

Project Builder User's Guide

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Chapter 1

Using This Guide

Introduction

This guide describes Project Builder, a component of the System Tools in the M-Tool family of products. This chapter describes:

- user guide organization
- chapter organization
- online help
- guide conventions

Key Concepts

User Guide Organization

This guide is divided into chapters based on program features or components.

Table 1-1: Project Builder User's Guide Overview - Chapters

Chapters	Title	Description
Chapter 1	Using This Guide	The current chapter provides an overview of the structure of the guide.
Chapter 2	Introduction to Project Builder	This chapter describes the requirements of the Project Builder and its relationship to the other System Tools.
Chapter 3	Getting Started	This chapter describes the basics of Project Builder: the main screen, menus, starting the program, creating or opening projects, adding devices and objects to projects, and configuring devices or objects in projects. This chapter is generic and tells you how to configure an object, but does not describe the specific details for different types of objects. Please refer to the <i>Object Dictionary</i> for more information on each type of object.
Chapter 4	Defining a Site	This chapter describes the details of defining the site object and the interconnection between Project Builder and Site Book.
Chapter 5	Importing Files	Project Builder allows you to import existing controller configuration files from other Johnson Controls configuration tools such as the HVAC PRO tool, the XTM Configurator, and the GX-9100 Software Configuration Tool. Metasys Integrator® (MIG) Vendor Communication Table (.vct) also can be imported in Project Builder. This chapter describes how to import and edit those files before adding them to your project database. This chapter also describes how to import Advanced Installation Management (AIM) Point and Room Schedules.
Chapter 6	Working with Objects and the M-View Screen	The N30 Supervisory Controller system is based on object-oriented technologies. This chapter describes the capabilities of objects and their use in creating and configuring projects. This chapter also describes the use of the M-View screen to define and configure objects added to a project database. The M-View screen is the standard object editing screen in Project Builder. All objects in Project Builder except for the Schedule, Calendar, and Display objects are edited via the M-View screen. You also can edit objects directly on Project Builder's main grid. There is also an Object Browser that allows you to copy attribute references from one object to another.
Chapter 7	Using M-Display to Configure an LDT	Menus in the Local Display Terminal (LDT) are defined in a Display object and configured via a control called M-Display. This chapter explains how to add and edit the Display object in Project Builder.
Chapter 8	Adding and Editing Schedules	Schedule objects in Project Builder are configured and edited via a custom graphical interface. This chapter describes how to add and edit Schedules in Project Builder.
Chapter 9	Adding and Editing a Calendar	Calendar objects are created as exceptions to standard schedules. Calendar objects in Project Builder are configured and edited via a custom graphical interface. This chapter describes how to add and edit Calendars in Project Builder.
Continued on next page . . .		

Chapters (Cont.)	Title	Description
Chapter 10	Using Queries	Project Builder provides the ability to organize your project according to almost any criteria you need. This chapter describes how Project Builder uses queries, both simple Boolean and Structured Query Language (SQL), to let you organize the views of your project that are most useful to you.
Chapter 11	Uploading and Downloading	This chapter describes the steps required to both upload an existing project database to Project Builder for editing or archiving and downloading your completed project to your controllers. It includes instructions for upgrading the firmware version level on an N30 and for upgrading existing N30 databases from older versions to the current version.
Chapter 12	Using the Simulator	This chapter describes how to use the Simulator, a feature that allows the creation of simulated N30s, allowing you to test your project databases before downloading them to an actual N30.

Chapter Organization

Chapters in the *Project Builder User's Guide* are divided into [four](#) main sections as needed:

Table 1-2: Chapter Organization

Section	Description
Introduction	Briefly outlines the contents of the chapter.
Key Concepts	Describes background information necessary to perform or understand specific tasks.
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 Project Builder.
Troubleshooting	Provides information on potential problems as well as methods for solving them.

If a section is not necessary for a particular chapter, it is omitted. For example, this chapter, *Using This Guide*, does not contain a *Troubleshooting* section.

Online Help

The Project Builder software includes online help for Project Builder and for objects. The Project Builder Help file provides assistance in using the features of Project Builder, while the object help files provide details about individual objects. Access the Project Builder and object help screens by selecting Help from the menu bar or by pressing Alt+H. Pressing the F1 key automatically brings up Project Builder Help. The online help system for Project Builder 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 newer [Hypertext Markup Language \(HTML\)](#) style help.

Guide Conventions

As in most [Windows based](#) programs, sometimes there are multiple ways to perform the same tasks. This guide does not describe how to use both the mouse and the keyboard to perform the same step. In general, Microsoft® [Corporation](#) conventions are used to describe software features.



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Chapter 2

Introduction to Project Builder

Introduction

Project Builder helps create and manage building engineering projects. The projects created in Project Builder are downloaded to and uploaded from controllers.

This chapter describes:

- hardware and software requirements
- operation overview

Key Concepts

Hardware and Software Requirements

Project Builder is part of the System Tools installed with M-Tool and can import files created in Configuration Tools. Project Builder also can import files from a Metasys Integrator® (MIG) Vendor Communications Table (.vct) and Advanced Installation Management (AIM) tools, including room schedules.

The recommended computer platform for running Project Builder and M-Tool is described in the *Metasys® Installation and Platform Requirements Technical Bulletin (LIT-12012)*. This guide also addresses various upgrade and migration issues, and extra hardware required to set up an N30 system.

Operation Overview

Project Builder allows you to create, edit, upload, and download N30 project databases. You can create multiple project databases at the same time and copy and paste information between them, saving data entry time. You can use Project Builder to upload files from an N30 and edit the data in them for use in multiple controllers.

Existing controller configuration files, such as .prn files created with HVAC PRO software, .vct tables from Metasys Integrator controllers, or point schedules from AIM Tools, can be imported. Then you can edit the data in these files, add them to your project database, and download them to multiple controllers.

You can edit most objects in Project Builder using the M-View screen. Three exceptions are the Schedule, Calendar, and Display objects, which have custom graphical user interfaces. You can edit some object attributes directly on Project Builder's main grid.



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Chapter 3

Getting Started

Introduction

This chapter describes how to get started with Project Builder using the basic functions and navigation capabilities. This chapter describes how to:

- start Project Builder
- create a new project
- open an existing project
- add a device to a project
- configure a device in a project database

This chapter assumes that Project Builder has been installed properly with the recommended Personal Computer (PC) requirements.

IMPORTANT: When uninstalling the latest release of Project Builder, certain files may remain on the PC. If you reinstall an earlier release of Project Builder to work with older N30/M-Workstation networks, these files can cause Project Builder to work improperly. If you must use two different versions of Project Builder, we recommend using two separate machines.

Key Concepts

Project Builder Main Window

Figure 3-1 shows the Project Builder desktop with all items visible. Table 3-1 describes the parts labeled by the callouts.

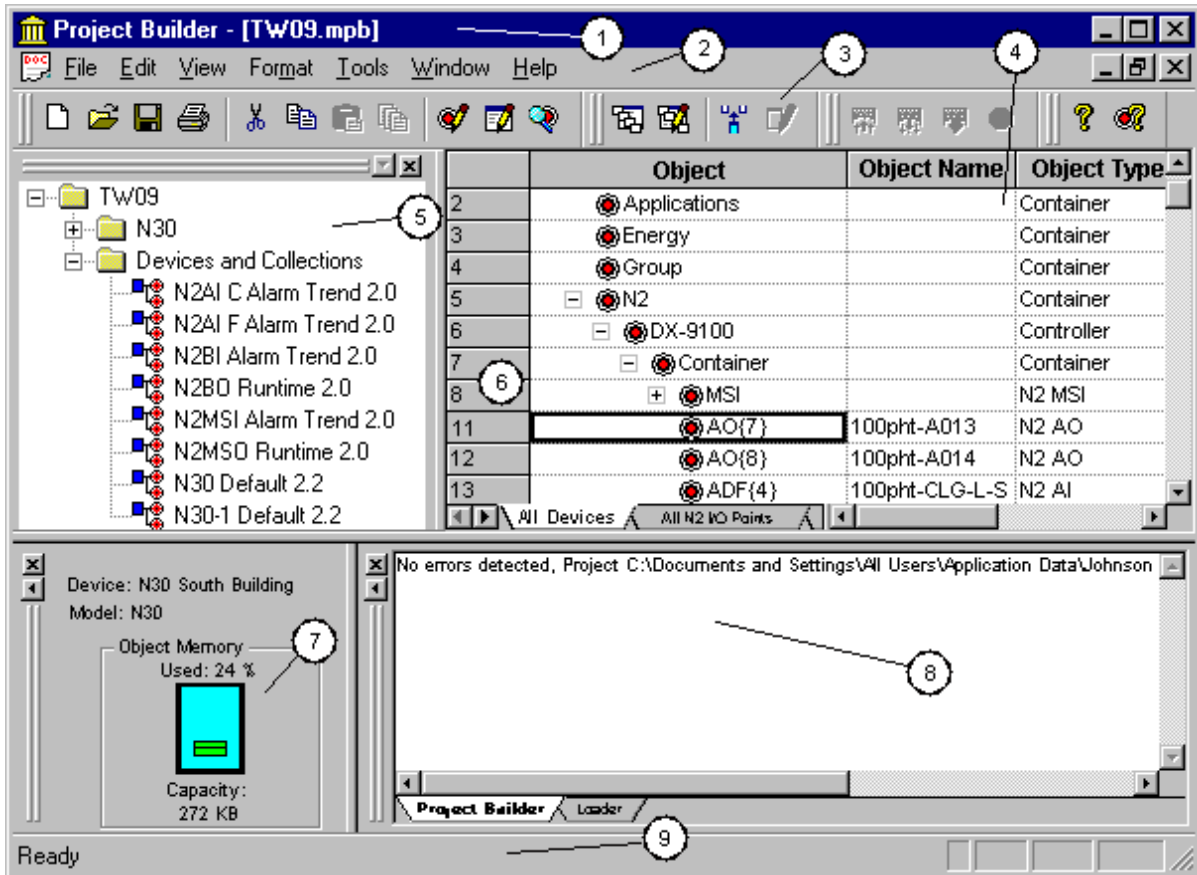


Figure 3-1: Project Builder Desktop

Table 3-1: Project Builder Desktop Callouts

Callout	Name	Description
1	Title Bar	Displays the name of the currently selected project database.
2	Menu Bar	Provides access to top level of Project Builder menus.
3*	Toolbar	Provides one button access to commonly used tools.
4	Project Window	Displays the current query for the current project database.
5*	Object Library	Displays object types (classes) and collections that can be dragged to project databases. Supervisory controllers such as the N30 are listed under the Devices and Collections folder.
6	Row Headers	Provides means to select objects. Row headers with line numbering reflect the number of objects that have been made visible. That is, if a container has 20 objects, line numbering does not reflect the number of objects until the container is expanded at least once in a viewing session.
7*	Memory Meter	Displays the total memory capacity and the percentage of memory in use for the selected device as objects are added to the database.
8*	Status Window	Displays Project Builder or Loader status and any error messages.
9	Status Bar	Describes menu and toolbar functions when they are selected.

* These items are dockable and may be dragged to other parts of the desktop or hidden.

Project Builder Main Window Menus

Table 3-2 describes the menus and commands available from the Project Builder main window.

Table 3-2: Project Builder Main Window Menu Options

Menu	Command	Description
<u>F</u>ile	<u>N</u> ew Ctrl+N	Creates a new project database.
	<u>O</u> pen... Ctrl+O	Opens an existing project database.
	<u>C</u> lose	Closes the selected project database.
	<u>I</u> mport >	Allows you to import N2 Controller Files, AIM Point Schedules or MIG .vct files.
	<u>S</u> ave Ctrl+S	Saves changes to the current project.
	Sa <u>v</u> e <u>A</u> s	Allows you to save the current project with a new name.
	<u>P</u> rint... Ctrl+P	Prints the information in the current project window.
	Print <u>P</u> review	Shows what is printed if the print command is used.
	<u>P</u> rint Setup...	Opens the setup dialog box for the current printer.
	Prop <u>e</u> rties...	Shows the project properties box for the selected project.
	<u>1</u> Project1.mpb	Lists the last four projects.
	<u>E</u> xit	Closes Project Builder.
	<u>E</u>dit	<u>C</u> ut Ctrl+X
<u>C</u> opy Ctrl+C		Copies the selected items to the Windows clipboard.
<u>P</u> aste Ctrl+V		Pastes the contents of the Windows clipboard to the current insertion point.
Mass Copy...		Creates user-specified number of duplicates of the selected items.
<u>E</u> dit Object...		Opens the Edit Attributes dialog box (M-View) for the selected object.
<u>D</u> elete Objects Del		Removes selected objects from the project database.
<u>E</u> dit <u>S</u> ite...		Opens the Edit Site dialog box.
<u>F</u> ind... Ctrl+F		Searches the selected column for the specified text.
<u>R</u> eplace... Ctrl+H		Allows you to search for, and replace, specific text.
<u>V</u>iew	<u>R</u> efresh	Refreshes the current view. Requires that project be saved first.
	<u>T</u> oolbar >	Allows you to select which toolbars are displayed.
	<u>S</u> tatus Bar	If checked, the Status Bar is visible; otherwise it is hidden.
	St <u>a</u> tus <u>W</u> indow	If checked, the Status Window is visible; otherwise it is hidden.
	<u>M</u> emory Meter	If checked, the Memory Meter is visible; otherwise it is hidden.
	Ob <u>j</u> ect Browser	If checked, the Object Browser is visible, otherwise it is hidden.
	<u>O</u> bject Library	If checked, the Object Library is visible; otherwise it is hidden.
	<u>R</u> efresh Object Library	Updates the Object Library and the current view.
<u>F</u>ormat	<u>A</u> dd Query...	Opens the Add Query dialog box to create a new query.
	<u>E</u> dit <u>Q</u> uery...	Opens the Edit Query dialog box to edit the current query.
	<u>D</u> elete Query	Deletes the current query.
	A <u>d</u> d <u>C</u> olumn...	Opens the Add Column dialog box to create a new column.
	<u>E</u> dit <u>C</u> olum <u>n</u> ...	Opens the Edit Column dialog box to edit the current column.
<u>D</u> elete Column	Deletes the selected column.	






















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Menu (Cont.)	Command	Description
<u>T</u>ools	<u>D</u> ownload Objects	Allows you to download objects to a selected device.
	<u>U</u> pload Objects	Allows you to upload objects from a selected device.
	A <u>d</u> vanced Download...	Opens the Advanced Download dialog box.
	A <u>b</u> ort Load	Allows you to halt the current upload or download operation.
	D <u>a</u> tabase	Allows you to compact the database or update classes (object types). Compacting a database removes unused space from the current project database. Updating classes updates the database class data to the latest version.
	<u>N</u> 2 Controller Tools	Allows you to launch N2 Controller tools. These include HVAC PRO tool, HVAC PRO tool in Passthrough mode, the GX9100 tool, XTM Configurator, and the DX Commissioning tool.
	<u>S</u> imulator	Launches the Simulator, which allows you to create a software representation of one or more N30s on which to test your database prior to downloading it to your actual device.
	O <u>p</u> tions	Launches the options dialog to allow you to choose your N2 Controller download options.
	M-Workstation Settings	Opens the M-Workstation settings dialog box.
	<u>W</u>indow	<u>C</u> ascade
<u>T</u> ile Horizontal		Arranges all open project windows horizontally.
T <u>i</u> le <u>V</u> ertical		Arranges all open project windows vertically.
<u>A</u> rrange Icons		Aligns any open but minimized project icons at bottom of window.
<u>1</u> Project1.mpb		Lists open project files.
<u>H</u>elp	<u>H</u> elp Topics F1	Opens the online help file for Project Builder.
	<u>O</u> bject Help	Opens the online help files for the individual objects.
	<u>A</u> bout Project Builder...	Displays copyright and version information about Project Builder.

Project Builder Toolbar

Table 3-3 describes the use of the Project Builder toolbar buttons.

Table 3-3: Project Builder Toolbar Buttons

Toolbar	Button	Name	Description
Standard		New	Creates a new project database.
		Open	Allows you to open an existing project database.
		Save	Saves changes to the current project database.
		Print	Prints the selected query.
		Cut	Removes the selected items from the current project database and places them on the Windows clipboard.
		Copy	Copies the selected items to the Windows clipboard.
		Paste	Pastes the contents of the Windows clipboard at the current insertion point.
		Mass Copy	Creates user-specified number of duplicates of the selected items.
		Edit Object Attributes	Opens the Edit Attributes dialog box (M-View) for the selected object.
		Edit Site Configuration	Opens the Edit Site dialog box.
		Toggle Object Browser	Opens or closes the Object Browser.
	Format		Add Query
		Edit Query	Opens the Edit Query dialog box to edit the current query.
		Add Column	Opens the Add Column dialog box to create a new column.
		Edit Column	Opens the Edit Column dialog box to edit the current column.
Load		Upload Objects	Allows you to upload objects from a selected device.
		Download Objects	Allows you to download objects to a selected device.
		Advanced Download	Opens the Advanced Download dialog box.
		Abort	Allows you to halt the current upload or download operation.
Help		Help Topics	Opens the Project Builder help file.
		Object Help	Opens the Object Help files.

File Types

Table 3-4 describes file types used by Project Builder.

Table 3-4: File Types

Extension	Describes Files Containing:
DWN	N30 operating system code
MAO	Compiled classes and collections shared by all projects
MOI	Object data created upon download/upload. The Load Manager creates Metasys® Object Instance (MOI) files.
MPB	Project database files created by Project Builder. Although these files are in Microsoft® Access format, all changes to the database should be done through Project Builder to ensure database integrity.

Loader

The Loader is the part of the Project Builder that performs the actual download of objects to a controller. For more information on the Upload and Download options and the actions associated with them, see the *Uploading and Downloading* chapter (*LIT-693250*).

Object Library

The Object Library contains the objects and collections that can be added to a project database via drag and drop. The device folders, such as the N30 folder, contain the objects that can be used in the named device. The Devices and Collections folder contains predefined, default object collections for specific devices (the N30 Default and N30-1 default collections). A predefined object collection such as the N30 Default must be used as a starting point for creating your database or adding supervisory devices to the network. For definitions of these objects and their uses, please refer to the Project Builder's online *Object Help*, the *Object Dictionary*, and the *N30 Supervisory Controller User's Manual*. See the *Working with Objects and the M-View Screen* chapter (*LIT-693230*) for a list of N30 objects and the containers in the supervisory controller default database to which you can drag them.

Project Database

The Project Database defines all devices, objects, controllers, and attributes that are to be used in an N30 system. Create and edit databases in Project Builder, and then download to the devices in the system.

N30 Example Database

An N30 database example is also supplied with M-Tool as a guide to creating objects for your N30 database. The N30 example database provides examples of how the object attributes must be configured for objects such as the Display, Multiple Command (MC) object, and Interlock objects. Use this database as a basis of design for any new project designed with Project Builder. The *N30 example database.mpb* file is located in *C:\Documents and Settings\All Users\Application Data\Johnson Controls\M-Data*.

Queries

Queries are a way of requesting and organizing information in a project database. In Project Builder, queries appear as tabbed spreadsheets in the project window.

Memory Meter

The Memory Meter shows the estimated memory usage of a Johnson Controls device in a graphical and textual format. The total capacity of the device on which the user is working is indicated in text. For example, the Memory Meter shows that N30 and N30-1 devices do not have the same amount of total memory available.

Notes: The estimates in Project Builder are updated to actual values when a device is uploaded.

Use the Memory Meter as a guide to how many objects (other than N2 objects) can be added to an N30. It is not a replacement for stated N2 object limitations of an N30. The N30-0 supports up to 400 N2 objects, and the N30-1 supports up to 800 N2 objects. Even if there is enough memory available in the N30, other factors, such as exceeding the recommended bandwidth of the processor, also control how many objects can work in a given N30.

The percentage of memory used appears as a bar graph and as a number. While the bar is limited to 100%, the associated text can exceed 100% and let the user perform what-if scenarios offline. The memory meter bar graph is color coded. The bar is normally green. When the percentage of memory used reaches 90%, the bar turns yellow. If the memory gauge reaches 95%, the bar turns red to warn you that the device memory may exceed a recommended value for reliable operation.

If Project Builder does not have a current estimate for the memory used by a device, the memory meter displays a warning that memory data is not available. A calculate now option is provided that allows the user to scan the objects for a device and calculate the memory.

Status Window

The Status Window provides feedback on actions performed by Project Builder or the Loader. When an action cannot be performed, the status window displays error messages explaining the problem.

Object Browser

The Object Browser is a pop-up dialog box, which shows objects of the current Project Builder project in a tree format. The Object Browser helps you to enter object and attribute references in M-View. See the *Working with Objects and the M-View Screen* chapter (*LIT-693230*) for more information on the use of the Object Browser.

Detailed Procedures

Starting Project Builder

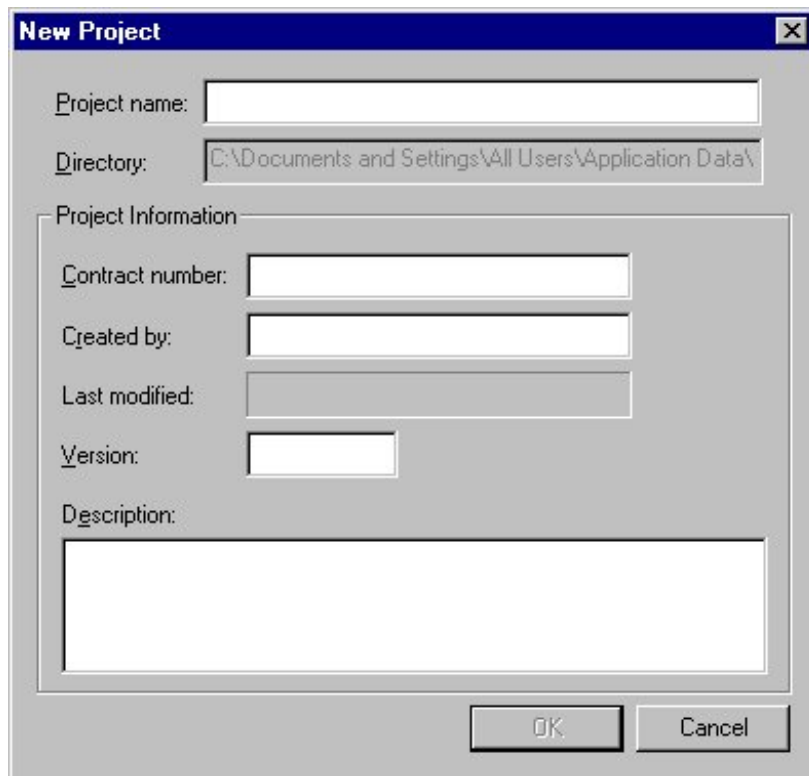
To start Project Builder:

On the Windows Start menu, select Programs > Johnson Controls > M-Tool > System Tools > Project Builder.

Creating a New Project

To create a new Project Builder project:

1. Select New on the File menu. The New Project screen appears (Figure 3-2).



The image shows a Windows-style dialog box titled "New Project". It has a blue title bar with a close button (X) on the right. The dialog contains the following fields and controls:

- Project name:** A text input field.
- Directory:** A text input field containing the path "C:\Documents and Settings\All Users\Application Data\".
- Project Information:** A section header above a group of fields:
 - Contract number:** A text input field.
 - Created by:** A text input field.
 - Last modified:** A text input field.
 - Version:** A text input field.
 - Description:** A large text area for entering project details.
- Buttons:** "OK" and "Cancel" buttons at the bottom right.

Figure 3-2: New Project Screen

Note: This screen also appears when you select Properties from the File menu while a project database is open.

2. Fill in the fields according to Table 3-5, and click OK.

Table 3-5: Create New Project Fields

Field	Contains
Project Name	Unique name for project database
Directory	Location where the project database is stored. This location is determined by and can be modified only with the M-Workstation Settings utility.
Contract Number	Contract number of the project, if applicable
Created By	Name of person creating database
Last Modified	The date and time the project database was last edited
Version	Optional, version number of project
Description	Optional, detailed description of the project database

Note: If Integrate with AIM Tools is checked in the M-Workstation Settings utility, the default directory is set to the default AIM Tools directory indicated by the utility. The appropriate subdirectory is then determined by AIM. In this case, the Directory field is dimmed on the New Project screen. If an AIM Project Folder Manager (PFM) project is open in the background, the Project Name, Directory, Contract Number, and Created By fields automatically fill with the information stored in the PFM. See the *M-Tool Overview and Installation Technical Bulletin (LIT-693100)* for more information.

Opening an Existing Project

To open an existing Project Builder project:

1. Select Open on the File menu. The Open Project dialog box appears.
2. Browse to and select the project you want to open.
3. Click Open.

Adding a Device to a Project

To add a device to a project:

1. Select the device from the Devices and Collections folder in the Object Library (for example, the N30 Default or the N30-1 Default as shown in Figure 3-1).
2. Drag the selected device to an empty row in the project window.

Note: Select the Object Library from the Project Builder View menu if it is not showing.

Configuring a Device in a Project Database

To configure a device in a project database:

1. Click the row header for the device in the project database. In this example, we are configuring an N30, so we click the N30 row header.
2. Select Edit Object from the Edit menu, or double-click the row header. The N30 Object Edit Attributes screen appears (Figure 3-3), open to the M-View tab. See the *Working with Objects and the M-View Screen* chapter (LIT-693230) for information on using M-View.

Edit Attributes - South Building

MView

Configuration

Object

Object Name: South Building

Description:

Object Type: N30

Object Category: HVAC

State

UTC Offset: 420 minutes

Daylight Savings

DST Enabled: TRUE

DST Latest Begin: 04/07/1999

DST Latest End: 10/31/1999

Standard Time Units: CST

Communication

IP Address: Array Elements

IP Mask: Array Elements

IP Router Address: Array Elements

Network Address: 1001

DHCP Enabled: FALSE

OK Cancel Help

Figure 3-3: N30 Object Edit Attributes Screen in M-View

3. Use M-View and the *Object Dictionary* to enter the parameters for the N30.
4. Click OK to exit the M-View screen.
5. Add object containers to the N30 as necessary. See *Working with Objects and the M-View Screen* (LIT-693230) for details on adding objects to an N30.

Notes: The predefined N30 assembly, N30 Default, contains the default containers for new N30 databases.

The Universal Time Coordinated (UTC) Offset attribute in the M-View screen defines the UTC Offset value, in minutes, during Standard Time (ST). There is no need to adjust the UTC Offset value during Daylight Saving Time (DST).



