JOHNSON CONTROLS

Table of Contents

M-Explorer User's Guide

Table of Contents **M-Explorer User's Guide 1**

Chapter 1 **Using This Guide 1-1**

Introduction 1-1

Key Concepts 1-2

Chapter Organization 1-2

Online Help 1-2

Manual Conventions 1-2

Chapter 2 **Introduction to M-Explorer 2-1**

Introduction 2-1

Key Concepts 2-2

System Component Interaction 2-2

OPC Data Access Servers 2-2

M-Inspector 2-2

M-Password 2-3

Chapter 3 **Getting Started 3-1**

Introduction 3-1

Key Concepts 3-2

M-Explorer User Interface 3-2

M-Explorer Menus 3-4

M-Explorer Toolbar 3-5

Code No. LIT-1153405

Details View Columns 3-6
Pop-Up Menus 3-7
Browsing Guidelines 3-7
AutoRefresh 3-7
Status Color Coding 3-7
Dynamic Data Display 3-8
Procedure Overview 3-9
Detailed Procedures 3-10
Starting M-Explorer as a Standalone Application 3-10
Starting M-Explorer as a Workspace in the M3 Workstation 3-10
Starting M-Explorer from an Icon on the M5 Screen Manager Bar 3-12
Changing Object Status Color Coding 3-12
Troubleshooting 3-14
Chapter 4 **Working with M-Explorer Documents 4-1**
Introduction 4-1
Key Concepts 4-2
Save Options 4-2
Launch Options 4-2
Procedure Overview 4-3
Detailed Procedures 4-4
Saving the Current Browser State of M-Explorer as a Document 4-4
Launching an M-Explorer Document 4-6
Chapter 5 **Using M-Inspector 5-1**
Introduction 5-1
Key Concepts 5-2
M-Inspector Window 5-2
Procedure Overview 5-3
Detailed Procedures 5-4
Starting M-Inspector from M-Explorer Using the Actions Menu 5-4

Starting M-Inspector from M-Explorer Using a Pop-Up Menu 5-4
Using M-Inspector in M-Graphics 5-4

Chapter 6 **Embedding M-Explorer ActiveX Controls into M-Graphics 6-1**

Introduction 6-1

Key Concepts 6-2

ActiveX 6-2
ActiveX Control 6-2
Container Application 6-2
M-Graphics 6-2
M-Inspector 6-2

Procedure Overview 6-4

Detailed Procedures 6-5

Embedding M-Explorer ActiveX Control into M-Graphics 6-5
Embedding M-Command ActiveX Control into M-Graphics 6-5
Embedding M-View ActiveX Control into M-Graphics 6-6
Embedding M-Schedule ActiveX Control into M-Graphics 6-7
Embedding M-Calendar ActiveX Control into M-Graphics 6-9

Chapter 7 **Dragging and Dropping 7-1**

Introduction 7-1

Key Concepts 7-2

TWXView32 ActiveX Control 7-2

Procedure Overview 7-3

Detailed Procedures 7-4

Dragging and Dropping an Item from M-Explorer into TWXView32 7-4

Appendix A **BACnet OPC Data Access Server A-1**

Introduction A-1

Key Concepts A-2

M-Explorer JC.BNOPC Hierarchy A-2
Site A-3

Site Book A-3
Status A-3
Label Icons/Symbols A-4
M-Inspector Window A-6
BACnet A-8
Pop-Up Menus A-8
Connect/Disconnect A-9
Procedure Overview A-10
Detailed Procedures A-11
Commanding an Object A-11
Viewing an Object A-14
Editing an Object A-15
Appendix B **Companion/Facilitator OPC Data Access Server B-1**
Introduction B-1
Key Concepts B-2
M-Explorer JC.CFOPC Hierarchy Server B-2
Site B-3
Phone Book B-3
Status B-3
Label Icons/Symbols B-3
Pop-Up Menus B-4
Connect/Disconnect B-4
Appendix C **N1 OPC Data Access Server C-1**
Introduction C-1
Key Concepts C-2
M-Explorer JC.N1OPC Hierarchy Server C-2
Site C-3
Label Icons/Symbols C-3
Pop-Up Menus C-4
Connect/Disconnect C-4

Appendix D **LN OPC Data Access Server D-1**

Introduction D-1

Key Concepts D-2

LONWORKS D-2
M-Explorer JC.LNOPCVNI Hierarchy D-2
OPC Tag D-4
Status D-4
M-Explorer JC.LNSchedOPC Hierarchy D-5
Label Icons/Symbols D-6
M-Inspector Window D-6
Pop-Up Menus D-7

Procedure Overview D-9

Detailed Procedures D-9

Commanding an LN OPC Tag or LN Schedule Object D-9
Viewing an LN OPC Tag D-11

Chapter 1

Using This Guide

Introduction

The *M-Explorer User's Guide* provides information about how to use the M-Explorer software application. This chapter outlines the guide's organization and content.

Code No. LIT-1153405

Key Concepts

Chapter Organization

Each chapter of this *M-Explorer User's Guide* contains five sections as described in Table 1-1.

Table 1-1: Chapter Organization

Section	Description
Introduction	Briefly outlines the contents of the chapter.
Key Concepts	Describes background information necessary to perform or understand specific tasks.
Procedure Overview	Describes general steps for performing the tasks described in the *Detailed Procedures* section. This section is geared toward users already experienced in using M-Explorer. This section may be used as a quick reference guide.
Detailed Procedures	Describes in detail the steps needed to complete specific tasks described within the chapter. This section is geared toward users who are new to M-Explorer.
Troubleshooting	Provides information on potential problems, as well as methods for solving them.

A section is omitted if it is not necessary for a particular chapter. For example, this chapter, *Using This Guide*, does not contain a *Procedure Overview* section.

Online Help

The M-Explorer application includes online help. To access the Help screens, select Help from the menu bar, or press the F1 key, or press Alt + H. Help describes the basic procedure for performing functions within the M-Explorer software. The online help system for M-Explorer is a cross platform help system that follows the basic conventions of Windows® 98 and Windows NT® help systems, but also incorporates some of the features of the HyperText Markup Language (HTML) help used in Windows 98 programs.

Manual Conventions

As in most Windows-based programs, sometimes there are multiple ways to perform the same tasks. This manual does not describe how to use both the mouse and the keyboard to perform the same step. In general, use Microsoft® conventions to describe software features.

Chapter 2

Introduction to M-Explorer

Introduction

M-Explorer is a software application for browsing a hierarchy of online objects in controller subsystems. This chapter describes:

- system component interaction
- Object Linking and Embedding (OLE) for Process Controls (OPC) Data Access Servers
- M-Inspector
- M-Password

Code No. LIT-1153410

Key Concepts

System Component Interaction

M-Explorer interacts with various system components to provide a comprehensive user interface for working with objects. These components include:

- OLE for Process Controls (OPC) Data Access Server provides dynamic data values from the controllers for the M-Explorer display.
- M-Inspector allows detailed object viewing and data manipulation.
- M-Password determines what data M-Explorer can access and what actions may be performed based on the currently logged in user.

OPC Data Access Servers

An OPC Data Access Server is a communications server providing access to data in a generic way so that the client does not require knowledge of the underlying subsystem. The OPC Data Access Server provides an interface for browsing the subsystem to view object values and status, as well as for reading and writing data values.

The existence of OPC Data Access Servers allows M-Explorer to access data from controller subsystems. Subsystems are sets of objects having similar physical or logical separation in terms of connection, protocol, or vendor. Examples of subsystems include BACnet® networks, Companion™/Facilitator™ Panel units, or N1 networks.

Each existing controller subsystem with a separate OPC Data Access Server displays in the M-Explorer workspace as branch items in the Tree view. Examples: `JC.BNOPC`, `JC.CFOPC`, or `JC.N1OPC`. M-Explorer automatically recognizes registered OPC Data Access Servers upon startup.

M-Inspector

M-Inspector is a tabbed dialog application presenting detailed information about a selected object.

Launch the M-Inspector application from M-Explorer via the Actions menu of M-Explorer, from a pop-up menu in the Tree or Focus view, or from an M-Graphic display.

Refer to the *Using M-Inspector* chapter of this document for details.

M-Password

M-Explorer supports the restriction of certain user activity as established by the M-Password component. According to M-Password configuration, M-Explorer:

- filters out any object names for which the current user does not have access and does not display the object names.
- restricts access to menu items. For example, a restricted Print option appears grayed out on the File menu.

Note: Individual Action menu options (such as Inspect, Connect, or Disconnect) cannot be disabled, although the main Action menu can be completely disabled.

In addition, while launching M-Inspector outside of the M-Explorer application, the M-Inspector launch fails if inspecting an object with restricted access.

Refer to the *M-Password Technical Bulletin* (*LIT-1153150)* in the *M-Series Workstation Manual* (*FAN 1153.2)* for more information.

Chapter 3

Getting Started

Introduction

M-Explorer displays online objects similarly to Microsoft Windows Explorer.

This chapter describes how to:

- start M-Explorer as a standalone application
- start M-Explorer as a workspace in the M3 Workstation
- start M-Explorer from an icon on the M5 Screen Manager Bar
- change object status color coding

Code No. LIT-1153415

Key Concepts

M-Explorer User Interface

Figure 3-1 shows the standalone M-Explorer application labeled with callouts. Table 3-1 describes the various parts, views, and items of the application labeled by the callouts.

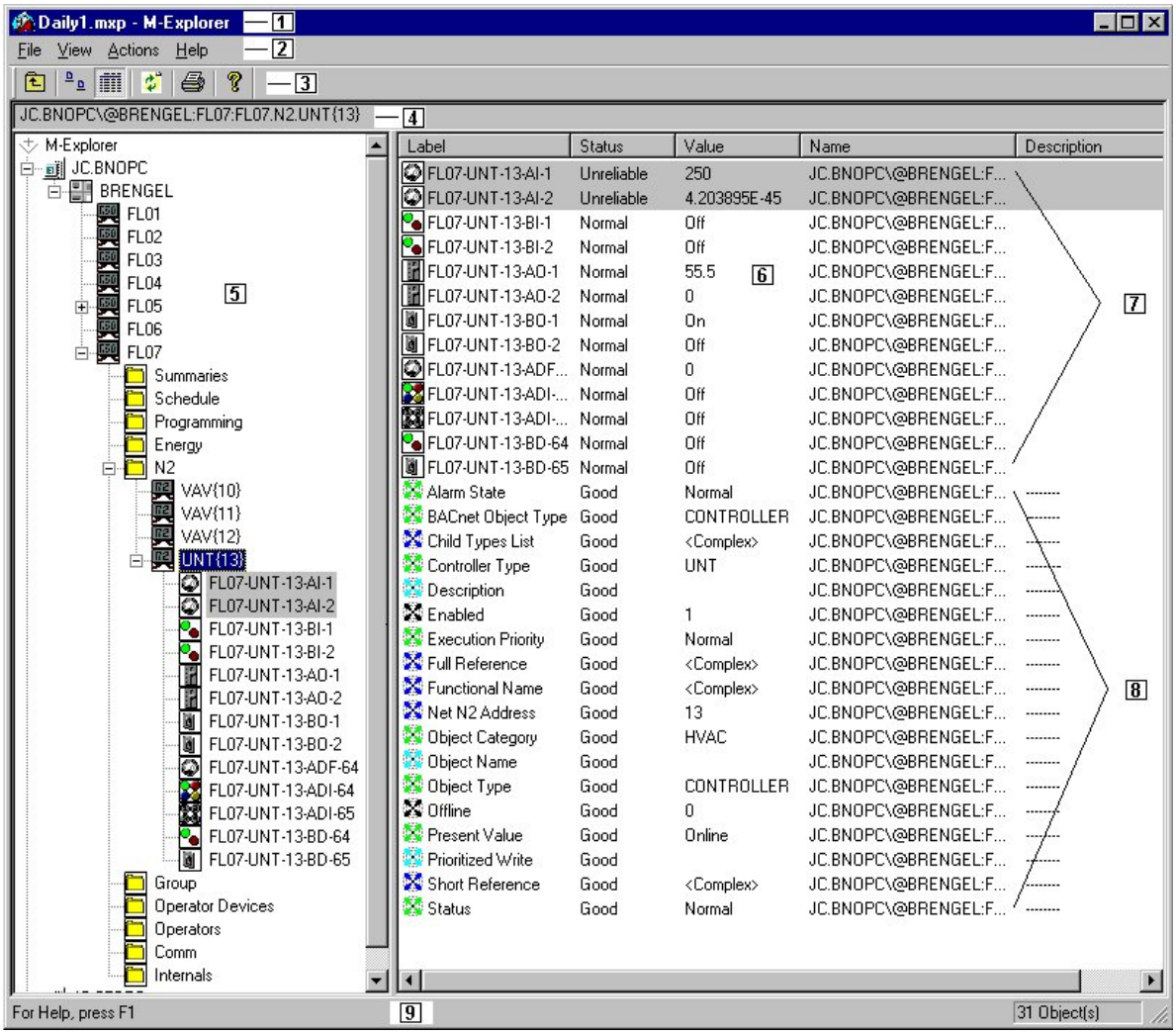


Figure 3-1: M-Explorer User Interface

Table 3-1: M-Explorer Main Window Callouts

Callout	View/Item	Description
1	Title Bar	Displays the name of the currently opened M-Explorer document.
2	Menu Bar	Provides access to top level M-Explorer menus.
3	Tool Bar	Provides one button access to commonly used tools.
4	Full Reference Line	Displays the complete hierarchical path or full reference for the currently selected item in the Tree or Focus view.
5	Tree View	Occupies the left window within M-Explorer and allows the user to open and close branch items in the system hierarchy.
6	Focus View	Occupies the right window within M-Explorer and displays the contents of the branch selected in the Tree view. A scroll bar appears if the information shown does not fit in the current dimensions of the window. The Focus view displays items in either Details view or Large Icon view. Choose the view options from the View menu, toolbar, or pop-up menu. **Details View** – Objects display as a list with columns for Label, Status (current), Value (current), Name, and Description. The appearance of the status text follows the status color coding scheme. By default, objects appear in the order returned by the OPC Data Access Server. **Icons View** – Objects display from left to right and top to bottom in the same order as the Detailed view. The label, current value, and current status of the item appear underneath the icon. The appearance of the status text follows the status color coding scheme.
7	Branch Item	Appears in M-Explorer, in both Tree view and Focus view, as an item containing other items (analogous to a directory in Windows Explorer).
8	Leaf Item	Appears in M-Explorer as an item not containing other items (analogous to a file in Windows Explorer). Leaf items represent data values.
9	Status Bar	Describes how to access Help and displays the number of objects currently appearing in the Tree view or contained within the selected Branch item.

M-Explorer Menus

Table 3-2 describes the menus and commands available from the M-Explorer application.

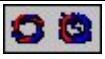
Table 3-2: M-Explorer Workspace Menu Options

Menu	Command	Description
File	New	Creates a new M-Explorer document.
	Open . . .	Opens an existing M-Explorer document.
	Save	Saves the current state of M-Explorer as a document using the current file name.
	Save As . . .	Saves the current state of M-Explorer as a document to a selected directory with the .mxp extension.
	Print . . .	Prints the information appearing in the Focus view.
	Print Preview	Shows how a document prints if the user selects the print command.
	Print Setup . . .	Opens the Print Setup dialog box for the current printer.
	Recent File	Reopens a previously accessed document.
	Exit	Closes the M-Explorer application.
View	Toolbar	If checked, the toolbar is visible; otherwise the toolbar is hidden.
	Status Bar	If checked, the status bar is visible; otherwise the status bar is hidden.
	Icons View	Changes the object representation to icons in the Focus view.
	Details View	Changes the object representation to a list with columns in the Focus view.
	Refresh	Rereads the items in the currently selected branch to show objects added or removed from a branch since the branch was first opened.
	StatusColors	Opens the M-Explorer Properties dialog box.
	AutoRefresh	Automatically updates M-Explorer View.
Actions		Provides a set of actions to perform on the currently selected item. Note: When selecting Companion points, the Actions menu is not available.
	Inspect	Provides access to the M-Inspector window when selecting an item with inspecting capabilities in M-Explorer's Tree or Focus view.
	Connect	Connects or disconnects communication to a site when selecting a site in either the Tree or Focus view.
	Disconnect	
Help	Help Topics	Opens the online help file for M-Explorer.
	About M-Explorer . . .	Displays M-Explorer's copyright and version information.

M-Explorer Toolbar

Table 3-3 describes the use of the toolbar buttons available from the M-Explorer workspace.

Table 3-3: M-Explorer Workspace Toolbar Buttons

Button	Name	Description
	Up One Level	Closes the current item and returns to the previous item in the hierarchy.
	Icons	Displays items as icons in the Focus view.
	Details	Displays items in a list with columns in the Focus view.
	View Refresh	Rereads the items in the currently selected branch to show objects added or removed from a branch since the branch was first opened.
	Print	Prints the information in the current M-Explorer Focus view.
	About	Shows software version number and copyright information.
	Inspect	Opens the M-Inspector window. This button only appears on the toolbar when selecting an item with inspecting capabilities in M-Explorer's Tree or Focus view.
	Connect Disconnect	Connects or disconnects communication for a selected item such as a site. These two buttons only appear on the toolbar when selecting an item with connecting or disconnecting capabilities in M-Explorer's Tree or Focus view.

Details View Columns

In Details view, the Focus window shows object/point data organized into five columns. Adjust columns by moving the column header boundaries with the mouse. Sort objects based on the values shown in a column by clicking the column header. Change the column order by dragging and dropping the column header left or right. Table 3-4 describes the Details view column headings.

Table 3-4: Details View Column Headings

Column	Description
Label	Lists the names of the items contained within the selected branch item.
Status	Status information depends on the OPC Data Access Server supplying the data. Refer to *Appendix A: BACnet OPC Data Access Server, Appendix B: Companion/Facilitator OPC Data Access Server,* and *Appendix C: N1 OPC Data Access Server* in this document for details.
Value	Lists the present value of the object, attribute, or point.
Name	Lists the full reference of each item (container, objects, attributes, points). Use the string for Leaf items to bind in the M-Graphics application.
Description	Lists the same information appearing in an object's optional Description attribute or any additional description for a point.

Label Icons/Symbols

In addition to the name listed in the Label column, M-Explorer also represents each object/point with an icon based on its object/point type. Different icons appear for the different OPC Data Access Servers available. Refer to the appendices in this guide for details.

A colored symbol based on the data type represents each object/point attribute:

- String = Cyan (light blue)
- Integer = Light green
- Boolean = Black
- Float = Red
- Complex = Blue

Pop-Up Menus

A right-click of the mouse on an item in either the Focus view or the Tree view brings up a pop-up menu. The available options depend on what type of OPC Data Access Server provides the data. Refer to the appendices in this guide for details.

