GFK-1186

GE Fanuc Manual Series 90-30

TCP/IP Ethernet Communications Station Manager Manual

GE Fanuc Automation

Programmable Control Products

TCP/IP Ethernet Communications

Station Manager Manual

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Warnings, Cautions, and Notes as Used in this Publication

Warning

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

Caution

Caution notices are used where equipment might be damaged if care is not taken.

Note

Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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Field Control	Motion Mate	Series One	Workmaster
FrameworX	ProLoop	Series Six	
GEnet	PROMACRO	Series Three	

Chapter 1 Introduction

This manual describes how to access and use the *Station Manager* software, which resides in the firmware of the PLC Ethernet Interface products listed below:

- Series 90™–30 PLC Ethernet Interface (IC693CMM321), both types.
- Series 90–30 PLC CPU364 with embedded Ethernet Interface (IC693CPU364)
- Series 90-30 PLC CPU374 with embedded Ethernet Interface (IC693CPU374)
- Series 90–70 PLC Ethernet Interface (Type 2) (IC697CMM742)

The term, *Ethernet Interface*, will generally be used in this manual to describe these products.

The Ethernet Interface enables Series 90 PLCs to communicate with other Series 90 PLCs, with GE Fanuc programming software, and with computer applications developed using GE Fanuc Ethernet protocols, such as CIMPLICITY® HMI. Refer to GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual* for information on installing and programming the Ethernet Interface.

The Station Manager is a part of the communications software built into the Ethernet Interface. The Station Manager executes as a background function to provide interactive supervisory access to the Ethernet Interface.

The Station Manager is available when the Ethernet Interface is in the Operational or Maintenance state. It is not available when running Power–Up Diagnostics or the Software Loader.

Station Manager Styles

This manual will refer to two different styles of Station Managers. The two styles have a similar interface, but details of the commands and output are different between the two styles.

Station Manager Styles	
Style	**Products Supported**
Style A	IC693CMM321, IC693CPU364, IC697CMM742
Style B	IC693CPU374

Station Manager Services

The Station Manager provides the following services:

- An interactive set of commands for an operator to interrogate and control the Ethernet Interface.
- Access to observe and modify internal statistics, an exception log, and advanced user parameters.
- Password security for commands that change the Ethernet Interface parameters or states.

The Station Manager allows you to monitor the operation of the local station (node) and the network. If a problem occurs at the local station or on the network, the Station Manager may be used to pinpoint the source of the problem through the various commands.

Quick Guide to the Manual

The table below provides a quick pointer into the manual for Station Manager operations. Be sure to reference the Table of Contents and Index for more specific questions.

Questions	Where to go in the Manual
How do I connect my PC or terminal to the Station Manager software on the Ethernet Interface?	Chapter 2. "Accessing the Station Manager"
How to I figure out what went wrong?	Chapter 3. "Troubleshooting"
How do I use the Station Manager in general?	Chapter 4. "How to Use the Station Manager"
How can I use the Station Manager to test the Ethernet Interfaces and verify operation of the physical network?	Chapter 5. "Testing Ethernet Interfaces on the Network"
Where do I find descriptions of each Station Manager Command?	Chapter 6. "Style A Command Descriptions" -or- Chapter 7. "Style B Command Descriptions" See especially the following commands: LOG command TALLY command STAT command

Chapter 2 Accessing the Station Manager

The Station Manager on the Ethernet Interface can be accessed in two* ways:

1. ***Through the Station Manager serial port on the Ethernet Interface*** by a PC running a terminal emulator (typically Hyperterm) or by an ASCII terminal. See Figure 2–1.
2. ***Remotely over the Ethernet network via another Ethernet Interface*** by a PC running a terminal emulator or by an ASCII terminal. This method requires the use of the *REM* (Remote) command to access the remote station. See Figure 2–2.

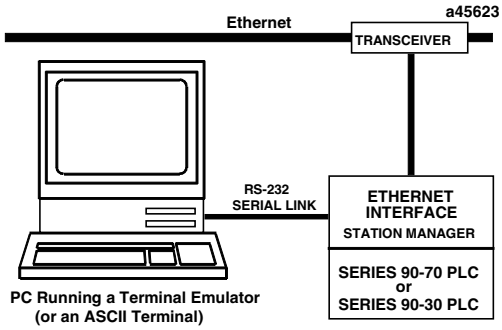


Figure 2-1. Station Manager Accessed Locally through the Station Manager Port

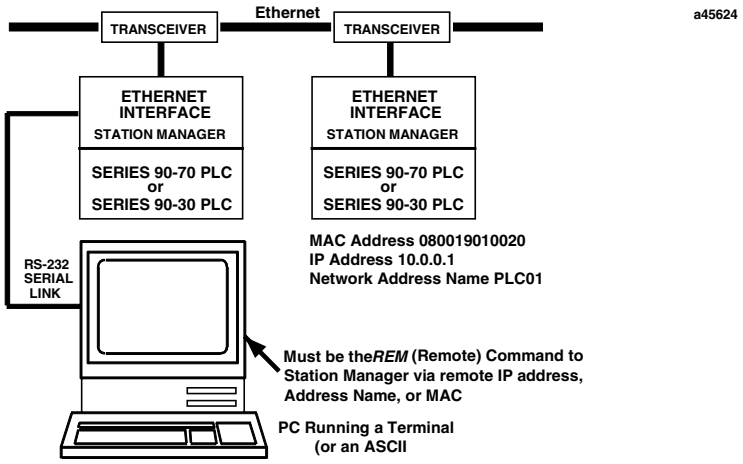


Figure 2-2. Station Manager Accessed Remotely over the Network Using the *REM* (Remote) Command

* A third way exists for customers whose networks contain Series 90 Ethernet Interfaces (Type 1) or Series 15/16 CNC OSI–Ethernet Interfaces. See the Terminal Emulator section later in this chapter.

Connecting to the Station Manager

Local Operation of the Station Manager

Whether using a PC running a terminal emulator or an ASCII terminal, the steps for connecting to the Station Manager are essentially the same.

1. Connect the serial cable IC693CBL316A from the PC or ASCII terminal to the Station Manager port of the Ethernet Interface. The end of the cable with the RJ–11 connector connects to the Station Manager port on the Ethernet Interface. The end of the cable with the D–type connector connects to the serial port on your PC or terminal.

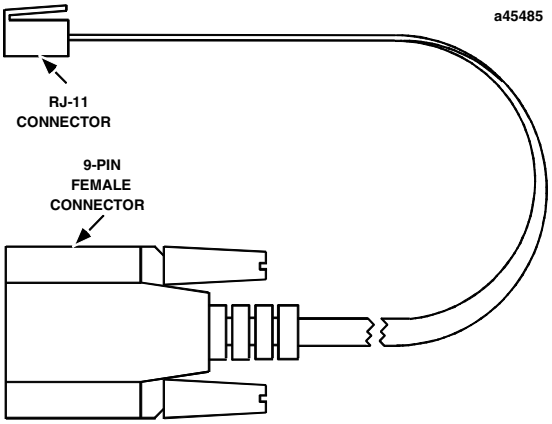


Figure 2-3. Serial Cable (IC693CBL316A) to Connect Personal Computer to Station Manager Port

For reference, the Station Manager serial port pinouts on the Ethernet Interface are included here. For a further description of this port, refer to GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*.

Figure 2-4. Station Manager Serial Port (RS–232)

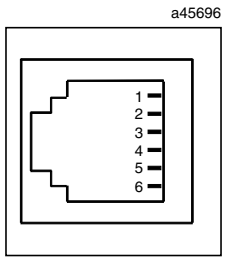


Table 2-1. Station Manager Serial Port Pinouts

Pin Number	Signal	Description
1	CTS	Clear To Send (input)
2	TD	Transmit Data (output)
3	SG	Signal Ground
4	SG	Signal Ground
5	RD	Receive Data (input)
6	RTS	Request to Send (output)

2. Set up the communication parameters of the terminal emulator or ASCII terminal to match the configuration for the Station Manager Port.

   If the the PLC programmer configuration for the Station Manager Port of the Ethernet Interface used the defaults, or the Ethernet Interface has not been configured using the PLC programmer, use the default values. If the PLC programmer configuration for the Station Manger Port of the Ethernet Interface used different values, use those values for the serial port of the PC or terminal. See GFK–1541, *TCP/IP Ethernet Communications for the Series 90*

PLC User's Manual for instructions on using the PLC programmer software to configure the serial ports of the Ethernet Interface. The default configuration is:

```
9600 bits per second
8 data bits
No parity
1 stop bit
No flow control
```

3. Press the **Enter** key. The Station Manager should respond with the Station Manager prompt character (>).

Note

The Ethernet Interface may intermittently miss input characters at the serial port when the module is very busy. Missed inputs are not echoed to the user. Under these conditions, the user should verify that the input character is echoed.

Terminal Emulators

A terminal emulator is supplied with the Windows® operating system that can be used to access the Station Manager.

Also, the ***GEnet System Manager (GSM)*** software supplied with the Series 90 PLC Ethernet Interface (Type 1) software and the Series 15/16 CNC Ethernet software contains a terminal emulator that can be used to access the Station Manager port on the Series 90 Ethernet Interfaces.

There are three ways to use the GSM to access the Station Manager on the Series 90 Ethernet Interface:

1. The personal computer on which the GSM runs can be connected directly to the Station Manager serial port on the Series 90 Ethernet Interface.
2. The personal computer on which the GSM runs can be connected directly to the Station Manager serial port on an Ethernet Interface. Then the *REM* Station Manager command can be addressed to a remote Series 90 Ethernet Interface over the network.
3. The personal computer on which the GSM runs can remotely access the Series 90 Ethernet Interface over the network, using the network interface within the PC, when the GSM is executing its Network Station Manager Terminal Feature.

   Refer to the GSM chapter in any of the following manuals for details.

   TCP/IP Ethernet Communications for the Series 90 PLC User's Manual (GFK–1004)
   MMS Ethernet Communications for the Series 90 PLC User's Manual (GFK–0868)
   OSI–Ethernet Communications for Series 15 and Series 16 CNCs User's Manual (GFK–0706)

Note

Style B Station Manager modules do not support the GSM.

® Windows is a registered trademark of Microsoft, Inc.

Remote Operation of the Station Manager

The Station Manager commands can be invoked over the network from other Series 90 PLC Ethernet Interfaces or GE Fanuc CNC OSI–Ethernet Interfaces by using the *REM* command. When invoked remotely, the Station Manager software processes the command as if it had been entered from a device attached to the serial port but automatically directs output from the command over the LAN to the station which issued the request. There is no indication on the local Station Manager terminal (if attached) when a remote command is being processed.

Note

Both the local and remote access share the same security level. See the LOGIN and *LOGOUT* command descriptions.

Note

Style B Station Manager modules do not support the remote station manager operation using a MAC address and thus cannot be accessed remotely from GE Fanuc CNC OSI–Ethernet Interfaces.

Chapter 3 Troubleshooting

This chapter is a guide to troubleshooting and problem isolation for the Ethernet Interface.

The chapter covers the following topics:

- Diagnostic tools available
- States of the Ethernet Interface
- Troubleshooting using the LEDs
- Troubleshooting using the Station Manager
- Troubleshooting using the PLC Fault Table
- What to do if you cannot solve the problem

Diagnostic Tools Available for Troubleshooting

There are several tools to assist you in diagnosing problems with the Series 90 Ethernet Interface and the network.

- Use the ***Ethernet Interface LEDs*** to troubleshoot a problem on power–up of the Ethernet Interface and for an immediate visual summary of the operational state of the Interface. Refer to the topic, "Troubleshooting using the LEDs", later in this chapter for more information.
- Use the ***Series 90 PLC Fault Table*** to troubleshoot a problem once the Interface is running. It provides a record of exceptions logged by the PLC, the Ethernet Interface, and other Series 90 modules. The PLC Fault Table may be accessed through the PLC Programmer software. Look in the PLC Fault Table for a logged fault, then refer to the topic "*Troubleshooting Using the PLC Fault Table*" in this chapter for instructions on what action to take.
- Use the ***Status Data*** to troubleshoot ladder programs containing COMMREQ functions that initiate communications. The status data consists primarily of the Status bits and the Communications Status words. Refer to GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual,* Chapter 3, "Programming Communications Requests", for more information.
- Use the ***Station Manager software*** to troubleshoot a problem with the Interface, with the network, with PLC backplane communication, or with your application. The LOG, TALLY, EXS, and STAT Station Manager commands are especially useful.
  - The LOG command provides a record of exceptions occurring with the network and Interface.
  - The TALLY command provides statistics about operation and performance of the network and Interface.
  - The EXS command provides information about COMMREQs.
  - The STAT command provides the current status on the operation of the Interface.

  Refer to relevant chapters in this manual for information on how to access and use the Station Manager software.

States of the Ethernet Interface

The states of the Ethernet Interface are described below.

