of the chart to zoom in on that area.</li> <li>• click Zoom to exit zoom mode and restore the mouse to normal mode.</li> <li>• left-click to zoom out one level.</li> </ul> <p>When you exit zoom mode, the chart remains at the current zoom level. Use the <a href="#">Restore</a> button to fully zoom out on the chart.</p> <p><b>Note:</b> You cannot pan while the mouse is in zoom mode.</p> <p><b>Note:</b> You can also zoom and unzoom in normal mode by using the Shift key and the mouse. To zoom, hold the Shift key down while dragging the mouse across the chart. To zoom out one level, left-click the mouse while holding the shift key down.</p>
	Restore	Allows you to return to an unzoomed view and switches the mouse back to normal mode if the chart's zoom mode is active.
	Pan	Allows you to pan the view of the chart vertically or horizontally by dragging the mouse across a zoomed chart. Panning is not available for unzoomed charts or when zoom mode is active. To pan left or right, drag the mouse over the X-axis. To pan up or down, drag the mouse over the Y-axis.
	Points Line	Displays the data using lines and point markers. This is the default.
	Area	Displays the data using an area chart.
	Bar	<p>Displays the data using a bar chart.</p> <p><b>Note:</b> Only use the bar chart when the number of data samples can reasonably be expected to display as bars. If too many data samples exist when you click this option, the display becomes unstable and fails to properly update the screen. To recover, select any other display option.</p>
	Points	Displays the data using markers with no lines.
	Line	Displays the data using lines with no markers.
	Stacked Y-axis	Displays the data in a separate Y-axis for each trend.
	Single Y-axis	Displays the trend data using a single Y-axis.

**Chart Right-Click Menu**

You can access a right-click menu from the Chart view. Place your cursor in the chart and right-click in the panel to display the menu.

**Table 115: Chart Right-Click Menu**

Menu Item	Description
Background Color	Opens the Select A Color dialog box and allows you to configure the background color of the chart.
Y-axis Scale	Displays the Y-axis scale Range Configuration dialog box.
X-axis Scale	Displays the X-axis Range Configuration dialog box.











**Table 115: Chart Right-Click Menu**

Menu Item	Description
Gridlines	Allows you to select what type of gridlines appear on the chart. You can choose: None, X and Y, X Only, and Y Only.
Chart Type	Allows you to select which type of chart to display. You can choose: Points Line, Area, Bar, Points, and Line.
Stacked Y-axis	Displays the chart on a stacked Y-axis when check box is selected.

**Chart Legend**

The Chart Legend appears below the graphical charting area. The Chart Legend displays the list of trend items for the Trend Viewer in a table, and includes information about each item.

**Table 116: Legend**

Button/Field	Name	Description
	Select All	Selects the maximum number (10) of trend items for display in the chart.
	Remove All Selections	Deselects all trend items in the chart Legend.
	Add	Opens the Select Item dialog box and allows you to add trend items to the Trend Viewer. <b>Note:</b> All items and navigation trees appear in the Select Item window; however, you can only select trends. All other items appear dimmed.
	Remove	Allows you to remove trend items from the Trend Viewer.
	Show	Indicates if the data for the trend item appears in the Chart. When checked, the data appears on the chart and in the table. When unchecked, the data does not appear in the chart or table.
	Historical Trend Icon	Indicates the trend was selected from the ADS Historical Database folder.
	Marker	Indicates the appearance of the marker style and color for the trend item on the Chart.
	Color Palette	Opens the Select a Color dialog box. Allows you to change the color used to chart the trend data.
	Name	Displays the trend item name based on the Name attribute.
	Reference	Displays the trend item's full reference.




**Chart Legend Right-Click Menu**

You can right-click an item in the Chart Legend to access item-specific menu options. The right-click menu content is based on the type of item you click on. For example, if you right-click a trend item from a historical database, you can only Refresh the Trend Viewer.

**Trend Viewer Table View**

The Table view of the Trend Viewer allows you to view data for the selected trends in a table format. You can copy the trend data to the clipboard for pasting into other applications such as Microsoft Excel.

**Table 117: Table View<sup>1</sup>**

Button	Name	Description
	Update	Updates the data samples with new trend data immediately.
	Add	Allows you to add additional trend items to the Trend Viewer.
	Copy to Clipboard	Allows you to copy selected trend data to the system clipboard for pasting into other applications such as Microsoft Excel. You can also use Ctrl + C to copy data to the clipboard.

1 The appears in the Table View column headings when applicable.

**Trend Viewer Definition View**

The Definition view of the Trend Viewer allows you to view and edit the Trend Viewer setup and charting options.




**Table 118: Definition View**

Section	Description
<b>General</b>	<p>Allows you to edit the refresh rate and display precision.</p> <ul style="list-style-type: none"> <li>• <b>Refresh Rate:</b> specifies the amount of time, in seconds, for automatic refresh of data. You must configure this attribute with a value of 0 seconds, 60 seconds, or greater than 60 seconds. Values 1 to 59 are invalid and not allowed. 0 means manual refresh. If the refresh rate is 0, click the Update button to display new data.</li> <li>• <b>Display Precision:</b> specifies the decimal point rounding and the number of decimal places used to format real values that do not report a display precision. If the value reports a display precision, this Trend Viewer attribute is ignored in favor of the value's native display precision.</li> </ul>
<b>Range Start and Range End</b>	<p>Specifies the Start Time and End Time for the Trend Viewer.</p> <ul style="list-style-type: none"> <li>• <b>Date:</b> Displays the dates for the Viewer Range.</li> <li>• <b>Time:</b> Displays the times for the Viewer Range.</li> </ul>
<b>Chart Display</b>	Allows you to add gridlines, stack the Y-axis, and choose the chart style for the Trend Viewer.

**Definition View Trend Items Table**

The Trend Items table appears at the bottom of the Definition view. The table displays the list of the Trend Viewer's trend items.

**Table 119: Definition View Trend Items Table**

Button	Name	Description
	Historical Trend Icon	Indicates the trend was selected from the ADS Historical Database folder.
	Add	Opens the Select Item dialog box and allows you to add trend items to the Trend Viewer.
	Remove	Allows you to remove a trend item from the Trend Viewer.
	Name	Displays the name of the trend item.
	Reference	Displays the trend item's reference information.
	Plotting Style	<p>Allows you to select the plotting method for the trend item.</p> <ul style="list-style-type: none"> <li>• Continuous - straight line between data samples. Continuous plotting connects samples with the shortest possible line, giving an appearance of a set of diagonal ramps as samples change value.</li> <li>• Discrete - line stays at the same value until the next data sample is taken (good for binary data). Discrete plotting has 90-degree angles at the time when samples change value. The chart appears to be a series of steps.</li> </ul>

## Trend Viewer Steps

### Selecting Trend Items

To select trend items for initial display in the Trend Viewer, click an individual item in the navigation tree (select items that have trend extensions). Use the Ctrl or Shift keys to select multiple items.

You can also select items from the Viewer. In the Global Search Viewer, you can select trend extensions or items with trend extensions. Once the Trend Viewer is displayed, you can add additional trend items by selecting trend extensions or historical trend items in the Select Item dialog box.

**Note:** If you selected an item from the navigation tree that does not have a trend extension, the Name column in the Legend and Trend Items Table states No Trend Defined.

### Launching the Trend Viewer

1. Select one or more trend items. See [Selecting Trend Items](#).
2. From the View menu, select Trend Viewer. The Trend Viewer appears with data for the selected items (if available).

**Note:** If the chart appears to flicker, you have too many trend samples in the Trend Viewer. Reduce the number of displayed trends or change the trending date/time range to display fewer samples, and performance will improve. See [Removing Trends from the Trend Viewer](#).

### Changing Views

To change views in the Trend Viewer, click the Chart, Table, or Definition view buttons.

### Editing the Chart View

#### Changing the Chart Type

To change the chart type in the Chart view, click one of the chart buttons (such as points, line, or area).

#### Configuring the X-axis

To configure the X-axis in the Chart view:

1. Place your cursor on the chart and right-click.
2. Select the X-axis Scale. The Range Configuration dialog box appears.
3. Specify whether to Use Automatic Range Calculation. The automatic range is determined automatically based on the setup in the Definition View.

**Note:** When you select Use Automatic Range Calculation, you do not fill in the Range fields.

4. Specify the Start Time, Start Date, End Time, and End Date.
5. Click OK.

**Note:** You can also configure the X-axis range by changing the start and end dates and times in the Definition View. See [Editing the Definition View](#).

#### Configuring the Y-axis

To configure the Y-axis in the Chart view:

1. Place your cursor on the chart and right-click.
2. Select the Y-axis Scale menu item. The Range Configuration dialog box appears.
3. If you are using stacked Y-axis, choose the trend item to which the Y-axis range should be applied.
4. Specify whether to Use Automatic Range Calculation. The Range is determined automatically based on the trend items.

**Note:** When you select Use Automatic Range Calculation, you do not fill in the Range fields.

5. Specify the minimum and maximum values for the Y-axis.

**Note:** When you use stacked Y-axis, click Apply to apply the changes to a specific trend item. You can continue setting the ranges for other trend items in the Range Configuration dialog box.

6. Click OK.


### ***Changing the Background Color***

To change the background color in the Chart View:

1. Place your cursor in the chart view and right-click.
2. Select the Background Color menu item. The Select a Color dialog box appears.
3. Select a new background color.
4. Click OK.

### ***Changing the Color for Charted Data***

To change the color used to plot the data for a trend item:

1. Click the  button in the Marker column in the Chart Legend for the desired trend item. The Select a Color dialog box appears.
2. Select a color.
3. Click OK. The color appears on all chart styles (not just the charts using Markers).

### ***Zooming***

To zoom in the Chart view:

1. Click to switch the mouse to zoom mode for the chart.
2. Click and drag your cursor over the area to zoom.

**Note:** Left-click within the chart to zoom out one level. To exit zoom mode while retaining the current zoom level, click Zoom. To exit zoom mode and restore the chart to an unzoomed state, click Restore.

## **Working with the Table View**

### ***Selecting Trend Data***

To select trend data, click an individual row in the Table view or use the Ctrl and/or Shift keys to select multiple rows.

To select all of the trend data, click Select All.

**Note:** You also can click and drag your cursor over rows in the table to select items that appear consecutively.

### ***Sorting Trend Data***

To sort search the trend data in the Table view, click the heading of the desired column. The column sorts and a small red triangle appears indicating the order of the sort (ascending or descending). Click the column heading again to change the sort order.

### ***Reordering Columns***

To reorder the columns in the Table view, drag the heading of the column to the desired location.

### ***Copying Trend Data to the Clipboard***

To copy trend data in the Table View to the system clipboard:

1. Select the desired trend data according to section.
2. Click Copy to Clipboard.

**Note:** You can also use standard keyboard shortcuts to select and copy the data (Ctrl + A to Select All, Ctrl + C to Copy).

3. Open the program to paste the results (for example, Microsoft Excel).
4. Paste the results according to the program's conventions (generally Edit > Paste or Ctrl + V).

## **Editing the Definition View**

### ***Configuring Trend Attributes***


To configure the Trend Viewer attributes, edit the values and selections using the text boxes, drop-down menus, and calendars. See the section.

### **Changing the Plotting Style**

To change the plotting style in Definition view:

1. In the Trend Items table, click the drop-down list in the Plotting Style column.
2. Select either Continuous or Discrete.


### **Expanding and Collapsing the Legend and Trend Items Table**

To expand and collapse the Legend and Trend Items table in the Chart and Definition view, click one of the arrows  located on the splitter bar to show and hide the table. Continue to click the arrows until the desired display is achieved.

**Note:** You can also drag the splitter bar to resize the Legend and Trend Items table areas.

### **Adding Trends**

To add trends to the Trend Viewer in the Chart, Table, and Definition views:


1. Click the  button. The Select Item dialog box appears.
2. Select one or more items (Ctrl or Shift).

**Note:** All non-trend items appear dimmed. If everything appears dimmed in the Select Item dialog box, check to see if you have at least one object with a Trend Extension and/or that Engine devices from other sites are storing samples in the ADS/ADX (if applicable).

3. Click OK.

**Note:** You can use the Select Item dialog box to select historical trends from an ADS.

### **Removing Trends from the Trend Viewer**

1. Select one trend item from either the [Chart Legend](#) or [Definition View Trend Items Table](#).
2. Click the  button. The Remove confirmation dialog box appears.
3. Click Yes.

### **Changing the Gridlines**

To change the gridlines in the Chart view, right-click > Gridlines > and select type.

To change the gridlines in the Definition view, click the Gridlines drop-down list and select type.

### **Printing Trend Viewer Information**

To print Trend Viewer information, follow the printing instructions in the [Site Management Portal User Interface](#) section.

## Trend Studies

The Metasys Historical Data Management feature allows you to collect and store historical samples of Engine object data. Metasys Trend Studies allow you to view the historical data. Using this information, you can manage energy usage, bill tenants, prove compliance to standards, and diagnose problems in your Metasys system. You can also trend attributes of system objects. With the addition of an [ADS Device Object/ADX](#) to your network, the Metasys system provides long-term storage of historical data and you dramatically *increase storage capabilities*.

See the [Site Object](#) and [Engine Device Object](#).

The Engine allows you to add [Trend Extensions](#) to objects. The Trend Extension contains all of the trend definition information associated with the object. Each trend is associated with a single attribute of that object and collects historical data samples of that attribute. With Trend Extensions, data is collected in the Engine only, but you can configure the Engine to transfer the data to the ADS/ADX for long-term storage. For more information on extensions, see [Extensions](#).

Do not confuse the trend study with the Trend Viewer or Trend Extension. For information on Trend Extensions or the Trend Viewer, see the Trend [Extensions](#) and [Trend Viewer](#) sections.

For performance information on trends, refer to the *Metasys System Extended Architecture Overview Technical Bulletin (LIT-1201527)*.

For more information on the wizard used to insert Trend Studies, see [Insert Trend Study Wizard](#).

## Trend Studies Concepts

### Historical Data Overview

Basic Historical Data Management begins with the Engine [trend extension](#). Each Engine attribute that can be trended can store historical data samples about the attribute. Sample storage in the Engine is limited to the size of the individual [Trend Buffer](#). For storage of long-term or large numbers of samples, configure your system to store historical data in the ADS/ADX. Use the Trend Extension to view and configure trends in the Engine and the Trend Study to view trend data from the Engine and/or ADS/ADX.

**Note:** Although multiple trend extensions can be added to an object on an NxE, these extensions will be combined as a single trend if sent to an Historical Data Repository. This may not yield the expected result. To use multiple trends on a single object in an Historical Data Repository, create duplicate AV or BV objects and that map to the point in question, then create a new trend on the parallel AV or BV.

### Historical Data Management in an ADS/ADX

When you add an ADS/ADX to your Metasys system, trend data can be placed in a Historical Data Repository for long-term storage. If your Engine is configured to route trends to the ADS/ADX, the ADS/ADX stores the trends in the Historical Data database. The ADS/ADX utilizes a standard database management system that supports archival storage.

### Trend Studies

Accessible through the navigation tree, [Trend Studies](#) display trend sample data from trends in Engine [trend buffers](#) and/or ADS/ADX repositories. An ADS/ADX on the site is not required to retrieve trend data from the Engine.

When you create a [Trend Study](#), you use the Trend Study [wizard](#) to choose the sources for the trends and the display properties.

An [Audit Trail](#) message is created whenever you create, delete, or edit a Trend Study. Trend Studies, [graphics](#), and folders are the only items you can create under an ADS/ADX on the navigation tree.

The main advantages to using Trend Studies are that you can:




- view multiple trends at once (from both Engine and ADS/ADX)
- view ADS/ADX historical trend data
- configure the [Study Range](#) with flexible parameters

**Note:** You do not need an ADS/ADX on the site to forward trend samples to an ADS/ADX. You can forward trend samples to an ADS/ADX on a different Metasys site. See the [ADS Device Object](#) for ADS/ADX information.

## Views

There are three views in the Trend Study: Chart View, Table View, and Definition View.









**Table 120: Views**

Button	View	Description
	Chart View	Allows you to view trend data in a chart format.
	Table View	Allows you to view trend data in a table format.
	Definition View	Allows you to view the Trend Study setup and display options.




### Trend Study Chart View

The Chart view allows you to view data samples in a graphical format and retrieve new trend data. You can zoom, unzoom, and pan within the Chart. You can also specify the X-axis and Y-axis ranges. You can change the Y-axis type to view the chart using stacked Y-axis or single Y-axis.

**Table 121: Chart View**

Button	Name	Description
	Update	Retrieves the most recent data samples for the displayed trends.
 (Zoom)  (Normal)	Zoom	<p>Toggles the mouse behavior for the chart between zoom mode and normal mode.</p> <p>While in zoom mode:</p> <ul style="list-style-type: none"> <li>• drag the mouse over an area of the chart to zoom in on that area.</li> <li>• click Zoom to exit zoom mode and restore the mouse to normal mode.</li> <li>• left-click to zoom out one level.</li> </ul> <p>When you exit zoom mode, the chart remains at the current zoom level. Use the <a href="#">Restore</a> button to fully zoom out on the chart.</p> <p><b>Note:</b> You cannot pan while the mouse is in zoom mode.</p> <p><b>Note:</b> You can also zoom and unzoom in normal mode by using the Shift key and the mouse. To zoom, hold the Shift key down while dragging the mouse across the chart. To zoom out one level, left-click the mouse while holding the shift key down.</p>
	Restore	Allows you to return to an unzoomed view and switches the mouse back to normal mode if the chart's zoom mode is active.
	Pan	Allows you to pan the view of the chart vertically or horizontally by dragging the mouse across a zoomed chart. Panning is not available for unzoomed charts or when zoom mode is active. To pan left or right, drag the mouse over the X-axis. To pan up or down, drag the mouse over the Y-axis.
	Points Line	Displays the data using lines and point markers. The Points Line chart is the default chart type in chart view.
	Area	Displays the data using an area chart.
	Bar	<p>Displays the data using a bar chart.</p> <p><b>Note:</b> Only use the bar chart when the number of data samples can reasonably be expected to display as bars. If too many data samples exist when you click this option, the display becomes unstable and fails to properly update the screen. To recover, select any other display option.</p>
	Points	Displays the data using markers, with no lines.

**Table 121: Chart View**

Button	Name	Description
	Line	Displays the data using lines, with no markers.
	Stacked Y-axis	Displays a separate Y-axis for each trend.
	Single Y-axis	Displays the trends using a single Y-axis.

**Chart Right-Click Menu**

You can access a right-click menu from the Chart view. Place your cursor in the chart and right-click in the panel to display the menu.






**Table 122: Chart View Right-Click Menu**

Menu Item	Description
Background Color	Opens the Select a Color dialog box and allows you to configure the background color.
Y-axis Scale	Displays the Y-axis Range Configuration dialog box.
X-axis Scale	Displays the X-axis Range Configuration dialog box.
Gridlines	Allows you to select what type of gridlines to appear on the chart. You can choose: None, X and Y, X Only, and Y Only.
Chart Type	Allows you to select what type of chart to display. You can choose: Points Line, Area, Bar, Points, and Line.
Stacked Y-axis	Displays the chart on a stacked Y-axis.

**Chart Legend**

The Chart Legend appears below the graphical charting area. The Chart Legend displays the list of trend items for the Trend Study in a table, and includes information about each item.

**Table 123: Legend**

Button/Field	Name	Description
	Select All	Selects the maximum number of trend items for display in the chart.
	Remove All Selections	Deselects all trend items in the chart Legend.
<input checked="" type="checkbox"/>	Show	Indicates if the trend item appears in the Chart. When checked, the data appears on the chart and in the table. When unchecked, the data does not appear in the chart or table.
	Historical Trend Icon	Indicates the trend was selected from the ADS Historical Database folder.
	Marker	Indicates the appearance of the marker style and color for the trend item on the Chart.
	Color Palette	Displays the Select a Color dialog box. Allows you to change the color used to chart the trend data.
	Name	Displays the trend item name based on the Name attribute.
	Reference	Displays the trend item's full reference.

**Chart Legend Right-Click Menu**



You can right-click an item in the Chart Legend to access item-specific menu options. The right-click menu content is based on the type of item you click on. For example, if you right-click a trend item from a historical database, you can only Refresh the Trend Study display.



### Trend Study Table View

The Table view of the Trend Study allows you to view data for the selected trends in a table format. You can copy the trend data to the clipboard for pasting into other applications such as Microsoft Excel.

**Table 124: Table View<sup>1</sup>**

Button	Name	Description
	Update	Updates the data samples with new trend data immediately.
	Copy to Clipboard	Allows you to copy selected trend data to the system clipboard for pasting into other applications such as Microsoft Excel. You can also use Ctrl + C to copy selected trend data.

<sup>1</sup> The *Historical Trend Icon* appears in the Table View column headings when applicable.

### Trend Study Definition View

Use the Definition View to edit the Trend Study configuration. You can choose which trends are viewed, choose the *Study Range*, and edit the display properties. You can view more than one trend item at a time on the same graph. The following table details the fields in the Definition View.



**Table 125: Definition View**

Field	Description
<b>General</b>	<p>Allows you to edit the refresh rate and display precision.</p> <ul style="list-style-type: none"> <li><b>Refresh rate:</b> specifies the amount of time, in seconds, for automatic refresh of data. You must configure this attribute with a value of 0 seconds, 60 seconds, or greater than 60 seconds. Values 1 to 59 are invalid and not allowed. 0 means manual refresh. If the refresh rate is 0, click the Update button to display new data.</li> <li><b>Display precision:</b> specifies the decimal point rounding and the number of decimal places used to format real values that do not report a display precision. If the value reports a display precision, this Trend Viewer attribute is ignored in favor of the value's native display precision.</li> </ul>
<b>Range Start and Range End</b>	<p>Specifies the Start Time and End Time for the Trend Study.</p> <ul style="list-style-type: none"> <li><b>Radio Buttons:</b> Allows you to choose relative time or absolute time for the Study Range (start and end times). The fields enable depending on which one you select.</li> <li><b>Date:</b> Displays the date for the Study Range.</li> <li><b>Absolute Time:</b> Select either Today or Now. If you select Today, enter the Relative Time. If you choose Now, specify an Offset.</li> <li><b>Relative Time:</b> Allows you to choose the relative time for the Study Range.</li> <li><b>Offset:</b> Represents a combination of a whole number of days, hours, minutes, and seconds before or after (- or +) the current date and time.</li> </ul>
<b>Chart Display</b>	Allows you to add gridlines, stack the Y-axis, and choose the chart style for the Trend Study.


### Definition View Trend Items Table

The Trend Items table appears at the bottom of the Definition view. The Trend Items table displays the list of the Trend Study's trend items.

**Table 126: Trend Items Table**

Button	Name	Description
	Historical Trend Icon	Indicates the trend was selected from the ADS Historical Database folder.
	Add	<p>Opens the Select Item dialog box and allows you to add trend items to the Trend Study. This button only enables when the view is in edit mode.</p> <p><b>Note:</b> All items and navigation trees appear in the Select Item window; however, you can only select trends. All other items appear dimmed.</p>

**Table 126: Trend Items Table**

Button	Name	Description
	Remove	Allows you to remove a trend item from the Trend Study. This button only enables when the view is in edit mode.
	Name	Displays the name of the trend item.
	Reference	Displays the trend item's reference information.
	Aggregate Function	Allows you to select the aggregate function to use on the trend sample data (NONE, Average, Minimum, Maximum, Standard Deviation, Range, Sum, and Variance). You can sample the same point for different aggregate functions and display them on a single chart.  The aggregate functions of the trend study apply to information in the Historical Data at the ADS/ADX Server and do not apply to data in the NAE buffer.
	Aggregate Interval	Specifies the time, in minutes, over which the aggregate function should be applied (for example, 60 for an hourly calculation, or 1,440 for a daily calculation).
	Plotting Style	Allows you to select the plotting method for the trend item. <ul style="list-style-type: none"> <li>• Continuous - straight line between data samples. Continuous plotting connects samples with the shortest possible line, giving an appearance of a set of diagonal ramps as samples change value.</li> <li>• Discrete - line stays at the same value until the next data sample is taken (good for binary data). Discrete plotting has 90-degree angles at the time when samples change value. The chart appears to be a series of steps.</li> </ul>

## Study Range

The Study Range is the time period used to filter trend data. The Trend Study gathers and displays the trends that are taken during this time period.

## Default Destination

The ADS Repository defines where trend samples are sent when the local trend buffers reach their defined [Transfer Setpoint](#) (see the [Trend Extensions](#) section), the Engine defined [ADS Delivery Time](#) (see the [Engine Device Object](#)) is reached, or the user initiates a transfer. You can initiate a transfer by using the Trend Extension's [Route](#) command.

**Note:** You do not need an ADS/ADX on the site to forward trends to an ADS/ADX. You can forward trend samples to an ADS/ADX on a different Metasys site. The off-site ADS/ADX that receives forwarded trend samples must be the site director of its site. See the [ADS Device Object](#) for more information on the ADS/ADX.

**Note:** You can define only one repository as the default destination for each Engine.

For more information on ADS/ADX default trend destinations, see [Configuring the ADS/ADX as the Destination for Trend Data](#).

## Trend Studies Steps

### Setting Up Trend Studies (Overview)

1. [Create a Trend Extension](#).
2. [Configure an ADS/ADX as the destination for trend data](#).
3. Configure the [trend extension to pass trends to the ADS/ADX](#).
4. Configure the [ADS/ADX to forward trends to another ADS/ADX](#) trend repository (if desired).
5. [Create a Trend Study](#).

**Note:** If you have a site with an ADS/ADX and engines, and you create a Trend Study on an engine (rather than on the ADS/ADX), any trend items added to the trend study from the ADS/ADX's Historical DB folder is listed with the current site name in their references instead of their actual site names.

**Note:** When referencing trend items that were forwarded from an off-site device, create the trend study object on the ADS/ADX, rather than on the engine.

## Configuring the ADS/ADX as the Destination for Trend Data

**Note:** You can define only one repository as the default destination.

**Note:** If you need to provide long-term storage for trend samples from an Engine, follow these steps to configure the Trend Repository of an ADS/ADX as the *Default Destination*.

To configure the ADS/ADX Trend Repository as the Default Destination for trend samples from an Engine:

1. Select the Engine device in the navigation tree.
2. View the Engine. See *Displaying Information About an Item* for more information on how to display an item.
3. Select the Focus tab and click the Advanced radio button to display additional item information.
4. Select Edit.
5. Edit the attributes listed below. Click one of the following for information on these *Engine Device Object* attributes (The Engine Device attributes table contains Default Value and Values/Options/Range information for the attributes.):

- [ADS Repository](#)
- [ADS Delivery Time](#)

6. Click Save.

**Note:** If you want to define the ADS/ADX attributes for the entire site instead of at the individual Engine level, select the Site in the navigation tree and edit the following *Site Object* attributes (The Site attributes table contains Default Value and Values/Options/Range information for the attributes.):

- [Default ADS Repository](#)
- [Default ADS Delivery Time](#)

## Configuring the Trend Extension to Pass Trend Data to the ADS/ADX

To configure the ADS/ADX as a default destination for trends, you must configure the *Repository Enabled* and *Transfer Setpoint* attributes in the *Trend Extension*. See the *Object Help* section.

## Configuring an ADS/ADX to Forward Trend Data to Another ADS/ADX Trend Repository

1. View the original ADS/ADX. See *Viewing Item Data* for information on how to display an item.
2. Select the Focus tab and click the Advanced radio button to display additional item information.
3. Select Edit.
4. Scroll down to the Repository Storage section.
5. Edit the *ADS Repositories* attribute. See the *ADS Device Object/ADX* object attributes table for more information on this attribute or other ADS/ADX attributes, including their Default Value and Values/Options/Range information.
6. Click Save.

## Creating Trend Studies (Overview)

**Note:** Before creating a Trend Study, create a Trend extension. See *Setting Up Trend Studies (Overview)* for details.

1. From the *Insert Menu*, select Trend Study.
2. Follow the Trend Study's *wizard* steps. The new study appears in the *Navigation Tree*.
3. Drag and drop the study to the *Display Frame*.
4. On the Definition View, click Edit and configure the fields (see *Trend Study Definition View*) as you want them.
5. Add trend items to the Trend Item table using the add button. The Select Item window appears.
6. Select one or more trend items.

**Note:** Multiple selection adds multiple items.

**Note:** All non-trend items appear dimmed. If everything appears dimmed in the Select Item tree, check to see if you have at least one object with a Trend Extension and/or that Engine devices from other sites are storing samples in the ADS/ADX (if applicable).

7. Click OK. See [Adding New Trend Items to the Trend Study](#).
8. Click Save.
9. Click the Chart or Table buttons to see trended data in the specific format.

**Note:** If nothing appears in the chart or table, check to see if you have samples in your study range and adjust if necessary.

## Editing Trend Studies

1. [View the Trend Study](#).
2. Click the Definition View button.
3. Click the Edit button.
4. Make your changes using the table in the [Trend Study Definition View](#) section, including adding new Trend Items.
5. Click the Save button to save the changes.

## Viewing Trend Studies

**Note:** To create Trend Studies, see [Creating Trend Studies \(Overview\)](#).

1. From the navigation tree, drag and drop the Trend Study you want to view to the [Display Frame](#).
2. Select the Definition View button to edit the Trend Study. Select the Chart View or Table View buttons to view the trend data.


**Note:** The UI limits the number of data samples you can retrieve. Therefore, you may not see the full range specified. The most recent data samples are always retrieved first.

**Note:** If the chart appears to flicker, you have too many trend samples in the Trend Study. Reduce the number of displayed trends or change the trending date/time range to display fewer samples and improve performance. See [Deleting Trends from the Trend Study](#).

## Deleting Trend Studies

1. Select a Trend Study in the navigation tree.
2. Select Edit > Delete Items and answer Yes to the Confirm Delete box.

## Adding New Trend Items to the Trend Study

1. [View the Trend Study](#).
2. If necessary, click the Definition View button.
3. Click the Edit button in the upper left of the Trend Study tab.
4. Click the  button in the Trend Items table. The Select Item dialog box appears.
5. Select the trend(s) that you wish to add from the Select Item dialog box.


**Note:** Multiple selection adds multiple items.

**Note:** All non-trend items appear dimmed. If everything appears dimmed in the Select Item dialog box, check to see if you have at least one object with a Trend Extension and/or that Engine devices from other sites are storing samples in the ADS/ADX (if applicable).

6. Click the OK button in the Select Item dialog box.
7. Click the Save button in the Definition View to save the changes.

## Deleting Trends from the Trend Study

1. [View the Trend Study](#).
2. Click the Definition View button.
3. Click the Edit button.

4. Select a trend in the Trend Item table.
5. Click the  button. The Remove confirmation dialog box appears asking if you want to remove the trend item. Click Yes.
6. Click Save.

## Configuring the X-axis

To configure the X-axis in the Chart view:

1. Place your cursor on the chart and right-click.
2. Select the X-axis Scale. The Range Configuration dialog box appears.
3. Specify whether to Use Automatic Range Calculation. The automatic range is determined automatically based on the set-up in the Definition View.

**Note:** You are limited to dates and times between the start and end dates configured in the Trend Study definition.

**Note:** When you select Use Automatic Range Calculation, you do not fill in the Range fields.

4. Specify the Start Time, Start Date, End Time, and End Date.
5. Click OK.

**Note:** You can also configure the X-axis range by changing the start and end dates and times in the Definition View. See the table in the [Trend Study Definition View](#).

## Configuring the Y-axis

To configure the Y-axis in the Chart view:

1. Place your cursor on the chart and right-click.
2. Select the Y-axis Scale menu item. The Range Configuration dialog box appears.
3. If you are using stacked Y-axis, choose the trend item to which the Y-axis range should be applied from the item drop-down list.
4. Specify whether to Use Automatic Range Calculation. The Range is determined automatically based on the trend items.

**Note:** When you select Use Automatic Range Calculation, you do not fill in the Range fields.

5. Specify the minimum and maximum values for the Y-axis.

**Note:** When you use stacked Y-axis, click Apply to apply the changes to a specific trend item. You can continue setting the ranges for other trend items in the Range Configuration dialog box.

6. Click OK.

# User Graphics Tool (UGT)

Graphics provide a visual representation of the monitored systems that enable you to quickly check the status of system symbols and recognize unusual system conditions. Graphics can be designed to allow the user to move through buildings, floors, and other areas, viewing building systems and control processes. You can view, create, and edit graphics using the User Graphics Tool (UGT).

User graphics are usually made up of three parts:

- the [Static Background](#) image
- [Symbols](#)
- [Hyperlinks](#) that allow you to navigate to graphics and Web addresses

The UGT operates in two modes:

- The [Edit Mode](#) allows you to edit an existing graphic or create new graphics.
- The [View Mode](#) allows you to view existing graphic to monitor and command all systems integrated into the Metasys network.

The UGT is available with the NAE, NIE, ADS, ADX, and SCT. You can access the UGT when you are logged in to the Metasys user interface via any Web browser. The [Group Object](#) represents user graphics in the All Items navigation tree and can be displayed in any active [display panel](#).

**Note:** If your graphics reference multiple Engines or multiple ADS/ADXs, and one device needs to be downloaded, upload all Engine/ADS/ADXs prior to making changes in SCT. This procedure ensures your graphics work consistently.

For information on default preferences for graphics (such as status colors, fan colors, state colors, and alarm flashing settings), see [Graphic Settings Tab](#) in the [Preferences](#) section.

For more information on configuring an NAE or NIE and for details on user access configuration, see the [Related Documentation](#) table.

## User Graphics Tool Concepts

### Graphic Workspace

When viewing an existing graphic or creating new graphics, the UGT runs in the Graphics Workspace, which is displayed in an active [display panel](#). The background for the workspace defaults to a gray background. The graphic workspace displays all graphical symbols and a user-selectable [Static Background](#). The UGT [Toolbar](#) shows only the appropriate tools for the [UGT Modes](#) you are working in [View Mode](#) or [Edit Mode](#).

### UGT Modes

The User Graphics tool runs in either [Edit Mode](#) or [View Mode](#). When you are generating new graphics or editing graphics, the User Graphics tool is in Edit mode. When you finish editing and click save and the UGT switches to View mode.

**Note:** You can generate graphics in the Metasys system online mode or offline mode ([Metasys Modes](#)). See the following scenarios:

**Online:** If your Web browser is connected to an Engine or ADS/ADX. In this case, a new graphic is generated online in the device where the graphic resides during normal operation. When you are finished creating or editing graphics, [Upload](#) the database to the archive database in the SCT.

**Offline:** If your Web browser is connected to the SCT. In this case, the new graphic is generated offline and stored in the archive database. When you are finished creating or editing graphics, [Download](#) the database to the device where the graphic will reside during normal operation.

### Edit Mode

Edit mode is the mode used by the UGT to design and edit graphics. Access the Edit mode by clicking the Edit button on the UGT [Toolbar](#). In Edit mode, you have access to all toolbar items/symbols and you can [bind](#) symbols to objects and link graphics to other graphics.

Right clicking in Edit mode brings up basic choices for editing graphics such as copy, paste, delete, duplicate, hide, and zoom, depending on the type of item you select. Double clicking in Edit mode brings up the binding information for a symbol.

For a list of mouse shortcuts, see the [Mouse Shortcuts: Edit Mode](#) topic.

### View Mode

Graphics display in the View mode when you are [navigating using graphics](#) and when you first open a graphic. Graphics appear in an active [display panel](#). You must enter the [Edit Mode](#) (by clicking the [Edit button](#)) to design or edit a graphic. In View mode, you have access only to a limited number of items on the UGT [Toolbar](#). The symbols in the palette on the left do not appear in this mode.

The View mode allows you to command an object bound to a [Value Display Box](#) or [Analog Fill Bar Graph](#) and to click on [Hyperlinks](#) to access linked graphics. Double clicking on a bound symbol in View mode displays the Focus view of the bound object.

For binary point objects, the value and status update every 10 seconds. For analog point objects, the value and status update every 10 seconds. Commands and value changes return a new state/value or error message within 10 seconds or less. The error message could be related to priority (if the system can't perform the requested function now) or failure to reach a commanded state or value. Error messages appear in dialog boxes.










For a list of mouse shortcuts, see the [Mouse Shortcuts: View Mode](#) topic.

### Toolbar













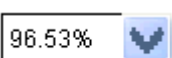
The UGT toolbar shows only the appropriate tools for the current [mode](#) of the UGT. The table below shows the toolbar options available in [Edit Mode](#) and [View Mode](#).

For information on mouse shortcuts, see [Mouse Shortcuts](#).

**Table 127: UGT Toolbar Options in Edit Mode and View Mode**

Icon (Standard Windows Icons not Shown)	Description	Visible In:		Action Performed
		Edit Mode	View Mode	
	Save	X		Saves all changes to the graphic and exits Edit mode.
	Cancel	X		Cancels any changes to the graphic (made since the last save) and exits Edit mode.
	Edit		X	Changes the UGT to Edit mode. <b>Note:</b> This is the only toolbar item that requires Configure Access (Security Administrator System).
	Print	X	X	Brings up the Print dialog.
	Print Preview	X	X	Brings up the Print Preview dialog.
	Cut	X		Cuts the selected symbol out of the graphic.
	Copy	X		Copies the selected symbol.
	Paste	X		Pastes a cut or copied symbol into the system.
	Undo	X		Undoes the previous action (except for a save) up to 4 actions.

**Table 127: UGT Toolbar Options in Edit Mode and View Mode**

Icon (Standard Windows Icons not Shown)	Description	Visible In:		Action Performed
		Edit Mode	View Mode	
	Redo	X		Redoes the previous undone action up to 4 actions.
	Set Background Image	X		Allows you to import the background of the graphic.
	Set Advanced Image	X		Allows you to import an advanced graphic.
	Save Background Image	X		Saves the background image.
	Bind	X		Brings up the Bind Information dialog box for the selected item (this is the same box as when you double click on an item).
	Select	X	X	Turns the cursor into a selection cursor.
	Text	X		Turns the cursor into a text cursor that allows you to create a text box.
	Pan	X	X	Turns the cursor into a hand that allows you to pan over the diagram by dragging.
	Marquee Zoom	X	X	Allows you to select an area to zoom in on.
	Interactive Zoom	X	X	Zooms in and out on a graphic when you hold the mouse down.
	Zoom - Fit Window	X	X	Zooms the diagram to fit within the window.
	Overview	X	X	Shows an overview of the entire graphic in one window.
	Selective Zoom	X	X	Allows you to select the percentage zoom applied to the diagram.

## Static Background

Backgrounds are static images displayed in the background of a graphic. Backgrounds represent buildings, floor plans, mechanical equipment, and any other picture that represents the location or function of the equipment in the graphic. By default, a newly created graphic has a gray background. You can insert a background image using a file based on SVG, SVGZ, or JPEG graphic format.

You can create SVG/SVGZ background images with graphic drawing packages or from established libraries of images. We recommend using the Professional or Standard edition of Microsoft Visio 2003, 2007 or 2010 (32 bit) software and the AGSL to create background images. Alternatively, you can use Microsoft Visio 2002 software with the Graphics Stencil Library (GSL). SVGZ and SVG images must be created in positive space (quadrant 1, on the positive X and positive Y axis).

Background images in JPG format are usually created with cameras or scanners. You cannot resize a UGT background in JPG format, and if an area of the graphics workspace is not fully covered by the JPG image, the exposed area defaults to gray.

Access available backgrounds with the background icon on the [Toolbar](#).



For information on how to edit an existing background image, see [Editing a Background Image](#).

## Managing Graphic Creation

In general, you should store your graphic files on the Site Director. The Site Director provides you with a uniform point of entry and traffic control. The Site Director allows information sharing between users while minimizing network traffic.

### NAE35/NAE45 Graphic Size Limitation

When you create or edit graphics with an online UI to an NAE35 or NAE45, changes you make do **not** save if the graphic is too large. The total size of the graphic background, dynamics, and static text must not exceed 700K bytes. A typical size for an SVGZ graphic is 100–200K. You do not receive a warning that the graphic is too large to save. Transactions larger than 1 MB are rejected by the NAE. The size limitation includes a 40% overhead from the HTML **wrapper** around the save transaction.

**Note:** This size restriction does not apply to graphics that are created and saved through the online UI to an NAE55, NAE85, or SCT.

When you work with NAE35/NAE45 graphics, use the following equation to help keep your graphics at a manageable size:

(background image size x 140%) - 1 MB (1,048,576 bytes) = available space for graphic dynamic symbols and text blocks

**Note:** Each graphic symbol is 3,000 bytes.

Example:

Background size: 700,000 bytes

Background + overhead: 700,000 x 140% = 980,000

Total Space for symbols and text = 1,048,576 - 980,000 = 68,576

Total symbol and text elements = 68,576 / 3,000 = 22

## Symbols

Symbols are graphic elements or components that are inserted into graphics to represent the value or status of equipment in your system. The UGT contains the set of symbols described in the table below. In Edit mode, the symbols appear in a palette to the left side of the graphic workspace.

Symbols support drag and drop functionality. For more information, see [Drag and Drop Shortcuts](#).

**Table 128: Symbol Descriptions**

Symbol	Description
<a href="#">Buttons</a>	Buttons allow you to hyperlink from one graphic to an item, URL, or application.
<a href="#">Value Display Boxes</a>	Value Display Boxes display the value and status of bound objects and allow you to access the Focus view of the bound object. Value Display Boxes also show the units used by the value.
<a href="#">Gauges</a>	Gauges display the value and status of bound objects with graphs, dials, and standard <i>colors</i> . UGT offers the following gauge categories:  <a href="#">Analog Fill Bar Graph</a>  <a href="#">Dial Gauge</a>
<a href="#">Dynamics</a>	Dynamic symbols indicate the value of bound objects. Some of these symbols move as the object change. Members of this category are:  <a href="#">Fans</a>  <a href="#">Basic Shapes</a> (Block)  <a href="#">Switch (2 or 3 State)</a>

### **Button Symbols**

Button symbols are useful when browsing to another graphic, object, or a Web site. Buttons support the drag and drop functionality, allowing you to drag items from the navigation tree and drop them in the graphic workspace with the following rules:

If you select multiple objects in the [Navigation Tree](#) and then drag a button to the [Graphic Workspace](#), the UGT creates buttons that [Alias](#) the selected objects.

If you select a graphic/object in the navigation tree and then drag a button to the graphic workspace, the UGT creates a button bound to the selected graphic/object.

In Edit mode, after you drag and drop a button, click on it to add a label. If you double click on a Button in the Edit mode, the Hyperlink Information box appears. Using this box, you can specify to link the graphic to a graphic, object, or Web page, choose display properties, and choose to hide the button. See the [Button Symbols](#) topic for more information.

Only buttons support [Hyperlinks](#).

In the View mode, left click on the Button to navigate to the bound object, graphic, or Web page. When your cursor passes over a button, the cursor changes into a finger pointer.

See the [Buttons](#) step section for information on binding Buttons.

### **Hyperlinks**

Hyperlinks are links from one graphic to other items (graphics or other objects), URLs, or applications using [buttons](#). If you click on a button hyperlinked to an item, your view switches from the current graphic to the hyperlinked graphic or object. If you click on a hyperlink to a URL, the Web site appears in a separate browser window. If you click on a hyperlink to an application, the application opens.

Only buttons support hyperlinks. Set hyperlinks when you bind a button symbol.

**Note:** You cannot link to items in the system, such as Tailored Summaries, unless you are also using Ready Access Portal software. To link to a Tailored Summary, use the Ready Access Portal UI URL as the link destination in the graphic. If you are not logged on to the Ready Access Portal UI, you are asked for your username and password after clicking the link.

### **Value Display Boxes**

Value Display Boxes are useful for displaying the value and status of a large number of objects in a single graphic. The Value Display Box supports drag and drop functionality. If you select a single item or multiple items in the navigation tree and then drag and drop a Value Display Box, the box/es automatically binds to the selected item/s.

If a Value Display Box is configured to display the Status of the bound object, the text and box background appear in the standard [Status Colors](#).

In View mode, Value Display Boxes appear as if they are editable boxes, but they are not. Double click on the Value Display Box to display the Focus view for the bound object and right click to show the command menu.

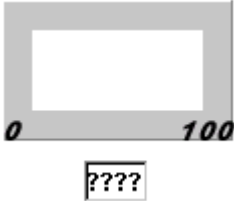
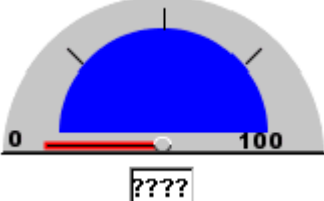
See the [Value Display Boxes](#) step section for information on binding Value Display Boxes.

### **Gauges Category**

Gauges provide an indication of the present value and status for the bound objects. If you select a single item or multiple items in the navigation tree and drag a gauge to the workspace, the UGT creates one gauge per item and binds each symbol to an item.

The following table lists the gauges included in the UGT.

**Table 129: Gauges**

Gauge Type	Symbol	Animation
<i>Analog Fill Bar Graph</i>		Bar moves to indicate value of bound object.
<i>Dial Gauge</i>		Dial needle moves to indicate value of bound object.

**Analog Fill Bar Graph**

Analog Fill bar graph symbols show the present value of an object by changing the size of the bar in the graph and indicating the present value as a number in the display box. The color of the moving bar graph and the display box background color indicate the status of the bound object. We recommend using Analog Fill Bar Graphs with analog objects.

You can define the minimum and maximum value of the bar graph range. If you don't define the minimum and maximum for the bar range, the gauge defaults to 0 for the minimum and 100 for the maximum. Under the bar, a value box displays the numeric value of the bound object. Analog Fill symbols can be configured to move vertically or horizontally. To change the orientation of the Analog Fill box, see [Gauges: Analog Fill](#).

In View mode, the display box appears as an edit box, but it is not editable. If you choose, the *color* of the display box background shows the status of the bound object and the units used by the symbol. Double click on the symbol to see the Focus view of the bound object and right-click to show the command dialog box.

**Dial Gauge**

Dial gauges indicate the present value of a bound object with the position of a needle on a gauge. A display box shows the present value as a number with units, and shows the status of the bound object. We recommend using Dial Gauge with analog objects.

You can choose the minimum and maximum value for the dial range. If you don't define the minimum and maximum for the dial range, the gauge defaults to 0 for the minimum and 100 for the maximum.

In the View mode, the Dial Gauge appears as a circular dial with a needle pointing to the position that represents the value of the bound analog object. A value box below the dial shows the numeric value of the bound object. Double click the dial gauge to display the Focus view for the bound object and right-click to show the command dialog box.


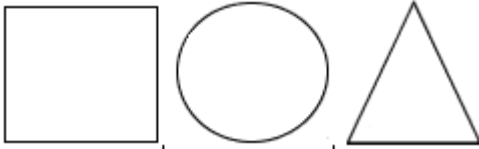
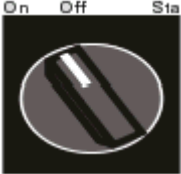
See the [Gauges: Dial Gauge Symbol](#) step section for information on binding Dial Gauges.

**Dynamics**

Dynamic symbols display the status of bound objects. If you select a single item or multiple items in the navigation tree and drag a dynamic symbol to the workspace, the UGT creates one symbol per item and binds each symbol to an item.

The dynamics category includes the symbols listed in the table below.

**Table 130: Dynamics**

Dynamics Type	Symbol	Animation
<i>Fans</i>		Fan/pump blades spin or remain stationary.
<i>Basic Shapes</i> (Square, Circle, and Triangle)		Colors change.
<i>Switch (2 or 3 State)</i>		Switch changes positions.

**Fans**

Fan symbols display rotational movement when bound to an object. Use this dynamic component to provide animation capabilities for fans or pumps that appear in the background image. You can choose either a clockwise or a counter-clockwise spin. We recommend using Fans with binary objects.

In View mode, if the bound object has a value of 0, the fan appears stationary. If the bound object has a value greater than 0, the fan/pump blade spins. The fan/pump *color* shows the state of the bound object (red for Off, green for On).

If the fan is spinning, the bound object has a normal status or is unreliable, and the device that the bound point resides on is online, the color of the fan is set to the color defined in the system preferences for the On state. If the fan is not spinning, the bound object has a normal status or is unreliable, and the device that the bound point resides on is online, the color of the fan is set to the color defined in the system preferences for the Off state. If neither of these scenarios apply, the color of the fan is defined by the status colors defined in the system preferences.

In the View mode, a double click on a fan symbol displays the Focus view of the bound object. A right-click shows the command dialog box.

See the [Dynamics: Fans](#) step section for information on binding Fans.

**Basic Shapes**

Basic Shapes show the status of the bound object. Any basic shape can be bound to either an analog, binary, or multistate object. You can resize these symbols, which include a square, triangle, and circle.

If a basic shape is bound to an analog object, in the View mode, the color of the shape indicates the status of the bound object. White is normal, but other colors are listed. See [Status Colors](#).

If a basic shape is bound to a binary object, in the View mode, the color of the shape indicates the state of the bound object. By default, if the state is 0, the shape is white and if the state is greater than 0, the shape is green. These can be configured by the user when you bind the symbol.

Double click on the shape to display the Focus view for the bound object. Right-click to display the commands.

**Tip:** Use the circles to depict temperature sensors on a floor plan graphic. Circles and rectangles can be used as status lights.

See the [Dynamics: Basic Shapes](#) step section for information on binding basic shapes.

### Switch (2 or 3 State)

The Switch is a dynamic symbol that can be bound to an object, and can be configured to be either a 2 or 3 state switch). User-defined text appears at the top of the Switch to show what state the point is in. You can resize Switches. We recommend you bind a Switch to a binary or multistate object.

In View mode, Switch symbols show the state of the bound object. Double click on the shape to display the Focus view for the bound object. Right-click to show the command dialog box.

See the [Dynamics: Switches](#) step section for information on binding switches.

### Binding Symbols to Objects

In the UGT you can bind symbols to objects, which allows the symbol to display the condition of the bound object. Refer to each [symbol](#) section for details about which object type can be bound to each symbol.

To speed up the binding process, select one item or several items (using the Shift or Control key) in the navigation tree and then drag and drop a symbol into the graphic workspace. The symbol automatically binds to the item or items selected in the tree.

To bind graphics in [Edit Mode](#), see [Binding Symbols to Objects in Edit Mode](#).

For information on drag and drop binding shortcuts, see [Drag and Drop Shortcuts](#).

### Status Colors

Status colors are used by symbols such as Value Display Boxes, Analog Fill Bar Graphs, and Basic Shapes to indicate the status of a bound object. The following table lists the default status colors used by the UGT.

**Table 131: Status Colors**

Status	Symbol Text Color	Symbol Background Color
Normal	Black	White
Alarm	Black	Red
Warning	Black	Yellow
Trouble	Black	Yellow
Offline	White	Black
Operator Override	Black	Orange
Out of Service	Black	Light Brown

**Note:** All status color defaults can be changed in the [Graphic Settings Tab](#) in the [Preferences](#) chapter.

See [Binding Symbols to Objects in Edit Mode](#) for information on binding graphics.

### Alias

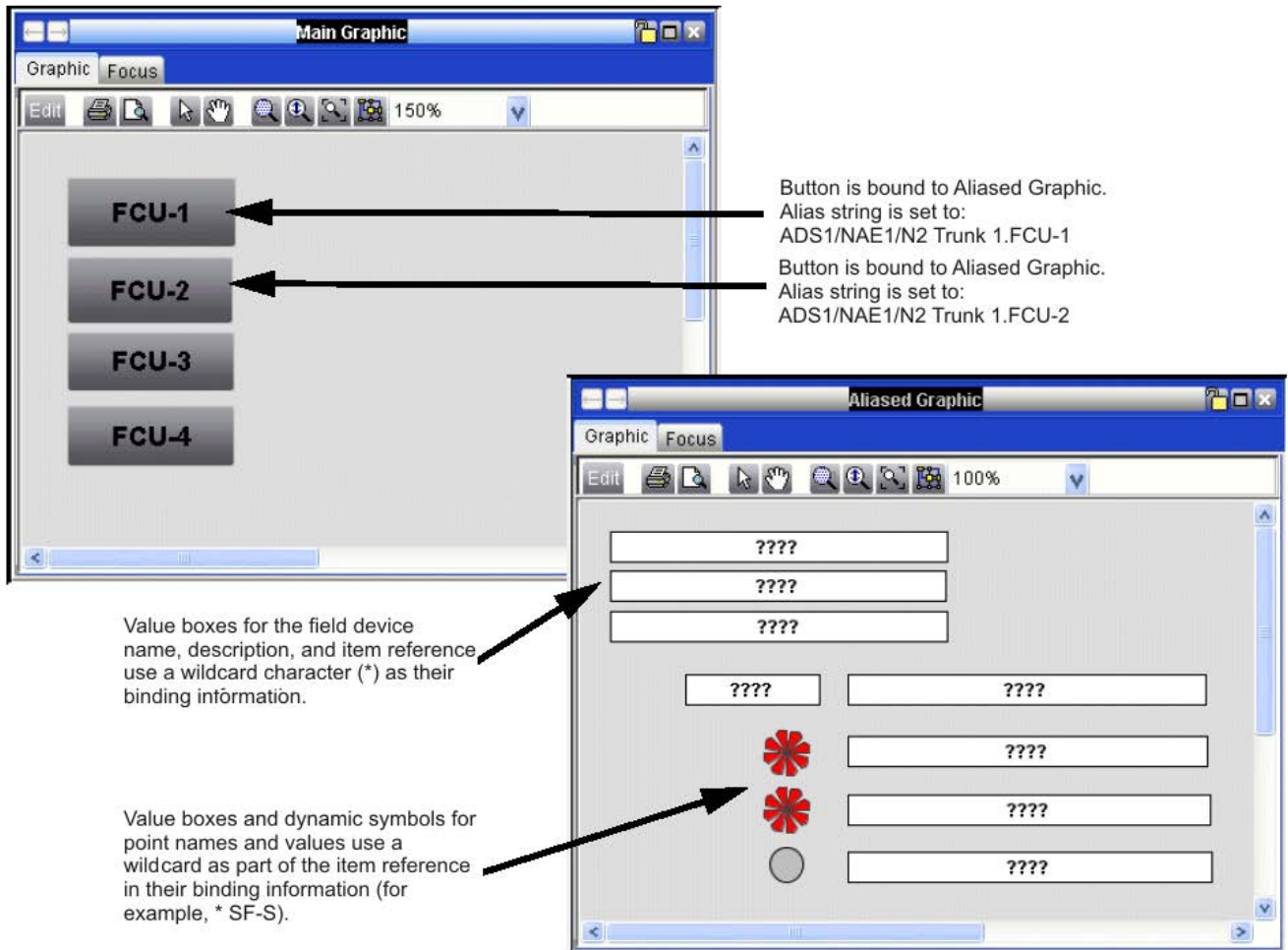
Aliases simplify the process of binding symbols to objects during graphic generation when a site has several graphics that contain a common set of objects. The Alias feature allows you to use a wildcard character (\*) to represent a single string of characters that may be part of the complete object reference as part of the binding information for a symbol. When a graphic is displayed in [View Mode](#), the alias symbol (\*) is replaced with the text from the alias box of the symbol you used to access the graphic. If you navigate to a graphic using an aliased button, you cannot edit the graphic. To edit the aliased graphic, access it via the navigation tree.

For example, aliasing allows you to use a single aliased graphic for multiple field controllers, such as VAV Modular Assemblies (VMAs), with similar configurations. See [Creating Aliases](#).

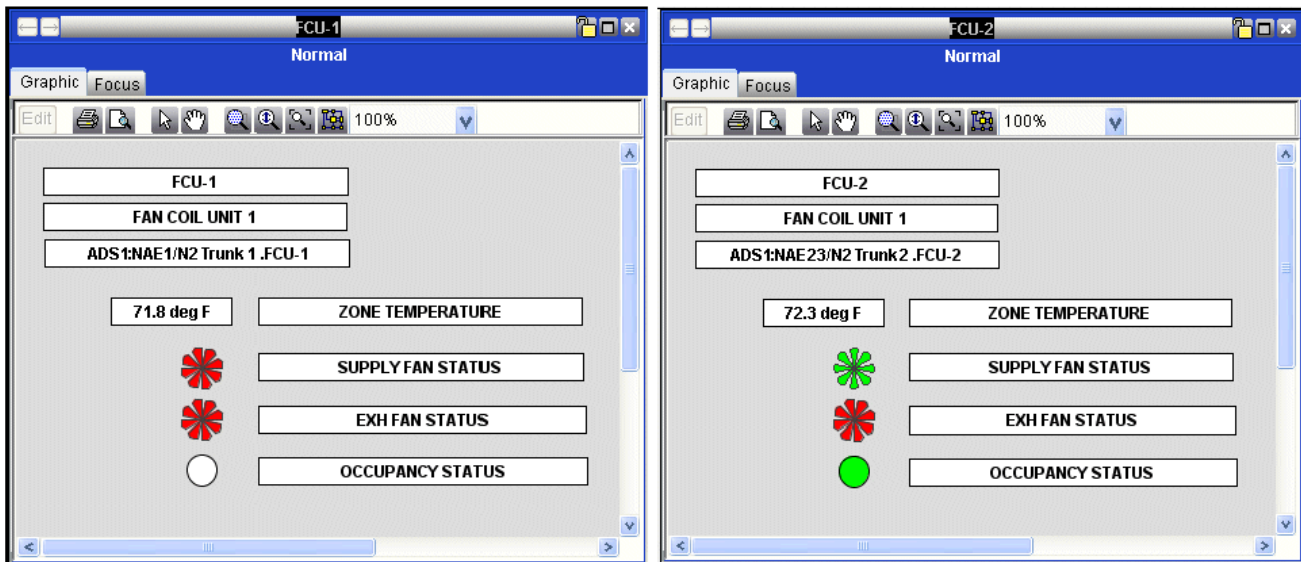
[Figure 51](#) shows an example of a main graphic and an aliased graphic. In the figure, the top panel contains the main graphic, which has several buttons bound to the aliased graphic. Each button has its alias string set to the reference for a different field device. The bottom panel shows the aliased graphic, displayed directly from the navigation view (that is, with no alias strings passed in).

Figure 52 show the aliased graphic as it displays when the user clicks the corresponding buttons in the main graphic (that is, with field device-specific values).

**Figure 51: Alias Example - Main and Aliased Graphics**



**Figure 52: Alias Example - Using the Aliases**



This graphic appears if you click FCU-1 in Main Graphic (Figure 20-41). Content is specific to FCU-1).

This graphic appears if you click FCU-2 in Main Graphic (Figure 20-41). Content is specific to FCU-2).

For more information on binding graphics, see [Binding Symbols to Objects in Edit Mode](#).

## Navigation

You can navigate between graphics by using [hyperlinked Button Symbols](#) or by selecting graphics from the navigation tree and displaying them in the Display Frame. You can restrict user access to specific graphics by setting security levels in the Security Administrator System.

You can also create user views that contain only graphics (hierarchy of graphics references). See [User Views](#) for more information.

## Commands

You can command objects that are bound to symbols by right clicking on the symbol in [View Mode](#). If you are not authorized to command the object, the command will be disabled in the command dialog box.

## Mouse Shortcuts

Use mouse shortcuts to speed up User Graphics Tool use. See [Mouse Shortcuts: Edit Mode](#) and [Mouse Shortcuts: View Mode](#).

### Mouse Shortcuts: Edit Mode

The following table lists the mouse shortcuts you can use in the [Edit Mode](#) of the User Graphics Tool.

**Table 132: Edit Mode Mouse Shortcuts**

Item	Single Left Click	Double Left Click	Right-Click
<b>Static Background Image</b>	No action takes place.	No action takes place.	Remove Background
<b>Button</b>	Select	<a href="#">Hyperlink Information dialog box appears.</a>	Cut, Copy, Paste, Duplicate, Delete, <a href="#">Format, Align</a>
<b>Value Display Box</b>	Select	<a href="#">Bind Information dialog box appears.</a>	Cut, Copy, Paste, Duplicate, Delete, <a href="#">Format, Align</a>
<b>Gauge: Analog Fill</b>	Select	<a href="#">Bind Information dialog box appears.</a>	Cut, Copy, Paste, Duplicate, Delete, <a href="#">Format, Align</a>
<b>Gauge: Dial</b>	Select	<a href="#">Bind Information dialog box appears.</a>	Cut, Copy, Paste, Duplicate, Delete, <a href="#">Format, Align</a>

**Table 132: Edit Mode Mouse Shortcuts**

Item	Single Left Click	Double Left Click	Right-Click
<i>Dynamics: Fan</i>	Select	<i>Bind Information dialog box appears.</i>	Cut, Copy, Paste, Duplicate, Delete, <i>Format, Align</i>
<i>Dynamic: Basic Shape</i>	Select	<i>Bind Information dialog box appears.</i>	Cut, Copy, Paste, Duplicate, Delete, <i>Format, Align</i>
<i>Dynamics: Switches</i>	Select	<i>Bind Information dialog box appears.</i>	Cut, Copy, Paste, Duplicate, Delete, <i>Format, Align</i>

**Format**

The Format menu choice contains the choices listed in the following table.

**Table 133: Format Menu Options**

Choice	Description
<b>Copy Binding</b>	Copies the selected symbol's binding information, which you can then paste to a new symbol. With this feature, you can easily bind several symbols to one object.
<b>Paste Binding</b>	Pastes the previously copied binding information to the selected symbol(s).
<b>Copy Format</b>	Copies the selected symbol's formatting (size and font information), which you can then paste onto another symbol. This allows you to easily format multiple symbols in the same way.
<b>Paste Format</b>	Pastes the previously copied formatting information to the selected symbol(s).

**Align**

The Align menu choice contains the choices listed in the following table.

**Table 134: Align Menu Options**

Choice	Description <sup>1</sup>
<b>Align Top</b>	Aligns all symbols to the top most edge of the first symbol you selected.
<b>Align Bottom</b>	Aligns all symbols to the bottom most edge of the first symbol you selected.
<b>Align Left</b>	Aligns all symbols to the left most edge of the first symbol you selected.
<b>Align Right</b>	Aligns all symbols to the right most edge of the first symbol you selected.
<b>Align Horizontal Center</b>	Aligns all symbols to the horizontal center of the first symbol you selected.
<b>Align Vertical Center</b>	Aligns all symbols to the vertical center of the first symbol you selected.

<sup>1</sup> When you select multiple objects by dragging the mouse across them, the **first selected** symbol is not based on the symbol's location within the graphic, but on the order in which it was originally added to the graphic. We recommend that you first click on the symbol with which you want to align other symbols. Once you have selected that symbol, hold down the Shift key while you drag the mouse across additional symbols to select them (you can also use Shift + click to select additional symbols).

**Mouse Shortcuts: View Mode**

The following table lists the mouse shortcuts you can use in the *View Mode* of the User Graphics Tool.

**Table 135: View Mode Mouse Shortcuts**

Symbol	Single Left Click	Double Left Click	Right-Click
<i>Button</i>	Navigate to <i>hyperlink</i> .	Navigate to <i>hyperlink</i> .	No action takes place.
<i>Value Display Box</i>	Select	Display focus view of bound object.	Command box appears.
<i>Gauge: Analog Fill</i>	Select	Display focus view of bound object.	Command box appears.
<i>Gauge: Dial</i>	Select	Display focus view of bound object.	Command box appears.
<i>Dynamics: Fan</i>	Select	Display focus view of bound object.	Command box appears.



**Table 135: View Mode Mouse Shortcuts**

Symbol	Single Left Click	Double Left Click	Right-Click
<a href="#">Dynamic: Basic Shape</a>	Select	Display focus view of bound object.	Command box appears.
<a href="#">Dynamics: Switches</a>	Select	Display focus view of bound object.	Command box appears.

## Drag and Drop Shortcuts

Consider the following shortcuts when dragging and dropping items to the [Graphic Workspace](#):

- If you select a [Graphic Object](#) in the navigation tree and then drag a [button](#) to the graphics workspace, the UGT creates a button already bound to the selected Graphic object.
- If you select multiple field points in the [Navigation Tree](#) and drag a [Value Display Box](#) to the graphics workspace, the UGT creates multiple Value Display Boxes each bound to a field point.
- If you select multiple field points in the navigation tree and drag a [dynamic symbol](#) or [gauge](#) to the graphics workspace, the UGT creates multiple symbols each bound to a field point.
- If you select multiple field controllers along with a Graphic object in the navigation tree and drag a button to the graphics workspace, the UGT creates buttons for all the controllers. All buttons have the appropriate [Alias](#) string already entered.
- To change the binding information for a symbol or to add [binding](#) information (if you drag and drop a symbol without selecting anything in the navigation tree), see [Binding Symbols to Objects in Edit Mode](#).

## User Graphics Tool Steps

### Generating Graphics (Overview)

**Note:** This process is the same when the system is [offline](#), except the binding is done to the archive database instead of the online system. You cannot create, edit, or delete a graphic in online mode with [Basic Access](#).

**Note:** For information on default preferences for graphics (such as status colors, fan colors, state colors, and alarm flashing settings), see [Graphic Settings Tab](#) in the [Preferences](#) section.

To create a complete graphic:

1. On the [Insert Menu](#), click Graphic. The [Insert Graphic Wizard](#) appears.
2. Follow the wizard instructions.
3. Drag the graphic from the [Navigation Tree](#) to the [display panel](#).
4. Click on the Background Image [icon](#) on the UGT toolbar to import a [Static Background](#) image into the graphic.

**Note:** To scale imported SVGZ Floorplans from Visio, cut the rescaled image from Visio. Paste the image into Paint. Cut the image from Paint and use paste special as a Device Independent Bitmap into Visio.

5. [Add Symbols](#) as needed on top of the static background.
6. [Bind](#) the symbols to [objects](#).
7. Add [Hyperlinks](#) to the buttons and [create aliases](#) (if desired).
8. [Save](#) the graphic.
9. [Download](#) the graphic to the online device (if you have created the graphic with the Metasys software [offline](#) using the SCT). [Upload](#) the graphic to the archive database of the SCT (if you have created the graphic with Metasys software [online](#)).

### Changing UGT Modes

To change from View mode to Edit mode, click the Edit button on the UGT [Toolbar](#).

To change from Edit mode to View mode, click Save on the UGT toolbar.

### Viewing User Graphics

To view user graphics, double click on or drag a graphic item from the [Navigation Tree](#) into the [Display Frame](#).

**Note:** To be sure the graphic item drops completely, release the drop with your cursor over the header section of the desired display frame.

## Copying an Existing Graphic

**Note:** This is available when using the [SCT](#) only.

1. Click on an existing graphic item in the [Navigation Tree](#).
2. From the Edit menu, select Copy.
3. Click in the navigation tree where the new graphic is to appear.
4. From the Edit menu, select Paste and name the new graphic.



## Binding Symbols to Objects in Edit Mode

### Buttons

To bind buttons to items, URLs, or applications:

1. Double-click on a [button](#). The Hyperlink Information dialog box appears.
2. Use the information below to edit the fields.

**Table 136: Button Options**



Field	Description
<b>Hyperlink Type</b>	Selects whether the button provides a link to an item, URL, or application.
<b>Item/URL/Application</b>	If you link the button to a URL, type the address here. If you link to an item or application, click  and see below. Applications configured using the Metasys Preferences <a href="#">Applications Tab</a> appear on the drop-down menu.
	Opens a dialog box for browsing to an item or application.  If you are linking to an item, UGT displays a navigation tree listing graphics/objects you can bind to the button.  If you are linking to an application that is not in the Application drop-down menu, UGT allows you to navigate to and select an executable file for an application that resides on your local file system or a network drive.  <b>Note:</b> The linked application does not close when you exit the UI.
<b>Hidden</b>	Hides the button in the View mode, creating a virtual hyperlink on the background image.
<b>Alias</b>	Passes the defined <a href="#">Alias</a> string to the linked graphic when you press the button.
<b>Properties</b>	Displays a dialog box to change font size and text justification for the button label text.
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancel changes.

### Value Display Boxes

To bind Value Display Boxes to objects:

1. Double click on a [Value Display Box](#). The Binding Information dialog box appears.
2. Use the information below to edit the fields.

**Table 137: Value Display Box Options**

Field	Description
<b>Object</b> 	Allows you to type in the Item Reference of the object you want to bind to the Value Display Box. Or, lets you click  to launch a tree browser to select the object to bind to the Value Display Box.
<b>Attribute</b>	Allows you to select the specific attribute to bind to the Value Display Box. The bound attribute is initially set to the object's Default attribute, which varies per object type, but is typically Present Value.  If an object does not have a Default attribute, the value box displays '????' on the graphic until you change the binding to a different attribute.  You can bind to string values or to numeric values.
<b>Units</b>	Shows the Units for the bound object in the Value Display box.
<b>Status</b>	Shows the Status for the bound object by <i>color-coding</i> the text and background for the Value Display box.
<b>Properties</b>	Allows you to configure the text properties for the Value Display Box text.
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancels changes.



**Note:** In the View mode, double clicking on the Value Display box displays the focus view for the bound object. Right-click displays the commands.

**Gauges: Analog Fill**

To bind Analog Fill symbols to objects:

1. Double-click on an *Analog Fill Bar Graph* icon. The Binding Information dialog box appears.
2. Use the information below to edit the fields.

**Table 138: Analog Fill Gauge Options**



Field	Description
<b>Object</b> 	Allows you to type in the Item Reference of the object you want to bind to the Analog Fill Gauge. Or, lets you click  to launch a tree browser to select the object to bind to the Analog Fill Gauge.
<b>Attribute</b>	Allows you to select the object's attribute to bind to the gauge.
<b>Fill Color</b>	Launches the fill color selector to select the color displayed by the bar graph.
<b>Orientation</b>	Chooses vertical or horizontal motion of the bar graph.
<b>High Limit</b>	Sets the high number for the display range of the gauge.
<b>Low Limit</b>	Sets the low number for the display range of the gauge.
<b>Units</b>	Displays the units used by the bound object.
<b>Status</b>	Displays the <i>status</i> of the object in the display box of the symbol.
<b>Properties</b>	Allows you to configure the text properties for the text in the display box of the gauge.
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancels changes.

**Gauges: Dial Gauge Symbol**

To bind Dial Gauge symbols to objects:

1. Double-click on the *Dial Gauge* symbol. The Binding Information dialog box appears.
2. Use the information below to edit the fields.

**Table 139: Dial Gauge Symbol Options**



Field	Description
<b>Object</b> 	Allows you to type in the Item Reference of the object you want to bind to the Dial Gauge. Or, lets you click  to launch a tree browser to select the object to bind to the Dial Gauge.
<b>Attribute</b>	Allows you to select the object's attribute to bind to the gauge.
<b>Gauge Color</b>	Launches the color selector for the gauge to select the color displayed in the center of the gauge.
<b>High Limit</b>	Sets the high number for the display range of the gauge.
<b>Low Limit</b>	Sets the low number for the display range of the gauge.
<b>Units</b>	Displays the units used by the bound object.
<b>Status</b>	Displays the <i>status</i> of the bound object in the display box of the gauge.
<b>Properties</b>	Allows you to configure the text properties for the text in the display box of the gauge.
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancels changes.

**Dynamics: Fans**

To bind Fan symbols to objects:

1. Double-click on the *Fans* symbol. The Binding Information dialog box appears.
2. Use the information below to edit the fields.

**Table 140: Fan Dynamics Options**

Field	Description
<b>Object</b> 	Allows you to type in the Item Reference of the object you want to bind to the Fan. Or, lets you click  to launch a tree browser to select the object to bind to the Fan.
<b>Attribute</b>	Allows you to select the object's attribute to bind to the fan.
<b>Clockwise/Counter-Clockwise</b>	Selects if the Fan symbol will spin in a clockwise or counter-clockwise direction.
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancels changes.



**Dynamics: Basic Shapes**

To bind Basic Shapes symbols to objects:

1. Double-click on the *Basic Shapes* symbol. The Binding Information dialog box appears.
2. Use the information below to edit the fields.

For information on default preferences for graphics (such as status colors, fan colors, state colors, and alarm flashing settings), see *Graphic Settings Tab* in the *Preferences* section.

**Table 141: Basic Shape Dynamics Options**

Field	Description
<b>Object</b> 	Allows you to type in the Item Reference of the object you want to bind to the Basic Shape. Or, lets you click  to launch a tree browser to select the object to bind to the Basic Shape.
<b>Attribute</b>	Allows you to select the object's attribute to bind to the Basic Shape.
<b>State 0<sup>1</sup></b>	Allows you to set the color for State 0.
<b>State 1</b>	Allows you to set the color for State 1.
<b>State 2</b>	Allows you to set the color for State 3.

**Table 141: Basic Shape Dynamics Options**



Field	Description
State 3	Allows you to set the color for State 4.
All Other States	Allows you to set the color for all other states.
Orientation	For the triangle basic shape, chooses the position of the point (Up, Down, Left, or Right).
OK	Accepts changes.
Cancel	Cancels changes.

1 The default color is determined by the preferences. See [Graphic Settings Tab](#) in the [Preferences](#) section for details.

### **Dynamics: Switches**

To bind Switch symbols to objects:

1. Double-click on the [Switch](#) symbol. The Binding Information dialog box appears.
2. Use the information below to edit the fields.

Field	Description
Object 	Allows you to type in the Item Reference of the object you want to bind to the Switch. Or, lets you click  to launch a tree browser to select the object to bind to the Switch.
Attribute	Allows you to select the object's attribute to bind to the switch.
Number of States	Allows you to choose the number of states (2 or 3) the switch will have.
State 0/1/2	Allows you to choose the text associated with each state.
OK	Accepts changes.
Cancel	Cancels changes.

### **Monitoring and Commanding Items Using Graphics in View Mode**

**Note:** The Metasys system user interface provides the capability to monitor and command the Metasys system using graphics. To navigate through the system, see [Navigating Graphics in View Mode](#).

To monitor your Metasys system using graphics:

1. [Display graphics](#) to show the status/state of your system components.
2. [Navigate](#) through the system.
3. To command objects/items using graphics, right-click on the symbol in View mode and select the desired command.

**Note:** Right clicking has no effect on [Button Symbols](#).

### **Navigating Graphics in View Mode**

To navigate graphics in View mode, double click on the symbol and navigate by one of the following two methods:

1. Navigate to the [hyperlink](#) of a [button symbol](#) by clicking on the button.
2. Navigate to the Focus view of an object by double clicking on a [Dial Gauge](#) or [Fan](#) symbol.

### **Adding Symbols to the Workspace**

To add symbols to the workspace, drag the symbol from the palette and drop the symbol into the workspace.

**Note:** Depending on the symbol you are adding, be wary if items are selected in the navigation tree. Some symbols will automatically bind to items selected in the tree. See the [Symbols](#) topics for more information on drag and drop capabilities.

**Note:** For more information on drag and drop binding shortcuts, see [Drag and Drop Shortcuts](#).

## Deleting Symbols from the Graphics Workspace

To delete symbols from the workspace, select the symbol and press Delete on your keyboard or right-click on the symbol and select Delete from the menu.

## Adding Text Blocks

To add text blocks in Edit mode:

1. Click on the Text icon on the UGT *Toolbar*.
2. Click on the workspace to select a location for the text. The text block appears.
3. Click the Select icon from the toolbar and double-click on the text block. The edit text box appears.
4. Type in the text box and click OK.
5. Select the Select icon on the UGT *Toolbar*.
6. Select the text block and drag the sides to resize the block.

## Editing Text Blocks

To edit text:

1. With the selection pointer *tool*, double-click on the block. The block opens for editing.
2. Change the text and click OK.
3. To change the text properties, right click on the text block and select Properties from the menu.

**Note:** You can change the font (type, size, bold, italic, bold italic), text color, background color, and border visibility/color.

## Editing a Background Image

Use this procedure if you want to edit a background of a graphic by exporting it from the UGT. Use this method when a copy of the existing background image is not available.

1. Drag the desired graphic from the *Navigation Tree* to the *display panel*.
2. Click the Edit button on the UGT *Toolbar* to enter *Edit Mode*.
3. Click the Save Background Image icon on the UGT toolbar to save the static background image to a location on your hard drive. The Save dialog box appears.
4. Enter a name for the background image, select the desired location on your hard drive, select JPG or SVG format, and click Save.
5. Open the background image file in the desired graphic editing program. Edit the background image as desired and save the file in SVG, SVGZ, or JPG format. See the Static background image section for information on supported file formats.

**Note:** You can only save a background image under its original file type. For example, if the background image was originally a JPG, you can save it only as a JPG now. You can save SVG and SVGZ files as SVG or SVGZ.

6. Return to the graphic in the UGT.
7. Click the Set Background Image icon on the UGT toolbar to import the revised background image file into the graphic.
8. *Save* the graphic.
9. *Download* the graphic to the online device (if you have created the graphic with the Metasys software *offline* using the SCT). *Upload* the graphic to the archive database of the SCT (if you have created the graphic with Metasys software *online*).

**Note:** Save a copy of the background image file in a folder on your hard drive as a backup method. If you decide to edit that background image later, you can edit your hard drive copy and use the Set Background Image icon to re-import the background into the graphic in the UGT. You also can use your hard drive copy in the event that you lose your databases and need to recover the background image.

## Creating Aliases

See [Alias](#) for more information on aliases.

**Note:** Do not set the Graphic attribute for an alarm extension to an aliased graphic. Aliased graphics will not display properly when displayed from the Alarms Window or Event Viewer.

1. **Create** a graphic with an appropriate background image, and add value boxes to represent common field points.
2. For each value box, edit the bound reference and use a wildcard character (\*) to replace the portion of the reference specific to a particular supervisory device, field trunk, and/or field controller.

For example, change the bound object reference for a Zone Temperature AI from ADS1:NAE1/N2 Trunk 1.VMA-1.ZN-T to \*.ZN-T. This is your **aliased graphic**.

**Note:** One wildcard character is allowed per reference, and all wildcard characters used in bindings for a particular aliased graphic must represent the same string.

3. **Create** a separate **main graphic** to use as the access point for your aliased graphic.
4. On the main graphic, add a button bound to the aliased graphic. Give the button a name indicating the field device it represents (see Tip below).
5. Set the alias string for the button to the text that should replace the wildcard in the reference for the value boxes on the aliased graphic.

For the example above, the alias string would be:

ADS1:NAE1/N2 Trunk 1.VMA-1

6. Repeat [Step 4](#) and [Step 5](#) to add buttons for additional field controllers, setting the alias string appropriately for each.

For example, ADS1:NAE201/N2 Trunk 2.VMA-43.

**Tip:** You can use the following shortcut steps to quickly create the buttons for your aliased graphic on your main graphic:

- a. Display your main graphic in the Display panel, and click Edit.
- b. Select the aliased graphic in the All Items navigation tree, then use Ctrl + click or Shift + click to select the items to use with the aliased graphic.

For the example given earlier, select VMA-1 under N2 Trunk on NAE1, and VMA-43 under N2 Trunk 2 on NAE 201.

- c. With the aliased graphic and other items selected in the navigation tree, drag the Button from the UGT palette into the graphic display area. A new button appears in the main graphic for each item. Each button is labeled with the item name, bound to the aliased graphic, and has its alias string set to the full reference of the selected item (for example, ADS1:NAE1/N2 Trunk 1.VMA-1).
- d. Find the button on the main graphic that has its alias string set to the aliased graphic (labeled with the name of the aliased graphic). This button is no longer needed, so you may delete it.
- e. Save your changes.

Once you have finished configuring your main and aliased graphic, display the main graphic in the online UI. Use the buttons on the main graphic to open the aliased graphic for each field device. See [Figure 51](#) and [Figure 52](#).

## Saving a Graphic

To save a graphic, click the Save button on the [Toolbar](#).

## Graphics+

Graphics+ files created with the Graphic Generation Tool (GGT) provide comprehensive and three-dimensional views of building automation systems that allow you to monitor the status of a single building or an entire campus of buildings. Unusual conditions are quickly identified on a dashboard screen that can navigate deeper into a building, floor, or zone. With minimal navigation, you can diagnose a problem and take corrective action. You can view historical data directly within the graphic, further enabling effective problem diagnosis. You can also issue commands from the graphic.

Graphics+ files are created offline with the GGT, a stand-alone application that runs on a computer with a supported Microsoft Windows operating system. These graphics are then saved as Metasys objects (typically on the Site Director) and viewed within the Site Management Portal UI or Ready Access Portal UI in any active display panel.

Graphics are usually made up of three parts:

- one or more background images
- animated HVAC elements, ductwork or piping, and/or floor plan information
- buttons that allow you to navigate to other graphics, applications, and Web addresses


You can access a graphic when you are logged in to the Site Management Portal UI via any Web browser. The [XAML Graphic Object](#) represents a Graphics+ object in the All Items navigation tree. You can open these graphics in any active [display panel](#).

For information about Graphics+ symbol and element functions, refer to the *Graphics+ Runtime Help (LIT-12011708)*.

For information about creating and editing Graphics+ files, then saving the graphic to an online device (ADS, ADX, or supervisory controller) or offline to an SCT archive database, refer to the *Graphic Generation Tool Help (LIT-12011697)*.

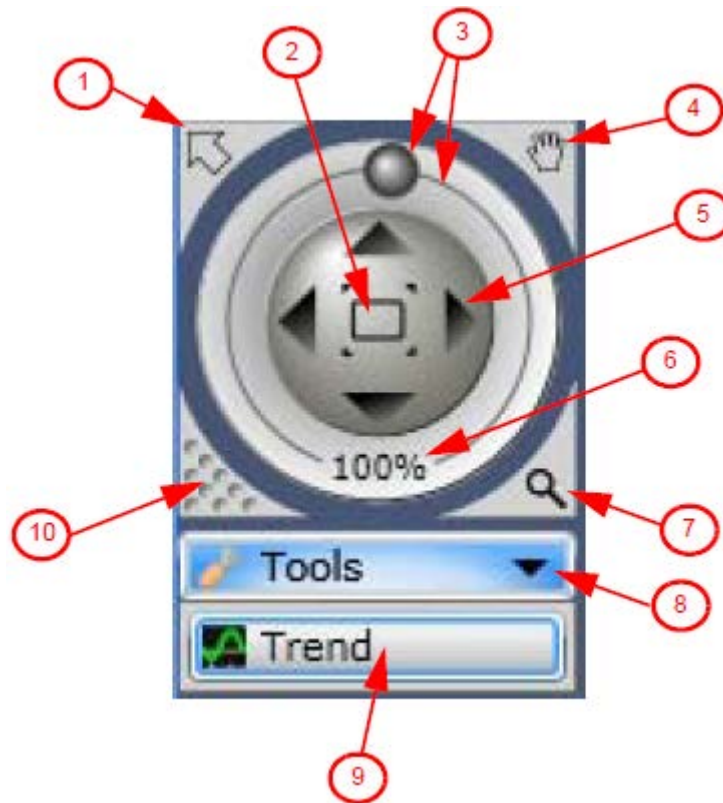
## Graphics+ Concepts

### Graphics+ View

Graphics appear in the navigation tree as stand-alone items. You can access graphics from a Tailored Summary, the Alarm Pop-ups window, or the Associated Graphic tab of a Field Controller device. The  symbol identifies a Graphics+ graphic. When you open the graphic, a Display Control tool appears in the upper left corner of the active display panel. Use the Display Control to zoom and pan a graphic. You can also open the Trend Module from this control. See [Figure 53](#) and [Table 142](#) for details on the Display Control tool.



**Figure 53: Graphics+ Control Tool**



**Table 142: Components of Display Control Tool**

Callout	Name	Description
1	Collapse	Hides the Display Control tool. After you hide the tool, a faint arrow appears that allows you to restore the tool.
2	Fit to Window (center block)	Zooms the graphic to fit in the frame.
3	Zoom Ball with Zoom Ring	Allows you to zoom by moving the ball clockwise (zoom in) and counterclockwise (zoom out) along the zoom ring.
4	Turn On/Off Panning	Enables and disables the panning tool that allows you to move the graphic in the workspace.
5	Move (four arrows)	Allows you to pan up, down, left, and right over the graphic in set increments.
6	Current Zoom Level	Displays the current zoom level.
7	Turn On/Off Zoom Mode	Enables and disables the manual zoom (magnifying glass) that allows you to re-center the graphic and zoom in an out.
8	Tools Menu	Drops down a list of Tools. At this time, only the Trend Module is available.
9	Trend	Opens and closes the Trend Module. This option appears when you click the Tools down arrow. See .
10	Move Display Control	Allows you to move the Display Control tool to a different area of the graphic.

## Navigation

You can navigate between graphics using the linked images and navigation buttons or opening the desired graphic from the navigation tree. You can restrict user access to specific graphics by setting security levels in the Security Administrator System.

You can also create user views that contain only graphics (hierarchy of graphics references). See [User Views](#) for more information.

## Commands

You can command objects that are bound to graphic symbols using two methods. The first method is to left-click the object's Inline Command Box or Advanced Value Box, then edit the value of the object. If commanding is disabled for that symbol, the value is not be editable. The second method is to right-click the object's Inline Command Box or Advanced Value Box to open the User Actions Panel, then select More Commands to bring up the Metasys commands dialog box. With either method, if you are not authorized to command the object, the command selection is disabled.

## User Actions Panel

You can open the User Actions Panel for a graphic element by right-clicking the graphic element. The User Actions Panel is a submenu of options that appears adjacent to the graphic element ([Figure 54](#)). The panel in the Site Management Portal UI supports three actions: View, Command, and Trend (SCT only supports View; Trend only appears for trended objects). To view the Focus window for the object, select its name (for example, ZN-SP). To command the object, select More Commands. To view trend data for the object in the Trend Module, select View Trend. If more than one attribute is trended, select View Trend, then click the attribute name. User access to all three actions is set with security levels in the Security Administrator System.

**Figure 54: Opening a User Actions Panel**



## Trend Module

From a Graphics+ object, you can view trended data for any object in the Site Management Portal UI with the Trend Module. The object must be displayed in the graphic and have at least one trend extension defined. Examples of graphic elements that support the Trend Module include any value box (for example, Basic Value Box, Inline Command Box, and Key Data Item), any basic shape, the LCD display in the Room Control Module, gauges, and the Room Status element. The Trend Module shows trend data from the device's online buffer, not from archived samples stored in a historical database.

## Opening the Trend Module

To open the Trend Module for an object on a Graphics+ graphic, click View Trend from the element's User Actions Panel ([Figure 55](#)). The Trend Module appears with the charted trend data. If more than one trended attribute is available, click View Trend to display a submenu that lists all available trended attributes. Click a trended attribute to open the Trend Module.

**Figure 55: Selecting a Trend to Add to the Trend Module**

**Single Trend Available**



**Multiple Trends Available**



If you want to open the Trend Module without adding or changing its content, click the Tools drop-down arrow on the Graphics+ Display Control tool ([Figure 56](#)) and select Trend. The Trend Module reappears in its last state and condition.

**Figure 56: Reopening the Trend Module**



For more details, see [Trend Module Chart Functions](#) and [Trend Module Legend Functions](#).

**Closing the Trend Module**

You close the Trend Module by clicking the X in the upper right corner of the Trend Module screen.

**Trend Module Chart Functions**

See [Figure 57](#) and [Table 143](#) for explanations of the Trend Module chart components.

Figure 57: Graphics+ Trend Module - Chart Functions



**Table 143: Descriptions of Trend Module Chart Components**

Number	Name	Description
1	Plot Area	Plots the trend data for all objects added to the Trend Module.
2	Box Zoom	Zooms in for the area that is highlighted. To enable box zoom, place the cursor inside the plot area, hold down the mouse and drag left or right. A white shadow appears to outline the zoom area.
3	Callouts	Indicates the name of the trended object with its value at the selected moment in time (white vertical line).
4	Maximize	Changes the size of the Trend Module to its maximum size within the constraints of the Metasys display panel.
5	Close	Removes the Trend Module from the screen.
6	Zoom Out	Returns the chart to its original size. This option is only available if the chart is currently zoomed in.
7	Right Y Axis (state data)	Indicates the axis that is plotting the discrete states for objects currently displayed in the Trend Module. Metasys objects that are displayed on this axis typically consist of Boolean or multi-state values.
8	Right Pan Arrow	Shifts the chart to display more recent trend data.
9	Newest Date/Time	Displays date and time of the last value that appears on the chart.
10	Moment in Time (X Axis)	Indicates the date and time of the value at a particular location on the chart. The date/time information as well as a vertical <b>moment in time line</b> is displayed as you move the mouse over the chart. The units along the x-axis always represent time.
11	Oldest Date/Time	Indicates the date and time of first sample that appears on the chart.
12	Left Pan Arrow	Shifts the chart to display older trend data.
13	Left Y Axis (numeric)	Indicates the axis that is plotting the numeric values for objects currently displayed in the Trend Module. Metasys objects that are displayed using this axis typically consist of analog values.
14	Scroll Bar	Adjusts the range of data that appears on the chart. Also zooms in and out when you resize the scroll bar. To zoom, click and drag the left/right arrows of the scroll bar. To pan, drag the scroll bar left or right.
15	Refresh	Updates the trend data for all objects shown in the Trend Module.



### Trend Module Legend Functions

See [Figure 58](#) and [Table 144](#) for explanations of the Trend Module legend components.

Figure 58: Graphics+ Trend Module - Legend Functions




**Table 144: Descriptions of Trend Module Legend Components**

Number	Name	Description
1	Legend Splitter Bar	Resizes the space taken by the legend. Move the splitter to the bottom or double-click the splitter bar to hide the legend and increase the size of the trend chart.
2	Legend Icons	<p>Display both the color and the y-axis that is used to display the trend data for the trended object in this row of the legend. The legend color assigned to an object matches its trended values in the chart, so that you can correlate information between the legend and the chart.</p> <p>Four preset trend line colors are used: blue, orange, violet, and white. The colors cannot be customized. These icons are used:</p> <p> The forward facing L indicates that the left y-axis is used for this trend series, which displays numeric values.</p> <p> The backward facing L indicates that the right y-axis is used for this trend series, which displays state values.</p>
3	Show/Hide Trend	Selects which objects currently appear in the chart. Click this box to hide and unhide trend data.
4	Object Name	Displays the name for the trended Metasys object. When you click the object name (or its row), the corresponding line in the chart is highlighted.
5	Trend Name	Displays the name of the trend that appears in the chart. If more than one trend is available for this trended object, a drop-down box appears from which to select.
6	Navigate	Navigates away from the Trend Module and the graphic and opens the trend data for the attribute. If you are not authorized to view the object, the navigate button is disabled.
7	Remove	Removes the trended object and its associated data from the Trend Module.

The Trend Module has the following characteristics:

### Loading Indicator

A loading indicator () appears in the chart area while the system is retrieving trend data.

### Trend Module Repositioning

You can reposition the trend module anywhere within the graphic's display panel, but not across panels in a multiple-panel layout. To move the Trend Module, drag the title bar.


You can dock the Trend Module by dragging the module outside the panel boundary on the top, bottom, right or left side of the Metasys display panel. The Trend Module does not support multiple monitors.

### Zoom Operations

You can zoom in the chart by holding down the mouse and sliding across the chart (either to the left or to the right). This action activates drag zoom. Zoom works for values on the x-axis, not values on the y-axis. To zoom out, click the Zoom Out link that appears in the upper right corner on a zoomed chart ( ).

You can also zoom from the horizontal scroll bar by clicking and dragging on the ends of the scroll bar.

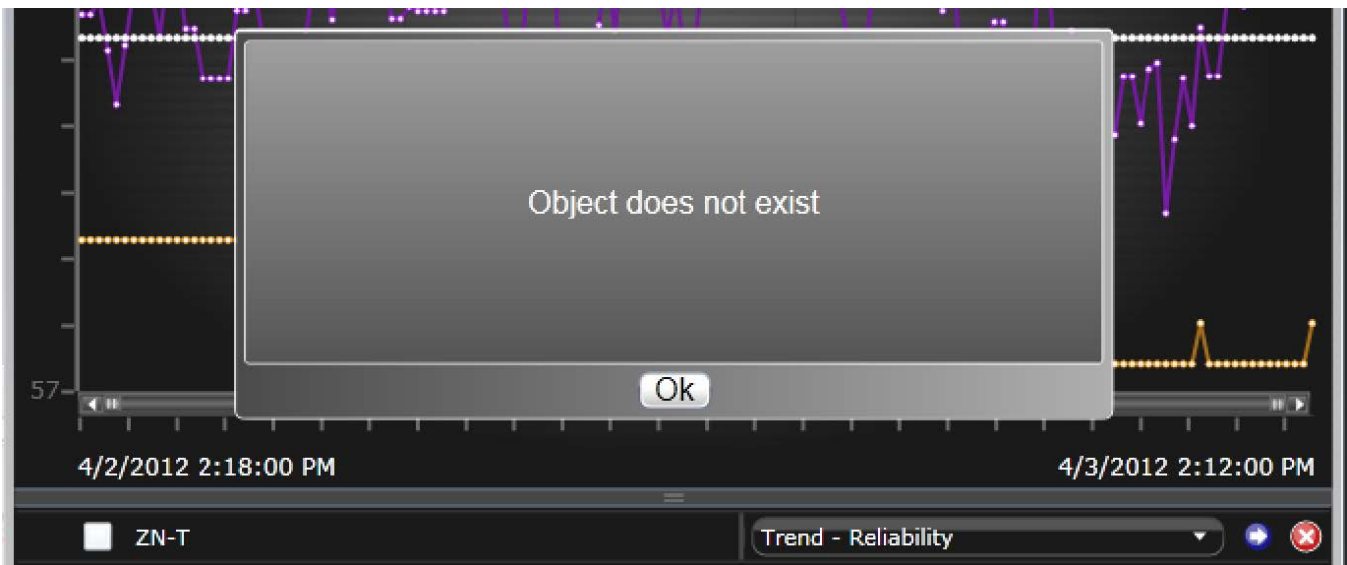
### Legend Operations

Once the trend data is plotted, use the check boxes in the legend to hide or unhide trend values from appearing in the chart. If you want to remove the trended object from the legend and the chart, click the remove () button.

To highlight a specific trend object and its data, click on its name in the legend. This action sends the selected series and its associated y-axis information to the foreground of the chart.

If you try to plot a trended attribute that was deleted or whose object is offline, its legend icon is blank and a user message box appears ([Figure 59](#)).

**Figure 59: User Message: No Trend Data Available**



### Trend Module Limitations

The limitations of the Trend Module are as follows:

- A maximum of 500 data points can be displayed for a single trended object. No data older than 2 years can be displayed.
- The trend data originates from the device's online buffer; samples stored in a historical database such as the JCIHistorianDB archive database are not included.
- You can open only one Trend Module per graphic.
- The Trend Module can chart a maximum of four trended Metasys objects. If you try to plot a fifth object, a user message box appears ([Figure 60](#)).

**Figure 60: User Message Example: Full Trend Module**





- The Trend Module does not support nested trend extensions. For example, the Trend Module cannot chart totalization extensions that contain a trend extension.
- You cannot save the Trend settings for later use. Once you close the graphic, you need to select the objects for the trend module again.

## Refresh Function

The Trend Module does not automatically refresh with new data samples. Use the refresh button to display the latest trend data within the Trend Module.

## Error Handling

If an error occurs while stored trend samples are retrieved (for example, the bound trend object does not exist or its supervisory device is offline), the chart line for this trend series does not appear. The error message **Could not retrieve trend information** appears as a tooltip for the existing legend item.

## Graphics+ Steps

### Viewing Graphics

To view a graphic, double-click or drag the Graphics+ object from the [Navigation Tree](#) into the [Display Frame](#).

### Monitoring and Commanding Items Using Graphics

**Note:** The Site Management Portal UI provides the capability to monitor and command the Metasys system from a graphic.

To monitor your Metasys system using graphics:

1. [Open a graphic](#) to display the current status/state of system components.
2. [Navigate](#) through the system.
3. To command Metasys objects or items using graphics, right-click the graphic element to open the User Actions Panel and click More Commands. Select from the available commands. To change the value of a Metasys object or item from an inline command box, click inside the box, type a new value, and press Enter. For information on the runtime behavior of a particular graphic element, refer to the Graphics+ Runtime *Help* (LIT-12011708).

### Navigating Graphics

To navigate graphics, click the image or navigation button in the graphic to navigate to the linked graphic.

### Opening the User Actions Panel from a Graphic

To open the user actions panel from a graphic:

1. Open a Graphics+ object to display the current status and state of system components.
2. Right-click the graphic element. The User Actions Panel that applies to the object appears. If no panel appears, this element does not support the User Actions Panel. Supported elements include value boxes, room status elements, the LCD display within a Room Control Module, basic shapes, and gauges.
3. Select an action.

### Opening the Trend Module from a Graphic

**Note:** You can open the Trend Module from a User Actions Panel or from the Graphics+ Display Control tool.

1. Open a Graphics+ object.
2. To open the Trend Module from a User Actions Panel, right-click a graphic element to open its User Actions Panel. Supported elements include value boxes, room status elements, the LCD display within a Room Control Module, basic shapes, and gauges.
3. Click View Trend. If more than one trend is available, click View Trend, then select from the list of trended attributes that appear in the submenu. The Trend Module loads and plots the trend data.

**Note:** If View Trend does not appear in the User Actions Panel, this object has no trend extension.

4. For more details, see [Trend Module](#).

5. To open the Trend Module from the Graphics+ Display Control tool, click the Tools drop-down arrow. The Trend option appears.
6. Click Trend. The Trend Module appears either blank (no trend data selected) or replots the trend data for the objects you selected earlier.

# Logic Connector Tool (LCT)

Use the Logic Connector Tool to create the logic within a control system using a graphical presentation. The control logic may include [System Blocks](#) and [Logic Blocks](#). The [Edit Mode](#) allows you to edit logic, and the [View Mode](#) allows viewing and limited commanding capabilities. When running the LCT on the SCT (Metasys system in offline mode), commanding is disabled.

The Logic Connector Tool allows control system viewing and editing via any browser logged onto any online or configuration server with access to a [Program \(Control System\) Object](#) and Metasys system.

Logic runs approximately every 5 seconds. It is important that control applications that require particular timing use internal logic to determine time between execution.

**Note:** You cannot insert logic on an ADS/ADX.

For information on installing an Engine, see the [Related Documentation](#) table.

## Logic Connector Tool Concepts

### Logic Connector Tool Workspace

The Logic Connector Tool runs inside an active display panel. The workspace for the [Program \(Control System\) Object](#) defaults to a white background. You have the option to add a lined or dotted grid to the workspace using the appropriate buttons on the [Toolbar](#). The workspace displays all building blocks and the connections between them, and serves as the destination for dragged and dropped blocks.

### LCT Modes

The Logic Connector Tool runs in either [Edit Mode](#) or [View Mode](#).

You can generate logic and make logic changes when you are using Metasys in offline mode (using the SCT) or online mode. (See [Metasys Modes](#).) After generating logic or making any changes to existing logic in offline mode, [download](#) the database to the online device to ensure the latest information is used.

#### Edit Mode

Access Edit mode by clicking the Edit mode button (see [Toolbar](#)). You must be in Edit mode to edit logic or create logic. The LCT opens in View mode.

In Edit mode, you have access to all toolbar items, System blocks, and Logic blocks.

Right-clicking in Edit mode brings up basic choices such as cut, copy, paste, delete, duplicate, hide, label, zoom, and connect, depending on the type of item you select.

**Note:** Do not start labels with a number and then follow it with any of these characters: \$ . - ,

For mouse shortcuts in Edit mode, see [Mouse Shortcuts: Edit Mode](#).

#### View Mode

The Logic Connector Tool displays in the View mode when you are browsing a site running Metasys software in offline mode (using the SCT) or online mode. (See [Metasys Modes](#).) See [Errors in View Mode](#).

In View mode, you have access only to a limited number of items on the toolbar. The System and Logic blocks do not appear in this mode. The LCT opens in View mode. You must enter the [Edit Mode](#) to edit any of the control system logic.

The View mode allows you to edit [Program \(Control System\) Object](#) attributes (from the Configuration tab) and send commands to any of the input reference blocks in the diagram.

Dynamic values display on the connection line between two logic blocks. Values refresh every 15 seconds unless you click the Refresh button on the [Toolbar](#). Click the Trace mode icon on the toolbar and the tool displays online values, but hides logical connections between blocks. If you click a block, the tool traces all connections to and from that block (from the first input to the last output).






















Right-clicking in View mode has no effect.

For mouse shortcuts in View mode, see [Mouse Shortcuts: View Mode](#).





## Toolbar

The Logic Connector Tool uses the toolbar described here:

**Table 145: LCT Toolbar**

Icon (Standard Windows Icons not Shown)	Command	Visible In		Action
		Edit Mode	View Mode	
	Edit Mode		X	Changes the control system to Edit mode.
	Refresh		X	Refreshes the values for control system components.
	Save	X		Saves the logic system and changes it to View mode. If there are unconnected points, the logic system warns to fix them prior to a save.
	Cancel	X		Cancels current changes and returns to View mode.
	Print	X	X	Print dialog appears
	Print Preview	X	X	Print Preview dialog appears
	Cut	X		Cuts an item of the control system.
	Copy	X		Copies an item in the control system.
	Paste	X		Pastes a cut or copied item into the logic system.
	Undo	X		Undoes the previous action (except for a save) for up to 4 actions.
	Redo	X		Redoes the previous undone action (for up to 4 actions).
	No Grid	X		Removes the grid from the diagram.
	Lines Grid	X		Displays a line grid behind the diagram.
	Points Grid	X		Displays a point grid behind the diagram.
	Select	X	X	Turns the cursor into a selection cursor.
	Text	X		Turns the cursor into a text cursor that allows you to create a text box.
	Pan	X	X	Turns the cursor into a hand that allows you to pan over the diagram by dragging.
	Zoom	X	X <sup>1</sup>	Zooms a selected area.
	Interactive Zoom	X	X <sup>1</sup>	Zooms in and out on a diagram when you hold the mouse down.
	Zoom - Fit Window	X	X <sup>1</sup>	Zooms the diagram to fit within the window.
	Trace Mode		X <sup>1</sup>	Removes all the connection lines in the diagram. Live values remain.

**Table 145: LCT Toolbar**

Icon (Standard Windows Icons not Shown)	Command	Visible In		Action
		Edit Mode	View Mode	
	Selective Zoom	X	X <sup>1</sup>	Allows you to select the percentage zoom applied to the diagram.
	Logic Checker	X		Checks the control system logic and places a balloon with an icon over unconnected points. See the <a href="#">Logic Checker</a> section.
	Sequence (Show Sequence Order)	X		Shows the logical sequence order of the connected blocks. A value of -1 indicates that logic does not execute on the block.
	Overview	X	X	Shows an overview of the entire control system.

<sup>1</sup> When using a zoom tool in View mode, if you click outside of the display panel containing the logic system, the zoom level automatically changes back to the default.

## Logic

Logic contains the following components:

- [System Blocks](#) that reference another control system
- [Logic Blocks](#) that represent functions performed on objects
- [Math Category](#) between the Logic blocks

Once a logic process completes, it runs again in approximately 5 seconds. For example, if a logic process starts at 10:00:00 and completes at 10:00:04, it runs again at 10:00:09. It is important that control applications that require particular timing use internal logic to determine time between execution.