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Chapter 4

Defining a Site

Introduction

You must configure a Site to set up a network of N30 devices. This chapter describes how to:

- configure a site
- access the Site Book

For further information on the attributes of the Site object, the Site Data object, and the N30 Device object, see the *Object Dictionary*. For information on accessing a site in a VT100 interface, see the *Getting Started* chapter (*LIT-6892030*) in the *N30 Supervisory Controller User's Manual*.

For information on how to use the Site Book, see the *Site Book User's Guide* (*LIT-6893100*).

Key Concepts

Site Object

The Site object maintains a list of devices on the site, including supervisory controllers, and is responsible for the synchronization of global objects, time synchronization, and device status monitoring. There is only one Site object per project, residing in the Site Manager device.

Site Data Object

The Site Data object holds information or data relating to the site, such as the site name. The master Site Data object exists on the Site Manager device. All other devices contain copies of the Site Data object.

N30 Device Object

The N30 Device object defines the attributes that represent the externally visible N30 characteristics.

Broadcast Management for BACnet™ Protocol Object

The Broadcast Management for BACnet Protocol object (formerly BACnet Broadcast Management Device [BBMD] object at Release 1.0) is necessary for N30s on different network segments to talk to each other. Only one N30 per segment may contain the Broadcast Management object for that segment. The Broadcast Management object can be added or deleted only through Project Builder. Each Broadcast Management object contains a list of designated devices on other Ethernet Internet Protocol (IP) subnets to which to forward broadcast messages. The data in each Broadcast Management object must be the same in all devices that have a Broadcast Management object.

Site Book

Site Book is a program used to define and edit a database of physical or logical locations (sites) to which the Project Builder or an M-Series Workstation may connect. Each site within the database has parameters that are needed to establish a connection to the site. The Site Book configures sites for N30 devices. The Site Book also can be set to communicate directly to simulated N30s.

Site Manager Device

A Site Manager Device is the device within a site that contains the master Site object. The Site Manager device provides online/offline alarm reporting and allows browsing the list of N30 devices and top level group objects from a VT100 device. If an N30 device is not designated as the Site Manager, a warning appears when downloading N30s.

Copy Holder Device

A Copy Holder Device is the device designated to hold a copy of the site data in the Site Manager. If the Site Manager goes offline, the Copy Holder device takes over the Site Manager role. The Copy Holder device backs up operator objects (objects that hold the VT100 passwords). This feature is optional.

Message Router Object

The Message Router object in each N30 device receives all alarm messages that are generated and automatically routes them to destinations, such as printers and workstations. This object also handles rerouting messages to alternate destinations and sends all messages requiring acknowledgement to the Report Server object.

Notification Object

The Notification object provides an alternate means to send alarm messages (Event Notification Messages) to any BACnet device. Typically, it is used to route alarm messages to third-party BACnet devices. Each Notification object must be defined with its own list of destinations when using this type of alarming.

Detailed Procedures

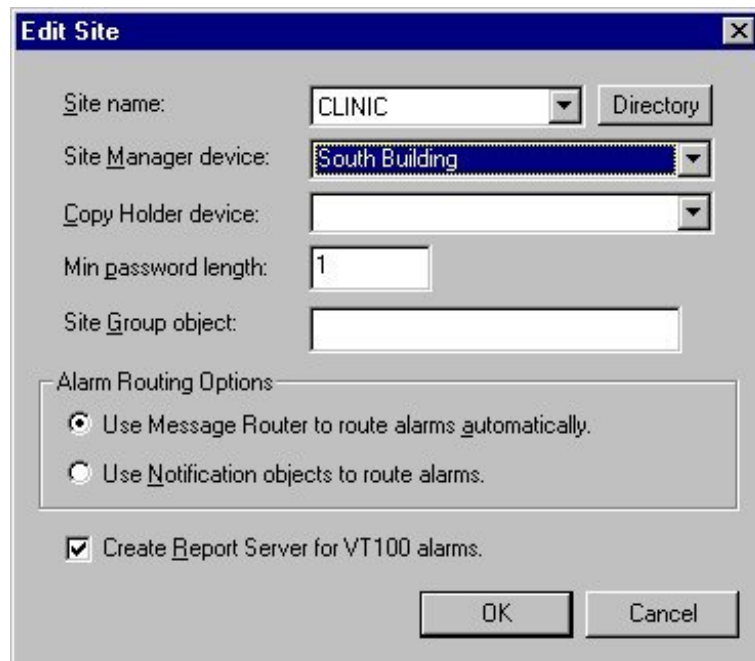
Note: The following procedures assume a site connection was created in the Site Book, and the N30s designated as Site Manager device and Copy Holder device have been added and saved to your project database. For information on adding a site in Site Book and setting up communications, see the *Site Book User's Guide (LIT-6893100)*.

Configuring a Site

To configure a site:

1. Select Edit Site from the Project Builder Edit menu. The Edit Site configuration screen appears (Figure 4-1).

Note: If the site name you are looking for is not in the site name list, it has not been defined in the Site Book. Click the Directory button to open Site Book. See the *Site Book User's Guide (LIT-6893100)* for more information.



The screenshot shows the 'Edit Site' dialog box with the following fields and options:

- Site name: CLINIC (dropdown menu) and Directory button
- Site Manager device: South Building (dropdown menu)
- Copy Holder device: (empty dropdown menu)
- Min password length: 1 (text input)
- Site Group object: (empty text input)
- Alarm Routing Options:
 - Use Message Router to route alarms automatically.
 - Use Notification objects to route alarms.
- Create Report Server for VT100 alarms.
- OK and Cancel buttons

Figure 4-1: Edit Site Configuration Screen

2. Modify the parameters according to Table 4-1.

Table 4-1: Edit Site Configuration Parameters

Parameter	Description
Site Name	Selects a site name from the drop-down list.
Directory	Opens the Site Book.
Site Manager Device	Selects a Site Manager device from the drop-down list.
Copy Holder Device	Selects a Copy Holder device from the drop-down list (optional). The Copy Holder device must be a different device from the Site Manager device.
Min Password Length	Enters the desired minimum password length.
Site Group Object	Enters the top-level group object in the group object hierarchy for the selected site. The Site Group object must exist in the database.
Alarm Routing Options	Selects the desired option to route alarms: <ul style="list-style-type: none"> • Use Message Router to route alarms automatically. • Use Notification objects to route alarms.
Create Report Server for VT100 Alarms	If checked, this parameter creates a Report Server object when the Edit Site dialog box is closed using the OK button. Use the Report Server to hold alarms for display at VT100 terminals.

Note: If a Site Manager device is not selected, a warning appears during a download. This prevents online/offline alarm reporting and browsing from VT100 devices.

3. Click OK.
4. Click Yes when prompted to save the changes to your database. Two warning dialog boxes appear to confirm the changes.

Accessing the Site Book

To access the Site Book from Project Builder:

1. Select Edit Site from the Project Builder Edit menu. The Edit Site Configuration screen appears (Figure 4-1).
2. Click on the Directory Button. The Site Book screen appears (Figure 4-2).

Note: For information on creating, editing, and deleting sites, see the *Site Book User's Guide (LIT-6893100)*.

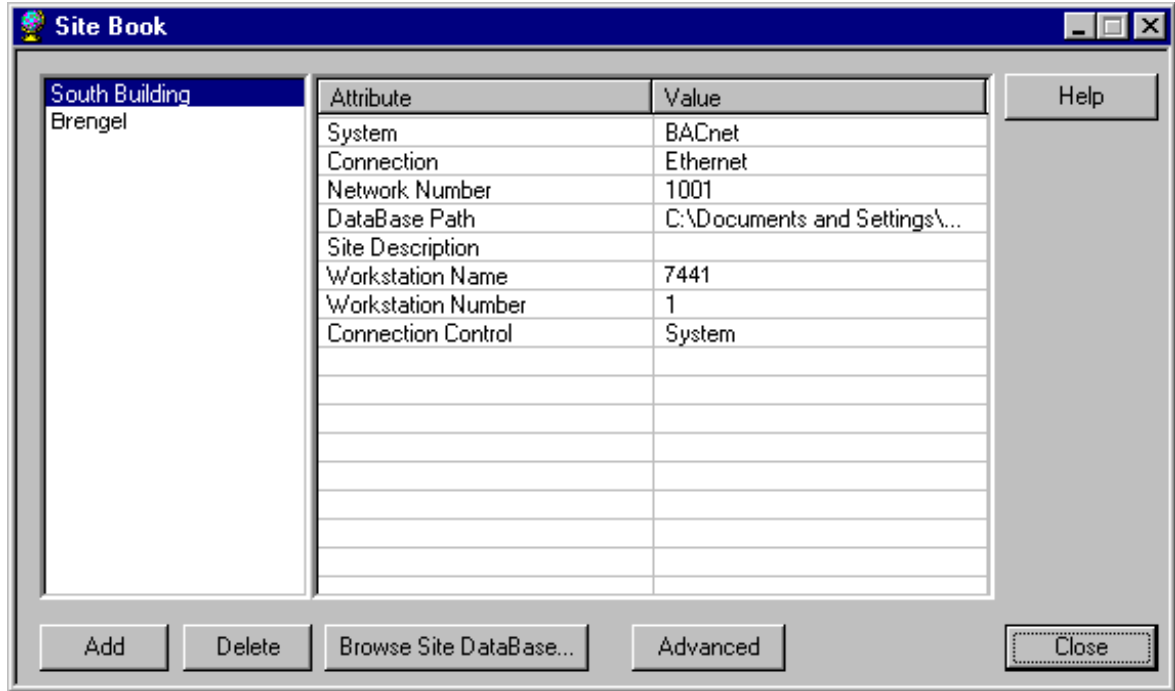


Figure 4-2: Site Book Screen with a Site Selected

Chapter 5

Importing Files

Introduction

You can create objects in a database by importing data previously defined by other tools. This chapter describes how to:

- import and edit the data in N2 Controller files (including .vct files for Metasys Integrator® Series controllers)
- import Advance Installation Management (AIM) Schedules

Key Concepts

N2 Controller Files

Configuration files for N2 controllers, such as Unitary (UNT) controllers, Variable Air Volume (VAV) controllers, and Variable Air Volume Modular Assembly (VMA) 1400 Series controllers, are created in another tool such as HVAC PRO software. Project Builder can import these files to use when setting up a project database.

Metasys Integrator Controller Files

You cannot create Vendor Configuration Table (.vct) files for Metasys Integrator controllers in HVAC PRO software, but you can order them as a complete package (MS-MIGSW0-0). Project Builder uses the same menu option to import N2 Controller files and to import Metasys Integrator Controller files for setting up a project database.

N2 Controller File Import Rules

Since the N2 controllers are not standard object controllers, the Import Wizard uses specific rules for converting controller data to standard object equivalents. You can edit any automatically generated data before saving the objects to the database.

The rules are as follows:

- The file types that can be imported are short format .prn, .hmc, and .dmo files for N2 controllers, and .vct files for Metasys Integrator controller files (Version 5.0 and later).

Note: When importing .dmo files into Project Builder, the Analog Input (AI), Binary Input (BI), and Binary Output (BO) points do not import if their default user name is the same as their tag name. Project Builder filters out these unused points. Make sure you enter either a user name or tag name for the points you want to import.

- All controller files imported in a single import session are assigned to the same supervisory controller.

- A controller object is created for each file.

Note: In the case of a Metasys Integrator controller file import, the object created reflects the equipment that is being integrated rather than the Metasys Integrator itself, which is transparent. To integrate multiple pieces of the same equipment through one Metasys Integrator controller, you either have to select the .vct file multiple times for import or use the copy and paste or mass copy features of Project Builder to generate the appropriate number of controller objects. See the *Working with Objects and the M-View Screen* chapter (LIT-693230) for more information on copying and pasting and using the mass copy feature.

- The controller objects are put in a container object with the functional name N2.
- All controller objects generated in a single session are assigned controller N2 addresses consecutively, beginning at 1 or the first available N2 address.

Note: The import files do not contain N2 addresses.

- The functional names of the controller objects are the controller type (for example, Air Handling Unit [AHU] and DX) plus an index number.
- The functional names of the point objects are the controller point type (AI, Analog Data Float [ADF], Analog Output [AO], Programmable Module Constants [PMK], and so on) plus an index number equal to the Net Point Address.
- The description attributes of the point objects are assigned the points' long names.
- If you are using HVAC PRO software at Release 7.03 and earlier, you must select the option **Generate .prn files on save**, and define the print format as short. This option is the default setting for HVAC PRO software at Release 8.0 and later.

AIM Point Schedules

The input for the AIM Import feature is the Software Schedule sheet of the AIM Point Schedule. The Point Schedule is a spreadsheet tool that manages Metasys® points lists and can generate Data Definition Language (DDL) software, check-off sheets, and cable tags. The points list that is generated becomes part of the engineering drawing package used for submittal and installation. The AIM Point Schedule reads software information from HVAC PRO software and the GX tool.

AIM Room Schedules

For room controllers, in addition to the Point Schedule, one or more Room Schedules may be available. The Room Schedule is an Excel based schedule of VAV boxes with associated components that shows the rooms served by each VAV box. All the setup parameters for each room controller are also included in the Room Schedule. The AIM Import is capable of importing the information from the Room Schedules through a link from the Point Schedule.

Note: You must use AIM Release 3.1 or later to import AIM Room Schedule files.

AIM File Import Rules

The output of the AIM Import feature is objects written to the Project Builder database.

Each row in the AIM Point Schedule represents a Metasys controller or point. From the information contained in each row, the AIM Import feature generates a number of objects and adds it to the Project Builder database (zero if the Metasys object is not supported, one for controllers, and one or more for points).

To read the Point Schedule, AIM Import uses Microsoft Excel as a Communication (COM) server. During the import process, the AIM Import filters out rows based on the content of the columns.

For example, to import general Heating, Ventilating, and Air Conditioning (HVAC) control objects from an AIM Point Schedule, mark the Generate Project Builder column with an X in the rows that correspond with the HVAC control objects.

To import room control objects from a Room Schedule, enter the model name for the room control objects under the Generate Project Builder column in the rows that correspond to the room control objects. The number of room controllers and associated objects created during an import depends on the number of times the model name in the Generate Project Builder column of the Point Schedule matches the Model name in the CS Model column of the Room Schedule. The Room Schedule is linked through the Point Schedule's Associated File Name column. (See Figure 5-1 and Figure 5-2.)

The screenshot shows a Microsoft Excel spreadsheet titled "epoit000.xls". The spreadsheet contains a table with the following data:

1	Keywords					
2	@NC.				Generate Noah (X = gen)	Associated Room Schedule File Name
3	Keyword	System Name	Object Name	Expanded ID	Generate Noah (X = gen)	Room Schedule File Name
4	DCCR	"NC1-Hw"	"DX1"	"First DX"	*	
5	CS	"AHU-1"	"DX1CS"		*	
6	AI	"AHU-1"	"RM-H"	"Room Humidity"	*	
7	AI	"AHU-1"	"RM-T"	"Room Temp"	*	
8	BI	"AHU-1"	"SF-S"	"Supply Fan Status"	*	
9	BO	"AHU-1"	"SF-C"	"Supply Fan Control"	*	
10	AOS	"AHU-1"	"CHW-VLV"	"COOLING COIL VALVE"	*	
11	AOS	"AHU-1"	"HW-VLV"	"HEATING COIL VALVE"	*	
12	BI	"AHU-1"	"PFLTR1-S"	"PRE-FILTER 30%"	*	
13	N2OPEN	"NC1-Hw"	"VMAx"	"Config 1 VAV Box"	VMAxCS	C:\Project2142\Schedule\room2.xls
14	CS	"VAV-x"	"VMAxCS"		VMAxCS	C:\Project2142\Schedule\room2.xls
15	AI	"VAV-x"	"ZN-T"	"Zone Temperature"	VMAxCS	C:\Project2142\Schedule\room2.xls
16	BI	"VAV-x"	"TEMP-OCC"	"Occupancy Button"		
17	AI	"VAV-x"	"TOT-VP"	"Total Dk Vel Press"	VMAxCS	C:\Project2142\Schedule\room2.xls
18	AI	"VAV-x"	"W-C-ADJ"	"Warm/Cool Adjust"	VMAxCS	C:\Project2142\Schedule\room2.xls
19	N2OPEN	"NC1-Hw"	"VMAy"	"Config BO-1c VAV Box"	VMAyCS	C:\Project2142\Schedule\room2.xls
20	CS	"VAV-y"	"VMAyCS"		VMAyCS	C:\Project2142\Schedule\room2.xls
21	AI	"VAV-y"	"ZN-T"	"Zone Temperature"	VMAyCS	C:\Project2142\Schedule\room2.xls
22	AI	"VAV-y"	"DA-T"	"Discharge Air Temp"		
23	BI	"VAV-y"	"OCC-S"	"Occupancy Sensor"	VMAyCS	C:\Project2142\Schedule\room2.xls

Figure 5-1: AIM Point Schedule

The screenshot shows a Microsoft Excel spreadsheet titled "Room Schedule" with the following data:

Room Controller/Sensor									
Controller									
No.	Name	System Name	Pt Sched N2 Addr	Code No.	Supv Addr	N2 Addr	CS Model		
401	TP_PE26	L_401_ON	x	AP-VMA1420-0	14	26	VMAxCS	TE-	
410	TP_PE52	L_410_O	y	AP-VMA1420-0	14	52	VMAyCS	TE-	
401	TP_PE53	L_401_OS	x	AP-VMA1420-0	14	53	VMAxCS	TE-	
432	TP_IN62	L_432_O	x	AP-VMA1420-0	14	62	VMAxCS	TE-	
431	TP_IN63	L_431_O	y	AP-VMA1420-0	14	63	VMAyCS	TE-	
430	TP_IN64	L_430_O	x	AP-VMA1420-0	14	64	VMAxCS	TE-	
428	TP_IN65	L_428_O	x	AP-VMA1420-0	14	65	VMAxCS	TE-	
410	TP_IN66	L_410_O	y	AP-VMA1420-0	14	66	VMAyCS	RES	
401	TP_PE67	L_401_OS	x	AP-VMA1420-0	14	67	VMAxCS	TE-	
426	TP_IN69	L_426_O	x	AP-VMA1420-0	14	69	VMAxCS	TE-	
429	TP_IN70	L_429_O	x	AP-VMA1420-0	14	70	VMAxCS	TE-	

Figure 5-2: AIM Room Schedule

Each AIM Release 3.x software schedule contains points for a single supervisory controller Network Control Module ([NCM] or N30); however, the complete set of points for a single supervisory controller may be listed on several Point Schedules. While the Project Builder AIM Import program is able to import one or more point sheets in a single session, all imported points go into a single N30.

The import performs the following operations:

- Locates all DCDR and N2OPEN keywords on the software schedule and creates the corresponding controller standard objects. The controller objects are placed in the N2 container object in the selected N30 device in the object hierarchy within the database. If the N2 container object does not already exist, it is created. If available, the program looks in a Room Schedule spreadsheet for additional information regarding the generation of controllers.

- Locates all other supported Metasys object keywords on the schedule that are associated with the mapped controllers and creates the equivalent standard objects. The standard objects are placed under the corresponding controller objects in the object hierarchy within the database.
- Gives standard objects an Object Name consisting of the Metasys System Name and the Metasys Object Name separated by a space. For example, Object Name = *'SystemName ObjectName'*.

Note: For objects created during Room Schedule Import, place the N2 address of each point at the end of the object name separated by a space. For example, Object Name = *'SystemName ObjectName N2 Address'*.

- Makes the standard object description attribute equal to the Metasys Expanded Identification (ID).
- Maps all other Metasys object attributes defined in the schedule to corresponding standard object attributes where available.
- Sets the standard object attributes that are required to have values, but do not have equivalent Metasys object attributes, to a default value by the import program.

Depending upon the features used in a Metasys object, you may need to create additional standard objects. In most cases, you can add these additional objects as extensions to the main standard object. The import program sets up the appropriate attributes to configure the interdependencies between parent and child (extension) objects.

Detailed Procedures

Importing and Editing the Data in N2 Controller Files (Including .vct Files for Metasys Integrator Series Controllers)

Notes: When importing N2 Controller files, you have the option of editing data in the files prior to importing them. This option is mainly a timesaver. You can further edit the data in the files after you import the files to your project database.

In this procedure, Metasys Integrator controller files (.vct files) are considered the same as N2 Controller files, as they are imported using the same menu command.

To import and edit the data in N2 Controller files:

1. Select the supervisory device to which you are importing the files by clicking on the associated row header.
2. Select Import > N2 Controller Files from the File menu. The Open dialog box appears.
3. Navigate to and select the N2 Controller file to import, and click OK. The M-Tool Import Utility dialog box appears showing the N2 Controller file you are importing (Figure 5-3).

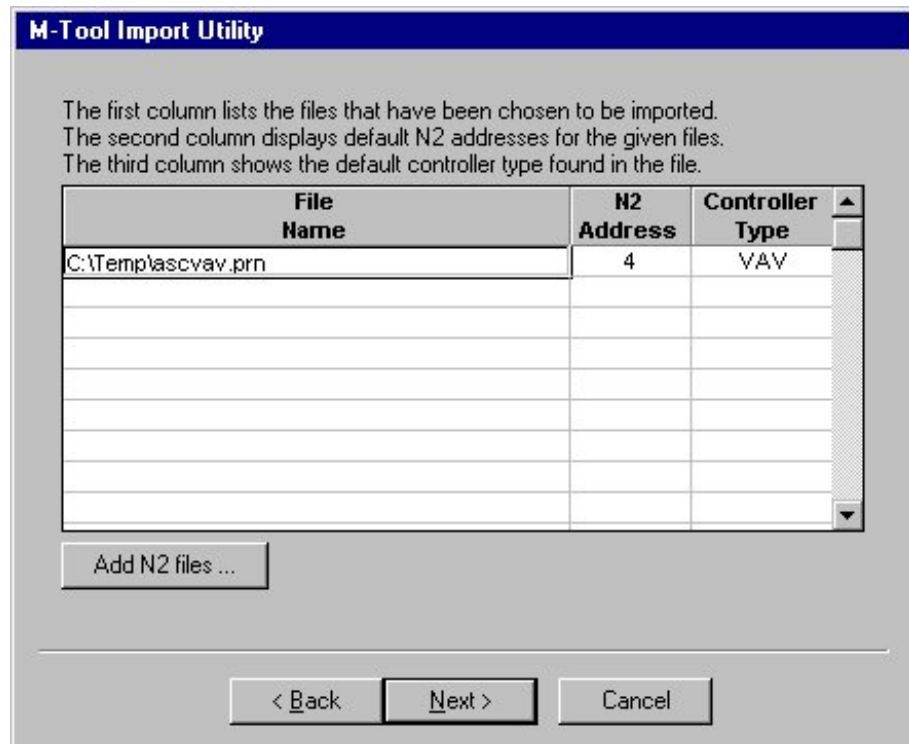


Figure 5-3: M-Tool Import Utility Dialog Box

4. Click the Add N2 files button if you want to import more N2 Controller files. Otherwise, click Next. The M-Tool Import Utility parameters list appears showing all the items contained in the N2 Controller file you are importing (Figure 5-4).

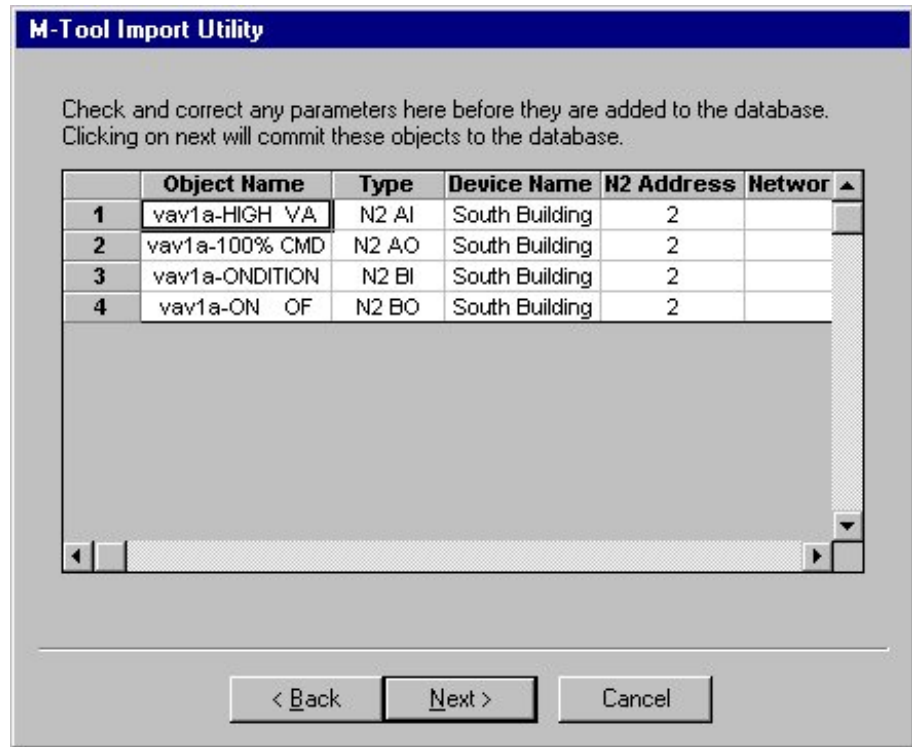


Figure 5-4: M-Tool Import Utility Parameters List

5. Select any parameters you do not want to import, and delete them using the delete key. Multiple rows may be selected and deleted at once.
6. Double-click cells for parameters you want to edit before importing. For example, in Figure 5-4, you can use the horizontal scroll bar to view columns that do not display when the M-Tool Import Utility screen appears. When finished, click Next. The files are saved to your project database, and the M-Tool Import Utility finished screen appears (Figure 5-5).



Figure 5-5: M-Tool Import Utility Finished Screen

7. Click Import to import more N2 Controller files. The M-Tool Import Utility then starts over. Otherwise, click Finish to return to Project Builder.

Importing AIM Schedules

Note: The targeted AIM Point Schedule has to be set up for Object Import to the Project Builder by putting X's or the model name in the appropriate cells in the Generate Project Builder column of the Software Schedule. See the *AIM File Import Rules* in the *Key Concepts* of this chapter.

To import and edit existing AIM Schedules:

1. Select the supervisory device in which to import the AIM Schedule in Project Builder.
2. Select Import > AIM Point Schedules from the File menu. The Open dialog box appears.
3. Browse to and open the AIM Schedule from which to import objects. If importing Control System (CS) objects, a dialog box prompts you for the location of the model file that corresponds to the CS object.