Note on LED Names

The IC693CMM321 Series 90–30 Ethernet Interfaces and the IC697CMM742 Series 90–70 Ethernet Interface (Type 2) each have 4 LEDs. The CPU364 and CPU374 Ethernet Interfaces have 3 LEDs. Many of the functions being indicated are the same from module-to-module, with the exception of the third LED from the top (FDX, SER, SERIAL ACTIVE, N/A) in the following table.

LED Indicators for Ethernet Interface Products			
10Base-T Type IC693CMM321 Ethernet Interface	**AAUI-Only Type IC693CMM321 Ethernet Interface**	**IC697CMM742 Ethernet Interface (Type 2)**	**IC693CPU364/374 CPUs with Ethernet Interface**
OK	OK	MODULE OK	EOK
LAN	LAN	LAN ONLINE	LAN
FDX	SER	SERIAL ACTIVE	(N/A)
STAT	STAT	STATUS	STAT

Hardware Failure State

When power is cycled on the Series 90 PLC, or whenever the Ethernet Interface is restarted, power–up diagnostics run. Diagnostics running is indicated by the OK LED fast blinking, while the other LEDs remain OFF.

Note

If all LEDs turn OFF and stay OFF during power–up diagnostics, or if on the CPU374, the EOK LED blinks in a repeated sequence, then power–up diagnostics have failed. Refer to the PLC Fault Table for more information.

The PLC Fault Table can be especially helpful in detailing faults that are detected during power–up because the Station Manager is not operational during power-up. If the Ethernet Interface has a problem, it may not be able to report fault details. In the case of the CPU374 only, the EOK LED blinks a two-digit failure code that can also help determine the nature of the failure. Refer to the topic, *"Troubleshooting Using the PLC Fault Table"* in this chapter for more information.

Upon successful completion of diagnostic testing, the Ethernet Interface waits for configuration data from the PLC CPU. This may take several seconds, depending upon the PLC configuration. If configuration data is not received, the Ethernet Interface will use a backup copy of the most recent valid configuration data. (Each Ethernet Interface is shipped from the factory with a valid set of default backup configuration data.)

Refer to GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual* for details on the power–up process.

The Restart pushbutton is not operable during the Ethernet Interface diagnostic phase nor is the Station Manager active.

Software Load State

The Software Load state is automatically entered if the Power–up Diagnostics detect a problem with the primary software. For Style A Station Manager modules, it can also be entered if the Station Manager user issues a *LOAD* command or the Restart pushbutton is pressed and held until the bottom (STAT) LED comes ON. In the Software Load state, all Ethernet Interface LEDs are blinking in unison.

In the Software Load state, the Ethernet Interface can accept a download of its operating software from an external PC Loader device (a PC running the PC Software Loader program). Refer to GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*, Appendix C, for a description of the software loading process. Once a software load has begun, the existing communications software is deleted; the Ethernet Interface must be completely reloaded.

For Style A Station Manager modules, the Restart pushbutton may be used to abort the Software Load state. If the existing operating software has not been erased or corrupted, the Ethernet Interface will restart immediately into the Operational state upon pressing the pushbutton. If the operating software is not available, the Ethernet Interface always restarts into the Software Load state.

For Style B Station Manager modules, the load takes place as a part of an overall update of the PLC CPU firmware. No separate load of the Ethernet Interface is required or supported.

Waiting for IP Address State

If a non–zero IP address for the Ethernet Interface was not configured prior to power up, or the IP address was configured to 0.0.0.0, the Interface will wait indefinitely for a non–zero IP address. The OK and STAT LEDs blink in unison. In this state, the Ethernet Interface does not perform any SRTP Server or Channel API operations (or Modbus/TCP Server or Channel API operations[*]). If this occurs, you need to configure a non–zero IP address using the PLC Programmer configuration software and restart the module.

For Style A Station Manager modules, you may temporarily supply an IP address using the *BOOTP* Station Manager command; an IP address supplied by a BOOTP server, or the *BOOTP* Station Manager command remains effective only until the next restart of the Ethernet Interface.

For Style B Station Manager modules, you may temporarily assign an IP address over the network. See Appendix D for the process to assign a temporary IP address to a Style B Station Manager module.

[*] Modbus/TCP available only on Series 90-30 Ethernet Interface IC693CMM321-FH or later.

The Maintenance State

For Style A Station Manager modules, the Maintenance state is entered after diagnostics if one of the following occurs:

- The Station Manager user issues a *MAINT* command,
- The Restart pushbutton is pressed and held until the bottom two LEDs come on
- The Ethernet Interface has detected a fatal error in the Operational state

Note

There is no Maintenance state for Style B Station Manager modules. Backup configuration and Advanced User Parameters may be modified in the operational state.

In the Maintenance state, the Ethernet Interface uses the configuration data from the PLC CPU (if available), but always defaults to the factory values for all Advanced User parameters, ignoring any customizations. In addition, the Ethernet Interface does not perform any SRTP Server or Channel API operations (or Modbus/TCP Server or Channel API operations*). This allows quick and safe isolation of the Ethernet Interface for troubleshooting purposes.

The Station Manager is active in the Maintenance state, and always uses the Modify command level without the necessity of logging in. The NODE command additionally displays, "<<<Maintenance State>>>". The Station Manager prompt is "*". For the Series 90–30 Ethernet Interface and Series 90–70 Ethernet Interface (Type 2), the OK and SER LEDs blink in unison. For the CPU364, only the EOK LED blinks.

In the Maintenance state, the *TEST* and *PING* commands may be used to check network connectivity. If this Ethernet Interface is using its internal backup configuration data (i.e., was not configured with the PLC), the *CHSOSW* command may be used to modify the backup configuration data. Also, the *CHPARM* command can be used to change Advanced User Parameters.

The Operational State

This section identifies possible problem symptoms that may occur while the module is operating.

The Operational state is the state of normal operation of the Ethernet Interface. Full connection to the PLC and full SRTP Server and Channel API operation (and Modbus/TCP Server and Channel API operations*) are provided. The Ethernet Interface uses configuration data from the PLC CPU, and the Advanced User parameters specified by the user. When the Ethernet Interface is properly configured, the Ethernet Interface enters the Operational state without any user intervention. This state permits user access to Station Manager commands at their respective command levels.

During normal operation of the Ethernet Interface, the OK LED is ON. The LAN, SER, and STAT LEDs provide information about the health of the Ethernet Interface and activity on the LAN and Serial Port 2.

The Station Manager is fully operational in the Operational state, and always assumes the Monitor command level upon completion of Diagnostics; the Monitor command level prompt is ">". The LOGIN command may be used to change to the Modify command level as desired; the Modify command level prompt is "=". There is no state indication message following the Station ID in the NODE command.

In the Operational state, the *TEST* and *PING* commands may be used to check network connectivity.

* Modbus/TCP available only on Series 90-30 Ethernet Interface IC693CMM321-FH or later.

Troubleshooting Using the LEDs

Powering–up the Ethernet Interface

After configuring the Interface and storing the configuration to the PLC, follow the procedure below to verify that the Ethernet Interface is operating correctly.

1. Turn power OFF to the PLC for 3-5 seconds, then turn the power back ON. This will initiate a series of diagnostic tests.

   The OK LED will blink indicating the progress of power–up.

2. The LEDs will have the following pattern upon successful power–up. At this time the Ethernet Interface is fully operational and on–line with no exception conditions.

Note

The "SER" LED is not present on the Series 90–30 CPU364 and CPU374. Also, this LED is labeled "SER" on AAUI-Only style IC693CMM321 and "FDX" on the 10Base-T style IC693CMM321. Refer to "Note on LED Names" in the previous section "States of the Ethernet Interface".

LED	Status After Power-Up
OK	● (ON)
LAN	●/* (ON or Blinking if Traffic is Present)
SER or FDX[1]	o (OFF)
STAT[2]	● (ON)

[1] The AAUI-Only type CMM321 has a SER LED; the 10Base-T type CMM321 has an FDX LED; the CPU364 and CPU374 do not have this LED.

[2] If STAT LED is OFF, check the PLC Fault Table. Alternatively, use the Station Manager LOG command.

Problems During Power–up

If a problem is detected during power–up, the Ethernet Interface may not transition directly to the Operational state. If the Interface does not transition to Operational, check the LED pattern on the Interface and refer to Figure 3–1, 3–2 or 3-3 to find out where the Interface stopped. Refer to Table 3–1, 3–2, or 3-3 for corrective actions.

States of the Series 90–30 Ethernet Interface (IC693CMM321) and the Type 2 Series 90-70 Ethernet Interface (IC697CMM742)