If your logic references multiple Engines or multiple ADS/ADXs, and one device needs to be downloaded, upload all Engine/ADS/ADXs prior to making changes in SCT. This procedure ensures your logic works consistently.

### System Blocks

System blocks support drag and drop functionality. When you deposit a System block onto the workspace, a configuration [wizard](#) guides you through the configuration of the control system. System blocks are useful when you have complex logic because they allow you to nest one control system in another control system. When you create a System block, the Metasys software creates a [Program \(Control System\) Object](#) under the first Program object in the navigation tree.

See [Adding Items to Logic](#).

### Logic Blocks

Logic blocks support drag and drop functionality. If the list of Logic blocks is too long to fit into the Logic block list area, use the scroll bar to expose additional blocks.

Logic blocks are not visible on the navigation tree. If the LCT window is not large enough to show all the logic blocks, you cannot scroll down to see the hidden blocks. To make sure you see them all, enlarge the panel displaying the logic by dragging the borders or reducing the number of panels.

See the following table for a list of Logic blocks.

**Table 146: Logic Blocks**

Logic Block Name	Description
<i>Math</i>	Performs mathematical functions on one or more inputs, producing a single output. 1–8 inputs
<i>Bool</i>	Performs Boolean functions on 2–8 inputs, producing a single output. This category also includes the Latch function.
<i>Statistical</i>	Performs statistical functions on 2–8 inputs producing a single output.
<i>Selector</i>	Performs multiplexing for 2–8 inputs, producing a single output. Based on the current mode assigned to each input, the selector chooses which input to pass through to the output.
<i>Control</i>	Performs control functions on three inputs, producing a single output.
<i>Psycho</i> (Psychometric)	Performs psychometric functions on the defined inputs, producing a single output.
<i>Attributes</i>	Gives the user the ability to expose values from within their control logic, either as an input or output. These blocks are considered attributes of the <i>Program (Control System) Object</i> in which they are included, and may be viewed or configured from the standard Focus view. A control system is limited to a combination of 24 inputs and 24 outputs. See the <i>Program (Control System) Object</i> for more information.
<i>Constant</i>	Passes a constant value to building block inputs.
<i>Calculation</i>	Controls the amount an output can change per control system execution or extrapolates an output using two inputs for reference.
<i>Timing</i>	Passes its input to its output at the next execution of the control system (every 5 seconds). Timing blocks are used to break up feedback loops. The Timing category also includes the Time and Timer blocks.

**Math Category**

Math blocks perform calculations on input. See the following table for details.

**Table 147: Math Blocks**

Block	Math Type	Inputs
*	Multiply	2–8
+	Add	2–8
X/Y	Divide	2
X-Y	Subtract	2
Neg	Negative	1
Abs	Absolute	1
Sqr	Square Root	1
Cos	Cosine	1
Sin	Sine	1
Tan	Tangent	1
ATan	Arc Tangent	1
ACos	Arc Cosine	1
ASin	Arc Sine	1
Exp	Exponent	1
LN	Natural Log	1

**Table 147: Math Blocks**

Block	Math Type	Inputs
LOG	Log	1
X^Y	X^Y	2

The number of inputs to a Math logic block depends on the number of inputs supported by the type of math function. The Logic Connector Tool allows you to add multiple connections to the output of the block.

See [Editing Blocks in Edit Mode](#) for information on editing Math blocks.

### Bool Category

Bool blocks apply Boolean functions to input. The number of inputs to a Bool logic block depends on the number of inputs supported by the type of Boolean function. The Logic Connector Tool allows you to add multiple connections to the output of the block.

**Table 148: Bool Blocks**

Bool Type	Inputs
AND	2–8
OR	2–8
XOR	2
NOT	1
LTCH	See <a href="#">LTCH (Latch)</a> for details.

See [Editing Blocks in Edit Mode](#) for information on editing Bool blocks.

### LTCH (Latch)

The Latch block holds a binary value until you command it to reset. Latch blocks help capture rapidly changing binary states that might otherwise be missed. The Input of the Latch block is a binary attribute, sampled every time the logic system runs (every 5 seconds). Use an [Attribute Reference](#) block to create the Input for Latch.

Reset determines if the Output of the block changes with a change in the value of the Input. When Reset is True, the Output of the Latch block stays its original value, even if the Input changes value. Reset is also a binary attribute. To change the value of Reset, double-click the binary attribute block in [View Mode](#) and issue an Inactive or Active command.

This table translates the value of the Input or Reset binary attribute into True and False values for the Latch block:

**Table 149: Latch Blocks**

Binary Attribute Value	Command/State	True or False
1.0	Active	True
0.0	Inactive	False

The following table and figure summarize the operation of the Latch block:

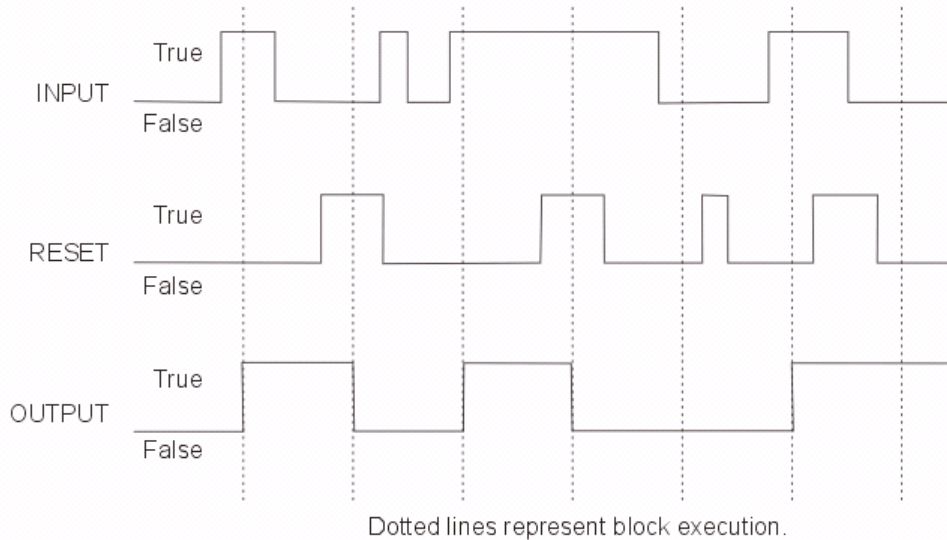
**Table 150: Latch Block Operation**

Input	Reset	Output
Goes from False to True	False	True Even if the Input goes to False, the Output stays True as long as Reset is False.
Goes from False to True	True	False

**Table 150: Latch Block Operation**

Input	Reset	Output
Goes from True to False	False	True Even if the Input goes to True, the Output stays False as long as Reset is False.
Goes from True to False	True	False

**Figure 61: Latch Block Example**



**Statistical Category**

Statistical blocks perform statistics on input. The number of inputs to a Statistical logic block depends on the number of inputs supported by the type of statistic. The Logic Connector Tool allows you to add multiple connections to the output of the block.

**Table 151: Statistical Block Connections**

Statistical Type	Inputs
AVG	2-8
MAX	2-8
MIN	2-8

See [Editing Blocks in Edit Mode](#) for information on editing Statistical blocks.

**Selector Category**

Selector logic blocks (Mux) have 2-8 inputs, one mode input, and one output. Depending on the current value of the mode input, the Selector chooses which input passes through to the output. The Logic Connector Tool allows you to add multiple connections to the output of the block.

See [Editing Blocks in Edit Mode](#) for information on editing Selector blocks.

**Control Category**

Most control logic blocks have three inputs, and you can add multiple connections to the output of the block. The blocks compare input number 1 with input number 2 using the differential (input number 3). The type of control depends on the statistical type. The Sequencer functions differently. See [SEQ \(Sequencer\)](#) for details.



**Table 152: Control Blocks**

Block	Statistical Type	Inputs
X>Y	greater than	3
X<Y	less than	3
X<=Y	less than or equal	3
X>=Y	greater than or equal	3
<>	not equal	3
=	equal	3
SEQ	Sequencer	See <a href="#">SEQ (Sequencer)</a> for details.

See [Editing Blocks in Edit Mode](#) for information on editing Compare blocks.

### SEQ (Sequencer)

Sequencer blocks activate devices in a sequential order based on the rank of the device and whether the device is enabled. Lower ranked devices are activated before higher ranked devices, and higher ranked devices are deactivated before lower ranked devices.

The Input value at which the sequencer activates or deactivates each device is based on the make and break limits configured for the Sequencer. See [Editing SEQ \(Sequencer\) Blocks](#) for information on configuring the make and break limits. The defaults for a 3-stage Sequencer with a range of 0–100 are the following:

**Table 153: SEQ (Sequencer Blocks)**

	Make Limits (Activation Points)	Break Limits (Deactivation Points)
Stage 1	33	1
Stage 2	67	34
Stage 3	99	68

Sequencer blocks can output a value for minimum of 2 and maximum of 8 devices. The following table describes the components of a Sequencer block:

**Table 154: Sequencer Block Components**

Component	Description
Input	Determines the number of activated stages.
Instant Shutdown	Determines if the Sequencer is enabled or disabled. Use a binary object attribute (1.0=Enabled, 0.0=Disabled).
Rotate Now	Activates reordering of output sequence. The manner in which the outputs Device 1 Output through Device 8 Output are reordered for activation is based on a combination of two factors: the ranking defined for each device, and whether the device is enabled. All enabled outputs are scheduled for output selection prior to disabled outputs. And, within each of these categories (enabled and disabled outputs), the selections are ordered beginning with the lowest ranked and proceeding on through to the highest ranked output. Unlike all other reordering scenarios, the issue of whether or not a device is currently active is not taken into account in this situation.  Use a binary object attribute (1.0=Rotate now, 0.0=Do not rotate now).
Device 1–8 Enable	Establishes whether or not the output is enabled. Use a binary object attribute (1.0=Enabled, 0.0=Disabled).
Device 1–8 Rank	Establishes the order in which device outputs are activated. Use an analog object attribute (reference block) or a Constant block.

**Table 155: Sequencer Block Example**

Binary Attribute Value	Command/State	True or False
1.0	Active	True
0.0	Inactive	False

See [Editing SEQ \(Sequencer\) Blocks](#) for information on editing Sequencer blocks.

### Psychrometric Category

Psychrometric logic blocks have 2 inputs, and you can add multiple connections to the output of the block.

**Table 156: Psychrometric Blocks**

Symbols	Description	Upper Input	Lower Input
EN-DP (EnDp)	Enthalpy - Dew Point	DB	DP
EN-RH (EnRh)	Enthalpy - Relative Humidity	DB	RH
RH-DP (RhDp)	Relative Humidity - Dew Point	DB	DP
RH-WB (RhWb)	Relative Humidity - Wet Bulb	DB	WB
WB-DP (WbDp)	Wet Bulb - Dew Point	DB	DP
WB-RH (WbRh)	Wet Bulb - Relative Humidity	DB	RH
ABH	Absolute Humidity	DB	RH
DP	Dew Point	DB	RH

See [Editing Blocks in Edit Mode](#) for information on editing Psychrometric blocks.

### Attributes Category

Attribute blocks let you expose values in your logic and configure inputs and outputs. Control systems can contain a maximum of 24 inputs and 24 outputs.

#### Input and Output Attributes

In [View Mode](#), a double-click on an Attribute Input or Output block has no effect. In the [Edit Mode](#), when you drag and drop an attribute block from the palette, configuration wizards launch to help you configure the attribute.

Attributes support a maximum of 24 input or 24 output blocks of Numeric, Enum, or Bool. Attributes expose values at different stages of the Metasys system for a user to see at a glance or connect to/from.

See [Editing Blocks in Edit Mode](#) for information on editing Attribute blocks.

**Note:** Once an attribute is configured as Numeric, Enum, or Boolean, it **cannot** be changed.

#### Attribute Reference

After inserting an attribute reference (Input Ref or Output Ref), you can edit which object/attribute is being referenced. See [Editing Blocks in Edit Mode](#). If you double-click in View mode, a Command dialog box appears for Input refs only.

### Constant Category

Constant logic blocks can have multiple connections to the output of the block. Constant logic blocks can be any one of the following:

**Table 157: Constant Blocks**

Block	Statistical Type
Enum	Enumeration
Float	Float
Rel.	Release <b>Note:</b> Sends the Release command at a specific priority based on the connection.

See [Editing Blocks in Edit Mode](#) for information on editing Constant blocks.

### Calculation Category

#### RL (Rate Limiter)

The Rate Limiter block controls the rate at which its Output changes with variations in its Input value. If rate limiting is disabled, this block passes the value of the Input to the Output. If rate limiting is enabled, this block limits changes to its Output to an increment determined by the Step Equation, executed according to the rate limit. This table describes the components of the Rate Limiter block:

**Table 158: RL (Rate Limiter Blocks)**

Symbol	Description
IN	Input
EN	Enabled Enables rate limiting. Use a binary object attribute reference for EN: 0 = Disabled (Inactive command) 1 = Enabled (Active command)

Rate Limiter blocks use the Step Equation to determine the maximum increment (step) the Output can change to match the Input if the two differ. The Step Equation recalculates the step every time system logic executes (every 5 seconds).

The Step Equation looks like this:

$$\text{Step} = \text{Rate Limit}/60,000 * \text{Actual Period}$$

Where:

Rate Limit: Rate per minute to increase or decrease the Output until it matches the Input

Actual Period: Time in milliseconds since the last execution of the block. The system logic and Step Equation execute every 5 seconds (5,000 milliseconds).

For example, if the Rate Limiter block is set up like this:

$$\text{Rate Limit} = 10$$

$$\text{Actual Period} = 5,000 \text{ (milliseconds)}$$

The Step Equation looks like this:

$$\text{Step} = 10/60,000 * 5,000$$

$$\text{Step} = .8$$

So, the maximum increment the Output can change on its way to match the Input is .8.

See [Editing Blocks in Edit Mode](#) for information on editing Rate Limiter blocks.

#### Span

The Span block applies a range and extrapolated values to an input to produce an output. This table describes the Span block components:

**Table 159: Span Blocks**

Symbol	Description
IN	Input
IL	Input Low
OL	Output Low

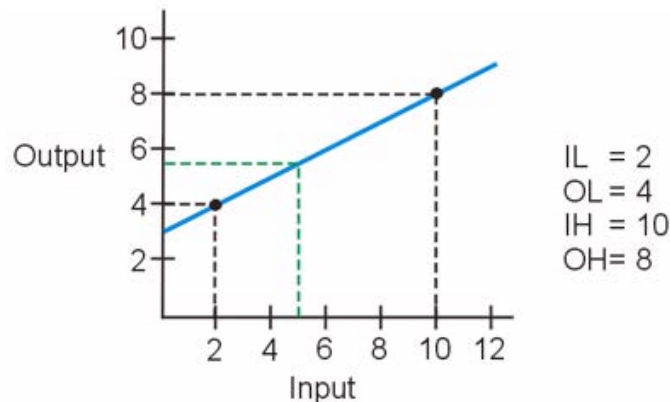
**Table 159: Span Blocks**

Symbol	Description
IH	Input High
OH	Output High

The Span block creates a linear relationship between the low input/output and high input/output pair. If the Input for the Span block falls between the low and high input, the Output of the Span block is found on the line between the low and high pairs.

The following example shows a graphical picture of how the Span block works:

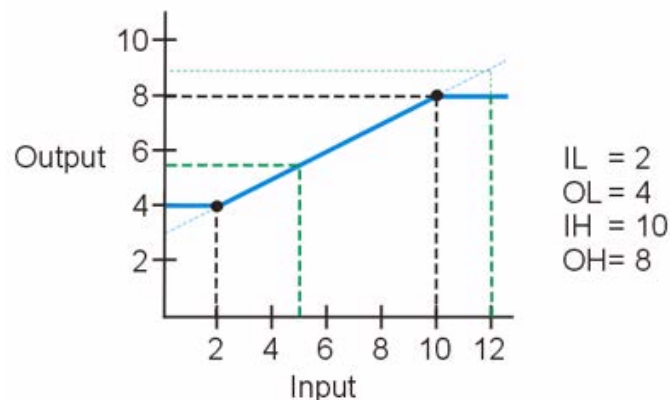
**Figure 62: Span Block Example 1**



The line connecting the low and high pairs (blue line) represents the linear relationship between them. When you enter an Input for the Span block, the logic finds where the line crosses that input and provides the corresponding output. (The output must lie on the thick blue line.) Using the figure above, if you enter 5 for the Span block Input, the block would find 5 on the Input axis and provide an output of 5.5 because that is where the line crosses an Input value of 5. (The green line shows this relationship.)

If the Span block is set up to Clamp (see [Editing Span Blocks](#)) the value of the Output, the Output of the block is restricted to the range between (and including) the low and high Output you enter for the block. Range clamping is the default setting. For example, assume you are using the values in the figure below and have clamping set to True. If you enter an Input of 5, you still generate an Output of 5.5, because the original line crosses an Input of 5 at 5.5, which is between 4 and 8 (low and high output). If you enter an Input of 12, you generate an Output of 8, because where the original line crosses an Input of 12 is higher than the high output (see where thin blue and thin green lines intersect). If clamping is True for both high and low, the output must lie on the newly drawn thick blue line.

**Figure 63: Span Block Example 2**



The Span block works for the reverse span as well (if the Output High is lower than the Output Low). See [Editing Blocks in Edit Mode](#) for information on editing Span blocks.

### Timing Category

Delay blocks have one input and one output and are commonly used to break up feedback loops.

The Timing category also includes the [TMR \(Timer\)](#) and [Time](#) blocks.

See [Editing Blocks in Edit Mode](#) for information on editing Timing blocks.

TMR (Timer)

This table describes the components of the TMR blocks:

**Table 160: TMR (Timer) Blocks**

Output	Description
IN	Input
RS	Reset. Cancels the timer. Reset does not apply to Minimum On or Minimum Off timers. Use a binary object attribute for Reset (1.0=Reset Active, 0.0=Reset Inactive).

The LCT contains five different types of timers. Each type uses a Duration (how long the timer is active) and unique functions to generate an Output. The different types of timers are listed below. Click the name of the timer for a description and figure of timer operation.

- [Pulse Timer Function](#)
- [On Delay Timer Function](#)
- [Off Delay Timer Function](#)
- [Minimum On Timer Function](#)
- [Minimum Off Timer Function](#)

For information on setting Duration and the type of Timer, see [Editing Timing Blocks](#).

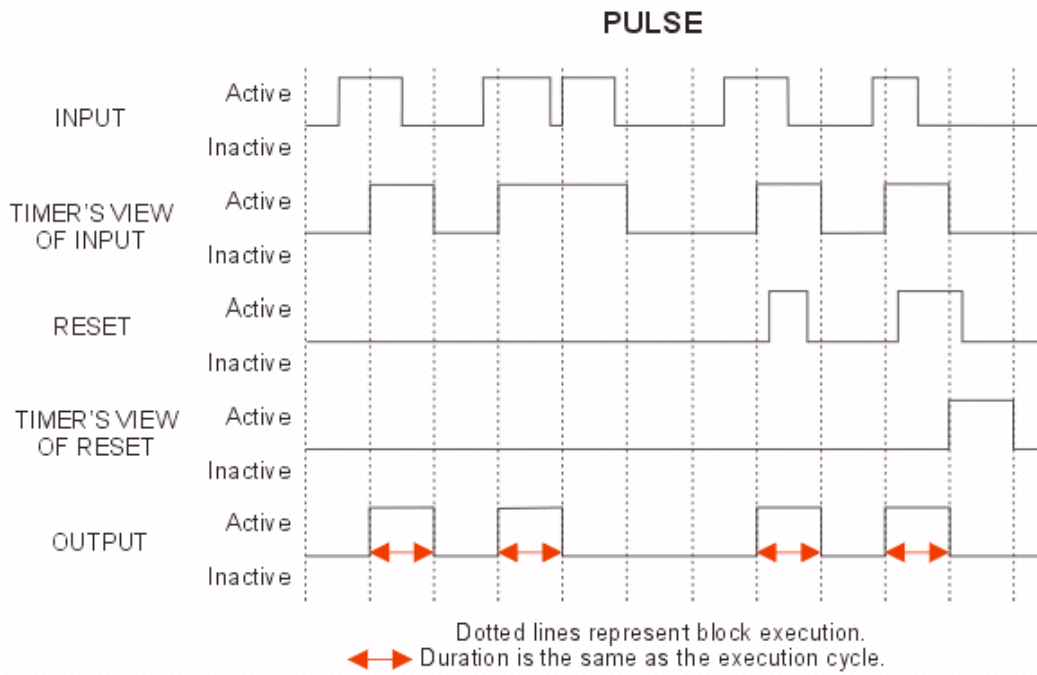
Pulse Timer Function

The following table and figures illustrate the function of the Pulse timer.

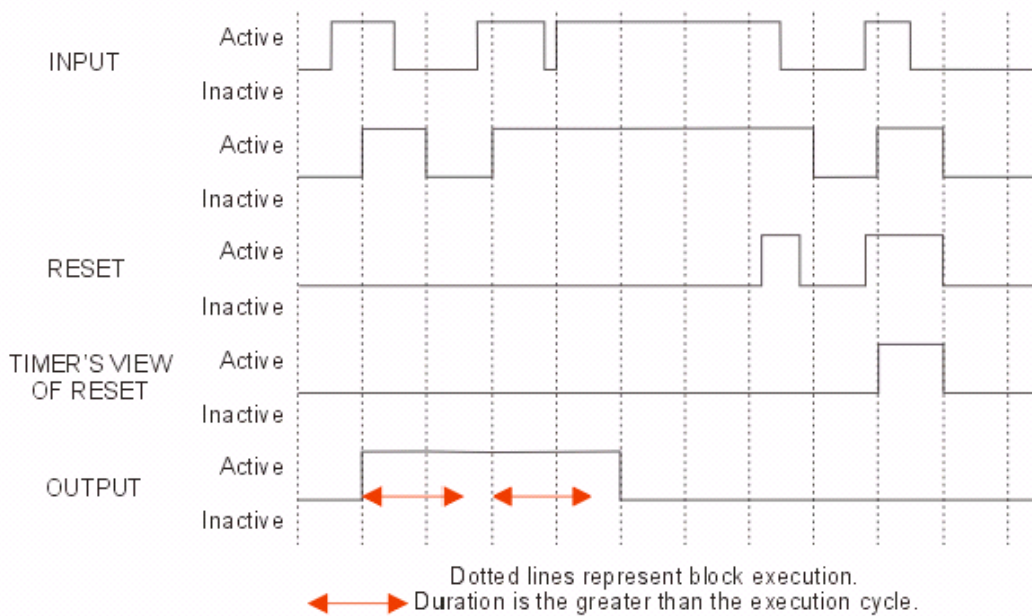
**Table 161: Pulse Timer Function**

Feature	Description
Activation	Goes active if the Input goes from low to high in two consecutive executions (logic executes every 5 seconds). The Pulse timer remains active for the amount of time specified in Duration, then goes to inactive. High to low transitions do not activate this timer.
Output	Stays high as long as the timer is active. After the Duration expires, the Output goes low at the next logic execution.
Reset	Cancels timer activity and makes the output low. If the Reset goes from high to low, the timer re-evaluates the Input at the next low to high transition.
Example	Captures a short pulse on a binary input and keeps the Output True long enough so that the logic can react to it.

**Figure 64: Pulse Timer Example 1**



**Figure 65: Pulse Timer Example 2**



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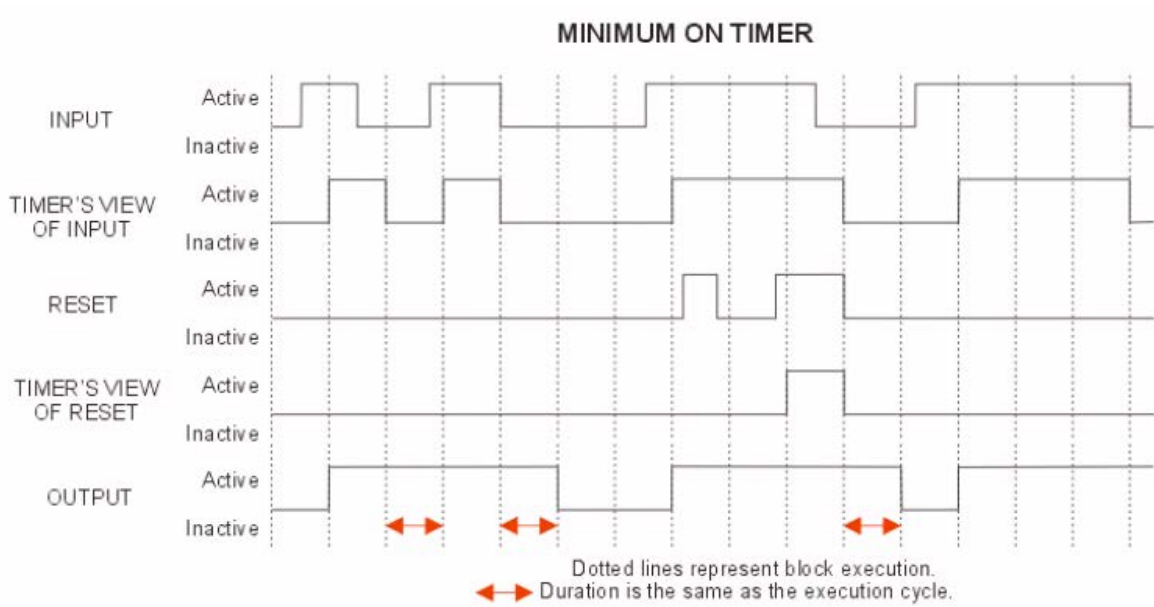
On Delay Timer Function

The following table and figures illustrate the function of the On Delay timer.

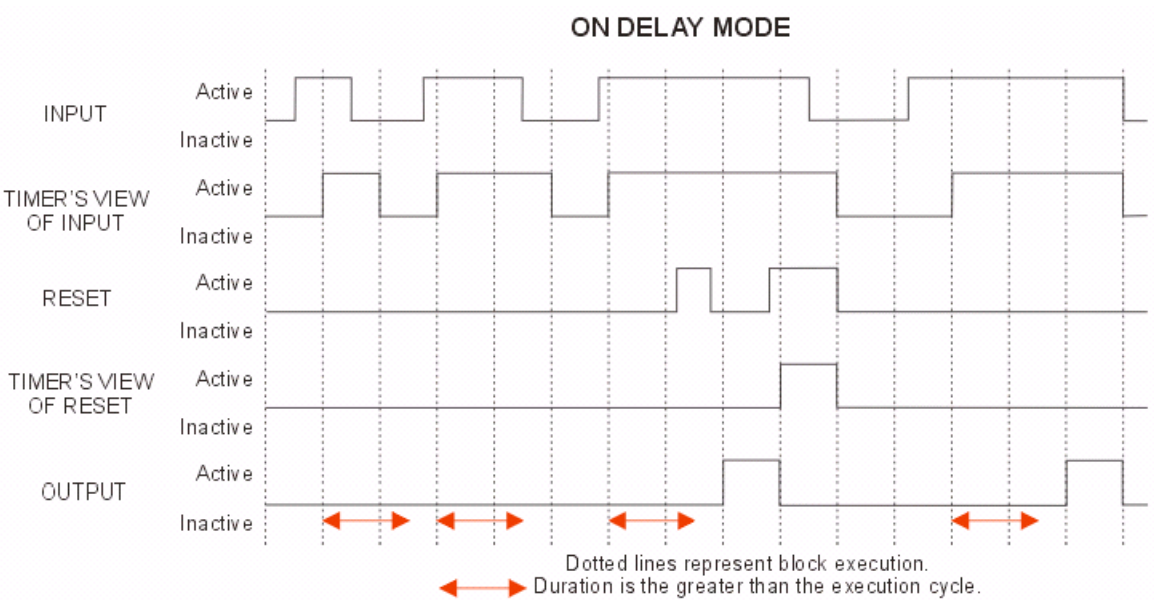
**Table 162: On Delay Timer Function**

Feature	Description
<b>Activation</b>	Goes inactive in a low to high Input transition, depending on the state of the input during the duration period. If the Input returns to a low state (inactive), the timing cycle is canceled and the Output remains inactive. If the Input remains in a high state, the Output goes to the high state at the next execution of logic.  In a high to low Input transition, the Output becomes inactive the next time the logic executes (logic executes every 5 seconds).
<b>Output</b>	See row above.
<b>Reset</b>	Cancels timer activity and makes the output inactive. If the Reset goes from active to inactive, the timer re-evaluates the Input at the next low to high transition.
<b>Example</b>	Delays the supply fan start 20 seconds after the return fan starts.

**Figure 66: On Delay Timer Example 1**



**Figure 67: On Delay Timer Example 2**



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**Off Delay Timer Function**

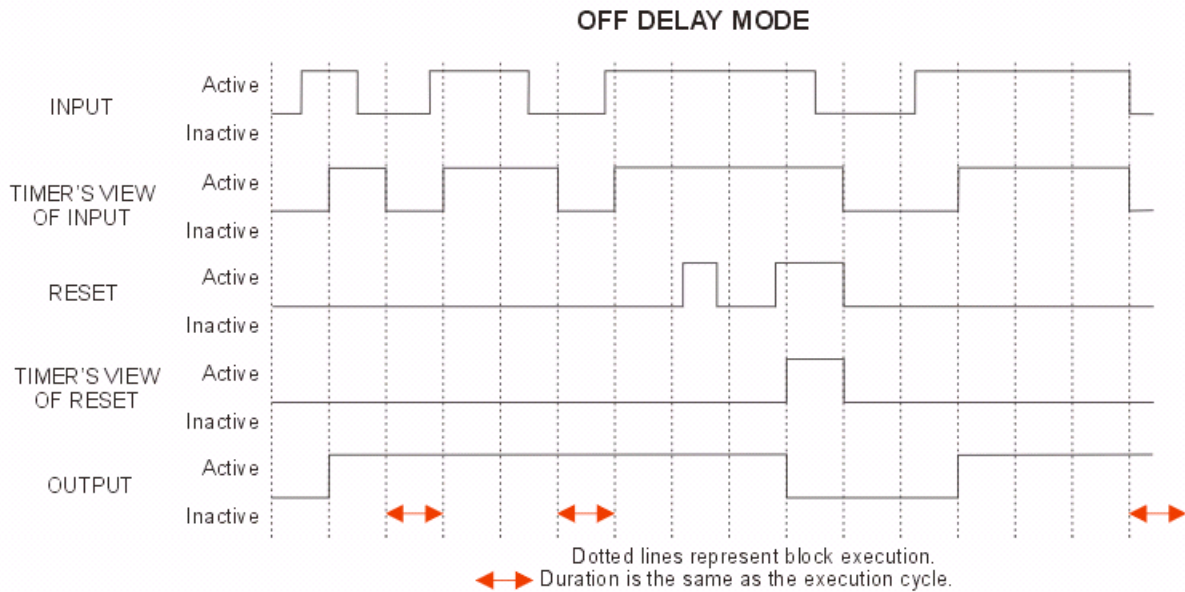
The following table and figures illustrate the function of the Off Delay timer.



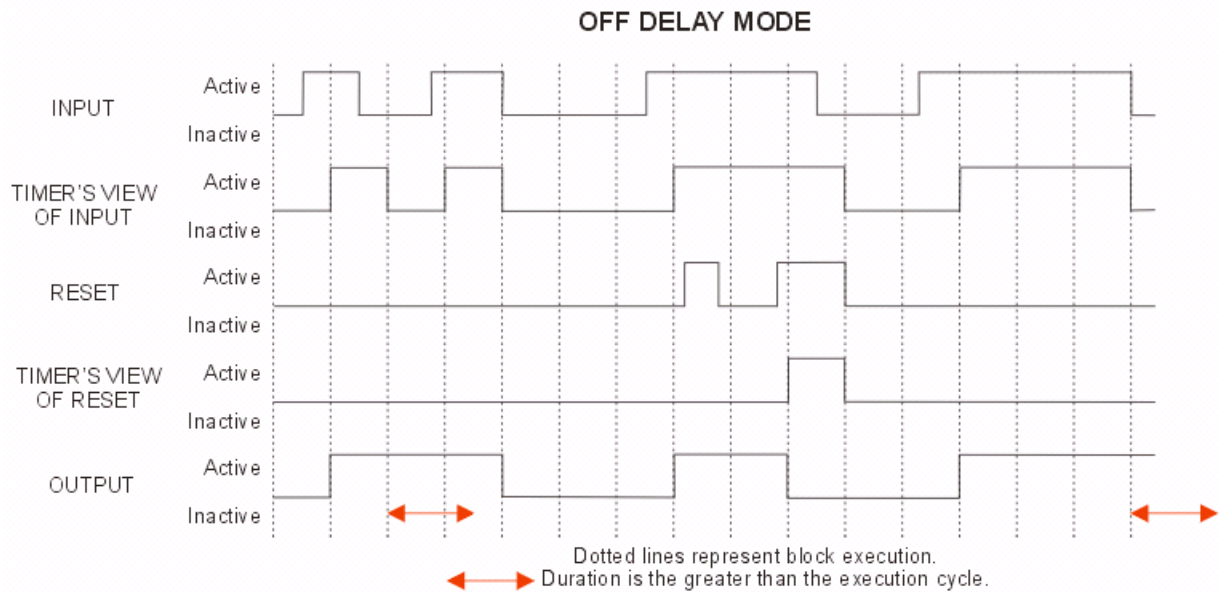
**Table 163: Off Delay Timer Function**

Feature	Description
<b>Activation</b>	In a low to high Input transition, the Output becomes active the next time the logic executes (logic executes every 5 seconds).  Goes inactive in a high to low Input transition, depending on the state of the input during the duration period. If the Input returns to a high state (active), the timing cycle is canceled and the Output remains active. If the Input remains in a low state, the Output goes to the low state at the next execution of logic.
<b>Output</b>	See row above.
<b>Reset</b>	Cancel timer activity and makes the output inactive. If the Reset goes from active to inactive, the timer re-evaluates the Input at the next low to high transition.
<b>Example</b>	Keeps the fan running to purge the coils after a heating or cooling system is turned off. Off Delay is useful when your building contains electrical heat and/or DX cooling.

**Figure 68: Off Delay Mode Example 1**



**Figure 69: Off Delay Mode Example 2**



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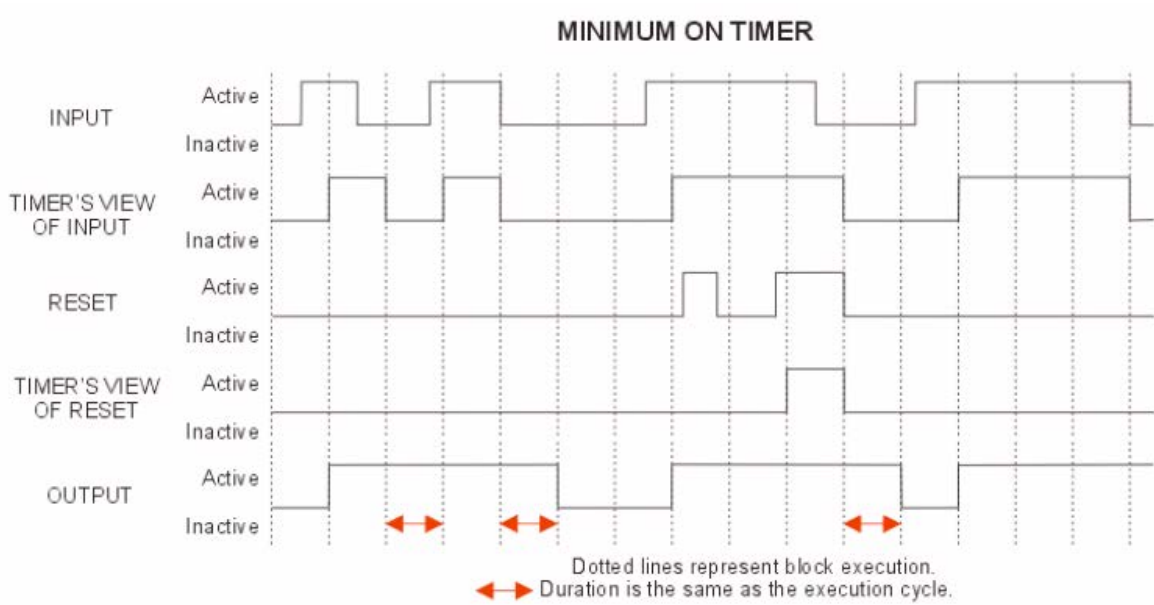
**Minimum On Timer Function**

The following table and figures illustrate the function of the Minimum On timer.

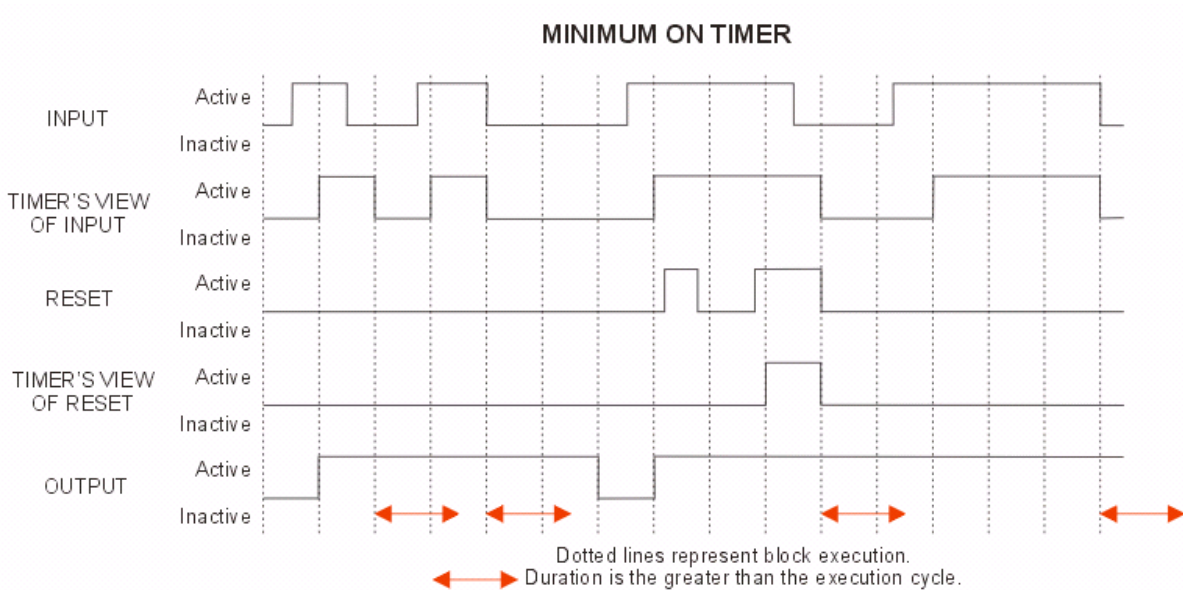
**Table 164: Minimum On Timer Function**

Feature	Description
Activation	See row below.
Output	Goes active when there is a low to high Input transition when the timer executes (logic executes every 5 seconds). The Output remains active until the time specified in Duration passes AND the Input returns to inactive.
Reset	Has no effect on Minimum On timer.
Example	Keeps a chiller running for a minimum time after startup to stabilize equipment.

**Figure 70: Minimum On Timer Example 1**



**Figure 71: Minimum On Timer Example 2**



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**Minimum Off Timer Function**

The following table and figures illustrate the function of the Minimum Off timer.

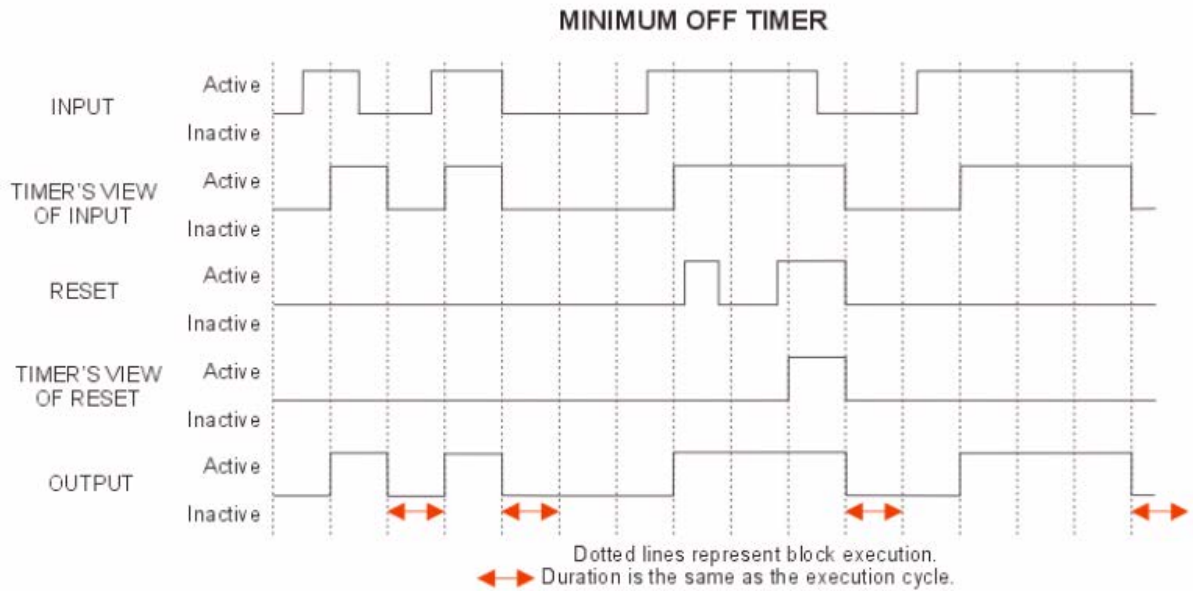
**Table 165: Minimum Off Timer Function**

Feature	Description
Activation	See row below.
Output	Goes inactive when there is a high to low Input transition when the timer executes (logic executes every 5 seconds). The Output remains inactive until the time specified in Duration passes AND the Input returns to active.

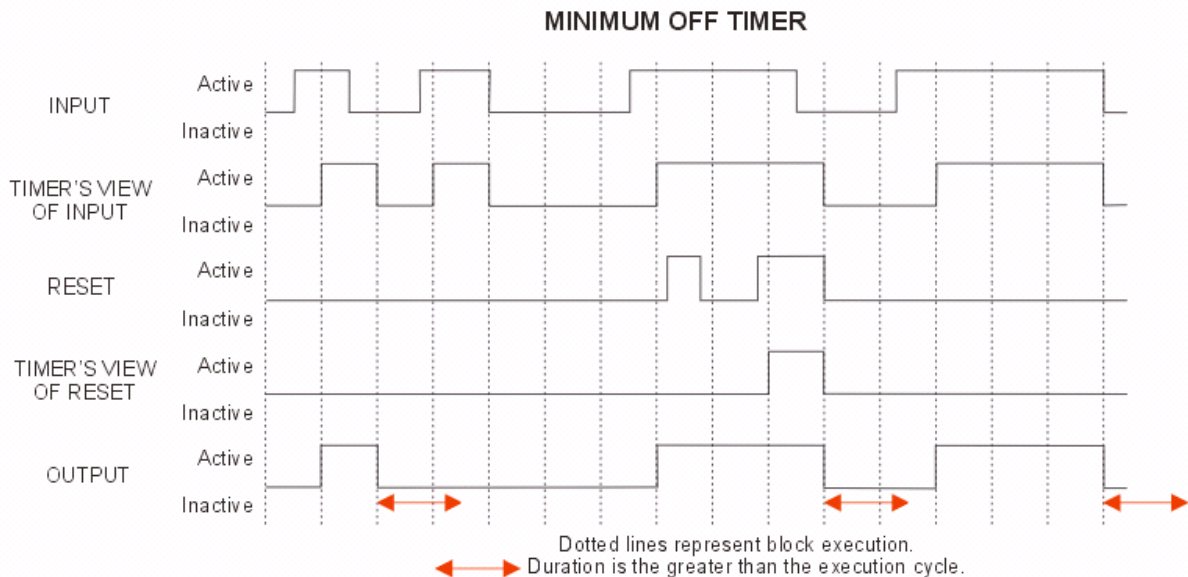
**Table 165: Minimum Off Timer Function**

Feature	Description
Reset	Has no effect on Minimum Off timer.
Example	Keeps a chiller off from a minimum time after shutdown to equalize refrigerant.

**Figure 72: Minimum Off Timer Example 1**



**Figure 73: Minimum Off Timer Example 2**



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## Time

A Time block has no configurable input because it extracts time and date information from the network. Network time/date is set at the site director (see the NAE and ADS commissioning documents listed in the [Related Documentation](#) table in the [Welcome](#) section for details on time management). The outputs of a Time block are six time/date values:

**Table 166: Time Blocks**

Output	Description	Format
HH	Hour	0–23 (24-hour time)
MM	Minute	0–59
YR	Year	four-digit year
MO	Month	1–12
DA	Day	1–31
DOW	Day of the Week	1=Monday 2=Tuesday 3=Wednesday 4=Thursday 5=Friday 6=Saturday 7=Sunday

## Connections

Connection lines connect blocks in the logic. The LCT does not do a datatype check; that is, you can connect Boolean and Constant values, and any other combination. But, the tool does not allow inputs to connect to inputs, or outputs to outputs. The tool determines the connection line routing, and the only way to change the routing is to move the blocks or use the hide feature.

## Control Systems

Control systems are collections of subsystems and/or [Logic Blocks](#) that may be connected together.

## General Logic Connector Tool Rules

**Table 167: General LCT Rules**

What Are You Doing?	What Components Are You Using?	These Rules Apply:	
Moving, Sizing, Typing	All blocks	<ul style="list-style-type: none"> <li>Left-click to drag and drop blocks</li> <li>Block size is fixed</li> <li>Font size and type are fixed</li> </ul>	
Connecting	System blocks	Attribute Properties: <ul style="list-style-type: none"> <li>Read Only</li> <li>Writable</li> <li>Prioritized Write</li> </ul>	Connection Type Allowed: <ul style="list-style-type: none"> <li>Output</li> <li>Input or Output</li> <li>Input, Output, or Both</li> </ul>
Connecting	Math, Bool, Statistical, Selector, Control, Psychrometric, Calculation	All inputs should be connected for these Logic blocks. If you attempt to save logic that is missing inputs, an error message displays. You may save anyway or supply inputs where necessary. We do not recommend saving with missing inputs. In the Edit view, blocks with missing inputs have red input points. When the inputs are connected, the connection point turns blue.	

## Logic Checker

The Logic Checker is not the same logic check run with a LCT save. It must be selected from the [Toolbar](#). The Logic Checker scans the control system logic and reports any configuration issues it finds.

**Table 168: Logic Checker**

Condition	Message Text	Message Text Position
An output is not connected.	Missing Output Connection	Top-center of the block
An input is not connected.	Missing Input Connection	Top-center of the block
A feedback loop exists in the logic.	Feedback Loop Is Present	Top-center of a connection in the loop
An attribute is not connected.	Attribute Is Not Connected	Top-center of the attribute
Duplicate attribute name is defined.	Duplicate Attribute Name	Top-center of the attribute

## Errors in View Mode

While in [View Mode](#), the tool displays the status of [System Blocks](#), references ([Attribute Reference](#)), and [Math Category](#). If any connection is unreliable, the tool inserts a red circle at the center of the connection. If you place your cursor over the circle, the error condition appears as transparent text over the block. For example, the error could be a write or offline error.

## Printing

The Logic Connector Tool supports printing of the following paper sizes in either landscape or portrait orientation:

- Letter (8.5 x 11 in)
- Folio (8.5 x 13 in)
- Legal (8.5 x 14 in)
- Tabloid (11 x 17 in)
- A1
- A2
- A3
- A4
- A5

The Logic Connector Tool supports printing of just the existing control system.

## Mouse Shortcuts

Use mouse shortcuts to speed up LCT use.

### Mouse Shortcuts: Edit Mode

The following table lists the mouse shortcuts you can use in the [Edit Mode](#) of the LCT.

**Table 169: Edit Mode Mouse Shortcuts**

Component	Single Left-Click	Double Left-Click	Right-Click
<a href="#">System Block</a>	Select	Lets you edit the block ( <a href="#">Editing System Blocks</a> ).	Cut, Copy, Paste, Duplicate, Delete
<a href="#">Math Block</a>	Select	Lets you edit the block ( <a href="#">Editing Math Blocks</a> ).	Cut, Copy, Paste, Duplicate, Delete
<a href="#">Bool Block</a>	Select	Lets you edit the block ( <a href="#">Editing Bool Blocks</a> ) (except for LTCH blocks).	Cut, Copy, Paste, Duplicate, Delete
<a href="#">Statistical Block</a>	Select	Lets you edit the block ( <a href="#">Editing Statistical Blocks</a> ).	Cut, Copy, Paste, Duplicate, Delete
<a href="#">Selector Block</a>	Select	Lets you edit the block ( <a href="#">Editing Selector Blocks</a> ).	Cut, Copy, Paste, Duplicate, Delete

**Table 169: Edit Mode Mouse Shortcuts**

Component	Single Left-Click	Double Left-Click	Right-Click
<b>Control Block</b>	Select	Lets you edit the block ( <i>Editing Control Blocks</i> ).	Cut, Copy, Paste, Duplicate, Delete
<b>Psychrometric Block</b>	Select	Lets you edit the block ( <i>Editing Psychrometric Blocks</i> ).	Cut, Copy, Paste, Duplicate, Delete
<b>Attribute Block</b>	Select	Lets you edit the block ( <i>Editing Attribute Blocks: Input and Output</i> ).	Cut, Copy, Paste, Duplicate, Delete
<b>Attribute Reference Block</b>	Select	Lets you edit the block ( <i>Editing Attribute Reference Blocks</i> ).	Cut, Copy, Paste, Duplicate, Delete
<b>Constant Block</b>	Select	Lets you edit the block ( <i>Editing Constant Blocks</i> ).	Cut, Copy, Paste, Duplicate, Delete, Label
<b>Calculation Block</b>	Select	Lets you edit the block ( <i>Editing Calculation Blocks</i> ).	Cut, Copy, Paste, Duplicate, Delete
<b>Timing Block</b>	Select	Lets you edit the block ( <i>Editing Timing Blocks</i> ) (except for Time blocks).	Cut, Copy, Paste, Duplicate, Delete
<b>Connection: Prioritized</b>	Select	Calls up a box to set connection priority.	Hide, Delete
<b>Connection: Non-Prioritized</b>	Select	Has no action.	Hide, Delete
<b>Text Block</b>	Select	Opens the box for editing.	Cut, Copy, Paste, Duplicate, Delete, Properties
<b>Workspace</b>	Select (drag to lasso items)	Releases a connection if one is in progress.	Cut, Copy, Paste, Duplicate, Delete, Connect, Zoom (with subcategories)

**Mouse Shortcuts: View Mode**

The following table lists the mouse shortcuts you can use in the *View Mode* of the LCT.

**Table 170: View Mode Mouse Shortcuts**

Component	Single Left-Click	Double Left-Click	Right-Click
<b>System Block</b>	Select	-	-
<b>Math Block</b>	Select	-	-
<b>Bool Block</b>	Select	-	-
<b>Statistical Block</b>	Select	-	-
<b>Selector Block</b>	Select	-	-
<b>Control Block</b>	Select	-	-
<b>Psychrometric Block</b>	Select	-	-
<b>Attribute Block</b>	Select	-	-
<b>Attribute Reference Block</b>	Select	-	-
<b>Constant Block</b>	Select	-	-
<b>Timing Block</b>	Select	-	-
<b>Calculation Block</b>	Select	-	-
<b>Connection</b>	Select	-	-
<b>Text Block</b>	-	-	-

## Logic Connector Tool Steps

### Generating a Logic System (Overview)

To generate a complete logic system:

1. On the *Insert Menu*, select Control System. The Insert System *wizard* appears.
2. Follow the instructions. The *Program (Control System) Object* appears in the *Navigation Tree*.
3. Drag and drop the program/control system to the workspace. The LCT opens in *View Mode*.
4. Change to Edit mode (*Changing LCT Modes*) to add or edit items in the workspace.
5. Add symbol blocks (*Adding Items to Logic*) and add text blocks (*Adding Text Blocks*) to the workspace.
6. Connect the blocks (*Connecting Blocks*).
7. Edit blocks (*Editing Blocks in Edit Mode*).
8. Save the program/control system (*Saving a Control System*).
9. *Download* the program/control system to the online controller, if you created or edited the logic in *offline mode* (using the SCT).

**Note:** You must create a unique name for each program/control system created under the same folder. You can create programs/control systems with the same names as long as they are stored in different folders.

**Note:** When defining logic with scientific notation where the number of digits to the left of the decimal point is large, the system extends the range of values displayed without scientific notation to include all values with an absolute value less than 10 million and greater than or equal to one millionth ( $0.000001 \leq |value| < 10,000,000.0$ ).

### Changing LCT Modes

To change from *View Mode* to Edit Mode, click the Edit mode button on the *Toolbar*.

To change from *Edit Mode* to View Mode, click the Cancel or Save button on the *Toolbar*.

### Viewing Existing Logic

1. Browse to either an archive database or an online controller.
2. Drag and drop the desired *Program (Control System) Object* from the tree structure to the workspace. The Logic Connector Tool opens in *View Mode*.

### Adding Items to Logic

#### *Drag and Drop*

To add items to a control system using the drag and drop method:

1. In the *Edit Mode* of the LCT, left-click and drag an item from the left side of the tool view and drop it in the workspace.

**Note:** If the item is a *System block*, a configuration wizard appears. Answer the questions to set up the new object/system or create a reference to an object or control system.

**Note:** There is not interaction between the user navigation tree and logic.

2. Edit the block to match your needs. See *Editing Blocks in Edit Mode*.

#### *Copy and Paste*

**Note:** You can copy and paste existing objects into the workspace from the workspace only.

To add items to a control system using the copy and paste method:

1. Right-click an existing object and select Copy.
2. Right-click in the workspace and Paste the object.

**Note:** The copy and paste method supports copying and pasting of multiple blocks. To copy and paste more than one block, hold down the Shift key while selecting blocks with the cursor or use the select tool to lasso the blocks.



## Connecting Blocks

1. Make sure the Logic Connector Tool is running in [Edit Mode](#).
2. Place the cursor over the starting connection point until it changes shape from an arrow to a magic wand and click on the point.
3. Click on the ending connection point.

**Note:** If the connection is valid, the cursor is a magic wand. If the connection is not valid, a circle with an X through it appears, and the tool does not connect the points.

**Note:** After you successfully connect two points, the line between them turns blue until you click somewhere else in the workspace.

**Note:** You do not need to click the exact connection point. If you click in the block, the tool automatically creates a connection to/from the nearest block's connection point. To cancel the connection after clicking the first block, click anywhere in the workspace.

4. The Priority Connection dialog box appears. Choose a priority from 1–16 (1 is the highest priority).

**Note:** To change the priority at a later time, you must delete the connection and reinsert it.

### Re-Routing a Connection

1. Make sure the LCT is running in [Edit Mode](#).
2. Place the cursor over an existing end connection point until the cursor changes into a cursor with lines protruding from the tip.

**Note:** You may only move the destination point. To completely change the connection, see [Deleting Connections](#).

3. Click the connection point. The tool removes the connection.
4. Click a new connection point. The tool creates the newly routed connection.

### Hiding Output Connections

1. Make sure the LCT is running in [Edit Mode](#).
2. Place the cursor over the output connection point and right-click and a menu appears.
3. Select Hide from the menu. The tool removes all connections from the output and replaces the lines with numbered symbolic representations of the connections.
4. To see the connections again, right-click the starting connection point and select Unhide.

**Note:** Double-click the hidden connection to label it. If multiple connections are from the same hidden input, it is shown as **Label: number** where number is the number of connections.

Do not start labels with a number and then follow it with any of these characters: \$ . - ,

### Deleting Connections

1. Make sure the LCT is running in [Edit Mode](#).
2. Select the connection and right-click.
3. Select Delete from the menu.

OR

1. Select the connection.
2. Press the Delete key on the keyboard.

## Editing Blocks in Edit Mode

To edit blocks in Edit mode:

1. Enter [Edit Mode \(Changing LCT Modes\)](#).
2. See one of the following sections for information on the block you are editing.

### Editing System Blocks

To edit [System Blocks](#) in Edit mode:

1. Double-click a System block. The Expose Attributes dialog box appears.
2. Configure the inputs, outputs, and attributes of the subsystem.

**Note:** Select the Add button to add an attribute to configure. To remove attributes from the System, select the check box next to one or more attributes and click the Remove button.

**Note:** To view the control system for the System block, drag and drop the control system from the [Navigation Tree](#) to the [Display Frame](#).

### Editing Math Blocks

To edit [Math](#) blocks in Edit mode:

1. Double-click a Math block. The configuration dialog box appears.
2. Edit the fields and configure the number of inputs based on the selected type of logic.

**Table 171: Math Block Configuration**

Field	Description
Input	The number of inputs depends on the type of Math block you use. You cannot reduce the input count lower than the number of current connections.
OK	Accepts changes.
Cancel	Cancels changes.

### Editing Bool Blocks

**Note:** [LTCH \(Latch\)](#) blocks are not editable.

To edit [Bool](#) blocks in Edit mode:

1. Double-click a Bool block. The configuration dialog box appears.
2. Edit the fields and configure the number of inputs based on the selected type of Boolean logic.

**Table 172: Bool Block Configuration**

Field	Description
Input	The number of inputs depends on the type of Bool block you use. You cannot reduce the input count lower than the number of current connections.
OK	Accepts changes.
Cancel	Cancels changes.

### Editing Statistical Blocks

To edit [Statistical](#) blocks in Edit mode:

1. Double-click a Statistical block. The configuration dialog box appears.
2. Edit the fields and configure the type of statistical block and number of inputs.

**Table 173: Statistical Block Configuration**

Field	Description
Type	Allows you to switch between the statistical types.
Input	You cannot reduce the input count lower than the number of current connections.
OK	Accepts changes.
Cancel	Cancels changes.

### Editing Selector Blocks

To edit [Selector](#) blocks in Edit mode:

1. Double-click a Selector (Mux) block. The Selector Edit dialog box appears.
2. Edit the fields and configure the number of inputs, the enumeration set, and the mode for each input.

**Table 174: Selector Block Configuration**

Field	Description
<b>Input</b>	The number of inputs determines the list of inputs.
<b>Enum Category</b>	Filters the enumeration set list based on the chosen category.
<b>Enum Set</b>	When Enum Set changes, all modes are reset.
<b>Input 1 Mode(s)</b>	Click the button and a dialog box appears that allows you to select which modes associate with each input. In the dialog box, select the check box next to the desired mode(s). If a mode is already assigned to another input, the mode appears dimmed. Select Default to select all modes for an input that are not currently selected by any other input.
<b>Input 2 Mode(s)</b>	Click the button and a dialog box appears that allows you to select which modes associate with each input. In the dialog box, select the check box next to the desired mode(s). If a mode is already assigned to another input, the mode appears dimmed. Select Default to select all modes for an input that are not currently selected by any other input. There is one of these per input (2–8).
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancels changes.

**Editing Control Blocks**

To edit [Control](#) blocks in Edit mode:

1. Double-click a Control block. The configuration dialog box appears.  
**Note:** See [Editing SEQ \(Sequencer\) Blocks](#) for Sequencer configuration information.
2. Edit the fields to configure the type of comparison.

**Table 175: Control Block Configuration**

Field	Description
<b>Type</b>	The Type of comparison performed by the block. This field defaults to what was dragged over, but may be changed.
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancels changes.

**Editing SEQ (Sequencer) Blocks**

To edit [SEQ \(Sequencer\)](#) blocks in Edit mode:

1. Double-click a Sequencer block. The Sequencer dialog box appears.
2. Edit the fields to configure the sequencer.

**Table 176: SEQ (Sequencer) Block Configuration**

Field	Description
<b>Outputs</b>	Determines the number of binary outputs for the block.
<b>Min On Time</b>	Specifies the minimum time an output must be on before being deactivated to an off condition. When an output is activated, a timer starts. Until the timer reaches the minimum time, the output cannot be deactivated.
<b>Min Off Time</b>	Specifies the minimum time an output must be off before being reactivated to an on condition. When an output is deactivated, a timer starts. Until the timer reaches the minimum time, the output cannot be activated.
<b>Interstage On Delay</b>	Defines the minimum time that must elapse between the sequential activation of Sequencer stages.
<b>Interstage Off Delay</b>	Defines the minimum time that must elapse between sequential deactivation of Sequencer stages.

**Table 176: SEQ (Sequencer) Block Configuration**

Field	Description
<b>Make/Break Limits</b>	<p>The box next to Make/Break indicates if Proactive is selected and, when you click, launches the Make/Break Dialog box.</p> <p>In the Make/Break Dialog box:</p> <ul style="list-style-type: none"> <li>• Default check box: Disables all make/break limit text boxes and uses the default values. The default values are set so that each device is on for a proportional amount of time.</li> <li>• Proactive check box: Disables the Stage 1 make/break limit boxes (because that stage is always on) and shifts all the make/break limits down one stage.</li> <li>• Make Limit: Turns on the stage when the input value to the block reaches this limit.</li> <li>• Break Limit: Turns off the stage when the input value to the block decreases to this value.</li> </ul> <p>Make/Break Limit Rules:</p> <ul style="list-style-type: none"> <li>• The current stage make limit must be less than the next stage make limit.</li> <li>• The current stage break limit must be less than the current stage make limit,</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• the current stage make limit must be greater than the current stage break limit.</li> <li>• The current stage break limit must be less than the next stage break limit.</li> </ul>
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancel changes.

**Editing Psychrometric Blocks**

To edit [Psychrometric](#) blocks in Edit mode:

1. Double-click a Psychrometric block. The configuration dialog box appears.
2. Edit the fields and configure the elevation based on the selected logic type.

**Note:** If you double-click an ABH or DP block, the Unit Type field does not appear.

**Table 177: Psychrometric Block Configuration**

Field	Description
<b>Elevation</b>	Allows you to configure the current elevation of the site (in feet or meters).
<b>Unit Type</b>	Allows you to choose International System of Units (SI) or Imperial (IP) units.
<b>OK</b>	Accepts changes.
<b>Cancel</b>	Cancel changes.

**Editing Attribute Blocks: Input and Output**

To edit [Attribute](#) blocks in Edit mode:

1. Double-click an attribute block.
2. Edit the fields and configure the input/output (see [Editing Attribute Inputs](#) and [Editing Attribute Outputs](#)).

**Editing Attribute Inputs****Table 178: Attribute Input**

Field	Description
<b>Name</b>	Name of the input
<b>Units</b>	The units for the output. This field only appears for floating inputs.

**Table 178: Attribute Input**

Field	Description
Display Precision	Tells the Metasys software what precision to use when formatting data. This field only appears for floating inputs. <b>Note:</b> Display Precision is used in the Focus view of data, not the graphical view.
Enum Category	Set category determined by the user interface (either Two State or Multi State). This field only appears for Enum inputs.
Enum Set	Set determined by the category selected in Enum Category. This field only appears for Enum inputs.
Trigger	This is checked if you want the attribute to trigger the control system to execute if its value changes by more than the defined increment.
OK	Accepts changes.
Cancel	Cancels changes.

**Editing Attribute Outputs****Table 179: Attribute Output**

Field	Description
Name	Name of the output
Units	The units for the output
Display Precision	Tells the Metasys software what precision to use when formatting data. This field only appears for floating outputs. <b>Note:</b> Display Precision is used in the Focus view of data, not the graphical view.
Enum Category	Set category determined by the user interface (either Two State or Multi State). This field only appears for Enum outputs.
Enum Set	Set determined by the category selected in Enum Category. This field only appears for Enum outputs.
OK	Accepts changes.
Cancel	Cancels changes.

**Editing Attribute Reference Blocks**

To edit [Attribute Reference](#) blocks in Edit mode:

1. Double-click an Attribute Reference block. The Attribute Reference Edit dialog box appears.
2. Edit the fields and configure the object or attribute to which the block refers ([Editing Attribute Reference Inputs](#) or [Editing Attribute Reference Outputs](#)).

**Editing Attribute Reference Inputs****Table 180: Attribute Reference Input**

Field	Description
Label	Enter a label here for the block. <b>Note:</b> Do not start labels with a number and then follow it with any of these characters: \$ . - ,
Object	Browses to the object to which the reference is linked. Leaving this field blank leaves a placeholder for a future reference. The dragged object's name appears in this field and the object's attributes appear in the drop-down list in the attribute field.
Attribute	The attribute to which the reference is linked. When you are configuring for an Input reference, the drop-down list contains numeric attributes only.

**Table 180: Attribute Reference Input**

Field	Description
Units	Units for the attribute
Trigger	This is checked if you want the attribute to trigger the control system to execute immediately instead of waiting for the next control system scan if the value changes by more than the defined increment. Otherwise, the control system executes normally.
Increment	Sets the increment.
OK	Accepts changes.
Cancel	Cancels changes.

**Editing Attribute Reference Outputs****Table 181: Attribute Reference Output**

Field	Description
Label	Enter a label here for the block. <b>Note:</b> Do not start labels with a number and then follow it with any of these characters: \$ . - ,
Object	Browses to the object to which the reference is linked. Leaving this field blank leaves a placeholder for a future reference. The dragged object's name appears in this field and the object's attributes appear in the drop-down list in the attribute field.
Attribute	The attribute to which the reference is linked. When you are configuring an Output reference, the drop-down list contains numeric, writable attributes only.
OK	Accepts changes.
Cancel	Cancels changes.

**Editing Constant Blocks**

To edit [Constant Category](#) blocks in Edit mode:

1. Double-click a Constant block. One of two dialog boxes appears depending on the type of constant you select.  
**Note:** There are no configurable parameters for the Rel. (Release) constant. When you double-click, nothing happens.
2. Edit fields and configure the constant value ([Editing Constant Enum](#), [Editing Constant Float](#)).

**Editing Constant Enum****Table 182: Constant Enum**

Callout	Description
Enum Category	Set category determined by the user interface (either Two State or Multi State).
Enum Set	Set determined by the category selected in Enum Category.
Enum	Set state determined by the set and set category.
OK	Accepts changes.
Cancel	Cancels changes.

**Editing Constant Float****Table 183: Constant Float**

Callout	Description
Value	The value of the float.
Units	The units used by the float.
OK	Accepts changes.
Cancel	Cancels changes.

## Editing Calculation Blocks

### Editing RL (Rate Limiter) Blocks

To edit *RL (Rate Limiter)* blocks in Edit mode:

1. Double-click a Rate Limiter block. The RL dialog box appears.
2. Edit the Rate Limit and Startup Value for the RL block.

**Table 184: RL (Rate Limiter) Block Configuration**

Field	Description
Rate Limit	Specifies the rate per minute to increase/decrease the Output until it matches the Input.
Startup Value	Specifies the initial value used when the block is enabled.
OK	Accepts changes.
Cancel	Cancels changes.

### Editing Span Blocks

To edit *Span* blocks in Edit mode:

1. Double-click a Span block. The Span dialog box appears.
2. Edit the fields to enable or disable clamping.

**Table 185: Span Block Configuration**

Field	Description
Clamp High	Selects whether (True) or not (False) to clamp the Output at the Output High (OH). For more information on clamping, see <a href="#">Span</a> .
Clamp Low	Selects whether (True) or not (False) to clamp the Output at the Output Low (OL). For more information on clamping, see <a href="#">Span</a> .
OK	Accepts changes.
Cancel	Cancels changes.

### Editing Timing Blocks

**Note:** *Time* (logic) blocks are not editable.

### Editing Delay Blocks

To edit *Timing Category* blocks in Edit mode:

1. Double-click a Delay block. The Delay dialog box appears.
2. Edit the field to configure the delay.

**Table 186: Delay Block Configuration**

Field	Description
Startup Value	Displays the initial value of the Delay block.
OK	Accepts changes.
Cancel	Cancels changes.

### Editing TMR (Timer) Blocks

To edit *TMR (Timer)* blocks in Edit mode:

1. Double-click a Timer block. The TMR dialog box appears.
2. Edit the timing functions of the block.

**Table 187: TMR (Timer) Block Configuration**

Field	Description
Duration	Specifies the length of the timer function in seconds. The range is 5–86,400 seconds.
Setup	Determines the type of timer you use: <ul style="list-style-type: none"><li>• Pulse</li><li>• On Delay</li><li>• Off Delay</li><li>• Minimum On</li><li>• Minimum Off</li></ul>
OK	Accepts changes.
Cancel	Cancels changes.

## Adding Text Blocks

1. Click the Text icon on the [Toolbar](#).
2. Click the workspace to select a location for the text. The text block appears.
3. Select the Select icon on the toolbar.
4. Double-click the text block to display the text editor. Edit the text and click OK.
5. Select the text block and drag the sides to resize the block.

**Note:** To edit the text, double-click the block. The block opens for editing.

**Note:** To change the text properties, right-click the text block and select Properties from the menu. You can change the font (type, size, bold, italic, bold italic), text color, background color, and border visibility/color.

**Note:** Colon (:) and quote (") characters cannot be entered by the user in this field.

## Running the Logic Checker

To run the [Logic Checker](#):

1. Select the Logic Checker icon from the [Toolbar](#).
2. If the Logic Checker does not detect errors, a No Warnings Found dialog box appears. Click OK to return to the logic.
3. If the Logic Checker detects errors, a Configuration Warnings Were Found dialog box appears. After you click OK, the tool returns you to the logic with Information symbols over the warning elements.

**Note:** The Information symbols remain unless you ignore them and save the logic or fix the errors and run the Logic Checker successfully.

## Saving a Control System

To save a control system, click Save on the [Toolbar](#). The LCT scans for logic errors.

**Note:** The logic check done with the Save command is not the same as the [Logic Checker](#) run from the toolbar.

**Note:** If inputs are missing, an error message appears asking if you want to continue with the save. Click No to return to the logic. Click Yes to save anyway. We do not recommend saving with errors.

## Printing a Control System

To print a control system, click the print icon on the [Toolbar](#).



# Security Copy

Two types of database load wizards exist:

- the **Manage Archive Wizard** for uploading, downloading, and synchronizing archive (configuration) databases
- the **Security Copy Wizard** for restoring the Security System databases of Site Directors and other supervisory devices

Both wizards use the ActionQueue (ActionQ) to initiate and monitor the load or restore process. The Security Copy Wizard is described in this section. For information on the Load Wizard, see [Database Uploading, Downloading, Upgrading Device and Synchronization](#).

Use the Security Copy [Wizards](#) to restore security system databases of Site Directors and other supervisory devices. The SCT archive database stores the security system database information.

Access this wizard by selecting **Security Copy** from the [Tools Menu](#) in the SCT (offline [mode](#)). The Security Copy Wizard collects information necessary to perform the security database restore such as action type, device names, and scheduled time. Once you complete the wizard, the restore commands are added to the [ActionQ](#) in the SCT. The ActionQ initiates and monitors the process.

For more information on the ActionQ, see [ActionQ](#).

For information on uploading, downloading, and synchronizing archive databases, see [Database Uploading, Downloading, Upgrading Device and Synchronization](#).

## Security Copy Concepts

### Security Copy Restore

The Security Copy Wizard restores the backup of the security system settings including all user and role definitions stored in the SCT archive database to the selected device's security database.

### Security Copy Considerations

When using the Security Copy Wizard, keep the following considerations in mind:

- If you want to restore an Engine or ADS/ADX security database in an SCT, you must use the Security Copy Wizard.
- If an SCT and ADS reside on the same computer, the security database is shared between them both and can be restored using the Security Copy Wizard.
- If an SCT is not installed on an ADS, you cannot use the Security Copy Wizard to restore the SCT security database.

## Security Copy Steps

### Restoring Security Databases

**Note:** You must be in offline [mode](#) to load databases.

**Note:** After restoring a security database on an Engine only, the password for the **MetasysSysAgent** or **BasicSysAgent** user resets to the default password, and must be manually restored. See [Step 3](#). (The **MetasysSysAgent** user password does not reset to the default password for an ADS/ADX.) See the [Related Documentation](#) table in the [Welcome](#) section to find information on user accounts, passwords, and security.

**Important:** Before restoring a security database, verify that the Item Reference of the device in the SCT matches (case-sensitive) the Item Reference of the same device in the online mode.

**Important:** To successfully restore an ADS security database, create and assign users and roles that have the System Administrator permission on the ADS and the SCT. Then on the SCT, restore the ADS security database. If the ADS user does not have this permission, that user cannot successfully perform the restore.

1. Select Security Copy from the [Tools Menu](#) in the SCT. The Security Copy Wizard appears. See [Wizards](#) for help on using wizards.

2. Follow the wizard instructions. See the following table for tips. The ActionQ appears after clicking Finish on the Summary screen of the wizard. See the [ActionQ](#) Help for information on monitoring the progress of the restore.
3. After restoring a security database on an Engine only, log on to the Site Director Engine as the **MetasysSysAgent** or **BasicSysAgent** user and change the password as desired using the Change Password option from the Tools menu. The password you select must meet the requirements for complex passwords. For details, refer to the *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)*.

**Table 188: Security Copy Wizard Tips**

Wizard Screen	Tips
<b>Select Source</b>	<ul style="list-style-type: none"> <li>• A list of devices that have backed up their security databases appears.</li> <li>• Select one source device that has the security database you want to restore to one or more devices.</li> </ul>
<b>Select Devices</b>	<ul style="list-style-type: none"> <li>• Select one or more devices for which you want to restore the security database.</li> <li>• Use the Ctrl or Shift keys to select multiple items.</li> </ul>
<b>Schedule Operation</b>	<ul style="list-style-type: none"> <li>• Select either the Perform Operation Now or Schedule Operation radio button.</li> <li>• If you select Schedule Operation, use the date, hour, and minute menus to select the date and time for the restore.</li> </ul> <p><b>Note:</b> If you schedule multiple restores to begin at the same time, some restores may not begin at the specified time because they are waiting for others to complete. You cannot define a restore order for devices scheduled together. If you must restore a certain device first, schedule that device separately with an earlier restore time.</p>
<b>Site Login</b>	<ul style="list-style-type: none"> <li>• Select the Communicate via Site Director check box if the device is not on the LAN. Only use this option if necessary because it slows down the restore process.</li> <li>• Enter the Username and Password for logging on to the Site Director to perform the restore.</li> <li>• Click the Test Login button to test if the Username and Password entered allow you to communicate with the device. The device must be online to perform this test successfully.</li> </ul> <p><b>Note:</b> If the SCT Username and Password do not match the Site Director or the destination device Username and Password, the restore fails and returns an Authorization Failure error. You must enter the correct Username and Password on this screen.</p> <p><b>Note:</b> Active Directory users may not be used to log on to the site.</p>
<b>Specify Retries</b>	<ul style="list-style-type: none"> <li>• Enter the number of times you want to retry the restore if communication failure occurs.</li> </ul>
<b>Summary</b>	<ul style="list-style-type: none"> <li>• View the final information for the restore and click Finish.</li> </ul>

# Database Uploading, Downloading, Upgrading Device and Synchronization

Two types of database load wizards exist:

- the **Manage Archive Wizard** for uploading, downloading, and synchronizing archive (configuration) databases
- the **Security Copy Wizard** for restoring the Security System databases of Site Directors and other supervisory devices

Both wizards use the ActionQ (ActionQueue) to initiate and monitor the load or backup/restore process. The Manage Archive Wizard is described in this section. For information on the Security Copy Wizard, see [Security Copy](#).

Use the Manage Archive [Wizard](#) to download, upload, and synchronize archive databases. Access the Manage Archive Wizard by selecting **Manage Archive Archive** from the [Tools Menu](#) in offline [mode](#). The Manage Archive Wizard collects information necessary to perform the load such as load type, controller names, and load time. Once you complete the wizard, the load commands are added to the [ActionQueue](#) in the SCT. The ActionQ initiates and monitors the load.

**Note:** When a computer running the SCT is restarted, the SCT application shuts down until a user logs on to the application again. If a load is scheduled and the computer running the SCT is restarted, the load does not start until a user logs on to the SCT application again. Logging on to the SCT restarts the application and automatically starts any scheduled loads.

There are four types of actions:

- [Upload](#)
- [Download](#)
- [Synchronize](#)
- [Upgrading Device](#)

For more information on the ActionQ, see [ActionQ](#).

For information on restoring security databases, see [Security Copy](#).

## **Database Uploading, Downloading, Upgrading Device and Synchronization Concepts**

### **Upload**

The Manage Archive Wizard Upload option transfers a copy of the engine or ADS/ADX archive database into the archive database of the SCT. Perform an upload to update the SCT archive database with changes made in the online mode. The engine or ADS/ADX database overwrites the SCT archive database for the device being loaded. The direction of an upload is from the engine or ADS/ADX to the SCT. [Figure 74](#) and [Table 189](#) describe the upload process.

**Note:** When uploading an NCE, the archive database and the local application (Controller Application File, .caf file) automatically upload. To perform successful NCE uploads, you must first add the Controller Application File (.caf file) as a Resource File extension of the NCE using the Resource File wizard. For details, see [Resource File Extensions](#).

**Note:** To ensure recent online changes are captured during an upload, manually archive the device (Actions > Commands > Archive) and then upload. The archive function moves data from the engine RAM to its nonvolatile memory, from which it then can be uploaded. Do not confuse the archive function within the engine with the archive database that is in SCT.

Figure 74: Upload Process

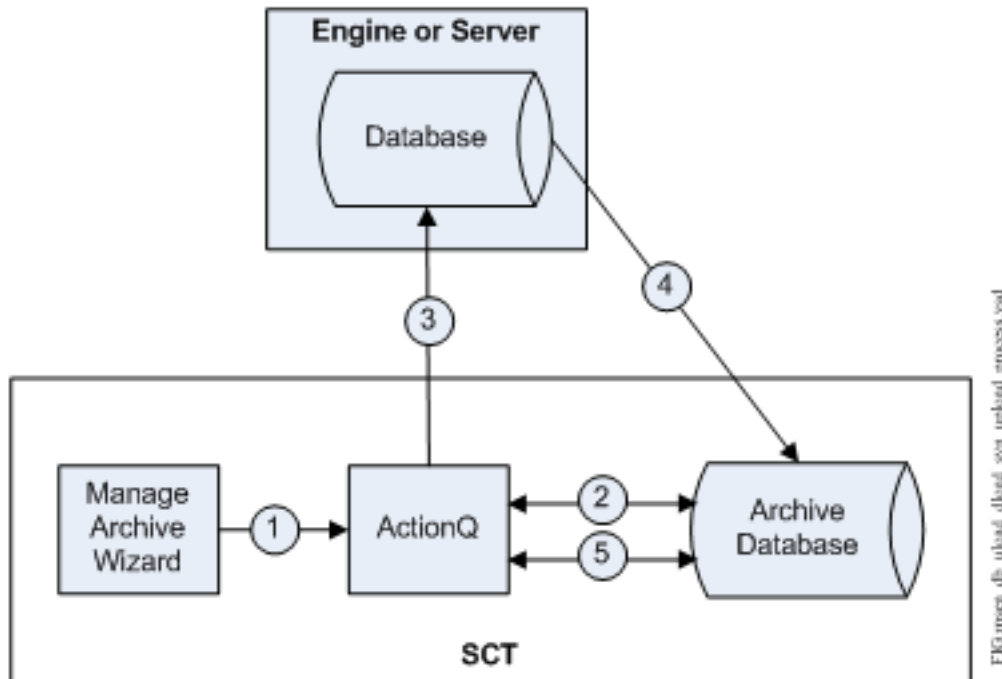


Table 189: Upload Process

Number	Process Description
1	After configuring an upload in the Manage Archive Wizard, the Manage Archive Wizard sends the upload command to the ActionQ feature in the SCT.
2	The <a href="#">ActionQ</a> locks the engine or ADS/ADX in the archive database. See <a href="#">Database Locking</a> .
3	1. The ActionQ begins the upload process at the time defined for uploading the engine or ADS/ADX database. 2. The engine or ADS/ADX creates an archive file of its database.
4	1. The ActionQ transfers the engine or ADS/ADX archive file to the SCT archive database. 2. The ActionQ replaces the existing archive database with the engine or ADS/ADX archive file.
5	1. The ActionQ unlocks the engine or ADS/ADX in the archive database. 2. The ActionQ displays the final status of the upload.

## Download

The Manage Archive Wizard Download option transfers a copy of the SCT archive database into the engine or ADS/ADX database. Perform a download to send the changes made in the SCT database to the engine or ADS/ADX database. The SCT archive database overwrites the engine or ADS/ADX database. At the end of the download, the engine or ADS/ADX restarts and does not control or monitor the system until the restart is complete. The following figure and table describe the download process.

**Note:** When downloading an NCE, you can download the archive database and/or the local application (Controller Application File, .caf file). To perform a successful download of the local application, you must first add the Controller Application File (.caf file) as a Resource File extension of the NCE using the Resource File wizard. Then, when you are ready to download the application, select the Local Application option on the Load Type screen of the Manage Archive Wizard. For details, see [Resource File Extensions](#).

Figure 75: Download Process

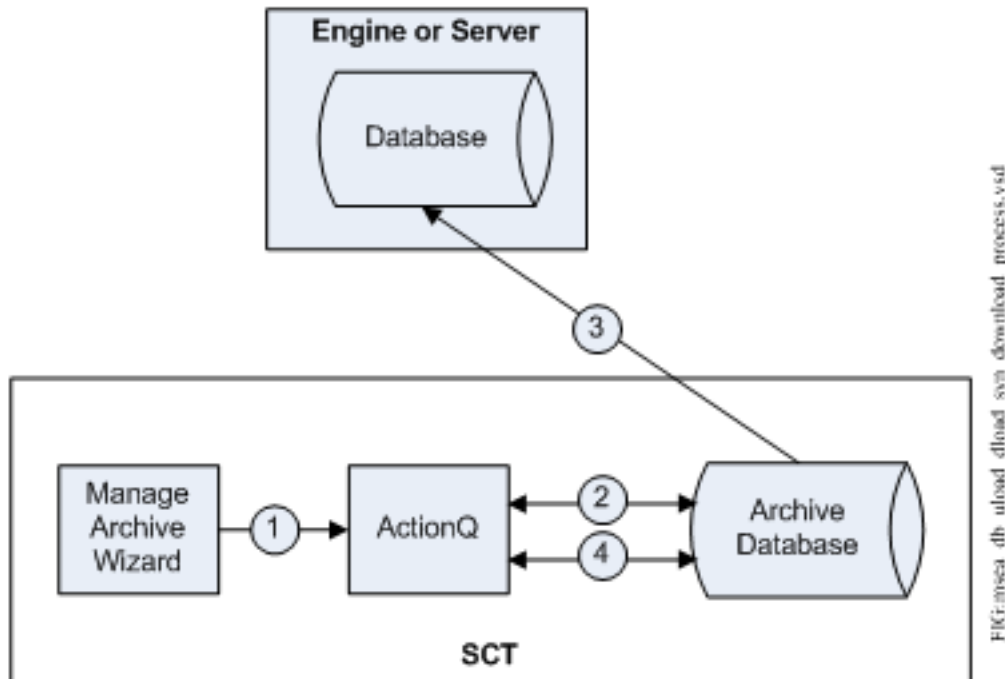


Table 190: Download Process

Number	Process Description
1	After configuring a download in the Manage Archive Wizard, the Manage Archive Wizard sends the download command to the ActionQ in the SCT.
2	<ol style="list-style-type: none"> <li>1. The <i>ActionQ</i> locks the engine or ADS/ADX in the archive database. See <a href="#">Database Locking</a>.</li> <li>2. The ActionQ polls for progress during the download process.</li> <li>3. The ActionQ begins the download process at the time defined for the download.</li> </ol>
3	The ActionQ transfers the SCT archive database file to the engine or ADS/ADX database.
4	<ol style="list-style-type: none"> <li>1. The ActionQ unlocks the engine or ADS/ADX in the archive database.</li> <li>2. The ActionQ displays the final status of the download.</li> </ol>

## Synchronize

**Note:** Read this section thoroughly before using the Synchronize feature to fully understand the implications of synchronizing databases. We recommend that you create a backup of the SCT database before proceeding with a synchronization.

The Manage Archive Wizard Synchronize option synchronizes an engine or ADS/ADX database with the SCT archive database. In synchronization, changes made since the last load process in the online database merge with changes made in the SCT database since the last load process, resulting in two databases that contain the same information. One of the benefits of the Synchronization feature is that the engine and ADS/ADX do not have to restart after the synchronization is complete.

If changes made since the last load process conflict, the SCT data supersedes the engine or ADS/ADX data. For example, if a Relinquish Default attribute of a setpoint is changed to 77° in the SCT and the same attribute is changed to 78° in the engine or ADS/ADX device, the attribute after synchronization is set to 77° in both databases.

**Note:** The UI does not indicate where discrepancies exist between the SCT data and the engine or ADS/ADX data. Use care when using the synchronize option.

**Note:** When synchronizing an NCE, the load only synchronizes the database. The local application (Controller Application File, .caf file) is not part of the synchronization process.

See [Table 191](#) for examples of synchronization scenarios.

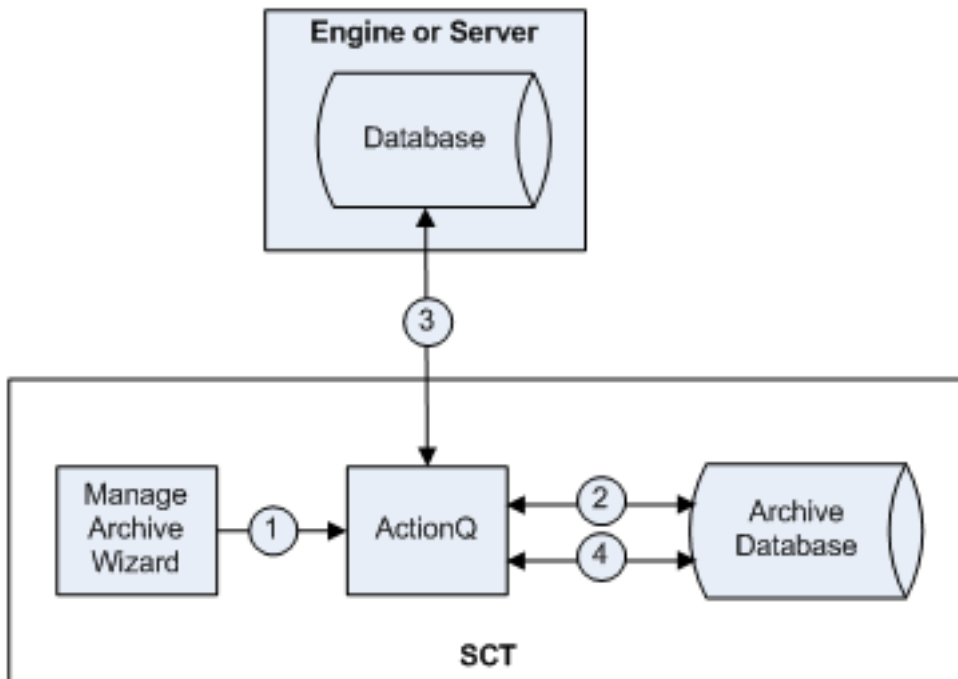
**Table 191: Synchronization Scenarios**

Change in SCT	Change in Device <sup>1</sup>	Final Result after Synchronization
Delete an Object	No Change	Object is deleted from both databases.
No Change	Delete an Object	Object is deleted from both databases.
Add an Object	No Change	Object is added to both databases.
No Change	Add an Object	Object is added to both databases.
No Change	Edit an Attribute	Attribute value is changed in both databases.
Edit an Attribute	No Change	Attribute value is changed in both databases.
Edit an Attribute	Edit Same Attribute to a Different Value	SCT attribute value is used in both databases.
Add an FEC to the FC Bus with an Address of 11	Add an IOM to the Same FC Bus with an Address of 11	The FEC with an address of 11 is added to both databases.
Add Object to the XYZ Folder	Delete the XYZ Folder	The databases stay the same as they were prior to the synchronization attempt. <b>Note:</b> Structural errors like this cause the synchronization process to fail with an error.

<sup>1</sup> This is most commonly done from the online device UI.

[Figure 76](#) and [Table 192](#) describe the synchronization process.

**Figure 76: Synchronize Process**



FIGURES\_db\_uklad\_uklad\_syn\_syn\_process.vsd

**Table 192: Database Synchronization Process**

Number	Process Description
1	After configuring a synchronization load in the Load Wizard, the Manage Archive Wizard sends the synchronization command to the ActionQ in the SCT.
2	<ol style="list-style-type: none"> <li>1. The <a href="#">ActionQ</a> locks the engine or ADS/ADX in the archive database. See <a href="#">Database Locking</a>.</li> <li>2. The ActionQ polls for progress during the synchronization process.</li> </ol>
3, 4	<ol style="list-style-type: none"> <li>1. The ActionQ begins the synchronization process at the time defined for the load by uploading the engine or ADS/ADX database into the SCT archive database. See the <a href="#">Upload</a> section.</li> <li>2. The SCT archive database saves a copy of the engine or ADS/ADX database, then rebuilds the engine or ADS/ADX database using the new file.</li> <li>3. The SCT archive database applies all changes from the engine or ADS/ADX database to its own archive database.</li> <li>4. If structural errors are detected, the saved copy of the original engine or ADS/ADX database is restored to the engine or ADS/ADX, an error message appears, and the engine or ADS/ADX and SCT databases remain unchanged.  <b>Note:</b> A structural error is a change made to one database that invalidates the other database. For example, a structural error occurs if you add an object to a folder in the SCT, but delete the corresponding folder online from the engine or ADS/ADX database.</li> <li>5. If structural errors are not detected, the ActionQ continues by downloading the new file from the SCT to the engine or ADS/ADX database. See the <a href="#">Download</a> section. However, the engine or ADS/ADX applies the changes from the new file to the database and goes through the startup process without resetting.</li> <li>6. The ActionQ unlocks the engine or ADS/ADX in the archive database.</li> <li>7. The ActionQ displays the final status of the synchronization.</li> </ol>

## Database Locking

After scheduling a load, the archive database for that device is locked in the SCT until all loads for that device have completed or are deleted. Only the device being loaded is locked. You can still access devices that have no scheduled loads.

If you need to edit the archive database in the SCT for a device with a scheduled load (locked device), you can still delete the load to clear the lock. After making your changes, you can schedule the load again.

## Upgrading Device

The Manage Archive Wizard upgrade device option upgrades the version of a supervisory device within the Archive database. If the site director is not already upgraded, include it to allow upgrades to the current SCT Version. You may schedule the load for later by selecting the Schedule upgrade radio button and entering a date and time.

**Table 193: Upgrade Device Process**

Number	Process Description
1	After configuring an upgrade device in the Manage Archive Wizard, the Manage Archive Wizard sends the upload command to the ActionQ feature in the SCT.
2	The <a href="#">ActionQ</a> locks the engine or ADS/ADX in the archive database. See <a href="#">Database Locking</a> .
3	<ol style="list-style-type: none"> <li>1. The ActionQ begins the upload process at the time scheduled in the upgrading device wizard.</li> <li>2. The supervisory device within the Archive database is upgraded. If the site director is upgraded, it will also allow upgrades to the current SCT Version.</li> </ol>
4	The ActionQ displays the final status of the upgrade device.

## Database Uploading, Downloading, Upgrading Device and Synchronization Steps

### Uploading, Downloading, Upgrading Device or Synchronizing a Database

You must be in [offline mode](#) to load databases.

**Important:** Before uploading, downloading, upgrading device or synchronizing a database, verify that the Item Reference of the device in the SCT matches (case-sensitive) the Item Reference of the same device in the online mode.

**Important:** During a load, the database files are sent to:

- Windows XP OS: C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\download
- Windows 7 OS, and Windows Server 2008 OS: C:\ProgramData\Johnson Controls\MetasysIII\download)

This location string and the item reference string make up the file name string. If the entire file name string exceeds the 256 character limit, the load fails.

For example, if you are downloading NAE-1, the location of the download files is:

- Windows XP OS and Windows Server 2003 OS: C:\Documents and Settings\All Users\Application Data\Johnson Controls\MetasysIII\download\NAE-1\NAE-1\\*.\*
- Windows 7 OS: C:\ProgramData\Johnson Controls\MetasysIII\download\NAE-1\NAE-1\\*.\*

This location string is already 102 characters long. If the location string and the item reference string (\*.\*) exceed the 256 character limit for the entire file name string, the download fails.

**Note:** If you change names in your system, we recommend using the upload or download process. If you add or delete points, use the upload, download, or synchronize process.

To [upload](#), [download](#), [upgrade device](#) or [synchronize](#) a database:

1. Select Manage Archive from the [Tools Menu](#). The [Manage Archive Wizard](#) appears. See [Wizards](#) for help on using wizards.
2. Follow the wizard instructions. See [Table 194](#).

The ActionQ appears after clicking Finish on the Summary screen of the manage archive wizard. See [ActionQ](#) for information on monitoring the load.

**Note:** If the download freezes with the load status of Establishing Communications, and no error message appears, wait a reasonable amount of time to allow the download to complete. Then, refresh the SCT display to update the screen. The updated status message appears when the download completes. The amount of time it takes to download depends on the size of the database, but is usually a few minutes. In addition, you can determine that the database downloaded properly by waiting for the device to come online after the download completes.

**Note:** When synchronizing databases, make sure the SCT computer remains running and online until the synchronization process completes. This action helps to prevent failures such as duplicate device databases. See the [Troubleshooting](#) section for more information on this problem.



**Table 194: Manage Archive Wizard Tips**

Wizard Screen	Tips
Load Type	<ul style="list-style-type: none"> <li>Select the radio button for the type of load: Synchronize, Upload From Device, Download To Device or Upgrade Device.</li> <li>Select the desired Options check boxes to download the Supervisory Device (archive database) and/or the Local Application (Controller Application File, .caf file). For an NCE, the load automatically pulls the archive database and application during an upload.</li> </ul> <p>To perform successful NCE uploads and downloads, you must first add the Controller Application File (.caf file) as a resource file of the NCE using the Resource File wizard. For details, see <a href="#">Resource File Extensions</a>.</p> <p><b>Note:</b> When synchronizing the NCE, the load only synchronizes the database. The application file is not part of the synchronization process.</p>
Select Devices	<ul style="list-style-type: none"> <li>Select one or more devices to upload, download, upgrade device or synchronize.</li> <li>Use the Ctrl or Shift keys to select multiple items.</li> </ul> <p><b>Note:</b> If upgrading device, if the site director is not already upgraded, include it to allow upgrades to the current SCT Version.</p>
Load Schedule	<ul style="list-style-type: none"> <li>Select either the Upload/Download/Synchronize/Upgrade now or Schedule upload/download/synchronize/upgrade radio button.</li> <li>If you select Schedule upload/download/synchronize/upgrade, a date and time selector appears.</li> </ul> <p><b>Note:</b> If you schedule multiple loads to begin at the same time, some loads may not begin at the specified time because they are waiting for other loads to complete. You cannot define a load order for devices scheduled together. If you must load a certain device first, schedule that device separately with an earlier load time.</p>
Site Login	<ul style="list-style-type: none"> <li>Enter the Username and Password for the load.</li> <li>Click the Test Login button to test if the Username and Password entered allow you to communicate with the device. The device must be online to perform this test successfully.</li> <li>Click the Communicate via Site Director check box if the device is not on the LAN.</li> </ul> <p><b>Note:</b> If the SCT Username and Password do not match the Site Director or the destination device Username and Password, the load fails and returns an Authorization Failure error. You must enter the correct Username and Password on this screen.</p> <p><b>Note:</b> Active Directory users may not be used to log on to the site.</p>
Specify Retries	Enter the number of times you want to retry the load if communication failure occurs.
Repeat Upload	<ul style="list-style-type: none"> <li>Appears only in the Upload Wizard.</li> <li>To repeat the upload automatically, enter the number of days between uploads. Enter 0 if you do not want to repeat the load.</li> </ul> <p><b>Note:</b> Use this option only if all changes are being made online to the engine or ADS/ADX database. The engine or ADS/ADX is always locked in the SCT archive database because once a scheduled load completes, another load is automatically scheduled. You can delete all scheduled loads for the engine or ADS/ADX to clear the database lock. See <a href="#">Database Locking</a>.</p>
Device Change	<ul style="list-style-type: none"> <li>Appears only in the Download Wizard when only one device is selected for download.</li> <li>To change the Name and Computer Name of a device during the download, click <b>Use this option to rename a device via download</b> and enter the new name in the text box.</li> <li>To change the address of a device during the download, click <b>Use this option to change a device address via download</b> and enter the new address in the text box.</li> </ul> <p><b>Note:</b> You cannot use this Device Change option to change the name of an ADS/ADX. The name of the ADS/ADX object is the same as the computer host name. To change the name of the ADS/ADX object you must change the name of your host computer, then reboot your computer.</p>
Summary	View the final information for the load or upgrade and click Finish.

# Simulation

Simulation allows you to test the system logic created for an Engine when the Metasys system is *offline*. With Simulation mode, you can enter commands and see how an online system would react if commanded to do the same action. The Simulation mode uses the same *Site Management Portal User Interface* and command features of the *online* system.

## Simulation Concepts

### Simulation

You must be running the System Configuration Tool (*offline*) to use Simulation. You cannot run Simulation on the same PC as an ADS/ADX because the ADS/ADX is part of the *online* system. Simulation supports the simulation of one Engine on one site, and if you attempt to *start* a second simulation, the first simulation must be *stopped*.

In Simulation mode, you can perform tasks including:

- viewing a control system created using the *Logic Connector Tool (LCT)*
- simulating *Inputs/Outputs (I/O)*

Simulation offers *menu choices* different from those available in other modes (the Edit, Insert, and Tools menus are not available). Simulation does not support moving logic or items from within the simulated system to the archive database or online system.

Simulation runs in a new browser window labelled Metasys Simulation in the title bar of the browser. Only the information for the simulated device appears in the simulation session (not the entire site).

### Inputs/Outputs

In Simulation, you can manually override and command the simulated I/O objects. Typically, the I/O objects are integrated into a *Logic system*, *Program (Control System) Object*, or a *Graphic*.

### Refresh

When you make changes to a simulated device, the changes become part of the simulated device immediately, without the need for a refresh.

## Simulation Steps

### Starting a Simulated Session

1. In the All Items *Navigation Tree*, select the Engine you want to simulate.
2. On the *Action Menu*, click Start Simulation.

or

Right-click the Engine you want to simulate in the All Items navigation tree and select Start Simulation from the menu.

**Note:** When you start a simulation session, a new Web browser window opens that can be closed immediately while the user interface for Simulation loads.

### Stopping a Simulated Session

To stop a simulated session, click the Exit button in the upper right corner of the Simulation screen.

**Note:** Be sure to also exit the Web browser window that was used to *start Simulation*.

# ActionQ

The ActionQ (pronounced Action Queue) receives time consuming commands such as an upload or download from [wizards](#), allows you to edit and monitor the commands, and sends the command information to the SCT for scheduled execution. You can only access the ActionQ from the [View menu](#) in the [offline mode \(SCT\)](#).

For more information on the load process, see [Database Uploading, Downloading, Upgrading Device and Synchronization](#).

## ActionQ Concepts

### ActionQ Operation

The ActionQ shows the status of commands and allows you to monitor, enable or disable, delete, and reschedule commands. See the [ActionQ Interface](#) section. The ActionQ receives a command from a wizard and executes the command based on the date, time, and other specified parameters.

The order of operation is as follows:

1. The ActionQ receives a command from the Manage Archive Wizard wizard.
2. The ActionQ initiates the command (for example, starts the [upload](#) process).
3. The ActionQ interface displays the progress and final status of the command.

**Note:** The final status remains on the ActionQ screen until you [delete](#) it or it is [automatically deleted](#) after a user-defined number of days (1–30).

**Note:** At this time, the ActionQ only supports [upload](#), [download](#), [upgrade device](#) and [synchronization](#) commands from the [Manage Archive Wizard](#).

### ActionQ Interface

The ActionQ contains three main screens.

**Table 195: ActionQ Screens**

Screen	Description
<b>ActionQ</b>	<p>Allows you to view active, scheduled, and completed commands. This screen is the main screen of the ActionQ interface and has three tabs:</p> <ul style="list-style-type: none"><li>• <b>Actions in Progress</b> - Allows you to monitor, enable/disable, delete, and reschedule commands that are in progress or pending.</li><li>• <b>Scheduled Actions</b> - Allows you to view, enable/disable, delete, and reschedule upcoming scheduled commands.</li><li>• <b>Completed Actions</b> - Allows you to view the status of completed commands, reschedule commands, and clear them from the screen.</li></ul> <p><b>Note:</b> A command is pending when it has not been issued because the recipient device is busy as a result of too many incoming commands.</p> <p><b>Note:</b> Once a command is issued, it may be complete before a command to disable, delete, or reschedule reaches it.</p>
<b>ActionQ Reschedule a Command Dialog Box</b>	<ul style="list-style-type: none"><li>• Allows clicking the Reschedule button from the Action in Progress, Scheduled actions, or Completed Actions tabs of the ActionQ main screen.</li><li>• Allows you to edit the scheduled start date and time of a command.</li></ul> <p><b>Note:</b> If you schedule multiple commands to occur at the same time, not all commands may begin at the specified time because they are waiting for other commands to complete.</p>
<b>ActionQ View Status Dialog Box</b>	<ul style="list-style-type: none"><li>• Appears after clicking the View Status button from the Completed Actions tab of the ActionQ main screen.</li><li>• Allows you to view the completion information of a command, such as destination, start time, end time, final status, error status, and any additional information.</li></ul>

## ActionQ Steps

### Launching the ActionQ

**Note:** You must be in *offline mode (SCT)* to access the ActionQ. The ActionQ automatically launches after the Load Wizard completes.

To launch the *ActionQ Interface*, select ActionQ from the *View menu*.

### Enabling/Disabling a Command

1. *Launch the ActionQ* and select either the Actions in Progress tab or the Scheduled Actions tab.
2. Click the command.
3. Click Enable or Disable.

### Rescheduling a Command

1. *Launch the ActionQ* and select a tab.
2. Click the command.
3. Click Reschedule. The ActionQ Reschedule a Command dialog box appears.
4. Edit the date and time using the drop-down menus.
5. Click OK.

### Viewing the Status of a Command

1. *Launch the ActionQ* and select the Completed Actions tab.
2. Click the command.
3. Click View Status. The *ActionQ View Status* dialog box appears.
4. Click OK to return to the ActionQ screen.

### Deleting a Command

1. *Launch the ActionQ* and select a tab.
2. Click the command.
3. Click Delete.

### Automatically Deleting Completed Commands

1. *Launch the ActionQ* and select the Completed Actions tab.
2. Enter the desired amount of days in the **Number of days after which entries will be automatically deleted (1–30)** text box.