Note: When the import is complete, an error list appears describing any errors found during the import (Figure 5-6).

4. Use the Copy button to copy the list of errors to the clipboard; from the clipboard, it can be pasted into a text editor and printed.



Figure 5-6: AIM Software Schedule Import Errors List

5. Double-click any line in the error list to go to the object with the error, and make corrections as needed.
6. Click Close. The AIM Software Schedule Import spreadsheet appears (Figure 5-7).

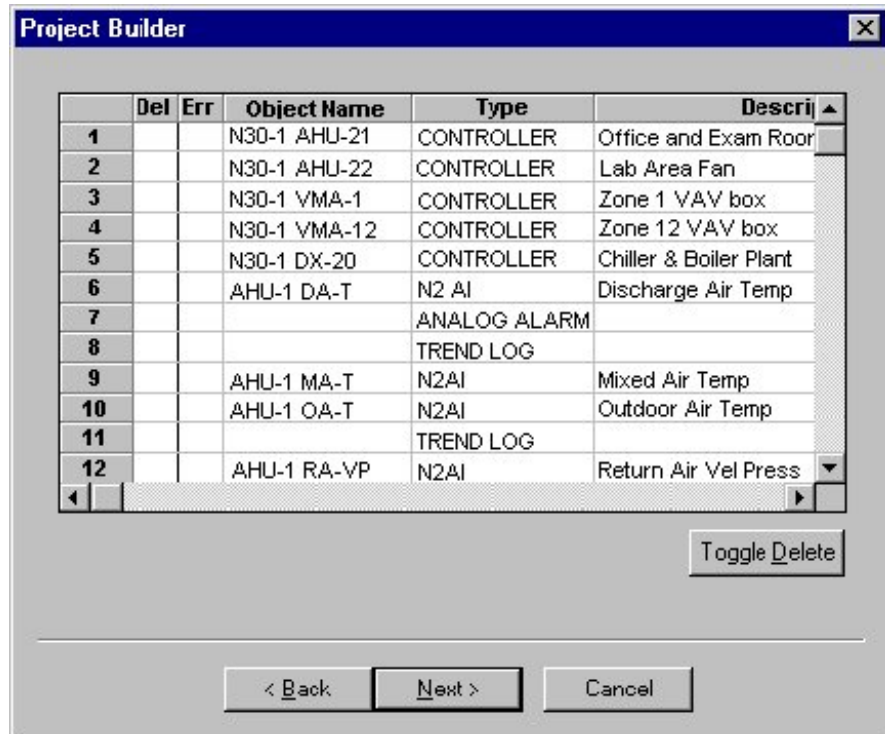


Figure 5-7: AIM Software Schedule Import Spreadsheet

- Use the Show Errors button to show the Error List window. Use the Toggle Delete button to delete unwanted objects.

Note: The Show Errors button only appears if there are errors.

- Click Next. The files are saved to your project database, and the AIM Software Schedule Import Finished screen appears (Figure 5-8).

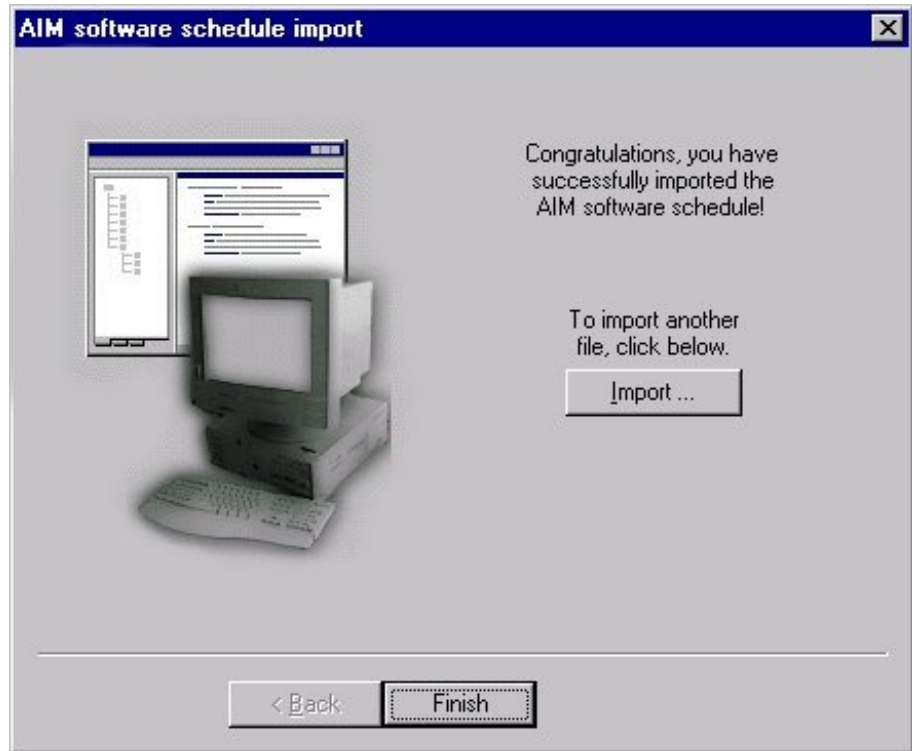


Figure 5-8: AIM Software Schedule Import Finished

9. Click Import if you want to import more AIM Schedules; the AIM Software Schedule Import then starts over. Otherwise, click Finish to return to Project Builder.

Chapter 6

Working with Objects and the M-View Screen

Introduction

The Project Builder uses a variety of objects to configure controllers and perform tasks. This chapter describes how to:

- create objects using drag and drop
- create objects using copy and paste
- create objects using mass copy
- edit objects in M-View
- use the Object Browser with M-View
- delete objects

Key Concepts

Objects

Objects are a unique instance of a data structure defined according to the template provided by its class. Each object has its own values for the variables belonging to its class and can respond to the messages (methods) defined by its class. An object is an instance of a particular class.

Object Class

An Object Class is a type of object rather than an object. For example, Belgium could be an object in the object class of Countries. All objects that come from an object class inherit certain attributes of the object class in which they belong.

You can have multiple objects with the same object identifier (object ID) within a device as long as the objects are from different object classes. For example, two Analog Value objects must have different object IDs, but an Analog Value object and a Binary Value object can have the same object ID because the objects are from different object classes.

IMPORTANT: If you modify two objects within the same object class to the same object identifier, the download fails in Project Builder. Be sure each object within an object class has a unique object identifier.

Object Name

Indicates unique names for an object. Providing an Object Name is optional, but if it is defined, it must be unique throughout the site. If it is not defined, the full reference becomes the identifier. For example, Building1Floor2. The following characters are not allowed:
@ # \$ * . , ? : ' ' " " [or].

We also recommend that you do **not** use the following characters:
/ \ &.

Child Objects

Child Objects are elements that are related to, and listed within, an object.

Extender Class

The Extender Class is a standard object class specifically designed to add functionality to other standard object classes.

Object Browser

The Object Browser is a pop-up dialog box that shows objects of the current Project Builder project in a tree format. The Object Browser helps you to enter object and attribute references in M-View and M-Display.

M-View

M-View is a control based on the concept of views. A view is a logical grouping of attributes and their respective values designed to create a display. The M-View control is an ActiveX® control that allows a user to view and edit the attributes of an individual object defined in the system. The control, while only able to display one view at a time, can have any number of views available per object.

Note: M-View is always in Edit mode in Project Builder.

If you right-click within the M-View control, a list of additional views that you may select displays (Figure 6-1).

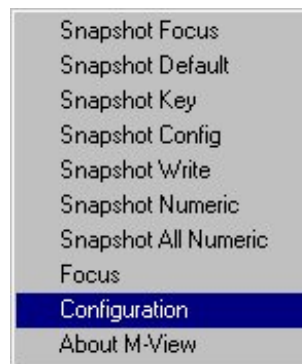


Figure 6-1: Right-click Options in M-View Control

Dragging Objects to Containers

To promote a consistent organization for each N30 database, containers are programmed to allow the insertion of only certain types of objects. When attempting to drag an object to a container in a database, your cursor changes to show whether you are allowed to put the selected object in the selected container. If allowed, the icon is a plus sign in a square; if not allowed, the icon is a circle with a slash through it. For definitions of objects and their uses, refer to the Project Builder's online *Object Help*, the *Object Dictionary*, and the *N30 Supervisory Controller User's Manual*.

Table 6-1: N30 Objects and Containers

Objects	Can Be Dragged to These Containers
Analog Alarm	*All
Analog Totalization	*All
Auto Shutdown	Programming
AV	Programming
BACnet™ Group	Group
Broadcast Management	Device Object (for example, an N30)
BV	Programming
Calendar	Schedule
Conn	Applications
Container	*All
Controller	N2
Data Broadcast	*All
Display	Operator Devices
Demand Limiting Load Rolling (DLLR)	Energy
Email	Operator Devices
Event Enrollment	*All
Event Totalization	*All
Global Data	Programming
Group	Group
Heavy Equip Contr	Energy
Interlock	Programming
LAN Remote Destination	Operator Devices
Latch	Applications
Load	Energy
Modem Config	Operator Devices
Multiple Command	Programming
Multistate Alarm	*All
MV	Programming
Continued on next page . . .	

* Objects listed with All can be dragged into all containers, but should be dragged into the objects within the containers.

Objects (Cont.)	Can Be Dragged to These Containers
N2 AI	Can be dragged only to an N2 Controller object that has been added to the N2 container.
N2 AO	Can be dragged only to an N2 Controller object that has been added to the N2 container.
N2 BI	Can be dragged only to an N2 Controller object that has been added to the N2 container.
N2 BO	Can be dragged only to an N2 Controller object that has been added to the N2 container.
N2 MSI	Can be dragged only to an N2 Controller object that has been added to the N2 container.
N2 MSO	Can be dragged only to an N2 Controller object that has been added to the N2 container.
N2 PC	Can be dragged only to an N2 Controller object that has been added to the N2 container.
Notification	Notification
Operator	Operator
Optimal Start	Energy
Pager	Operator Devices
Printer	Operator Devices
Pulse Meter	Energy
Remote Destination	Operator Devices
Runtime Totalization	*All
Schedule	Schedule
Signal Select	Programming
Summary	Summary
Tempocc	Schedule
Timer	Applications
Trend Log	*All
Utility Profile	Energy
VT100	Operator Devices

* Objects listed with All can be dragged into all containers, but should be dragged into the objects within the containers.

Collection

Collection defines a group of standard objects, their attribute values, and their relationships to one another. An example is an N2MSI Alarm Trend object that combines an Alarm object and a Trend Log object. Using a collection allows objects to be created with a minimum of manual data entry. Most attribute values are predefined by the collection data.

Standard objects are dragged from a Supervisory Controller folder in the Object Library (for example, the N30 in Figure 6-2). Collections are dragged from the Devices and Collections folder in the Object Library.

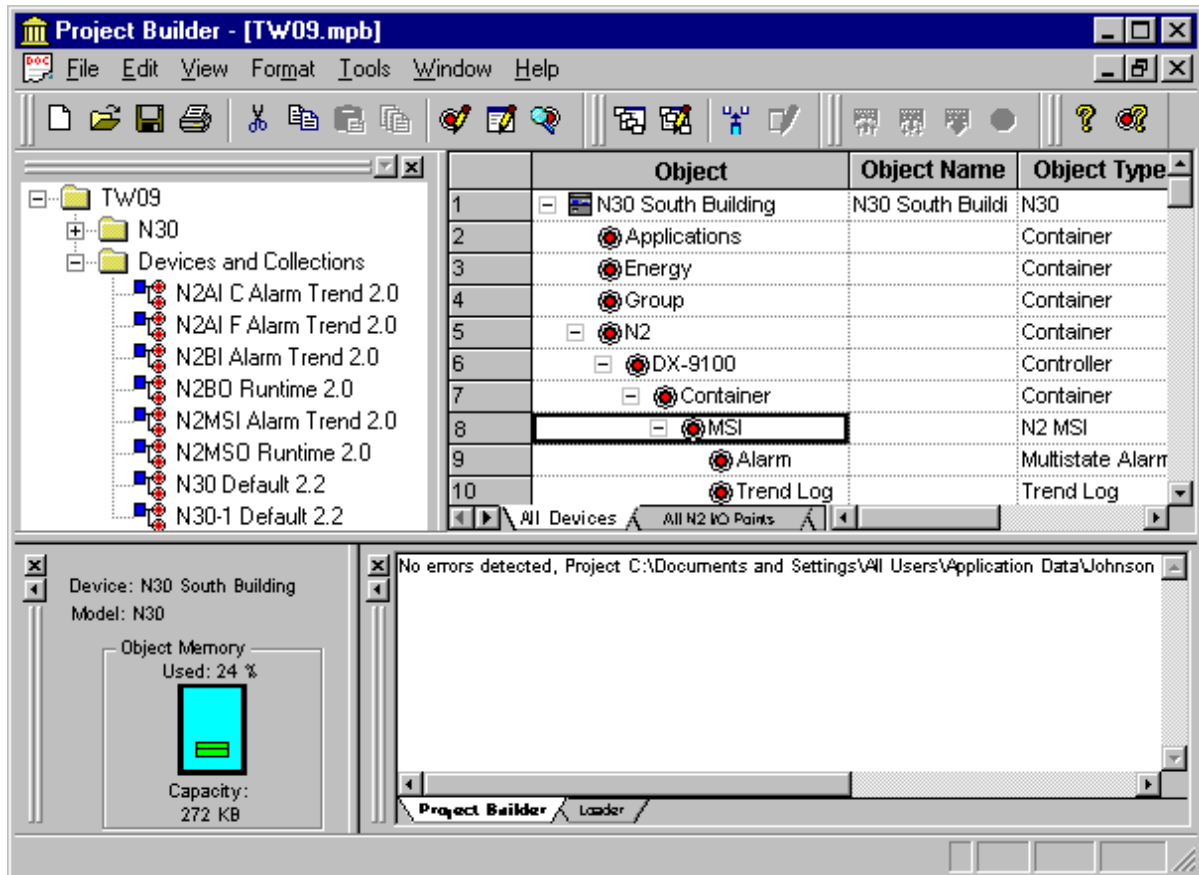


Figure 6-2: Project Builder with N2MSI Alarm Trend Collection Expanded

Detailed Procedures

Note: There are three procedures to create objects in Project Builder described in this section. For information on importing objects, see the *Importing Files* chapter (*LIT-693225*). For information on uploading objects, see the *Uploading and Downloading* chapter (*LIT-693250*).

IMPORTANT: A Supervisory Controller object, such as the N30 Default, must be in the database before any other object is created.

Although containers have a limit of 75 child objects, the Supervisory Controller object is limited to 50 child objects because it contains hidden objects. To put more than 50 objects in a supervisory controller requires using container objects to organize the excess objects. Use a maximum of 50 container objects.

The N30-0 supports up to 400 N2 objects. The N30-1 supports up to 800 N2 objects. Use the Memory Meter as a guide when adding other types of objects.

Creating Objects Using Drag and Drop

To create objects using drag and drop:

1. Select a class (or a collection) on the Object Library window with a project open, and drag it to the open project window.
2. Drop the object on another object or container. Table 6-1 describes the containers into which the different types of objects can be dragged.

Creating Objects Using Copy and Paste

To create objects using copy and paste:

1. Select the row header for the object you want to copy.
2. Select Copy on the Edit menu.
3. Open the database into which you want to copy if you want to copy an object to another project database.
4. Select the object or container to which you want to paste the copied object. Table 6-1 describes the containers into which the different types of objects can be pasted.
5. Select Paste on the Edit menu.
6. Select the entire row of the object being copied or the entire row into which you are pasting an object.

Creating Objects Using Mass Copy

To create objects using mass copy:

1. Select the row header for the object you want to copy.
2. Select Mass Copy on the Edit menu. The Mass Copy dialog box appears (Figure 6-3).

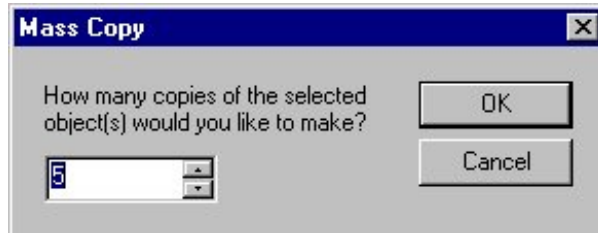


Figure 6-3: Mass Copy Dialog Box

3. Enter the number of copies you want to make in the Mass Copy dialog box.
4. Select OK. The number of copies you selected is added to the database.

Note: The names of the newly created objects have a number appended to them to distinguish them as separate objects.

Editing Objects in M-View

To edit objects:

1. Double-click the rowhead of the object you want to edit, or with the object selected, select Edit Object on the Edit menu. The M-View Edit Attributes screen appears. With the 100pht-A013 object selected, the Edit Attributes screen in Figure 6-4 appears.

Figure 6-4: M-View Edit Attributes Screen

2. Enter the information needed for your database using the Object Dictionary and the specifics of your project. If the field includes a drop-down list, click the down arrow to display a list of valid attribute values.

Note: Not all attributes can be edited.

3. Click OK.

Note: In multistate objects, enumeration sets must have the same number of states as the object. Project Builder does not check that the number of states matches, and downloads even if there is a discrepancy.

Note: For further information on valid entries for editable attributes in N30 objects, see the *N30 Supervisory Controller User's Manual*. For specific information on the Schedule and Calendar objects, see the *Using M-Display to Configure an LDT (LIT-1201107)*, *Adding and Editing Schedules (LIT-693235)*, or *Adding and Editing a Calendar (LIT-693240)* chapters.

Using the Object Browser with M-View

To use the Object Browser with M-View:

1. With the M-View screen open (Figure 6-4), click the Browser . . . button. The Object Browser appears (Figure 6-5).

Note: The Object Browser also can be opened by clicking the Toggle Object Browser button on the Project Builder toolbar.

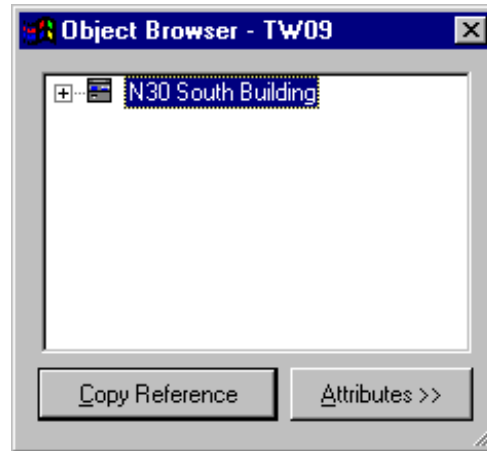


Figure 6-5: Object Browser

2. Navigate to the object with which you want to work. Click the plus (+) signs to expand trees and see the objects that they contain. See Figure 6-6.

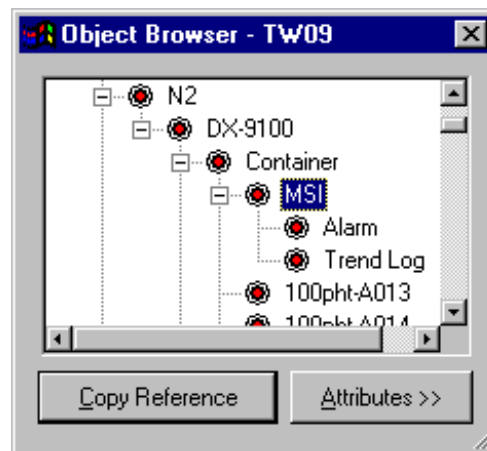


Figure 6-6: Object Browser with Expanded Objects

3. Click the Attributes button on the Object Browser to open a sliding child window that lists the attributes of the object that is selected in the Object Browser (Figure 6-7).

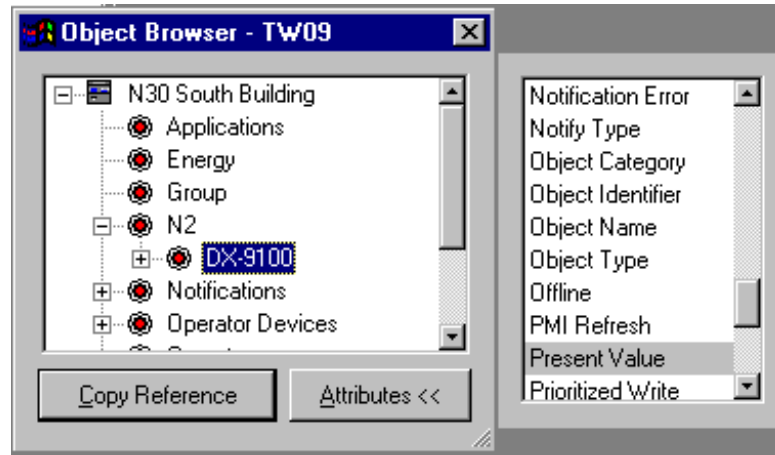


Figure 6-7: Object Browser with Sliding Child Window

4. Select the reference attribute on the sliding window. Click the Copy Reference button on the Object Browser to fill in a reference on an object editing control, such as M-View. This process copies the attribute reference to the clipboard (for example, N30.N2.AHU{1}.AI{1}.Present Value).

Note: Clicking the Copy Reference button when the sliding window is closed copies only the object reference to the clipboard (for example, N30 South Building.N2.AI{1}).

5. Select the reference field in M-View (or M-Display) and click paste.
6. When finished, click the X in the upper right corner of the Object Browser to close the browser. You may also click the toggle Object Browser button on the Project Builder toolbar to close the browser.

Deleting Objects

To delete objects:

1. Select the row of the object you want to delete.
2. Press the Delete key or, on the Edit menu, select Delete Objects.

Note: Deleting an object also deletes any child objects of the object you are deleting.

3. Click OK on the Object Deletion Warning dialog box.

Note: All objects are immediately deleted from the database. This is unlike the adding objects process, which requires you to select File>Save to save the objects in the database.

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Using M-Display to Configure an LDT

Introduction

When a Local Display Terminal (LDT) is used on an N30, a Display object must be created in that N30's database to configure the LDT display. The Display object is added to the Operator Devices section of the Project Builder database. When opened, it appears as the M-Display tab with the M-View control. The M-Display tab is used to view and configure the Local Display Terminal (LDT). A Display object must be created for each LDT used in a site.

Note: You cannot create or edit Display objects using a VT100 terminal or emulator.

For information about the LDT, see the *Local Display Terminal (LDT) Installation Instructions (LIT-12023)*. For information on the attributes of the Display object, see the *Display Object* chapter (*LIT-1201114*) in the *Object Dictionary*.

This chapter describes how to:

- add a Display object for the LDT and set its general properties
- define units sets and enumeration sets for your LDT
- create regular menus and submenus
- add Schedule and Calendar submenus to the LDT
- add and define menu items

Key Concepts

LDT

The LDT is a display optionally installed in the N30 Series supervisory controller. The LDT provides alarm notification, navigation, access to control setpoints, and allows display and modification of Display object attributes, such as temperature, heating and cooling setpoints, and fan override.

M-Display

M-Display (Figure 7-1) is the user interface to the Display object. It is an ActiveX control used to edit the Display object attributes that define the menus used in the LDT. M-Display is the tab added to the M-View control when a Display object is edited within Project Builder. M-Display acts as an interface to the Display object for viewing and configuring the LDT. Table 7-1 describes the areas of control.

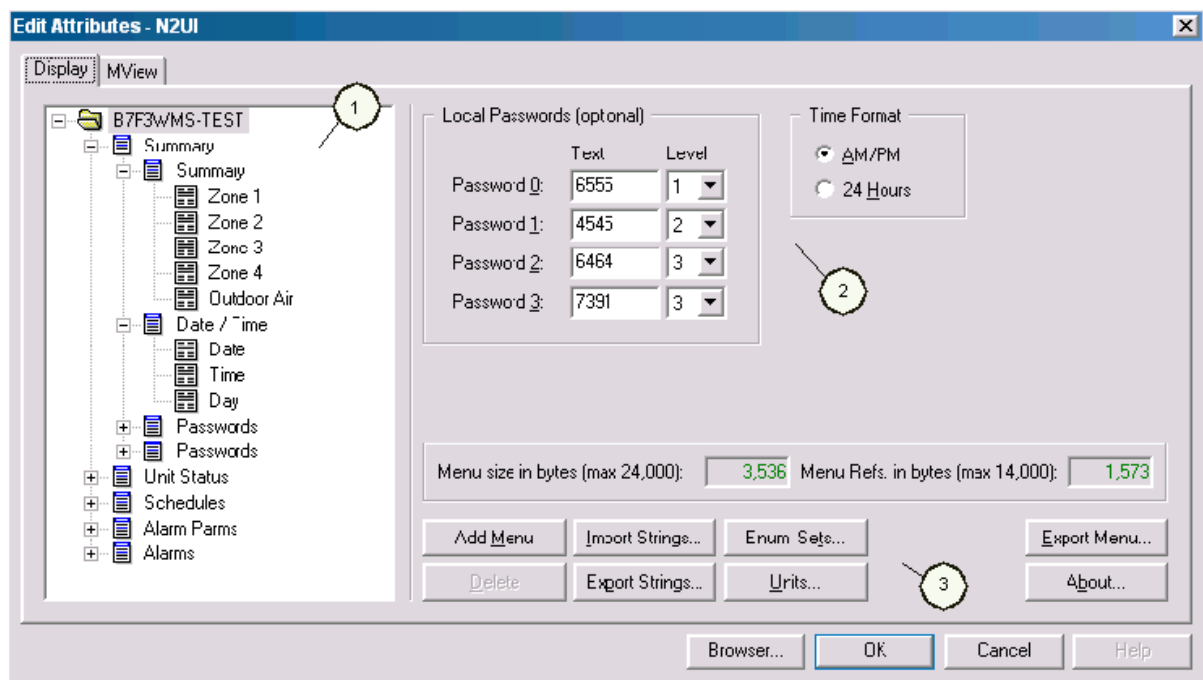


Figure 7-1: M-Display

Table 7-1: M-Display

Area	Description
1	Contains a tree representation of the menu system defined in the Display object. The branches of the tree are the menus, submenus, and items that display on the LDT.
2	With a tree item selected in Area 1, this part of the M-Display control is used to display and modify information associated with that item. If the selection in the tree changes, the entry form in Area 2 changes accordingly.
3	<p>This area contains a set of command buttons that provides a means for entering data to the tree items.</p> <p>The Add <Item> button allows you to add a new menu, submenu, or menu item, depending on the type of branch that is selected. For example, if you select Application name, the button reads Add Menu.</p> <p>The Delete button allows you to delete the selected branch.</p> <p>The Import Strings... and Export Strings... buttons allow you to import or export enumeration sets and units sets to text files for later reuse in another Display object.</p> <p>The Enum Sets... button accesses available enumeration sets that are defined in the menu system. Clicking this button also allows you to create or edit enumeration sets. These enumeration sets are associated with menu items of type "Enumeration".</p> <p>The Units... button allows you to define or edit the units to be used with the menu items of type "Number" or "Word".</p> <p>The Export Menu... button allows you to save the menu system to a readable text file. This file can be used for documenting the menu system or for comparison when translating a menu. However, the exported file cannot be read by M-Display.</p> <p>The About... button allows you to access version, release date, and copyright information about M-Display.</p>

Display Object

Project Builder downloads the information from M-Display to the Display object in the N30. The Display object manages:

- online/offline status of the LDT
- downloads of Menu Block and Dictionary data to the display unit
- updates of menu item data values to the LDT
- user edits from the LDT
- unit alarms displayed on the display unit

Fixed Enumeration Sets

The M-Display control uses seven fixed enumeration sets, also called strings. You cannot modify or delete the fixed enumeration sets. These sets are described in Table 7-2.

