

Foxboro®

by Schneider Electric

Foxboro Evo™
Process Automation System

System Manager



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Contents

Before You Beginix

About This Book	ix
Revision Information.....	ix
Reference Documents	ix
Control Core Services-Specific Documentation.....	ix
Control Software-Specific Documentation	xii

CHAPTER 1: Getting Started1

Overview	1
Features.....	2
System Management Resources	3
System Monitors.....	3
System Messages.....	5
Security.....	6
Installation and Setup	6
Interoperability Considerations	7
Installation Procedures	11
Configuring Interoperability between Workstations	16
Starting System Manager.....	21
The System Manager Service.....	23
Starting and Stopping the System Manager Service.....	23
Checking if the System Manager Service is Fully Up and Running	23
The System Manager Window	27
How Information is Maintained	28
Viewing Equipment Information.....	28
System Monitor View	28
Address Translation Station (ATS) View.....	30
LAN Interface (LI) View	31
Switch View.....	32
Health and Alarm Indicators.....	32
Responding to Alarms	35
Alarms Tab in the Accessories Pane.....	35
Acknowledging Alarms	36
Inhibiting Alarms.....	37
Next Step	37

CHAPTER 2: System Manager Window39

Starting System Manager	39
From the Desktop	39
From FoxView Software	39
From Foxboro Evo Control HMI.....	40

Connecting to a System Manager Service.....	40
Major Components.....	40
Navigation Pane.....	40
Information Pane	40
Accessories Pane	41
Menus	41
Toolbar.....	41
Status Bar.....	41
Navigation Pane	41
Status Indicators	47
Alarm Conditions	48
Blinking and Color-Coding	48
Information Pane.....	49
General Tab	49
Connections Tab	51
Counters Tab.....	52
Accessories Pane.....	55
Messages Tab.....	56
Alarms Tab	58
Inhibited Tab.....	60
Search Tab	61
Watch Tab	63
Smon (System Monitor) Log Tab.....	65
Menus.....	66
File Menu	66
View Menu	70
Options Menu	71
Actions Menu	76
Help Menu	88
Toolbar	89
Alarm Icons	89
View Icons	89
Go-To Feature.....	90
Hierarchy Navigation	90
Date and Time Tools.....	91
Daylight Saving Time (DST)	92
 CHAPTER 3: System Monitors.....	97
Status and Alarm Symbols.....	98
System Monitor Information.....	99
Monitored Equipment	99
Acknowledging Alarms	100

**CHAPTER 4: Workstations, Peripherals
and Network Printers 103**

Identification of Workstations, Peripherals and Network Printers.....	103
Workstation Information	106
Equipment Status	107
Equipment Information.....	109
Connected Peripherals.....	117
Counters Tab	118
Peripherals Information.....	119
Serial/GCIO Annunciators and GCIO Peripherals	119
USB Annunciator Keyboards	121
Serial or Parallel Printers	122
USB Printers	123
Peripherals Counters.....	125
Network Printers	126
Equipment Change Actions.....	131
Managing Alarms	131
Updating Peripheral Software	132
Disable/Enable All Reports	133
Go Off-Line or Go On-Line (for Printers).....	133

**CHAPTER 5: Control Stations, Control Network
Interfaces, ATSs, and LAN Interface (LIs) 135**

Identification of Control Stations, Control Network Interfaces (CNIs), ATSs, and LIs	135
Identification for FCP280 Control Processor	136
Identification for Control Network Interface (CNI)	137
Identification for FCP270/ZCP270	
Control Processors and Earlier	137
CP, CNI, and ATS Equipment Status Indicators.....	139
LAN Interface (LI) Equipment Status Indicators	142
Station Information for Control Processors, CNIs, and ATSs.....	147
Equipment Status	149
Equipment Information.....	155
Station Information for LAN Interface (LI).....	157
Equipment Status	158
Equipment Information.....	161
Faults	162
Connected FBMs.....	163
Control Station, CNI, ATS, and LI Counters	165
Primary ECB (Primary FBM) Information	167
Primary ECB Status	169
Primary ECB Equipment Information	173
Connections and Counters Tabs.....	175
Equipment Change Actions.....	175

Control Station or CNI Actions	175
Primary ECB Actions	206

CHAPTER 6: Station Counters.....211

Counters Tab for Stations.....	211
Diagnostic Counters - For FCP280 and CNI	212
MAC Sublayer - For FCP270/ZCP270 and Earlier Control Processors, ATSS and LIs.....	215
Network Layer	218
Transport Layer.....	219
Application Layer	221
Loading Parameters.....	224

CHAPTER 7: FCMs.....225

Identifying FCMs in the Navigation Pane	225
FCM Status and Equipment Information	228
Connected FBMs.....	233
Equipment Change Actions	234
Managing Alarms	234
Changing Run Mode	235
Downloading	236
EEPROM Updates.....	237
Switching Roles.....	238
Module Fieldbus Switching Actions	238

CHAPTER 8: Fieldbus Modules241

Identification of FBMs and Attached Devices.....	248
Status Indicators	250
FBM Status and Equipment Information	251
Equipment Status Table	256
Equipment Information Table.....	257
FBM246 Status and Equipment Information	260
DCI Based FBMs	261
Migration FBMs.....	262
Connections Tab.....	263
Counters Tab	264
Equipment Change Actions	265
Managing Device Alarms.....	266
Managing Cable Alarms.....	266
Go On-line and Go Off-line	267
Download or Reboot.....	268
EEPROM Update	269
Reset FBM.....	271

Software Download	272
DB Download	272
Switch Roles	272
Enabling and Disabling Communications for Multiple Devices (FBM222 and FBM228)	273
Enabling Control in Foundation fieldbus	
H1 Devices (FBM228)	277
Device Displays and Actions	279
Device Displays	279
Device Actions	280
Field Device System Integrator TSAA Driver	281

CHAPTER 9: Networking Equipment.....289

Identifying Switches in the Navigation Pane	289
Switch Status and Equipment Information.....	290
Connected Stations and Switches.....	292
Ports Tab.....	293
Port Counters	295
Equipment Change Actions.....	297
Switches.....	297
Ports	297

APPENDIX A: Supported Migration and Fieldbus Cluster I/O Modules.....299

APPENDIX B: Supported Classic I/A Series Services Modules309

Equipment Information for Device Integrator Peripherals	309
INI10, INI15 or SPECTRUM Interface Processor Peripheral Equipment Information Fields	311
SIP ECB Equipment Information Displays.....	313
INTERSPEC Integrator Translator Equipment Information.....	314
Equipment Information View for the Allen- Bradley Port (ECB 63, ECB 64, and ECB 65).....	317
Equipment Information for the A-B Station PLC5 Series	319
Equipment Information for the A-B Station Rack	321
Equipment Information Display for Modicon Port ECB (ECB60, ECB61, and ECB62)	323
Micro-I/A AB-PIO Peripherals Equipment Information	325
Micro-I/A GE-PIO Peripherals Equipment Information.....	326
Equipment Information Display for an AB-RIO Adapter.....	328
Equipment Information Display for a GE I/O Device and A-B I/O Device.....	329
Equipment Information Display for ECB96 Port.....	331

Equipment Information Display for ECB97 RTU	335
FoxGuard Manager Equipment Information.....	339
I/O Module Equipment Information Display.....	342
Equipment Information Display for ECB98, ECB99, and ECB100.....	344
ECB80 Equipment Information	347
ECB81 Equipment Information	348
Equipment Information Display for PROFIBUS-DP Gate and Devices.....	349
Equipment Information Display for PROFIBUS-DP Devices	350
Equipment Information Displays for AB-PLC5/E Gate Devices	351
Equipment Information Displays for the AB-PLC5/E Device	352
Equipment Information Displays for the Modbus Gate and Modbus Devices	353
Equipment Information Displays for the Modbus Device	354

APPENDIX C: System Messages355

Network Fault Detection Message	356
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**APPENDIX D: Device Specific Peripheral
Counter Background Information.....357**

Allen-Bradley, Modicon, or Instrument Gateway.....	357
Allen-Bradley PLC Devices.....	357
Allen-Bradley Redundant Gateway	358
Allen-Bradley Station PLC	359
Device Integrator.....	359
GE FANUC Programmable Controller Devices	360
INI10 Peripheral, INI15 Peripheral, and SIP	360
INTERSPEC Integrator Translator/INTERSPEC Integrator 30	361
I/O Gate ECB98 Devices	361
I/O Gate ECB99 and ECB100 Devices.....	362
Micro-I/A Station Devices	363
Modicon Programmable Controller Devices	363
Primary FBM/FBM Devices.....	364
Printer and Terminal Devices.....	364

Index365

Before You Begin

About This Book

This document describes how to use System Manager software to monitor the health of a system with Foxboro Evo Control Software (hereinafter referred to as the Control software) and/or Foxboro Evo Control Core Services (hereinafter referred to as the Control Core Services). This system may include:

- Network switches
- Workstations, their peripherals, and network printers
- Control processors, Fieldbus modules, and field devices.

This document should be read by all those who are responsible for monitoring system equipment and performing maintenance tasks on the equipment.

Revision Information

For this revision of this document (B0750AP-N), the following changes were made:

Chapter 5, “Control Stations, Control Network Interfaces, ATSs, and LAN Interface (LIs)”

- Clarified which fields only appear for specific hardware in Table 5-3 “Equipment Status Fields” on page 149.
- Removed ATS from the “Master Timekeeper Reporting” field in Table 5-4 “Equipment Information Fields” on page 155.
- Updated the “Master Timekeeper Reporting” field in Table 5-6 “Equipment Information Fields” on page 161.

Reference Documents

Control Core Services-Specific Documentation

You should use this document in conjunction with other subsystem documents that cover system management messages, preventive maintenance information, and corrective actions for specific equipment.

Most of these documents are available on the Foxboro Evo Electronic Documentation media (K0174MA). These documents may also be available on the Invensys Global Customer Support web site at
<https://support.ips.invensys.com>.

For more information on relevant topics, refer to the following Control Core Services documents:

- *DCS Fieldbus Modules for Bailey® NET90 and INFI90® Systems User's Guide* (B0193XG)
- *DCS Fieldbus Modules for Fisher® PROVOX® Controller Series Systems User's Guide* (B0400AR)
- *DCS Fieldbus Modules for Fisher® PROVOX® Series 10 Systems User's Guide* (B0193WV)
- *DCS Fieldbus Modules for Fisher® PROVOX® Series 20 Systems User's Guide* (B0193YV)
- *DCS Fieldbus Modules for Honeywell® TDC 2000 Systems User's Guide* (B0193VL)
- *DCS Fieldbus Modules for Honeywell® TDC 3000 Systems User's Guide* (B0193YW)
- *DCS Fieldbus Modules for ABB MOD300 Direct I/O Systems with HART I/O Capability User's Guide* (B0700AE)
- *Control Core Service V9.x System Error Messages* (B0700AF)
- *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA)
- *FCM100Et Redundant Fieldbus Communications Module* (PSS 21H-2Y10 B4)
- *FCM100E Redundant Fieldbus Communications Module* (PSS 21H-2Y11 B4)
- *FDSI and SOE Workstation Drivers for Triconex User's Guide* (B0700DF)
- *Field Control Processor 280 (FCP280) User's Guide* (B0700FW)
- *Control Network Interface (CNI) User's Guide* (B0700GE)
- *Field Control Processor (FCP270) User's Guide* (B0700AR)
- *Z-Module Control Processor 270 (ZCP270) User's Guide* (B0700AN)
- *Virtualization User's Guide* (B0700VM)
- *Field Device System Integrators (FBM230/231/232/233) User's Guide* (B0700AH)
- *Fieldbus Cluster I/O User's Guide* (B0193RB)
- *FOUNDATION™ fieldbus H1 Communication Interface Modules (FBM220/FBM221) User's Guide* (B0400FD)
- *HART™ Communication Interface Module User's Guide* (B0400FF)
- *I/A Series Configuration Component (IACC) User's Guide* (B0700FE)
- *Implementing FOUNDATION™ fieldbus on the I/A Series® System* (B0700BA)
- *Integrated Control Configurator* (B0193AV)
- *Modbus Communication Interface Module (FBM224) User's Guide* (B0400FK)
- *USB-Based Annunciator Keyboard User's Guide* (B0700FT)

- *On-Line Upgrade* (B0193RE)
- *PROFIBUS-DP™ Communication Interface Module (FBM223) User's Guide* (B0400FE)
- *SPEC 200™ MICRO® Control Integrator User's Guide* (B0193RR)
- *SPEC 200 CCM Control Integrator User's Guide* (B0193VU)
- *SPEC 200 Control Integrator User's Guide* (B0193RD)
- *SPECTRUM™ Migration Integrator User's Guide* (B0193RC)
- *System Definition: A Step-by-Step Procedure* (B0193WQ)
- *The MESH Control Network Architecture Guide* (B0700AZ)
- *Time Synchronization User's Guide* (B0700AQ)
- *Application Workstation 70 with Allen-Bradley PLCs* (B0400AL)
- *Application Workstation 70 with Modicon Programmable Controllers* (B0400AK)
- *Field Automation Sub-System Micro I/A Station User's Guide* (B0193VJ)
- *FoxGuard Manager Direct Connect Interface With TRICONEX* (B0193VK)
- *Application Workstation 51 with Allen-Bradley PLCs* (B0400BN)
- *Application Workstation 51 with Modicon Programmable Logic Controllers* (B0400CH)
- *I/O gate series OPC Client User's Guide* (DI700AA)
- *I/O gate series AW70 Modbus TCP Driver User's Guide* (DI700AB)
- *Device Integration using I/O gates Reference Guide* (DI700AH)
- *I/A Series INTERSPEC™ Integrator 30* (B0193LW)
- *SPECTRUM Master Gateway* (B0193RM)
- *Information Network Interface 10 and Information Interface 15* (B0193RJ)
- *Integrators for Modbus and Modbus Plus Devices* (B0193RL)
- *Non-Redundant I/A Series SCADA Processor User's Guide* (B0193XY)
- *Redundant I/A Series SCADA Processor User's Guide* (B0193WN)
- *Application Workstation 70 with Bristol Babcock Inc Remote Terminal Units (RTUs)* (B0400AZ)
- *100 Series Fieldbus Module Upgrade Subsystem Overview* (PSS 31H-2W100)
- *100 Series Fieldbus Module Upgrade User's Guide* (B0700BQ)
- *Control Core Services v9.0 Software Installation Guide* (B0700SP)
- *Control Core Services v9.1 Software Installation Guide* (B0700SS)
- *Control Core Services v9.2 Software Installation Guide* (B0700SU)

Control Software-Specific Documentation

For more information on relevant topics, refer to the following Control software documents:

- *Foxboro Evo Process Automation System Deployment Guide* (B0750BA)
- *Implementing a DeviceNet Network on the Foxboro Evo Core Services* (B0750CH)
- *Using HART Instrumentation with the Foxboro Evo Process Automation System* (B0750CM)
- *Implementing FOUNDATION fieldbus in Foxboro Evo Core Services Applications* (B0750DA)

CHAPTER 1

Getting Started

This chapter introduces the System Manager software, and describes how to open the System Manager window and perform several basic functions such as responding to alarms. Chapter 2, “System Manager Window” provides detailed information about the user interface, while subsequent chapters describe how to use System Manager to manage various types of equipment.

Contents

- Overview
- Installation and Setup
- The System Manager Service
- The System Manager Window
- Viewing Equipment Information
- Responding to Alarms
- Next Step

Overview

System Manager is a distributed application for monitoring the health and performance of all components of a Foxboro Evo Control Core Services (hereinafter referred to as the Control Core Services) system (with or without Foxboro Evo Control Software (hereinafter referred to as the Control software)), and managing network operations.

System Manager software has two components:

- The System Manager service is installed on one or more workstations running the Windows Server® 2008 R2 Standard, Windows 7®, Windows Server® 2003 or Windows XP® operating systems and interacts with other system management subsystems including:
 - System monitors
 - Station Manager software on each workstation and control station
 - Software Manager software on each workstation
 - Server Manager software on Windows Server operating system only
 - Network monitoring facilities

- System Manager client software, which also operates on workstations running the Windows Server® 2008 R2 Standard, Windows 7®, Windows Server 2003 or Windows XP® operating systems, provides the user interface, which is described in this document.

Note For I/A Series software v8.8 and Control Core Services v9.0 or later, the software packages used by System Manager have been modified from previous releases, as have their installation locations. Some packages which were previously installed on Control Processors are now installed on workstations or servers. Refer to the latest Control Core Services release notes (for Control Core Services v9.2, this is *Control Core Services v9.2 Release Notes* (B0700ST)) for a description of the current software packages installed on the stations and Control Processors.

System Manager is a replacement for the System Management Display Handler (SMDH) application. System Manager clients and SMDH can operate concurrently on the same workstation provided that the System Manager service is on a separate workstation. A System Manager service and SMDH cannot run side-by-side on the same station.

Features

The System Manager application provides the capability to:

- View the health of the system equipment, including workstations and their peripherals, control stations (CPs), Control Network Interfaces (CNIs), Fieldbus modules (FBMs), and field devices.
- Monitor the health of network communications hardware including Ethernet switches, fiber optic cables, Fieldbuses (PIO buses), Address Translation Stations (ATSS), and LAN Interfaces (LIs).
- Set the network time on systems without a Global Positioning System (GPS). For a system with GPS, date and time are set automatically by GPS.
- Perform Nodebus DST (Daylight Savings Time) adjustments.
- View station configuration information regarding location, system monitor, host workstation, and so forth.
- For each station, fieldbus device and peripheral, view the current status of the hardware and software, run mode, failure mode, error status, and so forth.
- Analyze the performance of each station and field device by monitoring counters.
- Perform equipment change actions, such as checkpoint, reboot, system software image/EEPROM update, and download and upload of the control database.
- Perform online cable tests (LAN and Nodebus) for stations and offline station diagnostic tests. These tests are useful to field service or maintenance personnel in identifying and correcting equipment problems.
- Review and acknowledge system alarms.

- Inhibit alarm functions for specific equipment and view the equipment for which alarms have been inhibited.
- Print and save data contained in various System Manager displays.
- Access on-demand help functions.

System Management Resources

This section provides a brief description of the system management resources used by System Manager. Figure 1-1 shows a sample System Manager implementation in a network consisting of nine control stations and six workstations, two of which host system monitors. The switches and field devices are not shown.

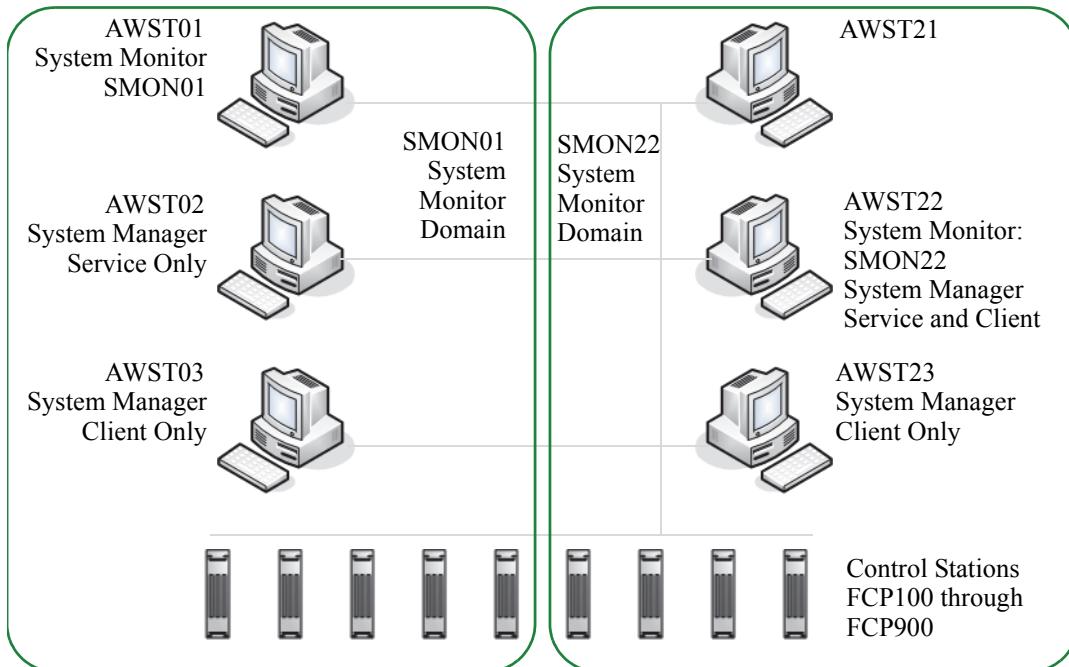


Figure 1-1. Example System Manager Implementation

In the example, System Manager client software is installed on three workstations: AWST03, AWST22, and AWST23. Each of these can connect to System Manager services running on either AWST02 or AWST22.

The connected service interacts with the two configured system monitors: SMON01 and SMON22. The system monitors in turn provide information about the stations and connected equipment in their respective domains. Note that the System Manager clients can access any service instance on the network, and that the service can reside on a workstation that hosts a system monitor or on one that does not.

System Monitors

A system monitor is a service that runs on a workstation and monitors the health of the stations configured in its domain. The system monitor application is a standard component in the Control Core Services software.

During system definition, the system monitor software is enabled on one or more workstations. Other workstations, control stations and switches are assigned to each system monitor's domain.

The system monitor supplies status information retrieved from each station in its domain to designated workstations via a variety of displays including System Manager.

The system monitor maintains accurate information concerning the health, current status, and performance of each station and its attached devices.

The system monitor routes standard error messages and system alarm messages to the designated workstations, logging devices such as printers, and historians. In addition, the system monitor responds to operator actions and reports those actions to the System Manager application.

The system monitor domains are configured during the site planning and system definition phases.

Error messages displayed by system monitors are documented in *Control Core Service V9.x System Error Messages* (B0700AF).

Station Manager

The Station Manager software residing on each station in the network performs the following functions:

- Maintains communication with the system monitor software
- Maintains a database of equipment information in order to process requests for changes to equipment status as well as report any status information to the system monitor
- Provides services such as rebooting stations, initiating diagnostics, updating software image information, and switching buses.

Software Manager

A Software Manager subsystem located in each workstation performs the following functions:

- Downloads station images, control databases, and FBM software
- Performs software image updates
- Uploads station images under certain conditions
- Checkpoints control databases.

Server Manager

Server Manager is only installed on Windows Server operating system with I/A Series software v8.6-v8.8 or Control Core Services v9.0 or later. It performs the following functions:

- Monitors HP® or Dell® critical components that reside on Windows Server operating system only.

- Utilizes the Simple Network Management Protocol (SNMP) to communicate with the Microsoft SNMP Service to obtain the status for the HP or Dell components.

Note During the initial installation of the Control Core Services software on stations with Windows 7 or Windows Server 2008 R2 Standard, a default SNMP community string is added to each workstation/server. This is a text string that acts as a password to authenticate messages that are sent between the management software and the device (the SNMP agent). The SNMP community string on each workstation/server must be modified from this default string to the string used by your network. It should be configured only after the Control Core Services software has been installed on the workstation or server. For details on configuring this string, refer to the appendix “SNMP Community String Configuration” in the *Control Core Services v9.x Software Installation Guide* shipped with your version of Foxboro Evo.



Caution The Microsoft SNMP Services are installed on Windows Server systems running I/A Series software v8.6-v8.8 or Control Core Services v9.0 or later. The services include the **SNMP service** and **SNMP Trap service**. After the installation of I/A Series software v8.6-v8.8 or Control Core Services v9.0 or later, the **SNMP Trap service** is disabled and it should **not** be manually enabled since the Windows Server, which monitors switches, would be affected.

Network Monitoring Facilities

The system uses a variety of services to detect faults on the physical connections between switches, stations and devices. The equipment monitored includes the Ethernet cables, fieldbus cables, and module fieldbuses.

System Manager can perform online diagnostics, including testing cables and selecting new Nodebus master and performing online cable tests (LAN and Nodebus) for stations.

System Messages

The system monitors and other workstation functions generate network operation, equipment health, and equipment status event messages.

Messages may be a general response to an operator’s request, or may contain an error response reflecting status change, completion messages, operation results, station limitations, communication malfunctions, or other problems associated with the station or communication path.

System Manager stores the most recent 500 messages in local memory and displays them in the Accessories pane Messages tab. For each message, the tab displays the following:

- Index reflecting the order in which the messages were received by System Manager
- Date and time the messages were received by System Manager
- System generated message text.

Security

The System Manager software provides two levels of access control:

- The software supports the access scheme defined in the configuration of the system monitors. System Manager menus and toolbar buttons reflect the equipment change action privileges configured for the workstation. Thus, for example, the System Manager Equipment Change Action menu includes the Reboot command only if the workstation has been assigned that privilege.
- System Manager can be configured to require the user to confirm equipment change actions and record the reason for taking the actions. Refer to “Options Menu” on page 71 for information on these action settings.

On a workstation running security enhanced I/A Series software v8.5-v8.8 or Control Core Services v9.0 or later, two criteria must be met in order to perform System Manager Equipment Change actions such as EEPROM updates, rebooting stations, and putting stations on-line/off-line:

1. You must be running in a user account that has permission to perform such actions. For example, a user account that belongs to the Plant Operators group does not have permission to perform Change Actions, but a user account that belongs to the following groups does have permission to perform Change Actions:
 - For I/A Series software v8.5-v8.7, Plant Engineers or Plant Maintenance group
 - For I/A Series software v8.8 or Control Core Services v9.0 or later, IA Plant Engineers or IA Plant Admins group

For more information on setting up accounts:

- For stations with I/A Series software v8.8 or Control Core Services v9.0 or later, refer to *Security Enhancements User's Guide for I/A Series Workstations with Windows 7 or Windows Server 2008 Operating Systems* (B0700ET).
 - For stations with I/A Series software v8.5 to v8.7, refer to *Security Enhancements User's Guide* (B0700DX).
2. The station needs to be configured for the change actions according to System Definition (SysDef).

Installation and Setup

Caution The System Manager Server cannot be installed while SMDH is running. This is because, after the installation, the System Manager service will be launched, and System Manager service and SMDH cannot run side-by-side on the same workstation.

Note You must have an account with administrative privileges in order to install System Manager on station with security enhanced Control Core Services software.

Interoperability Considerations

Note the following interoperability requirements when installing System Manager software on workstations:

- The System Manager Client and Service must be at the same version in order to communicate.
- System Manager software is not supported on Solaris® workstations.
- System Manager 2.6 or later can be installed only on stations running I/A Series software v8.4.4-v8.8 or Control Core Services v9.0 or later.

Warning:

You must follow the steps below to install the Quick Fixes for System Manager V2.6 or later:

1. Any existing System Manager software must be uninstalled before the Quick Fixes can be applied. From the Control Panel > Add or Remove Programs, **uninstall currently existing System Manager software**.
2. Read the following instructions carefully to determine which Quick Fixes are required for System Manager V2.5 or later:
 - a. If the **System Manager Server** component is installed on a workstation running I/A Series software version **8.4.4**, the following Quick Fixes, **QF1014714B**, **QF1014716B**, **QF1014717B**, and **QF1166538**, must be installed **before the installation of System Manager V2.6 or later. All four Quick Fixes must be installed for correct I/A Series software operation.**
 - b. If the **System Manager Server** component is installed on a workstation running I/A Series software version **8.5**, the following Quick Fixes, **QF1014718B**, **QF1014719B**, **QF1014720B**, and **QF1166538**, must be installed **before the installation of System Manager V2.6 or later. All four Quick Fixes must be installed for correct I/A Series software operation.**
 - c. If the **System Manager Server** component is installed on a workstation running I/A Series software **v8.6**, the Quick Fix **QF1117205** and **QF1166538** must be installed **before the installation of System Manager V2.6 or later. These Quick Fixes must be installed for correct I/A Series software operation.**
 - d. If the **System Manager Server** component is installed on a workstation running I/A Series software **v8.7**, the Quick Fix **QF1117206** and **QF1166538** must be installed **before the installation of System Manager V2.6 or later. These Quick Fixes must be installed for correct I/A Series software operation.**
 - e. If the **System Manager Server** component is installed on a workstation running I/A Series software **v8.8** the Quick Fix **QF1166538** must be installed **before the installation of System Manager V2.6 or later. This Quick Fix must be installed for correct I/A Series software operation.**

- f. If the **System Manager Server** component is installed on a workstation running Control Core Services software v9.0 or later, no Quick Fix is required.
- g. If there is only **System Manager Client** component to be installed on a workstation, no Quick Fix is required.
- 3. After the appropriate Quick Fixes have been installed, follow the “Installation Procedures” on page 11 to install System Manager V2.5 or later.

If you installed the above Quick Fixes on a workstation, then updated to a later version of I/A Series or Control Core Services software, make sure that you install any necessary Quick Fixes for this later version also, as part of the general procedure. **All the Quick Fixes must be installed for correct I/A Series or Control Core Services software operation.**

For example: If you installed the Quick Fixes on a workstation running I/A Series software v8.5 (where System Manager Server component is installed), and then updated to I/A Series software v8.6, make sure that you install any necessary Quick Fixes for I/A Series software v8.6 including QF1117205 and QF1166538.

Refer to the table “System Manager Server Quick Fixes” in *System Manager V2.6 Release Notes* (B0750RS).

- The following item is only applicable to Foxboro stations with security enhancements.

The error shown in Figure 1-2 may appear when trying to map a drive from a station with security enhanced I/A Series software v8.5-8.7 to a station with security enhanced I/A Series software v8.8 or Control Core Services v9.0 or later, or vice versa. This error prevents users from connecting the System Manager Client to System Manager Server.



Figure 1-2. Drive Mapping Error

Perform the following procedure to correct this issue:

1. Acquire the DNS server IP addresses for the PDC and SDC on the security enhanced I/A Series software v8.8 or Control Core Services v9.0 or later. On a station with I/A Series software v8.8 or Control Core Services v9.0 or later in the network, select **Start -> Control Panel -> Network and Internet -> Network Connections**, right-click the I/A Series intermediate Miniport driver (see Figure 1-3) and click **Properties**. In the adapter’s Properties dialog box, in the “This connection uses the following items”

area, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties** (an example is shown in Figure 1-4).

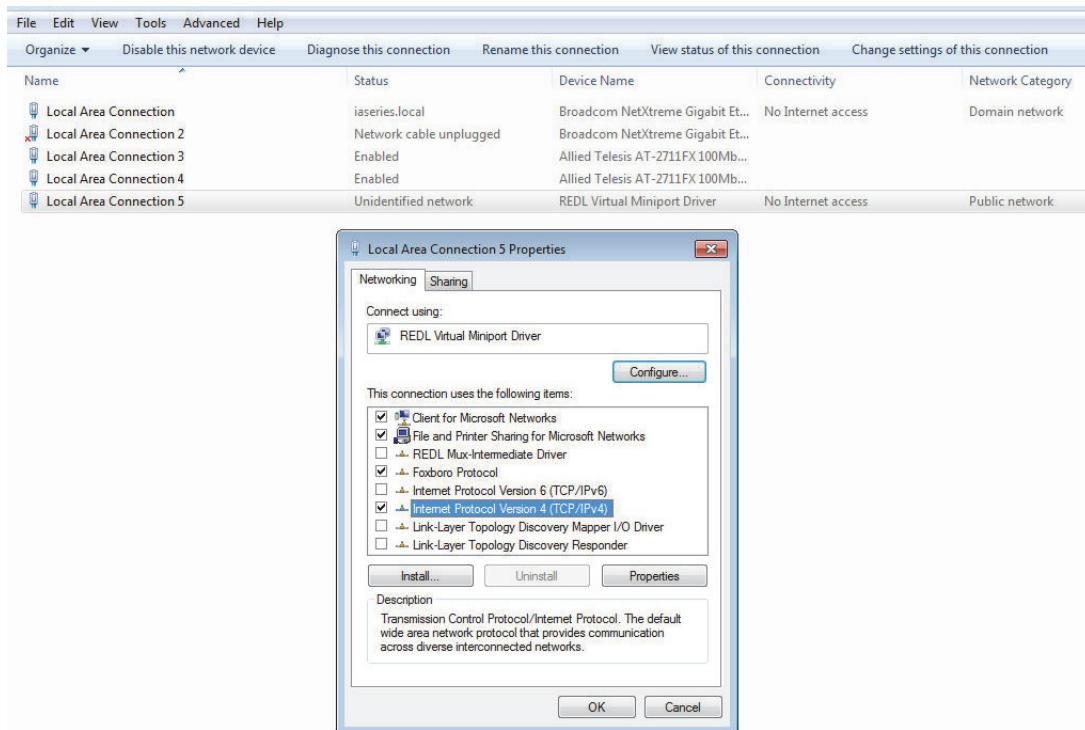
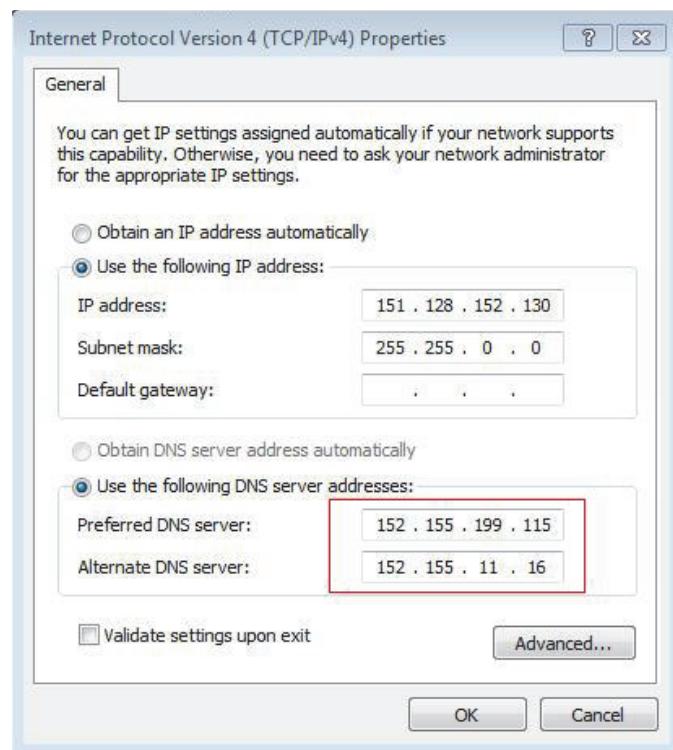


Figure 1-3. Local Area Connection Properties Dialog Box (v8.8-9.0 or Later)



Record the
DNS Settings.

Figure 1-4. Internet Protocol Version 4 (TCP/IPv4) Properties Dialog Box (v8.8-9.0 or Later)

2. In a workstation that runs I/A Series software v8.5-8.7 in the same network, select Start -> Control Panel -> Network Connections, right-click the I/A Series intermediate Miniport driver (see Figure 1-5) and click **Properties**. In the adapter's Properties dialog box, in the “This connection uses the following items” area, click **Internet Protocol (TCP/IP)**, and then click **Properties** (an example is shown in Figure 1-6).

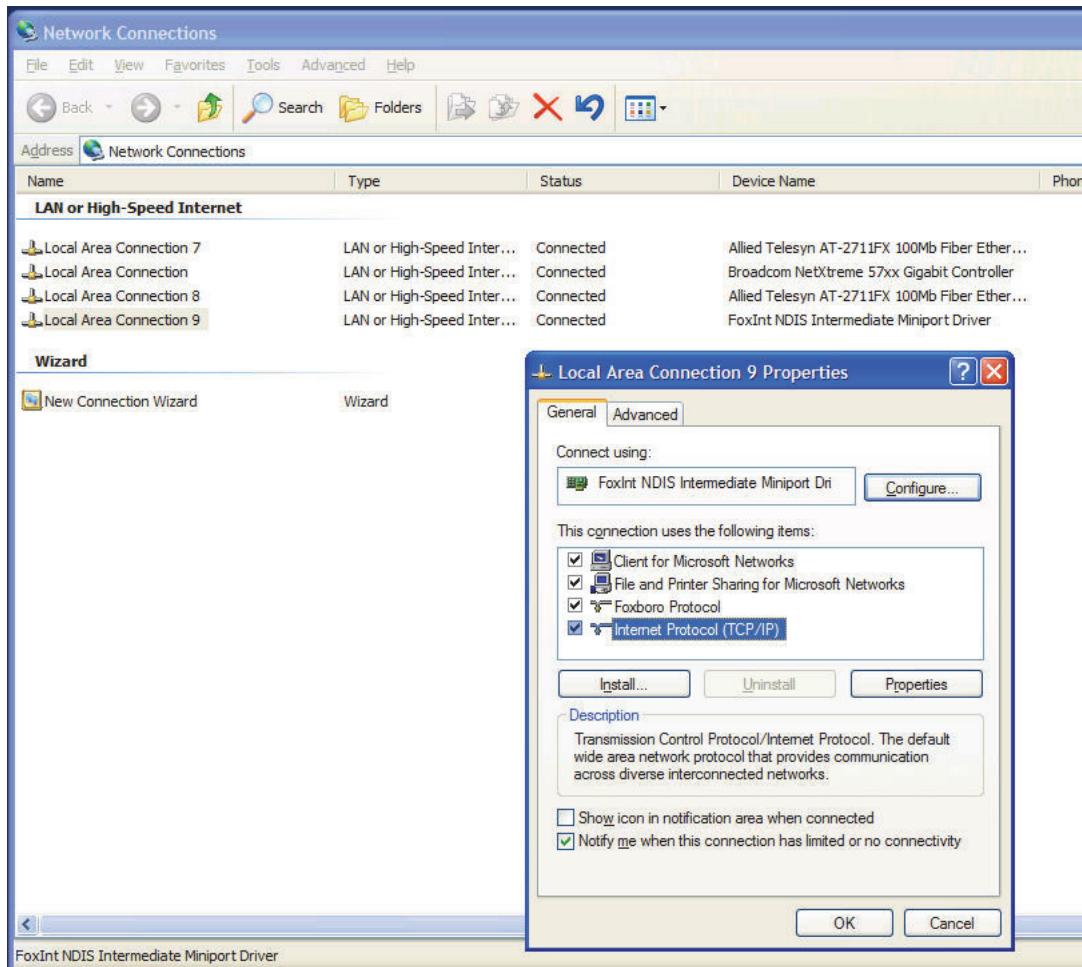


Figure 1-5. Local Area Connection Properties Dialog Box (v8.5-8.7)

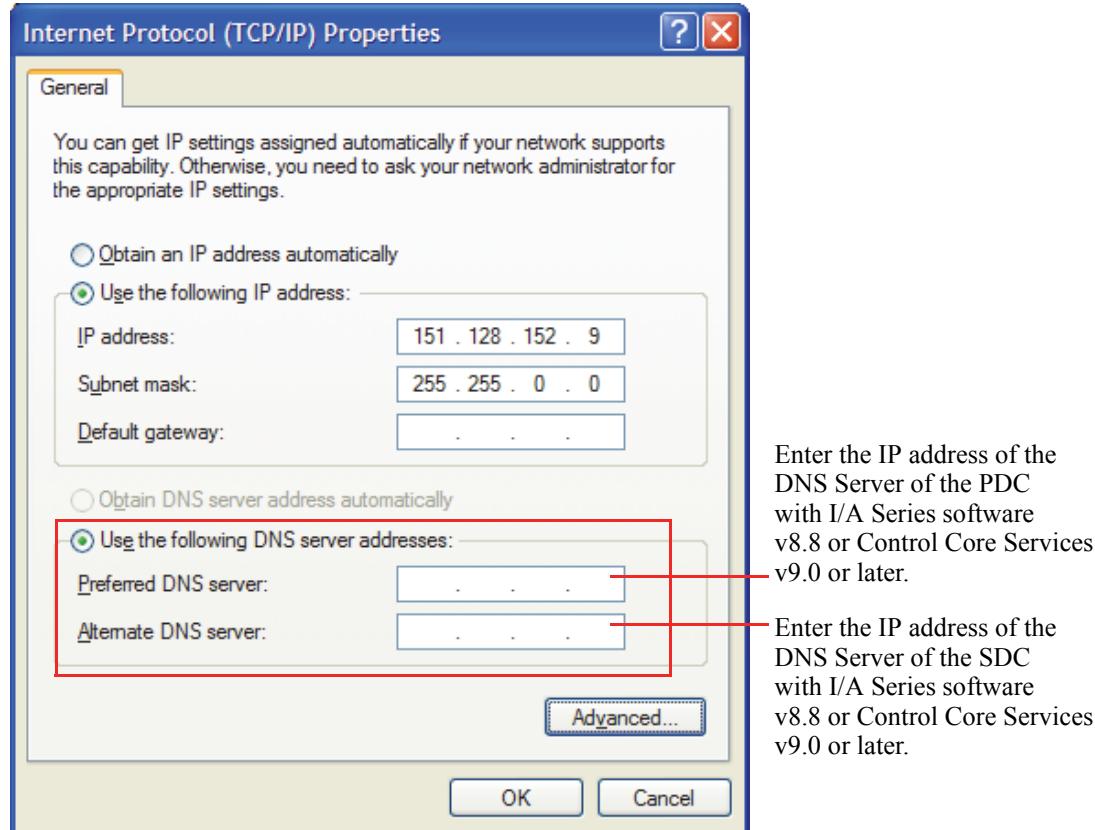


Figure 1-6. Internet Protocol (TCP/IP) Properties Dialog Box (v8.5-8.7)

3. Next, set the DNS settings for the intermediate Miniport driver in this workstation, as shown in Figure 1-6. In the “Preferred DNS server” field, enter the DNS server IP address of the PDC. In the “Alternate DNS server” field, enter the DNS Server IP address of SDC. Then, click **OK** to apply the changes.
4. On this workstation, log off all users from the domain and rejoin the domain. Then reboot the workstation.
5. Repeat the previous three steps for all workstations that run I/A Series software v8.5-8.7 in the same network as the PDC and SDC with the security enhanced I/A Series software v8.8 or Control Core Services v9.0 or later.

Installation Procedures

For each Control Core Services system, install the System Manager Server only on a limited number of stations (for example, one or two) to avoid having excessive traffic on the network.

System Manager is installed via one of two methods:

- As part of the Day 0 installation when loading a station with Control Core Services Software Installation media

- Via the System Manager software kit (K0201HU) provided with media kit Part No. K0201HT.

Separate instructions for these installation methods are provided below.

Installation via Foxboro Evo Control Core Services Software Installation Media

The System Manager V2.6 software kit is provided with Control Core Services v9.x Software Installation media on a workstation or server. Refer to the table “Workstation Specific Media Required for Foxboro Evo Control Core Services v9.[x] Software Installation” in the *Control Core Services v9.x Software Installation Guide* shipped with your version of Foxboro Evo for a list of part numbers for this installation media.

As part of the Day 0 installation, the System Manager Client is installed by default if the station is configured for ASMDW7 package.

However, the System Manager Server is not installed automatically during the Day 0 installation. You must install it manually from the Control Core Services Software Installation media. On stations with Windows 7 or Windows Server 2008 R2 Standard (or later), the System Manager Server is installed only if the workstation is configured for the IASVCS package.

To install the System Manager Server, proceed as follows:

1. Navigate to the Control Core Services 9.x Day 0 DVD media and open the folder “\3rd_party\SystemManager”.
2. Double click on **setup.exe**.
3. Click **Next**.
4. Keep the “Modify” choice selected (the default) and click **Next**.
5. Select “**This feature will be installed on local hard drive**” under “System Manager Server.”

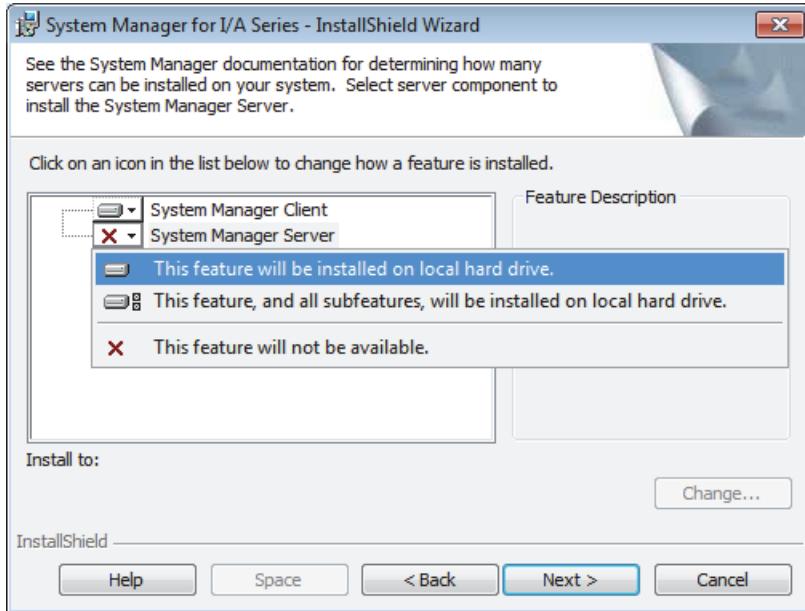


Figure 1-7. System Manager Server Installation

6. Click **Next** and then **Install** to install the System Manager Server.
7. For stations with security enhanced I/A Series software v8.8 or Control Core Services v9.0 or later, after the System Manager Server component is installed, update the group policy as described below.
 - a. Open the command prompt. Click the **Start** button, and click **Programs -> Accessories -> Command Prompt**.
 - b. In the command prompt, type **gpupdate /force** and press **<Enter>** as shown in Figure 1-8.

A screenshot of a Windows command prompt window titled 'C:\Windows\system32\cmd.exe'. The window shows the following text:

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\eng1>gpupdate /force
Updating Policy...
User Policy update has completed successfully.
Computer Policy update has completed successfully.
```

Figure 1-8. Running gpupdate /force

Note The user account performing this task must have privilege to run a command prompt under Windows.

- c. You are notified if the update is completed successfully.

This allows users in the Plant Engineers and Plant Operators groups to view the status of the System Manager Service. Otherwise, the status of System Manager Service will be unknown to these users.

Installation via System Manager Software Kit

The System Manager Client and Server can be installed from the System Manager software kit provided in the Day 0 media kit provided for your version of Foxboro Evo. Refer to the *Control Core Services v9.x Release Notes* provided for your version of Foxboro Evo for the part number of this media kit.

The workstation does not have to be configured for ASMDW7 package for the System Manager Client to be installed.

The System Manager Server is only installed if the workstation is configured for the IASVCS package.

During the installation of System Manager software, you are prompted to install the Client and/or Server components.

Note If you have System Manager v2.2 or earlier, it must be uninstalled prior to the new installation.

The System Manager software comes as a standard Microsoft Windows Installer setup. Upon inserting the installation CD into the CD drive, setup will proceed automatically. You can also launch the installation of System Manager software by executing setup.exe from the root of the CD. On some systems, there may be pre-requisite items to be loaded before System Manager can be installed. If so, the following dialog box (Figure 1-9) will be displayed with one or more of these items in the list.

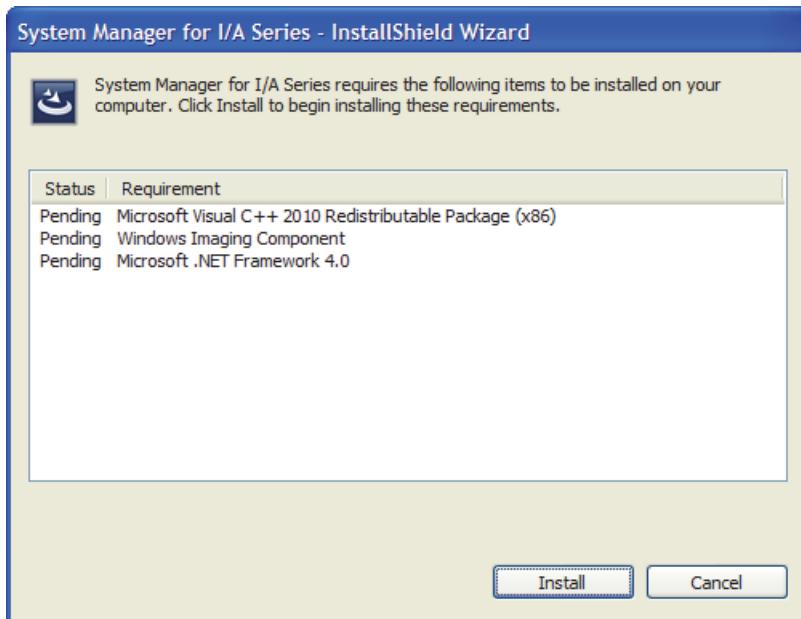


Figure 1-9. Pre-Requisite Window

This dialog box displays entries for the installation of Microsoft .NET 4.0 Framework software, required by the System Manager software. The pre-requisite packages for installing this software may vary, depending on your system. The packages shown in Figure 1-9 are provided as an example.

Click **Install** to proceed with the loading of pre-requisites.

If the error shown in Figure 1-10 appears during the installation process, you must first download and install Windows Installer version 3.1, which is the minimum requirement necessary to have the Visual C++ runtime libraries installed. Then you can try to install Microsoft .NET 4.0 Framework software again.



Figure 1-10. Installation Error

More information about Windows Installer version 3.1 is available at this site:
<http://support.microsoft.com/kb/893803>

You can download Windows Installer version 3.1 from this site:
<http://www.microsoft.com/download/en/details.aspx?amp;displaylang=en&id=25>

Once the System Manager setup starts, it will ask for the selection of components to be installed. By default, the client component is selected and the server component is not.

If System Manager was previously installed with the server component selected and removed in the previous step, then the server component will be automatically selected in the following dialog box. Otherwise, the default is not selected.

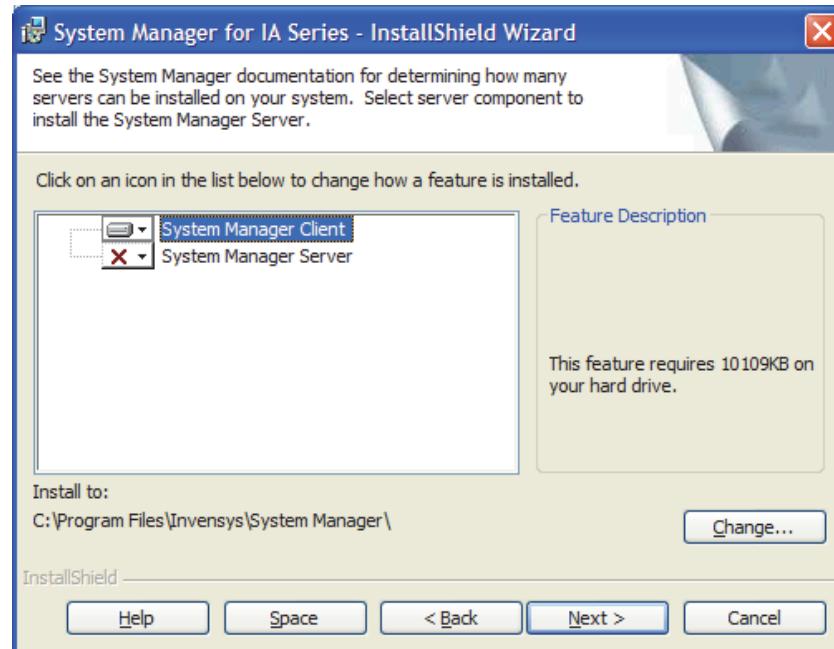


Figure 1-11. Select Components Window

Note Ensure the video resolution setting is set to at least 1280x1024.

Note Be sure to perform the last step in “Installation via Foxboro Evo Control Core Services Software Installation Media” on page 12 for stations with security enhanced I/A Series software v8.8 or Control Core Services v9.0 or later. This allows users in the Plant Engineers and Plant Operators groups to view the status of the System Manager Service. Otherwise, the status of System Manager Service will be unknown to these users.

Configuring Interoperability between Workstations

Interoperability is only allowed from a workstation running I/A Series or Control Core Services with security and I/A Series or Control Core Services without security.

There are two instances in System Manager where remote files are accessed:

- On the **Options > Configure** display, there is an indication as to whether a System Manager Service is installed or not.
- On a remote workstation, you can view the System Monitor log.

There are two interoperability issues that may arise when accessing remote files between workstations running Control Core Services software with and without security enhancements:

1. If the System Manager Service is installed on a workstation **without** security enhancements and the System Manager Client is installed on a Control Core Services workstation **with** security enhancements, the **Options > Configure** display in the client reports that the System Manager Service is not installed.
2. If the System Manager Client is installed on a workstation **with** security enhancements, you cannot view the System Monitor log that resides on a workstation **without** security enhancements.

These two issues exist because the workstation with security enhancements cannot access the file system of the workstation without security enhancements.

To configure interoperability between workstations running Control Core Services software with and without security enhancements, perform the appropriate procedure below (either for a station with Windows 7 or Windows Server 2008 R2 Standard, or a station with Windows XP or Windows Server 2003) before invoking the System Manager client.

Configuring Interoperability for Stations with Windows 7 or Windows Server 2008 R2 Standard

On stations with Windows 7 or Windows Server 2008 R2 Standard operating systems, perform the following procedure before the System Manager Client is invoked:

1. On a station with security enhancements, before starting System Manager, click **Start -> Run**. In the Open: text field, type the name of the station, for example, \\h11aw7 as shown in Figure 1-12. Then, click **OK**.

Note The Plant Operators user account does not have the privilege to invoke the Run command window.

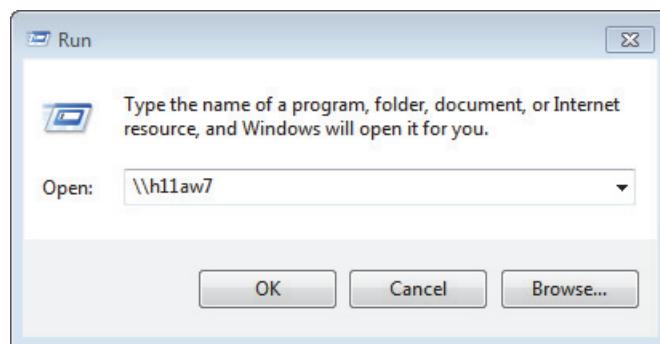


Figure 1-12. Accessing Station with Security Enhanced Foxboro Evo Control Core Services Software

2. A prompt appears for the user credentials as shown in Figure 1-13. Enter the user name and password of the station running the Control Core Services software without security enhancements. Then click **OK**.

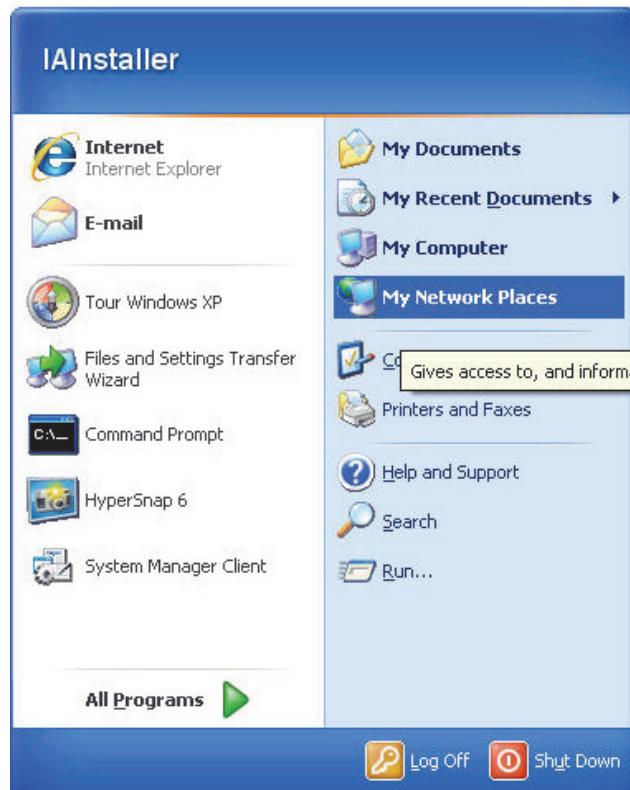


Figure 1-13. Accessing Station with Standard Foxboro Evo Control Core Services Software

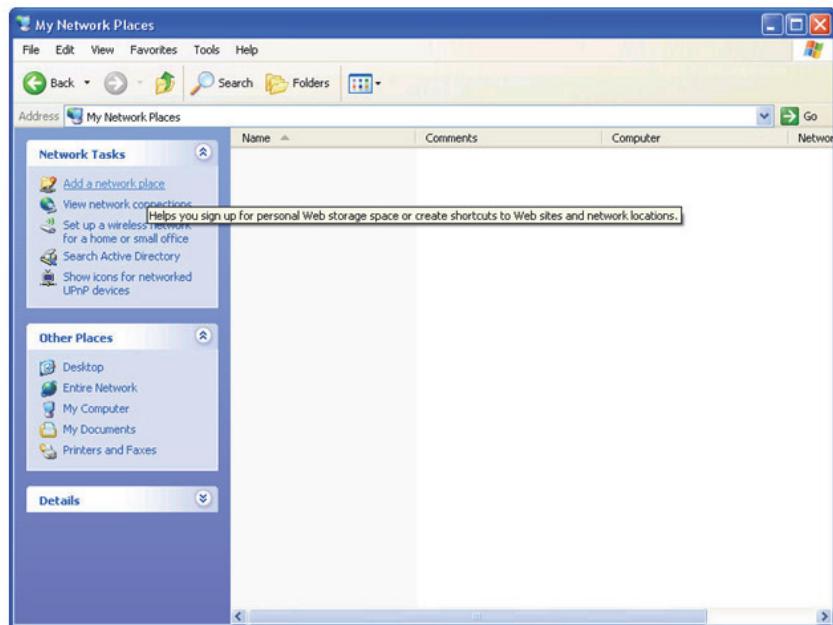
Configuring Interoperability for Stations with Windows XP or Windows Server 2003

For stations with Windows XP or Windows Server 2003, proceed as follows:

1. On the workstation with security enhancements, before starting System Manager, click **Start > My Network Places**.



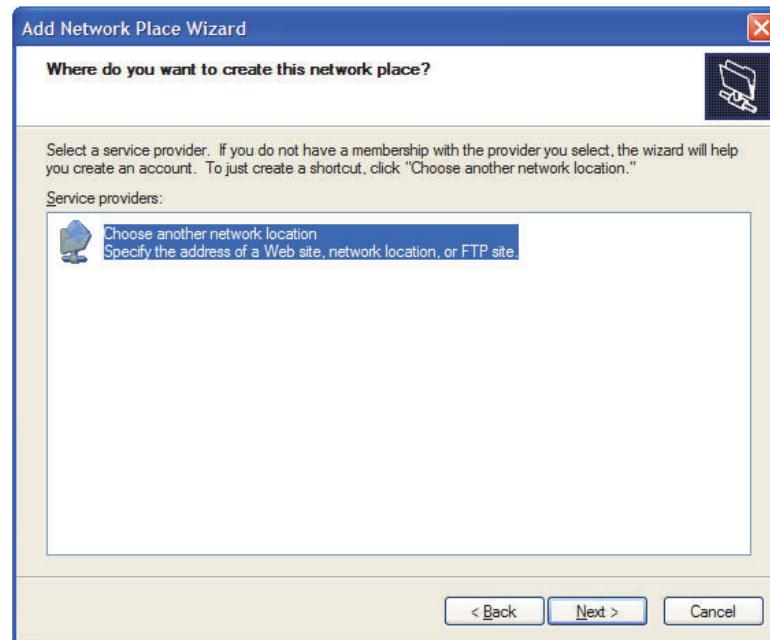
2. From the My Network Places display, select **Add Network Place**:



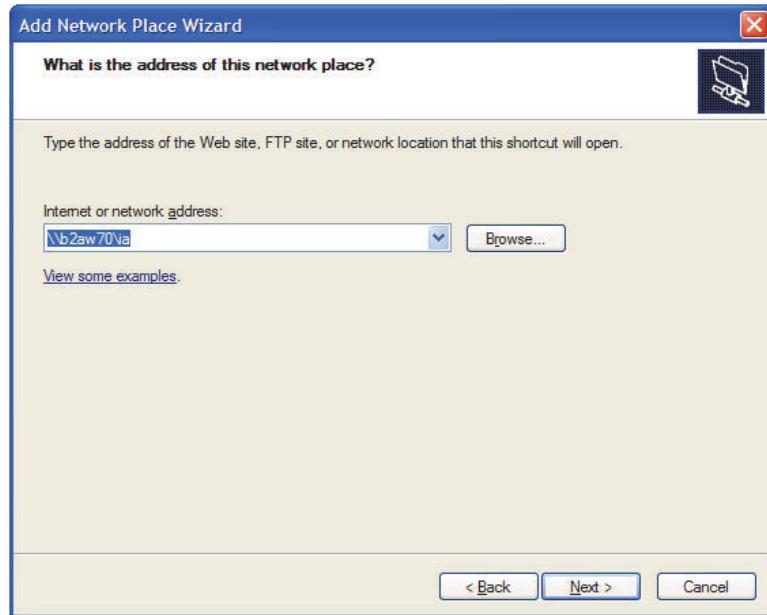
3. From the Welcome to the Add Network Place Wizard, click **Next**:



4. Click **Next** from the following display:



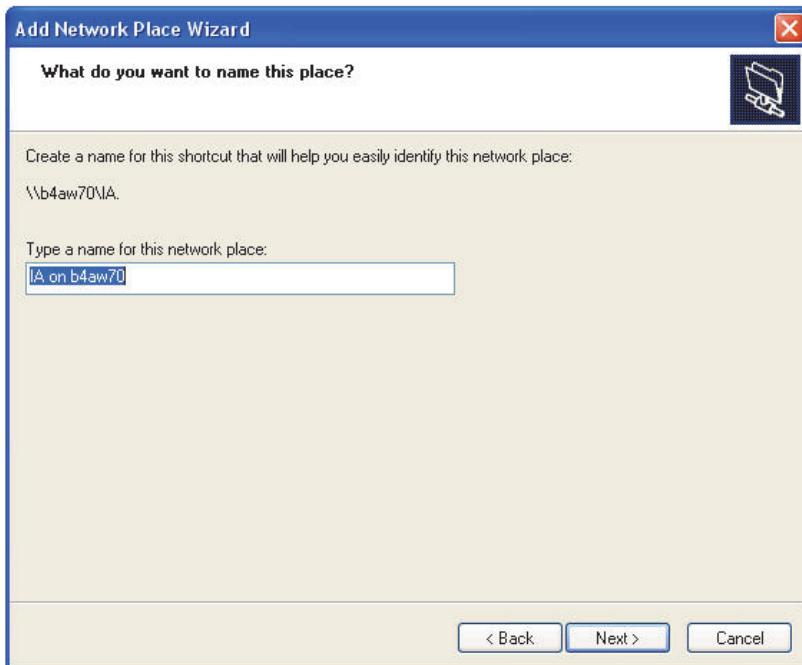
5. From the ‘What is the address of the network place?’ display, enter the station name and share name of the workstation without security enhancements, then click **Next**.



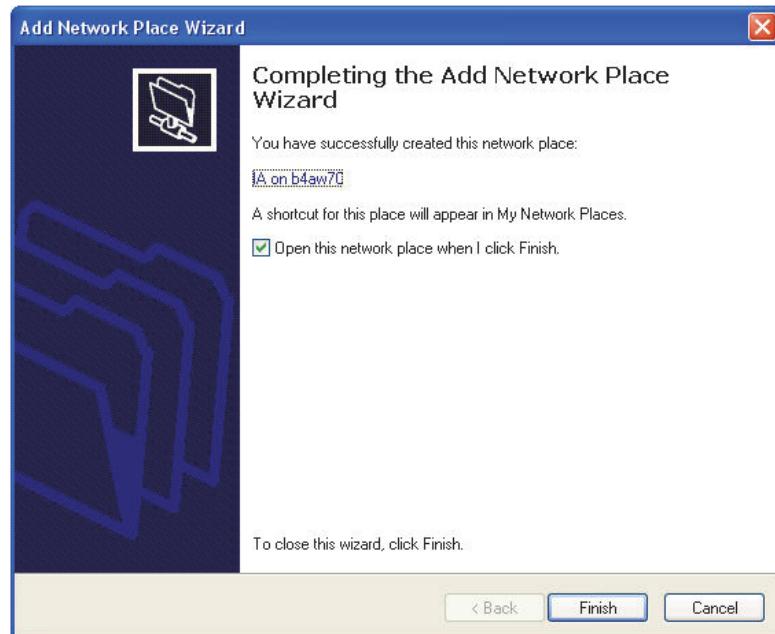
6. Enter the user name and password of the workstation running Control Core Services software without security enhancements, then click **OK**.



7. If desired, enter a name for the network place on the 'What do you want to name this place?' display, then click **Next**.



8. Click **Finish** on the Completing the Add Network Place Wizard display.



Starting System Manager

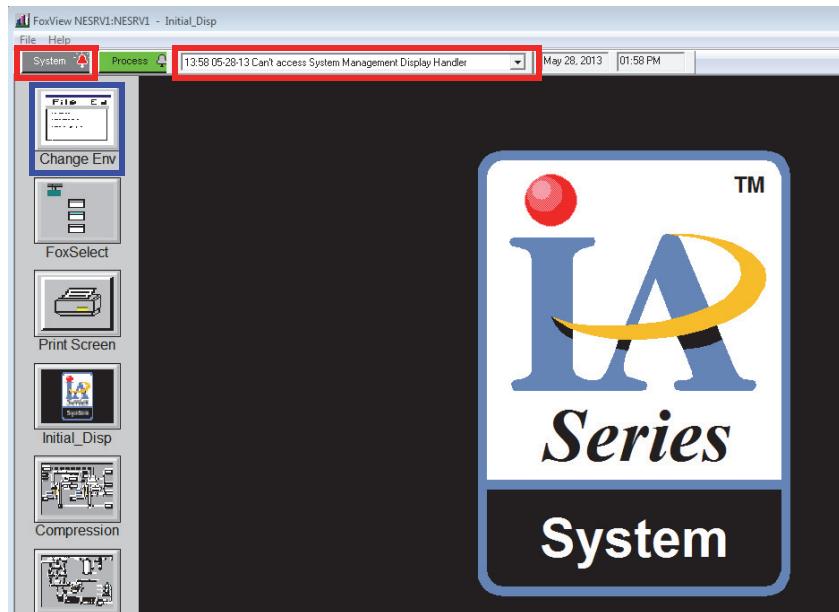
The System Manager service starts automatically when the host workstation is restarted. System Manager client software can be started from the Windows operating system Start button, from FoxView™ software or from Foxboro Evo Control HMI software.

To start the System Manager client:

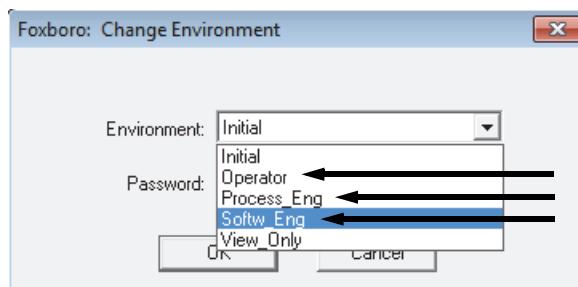
1. Choose the application from the **Start** menu as follows:
Start -> Programs -> Invensys -> System Manager -> System Manager Client
2. Start System Manager software:

- a. From FoxView software, click  in the FoxView Alarm bar.

Note Under I/A Series software v8.8 or Control Core Services v9.0 or later, the environment in FoxView software cannot be set to Initial or View_Only. If it is set to either of these environments, when attempting to invoke the System Manager from the System button in the FoxView Alarm bar, an error message “Can't access System Management Display Handler” is shown.



To choose other environment displays, select the **Change Env** button in FoxView software (see the blue square in the screenshot above) and select **Operator**, **Process_Eng**, or **Softw_Eng** from Environment drop-down list (see below).



- b. From Foxboro Evo Control HMI software, click **SysManager** in the toolbar at the top of the Control HMI window.
3. Connect to a System Manager service. Refer to “Options Menu” on page 71 for instructions.

The System Manager Service

Starting and Stopping the System Manager Service

The System Manager service is started automatically after a reboot. However, if you need to manually start or stop it, you can do so from the Services tool.

To start the System Manager service:

1. Invoke the Services tool by selecting: **Programs > Administrative Tools > Services**.
2. Search for the entry **System Manager Service**.
3. Right-click on the **System Manager Service** item, and select **Start**.

To stop the System Manager service:

1. Invoke the Services tool by selecting: **Programs > Administrative Tools > Services**
2. Search for the entry **System Manager Service**.
3. Right-click on the **System Manager Service** item, and select **Stop**.

Checking if the System Manager Service is Fully Up and Running

The status of the start-up of System Manager service is written to the system Event Viewer for tracking.

Note

1. Only a user with administrative privileges can access the Event Viewer application.
 2. The System Manager service may take approximately one to two minutes to be fully up and running.
-

Checking the Status of a System Manager Service using Event Viewer

The status of a System Manager service can be viewed from the Event Viewer application. To invoke Event Viewer, do the following:

1. Select: **Programs > Administrative Tools > Event Viewer**.

2. From the Event Viewer GUI, select **Application**.

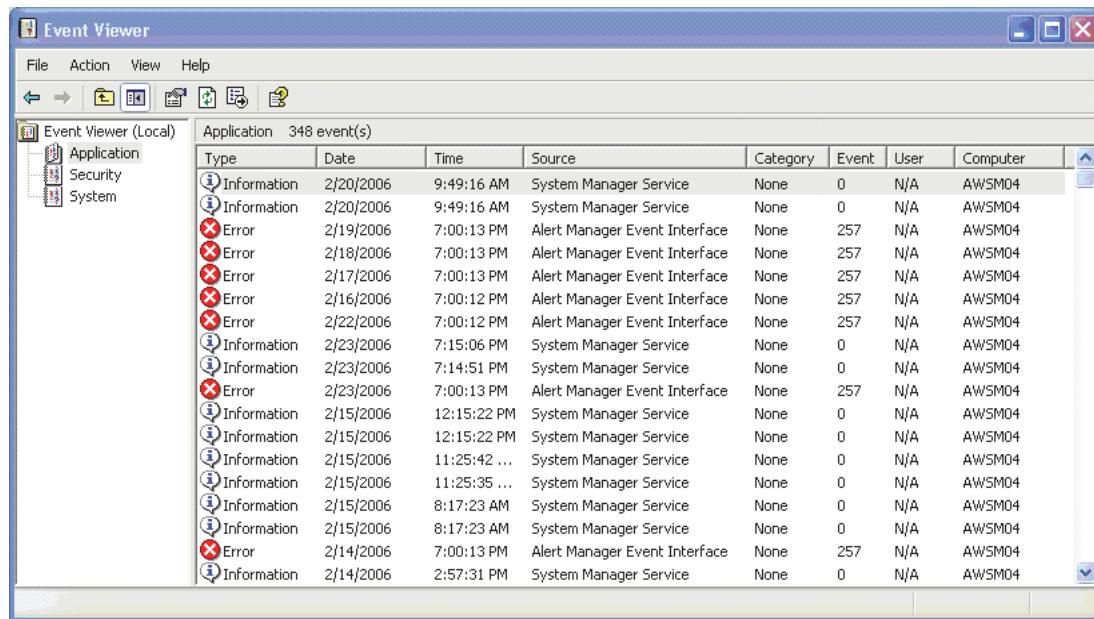


Figure 1-14. Checking the Status of a System Manager Service

From the Application page, select an entry where the **Source** column says **System Manager Service** to view the status of the service.

When the System Manager service starts, the presence of the following **four** log entries shows that the System Manager service is **completely** ‘up and running’. Log entry #4 may take approximately 1 to 2 minutes, depending on the number of stations in the system.

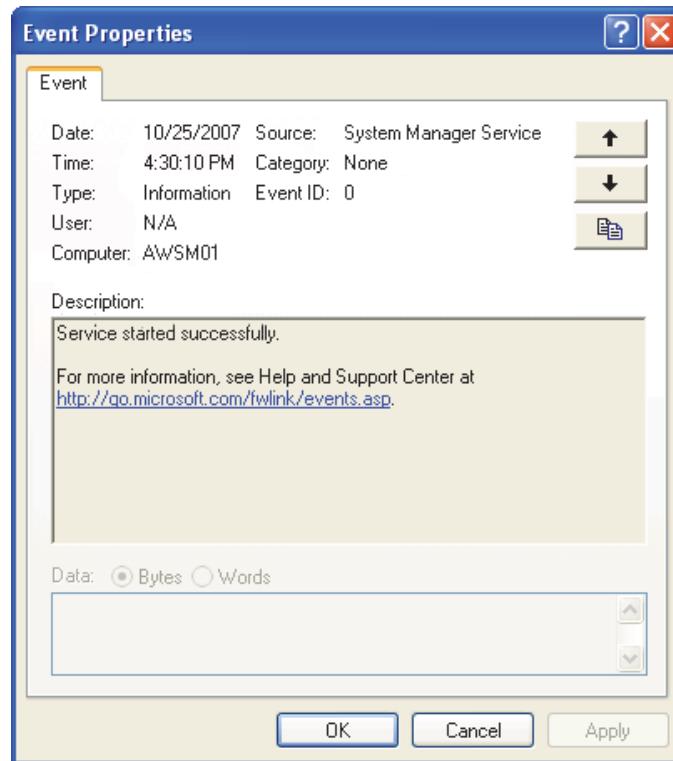


Figure 1-15. Log Entry #1

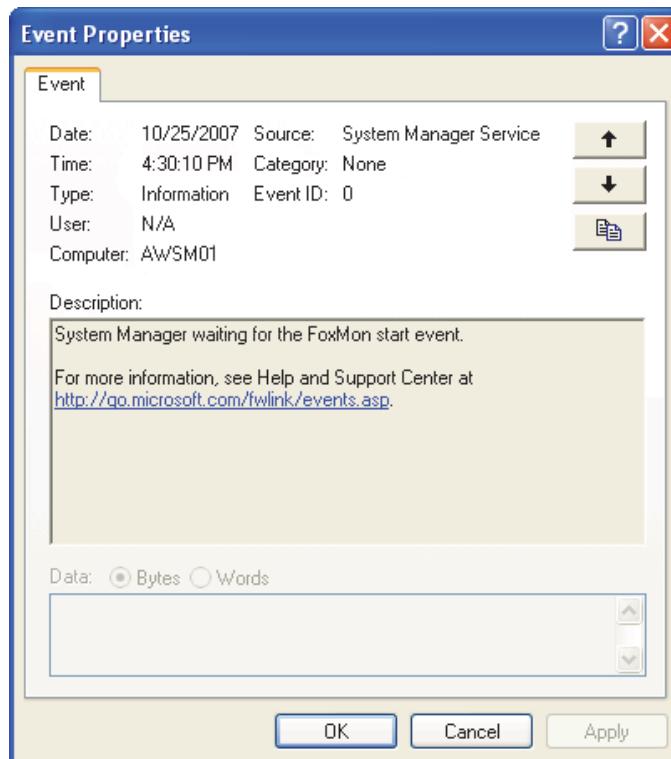


Figure 1-16. Log Entry #2

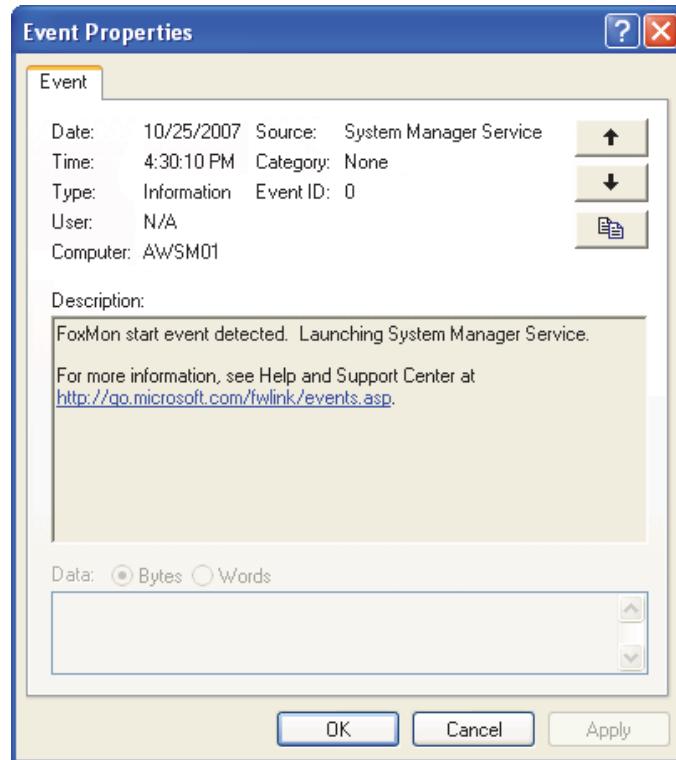


Figure 1-17. Log Entry #3

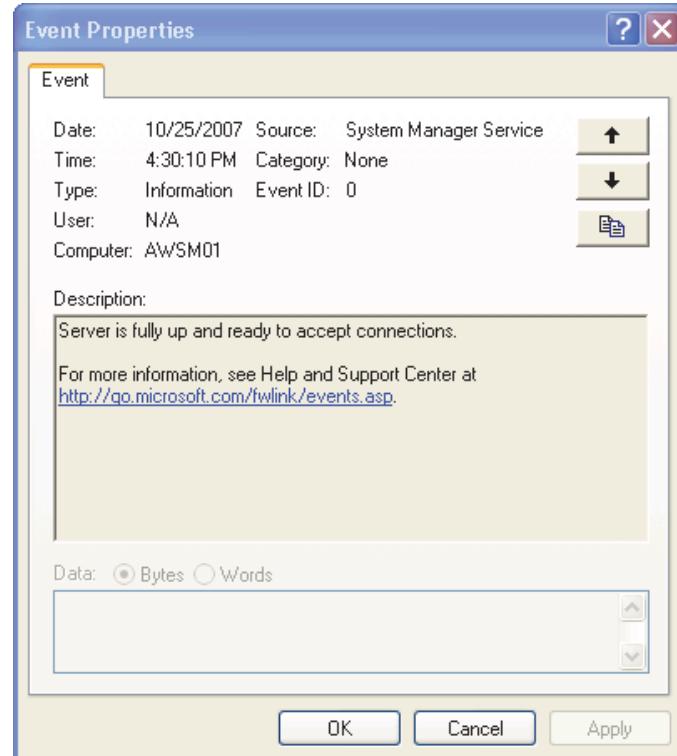


Figure 1-18. Log Entry #4

The System Manager Window

When the client software connects with the configured service, the window displays the system monitors in a Navigation pane on the left side of the window. The Messages tab in the Accessories pane in the bottom of the window shows the latest system messages (Figure 1-19).

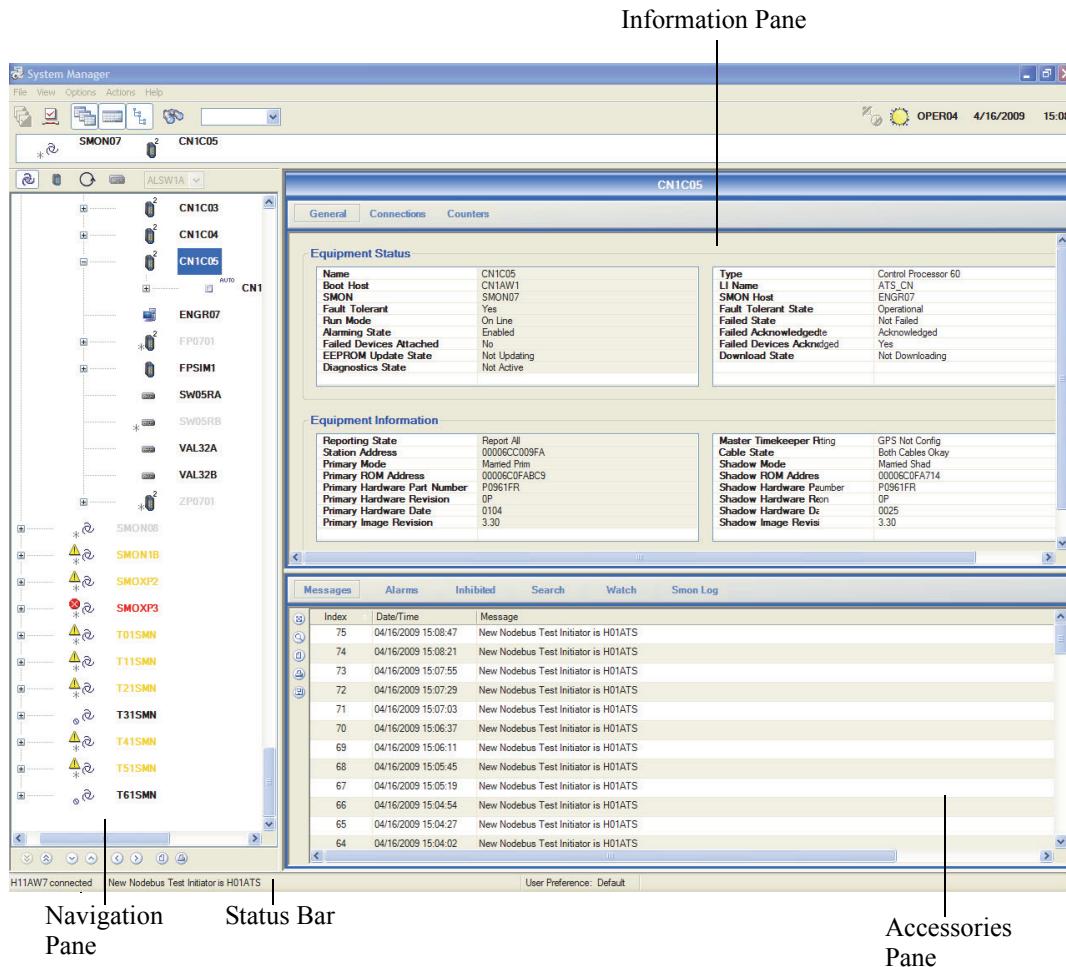


Figure 1-19. System Manager Window after Connection to a Service

The window displays system status and equipment information in three panes:

Navigation	<p>A tree view of the system equipment arranged by either system monitor domains, ATS domain, LI domain or switch domains. When an item is selected in the Navigation pane, tables in the Information pane provide status, configuration and equipment information about the item. Right-click the item in the Navigation pane to display a context menu of equipment change actions.</p>
-------------------	---

Information	The content of the Information pane varies with the type of equipment selected, but generally includes information on the equipment's current status, configuration and connected devices.
Accessories	Tabbed pages in the Accessories pane display system-wide information including messages, system alarms, equipment for which alarms have been inhibited, counters and system monitor logs.

A more detailed description of these panes is provided in Chapter 2, “System Manager Window”.

How Information is Maintained

On startup, System Manager identifies the stations and switches in each system monitor domain and stores that information in local memory. Information about peripherals and field devices connected to the stations and switches is retrieved on demand. The peripherals and field device information is then stored in local memory until the end of the System Manager session. On startup, System Manager also begins receiving messages and alarms and stores them in local memory. It is important to note that search and filtering tools in the Accessories pane are applied only to the information stored locally by System Manager in the current session.

Viewing Equipment Information

The equipment is displayed in the Navigation pane in one of four views:

-  Click this icon, at the top of the Navigation pane, to arrange equipment by system monitor domain.
-  Click this icon, at the top of the Navigation pane, to choose all configured ATS modules
-  Click this icon, at the top of the Navigation pane, to choose all configured LAN Interface modules.
-  Click this icon, at the top of the Navigation pane, and select a switch from the pull-down list to the right of the Switch button, to view all stations and switches connected to the selected network switch.

Note Choose **Help > Legend** from the main menu to display a legend of the icons used in the Navigation pane to identify equipment types.

System Monitor View

In the System Monitor view, you can expand each system monitor in the Navigation pane to display the stations and switches in its domain:

- Click  to the left of a system monitor to display the stations and switches assigned to it.
- Click  to the left of any station on the next level to display the equipment attached to the station.

Figure 1-20 shows a Navigation pane with the System Monitor and one of its control stations expanded. Each equipment item is identified by an icon for the equipment type and the equipment name (letterbug).

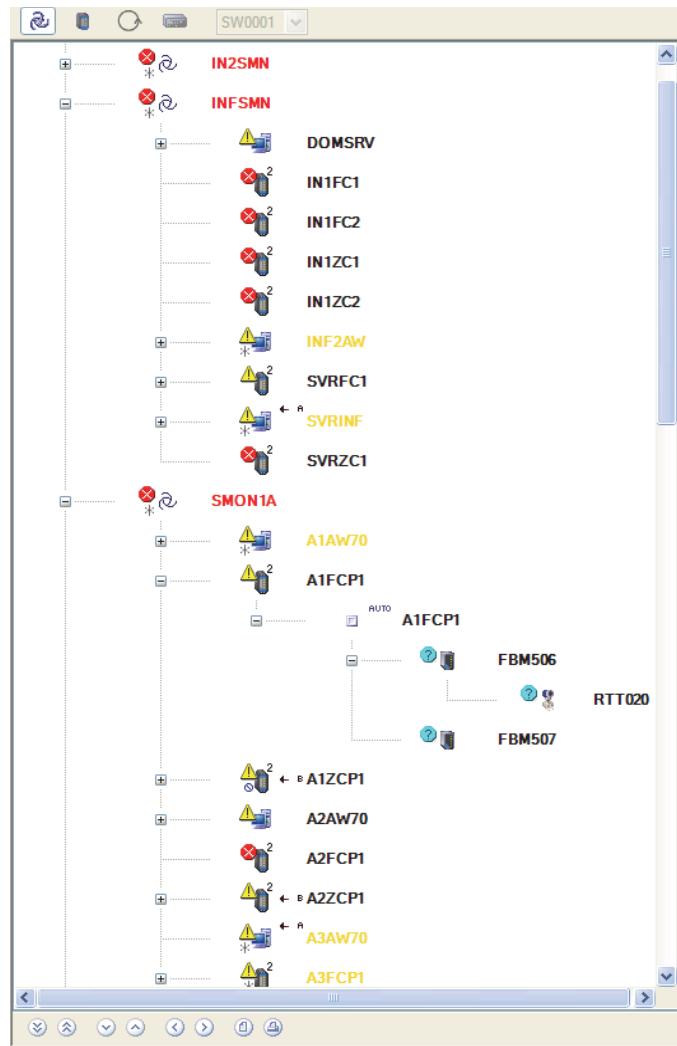


Figure 1-20. Expanded System Monitor in the Navigation Pane

Address Translation Station (ATS) View

The ATS view displays all ATS modules configured in LAN Interface, or “LI” mode, as shown in Figure 1-21.

- Click to the left of the configured ATS module to reveal all the stations residing under an ATS node.
- Click to the left of any station on the next level to display the equipment attached to the station.

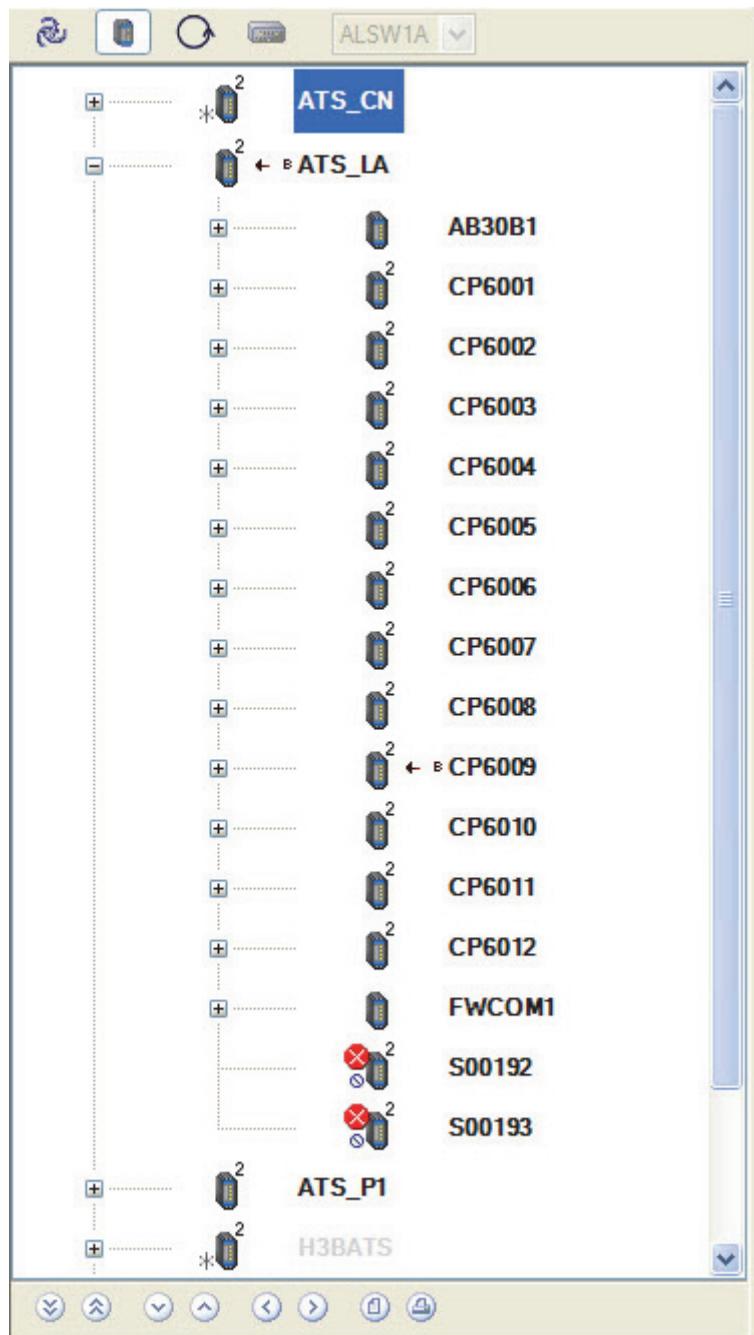


Figure 1-21. Navigation Pane ATS view

LAN Interface (LI) View

At the highest level, the LAN Interface (LI) View displays all configured LAN Interface modules as shown in Figure 1-22. At the next level, the LAN Interface view reveals all the stations residing in a particular node. When no LIs are configured on the Control Core Services network, the LI button on the navigation tool bar and the LAN Interface view will be disabled. The order of LIs shown in this display does not indicate the order of physical connections on the bus.

- Click to the left of the device to reveal all the stations residing on a particular LI domain.
- Click to the left of any station on the next level to display the equipment attached to the station.

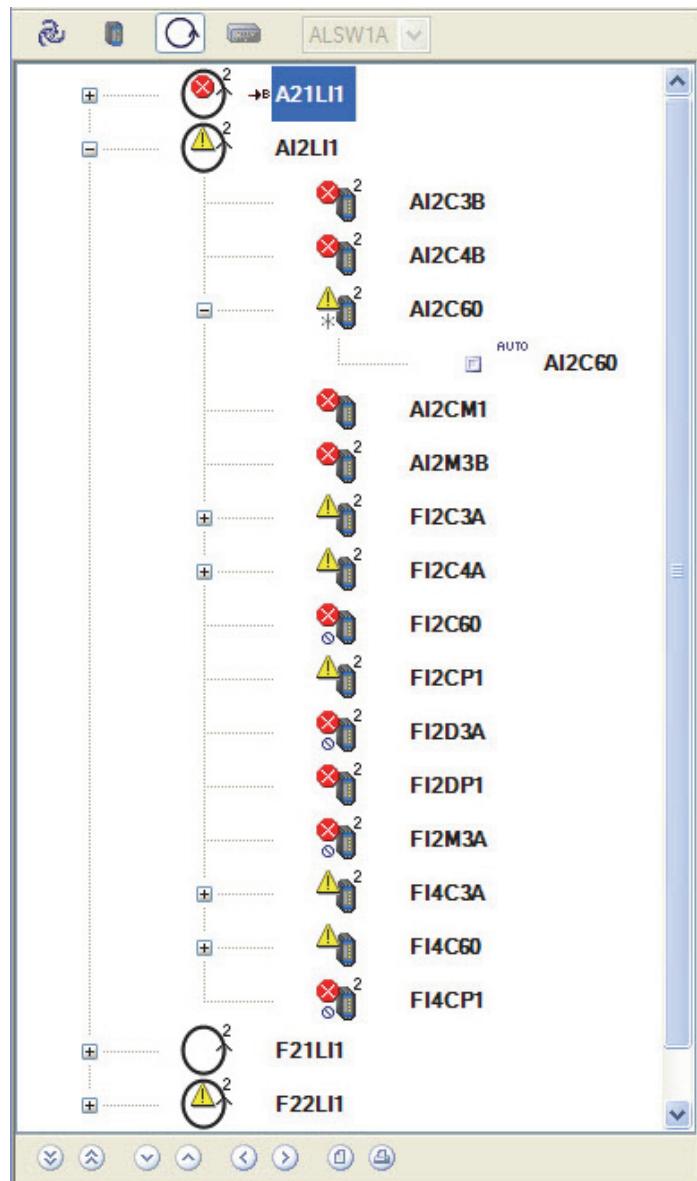


Figure 1-22. Navigation Pane the LAN Interface View

Switch View

When the Switch view is selected, the Navigation pane shows the selected switch and all the stations and switches connected to it.

- Use the pull-down list to the right of the Switch button to select the switch.
- Click to the left of the switch to display the stations and switches connected to it.
- Click to the left of any station on the next level to display the equipment attached to the station.

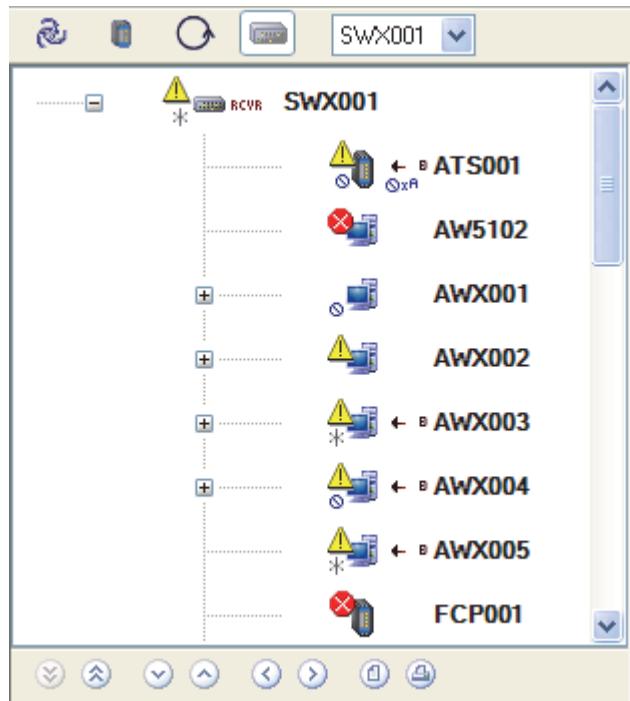


Figure 1-23. Navigation Pane Switch View

Health and Alarm Indicators

System Manager uses various symbols to indicate changes in equipment health. In addition to marking the problem equipment, the status information is propagated to the parent equipment and to the system monitor. For example, in Figure 1-25 a failure with an FBM is marked on the FBM itself (FCP704), its parent control station (FCP701) has a warning symbol, and the red symbol attached to system monitor (SYSMN1) reflects the FBM failure.

- Choose **Help > Legend** from the main menu to display a legend of the symbols used in the Navigation pane to identify equipment status.

When the equipment problem is reported by the system monitor, an asterisk is placed on the lower left corner of the equipment icon to show that the alarm condition has not been acknowledged.

If the **Enable blinking** option is checked in the Configuration dialog box (Figure 1-24), the name of the problem equipment is color-coded and the names blink on and off.

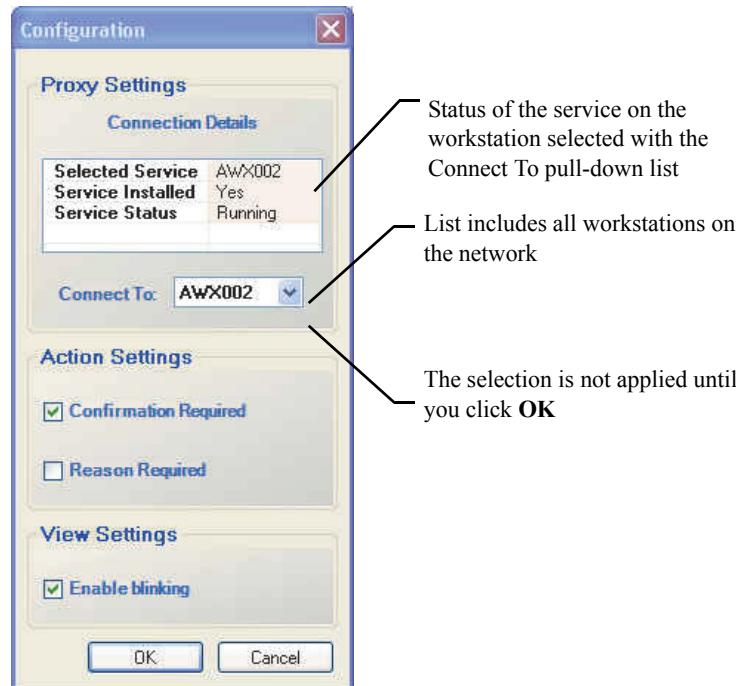


Figure 1-24. Configuration Dialog Box

When the condition is acknowledged, the asterisk is removed from the equipment icon, the name is displayed in black, and the blinking stops.

Red symbol indicates a failure within the system monitor's domain. The asterisk indicates at least one unacknowledged alarm.

The control station has a warning symbol as there is a problem with an attached device.

Expanded view shows an FBM is the failed device and the source of the unacknowledged alarm.

The yellow triangle indicates this switch has a warning condition. The condition has been acknowledged.

This control station has an unacknowledged alarm, but the station has returned to normal.

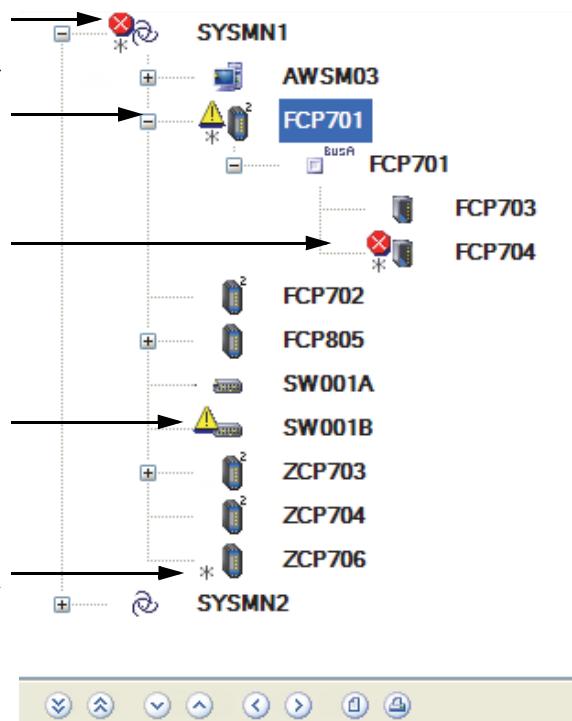


Figure 1-25. Status and Alarms Indicators in the Navigation Pane

The symbol attached to a system monitor reflects the most severe condition of any equipment within its domain. For example, when the problem with FCP704 (Figure 1-25) is resolved and the FBM returns to normal operation, the failure symbol is cleared from the FBM, and the warning symbol is cleared from FCP701, the FBM's parent control station. The red symbol is removed from SYSMN1 if there are no other failures in the system monitor domain.

The procedures for resolving an equipment problem vary with the types of devices involved, but generally include these steps:

1. Expand the marked equipment in the Navigation pane to identify all the problem devices.
2. Select each device to display its status in the Information pane.
3. Right-click the item in the Navigation pane and choose the appropriate equipment change action from the context menu.

To display the status of all FBMs connected to a control station:

1. Click the control station in the Navigation pane to display its status and equipment information in the Information pane.
2. Click the **Connections** tab in the Information pane to list the connected devices by name, type, status, run mode and failure mode (Figure 1-26).
3. Click any column header to sort the FBMs by the data in that column.

Name	Type	Status	Run Mode/Communications	Device/Failed State
FCP805	FBM 0	Normal	On Line	Not Failed
FCP803	FBM 206	Normal	On Line	On Scan
FCP804	FBM 207	Normal	On Line	On Scan

Figure 1-26. Connections Table for an FCP270

4. Do either of the following to navigate to an item listed in the Connections tab:
 - Double-click the equipment name.
 - Right-click the equipment name and choose **Navigate to <FBM name>** from the context menu (**Navigate to FCP804**, in Figure 1-26).

The item is selected in the Navigation pane and its status and equipment information are shown in the Information pane.

Responding to Alarms

Acknowledging system alarms and resolving the underlying equipment problem are separate but related activities in System Manager. Thus, if an alarm is still unacknowledged when the equipment returns to normal, the asterisk remains attached to the equipment (ZCP706 in Figure 1-25, for example).

There are two types of system alarms:

- Alarms reporting a failure in a piece of equipment such as a station, field device, or peripheral. These are generally referred to as **station alarms**.
- Alarms concerning communication faults associated with Ethernet cables and module Fieldbuses. These are generally referred to as **cable alarms**.

You can view and respond to both types of system alarms in the Alarms tab in the Accessories pane.

Alarms Tab in the Accessories Pane

To view all station and cable alarms:

1. Choose **View > Accessories** from the main menu if the Accessories pane is not already displayed.
2. Click the **Alarms** tab in the Accessories pane to display a table of system alarms (Figure 1-27).

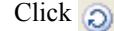
	Index	Date/Time	Source	Name	Message
*	299	01/05/2010 09:03:09	A21SMN	A230MC	Station failed
*	300	01/05/2010 09:04:59	A21SMN	A210MC	Station failed
*	307	01/08/2010 14:43:06	SMON07	FP0701\FCP72D\1F302	Warning condition exists
*	308	01/11/2010 16:17:30	SMON07	FP0701\FCP72D\SRD991	Warning condition exists
*	309	01/11/2010 15:56:00	SMON07	FP0701\FCP72D\4P_F39	Warning condition exists
	1	01/05/2010 13:59:20	T11SMN	T11ZCP	Station fault-tolerant failure
	3	01/08/2010 15:16:08	SMON03	ZP0301\03F100\03F105	Communication problem on busses A and B
	4	01/08/2010 15:16:09	SMON03	ZP0301\03F200\03F221	Communication problem on busses A and B
	5	01/08/2010 15:16:06	SMON03	ZP0303	Station fault-tolerant failure
	8	01/11/2010 16:41:09	SMON06	ZP0602\06F300\06F318	Device off-line

Figure 1-27. Alarms Tab in the Accessories Pane

The **Alarms** tab lists alarms in a multi-column display containing the fields described in Table 1-1:

Table 1-1. Alarms Tab Display Fields

*	An asterisk indicates that an alarm has not yet been acknowledged. Otherwise, the column is blank.
Index	A unique ID number.
Date/Time	The timestamp indicates when the alarm was generated.
Source	Source from which System Manager received the alarm, usually a system monitor.
Name	Letterbugs of the affected equipment. The alarm condition exists in the last item in the string of letterbugs and has been propagated up to the parent equipment to the left.
Message	System generated text describing the alarm condition.

3. Click the column header to sort the rows on that column; click the same column header to reverse the sort order.
4. Select a column and drag it to the left or right to arrange the order of the columns.
5. Click  in the tab toolbar to refresh the table and show the latest alarms.

Acknowledging Alarms

There are multiple ways to acknowledge system alarms using the Alarms tab, the Navigation pane context menus, and the main menu and toolbar:

Single Alarm

To acknowledge an individual system alarm:

- Select the alarm in the Alarms tab and click  in the tab toolbar.

Station Alarms

To acknowledge all equipment failures associated with a station or field device:

1. Select the equipment in the Navigation pane.
2. Do one of the following:
 - Choose **Actions > Equipment Change > Acknowledge Station** from the main menu.
 - Right-click the selection and choose **Acknowledge Station** or **Acknowledge Device** from the context menu.

All Station Alarms in a System Monitor Domain

To acknowledge all station alarms in a system monitor domain:

1. Select the system monitor in the Navigation pane.
2. Do one of the following:

- Right-click the selection and choose **Acknowledge Smon Domain** from the context menu.
- Choose **Actions > Acknowledge Smon Domain** from the main menu.
- Click  in the toolbar.

Cable Alarms

To acknowledge cable alarms:

- Click  in the toolbar, or choose **Actions > Acknowledge All Cable Alarms** from the main menu.

Inhibiting Alarms

Inhibiting alarms causes the system to filter alarm conditions so that the system monitor continues to indicate overall system and network health even while the equipment is failed or off-line.

To inhibit alarms for a station or device:

- Select an alarm from the equipment in the **Alarms** tab and click  in the tab toolbar.
- Right-click the equipment in the Navigation pane and choose **Inhibit Alarming** or **Inhibit Device Alarming** from the context menu.

The alarms from the equipment are cleared from the Alarms tab and the equipment is listed in the Inhibited tab in the Accessories pane. In the Navigation pane and the Hierarchy Navigation box, a  is added to the icons for the equipment, and the system monitor to indicate that alarms are being inhibited.

To re-enable the alarms:

- Right-click the equipment in the Navigation pane and choose **Enable Alarming** or **Enable Device Alarming** from the context menu.

Next Step

For additional information about using System Manager:

- Choose **Help > Contents** or **Help > Index** from the main menu for information on specific features.
- Review the next chapter for a catalog of the menus, toolbar features and other features of the System Manager window. By necessity, Chapter 2, “System Manager Window”, repeats some of the material in this getting-started section.
- Reference the relevant equipment-specific chapter for detailed descriptions of Information pane fields and equipment change actions:
 - Chapter 3, “System Monitors”
 - Chapter 4, “Workstations, Peripherals and Network Printers”

- Chapter 5, “Control Stations, Control Network Interfaces, ATSs, and LAN Interface (LIs)”
- Chapter 6, “Station Counters”
- Chapter 7, “FCMs”
- Chapter 8, “Fieldbus Modules”
- Chapter 9, “Networking Equipment”

C H A P T E R 2

System Manager Window

This chapter describes the features of the System Manager window, including the Navigation pane, Information pane, Accessories pane, menus and the toolbar. The chapter provides information on selecting equipment, displaying status and equipment information, responding to alarms and performing equipment changes actions.

Subsequent chapters contain more in-depth information on displays and procedures for specific equipment.

Contents

- Starting System Manager
- Major Components
- Navigation Pane
- Information Pane
- Accessories Pane
- Menus
- Toolbar

Starting System Manager

You can start the System Manager client software from the Windows operating system Start menu, FoxView software or Control HMI software.

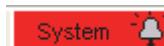
From the Desktop

To start System Manager from the Windows operating system desktop:

- Choose the application from the **Start** menu.

From FoxView Software

To start the application from FoxView software:

- Click  in the FoxView Alarm bar.

Note The System Manager cannot be invoked through FoxView software from the Initial environment.

From Foxboro Evo Control HMI

To start the System Manager from Control HMI:

- Click **SysManager** in the toolbar at the top of the View window.

Connecting to a System Manager Service

The System Manager window opens and the application connects to the configured service, which can be local or on any other workstation on the network. When the connection is made, the host workstation for the service is displayed on the left in the status bar.

The service is specified in the Configuration dialog box. If System Manager is unable to make the connection, you can select a service on another workstation, as described in “Options Menu” on page 71.

Note User can launch/open/view multiple System Manager clients from FoxView software. A maximum of 35 clients can be connected to a System Manager service.

Major Components

Figure 1-19, which is a typical System Manager window on startup, identifies the major components of the user interface.

Navigation Pane

The Navigation pane on the left side of the window is the principal means for selecting equipment to display status and equipment information and to perform equipment change actions.

Information Pane

The area to the right of the Navigation pane provides status and equipment information for the selected equipment. Depending on the type of equipment, the pane can include one or more of the following tabular displays:

- **General** includes tables with status and equipment information, and for stations and switches, shows the Ethernet switch to which the equipment is connected, as described in the section “General Tab” on page 49.
- **Connections** identifies the equipment connected to a station or field device and gives the status of the connected equipment; see “Connections Tab” on page 51.
- **Ports** provides status and equipment information for ports on an Ethernet switch, as described in the section “Ports Tab” on page 293.

- **Counters**, described in section “Counters Tab” on page 52, displays counters read from the selected equipment.

Accessories Pane

The Accessories pane below the Information pane provides system-wide information. The pane includes the following tabs:

- **Messages** displays all or selected system messages (page 56).
- **Alarms** lists system alarms and provides tools for acknowledging and inhibiting alarms (page 58).
- **Inhibited** shows the equipment for which alarms are inhibited and allows you to enable alarming (page 60).
- **Search** allows you to navigate to a specific piece of equipment based on a variety of search criteria such as name and equipment type (page 61).
- **Watch** tracks user-selected counters for various pieces of equipment (page 63).
- **Smon Log** displays the log for a selected system monitor (page 65).

Menus

The main menu provides a set of menus for acknowledging alarms, performing equipment change actions, selecting views, and saving and loading preferences. Context menus with equipment-specific commands can also be accessed from each item in the Navigation pane.

Toolbar

The toolbar functions include acknowledging alarms, choosing view options, selecting equipment, setting the system time and Daylight Saving Time (DST) adjustment is supported for Address Translation Stations.

Status Bar

The status bar at the bottom of the window identifies the connected System Manager service and, when a System Manager preference has been loaded from a file (as described in “Saving and Loading Preferences” on page 66), the name of the preference file.

Navigation Pane

The Navigation pane is a hierarchical display of equipment in the network, enabling you to select individual equipment items to be displayed in the Information pane. The equipment is shown in a tree view similar to the Folders display in Explorer and other Windows operating system applications.

The Navigation pane displays equipment in one of four selectable tree views:

- **System Monitor** view displays the system monitors and the equipment in each system monitor domain. On startup, only the system monitors are displayed, but each system monitor can be expanded to show the assigned switches and stations, and each station can be expanded to show connected equipment.

To select the System Monitor view:

- Click  at the top of the Navigation pane, or choose **View > Navigation > System Monitor View** from the main menu.
- The **ATS** view displays all configured ATS modules configured in LAN Interface mode. Expanding an ATS reveals the stations residing under an ATS node and its attached devices. This display is available only for systems that have ATS modules configured in LAN Interface mode.

To select the ATS view:

- Click  at the top of the Navigation pane or choose **View > Navigation > ATS View**.
- The **LAN Interface** view displays all configured LAN Interface modules. Expanding the LAN Interface view reveals all the stations residing in a particular node. The order of LIs shown in this display does not indicate the order of physical connections on the bus.

To select the LAN Interface view:

- Click  at the top of the Navigation pane or choose **View > Navigation > LAN Interface View**.
- The **Switch** view displays all stations and switches connected to a specific network switch. Each station can be expanded to display the field devices or peripherals connected to the station.

To select the Switch view:

- Click  at the top of the Navigation pane and select a switch using the pull-down list to the right of the button.

You can also select the view by choosing **View > Navigation > Switch View** from the main menu.

Each system monitor or piece of equipment is identified by an icon and its name (letterbug). Equipment status is indicated by symbols attached to the equipment icon. Additional symbols show when there are unacknowledged alarms and when alarms are inhibited.

On startup, the System Monitor view is selected and the Navigation pane shows only the system monitors and the first level of the hierarchy. If you choose the ATS, LAN Interface, or the Switch view, the Navigation pane displays the corresponding selected stations and respective hierarchies.

- Click  to the left of any view (System Monitor, ATS, LAN Interface, or Switch) or double-click the name to display the stations and switches assigned to it.
- Click  to the left of any station on the next level or double-click the station name, to display the equipment attached to the station.

- Click  to the left of any expanded equipment or double-click the equipment name to collapse the display and hide the equipment attached to the item.

You can resize the Navigation pane or use the scroll bars on the right side and bottom of the pane to bring equipment into view when the tree does not fit in the pane.

To maximize the display of the system hierarchy in the Navigation pane, you can select/deselect viewing options for both the Information pane and the Accessories pane.

- Choose **View > Information** from the main menu, or click  in the toolbar, to toggle display of the Information pane on and off.
- Choose **View > Accessories** from the main menu, or click  in the toolbar, to toggle display of the Accessories pane on and off.
- Choose **View > Navigation** from the main menu, or click  in the toolbar, to toggle display of the Navigation pane on and off.

Navigation Buttons

Use the buttons at the bottom of the Navigation pane to expand and collapse the display, select equipment, and print the contents of the Navigation pane:

Table 2-1. Navigation Pane Buttons

	Expands the display of the selected system monitor or switch domain. The first time in a session that the button is clicked for a system monitor, the hierarchy is expanded to show workstations and their peripherals, controls stations and their Primary ECBs, and switches. Thereafter, the button expands the full hierarchy to display FCMs, FBMs, and field devices also. Likewise in the Switch view, the first expansion of a switch domain adds peripherals to workstations and Primary ECBs to control stations. Thereafter, the domain is expanded to show FCMs, FBMs, and field devices.
	In the System Monitor view, collapses the system monitor domain hierarchy so that only the system monitor name is displayed. The button can be applied from the system monitor or any object beneath it. In the Switch view, collapses the tree view so that only the switch is shown. The button can be selected from any object in the tree.
	Expands the display of the selected equipment so that its child devices are displayed. This is equivalent to clicking  to the left of the item.
	Collapses the display of the selected equipment, hiding any child devices. This is equivalent to clicking  to the left of the item.
	Moves the focus to the parent of the selected item. The parent equipment or system monitor is selected in the Hierarchy Navigation box and the Information pane.
	Moves the focus to the first child of the selected item. The child equipment is selected in the Hierarchy Navigation box and the Information pane.

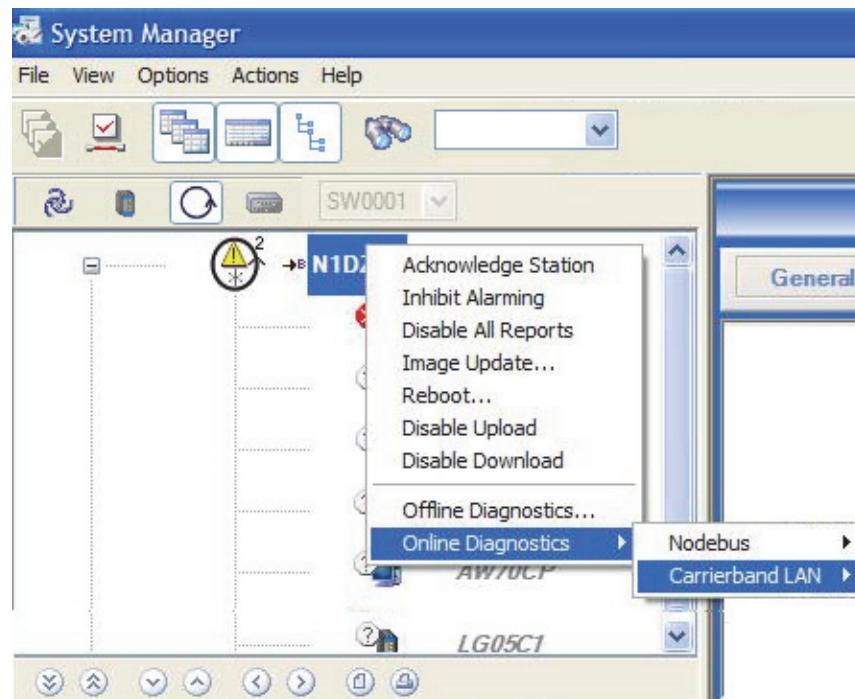
Table 2-1. Navigation Pane Buttons (Continued)

	Opens the Page Setup dialog box from which you can format and preview a printed report of the Navigation pane contents. See “Printing System Manager Information” on page 67.
	Opens the Page Setup dialog box from which you can format and print a report of the Navigation pane contents. See “Printing System Manager Information” on page 67.

Selecting Equipment

When you select a system monitor or piece of equipment in the tree:

- The Information pane displays status and equipment information about the system monitor or equipment.
- The Hierarchy Navigation box displays the equipment icon and name to the right of its parent equipment and the system monitor (if the System Monitor view is selected) or switch (if the Switch view is selected).
- Equipment-specific commands selected from the main menu or the toolbar are applied to the selected item.
- Equipment change actions are available from the context menu when you right-click on the equipment (Figure 2-1).

**Figure 2-1. Context Menu**

You can also change the selection in the Navigation pane by doing any of the following:

- Click a parent item in the Hierarchy Navigation box in the toolbar.

- Use the Go-To button and combo box in the toolbar (as described in “Go-To Feature” on page 90).
- Double-click an item listed in an Information pane Connections tab.
- Double-click an item listed in the results table in the Accessories pane Search tab.

Equipment Icons

The following table shows the icons that identify system monitors and various types of equipment:

Table 2-2. Equipment Icons

Symbol	Description
	This icon is used to identify system monitors, which are displayed in the top level of the hierarchy when the System Monitor view is selected in the Navigation pane. System monitors are not shown when other views are selected. Refer to Chapter 3, “System Monitors” for information on the displays and equipment change commands available when a system monitor is selected.
	The computer and video display icon represents a workstation. The workstations are on the second level of the hierarchy below the station’s system monitor. Refer to Chapter 4, “Workstations, Peripherals and Network Printers” for additional information.
	Peripherals such as USB- or serial/GCIO annunciator panels and printers (with the exception of the network printer which is a standalone printer) are attached to their host workstations. (This icon still represents the network printer.) Refer to Chapter 4, “Workstations, Peripherals and Network Printers” for additional information.
 	Control stations include modules such as CP and ATS. The 2 adjacent to the upper right corner of the icon indicates that the station is a fault-tolerant control station or redundant ATS. Refer to Chapter 5, “Control Stations, Control Network Interfaces, ATSs, and LAN Interface (LIs)” for additional information about control stations.
 	This icon is used to identify LAN Interface Modules, which are displayed in the top level of the hierarchy when the LAN Interface view is selected in the Navigation pane. This will also be shown as an LI station in the System Monitor view. The 2 adjacent to the upper right corner of the icon indicates that the station is a fault-tolerant LI.

Table 2-2. Equipment Icons (Continued)

Symbol	Description
  	<p>A small block icon under each control station represents the station's Primary ECB (also known as the ECB11, ECBP or Primary FBM), an equipment control block that manages communications with the attached FBMs.</p> <p>When the station is an FCP280, FCP270, CP30, or CP40, a label at the upper right corner of the block indicates which channel in the module fieldbus is being used to communicate with the station's FBMs. When the station is a ZCP270 or CP60, the label indicates which Fieldbus cable is being used to communicate with the attached FCMs.</p> <ul style="list-style-type: none"> • AUTO when the station automatically switches to the better channel or cable • Bus A when the A channel or A cable has been selected by an operator • Bus B when the B channel or B cable has been selected by an operator <p>Refer to Chapter 5, "Control Stations, Control Network Interfaces, ATSS, and LAN Interface (LIs)" for information on channel selection.</p>
	<p>For this symbol, be aware that the lightning bolt symbol is only applicable for an FCP280's Primary ECB. This symbol indicates that the communication fault is propagated to Primary ECB level if there is at least one FBM that has PIO bus failure on the HDLC fieldbus/PIO channel.</p> <p>This symbol is not shown until the station node in the Navigation pane is expanded for the first time in the session so that the System Manager retrieves the identity and status of the attached FBMs.</p>
  	<p>Fieldbus Communication Modules (FCMs) are baseplate-mounted modules that connect FBMs to a ZCP270 or CP60 over an optionally redundant Ethernet fieldbus. One or more FCMs can be shown on the level below the ZCP270 or CP60's Primary ECB (Primary FBM). A label at the upper right corner of the FCM icon indicates which channel in the module fieldbus is being used to communicate with the FBMs:</p> <ul style="list-style-type: none"> • AUTO when the station automatically switches to the better performing of the two channels • Bus A when the A channel has been selected by an operator • Bus B when the B channel has been selected by an operator <p>Refer to Chapter 7, "FCMs" for information on channel selection.</p>
	<p>The icons for baseplate mounted Fieldbus Modules (FBMs) are shown below the Primary ECB for the host FCP280, FCP270, CP30, or CP40 or the FCM that connects the FBMs to a ZCP270/CP60. Labels to the right of the FBM icon indicate the status of communication between the FBM and its host FCP280, FCP270, CP30, or CP40 or FCM including communication failures and inhibited cable alarms. Refer to Chapter 8, "Fieldbus Modules" for detailed information on these status indicators.</p>

Table 2-2. Equipment Icons (Continued)

Symbol	Description
	Certain FBMs can be expanded in the Navigation pane to show a second level of the attached intelligent field devices. These FBMs include the FoxCom™ dual-baud rate intelligent device interface and the Distributed Communication Interface (DCI) modules that support various fieldbus standards such as HART®, PROFIBUS-DPT™, and FOUNDATION™ fieldbus. The second-level items can be selected to view device status and equipment information, and to perform equipment change actions. Refer to Chapter 8, “Fieldbus Modules” for information on the DCI based FBMs, including a list of user guides for the specific fieldbus technologies.
	When the System Monitor view is used, the icon for an Ethernet switch in The Mesh control network ^a is on the second level of the Navigation pane hierarchy under the switch’s assigned system monitor. When the Switch view is used, the selected switch is at the top of the hierarchy, and stations and switches connected to it are displayed on the second level. Refer to Chapter 9, “Networking Equipment” for additional information about switches.
	The port icon does not appear in the Navigation pane, but is used in the Ports tab of the Information pane when a switch is selected. Refer to Chapter 9, “Networking Equipment” for additional information about ports.

^a For more information on this network, refer to *The MESH Control Network Architecture Guide* (B0700AZ).

Status Indicators

System Manager indicates system alarms by attaching symbols to the upper left corner of the icon. This scheme is used in the Navigation pane, the Hierarchy Navigation box, the Connections tab in the Information pane, and the results table in the Accessories pane Search tab. The table below shows how the symbols are used.

Table 2-3. Status Indicators

Symbol	Condition
	The question mark on a blue background indicates the equipment is off-line or not ready.
	The warning symbol indicates that there is at least one failed peripheral attached to the equipment.
	The X on a red background indicates that the equipment has failed.
	The question mark on a gray background indicates that the status of the equipment is unknown. There is no status response from the system monitor.

Alarm Conditions

The status of alarms associated with the equipment is indicated by symbols attached to the lower left corner of the icon in Navigation pane, the Hierarchy Navigation box, the Connections tab in the Information pane, and the results table in the Accessories pane Search tab. Table 2-4 shows how these symbols are used with a workstation.

Table 2-4. Alarm Condition Symbols

Symbol	Example	Condition
*		This equipment or an attached peripheral or field device has an unacknowledged health status change. The asterisk is removed when you acknowledge the alarm. To acknowledge the alarm, do one of the following: <ul style="list-style-type: none">• Right-click the equipment and choose Acknowledge Station or Acknowledge Device from the context menu.• Select the Alarm in the Accessories pane Alarms tab and click  in the tab toolbar.• From the main menu, select Action > Equipment Change > Acknowledge Station or Acknowledge Device.
		Alarms from the equipment are inhibited. To enable alarms: <ul style="list-style-type: none">• Right-click the equipment in the Navigation pane and choose Enable Alarming or Enable Device Alarming from the context menu.
		When there is no symbol attached to the lower left corner of the equipment, alarms are enabled and there are no unacknowledged alarms from the equipment.

Blinking and Color-Coding

If **Enable blinking** is checked in the Configuration dialog box (see “Options Menu” on page 71), the equipment name blinks when there is an unacknowledged alarm and the equipment name is shown in one of the following colors:

Table 2-5. Blinking and Color Code Alarm Indicators

Name	Condition
Yellow	The equipment has a warning condition, most often because an attached peripheral or field device has failed.

Table 2-5. Blinking and Color Code Alarm Indicators (Continued)

Name	Condition
Red	The equipment has failed.
Black	The equipment is operating normally or is off-line. The name will continue to blink if the alarm has not been acknowledged even though the equipment has returned to normal.

The blinking stops and the name is displayed in black when the alarm is acknowledged.

Information Pane

The area to the right of the Navigation pane is used to display information about the selected equipment.

- Choose **View > Information** from the main menu, or click  in the toolbar, to toggle display of the Information pane on and off.

The information is arranged in one or more tabular displays depending on the type of equipment that is selected and whether it has attached devices.

General Tab

The General tab displays status and equipment information for the selected equipment (Figure 2-2). The Equipment Status table is updated dynamically, while the Equipment Information table is updated periodically.

Values are displayed in green when they change from the previous update.

An Equipment Status field remains green until the next status update received from the equipment results in no change to that field. For example in Figure 2-2, the Failed Acknowledged State is green indicating that field was changed to **Acknowledged** when the user acknowledged an alarm. If several minutes later, the same or another user enables alarms, the Alarming State field will change from Inhibited to **Enabled** and Failed Acknowledge State will change from **Acknowledged** to **Acknowledged**. Depending on what is happening with the equipment, a status field may remain green for several seconds, several minutes, or even for the remainder of the session.

Equipment Information fields remain green for 10 seconds and then change to black if there is no change detected on the next scan of the equipment information.

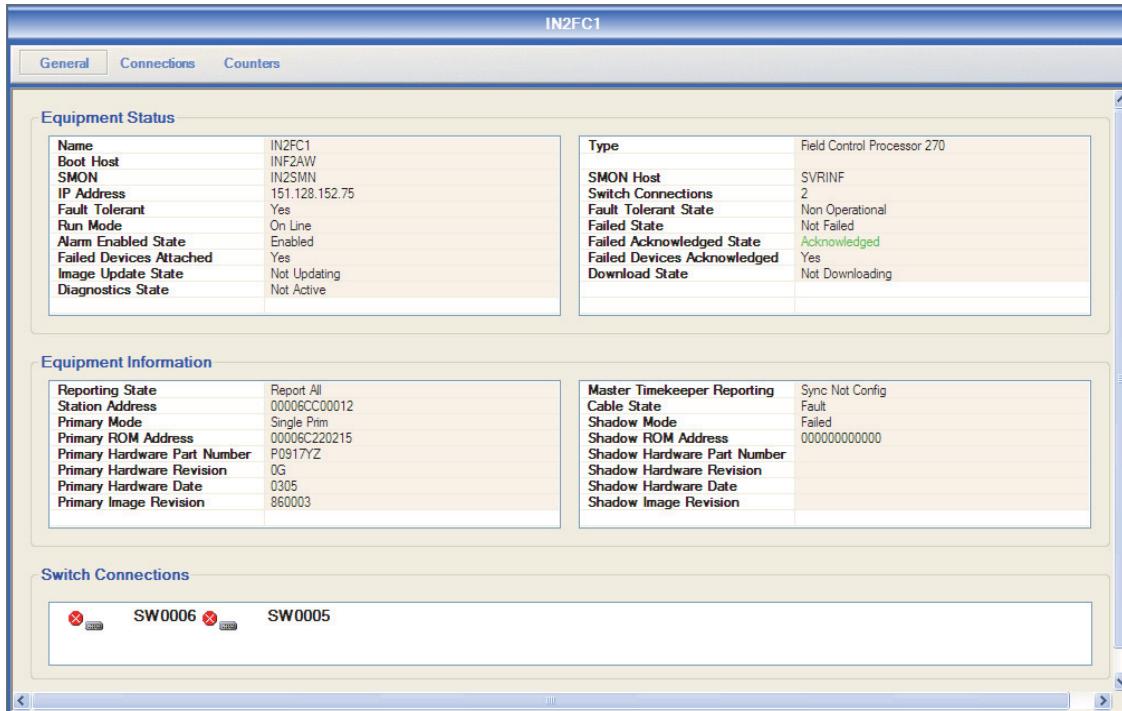


Figure 2-2. Information Pane, General Tab

The fields in both tables vary with the type of equipment selected. Figure 2-2 is the General tab for a fault-tolerant FCP270. (This pane appears similar for the fault-tolerant FCP280.) Subsequent chapters catalog the fields for system monitors and various equipment types:

- “System Monitors” on page 97
- “Workstations, Peripherals and Network Printers” on page 103
- “Control Stations, Control Network Interfaces, ATSS, and LAN Interface (LIs)” on page 135
- “Primary ECB (Primary FBM) Information” on page 167
- “FCMs” on page 225
- “Fieldbus Modules” on page 241
- “Networking Equipment” on page 289.

The General tab for stations and switches also includes a Switch Connections area that shows the switches to which the equipment is connected.

Do one of the following to select a connected switch for display in the Information pane:

- Double-click the switch name
- Right-click the switch name choose **Navigate to <switch name>** from the context menu.

Connections Tab

The Connections tab provides a summary of the attached equipment selected in the Navigation pane. It is available for stations, FCMs, FBMs, System Monitors, and Switches with attached devices. The Connections tab shows the hierarchical next level connections for the selected component. The Connections tab has been extended for LI and ATS, but in these two cases it shows logical connections rather than attached devices. Logical connections represent the stations residing under an ATS node (ATSs which are configured in LI mode) or an LI node. The Connections tab will not be shown for ATS if configured in 'Extended Mode'. Additionally, no Connections tab will be shown for ATS when seen under the Switch View. Figure 2-3 shows an example of the Connection Tab view.

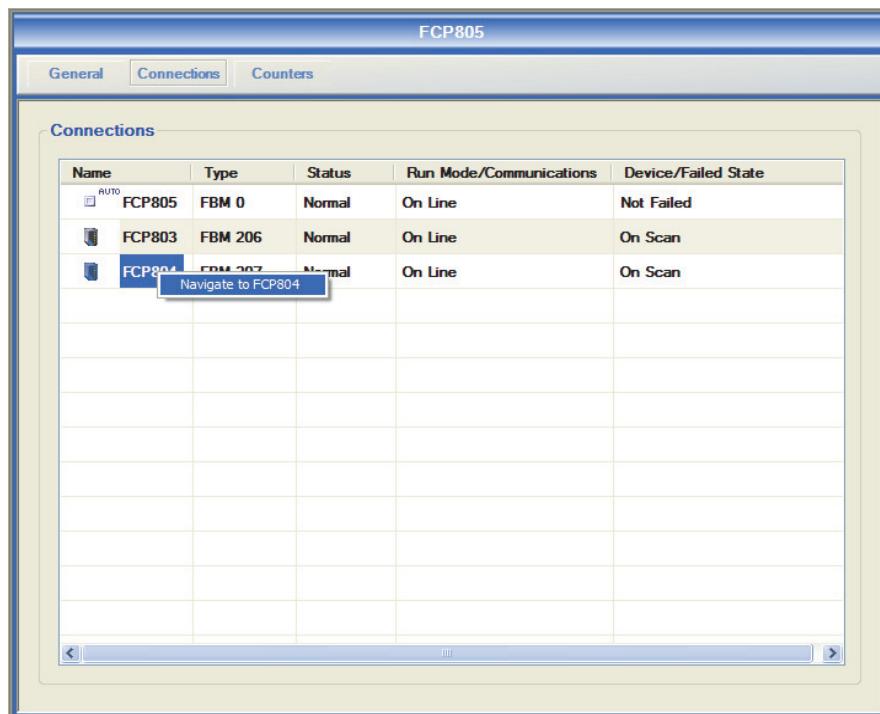


Figure 2-3. Information Pane, Connections Tab

In the Name column, the tab identifies each piece of equipment and its status using the same icons and symbols used in the Navigation pane. The other columns list the equipment type, status, run mode and failure mode.

To modify the table layout:

- Drag a column header to the right or left to change the order of the columns.
- Drag the right edge of a column to the right to increase the column width or the left to decrease the width.
- Scroll the displays if necessary using the scroll bars on the right side or bottom of the tab.

- Click any column header to sort the rows on that category; click the column a second time to reverse the sort order.

To navigate to equipment listed in the tab, do one of the following:

- Double-click the equipment name.
- Right-click the equipment name and choose **Navigate to <equipment name>** from the context menu (**Navigate to FCP804** in Figure 2-3).

The item is selected in the Navigation pane and displayed in the Information pane.

Counters Tab

System Manager provides access to a variety of counters maintained by the equipment itself to assist in monitoring performance and isolating problems. The counters track items such as messages sent and received, invalid commands, communication overruns, timeouts and so on.

Use the Counters tab for a selected station or peripheral device to periodically read the counters for the equipment. The tab also enables you to reset selected or all counters maintained by the equipment, if the workstation has the appropriate equipment change action privileges.

Individual counters can be selected in the Information pane tab and placed on a watch list to be monitored with counters for other system equipment (as described in “Watch Tab” on page 63).

The types of counters vary with the equipment and are described in subsequent chapters. Common features in the display are shown in Figure 2-4 with the Counters tab for an FCP280, or in Figure 2-5 with the Counters tab for an FCP270 selected in the Information pane and the Watch tab displayed in the Accessories pane.

The Counters tab includes one or more tables showing the Current and Previous values and the Maximum and Minimum readings for each counter. Maximum and Minimum are the highest and lowest values read from the equipment in the current System Manager session.

When you select the tab, System Manager reads the counter values from the equipment, and updates the columns accordingly. If this is the first time in a System Manager session that the counters are read, the Current, Maximum, and Minimum values are equal, and the Previous column is empty. You can then read all or selected counters. The new Current value is displayed in green text if it differs from the previous value.

The Counters tab for workstations and control stations include five separate tables of counters, which are selected using the Counter Categories radio buttons (Figure 2-5). These tables of counters are:

- Diagnostic Counters - for FCP280 only
- MAC Sublayer- for FCP270/ZCP270 or earlier control processors only
- Network Layer
- Transport Layer
- Application Layer

- Loading Parameters

Note Network Layer option will be enabled for LI and ATS stations only.

Figure 2-4 is an FCP280 Counters tab with the Diagnostic Counters selected.

Counter	Current Value	Previous Value	Maximum	Minimum
Bad Ethernet Packets	0	0	0	0
Ethernet Miscompares	74	74	74	74
Ethernet Port Switchovers	0	0	0	0
Hot Remany Count	0	0	0	0
Maximum NetBuffers Used	87	87	87	87
PIO Miscompares	0	0	0	0
PIO Timeouts	0	0	0	0
Primary Corrected Memory Error	0	0	0	0
Probe Packet Failures	1	1	1	1
Shadow Corrected Memory Error	0	0	0	0
Total Received Packets	24499	24499	24499	24499
Total Transmitted Packets	14077	14077	14077	14077

Figure 2-4. Counters Tab for FCP280

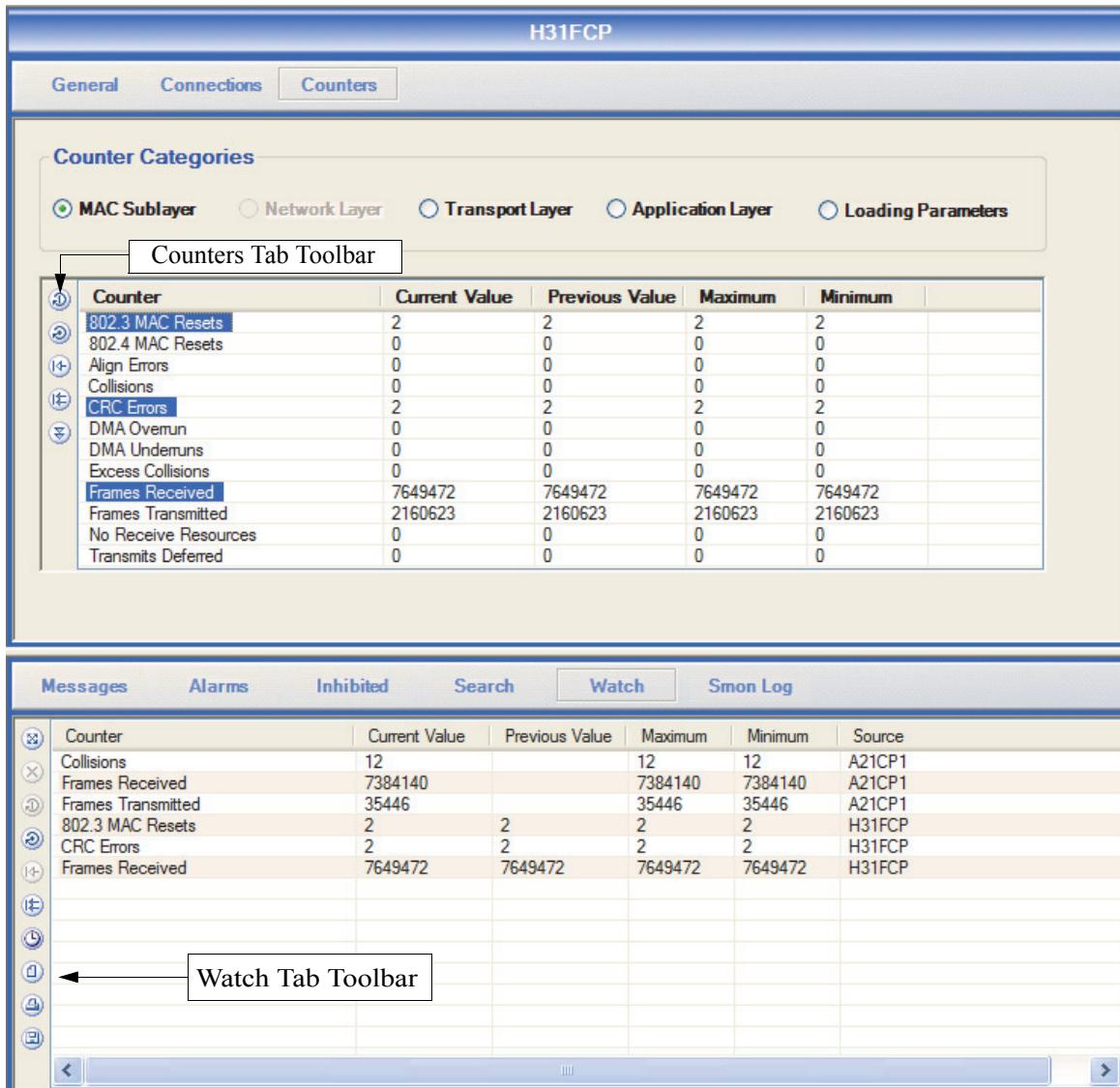


Figure 2-5. Information Pane, Counters Tab and Watch Tab

- To select multiple counters, click the first counter and then press **Ctrl** as you click each additional item.

The Counters tab toolbar includes the function buttons listed in the following table:

Table 2-6. Counters Tab Toolbar Buttons

	Reads the selected counters and updates the Current, Previous, Maximum and Minimum values accordingly. The new value is displayed in green if it differs from the previous reading.
	Reads all counters in the table from the equipment and updates the Current, Previous, Maximum and Minimum columns accordingly.

Table 2-6. Counters Tab Toolbar Buttons (Continued)

	Resets the selected counters. The selected counters are restarted in the equipment, and new values (usually, but not necessarily, 0) are displayed in the Current, Maximum and Minimum columns. The Previous column shows the counter value before the reset. This command is available only if the workstation has equipment change action privileges. This button is not active for switch port counters, as these counters cannot be reset from System Manager.
	Resets all counters. This command is available only if the workstation has equipment change action privileges. This button is not active for switch port counters, as these counters cannot be reset from System Manager.
	Adds the selected counters to the Watch tab in the Accessories pane (as described in “Watch Tab” on page 63). You can also add counters to the Watch tab by dragging them from the Counters tab to the Watch tab.

Accessories Pane

The Accessories pane, which is positioned below the Information pane, provides system-wide information and navigation tools in the following tabbed pages:

- Messages
- Alarms
- Inhibited
- Search
- Watch
- Smon Log

To show or hide the Accessories pane:

- Click  in the toolbar or choose **View > Accessories** from the main menu.

Each tab features a toolbar with buttons that enable you to perform related tasks, navigate to specific equipment, and print and save the tab contents. You can also do any of the following to adjust the display:

- Drag the bottom edge of the Information pane up or down to adjust the number of rows displayed in the Accessories pane.
- Drag a column header to the right or left to re-arrange the order of the columns.
- Use the scroll bars on the right side of a tab to view additional rows in a table.
- Click a column header to sort the table rows on the data in the column; click the header a second time to reverse the sort order. This feature is not available in the Messages and Smon Log tabs.

Each tab includes three buttons for printing and saving the tab contents:

- Click to open the Page Setup dialog box from which you can format and preview a printed report of the tab contents.
- Click to open the Page Setup dialog box from which you can format and print a report of the tab contents.
- Click to output the contents of the tab to a file.

See “Printing System Manager Information” on page 67 for additional information on printing.

Messages Tab

The first tab in the Accessories pane lists system messages in a three-column display, showing the message index, a timestamp when the message was received by System Manager and the message text (Figure 2-6).

When System Manager is started it begins accumulating system messages in a list, and makes these messages available in the Messages tab. When there are 500 messages in the list, incoming messages replace older messages on a first-in, first-out basis. The message index is not reset until the list is cleared.

The messages are cleared from local memory when the System Manager session is ended. Click in the Messages tab toolbar to save messages in a separate file.

Messages			Alarms	Inhibited	Search	Watch	Smon Log
Index	Date/Time	Message					
472	03/05/2009 22:51:32	Read Counter for FCP001 request failed. Error: Station is down					
471	03/05/2009 16:14:24	Current Tokenbus master is N1DZL1					
470	03/04/2009 20:02:13	New Nodebus Test Initiator is ATS001					
469	03/04/2009 20:02:01	SMNX03 Acknowledge Cable Faults Status = CABLE FAULTS ACTIVE					
468	03/04/2009 20:02:01	SMNX03 Sysmon Updated Status = SYSTEM MONITOR RESTOK					
467	03/04/2009 19:57:30	New Nodebus Test Initiator is ATS001					
466	03/04/2009 19:57:15	Station Equipment Information for CP60F1 request failed. Error: Station is down					

Figure 2-6. Accessories Pane, Messages Tab

To change the way the messages are displayed:

- Drag a column header to the right or left to re-arrange the order of the columns.

The Message tab toolbar includes the following buttons:

Table 2-7. Messages Tab Toolbar Buttons

	Clears the Messages tab, empties the message list, and resets the message index. System Manager displays a dialog box so you can confirm the action.
	Toggles display of the message filtering controls on the left side of the tab.
	Opens the Page Setup dialog box from which you can format and preview a printed report of the tab contents.
	Opens the Page Setup dialog box from which you can format and print a report of the tab contents.
	Outputs the contents of the tab to a file.

Message Filtering

Use the message filtering controls to select which messages are displayed in the tab. The selection can use any combination of three criteria:

- Date and time range
- Messages that include a specific text string (Match)
- Messages that do not include specified text (Filter).

To display only messages of immediate interest:

1. Click in the tab toolbar to display filtering controls in the tab (Figure 2-7).
2. Check **Date/Time Range** and use the Begin and End controls to specify the range.
 - The dates can be changed manually or with a calendar control pulled down with the arrow button on the right edge of each date field.
 - The times can be specified manually (using a 24-hour clock) or by clicking the spinner buttons on the right edge of each time field.
 - Uncheck Date/Time Range to display messages from the full range stored by System Manager.
3. Right-click **Match** and choose **Create** from the context menu to add a match string (with the default name **edit text**) under Match.
4. Right-click the string, choose **Edit** from the context menu, and specify the text to be used in the match.

The Match and Filter fields use substring searches. Thus, for example, **CP12** would find **FCP123**, **ZCP122**, and **ZCP129**.

5. Add other match strings.
6. Right-click any match string and choose **Edit** from the context menu to change the string or **Delete** to remove it.
7. Right-click **Filter** and add filtering criteria using the same procedures as used for creating, editing and deleting Match strings.

8. Check the box for **Match** and the box for each individual match string you want to apply.

As set in Figure 2-7, the Messages tab will display any message that includes the string Inhibit, but it will not apply the match string FC.

9. Check the box for **Filter** and the box for each filter criteria you want to apply.
10. Click **Apply** to display only messages that meet the criteria.

System Manager clears the tab and displays messages that match the criteria. New messages are displayed only if they meet the specified time, match and/or filter criteria.

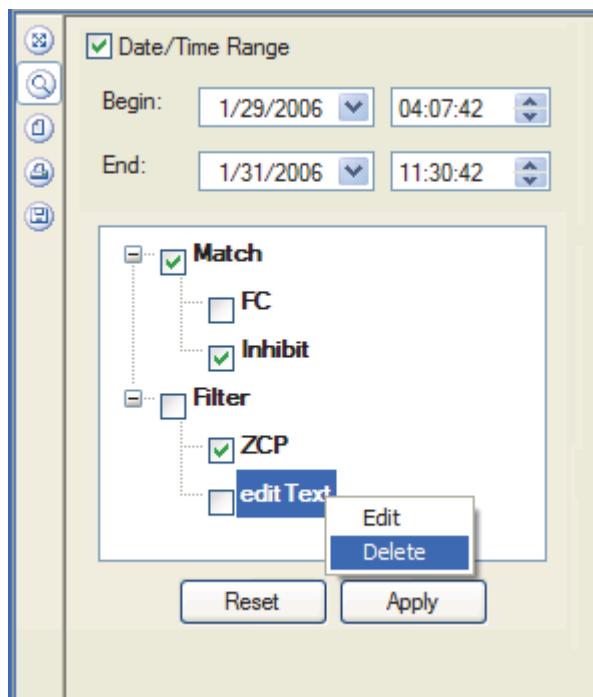


Figure 2-7. Messages Tab Filtering Controls

Alarms Tab

The Alarms tab (Figure 2-8) lists both device and cable alarms in a multi-column display:

Table 2-8. Alarms Tab Display Fields

*	An asterisk indicates that an alarm has not yet been acknowledged. Otherwise, the column is blank.
Index	A unique ID number.
Date/Time	The timestamp indicates when the alarm was generated.
Source	Source from which System Manager received the alarm, usually a system monitor.

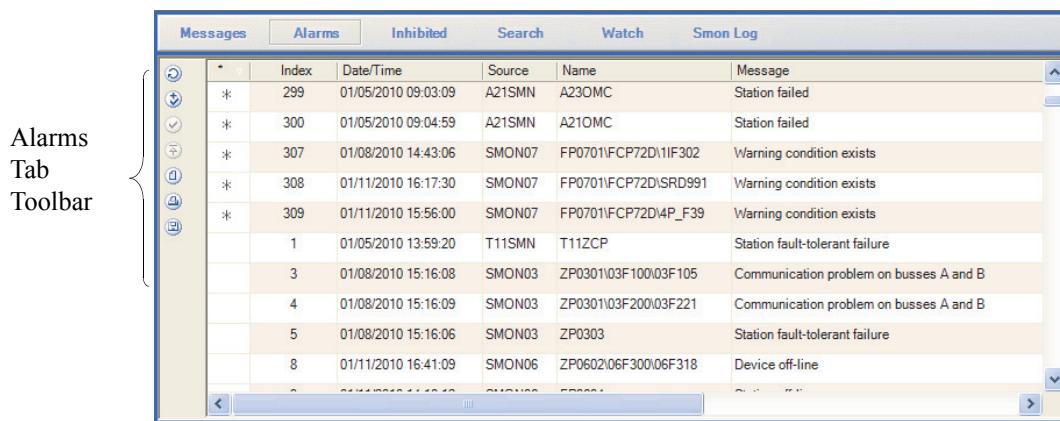
Table 2-8. Alarms Tab Display Fields (Continued)

Name	Letterbugs of the affected equipment. The alarm condition exists in the last item in the string of letterbugs and has been propagated up to the parent equipment to the left.
Message	Text describing the alarm condition.

To change the way the alarms are displayed:

- Drag a column header to the right or left to re-arrange the order of the columns.
- Click a column header to sort the rows on data in the column; click the column a second time to reverse the sort order.

The rows can be sorted on any column. For example, in Figure 2-8 the table has been sorted to list the unacknowledged alarms at the top.

**Figure 2-8. Accessories Pane, Alarms Tab**

The Alarms tab toolbar includes the following buttons:

Table 2-9. Alarms Tab Toolbar Buttons

	Refreshes the display to include the most recent alarms.
	Acknowledges all system alarms, including cable alarms.
	Acknowledges the selected alarm.
	Inhibits alarms from the selected device. Clicking this button is equivalent to selecting the equipment in the Navigation pane and choosing Inhibit Alarming , Inhibit Device Alarming or Inhibit PIO Bus Cable A/B Alarms from the context menu.
	Opens the Page Setup dialog box from which you can format and preview a printed report of the tab contents.
	Opens the Page Setup dialog box from which you can format and print a report of the tab contents.
	Outputs the contents of the tab to a file.

Inhibited Tab

System Manager enables you to inhibit alarming for selected equipment so that the system monitor continues to indicate overall system and network health even while the equipment is failed or off-line. When alarming is inhibited, the system does not send alarm messages for the equipment to the printer or historian.

To inhibit alarms from a specific piece of equipment, do one of the following:

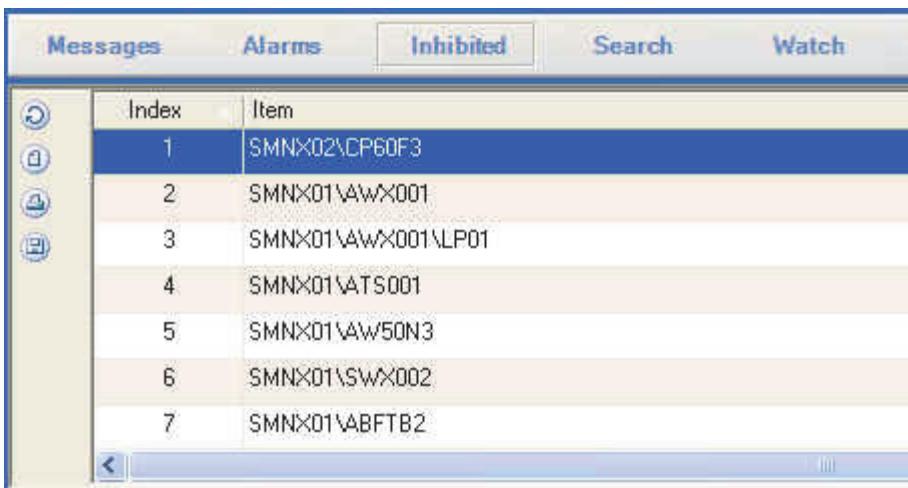
- Right-click the equipment in Navigation pane and choose **Inhibit Alarming**, **Inhibit Device Alarming** or **Inhibit PIO Bus Cable A/B Alarms** from the context menu.
- Select an alarm from the equipment in the Alarms tab and click  in the Alarms tab toolbar.

The Inhibited tab (Figure 2-9) lists all equipment on the network for which alarming is inhibited. This equipment can include cables, stations, switches, and field devices.

The Item column lists the system monitor, the parent devices and the equipment.

To change the way the inhibited items are displayed:

- Drag a column header to the right or left to re-arrange the order of the columns.
- Click a column header to sort the rows on data in the column; click the column a second time to reverse the sort order.



Index	Item
1	SMN\02\CF60F3
2	SMN\01\AW\001
3	SMN\01\AW\001\LP01
4	SMN\01\ATS001
5	SMN\01\AW50N3
6	SMN\01\SW\002
7	SMN\01\ABFTB2

Figure 2-9. Accessories Pane, Inhibited Tab

The Inhibited tab toolbar includes the following buttons:

Table 2-10. Inhibited Tab Toolbar Buttons

	Refreshes the display to include the most recent inhibited items.
	Opens the Page Setup dialog box from which you can format and preview a printed report of the tab contents.
	Opens the Page Setup dialog box from which you can format and print a report of the tab contents.
	Saves the list of inhibited alarms to a file.

To enable alarming:

1. Select the equipment in Navigation pane.
2. Choose **Enable Alarming**, **Enable Device Alarming**, or **Enable PIO Bus Cable A/B Alarms** from the context menu.

Search Tab

Use the Search tab (Figure 2-10) to find a specific piece of equipment based on a variety of search criteria such as name and equipment type, and then navigate to the equipment. The tab consists of fields on the left for specifying search criteria and a table on the right to display search results.

The Search tab toolbar includes the following buttons:

Table 2-11. Search Tab Toolbar Buttons

	Clears the search criteria and empties the results table.
	Opens the Page Setup dialog box from which you can format and preview a printed report of the search results.
	Opens the Page Setup dialog box from which you can format and print a report of the search results.
	Outputs the equipment listed in the results table to a text file.

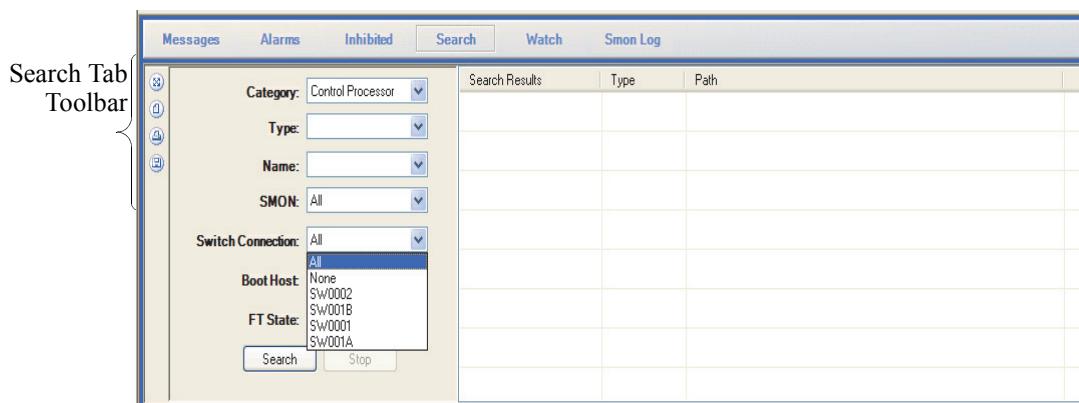


Figure 2-10. Accessories Pane, Search Tab

To find equipment:

1. Use the **Category** pull-down menu to select system monitors or one of the following general categories of equipment:

- SMON
- Switch
- Workstation
- Control Processor
- Network Printer

The tab displays fields for additional search criteria appropriate for the selected category.

2. Enter additional search criteria in the additional fields if desired.

- Use the drop-down list in fields such as **Type**, **SMON** or **Boot Host** to select additional criteria. For example, **SMON** is the System Monitor that monitors the equipment for which you are searching,
- Enter a text string in the name field, using an asterisk as a wildcard. For example:
 - Enter **FCP123** to find the device whose name matches the string FCP123 exactly.
 - Enter **FCP*** to search for names that start with the FCP.
 - Enter ***CP*** to find all names that contain the string CP.
 - Enter ***804** to find all names that end with the string 804.

The drop-down lists contain the search strings used for previous searches. The strings are cleared when System Manager is closed.

- To find a classic workstation or control processor, select **None** in the Switch Connection drop-down menu. **All** is the default option in the Switch Connection field. Refer to Figure 2-10.
3. Click **Search** to start the search and display the results in the table to the right.
 4. Do one of the following to navigate to an item in the table, select the item in the Navigation pane and display the equipment status and information in Information pane:
 - Double-click the equipment name.
 - Right-click the equipment and choose **Navigate to <equipment name>** from the context menu.

To change the way the search results are displayed:

- Drag a column header to the right or left to re-arrange the order of the columns.
- Click a column header to sort the rows on data in the column; click the column a second time to reverse the sort order.

Watch Tab

Use the Watch tab to monitor up to 25 counters for different pieces of equipment. The counters are selected from the Counters tabs for the equipment to be monitored. Figure 2-11 shows a Counters tab for an FCP270 above the Watch tab. (This tab is similar for the FCP280.)

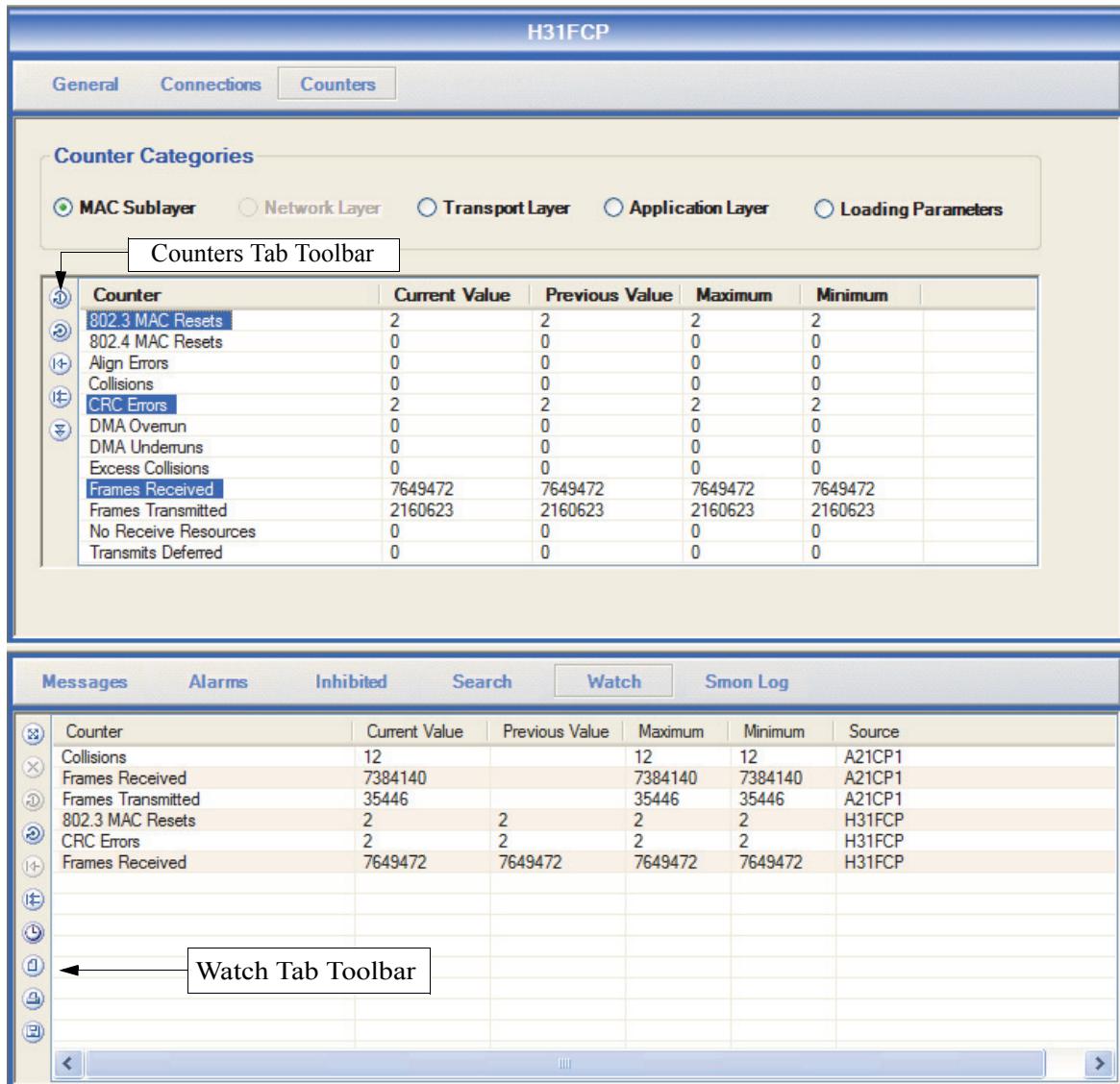


Figure 2-11. Accessories Pane, Watch Tab

To add counters to the watch list:

1. Select the equipment in the Navigation pane and click the **Counters** tab in the Information pane.
2. Select one or more counters in the Counters tab and do one of the following:
 - Click the button in the Counters tab toolbar.
 - Drag the items to the Watch tab.

The counters are inserted in the next available lines in the Watch tab.

Note Counters in the Loading Parameters table for workstations and control stations cannot be added to the Watch tab as their values are static.

The counter is identified by name and the equipment letterbug (Source). The Current, Previous, Maximum and Minimum values are copied from the Counters tab, but once copied, these values can be read and reset from the Watch tab.

To change the way the counters are displayed:

- Drag a column header to the right or left to re-arrange the order of the columns.
- Click a column header to sort the rows on data in the column; click the column a second time to reverse the sort order.

To select multiple counters in the Watch tab:

- Click the first counter and then press **Ctrl** while clicking the additional counters.

The Watch tab toolbar includes the following buttons:

Table 2-12. Watch Tab Toolbar Buttons

	Clears all counters from the watch list.
	Removes the selected counters from the list.
	Reads the selected counters, updating the values in the tab. New values are displayed in green if they differ from the previously read values.
	Reads all counters on the watch list.
	Resets the selected counters. The counters are restarted in the respective equipment, and new values (usually, but not necessarily, 0) are displayed in the Current, Maximum and Minimum columns. The Previous column displays the value prior to the reset. This command is available only if the workstation has equipment change action privileges.
	Resets all counters on the watch list. This button is not active when the list contains any switch port counters, as these counters cannot be reset from System Manager. This command is available only if the workstation has equipment change action privileges.
	Enables the auto-refresh feature, in which System Manager periodically reads all counters on the watch list. The fewer the counters on the list the more frequently the list is refreshed.
	Opens the Page Setup dialog box from which you can format and preview a printed report of the tab contents.
	Opens the Page Setup dialog box from which you can format and print a report of the tab contents.
	Outputs the contents of the tab to a file.

Smon (System Monitor) Log Tab

Use the Smon (System Monitor) Log tab to review the log for a selected system monitor:

- Pull down the **Smmons** list on the left to select the system monitor and click **View**.

The system monitor messages are displayed on the right.

If there is no log for the selected system monitor, System Manager prompts you to create one.

A dialog box advises you when the log has been renamed or deleted.

Note

- System Manager does not support creating or viewing System Monitor logs hosted on Solaris stations.
- The **View** button is disabled when you select a System Monitor with unknown status.
- If the Smon host workstation is not reachable, an error message appears stating that Cannot access Smon Log on <Station Name>, Station unreachable.



Figure 2-12. Accessories Pane, System Monitor Log

System Manager reads the selected log and displays approximately 1,000 of the most recent entries.

The tab shows when the log was created and the current size of the log in the system monitor workstation.

- Use the scroll bar on the right side of the tab to scroll to previous log entries.

The SMON Log tab toolbar includes the following buttons:

Table 2-13. SMON Log Tab Toolbar Buttons

	Clears the selected system monitor log. This command is only available if the workstation has equipment change action privileges.
	Opens the Page Setup dialog box from which you can format and preview a printed report of the tab contents.

Table 2-13. SMON Log Tab Toolbar Buttons (Continued)

	Clears the selected system monitor log. This command is only available if the workstation has equipment change action privileges.
	Opens the Page Setup dialog box from which you can format and print the log.
	Outputs the contents of the tab to a file.

Menus

This section describes the menus that can be pulled down from the System Manager main menu. Many of the options in these menus can be accessed from a toolbar icon or from a context menu when you right-click the equipment name in the Navigation pane.

File Menu

The File menu contains selections for printing System Manager information, saving and loading preferences, and exiting the application.

Saving and Loading Preferences

You can save the current System Manager layout and configuration settings to a file so that the setup can be applied to the current session or to a future session. The preferences that are saved include:

- Selected System Manager service
- Actions and View settings specified in the Configure dialog box
- Size, layout, and visibility of the Navigation, Information and Accessories panes
- Size of the System Manager window.

To save the current System Manager layout:

1. Choose **File > Save Preferences** from the main menu to open the Save Preferences dialog box (Figure 2-13).

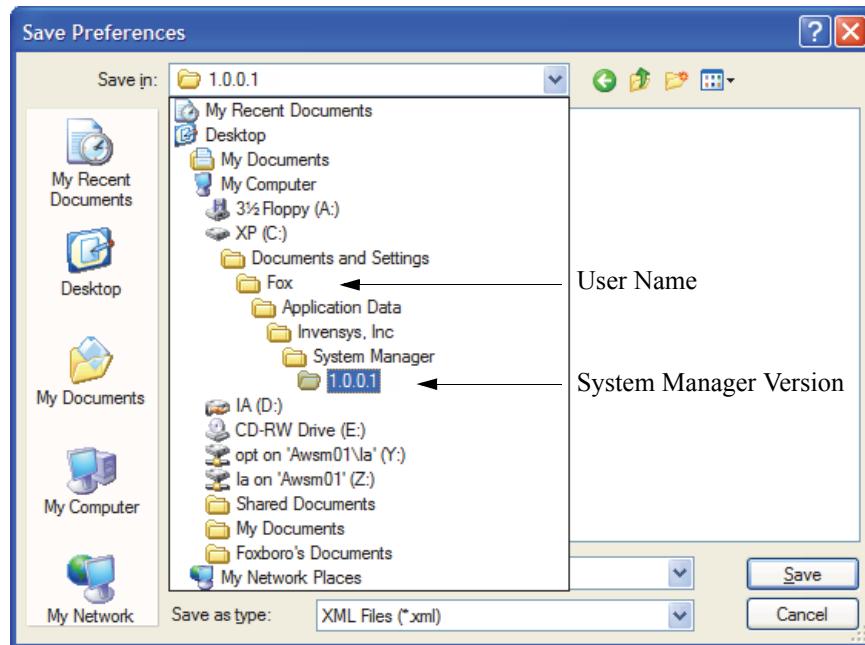


Figure 2-13. Save Preferences Dialog Box

2. Use the dialog box to specify a folder and a file name (but not extension) for the preferences.

Figure 2-13 shows the default path for preferences files, the Applications Data folder in the user's Documents and Settings. Note that the two variable elements in this path are the user name and the version number.

3. Click **Save**.

Multiple preferences files can be created.

When it initializes, System Manager always uses a default layout and connects to the System Manager service in use at the end of the previous session. You can load a previously saved setup at any time during a session.