# Diagnostics

Diagnostics help you discover problems with your Metasys system. The following areas have diagnostic information available:

- Hardware (found under Diagnostics tab of an object)
  - [N2, N1, and BACnet trunk statistics](#) or other integration type statistics
  - NAE and NxE (all engine types) statistics
  - ADS/ADX communication statistics
  - Field device statistics
  - BACnet Protocol Engine statistics per NxE
  - Ethernet IP Datalink statistics per NxE
- software
  - error logs viewed through [Audit Trails](#)
  - unbound/duplicate references ([Engine Device Object](#))
  - events viewed through [Alarm and Event](#) information
  - trends viewed through [Trend Studies](#) and [Trend Extensions](#)

For Ethernet statistics and task-utilization data, use off-the-shelf diagnostic tools. Refer to the manuals shipped with these tools for more information.

For more information on diagnostics, see [Displaying Diagnostic Data](#).

## Diagnostics Steps

### Displaying Diagnostic Data

1. Drag and drop the object you want diagnostic data on over to the [display frame](#).
2. Click the diagnostic tab. Diagnostic data appears.

For example, see the Diagnostic tab table in the Attributes section of the following objects for more information:

- NAE Object ([Engine Device Object](#))
- N2 Trunk ([N2 Master Datalink Object \(N2 Trunk\)](#))
- [NCM Object](#)
- [BACnet Integration Object](#) ( [Execution Time](#) attribute)
- [BACnet Protocol Engine Object](#)

## Energy Optimization

Energy Optimization features, when properly applied and configured for your facility, enable you to reduce energy usage.

For more information on the Optimal Start object and Energy Optimization, see [Optimal Start Object](#).

# Object Help

The Object Help describes each object in the system, the attributes of the objects, and the characteristics and functions of each attribute. The Object Help provides detailed information to aid in creating objects, entering values for configuring attributes, understanding how to read attributes, and defining the interaction between objects via the attributes.

## Object Help Concepts

### Objects

Objects are self-contained functional items in the Metasys system that contain processes to manage building automation system components. Objects appear as items in the [Navigation Tree](#) that shows the hierarchical physical or logical relationship between the objects as created by the user. These objects are generally referred to as items in the Metasys user interface.

Each object that exists in a system is based on a specific object type. There is an object type to manage the functions of the site, object types to manage the operation of the various device types installed on the site, object types to manage the physical input/output points of each field device, and others.

Examples: [Site Object](#), [Engine Device Object](#), [Analog Input Object](#), [Program \(Control System\) Object](#)

Objects communicate with the rest of the system and with the user through their [attributes](#). The object type defines the basic function of the object, but the actual behavior of each object also depends on the values assigned to its configuration attributes and received by its input attributes from other objects. The object writes its status conditions and the results of internal processes to its output attributes.

When an object type has an equivalent BACnet Object Type, the attribute list includes the BACnet Properties required by the BACnet protocol specification and some of the optional properties. These objects may be accessed from a BACnet network. For detailed information on BACnet objects and properties, refer to *ANSI/ASHRAE Standard 135-2008 - A Data Communication Protocol for Building Automation and Control Networks*.

### Object Extensions

Object extensions provide additional features to objects and include Alarm, Trend Log, Totalization (Analog, Runtime, and Event), Load, Averaging, and Resource File. Object extensions do not appear in the navigation tree. The attributes of Object Extensions are displayed under specific tabs when viewing object details. You may define object extensions when the object is first created using the configuration wizard or add them later.

For more information on extensions, see the [Extensions](#) section.

### Attributes

Attributes contain data that an object exposes to the system. The data in some attributes is set by the user or by other objects and features in the system and is used by the object to perform its function. Other attributes contain data produced by the object itself. The Attributes table for each object lists the characteristics of each attribute to help you configure the object.

There is a set of attributes common to many Metasys system objects. These attributes are described in the [Common Object Attributes](#) section. Each object attribute section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to that object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of the object (for example, the Hardware and Options tab appear on point objects and the Email tab appears on Engine and Server objects). The attributes listed in the tables appear in alphabetical order.

The column headings in the Attribute table are defined as follows:

#### **Attribute Name**

Gives the name of the attribute as it appears on the user interface.

Example: High Limit

See the [Status and Display Attribute Location](#) topic.

### Data Type

Lists the data type of the attribute value. The following table defines the various data types used in the Metasys system.

**Table 196: Data Types**

Data Type	Formal Name	Definition
<b>Attribute Reference</b>	Attribute Reference	Reference of an attribute from which data is read or to which data is sent. The format is <Object Reference.Attribute Name>
<b>Date</b>	Date	Day of week, day, month, year Example: Wednesday, February 19, 2003
<b>List</b>	List	List of attributes or properties of other objects that is created or used by a particular function of this object.
<b>Number</b>	Byte	Number from 0–255 with no decimal point. Allowable range appears in column headed Values/Options/Range
<b>Number</b>	Unsigned Integer Short	Number from 0 to 65,535 with no decimal point. Allowable range appear in column headed Values/Options/Range.
<b>Number</b>	Unsigned Long	Number from 0 to 4,294,967,295 with no decimal point. Allowable range appears in column headed Values/Options/Range.
<b>Number</b>	Signed Integer	Signed number that is also an integer with no decimal point. The value may be positive or negative. Allowable range appears in column headed Values/Options/Range. Examples: <ul style="list-style-type: none"><li>• DLLR: Shed Pending, Shed Lost</li><li>• Accumulator: Scale As Integer</li></ul>
<b>Object Reference</b>	Object Reference	Item Reference of an object to which a command is sent
<b>One State/Type/Node from a Set</b>	Enumeration	Discrete state/type/mode taken from a set of numbered possible values and normally represented on the user interface by text.
<b>Real Value</b>	Float	Number with a decimal point to show required precision Example: 24.5
<b>Set of Related Values</b>	Structure	A set of values of mixed data types representing one physical entity
<b>Series of True or False States</b>	Bit String	Series of true/false states that each have an independent meaning but together define the overall state of an attribute or object
<b>Set of Values</b>	Array	A set of a specified number of values of the same data type
<b>Text</b>	String	A line of characters (letters and numbers)
<b>Time</b>	Time	Hours, minutes, seconds Example: 12:30:56 AM Each Time data type has a time chooser for graphical time selection, where writable.
<b>True or False</b>	Boolean	Data that can only be true or false

### Notes

The Notes column lists specific characteristics of the attribute and its value. The characteristics (or flags) in Notes specify how the attribute is used in the object and how it can be set within the Metasys system.



**Table 197: Notes**

Note	Definition
<b>C - Configurable</b>	Indicates if the value of the attribute is defined by the user when first creating the object and cannot be changed by the object itself. Configurable (C) attributes that are writable (W) can be changed by the user online or by a process or feature in the running system after the object has been created.
<b>D - Default Attribute for Display</b>	Indicates that this is the primary value of this object, and is used when the user interface needs to display a single value from the object. For example, this attribute is displayed in the header bar of the display panel for an object.
<b>N - Value Not Required</b>	Indicates that this configurable attribute may contain a blank value. (Other configurable [C] attributes without N must contain a valid value for the object to function.) For example, a value for a high or low limit attribute is not required and a blank value indicates that the alarm processing is not required.
<b>R - Affected by Object Reliability</b>	Indicates that the reliability of the value of this attribute is dependent on the object being in a reliable state.
<b>W - Writable</b>	Indicates that the user can edit the value of the attribute online or by a process or feature in the running system or network. A write to a configurable (C) attribute replaces the existing value. A write to other attributes is handled as an override to the value calculated by the object or as a command for some action by the object.

**BACnet Notes**

The BACnet Notes column specifies if the attribute is exposed as a standard BACnet property and if it can be modified from a BACnet network.

**Table 198: BACnet [System] Notes<sup>1</sup>**

Note	Definition
<b>B - Exposed as Standard BACnet Property</b>	Indicates that the attribute can be accessed as a standard BACnet Property of the equivalent BACnet Object Type from a BACnet network.
<b>W - Writable</b>	Indicates that the value of the attribute can be modified by a message from a device on the BACnet network.

<sup>1</sup> The types listed in [Table 197](#) may also appear in the Note column, as applicable.

**Initial Value**

A configurable attribute takes the initial value when the object is being created if the user does not enter another value. Other attributes take the initial value on startup and until the object calculates a new value.

**Values/Options/Range**

Based on the attribute’s data type, this column may show the range of valid values or a reference to the set of possible values for this attribute. If the complete set of values for the attribute is small, all possible values are shown in this column.

**Status and Display Attribute Location**

The Status and default display attribute (typically the Present Value) of objects appear just below the header of the [Display Panel](#) displaying the object.

**Object Naming Attributes**

Every object can be identified by one of three naming attributes.

**Name** - a freely definable user name for the object

**Item Reference** - a fixed name used internally by the system

**BACnet Object Name** - the name exposed to a BACnet network based on the Item Reference; or the name based on the **User Name Is BACnet Obj Name** common attribute setting

See the [Object and Feature Tabs](#) section for more information on these attributes.

## Commands

The Commands table for each object lists the commands that the object supports. Commands allow you to perform an action on an object, such as Start or Stop. The user executes these commands through the user interface. If an object does not support any commands, the Commands table does not appear in the Help. For a description of each command, click the command name in the Commands table.

The column headings in the Commands table are defined as follows:

**Command Name** - Gives the name of the command as it appears in the user interface.

**Parameters** - Gives the parameters required in the command along with some descriptive information.

## State, Mode, and Type Sets

State, Mode, and Type Sets provide the source of readable text for the user interface when the displayed value can be one of many states, modes, or types. For example, the Status attribute of every object is displayed as one of the texts listed in the Object Status (Set 505).

References to specific sets appear throughout the Object Help, usually in the [Values/Options/Range](#) column of the object's attribute table.

## Common Object Attributes

The [Object and Feature Tabs](#) are used by most of the object types in the Metasys system. Each particular object in the [object list](#) contains a reference to the use of common object attributes.

## Object List

The entire list of objects that are available in the Metasys system appears in the table of contents in the Help system and PDF. Also see the [Extensions](#) section for object extensions.

## Object Creation

Objects can be created [offline](#) in the system database on the SCT and later [downloaded](#) to the host device as part of the edited database. You can also create objects [online](#) with a browser if you have the Access Privileges to configure objects using the Security Administrator System. The user interface screens and procedures are similar in either case. Creating an object involves placing it at the desired position in the [Navigation Tree](#) and defining all the attributes that are required for it to operate. The procedure begins with the [Insert Menu](#), and a [wizard](#) guides you through all the necessary configuration steps.

See the [Creating Items with Wizards](#) section for the steps to create objects/items.

## Object Deletion

Objects can be deleted [offline](#) in the system database on the SCT and later [downloaded](#) to the host device as part of the edited database. You can also delete objects [online](#) with a browser if you have the Access Privileges to configure objects using the Security Administrator System. The user interface screens and procedures are similar in either case. Deleting an object involves selecting it in the [Navigation Tree](#) and using the [Delete Items](#) command.

See the [Deleting Objects/Items](#) section for more information.

**Note:** Before deleting an object, you should delete all references to the object within other objects and reconfigure any objects that are referenced in the object to be deleted. If the references are not edited or deleted, the referenced objects may not operate correctly. See the [Unbound References](#) attribute in the [Engine Device Object](#) for an example of how to locate incomplete references.

## Common Object Attributes

The Common Object Attributes are used by most of the object types in the Metasys system. Each object type also has specific attributes that apply only to that object type. A reference to the use of Common Object Attributes and a description of specific object attributes are given under each particular object in the [Object List](#).

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the Common Object Attributes, see [Common Attributes](#).

### Common Attributes

This section lists the attributes that are common to Metasys system objects. Click the attribute name in the table for a description of the attribute.

For detailed information on BACnet properties, refer to *ANSI/ASHRAE Standard 135-2008 - A Data Communication Protocol for Building Automation and Control Networks*.

**Table 199: Common Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Archive Date</a>	Date				
<a href="#">Alarm State</a>	One state from a set			Normal	Subset of the Object Status (Set 505)
<a href="#">Description</a>	Text	CNW	BNW	No text	Maximum 40 characters
<a href="#">Enabled</a>	True or False			True	
<a href="#">Item Reference</a>	Text	C			All Items navigation tree path to object. SiteID:DeviceID/x.y.z
<a href="#">Name</a>	Text	CW		Item ID	Maximum 400 characters (40 or less is best for display layout)  During online creation, this field is limited to 32 characters; however, you can edit and lengthen the name later.
<a href="#">Object Category</a>	One type from a set	CW	W	General	HVAC, Fire, Security, Services, Administrative, General, Lighting, Refrigeration, Critical Environment, Air Quality, Power, Energy, System, Custom 1–12
<a href="#">Object Count</a>	Number				
<a href="#">Object Identifier</a>	Number	C	B		Instance Number of Object Type within the host device
<a href="#">Object Name</a>	Text		B		Item Reference less SiteID
<a href="#">Object Type</a>	One type from a set		B		Actual Object Type
<a href="#">Status</a>	One state from a set			Normal	(Displayed in panel header.)
<a href="#">User Name Is BACnet Obj Name</a>	True or False	CW	CW	False	
<a href="#">Version</a>					Actual version of Object in device

<sup>1</sup> B - Exposed as Standard BACnet Property, C - Configurable, N - Value Not Required, W - Writable

## Common Object Attribute Details

### Archive Date

Indicates the date of the last successful archive of object instances. The value of this attribute is valid if a valid archive exists and during the archive download process. The value of this attribute is 0xFF at all other times.

Back to [Common Object Attributes](#).

### Alarm State

Indicates the current Warning or Alarm state of an object. This attribute is set by an [Alarm Extension](#) associated with the object.

Back to [Common Object Attributes](#).

### Description

Contains a user-defined description of the object or, for some integrations, the device description. After the description is defined by the user, the description is not read from the device again.

Back to [Common Object Attributes](#).

### Enabled

Indicates whether the object is set to execute/enabled (True) or not execute/disabled (False).

Back to [Common Object Attributes](#).

### Item Reference

Contains a unique reference name for the object that is the full path name of the object through the All Items navigation tree using the unique identifier you specified when you manually created the object. The Item Reference begins with the site and device identifiers (separated by a colon), followed by the identifiers of any parent objects, such as an integration object, field device, or any nested folders, and ends with the identifier of the object itself.

You define the identifier of each object as it is created and the system builds the Item Reference automatically. Once the object is defined, the Item Reference cannot be changed directly. But, the Computer Name attribute of a Site Director or device is the object identifier. If you change the Site Director or device Computer Name attribute, the [Item Reference](#) then updates to show the new Computer Name.

If a device has a domain specified in the Domain Name attribute, the name for the domain appears in the Item Reference after the Computer Name:

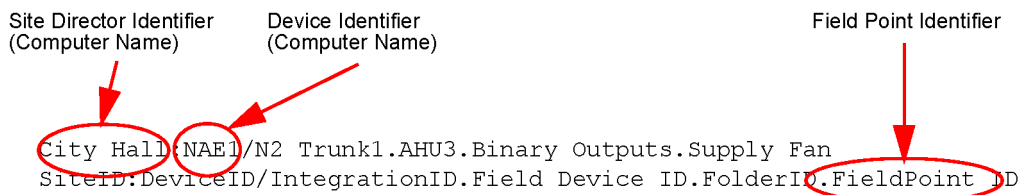
Computer Name.Domain Name

The following characters **are not** allowed in references:

@ . , ? \* # : ' " \ / [ ] < > |

[Figure 77](#) shows an example for a field point object in an N2 integration.

**Figure 77: Example of Item Reference**



Back to [Common Object Attributes](#).

## **Name**

Contains a freely definable user-friendly Name for the object that is independent of the [Item Reference](#) or the location of the object in the physical network. The Name is used as the label in the All Items navigation tree. The Name is shown in alarm reports, the event and audit viewers, and in summaries. The Name **does not** need to be unique to the site unless the name is used as the BACnet Object Name. When the name is used as the BACnet Object Name, it must be unique among the BACnet Object Names in the device (if it is not a Device object) or unique among the other device objects (if it is a Device object).

The Name defaults to the object identifier you used during manual object creation, but can be edited later. For integrated BACnet objects, the name defaults to the BACnet Object Name in the remote BACnet device. For integrated N1 network objects, the name defaults to the System.Object Name in the Network Communication Module (NCM).

Example: ConferenceCenter-Room2-SpaceSetPoint

For devices, both the Computer Name and Name attributes default to the object identifier you used during manual object creation. But, do not confuse the Computer Name attribute with the Name attribute. Changing the NAE Name attribute does not impact the object references or network communication with other devices on the site.

Changing the Computer Name online breaks any existing references between the NAE object and other objects on the site, and may break the existing network connection to other devices on the network. We do not recommend changing the Computer Name online. If you change the Computer Name attribute in the SCT (right-click the NAE in the navigation tree and select Rename), both the Computer Name and Name attributes are changed to the new name you select. The [Item Reference](#) then updates to show the new Computer Name.

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## **Object Category**

Classifies the object by the category of system or equipment that it monitors to aid in the determination of user access privileges and alarm routing.

Examples: HVAC, Fire, Security

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## **Object Count**

Indicates the number of object instances within the device. This count includes objects of any type.

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## **Object Identifier**

Indicates the instance number of the [Object Type](#) used in the BACnet Object ID as exposed to a BACnet network. The object ID must be unique within the host device. The object ID of the Device object must be unique within the BACnet network.

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## **Object Name**

Indicates the Object Name as exposed to a BACnet network. This attribute is equivalent to the [Item Reference](#) without the site identifier. You cannot edit this attribute, but it changes when the Item Reference attribute updates. In addition, you can change the Object Name attribute by editing the User Name attribute and setting the User Name Is BACnet Obj Name attribute to True.

Example: NAE3/N2 Trunk1.AHU4.Supply Temp

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## **Object Type**

Indicates the Object Type as displayed in the Metasys software and as exposed to a BACnet network.

Example: AI (Analog Input)

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### **Status**

**Note:** The value of the Status attribute displays next to the Default Attribute for Display (typically Present Value) in the header bar of the Display panel.

Displays the highest priority Status for the object.

Examples: (in order of priority - supported states depend on Object Type)

- **Out Of Service:** The Out Of Service attribute value is True.
- **Offline:** Communication with the physical hardware has failed.
- **Unreliable:** Reliability attribute is not reliable.
- **Alarm:** Object or alarm extension has an alarm state.
- **Normal:** No abnormal condition for this object detected.

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### **User Name Is BACnet Obj Name**

Controls whether the object's User Name attribute is also the Object Name attribute. The Object Name attribute is not writable, so the only way to change the Object Name attribute is to edit the User Name attribute and set the User Name Is BACnet Obj Name attribute to True.

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### **Version**

Displays the version number of the object software code. As the functionality of objects is enhanced, the version numbers are incremented.

Example: 3.1 where 3 is the major revision and 1 is a minor revision

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# Accumulator Objects

The accumulator object allows you to count pulses, which are often provided by energy meters. The accumulator objects can feed their Present Values to the [Pulse Meter Object](#).

**Note:** The Accumulator's Interface Value updates when the hardware is read by the [Pulse Meter Object](#) or when the hardware's current value changes.

[Table 200](#) describes the types of accumulator objects and how to add them to the Metasys system. The Integration (Device) Type column indicates the type of integration and device in which the accumulator object resides.

**Table 200: Accumulator Types**

Integration (Device) Type	Description	Steps and Tips
IP BACnet Integration (Third-Party General BACnet Device)	Provides integration of BACnet controllers with supervisory controllers via a BACnet accumulator mapper. This object provides information on the UI (including Present Value and Scale) from a BACnet integration with an accumulator that exists in a third-party BACnet device.  <b>Note:</b> A BACnet accumulator is mapped at the engine via the Insert Point Wizard.	To add an accumulator from a third-party general BACnet device on an IP BACnet integration:  <ol style="list-style-type: none"> <li>1. From the Metasys UI, add a BACnet integration.</li> <li>2. Add a BACnet device type compatible with the field device that contains an accumulator.</li> <li>3. Map the accumulator at the engine (that is, add the Accumulator point to the mapped BACnet device using the Insert Point Wizard).</li> </ol>
MS/TP Field Bus (Third-Party General BACnet Device)	Provides integration of BACnet controllers with supervisory controllers via a BACnet accumulator mapper. This object provides information on the UI (including Present Value and Scale) from a BACnet Integration with an accumulator that exists in a third-party BACnet device.  <b>Note:</b> A BACnet accumulator is mapped at the engine via the Insert Point Wizard.	To add an accumulator from a third-party general BACnet device on an MS/TP field bus:  <ol style="list-style-type: none"> <li>1. From the Metasys UI, add an MS/TP field bus.</li> <li>2. Add a BACnet device type compatible with the field device that contains an accumulator.</li> <li>3. Map the accumulator at the engine (that is, add the Accumulator point to the mapped BACnet device using the Insert Point Wizard).</li> </ol>
MS/TP Field Bus (FEC Family BACnet Device)	Provides integration of pulse meters integrated to the Dry Contact Pulse (MISC-MTR) binary input of an FEC family BACnet device. CCT creates an Accumulator object for the pulse meter input of the FEC family BACnet device. This FEC accumulator is shadowed by the engine.  <b>Note:</b> An FEC accumulator object is mapped at the engine via the Insert Point Wizard.	To add an accumulator from an FEC family BACnet device on an MS/TP field bus:  <ol style="list-style-type: none"> <li>1. From the Metasys UI, add an MS/TP field bus.</li> <li>2. Add an FEC family BACnet device compatible with the field device that contains a visible accumulator (defined by CCT).</li> <li>3. Map the accumulator at the engine (that is, add the Accumulator point to the mapped field device using the Insert Point Wizard).</li> </ol>

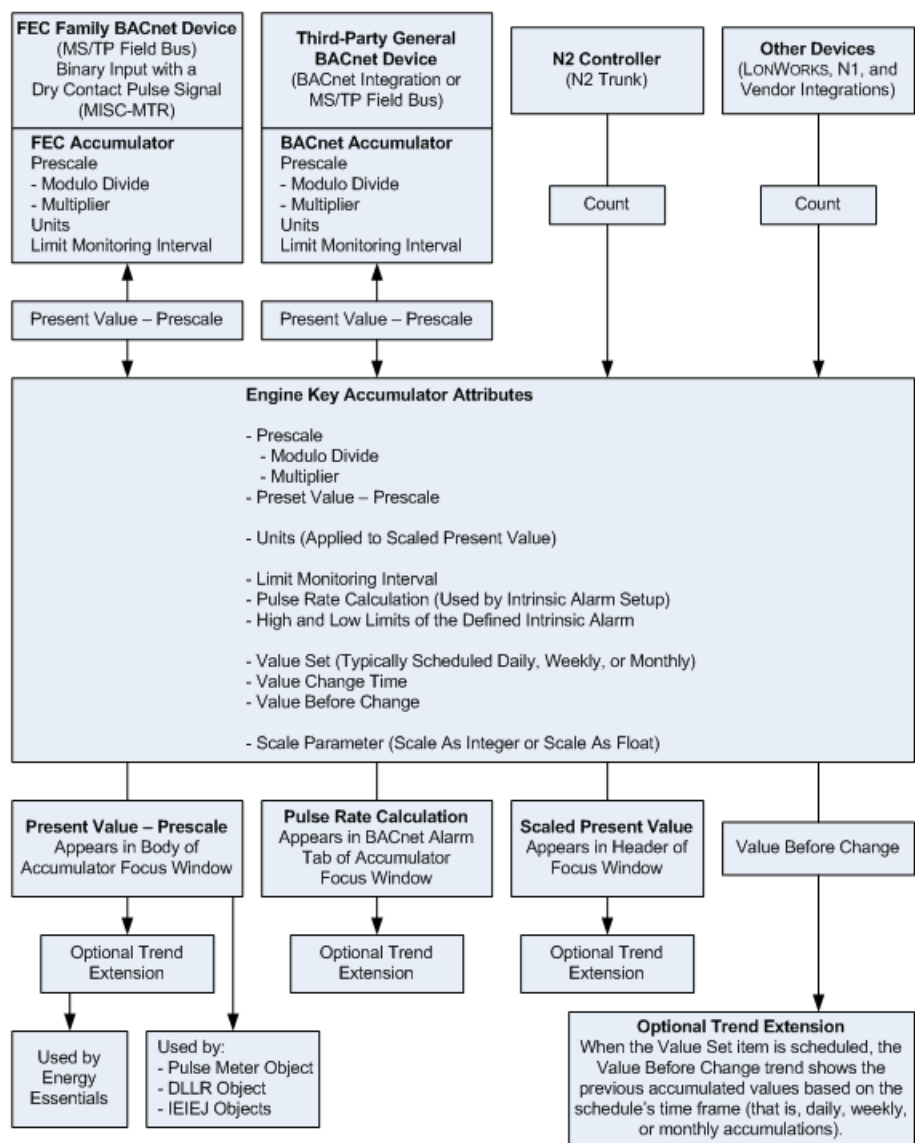
**Table 200: Accumulator Types**

Integration (Device) Type	Description	Steps and Tips
<b>N2 Trunk (N2 Device)</b>	<p>Provides integration of the wide variety of N2 controller binary input/pulse counters, resulting in a consistent interface for point mapping any N2 controller types.</p> <p><b>Note:</b> An N2 accumulator or pulse counter is mapped at the engine via the Insert Point Wizard.</p>	<p>To add an accumulator from an N2 device on an N2 trunk:</p> <ol style="list-style-type: none"> <li>1. From the Metasys UI, add an N2 trunk.</li> <li>2. Add an N2 device type compatible with the field device.</li> <li>3. Map the accumulator (Accumulator or Pulse Counter type) at the engine (that is, add the Accumulator point to the N2 device using the Insert Point Wizard).</li> <li>4. Define the Rollover Limit: You must set the rollover limit in the N2 accumulator to match the rollover limit of the N2 field device selected. For example, AHU or Unitary (UNT) devices have a rollover limit of 4,294,967,295. A DX-9100 CNT point has a rollover limit set by the GX-9100 configuration tool. An XT-9100 or XTM CNT point has a rollover limit set by either the GX-9100 configuration tool or XTM configuration tool.</li> </ol> <p>Map BI7 or BI8 for an AHU, BI4 for a UNT or VAV, or Analog Data Integer (ADI) network point types for a DX-9100 or XTM.</p>
<b>Other Integrations (For Example, LONWORKS, N1, VND, and XL5K Devices)</b>	<p>Allows you to monitor the increasing pulse count from any attribute that has an incrementing value. This provides greater flexibility for creating accumulator objects.</p> <p><b>Note:</b> An object with an attribute that has an incrementing value is mapped at the engine via the Insert Object Wizard.</p>	<p>To add an accumulator from a device on other integrations:</p> <ol style="list-style-type: none"> <li>1. From the Metasys UI, add the desired integration.</li> <li>2. Add a device type compatible with the field device.</li> <li>3. Map the accumulator at the engine (that is, add the Accumulator object using the Insert Object Wizard).</li> <li>4. Reference a value that continually counts up until the value wraps back to zero when it passes the Rollover Limit value defined in the accumulator object.</li> </ol>

*Figure 78* illustrates the interaction between the different types of accumulators and the accumulator in the engine, showing the key attributes and functionality.



**Figure 78: Accumulator Interaction**



An FEC family BACnet device that resides on the MS/TP field bus has a binary input with a Dry Contact Pulse signal (MISC-MTR) created in CCT. This provides an FEC accumulator. A third-party general BACnet device that resides on either the BACnet integration or the MS/TP field bus has an accumulator. Both the FEC accumulator and BACnet accumulators have BACnet Prescale, Units, and Limit Monitoring Interval attributes that interact with the accumulator in the engine via the prescaled Present Value.

An N2 controller resides on the N2 trunk, and has an attribute that counts. Similarly, other devices that reside on other integrations (for example, a LONWORKS device on a LONWORKS integration) that have attributes that count may take advantage of the accumulator functionality. The accumulator in the engine uses the count value.

The accumulator in the engine uses the prescaled Present Value or counts from the devices with the key engine accumulator attributes listed in the figure. For details on the calculations used by and functionality of these attributes, see the [Accumulator Attributes](#) section.

The accumulator's prescaled Present Value is used by the Pulse Meter, DLLR, or IEIEJ objects. You can trend the prescaled Present Value, which may then be used by Energy Essentials. You also can trend the accumulator's Pulse Rate, Scaled Present Value, or Value Before Change attributes.

**Note:** The prescaled Present Value, as well as its associated commands and attributes (Preset Value, Value Before Change, Max Value, Value Set), do not necessarily have the same units as Scaled Present Value or the Units attribute.

The header of the focus window shows the Scaled Present Value after the scale factor has been applied to the Present Value, as well as the units that apply to the Scaled Present Value.

For general information on Metasys system objects, see the [Object Help](#) section.

## Accumulator Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 201: Accumulator Object Attributes - Focus/Configuration Tab**

Attribute Name	Integration Type <sup>1</sup>	Data Type	Notes <sup>2</sup>	Initial Value	Values/Options/Range
<a href="#">Anti Spike</a>	N2 Other	True or False	CW	True	
<a href="#">Device Type</a>	All	Text	CNW	Null	20 Character Limit
<a href="#">Display Precision</a>	All	One type from a set	CW	Hundredths	
<a href="#">Input Ref</a>	Other	Attribute reference	C		Limited to Numeric type properties.
<a href="#">Interface Value</a>	N2	Number			
<a href="#">Internal Units</a>	All	One type from a set	CW	No Internal Units	Applies to Present Value, Value Set, Max Value, and Value Before Change
<a href="#">Intrinsic Alarming Defined</a>	All	True or False	CW	False	
<a href="#">JCI Logging Object Reference</a>	All	Object reference	CW		
<a href="#">Limit Monitoring Interval</a>	All	Number	CW	300	Range 60–604,800 Unit = Seconds
<a href="#">Logging Object Reference</a>	All	Object reference	CW		BACnet Object ID
<a href="#">Logging Record</a>	All	Structure			
<a href="#">Max Value</a>	All	Number	CW	2,000,000,000	
<a href="#">Out of Service</a>	All	True or False	W	False	
<a href="#">Periodic Update<sup>3</sup></a>	FEC N2 Other	Number	CW	60	Units = Seconds Minimum = 10 Maximum = 10,000
<a href="#">Prescale</a>	All	Structure	CW	1, 1	1–65,535
<a href="#">Present Value</a>	All	Number	NW	0	
<a href="#">Reliability</a>	All	One state from a set	W	Unreliable (FEC) 0 (Other, N2)	See the Reliability (Set 503).

**Table 201: Accumulator Object Attributes - Focus/Configuration Tab**

Attribute Name	Integration Type <sup>1</sup>	Data Type	Notes <sup>2</sup>	Initial Value	Values/Options/Range
<i>Rollover Limit</i>	N2 Other	Number	CW	32,767	
<i>Scale<sup>4</sup></i>	All	Number		0	
<i>Scale As Float</i>	All	Number	CNW	0.0	
<i>Scale As Integer</i>	All	Number	CNW	0	
<i>Scaled Present Value</i>	All	Number			Units
<i>Status Flags</i>	All	Series of True or False States			See the BAC Status Flags (Set 9).
<i>Units</i>	All	One type from a set	CW	No units	Applies to Scaled Present Value.
<i>Use Remote Alarming</i>	BACnet	True or False	CW	False	
<i>Value Before Change</i>	All	Number			
<i>Value Change Time</i>	All	Set of related values		*,*,*	
<i>Value Set</i>	All	Number	W	0	

1 BACnet (Third-Party General BACnet Device), FEC (FEC Family BACnet Device), N2, Other (LONWORKS, N1, VND, and XL5K, for example), or All

2 C - Configurable, D - Default Attribute for Display, N - Value not Required, W - Writable

3 This attribute only appears in the snapshot view of the mapper object and on the Engineering tab of the integration.

4 This attribute does not appear in a view; it is a BACnet property.

## Accumulator Attribute Details

### *Anti Spike*

When True, causes the object to use the first good input count value received after previously being unreliable as strictly an initial value. Any archived or last known value for input count is ignored. If the input device resets or loses power, uncontrolled changes to the input count value are filtered out and do not result in a spike in accumulator values. Use this setting in cases where the input device is not known to preserve its count value over a power loss (for example, in a LONWORKS integration an LN-PRG20 GPI, and in an N2 integration a UNT).

When False, causes the object to use the first good input device count value received after previously being unreliable as a valid change from the archived or last known value for input count. This means the first good input device value is used to catch up on any counts that were missed while the input device was unable to communicate due to either an NAE restart or communication loss. **Do not set this value to False unless the input device is known to preserve its count value during a power loss** (for example, in an N2 integration, an XTM-105 with a XPB-821 or in a LONWORKS integration LN-PRG300-2, LNPRG400-2, LN-PTRG500-2, LN-PRG600, or in a vendor integration BTR Netcom GmbH device LC14 [Model # 11045013-US], an IDEC SX5L-SBCN081, or an WATANBE Electric Industry WRBC-DI16F-A002).

**Note:** Any mapper object used to deliver a raw count value to the Accumulator **must** provide an unreliable value during startup if the value was not updated from the field controller at the time it is read by the accumulator. For example, a LON counter mapped as an Analog Input (AI) point object reports as unreliable until it reads a value from the field controller. If the LON counter is mapped as an Analog Output (AO) point object, it reports as reliable even if the value is not initialized, causing improper values to be recorded at the accumulator. This may occur regardless of the value of Anti Spike.

**Note:** Any mapper object used to deliver a raw count value to the accumulator must be allowed to count up without disruption from manual commands, schedules, interlocks, or any other function that may change its value outside the normal counting process. Any such changes may cause the Accumulator to record improper values regardless of the value of Anti Spike.

**Note:** When replacing the input device, set Anti Spike to True before the replacement is brought online for the first time. This setting prevents the accumulator value from spiking upward due to an uncontrolled count value change at the input device. Failure to set Anti Spike to True can upset the accumulator value. You can use a manual preset to restore the correct value after the new device is online.

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#### **Device Type**

Contains a description of the physical device connected to the object.

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#### **Display Precision**

Determines how many decimal places to display in the Scaled Present Value.

#### **Input Ref**

Identifies the attribute reference to the object property that is the pulse count input for the Accumulator object (for the Other integrations type: LONWORKS, N1, VND, and XL5K, for example). This must be a continuously increasing positive numeric attribute of another object, such as the present value of a totalization extension to an analog meter.

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#### **Interface Value**

Indicates current value from the hardware interface. This attribute is the same as input count, but is specific to the N2 accumulator.

#### **Internal Units**

Contains the engineering units for the Present Value, Value Set, Max Value, and Value Before Change attribute.

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#### **Intrinsic Alarming Defined**

Indicates whether intrinsic alarming is enabled when the site is defined as a BACnet site. When intrinsic alarming is defined for accumulators on the MS/TP field bus, the pulse rate of the accumulated point can be monitored.

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#### **JCI Logging Object Reference**

Indicates the object (Johnson Controls proprietary reference) that resides in the same device as the Accumulator object which, when it acquires Logging Record data from the Accumulator object, causes the Accumulator object to acquire, present, and store the Logging Record data (that is, snapshot) from the underlying system. When the object specified by the Logging Object Reference issues the Get Monitor Data command, the Logging Record is acquired and updated.

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#### **Limit Monitoring Interval**

Specifies the monitoring period in seconds for determining the Pulse Rate. The Pulse Rate is the number of pulses received during the previous Limit Monitoring Interval period.

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### **Logging Object Reference**

Indicates the object (via BACnet Object Identifier) that resides in the same device as the Accumulator object which, when it acquires Logging Record data from the Accumulator object, causes the Accumulator object to acquire, present, and store the Logging Record data (that is, snapshot) from the underlying system. When the object specified by the Logging Object Reference issues the Get Monitor Data command, the Logging Record is acquired and updated.

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### **Logging Record**

Specifies a list of values to acquire, save, and return when read by other objects or devices.

- **Timestamp** - Indicates the local date and time when the data was acquired.
- **Present Value** - Indicates the value of the Present Value attribute.
- **Accumulated Value** - Indicates the short-term accumulated value of the counter. The algorithm used to calculate the accumulated value is a function of the value of accumulator status. If this is the initial read, the value returned is zero.
- **Accumulator Status** - Indicates the reliability of the data in this list of values. The accumulator status values include:
  - **Normal** - Indicates that no event affecting the reliability of the data has occurred during the period from the preceding to the current qualified reads of the Logging Record attribute (Accumulated Value = current Present Value - previous Present Value).
  - **Starting** - Indicates that the data of the Logging Record attribute is either the first data acquired since startup by the object identified by Logging Object (that is, timestamp has no wildcard values) or that no data has been acquired since startup by the object identified by Logging Object (that is, timestamp has all wildcard values).
  - **Recovered** - Indicates that one or more writes to Value Set or changes to Value Before Change occurred since the Logging Record was acquired by the object identified by Logging Object (Accumulated Value = [current Present Value - Value Set] + [Value Before Change - previous Present Value]).
  - **Abnormal** - Indicates that the accumulation has been carried out, but some unrecoverable event such as the clock's time changing a significant amount since the Logging Record was acquired by the object identified by Logging Object.
  - **Failed** - Indicates that the accumulation value is not reliable due to some problem.

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### **Max Value**

Indicates the maximum value allowed for the [Present Value](#). The Present Value is not allowed to exceed this value, and wraps back to zero when this value is passed. Accumulation does not stop.

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### **Out of Service**

When set to True, indicates that the object is not tracking pulse count or rate.

Used to de-couple the object from the physical input. When Out of Service is True, the object de-couples the [Present Value](#) and [Reliability](#) from the hardware. The Reliability is writable when Out Of Service is True. When de-coupled, the Present Value can be changed to simulate specific conditions or for test purposes.

When the Accumulator object is placed Out of Service, the current value of the Present Value is saved. While Out of Service, an N2, FEC, or Other Accumulator continues to track the count of this saved value in the background, thereby ensuring that no counts are lost. When placed back in service, this new count is copied to the Present Value attribute.

A third-party BACnet accumulator behaves according to the design of the third-party vendor.

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### **Periodic Update**

This attribute only appears in the snapshot view of the mapper object and on the Engineering tab of the integration. This attribute applies to all integrations, except for BACnet integrations. Represents the time, in seconds, between successive COV messages issued by the local Accumulator object at a field device, or updates made to the Accumulator object on the UI.

The field device Accumulator object pushes its [Present Value](#) count up to the Supervisory controller through the COV mechanism. By requiring a minimum time between successive COVs, the Update Interval ensures that the integration does not get flooded with COVs from the Accumulator.

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### **Prescale**

Indicates the coefficients used to convert the accumulated pulses into the [Present Value](#). This attribute uses moduloDivide integer division (where 5/2 is 2). The algorithm used is:

Present Value = (prescale.multiplier x accumulated-pulses)/

prescale.moduloDivide.

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### **Present Value**

Represents the value of the Accumulator object, prescaled via the [Prescale](#) attribute. The Present Value falls in the range between 0 and the [Max Value](#). When the Present Value reaches the Max Value, it rolls over to zero. You can write to Present Value when it is out of service and you can reset the Present Value by updating the [Value Set](#), or you can use the [Preset Value](#) command to do so. The Scaled Present Value is the value of the object displayed in the UI, not the Present Value. If Scale As Float and Scale As Integer are both zero (the default value), the Present Value and Scaled Present Value are equal.

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### **Reliability**

Indicates whether the [Present Value](#) is reliable and why. You can write to Reliability when it is out of service.

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### **Rollover Limit**

Represents the actual rollover value of the input pulse counter. This attribute applies to N2 and Other Accumulators. This value is used to compute a change rate, which is added to the Accumulator property to calculate the Pulse Rate and [Present Value](#).

You must set the rollover limit in the N2 accumulator to match the rollover limit of the N2 field device selected. For example, AHU or UNT devices have a rollover limit of 4,294,967,295. A DX-9100 CNT point has a rollover limit set by the GX-9100 configuration tool. An XT-9100 or XTM CNT point has a rollover limit set by either the GX-9100 configuration tool or XTM configuration tool.

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### **Scale**

This BACnet property does not appear in a view in the Metasys system. Indicates the conversion factor to be multiplied with the value of the [Present Value](#) attribute to provide a Scaled Present Value in the units indicated by the Units attribute. By default, the Present Value and Scaled Present Value are equal. These values remain equal if you do not use the accumulator's Scale attribute.

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### **Scale As Float**

Indicates the floating conversion factor to be multiplied with the value of the [Present Value](#) attribute to calculate the Scaled Present Value for the chosen units. If set to zero (the default value), the Scale As Integer value is used and Scale As Float is ignored.

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### **Scale As Integer**

Indicates the power of ten to be multiplied with the value of the [Present Value](#) attribute to get Scaled Present Value. This attribute only applies if Scale As Float is zero. For example, when Scale As Integer is set to two, the Present Value is multiplied by 100; while setting Scale As Integer to -1 multiplies the Present Value by 0.1. When zero (the default value), the Present Value and Scaled Present Value are equal (see [Scaled Present Value](#)).

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### **Scaled Present Value**

Indicates the value of the [Present Value](#) attribute conversion. The Present Value is multiplied by the Scale as Float value when that attribute contains a value (not zero). Otherwise, the Present Value is multiplied by 10 to the power of the Scale As Integer value (for example, if Scale As Integer is 3, it is multiplied by 1,000 and if Scale As Integer is -2, it is multiplied by 0.01). This is the actual value of the object.

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### **Status Flags**

Indicates the general status of the Accumulator object in BACnet terms and contains four independent states.

The states are:

**In Alarm** - False if the Event State attribute value is Normal; otherwise, the In Alarm flag is True.

**Fault** - True if the Reliability attribute is not reliable; otherwise, the Fault flag is False.

**Overridden** - Overridden flag is always False.

**Out of Service** - Out of Service flag is True if the Out of Service attribute value is True; otherwise, the Out of Service flag is False.

Back to [Accumulator Attributes](#).

### **Units**

Contains the engineering units for the Scaled Present Value attribute.

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### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation.

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### **Value Before Change**

Indicates the [Present Value](#) prior to the last write to the [Value Set](#) property or [Preset Value](#) command.

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### **Value Change Time**

Indicates the time of the last change to the Value Before Change attribute or [Preset Value](#) command.

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### **Value Set**

Allows you to reset the [Present Value](#). The Present Value attribute gains its value from the value written to the Value Set attribute. The Value Before Change takes on the previous value of the Present Value attribute (that is, the original value before the write processed), and the Value Change Time is set to the current date and time. You also can use the [Preset Value](#) command to change Present Value if the Accumulator object is in or out of service.

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## Accumulator Commands

The table below lists the commands supported by the [Accumulator Objects](#).

**Table 202: Accumulator Object Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">Get Monitor Data</a>	
<a href="#">In Service</a>	
<a href="#">Out of Service</a>	The value to be written to the <a href="#">Present Value</a> Attribute.
<a href="#">Preset Counter</a>	The value to be written to the N2 device accumulator or pulse counter hardware point.
<a href="#">Preset Value</a>	The value to be written to the <a href="#">Value Set</a> attribute.

### Accumulator Command Details

#### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Accumulator Commands](#).

#### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Accumulator Commands](#).

#### **Get Monitor Data**

Acquires and updates the Logging Record when the object specified by the Logging Object Reference issues the Get Monitor Data command.

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#### **In Service**

Cancels the effect of an [Out of Service](#) write or command. The [Present Value](#) and [Reliability](#) revert to the values obtained from the physical input. The Present Value attribute continues to receive inputs from the hardware input while in the [Out of Service](#) state and continues to increment its count internally. When the Out of Service is cancelled, the Present Value attribute of the N2, FEC, or Other Accumulator updates with this new internal count.

A third-party BACnet accumulator behaves according to the design of the third-party vendor.

Back to [Accumulator Commands](#).

#### **Out of Service**

Allows a user to override the object's hardware input for simulation or other purposes. The Out Of Service command writes the [Present Value](#) to the value of the command parameter and writes the [Reliability](#) attribute to Reliable. The Present Value and Reliability no longer track the physical input, but the N2, FEC, or Other Accumulator continues to track pulses while out of service. When placed back in service, the Present Value resumes counting pulses.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

A third-party BACnet accumulator behaves according to the design of the third-party vendor.

Back to [Accumulator Commands](#).

#### **Preset Counter**

Allows you to set the value to write to the N2 device accumulator or pulse counter hardware point. You cannot adjust this attribute for a UNT or AHU. This attribute may be used with DX-9100, XTM, or XT hardware.



Back to [Accumulator Commands](#).

**Preset Value**

Allows you to reset the [Present Value](#). This command writes a supplied value to the Value Set attribute. The Present Value attribute then gains its value from the value written to the Value Set attribute. The Value Before Change takes on the previous value of the Present Value attribute (that is, the original value before the write processed), and the Value Change Time is set to the current date and time. This preserves the Present Value before the command took place. Use this command to change Present Value if the Accumulator object is in or out of service.

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# ADS Device Object

The ADS Device object defines the attributes that represent the externally visible characteristics of an ADS/ADX device. One ADS Device object exists per ADS/ADX device. This object allows you to see data about the ADS/ADX, such as the name of the current Post Office Protocol (POP) server host name or information on printer destinations. For general information on Metasys system objects, see the [Object Help](#) section.

## ADS Concepts

### ADS/ADX Features

The ADS/ADX runs on a computer platform and is installed within the Metasys network. With an ADS/ADX, you can provide a location to install the SCT and a location to send trend logs (Trend Studies), event logs (Alarm and Event Management), and audit trails (Audit Trail). The ADS/ADX can also be configured to take the role of the Site Director to coordinate system access and present data to the user in a Web browser running on the same computer or connected over the LAN, WAN, Internet, or telephone line via a dial-up connection.

**Note:** Online/offline modes as explained here do not apply to the ADS/ADX. However, the ADS/ADX can be online and offline in the same sense as any other device on the network can be connected or disconnected from the network.

**Note:** You may need to change the Windows Defender tool settings on the Windows 7 OS or Windows Server 2008 OS when using an ADS/ADX. Windows Defender is a spyware identification and removal tool that is part of the OS. For the Windows 7 OS, this tool is **on** by default. For the Windows Server 2008 OS, this tool is **off** by default. Windows Defender scans the OS for spyware every night at 2 A.M. If you expect heavy use of the ADS/ADX at this time (for example, due to trend collection), reschedule the scan to a time when the ADS/ADX is not as active.

**Note:** You may need to change the Disk Defragmentation settings on the Windows 7 OS or Windows Server 2008 OS when using an ADS/ADX. Disk Defragmentation on the OS is scheduled to run by default every Wednesday at 1 A.M. If you expect heavy use of the ADS/ADX at this time (for example, due to trend collection), reschedule the scan to a time when the ADS/ADX is not as active.

### Trend Repository Database

The trend repository database resides within the server that stores the trend data. For more information, click one of the following:

- [Trend Studies](#)
- [Trend Extensions](#)

### Event Repository Database

The event repository database resides within the server that stores the event data. For more information, see the [Alarm and Event Management](#) section.

### Audit Repository Database

The audit repository database resides within the server that stores the audit data. For more information, see the [Audit Trail](#) section.

### ADS/ADX Computer Name

For information on ADS/ADX computer name guidelines and changing the computer name, refer to the *Changing the ADS/ADX Name and the Computer Name Appendix* in the *ADS/ADX Commissioning Guide (LIT-1201645)*.

## ADS Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

Beginning with Release 2.2, the attributes shown on the ADS/ADX Focus tab (when viewed from the Site Director) do not refresh automatically. To refresh the Focus tab, either close and reopen the tab or issue the Refresh command.

**Table 203: ADS Device Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">ADS Repositories</a>	List of value sets	CW		See the attribute description for details on <a href="#">ADS Repositories</a> .
<a href="#">ADS Repositories Status</a>	List of value sets	CW		Offline, OK
<a href="#">Alarm Snooze Time</a>	Number	CW	5	0–75 Units = Minutes
<a href="#">DHCP Enabled</a>	True or False	CW	True (1)	0 = DHCP disabled, 1 = DHCP enabled
<a href="#">Enabled Audit Level</a>	One from a list of values	CW	Audit Level 2 (1)	See the attribute description for details on the Enabled Audit Level. Range = 1–4 with 5 Audit Levels Level 1 (N/A) User Action Level 2 (1) Critical System Events Level 3 (2) Application Level 4 (3) Non-critical System Events Level 5 (4) Diagnostic
<a href="#">Host Name</a>	Text			
<a href="#">IP Address</a>	List of numbers	CW		
<a href="#">Is Validated</a>	True or False	C	False	True or False
<a href="#">Local Date</a>	Date			
<a href="#">Local Time</a>	Time			
<a href="#">Model Name</a>	Text		ADS	
<a href="#">Number of NxEs Reporting</a>	Number			
<a href="#">Sample Rate</a>	Number			Units = Per Hour See attribute description for calculation details.
<a href="#">Service Time</a>	Number			Units = Seconds
<a href="#">Transfer Buffer Full Worst NxE</a>	Number			Units = %

1 C - Configurable, N - Value Not Required, W - Writable

**Table 204: ADS Device Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Average Intermittent Failure Period</a>	List			IP address and Value Units = seconds
<a href="#">Incoming Event Rate</a>	Number			Units = Per Hour
<a href="#">Maximum Intermittent Failure Period</a>	List			IP address and Value Units = seconds

**Table 204: ADS Device Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Outgoing Event Rate</a>	Number			Units = Per Hour
<a href="#">Transport Failure Rate</a>	List			IP address and Value Units = Failures Per Day

1 C - Configurable, N - Value Not Required, W - Writable

## ADS Device Attribute Details

### **ADS Repositories**

Lists the ADS/ADX device host names or IP addresses to which incoming trend and Alarm/Event data forwards. An ADS/ADX cannot have its own host name or IP address in this field. Refer to the *ADS/ADX Commissioning Guide (LIT-1201645)* for details on configuring repositories.

Back to [ADS Attributes](#).

### **ADS Repositories Status**

Indicates the status of the devices listed in the ADS Repositories attribute.

**Note:** When forwarding data to a secondary ADS/ADX (that is, data forwarded to an ADS/ADX is forwarded to another ADS/ADX), the status does not calculate. This attribute shows only the status for the initial forward.

Back to [ADS Attributes](#).

### **Alarm Snooze Time**

Specifies the amount of time to delay before re-announcing an alarm.

Back to [ADS Attributes](#).

### **Average Intermittent Failure Period**

Specifies the average number of seconds devices in the transport layer are offline (for diagnostic purposes). Only times less than 1 minute are used in this average, to eliminate device resets. Ideally, this number should be zero, indicating there are no failures.

Back to [ADS Attributes](#).

### **DHCP Enabled**

Indicates whether the Dynamic Host Configuration Protocol (DHCP) protocol should be used. The device may run in three modes:

1. DHCP is enabled and a DHCP server exists on the network. The DHCP server assigns network configuration information. The DHCP server assigns the IP Address attribute.
2. DHCP is enabled and no DHCP server exists on the network. Using the Automatic Client Configuration feature, the device automatically defines the network configuration. The DHCP server assigns the IP Address attribute.
3. DHCP is disabled. You must manually assign the network configuration. The values from the DHCP are assumed to be more current than the tool interface. When DHCP Enabled is True, the UI ignores the IP Address attribute and should not attempt to write to it.

**Note:** This attribute only appears in the ADS object in the SCT and is used by the SCT during a download or upload of the ADS database.

Back to [ADS Attributes](#).

### **Enabled Audit Level**

Specifies which level of audit entries are added to the audit repository. Only audit entries of type Level 1 through and including the specified level are included. All other levels are not stored in the audit trail. Level 1 and Level 2 audit entries are always stored in the audit trail.

- Level 1 and 2 (1): Stores all user action and system error audit messages.
- Level 3 (2): Stores application audit messages in addition to Level 1 and 2 auditing.
- Level 4 (3): Stores system audit messages in addition to Level 3 auditing.
- Level 5 (4): Stores diagnostic audit messages in addition to Level 4 auditing.

Back to [ADS Attributes](#).

### **Host Name**

Indicates the host name of the NxE whose value appears in the Transfer Buffer Full Worst NxE attribute.

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### **Incoming Event Rate**

Specifies the average rate of events, per hour, received from other devices (NxEs or ADS/ADXs) during the previous hour. The value of this attribute updates every 5 minutes. This rate only includes events generated by devices at Release 5.2 or later.

### **IP Address**

Represents the IP address of this ADS/ADX. The IP address identifies the ADS/ADX on the network and assists in the routing of messages. Each ADS must have a unique IP address for the network to operate properly. A write to this attribute is ignored when the DHCP Enabled attribute is True. A read of this attribute returns either the user-specified value or the value determined from DHCP.

Certain IP addresses are invalid and cannot be written successfully. The network address portion of the IP address is computed by including all bits in which the corresponding bit from the IP mask is 1. The device address portion of the IP address is computed by including all bits in which the corresponding bit from the IP mask is 0. Neither the network address nor device address can be all zero bits or all one bits. For example, if the IP mask is 255.255.0.0, the following IP addresses are invalid: 0.0.100.100 and 100.100.0.0.

The IP Address attribute can be set explicitly, or it may be automatically set using the DHCP server. Using the DHCP server, you can change this attribute even if you set it up explicitly. See the DHCP Enabled attribute.

**Note:** This attribute only appears in the ADS object in the SCT and is used by the SCT during a download or upload of the ADS/ADX database.

Back to [ADS Attributes](#).

### **Is Validated**

Enables the MVE feature at the device, which includes reauthentication with electronic signature and required annotation when the user makes a change to the system, such as commanding an object, acknowledging an alarm, or changing the value of an attribute. This attribute can be set to True for MVE sites only. This attribute is writable only with the SCT, and is read-only online.

Back to [ADS Attributes](#).

### **Local Date**

Displays the date on the ADS/ADX.

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### **Local Time**

Displays the time on the ADS/ADX.

Back to [ADS Attributes](#).

**Maximum Intermittent Failure Period**

Specifies the maximum number of seconds a device was offline at the transport layer (for diagnostic purposes). Only times under 1 minute are recorded, to eliminate device resets. The value of this attribute does not match the offline times determined from generated alarms. Ideally, this number should be zero, indicating there are no failures.

Back to [ADS Attributes](#).

**Model Name**

Contains the name of the device model. In this case, it is ADS.

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**Number of NxEs Reporting**

Specifies the number of NxE devices that registered this ADS/ADX as their trend repository.

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**Outgoing Event Rate**

Specifies the average rate of events per hour, sent to other repositories (ADS/ADXs or Ready Access Portal). This value of this attribute updates every 5 minutes. This rate only includes events generated by devices at Release 5.2 or later.

**Read Only Community**

Contains the community string used by the Network Management System to retrieve data from objects maintained by managed devices. This attribute is ignored if SNMP Enabled is False.

Back to [ADS Attributes](#).

**Read/Write Community**

Contains the community string used by the Network Management System to edit data in objects maintained by managed devices. This attribute is ignored if SNMP DDA is False.

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**Sample Rate**

Specifies the number of trend samples, per minute, received by the Metasys server from all NxEs (for diagnostic purposes). The value of this attribute updates every 5 minutes.

**Note:** The sample rate at the NxE is calculated based on the actual raw samples taken by every trend object. The sample rate at the ADS/ADX is calculated once every poll cycle and is based on the number of samples received from all the NxEs and the time it took to poll them. Most NxEs do not forward all the samples taken between polls because the ADS/ADX transfer setpoint is usually not set to 1 (that is, forward on every sample). The result is that the sample rate at the ADS/ADX is less than the sum of the samples taken at all the NxEs.

Back to [ADS Attributes](#).

**Service Time**

Displays the amount of time in seconds that it takes for the ADS/ADX device to poll all NxEs on the site for trend samples.

Back to [ADS Attributes](#).

**Transfer Buffer Full Worst NxE**

Indicates the buffer fullness, in percent, of the NxE with the fullest trend buffer of the trend poll cycle.

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**Transport Failure Rate**

Specifies the number of transport failures per day (for diagnostic purposes). This number represents how often HTTP posts from this server failed when they were sent to another device that is considered online. Failures include the inability to open the connection, to send the message, or to receive the reply. This value represents failures over the last 24 hours and is updated hourly, but does not correlate directly to the number of offline alarms generated by your system. Ideally, this number should be zero, indicating there are no failures.

Back to [ADS Attributes](#).

## ADS Commands

The table below lists the commands supported by the [ADS Device Object](#).

**Table 205: ADS Object Commands**

Command Name	Parameters
<a href="#">Rediscover Text Strings</a>	

### ADS Command Details

#### ***Rediscover Text Strings***

Resets the States Text across a supervisory device by rediscovering text strings from all mapped BACnet objects.

**Note:** When the Rediscover Text Strings command is sent from the Site Director device UI to another supervisory device and the UI is running on the supervisory device, you must close and restart the UI on the supervisory device in order for the text to appear correctly.

# Analog Input Object

The AI object processes data from a physical analog input point that resides on a field device and presents the data to the Metasys user interface in a consistent format that is independent of the source. Analog Input Objects appear under the field device object in the All Items navigation tree.

When the source of the data is an analog input in an N2 controller on the N2 Trunk, an NCM on an integrated N1 network, or an integrated BACnet device, the Analog Input Object exchanges data with the **native** analog object in the source to synchronize attribute data that are common to both. The source is identified under the hardware tab of the Analog Input Object.

For general information on Metasys system objects, see [Common Object Attributes](#).

## Analog Input Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 206: Analog Input Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">COV Increment</a>	Real value	CW <sup>2</sup>	BW	0.1	Any value > 0
<a href="#">Device Type</a>	Text	CNW	CNW	Null	20 Character Limit
<a href="#">Display Precision</a>	One from a set	CW	CW	10ths	
<a href="#">Intrinsic Alarming Defined</a>	True or False	C		False	
<a href="#">Max Value</a>	Real value	CW	BW	1.7E38	
<a href="#">Min Value</a>	Real value	CW	BW	-1.7E38	
<a href="#">Out of Service</a>	True or False	CW	BW	False	
<a href="#">Present Value</a>	Real value	DNRW	DNRW		
<a href="#">Reliability</a>	One state from a set	W	BW	Reliable	No Fault Detected (Reliable), No Sensor, Over Range, Under Range, Open Loop, Shorted Loop, Unreliable Other
<a href="#">Resolution</a>	Real value		B		
<a href="#">Status Flags</a>	Series of True or False states		B	False, False, False, False	In Alarm, Fault, Overridden, Out of Service
<a href="#">Units</a>	One value from a list	CW	W	Deg F	
<a href="#">Update Interval</a>	Number		B	0	0–65,535 Units = hundredths of a second



**Table 206: Analog Input Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Use COV Min Send Time</a>	True or False	W		False	Applies to MS/TP Analog Inputs.
<a href="#">Use Remote Alarming</a>	True or False		BCW	False	

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object Reliability, W - Writable

2 For MS/TP Analog Inputs, COV Increment may not be writable, based on its configuration.

## Analog Input Attribute Details

### **COV Increment**

Defines the minimum change in the Present Value required for the object to report a change.

Back to [Analog Input Attributes](#).

### **Device Type**

Contains a description of the physical device connected to the object.

Back to [Analog Input Attributes](#).

### **Display Precision**

Defines the decimal rounding and the decimal places to display for the Present Value and associated attributes.

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### **Intrinsic Alarming Defined**

Enables the BACnet Intrinsic Alarming feature in the object and the definition of related attributes. For detailed information, see [BACnet Intrinsic Alarming](#).

Back to [Analog Input Attributes](#).

### **Max Value**

Defines the highest reliable value (in engineering units) for the Present Value.

Back to [Analog Input Attributes](#).

### **Min Value**

Defines the lowest reliable value (in engineering units) for the Present Value.

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### **Out of Service**

Used to de-couple the object from the physical input. When Out of Service is True, the object de-couples the Present Value and Reliability from the hardware. The Reliability is writable when Out Of Service is True. When de-coupled, the Present Value can be changed to simulate specific conditions or for test purposes.

Additionally, the Out of Service state of the Status Flags attribute is set to True and the Fault state is decoupled from the physical input when Out of Service is True.

Back to [Analog Input Attributes](#).

### **Present Value**

Indicates the current value of the analog input object in the defined Units. When Out of Service is True, this attribute is writable.

Back to [Analog Input Attributes](#).

### **Reliability**

Indicates whether the Present Value is unreliable.

Examples:

- **Reliable** - No detectable faults
- **Unreliable High** - Present Value is greater than the Max Value.
- **Unreliable Low** - Present Value is less than the Min Value.

When Out of Service is True, the Reliability attribute may be written directly.

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### **Resolution**

Indicates the smallest possible change in Present Value (in engineering units) and is equal to the Display Precision. This attribute has the data type required by the standard BACnet property.

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### **Status Flags**

Indicates the general status of the Analog Input object in BACnet terms and contains four independent states.

The four flags are:

- **In Alarm** - False if the Event State attribute value is Normal; otherwise, the In Alarm flag is True. (Set only by BACnet Intrinsic Alarming.)
- **Fault** - True (1) if the Reliability attribute is **not** reliable; otherwise, the Fault flag is False.
- **Overridden** - Overridden flag is True if the Present Value is overridden at the hardware source level.
- **Out of Service** - Out of Service flag is True if the Out of Service attribute value is True; otherwise, the Out of Service flag is False.

Back to [Analog Input Attributes](#).

### **Units**

Indicates the engineering measurement units used by the object.

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### **Update Interval**

Indicates the time period (in hundredths of a second) between updates to Present Value when the input is not overridden or out of service.

Back to [Analog Input Attributes](#).

### **Use COV Min Send Time**

Configures the MS/TP Analog Input object to send COV messages on a periodic basis instead of on every change of value that exceeds the COV Increment . This attribute is typically set to True for objects with values that fluctuate greatly, such as air pressure, to decrease the number of COV messages. The change of value still must exceed the COV Increment to be reported. This attribute is available only on Metasys system field devices, such as the MS/TP field devices.

Back to [Analog Input Attributes](#).

### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Analog Input Attributes](#).

## Analog Input Commands

The table below lists the commands supported by the Analog Input Object.

**Table 207: Analog Input Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">In Service</a>	
<a href="#">Out of Service</a>	The value to be written to the Present Value attribute.

### Analog Input Command Details

#### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Analog Input Commands](#).

#### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Analog Input Commands](#).

#### **In Service**

Cancels the affect of an Out of Service command and returns the Out of Service attribute to False. The Present Value and Reliability will revert back to the values obtained from the physical input.

**Note:** For BACnet objects, this command is dependent on the ability to write the Out Of Service attribute of the BACnet Analog Input object in the remote BACnet device. Objects in the N30, for example, do not support this command.

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#### **Out of Service**

Allows a user to override the object's hardware input for simulation or other purposes. The Out Of Service command will change the Out of Service attribute to True, write the Present Value to the value of the command parameter and write the Reliability attribute to Reliable. The Present Value and Reliability will no longer track the physical input.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

**Note:** For BACnet objects, this command is dependent on the ability to write the Out Of Service attribute of the BACnet Analog Input object in the remote BACnet device. Objects in the N30, for example, do not support this command.

**Note:** For integrated N2 objects, this command is dependent on the ability to set the AI point in the N2 controller to an override state. System 91 controllers, for example, do not support this command.

Back to [Analog Input Commands](#).

# Analog Output Object

The AO object's attributes represent the external, visible characteristics of an analog output. This object integrates N1, N2, and BACnet controllers into supervisory controllers, resulting in:

- a consistent interface to point objects for all controller types, so they appear as a homogenous set to the user interface
- flexibility in point mapping
- permanent update of setpoints in controllers. The user has the ability to write to the permanent memory of some controllers.
- support for all Metasys controllers
- For example, this object allows you to command a damper to a given position from a supervisory controller.

For general information on Metasys system objects, see [Common Object Attributes](#).

## Analog Output Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 208: Analog Output Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">COV Increment</a>	Real value	CW <sup>2</sup>	BW	0.1	Any value > 0
<a href="#">Device Type</a>	Text	CW	W	Null	Limit: 20 characters
<a href="#">Display Precision</a>	One value from a list	CW	CW	10ths	
<a href="#">Intrinsic Alarming Defined</a>	True or False	C		False	
<a href="#">Max Value</a>	Real value	CW	BW	100.0	This attribute is not Writable for a Position Adjust Output (PAO).
<a href="#">Min Value</a>	Real value	CW	BW	0.0	This attribute is not Writable for a PAO.
<a href="#">Out of Service</a>	True or False	CW	BW		
<a href="#">Present Value</a>	Real value	DNRW	BW	0.0	
<a href="#">Priority Array</a>	Set of values				
<a href="#">Reliability</a>	One value from a set	W	BW	0	No Fault Detected (Reliable), Open Loop, Shorted Loop, No Output, Unreliable Other
<a href="#">Resolution</a>	Real value		B	0.1	
<a href="#">Status Flags</a>	Series of True or False states		B	False, False, False, False	In Alarm, Fault, Overridden, Out of Service
<a href="#">Units</a>	One value from a list	CW	W	%	This attribute is not Writable for a PAO.

**Table 208: Analog Output Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Use COV Min Send Time</a>	True or False	W		False	
<a href="#">Use Remote Alarming</a>	True or False		BCW	False	

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object Reliability, W - Writable

2 For MS/TP Analog Outputs, COV Increment may not be writable, based on its configuration.

## Analog Output Attribute Details

### **COV Increment**

Specifies the minimum change in [Present Value](#) required for the object to report a change.

Back to [Analog Output Attributes](#).

### **Device Type**

Contains a description of the physical device connected to the object.

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### **Display Precision**

Defines the decimal rounding and the decimal places to display of the [Present Value](#) and associated attributes.

Back to [Analog Output Attributes](#).

### **Intrinsic Alarming Defined**

Enables the BACnet Intrinsic Alarming feature in the object and the definition of related attributes. For detailed information, see [BACnet Intrinsic Alarming](#).

Back to [Analog Output Attributes](#).

### **Max Value**

Defines the highest reliable value (in engineering units) for the [Present Value](#).

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### **Min Value**

Defines the lowest reliable value (in engineering units) for the [Present Value](#).

Back to [Analog Output Attributes](#).

### **Out of Service**

Used to de-couple the object from the physical output. When Out of Service is True, the object de-couples the [Present Value](#) and [Reliability](#) from the hardware. The Reliability is writable when Out Of Service is True. When de-coupled, the Present Value can be changed to simulate specific conditions or for test purposes.

Additionally, the Out of Service state of the [Status Flags](#) attribute is set to True and the Fault state is decoupled from the physical input when Out of Service is True.

Back to [Analog Output Attributes](#).

### **Present Value**

Indicates the current value of the Analog Output object in the defined [Units](#). When [Out of Service](#) is True, this attribute is writable.

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### **Priority Array**

Lists values of the object in level of importance.

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### **Reliability**

Indicates whether the [Present Value](#) is unreliable.

Examples:

- **Reliable** - No detectable faults
- **Unreliable High** - Present Value is greater than the Max Value.
- **Unreliable Low** - Present Value is less than the Min Value.

When [Out of Service](#) is True, the Reliability attribute may be written directly.

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### **Resolution**

Indicates the smallest possible change in [Present Value](#) (in engineering units) and is equal to the [Display Precision](#). This attribute has the data type required by the standard BACnet property.

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### **Status Flags**

Indicates the general status of the Analog Output object in BACnet terms and contains four independent states.

The four flags are:

- **In Alarm** - False if the Event State attribute value is Normal; otherwise, the In Alarm flag is True. (Set only by BACnet Intrinsic Alarming.)
- **Fault** - True if the Reliability attribute is **not** reliable; otherwise, the Fault flag is False.
- **Overridden** - Overridden flag is True if the Present Value is overridden at the hardware source level.
- **Out of Service** - Out of Service flag is True if the Out of Service attribute value is True; otherwise, the Out of Service flag is False.

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### **Units**

Indicates the engineering measurements units used by the object.

Back to [Analog Output Attributes](#).

### **Use COV Min Send Time**

Configures the object to send COV messages on a periodic basis instead of on every change of value that exceeds the [COV Increment](#). This attribute is typically set to True for objects with values that fluctuate greatly, such as air pressure, to decrease the number of COV messages. The change of value still must exceed the COV Increment to be reported. This attribute is available only on Metasys system field devices, such as the MS/TP field devices.

Back to [Analog Output Attributes](#).

### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

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## **Analog Output Commands**

The table below lists the commands supported by the [Analog Output Object](#).

**Table 209: Analog Output Commands**

Command Name	Parameters
<i>Adjust</i>	The value to be written to the <i>Present Value</i> . The value must be less than Max Present value and greater than Min Present Value.
<i>Disable Alarms</i>	
<i>Enable Alarms</i>	
<i>In Service</i>	
<i>Operator Override</i>	The value to be written to the <i>Present Value</i> .
<i>Out of Service</i>	
<i>Release Operator Override</i> <sup>1</sup>	
<i>Release</i> <sup>1</sup>	Attribute name Command priority
<i>Release All</i> <sup>1</sup>	Attribute name
<i>Setpoint</i> <sup>2</sup>	

1 For the Release Operator Override, Release, and Release All commands, if all Command Priorities have been released and a Relinquish Default is not defined, the supervisory controller gives control to the actual hardware.

2 Setpoint command is supported by N2 protocol only.

## Analog Output Command Details

### **Adjust**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the *Present Value* at the Default (16) command priority. The value must be less than Max Present value and greater than Min Present Value.

**Important:** Be aware that an operator Adjust command releases the actions of any processes running to the object in the NxE or FEC controllers that use Priorities 9 through 16. Consider this behavior when creating control strategies.

If Local Control is True, this command is rejected.

The command is only sent when one of the following conditions is met:

1. NOT Local Control and NOT Out Of Service, or
2. NOT Local Control and after issuing the In Service command.

Back to [Analog Output Commands](#).

### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

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### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Analog Output Commands](#).

### **In Service**

Cancels the affect of an *Out of Service* command and returns the *Out of Service* attribute to False. The *Present Value* and *Reliability* will revert back to the values obtained from the physical hardware output.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

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### **Operator Override**

Updates the *Present Value* at Command Priority Operator Override (8).

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when not Out Of Service.

Back to [Analog Output Commands](#).

### **Out of Service**

Allows a user to override the object's hardware output for simulation or other purposes. The Out of Service command changes the Out of Service attribute to True. The Present Value and Reliability no longer track the physical output. No commands are sent to the actual hardware. When the *Out of Service* attribute is set to False, the current *Present Value* is sent to the actual hardware.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Analog Output Commands](#).

### **Release Operator Override**

Releases Command Priority Operator Override (8) from *Present Value*.

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### **Release**

Releases the identified Command Priority from the specified attribute and allows the next highest priority to control it.

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### **Release All**

Releases Command Priorities 3 through 16 (Default), from the specified, writable attribute. Command Priorities 1 and 2 remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space could overcool or overheat, a fan might run longer than expected, and so on.  
If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [Analog Output Commands](#).

### **Setpoint**

Writes the value to the permanent memory of the field device and may change the Present Value if there is no override.

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# Analog Value Object

Analog Value (AV) objects have similar software characteristics and capabilities to [Analog Input Objects](#); however, Analog Value objects are not associated with any physical hardware and are the result of a control process or operator entry. This object allows you to hold an analog value for other objects to reference. For example, an [Interlock Object](#) can reference and base its operation on an analog value such as Outdoor Air Temperature Low Limit.

For general information on Metasys objects, see [Common Object Attributes](#).

## Analog Value Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 210: Analog Value Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	BACnet Flags <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">COV Increment<sup>2</sup></a>	Real Value	CW	BW	0.01	Any value > 0
<a href="#">Display Precision</a>	One value from a set	CW	CW	10ths	
<a href="#">Intrinsic Alarming Defined</a>	True or False	C		False	
<a href="#">Max Value</a>	Real value	CW	BW	1.7E38	This value is not writable for FEC objects. This value is writable if the AV is the ZN-SP on a Net Sensor. This method is the only way to set the range for the Net Sensor.
<a href="#">Min Value</a>	Real value	CW	BW	-1.7E38	This value is not writable for FEC objects. This value is writable if the AV is the ZN-SP on a Net Sensor. This method is the only way to set the range for the Net Sensor.
<a href="#">Out of Service</a>	True or False		W	False	Always False
<a href="#">Present Value</a>	Real value	DRW	DRW		
<a href="#">Priority Array</a>	Set of values				
<a href="#">Reliability</a>	One value from a set	W	BW	Reliable	See the attribute description for details on Reliability. No Fault Detected (Reliable), Over Range, Under Range, Unreliable Other
<a href="#">Status Flags</a>	Series of True or False values		B	False, False, False, False	See the attribute description for details on Status Flags. In Alarm, Fault, Overridden, Out of Service

**Table 210: Analog Value Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	BACnet Flags <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Units</a>	One type from a set	W	W	Blank	
<a href="#">Use Remote Alarming</a>	True or False		BCW	False	

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, R - Affected by Object Reliability, W - Writable

2 This attribute is required if the object supports COV reporting.

## Analog Value Attribute Details

### **COV Increment**

Defines the minimum change in the [Present Value](#) required for the object to report a change.

Back to [Analog Value Attributes](#).

### **Display Precision**

Defines the decimal rounding and the decimal places to display of the [Present Value](#) and associated attributes.

Back to [Analog Value Attributes](#).

### **Intrinsic Alarming Defined**

Enables the BACnet Intrinsic Alarming feature in the object and the definition of related attributes. For detailed information, see [BACnet Intrinsic Alarming](#).

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### **Max Value**

Defines the highest reliable value (in engineering units) for the [Present Value](#).

This value is not writable for Analog Value objects in the FEC.

This value is writable if the AV is the ZN-SP on a Net Sensor. This method is the only way to set the range for the Net Sensor.

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### **Min Value**

Defines the lowest reliable value (in engineering units) for the [Present Value](#).

This value is not writable for Analog Value objects in the FEC.

This value is writable if the AV is the ZN-SP on a Net Sensor. This method is the only way to set the range for the Net Sensor.

Back to [Analog Value Attributes](#).

### **Out of Service**

This attribute is always False for this object due to the absence of hardware.

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### **Present Value**

Indicates the current value of the analog value. Present Value is optionally commandable. The optional [Priority Array](#) must be present for Present Value to be commandable. Values written to Present Value are compared with the [Min Value](#) and [Max Value](#) attributes and set the [Reliability](#).

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### **Priority Array**

Contains prioritized commands in effect for the object. The highest priority command is sent to the [Present Value](#) attribute.

Back to [Analog Value Attributes](#).

### **Reliability**

Indicates whether the [Present Value](#) is unreliable.

Examples:

- **Reliable** - No detectable faults
- **Unreliable High** - Present Value is greater than the Max Value.
- **Unreliable Low** - Present Value is less than the Min Value.

When [Out of Service](#) is True, the Reliability attribute may be written directly.

Back to [Analog Value Attributes](#).

### **Status Flags**

Indicates the general status of the Analog Input object in BACnet terms and contains four independent states.

The four flags are:

- **In Alarm** - False if the Event State attribute value is Normal; otherwise, the In Alarm flag is True. (Set only by BACnet Intrinsic Alarming.)
- **Fault** - True (1) if the [Reliability](#) attribute is not reliable; otherwise, the Fault flag is False.
- **Overridden** - Overridden flag is True if the [Present Value](#) is overridden at the hardware source level.
- **Out of Service** - Out of Service flag is True if the [Out of Service](#) attribute value is True; otherwise, the Out of Service flag is False.

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### **Units**

Indicates the engineering measurement units used by the object.

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### **Use COV Min Send Time**

Configures the object to send COV messages on a periodic basis instead of on every change of value that exceeds the [COV Increment](#). This attribute is typically set to True for objects with values that fluctuate greatly, such as air pressure, to decrease the number of COV messages. The change of value still must exceed the COV Increment to be reported. This attribute is available only on Metasys system field devices, such as the MS/TP field devices.

Back to [Analog Value Attributes](#).

### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Analog Value Attributes](#).

## **Analog Value Commands**

The table below lists the commands supported by the Analog Value Object.

**Table 211: Analog Value Object Commands**

Command	Description
<a href="#">Adjust</a>	The value to be written to the Present Value attribute. The value must be less than Max Present value and greater than Min Present Value.
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">Operator Override</a>	The value to be written to the Present Value attribute.
<a href="#">Release Operator Override</a>	
<a href="#">Release</a>	1. Attribute name 2. Command priority
<a href="#">Release All</a>	Attribute name

## Analog Value Command Details

### **Adjust**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the [Present Value](#) at the Default (16) command priority. The value must be less than Max Present value and greater than Min Present Value.

**Important:** Be aware that an operator Adjust command releases the actions of any processes running to the object in the NxE or FEC controllers that use Priorities 9 through 16. Consider this behavior when creating control strategies.

If Local Control is True, this command is rejected.

The command is only sent when one of the following conditions is met:

1. NOT Local Control and NOT Out Of Service, or
2. NOT Local Control and after issuing the In Service command.

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### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

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### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

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### **Operator Override**

Updates the [Present Value](#) at Command Priority Operator Override (8).

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when not Out Of Service.

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### **Release Operator Override**

Releases Command Priority Operator Override (8) from [Present Value](#).

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### **Release**

Releases the identified command priority from the specified, writable attribute, and allows it to be controlled by the next highest priority.

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### **Release All**

Releases Command Priorities 3 through 16 from the specified, writable attribute. Command Priorities 1 (Manual Emergency) and 2 (Fire Application) remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space could overcool or overheat, a fan might run longer than expected, and so on.

If an operator has overridden an input, use the [Release Operator Override](#) command.

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## Auto Shutdown Object

When a selected multistate control point is in a specified shutdown state, the Auto Shutdown object suppresses alarm reporting from a list of dependent objects to prevent nuisance alarms. The Auto Shutdown object accomplishes this by sending an enable/disable command to each of the dependent object's Alarm objects, based on the control point's current state (the value of the [Control](#) attribute) and the defined shutdown state. For BACnet intrinsic alarming and Event Enrollment objects, these commands set and reset the BACnet Alarm Event Enable property flags (To Off Normal, To Fault, and To Normal) that cause or prevent alarms. A startup delay is provided so that points are not released immediately from shutdown.

An example of a use for the Auto Shutdown object is to prevent alarms set to monitor the discharge air temperature of a fan when that fan is turned off. When the fan is turned off, the fan state value is sent to the Auto Shutdown object. The Auto Shutdown object then evaluates the current state of the point against the [Shutdown State](#) defined in the Auto Shutdown object. If the current point state matches the Shutdown State, the Auto Shutdown object sends a [Disable](#) command to the Alarm object of every referenced dependent object in the [Dependents](#) list.

Consequently, when the fan is turned back on, the Auto Shutdown object again evaluates the current state and, if the current state does not match the Shutdown State, starts the [Startup Delay](#) timer. Once the timer expires, the Auto Shutdown object sends an [Enable](#) command to the Alarm object of every referenced dependent object in the Dependents list.

**Note:** Changing the [Dependents](#) or [Shutdown State](#) attribute causes an immediate reevaluation of the current state. However, changes to the Startup Delay time do not take effect until the next change in the control point state.

For general information on Metasys system objects, see the [Object Help](#) section.

For more information on the wizard used to create an Auto Shutdown object, see [Insert Object - Auto Shutdown](#).

### Auto Shutdown Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section.

Click the attribute name in the table for a description of the attribute.

**Table 212: Auto Shutdown Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Control</a>	Attribute Reference	C		
<a href="#">Dependents</a>	List of Object Reference	CW		Number of Entries = 1–32
<a href="#">Enabled</a>	True or False		True	
<a href="#">Execution Priority</a>	One state from a set	CW	Normal	
<a href="#">Present Value</a>	One value from a set	R	Off	On = 1 Off = 0
<a href="#">Reliability</a>	One state from a set		Input Unreliable	Various
<a href="#">Shutdown State</a>	One state from a set	CW		Uses the value set of the control point once the Auto Shutdown object reads the control point value.
<a href="#">Startup Delay</a>	Number	CW	5	Units = Minutes
<a href="#">States Text</a>	List of states			

<sup>1</sup> C - Configurable, R - Affected by Object Reliability, W - Writable

## Auto Shutdown Attribute Details

### **Control**

Determines, in conjunction with the [Shutdown State](#), if an alarm shutdown should occur. This is the current state of the references control point.

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### **Dependents**

Uses each dependent object identified in this list of object references to locate the Alarm object that is to have its alarm reporting controlled by the control point.

Back to [Auto Shutdown Attributes](#).

### **Enabled**

Indicates whether the Auto Shutdown object is enabled (True) or disabled (False).

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### **Execution Priority**

Indicates the relative importance of performing the function of the object within the device.

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### **Present Value**

Represents the current value of the Auto Shutdown object. When the state is On, the object has disabled the Alarm objects. When the state is Off, the object has enabled the Alarm objects.

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### **Reliability**

Reflects the reliability of the control point. When the control point is not reliable, the Reliability attribute becomes Input Unreliable.

Back to [Auto Shutdown Attributes](#).

### **Shutdown State**

Determines the definition of the shutdown state. When the control point goes to the state defined as the shutdown state, Auto Shutdown disables alarms from the point.

Back to [Auto Shutdown Attributes](#).

### **Startup Delay**

Represents the time in minutes that must elapse before alarm reporting is re-enabled, once the control point changes from the [Shutdown State](#) to any other state.

Back to [Auto Shutdown Attributes](#).

### **States Text**

Indicates the displayed strings for the [Present Value](#).

Back to [Auto Shutdown Attributes](#).

## Auto Shutdown Commands

The table below lists the commands supported by the [Auto Shutdown Object](#).

**Table 213: Auto Shutdown Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	

## Auto Shutdown Command Details

### **Disable**

Prevents the Auto Shutdown object from responding to any change occurring at the [Control](#) attribute reference, including the [Reliability](#) associated with the master. Immediately following receipt of this command, an Enable command is sent to the Alarm object of every referenced dependent object in the [Dependents](#) list.

Back to [Auto Shutdown Commands](#).

### **Enable**

Allows the Auto Shutdown object to respond once again to any changes occurring at the control point. Immediately following receipt of this command, the control point current state is re-evaluated, and the appropriate action is taken on the items in the [Dependents](#) list.

Back to [Auto Shutdown Commands](#).



## BACnet Device Object

**Note:** The Johnson Controls NAE Device object includes attributes and methods not required by the BACnet Device object. For information on the NAE Device object, see the [Engine Device Object](#) section.

**Note:** The Object Type for this object is labeled Non-FEC BACnet Device in the software.

The BACnet Device object defines a standardized BACnet object with attributes that represent the external, visible characteristics of a device. Only one Device object exists in each BACnet Device.

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the BACnet Device object, see [BACnet Device Attributes](#).

### BACnet Device Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 214: BACnet Device Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Align Intervals</a>	True or False	W	False	
<a href="#">APDU Retries</a>	Number	W	3	
<a href="#">APDU Segment Timeout<sup>2</sup></a>	Number	W	4,000	
<a href="#">APDU Timeout</a>	Number		See next column	The default is 6,000 milliseconds for devices that permit modification of this attribute. The default value is 60,000 milliseconds for all other devices.
<a href="#">Active COV Subscriptions<sup>3</sup></a>	List			
<a href="#">Active VT Sessions<sup>4</sup></a>	List			
<a href="#">Appl SW Version</a>	Text			
<a href="#">Backup Fail Timeout<sup>5</sup></a>	Number	W	120	Units = Seconds
<a href="#">Configuration Files<sup>6</sup></a>	Set of values			
<a href="#">DST Status</a>	True or False	W		True, False
<a href="#">Database Revision</a>	Number			
<a href="#">Description</a>	Text	W		Unrestricted range
<a href="#">Device Addr Binding</a>	List	W		
<a href="#">Firmware Version</a>	Text			
<a href="#">Graphic</a>	Object reference	CW		
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">Interval Offset</a>	Number	CW	0	Units = Minutes
<a href="#">Last Restore Time<sup>6</sup></a>	One value from a set			
<a href="#">List of Session Keys</a>	List			
<a href="#">Local Date</a>	Date	W		
<a href="#">Local Time</a>	Time	W		
<a href="#">Location</a>	Text	W		

**Table 214: BACnet Device Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range
<i>Max APDU Length</i>	Number			Greater or equal to 50
<i>Max Info Frames<sup>7</sup></i>	Number		10 (FEC) 20 (NxE)	
<i>Max Master<sup>7</sup></i>	Number		127	
<i>Max Segments Accepted</i>	Number			
<i>Model Name</i>	Text			
<i>Offline</i>	True or False		False	
<i>Profile Name</i>	Text			
<i>Protocol Obj Support</i>	Series of True or False values			
<i>Protocol Revision</i>	Number			
<i>Protocol Ser Support</i>	Series of True or False values			
<i>Protocol Version</i>	Number			
<i>Restart Notification Recipients</i>	Structure	CW		
<i>Segmentation</i>	One type from a set			Segmented Both, Segmented Transmit, Segmented Receive, No Segmentation
<i>System Status</i>	One type from a set	D		Operational, Operational Read Only, Download Required, Download in Progress, Nonoperational, Backup in Progress
<i>Time Synchronization Interval</i>	Number	CW	0	Units = Minutes
<i>Time Sync Recipients<sup>8</sup></i>	List	W		Zero or more
<i>UTC Offset</i>	Number	W		-720 though +720
<i>VT Classes Supported<sup>4</sup></i>	List			
<i>Vendor ID</i>	Number			
<i>Vendor Name</i>	Text			

1 C - Configurable, D - Default Attribute for Display, W - Writable

2 If segmentation of any kind is supported, this is required.

3 If the device supports execution of either the Subscribe COV or Subscribe COV Property service, this attribute is required.

4 If either Video Terminal (VT) Classes Supported or Active VT Sessions is present, both are present. If the Protocol Implementation Conformance Statement (PICS) indicates support for VT Services, both of these attributes are present.

5 If the device supports the backup and restore procedures, this attribute must be present and writable.

6 If the device supports the backup and restore procedures, these attributes are required.

7 If the device is an MS/TP master node, these attributes are required.

8 If PICS indicates the device is a Time Master, this is required. If present, this attribute is writable.

## BACnet Device Attribute Details

### ***Align Intervals***

Specifies whether clock-aligned periodic time synchronization is enabled. If periodic time synchronization is enabled and the time synchronization interval is a factor of an hour or a day (that is, the value divides without remainder), then the beginning of the period specified for time synchronization aligns to the hour or day, respectively.

Back to [BACnet Device Attributes](#).

### ***APDU Retries***

Indicates the maximum number of times that an Application Protocol Data Unit (APDU) is retransmitted. The default value is 3. If this device does not perform retries, then this attribute is zero. If the value of this attribute is greater than zero, a nonzero value is placed in the Device object [APDU Timeout](#) attribute.

Back to [BACnet Device Attributes](#).

### ***APDU Segment Timeout***

Indicates the amount of time in milliseconds between retransmissions of an APDU segment. This value is nonzero if [APDU Retries](#) is nonzero. The APDU Segment Timeout attribute is present if segmentation of any kind is supported.

In order to achieve reliable communication, the values of the APDU Segment Timeout attributes of the Device objects of all intercommunicating devices should contain the same value.

Back to [BACnet Device Attributes](#).

### ***APDU Timeout***

Indicates the amount of time in milliseconds between retransmissions of an APDU requiring acknowledgement for which no acknowledgement has been received. This value is nonzero if [APDU Retries](#) is nonzero.

In order to achieve reliable communication, the values of the APDU Timeout attributes of the Device objects of all intercommunicating devices should contain the same value.

Back to [BACnet Device Attributes](#).

### ***Active COV Subscriptions***

Contains a list of BACnet COV Subscriptions, each of which consists of a Recipient, a Monitored Property Reference, an Issue Confirmed Notifications flag, a Time Remaining value, and an optional COV Increment. This attribute provides a network-visible indication of those COV subscriptions active at any given time. Whenever a COV Subscription is created with the Subscribe COV or Subscribe COV Property service, a new entry is added to the Active COV Subscriptions list. Similarly, whenever a COV Subscription is terminated, the corresponding entry is removed from the Active COV Subscriptions list.

If the device supports execution of either Subscribe COV or Subscribe COV Property service, this attribute is required.

Back to [BACnet Device Attributes](#).

### ***Active VT Sessions***

Specifies a list containing a Local Video Terminal (VT) Session Identifier, a Remote VT Session Identifier, and Remote VT Address. This attribute provides a network-visible indication of those VT sessions that are active. When a VT session is created with the VT-Open service, a new entry is added to the Active VT Sessions list. When a VT session terminates, the corresponding entry is removed from the Active VT Sessions list. If either VT Classes Supported or Active VT Sessions is present, then both are present. Both are required if support of VT Services is indicated in the PICS.

Back to [BACnet Device Attributes](#).

### ***Appl SW Version***

Identifies the version of the application software installed in the device. The content of this string is locally defined (date-and-time stamp, a programmer's name, a host file version number, and so on).

Back to [BACnet Device Attributes](#).

**Backup Fail Timeout**

Indicates the number of seconds that the device being backed up or restored waits before unilaterally ending the backup or restore procedure. This attribute is writable (the device performing the backup, or the operator, configures this with an appropriate timeout).

Back to [BACnet Device Attributes](#).

**Configuration Files**

Identifies the files within the device that determine what device image can be backed up. The contents of this attribute are only required to be valid during the backup procedure. If the device supports the BACnet backup and restore procedure, this attribute is supported.

Back to [BACnet Device Attributes](#).

**DST Status**

Indicates whether Daylight Saving Time (DST) time is in effect (True) or not (False).

Back to [BACnet Device Attributes](#).

**Database Revision**

Specifies a logical revision number for the device's database. Database Revision is incremented when an object is created or deleted, an object name changes, or a restore is performed.

Back to [BACnet Device Attributes](#).

**Description**

Contains a string of printable characters used to describe the application being run by the device or other descriptive information.

Back to [BACnet Device Attributes](#).

**Device Addr Binding**

Contains a list of BACnet Object Identifiers of a BACnet Device object and a BACnet device address in the form of a BACnet Address. Entries in the list identify the actual device addresses that are used when accessing the remote device via a BACnet service request. The list may be empty if no device identifier-device address bindings are currently known to the device.

Back to [BACnet Device Attributes](#).

**Firmware Version**

Contains a number assigned by the vendor to represent the level of firmware installed in the device.

Back to [BACnet Device Attributes](#).

**Graphic**

Indicates the graphic associated with the object.

Back to [BACnet Device Attributes](#).

**Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this object or the controller containing this point.

Back to [BACnet Device Attributes](#).

**Interval Offset**

Specifies the offset, in minutes, from the beginning of the period defined for time synchronization until the actual time synchronization requests are set. Interval Offset has no effect when Align Intervals is False.

Back to [BACnet Device Attributes](#).

**Last Restore Time**

Specifies when the device's image was last restored. If the device supports the BACnet backup and restore procedures, this attribute is supported.

Back to [BACnet Device Attributes](#).

#### **List of Session Keys**

Contains a list of the cryptographic keys used to communicate with other security-conscious BACnet Devices. This attribute is not readable or writable by any device except a device designated the Key Server. A session key consists of a 56-bit encryption key and a BACnet Address of the peer with which secure communications is requested.

Back to [BACnet Device Attributes](#).

#### **Local Date**

Indicates the date. If the device has no knowledge of time or date, Local Date is omitted.

Back to [BACnet Device Attributes](#).

#### **Local Time**

Indicates the time of day. If the device has no knowledge of time or date, Local Time is omitted.

Back to [BACnet Device Attributes](#).

#### **Location**

Indicates the physical location of the device.

Back to [BACnet Device Attributes](#).

#### **Max APDU Length**

Specifies the maximum number of octets contained in a single, indivisible application layer protocol unit. Underlying data link technology constrains the value of this attribute.

Back to [BACnet Device Attributes](#).

#### **Max Info Frames**

Specifies the maximum number of information frames the node may send before it passes the token. This attribute is present if the device is a node on an MS/TP network. If Max Info Frames is not writable or otherwise user configurable, its value is one.

Back to [BACnet Device Attributes](#).

#### **Max Master**

Specifies the highest possible address for master nodes and is less than or equal to 127. This is present if the device is a master node on an MS/TP network. If Max Master is not writable via BACnet services, its value is 127.

Back to [BACnet Device Attributes](#).

#### **Max Segments Accepted**

Indicates the maximum number of segments of an Application Protocol Data Unit (APDU) accepted by the device.

Back to [BACnet Device Attributes](#).

#### **Model Name**

Contains a name assigned by the vendor to represent the model of the device.

Back to [BACnet Device Attributes](#).

#### **Offline**

Displays the offline or online status of connected hardware.

Back to [BACnet Device Attributes](#).

#### **Profile Name**

Contains a string of characters that represents the name of the object profile to which the object conforms. A profile name must begin with a vendor identifier code in base-10 integer format, followed by a dash. The vendor identifier code indicates the organization that administers the remaining characters of the profile name, and publishes and maintains the profile document identified by the profile name. The vendor identifier does not need to match the vendor identifier of the device in which the object resides.

Back to [BACnet Device Attributes](#).

#### **Protocol Obj Support**

Indicates which standardized object types the device's protocol implementation supports. This attribute reflects the minimum set of object types, but implementation often supports additional standard and non-standard object types with their own set of attributes. (The list of attributes supported for a particular object may be acquired by use of the Read Property Multiple service with an attribute reference of All.)

Back to [BACnet Device Attributes](#).

#### **Protocol Revision**

Indicates the minor revision level of the BACnet standard. This starts at 1 and increases for each subsequent release. If the [Protocol Version](#) attribute changes, this number reverts to zero. This attribute is required for all devices with BACnet Protocol Version 1, Protocol Revision 1 and above. If this attribute is not present, the device is Protocol Version 1, Protocol Revision 0.

Back to [BACnet Device Attributes](#).

#### **Protocol Ser Support**

Indicates which standardized protocol services the device's protocol implementation supports. This attribute reflects the minimum set of services, but implementation often supports additional standardized services.

Back to [BACnet Device Attributes](#).

#### **Protocol Version**

Represents the BACnet protocol the device supports. Initial releases are Version 1; subsequent releases increase the number by one.

Back to [BACnet Device Attributes](#).

#### **Restart Notification Recipients**

Controls the restrictions on which devices, if any, are notified when a restart occurs. The value of this attribute is a list of BACnet Recipients. When the length of this list is empty, the device cannot send a device restart notification. The default value of this property is a single entry representing a broadcast on the local network. If the list has one or more entry, the device sends a restart notification, but only to the devices or addresses listed.

Back to [BACnet Device Attributes](#).

#### **Segmentation**

Indicates if the BACnet device supports segmentation of messages. If so, it supports segmented transmission, reception, or both.

Back to [BACnet Device Attributes](#).

#### **System Status**

Reflects the current physical and logical state of the device.

Back to [BACnet Device Attributes](#).

#### **Time Synchronization Interval**

Specifies the periodic interval, in minutes, at which TimeSynchronization and UTCTimeSynchronization requests are sent. When set to zero, then periodic time synchronization is disabled.

Back to [BACnet Device Attributes](#).

#### **Time Sync Recipients**

Controls the restrictions placed on a device's use of the Time Synchronization service. If the list is of length zero, a device is prohibited from automatically sending a Time Synchronization request. If the list is of length one or more, a device automatically sends a Time Synchronization request but only to the devices or addresses listed. If it is present, this attribute is writable. If the PICS indicates that this device is a Time Master, then Time Synchronization Recipients is present.

Back to [BACnet Device Attributes](#).

**UTC Offset**

Indicates the number of minutes offset between local standard time and UTC. The Time Zones to the west of the zero degree meridian are positive and those to the east are negative. Subtract the value of the UTC Offset from the UTC received in the UTC Time Synchronization service requests to calculate the correct local standard time.

Back to [BACnet Device Attributes](#).

**VT Classes Supported**

Contains a list of BACnet Video Terminal (VT) Classes that indicate a particular set of terminal characteristics. A device often supports multiple types of behaviors for differing types of terminals or differing types of operator interface programs. If either VT Classes Supported or [Active VT Sessions](#) is present, then both are present. Both are required if support of VT Services is indicated in the PICS.

Back to [BACnet Device Attributes](#).

**Vendor ID**

Distinguishes proprietary extensions to the protocol with a unique ASHRAE vendor ID code.

Back to [BACnet Device Attributes](#).

**Vendor Name**

Identifies the manufacturer of the device.

Back to [BACnet Device Attributes](#).

# BACnet Integration Object

The BACnet Integration object manages the communication with a BACnet network. All integrated BACnet devices and objects appear under the BACnet Integration object in the [Navigation Tree](#).

The BACnet Integration object serves as the root for all integrated BACnet objects on an Ethernet trunk. The BACnet Integration object is a direct child of a supervisory controller and integrates BACnet devices using the Ethernet trunk.

For general information on Metasys system objects, see the [Object Help](#) section.

For detailed information on the BACnet Integration object, see [BACnet Integration Attributes](#).

## BACnet Integration Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 215: BACnet Integration Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Count</a>	Number			
<a href="#">Device Discovery Range</a>	Structure	CW		Structure elements: <ul style="list-style-type: none"> <li>network number (see attribute description)</li> <li>high limit device instance (Range: 1–4,194,302)</li> <li>low limit device instance (Range: 1–4,194,302)</li> </ul>
<a href="#">Periodic Update</a>	Number	CW	60	0–65,535 Units = seconds
<a href="#">Poll Delay</a>	Number	CW		Milliseconds 10–50
<a href="#">Preserve Discovered Devices</a>	True or False	CW	True	
<a href="#">Requested Vendor ID</a>	Number	CNW		0–65,535 The current list of Vendor IDs can be viewed at <a href="http://www.bacnet.org/VendorID/BACnet%20Vendor%20IDs.htm">http://www.bacnet.org/VendorID/BACnet%20Vendor%20IDs.htm</a> .

1 C - Configurable, N - Value Not Required, W - Writable

**Table 216: BACnet Integration Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Duplicate Device Identifiers</a>	List			
<a href="#">Execution Time</a>	Number			0–4,294,967,295 Units = seconds
<a href="#">Polled Object Count</a>	Number			

1 C - Configurable, N - Value Not Required, W - Writable



## BACnet Integration Attribute Details

### **Count**

Indicates the number of BACnet objects defined for this integration.

Back to [BACnet Integration Attributes](#).

### **Device Discovery Range**

Contains the destinations for the Who-Is message sent during the device autodiscovery process. When the list is empty, the object sends a global broadcast in the form of the Who-Is. Adding entries to the list limits the scope of the Who-Is broadcast to only the networks and device instance ranges specified. Multiple entries to this list cause the object to send multiple Who-Is messages sequentially.

**Table 217: Device Discovery Range Network Number**

Broadcast Type	Network Numbers
Local	0 (locked for editing)
Global	65,535 (locked for editing)
Remote	1–65,534 (editable)

Back to [BACnet Integration Attributes](#).

### **Duplicate Device Identifiers**

Lists any duplicate BACnet Device Object Identifiers found after an auto-discovery of BACnet devices is performed. The list contains the instance number of the BACnet Device Object Identifier and the network address (represented in hex notation) of each device with the same identifier instance number as another device on the network. The devices in this list are not included in the list of auto-discovered devices in the integration tree under the Engineering tab of the BACnet Integration object. The physical locations of BACnet devices with duplicate device identifiers must be determined, and their object identifiers changed to make them unique network-wide.

Back to [BACnet Integration Attributes](#).

### **Execution Time**

Records the amount of time taken for the last periodic update of all integrated BACnet objects. The value for this attribute can be used to tune the [Periodic Update](#) attribute. If the Execution Time is greater than the Periodic Update, attribute values of integrated BACnet objects are constantly being updated over the network.

Back to [BACnet Integration Attributes](#).

### **Periodic Update**

Specifies how frequently integrated BACnet objects update their attribute values. Every period, the BACnet Integration object prompts each integrated BACnet object that needs to update its attribute values. Also see the [Execution Time](#) attribute.

Back to [BACnet Integration Attributes](#).

### **Poll Delay**

Specifies the time in milliseconds between BACnet object polls for attribute values. The polls start at the time specified in the [Periodic Update](#) attribute. As the Poll Delay increases, the overall time in the [Execution Time](#) attribute increases. It is useful to specify a Poll Delay on sites where the rate of reading the remote objects causes too high a burden on the Metasys network or third-party device. The initial value of the Poll Delay attribute is blank (zero).

Back to [BACnet Integration Attributes](#).

### **Polled Object Count**

Indicates the number of mapped BACnet objects currently being polled on a periodic basis. The polling is limited to those mapped BACnet objects which are currently being accessed either by a feature or the UI (the Instance Number is typically smaller than the total [Count](#)).

Back to [BACnet Integration Attributes](#).

**Preserve Discovered Devices**

Controls the behavior when field device discovery is started. When this value is True, any devices which were previously discovered or already mapped remain in the list of discovered devices, without any attempt to reestablish communication with them. If this value is False, an attempt is made to reestablish communication with all devices, and devices which do not respond are not shown in the list of discovered devices. Set this value to False to rediscover devices which have been re-addressed on the network.

Back to [BACnet Integration Attributes](#).

**Requested Vendor ID**

Specifies a Vendor ID when discovering new devices to limit the device list displayed to that specified Vendor ID. The default value of this attribute is Null (stored as zero) which allows all vendors to be discovered and displayed.

The current list of Vendor IDs can be viewed at <http://www.bacnet.org/VendorID/BACnet%20Vendor%20IDs.htm>.

**Note:** If you do not want to display devices already discovered or mapped, then set [Preserve Discovered Devices](#) to False.

Back to [BACnet Integration Attributes](#).

# BACnet Protocol Engine Object

The BACnet Protocol Engine object maintains diagnostic statistics on communications with the BACnet devices on the network.

For general information on Metasys system objects, see the [Object Help](#) section.

## BACnet Protocol Engine Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 218: BACnet Protocol Engine Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Abort Rcv</a>	Number		0	
<a href="#">Abort Tx</a>	Number		0	
<a href="#">Ack Rcv</a>	Number		0	
<a href="#">Ack Tx</a>	Number		0	
<a href="#">Allocated Record Count</a>	Number		0	
<a href="#">Clear Statistic</a>	True or False		False	
<a href="#">Conf Req Rcv</a>	Number		0	
<a href="#">Conf Req Tx</a>	Number		0	
<a href="#">Error Rcv</a>	Number		0	
<a href="#">Error Tx</a>	Number		0	
<a href="#">Latch Statistics</a>	True or False		False	
<a href="#">Local Abort Tx</a>	Number		0	
<a href="#">Net Messages Rcv</a>	Number		0	
<a href="#">Net Messages Tx</a>	Number		0	
<a href="#">Net Rejects Rcv</a>	Number		0	
<a href="#">Net Routed Messages</a>	Number		0	
<a href="#">Net Routes Busy</a>	Number		0	
<a href="#">Net Unknown Msg Rcv</a>	Number		0	
<a href="#">Net Unknown Routes</a>	Number		0	
<a href="#">Peak Pending Queue Count</a>	Number		0	
<a href="#">Peak Unknown Queue Count</a>	Number		0	
<a href="#">Pending Queue Count</a>	Number		0	
<a href="#">Rcv Messages Discarded</a>	Number		0	
<a href="#">Rcv Msg Rate</a>	Number		0	
<a href="#">Rcv Record Count</a>	Number		0	
<a href="#">Record Count</a>	Number		0	
<a href="#">Reject Rcv</a>	Number		0	
<a href="#">Reject Tx</a>	Number		0	

**Table 218: BACnet Protocol Engine Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Req Retries Tx</a>	Number		0	
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Seg Ack Rcv</a>	Number		0	
<a href="#">Seg Ack Tx</a>	Number		0	
<a href="#">Seg Conf Req Rcv</a>	Number		0	
<a href="#">Seg Conf Req Tx</a>	Number		0	
<a href="#">Seg Retries Tx</a>	Number		0	
<a href="#">Segment Ack Rcv</a>	Number		0	
<a href="#">Segment Ack Tx</a>	Number		0	
<a href="#">Segment Rcv</a>	Number		0	
<a href="#">Segment Tx</a>	Number		0	
<a href="#">Simple Ack Rcv</a>	Number		0	
<a href="#">Simple Ack Tx</a>	Number		0	
<a href="#">Transaction Timeouts</a>	Number		0	
<a href="#">Transmits Per Minute</a>	Number		0	
<a href="#">Tx Messages Discarded</a>	Number		0	
<a href="#">Tx Record Count</a>	Number		0	
<a href="#">Unconfirmed Rcv</a>	Number		0	
<a href="#">Unconfirmed Tx</a>	Number		0	
<a href="#">Unknown Queue Count</a>	Number		0	

1 C - Configurable, N - Value Not Required, W - Writable

## BACnet Protocol Engine Attribute Details

### **Abort Rcv**

Contains the number of abort messages received. Aborts occur in response to a number of situations, such as communication or memory problems.