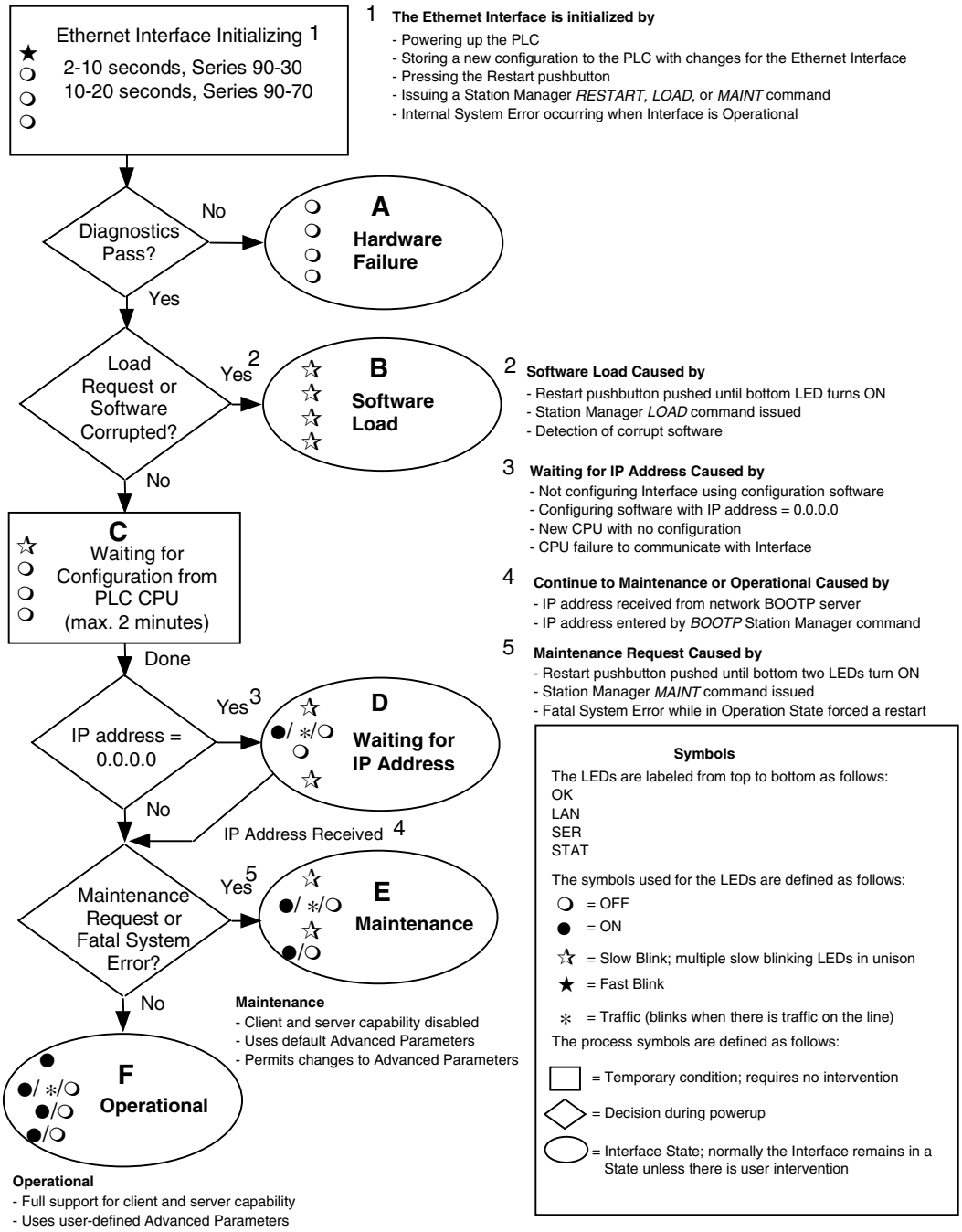


Figure 3-1. States of the IC693CMM321 and IC697CMM742

Table 3-1. Problems During Power–Up for IC693CMM321 and IC697CMM742

LED Pattern	Where Stopped	Possible Cause	Corrective Actions
❍ OK (OFF) ❍ LAN (OFF) ❍ FDX (OFF) ❍ STAT (OFF)	**A** **Hardware Failure**	Fatal Hardware Error.	■ Make sure the PLC has power. ■ Examine PLC Fault Table for clues.* ■ Recheck PLC Programmer configuration. ■ Power off baseplate, inspect the Interface for loose components, reseat the Interface, and Restart. ■ Try a different slot. ■ If the problem persists, replace the Interface or PLC hardware.
☆ OK (Slowblink) ☆ LAN (Slowblink) ☆ FDX (Slowblink) ☆ STAT (Slowblink) *All LEDs blink in unison.*	**B** **Software Loader**	■ Restart pushbutton until bottom LED turns ON. ■ Station Manager *LOAD* command issued. ■ Software corrupt.	■ Connect a PC Software Loader and load new software. See Appendix C. ■ Cycle power or press Restart pushbutton again for less than 5 seconds to restart the Interface and clear the load request.
☆ OK (Slowblink) ❍ LAN (OFF) ❍ FDX (OFF) ❍ STAT (OFF)	**C** **Waiting for Configuration from PLC**	■ Did not configure slot using PLC Programmer. ■ New CPU with no configuration. ■ CPU not communicating with Ethernet Interface (Condition can last a maximum of 2 minutes.)	■ Use PLC Programmer configuration software to configure the Interface then store the configuration to the PLC CPU. ■ Make sure Interface is in the correct slot on the baseplate. ■ Power cycle the PLC. ■ Clear faults and Restart Interface.
☆ OK (Slowblink) ●/*/❍ LAN (ON/Traffic/OFF) ❍ FDX (OFF/Slowblink) ☆ STAT (Slowblink) *OK and STAT blink in unison.*	**D** **Waiting for IP Address**	Interface's IP address has not been configured or has been configured as 0.0.0.0.	■ Use PLC Programmer to configure the Interface with a non-zero IP address. ■ Use a BOOTP server to provide Interface with a non-zero IP address.
☆ OK (Slowblink) ●/*/❍ LAN (ON/Traffic/OFF) ☆ FDX (Slowblink) ●/❍ STAT (ON/OFF) *OK and SER blink in unison.*	**E** **Maintenance**	■ Restart pushbutton pressed until bottom two LEDs turn ON. ■ Station Manager *MAINT* command issued. ■ Internal System Error when Interface was Operational caused a restart and entrance into Maintenance.	■ If you did not intend to enter Maintenance press the Restart pushbutton for less than 5 seconds. This clears the Maintenance request. ■ Examine PLC Fault Table for clues.* ■ If you need to use the Station Manager to troubleshoot a problem, see GFK-1186, *TCP/IP Ethernet Communications for the Series 90 PLC Station Manager Manual*.
● OK (ON) ●/*/❍ LAN (ON/Traffic/OFF) ●/❍ FDX (ON/OFF)[1] ●/❍ STAT (ON/OFF) [1] FDX should be ON if Full Duplex mode is activated; otherwise, it should be OFF.	**F** **Operational**	If the LAN LED is OFF, the problem may be: ■ Network cable or transceiver not connected to Interface or bad transceiver. ■ Network cable not terminated properly. ■ SQE not enabled on transceiver. If the STAT LED is OFF, an exception condition has occurred.	■ Connect cable and transceiver properly. Replace transceiver. ■ Terminate network cable properly. ■ Set SQE ON on transceiver in accord with manufacturer's instructions. ■ Examine PLC Fault Table to find out why the STAT LED is OFF. *

*Identify the PLC fault message using PLC Programmer, then refer to Table 3–4 for corrective actions.

States of the Series 90–30 CPU364 Ethernet Interface

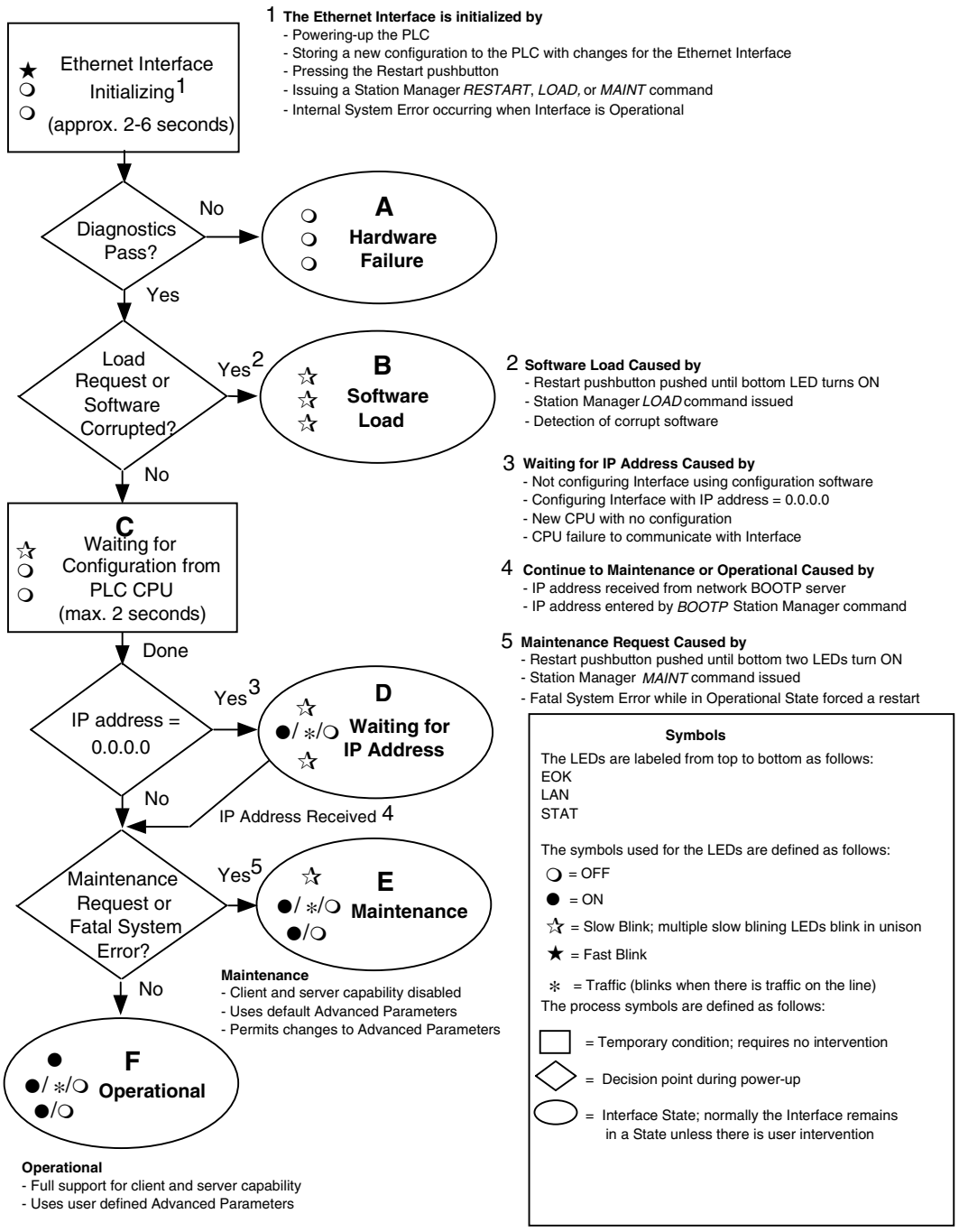


Figure 3-2. States of the Series 90–30 CPU364 Ethernet Interface

Table 3-2. Problems During Power–Up (Series 90–30 CPU364 Ethernet Interface)

LED Pattern	Where Stopped	Possible Cause	Corrective Actions
❍ EOK (OFF) ❍ LAN (OFF) ❍ STAT (OFF)	**A** **Hardware Failure**	Fatal Hardware Error.	■ Make sure the PLC has power. ■ Examine PLC Fault Table for clues.* ■ Recheck PLC Programmer configuration. ■ Power off baseplate, inspect the Interface for loose components, reseat the module, and Restart. ■ If the problem persists, replace the PLC hardware.
☆ EOK (Slowblink) ☆ LAN (Slowblink) ☆ STAT (Slowblink) *All LEDs blink in unison.*	**B** **Software Loader**	■ Restart pushbutton until the bottom LED turns ON. ■ Station Manager *LOAD* command issued. ■ Software corrupt.	■ Connect a PC Software Loader and load new software. See Appendix C. ■ Cycle power or press Restart pushbutton again for less than 5 seconds to restart the Interface and clear the load request.
☆ EOK (Slowblink) ❍ LAN (OFF) ❍ STAT (OFF)	**C** **Waiting for Configuration from PLC**	■ Did not configure slot using the PLC Programmer. ■ CPU not communicating with Ethernet Interface. (Condition can last a maximum of 2 seconds.)	■ Use the PLC Programmer configuration software to configure the Interface then store the configuration to the PLC CPU. ■ Power cycle the PLC. ■ Clear faults and Restart Interface.
☆ EOK (Slowblink) ●/☆/❍ LAN (ON/Traffic/OFF) ☆ STAT (Slowblink) *EOK and STAT blink in unison.*	**D** **Waiting for IP Address**	Interface's IP address has not been configured or has been configured as 0.0.0.0.	■ Use the PLC Programmer to configure the Interface with a non-zero IP address. ■ Use a BOOTP server to provide Interface with a non-zero IP address.
☆ EOK (Slowblink) ●/☆/❍ LAN (ON/Traffic/OFF) ●/❍ STAT(ON/OFF)	**E** **Maintenance**	■ Restart pushbutton until the bottom two LEDs turn ON. ■ Station Manager *MAINT* command issued. ■ Internal System Error when Interface was Operational caused a restart and entrance into Maintenance.	■ If you did not intend to enter Maintenance press the Restart pushbutton for less than 5 seconds. This clears the Maintenance request. ■ Examine PLC Fault Table for clues.* ■ If you need to use the Station Manager to troubleshoot a problem, see GFK-1186, *TCP/IP Ethernet Communications for the Series 90 PLC Station Manager Manual.*
● EOK (ON) ●/☆/❍ LAN (ON/Traffic/OFF) ●/❍ STAT(ON/OFF)	**F** **Operational**	If the LAN LED is OFF, the problem may be: ■ Network cable not connected or transceiver not connected to Interface or bad transceiver. ■ Network cable not terminated properly. ■ SQE not enabled on transceiver. If the STAT LED is OFF, an exception condition has occurred.	■ Connect cable and transceiver properly. Replace transceiver. ■ Terminate network cable properly. ■ Set SQE ON on transceiver in accord with manufacturer's instructions. ■ Examine PLC Fault Table to find out why the STAT LED is OFF. *

*Identify the PLC fault message using PLC Programmer, then refer to Table 3–4 for corrective actions.

States of the Series 90-30 CPU374 Ethernet Interface

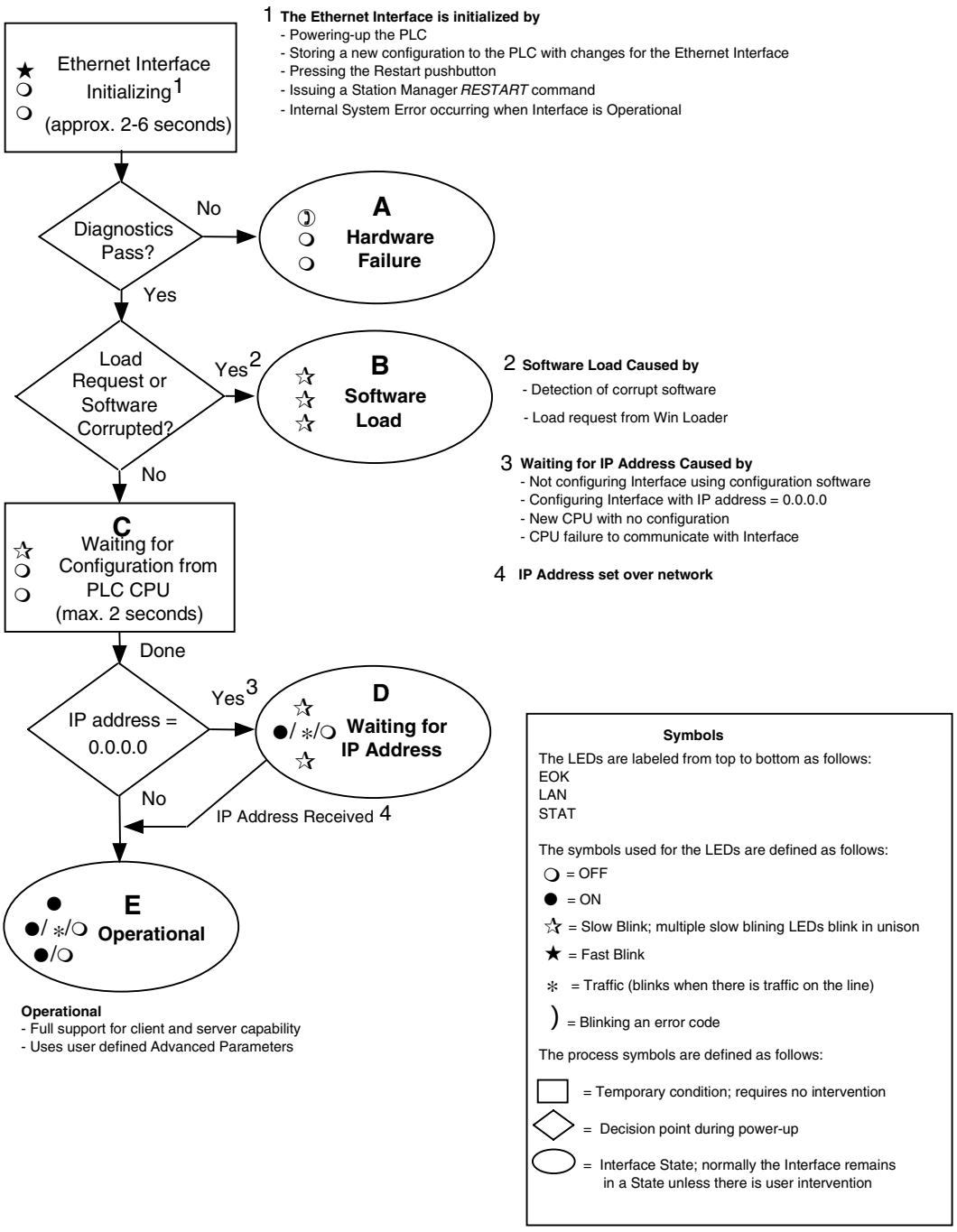


Figure 3-3. States of the Series 90–30 CPU374 Ethernet Interface

Table 3-3. Problems During Power–Up (Style B Station Manager Ethernet Interface)