To load previously saved preferences, do one of the following:

- Choose **File > Load Preferences** from the main menu, use the Windows operating system Open dialog box to browse for and select the preference file, and click **Open**.
- Choose **File > Recent Files > {File Name}** from the main menu.

Recent Files lists preference files loaded in the current and previous sessions.

Printing System Manager Information

Print opens a submenu for selecting an area of the System Manager window to be printed:

- **File > Print > Accessories > {Current Tab}** prints the tab currently displayed in the Accessories pane.

- **File > Print > Information > {Current Tab}** prints the tab currently displayed in the Information pane.
- **File > Print > Navigation** prints the contents of the Navigation Pane. The selection creates an image of the equipment hierarchy as it is arranged in the Navigation pane.

Before selecting the Navigation pane for printing, select System Monitor, ATS, LAN Interface, or Switch view, and expand items and collapse others to specify which equipment is to be included in the output.

Note For details on sharing a network printer on workstations with Windows 7 or servers with Windows Server 2008 R2 Standard, refer to the appendix “Printer Sharing” in the *Control Core Services v9.x Software Installation Guide* shipped with your version of Foxboro Evo.

To print System Manager information:

1. Select an area to be printed using the **File > Print** submenus.

Each selection opens the Page Setup dialog box which you can use to modify the print format, select a printer, preview the image, and print the report (Figure 2-14).

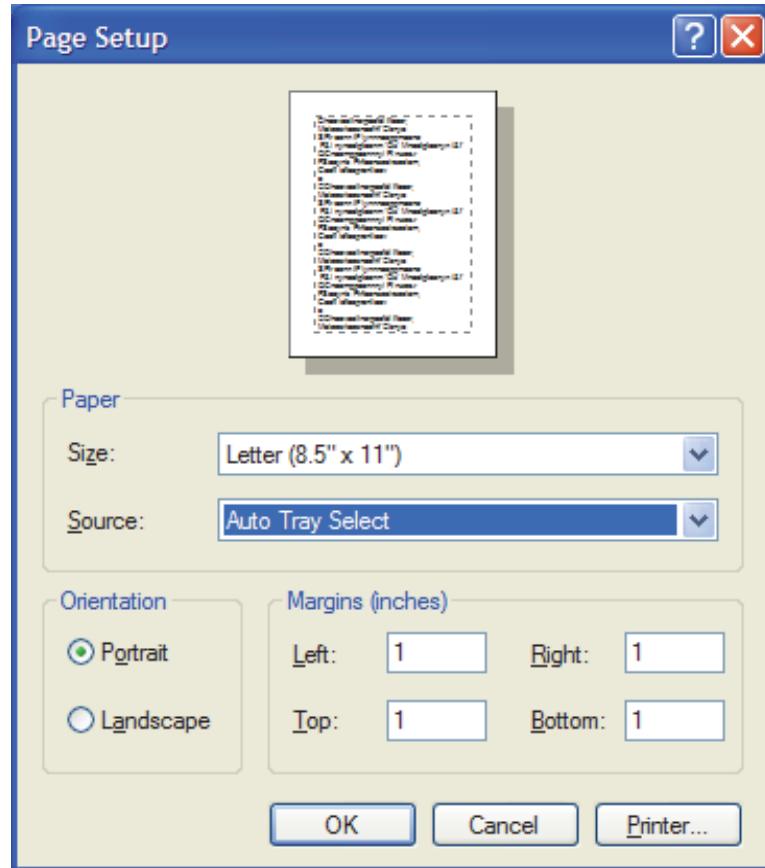


Figure 2-14. Page Setup Dialog Box

2. Use the dialog box controls to make changes in the page layout, and if desired, click **Printer** to select a printer and printer properties.

The printer properties dialog boxes vary with the type of printer selected.

3. Click **OK** to display the report in the **Print preview** window (Figure 2-15).
4. Use the controls at the top of the window to scale the preview and select the number of pages to be displayed in the preview.
5. Click **Close** to return to the Page Setup page if the page layout requires change.
6. Click  to print the report using the selected printer and layout.

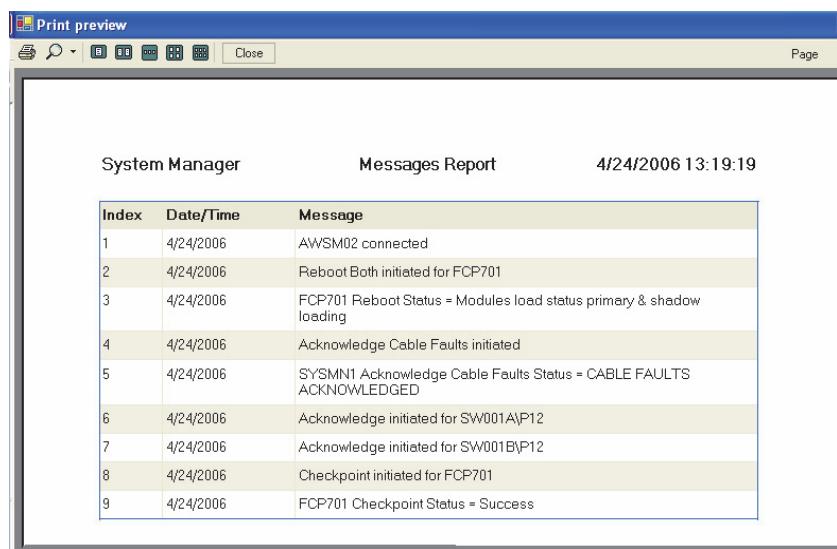


Figure 2-15. Print Preview of the Messages Tab

The Navigation pane and each of the Accessories tabs include two print selection buttons that also enable you to print the contents of the window area:

	Opens the Page Setup dialog box (Figure 2-14) from which you can format and preview a printed report of the selected display.
	Opens the Page Setup dialog box from which you can format and print a report of the selected display.

Exit

To end a System Manager session:

- Choose **File > Exit** from the main menu, or click  at the right edge of the title bar.

If a preference file is currently loaded, a dialog box prompts you to save changes made to the System Manager layout during the current session (Figure 2-16), even if no changes were made to the loaded layout. There is no prompt to save changes made to the Default layout.

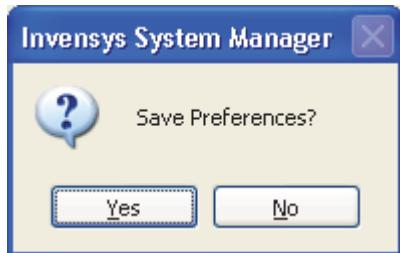


Figure 2-16. Saving Changes to a Preference File

If you issued commands such as Acknowledge All Stations just before closing the window, the commands may still be executing after you exit. Once initiated, the commands are not dependent on the window remaining open.

View Menu

Use the View menu to select viewing and navigation options:

- Choose **View > Accessories**, or click  in the toolbar, to toggle display of the Accessories pane on and off.
The Accessories pane is described on page 55.
- Choose **View > Information**, or click  in the toolbar, to toggle display of the Information pane on and off.
The Information pane is described page 49.
- Choose **View > Navigation**, or click  in the toolbar, to toggle display of the Navigation pane on and off.
- Choose **View > Navigation View > Hierarchy** to toggle display of the Hierarchy Navigation box in the toolbar.
The Hierarchy Navigation box is described page 90.
- Choose **View > Navigation View > System Monitor View** to change the Navigation pane to the System Monitor view.
- Choose **View > Navigation View > ATS View** to change the Navigation pane to ATS view.
- Choose **View > Navigation View > LAN Interface View** to change the Navigation pane to the LAN Interface view.
- Choose **View > Navigation View > Switch View** to change the Navigation pane to the Switch view.
- Choose **View > Status bar** to toggle display of the status bar at the bottom of the window.
The status bar displays the connected System Manager service, the most recent system message, and the name of the preferences file.
- Choose **View > Toolbar** to toggle display of the toolbar.

Options Menu

The Configure command in the Options menu opens a dialog box for specifying connection to a System Manager service, setting requirements for equipment change actions, and choosing view preferences (Figure 2-17).

When System Manager is started for the first time on a workstation, the application displays a Configuration dialog box so that you can specify a local or remote connection to a System Manager service.

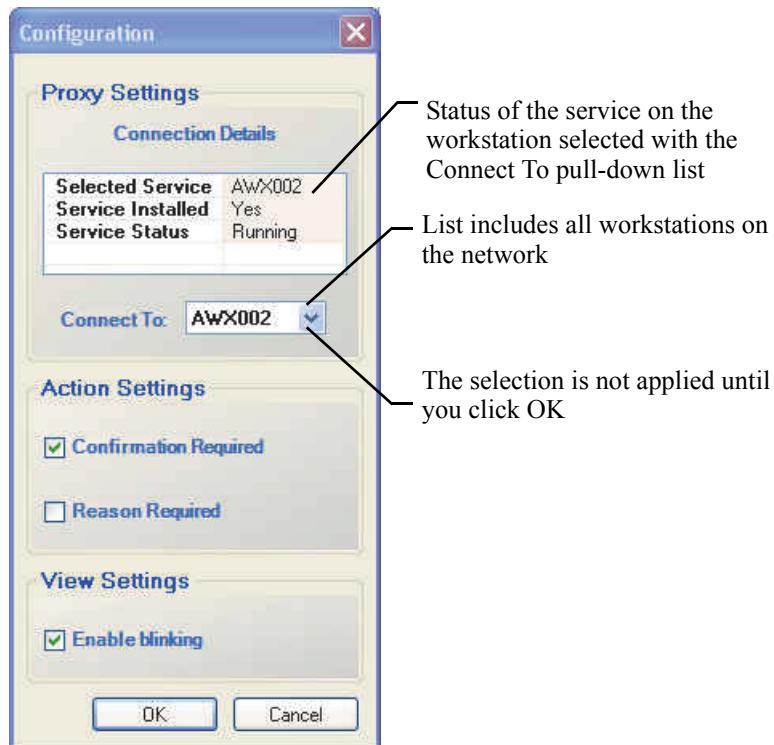


Figure 2-17. Configuration Dialog Box

Proxy Settings

On startup, System Manager automatically connects to a System Manager service on a workstation specified in the Proxy Settings group in the Configuration dialog box (Figure 2-17).

Note If you are running security enhanced I/A Series software v8.5-8.7, you must be logged in to a user account with administrative privileges in order to switch to a System Manager Service running on a Windows Server 2003 server. If you are logged in to a Plant Operators account, for example, System Manager will report an error if you attempt to connect to a System Manager Service on a Windows Server 2003 server.

In addition, on security enhanced I/A Series software v8.8 or Control Core Services v9.0 or later, System Manager v2.3 or later allows members of the Plant Admins, Plant Engineers and Plant Operators groups to switch to a System Manager Service.

If the connection cannot be made, System Manager displays a Connection dialog box (Figure 2-18). Click **Yes** to make additional attempts, or click **No** and select a different service in the Configuration dialog box.



Figure 2-18. Unsuccessful Connection to System Manager Service

To select a different connection after clicking **No**:

1. Choose **Options > Configure** from the main menu to open the Configuration dialog box.
The **Connect To** field includes a pull-down list of all workstations on the network and the **Connections Details** table shows whether the System Manager service is installed and running on the selected workstation.
2. Use the **Connect To** pull-down menu to select a workstation, confirm that the service is operating on the station, and then click **OK**.

If the connection cannot be made because the System Manager service is not running or System Manager service has a different version, such as, V2.0, then the following dialog box will be shown:

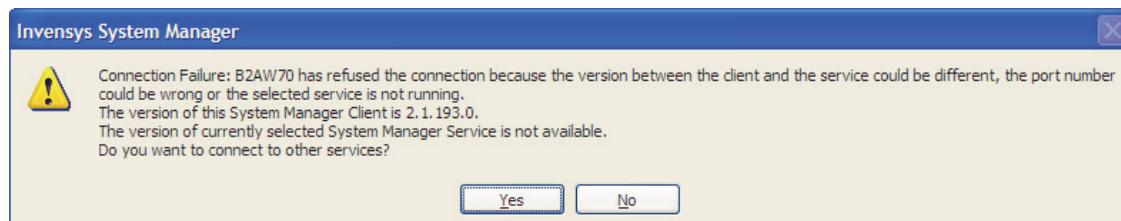


Figure 2-19. System Manager - Connection Failure 1

If System Manager client is trying to connect to System Manager service which has a different version and the version number is available, then the following dialog box is shown:

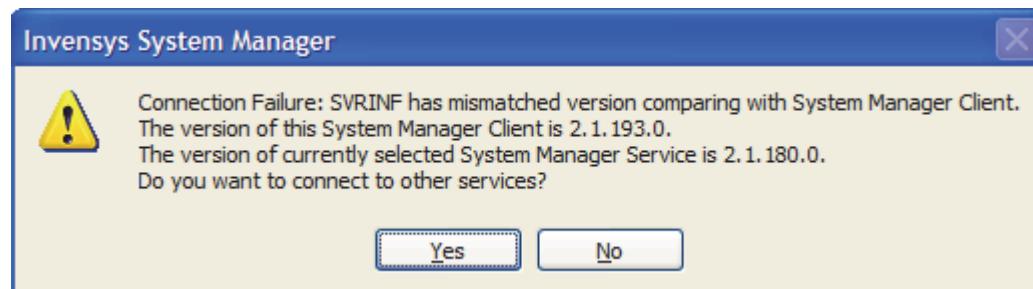


Figure 2-20. System Manager - Connection Failure 2

If either of the errors as shown in Figure 2-19 and Figure 2-20 appears, clicking **No** cancels the connection process, and clicking **Yes** allows you to connect to another System Manager service.

To connect to a different System Manager service:

1. Click **Yes** and the Configuration dialog box appears.
2. Use the **Connect To** pull-down menu on the Configuration dialog box to select a workstation.
3. Confirm that the service is operating on the station (that is, **Service Installed** is **Yes** and **Service Status** is **Running**), and then click **OK**.

Reconnecting to the System Manager Service

You may need to reconnect to the System Manager service if the following message appears (Figure 2-21). When this message appears, the System Manager graphical user interface is grayed out and the status bar indicates that the workstation is disconnected.

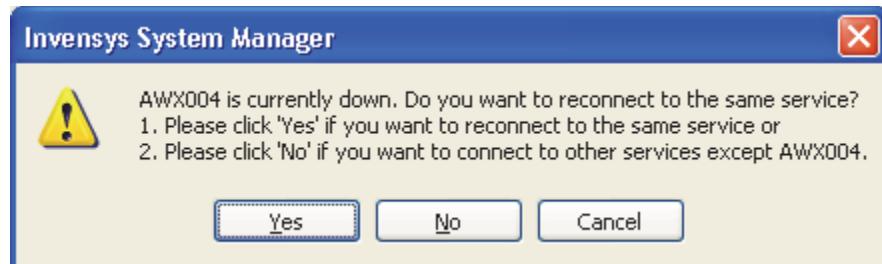


Figure 2-21. Reconnecting to a System Manager Service

When this message appears:

- Click **Yes** if you want to connect to the same System Manager service, and the status bar should indicate that the workstation is connected. If the connection is not successful, the dialog box in Figure 2-22 appears allowing you to periodically retry the connection.
- Click **No** if you want to connect to the System Manager service on a different workstation.

If you choose **No** to connect to a different workstation, the Configuration dialog box appears. To select a new System Manager service:

1. Use the **Connect To** pull-down menu to select a workstation.
2. Confirm that the service is operating on the station (that is, **Service Installed** is **Yes** and **Service Status** is **Running**), and then click **OK**.

If the connection is not successful, the dialog box in Figure 2-22 appears allowing you to periodically retry the connection. Click **Yes** to retry the operation and **No** to cancel.

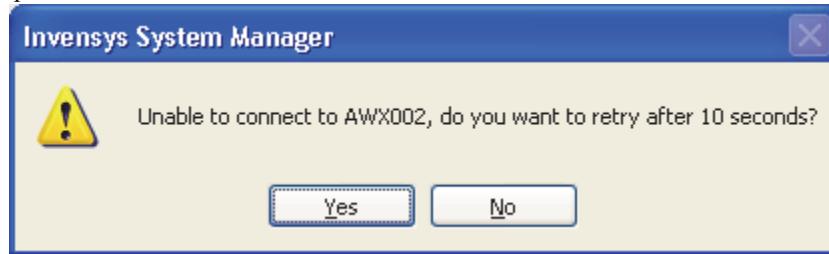


Figure 2-22. Unsuccessful Connection to System Manager Service

Action Settings

Action Settings are applied to the equipment change actions such as Reboot and Off-Line that affect the operational status of the selected station or device. The settings are not applied to alarm acknowledgments, commands to inhibit and enable alarms, and channel/cable switching.

The equipment change commands are initiated from the Actions menu and the equipment's context menus in the Navigation pane. There are two settings:

- When **Confirmation Required** is checked, System Manager displays a confirmation dialog box when one of the commands is initiated (Figure 2-23, top).
- If **Reason Required** is checked, the confirmation dialog box is expanded to include a field for noting why the command was initiated (Figure 2-23, bottom).

The text entered in the Reason field is used to generate a System Monitor message that can be received by other applications, such as AIM*Historian and FoxCTS, in addition to the System Monitor log.

Reason Required is only available when Confirmation Required is checked.

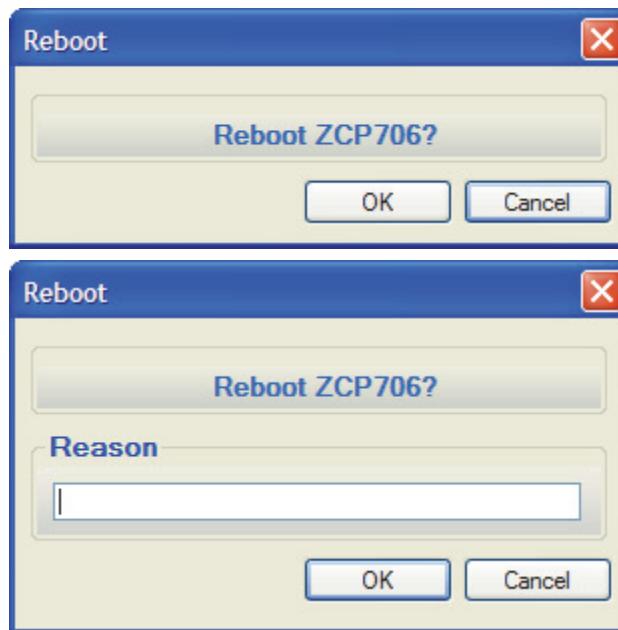


Figure 2-23. Confirmation Dialog Boxes

A confirmation dialog box is always displayed when the equipment change action is for a fault-tolerant control station or a redundant Fieldbus device. Figure 2-24 shows the confirmation dialog box for a redundant FCM when the Go On-Line action is selected, and how the dialog box is expanded if Reason Required is checked.

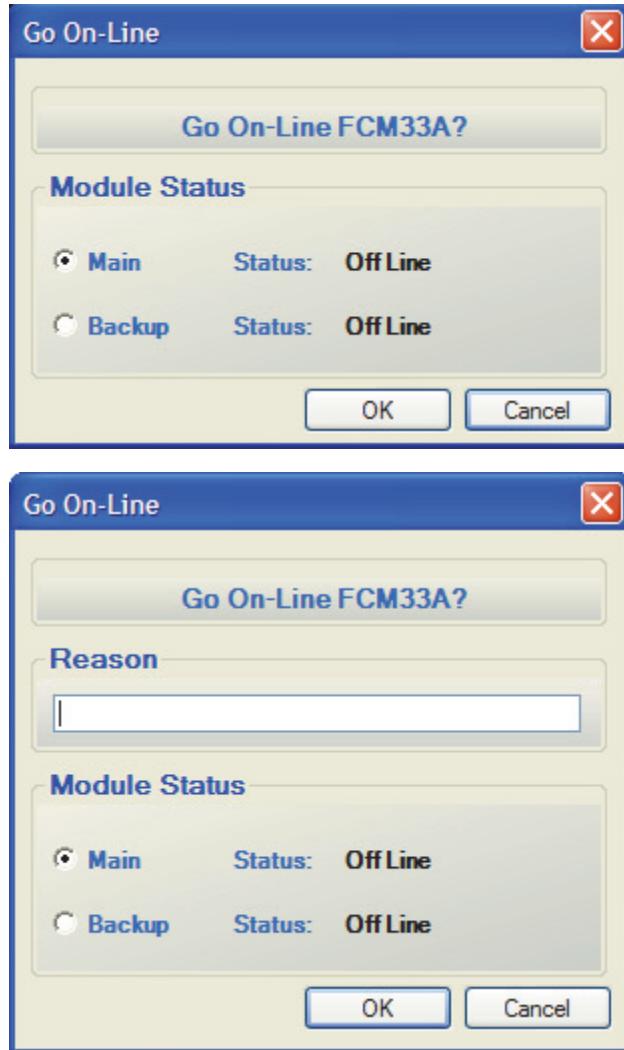


Figure 2-24. Dialog Boxes for Redundant FBMs

View Settings

When **Enable blinking** is checked, the names of system monitors and equipment with unacknowledged alarms blink on and off in the Navigation pane, and color-coding of the names is used to indicate the item's status (red for failed, yellow for warning and so forth). When the alarm is acknowledged the names of the affected equipment stop blinking and are displayed in black. When the option is not checked, all names are displayed in black without blinking, regardless of the item's alarm status.

Actions Menu

The Actions menu includes the following items: Equipment Change, Acknowledge Smon Domain, Acknowledge Cable Alarms, Set Date and Time, DST Options, and Download FF Devices File.

Equipment Change

Only workstations assigned the appropriate equipment change action privileges can access the equipment change commands.

- Choose **Actions > Equipment Change** to display a menu of commands for the selected equipment.

The list of equipment change actions varies with the type of device and its current status. Figure 2-25 shows the commands available when an FCP270 is selected from a workstation with full equipment change action privileges. (This would appear similar for an FCP280 as well.)

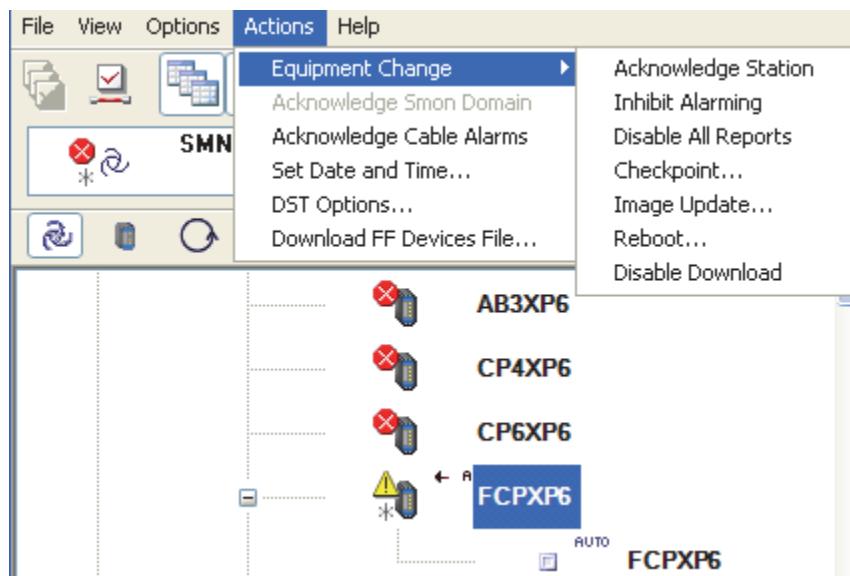


Figure 2-25. Equipment Change Menu

The **Actions > Equipment Change** menu of a station includes some or all of the following items in Table 2-14:

Table 2-14. Actions > Equipment Change Menu Items

Menu items	Description
Acknowledge Station	Acknowledge all alarms for the selected station.
Inhibit Alarming	This will allow you to inhibit, or filter out, alarms from a particular station or device. System Manager will continue to indicate overall system and network health even while equipment is failed or off-line.
Enable Alarming	You can use Enable Alarming to re-enable inhibited alarms.

Table 2-14. Actions > Equipment Change Menu Items (Continued)

Menu items	Description
Checkpoint	You can use the Checkpoint action to save process tuning changes to the checkpoint file database on the file server (AP). When you use the Checkpoint action, the system copies the current checkpoint file to a backup file and saves the database from the station into the current checkpoint file.
Reboot	You can select to reload a selected station's image from a file server and, if necessary, reload the database related to that station.
EEPROM Update	You can use the EEPROM Update action to update the existing EEPROM in a station with new EEPROM firmware.
Image Update	You can use the Image Update action to update the existing Image for the stations of type FCP280, FCP270 and ZCP270 with new images.
On-Line Image Update	On-Line Image Update allows you to upgrade to subsequent software on fault-tolerant Field Control Processors 280 (FCP280FT), Field Control Processors 270 (FCP270FT), and Z-Module Control Processors 270 (ZCP270FT), safely and with minimum hold-control time.
Enable Upload	You can use Enable Upload to upload the station image to a local file on the host Application Processor (AP) or Application Workstation (AW, WSTA70 or WSVR70).
Disable Upload	You can use Disable Upload to prohibit station to upload image to a local file on the host Application Processor (AP) or Application Workstation (AW, WSTA70 or WSVR70).
Enable Download	In order to reboot a station or to update the EEPROM, you must Enable Download.
Disable Download	You can use Disable Download to prevent rebooting a station or updating the image.
Enable All Reports	Enabling all reports permits the internal reporting of all status information for the station and any attached devices, as well as reporting of system and peripheral counters to the System Monitor.

The Actions menu includes some or all of the following items (Table 2-15) for ECBs:

Table 2-15. Actions > Equipment Change Menu Items for ECBs

Menu items	Description
EEPROM Update	You can use the EEPROM Update action to update the existing EEPROM in a station with new EEPROM firmware.
Go On-Line	To put peripherals on-line.
Go Off-line	To put peripherals off-line. For example, to turn selected peripherals off before performing EEPROM updates or before performing maintenance on those peripherals.
General Download	To download FBM images for all off-line, failed FBMs attached to a selected control processor (CP), tank processor (TP) or display processor (DP)
Download	To download a selected FBM with its image.
Periodic PIO Bus Switching	The PIO bus switches the buses from the control processor to the FBMs.
PLC Program	You can use PLC Program option to set the PLC to program with ladder logic.
PLC Run	You can use the PLC run option to run the ladder program and drive outputs.
PLC Test	You can use PLC test option to set the PLC to run the ladder program and update in-memory data fields.
Bus A Enable Switching	Allows communication over Port 1.
Bus B Enable Switching	Allows communication over Port 2.
Bus A Disable Switching	Stops communication over Port 1.
Bus B Disable Switching	Stops communication over Port 2.
Inhibit Device Alarming	This will allow you to inhibit, or filter out, alarms from a particular station or device. System Manager will continue to indicate overall system and network health even while equipment is failed or off-line.
Enable Device Alarming	You can use Enable Device Alarming to re-enable inhibited alarms.

Table 2-15. Actions > Equipment Change Menu Items for ECBs (Continued)

Menu items	Description
Reset Attention Bit	The Reset Attention Bit action is only available for the UIO and UFM INTERSPEC Integrator peripherals to reset attention bits when status setting of either LOC (local), FLK (flunk) or there is a momentary loss of power to the peripheral. Before performing the Reset Attention Bit action, you must clear the unacknowledged bit.
Reset Major Fault	Reset Major Fault action is used to reset a major fault bit in the PLC.
Reset Minor Fault	Reset Minor Fault action is used to reset a minor fault bit in the PLC.
Switch Roles	Switch Roles, that applies to Redundant equipment, enables you to switch the roles of the main and backup modules. Because the FCM100E module does not support the Master/Tracker functionality, the SWITCH ROLES selection on the FCM100E's Equipment Change display is disabled. Similarly, the SWITCH ROLES selection on the FCM100Et's Equipment Change display is disabled when the module is configured single.

The equipment change actions menu items that are applicable for each device group are given in Table 2-16

Table 2-16. Equipment Change Actions for Device Groups

Equipment Change Actions	Device Groups
EEPROM update	FCM10E and GE PIO
Enable Device Alarming Inhibit Device Alarming	All device groups
General Download	AB PIO and GE PIO Profibus Gate Echelon Gate PLC5 Gate Modbus Gate
Go On-line Go Off-line	All device groups except Bristol Babcock Port and F2068 Port
Periodic PIO Bus Switching Bus A Enable Switching Bus B Enable Switching Bus A Disable Switching Bus B Disable Switching	AB Port Modbus Port GIT devices

Table 2-16. Equipment Change Actions for Device Groups (Continued)

Equipment Change Actions	Device Groups
PLC - Program PLC - Run PLC - Test Upload Database Reset Major Fault Reset Minor Fault	ABPLC devices
Download	AB PIO and GE PIO AB RIO Adaptor

Equipment Change Actions for LI and ATS

When an ATS or LI is selected, the following commands can be selected from the peripheral's context menu or from the **Actions > Equipment Change** submenu pulled down from the System Manager main menu. Table 2-17 shows the list of equipment change actions available for LI and ATS stations.

Table 2-17. Equipment Change Actions Applicable for LI and ATS

Equipment Actions	Explanation
Acknowledge Station	Acknowledge all alarms for the selected ATS and LI station.
Inhibit Alarm or Enable Alarm	When alarming is inhibited for a station, the system monitor still updates the control station's status, but faults do not result in system alarm messages. When that alarm of the station is in inhibited state, Enable Alarm will enable the system alarm.
Disable All Reports or Enable All Reports	Enabling all reports permits the internal reporting of all status information for the control station, as well as the reporting of system alarms and counters to the system monitor. When reporting is disabled, the Equipment Status and Equipment Information tables may contain outdated information, the health status for the station and the attached devices may not be accurate.
EEPROM Update	The EEPROM Update action updates the existing EEPROM in a station with new EEPROM firmware.
Reboot	The Reboot action restarts the selected control station and reloads the station's control database from a file server.

Table 2-17. Equipment Change Actions Applicable for LI and ATS (Continued)

Equipment Actions	Explanation
Enable Upload or Disable Upload	When an ATS or LI station is rebooted due to a software failure, the system uploads the station image to a local file on the boot host workstation. The user can permit or prohibit the system from uploading this image when the station fails under certain conditions.
Enable Download or Disable Download	In order to reboot a station or to update the LI or ATS station image, you must enable downloading.

Equipment changes actions for specific equipment are described in later sections:

- System Monitors; see page 100
- Workstations; see page 131
- Control Stations and Primary ECBs; see page 175
- FCMs; see page 234
- FBMs; see page 265
- Switches and switch ports; see page 297.

Acknowledge Smon Domain

You can acknowledge alarms individually using either the equipment's context menu or the Alarms tab in the Accessories pane. You can also acknowledge all non-cable alarms in a system monitor domain with a single selection from the Actions menu, the system monitor's context menu or the toolbar.

To acknowledge all equipment failures in a system monitor domain:

1. Click  at the top of the Navigation pane if the System Monitor view is not already selected.
2. Select the system monitor in the Navigation pane.
3. Do one of the following:
 - Choose **Actions > Acknowledge Smon Domain** from the main menu.
 - Right-click the selection and choose **Acknowledge Smon Domain** from the context menu.
 - Click  in the toolbar.

System Manager acknowledges all non-cable alarms in the system monitor domain and clears the asterisks from the equipment icons.

Acknowledge All Cable Alarms

To acknowledge all cable faults:

- Choose **Actions > Acknowledge All Cable Alarms** from the main menu or click  in the toolbar.

Set Date and Time

Set Date and Time is described in “Date and Time Tools” on page 91.

DST Options

Instructions to configure Daylight Saving Time adjustments and the DST Options command are given in “Daylight Saving Time (DST)” on page 92.

Download FF Devices File

The Download FF Devices File option on the Actions menu allows you to download the latest version of the FF Devices file delivered with the System Manager application. This option downloads the FFRegistered.xml file to workstations running the System Manager or Control Core Services System Management Display Handler (SMDH) application, which may have an earlier version of this file.

To download the latest version of the FFRegistered.xml file to workstations running System Manager or SMDH, perform the following steps:

- Choose **Actions > Download FF Devices File**.

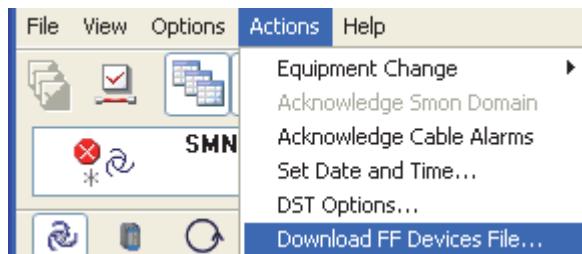


Figure 2-26. Download FF Devices File Option in Actions Menu

2. When the Download FF Devices File dialog box is being loaded, “Loading the dialog box” appears in the left corner of the System Manager status bar, and the progress is indicated in the right corner of the status bar.

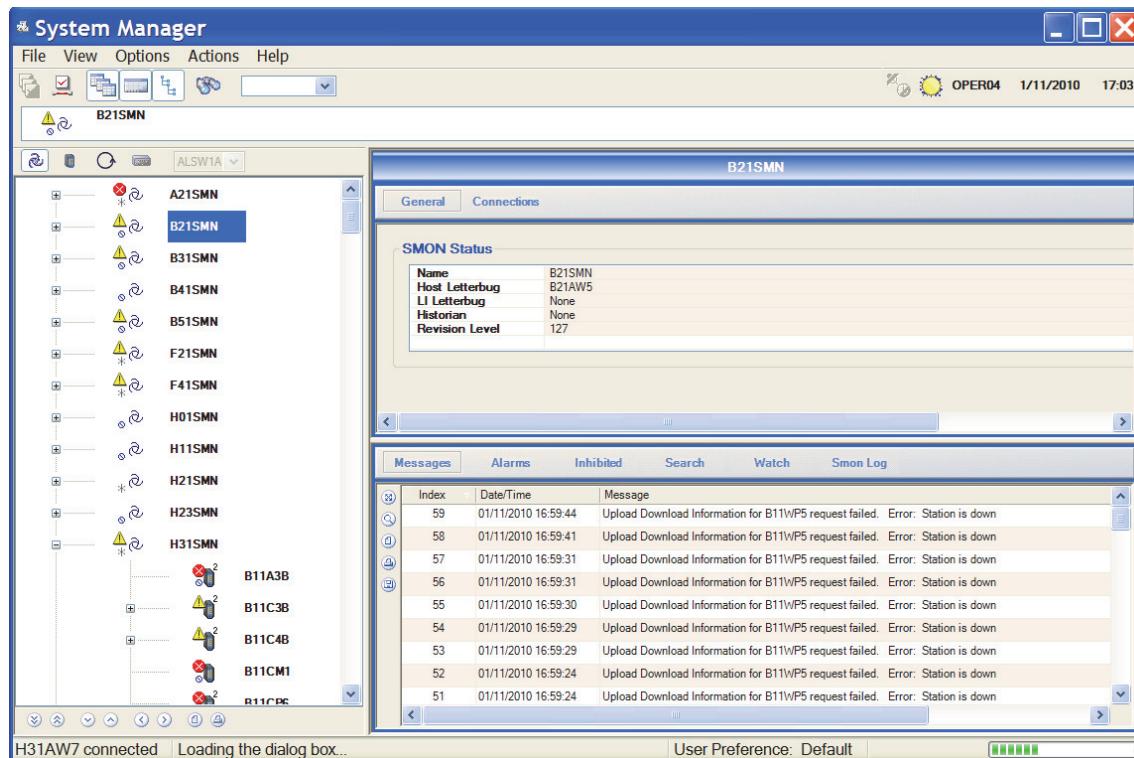


Figure 2-27. Loading Progress of Download FF Devices File Dialog Box

3. The Download FF Devices File dialog box appears and lists workstations that are currently running. Select those workstations to which you want to copy the FFRegistered.xml file. When the download is being performed, a description of the current status appears in the left corner of the Download FF Devices File dialog box, and the progress is indicated in the right corner of the status bar, as shown in Figure 2-28.

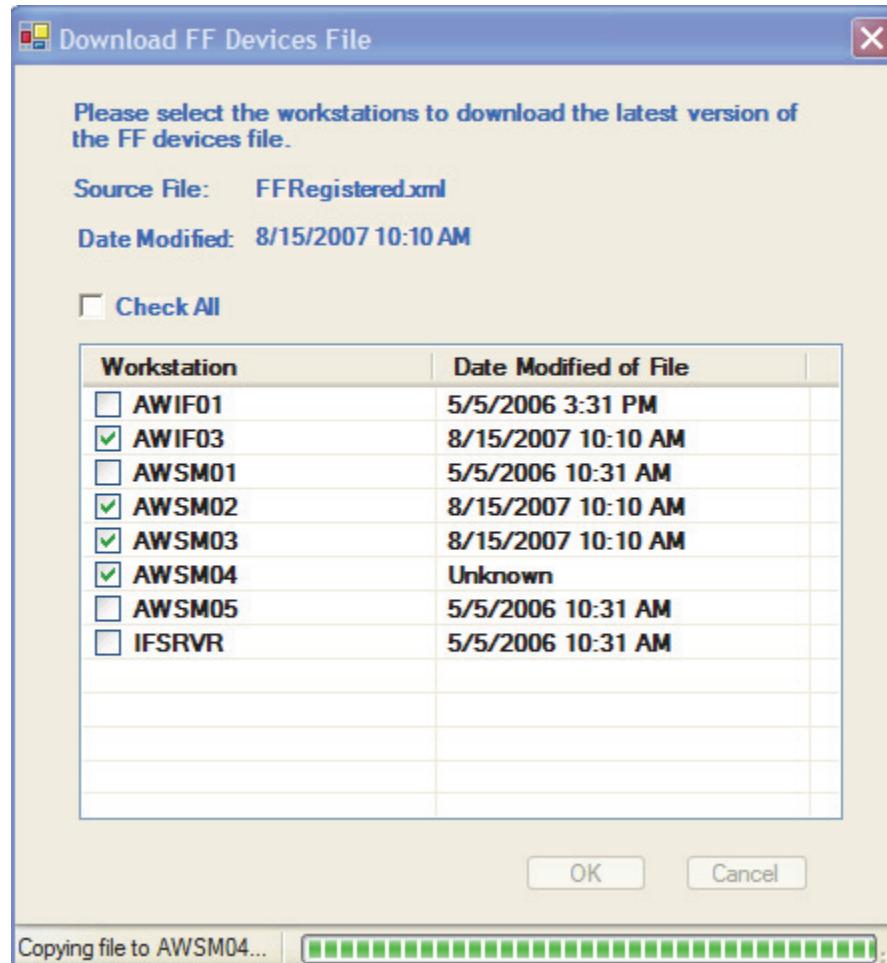


Figure 2-28. Download FF Devices File Dialog Box

4. Click **OK**. If no workstation is selected, the following message is displayed:

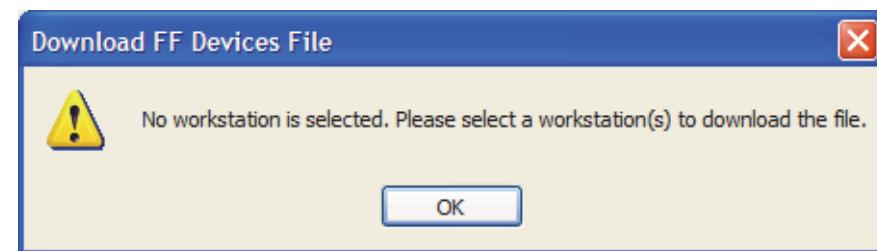
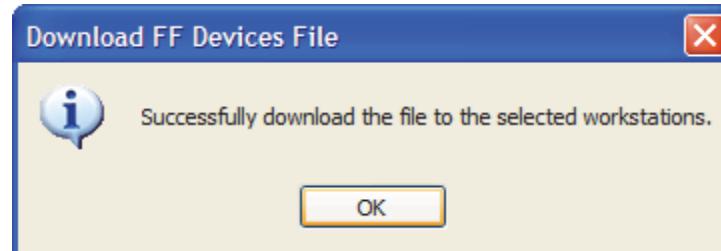
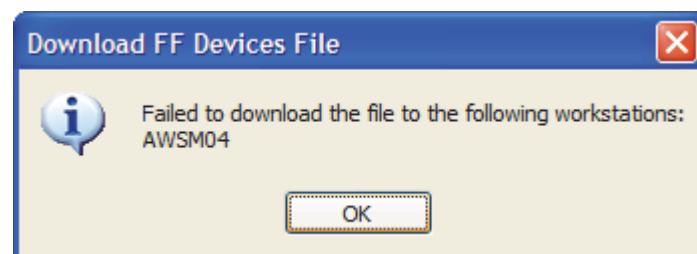


Figure 2-29. No Workstation Selected Message

5. The latest version of the FFRegistered.xml file is copied to D:\usr\fox\sysmgm\smdh directory of the selected workstations. The status bar shows the progress of the operation.
6. When the file is successfully downloaded, the following message displays:



7. If the download fails for any of the selected workstations, the following dialog box appears and lists the workstations for which the download failed.



8. If the download procedure fails, you may need to modify file sharing properties on each of the workstations for which the download failed. Perform the following steps:
 - a. Open Windows Explorer software.
 - b. Select **Tools > Folder Options**.
 - c. From the Folder Options dialog box, click the **View** tab.

- d. Scroll down to see the **Use simple file sharing (Recommended)** option. **Deselect** this entry.

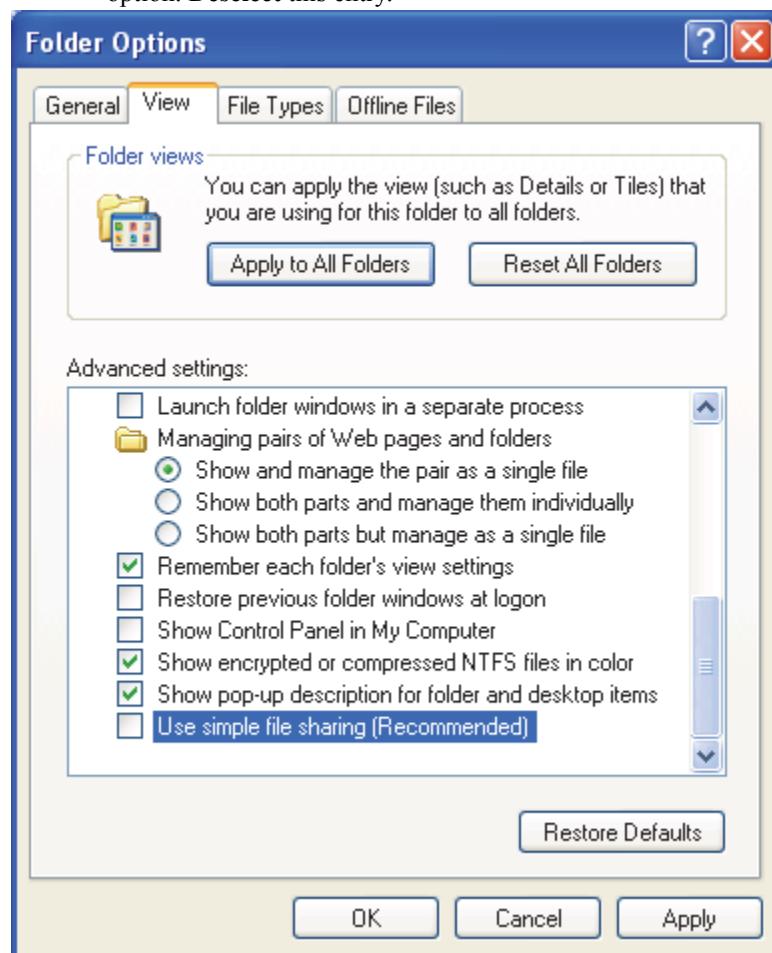
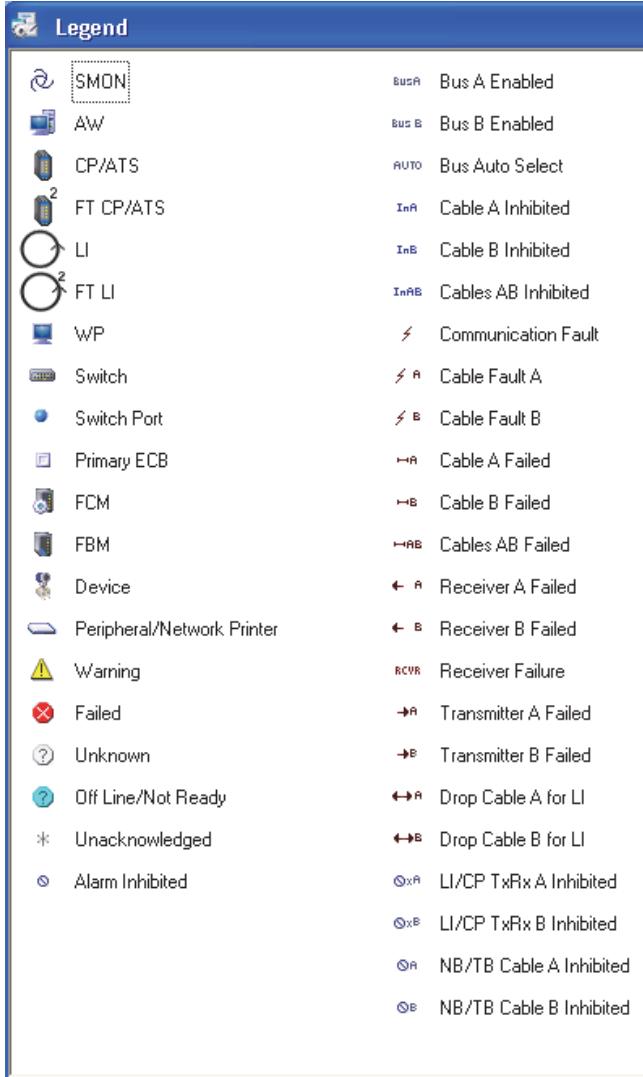


Figure 2-30. Disabling Simple File Sharing

Help Menu

The Help menu contains the following items:

About	Displays the version and copyright notices for the System Manager software.
Legend	<p>Provides a key to the equipment icons and the status symbols used in the Navigation pane and the Hierarchy Navigation box.</p>  <p>The legend window lists various icons and their meanings:</p> <ul style="list-style-type: none"> SMON: Bus A Enabled AW: Bus B Enabled CP/ATS: Bus Auto Select FT CP/ATS: Cable A Inhibited LI: Cable B Inhibited FT LI: Cables AB Inhibited WP: Communication Fault Switch: Cable Fault A Switch Port: Cable Fault B Primary ECB: Cable A Failed FCM: Cable B Failed FBM: Cables AB Failed Device: Receiver A Failed Peripheral/Network Printer: Receiver B Failed Warning: Receiver Failure Failed: Transmitter A Failed Unknown: Transmitter B Failed Off Line/Not Ready: Drop Cable A for LI Unacknowledged: Drop Cable B for LI Alarm Inhibited: LI/CP TxRx A Inhibited : LI/CP TxRx B Inhibited : NB/TB Cable A Inhibited : NB/TB Cable B Inhibited
Contents	Starts compiled HTML Help for the System Manager user interface and displays the Help Contents tab.
Index	Starts HTML Help and displays the Help Index tab.
Search	Starts HTML Help and displays the Help Search tab.

Additionally, a context-sensitive help function is provided with the System Manager application. Pressing **F1** allows you on-demand access to the specific

online help topic associated with the part of the software in which you are currently working. For example, if you are working in the Connections tab and press **F1**, the HTML Help immediately jumps to the Connections tab topic.

Toolbar

The toolbar contain buttons for commonly used functions, commands, additional navigational controls, and tools for setting network time. In addition, the toolbar displays the current system date and time, DST Options and the Master TimeKeeper. Figure 2-31 displays an example of the toolbar.

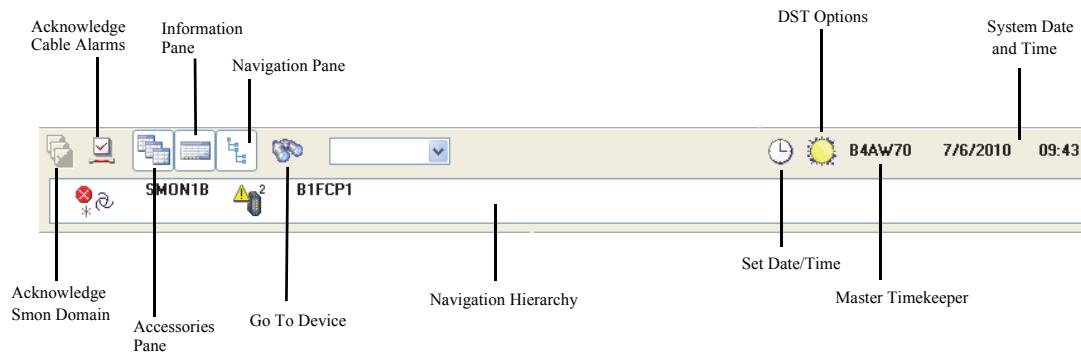


Figure 2-31. Example of a Toolbar

To display or hide the toolbar:

- Choose **View > Toolbar** from the main menu.

Alarm Icons

- Select a system monitor in the Navigation pane and click to acknowledge all station alarms in the system monitor domain.
Clicking this icon is the same as choosing **Actions > Acknowledge Smon Domain** from the main menu, or **Acknowledge Smon Domain** from the system monitor's context menu.
- Click to acknowledge all communication faults associated with cables, transmitters, receivers, and fieldbuses.
Clicking this icon is the same as choosing **Actions > Acknowledge Cable Alarms** from the main menu.

These buttons are only selectable if the workstation has been designated to perform secured actions during system monitor software configuration and the system monitor is currently active.

View Icons

- Click to toggle display of the Accessories pane.
Clicking this icon is the same as choosing **View > Accessories** from the main menu.

- Click  to toggle display of the Information pane.
Clicking this icon is the same as choosing **View > Information** from the main menu.
- Click  to toggle display of the Navigation pane.
Clicking this icon is the same as choosing **View > Navigation** from the main menu.

Go-To Feature

The Go-To icon (Figure 2-32) and the drop-down menu to its right enable you to search for and navigate to system monitors, stations and field devices by name. The found item is selected in the Navigation pane and the Hierarchy Navigation box, and displayed in the Information pane.

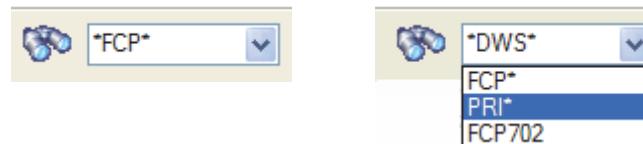


Figure 2-32. Go-To Icon and Drop-Down Menu

To find and navigate to a system monitor or equipment item by name:

1. Specify a search string in the combo box, using an asterisk as a wildcard.

For example:

- Enter **FCP123** to find the device whose name matches the string FCP123 exactly.
- Enter **FCP*** to search for names that start with the FCP.
- Enter ***CP*** to find all names that contain the string CP.
- Enter ***804** to find all names that end with the string 804.

2. Click  to find the next instance of the string specified in the combo box and select that item in the Navigation pane.
3. Click  to the right of the box to pull down a list of previous search strings.

The list of previous search strings is cleared when System Manager is closed.

Hierarchy Navigation

The Hierarchy Navigation box (Figure 2-33) is used to view and quickly navigate to predecessors in the selected equipment's hierarchy.

When the System Monitor view is selected for the Navigation pane, the box displays the currently selected station or device, its parent equipment and system monitor using the same symbols that are used in the Navigation pane.

When the Switch view is selected for the Navigation pane, the box displays the currently selected station or device, its parent equipment and the switch using the same symbols that are used in the Navigation pane.

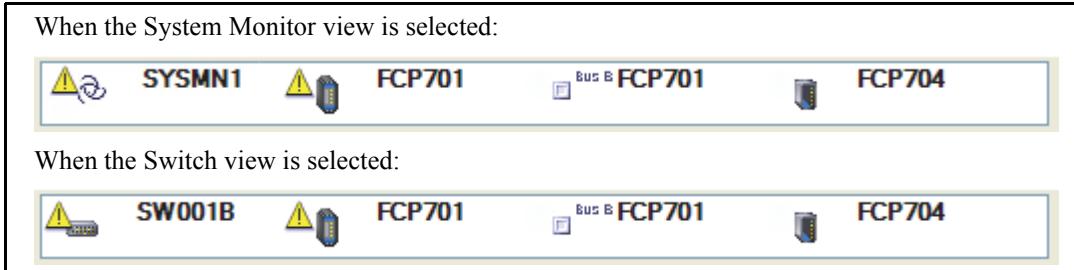


Figure 2-33. Hierarchy Navigation Box

To use the box:

1. Choose **View > Navigation > Hierarchy** from the main menu if the box is not already displayed in the tool bar.
The right-most item in the box is the device or station selected in the Navigation pane.
2. Click an item to the left to select a parent station, the system monitor, or the network switch.

Date and Time Tools

During system configuration, one workstation on the network is designated to serve as the master timekeeper for all stations. The master timekeeper is identified on the right side of the System Manager toolbar along with the current date and time (Figure 2-34).

- Double-click the master timekeeper name to navigate to the workstation.

The workstation is selected in the Navigation pane, and the General tab in the Information pane displays the workstation's status and equipment information.

When the GPS icon is displayed to the left of the master timekeeper name, time is externally sourced from the Global Positioning System (GPS) and cannot be set from System Manager.



Figure 2-34. Date and Time Tools

When a clock icon is shown to the left of the master timekeeper name, the system date and time can be set from System Manager.

Caution Resetting the time can affect other activities on the network, such as historian collection, trending and reporting. Only authorized personnel should set the time and date.

To keep all stations on the node synchronized, you must make time and date changes through the Set Date and Time command, not through the Windows operating system Adjust Time/Date functions (selected from the tool tray or Control Panel) on individual workstations.

To adjust the master timekeeper when the time is not sourced from the GPS:

1. Choose **Actions > Set Date and Time**, or click  in the toolbar, to open a dialog box for setting the date and time (Figure 2-35).

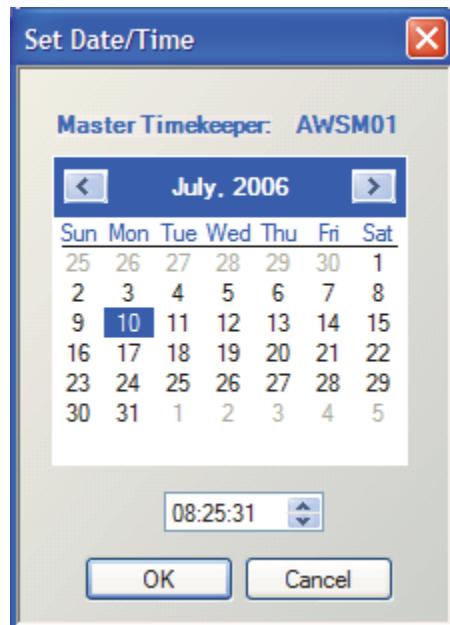


Figure 2-35. Set Date/Time Dialog Box

2. Use the calendar control to select a different date if necessary.
3. Select a portion of the time signature in the time box, and enter the change or use the spinner buttons to increment or decrement the selected portion.
4. Click **OK** to set the specified date and time, and close the dialog box.

Daylight Saving Time (DST)

The Address Translation Stations (ATS) connects The Mesh control network (described in *The MESH Control Network Architecture Guide* (B0700AZ)) to Nodebus networks. DST control is only supported if an ATS is installed in the system. The Master Timekeeper (MTK) resides on The Mesh and provides time updates to all stations on The Mesh and Nodebus Networks. DST time adjustments (Standard Time to Daylight Saving Time and vice versa) are automatically sent to all stations on The Mesh. Optional DST time adjustments are provided that allow an operator to determine when DST time adjustments are sent to Nodebus stations. This feature provides protection for applications

where changing time backwards (from Daylight Saving Time to Standard Time) could cause problems.

The **DST Options** dialog box is shown when you click the **DST Options** button (Figure 2-36). You can choose to have DST time adjustments sent automatically or manually. These options ensure backward-compatibility for Control Core Services system releases with Nodebus networks, where the operator decides when to manually change time using System Manager to adjust for DST.

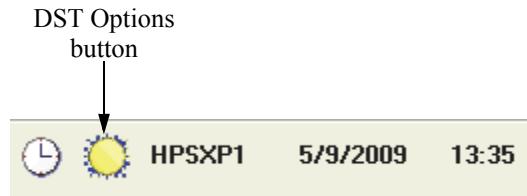


Figure 2-36. DST Options Button

The following two attributes control sending DST time adjustments to Nodebus stations (Table 2-18 and Table 2-19):

- DST Mode (Manual / Automatic)
- Nodebus Time Mode (Standard Time / Daylight Saving Time)

Table 2-18. DST Modes

DST Modes	Description
Manual DST Mode	The user can manually change from Standard Time to Daylight Saving Time and vice versa for Nodebus stations. Time changes from Standard Time to Daylight Saving Time in the spring and reverts back to Standard Time in the fall.
Automatic DST Mode	Nodebus stations will automatically track time of Mesh stations when they change from Standard Time to Daylight Saving Time and vice versa.

Table 2-19. Nodebus Time Modes

Nodebus Time Modes	Description
Standard Time	Standard Time is in any of 24 time zones, usually the mean solar time at the central meridian of each zone.
Daylight Saving Time	Daylight Saving Time is time during which clocks are set one hour or more ahead of Standard Time to provide more daylight at the end of the working day during spring, summer, and early fall.

DST Options

Figure 2-37 shows the information presented on the DST Options dialog box.

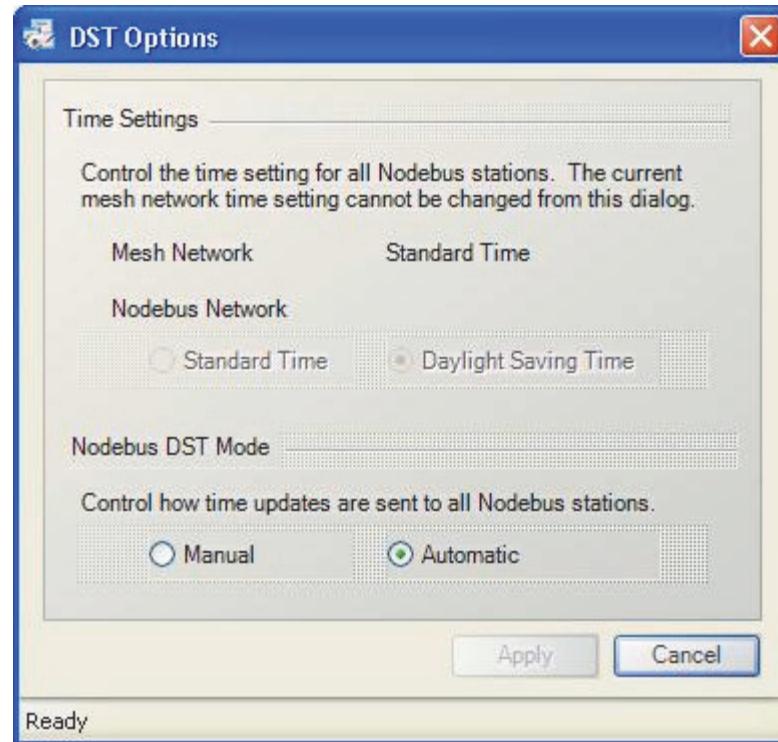


Figure 2-37. DST Options Dialog Box

When you click the **DST Options** button on the Toolbar, the **DST Options** dialog box appears and shows the current time settings of the Nodebus and The Mesh network.

- If **Nodebus DST Mode** is set to **Automatic**, time sent to the Nodebus stations is the same as The Mesh time mode (Standard Time or Daylight Saving Time). Any selection made under Nodebus Network has no effect.
- If **Nodebus DST Mode** is set to **Manual**, time sent to the Nodebus stations is based on Nodebus Time Mode regardless if The Mesh is in Standard Time or Daylight Saving Time mode.

To change the Nodebus station times from Standard Time to Daylight Saving Time or vice versa:

1. Make sure **Nodebus DST Mode** is set to **Manual**. This enables the Standard Time and Daylight Saving Time options available under Time Settings.
2. Choose **Standard Time** or **Daylight Saving Time** under Time Settings for the Nodebus Network.
3. Click **Apply**.

The message “Do not reboot any workstation for 1 minute” on the System Manager message line confirms that the System Manager selection has been processed. The user is warned not to intentionally reboot workstations until 1 minute to allow all workstations to record the System Manager time selection

thus making the time selection persistent should a workstation later fail and a new Master Timekeeper take over. The worst scenario that could happen is that the Primary MTK workstation fails immediately after a time selection is made and other workstations do not get a chance to record the new time selection. This could result in the Nodebus stations going to the selected System Manager time state and immediately reverting back to the previous time state when a new Master Timekeeper takes over. You would then have to repeat their desired time selection.

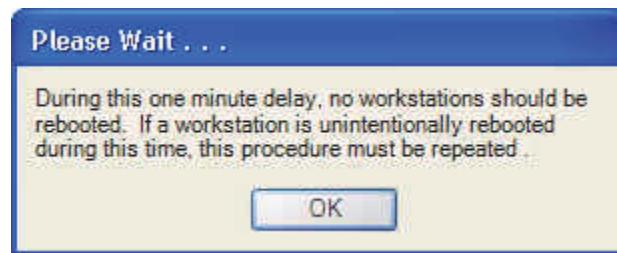


Figure 2-38. Please Wait Dialog Box

MTK generates system messages indicating if The Mesh and Nodebus networks are operating in the same time mode (Standard Time vs. Daylight Saving Time).

CHAPTER 3

System Monitors

When the System Monitor view is selected, the system monitors are shown at the top of the tree in the Navigation pane. Each system monitor is identified by the  icon and the system monitor name (Figure 3-1).

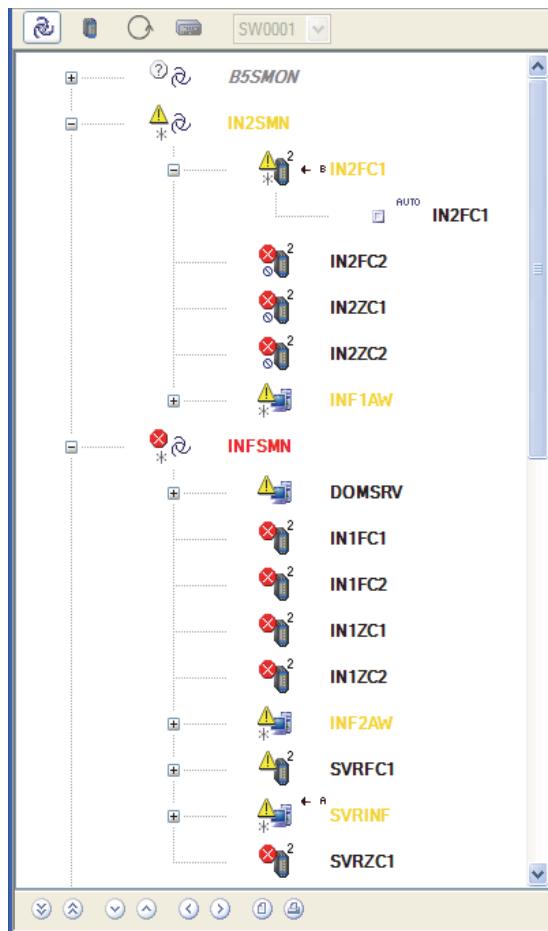


Figure 3-1. System Monitor View in the Navigation Pane

Contents

This chapter describes status symbols attached to the system monitor, the Information pane displays when a system monitor is selected and how to acknowledge all station alarms within the domain.

- Status and Alarm Symbols

- System Monitor Information
- Monitored Equipment
- Acknowledging Alarms

Status and Alarm Symbols

The status symbol attached to the upper left side of the system monitor icon represents the most severe condition among the stations and switches in the system monitor's domain. For example, the failure symbol attached to INFSMN in Figure 3-1 reflects the failed condition of control station IN1FC1, which is more severe than the warning condition associated with INF2AW.

IN2SMN monitor in Figure 3-1 also has a failed station (IN2FC2) and one with a warning (INF1AW). However, the system monitor is only marked with a warning symbol because alarms from the failed station are inhibited.

The status of alarms in the domain is indicated by symbols attached to the lower left corner of the system monitor icon as shown in the following table:

Symbol	Condition
	There is at least one alarm in the system monitor domain that has not been acknowledged.
	There is at least one switch, station, field device or peripheral in the system domain that is inhibited, and there are no unacknowledged alarms. The next time there is an alarm from equipment that is not inhibited, the inhibited symbol will be replaced by the asterisk until all alarms from the domain are acknowledged.

The status of the system monitor reflects the most severe condition in its domain. If the System Manager service cannot communicate with a system monitor, the Unknown symbol is attached to upper left corner of the icon and the system monitor name is displayed in gray italicized text, as shown in Figure 3-2.



Figure 3-2. System Monitor Not Available

System Monitor Information

Click a system monitor listed in the Navigation pane to display its status and configuration in the Information pane (Figure 3-3).

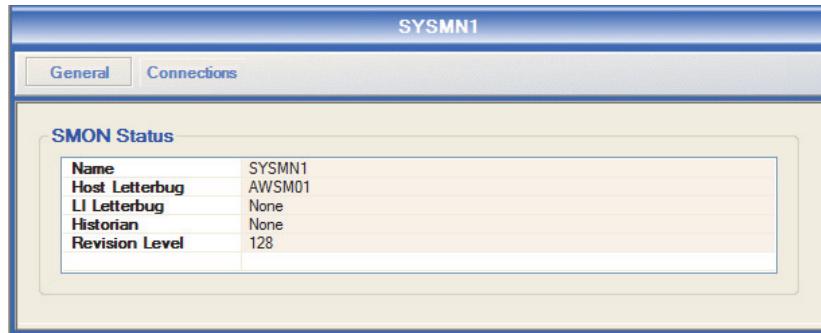


Figure 3-3. System Monitor Status

Table 3-1. System Monitor Status Display Fields

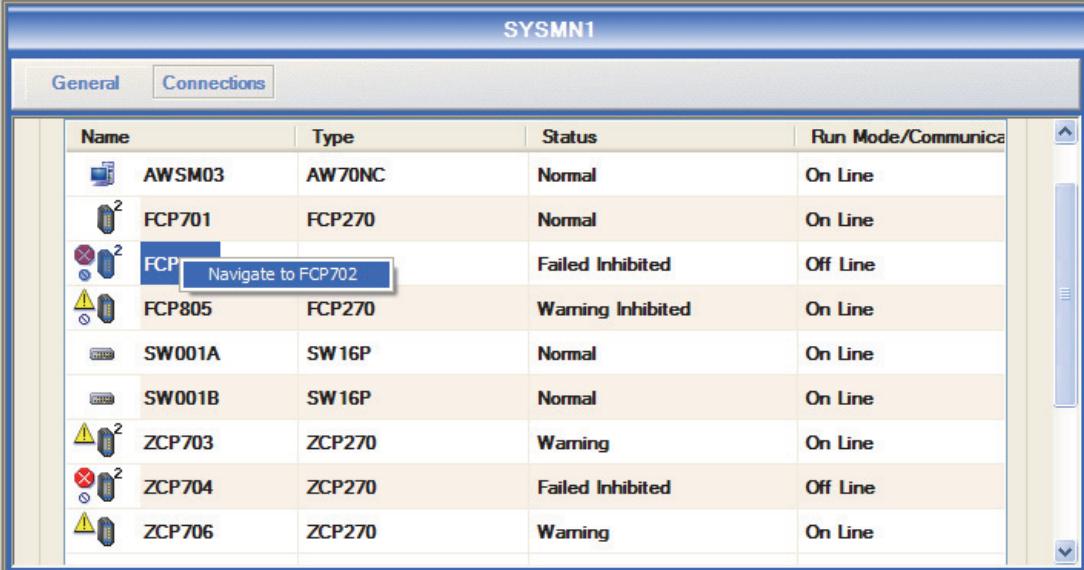
Field	Description
Name	Name of the system monitor
Host Letterbug	Name of the workstation on which the system monitor is running
LI Letterbug	Name of the LAN Interface host name (letterbug) for the selected Carrierband LAN station
Historian	Name of the historian acquiring messages from the system monitor
Revision Level	Revision level of the system monitor software

Monitored Equipment

To access additional information about stations and switches in the system monitor domain:

1. Click the **Connections** tab to display a table of the stations and switches.

The table lists the monitored equipment by name and type, and shows the status, run mode and error mode of each item (Figure 3-4).



Name	Type	Status	Run Mode/Communication
AWSM03	AW70NC	Normal	On Line
FCP701	FCP270	Normal	On Line
FCP702	FCP270	Failed Inhibited	Off Line
FCP805	FCP270	Warning Inhibited	On Line
SW001A	SW16P	Normal	On Line
SW001B	SW16P	Normal	On Line
ZCP703	ZCP270	Warning	On Line
ZCP704	ZCP270	Failed Inhibited	Off Line
ZCP706	ZCP270	Warning	On Line

Figure 3-4. Connections Tab for a System Monitor

2. Click any column header in the table to sort the rows on that column; click the column header a second time to reverse the sort order.
3. Drag a column header to the right or left to change the column order.
4. Do one of the following to navigate to a station or switch:
 - Double-click the equipment name.
 - Right-click the equipment name and chose **Navigate to <equipment name>** from the context menu (**Navigate to FCP702** in Figure 3-4).

The item is selected in the Navigation pane and the Information pane General tab displays status and equipment information tables for the selected device.

Acknowledging Alarms

The asterisk is attached to the bottom left corner of the system monitor icon if there is at least one unacknowledged station alarm in the system monitor's domain. There are multiple ways of acknowledging alarms:

- The System Manager toolbar contains a button for acknowledging all station alarms in the selected system monitor domain and a button for acknowledging all cable alarms system-wide.
- The Alarms tab toolbar contains buttons for acknowledging all alarms and individual alarms.
- The context menus in the Navigation pane contain selections for acknowledging alarms at the equipment level and/or domain level.

To acknowledge all station alarms in a system monitor domain:

1. Select the system monitor in the Navigation pane.
2. Do one of the following:
 - Right-click the selection and choose **Acknowledge Smon Domain** from the context menu.
 - Choose **Actions > Acknowledge Smon Domain** from the main menu.
 - Click  in the toolbar.

The commands and the toolbar button are active only when there are unacknowledged alarms in the domain and the workstation has the appropriate equipment change action privileges.

CHAPTER 4

Workstations, Peripherals and Network Printers

This chapter describes how to use System Manager software to monitor workstations and attached peripherals, such as USB or serial/GCIO annunciator panels and printers.

Contents

- Identification of Workstations, Peripherals and Network Printers
- Workstation Information
- Connected Peripherals
- Counters Tab
- Peripherals Information
- Equipment Change Actions

Identification of Workstations, Peripherals and Network Printers

In the Navigation pane, an Application Workstation is depicted by the  icon and a Workstation Processor is depicted by the  icon. For each workstation type, an attached peripheral or network printer is represented by the  icon. Figure 4-2 is a Navigation pane in which a system monitor has been expanded to display workstations in its domain and expanded to display the peripheral device.

Note The System Manager considers serial/parallel/USB printers (connected locally to a workstation) to be peripherals, while it considers network printers (connected to switches) to be separate objects, at the same level as stations in the Navigation pane.

Symbols attached to system monitor SYSMN2 show there is at least one failed device in the domain and at least one unacknowledged alarm. The failed device is a printer attached to workstation AWSM02, and thus the yellow warning symbol is attached to the workstation icon. Workstation AWSM05 has an unacknowledged alarm and the workstation is in the failed state.

- Choose **Help > Legend** from the main menu to identify the equipment health and alarm status symbols, or refer to “Status Indicators” on page 47.

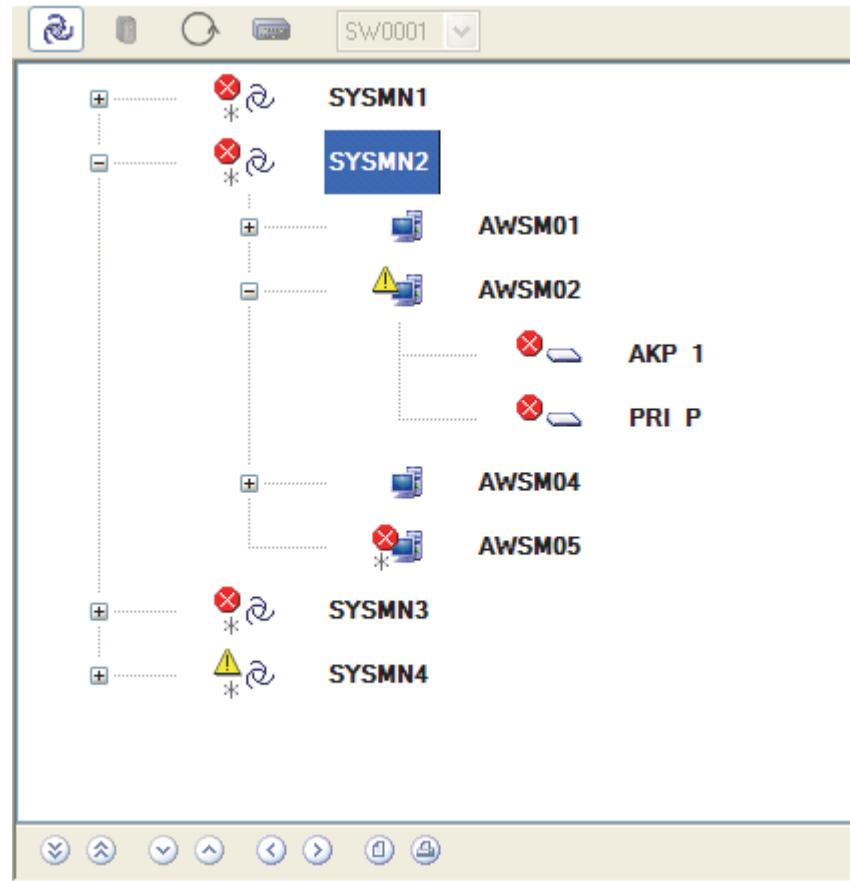


Figure 4-1. Workstations and Peripherals on The MESH in the Navigator

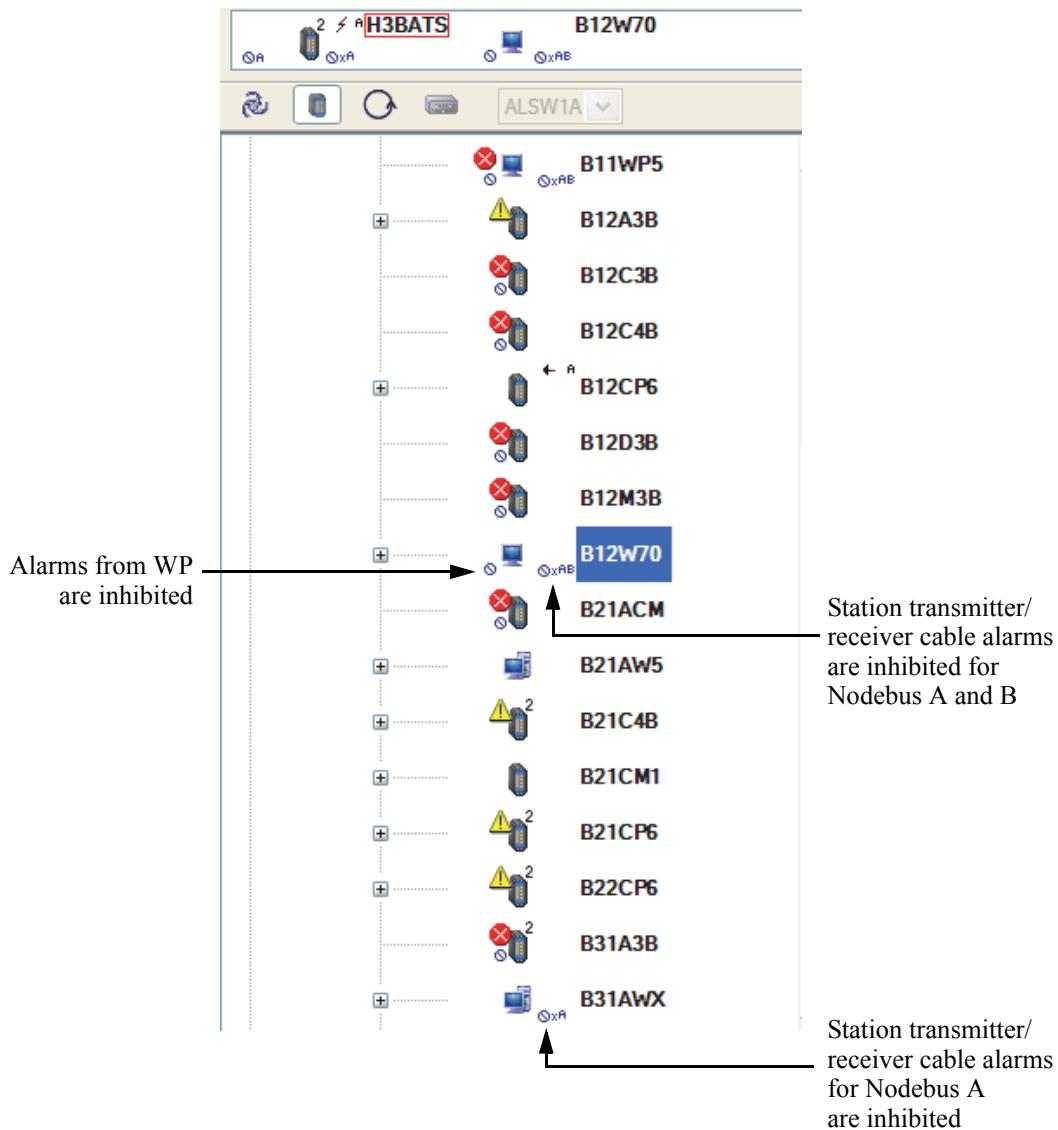


Figure 4-2. Nodebus Workstations and Peripherals in the Navigator

Labels attached to the workstation icon indicate the state of communications between the station and the Network:

Symbol	Condition
 	The top right corner is used for indicators of a fault in the station's connection to the network when the fault is with A channel (Receiver A) and middle right when the fault is in B channel (Receiver B).
 	The top right corner is used for indicators of a fault in the station's connection to the network when the fault is with A channel (Transmitter A) and middle right when the fault is in B channel (Transmitter B)
 	<p>The station with  symbol indicates that station transmitter/receiver cable alarms are inhibited for Nodebus Cable A.</p> <p>The station with  symbol indicates that station transmitter/receiver cable alarms are inhibited for Nodebus Cable B.</p>

Workstation Information

When a workstation or a server is selected, the **General** tab in the Information pane (Figure 4-3) displays the station's status and equipment information in two tables.

An area at the bottom of the tab identifies the switches to which the station is connected.

Do one of the following to navigate to a connected switch:

- Double-click the switch name.
- Right-click the switch name and choose **Navigate to <switch name>** from the context menu.

The switch is selected in the Navigation pane, and its status and equipment information are displayed in the Information pane.

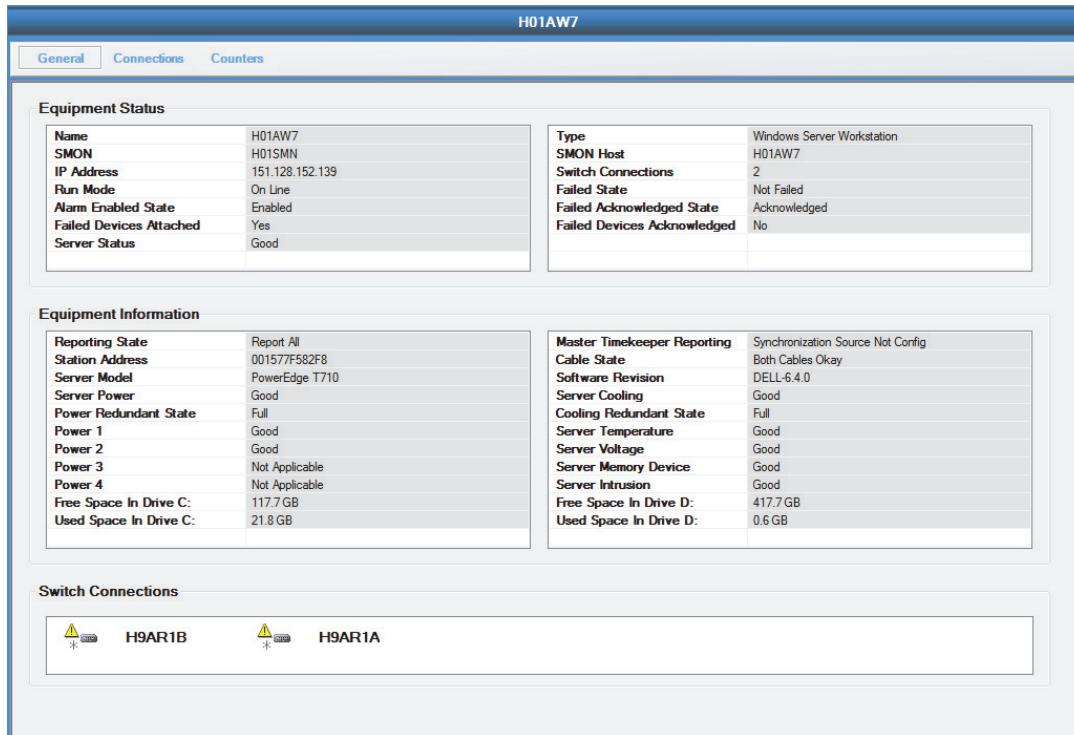


Figure 4-3. Information Pane General Tab for a Workstation

Equipment Status

The following table describes the Equipment Status grid:

Table 4-1. Equipment Status Display Fields

Field	Description
Name	The station letterbug assigned during system hardware definition.
Type	Type of hardware specified when the letterbug was defined. (For example “Windows Server Workstation.”)
IP Address	Foxboro station network address.
Switch Connections	Number of switches connected to this station.
SMON	System monitor domain to which the station is assigned.
SMON Host	Host station for the system monitor.
Run Mode	On Line or Off Line . The field changes to On Line when the station reports to the system monitor after booting up. If reporting is disabled, the last known state appears in this field.

Table 4-1. Equipment Status Display Fields (Continued)

Field	Description
Failed State	<p>Failed or Not Failed. The field changes from Not Failed to Failed if either of the following occurs:</p> <ul style="list-style-type: none"> • A hardware problem causes the station to fail for more than two minutes. • A station hardware failure or communication failure results in the station not being able to send its internal reports for one minute or more.
Alarm Enabled State	<p>Indicates whether alarming is Enabled or Inhibited for the station. When alarming is inhibited for a workstation, the system monitor still updates its status, but alarm messages are not displayed in System Manager, and are not logged to the printer or the historian.</p> <ul style="list-style-type: none"> • To inhibit alarming, right-click the station name in the Navigation pane and choose Inhibit Alarming from the context menu. • To enable alarming, right-click the station name in the Navigation pane and choose Enable Alarming from the context menu.
Failed Acknowledged State	<p>Acknowledged or Not Acknowledged. This field changes from Acknowledged to Not Acknowledged, when Failed State changes from Not Failed to Failed. To return the field to Acknowledged:</p> <ul style="list-style-type: none"> • Right-click the station name in the Navigation pane and choose Acknowledge Station from the context menu to acknowledge the status change.
Failed Devices Attached	<p>Yes, if a peripheral attached to the station is reported as failed; otherwise, No. To determine which peripherals are failed:</p> <ul style="list-style-type: none"> • Click the Connections tab to list the type, current status, run mode and failure mode of each peripheral as described in “Connected Peripherals” on page 117.

Table 4-1. Equipment Status Display Fields (Continued)

Field	Description
Failed Devices Acknowledged	Yes or No. This field is initially set to Yes. If an attached device fails, the field is set to No until the system alarm from the peripheral is acknowledged. <ul style="list-style-type: none"> • Right-click the peripheral in the Navigation pane and choose Acknowledge Device from the context menu to acknowledge the failed device.
Server Status	Good, Critical or Not Applicable. This status indicates the overall status of the components that are residing in Windows Server workstation as shown in Table 4-2, “Equipment Information Fields,” on page 109. Critical if any of the server components listed in Table 4-2, “Equipment Information Fields,” on page 109 are in failure state. Good if all the server components listed in Table 4-2, “Equipment Information Fields,” on page 109 are in healthy state. Not Applicable if the workstation is not a Windows Server.

Equipment Information

The following table describes the fields in the Equipment Information table:

Table 4-2. Equipment Information Fields

Field	Description
Reporting State	Indicates whether the station is reporting its status to its system monitor; values can be: <ul style="list-style-type: none"> • Reporting All • No Reporting • No Counters • No Information To change the Reporting State: <ul style="list-style-type: none"> • Right-click the station name in the Navigation Pane and choose Disable All Reports or Enable All Reports from the context menu.
Cable State	Status of cable connections between the workstation and the switch: <ul style="list-style-type: none"> • Both Cables Okay • Fault • No Information

Table 4-2. Equipment Information Fields (Continued)

Field	Description
Station Address	A six-octet media access control (MAC) address assigned during system definition and used by the networking protocol in the Foxboro stations
Master Timekeeper Reporting	If GPS or NTP is enabled: <ul style="list-style-type: none">• Synchronization Source Config• MTK Synchronization Source Enabled• Synchronization Source Failed• MTK Synchronization Source Failed If GPS is not enabled: <ul style="list-style-type: none">• MTK Synchronization Source Not Config• Synchronization Source Not Config <p>The Timekeeper's time source may be a GPS signal provided by a station on The Mesh control network or a source located off of The Mesh control network. NTP is enabled when the Master Timekeeper needs to be synchronized to a time source located on a station which is located off of The Mesh control network.</p>
Server Model	The model of the Windows Server operating system, for example, PowerEdge 2900 for DELL server or ProLiant ML350 G6 for HP server. This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.
Software Revision	For DELL servers, this field shows the software revision of the DELL OpenManage Server. For example, DELL-6.4.0 For HP servers, this field shows HP-Unknown and no information provided. This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.

Table 4-2. Equipment Information Fields (Continued)

Field	Description
Server Power	<p>The overall status of all the power supplies located in Windows Server system.</p> <ul style="list-style-type: none"> • Good when all the power supplies are operating. • Non-critical condition requires prompt attention. • Critical condition requires immediate attention. • Unknown when the health status of the power supplies is unknown. <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>
Server Cooling	<p>The operational state of the fans located in Windows Server system is shown as one of the following:</p> <ul style="list-style-type: none"> • Good when all the fans are operating. • Critical when one or more fans are not working. • Unknown when the health status of the fans is unknown. <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>
Server Temperature	<p>The status of the system board ambient temperature for Windows Server system is shown as one of the following:</p> <ul style="list-style-type: none"> • Good • Non-critical • Critical • Unknown <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>

Table 4-2. Equipment Information Fields (Continued)

Field	Description
Server Voltage	<p>The components on Windows Server system are rated for a specific operating voltage. Voltage probes are placed on different components to ensure adequate voltage and to prevent voltage that can result from excessive voltage. The status of the voltage can be one of the following:</p> <ul style="list-style-type: none"> • Good • Non-critical • Critical • Unknown • Other - no information provided (shown for HP servers) <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>
Server Memory Device	<p>The status of random-access memory (RAM) which indicates normal, prefailure or failure performance of the connection or slot for a memory device. The status of the memory device can be one of the following:</p> <ul style="list-style-type: none"> • Good • Non-critical • Critical • Unknown <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>
Server Intrusion	<p>Intrusion status for each chassis in Windows Server system. Good when the chassis cover or bezel cover is closed or Critical when the chassis cover or bezel cover is opened.</p> <p>Other (indicating no information is provided) is shown for HP servers.</p> <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>

Table 4-2. Equipment Information Fields (Continued)

Field	Description
Power 1	<p>The health status of power supply 1 located in Windows Server system is shown as one of the following:</p> <ul style="list-style-type: none"> • Good indicates power supply 1 is operating. • Non-critical condition indicates the power supply condition that should be addressed soon or at the next scheduled maintenance. • Critical condition means the cable cord of power supply 1 is unplugged or the power supply is operating outside of wattage limit which takes the power supply offline. It requires immediate attention. • Unknown/Undefined when the health status of power supply 1 is unknown or cannot be determined. <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>
Power 2	<p>The health status of power supply 2 located in Windows Server system is shown as one of the following:</p> <ul style="list-style-type: none"> • Good indicates power supply 2 is operating. • Non-critical condition indicates the power supply condition that should be addressed soon or at the next scheduled maintenance. • Critical condition means the cable cord of power supply 2 is unplugged or the power supply is operating outside of wattage limit which takes the power supply offline. It requires immediate attention. • Unknown/Undefined when the health status of power supply 2 is unknown or cannot be determined. <p>This field is applicable only to Windows Server system, otherwise, Not Applicable is displayed in the field.</p>

Table 4-2. Equipment Information Fields (Continued)

Field	Description
Power 3	<p>The health status of power supply 3 located in Windows Server system is shown as one of the following:</p> <ul style="list-style-type: none"> • Good indicates power supply 3 is operating. • Non-critical condition indicates the power supply condition that should be addressed soon or at the next scheduled maintenance. • Critical condition means the cable cord of power supply 3 is unplugged or the power supply is operating outside of wattage limit which takes the power supply offline. It requires immediate attention. • Unknown/Undefined when the health status of power supply 3 is unknown or cannot be determined. <hr/> <p>Note This field is dependent upon the model of the Windows Server system. For example, this field is applicable to Windows Server PowerEdge 2800 system. Otherwise, Not Applicable is displayed in the field.</p> <hr/> <p>This field is applicable only to Windows Server system, otherwise, Not Applicable is displayed in the field.</p>

Table 4-2. Equipment Information Fields (Continued)

Field	Description
Power 4	<p>The health status of power supply 4 located in Windows Server system is shown as one of the following:</p> <ul style="list-style-type: none"> • Good indicates power supply 4 is operating. • Non-critical condition indicates the power supply condition that should be addressed soon or at the next scheduled maintenance. • Critical condition means the cable cord of power supply 4 is unplugged or the power supply is operating outside of wattage limit which takes the power supply offline. It requires immediate attention. • Unknown/Undefined when the health status of power supply 4 is unknown or cannot be determined. <p>Note This field is dependent upon the model of the Windows Server system. For example, this field is applicable to Windows Server PowerEdge 2800 systems. Otherwise, Not Applicable is displayed in the field.</p>
Power Redundant State	<p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p> <p>Redundant power supply can prevent system shutdown due to power supply failure.</p> <ul style="list-style-type: none"> • Full when all the power supplies located in Windows Server system are working. • Lost when one or more power supply is not working. <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>

Table 4-2. Equipment Information Fields (Continued)

Field	Description
Cooling Redundant State	<p>Redundant fan can prevent system shutdown due to fan failure.</p> <ul style="list-style-type: none"> • Full when all the fans located in Windows Server system are working. • Lost when one or more fan is not working. • Undefined if the redundancy status is not available for some models of Windows Server systems, such as, PowerEdge T610. <p>This field is applicable only to Windows Server systems, otherwise, Not Applicable is displayed in the field.</p>
Free Space in Drive C:	<p>Displays available disk space (in GB) for Drive C.</p> <p>This field is applicable only to Windows Server system, otherwise, Not Applicable is displayed in the field.</p>
Used Space in Drive C:	<p>Displays used disk space (in GB) for Drive C.</p> <p>This field is applicable only to Windows Server system, otherwise, Not Applicable is displayed in the field.</p>
Free Space in Drive D:	<p>Displays available disk space (in GB) for Drive D.</p> <p>This field is applicable only to Windows Server system, otherwise, Not Applicable is displayed in the field.</p>
Used Space in Drive D:	<p>Displays used disk space (in GB) for Drive D.</p> <p>This field is applicable only to Windows Server system, otherwise, Not Applicable is displayed in the field.</p>

Note

1. The Microsoft SNMP Service and Server Manager must be installed on the Windows Server in order to view the status for the fields applicable to Windows Servers. The Microsoft SNMP Service and Server Manager are installed during I/A Series software v8.6 installation. For information on installing v8.6 software, refer to *V8.6 Release Notes and Installation Procedures* (B0700SD).
2. A System Monitor log entry is generated if Server Status as described in Table 4-1 is transitioned to a Critical or Non-recoverable status, as well as, when the Server Status is transitioned back to a recovered state. While the Windows Server is in a particular status and there is an event which results in the same status as it is already in, no message is logged to the System Monitor log. For example, the status of each component and the Server Status is in Good state, initially. If the cover of the Windows Server is opened, the Server Status is changed from Good to Critical, and this status change is logged in System Monitor log. Now, if a fan is pulled out from the Windows Server, there is no change in the Server Status as it is already in Critical status. Hence, no message is logged to the System Monitor log.



Caution The Microsoft SNMP Services are installed on Windows Server systems running I/A Series software v8.6-v8.8 or Control Core Services v9.0 or later. The services include the **SNMP service** and **SNMP Trap service**. After the installation of I/A Series software v8.6-v8.8 or Control Core Services v9.0 or later, the **SNMP Trap service** is disabled and it should **not** be manually enabled since the Windows Server system that monitors switches would be affected.

Connected Peripherals

To access additional information about a workstation's peripherals:

1. Click the **Connections** tab to display a table listing the workstation peripherals by name and type, and showing their status, run mode and error mode (Figure 4-4).

Name	Type	Status	Run Mode/Comm...	Device/Failed State
PRI P	GCIO	Failed	Off Line	Not Failed
Scanner	Unknown	Failed	Off Line	Not Failed

Figure 4-4. Connections Tab for a Workstation

2. Click any column header in the table to sort the rows on that column; click the column header a second time to reverse the sort order.
3. Drag a column header to the right or left to change the column order.
4. Do one of the following to navigate to a peripheral:
 - Double-click the equipment name.
 - Right-click the equipment name and chose **Navigate to <equipment name>** from the context menu (**Navigate to AKP 1** in Figure 4-4).

The peripheral is selected in the Navigation pane and the **General** tab in the Information pane displays status and equipment information tables for the selected device (Figure 4-6).

Counters Tab

The Counters tab (Figure 4-5) provides statistics on the workstation performance such as the number of transactions and errors. Counters from the tab can be added to a watch list that includes counters from other workstations or other equipment.

To access counters for a workstation:

1. Select the workstation in the Navigation pane and click the **Counters** tab in the Information pane.
2. Click the radio button at the top of the page to select the category to be displayed.

The tab consists of a five-column table with the counter names, current and previous values, and high and low values. Figure 4-5 is a workstation Counters tab with the MAC Sublayer category selected.

Counter	Current Value	Previous Value	Maximum	Minimum
802.3 MAC Resets	0	0	0	0
802.4 MAC Resets	0	0	0	0
Align Errors	0	0	0	0
Collisions	0	0	0	0
CRC Errors	518	518	518	518
DMA Overrun	0	0	0	0
DMA Underruns	3286	3286	3286	3286
Excess Collisions	0	0	0	0
Frames Received	55882410	55882410	55882410	55882410
Frames Transmitted	2322965	2322965	2322965	2322965
No Receive Resources	0	0	0	0
Transmits Deferred	0	0	0	0

Figure 4-5. Workstation Counters Tab

Buttons in the Counters tab toolbar are used to read and reset values in the table, and add selected counters to the Watch tab. See “Counters Tab” on page 52 and “Watch Tab” on page 63 for additional information on using features of the Counters and Watch tabs, respectively.

Workstations and control stations maintain the same counters, and these are described in detail in Chapter 6, “Station Counters”

Peripherals Information

When a peripheral is selected, the General tab in the Information pane displays Equipment Status and Equipment Information tables similar to those for the serial/GCIO annunciator in Figure 4-6 or the printer in Figure 4-8 or Figure 4-9.

Note The System Manager considers serial/parallel/USB printers to be peripherals, while it considers network printers to be separate objects. This section describes the serial/parallel/USB printers in System Manager. For network printers, refer to “Network Printers” on page 126.

The following objects are considered peripherals in the System Manager:

- “Serial/GCIO Announciators and GCIO Peripherals” on page 119
- “USB Announcer Keyboards” on page 121
- “Serial or Parallel Printers” on page 122
- “USB Printers” on page 123

Serial/GCIO Announciators and GCIO Peripherals

The table layout in Figure 4-6 is used to provide status and equipment information for serial/GCIO announciators and peripherals that use the GCIO interface. The data fields are described in Table 4-3.

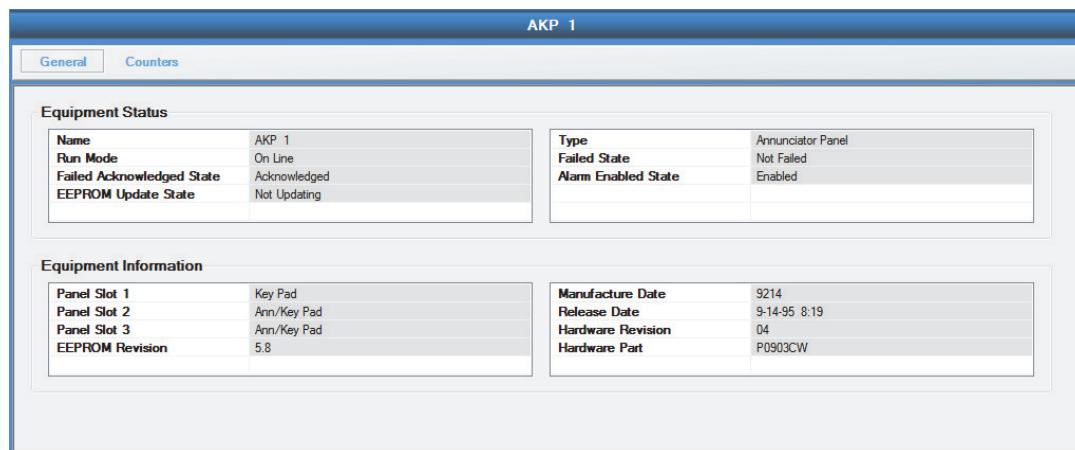


Figure 4-6. Information Pane for an Serial/GCIO Annunciator Panel

Table 4-3. Serial/GCIO Annunciator Panel Equipment Status and Equipment Information Display Fields

Field	Description
Equipment Status	
Name	Device name (letterbug) assigned during hardware definition
Type	Equipment type

Table 4-3. Serial/GCIO Annunciator Panel Equipment Status and Equipment Information Display Fields (Continued)

Field	Description
Run Mode	On Line or Off Line. The status changes to Off Line when you initiate an EEPROM update, and returns to On Line when the update is completed.
Failed State	Failed or Not Failed
Failed Acknowledge State	Acknowledged or Not Acknowledged. The field changes to Not Acknowledged when Failed State changes from Not Failed to Failed. <ul style="list-style-type: none"> • Right-click the peripheral name in the Navigation pane and choose Acknowledge Device from the context menu to acknowledge the failed peripheral.
Alarming State	Indicates whether alarming is Enabled or Inhibited for the peripheral. When alarming is Inhibited for the device, the system monitor still updates the device status, but system alarm messages are not sent to System Manager and are not logged to the printer or the historian.
EEPROM Update State	EEPROM Updating when the workstation is downloading peripheral software; otherwise, Not Updating
Equipment Information	
Release Date	Date of the revision level
EEPROM Revision	Revision level of the peripheral software image
Hardware Revision	Revision level of the hardware
Hardware Part	Part number of the peripheral
Panel Slot 1	Type of serial/GCIO annunciator in the slot: Annunciator/Keypad, Annunciator/Numeric Keypad, or Modular Keyboard
Manufacture Date	Date the hardware was manufactured
Panel Slot 2	Type of serial/GCIO annunciator in the slot: Annunciator/Keypad, Annunciator/Numeric Keypad, or Modular Keyboard
Panel Slot 3	Type of serial/GCIO annunciator in the slot: Annunciator/Keypad, Annunciator/Numeric Keypad, or Modular Keyboard

USB Announcer Keyboards

The table layout in Figure 4-7 is used to provide status and equipment information for USB annunciator and annunciator/numeric keyboards, and other peripherals. The data fields are described in Table 4-4.

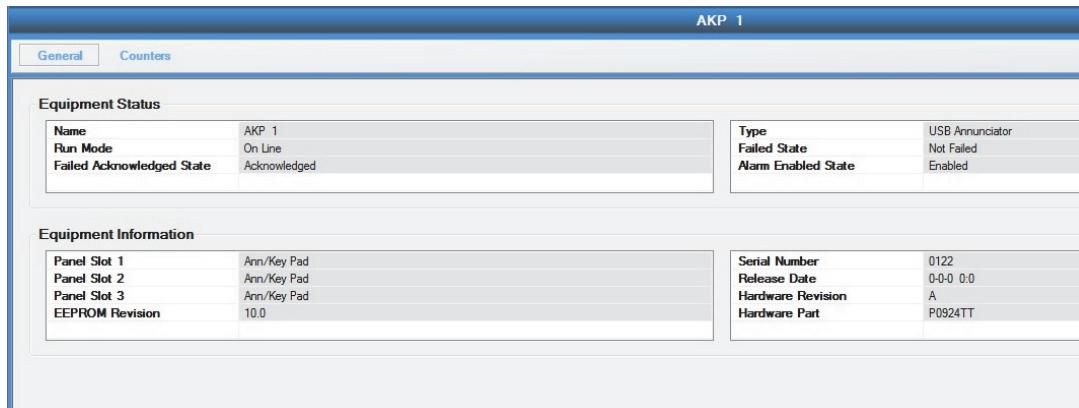


Figure 4-7. Information Pane for USB Annunciator Keyboard Panel

Table 4-4. USB Annunciator Keyboard Panel Equipment Status and Equipment Information Display Fields

Field	Description
Equipment Status	
Name	Device name (letterbug) assigned during hardware definition
Type	Equipment type
Run Mode	On Line or Off Line.
Failed State	Failed or Not Failed
Failed Acknowledge State	Acknowledged or Not Acknowledged. The field changes to Not Acknowledged when Failed State changes from Not Failed to Failed. <ul style="list-style-type: none">• Right-click the peripheral name in the Navigation pane and choose Acknowledge Device from the context menu to acknowledge the failed peripheral.
Alarming State	Indicates whether alarming is Enabled or Inhibited for the peripheral. When alarming is Inhibited for the device, the system monitor still updates the device status, but system alarm messages are not sent to System Manager and are not logged to the printer or the historian.
Equipment Information	
Release Date	Date of the revision level
EEPROM Revision	Revision level of the peripheral software image
Hardware Revision	Revision level of the hardware

Table 4-4. USB Annunciator Keyboard Panel Equipment Status and Equipment Information Display Fields (Continued)

Field	Description
Hardware Part	Part number of the peripheral
Panel Slot 1	Type of USB annunciator in the slot: Annunciator/Keypad or Annunciator/Numeric Keypad.
Serial Number	A unique code assigned for the identification of the unit. Only the last four digits of the serial number are displayed. The actual serial number can be up to eight digits; however, System Management and SMDH only support a four digit field, so System Manager only displays the last four digits of the serial number.
Panel Slot 2	Type of USB annunciator in the slot: Annunciator/Keypad or Annunciator/Numeric Keypad
Panel Slot 3	Type of USB annunciator in the slot: Annunciator/Keypad or Annunciator/Numeric Keypad

Serial or Parallel Printers

The table layout in Figure 4-8 is used to display status and equipment information for serial or parallel printers. The data fields are described in Table 4-5.

The screenshot shows the 'Information' pane for printer LP00. At the top, there are tabs for 'General' and 'Counters'. Below the tabs, the 'Equipment Status' section contains two tables:

Name	LP00
Run Mode	On Line
Failed Acknowledged State	Acknowledged
Ready State	Ready

Type	Printer
Failed State	Not Failed
Alarming State	Enabled

Below the 'Equipment Status' section is the 'Equipment Information' section, which also contains two tables:

Backup Name 1	No
Auto Recovery	
Port Number	1

Backup Name 2	No
Lockable	
Class Name	OKI132

Figure 4-8. Information Pane for a Serial or Parallel Printer

Table 4-5. Serial or Parallel Printer Equipment Status and Equipment Information Display Fields

Field	Description
Equipment Status	
Name	Device name (letterbug) assigned during hardware definition

Table 4-5. Serial or Parallel Printer Equipment Status and Equipment Information Display Fields (Continued)

Field	Description
Type	Equipment type
Run Mode	On Line or Off Line
Failed State	Failed or Not Failed
Failed Acknowledge State	Acknowledged or Not Acknowledged . The field changes to Not Acknowledged when Failed State changes from Not Failed to Failed. <ul style="list-style-type: none">• Right-click the peripheral name in the Navigation pane and choose Acknowledge Device from the context menu to acknowledge the failed peripheral.
Alarming State	Indicates whether alarming is Enabled or Inhibited for the peripheral. When alarming is Inhibited for the device, the system monitor still updates the device status, but system alarm messages are not sent to System Manager and are not logged to the printer or the historian.
Ready State	Ready or Not Ready
Equipment Information	
Backup Name 1	Letterbugs of the backup printers
Backup Name 2	
Auto Recovery	Yes or No indicating whether Auto Recovery is enabled
Lockable	Yes or No indicating whether access to the printer can be restricted
Port Number	Port connecting the printer to the workstation
Class Name	Type of printer

USB Printers

The table layout in Figure 4-9 is used to display status and equipment information for USB printers. The data fields are described in Table 4-6.

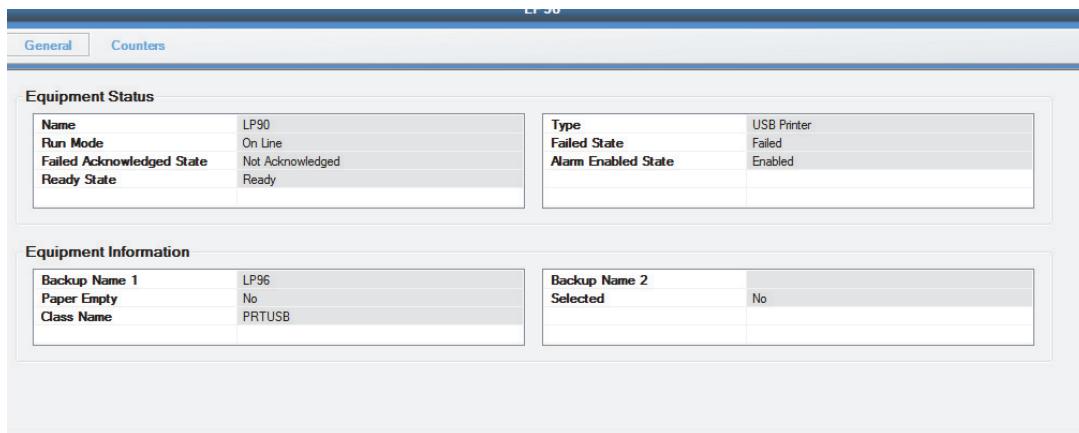


Figure 4-9. Information Pane for a USB Printer

Table 4-6. USB Printer Equipment Status and Equipment Information Display Fields

Field	Description
Equipment Status	
Name	Device name (letterbug) assigned during hardware definition
Type	Equipment type
Run Mode	On Line or Off Line
Failed State	Failed or Not Failed
Failed Acknowledge State	Acknowledged or Not Acknowledged. The field changes to Not Acknowledged when Failed State changes from Not Failed to Failed. <ul style="list-style-type: none"> Right-click the peripheral name in the Navigation pane and choose Acknowledge Device from the context menu to acknowledge the failed peripheral.
Alarm Enabled State	Indicates whether alarming is Enabled or Inhibited for the peripheral. When alarming is Inhibited for the device, the system monitor still updates the device status, but system alarm messages are not sent to System Manager and are not logged to the printer or the historian.
Ready State	Ready or Not Ready
Equipment Information	
Backup Name 1	Letterbugs of the backup printers
Backup Name 2	
Paper Empty	Yes or No indicating whether the printer is out of paper or not

Table 4-6. USB Printer Equipment Status and Equipment Information Display Fields (Continued)

Field	Description
Selected	Yes if the “SEL” button on the USB printer is pressed, otherwise No. Note the printer must be configured as USB printer.
Class Name	Type of printer

Peripherals Counters

The Counters tab for printers display the number of messages dropped. serial/GCIO annunciator and GCIO peripherals do not maintain counters.

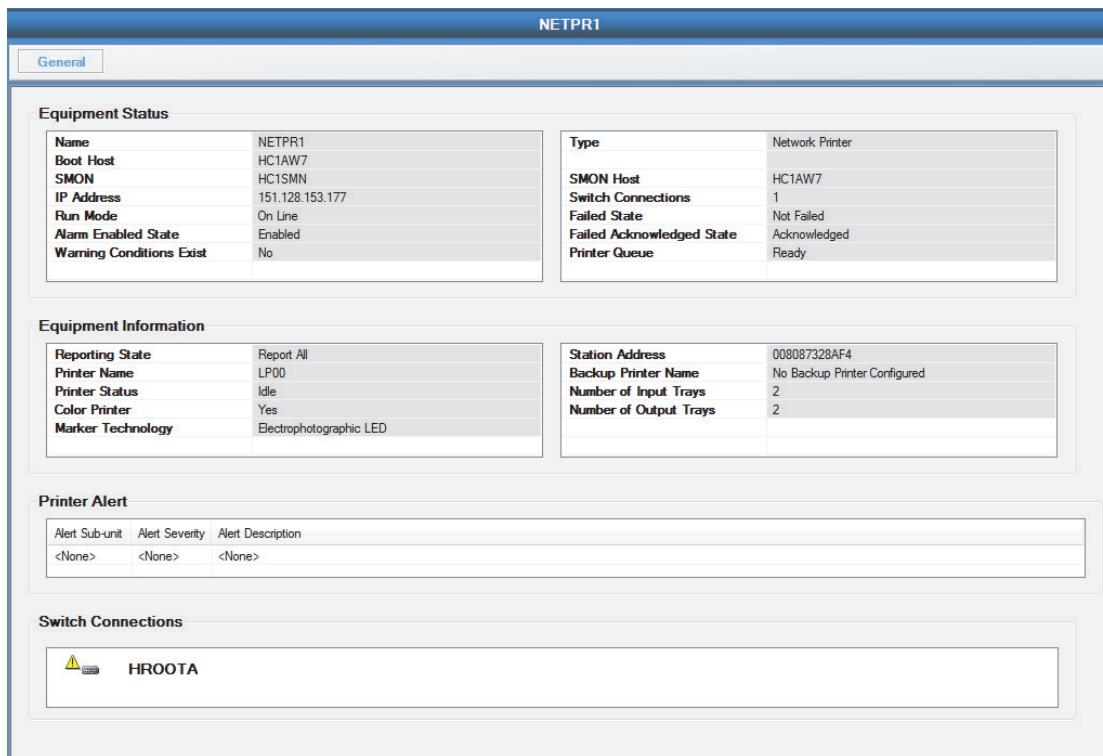
See “Counters Tab” on page 52 and “Watch Tab” on page 63 for additional information on using the Counters and Watch tabs, respectively.

Network Printers

Note The System Manager considers serial/parallel/USB printers to be peripherals, while it considers network printers to be separate objects. This section describes the network printers in System Manager. For serial/parallel/USB printers, refer to “Serial or Parallel Printers” on page 122 or “USB Printers” on page 123.

The network printer shares the same  icon as any peripheral in the System Manager.

The table layout in Figure 4-10 is used to display status and equipment information for network printers, as well as printer alerts. The data fields are described in Table 4-7 to Table 4-9.



Name	NETPR1	Type	Network Printer
Boot Host	HC1AW7	SMON Host	HC1AW7
SMON	HC1SMN	Switch Connections	1
IP Address	151.128.153.177	Failed State	Not Failed
Run Mode	On Line	Failed Acknowledged State	Acknowledged
Alarm Enabled State	Enabled	Printer Queue	Ready
Warning Conditions Exist	No		

Reporting State	Report All	Station Address	000807328AF4
Printer Name	LP00	Backup Printer Name	No Backup Printer Configured
Printer Status	Idle	Number of Input Trays	2
Color Printer	Yes	Number of Output Trays	2
Marker Technology	Electrophotographic LED		

Alert Sub-unit	Alert Severity	Alert Description
<None>	<None>	<None>

Switch Connections	
	HROOTA

Figure 4-10. Information Pane for a Network Printer

Table 4-7. Network Printer Equipment Status Display Fields

Field	Description
Equipment Status	
Name	Device name (letterbug) assigned during hardware definition
Type	Equipment type
Boot Host	Boot host of the network printer.

**Table 4-7. Network Printer Equipment Status
Display Fields (Continued)**

Field	Description
SMON	System Monitor that monitors the network printer.
SMON Host	Workstation that hosts the System Monitor.
IP Address	IP address of the network printer.
Switch Connections	Number of switches to which the network printer is connected.
Run Mode	On Line or Off Line
Failed State	Failed or Not Failed
Failed Acknowledge State	Acknowledged or Not Acknowledged. The field changes to Not Acknowledged when Failed State changes from Not Failed to Failed. <ul style="list-style-type: none">• Right-click the peripheral name in the Navigation pane and choose Acknowledge Device from the context menu to acknowledge the failed peripheral.
Alarm Enabled State	Indicates whether alarming is Enabled or Inhibited for the peripheral. When alarming is Inhibited for the device, the system monitor still updates the device status, but system alarm messages are not sent to System Manager and are not logged to the printer or the historian.