Back to [BACnet Protocol Engine Attributes](#).

### **Abort Tx**

Contains the number of abort messages sent.

Back to [BACnet Protocol Engine Attributes](#).

### **Ack Rcv**

Contains the number of complex acknowledgement messages received.

Back to [BACnet Protocol Engine Attributes](#).

### **Ack Tx**

Contains the number of complex acknowledgement messages sent.

Back to [BACnet Protocol Engine Attributes](#).

### **Allocated Record Count**

Indicates the number of state machines that have been allocated.

Back to [BACnet Protocol Engine Attributes](#).

**Clear Statistic**

Resets all of the attributes containing diagnostic statistics.

Back to [BACnet Protocol Engine Attributes](#).

**Conf Req Rcv**

Contains the number of confirmed request messages received.

Back to [BACnet Protocol Engine Attributes](#).

**Conf Req Tx**

Contains the number of confirmed request messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Error Rcv**

Contains the number of error messages received. An example of an error is an attempt to write to a read-only attribute.

Back to [BACnet Protocol Engine Attributes](#).

**Error Tx**

Contains the number of error messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Latch Statistics**

Updates the displayed statistics with the current values.

Back to [BACnet Protocol Engine Attributes](#).

**Local Abort Tx**

Contains the number of application layer abort messages generated locally (for example, messages that used up all allowed retries and did not get an acknowledge from the remote device).

Back to [BACnet Protocol Engine Attributes](#).

**Net Messages Rcv**

Contains the number of messages received at the network layer.

Back to [BACnet Protocol Engine Attributes](#).

**Net Messages Tx**

Contains the number of messages transmitted at the network layer.

Back to [BACnet Protocol Engine Attributes](#).

**Net Rejects Rcv**

Contains the number of reject messages received at the network layer.

Back to [BACnet Protocol Engine Attributes](#).

**Net Routed Messages**

Contains the number of messages routed through the network layer from one network (for example, IP) to another (for example, MS/TP).

Back to [BACnet Protocol Engine Attributes](#).

**Net Routes Busy**

Contains the number of messages not sent because the network route is busy or not initialized.

Back to [BACnet Protocol Engine Attributes](#).

**Net Unknown Msg Rcv**

Contains the number of unknown messages received at the network layer.

Back to [BACnet Protocol Engine Attributes](#).

**Net Unknown Routes**

Contains the number of messages not sent due to unknown route information.

Back to [BACnet Protocol Engine Attributes](#).

**Peak Pending Queue Count**

Indicates the largest number of client requests that were queued for transmission.

Back to [BACnet Protocol Engine Attributes](#).

**Peak Unknown Queue Count**

Indicates the largest number of client requests the unknown queue contained at one time.

Back to [BACnet Protocol Engine Attributes](#).

**Pending Queue Count**

Indicates the number of client requests currently queued for transmission.

Back to [BACnet Protocol Engine Attributes](#).

**Rcv Messages Discarded**

Indicates the number of messages received from the network that were not processed due to lack of resources or because there were too many requests for the Metasys Engine to process.

Back to [BACnet Protocol Engine Attributes](#).

**Rcv Msg Rate**

Indicate the number of messages received in the last minute.

Back to [BACnet Protocol Engine Attributes](#).

**Rcv Record Count**

Indicate the number of active state machines currently in use for receipt of requests from other BACnet devices (that is, the number of requests being processed at this moment).

Back to [BACnet Protocol Engine Attributes](#).

**Record Count**

Indicates the number of active state machines holding information on pending messages.

Back to [BACnet Protocol Engine Attributes](#).

**Reject Rcv**

Contains the number of reject messages received. Rejects occur in response to a variety of communication problems much like aborts and errors.

Back to [BACnet Protocol Engine Attributes](#).

**Reject Tx**

Contains the number of reject messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Req Retries Tx**

Contains the number of confirmed request messages re-sent due to timeout.

Back to [BACnet Protocol Engine Attributes](#).

**Reset Date**

Indicates the date of the last [Clear Statistic](#) command.

Back to [BACnet Protocol Engine Attributes](#).

**Reset Time**

Indicates the time of the last [Clear Statistic](#) command.

Back to [BACnet Protocol Engine Attributes](#).

**Seg Ack Rcv**

Contains the number of segmented complex acknowledgement messages received.

Back to [BACnet Protocol Engine Attributes](#).

**Seg Ack Tx**

Contains the number of segmented complex acknowledgement messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Seg Conf Req Rcv**

Contains the number of segmented confirmed request messages received.

Back to [BACnet Protocol Engine Attributes](#).

**Seg Conf Req Tx**

Contains the number of segmented confirmed request messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Seg Retries Tx**

Contains the number of segmented confirmed request messages re-sent due to timeout.

Back to [BACnet Protocol Engine Attributes](#).

**Segment Ack Rcv**

Contains the number of segment acknowledgement messages received.

Back to [BACnet Protocol Engine Attributes](#).

**Segment Ack Tx**

Contains the number of segment acknowledgement messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Segment Rcv**

Contains the number of segment messages received.

Back to [BACnet Protocol Engine Attributes](#).

**Segment Tx**

Contains the number of segment messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Simple Ack Rcv**

Contains the number of simple acknowledgement messages received.

Back to [BACnet Protocol Engine Attributes](#).

**Simple Ack Tx**

Contains the number of simple acknowledgement messages sent.

Back to [BACnet Protocol Engine Attributes](#).

**Transaction Timeouts**

Indicates the number of MS/TP Postpone messages sent due to a late reply to a received Confirmed Request message (that is, this device's applications could not process the request before a low-level MS/TP answer was required).

Back to [BACnet Protocol Engine Attributes](#).

**Transmits Per Minute**

Displays the calculated number of transmissions per minute.

Back to [BACnet Protocol Engine Attributes](#).

***Tx Messages Discarded***

Indicates the number of client requests aborted due to lack of resources. Usually, this situation occurs due to memory issues in the controller.

Back to [BACnet Protocol Engine Attributes](#).

***Tx Record Count***

Indicates the number of active state machines currently in use for transmission of client requests.

Back to [BACnet Protocol Engine Attributes](#).

***Unconfirmed Rcv***

Contains the number of unconfirmed messages received.

Back to [BACnet Protocol Engine Attributes](#).

***Unconfirmed Tx***

Contains the number of unconfirmed messages sent.

Back to [BACnet Protocol Engine Attributes](#).

***Unknown Queue Count***

Indicates the number of current client requests that need network address resolution.

Back to [BACnet Protocol Engine Attributes](#).

***BACnet Protocol Engine Commands***

The table below lists the commands supported by the [BACnet Protocol Engine Object](#).

**Table 219: BACnet Protocol Engine Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	None
<a href="#">Latch Statistics</a>	None

**BACnet Protocol Engine Command Details**

***Clear Statistics***

Resets all of the attributes containing diagnostic statistics.

Back to [BACnet Protocol Engine Commands](#).

***Latch Statistics***

Updates the displayed statistics with the current values.

Back to [BACnet Protocol Engine Commands](#).



## Binary Input Object

The Binary Input (BI) object's attributes represent the external, visible characteristics of a binary input. As a binary input, this object can be in either an Active or Inactive state. The [Polarity](#) attribute allows for normally open relays that are Active when energized and normally closed relays that are Inactive when energized.

The Binary Input object integrates N1, N2, and BACnet controllers into supervisory controllers, resulting in:

- a consistent interface to point objects for all controller types, so they appear as a homogenous set to the user interface
- flexibility in point mapping
- support for all Metasys controllers. See the [N2 Controller Object](#) section.

For example, this object allows you to map a fan status into a supervisory controller.

For general information on Metasys system objects, see [Common Object Attributes](#).

### Binary Input Concepts

#### BACnet Polarity Relationships

The relationship between the [Present Value](#) of an object and the physical state of the object is determined by the Polarity attribute.

The table below describes this relationship as defined by BACnet standards. Johnson Controls Polarity is always Normal. Johnson Controls N2 protocol does not support changes to the Polarity attribute.

**Table 220: BACnet Polarity Relationships**

Present Value	Polarity	Physical State of the Hardware Input	Physical State of the Monitored Device
Inactive	Normal	Off or Inactive	not running
Active	Normal	On or Active	running
Inactive	Reverse	On or Active	not running
Active	Reverse	Off or Inactive	running

### Binary Input Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 221: Binary Input Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Active Text<sup>2</sup></a>	Text		B		Limit: 20 characters
<a href="#">Active Time Reset<sup>3</sup></a>	Date/Time		B		
<a href="#">COS Count<sup>4</sup></a>	Number	W	B		0–4,294,967,295
<a href="#">COS Time<sup>4</sup></a>	Date/Time		B		
<a href="#">Device Type</a>	Text	CW	BW	Null	Limit: 20 characters
<a href="#">Elapsed Active Time</a>	Number		B	Null	0–4,294,967,295 Units = seconds

**Table 221: Binary Input Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Inactive Text<sup>2</sup></i>	Text		B		Limit: 20 characters
<i>Intrinsic Alarming Defined</i>	True or False	C		False	
<i>Out of Service</i>	True or False	CW	BW	False	
<i>Polarity</i>	One value from a set		BW		Normal, Reverse
<i>Present Value</i>	Real value	DNRW	BW	0	
<i>Reliability</i>	One state from a set	W	BW	Reliable	No Fault Detected (Reliable), No Sensor, Open Loop, Shorted Loop, Unreliable Other, Communication Failure
<i>State Count Reset<sup>4</sup></i>	Date/Time		B		
<i>States Text</i>	One value from a list	CW		Off On	
<i>Status Flags</i>	Series of True or False values		B	False, False, False, False	In Alarm, Fault, Overridden, Out of Service
<i>Use Remote Alarming</i>	True or False		BCW	False	

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object Reliability, W - Writable

2 If either Inactive Text or Active Text is present, both are present.

3 If either Elapsed Active Time or Time of Active Time Reset is present, both are present.

4 If Change of State Time, Change of State Count, or Time of State Count Reset is present, all are present.

## Binary Input Attribute Details

### Active Text

Characterizes the intended effect of the Active state of *Present Value* from the viewpoint of the operator. The content of this string is a local matter but is intended to represent a readable description of the Active state.

For example, if the physical input is a switch contact, then the *Active Text* attribute is assigned a value such as Fan 1 On. If either the Active Text or the *Inactive Text* attribute is present, both of them are present.

Back to [Binary Input Attributes](#).

### Active Time Reset

Represents the last date and time *Elapsed Active Time* was set to a zero value. If either Elapsed Active Time or Time of Active Time Reset is present, all are present.

Back to [Binary Input Attributes](#).

### COS Count

Represents the number of times the *Present Value* attribute changes state since the COS Count attribute was most recently set to zero. A change of state is any event that alters Present Value. This attribute persists in the archive.

Back to [Binary Input Attributes](#).

### **COS Time**

Represents the date and time at which the most recent change of state occurred. A change of state is any event that alters the *Present Value* attribute. When *Out of Service* is False, a change to the *Polarity* attribute alters Present Value and is considered a change of state. When Out of Service is True, changes to Polarity do not cause changes of state.

Back to [Binary Input Attributes](#).

### **Device Type**

Contains a description of the physical device connected to the object.

Back to [Binary Input Attributes](#).

### **Elapsed Active Time**

Represents the accumulated number of seconds *Present Value* is Active since the *Elapsed Active Time* attribute was most recently set to zero. This attribute value updates automatically a minimum of once a day.

Back to [Binary Input Attributes](#).

### **Inactive Text**

Characterizes the intended effect of the Inactive state of *Present Value* attribute from the viewpoint of the operator. The content of this string is a local matter, but it is intended to represent a readable description of the Inactive state.

For example, if the physical input is connected to a switch contact, then the Inactive Text attribute is assigned a value such as Fan 1 Off. If either the Inactive Text or *Active Text* attribute is present, both are present.

Back to [Binary Input Attributes](#).

### **Intrinsic Alarming Defined**

Enables the BACnet Intrinsic Alarming feature in the object and the definition of related attributes. For detailed information, see [BACnet Intrinsic Alarming](#).

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### **Out of Service**

Indicates (when True) that the *Present Value* and *Reliability* attributes are decoupled from the physical input to the object and their values may be changed for simulation or testing purposes. Functions that depend on the values of the Present Value or Reliability attributes continue to respond to changes while Out of Service is True, as if those changes had come from the physical input.

Additionally, the Out of Service state of the *Status Flags* attribute is set to True and the Fault state is decoupled from the physical input when Out of Service is True.

Back to [Binary Input Attributes](#).

### **Polarity**

Indicates the relationship between the physical state of the input and the logical state represented by *Present Value*. The Johnson Controls N2 Polarity attribute is always Normal.

Back to [Binary Input Attributes](#).

### **Present Value**

Indicates the current value of the binary input. Polarity determines the relationship between Present Value and the state of the input. When *Out of Service* is True, Present Value is writable.

Back to [Binary Input Attributes](#).

### **Reliability**

Indicates if the *Present Value* is unreliable.

Examples:

- **Reliable** - No detectable faults
- **Communication Failure** - Communication to the sensor or device reading the sensor has failed.

When *Out of Service* is True, the Reliability attribute may be written directly.

Back to [Binary Input Attributes](#).

### **State Count Reset**

Represents the date and time the *COS Count* attribute was most recently set to a zero value. If *COS Time* or Change of State Count is present, both are present.

Back to [Binary Input Attributes](#).

### **States Text**

Indicates the displayed strings for the *Present Value*.

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### **Status Flags**

Indicates the general status of the input object in BACnet terms and contains four independent states.

The four flags are:

- **In Alarm** - False if the Event State attribute value is Normal; otherwise, the In Alarm flag is True. (Set only by BACnet Intrinsic Alarming.)
- **Fault** - True (1) if the *Reliability* attribute is **not** reliable; otherwise, the Fault flag is False.
- **Overridden** - Overridden flag is True if the *Present Value* is overridden from the hardware source level.
- **Out of Service** - Out of Service flag is True if the *Out of Service* attribute value is True; otherwise, the Out of Service flag is False.

Back to [Binary Input Attributes](#).

### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Binary Input Attributes](#).

## **Binary Input Commands**

The table below lists the commands supported by the *Binary Input Object*.

**Table 222: Binary Input Commands**

Command Name	Number of Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">In Service</a>	
<a href="#">Out of Service</a>	The value to be written to the <i>Present Value</i> .

## **Binary Input Command Details**

### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Binary Input Commands](#).

### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Binary Input Commands](#).

### **In Service**

Cancels the affect of an [Out of Service](#) command and returns the [Out of Service](#) attribute to False. The [Present Value](#) and [Reliability](#) will revert back to the values obtained from the physical input.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Binary Input Commands](#).

### **Out of Service**

Allows a user to override the object's hardware input for simulation or other purposes. The [Out of Service](#) command will change the Out of Service attribute to True, write the Present Value to the value of the command parameter and write the [Reliability](#) attribute to Reliable. The Present Value and Reliability will no longer track the physical input.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Binary Input Commands](#).

## Binary Output Object

The BO object's attributes represent the external, visible characteristics of a binary output. As a binary output, this object can be in either an Active or Inactive state. The *Polarity* attribute allows for normally open relays that are Active when energized and normally closed relays that are Inactive when energized. This object integrates N1, N2, and BACnet controllers into supervisory controllers, resulting in:

- a consistent interface to point objects for all controller types, so they appear as a homogenous set to the user interface
- flexibility in point mapping
- support for all Metasys controllers. See [N2 Controller Object](#).

For example, this object allows you to start or stop a fan from a supervisory controller.

For general information on Metasys system objects, see [Common Object Attributes](#).

### Binary Output Concepts

#### BACnet Polarity Relationships

The relationship between the *Present Value* of an object and the physical state of the object is determined by the *Polarity* attribute.

**Note:** The table below describes this relationship as defined by BACnet standards. Johnson Controls Polarity is always Normal. Johnson Controls does not support changes to the Polarity attribute.

**Table 223: BACnet Polarity Relationships**

Present Value	Polarity	Physical State of the Hardware Input	Physical State of the Monitored Device
Inactive	Normal	Off or Inactive	not running
Active	Normal	On or Active	running
Inactive	Reverse	On or Active	not running
Active	Reverse	Off or Inactive	running

### Binary Output Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 224: Binary Output Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Active Text</a>	Text				Limit: 20 characters
<a href="#">Active Time Reset</a>	Date/Time				
<a href="#">COS Count</a>	Number	W		0	0–4,294,967,295
<a href="#">COS Time</a>	Date/Time				
<a href="#">Device Type</a>	Text	CW	W	Null	Limit: 20 characters
<a href="#">Elapsed Active Time</a>	Number			0	0–4,294,967,295 Units = seconds
<a href="#">Heavy Equip Delay</a>	Number	CW	Not supported	0	Range: 0–255 Seconds

**Table 224: Binary Output Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>HED Controller</i>	Number	CW	Not supported		1–5
<i>Inactive Text</i>	Text				Limit: 20 characters
<i>Intrinsic Alarming Defined</i>	True or False	C	Not supported	False	False True
<i>Min Off Time</i>	Number	CW	W	0	0–604,800 Units = seconds
<i>Min On Time</i>	Number	CW	W	0	0–604,800 Units = seconds
<i>Out of Service</i>	True or False		W		False True
<i>Polarity</i>	One value from a set				Normal, Reverse
<i>Present Value</i>	One value from a set	DRW	DRW		Inactive, Active <i>States Text</i> attribute identifies the value set for this attribute.
<i>Priority Array</i>	Set of values				
<i>Reliability</i>	One value from a set			Reliable	No Fault Detected (Reliable), No Output, Open Loop, Shorted Loop, Unreliable Other, Communication Failure
<i>State Count Reset</i>	Date/Time				
<i>States Text</i>	One value from a set	CW		Off On	
<i>Status Flags</i>	Series of True or False states			False, False, False, False	In Alarm, Fault, Overridden, Out of Service
<i>Use Remote Alarming</i>	True or False		BCW	False	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object's Reliability, W - Writable

## Binary Output Attribute Details

### Active Text

Characterizes the intended effect of the Active state of *Present Value* from the viewpoint of the operator. The content of this string is a local matter but is intended to represent a readable description of the Active state.

For example, if the physical output is a switch contact, then the Active Text attribute is assigned a value such as Fan 1 On. If either the Active Text or the *Inactive Text* attribute is present, both of them are present.

Back to [Binary Output Attributes](#).

### Active Time Reset

Represents the last date and time *Elapsed Active Time* set to a zero value. If either Elapsed Active Time or Active Time Reset is present, both are present.

Back to [Binary Output Attributes](#).

**COS Count**

Represents the number of times the [Present Value](#) attribute changed state since the COS Count attribute was last set to zero. A change of state is any event that alters Present Value. This attribute persists in the archive.

Back to [Binary Output Attributes](#).

**COS Time**

Represents the date and time at which the most recent change of state occurred. A change of state is any event that alters the [Present Value](#) attribute. When [Out of Service](#) is False, a change to the [Polarity](#) attribute alters Present Value and is considered a change of state. Changes to Polarity do not cause changes of state.

Back to [Binary Output Attributes](#).

**Device Type**

Contains a description of the physical device connected to the object.

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**Elapsed Active Time**

Represents the accumulated number of seconds [Present Value](#) is Active since the Elapsed Active Time attribute was last set to zero. This attribute value updates automatically a minimum of once a day.

Back to [Binary Output Attributes](#).

**Heavy Equip Delay**

Indicates the amount of time that this output point adds to the Accumulated Delay attribute of the Heavy Equipment Controller (HEC) object when this point is started. The next output point is delayed by that amount of time of the HEC Accumulated Delay is not already decremented to zero.

The NAE device's five internal Heavy Equipment Controller objects (see [HED Controller](#)) time their delays independently of one another. For example, HED 1 and HED 4 can count down their delays at the same time.

Back to [Binary Output Attributes](#).

**HED Controller**

Identifies the Heavy Equipment Controller (HEC) object managing the delays.

The NAE device has five internal Heavy Equipment Controller objects for use by BO and Multistate Output (MO) objects. The BO and MO objects reference the Heavy Equipment Delay (HED) controller objects by number (1-5).

All BO and MO objects on an NAE share the five internal HED controller objects. For example, if BO1 and MO3 on NAE-1 reference HED controller 1, they are using the same HED controller.

Also see [Heavy Equip Delay](#).

Back to [Binary Output Attributes](#).

**Inactive Text**

Characterizes the intended effect of the Inactive state of [Present Value](#) attribute from the viewpoint of the operator. The content of this string is a local matter, but it is intended to represent a readable description of the Inactive state.

For example, if the physical output is connected to a switch contact, then the Inactive Text attribute is assigned a value such as Fan 1 Off. If either the Inactive Text or [Active Text](#) attribute is present, then both are present.

Back to [Binary Output Attributes](#).

**Intrinsic Alarming Defined**

Enables the definition of the intrinsic alarm related attributes.

Back to [Binary Output Attributes](#).

**Min Off Time**

Represents the fewest number of seconds [Present Value](#) remains in the Inactive state after entering the Inactive state.



Back to [Binary Output Attributes](#).

#### **Min On Time**

Represents the fewest number of seconds [Present Value](#) remains in the Active state after entering the Active state.

Back to [Binary Output Attributes](#).

#### **Out of Service**

Used to decouple the object from the physical output. When out of service is True, the object will decouple [Present Value](#) and [Reliability](#) from the hardware. The Reliability will be writable when Out Of Service is True. Not all devices support setting this attribute to True.

Back to [Binary Output Attributes](#).

#### **Polarity**

Indicates the relationship between the physical state of the output and the logical state represented by [Present Value](#). If the Polarity attribute is Normal, then the Active state of the Present Value attribute is also the Active or On state of the physical output as long as [Out of Service](#) is False. If the Polarity attribute is Reverse, then the Active state of the Present Value attribute is in the Inactive or Off state of the physical output as long as Out of Service is False. If Out of Service is False for a constant physical output state, a change in the Polarity attribute produces a change in Present Value. If Out of Service is True, the Polarity attribute has no effect on Present Value. The N2 Polarity attribute is always Normal.

Back to [Binary Output Attributes](#).

#### **Present Value**

Indicates the current value of the binary output. [Polarity](#) determines the relationship between Present Value and the state of the output.

Back to [Binary Output Attributes](#).

#### **Priority Array**

Lists values of the object in level of importance.

Back to [Binary Output Attributes](#).

#### **Reliability**

Indicates whether the [Present Value](#) is unreliable and why. When [Out of Service](#) is True, the Reliability may be written directly.

Back to [Binary Output Attributes](#).

#### **State Count Reset**

Represents the date and time the [COS Count](#) attribute was last set to a zero value. If the [COS Time](#), Change of State Count, or State Count Reset attribute is present, all of these attributes are present.

Back to [Binary Output Attributes](#).

#### **States Text**

Indicates the displayed strings for the [Present Value](#).

#### **Status Flags**

Represents four true or false flags that indicate the general health of an analog output. Three flags are associated with the values of other attributes of the object.

The four flags are:

- **In Alarm** - In Alarm flag is False (0) if the Event State attribute value is Normal; otherwise, the In Alarm flag is True (1).
- **Fault** - Fault flag is True (1) if the [Reliability](#) attribute is **not** reliable; otherwise, the Fault flag is False (0).

- **Overridden** - Overridden flag is Logical 1 if the *Present Value* is decoupled from the hardware output because operator intervention provided a different value or local override is active.
- **Out of Service** - Out of Service flag is True if the *Out of Service* attribute value is True; otherwise, the Out of Service flag is False.

Back to [Binary Output Attributes](#).

### Use Remote Alarming

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Binary Output Attributes](#).

## Binary Output Commands

The table below lists the commands supported by the *Binary Output Object*.

**Table 225: Binary Output Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">In Service</a>	
<a href="#">Operator Override</a>	The value to be written to the <i>Present Value</i>
<a href="#">Out of Service</a>	
<a href="#">Release Operator Override<sup>1</sup></a>	
<a href="#">Release<sup>1</sup></a>	1. Attribute name 2. Command priority
<a href="#">Release All<sup>1</sup></a>	Attribute name
<a href="#">State0 . . State1</a>	

<sup>1</sup> For the Release Operator Override, Release, and Release All commands, if all Command Priorities have been released and a Relinquish Default is not defined, the supervisory controller gives control over to the actual hardware.

## Binary Output Command Details

### Disable Alarms

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Binary Output Commands](#).

### Enable Alarms

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Binary Output Commands](#).

### In Service

Cancels the affect of an Out of Service command and returns the *Out of Service* attribute to False. The *Present Value* and *Reliability* will revert back to the values obtained from the physical hardware output.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Binary Output Commands](#).

### **Operator Override**

Updates the [Present Value](#) at Command Priority equal to Operator Override (8).

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when one of the following conditions is met:

1. NOT Local Control and NOT Out Of Service, or
2. NOT Local Control and after issuing the In Service command.

Back to [Binary Output Commands](#).

### **Out of Service**

Allows a user to override the object's hardware output for simulation or other purposes. The Out of Service command changes the Out of Service attribute to True. The Present Value and Reliability no longer track the physical output. No commands are sent to the actual hardware. When the [Out of Service](#) attribute is set to False, the current [Present Value](#) is sent to the actual hardware.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Binary Output Commands](#).

### **Release Operator Override**

Releases Command Priority Operator Override (8) from [Present Value](#).

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### **Release**

Releases the identified command priority from the specified, writable attribute, and allows it to be controlled by the next highest priority.

Back to [Binary Output Commands](#).

### **Release All**

Releases Command Priorities 3 through 16 (Default) from the specified, writable attribute. Command Priorities 1 and 2 remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space might overcool or overheat, a fan might run longer than expected, and so on.

If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [Binary Output Commands](#).

### **State0. . . State1**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the [Present Value](#) at the Default (16) command priority. If this is the highest, it is sent to the controller. The state command names and number of commands are dependent on the [States Text](#) attribute.

**Important:** Be aware that an operator state command releases the actions of any processes running to the object in the NxE or FEC controllers that use Priorities 9 through 16. Consider this behavior when creating control strategies.

If Local Control is True, this command is rejected.

Back to [Binary Output Commands](#).

## Binary Value Object

Binary Value (BV) objects have similar software characteristics and capabilities to a [Binary Input Object](#); however, Binary Value objects are not associated with any physical hardware and are the result of a control process or operator entry. This object allows you to hold a binary value for other objects to reference. For example, an [Interlock Object](#) can reference and base its operation on a binary value such as duty/standby.

For general information on Metasys system objects, see [Common Object Attributes](#).

### Binary Value Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 226: Binary Value Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Active Text<sup>2</sup></a>	Text				Limit: 20 characters
<a href="#">Active Time Reset</a>	Date/Time				
<a href="#">COS Count<sup>3</sup></a>	Number	W		0	0–4,294,967,295
<a href="#">COS Time<sup>3</sup></a>	Date/Time			Null	
<a href="#">Elapsed Active Time<sup>4</sup></a>	Number			Null	0–4,294,967,295 Units = seconds
<a href="#">Inactive Text<sup>2</sup></a>	Text				Limit: 20 characters
<a href="#">Intrinsic Alarming</a>	True or False	C	Not supported	False	False True
<a href="#">Min Off Time</a>	Number	CW	W	0	0–4,294,967,295 Units = seconds
<a href="#">Min On Time</a>	Number	CW	W	0	0–4,294,967,295 Units = seconds
<a href="#">Out of Service</a>	True or False		W	False	Always False
<a href="#">Present Value<sup>5</sup></a>	Multistate	DRW	DRW		Inactive, Active <a href="#">States Text</a> attribute identifies the value set for this attribute.
<a href="#">Priority Array</a>	Set of values				
<a href="#">Reliability</a>	Multistate	W	W	Reliable	No Fault Detected (Reliable), Unreliable Other, Communication Failure
<a href="#">State Count Reset<sup>3</sup></a>	Date/Time				
<a href="#">States Text</a>	One state from a set	CW		Inactive, Active	

**Table 226: Binary Value Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Status Flags</a>	Series of True or False states				In Alarm, Fault, Overridden, Out of Service
<a href="#">Use Remote Alarming</a>	True or False		BCW	False	

1 C - Configurable, D - Default Attribute for Display, R - Affected by Object's Reliability, W - Writable

2 If either Inactive Text or Active Text is present, both are present.

3 If Change of State Time, Change of State Count, or State Count Reset is present, all are present.

4 If either Elapsed Active Time or Active Time Reset is present, both are present.

5 Present Value is commandable; it is also writable. This attribute is writable when Out of Service is True.

## Binary Value Attribute Details

### **Active Text**

Characterizes the intended effect of the Active state of [Present Value](#) from the viewpoint of the operator. The content of this string is a local matter but is intended to represent a readable description of the Active state. If either the Active Text or the [Inactive Text](#) attribute is present, both of them are present.

Back to [Binary Value Attributes](#).

### **Active Time Reset**

Represents the last date and time [Elapsed Active Time](#) set to a zero value. If either Elapsed Active Time or Time of Active Time Reset is present, both are present.

Back to [Binary Value Attributes](#).

### **COS Count**

Represents the number of times the [Present Value](#) attribute changed state since the COS Count attribute was last set to zero. A change of state is any event that alters Present Value. This attribute persists in the archive.

This attribute is persisted in the archive.

Back to [Binary Value Attributes](#).

### **COS Time**

Represents the date and time at which the most recent change of state occurred. A change of state is any event that alters the logical state of Binary Value.

Back to [Binary Value Attributes](#).

### **Elapsed Active Time**

Represents the accumulated number of seconds [Present Value](#) is Active since the Elapsed Active Time attribute was last set to zero. This attribute value updates automatically a minimum of once a day.

Back to [Binary Value Attributes](#).

### **Inactive Text**

Characterizes the intended effect of the Inactive state of [Present Value](#) attribute from the viewpoint of the operator. The content of this string is a local matter, but it is intended to represent a readable description of the Inactive state. If either the Inactive Text or [Active Text](#) attribute is present, both are present.

Back to [Binary Value Attributes](#).

### **Intrinsic Alarming**

Enables the definition of the intrinsic alarm related attributes.

Back to [Binary Value Attributes](#).

### **Min Off Time**

Represents the least number of seconds [Present Value](#) remains in the Inactive state after entering the Inactive state.

Back to [Binary Value Attributes](#).

#### **Min On Time**

Represents the least number of seconds [Present Value](#) remains in the Active state after entering the Active state.

Back to [Binary Value Attributes](#).

#### **Out of Service**

Indicates the offline/online state of the connected hardware. This attribute exists for compatibility with BACnet protocol and indicates whether the physical input that the object represents is in service. When out of service, the physical input is not coupled to changes in the [Present Value](#). The object does not send commands to the hardware. This attribute is always False due to the absence of hardware.

Back to [Binary Value Attributes](#).

#### **Present Value**

Indicates the current value of the binary value. When [Out of Service](#) is True, Present Value is writable. Present Value is optionally commandable. If Present Value is commandable, [Priority Array](#) and Relinquish Default are both present.

Back to [Binary Value Attributes](#).

#### **Priority Array**

Lists values of the object in level of importance. If Priority Array or Relinquish Default is present, both are present. If [Present Value](#) is commandable, Priority Array and Relinquish Default are both present and Present Value is writable.

Back to [Binary Value Attributes](#).

#### **Reliability**

Indicates whether the [Present Value](#) is unreliable and why.

Back to [Binary Value Attributes](#).

#### **State Count Reset**

Represents the date and time the [COS Count](#) attribute was last set to a zero value. If [COS Time](#), Change of State Count, or Time of State Count Reset is present, all are present.

Back to [Binary Value Attributes](#).

#### **States Text**

Indicates the displayed strings for the [Present Value](#). For BACnet compliant objects, if no States Text is specified when the object is created, the Inactive Text and Active Text are used to derive the equivalent States Text if possible.

Back to [Binary Value Attributes](#).

#### **Status Flags**

Contains four true or false flags that indicate the general health of the object. Three of the four flags are associated with the values of other attributes within the same object. By reading these attributes, you can achieve a clearer picture of the object status.

The four flags are:

- **In Alarm** - In Alarm flag is False (0) if the Event State attribute value is Normal; otherwise, the In Alarm flag is True (1).
- **Fault** - Fault flag is True (1) if the [Reliability](#) attribute is **not** reliable; otherwise, the Fault flag is False (0).
- **Overridden** - Overridden flag is Logical 1 if the [Present Value](#) has been overridden by some mechanism local to the BACnet device or because operator intervention provided a different value.
- **Out of Service** - Out of Service flag is True if the [Out of Service](#) attribute value is True; otherwise, the Out of Service flag is False.

Back to [Binary Value Attributes](#).

### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Binary Value Attributes](#).

## **Binary Value Commands**

The table below lists the commands supported by the [Binary Value Object](#).

**Table 227: Binary Value Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">Operator Override</a>	The value to be written to the <a href="#">Present Value</a> attribute.
<a href="#">Release Operator Override</a>	
<a href="#">Release</a>	1. Attribute name 2. Command priority
<a href="#">Release All</a>	Attribute name
<a href="#">State0</a>	
<a href="#">State1</a>	

### **Binary Value Command Details**

#### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Binary Value Commands](#).

#### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Binary Value Commands](#).

#### **Operator Override**

Updates the [Present Value](#) at Command Priority Operator Override (8).

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when one of the following conditions is met:

1. NOT Local Control and NOT Out Of Service, or
2. NOT Local Control and after issuing the In Service command.

Back to [Binary Value Commands](#).

#### **Release Operator Override**

Releases Command Priority Operator Override (8) from [Present Value](#).

Back to [Binary Value Commands](#).

#### **Release**

Releases the identified command priority from the specified, writable attribute, and allows it to be controlled by the next highest priority.

Back to [Binary Value Commands](#).

### **Release All**

Releases Command Priorities 3 through 16 from the specified, writable attribute. Command Priorities 1 (Manual Emergency) and 2 (Fire Application) remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space could overcool or overheat, a fan might run longer than expected, and so on.

If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [Binary Value Commands](#).

### **State0**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the [Present Value](#) at the Default (16) command priority.

**Important:** Be aware that an operator state command releases the actions of any processes running to the object in the NxE or FEC controllers that use Priorities 9 through 16. Consider this behavior when creating control strategies.

Back to [Binary Value Commands](#).

### **State1**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the [Present Value](#) at the Default (16) command priority.

**Important:** Be aware that an operator state command releases the actions of any processes running to the object in the NxE or FEC controllers that use Priorities 9 through 16. Consider this behavior when creating control strategies.

Back to [Binary Value Commands](#).



# Calendar Object

The Calendar object is used behind the scenes by the [Scheduling](#) feature by maintaining a list of dates designated as exceptions to the normal schedule. [Exception Schedule](#) days are days when you do not want the [Schedule](#) to operate, such as holidays. They can be defined as specific dates or ranges of dates. Typically, a [Schedule](#) object references a Calendar object, which lists the days the weekly schedule should not operate. A Schedule object working from a chosen Calendar reads the [Present Value](#) of the Calendar object, which indicates if the current day is within the [Date List \(Entry Detail\)](#) of the Calendar.

A different set of activities from those in the weekly schedule can be defined in the Schedule object to occur on these exception days. Multiple Schedule objects can reference a single Calendar object so that only the Calendar object needs to be changed to affect all schedules.

This object allows you to accommodate for a special day or days, like a holiday, in which the building controls should run differently from usual, in accordance with the change in the number of people and the amount of activity in the building.

For general information on Metasys system objects, see [Common Object Attributes](#).

For more information on the Scheduling feature and how to create a calendar, see [Scheduling](#). For detailed information on the Calendar object, see [Calendar Attributes](#). For more information on global calendar function, see [Global Calendar](#).

## Calendar Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 228: Calendar Attributes - Calendar Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Date List (Entry Detail)</a>	Date/Time	CW	W		
<a href="#">Global Calendar Object Reference</a>	Attribute reference	CW	W		
<a href="#">Global Calendar Update</a>	Date/Time				
<a href="#">Present Value</a>	True or False	D	D	False	

1 C - Configurable, D - Default Attribute for Display, W - Writable

## Calendar Attribute Details

### [Date List \(Entry Detail\)](#)

Lists dates defined as entries to the Calendar object. Each entry is either an individual date, range of dates, or month/week-of-month/day-of-week specification. If the current date matches any calendar entry, the [Present Value](#) is set to True. Also, individual fields of an entry can be left unspecified, thus acting as [Wildcards](#), or include all options. If a device allows writing to Date List, all date choices are permitted.

Back to [Calendar Attributes](#).

### [Global Calendar Object Reference](#)

Specifies a globally referenced calendar (if any) used as the master calendar for the site. Specifying a global calendar allows a site to synchronize many calendars so that only a single calendar (master calendar) needs to be changed. If you are using calendar references, you usually set up field controllers that reference a calendar on the engine, and engines that reference a calendar on a single supervisory engine, which is designated as the master calendar.

Back to [Calendar Attributes](#).

**Global Calendar Update**

Specifies a time and date when the local calendar date list was last updated from the master calendar. If no calendar is referenced by the device, then the global calendar update remains unspecified.

**Note:** If a calendar references a master calendar, the date list is not writable and the Edit button within the UI is unavailable.

Back to [Calendar Attributes](#).

**Present Value**

Indicates the current value of the Calendar. Present Value is True if the current date is in the [Date List \(Entry Detail\)](#) and False if the current date is not in the Date List.

Back to [Calendar Attributes](#).

# Data Broadcast Object

The Data Broadcast object provides a means of sharing globally useful data with third-party BACnet devices. The data value from an object/attribute to be shared is referenced by this object. Typically, this data may be the outdoor air temperature, or a value indicating whether a building is occupied. The Data Broadcast then broadcasts an [Unconfirmed COV Notification](#) message containing the referenced data value when it changes.

On a site containing only Metasys devices, the Data Broadcast object is not useful, and should not be created.

As the number of these objects on a site increases, the network performance may suffer due to excessive broadcasts. Therefore, use Data Broadcast objects only when necessary.

For general information on Metasys system objects, see the [Object Help](#) section.

For more information on the wizard used to create the Data Broadcast object, see [Insert Object - Data Broadcast](#) in the [Wizards](#) section.

## Data Broadcast Concepts

### Unconfirmed COV Notification

Unconfirmed COV Notification is a BACnet service that can be used to distribute object attributes of wide interest to many devices simultaneously without a subscription.

### Data Broadcast Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 229: Data Broadcast Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">COV Period</a>	Number	CNW	Null	Units = seconds Range = 30–86,400
<a href="#">Input Reference</a>	Attribute reference	C	Null	
<a href="#">Message Transmits</a>	Number		0	
<a href="#">Reliability</a>	One state from a set		Input Unreliable	

1 C - Configurable, N - Value Not Required, W - Writable

## Data Broadcast Attribute Details

### COV Period

Broadcasts an Unconfirmed COV on a periodic basis. When set to a value from 30 to 86,400, this object issues an Unconfirmed COV containing the attribute value and status flags at least once every period. This broadcast occurs even when the value remains unchanged. If an actual change of value occurs during the period and a COV is sent, the timer for the periodic COV resets. To disable the periodic broadcast feature, clear the value from the COV Period and save the change. The null entry represents not sending periodic COVs. The maximum range for this value is 86,400 seconds (24 hours). By default, this feature is disabled.

Back to [Data Broadcast Attributes](#).

### Input Reference

Specifies the object and attribute value that is monitored for COVs. This object's attribute value, if reliable, is then broadcast in an [Unconfirmed COV Notification](#) message.

Back to [Data Broadcast Attributes](#).

### **Message Transmits**

Provides a count of the number of [Unconfirmed COV Notification](#) messages that have been sent by the Data Broadcast object. After reaching 4,294,967,295, the value rolls over to 0 and the count continues.

Back to [Data Broadcast Attributes](#).

### **Reliability**

Specifies the reliability of the Data Broadcast object. The reliability changes to Input Unreliable when errors with the [Input Reference](#) occur.

Back to [Data Broadcast Attributes](#).

## **Data Broadcast Commands**

The following table lists the commands supported by the [Data Broadcast Object](#).

**Table 230: Data Broadcast Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	

### **Data Broadcast Command Details**

#### **Disable**

Locks all outputs and prevents the object from broadcasting any messages.

Back to [Data Broadcast Commands](#).

#### **Enable**

Specifies that the Data Broadcast object broadcasts [Unconfirmed COV Notification](#) messages when the [Input Reference](#) changes.

Back to [Unconfirmed COV Notification](#).

# Demand Limiting/Load Rolling (DLLR) Object

The Demand Limiting feature helps you save money by limiting peak energy usage. The Load Rolling feature helps save money by reducing overall energy consumption. The Demand Limiting (DL) portion of DLLR selectively turns off (sheds) equipment, such as fans and lights, or adjusts setpoints to limit energy use during peak times. The Load Rolling (LR) portion acts continuously to maintain a specified energy reduction by shedding unnecessary loads. A facility can implement either one or both of these strategies.

The DLLR object represents the attributes, commands, and reports that define the DLLR functionality. For information on the features and operation of DLLR, refer to the *DLLR Technical Bulletin (LIT-12011288)*.


## DLLR Object Attributes

The DLLR object is divided into three tabs, the [Focus/Configuration Tab](#), the [Profile Tab](#), and the [Load Summary Tab](#). If you add extensions to this object, see [Extensions](#) for descriptions of the extension tabs.

## DLLR Object Features

DLLR Object Icon

Table 231: DLLR Object Icon

Icon	Key Words
	Gears, Spinning gears

## Focus/Configuration Tab

### Object Attributes

#### Name

The Name attribute contains a freely definable user-friendly name for the object that is independent of the Item Reference or the location of the object in the physical network. The Name is used as the label in the All Items navigation tree. The Name is shown in alarm reports, the event and audit viewers, and in summaries. The Name **does not** need to be unique to the site.

The Name defaults to the object identifier you used during manual object creation but can be edited later.

#### Description

The Description attribute contains a user-defined description of the object.

#### Object Type

The Object Type attribute indicates the Object Type as displayed in the Metasys software and as exposed to a BACnet network.

Example: DLLR (Demand Limiting Load Rolling).

#### Object Category

The Object Category classifies the object by the category of system or equipment that it monitors to aid in the determination of user access privileges and alarm routing.

Examples: Energy, HVAC, Fire, Security

### Status Attributes

#### Enabled

The Enabled attribute provides a mechanism to stop DLLR operation. When disabled, DLLR releases all shed loads except those that are locked shed. Also, DLLR does not perform any calculations, report alarms, or issue any commands to any loads when disabled. DLLR attributes can be changed, but no actions are taken until DLLR is enabled.

When enabled, DLLR operation starts again. If Shed mode is active, the configured DLLR strategies begin shedding loads as needed. If Monitor Only mode is configured, simulated load shedding begins.

**Alarm State**

Indicates the current Warning or Alarm state of an object. This attribute is set by an Alarm Extension associated with the object.

**DLLR Status**

The DLLR Status attribute indicates the current DLLR status. The statuses include:

- Normal - no errors or problems in the DLLR object
- LR cannot meet target - the Load Rolling algorithm was unable to shed enough loads to meet its target.
- DL cannot meet target - the Demand Limiting algorithm was unable to shed enough loads to meet its target.
- Meter Off Normal - a meter is defined, but it is offline or its value is not reliable.
- EOI Off Normal - an End of Interval (EOI) attribute is defined, but it is offline or its value is not reliable. This also indicates that the EOI Attribute is replaced with the fixed window algorithm.
- Disabled - the DLLR object is not being used to shed (or simulate the shedding of) loads.
- No meter defined for DL - a meter is not currently defined for DL; a requirement if the Shed Strategy includes Demand Limiting.

**Meter Status**

The Meter Status attribute indicates the status of the meter, if the meter is defined. The meter status includes:

- Undefined
- Normal
- Off Normal

**EOI Status**

The EOI Status attribute indicates the status of the EOI object, if the EOI object is defined. The EOI Status attribute uses the same status set as [Meter Status](#).

**Operational Data Attributes****Energy Rate**

The Energy Rate attribute displays the current rate from the meter, if a meter is defined.

**Interval Demand**

The Interval Demand attribute displays the average energy demand over the current interval.

**Amount Shed**

The Amount Shed attribute indicates how much energy is currently shed. It is the default attribute of the DLLR object and is displayed near the top of the DLLR object window.

**Calculated Demand**

When DLLR is in Monitor Only mode, the Calculated Demand attribute indicates the energy rate when DLLR is in Shed mode (energy rate - amount shed). This attribute is blank when DLLR is in Shed mode.

**Setup Attributes****Mode**

The Mode attribute controls whether DLLR is actively shedding Loads (Shed mode) or is simulating Load shedding (Monitor Only mode). The mode pertains to both the Demand Limiting and Load Rolling strategies simultaneously.

The Modes include:

- Monitor Only - simulated shedding occurs, where loads appear shed but output points are not actually commanded or turned off.
- Shed - true shedding occurs where output points are commanded.

### **Shed Strategy**

The Shed Strategy attribute allows you to specify which shedding strategy the DLLR uses. The Shed Strategies include:

- Demand Limiting and Load Rolling
- Demand Limiting Only
- Load Rolling Only (default)

### **Meter Object**

The Meter Object identifies the Metasys object (for example, Pulse Meter, AI, AV) that is used for the energy rate if the Demand Limiting strategy is configured. If only the Load Rolling strategy is used, a meter is not required.

The Meter Object should be defined on the same supervisory controller as the DLLR Object. Do not use an N1 Integration object for the meter unless you can guarantee that the NCM Service Time is always less than 60 seconds because the DLLR algorithm requires an updated meter value every minute.

### **DLLR Startup Behavior**

The DLLR Startup Behavior attribute selects which mode the feature is set to whenever the supervisory controller is restarted or its database is downloaded. Two selections are offered:

- **Startup in Monitor Only mode** - DLLR starts in Monitor Only mode, even if it had been commanded or configured to Shed mode before the restart or download. Also, if the DLLR object was disabled while in Shed mode, it reverts to Monitor Only mode when enabled.
- **Startup in last commanded mode** - DLLR starts in the mode that was active at the time the controller was restarted or its database downloaded.

Regardless of the selection, the following also apply:

- Any Comfort Override commands that were in place before the startup are persisted.
- Any previous Shed commands are not automatically persisted to loads on startup. DLLR evaluates the current situation and completes all calculations before issuing any new Shed commands to loads.
- When DLLR starts issuing Shed commands to loads, it resumes where it left off with the first eligible, lowest-priority load.

### **Monitor Mode Release**

The Monitor Mode Release attribute allows you to specify the load output release behavior when DLLR is commanded to Monitor Only mode from Shed mode. If set to Release immediately, the outputs of loads that are not locked are immediately released regardless of whether their Minimum Shed Time has expired. If set to Release After Min Shed Time, the outputs of loads that are not locked are released only after their Minimum Shed Time expires. Possible behaviors include:

- Release Immediately
- Release After Min Shed Time

### **Profile Tracking Period**

The Profile Tracking Period attribute determines the time period for the Current Profile and Previous Profile attributes in the Profile tab. This is customarily set to the utility's billing period. If you change the Profile Tracking Period, the Current Profile is copied to the Previous Profile, and a new Current Profile is started. When Manual is selected, the Current Profile and Previous Profile are only changed when the user commands the DLLR object to Reset Profile. Possible settings include:

- Manual
- Hourly
- Daily
- Weekly
- Monthly

[Table 232](#) describes when the start and end times are set based on the tracking period.

**Table 232: Profile Tracking Periods**

Profile Tracking Period	Start Time	End Time
Hourly	At the top of the current hour Example: 08:00:00 A.M.	60 minutes from the current hour Example: 09:00:00 A.M.
Daily	12:00:00 A.M. current day	12:00:00 A.M. next day
Weekly	12:00:00 A.M. Monday of current week	12:00:00 A.M. Monday of next week
Monthly	12:00:00 A.M. first day of current month	12:00:00 A.M. first day next month
Manual	The moment when the Reset Profile command is issued.	Always <b>Not Specified</b>

There are three exceptions to when the Start Times and End Times can vary from what is shown in [Table 232](#). The Start Times and End Times differ when:

- a Reset Profile command is issued to the DLLR object while in Shed or Monitor Only mode
- a Reset Initialization Parameters command is issued to the DLLR object while in Monitor Only mode
- the controller is downloaded or reset

**Note:** The Start Times and End Times are not reset when DLLR changes from Monitor Only mode to Shed mode. Also, when the DLLR object is disabled, the current profile is copied to the previous profile, the current profile values are all set to 0, and the times are all set to undefined.

#### Stop DLLR Audits in Monitor Only Mode

The Stop DLLR Audits in Monitor Only Mode attribute specifies whether an audit entry is created each time a load is shed or released when DLLR is in Monitor Only mode and the NAE's Enabled Audit Level is set to 3 or 4. (When DLLR is in Active mode, an audit entry is always created to record that event.) The default is False, but if you set it to True, no audit entries are created in Monitor Only mode.

#### Demand Limiting Attributes

##### Active Demand Limit

The Active Demand Limit attribute always displays the actual demand target being used by the demand limiting strategy. If a ramp down is in progress, it displays the ramp down value; otherwise, it displays the Current Demand limit.

##### DL Tariff Targets

The DL Tariff Targets attribute is the list of energy targets for the Demand Limiting strategy. Each target consists of a target value and an entry from the Target Description set identifying the type of target, such as On-Peak. If the Demand Limiting strategy is used, there must be at least one target defined. Only one target is active at any time. The [Active DL Target](#) attribute specifies which target is currently active. The Target Description set includes:

- Continuous
- Off-Peak
- On-Peak
- Semi-Peak
- Shoulder
- Summer Off-Peak
- Summer On-Peak
- Winter Off-Peak
- Winter On-Peak
- Summer Semi-Peak



- Winter Semi-Peak
- Summer Shoulder
- Winter Shoulder

### **Active DL Target**

The Active DL Target specifies which of the defined Demand Limiting targets is currently active. When this attribute changes, the *Active DL Target Changed* attribute indicates True until the start of the next interval. This attribute uses the Target Description enumeration set.

### **Current Demand Limit**

The Current Demand Limit attribute represents the demand limiting target that is set by the user (DL Tariff Targets indexed by Active DL Target). This attribute defines the maximum allowed average demand during the current elapsing interval, and allows you to change the value of the demand limiting target. To change the value of the demand limiting target, write a new value to this attribute.

### **Algorithm**

The Algorithm attribute specifies which algorithm is used for the Demand Limiting strategy (Fixed Window or Sliding Window). In most cases, the Sliding Window Algorithm is required by North American utilities, while the Fixed Window Algorithm is used by European utilities.

### **Demand Interval Length**

The Demand Interval Length attribute specifies the length in minutes of an interval for the Demand Limiting strategy. This value is normally obtained from the energy utility. The DLLR Interval Lengths set specifies the possible interval lengths (15, 30, or 60).

### **Current Amount Shed by DL**

The Current Amount Shed by DL attribute displays how much energy is currently shed for the Demand Limiting strategy. When Shed Strategy is set to Demand Limiting and Load Rolling, this attribute indicates how much of the Amount Shed is due to Demand Limiting alone.

### ***Sliding Window Alg (Algorithm) Attributes***

#### **Unc (Uncontrolled) Interval Demand**

The Uncontrolled Interval Demand attribute displays the average uncontrolled energy demand (interval demand plus amount shed) over the current interval. It indicates what the demand would be if the DLLR object had not shed any loads.

#### **Ramp Down In Progress**

The Ramp Down In Progress attribute indicates whether a target ramp down is in progress.

### ***Fixed Window Alg (Algorithm) Attributes***

#### **Profile Limit**

The Profile Limit attribute displays the current value of the Demand Limit profile, which is the current demand limit adjusted by the safety factor for this minute.

#### **EOI Attribute**

The EOI attribute is a reference to the Metasys object (for example, BI, BV) supplying the EOI pulse, which is used for the Fixed Window algorithm only. The EOI pulse is used to synchronize DLLR's demand interval to the utility's demand interval. If this is not specified, DLLR performs its own interval timing, which is not as accurate.

This EOI attribute can be any binary type object, as long as the following requirements are met:

- A permanent communication path must exist between this attribute and the DLLR object; therefore, the EOI point and DLLR object should reside on the same supervisory controller.
- The attribute must be a numerical attribute, in which a change from 0 to 1 indicates the end of interval and the beginning of the next interval. The EOI Status attribute is set to Off Normal when the object supplying the EOI pulse becomes offline or unreliable to the DLLR object.

## ***Load Rolling Attributes***

### **LR Tariff Targets**

The LR Tariff Targets attribute lists the energy targets for the Load Rolling strategy. Each target consists of a target value and an entry from the Target Description set identifying the type of target, such as On-Peak. If the Load Rolling strategy is used, there must be at least one target defined. Only one target is active at a time. The [Active LR Target](#) attribute specifies which LR Target is currently active. The Target Description set includes:

- Continuous
- Off-Peak
- On-Peak
- Semi-Peak
- Shoulder
- Summer Off-Peak
- Summer On-Peak
- Winter Off-Peak
- Winter On-Peak
- Summer Semi-Peak
- Winter Semi-Peak
- Summer Shoulder
- Winter Shoulder

### **Active LR Target**

The Active LR Target attribute specifies which of the defined Load Rolling targets is currently active. When this attribute changes, the [Active LR Target Changed](#) attribute indicates True until the start of the next interval if demand limiting is configured, or the next minute if load rolling only is configured. This attribute uses the Target Description enumeration set.

### **Current LR Target**

The Current LR Target attribute represents the load rolling target that is set by the user (LR Tariff Targets indexed by Active LR Target). This target defines the amount of energy that should be shed each minute for the load rolling strategy. You can change the value of the load rolling target by writing to this attribute.

### **Current Amount Shed by LR**

The Current Amount Shed by LR attribute indicates how much energy is currently shed for the Load Rolling strategy. When Shed Strategy is set to Demand Limiting and Load Rolling, this attribute indicates how much of the Amount Shed is due to Load Rolling alone.

## ***Display Attributes***

### **Rate Units**

The Rate Units attribute specifies the energy units used for instantaneous energy demand attributes and referenced in the DLLR Profile and Load Summary (for example, kW). If a meter is defined, the Rate Units attribute indicates the units of the meter.

### **Consumption Units**

The Consumption Units attribute specifies the consumption energy units (for example, kWh).

### **Display Precision**

The Display Precision attribute defines the decimal display precision for all real values (floating values) in the DLLR object.

## ***Advanced Operational Data Attributes***

### **Minutes Since Meter Failure**

If the Meter is offline or unreliable, the Minutes Since Meter Failure attribute indicates the number of minutes (up to the interval length) since the meter was last reliable.

## ***Advanced Demand Limiting Attributes***

### **Unreliable Meter Options**

The Unreliable Meter Options attribute allows you to specify what should happen to Demand Limiting if the meter becomes unreliable or goes offline. These options are as follows:

- **Stop Shedding** - no more shedding occurs until the meter is again reliable. Currently, shed loads continue to be shed until their Max Shed Time expires.
- **Maintain the Current Shed Rate** - as loads are released, DLLR sheds other Loads to maintain the current amount of shed load.
- **Use Unreliable Meter Shed Rate** - sheds or releases loads as needed to maintain the amount of load specified in the [Unreliable Meter Shed Rate](#).

The second and third options cause Demand Limiting to act similarly to the Load Rolling strategy. If the Demand Limiting strategy is not defined, an offline or unreliable meter prompts no actions.

Also, when the meter goes offline or unreliable, DLLR sets its Meter Status attribute to **Off Normal** and continuously updates its Minutes Since Meter Failure attribute (up to the interval length) until the meter is again reliable. The Minutes Since Meter Failure value is listed under the Operational Data section of the DLLR object - Advanced view.

### **Unreliable Meter Shed Rate**

The Unreliable Meter Shed Rate attribute specifies how much load the DLLR object should keep shed if the meter goes unreliable, provided the Use Unreliable Meter Shed Rate option is selected for the Unreliable Meter Options attribute.

### **DL to Shed**

The DL to Shed attribute indicates how much energy needs to be shed to meet the current Demand Limit target for this minute. A negative value indicates how much energy can be released this minute.

### **DL Not Shed**

The DL not Shed attribute indicates how much energy was unable to be shed (this minute) to meet the current Demand Limit target for this minute. A positive value indicates a potential problem that Demand Limiting might not be able to meet its target during this interval.

### **Current Amount Eligible to be Shed by DL**

The Current Amount Eligible to be Shed by DL attribute represents the amount of energy available for Demand Limiting to shed at this moment. It does not include the energy of loads already shed.

### **Active DL Target Changed**

The Active DL Target Changed attribute displays True when the Active DL Target value is changed. It remains True until the start of the next interval, when it is reset to False. This attribute allows an alarm to be raised when the DL target changes.

## ***Sliding Window Alg (Algorithm) Advanced Attributes***

### **Target Ramp Down Enabled**

The Target Ramp Down Enabled attribute specifies whether a target reduction causes an incremental ramp down over the course of one interval, as opposed to an immediate target drop that could result in major immediate Load shedding.

## Sensitivity

The Sensitivity attribute specifies the level of aggression for shedding Loads when using the Sliding Window algorithm. A High sensitivity sheds more loads sooner than a Low sensitivity.

- **Low setting** - allows you to start shedding loads later and shedding loads over a shorter period of time. This setting reduces the amount of equipment that is turned off; however, it increases the possibility of exceeding the target.
- **Medium setting** - (default) allows you to start shedding slightly earlier than a low setting and later than a high setting. This setting turns off equipment earlier than with a low setting, but does not have to turn off as much equipment at once as with the high setting.
- **High setting** - allows you to begin shedding sooner into the demand peak. This setting decreases the possibility of exceeding the target; however, it increases the amount of equipment that is turned off.

## Smoothed ABS Error

The smoothed absolute error is based on the forecast error and is used to provide a safety margin to prevent the interval demand from exceeding the target. It equals the average percentage of variation in the uncontrolled energy rate.

## Error Limit

The Error Limit attribute limits the Smoothed ABS Error to a percentage of the Active Demand Limit. It can be used to reduce the size of the safety margin to avoid unnecessary overshedding. This value should be changed with care, since it increases the possibility of exceeding the demand limit target. The default value is 10%.

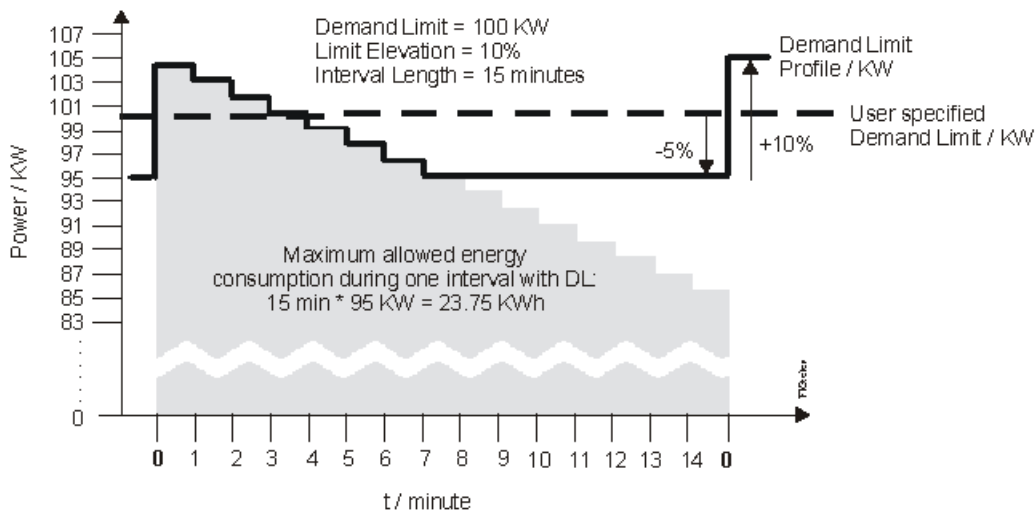
## Fixed Window Alg (Algorithm) Advanced Attributes

### Limit Elevation

The Limit Elevation attribute indicates the amount (in percent) by which the demand limit is increased at the beginning of the next interval to obtain the starting value of the demand limit profile. A high value may result in increased shedding toward the end of an interval. Changing this interval affects the next interval, not the current interval.

As shown in [Figure 79](#), the demand limit profile specifies for each minute the maximum allowed average power during the whole interval. If too much energy is consumed during the first half of the interval, because the limit elevation allowed this consumption, then more loads are shed during the second half of the interval, even though the actual metered power is then below the demand limit profile. In other words, the net effect of limit elevation is to defer aggressive load shedding to the second half of the fixed demand interval.

**Figure 79: Use of Limit Elevation on a Demand Limit Profile**



**Active Elevation**

The Active Elevation attribute indicates the amount (in percent) by which the demand limit was increased during the elapsing interval to obtain the starting value of the demand limit profile. The Active Elevation represents the Limit Elevation that is used for the current interval.

**Time Until EOI**

The Time Until EOI attribute indicates the number of minutes until the expected end of the interval.

**Time Since EOI**

The Time Since EOI attribute indicates the number of minutes since the latest EOI.

**Energy Since EOI**

The Energy Since EOI indicates the consumed energy since the latest EOI.

**Demand Since EOI**

The Demand Since EOI indicates the average power since the latest EOI.

**Max Allowed Peak Until EOI**

The Max Allowed Peak Until EOI attribute indicates the maximum allowed average power until the next EOI.

***Advanced Load Rolling Attributes*****LR to Shed**

The LR to Shed attribute indicates how much energy needs to be shed to meet the current Load Rolling target for this minute.

**LR Not Shed**

The LR not Shed attribute indicates how much energy was unable to be shed (this minute) to meet the current Load Rolling target for this minute. A non-zero value indicates an error situation in which Load Rolling was unable to meet its target this minute.

**Active LR Target Changed**

The Active LR Target Changed attribute displays True when the Active LR Target value is changed. It is set to False at the start of the next interval if demand limiting is configured, or at the start of the next minute if load rolling only is configured. This attribute allows the DLLR object to raise an alarm when the LR target changes.

***Control Attributes*****Allow Reset in Shed Mode**

The Allow Reset in Shed Mode attribute controls whether the Reset Initialization Parameters command can be issued while DLLR is in Shed mode. When True, the Reset Initialization Parameters command can be issued once if DLLR is in Shed mode. As soon as the command is issued, this attribute is automatically reset to False and must be manually set to True before the command can be issued again in Shed mode.

**Profile Tab**

The DLLR Object Profile indicates energy usage for the current and previous tracking periods. The current Energy Rate and Active Demand Limit values are also shown. The profile includes the following parameters:

***How Daylight Saving Time Affects Start Times and End Times***

If daylight saving time is used at your facility, the Profile reacts accordingly. For example, when daylight saving time begins, the system clock on the supervisory controller advances from 1:59 A.M. to 3:00 A.M. If an hourly tracking period is used, the Profile starts a new tracking period at that moment, setting the Current Start Time to 3:00 A.M. and the Current End Time to 4:00 A.M. The Profile also changes the Previous Start Time to 1:00 A.M. and the Previous End Time to 3:00 A.M. The previous profile indicates that 2 hours have elapsed, but contains only 1 hour of energy data.

When daylight saving time ends, the system clock on the supervisory controller changes from 1:59 A.M. to 1:00 A.M. In this scenario, the system does not reach 2:00 A.M. until 2 hours after 1:00 A.M. The current profile contains 2 hours of profile data, even though the Current Start Time is 1:00 A.M. and the Current End Time is 2:00 A.M.

Whereas start/end date and times are not affected when the other tracking periods are used (daily, weekly, monthly, or manual), the period in which daylight saving time begins always contains 1 hour of data fewer than in a standard period. The period in which daylight saving time ends always contains 1 hour of data more than a standard period.

### **Start Time**

Start Time indicates when the DLLR Object starts to record demand profile data.

The Start Time depends on the situation. For example, at startup, the Start Time is set to when the controller was restarted. If the [Profile Tracking Period](#) has expired, Start Time is set to when the next tracking period begins.

The Start Time is also reset if the Profile Tracking Period is changed, a Reset Profile command is issued to the DLLR object while in Shed or Monitor Only mode, a Reset Initialization Parameters command is issued to the DLLR object while in Monitor Only mode, or the controller is downloaded. Note that the Start Time is not reset when DLLR changes from Monitor Only mode to Shed mode.

See the [How Daylight Saving Time Affects Start Times and End Times](#) section.

### **End Time**

The End Time for current profile indicates the predicted end time. The End Time for the previous profile indicates the actual end time. If the [Profile Tracking Period](#) is set to Manual, the End Time indicates Unspecified for the Current Profile.

See the [How Daylight Saving Time Affects Start Times and End Times](#) section.

### **Energy Consumption**

Energy indicates the calculated total energy consumption.

### **Peak Interval Demand**

Peak Interval Demand indicates the total Peak Interval Demand with date and time.

### **Peak**

Peak indicates the highest measured energy demand.

### **Projected Peak**

Projected Peak indicates the highest energy demand that would have occurred if DLLR had not been enabled and had not shed any loads.

### **Targets**

The Targets list the Energy Consumption, Peak Interval Demand, Peak, and Projected Peak for each target that is active during the current profile tracking period. Only configured targets are listed.

## **Load Summary Tab**

In the Runtime view, the Load Summary provides real-time information about each load associated with the DLLR object, as well as the Energy Rate and Current LR Target values. By default, all of the loads associated with this DLLR object are displayed in the order in which they were added to the object. They are sorted by priority, starting with the lowest Shed priority (10) at the top of the list. This matches the order in which DLLR seeks eligible loads to shed. Clicking on column headers allows you to sort the information. Reordering is available for all columns except Status and Load Rating.

**Note:** The entry **Unspecified** in the Last Shed Time column means that the load has never been shed or has not been shed since the last controller download.

The Load Summary is automatically refreshed at the standard UI refresh rate. You can command one or more loads directly from the Load Summary by selecting them and right-clicking the mouse to display the appropriate command window. Right-clicking a single load also allows you to command the output or navigate to the output's focus view.

The Setup option on the Load Summary changes the view to allow editing of some of the fields.

When the Setup view for the Load Summary is displayed, the Associate Load(s) button is used to add new loads to the table. The Remove Load(s) button removes loads from the table. The MultiEdit button edits more than one load at a time when several loads are highlighted.







### Energy Rate and Current LR Target

The top portion of the Load Summary indicates current values for the Energy Rate and Current LR Target.

### Status

Status displays an icon to indicate the current status of the load. [Table 233](#) provides icon descriptions.

**Table 233: Load Summary Icons and Their Status**

Status Icon <sup>1</sup>	Load Status
	Load appears to be offline; system is awaiting confirmation.
	Load is offline.
	Load is disabled.
	Load is shed.
	Load is locked.
	Load is in comfort override.
<no icon>	Load is released.

1 Positioning the mouse on an icon in the Status column displays a tooltip.

### Point Name and Point Reference

The Point Name and Point Reference fields display in colors that indicate the load output's current condition. [Table 234](#) describes the default colors.

**Table 234: Default Coloration of Point Name and Point Reference Fields**

Condition of Output	Point Name and Point Reference Field Color <sup>1</sup>
Normal	White
Overridden	Orange
Offline	Black
Trouble/Warning	Yellow
Alarm	Red

1 The actual colors used are set in the Status Colors section of Metasys Preferences > Graphic Settings. For details, refer to the *ADS/ADX Commissioning Guide (LIT-1201645)* or *NAE Commissioning Guide (LIT-1201519)*.

### Load Priority

The priority of the load affects the order in which it is shed. Priority 10 loads are the lowest priority and are shed first. Priority 1 loads are not shed unless no higher priority loads are available for shedding.

### Shed Strategy

Shed Strategy indicates whether the load can be shed for Demand Limiting, Load Rolling, or both.

### Minimum Shed Time

Minimum Shed Time specifies the minimum number of minutes that a load must be shed before it can be automatically released. A load can be manually released before this value expires. The range is 0 to 65,535 minutes.

### Maximum Shed Time

Maximum Shed Time (optional) specifies the maximum number of minutes that a load can be shed before it is automatically released. If the Maximum Shed Time value is not defined, the default value of 65,535 is used. The range is 0 to 65,535 minutes.

### **Minimum Release Time**

Minimum Release Time specifies the minimum number of minutes that a load must be released from shed before it can be shed again. Although DLLR does not shed a load before this time expires, a load can be manually shed before this value expires. The range is 0 to 65,535 minutes.

### **Load Rating**

Load Rating indicates how much energy is saved when the load is shed. This is specified in the same units as the Rate Units.

### **Output Present Value**

The Output Present Value indicates the current value of the load's output.

### **Ineligibility**

Ineligibility indicates the reason that the load cannot be shed at this time. This field is blank if the load is eligible to be shed.

### **Active Timer**

The Active Timer displays the shed or release timer if one is in effect.

### **Time Remaining**

The Time Remaining displays the minutes remaining if a shed or release timer is in effect.

### **Last Shed Time**

The Last Shed Time displays the last time that the load was shed.

## **DLLR Object Commands**

After a DLLR Object is defined, an authorized user can issue one of several commands (see [DLLR Object Commanding](#)). Metasys objects with a Load extension are intended for use with the DLLR feature permit operator or scheduled commands.

## **DLLR Object Commanding**

After a DLLR object is defined, an authorized user can issue one of several commands to the object.

**Table 235: Commands Available to DLLR Objects**

<b>Command</b>	<b>Parameters</b>	<b>Description</b>
<b>Set Mode</b>	Monitor Only Shed	Selects between Monitor Only mode and Shed mode for the Demand Limiting and Load Rolling strategies. The selected mode applies to both strategies; in other words, you cannot put DL in Monitor Only mode and keep LR in Shed mode.
<b>Set Target</b>	Type Demand Limiting Load Rolling Target Level <sup>1</sup> Value New value	Sets the active Target Level used for either the Demand Limiting or Load Rolling strategy. Optionally, you can specify a new value for the target and select a Target Description. The Target Description is an element of the DL Targets and LR Targets attributes, which describes the purpose of the target. Examples include Continuous, Off-Peak, On-Peak, and Semi-Peak.  You also can: <ul style="list-style-type: none"><li>Change the value of the current target by writing to the <a href="#">Current Demand Limit</a> and <a href="#">Current LR Target</a> attributes.</li><li>Set which target is active using the <a href="#">Active DL Target</a> and <a href="#">Active LR Target</a> attributes.</li></ul>
<b>Reset Profile</b>	None	Copies the current DLLR profile to the previous DLLR profile and starts a new, current profile. Use this command if DLLR's Profile Tracking Period is set to Manual. It is not necessary to use this command if a definitive tracking period is selected, such as Monthly, because DLLR resets the profile automatically.



**Table 235: Commands Available to DLLR Objects**

Command	Parameters	Description
<b>Reset Interval</b>	None	<p>Restarts the Demand Limiting calculations associated with the current interval - Fixed Window Algorithm only.</p> <p>You can specify a new start of a demand interval for the Demand Limiting strategy. If you are using the Fixed Window Algorithm, and there is no EOI input defined, issue this command at the start of the utility company's interval, the first time that DLLR runs. It synchronizes DLLR to the start minute of the utility company's billing interval (15, 30, or 60 minutes). Thereafter, DLLR uses a pseudo EOI pulse, so that the start of each subsequent interval is synchronized. If an EOI input is defined, DLLR automatically starts each interval at the correct time.</p> <p>When the Reset Interval command is received, the DLLR object resets interval parameters and starts a new Demand Interval.</p> <p><b>Note:</b> If the Sliding Window Algorithm is used, do not use this command, as the interval is reset each minute.</p>
<b>Disable</b>	None	<p>Stops DLLR operation. When disabled, DLLR releases all shed loads except those that are locked shed. Also, DLLR does not perform any calculations, report alarms, or issue any commands to any objects when disabled. DLLR attributes can be changed, but no actions are taken until DLLR is enabled.</p>
<b>Enable</b>	None	<p>Starts DLLR operation. If Shed mode is active, the configured DLLR strategies begin shedding loads as needed. If Monitor Only mode is configured, simulated load shedding begins.</p>
<b>Reset Initialization Parameters</b>	None	<p>Initializes DLLR as if it were running the demand limiting algorithm for the first time. Use it in Monitor Only mode for testing new potential demand tariff targets without using any data from a previous test. It releases all shed loads, clears all load timers, reinitializes DLLR, and clears the Energy Profile.</p> <p><b>Note:</b> Since these actions would adversely affect a smoothly running DLLR feature, you cannot issue this command while in Shed mode unless you manually set the Allow Reset in Shed Mode attribute to True. If you issue the Reset Initialization Parameters command while in Shed mode, the Allow Reset in Shed Mode attribute reverts to False immediately after the command is issued.</p>

1 Possible target descriptions: Continuous, Off-Peak, On-Peak, Semi-Peak, Shoulder, Summer Off-Peak, Summer On-Peak, Winter Off-Peak, Winter On-Peak, Summer Semi-Peak, Winter Semi-Peak, Summer Shoulder, Winter Shoulder.

# Engine Device Object

The Engine object defines the attributes that represent the externally visible characteristics of an NAE/NIE/NCE controller. One Engine Device object exists per controller. The Johnson Controls Engine object functions differently from the BACnet Device object.

**Note:** This chapter applies to the NCE25, NAE35, NAE45, NAE55/NIE55, NAE85/NIE85, and NCE25. In this chapter, Engine refers to all NCE25, NAE35, NAE45, NAE55/NIE55, NAE85/NIE85, and NCE25 models.

**Note:** In this chapter, references to the NAE45 encompass hardware versions NAE45-1 and higher. References to the NAE55 also describe the NAE45-0.

**Note:** The Object Type for this object is labeled **Device** in the software.

This object allows you to see data about the controller, such as the IP address and the current date and time.

For general information on Metasys system objects, see the [Object Help](#) section.

## Engine Concepts

### Flash Memory

A type of nonvolatile memory within the Engine device. The Engine stores the [operating system](#), [software](#), and [archive](#) within this memory. This memory is not used during normal operation of the Engine device, except when a new graphic is added and the new image is uploaded and stored. The Flash Memory is mostly used during shutdown and system restart.

### Operating System

Engines use a Microsoft Windows operating system (specific OS depends on the model), which is shipped preinstalled on the Engine. In general, the operating system cannot be modified by adding or deleting programs or drivers, although provisions are made to install factory-authorized patches and upgrades. See [Related Documentation](#) for details.

### Software

The software is the Johnson Controls programs used in the Engine, also preinstalled at the factory. This includes graphics, trending, logic, alarm, and other programs. Provisions are made for both the software and the operating system to be upgraded at the job site when new revisions of Metasys Engine software are available. See [Related Documentation](#) for details.

### Database

The database is the collection of objects and their parameters as defined by the user. Each database is unique to the job. A database can be created or edited (with appropriate user authority) either online using the Site Management Portal UI, or offline using the SCT. SCT can also be used to download a database or upload and create a backup copy of the database.

### Archive

A copy of the database, called the archive, is kept in each Engine's flash memory. This happens automatically once a day or on operator command. Following restoration of power loss to an Engine, the archive is copied into main memory to restore normal operation.

## Engine Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 236: Engine Device Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>2</sup>
<b>ADS Connection Type</b>	One from a list of types	CNW	LAN	LAN (0) Dial (1)
<b>ADS Delivery Time</b>	Time	CNW	12:15 AM	
<b>ADS Priority Threshold</b>	Number	CW	255	0–255
<b>ADS Repository</b>	Set of mixed values	CNW		IP address or hostname
<b>Alarm Repository Size</b>	Number	CW	1,000 (NAE55/ NIE55/NAE85/ NIE85)  500 (NAE35/ NAE45/NCE25)	Units = Entries 100–1,000 = NAE55/NIE55/NAE85/NIE85 100–500 = NAE35/NAE45/NCE25
<b>Alarm Snooze Time</b>	Number	CW	5	0–75 Units = Minutes
<b>Align Intervals</b>	True or False		False	
<b>APDU Retries<sup>2</sup></b>	Number	CW	4	2–10
<b>APDU Segment Timeout<sup>2</sup></b>	Number	CW	4,000	1,000–65,535 Units = milliseconds
<b>APDU Timeout<sup>2</sup></b>	Number	CW	6,000	1,000–65,535 Units = milliseconds
<b>Appl SW Version</b>	Text			
<b>Archive Date</b>	Date			
<b>Audit Action When Full</b>	One from a list of values	CW	Rollover (0)	Rollover = 0 Stop = 1
<b>Audit Forwarding Threshold</b>	Number	CW	80	1–100 Units = %
<b>Audit Generate Alarm When Full</b>	True or False	CW	True	
<b>Audit Repository Size</b>	Number	CW	500 (NAE55/ NIE55/NAE85/NIE85)  250 (NAE35/ NAE45/NCE25)	Units = Entries 10–500 = NAE55/NIE55/NAE85/NIE85 10–250 = NAE35/NAE45/NCE25
<b>BACnet Communications Password</b>	Text	CW	jci_bacnet_comm	
<b>BACnet IP Port<sup>2</sup></b>	Number	CW	47,808	0–65,535
<b>BIOS Version</b>	Text			
<b>Database Revision</b>	Number			
<b>Device Addr Binding</b>	List	W		
<b>DST Status</b>	True or False			
<b>Duplicate References</b>	List			

**Table 236: Engine Device Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>2</sup>
<b>Enabled Audit Level</b>	One from a list of values	CW	Audit Level 2 (1)	See the attribute description for details on the Enabled Audit Level. Range = 1–4 with 5 Audit Levels Level 1 (N/A) User Action Level 2 (1) Critical System Events Level 3 (2) Application Level 4 (3) Non-critical System Events Level 5 (4) Diagnostic
<b>Event Action When Full</b>	One from a list of values	CW	Rollover (0)	Rollover = 0 Stop = 1
<b>Firmware Version</b>	Text			
<b>IEIEJ Function A List</b>	Structure	CW		Structure of Destination Networks
<b>IEIEJ Function A Period</b>	Number	CW	60	Units = Seconds Min value = 30
<b>Internode Comm Timer</b>	Number	CW	20	Range = 5–255
<b>Interval Offset</b>	Number	CW	0	Units = Minutes
<b>Is Validated</b>	True or False	C	False	True or False
<b>JCI Exception Schedule</b>	One from a list of values	CW	Auto Delete 31 days	Auto Delete 31 days Manual Delete Auto Delete 7 days
<b>Last Restart Reason</b>	One type from a set			Uses the BACnetRestartReason set.
<b>Local Date</b>	Date			
<b>Local Site Director</b>	Set of mixed values	CW		
<b>Local Time</b>	Time			
<b>Location</b>	Text	CW	(empty string)	
<b>Max APDU Length<sup>2</sup></b>	Number	CW	1,024	128–65,535 Units = bytes
<b>Max Message Buffer</b>	Number	CW	994	98–65,535 Units = bytes
<b>Max Segments Accepted</b>	Number			
<b>Model Name</b>	Text			
<b>Network Address<sup>2</sup></b>	Number	CW	1,001	0–65,535
<b>Power Consecutive Samples</b>	Number	CW	5	0–32
<b>Power Sampling Interval</b>	Number	CW	1	0–32 Units = Seconds
<b>Process ID List</b>	List of value sets	CW	empty list	Maximum 64 elements, values limited by range of unsigned 32

**Table 236: Engine Device Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>2</sup>
<i>Protocol Obj Support</i>	Series of True or False values			Series of bits
<i>Protocol Revision</i>	Number			
<i>Protocol Ser Support</i>	Series of True or False values			Series of bits
<i>Protocol Version</i>	Number			
<i>Restart Notification Recipients</i>	Structure	CW		
<i>Segmentation</i>	One type from a set			Segmented Both, Segmented Transmit, Segmented Receive, No Segmentation
<i>Site Director Online</i>	True or False		True	
<i>System Status</i>	One type from a set	D		Operational, Operational Read Only, Download Required, Download in Progress, Nonoperational, Backup in Progress
<i>Time of Device Restart</i>	Structure			BACnetTimeStamp
<i>Time Sync Recipients</i>	List	W		Zero or more
<i>Time Synchronization Interval</i>	Number	CW	0	Units = Minutes
<i>Unbound References</i>	List			
<i>UTC Offset</i>	Number	C		-900 to +900
<i>Vendor ID</i>	Number		5	0–65,535
<i>Vendor Name</i>	Text		JCI	

1 C - Configurable, N - Value Not Required, Q - BACnet Required, W - Writable

2 If you write the value of this attribute, you must *reset* the Engine for the new settings to take effect.

**Table 237: Engine Device Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>2</sup>
<i>Audit Rate</i>	Number			Units = Per Hour
<i>Average Intermittent Failure Period</i>	List			IP address and Value Units = seconds
<i>BACnet Broadcast Receive Rate</i>	Number			Units = Per Minute
<i>BACnet Routed Messages Rate</i>	Number			Units = Per Minute
<i>Battery Condition</i>	One from a list of conditions			Uses Ok Fault (Set 161) or Battery Condition (Set 175).
<i>Battery Charging</i>	True or False			This attribute appears in only the NAE35/NAE45/NCE25.
<i>Board Temperature</i>	Real value			Units = Deg C Display Precision = 1 COV Increment = 1.0
<i>COV Rcv Rate</i>	Number			Units = Per Minute
<i>COV Tx Rate</i>	Number			Units = Per Minute

**Table 237: Engine Device Object Attributes - Diagnostic Tab**

<b>Attribute Name</b>	<b>Data Type</b>	<b>Flags<sup>1</sup></b>	<b>Initial Value</b>	<b>Values/Options/Range<sup>2</sup></b>
<i>CPU Temperature</i>	Real value			This attribute appears in only the NAE45/ NAE55/NIE55.  Units = Deg C  Display Precision = 1  COV Increment = 1.0
<i>CPU Usage</i>	Real value			Units = %  Display Precision = 1  COV Increment = 1
<i>Detection Interval</i>	Number			Units = seconds
<i>Estimated Flash Available</i>	Real value			Units = megabytes  Display Precision = 0.1  COV Increment = 0.1
<i>Event Rate</i>	Number			Units = Per Hour
<i>Events Lost</i>	Number			
<i>Flash Usage</i>	Real value			Units = %  Display Precision = 1  COV Increment = 1.0
<i>Maximum Intermittent Failure Period</i>	List			IP address and Value  Units = seconds
<i>Memory Usage</i>	Number			Units = %  Display Precision = 0.01  COV Increment = 0.1
<i>Network Tolerance</i>	One from a list of values	CW	Low	Uses Error Tolerance set.  Low, Medium, High
<i>Object Count</i>	Number			
<i>Object Memory Usage</i>	Real value			Units = %  Display Precision = 1.0  COV Increment = 1.0
<i>Pager Dial-up Status</i>	One from a list of values			Uses Network Status (Set 570).
<i>Repository Status</i>	One from a list of values			Uses Repository Status set:  0 = Offline  1 = OK  2 = Undefined  3 = Dialup  4 = RAP  5 = Incompatible Release
<i>Samples Lost</i>	Number			

**Table 237: Engine Device Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>2</sup>
<a href="#">Sample Rate</a>	Number			Units = Per Hour See attribute description for calculation details.
<a href="#">Time Between Buffer Reads</a>	Number			0 - 65,534 Units = Minutes
<a href="#">Transfer Buffer Full</a>	Real value			Units = %
<a href="#">Transport Failure Rate</a>	List			IP address and Value Units = Failures Per Day

1 C - Configurable, N - Value Not Required, Q - BACnet Required, W - Writable

2 If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

**Table 238: Engine Device Object Attributes - Communications Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>2</sup>
<a href="#">External Modem Config</a>	Set of mixed values	CW		See attribute <a href="#">description</a> .
<a href="#">Internal Modem Config</a>	Set of mixed values	CW		See attribute <a href="#">description</a> .
<a href="#">Serial Port Cable Config</a>	Set of mixed values	CW		See attribute <a href="#">description</a> .

1 C - Configurable, N - Value Not Required, Q - BACnet Required, W - Writable

2 If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

**Table 239: Engine Device Object Attributes - Network Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>3</sup>
<a href="#">ADS Dial-up Config<sup>3</sup></a>	Set of mixed values	CW		
<a href="#">BACnet Integrated Objects</a>	One from a list of objects	C		
<a href="#">Completion Domains</a>	List of text	CW		For the NAE55/NIE55/NAE85/NIE85 only.
<a href="#">Computer Name<sup>3</sup></a>	Text	W		See attribute <a href="#">description</a> .
<a href="#">DHCP Enabled</a>	True or False	CW	True (1)	0 = DHCP disabled 1 = DHCP enabled
<a href="#">DNS Server IP Addresses</a>	List of numbers	CW		List of IP addresses.
<a href="#">Domain Name<sup>3</sup></a>	Text	W		
<a href="#">Ethernet MAC Address</a>	List of numbers			
<a href="#">IP Address</a>	List of numbers	CW		Any valid IP address
<a href="#">IP Mask</a>	List of numbers	CW		
<a href="#">IP Router Address</a>	List of numbers	CW		

**Table 239: Engine Device Object Attributes - Network Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	Initial Value	Values/Options/Range <sup>3</sup>
<a href="#">Obtain DNS Address Automatically</a>	True or False	CW	True (1)	
<a href="#">Routing Mode</a>	One from a list of values	CW		

1 C - Configurable, N - Value Not Required, Q - BACnet Required, W - Writable

2 If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

3 If you change the value of this attribute, the Engine automatically resets.

## Engine Device Attribute Details

### ADS Connection Type

Specifies whether the ADS/ADX (defined in the [ADS Repository](#) attribute) is connected via a LAN or dial-up connection. If a value is specified, it overrides the value of the Default ADS Connection Type attribute. If no value is specified, the value of the Default ADS Connection Type attribute is used (Default ADS Connection Type is a site level setting sent to the site's devices). ADS Connection Type is ignored if no ADS/ADX is defined for this site.

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### ADS Delivery Time

Specifies the time of day when a connection should be established to the ADS/ADX (determined by the [ADS Repository](#) attribute). A connection is attempted at a minimum of once a day at the specified time to deliver audit, alarm, and trend data to the ADS/ADX. If a value is specified, it overrides the value of the Default ADS Delivery Time attribute. If no value is specified, the value of the Default ADS Delivery Time attribute is used (Default ADS Delivery Time is a site level setting sent out to the site's devices). ADS Delivery Time is ignored if no ADS/ADX is defined for this site.

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### ADS Dial-up Config

If ADS Connection Type is Dial-up, this attribute specifies the dial-up configuration used for a remote ADS/ADX. The following describes the structure parameters for this attribute:

**Table 240: Engine Object: ADS Dial-up Config Parameters**

Parameter Name	Data Type	Initial Value	Minimum/Maximum Value
<b>Connect Using</b>	One from a list of values	Internal Modem (0)	Internal Modem (0) External Modem (1)
<b>Access Number</b>	Text		
<b>Redial Attempts</b>	Number	3	0-32767
<b>Time between Redial Attempts</b>	One from a list of values	1 Second (0)	Uses Redial Delay (Set 565).
<b>Idle Time before Hanging Up</b>	One from a list of values	1 Minute (1)	Uses Idle Time (Set 566).
<b>Redial if Line Is Dropped</b>	True or False	True	
<b>Enable Internet Connection Sharing</b>	True or False	False	
<b>Enable DHCP</b>	True or False	True	False = DHCP disabled True = DHCP enabled
<b>IP Address</b>	List of numbers		
<b>ISP Password</b>	Text		
<b>ISP Username</b>	Text	Administrator	



**Table 240: Engine Object: ADS Dial-up Config Parameters**

Parameter Name	Data Type	Initial Value	Minimum/Maximum Value
Obtain DNS Address Automatically	True or False	True	
DNS Server IP Address	List of numbers		

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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### **ADS Priority Threshold**

This attribute is used for [Alarm and Event Management](#) only. The ADS Priority Threshold attribute allows you to specify the priority of an event that triggers the Engine to connect (dial or LAN connection) to the defined ADS/ADX and delivers the event messages from the Engine local event repository to the ADS/ADX event repository without waiting for the ADS Delivery Time.

For example, a value of 20 for this attribute means that any event having a priority of 20 or higher (events of higher alarm priority have lower alarm priority numbers) forces a connection to the ADS/ADX and forwards event messages from the Engine local event repository to the ADS/ADX's repository.

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### **ADS Repository**

Specifies the ADS Repository device. The ADS/ADX is the device to which local audit, alarm, and trend data is delivered. Repository refers to the three files in the ADS/ADX that store this data. If a value is specified, it overrides the value of the Default ADS Repository attribute of the site. If no value is specified, the value of the Default ADS Repository attribute is used (Default ADS Repository is a site level setting sent to the site's devices).

**Note:** If the Engine uses a dial-up connection to transmit data to the ADS/ADX, then the ADS Repository must be the first IP address listed in the range specified when configuring the ADS/ADX to Allow Incoming Connections (see [External Modem Config](#)).

The Default ADS Repository of the Site is intentionally left blank and must be updated by the user (online or offline). If the user does not populate the Default ADS value and leaves the Default ADS Repository value for all devices at 0.0.0.0, the ADS/ADX does not receive any audit, alarm, or trend data. The SCT does not automatically populate the Default ADS Repository value because of the many different possibilities that could exist during archive creation, including multiple ADSs/ADXs on a site or no ADS/ADX for a site. In these cases, it is not immediately clear which ADS should be the Default ADS under the Site object.

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### **Alarm Repository Size**

Specifies the maximum number of alarms that can be maintained on the local device.

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### **Alarm Snooze Time**

Specifies the amount of time to delay after an operator temporarily ignores, or snoozes an alarm before re-announcing the alarm.

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### **Align Intervals**

Specifies whether clock-aligned periodic time synchronization is enabled. If periodic time synchronization is enabled and the time synchronization interval is a factor of an hour or a day (that is, the value divides without remainder), then the beginning of the period specified for time synchronization aligns to the hour or day, respectively.

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**APDU Retries**

Indicates the maximum number of times that an Application Layer Protocol Data Unit (APDU) (as specified by the BACnet device) is retransmitted. If the device does not perform retries, it is set to zero. If the value is greater than zero, a nonzero value appears in the APDU Timeout attribute.

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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**APDU Segment Timeout**

Indicates the amount of time in milliseconds between retransmission of an APDU segment.

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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**APDU Timeout**

Indicates the amount of time in milliseconds between retransmissions of an APDU requiring acknowledgment for which no acknowledgment has been received.

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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**Appl SW Version**

Identifies the version of the application software installed in the device. The content of this string is locally defined (date-and-time stamp, a programmer's name, a host file version number, and so on).

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**Archive Date**

Indicates the date of the last successful archive of object instances. The value of this attribute is valid when a valid archive exists and during the archive download process. The value of this attribute is \*.\*.\* at all other times.

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**Audit Action When Full**

Specifies the operation of the audit trail feature when the audit repository is full. If the value is Stop, additional audit entries are discarded. If the value is Rollover, additional audit entries replace the oldest audit entries.

See [Default Destination and Message Forwarding](#) in the [Audit Trail](#) section.

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**Audit Forwarding Threshold**

Specifies the size limit of the audit repository (as a percent of the audit repository size) at which the system attempts to deliver audit entries to the ADS. This attribute applies only if an ADS device has been defined for the site. When the Audit Forwarding Threshold is reached, all audits in the Local Audit Repository that have not been forwarded are forwarded to the defined ADS Repository.

See [Default Destination and Message Forwarding](#) in the [Audit Trail](#) section.

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**Audit Generate Alarm When Full**

Specifies whether an alarm is generated when the audit repository is full.

See [Default Destination and Message Forwarding](#) in the [Audit Trail](#) section.

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**Audit Rate**

Specifies the number of audit messages destined for the Metasys server in the last hour (for diagnostic purposes). The value of this attribute updates every 5 minutes.

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### **Audit Repository Size**

Specifies the maximum number of audit trail entries that can be maintained on the local device.

See [Default Destination and Message Forwarding](#) in the [Audit Trail](#) section.

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### **Average Intermittent Failure Period**

Specifies the average number of seconds devices in the transport layer are offline (for diagnostic purposes). Only times less than one minute are used in this average, to eliminate device resets. Ideally, this number should be zero, indicating there are no failures.

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### **BACnet Broadcast Receive Rate**

Indicates the number of BACnet broadcast messages received by the device in the previous minute. BACnet broadcast messages are generated as part of the normal BACnet operation, but are also generated when a BACnet device searches for another device that does not exist, such as when a device has objects with references to other nonexistent objects (called unbound references). This number increases when the number of unbound references increases on network connected devices. If this number gets too high, it indicates possible performance problems.

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### **BACnet Communications Password**

Provides password protection of BACnet services, such as DeviceCommunicationControl and ReinitializeDevice. Third-party workstations may send these services and must provide the password for the Engine to execute the services. The default password is **jci\_bacnet\_comm**. Third-party workstations cannot read or write this password.

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### **BACnet Integrated Objects**

Specifies whether integrated objects are displayed in the object list. The values are:

- **Include in Object List** - Makes internal integration objects visible to BACnet devices. This is the default value.
- **Exclude from Object List** - Makes internal integration objects unavailable to BACnet devices.

When this attribute is set to Include in Object List and [Routing Mode](#) is set to Enabled, the same third-party object appears in the list twice (as a native object on the actual device and as an integrated object within the Engine); therefore, this setup is not recommended. When Routing Mode is set to Enabled Without Broadcasts, it prevents third-party devices outside the network from discovering devices on a routed network using broadcast data.

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### **BACnet IP Port**

Specifies the User Datagram Protocol (UDP) port number used to communicate with other BACnet devices over the IP network. This value allows multiple BACnet networks on a single IP network and prevents communication between the multiple BACnet networks.

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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### **BACnet Routed Messages Rate**

Indicates the number of BACnet messages received by the device on the IP network in the previous minute. If this number is high, it indicates that the performance of the MS/TP field bus network is affected by broadcast transmit traffic.

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### **BIOS Version**

Specifies the BIOS version in the Engine. The format of the Basic Input/Output System (BIOS) version is a **V** (in some models), **major release**, **.**, **minor release**. For example: V2.02.

For NAE55/NIE55, if the BIOS version is earlier than **V2.02**, update the BIOS using the BIOS Update Utility. This update significantly improves overall product performance. For information on the BIOS Update Utility, refer to the *BIOS Update Utility Technical Bulletin (Part No. 24-10110-42)*.

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### **Battery Charging**

Specifies the current battery charging state in an NCE25/NAE35/NAE45. A value of False indicates the battery contains at least 80% of full charge capacity and is not currently recharging. A value of True indicates the battery contains less than 80% of full charge capacity and is currently charging.

If the Battery Charging value is True and the battery is charging, the battery stops charging when it is 100% charged. Trend this attribute value to determine the current battery charge cycle time. In Simulation, this attribute is False.

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### **Battery Condition**

Specifies the current battery condition. It is updated every 60 seconds.

For the NAE55/NIE55, a value of Fault implies the battery is missing or defective and a value of OK implies there is no known problem with the battery.

For the NCE25/NAE35/NAE45, the values are:

- Good - Battery is operating at normal specifications. Provided the battery is fully charged, it should supply backup power to the engine three times a day for 6 minutes each time.
- Service - Battery useful life is predicted to end soon. We recommend you replace the battery. Backup power lasts less than 72 hours.
- Replace - Battery useful life is over. Replace the battery. Backup power may fail if the battery is not charged fully.
- Defective - Battery is either missing, disconnected, incorrectly installed, or the battery is internally shorted or otherwise defective. Take corrective action. Backup power is not provided for any duration.

After a line power failure, the battery is used to supply power to the device so the device can perform an orderly shutdown without losing data. After the device shutdown process finishes, the device discontinues its use of battery power. Valid data is provided only on the Engine hardware. Under device simulation, the value is Fault.

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### **Board Temperature**

Specifies the current Printed Wire Board (PWB) temperature in degrees Celsius. It is updated every 60 seconds. It is obtained from a temperature sensor built onto the PWB. The device is designed to run reliably with a PWB temperature at or below 67 degrees Celsius. If this temperature is exceeded, appropriate measures should be taken to cool the device. Under device simulation, the value is 0.

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### **COV Rcv Rate**

Specifies the number of COV messages the Engine receives from other supervisory devices or field controllers per minute. This attribute value updates every minute. Each COV message represents one object reporting a value change.

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### **COV Tx Rate**

Specifies the number of COV messages the Engine sends to other supervisory devices per minute. This attribute updates every minute. Each COV message represents one object reporting a value.

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### **CPU Temperature**

Specifies the current CPU temperature in degrees Celsius for an NAE55/NIE55. It is updated every 60 seconds. It is obtained from a temperature sensor built into the CPU. The CPU is designed to run reliably at or below 77 degrees Celsius. If this temperature is exceeded, appropriate measures should be taken to cool the device. Under device simulation, the value is 0.

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### **CPU Usage**

Specifies a running average of CPU usage over the last 50 minutes. The value is updated every 30 seconds. The running average is calculated by adding or subtracting 1% of the difference between the current and average CPU usage. The value may not be meaningful until 50 minutes after a system restart. A value of 0% means the CPU is 100% idle. A value of 100% means the CPU is 0% idle. A value of 50% or less is considered OK, although other performance indicators should also be assessed. Under device simulation, the value is 0.

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### **Completion Domains**

Controls how unqualified host names are resolved into IP addresses from the local device. The following attributes may specify a qualified or unqualified host name or IP address: Local Site Director Hostname, ADS Repository Host, Default ADS Repository Host, Site Time Server Hostnames, Device Timer Server Hostnames. This attribute is applicable only for unqualified host names.

If this attribute is **not** an empty list, the Engine attempts name resolution for the host name appended with each domain name, one at a time, in the order specified by this attribute until resolved. This attribute affects both Domain Name System (DNS) and host file name resolution. For example, if the host name is x, and completion domains are jci.com and na.jci.com, the device tries to resolve the following fully qualified host names in the order here:

x.jci.com

x.na.jci.com

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### **Computer Name**

Resides on the Network tab as an editable attribute. Devices on the LAN and the Metasys system network use the Computer Name to identify and communicate with the Engine across the network. Computer Name is synonymous with host name on a network.

**Important:** Starting at Release 2.1.10, the Engine Update Tool places restrictions on the Host Name (Computer Name) values you can use for NCE25/NAE35/NAE45 models. Name values must start with a letter, end with either a letter or a number, and may contain dashes only in the interior of the name. Failure to follow the name restrictions results in the Computer Name value changing when an NCE25/NAE35/NAE45 is updated. Refer to the *NAE/NIE Update Tool Technical Bulletin (LIT-12011524)* for more information on Host Name restrictions.

Each Engine ships with a unique initial Computer Name value, which is NAExxxxxxxxxxx, where xxxxxxxxxxxx is the Ethernet Media Access Control (MAC) address of the device without the hyphens. For example, if the Engine has a MAC address of 00-80-66-05-0F-FC, the initial computer name is NAE008066050FFC.

If you change the value of this attribute, a Metasys Confirmation dialog box appears stating that the changes you have made will cause the device to reset, and will cause any unsaved data in other user interface display panels to be lost. Click OK to continue, or click Cancel to return to Edit mode. If you clicked OK, the Engine resets and the new settings take effect. The name entered in the Computer Name attribute is automatically entered in the Local Site Director attribute of the Engine, if it is defined as the Site Director.

Both the Computer Name and Name attributes default to the object identifier you used during manual object creation; however, do not confuse the Computer Name attribute with the Name attribute. Changing the Engine Name attribute does not impact the object references or network communication with other devices on the site.

Changing the Computer Name online breaks any existing references between the Engine object and other objects on the site, and may break the existing network connection to other devices on the network. We do not recommend changing the Computer Name online. If you change the Computer Name attribute in the SCT (right-click the Engine in the navigation tree and select Rename), both the Computer Name and Name attributes are changed to the new name you select. The Item Reference then updates to show the new Computer Name. Download the updated database to the renamed device and any other devices that refer to the renamed device.

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#### **Database Revision**

Specifies a logical revision number for the device's database. Database Revision is incremented when an object is created or deleted, an object name changes, or a restore is performed.

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#### **Device Addr Binding**

Contains a list of BACnet Object Identifiers of an Engine Device object and a BACnet device address in the form of a BACnet Address. Entries in the list identify the actual device addresses that are used when accessing the remote device via a BACnet service request. The list may be empty if no device identifier-device address bindings are currently known to the device.

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#### **DHCP Enabled**

Indicates whether the DHCP protocol should be used. The device may run in three modes:

1. DHCP enabled and a DHCP server exists on the network. The DHCP server assigns network configuration information. The DHCP server can assign the following attributes:
  - IP Address
  - IP Mask
  - IP Router Address
  - DNS Server IP Addresses (when Obtain DNS Address Automatically attribute is True)
2. DHCP enabled and no DHCP server exists on the network. Using the Automatic Client Configuration feature, the device automatically configures the network configuration. The following attributes can be assigned:
  - IP Address
  - IP Mask
3. DHCP disabled. You must manually assign the network configuration.

When DHCP Enable is True, the UI ignores the following attributes and should not attempt to write to them. The values from the DHCP are assumed to be more current than the tool interface:

- IP Address
- IP Mask
- IP Router Address
- DNS Server IP Addresses (when Obtain DNS Address Automatically attribute is True)

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#### **DNS Server IP Addresses**

Lists the IP address of the DNS on the network. The system uses a DNS to resolve host names to IP addresses and similar tasks. A write to this attribute is ignored when the Obtain DNS Address Automatically attribute is True. A read of this attribute returns either the user-specified value or the value determined from DHCP.

The DNS Server IP Addresses attribute can be set explicitly, or it may be automatically set using the DHCP server. Using the DHCP server, you can change this attribute even if you set it up explicitly. See the [DHCP Enabled](#) attribute.

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**DST Status**

Indicates whether daylight saving time is in effect (True) or not (False) at the device's location.