Browsing Guidelines

Since M-Explorer behaves similarly to Microsoft Windows Explorer, browsing occurs in much the same way as well. Here are guidelines for browsing in M-Explorer:

- When branch items in the Tree View contain other items, a + appears to the left of the branch.
- To view the items contained in a branch item, either click the + to the left of the branch or double-click the branch.
- To close an open branch item, click the – that appears to the left of the branch or double-click the branch.
- Branch items without sub-branches do not have a + to the left of the branch or the + may appear at first, but disappears when the branch item is clicked.

AutoRefresh

The AutoRefresh feature automatically updates the current values from the controller. Refresh manually is the Default. On the View menu, select AutoRefresh to activate the AutoRefresh feature. When viewing third-party controllers with a large number of objects (appearing in a flat list), we recommend turning off the AutoRefresh feature to improve performance.

Status Color Coding

M-Explorer uses color coding to indicate five levels of object status, meaning the color of the text and background of the object name indicates the current condition of the object. Status color coding appears for objects in both the Details view and the Icons view. These settings are applied globally to the entire M-Explorer application. See the procedure to change status color coding in this document.
Table 3-5 describes the default color coding scheme.

Table 3-5: Status Color Coding Scheme

Status Category	Text Display Properties
Communication Problem	White letters on black background
Overridden/Unknown	Black letters on gray background
Alarm Condition	Yellow letters on red background
Warning Condition	Blue letters on yellow background
Normal Condition	Black letters on white background

Dynamic Data Display

M-Explorer updates dynamic values as soon as the OPC Data Access Server reports the value change. Users see these values change as they browse object data in the M-Explorer user interface. Refresh the display only if there are changes to the object hierarchy structure within the OPC Data Access Servers.

Procedure Overview

Table 3-6: Getting Started

To Do This	Follow These Steps:
Start M-Explorer as a Standalone Application	On the Windows Start menu, select Programs > Johnson Controls > M-Explorer.
Start M-Explorer as a Workspace in the M3 Workstation	With the M3 Workstation application open, select Add Workspace from the M3 Options menu. Select Johnson Controls M-Explorer Display from the list. Click OK.
Start M-Explorer from an Icon on the M5 Screen Manager Bar	From the M5 Screen Manager Bar, click the icon for M-Explorer.
Change Object Status Color Coding	From the View menu, select StatusColors. In the Property Name field, click the drop-down arrow to view the available options. Select the desired Property Name option from the list. Select the desired color from the pallet, or click the drop-down arrow in the System Color field and select a system color. Click Apply. Click OK.

Detailed Procedures

Starting M-Explorer as a Standalone Application

To start a standalone M-Explorer application:

On the Windows Start menu, select Programs > Johnson Controls > M-Explorer.

Starting M-Explorer as a Workspace in the M3 Workstation

To start M-Explorer from M3 Workstation:

1. Open the M3 Workstation application.
2. Select Add Workspace from the M3 Options menu. The Add Workspace window appears (Figure 3-2).

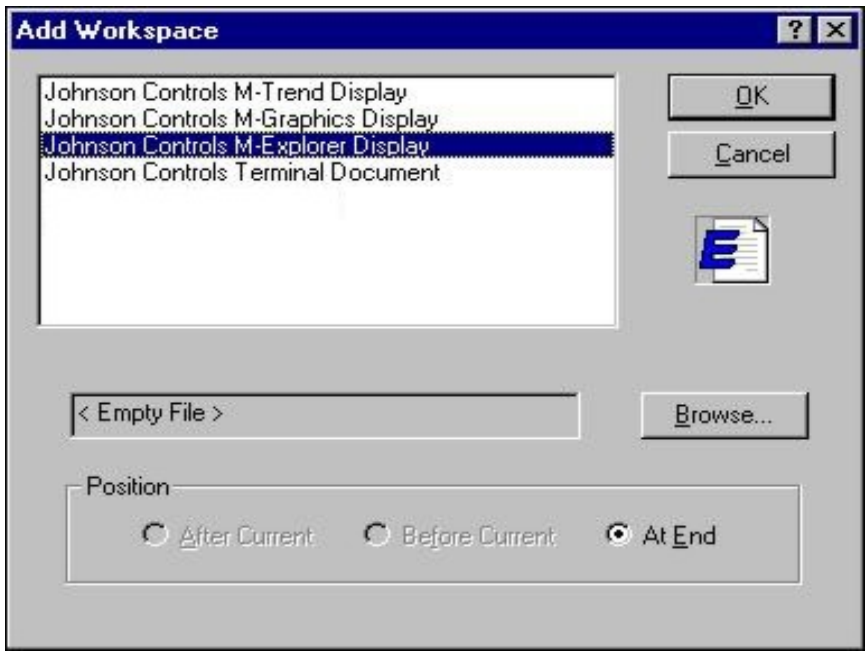


Figure 3-2: Add Workspace Window

3. Select Johnson Controls M-Explorer Display from the list.

Note: To locate a specific file to appear in the workspace when adding the file, click Browse to make the Open dialog box appear. Locate and select the file, then click Open to return to the Add Workspace dialog box.

4. Click OK. The M-Explorer workspace appears within the M3 Workstation display (Figure 3-3).

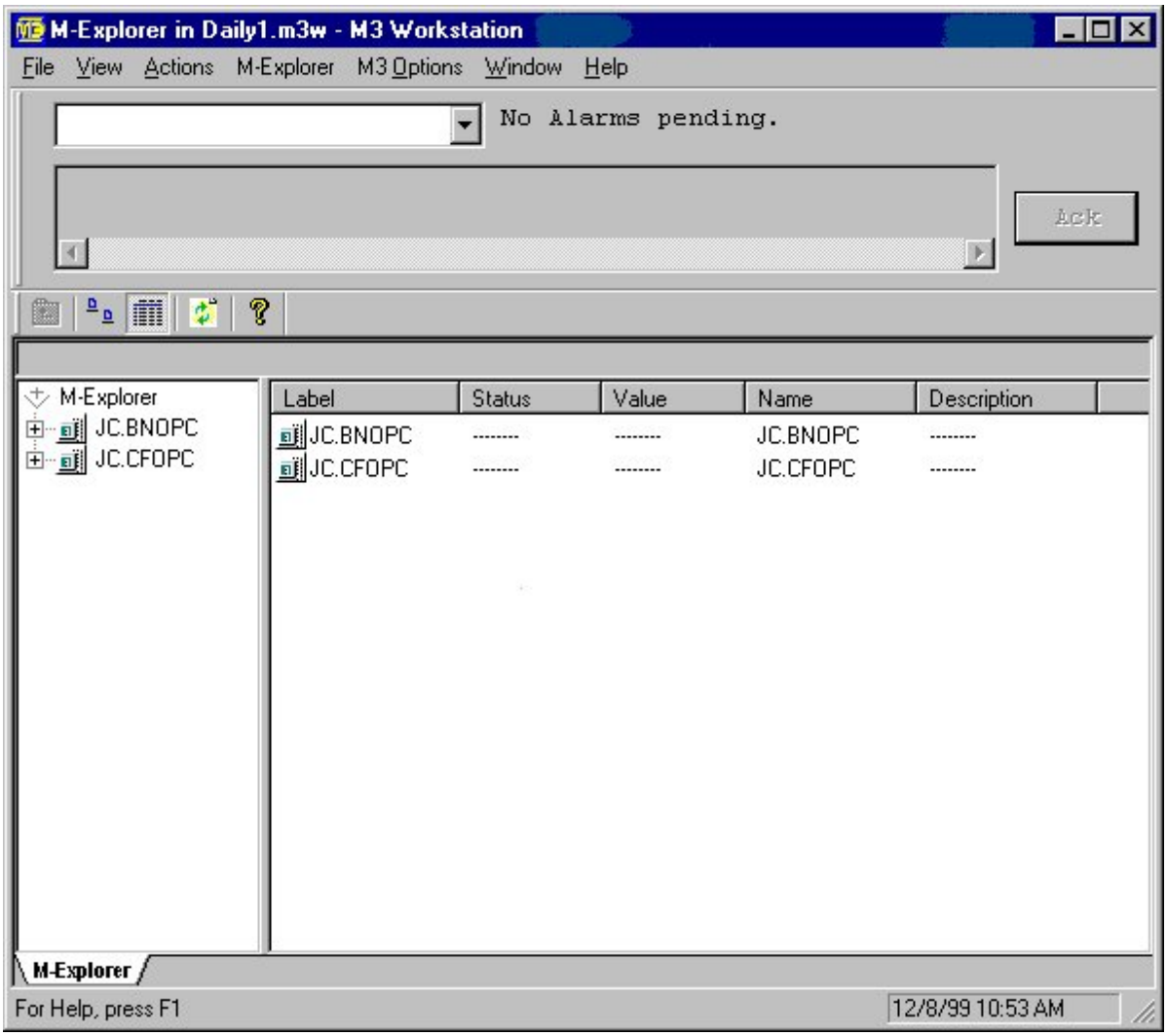


Figure 3-3: M-Explorer in M3 Workstation Display

Note: Adding multiple M-Explorer workspaces on large databases may cause the system to freeze. This problem has occurred when browsing the JC.CFOPC server with Companion databases larger than 600 points.

Starting M-Explorer from an Icon on the M5 Screen Manager Bar

To start M-Explorer from the M5 Screen Manager Bar (Figure 3-4):

Click the icon for the M-Explorer application.

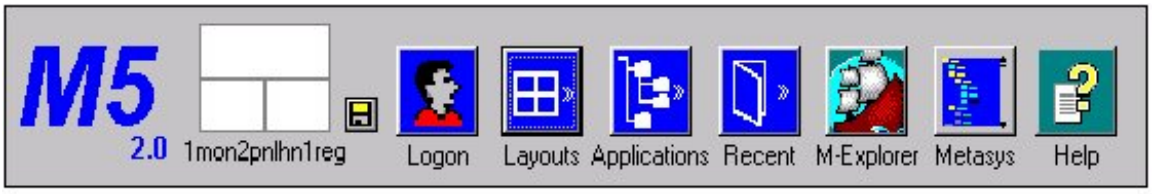


Figure 3-4: M-Explorer on the M5 Screen Manager Bar

Changing Object Status Color Coding

To change object status color coding:

1. From the View menu, select StatusColors. The M-Explorer Properties window appears (Figure 3-5).

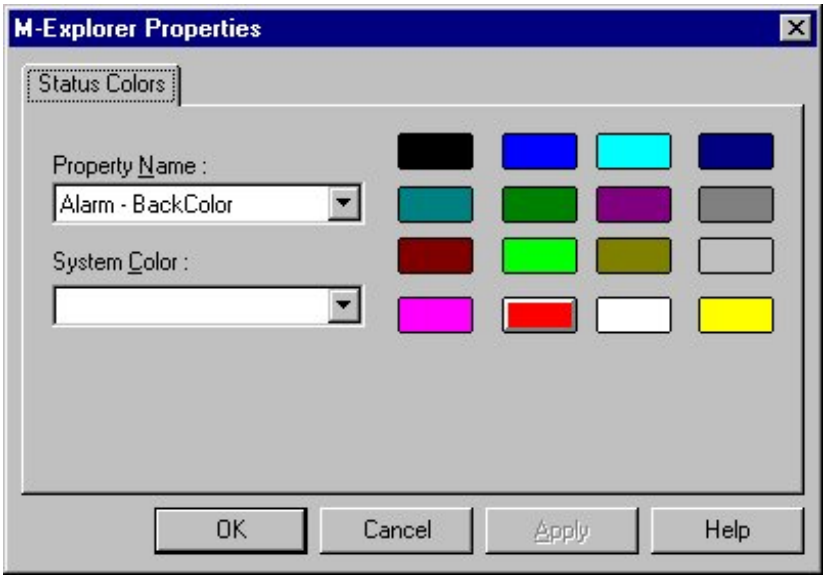


Figure 3-5: M-Explorer Properties Window

2. In the Property Name field, select an option from the drop-down list.

   Table 3-7 describes the Property Name options.

Table 3-7: Property Names for Status Color Coding

Property Name	Description
Alarm – BackColor	Alarm Background Color
Alarm – TextColor	Alarm Text Color
CommProblem – BackColor	Communication Problem Background Color
CommProblem – TextColor	Communication Problem Text Color
Normal – BackColor	Normal Background Color
Normal – TextColor	Normal Text Color
Override – BackColor	Override Background Color
Override – TextColor	Override Text Color
Warning – BackColor	Warning Background Color
Warning – TextColor	Warning Text Color

3. Select the desired color from the pallet or the drop-down list in the System Color field.

Note: By selecting a system color, the M-Explorer color properties automatically follow these settings as configured in the Windows Control Panel.

4. Click Apply.
5. Click OK.

Troubleshooting

In the M-Series Workstation, OLE for Process Control (OPC) servers such as the BACnet OPC server, Companion/Facilitator OPC server, and the N1 OPC server may not appear as points within the root level of the M-Explorer tree. This occurs when M-Password is configured incorrectly. Configure M-Password to grant access to OPC servers (points).

To configure points in M-Password:

1. Log in as Administrator to the M-Password Configuration software. Refer to the *M-Password Technical Bulletin (LIT-1153150).*
2. Select Edit > Default Group. The Default Group Properties Page appears (Figure 3-6).

Note: To edit individual group properties, select the group and select Edit > Edit. The Group Properties Page appears. To edit individual user properties, select the user and select Edit > Edit. The User Properties Page appears.

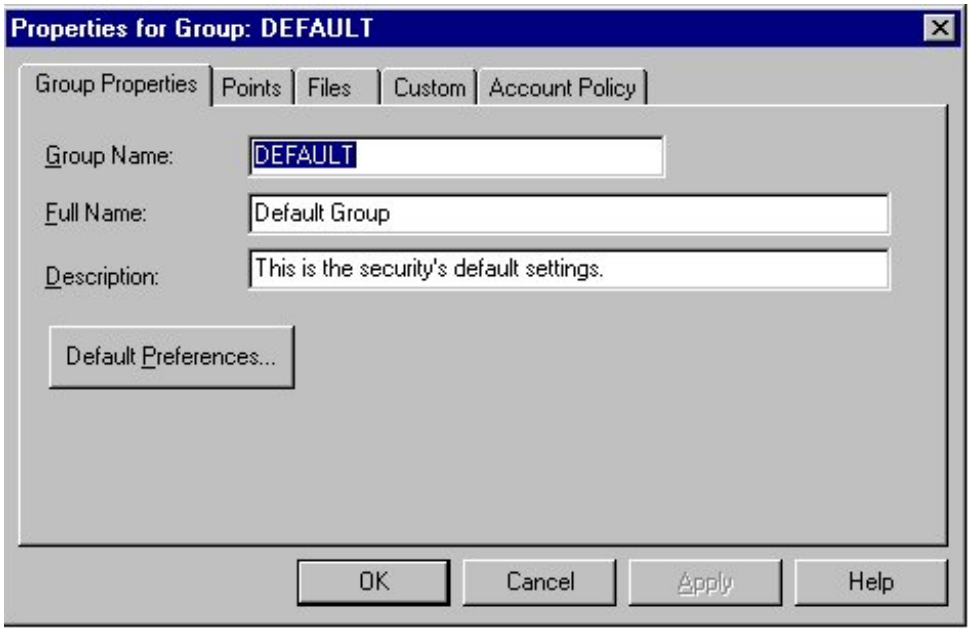


Figure 3-6: Default Group Properties Page

3. Select the Points tab (Figure 3-7).

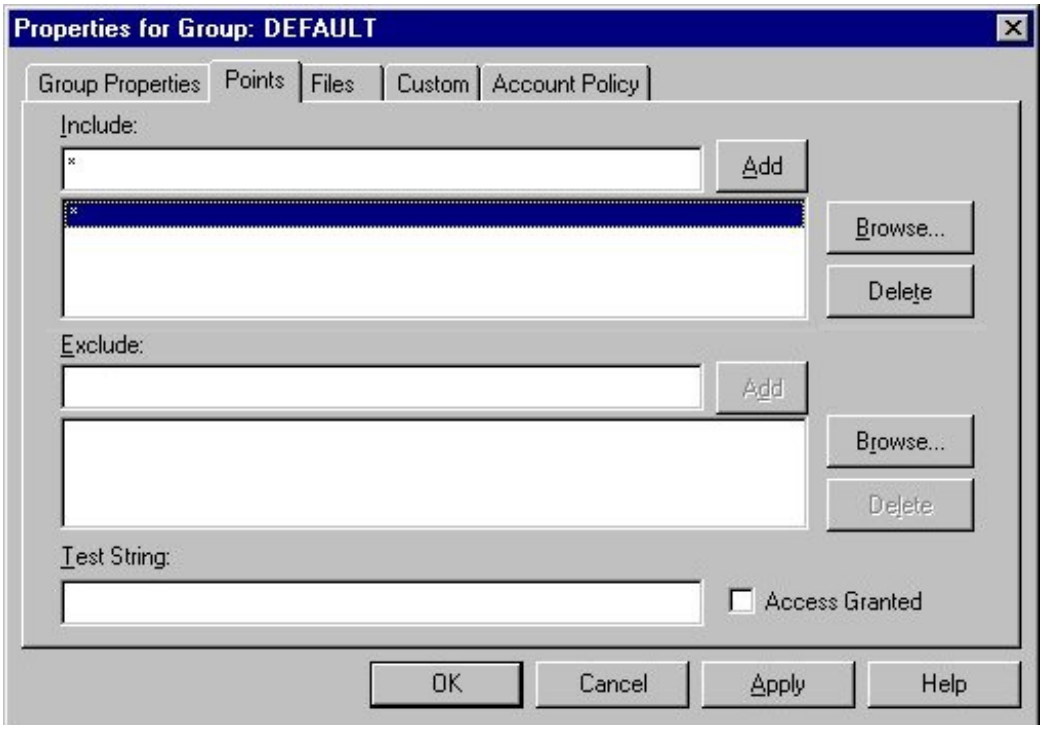


Figure 3-7: Default Group Properties Page – Points Tab

4. In the Include edit box of the Points tab, perform one of the following options:

   - enter * to grant access to all OPC servers (Figure 3-7). Use this option when users or groups need access to browse all OPC servers and restricting access is not needed for security.
   - enter or browse to the desired OPC server point name (i.e., JC.BNOPC) to grant access to only certain OPC servers (Figure 3-8). Use this option when OPC server access for users or groups must be restricted for security. The user or group can browse only the OPC servers to which they were granted access.