LED Pattern	Where Stopped	Possible Cause	Corrective Actions
◑ EOK (OFF) ❍ LAN (OFF) ❍ STAT (OFF)	**A** **Hardware Failure**	Fatal Hardware Error.	■ Make sure the PLC has power. ■ Examine blink code for clues. ■ Examine PLC Fault Table for clues.* ■ Recheck PLC Programmer configuration. ■ Power off baseplate, inspect the Interface for loose components, reseat the module, and Restart. ■ If the problem persists, replace the PLC hardware.
☆ EOK (Slowblink) ☆ LAN (Slowblink) ☆ STAT (Slowblink) *All LEDs blink in unison.*	**B** **Software Loader**	■ Winloader attached to CPU ■ Software corrupt.	■ Connect a PC Software Loader and load new software. See Appendix C.
☆ EOK (Slowblink) ❍ LAN (OFF) ❍ STAT (OFF)	**C** **Waiting for Configuration from PLC**	■ Did not configure slot using the PLC Programmer. ■ CPU not communicating with Ethernet Interface. (Condition can last a maximum of 2 seconds.)	■ Use the PLC Programmer configuration software to configure the Interface then store the configuration to the PLC CPU. ■ Power cycle the PLC. ■ Clear faults and Restart Interface.
☆ EOK (Slowblink) ●/✲/❍ LAN (ON/Traffic/OFF) ☆ STAT (Slowblink) *EOK and STAT blink in unison.*	**D** **Waiting for IP Address**	Interface's IP address has not been configured or has been configured as 0.0.0.0.	■ Use the PLC Programmer to configure the Interface with a non-zero IP address. ■ Assign IP address over the network.
● EOK (ON) ●/✲/❍ LAN (ON/Traffic/OFF) ●/❍ STAT(ON/OFF)	**E** **Operational**	If the LAN LED is OFF, the problem may be: ■ Network cable not connected or transceiver not connected to Interface or bad transceiver. ■ Network cable not terminated properly. If the STAT LED is OFF, an exception condition has occurred.	■ Connect cable and transceiver properly. Replace transceiver. ■ Terminate network cable properly. ■ Examine PLC Fault Table to find out why the STAT LED is OFF. *

*Identify the PLC fault message using PLC Programmer, then refer to Table 3–4 for corrective actions.

Troubleshooting Using the Station Manager

The Station Manager provides interactive commands that can be used to troubleshoot the Ethernet Interface. There are two types of commands: *monitor* commands and *modify* commands. The *monitor* commands allow you to observe internal statistics, the contents of an exception log, and configuration parameter values. The *modify* commands allow you to clear the statistics and the log, and to change parameter values. The Station Manager commands are discussed in detail in Chapter 6/7, "Command Descriptions".

Within the Ethernet Interface software are various *tasks*, each of which performs a specific function. For example, the *TCP task* performs the TCP protocol functions. Many Station Manager commands allow you to access information about one or more specific task at a time.

Tasks for Modules Using Style A Station Manager

The figure below provides a visual reference for the various tasks within the Ethernet Interface software.

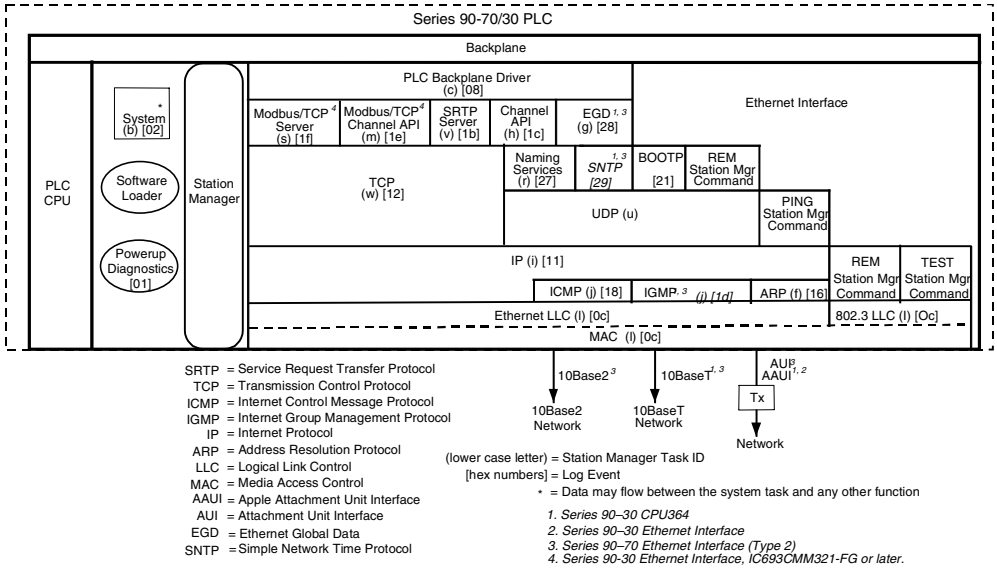


Figure 3-4. Visual Reference for Tasks within the Series 90 Ethernet Interface Software

Tasks for Modules Using Style B Station Manager

The figure below provides a visual reference for the various tasks within the Ethernet Interface software for modules using a Style B Station Manager.

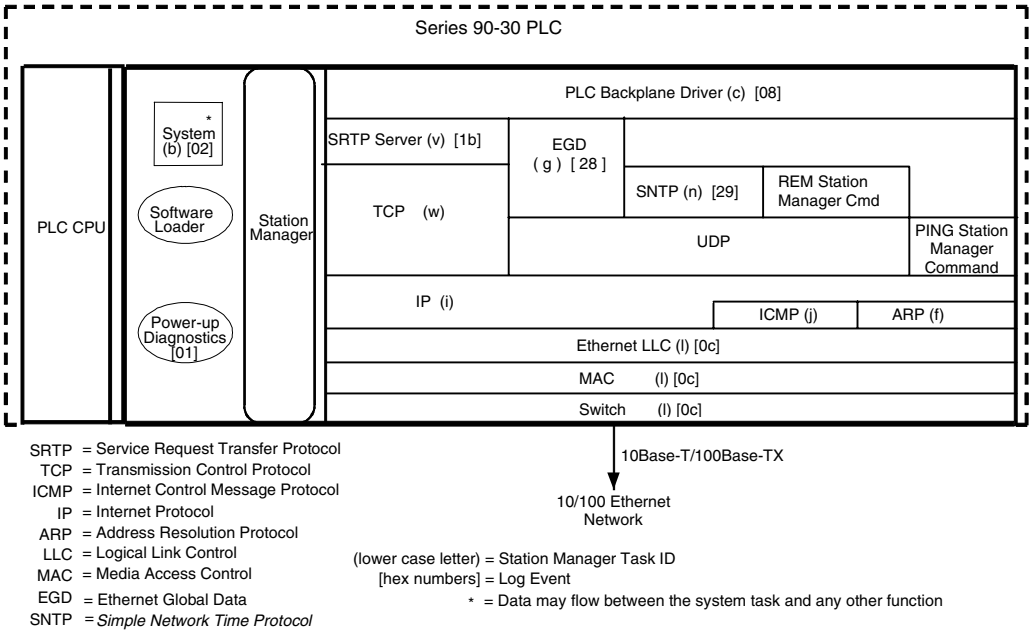


Figure 3-5. Tasks for Modules Using Style B Station Manager

Exception Log

When the Ethernet Interface software detects a very unusual condition-an *exception* condition, it records information about the condition in its *exception log*. The exception log can be viewed using the Station Manager LOG command. Exception log contents are retained when the Ethernet Interface restarts (in most cases), and are cleared when the user issues the Station Manager *CLEAR LOG* command. (For the Series 90–30 Ethernet Interface only, the exception log contents are cleared when power is cycled). Each task uses a unique numeric code to identify its entries in the exception log.

Table 3-4. Exception Log Event Definitions

Log Event	Cause
1	Power up. A log entry of this event will appear every time the Ethernet Interface is Restarted or powered up.
2 and 3	System events
8	PLC driver events
c	LLC events
d	ERR events
e	Station manager events
f	Common utility events
11	IP events
12	TCP events
13	Toolkit XTI events
14	Toolkit shell events
15	Toolkit user events
16	ARP events
18	ICMP events
1a	Application specific events
1b	SRTP Server events
1c	SRTP Channel API events
1d	IGMP events
1e	Modbus/TCP Channel API events
1f	Modbus/TCP Server events
26	Non–volatile memory backup events
27	Naming Services events
28	Ethernet Global Data events
29	SNTP events
2a	Runtime diagnostic events

When the STAT LED is OFF

If the Ethernet Interface is in the Operational or the Maintenance state and the STAT LED is OFF, then the Ethernet Interface has detected an exception condition and has made an entry in the Exception Log. Each new (not repeating) log event is also sent to the PLC Fault Table, where it can be viewed using the PLC Programmer. Refer to Appendix B, "Exception Log Event Descriptions" for a list of possible log events.

Log events are entered in the Exception Log from top to bottom, with the latest event being identified by "->". If the Exception Log becomes full, wrap around will occur back to the top of the Log with the entry of new log events.

The format of a log event as displayed by the Station Manager LOG command is shown below:

				Entry					
Date	**Time**	**Event**	**Count**	**1**	**2**	**3**	**4**	**5**	**6**
dd–mmm–yyyy	hh:mm:ss.s	xx	xxxx	xx	xxxx	xxxx	xxxx	xxxx	xxxx

Date – The Date column contains the system date of the last occurrence of the logged event.

Time – The Time column contains the system time of the last occurrence of the logged event.

Event – The Event column gives the kind of event which occurred.

Count – The Count column contains a repetition count for the event. If events which are identical occur regularly, they might otherwise flood the log with useless entries. Instead of recording each repeated event in detail, the log simply keeps the time of the latest event and a count of the number of repetitions of the repeated event. Log entries are generally retained on restart and reloads of the Ethernet Interface.

Entry – The Entry columns contain detailed information about the event and is subdivided into 6 entries, Entry 1 – Entry 6.

For Style B Station Manager modules, extended information is available in the log. This information can be displayed by using the "LOG Z" command. When the "Z" option is entered, the log command produces 132 columns of output; so an appropriate terminal or terminal emulator should be used. In addition to the information displayed in the log command, the following additional information is displayed.

- **S-Code.** A 32-bit internal status code. See Appendix E for a description of the S-Code format and values.
- **Remote IP Addr.** Port or Produced IP Exchg. For some errors, this field contains the IP address and port of the remote node associated with the error. For EGD, this field sometimes contains the Producer ID and Exchange ID of the exchange associated with the error.
- **Local IP Addr. Port**. For some errors, this field contains the IP Address and Port of the local end point associated with the error.

Furthermore, if the LAN LED is OFF, this indicates that an attempt to send a frame resulted in a local fault indication. This usually results from a hardware problem. If this occurs, follow the procedure below.

1. Check to be sure that the cables are securely fastened to the Ethernet Interface connector and to the transceiver (if used).
2. Make sure the transceiver (if used) is securely fastened to the Ethernet network trunk cable.
3. Issue a TALLY L Station Manager. If either the *MacErr* or the *SQEErr* tally is non–zero, the local station may be experiencing an unstable network. In this case follow the procedure below.