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**Detection Interval**

Indicates the time, in seconds, determined by the HTTP transport mechanism based on the Poll Rate and Network Tolerance settings. This value determines how fast a site detects a device going offline.

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**Domain Name**

Indicates the Domain Name in which the Engine is defined. The Item Reference attribute of this object is constructed using the Domain Name. When creating or renaming an Engine in the SCT, the Domain Name of an Engine is specified by including it in the Engine's Item Reference in this format: Computer Name.Domain Name.

In the online UI, the Domain Name of an Engine is specified directly on the Network tab. Change the Domain Name only if you are working with a newly installed Engine. If you change the Domain Name at any other time, you may invalidate object references on other devices to the Engine.

If a DHCP server is present and configured, the Domain Name changes automatically. If the name resolution method for a site is a host file or DNS completion domains are used, you can leave the Domain Name field blank. If the site uses DNS name resolution, the combination of the computer name dot domain name (Computer Name.Domain Name) should resolve to the Engine's IP address.

If you write the value of this attribute in the UI, a Metasys Confirmation dialog box appears, stating that the changes you have made will cause the device to reset, and will cause any unsaved data in other user interface display panels to be lost. Click OK to continue, or click Cancel to return to Edit mode.

If you rename the device in the SCT (right-click the Engine in the navigation tree and select Rename), both the Computer Name and Name attributes are changed to the new name you select. You may invalidate object references on other devices to the Engine because the Domain Name is included in the Item Reference of the device. Be sure to download the updated database to the renamed device and any other devices that refer to the renamed device.

**Note:** Periods (.) are allowed in Domain Names.

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**Duplicate References**

Lists references that are duplicated in the system. Entries in this list are object references that exist on more than one device within the system.

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**Enabled Audit Level**

Specifies which level of audit entries are added to the Audit Repository. Only audit entries of type Level 1 through (and including) the specified level are included. All other levels are not stored in the audit trail. Level 1 and Level 2 audit entries are always stored in the audit trail.

- Level 1 and 2 (1): Stores all user action and system error audit messages.
- Level 3 (2): Stores application audit messages in addition to Level 1 and 2 auditing.
- Level 4 (3): Stores system audit messages in addition to Level 3 auditing.
- Level 5 (4): Stores diagnostic audit messages in addition to Level 4 auditing.

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**Estimated Flash Available**

Specifies the estimated flash memory available within the device for use by the user's database and applications. This value can be used to determine whether additional use of flash can be accommodated; however, other performance indicators should also be assessed. This property's value is calculated at the same time as the Flash Usage attribute. A negative value suggests that the flash usage should be reduced. Also, a negative value can affect system reliability now or in future releases of software.

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**Ethernet MAC Address**

Displays the Ethernet Media Access Control (MAC) address of this device.

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**Event Action When Full**

Specifies the operation of the Alarm and Event Management feature when the event repository is full. If the value is Stop, additional event entries are discarded. If the value is Rollover, additional event entries replace the oldest event entries.

See [Default Destination](#) in the [Alarm and Event Management](#) section.

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**Event Rate**

Specifies the number of event messages destined for the Metasys server in the last hour (for diagnostic purposes). The value of this attribute updates every 5 minutes.

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**Events Lost**

Specifies the total number of events which failed to be forwarded to the configured repository and which were deleted from the NxE's local repository. This count does not persist through an NxE reset, and reflects the number of lost events since the last reset.

**External Modem Config**

Specifies the modem configurations. If there is no external modem connected to the NAE55/NIE55, you cannot edit the External Modem Config attribute. To edit this attribute, plug in an external modem, wait approximately 30 seconds, and refresh the Communications tab. See the following table for the structure parameters of this attribute:

**Table 241: Engine Object: External Modem Config Parameters**

Parameter Name	Data Type	Initial Value	Minimum/Maximum Value
<b>Enabled</b>	True or False	True (1)	The connection is defined only if it is enabled (read-only).
<b>Allow Incoming Connections</b>	True or False	False (0)	When false, the connection can be used only for outgoing calls.
<b>Baud Rate</b>	One from a list of rates	115,200	Uses Pager Baud Rates (Set 306).
<b>Maximum Baud Rate</b>	One from a list of rates	115,200	Uses Pager Baud Rates (Set 306).
<b>Wait for Dial tone Before Dialing</b>	True or False	False (0)	
<b>Extra Initialization Commands</b>	Text	M0	This is the initialization string sent to the modem whenever a modem is being used.

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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### **Firmware Version**

Represents the release of firmware installed in the main code section of the device. The first digit in the revision number is advanced on major releases. The second digit is advanced on minor releases.

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### **Flash Usage**

Specifies the estimated percent of flash memory currently in use. The percentage is based on the portion of flash that is designated for use by the user's database. The value is updated on device startup, after a database archive, sync or download from the SCT ([offline mode](#)), and by manual command (Update Flash Usage). A value greater than 100% can affect system reliability now or in future software releases. No restrictions are in place to prohibit use of flash over 100%.

If you are simulating an NAE/NIE, your computer's hard disk must be formatted for NTFS. If your computer's hard disk is formatted to use FAT32 (32-bit File Allocation Table), the simulated value for the Flash Usage attribute is not accurate.

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### **IEIEJ Function A List**

Provides a list of structures with the following elements: Network Number, Device ID High Limit, and Device ID Low Limit. The first set of Who-Is messages is broadcast once the device reaches the Enable Field Commands phase of startup. At this time, a timer starts running that calls a method to send the Who-Is messages at the period specified by IEIEJ Function A Period.

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### **IEIEJ Function A Period**

Sets the period at which the IEIEJ Function A List sends the Who-Is message broadcasts. Clearing the value of this property disables the function A feature. Each destination is guaranteed to get a Who-Is message within the period specified by this property; however, if there are multiple destinations in the list, the object attempts to spread out the Who-Is messages so that they are not all sent out at the same instant.

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### **Internode Comm Timer**

Controls the frequency of communication with remote Ethernet devices. This value is used by the Ethernet IP Datalink object. Among other communications, this attribute defines the frequency of the heartbeat to monitored devices (monitored at a rate of two times the Internode Comm Timer). A change to this attribute does not take effect until the next Engine restart (cold or warm).

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### **Interval Offset**

Specifies the offset, in minutes, from the beginning of the period defined for time synchronization until the actual time synchronization requests are set. Interval Offset has no effect when Align Intervals is False.

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### **IP Address**

Represents the IP address of this Engine. The IP address identifies the Engine on the network and assists in the routing of messages. Each Engine must have a unique IP address for the network to operate properly. A write to this attribute is ignored when the DHCP Enable attribute is True. A read of this attribute returns either the user specified value or the value determined from DHCP.

Certain IP addresses are invalid and cannot be written successfully. The network address portion of the IP address is computed by including all bits in which the corresponding bit from the IP mask is 1. The device address portion of the IP address is computed by including all bits in which the corresponding bit from the IP mask is 0. Neither the network address nor device address can be all zero bits or all one bits. For example, if the IP mask is 255.255.0.0, the following IP addresses are invalid: 0.0.100.100 and 100.100.0.0.

The IP Address attribute can be set explicitly, or it may be automatically set using the DHCP server. Using a DHCP server may change this attribute even if you have set it up explicitly. See the DHCP Enabled attribute.

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**IP Mask**

Represents the IP mask used on the Ethernet network. The IP Mask is used for subnet addressing. A write to this attribute is ignored when the DHCP Enabled attribute is True. A read of this attribute returns either the user specified value or the value determined from DHCP. The following IP masks are invalid and cannot be written successfully: 0.0.0.0 and 255.255.255.255. Generally, an IP mask consists of between 1 and 31 consecutive 1 bits, followed by 31 to 1 consecutive 0 bits when written out in binary notation. We recommend the IP mask follow this pattern.

The IP Mask attribute may be set explicitly, or it may be automatically set using the DHCP server. Using a DHCP server may change this attribute even if you have set it up explicitly. See the DHCP Enabled attribute.

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**IP Router Address**

Represents the IP address of one or more default gateways. A write to this attribute is ignored when the DHCP Enabled attribute is True. A read of this attribute returns either the user specified value or the value determined from DHCP. Certain IP router addresses are invalid and cannot be written successfully. See the description of the IP Address.

The IP Router Address attribute may be set explicitly, or it may be automatically set using the DHCP server. Using a DHCP server may change this attribute even if you have set it up explicitly. See the DHCP Enabled attribute.

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**Internal Modem Config**

Specifies the modem configurations. See the following table for the structure parameters of this attribute:

**Table 242: Engine Object: Internal Modem Config Parameters**

Parameter Name	Data Type	Initial Value	Minimum/Maximum Value
Enabled	True or False	True (1)	The connection is defined only if it is enabled (read-only).
Allow Incoming Connections	True or False	False (0)	When false, the connection can be used only for outgoing calls.
Baud Rate	One from a list of rates	115,200	Uses Pager Baud Rates (Set 306).
Maximum Baud Rate	One from a list of rates	115,200	Uses Pager Baud Rates (Set 306).
Wait for Dial Tone Before Dialing	True or False	False (0)	
Extra Initialization Commands	Text	M0	This is the initialization string sent to the modem whenever a modem is detected.

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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**Is Validated**

Enables the MVE feature at the device, which includes reauthentication with electronic signature and required annotation when the user makes a change to the system, such as commanding an object, acknowledging an alarm, or changing the value of an attribute. This attribute can be set to True for MVE sites only. This attribute is writable only with the SCT, and is read-only online.

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### **JCI Exception Schedule**

Indicates how long exception schedules are kept after the exception date has expired. The default value is Auto Delete 31 days, which is the same behavior prior to this release. New options are Auto Delete 7 days and Manual Delete. See the [Scheduling](#) section for more information on [Exception Schedules](#).

**Note:** The NAE (using SCT and online UI) and FAC (at CCT) allows selections for Manual Delete, Auto Delete 31 days, and Auto Delete 7 days.

**Note:** Manual Delete is needed for locations like Japan where the local standards state that only the BACnet workstation can delete exception schedules.

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### **Last Restart Reason**

Indicates the reasons for the last device restart.

The possible reasons are:

- UNKNOWN: The device cannot determine the cause of the last reset. This may occur due to a startup error, shutdown error, crash, or pushing the hardware reset button. The state is UNKNOWN if the device is powered without the battery or if the Device Manager service is stopped.
- COLDSTART: A ReinitializeDevice request was received with a Reinitialized State of Device of COLDSTART or the device was made to COLDSTART via the user interface.
- WARMSTART: A ReinitializeDevice request was received with a Reinitialized State of Device of WARMSTART or the device was made to WARMSTART by some other means. WARMSTART also occurs after a download from SCT.
- DETECTED\_POWER\_LOST: The device detected that incoming power was lost. This state occurs as the result of a normal power down (with battery).
- DETECTED\_POWERED\_OFF: The device detected that its power switch was turned off.
- HARDWARE\_WATCHDOG: The hardware watchdog timer reset the device.
- SOFTWARE\_WATCHDOG: The software watchdog timer reset the device. This state is reported when Device Manager cannot communicate with the control engine for any reason.
- SUSPENDED: The device was suspended. How the device was suspended or what it means to be suspended is a local matter.

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### **Local Date**

Indicates the date to the best of the device's knowledge. The Date type is a series of 4 one-number elements. The first number is the year (for example, 2005); the second number is the month (1..12, 1=January); the third is the day of month (1..31). To maintain compatibility with BACnet protocol, a fourth number contains the day of week (1=Monday). A value of FF \* (asterisk) in any of the elements indicates the value is not specified.

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### **Local Site Director**

Specifies a resolvable host name or IP address of the Site Director. A host name may be specified only if a DNS server or other means of name resolution is available to the device. A Site Director may have more than one host name. The host name specified here must be resolvable to an IP address on the LAN or WAN on which the site's devices exist.

The Local Site Director attribute is based on the Computer Name attribute, **not** the Name attribute. When you change the Site Director device's Computer Name attribute, its Local Site Director attribute automatically changes to match its Computer Name. When you change a non-Site Director device's Computer Name, its Local Site Director attribute remains unchanged.

For information designating an Engine as the Site Director, refer to the *NAE Commissioning Guide (LIT-1201519)*.

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**Local Time**

Indicates the time of day to the best of the device's knowledge. The Time type is a series of four one-number elements. The first number is the hour (0..23); the second number is the minute (0..59); and the third number is the seconds (0..59). A fourth number has been added to maintain compatibility with BACnet protocol and contains the hundredths of second (0..99). A value of \* (asterisk) for any number indicates the value is unspecified. This value would be used, for example, when the hundredths value is not important.

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**Location**

Indicates the physical location of the device.

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**Max APDU Length**

Indicates the maximum number of bytes that may be contained in a single, indivisible application layer protocol data unit.

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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**Max Message Buffer**

Specifies the largest piece of data that can be sent to a device at one time, excluding all communications headers. Some applications need to perform segmentation of data outside the communications system. This value is used to size the data in those situations.

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**Max Segments Accepted**

Indicates the maximum number of segments of an APDU accepted by the device.

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**Maximum Intermittent Failure Period**

Specifies the maximum number of seconds a device was offline at the transport layer (for diagnostic purposes). Only times under one minute are recorded, to eliminate device resets. The value of this attribute does not match the offline times determined from generated alarms. Ideally, this number should be zero, indicating there are no failures.

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**Memory Usage**

Specifies the percent of system RAM that is currently in use.

It is calculated as follows:

$$\frac{\text{Total commit charge}}{\text{Commit charge limit}} \times 100$$

These values are obtained from the Windows OS. Memory usage can be used to diagnose operational problems with the device. For example, if the value climbs steadily over time (about 24 hours), it would indicate a memory leak. A memory leak eventually consumes all system RAM and causes a device reset. Valid data is provided only on the Engine hardware. Under device simulation, the value is 0.

If your computer's hard disk is formatted to use FAT32 (32-bit File Allocation Table), the simulated value for the Memory Usage attribute is not accurate.

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**Model Name**

Indicates the device model, the hardware revision associated with the firmware, and the code file name used to download the device.

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### **Network Address**

Specifies the BACnet network address. A change to this attribute takes effect after the next Engine restart (cold or warm).

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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### **Network Tolerance**

Sets the timeout tolerance of the flexible polling feature (that is, changes the lower level communication timeouts). When edited by a user, this attribute is sent to the HTTP transport layer and determines how long the device waits to connect, send, and wait to receive HTTP Post responses. The setting options are LOW, MEDIUM, and HIGH. LOW is the default and matches the current behavior. The MEDIUM or HIGH setting increases the tolerance by adding longer timeouts and more retries and should be used for poor network connections. Note that it takes longer to detect an offline device as the tolerance gets higher.

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### **Object Count**

Indicates the number (count) of all of the object instances within the device. Objects of all classes are included.

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### **Object Memory Usage**

Specifies the percent of the object database that is currently in use. Each object created consumes memory within the object database. This attribute can be used to help determine the device's capacity for additional objects; however, other performance indicators should also be assessed. Generally, the number of objects you define determines the object memory usage. This attribute is valid on the Engine hardware and under device simulation.

**Note:** If you have a large number of objects, the object memory usage increases and the archive.moi file size increases also. The archive.moi file is stored in flash memory.

Also, an attempt to create an object known to require X bytes of object database may fail even if more than X bytes are available in the object database. This is because the object database is composed of multiple blocks. If the free space of each block is fewer than X bytes, the request for X bytes fails even though the sum total of free space from all blocks is greater than X bytes.

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### **Obtain DNS Address Automatically**

Controls whether the DNS Server IP Addresses attribute should be automatically determined using DHCP. If the DHCP Enabled attribute is False, this attribute is ignored and a value of False is assumed. When True, a write to the DNS Server IP Addresses attribute is ignored.

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### **Pager Dial-up Status**

Specifies the current status of the pager dial-up connection.

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### **Power Consecutive Samples**

Specifies the number of consecutive AC line status samples (indicate a power loss) must be received before the device concludes that a power failure has occurred. When the device concludes that power has failed, the device begins an orderly shutdown process. The process used for determining whether a power failure has occurred protects the device from shutting down during short power failures or certain brownout conditions. Using default values, a power failure of less than 5 seconds does not prompt a device shutdown.

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### **Power Sampling Interval**

Specifies the period at which the AC line status is sampled to determine whether a power failure has occurred. This attribute is used in conjunction with the Power Consecutive Samples attribute.

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### **Process ID List**

Contains a list of unsigned 32-bit numbers used to compare the Process ID sent with the BACnet events. If the event Process ID is not found on this list, then the event is ignored. An empty list or a list containing only one entry with the value of zero allows all events to be processed.

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### **Protocol Obj Support**

Indicates which standard BACnet object types the device's protocol implementation supports.

This attribute is a bit string that uses the Object Type (Set 508). Each bit represents a BACnet object type in that set. For example, bit 0 represents the BACnet AI object type, whereas bit 17 represents the BACnet schedule object type. If the bit is true (1), the object type is supported. If the bit is false (0), the object type is not supported. The BACnet object types supported can vary between device models.

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### **Protocol Revision**

Indicates the minor revision level of the BACnet standard the device supports.

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### **Protocol Ser Support**

Indicates which standard BACnet protocol services the device's protocol implementation supports. For more information on the PICS and BIBBs of the Engine, see the [Related Documentation](#) table in the [Welcome](#) section. This object now supports both the BACnet UTCTimeSynchronization message and the BACnet TimeSynchronization message (non-UTC version). Third-party devices now have the ability to send the TimeSynchronization message to an Engine.

This attribute is a bit string that uses the Protocol Ser Support (Set 136). Each bit represents a BACnet service in that set. For example, bit 0 represents the Acknowledge Alarm service, whereas bit 12 represents the Read Property service. If the bit is true (1), the service is supported. If the bit is false (0), the service is not supported.

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### **Protocol Version**

Represents the BACnet protocol the device supports. Initial releases are Version 1; subsequent releases increase the number by one.

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### **Repository Status**

Indicates the status of the communication between the device and the trend log sample repository (for diagnostic purposes). This attribute uses the Repository Status set.

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### **Restart Notification Recipients**

Controls the restrictions on which devices, if any, are notified when a restart occurs. The value of this attribute is a list of BACnetRecipients. When the length of this list is empty, the device cannot send a device restart notification. The default value of this property is a single entry representing a broadcast on the local network. If the list has one or more entry, the device sends a restart notification, but only to the devices or addresses listed.

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### **Routing Mode**

Specifies whether third-party configuration tools operating on an IP network can access third-party MS/TP devices connected to an Engine MS/TP trunk. Routing is disabled by default to keep present configurations intact. Enabling routing is only recommended if existing third-party tool configurations cannot support any other connection method to the third-party MS/TP device. Once routing is enabled on an Engine, all Device Identifiers and Network Address numbers within each device on the network must be unique across all routed networks. The values are:

- **Disabled** - Disables routing of BACnet messages from one supervisory controller network to another.
- **Enabled** - Enables routing of BACnet messages from one supervisory controller network to another.
- **Enabled Without Broadcasts** - Enables routing of BACnet messages from one supervisory controller network to another while blocking broadcasts.

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### **Samples Lost**

Specifies the number of trend samples lost because the Metasys server did not retrieve them fast enough (for diagnostic purposes). This value resets only when the device restarts.

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### **Sample Rate**

Specifies the number of trend samples destined for the Metasys server in the last hour (for diagnostic purposes). The value of this attribute updates every 5 minutes.

**Note:** The sample rate at the NxE is calculated based on the actual raw samples taken by every trend object. The sample rate at the ADS is calculated once every poll cycle and is based on the number of samples received from all the NxEs and the time it took to poll them. Most NxEs do not forward all the samples taken between polls because the ADX transfer setpoint is usually not set to 1 (that is, forward on every sample). The result is that the sample rate at the ADS is less than the sum of the samples taken at all the NxEs. The total ADS sample rate is 60,000 and the total NxE sample rate is larger than 100,000.

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### **Segmentation**

Indicates if the device supports segmentation of messages and (if so) if it supports segmented transmission, reception, or both.

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### **Serial Port Cable Config**

Specifies the configuration of a communications cable connected between Engine serial port A or port B and another computer. See the following table for the structure parameters of this attribute:

**Table 243: Engine Object: Serial Port Cable Config Parameters**

Parameter Name	Data Type	Initial Value	Minimum/Maximum Value
<b>Enabled</b>	True or False	True (1)	The connection is defined only if it is enabled (read-only).
<b>Allow Incoming Connections</b>	True or False	True (1)	When false, the connection can be used only for outgoing calls.
<b>Baud Rate</b>	One from a list of rates	115,200	Uses Baud Rate (Set 121).
<b>Maximum Baud Rate</b>	One from a list of rates	115,200	Uses Baud Rate (Set 121).
<b>Wait for Dial Tone Before Dialing</b>	True or False	False (0)	Not applicable
<b>Extra Initialization Commands</b>	Text		Not applicable Maximum length - 80

If you write the value of this attribute, you must [reset](#) the Engine for the new settings to take effect.

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### **Site Director Online**

Indicates the communication status of this device with the Site Director. This value is kept current by a command sent by the Data Refresh COV Monitor task whenever the status changes. The COV Monitor task performs this check every 80 seconds. This attribute is triggered so it can be used for an alarm.

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### **System Status**

Reflects the current physical and logical state of the device.

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### **Time Between Buffer Reads**

Indicates the time, in minutes, between Engine trend consolidation buffer readings from the Metasys server (for diagnostic purposes).

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### **Time of Device Restart**

Indicates the time at which the device was restarted.

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### **Time Sync Recipients**

Controls the restrictions placed on a device's use of the Time Synchronization service. If the list is of length zero, a device is prohibited from automatically sending a Time Synchronization request. If the list is of length one or more, a device automatically sends a Time Synchronization request but only to the devices or addresses listed. If it is present, this attribute is writable.

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### **Time Synchronization Interval**

Specifies the periodic interval, in minutes, at which TimeSynchronization and UTCTimeSynchronization requests are sent. When set to zero, then periodic time synchronization is disabled.

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### **Transfer Buffer Full**

Indicates the percentage full of the Engine trend consolidation buffer (for diagnostic purposes).

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### **Transport Failure Rate**

Specifies the number of transport failures per day (for diagnostic purposes). This number represents how often HTTP posts from this engine failed when they were sent to another device that is considered online. Failures include the inability to open the connection, to send the message, or to receive the reply. This value represents failures over the last 24 hours and is updated hourly, but will not correlate directly to the number of offline alarms generated by your system. Ideally, this number should be zero, indicating there are no failures.

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### **UTC Offset**

Contains the Universal Coordinated Time (UTC). The UTC Offset attribute indicates the number of minutes (-900 to +900) offset between local standard time and Universal Coordinated Time. The time zones to the west of the zero degree meridian are indicated by positive values, and those to the east are indicated by negative values. The value of the UTC Offset attribute is derived from the Time Zone attribute of the site.

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### **Unbound References**

Lists references that are not bound in the system. This attribute indicates that a process cannot find an object either because the device on which the object is located is offline, the object has been deleted, or the object reference is incorrect.

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### **Vendor ID**

Distinguishes proprietary extensions to the protocol using a unique vendor identification code assigned by ASHRAE. The Johnson Controls Vendor ID is 5.

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### **Vendor Name**

Identifies the manufacturer of the device.

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## **Engine Commands**

The table below lists the commands supported by the [Engine Device Object](#).

**Table 244: Engine Device Object Commands**

Command Name	Parameters
<a href="#">Archive</a>	
<a href="#">Change Audit Enabled Class Level</a>	Integer (1–4)
<a href="#">Reset Device</a>	
<a href="#">Route Samples</a>	
<a href="#">Rediscover Text Strings</a>	
<a href="#">Update Flash Usage</a>	

## **Engine Device Command Details**

### **Archive**

Archives the object instances to the nonvolatile memory.

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### **Change Audit Enabled Class Level**

Changes the Audit Enabled Class Level attribute.

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### **Reset Device**

Resets the device. This is an orderly reset that saves the archive and restarts the operating system. A reset is often required after making changes to [Operating System](#) parameters and the following attributes:

- APDU Retries
- APDU Segment Timeout
- APDU Timeout
- BACnet IP Port
- Computer Name
- Contact Person
- Domain Name
- External Modem Config
- Internal Modem Config

- Max APDU Length
- Network Address
- Port Number
- Read Only Community
- SNMP DDA Attributes
- Serial Port Cable Config
- Time Sync Period
- Read/Write Community
- ADS Dial-up Config

**Note:** When you update the time servers, you do not need to reset the Engine; however, if you change any direct connect, internal modem, or external modem attributes, reset the Engine.

When the Engine requires a reset, Reset Needed appears in the title bar of the object in the display panel. The Reset Needed status is triggered by Reset Needed (19) and Cold Reset Needed (20) in the JCI System Status (Set 25).

**Important:** Do not push the RE-BOOT SYSTEM switch on the Engine to initiate a reset to address a Reset Needed status. Pushing the RE-BOOT SYSTEM switch initiates CPU reset and reboot, which causes all unsaved data to be lost (including recent attribute value changes).

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#### **Route Samples**

Routes all Trend samples to the Metasys Server. Use this command before performing an engine upgrade to minimize the risk of losing any trend samples.

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#### **Rediscover Text Strings**

Resets the States Text across a supervisory device by rediscovering text strings from all mapped BACnet objects.

**Note:** When the Rediscover Text Strings command is sent from the Site Director device UI to another supervisory device and the UI is running on the supervisory device, you must close and restart the UI on the supervisory device in order for the text to appear correctly.

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#### **Update Flash Usage**

Ensures the values of the Flash Usage and Estimated Flash Available attributes are current. The Engine executes this command internally on device startup, after an Archive command, which also executes automatically at 12:02 A.M. daily, and after a database [download](#) or [synchronize](#) from the SCT ([offline mode](#)).

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# Ethernet IP Datalink Object

The Ethernet IP Datalink object manages the Ethernet communications bus and the messages transmitted on it. Working with this object allows you to access Ethernet card statistics.

For general information on Metasys system objects, see the [Object Help](#) section.

## Ethernet IP Datalink Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 245: Ethernet IP Datalink Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Address Length</a>	Number			
<a href="#">APDU Retries</a>	Number	CW	4	2-10
<a href="#">APDU Segment Timeout</a>	Number	CW	4,000	1,000–65,535 Units = milliseconds
<a href="#">APDU Timeout</a>	Number	CW	6,000	1,000–65,535 Units = milliseconds
<a href="#">BACnet IP Port</a>	Number		47,808	
<a href="#">Broadcast Address</a>	Text			Maximum length = 6 octets
<a href="#">Device Address</a>	Text			Maximum length = 6 octets
<a href="#">Max APDU Length</a>	Number	CW	1,024	128–65,535 Units = bytes
<a href="#">Network Address</a>	Number			

1 C - Configurable, W - Writable

**Table 246: Ethernet IP Datalink Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Broadcast Receives</a>	Number			
<a href="#">Broadcast Transmits</a>	Number			
<a href="#">Discarded Frames</a>	Number			
<a href="#">Message Receives</a>	Number			
<a href="#">Message Transmits</a>	Number			
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Retry Attempts</a>	Number			
<a href="#">Transmit Failures</a>	Number			

1 C - Configurable, W - Writable

## Ethernet IP Datalink Attribute Details

### Address Length

Indicates the number of octets for the device address (Data Link Address).

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**APDU Retries**

Indicates the maximum number of times that an APDU is retransmitted. If the device does not perform retries, it is set to zero. If this value is greater than zero, a non-zero value appears in the APDU Timeout attribute.

Back to [Ethernet IP Datalink Attributes](#).

**APDU Segment Timeout**

Indicates the amount of time in milliseconds between retransmission of an APDU segment. This value is non-zero if the device supports segmentation of transmitted APDUs.

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**APDU Timeout**

Indicates the amount of time in milliseconds between retransmissions of an APDU requiring acknowledgement for which no acknowledgement has been received.

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**BACnet IP Port**

Indicates the IP Port number that the device uses to transmit and receive messages.

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**Broadcast Address**

Indicates the address used when sending broadcast messages.

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**Broadcast Receives**

Indicates the number of broadcast messages received.

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**Broadcast Transmits**

Indicates the number of broadcast message transmissions.

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**Device Address**

Indicates the address of the device (Data Link Address).

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**Discarded Frames**

Indicates the count of received messages discarded due to critical low resources (that is, the System Memory Resource, Object Engine Queue Resource, or Protocol Engine Input Queue Resource).

Back to [Ethernet IP Datalink Attributes](#).

**Max APDU Length**

Indicates the maximum number of bytes that may be contained in a single, indivisible application layer protocol data unit.

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**Message Receives**

Indicates the number of messages received.

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**Message Transmits**

Indicates the number of message transmissions.

Back to [Ethernet IP Datalink Attributes](#).

**Network Address**

Indicates the BACnet network address of this data link.

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**Reset Date**

Indicates the date of the last [Clear Statistics](#) command.

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**Reset Time**

Indicates the time of the last [Clear Statistics](#) command.

Back to [Ethernet IP Datalink Attributes](#).

**Retry Attempts**

Indicates the number of retry attempts.

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**Transmit Failures**

Indicates the number of message transmit failures.

Back to [Ethernet IP Datalink Attributes](#).

**Ethernet IP Datalink Commands**

The table below lists the commands supported by the [Ethernet IP Datalink Object](#).

**Table 247: Ethernet IP Datalink Object Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	None
<a href="#">Latch Statistics</a>	None

**Ethernet IP Datalink Command Details****Clear Statistics**

Resets all statistics to zero and updates the Reset Data and Reset Time values.

Back to [Ethernet IP Datalink Commands](#).

**Latch Statistics**

Updates the displayed statistics with the current values.

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## Event Enrollment Object

The Event Enrollment object's attributes represent and contain information for managing events. Events are changes in the value of an object that meet specific criteria. The Event Enrollment object defines the event criteria and provides a connection between an event and a notification message sent to recipients. A recipient device is enrolled for notification if:

- it is one of the recipients in a [Notification Class Object](#) referenced by the Event Enrollment object
- a Notification Class object is not referenced and it is the recipient of the Event Enrollment object

For general information on Metasys system objects, see the [Object Help](#) section.

## Event Enrollment Concepts

### Event Relationships

[Event Types](#), Event States, and Event Parameters are interrelated attributes:

**Table 248: Event Relationships**

Event Type <sup>1</sup>	Event State	Event Parameters
Change of Bitstring	Normal Offnormal	Time Delay Bitmask List of Bitstring Values
Change of State	Normal Offnormal	Time Delay List of Values
Change of Value (COV)	Normal	Time Delay Bitmask <sup>2</sup> COV Increment <sup>2</sup>
Command Failure	Normal Offnormal	Time Delay Feedback Property Reference
Floating Limit	Normal High Limit Low Limit	Time Delay Setpoint Reference Low Diff Limit Hi Diff Limit Deadband
Out of Range	Normal High Limit Low Limit	Time Delay Low Limit High Limit Deadband

1 Any Event Type generates a Fault Event State if the object referenced in the Object Property Reference becomes unreliable and the Object Property Ref attribute is linked to Reliability.

2 Only one of these parameters is used.

### Event Parameters

The table below lists the parameters in the Event Parameters attribute. For a description of the algorithms to which these parameters apply, refer to *ANSI/ASHRAE BACnet Standard 135 - 1995*.

**Table 249: Event Parameters**

Parameter	Description
<b>Bitmask</b>	This parameter applies to the Change of Bitstring event algorithm and the Change of Value event algorithm in the special case where the referenced attribute is a Bit String data type. It represents a bitmask that is used to indicate which bits in the referenced attribute are monitored by the algorithm. A value of one in a bit position indicates that the bit in this position in the referenced attribute is monitored by the algorithm. A value of zero in a bit position indicates that the bit in this position in the referenced attribute is not significant for the purpose of detecting this Change of Bitstring or Change of Value. A Bitmask must contain 4 bits.
<b>Deadband</b> <b>High Diff Limit</b> <b>Low Diff Limit</b> <b>High Limit</b> <b>Low Limit</b>	These parameters apply to the Floating Limit and Out of Range event algorithms.
<b>Feedback Property Reference</b>	This parameter (BACnet Object Property Reference) applies to the Command Failure algorithm. Feedback Property Reference identifies the object and attribute that provides the feedback to ensure that the commanded attribute changes value. This attribute may reference only object properties that have lists of true and false values.
<b>List of Bitstring Values</b>	This is a list that applies to the Change of Bitstring event algorithm. This list defines the set of states for which the referenced attribute is Offnormal. Only the bits indicated by the Bitmask are significant. If the value of the referenced attribute changes to one of the values in the List of Bitstring Values, then the Event State attribute of the Event Enrollment object makes a transition To Offnormal and sends the appropriate notifications. This list must contain 4 bits.
<b>List of Values</b>	This is a list of BACnet Property States that applies to the Change of State event algorithm. This event algorithm applies to referenced properties that have discrete or lists of values. The List of Values is a subset of the possible values that the attribute may have. If the value of the referenced attribute changes to one of the values in the List of Values, then the Event State attribute of the Event Enrollment object makes a transition to To Offnormal and sends the appropriate notifications.
<b>COV Increment</b>	This parameter applies to the Change of Value event algorithm. It represents the increment by which the referenced attribute must change in order for the event to occur.
<b>Setpoint Reference</b>	This parameter (BACnet Object Property Reference), applies to the Floating Limit event algorithm. Setpoint Reference indicates the setpoint reference for the reference attribute interval.
<b>Time Delay</b>	This parameter applies to all event types and represents the seconds that the conditions monitored by the event algorithm persist before an event notification is issued.
<b>Referenced Property Increment</b>	This parameter represents the increment by which the referenced property must change for an event to occur.

## ***Event Enrollment Attributes***

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 250: Event Enrollment Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Acked Transitions</a>	Series of True or False states			True, True, True	To Offnormal, To Fault, To Normal
<a href="#">Alarm Message Text</a>	Text	CW	Not supported		
<a href="#">Event Enable</a>	Series of True or False states	CW	W	True, True, True	To Offnormal, To Fault, To Normal
<a href="#">Event State</a>	One state from a set			Normal	Normal, Fault, Offnormal, High Limit, Low Limit
<a href="#">Event Time Stamps</a>	Set of values			NONE_FFFF	BACnetArray[3] of BACnet Time Stamp
<a href="#">Execution Priority</a>	One state from a set	CW	CW	Normal	
<a href="#">Graphic</a>	Object reference	CW	CW		
<a href="#">Graphic Alias</a>	Text	CW	CW		Maximum 256 characters
<a href="#">Notification Object Reference<sup>2</sup></a>	Number	CW	W	1	0–4,294,967,295 The BACnet Object Identifier of the <a href="#">Notification Class</a> used for routing
<a href="#">Notify Type</a>	One type from a set	CW	W	Alarm	Alarm, Event
<a href="#">Process Identifier</a>	Number	CNW	CW	3–15	3–15
<a href="#">Recipient</a>	Object reference	CNW	CW		

1 C - Configurable, W - Writable

2 The Notification Class attribute is used if the Recipient attribute is not used. We recommend using the Notification Class attribute.

**Table 251: Event Enrollment Object Attributes - Event Tab**

Attribute Name	Data Type	Flags <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Event Parameters</a>	Set of related values	CW	W		See the <a href="#">Event Parameters</a> term.
<a href="#">Event Type</a>	One type from a set	C			Change of Bitstring, Change of State, Change of Value, Command Failure, Floating Limit, Out of Range
<a href="#">Object Property Ref (Input Reference)</a>	Set of related values	C			Also referred to as Input Reference.

1 C - Configurable, W - Writable

## Event Enrollment Attribute Details

### **Acked Transitions**

Conveys three separate flags that each indicate if the most recent To Offnormal, To Fault, and To Normal event transitions have been acknowledged (if the transition requires acknowledgement).

Back to [Event Enrollment Attributes](#).



### **Alarm Message Text**

Contains the user-defined text included with the event notification.

Back to [Event Enrollment Attributes](#).

### **Event Enable**

Conveys three flags that determine if notifications are enabled for To Offnormal, To Fault, and To Normal transitions. When a flag is set, this means that the corresponding transition causes notification to be sent to all enrolled devices. When a flag is cleared, this means that the corresponding transition is not reported. The object's [Event State](#) continuously updates, regardless of the value of the Event Enable attribute.

Back to [Event Enrollment Attributes](#).

### **Event Parameters**

Determines the method used to monitor the referenced object. This attribute provides the parameter values used for the algorithm. See the [Event Parameters](#) section for descriptions of the parameters.

Back to [Event Enrollment Attributes](#).

### **Event State**

Indicates the current state of the event. The permitted values for Event State are specific to the [Event Type](#). The value of Event State is independent of the [Event Enable](#) flags.

Back to [Event Enrollment Attributes](#).

### **Event Time Stamps**

Conveys the times of the last event notifications for To Offnormal, To Fault, and To Normal events. Time stamps of type Time or Date have \* in each octet. Sequence number time stamps have 0 if no event notification of that type has generated since the object was created.

Back to [Event Enrollment Attributes](#).

### **Event Type**

Indicates the type of event algorithm used to detect events and report to enrolled devices. See the BACnet standard for more information on algorithms. See [Event Relationships](#) for more information on the event types.

The table below describes the event types:

**Table 252: Event Types**

<b>Event Type</b>	<b>Description</b>
<b>Change of Bitstring</b>	Generates an offnormal transition when the value of the referenced property ( <a href="#">Object Property Ref (Input Reference)</a> ) is equal to one of the user-defined Bitstring Values (List Elements after applying the Bitmask) and the values are equal for the amount of seconds defined by the Time Delay attribute you're using. The Bitmask defines the bits important for monitoring.
<b>Change of State</b>	Generates an offnormal transition when the value of the referenced property ( <a href="#">Object Property Ref (Input Reference)</a> ) is equal to one of the values in the List of Values (List Elements) and the values are equal for the number of seconds defined by the Time Delay attribute of the object you're using.
<b>Change of Value</b>	Generates a normal transition when the value of the referenced property ( <a href="#">Object Property Ref (Input Reference)</a> ) changes by an amount equal to or greater than the referenced property increment (Change of Value [COV] Increment) for the number of seconds defined by the Time Delay attribute of the object you're using.
<b>Command Failure</b>	Generates an offnormal transition if the values of the referenced property ( <a href="#">Object Property Ref (Input Reference)</a> ) and the Feedback Reference are not equal for a time greater than the number of seconds defined by the Time Delay attribute of the object you're using.

**Table 252: Event Types**

Event Type	Description
<b>Floating Limit</b>	Generates a transition to high or low limit alarm if the value of the referenced property ( <a href="#">Object Property Ref (Input Reference)</a> ) is higher or lower than the range of values determined by the current value of the Setpoint Reference, High Limit, Low Limit, and Deadband for a time greater than the number of seconds defined by the Time Delay attribute of the object you're using.
<b>Out of Range</b>	Generates a transition to high or low limit alarm if the value of the referenced property ( <a href="#">Object Property Ref (Input Reference)</a> ) is higher or lower than the range of values determined by the High Limit and Low Limit for a time greater than the number of seconds defined by the Time Delay attribute of the object you're using.

Back to [Event Enrollment Attributes](#).

### **Execution Priority**

Indicates the relative importance of performing the function of the object within the device.

Back to [Event Enrollment Attributes](#).

### **Graphic**

Indicates the graphic associated with the object.

Back to [Event Enrollment Attributes](#).

### **Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this object or the controller containing this point.

Back to [Event Enrollment Attributes](#).

### **Notification Object Reference**

Specifies the notification class used when handling and generating event notifications for the object. This attribute implicitly refers to the [Notification Class Object](#) that has a [Notification Class](#) attribute of the same value.

Back to [Event Enrollment Attributes](#).

### **Notify Type**

Conveys if the notifications generated by the object are Events or Alarms. This attribute is required if the object supports intrinsic reporting.

Back to [Event Enrollment Attributes](#).

### **Object Property Ref (Input Reference)**

Designates the particular object and attribute referenced by the Event Enrollment object. This attribute applies the algorithm specified by [Event Type](#) to the referenced attribute to determine the [Event State](#).

Back to [Event Enrollment Attributes](#).

### **Process Identifier**

Determines the numeric handle of a process within the recipient device that is enrolled for event notification when a [Notification Class object](#) is not used.

Back to [Event Enrollment Attributes](#).

### **Recipient**

Designates the recipient device that is enrolled for event notification when a [Notification Class object](#) is not used.

Back to [Event Enrollment Attributes](#).

## **Event Enrollment Commands**

The table below lists the commands supported by the [Event Enrollment Object](#).

**Table 253: Event Enrollment Commands**

Command Name	Parameters	BACnet Support
<a href="#">Disable</a>		No
<a href="#">Enable</a>		No

## Event Enrollment Command Details

### **Disable**

Prevents distribution of event notifications.

Back to [Event Enrollment Commands](#).

### **Enable**

Allows distribution of event notifications.

Back to [Event Enrollment Commands](#).

## Folder

A Folder object helps support the hierarchical organization of objects.

A total of 1000 objects can be added per folder, and up to 10 consecutive levels of Folder objects can be added within any other folder or object.

**Note:** You must name a new folder differently from the folders in the default set on the user interface.

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section.

## Generic Integration Object

The Generic Integration Object (GIO) is a single software representation of the hardware/internal data points from a device that has been integrated into your Metasys network. One GIO can represent one or more control strategies (for example, temperature control or static pressure control). Up to 256 data points can become attributes of the GIO and each attribute of the GIO works with Metasys features such as historical data management, alarm and event handling, and basic monitoring and commanding capabilities.

You can map data points to the GIO in either [online](#) or [offline](#) mode. When you map the data points, you define their label, units, display precision, category, and whether or not the data point should be commandable. You can command points from the GIO using [Generic Integration Attributes](#) commands.

The GIO is useful when you have multiple hardware/internal data points from an integrated device and it logically makes sense to view them as a single entity rather than individual Metasys objects (that is, AI, BI, AO, BO, an so on). While you may be able to browse to each device, there may only be a few data points you need to see on a regular basis. The GIO lets you group the data points you need to see in one place and organize them in the following categories:

- inputs
- outputs
- parameters

When the GIO appears in Metasys software, the attributes are organized by tabs bearing the names of the three categories (Input Category, Output Category, and Parameter Category tabs). Each tab includes the status, description, and value of the items in that category.

**Note:** Currently, the GIO supports [N1 Migration Object](#) and [LON Integration Object](#). You can no longer manually add a GIO to a LON trunk; however, the GIO is still supported in existing databases, even after upgrading to the next software release.

For general information on Metasys system objects, see [Common Object Attributes](#).

## Generic Integration Concepts

### N1 Integration and the GIO

For N1 integration, use the Control System object from your existing Metasys network. Hardware and internal points are already defined in the Control System object so there is one to one mapping between a Control System object and the GIO. N1 point mapping is one to one and the Metasys system restricts which characteristics of the GIO (for example, label, display precision) can be edited once they are added to the system.

For more information on N1 integration, see the [Related Documentation](#) table in the [Welcome](#) section.

### LONWORKS Network Integration

**Note:** You can no longer manually add a GIO to a LON trunk; however, the GIO is still supported in existing databases, even after upgrading to the next software release.

In LONWORKS network integration, the GIO presents multiple LONWORKS network variables (with their individual data elements) and/or NexSys controller points of an integrated LONWORKS network controller as a single Metasys object. During the configuration of a GIO for an integrated LONWORKS network controller, the user is presented with the internal network variables and NexSys controller points in a tree structure which then allows the user to add these data points as attributes of the GIO object. The characteristics of the GIO attributes (label, units, display precision, field units, category) and the commandability of the GIO attributes can be edited.

For more information on LONWORKS network integration, see the [Related Documentation](#) table in the [Welcome](#) section.

## Generic Integration Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 254: Generic Integration Object (GIO) Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Display Reference</a>	Text	N		
<a href="#">Offline</a>	True or False			
<a href="#">Overridden</a>	True or False			
<a href="#">Present Value</a>	(Depends on the display attribute)	D		Redirected to the Display attribute
<a href="#">Reliability</a>	One value from a set			Reliable, Unreliable Uses Reliability (Set 503).
<a href="#">Target Reference</a>	Text			

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

**Table 255: Generic Integration Object (GIO) Attributes - Insert Point Wizard Hardware Tab<sup>1</sup>**

Attribute Name	Data Type	Notes <sup>2</sup>	Initial Value	Values/Options/Range
<a href="#">Attribute Info</a>	List	CW		See the attribute <a href="#">description</a> .
<a href="#">Display Attribute</a>	Text	C		Must be one of the defined 256 possible attributes
<a href="#">Remote Object Name</a>	Text	CW	None	<system>.<object> 8 characters each maximum

1 These attributes only appear on the Hardware tab of the Configure screen of the Insert Point Wizard - GIO.

2 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

**Table 256: Generic Integration Object (GIO) Attributes - Input Category, Output Category, and Parameter Category Tabs**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">GIO 1 Attr . . . GIO 256 Attr<sup>2</sup></a>	Set of Values	W		

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

2 This attribute represents the items that appear on the Input Category, Output Category, and Parameter Category tabs of the GIO.

## GIO Attribute Details

### Attribute Info

Contains a list of structures that store data about each attribute defined within a GIO. The elements listed in this table appear as columns on the Hardware tab of the Configure screen of the Insert Point Wizard - GIO.

**Table 257: Attribute Info**

Element Name	Data Type	Initial Value	Minimum/Maximum Value
<a href="#">Adjust Allowed</a>	True or False value		
<a href="#">Category</a>	Number		0 - Input, 1 - Output, 2 - Parameter
<a href="#">Display Precision</a>	List of values		
<a href="#">ElementRef</a>	Text		
<a href="#">Field Units</a>	One value from a set		Uses Unit Set (Set 869)

**Table 257: Attribute Info**

Element Name	Data Type	Initial Value	Minimum/Maximum Value
<i>Label</i>	Text		
<i>Override Allowed</i>	True or False value		
<i>Status</i>	List of values		Uses Object Status (Set 505).
<i>Units or EnumSet</i>	List of values		Use Unit Set (Set 869) to set the units of a real value.

Back to [Generic Integration Attributes](#).

**Adjust Allowed**

Indicates whether or not this attribute supports the Adjust command.

Back to [Generic Integration Attributes](#).

**Category**

Specifies the attribute category (input, output, or parameter).

Back to [Generic Integration Attributes](#).

**Display Precision**

Specifies the display precision for an attribute with a real value (floating point).

Back to [Generic Integration Attributes](#).

**ElementRef**

Specifies the element within the target reference associated with this attribute to provide it data for value/status/reliability.

Back to [Generic Integration Attributes](#).

**Field Units**

Represents the units that can be used for the attribute.

Back to [Generic Integration Attributes](#).

**Label**

Contains the user label for the attribute name. This is the name used whenever you view the attribute in Metasys software.

Back to [Generic Integration Attributes](#).

**Override Allowed**

Indicates whether or not this attribute supports the Override command.

Back to [Generic Integration Attributes](#).

**Status**

Represents the status value of the attribute.

Back to [Generic Integration Attributes](#).

**Units or EnumSet**

Specifies the units for an attribute that is a real value (floating point).

If an attribute is one value from a set, this attribute sets the states text from the sets listed in the Alphabetical Set List.

Back to [Generic Integration Attributes](#).

**Display Attribute**

Specifies the attribute that represents the value of the GIO. The value of this attribute is used as the [Present Value](#) of the GIO. For example, for a GIO representing a temperature control strategy, you might choose the attribute representing room temperature to be the Display attribute. Then, the room temperature appears as the GIO Present Value.

Back to [Generic Integration Attributes](#).

**Display Reference**

Represents the label of the [Display Attribute](#). The Display Reference is not stored in the object, but read when requested.

Back to [Generic Integration Attributes](#).

**GIO 1 Attr . . . GIO 256 Attr**

Represents user-definable attributes that can be part of a GIO. Each attribute represents a potential entry in the Attribute Info attribute which in turn represents a physical or logical piece of data within an integrated device.

Back to [Generic Integration Attributes](#).

**Offline**

Has a value of True if the native data source is offline in the native system.

Back to [Generic Integration Attributes](#).

**Overridden**

Indicates if the data source is overridden.

Back to [Generic Integration Attributes](#).

**Present Value**

Specifies the current value associated with the [Display Attribute](#) of the GIO.

Back to [Generic Integration Attributes](#).

**Remote Object Name**

Contains the name of the object in the format of system.object.

Back to [Generic Integration Attributes](#).

**Reliability**

Holds the current reliability state for the GIO. If the source of any individual attribute of the GIO is unreliable, then the GIO itself becomes unreliable.

Back to [Generic Integration Attributes](#).

**Target Reference**

Identifies the source that provides the data elements linked to the individual attributes of the GIO.

Back to [Generic Integration Attributes](#).

**Generic Integration Commands**

The table below shows the command supported by the [Generic Integration Object](#).

**Table 258: GIO Commands**

Command Name	Number of Parameters
<a href="#">Attribute Command</a>	



## GIO Command Details

### Attribute Command

Allows you to select one of the user-definable attributes of the GIO. When you select an attribute and click the ellipses button, the [Attribute Commands](#) available for that attribute appear. This allows you to command individual attributes represented by the GIO.

Back to [Generic Integration Commands](#).

### Attribute Commands

Attribute commands are commands you can issue from the GIO to individual attributes of the GIO. To access the attribute commands, do one of the following:

- In the navigation tree, right click on the GIO object and select Commands then select an attribute for the GIO [Attribute Command](#), and click the ellipsis button.
- In a category view for the GIO (in the [display frame](#)), right-click on the attribute you want to command, and select Commands.

The attribute commands that appear are based on the data type of the attribute and whether [Override Allowed](#) and [Adjust Allowed](#) are True or False:

**Table 259: Attribute Commands**

Command	Notes
<a href="#">Adjust</a> <sup>1</sup>	Real values only (floating points)
<a href="#">Operator Override</a> <sup>2</sup>	
<a href="#">Release Operator Override</a> <sup>2</sup>	
<a href="#">Change Units</a>	All values but True/False
<a href="#">Change Name</a>	
<a href="#">Change Display Precision</a>	Real values only (floating points)
<a href="#">State0...StateN</a> <sup>1</sup>	Two state or multistate values
<a href="#">True</a> <sup>1</sup>	True/False only
<a href="#">False</a> <sup>1</sup>	True/False only

<sup>1</sup> [Adjust Allowed](#) must be True.

<sup>2</sup> [Override Allowed](#) must be True.

Back to [Generic Integration Commands](#).

## Global Data Sharing Object

The Global Data Sharing object provides a means for distributing information about changes in a single attribute value to other attribute reference points. This minimizes hardware costs and system complexity. For example, an NAE might have multiple Air Handling Units (AHUs) on its network, but only one has an outdoor air sensor. The Global Data Sharing object can share the value from the single sensor with the other AHUs.

The data types defined for the Global Data Sharing object's input and corresponding outputs should match. Otherwise, each output attempts to convert the value being received to the data type defined for it. The software does not check for data type consistency. Global data sharing is restricted to within one site.

For general information on Metasys system objects, see [Common Object Attributes](#).

### Global Data Sharing Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 260: Global Data Sharing Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Alternate Master</a>	Attribute reference	CNW	None	
<a href="#">Execution Priority</a>	One state from a set	CW	Normal	
<a href="#">Fail Soft</a>	Real value	CW		
<a href="#">Master</a>	Attribute reference	CW	None	
<a href="#">Present Value</a>	One state from a set	C	Master	n = 4 0 = Master, 1 = Alt Master, 2 = Last Reliable, 3 = Fail Soft
<a href="#">Priority for Writing</a>	Number	CW	15	16 (lowest priority) to 7 (highest priority)
<a href="#">Refresh Timer</a>	Number	CW	2 min	Default value is 0. No range check done.
<a href="#">Reliability</a>	One state from a set			Reliable, Input Unreliable
<a href="#">Setup</a>	One value from a set	C	Last Reliable	n = 2 0 = Master, 1 = Alt Master
<a href="#">Slaves List</a>	List of attribute references	CNW	None	Minimum number of entries = 0

<sup>1</sup> C - Configurable, N - Value Not Required, W - Writable

### Global Data Sharing Attribute Details

#### **Alternate Master**

Defines an alternate to the [Master](#). When the Master becomes unreliable, this attribute becomes the master attribute.

Back to [Global Data Sharing Attributes](#).

#### **Execution Priority**

Indicates the relative importance of performing the function of the object within the device.

Back to [Global Data Sharing Attributes](#).

### **Fail Soft**

Routes to all the outputs if [Setup](#) is configured as Fail Soft. Fail Soft routes when the object becomes unreliable and when the output transitions from Reliable to Unreliable. This attribute is initialized to a specific value.

Back to [Global Data Sharing Attributes](#).

### **Master**

Contains an attribute reference. The value associated with this attribute is written to each of the designated slave destinations.

Back to [Global Data Sharing Attributes](#).

### **Present Value**

Stores data about the value shared with the [slaves](#).

Back to [Global Data Sharing Attributes](#).

### **Priority for Writing**

Defines the priority at which the referenced attributes are commanded. Seven is the highest priority and 16 is the lowest supported by the Global Data Sharing object, with the default of 15.

**Note:** We do not recommend using priorities 7 or 8 as they may interfere with the operator override function.

### **Refresh Timer**

Indicates the amount of time, in minutes, between updates to the slaves from the [Master](#) or [Alternate Master](#). Updates initiated by the refresh timer occur in addition to updates initiated by a COV from the Master/Alt Master.

For example, if the Refresh Timer attribute's value is 2, the Global Data Sharing object updates the slaves with information from the Master/Alt Master every 2 minutes and with each COV.

If this attribute is set to zero instead, updates are only sent upon receipt of additional COV reports.

Back to [Global Data Sharing Attributes](#).

### **Reliability**

Indicates whether a value is questionable. This attribute value equals Input Unreliable only if both the configured [Master](#) and [Alternate Master](#) inputs are unreliable.

Back to [Global Data Sharing Attributes](#).

### **Setup**

Defines whether the [Fail Soft](#) or Last Reliable value needs to be the output if the object becomes unreliable.

Back to [Global Data Sharing Attributes](#).

### **Slaves List**

Contains a list of attribute references. Each slave identified in this list of attribute references receives its value from the Master.

Back to [Global Data Sharing Attributes](#).

## **Global Data Sharing Commands**

The table below lists the commands supported by the [Global Data Sharing Object](#).

**Table 261: Global Data Sharing Object Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	

## **Global Data Sharing Command Details**

### **Disable**

Prevents the object from responding to any change in the [Master](#), including reliability changes.

Back to [Global Data Sharing Commands](#).

**Enable**

Updates the [Slaves List](#) with COVs. Immediately after receiving this command, the [Master](#) referenced value is routed to each of the output references.

Back to [Global Data Sharing Commands](#).

# Group Object

The Group object's attributes represent a collection of other objects and one or more of their attributes. This object provides the user with the ability to customize the organization of objects within the site. The Group object simplifies the exchange of information between objects by calling all members of the group at once. A group consists of any combination of object types. For example, you can use the Group object to monitor the temperature in different rooms throughout a floor of a building.

For general information on Metasys system objects, see [Common Object Attributes](#).

For detailed information on the Group object, see [Group Attributes](#).

For more information on the wizard used to create the Group object, see [Insert Object - Group](#).

## Group Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 262: Group Object Attributes - Group Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Options/Range
<a href="#">List of Group Members</a>	Set of types	CW	W		
<a href="#">Present Value</a>	Set of values				

1 C - Configurable, W - Writable

## Group Attribute Details

### List of Group Members

Contains the references (Input References) that define the members of the group. These group members are referenced during a transaction. The List of Group Members consists of two parts:

- Object Identifier (Object ID)
- List of Property References

All members of the group are objects that reside in the same device that maintains the Group object. Nesting is not allowed.

Back to [Group Attributes](#).

### Present Value

Lists the values of all the attributes specified in the [List of Group Members](#). This is a read-only attribute; it cannot be used to write a set of values to the members of the group. The Present Value list reconstructs each time the attribute is read by fetching the member attributes.

Back to [Group Attributes](#).

# Graphic Object

The Graphics object defines the attributes that represent a defined user graphic for a given set of objects. Graphic objects must exist under a container object or under another Graphic object (this allows you to [link](#) graphics together).

For detailed information on the User Graphics Tool, see [User Graphics Tool \(UGT\)](#).

## Graphic Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 263: Graphic Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">File Name</a>	Set of related values	W		

1 W - Writable

## Graphics Attribute Details

### **File Name**

Specifies an XML file containing a UI tree.

**Table 264: File Name Elements**

Element Name	Data Type	Initial Value
<b>Exportable</b>	True or False value	False (0)
<b>Object Reference</b>	List of references	
<b>References</b>	True or False value	False (0)
<a href="#">Relative Path</a>	Text	

Back to [Graphic Attributes](#).

### **Relative Path**

The name of the file relative to the directory containing the .moi file for the device.

Back to [File Name](#).

Back to [Graphic Attributes](#).

## IEIEJ BACnet System Objects

IEIEJ BACnet System Objects comply to the Institute of Electrical Installation Engineers of Japan (IEIEJ) Standard Protocol based on BACnet specifications. Use these objects to comply with these guidelines.

For more information on IEIEJ BACnet System Objects, click one of the following:

- [Electric Demand Monitoring Object](#)
- [Electric Demand Control Object](#)
- [Generator Load Control Object](#)

### ***IEIEJ BACnet System Object Descriptions***

#### **Electric Demand Monitoring Object**

The Electric Demand Monitoring Object is a specialized object that monitors the power consumption in a fixed 30-minute window. This object uses an accumulator or analog input and calculates the demand every minute. The object calculates a projected demand for the end of the 30-minute window, and compares that demand value to the target demand. If the projected demand value exceeds the target demand value, the object triggers an alarm notification. A graph of the demand values is the default view of the object.

Back to [IEIEJ BACnet System Object Descriptions](#).

#### **Electric Demand Control Object**

The Electric Demand Control Object interacts with the [Electric Demand Monitoring Object](#) to control electrical loads so the actual demand stays below the target demand. The present value is a value (1–16) that indicates the level of shed activity needed to stay within the target demand. External logic must be used to interpret this value and switch on/off loads.

Back to [IEIEJ BACnet System Object Descriptions](#).

#### **Generator Load Control Object**

This object is similar to the [Electric Demand Control Object](#) but specifically controls the loads on a backup generator. A given generator can supply a fixed maximum amount of power. A reference to the current load on the generator and the value of the maximum generator output are configured in the object. This present value is a value (1–16) that indicates the level of shed activity needed so the demand does not exceed the maximum power output of the generator. External logic must be used to interpret this value and switch on/off loads.

Back to [IEIEJ BACnet System Object Descriptions](#).

# Interlock Object

The Interlock object provides a means to establish conditional control over one or more other objects. It consists of an IF conditional statement, True command statements, and False command statements. Through these statements, the user specifies a set of conditional checks (using one or more points) for which a series of commands is used to control a collection of one or more other objects.

Three essential parameters of the IF conditional statement, shown in the following list, determine the Interlock object's mode of operation:

- list of attribute references
- constants
- operators

This object allows a user to place a VAV controller in the occupied mode whenever the main fan is on and in the occupied mode.

For general information on Metasys system objects, see [Common Object Attributes](#).

For information on the logic used in the interlock object, see the [Logic](#) attribute description.

For more information on the wizard used to insert Interlock objects, see [Insert Object - Interlock](#).

## Interlock Configuration

Configure the attributes of the Focus/Configuration, Interlock Definition, and Action Tables tabs of the Interlock object. See the [Interlock Attributes](#) section for descriptions of the attributes on these tabs.

On the **Focus/Configuration** tab, click the **Advanced** radio button to view and edit all the attributes available on this tab.

On the **Interlock Definition** tab, define the items/objects to control and the desired conditional logic. Tips for this tab include:

- Click the Add button to add items to the list from the Select Item dialog box.
- Click the check box next to an item in the list and click Delete to remove the item from the list.
- Select the type of logic to use for the items in the list from the Logic menu. See the [Logic](#) attribute description for the types of logic.

On the **Action Tables** tab, define the commands and the priority for the items/objects under control. Tips for this tab include:

- Check the **All Commands Priority** check box if you wish to use the same priority for all commands in the action tables. Clear the **All Commands Priority** check box to enable individual priority selection for the commands in the action tables.
- For the **Actions for Condition: True** and **Actions for Condition: False** tables, click the Add button to add items to the table from the Select Item dialog box.
- For the **Actions for Condition: True** and **Actions for Condition: False** sections, click the check box next to an item in the table and click Delete if you want to remove the item from the table.

## Interlock Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.



**Table 265: Interlock Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Executing</i>	True or False		False	
<i>Execution Priority</i>	One state from a set	CW		
<i>Last Executed Date</i>	Date	N		
<i>Last Executed Time</i>	Time	N		
<i>Present Value</i>	One state from a set	DRW		
<i>Priority Array</i>	Set of values			
<i>Reliability</i>	One state from a set			Uses Reliability (Set 503).
<i>Restore Command Priority</i>	Series of True or False states	CW	Operator Override	
<i>Send OK</i>	True or False			
<i>States Text</i>	One state from a set	CW		States Text defaults to False/True, but you can use any two state set.

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object Reliability, W - Writable

**Table 266: Interlock Object Attributes - Interlock Definition Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Logic</i>	One state from a set	CW	0	Match All (AND) Match Any (OR) Complex
<i>Logic Equation</i>	Text	CW		Maximum 56 characters
<i>Source</i>	List of value sets	CW		Item/Object Name Attribute Relation (Equal, Not Equal, Greater Than, Less Than, Greater Or Equal, Less Or Equal) Value Differential (required and only used when the value is analog)

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object Reliability, W - Writable

**Table 267: Interlock Object Attributes - Action Tables Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Action Tbl 1 (True)</i>	List of Command References	CW		Item/Object Name Command Priority Delay (0–65,535 seconds) Parameters (vary according to command)
<i>Action Tbl 2 (False)</i>	List of Command References	CW		Item/Object Name Command Priority Delay (0–65,535 seconds) Parameters (vary according to command)
<i>Commands Priority</i>	One state from a set	CW	16	Uses Write Priority (Set 1).

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object Reliability, W - Writable

## Interlock Attribute Details

### *Action Tbl 1 (True)*

Lists commands issued by this object when the condition is true:

- **Item** - The name of the object to be commanded.
- **Command** - The type of command to send to the object.
- **Priority** - The priority at which to send the command.
- **Delay** - The amount of time, in seconds, each command waits to be sent, after a change in condition.
- **Parameters** - These vary according to command.

Any object capable of accepting commands can be defined in either action table. The available commands depend on the type of object and the user's access capability. An object may be sent more than one command by identifying the object more than once and specifying a different command. The user does not have to specify objects for both the True and False Action Tables. If no command is specified for an object, no command is sent.

Back to [Interlock Attributes](#).

### *Action Tbl 2 (False)*

Lists commands issued by this object when the condition is false:

- **Item** - The name of the object to be commanded
- **Command** - The type of command to send to the object
- **Priority** - The priority at which to send the command
- **Delay** - The amount of time, in seconds, each command waits to be sent, after a change in condition
- **Parameters** - These vary according to command.

Any object capable of accepting commands can be defined in either action table. The available commands depend on the type of object and the user's access capability. An object may be sent more than one command by identifying the object more than once and specifying a different command. The user does not have to specify objects for both the True and False Action Tables. If no command is specified for an object, no command is sent.

Back to [Interlock Attributes](#).

### **Commands Priority**

Determines the order by importance for all commands sent. If the All Commands Priority option is not selected, the commands are sent at each individual priority specified in the Action Tbl attribute. If the All Commands Priority option is selected, then every item in the Action Table is sent a command at the priority specified. For example, if the command chosen is Operator Override, the command priority automatically sets to Operator Override (8) for every item listed in the Action Table. When the All Commands Priority option is selected, you cannot change the command priority within the Action Table.

An object defined in the Action Tables must use commands greater than Priority 16 (default) if no Relinquish Default attribute is defined for that object. Otherwise, commands sent at Priority 16 to objects without a Relinquish Default will not be accepted by that object. Commands with a lower priority number are of higher priority (importance) or are more critical than commands with a higher priority number. For example, Manual Life Safety (1) is of higher priority than Scheduling (15).

If the Commands Priority is defined as 16 (Default), then any existing commands from Scheduling (15) through Priority 9 (9) will be released when the command is sent.

The Commands Priority uses the priorities in the Write Priority (Set 1).

Back to [Interlock Attributes](#).

### **Executing**

Specifies the current execution status of the object. It is True when the object receives a state command and starts sending commands. When all actions are completed for a given state, this flag is set to False.

Back to [Interlock Attributes](#).

### **Execution Priority**

Indicates the relative importance of performing the function of the object within the device.

Back to [Interlock Attributes](#).

### **Last Executed Date**

Indicates the date stamp for the beginning of executing the current state.

Back to [Interlock Attributes](#).

### **Last Executed Time**

Indicates the time stamp for the beginning of executing the current state.

Back to [Interlock Attributes](#).

### **Logic**

Specifies the Boolean logic (And/Or) to be employed in combination with source inputs in deriving a True or False outcome.

When the source input operator is unreliable, the interlock operates according to the following rules:

- **Complex** - Uses the equation defined by the [Logic Equation](#) attribute. If **any** input is **unreliable**, the expression cannot be evaluated; therefore, the interlock is unreliable and does not execute.
- **Match All (AND)** - Every one of the source conditions must be True. If an input is **reliable**, it is evaluated. If the result is False, the interlock evaluates to False and executes. All inputs are checked for trouble (Reliability != Reliable). If any input is **not reliable**, the expression cannot be evaluated; therefore, the interlock is unreliable and does not execute.
- **Match Any (OR)** - One or more of the source conditions must be True. If an input is **reliable**, it is evaluated. If the result is True, the interlock evaluates to True and executes. All inputs are checked for trouble (Reliability != Reliable). If **no** inputs are reliable, the expression cannot be evaluated; therefore, the interlock is unreliable and does not execute.

Back to [Interlock Attributes](#).

### Logic Equation

Contains a logic equation when the [Logic](#) attribute is set to Complex.

Use the logic equation to define the relationship between the master conditions using logic operators and parentheses for determining precedence.

Valid characters in the Logic Equation string are:

- \* AND operator
- + OR operator
- ( Open parenthesis (for grouping)
- ) Closed parenthesis (for grouping)
- numbers Master condition numbers
- spaces Spaces are allowed for readability

### Equation Syntax:

- Open and close parenthesis must match.
- Empty parenthesis are not allowed ().
- The equation must be at least 3 characters in length, not including spaces.
- The numbers must not exceed the master condition numbers.
- There is no implied precedence for the operators (\*,+).
- Any combination of different operators must be grouped with parenthesis to determine precedence.
- Operators of the same type do not require the use of parenthesis.
- A grouping may contain only one operator type.
- Numbers or groupings must be separated by an operator (\*,+).
- Groups can be nested.

**Table 268: Examples**

Incorrect	Correct
$1+2+3*4$	$1+2+(3*4)$ or $(1+2+3)*4$
$1*2+3*4$	$(1*2)+(3*4)$ or $1*(2+3)*4$
$1*2*3+4$	$1*((2*3)+4)$ or $(1*2)*(3+4)$ or $(1*2*3)+4$
$(1+2)*(3+4)+(6*7)$	$((1+2)*(3+4))+(6*7)$ or $(1+2)*((3+4)+(6*7))$
$(3*4)(1*2)$	$(3*4)*(1*2)$
$(3*+1)$	$(3*1)$
$(3*$	$(3*1)$

### Sample Logic Equation:

$$((1+2)*(3+4))+(6*7)$$

Where the equation says that master condition ((1 OR 2) AND (3 OR 4)) OR (6 AND 7) results in a TRUE (Action Tbl 1) execution.

Objects are given numbers in the left column that correspond to the order you add them to the Interlock Definition list (the first added is 1, the second added is 2, and so on). Use these numbers to represent the corresponding objects in the Logic Equation.

Back to [Interlock Attributes](#).

**Present Value**

Represents the current value of the object. Present Value is set based on the relationships set up in the Interlock definition.

Back to [Interlock Attributes](#).

**Priority Array**

Lists values of the object in level of importance.

Back to [Interlock Attributes](#).

**Reliability**

Indicates if the Present Value is questionable.

Back to [Interlock Attributes](#).

**Restore Command Priority**

Selects which commands (at a selected priority) persist through a device restart. When the bit is set, the command (at a selected priority) is saved at shutdown and restored at startup.

Back to [Interlock Attributes](#).

**Send OK**

Indicates the success or failure of the slave commands. If any slave commands failed, this attribute is set to False. When a send error is detected, a five minute timer is set. When the timer expires, the interlock is reevaluated and all commands are sent again. Commands may fail if the slave object is off-box and offline **or** if the slave object is set for local control.

Back to [Interlock Attributes](#).

**Source**

Lists objects whose attributes are used for input into the logic expression to decide if the condition is True or False. Information needed:

- **Item** - Name of the source object
- **Attribute** - Varies according to object. Default = [Present Value](#)
- **Relation** - Equal, Not Equal, Greater Than, Less Than, Greater Than or Equal, Less Than or Equal
- **Value** - The value used in the Relation. Varies according to the object.
- **Differential** - Accounts for variations in the value. Required (and only used) if the value is analog.

Back to [Interlock Attributes](#).

**States Text**

Indicates the displayed strings for the [Present Value](#).

**Interlock Commands**

The table below lists the commands supported by the [Interlock Object](#).

**Table 269: Interlock Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Operator Override</a>	The value to be written to the Present Value attribute. This parameter has a True or False data type.
<a href="#">Release Operator Override</a>	
<a href="#">Re-Command</a>	

**Table 269: Interlock Commands**

Command Name	Parameters
<a href="#">Release</a>	Attribute name Command priority
<a href="#">Release All</a>	Attribute name

## Interlock Command Details

### **Disable**

Locks out all outputs and prevents the Interlock functionality.

Back to [Interlock Commands](#).

### **Enable**

Ensures object reacts to any changes it may have missed while it was disabled, and returns it to normal operation.

Back to [Interlock Commands](#).

### **Operator Override**

Updates the [Present Value](#) at Command Priority Operator Override.

**Important:** The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when one of the following conditions is met: a) NOT Local Control and NOT Out Of Service, or b) NOT Local Control and after issuing the In Service command.

Back to [Interlock Commands](#).

### **Release Operator Override**

Releases Command Priority Operator Override from [Present Value](#).

Back to [Interlock Commands](#).

### **Re-Command**

Reissues the commands for the current state.

Back to [Interlock Commands](#).

### **Release**

Releases the identified command priority from the specified, writable attribute, and allows it to be controlled by the next highest priority.

Back to [Interlock Commands](#).

**Release All**

Releases Command Priorities 3 through 16 from the specified, writable attribute. Command Priorities 1 and 2 remain.

**Note:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space could overcool or overheat, a fan might run longer than expected, and so on. If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [Interlock Commands](#).

## Life Safety Point Object

The Life Safety Point object's attributes represent the state of smoke detectors, fire detectors, security alarms, and similar devices. As a Life Safety Point, the state of this object can be one of 24 states.

The Life Safety Point object is a standardized object that represents a BACnet Safety Point Object as defined in the 2008 BACnet specification.

### Life Safety Point Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 270: Life Safety Point Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	BACnet Notes <sup>1</sup>	Values/Options/Range
<a href="#">Accepted Modes</a>	List of	Q	Uses BAC LifSfty Mode (BACnet Lifesafety Mode) (Set 189).
<a href="#">Direct Reading</a>	Float	O	Units = Redirected to <a href="#">Units</a> attribute
<a href="#">Event State</a>	One state from a set		Uses BAC Event State (Set 5).
<a href="#">Life Safety Mode</a>	One value from a set	WQ	Uses BAC LifSfty Mode (BACnet Lifesafety Mode) (Set 189).
<a href="#">Maintenance Required</a>	One value from a set	O	Uses BAC LifSfty Maint (BACnet Lifesafety Maintained) (Set 187).
<a href="#">Operation Expected</a>	One value from a set	Q	Uses BAC LifSfty Oper (Set 190).
<a href="#">Out of Service</a>	True or False	BCW	
<a href="#">Present Value</a>	One value from a set	WDRQ	Uses BAC LifSfty State (BACnet Lifesafety State) (Set 186).
<a href="#">Reliability</a>	One state from a set	BW	Uses Reliability (Set 503)
<a href="#">Setting</a>	Byte	O	Units = No Unit
<a href="#">Silenced</a>	One value from a set	Q	Uses BAC LifSfty SilState (BACnet Life Safety Silent State) (Set 188).
<a href="#">Tracking Value</a>	One value from a set	O	Uses BAC LifSfty State (BACnet Lifesafety State) (Set 186).
<a href="#">Units</a>	One value from a set	O	Uses Unit Set (Set 869)

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, N - Value Not Required, O - BACnet Optional, Q - BACnet Required, R - Affected by Object Reliability, W - Writable

**Table 271: Life Safety Point Object Attributes - Member Tab**

Attribute Name	Data Type	BACnet Notes <sup>1</sup>	Values/Options/Range
<a href="#">Units</a>	List of	O	

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, N - Value Not Required, O - BACnet Optional, Q - BACnet Required, R - Affected by Object Reliability, W - Writable

### Life Safety Point Attribute Details

#### Accepted Modes

Specifies all the values the Life Safety Mode attribute accepts when written.

Back to [Life Safety Point Attributes](#).



**Direct Reading**

Indicates an analog quantity that reflects the measured or calculated reading from an initiating device.

Back to [Life Safety Point Attributes](#).

**Event State**

Indicates if an active event state is associated with the object. If the object supports intrinsic reporting, this attribute indicates the event state of the object. If not, the attribute is Normal.

Back to [Life Safety Point Attributes](#).

**Life Safety Mode**

Specifies the operating mode of the Life Safety Point object. The Life Safety Point object generates Change-of-Life-Safety event notifications for any mode transition if the flags in the Event Enable attribute are set.

Back to [Life Safety Point Attributes](#).

**Maintenance Required**

Indicates that maintenance is required for the life safety point. This may indicate periodic maintenance or parameter-determined maintenance, such as a dirtiness value for an associated detector.

Back to [Life Safety Point Attributes](#).

**Member Of**

Indicates the Life Safety Zone objects of which this Life Safety Point is considered to be a zone member. Each object in the Member Of list is a Life Safety Zone object.

Back to [Life Safety Point Attributes](#).

**Operation Expected**

Specifies the next operation expected by this object to handle a specific life safety situation.

Back to [Life Safety Point Attributes](#).

**Out of Service**

Indicates (when True) that the [Present Value](#) and [Reliability](#) attributes are decoupled from the physical input to the object and their values may be changed for simulation or testing purposes. Functions that depend on the values of the Present Value or Reliability attributes continue to respond to changes while Out of Service is True, as if those changes had come from the physical input.

Additionally, the Out of Service state of the Status Flags attribute is set to True and the Fault state is decoupled from the physical input when Out of Service is True.

Back to [Life Safety Point Attributes](#).

**Present Value**

Indicates the current value of the Life Safety Point object in the defined [Units](#). When [Out of Service](#) is True, this attribute is writable.

Back to [Life Safety Point Attributes](#).

**Reliability**

Indicates whether the [Present Value](#) is unreliable. When [Out of Service](#) is True, the Reliability attribute may be written directly.

Back to [Life Safety Point Attributes](#).

**Setting**

Specifies the next operation expected by this object to handle a specific life safety situation.

Back to [Life Safety Point Attributes](#).

**Silenced**

Indicates whether the most recently occurring transition for this object produced an audible or visual indication that has been silenced by the recipient of a Life Safety Operation service request or a local process.

Back to [Life Safety Point Attributes](#).

**Tracking Value**

Reflects the non-latched state of the Life Safety Point object. This attribute continuously tracks changes in the latched state of the object.

Back to [Life Safety Point Attributes](#).

**Units**

Indicates the units of the quantity represented by Direct Reading.

Back to [Life Safety Point Attributes](#).

**Life Safety Point Commands**

The table below lists the commands supported by the [Life Safety Point Object](#).

**Table 272: Life Safety Point Commands**

Command Name	Number of Parameters
<a href="#">In Service</a>	
<a href="#">Out of Service</a>	The value to be written to the <a href="#">Present Value</a> .

**Life Safety Point Command Details****In Service**

Cancels the affect of an [Out of Service](#) command and returns the [Out of Service](#) attribute to False. [Present Value](#) and [Reliability](#) revert back to the values obtained from the physical input.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Life Safety Point Commands](#).

**Out of Service**

Allows a user to override the object's hardware input for simulation or other purposes. The [Out of Service](#) command changes the Out of Service attribute to True, writes the Present Value to the value of the command parameter, and writes the [Reliability](#) attribute to Reliable. Present Value and Reliability no longer track the physical input.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Life Safety Point Commands](#).

# Life Safety Zone Object

The Life Safety Zone object represents a grouping of Life Safety Points. The Life Safety Zone can also represent a grouping of Life Safety Zones.

The Life Safety Zone object is a standardized object that represents a BACnet Safety Zone Object as defined in the 2008 BACnet specification.

## Life Safety Zone Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 273: Life Safety Zone Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	BACnet Notes <sup>1</sup>	Values/Options/Range
<a href="#">Accepted Modes</a>	One value from a list	Q	Uses BAC LifSfty Mode (BACnet Lifesafety Mode) (Set 189).
<a href="#">Event State</a>	One state from a set	B	Uses BAC Event State (Set 5).
<a href="#">Life Safety Mode</a>	One value from a set	WQ	Uses BAC LifSfty Mode (BACnet Lifesafety Mode) (Set 189).
<a href="#">Maintenance Required</a>	Boolean	O	Uses BAC LifSfty Maint (BACnet Lifesafety Maintained) (Set 187).
<a href="#">Operation Expected</a>	One value from a set	Q	Uses BAC LifSfty Oper (Set 190).
<a href="#">Out of Service</a>	True or False	BCW	
<a href="#">Present Value</a>	One value from a set	WDRQ	Uses BAC LifSfty State (BACnet Lifesafety State) (Set 186).
<a href="#">Reliability</a>	One state from a set	BW	Uses Reliability (Set 503)
<a href="#">Silenced</a>	One value from a set		Uses BAC LifSfty SilState (BACnet Life Safety Silent State) (Set 188).
<a href="#">Tracking Value</a>	One value from a set	O	Uses BAC LifSfty State (BACnet Lifesafety State) (Set 186).

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, N - Value Not Required, O - BACnet Optional, Q - BACnet Required, R - Affected by Object Reliability, W - Writable

**Table 274: Life Safety Zone Object Attributes - Members Tab**

Attribute Name	Data Type	BACnet Notes <sup>1</sup>	Values/Options/Range
<a href="#">Member Of</a>	List of	O	
<a href="#">Zone Members</a>	List of	Q	

1 B - Exposed as Standard BACnet Property, C - Configurable, D - Default Attribute for Display, N - Value Not Required, O - BACnet Optional, Q - BACnet Required, R - Affected by Object Reliability, W - Writable

## Life Safety Zone Attribute Details

### Accepted Modes

Specifies all the values the Life Safety Mode property accepts when written.

Back to [Life Safety Zone Attributes](#).

### Event State

Indicates if an active event state associated with the object. If the object supports intrinsic reporting, this attribute indicates the event state of the object. If not, the attribute is Normal.

Back to [Life Safety Zone Attributes](#).

### **Life Safety Mode**

Specifies the operating mode of the Life Safety Zone object. The Life Safety Zone object generates Change-of-Life-Safety event notifications for any mode transition if the flags in the Event Enable attribute are set.

Back to [Life Safety Zone Attributes](#).

### **Maintenance Required**

Indicates that maintenance is required for one or more of the life safety points that are members of this zone.

Back to [Life Safety Zone Attributes](#).

### **Member Of**

Indicates the Life Safety Zone objects of which this Life Safety Point is considered to be a zone member. Each object in the Member Of list is a Life Safety Zone object.

Back to [Life Safety Zone Attributes](#).

### **Operation Expected**

Specifies the next operation expected by this object to handle a specific life safety situation.

Back to [Life Safety Zone Attributes](#).

### **Out of Service**

Indicates (when True) that the [Present Value](#) and [Reliability](#) attributes are decoupled from the physical input to the object and their values may be changed for simulation or testing purposes. Functions that depend on the values of the Present Value or Reliability attributes continue to respond to changes while Out of Service is True, as if those changes had come from the physical input.

Additionally, the Out of Service state of the Status Flags attribute is set to True and the Fault state is decoupled from the physical input when Out of Service is True.

Back to [Life Safety Zone Attributes](#).

### **Present Value**

Indicates the current value of the Life Safety Zone object. When [Out of Service](#) is True, this attribute is writable.

Back to [Life Safety Zone Attributes](#).

### **Reliability**

Indicates whether the [Present Value](#) is unreliable.

When [Out of Service](#) is True, the Reliability attribute may be written directly.

Back to [Life Safety Zone Attributes](#).

### **Silenced**

Indicates whether the most recently occurring transition for this object produced an audible or visual indication that has been silenced by the recipient of a Life Safety Operation service request or a local process.

Back to [Life Safety Zone Attributes](#).

### **Tracking Value**

Reflects the non-latched state of the Life Safety Zone object. This attribute continuously tracks changes in the latched state of the object.

Back to [Life Safety Zone Attributes](#).

### **Zone Members**

Indicates which Life Safety Point and Life Safety Zone objects are members of the zone represented by this object.

Back to [Life Safety Zone Attributes](#).

## Life Safety Zone Commands

The table below lists the commands supported by the [Life Safety Zone Object](#).

**Table 275: Binary Input Commands**

Command Name	Number of Parameters
<a href="#">In Service</a>	
<a href="#">Out of Service</a>	The value to be written to the <a href="#">Operation Expected</a>

### Life Safety Zone Command Details

#### **In Service**

Cancels the affect of an [Out of Service](#) command and returns the [Out of Service](#) attribute to False. [Operation Expected](#) and [Reliability](#) revert to the values obtained from the physical input.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Life Safety Zone Commands](#).

#### **Out of Service**

Allows a user to override the object's hardware input for simulation or other purposes. The [Out of Service](#) command changes the Out of Service attribute to True, writes the Present Value to the value of the command parameter and writes the [Reliability](#) attribute to Reliable. [Present Value](#) and [Reliability](#) no longer track the physical input.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Life Safety Zone Commands](#).

# LON Controller Object

The LON Controller object defines attributes that represent the external, visible characteristics of a device residing on a LONWORKS network.

For general information on Metasys system objects, see the [Object Help](#) section.

## LON Controller Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 276: LON Controller Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Enabled</a>	True or False	CW	True	
<a href="#">Graphic</a>	Object reference	CW		
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">Offline</a>	True or False		False	
<a href="#">Present Value</a>	One value from a set		Offline	Number of Elements = 4 Uses Controller Status (Set 43).
<a href="#">XIF Present</a>	True or False			

1 C - Configurable, W - Writable

**Table 277: LON Controller Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Command Count</a>	Number			
<a href="#">Error Log</a>	One value from a set		NOERROR	LON_DEV_ERROR_LOG
<a href="#">Lost Messages</a>	Number		0	
<a href="#">Missed Messages</a>	Number			
<a href="#">Neuron Model</a>	One value from a set		Neuron_3150	LON Model Number
<a href="#">Node State</a>	One value from a set			Number of Elements = 7 Type = Value Given Uses Node State (Set 583).
<a href="#">Offline Poll Count</a>	Number		0	
<a href="#">Receive Transaction Full</a>	Number		0	
<a href="#">Reset Cause</a>	One value from a set		Clear	Size = 5 Type = Value Given Uses Neuron Reset Cause (Set 182).
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Total Messages To Device</a>	Number		0	

**Table 277: LON Controller Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#"><i>Total Single Message Failures</i></a>	Number		0	
<a href="#"><i>Transaction Timeouts</i></a>	Number		0	
<a href="#"><i>Transmit Errors</i></a>	Number		0	
<a href="#"><i>Version Number</i></a>	Number		0	

1 C - Configurable, W - Writable

## LON Controller Attribute Details

### **Command Count**

Displays the total number of commands sent to this controller.

Back to [LON Controller Attributes](#).

### **Enabled**

If True, allows integration between the Metasys system extended architecture and the LON controller.

Back to [LON Controller Attributes](#).

### **Error Log**

Shows the error log according to the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

### **Graphic**

Indicates the graphic associated with the object.

Back to [LON Controller Attributes](#).

### **Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this object or the controller containing this point.

Back to [LON Controller Attributes](#).

### **Lost Messages**

Shows the number messages lost according to the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

### **Missed Messages**

Shows the number messages missed according to the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

### **Neuron Model**

Shows the Neuron model according to the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

### **Node State**

Shows the state of the node according to the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

### **Offline**

Displays the offline or online status of connected hardware. The LONWORKS network server updates this attribute value.

Back to [LON Controller Attributes](#).

**Offline Poll Count**

Displays the total number of times this controller was sent a poll while offline.

Back to [LON Controller Attributes](#).

**Present Value**

Displays the communication status of the object.

Back to [LON Controller Attributes](#).

**Receive Transaction Full**

Shows the number of times the transaction full message appeared in the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

**Reset Cause**

Shows the cause of the last reset according to the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

**Reset Date**

Contains the date stamp of the last local Neuron statistics reset command.

Back to [LON Controller Attributes](#).

**Reset Time**

Contains the time stamp of the last local Neuron statistics reset command.

Back to [LON Controller Attributes](#).

**Total Messages To Device**

Displays the total number of messages sent to this controller.

Back to [LON Controller Attributes](#).

**Total Single Message Failures**

Displays the total number of failures for single messages sent to this controller.

Back to [LON Controller Attributes](#).

**Transaction Timeouts**

Shows the timeouts that appeared in the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

**Transmit Errors**

Shows the number of transmit errors that appeared in the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

**Version Number**

Shows the version number according to the last standard LONWORKS network Query Status message.

Back to [LON Controller Attributes](#).

**XIF Present**

Indicates whether a External Interface (XIF) file matching this controller's Program ID was found.

Back to [LON Controller Attributes](#).

**LON Controller Commands**

The table below lists the commands supported by the [LON Controller Object](#).



**Table 278: LON Controller Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Latch Statistics</a>	

## LON Controller Command Details

### **Clear Statistics**

Resets the statistics for the integrated LONWORKS network. The contents of the Query Status message reflect these statistics:

- [Transmit Errors](#)
- [Transaction Timeouts](#)
- [Receive Transaction Full](#)
- [Lost Messages](#)
- [Missed Messages](#)
- [Reset Cause](#)
- [Node State](#)
- [Version Number](#)
- [Error Log](#)
- [Neuron Model](#)

For information on gathering this statistical information, see the [Latch Statistics](#) command.

Back to [LON Controller Commands](#).

### **Disable**

Disables the entire LONWORKS network integration. No requests are made to the field trunk and no data broadcasts to the network are processed.

Back to [LON Controller Commands](#).

### **Enable**

Allows the integration to function normally.

Back to [LON Controller Commands](#).

### **Latch Statistics**

Updates the displayed statistics with the current values. The following attributes reflect the statistics:

- [Transmit Errors](#)
- [Transaction Timeouts](#)
- [Receive Transaction Full](#)
- [Lost Messages](#)
- [Missed Messages](#)
- [Reset Cause](#)
- [Node State](#)
- [Version Number](#)
- [Error Log](#)
- [Neuron Model](#)

For information on clearing this statistical information, see the [Clear Statistics](#) command.

Back to [LON Controller Commands](#).

## LON Integration Object

The LON Integration object defines LONWORKS network integration for the NAE. The object contains pertinent attributes and holds a list of LONWORKS network-related configuration resource files.

For general information on Microsoft system objects, see the [Object Help](#) section.

### LON Integration Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

Also, see [Status](#).

**Table 279: LON Integration Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Bind Retry Count</a>	Number			
<a href="#">Count</a>	Number			
<a href="#">Device Offline Polling Cycle Time</a>	Number		0	
<a href="#">Device Online Polling Cycle Time</a>	Number		0	
<a href="#">Error Log</a>	One value from a set		NOERROR	
<a href="#">LON Integration DLL Date</a>	Date			
<a href="#">LON Integration DLL Size</a>	Number		0	
<a href="#">LON Integration DLL Time</a>	Time			
<a href="#">Lost Messages</a>	Number		0	
<a href="#">Missed Messages</a>	Number		0	
<a href="#">Neuron Model</a>	One state from a set		Neuron_3150	LON Model Number
<a href="#">Node State</a>	One state from a set			Size = 7 Type = Value Given Uses Node State (Set 583).
<a href="#">Offline</a>	True or False		0	
<a href="#">Permanent Status Item Count</a>	Number		0	
<a href="#">Point Scan Time</a>	Number			Seconds
<a href="#">Priority 1 Poll Items</a>	Number		0	
<a href="#">Priority 2 Poll Items</a>	Number		0	
<a href="#">Priority 3 Poll Items</a>	Number		0	
<a href="#">Priority 1 Poll Time</a>	Number		0	
<a href="#">Priority 2 Poll Time</a>	Number		0	
<a href="#">Priority 3 Poll Time</a>	Number		0	

**Table 279: LON Integration Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Receive Transaction Full</a>	Number		0	
<a href="#">Reset Cause</a>	One cause from a set		Clear	Size = 5 Type = Value Given Uses Neuron Reset Cause (Set 182).
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Status Cache Hits</a>	Number		0	
<a href="#">Status Cache Misses</a>	Number		0	
<a href="#">Temporary Status Item Count</a>	Number		0	
<a href="#">Transaction Timeouts</a>	Number		0	
<a href="#">Transmit Errors</a>	Number		0	
<a href="#">Transmits Per Minute</a>	Number		0	
<a href="#">Version Number</a>	Number		0	
<a href="#">XIF Present</a>	True or False			

1 C - Configurable, W - Writable

## LON Integration Attribute Details

### **Bind Retry Count**

Indicates the number of objects for which the LON Integration code is still verifying with the field controller that it has the correct type information.

Back to [LON Integration Attributes](#).

### **Count**

Displays the number of LONWORKS network point object defined for the trunk.

Back to [LON Integration Attributes](#).

### **Device Offline Polling Cycle Time**

Indicates how often all offline devices are polled.

Back to [LON Integration Attributes](#).

### **Device Online Polling Cycle Time**

Indicates how often all online devices are polled.

Back to [LON Integration Attributes](#).

### **Error Log**

Shows the error log according to the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

### **LON Integration DLL Date**

Displays the current date stamp on the LonIntegration.DLL.

Back to [LON Integration Attributes](#).

### **LON Integration DLL Size**

Displays the current size of the LonIntegration.DLL.

Back to [LON Integration Attributes](#).

**LON Integration DLL Time**

Displays the current time stamp on the LonIntegration.DLL.

Back to [LON Integration Attributes](#).

**Lost Messages**

Shows the number messages lost according to the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Missed Messages**

Shows the number messages missed according to the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Neuron Model**

Shows the Neuron model according to the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Node State**

Shows the state of the node according to the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Offline**

Displays the offline or online status of connected hardware. The LONWORKS network server updates this attribute value.

Back to [LON Integration Attributes](#).

**Permanent Status Item Count**

Displays the number of items polled as a result of COV signups.

Back to [LON Integration Attributes](#).

**Point Scan Time**

Displays the calculated number of seconds the server takes to read all defined points.

Back to [LON Integration Attributes](#).

**Priority 1 Poll Items**

Displays the number of items in the Priority 1 list.

Back to [LON Integration Attributes](#).

**Priority 2 Poll Items**

Displays the number of items in the Priority 2 list.

Back to [LON Integration Attributes](#).

**Priority 3 Poll Items**

Displays the number of items in the Priority 3 list.

Back to [LON Integration Attributes](#).

**Priority 1 Poll Time**

Indicates how often the items in the Priority 1 list are polled.

Back to [LON Integration Attributes](#).

**Priority 2 Poll Time**

Indicates how often the items in the Priority 2 list are polled.

Back to [LON Integration Attributes](#).

**Priority 3 Poll Time**

Indicates how often the items in the Priority 3 list are polled.

Back to [LON Integration Attributes](#).

**Receive Transaction Full**

Shows the number of times the transaction full message appeared in the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Reset Cause**

Shows the cause of the last reset according to the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Reset Date**

Contains the date stamp of the last local Neuron statistics reset command.

Back to [LON Integration Attributes](#).

**Reset Time**

Contains the time stamp of the last local Neuron statistics reset command.

Back to [LON Integration Attributes](#).

**Status**

Indicates the status of the object, where Normal means the LON integration is working normally.

Back to [LON Integration Attributes](#).

**Status Cache Hits**

Displays the number of READATTRIBUTE calls that occurred while the object was already being polled.

Back to [LON Integration Attributes](#).

**Status Cache Misses**

Displays the number of READATTRIBUTE calls that occurred while the object was not being polled.

Back to [LON Integration Attributes](#).

**Temporary Status Item Count**

Displays the number of items polled as a result of READATTRIBUTE calls.

Back to [LON Integration Attributes](#).

**Transaction Timeouts**

Shows the timeouts that appeared in the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Transmit Errors**

Shows the number of transmit errors that appeared in the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**Transmits Per Minute**

Displays the calculated number of transmissions per minute.

Back to [LON Integration Attributes](#).

**Version Number**

Shows the version number according to the last standard LONWORKS network Query Status message.

Back to [LON Integration Attributes](#).

**XIF Present**

Indicates whether the XIF is present. The XIF is a resource file required for the NAE to understand a particular device type. This attribute is not used in the SCT.

Back to [LON Integration Attributes](#).

**LON Integration Commands**

The table below lists the commands supported by the [LON Integration Object](#).

**Table 280: LON Integration Object Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Latch Statistics</a>	

**LON Integration Command Details****Clear Statistics**

Resets the statistics for the integrated LONWORKS network. The contents of the Query Status message reflect these statistics:

- [Transmit Errors](#)
- [Transaction Timeouts](#)
- [Receive Transaction Full](#)
- [Lost Messages](#)
- [Missed Messages](#)
- [Reset Cause](#)
- [Node State](#)
- [Version Number](#)
- [Error Log](#)
- [Neuron Model](#)

For information on gathering this statistical information, see the [Latch Statistics](#) command.

Back to [LON Integration Commands](#).

**Disable**

Disables the entire LONWORKS network integration. No requests are made to the field trunk and no data broadcasts to the network are processed.

Back to [LON Integration Commands](#).

**Enable**

Allows the integration to function normally.

Back to [LON Integration Commands](#).

**Latch Statistics**

Updates the displayed statistics with the current values. The following attributes reflect the statistics:

- [Transmit Errors](#)
- [Transaction Timeouts](#)
- [Receive Transaction Full](#)
- [Lost Messages](#)

- [Missed Messages](#)
- [Reset Cause](#)
- [Node State](#)
- [Version Number](#)
- [Error Log](#)
- [Neuron Model](#)

For information on clearing this statistical information, see the [Clear Statistics](#) command.

Back to [LON Integration Commands](#).



# Loop Object

The Loop object allows a third-party BACnet workstation to represent a control loop in a standard way. If you use the Site Management or Ready Access Portals as the primary mechanisms to view system information, you do not need to use the Loop object.

The Loop object represents the key information from a Proportional plus Integral plus Derivative (PID) logic module. The object does not execute the PID algorithm but simply allows you to represent the key parameters of a PID logic module in a Focus tab view.

The Loop object uses the data provided by mapped field points to execute the BACnet intrinsic alarming algorithm. First, create a folder and map the field points representing the loop information. Then use the Insert Object Wizard to add the Loop object to the same folder and configure references to the mapped points representing the loop information. The Loop object reads the information indicated by the references, and presents the values received in the Focus tab of the Loop object.

The behavior of the Loop object's intrinsic alarming algorithm is as follows:

- The loop object generates a TO OFFNORMAL event when the difference between the Setpoint Value and the Controlled Variable Value remain outside the band defined by the Error Limit and the Time Delay has been exceeded.
- The loop object generates a TO NORMAL event when the difference between the Setpoint Value and the Controlled Variable Value is within the band defined by the Error Limit.

**Note:** You must configure references to the BACnet required properties to successfully create the Loop object. These references appear red in the wizard until configured. You may optionally configure references for the BACnet optional properties. If you do not define the optional references for some reason, the Loop object responds to a read for the corresponding value with an Unknown Property error. These BACnet required and optional properties are noted with footnotes in the attribute table. See [Loop Attributes](#).

For general information on Metasys system objects, see the [Object Help](#) section.

## Loop Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 281: Loop Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Action</a>	One state from a set	CW	Direct	Direct Reverse
<a href="#">Alarm State</a>	One state from a set			Uses BACEventState set.
<a href="#">Bias</a>	Number			
<a href="#">Bias Reference<sup>2</sup></a>	Object reference	CNW		
<a href="#">Controlled Var Value</a>	Number			Restricted to field mapper points.
<a href="#">Controlled Variable Reference<sup>3</sup></a>	Object reference	CW		
<a href="#">COV Increment</a>	Real Value		0.1	
<a href="#">Derivative Constant</a>	Number			
<a href="#">Derivative Constant Reference<sup>2</sup></a>	Object reference	CNW		

**Table 281: Loop Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Display Precision</i>	One value from set	CW	10ths	Uses Display Precision set.
<i>Integral Constant</i>	Number			
<i>Integral Constant Reference<sup>2</sup></i>	Object reference	CNW		
<i>Manipulated Variable Reference<sup>3</sup></i>	Object reference	CW		Restricted to field points.
<i>Max Output</i>	Number			
<i>Maximum Output Reference<sup>2</sup></i>	Object reference	CNW		
<i>Min Output</i>	Number			
<i>Minimum Output Reference<sup>2</sup></i>	Object reference	CNW		
<i>Present Value</i>	Number			
<i>Present Value Reference</i>	Object reference	CW		Restricted to field points.
<i>Proportional Const</i>	Number			
<i>Proportional Constant Reference<sup>2</sup></i>	Object reference	CNW		
<i>Reliability</i>	One state from a set			Uses Reliability set.
<i>Setpoint</i>	Number			
<i>Setpoint Variable Reference<sup>3</sup></i>	Object reference	CW		
<i>Units</i>	One type from a set			Uses Units set.
<i>Update Interval</i>	Number			Units = milliseconds

1 C - Configurable, N - Value Not Required, W - Writable

2 You may optionally configure a reference for this BACnet optional property. If you do not define the optional reference for some reason, the Loop object responds to a read for the corresponding value with an Unknown Property error.

3 You must configure references to this BACnet required property to successfully create the Loop object. This reference appears red in the wizard until configured.

## Loop Attribute Details

### Action

Indicates whether the loop is direct or reverse acting.

Back to [Loop Attributes](#).

### Alarm State

Indicates whether the object has an active alarm state associated with it. The intrinsic alarming algorithm determines the Alarm State value.

Back to [Loop Attributes](#).

### Bias

Indicates the bias value used by the loop algorithm. If the Bias Reference does not contain a value, a read of the Bias attribute returns an Unknown Property error.

Back to [Loop Attributes](#).

**Bias Reference**

Provides the object reference for the Bias attribute. The Loop object reads and signs up for changes in the Present Value attribute of the object referenced by the Bias Reference. The value received is stored as the Bias.

Back to [Loop Attributes](#).

**Controlled Var Value**

Reflects the Present Value of the field point mapper defined by the Controlled Variable Reference.

Back to [Loop Attributes](#).

**Controlled Variable Reference**

Defines the field point mapper that represents the source of the input to the control loop.

Back to [Loop Attributes](#).

**COV Increment**

Defines the minimum change in the Present Value required for the object to report a change.

Back to [Loop Attributes](#).

**Derivative Constant**

Indicates the value of the derivative gain parameter used by the loop algorithm. If the Derivative Constant Reference does not contain a value, a read of the Derivative Constant attribute returns an Unknown Property error.

Back to [Loop Attributes](#).

**Derivative Constant Reference**

Provides the object reference for the Derivative Constant attribute. The Loop object reads and signs up for changes in the Present Value attribute of the object referenced by the Derivative Constant Reference. The value received is stored as the Derivative Constant.

Back to [Loop Attributes](#).

**Display Precision**

Indicates the rounded position and the number of decimal places to display for this object.

Back to [Loop Attributes](#).

**Integral Constant**

Indicates the value of the integral gain parameter used by the loop algorithm. If the Integral Constant Reference does not contain a value, a read of the Integral Constant attribute returns an Unknown Property error.

Back to [Loop Attributes](#).

**Integral Constant Reference**

Provides the object reference for the Integral Constant attribute. The Loop object reads and signs up for changes in the Present Value attribute of the object referenced by the Integral Constant Reference. The value received is stored as the Integral Constant.

Back to [Loop Attributes](#).

**Manipulated Variable Reference**

Defines the field point mapper that represents the destination of the output of the control loop.

Back to [Loop Attributes](#).

**Max Output**

Indicates the maximum value of the output (Present Value) as limited by the PID loop algorithm. This value is normally used to prevent the algorithm from controlling beyond the range of the controlled device, and to prevent integral term wind up. If the Maximum Output Reference does not contain a value, a read of the Max Output attribute returns an Unknown Property error.

Back to [Loop Attributes](#).

**Maximum Output Reference**

Provides the object reference for the Max Output attribute. The Loop object reads and signs up for changes in the Present Value attribute of the object referenced by the Maximum Output Reference. The value received is stored as the Max Output.

Back to [Loop Attributes](#).

**Min Output**

Indicates the minimum value of the output (Present Value) as limited by the PID loop algorithm. This value is normally used to prevent the algorithm from controlling beyond the range of the controlled device, and to prevent integral term wind up. If the Minimum Output Reference does not contain a value, a read of the Min Output attribute returns an Unknown Property error.

Back to [Loop Attributes](#).

**Minimum Output Reference**

Provides the object reference for the Min Output attribute. The Loop object reads and signs up for changes in the Present Value attribute of the object referenced by the Minimum Output Reference. The value received is stored as the Min Output.

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**Present Value**

Indicates the current output value of the loop algorithm.

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**Present Value Reference**

Provides the object reference for the Present Value attribute. The Loop object reads and signs up for changes in the Present Value attribute of the object referenced by the Present Value Reference. The value received is stored as the Present Value.

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**Proportional Const**

Indicates the value of the proportional gain parameter used by the loop algorithm. If the Proportional Constant Reference does not contain a value, a read of the Proportional Const attribute returns an Unknown Property error.

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**Proportional Constant Reference**

Provides the object reference for the Proportional Const attribute. The Loop object reads and signs up for changes in the Present Value attribute of the object referenced by the Proportional Constant Reference. The value received is stored as the Proportional Const.

Back to [Loop Attributes](#).

**Reliability**

Reflects the Reliability attribute of the object referenced by the Present Value Reference attribute, providing an indication of whether the Present Value of the loop in question is reliable. This attribute may have a value of Reliable or Open when the field point mapper's Reliability is Reliable or Open. This attribute may have a value of Unreliable when the field point mapper's Reliability is a value other than Reliable or Open.

Back to [Loop Attributes](#).

**Setpoint**

Reflects the Present Value of the field point mapper defined by the Setpoint Variable Reference.

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**Setpoint Variable Reference**

Defines the field point mapper that represents the setpoint for the control loop.

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**Units**

Reflects the Units attribute of the object referenced by the Present Value Reference attribute.

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**Update Interval**

Indicates the time period, in milliseconds, between updates to the Present Value attribute.