Note: When granting access to individual users or groups, access is least restrictive.

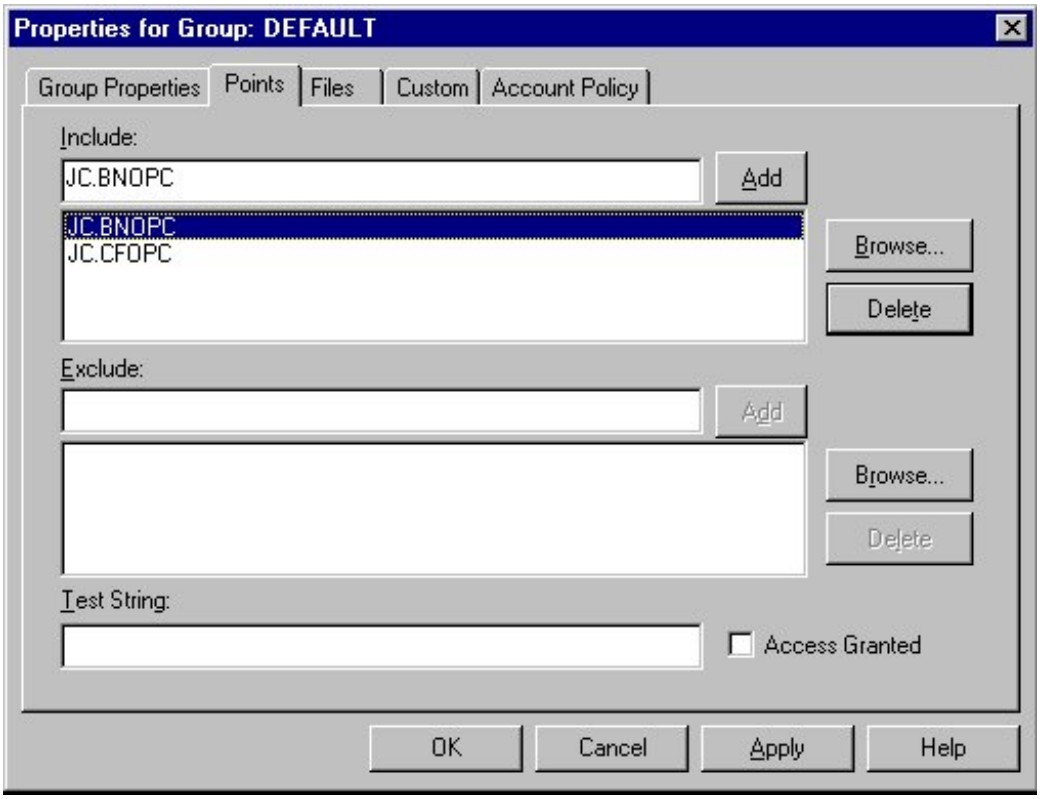


Figure 3-8: Default Group Properties Page – Points Tab

5. Click Add.
6. Enter other OPC server point names as desired and click Add.
7. Click Apply.
8. Click OK.
9. Select File > Exit to close M-Password.

After granting access to the OPC servers in M-Password, open the M-Explorer software to browse them. Figure 3-3 is an example of an M-Explorer tree granting access to browse the BACnet OPC server and the Companion/Facilitator OPC server.

Chapter 4

Working with M-Explorer Documents

Introduction

M-Explorer allows its current browser state to be saved at any point. The saved browser state is an M-Explorer document and has an .mxp extension.

This chapter describes how to:

- save the current browser state of M-Explorer as a document
- launch an M-Explorer document

Code No. LIT-1153420

Key Concepts

Save Options

By saving the current browser state of M-Explorer, a user can quickly access data that may need frequent monitoring and can easily customize the browser for specific data. For example, a user can:

- Check an object with a detection alarm every day.
- View data efficiently with a Detailed view sorted by Status and with the Focus view splitter window moved over to the left.
- Save the browser state as a document at this exact point with these exact settings.

The information saved in an M-Explorer document includes:

- open branches in the Tree view
- currently selected branch item shown in the Focus view
- Focus view selections (details vs. large icon)
- location of splitter window boundaries
- location of columns and column boundaries within the Details view

Notes: M-Explorer documents do not save changes to object status color coding settings. These settings are globally applied to the workstation.

Make sure `M-Explorer Documents (*.mxp)` appears in the Save as type field to save the current browser state of M-Explorer as a document.

Launch Options

The flexibility of the M-Explorer application allows access to M-Explorer documents in a variety of ways.

Launch an M-Explorer document by:

- double-clicking the document name from a file browser such as Windows Explorer
- selecting the Open option on the File menu from the M-Explorer application or from an M-Explorer workspace (described later in this document)
- double-clicking a shortcut icon to the M-Explorer application on the Windows Desktop

Procedure Overview

Table 4-1: Working with M-Explorer Documents

To Do This	Follow These Steps:
Save the Current Browser State of M-Explorer as a Document	From the File menu, select Save As. The Save As dialog box appears. If necessary, browse to a different location to save the document using the drop-down arrow in the Save in field, the Up One Level button, or the Create new folder button. In the File name field, type a name for the document, keeping the .mxp extension. Make sure `M-Explorer Documents (*.mxp)` appears in the Save As type field. Click Save.
Launch an M-Explorer Document	From the File menu, click Open. Make sure `M-Explorer Documents (*.mxp)` appears in the Files of type field. Select the desired document via one of these three possible options: • In the File name field, type the name of the desired document with the .mxp extension. • Browse using the Look in field or the Up One Level button until the desired document appears in the list and select it. • Select the desired document that may already appear in the list. Click Open.

Detailed Procedures

Saving the Current Browser State of M-Explorer as a Document

Note: This procedure applies to a standalone version of M-Explorer.

To save the current browser state of M-Explorer as a document:

1. From the File menu, select Save As. The Save As dialog box appears (Figure 4-1).

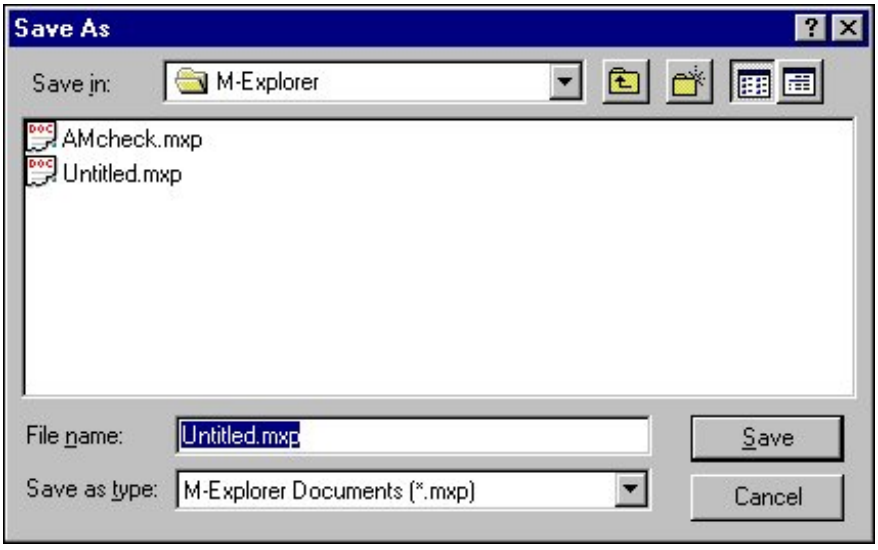


Figure 4-1: Save As Dialog Box

Note: Selecting Save also brings up the Save As dialog box for the current browser state's first save.

2. If necessary, browse to a different location to save the document using the drop-down arrow in the Save in field, the Up One Level button, or the Create New Folder button.

Note: The default save location is:
Program Files/Johnson Controls/M-Explorer, unless installing M-Explorer into a different directory.

3. In the File name field, type a name for the document, keeping the .mxp extension.
4. Make sure `M-Explorer Documents (*.mxp)` appears in the Save As type field.
5. Click Save. The new document name appears in the title bar of the M-Explorer application.

Note: Click the List or Details button for different views of the existing documents.

Launching an M-Explorer Document

Note: This procedure applies to a standalone version of M-Explorer.

To launch an M-Explorer document:

1. From the File menu, click Open. The Open dialog box appears (Figure 4-2).

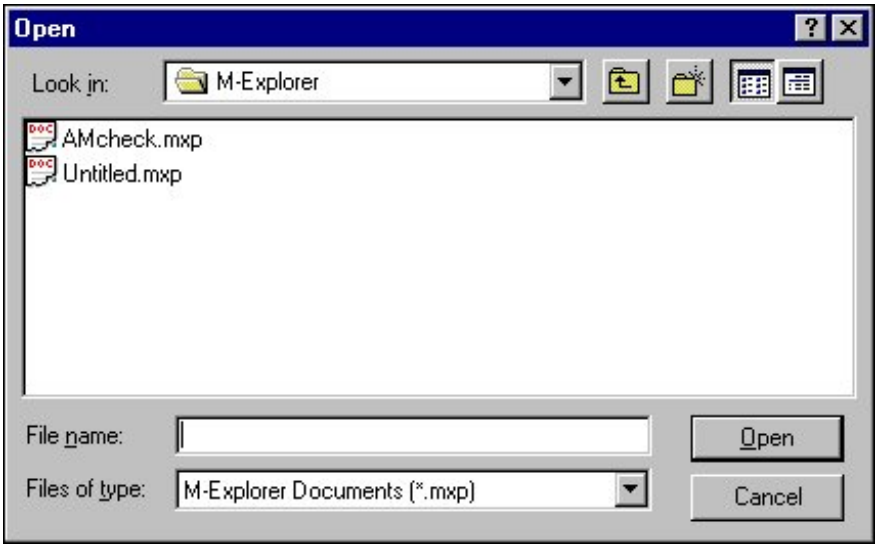


Figure 4-2: Open Dialog Box

Note: Recently opened documents appear near the bottom of the drop-down File menu. Immediately open a document by clicking on the desired document name.

2. Make sure `M-Explorer Documents (*.mxp)` appears in the Files of type field.

Note: Click the List or Detail button for different views of the existing documents.

3. Select a document via one of these three possible options:
   - In the File name field, type the name of the desired document with the .mxp extension.
   - Browse using the Look in field or the Up One Level button until the desired document appears in the list and select it.
   - Select the desired document that may already appear in the list.
4. Click Open. M-Explorer appears at the desired browser state.

Chapter 5

Using M-Inspector

Introduction

The M-Explorer application provides capabilities beyond its browser features. Through M-Inspector, M-Explorer provides access to object data for viewing and modification. This chapter describes how to:

- start M-Inspector from M-Explorer using the Actions menu
- start M-Inspector from M-Explorer using a pop-up menu
- use M-Inspector in M-Graphics

Code No. LIT-1153425

Key Concepts

M-Inspector Window

The M-Inspector window consists of a tabbed presentation style. The tabs that appear depend on the type of object selected. Users move between tabs by clicking the tab name near the top of the window.

Buttons, drop-down lists, and text fields appearing on each tab allow users to perform the various available functions.

Each tab is an ActiveX® control meaning that it can be inserted into other applications. Refer to the *Embedding M-Explorer ActiveX Controls into M-Graphics* chapter in this guide for more information.

For information about available tabs and commanding, viewing, and editing objects, refer to *Appendix A: BACnet OPC Data Access Server*.

Figure 5-1 shows an example of the M-Inspector window.

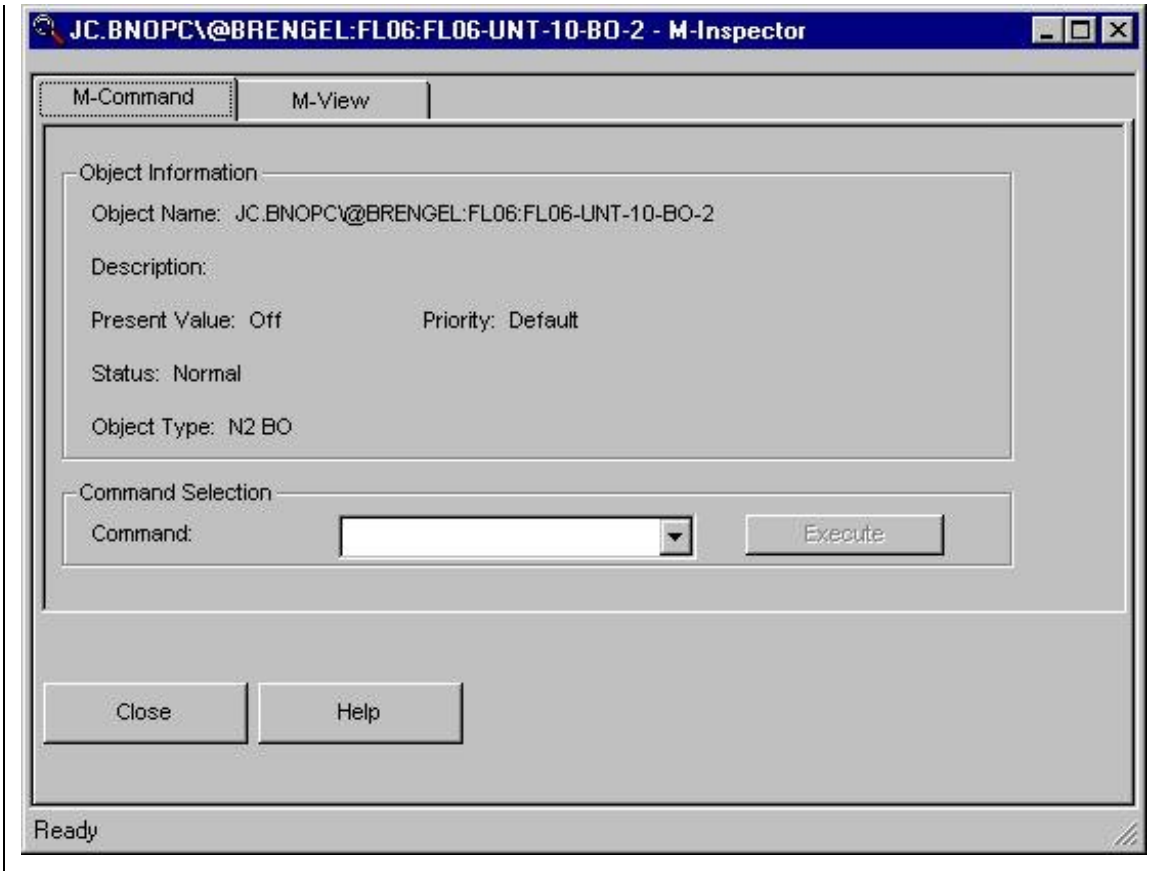


Figure 5-1: Example of the M-Inspector Window

Procedure Overview

Table 5-1: Using M-Inspector

To Do This	Follow These Steps:
Start M-Inspector from M-Explorer Using the Actions Menu	Open the M-Explorer application. Select an object in either the Tree view or Focus view. From the Actions menu, select Inspect.
Start M-Inspector from M-Explorer Using a Pop-up Menu	Open the M-Explorer application. Select an object in either the Tree view or Focus view. Right-click the mouse. Select Inspect.
Use M-Inspector in M-Graphics	Open the M-Graphics application. Draw an object for the M-Inspector pick. From the Dynamics menu, point to Actions, select Pick. In the Action field, select Launch Application from the drop-down menu. In the Filename field, type in the name of the M-Inspector executable file or click the Browse button to locate the file on the system. After the executable name in the Filename field, insert a space and type in the complete hierarchical path of an object. Click OK. Click Runtime on the menu bar. Click the M-Inspector pick.

Detailed Procedures

Starting M-Inspector from M-Explorer Using the Actions Menu

To start M-Inspector from M-Explorer using the Actions menu:

1. Open the M-Explorer application.
2. Select an object in either the Tree view or Focus view. The Actions menu becomes available.
3. From the Actions menu, select Inspect. The M-Inspector window appears.

Starting M-Inspector from M-Explorer Using a Pop-Up Menu

To start M-Inspector from M-Explorer using a pop-up menu:

1. Open the M-Explorer application.
2. Select an object in either the Tree view or Focus view.
3. Right-click the mouse. A pop-up menu appears.
4. Select Inspect. The M-Inspector window appears.

Using M-Inspector in M-Graphics

To use M-Inspector in M-Graphics:

1. Open the M-Graphics application.
2. Draw an object for the M-Inspector pick.
3. From the Dynamics menu, point to Actions, select Pick. The Property Inspector dialog box appears.
4. In the Action field, select Launch Application from the drop-down menu.
5. In the Filename field, type in the full path name of the M-Inspector executable file or click the Browse button to locate the file on the system.

Example:

C:\Program Files\Johnson Controls\M-Explorer\Inspector.exe

6. After the executable name in the Filename field, insert a space and type in the complete hierarchical path of an object (Figure 5-2).

Example:

JC.BNOPC\@BRENGEL:FL06:FL06-UNT-10-ADF-64.

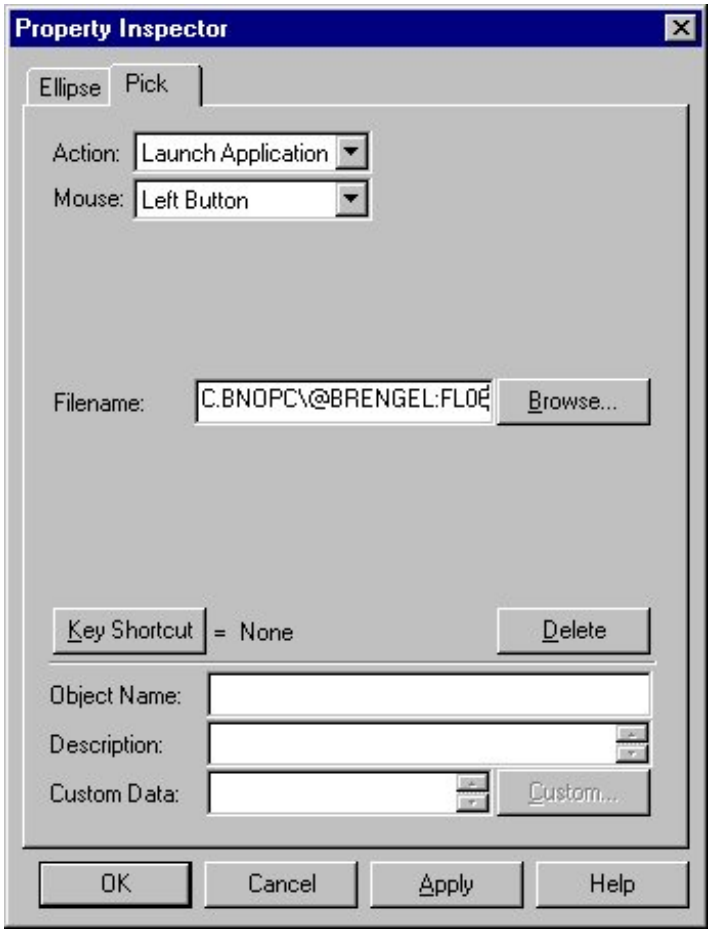


Figure 5-2: Completed Property Inspector Dialog Box

Note: For a quick and accurate way to enter the complete hierarchical path of an object, go to the M-Explorer application, select an object, and copy the Full Reference Line; then, return to M-Graphics and paste the Full Reference Line into the Object Name field after the executable name.