   If this station is the only one experiencing problems:

   1. Verify that the SQE test is enabled on the transceiver connected to the Ethernet Interface.
   2. Re–tighten all transceiver cable and network connections.
   3. Make sure the Interface is seated and secured properly.
   4. Replace the transceiver cable with a known good cable.
   5. Verify that the Series 90 PLC power supply is properly grounded.
   6. If using an external transceiver, replace the transceiver with a known good transceiver.

   If all stations are experiencing the problem, the cable plant is probably at fault. Re-certify the cable plant.

When the STAT LED is ON

Sometimes problems can occur even when the STAT LED is ON, indicating normal operation. In this case, check if the LAN LED is also ON, indicating that the Interface is successfully attached to the Ethernet network, but there is no network activity.

To verify that the Ethernet Interface can access the PLC, issue successive TALLY C Station Manager commands. If the *PlcSweep* tally is not increasing, there are no windows being provided by the PLC. If any of the tallies *PlcAbt*, *MyAbt*, or *Timeout* are incrementing, there may be a hardware problem with the Series 90 PLC backplane interface. Check the PLC Fault Table for entries for the Ethernet Interface.

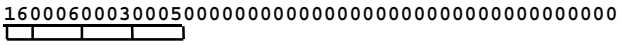
Troubleshooting Using the PLC Fault Table

The PLC Fault Table can be accessed via the PLC Programmer. If you are experiencing a problem with the Ethernet Interface, check the PLC Fault Table for a fault message, then refer to Table 3–4 for instructions on what to do about the problem. The relation of the fault message with the Ethernet Interface can be determined by the rack/slot reference displayed with the fault message in the PLC Fault Table.

To access the details of a PLC Fault Table Entry:

- For Windows–based programming software, double–click on the Fault Table entry and the details are displayed as “fault extra data”. Refer to Online Help for more information.
- For Logicmaster 90, select the Fault Table entry and press <CTRL–F> to view the fault details. The “fault extra data” are the long strings of digits on the right half of the message line. Refer to GFK–0265, *Logicmaster 90–70 Programming Software Reference Manual* or GFK–0467, *Series 90–30/20/Micro Programming Software Reference Manual*, for more information.

An example of the fault extra data is shown below:



For Ethernet Interfaces the leftmost 14 digits of the the fault extra data (underlined in the example above) show the corresponding log Events (2 digits) and Entries 2, 3, and 4 (in that order, 4 digits each). The example above is reporting an Event 16, Entry 2=6, Entry 3=3, and Entry 4=5.

This information can be used to refer directly to detailed fault descriptions included in the LOG event table under the LOG command in Chapter 6/7, “Command Descriptions”.

Table 3-5. PLC Fault Table Message Descriptions

PLC Fault Message	User Action
Backplane communications with PLC fault; lost request	User Action: Check to make sure you are not sending COMMREQs faster than the Ethernet Interface can process them. If problem persists, contact GE Fanuc Automation – NA.
Bad local application request; discarded request	User Action: Check for valid COMMREQ command code. If problem persists, contact GE Fanuc Automation – NA.
Bad remote application request; discarded request	User Action: Try to validate the operation of the remote node. If problem persists, contact GE Fanuc Automation - NA.
Can't locate remote node; discarded request	Error reported when remote IP/MAC address cannot be resolved. Error may indicate that remote host is not operational on the network. User Action: Check that remote host is operational on network and its addresses are correct.
Comm_req – Bad task ID programmed	Message from PLC for unknown Ethernet Interface task. User Action: Check COMMREQ function block.
Comm_req – Wait mode not allowed	User Action: Check COMMREQ to make sure sent in no–wait mode.
Config'd gateway addr bad; can't talk off local net	Error in configuration. Verify IP address, Subnetwork Mask, and default Gateway IP address are correct.
Connection to remote node failed; resuming without it	Underlying communications software detects error transferring data; resuming. If persistent error, check connection to LAN and operation of remote node.
LAN controller fault; restart LAN I/F	User Action: HW fault, perform power cycle. If problem persists, contact GE Fanuc Automation – NA.
LAN controller Tx underflow; attempt recovery	Internal system error. User Action: If problem persists, contact GE Fanuc Automation – NA.
LAN controller underrun/overrun; resuming	Internal system error. User Action: If problem persists, contact GE Fanuc Automation – NA.
LAN data memory exhausted – check parms; resuming	The Ethernet Interface does not have free memory to process communications. User Action: If problem persists, contact GE Fanuc Automation – NA.

Table 4-4. PLC Fault Table Message Descriptions (Continued)

PLC Fault Message	User Action
LAN duplicate MAC Address; resuming	A frame was received in which the source MAC Address was the same as this station's MAC Address. All stations on a network must have a unique MAC address. Immediately isolate the offending station; it may be necessary to turn it off or disconnect it from the network. This station remains Online unless you intervene to take it Offline.
LAN controller fuse blown; off network	*(Series 90–70 Ethernet Interface (Type 2) and Series 90–30 PLC CPU364)* The network port fuse is blown; port is unusable. Isolate and correct the cause of the problem, and then replace the fuse or the Ethernet Interface. Refer to GFK–1541 for fuse type and replacement procedures.
LAN I/F can't init – check parms; running soft Sw utl	Internal system error. User Action: If problem persists, contact GE Fanuc Automation – NA.
LAN I/F capacity exceeded; discarded request	Verify that connection limits are not being exceeded.
LAN interface hardware failure; switched off network	User Action: Replace Ethernet Interface.
LAN network problem exists; performance degraded	Excessive backlog of transmission requests due to excessive traffic on the network. For a sustained period the MAC was unable to send frames as quickly as requested. User Action: If problem persists, contact GE Fanuc Automation – NA.
LAN severe network problem; attempting recovery	External condition prevented transmission of frame in specified timeframe. Could be busy network or network problem. User Action: Check transceiver to make sure it is securely attached to the network. Check for unterminated trunk cable.
LAN system–software fault; aborted connection resuming	Internal system error. User Action: If problem persists, contact GE Fanuc Automation – NA.
LAN system–software fault; restarted LAN I/F	Internal system error. User Action: If problem persists, contact GE Fanuc Automation – NA.
LAN system–software fault; resuming	Internal system error. User Action: If problem persists, contact GE Fanuc Automation – NA.
LAN transceiver fault; OFF network until fixed	Transceiver or transceiver cable failed or became disconnected. User Action: Reattach the cable or replace the transceiver cable. Check SQE test switch if present on transceiver.
Local request to send was rejected; discarded request	Internal error. Check that the Ethernet Interface is online. User Action: If problem persists, contact GE Fanuc Automation – NA.
Memory backup fault; may lose config/log on restart	Internal error accessing FLASH device. User Action: If problem persists, contact GE Fanuc Automation – NA. Replace Ethernet Interface.
Module software corrupted; requesting reload	Catastrophic internal system error. Contact GE Fanuc Automation – NA.
Module state doesn't permit Comm_Req; discarded	COMMREQ received when Ethernet Interface cannot process COMMREQ. User Action: Make sure Ethernet Interface is configured and online.
Unsupported feature in configuration	PLC firmware does not support Ethernet communications software. User Action: Check CPU revision, order upgrade kit for CPU.

What to do if you Cannot Solve the Problem

If, after using the troubleshooting guide, you still cannot solve your problem, call GE Fanuc Automation – NA. Please have the following information available when you call.

- The Name and Catalog Number marked on the product (label on the outside of the side wall of the Interface cover).
- Description of symptoms of problem. *Depending on the problem–you may also be asked for the following information:*
  - The ladder logic application program and the PLC sweep time at the time the problem occurred.
  - A listing of the configuration parameters for the Ethernet Interface that failed.
  - A description of the network configuration. This should include the following:
    - The number of PLCs and host computers accessing the network
    - The type of network cable used (for example, twisted pair, fiber optic, etc.)
    - The length of network cable
    - The manufacturer and quantity of transceivers, hubs, and network switches used

Chapter 4 How to use the Station Manager

This chapter describes the two types of Station Manager commands, monitor and modify commands, and general rules for using them. Also discussed are the various states of the Ethernet Interface and how the Station Manager operates in each state.

Note

The Station Manager is a "background" task. It only executes when communication processing is not occurring. Because of this, the command response time is sensitive to the communication load of the Ethernet Interface—the greater the load, the longer it takes for the commands to execute. Under extremely high load conditions, this can include the loss of input or output characters, especially when using a serial connection to the Station Manager. Under extreme load, you may find the Station Manager unable to process commands until the load is removed.

Station Manager Security

The Station Manager commands are divided into two groups:

- Monitor commands
- Modify commands

The *Monitor* commands provide information about the Ethernet Interface and the network. Executing these commands will not affect the operation of the Ethernet Interface or the network, and they are available to anyone using the Station Manager. See Table 4–1 for a list of Monitor commands.

The *Modify* commands perform functions that may change the operation of the Ethernet Interface and the network. These commands are secure and may only be executed when the secure level of operation has been selected by "logging in" with the current password or while in the Maintenance state. These commands will be printed in italics in this manual. See the LOGIN command description, and see Table 4–2 for a list of Modify commands.

Using the Monitor Commands

All of the Monitor commands can be executed from either the Monitor ">" prompt or the Modify "=" prompt. To display a list of the Monitor commands on the screen, type:

```
> HELP  <RET>
```
or
```
> ?  <RET>
```

Table 4-1. Monitor Commands for a Style A Station Manager

Command	Description
?	Display list of commands
CHANNEL	Display the status of a communication channel
DATE	Display current date
EXS	Display Extended Status buffer
HELP	Display list of commands
LOG	Display Exception log
LOGIN	Login to Modify mode
LTIME	Display login timeout
MYNAME	Display Network Address Name
NAMETBL	Display Name Table
NODE	Display node identification message
PARM	Display a set of advanced user parameters
PROG	Display the main PLC logic program name
RDNIP[2]	This command is reserved
ROUTETBL[1, 2]	Display routing information
SNTP[1, 2]	Display SNTP time synchronization information
SOSW	Display current Soft Switch configuration data
STAT	Display task(s) status
TALLY	Display task(s) tallies
TIME	Display current time of day
UDIS	Reserved on all Ethernet Interfaces
XCHANGE[1, 2]	Display the status of an Ethernet Global Data exchange

[1] Series 90–30 CPU364 only
[2] Series 90–70 Ethernet Interface (Type 2) only

Table 4-2. Monitor Commands for a Style B Station Manager

Command	Description
?	Display list of commands
EGDREAD	Display contents of an EGD exchange
HELP	Display list of commands
LOG	Display Exception log
LOGIN	Login to Modify mode
LTIME	Display login timeout
NODE	Display node identification message
PARM	Display a set of advanced user parameters
PLCREAD	Display contents of PLC memory
PROG	Display the main PLC logic program name
SOSW	Display current Soft Switch configuration data
STAT	Display task(s) status
TALLY	Display task(s) tallies
TIME	Display current time of day
XCHANGE	Display the status of an Ethernet Global Data exchange

For most commands, simply enter the command and press Enter. Some commands require additional information to be entered along with the command. Those arguments should be separated from the command and from each other by one or more spaces. The Command Descriptions section in this chapter provides a complete description of each command.

The LOGIN command is required to access the Modify commands. To execute the LOGIN command, you must know the current password.

Useful Monitor Commands for Network Troubleshooting

There are three Monitor commands that are especially useful to troubleshoot the network:

- The NODE command
- The LOG command
- The TALLY command

NODE Command: Displays the TCP/IP Ethernet sign–on message, identifying the node by its MAC and IP addresses and identifying the resident software version number.

LOG Command: Displays a log of exception conditions (events) occurring at the local node. The events are counted, time stamped, and differentiated by an error code.

TALLY Command: Displays counts of transactions of the specific tasks.

Using the Modify Commands

To use any of the Modify commands you must obtain the modify "=" prompt using the LOGIN command. To do this you must know the current password. The default password is "system" (lower case characters). If you want to change the password or if you have forgotten the password when using a Style A Station Manager, follow the appropriate procedure under the *CHPARM STPASSWD* command in Chapter 6/7, "Command Descriptions." For modules using the Style B Station Manager, use the AUP file.

To log in, type from the ">" prompt:

```
LOGIN   <RET>
```

The password prompt will then be displayed.

```
Password:
```

Type in the current password and press Enter. If the entered password matches the current password for the station, the modify "=" prompt is displayed. The password is **case sensitive** and special characters such as "backspace" will become part of the password.

One may execute all Monitor and Modify commands (with the exception of the *CHPARM* and *CHSOSW* commands) from the Modify "=" prompt. The *CHPARM* and *CHSOSW* commands can be executed only

- in the Maintenance state for modules using the Style A Station Manager
- in the absence of a configuration from the PLC.

If no commands are executed within 10 minutes, the Modify login will time–out and you will have to login again. This 10 minute timeout between commands can be changed if desired by using the *CHLTIME* command.