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**Loop Commands**

The table below lists the commands supported by the [Loop Object](#).

**Table 282: Loop Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	

**Loop Command Details****Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects. This command restores the previous Event Enable values.

Back to [Loop Commands](#).

**Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects. This command sets the Event Enable values to False, False, False.

Back to [Loop Commands](#).

# MS/TP Field Device Object

The MS/TP Field Device object is used to represent FEC family MS/TP devices on the MS/TP Field bus. The MS/TP Field Device object appears as a child of an MS/TP Field Bus Integration object.

**Note:** The Object Type for this object is labeled **FEC Family BACnet Device** in the software.

## MS/TP Field Device Concepts

### Supported Controllers

The Field Device object supports these MS/TP controllers:

- VMA16s
- Input/Output Modules (IOMs)
- Field Equipment Controllers (FECs)
- FACs

## MS/TP Field Device Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 283: MS/TP Field Device Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">COV Min Send Time</a>	Number	W	15	Units = Seconds
<a href="#">Enabled</a>	True or False	CW	True	
<a href="#">End of Line</a>	True or False		False	False True
<a href="#">Firmware Version</a>	Text			
<a href="#">Fixed Boot Version</a>	Text			
<a href="#">Graphic</a>	Object reference	CW		
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">In Test</a>	True or False			
<a href="#">JCI System Status</a>	One state/type/ mode from a set			Uses JCI System Status (Set 25).
<a href="#">Location</a>	Text			
<a href="#">Model Name</a>	Text			
<a href="#">Offline</a>	True or False			
<a href="#">Pcode</a>	Text			
<a href="#">Present Value</a>	One state/type/ mode from a set	D	Online	Uses Controller Status (Set 43).
<a href="#">Protocol Obj Supported</a>	Series of True or False values			Uses Object Type (Set 508).
<a href="#">Protocol Ser Supported</a>	Series of True or False states			Uses Protocol Ser Support (Set 136).
<a href="#">Startup Code Version</a>	Text			

**Table 283: MS/TP Field Device Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Vendor ID</a>	Number			
<a href="#">Vendor Name</a>	Text			

1 C - Configurable, D - Default Attribute for Display, W - Writable

**Table 284: MS/TP Field Device Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">CPU Usage</a>	Real value			Units = %
<a href="#">Flash Usage</a>	Real value			Units = %
<a href="#">Has Unbound References</a>	True or False			
<a href="#">Memory Usage</a>	Real value			Units = %
<a href="#">Object Count</a>	Number			
<a href="#">Object Memory Usage</a>	Real value			Units = %

1 C - Configurable, D - Default Attribute for Display, W - Writable

## MS/TP Field Device Controller Attribute Details

### **COV Min Send Time**

Defines a specific rate at which the field device sends COV messages to the NAE for analog objects that have the Use COV Min Sent Time attribute set to True. When analog objects have the Use COV Min Sent Time attribute set to False, the COV Min Send Time attribute is ignored and COV messages are sent on every change of value.

Back to [MS/TP Field Device Attributes](#).

### **COV TX Rate**

The number of COV messages the field device sends to the NAE per minute. This value updates once every minute and each COV message represents one object reporting a value change.

Back to [MS/TP Field Device Attributes](#).

### **CPU Usage**

Specifies a running average of CPU use. The value is updated every minute.

Back to [MS/TP Field Device Attributes](#).

### **Enabled**

If True, allows communication between the Metasys system and the MS/TP controller.

Back to [MS/TP Field Device Attributes](#).

### **End of Line**

Indicates whether the device is at the end of the bus.

Back to [MS/TP Field Device Attributes](#).

### **Firmware Version**

Indicates the version of the Main code in the field device.

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### **Fixed Boot Version**

Indicates the version of the Boot code in the field device. The Boot code is responsible for loading the Main code.

Back to [MS/TP Field Device Attributes](#).

**Flash Usage**

Specifies the estimated percent of flash memory currently in use. The percentage is based on the portion of flash that is designated for use by the user's database. A value greater than 100% can affect system reliability now or in future software releases. There are no restrictions in place to prohibit use of flash over 100%.

Back to [MS/TP Field Device Attributes](#).

**Graphic**

Indicates the graphic associated with the object.

Back to [MS/TP Field Device Attributes](#).

**Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this object or the controller containing this point.

Back to [MS/TP Field Device Attributes](#).

**Has Unbound References**

Indicates that a process cannot find an object either because the device on which the object is located is offline, the object has been deleted, or the object reference is incorrect.

Back to [MS/TP Field Device Attributes](#).

**In Test**

Displays True when a Control Sequence in the device is currently in a test mode. When True, the device is marked offline, although communication with the device is acceptable.

Back to [MS/TP Field Device Attributes](#).

**JCI System Status**

Reflects the current status of the system.

Back to [MS/TP Field Device Attributes](#).

**Location**

Indicates the physical location of the device.

Back to [MS/TP Field Device Attributes](#).

**Memory Usage**

Specifies the percent of field device RAM currently in use.

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**Model Name**

Indicates the product code for the device.

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**Object Count**

Indicates the number (count) of all of the object instances within the device. Objects of all types are included.

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**Object Memory Usage**

Specifies the percent of the object database that is currently in use. Each object created consumes memory within the object database. This attribute can be used to help determine the device's capacity for additional objects; however, other performance indicators should also be assessed.

Also, an attempt to create an object known to require X bytes of object database may fail even if more than X bytes are available in the object database. This is because the object database is composed of multiple blocks. A free space block of at least X contiguous bytes available for allocation may not exist, even if the total free space is more than X bytes.



Back to [MS/TP Field Device Attributes](#).

**Offline**

Indicates whether the MS/TP controller is offline.

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**Present Value**

Indicates the current status of communication with the field device (Online, Offline, or Comm Disabled). A status of Comm Disabled indicates that the field device has been disabled. A status of Offline indicates that either communication problems exist, or the field device is currently in test mode. See [In Test](#).

Back to [MS/TP Field Device Attributes](#).

**Pcode**

Displays the device orderable product code.

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**Protocol Obj Supported**

Indicates which standardized object types the device's protocol implementation supports. Protocol Conformance Class reflects the minimum set of object types, but implementation often supports additional standard and non-standard object types with their own set of attributes. (The list of attributes supported for a particular object may be acquired by use of the ReadPropertyMultiple Web method with an attribute reference of All.)

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**Protocol Ser Supported**

Indicates which standardized protocol services the device's protocol implementation supports. Protocol Conformance Class reflects the minimum set of services, but implementation often supports additional standardized services.

Back to [MS/TP Field Device Attributes](#).

**Startup Code Version**

Specifies the version of the Startup code running in the controller. The Startup code is responsible for initial power up operations.

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**Vendor ID**

Identifies the unique manufacturer's identifier, as defined by ASHRAE. For Johnson Controls, this value is 5.

Back to [MS/TP Field Device Attributes](#).

**Vendor Name**

Identifies the manufacturer of the device (should be Johnson Controls).

Back to [MS/TP Field Device Attributes](#).

**MS/TP Field Device Commands**

The table below lists the commands supported by the MS/TP Field Device object.

**Table 285: MS/TP Field Device Object Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Reset Field Device</a>	

## MS/TP Field Device Command Details

### **Disable**

Causes the MS/TP Field Device object to generate an offline alarm if previously online and to stop communicating with the field device (stops receiving change of value and prevents any writes/commands from being sent). The [Present Value](#) of a disabled field device is Comm Disabled.

Back to [MS/TP Field Device Commands](#).

### **Enable**

Causes the MS/TP Field Device object to re-establish communication with the field device (for example, sign-up for COVs), eventually generating an online alarm if communication is OK.

Back to [MS/TP Field Device Commands](#).

### **Reset Field Device**

Causes the MS/TP field device to reset.

Back to [MS/TP Field Device Commands](#).

## MS/TP Field Bus Integration Object

The MS/TP Field Bus Integration is the root for all Field Devices and BACnet objects on the MS/TP Field Bus in the Metasys system. When you add a Field Bus integration to an NAE, you create an MS/TP communication link on a specified hardware port. The MS/TP Field Bus Integration object offers diagnostic data related to the MS/TP network. Once a Field Bus integration has been created, BACnet devices and associated BACnet objects can be added to the trunk using the Insert Field Device and Insert Field Point wizards within SMP. The integration wizards support both Automatic Device and Point discovery or manual object creation. The Field Bus integration supports 3rd party BACnet MS/TP devices and all FEC family BACnet MS/TP devices.

For general information on Metasys system objects, see the [Object Help](#) section.

### MS/TP Field Bus Integration Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 286: MS/TP Field Bus Integration Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">APDU Retries</a>	Number	CW	4	0–65,535
<a href="#">APDU Timeout</a>	Number	CW	6,000	0–65,535 Milliseconds
<a href="#">APDU Segment Timeout</a>	Number	CW	4,000	0–65,535 Milliseconds
<a href="#">Baud Rate Selection</a>	One state/type/ mode from a set	CW	0	Uses MSTPDL Baud Rate (Set 300). See the attribute <a href="#">description</a> .
<a href="#">Count</a>	Number			
<a href="#">Device Discovery Range</a>	List	CW		Network number, high limit device instance, low limit device instance
<a href="#">Discover All As General BACnet Device</a>	True or False	CW	False	
<a href="#">Execution Priority</a>	One set from a state	CW	Normal	
<a href="#">Internode Comm Timer</a>	Number	CW	20	Range = 5–255
<a href="#">Max APDU Length</a>	Number	CW	480	Legal values are: 50 128 206 480
<a href="#">Max Master</a>	Number	CW	127	4–127
<a href="#">Page Size</a>	Number	CW	1,000	10–65,535
<a href="#">Periodic Update</a>	Number	CW	20	0–65,535 Units = seconds
<a href="#">Poll Delay</a>	Number	CW	0	10–50 Units = milliseconds

**Table 286: MS/TP Field Bus Integration Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Preserve Discovered Devices</a>	True or False	CW	True	
<a href="#">Requested Vendor ID</a>	Number	CN		The current list of Vendor IDs can be viewed at <a href="http://www.bacnet.org/VendorIDBACnet/%20Vendor%20IDs.htm">http://www.bacnet.org/VendorIDBACnet/%20Vendor%20IDs.htm</a>
<a href="#">Synchronize Time</a>	True or False	CW	False	
<a href="#">Synchronize Time Zone</a>	True or False	CW	False	

1 C - Configurable, W - Writable, N - Value Not Required

**Table 287: MS/TP Field Bus Integration Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Active Baud Rate</a>	One state/type/mode from a set			Uses MSTPDL Baud Rate (Set 300). See the attribute <a href="#">description</a> .
<a href="#">Broadcast Receive Rate</a>	Number			Units = Per Minute
<a href="#">Broadcast Receives</a>	Number			0-4,294,967,295
<a href="#">Broadcast Transmit Rate</a>	Number			Units = Per Minute
<a href="#">Broadcast Transmits</a>	Number			0-4,294,967,295
<a href="#">Buffer Overflows</a>	Number			0-4,294,967,295
<a href="#">Bus Analysis Date</a>	Date			
<a href="#">Bus Analysis Time</a>	Time			
<a href="#">Bus Analysis Progress</a>	One state/type/mode from a set			See the MS/TP Analysis Set.
<a href="#">Bus Device Configuration List</a>	List			
<a href="#">Bus Health Index</a>	Number			
<a href="#">Bus Performance Index</a>	Number			
<a href="#">Bytes In</a>	Number			0-4,294,967,295
<a href="#">Bytes Out</a>	Number			0-4,294,967,295
<a href="#">Data CRC Errors</a>	Number			0-4,294,967,295
<a href="#">Data Expecting Reply Frames Rxd</a>	Number			0-4,294,967,295
<a href="#">Data Expecting Reply Frames Txd</a>	Number			0 - 4,294,967,295
<a href="#">Data Not Expecting Reply Frames Rxd</a>	Number			0-4,294,967,295
<a href="#">Data Not Expecting Reply Frames Txd</a>	Number			0-4,294,967,295
<a href="#">Duplicate Device Identifiers</a>	List			
<a href="#">Execution Time</a>	Number		0	0-4,294,967,295 Units = seconds
<a href="#">Framing Errors</a>	Number			0-4,294,967,295

**Table 287: MS/TP Field Bus Integration Attributes - Diagnostic Tab**

<b>Attribute Name</b>	<b>Data Type</b>	<b>Notes<sup>1</sup></b>	<b>Initial Value</b>	<b>Values/Options/Range</b>
<i>Header CRC Errors</i>	Number			0–4,294,967,295
<i>Internal Errors</i>	Number			0–4,294,967,295
<i>Lost Token</i>	Number			0–4,294,967,295
<i>Max Output Queue Used</i>	Number			1–65,534
<i>Maximum Token Loop Time</i>	Number			0–4,294,967,295 Milliseconds
<i>Overrun Errors</i>	Number			0–4,294,967,295
<i>PFM Frames Rxed</i>	Number			0–4,294,967,295
<i>PFM Frames Txed</i>	Number			0–4,294,967,295
<i>Packets Timed Out</i>	Number			0–4,294,967,295
<i>Packets Too Long</i>	Number			0–4,294,967,295
<i>Polled Object Count</i>	Number			
<i>Port Status</i>	One state/type/ mode from a set			Uses MSTPDL Port Status (Set 302).
<i>Predicted Token Loop Time</i>	Number			Milliseconds
<i>Reply Postponed Frames Rxed</i>	Number			0–4,294,967,295
<i>Reply Postponed Frames Txed</i>	Number			0–4,294,967,295
<i>Reply to PFM Frames Rxed</i>	Number			0–4,294,967,295
<i>Reply to PFM Frames Txed</i>	Number			0–4,294,967,295
<i>Reply Too Slow Application Errors</i>	Number			0–4,294,967,295
<i>Reply Too Slow Datalink Errors</i>	Number			0–4,294,967,295
<i>Reset Date</i>	Date			
<i>Reset Time</i>	Time			
<i>Retries</i>	Number			0–4,294,967,295
<i>Test Request Frames Rxed</i>	Number			0–4,294,967,295
<i>Test Request Frames Txed</i>	Number			0–4,294,967,295
<i>Test Response Frames Rxed</i>	Number			0–4,294,967,295
<i>Test Response Frames Txed</i>	Number			0–4,294,967,295
<i>Token Frames Rxed</i>	Number			0–4,294,967,295
<i>Token Frames Txed</i>	Number			0–4,294,967,295

**Table 287: MS/TP Field Bus Integration Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Token Loop Time</a>	Number			0–4,294,967,295 Milliseconds
<a href="#">Unexpected Frames Rxed</a>	Number			0–4,294,967,295
<a href="#">Weighted Bus Health Constant</a>	Number	W	0.5	Minimum = 0.10 Maximum: 0.99
<a href="#">Weighted Bus Performance Constant</a>	Number	W	0.5	Minimum = 0.10 Maximum: 0.99

1 C - Configurable, W - Writable, N - Value Not Required

## MS/TP Field Bus Integration Attribute Details

### **APDU Retries**

Indicates the maximum number of times the device can retransmit a data frame. If the device does not perform retries, it has a value of 0. If this value is greater than 0, a non-zero value appears in the [APDU Segment Timeout](#) attribute. We do **not** recommend changing this attribute value from the default value without a strong reason.

Back to [MS/TP Field Bus Integration Attributes](#).

### **APDU Segment Timeout**

Indicates the amount of time in milliseconds between retransmissions of a data frame segment requiring acknowledgement for which no acknowledgement has been received. This value is not 0 if the device supports segmentation of transmitted data frames. We do not recommend changing this attribute value from the default value without a strong reason.

Back to [MS/TP Field Bus Integration Attributes](#).

### **APDU Timeout**

Indicates the amount of time in milliseconds between retransmissions of a complete data frame requiring acknowledgement for which no acknowledgement has been received. This attribute applies to smaller data messages where the entire message fits within a single frame on the MS/TP bus. We do not recommend changing this attribute value from the default value without a strong reason.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Active Baud Rate**

Displays the actual data rate on the wire for transmitting and receiving. When set to Auto, the port is waiting to synchronize with the network.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Baud Rate Selection**

Indicates the baud rate of the NAE FC bus ([Table 288](#)).

**Table 288: Baud Rate Options**

Baud Rate	Description
<b>Auto</b>	Use baud rate of running network. This value is the recommended setting for everything on the FC bus except the bus supervisor port. See <a href="#">Active Baud Rate</a> .
<b>1200</b>	Use 1200 baud only. This value is not recommended and may not be allowed on some devices.
<b>9600</b>	Use 9600 baud only. This value is the lowest standard MS/TP baud rate.
<b>19200</b>	Use 19200 baud only. This value is not recommended.

**Table 288: Baud Rate Options**

Baud Rate	Description
38400	Use 38400 baud only. This value is the recommended baud rate for bus supervisor ports.
76800	Use 76800 baud only.

**Important:** At least one online device on the FC bus must have a Baud Rate Selection that is not **Auto** to establish the baud rate for the other bus devices. Normally, this device is the supervisory device of the FC bus.

Back to [MS/TP Field Bus Integration Attributes](#).

**Broadcast Receive Rate**

Indicates the number of BACnet broadcast messages received on the MS/TP field bus network of the device in the last minute. If this number is high, it indicates that the performance of the specific MS/TP field bus network is affected by broadcast receive traffic.

Back to [MS/TP Field Bus Integration Attributes](#).

**Broadcast Receives**

Indicates the number of broadcast messages received.

Back to [MS/TP Field Bus Integration Attributes](#).

**Broadcast Transmit Rate**

Indicates the number of BACnet broadcast messages transmitted on the MS/TP field bus network for the device in the last minute. If this number is high, it indicates that the performance for the specific MS/TP field bus network is affected by broadcast transmit traffic.

Back to [MS/TP Field Bus Integration Attributes](#).

**Broadcast Transmits**

Indicates the number of broadcast message transmissions.

Back to [MS/TP Field Bus Integration Attributes](#).

**Buffer Overflows**

Indicates the number of data frames lost at this MS/TP device because there was no buffer available to which to save it. This number includes outgoing and incoming messages.

Back to [MS/TP Field Bus Integration Attributes](#).

**Bus Analysis Date**

Displays the date when the last full MS/TP field bus scan finished. The [Analyze Field Bus](#) command initiates the network scan.

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**Bus Analysis Time**

Displays the time when the last full MS/TP field bus scan finished. The [Analyze Field Bus](#) command initiates the network scan.

Back to [MS/TP Field Bus Integration Attributes](#).

**Bus Analysis Progress**

Indicates the progress of the full MS/TP field bus scan initiated by the [Analyze Field Bus](#) command.

Back to [MS/TP Field Bus Integration Attributes](#).

**Bus Device Configuration List**

Lists MS/TP devices that either have been detected on the FC bus or have been configured on field devices existing under the [MS/TP Field Bus Integration Object](#).

The Bus Device Configuration List provides configuration information for each device, including which devices are responding, which devices may have been configured incorrectly, and the addresses of all devices. Only bus supervisor devices provide all this information. This object creates the list when you issue an [Analyze Field Bus](#) command.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Bus Health Index**

Indicates the overall health of the MS/TP field bus based on the number of errors occurring at the NAE. The most desirable value is 0. The higher the number, the worse the bus health/higher the number of errors. The Bus Health Index is re-evaluated every 30 seconds and gradually returns to zero if no new errors occur.

This object derives the value for the Bus Health Index from periodically reading the [Header CRC Errors](#), [Data CRC Errors](#), [Framing Errors](#), and [Lost Token](#) attribute values to create a moving average of total errors. The [Weighted Bus Health Constant](#) attribute determines the responsiveness of the Bus Health Index.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Bus Performance Index**

Indicates the responsiveness of the bus supervisor device on the MS/TP field bus. The most desirable value is 1. Values from 2.5 to 6 are marginal and updates to devices on the bus may be slow. If the value is greater than 6, the performance is poor and may indicate offline conditions.

The device derives the value for the Bus Performance Index by comparing the measured [token loop time](#) at the NAE and the [predicted token loop time](#) calculated when the MS/TP Field Bus Integration object is first created or when the NAE device count changes. This object uses the difference as input for determining the weighted moving average of the token loop time. The [Weighted Bus Performance Constant](#) attribute determines the responsiveness of the Bus Performance Index.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Bytes In**

Indicates the number of data bytes received by this device. This number includes all messages from all devices.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Bytes Out**

Indicates the number of data bytes sent by this device. This number includes all messages to all devices.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Count**

Contains the number of FEC series and non-FEC series BACnet objects mapped on the field bus.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Data CRC Errors**

Counts errors detected in the data portion of data frames sent to the device. Many data frames are used only for protocol control and do not contain a data portion, and thus cannot have Data CRC Errors. The [Header CRC Errors](#) check must be successful before the device attempts a Data CRC check. This attribute supplies an error count for the [Bus Health Index](#) attribute.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Data Expecting Reply Frames Rxed**

Displays the number of data frames received by the device that require an immediate reply. This value includes proprietary frames that have been received and are expecting a reply.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Data Expecting Reply Frames Txed**

Displays the number of data frames sent by the device that requires an immediate reply from the destination device. This value includes proprietary frames that have been sent and are expecting a reply.



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#### **Data Not Expecting Reply Frames Rxed**

Displays the number of data frames received by this item that do not require an immediate reply. This value includes proprietary frames that have been received and are not expecting a reply.

Back to [MS/TP Field Bus Integration Attributes](#).

#### **Data Not Expecting Reply Frames Txed**

Displays the number of data frames sent by the device that do not require an immediate reply. This value includes proprietary frames that have been sent and received a reply.

Back to [MS/TP Field Bus Integration Attributes](#).

#### **Device Discovery Range**

Specifies the destinations for the messages sent during the device auto discovery process. This list is empty by default. When the list is empty, a global broadcast message is sent. Adding entries to the list limits the scope of the broadcast message to only the specified networks and device instance ranges. If multiple entries appear in the list, the messages are sent sequentially. This attribute appears only in the snapshot view.

Back to [MS/TP Field Bus Integration Attributes](#).

#### **Discover All As General BACnet Device**

Toggles the integration between pure BACnet mode and BACnet with proprietary messaging. When set to True, proprietary messaging is disabled. This may be useful for special cases where customers do not want Private Transfer messages on the BACnet trunk. Note that when this attribute is True, proprietary Objects, Attributes, and Services on Johnson Controls devices (such as FECs, FACs, VMAs) will not be available. This attribute must be set before devices are added to the Integration. The default value is False.

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#### **Duplicate Device Identifiers**

Lists any duplicate object identifiers found after an auto-discovery of MS/TP BACnet devices finishes. If any devices are listed, then the list of automatically discovered devices may be incomplete. The list contains the instance number of the Object Identifier and the network address (represented in hex notation) of each device with the same identifier instance number as another device on the same bus. MS/TP devices with duplicate device identifiers may be integrated without problem, but should be physically located and their object identifiers changed to make them unique network-wide.

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#### **Execution Priority**

Indicates the order in which any given object within a group of objects is allowed to run or change data within a system. This attribute should not be changed for this object.

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#### **Execution Time**

Records the amount of time taken for the last periodic update of all referenced mapped BACnet objects. The value for this attribute can be used to tune the [Periodic Update](#) attribute. If the Execution Time is greater than the Periodic Update, attribute values of referenced BACnet objects are constantly being updated over the network. This attribute applies only to non-FEC series devices. See the [Poll Delay](#) attribute description for information on how these attributes interact.

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### **Framing Errors**

Counts the number of errors detected in the individual data bytes received by the device. A framing error occurs when the device receives a stop bit in the wrong state. This attribute supplies an error count for the [Bus Health Index](#) attribute. Framing errors are usually caused by electrical noise on the bus, message collisions, incorrect baud rate settings, bus wiring or termination errors, or devices that are not operating within the BACnet specified timing. Framing errors generally cause CRC errors since the frame has been corrupted.

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### **Header CRC Errors**

Counts the number of errors detected in the header portion of frames received by the device. Many frames are only used for protocol control and only contain a header portion. This attribute supplies an error count for the [Bus Health Index](#) attribute.

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### **Internal Errors**

Indicates the number of internal MS/TP driver operation errors resulting from an incorrect state, insufficient memory, errors from the serial port driver, incorrect internal state transitions, and other error states.

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### **Internode Comm Timer**

Controls the frequency of communication with MS/TP devices. Among other communications, this attribute defines the frequency of the heartbeat to monitored devices (monitored at a rate of two times the Internode Comm Timer).

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### **Lost Token**

Indicates the number of times the device detects a lost token. A lost token indicates that the bus encountered a serious network disruption. Serious disruption may occur when the bus first starts up or when wiring changes are made. This attribute supplies an error count for the [Bus Health Index](#) attribute.

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### **Max APDU Length**

Indicates the maximum number of bytes that may be contained in a single, indivisible application layer protocol data unit. This value should **not** be changed during normal installation or operation.

If you write the value of this attribute, you must issue a [Reset Device](#) command to the NAE for the new settings to take effect.

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### **Max Master**

Specifies the highest possible address for devices on this network and is less than or equal to 127. This attribute is present if the device is a bus supervisor device on an MS/TP network. Do **not** change this value from the default unless you have a strong reason because incorrect values may cause devices to lose communications.

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### **Max Output Queue Used**

Displays the largest number of outgoing frames the device has held in a queue for transmission. The largest possible value for this attribute depends on the capabilities of the engine. Generally, the maximum value is reached during device startup, but is not reached during normal operation.

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### **Maximum Token Loop Time**

Indicates the maximum time in milliseconds last seen at the device for the token to complete one circuit of the MS/TP field bus (go from the originating bus supervisor device through several other devices and return to the original bus supervisor device). The value is reset when the statistics are cleared. Maximum loop time is closely associated with the worst-case performance encountered since the last time the value was reset.

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### **Overrun Errors**

Displays the number of times the MS/TP port hardware loses received data because the device is too slow in reading the data. An overrun error occurs when the hardware receives a byte before it moves the prior byte to a buffer.

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### **PFM Frames Rxed**

Displays the number of Poll For Master frames received by the device. On a clean network, this should only count the first Poll For Master (PFM) frame received when the device (or another with a MAC address below that of the device) comes online. These frames are used to discover other devices on the network and should be seldom received.

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### **PFM Frames Txed**

Displays the number of Poll For Master frames sent by the device. In normal operation on a clean network, only the bus supervisor (MAC address 0) and the highest numbered master device on the network should be sending Poll For Master (PFM) frames. These frames are used to discover other devices on the network.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Packets Timed Out**

Counts the number of data frames expected by the device that did not arrive within the time allowed.

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### **Packets Too Long**

Counts any attempts to transmit or receive a data frame that is longer than allowed by the device or by MS/TP.

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### **Page Size**

Determines how many points are discovered per page. Default is 1,000.

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### **Periodic Update**

Specifies how frequently integrated BACnet objects that do not support COV subscription update their attribute values. Every period, the MS/TP Field Bus Integration object prompts each integrated BACnet object that needs to update its attribute values. This attribute applies only to non-FEC series devices. See the [Poll Delay](#) attribute description for information on how these attributes interact.

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### **Poll Delay**

Specifies the time in milliseconds between BACnet object polls for attribute values. The polls start at the time specified in the [Periodic Update](#) attribute. As the poll delay increases, the overall time in the [Execution Time](#) attribute increases. It is useful to specify a Poll Delay on sites where the rate of reading the remote objects causes too high of a burden on the Metasys network or third-party device. The initial value of the Poll Delay attribute is blank (zero).

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### **Polled Object Count**

Indicates the number of mapped BACnet objects that are currently polled on a periodic basis. This attribute applies only to non-FEC series devices.

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#### **Port Status**

Indicates the state of the port.

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#### **Predicted Token Loop Time**

Indicates the theoretical time in milliseconds needed for the token to complete one circuit of the MS/TP field bus.

The object derives this value from the defined bus baud rate, number of devices on the bus, and an estimate of the type and amount of messages transmitted on the bus during this time. This object compares the value of this attribute with that of the [Token Loop Time](#) attribute to help calculate the value of the [Bus Performance Index](#) attribute.

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#### **Preserve Discovered Devices**

Controls the behavior when field device discovery is started. This attribute exists for historical reasons and is ignored by the MS/TP Field Bus Integration object for FEC series or non-FEC series devices. The value of the attribute is shown in the snapshot view. If an auto discovery has been completed since the last device restart, a complete new auto discovery is performed for all FEC Series or non-FEC Series devices for each subsequent auto discovery in which Restart is selected.

Back to [MS/TP Field Bus Integration Attributes](#).

#### **Reply Postponed Frames Rxed**

Counts the number of data frames sent at the device that requires an immediate reply where the destination device requests additional time to prepare the reply. This may happen normally if the reply involves a large amount of data. It may also indicate that a device on the network is overloaded.

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#### **Reply Postponed Frames Txed**

Counts the number of data frames received at the device that requires an immediate reply where this device requests additional time to prepare the reply. This may happen normally if the reply involves a large amount of data. It may also indicate that this device is overloaded.

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#### **Reply to PFM Frames Rxed**

Counts the number of Reply to Poll For Master frames the device receives. On a clean network in normal operation, the device receives only one Reply to PFM frame when either the device comes online or the next higher numbered device comes online during normal operation. These frames announce the presence of this device on the network.

Back to [MS/TP Field Bus Integration Attributes](#).

#### **Reply to PFM Frames Txed**

Counts the number of Reply to Poll For Master frames the device transmits. On a clean network during normal operation, only one Reply to Project Folder Manager (PFM) frame needs to be sent when the device first comes online. These frames are used to announce the presence of other devices on the network.

Back to [MS/TP Field Bus Integration Attributes](#).

#### **Reply Too Slow Application Errors**

Counts the number of data frames received at this device that requires an immediate reply where the device cannot assemble reply data within the time allowed and cannot internally detect the need for additional time. These errors generally indicate an overloaded device if they occur frequently.

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### **Reply Too Slow Datalink Errors**

Counts the number of data packets sent by the device that requires an immediate reply from the destination device, but do not receive any reply within the time allowed. This number does not include Reply Postponed responses. The affected frames likely require a retry and bus performance is reduced when this happens.

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### **Requested Vendor ID**

Used as a filter when discovering new devices to limit the device list to whatever is specified as the Vendor ID value. The default value of this attribute is Null (stored as zero) which allows all vendors to be discovered and displayed. Note that this filter applies only to non-Johnson Controls devices. Johnson Controls devices will always be included in the discovered device list.

The current list of Vendor IDs can be viewed at <http://www.bacnet.org/VendorID/BACnet%20Vendor%20IDs.htm>.

**Note:** If you do not want to display devices already discovered or mapped, then set [Preserve Discovered Devices](#) to False.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Reset Date**

Contains the date of the last [Clear Statistics](#) command (when the statistics for the device were last reset).

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### **Reset Time**

Contains the time of the last [Clear Statistics](#) command (when the statistics for the device were last reset).

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### **Retries**

Displays the number of times the device tried to pass a token as the next node did not start using it within the time allowed by BACnet protocol.

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### **Synchronize Time**

Broadcasts time synchronization to all devices on the field bus when the field device comes online or when the time changes by a significant amount. When changed from false to true, a time synchronization is sent immediately to all devices on the field bus.

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### **Synchronize Time Zone**

Used to enable/disable time zone synchronization messages to devices on a trunk that support real time clock capabilities, such as FACs. When this attribute is set to True, time zone synchronization messages are broadcasted to devices on the field bus. The broadcast occurs either when individual devices come online or to all devices when any of the time zone related attributes change (Time Zone, UTC Offset, Standard Time Offset, Daylight Savings Time Offset, Standard Time Start, and Daylight Savings Time Start). When changed from false to true, time zone synchronization is automatically sent to all devices on the field bus.

Back to [MS/TP Field Bus Integration Attributes](#).

### **Test Request Frames Rxd**

Displays the number of Test Request Frames the device receives. Test Request Frames are a normal part of bus analysis, but should not be received during normal operation. A Test Response Frame should be sent in reply to each Test Request Frame received.

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### **Test Request Frames Txed**

Displays the number of Test Request Frames the device transmits. Test Request Frames are a normal part of bus analysis, but should not be sent during normal operation. A Test Response Frame should be received in response to each test Request Frame sent to an online device. Test Request Frames may also be sent to offline devices where no response is received.

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### **Test Response Frames Rxed**

Displays the number of Test Response Frames the device receives. Test Response Frames are a normal part of bus analysis, but should not be received during normal operation. A Test Response Frame should be received in response to each test Request Frame sent to an online device.

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### **Test Response Frames Txed**

Displays the number of Test Response Frames transmitted by this MS/TP port. Test Response Frames are a normal part of bus analysis, but should not be sent during normal operation. A Test Response Frame should be sent in response to each test Request Frame received.

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### **Token Frames Rxed**

Displays the number of Token Frames the device receives. In MS/TP, each master device passes a logical token to the next device during normal operation. Only the master device currently holding the token is allowed to initiate a message; thus, the number of Token Frames sent or received should be large. Normally the number of Token Frames received should be almost the same as the number of Token Frames transmitted.

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### **Token Frames Txed**

Displays the number of Token Frames the device transmits. In MS/TP, each master device passes a logical token to the next device during normal operation. Only the master device currently holding the token is allowed to initiate a message, thus the number of Token Frames sent or received should be large. Normally the number of Token Frames received should be almost the same as the number of Token Frames transmitted.

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### **Token Loop Time**

Indicates how much time passes between the periods when the device allows initiation of messages on the network. This time is a strong indicator of network performance and is associated strongly with the amount of traffic or errors on the network. Shorter times indicate a more responsive network. Longer times indicate an increasingly busy and slow network.

The object compares the value of this attribute with that of the [Predicted Token Loop Time](#) attribute to help calculate the value of the [Bus Performance Index](#) attribute.

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### **Unexpected Frames Rxed**

Displays the number of data frames of an illegal type the device receives. During normal operation, only certain kinds of MS/TP data frames are allowed to be sent during each phase of operation. If the device receives some other kind of data frame (other than the allowed types for the current phase of operation), the device counts the data frame as an Unexpected Frame. The device may often detect Unexpected Frames when connecting running devices to a live MS/TP bus.

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### **Weighted Bus Health Constant**

Indicates a smoothing constant used to calculate the [Bus Health Index](#) attribute value. The Weighted Bus Health Constant attribute weighs the importance of the change from one reading to the next reading for the error attributes associated with the Bus Health Index attribute. The higher the value for this attribute, the faster the Bus Health Index value changes (the more responsive the Bus Health Index attribute is to changes in error values). The value is always less than 1.0. The initial value is 0.5.

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### **Weighted Bus Performance Constant**

Indicates a smoothing constant used to calculate the [Bus Performance Index](#) attribute value. The Weighted Bus Performance Constant attribute weighs the importance of the change from one reading to the next reading for the [Token Loop Time](#) attribute. The higher this value, the faster the Bus Performance Index value changes (the more responsive the Bus Performance Index attribute is to changes in Token Loop Time). The value is always less than 1.0. The initial value is 0.5.

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## **MS/TP Field Bus Integration Commands**

The following table lists the commands supported by the [MS/TP Field Bus Integration Object](#).

**Table 289: MS/TP Field Bus Integration Commands**

Command Name	Parameters
<a href="#">Analyze Field Bus</a>	
<a href="#">Clear Statistics</a>	
<a href="#">Latch Statistics</a>	

## **MS/TP Field Bus Integration Command Details**

### **Analyze Field Bus**

Scans the entire MS/TP field bus (addresses 0–254) and compiles a list of all devices on the bus. The Analyze Field Bus command also provides configuration information for each device that responds. The data collected helps to determine devices that may be configured incorrectly and thus affect the bus performance. Because of the high bus traffic load created by the scan, this command should not be used on a regular basis. This command is primarily intended for use during commissioning.

Track the progress of this analysis in the [Bus Analysis Progress](#) attribute. The results of this command appear in the [Bus Device Configuration List](#) attribute. The date and time of the last completed scan appear in the [Bus Analysis Date](#) attribute and [Bus Analysis Time](#) attribute, respectively.

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### **Clear Statistics**

Clears the statistics for the integrated MS/TP network.

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### **Latch Statistics**

Updates the displayed statistics with the current values.

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## Multiple Command Object

The Multiple Command object issues a series of commands to multiple objects by means of a single command action. Commanding this object results in the execution of the commands for the given state. This object supports States 1–32.

This object allows a user to start building controls for the day with one command or to prevent selected points from generating Change-of-State (COS) and alarm messages when a control point is in a specified state (Auto Shutdown).

For example, based on a single input, such as Room Occupied, a defined set of actions can occur: setpoint goes to 72°, a fan comes on, lights come on, and the door unlocks.

For general information on Metasys system objects, see the [Common Object Attributes](#) section.

For more information on the wizard used to create Multiple Command objects, see the [Insert Object - Multiple Command](#) section.

### Multiple Command Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 290: Multiple Command Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Enabled</a>	True or False			
<a href="#">Executing</a>	True or False		False	False, True
<a href="#">Execution Priority</a>	One state from a set	CW		
<a href="#">Last Executed Date</a>	Date	N		
<a href="#">Last Executed Time</a>	Time	N		
<a href="#">Number of States</a>	Number	C	4	1–32
<a href="#">Present Value</a>	One state from a set	DW		<a href="#">States Text</a> attribute identifies the states set for this attribute.
<a href="#">Send OK</a>	True or False			
<a href="#">States Text</a>	One state from a set	C	States	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

**Table 291: Multiple Command Object Attributes - Action Tables Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Action Table (State0 . . . StateN)</a>	List of Command References	CW		Object Reference, Delay, Command ID, Parameters, Priority <b>Note:</b> The total number of commands identified in the Action Table 1 command set should not exceed 40.
<a href="#">Command Priority</a>	One state from a set	CW	16	Uses Write Priority (Set 1).
<a href="#">Number of States</a>	Number	C	4	1–32
<a href="#">Relinquish Default</a>	One state from a set	CNW		
<a href="#">States Text</a>	One state from a set	C	States	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable



## Multiple Command Attribute Details

### **Action Table (State0. . . StateN)**

Lists actions to take for each supported state. Each action of the table contains a slave object reference, a delay, a command and its associated parameters, and a priority. The priority in this table is used only when Commands Priority is set to No Priority. The delay is the number of seconds before the given command is issued. Command delays can be lengthened or shortened to result in commands being sent out after, before, or at the same time as any other command.

The total number of commands identified in the Action Table command set should not exceed 40.

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### **Command Priority**

Determines the order by importance for all commands sent. If it is set to Priority None, commands will be sent at each individual priority specified in the Action Table attribute.

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### **Enabled**

Indicates whether the Multiple Command object is enabled or disabled.

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### **Executing**

Specifies the current execution status of the object. It is True when the object receives a state command and starts sending commands. When all actions are completed for a given state, this flag is set to False.

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### **Execution Priority**

Indicates the relative importance of performing the function of the object within the device.

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### **Last Executed Date**

Indicates the date stamp for the beginning of executing the current state.

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### **Last Executed Time**

Indicates the time stamp for the beginning of executing the current state.

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### **Number of States**

Specifies the number of possible states this object can have.

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### **Present Value**

Indicates the current value of this object.

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### **Relinquish Default**

Specifies the default value to be used for the [Present Value](#) attribute when no commands are currently controlling this object. If this attribute is configured to any value other than None, the object sends commands for the value immediately.

Back to [Multiple Command Attributes](#).

**Send OK**

Indicates the success or failure of the slave commands. If any slave commands failed, this attribute is set to False. When a send error is detected, a 5-minute timer is set. When the timer expires, the object is reevaluated and all commands are sent again. Commands may fail if the slave object is off-box and offline **or** if the slave object is set for local control.

Back to [Multiple Command Attributes](#).

**States Text**

Indicates the displayed strings for the [Present Value](#).

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**Multiple Command Commands**

The table below lists the commands supported by the [Multiple Command Object](#).

**Table 292: Multiple Command Object Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Multistate0.. Multistate31</a>	
<a href="#">Operator Override</a>	State 0–31
<a href="#">Release</a>	1. Attribute name 2. Command priority
<a href="#">Release All</a>	Attribute name
<a href="#">Release Operator Override</a>	

**Multiple Command Object Command Details****Disable**

Specifies that (when the Multiple Command object is disabled) outputs are locked and commands are prevented from being sent.

Back to [Multiple Command Commands](#).

**Enable**

Specifies that (when the Multiple Command object is enabled) the object it is capable of issuing commands.

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**Multistate0.. Multistate31**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the [Present Value](#) at the Default (16) command priority. The state command names and number of commands are dependent on the [States Text](#) and [Number of States](#) attributes.

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**Operator Override**

Updates the [Present Value](#) at Command Priority Operator Override.

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when one of the following conditions is met: a) NOT Local Control and NOT Out Of Service, or b) NOT Local Control and after issuing the In Service command.

Back to [Multiple Command Commands](#).

**Release**

Releases the identified command priority from the specified, writable attribute, and allows it to be controlled by the next highest priority.

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**Release All**

Releases Command Priorities 3 through 16 from the specified, writable attribute. Command Priorities 1 (Manual Emergency) and 2 (Fire Application) remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space could overcool or overheat, a fan might run longer than expected, and so on.  
If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [Multiple Command Commands](#).

**Release Operator Override**

Releases Command Priority Operator Override from [Present Value](#).

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## Multistate Input Object

The Multistate Input object's [Present Value](#) attribute represents results of an algorithmic process within the device in which the object resides. For example, the Present Value of the Multistate Input object could be either the result of a combination of multiple binary inputs, the threshold of one or more analog inputs, or the result of a mathematical computation. Present Value is an integer representing the state of the object. The [State Text](#) attribute associates a description with this state.

**Note:** Do not confuse the Present Value state with the Event State attribute, which reflects the Offnormal state of the Multistate Input.

The Multistate Input object integrates N1, N2, and BACnet controllers with supervisory controllers, resulting in:

- a consistent interface to point objects for all controller types
- flexibility in point mapping
- support for Metasys N2 controllers. See the [N2 Controller Object](#).

For example, this object allows you to display the speeds of a multispeed fan at a supervisory controller.

For general information on Metasys system objects, see [Common Object Attributes](#).

### Multistate Input Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 293: Multistate Input Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Device Type</a>	Text	CW	W	Null	Limit: 20 characters
<a href="#">Intrinsic Alarming Defined</a>	True or False	C	Not Supported	False	False True
<a href="#">Number of States</a>	Number	CW	W	4	Minimum Value = 2 Maximum Value = 16
<a href="#">Out of Service</a>	True or False	CW	W	False	False True
<a href="#">Present Value<sup>2</sup></a>	One value from a set	DNRW	DNRW		<a href="#">States Text</a> attribute identifies the value set for this attribute.
<a href="#">Reliability</a>	One value from a set	W	W		No Fault Detected (Reliable), No Sensor, Over Range, Under Range, Open Loop, Shorted Loop, Multi State Fault, Unreliable Other Uses Reliability (Set 503).
<a href="#">State Text</a>	Set of Values				
<a href="#">States Text</a>	One value from a set	CW	C	Off Low Med Hi	

**Table 293: Multistate Input Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Status Flags</a>	Series of True or False states				In Alarm, Fault, Overridden, Out of Service Uses BAC Status Flags (Set 9).
<a href="#">Use Remote Alarming</a>	True or False		BCW	False	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object's Reliability, W - Writable

2 This attribute is required to be writable if Out of Service is True.

## Multistate Input Attribute Details

### **Device Type**

Contains a description of the physical device connected to the object.

Back to [Multistate Input Attributes](#).

### **Intrinsic Alarming Defined**

Enables the BACnet Intrinsic Alarming feature in the object and the definition of related attributes. For detailed information, see [BACnet Intrinsic Alarming](#).

Back to [Multistate Input Attributes](#).

### **Number of States**

Defines the number of states [Present Value](#) can have.

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### **Out of Service**

Used to decouple the object from the physical input that feeds its [Present Value](#) and [Reliability](#). When out of service is True, the object does not read the Present Value and Reliability from the hardware.

In addition, the Reliability attribute and the corresponding state of the Fault flag of the [Status Flags](#) attribute is decoupled from the input when Out of Service is True. While the Out of Service attribute is True, Present Value and Reliability may be changed to any value either as a means of simulating specific fixed conditions or for testing purposes. Other functions that depend on the state of the Present Value or Reliability attributes respond to changes made to these attributes while Out of Service is True, as if those changes had occurred in the input.

Back to [Multistate Input Attributes](#).

### **Present Value**

Reflects the current value of the input as one of  $n$  states, where  $n$  is the number of states defined in the [Number of States](#) attribute. When [Out of Service](#) is True, Present Value is writable.

Back to [Multistate Input Attributes](#).

### **Reliability**

Indicates if the [Present Value](#) is unreliable and why. When [Out of Service](#) is True, the Reliability may be written directly.

Back to [Multistate Input Attributes](#).

### **State Text**

Represents descriptions of all possible states of [Present Value](#). The number of descriptions matches the number of states defined in [Number of States](#). Present Value (an integer) serves as an index into this attribute.

Back to [Multistate Input Attributes](#).

### **States Text**

Indicates the displayed strings for the [Present Value](#).

Back to [Multistate Input Attributes](#).

### Status Flags

Contains four true or false flags that indicate the general health of the object. Three of the four flags are associated with the values of other attributes within the same object. By reading these attributes, you get a clearer picture of the object status. The four flags are:

**In Alarm** - In Alarm flag is False (0) if the Event State attribute value is Normal; otherwise the In Alarm flag is True (1).

**Fault** - Fault flag is True (1) if the [Reliability](#) attribute is **not** reliable; otherwise the Fault flag is False (0).

**Overridden** - Overridden flag is Logical 1 if the [Present Value](#) is decoupled from the hardware output because operator intervention provided a different value.

**Out of Service** - Out of Service flag is True if the [Out of Service](#) attribute value is True; otherwise the Out of Service flag is False.

Back to [Multistate Input Attributes](#).

### Use Remote Alarming

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Multistate Input Attributes](#).

## Multistate Input Commands

The table below lists the commands supported by the [Multistate Input Object](#).

**Table 294: Multistate Input Object Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">In Service</a>	
<a href="#">Out of Service</a> (Command)	The value to be written to the <a href="#">Present Value</a> attribute.

### Multistate Input Command Details

#### Disable Alarms

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Multistate Input Commands](#).

#### Enable Alarms

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Multistate Input Commands](#).

#### In Service

This command cancels the affect of an [Out of Service](#) (Command) command and returns the [Out of Service](#) attribute to False. The [Present Value](#) and [Reliability](#) will revert back to the values obtained from the physical input.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Multistate Input Commands](#).

### ***Out of Service***

This command allows a user to override the object's hardware input for simulation or other purposes. The Out Of Service command changes the *Out of Service* attribute to True, write the *Present Value* to the value of the command parameter and write the *Reliability* attribute to Reliable. The Present Value and Reliability will no longer track the physical input.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Multistate Input Commands](#).

## Multistate Output Object

The Multistate Output object's attributes represent the desired state of one or more physical outputs or processes of the device in which the object resides. The actual functions associated with a particular state are determined locally (not part of protocol). *Present Value* represents the state with a number, and *State Text* associates a description with each state.

The Multistate Output object integrates N1, N2, and BACnet controllers with supervisory controllers, resulting in:

- a consistent interface to point objects for all controller types
- flexibility in point mapping
- support for Metasys controllers

For example, this object allows you to command the modes of an access control device from a supervisory controller.

**Note:** The N1 migration Multiple Command object maps to this Multistate Output object.

For general information on Metasys system objects, see [Common Object Attributes](#).

### Multistate Output Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 295: Multistate Output Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Device Type</a>	Text	CW	W		Limit: 20 characters
<a href="#">Heavy Equip Delay</a>	Number	CW	Not supported	0	Range: 0–255 Seconds
<a href="#">HED Controller</a>	Number	CW	Not supported		1–5
<a href="#">Intrinsic Alarming Defined</a>	True or False	C	Not supported	False	False True
<a href="#">Number of States</a>	Number	CW	W	4	2–16
<a href="#">Out of Service</a>	True or False	CW	W		False True
<a href="#">Present Value</a>	One value from a set	DRW	DRW		<a href="#">States Text</a> attribute identifies the value set for this attribute.
<a href="#">Priority Array</a>	Set of values				
<a href="#">Reliability</a>	One value from a set			Reliable	No Fault Detected (Reliable), Open Loop, Shorted Loop, No Output, Unreliable Other  Uses Reliability (Set 503).
<a href="#">State Text</a>	One state from a set			Off Low Med Hi	
<a href="#">States Text</a>	One state from a set	CW	CW	Off Low Med Hi	



**Table 295: Multistate Output Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Status Flags</a>	One value from a set				In Alarm, Fault, Overridden, Out of Service Uses BAC Status Flags (Set 9).
<a href="#">Use Remote Alarming</a>	True or False		BCW	False	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object's Reliability, W - Writable

## Multistate Output Attribute Details

### **Device Type**

Contains a description of the physical device connected to the object.

Back to [Multistate Output Attributes](#).

### **Heavy Equip Delay**

Indicates the amount of time that this output point adds to the Accumulated Delay attribute of the Heavy Equipment Controller object when this point is started. The next output point is delayed by that amount of time of the HEC Accumulated Delay is not already decremented to zero.

The NAE device's five internal Heavy Equipment Controller objects (see [HED Controller](#)) time their delays independently of one another. For example, HED 1 and HED 4 can count down their delays at the same time.

Back to [Multistate Output Attributes](#).

### **HED Controller**

Identifies the Heavy Equipment Controller object managing the delays.

The NAE device has five internal Heavy Equipment Controller objects for use by Binary Output and Multistate Output objects. The BO and Multistate Output (MO) objects reference the HED controller objects by number (1–5).

All BO and MO objects on an NAE share the five internal HED controller objects. For example, if BO1 and MO3 on NAE-1 reference HED controller 1, they are using the same HED controller.

Also see [Heavy Equip Delay](#).

Back to [Multistate Output Attributes](#).

### **Intrinsic Alarming Defined**

Enables the definition of the intrinsic alarm related attributes.

Back to [Multistate Output Attributes](#).

### **Number of States**

Defines the number of states possible for [Present Value](#).

Back to [Multistate Output Attributes](#).

### **Out of Service**

Used to decouple the object from the physical output. When Out of Service is True, the object decouples [Present Value](#) and [Reliability](#) from the hardware. The Reliability will be writable when Out Of Service is True. Not all devices support setting this attribute to True.

Back to [Multistate Output Attributes](#).

### **Present Value**

Indicates the current value of the output as one of  $n$  states, where  $n$  is the number of states defined in [Number of States](#).

Back to [Multistate Output Attributes](#).

### **Priority Array**

Lists object commands in level of importance.

Back to [Multistate Output Attributes](#).

### **Reliability**

Indicates if the [Present Value](#) is unreliable and why. When [Out of Service](#) is True, the Reliability may be written directly.

Back to [Multistate Output Attributes](#).

### **State Text**

Represents descriptions of all possible states of [Present Value](#). The number of descriptions matches the number of states defined in [Number of States](#). Present Value (an integer) serves as an index into this attribute.

Back to [Multistate Output Attributes](#).

### **States Text**

Indicates the displayed strings for the [Present Value](#).

Back to [Multistate Output Attributes](#).

### **Status Flags**

Contains four true or false flags that indicate the general health of the object. Three of the four flags are associated with the values of other attributes within the same object. By reading these attributes, you get a clearer picture of the object status. The four flags are:

**In Alarm** - In Alarm flag is False (0) if the Event State attribute value is Normal; otherwise, the In Alarm flag is True (1).

**Fault** - Fault flag is True (1) if the [Reliability](#) attribute is **not** reliable; otherwise, the Fault flag is False (0).

**Overridden** - Overridden flag is Logical 1 if the [Present Value](#) is decoupled from the hardware output because operator intervention provided a different value or local override is active.

**Out of Service** - Out of Service flag is True if the [Out of Service](#) attribute value is True; otherwise, the Out of Service flag is False.

Back to [Multistate Output Attributes](#).

### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Multistate Output Attributes](#).

## **Multistate Output Commands**

The table below lists the commands supported by the [Multistate Output Object](#).

**Table 296: Multistate Output Object Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">In Service</a>	
<a href="#">Operator Override</a>	The value to be written to the <a href="#">Present Value</a> attribute.

**Table 296: Multistate Output Object Commands**

Command Name	Parameters
<i>Out of Service</i>	
<i>Release Operator Override</i>	
<i>Release</i>	1. Attribute name 2. Command priority
<i>Release All</i>	Attribute name
<i>State0 . . StateN</i>	

**Note:** For the Override Release, Release, and Release All commands, if all Command Priorities have been released and a Relinquish Default is not defined, the supervisory controller gives control over to the actual hardware.

## Multistate Output Command Details

### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Multistate Output Commands](#).

### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Multistate Output Commands](#).

### **In Service**

Cancels the effect of an Out of Service command and returns the Out of Service attribute to False. The *Present Value* and *Reliability* will revert back to the values obtained from the physical hardware output.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [Multistate Output Commands](#).

### **Operator Override**

Updates the *Present Value* at Command Priority Operator Override (8).

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when one of the following conditions is met: a) NOT Local Control and NOT Out Of Service, or b) NOT Local Control and after issuing the In Service command.

Back to [Multistate Output Commands](#).

### **Out of Service**

Allows a user to override the object's hardware output for simulation or other purposes. The *Out of Service* command changes the Out of Service attribute to True. The Present Value and Reliability no longer track the physical output. No commands are sent to the actual hardware. When the Out of Service attribute is set to False, the current *Present Value* is sent to the actual hardware.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

For BACnet objects, support of this command depends on the ability to write the Out Of Service attribute.

Back to [Multistate Output Commands](#).

### **Release**

Releases the identified command priority from the specified, writable attribute, and allows it to be controlled by the next highest priority.

Back to [Multistate Output Commands](#).

### **Release All**

Releases Command Priorities 3 through 16 (Default) from the specified, writable attribute. Command Priorities 1 and 2 remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this release happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space might overcool or overheat, a fan might run longer than expected, and so on.  
If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [Multistate Output Commands](#).

### **Release Operator Override**

Releases Command Priority Operator Override (8) from [Present Value](#).

Back to [Multistate Output Commands](#).

### **State0 . . . StateN**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the [Present Value](#) at the Default (16) command priority. If this is the highest priority, it is sent to the controller. Both the state command names and the number of commands are dependent on the [States Text](#) and [Number of States](#) attributes.

**Important:** Be aware that an operator state command releases the actions of any processes running to the object in the NxE or FEC controllers that use Priorities 9 through 16. Consider this behavior when creating control strategies.

If Local Control is True, this command is rejected.

Back to [Multistate Output Commands](#).

## Multistate Value Object

The Multistate Value object's attributes represent the desired state of one or more physical outputs or processes of the device in which the object resides. The actual functions associated with a particular state are determined locally (not part of protocol). *Present Value* represents the state with a number and *State Text* associates a description with each state.

Multistate Value objects have similar software characteristics and capabilities to a *Multistate Input Object*; however, Multistate Value objects are not associated with any physical hardware and are the result of a control process or operator entry.

The Multistate Value object provides a means to map up to 32 different states to an object.

This object allows you to hold a multistate value for other objects to reference. For example, a specific multistate value can be available for the Interlock object to reference and to base its operation on this value.

For general information on Metasys system objects, see *Common Object Attributes*.

### Multistate Value Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the *Common Object Attributes* section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the *Object and Feature Tabs* section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 297: Multistate Value Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Intrinsic Alarming Defined</a>	True or False	C	Not supported	False	False True
<a href="#">Number of States</a>	Number	CW <sup>2</sup>	W	4	2–32
<a href="#">Out of Service</a>	True or False			False	Always False
<a href="#">Present Value<sup>3</sup></a>	One value from a set	DRW	DRW		<a href="#">States Text</a> attribute identifies the value set for this attribute.
<a href="#">Priority Array<sup>4</sup></a>	Set of values				
<a href="#">Reliability<sup>5</sup></a>	One value from a set	W	W	Reliable	No Fault Detected (Reliable), Multistate Fault, Unreliable Other Uses Reliability (Set 503).
<a href="#">State Text</a>	Set of values				
<a href="#">States Text</a>	One value from a set	CW	CW		
<a href="#">Status Flags</a>	Series of True or False states				In Alarm, Fault, Overridden, Out of Service Uses BAC Status Flags (Set 9).
<a href="#">Use Remote Alarming</a>	True or False		BCW	False	

1 C - Configurable, D - Default Attribute for Display, R - Affected by Object's Reliability, W - Writable

2 Not writable through the MS/TP integration. Must be configured through CCT.

3 If Present Value is commandable, then it must be writable. If Out of Service is True, this attribute is True.

4 If Present Value is commandable, both these attributes are present.

5 The Reliability attribute is always present in NAE implementations.

## Multistate Value Attribute Details

### ***Intrinsic Alarming Defined***

Enables the BACnet Intrinsic Alarming feature in the object and the definition of related attributes. For detailed information, see [BACnet Intrinsic Alarming](#).

Back to [Multistate Value Attributes](#).

### ***Number of States***

Defines the number of states possible for [Present Value](#).

Back to [Multistate Value Attributes](#).

### ***Out of Service***

Indicates the offline/online state of the connected hardware. This attribute exists for compatibility with BACnet protocol and indicates whether the physical input that the object represents is in service. When out of service, the object does not read the hardware. This attribute is always False.

Back to [Multistate Value Attributes](#).

### ***Present Value***

Reflects the current value of the multistate value object as one of  $n$  states, where  $n$  is the number of states defined in the [Number of States](#) attribute. The Present Value is equal to the last value corresponding to the [States Text](#) attribute. Present Value is optionally commandable. If Present Value is commandable for a given object instance, then [Priority Array](#) and Relinquish Default are also present for that instance. If [Out of Service](#) is true, Present Value is writable.

Back to [Multistate Value Attributes](#).

### ***Priority Array***

Contains prioritized commands that are in effect for this object. See the BACnet standard for a description of the prioritization mechanism. If either Priority Array or Relinquish Default is present, both are present. If [Present Value](#) is commandable, Priority Array and Relinquish Default are both present.

Back to [Multistate Value Attributes](#).

### ***Reliability***

Indicates whether the Present Value is reliable and why. If Fault Values is present, [Reliability](#) is also present. A To Fault event generates under these conditions: Reliability is not equal to No Fault Detected, and the To Fault flag is enabled in Event Enable.

Back to [Multistate Value Attributes](#).

### ***State Text***

Represents descriptions of all possible states of [Present Value](#). The number of descriptions matches the number of states defined in [Number of States](#). Present Value (an integer) serves as an index into this attribute.

Back to [Multistate Value Attributes](#).

### ***States Text***

Indicates the displayed strings for the [Present Value](#).

Back to [Multistate Value Attributes](#).

### ***Status Flags***

Contains four true or false flags that indicate the general health of the object. Three of the four flags are associated with the values of other attributes within the same object. By reading these attributes, you get a clearer picture of the object status.

The four flags are:

- **In Alarm** - In Alarm flag is False (0) if the Event State attribute value is Normal; otherwise, the In Alarm flag is True (1).
- **Fault** - Fault flag is True (1) if the *Reliability* attribute is **not** reliable; otherwise, the Fault flag is False (0).
- **Overridden** - Overridden flag is Logical 1 if the *Present Value* has been overridden by some mechanism local to the BACnet device or because the operator provided a different value.
- **Out of Service** - Out of Service flag is True if the *Out of Service* attribute value is True; otherwise, the Out of Service flag is False.

Back to [Multistate Value Attributes](#).

### **Use Remote Alarming**

When the attribute Intrinsic Alarming Defined is set to True, determines where alarms for the object originate. If the remote integrated object contains attributes for originating alarms, then Use Remote Alarming defaults to True, causing the local mapper object to accept alarms from the remote integrated object that are routed to the NxE. If the remote integrated object does not contain attributes for originating alarms, then Use Remote Alarming defaults to False causing the local mapper object to originate alarms. When Use Remote Alarming is false, any alarms from the remote integrated object are ignored at the NxE. If the value of Use Remote Alarming is changed, a restart of the NxE may be required to assure correct operation. This attribute applies only to BACnet integrations.

Back to [Multistate Value Attributes](#).

## **Multistate Value Commands**

The table below lists the commands supported by the [Multistate Value Object](#).

**Table 298: Multistate Value Object Commands**

Command Name	Parameters
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">Operator Override</a>	State0–StateN
<a href="#">Release Operator Override</a>	
<a href="#">Release</a>	1. Attribute name 2. Command priority
<a href="#">Release All</a>	Attribute name
<a href="#">State0 . . . StateN<sup>1</sup></a>	

<sup>1</sup> The MS/TP Multistate Value supports an equivalent Set State command which takes State0-StateN as parameters.

## **Multistate Value Command Details**

### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Multistate Value Commands](#).

### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [Multistate Value Commands](#).

### **Operator Override**

Updates the *Present Value* at Command Priority Operator Override (8).

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when one of the following conditions is met: a) NOT Local Control and NOT Out Of Service, or b) NOT Local Control and after issuing the In Service command.

Back to [Multistate Value Commands](#).

### **Release**

Releases the identified command priority from the specified, writable attribute, and allows it to be controlled by the next highest priority.

Back to [Multistate Value Commands](#).

### **Release All**

Releases Command Priorities 3 through 15 from the specified, writable attribute. Command Priorities 1 (Manual Emergency) and 2 (Fire Application) remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space could overcool or overheat, a fan might run longer than expected, and so on.  
If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [Multistate Value Commands](#).

### **Release Operator Override**

Releases Command Priority Operator Override (8) from [Present Value](#).

Back to [Multistate Value Commands](#).

### **State0 . . . StateN**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the [Present Value](#) at the Default (16) command priority. The state command names and number of commands are dependent on the [States Text](#) and [Number of States](#) attributes.

**Important:** Be aware that an operator state command releases the actions of any processes running to the object in the NxE or FEC controllers that use Priorities 9 through 16. Consider this behavior when creating control strategies.

Back to [Multistate Value Commands](#).



# N1 Migration Object

**Note:** This object is for use with the NIE only. For more information on N1 migration, see the [Related Documentation](#) table in the [Welcome](#) section.

The N1 Migration object contains all the necessary information to communicate with points on an existing Metasys network. Add the new Metasys system hosting the migration server to the existing Metasys network as an Operator Workstation (OWS) at a fixed IP Address. All existing Metasys networks are defined as N1 Migration objects in the host NIE. Many of the existing point objects are defined as mapped devices to the NIE.

For general information on Metasys system objects, see the [Object Help](#) section.

## N1 Migration Concepts

### Migration Overview

When you add a new Metasys system N1 Migration object, the N1 migration component establishes communication with the N1 network. The N1 Migration object is only an object on the new Metasys system controller to which it was added.

After the N1 Migration object establishes communication with the existing Metasys system, the N1 Migration object creates 2 new calendars that are a portal to the existing NCM calendar. (See [Today's Schedule](#) in the [Scheduling](#) section.) One calendar is a list of alternates, and one calendar is a list of holidays.

**Note:** An Ethernet connection is the only method for the NIE to connect to the N1 network. ARCnet jobs must use an Ethernet router.

See the [N1 Migration Attributes](#) section for more information on N1 migration attributes.

### Mapped Points

Existing features of the Metasys system are supported by moving their functionality to the host NIE. These features are: trend, totalization, point history, and scheduling. When possible, existing objects maintain their configuration parameters in the new Metasys system. For example, alarm limits, alarm state, and units. The table below lists points specific to the Metasys system.

**Table 299: Mapped Points**

Existing Metasys System Object	New Metasys System Mapped Object
Accumulator Object	<a href="#">N1 Pulse Counter Object</a>
Analog Input	<a href="#">Analog Input Object</a>
Analog Output	<a href="#">Analog Output Object</a>
Analog Data	<a href="#">Analog Output Object</a>
Binary Input	<a href="#">Binary Input Object</a>
Binary Output	<a href="#">Binary Output Object</a>
Binary Data	<a href="#">Binary Output Object</a>
Control System	<a href="#">Generic Integration Object</a> (GIO)
Multistate Input	<a href="#">Multistate Input Object</a>
Multistate Output	<a href="#">Multistate Output Object</a>
Multistate Data	<a href="#">Multistate Output Object</a>

### Multiple NIEs

Migration can be split across multiple NIEs with the following constraints:

- Only one N1 Migration object can exist per NIE per N1 network.
- Multiple NIEs can reference the same N1 network.
- Only one NCM object can exist per NCM per N1 Migration object.
- Multiple NCM objects can reference the same NCM as long as they exist on different NIEs.

- Only one point object can exist per NIE per N1 object.
- Multiple point objects can reference the same N1 object as long as they exist on different NIEs.

## N1 Migration Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 300: N1 Migration Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Broadcast Address</a>	List of 4 values	CW	255.255.255.255	
<a href="#">Connected Status</a>	Number		0	0 = not connected (offline) 1 = connected (normal)
<a href="#">Device Name</a>	Text	CW	NULL	8 characters max
<a href="#">Discovery IP Address</a>	Set of values	CW	0.0.0.0	
<a href="#">Discovery Gate Number</a>	Number	CW	1	
<a href="#">Discovery Node Number</a>	Number	CW	1	
<a href="#">Duty-Standby</a>	Number	CW	False	
<a href="#">Enable Polling</a>	True or False	CW	False	
<a href="#">Gate Number</a>	Number	CW	100	1–255
<a href="#">Message Timeout</a>	Number	CW	60	Seconds
<a href="#">Migrate Object Configuration</a>	True or False	CW	True	
<a href="#">Migrate Schedules</a>	True or False	CW	True	
<a href="#">Migrate Totalization Configuration</a>	True or False	CW	True	
<a href="#">Migrate Trend Configuration</a>	True or False	CW	True	
<a href="#">Network Name</a>	Text	C	NULL	8 characters maximum
<a href="#">Node Number</a>	Number	CW	100	1–255
<a href="#">Poll Delay</a>	Number	CW	1000	Milliseconds
<a href="#">RetryCounterLimit</a>	Number	CW	4	
<a href="#">RetryWaitTime</a>	Number	CW	4	Seconds
<a href="#">Synchronize Time</a>	True or False	CW	False	
<a href="#">UDP Port</a>	Number	CW	11001	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

## N1 Migration Attribute Details

### Broadcast Address

Edits the address to use directed broadcasts. The user typically does not edit this attribute.

Back to [N1 Migration Attributes](#).

**Connected Status**

Displays if the NIE communicated with the Metasys N1 network for the object mapping service and UI service. This attribute drives the status of the object.

Back to [N1 Migration Attributes](#).

**Device Name**

Displays the defined case-insensitive device name. The device name is required for the existing Metasys system to detect the On-Line status and Off-Line status of the NIE. This attribute must match the name of the NIE in the existing N1 network.

Back to [N1 Migration Attributes](#).

**Discovery IP Address**

Displays the defined NCM IP address of the existing Metasys system. Use for self discovery of the existing Metasys system. You need at least 1 NCM in the existing N1 network that the NIE can talk to, to find the other N1 devices and get N1 points.

Back to [N1 Migration Attributes](#).

**Discovery Gate Number**

Displays the defined NCM Gate address on the existing Metasys system. Use for self discovery of the existing Metasys system. You need at least 1 NCM in the existing N1 network that the NIE can talk to, to find the other N1 devices and get N1 points.

Back to [N1 Migration Attributes](#).

**Discovery Node Number**

Displays the defined NCM Node address on the existing Metasys system. Use for self discovery of the existing Metasys system. You need at least 1 NCM in the existing N1 network that the NIE can talk to, to find the other N1 devices and get N1 points.

Back to [N1 Migration Attributes](#).

**Duty-Standby**

Displays whether the existing Metasys system is a Duty/Standby network. The NIE has to know if the existing N1 network is a Duty/Standby.

Back to [N1 Migration Attributes](#).

**Enable Polling**

When True, this attribute causes the integration in the NIE to place any system into a 20 second fast polling table being viewed. This attribute also places a system into this table on an object's Focus view. This provides faster updates to objects being viewed in any Metasys system UI. When viewing points from several systems, the Service Time for the NCM increases. Take care when enabling this fast polling feature as it may affect the service times.

**Note:** To prevent delays in event reporting due to the fast scan operation, follow the existing report routing guidelines.

**Note:** Do not set this attribute to True when for NIEs used with validated environments (that is, when Trend data must be collected within 2 minutes).

Back to [N1 Migration Attributes](#).

**Gate Number**

Displays how the NIE is defined in the existing N1 network. This attribute is read from the NCM.

Back to [N1 Migration Attributes](#).

**Message Timeout**

Displays the reply timeout in seconds. The reply timeout is how long the NIE waits for a reply from an NCM. The user typically does not edit this attribute.

Back to [N1 Migration Attributes](#).

### **Migrate Object Configuration**

When True, this attribute displays the basic object configuration from the existing Metasys system object used to write basic configurations for newer Metasys objects. For example, units or descriptor. This attribute (when True) tells the new Metasys system to bring alarm setup information from the existing N1 network and creates [Alarm Extensions](#) ([Analog Alarm](#) and [Multistate Alarm](#)) for new objects that are added.

Back to [N1 Migration Attributes](#).

### **Migrate Schedules**

Displays the attached existing Metasys system schedules used to create the newer Metasys system [Schedule](#). The schedules that appear in the new Metasys systems are portals to the schedules in the existing N1 network. Schedules appear in the new format and offer the same functionality. Changes made to the schedules in the new Metasys system are also made to the N1 schedules in the NCM.

Back to [N1 Migration Attributes](#).

### **Migrate Totalization Configuration**

Displays the totalization configuration from the existing Metasys system object used to create the newer Metasys system [Totalization Extensions](#) when an existing object is mapped to a newer object.

Back to [N1 Migration Attributes](#).

### **Migrate Trend Configuration**

Displays the trend configuration from the existing Metasys system object used to create the newer Metasys system [Trend Extension](#) when an existing object is mapped to a newer object. This attribute creates one or more trend extensions for existing N1 network trends.

Back to [N1 Migration Attributes](#).

### **Network Name**

Displays the defined network name.

**Note:** Be sure to configure the Network Name attribute of the N1 Migration. Once you insert the N1 Migration, you cannot edit the Network Name attribute. The workaround is to delete the existing N1 Migration and insert a new N1 Migration ensuring you enter the desired Network Name before completing the Insert Integration Wizard.

Back to [N1 Migration Attributes](#).

### **Node Number**

Displays how the NIE is defined in the existing N1 network.

Back to [N1 Migration Attributes](#).

### **Poll Delay**

Displays the polling time for non-triggerable attributes in milliseconds. The poll delay is the time between NIE polls to the N1 network points.

Back to [N1 Migration Attributes](#).

### **RetryCounterLimit**

Contains the number of retry attempts made. The NIE waits for the [Message Timeout](#), then retries sending messages the number of times defined in this attribute.

Back to [N1 Migration Attributes](#).

### **RetryWaitTime**

Contains the time between communication retries (in seconds). This attribute is the time the NIE waits for a low-level Ack from the NCM. The user typically does not edit this attribute.

Back to [N1 Migration Attributes](#).

**Synchronize Time**

Displays whether the NIE is the master time keeper for the existing N1 network system. Time updates are sent to the existing system once daily and when the time changes.

Back to [N1 Migration Attributes](#).

**UDP Port**

Displays the UDP Port as defined in the existing Metasys system.

Back to [N1 Migration Attributes](#).

# N1 PID Loop Object

The N1 PID Loop (PIDL) object generates outputs to maintain a measured value at a desired level. The PIDL performs Proportional, Integral, and Derivative control. The PID Loop object manipulates outputs for closed loop control at a given Digital Control Module (DCM101 or DCM140).

**Note:** For the PIDL object, the only difference between DCM101 and DCM140 operation is that the DCM101 has up to 16 PID Loops, and the DCM140 has up to 20 PID Loops.

The PID Loop object generates outputs for closed loop control by using a collection of inputs and other variables to perform calculations and issue commands. Each PID Loop object can accept up to six analog inputs, and issue commands to a maximum of eight analog outputs. Inputs come from Active Interconnect (AI) objects. Outputs are sent to Analog Output Digital object (AOD) objects or other PID Loops.

A primary function of the PID Loop object is to perform Proportional plus Integral plus Derivative calculations in order to maintain steady and accurate control of a closed loop. PID calculations take into account the past, present, and future (forecasted) performance of loop inputs for the purpose of adjusting outputs to correct levels. You can configure the PID Loop object to compute any or all of the following:

- **Proportional Only:** Present performance is analyzed by computing the difference between the PID Loop setpoint and its feedback. This difference is called an error. With proportional control, the output signal is directly proportional to the difference between the input and the setpoint (that is, the error).
- **Proportional plus Integral:** Present and past performance are analyzed in this calculation to affect the output. The error computed in the proportional calculation is now integrated (that is, accumulated over time). If the loop failed to reach setpoint in the past, the integration causes the output to increase or decrease to maintain setpoint.
- **Proportional plus Integral plus Derivative:** This calculation uses past, present, and future (forecasted) performance. The derivative part of the computation analyzes the rate of change of the feedback to predict the future value of the feedback. As the feedback changes faster, the PID Loop issues outputs that slow down the rate of change.

You can use the PID Loop object with a variety of control schemes, including sequencing a number of physical devices to maintain control of a closed loop. Additional functions of the PID Loop object include Self-tuning PID Control, bumpless transfer, and an auxiliary switch. Self-tuning PID Control automatically and continually self-tunes the PID Loop to ensure correct feedback levels. The auxiliary switch allows another PID Loop object or a control process to take control of the closed loop. When control of a closed loop is turned over to the PID Loop object, the bumpless transfer function provides for a smooth and predictable transition.

For general information on Metasys system objects, see the [Object Help](#) section.

## N1 PID Loop Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 301: N1 PID Loop Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">COV Increment</a>	Real value	CW	0.1	Any value > 0
<a href="#">Device Type</a>	Text	CNW		20 Character Limit
<a href="#">Display Precision</a>	One from a set	CW	10ths	
<a href="#">Feedback</a>	Real value			
<a href="#">Max Value</a>	Real value	CW	1.7E38	
<a href="#">Min Value</a>	Real value	CW	-1.7E38	

**Table 301: N1 PID Loop Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>Out of Service</b>	True or False	CW		
<b>Present Value (Value)</b>	Real value	DNRW		
<b>Reliability</b>	One value from a set	W	0	No Fault Detected (Reliable), Open Loop, Shorted Loop, No Output, Unreliable Other
<b>Setpoint</b>	Real value			
<b>Units</b>	One type from a set	CW	No units	

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, R - Affected by Object Reliability, W - Writable

## N1 PID Loop Attribute Details

### **COV Increment**

Defines the minimum change in the Present Value required for the object to report a change.

Back to [N1 PID Loop Attributes](#).

### **Device Type**

Contains a description of the physical device connected to the object.

Back to [N1 PID Loop Attributes](#).

### **Display Precision**

Defines the decimal rounding and the decimal places to display for the Present Value and associated attributes.

Back to [N1 PID Loop Attributes](#).

### **Feedback**

Indicates the Feedback value, which results from the PIDL Input Conditioning process. This process scales each of the six PIDL inputs and determines a sum, a maximum, or a minimum.

Back to [N1 PID Loop Attributes](#).

### **Max Value**

Defines the highest reliable value (in engineering units) for the Present Value.

Back to [N1 PID Loop Attributes](#).

### **Min Value**

Defines the lowest reliable value (in engineering units) for the Present Value.

Back to [N1 PID Loop Attributes](#).

### **Out of Service**

De-couples the object from the physical input. When Out of Service is True, the object de-couples the Setpoint and [Reliability](#) from the hardware. The Reliability is writable when Out Of Service is True. When de-coupled, the Setpoint can be changed to simulate specific conditions or for test purposes.

Back to [N1 PID Loop Attributes](#).

### **Present Value (Value)**

Represents the current value of the object.

Back to [N1 PID Loop Attributes](#).

### **Reliability**

Indicates whether the Setpoint is unreliable.

Examples:

- **Reliable** - No detectable faults
- **Unreliable High** - Setpoint is greater than the Max Value.
- **Unreliable Low** - Setpoint is less than the Min Value.

When *Out of Service* is True, the Reliability attribute may be written directly.

Back to [N1 PID Loop Attributes](#).

### **Setpoint**

Indicates the desired value for the control loop feedback signal.

Back to [N1 PID Loop Attributes](#).

### **Units**

Contains the engineering units for the Present Value attribute.

Back to [N1 PID Loop Attributes](#).

## **N1 PID Loop Commands**

The following table lists the commands supported by the [N1 PID Loop Object](#).

**Table 302: N1 PID Loop Object Commands**

Command Name	Parameters
<a href="#">Adjust</a>	The value to be written to the Setpoint. The value must be less than Max Value and greater than Min Value.
<a href="#">Disable Alarms</a>	
<a href="#">Enable Alarms</a>	
<a href="#">In Service</a>	
<a href="#">Operator Override</a>	The value to be written to the Setpoint.
<a href="#">Out of Service</a>	
<a href="#">Release Operator Override<sup>1</sup></a>	
<a href="#">Release<sup>1</sup></a>	Attribute name Command priority
<a href="#">Release All<sup>1</sup></a>	Attribute name

<sup>1</sup> For the Release Operator Override, Release, and Release All commands, if all Command Priorities have been released and a Relinquish Default is not defined, the supervisory controller gives control to the actual hardware.

## **N1 PID Loop Command Details**

### **Adjust**

Releases Command Priorities 9 through 15 (Scheduling) and then writes to the Setpoint at the Default (16) command priority. The value must be less than Max Value and greater than Min Value.

If Local Control is True, this command is rejected.

The command is only sent when one of the following conditions is met: a) NOT Local Control and NOT Out Of Service, or b) NOT Local Control and after issuing the In Service command.

Back to [N1 PID Loop Commands](#).

### **Disable Alarms**

Disables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [N1 PID Loop Commands](#).



### **Enable Alarms**

Enables all types of alarming: alarm extensions, BACnet intrinsic alarming, and BACnet Event Enrollment objects.

Back to [N1 PID Loop Commands](#).

### **In Service**

Cancels the effect of an [Out of Service](#) command and returns the [Out of Service](#) attribute to False. The Setpoint and [Reliability](#) revert back to the values obtained from the physical hardware output.

**Note:** For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [N1 PID Loop Commands](#).

### **Operator Override**

Updates the Setpoint at Command Priority Operator Override (8).

The Operator Override command sends the specified command to the internal NxE object, which is then only sent to the field device when not Out Of Service.

Back to [N1 PID Loop Commands](#).

### **Out of Service**

Allows a user to override the object's hardware output for simulation or other purposes. The Out of Service command changes the Out of Service attribute to True. The Setpoint and Reliability no longer track the physical output. No commands are sent to the actual hardware. When the [Out of Service](#) attribute is set to False, the current Setpoint is sent to the actual hardware.

When an Out Of Service command is issued, the NxE does not communicate subsequent changes (operator or system) to the field device.

For BACnet objects, support of this command is dependent on the ability to write the Out Of Service attribute.

Back to [N1 PID Loop Commands](#).

### **Release Operator Override**

Releases Command Priority Operator Override (8) from Setpoint.

Back to [N1 PID Loop Commands](#).

### **Release**

Releases the identified Command Priority from the specified attribute and allows the next highest priority to control it.

Back to [N1 PID Loop Commands](#).

### **Release All**

Releases Command Priorities 3 through 16 (Default), from the specified, writable attribute. Command Priorities 1 and 2 remain.

**Important:** The **Release All** command may not cause an immediate return to automatic operation. The **Release All** command clears all command priorities, including those that come from applications and features. When this happens, the output point goes to its Relinquish Default condition. In some cases, the application or feature may have sent a command that does not match Relinquish Default. In this instance, the output point does not end in the state that the applications or features intended. This situation can cause unexpected operation to occur; for example, a space could overcool or overheat, a fan might run longer than expected, and so on.  
If an operator has overridden an input, use the [Release Operator Override](#) command.

Back to [N1 PID Loop Commands](#).

# N1 Pulse Counter Object

The N1 Pulse Counter object aids in the integration of N1 controllers with supervisory controllers, resulting in:

- consistent interface to N1 point objects for all controller types, so they appear as a homogenous set to the user interface
- flexibility in point mapping

This object allows you to read pulses from an electric or gas meter at a supervisory controller.

**Note:** The Pulse Counter object may feed its Present Value to the [Pulse Meter Object](#).

For general information on Metasys system objects, see the [Object Help](#) section.

## N1 Pulse Counter Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 303: N1 Pulse Counter Object Attributes - Focus/Configuration**

Tab	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Attribute Name</a>				
<a href="#">Present Value</a>	Number	DRW		0–4,294,967,295
<a href="#">Reliability</a>	One value from a set			Uses Reliability (Set 503).

<sup>1</sup> C - Configurable, D - Default Attribute for Display, R - Affected by Object's Reliability, W - Writable

## N1 Pulse Counter Attribute Details

### **Present Value**

Actual value of the Pulse Count the last time it was read.

Back to [N1 Pulse Counter Attributes](#).

### **Reliability**

Indicates whether the [Present Value](#) is reliable and why.

Back to [N1 Pulse Counter Attributes](#).

## N1 Pulse Counter Commands

The following table lists the commands supported by the [N1 Pulse Counter Object](#).

**Table 304: N1 Pulse Counter Object Commands**

Command Name	Parameters
<a href="#">Preset Counter</a>	
<a href="#">Enable Alarms</a>	
<a href="#">Disable Alarms</a>	

## N1 Pulse Counter Command Details

### **Preset Counter**

Defines a preset value in the counter. This command is available only if you have the Supervise Access level command priority.

Back to [N1 Pulse Counter Commands](#).

**Enable Alarms**

Enables alarms for the N1 pulse counter.

Back to [N1 Pulse Counter Commands](#).

**Disable Alarms**

Disables alarms for the N1 pulse counter.

Back to [N1 Pulse Counter Commands](#).

## N2 Controller Object

The N2 Controller object defines a physical device such as a DX-9100, VAV Modular Assembly (VMA), or UNT controller on the N2 Bus of the NAE and is required for mapping data from the controller into the system. The N2 Controller object monitors the device and reports online/offline transitions. This object also allows you to access information about the N2 controllers.

For general information on Metasys system objects, see the [Object Help](#) section.

### N2 Controller Concepts

#### Supported Controllers

This table lists all N2 controllers supported by the system.

Metasys Integrator units, VAV, UNT, and AHU controllers are supported at all revision levels.

**Table 305: Supported Controllers**

Device/ Controller Type	Revision	Protocol Type	Comments
DR-9100	Rev 1.x - 2.x	Sys91	Room Controller
DR-9101	Rev 2.x	Sys91	Room Controller
DC-9100	Rev 1.x - 2.x	Sys91	Plant Controller
DO-9100	Rev 1.x	Sys91	Digital Optimizer
DX-9100 (V.1)	Rev 1.x	Sys91	Digital Controller
DX-9100 (V.2)	Rev 2.x	Sys91	Digital Controller
TC-9100 TC-9102 TC-9109	Rev 1.x - 3.x	Sys91	Temperature Controller
XT-9100	Rev 1.x	Sys91	Extension Module
XTM-101	Rev 1.x	Sys91	Extension Module
XTM-105	Rev 1.x	Sys91	Extension Module
XTM-905	Rev 1.x	Sys91	Extension Module
LCP-100	Revs all	Sys91	Lab and Central Plant Controller
Metasys Integrator Unit	Revs all	N2 Open	Metasys Integrator Unit
UNT	Revs all	N2 Open	Unitary Controller
VAV	Revs all	N2 Open	Variable Air Volume Controller
AHU	Revs all	N2 Open	Air Handling Unit Controller
PHX	Revs all	N2 Open	Phoenix Interface Module
VMA (VMA14)	Revs all	N2B	VAV Modular Assembly
VND		N2 Open	Metasys Compatible Vendor Devices (by others)
ILC		N2 Other	Intelligent Lighting Controller

### N2 Controller Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 306: N2 Controller Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Graphic</a>	Object Reference	CNW	Null	Object Type = Graphic
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">Offline</a>	True or False			Offline (True), Online (False)
<a href="#">Present Value</a>	One value from a set	D		Offline, Online, Pass Through, Comm Disabled, Comm Enabled

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

## N2 Controller Attribute Details

### **Graphic**

Indicates the graphic associated with the N2 controller.

Back to [N2 Controller Attributes](#).

### **Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this N2 controller.

Back to [N2 Controller Attributes](#).

### **Offline**

Indicates if the NAE is or is not currently communicating with this N2 controller.

Back to [N2 Controller Attributes](#).

### **Present Value**

Represents the current communication state of the object.

Back to [N2 Controller Attributes](#).

## N2 Controller Commands

The table below lists the commands supported by the [N2 Controller Object](#).

**Table 307: N2 Controller Commands**

Command Name	Number of Parameters
<a href="#">Disable</a>	0
<a href="#">Enable</a>	0

## N2 Controller Command Details

### **Disable**

Puts the controller offline and leaves it offline (Comm. Disabled).

Back to [N2 Controller Commands](#).

### **Enable**

Brings the controller from the offline state to the online state (Comm. Enabled).

Back to [N2 Controller Commands](#).

## N2 Master Datalink Object (N2 Trunk)

The N2 Master Datalink object creates the communication link between the N2 controllers and the supervisory controller. The N2 Master Datalink object is the root for all N2 objects in the Metasys system. When you add an N2 Trunk to an engine, you establish communication with the specific N2 controller network. The N2 Master Datalink object offers diagnostic data related to the N2 controller network. This object allows you to see N2 Bus communication statistics.

**Note:** The Object Type for this object is labelled **N2 Trunk** in the software.

For general information on Metasys system objects, see the [Object Help](#) section.

### N2 Master Datalink (N2 Trunk) Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 308: N2 Master Datalink Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1,2</sup>	Initial Value	Values/Options/Range
<a href="#">Buffer Overflows</a>	Number		0	
<a href="#">Checksum Errors</a>	Number			0–4,294,967,295
<a href="#">Command Count</a>	Number			
<a href="#">Count</a>	Number			0–65,535
<a href="#">COV-COS Count</a>	Number			0–4,294,967,295
<a href="#">Data CRC Errors</a>	Number		0	
<a href="#">Framing Errors</a>	Number		0	
<a href="#">Hardware Overflows</a>	Number		0	
<a href="#">HP Point Scan Time</a>	Number			0–65,535 Seconds
<a href="#">LP Point Scan Time</a>	Number			0–65,535 Seconds
<a href="#">Message Receives</a>	Number			0–4,294,967,295
<a href="#">Message Transmits</a>	Number			0–4,294,967,295
<a href="#">NAK Errors</a>	Number			0–4,294,967,295
<a href="#">Offline Occurrences</a>	Number			0–4,294,967,295
<a href="#">Offline Polls</a>	Number			0–4,294,967,295
<a href="#">Online Polls</a>	Number			0–4,294,967,295
<a href="#">Parity Errors</a>	Number		0	
<a href="#">Poll Scan Time</a>	Number			0–65,535 Seconds
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Retry Attempts</a>	Number			0–4,294,967,295
<a href="#">Transmits Per Minute</a>	Number			65,535
<a href="#">VMA BAC Errors</a>	Number			0–4,294,967,295

**Table 308: N2 Master Datalink Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1,2</sup>	Initial Value	Values/Options/Range
<a href="#">VMA COV Errors</a>	Number			0–4,294,967,295
<a href="#">VMA FMT Errors</a>	Number			0–4,294,967,295

1 W - Writable

2 The writable attributes in the N2 Master Datalink object are writable only if the UDP Port attribute is not zero. If the UDP Port attribute is zero and you attempt to write these attributes, an error message appears.

## N2 Master Datalink Attribute Details

### **Buffer Overflows**

Indicates the number of input buffer overflows.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **Checksum Errors**

Indicates the number of checksum errors.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **Command Count**

Indicates the number of N2 user or process commands.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **Count**

Specifies the number of N2 point objects defined for this trunk.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **COV-COS Count**

Indicates the number of Changes of Value/Changes-of-State since the last reset.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **Data CRC Errors**

Indicates the number of System 9100 checksum errors.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **Framing Errors**

Indicates the number of UART framing errors.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **Hardware Overflows**

Indicates the number of UART hardware overruns.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **HP Point Scan Time**

Indicates the calculated number of seconds the N2 master takes to scan **high priority** N2 point objects, such as those used in alarming and interlocks.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **LP Point Scan Time**

Indicates the calculated number of seconds the N2 master takes to scan **low priority** N2 point objects (all N2 point objects that do not fall in the high priority category).

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

### **Message Receives**

Indicates the number of messages received from the N2 controllers.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Message Transmits**

Indicates the number of message transmissions to the N2 controllers.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**NAK Errors**

Indicates the number of negative acknowledge errors. A NAK is returned by an N2 device to indicate that it received and decoded a command correctly, but the command did not make sense or could not be carried out. An example of a NAK is an attempt to read an Analog Input beyond the range of the device.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Offline Occurrences**

Indicates the number of offline occurrences by the N2 controllers.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Offline Polls**

Indicates the number of offline polls to the N2 devices.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Online Polls**

Indicates the number of online polls to the N2 devices.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Parity Errors**

Indicates the number of messages that contain invalid hexadecimal characters (hexadecimal characters are 1-9 and A-F).

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Poll Scan Time**

Indicates the calculated number of seconds the N2 master takes to poll all defined N2 devices.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Reset Date**

Indicates the date of the [Clear Statistics](#) command.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Reset Time**

Indicates the time of the [Clear Statistics](#) command.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Retry Attempts**

Indicates the number of message retry attempts.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**Transmits Per Minute**

Indicates the calculated number of message transmissions per minute.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**VMA BAC Errors**

Indicates the number of VMA BACnet errors

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).



**VMA COV Errors**

Indicates the number of VMA Change-of-Value errors.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**VMA FMT Errors**

Indicates the number of VMA Format errors.

Back to [N2 Master Datalink \(N2 Trunk\) Attributes](#).

**N2 Master Datalink (N2 Trunk) Commands**

The table below lists the commands supported by the [N2 Master Datalink Object \(N2 Trunk\)](#).

**Table 309: N2 Master Datalink Object Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	
<a href="#">Latch Statistics</a>	

**N2 Master Datalink Command Details****Clear Statistics**

Allows the user to clear the N2 statistics.

Back to [N2 Master Datalink \(N2 Trunk\) Commands](#).

**Latch Statistics**

Updates the displayed statistics with the current values.

Back to [N2 Master Datalink \(N2 Trunk\) Commands](#).

## NCM Object

Create NCM objects by adding NCMs to the system [Navigation Tree](#). The attributes of the NCM object are read from the NCM device. The NCM object attributes update periodically based on the poll delay attribute of the parent [N1 Migration Object](#). The NCM object can only be a child object to the N1 Migration object. Add more NCM objects with the [Insert Field Device Wizard](#).

For general information on Metasys system objects, see [Common Object Attributes](#).

### NCM Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 310: NCM Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Disable Automatic Alarming</a>	True or False	CW	False	False True
<a href="#">Gate Number</a>	Number			
<a href="#">Graphic</a>	Object Reference	CNW	Null	Object Type = Graphic
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">IP Address</a>	Text			
<a href="#">NCM Name</a>	Text	C		8 characters maximum
<a href="#">Node Number</a>	Number			
<a href="#">Offline</a>	True or False			
<a href="#">Poll Delay</a>	Number	CW	0	Milliseconds

1 C - Configurable, W - Writable

**Table 311: NCM Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Device Status</a>				
<a href="#">Message Errors</a>	Number			
<a href="#">Message Receives</a>	Number			
<a href="#">Message Transmits</a>	Number			
<a href="#">Object Count</a>				
<a href="#">Offline</a>	True or False			
<a href="#">Service Time</a>				

1 C - Configurable, W - Writable

### NCM Attribute Details

#### Device Status

Displays **Discovery in Progress** when the N1 migration is currently reading trend, totalization, schedule, or object configuration data for at least one mapped object within the NCM. If this attribute value is **Discovery Complete**, these operations are complete.

Back to [NCM Attributes](#).

**Disable Automatic Alarming**

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device's mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

Back to [NCM Attributes](#).

**Gate Number**

Displays how the NIE is defined in the existing N1 network. This attribute is read from the NCM.

Back to [NCM Attributes](#).

**Graphic**

Indicates the graphic associated with the NCM.

Back to [NCM Attributes](#).

**Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this NCM.

Back to [NCM Attributes](#).

**IP Address**

Displays the IP address of the NCM as read from the NCM itself.

Back to [NCM Attributes](#).

**Message Errors**

Displays the number of error messages in the NCM as read from the NCM itself. The number of error messages matches the N1 statistics in the NCM. The error message count is cleared by the [Clear Statistics](#) command.

Back to [NCM Attributes](#).

**Message Receives**

Displays number of messages received as read from the NCM itself. The number of error messages matches the N1 statistics in the NCM. The error message count is cleared by the [Clear Statistics](#) command.

Back to [NCM Attributes](#).

**Message Transmits**

Displays the number of messages transmitted. The number of error messages matches the N1 statistics in the NCM. The error message count is cleared by the [Clear Statistics](#) command.

Back to [NCM Attributes](#).

**NCM Name**

Represents the defined name of the NCM as it appears in the existing N1 network.

Back to [NCM Attributes](#).

**Network Name**

Displays the defined network name.

Back to [NCM Attributes](#).

**Node Number**

Displays how the NIE is defined in the existing N1 network.

Back to [NCM Attributes](#).

**Object Count**

Counts the mapped objects within the NIE for this NCM. This count includes (NCM) AI, AO, Analog Data (AD), BI, BO, Binary Data (BD), Metasys System Integrator (MSI), Multistate Object Output (MSO), Message Storage Device (MSD), Control System (CS), Annunciator Control Module (ACM) objects.

Back to [NCM Attributes](#).

**Offline**

Displays True if the NCM is offline. If this attribute is true, the NIE cannot talk with the NCM.

Back to [NCM Attributes](#).

**Poll Delay**

Displays the polling time for non-triggerable attributes in milliseconds. The poll delay is the time between NIE polls to the N1 network points.

Back to [NCM Attributes](#).

**Service Time**

Displays the amount of time in seconds that it takes for the NIE to poll the NCM for all mapped objects within the NCM.

Back to [NCM Attributes](#).

**NCM Commands**

The table below lists the command specific to the [NCM Object](#).

**Table 312: NCM Object Commands**

Command Name	Number of Parameters
<a href="#">Clear Statistics</a>	0

**NCM Commands Details**

**Clear Statistics**

Resets the statistics at the NCM. The [Message Errors](#), [Message Receives](#), and [Message Transmits](#) attributes reflect these statistics.

Back to [NCM Commands](#).

# Notification Class Object

The Notification Class object provides a means to send alarm messages (Event Notification Messages) that are generated by other objects to any BACnet device. Typically, it is used to route alarm messages to third-party BACnet devices. Notification Classes are useful for event-initiating objects that have identical needs in terms of how their notifications should be handled, what the destinations for their notifications should be, and how they should be acknowledged.

For general information on Metasys system objects, see [Common Object Attributes](#).

For more information about the wizard used to insert a Notification Class object, see [Insert Object - Notification](#).

## Notification Class Concepts

### Notification Class

A notification class defines how event notifications are prioritized according To Offnormal, To Fault, and To Normal events; whether these categories of events require acknowledgement (nearly always, by a human operator); and what destination devices or processes receive notifications.

### Prioritization

Prioritization provides a means to ensure that alarms or event notifications with critical time considerations are not unnecessarily delayed. Priorities may be assigned To Offnormal, To Fault, and To Normal events individually within a notification class.

### Acknowledgement

Acknowledgement provides assurance that a notification has been acted upon by some other agent, rather than received correctly by another device. In most cases, acknowledgements come from human operators. To Offnormal, To Fault, and To Normal events may, or may not, require individual acknowledgement within a notification class.

### Destinations

You can send event notifications to multiple destinations or to different destinations based on the time of day or day of week. Notification Classes specify a list of destinations, each of which is qualified by time, day of week, and type of handling. The [Recipient List](#) attribute describes how the destination parameters relate to the Notification Class object. If an event that uses a Notification Class object occurs, the day is one of the days of the week that is valid for a given destination, and the time is within the window specified in the destination, then a notification is sent to the destination defined in the Recipient List. You can qualify destinations by any combination of the three event transitions: To Offnormal, To Fault, and To Normal.

The destination also defines the recipient device that receives the notification. The recipient device is specified by either its unique Device Object Identifier or by its Network Address and MAC Address. In the latter case, a unicast address or a broadcast, local/remote, or global address is used. The destination information specifies whether the notification is sent using a confirmed or unconfirmed event notification.

The Ack Required attribute of the Notification Class object and the type of event transition determine whether the event notification message requires acknowledgement.

## Notification Class Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 313: Notification Class Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>Ack Required</b>	Series of True and False states	CW	W	False, False, False	To Offnormal To Fault To Normal Uses BAC Event Bits (Set 525).
<b>Notification Class</b>	Number				0–4,294,967,295
<b>Priority</b>	List of numbers	CW	W	120 200 70	To Offnormal To Normal To Fault Range = 0–255
<b>Route to Metasys</b>	True or False	CW	Not supported	True	True, False
<b>Send Notifications to Supervisor</b>	True or False	CW	Not supported	True	True, False

1 C - Configurable, W - Writable

**Table 314: Notification Class Object Attributes - Recipient List Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	BACnet Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>Recipient List</b>	List of value sets	CW	W		See <a href="#">Recipient List</a> . Uses BAC Day Bitset (Set 176), Recipient Choice (Set 526), and BAC Event Bits (Set 525).

1 C - Configurable, W - Writable

## Notification Class Attribute Details

### **Ack Required**

Conveys three separate flags that represent whether acknowledgement is required in notifications generated for To Offnormal, To Fault, and To Normal event transitions, respectively.

Back to [Notification Class Attributes](#).

### **Notification Class**

Indicates the numeric value of this notification class and equals the instance number of the Notification Class object. Event initiating objects use this number to reference a specific Notification Class object.

Back to [Notification Class Attributes](#).

### **Priority**

Conveys the priority to be used for event notifications for To Offnormal, To Fault, and To Normal events, respectively. A lower number indicates a higher priority.

Back to [Notification Class Attributes](#).

### **Recipient List**

Conveys a list of one or more recipient destinations to which notifications are sent when event-initiating objects using this class detect the occurrence of an event. Each destination structure contains the following:

- **From Time, To Time (Start and Stop Times)** - The window of time (inclusive) during which the destination may be used. To specify all times, use 00:00:00 for Start Time and 23:59:59 for Stop Time.
- **IP Address** - The 4 byte IP Address of the destination if routing by IP address. This value is ignored when Network Number is set to 65,535. When set to 255.255.255.255 IP Address or the broadcast IP Address, notifications are broadcast based on the Network Number. A value of 0 sends a local broadcast. A value of 1–65,534 sends a remote broadcast.
- **Issue Confirmed Notifications (Confirmed, Unconfirmed)** - Indicates whether to send Confirmed or Unconfirmed event notifications via radio button selection. This selection is ignored when using global broadcast notifications.
- **MSTP Address** - The MS/TP address of the destination if routing by MS/TP address.
- **Network Number** - The network number for the destination if routing by IP or MS/TP address:
  - 0 designates the address of the local network
  - 1–65,534 identifies a destination address on the specified network
  - 65,535 specifies the use of global broadcast notification (note that the IP Address is not used and the notifications are unconfirmed)
- **Process Identifier** - The process ID within the recipient device that receives the event notification messages.
- **Recipient (Device Object ID)** - The destination devices to receive event notification messages.
- **Recipient Choice (Object ID or Address)** - The choice of whether to use an Object Identifier or the Address of the destination to route the notifications. If set to Address, the notification is sent either to the specified address or broadcast. See IP Address and Network Number descriptions for details.
- **Transitions (Off Normal, Fault, Normal)** - Three flags which indicate the types of transitions (To Offnormal, To Fault, or To Normal) sent to the destination.
- **UDP Port Number** - The UDP Port number used to send the notification message to the destination if routing by address. When the port is set to 0, this value when written is replaced with the port used by the supervisory device on the IP network.
- **Valid Days** - The days of the week on which notifications may be sent to this destination during the value of From Time, To Time (Start and Stop Times).

Back to [Notification Class Attributes](#).

### **Route to Metasys**

Determines whether or not the Notification Class object routes alarms to the Metasys alarming system.

Back to [Notification Class Attributes](#).

### **Send Notifications to Supervisor**

Determines whether or not the Notification Class object routes alarms to the supervisory device.

Back to [Notification Class Attributes](#).

## **Notification Class Commands**

The table below lists the commands supported by the [Notification Class Object](#).

**Table 315: Notification Class Object Commands**

Command Name	Parameters	BACnet Supported
<a href="#">Add Recipient</a>	See <a href="#">Recipient List</a> .	Yes
<a href="#">Disable</a>	0	No

**Table 315: Notification Class Object Commands**

Command Name	Parameters	BACnet Supported
<a href="#">Enable</a>	0	No
<a href="#">Remove Recipient<sup>1</sup></a>	See <a href="#">Recipient List</a> .	Yes

1 Only supported by the BACnet Notification Class

## Notification Class Command Details

### **Add Recipient**

Adds the Metasys device hosting the BACnet integration (for example, the NAE) to the [Recipient List](#) attribute.

Back to [Notification Class Commands](#).

### **Disable**

Prevents distribution of event notifications.

Back to [Notification Class Commands](#).

### **Enable**

Allows distribution of event notifications.

Back to [Notification Class Commands](#).

### **Remove Recipient**

Deletes the device hosting the BACnet integration from the [Recipient List](#) attribute.

Back to [Notification Class Commands](#).



# Optimal Start Object

The Optimal Start object aids in the reduction of energy costs during a building's transition from unoccupied to occupied. This scenario is accomplished by turning on the preheating/precooling as late as possible to reach comfort levels prior to occupancy and turning off the heating/cooling as early as possible while maintaining occupied zone comfort until zone vacancy.

This object allows you to save energy by coordinating the startup and shutdown times of equipment according to when people occupy certain rooms or areas of the building.

For general information on Metasys system objects, see the [Object Help](#) section.

For more information on the wizard used to insert Optimal Start objects, see [Insert Object - Optimal Start](#).

## Optimal Start Concepts

### Optimal Start Overview

After you create an [Optimal Start Object](#) using the known characteristics of your building, the Optimal Start (OST) calculates the best times for startup and shutdown. For Optimal Start mode ([Optimal Start Equation](#)), the OST commands the [Zone WC Mode Obj](#) attribute to occupied and starts the heating or cooling sequence at the appropriate time. For [Optimal Stop](#) mode, the OST commands the [Zone Occ Mode Obj](#) attribute to unoccupied at the appropriate time.

If you set the [Adaptation Enabled](#) attribute to True (1), the OST automatically adjusts the [Cooling Constant](#) and [Heating Constant](#) as needed.