Warning Conditions Exist	Indicates if any warning condition occurs on the network printer (Yes , No , or Diags Active , which means the printer queue is paused).
Printer Queue	Indicates the status of the network printer queue (Ready or Paused).

**Table 4-8. Network Printer Equipment Information
Display Fields**

Field	Description
Reporting State	Reporting All , No Reporting , or No Information .
Station Address	The MAC address of the network printer.
Printer Name	Name of the printer.
Backup Name 1	Letterbug of the backup printer. If none is configured, then No Backup Configured .
Color Printer	Indicates if the network printer is color printer (Yes or No).

**Table 4-8. Network Printer Equipment Information
Display Fields (Continued)**

Field	Description
Printer Status	Status of the printer: <ul style="list-style-type: none">• Idle• Busy• Unavailable• Standby or Power Save Mode• Warm Up• Running• Off Line• Moving Off Line• Critical Alert• Non-critical Alert
Number of Input Trays	Number of the input trays.

**Table 4-8. Network Printer Equipment Information
Display Fields (Continued)**

Field	Description
Number of Output Trays	Number of the output trays.
Marker Technology	Type of marking technology used for the marking subunit: <ul style="list-style-type: none">• Undefined• Other• Unknown• Electrophotographic LED• Electrophotographic Laser• Electrophotographic Other• Impact Moving Head Dot Matrix 9-pin• Impact Moving Head Dot Matrix 24-pin• Impact Moving Head Dot Matrix Other• Impact Moving Head Fully Formed• Impact Band• Impact Other• Inkjet Aqueous• Inkjet Solid• Inkjet Other• Pen• Thermal Transfer• Thermal Sensitive• Thermal Diffusion• Thermal Other• Electroerosion• Electrostatic• Photographic Microfiche• Photographic Imagesetter• Photographic Other• Ion Deposition• E Beam• Typesetter• Unknown Technology

The Printer Alerts field displays any alerts present for the selected network printer. It provides the following fields for each alert. A maximum of five printer alerts will be displayed.

Table 4-9. Network Printer Alert Display Fields

Field	Description
Alert Subunit	<p>The subunit of the network printer where the alert occurs:</p> <ul style="list-style-type: none"> • Unknown • Other • Host Resources MIB Storage Table • Host Resources MIB Device Table • General Printer • Cover • Localization • Input • Output • Marker • Marker Supplies • Marker Colorant • Media Path • Channel • Interpreter • Console Display Buffer • Console Lights • Alert • Finisher Device
Alert Severity	<p>The severity level of the alert.</p> <ul style="list-style-type: none"> • Undefined • Other • Unknown • Critical • Warning
Alert Description	Short description about the alert.

Also, refer to “Equipment Change Actions” on page 131 for additional actions for network printers.

Equipment Change Actions

Equipment Change Actions are provided below for workstations, network printers and peripherals (which include serial/parallel/USB printers).

When a workstation is selected, the following commands can be selected from the station's context menu or from the **Actions > Equipment Change** submenu pulled down from the System Manager main menu:

- **Acknowledge Station** (when there is an unacknowledged alarm)
- **Inhibit Alarming or Enable Alarming**
- **Disable All Reports or Enable All Reports**

For a selected network printer, the following commands can be selected from the network printer's context menu or from the **Actions > Equipment Change** submenu pulled down from the System Manager main menu:

- **Acknowledge Station** (when there is an unacknowledged alarm)
- **Inhibit Alarming or Enable Alarming**
- **Disable All Reports or Enable All Reports**
- **Go Off-Line or Go On-Line** (for printers)

When a peripheral is selected, the following commands can be selected from the peripheral's context menu or from the **Actions > Equipment Change** submenu pulled down from the System Manager main menu:

- **Acknowledge Device** (when there is an unacknowledged alarm)
- **Inhibit Device Alarming or Enable Device Alarming**
- **Go Off-Line or Go On-Line** (for printers)
- **EEPROM Update** (for only serial/GCIO annunciator panels and GCIO. Not available for the USB annunciator keyboards.)

Managing Alarms

There are multiple ways to acknowledge alarms associated with a workstation or one of its peripherals:

- Use the Alarms tab in the Accessories pane to identify and acknowledge an individual alarm, or acknowledge all alarms (see "Alarms Tab" on page 58).
- Right-click the workstation in the Navigation pane and choose **Acknowledge Station** from the context menu to acknowledge all alarms for the selected station.
- Right-click the peripheral in the Navigation pane and choose **Acknowledge Device** from the context menu to acknowledge an alarm from the selected device.
- Acknowledge all alarms in the system monitor domain to which the workstation is assigned by selecting the system monitor in the Navigation pane and doing one of the following:

- Choose **Actions > Acknowledge Smon Domain** from the main menu.
- Click  in the toolbar.
- Right-click the system monitor and choose **Acknowledge Smon Domain** from the context menu.

You can inhibit all alarms for the workstation or one of its peripherals so that no alarm conditions are reported to the system monitor.

To inhibit workstation alarms:

1. Right-click the workstation in the Navigation pane.
2. Choose **Inhibit Alarming** from the context menu.

The workstation is marked with the  symbol to indicate that alarms are being inhibited.

To inhibit alarms from one of the station's peripherals:

1. Right-click the peripheral in the Navigation pane.
2. Choose **Inhibit Device Alarming** from the context menu.

The peripheral's icon is marked with the  symbol to indicate that alarms are being inhibited.

To re-enable the alarms:

1. Right-click the peripheral in the Navigation pane.
2. Choose the appropriate command from the context menu:

Enable Alarming

Enable Device Alarming

Updating Peripheral Software

The EEPROM Update action for a peripheral device updates the selected device with new firmware. The action downloads the software, burns a new EEPROM image, and restarts the device. During the update operation, the peripheral is off-line and marked as failed.

Invensys® supplies the EEPROM update software. It is recommended that you perform an EEPROM update only after an official Invensys software release.

To update existing peripheral firmware:

1. Right-click the peripheral in the Navigation pane and choose **EEPROM Update** from the context menu.
2. Respond to the prompts in the confirmation dialog if the Action Settings requires that you confirm the action and document the reason for the firmware update.
3. Right-click the device and choose **Acknowledge Device** from the context menu when the peripheral is back on-line.

Disable/Enable All Reports

Enabling all reports permits the internal reporting of all status information for the workstation and any attached peripherals, as well as reporting of system and peripheral counters to the system monitor. When reporting is enabled, all displays are updated with the current status of the station and its peripherals, and equipment failures can be acknowledged.

- Right-click the workstation and choose **Disable All Reports** to stop internal reporting.

When reporting is disabled, the Equipment Status and Equipment Information tables may contain outdated information, you cannot acknowledge equipment failures, and the station health status may not be accurate in terms of the peripherals attached to the station.

Note Disabling reports is not recommended unless you need to reduce traffic on the network to diagnose a problem.

Go Off-Line or Go On-Line (for Printers)

Selecting **Go Off-Line** pauses the printer queue.

Selecting **Go On-Line** resumes the processing of a paused printer queue.

CHAPTER 5

Control Stations, Control Network Interfaces, ATSSs, and LAN Interface (LIs)

This chapter describes how to use System Manager software to monitor control stations and proprietary network management modules (CNIs, ATSSs, and LIs) and perform equipment change actions on these devices.

Note The examples used in this chapter involve the Field Control Processor 280 (FCP280), Control Network Interface (CNI), Field Control Processor 270 (FCP270), and Z-Module Control Processor 270 (ZCP270).

Contents

- Identification of Control Stations, Control Network Interfaces (CNIs), ATSSs, and LIs
- Station Information for Control Processors, CNIs, and ATSSs
- Station Information for LAN Interface (LI)
- Connected FBMs
- Control Station, CNI, ATSS, and LI Counters
- Primary ECB (Primary FBM) Information
- Equipment Change Actions

Identification of Control Stations, Control Network Interfaces (CNIs), ATSSs, and LIs

Control stations and proprietary network management modules (Control Network Interfaces (CNIs), Address Translation Station (ATSSs), and LAN interface (LI) modules) are depicted in the Navigation pane by the  icon displayed on the second level below the assigned system monitor (or the selected switch when the Switch view is used). When the station is a fault-tolerant control processor, fault-tolerant CNI, a redundant ATSS, or a fault-tolerant LI, a **2** is attached to the upper right corner of the icon.

Identification for FCP280 Control Processor

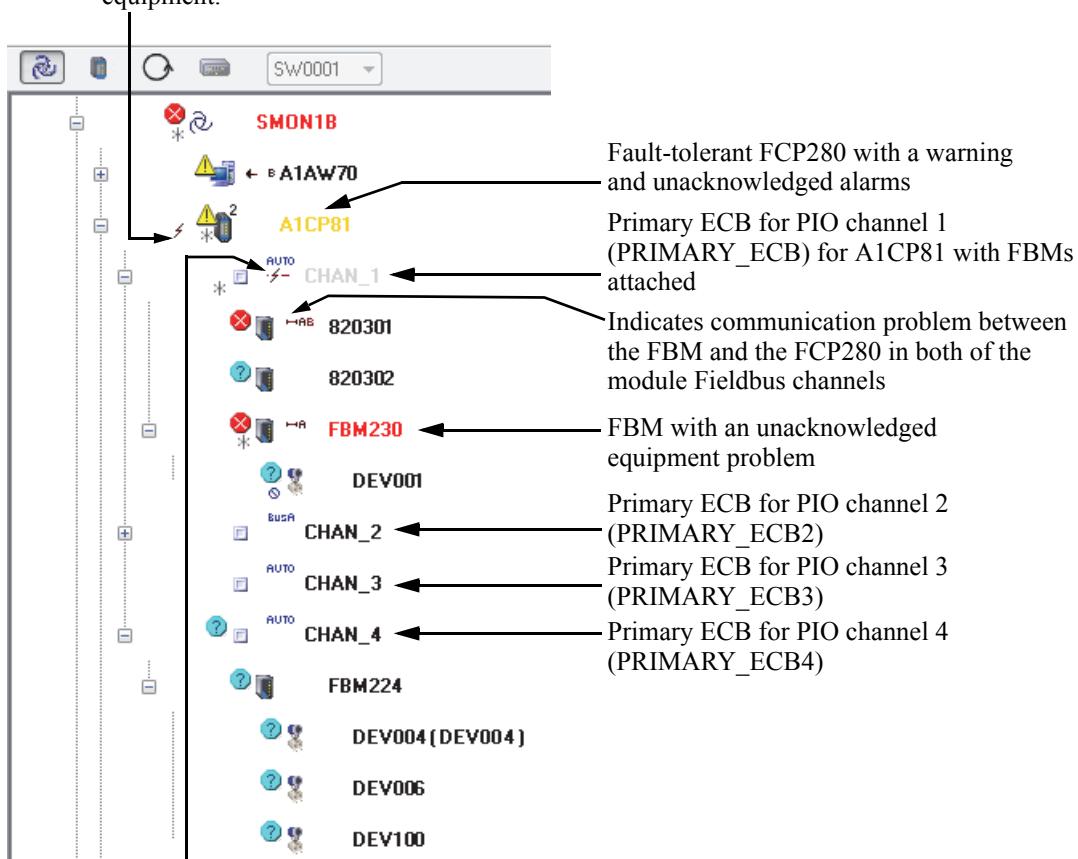
FCP270/ZCP270 and earlier control processors connect to one HDLC fieldbus (PIO channel). Their software “driver” for this fieldbus/channel is called the Primary Equipment Control Block (ECB), also referred to as ECB11, ECBP, FBM0, or the Primary FBM. It resides in the control processor and manages communications with the Fieldbus Modules (FBMs).

However, the Field Control Processor 280 (FCP280) can connect directly to four HDLC fieldbuses (PIO channels) without the use of an FEM100. Its compound has a Primary ECB for each of the four PIO channels (a total of four Primary ECBs).

When you expand an FCP280 in the Navigation pane, the next level shows the FCP280’s four Primary ECBs (□) (Figure 5-1).

The Primary ECBs can be selected to view additional information about the control processor and perform equipment change actions that affect the FBMs and the Fieldbus communications on the HDLC fieldbus (PIO channel) for which the Primary ECB is responsible.

NOTE: The lightning bolt symbol indicates there is a communication fault between the attached equipment.



NOTE: The lightning bolt on the right of primary ECB icon for CHAN_1 indicates a communication fault for the attached FBM. It indicates there is at least one FBM that has a PIO bus fault on the HDLC fieldbus/PIO channel. The communication fault is only displayed after the Primary ECB is expanded.

Figure 5-1. FCP280s and their Primary ECBs (Primary FBMs)

Identification for Control Network Interface (CNI)

The Control Network Interface acts a gateway to enable other Foxboro Evo systems to read specified Object Manager tags (which hold the values of control block parameters, etc.) from within its own Foxboro Evo system. It does not manage any other modules in the system. It is described in detail in *Control Network Interface (CNI) User's Guide* (B0700GE).

In the Navigation pane, the CNI is shown under the System Monitor to which it is assigned. When you expand the CNI in the Navigation pane, the next level shows the CNI's Primary Equipment Control Block (ECB -  - see Figure 5-2), which is its communication software "driver" (also referred to as ECB11 or ECBP). It resides in the CNI and manages communications with the local Object Manager hosts and the other CNIs to which it is linked.

The Primary ECB can be selected to view additional information about the CNI and perform equipment change actions that affect the CNI.

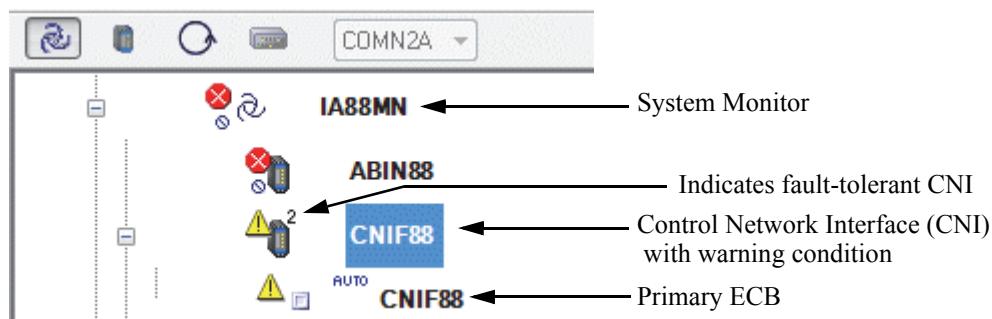


Figure 5-2. Control Network Interface (CNI) and its Primary ECB

Identification for FCP270/ZCP270 Control Processors and Earlier

When you expand an FCP270/ZCP270 or earlier control processor in the Navigation pane, the next level shows the station's Primary ECB () , sometimes referred to as ECB11, ECBP, FBM0 or the Primary FBM. The Primary ECB is not a separate piece of hardware, but is an equipment control block residing in the control processor and managing communications with the attached field devices:

- Fieldbus Modules (FBMs) when the control processor is an FCP280, FCP270, CP40, or CP30 (Figure 5-3)
- Fieldbus Communication Modules (FCMs) when the control processor is a ZCP270 or CP60 (Figure 5-4).

This Primary ECB can be selected to view additional information about the control processor and perform equipment change actions that affect the FBMs and the Fieldbus communications.

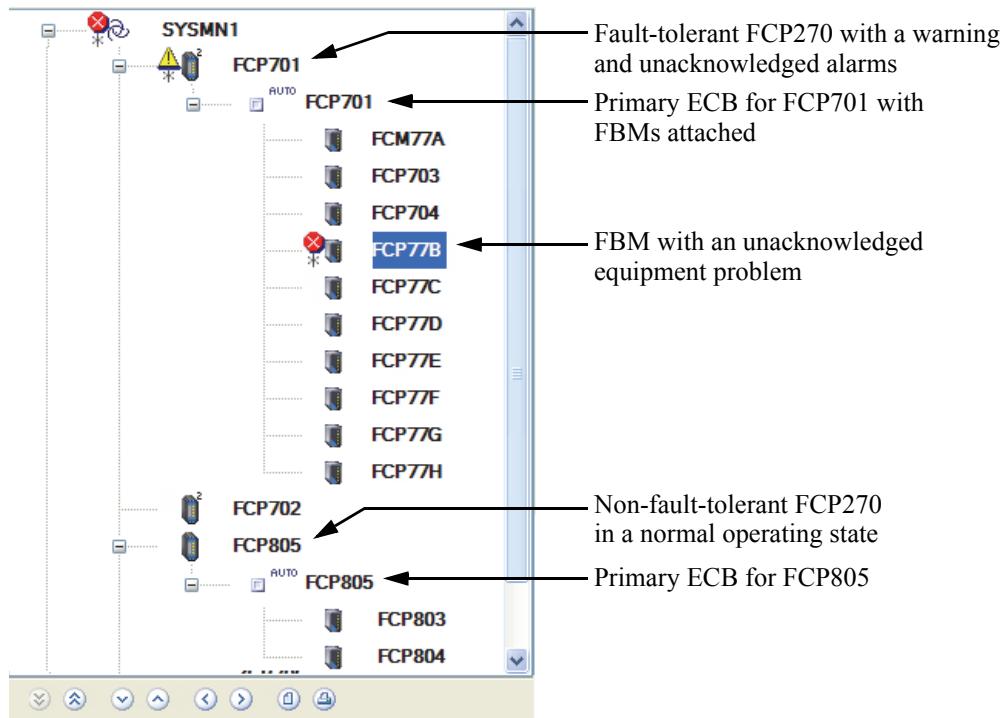


Figure 5-3. FCP270s and their Primary ECBS (Primary FBMs)

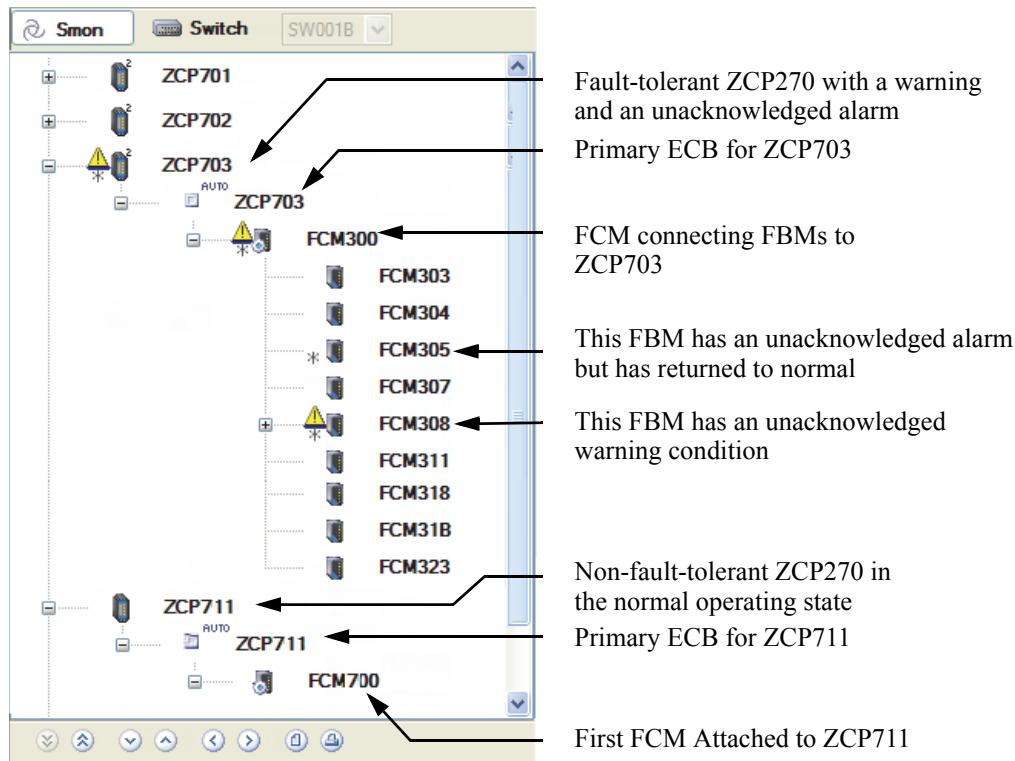


Figure 5-4. ZCP270s and their Primary ECBS (Primary FBMs)

CP, CNI, and ATS Equipment Status Indicators

A symbol attached to the upper left corner of the control station, CNI, or ATS icon indicates an adverse condition. For example, for a station or one of its field devices, the warning symbol on FCP701 and the red failure symbol on the attached FBM in Figure 5-3 may appear. The alarm status associated with the control station is indicated by symbols on the lower left side of the station.

- Choose **Help > Legend** from the main menu to identify the equipment health and alarm status symbols, or refer to “Status Indicators” on page 47.

Labels attached to the control station, CNI, or ATS icon indicate the state of communications with its attached field devices and with switches in the network:

Table 5-1. Equipment Status Indicators for CP, CNI, and ATS

Symbol	Condition
	[Not applicable for CNI.] The lightning symbol to the left of the station icon indicates that there is a cable fault with at least one of the field devices attached to the station. This symbol is not shown until the station node in the Navigation pane is expanded for the first time in the session so that System Manager retrieves the identity and status of the attached devices.
	The lightning symbol on the top right of the CP/ATS indicates that there is a failure in Cable A.
	The lightning symbol on the middle right of the CP/ATS indicates that there is a failure in Cable B.
	The top right corner is used for indicators of a fault in the station’s, CNI’s, or ATS’s connection to the network when the fault is with A channel (Receiver A) and middle right when the fault is in B channel (Receiver B).
	The top right corner is used for indicators of a fault in the station’s, CNI’s, or ATS’s connection to the network when the fault is with A channel (Transmitter A) and middle right when the fault is in B channel (Transmitter B).
	The CP30, CP40, CP60, or ATS with symbol indicates that station transmitter/receiver cable alarms are inhibited for Nodebus Cable A.
	The CP30, CP40, CP60, or ATS with symbol indicates that station transmitter/receiver cable alarms are inhibited for Nodebus Cable B.

Table 5-1. Equipment Status Indicators for CP, CNI, and ATS

Symbol	Condition
 	The ATS with  symbol on bottom left indicates that the cable alarms are inhibited for Nodebus Cable A.
	The ATS with  symbol on bottom left indicates that the cable alarms are inhibited for Nodebus Cable B.
	The CP with the  symbol on the bottom right indicates that the station has devices attached to the single cable (that is, ThinNet).
	<p>The red outline around an ATS letterbug indicates that there is:</p> <ul style="list-style-type: none"> • A communication fault on the Nodebus cable • A communication fault with connected station or FBM (indicates the communication fault path) <p>In this example, the affected ATS letterbug is H3BATS. Refer to Figure 5-5.</p>

Labels attached to the right side of the station's or CNI's Primary ECB indicate the state of communications between the control station and the Fieldbus devices:

Symbol	Condition
  	<p>When the station is an FCP280, FCP270, CP30, or CP40, a label at the upper right corner of the block indicates which channel in the module fieldbus is being used to communicate with the station's FBM.</p> <p>When the station is a ZCP270 or CP60, the label indicates which Fieldbus cable is being used to communicate with the attached FCMs. The indicators are:</p> <ul style="list-style-type: none"> • AUTO when the station automatically switches to the better channel or cable • Bus A when the A channel or A cable has been selected by an operator • Bus B when the B channel or B cable has been selected by an operator

Symbol	Condition
 	<p>[Not applicable to the CNI] For this symbol, be aware that the lightning bolt symbol is only applicable for an FCP280's Primary ECB. This symbol indicates that the communication fault is propagated to Primary ECB level if there is at least one FBM that has PIO bus failure on the HDLC fieldbus/PIO channel.</p> <p>This symbol is not shown until the station node in the Navigation pane is expanded for the first time in the session so that the System Manager retrieves the identity and status of the attached FBMs.</p>
 InA  InB  InAB	<p>[Not applicable to the CNI] The labels indicated to the left, when attached to the bottom right corner of the Primary ECB icon, indicate whether cable alarms are inhibited for channel A, channel B, or both A and B.</p> <p>Cable alarms can be inhibited for all FBMs on a module Fieldbus with a Primary ECB Equipment Change Action ("Managing Alarms" on page 207).</p> <p>Cable alarms can be inhibited and enabled for an individual FBM using the FBM's context menu in the Navigation pane, as described in "Managing Cable Alarms" on page 266.</p>

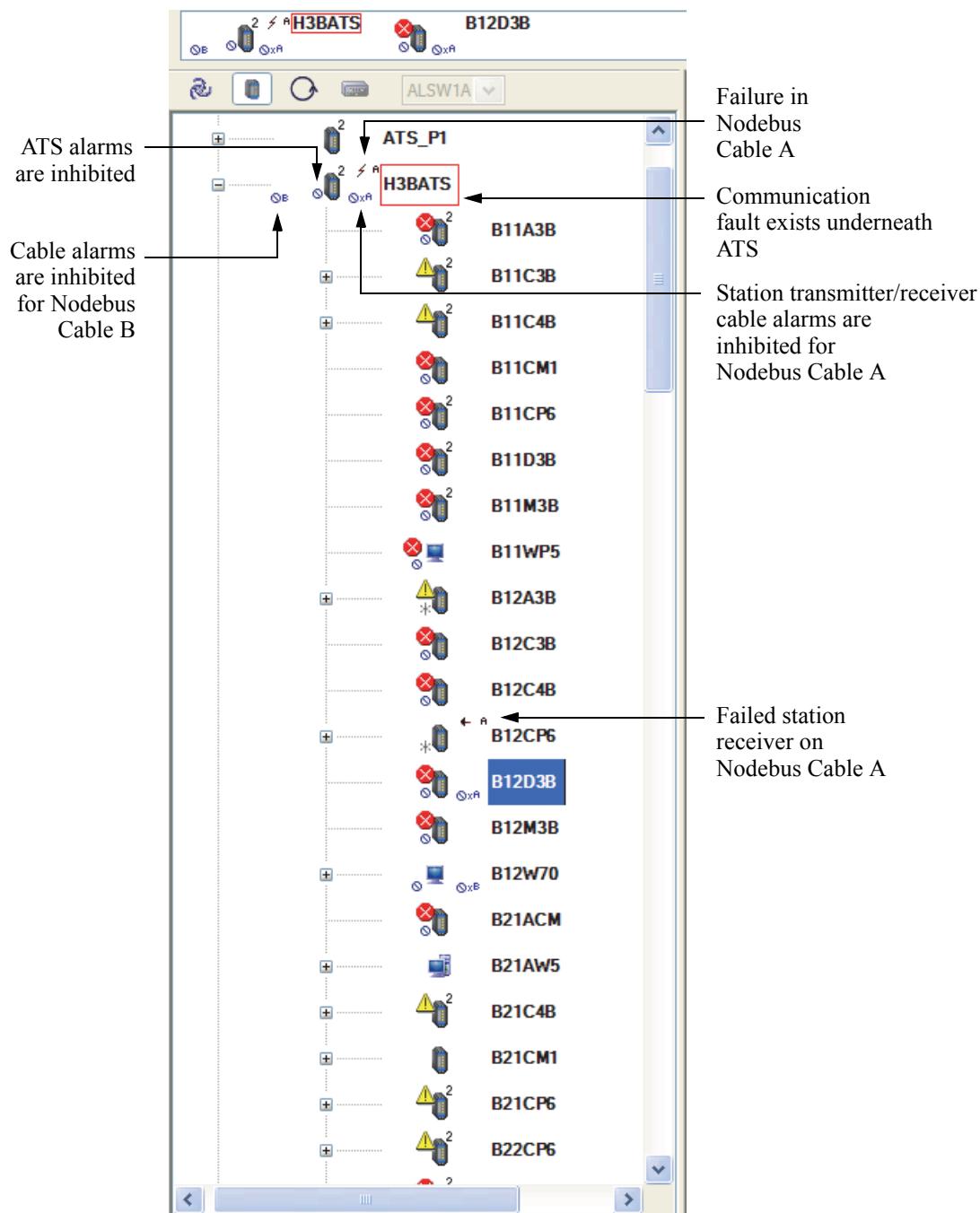


Figure 5-5. Example of ATS Equipment Status Indicators

LAN Interface (LI) Equipment Status Indicators

A symbol attached to the upper left corner of the LI icon indicates an adverse condition with an attached station. The alarm status associated with the Local Area Network Interface (LI) is indicated by symbols on the lower left side of the station.

- Choose **Help > Legend** from the main menu to identify the equipment health and alarm status symbols, or refer to “Status Indicators” on page 47.

Labels attached to the LI icon indicate the state of communications with its attached equipment.

Table 5-2. Equipment Status Indicators for LI Stations

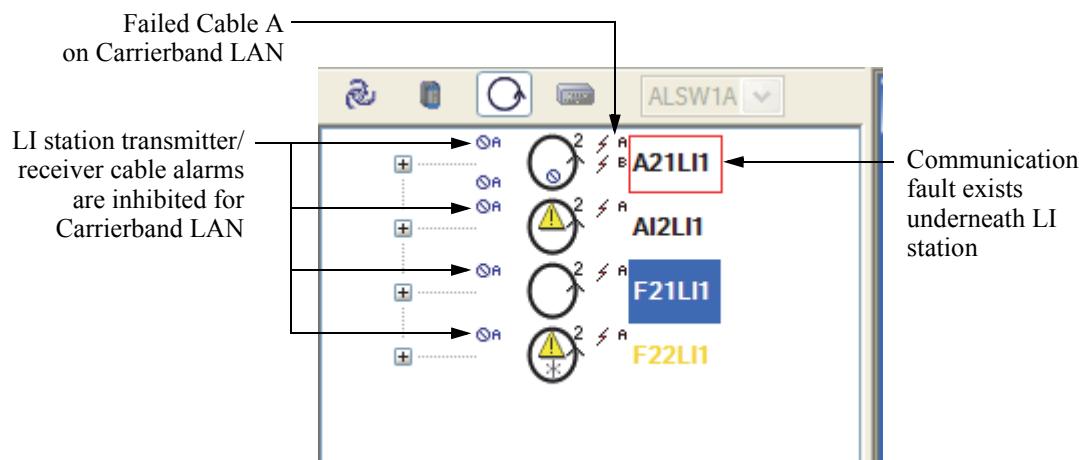
Symbol	Condition
	The lightning symbol on the top right of the LAN Interface station indicates that there is a failure in Cable A on the Nodebus or Carrierband LAN.
	The lightning symbol on the middle right of the LAN Interface station indicates that there is a failure in Cable B on the Nodebus or Carrierband LAN. For more information on the type of fault and where the fault has occurred (either on the Carrierband LAN, the Nodebus, or both simultaneously), go to the LI’s Equipment Information pane and refer to the Faults group (Figure 5-11).
	<ul style="list-style-type: none"> For Carrierband LAN, the symbol at the top right corner indicates the failed Receiver A in the primary module on the LAN side of the LI. For the Nodebus, the symbol at the top right corner indicates a failed station receiver on Nodebus Cable A. <p>The symbol  on the right side of the LI icon represents a possible Drop Cable A fault. For more information on the type of fault and where the fault has occurred (either on the Carrierband LAN, the Nodebus, or both simultaneously), go to the LI’s Equipment Information pane and refer to the Faults group (Figure 5-11).</p>
	<ul style="list-style-type: none"> For Carrierband LAN, the symbol at the middle right indicates the failed Receiver B in the primary module on the LAN side of the LI. For the Nodebus, this symbol at the middle right indicates a failed station receiver on Nodebus Cable B. <p>The symbol  on the right side of the LI icon represents a possible Drop Cable B fault. For more information on the type of fault and where the fault has occurred (either on the Carrierband LAN, the Nodebus, or both simultaneously), go to the LI’s Equipment Information pane and refer to the Faults group (Figure 5-11).</p>

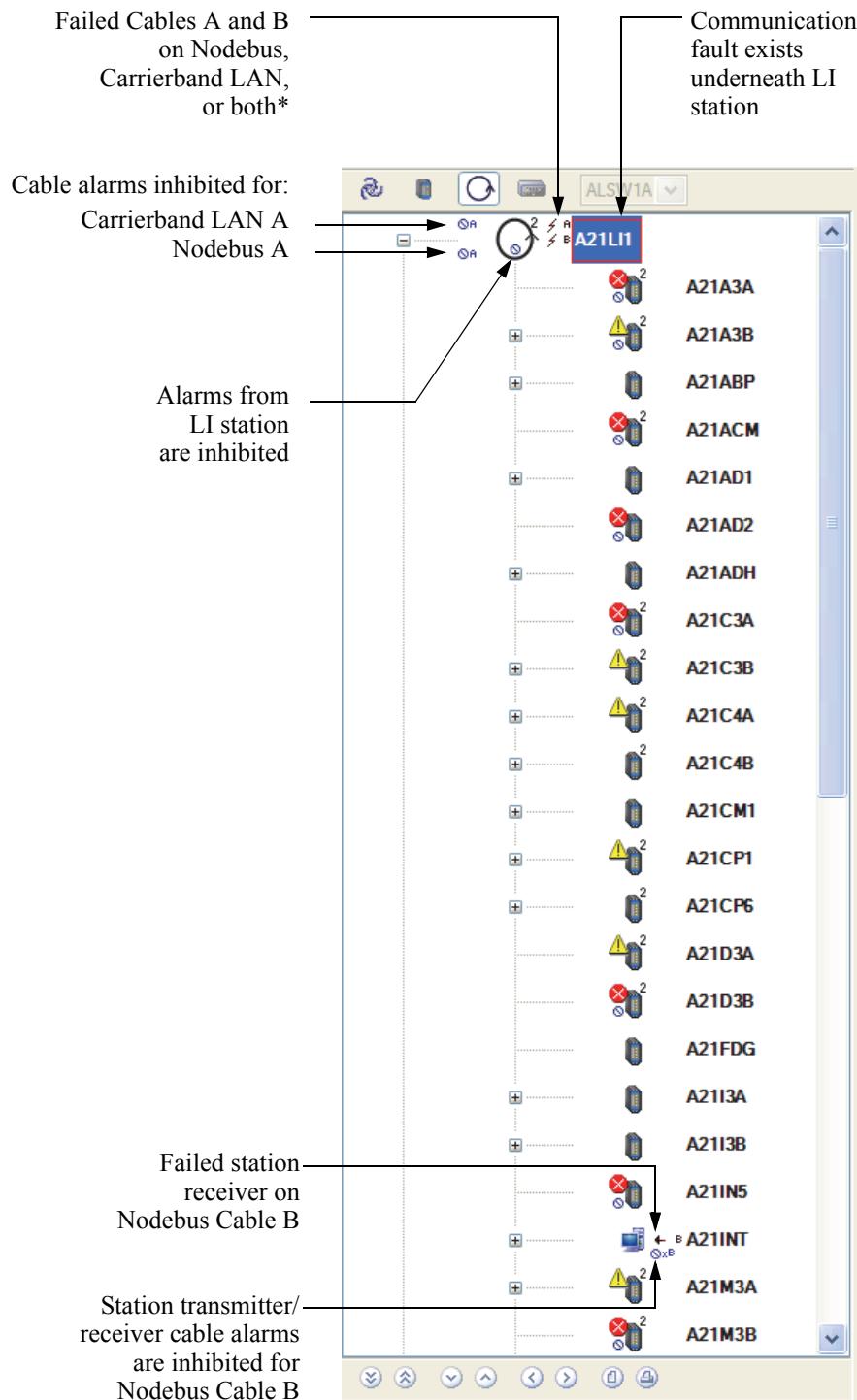
Table 5-2. Equipment Status Indicators for LI Stations (Continued)

Symbol	Condition
	<ul style="list-style-type: none"> For Carrierband LAN, the symbol at the top right corner indicates the failed Transmitter A in the primary module on the LAN side of the LI. For the Nodebus, the symbol at the top right corner indicates a failed station transmitter on Nodebus Cable A. <p>The symbol  on the right side of the LI icon represents a possible Drop Cable A fault.</p> <p>For more information on the type of fault and where the fault has occurred (either on the Carrierband LAN, the Nodebus, or both simultaneously), go to the LI's Equipment Information pane and refer to the Faults group (Figure 5-11).</p>
	<ul style="list-style-type: none"> For Carrierband LAN, the symbol at the middle right indicates the failed Transmitter B in the primary module on the LAN side of the LI. For the Nodebus, this symbol at the middle right indicates a failed station transmitter on Nodebus Cable B. <p>The symbol  on the right side of the LI icon represents a possible Drop Cable B fault.</p> <p>For more information on the type of fault and where the fault has occurred (either on the Carrierband LAN, the Nodebus, or both simultaneously), go to the LI's Equipment Information pane and refer to the Faults group (Figure 5-11).</p>
 	<p>The LAN Interface station with  symbol indicates that station transmitter/receiver cable alarms are inhibited for Nodebus Cable A.</p> <p>The LAN Interface station with  symbol indicates that station transmitter/receiver cable alarms are inhibited for Nodebus Cable B.</p>
 	<p>The LAN Interface station with  symbol on bottom left indicates that cable alarms are inhibited for Nodebus Cable A.</p> <p>The LAN Interface station with  symbol on bottom left indicates that cable alarms are inhibited for Nodebus Cable B alarms are inhibited.</p>
 	<p>The LAN Interface station with  symbol on middle left indicates that the LI station transmitter/receiver cable alarms are inhibited for Carrierband LAN A.</p> <p>The LAN Interface station with  symbol on middle left indicates that the LI station transmitter/receiver cable alarms are inhibited for Carrierband LAN B.</p>

Table 5-2. Equipment Status Indicators for LI Stations (Continued)

Symbol	Condition
	The LAN Interface station with symbol on top left indicates that the cable alarms are inhibited for Carrierband LAN A . The LAN Interface station with symbol on top left indicates that the cable alarms are inhibited for Carrierband LAN B .
	The red outline around the letterbug of an LI indicates that there is: <ul style="list-style-type: none">• A communication fault on the Nodebus cable• A communication fault with connected station or FBM (indicates the communication fault path) In this example, the affected LI letterbug is A21LI1. Refer to Figure 5-6.

**Figure 5-6. Example of LI Equipment Status Indicators**



* For more information on the type of fault and where the fault has occurred (either on the Carrierband LAN, the Nodebus, or both), go to the LI's Equipment Information pane and refer to the Faults group in Figure 5-11.

Figure 5-7. Example of LI Equipment Status Indicators

Station Information for Control Processors, CNIs, and ATSS

When a control station, CNI, or ATS is selected in the Navigation pane, the General tab in the Information pane displays status and equipment information for the station in two tables and the switches to which the station is connected (Figure 5-8 for the FCP280, Figure 5-9 for the CNI, and Figure 5-10 for the FCP270).

The first two fields in the Equipment Status table identify the station by name and type. The remainder of the fields in this group provide status information and are updated dynamically. The fields in the Equipment Information group are updated periodically.

Equipment Status

Name	A1CP81
Boot Host	A1AW70
SMON	SMON1B
IP Address	151.128.153.14
Fault Tolerant	Yes
Run Mode	On Line
Alarm Enabled State	Enabled
Failed Devices Attached	Yes
Image Update State	Not Updating
Diagnostics State	Not Active

Type	Field Control Processor 280
SMON Host	A1AW70
Switch Connections	2
Fault Tolerant State	Non Operational
Failed State	Not Failed
Failed Acknowledged State	Acknowledged
Failed Devices Acknowledged	No
Download State	Not Downloading
Self Hosting	Not Enabled

Equipment Information

Reporting State	Report All
Station Address	00006CC005C2
Primary Mode	Single Prim
Primary ROM Address	00006CC001319
Primary Hardware Part Number	FLASHrv
Primary Hardware Revision	A0
Primary Hardware Date	1227
Primary Image Revision	900016

Master Timekeeper Reporting	Sync Not Config
Cable State	Both Cables Okay
Shadow Mode	Off Line
Shadow ROM Address	000000000000
Shadow Hardware Part Number	
Shadow Hardware Revision	
Shadow Hardware Date	
Shadow Image Revision	

Switch Connections

SW0002	SW0001
--------	--------

Figure 5-8. General Tab for a Non-Fault Tolerant FCP280

CNIF88

General Connections Counters

Equipment Status

Name	CNIF88
Boot Host	STIA88
SMON	IAB8MN
IP Address	151.128.152.201
Fault Tolerant	Yes
Run Mode	On Line
Alarm Enabled State	Enabled
Failed Devices Attached	Yes
Image Update State	Not Updating
Diagnostics State	Not Active
Remote CNI Heartbeat Failure	No
Remote CNI Connection Failure	No
Port A Failure	No
Port B Failure	No
Configuration Change Failure	No
CNI Download Service Failure	Yes

Type

Control Network Interface	STIA88
Switch Connections	2
Fault Tolerant State	Operational
Failed State	Not Failed
Failed Acknowledged State	Not Acknowledged
Failed Devices Acknowledged	No
Download State	Not Downloading
Reboot of Local CNI Required	No
CSI Data Corrupted - Disconnecting from Remote CNI	No
Max Number of Compounds Exceeded	No
OM Tags Exceeded	No
CNI Connection Configuration Unavailable	No
Change Updates being Lost	No

Equipment Information

Reporting State	Report All
Station Address	00006CC025DA
Primary Mode	Married Prim
Primary ROM Address	00006C2E041D
Primary Hardware Part Number	RH924YA
Primary Hardware Revision	C0
Primary Hardware Date	1413
Primary Image Revision	092006

Master Timekeeper Reporting	Sync Not Config
Cable State	Both Cables Okay
Shadow Mode	Married Shad
Shadow ROM Address	00006C2E01ED
Shadow Hardware Part Number	RH924YB
Shadow Hardware Revision	AA
Shadow Hardware Date	2008
Shadow Image Revision	092006

Figure 5-9. General Tab for a Fault Tolerant CNI

FCP700

General Connections Counters

Equipment Status

Name	FCP700
Boot Host	AWSM01
SMON	SYSMN1
IP Address	151.128.152.27
Fault Tolerant	Yes
Run Mode	On Line
Alarming State	Enabled
Failed Devices Attached	Yes
Image Update State	Not Updating
Diagnostics State	Not Active

Type

Field Control Processor 270	
SMON Host	AWSM01
Switch Connections	2
Fault Tolerant State	Operational
Failed State	Not Failed
Failed Acknowledged State	Acknowledged
Failed Devices Acknowledged	Yes
Download State	Not Downloading

Equipment Information

Reporting State	Report All
Station Address	00006CC00076
Primary Mode	Married Prim
Primary ROM Address	00006C2202D1
Primary Hardware Part Number	P0917YZ
Primary Hardware Revision	OR
Primary Hardware Date	0429
Primary Image Revision	84_D13

Master Timekeeper Reporting	Sync Not Config
Cable State	Both Cables Okay
Shadow Mode	Married Shad
Shadow ROM Address	00006C2202FB
Shadow Hardware Part Number	P0917YZ
Shadow Hardware Revision	OJ
Shadow Hardware Date	0429
Shadow Image Revision	84_D13

Switch Connections

Figure 5-10. General Tab for a Fault Tolerant FCP270

The area at the bottom of the pane displays the switches to which the station is connected.

Do one of the following to navigate to a connected switch:

- Double-click the switch name.
- Right-click the switch name and choose **Navigate to <switch name>** from the context menu.

The switch is selected in the Navigation pane, and its status and equipment information are displayed in the Information pane.

Equipment Status

Table 5-3. Equipment Status Fields

Field	Description
Name	The letterbug assigned during system hardware definition
Type	Type of hardware specified when the letterbug was defined
Boot Host	Host station for the CP/CNI/ATS
SMON	System monitor domain to which the CP/CNI/ATS is assigned
SMON Host	Host station for the system monitor
IP Address	CP/CNI/ATS network address
Switch Connections	Number of switches connected to this CP/CNI/ATS
Fault Tolerant	Yes or No . Indicates whether the CP/CNI is fault-tolerant.
Fault Tolerant State	Operational or Non-Operational for fault-tolerant control stations and CNIs only. Fault Tolerant State indicates Non-Operational if the shadow module is not installed or configured.
Redundant State	Operational or Non-Operational for redundant ATSSs only. Fault Tolerant State indicates Non-Operational if the shadow module is not installed or configured.

Table 5-3. Equipment Status Fields (Continued)

Field	Description
Run Mode	<p>On Line or Off Line. This field is initially Off Line, but changes to On Line when the CP/CNI/ATS reports to the system monitor after booting up. If reporting is disabled, the last known state appears in this field. Run Mode and Failed State are separate, but related fields. Although certain Equipment Change options change the Run Mode to Off Line, they do not fail the station. However, a failed CP/CNI/ATS results in the Run Mode changing to Off Line.</p> <p>The field changes to Off Line if any of the following occurs:</p> <ul style="list-style-type: none"> • Reboot of the CP/CNI/ATS • Image update • Power failure • Any CP/CNI/ATS hardware failure or communication failure that results in the station not being able to send its internal reports for one minute or more. <p>For fault-tolerant CP/CNI/ATS, refer to the Primary Mode and Shadow Mode fields for the current Run Mode of each module in the pair.</p>
Failed State	<p>Failed or Not Failed. This field changes from Not Failed to Failed if any of the following occurs:</p> <ul style="list-style-type: none"> • A hardware problem causes the CP/CNI/ATS to fail for more than two minutes. • A physical pull/push of the CP/CNI is performed to reboot the CP/CNI, and the CP/CNI requires more than two minutes to come back on-line. • Any CP/CNI/ATS hardware failure or communication failure that results in the CP/CNI/ATS not being able to send its internal reports for one minute or more. <p>For fault-tolerant CPs/CNIs, refer to the Primary Mode and Shadow Mode fields for the current Fail State of each module.</p>
Alarm Enabled State/ Alarming State	<p>Indicates whether alarming is Enabled or Inhibited for the CP/CNI. When alarming is Inhibited for a CP/CNI, the system monitor still updates the CP's/CNI's status, but faults do not result in system alarm messages.</p> <ul style="list-style-type: none"> • To inhibit alarming, right-click the module name in the Navigation pane and choose Inhibit Alarming from the context menu. • To enable alarming, right-click the module name in the Navigation pane and choose Enable Alarming from the context menu.

Table 5-3. Equipment Status Fields (Continued)

Field	Description
Failed Acknowledged State	Acknowledged or Not Acknowledged. If the Failed State changes from Not Failed to Failed, the Failed Acknowledged State field changes to Not Acknowledged to indicate this transition. To acknowledge the failed state: <ul style="list-style-type: none"> Right-click the station in the Navigation pane and choose Acknowledge Station from the context menu.
Failed Devices Attached	Yes if one or more Fieldbus devices attached to the station are reported as failed; otherwise, No
Failed Devices Acknowledged	Yes or No. If any of the attached devices becomes unacknowledged, the field changes from Yes to No. Do one of the following to acknowledge the failed equipment: <ul style="list-style-type: none"> Use the Connections tab to identify the failed device, right-click the equipment in the Navigation pane, and choose Acknowledge Device from the context menu. Use the Alarms tab in the Accessories pane to identify and acknowledge the alarm.
Image/EEPROM Update State	Image Updating or EEPROM Updating (for classic stations) when the CP's/CNI's operating software image is being updated; otherwise, Not Updating . For fault-tolerant CPs/CNIs, refer to the Primary Mode and Shadow Mode fields for the current Image Updating State.
Download State	Downloading when the CP/CNI is rebooted via an operator-initiated request; otherwise, Not Downloading . For fault-tolerant CPs/CNIs, refer to the Primary Mode and Shadow Mode fields for the current Download State.
Diagnostics State	Active for a non-fault-tolerant CP/CNI that is off-line; otherwise, Not Active

Table 5-3. Equipment Status Fields (Continued)

Field	Description
Self Hosting	<p>(THIS FIELD APPEARS FOR FCP280 ONLY)</p> <p>Enabled or Not Enabled. This field is set to Enabled when the FCP280 control processor is in self-hosting mode, and Not Enabled when the CP is not in self-hosting mode.</p> <p>When the self-hosting capability of an FCP280 is enabled, the controller can restart and execute its configured control scheme without communicating with a host workstation; a host workstation is only required when changing the system configuration or the controller image.</p> <p>To enable self-hosting in an FCP280, use your control configuration software to set the self-hosting bit (Bit 8) of the CFGOPT parameter and issue a Checkpoint command, as described in your control processor's <i>User Guide</i>. Refer to <i>Integrated Control Block Descriptions</i> (B0193AX) for additional information on the CFGOPT Station block parameter.</p> <p>When a checkpoint is performed on an FCP280, the selected station's database is saved in a checkpoint file on the host file server and Bit 8 of the CFGOPT parameter is evaluated to determine the controller's mode of operation.</p> <ul style="list-style-type: none"> • If the FCP280 is not currently in self-hosting mode and was not in self-hosting mode prior to the Checkpoint command being issued, the checkpoint is complete. • If the FCP280 is in self-hosting mode, the controller requests a copy of the checkpoint file from the download server. This file is then copied (burned) into the control station's flash memory.
Remote CNI Heartbeat Failure	<p>(THIS FIELD APPEARS FOR CNI ONLY)</p> <p>Yes or No. This field is set to Yes when the expected heartbeat from the remote CNI to which this CNI is linked does not arrive within the expected timeframe. Refer to "Heartbeat and Connection Timeouts" in <i>Control Network Interface (CNI) User's Guide</i> (B0700GE) for details on the concept of CNI heartbeat timeouts. For details on the error messages for the CNI, refer to <i>Control Core Services V9.x System Error Messages</i> (B0700AF).</p>
Reboot of Local CNI Required	<p>(THIS FIELD APPEARS FOR CNI ONLY)</p> <p>Yes or No. This field indicates whether or not a manual reboot of the local CNI is required, due to a significant configuration change.</p>

Table 5-3. Equipment Status Fields (Continued)

Field	Description
Remote CNI Connection Failure	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. This field is set to Yes when a connection timeout occurs following the expected heartbeat from the remote linked CNI failing to arrive in the expected timeframe. Refer to “Heartbeat and Connection Timeouts” in <i>Control Network Interface (CNI) User’s Guide</i> (B0700GE) for details on the concept of CNI connection timeouts. For details on the error messages for the CNI, refer to <i>Control Core Services V9.x System Error Messages</i> (B0700AF).
CSI Data Corrupted - Disconnecting from Remote CNI	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. This field is set to Yes when the CNI detects data corruption over the customer-supplied interconnection. The CNI disconnects from and reconnects to its remote partner as a security measure.
Port A Failure	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. For details, refer to “Control Network Interface (CNI) System Monitor Messages” in <i>Control Core Services V9.x System Error Messages</i> (B0700AF).
Max Number of Compounds Exceeded	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. This field is set to Yes when the CNI is managing access to OM tags in more compounds than it can process. For details, refer to “Control Network Interface (CNI) System Monitor Messages” in <i>Control Core Services V9.x System Error Messages</i> (B0700AF).
Port B Failure	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. For details, refer to “Control Network Interface (CNI) System Monitor Messages” in <i>Control Core Services V9.x System Error Messages</i> (B0700AF).
OM Tags Exceeded	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. This field is set to Yes when the CNI is managing access to more OM tags than it can process. For details, refer to “Control Network Interface (CNI) System Monitor Messages” in <i>Control Core Services V9.x System Error Messages</i> (B0700AF).
Configuration Change Failure	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. This field is set to Yes when some configuration data, such as the CNI settings or the access lists, is sent to the CNI as incompatible or corrupt. This may be caused by corrupted data, data that has been tampered with, or data with a later version/format than the CNI’s software.
CNI Connection Configuration Unavailable	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. For details, refer to “Control Network Interface (CNI) System Monitor Messages” in <i>Control Core Services V9.x System Error Messages</i> (B0700AF).

Table 5-3. Equipment Status Fields (Continued)

Field	Description
CNI Download Service Failure	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. For details, refer to “Control Network Interface (CNI) System Monitor Messages” in <i>Control Core Services V9.x System Error Messages</i> (B0700AF).
Change Updates being Lost	(THIS FIELD APPEARS FOR CNI ONLY) Yes or No. For details, refer to “Control Network Interface (CNI) System Monitor Messages” in <i>Control Core Services V9.x System Error Messages</i> (B0700AF).

Note For the CNI, the System Monitor log (smon_log) shows the corresponding alarm message for each alarm that occurs. When the alarm is resolved, a recovery message is issued, which is also shown in this log.

Equipment Information

Table 5-4. Equipment Information Fields

Field	Description
Reporting State	<p>Status of the CP's/CNI's/ATS's reporting to the system monitor is shown as one of the following:</p> <ul style="list-style-type: none"> • Report All • No Reporting • No Counters • No Information <p>To change the Reporting State:</p> <ul style="list-style-type: none"> • Right-click on the CP/CNI name in the Navigation Pane and choose Disable All Reporting or Enable All Reporting from the context menu.
Master Timekeeper Reporting	<p>Indicates the status of UTC and time strobe from the system timekeeper (STK), as received by the CP. If STK synchronization (STK SYN) is enabled, the status can be:</p> <ul style="list-style-type: none"> • Pulsed STK: Receiving UTC time from MTK and time strobe from both ports A and B. • Sync A in Fail: Receiving UTC time from MTK and time strobe only from port B. • Sync B in Fail: Receiving UTC time from MTK and time strobe only from port A. • Sync AB in Fail: Receiving UTC time from MTK, but lost time strobe from ports A and B. <p>If STK SYN is not enabled, the status can be either AB Fail Not Config or Sync Not Config.</p>
Station Address	A six-octet media access control (MAC) address assigned during system definition and used by the networking protocol in the CP/CNI/ATS
Cable State	<p>The state of communications between the control station and the attached field devices (or the CNI and its customer network connections) is reported as:</p> <ul style="list-style-type: none"> • Both Cables Okay • Fault • No Information

Table 5-4. Equipment Information Fields (Continued)

Field	Description
Primary Mode	Shows the mode of the Primary CP/CNI/ATS module: <ul style="list-style-type: none"> • Single Primary when the CP/CNI/ATS is a non-redundant station and it is on-line • Married Primary for the primary module in a redundant pair that is operating normally • Image Updating when the primary module software image is being updated • Off Line • Downloading when the control database is being downloaded to the primary module • Failed • No Information
Primary ROM Address	A six-octet MAC address of the Primary CP/CNI/ATS assigned during manufacturing. The last six characters of this address are the module hardware ID which is stamped on a label on the module's outer cover.
Primary Hardware Part Number	Part number for a non-fault-tolerant CP/CNI/ATS or for the Primary module in a fault-tolerant pair
Primary Hardware Revision	Revision level of the hardware for a non-fault-tolerant CP/CNI/ATS or of the Primary module hardware in a fault-tolerant pair
Primary Hardware Date	Manufacturing date of the hardware for a non-fault-tolerant CP/CNI/ATS or of the Primary module hardware in a fault-tolerant pair
Primary Image Revision	Revision number for the operating software image in a non-fault-tolerant CP/CNI/ATS or in the Primary module hardware in a fault-tolerant pair
Shadow parameters are only shown for fault-tolerant CPs/CNIs/ATSS. ("Backup" is used in place of "Shadow" when referring to a redundant ATS.)	
Shadow Mode	<ul style="list-style-type: none"> • Married Shadow for the shadow module in a redundant pair that is operating normally • Image Updating when the software for a shadow station in a redundant pair is being updated • Downloading when the control database is being downloaded to the shadow station • Diags Active when the station is performing Offline Diagnostics • Off Line • Failed • No Information

Table 5-4. Equipment Information Fields (Continued)

Field	Description
Shadow ROM Address	A six-octet MAC address of the Shadow CP/CNI/ATS assigned during manufacturing. The last six characters of this address are the module hardware ID which is stamped on a label on the module's outer cover.
Shadow Hardware Part Number	Part number for the Shadow module.
Shadow Hardware Revision	Revision level of the Shadow module hardware.
Shadow Hardware Date	Manufacturing date of the Shadow module hardware.
Shadow Image Revision	Revision number for the operating software image in the Shadow module hardware.

Station Information for LAN Interface (LI)

When a LAN Interface module is selected in the Navigation pane, the General tab in the Information pane displays equipment status, equipment information, and faults for the module in three tables (Figure 5-11).

The first two fields in the Equipment Status table identify the module by name and type. The remainder of the fields in this group provide status information and are updated dynamically. The fields in the Equipment Information group are updated periodically.

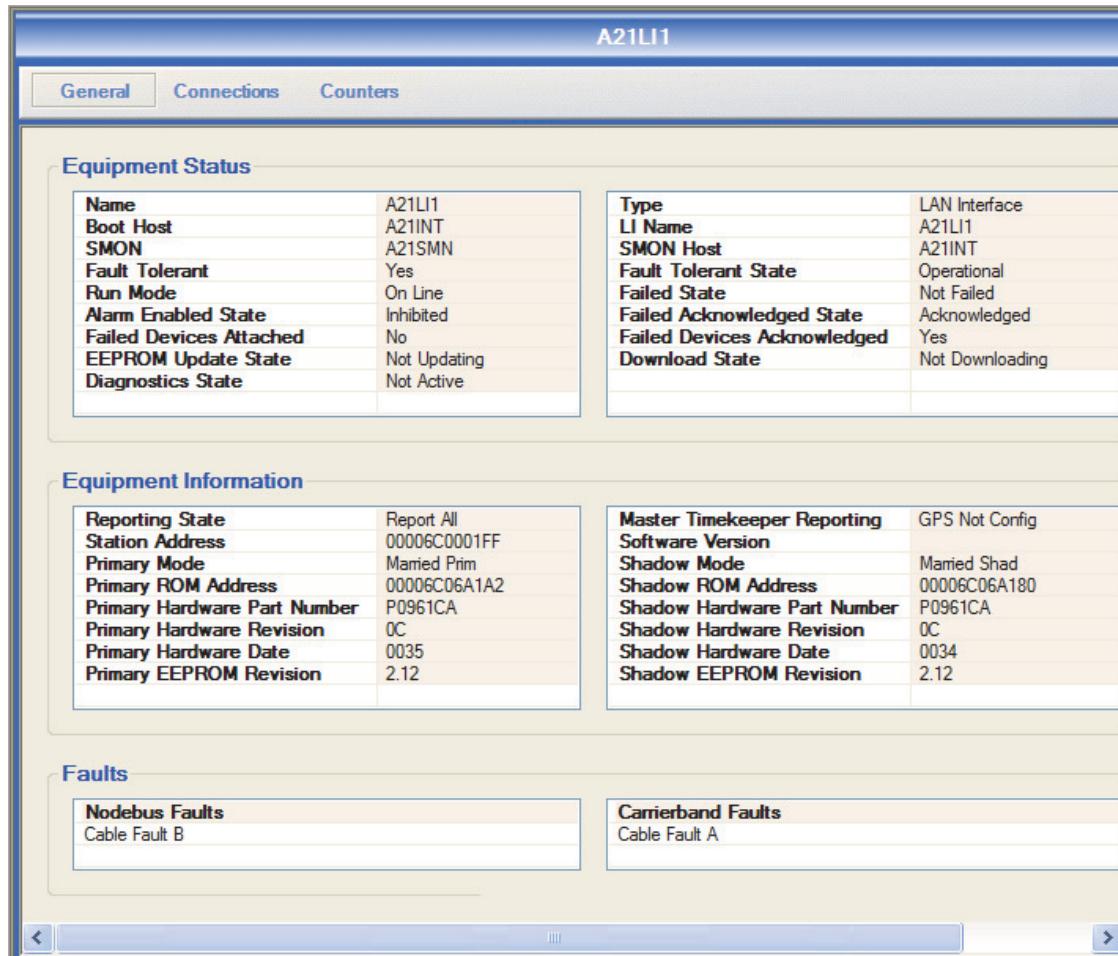


Figure 5-11. General Tab for a LAN Interface Module

The Faults area at the bottom of the pane describes Nodebus and Carrierband LAN faults. Because the symbols in the LAN Interface view can represent a cable fault on the Carrierband LAN, the Nodebus, or on both simultaneously, the General tab displays a Faults group.

The left table under the Faults group displays Nodebus cable faults, and the right table displays Carrierband LAN faults.

Equipment Status

Table 5-5. Equipment Status Fields

Field	Description
Name	The station letterbug assigned during system hardware definition
Type	Type of hardware specified when the letterbug was defined

Table 5-5. Equipment Status Fields (Continued)

Field	Description
Boot Host	Host station for the LI
LI Name	LI's logical name
SMON	System monitor domain to which the station is assigned
SMON Host	Host station for the system monitor
Fault Tolerant	Yes or No. Indicates whether the station is fault-tolerant.
Fault Tolerant State	Operational or Non-Operational for fault-tolerant LIs only. Fault Tolerant State indicates Non-Operational if the shadow module is not installed or configured.
Run Mode	<p>On Line or Off Line. This field is initially Off Line, but changes to On Line when the station reports to the system monitor after booting up. If reporting is disabled, the last known state appears in this field. Run Mode and Failed State are separate, but related fields. Although certain Equipment Change options change the Run Mode to Off Line, they do not fail the station. However, a failed station results in the Run Mode changing to Off Line.</p> <p>The field changes to Off Line if any of the following occurs:</p> <ul style="list-style-type: none"> • Reboot of the station • Image update • Power failure • Any station hardware failure or communication failure that results in the station not being able to send its internal reports for one minute or more. <p>For fault-tolerant stations, refer to the Primary Mode and Shadow Mode fields for the current Run Mode of each module in the pair.</p>
Failed State	<p>Failed or Not Failed. This field changes from Not Failed to Failed if any of the following occurs:</p> <ul style="list-style-type: none"> • A hardware problem causes the station to fail for more than two minutes. • A physical pull/push of the module is performed to reboot the station, and the station requires more than two minutes to come back on-line. • Any station hardware failure or communication failure that results in the station not being able to send its internal reports for one minute or more. <p>For fault-tolerant stations, refer to the Primary Mode and Shadow Mode fields for the current Fail State of each module.</p>

Table 5-5. Equipment Status Fields (Continued)

Field	Description
Alarm Enabled State	<p>Indicates whether alarming is Enabled or Inhibited for the device. When alarming is Inhibited for a station, the system monitor still updates the control station's status, but faults do not result in system alarm messages.</p> <ul style="list-style-type: none"> • To inhibit alarming, right-click the station name in the Navigation pane and choose Inhibit Alarming from the context menu. • To enable alarming, right-click the station name in the Navigation pane and choose Enable Alarming from the context menu.
Failed Acknowledged State	<p>Acknowledged or Not Acknowledged. If the Failed State changes from Not Failed to Failed, the Failed Acknowledged State field changes to Not Acknowledged to indicate this transition. To acknowledge the failed state:</p> <ul style="list-style-type: none"> • Right-click the station in the Navigation pane and choose Acknowledge Station from the context menu.
Failed Devices Attached	<p>Yes if one or more Fieldbus devices attached to the station are reported as failed; otherwise, No</p>
Failed Devices Acknowledged	<p>Yes or No. If any of the attached devices becomes unacknowledged, the field changes from Yes to No. Do one of the following to acknowledge the failed equipment:</p> <ul style="list-style-type: none"> • Use the Connections tab to identify the failed device, right-click the equipment in the Navigation pane, and choose Acknowledge Device from the context menu. • Use the Alarms tab in the Accessories pane to identify and acknowledge the alarm.
EEPROM Update State	<p>EEPROM Updating (for classic stations) when the station's operating software image is being updated; otherwise, Not Updating. For fault-tolerant stations, refer to the Primary Mode and Shadow Mode fields for the current EEPROM Update State.</p>
Download State	<p>Downloading when the station is rebooted via an operator-initiated request; otherwise, Not Downloading. For fault-tolerant stations, refer to the Primary Mode and Shadow Mode fields for the current Download State.</p>
Diagnostics State	<p>Active for a non-fault-tolerant station that is off-line; otherwise, Not Active</p>

Equipment Information

Table 5-6. Equipment Information Fields

Field	Description
Reporting State	<p>Status of the station's reporting to the system monitor is shown as one of the following:</p> <ul style="list-style-type: none"> • Report All • No Reporting • No Counters • No Information <p>To change the Reporting State:</p> <ul style="list-style-type: none"> • Right-click on the station name in the Navigation Pane and choose Disable All Reporting or Enable All Reporting from the context menu.
Master Timekeeper Reporting	The LI does not support sync pulses from a Master Timekeeper, so this field should read GPS Not Config .
Station Address	A six-octet media access control (MAC) address assigned during system definition and used by the networking protocol in the Foxboro stations
Primary Mode	<p>Shows the mode of the Primary module:</p> <ul style="list-style-type: none"> • Single Primary when the station is a non-redundant station and it is on-line • Married Primary for the primary module in a redundant pair that is operating normally • Image Updating when the primary station software image is being updated • Off Line • Downloading when the control database is being downloaded to the primary station • Failed • No Information
Primary ROM Address	A six-octet MAC address of the Primary controller assigned during manufacturing. The last six characters of this address are the module hardware ID which is stamped on a label on the module's outer cover.
Primary Hardware Part Number	Part number for a non-fault-tolerant station or for the Primary module in a fault-tolerant pair
Primary Hardware Revision	Revision level of the hardware for a non-fault-tolerant station or of the Primary module hardware in a fault-tolerant pair

Table 5-6. Equipment Information Fields (Continued)

Field	Description
Primary Hardware Date	Manufacturing date of the hardware for a non-fault-tolerant station or of the Primary module hardware in a fault-tolerant pair
Primary EEPROM Revision	Revision number for the operating software image in a non-fault-tolerant station or in the Primary module hardware in a fault-tolerant pair
Shadow parameters are only shown for fault-tolerant stations.	
Shadow Mode	<ul style="list-style-type: none"> • Married Shadow for the shadow module in a redundant pair that is operating normally • Image Updating when the software for a shadow station in a redundant pair is being updated • Downloading when the control database is being downloaded to the shadow station • Diags Active when the station is performing Offline Diagnostics • Off Line • Failed • No Information
Shadow ROM Address	A six-octet MAC address of the Shadow controller assigned during manufacturing. The last six characters of this address are the module hardware ID which is stamped on a label on the module's outer cover.
Shadow Hardware Part Number	Part number for the Shadow module.
Shadow Hardware Revision	Revision level of the Shadow module hardware.
Shadow Hardware Date	Manufacturing date of the Shadow module hardware.
Shadow Image Revision	Revision number for the operating software image in the Shadow module hardware.

Faults

The Faults tables give additional information about the symbols associated with the LI in the navigation pane. For example, if an LI had an icon with the symbols , you can look at the faults table for more information on where the faults have occurred, either in the Carrierband LAN, the Nodebus, or both. By looking at the Faults tables in Figure 5-12, you can determine that there is a failure of Cable A on the Carrierband LAN, and there is a failure of Cable B on the Nodebus.

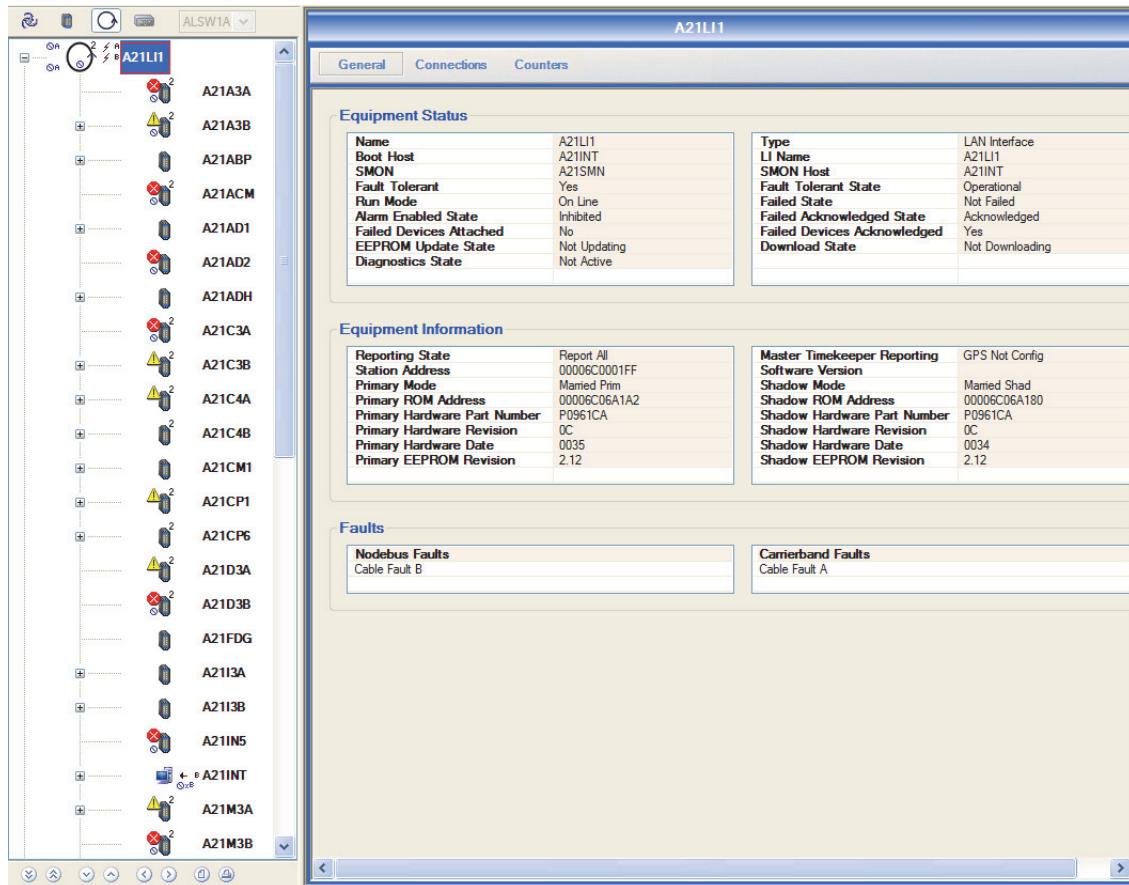


Figure 5-12. Viewing Nodebus and Carrierband LAN Faults

Connected FBMs

To display a list of the Fieldbus devices attached to a control station:

1. Select the station in the Navigation pane and click the **Connections** tab in the Information pane.

For a control processor, the Connections tab lists the attached field devices by name, type, status, run mode, and failure mode (Figure 5-13, Figure 5-14, and Figure 5-15).

For FCP280 control processors, the tab lists its four Primary ECBs.

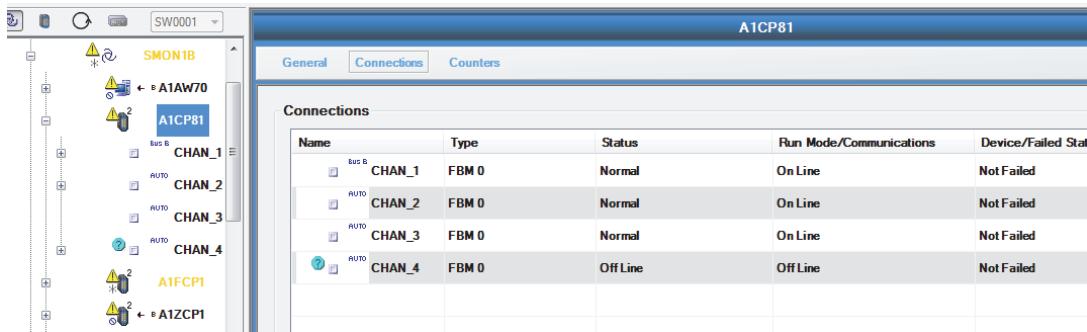


Figure 5-13. Connections Tab for an FCP280

The Connections tab can also be selected from any of the four Primary ECBs as well, in which case it lists the FBMs attached to the PIO channel to which the selected Primary ECB is associated.

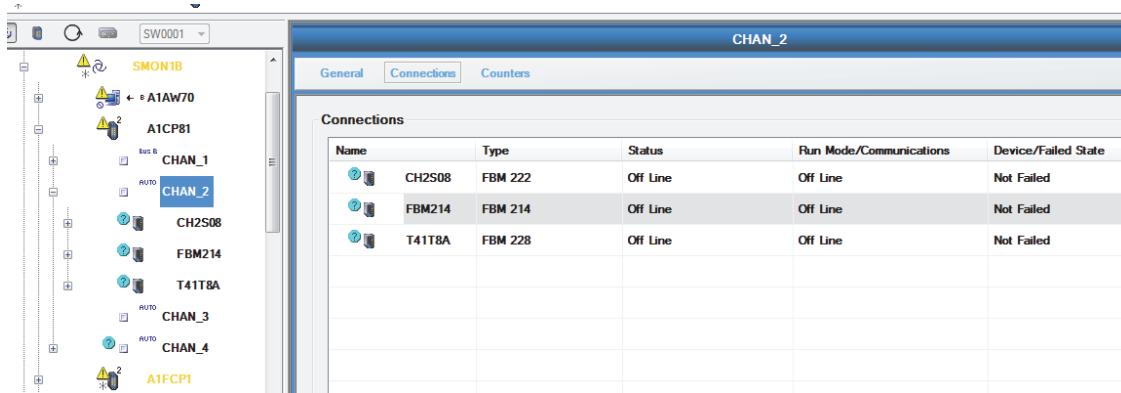


Figure 5-14. Connections Tab for an FCP280's Primary ECB

For FCP270/ZCP270 control processors and earlier, the tab lists the Primary ECB, the attached FCMs (if the station is a ZCP270 or CP60) and the connected FBMs. The Connections tab can also be selected from the Primary ECB, in which case it lists the attached FCMs and FBMs.

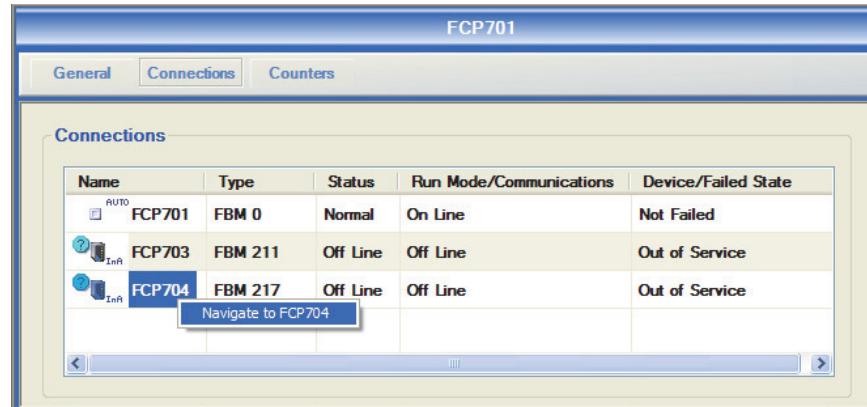


Figure 5-15. Connections Tab for an FCP270

For an ATS or LAN Interface module, the Connections tab lists the CP30, CP40, or CP60 and the workstation that resides on the particular network.

Name	Type	Status	Run Mode/Communications	Device/Failed State
B11A3B	AB3B	Failed Inhibited	Off Line	Not Failed
B11C3B	CP30B	Warning	On Line	Not Failed
B11C4B	CP40B	Warning	On Line	Not Failed
B11CM1	CMP	Failed Inhibited	Off Line	Not Failed
B11CP6	CP60	Failed Inhibited	Off Line	Not Failed
B11D3B	FD3B	Failed Inhibited	Off Line	Not Failed
B11M3B	MG3B	Failed Inhibited	Off Line	Not Failed
B11WP5	WP51	Failed Inhibited	Off Line	Not Failed
B12A3B	AB3B	Warning	On Line	Not Failed
B12C3B	CP30B	Failed Inhibited	Off Line	Not Failed
B12C4B	CP40B	Failed Inhibited	Off Line	Not Failed
B12CP6	CP60	Normal	On Line	Not Failed
B12D3B	FD3B	Failed Inhibited	Off Line	Not Failed

Figure 5-16. Connections Tab for an ATS or LAN Interface Module

2. Click any column header to sort the rows on the values in that column; click the column header a second time to reverse the sort order.
3. Drag a column header to the right or left to change the column order.
4. Double-click a device name, or right-click the name and choose **Navigate to <Name>** to go to the selected FCM or FBM (**Navigate to FCP704** in Figure 5-15).

The device is selected in the Navigation pane and its information is displayed in the Information pane. If there are devices connected to the FCM or FBM, the Connections tab is shown in the Information pane; otherwise, the General tab is displayed.

Control Station, CNI, ATS, and LI Counters

The Counters tab (Figure 5-17, Figure 5-18, and Figure 5-19) provides statistics on the station performance such as the number of transactions and errors. Counters from the tab can be added to a watch list that includes counters from other workstations or other equipment.

To access counters for a control station, CNI, ATS, or LI:

1. Select the control station, CNI, ATS, or LI in the Navigation pane and click the **Counters** tab in the Information pane.
2. Click the option button of at the top of the page to select the category of counters to be displayed.

The tab consists of a table with the counter names, current and previous values, and high and low values read during this System Manager session.

Figure 5-17 is an FCP280 Counters tab with the Diagnostic Counters selected.

The screenshot shows the NECP81 software interface with the 'Counters' tab selected. Under 'Counter Categories', the 'Diagnostic Counters' option is selected. A table displays the following data:

Counter	Current Value	Previous Value	Maximum	Minimum
Bad Ethernet Packets	0	0	0	0
Ethernet Miscompares	74	74	74	0
Ethernet Port Switchovers	0	0	0	0
Hot Remany Count	0	0	0	0
Maximum NetBuffers Used	87	87	87	87
PIO Miscompares	0	0	0	0
PIO Timeouts	0	0	0	0
Primary Corrected Memory Error	0	0	0	0
Probe Packet Failures	1	1	1	1
Shadow Corrected Memory Error	0	0	0	0
Total Received Packets	24499	24499	24499	24499
Total Transmitted Packets	14077	14077	14077	14077

Figure 5-17. Counters Tab for FCP280

Figure 5-18 is a CNI Counters tab with the Diagnostic Counters selected.

The screenshot shows the CNIF88 software interface with the 'Counters' tab selected. Under 'Counter Categories', the 'Diagnostic Counters' option is selected. A table displays the following data:

Counter	Current Value	Previous Value	Maximum	Minimum
Bad Ethernet Packets	0	0	0	0
Ethernet Miscompares	1	1	1	1
Ethernet Port Switchovers	0	0	0	0
Hot Remany Count	3	3	3	2
Maximum NetBuffers Used	0	0	0	0
Primary Corrected Memory Error	0	0	0	0
Probe Packet Failures	0	0	0	0
Shadow Corrected Memory Error	0	0	0	0
Total Received Packets	339381	339381	339381	179902
Total Transmitted Packets	35564	35564	35564	19090

Figure 5-18. Counters Tab for CNI

Note The Diagnostic Counters pane is only applicable to the FCP280 and CNI.

Figure 5-19 is a control station Counters tab with the MAC Sublayer counters selected.

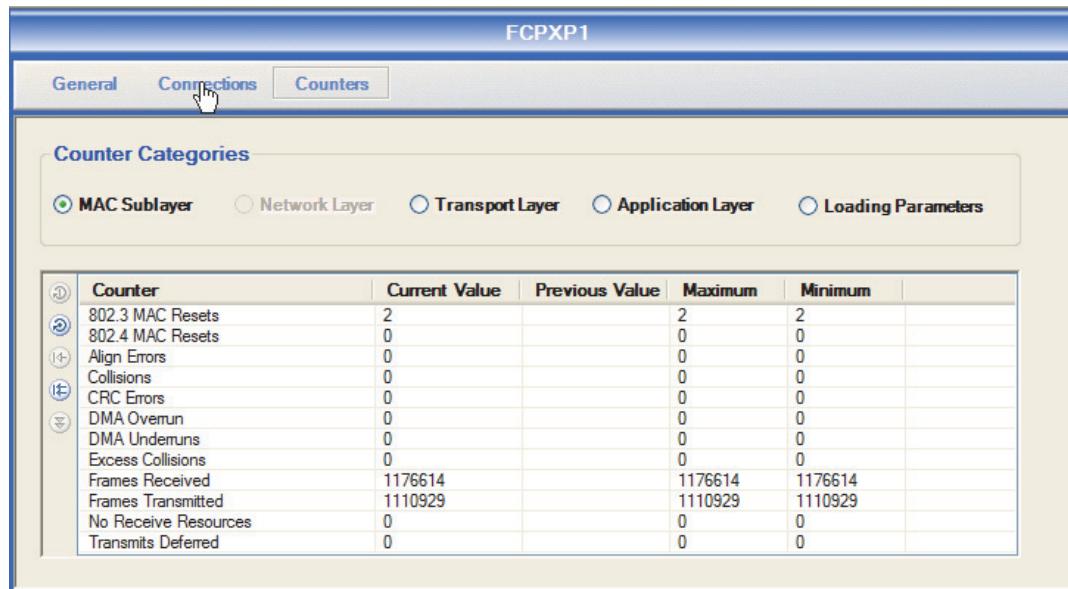


Figure 5-19. Counters Tab for FCP270/ZCP270 and Earlier Control Processors

Buttons in the Counters tab toolbar are used to read and reset values in the table, and add selected counters to the Watch tab. See “Counters Tab” on page 52 and “Watch Tab” on page 63 for additional information on using features of the Counters and Watch tabs, respectively.

Control stations and workstations maintain the same counters, and these are described in detail in Chapter 6, “Station Counters”.

Primary ECB (Primary FBM) Information

Figure 5-20 shows an example General tab for the first of the four Primary ECBS in an FCP280 control processor.

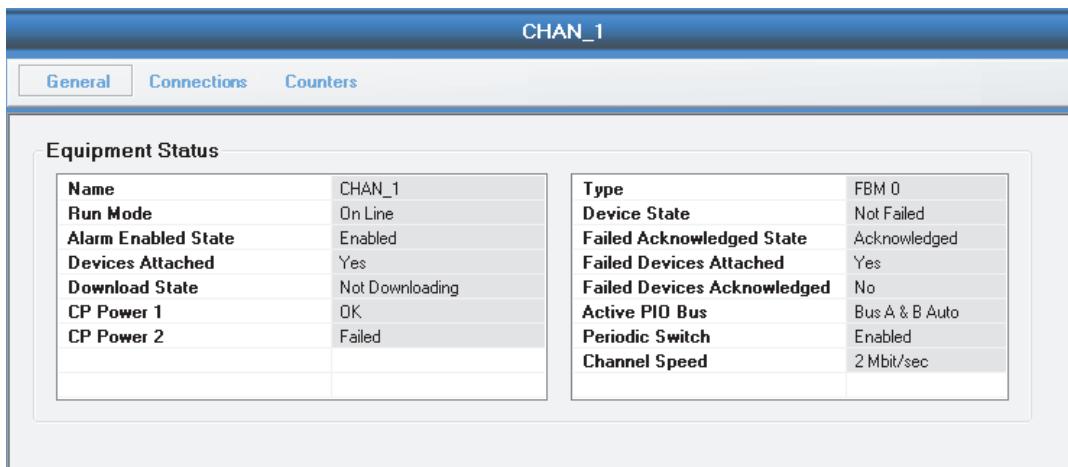


Figure 5-20. Equipment Status for a Primary ECB for FCP280

Note For a Primary ECB for FCP280 or CNI, the Equipment Information group box is not displayed.

Figure 5-21 shows an example General tab for the Primary ECB of a CNI.

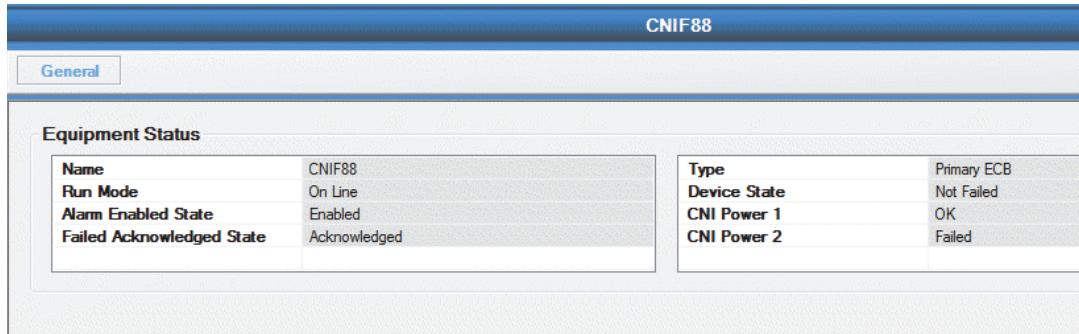


Figure 5-21. Equipment Status for a Primary ECB for CNI

Figure 5-22 shows a General tab for a Primary ECB for an FCP270 or earlier control processor, and Figure 5-23 shows a General tab for a Primary ECB for a ZCP270.

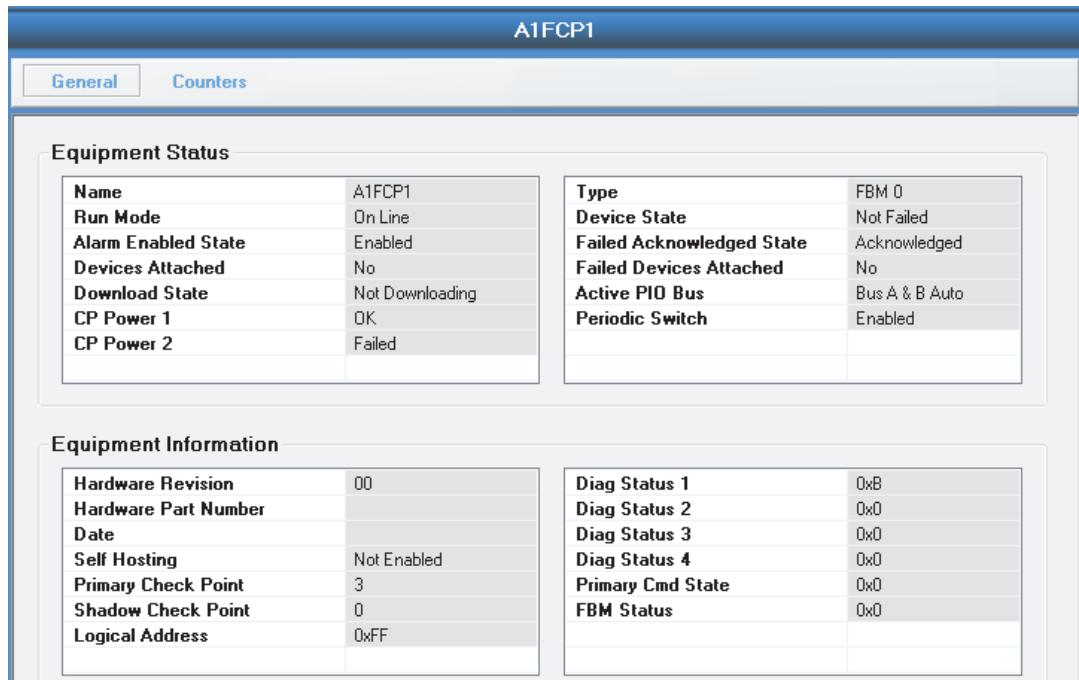


Figure 5-22. Status and Equipment Information for a Primary ECB for FCP270 or Earlier Control Processor

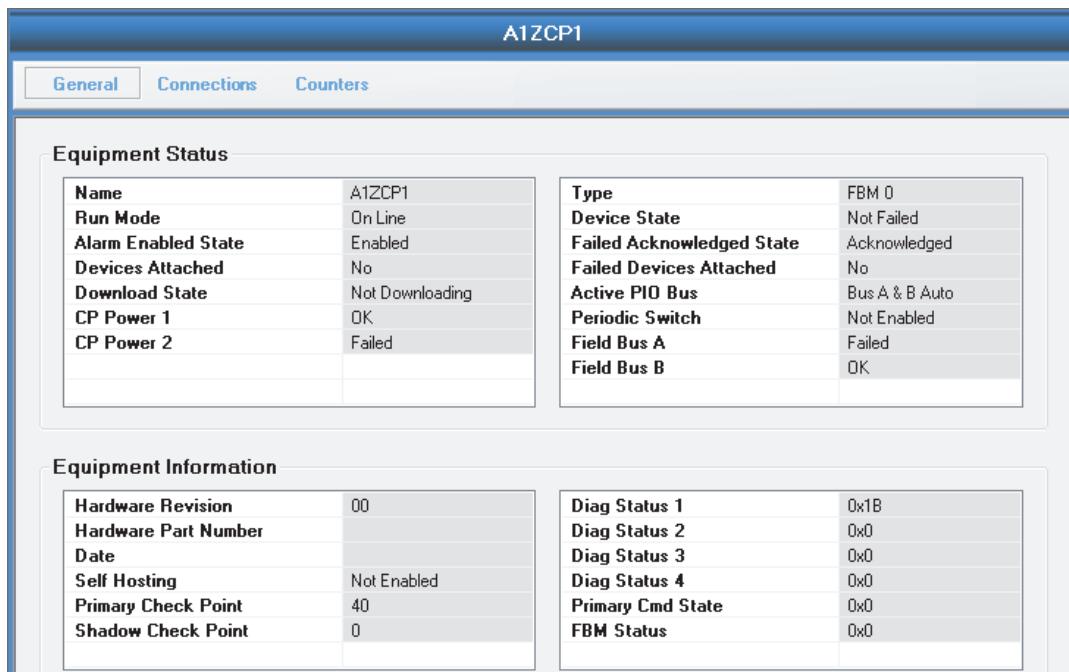


Figure 5-23. Status and Equipment Information for a Primary ECB for ZCP270

The first two fields in the Equipment Status table identify the Primary ECB by name and type. The remainder of the fields in this group provide status information and are updated dynamically. The fields in the Equipment Information group are updated periodically.

Note When a station status is off-line, the Primary ECB, any attached FCMs (if station is a ZCP270 or CP60), and connected FBMs and devices will be removed from station hierarchy and will be restored once the station has returned to an on-line status.

Primary ECB Status

Table 5-7. Primary ECB Equipment Status Display Fields

Field	Description
Name	Same as the name of the control station. The Primary ECB does not have its own letterbug designation.
Type	Always FBM0

Table 5-7. Primary ECB Equipment Status Display Fields (Continued)

Field	Description
Run Mode	On Line or Off Line. The Primary ECB is installed as On Line after it is “fixed” and configured. Changing the Primary ECB status to Off Line causes all communication to the Ethernet Fieldbus or module Fieldbus to stop. All attached FBMs and FCMs go off-line. Refer to “Go Off-Line/Go On-Line” on page 208 for additional information.
Device State	Failed or Not Failed
Alarm Enabled State/ Alarming State	Enabled or Inhibited. When alarms are inhibited, Primary ECB failures do not result in system alarms. To change Alarming State: <ul style="list-style-type: none"> Right-click the Primary ECB in the Navigation pane and choose Enable Device Alarming or Inhibit Device Alarming from the context menu.
Failed Acknowledged State	Acknowledged or Not Acknowledged. The field changes to Not Acknowledged when Device State transitions to Failed.
Failed Devices Acknowledged	FOR FCP280 ONLY No until all attached devices that have failed are acknowledged; otherwise, Yes
Devices Attached	[Not applicable to CNI] Yes or No . Whether or not any devices are attached to this Primary ECB.
Failed Devices Attached	For all earlier control processors (Not applicable to CNI): Yes or No . Whether or not any of the devices attached to this Primary ECB are failed.
Download State	[Not applicable to CNI] Downloading when the station is rebooted via an operator-initiated request; otherwise, Not Downloading . For fault-tolerant stations, refer to the Primary Mode and Shadow Mode fields for the current Download State.
Periodic Switch	[Not applicable to CNI] Enabled or Not Enabled . When Enabled, automatic switching between Bus A and B occurs periodically.

Table 5-7. Primary ECB Equipment Status Display Fields (Continued)

Field	Description
Run Mode	On Line or Off Line. The Primary ECB is installed as On Line after it is “fixed” and configured. Changing the Primary ECB status to Off Line causes all communication to the Ethernet Fieldbus or module Fieldbus to stop. All attached FBMs and FCMs go off-line. Refer to “Go Off-Line/Go On-Line” on page 208 for additional information.
Device State	Failed or Not Failed
Alarm Enabled State/ Alarming State	Enabled or Inhibited. When alarms are inhibited, Primary ECB failures do not result in system alarms. To change Alarming State: <ul style="list-style-type: none"> Right-click the Primary ECB in the Navigation pane and choose Enable Device Alarming or Inhibit Device Alarming from the context menu.
Failed Acknowledged State	Acknowledged or Not Acknowledged. The field changes to Not Acknowledged when Device State transitions to Failed.
Failed Devices Acknowledged	FOR FCP280 ONLY No until all attached devices that have failed are acknowledged; otherwise, Yes
Devices Attached	[Not applicable to CNI] Yes or No. Whether or not any devices are attached to this Primary ECB.
Failed Devices Attached	For all earlier control processors (Not applicable to CNI): Yes or No. Whether or not any of the devices attached to this Primary ECB are failed.
Download State	[Not applicable to CNI] Downloading when the station is rebooted via an operator-initiated request; otherwise, Not Downloading . For fault-tolerant stations, refer to the Primary Mode and Shadow Mode fields for the current Download State.
Periodic Switch	[Not applicable to CNI] Enabled or Not Enabled. When Enabled, automatic switching between Bus A and B occurs periodically.

Table 5-7. Primary ECB Equipment Status Display Fields (Continued)

Field	Description
Active PIO Bus	[Not applicable to CNI] On an FCP280 or FCP270, the module fieldbus being used by the control station to communicate with the attached FBMs. On a ZCP270, the Ethernet fieldbus cable being used to communicate with the attached FCMs. <ul style="list-style-type: none"> • Bus A when bus A has been selected by an operator • Bus B when bus B has been selected by an operator • Bus A & B Auto when Switching Mode is enabled See “Ethernet and Module Fieldbus Switching Actions” on page 208 for additional information.
The following field is only displayed for an FCP280 Primary ECB:	
Channel Speed	2 Mbit/sec or 268 Kbit/sec. The speed at which this HDLC fieldbus/PIO channel communicates to its FBMs. This is set in the BAUD2M parameter in the Primary ECB, or from the Channel Assignment tab for the FCP280 in the Hardware Editor.
The following fields are only displayed for an FCP280 or FCP270 Primary ECB:	
CP Power 1	Status of the control station’s primary power cable is either Ok or Failed
CP Power 2	Status of the control station’s secondary power cable is either Ok or Failed
The following fields are only displayed for a CNI’s Primary ECB:	
CNI Power 1	Status of the CNI’s primary power cable is either Ok or Failed
CNI Power 2	Status of the CNI’s secondary power cable is either Ok or Failed
The following fields are only displayed for a CP30, CP40, CP60, or ZCP270 Primary ECB:	
Switching Mode	Automated switching for the Ethernet fieldbus is either Enabled or Not Enabled
Periodic Config	Yes if Periodic Switching has been enabled by an operator; otherwise, No
The following fields are only displayed for a ZCP270 Primary ECB:	
Field Bus A	Status of the A fieldbus cable connecting the control station and the FCMs is either OK or Failed
Field Bus B	Status of the B fieldbus cable connecting the control station and the FCMs is either OK or Failed

Primary ECB Equipment Information

Note Table 5-8 is not applicable to the FCP280 or CNI, as the Equipment Information group box is not shown for the FCP280 or CNI.

Table 5-8. Primary ECB Equipment Information Display Fields (FCP270/ZCP or Earlier Control Processors)

Field	Description
Diag Status 1 through Diag Status 4	Hexadecimal values relating to the status of the FBM. If the module is operating properly, these values can be safely ignored. If there are hardware and software errors, these values will assist the Global Customer Support Center (CSC) in resolving the problem.
Primary Cmd Status	Value indicating health of communications with the FBMs and FCMs: 0x0 Normal 0x1 Success with retry 0x3 The control station has timed out the FBM >0x3: Link level protocol error
FBM Status	[not used]

**Table 5-8. Primary ECB Equipment Information Display Fields
(FCP270/ZCP or Earlier Control Processors) (Continued)**

Field	Description
Self Hosting	<p>Enabled or Not Enabled. This field is set to Enabled when the FCP270, or ZCP270 control processor is in self-hosting mode, and Not Enabled when the CP is not in self-hosting mode.</p> <p>When the self-hosting capability of an FCP270, or ZCP270 is enabled, the controller can restart and execute its configured control scheme without communicating with a host workstation; a host workstation is only required when changing the system configuration or the controller image.</p> <p>To enable self-hosting in an FCP270, or ZCP270, use your control configuration software to set the self-hosting bit (Bit 8) of the CFGOPT parameter and issue a Checkpoint command, as described in your control processor's <i>User Guide</i>. Refer to <i>Integrated Control Block Descriptions</i> (B0193AX) for additional information on the CFGOPT Station block parameter.</p> <p>When a checkpoint is performed on an FCP270, or ZCP270, the selected station's database is saved in a checkpoint file on the host file server and Bit 8 of the CFGOPT parameter is evaluated to determine the controller's mode of operation.</p> <ul style="list-style-type: none"> • If the FCP270, or ZCP270 is not currently in self-hosting mode and was not in self-hosting mode prior to the Checkpoint command being issued, the checkpoint is complete. • If the FCP270, or ZCP270 is in self-hosting mode, the controller requests a copy of the checkpoint file from the download server. This file is then copied (burned) into the control station's flash memory. <p>For the FCP280, this field is shown in the Station Equipment Status field for the FCP280; refer to Table 5-3 "Equipment Status Fields" on page 149.</p>
Logical Address	<p>Address used by the control station to communicate with FBMs and FCMs. The Primary ECB is always 0xFF.</p>
Primary Check Point Shadow Check Point	<p>Field used to display the number of times the primary or shadow FCP270, or ZCP270 module's flash memory has been burned. Refer to <i>Field Control Processor (FCP270) User's Guide</i> (B0700AR) and <i>Z-Module Control Processor 270 (ZCP270) User's Guide</i> (B0700AN) for additional information on self-hosting.</p>

Connections and Counters Tabs

The Connections tab for a Primary ECB displays the connected FBMs and FCMs (when the station is a ZCP270). The tab functions the same way as the Connections tab for a control station, as described on page 163.

The Counters tab for a Primary ECB (Figure 5-24) displays three counters:

Counter	Description
Timeouts	Number of times the primary ECB timed out an FBM during communication attempts.
Inval Cmnd	Number of commands received by the primary ECB that were invalid in the present state of the station.
Inval Resp	Number of invalid messages received by the primary ECB from an FBM.



Figure 5-24. Counters Tab for a Primary ECB

See “Counters Tab” on page 52 and “Watch Tab” on page 63 for additional information on using the Counters and Watch tabs, respectively.

Note The Primary ECB for a CNI does not have either of these tabs.

Equipment Change Actions

Control Station or CNI Actions

When a control station is selected, the following commands can be chosen from the station’s context menu or from the **Actions > Equipment Change** submenu pulled down from the main menu:

- Acknowledge Station (if there are any unacknowledged alarms)

- Inhibit/Enable Alarming
- Disable/Enable All Reports
- Checkpoint
- Image Update
- EEPROM Update
- On-line Image Update (on fault-tolerant stations only)
- Reboot
- Disable/Enable Download
- Disable/Enable Upload (available for non-FCP280, non-CP270, and non-Allen Bradley™ stations only)
- Online Diagnostics
- Offline Diagnostics

When a CNI is selected, the following commands can be chosen from the station's context menu or from the **Actions > Equipment Change** submenu pulled down from the main menu:

- Acknowledge Station (if there are any unacknowledged alarms)
- Inhibit/Enable Alarming
- Disable/Enable All Reports
- Retry Sink Connections
- Image Update
- Reboot
- Disable/Enable Download
- Go Off-Line/Go On-Line (on fault-tolerant modules only) - This action is the equivalent of the Offline Diagnostics action for the other stations.

Managing Station Alarms

Acknowledge

There are multiple ways to acknowledge system alarms associated with a control station or one of its field devices, or with a CNI:

- Use the Alarms tab in the Accessories pane to identify and acknowledge individual alarms, or acknowledge all alarms (see “Alarms Tab” on page 58).
- Right-click the station/CNI in the Navigation pane and choose **Acknowledge Station** from the context menu to acknowledge alarms for the selected station.
- Right-click the FBM in the Navigation pane and choose **Acknowledge Device** from the context menu to acknowledge an alarm from the selected device.

- Acknowledge all alarms in the station's/CNI's system monitor domain by selecting the system monitor in the Navigation pane and doing one of the following:
 - Choose **Actions > Acknowledge Smon Domain** from the main menu.
 - Click  in the toolbar.
 - Right-click the system monitor and choose **Acknowledge Smon Domain** from the context menu.

Inhibit

You can inhibit alarms for the control station or CNI so that no alarm conditions are reported to the system monitor.

To inhibit station alarms:

- Right-click the station/CNI in the Navigation pane and choose **Inhibit Alarming** from the context menu.

Any unacknowledged alarms are acknowledged, and the station/CNI is marked with the  symbol to indicate that alarms are being inhibited.

To re-enable alarms:

- Right-click the inhibited equipment in the Navigation pane and choose **Enable Alarming** from the context menu.

Enable/Disable All Reports

Enabling all reports permits the internal reporting of all status information for the control station/CNI and its attached devices, as well as the reporting of system alarms and counters to the system monitor. When reporting is enabled, all displays are updated with the current status of the station/CNI and its attached devices, and equipment failures can be acknowledged.

- Right-click the control station/CNI and choose **Disable All Reports** from the context menu to turn off reporting to the system monitor.
- Right-click the control station/CNI and choose **Enable All Reports** from the context menu to turn on reporting to the system monitor.

When reporting is disabled, the Equipment Status and Equipment Information tables may contain outdated information, the health status for the station and the attached devices may not be accurate, and you cannot acknowledge equipment failures.

Note Disabling reports is not recommended unless you need to reduce traffic on the network to diagnose a problem.

If you have disabled all reports and an FBM is deleted using ICC, the FBM icon will still appear in System Manager displays.

When you re-enable reporting, expand the station/CNI node in the Navigation pane so that System Manager retrieves status and equipment information for the connected devices.

Checkpointing

Checkpointing copies the control database in the control station to the boot host checkpoint file. Use the checkpoint command to save current controller tuning before you reboot the station to resolve system maintenance issues.

If the control station is in self-hosting mode, the control station obtains the current checkpoint file from its flash memory when the station restarts. If the control station is not in self-hosting mode (default), the control station downloads the current checkpoint file from the boot host.

Refer to *Field Control Processor 280 (FCP280) User's Guide* (B0700FW), *Field Control Processor 270 (FCP270) User's Guide* (B0700AR) and *Z-Module Control Processor 270 (ZCP270) User's Guide* (B0700AN) for information on FCP280 or CP270 self-hosting mode.

Checkpoint saves the following control station changes to the checkpoint file:

- Control database configuration changes
- Tuning changes made through the process displays
- FBM status changes made outside System Manager

To save recent control processor changes to the checkpoint file:

1. Right-click the station and choose **Checkpoint** from the context menu.
2. Enter the reason for the checkpointing and click **OK** in the confirmation dialog box (Figure 5-25) if these actions settings are configured (see "Action Settings" on page 74).

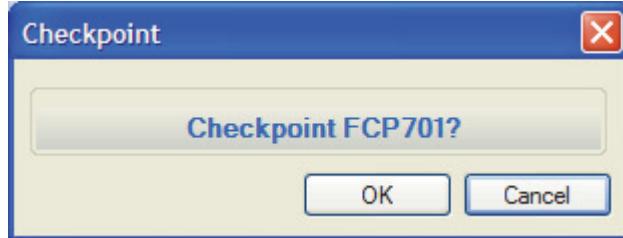


Figure 5-25. Confirmation Dialog Box for Checkpoint Action

You can make another selection while checkpoint is in progress.

3. Review the messages in the Accessories pane or the status bar to verify that the checkpoint was completed successfully.

Additional messages related to the Checkpoint operation are generated in the System Monitor (SMON) log.

- a. If self-hosting is not enabled, verify that a message appears in the SMON log indicating that the checkpoint was successful. For example:

```
10-31-07 09:58:38 0 SYSMON = SYSMN1 CP0008
Software Manager
SYSMON -00021 Checkpoint Successful
```

- b. If an FCP280, FCP270, or ZCP270 is configured for self-hosting, a series of messages will appear in the SMON log. The **Checkpoint Successful** message indicates that the checkpoint file was

successfully sent to the host workstation, but at this point, the checkpoint file has not yet been burned to the control processor's flash memory. The checkpoint is not complete until the **Checkpoint installed into flash** message appears in the SMON log. Following is an example of the series of messages that will appear if the FCP280, FCP270, or ZCP270 is configured for self-hosting:

```
2007-10-17 14:25:51 FP0101 Process = Checkpoint  
CIO_DB 000015 -  
    Checkpoint to Flash Requested  
  
2007-10-17 14:25:51 FP0101 Process = Checkpoint  
CIO_DB 000015 -  
    Wait For Message 'Checkpoint installed into  
    flash'  
  
2007-10-17 14:26:33 FP0101 Software Manager  
SYSMON -00021  
    Checkpoint Successful  
  
2007-10-17 14:26:35 FP0101 Process = Self  
Hosting RDHSS 000131 -  
    Checkpoint loading to Flash  
  
2007-10-17 14:27:15 FP0101 Process = Self  
Hosting RDHSS 000131 -  
    Backup Checkpoint erased  
  
2007-10-17 14:29:27 FP0101 Process = Self  
Hosting RDHSS 000131 - Checkpoint File verified  
  