Table 7-2: Enumeration Sets

Enumeration Set	Contents
ES_TmpString	**Last Menu **First Menu **Top of List **End of List **Not Changeable **Edit Mode **Log Off Password **Lo Limit Reached **Hi Limit Reached **Password Invalid **Enter L-1 Password **Enter L-2 Password **Enter L-3 Password **No Active Alarms **Invalid Keystroke Password
ES_Months	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec
ES_Days	Sun, Mon, Tue, Wed, Thu, Fri, Sat, Hol,
ES_NoaAlmPri	Critical, Serious, Important, Status
ES_NoaAlmSta	Normal Fault Off Normal Hi Limit Lo Limit Lo Warning Hi Warning Lo Alarm Hi Alarm Alarm Trouble Status Offline Shutdown Unreliable None
ES_AlarmPri	This enumeration set has a content specific for different Original Equipment Manufacturers (OEMs), otherwise, it is unused.
ES_AlarmSta	Clear, Active

Typical Enumeration and Units Sets

M-Tool includes typical enumeration and units sets to increase user efficiency. These sets are supplied in addition to the fixed enumeration sets listed in Table 7-2. Just like the fixed sets mentioned above, the typical enumeration and units sets load when editing the Display object. Unlike the fixed enumeration sets however, you can edit the typical enumeration sets. However, changes only apply to the Display objects that reside in the same project as the one that has been modified. If changes that apply to all Display objects are required, use a text editor to modify the *DisplayUserSetsXXyyy.eus* file located in the *C:\Documents and Settings\All Users\Application Data\Johnson Controls\M-Data\Shared\Mdisplay Strings\yyy* directory, where XX is typically 00 for Johnson Controls use, and yyy is the standard language abbreviation (for example, enu for English US) for the language in which you are operating M-Tool.

User-Defined Enumeration and Units Sets

It is important to keep in mind that text displayed on the LDT is limited to four rows of 20 alphanumeric characters, including the menu text, variable value, engineering units, and spaces between them. This limitation is the reason why the regular N30 enumeration and units sets specified in the Object Dictionary and defined in full text with larger displays in mind, are not used in the LDT. A suggested workaround to this limitation is to split a line on two or more rows.

When defining enumeration sets, the name of each set must begin with ES_. You cannot duplicate names. You cannot delete sets that are already in use.

Calendar Object Reference in the LDT

The LDT can reference a Calendar object as part of the menu items. However, the LDT only displays the first 16 individual dates or ranges of dates. If any month/week-of-month/day-of-week specification entries are found in the date list, they are not displayed on the LDT. The LDT assumes the year is every year and does not display the year. The display device does not support any other wildcard fields. When you change the calendar from the display device, it overwrites the calendar's Date List attribute with the only information it has (that is, 16 entries and only the 1st and 2nd time from each entry). This may eliminate any information entered from a user interface device that can define more complex calendar data. It is therefore very important to evaluate whether changes should be allowed at the LDT. The default capability is Read Only. Only one Calendar object can be defined per LDT.

The Calendar object displays as follows on the LDT:

Holiday Schedule

```
Hol 1=      Jan 01
Hol 2=      Apr 02-Apr 09
Hol 3=      May 31
.
.
Hol16=
```

Schedule Object Reference in the LDT

The LDT can reference a Schedule object as part of the menu items. However, the LDT only displays the first two time entries in the Weekly Schedule attribute for each of the days (Monday – Sunday, + Holiday). The LDT assumes the first time is the start time (State 1 command) and the second time is the stop time (State 0 command). The LDT does not display the schedule command. It only allows State 0 or State 1. The display device obtains the holiday entry for the weekly schedule from the Exception Schedule attribute of the Schedule object. If this attribute is not defined or has no times entered, the holiday times are displayed as 00:00 - 00:00. This is an invalid time pair and no operation can occur.

The Exception Schedule attribute of the Schedule object also contains values used to display an exception on the display device. This is an optional menu item and is used to display an exception with “start date @ start time” and “end date @ end time” pairs. The LDT assumes the year is every year and does not display the year. The display device does not support any other wildcard fields. When you change the holiday times or exceptions schedule from the LDT, it overwrites the Schedule’s Exception Schedule attribute with only the information it has. This may eliminate any information entered from a user interface device that can define more complex schedule data. It is, therefore, important to evaluate whether changes should be allowed at the LDT. The default capability is Read Only.

The Exception menu items must directly follow the Weekly Schedule menu items in the Display object application file. All exceptions that have a calendar reference must access the same Calendar object.

The Schedule object displays as follows on the LDT:

Weekly Schedule

Mon= 08:01 - 18:01

Tue= 08:02 - 18:02

Wed= 08:03 - 18:03

Thu= 08:04 - 18:04

Fri= 08:05 - 18:05

Sat= 08:06 - 18:06

Sun= 08:07 - 18:07

Hol= 08:08 - 18:08

OR Blank line

Exception

Beg= Jan 01 @ 06:30

End= Jan 03 @ 18:00

N30 Example Database

An N30 database example is also supplied with M-Tool as a guide to creating objects for your N30 database. The N30 example database provides examples of how the object attributes must be configured for objects such as the Display, Multiple Command (MC), and Interlock objects. Use this database as a basis of design for any new project designed with Project Builder. The *N30 example database.mpb* file is located in *C:\Documents and Settings\All Users\Application Data\Johnson Controls\M-Data*.

Detailed Procedures

Adding a Display Object for the LDT and Setting its General Properties

To add and set general properties of a Display object for the LDT:

1. Open the Project Builder database that has the N30 in which you want to configure an LDT.
2. In the Project window, expand the N30 Container by clicking the plus sign next to it.
3. Drag a Display object from the Object Library to the Operator Devices container of the N30 database.
4. Double-click the Display object row header. The Select Language screen appears (Figure 7-2).

Notes: The LDT can support many different languages. However, each LDT is defined by one Display object that contains its address and is associated to one specific language. We recommend that you limit the display of values through the LDT to a single language per N30.

Language selection determines the language for display error, information messages, and the fixed enumeration sets listed in Table 7-2. User definition of display menu and item names does not change automatically.



Figure 7-2: Select Language Screen

5. The drop-down list in the Select Language screen contains a list of each language for which M-Display finds a fixed enumeration set resource file. Select a language from the list and click OK. The M-Display control appears (Figure 7-3).

Notes: If you click the Cancel button on the Select Language screen, the dialog box closes and cancels editing of the Display object.

Notice that M-Display is a tabbed control in front of an M-View tab. M-View is used to edit the attributes of the Display object that are not edited in M-Display.

6. With the application level selected (Figure 7-3), define Application attributes as described in Table 7-3.

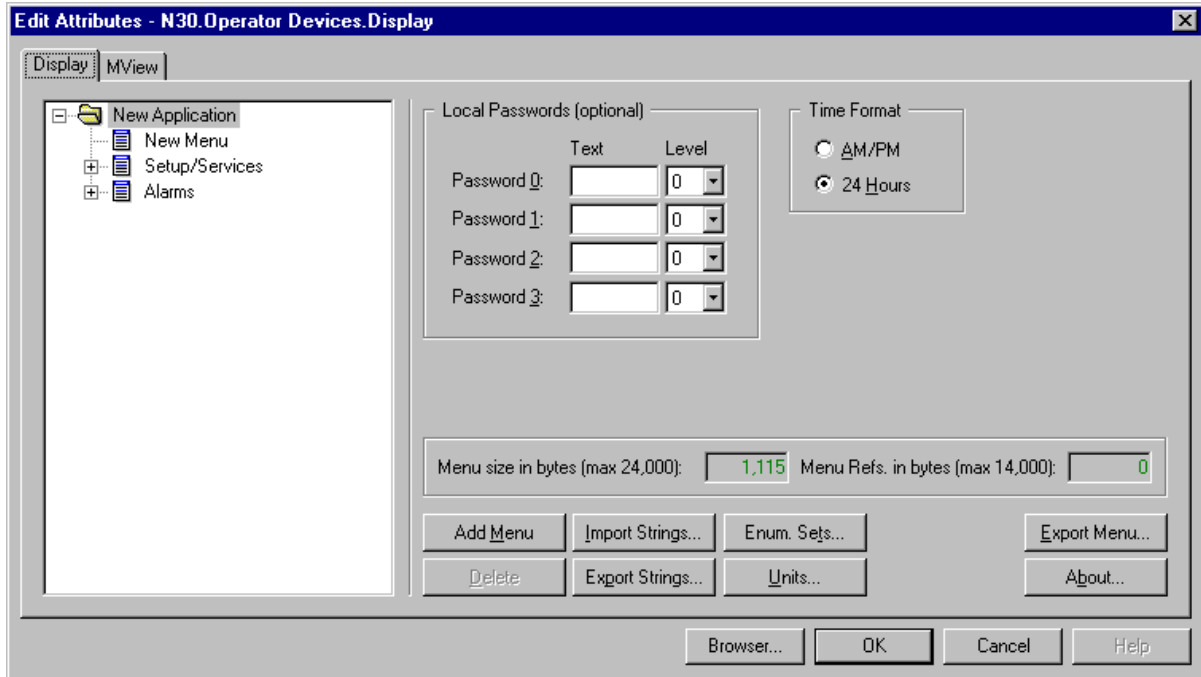


Figure 7-3: New Display Object

Table 7-3: Application Attributes

Attribute	Default Value	Description
Application Name	New Application	This caption appears at the top of the LDT screen when you display the highest level of menus.
Local Passwords Text	None	The Display object may contain up to four internal passwords. These passwords are defined only in the Display object and cannot be changed or viewed at the LDT. They are restricted to a four digit numeric value in the range of 0000 to 9999. The LDT can reference Operator objects already defined in the Project Builder database as part of the menu items. Please see Configuring Menu Items for information on referencing these objects to allow their passwords to be used on the LDT.
Local Passwords Level	0	The LDT has a four level password scheme. The levels are: Level 0 - Read Only Level 1 - Least Capability Level 2 - Medium Capability Level 3 - Highest Capability Each level has all the capabilities of the levels beneath it. That is, Level 3 has all the capabilities of Levels 0, 1, and 2.
Time Format	24 Hours	Allows the LDT to display the time in either 12-hour (am, pm) or 24-hour format.

7. Click on the M-View tab. The M-View screen appears (Figure 7-4).

Edit Attributes - N30.Operator Devices.Display

Display | MView

Configuration

Object

Object Name:

Description:

Object Type:

Object Category:

Enabled:

Alarm Setup

Active Filter:

Priority Filter A:

Category Filter A:

Msg Type Filter A:

Priority Filter B:

Setup

Net N2 Address:

Password Level Ack:

Password Timeout: minutes

Display Units:

Browser... OK Cancel Help

Figure 7-4: M-View

8. Define priority levels as necessary for the Display (see *Display [LIT-1201114]* in the *Object Dictionary*).
9. In the Setup section of M-View, make sure that the Net N2 Address matches that of your LDT. LDTs are shipped with a default address of 32. Addresses 32 to 35 are the only ones allowed for LDTs.
10. In the Setup section of M-View, define the level of password required to acknowledge alarms.

Note: The default for Password Level Ack is 1. Changing it to 0 allows anyone to acknowledge alarms without having to use a password.

11. Click the Display tab. The M-Display screen appears (Figure 7-3).
12. Define units sets and enumeration sets as needed. See *Defining Units Sets and Enumeration Sets for your LDT* in this chapter.

Note: Units sets and enumeration sets can be added when needed. If you are adding a menu item and realize you need a set that does not exist, this procedure can be used to add additional sets.

Defining Units Sets and Enumeration Sets for Your LDT

To define units sets and enumeration sets for your LDT:

1. In the M-Display control, press the Units button to open the Units Sets screen (Figure 7-5).

Note: The Display object uses three strings for each unit: one for English (Imperial), one for Canadian Metric (SI Canada), and one for European Metric (SI Europe). The default base units attribute in the N30 Device object determines which of these strings is used.

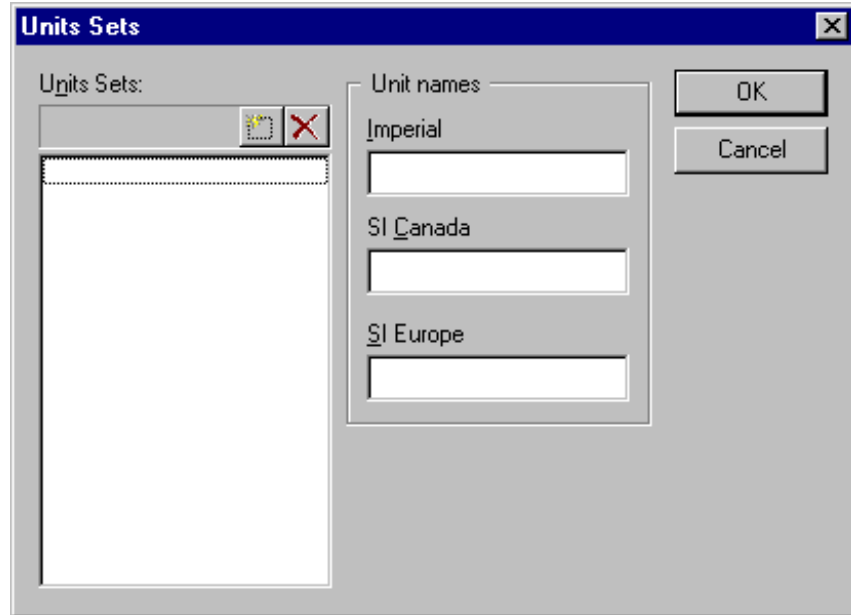


Figure 7-5: Units Sets Screen

2. In the Units Sets column, click the new box, or select a units set to edit. The new box is the dotted line box next to the X.
3. If adding a set, type the name of the new units set. In the example, we are adding a temperature set, U_Temp.

Note: When defining units sets, the name of each set **must** begin with U_. Duplicate names are not allowed. You may not delete sets that are in use in menu items.

4. In the Unit Names column, type in the units you want displayed for each of the three possible unit attributes. See Figure 7-6 for an example of a temperature units set added to the Units Sets screen.

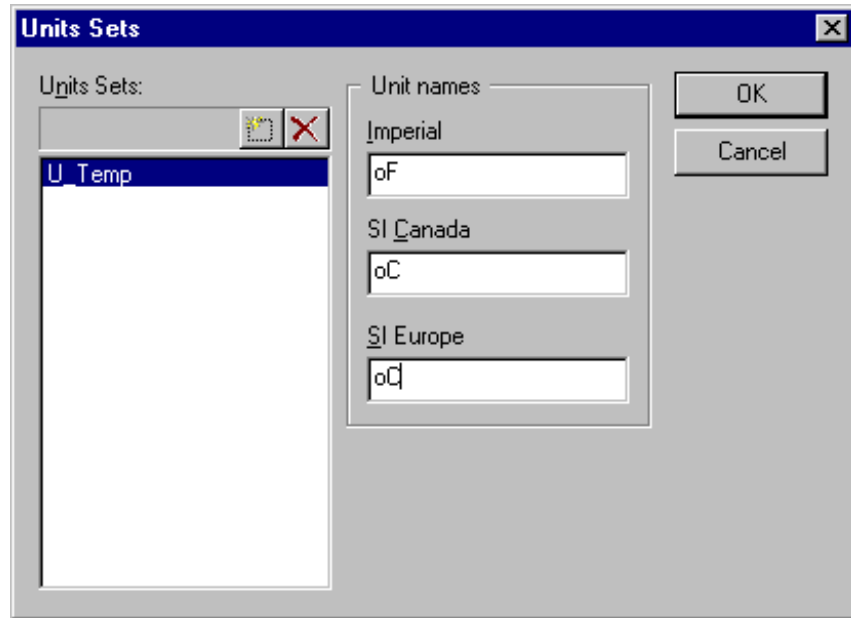


Figure 7-6: Units Set Added to Units Sets Screen

5. Click OK. The M-Display screen appears.
6. In the M-Display control, press the Enum. Sets... button. The Enumeration Sets screen appears (Figure 7-7).
7. Select from the list of fixed and typical enumeration sets or you may create your own. When you select a fixed enumeration set, the two columns on the right list the state and the associated string that the enumeration set contains.

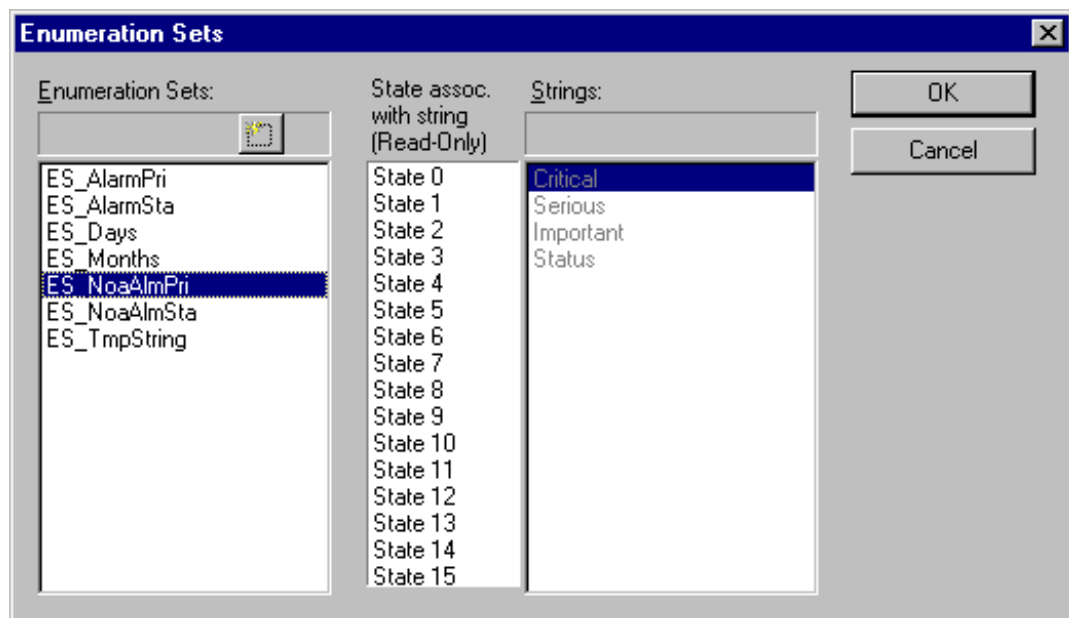


Figure 7-7: Enumerations Sets Screen

8. To create your own enumeration set, click the new box in the Enumeration Sets column.
9. Type a name for the new enumeration set. In the example, we are putting in a binary set called StartStop.

Note: Enumeration set names must begin with ES_.

10. Press Enter.
11. In the Strings column, press the new box and type in the string for State 0. In our example State 0 = Off.
12. Click the new box and add all strings you want in your enumeration set. You can change the order of the strings using the up and down arrows in the Strings column, or you can delete strings by pressing the red X button.
13. Click OK when finished. See Figure 7-8 for an example of a user created enumeration set.

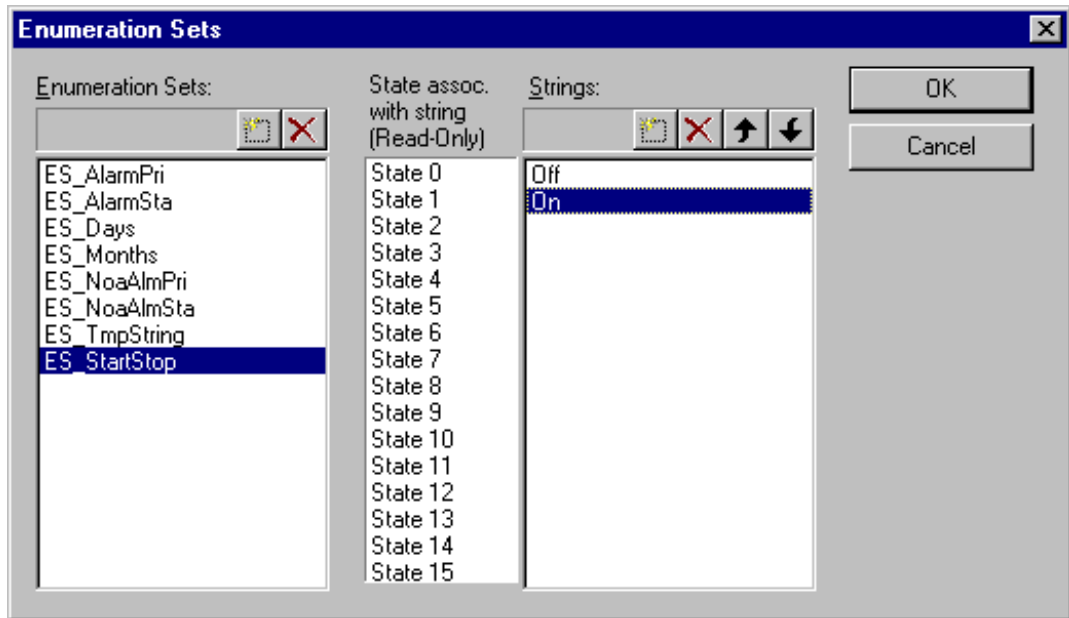


Figure 7-8: New Enumeration Set

Creating Regular Menus and Submenus

IMPORTANT: There are limitations on using the LDT to display schedules and calendars. Please see *Adding Schedule and Calendar Submenus to the LDT* in this chapter prior to adding any schedules or calendars to the LDT. Failure to do so can result in existing schedules and calendars becoming unusable.

To create regular menus and submenus:

1. With M-Display open, add top level menus to your LDT following the rules in Table 7-4 and using the methods described in Table 7-5. See Figure 7-9 for an example of an LDT menu structure.

Table 7-4: Menu Structure Rules

Rules for Creating a Menu Structure for an LDT
• Only one application may be defined per Display object.
• The hierarchy in the menu tree is limited to four levels: Application, Menus, Submenus, and Menu Items.
• Every menu (except the Alarm and Setup/Services menus created by default when the Display object is defined) must have at least three submenus.
• Each submenu must have at least three menu items.
• If the menu structure you want to implement requires less than three submenus or three menu items, blank submenus and menu items may be created.

2. Select the menu branch to which you want to add a submenu.

Note: When the menu level is selected, you cannot select the Special Handling and Reference fields (Figure 7-9).

Table 7-5: Creating a Menu Structure

Editing Method	Description
Create a New Branch	<p>You can create new branches from all components of the menu. Add a branch by right-clicking the branch under which you want the new branch to display, and selecting the type you want to add from the pop-up menu that appears.</p> <p>The pop-up menu changes depending on the level of the branch you have selected. For menus and submenus, the pop-up menu includes options for adding a branch at the same level or for adding a branch at the level immediately beneath the selected branch as a child. When adding branches at the same level, they can be differentiated by their caption. The branch created at the same level is added immediately after the selected branch, while the branch created as a child is added after the first child.</p>
In Place Editing	<p>When you add a menu component, you can enter the text that displays for that component in the LDT. You can edit the caption of a menu component by selecting it and pressing the F2 key.</p>
Selecting a Branch	<p>Selecting a branch in the menu tree activates the appropriate form associated with the item selected. The parameters of the menu item associated with the branch are presented for editing. If the currently selected menu component has been changed, the changes are automatically saved. However, modifications are only saved to the copy of the Display object local to the control. They are saved to the Display object in the database when the control is closed using the OK button.</p>
Copying and Pasting Branches	<p>You can copy branches in the menu tree (including the children) and paste them to a different location in the tree. There are limitations to where you can paste a branch.</p>
Changing the Order of Branches Using Cut and Paste	<p>You can move branches in the menu tree using cut and paste. Right-click the branch you want to move and select Cut. Then, right-click on the branch immediately above its target destination, and select Paste. You can move branches anywhere in the menu structure, as long as they remain at the same level. You cannot promote or demote branches – submenus may not become menus using this method.</p>
Delete a Branch	<p>You can remove branches in the menu tree (including the children); the parent of the deleted branch becomes the selected item. However, you cannot delete the Application item (the root).</p>
Renaming a Branch	<p>Using the context menu and Rename or Rename All fields, you can rename one or more branches at the same time. Rename changes the text of only the selected branch. Rename All changes the text of all the branches with the same text as the selected branch, regardless of whether they are expanded or collapsed.</p>

Figure 7-9, Figure 7-10, and Figure 7-11 are examples of the different types of editing forms in M-Display. Notice how the attribute entry area on the right changes, depending on the branch selected in the menu tree.