Note

The security feature is intended to prevent inadvertent misuse of the Modify commands. It is not a foolproof mechanism to prevent unauthorized changes. For the greatest protection, restrict the number of people who know the password, restrict access to the Station Manager terminal, and always log off when you leave the Station Manager.

To list the Monitor commands and Modify commands on the screen, type:

```
HELP  <RET>      or
?  <RET>
```

The following table provides a brief description of the Modify commands.

Table 4-3. Modify Commands for a Style A Station Manager

Command	Description
BOOTP	Supply temporary configuration parameters (Not recommended if PLC CPU is configured properly.)
BROWSEDDP	Display names defined in the DDP Directory Information Base
CHDATE	Change date (Not recommended if Ethernet Interface obtains correct date and time from the PLC CPU.)
CHLTIME	Change login timeout
CHMYNAME +[2]	Change or create Network Address Name (Not permitted if the Network Address Name is configured at the PLC Programmer)
CHNAMETBL +[2]	Add, change, or delete entries in the Name Table (Not permitted if the Name Table is configured at the PLC Programmer)
CHPARM +	Change a specified advanced user parameter
CHSNTP[1, 3]	Temporarily override automatic SNTP time synchronization server selection
CHSOSW+	Change Soft Switch data (Not recommended if PLC CPU is configured properly.)
CHTIME	Change time (Not recommended if Ethernet Interface obtains correct date and time from the PLC CPU)
CLEAR	Clear Extended Status buffer, Error Log,Tallies, or Heap
KILLMS[4]	Delete and close a specified Modbus/TCP Server connection
KILLSS	Delete and close a specified SRTP Server connection
LOAD	Force Ethernet Interface software update
LOGOUT	Exit modify mode
MAINT	Restart the Interface and enter the Maintenance state
NET	Disable/Enable network access at this Ethernet Interface
OK	Turns on STAT LED
PING	Sends ICMP echo request messages to remote station
REM	Send Station Manager command to remote station
REPORT	Report test results
REPP	Report ping results
RESOLVE	Resolve a Network Address Name into an IP address
RESTART	Restart the Ethernet Interface
STOPP	Stop an active *PING* command
STOPT	Stop an active *TEST* command
TEST	Send test frames to remote station(s)
TRACE	Turn on specific task trace flags

\+ The Ethernet Interface must be in the Maintenance state to execute this command.

1 Series 90–30 CPU364 only

2 Series 90–30 Ethernet Interface only

3 Series 90–70 Ethernet Interface (Type 2) only

4 Series 90–30 Ethernet Interface IC639CMM321-FH or later only

Table 4-4. Modify Commands for Style B Station Manager

Command	Description
CHLTIME	Change login timeout
CHPARM +	Change a specified advanced user parameter
CHSOSW+	Change Soft Switch data (Not recommended if PLC CPU is configured properly.)
CHTIME	Change date and time (Not recommended if Ethernet Interface obtains correct date and time from the PLC CPU)
CLEAR	Clear Error Log or Tallies
EGDWRITE	Modify and EGD exchange
KILLSS	Delete and close a specified SRTP Server connection
LOGOUT	Exit modify mode
NET	Disable/Enable network access at this Ethernet Interface
OK	Turns on STAT LED
PING	Sends ICMP echo request messages to remote station
PLCWRITE	Modify PLC reference memory
REM	Send Station Manager command to remote station
REPP	Report ping results
RESTART	Restart the Ethernet Interface
STOPP	Stop an active *PING* command
TRACE	Turn on specific task trace flags

\+ The Ethernet Interface must not have a configuration from the PLC in order to execute this command.

Date and Time

The Station Manager provides commands to examine the date and time. Any time the Ethernet Interface is restarted or power to it is cycled, it will attempt to read the date and time from the PLC CPU. If this fails or the PLC model does not provide date and time, the time reverts to midnight and the date to January 1 of a default year.

(Series 90–30 CPU364, Series 90–30 CPU374 and Series 90–70 Ethernet Interface (Type 2) only) If the Ethernet Interface is configured to use Network Time Synchronization, the Ethernet module will synchronize its internal date and time to the network time server. In this case, the date and time as shown by the Ethernet Interface *may* be different from that of the PLC CPU. It should be noted that the timestamp information in the Exception Log is based on the internal clock of the Ethernet Interface, but the timestamp in the PLC Fault Table is based on the internal clock of the PLC CPU.

If the Ethernet Interface is configured to use Network Time Synchronization, the time–stamp in EGD exchange data is based on the internal clock of the Ethernet Interface *that produces that particular exchange*. For exchanges that are produced by an Ethernet Interface *not* configured to use Network Time Synchronization, the timestamp in EGD exchange data will be based on the internal clock of the PLC CPU.

If desired, the Ethernet Interface's date and time may be set using the Station Manager. If Network Time Synchronization is enabled, however, time updates from the network time server will take precedence and Station Manager cannot be used to change the Ethernet Interface's date and time settings.

Note

Series 90–30 PLC CPU models 311–323 do not support date and time. The Ethernet Interface date and time will revert to midnight, January 1, 1989 at startup.

Station Manager Command Syntax

Chapter 6/7, *"Command Descriptions"*, provides an alphabetical listing of the commands. Each entry describes the input and output for each command.

All commands have the format of a command followed by a variable number of arguments separated by spaces. Details about the arguments are discussed with each command. All arguments to the commands will be automatically converted to all lower case characters unless they are enclosed in double quotation marks (e.g., "A").

Task Identification

Several commands refer to "tasks" or subsystems of the operating software. Each task has a unique identifying letter which is used to select the desired task or tasks. The following table shows the task identifiers and their associated tasks.

Table 4-5. Task Identifiers

Identifier	Task
b	System Memory
c	PLC Driver
f	ARP
g	Ethernet Global Data [1, 2, 3]
h	SRTP Channel API
i	IP
j	ICMP
l	Data Link
m	Modbus/TCP Channel API [4]
n	SNTP[3]
r	Naming Services
s	Modbus/TCP Server [4]
u	UDP
v	SRTP Server
w	TCP

1 Series 90–30 CPU364 only

2 Series 90–70 Ethernet Interface (Type 2) only

3 Series 90-30 CPU374 only

4 Series 90-30 Ethernet Interface IC693CMM321-FH or later only

Display Data Representation

The data that is displayed by the Station Manager is formatted in one of several ways depending on the type of data being input or output.

Note

The Ethernet Interface has a limited output buffer for storing and displaying Station Manager command results. During heavy Station Manager use, the buffer capacity may be exceeded and part of the command results will be lost.

Numeric Values

Most numeric values are displayed as decimal values. In cases where it would be helpful, the value is displayed in both decimal and hexadecimal. A few values are displayed only in hexadecimal. Hexadecimal values are are displayed with an "H" as their last character. An example of numeric output is shown below:

```
ifragtmr = 100 (0064H)
```

When a numeric value is entered, it may be entered as either a decimal value or as a hexadecimal value. A hexadecimal value must be entered using the trailing "H" (either upper or lower case) as its last character.

Byte String Values

Byte strings represent each successive byte as a pair of hexadecimal digits enclosed in double angle brackets (<<...>>). An example of a byte string output is shown below.

```
MAC address = <<080019010842>>
```

IP Addresses

IP addresses are displayed and entered in dotted decimal format. An example is shown below:

```
= ping 10.0.0.1 10
Ping initiated

<<< Ping Results >>>
Command:  ping  10.0.0.1  10 100 64
Sent = 10, Received = 10, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 10/10/10
```

Station Manager Operation in Different Ethernet Interface States

The states of the Ethernet Interface are:

- Hardware Failure
- Software Load
- Waiting for IP Address
- Maintenance
- Operational

The Ethernet Interface states are distinguished by different LED patterns on the module. See Chapter 3, "Troubleshooting".

Hardware Failure and Software Load States

The Station Manager is not active in the Hardware Failure and Software Load states.

Waiting for IP Address State

The Station Manager is active in this state. The Station Manager functionality and prompt displayed depends on whether the Ethernet Interface will transition to the Maintenance state or the Operational state after it receives an IP address. If the Interface will transition to the Maintenance state, the Station Manager prompt is "*". If the Interface will transition to the Operational state, the Station Manager prompt is ">". Tasks which require an IP address are not functional in this state. See also "Differences in Station Manager Operation" at the end of this section.

Maintenance State

The Station Manager is active in the Maintenance state, and always uses the Modify command level without the necessity of logging in. The Station Manager prompt is "*". Additionally, the NODE command displays "<<<Maintenance State>>>" and the reason for invoking Maintenance state. For modules using the Style A Station Manager, the *CHPARM* and *CHSOSW* commands are available only in the Maintenance state. See also "Differences in Station Manager Operation" at the end of this section.

Operational State

The Station Manager is fully operational in the Operational state, and assumes the Monitor command level upon completion of a successful restart; the Monitor command level prompt is ">". The LOGIN command may be used to change to the Modify command level as desired; the Modify command level prompt is "=". See also "Differences in Station Manager Operation" at the end of this section.

Differences in Station Manager Operation

A similar set of Station Manager commands can be executed whether the Interface is in the Operational state or in the Maintenance state. The results of some commands may be different, however, depending on the state of the Interface. There are two reasons for the differences:

1. The Ethernet Interface uses user–defined advanced parameter values when in the Operational state and default advanced parameter values when in the Maintenance state.
2. There is no support for applications (such as SRTP Channel COMMREQ commands or PLC Programmer TCP connection) in the Maintenance state. Therefore, the SRTP Channel API layer (task h), the SRTP Server layer (task v), and Ethernet Global Data (task g) are not initialized. The Modbus/TCP Channel API layer (task m) and the Modbus/TCP Server layer (task s) are also not initialized[1].

Station Manager commands that access the advanced parameters, the SRTP layers or the Modbus/TCP layers in some way can be executed, but their effect will be limited.

Also, if a valid non–zero IP address has not been configured, the Ethernet Interface cannot fully operate. The tasks which require an IP address to function (SRTP Channel API (task h), SRTP server (task v), Modbus/TCP Channel API (task m)[1], Modbus/TCP Server (task s)[1],TCP (task w), EGD (task g), IP (task i), ICMP (task j), UDP (task u), Naming Services (task r) and part of ARP (task f)) will not be operational. Station Manager commands that access these tasks will display results that reflect the tasks' inoperable state. Remote Station Manager operation using IP addressing or Naming Services is not possible until a valid IP address is received.

[1] Series 90-30 Ethernet Interface IC693CMM321-FH or later only

Chapter 5 Testing on the Network

This chapter describes how to verify operation of the physical network to provide the necessary foundation for reliable communications.

This procedure will ensure that:

- The cable plant is functional.
- The physical connection of each node is functional.
- All transmission paths meet or exceed the expected low bit error rate.

When you are testing the network, be sure there is an adequate explanation for anything unusual. Logging of exceptions should be the exception, not the rule. Properly setup nodes and networks can run for long periods (weeks or months) without logging exceptions.

Note

After you have established confidence in your particular application and configuration parameters, you can periodically re–test your physical network *while the applications are running*. This is done by using the *TEST* and/or the *PING* Station Manager commands.

The tests described here can be performed when the Ethernet Interfaces are in either the Operational or Maintenance state.

Running a Network Test Using Style A Station Manager

The Ethernet Interfaces you are going to use to test the network can be in either the Operational or the Maintenance state. You will use the Station Manager to run tests to verify that the cable plant is operating correctly and to examine statistics about network performance.

Note

Style B Station Manager modules do not support the Station Manger *TEST* command either as an initiator or as a responder on the network. Connectivity to these modules may be tested using the *PING* station manager command. See "Performing a PING Test" in this chapter.

The procedure below describes the steps to be performed for the Network Test.

1. Select a station to be the test initiator and connect the terminal emulator to serial port 1 on this station. This may be any Ethernet Interface. If your application uses a particular node to communicate with most others, we suggest you designate this node as the test initiator. You will connect a terminal emulator to this Interface to access its Station Manager.

   Note

   All commands described in this procedure are issued from your test initiator.

2. Enter the command:

   ```
   = test all              :Lists all nodes on operating network.
   ```

   or

   ```
   = test 010000000000     :Lists all GE Fanuc nodes on operating network.
   ```

   The response to "test all" will return a list of the MAC addresses of all nodes attached to the network and presently operating. (This list may include other vendor's nodes since the standard IEEE 802.2 test response mechanism is used. Testing other vendor's nodes is, however, beyond the scope of this procedure. Ignore responses from these nodes.)

   Caution

   Using either of the addresses "all" or "010000000000" to access stations on the network is recommended *only* under controlled test conditions. Execution of Station Manager commands on an operational network using these addresses may generate a great deal of traffic and might degrade network or node performance temporarily.

   Compare this list with the nodes in the network. If all expected nodes are not listed, double–check that each node is powered up, has its transceiver cable connected, and has its transceiver connected to the network.

   Correct any deficiencies and repeat steps 1 and 2 until all nodes to be tested are in the response list.