7. Click OK.
8. Save the M-Graphics display.
9. Click Runtime on the Menu bar.
10. Click the M-Inspector pick. The M-Inspector window opens.

Chapter 6

Embedding M-Explorer ActiveX Controls into M-Graphics

Introduction

Each tab of the M-Inspector and the M-Explorer itself are ActiveX controls capable of being embedded into a container application such as M-Graphics. This chapter describes how to:

- embed M-Explorer ActiveX control into M-Graphics
- embed M-Command ActiveX control into M-Graphics
- embed M-View ActiveX control into M-Graphics
- embed M-Schedule ActiveX control into M-Graphics
- embed M-Calendar ActiveX control into M-Graphics

Code No. LIT-1153430

Key Concepts

ActiveX

ActiveX is a set of integration technologies that enables software components to interoperate in a networked environment using different programming languages. The foundation for ActiveX is Microsoft Object Linking and Embedding (OLE) and the Component Object Model (COM).

ActiveX Control

ActiveX is a type of software module and an extension of the Microsoft Visual Basic® programming language toolbox. When adding an ActiveX control to a program, the ActiveX becomes part of the development and runtime environment and provides new functionality for your application.

Container Application

A container application is a software application, such as M-Inspector or M-Graphics, that can hold an Active X control such as M-View or M-Explorer.

M-Graphics

M-Graphics allows monitoring, control, and analysis of facilities using dynamic color graphic displays. M-Graphics also provides graphical navigation of a facility and launching of other applications. For information about M-Graphics, refer to the *M-Graphics User's Manual (FAN 644.0)*.

M-Inspector

The M-Inspector window consists of a tabbed presentation style. The tabs that appear depend on the type of object selected. Users move between tabs by clicking the tab name near the top of the window.

Buttons, drop-down lists, and text fields appearing on each tab allow users to perform the various available functions.

Each tab is an ActiveX control, meaning that it can be inserted into other applications. For example, the M-Command tab of M-Inspector is equivalent to embedding M-Command into M-Graphics.

Figure 6-1 shows an example of the M-Inspector window.

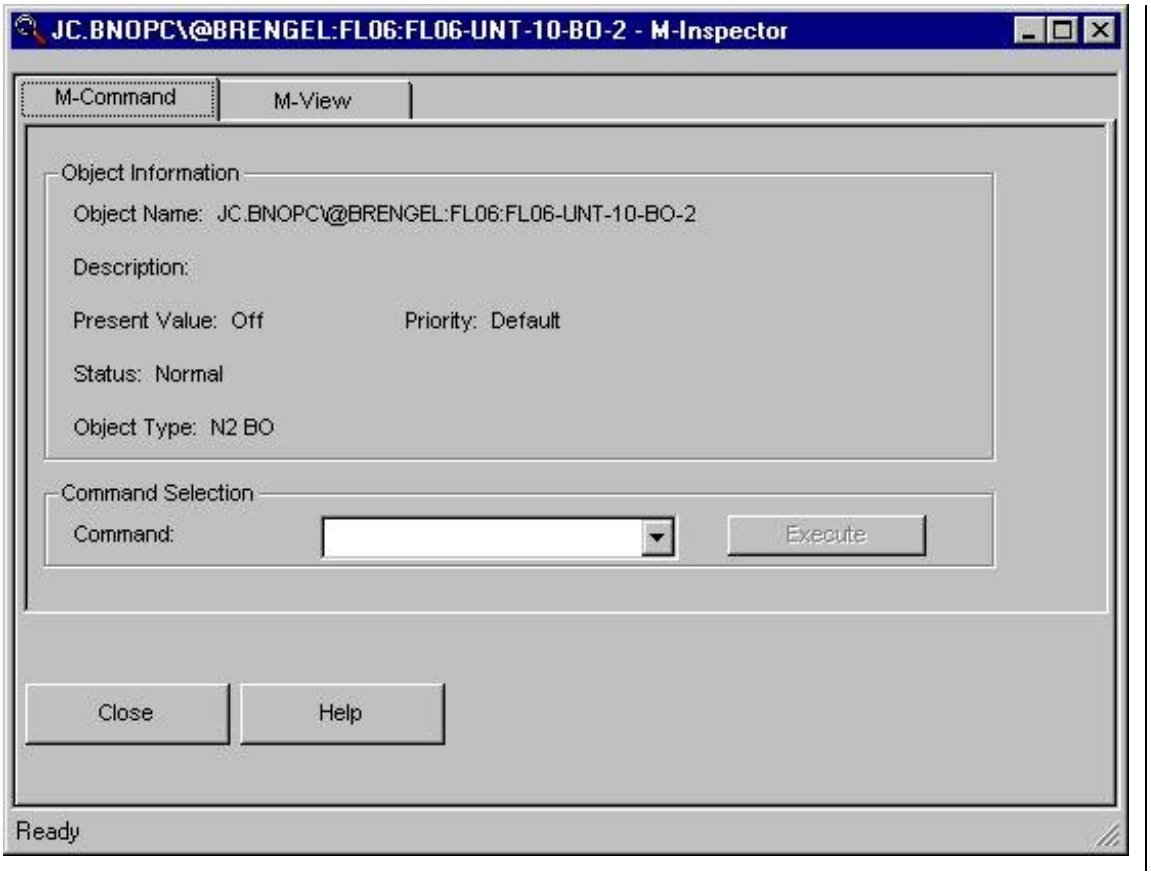


Figure 6-1: Example of the M-Inspector Window

Procedure Overview

Table 6-1: Embedding ActiveX Controls into M-Graphics

To Do This	Follow These Steps:
Embed M-Explorer ActiveX Control into M-Graphics	Open the M-Graphics application. From the Edit menu, select Insert New Object. Be sure to select the default, Create Control. Use the vertical scroll bar to locate and select Johnson Controls M-Explorer Control from the Object Type list. Click OK. Save the M-Graphics display, so you can return to it from other M-Graphics displays. Click Runtime on the Menu bar to access M-Explorer.
Embed M-Command ActiveX Control into M-Graphics	Open the M-Graphics application. From the Edit menu, select Insert New Object. Be sure to select the default, Create Control. Use the vertical scroll bar to locate and select Johnson Controls M-Command Control from the Object Type list. Click OK. From the Edit menu, point to Johnson Controls M-Command Control Object, and select Properties. In the Object Name field, type in the complete hierarchical path of an object. Click OK. Save the M-Graphics display, so you can return to it from other M-Graphics displays. Click Runtime on the Menu bar to command the object.
Embed M-View ActiveX Control into M-Graphics	Open the M-Graphics application. From the Edit menu, select Insert New Object. Be sure to select the default, Create Control. Use the vertical scroll bar to locate and select Johnson Controls M-View Control from the Object Type list. Click OK. From the Edit menu, point to Johnson Controls M-View Control Object and select Properties. In the Object Name field, type in the complete hierarchical path of an object. Click OK. Save the M-Graphics display, so you can return to it from other M-Graphics displays. Click Runtime on the Menu bar to proceed viewing the object.
Embed M-Schedule ActiveX Control into M-Graphics	Open the M-Graphics application. From the Edit menu, select Insert New Object. Be sure to select the default, Create Control. Use the vertical scroll bar to locate and select Johnson Controls M-Schedule Control. Click OK. From the Edit menu, point to Johnson Controls M-Schedule Control Object, and select Properties. In the Schedule Object Name field, type in the complete hierarchical path of a Schedule object. Click OK. Save the M-Graphics display, so you can return to it from other M-Graphics displays. Click Runtime on the Menu bar to proceed working with the Schedule object.
Embed M-Calendar ActiveX Control into M-Graphics	Open the M-Graphics application. From the Edit menu, select Insert New Object. Be sure to select the default, Create Control. Use the vertical scroll bar to locate and select Johnson Controls M-Calendar Control from the Object Type list. Click OK. From the Edit menu, point to Johnson Controls M-Calendar Control Object, and select Properties. In the Calendar Object Name field, type in the complete hierarchical path of a Schedule object. Click OK. Save the M-Graphics display. Click Runtime on the Menu bar to proceed working with the Calendar object.

Detailed Procedures

Embedding M-Explorer ActiveX Control into M-Graphics

Note: Techniques for inserting an ActiveX control may vary slightly among different control containers; however, the basics are the same.

To embed M-Explorer ActiveX control into M-Graphics:

1. Open the M-Graphics application.
2. From the Edit menu, select Insert New Object. The Insert Object dialog box appears (Figure 6-2).

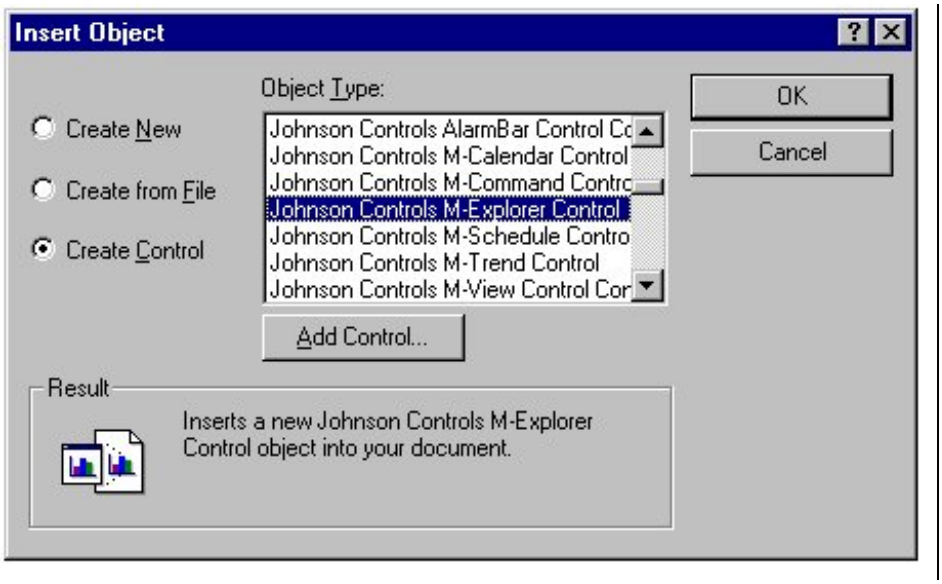


Figure 6-2: Insert Object Dialog Box

3. Be sure to select the default, Create Control.
4. Use the vertical scroll bar to locate and select Johnson Controls M-Explorer Control from the Object Type list.
5. Click OK. The ActiveX control appears in the display.
6. Save the M-Graphics display. By saving the M-Graphics display, you can return to the display from other M-Graphics displays.
7. Click Runtime on the Menu bar to access M-Explorer.

Embedding M-Command ActiveX Control into M-Graphics

To embed M-Command ActiveX control into M-Graphics:

1. Open the M-Graphics application.

2. From the Edit menu, select Insert New Object. The Insert Object dialog box appears (Figure 6-2).
3. Be sure to select the default, Create Control.
4. Use the vertical scroll bar to locate and select Johnson Controls M-Command Control from the Object Type list.
5. Click OK. The ActiveX control appears in the display.
6. From the Edit menu, point to Johnson Controls M-Command Control Object, and select Properties. The Properties dialog box appears.
7. In the Object Name field, type in the complete hierarchical path of an object (Figure 6-3).

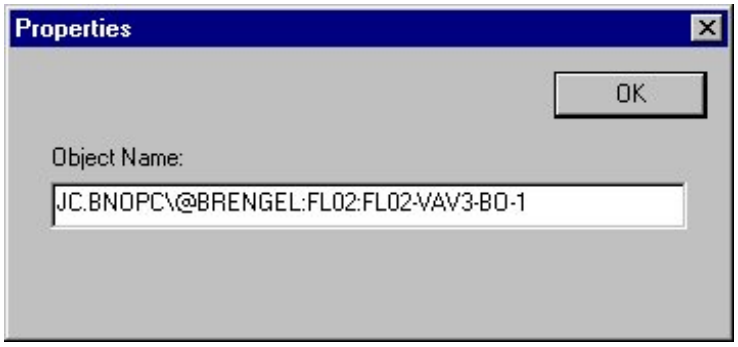


Figure 6-3: Completed Properties Dialog Box

Note: For a quick and accurate way to complete the Object Name field, go to the M-Explorer application, select an object and copy the Full Reference Line; then, return to M-Graphics and paste the Full Reference Line into the Object Name field. Do not include the attribute name when copying and pasting.

8. Click OK.
9. Save the M-Graphics display. By saving the M-Graphics display, you can return to the display from other M-Graphics displays.
10. Click Runtime on the Menu bar to proceed commanding the object.

Embedding M-View ActiveX Control into M-Graphics

To embed M-View ActiveX control into M-Graphics:

1. Open the M-Graphics application.
2. From the Edit menu, select Insert New Object. The Insert Object dialog box appears (Figure 6-2).

3. Be sure to select the default, Create Control. Use the vertical scroll bar to locate and select Johnson Controls M-View Control from the Object Type list.
4. Click OK. The ActiveX control appears in the display.
5. From the Edit menu, point to Johnson Controls M-View Control Object, and select Properties. The Properties dialog box appears.
6. In the Object Name field, type in the complete hierarchical path of an object (Figure 6-3).

Note: For a quick and accurate way to complete the Object Name field, go to the M-Explorer application, select an object, and copy the Full Reference Line; then, return to M-Graphics and paste the Full Reference Line into the Object Name field. Do not include the attribute name when copying and pasting.

7. Click OK.
8. Save the M-Graphics display, so you can return to the display from other M-Graphics displays.
9. Click Runtime on the Menu bar to view the object.

Embedding M-Schedule ActiveX Control into M-Graphics

To embed M-Schedule ActiveX control into M-Graphics:

1. Open the M-Graphics application.
2. From the Edit menu, select Insert New Object. The Insert Object dialog box appears (Figure 6-2).
3. Make sure to select the default, Create Control.
4. Use the vertical scroll bar to locate and select Johnson Controls M-Schedule Control from the Object Type list.
5. Click OK. The ActiveX control appears in the display.
6. From the Edit menu, point to Johnson Controls M-Schedule Control Object and select Properties. The Input Object Name dialog box appears.
7. In the Schedule Object Name field, type in the complete hierarchical path of a Schedule object (Figure 6-4).

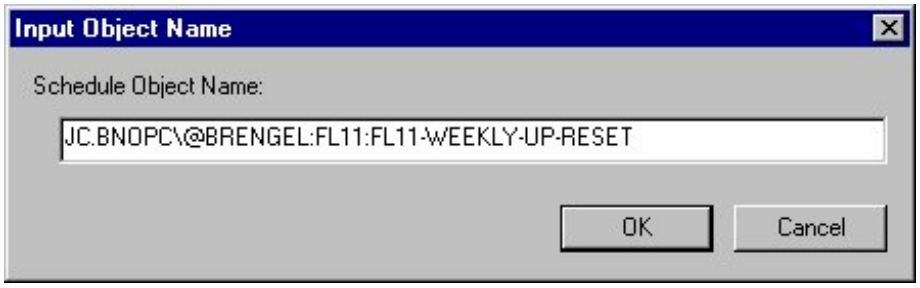


Figure 6-4: Completed Input Object Name Dialog Box

Note: For a quick and accurate way to complete the Object Name field, go to the M-Explorer application, select an object, and copy the Full Reference Line; then, return to M-Graphics and paste Full Reference Line into the Object Name field. Do not include the attribute name when copying and pasting.

8. Click OK.
9. Save the M-Graphics display so you can return to the display from other M-Graphics displays.
10. Click Runtime on the Menu bar to work with the Schedule object.

Embedding M-Calendar ActiveX Control into M-Graphics

To embed M-Calendar ActiveX control into M-Graphics:

1. Open the M-Graphics application.
2. From the Edit menu, select Insert New Object. The Insert Object dialog box appears (Figure 6-2).
3. Make sure to select the default, Create Control.
4. Use the vertical scroll bar to locate and select Johnson Controls M-Calendar Control from the Object Type list.
5. Click OK. The ActiveX control appears in the display.
6. From the Edit menu, point to Johnson Controls M-Calendar Control Object, and select Properties. The Input Object Name dialog box appears.
7. In the Calendar Object Name field, type in the complete hierarchical path of a Schedule object (Figure 6-5).

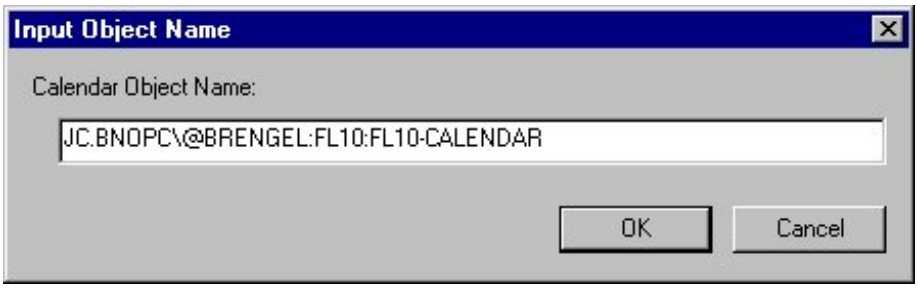


Figure 6-5: Completed Input Object Name Dialog Box

Note: For a quick and accurate way to complete the Object Name field, go to the M-Explorer application, select an object, and copy the Full Reference Line; then, return to M-Graphics and paste the Full Reference Line into the Object Name field. Do not include the attribute name when copying and pasting.

8. Click OK.

9. Save the M-Graphics display. By saving the M-Graphics display, you can switch back to it from other M-Graphics displays.
10. Click Runtime on the Menu bar to work with the Calendar object.

Chapter 7

Dragging and Dropping

Introduction

M-Explorer allows leaf items, such as attributes of N30 objects or Companion/Facilitator points, to be moved into the TWXView32 ActiveX Control for realtime viewing of trend data. This works with both controls embedded into M-Graphics or with M-Explorer running next to an M-Graphics display with only the TWXView32 control embedded. This chapter describes how to drag and drop an item from M-Explorer to TWXView32.