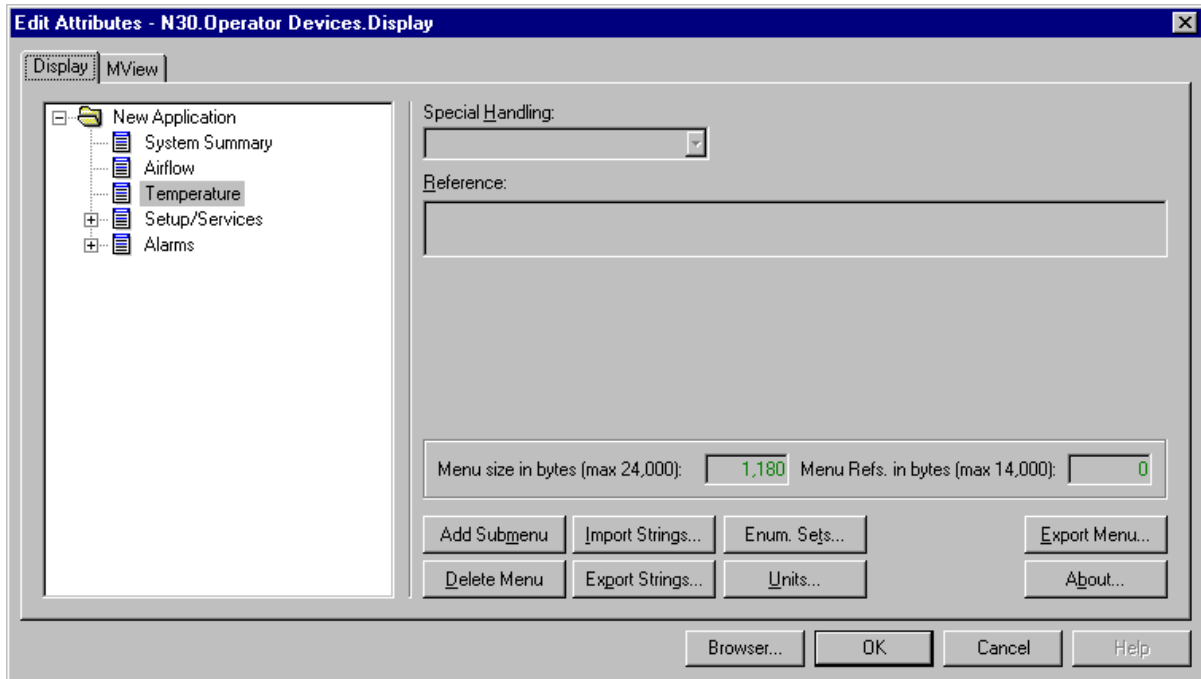


Figure 7-9: Example of LDT Menu Structure

3. With a branch selected, press the Add Submenu button at the bottom of the control, or right-click and select Add submenu from the pop-up menu.

Note: See Table 7-4 and Table 7-5 for rules and other methods of adding submenu branches.

4. When defining a submenu in the Submenu Editing form (Figure 7-10), a Special Handling drop-down list allows you to select the characteristics of the submenu. For regular submenus, the Special Handling field should be left blank. See *Adding Schedule and Calendar Submenus to the LDT* in this chapter for information on using Special Handling.
5. Continue adding menus and submenus as needed.

Adding Schedule and Calendar Submenus to the LDT

IMPORTANT: There are limitations on using the LDT to display schedules and calendars. Please read and understand this section prior to adding any schedules or calendars to the LDT. Failure to do so can result in existing schedules and calendars becoming unusable.

When adding a reference to a Schedule or Calendar object to the LDT, you must be aware of certain considerations in the way the LDT handles these objects, particularly if you give LDT users the capability to edit these objects from the LDT.

The LDT is designed to display only one typical instance of all the possibilities of schedules that can be defined in an N30. To edit a schedule (or a calendar) from the LDT, we recommend that you create a specific Schedule object in Project Builder, for the objects on which you want it to take action, which follows the rules below. For example, create a Schedule object for simple start and stop of fans or pumps. That object may then be referenced in the Display object's Schedule submenu. You can create more complex schedules in Project Builder that are not referenced in the Display object.

- Each day in the schedule must contain a maximum of two time entries. If the LDT user has the capability to edit the schedule from the LDT, any extra time entries are eliminated from the N30 database after the first edit action from the LDT.
- The first time must be the start time (State 1 command) and the second one the stop time (State 0 command). No other type or sequence of command is supported. The LDT does not display the Schedule command. If the LDT user has the capability to edit the schedule from the LDT, then any other type of action (for example, analog command) is overwritten to a State 1 command for the first time entry and to a State 0 command for the second time entry after the first edit action. All other commands are lost.
- If no action is to occur on holidays, leave the Exception Schedule attribute of the Schedule object undefined or enter no times. The holiday times are displayed as 00:00 – 00:00.
- The calendar must contain a maximum of 16 dates or ranges of dates. If the LDT user has the capability to edit the calendar from the LDT, any extra entries are eliminated from the N30 database after the first edit action.

To add schedules and calendars:

1. Add a menu for schedules. See *Creating Regular Menus and Submenus* in this chapter.
2. Add a submenu for the type of schedule you want to add.
3. Name the submenu. In the example in Figure 7-10, we added a submenu called Weekly Schedule.
4. Select the type of Special Handling the schedule you are adding requires. See Table 7-6 for a description of how the Special Handling selections affect the submenu. In our example, we selected Weekly Schedule, which automatically adds the days of the week as menu items to our submenu.

Note: Menu items created by the Special Handling submenus cannot be edited.

Table 7-6: Submenu Special Handling

Special Handling Selection	Submenu Behavior
None	Regular menu. You can add menu items of any of the following types to this submenu: Enumeration, Number, Word, Password, Text, or nothing.
Weekly Schedule	When selected, the control creates eight menu items of type Time Interval with text Mon through .” (period) or Hol . The last item initially has a period .” for its text and Nothing for its type. If you define a Holiday Schedule later, the last item automatically changes to Hol and type Time Interval. Together, these menu items define a weekly schedule submenu. The submenu requires a reference. By default, the reference is preset to <Object Name>.PMI Refresh . You need to change the <Object Name> to a valid Schedule object. Once defined, the reference cannot be changed to another type of submenu. To change the reference, it must be deleted and recreated.
Holiday Schedule	When selected, the control creates sixteen menu items of type Date Interval with text Hol 1 through Hol 16 . Together they define a holiday submenu. The submenu requires a reference. By default, the reference is preset to <Object Name>.PMI Refresh . You need to change <Object Name> to a valid Calendar object. Once defined, the reference cannot be changed to another type of submenu. To change the reference, it must be deleted and recreated.
Exception	When selected, the control creates two menu items of type Date and Time, and a third menu item of type Nothing, with captions Beg , End , and .” (period). Together they define an exception menu and no reference is required. If used, the reference must be placed immediately after the Weekly Schedule. Once defined the reference cannot be changed to another type of submenu. To change the reference, it must be deleted and recreated.

5. Use the Object Browser (click the Browser button) to add an attribute reference for the schedule. The attribute reference selected must end in PMI refresh. See the *Working with Objects and the M-View Screen* chapter (*LIT-693230*) for instructions on how to use the Object Browser.

- Set the capability level of the schedule. A capability level of 0 indicates that the schedule is Read Only. This is the default selection.

Note: Setting the capability level to any other number allows the user to edit the schedule from the LDT. If the schedule is anything other than the binary type described at the beginning of this procedure, editing the schedule may make it unusable.

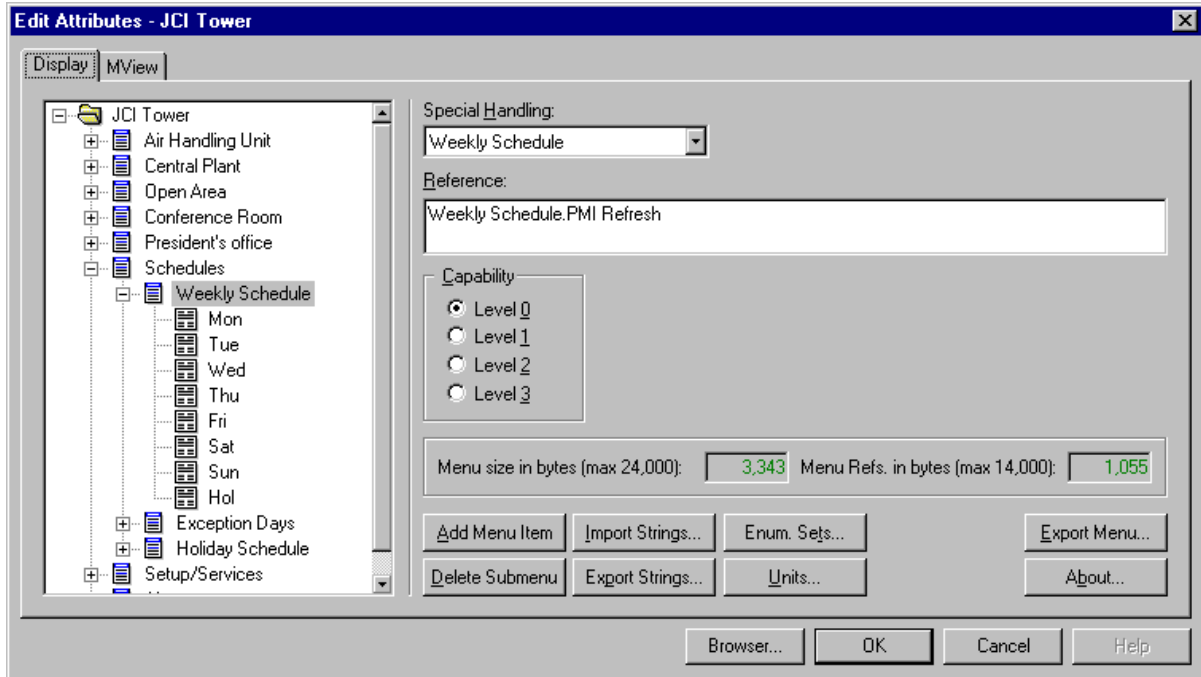


Figure 7-10: Schedule Example

Adding and Defining Menu Items

To add and define menu items for the LDT:

- Select the submenu where you want to add menu items.
- Click the Add Menu Item button, or right-click and select Add Menu Item from the pop-up menu. The Menu Item Editing form (Figure 7-11) appears.

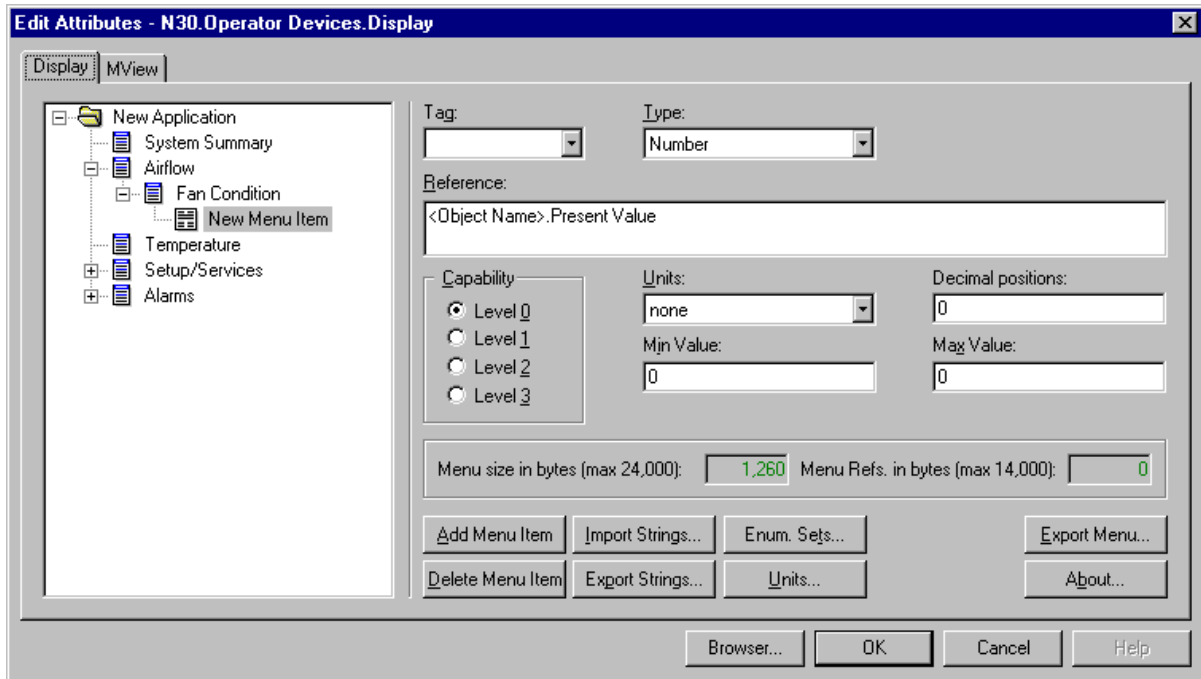


Figure 7-11: Menu Item Editing Form

3. Name the menu item that you are adding and press Enter.
4. Select the type of menu item you are adding.

Note: Use menu items to display or modify values of N2 objects. Each menu item has a tag that determines its possible types. The type determines whether the menu item needs a reference, a password capability, units or enumeration set, and so on. Menu item tags and the types these tags determine are described in Table 7-7. For N2 objects, the Tag field is left blank.

Table 7-7: Menu Items Tags

Tag	Type of the Menu Item
Blank	Type can be selected from the Type drop-down list. Select Enumeration, Number, Word, Password, Text only, or nothing.
DAYS	Enumeration with the enumeration set ES_Days. No reference is necessary.
TIME	Time, no other parameters are necessary.
DATE	Date, no other parameters are necessary.
LANGSEL	Enumeration. A reference must be entered and an enumeration set must be selected.
PW_ACK	<p>Enumeration. The reference is automatically set to <This Display Object>.Password Level Ack. You must select the enumeration set. Choose ES_Alm_Ack_Lvl from the list of possible enumeration sets.</p> <p>To change the acknowledge alarms password level from the LDT, the PW_ACK capability level must be set to something other than 0. However, please note that this change opens up the possibility to set the Ack Level down to 0. This would result in LDT users not needing a password to acknowledge alarms.</p>
PW_TIM	<p>Number. The reference is automatically set to <This Display Object>.Password Timeout. You must select the units. The number for this attribute is displayed in minutes. Choose U_Minutes from the list of possible units sets.</p> <p>To allow the Password Timeout to be edited from the LDT, the PW_TIM capability level must be set to something other than 0.</p>
UNITS	<p>Enumeration. The reference is automatically set to <This Display Object>.Display Units. You must select the enumeration set. Choose ES_Units from the list of possible enumeration sets.</p> <p>To change the LDT display units from the LDT, the units capability level must be set to something other than 0.</p>

Table 7-8: Menu Items Types

Type	Type of the Menu Item
Enumeration	Generally used for items that have a fixed set of possible values, such as binary and multi-state objects, and other parameters such as day of the week, LDT Display units, password levels, etc. When this type is used, an enumeration set must be chosen to define what value is displayed on the LDT for each of the object's possible states.
Number	Generally used for items such as analog objects. When this type of item is selected, the user is given the ability to select a units set if the number would benefit from being followed by engineering units. The user can also define the decimal precision needed, as well as minimum and maximum values, to which this item can be overridden if overrides are allowed.
Word	Used in the same manner as the Number type.
Password	<p>The display device can reference Operator objects as part of the menu items. When used, the N30 operator passwords that are referenced are restricted to four digit numeric values in the range of 0000 to 9999 to match the restrictions of the LDT.</p> <p>These passwords also must be assigned one of the four levels of the LDT password scheme. The levels are Level 0 - View Only, Level 1 - Least Capability, Level 2 - Medium Capability, and Level 3 - Highest Capability. Each of these passwords can be viewed and changed from the display unit based on the capability level assigned to its menu item.</p> <p>There is no limit on the number of N30 operator passwords defined in the application. Both the internal and menu item passwords can be used at the same time. The display unit checks for a match on any menu item passwords first, and then checks for a match on internal passwords. See Table 7-3 for more information on internal (local) passwords. The display attribute Password Level Ack is the level needed by the operator to acknowledge or clear alarms on the display device. The user ID in the acknowledge record defaults to "Local".</p>
Text Only	Most often used when the user chooses to display values on two or more lines of the LDT. For example, this can be used to allow longer strings for descriptors and units. When displaying values on two lines, the full width of the LDT screen may be used as the item's descriptor on the first line, while the value and units are displayed on the second line.
Nothing – Blank Entry	Generally used for "padding", since the LDT requires that all menus be made up of three submenus, and all submenus be comprised of three menu items. If less than three submenus of items are required, it is recommended to use a displayed text of ".", and define its type as "Nothing – Blank Entry".

- In the example in Figure 7-12, we have selected Enumeration for the type and left the tag blank.

Note: The parameters available for editing change based on the type of menu item you are adding. Since we selected enumeration set for the type, we have a drop-down list to select from available enumeration sets.

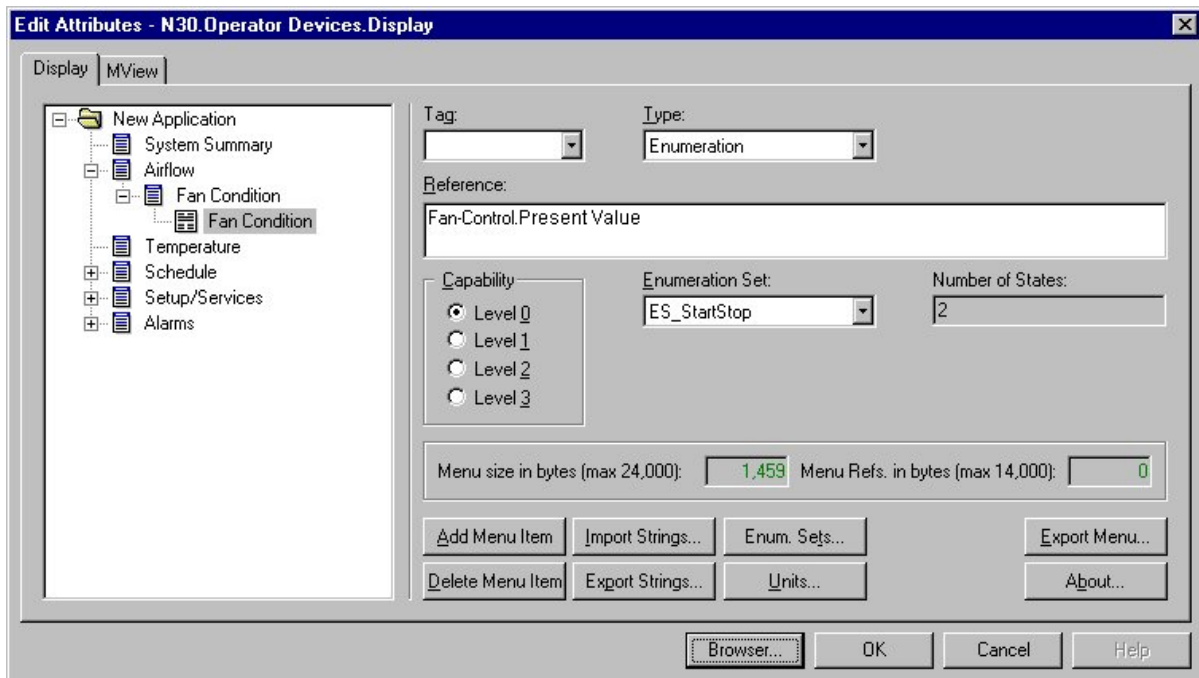


Figure 7-12: Menu Item Example

6. Select an enumeration set. In the example, we selected the StartStop set we created earlier. The Number of States field is automatically updated to indicate the number of states in which the object resides.
7. Select the appropriate capability for commanding this object from the LDT. The capability defines the password level required by the LDT user to command this object. Choose Level 0 to make the object Read Only at the LDT.

Notes: If you are modifying a menu item and realize that the Enumeration set or Units set needed by the item is not defined, you may click on the **Enum.Sets...** or **Units...** buttons and add the required sets. See *Defining Units Sets and Enumeration Sets for your LDT* in this chapter. When the dialog box for editing the sets is closed, the drop-down list for selecting the enumeration set or units is automatically updated with the new sets, and can be selected.

For menu items that need references (see Table 7-7), the M-Display control automatically fills in the reference with <Object Name>.Present Value. If the reference is empty, an error box appears.

IMPORTANT: All non-blank tags in the table are unique; that is, there can be only one menu item with a certain tag. If a tag is associated with a menu item, the tag of the item that previously had it is cleared.

8. When finished, click OK to return to the Project Builder or continue adding menu items, submenus, or menus.



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Adding and Editing Schedules

Introduction

A schedule allows you to run events at specified times. This chapter explains how to:

- add a Schedule object
- set general properties of a schedule
- add objects to a schedule
- add events to a schedule using the BACnetSchedule Property Page
- add events to a schedule using the BAC Schedule object Edit Attributes screen
- copy a day's events to other days
- add exceptions to a schedule using the BACnetSchedule Property Page
- add exceptions to a schedule using the BAC Schedule object Edit Attributes screen

For further information on the attributes of the Schedule object, see the *Schedule/BACnet™ Schedule* chapter (LIT-694280) in the *Object Dictionary*. For information on accessing a schedule through a VT100 interface, see the *Working with Schedule Objects* chapter (LIT-6892070) in the *N30 Supervisory Controller User's Manual*.

Key Concepts

Schedule Object

The Schedule object updates object attributes at specified times, days, and dates. Using schedules automates events for specific times. For example, you can turn on a fan every day at 7:00 A.M. and turn it off every day at 6:00 P.M.

Exception Schedules

Exception schedules refine your control of objects by preempting the weekly schedule with other instructions on specified days. In the example above, you could create exceptions to the fan schedule, so the fan would not turn on during weekends or holidays. Several types of exception schedules are available. See Table 8-1.

Table 8-1: Types of Exception Schedules

Exception Schedule Type	Purpose
Date	Allows an exception to the selected schedule on a specific date.
Date Range	Specifies a string of consecutive dates that the selected schedule is changed.
Week and Day	Allows an exception to the selected schedule on a specified day of each week or month. For example, the second Friday of each month or every Monday.
Calendar Reference	Refers to a Calendar object. A Calendar object allows the creation of a more detailed exception schedule (for example, holidays that are not working days in a building). This Calendar object can then be referenced by a schedule as an exception to the normal schedule. See the <i>Adding and Editing a Calendar</i> chapter (LIT-693240).

BACnet Schedule

The Schedule object in Project Builder and the N30 is considered a BACnet Schedule object because it supports BACnet functionality. Some proprietary attributes have been added by Johnson Controls to extend its functionality.

Time and Value Pairs

Time and Value Pairs describes the time that an attribute changes to a defined state.

Event

An Event is a way of describing a time and value pair. When a time and a value are entered, they show up on a schedule as an event. By default, an event begins at the specified time and ends either at the end of the day (midnight) or at the next defined event for that day.

Event Colors

Events (time and value bars) appearing on the M-Schedule tab are color coded (text on background) according to the color scheme in Table 8-2.

Table 8-2: Event Color Coding

Values	Appearance
Integer 0, 1	<ul style="list-style-type: none"> • black on cyan (light blue) for integer value 0 • white on blue for integer value 1
Multistate 0, 1, 2, 3, 4	<ul style="list-style-type: none"> • black on cyan (light blue) for integer value 0 • white on blue for integer value 1 • black on green for integer value 2 • black on yellow for integer value 3
Analog	First instance is one color, second is another, and so on, repeating the four colors for more than four different analog values.

Detailed Procedures

Note: The following procedures assume that you already created a database and added an N30, a Schedule container, and items to be scheduled.

Adding a Schedule Object

To add a Schedule object from within Project Builder:

1. Select the Schedule object from the Object Library.
2. Drag the Schedule object to the Schedule container in the N30 database.

Note: Click in the text of the Schedule object name to enter a descriptive name.

Setting General Properties of a Schedule

To set the general properties of a schedule:

1. Select the Schedule object in the Schedule container.
2. Select Edit Object on the Edit menu, or double-click the row head for the Schedule with which you want to work. The Edit Attributes screen for BAC Schedule appears (Figure 8-1).

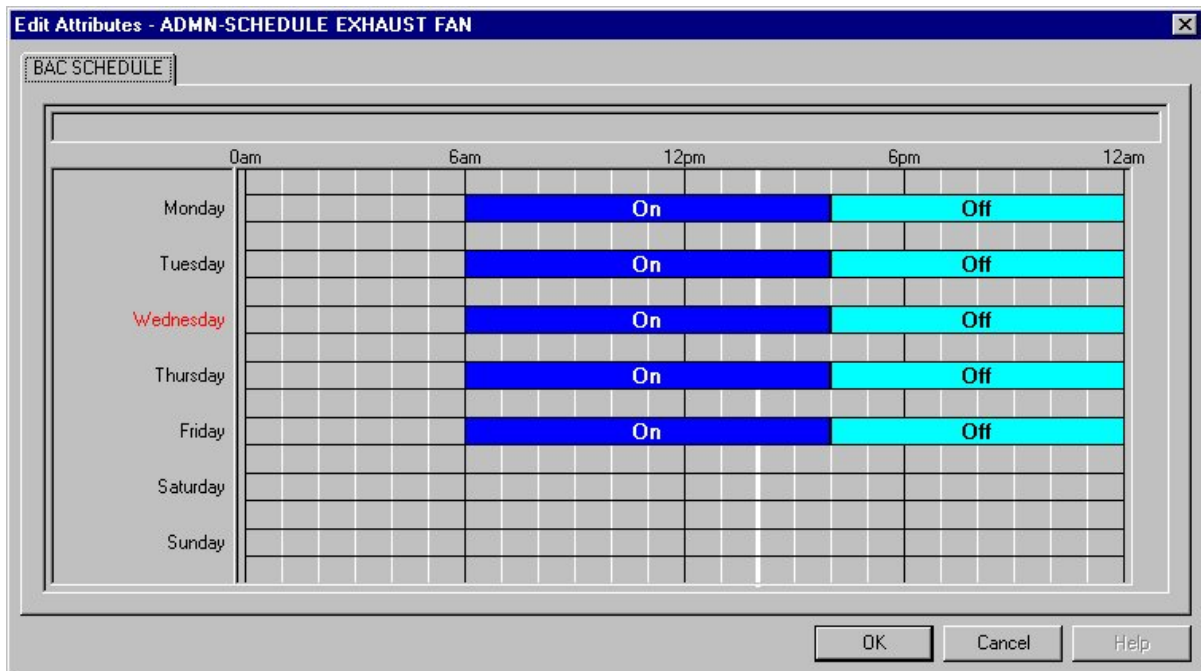


Figure 8-1: BAC Schedule Object Edit Attributes Screen

- Right-click within the schedule grid, and select Details... from the pop-up menu that appears. The BACnetSchedule Property Page appears with the General tab selected (Figure 8-2).

Figure 8-2: BACnetSchedule Property Page - General Tab

- Fill in the fields of the BACnetSchedule general properties according to Table 8-3.
- Click OK to apply your changes and return to the project database, or click Apply to save changes and continue working in the same schedule.

Table 8-3: BACnetSchedule Property Page - General Tab Fields

Field	Value
Schedule Name	Enter a name for the schedule being created.
Schedule Description	Enter a description for the schedule being created.
Effective Period - From	Enter a date and day for the schedule to begin to take effect.
Effective Period - To	Enter an end date and day for the schedule.
Enabled	Select True to enable the schedule and False to disable the schedule.
Execution Priority	Select a priority for the schedule from the drop-down list.
Object Category	Select the object category under which the schedule falls.