This procedure assumes that all stations attached to the network remain either powered or not powered continuously from step 2 through step 6. Turning any node(s) ON or OFF or Restarting any node during this test will artificially inflate the error count.

3. Clear the error log and LLC and MAC tallies in all GE Fanuc *test responde*rs in the test. This step cannot be performed for non–GE Fanuc devices using the Station Manager.

   This step can be done for all Ethernet Interfaces at one time by executing the following *REM*ote commands:

```
= rem 010000000000 login system      :Logon to all GE Fanuc stations
= rem 010000000000 clear log         :Clear logs of all GE Fanuc stations
= rem 010000000000 clear tally       :Clear tallies of all GE Fanuc stations
```

Note

> Pressing <CTRL–R> will display the last command executed. This is especially helpful when you are repeating similar commands. Simply display the previous command, change the desired part of the command, and press Enter.

   This step can be done for individual Ethernet Interfaces by executing the following set of *REM*ote commands for *each* Ethernet Interface to be tested.

```
= rem <node> login system
= rem <node> clear log
= rem <node> clear tally
```

   where <node> is the 12–digit MAC address of the target node.

4. To clear the error log and LLC and MAC tallies in the *test initiator* Ethernet Interface, issue the following commands:

```
= clear log
= clear tally
```

5. Issue the desired *TEST* command to initiate the network test.

```
= test 010000000000 1000 50 256      :Tests all GE Fanuc stations on the network
```

   or

```
= test all 1000 50 256               :Tests all stations on the network
```

   This *TEST* command causes the test initiator to broadcast 1000 test command frames of varying lengths and data patterns to all GE Fanuc nodes or all nodes of all types on the network. All nodes receiving these commands are expected to send a similar test response back to the initiating node. The initiating node counts all responses from each responding node.

This command will take about 10 minutes to complete. When the command is complete, a report like the following should be displayed.

```
<<< Test Results >>>                                  Page 1 of 1

Command:  test  <<ffffffffffff>>   3e8H 32H 100H ALT
Init Node: <<08001901001f>> Frames sent: 3e8H Nodes responding: 4H
Responding nodes    Response recd  Response w/err    No Response
<<08001901027d>>      3e8H              0H                0H
<<080019010163>>      3e8H              0H                0H
<<080019010043>>      3e8H              0H                0H
<<08001901012c>>      3e8H              0H                0H
```

This *TEST ALL* command and report shows performance over the network between the initiating node and each responding node, at a rate comparable to what an application might experience. For further information, see the descriptions of the *TEST* and *REPORT* commands in Chapter 6, “Command Descriptions”.

Verify that all GEnet stations under test are included in the list, either as the initiating node or as a responding node. Also, all GEnet stations should report:

- 3e8H Responses received.
- 0H Responses with error.
- 0H No Responses. (A No Response will occur occasionally. But, on average, a No Response should occur no more than *once* with the *TEST* command above executed with 40,000 frames instead of 1,000 frames.)

Transcribe this report onto a clean copy of the Ethernet Network Test Data Sheet found at the end of this chapter. If you are testing a network with many nodes, you may need more than one data sheet.

If you are using a terminal emulator program running on a PC to communicate with the Station Manager on the test initiator, and the program has the capability to capture serial data to a file, you may prefer to save the test result, tally, and exception log data from this test in a file. Use a different capture file name each time you perform the test.

6. When the *TEST ALL* command has completed and its results have been transcribed, gather the accumulated error log and LLC and MAC tallies from all GEnet stations by sending the following commands to each station. Transcribe all non–zero results to the Data Sheet.

```
$ rem <node> log
$ rem <node> tally l
```

7. Get the exception log and LLC and MAC tallies from the initiator by issuing the following commands:

   ```
   $ log
   $ tally l
   ```

   Transcribe all non–zero results to the Data Sheet.

   The LOG response from each node, including the initiator, should appear as follows:

   ```
   REM$ <<<Exception Log>>>
   REM$ Exception log empty
   ```

   Make a notation on the Network Test Data Sheet that the log is empty, or record the values, if any, reported in the log response message.

   The TALLY L response from *each* station should appear as follows:

```
REM>    <<< Data Link Tallies >>>
REM>    Unreg    = 0000H    Lsap0     = 0000H    LsapOfl     =0000H    EthUnreg   = 0000H
REM>    MacErr   = 0000H    BufProb   = 0000H    UnrecPdu    =0000H    TstRcvd    = 03E8H
REM>    TstResp  = 0000H
REM>
REM>    <<< MAC Tallies >>>
REM>    SQEErr   = 0000H    MisdPack  = 0000H    FrameErr    =0000H    SuccOne    = 0000H
REM>    CrcErr   = 0000H    RbufErr   = 0000H    LateColl    =0000H    LostCarr   = 0000H
REM>    BsyCar   = 0000H    NoRtry    = 0647H    SuccMore    =0000H    FRtry      = 0000H
```

   The TALLY L report provides more detailed information about faults than the *TEST ALL* command. Acceptable tally rates are indicated on the Network Test Data Sheet. Note that certain tallies should always be 0, while other tallies are acceptable if their average rate is not excessive.

   Record the LOG and TALLY L results for each Interface under test.

8. At this point, you have completed your initial checkout of the Ethernet Interface and its operation on the network. If the acceptance criteria is met, your Interface and network meets requirements and no further testing is necessary. If the criteria is *not* met, refer to earlier sections of this chapter for the meaning of the log data and refer to Appendix C, “Tally Descriptions”, for meaning of the tally data.

Performing a "Ping" Test

PING (Packet InterNet Grouper) is the name of a program used on TCP/IP networks to test reachability of destinations by sending them an ICMP echo request message and waiting for a reply. Most nodes on TCP/IP networks, including all Series 90 Ethernet Interfaces (whether supporting Style A or Style B Station Manager), implement a *ping* command. *Ping* can reach remote IP networks through routers and gateways (unlike the *TEST* command which may not operate over certain routers and gateways). *Ping* is restricted to testing communication to a single remote node.

The user should *ping* each installed Ethernet Interface. When the Ethernet Interface responds to the *ping,* it verifies that the interface is operational and configured with proper TCP/IP parameters.

Pinging the Interface from a UNIX host or a PC Running TCP/IP Software

The *ping* can be executed from a UNIX host or PC running TCP/IP (since most TCP/IP communications software provides a *ping* command) or from another Ethernet Interface. When using a PC or UNIX host, the user can refer to the documentation for the *ping* command, but in general all that is required is the IP address of the remote host as a parameter to the *ping* command. For example, at the command prompt type:

```
ping  10.0.0.1
```

Pinging the Interface Using the Station Manager PING *Command*

Perform the following steps to *ping* from an Ethernet Interface using the Station Manager *PING* command.

1. Access the Station Manager and issue the NODE command to verify that the local Interface has the correct IP address. A typical NODE command is shown below:

```
> node

IC693 PLC LAN Interface
Copyright (c) 1998. All rights reserved.
Version 1.00 (28A1) TCP/IP
Version 1.00 (28A1) Software Loader
IP address = 10.0.0.2
MAC address = <<080019010688>>
```

2. Login to be able to use the *PING* command. (The LOGIN command is described in Chapter 6, "Command Descriptions").

```
> login
Password:        (The default password is "system".)
Logged in

=
```

3. Enter the *PING* command supplying the IP address for the remote Ethernet Interface to be tested. A typical *PING* command is shown below:

```
= ping 10.0.0.1

<<< Ping Results >>>
Command:  ping  10.0.0.1 1 100 64
Sent = 1, Received = 1, No Timely Timely Response = 0
Late/Stray Response = 0
Round-trip (ms) min/avg/max 10/10/10
```

Determining If an IP Address Has Already Been Used

It is very important not to duplicate IP addresses. To determine if you have configured your Ethernet Interface with the same IP address as another node:

1. Disconnect your Interface from the LAN.
2. Ping the disconnected Interface's IP address from some other device on the network. If you get an answer to the ping, then the chosen IP address is already in use by another node. You *must* correct this situation by assigning unique IP addresses.

Note

A Style A Station Manager module will not respond to a ping issued from itself to its own IP address. A Style B Station Manager module will.

Network Test Data Sheet (for Style A Station Manager only)

	Init Node	**Resp Node 1**	**Resp Node 2**	**Resp Node 3**	**Resp Node 4**	**Resp Node 5**	**Resp Node 6**	**Resp Node 7**	**Acceptable Rate**
User's Node Description									N/A
<<<Test Results>>>									
Node Address									N/A
Frames Sent/ Response Recvd									>3e6H
Response W/Err									0
No Response									<once / 40K frames
<<<Data Link Tallies>>>									
Lsap Ofl									0
MacErr									0
BufProb									0
TstRcvd									>3e6H
TstResp									>3e6H
<<<MAC Tallies>>>									
SQEErr									0
MisdPack									0
RbufErr									0
LateColl									0
LostCarr									0
Frtry									0
<<<Exception Log>>>									
Event									Empty
Count									
Entry(s)									

Chapter 6 Style A Station Manager Command Descriptions

This chapter describes how to execute each Style A Station Manager command and interpret its results.

Symbols Used in the Station Manager Commands

In the descriptions below, symbols are used to denote options or alternatives in the command parameters. These symbols are used to help give a clear and complete description of the command and are not part of the command. The use of these symbols is briefly described below:

Arguments to commands are often given symbolic names which are enclosed in angle brackets (< >). For example; "<PAGE>" is an argument to many commands. The command specification for "<PAGE>" is described as a number which specifies the page number of the display. It is important to remember to enter the argument and not its symbolic name. For example, to see the second page of the Test Results, you should enter:

REPORT 2 – not – **REPORT <PAGE>**

Optional arguments are surrounded by square brackets, for example *REPORT* [<PAGE>]. Again, the brackets should not be entered as part of the command.

Sometimes there are several *alternatives* for an argument. The alternatives are listed in the command description separated by a vertical bar (|) and enclosed in braces ({|}). For example, when using the *NET* command, only one of the alternatives should be selected:

NET { ON | OFF }

Command Input Processing

Anything in a command description that is not one of the constructs discussed above should be entered exactly as it is shown. All data entered for the command is converted to lower case unless it is enclosed in double quotes (“”). To use a double quote character within an argument string, the double quote should be entered twice, for example:
“This string would contain one ” “character.”

The Style A Station Manager accepts several ASCII control characters for various functions. The control characters accepted by the Station Manager are listed in the following table. All other control characters are ignored on normal command inputs. Illegal control characters sent to the Station Manager result in a <BEL> character being sent to the terminal.

Table 6-1. Control Characters

Control Character	Usual Keyboard Function	Function
BS	CTRL–H (Backspace)	Delete previous character
DEL	Delete	Delete previous character
DC1	CTRL–Q	Resume output to the display
DC2	CTRL–R	Recall previous command line(s)
DC3	CTRL–S	Stop output to the display
CAN	CTRL–X	Cancel the current input line
CR	Return (Enter)	Terminate line and execute command

If a command line becomes too long to easily type on a single display line, the character pair “\<CR>” can be used to continue the command on the next line on the display. The “\” (backslash) character will not be used as a part of any argument.

(Series 90–30 CPU364 and Series 90–70 Ethernet Interface (Type 2) only) Up to the last 10 command lines are stored in a recall list. Repeated <CTRL-R> recalls up to the last 10 command lines before the list wraps around. <CTRL-X> resets back to the starting position in the recall list. The recall list is cleared upon module restart or power-up. A blank command line is returned by <CTRL-R> if the recall list is empty.

BOOTP Command

Not recommended. The *BOOTP* command can *temporarily* assign an IP address and other TCP/IP parameters to an Ethernet Interface. The correct means to assign these parameters is by using the PLC Configurator, or from a BOOTP server on the network. The BOOTP–supplied parameters remain in effect only until the Ethernet Interface receives a proper configuration or the Ethernet Interface is restarted.

The *BOOTP* command has the form:

```
BOOTP <ip-address> [<subnet-mask>[<gateway>[<name-server>]]]
```

This command provides a simulated BOOTP server response consisting of the dotted decimal IP parameters specified for the station's IP address, subnet mask, gateway, and name server. Arguments not specified default to 0.0.0.0. This command is useful only when the Ethernet Interface has not yet received a valid non–zero IP address. Once a valid IP address is received, this command is ignored.

BROWSEDDP Command

The *BROWSEDDP* command has the form:

```
BROWSEDDP  [<starting name> [<ending name>]]
```

where the optional starting and ending name pair define a range of names to be browsed. Starting and ending names are "Long–Form" names in the format: `<Device name>@<Network Address Name>.` Both Network Address Name and Device Name are character strings and may not exceed 31 characters. (To enter a Network Address Name only, omit the Device Name by beginning the name with "@".)

The *BROWSE*DDP command displays names defined in the DDP Directory Information Base (DIB). The DDP DIB is distributed across all stations using the DDP protocol.