Code No. LIT-1153435

Key Concepts

TWXView32 ActiveX Control

The TWXView32 ActiveX Control displays realtime trend data from connected OPC data access servers from within the M-Graphics application. Refer to *M-Graphics User's Manual (FAN 644.0)* for more information.

Procedure Overview

Table 7-1: Dragging and Dropping

To Do This	Follow These Steps:
Drag and Drop an Item from M-Explorer into TWXView32	Embed the TWXView32 ActiveX Control into M-Graphics. Embed the M-Explorer ActiveX Control into the same M-Graphics display as the TWXView32 ActiveX Control. In M-Explorer, select a Leaf item with the mouse, then drag and drop the Leaf item into TWXView32.

Detailed Procedures

Dragging and Dropping an Item from M-Explorer into TWXView32

Note: These procedures describe dragging and dropping with both controls embedded into M-Graphics.

To drag and drop an item from M-Explorer into TWXView32:

1. Embed the TWXView32 ActiveX Control into M-Graphics. Refer to *M-Graphics User's Manual (FAN 644.0)*.
2. Embed the M-Explorer ActiveX Control into the same M-Graphics display as the TWXView32 ActiveX Control (Figure 7-1). Refer to the *Embedding M-Explorer ActiveX Controls into M-Graphics* chapter.

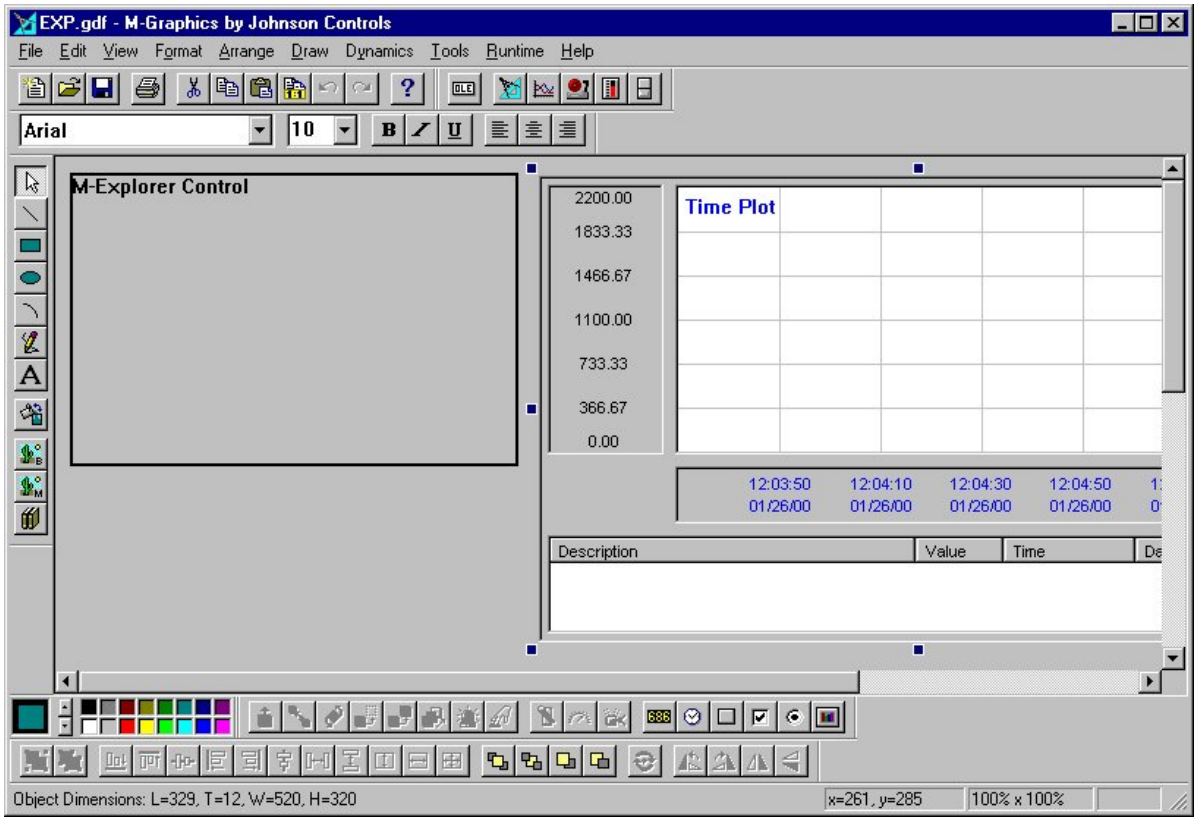


Figure 7-1: M-Explorer and TWXView32 in M-Graphics Configure Mode

3. Be sure the M-Graphics display is in Runtime mode to perform the drag and drop.
4. In M-Explorer, click and hold the left mouse button on a leaf item to select it, move the mouse to drag the item to TWXView32, then release the mouse button (Figure 7-2).

5. The TWXView32 ActiveX control will start showing the real-time data of the selected point in a dynamic trend display format.

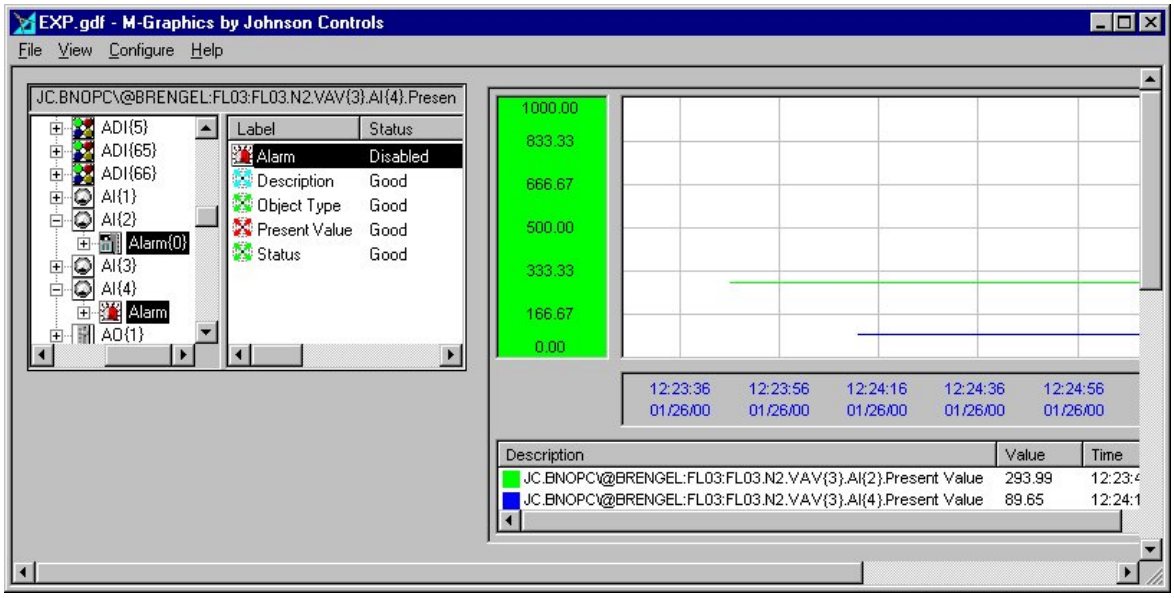


Figure 7-2: Item from M-Explorer in TWXView32 in Runtime Mode

Appendix A

BACnet OPC Data Access Server

Introduction

The BACnet OPC Data Server provides M-Explorer with dynamic data values from N30 series supervisory controller objects, third-party BACnet objects, and Cardkey® PEGASYS® objects for display. M-Inspector views and commands specific N30, BACnet, and Cardkey PEGASYS objects. In addition to describing how M-Explorer and M-Inspector provide unique access to the data provided by the BACnet OPC Data Access Server, this appendix describes how to:

- command an object
- view an object
- edit an object

Code No. LIT-1153440

Key Concepts

M-Explorer JC.BNOPC Hierarchy

M-Explorer presents data from a BACnet OPC Data Access Server in a hierarchical structure as illustrated in Figure A-1. Table A-1 describes the numbered callouts in Figure A-1.

This hierarchy matches the M-Tool Project Builder application and the VT100 interface embedded in the N30 supervisory controller. However, this hierarchy is different from the OPC Tag Browser which shows a flat list of named objects within each N30 device and does not show additional containers within the N30 device. Third-party BACnet devices and Cardkey devices are shown in a flat list similar to the Tag Browser. Refer to *Project Builder User's Guide (LIT-693200)* in the *M-Tool Manual (FAN 693)*, the *N30 Supervisory Controller User's Manual (FAN 689.2)*, and *M-Graphics User's Manual (FAN 644.0)* for more information.

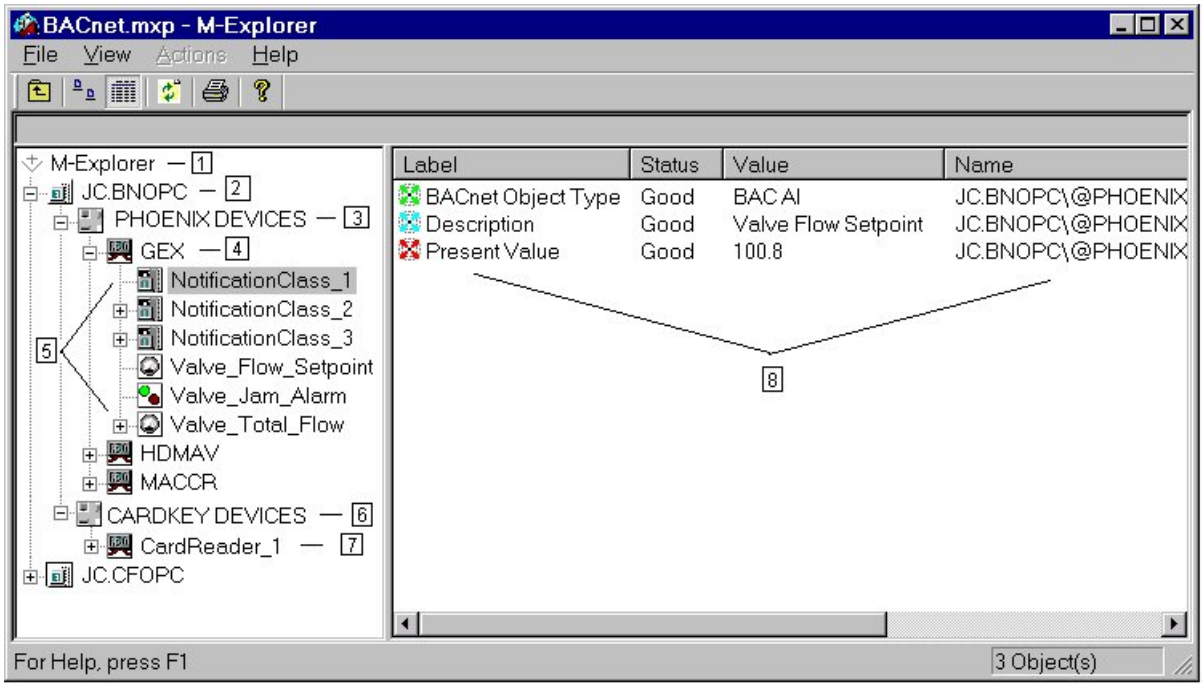


Figure A-1: M-Explorer JC.BNOPC Hierarchy

Table A-1: M-Explorer JC.BNOPC Hierarchy Callouts

Callout	View/Item	Description
1	M-Explorer	Top of the M-Explorer hierarchy
2	JC.BNOPC	BACnet OPC Data Access server
3	Phoenix Devices	Site (name)
4	GEX, HDMAV, etc.	Devices
5	NotificationClass_1, etc.	Objects
6	Cardkey Devices	Site (name)
7	CardReader_1	Device
8	Label, etc.	Attributes of the selected item (NotificationClass_1)

Site

A logical or physical grouping of devices that exist in connected or disconnected state relative to the M-Series Workstation. Each site has its own communication characteristics that can be described by protocol or physical connection. Examples of sites within the Johnson Controls product family include Companion panels, N1 networks, or N30 networks.

Site Book

The Site Book is a software program used to define and edit a physical or logical grouping of N30, third-party BACnet, and Cardkey objects that can be connected to an M-Series Workstation. Each site within the database has parameters that are needed to establish the connection. For more information, refer to the *Site Book User's Guide (LIT-6893100)* in the *N30 Supervisory Controller System Communications Manual (FAN 689.3).*

Status

With M-Explorer in Details view, the Status column displays data for N30, BACnet, and Cardkey PEGASYS objects as follows:

- The status of Leaf items lists the OPC Data Access Server quality, such as Good, Unsure, and Bad, for the value of attributes.
- The status of Branch items represents the object status. Refer to the *Object Dictionary (FAN 694)* for more information.

Note: Objects in Overridden status appear in Normal status color, as long as the objects are within alarm/warning limits. Refer to the *Getting Started* chapter in this manual for more information about status colors.

Label Icons/Symbols

In addition to the name listed in the Label column, M-Explorer also represents each object from a BACnet OPC Data Access Server with an icon based on object type. Table A-2 shows each type of icon and what object type the icon represents.

Table A-2: Label Icons for Objects

Icon	Object Type
	Analog Alarm
	Analog Totalization
	Analog Value
	BACnet Averaging
	BACnet Event Enrollment
	BACnet File
	BACnet Life Safety Point
	BACnet Life Safety Zone
	BACnet Loop
	BACnet Protocol Engine
	Binary Value
	Broadcast Management
	Calendar
	Connection (Not available in North America as of this release)
	Container
	Controller
	Data Broadcast
	Demand Load Rolling
	Device Diagnostic
	Ethernet IP Datalink
	Event Totalization
	Global Data Sharing
	Group
	Heavy Equipment Controller
	Interlock
	Latch
	Load
	Message Router
	Modem Configuration
	Multiple Command
	Multistate Alarm

Continued on next page . . .

Icon (Cont.)	Object Type
	N2 Analog Input
	N2 Analog Output
	N2 Binary Input
	N2 Binary Output
	N2 Master Data Link
	N2 Multistate Input
	N2 Multistate Output
	N2 Pulse Counter
	N30 Device
	Name List
	Notification Class
	Operator
	Optimal Start
	Printer
	Pulse Meter
	Reference (Not available in North America as of this release)
	Remote Destination
	Report Server
	Runtime Totalization
	Schedule
	Serial Datalink
	Signal Select
	Site
	Site Data
	Summary
	Temporary Occupancy
	Trend Log
	Utility Profile
	VT100

M-Inspector Window

When accessing N30, third-party BACnet, or Cardkey objects from the BACnet OPC Data Access Server, M-Inspector displays object data in a tabbed presentation style. Users select a tab to command objects, view and edit attributes, or to modify Schedule and Calendar objects.

For information about the commands supported by each object and the attributes for each object, refer to the *Object Dictionary (FAN 694).*

M-Command

The M-Command ActiveX control appears as the M-Command tab in the M-Inspector window and displays values for key attributes associated with an N30, third-party BACnet, or Cardkey object being inspected, including Object Name, Present Value, Description, Status, and Object Type. The values of these attributes refresh every sixty seconds. The M-Command tab allows a user to send commands to objects that support commands. (If an object does not support commands, then the Command Selection drop-down list is empty.) The pop-up menu that appears when right-clicking on the M-Command tab with the mouse lists the About M-Command menu item. Selecting this menu item displays information about the copyright of the M-Command ActiveX control.

M-View

The M-View ActiveX control appears as the M-View tab in the M-Inspector window and allows users to view and edit the attributes of an individual object defined in the system. From the M-View tab, users view data while in the View mode. By clicking the Edit button, users can change the M-View tab to the Edit mode to modify attribute values. Users can choose multiple views of data from a pop-up menu that appears by right-clicking the M-View tab (Figure A-2).

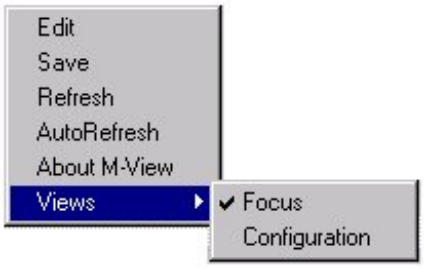


Figure A-2: View Tab Pop-Up Menu

The default views available to users from the pop-up menu include:

- Focus – Contains the most important attributes of the object, providing the most useful data to a user and may or may not include configurable/writeable attributes.
- Configuration – Contains only configurable/writeable attributes of an object. Use this view to edit an object's attributes.

Note: Third-Party BACnet objects do not support the Focus and Configuration views. Third-Party BACnet objects display in Snapshot view.

The Edit, Save, and Refresh menu items in Figure A-2 correspond to the buttons described in Table A-5. Selecting the About M-View menu item displays information about the copyright of the M-View ActiveX control.

M-Schedule

An M-Schedule ActiveX Control appears as the M-Schedule tab in the M-Inspector window and allows users to view and modify a Schedule object. A Schedule object runs events within a facility management system at specified times.

Note: M-Schedule refers to both an N30 Schedule and a BACnet Schedule.

For details, refer to the *M-Schedule/M-Calendar User's Guide (LIT-1153600)* in the *M-Series Workstation Manual* (*FAN 1153.2)*.

M-Calendar

The M-Calendar ActiveX Control appears as the M-Calendar tab in the M-Inspector window and allows users to view and modify a Calendar object. A Calendar object is a reusable exception to weekly schedules within a facility management system.

Note: M-Calendar refers to both an N30 Calendar and a BACnet Calendar.

For details, see the *M-Schedule/M-Calendar User's Guide (LIT-1153600)* in the *M-Series Workstation Manual* (*FAN 1153.2)*.

BACnet

The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) developed the Building Automation Controls Network (BACnet) as a data communications protocol designed to promote connectivity among multiple vendors of control equipment. BACnet is the protocol used for communication between the M-Series Workstation and N30 Controller network. M3 Workstation Release 3.0 and M5 Workstation Release 2.0 communicate with:

- N30 Supervisory Controllers
- devices through BACnet OPC Alarm and Events (AE) and Data Server
- third-party BACnet devices

Pop-Up Menus

Pop-up menus provide another means to access menu options. A pop-up menu displays various options for different views, as described in Table A-3, when selecting specific items from a BACnet Data Access Server in M-Explorer.