Adding Objects to a Schedule

To add objects to a schedule:

1. Select the Object tab on the BACnetSchedule Property Page (Figure 8-2). The BACnetSchedule Property Page appears with the Object tab selected (Figure 8-3).

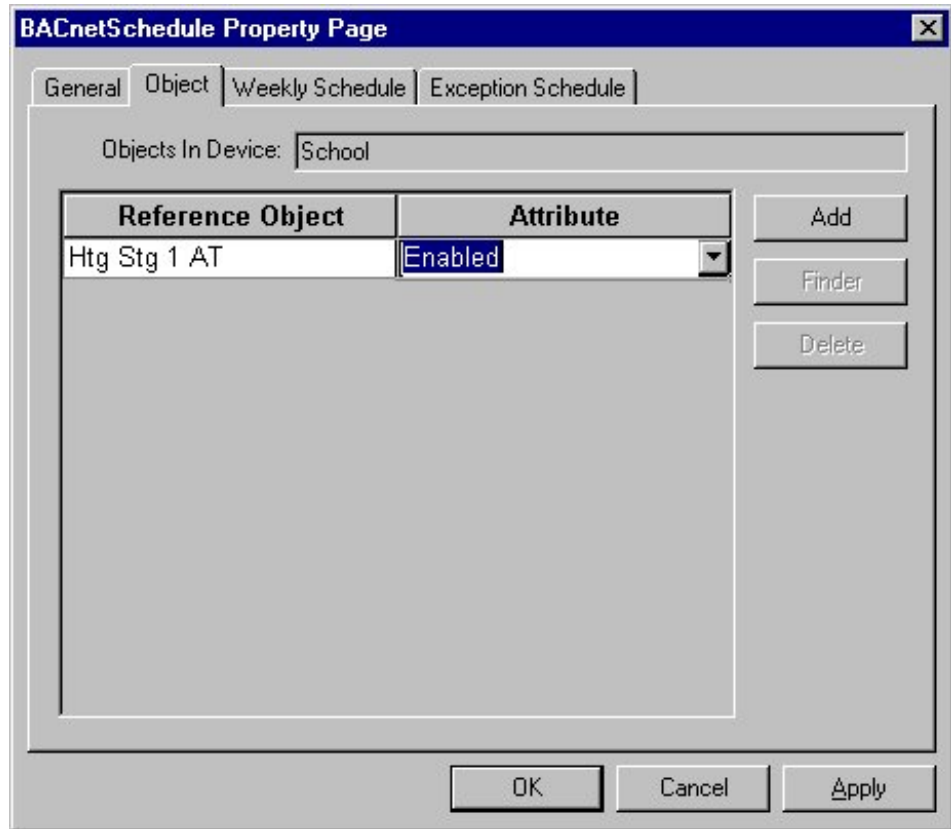


Figure 8-3: BACnetSchedule Property Page - Object Tab

2. Click Add, and enter an object reference.

Note: Enter the object reference exactly as it appears in either the Name field or the Full Reference field of the Project Builder database. Copy and paste object names or full references from the Project Window to ensure accuracy. When a valid object is entered, the device where it resides is listed in the Objects in Device field located above the Reference Object/Attribute grid.

3. Select the attribute for the object from the drop-down list that appears. In the example in Figure 8-3, the Enabled attribute of an Analog Totalization object for Heating Stage One is scheduled to change state at the times and dates specified by the current schedule.

4. Click Add to add additional objects to the schedule or Delete to remove objects from the schedule.
5. Click OK to apply your changes and return to the project database, or click Apply to save changes and continue working in the same schedule.

Adding Events to a Schedule Using the BACnetSchedule Property Page

To add events to a schedule using the BACnetSchedule Property Page:

1. Select the Weekly Schedule tab on the BACnetSchedule Property Page (Figure 8-2). A blank weekly schedule appears (Figure 8-4).

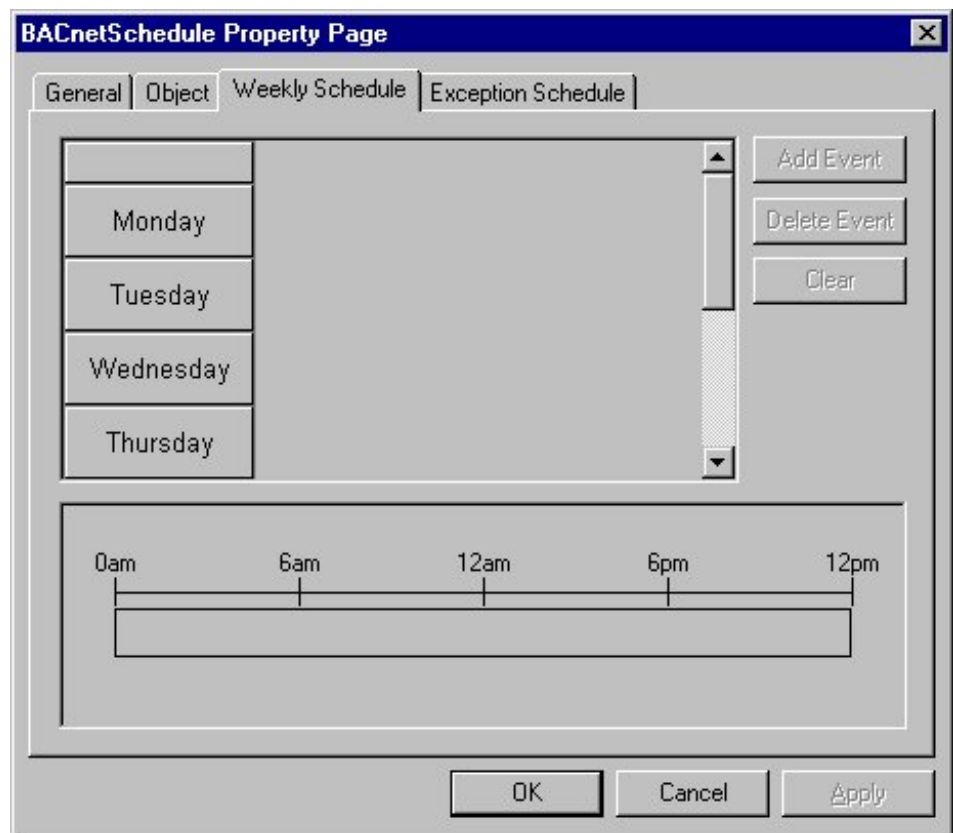


Figure 8-4: BACnetSchedule Property Page

2. Select the day of the week on which you want to schedule events.

Note: If creating a schedule for the whole week, you can copy the events from one day to the rest of the days of the week when your schedule is complete. See *Copying a Day's Events to Other Days* in this chapter.

3. Click on the Add Event button. The Input Value screen appears (Figure 8-5).



Figure 8-5: Input Value Screen

4. Enter a time and value in the input value screen. The time represents when the indicated value is applied to the object attribute referenced in the schedule.
5. Press the Enter key.
6. Repeat Steps 3, 4, and 5 to schedule an additional change. For example, to turn a fan on at 6:00 A.M. and off at 6:00 P.M., schedule a time and value for which the input is turned on and a second time and value pair to turn it off.
7. Click OK to apply your changes and return to the project database, or click Apply to save changes and continue working in the same schedule.

Adding Events to a Schedule Using the BAC Schedule Object Edit Attributes Screen

To add an event to a weekly schedule using the BAC Schedule object Edit Attributes screen:

1. Select the Schedule object in the Schedule container.
2. Select Edit Object on the Edit menu, or double-click the row head for the schedule with which you want to work. The BAC Schedule object Edit Attributes screen appears (Figure 8-1).
3. Right-click on a day of week on the left side of the screen, and check Add Event. A pop-up menu for weekly schedule events appears (Figure 8-6).

Note: If Add Event is already checked, click somewhere else on the left side of the screen to close the pop-up menu.

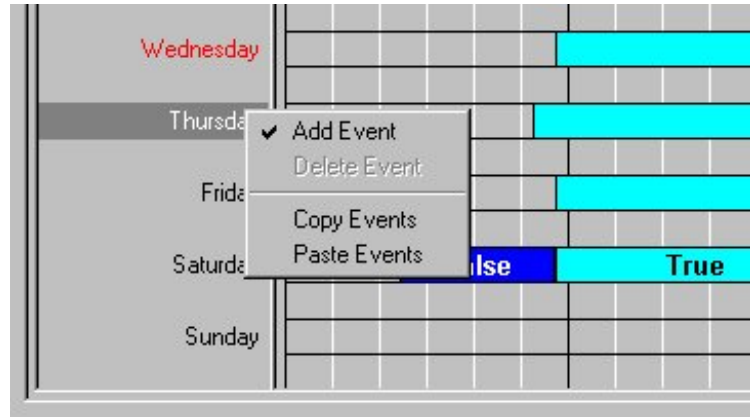


Figure 8-6: Right-click Pop-up Menu Over a Day in the BAC Schedule Object Edit Attributes Screen

4. Select the day of the week on the left side of the screen.
5. Left-click on the time that you want the event to take place. The Input Value screen appears (Figure 8-5) with the time set to the time on the day's timeline over which the cursor was when you clicked it.

Note: The cursor appears as a plus sign (+) if Add Event has been checked in the pop-up menu and you have the cursor over the selected day's timeline.

6. Edit the time and value pair as desired.
7. Press the Enter key to apply your changes, and return to the Edit Attributes screen for BAC Schedule. Continue working in the same schedule, or click OK to return to the project database.

Copying a Day's Events to Other Days

To copy a day's events to other days:

1. Open the BAC Schedule object Edit Attributes screen (Figure 8-1).
2. Select the day with the events that you want to duplicate on the left side of the screen.
3. Right-click, and select Copy Events.
4. Select the day that you want to have the same schedule of events on the left side of the screen.
5. Right-click, and select Paste Events.

Note: Any existing events in the weekly schedule for that day are overwritten.

6. Continue working in the same schedule, or click OK to return to the project database.

Adding Exceptions to a Schedule Using the BACnetSchedule Property Page

To add exceptions to a schedule using the BACnetSchedule Property Page:

1. Select the Exception Schedule tab on the BACnetSchedule Property Page (Figure 8-2). A blank Exception Schedule appears (Figure 8-7).

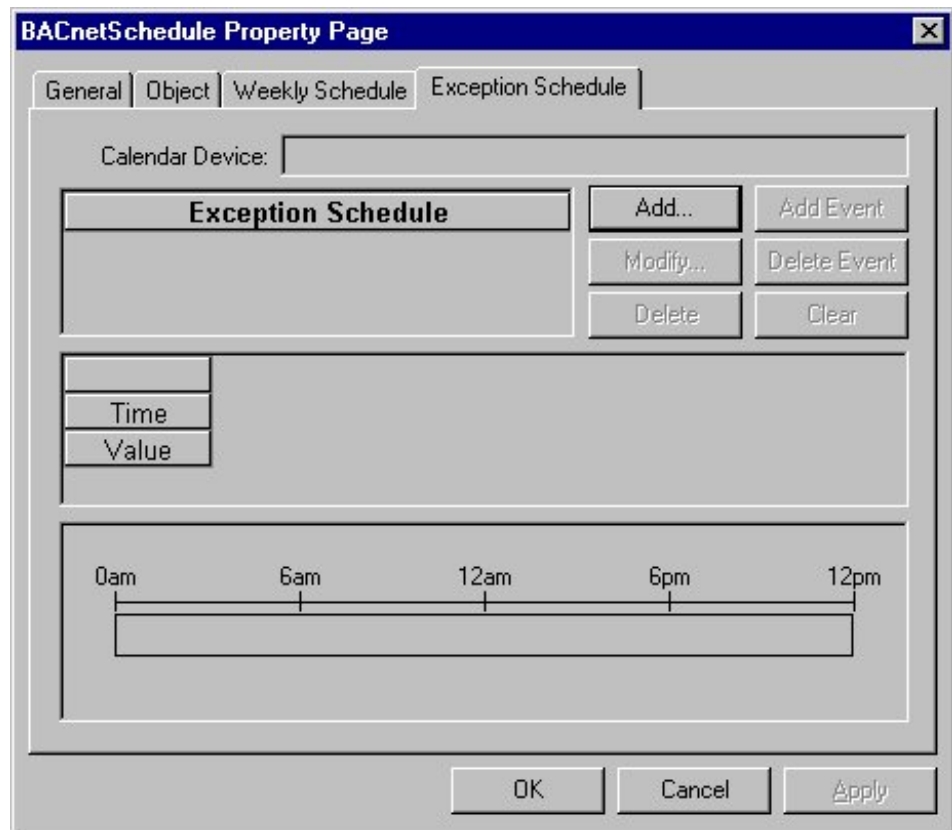


Figure 8-7: Blank Exception Schedule Screen

2. Click Add. The Exception Schedule Creation screen appears (Figure 8-8).

Figure 8-8: Exception Schedule Creation Screen

- Fill in the fields of the Exception Schedule Creation screen according to Table 8-4.

Table 8-4: Exception Schedule Creation Fields

Field	Value/Options
Priority	Enter a priority to determine which exception schedules are run first.
Period Type - Date	Enter a specific date and day (optional) to run the exception to your weekly schedule.
Period Type - Date Range	Enter a range of dates and days to run the exception to your weekly schedule.
Period Type - Week and Day	Enter a month, week, and day to run the exception to your weekly schedule; for example, the second Wednesday of August or the last Friday of every (any) month.
Period Type - Calendar Reference	Enter a reference to a Calendar object you have created to use it as an exception to a weekly schedule. See the <i>Adding and Editing a Calendar</i> chapter (<i>LIT-693240</i>) for more information.
Effective Period - any month*	Enter a specific month to run an exception schedule, or leave it on any month to run the exception every month.
Effective Period - any week*	Enter the week of the specified month that you want to run the exception schedule. Choices are: any, 1st, 2nd, 3rd, 4th, 5th, or last.
Effective Period - any day*	Enter the day of the specified week that you want to run the exception schedule, or leave it on any day to run the exception every day.

* The effective period fields change depending on the selected period type.

- Click OK.
- Select the new Exception Schedule from the Exception Schedule table, and click the Add Event button to define events for this Exception Schedule.

6. Add additional exception schedules as needed.
7. Click Apply to save changes, and continue working in the same schedule. To return to the BAC Schedule object Edit Attributes screen, click OK. To return to the project database, click OK a second time.

Adding Exceptions to a Schedule Using the BAC Schedule Object Edit Attributes Screen

To add exceptions to a schedule using the BAC Schedule object Edit Attributes screen:

1. Open the BAC Schedule object Edit Attributes screen (Figure 8-1).
2. Right-click inside the timeline grid on the right side of the screen, and select Exception. The BAC Schedule object Edit Attributes exception schedule screen appears (Figure 8-9).

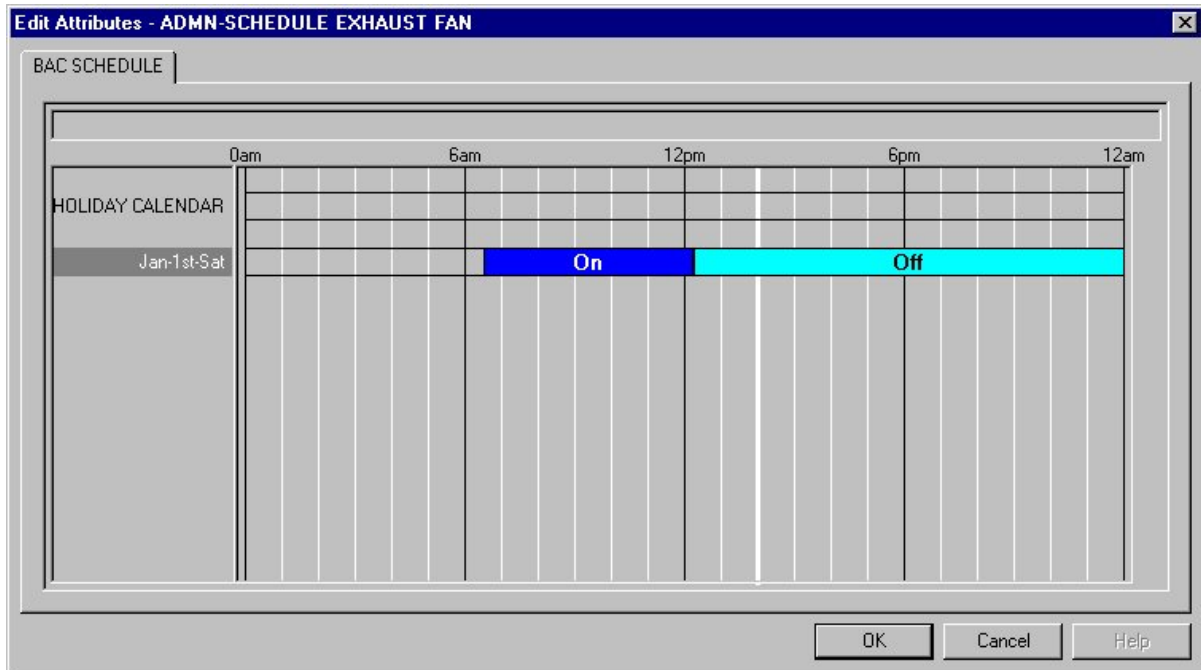


Figure 8-9: BAC Schedule Object Edit Attributes Exception Schedule Screen

3. Right-click in the timeline grid on the right, and select Add New Exception. The Exception Schedule Creation screen appears (Figure 8-8).
4. Fill in the fields of the Exception Schedule Creation screen according to Table 8-4.
5. Click OK.

6. Right-click on the timeline grid on the right of the new Exception Schedule, and select Add Event to define the events to occur during that Exception Schedule.
7. Add additional exception schedules as needed.
8. Click OK to apply your changes and return to the project database, or continue working in the same schedule.



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Adding and Editing a Calendar

Introduction

A Calendar object is a reusable exception to weekly schedules. This chapter describes how to:

- create a Calendar object
- set general properties of a calendar
- add dates to a calendar using the BAC Calendar object Edit Attributes screen
- add dates to a calendar using the BACnetCalendar Control Property Page

For further information on the attributes of the Calendar object, see the *Calendar/BACnet™ Calendar chapter (LIT-694130)* of the *Object Dictionary*. For information on accessing a calendar through a VT100 in *Working with Calendar Objects (LIT-6892080)* in the *N30 Supervisory Controller User's Manual*.

Key Concepts

Exception Calendar

The Calendar object maintains a list of dates designated as exceptions to the normal schedule. A Schedule object working from a chosen calendar reads the present value of the Calendar object to determine if the current day is within the date list of the calendar.

This object allows a user to accommodate special days, like holidays, in which the building controls should run differently from usual. For example, you can create exceptions due to changes in the number of people or the amount of activity scheduled to take place in the building on the specified day. See Table 9-1.

Table 9-1: Types of Exception Calendar

Type	Purpose
Single Date	Define a single day on which the exception to the schedule is to be run.
Date Range	Define a range of days on which the exception to the schedule is to be run.
Week and Day	Define a Week and Day on which the exception to the schedule is to be run. For example, you could choose any day in the first week (Days 1 through 7) of January. See Figure 9-1 for an example of a BACnet Calendar object definition screen with two Week and Day exception calendars.

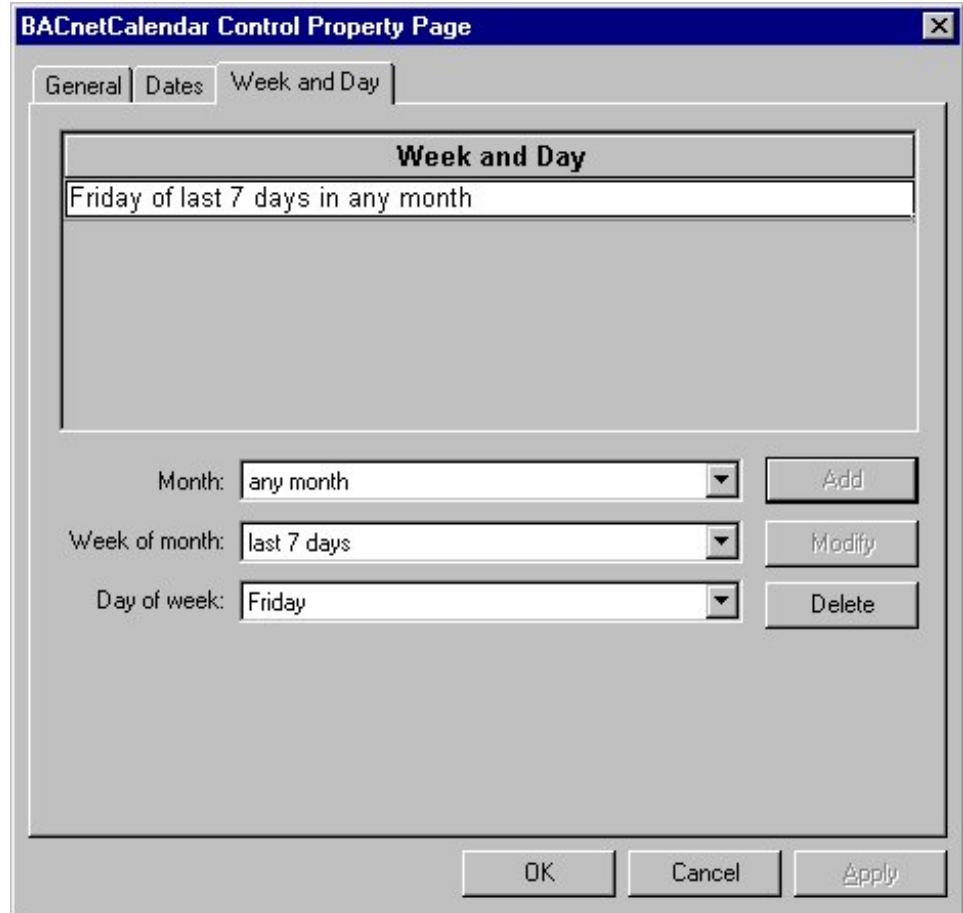


Figure 9-1: Week and Day Exception

Detailed Procedures

Note: The following procedures assume that you already created a database, added an N30, and defined a Schedule object.

Creating a Calendar Object

To create a Calendar object:

1. Select the Calendar object from the Object Library.
2. Drag the Calendar object to the Schedule container in the N30 database.

Note: Click the text of the calendar's name field in the project database to enter a descriptive name.

Setting General Properties of a Calendar

To set the general properties of a calendar:

1. Select the Calendar object in the Schedule container.
2. Select Edit Object from the Edit menu, or double-click the row header for the calendar with which you want to work. The BAC Calendar object Edit Attributes screen appears (Figure 9-2).

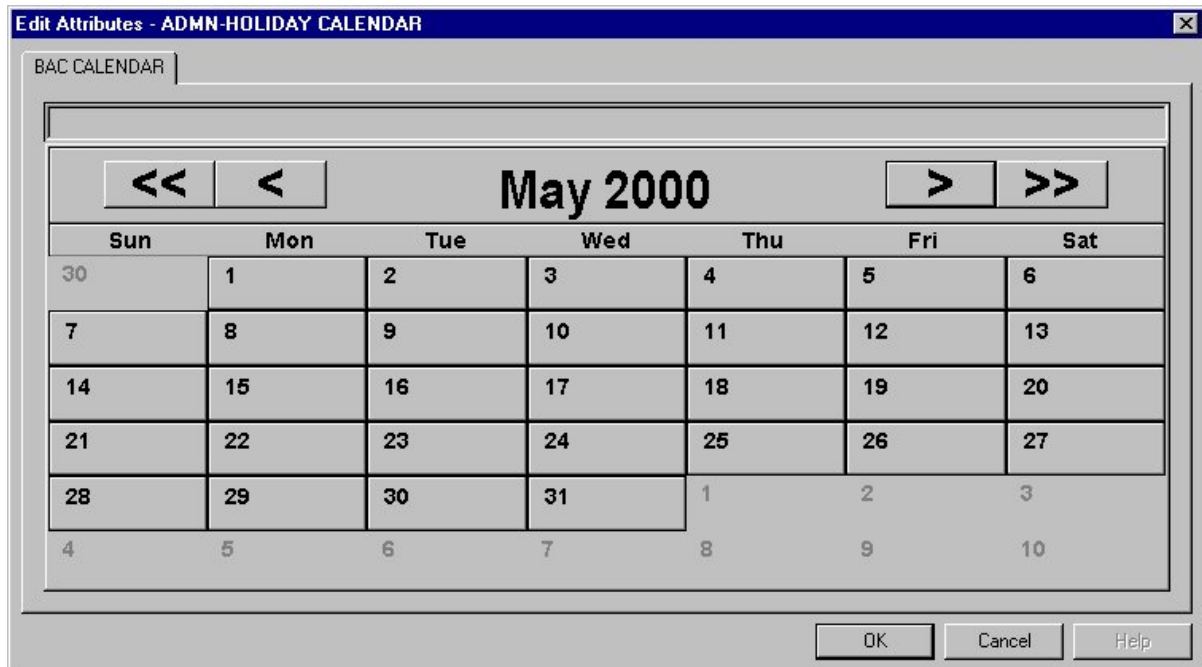


Figure 9-2: BAC Calendar Object Edit Attributes Screen

- Right-click on the calendar, and select Details from the pop-up menu that appears. The BACnetCalendar Control Property Page appears (Figure 9-3).

Figure 9-3: BACnetCalendar Control Property Page – General Tab

- Fill in the fields of the BACnet Calendar general properties according to Table 9-2.

Table 9-2: BACnetCalendar Control Property Page - General Tab

Field	Value/Options
Calendar Name	Enter a name for the exception calendar you are creating.
Calendar Description	Enter a description for the exception calendar you are creating (optional).
Enabled	Select True or False.
Execution Priority	Choose Normal, Urgent, Critical, Life Safety.
Object Category	Choose HVAC, Fire, Services, Security, Administrative.

- Click OK to return to the BAC Calendar object Edit Attributes screen.
- Click OK to return to the project database.

Adding Dates to a Calendar Using the BAC Calendar Object Edit Attributes Screen

To add dates to a calendar using the BAC Calendar Edit Attributes screen:

1. Select the Calendar object in the Schedule container.
2. Select Edit Object on the Edit menu, or double-click the row header for the calendar with which you want to work. The BAC Calendar object Edit Attributes screen appears (Figure 9-2).
3. Select the date or ranges in the BAC Calendar object Edit Attributes screen by clicking on them.
4. Use the << and >> buttons to select the year.
5. Use the < and > buttons to select the month.
6. Click OK to return to the project database.