**Note:** Warmup and cooldown (WC) is also referred to as the prestart period in the OST object.

### Optimal Start

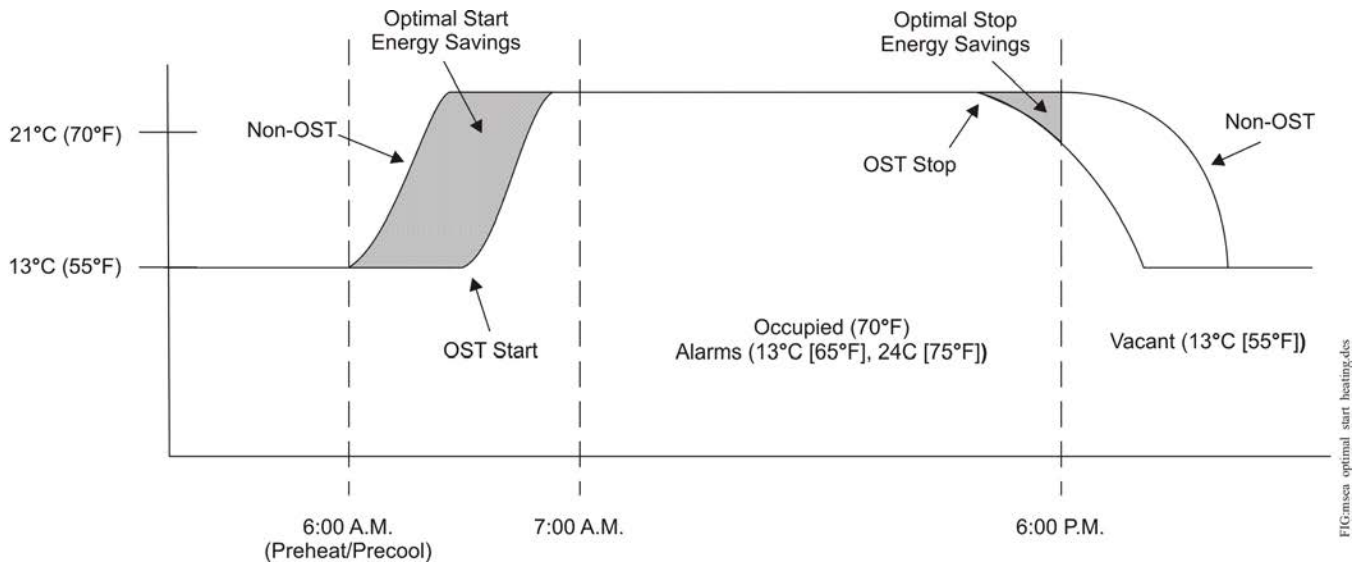
The goal of [Optimal Start Object](#) is to reach either the [Heating Setpoint](#) or [Cooling Setpoint](#) at occupancy. The Optimal Start object selects the appropriate setpoint depending on the temperature before starting the equipment. To meet this goal, the Optimal Start object calculates:

- [Heating Constant](#) and [Cooling Constant](#) represent the rate at which the temperature inside the building changes when the heating or cooling equipment is running
- the temperature difference between the [Zone Temperature](#) and the Heating Setpoint or Cooling Setpoint before occupancy
- how many minutes of precooling (cooldown) or preheating (warmup) are required based on the above difference
- optimal start time when the [Zone WC Mode Obj](#) (BO or BV only) is controlled by the optimal start process

The Optimal Start object interacts with a [Schedule Object](#), binary objects, and analog objects in an Optimal Start application. See the [Object Help](#) section for information on these objects. See the [Optimal Start Object](#) section for attribute information on the Optimal Start object.

[Figure 80](#) illustrates optimal start.

**Figure 80: Optimal Start - Heating**



### Optimal Start Equation

The following equation calculates the optimal start time:

$$[(\text{Heating or Cooling Constant}/100) \times \text{Temperature Difference}^2] + \text{Heating or Cooling Deadtime} = \text{Optimal Start Time}$$

**Table 316: Optimal Start Equation**

Variable	Description
<b>Heating or Cooling Constant</b>	This variable is the value of the Heating or Cooling Constant attribute of the OST object and represents the rate of warmup or cooldown in the zone after equipment startup. If <i>Adaptation Enabled</i> is Yes, the Optimal Start object learns each day and sets a new value. This variable can be edited by the user.
<b>Temperature Difference</b>	This variable is the difference between the Zone Temperature and the value of the Heating Setpoint or Cooling Setpoint attribute before the warmup or cooldown period. Units = delta deg F or delta deg K
<b>Heating or Cooling Deadtime</b>	This variable is the value of the Heating or Cooling Deadtime attribute of the OST object and is the amount of time required to raise or lower the Zone Temperature 1.0 degree. Units = minutes. If <i>Adaptation Enabled</i> is Yes, the Optimal Start object learns each day and sets a new value. This variable can be edited by the user.

### Optimal Start Example

For an example of the optimal start process, assume:

- The *Zone Occ Mode Obj* is scheduled to be occupied at 7:00 A.M. and unoccupied at 5:00 P.M.
- *Zone Temperature* = 55°F before the warmup period
- *Heating Setpoint* (since in Heating mode) = 70°F
- *Heating Deadtime* (since in Heating mode) = 5 minutes
- *Heating Constant* (since in Heating mode) = 10 (The optimal start process has run for several days, and the Heating Constant has been adjusted to 10 based on past performance.)
- Temperature Difference = 70°F - 55°F = 15°F

Therefore:

$$\text{Optimal Start Time} = [(10/100) \times 15^2] + 5$$

$$\begin{aligned}
&= (0.1 \times 15^2) + 5 \\
&= (0.1 \times 225) + 5 \\
&= 22.5 + 5 \\
&= 27.5 \\
&= 28 \text{ minutes}
\end{aligned}$$

The optimal start process turns on the [Zone WC Mode Obj](#) at 6:32 A.M. (28 minutes prior to the scheduled 7:00 A.M. start time.)

### Adaptation

Each day, at occupancy, the optimal start process adapts the Heating or Cooling Constant. It checks the [Zone Temperature](#) at occupancy time. If the Zone Temperature did not reach a value within the range defined by the [Temp Differential](#) and the [Heating Setpoint](#) or [Cooling Setpoint](#) before the occupancy time, the [Heating Constant](#) or [Cooling Constant](#) is increased. This increase moves the optimal start time closer to the earliest start time defined in the OST object. If the Zone Temperature reached a value within the range defined by Temperature Differential and the Heating Setpoint or Cooling Setpoint prior to occupancy, the Heating Constant or Cooling Constant is decreased. This decrease moves the optimal start time closer to the occupancy start time defined in the [Schedule Object](#).

### Optimal Stop

The goal of optimal stop is to set the zone to the unoccupied mode prior to actual zone vacancy. The OST must do this while the zone is still occupied, without causing comfort level alarms. The Optimal Start object calculates the number of minutes before the zone is scheduled to change from occupied to unoccupied. The OST then uses the same equation ([Optimal Start Equation](#)) for deriving the optimal start time to determine the earliest stop time, except for two differences:

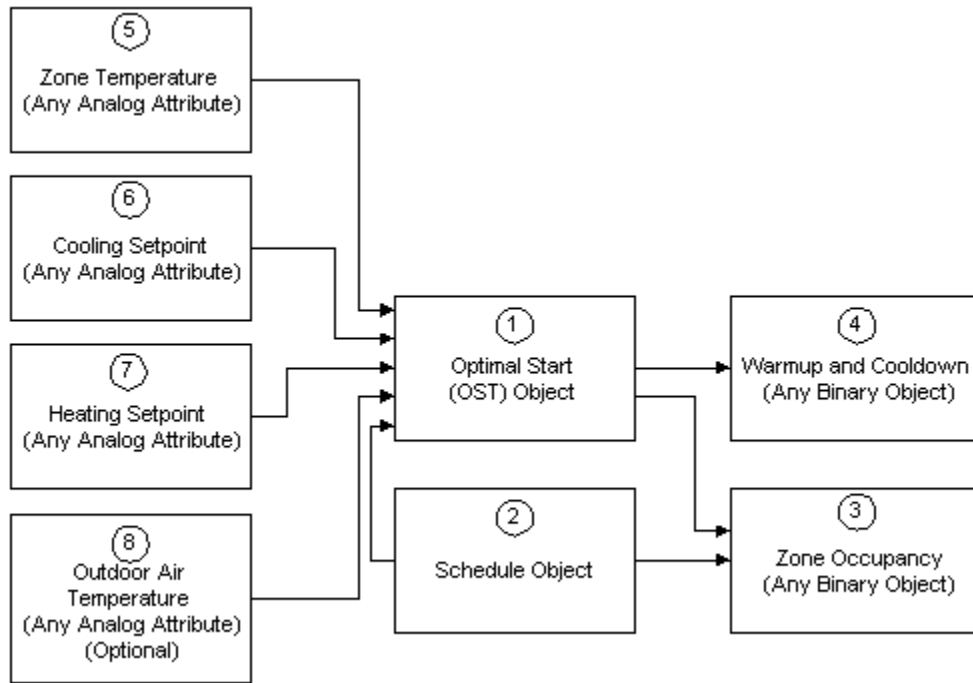
- To ensure occupancy comfort, the OST sets the Temperature Difference factor to the [Temp Differential](#) attribute.
- The Deadtime is set to 0.

$(\text{Heating or Cooling Constant}/100) \times (\text{Temperature Difference})^2 + \text{Heating or Cooling Deadtime (always = 0)} = \text{Optimal Stop Time}$

### Object Interaction

Different objects interact in an Optimal Start application. The following figure illustrates a sample Optimal Start application. The table describes the objects and their role in an Optimal Start application.

**Figure 81: Optimal Start Object Interaction**



**Table 317: Optimal Start Application Object Interaction**

#	Object or Attribute	Role
1	Optimal Start (OST) Object	Receives temperature, setpoint, and scheduling data to determine optimal start and optimal stop times for the building zone.
2	Schedule Object	Provides occupied and unoccupied times for the building zone.
3	Zone Occupancy Mode	Refers to the binary object (Binary Output, Binary Value, for example) that commands a zone to occupied or unoccupied. It is commanded by the Schedule object to occupied and by the Optimal Start to unoccupied, possibly earlier than scheduled if the Maximum Prestop Time attribute is non-zero.
4	Zone Warmup or Cooldown Mode	Refers to the binary object (Binary Output, Binary Value, for example) that commands the zone to warm up or cool down. It is commanded by the Optimal Start object at the optimal start time and released at the occupied time. It will not be released if the Zone Warmup or Cooldown (WC) Mode and the Zone Occupancy Mode objects are the same.
5-8	Zone Temperature, Cooling Setpoint, Heating Setpoint, Outdoor Air Temperature	Refers to the analog attributes (within Analog Input objects, Analog Value objects, for example) that are referenced by the Optimal Start object and provide the temperatures and setpoints for use in calculations.

### Object/Attribute Involvement

Building an Optimal Start application means that the OST object and its associated Schedule object must have their attributes configured to reference the appropriate objects in order to achieve the desired operation. The table lists the objects and attributes involved and guidelines for data entry.

**Table 318: Optimal Start Object/Attribute Involvement**

Object Type/ Function	Attributes Involved	Data Entry Guidelines
<a href="#">Optimal Start Object</a>	<a href="#">Zone Schedule Obj</a>	Enter the Object Name of the Schedule object that schedules occupied and unoccupied times for the binary object controlling the zone occupancy mode of the heating and cooling equipment for the zone.  This object must be defined in the schedule and have valid start and stop times for the current day for the Optimal Start object to run. Only one start time and stop time can be defined per day, and the start time must precede the stop time.
	<a href="#">Zone Occ Mode Obj</a>	Enter the Object Name of the binary object controlling the occupancy mode of the heating and cooling equipment for the zone.
	<a href="#">Zone WC Mode Obj</a>	Enter the Object Name of the binary object (BO or BV only) controlling the warmup and cooldown mode of the heating and cooling equipment for the zone. This may be the same object as the Zone Occ Mode Object.
	<a href="#">Cooling Setpoint</a>	Enter the Object/Attribute Name of the analog value that represents the cooling setpoint.
	<a href="#">Heating Setpoint</a>	Enter the Object/Attribute Name of the analog value that represents the heating setpoint.
	<a href="#">Zone Temperature</a>	Enter the Object/Attribute Name of the analog value that represents the temperature in the zone being controlled.
	<a href="#">Outdoor Air Temp</a>	Enter the Object/Attribute Name of the analog value that represents the outdoor air temperature.  If this attribute is not defined, or the referenced analog attribute is offline, the outdoor air temperature is assumed to be within the design temperatures limits for the OST calculations.  If an analog attribute reference is defined for the outdoor air temperature, its value determines if the Optimal Start object should adapt heating and cooling constants and deadtimes.  If its value is outside the design temperature limits, deadtime and constant calculations are skipped.  If its value is outside the design temperatures before the warmup or cooldown period, the optimal start time is set to the maximum prestart time.  If its value is outside the design temperatures before the unoccupied period, Prestop does not occur.
<a href="#">Schedule Object</a>	List of Object Property References	Enter the Object Name of the binary object controlling the occupancy mode of the heating and cooling equipment for the zone as one of the Property References.

### **Optimal Start Attributes**

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 319: Optimal Start Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Adaptation Enabled</i>	True or False	CW	True	
<i>Calc Prestart Date</i>	Date			
<i>Calc Prestart Time</i>	Time			
<i>Calc Prestop Date</i>	Date			
<i>Calc Prestop Time</i>	Time			
<i>CoolDown Command</i>	One state from a set	W	1	Set redirected to ZWC States Text; Number of States redirected to ZWC Nbr States Only available in the online UI
<i>Cooling Constant</i>	Real value	CW	75.0	1–999
<i>Cooling Deadtime</i>	Number	CW	10 minutes	1–480 Units = Minutes
<i>Cooling Design Temp</i>	Real value	CW	35.0 deg C or 95.0 deg F	-20 to 120 Units = Temperature Units
<i>Cooling Setpoint</i>	Attribute Reference	CW		
<i>Cooling Stpt Status</i>	One value from a set			Offline = 0 Online = 1 Uses Offline Online (Set 91).
<i>Display Precision</i>	One value from a set	CW	0.1	Uses Display Precision (Set 0).
<i>Heating Constant</i>	Real value	CW	75.0	1–999
<i>Heating Deadtime</i>	Number	CW	10 minutes	1–480 Units = Minutes
<i>Heating Design Temp</i>	Real value	CW	-20.6 deg C or -5.0 deg F	-35 to 90 Units = Temperature Units
<i>Heating Setpoint</i>	Attribute Reference	CW		
<i>Heating Stpt Status</i>	One value from a set			Offline = 0 Online = 1
<i>Max Prestart Time</i>	Number	CW	120 minutes	5–480 Units = Minutes
<i>Max Prestop Time</i>	Number	CW	0 minutes	0–60 Units = Minutes
<i>Min Prestart Time</i>	Number	CW	20 minutes	0–240 Units = Minutes
<i>OST Type</i>	One type from a set	CW	Heating/Cooling	Heating and Cooling = 0 Heating Only = 1 Cooling Only = 2 Uses OST Type (Set 126).
<i>Outdoor Air Temp</i>	Attribute Reference	CNW		

**Table 319: Optimal Start Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>Present Value</b>	One value from a set	D	Idle	Idle = 0 Prestart Heating = 1 Prestart Cooling = 2 Calculating Deadtime = 3 Calculating Constant = 4 Occupied = 5 Prestop = 6 Not Operational = 7 Uses OST State (Set 125).
<b>Prestart Cooling Command</b>	One state from a set	W	1	Set redirected to ZOM States Text; Number of States redirected to ZOM Nbr States Only available in the online UI
<b>Prestart Heating Command</b>	One state from a set	W	1	Set redirected to ZOM States Text; Number of States redirected to ZOM Nbr States Only available in the online UI
<b>Prestop Command</b>	One state from a set	W	0	Set redirected to ZOM States Text; Number of States redirected to ZOM Nbr States Only available in the online UI
<b>Relative Temp Units</b>	One type of units from a set	C	Relative deg F	Uses Unit Set (Set 869).
<b>Reliability</b>	One value from a set		Reliable	Uses Reliability (Set 503).
<b>Schedule Occupied Command</b>	One state from a set	W	1	Set redirected to ZOM States Text; Number of States redirected to ZOM Nbr States Only available in the online UI
<b>Schedule Unoccupied Command</b>	One state from a set	W	0	Set redirected to ZOM States Text; Number of States redirected to ZOM Nbr States Only available in the online UI
<b>Send OK</b>	True or False			
<b>Stpt Reached Time</b>	Time			
<b>Temp Differential</b>	Real Value	CW	3.0 delta deg F or 1.67 delta K	0–10 Units = Relative Temp Units
<b>Temperature Units</b>	One value from a set	C	Deg F	Uses Unit Set (Set 869).
<b>WarmUp Command</b>	One state from a set	W	1	Set redirected to ZWC States Text; Number of States redirected to ZWC Nbr States Only available in the online UI
<b>Zone Occ Mode Obj</b>	Object Reference	CW		
<b>Zone Occ Time</b>	Time			
<b>Zone Schedule Obj</b>	Object Reference	CW		
<b>Zone Schedule Status</b>	One value from a set			Offline = 0 Online = 1

**Table 319: Optimal Start Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Zone Temperature</a>	Attribute Reference	CW		
<a href="#">Zone Temp At Start</a>	Real value	N		
<a href="#">Zone Temp Status</a>	One value from a set			Offline = 0 Online = 1
<a href="#">Zone Unocc Time</a>	Time			
<a href="#">Zone WC Mode Obj</a>	Object Reference	CW		Must be defined as an N2 BO or N2 BV object.

1 C - Configurable, D - Default Attribute for Display, N - Value Not Required, W - Writable

## Optimal Start Attribute Details

### **Adaptation Enabled**

Indicates whether OST uses adaptive learning to change the building heating and cooling constants and heating and cooling deadtimes.

Back to [Optimal Start Attributes](#).

### **Calc Prestart Date**

Indicates the last calculated prestart date. This value is updated each time the optimal start time is calculated (between early start time and optimal start time).

Back to [Optimal Start Attributes](#).

### **Calc Prestart Time**

Indicates the last calculated prestart time. This value is updated each time the optimal start time is calculated (between early start time and optimal start time).

Back to [Optimal Start Attributes](#).

### **Calc Prestop Date**

Indicates the last calculated prestop date. This value is updated each time the optimal stop time is calculated (between early stop time and optimal stop time).

Back to [Optimal Start Attributes](#).

### **Calc Prestop Time**

Indicates the last calculated prestop time. This value is updated each time the optimal stop time is calculated (between early stop time and optimal stop time). If [Max Prestop Time](#) is zero, the value of this attribute is equal to the unoccupied time.

Back to [Optimal Start Attributes](#).

### **CoolDown Command**

Specifies the command sent to the [Zone WC Mode Obj](#) point at prestart time when in cooling mode. The enumeration set and number of states for this attribute are redirected and filled in at runtime from the Zone WC Mode Obj point. The default value is set to a value of 1 upon creation so the attribute requires no configuration.

Back to [Optimal Start Attributes](#).

### **Cooling Constant**

Defines the rate at which the zone cools down after equipment startup. If adaptation is enabled, this constant is adapted without user intervention. If adapting, cooling, and heating setpoints are the same attribute, the cooling constant is adapted even if the mode is not cooling, meaning both constants change.

Back to [Optimal Start Attributes](#).



**Cooling Deadtime**

Indicates the time required after startup to lower the temperature by one degree. This value is adapted by the OST algorithm, if adaptation is enabled. If adapting, cooling, and heating setpoints are the same attribute, the Cooling Deadtime is adapted even if the mode is not cooling, meaning both deadtimes change.

Back to [Optimal Start Attributes](#).

**Cooling Design Temp**

Indicates the highest outside temperature at which the cooling system maintains zone comfort in the cooling mode.

Back to [Optimal Start Attributes](#).

**Cooling Setpoint**

Identifies the attribute of an object used to define the zone occupied target cooling temperature. This attribute may be the same as the [Heating Setpoint](#) attribute.

Back to [Optimal Start Attributes](#).

**Cooling Stpt Status**

Identifies the OST object's connection status to the [Cooling Setpoint](#) attribute. If this status is Offline, the [Present Value](#) is set to Not Operational.

- **Offline** - Cooling Setpoint attribute is offline.
- **Online** - Cooling Setpoint attribute is online.

Back to [Optimal Start Attributes](#).

**Display Precision**

Indicates the rounded position and decimal places to display for this object.

Back to [Optimal Start Attributes](#).

**Heating Constant**

Defines the rate at which the zone heats up after equipment startup. If adaptation is enabled, this constant is adapted without user intervention. If adapting, cooling, and heating setpoints are the same attribute, the heating constant is adapted even if the mode is not heating, meaning both constants change.

Back to [Optimal Start Attributes](#).

**Heating Deadtime**

Indicates the time required after startup to raise the temperature by one degree. This value is adapted by the OST algorithm, if adaptation is enabled. If adapting, cooling, and heating setpoints are the same attribute, the Heating Deadtime is adapted even if the mode is not heating, meaning both deadtimes change.

Back to [Optimal Start Attributes](#).

**Heating Design Temp**

Indicates the lowest outside temperature at which the heating system maintains zone comfort in the heating mode.

Back to [Optimal Start Attributes](#).

**Heating Setpoint**

Identifies the attribute of an object used to define the zone occupied target heating temperature. This attribute may be the same as the [Cooling Setpoint](#) attribute.

Back to [Optimal Start Attributes](#).

**Heating Stpt Status**

Identifies the OST object's connection status to the [Heating Setpoint](#) attribute. If this status is Offline, the [Present Value](#) is set to Not Operational.

- **Offline** - Heating Setpoint attribute is offline.
- **Online** - Heating Setpoint attribute is online.

Back to [Optimal Start Attributes](#).

#### **Max Prestart Time**

Indicates the maximum period of time required to bring the zone up to occupancy setpoint temperature under the worst conditions (earliest optimal start time).

Back to [Optimal Start Attributes](#).

#### **Max Prestop Time**

Indicates the maximum period of time that the heating/cooling system can be shut down and still maintain the occupied zone temperature until entering the unoccupied mode (earliest optimal stop time). By setting this time to zero (the default value), optimal stop is disabled.

Back to [Optimal Start Attributes](#).

#### **Min Prestart Time**

Indicates the minimum period of time before occupancy to start the heating/cooling system. This time allows for the required amount of air changes in the zone prior to occupancy (latest optimal start time).

Back to [Optimal Start Attributes](#).

#### **OST Type**

Defines the OST supported configuration. When the zone is in a mode not supported by the OST object, the [Present Value](#) is idle. OST-supported modes include:

- Heating and Cooling
- Heating Only
- Cooling Only

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#### **Outdoor Air Temp**

Identifies the attribute of an object used to determine the outdoor temperature:

- If this attribute is not defined, or is offline, the outdoor air temperature is not used in the OST calculations and is assumed to be within the design temperatures.
- If an Analog attribute reference is defined for the outdoor air temperature, it aids in determining if the Optimal Start object should adapt constants and deadtimes.
- If the attribute is defined and outside the design temperatures, deadtime and constant calculations are skipped.
- If the attribute is defined and is outside the design temperatures during Prestart, the optimal start time is set to early start time.
- If the attribute is defined and outside the design temperatures during Prestop, do not Prestop.

Back to [Optimal Start Attributes](#).

#### **Present Value**

Represents the current value of the object:

- **Idle** - Waiting for next occupied time for a supported mode (heating or cooling).
- **Prestart Heating** - Heating optimal start time is pending.
- **Prestart Cooling** - Cooling optimal start time is pending.
- **Calculating Deadtime** - Valid only if Adaptation Enabled.
- **Calculating Constant** - Valid only if Adaptation Enabled.
- **Occupied**
- **Prestop** - Waiting to reach optimal stop time. If Max Prestop Time = 0, then mode is Occupied, not Prestop.
- **Not Operational** - Optimal Start object is not operational due to errors in its connection status to other required objects. The specific problem can be determined by viewing the other status attributes. The Optimal Start object

could also be Not Operational (or Unreliable) if the Zone Occ Mode Obj is in the schedule but there are no valid start and stop times for that day (due to holiday or schedule offline, for example).

Back to [Optimal Start Attributes](#).

#### **Prestart Cooling Command**

Specifies the command sent to the [Zone Occ Mode Obj](#) point at prestart time when in cooling mode. The enumeration set and number of states for this attribute are redirected and filled in at runtime from the Zone Occ Mode Obj point. The default value is set to a value of 1 upon creation so the attribute requires no configuration.

Back to [Optimal Start Attributes](#).

#### **Prestart Heating Command**

Specifies the command sent to the [Zone Occ Mode Obj](#) point at prestart time when in heating mode. The enumeration set and number of states for this attribute are redirected and filled in at runtime from the Zone Occ Mode Obj point. The default value is set to a value of 1 upon creation so the attribute requires no configuration.

Back to [Optimal Start Attributes](#).

#### **Prestop Command**

Specifies the command sent to the [Zone Occ Mode Obj](#) point at prestop time. The enumeration set and number of states for this attribute are redirected and filled in at runtime from the Zone Occ Mode Obj point. The default value is set to a value of 0 upon creation so the attribute requires no configuration.

Back to [Optimal Start Attributes](#).

#### **Relative Temp Units**

Specifies the units associated with the [Temp Differential](#) attribute.

Back to [Optimal Start Attributes](#).

#### **Reliability**

Indicates if a value is questionable due to operational errors in the Optimal Start object's connection status to other required objects. Without a valid start and stop time for the current day (due to holiday or schedule offline, for example), the value is also Unreliable.

Back to [Optimal Start Attributes](#).

#### **Schedule Occupied Command**

Specifies the command sent to the [Zone Schedule Obj](#) point at prestart time when in occupied mode. The enumeration set and number of states for this attribute are redirected and filled in at runtime from the Zone Schedule Obj point. The default value is set to a value of 1 upon creation so the attribute requires no configuration.

Back to [Optimal Start Attributes](#).

#### **Schedule Unoccupied Command**

Specifies the command sent to the [Zone Schedule Obj](#) point at prestart time when in unoccupied mode. The enumeration set and number of states for this attribute are redirected and filled in at runtime from the Zone Schedule Obj point. The default value is set to a value of 0 upon creation so the attribute requires no configuration.

Back to [Optimal Start Attributes](#).

#### **Send OK**

Indicates if the status of the last command was sent to the [Zone WC Mode Obj](#), [Zone Occ Mode Obj](#), or [Zone Schedule Obj](#).

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#### **Stpt Reached Time**

Indicates the time at which the zone temperature was equal to (within differential) the zone setpoint. This point is set between the optimal start time and occupied. If this point is not reached during that time, then it continues to be monitored during the occupied time until the zone temperature reaches the setpoint.

Back to [Optimal Start Attributes](#).

### **Temp Differential**

Indicates the value added and subtracted to the zone setpoint to define a temperature range.

Back to [Optimal Start Attributes](#).

### **Temperature Units**

Indicates the units associated with the attributes for temperatures.

Back to [Optimal Start Attributes](#).

### **WarmUp Command**

Specifies the command sent to the [Zone WC Mode Obj](#) point at prestart time when in heating mode. The enumeration set and number of states for this attribute are redirected and filled in at runtime from the Zone WC Mode Obj point. The default value is set to a value of 1 upon creation so the attribute requires no configuration.

Back to [Optimal Start Attributes](#).

### **Zone Occ Mode Obj**

Identifies the object used to command a zone to occupied or unoccupied. This object must be specified in the [Zone Schedule Obj](#). This is commanded by scheduling to occupied and by OST if prestop is enabled.

**Note:** If the Zone Occ Mode Obj and the Warmup/Cooldown Mode Obj are the same point, then the point is commanded by the Prestart Cooling/Heating Command at the prestart time and by the Scheduling at the scheduled time.

Back to [Optimal Start Attributes](#).

### **Zone Occ Time**

Indicates the scheduled zone occupied time, obtained from the [Zone Schedule Obj](#).

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### **Zone Schedule Obj**

Identifies the Schedule object, which schedules the [Zone Occ Mode Obj](#). This object must be defined in the schedule and have valid start and stop times for the current day in order for OST to run. Otherwise, the OST object's [Present Value](#) is Not Operational. Only one Start and Stop time can be defined per day, and the Start time must precede the Stop time. The Start time must be defined as binary State ON (1) and Stop time must be defined as binary State OFF (0).

Back to [Optimal Start Attributes](#).

### **Zone Schedule Status**

Identifies the OST object's connection status to the [Zone Schedule Obj](#). If this status is Offline, the [Present Value](#) is set to Not Operational.

- **Offline** - Zone Schedule Obj is offline.
- **Online** - Zone Schedule Obj is online.

Back to [Optimal Start Attributes](#).

### **Zone Temperature**

Identifies the attribute of an object used to determine the zone temperature.

Back to [Optimal Start Attributes](#).

### **Zone Temp At Start**

Specifies the zone temperature at the last optimal start time.

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### **Zone Temp Status**

Identifies the OST object's connection status to the [Zone Temperature](#) attribute. If this status is Offline, the [Present Value](#) is set to Not Operational.

- **Offline** - Zone Temp attribute is offline.
- **Online** - Zone Temp attribute is online.

Back to [Optimal Start Attributes](#).

### **Zone Unocc Time**

Indicates the scheduled zone unoccupied (vacancy) time, obtained from the [Zone Schedule Obj](#).

Back to [Optimal Start Attributes](#).

### **Zone WC Mode Obj**

Identifies the object used to command a zone to Warmup or Cooldown mode. This object may be the same as the Zone Occ Mode Obj. This object is commanded by the OST at the optimal start time. This object is released at the occupied time unless this object is also the value for the Zone Occ Mode Obj.

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## **Optimal Start Commands**

The table below lists the commands supported by the [Optimal Start Object](#).

**Table 320: Optimal Start Object Commands**

Command Name	Parameters
<a href="#">Cancel Prestart</a>	
<a href="#">Cancel Prestop</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	

## **Optimal Start Command Details**

### **Cancel Prestart**

Delays pending start until latest prestart time. Only valid during Prestart and before the optimal start time.

Back to [Optimal Start Commands](#).

### **Cancel Prestop**

Cancels the pending stop. Only valid during Prestop and before the optimal stop time.

Back to [Optimal Start Commands](#).

### **Disable**

Prevents the object's functionality; no calculations take place.

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### **Enable**

Allows the object to perform its calculations once a minute.

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## **Optimal Start Steps**

### **Building an Optimal Start Application**

To build an Optimal Start application:

1. Add the N2 Controller object and the analog and binary objects required for the OST application to the database. See the [Object Help](#) section for information on objects and the [Related Documentation](#) table in the [Welcome](#)

section for information on the SCT. See [Creating Items with Wizards](#) for information on creating objects and other items.

2. Add the [Schedule Object](#) (see [Scheduling](#)), referencing the binary object controlling Zone Occupancy Mode.
3. Make sure valid occupied and unoccupied times are entered into the Schedule object.
4. Add the [Optimal Start Object](#) referencing the above Schedule object, the Binary objects designated as Zone Occupancy Mode and Zone Warmup or Cooldown Mode, and the analog attributes of objects designated as temperatures and setpoints.

**Note:** See the [Site Management Portal User Interface](#) section for information on creating, editing, commanding, and deleting objects. See the [Scheduling](#) section for information on scheduling.

## Optimal Start Troubleshooting

Table 321: Optimal Start Application Troubleshooting

Problem	Solution
<b>Present Value of the Optimal Start Object indicates Not Operational</b>	<p>The Optimal Start object's <a href="#">Present Value</a> attribute may indicate Not Operational because of errors in its connection status to other required objects.</p> <p>To verify the Optimal Start object's connection status to other required objects:</p> <ul style="list-style-type: none"> <li>• Verify that the required Schedule object, binary objects, and analog objects are all defined and online.</li> <li>• Verify that the binary object controlling Zone Occupancy Mode is in the List of Prop Refs for the <a href="#">Schedule Object</a>.</li> <li>• Verify that valid occupied and unoccupied times for the current day are defined in the Schedule object.</li> </ul>
<b>Optimal Start Object is not adapting Constants and Deadtimes</b>	<p>To ensure the Optimal Start object is adapting constants and deadtimes:</p> <ul style="list-style-type: none"> <li>• Verify that the <a href="#">Adaptation Enabled</a> attribute indicates True.</li> <li>• Verify that the value of the <a href="#">Zone Temperature</a> attribute <b>is not</b> within the value of the <a href="#">Temp Differential</a> attribute relative to the Heating or Cooling Setpoint (plus or minus one degree) before the warmup or cooldown period.</li> <li>• Verify that the value of the <a href="#">Outdoor Air Temp</a> attribute <b>is</b> within the values of the <a href="#">Cooling Design Temp</a> and <a href="#">Heating Design Temp</a> attributes.</li> </ul>

## P2000 Integration

The P2000 system integration enables you to view access control objects in the P2000 security system from a single user interface, the Metasys Site Management Portal UI. You also can view the objects from other building systems controlled by the Metasys system. The integration leverages Web Services technology to integrate the P2000 system.

The P2000 integration provides many features, allowing you to:

- see P2000 objects in the navigation tree.
- perform door and output point control tasks.
- see P2000 events in the Metasys Event Viewer.
- use P2000 events to initiate actions on the Metasys system.

| For information, refer to the *P2000 Metasys System Extended Architecture Integration Manual (Part No. 24-10618-82)*.

# Program (Control System) Object

The Program object (previously the Control System object) stores information needed for the user-defined control strategies created (graphically) with the [Logic Connector Tool \(LCT\)](#). The Control System object application now includes BACnet command object functionality and appears as the Program object in the Metasys software. The Program object attributes allow manipulation of the LCT application.

For general information on Metasys system objects, see [Common Object Attributes](#).

## Program Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 322: Program Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Description Of Halt</a>	Text			
<a href="#">Enabled</a>	True or False	CW		
<a href="#">Instance Of</a>	Text			
<a href="#">Program Change</a>	One state from a set	W	Ready	0 = Ready 1 = Load 2 = Run 3 = Halt 4 = Restart 5 = Unload
<a href="#">Program Location</a>	Text			
<a href="#">Program State</a>	One state from a set			0 = Idle 1 = Loading 2 = Running 3 = Waiting 4 = Halted 5 = Unloading
<a href="#">Reason For Halt</a>	One state from a set			0 = Normal 1 = Load Failed 2 = Internal 3 = Program 4 = Other
<a href="#">Reliability</a>	One state from a set			Uses Reliability set.

1 C - Configurable, W - Writable

## Program Attribute Details

### Description Of Halt

Displays the text matching the Reason for Halt attribute's set value.



Back to [Program Attributes](#).

**Enabled**

Indicates whether the program/control system logic is enabled or disabled.

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**Instance Of**

Reflects the LCT control system's user name.

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**Program Change**

Requests changes to the current state of the LCT application. When written, the following actions are carried out. After the action is carried out, the Program Change value returns to Ready.

- Ready - Specifies that the LCT control system is ready for a change request (normal state).
- Load - Enables the LCT control system.
- Run - Enables the LCT control system.
- Halt - Disables the LCT control system.
- Restart - Disables, then Enables, the LCT control system.
- Unload - Disables the LCT control system.

Back to [Program Attributes](#).

**Program Location**

Indicates the location of the program/control system.

Back to [Program Attributes](#).

**Program State**

Reflects the current state of the LCT application.

- Halted - The Program object is Disabled.
- Running - The Program object is Enabled.

Back to [Program Attributes](#).

**Reason For Halt**

Indicates that the LCT Control System has been disabled by a means other than the writing of the Program Change attribute.

- Normal - The LCT control system is Enabled.
- Internal - The LCT control system has been disabled by a means other than writing of the Program Change attribute.
- Program - The LCT control system has been disabled by writing the Program Change attribute.

Back to [Program Attributes](#).

**Reliability**

Indicates whether the connections between logic blocks are reliable.

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## Pulse Meter Object

The Pulse Meter object accumulates the differences between consecutive reads of the integer value provided by an [Accumulator Object](#) or Counter Input Object (defined by CCT), and calculates the rate of change between each reading of the value. This object also totals the counted pulses and converts them into units of consumption.

The Pulse Meter object must reference a counter/accumulator object to access the counter value that resides in the counter/accumulator hardware device (which is hardwired to the pulse input). The counter/accumulator object is hardware specific, while the Pulse Meter object is hardware independent.

Multiple Pulse Meter objects may share the same counter/accumulator object, and must reside on the same device as the counter/accumulator hardware device.

**Note:** The Pulse Meter object only handles counters that count forward.

Each Pulse Meter object may have different purposes, such as one calculates the rate over a 60-second period, while others calculate the rate over a 5-minute period. For example, some Pulse Meters are supposed to run only during certain times of the day.

For general information on Metasys system objects, see the [Object Help](#) section.

### Pulse Meter Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 323: Pulse Meter Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Calculation</a>	Number		0	0–4,294,967,295
<a href="#">Consump Unreliable</a>	True or False	W	False	
<a href="#">Consumption</a>	Real value (double)	W	0	Units = Consumption Units
<a href="#">Consumption Units</a>	One value form a set	CW	kWh	Uses Unit Set (Set 869).
<a href="#">Counter Object</a>	Object Reference	CW		
<a href="#">Display Precision</a>	One value from a set	CW	10ths	See <a href="#">Display Precision</a> .
<a href="#">Execution Trigger</a>	True or False	W	False	
<a href="#">Meter Active</a>	True or False	CW	True	True, False
<a href="#">Present Value</a>	Real value	DR		Units = Rate Units
<a href="#">Previous Consumption</a>	Real value (double)	W	0	Units = Consumption Units
<a href="#">Pulse Consumption</a>	Real value (double)	CW	1.000000	Units = Consumption Units
<a href="#">Pulse Count</a>	Number			0–4,294,967,295
<a href="#">Rate Constant</a>	Real value (double)	CW	3600.000000	
<a href="#">Rate Default</a>	Real value	CW	0.0	> = 0, Units = Rate Units
<a href="#">Rate Limit</a>	Real value	CW	3.402823466 E38	> = 0, Units = Rate Units

**Table 323: Pulse Meter Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Rate Units</a>	One value from a set	CW	kW	Uses Unit Set (Set 869).
<a href="#">Rate Unreliable</a>	True or False		False	
<a href="#">Reliability</a>	One value from a set		Reliable	Uses Reliability (Set 503).
<a href="#">Reset</a>	True or False	W	False	True while reset in progress
<a href="#">Reset Date</a>	Date	W		
<a href="#">Reset Time</a>	Time	W		
<a href="#">Rollover Limit</a>	Number	CW	32767	0–4,294,967,295
<a href="#">Sample Time</a>	Number	CW	60	Units = seconds, Value > 9

1 C - Configurable, D - Default Attribute for Display, R - Affected by Object Reliability, W - Writable

## Pulse Meter Attribute Details

### **Calculation**

Increases by one each time the Pulse Meter object executes its main routine until it rolls over and starts again with zero.

Back to [Pulse Meter Attributes](#).

### **Consump Unreliable**

Indicates that the [Consumption](#) attribute may contain unreliable data.

Back to [Pulse Meter Attributes](#).

### **Consumption**

Indicates the consumption since the last reset of the Pulse Meter object.

Back to [Pulse Meter Attributes](#).

### **Consumption Units**

Indicates the measurement units for all consumption attributes.

Back to [Pulse Meter Attributes](#).

### **Counter Object**

Specifies the associated [Accumulator Object](#) or Counter Input Object (defined by CCT).

Back to [Pulse Meter Attributes](#).

### **Display Precision**

Specifies the rounded position and decimal places to display for this object's analog values.

Back to [Pulse Meter Attributes](#).

### **Execution Trigger**

When written to True, the execution function runs.

Back to [Pulse Meter Attributes](#).

### **Meter Active**

Specifies whether the pulse meter object currently should be metering.

Back to [Pulse Meter Attributes](#).

### **Present Value**

Represents the currently calculated rate of consumption.

Back to [Pulse Meter Attributes](#).

**Previous Consumption**

Indicates the last value of [Consumption](#) before the last reset.

Back to [Pulse Meter Attributes](#).

**Pulse Consumption**

Specifies the physical quantity that each single pulse represents.

Back to [Pulse Meter Attributes](#).

**Pulse Count**

Indicates the pulse counter value as last reported from the Counter Input Object (define by CCT), or the last Present Value of the [Accumulator Object](#).

Back to [Pulse Meter Attributes](#).

**Rate Constant**

Specifies the value multiplied by the [Consumption Units](#) to get the [Present Value](#) units to match Rate Units.

Back to [Pulse Meter Attributes](#).

**Rate Default**

Specifies the value of [Present Value](#) when the calculated rate exceeds the [Rate Limit](#).

Back to [Pulse Meter Attributes](#).

**Rate Limit**

Specifies the highest allowed [Present Value](#) before using [Rate Default](#).

Back to [Pulse Meter Attributes](#).

**Rate Units**

Indicates the measurement units for all rate attributes.

Back to [Pulse Meter Attributes](#).

**Rate Unreliable**

Indicates that the [Present Value](#) is unreliable because of a misreading of a counter.

Back to [Pulse Meter Attributes](#).

**Reliability**

Indicates if a value is questionable.

Back to [Pulse Meter Attributes](#).

**Reset**

When written to True, it transfers the current value of the Consumption attribute into the [Previous Consumption](#) attribute before resetting [Consumption](#) to zero.

Back to [Pulse Meter Attributes](#).

**Reset Date**

Indicates the date of the last resetting of [Consumption](#) attribute.

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**Reset Time**

Indicates the time of the last resetting of [Consumption](#) attribute.

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**Rollover Limit**

Specifies the highest counter value before the pulse counter rolls over to zero. This value must match that of the counter, or the Max Value of the Accumulator.

Back to [Pulse Meter Attributes](#).

**Sample Time**

Specifies the period of automatic executions of the algorithm in seconds.

Back to [Pulse Meter Attributes](#).

**Pulse Meter Commands**

The table below lists the commands supported by the [Pulse Meter Object](#).

**Table 324: Pulse Meter Object Commands**

Command Name	Parameters
<a href="#">Enable</a>	
<a href="#">Disable</a>	
<a href="#">Reset</a>	
<a href="#">Start Meter</a>	
<a href="#">Stop Meter</a>	

**Pulse Meter Command Details****Enable**

Enables the calculation of the pulse count and consumption for the Pulse Meter object.

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**Disable**

Disables the calculation of the pulse count and consumption for the Pulse Meter object.

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**Reset**

Resets the Pulse Meter, including the [Consumption](#) attribute.

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**Start Meter**

Resumes metering.

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**Stop Meter**

Stops metering.

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# Schedule Object

The Schedule object works behind the scenes of the [Scheduling](#) feature. The Schedule object updates attribute values of objects according to the time of day. These times can be specified for days of the week and as exceptions.

For more information on the Scheduling feature or the steps it takes to create one, see the [Scheduling](#) section.

For general information on Metasys system objects, see the [Object Help](#) section.


## Schedule Object Attributes

The display of the Schedule object uses two tabs, the [Schedule Object Schedule Tab](#) and the [Schedule Object Focus/Configuration Tab](#). If you add extensions, see [Extensions](#) for information on the extension tabs.

## Schedule Object Features

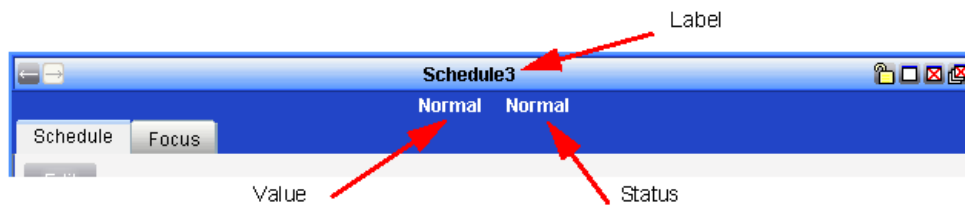
[Table 325](#) shows the icon of the Schedule object. The key words are included in the table to help users who may search the help system using a description of the icon to find this chapter.

**Table 325: Schedule Object Icon**

Icon	Key Words
	Stopwatch, Pocket Watch, Clock

### Display Frame Attributes

**Figure 82: Schedule Object Display Frame Example**



### Label

The name or label that appears in the Navigation Tree.

### Value

The Present Value or the Value indicates the current value of the Schedule object. This value is written to each of the scheduled items.

### Status

The status of the Schedule object. The possible statuses include:

- Normal
- Inactive - Today is not within the effective period
- Unreliable - Data in Schedule is not consistent. This is a rare occurrence.
- Disabled
- Out of Service

## Schedule Object Schedule Tab

### Operation and Display Attributes

#### Effective Period

The Effective Period attribute defines the range of dates within which the Schedule object is active. By default, these dates are unspecified, causing the Schedule object to be active for all days. When the Schedule is not within the Effective Period, the Schedule is considered Inactive and the Schedule's status is set to Inactive. [Wildcards](#) may be used in the date fields. For more information on using wildcards, see [Wildcards](#).

## Schedule Output Type

The Schedule Output Type attribute indicates the value type of the Schedule object's Present Value, Default Schedule Command, and all scheduled events.

**Table 326: Schedule Output Type Options**

Option	Description
<b>Binary</b>	Select this option to set the schedule's Value type to Binary (one of two states, such as Off and On).
<b>Analog</b>	Select this option to set the schedule's Value type to Analog (for example, 72.0).
<b>Multistate</b>	Select this option to set the schedule's Value type to Multistate (one of a set of states, such as Off, Low, Medium, and High).
<b>Derived from Key Item</b>	Select this option to set the schedule's Value type to match the Value type of the attribute scheduled for the Key Item. For example, all values are Boolean (True/False) if the Key Item's Enabled attribute is scheduled.
<b>Derived from Value</b>	This type is only set by the system - it cannot be manually selected. This type indicates that the current schedule type matches preexisting values.

## Default Schedule Command

The Default Schedule Command attribute indicates the command of the Schedule object when no event is in effect, due to no scheduled command or a conscious gap in the schedule. The Default Schedule Command is executed every midnight unless another event is in place to begin at midnight.

The Default Schedule Command also supports the Release command. The Release command releases the Scheduling function's control of the scheduled objects. Setting the Default Schedule Command to Release is the only available method to release the schedule's control of scheduled objects through the Schedule object. Release should only be used for the Schedule Default Command if the scheduled items support the Release command.

## States Text

The States Text attribute indicates the displayed strings for the Present Value when the Schedule Output Type is either binary or multistate. This attribute allows you to change what states the Schedule's Present Value displays if you want it to be different from the key item.

## Display Units

The Display Units attribute indicates the displayed units of the Present Value when the Schedule Output Type is analog. This attribute allows you to change the units displayed with the Schedule's Present Value if you want them to be different from the key item.

## Display Mode

The Display Mode drop-down menu allows you to select what is displayed in the lower panel of the Schedule Tab.

See the [Scheduling](#) topic for more information on the Display Modes.

## Today's Schedule

Contains the schedule timeline for the current day. The timeline displays the projected schedule output that will be written to the scheduled objects for the current day, combining the default Schedule Command with events from both the Weekly Schedule and Exception Schedule. Today's Schedule also displays a table of times and values, which details the changes in the schedule's output for the current day.

**Note:** Today's Schedule does not display in the SCT. It also does not display for mapped third-party schedules.

## Weekly Schedule

Contains a timeline of events for each day of the week - Monday, Tuesday, . . . Sunday. Each event has a time and value that the Schedule writes to the scheduled objects. An event ends at midnight, but it can be ended earlier by specifying an end time or by scheduling another event to start. Events in the Exception Schedule override times and values in this Weekly Schedule. If the Weekly Schedule has no events defined on a particular day and time, and there are also no exception events scheduled, the Default Schedule Command takes effect.

**Note:** Weekly Schedule does not display for third-party schedules that do not support a weekly schedule.

## Exception Schedule

Contains a list of exceptions to the weekly schedule. The times and values in the exception replace anything that is in the weekly schedule. If more than one exception is scheduled on the same day, the highest priority (precedence) exception takes effect. If all exceptions are of the same precedence, they are executed in time order. Exceptions override the Weekly Schedule only when events are scheduled for the exception. Any time that an exception event is not in effect, such as when an event is ended before midnight (or no exception events are defined), the Weekly Schedule takes effect. If the Weekly Schedule also has no scheduled events at that time, the Default Schedule Command takes effect.

**Note:** By default, exception schedules which have already occurred are deleted after 31 days. You can disable automatic deletion of exception schedules or change the number of days until the exception schedules are deleted to 7 days by configuring the JCI Exception Schedule attribute. For more information, see [JCI Exception Schedule](#) in the [Engine Device Object](#) section.

**Note:** Exception Schedule does not display for third-party schedules that do not support exceptions.

## Scheduled Items

Contains the list of items to be commanded by the schedule object. If empty, the Schedule does not directly command objects but its Present Value can still be used as an input to other logic, such as an Interlock or Control System. The online display also includes a Status Log that shows the status of the schedule's attempts to control each of the scheduled items. If no objects are scheduled, the Schedule Output Type determines what type of command may be scheduled.

## Schedule Object Focus/Configuration Tab

The online UI displays the Focus tab. The SCT displays the Configuration tab.

### Object Attributes

#### Name

The Name attribute contains a freely definable user-friendly Name for the object that is independent of the Item Reference or the location of the object in the physical network. The Name is used as the label in the All Items navigation tree. The Name is shown in alarm reports, the event and audit viewers, and in summaries. The Name **does not** need to be unique to the site.

The Name defaults to the object identifier you used during manual object creation, but can be edited later. For integrated BACnet objects, the name defaults to the BACnet Object Name in the remote BACnet device. For integrated N1 network objects, the name defaults to the System.Object Name in the NCM.

Example: ConferenceCenter-Room2-LightingSchedule

The Name attribute allows up to 400 characters, but 40 or less is best for the display layout.

Name is a common object attribute; for more information, see [Common Object Attributes](#).

#### Description

The Description attribute contains a user-defined description of the object. The Description attribute allows up to 40 characters, but is not required. Description is a common object attribute; for more information, see [Common Object Attributes](#).

#### Object Type

The Object Type attribute indicates the type of object as displayed in the Metasys software and as exposed to a BACnet network. The Object type of the Schedule object is Schedule. The Schedule object is a standard BACnet schedule object and conforms to the BACnet protocol 135-2004 specification. Object Type is a common object attribute; for more information, see [Common Object Attributes](#).

#### Object Category

The Object Category attribute classifies the object by the category of system or equipment that it monitors to aid in the determination of user access privileges and alarm routing.

Examples: HVAC, Fire, Security



## Status Attributes

### Enabled

Setting the Enabled attribute to **False** stops the object from updating its Present Value **and** stops the object from commanding the referenced attributes. Setting the Enabled attribute to False does not change the Out of Service attribute.

### Status Flags

The Status Flags indicate the general health of the object. This attribute does not appear in the SCT.

Status Flag	Description
In Alarm	This flag is always False for the Schedule object.
Fault	False means that the Reliability attribute is reliable, otherwise the flag is True.
Overridden	This flag is always False for the Schedule object.
Out of Service	True means that the Out of Service attribute is also True, otherwise the flag is False.

### Reliability

The Reliability attribute indicates the reliability of the object. If there are data type mismatches in the weekly schedule, exception schedules, or Default Schedule Command, the object reports that it is unreliable. This attribute does not appear in the SCT.

### Out of Service

When True, the object no longer updates the Present Value itself. This attribute does not appear in the SCT.

**Note:** Disabling the object does not impact the ability to put the Schedule Out Of Service and write to its Present Value and thus to its Outputs.

### Error Status

The Error Status attribute indicates whether the Present Value was successfully written to the list of property values in the Scheduled Items list. The Error Status displays Ok if the object was able to send its latest Present Value to every object in the Scheduled Items list. Otherwise, the Error Status displays the error of the first failed command. See the status log in the Scheduled Items view for the status for each attempted command. This attribute does not appear in the SCT, and does not appear for mapped third-party schedules.

### Alarm State

The Alarm State attribute indicates that the object transitioned into alarm or unreliable conditions. This attribute does not appear in the SCT.

## Engineering Values Attributes

### Item Reference

The Item Reference attribute contains a unique reference name for the object that is the full path name of the object through the All Items navigation tree using the unique identifier you specified when you manually created the object. Item Reference is a common object attribute; for more information, see [Common Object Attributes](#).

### Version

The Version attribute displays the version number of the object software code. Version is a common object attribute; for more information, see [Common Object Attributes](#).

## Execution Attributes

### Execution Priority

The Execution Priority attribute indicates the relative importance of performing the function of the object within the device.

### Priority for Writing

The Priority for Writing attribute defines the priority at which the referenced attributes are commanded. Seven is the highest priority and 16 is the lowest supported by the Schedule object, with the default of 15.

**Note:** We do not recommend using priorities 7 or 8 as they may interfere with the operator override functionality.

## Scheduled Commands

### ***Disable***

The Disable command stops all future scheduled events. Neither the Weekly Schedule nor the Exception Schedule run again until the Schedule object is re-enabled. While disabled, the status log in the Scheduled Items view lists the object as disabled. The schedule remains disabled until re-enabled.

### ***Enable***

The Enable command allows the Schedule object to resume normal scheduling operation. The Schedule object starts the schedule as soon as it is enabled. When it is re-enabled, the Schedule object writes its current value to the scheduled items.

# Signal Select Object

The Signal Select object can process values from multiple zones to adjust various setpoints and can function with either analog or binary points.

For analog point types, the Signal Select object determines (one or more of) the low input, average input, and/or high input values for use in updating an attribute value of another object.

For binary point types, the Signal Select object determines (one or more of) the *average* state, the *logical Or* state, and/or the *logical And* state values for use in updating an attribute value of another object.

Computations take place at startup and at each time an input value experiences a change in value or reliability. The results of these calculations are sent to specified output points as commands. For example, this object allows you to average multiple zone temperatures and base a control, such as adjusting a setpoint, on that average.

For general information on Metasys system objects, see the [Object Help](#) section.

## Signal Select Concepts

### Average Output Computation

In the case of binary types of input references, if the majority of inputs are at State 1 or the inputs are evenly split between State 1 and State 0, the Average output is commanded to State 1. If the majority of inputs are at State 0, the Average output is commanded to State 0.

### Logical OR Computation

If any input is at State 1, the OR output is commanded to State 1. If all inputs are at State 0, the OR output is commanded to State 0.

### Logical AND Computation

If all inputs are at State 1, the AND output is commanded to State 1. If any input is at State 0, the AND output is commanded to State 0.

## Signal Select Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 327: Signal Select Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Average Output</a>	Attribute reference	CNW	None	
<a href="#">Execution Priority</a>	One state from a set	CW	Normal	
<a href="#">Failsoft</a>	Real Value	CW		
<a href="#">High OR</a>	Attribute reference	CNW	None	
<a href="#">Input List</a>	List of attribute references	CW		Minimum number of elements in the list = 1, Maximum number of elements in the list = 12
<a href="#">Low AND</a>	Attribute reference	CNW	None	
<a href="#">Point Type</a>	One type from a set	CW	Analog	Analog or Binary
<a href="#">Present Value</a>	One value from a set	C	Master	N = 3 0 = Calculated, 1 = Last Reliable, 2 = Fail Soft

**Table 327: Signal Select Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Reliability</a>	One state from a set			Reliable or Input Unreliable
<a href="#">Setup</a>	One state from a set	C	Last Reliable	n = 2 0 = Last Reliable, 1 = Fail Soft

1 C - Configurable, N - Value Not Required, W - Writable

## Signal Select Attribute Details

### **Average Output**

Specifies the object attribute whose value is updated using the calculated average of all of the inputs of the [Signal Select Object](#).

Back to [Signal Select Attributes](#).

### **Execution Priority**

Indicates the relative importance of performing the function of the object within the device.

Back to [Signal Select Attributes](#).

### **Failsoft**

Routes to all the outputs if [Setup](#) is configured as Fail Soft. Fail Soft routes when the object becomes unreliable and when the output transitions from Reliable to Unreliable.

Back to [Signal Select Attributes](#).

### **High OR**

Specifies the object attribute whose value is updated using the highest input of all the inputs in the Signal Select object, for analog point types. For binary point types, the value is updated using a logical OR condition of all inputs of the Signal Select object.

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### **Input List**

Contains the list of attribute references used in the Signal Select calculations. An analog type defined as a binary input is converted to a binary value prior to each computation, and vice versa.

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### **Low AND**

Object attribute whose value is updated using the lowest input of all the inputs in the Signal Select object, for analog point types. For binary point types, the value is updated using a logical AND condition of all inputs of the Signal Select object.

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### **Point Type**

Specifies the type of input values monitored by the Signal Select object, the calculations it performs, and the outputs it produces. Point type can be analog or binary.

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### **Present Value**

Represents the current value of the output.

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### **Reliability**

Indicates a value of Unreliable only if all of the configured inputs in question are unreliable.

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**Setup**

Defines whether the [Failsoft](#) or Last Reliable value needs to be the output if the object becomes unreliable.

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**Signal Select Commands**

The table below lists the commands supported by the [Signal Select Object](#).

**Table 328: Signal Select Object Commands**

Command Name	Parameters
<a href="#">Disable</a>	
<a href="#">Enable</a>	

**Signal Select Command Details****Disable**

Locks out all outputs and prevents the Signal Select functionality.

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**Enable**

Ensures object reacts to any changes it may have missed while it was disabled and returns it to normal operation.

Back to [Signal Select Commands](#).

## Site Object

The Site object defines the attributes that represent the characteristics of a site. If the Site object exists on a device, that device is considered a Site Director.

**Note:** In SCT, it is possible for a site object to exist without a Site Director. In this case, you can open the edit window and make changes to the custom object category; however, you cannot save any changes until you add a Site Director.

**Note:** When promoting or demoting a Site Director offline in SCT, the custom categories are rebuilt using their default settings.

**Note:** If you need to change the name of the Site object, make sure you first close all user views. This action ensures that all object references throughout the site reflect the new site object name.

For general information on Metasys system objects, see the [Object Help](#) section.

### Site Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 329: Site Object Attributes - Site View Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">All Items Update in Progress</a>	True or False	CW	False	
<a href="#">Annotation Alarm Priority Threshold</a>	Number	CW	140	0–255
<a href="#">Annotation Exclude</a>	List	CW		Maximum length = 400
<a href="#">Annotation Include</a>	List	CW		Maximum length = 400
<a href="#">BACnet Encoding Type</a>	One type from a set	CW	Unicode (0)	Uses Bacnet Encoding (Set 575). 0 = Unicode 1 = ASCII 2 = Japanese Shift JIS
<a href="#">BACnet Site</a>	True or False	CW	False (0)	
<a href="#">Broadcast Disabled<sup>2</sup></a>	True or False	CW	False	
<a href="#">Default Language<sup>2</sup></a>	One type from a set	CW		Uses Dictionary Language
<a href="#">DNS Refresh Period</a>	Number	CW	20	0–65535 Units = minutes
<a href="#">Default ADS Priority Threshold</a>	Number	CW	255	0–255
<a href="#">Default ADS Connection Type</a>	One type from a set	CW	LAN	Uses Connection Type (Set 147). 0 = LAN 1 = Dial
<a href="#">Default ADS Delivery Time</a>	Date/Time	CW	12:15 AM	
<a href="#">Default ADS Repository</a>	Set of values	CW	0.0.0.0	
<a href="#">Device Time Servers</a>	List of value sets	CW		

**Table 329: Site Object Attributes - Site View Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>Dynamic Broadcast Management</b>	True or False		True	
<b>File Name<sup>2</sup></b>	Set of Values	CW		
<b>Multicast Group Address</b>	Text	CW		
<b>Multicast Heartbeat Interval</b>	Number	CW	5	Units = Minutes
<b>Multicast TTL</b>	Number	CW	1	0-255
<b>Multicast UDP Port</b>	Number	CW	123	0-65, 535
<b>Poll Rate</b>	One type from a set	CW	Fast	Fast, Medium, Slow
<b>Security Level<sup>2</sup></b>	One type from a set	CW	Medium (1)	Low (0), Medium (1), High (2)
<b>Signature Alarm Priority Threshold</b>	Number	CW	140	0-255
<b>Signature Exclude</b>	List	CW		Maximum length = 400
<b>Signature Include</b>	List	CW		Maximum length = 400
<b>Site Director</b>	Set of values	CW	0.0.0.0	
<b>Site Time Servers</b>	List of value sets	CW		
<b>Third Party BBMDs</b>	List of value sets	CW		
<b>Time Sync Method</b>	One method from a set	CW		
<b>Time Sync Period</b>	Number	CW		
<b>Time Zone</b>	One zone from a set	CW	Central Time (US and Canada)	Uses Time Zone (Set 576).

1 C - Configurable, W - Writable

2 This attribute appears only in the Snapshot Focus view.

**Note:** The changes made to labels on Object Categories in the Site Object are shown in the Security Administrator screens. Refer to the *Object Category Assignment* section of the *Security Administrator System Technical Bulletin (LIT-1201528)* for more information on changing Object Categories labels and how these changes affect the UI.

**Table 330: Site Object Attributes - Object Categories Tab**

Object Category	Initial Text
<b>Standard Object Category<sup>1</sup></b>	
HVAC	HVAC
Fire	Fire
Security	Security
Services	Services
Administrative	Administrative
General	General
Lighting	Lighting
Refrigeration	Refrigeration
Critical Environment	Critical Environment

**Table 330: Site Object Attributes - Object Categories Tab**

Object Category	Initial Text
Air Quality	Air Quality
Energy	Energy
System	System
<b>Custom Object Category<sup>2</sup></b>	
<b>Custom 1 - Custom 150</b> <b>Note: Devices at a release earlier than 5.2 are limited to 12 categories.</b>	Custom 1 - Custom 150 (default)

1 Standard Object strings cannot be modified.

2 Display text can be modified.

## Site Attribute Details

### **All Items Update in Progress**

Indicates when the cache update completes after executing an [Update All Items Cache](#) command. Beginning with Release 5.0, the All Items navigation tree in the Metasys UI depends on the data cached in the Site Director, called the All Items cache. The All Items cache automatically updates for engines at Release 5.0 or later. The cache does not automatically update for engines at a Release prior to 5.0 after making changes the UI logged directly into the engine (that is, not through the Site Director), or when downloading an engine from the SCT (not via the Site Director). For these scenarios, you must use the [Update All Items Cache](#) command to update the All Items cache on the Site Director. This attribute appears only in the online UI.

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### **Annotation Alarm Priority Threshold**

Specifies the value that represents the range of alarm priority thresholds. The default value is 140. This attribute is checked when determining whether an event requires annotation on an ADX MVE installation. If the Event Priority value is below the threshold, annotation is required. This attribute appears only when you have MVE installed.

For more information, refer to [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) and the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

Back to [Site Attributes](#).

### **Annotation Exclude**

Specifies a list of editable reference strings (fully qualified references) that allow wild card notation at any location in the string. If an item reference appears in this attribute, an event for this item **does not require** an annotation on an ADX MVE installation. This attribute appears only when you have MVE installed.

For more information, refer to [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) and the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

Back to [Site Attributes](#).

### **Annotation Include**

Specifies a list of editable reference strings (fully qualified references) that allow wild card notation at any location in the string. If an item reference appears in this attribute, an event for this item **requires** an annotation on an ADX MVE installation. This attribute appears only when you have MVE installed.

For more information, refer to [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) and the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

Back to [Site Attributes](#).



**BACnet Encoding Type**

Specifies the type of string encoding to use in BACnet messages. Unicode should be specified unless third-party BACnet devices are employed on the site. In this case, specify the BACnet encoding type supported by the third-party BACnet devices. This attribute is automatically distributed to the site devices.

For information on how to set up an NAE as a BACnet system integrator in a Metasys system network, see the [Related Documentation](#) table in the [Welcome](#) section.

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**BACnet Site**

Specifies whether specific information from the BACnet device for each Metasys object is shown in the UI. When true, BACnet information integrates into the UI for objects. When false, the information is omitted. Internally, the BACnet protocol is used at a certain level regardless of this attribute. This attribute is distributed automatically to site devices.

For information on how to set up an NAE as a BACnet system integrator in a Metasys system network, see the [Related Documentation](#) table in the [Welcome](#) section.

Back to [Site Attributes](#).

**Broadcast Disabled**

Specifies if broadcast messages are sent by the device. When false (default value) or no Broadcast Management object exists, the device sends broadcast messages as defined by BACnet communication. When the Broadcast Management object is configured and this attribute is true, the device does not send network broadcast messages. This attribute appears only in the Snapshot Focus view.

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**DNS Refresh Period**

Specifies the time in minutes between DNS lookups to update the IP address of BACnet Broadcast Management Device (BBMD)s referenced by host name. If an IP address is changed within a DNS server, the BBMD system automatically obtains the new IP address upon the expiration of this period. A value of 0 is used to disable periodic DNS lookups.

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**Default ADS Connection Type**

Specifies whether the ADS (identified in the [Default ADS Repository](#) attribute) is connected via a LAN or dial-up connection. This attribute is distributed automatically to the site devices.

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**Default ADS Delivery Time**

Specifies the time of day when a connection should be established to the ADS (identified by the [Default ADS Repository](#) attribute). A connection is attempted at least daily at the specified time to deliver audit, alarm, and trend data to the ADS. This attribute is distributed automatically to the site devices.

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**Default ADS Priority Threshold**

Allows you to specify the priority of an event that triggers the Engine to connect (dial-up or LAN connection) to the defined ADS/ADX and deliver the event messages from the Engine local event repository to that ADS/ADX's event repository. This attribute is used for [Alarm and Event Management](#) only.

For example, a value of 20 for this attribute means that any event having a priority of 20 or higher (1 is highest) forces a connection to the ADS/ADX and forwards event messages from the Engine local event repository to the ADS/ADX's repository.

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### **Default ADS Repository**

Specifies the resolvable host name or IP address of an ADS. The ADS is the device to which local audit, alarm, and trend data is delivered. Repository refers to the files in the ADS in which this data is stored. A host name may be specified only if a DNS server is available to the device. This attribute is distributed automatically to the site devices.

The Default ADS Repository of the Site is intentionally left blank and must be updated by the user (online or offline). If the user does not populate the Default ADS value and leaves the Default ADS Repository value for all devices at 0.0.0.0, the ADS does not receive any audit, alarm, or trend data. The SCT does not automatically populate the Default ADS Repository value because of the many different possibilities that could exist during archive creation, including multiple ADSs on a site or no ADS for a site. In these cases, it would not be immediately clear which ADS should be the Default ADS under the Site object.

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### **Default Language**

Specifies the site's default language. All devices on the site have a dictionary using this language. This attribute appears only in the Snapshot Focus view.

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### **Device Time Servers**

**This attribute is used only for Windows time synchronization. Leave this attribute blank if you are not using Windows time synchronization.** Specifies a list of resolvable host names or IP addresses of Simple Network Time Protocol (SNTP) server devices that the devices on the site (except the Site Director) use as their time server. Periodically, each device on the site (except the Site Director) attempts to synch time from an SNTP server from this list. Contact with an SNTP server is attempted one at a time in list order until one successful contact is made. A host name may be specified only if a DNS server is available to the site server. If the site server is also an SNTP time server, the site server may be specified in this attribute. This attribute is distributed automatically to the site devices.

**Note:** The NxE/ADS/ADX designated as the Site Director is the device time server for the site and provides the time management for all other engines/servers on the site.

**Note:** The Engine accepts BACnet Time Sync messages only if no SNTP server is defined for that Engine.

Refer to the NAE and ADS commissioning documents listed in the [Related Documentation](#) table in the [Welcome](#) section for information on time management.

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### **Dynamic Broadcast Management**

Configures the Metasys system with BBMDs automatically when a Metasys system includes more than one IP subnet so that BACnet protocol broadcasts reach all Metasys system devices. The feature automatically determines the number of IP subnets and ensures that each IP subnet has exactly one BBMD. The feature uses the Third Party BBMDs List attribute when determining the list of devices to be BBMDs.

When True, the selection of broadcast management devices occurs automatically as devices are added or removed from the site. When False, the selection of devices occurs only when the Update Broadcast Management command is issued to the site.

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### **File Name**

Specifies an XML file containing site organization data within the file system of the host computer. This attribute appears only in the Snapshot Focus view.

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### **Multicast Group Address**

Specifies the IP address used to multicast the SNTP message. The RFC-2030 defined standard address is 224.0.1.1. The address is configurable to allow site-specific use.

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### **Multicast Heartbeat Interval**

Specifies the number of minutes between forcing a multicast time synchronization message.

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### **Multicast TTL**

Specifies the Time-to-Live for a multicast message. The value indicates the number of router hops allowed before the message is not sent. Routers must be configured to pass multicast messages to allow the time sync message to pass.

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### **Multicast UDP Port**

Specifies the UDP port on which multicast time synchronization polls and listens for messages. The RFC-2030 defined standard port is 123.

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### **Object Category**

Allows the customization of text in the custom categories. The description entered in the Display Text field is limited to 50 characters and can include any printable character. This description cannot be blank and cannot duplicate any other description. For more information, see [Common Object Attributes](#).

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### **Poll Rate**

Specifies the frequency at which the Site Director checks its communication status with site devices. This setting affects the detection time of offline NxEs, and the amount of network bandwidth needed to support this detection. At the default setting Fast, the detection time is short, but the network bandwidth use is high. At a Slow setting, the detection time is longer, but network bandwidth use is low. The calculated Detection Interval is shown in the NxE. This setting only affects communications with devices at Release 5.2 or later.

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### **Security Level**

Specifies the security level to be used by this device. This attribute is distributed to the site's devices automatically. This attribute appears only in the Snapshot Focus view. Valid options include:

- Low [0]: Logon required.
- Medium [1]: Low plus authorization.
- High [2]: Medium plus signatures.

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### **Signature Alarm Priority Threshold**

Specifies the value that represents the range of alarm priority thresholds. The default value is 140. This attribute is checked when determining whether an event requires electronic signature on an ADX MVE installation. If the Event Priority value is below the threshold, a signature is required. This attribute appears only when you have MVE installed.

For more information, refer to [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) and the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

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### **Signature Exclude**

Specifies a list of editable reference strings (fully qualified references) that allow wild card notation at any location in the string. If an item reference appears in this attribute, an event for this item **does not require** a signature on an ADX MVE installation. This attribute appears only when you have MVE installed.

For more information, refer to [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) and the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

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### **Signature Include**

Specifies a list of editable reference strings (fully qualified references) that allow wild card notation at any location in the string. If an item reference appears in this attribute, an event for this item **requires** a signature on an ADX MVE installation. This attribute appears only when you have MVE installed.

For more information, refer to [Configuring Annotation and Electronic Signature Requirements in the Site Object in MVE](#) and the *Metasys for Validated Environments, Extended Architecture Technical Bulletin (LIT-12011327)*.

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### **Site Director**

Specifies a resolvable host name or IP address of the Site Director. A host name may be specified only if a DNS server or other means of name resolution is available to the device. A Site Director may have more than one host name. The host name specified here must be resolvable to an IP address on the LAN or WAN on which the site's devices exist.

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### **Site Time Servers**

Specifies a list of resolvable host names or IP addresses of SNTP server devices that the Site Director uses as its time server. Periodically, the site director attempts to synch time from an SNTP server from this list. Contact with an SNTP server is attempted one at a time in list order until one successful contact is made. A host name may be specified only if a DNS server is available to the site server.

**Note:** The Site Director provides the time management for the site.

**Note:** On the NAE35/NAE45/NCE25, only the first listed address is used.

**Note:** An error message appears when you have configured one or more Site Time Servers and attempt to change the time and date using the Set Time and Set Date commands.

**Note:** The Engine accepts BACnet Time Sync messages only if no SNTP server is defined for that Engine.

**Note:** The Site Time Servers attribute must be set to an SNTP server to facilitate synchronization when in Multicast mode. Only the first Site Time Server is used if more than one is specified in Multicast mode.

Refer to the NAE and ADS commissioning documents listed in the [Related Documentation](#) table in the [Welcome](#) section for information on time management.

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### **Third Party BBMDs**

The Third Party BBMDs attribute is used by the [Dynamic Broadcast Management](#) feature to help determine the placement of BBMDs.

BBMDs are used in the BACnet protocol to eliminate broadcast messages sent across multiple subnets on an IP network. A single device on each subnet, referred to as the BBMD, receives messages from other BBMDs and broadcasts them locally on its own subnet.

If one or more third-party BBMDs exist, this attribute should specify the complete list of IP addresses of third-party BBMDs and Metasys system devices that should act as a BBMD. Each IP subnet should have exactly one BBMD, either a third-party or Metasys system device. To function properly, each third-party BBMD must be configured with the list of all other BBMDs within the system as well.

If the Metasys system does not include any third-party BBMDs, then this attribute typically should be left empty. A possible exception would be if you want to designate a particular Metasys system device as a BBMD, then that device could be added to the Third Party BBMD list. If no device is specified by this attribute for an IP subnet, the Dynamic Broadcast Management feature automatically assigns a Metasys system device. Do not specify more than one Metasys system device per IP subnet.

The devices are configured in the Third Party BBMD list in the following ways:

## Third-Party Devices

**Table 331: Configuring Third-Party Devices in the Third Party BBMD List**

Field	Description
Address-UDP Port	Use the BACnet UDP Port address. The default is 47808.
Address-IP	Use the IP address of the device.
IP Broadcast Mask	Use the BACnet Broadcast Mask as defined by <i>BACnet standard 135-2004, section J.4.3.2</i> . Specify 255.255.255.255 if messages should be directly sent to remote BBMDs using a unicast IP address or broadcast messages are not allowed through the IP router to the remote subnet.  Otherwise, specify the subnet mask of the remote subnet if broadcast messages are allowed through the IP router to a remote subnet. <b>Note:</b> In most cases, IP routers do not allow broadcast messages to be passed to a remote subnet; therefore, the mask should be set to 255.255.255.255. If the IT department knows that broadcast messages are allowed to the remote subnet, then set the mask to the subnet mask that the BBMD resides upon.

## Metasys System Devices

**Table 332: Configuring Metasys System Devices in the Third Party BBMD List**

Field	Description
Address-UDP Port	Use the BACnet UDP Port address. The default is 47808.
Address-IP	Use the IP address of the device.
IP Broadcast Mask	Use the Subnet Mask of the Metasys system device.  <b>Important:</b> This is <b>not</b> the broadcast mask for Metasys system devices. Metasys system devices automatically use 255.255.255.255 for the broadcast mask.

For information on how to set up an NAE as a BACnet system integrator in a Metasys system network, see the [Related Documentation](#) table in the [Welcome](#) section.

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### **Time Sync Method**

Determines which mode is used to synchronize time. The available modes are Windows or Multicast. Windows mode uses the Microsoft W32Time service. Multicast mode uses a specific implementation of the standard SNTP, which includes periodic multicasting of system time to maintain better time synchronization across devices.

### **Time Sync Period**

Specifies the interval at which the Site Director polls the defined Site Time Server (STS) (for example, the Atomic clock) for the time. We recommend leaving the default value for this attribute. This attribute applies only to the Engine. The time zone is set through the Windows operating system on ADS/ADX computers.

For more information on managing time in the Metasys system, see the NAE and ADS commissioning documents listed in the [Related Documentation](#) table in the [Welcome](#) section.

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### **Time Zone**

Specifies the site's time zone. The Site object determines and updates the UTC offset from this value. Once set in the Site object, the time zone is propagated to the other devices on the site.

**Note:** All Metasys devices that are part of the Site use the time zone of the Site Director, even if some of those devices are physically located in a different time zone.

For more information on managing time in the Metasys system, refer to the the NAE and ADS commissioning documents listed in the [Related Documentation](#) table in the [Welcome](#) section.

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## Site Commands

The following table lists the commands supported by the [Site Object](#).

**Table 333: Site Object Commands**

Command Name	Parameters
<a href="#">Global Time Synchronization</a>	
<a href="#">Set Date</a>	
<a href="#">Set Time</a>	
<a href="#">Update All Items Cache</a>	
<a href="#">Update Broadcast Management</a>	

### Site Command Details

#### **Global Time Synchronization**

Allows the user to send a broadcast time synchronization message. This command takes a single enumeration parameter from the global time synchronization type enumeration to specify whether to send local time, UTC time, or both.

Back to [Site Commands](#).

#### **Set Date**

Sets the clock date in the site server. If any Site Time Servers are specified, this command fails and the date is not modified. This command is only used when an engine is the Site Director. When the Site Director is an ADS or ADX, the Set Date command is not needed.

Back to [Site Commands](#).

#### **Set Time**

Sets the clock time in the site server. If any Site Time Servers are specified, this command fails and the time is not modified. This command is only used when an engine is the Site Director. When the Site Director is an ADS or ADX, the Set Time command is not needed.

Back to [Site Commands](#).

#### **Update All Items Cache**

Updates the data cached in the Site Director for pre-Release 5.0 engines in the site. The [All Items Update in Progress](#) attribute indicates when the update completes. This command has no behavioral effect when no pre-Release 5.0 engines exist on the site. Beginning with Release 5.0, the All Items navigation tree in the Metasys UI depends on the data cached in the Site Director, called the All Items cache. The All Items cache automatically updates for engines at Release 5.0 or later. The cache does not automatically update for engines at a Release prior to 5.0 after making changes the UI logged directly into the engine (that is, not through the Site Director), or when downloading an engine from the SCT (not via the Site Director). For these scenarios, you must use this command to update the All Items cache on the Site Director.

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#### **Update Broadcast Management**

Causes the selection of broadcast management devices to occur. This command, in combination with the Dynamic Broadcast Management attribute, allows the device selection to be done on an as needed basis, instead of automatically.

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## Solar Clock Object

The solar clock object computes Present Value (Night/Day), Sun Position (Azimuth and Elevation), and Sunrise and Sunset times based on the local position (Latitude and Longitude) and local time and time zone information. This information is needed to control external motorized louvers as part of bioclimatic facades for buildings and may also be used to position tracking photovoltaic solar arrays. The Sunrise/Sunset times can be used for external lighting control.

This object runs on a periodic basis to compute its attributes. The equations to compute azimuth, elevation, sunrise, and sunset attributes were obtained from the National Oceanic and Atmospheric Administration (NOAA) Web site (<http://www.noaa.gov/>). The object obtains the Local Time, UTC Offset, DST Status, and DST Offset from the BACnet Device object.

Latitude and Longitude for this object are provided in decimal degrees. Often, these values are provided as degrees, minutes, and seconds. There are numerous Web sites that can convert the latitude and longitude values, if necessary. In addition, you can obtain your current location on the planet from free tools such as Google® Earth. Google Earth includes an option to provide your location in decimal degrees.

**Note:** For correct sunrise and sunset calculations, you must apply north/south and east/west rules. North latitudes are preceded by a plus, South latitudes are preceded by a minus. West Longitudes are preceded by a minus, East Longitudes are preceded by a plus. See [Table 334](#).

**Table 334: Latitude and Longitude Examples**

Location	Landmark	Latitude	Longitude
Milwaukee, WI, USA	Brengel Technology Center	43.037507	-87.904456
Paris, France	Notre Dame Cathedral	48.854212	2.347641
Cape Town, South Africa	Green Point Stadium	-34.903488	18.411073
Sydney, Australia	Opera House	-33.857184	151.215176
Beijing, China	Tiananmen Square	39.06514	116.391213

For general information on Metasys system objects, see Common Object Attributes .

### Solar Clock Object Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the Common Object Attributes section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the Object and Feature Tabs section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

**Note:** For correct sunrise and sunset calculations, you must apply north/south and east/west rules. North latitudes are preceded by a plus, South latitudes are preceded by a minus. West Longitudes are preceded by a minus, East Longitudes are preceded by a plus. See [Table 334](#).

Click the attribute name in the table for a description of the attribute.

**Table 335: Solar Clock Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Present Value</a>	Enumeration			1 = Day 0 = Night
<a href="#">Latitude</a>	Float	WCA		Units = Degrees Angular Range = -90–90
<a href="#">Longitude</a>	Float	WCA		Units = Degrees Angular Range = -180–180
<a href="#">Periodic Update</a>	Signed16	WCA	5	Units = Minute Range = 2–60

**Table 335: Solar Clock Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Azimuth</a>	Float			Units = Degrees Angular
<a href="#">Elevation</a>	Float			Units = Degrees Angular
<a href="#">Sunrise</a>	Time			Display = HH:MM
<a href="#">Solar Noon</a>	Time			Display = HH:MM
<a href="#">Sunset</a>	Time			Display = HH:MM
<a href="#">Offset</a>	Signed16	WA		Units = Minutes Range = -60–60
<a href="#">Equation of Time</a>	Float			Units = Minutes
<a href="#">Solar Declination</a>	Float			Units = Degrees

1 A - Archive, C - Configurable, W - Writable

## Solar Clock Object Attributes Details

### **Present Value**

Represents an Enumeration value that is true when the current time is between the computed time of Sunrise and Sunset, where 1 = Day and 0 = Night.

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### **Latitude**

Defines the angular distance, in decimal degrees, of the current location north or south of the equator. Lines of latitude are also known as parallels. The International standard defines north latitudes as positive values.

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### **Longitude**

Defines the angular distance, in decimal degrees, of the current location east or west of the Prime Meridian. Lines of longitude are also known as meridians. The International standard defines east longitude as positive values.

Back to [Solar Clock Object Attributes](#).

### **Periodic Update**

Determines how often sun position and Present Value attributes update during normal operation. The default value is 5 minutes.

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### **Azimuth**

Defines the angular measurement in a spherical coordinate system. The vector from an observer (origin) to a point of interest (sun) is projected perpendicularly onto a reference plane; the angle between the projected vector and the reference vector on the reference plane is called the azimuth. It is defined as the angle from due north in a clockwise direction.

Back to [Solar Clock Object Attributes](#).

### **Elevation**

Defines the angle between the direction of the geometric center of the sun's apparent disk and the idealized horizon.

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### **Sunrise**

Defines the time of apparent sunrise in hours and minutes. Sunrise may not occur in the same calendar day as sunset. Due to changes in air pressure, relative humidity, and other factors, we cannot predict the exact effects of atmospheric refraction on sunrise time. The error may increase with higher latitudes (closer to the poles).

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**Solar Noon**

Defines the time when the sun crosses the meridian of the observer's location. At solar noon, a shadow cast by a vertical pole points either directly north or directly south, depending on the observer's latitude and the time of year.

Back to [Solar Clock Object Attributes](#).

**Sunset**

Defines the time of apparent sunset in hours and minutes. Sunset may not occur in the same calendar day as sunrise. Due to changes in air pressure, relative humidity, and other factors, we cannot predict the exact effects of atmospheric refraction on sunset time. The error may increase with higher latitudes (closer to the poles).

Back to [Solar Clock Object Attributes](#).

**Offset**

Defines an offset to the computed Sunrise and Sunset times. The offset value is used to compute Present Value. A positive value makes the day longer and a negative value makes the day shorter.

Back to [Solar Clock Object Attributes](#).

**Equation of Time**

Represents an astronomical term accounting for changes in the time of solar noon for a given location over the course of a year. Earth's elliptical orbit and Kepler's law of equal areas in equal times are the factors behind this phenomenon.

Back to [Solar Clock Object Attributes](#).

**Solar Declination**

Defines the declination of the Sun. The declination varies from 23.44° at the winter solstice in the northern hemisphere, through 0° at the vernal equinox, to +23.44° at the summer solstice. The variation in the solar declination is the astronomical description of the sun going south in the northern hemisphere for the winter. For a ground-based view of the seasonal solar paths for different latitudes, use 0° for the Equator, 23°N for the Tropic of Cancer, 40°N for Boulder, CO, 71°N for the Arctic Circle, and 90° for the North Pole.

Back to [Solar Clock Object Attributes](#).

**Solar Clock Object Commands**

This object has no commands.

For managing outside lighting schedules, use the day / night present value status of this object with an Interlock Object's definition to drive the Action Tables for the **Actions of Conditions** setup.

## Summary Definition Object

The Summary Definition object is an integral part of the Tailored Summary feature. This object allows you to view and edit the columns and key data values used in a Tailored Summary based user view. Tailored summaries are essentially summary views of Metasys system items where the rows and columns of the summary are tailored to contain information of interest.

A summary definition contains the column rules and key data rules used to display a tailored summary. Each column may contain a column heading, an item name or Fully Qualified Reference (FQR), and attribute to display in that column. Each key data item may contain an item name to display in a tailored summary in a header section outside of the data table. After defining the columns and key data items in the summary definition, you can associate that definition with a user view folder using the user view editor.

For information on how this object interacts with the Tailored Summary and User View features, see [Tailored Summaries](#). For information on the User View feature, see [User Views](#).

For general information on Metasys system objects, see the [Object Help](#) section.

### Summary Definition Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. For information on the Tailored Summary feature, see [Tailored Summaries](#).

Click the attribute name in the table for a description of the attribute.

**Table 336: Summary Definition Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Key Data</a>	List of Strings	CNW		Limit of 4 key items

1 C - Configurable, N - Value Not Required, W - Writable

**Table 337: Summary Definition Object Attributes - Summary Definition Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Column Definition</a>	List of Structures	CW		Column Heading, Child Item, Attribute
<a href="#">Row Heading Column Text</a>	Text	CNW		Label Maximum: 50 characters

1 C - Configurable, N - Value Not Required, W - Writable

### Summary Definition Attribute Details

#### Column Definition

Defines the columns displayed in a tailored summary. You can define up to seven columns (list of structures).

Each structure contains the following information:

- **Column Heading** - Defines the name of the column header.
- **Child Item** - Indicates item for which the column data is retrieved based on its name attribute, which must match a user-specified pattern (such as ZN-\* or ZN-T, Zone-T). To display an attribute of the row item, leave this field blank. Otherwise, specify the name of the child item to display.
- **Attribute** - Defines the attribute information for the column. The attributes are grouped into categories for easy selection. Select a category in the Attribute Filter section of the Select Column Attribute dialog, and then select the desired attribute from the list.

Back to [Summary Definition Attributes](#).

#### Key Data

Holds the item name or Fully Qualified Reference of a key item to display in a tailored summary. You can configure up to four key items.

Back to [Summary Definition Attributes](#).

**Row Heading Column Text**

Defines the text to display as the label for the row headings column (that is, the first column) in a tailored summary.

Back to [Summary Definition Attributes](#).

## User Navigation Tree

The user navigation tree object defines the attributes that represent the navigation tree.

For information on the Tree View and the User View feature, see [User Views](#).

For general information on Metasys system objects, see the [Object Help](#) section.

### ***User Navigation Tree Attributes***

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

See [Tree View Tab](#) in the [User Views](#) section for details on the buttons of the tab.

# VND Controller

The VND (Vendor) Controller object defines a physical vendor device on a bus of the NAE and is required for mapping data from the controller into the system.

For general information on Metasys system objects, see the [Object Help](#) section.

## VND Controller Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

Also, see [Status](#).

**Table 338: VND Controller Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Enabled</a>	True or False	CW	True	
<a href="#">Graphic</a>	Object Reference	CNW	Null	Object Type = Graphic
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">Offline</a>	True or False		True	
<a href="#">Present Value</a>	One value from a set	D		Offline, Online, Pass Through, Comm Disabled, Comm Enabled

1 C - Configurable, D - Default Attribute for Display, W - Writable

**Table 339: VND Controller Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Count</a>	Number		0	
<a href="#">Errors In</a>	Number		0	
<a href="#">Errors Out</a>	Number		0	
<a href="#">Message Receives</a>	Number		0	
<a href="#">Message Transmits</a>	Number		0	
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Transmits In</a>	Number		0	
<a href="#">Transmits Out</a>	Number		0	

1 C - Configurable, W - Writable

## VND Controller Attribute Details

### Count

Displays the number of point objects defined for the vendor device.

Back to [VND Controller Attributes](#).

### Enabled

If True, allows communication to the vendor device. If False, prevents communication to the vendor device.

Back to [VND Controller Attributes](#).

**Errors In**

Indicates the number of field communication errors (bad format, for example) received. The Clear Statistics command resets this value.

Back to [VND Controller Attributes](#).

**Errors Out**

Indicates the number of field communication attempts that failed. The Clear Statistics command resets this value.

Back to [VND Controller Attributes](#).

**Graphic**

Indicates the graphic associated with the vendor device.

Back to [VND Controller Attributes](#).

**Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this vendor device.

Back to [VND Controller Attributes](#).

**Message Receives**

Indicates the number of messages received by the vendor device. This value resets to zero at midnight. The Latch Statistics command updates this value.

Back to [VND Controller Attributes](#).

**Message Transmits**

Indicates the number of messages sent to the vendor device. This value resets to zero at midnight. The Latch Statistics command updates this value.

Back to [VND Controller Attributes](#).

**Offline**

Displays the offline or online status of connected hardware.

Back to [VND Controller Attributes](#).

**Present Value**

Represents the current communication state of the object.

Back to [VND Controller Attributes](#).

**Reset Date**

Contains the date stamp of the last Clear Statistics command.

Back to [VND Controller Attributes](#).

**Reset Time**

Contains the time stamp of the last Clear Statistics command.

Back to [VND Controller Attributes](#).

**Transmits In**

Indicates the rate of transmissions received by the vendor device.

Back to [VND Controller Attributes](#).

**Transmits Out**

Indicates the rate of transmissions sent by the vendor device.

Back to [VND Controller Attributes](#).

**VND Controller Commands**

The table below lists the commands supported by the [VND Controller](#).

**Table 340: VND Controller Object Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Latch Statistics</a>	

## VND Controller Command Details

### **Clear Statistics**

Resets the statistics for the vendor device.

For information on gathering this statistical information, see the [Latch Statistics](#) command.

Back to [VND Controller Commands](#).

### **Disable**

Disables the vendor device.

Back to [VND Controller Commands](#).

### **Enable**

Allows the vendor device to function normally.

Back to [VND Controller Commands](#).

### **Latch Statistics**

Updates the displayed statistics with the current values.

For information on clearing this statistical information, see the [Clear Statistics](#) command.

Back to [VND Controller Commands](#).

# VND Integration Object

The VND (Vendor) Integration object defines a vendor integration for the NAE.

For general information on Metasys system objects, see the [Object Help](#) section.

## VND Integration Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute. Also, see [Status](#).

**Table 341: VND Integration Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Enabled</a>	True or False	CW	True	
<a href="#">Offline</a>	True or False		True	

1 C - Configurable, W - Writable

**Table 342: VND Integration Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Count</a>	Number		0	
<a href="#">Errors In</a>	Number		0	
<a href="#">Errors Out</a>	Number		0	
<a href="#">Function Time Exceeded</a>	Number		0	
<a href="#">Message Receives</a>	Number		0	
<a href="#">Message Transmits</a>	Number		0	
<a href="#">Permanent Status Item Count</a>	Number		0	
<a href="#">Priority 1 Poll Time</a>	Number		0	Units = Seconds
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Temporary Status Item Count</a>	Number		0	
<a href="#">Transmits In</a>	Number		0	
<a href="#">Transmits Out</a>	Number		0	

1 C - Configurable, W - Writable

## VND Integration Attribute Details

### Count

Displays the number of vendor device and point objects defined for the trunk. This count does not include extensions.

Back to [VND Integration Attributes](#).

### Enabled

If True, allows the use of the vendor integration. If False, prevents the use of the vendor integration.

Back to [VND Integration Attributes](#).



**Errors In**

Indicates the number of field communication errors (bad format, for example) received. The Clear Statistics command resets this value.

Back to [VND Integration Attributes](#).

**Errors Out**

Indicates the number of field communication attempts that failed. The Clear Statistics command resets this value.

Back to [VND Integration Attributes](#).

**Function Time Exceeded**

Indicates the number of functions to the Vendor DLL that took longer than 100 milliseconds to execute. The Clear Statistics command resets this value.

Back to [VND Integration Attributes](#).

**Message Receives**

Indicates the number of messages received field devices. This value resets to zero at midnight. The Latch Statistics command updates this value.

Back to [VND Integration Attributes](#).

**Message Transmits**

Indicates the number of messages sent to field devices. This value resets to zero at midnight. The Latch Statistics command updates this value.

Back to [VND Integration Attributes](#).

**Offline**

Displays the offline or online status of connected hardware.

Back to [VND Integration Attributes](#).

**Permanent Status Item Count**

Displays the number of items polled as a result of COV signups.

Back to [VND Integration Attributes](#).

**Priority 1 Poll Time**

Indicates how often the items in the Priority 1 list are polled.

Back to [VND Integration Attributes](#).

**Reset Date**

Contains the date stamp of the last Clear Statistics command.

Back to [VND Integration Attributes](#).

**Reset Time**

Contains the time stamp of the last Clear Statistics command.

Back to [VND Integration Attributes](#).

**Temporary Status Item Count**

Displays the number of items polled.

Back to [VND Integration Attributes](#).

**Transmits In**

Indicates the rate of transmissions received by the integration.

Back to [VND Integration Attributes](#).

**Transmits Out**

Indicates the rate of transmissions sent by the integration.

Back to [VND Integration Attributes](#).

## VND Integration Commands

The table below lists the commands supported by the [VND Integration Object](#).

**Table 343: VND Integration Object Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Latch Statistics</a>	

### VND Integration Command Details

#### **Clear Statistics**

Resets the statistics for the integrated vendor network.

For information on gathering this statistical information, see the [Latch Statistics](#) command.

Back to [VND Integration Commands](#).

#### **Disable**

Disables the entire vendor network integration. No requests are made to the field trunk and no data broadcasts to the network are processed.

Back to [VND Integration Commands](#).

#### **Enable**

Allows the integration to function normally.

Back to [VND Integration Commands](#).

#### **Latch Statistics**

Updates the displayed statistics with the current values.

For information on clearing this statistical information, see the [Clear Statistics](#) command.

Back to [VND Integration Commands](#).

# Wireless Receiver Object

The Wireless Receiver object is the field device of the Wireless Sensor integration. The Wireless Receiver object establishes communication with the wireless receiver hardware.

All integrated wireless field devices (Wireless Receiver objects) and field point objects ([Wireless Sensor Object](#)) appear under the [Wireless Receiver Supervisor Object](#) in the [Navigation Tree](#).

For general information on Metasys system objects, see the [Object Help](#) section.

## Wireless Receiver Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

Also, see [Status](#).

**Table 344: Wireless Receiver Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Disable Automatic Alarming</a>	True or False	CW	False	False True
<a href="#">Graphic</a>	Object reference	CW		
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">Host Name</a>	Text			
<a href="#">IP Address</a>	Set of values	CW	0.0.0.0	xxx.x.x.xxx
<a href="#">Low Battery</a>	True or False			
<a href="#">Max Data Life</a>	Number	CW	150	Range = 120–480 seconds
<a href="#">Network Address</a>	Number	C		Range = 1–50
<a href="#">Present Value</a>	One value from a set			Uses Controller Status (Set 43).

1 C - Configurable, W - Writable

**Table 345: Wireless Receiver Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Date of Manufacture</a>	Number			mmyy
<a href="#">Firmware Version</a>	Number			
<a href="#">Hardware Version</a>	Number			

1 C - Configurable, W - Writable

## Wireless Receiver Attribute Details

### **Date of Manufacture**

Indicates the date the wireless receiver was manufactured.

Back to [Wireless Receiver Attributes](#).

### ***Disable Automatic Alarming***

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device's mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

Back to [Wireless Receiver Attributes](#).

### ***Firmware Version***

Indicates the firmware version of the wireless receiver.

Back to [Wireless Receiver Attributes](#).

### ***Graphic***

Indicates the graphic associated with the object.

Back to [Wireless Receiver Attributes](#).

### ***Graphic Alias***

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this object or the controller containing this point.

Back to [Wireless Receiver Attributes](#).

### ***Hardware Version***

Indicates the hardware version of the wireless receiver.

Back to [Wireless Receiver Attributes](#).

### ***Host Name***

Indicates the host name of the wireless receiver. When a host name is given, the system attempts to resolve the Host Name and IP Address using DNS/DHCP (assuming that the installer assigned a host name to the wireless receiver and enabled DHCP). If the device can be located using the **ping hostname** command, the system can resolve the host name to an IP address. After resolving the host name, the system updates the IP address.

Back to [Wireless Receiver Attributes](#).

### ***IP Address***

Indicates the IP Address of the wireless receiver.

Back to [Wireless Receiver Attributes](#).

### ***Low Battery***

Indicates if any wireless sensors defined as children of the Wireless Receiver object have a low battery. The Low Battery status is an advanced warning that can occur many days before a wireless sensor ceases to function. You can configure an alarm for this attribute to allow the building operator time to locate the sensor and change the battery.

Back to [Wireless Receiver Attributes](#).

### ***Max Data Life***

Indicates the maximum amount of time in seconds that the wireless receiver module waits for a transmission from a wireless sensor before generating a report that tells the NAE that the [Wireless Sensor Object](#) is unreliable due to Data Life Timeout.

Back to [Wireless Receiver Attributes](#).

### ***Network Address***

Indicates the network address of the wireless receiver. You can define only up to 50 wireless receivers per [Wireless Receiver Supervisor Object](#).

Back to [Wireless Receiver Attributes](#).

**Present Value**

Indicates the online/offline state of the wireless receiver.

Back to [Wireless Receiver Attributes](#).

**Status**

Indicates the following status of the object:

**Offline** Communication with the physical hardware has failed.

Back to [Wireless Receiver Attributes](#).

# Wireless Sensor Object

There is a Wireless Sensor object is the field point object for each wireless temperature sensor mapped to the NAE. The Wireless Sensor object receives communications from the wireless sensor.

All integrated wireless field points (Wireless Sensor objects) appear under the [Wireless Receiver Objects](#) (field devices), which appear under the [Wireless Receiver Supervisor Object](#) in the [Navigation Tree](#).

For general information on Metasys system objects, see the [Object Help](#) section.

## Wireless Sensor Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

**Table 346: Wireless Sensor Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Low Battery</a>	Object Reference			Reliability from the Reliability attribute.
<a href="#">Max Value</a>	Real value	CW	3.0	Range = -10 to 100 Units from the Units attribute.
<a href="#">Min Value</a>	Real value		-3.0	Range = -10 to 100 Units from the Units attribute.
<a href="#">Occupancy Request</a>	Object Reference	CW		
<a href="#">Occupancy Status</a>	One state from a set			Uses Unocc Occ (Set 106).
<a href="#">Occupancy Time</a>	Number	CW	2	Range = 2–240 minutes
<a href="#">Occupied Output</a>	Attribute Reference	CNW		
<a href="#">Offset</a>	Real value	CW	0	Range = +/- 3 degrees Units from the Units attribute.
<a href="#">Present Value</a>	Real value			Units from the Units attribute and reliability from the Reliability attribute.
<a href="#">Property Code</a>	Number	CW	1	Range = 1–31
<a href="#">Reliability Action</a>	One state from a set	CW	None	Uses Reliability Action (Set 14).
<a href="#">Setpoint</a>	Real value			Units from the Units attribute and reliability from the Reliability attribute.
<a href="#">Setpoint Output</a>	Attribute Reference	CNW		
<a href="#">Time Remaining</a>	Number			Units = Minutes
<a href="#">Transmitter Id</a>	Number	CW	0	Range = 1–511
<a href="#">Units</a>	One type from a set	CW	Deg F	Uses Unit Set (Set 869).
<a href="#">Zone Temp Output</a>	Attribute Reference	CNW		

1 C - Configurable, N - Value Not Required, W - Writable

**Table 347: Wireless Sensor Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Missed Transmissions</a>	Number			
<a href="#">RF Quality</a>	Number			

**Table 347: Wireless Sensor Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Rx Data Life Errors</a>	Number			
<a href="#">Signal Strength</a>	Object Reference			Units = Percent

1 C - Configurable, N - Value Not Required, W - Writable

## Wireless Sensor Attribute Details

### Low Battery

Indicates if any wireless sensors defined as children of the [Wireless Receiver Objects](#) have a low battery. The Low Battery status is an advanced warning that can occur many days before a wireless sensor ceases to function. You can configure an alarm for this attribute to allow the building operator time to locate the sensor and change the battery. The sensor sends a low battery signal when there is 30 days of battery life left.

Back to [Wireless Sensor Attributes](#).

### Max Value

Indicates the maximum value allowed for the [Setpoint](#). This is the value of the Setpoint attribute when the Setpoint adjust dial on the wireless sensor is in the fully clockwise position.

If the [Min Value](#) is greater than the Max Value, the Setpoint is forced to the Min Value. Otherwise, these attributes are all used to compute the Setpoint with the following formula:

$$SP = [(Max\ Value - Min\ Value) \times (dial\ position \times 0.01)] + Min\ Value$$

Back to [Wireless Sensor Attributes](#).

### Min Value

Indicates the minimum value allowed for the [Setpoint](#). This is the value of the Setpoint attribute when the Setpoint adjust dial on the wireless sensor is in the fully counterclockwise position.

If the Min Value is greater than the [Max Value](#), the Setpoint is forced to the Min Value. Otherwise, these attributes are all used to compute the Setpoint with the following formula:

$$SP = [(Max\ Value - Min\ Value) \times (dial\ position \times 0.01)] + Min\ Value$$

Back to [Wireless Sensor Attributes](#).

### Missed Transmissions

Indicates the number of wireless sensor transmissions missed by the wireless receiver. The [Wireless Receiver Supervisor Object's](#) [Clear Statistics](#) command resets this attribute.

Back to [Wireless Sensor Attributes](#).

### Occupancy Request

Represents an object reference to the Binary Value object that represents the BV 0 Occupancy Request object of the Zone Sensor device.

Back to [Wireless Sensor Attributes](#).

### Occupancy Status

Changes to Occupied after pushing the Temporary Occupied button on the Transmitter, if supported by that model. The Occupied state is held for the minutes defined by the [Occupancy Time](#) attribute, or until cancelled by a release command.

Back to [Wireless Sensor Attributes](#).

### Occupancy Time

Indicates the time in minutes that the [Occupied Output](#) (if defined) is overridden to the Occupied state after pushing the Temporary Occupied button on the Transmitter.

Back to [Wireless Sensor Attributes](#).

### **Occupied Output**

Provides an optional reference to a binary object located anywhere on the Metasys network. The binary object is commanded to Occupied/Unoccupied when the [Occupancy Status](#) attribute changes states.

**Note:** The Present Value attribute of the referenced object at the Priority Scheduling OST priority writes to the output commands.  
The Present Value attribute of the referenced object at the Priority Scheduling OST priority writes the None Data Type value to the release commands.

These operations assume that the referenced object is an output object that has a Present Value that can be written to. Keep this in mind when mapping objects from controllers. You would normally map these points as input points (AI, BI, MSI), but for proper operation you must map the points as output points (AO, BO, MSO).

Back to [Wireless Sensor Attributes](#).

### **Offset**

Indicates the offset value that is added to the zone temperature reading before updating the [Present Value](#), forcing the Present Value to match a calibrated temperature measured at the wireless sensor.

Back to [Wireless Sensor Attributes](#).

### **Present Value**

Indicates the zone temperature reading at the wireless sensor.

Back to [Wireless Sensor Attributes](#).

### **Property Code**

Indicates the Property Code address of the wireless sensor. This setting must match the Property Code address switch setting of the wireless temperature sensor.

Back to [Wireless Sensor Attributes](#).

### **Reliability Action**

Indicates the action taken on the three output references ( [Zone Temp Output](#), [Setpoint Output](#), and [Occupied Output](#)) when the wireless sensor object goes Unreliable. The actions are No Action or Release commands.

Back to [Wireless Sensor Attributes](#).