Table A-3: Pop-Up Menu Options

Item Selected	Tree View Pop-Up Menu Options	Focus View Pop-Up Menu Options
Site	Connect, Disconnect, AutoRefresh	Connect, Disconnect, Icons View, Details View, Refresh, Up One Level, AutoRefresh
Device	Inspect, AutoRefresh	Inspect, Icons View, Details View, Refresh, Up One Level, AutoRefresh
Object	Inspect, AutoRefresh	Inspect, Icons View, Details View, Refresh, Up One Level, AutoRefresh
Attribute	Not listed in Tree view	Icons View, Details View, Refresh, Up One Level, AutoRefresh

Connect/Disconnect

When selecting sites, the connect/disconnect options appear on the Actions or pop-up menu. Connect or disconnect a user-connected site from the M-Explorer application by selecting one of these options. These options are applicable only to user connected sites as defined in the Site Book application.

System-connected sites automatically connect upon startup of the M-Series Workstation. System-connected sites cannot be connected or disconnected, even though these options are presented by M-Explorer.

Only two sites may be connected simultaneously. Attempting a third site connection fails by leaving the site disconnected.

Procedure Overview

Table A-4: BACnet OPC Data Access Server

To Do This	Follow These Steps:
Command an Object	On the M-Explorer workspace, select the object to be inspected. From the Actions menu, select Inspect. In the Command field, click the drop-down arrow to view a list of supported commands. Select a command from the list. Fill in any additional command parameters that may appear for the selected command. Click Execute. Click Close.
View an Object	On the M-Explorer workspace, select the object to be inspected. From the Actions menu, select Inspect. Click on the View tab. View the object attributes. Select a button from the bottom of the window.
Edit an Object	On the M-Explorer workspace, select the object to be inspected. From the Actions menu, select Inspect. Click on the View tab. Click Edit. Edit the fields as desired. Click Save to save the changes. Click Refresh to update the information in the display. Click Close.

Detailed Procedures

Commanding an Object

To command an object:

1. On the M-Explorer application, select an object.
2. From the Actions menu, select Inspect. The M-Inspector window appears with the M-Command tab selected and the complete hierarchical path of the object appearing in the Title bar (Figure A-3).

Note: Right-clicking on a selected item in either the Tree view or Focus view brings up the Inspect option on a pop-up menu.

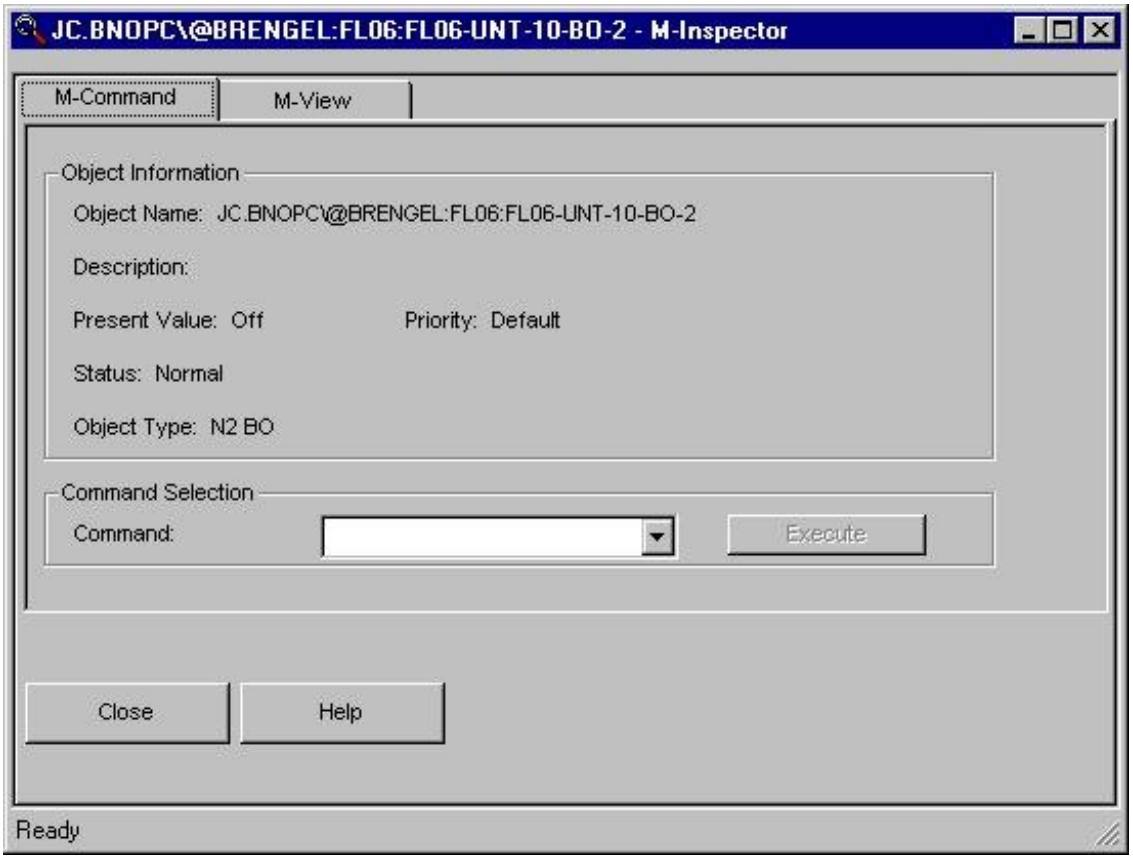


Figure A-3: M-Inspector Window with M-Command Tab Visible

3. In the Command field, click the drop-down arrow to view a list of supported commands (Figure A-4).

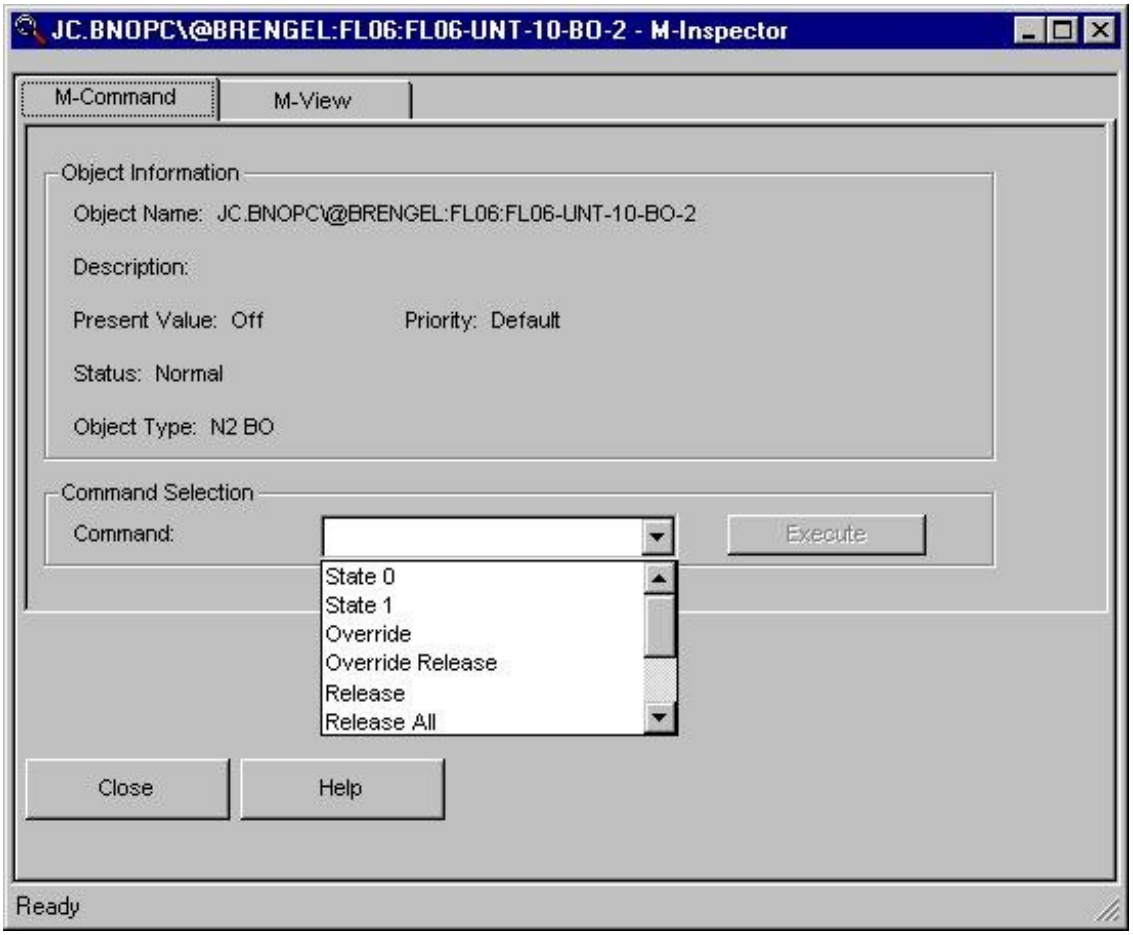


Figure A-4: Command Drop-Down List

4. Select a command from the list. If the command selected has additional command parameters, the Command Parameter section appears below the Command Selection section in the M-Inspector window (Figure A-5). For more information about the object's supported commands, refer to the *Object Dictionary (FAN 694)*.

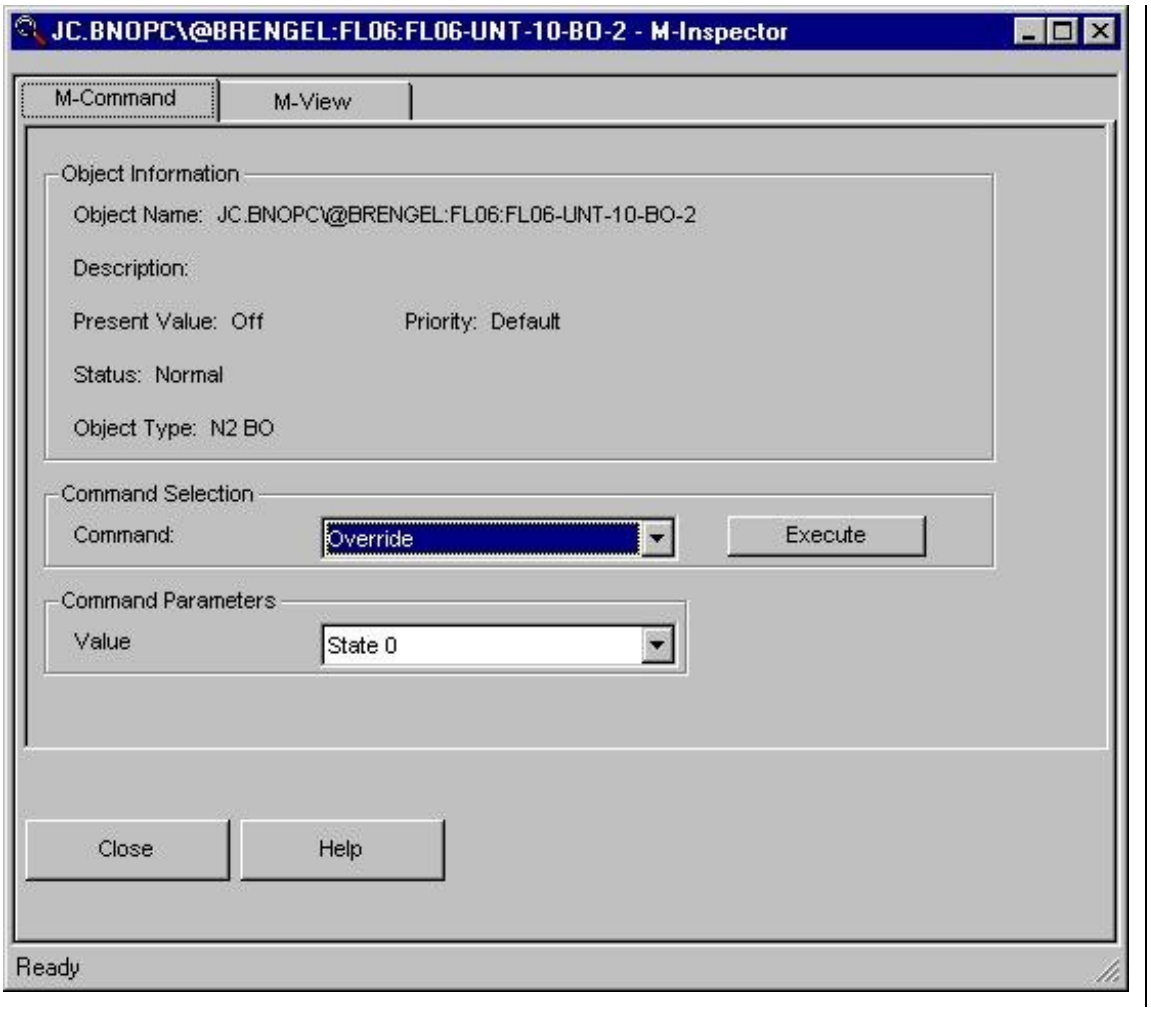


Figure A-5: Command Parameters

5. In the Value field, click the drop-down arrow to view and select from a list of command parameter values. For more information about the object's command parameters, refer to the *Object Dictionary (FAN 694).*
6. Click Execute.
7. Click Close.

Note: The Help button brings up information specifically about the inspected object.

Viewing an Object

To view an object:

1. On the M-Explorer application, select an object.
2. From the Actions menu, select Inspect. The M-Inspector window appears with the M-Command tab selected and the complete hierarchical path of the object in the Title bar (Figure A-3).

Note: Right-clicking on a selected item in either the Tree view or Focus view brings up the Inspect option on a pop-up menu.

3. Click on the M-View tab. The M-View tab appears in the M-Inspector window (Figure A-6).

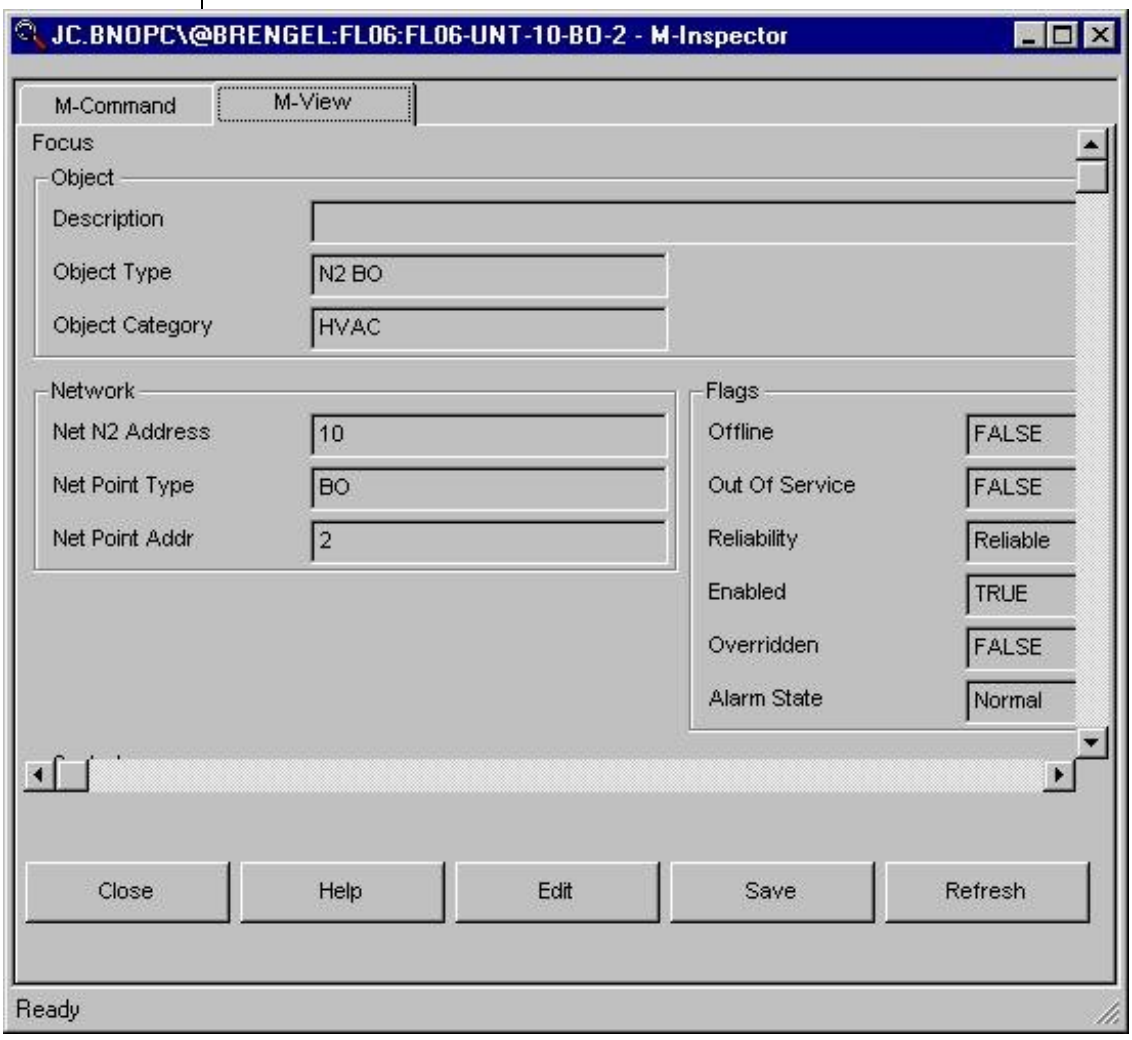


Figure A-6: M-Inspector Window with M-View Tab Visible

4. View the object attributes using the horizontal and vertical scroll bars or resizing the M-Inspector window to make other attributes visible. For more information about object attributes, refer to the *Object Dictionary (FAN 694)*.

Notes: The values on the View tab may automatically refresh. Refresh manually is the Default. Right click the M-View tab and select AutoRefresh to automatically update the current values from the Controller.

When viewing third-party controllers with a large number of objects (appear in a flat list), we recommend turning off the AutoRefresh feature to improve performance.

5. Select a button from the bottom of the window, or right-click the M-View tab and select an option from the pop-up menu. Table A-5 describes the button and menu options.

Table A-5: View Tab Button Options

Button	Description
Close	Closes the M-Inspector window.
Help	Brings up information specifically about the inspected object.
Edit/View	The Edit button allows the visible attributes to be edited. Edit the object when the Edit button is clicked, even though the button name changes to View. The View button switches to view-only mode for the attributes. View the object when the View button is clicked, even though the button name changes to Edit. This button toggles between the Edit and View modes.
Save	Saves any changes to the attributes after editing.
Refresh	Updates any changes to attributes on the M-View display since M-Inspector opened (M-View does not automatically refresh values).

Editing an Object

To edit an object:

1. On the M-Explorer application, select an object.
2. From the Actions menu, select Inspect. The M-Inspector window appears with the M-Command tab selected and the complete hierarchical path or functional name of the object appearing in the Title bar (Figure A-3).