Adding Dates to a Calendar Using the BACnetCalendar Control Property Page

To add dates to a calendar using the BACnetCalendar Control Property Page:

1. Select the Calendar object in the Schedule container.
2. Select Edit Object on the Edit menu, or double-click the row header for the calendar with which you want to work. The BAC Calendar object Edit Attributes screen appears (Figure 9-2).
3. Right-click on the calendar, and select Details... from the pop-up menu that appears. The BACnetCalendar Control Property Page appears (Figure 9-3).
4. Select the Dates tab (Figure 9-4) to add specific dates or date ranges to a calendar, or select the Week and Day tab (Figure 9-5) to set a specific day without knowing the date (for example, the third Tuesday in July) or a repeating day (for example, the last Friday of every month).

BACnetCalendar Control Property Page [X]

General | **Dates** | Week and Day

Dates

- 02/12/2000, Any Day
- 03/30/2000, Any Day
- 07/24/2000, Any Day
- 10/26/2000, Any Day
- (04/02/2000, Any)-(04/09/2000, A

Criteria

Date

Date Range

Date: 02/12/2000 Any

<< < **May 2000** > >>

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Add

Modify

Delete

OK Cancel Apply

Figure 9-4: BACnetCalendar Control Property Page - Dates Tab

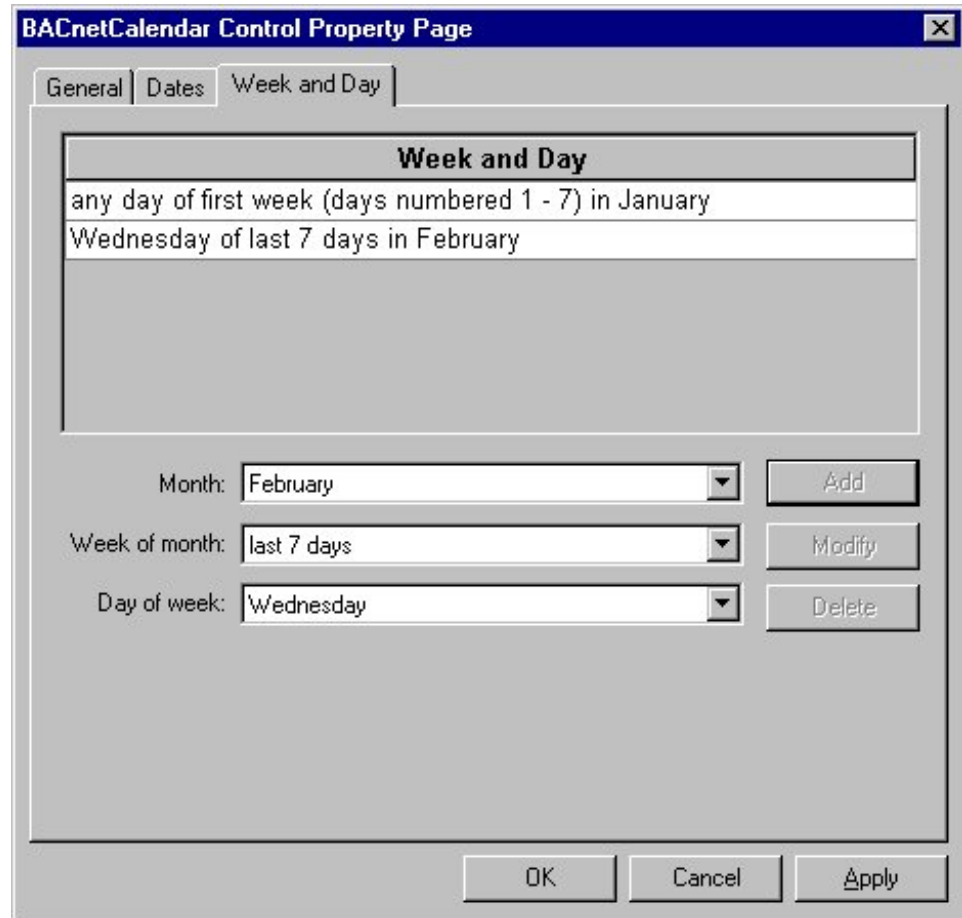


Figure 9-5: BACnetCalendar Control Property Page – Week and Day Tab

5. Select the days on the Dates tab or the Week and Day tab for each date, range, or week and day definition, and click Add.
6. Click OK to return to the BACnetCalendar Edit Attributes screen when all days have been entered (Figure 9-2). The dates you have added to the Calendar appear highlighted.
7. Click OK to return to Project Builder.



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Using Queries

Introduction

In Project Builder, queries create tabbed sheets to organize the display of the data in a project database. This chapter describes how to:

- add or define a new query
- edit a query
- add a column to a query display
- edit a column in a query display
- delete a column from a query display
- delete a query

Key Concepts

Query

A request for information from a database. In Project Builder, queries provide a means of requesting and organizing information in your project database. Project Builder provides two types of user defined queries: simple and Structured Query Language (SQL).

Simple Query

A simple query consists of a standard Boolean search for the specific attributes desired. In a simple query, Key 1 is a required field. Keys 2 and 3 are optional fields to allow you to expand or refine your query. A simple query is based on object attributes, logical functions, and values. Multiple attributes can be combined in a single query using AND and OR statements. See Table 10-1 for a list of the logical functions that may be applied to an attribute in a simple query.

Table 10-1: Simple Query Logical Functions

Logical Function	Name	Returns
=	Equal to	All objects that have the chosen attribute with a value that matches the value given in the query with the attribute chosen
<>	Less than or greater than	All objects that have the chosen attribute with a value that is not equal to the value given in the query, because they are above or below the chosen value. In other words, all objects that do not have the chosen attribute. This function does not apply to Boolean type attributes.
>	Greater than	All objects that have the chosen attribute with a value that is more than the value given in the query. This function does not apply to Boolean type attributes.
>=	Greater than or equal to	All objects that have the chosen attribute with a value that either matches or is larger than the value given in the query. This function does not apply to Boolean type attributes.
<	Less than	All objects that have the chosen attribute with a value that is smaller than the value given in the query. This function does not apply to Boolean type attributes.
<=	Less than or equal to	All objects that have the chosen attribute with a value that either matches or is smaller than the value given in the query. This function does not apply to Boolean type attributes.
LIKE	Similar to	All objects that have the chosen attribute with a value that is similar to the value given in the query. For example, using this function with the Object Name attribute and a value of N* returns all objects that have a name beginning with N. This function only applies to string type attributes.

SQL Query

A more complex query may be written using Structured Query Language (SQL). Project Builder uses the Microsoft® Access SQL Syntax and its underlying database manager. SQL queries can be used with the following attribute names:

- Object Name
- Full Reference Name
- Device Name
- Class ID

SQL queries can be used with all other attributes. However, the Attribute Number must be used in place of the name. See Table 10-2 for some examples of Attributes and their corresponding numbers.

Table 10-2: Attribute Numbers

Attribute Name	Attribute Number
Description	28
Units	117
Input Reference	132
Analog Alarm Reference	627
High Alarm Limit	631
Low Alarm Limit	632

Query Display

The query display contains the results of a query and may be further edited according to your needs. Each query appears as an individual tabbed sheet in the project database window. The tabbed sheet is divided into rows of objects and columns for specific attributes. These columns may be added, deleted, or edited.

For display purposes, objects returned by a query are placed at the top of a hierarchy in the display for that query. Therefore, if an object in a query has children, it can be expanded to display them. However, if it is a child of another object, you cannot navigate to the parent object of an object returned by a query.

Default Queries

Project Builder contains several queries by default.

Table 10-3: Default Queries in Project Builder

Query	Displays
All Devices	A device-centric view of the project database
All N2 I/O Points	All Input/Output (I/O) point type objects
All Objects	Every object in the current database

Detailed Procedures

Adding or Defining a New Query

To add or define a query:

1. Select Add Query from the Format menu. The Add Query dialog box appears (Figure 10-1).

Figure 10-1: Add Query Dialog Box

2. Enter a unique title for your query. A title is a required field. This title appears on the tabbed sheet that displays your query results.
3. Define the query using either the simple query or an SQL query. If adding a simple query, the Key 1 field is required, and Keys 2 and 3 are optional. If entering an SQL query, use the Microsoft Access SQL syntax to define your query. Figure 10-2 shows a simple query used to return a list of defined alarms.

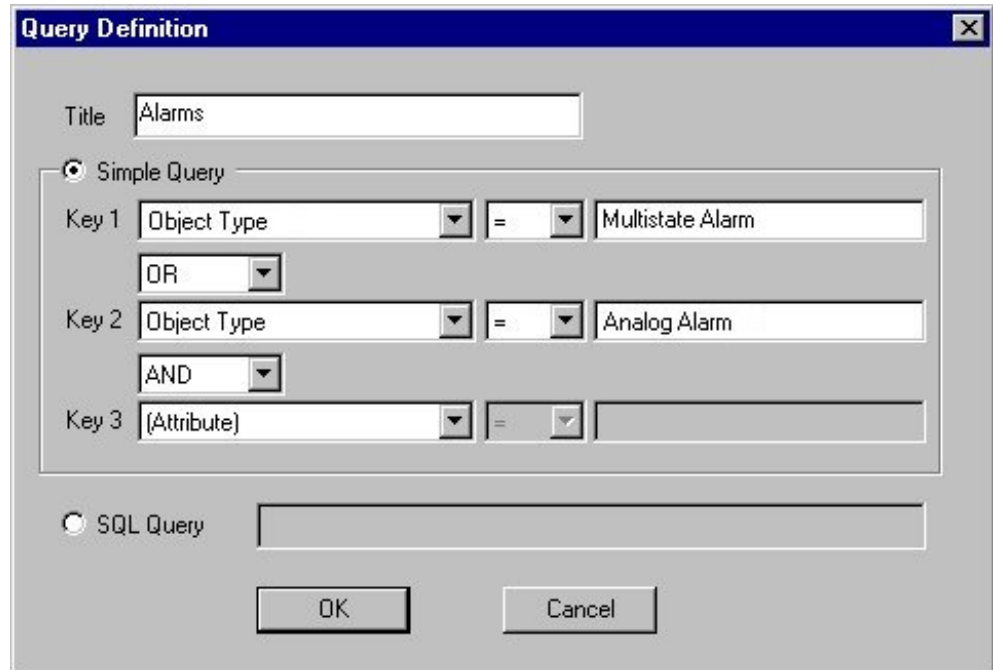


Figure 10-2: Simple Query to Return Defined Alarms

4. Click OK when done. The query is saved in the project database, a new tabbed sheet is added to the current project window, and the query is executed to populate the new sheet.

Note: If you did not assign a unique title for the query, a warning box appears stating that the query name already exists.

Editing a Query

To edit a query:

1. Select the tab that corresponds to the query you want to edit. For example, the query defined in the *Adding or Defining a New Query* section in this chapter creates a tab named Alarms. To edit this query, select the Alarms tab.
2. Select Edit Query on the Format menu. The Query Definition screen for that query appears (Figure 10-2).
3. Edit the fields as desired, and select OK.

Adding a Column to a Query Display

To add a column to a query display:

1. Select the tab that corresponds to the query display you want to edit. For example, the query defined in the *Adding or Defining a New Query* section in this chapter creates a tab named Alarms. To edit the query display for this query, first select the Alarms tab.

2. Select the column to the right of where you want to insert the new column. Selecting a column enables the column commands on the Format menu.
3. Select Add Columns on the Format menu. The Add Column dialog box appears (Figure 10-3).

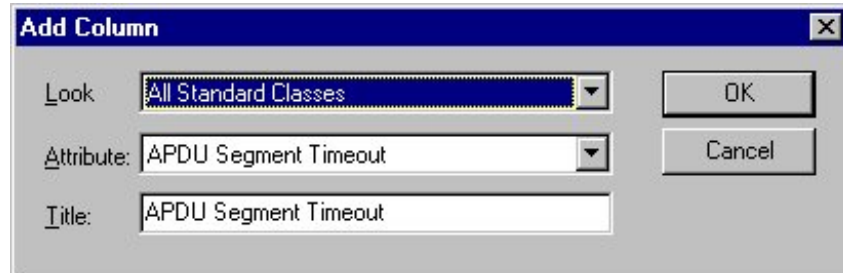


Figure 10-3: Add Column Dialog Box

4. Fill in the fields using Table 10-4.

Table 10-4: Add Column Dialog Box Fields

Field	Contains	Default
Look	List of Object Classes	All Standard Classes
Attribute	Attributes for object class selected in the Look field	Varies according to the selected column
Title	Name that appears on the head of the column in query display	Varies according to the selected column

5. Click OK.

Editing a Column in a Query Display

To edit a column in a query display:

1. Select the tab that corresponds to the query display you want to edit. For example, the query defined in the *Adding or Defining a New Query* section of this chapter creates a tab named Alarms. To edit the query display for this query, first select the Alarms tab.
2. Select the column you want to edit. Selecting a column enables the column commands on the Format menu.
3. Select Edit Columns on the Format menu. The Edit Column dialog box appears (Figure 10-4).

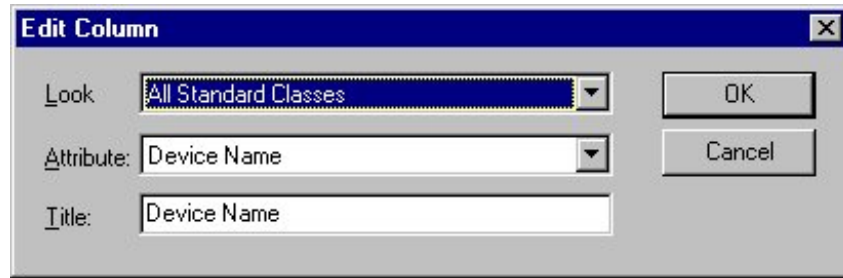


Figure 10-4: Edit Column Dialog Box

4. Edit the fields using Table 10-4.
5. Click OK.

Deleting a Column from a Query Display

To delete a column from a query display:

1. Select the tab that corresponds to the query display you want to edit. For example, the query defined in the *Adding or Defining a New Query* section in this chapter creates a tab named Alarms. To edit the query display for this query, first select the Alarms tab.
2. Select the column you want to delete. Selecting a column enables the column commands on the Format menu.
3. Select Delete Columns on the Format menu.

Note: Selecting Delete Columns **immediately** deletes the selected column. The column cannot be retrieved without adding and defining it again.

Deleting a Query

To delete a query:

1. Select the tab that corresponds to the query you want to delete. For example, the query defined in the *Adding or Defining a Query* section in this chapter creates a tab named Alarms. To delete this query, first select the Alarms tab.
2. Select Delete Query on the Format menu.

Note: Selecting Delete Query **immediately** deletes the selected query. The query cannot be retrieved without defining it again.

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Uploading and Downloading

Introduction

To work with objects that are already in devices and to use completed project files requires the ability to upload and download files between Project Builder and your N30 System. This chapter describes how to:

- upload objects to a project database
- download objects from a project database
- use advanced download
- change load options
- upgrade the firmware and download the database via the upgrade utility tool
- upgrade the firmware and download the database via advanced download
- divide a large site across multiple databases

Key Concepts

Uploading

Uploading is copying objects from a device's existing database into your project database for editing.

Downloading

Downloading is copying code, dictionary, and/or objects from your project database into a device.

Main Code

Code refers to programmed instructions to your devices. Main code is the code within the N30 that is run for normal operation. This is the code included in the Main Code, Dictionary and Objects option. Project Builder stores this code in flash memory. You can update the code through an advanced download using the Main Code, Dictionary and Objects option.

Note: If you are using Advanced Download to download main code through the Main Code, Dictionary and Objects option and a direct or dial-up connection, your connection speed must be higher than 9600 baud. 9600 baud is the default speed of Port 1 and 2 on an N30. Use Port 3, which has a default baud rate of 57,600.

Startup Code

Startup Code is the code within the N30 that is run immediately after a device reset or device power up. This code is stored in flash memory and is updated through a code download. It performs checksum tests on the startup, boot, and main code, as well as other diagnostic tests. It also determines whether boot or main code should be run. Startup code does not download without the main code.

Boot Code

Boot Codes is the code within the N30 that is primarily used when attempting to download the main code. The boot code is a minimal size version of the main code, designed to support communications and code downloads. It is stored in flash memory and updated through a code download. Boot code cannot be downloaded without the startup and main code.

N30 Upgrade Utility

Due to changes in the database structure of the N30 at firmware Revision level 2.x, an upgrade utility has been added to System Tools to upgrade the firmware revision level and database from Version 1.x to Versions 2.0 and later.

MIG Download Utility

The MIG Download Utility is used to download MIG files. MIG files cannot be downloaded through Project Builder. For information on downloading MIG files from M-Tool, see the *Downloading Metasys® Integrator 300 Series Code Application Note (LIT-693400)*.

Load Manager

The Load Manager is a component of Project Builder that manages the uploading and downloading of objects.

Load Options

The Options selection on Project Builder's Tools menu provides a means to change the settings of the Load Manager.

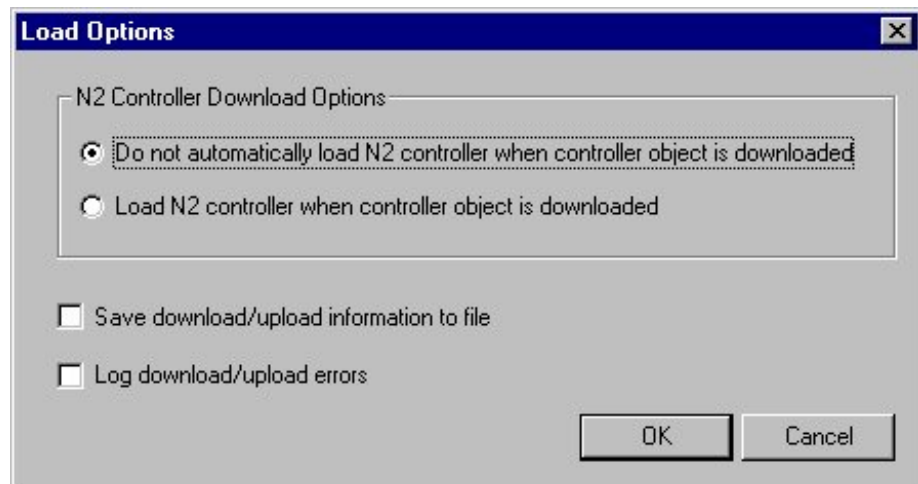


Figure 11-1: Load Options Dialog Box

The N2 Controller Download Options generally should be left in the default selection of **Do not automatically load N2 controller when controller object is downloaded**. You may choose to use the **Load N2 controller when controller object is downloaded** option to get a job running on a full download or for an incremental download to only a few N2 controllers. To do this, enter the download file name in the File name field of the controller object in the M-View screen (Figure 11-2).

Edit Attributes - Dean.N2.UNT{1}

MView

Configuration

Object

Object Name: First UNT

Description:

Object Type: Controller

Object Category: HVAC

Enabled: True

Network

Controller Type: UNT

Net N2 Address: 1

Setup

File Name: Jnt111.ASC

Notification Class: 4194001

OK Cancel Help

Figure 11-2: M-View Screen

When downloading N30s with the **Load N2 controller when controller object is downloaded** option selected, the HVAC PRO software (.asc), GX-9100 (.dxf), or XTM 101/105 (.dbf) files automatically download to the appropriate controller, provided the following conditions are met:

- The file name is entered in the controller object's File name field.
- The file resides within the Config Files directory under the current project directory.

If the above conditions are not met, you are prompted for files that have been created using the HVAC PRO software, GX-9100 Tools, or the XTM Configurator. These files replace any existing files in your Application Specific Controllers (ASCs), DXs, or XTMs. The System Tools attempt to download every controller attached to a selected N30 when you download that N30. This can add a significant amount of time to your downloads.

As an alternative, you can download only selected ASCs and DX-9100s by choosing the appropriate controller objects in Project Builder. Supported ASCs for the Load Options feature include the Air Handling Unit (AHU), Unitary Controller (UNT), and Variable Air Volume (VAV) controllers.

Detailed Procedures

Uploading Objects to a Project Database

To upload objects to a project database:

1. Connect the computer where Project Builder is running to the device from which you want to upload or to an N30 on the same network.
2. Open the project database with the N30s to which you want to upload.

Notes: You must configure the Site using the Edit Site menu prior to performing any uploads or downloads. See the *Defining a Site* chapter (*LIT-693220*).

The name of the N30 in Project Builder must match the name of the N30 being uploaded.

3. Select the N30s to which you want to upload objects in the project database.
4. Select Upload Objects on the Tools menu.
5. Click Yes in the confirmation dialog box.

Downloading Objects from a Project Database

To download objects from a project database:

1. Connect the computer where Project Builder is running to the supervisory controller to (or through) which you want to download or to an N30 on the same network.

Note: You must configure the Site using the Edit Site menu prior to performing any uploads or downloads. See the *Defining a Site* chapter (*LIT-693220*).

2. Select the devices to which you want to download objects.
3. Select Download Objects on the Tools menu. A Download warning appears (Figure 11-3).

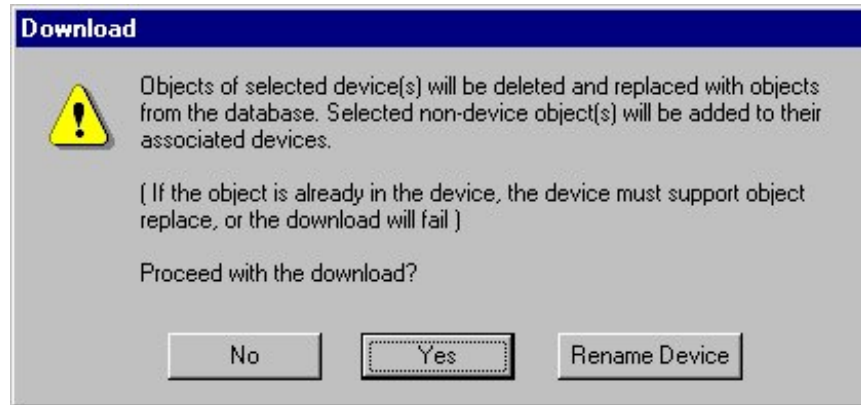


Figure 11-3: Download Warning

4. Click Yes if you agree. To cancel the download, click No. To rename the device before downloading, click Rename Device. The Rename and Download Device dialog box appears (Figure 11-4).



Figure 11-4: Rename and Download Device Dialog Box

5. Make any desired changes, and click OK. Project Builder opens the Site Manager, connects to the N30, and downloads the project database. The download may be cancelled by selecting Abort on the Tools menu.

Note: When you rename a device, the name of the device in the Project Builder database is the New Name for the device. The Destination Device Name is the device's current (or old) name.

6. Check the status window to ensure the download was successful.

Using Advanced Download

IMPORTANT: When changing BACnet™ Internet Protocol (IP) ports to an N30 segment that has a Broadcast Management object, and performing an advanced download, you must download the N30 with the Broadcast Management object last. Downloading this N30 at any other time prevents Project Builder from communicating with the other N30s on the segment.

If using Advanced Download to download main code through the Main Code, Dictionary and Objects option, and a direct or dial-up connection, your connection speed must be higher than 9600 baud. 9600 baud is the default speed of Port 1 and 2 on an N30. Use Port 3, which has a default baud rate of 57,600.

To use the Advanced Download feature:

1. Select the device or devices to which you are downloading in the project database.

Note: You must configure the Site using the Edit Site menu prior to performing any uploads or downloads.

2. Select Advanced Download on the Tools menu. The Advanced Download dialog box appears (Figure 11-5).

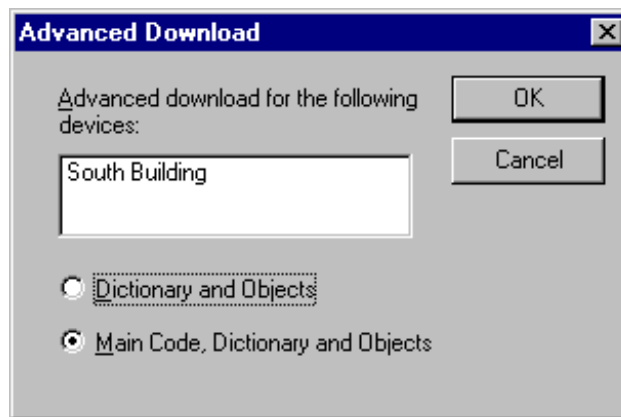


Figure 11-5: Advanced Download Dialog Box

3. Select Main Code, Dictionary and Objects.

Notes: Checking the Dictionary and Objects option updates the dictionary that defines the language displayed on a VT100 attached to the device. Use the Dictionary Language attribute on the M-View screen of the N30 Device object to select the desired language for the dictionary.

Checking the Main Code, Dictionary and Objects option updates the main code (boot code and startup code, if necessary) as well as performs the function of the Dictionary and Objects option.

4. Click OK to start the code download.

Note: You can cancel the download by selecting Abort on the Tools menu.

5. Check the status window to make sure the download was successful.

Changing Load Options

To change load options:

1. Select Options on the Tools menu. The Load Options dialog box appears (Figure 11-6).

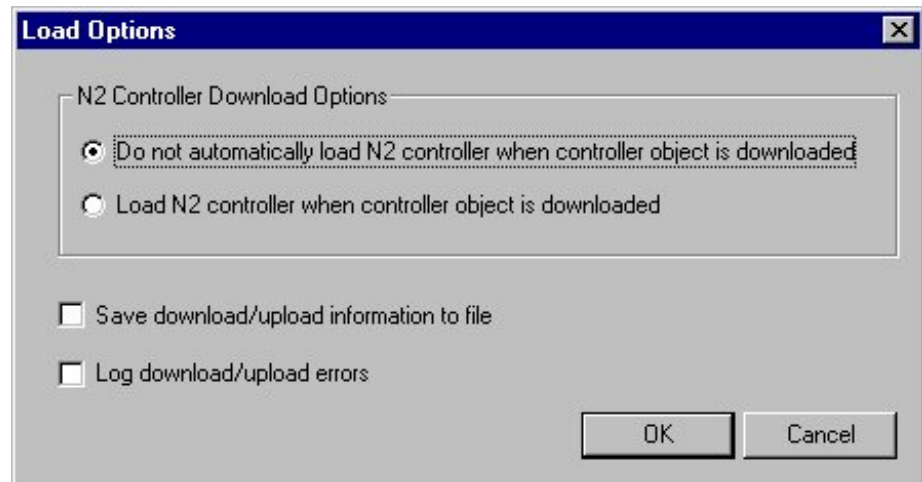


Figure 11-6: Load Options Dialog Box

2. Select the Load Options using Table 11-1.

Table 11-1: Load Options

Option	Description
Do not automatically load N2 controller when controller object is downloaded	The N2 controller does not automatically load when a controller object is downloaded. This option is selected by default and prevents lengthy downloads.
Load N2 controller when controller object is downloaded	The HVAC PRO (.asc), GX-9100 (.dxf), or XTM 101/105 (.dbf) files download to the appropriate controller. This option adds a significant amount of time to downloads.
Save download/upload information to file	Saves the object data file created by the Load Manager (.moi) to the Load Files directory under the project directory (optional) if checked.
Log download/upload errors	Logs the errors from a download or an upload if checked (optional).