### **RF Quality**

Indicates the signal quality level with respect to unwanted wireless noise or interference. This attribute displays a number from 0 to 100. A number less than 50 indicates too much interference.

Back to [Wireless Sensor Attributes](#).

### **Rx Data Life Errors**

Indicates the diagnostic measure of the number of Data Life detected by the receiver module. Data Life errors occur when a wireless sensor does not report its status to the wireless receiver before the Max Data Life timer expires. The [Wireless Receiver Supervisor Object's](#) [Clear Statistics](#) command resets this attribute.

Back to [Wireless Sensor Attributes](#).

### **Setpoint**

Indicates the Setpoint based on three variables: the Setpoint Adjustment reading (the setpoint adjust dial position) at the wireless sensor, the [Min Value](#), and the [Max Value](#).

The wireless sensor model determines the Setpoint Adjustment. Options include:

- None
- Warmer/Cooler (Range = +/- 5 Deg F)
- Remote Setpoint (Range = 55 to 85 Deg F/13 to 29 Deg C)



If the Min Value is greater than the Max Value, the Setpoint is forced to the Min Value. Otherwise, these attributes are all used to compute the Setpoint with the following formula:

$$SP = [(Max\ Value - Min\ Value) \times (dial\ position \times 0.01)] + Min\ Value$$

Back to [Wireless Sensor Attributes](#).

### **Setpoint Output**

Provides an optional reference to a temperature Setpoint object located anywhere on the Metasys network. The temperature Setpoint object is commanded when the wireless sensor reports an updated [Setpoint](#) value.

**Note:** The Present Value attribute of the referenced object at the Priority Scheduling OST priority writes to the output commands.  
The Present Value attribute of the referenced object at the Priority Scheduling OST priority writes the None Data Type value to the release commands.

These operations assume that the referenced object is an output object that has a Present Value that can be written to. Keep this in mind when mapping objects from controllers. You would normally map these points as input points (AI, BI, MSI), but for proper operation you must map the points as output points (AO, BO, MSO).

Back to [Wireless Sensor Attributes](#).

### **Signal Strength**

Indicates the wireless signal strength of the wireless sensor as recorded by the wireless receiver module.

Back to [Wireless Sensor Attributes](#).

### **Time Remaining**

Indicates the time remaining before the [Occupied Output](#) (if defined) is released from the Occupied state.

Back to [Wireless Sensor Attributes](#).

### **Transmitter Id**

Indicates the sensor transmitter Id address of the wireless sensor. This setting must match the transmitter Id address switch setting of the wireless sensor.

Back to [Wireless Sensor Attributes](#).

### **Units**

Indicates the engineering units displayed on the user interface (Deg F or Deg C). All temperature and Setpoint values convert to the proper units.

Back to [Wireless Sensor Attributes](#).

### **Zone Temp Output**

Provides an optional reference to a temperature input object located anywhere on the Metasys network. The temperature input object is commanded when the wireless sensor reports an updated [Present Value](#).

**Note:** The Present Value attribute of the referenced object at the Priority Scheduling OST priority writes to the output commands.  
The Present Value attribute of the referenced object at the Priority Scheduling OST priority writes the None Data Type value to the release commands.

These operations assume that the referenced object is an output object that has a Present Value that can be written to. Keep this in mind when mapping objects from controllers. You would normally map these points as input points (AI, BI, MSI), but for proper operation you must map the points as output points (AO, BO, MSO).

Back to [Wireless Sensor Attributes](#).

## Wireless Sensor Commands

The table below lists the commands supported by the [Wireless Sensor Object](#).

**Table 348: Wireless Sensor Object Commands**

Command Name	Parameters
<a href="#">Release</a>	None

### Wireless Sensor Command Details

#### **Release**

Releases the effects of the Temporary Occupancy button pressed at the wireless sensor. This command resets the [Time Remaining](#) and releases any defined outputs.

Back to [Wireless Sensor Commands](#).

# Wireless Receiver Supervisor Object

The Wireless Receiver Supervisor object is the root of the Wireless Sensor integration. The Wireless Sensor integration allows the NAE to communicate with the wireless sensing system over the Ethernet network. The Wireless sensing system consists of wireless receivers and wireless sensors.

All integrated wireless field devices (*Wireless Receiver Objects*) and field point objects (*Wireless Sensor Objects*) appear under the Wireless Receiver Supervisor object in the *Navigation Tree*. Only one Wireless Receiver Supervisor object can be configured in each NAE.

For general information on Metasys system objects, see the *Object Help* section.

## Wireless Receiver Supervisor Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the *Common Object Attributes* section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the *Object and Feature Tabs* section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

Also, see *Status*.

**Table 349: Wireless Receiver Supervisor Object Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Low Battery</a>	True or False			
<a href="#">Message Timeout</a>	Number	W	1,750	Range = 250–2,500 ms
<a href="#">Poll Delay</a>	Number	W	100	Range = 100–1,000 ms
<a href="#">Present Value</a>	One value from a set			Uses Controller Status (Set 43).
<a href="#">Retries</a>	Number	W	5	Range = 3–8
<a href="#">UDP Port</a>	Number	CW	4,050	Range = 1,024–32,767

1 C - Configurable, W - Writable

**Table 350: Wireless Receiver Supervisor Object Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">COV-COS Count</a>	Number			
<a href="#">Checksum Errors</a>	Number			
<a href="#">Count</a>	Number			
<a href="#">NAK Errors</a>	Number			
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Retry Attempts</a>	Number			
<a href="#">Transmits Per Minute</a>	Number			

1 C - Configurable, W - Writable

## Wireless Receiver Supervisor Attribute Details

### COV-COS Count

Indicates the number of reports processed from all mapped wireless sensor transmitters since the last *Clear Statistics* command was issued.

Back to *Wireless Receiver Supervisor Attributes*.

**Checksum Errors**

Indicates the number of checksum errors.

Back to [Wireless Receiver Supervisor Attributes](#).

**Count**

Indicates the number of [Wireless Sensor Objects](#) defined for this object.

Back to [Wireless Receiver Supervisor Attributes](#).

**Low Battery**

Indicates if any wireless sensors defined as children of the [Wireless Receiver Objects](#) have a low battery. The Low Battery status is an advanced warning that can occur many days before a wireless sensor ceases to function. You can configure an alarm for this attribute to allow the building operator time to locate the sensor and change the battery.

Back to [Wireless Receiver Supervisor Attributes](#).

**Message Timeout**

Indicates the maximum delay in milliseconds before retrying to send an online message to a receiver module.

Back to [Wireless Receiver Supervisor Attributes](#).

**NAK Errors**

Indicates the number of negative acknowledge errors. A NAK is returned by a device to indicate that it received and decoded a command correctly, but the command did not make sense or could not be carried out. An example of an NAK is an attempt to read an Analog Input beyond the range of the device.

Back to [Wireless Receiver Supervisor Attributes](#).

**Poll Delay**

Indicates the maximum delay in milliseconds before stopping attempts to send an offline poll message to a receiver module.

Back to [Wireless Receiver Supervisor Attributes](#).

**Present Value**

Indicates the online/offline state of the Wireless Receiver Supervisor integration.

Back to [Wireless Receiver Supervisor Attributes](#).

**Reset Date**

Indicates the date of the last [Clear Statistics](#) command.

Back to [Wireless Receiver Supervisor Attributes](#).

**Reset Time**

Indicates the time of the last [Clear Statistics](#) command.

Back to [Wireless Receiver Supervisor Attributes](#).

**Retries**

Indicates the number of retries allowed before putting a wireless receiver offline.

Back to [Wireless Receiver Supervisor Attributes](#).

**Retry Attempts**

Indicates the number of message retry attempts.

Back to [Wireless Receiver Supervisor Attributes](#).

**Status**

Indicates the following status of the object:

**Offline** Communication with the physical hardware has failed.

Back to [Wireless Receiver Supervisor Attributes](#).

**Transmits Per Minute**

Indicates the number of messages sent to the wireless receivers in 1 minute. This number shows the overall health of the communications network for the Wireless Sensor system.

Back to [Wireless Receiver Supervisor Attributes](#).

**UDP Port**

Indicates the UDP Port on the NAE used to communicate to the Ethernet to RS-485 converter. The port must be 1024 or higher, but cannot be equal to the BACnet UDP Port, the N2 Trunk UDP Port, or 9999.

Back to [Wireless Receiver Supervisor Attributes](#).

**Wireless Receiver Supervisor Commands**

The table below lists the commands supported by the [Wireless Receiver Supervisor Object](#).

Command Name	Parameters
<a href="#">Clear Statistics</a>	None

**Wireless Receiver Supervisor Command Details**

**Clear Statistics**

Resets all the attributes containing diagnostic statistics for this Wireless Receiver Supervisor and all its [Wireless Receiver Objects](#) and [Wireless Sensor Objects](#).

Back to [Wireless Receiver Supervisor Commands](#).

## XAML Graphic Object

The Extensible Application Markup Language (XAML) Graphic object defines the attributes that represent a defined Graphics+ file for a given set of objects. XAML Graphic objects are created exclusively with the Graphic Generation Tool (GGT) and are saved on an ADS, ADX, SCT computer, or supervisory device as a file with an .xaml file extension.

**Note:** The Object Type for this object is labeled XAML Graphic in the software.

For detailed information on viewing XAML Graphic objects, refer to the Graphics+ Runtime *Help* (LIT-12011708).

For detailed information on the Graphic Generation Tool that is used to create and modify XAML Graphic objects, refer to the Graphic Generation Tool *Help* (LIT-12011697).

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section.

# XL5K Controller Object

The XL5K Controller object (Honeywell Excel 5000 [XL-5000]) maps a C-Bus field device to the Metasys system. The object contains pertinent addressing information.

For general information on Metasys system objects, see the [Object Help](#) section.

## XL5K Controller Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

Also, see [Status](#).

**Table 351: XL5K Controller Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Ranges
<a href="#">Enabled</a>	True or False	CW	True	
<a href="#">Graphic</a>	Object reference	CW		
<a href="#">Graphic Alias</a>	Text	CW		Maximum 256 characters
<a href="#">Offline</a>	True or False			
<a href="#">Present Value</a>	One state from a set		0 (Offline)	Uses Controller Status (Set 43).

1 C - Configurable, W - Writable

**Table 352: XL5K Controller Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Ranges
<a href="#">Error Percent</a>	Number			
<a href="#">Errors Today</a>	Number			
<a href="#">Packets Today</a>	Number			
<a href="#">Point Scan Time</a>	Number			
<a href="#">Retries Today</a>	Number			
<a href="#">Transmits Per Minute</a>	Number			

1 C - Configurable, W - Writable

## XL5K Controller Attribute Details

### Enabled

If True, allows the controller to be integrated into the Metasys system extended architecture.

Back to [XL5K Controller Attributes](#).

### Error Percent

Indicates the computed error rate for communications to the device using the following equation: (Errors Today + Retries Today) / Number of Packets Today.

Back to [XL5K Controller Attributes](#).

### Errors Today

Indicates the number of transmissions (packets) since midnight that had errors (for example, the data was returned, but the data contained errors).

Back to [XL5K Controller Attributes](#).

**Graphic**

Indicates the graphic associated with the object.

Back to [XL5K Controller Attributes](#).

**Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this object or the controller containing this point.

Back to [XL5K Controller Attributes](#).

**Offline**

Indicates the offline/online state of the connected hardware.

Back to [XL5K Controller Attributes](#).

**Packets Today**

Indicates the number of transmissions (packets) since midnight.

Back to [XL5K Controller Attributes](#).

**Point Scan Time**

Indicates the total amount of time to scan for point data from this controller.

Back to [XL5K Controller Attributes](#).

**Present Value**

Indicates the communication status of the device.

Back to [XL5K Controller Attributes](#).

**Retries Today**

Indicates the number of transmissions (packets) since midnight where no response data was obtained, causing the transmission to be retried.

Back to [XL5K Controller Attributes](#).

**Status**

Indicates the following status of the object:

- **Disabled:** Enabled attribute is False.
- **Offline:** Communication with the physical hardware has failed.
- **Normal:** No abnormal condition for this object detected.

Back to [XL5K Controller Attributes](#).

**Transmits Per Minute**

Indicates the calculated number of transmissions per minute.

Back to [XL5K Controller Attributes](#).

**XL5K Controller Commands**

The table below lists the commands supported by the [XL5K Controller Object](#).

**Table 353: XL5K Controller Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Latch Statistics</a>	



## **XLK5 Controller Command Details**

### ***Clear Statistics***

Resets the statistics for the integrated XL-5000 network.

Back to [XL5K Controller Commands](#).

### ***Disable***

Disables the XL-5000 controller integration. No requests are made to the field trunk for that controller and all packets received from the Honeywell field device are ignored.

Back to [XL5K Controller Commands](#).

### ***Enable***

Allows the integration to function normally.

Back to [XL5K Controller Commands](#).

### ***Latch Statistics***

Updates the displayed statistics with the current values.

Back to [XL5K Controller Commands](#).

# XL5K Integration Object

The XL5K Integration object defines Honeywell Excel 5000 (XL-5000) network integration for the NIE. The object contains pertinent communications attributes and statistics. Only one XL5K Integration object can be configured in each NIE.

For general information on Metasys system objects, see the [Object Help](#) section.

## XL5K Integration Attributes

This object contains attributes common to many Metasys system objects. These common attributes are described in the [Common Object Attributes](#) section. This section includes attributes of the Focus/Configuration tab, the Diagnostics tab (if applicable), and any other tab specific only to this object. See the [Object and Feature Tabs](#) section for information on the attributes that appear on the other tabs of this object (for example, the Hardware and Options tab appear on point objects).

Click the attribute name in the table for a description of the attribute.

Also, see [Status](#).

**Table 354: XL5K Integration Attributes - Focus/Configuration Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options Ranges
<a href="#">Enabled</a>	True or False	CW	True	
<a href="#">Offline</a>	True or False		False	

1 C - Configurable, N - Value Not Required, W - Writable

**Table 355: XL5K Integration Attributes - Diagnostic Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options Ranges
<a href="#">Count</a>	Number			
<a href="#">Point Scan Time</a>	Number			
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<a href="#">Transaction Timeouts</a>	Number			
<a href="#">Transmit Errors</a>	Number			
<a href="#">Transmits Per Minute</a>	Number			
<a href="#">Transmits Today</a>	Number			

1 C - Configurable, N - Value Not Required, W - Writable

## XL5K Integration Attribute Details

### Count

Indicates the number of scannable points for all [XL5K Controller objects](#) defined for this object.

Back to [XL5K Integration Attributes](#).

### Enabled

If True, allows integration between the XL5K system and the Metasys system extended architecture.

Back to [XL5K Integration Attributes](#).

### Offline

Indicates the offline/online state of the connected hardware.

Back to [XL5K Integration Attributes](#).

### Point Scan Time

Indicates the total amount of time to scan for point data.

Back to [XL5K Integration Attributes](#).

#### **Reset Date**

Indicates the date of the last [Clear Statistics](#) command or due to automatic midnight rollover.

Back to [XL5K Integration Attributes](#).

#### **Reset Time**

Indicates the time of the last [Clear Statistics](#) command or 12:00:00 if due to automatic midnight rollover.

Back to [XL5K Integration Attributes](#).

#### **Status**

Indicates the following status of the object:

- **Disabled:** [Enabled](#) attribute is False.
- **Offline:** Communication with the physical hardware has failed.
- **Normal:** No abnormal condition for this object detected.

Back to [XL5K Integration Attributes](#).

#### **Transaction Timeouts**

Indicates the number of transmissions (packets) since the last [Clear Statistics](#) command where no response data was obtained and the transmission was retried.

Back to [XL5K Integration Attributes](#).

#### **Transmit Errors**

Indicates the number of transmissions (packets) since the last [Clear Statistics](#) command that have errors (for example, bad data was returned).

Back to [XL5K Integration Attributes](#).

#### **Transmits Per Minute**

Indicates the calculated number of transmissions per minute.

Back to [XL5K Integration Attributes](#).

#### **Transmits Today**

Indicates the number of transmissions (packets) since midnight.

Back to [XL5K Integration Attributes](#).

## **XL5K Integration Commands**

The table below lists the commands supported by the [XL5K Integration Object](#).

**Table 356: XL5K Integration Commands**

Command Name	Parameters
<a href="#">Clear Statistics</a>	
<a href="#">Disable</a>	
<a href="#">Enable</a>	
<a href="#">Latch Statistics</a>	

## **XL5K Integration Command Details**

### **Clear Statistics**

Resets the statistics for the integrated XL-5000 network.

Back to [XL5K Integration Commands](#).

**Disable**

Disables the entire XL-5000 network integration. No requests are made to the field trunk and all packets received from the Honeywell field device are ignored.

Back to [XL5K Integration Commands](#).

**Enable**

Allows the integration to function normally.

Back to [XL5K Integration Commands](#).

**Latch Statistics**

Updates the displayed statistics with the current values.

Back to [XL5K Integration Commands](#).

## Object and Feature Tabs

This section describes the tabs of the display panel for the objects and features in the system. Each display panel can contain different tabs depending on the item being viewed, and each tab shows different information.

**Note:** This section contains detailed information about the tabs used by multiple objects/features. When a tab only appears for a specific object/feature, the details of that tab are defined in that object/feature section. However, this section includes a brief description of such tabs and provides links to the detailed object/feature sections.

### Action Tables Tab

The Action Tables tab appears on Interlock and Multiple Command objects. See the and sections for details.

### Alarm Tab

The Alarm tab appears on an object that has an alarm extension. See in the section.

### Associated Graphic Tab

The Associated Graphic tab appears when a graphic is referenced from the object using the Graphic attribute. See the section for details on working with this tab.

### Averaging Tab

The Averaging tab appears on an object that has an averaging extension. See in the section.

### BACnet Alarm Tab

Attributes associated with the BACnet Intrinsic Alarming for an object are shown under the BACnet Alarm tab of the display panel. This tab appears when the site is defined as a BACnet site and the object has intrinsic alarming enabled (that is, Intrinsic Alarming Defined set to True).

**Table 357: BACnet Alarm Tab**

Attribute Name	Data Type	Notes	BACnet Notes	Initial Value	Values/Options/Range
	Series of True or False states		B	True, True, True	To Offnormal, To Fault, To Normal Applies to all point objects and the Accumulator.
	Text	CW	CW		Maximum 256 characters Applies to all point objects and the Accumulator.
	One value from a list (see Values/Options/Range column)	CW	W	Active	Inactive, Active States Text attribute identifies the value set for this attribute. Applies to BI, BV, MI, and MV objects. For MI and MV objects, you can select multiple values from a list, unlike the other objects that are limited to one value.
	Real value	CW	BW	0.0	Applies to AI, AO, and AV objects.
	One state from a set				Applies to the BO object.
	Series of True or False states	CW	BW	True, True, True	To Offnormal, To Fault, To Normal Applies to all point objects and the Accumulator.
	One state from a set		B	Normal	Normal, Fault (unreliable), High Limit, Low Limit Applies to all point objects and the Accumulator.

**Table 357: BACnet Alarm Tab**

Attribute Name	Data Type	Notes	BACnet Notes	Initial Value	Values/Options/Range
	Set of values		B		BACnet formatted Time Stamps Applies to all point objects and the Accumulator.
	List of numbers (see Values/Options/Range column)	CW	W		Numbers: 0–65,535 States Text attribute identifies the value set for this attribute. The list of numbers come from a list of the Alarm Values. Applies to MI and MV objects.
	Object reference	CW	W		Applies to BO and MO objects.
	One value from a set	CW	W	Active	Inactive, Active States Text attribute identifies the value set for this attribute. Applies to BO and MO objects.
	Object reference	CW	CW		Applies to all point objects and the Accumulator.
	Text	CW	CW		Maximum 256 characters Applies to all point objects and the Accumulator.
	Real value	CW	BW	70.0	Applies to AI, AO, AV, and Accumulator objects.
	List of				Uses BAC LifSfty State (BACnet Lifesafety State) (Set 186). Applies only to Life Safety Zone and Life Safety Point objects.
	Series of True or False states	CW	BW	True, True	Applies to AI, AO, AV, and Accumulator objects.
	Real value	CW	BW	65.0	Applies to AI, AO, AV, and Accumulator objects.
	Number	CW	BW	1	0–4,294,967,295 This is the BACnet Object Identifier of the Notification Class Object used for routing. Applies to all point objects and the Accumulator.
	Object reference	CW	CW	1	Set to Notification Class: 1 Applies to all point objects and the Accumulator.
	One type from a set	CW	BW	Alarm	Alarm, Event Applies to all point objects and the Accumulator.

**Table 357: BACnet Alarm Tab**

Attribute Name	Data Type	Notes	BACnet Notes	Initial Value	Values/Options/Range
	Number	CW		0	Applies to the Accumulator object.
	Number	CW	BW	0	0–65,535 Units = seconds Applies to all point objects and the Accumulator.

1 B - Exposed as Standard BACnet Property, C - Configurable, W - Writable

## BACnet Alarm Tab Attribute Details

### ***Acked Transitions***

Displays three states that independently indicate the receipt of acknowledgements for To Offnormal, To Fault, and To Normal events. Transitions to High Limit and Low Limit Event States are considered Offnormal events.

These states are set to False when the corresponding event occurs and an acknowledgement is expected as defined in the Notification Class Object referenced by the Notification Class attribute of this object.

The states are set to True upon receipt of the corresponding acknowledgement.

Back to .

### ***Alarm Message Text***

Specifies the body of the alarm messages.

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### ***Alarm Value (Alarm Values)***

Specifies the value (or list of values for multistate objects) that Present Value must reach before an event generates. If the object supports intrinsic reporting, this attribute is required.

A To Offnormal event generates under these conditions:

- The Present Value maintains the value(s) specified by Alarm Value(s) for a minimum period of time, specified in the Time Delay attribute.
- The To Offnormal flag is enabled in the Event Enable attribute.
- Once equal to the Alarm Value(s), the Present Value must become not equal to Alarm Value(s) before a To Normal event is generated under these conditions:
  - The Present Value remains not equal to the Alarm Value(s) for a minimum period of time, specified by the Time Delay attribute.
  - The To Normal flag is enabled in the Event Enable attribute.

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### ***BACnet Deadband***

Defines the value by which the Present Value must change below the High Limit or above the Low Limit before the object generates a To Normal event.

Back to .

### ***Error Status***

Indicates whether the Present Value was successfully written to the object defined by the Feedback Reference. The Error Status displays Ok if the object was able to send its latest Present Value to the feedback object. Otherwise, the Error Status displays the error of the first failed command.

Back to .

**Event Enable**

Contains three states that independently enable To Offnormal, To Fault, and To Normal events. Transitions to High Limit and Low Limit Event States are considered Offnormal events. An unreliable condition generates a Fault event.

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**Event State**

Indicates the active alarm state of the Intrinsic Alarming feature if enabled for the object. In BACnet terms, High Limit and Low Limit states are Offnormal.

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**Event Time Stamps**

Indicates the times of occurrence of the last To Offnormal, To Fault, and To Normal event transitions. Time and Date time stamps are shown as \* if no transition of that type has been generated. Sequence time stamps are 0 if no transition of that type has been generated. If intrinsic reporting is supported by the object, this attribute is required.

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**Fault Values**

Specifies any states the Present Value must equal before a To Fault event issues. If Present Value becomes equal to any of the states in the Fault Values list, and no physical fault is detected for any inputs represented by the Present Value attribute, then the Reliability attribute has the value Multistate Fault. If the object supports intrinsic reporting, the Fault Values attribute is required.

Back to .

**Feedback Reference**

Indicates the object reference of the feedback object.

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**Feedback Value**

Indicates the status of a feedback value from which Present Value must differ before an event generates. The amount Present Value differs from Feedback Value to generate an event is locally determined. This attribute is required if the object supports intrinsic reporting.

A To Offnormal event generates under these conditions:

- The Present Value differs from the Feedback Value for a minimum period of time, specified in Time Delay.
- The Event Enable attribute enables the To Offnormal flag.

Once equal to the Feedback Value, the Present Value must become different from the Feedback Value before a To Normal event generates under these conditions:

- The Present Value remains not equal to the Feedback Value for a minimum period of time, specified by Time Delay.
- The Event Enable attribute enables the To Normal flag.

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**Graphic**

Indicates the graphic associated with the alarm extension.

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**Graphic Alias**

Indicates a portion of the graphic's item reference, up to and including the name of the folder containing this object or the controller containing this point.

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**High Limit**

Defines the high limit that the Present Value attribute must exceed before an event is generated.



The object generates a To Offnormal event when the Present Value exceeds the High Limit for a minimum period of time, defined in the Time Delay attribute; the High Limit Enable is True in the Limit Enable attribute; or the To Offnormal is True in the Event Enable attribute.

The object generates a To Normal event when the Present Value falls below the High Limit minus the Deadband for a minimum period of time, specified in the Time Delay attribute; the High Limit Enable flag is set in the Limit Enable attribute; or the To Normal flag is set in the Event Enable attribute.

For the Accumulator object, this attribute indicates the upper limit of the range.

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### ***Life Safety Alarm Values***

Specifies any states that the Present Value must equal before the point generates a To Offnormal event and enters the Life-Safety-Alarm event state.

[Back to .](#)

### ***Limit Enable***

Contains two flags that independently enable and disable reporting of High Limit and Low Limit events and their return to Normal. This attribute is required if the object supports intrinsic reporting.

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### ***Low Limit***

Defines the low limit that the Present Value attribute must fall before an event generates.

The object generates a To Offnormal event when the Present Value falls below the Low Limit for a minimum period of time, defined in the Time Delay attribute; the Low Limit Enable is True in the Limit Enable attribute; or the To Offnormal is True in the Event Enable attribute.

The object generates a To Normal event when the Present Value exceeds the Low Limit plus the Deadband for a minimum period of time, specified in the Time Delay attribute; the Low Limit Enable flag is set in the Limit Enable attribute; or the To Normal flag is set in the Event Enable attribute.

For the Accumulator object, this attribute indicates the lower limit of the range.

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### ***Notification Class***

Defines the notification class for handling and generating event notifications for the object. This attribute implicitly refers to the Notification Class Object that has a Notification Class attribute of the same value.

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### ***Notification Object Reference***

Allows selection of a Notification Class object. When the Notification Object Reference is written, the value of the Notification Class attribute is updated to reflect the referenced object's instance number. The value of the Notification Object Reference attribute is restricted to Notification Class objects on the same device as the Alarming object.

[Back to .](#)

### ***Notify Type***

Defines whether the transitions generated by the object are Events or Alarms.

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### ***Pulse Rate***

Indicates the number of input pulses received during the most recently completed period specified by the Limit Monitoring Interval. This value is monitored by the Intrinsic Alarming logic for this object. This attribute is writable only when the object is out of service.

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### ***Time Delay***

Defines the minimum number of seconds that the Present Value must remain outside the range defined by the High Limit and Low Limit attributes before the object generates a To Offnormal event.

Also defines the minimum time the Present Value must remain within the range defined by the High Limit and Low Limit attributes, including the Deadband attribute value, before the object generates a To Normal event.

When used with the **Feedback Value**, this value specifies the minimum number of seconds that the Present Value must remain equal to the Feedback Value before a To Offnormal event generates or different from the Feedback Value before a To Normal event generates.

For the **Accumulator** object, this value defines the minimum number of seconds that the must remain outside of the range defined by the High Limit and Low Limit attributes before the object generates an event or alarm.

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### ***Calendar Tab***

The Calendar tab appears on Calendar objects, which are used behind the scenes by the Scheduling feature. See the and the feature sections for details.

### ***Communications Tab***

The Communications tab appears on Engine Device objects. See the section for details.

### ***Configuration Tab***

The Configuration tab appears when you define an object in the SCT or in a Wizard. The Configuration tab shows operation attributes available for the object type to which the object belongs. The attributes displayed on the Configuration tab varies by object type. For example, the Analog Input object's Configuration tab has different attributes than the ADS object's Configuration tab. See the specific object section for details on its Configuration tab.

**Note:** This tab is called the Focus tab in the online Site Management Portal.

### ***Diagnostic Tab***

The Diagnostic tab only appears for objects containing diagnostic data. The attributes displayed on the Diagnostic tab varies by object type. For example, the Diagnostic tab of the has different attributes than the . See the specific object section for details on its Diagnostic tab. Also, see the section.

### ***Email Tab***

The Email tab appears on Engine or Server objects. The Email DDA Attributes appear on the Shared Configuration section of the Email Tab. The Email DDA Destination Configuration Attributes appear when you edit a specific Email destination on the Email tab.


**Table 358: Email DDA Shared Configuration Attributes**

<b>Attribute Name</b>	<b>Description</b>
<b>SMTP Server Host</b>	Specifies either a host name or IP address of a SMTP server. A host name can be specified only if a DNS is available to the device. This attribute is used in conjunction with Email DDA attribute. If no Email DDA destinations are configured, this attribute is ignored.
<b>SMTP Port</b>	Signifies the TCP port on which Email DDA should connect to deliver an email message. By default, this field is set to 25 (SMTP); however, some internal SMTP servers may be set up to non-standard ports which require that this field be changed to match the listening port of the mail exchanger. If no Email DDA attribute exists, this attribute is ignored.
<b>Authentication Type</b>	Specifies the type of authentication used to send and receive emails. Depending on the selection you make, the fields on the Email tab become enabled or disabled to help you fill in only the fields required for that authentication type. If you select SMTP, the SMTP User Name and SMTP Password attributes become enabled. If you select POP-before-SMTP, the POP User Name and POP Password attributes become enabled.

**Table 358: Email DDA Shared Configuration Attributes**

Attribute Name	Description
<b>SMTP User Name</b>	Specifies a user name for the SMTP server. This attribute is ignored if the SMTP Server Host is empty. This attribute applies only when using SMTP authentication. If no Email DDA destinations are configured, this attribute is ignored. See SMTP Password.
<b>SMTP Password</b>	Specifies the password for the SMTP user name. This attribute is ignored if the SMTP Server Host is empty. This attribute applies only when using SMTP authentication. If no Email DDA destinations are configured, this attribute is ignored. See SMTP User Name.
<b>POP Server Hostname</b>	Specifies the hostname for the POP server. This attribute applies only when using POP authentication. If no Email DDA destinations are configured, this attribute is ignored.
<b>POP User Name</b>	Specifies a user name for the POP server. This attribute is ignored if the POP Server Hostname is empty. This attribute applies only when using POP authentication. If no Email DDA destinations are configured, this attribute is ignored.
<b>POP Password</b>	Specifies the password for the POP user name. This attribute is ignored if the POP Server Hostname is empty. This attribute applies only when using POP authentication. If no Email DDA destinations are configured, this attribute is ignored.
<b>From Email Address</b>	Specifies the e-mail address from which all e-mails are sent. The From Email Address is a required field. If this attribute is not populated, the Email DDA does not attempt to send an e-mail message.
<b>Email Diagnostics</b>	Displays diagnostic information regarding the communication between the Email DDA (SMTP Client) and the SMTP Server. This attribute displays both successful and unsuccessful e-mail message deliveries.

**Table 359: Email DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Label</b>	Identifies the user-friendly destination name in the list of Email DDAs. Maximum characters: 80
<b>Email Address</b>	<p>Specifies the email address of one or more recipients. You must use valid email addresses set up on an email server for the device to successfully send the email alarms. When entering more than one email address, separate the addresses with a comma (for example, Jonathan.Smith@jci.com,Jane.Smith@jci.com).</p> <p>Click  to select email addresses defined by the user accounts in the Security Administrator system. See the <a href="#">Alarm and Event Management</a> section for more information on the Email DDA and selecting email addresses.</p> <p>Maximum characters: 256</p>
<b>Priority</b>	<p>Specifies the priority of the outbound email message. This attribute defines the X-Priority field within the email's MIME header. X-Priority is one of several ways to define the significance of an email. Not all email clients interpret it the same way. Please refer to your email client's documentation for more information.</p> <p>You can choose from the following values:</p> <ul style="list-style-type: none"> <li>• High</li> <li>• Normal</li> <li>• Low</li> </ul> <p>See the Hi Normal Low (Set 100).</p>
<b>Subject</b>	<p>Specifies the user-defined text that appears in the subject field of the e-mail message.</p> <p>Maximum characters: 256</p>
<b>Retries</b>	<p>Specifies the number or attempts made to send a message if there is a failure before the system discards it.</p> <p>Range: 0–10</p>
<b>Enabled</b>	Defines whether or not the destination is enabled. When this attribute is False, the Engine or Server does not deliver alarms to the configured recipients.

**Table 359: Email DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Filters</b>	Specifies the rules to filter alarms. This attribute uses Alarm Value (Set 108). See <a href="#">Filters</a> for more information.
<b>Format</b>	Defines the format of the message, indicating which fields are present in the received message.  The following fields are optional: <ul style="list-style-type: none"> <li>• Acknowledge Required (not an option for pager)</li> <li>• Item Category</li> <li>• Item Description</li> <li>• Item Fully Qualified Reference</li> <li>• Message</li> <li>• Previous Status</li> <li>• Priority</li> <li>• Site Name</li> <li>• Value</li> </ul>

See [Event Message Routing, Filtering, and Destinations](#) for more information on this DDA.

## Filters

Defines the rules used to filter alarms. This attribute appears on the Email, Pager, Printer, and SNMP tabs. See [Event Message Routing, Filtering, and Destinations](#) in the [Alarm and Event Management](#) section for more information on filtering.

**Table 360: Filter Parameters**

Filters	Operators Allowed	Values
<b>Acknowledge Required</b>	== or !=	True or False
<b>Current Status</b>	== or !=	Object Status Set
<b>Start Day of Week</b>	<, <=, >, >=, ==, or !=	Day of the week. Any value from Monday to Sunday
<b>Start Time</b>	<, <=, >, >=, ==, or !=	Time
<b>End Day of Week</b>	<, <=, >, >=, ==, or !=	Day of the week. Any value from Monday to Sunday
<b>End Time</b>	<, <=, >, >=, ==, or !=	Time
<b>Item Type</b>	== or !=	Object Type Set
<b>Item Category</b>	== or !=	Object Category Set
<b>Previous Status</b>	== or !=	Object Status Set
<b>Priority<sup>1</sup></b>	<, <=, >, >=, ==, or !=	Number value

<sup>1</sup> If you specify a filter with a value of >10, you receive only alarms with priorities between 11 and 255.

If you define multiple filters for a destination, the DDA combines all the criteria with an AND condition (all filter criteria must be met).

## Engineering Tab

The Engineering tab appears on integration objects in the system. This tab allows you to view and edit attributes of items such as devices and points on an integration.

To use the Engineering tab to view and edit attributes:

1. Right-click the integration object on the Navigation tree and select View. The Integration object appears.

- Click the Engineering tab, and navigate to an item in the Integration Tree.

**Note:** You may need to click Relearn to discover the integrated devices and points on the network and populate the Integration Tree with the data.

- Double-click the selected item. The Details screen for the selected item appears.
- Click the Edit button.
- Make the desired changes and click Save.

## Event Tab

The Event tab appears on Event Enrollment objects. See the [Event Enrollment Object](#) section.

Also, see the [BACnet Event Enrollment Object Alarming](#) and [Event Enrollment Configuration Examples](#) in the [Alarm and Event Management for Metasys Systems Integrated with BACnet Devices](#) section.

## Focus Tab

The Focus tab appears when you define an object in the online Site Management Portal. The Focus tab shows operation attributes available for the object type to which the object belongs. The attributes displayed on the Focus tab varies by object type. For example, the Analog Input object's Focus tab has different attributes than the ADS object's Focus tab. See the specific object section for details on its Focus tab.

**Note:** This tab is called the Configuration tab in the SCT or in a Wizard.

## Graphic Tab

The Graphic tab appears on a device object that has an associated Graphic defined. See the [Graphic Object](#) and the [User Graphics Tool \(UGT\)](#) sections for details on this object and working with this tab.

## Group Tab

The Group tab appears on Group objects. See the [Group Object](#) section for details.

## Hardware Tab

The Hardware tab shows hardware-related attributes associated with the hardware source of an integration, device, or a point (for example, when an object has a reference to a physical input or output).

**Note:** Each Hardware attribute table is organized and divided into sections of Integration Hardware attributes, Device Hardware attributes, and Point Hardware attributes (calling out when attributes are shared between these object types). These sections are indicated by headings that span across the table.

### BACnet Hardware Tab

Attributes associated with the hardware source for object data are shown under the Hardware tab of the display panel. These attributes are not exposed to a BACnet network.

**Note:** Each Hardware attribute table is organized and divided into sections of Integration Hardware attributes, Device Hardware attributes, and Point Hardware attributes (calling out when attributes are shared between these object types). These sections are indicated by headings that span across the table.

**Table 361: BACnet Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>BACnet Device Hardware Attributes</b>				
<a href="#">Disable Automatic Alarming</a>	True or False	CW	False	False True
<b>BACnet Device and Point Hardware Attributes</b>				
<a href="#">Instance Number</a>	Number	C	None	0–65,535

**Table 361: BACnet Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Remote Device Addr</a>	Series of numbers		None	BACnet device address
<a href="#">Remote Object Name</a>	Text		None	

1 C - Configurable, W - Writable

**BACnet Hardware Tab Attribute Details**

**Disable Automatic Alarming**

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device’s mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

Back to [BACnet Hardware Tab](#).

**Instance Number**

Contains the number of mapped BACnet objects that are being polled on a periodic basis or are part of the BACnet Object Identifier (along with the Object Type). The BACnet Object Identifier is used to establish communication with the object.

Back to [BACnet Hardware Tab](#).

**Remote Device Addr**

Contains the BACnet address of the remote BACnet device where the integrated BACnet object resides.

Back to [BACnet Hardware Tab](#).

**Remote Object Name**

Contains the BACnet Object Name of the integrated BACnet object as defined in the remote BACnet device.

Back to [BACnet Hardware Tab](#).

**LONWORKS Hardware Tab**

Attributes associated with the hardware source for object data are shown under the Hardware tab of the display panel. These attributes are not exposed to a BACnet network.

**Table 362: LONWORKS Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>LONWORKS Integration Hardware Attributes</b>				
<a href="#">Domain ID</a>	Text	C	01	Maximum Length = 12 Category = Default Hex bytes of length 0,1,3, or 6
<a href="#">Driver Name</a>	Text		lpcdrv	Maximum Length = 30 Category = Default
<a href="#">File Filter</a>	Text	W		Maximum Length = 40 Category = Default
<a href="#">LNS Database Name</a>	Text	CW		Maximum Length = 30 Category = Default
<a href="#">Resource File Language</a>	Text	CW	ENU	Maximum Length = 3 Category = Default
<a href="#">Status Launch Interval</a>	Number	CW	0	Range = 0–10,000 milliseconds

**Table 362: LONWORKS Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Temporary Status Item Expiration Time</i>	Number	CW	60	Range = 0–65,535 seconds Immediate (0), Never (65,535)
<b>LONWORKS Device Hardware Attributes</b>				
<i>Alarm Event State</i>	True or False	CW	True	False True
<i>Device Class</i>	Text			Maximum Length = 40 Category = Default
<i>Device Subclass</i>	Text			Maximum Length = 40 Category = Default
<i>Disable Automatic Alarming</i>	True or False	CW	False	False True
<i>DSN 1</i>	Text	C		Maximum Length = 30 Category = Default
<i>DSN 2</i>	Text	C		Maximum Length = 30 Category = Default
<i>Location Label</i>	Text			Maximum Length = 30 Category = Default
<i>Manufacturer</i>	Text			Maximum Length = 40 Category = Default
<i>Message Retry Count</i>	Number	CW	1	Range = 0–15
<i>Model</i>	Number		0	
<i>Program ID</i>	Text			Number of Elements = 40 Category = Default
<i>Transceiver</i>	Text			Maximum Length = 40 Category = Default
<i>XIF Present</i>	True or False			
<b>LONWORKS Integration and Device Hardware Attributes</b>				
<i>Neuron ID</i>	Text			Fixed Length = 6 Category = Default
<b>LONWORKS Point Hardware Attributes</b>				
<i>Command Status Mapping Table</i>	Text	CW		Applies to BI, BO, MI, and MO objects only.
<i>Custom Scale/Offset</i>	Text	CW		Applies to AI and AO objects only.
<i>Enable Polling</i>	True or False	CW		Applies to AO, BO, and MO objects only.
<i>Field Units</i>	One unit of measure from a set	CW	DegF	Uses Unit Set (Set 869). This attribute is for AI and AO objects only.
<i>Interface Value</i>	One from a set or Number			
<i>Manual Control</i>	True or False			Applies to AO, BO, and MO objects only.

**Table 362: LONWORKS Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Offline</i>	True or False			
<i>Overridden</i>	True or False			
<i>Priority</i>	Number			1–3
<i>Target Reference</i>	Text	C		
<i>Trouble</i>	True or False			Applies to BI and BO objects.
<i>Update Interval</i>	Number	CW		Units = Seconds 0–65,535 Applies to AO, BO, and MO objects only.

1 C - Configurable, W - Writable

**LONWORKS Hardware Tab Attribute Details**

**Alarm Event State**

Specifies whether Node State changes will cause alarms. The value of True allows Node State alarms to be processed by the NxE. The value of False masks Node State alarms from the NxE.

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**Command Status Mapping Table**

Limits or modifies the mapping to the field states/commands used by the object. This string refers to one of the conversion identifiers in the CommandStatusMap.xml file.

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**Custom Scale/Offset**

Provides a custom scaling function for converting the field data to the defined units of the object. This attribute is for AI and AO objects only.

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**Device Class**

Indicates the class of a device. The LONWORKS network server is responsible for populating the *Program ID* (which includes the *Manufacturer*, Device Class, *Device Subclass*, *Transceiver*, and *Model*). If no standard Program ID exists, the value is n/a.

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**Device Subclass**

Indicates the device subclass usage of a device. The LONWORKS network server is responsible for populating the *Program ID* (which includes the *Manufacturer*, *Device Class*, Device Subclass, *Transceiver*, and *Model*). If no standard Program ID exists, the value is n/a.

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**Disable Automatic Alarming**

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device’s mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

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**Domain ID**

Defined by Metasys system Connectivity to LONWORKS network (MCL) software for the particular LONWORKS network trunk. The validation code checks for proper format (zero, one, three, or six hexadecimal bytes).



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#### **Driver Name**

Displays to the name of the installed LONWORKS network driver.

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#### **DSN 1**

Displays the native LONWORKS network address (in Domain-Subnet-Node format). DNSs must be unique on the LONWORKS network. DSN 1 is required. Use the format xx/xx/xx.

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#### **DSN 2**

Displays the native LONWORKS network address (in Domain-Subnet-Node format). DNSs must be unique on the LONWORKS network. DSN 1 is required, but DSN 2 can be left blank. Use the format xx/xx/xx.

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#### **Enable Polling**

Indicates whether polling is enabled or disabled when the Engine is in complete control of this item.

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#### **Field Units**

Lists the engineering units that pertain to the LONWORKS network data. This attribute is for AI and AO objects only.

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#### **File Filter**

Lists the types of files that can be used as file extensions to the LON Integration object. The list includes:

- eng
- enm
- enu
- fmt
- fpt
- typ
- xif

File Filter can be edited for alternate languages and must be in the xxx file format.

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#### **Interface Value**

Indicates the current value from the hardware interface. The Interface Value updates when the hardware is read or when the hardware's current value changes.

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#### **Location Label**

Describes the location of the controller.

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#### **LNS Database Name**

Displays the name of the LONWORKS® Network Services (LNS) database used to build the LONWORKS network trunk.

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#### **Manual Control**

Indicates that an Hands Off Auto (HOA) switch on the referenced item is set to Hand or Off.

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### **Manufacturer**

Indicates the manufacturer of a device. The LONWORKS network server is responsible for populating the *Program ID* (which includes the Manufacturer, *Device Class*, *Device Subclass*, *Transceiver*, and *Model*). If no standard Program ID exists, the value is n/a.

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### **Message Retry Count**

Indicates the number of retry attempts to use when communicating with this controller.

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### **Model**

Indicates the model number of a device. The LONWORKS network server is responsible for populating the *Program ID* (which includes the *Manufacturer*, *Device Class*, *Device Subclass*, *Transceiver*, and *Model*). If no standard Program ID exists, the value is n/a.

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### **Neuron ID**

Displays the Neuron ID of the local LONWORKS network interface board or contains the Neuron ID of the remote LONWORKS network controller. The Neuron ID must be unique to the LONWORKS network.

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### **Offline**

Indicates whether the connected LONWORKS network hardware is online or offline.

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### **Overridden**

Indicates if the hardware is overridden (if supported).

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### **Priority**

Indicates the Priority (1–3) at which to poll this item.

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### **Program ID**

Displays the Standard Program ID for the device in hex characters. The LONWORKS network server is responsible for populating the Program ID (which includes the *Manufacturer*, *Device Class*, *Device Subclass*, *Transceiver*, and *Model*). If no standard Program ID exists, the value is n/a.

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### **Resource File Language**

Defines the language extracted from the resource file.

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### **Status Launch Interval**

Indicates how often the LON integration launches a status request to the field. A value of 0 means as often as needed. This attribute limits the LON bandwidth usage for the LON integration.

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### **Target Reference**

Defines the path into a controller for the data being mapped by the object.

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### Temporary Status Item Expiration Time

Indicates the time to poll the temporary objects in the status list.

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### Transceiver

Indicates the transceiver type for a device. The LONWORKS network server is responsible for populating the [Program ID](#) (which includes the [Manufacturer](#), [Device Class](#), [Device Subclass](#), Transceiver, and [Model](#)). If no standard Program ID exists, the value is n/a.

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### Trouble

Indicates whether the hardware device is currently under a trouble condition. Applies to BI and BO objects.

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### Update Interval

Specifies how often (in seconds) to repeat the last command. This attribute provides a heartbeat for controllers needing it. **Use this attribute sparingly.**

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### XIF Present

Indicates whether a XIF file matching this controller's Program ID was found.

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## MS/TP Hardware Tab

Attributes associated with the hardware source for object data are shown under the Hardware tab of the display panel.

Table 363: MS/TP Hardware Tab

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>MS/TP Integration Hardware Attributes</b>				
<a href="#">Baud Rate Selection</a>	One state/type/ mode from a set	CW	0	Uses MSTPDL Baud Rate (Set 300). See the attribute <a href="#">description</a> .
<a href="#">Network Address</a>	Number	C W	0	1–65,534 0 = Local network 65,535 = Reserved for broadcast
<a href="#">Trunk Number</a>	Number			
<b>MS/TP Device Hardware Attributes</b>				
<a href="#">Disable Automatic Alarming</a>	True or False	CW	False	False True
<a href="#">Instance Number</a>	Number			
<a href="#">MAC Address</a>	Number	C		1–255
<b>MS/TP Point Hardware Attributes</b>				
<a href="#">Device Type</a>	Text			
<a href="#">FC Bus MAC Address</a>	Number			
<a href="#">Offline</a>	True or False			
<a href="#">SA Bus MAC Address</a>	Number			This attribute applies to AI, AO, BI, BO, and Accumulator objects.

**Table 363: MS/TP Hardware Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#">Slot</a>	Number			This attribute applies to AI, BI, and Accumulator objects.
<a href="#">Slot A</a>	Number			This attribute applies to AO and BO objects.
<a href="#">Slot B</a>	Number			This attribute applies to PAO and BO objects.

1 C - Configurable, W - Writable

### **MS/TP Hardware Tab Attribute Details**

#### **Baud Rate Selection**

Indicates the baud rate of the NAE FC bus ([Table 364](#)).

**Table 364: Baud Rate Options**

Baud Rate	Description
<b>Auto</b>	Use baud rate of running network. This value is the recommended setting for everything on the FC bus except the bus supervisor port. See <a href="#">Active Baud Rate</a> .
<b>1200</b>	Use 1200 baud only. This value is not recommended and may not be allowed on some devices.
<b>9600</b>	Use 9600 baud only. This value is the lowest standard MS/TP baud rate.
<b>19200</b>	Use 19200 baud only. This value is not recommended.
<b>38400</b>	Use 38400 baud only. This value is the recommended baud rate for bus supervisor ports.
<b>76800</b>	Use 76800 baud only.

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#### **Device Type**

Indicates the type of device. This value comes from CCT.

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#### **Disable Automatic Alarming**

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device's mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

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#### **FC Bus MAC Address**

Displays the MAC address of the device on which the object exists (if the object physically resides on a device on the FC bus) or the FEC/VMA field controller MAC Address that the point is connected to (if the object physically resides on the SA bus).

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#### **Instance Number**

Displays the Instance Number of the object on the remote field device. The Instance number, along with the object type, defines the remote object's BACnet Object Identifier. The BACnet Object Identifier is used to establish communication with the object.

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#### **MAC Address**

Indicates the MAC address of the device on the field bus.

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### Network Address

Contains the network number of the MS/TP bus used for BACnet message addressing. A value of 0 indicates a local network (the device is not intended as a router). Do **not** change this number after you start device mapping or discovery because it may invalidate the devices that have been found.

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### Offline

Specifies whether or not the point is offline.

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### Trunk Number

Displays the trunk number where the device (on which the point resides) is located.

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### SA Bus MAC Address

Displays the MAC address of the device on which the object exists (if the object physically resides on a device on the SA bus).

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### Slot

Defines the physical location of a point data source on the device.

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### Slot A

Defines the physical location of a point data source on the device.

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### Slot B

Defines the physical location of a second data point source on the devices (if present). Only a PAO would have Slot B defined.

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## N1 Hardware Tab

Attributes associated with the hardware source for object data are shown under the Hardware tab of the display panel. These attributes are not exposed to a BACnet network.

**Table 365: N1 Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>N1 Point Hardware Attributes</b>				
<a href="#">Interface Value</a>	One from a set or Number			
<a href="#">NCM Name</a>	Text		None	8 characters maximum
<a href="#">Network Name</a>	Text		None	8 characters maximum
<a href="#">Offline</a>	True or False		False	
<a href="#">Overridden</a>	True or False	R	False	
<a href="#">Reference</a>	Text		None	<system>.<object>
<a href="#">Remote Object Name</a>	Text	CW	None	<system>.<object> 8 characters each maximum

<sup>1</sup> C - Configurable, R - Affected by Object Reliability, W - Writable

## N1 Hardware Tab Attribute Details

### Interface Value

Indicates the current value from the hardware interface. The Interface Value updates when the hardware is read or when the hardware's current value changes.

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### NCM Name

Contains the name of the NCM where the integrated N1 object resides, as defined in the N1 network. Read from the NCM.

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### Network Name

Contains the network name of the NCM where the integrated object resides as defined in the N1 network. The network name is obtained at startup via the [N1 Migration Object](#).

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### Offline

Indicates whether the object is online or offline as determined by the communication status to the NCM.

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### Overridden

Indicates if the point is overridden in the NCM.

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### Reference

Contains the name of the hardware object in the format of system.object, that the N1 object is associated with in the NCM.

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### Remote Object Name

Contains the name of the integrated N1 object in the format of system.object, as defined in the N1 network. If this name is changed in the N1 network, the object goes offline.

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## N2 Hardware Tab

Attributes associated with the hardware source for object data are shown under the Hardware tab of the display panel. These attributes are not exposed to a BACnet network.

Table 366: N2 Hardware Tab

Attribute Name	Data Type	Notes <sup>1,2</sup>	Initial Value	Values/Options/Range
<b>N2 Integration Hardware Attributes</b>				
<a href="#">Error Log</a>	One type from a list	W		See <a href="#">Table 367</a>
<a href="#">Message Timeout</a>	Number	W	250	250–3,000 Milliseconds
<a href="#">Poll Delay</a>	Number	W	100	0–65,535 Milliseconds
<a href="#">Retries</a>	Number	W	3	3–10
<a href="#">Trunk Number</a>	Number			0–65,535
<a href="#">UDP Port</a>	Number	W	0	
<b>N2 Device Hardware Attributes</b>				

**Table 366: N2 Hardware Tab**

Attribute Name	Data Type	Notes <sup>1,2</sup>	Initial Value	Values/Options/Range
<i>Controller Type</i>	One type from a list	C		AHU, VAV, UNT, PHX, VND, MIG, VMA, DX, TC, XTM, LCP, ILC, IFC
<i>Disable Automatic Alarming</i>	True or False	CW	False	False True
<i>Host Name</i>	Text			
<i>Net N2 Address</i>	Number	C	0	1–254
<i>Online Point Delay</i>	Number	CW		Range = 0–8 Units = Minutes
<b>N2 Point Hardware Attributes</b>				
<i>Interface Value</i>	One from a set or Number			
<i>Net Point Addr</i>	One type from a set			
<i>Net Point Type</i>	One type from a set			
<i>Offline</i>	True or False			Offline (True), Online (False)
<i>Overridden</i>	True or False			
<i>Trouble</i>	True or False			Applies to BI and BO objects.

1 C - Configurable, W - Writable

2 The Writable attributes in the N2 Master Datalink object are writable only if the UDP Port attribute is not zero. If the UDP Port attribute is zero and you attempt to write these attributes, an error message appears.

**Table 367: N2 Errors**

Error Number	Description
0	Controller has reset and is waiting for the Identify Yourself command
1	Undefined Command: command not understood by addressed controller
2	Checksum Error detected by controller
3	Input buffer overflow detected by controller
4	Invalid ASCII character detected by controller
5	Data field error: size of message not correct for command type
6	Invalid Data: one of the fields contains a value that is out of the expected range
7	Invalid command for data type: command not appropriate for this field or record
8	Command not accepted due to problems with the controller, the command is ignored
9	Device at address is the wrong type
10	No additional records are available (end of search)
11	Controller not ready
12	Data not matching the item or function type
13	Nonexistent item or function
14	Temporarily impossible to access the item
15	Not a programmable item
16	Table programmed with illegal item
17	Trend programmed with illegal item
18	Invalid Function Module

**Table 367: N2 Errors**

Error Number	Description
19	Exceeding Addressing Range
20	Password Not Enabled
21	I2C bus communication error (see I2CE)
22	Hardware not available (see OPMO)
23	Illegal item number
24	Counters unreliable
25	Power supply unreliable
26	Checksum Error detected by NxE
27	Block Checksum Error detected by NxE
28	Controller type does not match NxE database
29	Controller revision is less than C03
30	Controller revision is less than B03
31	Controller revision is less than A03
32	Controller revision is less than C05
33	VMA COV error
34	VMA BAC error
35	VMA FMT error
36	Retry error not due to a NAK
37	Unknown NAK error

**N2 Hardware Tab Attribute Details****Controller Type**

Defines the N2 controller type assigned to this object.

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**Disable Automatic Alarming**

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device's mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

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**Error Log**

Lists up to 100 error log entries. Each entry contains the N2 Controller Type, N2 Address, Error Description, and a Timestamp (time error occurred). Logging stops once the 100th entry is added. This list is stored in memory only. The Clear Statistics command clears the Error Log.

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**Host Name**

Indicates the host name of the Ethernet (or wireless) converter. When a host name is given, the system attempts to resolve the Host Name and IP Address using DNS/DHCP (assuming that the installer assigned a host name to the converter and enabled DHCP). If the device can be located using the **ping hostname** command, the system can resolve the host name to an IP address. After resolving the host name, the system updates the IP address.

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**Interface Value**

Indicates the current value from the hardware interface. The Interface Value updates when the hardware is read or when the hardware's current value changes.

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**Message Timeout**

Specifies the delay in milliseconds between the last character going out and the first character received. The timeout for VMA devices is three times this value. The actual timeout can be extended dynamically when at least one character of a response message is received before the timeout.

**Note:** The Message Timeout attribute is writable only if [UDP Port](#) is not zero. If UDP Port is zero and you attempt to write Message Timeout, an error message appears.

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**Net N2 Address**

Defines the host controller Address (1–254) on the N2 bus.

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**Net Point Addr**

Defines the hardware address associated with the point.

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**Net Point Type**

Indicates the type of point (for example, AI or BI).

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**Offline**

Indicates whether the hardware device is currently communicating with the system (True = Offline; False = Online).

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**Online Point Delay**

Indicates the number of minutes that must elapse before bringing an N2 Controller online. This attribute allows integration devices, such as the MIG or VND, to gather status from their many field points before being reported online by the engine. With no delay, the N2 Controller reports unreliable and causes nuisance alarms. This timer is ignored when the Controller Type is not MIG or VND.

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**Overridden**

Indicates whether the hardware device is currently overridden.

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**Poll Delay**

Specifies the time to wait in milliseconds for a response to an offline poll.

**Note:** The Poll Delay attribute is writable only if UDP Port is not zero. If UDP Port is zero and you attempt to write Poll Delay, an error message appears.

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**Retries**

Specifies the number of message retries allowed when the device is online, including the initial attempt. Only one retry is attempted to an offline device.

**Note:** The Retries attribute is writable only if [UDP Port](#) is not zero. If UDP Port is zero and you attempt to write Retries, an error message appears.

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### Trouble

Indicates whether the hardware device is currently under a trouble condition. Applies to BI and BO objects.

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### Trunk Number

Specifies the number of the trunk on which the object resides.

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### UDP Port

Indicates the Ethernet UDP Port used for N2 communication over the IP network. The recommended UDP Port for N2 Trunk 1 is 4096 and for N2 Trunk 2 is 4097. Only valid on NAE5512 and NAE5513 models.

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### VND Hardware Tab

Attributes associated with the hardware source for object data are shown under the Hardware tab of the display panel.

**Table 368: VND Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<b>VND Integration Hardware Attributes</b>				
<a href="#">Disable Automatic Alarming</a>	True or False	CW	False	
<a href="#">Protocol Description</a>	Text	C	VendorDriver	
<a href="#">Protocol Revision</a>	Text	C		
<a href="#">Protocol Revision Date</a>	Date	C		
<a href="#">Protocol Revision Time</a>	Time	C		
<a href="#">Temporary Status Item Expiration Time</a>	Number	CW		0–65,535 Units = Seconds
<a href="#">Vendor DLL</a>	Text	CW	VENDOR.DLL	
<a href="#">Vendor Integration Size</a>	Number			Units = bytes
<a href="#">Vendor Revision Date</a>	Date	C		
<a href="#">Vendor Revision Time</a>	Time	C		
<b>VND Integration, Device, and Point Hardware Attributes</b>				
<a href="#">Vendor Configuration Data</a>	List	CW		Maximum characters = 80 Maximum entries = 128
<a href="#">Vendor Reference</a>	Text	C		
<b>VND Point Hardware Attributes</b>				
<a href="#">Field Value</a>	Text			Applies to only AI, AO, BO, MI, and MO objects.
<a href="#">Interface Value</a>	One from a set			Applies to only AI, AO, BO, MI, and MO objects.
<a href="#">Max Value</a>	Real value	CW	250.0 deg F	Applies to only AO objects.
<a href="#">Min Value</a>	Real value	CW	-50.0 deg F	Applies to only AO objects.
<a href="#">Offline</a>	True or False			Applies to only AI, AO, BI, BO, MI and MO objects.

**Table 368: VND Hardware Tab Attributes**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<i>Overridden</i>	True or False			Applies to only AI, AO, BO, MI, and MO objects.
<i>Priority</i>	Number	CW		Applies to only AI, AO, BO, MI, and MO objects.
<i>Trouble</i>	True or False			Applies to only BI and BO objects.

1 C - Configurable, W - Writable

### **VND Hardware Tab Attribute Details**

#### **Disable Automatic Alarming**

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device's mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

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#### **Field Value**

Indicates the current value of the field point. Applies to only AI, AO, BO, MI, and MO objects.

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#### **Interface Value**

Indicates the current value from the hardware interface. The Interface Value updates when the hardware is read or when the hardware's current value changes. Applies to only AI, AO, BO, MI, and MO objects.

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#### **Max Value**

Defines the highest reliable value for the Present Value. Applies to only AO objects.

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#### **Min Value**

Defines the lowest reliable value for the Present Value. Applies to only AO objects.

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#### **Offline**

Specifies whether or not the point is offline. Applies to only AI, AO, BI, BO, MI and MO objects.

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#### **Overridden**

Indicates whether the hardware device is currently overridden. Applies to only AI, AO, BI, BO, MI and AO objects.

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#### **Priority**

Specifies the priority for polling the vendor point. Applies to only AI, AO, BI, BO, MI and MO objects.

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#### **Protocol Description**

Indicates the protocol supplied by the Vendor DLL.

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#### **Protocol Revision**

Indicates the revision of the protocol for reference purposes.

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**Protocol Revision Date**

Indicates the date the Vendor DLL protocol was compiled.

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**Protocol Revision Time**

Indicates the time the Vendor DLL protocol was compiled.

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**Temporary Status Item Expiration Time**

Indicates how long a point remains in the polling list.

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**Trouble**

Indicates whether the hardware point is currently under a trouble condition. Applies to only BI and BO objects.

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**Vendor Configuration Data**

Contains data for proper configuration of the integration.

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**Vendor DLL**

Specifies the name of the vendor DLL to load at startup.

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**Vendor Integration Size**

Indicates the size, in bytes, of the vendor integration.

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**Vendor Reference**

Specifies the address of the vendor device.

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**Vendor Revision Date**

Indicates the date of the Vendor integration revision.

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**Vendor Revision Time**

Indicates the time of the Vendor integration revision.

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**XL5K Hardware Tab**

Attributes associated with the hardware source for object data are shown under the Hardware tab of the display panel.

**Table 369: XL5K Hardware Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options Ranges
<b>XL5K Integration Hardware Attributes</b>				
<a href="#">Baud Rate</a>	Number	CW	9600	
<a href="#">Data Bits</a>	One value from a set	W	8	Uses Databits (Set 122).
<a href="#">Driver Name</a>	Text		XL5Kdrv	

**Table 369: XL5K Hardware Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options Ranges
<a href="#">Parity</a>	One type from a set	W	Even	Uses Parity (Set 123).
<a href="#">Protocol Revision</a>	Text			
<a href="#">Stop Bits</a>	One value from a set	W	1	Uses Stopbits (Set 124).
<a href="#">Trunk Number</a>	Number	W	1	Range = 0–6
<b>XL5K Device Hardware Attributes</b>				
<a href="#">Device Configured OK</a>	True or False			
<a href="#">Device Database OK</a>	True or False			
<a href="#">Device Health</a>	One state from a set			OK or Fault
<a href="#">Device Type</a>	Text	C		Maximum Length = 18 characters
<a href="#">Disable Automatic Alarming</a>	True or False	CW	False	False True
<a href="#">Download Date</a>	Date			
<a href="#">Download Time</a>	Time			
<a href="#">Firmware Version</a>	Text			
<a href="#">Hardware Version</a>	Text			
<a href="#">Reset Date</a>	Date			
<a href="#">Reset Time</a>	Time			
<b>XL5K Integration and Device Hardware Attributes</b>				
<a href="#">Device Number</a>	Number	CW	30	Range = 1–30
<b>XL5K Device and Point Hardware Attributes</b>				
<a href="#">Remote Name</a>	Text	CW		Honeywell device name
<b>XL5K Point Hardware Attributes</b>				
<a href="#">Remote Object Type</a>	One type from a set	C	Undefined	

1 C - Configurable, N - Value Not Required, W - Writable

**XL5K Hardware Tab Attribute Details**

**Baud Rate**

Indicates the baud rate of the integrated Honeywell® XL-5000 field device. Baud rates typically encountered include: 4800, 9600, 19200, 38400, and 76800.

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**Data Bits**

Indicates the data bits used by the XL-5000 equipment. The valid data bits/ [Stop Bits](#) value for Honeywell protocol is 8/1.

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**Device Configured OK**

Indicates if the Honeywell field device is fully configured, ready to run, operational, and if its database has objects.

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**Device Database OK**

Indicates if the Honeywell field device has a fully populated database containing no errors, corruptions, or missing parts.

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**Device Health**

Indicates if the Honeywell field device is fully operational, running, and has correct operations.

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**Device Number**

Indicates the number assigned to the NIE (as a Honeywell field device on the C-bus).

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**Device Type**

Indicates the type of Honeywell field device. For example, the XL-5000 family: XL-10, XL-20, XL-50, XL-80, XL-100, XL-300, XL-500, XL-600, Zone Manager.

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**Disable Automatic Alarming**

Specifies whether automatic online/offline device event reporting is disabled (True) or enabled (False). This attribute only applies to the device and not to the device's mapped objects. Devices with the Disable Automatic Alarming attribute set to True suppress the alarm event but still indicate they are offline in the navigation tree with a red X. Alarm extensions are not affected by this attribute.

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**Download Date**

Displays the Date stamp returned from the Honeywell field device (if extractable, otherwise displays the date when the object was defined).

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**Download Time**

Displays the Time stamp returned from the Honeywell field device (if extractable, otherwise displays the time when the object was defined).

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**Driver Name**

Indicates the protocol DLL driver name for this integration (for example, XL5Kdrv).r).

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**Firmware Version**

Indicates the firmware version of the receiver module.

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**Hardware Version**

Indicates the hardware version of the receiver module.

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**Parity**

Indicates the parity used by the XL-5000 equipment. The valid parity for Honeywell protocol is Even.

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**Protocol Revision**

Indicates the current version number of the XL5K Protocol Engine (PC104).

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#### **Remote Name**

Indicates the existing name of the Honeywell field device.

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#### **Remote Object Type**

Indicates the type of remote object (for example, Analog Input, Digital Output, and Pulse Input).

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#### **Reset Date**

Indicates the date of the last Clear Statistics command.

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#### **Reset Time**

Indicates the time of the last Clear Statistics command.

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#### **Stop Bits**

Indicates the stop bits used by the XL-5000 integration. The valid [Data Bits](#) value for Honeywell protocol is 8/1.

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#### **Trunk Number**

Indicates the trunk number used for the integration. This number is typically 1.

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### ***Input Category Tab***

The Input Category tab appears on GIO objects and includes the status, description, and value of the items in the category. See the [Generic Integration Object](#) section for details.

### ***Interlock Definition Tab***

The Interlock Definition tab appears on Interlock objects. See the [Interlock Object](#) section for details.

### ***Load Tab***

The Load tab appears on an object that has a load extension. See [Load Extensions](#) in the [Extensions](#) section.

### ***Load Summary Tab***

The Load Summary tab appears on DLLR objects. See the [Demand Limiting/Load Rolling \(DLLR\) Object](#) section for details.

### ***Logic Tab***

The Logic tab appears on Program (Control System) objects, which are used for the LCT feature. See the [Program \(Control System\) Object](#) and the [Logic Connector Tool \(LCT\)](#) feature section for details.

### ***Members Tab***

The Members tab appears on Life Safety Point and Life Safety Zone point objects. See the [Life Safety Point Object](#) and [Life Safety Zone Object](#) sections for details.

### ***Network Tab***

The Network tab appears on Engine Device objects. See the [Engine Device Object](#) section for details.

### ***Options Tab***

Attributes associated with the default state, control source, and restart options for an object are shown under the Options tab of the display panel.

**Table 370: Options Tab**

Attribute Name	Data Type	Notes <sup>1</sup>	Initial Value	Values/Options/Range
<a href="#"><i>Auto Restore</i></a>	True or False	CW	True	Applies to AO, BO, and MO objects.
<a href="#"><i>Ignore Relinquish Default</i></a>	True or False	CW	True	Applies to AO, BO, MC, and MO objects.
<a href="#"><i>Local Control</i></a>	True or False	CW	True	Applies to AO, BO, and MO objects.
<a href="#"><i>Ignore Relinquish Default</i></a>	Real value	CW		Range = Min Value - Max Value Applies to AO, BO, MC, MO, AV, BV, and MV objects.
<a href="#"><i>Restore Command Priority</i></a>	Set of values	CW	Operator Override	Uses Restore Priority (Set 357). Applies to AO, BO, MC, MO, AV, BV, and MV objects.

1 C - Configurable, W - Writable

## Options Tab Attribute Details

### **Auto Restore**

When True, the point restores the last command on field device online/offline transition. Applies to AO, BO, MO, AV, BV, and MV objects.

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### **Ignore Relinquish Default**

When True, the Relinquish Default attribute is not used and has no effect. Applies to AO, BO, MC, MO, AV, BV, and MV objects.

Back to [Options Tab](#).

### **Local Control**

When True, the point is under local control and the Present Value can be commanded only with an operator override command. Applies to AO, BO, MO, AV, BV, and MV objects.

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### **Relinquish Default**

Used as the default value for Present Value when all command values in Priority Array are Null. Applies to AO, BO, MO, AV, BV, and MV objects.

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### **Restore Command Priority**

Allows you to select which commands (at a selected priority) persist through a supervisory device restart. When the bit is set, the command (at the selected priority) is saved at shutdown and restored at startup. Applies to AO, BO, MC, MO, AV, BV, and MV objects.

Back to [Options Tab](#).

## Output Category Tab

The Output Category tab appears on GIO objects and includes the status, description, and value of the items in the category. See the [Generic Integration Object](#) section for details.

## Pager Tab

The Pager tab appears on Engine or Server objects. The Pager DDA Attributes appear on the Shared Configuration section of the Pager Tab. The Pager DDA Destination Configuration Attributes appear when you edit a specific Pager destination on the Pager tab.



**Table 371: Pager DDA Shared Configuration Attributes**

Attribute Name	Data Type	Initial Values	Description
<b>Connect Using</b>	One from a list of values	Internal Modem (0)	See Modem Type (Set 564).
<b>Access Number<sup>1</sup></b>	Text		
<b>Redial Attempts</b>	Number	3	Minimum Value = 0, Maximum Value = 32767 Range Check = Use Limits
<b>Time Between Redial Attempts</b>	One from a list of values	1 Second (0)	See the Redial Delay (Set 565).
<b>Idle time Before Hanging Up</b>	One from a list of values	1 Minute (1)	See the Idle Time (Set 566).
<b>Redial if Line is Dropped</b>	True or False	True	
<b>Databits</b>	One from a list of values	7	See the Pager Databits (Set 429).
<b>Parity</b>	One from a list of types	Even	See the Pager Parity (Set 430).
<b>Stopbits</b>	One from a list of values	1	See the Pager Stopbits (Set 431).
<b>Password</b>	Text	000000 <sup>2</sup>	Supports alphanumeric and special ASCII characters.
<b>Pager Diagnostics</b>	Text		Displays the communication between the Pager DDA, modem, and customer's paging Service. It displays both successful and unsuccessful attempts to send a page.

1 Be sure to check the Access Number and Password after an upgrade. In some cases, these values are not maintained after upgrade.

2 000000 is the standard default password for the Telocator Alphanumeric Protocol used by the pager.

**Table 372: Pager DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Label</b>	Identifies the user-friendly name for a pager destination in the list of Pager DDAs.
<b>Pager Phone Number</b>	Specifies the phone number for the user's pager.
<b>Max Characters</b>	Specifies the maximum number of characters supported by the pager service provider.
<b>Retries</b>	Specifies the number of attempts made to send a message if there is a failure before the system discards it. Range: 0–10
<b>Enabled</b>	Defines whether or not the destination is enabled. When this attribute is False, the Engine or Server does not deliver pager messages to the configured recipients.

**Table 372: Pager DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Filters</b>	Specifies the rules to filter pager messages. See <a href="#">Filters</a> for more information.
<b>Format</b>	Defines the format of the message, indicating which fields are present in the received message. The following fields are optional: <ul style="list-style-type: none"> <li>• Acknowledge Required (not an option for pager)</li> <li>• Item Category</li> <li>• Item Description</li> <li>• Item Fully Qualified Reference</li> <li>• Message</li> <li>• Previous Status</li> <li>• Priority</li> <li>• Site Name</li> <li>• Value</li> </ul>

See [Event Message Routing, Filtering, and Destinations](#) for more information on this DDA.

### **Parameter Category Tab**

The Parameter Category tab appears on GIO objects and includes the status, description, and value of the items in the category. See the [Generic Integration Object](#) section for details.

### **Printer Tab**

The Printer tab appears on Server objects. The Printer DDA Destination Configuration Attributes appear when you edit a specific Printer destination on the Printer tab.

**Table 373: Printer DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Printer</b>	Specifies the name of the printer where reports are routed. The Printer DDA can send alarms to one or multiple printers. <b>Note:</b> If you are uncertain about the proper printer name to use, print a test page from the printer and look for the Printer name line in the test printout. Copy the name and syntax exactly.
<b>Font Face</b>	Specifies the font used by the printed report.
<b>Font Size</b>	Specifies the font size used in the printed report.
<b>Orientation</b>	Defines the orientation of the printed report (landscape or portrait).
<b>Line Out</b>	Defines how many lines of data are required before the Printer DDA routes reports to the printer. Setting this value to 0 enables tractor-feed/line printing. See the <a href="#">Printer</a> topic in the <a href="#">Alarm and Event Management</a> section. Range: 0–60
<b>Timeout</b>	Timer (in minutes) that begins when the first alarm is stored in the DDA line out buffer (Line Out). Upon expiration, the contents of the line out buffer prints.

**Table 373: Printer DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Printing Priority Threshold</b>	<p>Specifies the priority for printing alarm messages. You can print multiple alarms in a normal priority range at once using the Line Out and Timeout attributes. You also can set the Printing Priority Threshold to print the contents of the line out buffer immediately when a higher priority alarm (such as a fire alarm) is detected. You can set the Printing Priority Threshold to a value from 0 to 255. When an alarm is received that has a lower priority number than the Printing Priority Threshold (lower priority numbers have a higher alarm priority), the contents of the line out buffer print immediately when the higher priority alarm (such as a fire alarm) is detected, thus printing the high priority alarm in addition to the contents of the line out buffer.</p> <p>For example, if the Printing Priority Threshold is set to 20, alarms with a priority number of 20 or greater are buffered using the Line Out and Timeout attributes. Receiving an alarm with a priority number of 19 or less forces an immediate printout of the currently buffered alarms plus the new high priority alarm.</p> <p>This functionality applies when the Line Out attribute is set to 1 or greater. Also see the the <a href="#">Printer</a> topic in the <a href="#">Alarm and Event Management</a> section.</p> <p>See the Hi Normal Low (Set 100).</p>
<b>Retries</b>	<p>Specifies the number or attempts made to print a report if there is a failure before the system discards it.</p> <p>Range: 0–10</p>
<b>Enabled</b>	<p>Defines whether or not the destination is enabled. When this attribute is False, the Server does not deliver reports to the configured printer.</p>
<b>Filters</b>	<p>Specifies the rules to filter messages.</p> <p>See <a href="#">Filters</a> for more information.</p>
<b>Format</b>	<p>Defines the format of the message, indicating which fields are present in the received message.</p> <p>The following fields are optional:</p> <ul style="list-style-type: none"> <li>• Acknowledge Required (not an option for pager)</li> <li>• Item Category</li> <li>• Item Description</li> <li>• Item Fully Qualified Reference</li> <li>• Message</li> <li>• Previous Status</li> <li>• Priority</li> <li>• Site Name</li> <li>• Value</li> </ul>

See [Event Message Routing, Filtering, and Destinations](#) for more information on this DDA.

### **Profile Tab**

The Profile tab appears on DLLR objects. See the [Demand Limiting/Load Rolling \(DLLR\) Object](#) Object section for details.

### **Recipient List Tab**

The Recipient List tab appears on Notification Class objects. See the [Notification Class Object](#) section for details.

### **Resource Tab**

The Resource tab appears on an object that has a resource file extension. See [Resource File Extensions](#) in the [Extensions](#) section.

### **Schedule Tab**

The Schedule tab appears on Schedule objects. See the [Schedule Object](#) and the [Scheduling](#) feature sections for details.

## Site View Tab

The Site View tab appears on Site objects. See the [Site Object](#) section for details.

## SNMP Tab

The SNMP tab appears on Engine or Server objects. The SNMP DDA Attributes appear on the Shared Configuration section of the SNMP Tab. The SNMP DDA Destination Configuration Attributes appear when you edit a specific SNMP destination on the SNMP tab.

**Table 374: SNMP DDA Shared Configuration Attributes**

Attribute Name	Description
<b>SNMP Enabled</b>	Specifies whether the SNMP feature is enabled. Once this attribute is enabled, the ability to send and receive messages (Traps and Gets) can be enabled or disabled on an individual basis using the other SNMP DDA attributes.
<b>SNMP Trap Version</b>	Specifies the version used to send SNMP traps. The versions are v1, v2c, and v3.
<b>SNMP Management Device</b>	Specifies an IP address or Host Name on which to filter Get requests. SNMP only responds to requests from the device listed in this attribute. If this attribute is 0.0.0.0, SNMP responds to all requests.
<b>SNMP Request Port</b>	Specifies the port on which SNMP communication occurs. Setting this attribute to 0 disables the Get feature of SNMP.
<b>Contact Person</b>	Specifies the IT person who is responsible for managing SNMP communications.
<b>Public Community Name</b>	A case-sensitive string used to authenticate v1 and v2c Get and Get Next messages. This attribute contains the community string used by the Network Management System to edit data in objects maintained by managed devices.
<b>SNMP Trap Message Format</b>	Defines the message format used for generating SNMP Traps, including the startup Trap. The options are: <ul style="list-style-type: none"><li>• String Based (default) - SNMP Traps are sent as a string of characters</li><li>• MIB Based - SNMP Traps are sent using the object identifier (OID) defined in the Johnson Controls MIB (called, JCI MIB).</li></ul>

**Table 375: SNMP DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Label</b>	The name of this destination when it appears in the Destinations list.
<b>Trap Community Name</b>	A case-sensitive string used to authenticate v1 and v2c SNMP Traps. This attribute contains the community string used by the Network Management System to edit data in objects maintained by managed devices.
<b>IP Address</b>	Specifies the IP address or host name of the system that receives the traps.
<b>Destination Port Number</b>	Specifies the port number from which the destination machine is expecting to receive traps.
<b>Enabled</b>	Specifies whether this SNMP destination is enabled or disabled.

**Table 375: SNMP DDA Destination Configuration Attributes**

Attribute Name	Description
<b>Filters</b>	Specifies the rules to filter alarms. This attribute uses Alarm Value (Set 108). See <a href="#">Filters</a> for more information.
<b>Format</b>	<p>Allows you to select which attributes of a Metasys event are in the SNMP Trap.</p> <p>The following fields are optional:</p> <ul style="list-style-type: none"> <li>• Acknowledge Required (not an option for pager)</li> <li>• Item Category</li> <li>• Item Description</li> <li>• Item Fully Qualified Reference</li> <li>• Message</li> <li>• Previous Status</li> <li>• Priority</li> <li>• Site Name</li> <li>• Value</li> </ul>

See [Event Message Routing, Filtering, and Destinations](#) for more information on this DDA.

For detailed information on SNMP, refer to the **SNMP Agent Protocol Implementation appendix** located in the following documents:

- *Network and IT Considerations for the IT Professional Technical Bulletin (LIT-1201578)*
- *Network and IT Guidance for the BAS Professional Technical Bulletin (LIT-12011279)*

## Summary Tab

The Summary tab provides summary data for items in the navigation tree. For example, the Summary tab of the MSTP Field Bus object shows summary data for the devices on the field bus. The Summary tab shows the status, icon, item, value, and description information of the items. You can view and edit items on this tab using the right-click menu options.

**Note:** Data appears in the Status column of the Summary tab when the status is not Normal (for example, High Alarm).

## Summary Definition Tab

The Summary Definition tab appears on Summary Definition objects used by the Tailored Summary feature. This tab allows you to view and edit the Summary Definition object. See the [Summary Definition Object](#) and the [Tailored Summaries](#) sections for more information on this object and feature.

## Tailored Summary Tab

The Tailored Summary tab appears when you view the folder containing the Tailored Summary in the associated User View. This tab allows you to view the Tailored Summary you defined using the User View and the Summary Definition tab. See the [Tailored Summaries](#) section for more information on this feature.

## Totalization Tab

The Totalization tab appears on an object that has a totalization extension. See [Totalization Extensions](#) in the [Extensions](#) section.

## Tree View Tab

The Tree View tab appears on User Navigation Tree objects, which are used by the User Views feature. See the [User Navigation Tree](#) object and the [User Views](#) feature sections for details.

## Trend Tab

The Trend tab appears on an object that has a trend extension. See [Trend Extensions](#) in the [Extensions](#) section.

## ***Trend Study Tab***

The Trend Study tab appears on the Trend Study feature. See the [Trend Studies](#) feature section for details.

# Troubleshooting

Table 376: Troubleshooting

Problem	Solution
<p><b>When you attempt to execute any N2 Passthru tool (for example, HVAC PRO) from the ADS, ADX, or NAE user interface, the following error appears:</b></p> <p>The Supervisory Controller does not contain any supported devices</p>	<p>Date and/or time may be incorrect. Verify that all dates and times are correct. For more information, refer to <i>Appendix: Time Zone, Date, and Time Management</i> in the <i>ADS/ADX Commissioning Guide (LIT-1201645)</i>.</p> <p>OR</p> <p>Item name may be too long. See the <i>HVAC PRO Name Restrictions in Passthru Mode</i> section in the <i>SCT Technical Bulletin (LIT-120534)</i>.</p>
<p><b>SCT does not log on to allow HVAC PRO to load despite already being logged on to the NAE.</b></p> <p><b>SCT (offline) allows you to log on and run HVAC PRO, but you receive a ZSWHPRO crash when you try to do anything over Passthru.</b></p>	<p>The Site Director is offline. Log on and verify it is online.</p>
<p><b>Logon responds with:</b></p> <p>Unable to Login. Unexpected Error.</p>	<p>A user might be denied access to the ADS/ADX/SCT computer over the network. From the Control Panel &gt; Administrative Tools, check the Local Security Policy properties on the ADS/ADX/SCT computer and make sure that the user's name is not listed under the User Rights Assignment called <b>Deny access to this computer from the network</b>.</p> <p>OR</p> <p>An Active Directory user is denied access to the SCT because their user name has not been added to the MSEA-SSO user group on the SCT computer. For details, refer to the <i>Security Administrator System Technical Bulletin (LIT-1201528)</i>.</p> <p>OR</p> <p>Verify the Java® Runtime Environment (JRE) proxy settings are disabled. To verify proxy settings are disabled:</p> <ol style="list-style-type: none"> <li>1. From the Start menu, select Settings &gt; Control Panel.</li> <li>2. Select the Java icon. The Java Control Panel appears.</li> <li>3. Select the Proxies Tab.</li> <li>4. Uncheck Use browser settings.</li> <li>5. Click OK.</li> </ol> <p>OR</p> <p>SCT must be completely uninstalled. You may also have to uninstall IIS 5.0 and the .NET Framework. Reinstalling SCT should fix this problem. If there are error messages from the Installer, there may also be an issue at runtime.</p>
<p><b>SCT installer responds with:</b></p> <p>XPPKInitConsole.exe crash</p>	<p>Error typically occurs if IIS 5.0 is installed after the .NET Framework. Uninstall .NET, IIS, and SCT. Reinstall in the following order: IIS, .NET, SCT.</p>
<p><b>HVAC PRO gives the item reference of the NAE, but fails to get any controllers and causes ZSWHPRO.EXE to crash.</b></p>	<p>Only the second N2 Trunk is integrated. Integrate the first N2 Trunk, even if it has no controllers on it. You must integrate the first N2 Trunk if N2 Trunk 2 is being used in HVAC PRO, even if there are no devices on the first N2 trunk.</p>

**Table 376: Troubleshooting**

Problem	Solution
<p><b>Downloading and uploading the database of an NxE in SCT causes a Communication Error (521).</b></p>	<p>The SCT is case sensitive for the names of the NxE devices. Create a new Supervisory device in SCT and give it the exact same name of the NAE. For example, the name nae is different from NAE in SCT.</p>
<p><b>N2 applications respond with no information, or lock up.</b></p>	<p>Two N2 Passthru Applications may not run at the same time when used in Passthru mode. Close all of the N2 Passthru applications and restart. Run one N2 Passthru application at a time.</p>
<p><b>Downloading/Uploading the database of an NxE in SCT causes a Communication Error (521) or error (522).</b></p>	<p>This error occurs when the NxEs have domain names defined for them, but the domain names are not defined in SCT. When you define a new Site or a new Supervisory device in SCT, you must include the domain name as part of the name (for example, NAE.cg.jci.com instead of just NAE). It is also possible to use the IP address of the device that the archive is being taken from.</p>
<p><b>SCT upgrade tool fails with the following archive upgrade log error for a restored database:</b></p> <p>In ConvertArchives: Error in reading archive data for fixbuild1, Empty Archive</p>	<p>Verify the name of the backup matches the name of the archive. To verify the backup and archive names match, log onto the Site Director. The name at the top of the tree is the archive name. Rename the SCT backup database to match the archive name, restore the database, and execute the archive upgrade again.</p>
<p><b>When you attempt to use one of the N2 Passthru tools, the following error message appears:</b></p> <p>Supervisory Device Offline</p>	<p>M-Tools may have been installed while running the N2 Passthru. Shutdown all active N2 Tools and SCT. Reinstall SCT.</p>
<p><b>A DX9100 device may remain offline after exiting the GX9100 Commissioning tool. This occurs when the tool is run in passthru mode from an ADS. In the NAE, the DX9100 N2 Device tab shows:</b></p> <p>Offline = True and Enabled = True</p>	<p>The GX9100 device is disabled at the GX9100. To enable the GX9100 device, you must first command the DX9100 N2 Device to Disable, then command the DX9100 device to Enable.</p>
<p><b>The N2DeviceLoader/LoaderUI (LoaderUIG3.exe) crashes when you try to connect to the site.</b></p>	<p>The error typically occurs when you have a child NAE listed above the Site Director. When the child NAE appears offline (with a red or blue X), the N2DeviceLoader/LoaderUI crashes. Right-click on the offline NAE and choose Remove from Site.</p>
<p><b>The SCT installed without error, but the SCT UI window freezes or stalls while Java software is loading.</b></p>	<p>A connection manager may be installed on the computer. If present, uninstall the connection manager.</p> <p>As a reference, refer to <i>Microsoft Knowledge Base Article KB910435</i> (<a href="http://support.microsoft.com/kb/910435">http://support.microsoft.com/kb/910435</a>).</p>
<p><b>SCT responds with:</b></p> <p>You do not have permission to use the System Configuration Tool</p>	<p>This error occurs when you attempt to log onto the SCT and you do not have proper permissions assigned. If you are an Active Directory user, this occurs when attempting to start the SCT.</p> <p>Verify that System Configuration Tool is an assigned privilege for the user in the System Access Permissions of the Security Administrator System.</p>



**Table 376: Troubleshooting**

Problem	Solution
<p><b>The SCT download freezes with the load status of establishing communications. No error message appears.</b></p>	<p>If this problem occurs while performing downloads in the SCT, wait a few minutes to allow the download to complete. Then, refresh the SCT display. The updated status message appears when the download completes.</p> <p><b>Note:</b> The amount of time it takes to download depends on the size of the database, but is usually a few minutes.</p> <p><b>Note:</b> In addition, you can determine that the database downloaded properly by waiting for the device to come online after the download completes.</p>
<p><b>When downloading a device or server, one of the following messages appears:</b></p> <p><code>Communication Lost after Reset Communication error (521)</code></p>	<p>This error may occur due to problems with network connectivity, or the unavailability of the target devices. Check the following:</p> <ul style="list-style-type: none"> <li>• The device (ADS, ADX, NxE) to which you are downloading is powered, operational, and has network connectivity to the computer running SCT.</li> <li>• In an ADX split configuration, both the ADX Web/ Application Server and the ADX Database Server are powered and operational, and the ADX Web/ Application Server has network connectivity to the computer running SCT and to the ADX Database Server.</li> </ul>
<p><b>In SCT, device names start with sync_copy after synchronizing databases.</b></p>	<p>The synchronization failed. This problem may occur when the SCT computer disconnects from the network before the synchronization completes.</p> <p>Under normal synchronization behavior, the SCT creates a copy of your device database. For example, a database named NAName has a copy called sync_copy_NAName. Then the SCT creates a fresh copy of the database NAName with which to work. If a problem occurs with the synchronization while SCT has control, the SCT deletes the fresh copy NAName database and renames the sync_copy_NAName database to NAName. No data is lost.</p> <p>When problems such as the SCT computer disconnecting from the network before the synchronization completes, both copies of the database appear in the SCT.</p> <p>To resolve sync_copy device databases:</p> <ol style="list-style-type: none"> <li>1. Delete both the device and its copy (for example, NAName and sync_copy_NAName) from the SCT database.</li> <li>2. Upload the device (NAName) if you have only made changes in the online Site Management Portal UI; otherwise, restore the backup of the SCT database and download the device.</li> </ol> <p><b>Note:</b> Make sure the SCT computer remains running and online until the synchronization process completes to prevent future failures.</p>
<p><b>You are uncertain whether to control your building with standard objects or the LCT.</b></p>	<p>In general, if you can perform tasks with standard objects, do so. Standard objects are less memory intensive and thus have a smaller impact on system performance than complex LCT logic.</p>

**Table 376: Troubleshooting**

Problem	Solution
<p>In SCT, when trying to save a standard user graphic from a restored database, the following error appears:</p> <p>Failed to communicate to the server or device.</p>	<p>This problem occurs when the user graphic size is over 4 MB, which is the default maximum allowed size for a IIS message as defined by Microsoft Corporation.</p> <p>The workaround is to increase the default size using the &lt;httpRuntime&gt; element in the <b>system.web</b> section of the <b>web.config</b> file. Change the values of the maxRequestLength and executionTimeout attributes.</p> <p><b>Note:</b> maxRequestLength is defined as the number of KB allowed, so the default is 4096 KB (4 MB); executionTimeout is the number of seconds until the request is killed.</p> <p>For example, a maxRequestLength of 40 MB and executionTimeout of 10 minutes appears as follows (see the bold text in this sample web.config file snippet):</p> <pre> ... &lt;configuration&gt;   &lt;appSettings&gt;     &lt;!-- The following settings are used by the GenericItem Capability. --&gt;     &lt;add key="GenericItemDb.AssemblyName" value="C:\inetpub\wwwroot\MetasysIII\Tool \bin\Subsystems.Database.dll" /&gt;     &lt;add key="GenericItemDb.ClassName" value="JohnsonControls.MetasysIII.Database. GenericItemDbFactory" /&gt;     ...   &lt;/appSettings&gt;   &lt;system.web&gt;     &lt;httpRuntime executionTimeout="600" maxRequestLength="40960" /&gt;   &lt;/system.web&gt; &lt;/configuration&gt; </pre>
<p>On the Windows 7 OS, and Windows Server 2008 OS, applications (including Windows Tools such as IIS Manager, Windows Event Viewer, and so on) do not run with Administrative privileges even though you are logged into the computer as an Administrator.</p>	<p>Manually run the application as an Administrator:</p> <p>Right-click the application and select Properties &gt; Run As Administrator.</p>
<p>On the Windows 7 OS, or Windows Server 2008 OS, when using Windows Authentication to access a SQL database with SQL Server Express Management Studio (or other user driven application), you do not obtain sysadmin permissions in the SQL database even though you are logged into the computer as Built-in/ Administrators have sysadmin permissions in the SQL database.</p>	<p>Manually run the application as an Administrator:</p> <p>Right-click the application and select Run As Administrator.</p>
<p>On the Windows 7 OS, and Windows Server 2008 OS, you cannot view log files.</p>	<p>Due to changes in Administrator viewing behavior, log files may not be visible. Manually run Windows Explorer as an Administrator:</p> <p>Right-click the Windows Explorer icon and select Run As Administrator.</p>

**Table 376: Troubleshooting**

Problem	Solution
<p><b>On the Windows 7 OS, and Windows Server 2008 OS you cannot access protected folders (such as Program Data) even though you are logged into the computer as an Administrator.</b></p>	<p>Manually run Windows Explorer as an Administrator: Right-click the Windows Explorer icon and select Run As Administrator.</p>
<p><b>On the Windows 7 OS, and Windows Server 2008 OS, you cannot find the Add/Remove programs option in the Control Panel.</b></p>	<p>Add/Remove Programs is now called <b>Programs and Features</b>. From the Control Panel, select Control Panel Home on the left hand pane. Then in the right hand pane, select Programs &gt; Programs and Features.</p>
<p><b>On the Windows 7 OS, and Windows Server 2008 OS you cannot locate where to change the folder settings, such as showing file extensions and showing system files.</b></p>	<p>From the Control Panel, select Appearance and Personalization &gt; Folder Options. <b>Note:</b> This task is done on an individual user basis.</p>
<p><b>Windows 7 OS, and Windows Server 2008 OS do not prompt for Consent or Credentials.</b></p>	<p>This situation happens when you are logged in as the built-in <b>Administrator</b> account. The built-in <b>Administrator</b> account provides a full administrator access token, unlike other administrative users who are logged in with only standard access tokens that require elevation to perform administrative tasks. In the Windows 7 OS, the built-in <b>Administrator</b> account is disabled.</p>
<p><b>Some OS combinations do not support SSO.</b></p>	<p>A restriction exists if you are using a client computer with Windows 7 OS to access the Site Management Portal UI of an ADS/ADX or SCT installed on a computer running Windows 7 OS, or Windows Server 2008 OS. SSO is not supported with these combinations. When configuring the Active Directory feature of the Metasys system, disable SSO for the Metasys site. Users still can use the Active Directory username/password/domain function at the Metasys system login screen.</p>
<p><b>One of the following errors appears after attempting a global modification:</b>  Object does not exist.  One or more attribute modifications failed.</p>	<p>When running Metasys Release 3.0 or later, you cannot use the global modify feature on devices at Release 2.2 or earlier. For information on globally modifying items, see Performing a Global Modify in the Modify Dialog section.</p>
<p><b>An object appears with no name in the navigation tree or the Focus/Configuration tab.</b></p>	<p>This problem occurs when an object is created through third-party BACnet network and neither the Object Name (BACnet property) nor the User Name (Johnson Controls proprietary property) is initialized. As a result, the object appears with no name in the navigation tree (that is, only the icon appears) or the Focus/Configuration tab. The object functions properly. An SCT download works and the Site Management Portal UI displays the information as it was before the upload.  The UI forces you to enter a user name when you attempt to edit any other fields of the object.  This problem does not occur if you specify an Object Name either during the BACnet create or through a BACnet write after object creation.</p>

**Table 376: Troubleshooting**

Problem	Solution
<p>If you use the Release All command from the Site Management Portal UI to release overrides of the FEC Outputs, the priority array that resides in the FEC controller clears. The FEC controller outputs go to the Relinquish Default values and are not commanded with the value determined by the controller application because the module outputs send on a COV basis.</p>	<p>This is a misuse of the Release All command. The Release All command works exactly as designed. The proper command to use is the Override Release command.</p> <p>To recover the FEC controller from a Release All Command, issue the command value determined by the application instead of the relinquish default.</p> <p>To release an override, use the Override Release command. For other types of releases, make sure you use the release that corresponds to the command to release.</p>
<p>The Metasys system cannot discover BACnet Trend Logs on a Siemens device.</p>	<p>You cannot discover BACnet Trend Logs on a Siemens device. Add the Trend Log manually to show the trend log attributes in the views and log data graph properly. The Siemens third-party Trend Log object does not support the Logging Type attribute, which is used in the BACnet discovery process.</p>
<p>When adding a LonWORKS point manually, the Target Reference appears blank.</p>	<p>This is normal functionality. Manually type the path for the Target Reference (path into the controller for the data being mapped by the object) in the text box on the Select Data Source screen.</p>
<p>You cannot command analog objects to values outside of the minimum/maximum present value allowable range. If you have objects with values outside of the allowable range and upgrade to the next software release, the objects may now appear unreliable.</p> <p>This affects programmed features such as the LCT, Scheduling, and the Multiple Command Object (MCO), as well as manual commands.</p>	<p>Change the minimum and maximum range to include the values used to ensure your features work properly.</p>
<p>The Metasys system cannot command or write LonWORKS, N1, N2, XL5000, and VND output points at priority 6 (Minimum On Off).</p>	<p>Priority 6 (Minimum On Off) is reserved by the BACnet protocol for minimum on/off control. You may need to edit interlocks, multiple command objects, schedules, and LCT objects in existing databases using this priority after converting them.</p>
<p>When a point goes into alarm, Metasys software receives the alarm message and a multitude of normal messages. You must acknowledge all normal messages to get to the alarm message. You are not using BACnet intrinsic alarming.</p>	<p>If you experience this issue:</p> <ol style="list-style-type: none"> <li>1. In the Notification Class object, on the Focus\Configuration tab, click Edit.</li> <li>2. Find the Ack Required attribute.</li> <li>3. Deselect To Normal.</li> <li>4. Click Save.</li> </ol>
<p>Computer Name (Host Name) restrictions are unclear to you.</p>	<p>Starting at Release 2.1.10, the NAE/NIE Update Tool placed restrictions on the Host Name (Computer Name) values you can use for NAE35, NAE45, and NCE25 models. Name values must start with a letter, end with either a letter or a number, and may contain dashes only in the interior of the name. The Host Name must contain a letter other than or in addition to the letter A. For example, A522446 is not valid, but either A522446B or AB52446 are valid. Failure to follow the Host Name restrictions results in the Computer Name value changing when an NAE35, NAE45, or NCE25 is updated. Refer to the <i>NAE/NIE Update Tool Technical Bulletin (LIT-12011524)</i> for more information on Host Name restrictions.</p>

**Table 376: Troubleshooting**

Problem	Solution
<p><b>Changes made at an NxE do not appear in the UI of the Site Director.</b></p>	<p>For releases prior to Release 5.0, use the Update All Items Cache command to update the All Items cache on the Site Director.</p> <p>See the Update All Items Cache <a href="#">Update All Items Cache</a> command and All Items Update in Progress <a href="#">All Items Update in Progress</a> attribute descriptions in the <a href="#">Site Object</a> section for details.</p> <p><b>Note:</b> The All Items cache automatically updates for engines at Release 5.0 or later.</p>
<p><b>You cannot edit an LCT process on an NxE at version 2.1 or 2.2 from ADSs/ADXs at Release 3.0 or later.</b></p> <p><b>The following error message appears when attempting to edit LCT processes or Program (Control System) objects from earlier versions:</b></p> <p>This logic diagram is read-only for the current version of Metasys. To edit the diagram you must directly login to the device on which it is located.</p> <p><b>A similar error message appears if you try to edit a graphic object at Release 2.2 or earlier from a Site Director at Release 3.0 or greater.</b></p>	<p>You cannot have mixed revisions when you want to edit the LCT in the Engine from the ADS/ADX, if the ADS/ ADX is at Release 3.0 or later. You cannot have devices at different releases because the Scalable Vector Graphic (SVG) rendering program was changed after Release 2.2.</p> <p>This change in functionality is per design. As the system progressed, we were unable to support newer features while maintaining the ability to edit the processes created in the earlier versions. To edit LCT processes or Program (Control System) objects in a mixed system you need to log into the Engine directly.</p>
<p><b>The download seems to progress correctly, but the SCT UI reports that the load still is establishing communications. No errors appear.</b></p>	<p>This issue can occur at any Metasys release and is a result of a problem with the ActionQ. With this issue, the load executes successfully, but the UI does not show the status of the download correctly. If you suspect the download is complete, refresh the screen and verify that the status of the download is complete.</p>
<p><b>Some graphics appear jumbled when viewed in a single pane. If you minimize the window and maximize it again, the problem resolves for a few moments and then recurs.</b></p>	<p>This issue may be due to the following circumstances:</p> <ul style="list-style-type: none"> <li>• older Java software components present on the computer</li> <li>• the graphics card on your computer is not configured properly</li> <li>• To resolve this issue, remove any unused Java software on your computer using Add/Remove Programs. Check the product documentation from the graphic card manufacturer to make sure the card is configured properly.</li> </ul>
<p><b>You are using Metasys software with P2000 software and alarm behavior is unexpected.</b></p>	<p>Discarding or acknowledging an alarm at the ADS/ADX acknowledges the alarm, but then the alarm reappears (with the same date/time stamp) in the Alarms window and Event Viewer of the ADS/ADX, but not the P2000 Event Viewer.</p> <p>This is expected behavior at this time and occurs because the ADS/ADX cannot confirm activity in the P2000 system.</p>
<p><b>A graphic takes an unusually long time to appear in the UI.</b></p>	<p>To resolve this issue, try resizing the UI window. The graphic should appear at the usual speed.</p> <p><b>Note:</b> Keep in mind that graphic complexity, network traffic, and other factors can impact the speed at which graphics display. If a graphic displays consistently slowly, one of the factors may be the cause.</p>

**Table 376: Troubleshooting**

Problem	Solution
<p><b>Nodes in the navigation tree are slow to open for Release 5.0 or later.</b></p>	<p>This behavior may occur if the NavTreeCache database requires maintenance. A stored procedure in the NavTreeCache database called spu_DoDBMaintenance performs the required maintenance. You can run this stored procedure manually or on a schedule using either the SQL Server Agent or Windows OS Task Scheduler. Refer to microsoft.com for details on stored procedures and how to run them.</p>
<p><b>When entering the IP address in the Internet Explorer address bar to launch Metasys software, Multiple UI windows open.</b></p>	<p>If you are using a private network, we recommend you turn off the Internet Explorer SmartScreen Filter feature.</p> <p>Failure to do so does not prevent Metasys software from running, but may launch multiple UI windows unnecessarily.</p>
<p><b>E-mail is no longer being sent after upgrading from Release 4.0 to Release 5.0.</b></p>	<p>Due to changes made at Release 5.0, you may need to rebuild the E-mail DDA.</p>
<p><b>You are editing pager destinations and you lose some of the definitions.</b></p>	<p>This occurs when the web service times out. To workaround this you can extend the web service timeout. To do this:</p> <ol style="list-style-type: none"> <li>1. Navigate to c:\inetpub\wwwroot\MetasysIII\WS</li> <li>2. Open the web.config file in a text editor.</li> <li>3. Go to the section that ends with &lt;/system.web&gt;.</li> <li>4. Insert a blank line above that entry.</li> <li>5. In the inserted line, enter: &lt;httpRuntime executionTimeout="600"/&gt;</li> <li>6. Save the web.config file. This changes the default timeout of 110 seconds to 10 minutes, allowing sufficient time for the save to occur.</li> </ol> <p><b>Note:</b> Depending on your operating system and configuration, this file may be listed as an XML configuration file named web.</p>
<p><b>After a VND Integration is defined and a resource file extension is added, the file associated with the resource is not downloaded into the NAE45 (N40 folder) and therefore cannot be found or used for point auto-discovery.</b></p>	<p>Problem occurs when the User Access Control (UAC) default setting is set higher than Never Notify. Lower the UAC to Never Notify and the resource file can then be downloaded into the NAE.</p> <p><b>Note:</b> Windows 7 and server class Windows Operating Systems may require changing the User Account Control (UAC) settings to allow resource files (LON and Vendor Integrations) to be added to the NxE/LCS engines. The Metasys Site Portal does not inform the user when a resource file fails to download. For details, refer to the Refer to the <i>Disabling User Access Control section of the ADS, ADX, and SCT Installation and Upgrade Wizard Content (LIT-12011331)</i>.</p>
<p><b>After adding a field device using the Insert Field Device Wizard and using Auto Discovery, the navigation tree does not automatically update for defined points (+ sign appears next to device in tree).</b></p>	<p>If the navigation tree does not automatically update for defined points after adding a field device using Auto Discovery (+ sign appears next to device in tree) select Refresh All Tabs on the Action Menu to update.</p>

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