Note: Right-clicking on a selected item in either the Tree view or Focus view also brings up the Inspect option on a pop-up menu.

3. Click on the M-View tab. The entire M-View tab appears in the M-Inspector window (Figure A-6).

4. Click Edit, or right-click the M-View tab and select Edit from the pop-up menu. The attributes become available for editing.

Note: After clicking the Edit button, the View button appears in its place to return to the view-only mode for the attributes.

5. Edit the fields as desired. For more information about the object's attributes, refer to the *Object Dictionary (FAN 694)*, or select the M-Inspector Help button.
6. Click Save to save the changes. Any error messages regarding invalid parameters appear at this time.
7. Click Close.

Appendix B

Companion/Facilitator OPC Data Access Server

Introduction

The Companion/Facilitator OPC Data Server provides dynamic data values for points to M-Explorer for display. Companion/Facilitator points are not accessible through M-Inspector, but M-Explorer still provides access to the data provided by the Companion/Facilitator OPC Data Access Server as described in this appendix.

Code No. LIT-1153445

Key Concepts

M-Explorer JC.CFOPC Hierarchy Server

M-Explorer presents data from a Companion/Facilitator OPC Data Access Server in a hierarchical structure as illustrated in Figure B-1. Table 2-1 describes the numbered callouts in Figure B-1.

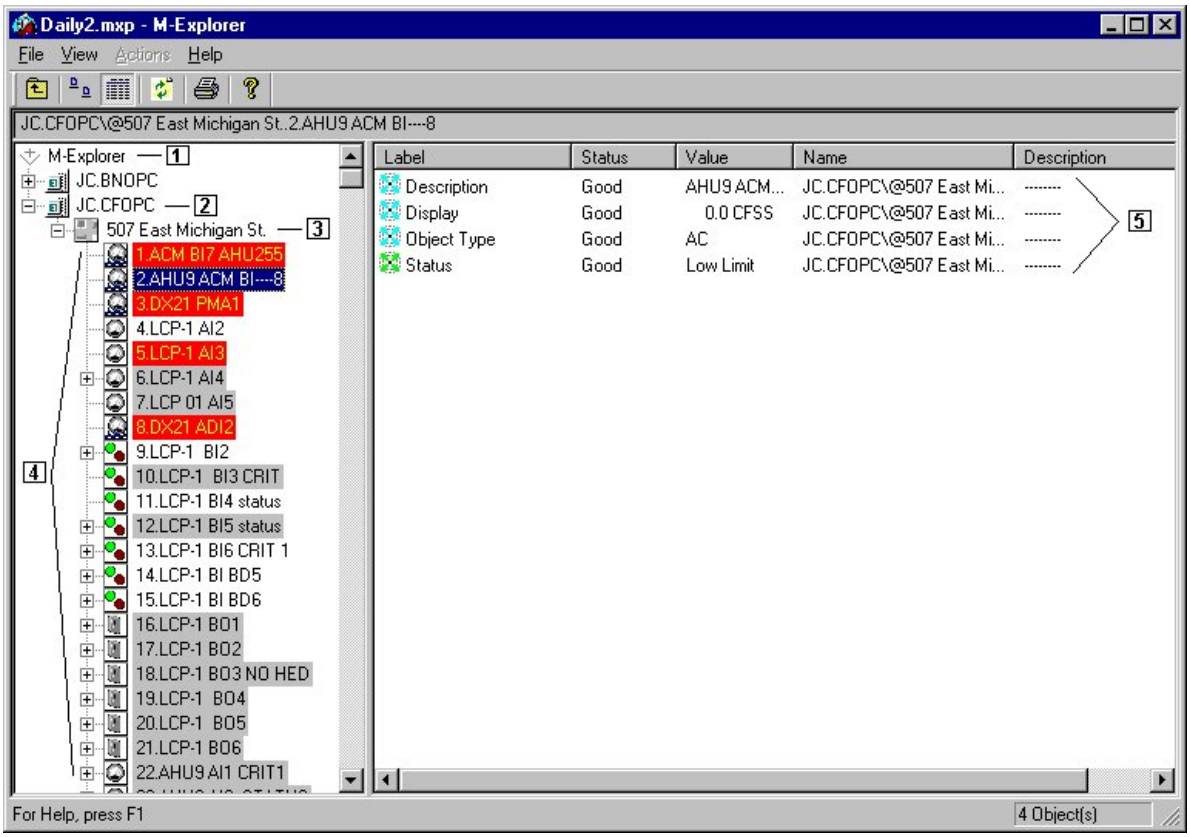


Figure B-1: M-Explorer JC.CFOPC Hierarchy

Table B-1: M-Explorer JC.CFOPC Hierarchy Callouts

Callout	View/Item	Description
1	M-Explorer	Top of the M-Explorer hierarchy
2	JC.CFOPC	Companion/Facilitator OPC Data Access Server
3	507 East Michigan St.	Site (name)
4	1.ACM B17 AHU255, etc.	Companion/Facilitator points
5	Description, etc.	Attributes of the selected item (2.AHU9 ACM BI----8)

Site

A site is a logical or physical grouping of devices that exist in connected or disconnected state relative to the M3 Workstation. Each site has its own communication characteristics that can be described by protocol or physical connection. Examples of sites within the Johnson Controls product family include Companion Panels, N1 networks, or BACnet networks.

Phone Book

The Phone Book includes a list of defined sites and allows operators to select and open a connection to a site, add a site, modify a site, or delete a site. All sites, dial-up and direct-connect, must be defined in the Phone Book.

Status

With M-Explorer in Details view, the Status column displays a status for each OPC attribute. For more information about status, refer to the *Companion/Facilitator OPC Server User's Guide (LIT-11531100)* in the *M-Series Workstation with Companion/Facilitator Manual (FAN 1153.1)*.

Label Icons/Symbols

In addition to the name listed in the Label column, M-Explorer also represents points from a Companion/Facilitator OPC Data Access Server with an icon based on its object type. Table B-2 shows each type of icon and what object type it represents.

Table B-2: Label Icons for Points

Icon	Point Type
	Accumulator
	Analog Input
	Analog Output
	Binary Input
	Binary Output

Pop-Up Menus

Pop-up menus provide another means to access menu options. A pop-up menu displays various options for different views, as described in Table B-3, when selecting specific items from a Companion/Facilitator Data Access Server in M-Explorer.

Table B-3: Pop Up Menu Options

Item Selected	Tree View Pop-Up Menu Options	Focus View Pop-Up Menu Options
Site	Connect, Disconnect, AutoRefresh	Connect, Disconnect, AutoRefresh
Companion Point	None. No pop-up menu appears.	Icons View, Details View, Refresh, Up One Level, AutoRefresh
Attribute	Not listed in Tree view	Icons View, Details View, Refresh, Up One Level, AutoRefresh

Connect/Disconnect

When selecting a Companion/Facilitator site, the connect/disconnect options appear on the Actions or pop-up menu. Connect or disconnect Companion/Facilitator sites from the workstation. Connect only one Companion/Facilitator site at one time.

Appendix C

N1 OPC Data Access Server

Introduction

The N1 OPC Data Access Server provides dynamic access to point data values residing on a Metasys® N1 network. M-Explorer provides read access capabilities to the data provided by the N1 OPC Data Access Server as described in this appendix.

Key Concepts

M-Explorer JC.N1OPC Hierarchy Server

M-Explorer presents data from an N1 OPC Data Access Server in a hierarchical structure as illustrated in Figure C-1. Table C-1 describes the numbered callouts in Figure C-1.

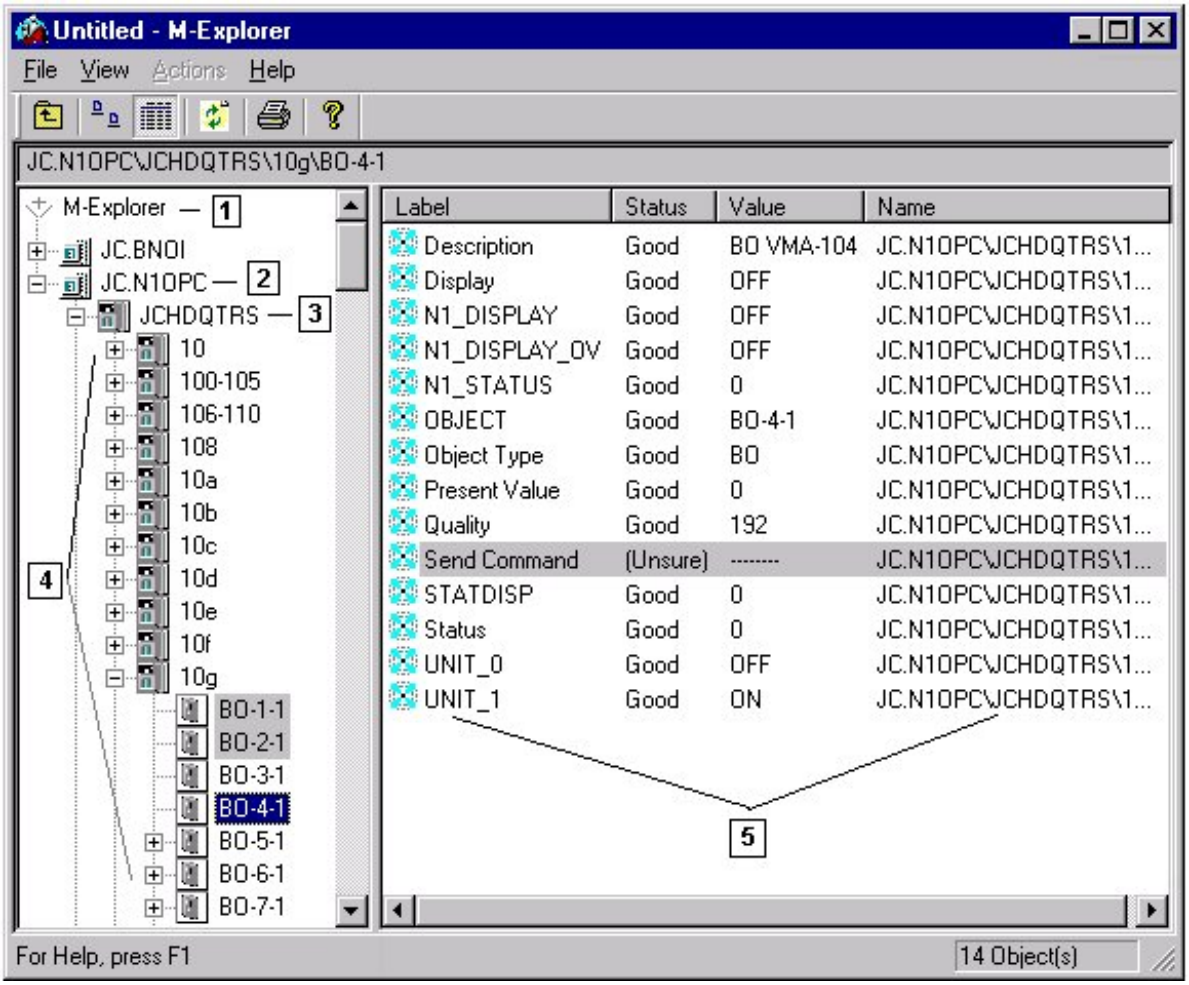


Figure C-1: M-Explorer JC.N1OPC Hierarchy

Table C-1: M-Explorer JC.N1OPC Hierarchy Callouts

Callout	View/Item	Description
1	M-Explorer	Top of the M-Explorer hierarchy
2	JC.N1OPC	N1 OPC Data Access Server
3	JCHDQTRS	Site (name)
4	10, 100-105, for example	N1 OPC Data Access Server points
5	Label, Status, for example	Attributes of the selected item (BO-4-1)

Site

A site is a logical or physical grouping of devices that exist in a connected or disconnected state relative to the M-Series Workstation. Each site has its own communication characteristics that can be described by protocol or physical connection. Examples of sites within the Johnson Controls product family include Companion Panels, N1 networks, or BACnet™ networks.

Label Icons/Symbols

In addition to the name listed in the Label column, M-Explorer also displays points from an N1 OPC Data Access Server with an icon based on its object type. Table C-2 shows each type of icon and what object type it represents.

Table C-2: Label Icons for Points

Icon	Point Type
	Accumulator
	Analog Input
	Analog Output
	Analog Value
	Binary Input
	Binary Output
	Binary Value
	Lighting
	Proportional Integral Derivative (PID) Loop

Pop-Up Menus

Pop-up menus provide another means to access menu options. A pop-up menu displays various options for different views, as described in Table C-3, when selecting specific items from an N1 OPC Data Access Server in M-Explorer.

Table C-3: Pop Up Menu Options

Item Selected	Tree View Pop-Up Menu Options	Focus View Pop-Up Menu Options
Site	Connect, Disconnect, AutoRefresh	Connect, Disconnect, AutoRefresh
Companion Point	None. No pop-up menu appears.	Icons View, Details View, Refresh, Up One Level, AutoRefresh
Attribute	Not listed in Tree view	Icons View, Details View, Refresh, Up One Level, AutoRefresh

Connect/Disconnect

When selecting an N1 OPC site, the connect/disconnect options appear on the Actions or pop-up menu. Connect or disconnect N1 OPC sites from the workstation. Connect only one N1 OPC site at one time.

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Appendix D

LN OPC Data Access Server

Introduction

The LONWORKS® Network (LN) OLE for Process Controls (OPC) Data Access Server provides M-Explorer with dynamic data values from Johnson Controls LONWORKS controllers, and qualified third-party LONWORKS devices for display. M-Inspector views and commands specific LN data values (OPC tags). The LN Scheduling OPC Server provides access to the database of LN Schedule objects that are used to implement workstation (computer) based scheduling for the LONWORKS network. Both of these server components are supplied with the Metasys® system Connectivity to LONWORKS network (MCL) software package that is designed to allow the M3 Workstation to communicate with the LONWORKS network.

In addition to describing how M-Explorer and M-Inspector provide unique access to the data provided by the LN OPC Data Access Server and LN Scheduling OPC Server, this appendix describes how to:

- command an LN OPC tag or LN Schedule object
- view an LN OPC tag

Code No. LIT-1201121

Key Concepts

LONWORKS

LONWORKS network technology was developed by the Echelon® Corporation to provide an industry-standard Local Operating Network (LON®). The network is built around the Neuron® chip, a microprocessor that combines three Central Processing Units (CPUs) into one chip. The Neuron chip is an integral component of any LONWORKS device. LONWORKS is the generic term for Neuron chip technology and networking applications.

LONMARK® standards are a set of guidelines issued by the LONMARK Interoperability Association. These guidelines ensure that devices from different vendors can coexist and cooperate on a single LONWORKS network. The organization also certifies specific devices as LONMARK compliant.

M-Explorer JC.LNOPCVNI Hierarchy

M-Explorer presents data from the LN OPC Data Access Server (named JC.LNOPCVNI in the Tree view) in a hierarchical structure as illustrated in Figure D-1. The JC.LNOPCVNI hierarchy is defined during MCL setup either to match the physical subsystem/device hierarchy of the LONWORKS network, or is freely definable to reflect, for example, an application-oriented view of the LONWORKS network.

Note: In M-Explorer and the OPC Universal Tag Browser, this hierarchy may be shown as a flat list of named objects, with or without dots (or periods [.]) as separator characters between the branch item names. The display format (hierarchical, flat with separators, or flat without separators) is defined during MCL setup. For more information, refer to the *MCL Installation and Commissioning Technical Bulletin (LIT-1201120)*.

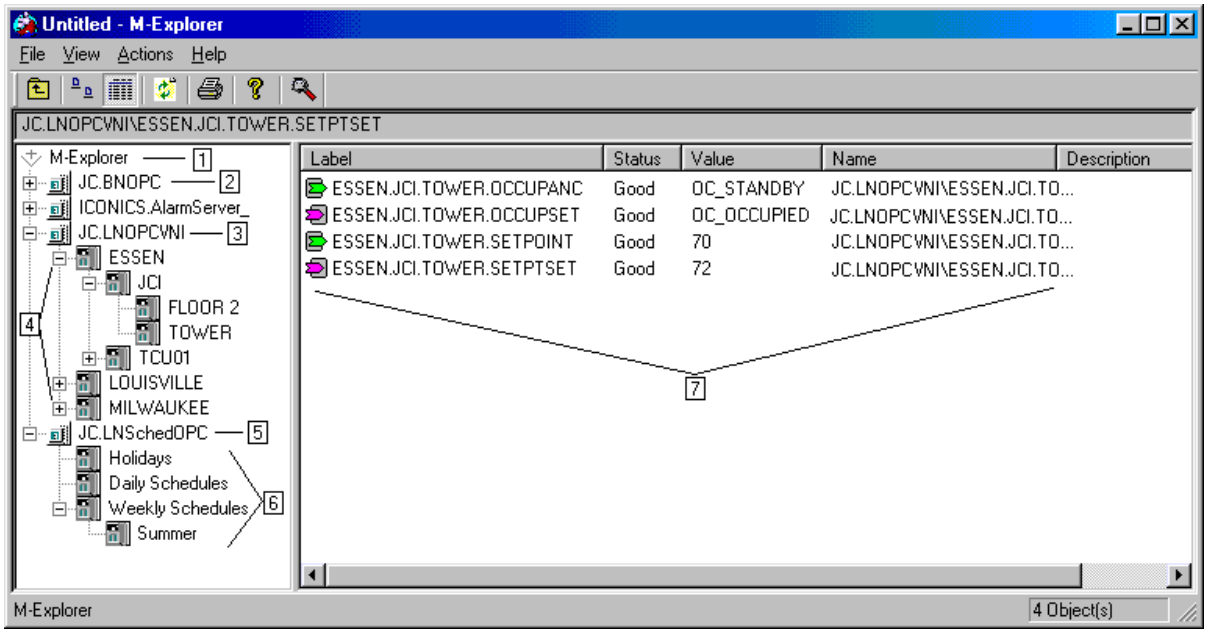

Figure D-1: M-Explorer JC.LNOPCVNI Hierarchy

Table D-1 describes the numbered callouts in Figure D-1.

Table D-1: M-Explorer JC.LNOPCVNI Hierarchy Callouts

Callout	View/Item	Description
1	M-Explorer	Top of the M-Explorer hierarchy
2	JC.BNOPC	N30/BACnet OPC Data Access server
3	JC.LNOPCVNI	LN OPC Data Access server
4	ESSEN, JCI, etc.	Branch names derived from LONWORKS subsystem/device (physical) hierarchy, or user-defined, application-oriented (logical) hierarchy. MCL setup allows you to choose how the display hierarchy is organized; the Tree view pane of Figure D-1 shows an application-oriented hierarchy.
5	JC.LNSchedOPC	LN Scheduling OPC server
6	Holidays, etc.	LN schedule object hierarchy
7	ESSEN.JCI.TOWER…	OPC tags of the selected branch item (TOWER). Using the tree analogy, these are the leaf (lowest level) items in the hierarchy, which do not contain any other items.