2007-10-17 14:29:28 FP0101 Process = Self  
Hosting RDHSS 000131 -  
    Checkpoint installed into flash
```

The full set of these SMON messages, related to the checkpoint operation, are explained in Table 5-9.

Table 5-9. System Monitor Log Messages Following Checkpoint Operation

Message	Definition	Meaning
Checkpoint to Flash Requested	This message indicates a checkpoint command has been issued and self-hosting is enabled. If self-hosting is disabled, this message will not be sent to the SMON log.	The checkpoint process has started. The checkpoint file has not been written to the Host or control processor flash. If the control processor is rebooted after this message, the control processor will load the checkpoint file out of flash. The loaded checkpoint file from flash will not contain any changes that were made prior to issuing the checkpoint command.
Wait For Message 'Checkpoint installed into flash'	This message is a reminder to the user that the checkpoint operation will not be complete until the message "Checkpoint installed into flash" has been sent. If self-hosting is disabled, this message will not be sent to the SMON log.	The checkpoint process has started. The checkpoint file has not been written to the Host or control processor flash. If the control processor is rebooted after this message, the control processor will load the checkpoint file out of flash. The loaded checkpoint file from flash will not contain any changes that were made prior to issuing the checkpoint command.
Checkpoint Successful	This message indicates the checkpoint file was successfully sent to the host workstation only. It is not an indication that the complete checkpoint operation is complete if self-hosting is enabled. This message is sent to the SMON log if self-hosting is enabled or disabled.	The checkpoint file has been written to the host but not the control processor flash. If the control processor is rebooted after this message, the control processor will load the checkpoint file out of flash. The checkpoint file will not contain any changes that were made prior to issuing the checkpoint command. A checkpoint command should be issued to synchronize both checkpoint files. Once the checkpoint command completes, the changes will be lost. If you want to load/use the checkpoint file and it contains the latest changes to the host, the flash in the control processor must be invalidated (that is, disable self-hosting or reconfigure the letterbug) and the control processor must be rebooted. This will force the control processor to load the checkpoint file from the host.

Table 5-9. System Monitor Log Messages Following Checkpoint Operation (Continued)

Message	Definition	Meaning
Checkpoint loading to Flash	This message indicates that the process of downloading the checkpoint file from the host to be burned into the control processor flash area has begun. If self-hosting is disabled, this message will not be sent to the SMON log.	The checkpoint file has been written to the host but not the control processor flash. If the control processor is rebooted after this message, the control processor will load the checkpoint file out of flash. The loaded checkpoint file from flash will not contain any changes that were made prior to issuing the checkpoint command. The checkpoint file on the host and the checkpoint file in flash of the control processor will not match. A checkpoint command should be issued to sync up both checkpoint files. Once the checkpoint command completes, the changes will be lost. If you want to load/use the checkpoint file that contains the latest changes from the host, the flash in the control processor must be invalidated (that is, disable self-hosting or reconfigure the letterbug) and the control processor must be rebooted. This will force the control processor to load the checkpoint file from the host.
Backup Checkpoint erased	The flash area that is to receive the new checkpoint file has been erased and is ready for the checkpoint file to be burned. If self-hosting is disabled, this message will not be sent to the SMON log.	The checkpoint file has not been written to the control processor flash. The area that is to receive the checkpoint file has been erased but the previous area still contains a valid checkpoint file. If the control processor is rebooted after this message, the control processor will load the checkpoint file out of flash. The loaded checkpoint file from flash will not contain any changes that were made prior to issuing the checkpoint command. The checkpoint file on the host and the checkpoint file in flash of the control processor will not match. A checkpoint command should be issued to sync up both checkpoint files. Once the checkpoint command completes, the changes will be lost. If you want to load/use the checkpoint file that contains the latest changes from the host, the flash in the control processor must be invalidated (that is, disable self-hosting or reconfigure the letterbug) and the control processor must be rebooted. This will force the control processor to load the checkpoint file from the host.

Table 5-9. System Monitor Log Messages Following Checkpoint Operation (Continued)

Message	Definition	Meaning
Checkpoint File verified	The checkpoint file has been burned to flash and has been verified that it is an exact copy of the checkpoint file on the host workstation. The checkpoint file in flash will be marked as valid. If self-hosting is disabled, this message will not be sent to the SMON log.	The checkpoint file has been written to the control processor flash and marked valid. If the control processor is rebooted after this message, the control processor will load the checkpoint file out of flash. The checkpoint file will contain all changes that were made prior to issuing the checkpoint command. The checkpoint file on the Host and the checkpoint file in flash of the control processor are identical.
Checkpoint installed into flash	The checkpoint operation is complete. The checkpoint file has been sent to the host workstation and burned into the control processor flash.	The checkpoint file has been written to the control processor flash and marked valid. If the control processor is rebooted after this message, the control processor will load the checkpoint file out of flash. The checkpoint file will contain all changes that were made prior to issuing the checkpoint command. The checkpoint file on the Host and the checkpoint file in flash of the control processor are identical.

Note If self-hosting is enabled, the message “Checkpoint Successful” only indicates that the checkpoint file has been sent to the host workstation. If a station reboot were to occur prior to the message “Checkpoint installed into flash”, the newest checkpoint file would not be burned in the control processor’s flash. Always wait for the message “Checkpoint installed into flash” to ensure the latest checkpoint file is burned correctly into the control processor flash area.

Checkpoint Invalidation in Self-Hosting FCP280, FCP270, or ZCP270

There are some conditions that exist that will result in the checkpoint in flash to be invalidated. An invalid checkpoint file in flash results in the FCP280, FCP270, or ZCP270 loading the checkpoint file from the host workstation on reboots.

The following is a list of conditions that result in the checkpoint file in flash to be invalidated:

- If the letterbug of an FCP280, FCP270, or ZCP270 is changed, the checkpoint file in flash is invalidated. This ensures the checkpoint file from the host workstation is loaded and not a leftover checkpoint file in flash.
- If an FCP280, FCP270, or ZCP270 in self-hosting mode fails to load the checkpoint file from flash successfully, the checkpoint file in flash is invalidated. The failure of the checkpoint file to load from flash properly indicates there is some form of corruption in the database. The station will

be rebooted forcing the FCP280, FCP270, or ZCP270 to load the checkpoint file from the host workstation.

- If an FCP280, FCP270, or ZCP270 with a valid checkpoint file in flash marries into a Single Primary CP operating with self-hosting disabled, the newly booted module will invalidate the checkpoint file in flash and reboot to complete the marriage. This prevents that module from loading the checkpoint file from flash in the event the station is rebooted causing that module to come up as the primary module.
- If an On-line Image Update or Image Update operation is performed, the checkpoint file in flash is invalidated forcing the checkpoint file to be loaded from the host workstation. Only after the On-line Image Update or Image Update operation is complete will the checkpoint file be burned to flash.
- If one module of a fault-tolerant pair fails to burn to flash successfully and the other module successfully burns to flash memory, the module that fails to burn to flash will invalidate the checkpoint in flash and go off-line. The module that successfully burns to flash will switch to Single Primary mode and send a message to the SMON log indicating why the other module went off-line.
- If both modules of a fault-tolerant pair fail to burn to flash successfully, both modules will invalidate the checkpoint in flash and send a message to the SMON log. The station will continue to run fault-tolerant.
- If a Single Primary module fails to burn to flash successfully, the module will invalidate the checkpoint in flash and send a message to the SMON log. The station will continue to run single.
- If one side of a fault-tolerant pair goes off-line while running in self-hosting mode, the off-line module's flash data will be invalidated the next time the Single Primary module performs a checkpoint.

If any of the above conditions occurred and:

- A checkpoint command is issued before the station has been rebooted, there will be an attempt to burn the checkpoint file to the flash of the FCP280, FCP270, or ZCP270 if self hosting is enabled.
- The station is rebooted before a checkpoint command is issued, the checkpoint file will be loaded from the host workstation. In addition, if self hosting is enabled, a checkpoint command will be automatically issued after the Database Download is complete. This will result in the checkpoint file getting burned to flash.

These actions will prevent an incorrect checkpoint file from being loaded.

Checkpointing Information for ICC Databases

The database file developed with the I/A Series Configuration Component (IACC) or the Integrated Control Configurator (ICC) and maintained in the host workstation is a separate file from the checkpoint file used by the control processor. The separate configuration database is not affected by checkpointing within System Manager. You must use the IACC or ICC to change the database in the configurator. Before exiting, ICC saves the ICC database changes to the checkpoint file. The IACC saves the ICC database

automatically after a download to the CP, or manually when requested by the operator.

Refer to *Integrated Control Configurator* (B0193AV) or *I/A Series Configuration Component (IACC) User's Guide* (B0700FE) for additional information.

Reboot

The Reboot action restarts the selected control station/CNI and reloads the station's/CNI's control database from a file server. While a station/CNI is rebooting, it is off-line until the reboot is complete; this suspends any access to the station/CNI database.

Rebooting is typically used to resolve maintenance issues.

To reboot a fault-tolerant control station/CNI:

1. Right-click the station/CNI in the Navigation pane, and choose **Enable Download** if the command is listed in the context menu.
2. Right-click the station/CNI in the Navigation pane, and choose **Reboot** from the context menu.

System Manager displays a dialog box for selecting which module to reboot (Figure 5-26). The dialog box gives the status and MAC address of each module.

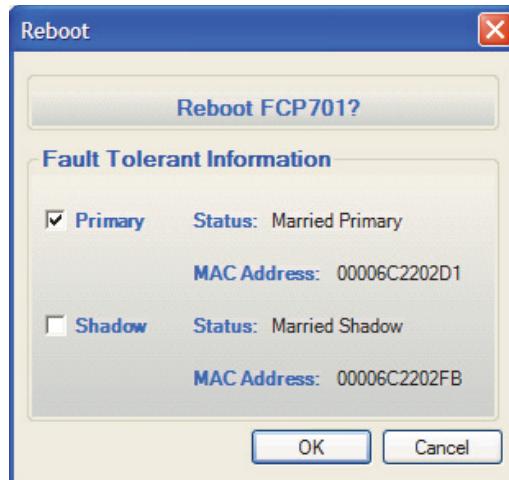


Figure 5-26. Dialog Box for Selecting Target Device

3. Make an entry in the Reason field if the field is included in the dialog box.
The Reason Required action setting is set in the Configuration dialog box (see “Action Settings” on page 74).
4. Select one or both modules, and click **OK**.
5. Review the messages in the Accessories pane or the status bar to verify that the reboot was completed successfully.

To reboot a non-fault-tolerant station/CNI:

1. Right-click the station/CNI in the Navigation pane, and choose **Enable Download** if the command is listed in the context menu.

2. Right-click the station in the Navigation pane, and choose **Reboot** from the context menu.
A dialog box is displayed if confirmation is required.
 - Make an entry in the Reason field if the field is included in the dialog box, and click **OK**.
3. Review the messages in the Accessories pane or the status bar to verify that the reboot was completed successfully.

Retry Sink Connections

At times it may be necessary to re-establish the Object Manager (OM) sink connections between a CNI station and its source stations, such as with FCP280 control processors.

One instance when this may be necessary is during a plant startup, such as after a power failure. In this case, not all of the OM connections may get re-connected due to the large amount of network traffic generated after such an event.

Another time this may be necessary is during a CNI overrun condition. In this case, OM open requests and compound broadcasts could get dropped. A CNI which has disconnected OM sink connections will be unable to provide control data to the consumer CNI station on the other side of the customer supplied interconnection. This would be manifested by Out Of Service (OOS) points on HMI displays for points which are expected to be available through the CNI connection made between the Foxboro Evo Control Networks as well as disconnected or “not found” peer-to-peer connections on control processor stations.

In order to verify that a CNI station has disconnected OM sink connections, use the CNI-specific Object Manager shared variables.

LBUGXXSNKPTS	Total OM sink connections ^a for letterbug LBUGXX
LBUGXXSNKDIS	Total disconnected OM sink connections for letterbug LBUGXX
LBUGXXSNKDEL	Total deleted OM sink connections for letterbug LBUGXX
LBUGXXSNKNFD	Total not-found OM sink connections for letterbug LBUGXX

^a. “Sink connections” refers to the OM Inter-Process Communication (IPC) connections between two stations.

Note The letterbug in the above CNI-specific OM shared variables refers to the local CNI.

This should be checked on the provider-side CNI station; that is, the CNI station which is collecting control data for transfer across the CNI-CNI interconnection in order to be displayed on the consumer side.

It may also be necessary to check the peer-to-peer disconnected or “not found” points for individual control processor stations as well. These parameters on the station block of each CP station are used to indicate peer-to-peer status.

LBUGXX_STA:STATION.PP_TOT	Total OM sink connections for letterbug LBUGXX
LBUGXX_STA:STATION.PP_DSC	Total disconnected OM sink connections for letterbug LBUGXX

LBUGXX_STA:STATION.PP_DEL Total deleted OM sink connections for letterbug LBUGXX

LBUGXX_STA:STATION.PP_NFD Total not-found OM sink connections for letterbug
LBUGXX

In order to reestablish peer-to-peer sink connections for a CP station, a checkpoint operation on the consumer side CP (**B**) (see Figure 5-27) should be initiated. During the checkpoint, the CP station will attempt to reconnect all disconnected or “not found” points.

The following are some troubleshooting guidelines for OM data transfer across the customer supplied interconnection using CNI stations. If points show up as CYAN on workstation HMI displays (**A**) (see Figure 5-27), verify that the points are accessible across the CNI by attempting an Object Manager “omget” operation through the Windows command prompt.

- If the points are not available through an Object Manager “omget” operation:
 - Verify that the remote compound assignments for CNI001 are made for the compound being accessed from the remote control network. This can be checked in the CSAMonitorNamespaceMap.xml on the workstation host for CNI001. If the settings are made in the configuration file, also verify that these settings have been deployed to CNI001.
For more details on the CSAMonitorNamespaceMap.xml file, refer to “Compound Summary Access (CSA) Monitor Service” in *Control Network Interface (CNI) User’s Guide* (B0700GE).
 - Verify that the necessary access list entry (Read-Only or Read / Write) has been made for that parameter on CNI002. If the appropriate settings have been made, also verify that these settings have been deployed to CNI002.
- If the points are available through an “omget” operation:
 - Check the OM shared variables for sink points on CNI002 (**C**). If there are any disconnected or “not found” sink points, execute the “retry sink points” operation for CNI002 through System Manager.
 - It may also be necessary to check the station block parameters for the local CP stations (**B**) to see if any peer-to-peer sink points are disconnected or “not found.” If there was an issue with the remote CNI delivering OM data, this could have caused issued with the CP station sink connections as well.

In this scenario, shown in Figure 5-27, CNI001 is the consumer-side CNI and CNI002 is the provider-side CNI. All of these steps can be performed for data flowing in the opposite direction in which case CNI001 is the provider-side CNI and CNI002 is the consumer-side CNI.

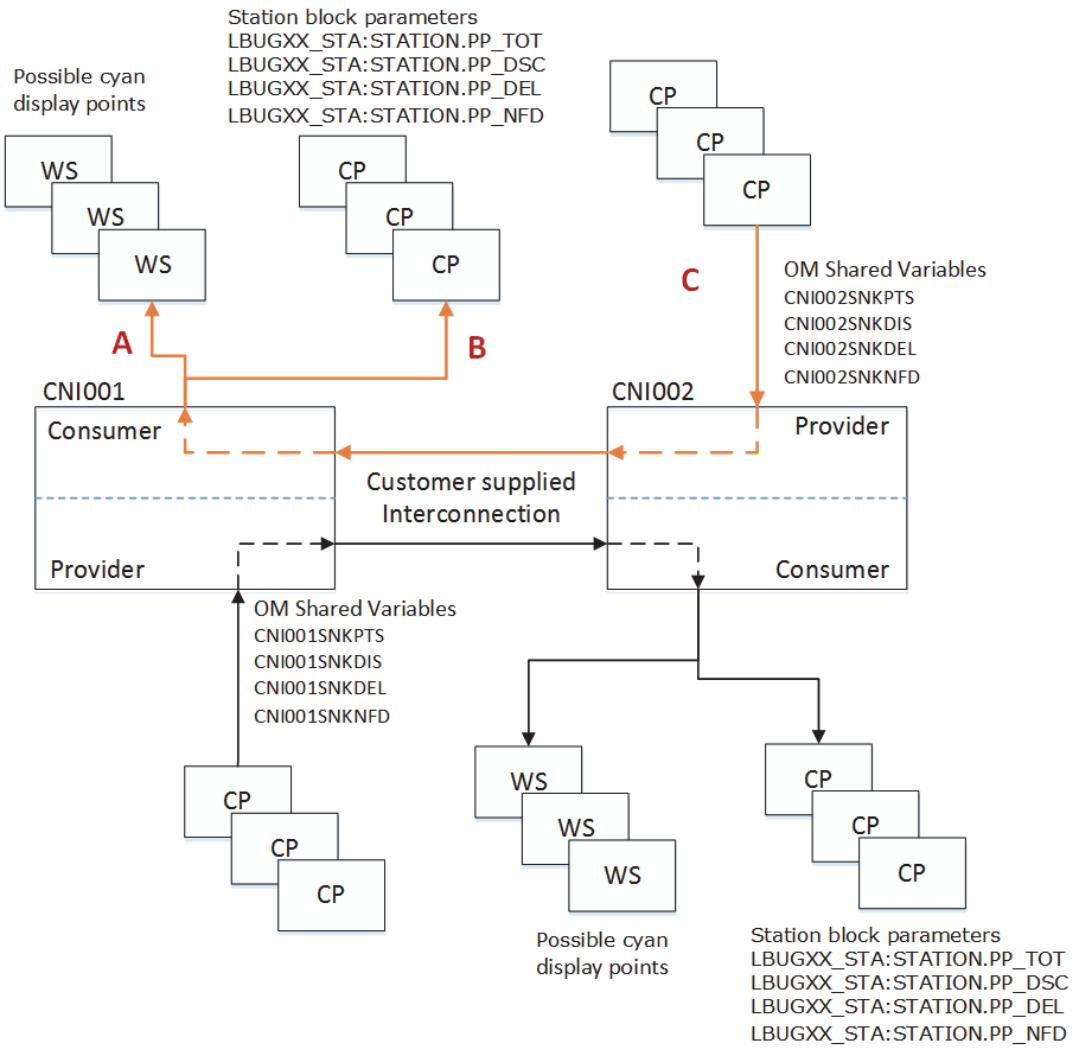


Figure 5-27. Retry Sink Connections - Data Flow

The time taken to execute the Retry Sink Connections operation on the CNI varies depending on both the number of compounds managed by the CNI and the number of OM lists required to make connections. With a large configuration of many compounds and lists in use, this could take up to 20 minutes to complete.

Note If the retry sink connections operation is already in progress and a second request is made again on the same CNI, this request will be ignored. It will also not be possible to initiate any further Retry Sink Connections or Checkpoint requests on any other stations until this second request has timed out (two minutes). A Retry Sink Connections Failed message in the System Monitor log will indicate when this period has completed.

The message “Retry Sink Connections Successful” in the smon_log indicates the sink connection operation is in progress. The result of this operation will be displayed in the smon_log after this operation is done.

To retry sink connections for a CNI:

1. Right-click the CNI and choose **Retry Sink Connections** from the context menu.
2. Enter the reason for the retrying the sink connections and click **OK** in the confirmation dialog box (Figure 5-28) if these actions settings are configured (see “Action Settings” on page 74).



Figure 5-28. Confirmation Dialog Box for Retry Sink Connections Action

3. Review the messages in the Accessories pane or the status bar to verify that the retry sink connections operation was completed successfully.

Additional messages related to the Retry Sink Connections operation are generated in the System Monitor (SMON) log.

Image Update

The Image Update action updates the operating system software in the selected station/CNI. The action downloads a file and burns a new image to flash memory. During the update, the station is off-line and access to the database for that station/CNI is suspended.

Note Although Image Update is available for both fault-tolerant and non-fault-tolerant stations/CNIs, use On-Line Image update instead on fault-tolerant stations to minimize hold-control time.

Update the station’s/CNI’s image to upload the latest changes provided by the latest version of Foxboro Evo Control Core Services or to resolve a maintenance issue.

To update a station’s/CNI’s image:

1. Right-click the station and choose **Checkpoint** from the context menu to ensure that all changes to the control database are recorded in the host server.
(Skip this step for the CNI.)
2. Right-click the station/CNI and choose **Enable Download** if the action appears in the context menu.
3. Right-click the station/CNI and choose **Image Update** from the context menu.

With a fault-tolerant station/CNI, the station/CNI places the Shadow module off-line and then downloads and burns the new image in the Primary module. After verification, the Primary reboots automatically. When the Primary finishes rebooting, it sends the new image to the

Shadow. The Shadow reboots and the module pair marries using the new image.

EEPROM Update

The EEPROM Update action updates the firmware in a selected classic station such as an LI, CP30, CP40, or CP60, etc. with new EEPROM firmware. The update downloads a file, burns a new EEPROM, and reboots the system. During the update, the station is off-line and access to the database for that station is suspended.

Update the station's EEPROM to implement an official Invensys software release or to resolve a maintenance issue.

To update existing EEPROM station firmware:

1. Right-click the station and choose **Checkpoint** from the context menu to ensure that all changes to the control database are recorded in the host server.
2. Right-click the station and choose **Enable Download** if the action appears in the context menu.
3. Right-click the station and choose **EEPROM Update** from the context menu.

With a fault-tolerant station, the station places the Shadow module off-line and then downloads and burns the new image in the Primary module.

After verification, the Primary reboots automatically. When the Primary finishes rebooting, it sends the new firmware to the Shadow. The Shadow reboots and the module pair marries using the new firmware.

Caution FOR A SINGLE CARRIERBAND LAN INTERFACE OR A SINGLE ATS MODULE: If you perform EEPROM updates on a single Carrierband LAN Interface (LI) or a single ATS module, the Nodebus is isolated from the network. During the update, any further actions on that LI or ATS through System Management are inhibited. To avoid network isolation, initiate EEPROM updates only on one LI or ATS module of a redundant pair at a time.

4. While the EEPROM update processes, the system sends standard update progress messages to the printer.

Upon completion of the EEPROM update, the station reboots.

On-Line Image Update

Use On-Line Image Update to minimize hold-control time while upgrading software on **fault-tolerant** control stations.

Note For CP270s and earlier CPs, both cables connecting the control modules to the network must be attached and functional to perform an on-line image update, as one module must continue using the A cable for control while the other is using the B cable for downloading the new image.

To update a station's image on-line:

1. Right-click the station and choose **Checkpoint** from the context menu to ensure that all changes to the control database are recorded in the host server.
2. Right-click the station and choose **Enable Download** if the command appears in the context menu.
3. Right-click the station and choose **On-Line Image Update** from the context menu.

The On-Line Image Update dialog box prompts you to select the type of restart after each module is updated (Figure 5-29).

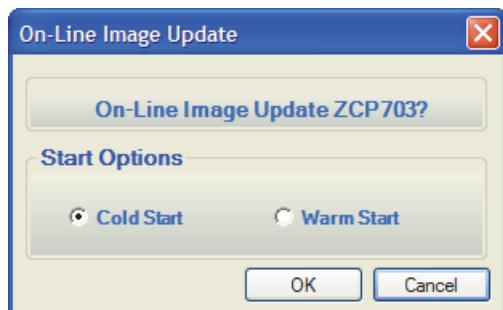


Figure 5-29. On-Line Image Update Dialog Box

4. Click the start option.

With **Cold Start**, initialization occurs as follows:

- Compounds initialize according to the state configured in the INITON parameter.
- Continuous control blocks initialize according to the states configured in the INITMA and INITLR parameters.
- Sequence control blocks initialize according to the states configured in the RSTMA and RSTACT parameters. This clears internal variable values and restarts sequence code execution at the first statement.

With **Warm Start**, all compounds and blocks initialize according to the states saved in the checkpoint file, with the following exceptions:

- CALC, CALCA, MATH, and LOGIC blocks initialize to the state configured in the INITMA parameter. This clears the stack and resets memory values to those stored in the checkpoint file.
- Sequence control blocks initialize according to the states configured in the RSTMA and RSTACT parameters. This clears internal variable values and restarts sequence code execution at the first statement.

Note In conjunction with the Warm Start option, the control loops in the control station can be configured to initialize bumplessly by reading back the current output values and performing an upstream initialization of the blocks in the control loop.

The fault-tolerant pair goes single, and the Primary module downloads the image from the host (messages are sent to the system printer to indicate progress) and passes the image to the Shadow module.

The Shadow module updates its flash memory with the new image and reboots. The Primary module performs a checkpoint of the database and turns off the B cable. When complete, the Primary module tells the Shadow module (with the new image) to perform a database download.

The Shadow module downloads the database on the B cable and then assumes control via a role switch.

5. Evaluate the station operation under the new software, and perform one of the following steps:

If you are satisfied with the behavior of the station:

- Right-click the control station in Navigation pane, choose **Reboot** from the context menu and select the **Shadow** module in the Reboot dialog box.

This completes the update process by implementing the new image in the pair.

If you do not want to continue running with the new software image:

- Right-click the control station in Navigation pane, choose **Reboot** from the context menu and select the **Primary** module in the Reboot dialog box.

This causes the module running the old software image to reboot, download the database, and then assume control. The other module that was running the new image relinquishes control, reboots, then copies the old image from the running module, re-burns the image, and reboots again. The end result is that the modules resume fault-tolerant operation running the old software image.

Enable or Disable Download Actions

In order to reboot a station/CNI or to update the station image, you must enable downloading.

To enable downloading:

- Right-click the station/CNI and choose **Enable Download** if it is listed in the context menu.

To disable downloading:

- Right-click the station/CNI and choose **Disable Download** if it is listed in the context menu.

If the Enable Download or Disable Download actions fail, do the following:

- Check the boot host for the station/CNI.
- Make sure no other workstations are running the CIO configurator for the station/CNI.
- Make sure no other workstations are executing equipment change actions for the station/CNI using System Manager.

Enable or Disable Upload Actions

Note This section is applicable to non-FCP280, non-CP270, and non-Allen-Bradley station types only.

When a station is rebooted due to a software failure, the system uploads the station image to a local file on the boot host workstation. You can permit or prohibit the system from uploading this image when the station fails under certain conditions.

To enable uploading:

- Right-click the station and choose **Enable Upload** if it is listed in the context menu.

To disable uploading:

- Right-click the station and choose **Disable Upload** if it is listed in the context menu.

If the Enable Upload or Disable Upload actions fail, do the following:

- Check the boot host for the station.
- Make sure no other workstations are running the CIO configurator for the station.
- Make sure no other workstations are executing equipment change actions for the station using System Manager.

Offline Diagnostics (Go Off-Line/Go On-Line for CNI)

The Offline Diagnostic tests are used to verify proper operation of the station/CNI/ATS components. Offline diagnostic tests are station specific; when Offline Diagnostics appears for a selected station/CNI/ATS, the menu shows only those tests available for that station.

Offline Diagnostics are applicable to FCP280, FCP270, ZCP270, CNI, ATS, LI, and classic stations. For classic stations, offline diagnostics can be performed locally (across the Nodebus) and remotely (across the Carrierband LAN or fiber optic LAN).

Note For the CNI, these tests are selected from the Go Off-Line and Go On-Line equipment change actions.

Note PW (Personal Workstations) and Solaris based workstations do not support Offline Diagnostics.

Offline Diagnostics cannot be performed on stations that are configured as fault-tolerant in System Definition but running in non-fault-tolerant mode.

Accessing Offline Diagnostics

To perform Offline Diagnostics with a fault-tolerant station/CNI or redundant ATS:

1. Right-click the station/ATS and choose **Offline Diagnostics** from the context menu.

For the CNI, right-click the CNI and choose **Go Off-Line** from the context menu (Figure 5-30).

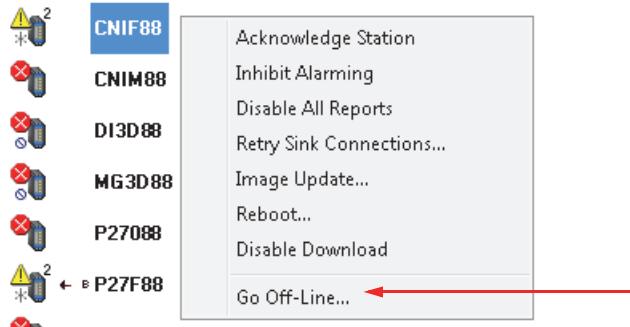


Figure 5-30. Selecting Go Off-Line... for CNI

The Offline Diagnostics dialog box displays the current status of each module and prompts you to select the module to take off-line.

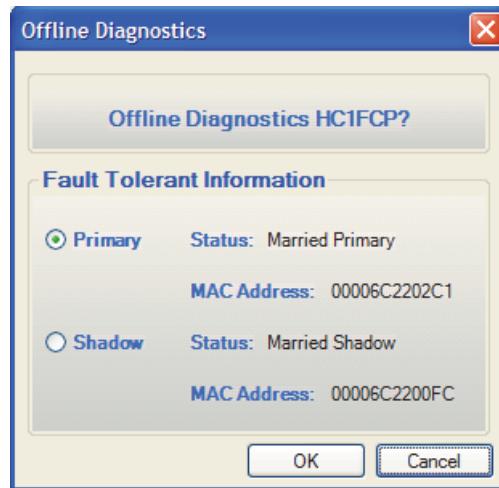


Figure 5-31. Selecting a Station for Offline Diagnostics

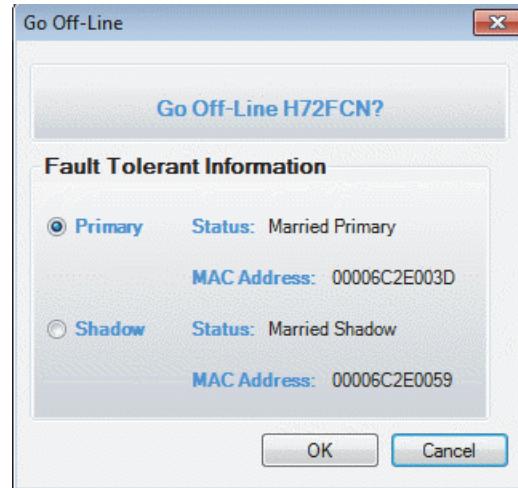


Figure 5-32. Selecting a CNI for Offline Diagnostics

2. Type an entry in the **Reason** field if the field is included in the dialog box.
 3. Select the module to be taken off-line and click **OK**.
- The selected module goes off-line. For a non-CNI module, its status changes to **Diagnostics Active**. For the CNI, its status changes to **Off Line**. The status of the other module changes to **Single Primary**.
4. Right-click the station/ATS a second time and choose **Offline Diagnostics**. The submenu for Offline Diagnostics can differ depending on the station type.
(Skip this step for the CNI.)

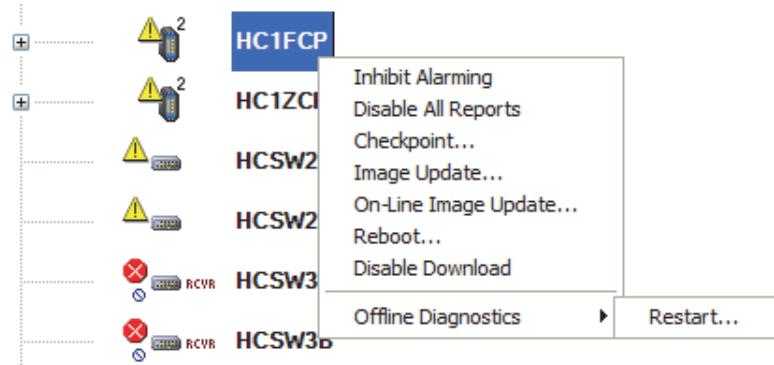


Figure 5-33. Offline Diagnostics Submenu for an FCP270 - Similar for FCP280

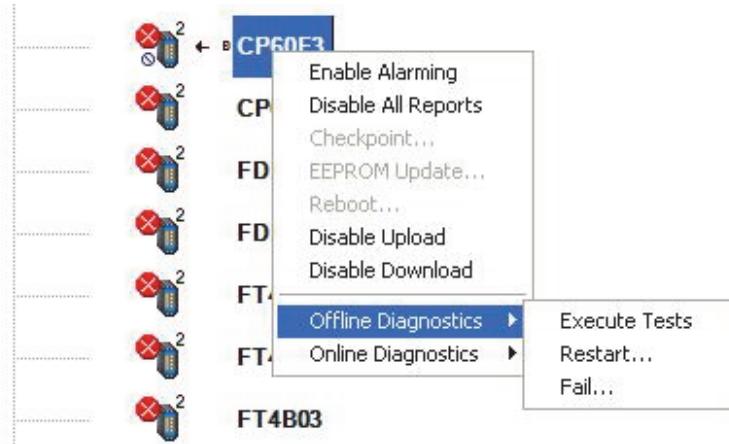


Figure 5-34. Offline Diagnostics Submenu for a CP60

5. For stations/ATSSs, choose **Execute Tests** to run the diagnostic test, **Restart** to reboot the station, or **Fail** to mark the station/ATS as failed. Refer to “Performing Offline Diagnostics” on page 196.
- To reboot the CNI, right-click the CNI, select **Go On-Line** (Figure 5-35), and then select which module to be rebooted (Figure 5-36) and click **OK**.

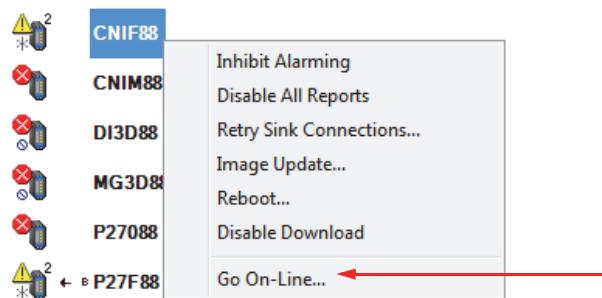


Figure 5-35. Selecting Go On-Line... for CNI



Figure 5-36. Selecting a CNI for Reboot

To perform Offline Diagnostics with a non-fault-tolerant control station/CNI:

1. Right-click the control station and choose **Offline Diagnostics** from the context menu.
For the CNI, right-click the CNI and choose **Go Off-Line** from the context menu (Figure 5-30).

A dialog box prompts you to confirm the action if Confirmation Required is checked in the Configuration dialog box. Type an entry in the **Reason** field if the field is included in the dialog box, and click **OK** to take the station off-line.

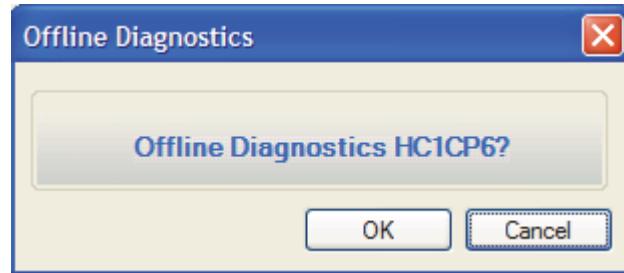


Figure 5-37. Offline Diagnostics for a Control Processor

The selected module goes off-line now.

2. Right-click the station/ATS a second time and choose **Offline Diagnostics**. The submenu for Offline Diagnostics can differ depending on the station type.
(Skip this step for the CNI.)
3. For stations/ATSS, choose **Execute Tests** to run the diagnostic test, **Restart** to reboot the station/ATS, or **Fail** to mark the station/ATS as failed. Refer to “Performing Offline Diagnostics” below.
To reboot the CNI, right-click the CNI and select **Go On-Line** (Figure 5-35).

Performing Offline Diagnostics

When you click on **Execute Tests**, the **Offline Diagnostics** screen appears (Figure 5-38) showing the diagnostics tests for the selected station/ATS. Figure 5-38 shows the available off-line diagnostic tests for a CP60.

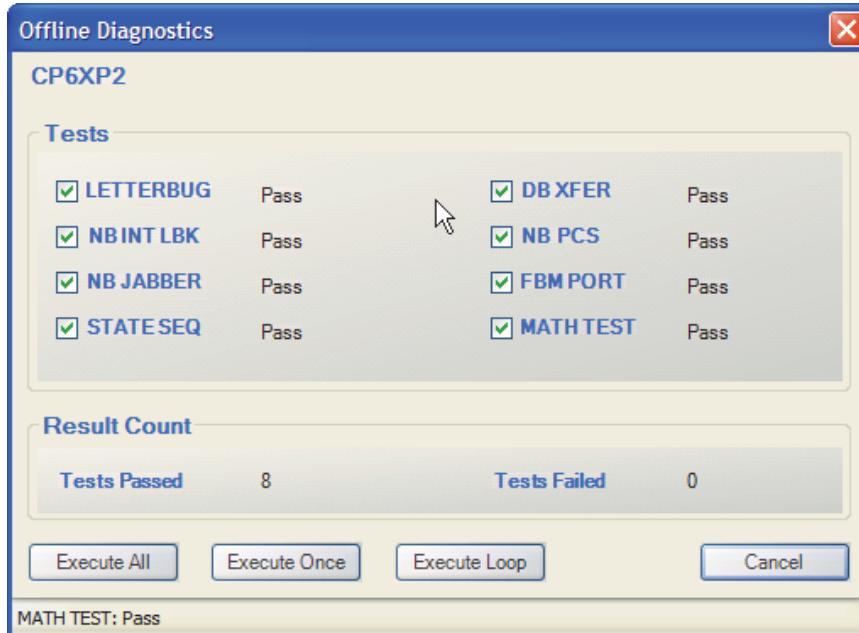


Figure 5-38. Offline Diagnostics Dialog Box

To run off-line diagnostics tests:

1. Choose one or more tests to run for the selected station/ATS by checking the box next to the desired test.
2. Execute the selected tests. Click **Execute All**, **Execute Once**, or **Execute Loop**, as described in Table 5-10.

Table 5-10. Offline Diagnostics Test Execution Options

Button	Description
Execute All	Click Execute All to perform all the tests shown in the Offline Diagnostics dialog box.
Execute Once	Select the desired test(s) and click Execute Once to perform each selected test one time.
Execute Loop	Select the desired test(s) and click Execute Loop to perform each selected test continuously. The Execute Loop button changes to a Halt button, and the tests will continue executing until you click Halt in the Offline Diagnostics dialog box.

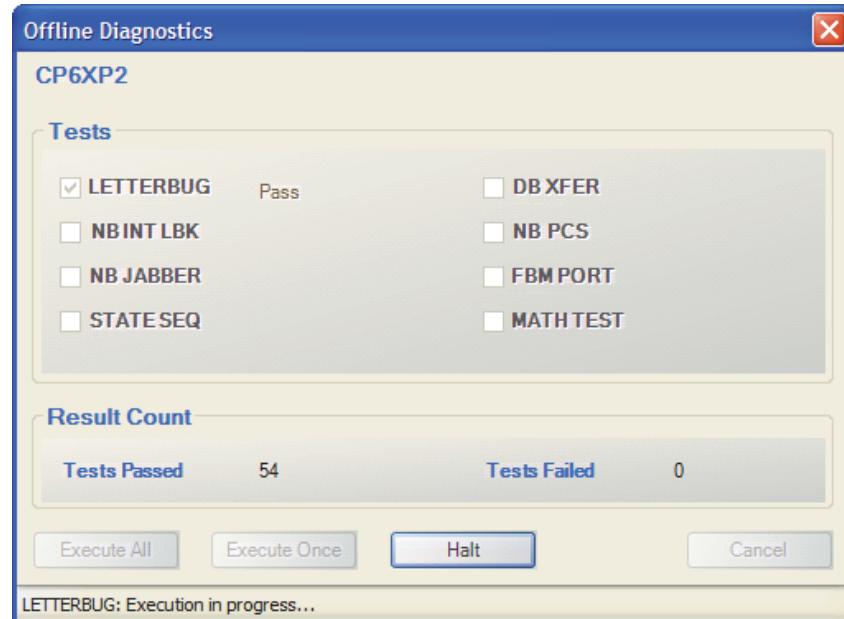


Figure 5-39. Offline Diagnostics Dialog Box for CP60 Showing the Halt Option

The system runs the selected tests as designated. The Offline Diagnostics results appear, showing the tests results of each as it completes. The result count section on the Offline Diagnostics dialog box shows the total number of tests passed and the total number of tests failed.

Results of the Offline Diagnostics Tests

Possible Offline Diagnostics test results are described in Table 5-11.

Table 5-11. Possible Offline Diagnostics Test Results

Result	Description
Pass	Indicates that the station/ATS passed the diagnostics test(s).
Fail	When shown in red text, it indicates that the station/ATS failed the diagnostics test.
No Response	Indicates that the station/ATS is not responding to the test execution request.

Note Possible reasons for No Response are:

1. The station/ATS is not responding to a particular test
2. A time-out has occurred. A time-out is the minimum time required to get a response from a station/ATS for a particular test. If a time-out occurs, the result for the particular test(s) is shown as **No Response**.

After performing the Offline Diagnostics test(s), you can restart or set the station to fail.

Table 5-12. Possible User Actions After Performing Offline Diagnostics

User action	Description
Restart	To reboot/reload the station/ATS after running Offline Diagnostics tests.
Fail	To set the station/ATS to off-line indefinitely. Fail is generally used when the station/ATS needs repair or replacement.

Tests for Various Devices

Devices	Tests
Control processors:- CP30 style-B/CP30FT style-B, CP40 style- B/CP40FT style-B, CP60/CP60FT	DB XFER LETTERBUG FBM PORT MATH TEST NB INT LBK NB JABBER NB PCS STATE SEQ
A-B Integrator 30B, INTERSPEC Integrator (IS30)	I/O PROCES LETTERBUG 80387 TEST
Carrierband LAN Interface	LETTERBUG
Comm Processor 10	LETTERBUG ASYNC LPBK M/P/M TST SCC RD/WRT DMA WRITE
Applc Proc 10	LETTERBUG DMA WRITE SER R LOOP SER P LOOP FLOPY READ SCSI RD/WR CLNDR CLK
Applc Proc 20	LETTERBUG CLNDR CLK ADMA DMA MEM DMA SCSI TESTS

Devices	Tests
Spect Slave Gateway	LETTERBUG 8087 TEST NODEBS COM CLNDR CLK PORT TEST DMA TEST ADMA DMA SSG MAIN SSG SEC
Wrksta Processor 20, WP20 - Japanized	LETTERBUG GE KERNEL 8087 TEST SHARED RAM REG TEST INTR LOGIC I/O PORT PLANE MASK PIXEL MASK
Display Panel, PW for Hydrostatic Sys	LETTERBUG I/O PORT NODEBS COM 8087 TEST
Modbus Plus Integrator	LETTERBUG 80387 TEST

Online Diagnostics

Online Diagnostics enables you to perform on-line diagnostic tests specific to a selected network.

The on-line diagnostic tests available differ based on network type, and include the following:

- Cable testing
- Enabling or inhibiting alarms
- Viewing the current Nodebus master
- Selecting a station as the Nodebus master
- Selecting the default Nodebus master.

You can use Online Diagnostics to test Carrierband LAN cables and the Nodebus cables on-line.

Online Diagnostics for Carrierband LAN

When an LI station is selected, the Actions menu will include on-line diagnostics for Carrierband LAN. On-line diagnostics tests can be used to verify the proper operation of the Tokenbus network.

Accessing Carrierband Cable Tests

In order to perform a Carrierband LAN cable test, select **Online Diagnostics > Carrierband LAN** from the Actions menu, or select **Online Diagnostics > Carrierband LAN** from the context menu by right-clicking an LI node.

Figure 5-40 shows how to access to the Carrierband LAN Online Diagnostics by right-clicking an LI node and using the context menu.

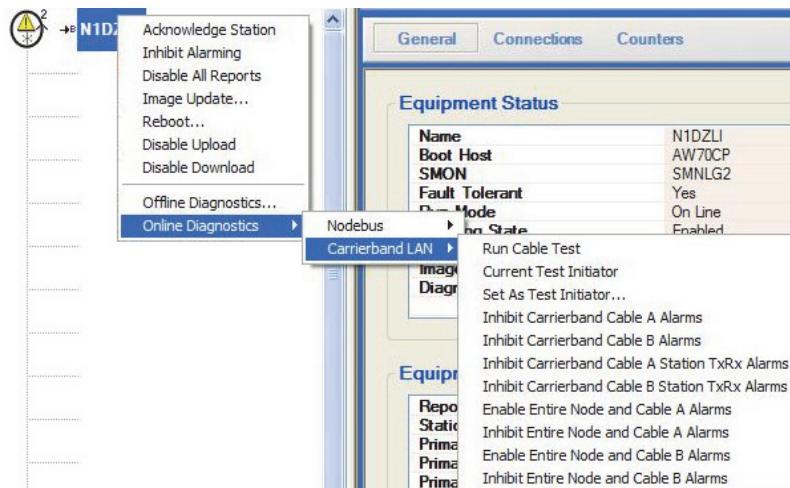


Figure 5-40. Context Menu for Carrierband LAN Cable Test

You can perform on-line diagnostics for Carrierband LAN operations as listed in Table 5-13.

Table 5-13. Carrierband LAN Cable Test Operations

Function	Definition
Run Cable Test	Runs the carrierband cable test.
Current Test Initiator	Shows the current carrierband test initiator.
Set As Test Initiator	Set the current selected LI station as carrierband test initiator.
Enable/Inhibit Carrierband Cable A Alarms	Allows/Inhibits reporting of carrierband LAN Cable A alarms.
Enable/Inhibit Carrierband Cable B Alarms	Allows/Inhibits reporting of carrierband LAN Cable B alarms.
Enable/Inhibit Carrierband Cable A Station TxRx Alarms	Allows/Inhibits reporting of the selected transmitter/receiver alarms of Cable A for the selected station on the carrierband.
Enable/Inhibit Carrierband Cable B Station TxRx Alarms	Allows/Inhibits reporting of the selected transmitter/receiver alarms of Cable B for the selected station on the carrierband.

Table 5-13. Carrierband LAN Cable Test Operations (Continued)

Function	Definition
Enable/Inhibit Entire Nodebus and Cable A Alarms	Allows/Inhibits reporting of all the equipment on the selected LI station, and nodebus Cable A alarms.
Enable/Inhibit Entire Nodebus and Cable B Alarms	Allows/Inhibits reporting of all the equipment on the selected LI station, and nodebus Cable B alarms.

When you select the **Set As Test Initiator** from either the Actions menu or the context menu for an LI station, a confirmation dialog box appears (Figure 5-41).

**Figure 5-41. Set Test Initiator Confirmation Dialog Box**

Results of the Online Diagnostics Tests

The result of Online Diagnostics will be shown under result dialog as shown in Figure 5-42 and Figure 5-43. The result will also be added to the Message tab of the Accessories pane.

**Figure 5-42. Carrierband Cable Test Result Window**

Click the **Detail** button to show or hide the current messages. The most recent message is at the top of the message display area.

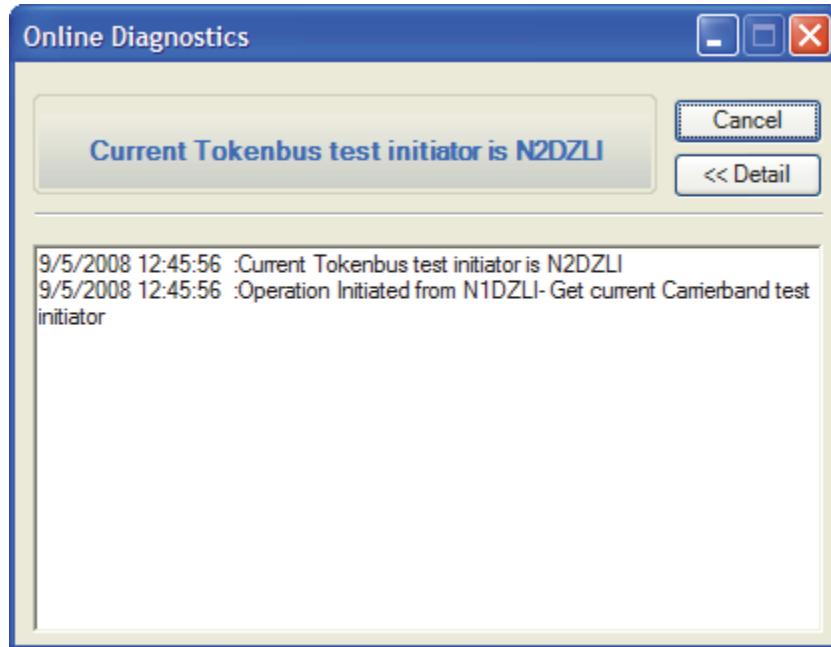


Figure 5-43. Carrierband Cable Test Result window

Online Diagnostics for Nodebus Cable Test

Nodebus Cable test is intended to verify the health of the Nodebus cables (A and B) as well as the transmitters and receivers for each of the stations on the Nodebus or Nodebus segment.

Nodebus cable testing involves a series of loopback tests wherein the Initiator sends messages over cable A or B between the two stations selected for the test. The Nodebus cable test requires two stations on the Nodebus excluding the cable test initiator.

The Nodebus cable test isolates the communication faults related to the faulting Nodebus/station hardware (Nodebus Cables A and B, Station Tx and Rx).

Accessing Nodebus Cable Test

The Online Diagnostics context menu will be available for all stations on the Nodebus by right-clicking on the node and selecting **Online Diagnostics > Nodebus**. This can be accessed via the SMON view, LAN Interface view, ATS view, or Switch view. Figure 5-44 shows an example of this menu being accessed via the LAN Interface view. Online Diagnostics involves several other actions such as Verifying the Test Initiator, Changing the Test Initiator, Configuring the Default Test Initiator, Running Tests, and Enabling/Inhibiting desired Alarms.

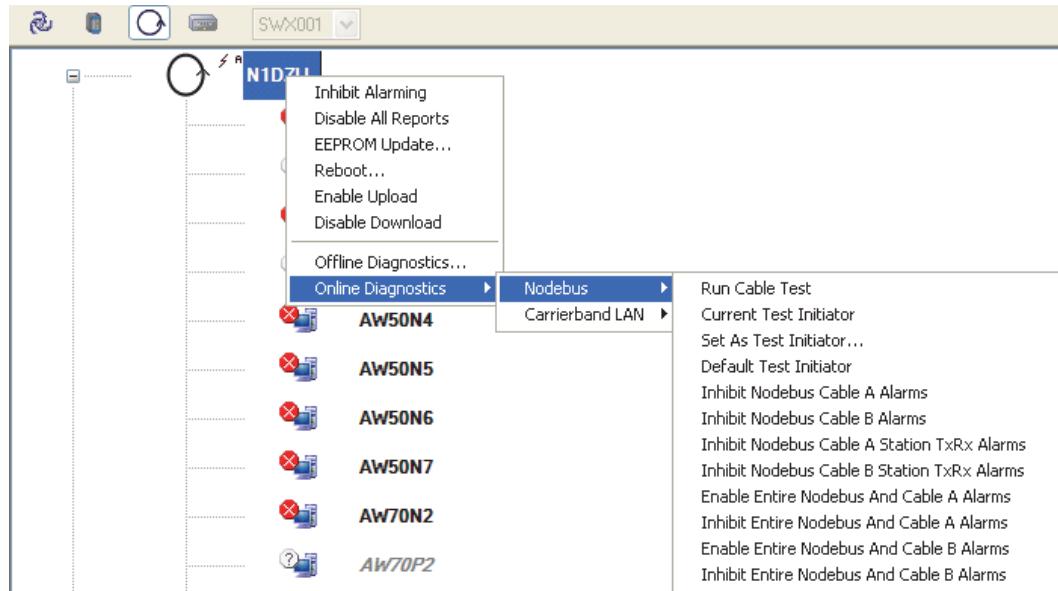


Figure 5-44. Context Menu for Nodebus Cable Test

Setting Nodebus Test Initiator

In order to perform a cable test there should be a designated Nodebus Test Initiator.

You will be able to verify the designated test initiator by selecting **Online Diagnostics > Nodebus > Current Test Initiator** from the right-click context menu of a Nodebus node or from the Actions menu. The result will be displayed in Online Diagnostics results window when the details are selected.

A Nodebus station can be designated as a Test Initiator. If there is an ATS attached to the Node then the ATS station will be assigned as default Nodebus Test initiator.

To change the Nodebus Test Initiator, select the desired station of type ATS, LI, AP20, AP50/AP51, AW50/AW51, or AW70 from the Navigation Pane and select **Online Diagnostics > Nodebus > Set As Test Initiator** from the right-click context menu. On confirmation, the selected station will be set as Nodebus Test initiator. The results will be displayed in the Online Diagnostics results window when the details are selected.

You will be allowed to set Nodebus Test initiator to the default value, that is, ATS, if it is present on Node otherwise LI. This can be performed by selecting **Online Diagnostics > Nodebus > Default Test Initiator** from the Actions menu or from the right-click context menu of a node in Navigation Pane. The results of this action will be displayed in the Online Diagnostics results window with the details.

Performing Cable Test

You can perform a Nodebus cable test by selecting **Online Diagnostics > Nodebus > Run Cable Test** from the Actions menu or from the context menu of a Nodebus node in the Navigation Pane. The Online Diagnostics window as shown in Figure 5-45 will be displayed with the list of Nodebus stations, from which a second station needs to be selected in order to perform a cable test.

Clicking the **Run** button after selecting the second station will perform a Nodebus cable test between this station and the default Nodebus test initiator. The test results will be stacked in the Message pane available on the Online Diagnostics window in the order of occurrence, that is, the most recent message will be shown on the top level.

On-line diagnostics test results will be directed to the configured fault notification printer. The System Manager Navigation pane will be updated with appropriate icons to represent the cable test results. The system will send the cable test results to all workstations only if the cable test fails. If any of the station involved in the cable test is in failed state, appropriate error messages will be appended to the Message pane.

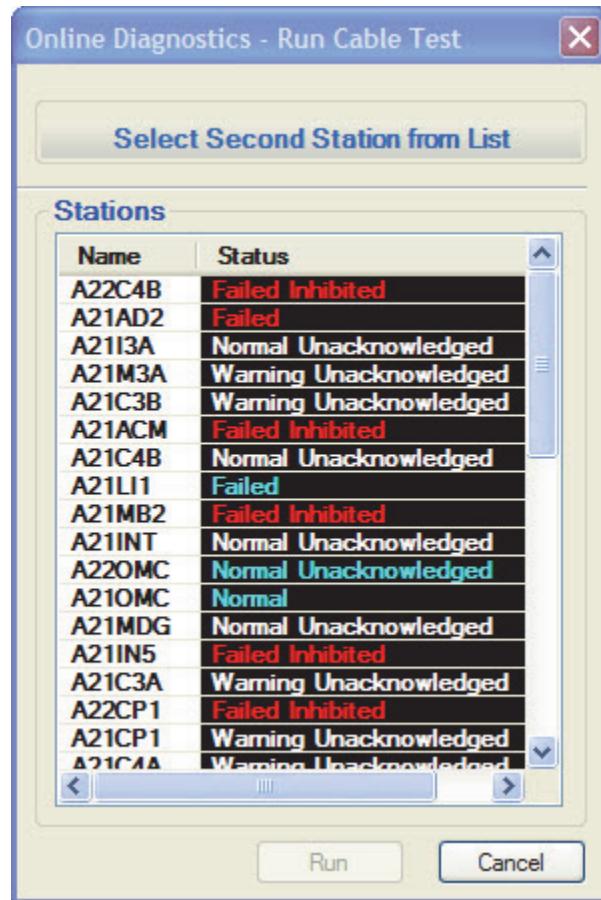


Figure 5-45. Online Diagnostics Run Cable Test Window

Enable/Disable Alarms for Nodebus Cable Test

You can Enable/Inhibit the alarms during Online Diagnostics by selecting the desired menu option displayed as shown in Table 5-14.

Table 5-14. Menu Options To Enable/Inhibit Alarms

Function	Definition
Enable/Inhibit Nodebus Cable A Alarms	Allows/disallows reporting of nodebus LAN Cable A alarms.
Enable/Inhibit Nodebus Cable B Alarms	Allows/disallows reporting of nodebus LAN Cable B alarms.
Enable/Inhibit Nodebus Cable A Station TxRx Alarms	Allows/disallows reporting of the selected transmitter/receiver alarms of Cable A for the selected station on the nodebus.
Enable/Inhibit Nodebus Cable B Station TxRx Alarms	Allows/disallows reporting of the selected transmitter/receiver alarms of Cable B for the selected station on the nodebus.
Enable/Inhibit Entire Nodebus and Cable A Alarms	Allows/disallows reporting of all the equipment on the selected LI nodebus station, its PIO bus (if any), and nodebus Cable A alarms.
Enable/Inhibit Entire Nodebus and Cable B Alarms	Allows/disallows reporting of all the equipment on the selected LI nodebus station, its PIO bus (if any), and nodebus Cable B alarms.

Primary ECB Actions

When one of the Primary ECBs for the FCP280 is selected, or the Primary ECB for an FCP270 is selected, the following actions can be chosen from the FBM's context menu or from the **Actions > Equipment Change** submenu pulled down from the main menu:

- **Inhibit Device Alarming or Enable Device Alarming**
- **Go Off-Line or Go On-Line**
- **General Download**
- **Select Bus A Only/Select Bus B Only/Bus Auto Select**
- **Inhibit PIO Bus Cable A Alarms or Enable PIO Bus Cable A Alarms**
- **Inhibit PIO Bus Cable B Alarms or Enable PIO Bus Cable B Alarms**

The following equipment change actions are available when the Primary ECB for a CNI is selected:

- **Acknowledge Device**
- **Inhibit Device Alarming or Enable Device Alarming**

The following equipment change actions are available when the Primary ECB for a ZCP270 is selected:

- **Inhibit Device Alarming or Enable Device Alarming**

- Go Off-Line or Go On-Line
- General Download
- Enet A Only/Enet B Only/Enet Auto Select

The following equipment change actions are available when the Primary ECB for a CP60 is selected:

- Inhibit Device Alarming or Enable Device Alarming
- Go Off-Line or Go On-Line
- General Download

The following equipment change actions are available when the Primary ECB for other classic stations is selected:

- Inhibit Device Alarming or Enable Device Alarming
- Go Off-Line or Go On-Line
- General Download
- Periodic PIO Bus Switch
- Bus A Enable Switching or Bus A Disable Switching
- Bus B Enable Switching or Bus B Disable Switching
- Inhibit PIO Bus A
- Inhibit PIO Bus B

Managing Alarms

From a Primary ECB, you can inhibit all alarms for the Primary ECB so that no alarm conditions are reported to the system monitor. When the station is an FCP280 or FCP270, you can also inhibit all cable alarms on either or both module fieldbus channels connecting the station to the field devices. When the station is ZCP270, inhibiting and enabling cable alarms are initiated from the FCMs (refer to “Cable Alarms” on page 235).

To inhibit device alarms:

- Right-click the Primary ECB in the Navigation pane and choose **Inhibit Device Alarming** from the context menu.

The Primary ECB is marked with the  symbol to indicate that alarms are being inhibited.

To inhibit cable alarms for the FBMs attached to an FCP280 or FCP270:

- Right-click the desired Primary ECB and choose **Inhibit PIO Bus Cable A Alarms** or **Inhibit PIO Bus Cable B Alarms** from the context menu.

A symbol (,  or ) attached to lower right corner of each FBM icon indicates which cables have alarms inhibited.

To re-enable the alarms:

- Right-click the Primary ECB in the Navigation pane and choose the appropriate command from the context menu.

Enable Device Alarming

Enable PIO Bus Cable A Alarms**Enable PIO Bus Cable B Alarms**

Go Off-Line/Go On-Line

The Go Off-Line action takes all Fieldbus devices attached to the station off-line. Placing a Primary ECB off-line stops all communication to the Fieldbus. The system sends multiple messages to the printer indicating PIO Bus cable failures.

The Go On-Line command can be used after a general download to implement a new strategy involving multiple FBMIs.

Depending on how the Actions Settings are configured (see “Action Settings” on page 74), System Manager may prompt you to confirm the action and enter a reason when you select Go Off-Line or Go On-Line.

General Download

General Download updates FBM images for all off-line and failed FBMs attached to a selected station.

Use this command when you add a new FBM to the CP and the FBM data is not already in the checkpoint file. Typically, you use the General Download action to download FBM images after you perform integrated control configuration and FBM fix on each of the new FBMs.

If the checkpoint file information in the station already includes the selected FBM data (that is, checkpointing was performed while the FBMs were on-line), downloading occurs automatically, when necessary.

Depending on how the Actions Settings are configured (see “Action Settings” on page 74), System Manager may prompt you to confirm the action and enter a reason when you select General Download.

To download FBM images for all off-line and failed FBMs:

- Right-click the Primary ECB in the Navigation pane and choose **General Download** from the context menu.

Note For a ZCP270, you must choose **General Download** a second time when performing a General Download after a LoadAll. The first command downloads all the FCMs and the second action downloads all the FBMs.

Note If you use the General Download option during initial start-up, perform a checkpoint to the control processor after downloading to all the FBMs. This preserves the on-line state of the FBMs in the checkpoint file. Refer to “Checkpointing” on page 178.

Ethernet and Module Fieldbus Switching Actions

The module Fieldbus is a redundant bus that connects the modules installed in the modular baseplates. The Primary ECBs for the baseplate mounted FCP280 or FCP270 enables you to select channel A or B for that Primary ECB’s PIO

channel, or set the Primary ECB to periodically select the better of the two cables based on the number of faults recorded for each cable (auto-switching).

Similarly, the Primary ECB for a ZCP270 enables you to select one of the ethernet cables connecting the station to its FCMs, or to set the Primary ECB to periodically select the better of the two ethernet cables based on the number of faults recorded for each cable.

To select auto-switching:

- Right-click the Primary ECB and choose **Bus Auto Select** from the context menu.

On a ZCP270, select **Enet Auto Select**.

The Primary ECB records the number of FBM access failures on each channel or cable and periodically determines whether switching should occur. If the current channel or cable has failures and the other has fewer failures, the station automatically switches. If both have an equal number of FBM or FCM access failures, the station continues transmission over the existing bus.

To disable auto-switching:

- Right-click the Primary ECB and choose **Select Bus A Only** or **Select Bus B Only** from the context menu.

On a ZCP270, choose either **Enet A Only** or **Enet B Only** from the context menu.

The station attempts to continue transmission over the selected cable/bus regardless of the number of failures in each module.

Acknowledge Device (CNI Only)

Select this to acknowledge an alarm for the CNI.

C H A P T E R 6

Station Counters

This chapter describes the workstation and control station counters.

Contents

- Counters Tab for Stations
- Diagnostic Counters - For FCP280 and CNI
- MAC Sublayer - For FCP270/ZCP270 and Earlier Control Processors, ATSs and LIs
- Network Layer
- Transport Layer
- Application Layer
- Loading Parameters

Note Network Layer option is only enabled for LI and ATS stations.

Counters Tab for Stations

When a workstation, control station or CNI is selected in the Navigation pane, the Counters tab displays counts of transactions, errors and other performance indicators maintained by the station/CNI. Counters from the tab can be added to a watch list that includes counters from other stations, CNI or other equipment.

To access counters for a station/CNI:

1. Select the station/CNI in the Navigation pane and click the **Counters** tab in the Information pane.
2. Click the radio button at the top of the page to select the category to be displayed.

A table below the Counter Categories displays the counter names, current and previous values, and high and low values read during this System Manager session.

Use the buttons in the Counters tab toolbar to read and reset values in the table, and to add selected counters to the list in the Watch tab in the Accessories pane.

Note The entries on the counter are blank if the station is off-line:

Counter	Current Value	Previous Value	Maximum	Minimum
802.3 MAC Resets				
802.4 MAC Resets				
Align Errors				
Collisions				
CRC Errors				
DMA Overrun				
DMA Underruns				
Excess Collisions				
Frames Received				
Frames Transmitted				
No Receive Resources				
Transmits Deferred				

See “Counters Tab” on page 52 and “Watch Tab” on page 63 for additional information on using features of the Counters and Watch tabs, respectively.

Diagnostic Counters - For FCP280 and CNI

Diagnostic Counters is for the FCP280 control processors, as shown in Figure 6-1, and the CNI as shown in Figure 6-2.

Counter	Current Value	Previous Value	Maximum	Minimum
Bad Ethernet Packets	0	0	0	0
Ethernet Miscompares	74	74	74	74
Ethernet Port Switchovers	0	0	0	0
Hot Remany Count	0	0	0	0
Maximum NetBuffers Used	87	87	87	87
PIO Miscompares	0	0	0	0
PIO Timeouts	0	0	0	0
Primary Corrected Memory Error	0	0	0	0
Probe Packet Failures	1	1	1	1
Shadow Corrected Memory Error	0	0	0	0
Total Received Packets	24499	24499	24499	24499
Total Transmitted Packets	14077	14077	14077	14077

Figure 6-1. Counters Tab for FCP280

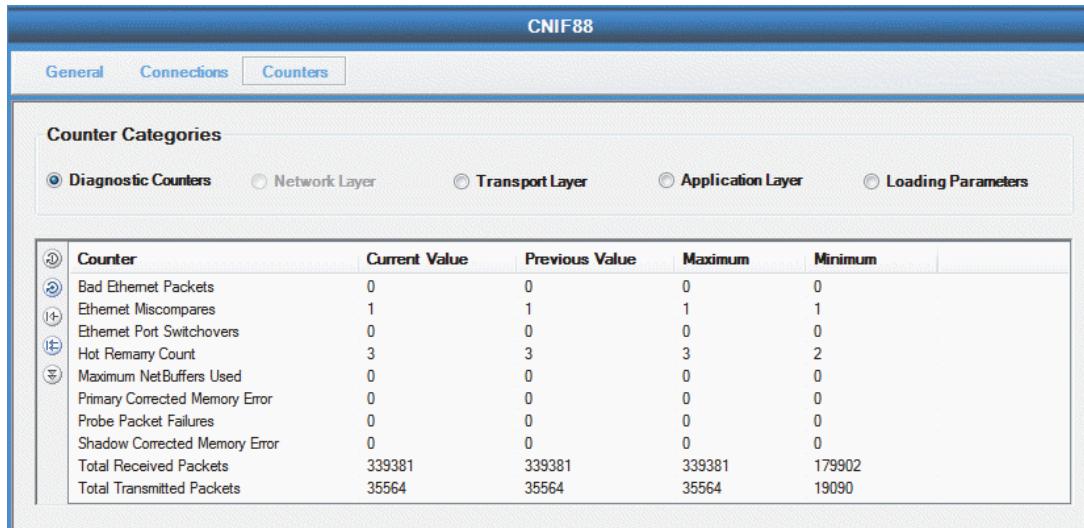


Figure 6-2. Counters Tab for CNI

Table 6-1 describes the Diagnostic counters for an FCP280 or CNI. A problem with the equipment may be indicated if the counter exceeds the threshold listed in the Value column. The error counters are all absolute and not a “rate” over time. When an error condition occurs (such as a bad Ethernet frame), the counter is incremented. The counter is zeroed on reset or with the Counters tab toolbar buttons listed in Table 2-6 “Counters Tab Toolbar Buttons” on page 54.

Table 6-1. Diagnostic Counters Display Fields

Counter	Description	Value	Possible Reason For Increment
Bad Ethernet Packets	Number of Bad Ethernet frames detected by the MAC chips. Incremented on each occurrence.	1	Signifies a hardware error on local station, notify service. It could also be problem with the network such as dirty fiber cable or bad switch.
Ethernet Miscompares	For fault tolerant FCP280s or CNIs, the number of Ethernet packets presented for transmission that were not identical	0.1% of frames received	Bad cable or bad local receiver or remote transmitter if threshold is exceeded in 30 seconds.
Ethernet Port Switchovers	Incremented each time the FCP280 or CNI switches Primary message processing from The “A” Mesh network port to The “B” Mesh network port and vice versa	2	Hardware error on local station. It could also be problem with the network such as dirty fiber cable or bad switch. Also check the Probe Packet Failure counter which can indicate the cause of switchovers.

Table 6-1. Diagnostic Counters Display Fields (Continued)

Counter	Description	Value	Possible Reason For Increment
Hot Remarry Count	Incremented each time the FCP280 or CNI detects a synchronization time-out or a message miscompare. A “normal” value might be 1-9 per day. A steadily incrementing count indicates an abnormal condition. The “Hot Remarry” operation is discussed in B0700FW and B0700GE.	2 per day	Hardware error on local station. It could also be problem with the network such as dirty Mesh fiber cable or bad switch. Also noise on the PIO Bus could cause these type of errors.
Maximum NetBuffers Used	Maximum netbuffers in use by the communication systems	Nominally 80-100 a slow increase indicates a loss of communication resources	To detect communication error resulting in buffer leaks. This is not normally caused by a hardware problem but by a station overload problem could cause this counter to steadily increase.
PIO Miscomparisons [For FCP280 Only]	For fault tolerant FCP280s, the number of PIO packets presented for transmission that were not identical.	0.1% of frames received	Bad local receiver or external transmitter.
PIO Timeouts [For FCP280 Only]	The number of PIO transactions that timed out	0	Possible station overload or incoming traffic in process.
Primary Corrected Memory Error	Correctable ECC errors detected by the Primary FCP280 or CNI. This counter should not be increasing by more than one per day	5.0% of transmitted frames	Bad cable, bad hardware, hot remarries.
Probe Packet Failures	Indicates the number of times a packet sent from the “A” Mesh port to the “B” Mesh port encounters a failure. It should not be incrementing by more than one per hour.	1	If incrementing, it typically indicates a problem in The Mesh network (typically a switch or cable failure).
Shadow Corrected Memory Error	Correctable ECC errors detected by the Shadow/Backup FCP280 or CNI. This counter should not be increasing by more than one per day	5.0% of transmitted frames	Bad cable, bad hardware, hot remarries.

Table 6-1. Diagnostic Counters Display Fields (Continued)

Counter	Description	Value	Possible Reason For Increment
Total Received Packets	Number of frames successfully received by the MAC. Receptions are counted and every ten seconds, a rate is obtained (by dividing the count by ten). The count is then set to zero. Estimates average load on the FCP280 or CNI.	N/A	Each message received on network increments this counter by 1.
Total Transmitted Packets	Number of frames successfully transmitted by the MAC. Transmissions are counted and every ten seconds, a rate is obtained (by dividing the count by ten). The count is then set to zero. Estimates average load on the FCP280 or CNI.	180,000	Each message transmitted on network increments this counter by 1.

MAC Sublayer - For FCP270/ZCP270 and Earlier Control Processors, ATSS and LIs

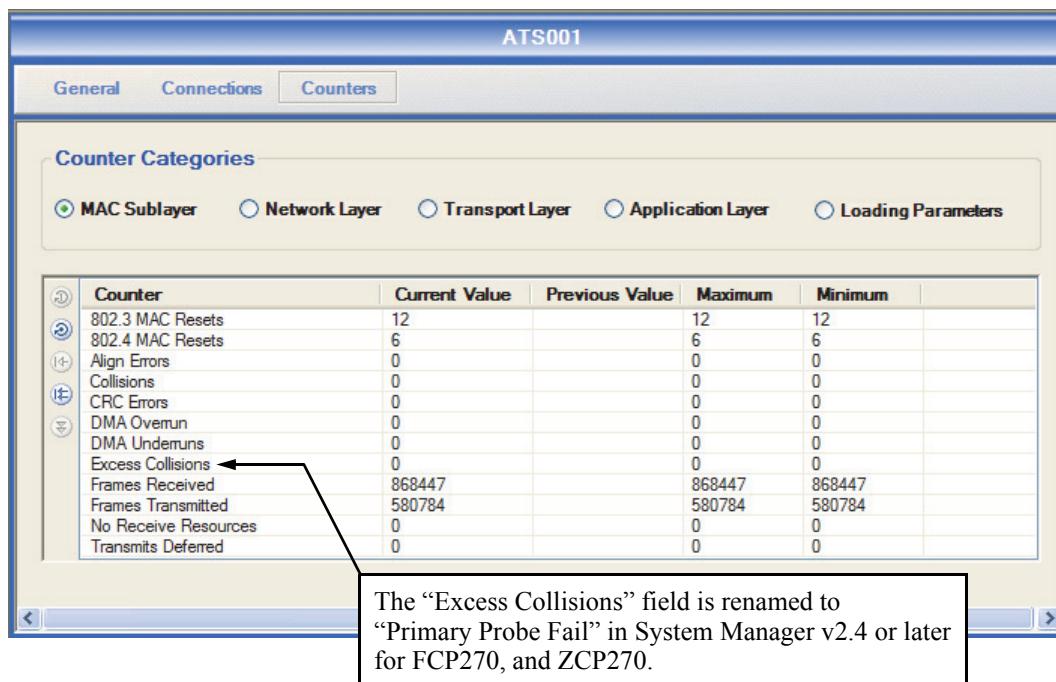
**Figure 6-3. MAC Sublayer Counters Tab**

Table 6-2 describes the MAC Sublayer counters. A problem with the equipment may be indicated if the counter exceeds the threshold listed in the Value column (the threshold is usually counts per hour).

Table 6-2. MAC Sublayer Counters Display Fields

Counter	Description	Value	Possible Reason For Increment
802.3 MAC Resets	Number of times the Nodebus MAC was initialized due to transmission errors and hot remarries.	2	Bad cable or bad receiver if very large values are observed over short periods of time. Low values (less than threshold) are norm for 30 second intervals. Possible heavy network traffic.
802.4 MAC Resets	Number of times the tokenbus MAC was initialized due to transmission errors and hot remarries. This counter applies to the LI station only.	2	Possible bad cable, bad receiver or very heavy loaded network for large value over short periods. Occasionally DEFER may appear, and is acceptable if less than threshold levels over 30 seconds.
Align Errors	Number of received, misaligned frames with CRC errors. Not reported for a fault-tolerant station (excluding the LI station) running married.	0.1% of frames received	Bad local receiver or external transmitter.
Collisions	Number of collisions experienced by the controller chip during transmission attempts. Not reported for a fault-tolerant station (excluding the LI station) running married.	5.0% of transmitted frames	Bad cable, bad hardware, hot remarries.
CRC Errors	Number of properly aligned frames received with CRC errors. Not reported for a fault-tolerant station (excluding the LI station) running married.	0.1% of frames received	Bad cable or bad local receiver or remote transmitter if threshold is exceeded in 30 seconds.

Table 6-2. MAC Sublayer Counters Display Fields (Continued)

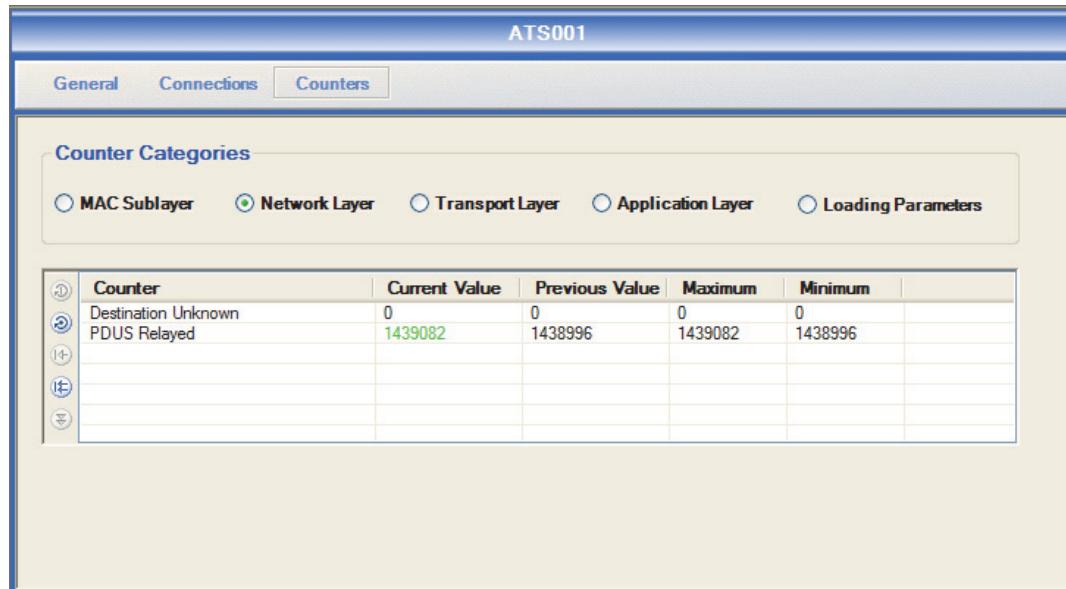
Counter	Description	Value	Possible Reason For Increment
DMA Overrun	Number of frames lost because the memory bus was not available to the controller chip. Not reported for a fault-tolerant station (excluding the LI station) running married.	0	Possible station overload or incoming traffic in process.
DMA Underruns	Number of times the station ran out of internal bus bandwidth. Not reported for a fault-tolerant station (excluding the LI station) running married.	1	Signifies a hardware error on local station, notify service.
Primary Probe Fail - For FCP270, and ZCP270 Only	Number of times the station has changed its primary cable for MESH communications due to probe test failure.	An incrementing value indicates a potential network or station problem which should be investigated	A high or incrementing count usually indicates some instability in The Mesh.
Excess Collisions - For earlier CPs such as CP60, CP40, and CP30 Only	Number of unsuccessful transmissions because the number of collisions exceeded the maximum number of retries.	1	Bad cable or bad receiver. Possible very heavy network traffic.
Frames Received	Number of frames successfully received by the MAC.	N/A	Each message received on network increments this counter by 1.
Frames Transmitted	Number of frames successfully transmitted by the MAC.	180,000	Each message transmitted on network increments this counter by 1.

Table 6-2. MAC Sublayer Counters Display Fields (Continued)

Counter	Description	Value	Possible Reason For Increment
No Receive Resources	Number of received frames lost due to memory resource problems in the station. Not reported for a fault-tolerant station (excluding the LI station) running married.	0.1% of frames received	Signifies hardware error on local station notify service personnel.
Transmits Deferred	Number of times the controller chip deferred traffic during the first transmission attempt. Not reported for a fault-tolerant station (excluding the LI station) running married.	5.0% of transmitted frames	Bad cable, bad hardware, hot remarries.

Network Layer

This layer is enabled only for ATS and LI stations.

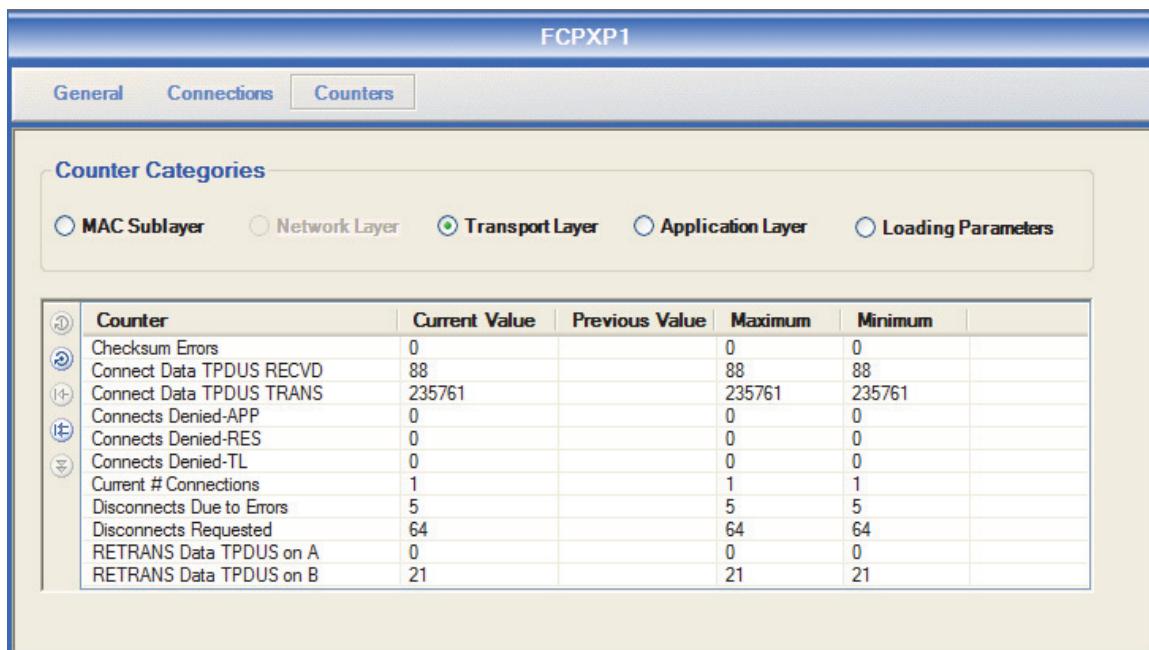
**Figure 6-4. Network Layer Counters Tab**

The following table describes the Network Layer counters.

Table 6-3. Network Layer Counters Display Fields

Counter Name	Description
Destination Unknown	Number of messages dropped because the destination node ID was unknown.
PDUS Relayed	Number of PDU (Protocol Data Unit) messages which pass through the LI (LAN Interface) or ATS.

Transport Layer

**Figure 6-5. Transport Layer in a Control Station Counters Tab**

The following table describes the Transport Layer counters.

Table 6-4. Transport Layer Counters Display Fields

Counter	Description	Value	Possible Reason For Increment
Checksum Errors	Number of TPDUs received with checksum errors.	1	System overload condition.
Connect Data TPDUS Recvd	Number of successfully received, connection-oriented TPDUs.	N/A	Each connection data packet received increments counter by 1.

Table 6-4. Transport Layer Counters Display Fields (Continued)

Counter	Description	Value	Possible Reason For Increment
Connect Data TPDUS Trans	Number of successfully transmitted, connection-oriented TPDUs.	N/A	Each connection data packet transmitted (non-ack) increments by 1.
Connects Denied – APP	Number of connection requests denied by a local application.	10	The local TL detects one of the following errors; peer connection not valid; destination station not available.
Connects Denied – RES	Number of connection requests denied due to lack of Transport Layer (TL) local resources.	1	Application not ready to get connections.
Connects Denied – TL	Number of connection requests denied by the TL.	1	The local TL detected one of the following errors: packet format error from peer; no response from peer; peer TL denied the connection due to one of these two error conditions.
Current # Connections	Number of Fox IPC connections currently established. You cannot set this counter.	N/A	N/A
Disconnects Due To Errors	Number of established connections that broke due to error.	1	This counter is incremented only if an established connection experiences one of the following conditions: retransmits were exceeded and the TL did not acknowledge a TPDU; no TPDUs were received from the peer TL in a sufficient time period; the peer TL broke connection due to one of two error conditions.
Disconnects Requested	Number of established connections broken due to a local or remote application request.	N/A	N/A
Retrans Data TPDUS on A	Number of retransmitted Transport Protocol Data Units (TPDUs) on Cable A.	0.2% of transmitted TPDUs	Heavily loaded network.
Retrans Data TPDUS on B	Number of retransmitted TPDUs on Cable B.	0.2% of transmitted TPDUs	Heavily loaded network.

Application Layer

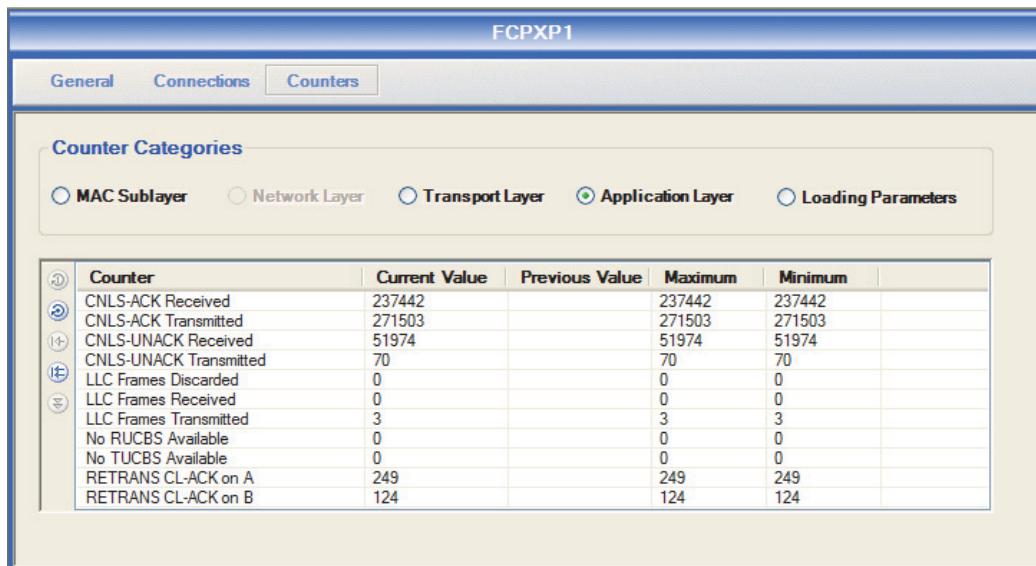


Figure 6-6. Application Layer in a Control Station Counters Tab

The following table describes the Application Layer counters.

Table 6-5. Application Layer Counters Display Fields

Counter	Description	Value	Possible Reason For Increment
CNLS-ACK Received	Number of connectionless, acknowledged data packets received by the AL.	180,000 where: CNLS-ACK is sum of transmitted and received CNLS-ACKs.	Incremented by 1 when received.
CNLS-ACK Transmitted	Number of connectionless, acknowledged data packets transmitted by the AL.	180,000 where: CNLS-ACK is sum of transmitted and received CNLS-ACKs.	Incremented by 1 when received.

Table 6-5. Application Layer Counters Display Fields (Continued)

Counter	Description	Value	Possible Reason For Increment
CNLS-UNACK Received	Number of connectionless, unacknowledged data packets received by the AL. These data packets have a minimal overhead, provide no connection-oriented services, and neither send nor receive acknowledgment. Delivery is further assured by sending the message a second time on the primary and secondary cables.	N/A	Each received connectionless unacknowledged packet increments this counter by one.
CNLS-UNACK Transmitted	Number of connectionless, unacknowledged data packets transmitted by the Application Layer (AL).	200	Each transmitted connectionless unacknowledged packet increments this counter by one.
LLC Frames Discarded	Number of LLC frames received directly from the LLC layer, but discarded because a lack of memory prevented the AL from copying and passing the message.	N/A	Memory overload: lack of space available.
LLC Frames Received	Number of LLC frames received directly from the LLC layer, bypassing the Transport and Network layers.	N/A	Incremented by 1 each time sent.
LLC Frames Transmitted	Number of frames transmitted directly to the Logical Link Control layer (LLC), bypassing the Transport and Network layers.	N/A	Incremented by 1 each time received.

Table 6-5. Application Layer Counters Display Fields (Continued)

Counter	Description	Value	Possible Reason For Increment
No RUCBS Available	Number of connectionless data packets rejected due to lack of Receive Unit Control Blocks (RUCBs). A lack of available RUCBs indicates an insufficient number of control structures allocated to process the current incoming traffic. You may need to reconfigure the allocation.	5	A lack of available RUCBS indicates an insufficient number of control structure allocated to process current incoming traffic and re-configuration may be necessary.
No TUCBS Available	Number of connectionless data packets not sent due to a lack of available Transmit Unit Control Blocks (TUCBs). A lack of available TUCBs indicates the control structures allocated to process the current outgoing traffic are insufficient. You may need to reconfigure the allocation.	5	A lack of available TUCBs indicates the control structures allocated to process current outgoing message to the traffic is insufficient.
RETRANS CL-ACK on A RETRANS CL-ACK on B	Number of retransmitted, connectionless, acknowledged data packets on Cable A or Cable B. Cable problems (one cable, two cables or transitory problems affecting both cables) may be responsible for the acknowledgment never arriving; this may result in retransmissions.	0.2% of CL-ACK transmitted where: CL-ACK is sum of A and B CL-ACKs.	Cable problems (one or more cables, or transitory problems may be responsible for ack never arriving, resulting in retransmission.

Loading Parameters

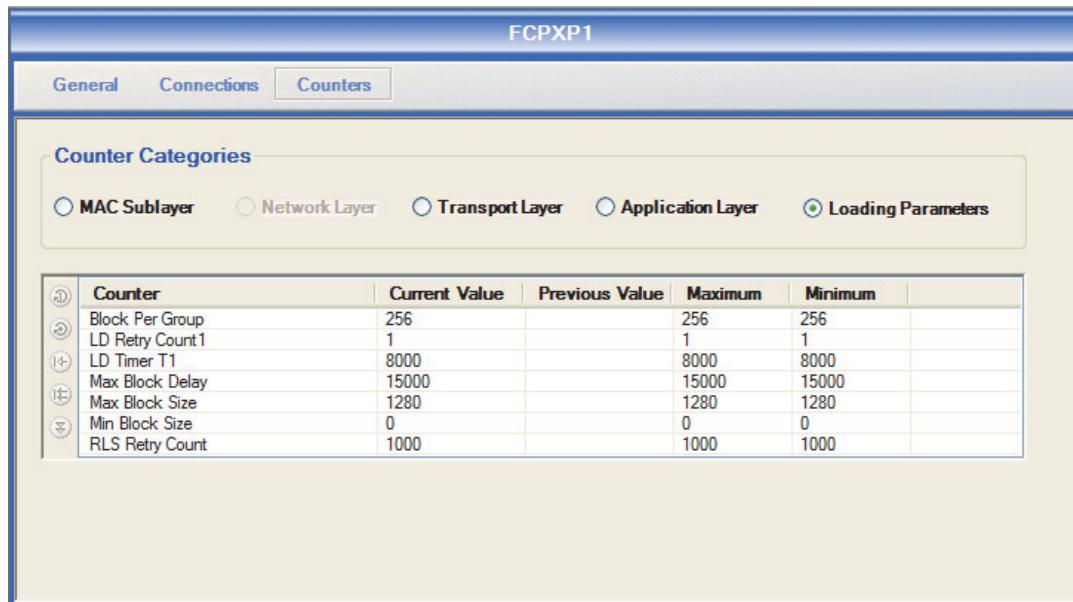


Figure 6-7. Loading Parameters Counters Tab

The following table describes the Loading Parameters. These counters are static values, and as such cannot be reset or added to the Watch tab in the Accessories pane.

Table 6-6. Loading Parameters Display Fields

Counter	Description	Static Value
Block per group	Number of blocks in a logical group. Files are segmented into groups for the purpose of loading station images.	256 blocks/ logical group at 1400 octets per block
LD Retry Count1	Number of times a load request is sent before the load is considered failed.	1 time
LD Timer_t1	Number of counts, converted to milliseconds, the LD waits for a load response before issuing another Load Request.	8000 milliseconds
Max Block Delay	Maximum number of counts (converted to milliseconds) that an LD can tolerate between transmission of individual data blocks.	15000 milliseconds
Max Block Size	Maximum data block size, in octets, that a station can accept for loading.	1280 octets
Min Block Size	Minimum data block size, in octets, that a station can accept for loading.	0 octets
Rls Retry Count	Number of times the ROM Load Server (RLS) requests completion status from a Loadable Device (LD).	1000 retries

C H A P T E R 7

FCMs

Field Communication Modules (FCMs) connect FBMs to rack-mounted control stations such as the ZCP270 and CP60. The FCMs communicate with the control stations over a 100-Mbit Ethernet trunk Fieldbus.

The optionally redundant FCM100Et and FCM100E modules communicate with 200 Series (DIN rail mounted) FBMs using the 2 Mbps HDLC Module fieldbus provided by the baseplates and baseplate cabling. The FCM100E can additionally communicate with 100 Series FBMs using the 268 Kbps HDLC Module fieldbus. An FCM100E pair can support either 100 Series or 200 Series FBMs, but not simultaneously.

This chapter describes how to use System Manager software to monitor and control FCMs.

Contents

- Identifying FCMs in the Navigation Pane
- Symbols for FCM100
- Symbols for FCM10
- Connected FBMs
- Equipment Change Actions

Identifying FCMs in the Navigation Pane

An FCM is depicted in the Navigation pane by the  icon

attached to the Primary ECB of the host ZCP270. The single icon is used to represent both redundant FCM pairs and a single non-redundant module.

Note The host for FCM10 is CP60.

A symbol attached to the upper left corner of the FCM icon indicates an adverse condition with the module or one of the attached field device. The status of alarms associated with the FCM is indicated by symbols on the lower left side of the module.

Labels attached to the right side of the station's Primary ECB indicate the state of communications between the FCM and the FBMs, and the status of communications between the FCM and the control station.

- Choose **Help > Legend** from the main menu to identify the equipment health and alarm status symbols, or refer to “Status Indicators” on page 47.

Figure 7-1 shows a Navigation pane in which a ZCP270 and its Primary ECB (both labeled ZCP703) have been expanded to display an FCM100Et (FCM300). The FCM in turn has been expanded to display the attached FBMs.

The attached FBMs include a module that is off-line (FCM308) and another that has failed (FCM311). Thus, the yellow warning symbol is attached to the FCM icon. The FBM failure has not been acknowledged, and an asterisk has been attached to the FBM, the FCM, and the host control station.

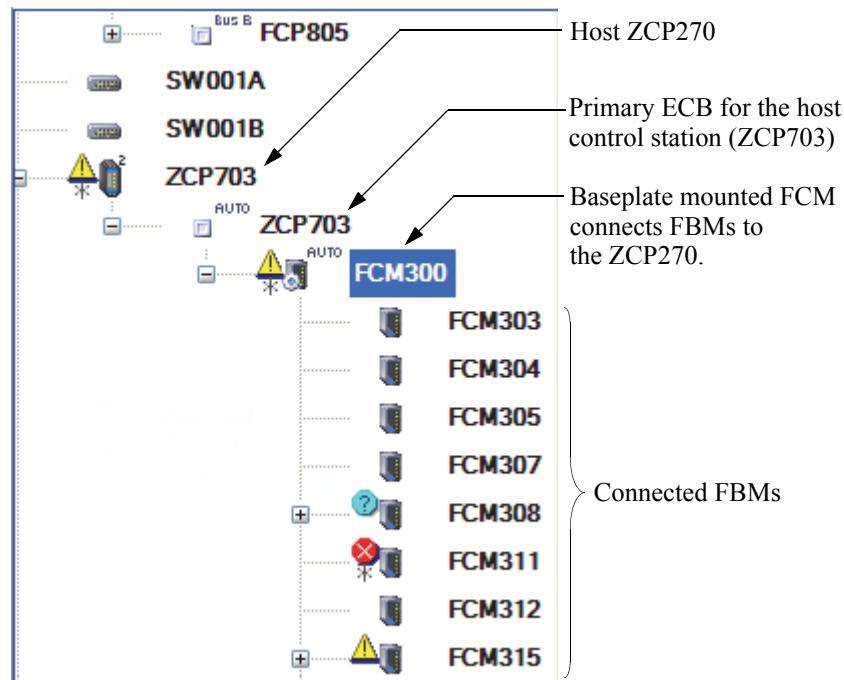


Figure 7-1. Displays of FCMs in the Navigation Pane

Labels and symbols attached to the right side of the FCM indicate the state of communications between the FCM and the attached FBMs and the FCM and the control station, as described in the following table:

Table 7-1. Symbols for FCM100

Symbol	Condition
  	<p>A label attached to the upper right corner of the FCM icon indicates which module Fieldbus channel is being used for communications between the FCM and the FBMs:</p> <ul style="list-style-type: none"> Bus A when the A cable has been selected by an operator Bus B when the B cable has been selected by an operator AUTO when the station automatically switches to the better cable based on a periodic check of the number of faults on each cable <p>See “Module Fieldbus Switching Actions” on page 238 for information on specifying the module Fieldbus channel.</p>
	A lightning symbol attached to the right side of the FCM icon indicates that there is a cable fault with one of the attached FBMs.
  	A red line with A, B or AB attached to the right side of the FCM icon indicates a PIO bus failure, that is, a failure in one or both of the Fieldbus cables connecting the FCM with its host control station.
  	A label attached to the bottom right corner of the FCM icon indicates whether cable alarms are inhibited for channel A, channel B, or both A and B. Cable alarms can be inhibited for all FBMs on a module Fieldbus with an FCM equipment change action (“Cable Alarms” on page 235). Cable alarms can be inhibited and enabled for an individual FBM using the FBM’s context menu in the Navigation pane, as described in “Managing Cable Alarms” on page 266.

Table 7-2. Symbols for FCM10

Symbol	Condition
	A lightning symbol attached to the right side of the FCM icon indicates that there is a cable fault with one of the attached FBMs.
	A red line with A, B or AB attached to the right side of the FCM icon indicates a PIO bus failure, that is, a failure in one or both of the Fieldbus cables connecting the FCM with its host control station.

FCM Status and Equipment Information

When an FCM is selected in the Navigation pane, the General tab in the Information pane displays FCM status and equipment information in two tables.

The first two fields in the Equipment Status table (Figure 7-2) identify the FCM by name and type. The remaining fields in this group provide status information and are updated dynamically. The fields in the Equipment Information table (Figure 7-3) are updated periodically.

When the FCM is a redundant pair, the designation **A** or **Main** refers to the module located in the first position in the baseplate, and the designation **B** or **Backup** refers to the module located in the second position.

The screenshot shows the System Manager interface for an FCM300. The title bar says "FCM300". Below it, there are tabs for "General" and "Connections", with "General" being active. The main area contains two tables:

Equipment Status

Name	FCM300
Run Mode A	On Line
Device State A	Not Failed
Failed Acknowledged State	Acknowledged
Failed Devices Attached	Yes
EEPROM State A	Not Updating
Download State A	Not Downloading

Type

Run Mode B	FCM100ET
Device State B	On Line
Alarming State	Not Failed
Failed Devices Acknowledged	Enabled
EEPROM State B	No
Download State B	Not Updating

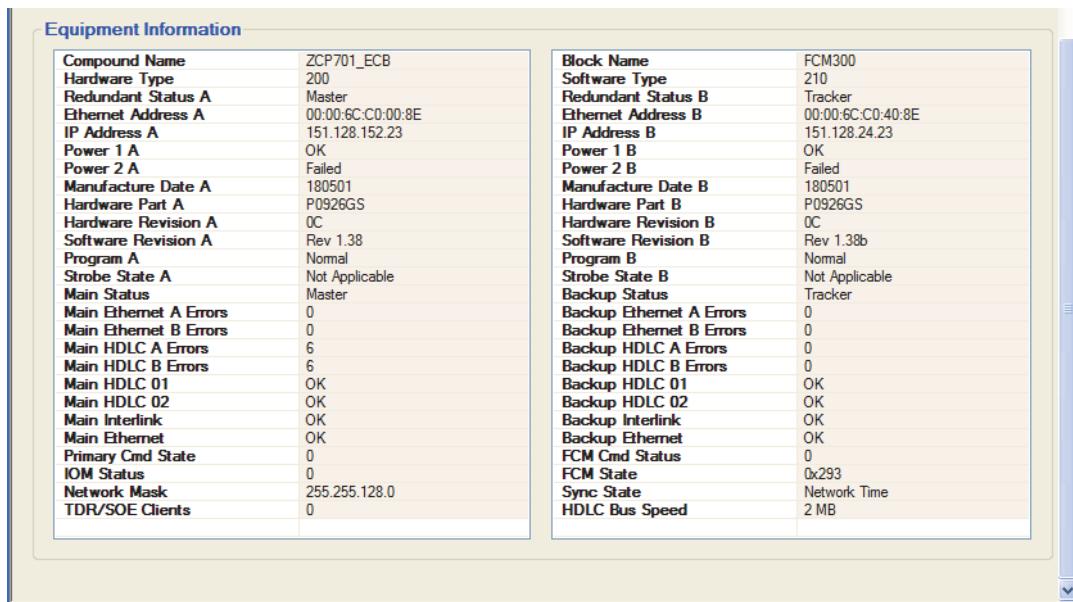
Figure 7-2. FCM Equipment Status Table

Table 7-3. FCM Equipment Status Display Fields

Field	Description
Name	FCM letterbug assigned during definition of system hardware
Type	Model number of the FCM defined during the system definition
Run Mode A Run Mode B	Gives the run mode of each module in a redundant pair as either On Line or Off Line . The field changes from Off-Line to On-line when the FCM reports to its host control processor after booting up. If reporting is disabled, the last known state appears in this field. Although certain equipment change options change the Run Mode to Off Line, they do not fail the FCM. However, a failed FCM results in the Run Mode changing to Off Line. Run Mode changes to Off Line if any of the following occurs: <ul style="list-style-type: none"> • An EEPROM update • A physical pull/push of the module to reboot the module • Any FCM hardware failure or communication failure
Device State A Device State B	Normally Not Failed . The field displays Failed if any of the following occurs: <ul style="list-style-type: none"> • A physical pull/push of the module to reboot the module • Any module failure or communication failure
Failed Acknowledged State	Acknowledged or Not Acknowledged . If the Device State changes to Failed, the Failed Acknowledged State changes to Not Acknowledged until the failed state is acknowledged. Refer to “Managing Alarms” on page 234.
Alarming State	Alarming for the FCM is either Enabled or Inhibited . When alarming is inhibited, the system monitor continues to indicate overall system and network health while equipment is failed or off line. Refer to “Managing Alarms” on page 234.
Failed Devices Attached	Yes if one or more attached FBMs are reported as failed; otherwise, No
Failed Devices Acknowledged	No until all attached devices that have failed are acknowledged; otherwise, Yes

Table 7-3. FCM Equipment Status Display Fields (Continued)

Field	Description
EEPROM State A EEPROM State B	Updating while the module's operating software is being updated from a workstation; otherwise, Not Updating . Refer to "EEPROM Updates" on page 237.
Download State A Download State B	Downloading , while the module is rebooting after a download of the FCM's control configuration; otherwise, Not Downloading . Refer to "Downloading" on page 236.

**Figure 7-3. FCM Equipment Information Table****Table 7-4. FCM Equipment Information Display Fields**

Field	Description
Redundant Status A Redundant Status B	Status of each module in a redundant pair is shown as: <ul style="list-style-type: none"> • Master when the module in a redundant pair is in control • Tracker when the module is ready to take over control if the other module fails • Off-Line when Run Mode (A, B) is Failed • Not Operational when the module has been taken off-line by an operator action
Compound Name	Compound name containing the FCM's ECB
Block Name	Name of the FCM's ECB

Table 7-4. FCM Equipment Information Display Fields (Continued)

Field	Description
Ethernet Address A Ethernet Address B	A six-octet media access control (MAC) address assigned to each module during system definition and used by the networking protocol in the Foxboro stations. The A (Main) module in a redundant pair has the lower MAC address.
IP Address A IP Address B	Internet Protocol address of each module assigned during system definition and used by the networking protocol in the Foxboro stations
Network Mask	The subnet mask of the FCM is normally set to 255.255.128.0 as assigned during system definition.
Sync Sate	<ul style="list-style-type: none"> • Network Time • Sync Pulse • Drifting • No Sync Pulse
Power 1 A Power 1 B	Failed if there is a fault with the module's primary power supply; otherwise, OK
Power 2 A Power 2 B	Failed if there is a fault with the module's secondary power supply; otherwise, OK
Manufacture Date A Manufacture Date B	Manufacturing date for each module
Hardware Part A Hardware Part B	Module part number
Hardware Revision A Hardware Revision B	Release level of the module hardware
Software Revision A Software Revision B	Release level of the software running in the FCM
Program A Program B	The software running in module A or B is the Backup or Normal (main) module software.
Software Type	Number indicating the software running in the FCM: 210 for an FCM100Et or FCM100E
Hardware Type	Number indicating the FCM hardware type: 200 for an FCM100Et or FCM100E
Primary CMD Status	Value related to the status of communication between the FCM and the control station and between the FCM and the FBMs: 0 = Normal, no error 1 = Success with retry (this condition is very rare) 2 = FCM timed out FBM 3 = CP timed out FCM > 3 = Link level protocol error (this is very rare and transient)

Table 7-4. FCM Equipment Information Display Fields (Continued)

Field	Description
FCM CMD Status	A hexadecimal value associated with the return status included in the header of every response from the FBMs to the FCM. Typically, the hexadecimal value is 0, indicating the command was understood and action was taken. 0 = Command understood, action taken 1 = Command not understood 2 = Command understood, but unable to take action 4 = Invalid argument
Main Ethernet A Errors Backup Ethernet A Errors	Number of messages with errors received from the control station over the A cable
Main Ethernet B Errors Backup Ethernet B Errors	Number of messages with errors received from the control station over the B cable
Main HDLC A Errors Backup HDLC A Errors	Number of messages with errors received from FBMs over the module Fieldbus A channel
Main HDLC B Errors Backup HDLC B Errors	Number of messages with errors received from FBMs over the module Fieldbus B channel
IOM Status	Code used by Invensys service personnel, usually 0 .
FCM State	Main FCM operational status, same as the Main Status field
Strobe Status A Strobe Status B	Not applicable
Main Status Backup Status	Status of each module: <ul style="list-style-type: none">• Normal for a non-redundant FCM operating under normal conditions• Master for the controlling FCM in a redundant pair• Tracker for a module in a redundant pair that is ready to take control if the other module fails• Not Operational for a module that is Off Line
Main HDLC 01 Backup HDLC 01	Status of communications on the A channel of the module Fieldbus
Main HDLC 02 Backup HDLC 02	Status of communications on the B channel of the module Fieldbus
Main Interlink Backup Interlink	Status of communications on the A cable of the Ethernet Fieldbus connection with the control station
Main Ethernet Backup Ethernet	Status of communications on the B cable of the Ethernet Fieldbus connection with the control station

Connected FBMs

To display a list of the FBMs attached to the FCM:

1. Select the FCM in the Navigation pane and click the **Connections** tab in the Information pane.

Connections lists the attached FBMs by name, type, status, run mode, and failure mode (Figure 7-4).

Name	Type	Status	Run Mode/Comm...	Device/Failed State
✗ InRB FCM521	FBM 240	Failed	On Line	Comm Failure
✗ InRB FCM507	FBM 213	Failed	On Line	Comm Failure
✗ InRB FCM505	FBM 208	Failed	On Line	Comm Failure
✗ InRB FCM504	FBM 204	Failed	On Line	Comm Failure
✗ InRB FCM503	FBM 201	Failed	On Line	Comm Failure
✗ InRB FCM516	FBM 232	Failed	On Line	Failed
✗ InRB FCM515	FBM 230	Failed	On Line	Failed
✗ InRB FCM514	FBM 228	Failed	On Line	Failed
✗ InRB FCM513	FBM 224	Failed	On Line	Failed
✗ InRB FCM576	FBM 222	Failed	On Line	Failed
✗ InRB FCM517	FBM 217	Failed	On Line	Failed
?	FCM523	Off Line	Main Off Line / B...	Not Applicable
?	FCM52C	Off Line	Main Off Line / B...	Not Applicable
✗ InRB	FCM51A	Failed	Main Failed / Ba...	Not Applicable

Figure 7-4. Connections Tab for an FCM

2. Click any column header to sort the rows on the values in that column; click the column header a second time to reverse the sort order.
3. Drag a column header to the right or left to change the column order.
4. Double-click an FBM name or right-click the name and choose **Navigate to <FBM name>** to go to the selected module (Navigate to FCM517 in Figure 7-4).

The FBM is selected in the Navigation pane and its information is displayed in the Information pane. If there are devices connected to the FBM, the Connections tab is shown in the Information pane; otherwise, the General tab is displayed.

Equipment Change Actions

For commands available from the FCM's context menu or from the **Actions > Equipment Change** submenu pulled down from the main menu when either FCM100 or FCM10 is selected, refer Table 2-14 and Table 2-15.

Managing Alarms

Acknowledge

There are multiple ways to acknowledge system alarms associated with an FCM:

- Use the Alarms tab in the Accessories pane to identify and acknowledge individual alarms (see “Alarms Tab” on page 58).
- Right-click the FCM in the Navigation pane and choose **Acknowledge Device** from the context menu to acknowledge device alarms for the selected FCM.
- Acknowledge all alarms in the FCM’s system monitor domain by selecting the system monitor in the Navigation pane and doing one of the following:
 - Choose **Actions > Acknowledge Smon Domain** from the main menu.
 - Click  in the toolbar.
 - Right-click the system monitor and choose **Acknowledge Smon Domain** from the context menu.

Inhibit Alarms

You can inhibit all device alarms for the FCM so that no alarm conditions are reported to the system monitor.

To inhibit FCM device alarms, do one of the following:

- Right-click the FCM in the Navigation pane and choose **Inhibit Alarming** from the context menu.
- Select the FCM in the Accessories pane **Alarms** tab and click  in the tab toolbar.

The FCM icon is marked with the  symbol to indicate that alarms are being inhibited.

To re-enable alarms:

- Right-click the FCM in the Navigation pane and choose the **Enable Device Alarming** from the context menu.

Cable Alarms

To inhibit cable alarms:

- Right-click the FCM and choose **Inhibit PIO Bus Cable A Alarms** or **Inhibit PIO Bus Cable B Alarms** from the context menu.

A symbol (**InA**, **In B** or **InAB**) attached to lower right corner of each FBM icon indicates which cables have alarms inhibited.

To re-enable cable alarms:

- Right-click the FCM in the Navigation pane and choose the appropriate command from the context menu:

Enable PIO Bus Cable A Alarms

Enable PIO Bus Cable B Alarms

Changing Run Mode

The context menu for an FCM includes the Go On-Line command when a non-redundant FCM is off line, or one or both modules in a redundant pair are off line. Likewise, the menu includes the Go Off-Line command when a non-redundant FCM is on line, or at least one module in a redundant pair is on line.

Note When you take a non-redundant module or both modules in a redundant pair off line, the control station cannot communicate with the attached FBMs.

To change a module's run mode:

- Right-click the FCM in the Navigation pane and choose **Go On-Line** or **Go Off-Line** from the context menu.

A dialog box displays the current run mode of each module and prompts you to select which module is to go on line or off line (Figure 7-5). Note that **Main** is the module located in the first baseplate position, and not necessarily the Master (or controlling) module.

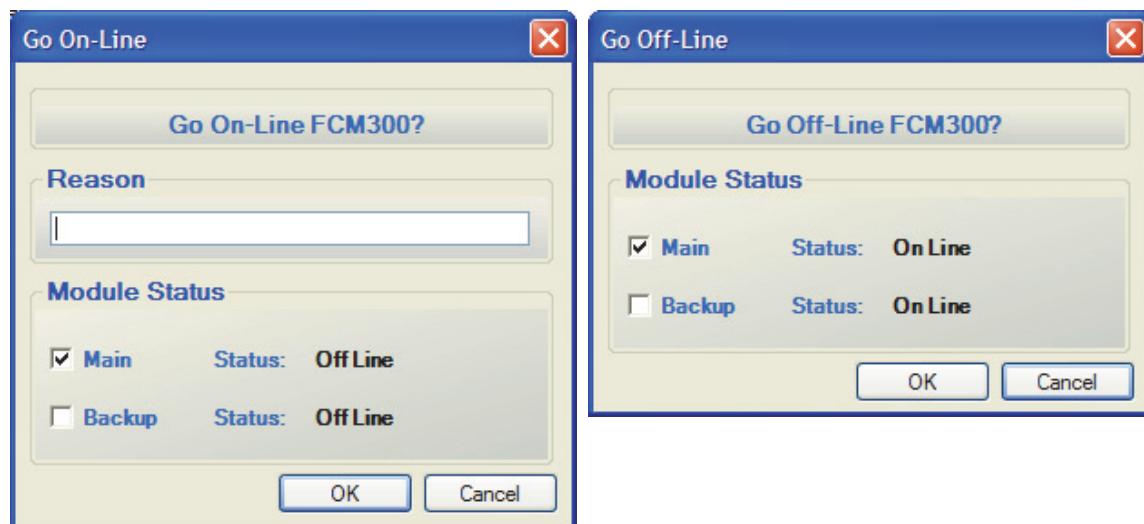


Figure 7-5. Go On-Line and Go Off-Line Dialog Boxes

2. For redundant modules, click the check box for **Main**, **Backup** or both.

The second module in a redundant pair to be brought on line automatically assumes the Tracker role.

If you take one module off line, the other assumes the Master role if it is not already in control. If you take both modules off line, all the attached FBMs also go off line.

For non-redundant FCMs, click the check box for **Main**.

3. Enter a reason for the action if the Reason field is displayed in the dialog box.

This action setting is configured in the Configuration dialog (refer to “Options Menu” on page 71).

4. Click **OK** to complete the command.

Downloading

Downloading takes the FCM off line, copies the module’s configuration database from the ZCP270, and brings the module back on line.

When you download to a non-redundant FCM, the attached FBMs are off-line while the FCM is off-line. For redundant FCMs, you can download to either or both modules in one command.

To download to an FCM:

1. Right-click the FCM in the Navigation pane and choose **Download** from the context menu.

A dialog box displays the current run mode of each module and prompts you to select which module is to be updated (Figure 7-6). Note that **Main** is the module located in the first baseplate position, and not necessarily the Master (or controlling) module.

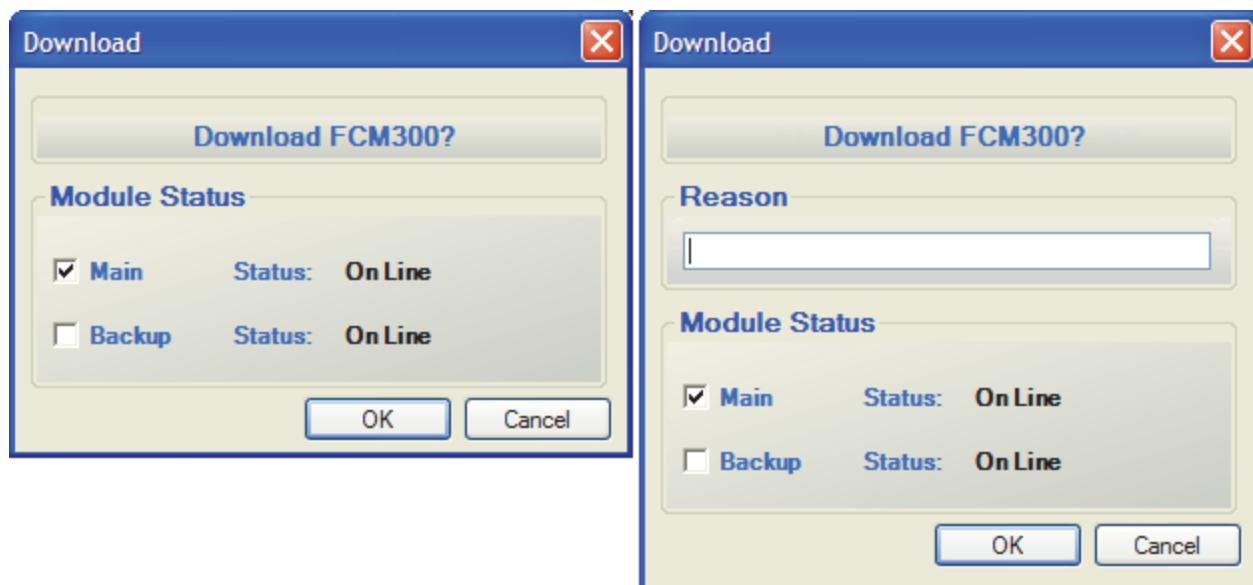


Figure 7-6. FCM Download Dialog Boxes

2. For redundant modules, click the check box for **Main**, **Backup** or both. If you download one module, the other assumes the Master role if it is on-line and not already in control.
For non-redundant FCMs, click the check box for **Main**.
3. Enter a reason for the action if the Reason field is displayed in the dialog box.
This action setting is configured in the Configuration dialog (refer to “Options Menu” on page 71).
4. Click **OK** to complete the command.

EEPROM Updates

An **EEPROM Update** takes the FCM off line, loads the module’s operating system software to the FCM’s flash memory and restarts the module. During an EEPROM update of a non-redundant FCM, the attached FBMs are off-line, but are automatically returned to their prior status when the FCM is restarted. For a redundant pair, you can only update one module at a time.

To update an FCM operating system image:

1. Right-click the FCM in the Navigation pane and choose **EEPROM Update** from the context menu.

A dialog box displays the current run mode of each module and prompts you to select which module is to be updated (Figure 7-7). Note that **Main** is the module in the first baseplate position, and not necessarily the Master (or controlling) module.

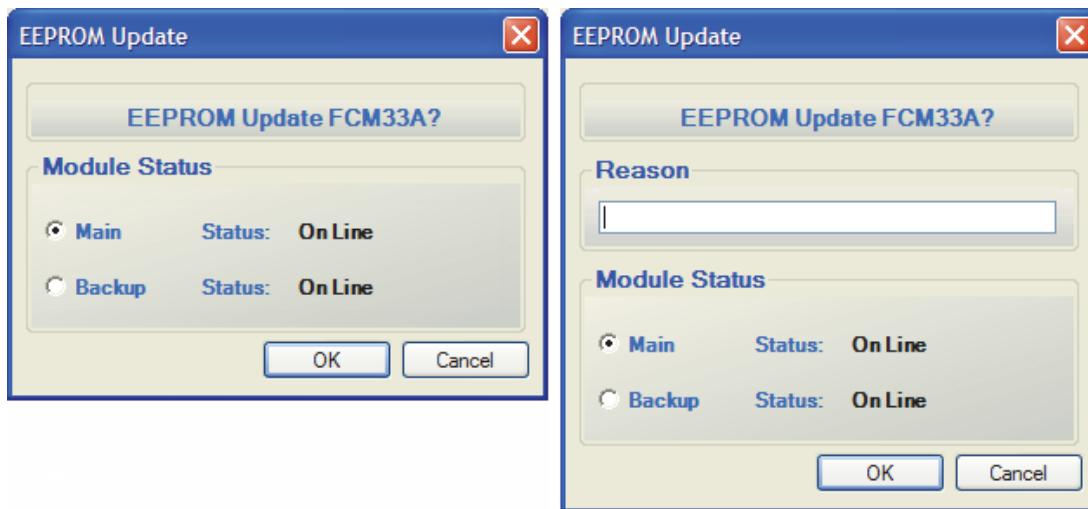


Figure 7-7. FCM EEPROM Update Dialog Boxes

2. For redundant modules, click the check box for **Main** or **Backup**. If both modules are on-line, the module selected for the update goes off-line and the other assumes the Master role if it is not already in control.
For a non-redundant FCM, click the check box for **Main**.

3. Enter a reason for the action if the Reason field is displayed in the dialog box.

This action setting is configured in the Configuration dialog, as described in “Options Menu” on page 71.

4. Click **OK** to complete the command.

Switching Roles

In a redundant FCM pair, one module assumes control of the module Fieldbus (the Master role) and the other module operates in the Tracker role, ready to take over if the other module fails. The current role of each module is displayed in the Redundant State A and Redundant State B fields in the General tab Equipment Information table (Figure 7-3).

To force the modules in a redundant pair to switch roles:

1. Right-click the FCM in the Navigation pane and choose **Switch Roles** from the context menu.

The Switch Roles dialog box displays the current run mode of each module and prompts you to confirm the action (Figure 7-8). Note that **Main** is the module in the first baseplate position, and not necessarily the Master (or controlling) module.

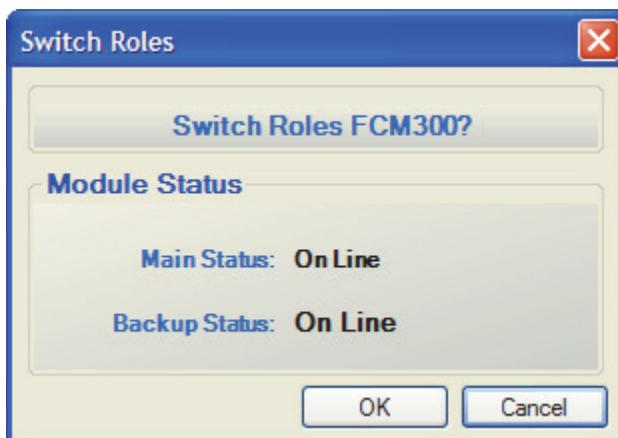


Figure 7-8. Confirmation Dialog Box for Switching FCM Roles

- If both modules are not on line, click **Cancel**, use the **Go On Line** command to change the run mode of the modules, and select the **Switch Roles** command a second time.
2. Click **OK** in the Switch Roles dialog box to complete the switch.

Module Fieldbus Switching Actions

FCMs communicate with the attached FBMs over the redundant module Fieldbus. You can specify that the FCM use channel A or channel B, or set the module to automatically switch to the better of the two channels.

When auto-switching is specified, the FCM records the number of FBM access failures per channel and determines whether switching should occur:

- If the current module Fieldbus has failures and the other bus has fewer failures, the station automatically switches to the better bus.
- If the channels have an equal number of FBM access failures, the FCM continues transmission over the existing bus.

When the operator selects Bus A Only or Bus B Only, the FCM attempts to transmit over the selected channel regardless of the number failures on that channel.