3. Click OK.

Upgrading the Firmware and Downloading the Database via the Upgrade Utility Tool

Notes: Due to changes in the database structure of the N30 at Firmware Version 2.x, we have added an Upgrade Utility Tool to upgrade the Firmware Version from 1.x to 2.0 and later.

The Upgrade Utility tool does not upgrade an N30 that is already at Version 2.0 or later. For example, it does not upgrade Version 2.0 firmware to Version 5.0 firmware.

This feature does not transform an N30 into an N30-1, as these are physically different devices. The N30-1 has more memory and can hold larger databases.

Use this procedure if a Project Builder database for the N30 is not available or the available Version 1.x database is not current.

To upgrade the Firmware and download the database via the Upgrade Utility Tool:

1. Connect the N30 devices you want to upgrade to the computer where the System Tools is loaded.
2. Close any running System Tools (or other programs) to avoid interference between programs and devices during the upgrade.
3. Select Programs > Johnson Controls > M-Tool > System Tools > N30 Upgrade on the Windows operating system Start menu. The Upgrade Utility screen appears (Figure 11-7).

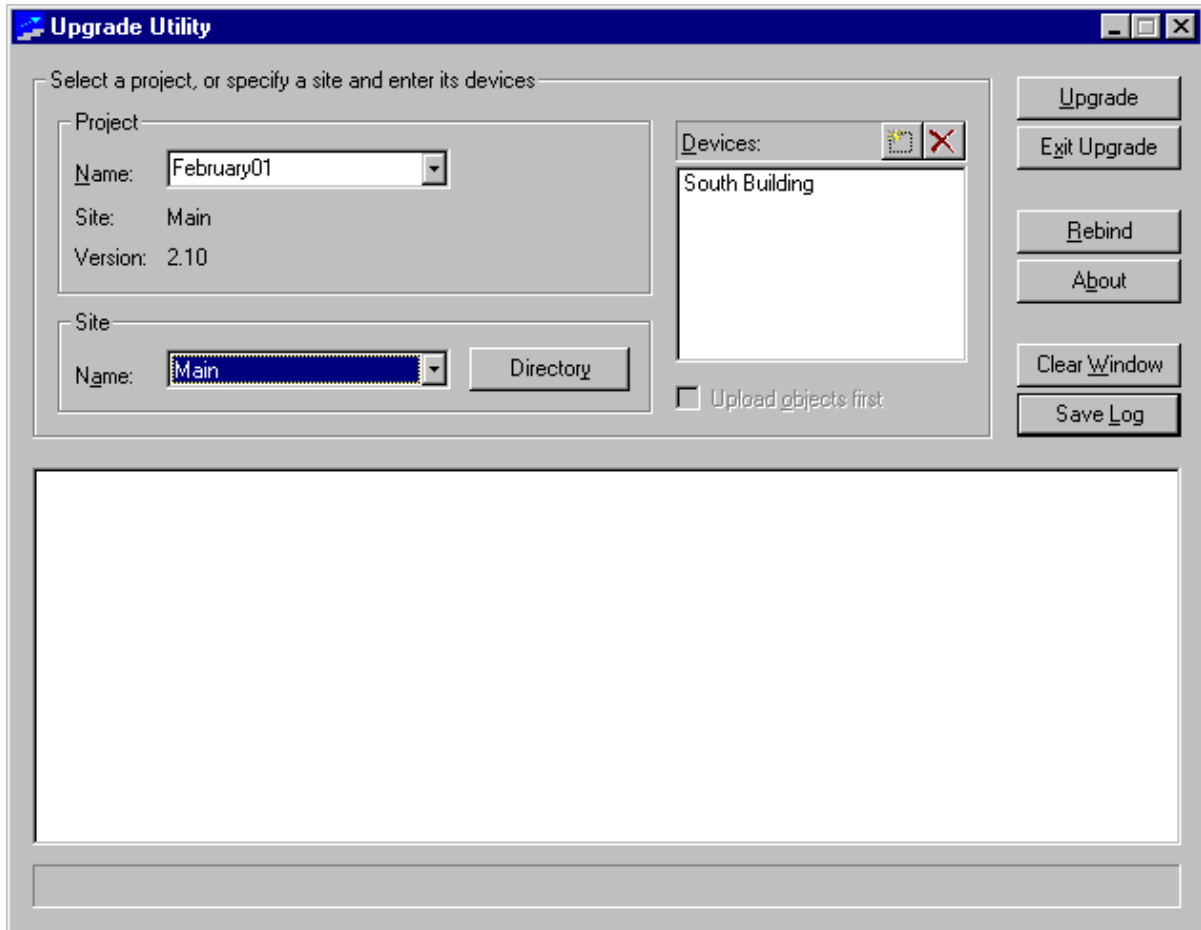


Figure 11-7: Upgrade Utility Screen

4. Select or enter the name of the project with the devices from which to upload the objects in the Project section. The Upgrade Utility creates the database if it does not already exist, then upgrades to the present version.

Notes: If you do not want to overwrite the contents of this project, leave the project name empty. A default empty project is created.

After the project name is selected, the Devices list shows all the devices in that project.

5. Use the New or Delete buttons to add or remove devices from the list. To add a device, click the New button and then type the name of the device in the newly inserted line in the Devices list. To remove a device, select the device name in the Devices list, and click the Remove button.

Notes: Only the devices in the Devices list are upgraded.

If the Site name is not automatically displayed in the Site drop-down list after selecting a project, then the site defined in the database does not exist in the site directory defined on that machine.

6. Click the Directory button to open the Site Book to add (or modify) a site.

Notes: If you left the project name blank to use a default project, the site name does not automatically appear. In this case, if the site exists, you may select it from the site drop-down list.

If the database of the project you selected in Step 4 is an earlier version than Version 2.0, or if you selected the default project (left the project name blank), the Upload objects' first checkbox is enabled. When checked, objects from the devices upload from the devices, and then, after the firmware and database update, the objects download back to the devices.

The Upload Objects' first checkbox is selected automatically when a project does not exist in order to force the objects within the device to upload.

If the database is already at Version 2.0 or later, the Upload objects' first checkbox is disabled.

7. Click the Upgrade button. The status window displays a series of messages describing the process of the upgrade. The Exit Upgrade button toggles to become the Cancel button during an upgrade. The Upgrade Utility performs the following actions:

- uploads the objects from the device into a Version 1.x of the project
- converts the 1.x Version of the project to the present version
- upgrades the firmware in the device to the present version
- downloads the objects from the database created at the present version into the upgraded device

Notes: During an upgrade, the new firmware and database versions overwrite the existing firmware and database. The objects within the device save to the database in the selected project. If necessary, the database upgrades during the upgrade process. If you did not select a project, the objects save to the default project:

C:\Documents and Settings\All Users\Application Data\
Johnson Controls\M-Data\DataBase\Default Project\
UpgradeUtilityTempDB.

8. Check the status window to make sure that the download was successful. If successful, the N30 firmware version is upgraded to the present firmware version.
9. Upgrade additional projects and/or devices as desired.
10. Click the Rebind button to reinitialize object references in the devices on the site after the last device on the site upgrades to the present version. Rebind updates addresses in the Site Master N30 device.

11. Click the Exit Upgrade button to close the Upgrade Utility screen.

Notes: If the selected project is at Version 2.0 or later, the Upgrade Utility performs the same operation as the Project Builder Advanced Download – Main Code, Dictionary and Objects download.

If the selected device is at Version 2.0 or later, the upgrade procedure is cancelled.

IMPORTANT: Case sensitivity was one of the main changes in the database structure between Version 1.x and Version 2.0. This was done to better comply with BACnet rules. However, some references in Groups and Interlock objects, for example, may be broken if you upgrade from a Version 1.x N30, which was case insensitive. To make sure all bound references are maintained after the upgrade, run the Nx Diagnostic Tool (zsrldi.exe), which is in the C:\Programs Files\Johnson Controls\System Tools directory, and select the **Command\Get unbound references** option. Repair as required in Project Builder.

Upgrading the Firmware and Downloading the Database via Advanced Download

Notes: Use this procedure if you have a database of any earlier version existing on your Personal Computer (PC) and you want to upgrade and download the database to an N30 with it. You need to be sure that the database is up-to-date before you proceed, or you will replace the existing database in the N30 with an older one.

This feature does not transform an N30 into an N30-1, as these are physically different devices. The N30-1 has more memory and can hold larger databases.

To upgrade the firmware and download the database via Advanced Download:

1. Open the existing project database file Version 1.x in Project Builder. A warning dialog box appears asking if you want to convert the old file to the latest format.

2. Select Yes to convert the file.
3. Perform the Advanced Download. Make sure to select the Main Code, Dictionary and Objects radio button to upgrade the firmware code. Refer to the *Using Advanced Download* section in this chapter.

IMPORTANT: Case sensitivity was one of the main changes in the database structure between Version 1.x and Version 2.x. This was done to better comply with BACnet rules. However, some references in Groups and Interlock objects, for example, may be broken if you upgrade from a Version 1.x N30, which was case insensitive. To make sure all bound references are maintained after the upgrade, run the Nx Diagnostic Tool (zsrdi.exe), which is in the C:\Programs Files\Johnson Contols\System Tools directory, and select the **Command\Get unbound references** option. Repair as required in Project Builder.

Dividing a Large Site Across Multiple Databases

The following procedure should be considered only if your database has become so large that Project Builder stops working with it or performance degrades to an unacceptable level. The procedure in this section describes how to break up a site into multiple databases.

1. Define a primary database. The primary database must contain full definitions (all objects defined) of the Site Manager and Copy Holder N30s and the names of all the remaining N30 devices on the site.

2. Define secondary databases as needed. The secondary databases should contain the full definitions (all objects defined) of all other N30 devices on the site. Each secondary database should include only the devices that are fully defined in that secondary database. Each N30 in these secondary databases must have a placeholder (have its exact name defined) in the primary database.

IMPORTANT: The following items describe changes to Project Builder software's behavior when dividing large sites across multiple databases.

- An object name is checked for uniqueness only in the database in which it resides. Project Builder does not compare the primary and secondary databases.
- If a device is added to a secondary database, it must be added as a placeholder in the primary database.
- If the placeholder is accidentally downloaded to a device, it replaces the actual N30 database with the default (empty) database.
- Upload of an actual N30 database (that is represented by a placeholder) to the primary database adds all the objects to the primary database, thus increasing the size of the primary database and possibly recreating the performance problems that you are trying to avoid.

Troubleshooting

Table 11-2: Uploading and Downloading Troubleshooting

Error/Condition	Problem	Solution
Upload unsuccessful.	Site not defined in Site Book.	Choose Edit Site on the Edit menu. The Edit Site dialog box appears. Choose the site name from the Site Name drop-down list. If the site does not exist, click Directory to open Site Book, and add your site. See the <i>Site Book User's Guide (LIT-6893100)</i> for more information.
With a direct serial or dial-up (modem) connection, while trying to upload or download, you receive an error message with "Unable to read the Model_Name Attribute" in the Loader status window.	N30 name in database does not match the name of the N30 with which you are trying to communicate. Note: Name is case sensitive.	When a direct connection is made, the Site Manager displays the name of the N30 to which it is connected. Make a direct connection to the N30. Start the Site Manager on its own to connect to the site. Note the name. Go back to Project Builder, update the name in the database, and try the upload/download again.
With an Ethernet connection, while trying to upload or download, you receive an error message with "Unable to read the Model_Name Attribute" in the Loader status window.	Communications problem that may be caused by either a bad or disconnected cable or an improper Ethernet setup	Check your cable connections. Make sure your Ethernet setup is correct. See the <i>Site Book User's Guide (LIT-6893100)</i> for more information.
With a direct serial connection, while trying to upload or download, you get a pop-up window with Remote Access Service (RAS) Error 731.	The direct serial connection is connected to the N30 at the wrong baud rate.	You can communicate over a direct serial connection only if the baud rate defined for the N30 port to which you are connecting matches the baud rate defined in the connectoid you are using for direct serial connections. If you are connected to the correct N30 port, edit either the connectoid or the N30 so that the baud rates match. See the <i>Site Book User's Guide (LIT-6893100)</i> for more information.
With a direct serial connection, while trying to upload or download, you get a pop-up window with RAS Error 602.	The port to which you are trying to connect is already in use.	Make sure that the VT100 Terminal Emulator on your PC is not already connected to the port through which you are trying to communicate.
With a direct serial connection, while attempting to download main code, you receive the error message "An error occurred while downloading main code to N30. Timed out. Aborting-status = timeout."	Connection speed is too slow.	The connection must be higher than 9600 baud, the default speed of Ports 1 and 2 on an N30. Use Port 3 (57,600) for the main code download, or increase the speed on N30 Port 1 or 2. Make sure the associated connectoid speed matches the N30 port speed.
While working with a large database, Project Builder stops responding, or performance becomes very slow.	Database is too large for Project Builder.	Divide the site among several databases. See the <i>Dividing a Large Site Across Multiple Databases</i> section in this chapter.



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Using the Simulator

Introduction

The Simulator allows you to create simulations of an N30 environment locally on a workstation. You can then download objects to the simulated devices for testing and debugging purposes. These simulated devices are able to communicate with each other and any tools or components configured to communicate with the simulated site.

This chapter describes how to:

- start the Simulator
- create a simulated device
- configure a site to communicate with a simulated device
- remove a simulated device
- restart a simulated device
- close all simulated devices
- exit the Simulator

Key Concepts

Simulator

The Simulator allows you to test applications by simulating how the code runs on an actual N30. Because an object may interact with objects on more than one device, the Simulator allows you to generate a simulated environment of multiple devices locally on your workstation. Then you can download objects to be tested into the simulated environment.

This feature is useful for running through the steps of performing a download to check the integrity of the database and the actual download action without physically connecting to an N30. Once the simulated N30s are loaded with objects, any workstation component can interact with the simulated devices in the same manner as the real devices. Programs such as M-Graphics and M-Explorer can run in an offline mode to generate graphic bindings or tailoring of the M-Series operation windows.

Note: This feature simulates only an N30 and no associated N2 controllers. Therefore, the functionality of the Simulator is similar to that of an N30 with no field devices attached.

Site Configuration

The Project Builder communicates with simulated devices using the following site configuration:

- Define the simulation site as an Ethernet Local Area Network (LAN).
- Set the BACnet™ Internet Protocol (IP) port to a value not used to avoid communicating with both simulators and real N30s on an Ethernet LAN (or, as an alternative, disconnect from the LAN).
- Enable the Internal Routing parameter located on the Advanced Parameters screen of the Site Book.

Use a simulation site configuration to communicate with simulated, not actual, devices. We recommend creating a site specifically for use with Simulator devices instead of temporarily modifying an existing site to use with the Simulator.

Once the configuration changes have been made to the site, select the simulation site in the Edit Sites dialog box. Objects can be downloaded to the simulated environment using the same method for downloading to an actual device. For information on downloading, see the *Uploading and Downloading* chapter (LIT-693250).

For more information on site configuration, see the *Defining a Site* chapter (LIT-693220) and the *Site Book User's Guide* (LIT-6893100).

Simulated Device

A simulated device is the simulated N30 environment that Project Builder creates for you. You can run several simulated devices at once within the Simulator. Each simulated device must correspond to the name of the N30 being simulated and have a unique name that is no longer than 32 characters.

Simulation Restart

Restarting a simulation clears any objects downloaded to it and allows you to begin using the simulation again as if you had just created it.

Detailed Procedures

Starting the Simulator

To start the Simulator:

On the Project Builder Tools menu, select Simulator. The Simulator window appears (Figure 12-1).

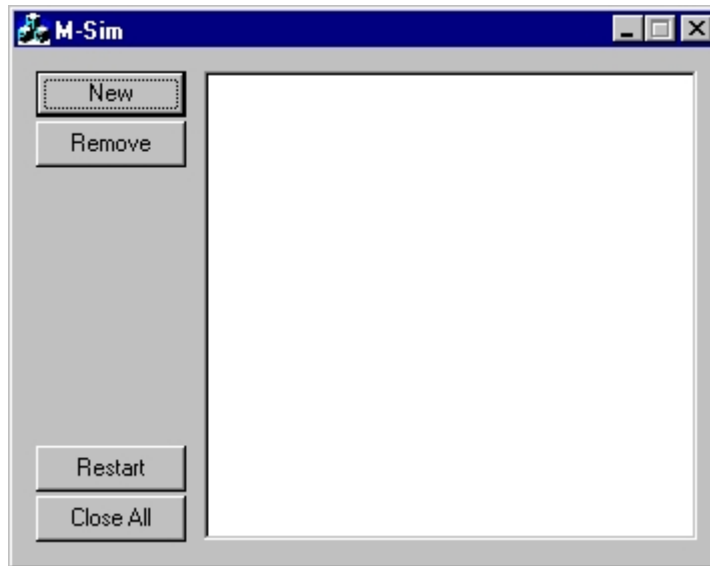


Figure 12-1: Simulator Window

Creating a Simulated Device

To create a simulated device:

1. Click New in the Simulator window. The Device Name dialog box appears (Figure 12-2).

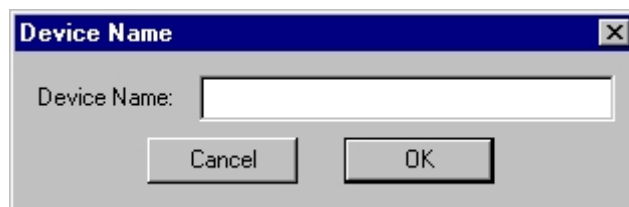


Figure 12-2: Device Name Dialog Box

2. Enter a device name from your project database (for example, South Building).

Note: The device names in the Simulator are case sensitive and must match the device names in the database exactly.

3. Click OK. The new simulated device appears in the Simulator window (Figure 12-3).

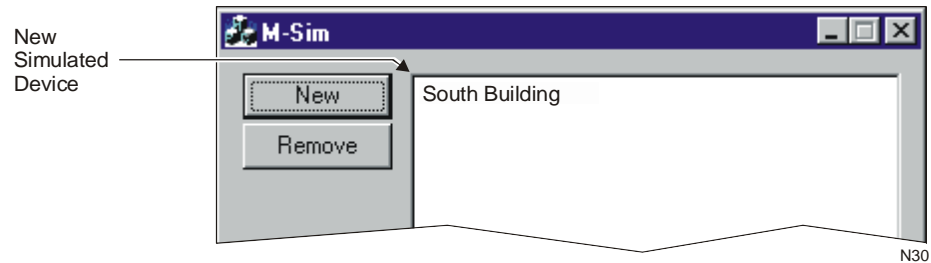


Figure 12-3: New Simulated Device in the Simulator Window

Configuring a Site to Communicate with a Simulated Device

To configure a site to communicate with a simulated device:

1. Open the project that you want to download to a simulated device in Project Builder.
2. Select Edit Site from the Edit menu. The Edit Site dialog box appears (Figure 12-4).

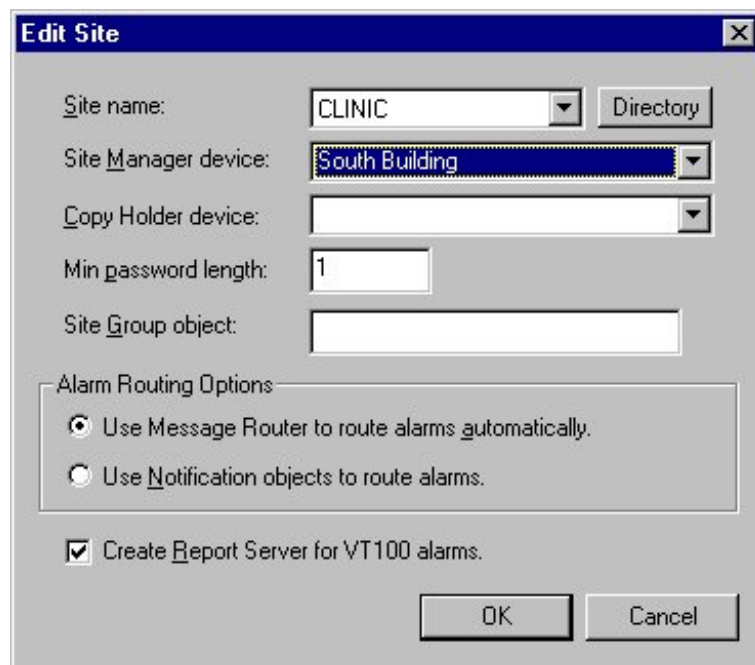


Figure 12-4: Edit Site Dialog Box

3. Click Directory. The Site Book window appears (Figure 12-5).

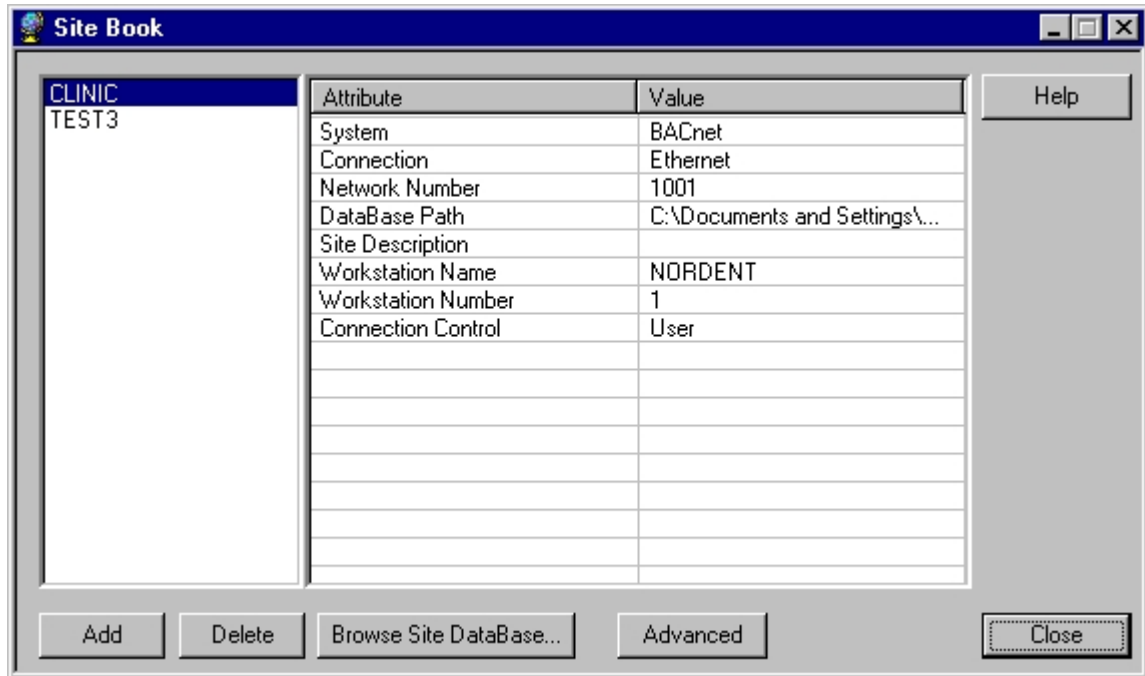


Figure 12-5: Site Book Window

4. Look at the Connection attribute for your project's site. If it is currently set to Ethernet, continue to Step 5. If it is set to another value, double-click on the attribute, and select Ethernet from the drop-down list.
5. Click Advanced. Additional attributes appear in the window. Scroll down to the Internal Routing attribute.
6. Double-click on the Internal Routing attribute, and select Enabled from the drop-down list.
7. Click Close. The Site Book window closes, and the Edit Site dialog box remains visible.
8. Click OK on the Edit Site dialog box. The dialog box closes.

Note: When finished using the simulated environment, set the site communication properties back to the original settings.

Removing a Simulated Device

To remove a simulated device:

1. Select the simulated device you wish to remove in the Simulator window.
2. Click Remove. The simulated device no longer appears in the Simulator window.

Restarting a Simulated Device

To restart a simulated device:

1. Select the simulated device you wish to restart in the Simulator window.
2. Click Restart. All objects downloaded to the simulated device are cleared, and the simulated device is restarted.

Closing All Simulated Devices

To close all simulated devices:

In the Simulator window, click Close All. All simulated devices are removed from the Simulator window.

Exiting the Simulator

To exit the Simulator:

Click the Close button on the Simulator window (Figure 12-6).

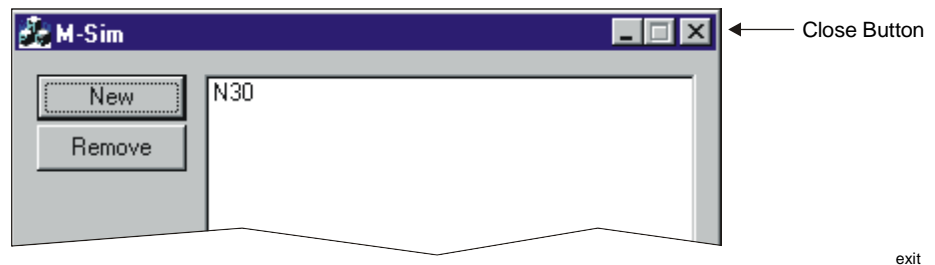


Figure 12-6: Close Button on the Simulator Window

If any simulated devices are running when you attempt to exit the Simulator, the dialog box in Figure 12-7 prompts you to verify that you wish to close all simulated devices. Click Yes to exit.

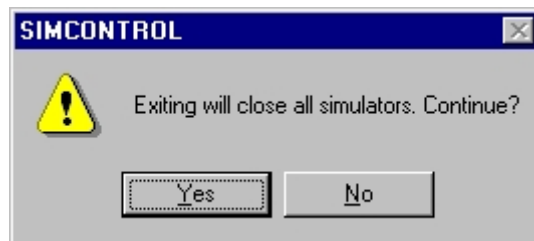


Figure 12-7: Exit Verification Dialog Box