OPC Tag

An OPC tag is a named object in an OPC server database that can be accessed from an OPC client, such as M-Explorer. An LN OPC tag represents an entire LONWORKS Network Variable (NV) if the variable has a single value, or the tag can represent an individual field of a structured network variable. For simplicity, the rest of this chapter uses the term network variable to mean both single-valued network variables and the fields of structured network variables.

Note: An LN OPC tag can also represent an entire structured network variable. In this case, the Value displayed in M-Explorer and M-Inspector is a byte string showing the individual bytes of all fields of the variable (in decimal) separated by commas, e.g., `16, 255, 123, 74`. Due to their ambiguous nature, these OPC tags cannot be commanded in M-Inspector.

Status

With M-Explorer in Details view, the Status column displays data for LN OPC tags as follows:

- The status of Leaf items lists the OPC Data Access Server quality, such as Good, Unsure, or Bad, for the values of the displayed LN OPC tags.
- The status of Branch items under JC.LNOPCVNI is always displayed as dashes (--), because the branch items only help to organize the hierarchical display and are not objects with viewable or commandable properties (see Figure D-2 for an example). The branch items can be compared with the folders shown in Windows Explorer.

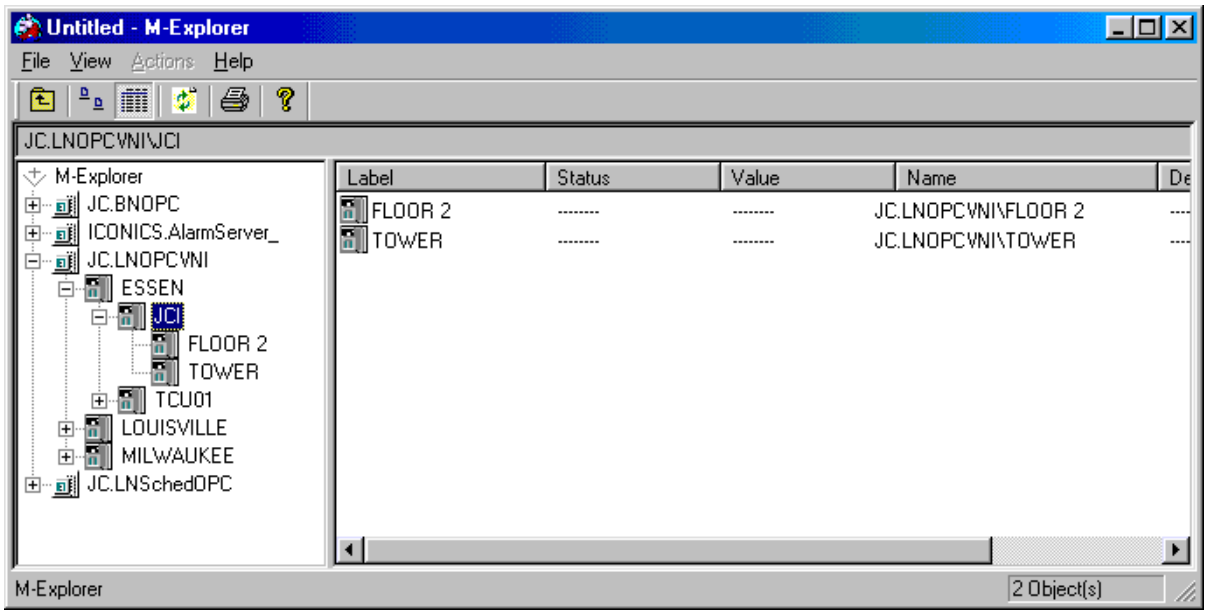

Figure D-2: Details View of JC.LNOPCVNI Branch Items

M-Explorer JC.LNSchedOPC Hierarchy

In addition to the OPC server for accessing data on the LONWORKS network, MCL provides an OPC server (JC.LNSchedOPC) for accessing LN Schedule objects. These objects help to implement workstation (PC) based scheduling for the LONWORKS network. Note that workstation-based scheduling is not the same as controller- or device-based scheduling provided by special LONWORKS timer devices. Schedules can be configured from M-Explorer by selecting a Schedule object, and then selecting the Inspect option. For details, refer to the *Working with LN Schedule Objects (LIT-1201123)* chapter of the *M-Schedule/M-Calendar User's Guide (LIT-1153605)*.

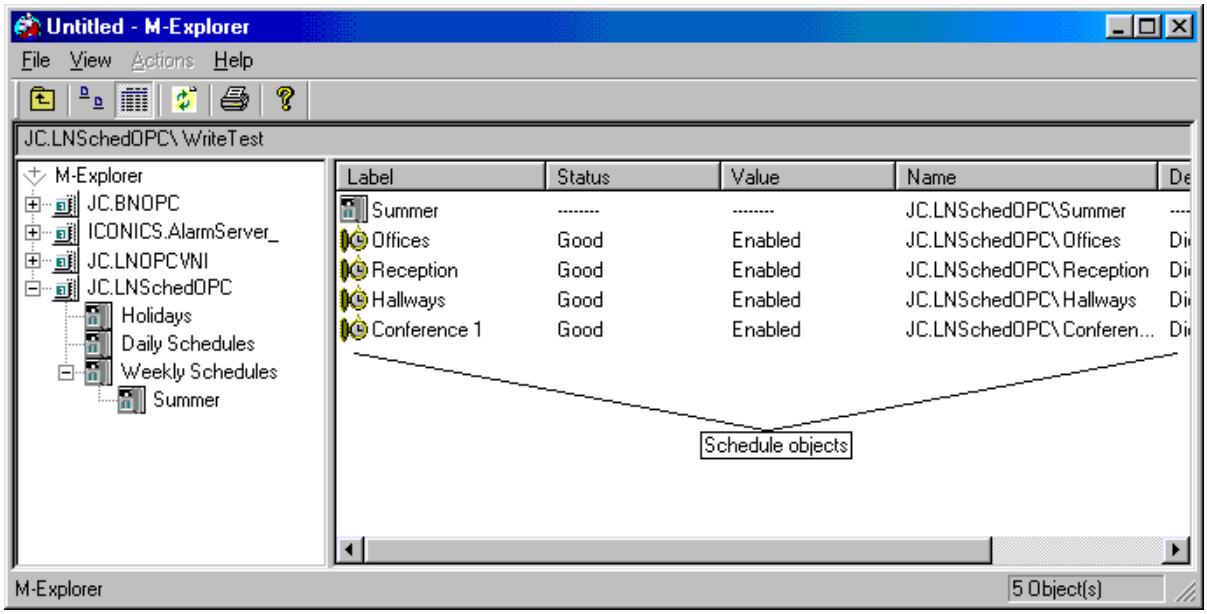

Figure D-3: M-Explorer JC.LNSchedOPC Hierarchy

Label Icons/Symbols

In addition to the name listed in the Label column, M-Explorer also displays an icon for each OPC tag and Schedule object from the LN OPC Data Access server and LN Scheduling OPC server. The icon shown for an LN OPC tag is based on the type of network variable the tag represents, as listed in Table D-2.

Table D-2: Label Icons for LN OPC Tags

Icon	Object Type
	OPC tag representing a LONWORKS network variable input (NVI). If the OPC tag represents a single-valued NVI or a single field of a structured NVI, then it can be commanded in M-Inspector.
	OPC tag representing a LONWORKS network variable output (NVO). NVOs are read-only, and can only be viewed in M-Inspector.
	LN Schedule object, which can be commanded and configured in M-Inspector.

M-Inspector Window

When accessing LN OPC tags from the LN OPC Data Access Server (JC.LNOPCVNI), or Schedule objects from the LN Scheduling OPC Server (JC.LNSchedOPC), M-Inspector displays object data in a tabbed presentation style. Users select a tab to command and view OPC tags, or to command and configure Schedule objects.

Command Tab

The LN Command ActiveX control appears as the Command tab in the M-Inspector window and displays values for key attributes associated with the LN OPC tag or Schedule object being inspected, including Object Name, Present Value, Communication Status, Value Range, and Description. The displayed values are event-driven, meaning that if the tag's value changes, it is automatically refreshed on the screen. The Command tab allows a user to send commands to tags and objects that support commands. If a tag or object does not support commands, or the user does not have the proper access rights, or the OPC tag represents a structured NV (not a single-valued NV and not a single field of a structured NV), then the Command tab does not appear in the M-Inspector window for that object.

View Tab

The LN View ActiveX control appears as the View tab in the M-Inspector window and allows users to view the attributes of an individual LN OPC tag defined in the system.

Note: In contrast to objects from other OPC Data Access servers, such as the BACnet OPC Data Access server, LN OPC tags do not have editable attributes, so an Edit mode is not available on the View tab.

Schedule Tab

The LN Schedule ActiveX control appears as the Schedule tab in the M-Inspector window when the user inspects an LN Schedule object from the JC.LNSchedOPC server. The Schedule tab allows users to configure the Schedule object. A Schedule object runs events within a building automation system at specified times. For details, refer to the *Working with LN Schedule Objects (LIT-1201123)* chapter of the *M-Schedule/M-Calendar User's Guide (LIT-1153605).*

Pop-Up Menus

Pop-up menus provide another means to access menu options. A pop-up menu displays various options for different views, as described in Table D-3, when selecting specific items from the LN OPC Data Access Server and the LN Scheduling OPC Server in M-Explorer.

Table D-3: Pop-Up Menu Options

Item Selected	Tree View Pop-Up Menu Options	Focus View Pop-Up Menu Options
OPC Server	AutoRefresh	Icons View, Details View, Refresh, Up One Level, AutoRefresh
Branch Item	AutoRefresh	Icons View, Details View, Refresh, Up One Level, AutoRefresh
LN OPC Tag	Not listed in Tree view	Inspect, Icons View, Details View, Refresh, Up One Level, AutoRefresh
LN Schedule Object	Not listed in Tree view	Inspect, Icons View, Details View, Refresh, Up One Level, AutoRefresh

Procedure Overview

Table D-4: LN OPC Data Access Server

To Do This	Follow These Steps:
Command an LN OPC Tag or Schedule Object	On the M-Explorer workspace, select the tag or object to be inspected. From the Actions menu, select Inspect. In the Command Value To field, click the drop-down arrow to select a value from the list of supported command values for tags that have enumerated, named values, or type the numeric value for analog (floating point) or digital (integer) tags. Schedule objects support the Enable and Disable commands. Click Execute. Click Close.
View an LN OPC Tag	On the M-Explorer workspace, select the LN OPC tag to be inspected. From the Actions menu, select Inspect. Click on the View tab. View the tag's attributes. Click Close.

Detailed Procedures

Commanding an LN OPC Tag or LN Schedule Object

To command an LN OPC tag or Schedule object:

1. In the M-Explorer application, select the LN OPC tag or Schedule object in the Focus view pane.
2. From the Actions menu, select Inspect, or click the Inspect toolbar button (), or right-click on the tag or object and select Inspect from the pop-up menu. The M-Inspector window appears with the complete hierarchical path of the tag or object displayed in its Title bar (Figure D-4). If the tag or object can be commanded and the user has the proper access rights, the Command tab is selected. Otherwise, only the View tab appears in the M-Inspector window (see *Viewing an LN OPC Tag*).

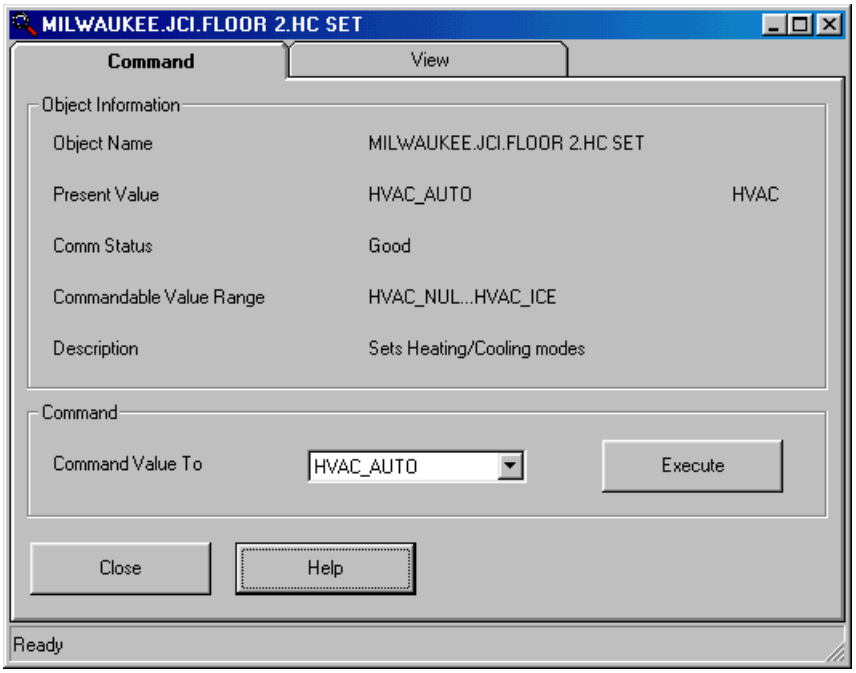

Figure D-4: M-Inspector Window with Command Tab Visible

Note: Resize the window to display all available button options. You can click the window's Maximize button (🗖) in the upper right corner, which automatically resizes the window to the optimal size for the Command tab.

3. In the Command Value To field, click the drop-down arrow to select a value from the list of supported command values for tags that have enumerated, named values (Figure D-5), or type the numeric value for analog (floating point) or digital (integer) tags. The range of values is shown in the Commandable Value Range field. Schedule objects support the Enable and Disable commands.

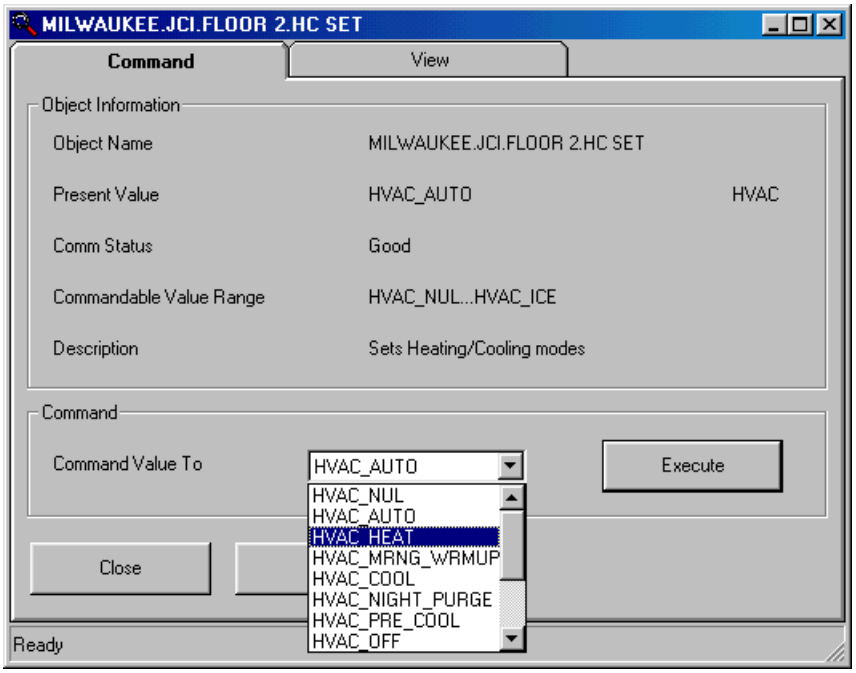

Figure D-5: Command Value To Drop-Down List

4. Click Execute.
5. Click Close.

Viewing an LN OPC Tag

To view an LN OPC tag:

1. In the M-Explorer application, select an LN OPC tag in the Focus view pane.
2. From the Actions menu, select Inspect, or click the Inspect toolbar button (), or right-click on the tag and select Inspect from the pop-up menu. The M-Inspector window appears with the complete hierarchical path of the tag displayed in its Title bar (Figure D-6). If the tag can be commanded and the user has the proper access rights, the Command tab is selected. Otherwise, there is no Command tab and the View tab is selected.
3. Click on the View tab. The View tab appears in the M-Inspector window (Figure D-6).

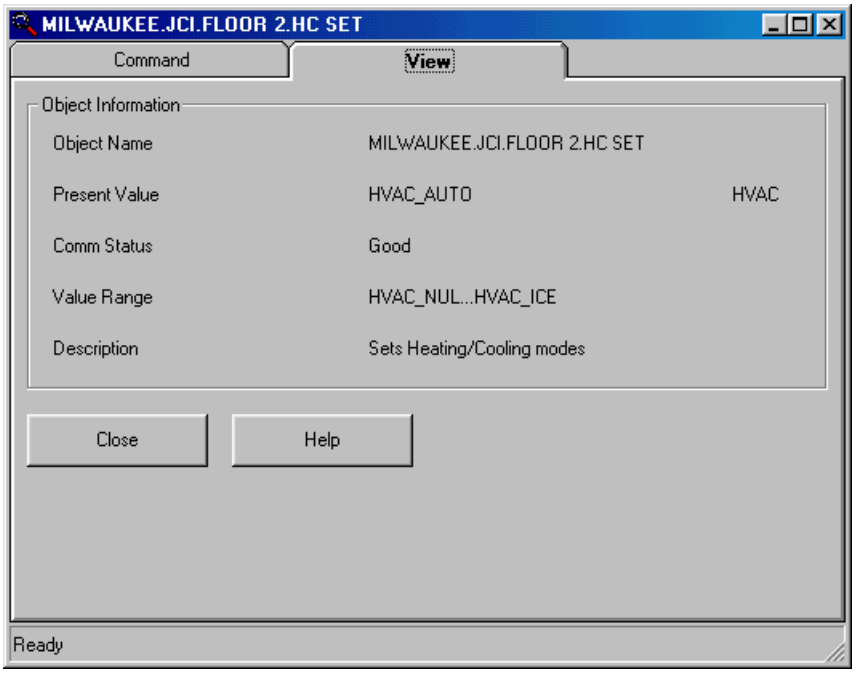

Figure D-6: M-Inspector Window with View Tab Visible

Note: Resize the window to display all available button options. You can click the window's Maximize button (🗖) in the upper right corner, which automatically resizes the window to the optimal size for the View tab.

4. View the tag's attributes.
5. Click Close.

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