- Right-click the FCM in the Navigation pane and choose the switching option:

Select Bus A

Select Bus B

Bus Auto Select

C H A P T E R 8

Fieldbus Modules

This chapter describes how to use System Manager software to monitor and control Fieldbus Modules (FBMs) and their attached field devices.

The information in this chapter applies to the 200 Series (DIN rail mounted) FBMs listed in Table 8-1 and the 100 Series FBMs listed in Table 8-2. For a list of equivalent migration FBMs and Fieldbus Cluster I/O modules, refer to Appendix A, “Supported Migration and Fieldbus Cluster I/O Modules”.

Table 8-1. Supported 200 Series FBMs

FBM	Description
FBM201	8-Channel 0 to 20 mA Input, Channel Isolated (8 AI)
FBM201b	8-Channel 0 to 100 mV dc Input, Channel Isolated (8 AI)
FBM201c	8-Channel 0 to 5 V dc Input, Channel Isolated (8 AI)
FBM201d	8-Channel 0 to 10 V dc Input, Channel Isolated (8 AI)
FBM201e	8-Channel 0 to 20 mA Input, Channel Isolated (8 AI)
FBM202	8-Channel Thermocouple/Millivolt Input, Channel Isolated (8 AI)
FBM203	8-Channel RTD Input (platinum or nickel), Channel Isolated, 0 to 320 ohm (8 AI)
FBM203b	8-Channel RTD Input (platinum or nickel), Channel Isolated, 0 to 640 ohm (8 AI)
FBM203c	8-Channel RTD Input (copper), Channel Isolated, 0 to 30 ohm (8 AI)
FBM203d	8-Channel 4-wire RTD Input (Pt, Ni, Cu), Channel Isolated, 0 to 320 ohm (8 AI, FBM3 replacement)
FBM204	8-Channel 0 to 20 mA I/O (4 Input, 4 Output), Channel Isolated (can have redundant outputs)
FBM205	Redundant 0 to 20 mA Input/Output (4 Input and 4 Output), Channel Isolated (4 AI/4 AO)
FBM206	8-Channel Pulse Input, Channel Isolated (8 PI)
FBM206b	4-Channel Pulse Input, 4-Channel 0 to 20 mA Output (non-HART), Channel Isolated (FBM06 replacement)
FBM207	Redundant Ready 6-Channel Voltage Monitoring, Channel Isolated (16 DI)

Table 8-1. Supported 200 Series FBMs (Continued)

FBM	Description
FBM207b	Redundant Ready 16-Channel 24 V dc Contact Sense, Channel Isolated
FBM207c	Redundant Ready 16-Channel 48 V dc Contact Sense, Channel Isolated
FBM208	Redundant with Readback, 0 to 20 mA Input/Output (4 Input and 4 Output), Channel Isolated (4AI/4AO)
FBM208b	Redundant with Readback, 0 to 20 mA Input/Output (4 Input and 4 Output), Channel Isolated (FBM05 Replacement)
FBM211	16-Channel Differential Analog Input, 0 to 20 mA, Differential Isolated (16 AI)
FBM212	14-Channel Differential Analog Input, Thermocouple, Differential Isolated (14 AI)
FBM213	RTD (Platinum and Nickel) (8 AI)
FBM214	8-Channel 0 to 20 mA, HART® Input
FBM214b	8-Channel 0 to 20 mA, HART® Input (FBM01 replacement with HART capability)
FBM215	8-Channel 0 to 20 mA, HART Output
FBM216	Redundant 8-Channel 0 to 20 mA, HART Input
FBM216b	Redundant 8-Channel 0 to 20 mA, HART Input
FBM217	Redundant Ready 32-Channel Discrete Input, Group Isolated (32 DI)
FBM218	Redundant 8-Channel 0 to 20 mA, HART Output
FBM219	24-Channel Voltage Monitor, Plus 8-Channel Discrete Output, External Source, Group Isolated
FBM220	1-Channel Interface to H1 FOUNDATION fieldbus (one segment)
FBM221	4-Channel Interface to H1 FOUNDATION fieldbus (four segments)
FBM222	Redundant Ready 2-Channel Interface to Redundant PROFIBUS-DP™
FBM223	2-Channel Interface to PROFIBUS-DP™
FBM224	4-Port RS-232, RS-422 and/or RS-485 Interface to Modbus® Devices
FBM227	4-Channel 0 to 10 V dc Input, 2-Channel 0 to 10 V dc Output 4-Channel Discrete Input, 4-Channel Discrete Output; Discrete channels are isolated in channel pairs (FBM17 replacement with MDACT and DPIDA control)
FBM228	Redundant Ready 4-Channel Interface to H1 FOUNDATION fieldbus
FBM229	1-Channel Interface to up to 64 DeviceNet devices

Table 8-1. Supported 200 Series FBMs (Continued)

FBM	Description
FBM230	RS-232, RS-422, and/or RS-485 Field Device System Integrator (FDSI) Interface
FBM231	Redundant RS-232, RS-422, and/or RS-48 Field Device System Integrator (FDSI) Interface
FBM232	Ethernet Field Device System Integrator (FDSI) Interface
FBM233	Redundant Field Device System Integrator (FDSI) Interface
FBM237	Redundant Ready 8-Channel 0 to 20 mA Output, Redundant, Channel Isolated (8 AO)
FBM238	24-Channel Voltage Monitor, Plus 8-Channel Discrete Output, External Source, Group Isolated (FBM9/14, 10/15, 11/16, 26/27, 41/42 replacements)
FBM239	16-Channel Voltage Monitor, Plus 16-Channel Discrete Output, External Source, Group Isolated (FBM9/14, 10/15, 11/16, 26/27, 41/42 replacements)
FBM240	Redundant Ready 8-Channel Externally Sourced Discrete Output with Readback, Channel Isolated (8 DO)
FBM241	8-Channel Voltage Monitor, Plus 8-Channel Discrete Output, External Source, Channel Isolated (8 DI/8 DO)
FBM241b	8-Channel Voltage Monitor, Plus 8-Channel Discrete Output, Internal Source, Channel Isolated
FBM241c	8-Channel Contact Sense, Plus 8-Channel Discrete Output, External Source, Channel Isolated
FBM241d	8-Channel Contact Sense, Plus 8-Channel Discrete Output, Internal Source, Channel Isolated
FBM242	16-Channel Externally Sourced Discrete Output, Channel Isolated (8 DO)
FBM243	8-Channel Bi-directional FoxCom™ Dual Baud Rate Intelligent Device Interface Communication
FBM243b	4-Channel Bi-directional FoxCom™ Dual Baud Rate Intelligent Device Interface Communication, Plus 4-Channel 0 to 20 mA, Output (FBM39 and FBM44 replacement)
FBM244	4-Channel 0 to 20 mA Input and 4-Channel 0 to 20 mA Output (with HART® Support on All Channels) (FBM04 replacement)

Table 8-1. Supported 200 Series FBMs (Continued)

FBM	Description
FBM245	Redundant 4-Channel 0 to 20 mA Input and 4-Channel 0 to 20 mA Output (with HART® Support on All Channels) (FBM05 replacement)
FBM246	Redundant, 8-Channel Bi-directional FoxCom Dual Baud Rate Intelligent Device Interface Communication
FBM246b	Redundant, 4-Channel Bi-directional FoxCom Dual Baud Rate Intelligent Device Interface Communication, Plus 4-Channel 0 to 20 mA, Output (FBM46 replacement)
FBM247	8-Channel Current/Voltage Analog/Digital/Pulse I/O Configurable Channel Interface Module (with HART® Support on All Channels) - Includes support for additional communication types

Table 8-2. Supported 100 Series FBMs

FBM	Description
FBM01	0 to 20 mA Input (8 AI)
FBM02	Thermocouple/mV Input (8 AI)
FBM03	RTD Input (8 AI)
FBM04	0 to 20 mA Input/Output (4 AI/4 AO)
FBM05	0 to 20 mA Input/Output Interface (4 AI/4 AO) (Redundant I/O)
FBM06	Pulse Input, 0 to 20 mA Output (4 PI/4 AO) (can be redundant)
FBM07	Contact/dc Input (16 DI)
FBM08	120 V ac Input (16 DI)
FBM09	Contact/dc Input/Output (8 DI/8 DO)
FBM10	120 V ac Input/Output (8 DI/8 DO)
FBM11	240 V ac Input/Output (8 DI/8 DO)
FBM12	Contact/dc Input Expander
FBM13	120 V ac Input Expander
FBM14	Contact/dc Input/Output Expander
FBM15	120 V ac Input/Output Expander
FBM16	240 V ac Input/Output Expander
FBM17	0 to 10 V dc, Contact/dc Input/Output (4 AI/2 AO and 4 DI/4 DO)
FBM18	Intelligent Field Device (8 Inputs)
FBM20	240 V ac Input (16 DI)
FBM21	240 V ac Input Expander
FBM22	Single 0 to 20 mA Input/Output with Auto/Manual (1 AI/1 AO)

Table 8-2. Supported 100 Series FBMs (Continued)

FBM	Description
FBM23 (HIU)	HTG Interface Unit
FBM24	Contact/125 V dc Input Interface (16 DI)
FBM25	Contact/125 V dc Input Interface
FBM26	Contact/125 V dc Input/Output (8 DI/8 DO)
FBM27	Contact/125 V dc Input/Output Expander
FBM33	RTD Input (Copper) (8 AI)
FBM36	Type R Thermocouple/mV Input (8 AI)
FBM37	0 to 20 mA Output (8 AO)
FBM38	Mass Flow Transmitter
FBM39	Intelligent Field Device Input and 0 to 20 mA Output (4 Inputs/4 AO) (can be redundant)
FBM41	Contact 24 V dc Input/0 to 60 V dc Output (8 DI/8 DO)
FBM42	Contact 24 V dc Input/0 to 60 V dc Output Expander
FBM43	Intelligent Field Device Dual Baud Rate Intelligent Interface (8 Inputs)
FBM44	Intelligent Field Device Dual Baud Rate Intelligent Transmitter Interface/0 to 20 mA Output (4 Inputs/4 AO) (can have redundant outputs)
FBM46	Redundant Dual Baud Rate Interface to Intelligent Transmitters and Redundant 0 to 20 mA Outputs (4 Inputs/4 AO)
PDISP	Panel-Mounted Display

Supported Device Groups

The following table lists all the device groups that are supported.

Device Group	Devices supported	Equipment information reference
Foreign Device Group	Foreign Device RS232	Refer to “Equipment Information for Device Integrator Peripherals” on page 309
INI X.25 Port group	INI X.25 Port ECB	Refer to “INI10, INI15 or SPECTRUM Interface Processor Peripheral Equipment Information Fields” on page 311
SIP group	Spectrum Interface Proc ECB	Refer to “SIP ECB Equipment Information Displays” on page 313
IS30 GIT device group	IS30 GIT device	Refer to “INTERSPEC Integrator Translator Equipment Information” on page 314.

Device Group	Devices supported	Equipment information reference
Allen Bradley ECBs group	AB Port AB PLC AB Scan	Refer to “Equipment Information View for the Allen- Bradley Port (ECB 63, ECB 64, and ECB 65)” on page 317
Allen Bradley PLC device group	Allen Bradley 540 PLC type Allen Bradley 560 PLC type Allen Bradley 511 PLC type Allen Bradley 520 PLC type Allen Bradley 530 PLC type Allen Bradley 530 PLC type	Refer to “Equipment Information for the A-B Station PLC5 Series” on page 319
Allen Bradley rack device group	Allen Bradley Rack type	Refer to “Equipment Information for the A-B Station Rack” on page 321
ModBus ECBs group	MG Port MG PLC MG Scan	Refer to “Equipment Information Display for Modicon Port ECB (ECB60, ECB61, and ECB62)” on page 323
AB primary port OMC	FC Primary ECB for AB	Refer to “Micro-I/A AB-PIO Peripherals Equipment Information” on page 325
GE primary port OMC	FC Primary ECB for GE	Refer to “Micro-I/A GE-PIO Peripherals Equipment Information” on page 326
AB Remote Adapter for OMC	FC AB RIO Adaptor	Refer to “Equipment Information Display for an AB-RIO Adapter” on page 328
AB and GE I/O Modules	FC GE 8 DO #GEDC/GE120AO FC GE 16 DO #GE24DO FC GE 8 AI #GE20 FC GE 16 DI #GE24/48/120 DI FC GE 4 AO #GE04 FC AB 8 AI #1794-IE8 FC AB 8 DI #1794-IB8S/IA8 FC AB 16 DI #1794-IB16 FC AB 4 AO #1794-OE4 FC AB 4AI/2AO #1794-IE4OE2 FC AB 16 DO #1794-OB16 FC AB 8 DO #1794-OA8/OW8 FC AB T/C #1794-IT8 FC AB RTD #1794-IR8	Refer to “Equipment Information Display for a GE I/O Device and A-B I/O Device” on page 329
SCADA (port device)	Port (Bristol-Babcock)	Refer to “Equipment Information Display for ECB96 Port” on page 331
SCADA (device)	RTU (Bristol-Babcock)	Refer to “Equipment Information Display for ECB97 RTU” on page 335

Device Group	Devices supported	Equipment information reference
ACM (Main Processor) device	TRICON™ Monitor	Refer to “FoxGuard Manager Equipment Information” on page 339
ACM (I/O Cards)	TRICON 32 DI TRICON 64 DI TRICON 8 PI TRICON 16 DO TRICON 8 DO TRICON 32 DO TRICON 32 AI TRICON 16 AI TRICON 64 AI TRICON 32 TC TRICON 16 TC TRICON 8 AO	Refer to “I/O Module Equipment Information Display” on page 342
DI-WIN-NT Character Port group, DI-WIN-NT Message Port group, and DI-WIN-NT Device group	Port for Character Protocols Port for Msg protocols Generic Device	Refer to “Equipment Information Display for ECB98, ECB99, and ECB100” on page 344
FOX2068 Port group	Fox2068 Port	Refer to “ECB80 Equipment Information” on page 347
FOX2068 RTU group	Fox2068 RTU	Refer to “ECB81 Equipment Information” on page 348
Profibus Gate group	Profibus Gate	Refer to “Equipment Information Display for PROFIBUS-DP Gate and Devices” on page 349
Profibus Device group	Profibus Device	Refer to “Equipment Information Display for PROFIBUS-DP Devices” on page 350
PLC5 Gate Group	PLC5 Gate	Refer to “Equipment Information Displays for AB-PLC5/E Gate Devices” on page 351
PLC5 Device Group	PLC5 Device	Refer to “Equipment Information Displays for the AB-PLC5/E Device” on page 352
Modbus Gate Group	Modbus Gate	Refer to “Equipment Information Displays for the Modbus Gate and Modbus Devices” on page 353
Modbus Device Group	Modbus Device	Refer to “Equipment Information Displays for the Modbus Device” on page 354

Contents

- Identification of FBMs and Attached Devices

- FBM Status and Equipment Information
- FBM246 Status and Equipment Information
- DCI Based FBMs
- Migration FBMs
- Connections Tab
- Counters Tab
- Equipment Change Actions
- Device Displays and Actions

Identification of FBMs and Attached Devices

FBMs are depicted in the Navigation pane by the  icon attached either to the Primary ECB (Primary FBM, or ECBP) of a control station or to an FCM. The same icon is used for both redundant and non-redundant FBMs.

Certain FBMs can be expanded in the Navigation pane to show a second level of the attached intelligent field devices, represented by the  icon. These FBMs include the FBM246 FoxCom dual-baud rate intelligent device interface and the Distributed Communication Interface (DCI) modules that support various fieldbus standards such as HART®, PROFIBUS-DPT™, and FOUNDATION™ fieldbus. The second-level items can be selected to view device status and equipment information, and to perform equipment change actions.

Note 100 Series upgrade FBMs are treated as if they were 200 Series FBMs.

Note The System Manager does not distinguish between standard or Compact 200 Series FBMs.

For example, the selected FBM in Figure 8-1 (FBM232) is an FDSI module with four devices attached. Each of the devices can be selected to display device status and equipment information in the Information pane and to perform equipment change actions.

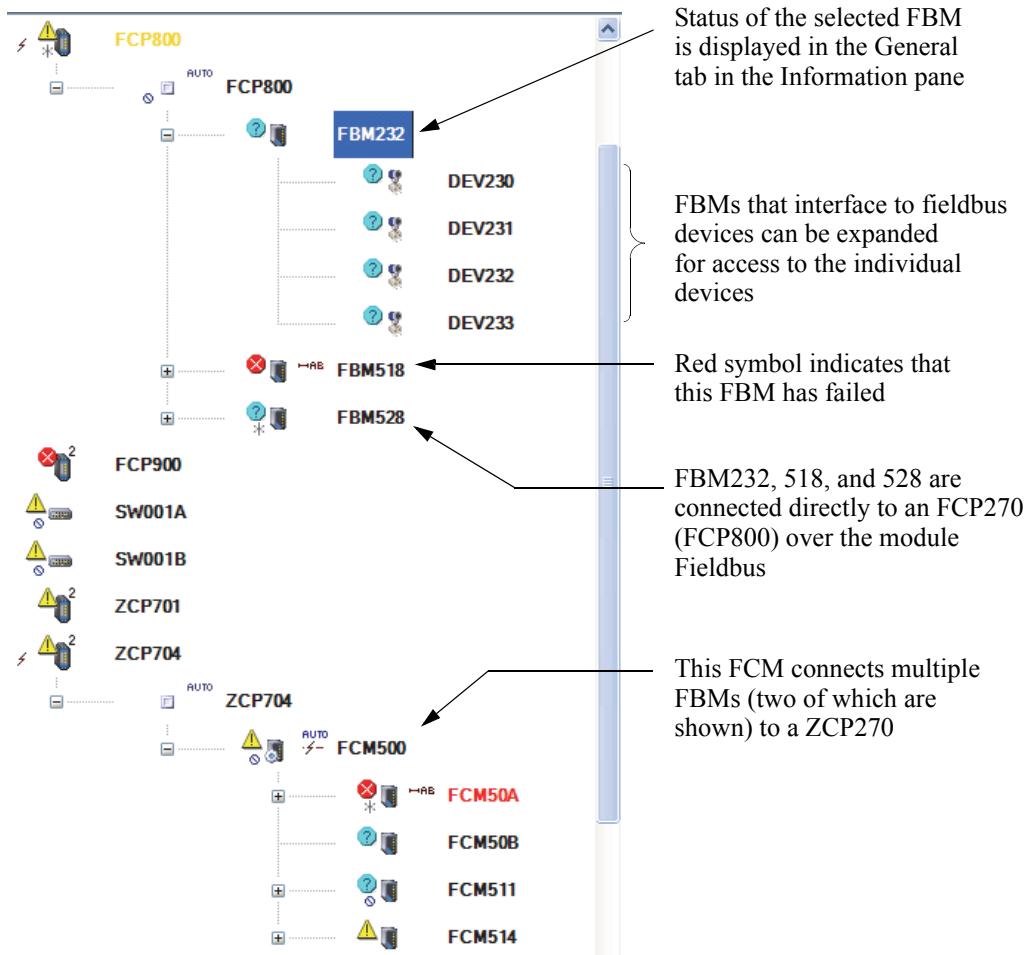
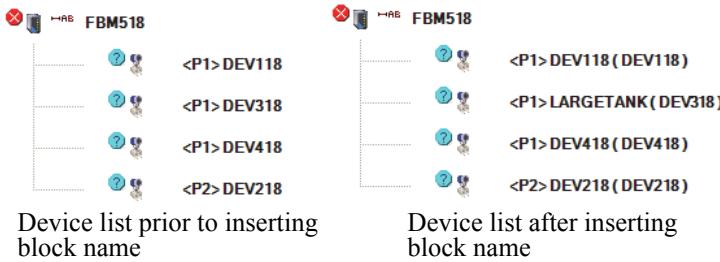


Figure 8-1. FBM_s and Attached Devices in the Navigation Pane

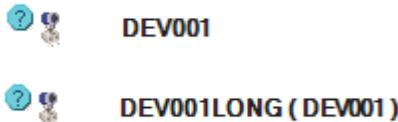
FOUNDATION fieldbus FBM228 device names are prefixed with <P1>, <P2>, <P3> or <P4> to identify the H1 segment on which the device is operating. The first time an FBM228 device is shown in a System Manager session, the device is identified by its segment and six-character DEV_ID. When you click on the device, System Manager retrieves complete status and equipment information for the device and changes the display so that the device is identified by its segment, block name, and DEV_ID for the remainder of the System Manager session.



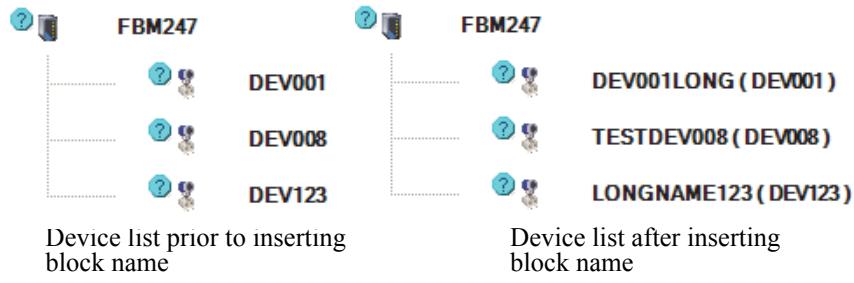
Note Depending on the block name and the DEV_ID of the device, FBM228 devices may appear out-of-order on the Navigation pane as shown below:



The devices connected to the HART FBMs (FBM214/214b/215/216/216b/218/244/245) and the HART-capable FBM247 support a similar feature. While their device names are **not** prefixed with a <Px> identifier, the first time a HART device or device connected to the HART-capable FBM247 is shown in a System Manager session, the device is identified by its six-character DEV_ID. When you click on the device, System Manager retrieves complete status and equipment information for the device and changes the display so that the device is identified by its block name, and DEV_ID for the remainder of the System Manager session.



Note Depending on the block name and the DEV_ID of the device, HART FBM and HART-capable FBM247 devices may appear out-of-order on the Navigation pane as shown below:



Status Indicators

A symbol attached to the upper left corner of the FBM or device icon indicates an adverse condition with the equipment. The status of alarms associated with the FBM and attached devices is indicated by symbols on the lower left side of the equipment icon.

- Choose **Help > Legend** from the main menu to identify the equipment health and alarm status symbols, or refer to “Status Indicators” on page 47.

Labels attached to the right side of the FBM (for example, FCM50A in Figure 8-1) indicate the state of communications between the FBM and the control station or FCM:

Symbol	Condition
	A red label to the right of the FBM indicates a problem with communications between the FBM and the control station or FCM in one or both of the module Fieldbus channels.
	A label attached to the bottom right corner of the FBM icon indicates whether cable alarms are inhibited for channel A, channel B, or both A and B. Cable alarms can be inhibited and enabled for an individual FBM using the FBM's context menu in the Navigation pane, as described in “Managing Cable Alarms” on page 266. Cable alarms can be inhibited for all FBMs on a module Fieldbus with an FCM equipment change action (“Cable Alarms” on page 235) or a Primary ECB equipment change action (“Managing Alarms” on page 207).

FBM Status and Equipment Information

When an FBM is selected in the Navigation pane, the General tab in the Information pane displays status and equipment information for the FBM in two tables. The tab can also include indicators of I/O quality. Figure 8-2 is the Information tab for an FBM206.

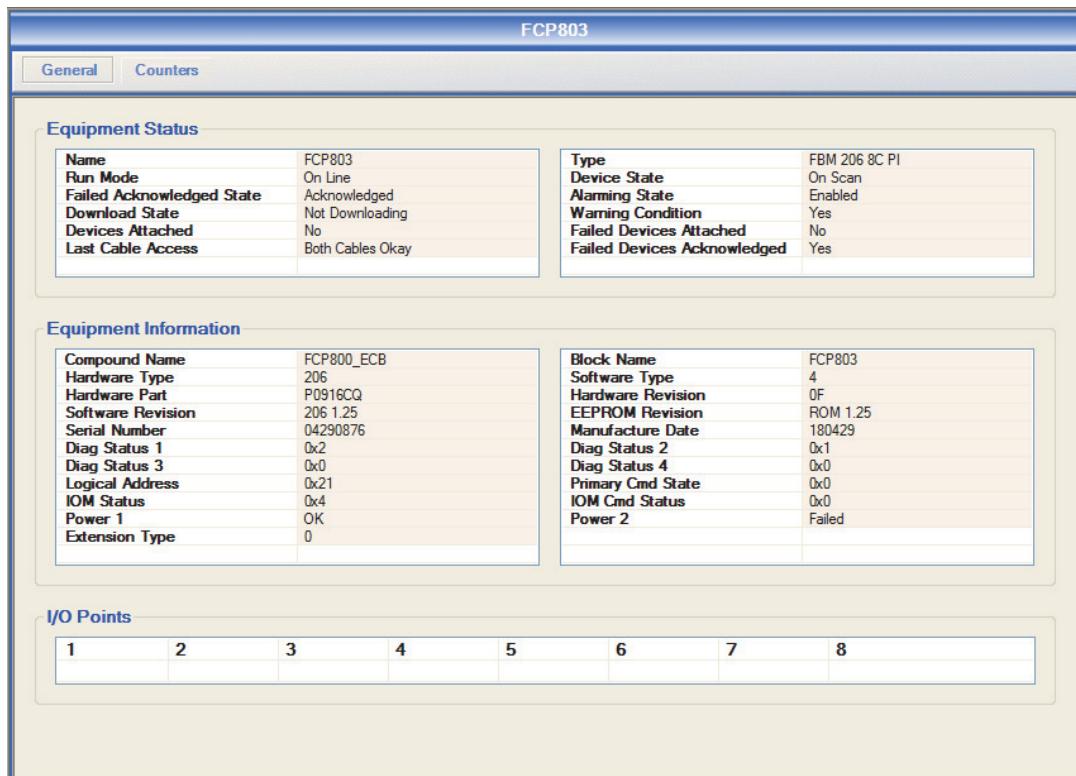


Figure 8-2. Status and Configuration Information for an FBM206

The first two fields in the Equipment Status table identify the FBM by name and type. The remainder of the fields in this group provide status information and are updated dynamically. The fields in the Equipment Information group are updated periodically.

The I/O Points group at the bottom of the tab shows the quality of the data from each point handled by the FBM. This display is available only if the bad I/O bit is set in BADALM parameter (**BADALM: 1**) of the control station's Primary ECB (that is, the ECBP or Primary ECB in the station's ECB compound). This requirement does not apply to the DCI-based FBMs.

The fields displayed in the General tab vary with the type of FBM. For example, the displays for redundant FBMs have additional fields that apply to the Main and Backup modules.

The FBM206 information in Figure 8-2 is an example of the format used for the following non-DCI FBMs:

FBM	Description
100 Series FBMs	
FBM01	0 to 20 mA Input (8 AI)
FBM02	Thermocouple/mV Input (8 AI)
FBM03	RTD Input (8 AI)
FBM04	0 to 20 mA Input/Output (4 AI/4 AO)

FBM	Description
FBM05	0 to 20 mA Input/Output Interface (4 AI/4 AO) (Redundant I/O)
FBM06	Pulse Input, 0 to 20 mA Output (4 PI/4 AO) (can be redundant)
FBM07	Contact/dc Input (16 DI)
FBM08	120 V ac Input (16 DI)
FBM09	Contact/dc Input/Output (8 DI/8 DO)
FBM10	120 V ac Input/Output (8 DI/8 DO)
FBM11	240 V ac Input/Output (8 DI/8 DO)
FBM12	Contact/dc Input Expander
FBM13	120 V ac Input Expander
FBM14	Contact/dc Input/Output Expander
FBM15	120 V ac Input/Output Expander
FBM16	240 V ac Input/Output Expander
FBM17	0 to 10 V dc, Contact/dc Input/Output (4 AI/2 AO and 4 DI/4 DO)
FBM18	Intelligent Field Device (8 Inputs)
FBM20	240 V ac Input (16 DI)
FBM21	240 V ac Input Expander
FBM22	Single 0 to 20 mA Input/Output with Auto/Manual (1 AI/1 AO)
FBM23 (HIU)	HTG Interface Unit
FBM24	Contact/125 V dc Input Interface (16 DI)
FBM25	Contact/125 V dc Input Interface
FBM26	Contact/125 V dc Input/Output (8 DI/8 DO)
FBM27	Contact/125 V dc Input/Output Expander
FBM33	RTD Input (Copper) (8 AI)
FBM36	Type R Thermocouple/mV Input (8 AI)
FBM37	0 to 20 mA Output (8 AO)
FBM38	Mass Flow Transmitter
FBM39	Intelligent Field Device Input and 0 to 20 mA Output (4 Inputs/4 AO) (can be redundant)
FBM41	Contact 24 V dc Input/0 to 60 V dc Output (8 DI/8 DO)
FBM42	Contact 24 V dc Input/0 to 60 V dc Output Expander
FBM43	Intelligent Field Device Dual Baud Rate Intelligent Interface (8 Inputs)
FBM44	Intelligent Field Device Dual Baud Rate Intelligent Transmitter Interface/0 to 20 mA Output (4 Inputs/4 AO) (can have redundant outputs)

FBM	Description
FBM46	Redundant Dual Baud Rate Interface to Intelligent Transmitters and Redundant 0 to 20 mA Outputs (4 Inputs/4 AO)
PDISP	Panel-Mounted Display
200 Series FBMs	
FBM201	0 to 20 mA Input (8 AI)
FBM202	Thermocouple/mV Input (8 AI)
FBM203	RTD Input (Platinum, Nickel and Copper) (8 AI)
FBM203d	8 - Channel RTD for 2 and 4-wire RTD [FBM3 replacement]
FBM204	0 to 20 mA Input/Output (4 AI/4 AO)
FBM205	0 to 20 mA Input/Output Interface (4 AI/4 AO)
FBM206	Pulse Input, 0 to 20 mA Output (8 PI)
FBM206b	4 Pulse In & 4 (4-20mA) Out (non-HART); [FBM06 replacement]
FBM207	Contact/dc Input (16 DI)
FBM208	0 to 20 mA (4AI/4AO)
FBM208b	Redundant with readback, 4 (0 to 20mA) IN, 4 (0 to 20mA) OUT with 50ohm sense [FBM05 replacement]
FBM211	0 to 20 mA (16 AI)
FBM212	Thermocouple/mV (14AI)
FBM213	RTD (Platinum and Nickel (8 AI)
FBM217	Contact (32DI)
FBM219	Switch (24 DI/8 DO)
FBM227	4 AI (0-10V), 2 AO (0-10V), 4 DI, 4 DO; [FBM17 replacement with MDACT and DPIDA control]
FBM229	One channel support for a network of up to 64 DeviceNet devices (including the FBM itself, the slave I/O modules and a third-party configuration workstation).
FBM238	24DI/8DO Mixed Expander; [FBM9/14, 10/15, 11/16, 26/27, 41/42 replacements]
FBM239	16DI/16DO Mixed Expander; [FBM9/14, 10/15, 11/16, 26/27, 41/42 replacements]
FBM240	120V ac/125 V dc Switch (8 DO)
FBM241	Contact 24 V dc Input/0 to 240 V ac Output (8 DI/8 DO)
FBM242	0 to 60 V dc Externally Sourced Output (8DO)
FBM243	FoxCom Dual Baud Rate, 8 channel, Intelligent Device Interface
FBM243b (ECB23)	4 FoxCom Dual Baud (4800 or 600 Baud) & 4 AO (4-20mA); [FBM39 and FBM44 replacement]

FBM	Description
FBM246b (ECB49)	4 Redundant FoxCom Dual Baud (4800 or 600 Baud) & 4 AO (4-20mA); [FBM46 replacement]
FBM247	<p>0 to 20 mA, non-HART or 4-20 mA, HART, over eight channels, each of which can be individually configured for a specific type of field I/O signal, and as either an input or output.</p> <p>Also supports:</p> <ul style="list-style-type: none"> • 0 to 10 V and 0 to 5 V analog input, non-HART • Digital dry contact sense 24 V dc • Discrete voltage monitor, configurable 0 and 1 thresholds 0-10 V • NAMUR sensor discrete input • Signal level according to DIN EN 50227 (NAMUR): <ul style="list-style-type: none"> • “On” at 2.1 mA dc with short circuit detection at > 6 mA • “Off” at 1.2 mA dc with open detection at <0.25 mA • Pulse count, frequency, acceleration and jerk, contact sense or voltage input • Discrete Output 24 V, 20 mA current or solid state switch output

The Equipment Status and Equipment Information tables for these FBMs are described below.

Formats used for other FBMs are covered in the following sections:

- “FBM246 Status and Equipment Information” on page 260
- “DCI Based FBMs” on page 261
- “Migration FBMs” on page 262
- For the DeviceNet FBM229, refer to the “FBM229 Equipment Information” section in *Implementing a DeviceNet Network on the Foxboro Evo Core Services* (B0750CH).
- For the HART-capable FBM247, refer to the “HART-Capable FBM247 Equipment Status and Information Display” section in *HART™ Communication Interface Modules User’s Guide* (B0400FF).

Equipment Status Table

Table 8-3. FBM Equipment Status Display Fields

Field	Description
Name	Letterbug assigned to the FBM
Type	Type is determined by the Primary ECB when checking the devices on its Fieldbus. Table 8-1 describes the available 200 Series FBMs and Table 8-2 describes the available 100 Series FBMs.
Run Mode	On Line or Off Line. You can set the Run Mode using the Go On-Line and Go Offline actions from the module's context menu. If station reporting is disabled, the last known FBM run mode appears in this field. If the field indicates an Off-line status: <ul style="list-style-type: none"> • Check the hardware. • Download to the module if necessary. • Check related fields such as Download State.
Device State	Failed or Not Failed
Failed Acknowledge State	Acknowledged or Not Acknowledged. If the Device State value changes from Not Failed to Failed, the value in this field changes to Not Acknowledged. Do the following if the field indicates a Not Acknowledged status: <ul style="list-style-type: none"> • Check the Alarms tab in the Accessories Pane for the type of failure. • Acknowledge system failures using the Alarms tab in the Accessories pane or right-click FBM in the Navigation pane and choose Acknowledge Device from the context menu.
Alarming State	Enabled or Inhibited. When device alarming is inhibited, the system monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the historian. To change the Alarming State: <ul style="list-style-type: none"> • Right-click the FBM icon in the Navigation pane and choose Inhibit Device Alarming or Enable Device Alarming from the context menu. Inhibiting alarms acknowledges any unacknowledged alarms.
Download State	Downloading if the FBM is downloading its application image; otherwise, Not Downloading
Warning Condition	Yes if the device has a non-fatal error condition or if an attached field device has failed; otherwise, No

Table 8-3. FBM Equipment Status Display Fields (Continued)

Field	Description
Devices Attached	Yes if the FBM has devices attached; otherwise, No
Failed Devices Attached	Yes if a device attached to the FBM has failed; otherwise, No
Last Cable Access	The status of both module Fieldbus channels is reported as: <ul style="list-style-type: none"> • Both Cables OK • A Okay / B Fail • A Fail / B Okay • A Fail / B Fail
Failed Devices Acknowledged	No if a failure of an attached device has yet to be acknowledged; otherwise, Yes . Refer to “Managing Device Alarms” on page 266.

Equipment Information Table

Table 8-4. FBM Equipment Information Display Fields

Field	Description
Compound Name	Name of the compound that holds the FBM’s equipment control block (ECB)
Block Name	ECB name of the FBM, typically but not necessarily the same as the FBM (letterbug) name
Hardware Type	Number associated with this FBM type
Software Type	Software type being used with the designated FBM hardware type. The FBM Software Type is not the ECB type. Software types for supported FBMs are given in Table 8-5.
Hardware Part	The hardware part number related to this FBM
Hardware Revision	The hardware release level of this FBM hardware type
Software Revision	Release level of this FBM’s software
EEPROM Revision	Firmware release for this FBM
Serial Number	Serial number assigned to this module
Manufacture Date	Date of manufacture for this module
Diag Status 1 through Diag Status 4	Hexadecimal values relating to the status of the FBM. If the module is operating properly, these values can be safely ignored. If there are hardware and software errors, these values will assist the Global CSC in resolving the problem.

Table 8-4. FBM Equipment Information Display Fields (Continued)

Field	Description
Logical Address	Logical Address is the number of the FBM based on the order in which the FBMs were “fixed” using the Integrated Control Configurator. If an FBM is deleted and another added later, the new FBM is given the lowest number available. For example, if 0x02 is deleted from the sequenced group of 0x01 , 0x02 , and 0x03 , the next FBM added results in the following sequence group: 0x01 , 0x03 , and 0x02 .
Primary Cmd State	A hexadecimal value associated with the return status included in the header of every response from the FBM to the Primary ECB: 0 = the command was understood and action was taken. 1 = the command was not understood. 2 = the command understood, but unable to take action. 4 = the argument was invalid.
IOM Status	Hexadecimal values relating to the status of the FBM. If the module is operating properly, these values can be safely ignored. If there are hardware and software errors, these values will assist the Customer Service Center in resolving the problem.
IOM Cmd Status	
Power 1	OK if power is applied to the primary module in a redundant FBM or to a non-redundant module; otherwise, Failed
Power 2	For a redundant FBM, OK if power is applied to the secondary module in the redundant pair; otherwise, Failed . For a non-redundant FBM, always Failed
Extension Type	Not used in this version of System Manager

Table 8-5. FBM Software Types^a

Type	100 Series FBMs (and Expander)	200 Series FBMs	Software Application
1	1, 2, 3, 36	201, 203, 211, 212, 213	All Analog Inputs
2	4, 5	204, 205, 206, 208	Analog Inputs and Outputs
4	6		Pulse Rates, Pulse Rate Inputs, and Analog Outputs
5	9 (14), 10 (15), 11 (16), 26 (27), 41 (42)	207, 217, 219, 238, 239, 240, 241, 242	Digital Inputs, Sustained/Momentary, Digital Outputs
6	7 (12), 8 (13), 20 (21), 24 (25)	207, 217	Sequence of Events Inputs
7	7 (12), 8 (13), 20 (21), 24 (25)	207, 217	DI and Pulse Count Inputs

Table 8-5. FBM Software Types^a (Continued)

Type	100 Series FBMs (and Expander)	200 Series FBMs	Software Application
8	9 (14), 10 (15), 11 (16), 26 (27), 41 (42)	207, 217, 218, 239, 238, 239, 241, 242	Ladder Logic or dc Output/Validated Input
9	17, 22	227	Analog Inputs and Analog Outputs, Digital Inputs and Digital Outputs (Remote/Manual station)
12	18	243	Intelligent Field Device Interface
13	23		Hydrostatic Tank Gauge Interface Unit.
22	38		Coriolis Mass Flowmeter
23	39	243b	Intelligent Device Interface with Analog Outputs
37	43		Intelligent Field Device Interface, Dual Baud Rate
38	44		Intelligent Device Interface, Dual Baud Rate, with Analog Outputs
49	98 (FBM46 only)	246b	Redundant Dual Baud Rate Intelligent Transmitter Interface and Redundant Analog Outputs
214, 215, 216, 218		214, 215, 216, 218	HART Communication Interface
53	37	237	All Analog Outputs
73		243, 246	FoxCom Dual Baud Rate Intelligent Device Interface
224		224	Modbus Communication Interface
128		FBM228 with 128 type (CIF) software (introduced with InFusion 2.0)	FOUNDATION fieldbus Interface with CIF
228		FBM228 with 228 type (non-CIF) software	FOUNDATION fieldbus Interface
230		230, 231	Field Device System Integrators
232		232, 233	Field Device System Integrators
227		227	0 to 10 V dc, Contact/dc I/O Interface Module with DPIDA and MDACT Support
229		229	1-Channel Interface to up to 64 DeviceNet devices (refer to <i>Implementing a DeviceNet Network on the Foxboro Evo Core Services</i> (B0750CH) for details.)
238		238	Digital I/O Mix Expander Module (24 DI/8 DO)

Table 8-5. FBM Software Types^a (Continued)

Type	100 Series FBMs (and Expander)	200 Series FBMs	Software Application
239		239	Digital I/O Mix Expander Module (16 DI/16 DO)
244		244	0 to 20 mA I/O Interface Module with HART Support
245		245	0 to 20 mA I/O Interface Module with HART Support (Redundant)
247		247	8 Current/Voltage Analog/Digital/Pulse I/O Configurable Channels

^a For a more comprehensive list, refer to the table “DIN Rail Mounted FBMs and Related ECBS” and the Appendix “DIN Rail Mounted FBM Control Schemes” in *Standard and Compact 200 Series Subsystem User’s Guide* (B0400FA).

FBM246 Status and Equipment Information

When you select a redundant FBM246, the tables in the General tab display status and equipment information for each module in the pair (Figure 8-3). In the tables, **Main** refers to the module with the lower baseplate position number, and **Backup** refers to the module installed to the right of the Main module and configured with the higher baseplate position number.

Equipment Status	
Main Module	FCM523
Main State	Main Off Line
Type	FBM 246
Failed Acknowledged State	Acknowledged
Failed Devices Acknowledged	No
Failed Devices Attached	Yes
Backup Module	FCM524
Backup State	Backup Off Line
Active Cable Access	Both Cables Okay
Warning Condition	No
Alarming State	Enabled

Equipment Information	
Tracker Cable Access	Both Cables Okay
Compound Name	ZCP706_ECB
Hardware Type	246
Software Revision	000000000000
Main Cmd Status	0x0
Main Logical Address	0x2E
Main Diag Status 1	0x0
Main Diag Status 2	0x0
Main Diag Status 3	0x0
Main Diag Status 4	0x0
Main Hardware Part Number	
Main Hardware Revision	00
Main EEPROM Revision	
Main Serial Number	
Main Manufacture Date	
Block Name	FCM523
Software Type	73
Cmd Status	0x0
Backup Logical Address	0x2F
Backup Diag Status 1	0x0
Backup Diag Status 2	0x0
Backup Diag Status 3	0x0
Backup Diag Status 4	0x0
Backup Hardware Part Number	
Backup Hardware Revision	
Backup EEPROM Revision	
Backup Serial Number	
Backup Manufacture Date	

Figure 8-3. Status and Equipment Information for an FBM246

DCI Based FBMs

Figure 8-4 is a General tab for an FBM233 Redundant Field Device System Integrator and provides an example of the way equipment status and equipment information are displayed for DCI-based FBMs.

When the FBM is a redundant pair, status and equipment information are separately reported for each module in the pair: **Main**, which is installed in the lower numbered baseplate position, and **Backup**, which is installed to the right of Main in the next higher numbered position. Each module can be assigned the Master or Tracker role. The General tab includes information about each module in the redundant pair, the ports connecting the field devices and connected equipment.

The General tab for DCI based FBMs often includes a third table with additional status information.

Equipment Status		
Name	FCM32A	Type
Main Slot Number	21	Backup Slot Number
Main State	Master	Backup State
Failed Acknowledged State	Acknowledged	Active Cable Access
Failed Devices Acknowledged	No	Alarming State
Failed Devices Attached	No	Warning Condition

Equipment Information		
Compound Name	ZCP703_ECB	Block Name
Hardware Type	233	Software Type
Power 1	OK	Power 2
Primary Cmd State	0x0	IOM Cmd Status
Main Logical Address	0x31	
FBM Diag Status 1	0x2	FBM Diag Status 2
FBM Diag Status 3	0x0	FBM Diag Status 4
Main Hardware Part Number	P0926GX	Backup Hardware Part Number
Main Hardware Revision	0C	Backup Hardware Revision
Main Software Revision	233 1.01	Backup Software Revision
Main EEPROM Revision	0097/0305	Backup EEPROM Revision
Main Serial Number	04410217	Backup Serial Number
Main Manufacture Date	180441	Backup Manufacture Date
API Version	108	Driver Type
Driver Version	1.09 / 5110 CRC 726E3107	File ID
Main Port 1	Enabled/Fail	Backup Port 1
Main Port 2	Not Applicable	Backup Port 2
Main Port 3	Not Applicable	Backup Port 3
Main Port 4	Not Applicable	Backup Port 4

FBM Status		
FDSI FBM	Main Status	Backup Status
DCI Ready	Master	Not Operational
System Alarm	Power2 Fault	Power2 Fault

Figure 8-4. Status and Configuration Information for an FBM233

For the FBM233 and similar DCI modules, more detailed descriptions of the Information pane fields are available in the user's guide for the FBM or the fieldbus standard, as listed in the following table:

FBM	Document
FBM220, FBM221	<i>FOUNDATION fieldbus H1 Interface Module (FBM220/221) User Guide</i> (B0400FD)
FBM222	<i>Implementing PROFIBUS Networks in Foxboro Evo Control Software Applications</i> (B0750BE)
FBM223 and related slave devices	<i>PROFIBUS-DP Communication Interface Module (FBM223) User's Guide</i> (B0400FE)
FBM214, FBM215, FBM216, FBM218 and related slave devices	<i>HART Communication Interface Module (FBM214/215/216/218) User's Guide</i> (B0400FF)
FBM224	<i>Modbus Communication Interface Module (FBM224) User's Guide</i> (B0400FK)
FBM228	<ul style="list-style-type: none"> • <i>Implementing FOUNDATION™ fieldbus on the I/A Series System</i> (B0700BA) • <i>Implementing FOUNDATION fieldbus in Foxboro Evo Core Services Applications</i> (B0750DA) for InFusion v2.x, Foxboro Control Software v3.x-v4.x or Foxboro Evo Control Software v5.0 and later systems • <i>Implementing FOUNDATION™ fieldbus</i> (B0750BC, for InFusion v1.2.2 and earlier systems)
FBM229	<i>Implementing a DeviceNet Network on the Foxboro Evo Core Services</i> (B0750CH)
FBM230, FBM231, FBM232, FBM233	<i>Field Device System Integrators (FBM230/231/232/233) User's Guide</i> (B0700AH)
FBM247	<i>HART Communication Interface Modules User's Guide</i> (B0400FF)

Migration FBMs

The Invensys Plug-in Migration program enables users of legacy Foxboro systems that are no longer supported to migrate to the Control Core Services system. In this program, the legacy I/O modules are replaced with migration FBMs that plug into the existing I/O racks and use existing field wiring. System Manager includes support for several such programs. The Siemens/Moore APACS+ and Westinghouse WPDF migration programs are based on 200 Series FBM technology. The SPEC 200™, SPEC 200 MICRO, CCM, SPECTRUM™ (UCM, UIO, UFM, FIO), Cluster, and Competitive Migration (Honeywell, Bailey, Provox) programs are based on 100 Series FBM technology.

The migration FBM s are represented in the Control Core Services system by ECBs that are the same or similar to those used for standard 100 Series or 200 Series FBM s. For example, the ADO115 is a Control Core Services FBM242 packaged in a Moore APACS+ form factor. The module is displayed in System Manager as if it were an FBM242. Some migration FBM s consist of two Control Core Services FBM s in a single module and are thus represented by two ECBs. For example, the ASA211 for Moore APACS+ migration is displayed in System Manager as two FBM211s. System Manager uses the same icons, status indicators and Information pane formats as it does for other FBM s.

For specific information on the content of Status and Equipment Information displays and on the available equipment change actions, refer to the user's guide for the particular migration program:

- *DCS Fieldbus Modules for Moore® APACS+ Systems* (B0700BK)
- *DCS Fieldbus Modules for Westinghouse® WPDF Systems User's Guide* (B0400BA)
- *DCS Fieldbus Modules for Bailey® NET90 and INFI90 Systems User's Guide* (B0193XG)
- *DCS Fieldbus Modules for Fisher® PROVOX Controller Series Systems User's Guide* (B0400AR)
- *DCS Fieldbus Modules for Fisher® PROVOX Series 10 Systems User's Guide* (B0193WV)
- *DCS Fieldbus Modules for Fisher® PROVOX Series 20 Systems User's Guide* (B0193YV)
- *DCS Fieldbus Modules for Honeywell® TDC 2000 Systems User's Guide* (B0193VL)
- *DCS Fieldbus Modules for Honeywell® TDC 3000 Systems User's Guide* (B0193YW)
- *Fieldbus Cluster I/O User's Guide* (B0193RB)
- *SPEC 200 MICRO® Control Integrator User's Guide* (B0193RR)
- *SPEC 200® CCM Control Integrator User's Guide* (B0193VU)
- *SPEC 200® Control Integrator User's Guide* (B0193RD)
- *SPECTRUM™ Migration Integrator User's Guide* (B0193RC)

Connections Tab

To display a list of the devices attached to an FBM:

1. Select the FBM in the Navigation pane and click the **Connections** tab in the Information pane.

The Connections tab lists the attached field devices by name, type, status, run mode, and failure mode (Figure 8-5).



Figure 8-5. Connections Tab for an FBM211

2. Click any column header to sort the rows on the values in that column; click the column header a second time to reverse the sort order.
3. Drag a column header right or left to rearrange the column order.
4. Double-click a device name, or right-click the name and choose **Navigate to <device name>** to go to the selected device.

The device is selected in the Navigation pane and its information is displayed in the Information pane.

Counters Tab

The Counters tab for an FBM (Figure 8-6) displays three statistics:

Counter	Description
Timeouts	Number of times the Primary ECB timed out an FBM during communication attempts.
Inval Cmnd	Number of commands received by the primary ECB that were invalid in the present state of the station.
Inval Resp	Number of invalid messages received by the primary ECB from an FBM.

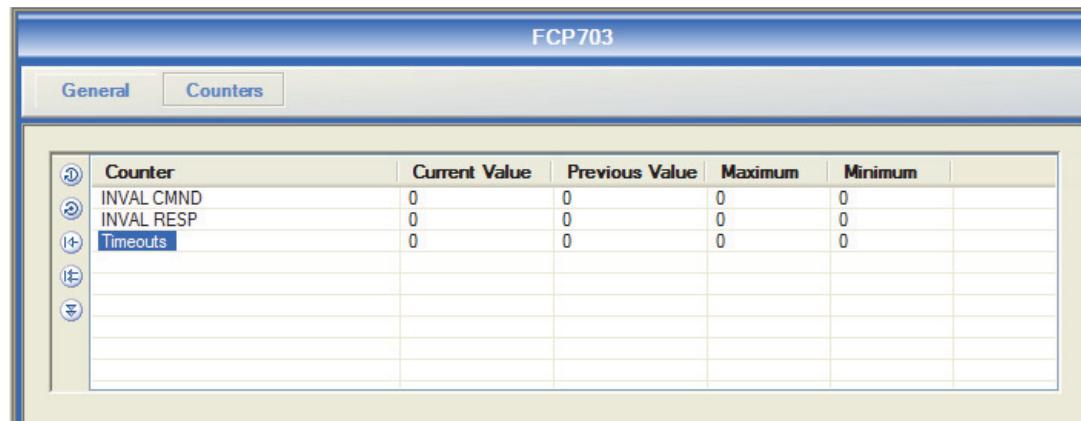


Figure 8-6. Counters Tab for an FBM211

See “Counters Tab” on page 52 and “Watch Tab” on page 63 for additional information on using the Counters and Watch tabs, respectively.

Equipment Change Actions

When an FBM is selected in the Navigation pane, the following equipment change actions are available from the FBM’s context menu and from the **Actions > Equipment Change** submenu pulled down from the main menu:

- **Acknowledge Device** when there is an unacknowledged alarm
- **Inhibit Device Alarming or Enable Device Alarming**
- **Go On-line** when a non-redundant FBM or at least one module in a redundant pair is off line
- **Go Off-line** when a non-redundant FBM or at least one module in a redundant pair is on line
- **Download or Reboot** for all FBMs except Field Device System Integrator (FDSI) modules (FBM230/231/232/233)
- **EEPROM Update**
- **Enable/Disable Control on Port 1, 2, 3, and 4** (only for FBM228 with Software Type 128)
- **Enable/Disable Control for Multiple Devices** (only for FBM228 with Software Type 128)
- **Enable/Disable Communications for Multiple Devices** (only for FBM222 and FBM228 with Software Type 228)
- **Software Download** only on FDSI modules (FBM230/231/232/233)
- **DB Download** only for Profibus (FBM223), Modbus (FBM224) and FDSI (FBM230/231/232/233) interfaces, and APACS+ Fieldbus Modules 234, 235, 236 and 237
- **Reset FBM** only on FDSI modules (FBM230/231/232/233)
- **Switch Roles** on redundant FBMs (FBM216/218/222/228/231/233)
- **Inhibit PIO Bus Cable A Alarming or Enable PIO Bus Cable A Alarming**
- **Inhibit PIO Bus Cable B Alarming or Enable PIO Bus Cable B Alarming**

For the DeviceNet FBM229’s equipment change actions, refer to the “FBM229 Equipment Change Actions” section in *Implementing a DeviceNet Network on the Foxboro Evo Core Services* (B0750CH).

For the HART-capable FBM247’s equipment change actions, refer to the “FBM214/214b/215/244 and FBM247 Equipment Change Display” section in the *HART™ Communication Interface Modules User’s Guide* (B0400FF).

Managing Device Alarms

Acknowledge

There are multiple ways to acknowledge system alarms associated with an FBM or its attached devices:

- Use the Alarms tab in the Accessories pane to identify and acknowledge individual alarms, or acknowledge all alarms (see “Alarms Tab” on page 58).
- Right-click the FBM in the Navigation pane and choose **Acknowledge Device** from the context menu to acknowledge all alarms for the selected FBM.
- Acknowledge all alarms in the FBM’s system monitor domain by selecting the system monitor in the Navigation pane and doing one of the following:
 - Choose **Actions > Acknowledge Smon Domain** from the main menu.
 - Click  in the toolbar.
 - Right-click the system monitor and choose **Acknowledge Smon Domain** from the context menu.

Inhibit Alarms

You can inhibit alarms for an FBM and its attached devices so that no alarm conditions are reported to the system monitor.

To inhibit device alarms, do one of the following:

- Right-click the FBM in the Navigation pane and choose **Inhibit Device Alarming** from the context menu.
- Select a device in the Accessories pane **Alarms** tab and click  in the tab toolbar.

The FBM icon is marked with the  symbol to indicate that alarms are being inhibited.

To re-enable device alarms:

- Right-click the FBM in the Navigation pane and choose **Enable Device Alarming**.

Managing Cable Alarms

There are multiple ways to acknowledge cable alarms associated with an FBM or its attached devices:

- Use the Alarms tab in the Accessories pane to identify and acknowledge individual alarms, or acknowledge all alarms (see “Alarms Tab” on page 58).
- Choose **Actions > Acknowledge All Cable Alarms** from the System Manager main menu or click  in the System Manager toolbar to

acknowledge all cable alarms including those associated with the selected FBM.

You can inhibit all cable alarms on either or both cables/busses connecting the FBM to its host station.

To inhibit cable alarms:

- Right-click the FBM and choose **Inhibit PIO Bus Cable A Alarming** or **Inhibit PIO Bus Cable B Alarming** from the context menu.

A symbol (**InA**, **In B** or **InAB**) attached to lower right corner of the FBM icon indicates which cables have alarms inhibited.

To re-enable the alarms:

- Right-click the FBM in the Navigation pane and choose the appropriate command from the context menu:
 - Enable PIO Bus Cable A Alarming
 - Enable PIO Bus Cable B Alarming

Go On-line and Go Off-line

If you place an FBM on line from a cold start, the FBM fail-safe condition for the FBM outputs is 0 (outputs are de-energized). If you place an FBM on line while it is running under control, the FBM fail-safe condition is dictated by the ECB configuration. If the fail-safe timer is enabled, the outputs go to fail-safe as configured; if the fail-safe timer is not enabled, the outputs hold.

If you remove FBMs from a rack, or power them off, ensure that you place those FBMs off-line to prevent them from being scanned.

If you place an intelligent field device on-line, the FBM uploads the intelligent field device database.

To place a non-redundant FBM on-line:

- Select the FBM in the Navigation pane and choose **Go On-line** from the context menu.

If Confirmation Required is checked in the Configuration dialog box (as described in “Action Settings” on page 74), a Go On-Line dialog box prompts you to confirm the action (Figure 8-7, left) and, if Reason Required is checked, note why the action is being taken (Figure 8-7, right).

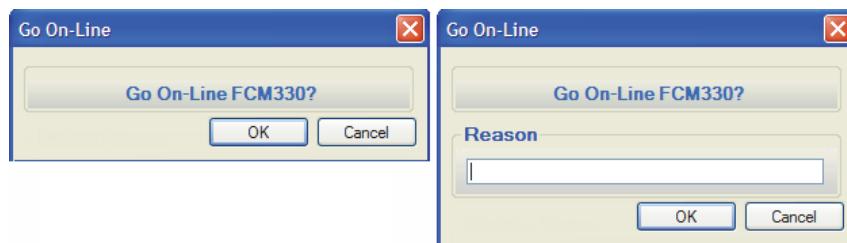


Figure 8-7. Dialog Box When Confirmation and Reason Required

- Enter a reason for the action (if prompted), and click **OK**.

To place a redundant FBM on-line:

1. Select the FBM in the Navigation pane and choose **Go On-Line** from the context menu.

A dialog box prompts you to select the module to go on line. Figure 8-8 shows the dialog box with and without the text box for entering a reason.

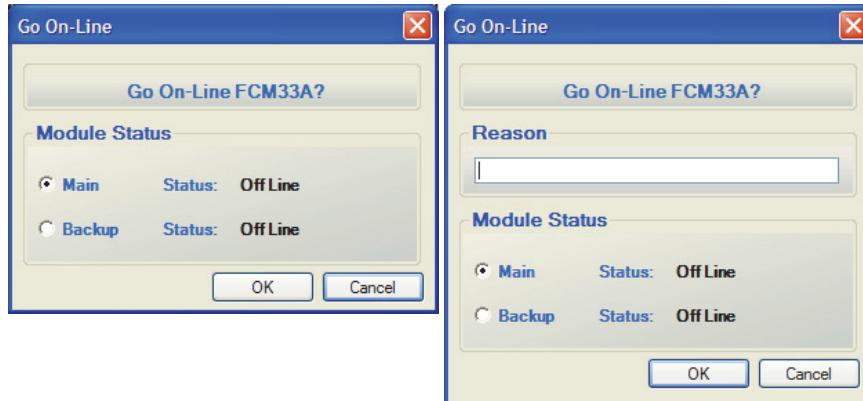


Figure 8-8. Go On-Line Dialog Box for Redundant FBMs

2. Click the radio button for **Main** or **Backup**.
3. Enter the reason for the mode change if prompted.
4. Click **OK**.

When a non-redundant FBM or at least one module in a redundant pair is on line, the FBM's context menu includes the Go Off-Line command, which works the same way as the Go On-Line command.

Download or Reboot

The Download or Reboot actions takes the FBM off line, loads the FBM's control configuration from the control station, and brings the FBM back on line.

If the checkpoint file information does not include the FBM data, you must download the new FBM added to the control station after performing integrated control configuration and FBM fix.

If the checkpoint file information in the control station already includes the selected FBM data (that is, checkpointing was performed while the FBM was on line), downloading occurs automatically, when necessary. Refer to "Checkpointing" on page 178.

Note The download command is not available for FDSI interfaces (FBM230/231/232/233). See "Reset FBM" on page 271.

To download an FBM's control configuration to the module:

1. Right-click the FBM in the Navigation pane and choose **Download** or **Reboot** from the context menu.

A dialog box prompts you to confirm the action. For redundant FBMs, the dialog box also prompts you to select which modules to update: **Main**, **Backup** or both (Figure 8-9).

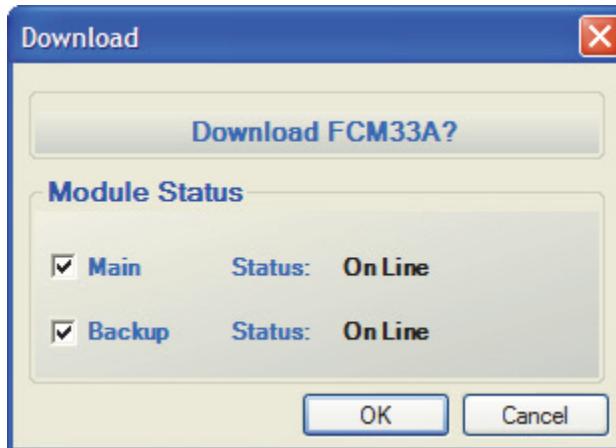


Figure 8-9. Download Dialog Box for a Redundant FBM

2. Check the box for one or both modules if the FBM is a redundant pair.
 3. Enter a reason for the download if prompted.
 4. Click **OK**.
- The system displays a message indicating the success or failure of the action for each downloaded FBM. If the download is successful, the FBM goes on-line. If there is an error, the System Manager displays a message in the Message tab.
5. After the FBM image download is complete, right-click the control station in the Navigation pane and choose **Checkpoint** from the context menu to align the control database in the checkpoint file in the boot host with the control station.

EEPROM Update

The EEPROM Update copies FBM operating system software from the host workstation to the module's flash memory and restarts the module.

It is advised that you use this action only after an official Invensys software release.

Note For FBMs you can perform numerous, consecutive EEPROM updates without waiting for the completion of each. However, all EEPROM updates must be completed successfully before you perform a download. Check the revision level of all stations after the FBMs are downloaded to ensure that the update was successful before you perform a download.

To update firmware in a non-redundant FBM:

1. Right-click the FBM in the Navigation pane and choose **EEPROM Update** from the context menu.

System Manager displays an EEPROM Update dialog box (Figure 8-10, left) if Confirmation Required is checked in the Configuration dialog box. The dialog box may also contain the Reason field (Figure 8-10, right) if Reason Required is also set.

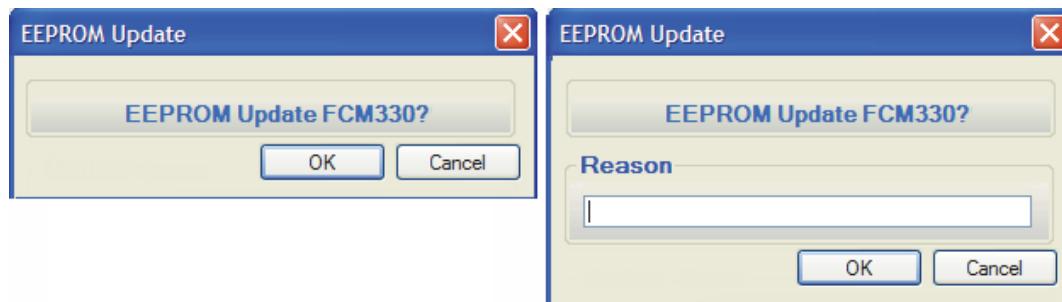


Figure 8-10. Dialog Boxes for Confirming an EEPROM Update

2. For 200 Series FBMs, observe the **Run Mode** field to see when the FBM is returned to **On-Line**.

For 100 Series FBMs, follow Step 3 to perform **Download** (or **Reboot**) action in order to bring the FBM back on-line.

The update is complete when the FBM is back on-line. The system displays a message indicating that the device is back on-line. If the update action fails, a failure message is shown in the Messages tab.

3. Right-click the FBM in the Navigation pane and choose **Download** (or **Reboot**) from the context menu to download the control configuration from the control station.
4. Right-click the control station and choose **Checkpoint** from the context menu to update the control database in the host workstation.
5. Review the Messages tab in the Accessories pane to verify success of the EEPROM Update, Download, and Checkpoint actions.

To update firmware in a redundant FBM:

1. Right-click the FBM in the Navigation pane and choose **EEPROM Update** from the context menu.

A dialog box prompts you to select which modules to update: Main or Backup (Figure 8-9).

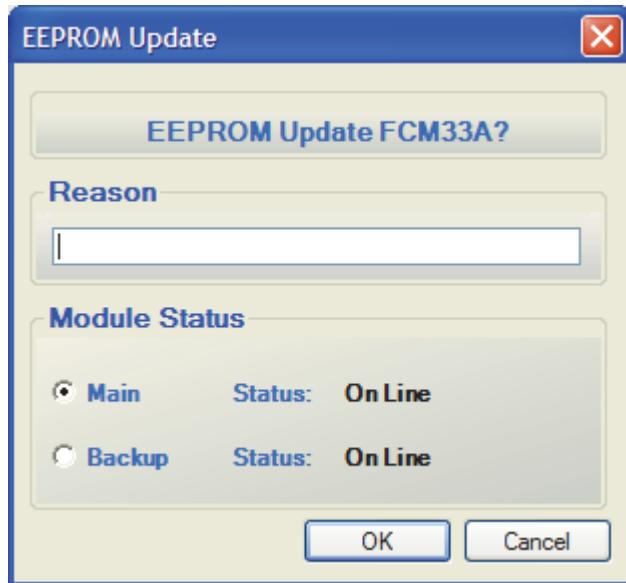


Figure 8-11. EEPROM Dialog Box for a Redundant FBM

2. Click the radio button for **Main** or **Backup**.

When you update a module in a redundant pair, the other module assumes the Master role.

3. Enter a reason for the update if prompted.
4. Click **OK**.
5. Observe the Run Mode field to see when the FBM is returned to **On Line**.
The update is complete when the FBM is back on-line. The system displays a message indicating that the device is back on-line. If the update action fails, the System manager displays a message in the Messages tab.
6. Right-click the FBM in the Navigation pane and choose **Download** (or **Reboot**) from the context menu to download the control configuration from the control station.
7. Right-click the control station and choose **Checkpoint** from the context menu to update the control database in the host workstation.
8. Review the Messages tab in the Accessories pane to verify success of the EEPROM Update, Download, and Checkpoint actions.

Reset FBM

The Reset FBM action is only available for the FDSI modules: FBM230, FBM231, FBM232 and FBM233.

The action restarts the FBM logic without downloading the image to the FBM. For the redundant FBM231 and FBM233, the confirmation dialog box prompts selection of either the Main or Backup module for the reset.

See *Field Device System Integrators (FBM230/231/232/233) User's Guide* (B0700AH) for details.

Software Download

The Software Download action is only available for the FDSI modules: FBM230, FBM231, FBM232 and FBM233.

The action downloads the I/O Device Driver (.ziph) to the FBM and restarts the FBM logic. For the redundant FBM231 and FBM233, the confirmation dialog box prompts selection of either the Main or Backup module for the driver download.

See *Field Device System Integrators (FBM230/231/232/233) User's Guide* (B0700AH) for details.

DB Download

The DB Download action updates port configuration files in the following FBMs:

- Profibus: FBM223 and FBM222
- Modbus: FBM224
- FDSI modules: FBM230, FBM231, FBM232 and FBM233
- APACS+ Fieldbus Modules: FBM234, FBM235, FBM236 and FBM237

For the redundant modules, the configuration database is downloaded to the Master module, which in turn updates the Tracker module. For details on the DB Download action refer to the maintenance section of the appropriate FBM user guide:

- *Field Device System Integrators (FBM230/231/232/233) User's Guide* (B0700AH)
- *PROFIBUS-DP Communication Interface Module (FBM223) User's Guide* (B0400FE)
- *Implementing PROFIBUS Networks in Foxboro Evo Control Software Applications* (B0750BE)
- *Modbus Communication Interface Module (FBM224) User's Guide* (B0400FK)
- *DCS Fieldbus Modules for Moore APACS+ Systems* (B0700BK)

Switch Roles

For some DCI based FBMs, two modules are installed for redundant operation with one module taking control (the Master role) and the other playing the role of Tracker, ready to assume control if there is a failure with the Master. The module with the lower system network address is identified in System Manager as **Main**, while the second module is referred to as **Backup**. When both modules are on line, you can assign the Master role to either.

The Switch Roles action can be selected for the following FBMs:

- FBM216 and FBM218 HART Interfaces
- FBM222 Profibus Interfaces
- FBM228 FOUNDATION fieldbus interface (when installed as a redundant pair and defined with an ECB202)
- FBM231 and FBM233 FDSI modules

To switch the module roles for a redundant FBM:

1. Right-click the FBM in the Navigation pane and choose **Switch Roles** from the context menu.

The Switch Roles dialog box displays the operating mode for each module (Figure 8-12).

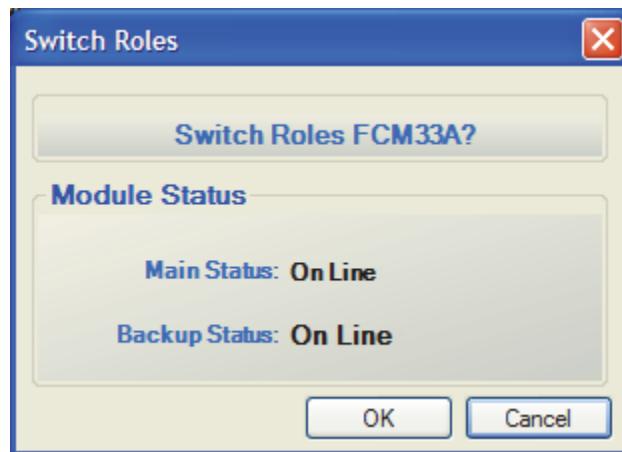


Figure 8-12. Switch Roles Dialog Box

If one of the modules is off-line:

- Click **Cancel**, use the **Go On-Line** command to bring the module back on-line, and then choose **Switch Roles** again.
2. Click **OK** for the change to take effect.

The system displays a message in the Messages tab indicating the success or failure of the switch action.

Enabling and Disabling Communications for Multiple Devices (FBM222 and FBM228)

The Enable/Disable Communications for Multiple Devices actions allow you to enable or disable communications for multiple devices attached to a Profibus FBM222 or FOUNDATION fieldbus FBM228.

To enable or disable communications for multiple devices attached to an FBM222 or FBM228:

1. Perform one of the following steps:
 - a. From the Connections tab:
 - Click the FBM222 or FBM228 in the Navigation tree.

- Click the **Connections** tab in the Information pane.
 - Click **Enable Communications** to enable communications or **Disable Communications** to disable communications for multiple devices attached to the selected FBM. These buttons are inactive (grayed out) on non Foxboro workstations.
- b. From the FBM's context menu (as shown in Figure 8-13):
- Right-click the FBM222 or FBM228 in the Navigation tree.
 - Select **Enable Communications for Multiple Devices** or **Disable Communications for Multiple Devices** from the pop-up menu.
- c. From the **Actions** menu:
- Click the FBM222 or FBM228 in the Navigation tree.
 - Select **Actions > Equipment Change > Enable Communications for Multiple Devices** or **Disable Communications for Multiple Devices**.

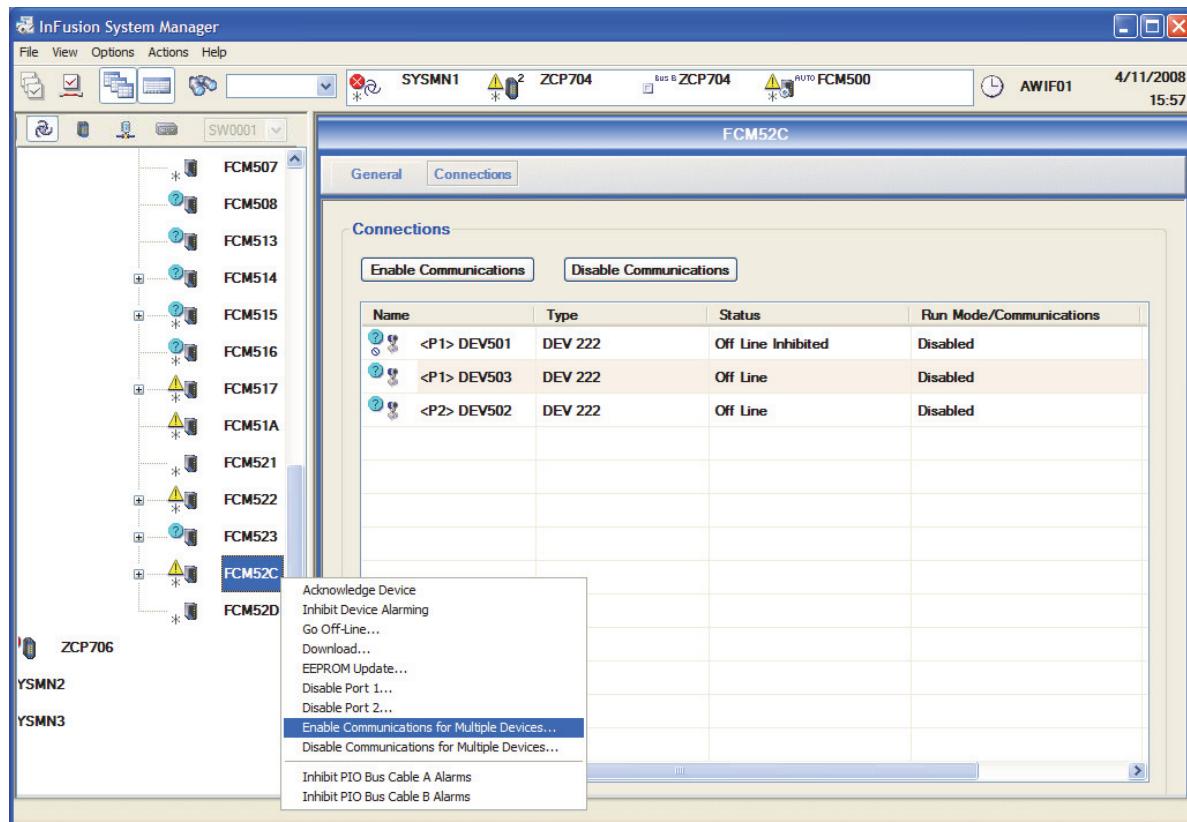


Figure 8-13. Enable/Disable Communications for Multiple Devices (via FBM Context Menu)

Note that the first time you use this function, you must expand the FBM222 or FBM228 in order to enable or disable communications for

multiple devices. If the FBM222/228 is not expanded the first time, the following message appears:

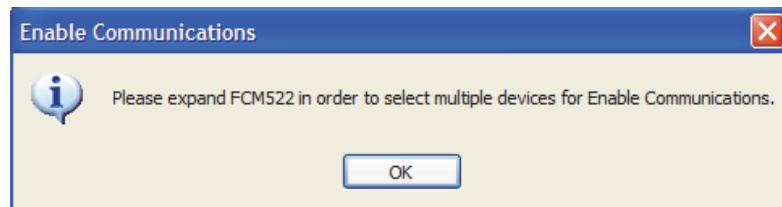


Figure 8-14. Expanding the FBM222/FBM228 Prior to Enabling/Disabling Device Communications

2. The Enable Communications (shown in Figure 8-15) or Disable Communications dialog box appears showing only the valid devices for which communication can be enabled or disabled. Click the **Name** column heading to sort the list in ascending or descending order. (By default, the list of valid devices appears sorted in ascending order.) Select the desired devices for which you want to enable or disable communications and click **Start**. Information on the status bar shows the progress of the action.

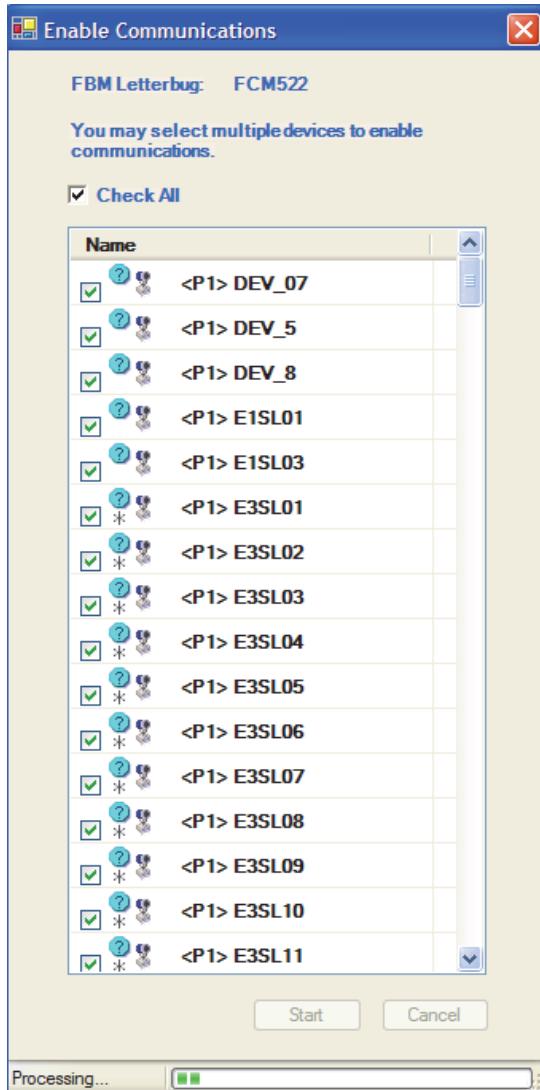


Figure 8-15. Enable Communications Dialog Box

3. If no device is selected from the list view, the following message appears:



Figure 8-16. No Device Selected for Enabling Communications

4. To disable communications, the selected devices should be on-line. If all devices for the selected FBM are off-line, the following message appears:

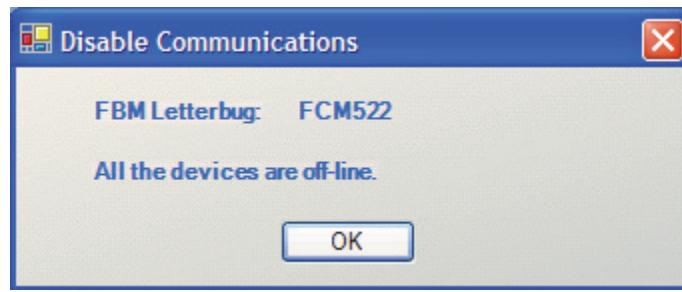


Figure 8-17. All Devices are Off-Line

Enabling Control in FOUNDATION fieldbus H1 Devices (FBM228)

System Manager provides a variety of ways to enable control in the H1 devices attached to an FBM228. When a device is placed on control, the FBM228 causes the device to execute its deployed function blocks, publish the outputs, and process client/server connections to the device, including reading block views.

Four selections in the FBM context menu toggle devices on a segment (or port) on and off control. For example, to enable control for all devices on segment 1:

- Right-click the FBM in the Navigation pane and choose **Enable Control for Port 1** to enable all device on the selected port. The menu selection changes to **Disable Control for Port 1**.

The same procedure can be followed to enable or disable control for ports 1, 2, 3, and 4.

To place selected devices on one or more segments on control:

1. Right-click the FBM in the Navigation pane and choose **Enable Control for Multiple Devices**.

If there are any devices attached to the FBM that are off-line, System Manager displays the Enable Communications dialog box (Figure 8-18):

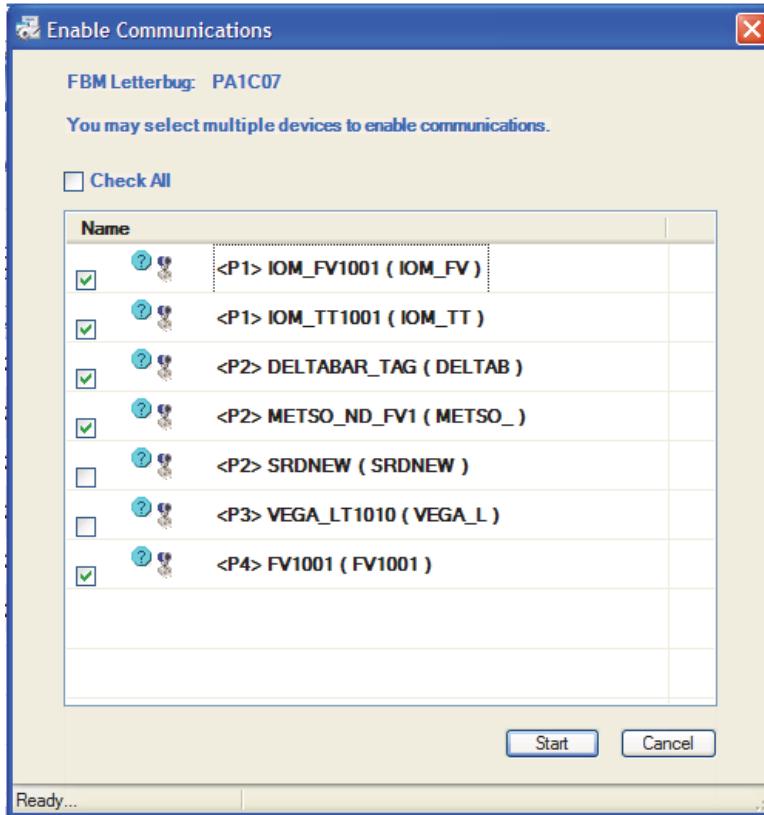


Figure 8-18. Enable Communications Dialog Box

The Enable Communications dialog box can also be opened from the Connections tab in the Information pane, as discussed in the next section.

Click the check box for individual devices or click **Check All**, and then click **Start**. If all devices are already on line, System Manager displays a dialog box displayed in Figure 8-19.

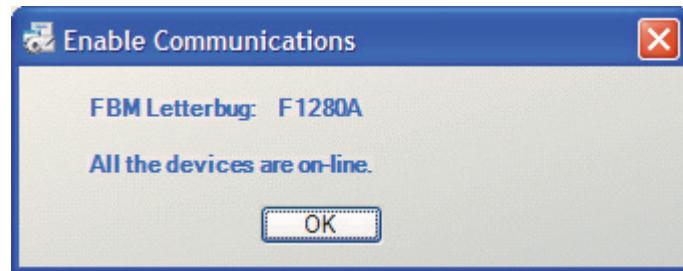


Figure 8-19. All Devices On-line

2. **Disable Control for Multiple Devices** works the same way as the Enable Control equipment change action. The command opens a Disable Communications dialog box when there are devices on control and shows a dialog box advising **All the devices are off-line** when there are no devices on control.

Device Displays and Actions

The following sections describe displays associated with devices attached to DCI based FBMs.

Device Displays

Do one of the following to display detailed status and equipment information for a device:

- Select the device in the Navigation pane.
- Right-click the device listed in the Connections tab for the FBM in the Information pane, and choose **Navigate to <device name>** from the context menu.

The Information pane General tab includes an Equipment Status display and an Equipment Information table.

The information displays and context menus for device ECBs attached to the DCI based FBMs vary with the supported fieldbus technology. Refer to the System Management section of the individual FBM user guide for a comprehensive discussion regarding information provided by these displays.



Figure 8-20. Information Pane for a Device Attached to an FBM24

For the DeviceNet FBM229's device display, refer to the "Device Information Displays" section in *Implementing a DeviceNet Network on the Foxboro Evo Core Services* (B0750CH).

For the HART-capable FBM247's device display, refer to the "FBM247 Device Equipment Status and Information Display" section in the *HART™ Communication Interface Modules User's Guide* (B0400FF).

Device Actions

The following commands are available from the context menu of a device:

- **Acknowledge Device** when there is an unacknowledged alarm.
- **Inhibit Device Alarming** (when alarms are enabled) to disable communication of alarms generated by the device.

System Manager marks any unacknowledged alarm from the device as acknowledged, and places the  symbol next to bottom left corner of the device icon to indicate that alarms are being inhibited.

- **Enable Device Alarming** (when alarms are inhibited) to re-enable communication of alarms generated by the device.

System Manager clears the  symbol from the bottom left corner of the device icon.

- **Enable Control/Communications** (when the device is off-line) to enable communications between the FBM and the device and place the device on control.

A dialog box prompts you to confirm the action (Figure 8-21):

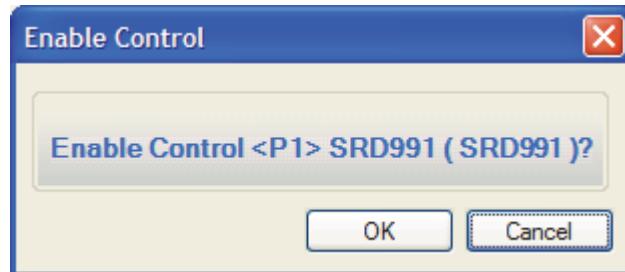


Figure 8-21. Enable Control Dialog Box

- **Disable Control/Communications** (when the device is on-line) to disable communications between the FBM and the device, taking the device off control.

A dialog box (similar to the one in Figure 8-21) prompts you to confirm the action.

For the DeviceNet FBM229's equipment change actions, refer to the "Device Equipment Change Actions" section in *Implementing a DeviceNet Network on the Foxboro Evo Core Services* (B0750CH).

For the HART-capable FBM247's equipment change actions, refer to the "HART Device and FBM247 Device/Signal Equipment Change Actions" section in the *HART™ Communication Interface Modules User's Guide* (B0400FF).

Field Device System Integrator TSAA Driver

The Field Device System Integrator (FDSI) Triconex® Integrator driver runs in an FBM232 or FBM233 to integrate Tricon®[®], Trident®[®], and Triconex General Purpose (Tri-GP) devices using the Triconex System Access Application (TSAA) protocol. Refer to *FDSI and SOE Workstation Drivers for Triconex User's Guide* (B0700DF) for additional information.

System Manager allows you to view the status and information for a Triconex device attached to an FDSI FBM.

If Triconex software v2.9 or later is installed, the Triconex Enhanced Diagnostic Monitor (EnDM) application can be invoked from System Manager. There are two methods to launch EnDM:

1. Click on the FDSI device and click Actions > Equipment Change > Triconex Enhanced Diagnostic Monitor.

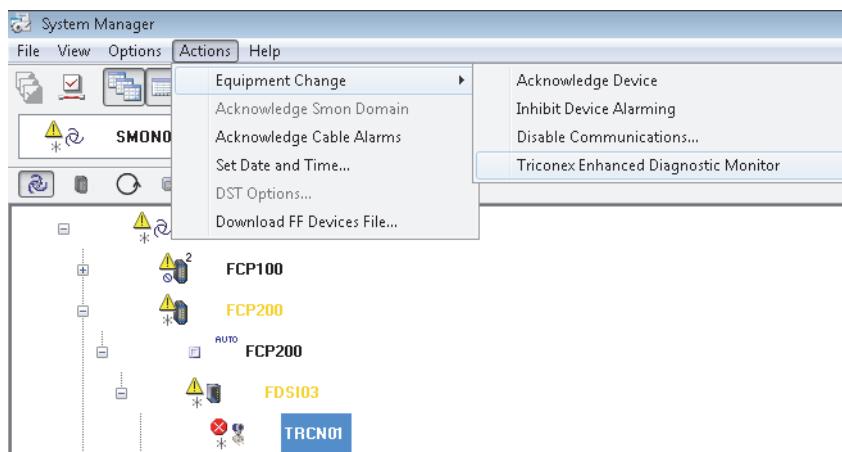


Figure 8-22. Invoking Triconex EnDM Application

2. Right-click the FDSI device and select Triconex Enhanced Diagnostic Monitor.

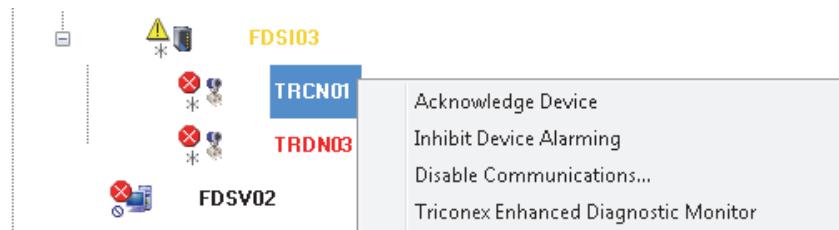


Figure 8-23. Selecting Triconex Enhanced Diagnostic Monitor

3. If System Manager fails to invoke the Triconex EnDM application, an error message will be posted to notify the user. For example, invalid node number, as shown in Figure 8-24, below.

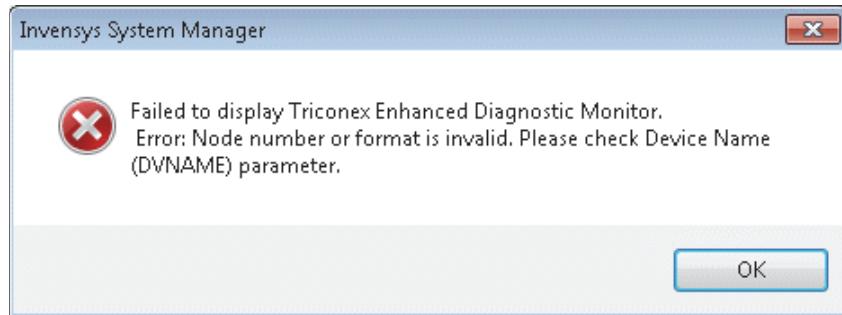


Figure 8-24. Error Message

From the equipment information of Tricon device, the node number is identified from the IP address listed in “Device Name”. In this case, the node number is 1, the last octet of “192.168.1.1”. (Refer to Figure 8-25 below.)

Name	TRCN01
Communications	Enabled
Failed Acknowledged State	Acknowledged
DB Download State	Not Downloading
Failed Devices Attached	No
EEPROM Update State	Not Updating

Compound Name	FCP200_ECB
Hardware Type	232
Bus ID	0
Primary Status	0x0
FBM Cmd Status	0x0
FBM IDM Status	0x4
File Revision	110
Device Protocol	TSAA
File ID	
Model	Triconex
Device Address	192.168.1.1
Master Address	0

Type	DEV 232
Device State	Not Failed
Alarm Enabled State	Enabled
Warning Conditions Exist	No
Failed Devices Acknowledged	Yes

Block Name	TRCN01
Software Type	232
Manufacture Date	000000
FBM Diag Status 2	0x0
FBM Diag Status 3	0x0
FBM Diag Status 4	0x0
Port Number	1
Protocol Version	1
Manufacturer	Triconex
Device Name	192.168.1.1
Device Options	TRICONEX+AD
Identification Number	0x0000

Figure 8-25. Node 1 Equipment Information

The user interface display for Node 1 of Tricon device in EnDM application is shown in Figure 8-26 below.

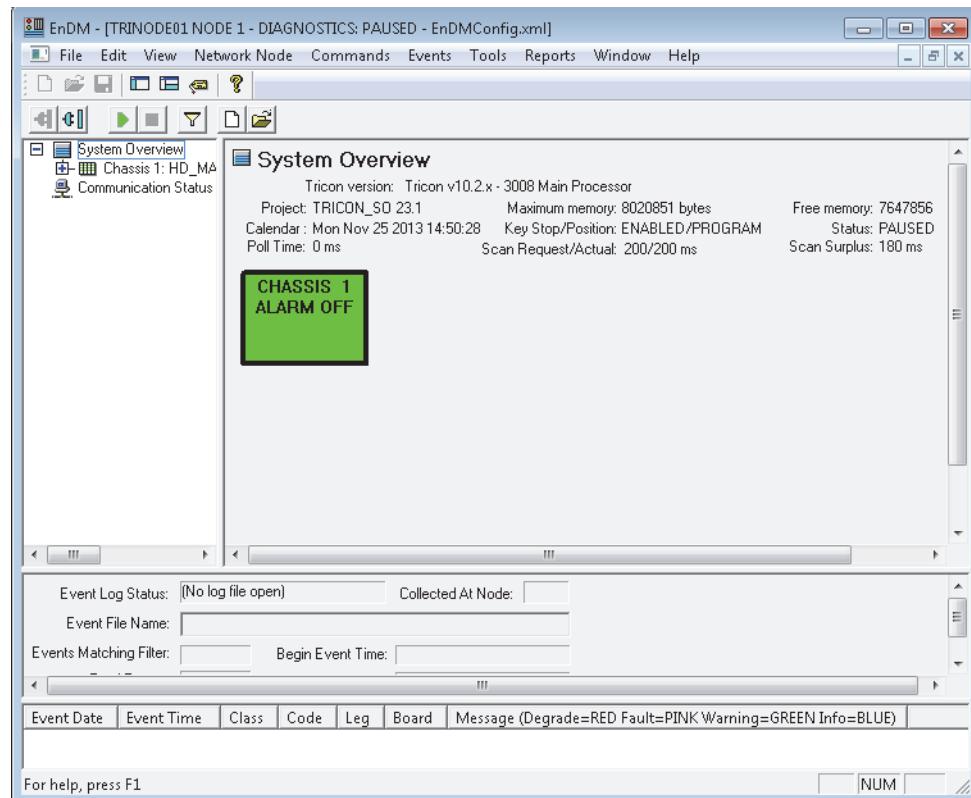


Figure 8-26. User Interface Display for Node 1 of Tricon Device

From the equipment information of Trident device, the node number is identified from the IP address listed in “Device Name”. In this case, the node number is 3, the number after the forward slash in “192.168.1.3/3”. (See Figure 8-27 below.)

General	
Equipment Status	
Name	TRDN03
Communications	Enabled
Failed Acknowledged State	Acknowledged
DB Download State	Not Downloading
Failed Devices Attached	No
EEPROM Update State	Not Updating
Type	DEV 232
Device State	Not Failed
Alarm Enabled State	Enabled
Warning Conditions Exist	No
Failed Devices Acknowledged	Yes
Equipment Information	
Compound Name	FCP200_ECB
Hardware Type	232
Bus ID	0
Primary Status	0x0
FBM Cmd Status	0x0
FBM IDM Status	0x4
File Revision	110
Device Protocol	TSAA
File ID	
Model	Triconex
Device Address	192.168.1.3/3
Master Address	0
Block Name	TRDN03
Software Type	232
Manufacture Date	000000
FBM Diag Status 2	0x0
FBM Diag Status 3	0x0
FBM Diag Status 4	0x0
Port Number	1
Protocol Version	1
Manufacturer	Triconex
Device Name	192.168.1.3/3
Device Options	TRICONEX/TRIDENT+AL
Identification Number	0x0000

Figure 8-27. Trident Device Equipment Information

Figure 8-28, below, shows the user interface display for Node 3 of Trident device in Triconex EnDM application.

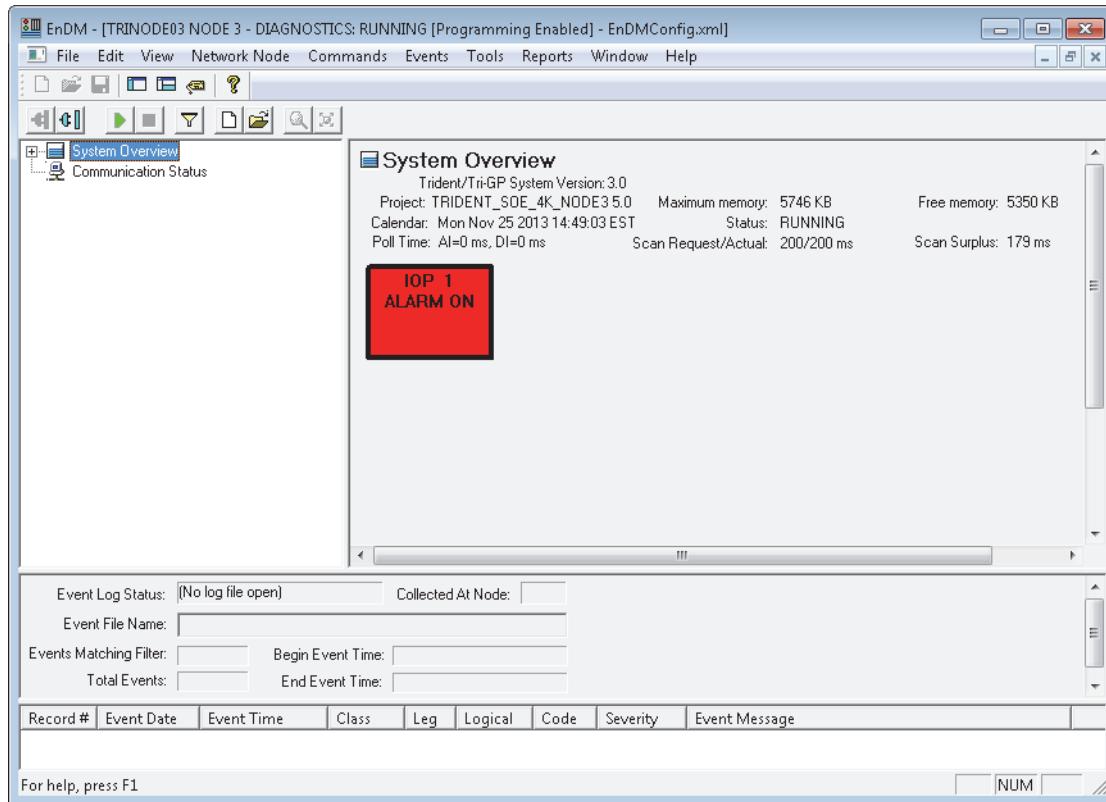


Figure 8-28. User Interface Display for Node 3 of Trident Device in Triconex EnDM Application

If Triconex EnDM software is not installed, the FoxView Diagnostic Display menu item will be visible as described in the section below.

To invoke the FoxView Diagnostic Display for the Triconex device:

1. Ensure that FoxView software is installed and running on the workstation where System Manager is installed.
2. Click on the FDSI device and click **Actions > Equipment Change > FoxView Diagnostic Display**.

or

Right-click the FDSI device and select **FoxView Diagnostic Display** from the pop-up menu.

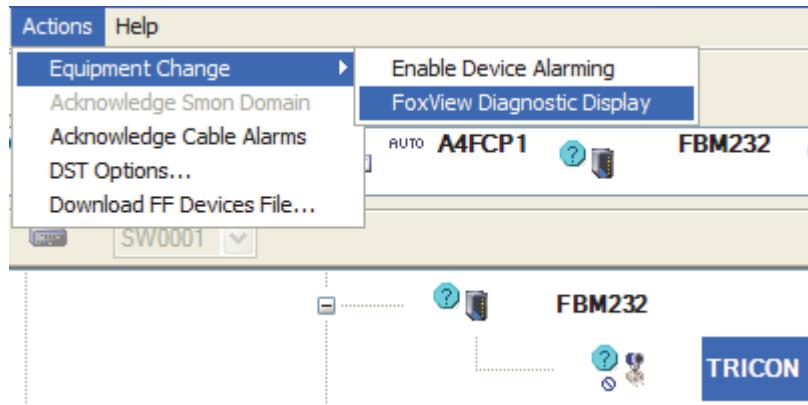


Figure 8-29. Accessing the FoxView Diagnostic Display for a Triconex Device (Actions Menu)



Figure 8-30. Accessing the FoxView Diagnostic Display for a Triconex Device (Context Menu)

The TRICON Main Chassis Diagnostics display, shown in Figure 8-31, allows you to observe the diagnostic status of each chassis in a TRICON system.

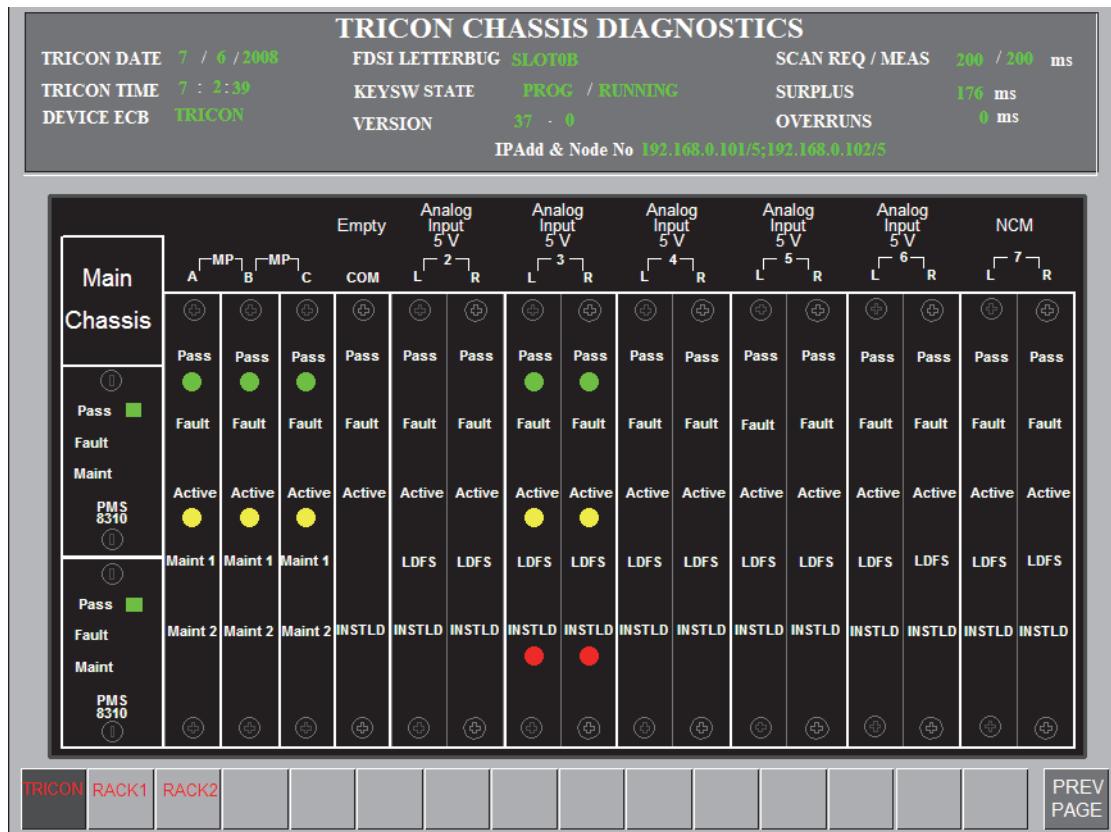


Figure 8-31. TRICON Main Chassis Diagnostics Display

Figure 8-32 shows the TRIDENT Baseplate Diagnostics display, which provides the diagnostic status of each baseplate.

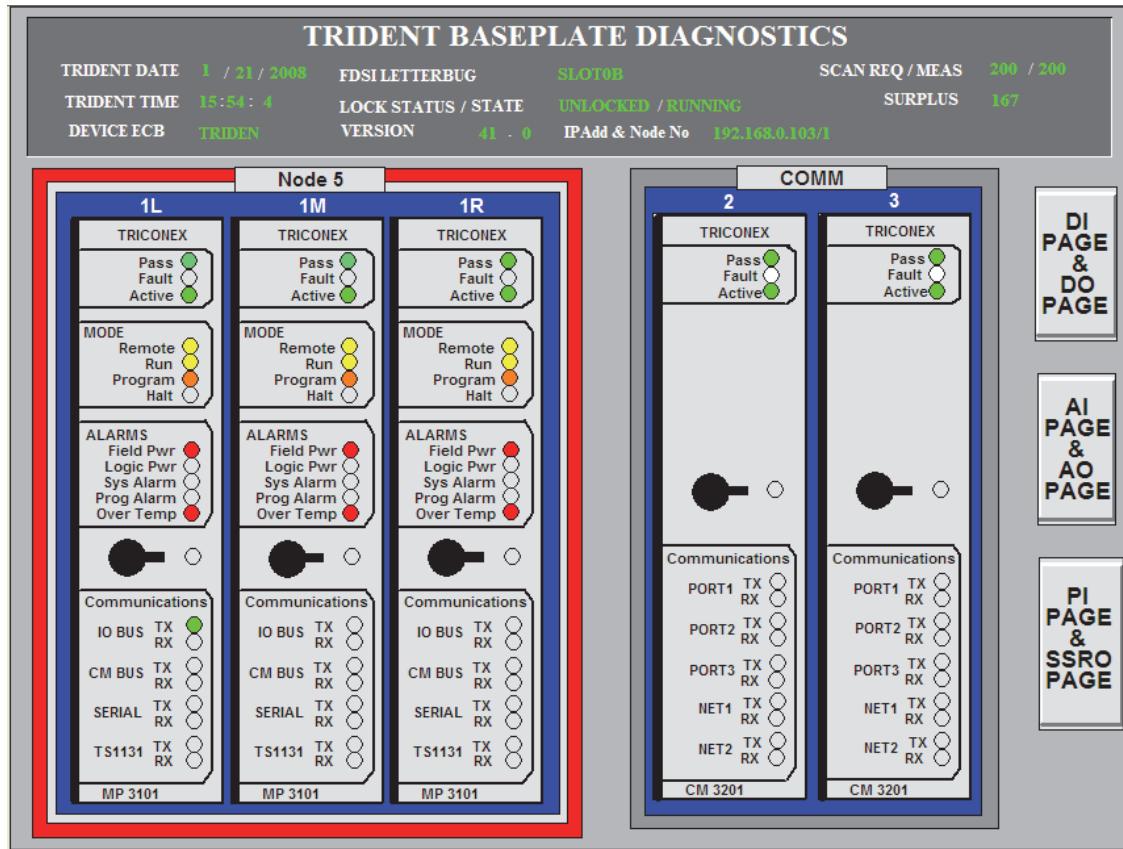


Figure 8-32. TRIDENT Baseplate Diagnostics Display

3. The following warning message will appear if there is an error opening the FoxView Diagnostic Display.

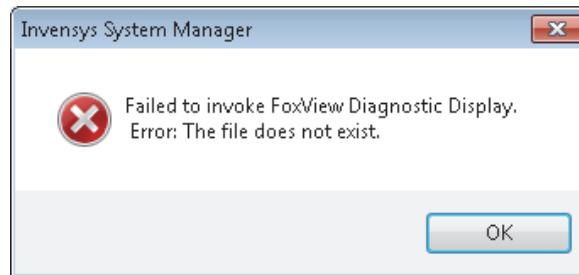


Figure 8-33. Error Opening the FoxView Diagnostic Display for a Triconex Device

Figure 8-34 shows the Information pane for a Triconex device attached to an FDSI FBM. A bit in the DDIAG1 device status determines the presence of the Triconex Device in Alarm state field.

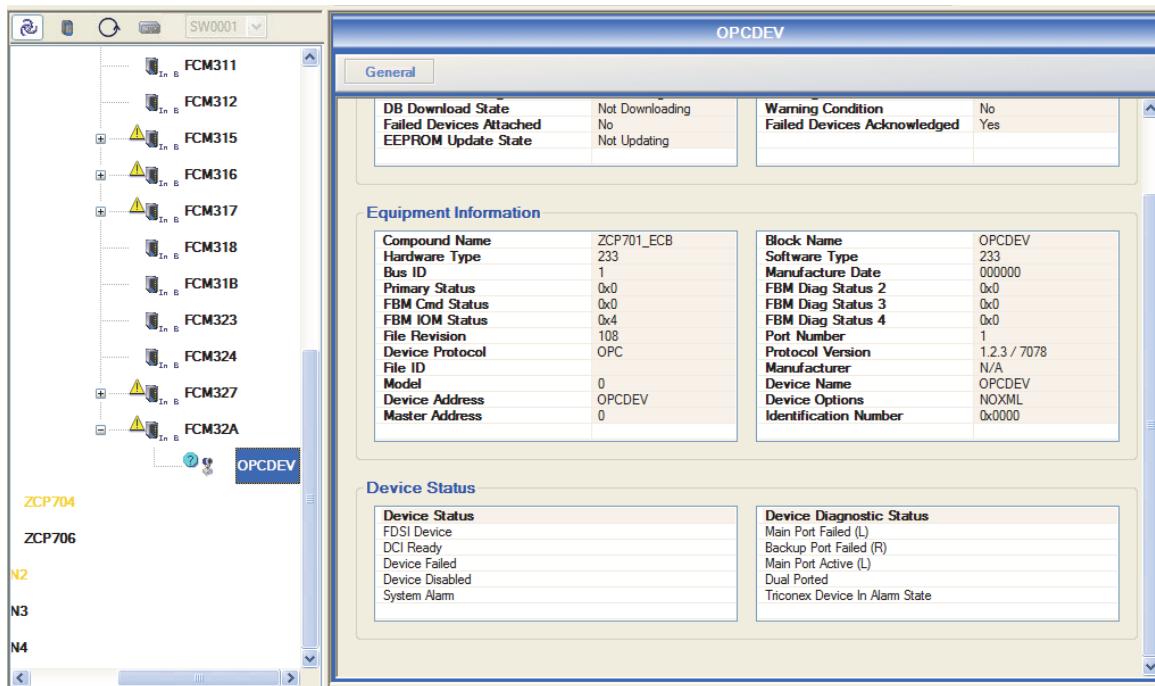


Figure 8-34. Information Pane for a Triconex Device Attached to an FDSI FBM

CHAPTER 9

Networking Equipment

This chapter describes how to use the System Manager application to monitor and control switches and switch ports in The Mesh control network.

Contents

- Identifying Switches in the Navigation Pane
- Switch Status and Equipment Information
- Connected Stations and Switches
- Ports Tab
- Equipment Change Actions

Identifying Switches in the Navigation Pane

Figure 9-1 shows a Navigation pane with the first system monitor expanded to display the stations and switches on the next level. Ports for a switch are shown in a separate Ports tab in the Information pane when the switch is selected (as described in “Ports Tab” on page 293).

A symbol attached to the upper left corner of the switch icon indicates an adverse condition with the equipment. The status of alarms associated with the switch is indicated by symbols on the lower left side of the equipment icon.

- Choose **Help > Legend** from the main menu to identify the equipment health and alarm status symbols, or refer to “Status Indicators” on page 47.

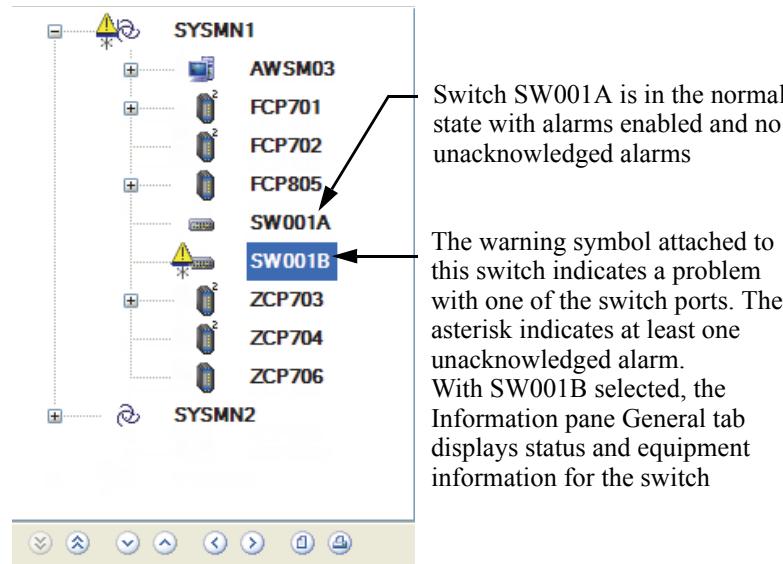


Figure 9-1. Display of Switches in the Navigation Pane

Labels on the right side of the switch icon indicate the state of communications between the switch and stations and switches in its domain:

Symbol	Condition
	<p>The RCVR label attached to the right side of the switch icon indicates a receiver failure for one or more stations in the switch domain.</p> <ul style="list-style-type: none"> Select the switch and use the Connections tab in the Information pane to identify the station with an A channel or B channel receiver fault. <p>The fault is marked on the lower right corner of the station icon with or .</p> <p>The RCVR error on the switch cannot be cleared by inhibiting or acknowledging the alarm. The RCVR error will remain on the switch until all the receiver faults for that station(s) in the switch domain are fixed.</p>

Switch Status and Equipment Information

When a switch is selected in the Navigation pane, the General tab displays an Equipment Information table (Figure 9-2). The first two fields identify the switch by name and type. Status information in the remaining fields is dynamically. Reporting State and Station Address are updated periodically.

The Switch Connections area below the table lists the other switches to which this one is connected.

Do one of the following to navigate to a connected switch:

- Double-click the switch in the **Switch Connections** area.

- Right-click the switch and choose **Navigate to <switch name>** from the context menu.

The switch is selected in the Navigation pane and its equipment information is displayed in the Information pane.

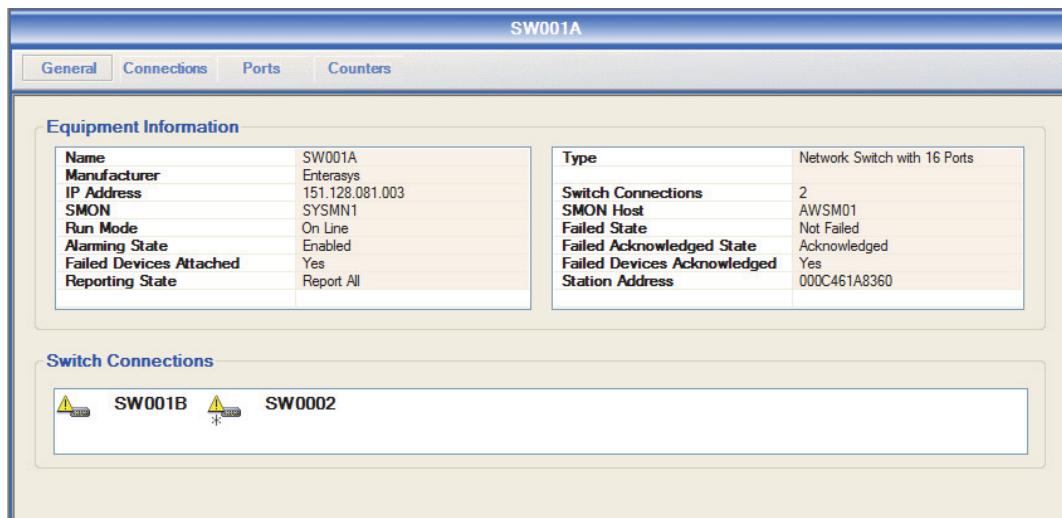


Figure 9-2. Switch Status and Equipment Information

Table 9-1. Switch Equipment Information Display Fields

Field	Description
Name	The station letterbug assigned during system hardware definition
Type	Type of hardware specified when the letterbug was defined
SMON	System monitor domain to which the station is assigned
SMON Host	Host station for the system monitor
Manufacturer	Original equipment manufacturer
IP Address	Foxboro station network address
Switch Connections	Number of other switches connected to the switch
Failed State	Failed or Not Failed
Run Mode	Displays either On-Line or Off-line
Alarming State	Indicates whether alarming is Enabled or Inhibited for this switch

Table 9-1. Switch Equipment Information Display Fields (Continued)

Field	Description
Failed Acknowledged State	<p>Indicates whether the last reported failed state was acknowledged. To acknowledge the failed state:</p> <ul style="list-style-type: none"> Right-click the switch in the Navigation pane and choose Acknowledge Station from the context menu. <p>See “Equipment Change Actions” on page 297 for information on acknowledging switch alarms.</p>
Failed Devices Acknowledged	<p>No if there are switch port failures that have not been acknowledged; otherwise, Yes. To acknowledge a switch port failure:</p> <ul style="list-style-type: none"> Right-click the failed port in the Ports tab in the Information pane and choose Acknowledge Device from the context menu. <p>See “Ports Tab” on page 293.</p>
Failed Devices Attached	<p>Yes if a switch port has failed or is off-line; otherwise, No. To review the status of individual ports:</p> <ul style="list-style-type: none"> Click the Ports tab in the Information pane. See “Ports Tab” on page 293.
Station Address	<p>The six-octet media access control (MAC) address assigned during system definition and used by the networking protocol in the Foxboro stations</p>
Reporting State	<p>Indicates whether status of the switch and its ports is being reported to the system monitor. To change the Reporting State:</p> <ul style="list-style-type: none"> Right-click the switch in the Navigation pane and choose Disable All Reports or Enable All Reports from the context menu.

Connected Stations and Switches

To display a list of connected stations and switches:

1. Click the **Connections** tab in the Information pane.

The Name column in the Connections table (Figure 9-3) identifies the stations and other switches by name and the equipment icons and status indicators used in the Navigation pane. The table also gives the type, status, run mode and error mode for each piece of equipment.

Name	Type	Status	Run Mode/Comm...	Device/Failed State
AWSM01	AW70NC	Warning Unacknowl...	On Line	Not Failed
AWSM02	AW70NC	Normal	On Line	Not Failed
AWSM03	AW70NC	Warning	On Line	Not Failed
AWSM04	AW70NC	Warning Inhibited	On Line	Not Failed
AWSM05	AW70NC	Failed	Off Line	Not Failed
FCP702	FCP270	Failed	Off Line	Not Failed
FCP701	FCP270	Warning Inhibited	On Line	Not Failed
ZCP703	ZCP270	Warning	On Line	Not Failed
ZCP704	ZCP270	Failed	Off Line	Not Failed
FCP805	FCP270	Normal	On Line	Not Failed
ZCP706	ZCP270	Warning Unacknowl...	On Line	Not Failed
SW001B	SW16P	Warning	On Line	Not Failed

Figure 9-3. Connections Tab for a Switch

2. Click a column header to sort the rows in the table on the data in that column. Click the column header a second time to reverse the sort order.
3. Drag a column header to the right or left to rearrange the column order.
4. Do one of the following to go to a connected station or switch:
 - Double-click the equipment name.
 - Right-click the equipment name and choose **Navigate to <equipment name>** from the pop up menu (**Navigate to AWSM02** in Figure 9-3).

The equipment is selected in the Navigation pane, and displayed in the Information pane. If there are items connected to the new selection, the Connections tab is shown in the Information pane; otherwise, the General tab is displayed.

Ports Tab

To review information about a specific switch port:

1. Click the **Ports** tab in the Information pane to display the Ports tab (Figure 9-4).

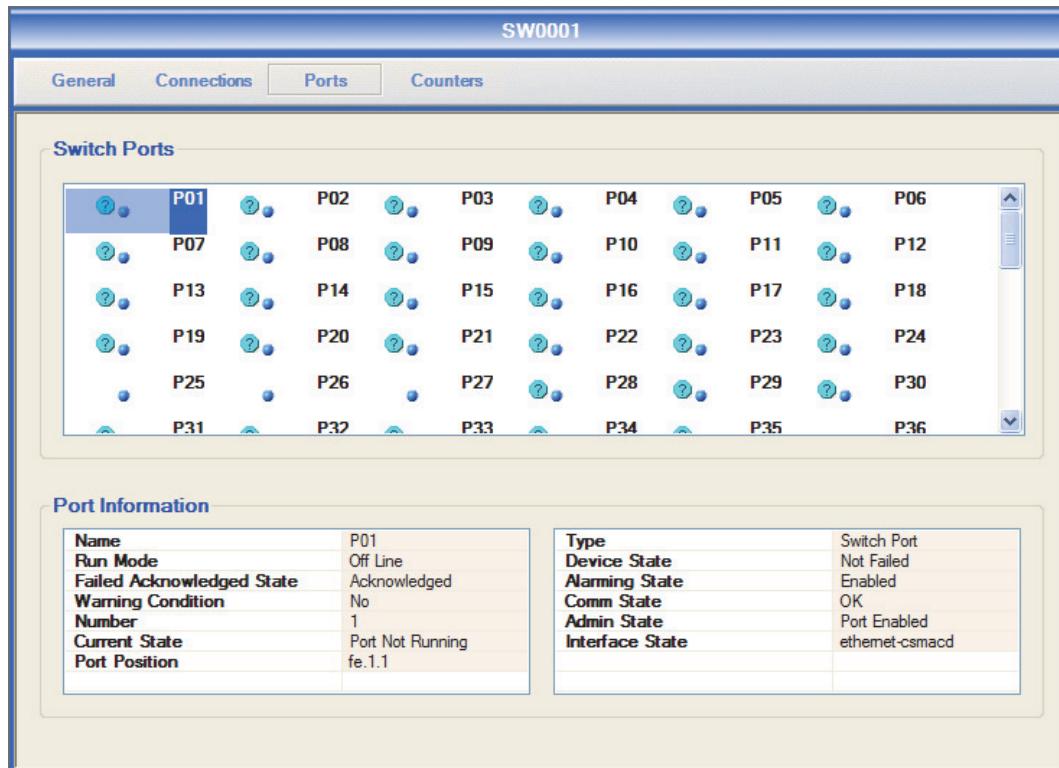


Figure 9-4. Ports Tab for a Switch

The Switch Ports pane at the top of the Ports tab displays the status of each port in the selected switch using the icons and symbols listed in the following table:

Symbol	Condition
●	The port is on-line, alarming is enabled and there are no unacknowledged alarms associated with the port.
● ?	The port is off-line. When an asterisk also appears with the question mark symbol, the port's transition to off-line has not been acknowledged.
✗ ●	The port has failed.
* ●	The port has an unacknowledged system alarm. The asterisk is removed when you acknowledge the alarm. Do one of the following to acknowledge the alarm: <ul style="list-style-type: none"> Right-click the port and choose Acknowledge Device from the context menu. Select the alarm in the Accessories pane Alarms tab and click in the Alarms tab toolbar.
○ ●	Alarms from this port are inhibited. To re-enable alarms: <ul style="list-style-type: none"> Right-click the port and choose Enable Device Alarming from the context menu.

2. Select a port to display detailed status information in lower half of the page.

The Port Information fields are described in the following table:

Table 9-2. Switch Port Information Display Fields

Field	Description
Name	Port name (P01 for example)
Type	Port type, Switch Port
Run Mode	On Line or Off Line
Device State	Failed if the port is failed; otherwise, Not Failed
Failed Acknowledged State	Acknowledged if the last port failure (Device State is Failed) has been acknowledged; otherwise, Not Acknowledged . To acknowledge a failed port: <ul style="list-style-type: none"> • Right-click the port name in the Switch Ports pane and choose Acknowledge Device from the context menu.
Alarming State	Whether alarming for the port is Enabled or Inhibited . To change the Alarming State: <ul style="list-style-type: none"> • Right-click the port name in the Switch Ports pane and choose Inhibit Device Alarming or Enable Device Alarming from the context menu (Figure 9-4). Inhibiting alarms acknowledges any unacknowledged alarms for the port.
Warning Condition	Yes if the port has a non-fatal error condition; otherwise, No
Comm State	OK or Failed
Number	Port number
Admin State	Port Enabled or Port Not Enabled
Current State	Port Running or Port Not Running
Interface State	Indicates the communications protocol in use by the port
Port Position	Physical location of the port, usually the same as the port number

Port Counters

The Counters tab for a switch consists of the Switch Ports display used in the upper half of the Ports tab and a table of counters for the port selected in the Switch Ports display (Figure 9-5).

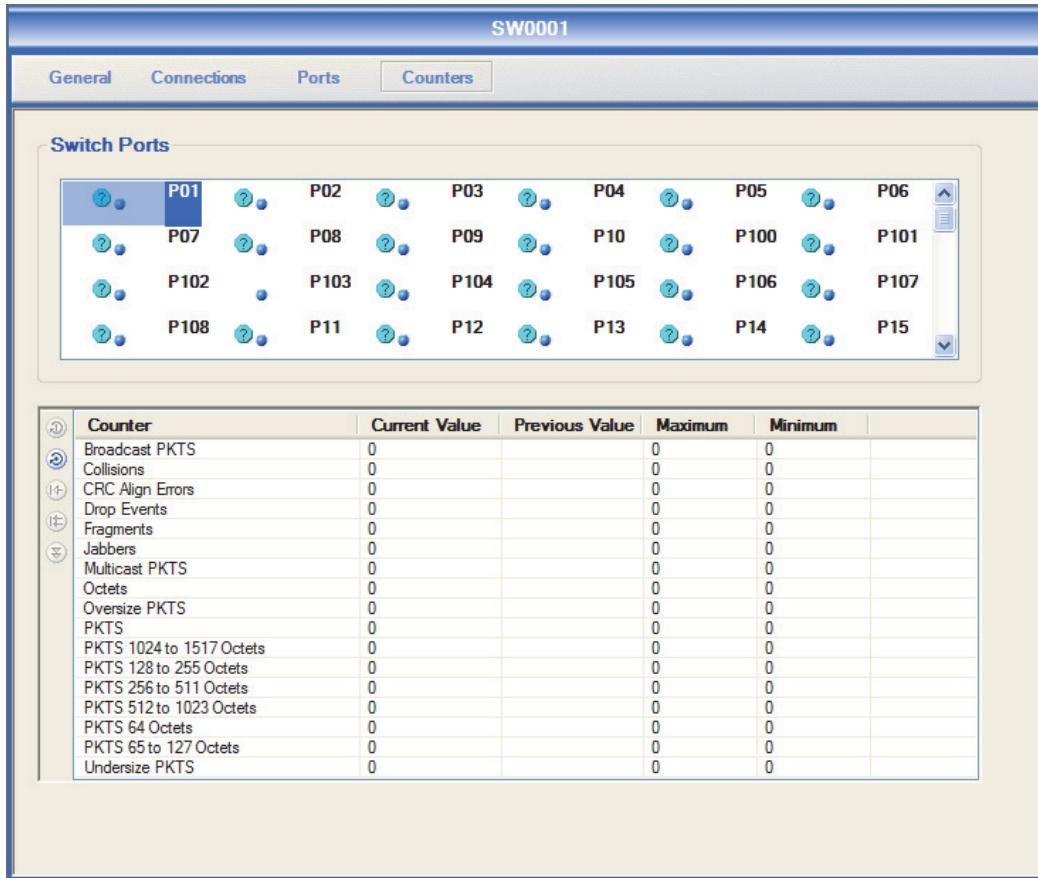


Figure 9-5. Counters Tab for a Switch

As with the Counters tab for other equipment, the buttons in the tab toolbar enable you to read counters for the selected port, and add counters to the list in the Accessories pane Watch tab. However, unlike the tabs for other equipment, the reset buttons are not enabled as switch port counters cannot be reset from System Manager. See “Counters Tab” on page 52 and “Watch Tab” on page 63 for additional information on using the Counters and Watch tabs, respectively.

The switch ports counters are described in the following table:

Table 9-3. Switch Port Counters Display Fields

Counter	Description
Broadcast PKTS	Number of broadcast packets that were transmitted to all stations.
Collisions	Number of collisions experienced by the controller chip during transmission attempts. This number should be zero (0) on The MESH switches.
CRC Align Errors	Number of properly aligned frames received with CRC errors. This number should be non-incrementing.

Table 9-3. Switch Port Counters Display Fields (Continued)

Counter	Description
Drop Events	The number of times packets that were dropped because the device could not keep up with the flow of traffic on the network. The number reflects the number of times packets were dropped, not the number of packets.
Fragments	The number of packets that were undersized (less than 64 bytes) and had either a non-integral number of bytes (alignment error) or a CRC error.
Jabbers	The number of packets that were oversized (greater than 1518 bytes) and had either a non-integral number of bytes (alignment error) or a CRC error. This number should be 0 with Ethernet switches.
Multicast PKTS	Number of multicast packets that were transmitted.
Octets	Number of octets that were transmitted.
Oversize PKTS	Number of packets that were greater than 1518 octets.
PKTS	Number of packets that were transmitted.
PKTS <range> Octets	Number of packets of the specified size that were transmitted.
Undersize PKTS	Number of packets that were less than 64 octets.

Equipment Change Actions

Switches

When a switch is selected, the following commands are available from the equipment's context menu and from the **Actions > Equipment Change** submenu pulled down from the main menu:

- **Acknowledge Station**
Acknowledges device alarms related to the switch. This command is displayed only when there is an unacknowledged alarm.
- **Inhibit Device Alarming/Enable Device Alarming**
Inhibits/enables reporting of switch alarms to the system monitor.
- **Disable All Reports/Enable All Reports**
Disables/enables all internal reporting from the switch, including the status of individual ports, to the assigned system monitor.

Ports

When a port number is selected in the Ports tab, the following commands are available from the port's context menu:

- **Acknowledge Device**

Acknowledges an alarm related to the port. This command is displayed only when there is an unacknowledged alarm.

- **Inhibit Device Alarming/Enable Device Alarming**

Inhibits/enables reporting of alarms from the port to the system monitor.

APPENDIX A

Supported Migration and Fieldbus Cluster I/O Modules

This chapter provides a list of migration modules as well as Fieldbus Cluster I/O modules that are supported by the System Manager software. For additional supported FBMs, refer to Chapter 8, “Fieldbus Modules”.

Following are the SPECTRUM™ migration modules supported by System Manager software. Refer to *SPECTRUM Migration Integrators* (PSS 31H-7SMI).

Table A-1. Spectrum Migration Modules

Module	Description
FBP11	UCM Spectrum Migration Interface
FBP11R	Redundant UCM Spectrum Migration Interface
3A2-V2D	High Level, Isolated
3A2-V3D	High Level
3A2-E2D	ac Voltage Input
3A2-I2D	Current Input, Isolated
3A2-I2DA	High Level, Isolated
3A2-I3D	Current Input
3A2-I3DA	High Level
3A2-H3D	High Level
3A4-I2D	Quad Current Input
3A2-M2D	MV/TC Adj Range
3A2-T2DJ1	Thermocouple Input
3A2-T2DJ2	Thermocouple Input
3A2-T2DK1	Thermocouple Input
3A2-T2DK2	Thermocouple Input
3A4-M2DA1	Millivolt/TC Input
3A4-M2DA2	Millivolt/TC Input
3A4-M2DA3	Millivolt/TC Input
3A4-M2DA4	Millivolt/TC Input

Table A-1. Spectrum Migration Modules (Continued)

Module	Description
3A4-M2DA5	Millivolt/TC Input
3A4-M2DA6	Millivolt/TC Input
3A4-M2DA7	Millivolt/TC Input
3A2-R2DC	Copper RTD
3A2-R2DN	Nickel RTD
3A2-R2DP	Platinum 1 RTD
3A2-R2DP	Platinum 2 RTD
3A2-R2DP	Platinum 3 RTD
3A2-R2DP2	Platinum RTD
3C8-C3D	Octal Contact Input
3C8-E2D	Octal Line V Mon
3A2-F2D	Pulse Rate Counter
3A2-Q2D	Pulse Input Count
3A2-D3V	Dual Voltage Output
3A2-D2I	Dual Current Output
3A2-D3I	Dual Current Output
3C4-D2CS	DC Switch Output
3C4-D2KS	AC Switch Output
3C8-D2CS	Octal Contact Output
3C4-D2VS	dc Volt Output
3C4-D2CP	dc Pulse Output
3C4-D2KP	ac Pulse Output
3C4-D2VP	dc Pulse Output
3AS-I2I	Single Loop I/O
3AS-I3I	Single Loop I/O
3AD-I3I	Dual Loop I/O
3A2-V2D	High Level, Isolated
3A2-V3D	High Level
3A2-E2D	ac Voltage Input
3A2-I2D	Current Input, Isolated
3A2-I2DA	High Level, Isolated
3A2-I3D	Current Input
3A2-I3DA	High Level
3A2-H3D	High Level
FBP12	FIO Spectrum Migration Interface
3F8-V2DA1	Octal High Level
3F8-V2DA2	Octal High Level
3F8-V2DA	Octal High Level

Table A-1. Spectrum Migration Modules (Continued)

Module	Description
3F4-I2D1A	Quad 0 to 20 mA dc, 16V
3F4-I2D2A	Quad 0 to 20 mA dc, 22V
3F8-I2DA	Octal High Level
3F8-H2DA	Octal High Level
3F8-T2DA1	Octal Thermocouple
3F8-T2DA2	Octal Thermocouple
3F8-T2DA3	Octal Thermocouple
3F8-T2DA4	Octal Thermocouple
3F8-T2DA5	Octal Thermocouple
3F8-T2DA6	Octal Thermocouple
3F8-T2DA7	Octal Thermocouple
3F8-M2DA1	Octal Millivolt
3F8-M2DA2	Octal Millivolt
3F8-M2DA3	Octal Millivolt
3F8-M2DA4	Octal Millivolt
3F8-M2DA5	Octal Millivolt
3F8-M2DA6	Octal Millivolt
3F8-M2DA7	Octal Millivolt
3F8-R2DCA	Octal RTD (Copper)
3F8-R2DNA	Octal RTD (Nickel)
3F8-R2DPA1	Octal RTD (Platinum 1)
3F8-R2DPA2	Octal RTD (Platinum 2)
3F8-R2DPA3	Octal RTD (Platinum 3)
3F8-C2DCA	Octal Contact
3F8-C2DNA	Octal Prox Sensor
3F8-E2DA	Octal HL Digital
3F4-F2DA	Quad Pulse Rate
3F4-Q2DA	Quad Pulse Counter
3F4-D2VA	Quad High Level Output
3F4-D2IA	Quad High Level Output
3F8-D2CSA	Octal dc Switch
3F8-D2ZA	Octal Solenoid Dvr
3F8-D2KSA	Octal ac Switch
3F4-D2WA	Quad Solenoid Dvr
3F8-D2CPA	Octal dc Pulse Sw
3F8-D2KPA	Octal ac Pulse Sw
3F8-V2DA1	Octal High Level
3F8-V2DA2	Octal High Level

Table A-1. Spectrum Migration Modules (Continued)

Module	Description
3F8-V2DA	Octal High Level
3F4-I2D1A	Quad 0 to 20 mA dc, 16V
3F4-I2D2A	Quad 0 to 20 mA dc, 22V
3F8-I2DA	Octal High Level
3F8-H2DA	Octal High Level
3F8-T2DA1	Octal Thermocouple
3F8-T2DA2	Octal Thermocouple
3F8-T2DA3	Octal Thermocouple
3F8-T2DA4	Octal Thermocouple
3F8-T2DA5	Octal Thermocouple
3F8-T2DA6	Octal Thermocouple
3F8-T2DA7	Octal Thermocouple
3F8-M2DA1	Octal Millivolt
3F8-M2DA2	Octal Millivolt
3F8-M2DA3	Octal Millivolt
3F8-M2DA4	Octal Millivolt
3F8-M2DA5	Octal Millivolt
3F8-M2DA6	Octal Millivolt
3F8-M2DA7	Octal Millivolt
3F8-R2DCA	Octal RTD (Copper)
3F8-R2DNA	Octal RTD (Nickel)
3F8-R2DPA1	Octal RTD (Platinum 1)
3F8-R2DPA2	Octal RTD (Platinum 2)
3F8-R2DPA3	Octal RTD (Platinum 3)
3F8-C2DCA	Octal Contact
3F8-C2DNA	Octal Prox Sensor
3F8-E2DA	Octal HL Digital
3F4-F2DA	Quad Pulse Rate
3F4-Q2DA	Quad Pulse Counter
3F4-D2VA	Quad High Level Output
3F4-D2IA	Quad High Level Output
3F8-D2CSA	Octal dc Switch
3F8-D2ZA	Octal Solenoid Dvr
3F8-D2KSA	Octal ac Switch
3F4-D2WA	Quad Solenoid Dvr
3F8-D2CPA	Octal dc Pulse Sw
3F8-D2KPA	Octal ac Pulse Sw

Table A-1. Spectrum Migration Modules (Continued)

Module	Description
FBP13	UFM Spectrum Migration Interface
3A8-V2D1	Octal High Level
3A8-I2D1	Octal High Level
3A8-M2D1	Octal Millivolt
3A8-M2D2	Octal Millivolt
3A8-M2D3	Octal Millivolt
3A8-T2D1	Octal Thermocouple
3A8-T2D2	Octal Thermocouple
3A8-T2D3	Octal Thermocouple
3A8-R2DC1	Octal RTD (Copper)
3A8-R2DN1	Octal RTD (Nickel)
3A8-R2DP1	Octal RTD (Platinum 1)
3A8-R2DP2	Octal RTD (Platinum 2)
3A8-R2DP3	Octal RTD (Platinum 3)
3D8-C2D1	Octal Contact
FBP14	UIO Spectrum Migration Interface

Following are the SPEC 200 Control Integrators supported by System Manager software. Refer to *SPEC 200 Control Integrators* (PSS 21H-7R1 B3).

Table A-2. SPEC 200 Control Integrators

Module	Description
S2BM04	Spec200 0 to 10 V dc I/O
S2BM17	Spec200 0 to 10 Volt
S2MM09	Extended Control Integrator
S2MM17	Basic Control Integrator

Following are the Fisher PROVOX migration modules supported by System Manager software. Refer to *DCS Fieldbus Module for Migration of Fisher PROVOX Systems* (PSS 31H-3A2).

Table A-3. Fisher PROVOX Migration Modules

Module	Description
F1M01A/C/E/F	Analog Input
F1M02	Analog Input
F1M03	Analog Input, 4 RTD
F1M04A/B	Analog Output
F1M06	Pulse Input

Table A-3. Fisher PROVOX Migration Modules (Continued)

Module	Description
F1M07	Discrete Input
F1M09	Digital Output
F1SFIA/B	Fieldbus Isolator
F2M214	Analog HART Input FBM
F2M215	Analog HART Output FBM
F2M239	Discrete I/O FBM
F2DFBI	Dual Baud Fieldbus Isolator, installed in F2DFBC Dual Baud Fieldbus Isolator Carrier Board
F2M67A (Legacy)	Discrete FBM (Replaced by F2M239)
F2M68A (Legacy)	Analog I/O FBM (Analog inputs replaced by F2M214, analog outputs replaced by F2M215)
F2SFBI	Fieldbus Isolator
FRM701	Configurable Controller FBM
FRM711	Computing Controller FBM
FRMMPU	Integrator for Fisher Interactive Controller

Following are the Honeywell migration modules supported by System Manager software. Refer to *DCS Fieldbus Module for Migration of Honeywell Systems* (PSS 31H-3A1).

Table A-4. Honeywell Migration Modules

Module	Description
H2C02A,B,D-H,J-N,P-Z	Analog Input
H2D02A-E,G,H	Analog Input
H2J02A-H	Analog Input
H2M01A,B,C,D	Analog Input
H2M02A,B,E	Analog Input
H2M03A-G	Analog Input
H2M04	Analog Output
H2M06, 6A	Pulse Input
H2M07,7E	Digital Input
H2M09	Digital Output
H2M17	AI/AO/DO
H2M24	Digital Input
H2M26	Digital Output
H2SFBI, H3SFBI	Fieldbus Isolator
H2V02B-R	Analog Input
H3M01	Analog Input

Table A-4. Honeywell Migration Modules (Continued)

Module	Description
H3M02A	DCS Integrator Kit
H3M02B	DCS Integrator Kit
H3M03	Analog Input
H3M04	DCS Integrator
H3M06	Pulse Input
H3M07	Digital Input
H3M09	Digital Output
H3M37	Analog Output
H3SFBI	DCS Fieldbus Isolator

Following are the Bailey migration modules supported by System Manager software. Refer to *DCS Fieldbus Module for Migration of Bailey Systems* (PSS 31H-3A3).

Table A-5. Bailey Migration Modules

Module	Description
BAMM01	Analog Input
BAOM37	Analog Output
BASIO1	Analog Input
BASIO3	Analog Input
BASM01	Analog Input
BASM02	Analog Input
BASM03	Analog Input
BASM33	Analog Input
BASO37	Analog Output
BCOM17	AI/DI/AO/DO
BDSI07	Discrete Input
BDSM06	Pulse Input
BDSM09	Discrete Output
BDSM09A	Discrete Input
BDSM09B	Discrete Input/Output
BDSO10	Discrete Output
BDSO26	Discrete Output
BDSO41	Discrete Output
BSEM01	Discrete Input
BSBE2	Fieldbus A/B Switch
BFBI	Fieldbus Isolator

Following are the Westinghouse Process Control WDPF I and II Systems migration modules supported by System Manager software. Refer to *DCS Fieldbus Module for Westinghouse Process Control WDPF I and II Systems* (PSS 31H-3A4).

Table A-6. Westinghouse Process Control WDPF I and II Systems Migration Modules

Module	Description
WAH01	Analog Input
WAI02A	Thermocouple Input
WAI01	Analog Input
WAO37	Analog Output
WAV02A	Thermocouple Input
WAW01	Analog Input
WAX01	Analog Input
WAX02A	Thermocouple Input
WBO09	Discrete Output
WCI07A	Contact Input
WDI07	Contact Input External
WID07	Contact Input
WLJ04	Analog I/O
WPA06A	Pulse Accumulator
WRF03	RTD Input
WRO09	Relay Output
WRT03	RTD Input
WTO09	TRIAC Output

Following are the Fieldbus Cluster I/O modules supported by System Manager software. Refer to B0193RB.

Table A-7. Fieldbus Cluster I/O Modules

Module	Description
FBP10	Fieldbus processor
FBP10R	Redundant Fieldbus Processor
FBC01	0 to 20 mA Input - 32
FBC01R	0 to 20 mA Input - 32 - Redundant
FBC02	T/C Input -32
FBC04R	0 to 20 mA Output – 16 - Redundant
FBC07A	24 Volt dc Inputs – 32
FBC07A/R	24 Volt dc Inputs – 32 - Redundant
FBC07B	Contact Input - 32

Table A-7. Fieldbus Cluster I/O Modules (Continued)

Module	Description
FBC07B/R	Contact Input – 32 - Redundant
FBC09	Contact Output – 32
FBC09R	Contact Output – 32 - Redundant
FBC10	Digital Input/Output - 64
FBC17	0 to 10 Volt Digital Input - 32
FBC17R	0 to 10 Volt Digital Input - 32 - Redundant
FBC21	0 to 20 mA Input - 16
FBC21R	0 to 20 mA Input – 16 - Redundant

A P P E N D I X B

Supported Classic I/A Series Services Modules

This chapter provides information on classic I/A Series modules supported by System Manager software.

Equipment Information for Device Integrator Peripherals

This Equipment Information Display contains information specific to the selected Device Integrator peripheral.

NAME

This name, PORT 00, 01, 02 or 03, is predefined by the gateway device.

TYPE

This type, FD_RS-232, identifies that the Foreign Device Gateway supports the FD_RS-232 device.

RUN MODE

On-line or Off-line. You can change the RUN MODE using the GO ON-LINE and GO OFF-LINE options in the Equipment Change Display. If the gateway is disabled, the last known run state of this peripheral appears.

The system updates this field when a status change occurs.

Off-line status:

- Check hardware.
- Download, if necessary.
- Check related fields (DOWNLOAD and EEPROM UPDATE).

FAIL STATE

Not Failed or Failed. The Foreign Device Gateway peripheral is installed as Failed, Off-line and remains as such until you put it on-line.

The following actions change this field to Failed:

- You physically disconnect the port.

- A physical failure occurs.

The system updates this field when a status change occurs.

If the field indicates a Failed status:

- Check peripheral hardware.
- Download, if necessary.
- Check Fieldbus and Foreign Device Gateway (FDG).

FAIL ACK STATE

Failure Acknowledged State displays Acknowledged (default) or Not Acknowledged. If the DEVICE STATE value changes from Not Failed to Failed, the value in this field changes to Not Acknowledged.

Click ACK in this display to acknowledge the selected faulted device; or click ACK ALL in the initial system management display to acknowledge all unacknowledged devices for which the workstation is responsible. The system updates this field when a status change occurs.

If the field indicates a Not Acknowledged state:

- Check printed/historical log for type of failure.
- To clear, click ACK or ACK ALL on the configured workstation processor.

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

The system updates this field when a status change occurs.

PROTOCOL

Identifies the protocol used on the port. Refer to the programmer's reference guide for the specific device to determine the protocol this number represents.

STOP BITS

Displays the number of stop bits, 1 or 2, required by the foreign device. You set this value during integrated control configuration.

PARITY

Indicates the type of parity required, as either None, Odd, or Even. You set this value during Integrated Control Configuration.

ECHO ENABLED

Indicates the echo mode as either enabled (Yes) or disabled (No). You set this value during integrated control configuration.

WAIT FOR EOM

Displays the amount of time the system waits for the end of message signal. This number represents the value in tenths of a second, for example, 5 indicates 0.5 of a second.

WAIT FOR RSP

Indicates the amount of time the system waits for a response signal. This number represents the value in tenths of a second, for example, 5 indicates 0.5 of a second.

RETRY COUNT

The number of times a device tries to re-send a message before timing out. The range of configurable counts depends on the type of Foreign Device peripheral; this value is set during Integrated Control Configuration.

LINE TIME

Length of time to validate a change of state when the data carrier detects signal changes. This number represents the value in tenths of a second, for example, 5 indicates 0.5 of a second.

MAX INPUT BYTES

The maximum number of bytes in a message. The range of configurable bytes depends on the type of Foreign Device peripheral

BAUD RATE

The rate for sending transmissions, 300, 600, 1200, 2400, 4800, 9600, or 19200. The range of configurable baud rates depends on the type of Foreign Device peripheral and is set during Integrated Control Configuration.

DATA BITS

The number of data bits per message word, 8, 7, 6, or 5. This number depends on the type of Foreign Device peripheral.

INI10, INI15 or SPECTRUM Interface Processor Peripheral Equipment Information Fields

This Equipment Information Display contains information specific to the Information Network Interface 10 (INI10), Information Network Interface 15 (INI15), or SPECTRUM Interface Processor (SIP). The INI10, INI15, and SIP each can have only one peripheral device, the X.25 port.

NAME

This name, PORT 00, 01, 02, or 03, is predefined by the gateway device.

TYPE

This type, FD_RS-232, identifies that the Foreign Device Gateway supports the FD_RS-232 device.

RUN MODE

On-line or Off-line. You can change the RUN MODE using the GO ON-LINE and GO OFF-LINE options in the Equipment Change Display. If the gateway is disabled, the last known run state of this peripheral appears.

The system updates this field when a status change occurs.

If the status is Off-line:

- Check hardware.
- Download, if necessary.
- Check related fields (DOWNLOAD and EEPROM UPDATE).

FAIL STATE

Failed or Not Failed (default). The system updates this field when a status change occurs.

The following can change this field to a Failed state:

- You click FAIL after running off-line diagnostics
- A hardware problem causes the station to fail for more than two minutes.
- You pulled/pushed the station, and it required more than two minutes to come back on-line.
- Any station hardware failure or communication failure that prevents the station from sending its internal reports for two or more minutes.

The operator-initiated equipment change actions (REBOOT, EEPROM UPDATE) and off-line diagnostics change the RUN MODE to Off-line, but do not change the FAIL STATE to Failed.

For fault-tolerant stations, refer to the PRIMARY MODE and SHADOW MODE fields for the current FAIL STATE of each module in the fault-tolerant pair.

If the status is Failed:

- Check Printer/Terminal/CPU hardware.
- Check communication path with parent station.
- Check configuration information.

FAIL ACK STATE

Displays Acknowledged (default) or Not Acknowledged. If the DEVICE STATE value changes from Not Failed to Failed, the value in this field changes to Not Acknowledged.

Click ACK in this display to acknowledge the selected faulted device; or click ACK ALL in the initial system management display to acknowledge all unacknowledged devices for which the workstation is responsible.

The system updates this field when a status change occurs.

If the state is Not Acknowledged:

- Check printed/historical log for type of failure.

- To clear, click ACK or ACK ALL on the configured workstation processor.

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

The system updates this field when a status change occurs.

SIP ECB Equipment Information Displays

NAME

This name, PORT 00, 01, 02, or 03, is predefined by the gateway device.

TYPE

Redundant ECB Selected (Black)

RUN MODE

On-Line. The ECB24 is placed On-Line when it is created and cannot be placed Off-Line. However, requesting “GO OFF LINE” through the EQUIPMENT CHANGE page for the AW51RS that is in the CTL state forces a switch to the other AW51RS in the redundant pair, if it is in the TRK state at the time of the request.

FAIL STATE

Failed or Not Failed. An ECB24 is in the normal, Not Failed state when the two AW51RSs in the redundant pair are able to communicate with each other normally. When there is a failure in these inter-processor communications, the ECB24 is Failed.

FAIL ACK STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If the FAIL STATE changes from Not Failed to Failed, the FAIL ACK STATE field changes to Not Acknowledged to indicate this transition. Use the ACK key in the top menu bar of the Equipment Information Display to acknowledge the selected faulted device or use the ACK ALL key in the top menu bar of the initial System Management Display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

ALRMING STATE

Indicates whether alarming is Enabled or Inhibited for the Device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health (a green “SYS BAR”) while equipment is failed or off-line.

System Alarm messages are not logged to the system printer, nor the Historian.

LAST SWITCH

Successful or Unsuccessful last switch of control between the two AW51RSs.

HARDWARE TYPE

41 for ECB24.

SOFTWARE TYPE

24 for ECB24.

ALT LETTERBUG

Physical letterbug of the other AW51RS in the redundant pair.

OPERATION STATE

CTL, SBY, TRK, or SBY/FAIL

INTERSPEC Integrator Translator Equipment Information

NAME

Letterbug of the INTERSPEC Integrator 30 station containing the INTERSPEC Integrator Translator (IIT).

TYPE

ISEC Intgr Trans (INTERSPEC Integrator Translator).

RUN MODE

On-line or Off-line. The IIT is installed as On-line after it is “fixed” and configured. For the INTERSPEC Integrator Translator (IIT) located in the station, changing the IIT status to Offline causes all communication to the integrator to stop and, therefore, all attached gateway peripherals to fail. As a result, the system sends numerous messages to the printer indicating communication and peripheral equipment failures.

Changing a peripheral status to Off-line causes communications to that specific device to stop.

You can change the RUN MODE using the GO ON-LINE and GO OFF-LINE Equipment Change options. If station reporting is disabled, the last known run state appears in this field.

The system updates this field when a status change occurs.

Off-line status:

- Check hardware.
- Download, if necessary.
- Check related fields (DOWNLOAD and EEPROM UPDATE).

FAIL STATE

Failed or Not Failed (initial setting). This field updates when a status change occurs. The following events change this field to Failed:

- Failure of the 186 chip
- Loss of Data Carrier Detect (DCD), indicating a cable break
- Software problem.

The field changes to Failed if any one of the following occurs to the IIT:

- Power is lost to the local enclosure
- The peripheral connection (elevator) is disengaged on the Integrator.
- If communications are not established to the IIT from the gateway station.

Failed status:

- Check peripheral hardware.
- Download, if necessary.
- Check INTERSPEC bus and INTERSPEC device.

FAIL ACK STATE

Displays Acknowledged (default) or Not Acknowledged. If the FAIL STATE value changes from Not Failed to Failed, the value in this field changes to Not Acknowledged to indicate this transition.

Click ACK to acknowledge the selected faulted device or click ACK ALL in the initial system management display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

The system updates this field when a status change occurs.

If the state is Not Acknowledged:

- Check printed/historical log for type of failure.
- To clear, click ACK or ACK ALL on the configured workstation processor.

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

The system updates this field when a status change occurs.

ACTIVE PIO BUS

Bus A or Bus B. This field initially is set to Bus A, or to the value saved in the checkpoint file.

This field indicates the current port used for communications to the INTERSPEC Integrator 30:

- Bus A indicates Port 1

- Bus B indicates Port 2.

SWITCHING MODE

Enabled (initial setting) or Not Enabled. When this field is set to Enabled, automatic switching can occur in the event of a bus fault for the following modes: BUS A: ENABLED and BUS B: ENABLED.

To change this field to Not Enabled, select the BUS A: DISABLED or BUS B: DISABLED action from the Equipment Change Display.

DIAG STATUS 1

Diagnostic Status 1 indicates the electrical status of Port 1 communications.

Table B-1. Electrical Status Definitions for Port 1 Communications

Electrical Status	Definition
00	Status appears before IIT has run diagnostics to determine the DCD and communication statuses.
08	Status indicates the DCD test to indicate the presence of a cable was successful; but the loopback diagnostics test was unsuccessful.
80	Status indicates the DCD test was unsuccessful; the last loopback diagnostics test was successful.
88	Status indicates that the cable is present and the loopback diagnostics was successful.

DIAG STATUS 2

Diagnostic Status 2 indicates the electrical status of Port 2 communications.

Table B-2. Electrical Status Definitions for Port 2 Communications

Electrical Status	Definition
00	Status appears before IIT has run diagnostics to determine the DCD and communication statuses.
08	Status indicates the DCD test to indicate the presence of a cable was successful; but the loopback diagnostics test was unsuccessful.
80	Status indicates the DCD test was unsuccessful; the last loopback diagnostics test was successful.
88	Status indicates that the cable is present and the loopback diagnostics test was successful.

SOFTWARE REV

This field is not applicable to the INTERSPEC Integrator Translator.

Equipment Information View for the Allen-Bradley Port (ECB 63, ECB 64, and ECB 65)

NAME

User-supplied ECB name, as configured using ICC.

TYPE

Identifies the type of Allen-Bradley device as follows: AB PIOM (A-B Port ECB63); AB PLC (A-B PLC ECB64); AB SCAN (A-B Scan ECB65).

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up. You can change the RUN MODE using the GO ON-LINE and GO OFFLINE options in the Equipment Change Display. If station reporting is disabled, the last known run state appears in this field. If reporting is disabled, the last known state appears in this field.

The system updates this field when a status change occurs.

RUN MODE and FAIL STATE are separate but related fields for some stations. Although you can use the GO ON-LINE and GO OFF-LINE options to change the RUN MODE to Off-line, this does not fail the station. However, a failed station changes the RUN MODE to Off-line.

This value changes to Off-line if any of the following occur:

- A reboot of the station.
- An EEPROM update.
- An off-line diagnostic request.
- A physical pull/push of the station (requiring more than two minutes to come back on-line).
- Any station hardware failure or communication failure that results in the station no longer being able to send its internal reports for two minutes or more.

For fault-tolerant stations, refer to the PRIMARY MODE and SHADOW MODE fields for the current RUN MODE of each module of the pair.

DEVICE STATE

Failed or Not Failed. This field is initially Not Failed. This field changes to Failed if any of the following occur:

- The operator selects the FAIL soft key after running off-line diagnostics.
- A hardware problem causes the station to fail for more than two minutes.
- A physical pull/push of the station (requiring more than two minutes to come back on-line) is performed.

- Any station hardware failure or communication failure results in the station not able to send its internal reports for two or more minutes.
- Operator-initiated equipment change actions (REBOOT, EEPROM UPDATE) or off-line diagnostics change the RUN MODE to Off-line, but do not change the FAIL STATE to Failed.

FAIL ACK STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If the FAIL STATE changes from Not Failed to Failed, the FAIL ACK STATE field changes to Not Acknowledged to indicate this transition. Use the ACK key in the top menu bar of the Equipment Information Display to acknowledge the selected faulted device or use the ACK ALL key in the top menu bar of the initial System Management Display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health (a green System bar) while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

HARDWARE TYPE

Number associated with the peripheral hardware, as follows: 103 (ECB63); 104 (ECB64); 105 (ECB65). This value is configured with the ICC for the specific ECB.

SOFTWARE TYPE

Number identifying the software used in the DIW devices, as follows: 63 (ECB63); 64 (ECB64); 65 (ECB65). This value is configured with the ICC for the ECB.

COMPOUND NAME

Displays the compound name for the device. This field does not apply to the ECB63 device.

BLOCK NAME

Displays the block name for the device. This field does not apply to the ECB63 device.

PRIM CMD STAT

Primary Command Status represents a communication status code. This field does not apply to the ECB63 device.

PLC ERROR STAT

0; This field does not apply to the ECB63 device.

PLC EXT STAT

0; This field does not apply to the ECB63 device.

Equipment Information for the A-B Station PLC5 Series

NAME

Letterbug assigned to the PLC.

TYPE

The type is determined by the A-B station when checking the devices on its PLC.

The type for this A-B PLC can be one of the following: PLC5/11, PLC5/20, PLC5/30, PLC5/40, PLC5/60, or PLC5/80.

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up. You can change the RUN MODE using the GO ON-LINE and GO OFF-LINE options in the Equipment Change Display. If the station reporting is disabled, the last known run state appears in this field. If reporting is disabled, the last known state appears in this field. The system updates this field when a status change occurs. RUN MODE and FAIL STATE are separate but related fields for some stations. Although you can use the GO ON-LINE and GO OFF-LINE options to change the RUN MODE to Off-line, this does not fail the station. However, a failed station changes the RUN MODE to Off-line.

This value changes to Off-line if any of the following occur:

- A reboot of the station
- An EEPROM update
- An off-line diagnostic request
- A physical pull/push of the station (requiring more than two minutes to come back on-line)
- Any station hardware failure or communication failure that results in the station no longer being able to send its internal reports for two minutes or more.

For fault-tolerant stations refer to the PRIMARY MODE and SHADOW MODE fields for the current RUN MODE of each module of the pair.

FAIL STATE

Failed or Not Failed (default). The system updates this field when a status change occurs.

The following can change this field to a Failed state:

- You click FAIL after running off-line diagnostics
- A hardware problem causes the station to fail for more than two minutes
- You pulled/pushed the station, and it required more than two minutes to come back on-line

- Any station hardware failure or communication failure that prevents the station from sending its internal reports for two or more minutes.

The operator-initiated equipment change actions (REBOOT, EEPROM UPDATE) and the off-line diagnostics change the RUN MODE to Off-line, but do not change the FAIL STATE to Failed.

For fault-tolerant stations, refer to the PRIMARY MODE and SHADOW MODE fields for the current FAIL STATE of each module in the fault-tolerant pair.

FAIL ACK STATE

Failure Acknowledged State displays Acknowledged (default) or Not Acknowledged. If the FAIL STATE value changes from Not Failed to Failed, the value in this field changes to Not Acknowledged to indicate this transition.

Click ACK to acknowledge the selected faulted device or click ACK ALL in the initial system management display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

The system updates this field when a status change occurs.

If the state is Not Acknowledged, check printed/historical log for type of failure. To clear, click ACK or ACK ALL on the configured workstation processor.

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

The system updates this field when a status change occurs.

If the state is Not Responding or Not Acknowledged, check hardware.

PLC MODE

Displays the PLC mode, as follows:

- RUN Mode: The PLC is running the ladder program and is driving the outputs.
- PROGRAM Mode: The PLC is being programmed with ladder logic, is not running a ladder program, and is not driving the outputs.
- TEST Mode: The PLC is running the ladder program and updating in-memory data fields, but is not driving the outputs.

DH ADDRESS

Address of the PLC on the A-B Data HighwayPlus™ displayed in decimal.

RAM STATUS

Displays the PLC RAM status as either good or bad. If bad, refer to the PLC documentation.

MAX PROGRAM SCAN

The Maximum Program Scan is the current maximum value (in milliseconds) for the last program scan.

MAJOR FAULT

A bit pattern display of major faults in the PLC. Major faults (for example, a hardware fault) halt the processor and stop it from processing information. Consult your PLC documentation for the meaning of fault codes.

FAULTED PGM RUNG

The rung number of the ladder program executing when the fault occurred.

MINOR FAULT 1

A bit pattern display of minor faults in the PLC. Minor faults indicate a problem that is not severe enough to halt the processor. Consult your PLC documentation for the meaning of fault codes.

FAULTED PGM FILE

The name of the file that contains the ladder program executing when the fault occurred.

MINOR FAULT 2

A bit pattern display of minor faults in the PLC. Minor faults indicate a problem that is not severe enough to halt the processor. Consult your PLC documentation for the meaning of fault codes.

FAULT CODE

Consult your PLC documentation for the error corresponding to the fault code.

Equipment Information for the A-B Station Rack

The A-B Station Rack is always a site specific I/O card. All rack-specific fields indicate status and cannot be set.

NAME

Letterbug assigned to the A-B Rack.

TYPE

A-B Rack.

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up. You can change the RUN MODE using the GO ON-LINE and GO OFFLINE options in the Equipment Change Display. If station reporting is disabled, the last known run state appears in this field. If reporting is disabled, the last known state appears in this field.

The system updates this field when a status change occurs.

RUN MODE and FAIL STATE are separate but related fields for some stations. Although you can use the GO ON-LINE and GO OFF-LINE options to change the RUN MODE to Off-line, this does not fail the station. However, a failed station changes the RUN MODE to Off-line.

This value changes to Off-line if any of the following occur:

- A reboot of the station
- An EEPROM update
- An off-line diagnostic request
- A physical pull/push of the station (requiring more than two minutes to come back on-line)
- Any station hardware failure or communication failure that results in the station no longer being able to send its internal reports for two minutes or more.

For fault-tolerant stations, refer to the PRIMARY MODE and SHADOW MODE fields for the current RUN MODE of each module of the pair.

FAIL STATE

Failed or Not Failed (default). The system updates this field when a status change occurs.

The following can change this field to a Failed state:

- You click FAIL after running Off-line Diagnostics
- A hardware problem causes the station to fail for more than two minutes
- You pulled/pushed the station, and it required more than two minutes to come back on-line.
- Any station hardware failure or communication failure that prevents the station from sending its internal reports for two or more minutes.

The operator-initiated equipment change actions (REBOOT, EEPROM UPDATE) and the off-line diagnostics change the RUN MODE to Off-line, but do not change the FAIL STATE to Failed.

For fault-tolerant stations, refer to the PRIMARY MODE and SHADOW MODE fields for the current FAIL STATE of each module in the fault-tolerant pair.

FAIL ACK STATE

Failure Acknowledged State displays Acknowledged (default) or Not Acknowledged. If the FAIL STATE value changes from Not Failed to Failed, the value in this field changes to Not Acknowledged to indicate this transition.

Click ACK to acknowledge the selected faulted device or click ACK ALL in the initial system management display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

The system updates this field when a status change occurs.

If the state is Not Acknowledged, check printed/historical log for type of failure. To clear, click ACK or ACK ALL on the configured workstation processor.

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

The system updates this field when a status change occurs.

If the state is Not Responding or Not Acknowledged, check hardware.

RACK FAULT

Displays Yes if the rack configuration is correct; otherwise, displays No.

RACK QUEUE FULL

Displays Yes if the block transfer queue is full; otherwise, displays No.

RACK INHIBIT

Displays Yes if the rack is inhibited; otherwise, displays No. If the rack is inhibited, the A-B Station does not scan the I/O.

RACK RESET

Displays Yes if the outputs to the rack are turned off and stay off until the Rack Reset is cleared; otherwise, displays No. When the PLC gets no response from the rack after 100 ms, it issues a Reset.

I/O SLOT 0-15

User-defined names for I/O devices installed in the related slots.

Equipment Information Display for Modicon Port ECB (ECB60, ECB61, and ECB62)

NAME

User-supplied ECB name, as configured using ICC.

TYPE

Identifies the type of Modbus device as follows: MODBUS PIOM (ECB60); MODBUS PLC (ECB61); MODBUS SCAN (ECB62).

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up.

DEVICE STATE

Failed or Not Failed. This field is initially Not Failed.

FAILURE ACKNOWLEDGED STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged.

ALARMING STATE

Indicates whether alarming is Enabled or Inhibited for the device.

HARDWARE TYPE

100 (ECB60); 101 (ECB61); 102 (ECB62).

SOFTWARE TYPE

60 (ECB60); 66 (ECB61) or 62 (ECB62).

COMPOUND NAME and BLOCK NAME

Displays the compound name and block name for the device.

PRIMARY COMMAND STATUS

Represents a communication status code. This field does not apply to the ECB60 device.

PLC ERROR STATUS

0; This field does not apply to the ECB60 device.

PLC EXT STATUS

0, This field does not apply to the ECB60 device.

LAST CABLE ACCESS

Reflects the health of both cables as follows: Both Cables OK, Cable A Not OK, Cable B Not OK, or Both Cables Not OK. This field applies to the selected device and indicates whether transmissions were successfully sent the last time either Bus A or B was used.

This field does not apply to the ECB60 device.

The system updates this field when a status change occurs.

A Not OK status indicates a PIO Bus send failure. To resolve:

- Check the PIO Bus.
- Switch to the other cable if the bus is bad.

LOGICAL ADDRESS

The logical address, 1 through 16, of the gateway peripheral; this value is configured using the ICC. The logical address order of the peripherals is the order in which the peripherals were “fixed” during configuration. This field does not apply to the ECB60 device.

ALTERNATE PORT

No Bkup Possible or None. Identifies whether backups are permitted to the alternate parent ECB port for this device. This alternate port takes over if the designated parent ECB port fails or has a change of state. This field does not apply to the ECB60 device.

Micro-I/A AB-PIO Peripherals Equipment Information

NAME

User-supplied ECB name, as configured using ICC.

TYPE

Identifies the type of AB-PIO device as AB PRIMARY IO.

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up.

DEVICE STATE

Failed or Not Failed. This field is initially Not Failed.

FAILURE ACKNOWLEDGED STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged.

ALARMING STATE

Indicates whether alarming is Enabled or Inhibited for the device.

FAILED DEVICE ATTACHED

Displays Yes if one or more peripherals attached to the station report as failed; otherwise, displays No.

The system updates this field when a status change occurs.

If the status is Yes, one or more of the attached peripherals have failed. Verify status of peripherals.

COMPOUND NAME and BLOCK NAME

Displays the compound name and block name for the device.

HARDWARE TYPE

Number, 123, associated with the peripheral hardware type.

PORT

Displays 2, 3 or 4. This field displays the PCMCIA card's port number, which corresponds with the Micro-I/A Station slot number in which the card is plugged.

NUMBER OF ADAPTERS

Displays the number (1 through 32) representing the number of actively scanned RIO adapters on the A-B network.

FAULTED ADAPTERS

Displays the number (0 through 32) indicating the number of RIO adapters that are in the fault state.

MODE

Indicates the mode (program or run) the AB-PIO Bus device is currently in. Mode 1 is program and 2 is run.

DUPLICATE SCANNER

This field displays a 0 or a 1. The AB-RIO adapters do not work properly when there is more than one AB-PIO Bus device connected to a single network. A value of 1 indicates duplicate active scanners; 0 indicates that only one AB-PIO Interface card is connected.

BAUD RATE

This field indicates the baud rate at which the bus is operating. The value in this field describes the configuration of the ECB, and must match the rate configured by the Adapter DIP switches (jumper-configured rate) at the AB-RIO modules.

Table B-3. Baud Rate values

Value	Baud Rate (Kbd)
0	57.6
1	115.2
2	230.4

Micro-I/A GE-PIO Peripherals Equipment Information

NAME

User-supplied ECB name, as configured using ICC.

TYPE

Identifies the type of GE-PIO device as GE PRIMARY IO.

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up.

DEVICE STATE

Failed or Not Failed. This field is initially Not Failed.

FAILURE ACKNOWLEDGED STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. F.

ALARMING STATE

Indicates whether alarming is Enabled or Inhibited for the device.

FAILED DEVICE ATTACHED

Displays Yes if one or more peripherals attached to the station report as failed; otherwise, displays No.

The system updates this field when a status change occurs.

If the status is Yes, one or more of the attached peripherals have failed. Verify status of peripherals.

COMPOUND NAME and BLOCK NAME

Displays the compound name and block name for the device.

HARDWARE TYPE

Number, 113, associated with the peripheral hardware type.

PORt

Displays 2, 3 or 4. This field displays the PCMCIA card's port number, which corresponds with the Micro-I/A station slot number in which the card is plugged.

HARDWARE REVISION

This field is not currently supported.

MANUFACTURE DATE

This field is not currently supported.

EROM REVISION

This field is not currently supported.

SERIAL NUMBER

This field is not currently supported.

SOFTWARE REVISION

This field is not currently supported.

ORIENTATION

Identifies the GE FANUC bus device orientation using the following values:

- **0** - A left-to-right physical orientation indicates that the field interface cable attaches to the field terminal base such that with the I/O module installed the cable enters on the side nearest the label text “SLOT.”
- **1** - A right-to-left physical orientation indicates that the field interface cable attaches to the field terminal base such that with the I/O module installed the cable enters on the side nearest the label text “PWR.”

ERROR CODE

This field is normally 0. If an error is detected in the GE FANUC bus device, this field is set to a non-zero value.

Note Refer to Micro-I/A station maintenance documentation for error code identification, description and corrective action.

Equipment Information Display for an AB-RIO Adapter

NAME

User-supplied ECB name, as configured using ICC.

TYPE

Identifies the type of AB-RIO device as AB-RIO ADAPTER.

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up.

DEVICE STATE

Failed or Not Failed. This field is initially Not Failed.

FAILURE ACKNOWLEDGED STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged.

ALARMING STATE

Indicates whether alarming is Enabled or Inhibited for the device.

FAILED DEVICE ATTACHED

Displays Yes if one or more peripherals attached to the station report as failed; otherwise, displays No.

The system updates this field when a status change occurs.

If the status is Yes, one or more of the attached peripherals have failed. Verify status of peripherals.

COMPOUND NAME and BLOCK NAME

Displays the compound name and block name for the device.

HARDWARE TYPE

Number, 114, associated with the peripheral hardware type.

RESTART LOCKOUT

This field is not currently supported.

FAULT GROUP ID

An RIO adapter can be configured to be part of a fault group. The Fault Group ID identifies the number of the fault group (1 through 15) to which the RIO is configured.

ADAPTER ON-LINE

Indicates the current state of the AB-RIO adapter, where Off-line is 0 and On-line is 1.

GROUP FAULT

Normally, this field displays a 0. If one of the adapters in the fault groups has a fault, this value is a 1.

RACK NUMBER

Displays the value from 1 to 32 representing the rack number configured to the ECB as set by the adapter DIP switches. This value appears as a one-based decimal, as opposed to the DIP switches on the module which are set with zero-based octal values.

Equipment Information Display for a GE I/O Device and A-B I/O Device

NAME

GE4752 and TS5783

TYPE

GE-IO Mod B AI and AB-IO Mod 4 AO

RUN MODE

On-line or Off-line. You can change the RUN MODE using the GO ON-LINE and GO OFF-LINE options in the Equipment Change Display. If the gateway is disabled, the last known run state of this peripheral appears.

The system updates this field when a status change occurs.

If the status is Off-line:

- Check hardware.
- Download, if necessary.

Check related fields (DOWNLOAD and EEPROM UPDATE)

DEVICE STATE

Failed or Not Failed.

FAIL ACK STATE

Failure Acknowledged State displays Acknowledged (default) or Not Acknowledged. If the FAIL STATE value changes from Not Failed to Failed, the value in this field changes to Not Acknowledged to indicate this transition.

Click ACK to acknowledge the selected faulted device or click ACK ALL in the initial system management display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

The system updates this field when a status change occurs.

If the state is Not Acknowledged, check printed/historical log for type of failure. To clear, click ACK or ACK ALL on the configured workstation processor

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

The system updates this field when a status change occurs.

If the state is Not Responding or Not Acknowledged, check hardware.

COMPOUND NAME

PORt3 and PORT4

BLOCK NAME

GE4752 and TS5783

HARDWARE TYPE

123

FAULT BYTE

Only A-B I/O analog devices report per channel faults in the FAULT BYTE field. If a channel is not set active, the fault byte information is not set.

Each bit represents one channel. Bit 0 (the right-most bit on display) is channel 1 (0 on the module).

The following can be displayed in the FAULT BYTE field:

- ECB75 (1794-IE8) – Under range errors (4 to 20 mA range only) for each channel indicate either a broken or open input wire, or input at or below 4 mA.
- ECB78 (1794-OE4) – An error in any of the four outputs (4 to 20 mA range only) indicates the wire on the output is either broken or the load resistance is too high.
- ECB79 (1794-IE4XOE2) – Under range errors for any of the four input channels (4 to 20 mA range only) indicates either a broken or open input wire, or input at or below 4 mA. Errors in the two outputs (4 to 20 mA range only) indicate the wire on the output is either broken or the load resistance is too high.
- ECB101 (Hardware types 127 and 128, 1794-IT8 and 1794-IR8) – Indicate over and under range errors. An under range error is set if the input signal is below the input channel's minimum range. An over range error is set if the input signal is above the input channel's maximum range or an open detector is identified.

MODULE NUMBER

This value, 1 through 8 inclusive, indicates the position of the GE I/O module with regard to the GE Fanuc bus device, with Module 1 being the closest to the field interface cable.

This value, 1 to 8 inclusive, defines the position of the module with regard to the RIO adapter. Module 1 is the closest to the AB-RIO adapter, and Module 8 is the furthest away.

ERROR CODE

This field is normally 0. If an error is detected in the GE I/O module, this field is set to a nonzero value.

Equipment Information Display for ECB96 Port

NAME

Shows the station letterbug assigned during System hardware configuration.

TYPE

Shows the type of station defined when the letterbug is assigned during System configuration.

RUN MODE

On-line. This field is always on-line (ECB96 is always on line) when the station reports to the System Monitor.

DEVICE STATE

On Scan or Not Ready. This field is initially On Scan.

This field changes to Not Ready if any of the following occur:

- The operator selects the FAIL softkey after running Off-line Diagnostics.
- A hardware problem causes the station to fail for more than two minutes.
- Any station hardware failure or communication failure that results in the station not able to send its internal reports for two or more minutes.

Operator-initiated Equipment Change actions (EEPROM update) or Off-line Diagnostics change the RUN MODE to Not Ready.

FAIL ACK STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If the DEVICE STATE changes from On Scan to Not Ready, the FAIL ACK STATE field changes to Not Acknowledged to indicate this transition. Use the ACK key in the top menu bar of the Equipment Information Display to acknowledge the selected faulted device or use the ACK ALL key in the top menu bar of the initial System Management Display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

ALARMING STATE

Indicates whether alarming is Enabled or Inhibited for the device. When alarming is Inhibited, the System Monitor continues to indicate overall system and network health (a green “SYS BAR”) while equipment is failed or off-line. System Alarm messages are not logged to the system printer, nor the Historian.

FAIL DEV ATT

Yes or No. Yes is specified if one or more devices attached to the station are reported as failed.

FAIL DEV ACK

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If any of the attached devices become unacknowledged, the field changes to Not Acknowledged.

COMPOUND NAME

The name of the compound that contains the ECB96 Database.

BLOCK NAME

The text string configured (with ICC) for the ECB96’s NAME parameter. This name is used by all I/O blocks (in their IOM_ID parameter) to reference the device.

HARDWARE TYPE

158 (as configured with the ICC for ECB96).

SOFTWARE TYPE

Zero (as configured with the ICC for ECB96).

POR TFLAGS

Indicates type and status of data exchange. Currently the flags are:

0x02 WAIT LOCK

The process attached to the message exchange is currently accessing the wait packet queue.

0x20 THROTTLE

A message exchange which allows requests to be sent if the quota of buffers used exceeds the maximum allotted.

0x40 UNSOL MSG

A message exchange which is expecting requests from the remote system, but in an asynchronous fashion. If this flag is not set, if a solicited type message (one without the BSI_UNSOL_MSG flag set) arrives without a matching wait packet, the message is discarded.

0x80 CRIT APP

If this bit is set, the Open BSI cannot be shutdown until the current message exchange is released.

PRIM CMD STAT

- 0 = Normal – No Problem.
- 2 = Device did not respond.
- 1 = A retry will be made in an attempt to clear a problem.
- 4 = The response from the device had one of the following errors: exception code returned by the device (which is saved in DEVICE STATUS); or parity, framing, buffer overrun, or block-check (CRC) error.
- 64 = Disconnected.

DEVICE STATUS

Exception error code sent by the device in a reply message.

Code Number	Meaning
1	Normal – No error
2	No communications event present

DEVICE CMD STATUS

A non-zero value indicates that an error was detected by the communication driver software. If the condition persists (so that successful communications

are not possible) and is not eliminated by a hardware reset of the AW70, replace the communications card.

If the condition happens often, but is not debilitating, report it to your Foxboro Service Representative

MESSAGE SENT

Number of messages sent from this message exchange since the last time the MEX was allocated, or the statistics were initialized

WAIT MESSAGE

Number of message blocks waiting for processing by the current process

MESSAGE RECV

Number of messages processed by this message exchange

LOCAL MESSAGE

If non-zero, the message exchange currently has message data which was copied to the local queue

BUFFER OVERFLOW

Number of times which this server attempted to send out more messages than allowed by its reserved buffer count

WAIT RESPONSES

Number of responses being waited for by the current service

NO BUFFERS

Number of times that an allocate buffer or send message was refused due to a lack of buffers in the system. This field should always be zero.

MAX BUFFERS

Maximum number of buffers allowed to be reserved by this message exchange (task). A buffer is reserved when the MEX is expecting a response to a previously sent message

LOCK ERROR

Number of times that a conflict has occurred locking this message exchange

USED BUFFERS

Number of buffers currently reserved for use by the message exchange (task). In general, the number of buffers cannot exceed the maximum buffer count; however, exceptions can arise during peak communications loading

Equipment Information Display for ECB97 RTU

NAME

RTU1. Shows station letterbug assigned during System hardware configuration.

TYPE

BB RTU. Shows type of station defined when the letterbug is assigned during System configuration.

RUN MODE

On-line or Off-line. This field is initially off-line. It changes to on-line when the station, after booting up, reports to the System Monitor. If reporting is disabled, the last known state appears in this field.

RUN MODE and DEVICE STATE should be viewed as separate, but related fields. Although certain Equipment Change options change the RUN MODE to Off-line, they do not fail the station.

However, a failed station results in the RUN MODE changing to Off-line.

The field changes to Off-line if any of the following occur:

- A reboot of the station.
- An EEPROM update.
- An off-line diagnostic request.
- Any station hardware failure or communication failure that results in the station not able to send its internal reports for two or more minutes.

DEVICE STATE

On Scan or Not Ready. This field is initially Not Ready. This field changes to Not Ready if any of the following occur:

- A hardware problem causes the station to fail for more than two minutes.
- Any station hardware failure or communication failure that results in the station not able to send its internal reports for two or more minutes.

Operator-initiated Equipment Change actions (reboot, EEPROM update) or Off-line Diagnostics change the RUN MODE to Off-line, but do not change the DEVICE STATE to Not Ready.

FAIL ACK STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If the DEVICE STATE changes from On Scan to Not Ready, the FAIL ACK STATE field changes to Not Acknowledged to indicate this transition. Use the ACK key in the top menu bar of the Equipment Information Display to acknowledge the selected faulted device or use the ACK ALL key

in the top menu bar of the initial System Management Display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

ALARMING STATE

Indicates whether alarming is Enabled or Inhibited for the device. When alarming is Inhibited, the System Monitor continues to indicate overall system and network health (a green “SYS BAR”) while equipment is failed or off-line. System Alarm messages are not logged to the system printer, nor the Historian.

FAIL DEV ATT

Yes or No. Yes is specified if one or more devices attached to the station are reported as failed.

FAIL DEV ACK

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If any of the attached devices become unacknowledged, the field changes to Not Acknowledged.

COMPOUND NAME

AWNT01_ECB. Name of the compound that contains the ECB97.

BLOCK NAME

Text string configured (with ICC) for the ECB97’s NAME parameter. All I/O blocks use this name (in their IOM_ID parameter) to reference the device.

HARDWARE TYPE

159 (as configured with the ICC for ECB96).

SOFTWARE TYPE

Zero (as configured with the ICC for ECB96).

PORT STATUS

Flags indicating current status of the current RTU:

0x01= PORT_OFFLINE

Indicates that the RTU is not configured into system.

0x02= TIME SYNC NEEDED

Set when the RTU is due to receive a time synch message.

0x04= PORT_DEAD

Set when the current RTU will not accept messages.

0x08= CONFIG ERROR

Set when an RTU is declared inactive due to a configuration error on the current communication line.

0x10= DOWNLOADING

Download to current RTU is in progress.

0X20= NEED POLL

The attached RTU requires a poll on the next poll pass. Used to implement a

preferred poll pass of only those nodes which responded to the previous poll pass.

PRIME CMD STAT

- 0 = Normal – No Problem.
- 0x40 = CMD_INV = invalid command used

PORT FLAGS

Flags indicating the options used for the current RTU:

0x01= LOCAL SLAVE
Direct connected to RTU

0x02= FIRST SLAVE
Current RTU is the first slave defined on the line.

0x04= DIAL LINE
This RTU is on a line which must be dialed.

0x08= MODEM
This RTU requires RTS / CTS keying

DEV CMD STATUS

The request type.

PORT TYPE

Flags indicating the protocol used:

- 0x01 = BSAP
- 0x02 = REMOTE
- 0x03 = EBSAP

DEVICE STATUS

Exception error code sent by the RTU in a reply message.

Code Number	Meaning
1	Normal – No error
2	No communications event present
3	Node requires local download
20	Data stored in user buffer
21	Some data has been stored
22	Data not available – communications error
23	Error attempting to send to BSI
24	Node name not found
25	Error parsing response
27	Node's load version has changed

Code Number	Meaning
-100	MEX not initialized for process
-101	Service already allocated by other process
-102	No unused service found
-105	Unable to reserve wait packet for response
-115	System not initialized
-116	Initialization already performed
-117	Not correct NETTOP version number
-118	First level slave not accepting message
-119	Message to send has invalid length
-121	Invalid MEX number specified
-122	Invalid first level slave number specified
-126	RTU not located in NETTOP file
-127	Communication line already started with

READ MESSAGE CNT

Read Messages Sent/Received RTU

READ NAK COUNT

Read NAKs Sent/Received

READ TIMEOUTS

Read Time-outs on Send/Receive

READ CRC ERRORS

Read CRC errors statuses Sent/Received

WRITE MSG COUNT

Write Messages Sent/Received

WRITE NAK COUNT

Write NAKs Sent/Received

WRITE TIMEOUTS

Write Time-outs on Send/Receive

WRITE CRC ERRORS

Write CRC errors statuses Sent/Received

BUFFER OVERFLOW

Input character buffer overflowed before receiving the end of message sequence.

MISSING END MESSAGE

A start message sequence was detected before receiving the corresponding end codes.

INVALID DLE

An invalid DLE sequence was received: the DLE (10 hex) was not followed by an ETX (03 hex), STX (02 hex), SOH (01 hex), or DLE.

NO BUFFERS

A buffer was not available to load in an incoming message.

INVALID ACK

An ACK message has been received when one was not expected, or the message contained an invalid message identifier.

DUPLICATE ID

Number of times that a message was received with a duplicated sequence number. This can occur when a remote system misses an ACK message.

ACK TIMEOUTS

Number of times that a messages ACK has not returned within the time interval allowed.

DIAL OK

Available only on systems which support dial-up. It is the number of times that this RTU has successfully been connected via a dial operation.

DIAL FAIL

Available only on systems which support dial-up. It is the number of times that a dial operation failed to the current RTU.

OUT QUEUE

Number of messages waiting to be sent to this RTU. Note: When using direct connect BSAP, this field is only maintained for the first slave on the communication line.

RETRY COUNT

Number of attempts which have been made to send the current message out of the communication port. For direct connect BSAP, this field is only maintained on the first slave on the communication line.

FoxGuard Manager Equipment Information

NAME

Device name for the ECB85.

TYPE

Always FoxGuard Monitor based on the ECB hardware type parameter (HWTYPE).

RUN MODE

The FoxGuard Manager mode is either on-line or off-line.

DEVICE STATE

Indicates whether the Advanced Communications Module has failed.

FAIL ACK STATE

Indicates whether failure in the Advanced Communications Module has been acknowledged.

ALARMING STATE

Indicates whether device alarming to the Nodebus level has been enabled or inhibited. Device alarming can be enabled or inhibited with the Equipment Change overlay.

FAIL DEV ATT

Reports when a TRICON module referenced by a FoxGuard Manager I/O ECB has a fault.

WARNING CONDITION

Yes indicates that there is a warning condition concerning the FoxGuard Manager hardware, either Power Supply Failure or Maintenance Required.

FAIL DEV ACK

Shows whether a TRICON I/O module fault has been acknowledged from a Nodebus workstation.

COMPOUND NAME

Name of the ECB compound, <letterbug>_ECB, where letterbug is the letterbug of the DNBI.

LOGICAL ADDRESS

This field is not used in the FoxGuard Manager.

BLOCK NAME

TRICON_ECB, the block name of the FoxGuard Monitor ECB.

HARDWARE TYPE

The ECB85 hardware type is 142.

SOFTWARE TYPE

The software type of the FoxGuard Monitor ECB is always 285.

PRIM CMD STAT

Reserved for future use.

DEVICE CMD STAT

Reserved for future use.

DEVICE STATUS

Reserved for future use.

MAIN PROC STATUS

Displays hexadecimal code for the individual main processor status fields in the left column.

WRITE PROTECT

Indicates whether the Advanced Communications Module is configured in the TRICON module as a read-only module or as a read/write module.

PROGRAM MODE

Reports the current state of the TRICON control program as Running, Halted, or Paused.

KEY SWITCH

Indicates the front panel key switch position on the TRICON main chassis as Remote, Run, Program, or Stop.

UPPER P/W SUPPLY and LOWER P/W SUPPLY

Operational status of each TRICON power supply is reported in a hexadecimal code.

MAJOR VERSION

Name of the current TRICON control program downloaded from the TRISTATION™ device.

NODE NUMBER

Node number of the TRICON main chassis in a networked system. Node can be 1 through 10. A stand-alone TRICON module is 0.

MAINTENANCE REQ

Yes, if at least one TRICON module has reported a fault.

BOARD WITH FAULT

Maps to the TRICON chassis and physical slot of the module with a fault.

MINOR VERSION

Version number of the TRICON control program. The version number is incremented by one each time the program is downloaded from the TRISTATION device.

SCAN TIME

The time allocated by the control program for the TRICON module to scan its I/O modules and execute one cycle of the control program.

I/O Module Equipment Information Display

NAME

Device name for the selected ECB.

RUN MODE

The FoxGuard Manager mode is either on-line or off-line.

FAIL ACK STATE

Indicates whether failure in the Advanced Communications Module has been acknowledged.

WARNING CONDITION

Reserved for future use.

LOGICAL ADDRESS

This field is not used in the FoxGuard Manager.

HARDWARE TYPE

For I/O module ECBs, Hardware Type identifies the referenced TRICON hardware are as follows:

- 143: discrete input, 32 points
- 144: discrete input, 64 points
- 145: discrete (pulse) input, 8 points
- 146: discrete output, 16 points
- 147: discrete output, 8 points
- 148: discrete output, 32 points
- 149: analog input, 32 points
- 150: analog input, 16 points
- 151: analog input, 64 points

- 152: analog input, 32 points, thermocouple
- 153: analog input, 16 points, thermocouple
- 154: analog output, 8 points

For window ECBs, Hardware Type indicates function as follows:

- 140: input (ECB90, ECB91, ECB92)
- 141: output (ECB93, ECB94, ECB95)

TYPE

Describes the ECB based on the HARDWARE TYPE parameter.

DEVICE STATE

Indicates whether the Advanced Communications Module has failed.

ALARMING STATE

Indicates whether device alarming to the Nodebus level has been Enabled or Inhibited. Device alarming can be enabled or inhibited with the Equipment Change overlay.

COMPOUND NAME

Name of the ECB compound, <letterbug>_ECB, where letterbug is the letterbug of the DNBI.

BLOCK NAME

Displays the NAME parameter of the configured ECB.

SOFTWARE TYPE

Reserved for future use.

DIAG STATUS 1

Reserved for future use.

DIAG STATUS 2, DIAG STATUS 3, and DIAG STATUS 4

In an output ECB, identify the first TRICON alias in the ECB. The three fields are used to show the 5-digit alias as follows: DIAG 2 for 1000s, DIAG 3 for tens, and DIAG 4 for ones. For example, alias 2010 is coded as:

DIAG 2: 2

DIAG 3: 1

DIAG 4: 0

Alias 40252 is coded as:

DIAG 2: 40

DIAG 3: 25

DIAG 4: 2

MODULE TYPE

For I/O module ECBs, displays a description of the referenced TRICON module read from the TRICON configuration data. For FoxGuard Manager window ECBs, this field displays the description of the block from the MDSCRP parameter, which copies the user-configured DESCRP parameter.

PRIM CMD STAT

Reserved for future use.

DEVICE CMD STAT

Reserved for future use.

DEVICE STATUS

Used with I/O module ECBs only.

Shows the status of modules in the referenced logical slots as follows:

0 No problem.

0x01 Left physical slot is empty.

0x02 Right physical slot is empty.

0x03 Both physical slots are empty.

0x04 There is an I/O module fault.

0x08 There is a load/fuse warning.

0x10 TRICON did not accept a write request packet from the FoxGuard Manager.

0x20 An output from this ECB was the first write in the packet to be rejected by the TRICON.

MS CODE

For I/O module ECBs, displays a model number of the referenced TRICON module as read from the TRICON configuration data.

For FoxGuard Manager window ECBs, the codes are as follows:

ECB90 READ BOOL

ECB91 READ REAL

ECB92 READ INT

ECB93 WRITE BOOL

ECB94 WRITE REAL

ECB95 WRITE INT

Equipment Information Display for ECB98, ECB99, and ECB100

NAME

The letterbug assigned during system definition for hardware configuration:
PORT1 (ECB98), PORT2 (ECB99) or DEV_M1 (ECB100).

TYPE

Type of ECB defined when the letterbug is assigned during site planning and system definition:

POR-T-CHARACTER (ECB98), POR-T-MESSAGE (ECB99) or POR-T-DEVICE (ECB100).

RUN MODE

On-line or Off-line (default). This value changes to On-line when the station reports to the System Monitor after booting up. You can change the RUN MODE using the GO ON-LINE and GO OFF-LINE options in the Equipment Change Display. Changing the ECB status to Off-line causes all communication to the respective device to stop and all attached devices to fail. As a result, a number of messages appear at the printer indicating communication failures and device equipment failures.

If reporting is disabled, the last known run state appears in this field. The system updates this field when a status change occurs.

DEVICE STATE

The system updates this field when a status change occurs. The possible mutually exclusive states are:

- Not Failed: The device is connected to the control strategy, though measurements are not guaranteed to be good.
- Failed: Fatal hardware or other fatal fault reported by the device.

FAIL ACK STATE

Displays Acknowledged (default) or Not Acknowledged. If the DEVICE STATE changes from Not Failed to Failed, the FAIL ACK STATE field changes to Not Acknowledged.

Click ACK to acknowledge the selected faulted device; or click ACK ALL in the initial system management display to acknowledge all unacknowledged devices for which the workstation is responsible.

The system updates this field when a status change occurs.

ALARMING STATE

Indicates whether alarming is enabled or inhibited for this device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health while equipment is failed or off-line, and any system alarm messages are not logged to the system printer or to the Historian.

The system updates this field when a status change occurs.

HARDWARE TYPE

Number associated with the peripheral hardware: 160 (ECB98), 161 (ECB99) or 162 (ECB100).

This value is configured with the ICC for the specific ECB.

SOFTWARE TYPE

Number identifying the software used in the DIW devices: 98 (ECB98), 99 (ECB99) or 100 (ECB100). This value is configured with the ICC for the ECB.

FAIL ALGO

Failure Algorithm indicates the failure algorithm used to cause the port to fail internally even if the port is connected and on-line. When the port fails, the system generates a trigger ID. Triggers communicate event information

between ECBs and can be used to initiate status changes in the destination ECBs. This failure algorithm uses the generated trigger IDs to determine the ratio of errored communications to good (complete) communications.

The possible values are as follows:

- 1 = The port fails when the WatchDog timer reaches zero.
- 2 = The port fails based on a predefined Trigger Event.
- Other = 0x10, 0x100, or 0x1000.

NOT FAIL ALGO

Not Failed Algorithm identifies the algorithm that causes the port to transition from Failed to Not Failed state. When the ECB returns to the Not Failed state from Failed, the system generates a predefined trigger ID.

The possible values are as follows:

- 0 = No Information available.
- 1 = The port goes back on-line based on the WatchDog timer value (Time delay).
- 2 = The port goes back on-line based on the Trigger ID generated (Trigger Event).

SERVER TYPE

Identifies the type of server (IOGATE) Control Core Services used to communicate with this ECB device.

The values are as follows:

- 1 = DDE (Dynamic Data Exchange protocol)
- 2 = OLE (Object Linking and Embedding).

SERVER NAME

Identifies the name of the server application (driver) used for communications with the related gate. (Each gate type can have more than one server.) Refer to the documentation which accompanies each IOGATE for valid options.

WD TIMER

Watchdog Timer indicates the value of the port ECB watchdog timer (in seconds). When this value is zero, the watchdog timer has expired and the device goes off-line. If no communications activity occurs for the specified time, the port goes to Off-line state.

ONL TIMER

On-line Timer indicates the number of seconds before the off-line port with the ECB device attempts to transition to on-line.

PARENT NAME

Identifies the parent port as Port 1 for ECB99 or ECB100. Not applicable (N/A) for ECB98.

ALT NAME

Alternate Parent Name identifies the alternate parent port for this ECB99 or ECB100 device.

This alternate port takes over if the designated parent ECB port fails or has a change of state.

Not applicable (N/A) for ECB98.

ECB80 Equipment Information

NAME

User-supplied ECB name, as configured using the ICC.

TYPE

User-supplied ECB type descriptor, as configured using ICC.

RUN MODE

On-Line. The ECB80 is put On-Line when it is created, and cannot be put Off-Line.

FAIL STATE

Failed or Not Failed. The ECB80 is Failed if and only if the SCADA database becomes inaccessible to the Control database.

There are several events that can result in failure of the ECB80. Although such events are abnormal, and recovery from them should be automatic, if the Failed state persists for more than a few minutes, the AW51RS should be shut down and restarted. A failure of the ECB80 in the AW51RS that is in the CTL state causes a switch to the other AW51RS if it is in the TRK state.

FAIL ACK STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If the FAIL STATE changes from Not Failed to Failed, the FAIL ACK STATE field changes to Not Acknowledged to indicate this transition. Use the ACK key in the top menu bar of the Equipment Information Display to acknowledge the selected faulted device or use the ACK ALL key in the top menu bar of the initial System Management Display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

ALRMING STATE

Indicates whether alarming is enabled or inhibited for the device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health (a green “SYS BAR”) while equipment is failed or off-line. System Alarm messages are not logged to the system printer, nor the Historian.

ECB81 Equipment Information

NAME

User-supplied ECB name, as configured using ICC.

TYPE

User-supplied ECB type descriptor, as configured using ICC.

RUN MODE

On-Line or Off-Line. The ECB81 is placed Off-Line when it is created and whenever it is modified via the ICC. Thereafter, its On-Line/Off-Line state can be changed only via the EQUIPMENT CHANGE function of the System Manager display.

When the AW51RS is rebooted, the Run Mode of all ECBs, including the ECB81, is whatever their Run Mode was at the time of the last database checkpoint prior to the reboot. The Run Mode is controlled solely by the user actions in the Control database. No operating conditions can change the Run Mode, nor can any state changes in the SCADA database.

When an ECB81 is in the Off-Line state, all control blocks that have been configured to access data in the RTU represented by the ECB81, or in any equipment (such as an IT) whose ECB is parented by the Off-Line ECB81, have their live data (i.e., inputs and outputs) marked Out of Service.

FAIL STATE

Failed or Not Failed. An ECB81 is in the normal, Not Failed state when the RTU it represents is being polled successfully by the SCADA software, and when the port ECB (ECB80) is Not Failed. If any operator actions or equipment failures cause the SCADA polling of the RTU to be discontinued intentionally or disrupted unintentionally, the ECB81 goes to the Failed state and remains in this state until successful polling by the SCADA software is resumed. Also, if the ECB80 goes to the Failed state, all ECB81s go to the Failed state.

All control blocks that have been configured to access data in an RTU represented by a failed ECB81, or in any equipment (such as an IT) whose ECB is parented by the failed ECB81, have their live data (i.e., inputs and outputs) marked Out of Service.

FAIL ACK STATE

Acknowledged or Not Acknowledged. This field is initially set to Acknowledged. If the FAIL STATE changes from Not Failed to Failed, the FAIL ACK STATE field changes to Not Acknowledged to indicate this transition. Use the ACK key in the top menu bar of the Equipment Information display to acknowledge the selected faulted device or use the ACK ALL key in the top menu bar of the initial System Management Display to acknowledge all the unacknowledged devices for which the workstation has responsibility.

ALRMING STATE

Indicates whether alarming is Enabled or Inhibited for the device. When alarming is inhibited, the System Monitor continues to indicate overall system and network health (a green “SYS BAR”) while equipment is failed or off-line. System Alarm messages are not logged to the system printer, nor the Historian.

DEVICES ATT

Indicates (yes/no) whether one or more devices are attached to this ECB.

FAIL DEV ATT

Indicates (yes/no) whether an attached device has failed.

FAIL DEV ACK

Indicates (yes/no) whether a failure associated with an attached device has been acknowledged.

Equipment Information Display for PROFIBUS-DP Gate and Devices

COMPOUND NAME

This identifies the compound-level name for the PROFIBUS-DP ECB, as assigned using the Integrated Control Configurator.

BLOCK NAME

This identifies the block-level name for the PROFIBUS-DP ECB, as assigned using the Integrated Control Configurator.

GATE

This identifies the number of the gate where the PROFIBUS is located.

HARDWARE TYPE

This identifies the ECB responsible for interfacing with the port communications message control software.

BAUD RATE

This indicates the baud rate at which the bus is operating.

IDENT NUMBER

This is the identifying number of the PROFIBUS-DP as defined by the PROFIBUS User Organization and entered through the Integrated Control Configurator.

ERROR CODE

This field is normally 0. If an error is detected in the PROFIBUS gate operation, this field is set to a nonzero value.

MASTER ADDRESS

This identifies the address of the Micro-I/A station that is the parent for the PROFIBUS-DP card.

OPERATION MODE

This indicates the operational state in hexadecimal format of the PROFIBUS-DP gate.

DP HARDWARE VER

This displays DDLM/USIF release information.

DP FIRMWARE VER

This displays DDLM/USIF release information.

USER HARDWARE VER

This displays user-entered information where applicable.

USER FIRMWARE VER

This displays user-entered information where applicable.

Equipment Information Display for PROFIBUS-DP Devices

COMPOUND NAME

This identifies the compound-level name for the PROFIBUS-DP ECB, as assigned using the Integrated Control Configurator.

BLOCK NAME

This identifies the block-level name for the PROFIBUS-DP ECB, as assigned using the Integrated Control Configurator.

HARDWARE TYPE

This identifies the ECB responsible for interfacing with the port communications message control software.

IDENT NUMBER

This is the identifying number of the PROFIBUS-DP device as defined by the PROFIBUS User Organization (PROFIBUS Nutzer Organization) and entered through the Integrated Control Configurator.

ERROR CODE

This field is normally 0. If an error is detected in the PROFIBUS-DP module, this field is set to a nonzero value.

SLAVE ADDRESS

This identifies the unique identifier for each PROFIBUS device, which is assigned using the Integrated Control Configurator.

MASTER ADDRESS

This identifies the address of the Micro-I/A station that is the parent for the PROFIBUS-DP card.

DIAGNOSTIC INFO

This gives common diagnostic information. ECB103 contains specific error information, and associated error codes, that are displayed based on analysis of data from regular software calls.

DIAGNOSTIC EXT

This gives diagnostic information for each slave device channel. This is split into two parts: a device part and a module/channel part. Information appearing in this field is device dependent and information must be determined during configuration based on vendor supplied information.

Equipment Information Displays for AB-PLC5/E Gate Devices

COMPOUND NAME

This identifies the compound-level name for the AB-PLC5/E ECB, as assigned using the Integrated Control Configurator.

BLOCK NAME

This identifies the block-level name for the AB-PLC5/E ECB, as assigned using the Integrated Control Configurator.

GATE

This identifies the number of the gate where the AB-PLC5/E is located.

HARDWARE TYPE

This identifies the ECB responsible for interfacing with the port communications message control software.

DIAGNOSTIC EXT

This gives diagnostic information for each slave device channel. This is split into two parts: a device part and a module/channel part. Information appearing in this field is device dependent and information must be determined during configuration based on vendor supplied information.

EROM (EEPROM) REV

This displays user-entered information when applicable.

SERIAL NUMBER

This displays user-entered information when applicable.

Equipment Information Displays for the AB-PLC5/E Device

COMPOUND NAME

This identifies the compound-level name for the AB-PLC5/E ECB, as assigned using the Integrated Control Configurator.

BLOCK NAME

This identifies the block-level name for the AB-PLC5/E ECB, as assigned using the Integrated Control Configurator.

HARDWARE TYPE

This identifies the ECB responsible for interfacing with the port communications message control software.

IP ADDRESS

This identifies the address of the AB-PLC5/E. It is a 4-byte unsigned integer. Display shows an incorrect data type.

GATEWAY ADDRESS

This identifies the address of the router assigned to the network. It is a 4-byte unsigned integer.

BOOTP ID

This identifies the address of the starting address assigned to calling stations. It is a 4-byte unsigned integer. It is displayed in decimal format.

NETMASK

This identifies the Gate Subnet Mask. It is a 4-byte unsigned integer. Display is in decimal format with a period between each byte.

STATUS

This is not currently supported. It identifies the PLC5/E processor status. It is a 2-byte integer. It represents the PLC5/E Status File Word 1.

FAULT

This is not currently supported. It identifies the PLC5/E fault codes. It is a 2-byte integer. It represents the PLC5/E Status File Word 12.

MJ FAULT

This is not currently supported. It identifies the PLC5/E major fault flags. It is a 2-byte integer. It represents the PLC5/E Status File Word 11.

MN FAULT

This is not currently supported. It identifies the PLC5/E minor fault flags. It is a 2-byte integer. It represents the PLC5/E Status File Word 10.

Equipment Information Displays for the Modbus Gate and Modbus Devices

COMPOUND NAME

This identifies the compound-level name for the Modbus gate ECB, as assigned using the Integrated Control Configurator.

BLOCK NAME

This identifies the block-level name for the Modbus gate ECB, as assigned using the Integrated Control Configurator.

HARDWARE TYPE

This identifies the ECB responsible for interfacing with the port communications message control software.

GATE

This identifies the number of the gate where the Modbus is located, as assigned using the Integrated Control Configurator.

DIAG STATUS

This indicates the status of the communications port.

GATE STATUS

This indicates the specific operational status of messages passing through the gate. The gate may have an error specific to a message being passed or there can be a general problem with input/output.

GATE CMD STATUS

This indicates the operational status of the gate.

LOGICAL ADDR

This indicates the logical address of the gate as assigned when it is configured using the Integrated Control Configurator BUSOPT parameter.

Equipment Information Displays for the Modbus Device

COMPOUND NAME

This identifies the compound-level name for the Modbus ECB, as assigned using the Integrated Control Configurator.

BLOCK NAME

This identifies the block-level name for the Modbus ECB, as assigned using the Integrated Control Configurator.

HARDWARE TYPE

This identifies the ECB responsible for interfacing with the port communications message control software, as assigned using the Integrated Control Configurator.

DIAG STATUS 1

This indicates the number of misaligned frames that occurred.

DIAG STATUS 2

This indicates the number of receiver buffer overruns.

DIAG STATUS 3

This indicates the number of parity errors.

DIAG STATUS 4

This indicates the number of properly aligned frames received with CRC errors.

GATE CMD STATUS

This indicates the operational status of the communications with the gate ECB.

DEVICE CMD STATUS

This indicates that an error was detected by the communication driver software when the value in this field is not zero.

DEVICE STATUS

This indicates the failure state of the device. A failure may be the result of termination of gate activity, a user-defined event triggering an off-line state, or server failure.

LOGICAL ADDR

This indicates the logical address of the gate, as assigned using the Integrated Control Configurator.

APPENDIX C

System Messages

This section contains system messages that can appear in the System Manager display.

Table C-1. System Manager Event Messages

Message	Description/Cause	Corrective Action (s)
<Peripheral Equipment Change Action> Succeeded or Failed:<Letterbug>	Indicates the success or failure of the following peripheral equipment change actions: Upload Database, Download Database, Download, EEPROM Update.	Retry action if failed.
Action not allowed	You attempted to perform an illegal action. This could be due to network operation, station status or an action not available to that workstation.	Verify that the action can, and should, be requested for this station type. Check the system health, then try the action again. Check the station health, network health, and so forth, then try again.
Cannot unlock station letterbug available	Unable to unlock station records. This prohibits station actions such as reboots.	Determine if another utility such as a configuration or another System Manager is running and has locked the station.
Checkpoint succeeded or failed: <Station Letterbug>	Indicates the success or failure of the checkpoint equipment change action for a specific type of station (control processor, selected gateways, display station processor).	If checkpoint failed, retry checkpoint action. If the problem continues, contact the Global CSC. Check the printer for appropriate error code. Check the applicable subsystem.
Master timekeepers not responding	System Manager cannot initiate communications with a master timekeeper. You cannot set the date and time.	Check for an on-line application processor (AP). There must be an on-line AP to run a master timekeeper.
IPC Failed	System Manager cannot communicate with the network using Foxboro Inter-Process Communication (IPC).	Verify network configuration health and revision levels.

Table C-1. System Manager Event Messages (Continued)

Message	Description/Cause	Corrective Action (s)
No Off-line Diagnostics for this station	System Manager cannot recognize the type of station, or System Manager's off-line test data file does not contain any test for the station type.	
No System Monitors configured or responding	The System Monitor data file (smonlst.cfg) is not available and no System Monitors responded to System Manager's request for information.	Verify the existence of /usr/fox/sysmgm/smonlst.cfg , verify network communication, verify existence of active System Monitor(s).
SYSMON not responding	Inability to communicate with a System Monitor.	Check path to the AP hosting the System Monitor and the load on the AP. Call Global Customer Support (GCS).

Network Fault Detection Message

Table C-2. Network Fault Detection Message

Message	Description	Action
Configuration Integrity In Question	System Manager cannot communicate with, or does not know who is, the current Nodebus initiator.	Check for File Server utility operation; close and restart System Manager.

APPENDIX D

Device Specific Peripheral Counter Background Information

This appendix contains device-specific information for Peripheral Counters.

Allen-Bradley, Modicon, or Instrument Gateway

Table D-1. Counter Descriptions for AB, Modicon, or Instrument Gateway

Counter	Description
TIMEOUTS	Number of times an ABG, MODG or IG timed-out an attached device during communication attempts.
INVAL CMND	For an ABG, the number of invalid commands from the A-B interface module.
INVAL RESP	For an ABG or MODG, the number of invalid commands from a controller on the Data Highway; for an IG, the number of invalid commands from a 760 or 761 controller.

Allen-Bradley PLC Devices

No PLC remote I/O level cable information is displayed for the AW70. A standard set of communication counters are maintained by the AW70.

Table D-2. Counter Descriptions for AB PLC Devices

Counter	Description
DATE ACCESS READ	Number of times read accesses occurred.
DATE ACCESS WRITE	Number of times write accesses occurred.

Table D-2. Counter Descriptions for AB PLC Devices (Continued)

Counter	Description
DATE ACCESS READ ERRORS	Number of times read data errors occurred.
DATE ACCESS WRITE ERRORS	Number of times write access error occurred.

Allen-Bradley Redundant Gateway

All fields are initialized to zero when booting the ABG station, when switching to/from CTL state, and when you select the RESET COUNTERS action.

Table D-3. Counter Descriptions for AB Redundant Gateway

Counter	Description
RDM XMIT COUNT	Total number of IPC messages transmitted to alternate gateway.
RDN RCV COUNT	Total number of IPC messages received from alternate gateway.
PROCESS UPDATES	Number of ABCAN block updates transmitted to tracking gateway if in control mode, or the number of messages received if in track or standby mode
RDN OM UPDATES	Number of one-time object sets, om-writes, or peer-to-peer scan updates transmitted if in control or received if in track or standby mode.
RDN DB UPDATES	Number of CIO Configurator database change requests transmitted if in control mode, or received if in track or standby mode
RDN IPC UPDATES	Number of communication errors detected in IPC link to alternate gateway
RDN DB TIMEOUTS	Number of times that a heartbeat period (six seconds) expired without receiving an IPC message from the alternate gateway.
RDN RCV UPDATES	Number of unrecognized IPC messages received from alternate gateway.
RDN OM UPDATES	Number of one-time object sets, om-writes or peer-to-peer scan updates resulting in errors detected by tracking gateway.

Allen-Bradley Station PLC

No PLC remote I/O level cable information is displayed for the AW70. A standard set of communication counters are maintained by the AW70.

Table D-4. Counter Descriptions for AB Station PLC

Counter	Description
DATE ACCESS READ	Number of times read accesses occurred.
DATE ACCESS WRITE	Number of times write accesses occurred.
DATE ACCESS READ ERRORS	Number of times read data errors occurred.
DATE ACCESS WRITE ERRORS	Number of times write access error occurred.

Device Integrator

Table D-5. Counter Descriptions for Device Integrators

Counter	Description
NUM XMIT	Number of messages transmitted by the Device Integrator.
NUM ERRS	Number of errors that occurred during the transmission of messages from the gateway
NUM TMOUT	Number of timeouts that occurred during the transmission of messages from gateway.
NUM RECV	Number of messages successfully received by the gateway. Messages are counted in groups of 10.
RECV ERRS	Number of errors that occurred during the receipt of messages to the gateway that are not due to a time-out condition (for example, line disconnects).
RECV TMOUT	Number of errors that occurred during the receipt of messages to the gateway due to time-outs
RSP TMOUT	Number of time-out errors that occurred between the transmission of a message and the receipt of a reply.
CHKSUM ERR	Number of messages received by the gateway with checksum errors (not all messages contain checksums).
SEQ NM ERR	Number of messages received by the gateway with sequence number errors (that is, not all messages contain sequence numbers).

Table D-5. Counter Descriptions for Device Integrators (Continued)

Counter	Description
BT CNT ERR	Number of messages received by the gateway with bad byte counts (that is, not all messages are transmitted with byte count checks)
PARITY ERR	Number of messages received by the gateway with parity byte errors.
DISCONS	Number of times the RS-232 port connection on the gateway was disconnected.
QUEUE FULL	Number of messages discarded by the gateway because its queues were full

GE FANUC Programmable Controller Devices

Table D-6. Counter Descriptions for GE FANUC Programmable Controller Devices

Counter	Description
TIMEOUTS	Number of times the primary station timed out a GE controller during communication attempts.
PROTOCOL ERRORS	Number of protocol-specific-routine errors detected during communications with the GE controller.
CRC ERRORS	Number of properly aligned frames received with CRC errors.
FRAMING ERRORS	Number of misaligned frames that occurred.
COMMUNICATION ERRORS	Number of communication errors detected in GE Controller communications link.
BUSY ERRORS	Number of times the station attempted communications with the GE controller and recorded an error because the controller was busy.

INI10 Peripheral, INI15 Peripheral, and SIP

Table D-7. Counter Descriptions for INI10, INI15, and SIP

Counter	Description
T1 EXPIRES	Number of X.25 frame level T1 timer expirations.
PKT LVL TO	Number of X.25 packet level time-outs (T20, T21, T22, T23 timers).

**Table D-7. Counter Descriptions for
INI10, INI15, and SIP (Continued)**

Counter	Description
ERROR PKTS	Number of error packets transmitted and received.
DATA XMTD	Number of data packets successfully transmitted and received.
DATA RCVD	Number of data packets successfully received.
RR FRAMES	Number of Received Ready (RR) frames transmitted and received.
ERR FRAMES	Number of error frames transmitted and received.

INTERSPEC Integrator Translator/INTERSPEC Integrator 30

Table D-8. Counter Descriptions for INTERSPEC Integrator Translator/INTERSPEC Integrator 30

Counter	Description
TIMEOUTS	Number of times the IIT timed out a peripheral during communication attempts.
INVAL CMND	Number of commands received by the IIT that were invalid in the present state.
INVAL RESP	Number of invalid messages received by the IIT from a peripheral.

I/O Gate ECB98 Devices

**Table D-9. Counter Description for I/O Gate E
CB98 Devices**

Counter	Description
SUCCESSFUL TRANSMITS	Number of messages successfully sent since the last time the statistics were initialized.
SUCCESSFUL RECEIVES	Number of messages successfully received since the last time the statistics were initialized.
NO RESPONSE CTR	Number of times that there was no response to the Clear To Receive (CTR) signal since the last time the statistics were initialized.
CONNECT ERRS	Number of errors generated while attempting to establish communications.

**Table D-9. Counter Description for I/O Gate E
CB98 Devices (Continued)**

Counter	Description
DISCONNECTS	Number of times that the link disconnected since the last time the statistics were initialized. This is the number of established connections that broke due to error. This counter is incremented only if an established connection experiences one of the following conditions: retransmits were exceeded and the client did not acknowledge; no messages were received from the server in a sufficient time period; the server broke connection due to one of the previous conditions.
AUXILIARY CTR	Reserved for use by the application.

I/O Gate ECB99 and ECB100 Devices

Table D-10. Counter Descriptions for I/O Gate ECB99 and ECB100 Devices

Counter	Description
SUCCESSFUL TRANSMITS	Number of messages successfully sent since the last time the statistics were initialized.
INCOMPLETE TRANSMITS	Number of incomplete messages sent since the last time the statistics were initialized
OTHER TRANSMIT ERRS	Number of errors generated during the transmission of messages that are not due to a time-out condition (for example, link disconnects)
SUCCESSFUL RECEIVES	Number of messages successfully received since the last time the statistics were initialized.
INCOMPLETE RECEIVES	Number of incomplete messages received since the last time the statistics were initialized.
OTHER RECEIVE ERRORS	Number of errors received that occurred during the reception of messages that are not due to a time-out condition (for example, link disconnects).
CHECKSUM ERRORS	Number of checksum errors generated since the last time the statistics were initialized.
PARITY ERRORS	Number of parity errors generated since the last time the statistics were initialized.

Table D-10. Counter Descriptions for I/O Gate ECB99 and ECB100 Devices (Continued)

Counter	Description
DROPPED CHARS	Number of characters dropped since the last time the statistics were initialized.
DISCONNECTS	Number of times that the link disconnected since the last time the statistics were initialized. This is the number of established connections that broke due to error. This counter is incremented only if an established connection experiences one of the following conditions: retransmits were exceeded and the client did not acknowledge; no messages were received from the server in a sufficient time period; the server broke connection due to one of the previous conditions.

Micro-I/A Station Devices

A Micro-I/A station connects GE and A-B devices to the system. Peripheral counters for A-B Flex™ I/O and GE FANUC devices are implemented in the current release.

Modicon Programmable Controller Devices

Table D-11. Counter Descriptions for Modicon Programmable Controller Devices

Counter	Description
TIMEOUTS	Number of times the primary station timed out a GE Controller during communication attempts.
PROTOCOL ERRORS	Number of protocol errors generated in communications with the Modbus PC. Protocol-specific-routine errors are detected and reported by the driver and usually signify an error in the communications link.
CRC ERRORS	Number of properly aligned frames received with CRC errors.
FRAMING ERRORS	Number of misaligned frames that occurred.
COMMUNICATION ERRORS	Number of communication errors detected in the Modbus communications link.
BUSY ERRORS	Number of times the station attempted communications with the Modbus controller and recorded an error because the controller was busy.

Primary FBM/FBM Devices

These counters are currently not being reported and, therefore, are zero.

Table D-12. Counter Descriptions for Primary FBM/FBM Devices

Counter	Description
TIMEOUTS	Number of times the primary station timed out an FBM during communication attempts.
INVAL CMND	Number of commands received by the primary station that were invalid in the present state of the station.
INVAL RESP	Number of invalid messages received by the primary station from an FBM.

Printer and Terminal Devices

Table D-13. Counter Descriptions for Printer and Terminal Devices

Counter	Description
MSGs DROP	Number of alarm messages that could not be printed because the output device failed.

Index

A

About dialog box 88
 access control 6
 Accessories pane 55
 Alarms tab 58
 hiding and showing the pane 55, 70
 Inhibited tab 60
 Messages tab 56
 re-arranging columns 55
 Smon Log tab 65
 Watch tab 63
 Acknowledge All Stations
 Actions menu 200
 Action Settings in the Configuration dialog box 74
 Actions menu 76
 Acknowledge All Stations 200
 Download FF Devices File 93
 Equipment Change 77
 Set Date and Time 91
 alarm status indicators
 ports 293
 system monitors 98
 alarms
 acknowledging alarms 36
 acknowledging all alarms in a system monitor domain 100
 control stations 176
 enabling alarms 37, 60
 FBMs 266
 FCMs 234
 inhibiting alarms 37, 60
 peripherals 131
 Primary ECB 207
 unacknowledged and inhibited indicators 48
 workstations 131
 Alarms tab 58
 acknowledge all alarms 58
 acknowledge selected alarm 58
 changing the column order 58
 inhibit alarms 58
 sorting alarms by equipment, acknowledge status, time 58
 asterisk symbol 48
 AUTO indicator
 FCMs 225
 Primary ECB 139

B

blinking of equipment names 48
 Bus Auto Select
 FCMs 238
 bus switching
 FCMs 238
 Primary ECB 208

C

cable alarms
 FBMs 266
 FCMs 235
 Checkpoint
 control stations 178

client
 description 1
Cold Start option when performing an On-line Image Update 189
color-coding of equipment names 48
communication fault indicators
 FBMs 250
Configuration dialog box 71
Confirmation Required for equipment change actions 74
connected devices
 FBMs 263
connected FBMs
 control stations 163
 FCMs 233
connected stations and switches
 switches 292
Connections tab 51
 system monitors 99
 workstations 117
Control Network Interface (CNI) 137
 status and equipment information 147
control stations 135
 Checkpoint 178
 connected FBMs 163
 counters 211
 Counters tab 165
 EEPROM Update 189
 Enable/Disable All Reports 177
 Enable/Disable Downloads 191
 Enable/Disable Uploads 192
 equipment change actions 175
 Image Update 188
 Offline Diagnostics 192
 On-line Image Update 189
 Reboot 184
 status and equipment information 147, 157
counters
 adding counters to the Watch tab 63
Counters tab 52
 control stations 165, 211
 FBMs 264
 functions and features 52
 peripherals 125
 See also Watch tab 52
 switches 295
 workstations 118, 211

D

data tree. See Navigation pane. 41
DB Download
 FBMs 272
DCI based FBMs
 status and equipment information 261
DIN Rail Mounted Fieldbus Modules. See FBMs 241
Download
 FBMs 268
 FCMs 236
Download FF Devices File
 Actions menu 93

E

ECBP. See Primary ECB 135
EEPROM Update

control stations 189
FBMs 269
FCMs 237
EEPROM update
peripherals 132
Enable blinking in the Configuration dialog box 76
Enable/Disable All Reports
control stations 177
Enable/Disable Downloads
control stations 191
Enable/Disable uploads
control stations 192
equipment change actions 76
configuration of Confirmation Required and Reason Required 74
control stations 175
FBMs 265
FCMs 234
peripherals 131
ports 297
Primary ECB 206
switches 297
workstations 131
Equipment Change menu 77
equipment icon
ports 293
switches 289
equipment icons
FBMs 248

F

FBM0. See Primary ECB 135
FBM246s
status and equipment information 260
FBMs 241
alarms 266
cable alarms 266
communication fault indicators 250
connected field devices 263
Counters tab 264
DB Download 272
Download 268
EEPROM Update 269
equipment change actions 265
equipment icon 248
Go On-Line / Go Off-Line 267
Reset FBM 271
Software Download 272
status and equipment information 251
supported modules 241
Switch Roles 272
FCMs 225
alarms 234
cable alarms 235
connected FBMs 233
Download 236
EEPROM Update (Image Update) 237
equipment change actions 234
equipment icon 225
Go On-Line / Go Off-Line 235
Select Bus A / Select Bus B / Bus Auto Select 238
status and equipment information 227
SwA / Sw B / AUTO indicators 225
Switch Roles 238

Field Communication Modules. See FCMs 225
Field Control Processor 270 (FCP270). See control stations 135
Field Control Processor 280 (FCP280). See control stations 136
field devices
 connected to an FBM 279
Fieldbus Modules. See FBMs 241
filtering messages 57
finding an equipment item
 Search tab 61
FoxView software 39

G

General Download
 Primary ECB 208
General tab 49
Go On-Line / Go Off-Line
 FBMs 267
 FCMs 235
Go To feature 90

H

Help 88
 on-demand help 88
Help menu 88
Hierarchy Navigation 90

I

Image Update
 control stations 188
 FBMs 269
 FCMs 237
Information pane
 Connections tab 51
 Counters tab 52
 hiding and showing the pane 70
Inhibited tab 60
 changing the column order 60
 sorting the display 60
 sorting the table of inhibited alarms 60
 updating the table 60
initial display 40
installation 6
InTouch software 39

L

Legend 88

M

Menus 66
 View 70
menus
 Actions 76
 Help 88
 Options 71
messages
 displayed by System Manager 5
Messages tab 56
 filtering messages 57
migration FBMs 262
Moore APACS migration FBMs 262

N

Navigation pane 41
alarm status indicators 48
buttons at the bottom of the pane 43
expanding and collapsing the data tree 41
selecting equipment 44
status indicators 47
view selection buttons 41
network monitoring facilities 5

O

Offline Diagnostics
control stations 192
On-line Image Update
Cold Start versus Warm Start 189
control stations 189
Options menu 71

P

peripherals 103
Counters tab 125
equipment change actions 131
status and equipment information 119
updating the software image (EEPROM update) 132
ports
alarm status indicators 293
equipment change actions 297
equipment icons 293
status indicators 293
Ports tab 293
previewing printed reports 66
Primary ECB
alarms 207
bus switching 208
equipment change actions 206
General Download 208
icons 135
status and equipment information 167
SwA / Sw B / AUTO indicators 139
Primary FBM. See Primary ECB 135
print and print preview buttons
Accessories pane 55
Print menu 66
printers
serial/parallel/USB printers versus network printers 103
printers. See peripherals 119
Proxy Settings group in the Configuration dialog box 71

R

Reason field in equipment change action confirmation dialog box 74
Reason Required for equipment change actions 74
Reboot
control stations 184
Refresh Rate in the Configuration dialog box 76
reports
enabling and disabling reports for a workstation 133
Reset FBM
FBMs 271

S

save button
 Accessories pane 55

Search tab 61
 changing the column order 61
 sorting the search results 61

security 6

Select Bus A / Select Bus B
 FCMs 238

selecting equipment 44

self-hosting
 checkpoint invalidation 182

service
 description of System Manager service component 1

service connection
 first time System Manager is used on a workstation 23

Set Date and Time 91

SMDH
 and System Manager 1

Smon button 41

Smon Log tab 65

SMON. See system monitors 97

Software Download
 FBMs 272

software manager subsystem 4

station manager software 4

status and equipment information
 Control Network Interface (CNI) 147
 control stations 147, 157
 DCI based FBMs 261
 FBM246s 260
 FBMs 251
 FCMs 227
 peripherals 119
 Primary ECB 167
 switches 290
 workstations 106

Status bar
 showing and hiding the bar 70

status indicators 47
 ports 293
 system monitors 98

SwA / Sw B indicators
 FCMs 225
 Primary ECB 139

Switch button 41

Switch Roles
 FBMs 272
 FCMs 238

Switch view
 selecting the view 70

switches 289
 connected stations and switches 292
 counters 295
 equipment change actions 297
 equipment icon 289
 port status information 293
 status and equipment information 290

symbols. Choose Help > Legend from the menu bar 88

system alarms. See alarms 35

system management components 3

System Manager
 and SMDH 1

client software 1
features 2
installation 6
product structure 1
service component 1
startup 39
user interface 27
System Manager service connection
on startup 40
System Manager window 40
system messages 5
system monitor
role in system management 3
Smon Log tab in the Accessories pane 65
status table in the Information pane 99
System Monitor view
selecting the view 70
system monitors
acknowledging all alarms in a system monitor domain 100
alarm status in a system monitor domain 98
displaying equipment in the system monitor domain 99
displays in the Navigation pane 97
name displayed in italic 98
status indicators 98

T

The Foxboro Evo System Fieldbus Modules 262
toolbar
buttons 89
showing and hiding the toolbar 70

V

View menu 70
View Settings
Enable Blinking 76

W

Warm Start option when performing an On-line Image Update 189
Watch tab 63
changing the column order 63
sorting the display of watched counters 63
Westinghouse WPDF migration FBMs 262
Windows operating system Start menu 39
workstations 103
connected peripherals 117
counters 118, 211
enabling and disabling reports 133
equipment change actions 131
status and equipment information 106

Z

Z-Form Control Processor 270 (ZCP270). See control stations 135

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