If either end of the search range is not specified, there is no limit at that end of the range. Thus, *BROWSEDDP* without a range attempts to return all defined DDP names.

The *BROWSEDDP* output first displays the local DDP DIB entry, then the names returned by the responding stations. Each name in the DIB is displayed with the IP address of the station where that name is defined. *Note that this is not necessarily the actual IP address assigned to this name.*

A typical *BROWSEDDP* command is shown below:

```
= browseddp
The DDP browse has returned 3 entries:
Device Name @ Network Address Name  is defined at  IP Address

------------------------------------------------------------------

"@cato"       (at 10.0.0.1)
"@anthony"    (at 10.0.0.2)
"@jerry"      (at10.0.0.3)
```

Every responding device contains a Network Address Name. Device Names are not used at this time; the *BROWSEDDP* output will display Device Names when they become available in the future.

For further information, refer to Chapter 6, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual.*

CHANNEL Command

The CHANNEL command has the form:

```
CHANNEL  [<channel number>]
```

This command displays detailed information about a specified communication channel (activated via an Establish Channel COMMREQ command) originating within the local PLC. A typical CHANNEL command for an active channel is shown below:

```
> channel 1
<<< Individual Channel Information >>>
Type: read, State: AWAIT_BPX
Application-Visible Detailed Channel Status Information:
  Status Code: 0001H, Active: 1
Application-Invisible Detailed Channel Status Information:
  Transfers Completed: 138, Error Transfer Number: 0
Establish Channel COMM_REQ Information:
  CRSW Reference Address (zero-based): 00008:00009
  Command Code: 2003, Channel Number: 1, Reps: 0
  Period Time Unit Code: 3, Repetition Period: 0
  Timeout: 50 10ms tics
  Local Reference Address: 00008:00100
  Remote Reference Address: 00008:00050
  Number of Remote References to Access: 8
  Remote Address Type: 1, Remote Address Word Length: 4
  Remote IP Address: 10.0.0.1
```

CHDATE Command

(Not recommended if the Ethernet Interface obtains the correct date from the PLC CPU.)

The *CHDATE* command has the form:

```
CHDATE  <DD-MMM-YYYY>
(an example date is:   01-JAN-1989)
```

This command is used to change the system date to the date specified in the command. No date earlier than Jan 1, 1989 may be entered. If an invalid date is entered, the current date is not changed. Date changes remain in effect until the Ethernet Interface is powered–up or restarted. This command affects only the Ethernet Interface, it does not alter the date kept in the PLC CPU.

(Series 90–30 CPU364 and Series 90–70 Ethernet Interface (Type 2) only) If the Ethernet Interface is configured to use Network Time Synchronization, this command is allowed only if the module is not synchronized with a network time server.

A typical *CHDATE* command is shown below:

```
= chdate 24-MAY-1990
Date = 24-MAY-1990
```

CHLTIME Command

The *CHLTIME* command has the form:

```
CHLTIME  <minutes>
```

where <minutes> is a login timeout value expressed in minutes which has a range of 0 to 32767.

The *CHLTIME* command is used to change the secure login timeout value. This change remains in effect until it is explicitly changed or until the next *LOGOUT* command is entered. If the number of minutes specified is zero, secure login timeout is not enforced.

A typical *CHLTIME* command is shown below:

```
= chltime 5
Login timeout = 5 min
```

Note that the secure logout timeout clock is suspended during execution of a *TEST, TRACE,* or *PING* command.

CHMYNAME Command (Series 90–30 Ethernet Interface only)

The Ethernet Interface must be in the Maintenance state to execute this command. The *CHMYNAME* command has the form:

```
CHMYNAME {<name> | def }
```

where <name> is a character string of 1 to 31 characters containing the new DDP Network Address Name.

The *CHMYNAME* command changes the DDP Network Address Name of this Ethernet Interface. This comand is permitted only when the DDP Network Address Name is obtained from internal backup data. (When the DDP Network Address Name is obtained from the PLC Configuration stored into the PLC CPU, changes must be made in the PLC Configuration.)

The existing DDP Network Address Name is deleted and replaced by the specified name. If "def" is entered, the factory Default DDP Network Address Name for this Ethernet Interface is used. The Ethernet Interface attempts to register the name with DDP across the network; an error occurs if the name is already in use. When such a DDP name conflict occurs, the conflicting name is not registered in this Ethernet Interface. Upon successful registration of the DDP Network Address Name, it is backed up into non–volatile memory.

A typical *CHMYNAME* command is shown below:

```
* chmyname "Fred"

Network adapter name is changed to "Fred"
```

For further information, refer to Chapter 6, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*.

CHNAMETBL Command (Series 90–30 Ethernet Interface only)

The Ethernet Interface must be in the Maintenance state to execute this command. The *CHNAMETBL* command has the form:

```
CHNAMETBL <name> {<IP address> | del }
```

where <name> is a character string of 1 to 31 characters and <IP address> is the valid dotted–decimal IP address of the remote node you wish to access via this name.

The *CHNAMETBL* command is used to add a new entry to the Name Table, to modify an existing entry, or to delete an existing entry. This command is permitted only when the Name Table is obtained from internal backup data. (When the Name Table is obtained from the PLC Configuration stored into the PLC CPU changes must be made in the PLC Configuration.)

If the specified <name> and <IP address> do not already exist, they are added to the Name Table. If they do exist, the existing entry is replaced by the new values. Finally, if "del" is entered instead of a valid IP address, any existing entry for "name" is deleted. The Station manager informs the user of the operation performed. Definition of multiple names with the same IP address is permitted but is flagged to the user. The Name Table is backed up into non–volatile memory after each change by this command.

A typical *CHNAMETBL* command is shown below:

```
* chnametbl foo 10.0.0.1

Adapter foo@IP address 10.0.0.1 added
```

For further information, refer to Chapter 6, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual.*

CHPARM Command

The Ethernet Interface must be in the Maintenance state to execute this command. The *CHPARM* command has the form:

```
CHPARM <parm name> (<value> | def)
```

or

```
CHPARM ALL DEF
```

where <parm name> specifies the name of an advanced user parameter (see Table 6–2)
<value> specifies the new value for the specified advanced parameter.
"def" may be entered instead of an actual value to set the specified parameter to its factory default value

This command changes the value of a specified advanced user parameter. Advanced user parameters are not configurable by the PLC Programmer configuration package; default values are normally used. It is not recommended that you change any advanced parameter other than "stpasswd". Changes do not take effect until the Ethernet Interface is restarted or power is cycled such that the Operational state is entered. Advanced user parameters are saved in non–volatile flash memory. Changes made by the *CHPARM* command are retained over restart and power cycles, until changed again by the *CHPARM* command.

Important note: If you change these parameters, record any changes made for future reference.

A typical *CHPARM* command is shown below:

```
* chparm ltxringlen 7
Old value = 3 (0003H)
New value = 7 (0007H)
```

Note

Use caution when setting any advanced parameter. Poor choice of settings may result in degraded Ethernet Interface operation.

What To Do If You Have Forgotten Your Password

The default Station Manager password is “system”. The current password is needed to access the “Modify level” of the Station Manager. If you forget the current password, follow these steps.

1. Press the Restart pushbutton on the Ethernet Interface for more than 10 seconds so that the bottom two LEDs are both ON; then, release the pushbutton. This causes the Interface to restart and enter the Maintenance state (indicated by the “*” prompt). The Maintenance state uses the “Modify level” of the Station Manager.
2. Use the *CHPARM* command to change the password to a known value. The *CHPARM* command to do this has the following form:

   ```
   chparm stpasswd <new password>
   ```

   To change the password to the default value “system”, issue the following command.

   ```
   chparm stpasswd def
   ```

   Or, to change the password to the value “stingray”, issue the following command.

   ```
   chparm stpasswd stingray
   ```
3. To complete the procedure, issue the command

   ```
   restart
   ```

   This returns the Interface to the Operational state.

CHSNTP Command (Series 90–30 CPU364 and Series 90–70 Ethernet Interface (Type 2) only)

(Not recommended for normal operation) The *CHSNTP* command modifies the manual override table and forces the Ethernet Interface module to enter manual override mode for SNTP operations. This command is intended for specialized applications where it is necessary to ***temporarily*** override the automatic SNTP server selection algorithm.

While in manual override mode, the Ethernet Interface will only accept SNTP messages from the servers whose IP addresses are listed in the manual override table. Messages from all other servers will be ignored by the module. *The Ethernet Interface will remain in the manual override mode until the module is restarted or power–cycled.* Deleting all entries in the manual override table does not result in a return to automatic server selection mode.

The manual override table, if present, will be displayed in the screen output for *CHSNTP* and SNTP commands. *This table is not retained across module restarts nor power–cycles.*

The *CHSNTP* command has the following form:

```
CHSNTP USE|DELETE <ip address>[ <ip addr>[ <ip addr>[ <ip addr>]]]
```

Up to four IP addresses, in dotted–decimal format, will be accepted. If more than four are entered, only the first four will be added to the table. Since the manual override table only holds four entries, it's impossible to delete more than four servers from the manual override table. The zero IP address (0.0.0.0) is not allowed.

The *CHSNTP USE* form of the command replaces the contents of the manual override table with the list of IP addresses entered on the command line. Also, the use of this command causes the tracking table to be cleared.

The *CHSNTP DELETE* form of the command deletes the list of servers specified on the command line from the manual override table and, if present, from the server tracking table. The current locked–on server cannot be deleted. In addition, the only way to exit manual override mode of operation for SNTP is to restart or power-cycle the Ethernet Interface. Deletion of all entries in the manual override table *does not* cause the Ethernet Interface to return to automatic SNTP mode. Moreover, the manual override table is not retained across an Ethernet Interface restart nor a power–cycle.

A typical *CHSNTP* command is shown below:

```
= chsntp use 10.16.32.61  10.16.169.73

Manual override is now active until module restart
```

CHSOSW Command

(Not recommended if the PLC CPU is configured properly.) The Ethernet Interface must be in the Maintenance state to execute this command.

This command changes the value of the backup configuration parameters (sometimes called "Soft Switches") maintained within the Ethernet Interface. Configuration parameters are normally supplied by the PLC Programmer configuration software and stored to the PLC CPU for delivery to the Ethernet Interface at each configuration store, power–cycle, or restart. When the Ethernet Interface has received configuration parameters from the PLC CPU at the last restart, this Station Manager command is prohibited and any previous changes made using it are no longer effective. The *CHSOSW* command is used to change the backup configuration parameters used by the Ethernet Interface when configuration has not been received. Whenever the Ethernet Interface receives configuration from the PLC CPU, it replaces the configuration parameters, always overriding any user set values.

Changes made by the *CHSOSW* command do not take effect until the Ethernet Interface is restarted or power cycled. Such changes will then remain until a new configuration is supplied to the Ethernet Interface by the PLC Programmer configuration software.

The *CHSOSW* command has the form:

```
CHSOSW  {<sosw data>|def}
```

A typical set of sosw data selections is:

{ip_address <dotted–decimal IP address>|
subnet_mask <dotted–decimal subnet mask>|
gateway <dotted–decimal default gateway address>|
name_server <dotted–decimal DNS name server address>|
p1_data_rate {300|600|1200|2400|4800|9600|19200|38400}|
p2_data_rate {300|600|1200|2400|4800|9600|19200|38400}|
p1_parity {NONE|ODD|EVEN} | p2_parity {NONE|ODD|EVEN}|
p1_stop_bits {1|2} | p2_stop_bits {1|2}|
p1_flow_control|{NONE|HARDWARE|SOFTWARE}|
p2_flow_control|{NONE|HARDWARE|SOFTWARE}|
p1_turna_delay {NONE|10|100|500}| p2_turna_delay {NONE|10|100|500}|
p1_timeout {LONG|MEDIUM|SHORT|NONE}|
p2_timeout {LONG|MEDIUM|SHORT|NONE}}

* Use 'chsosw def' to set all values to default
** p1_ above implies the Station Manager port, p2_ the Software Loader port
*** All parameters are converted to lower case unless within quotes.

A typical *CHSOSW* command is shown below:

```
* CHSOSW ip_address 10.0.0.1
```

CHTIME Command

(Not recommended if the Ethernet Interface obtains the correct time from the PLC CPU.)

The *CHTIME* command has the form:

```
CHTIME  <HH[:MM[:SS]]>
```

where <HH> is an hour in the range 0–23
<MM> is an optional minute in the range 0–59 which defaults to 0
<SS> is an optional second in the range 0–59 which defaults to 0

This command sets the current system time to the value specified. If an invalid time is entered, the current time is not changed. Leading zeros do not need to be entered when entering the new time value. Time changes remain in effect until the Ethernet Interface is powered–up or restarted. This command affects only the Ethernet Interface, it does not alter the time kept in the PLC CPU.

(Series 90–30 CPU364 and Series 90–70 Ethernet Interface (Type 2) only) If the Ethernet Interface is configured to use Network Time Synchronization, this command is allowed only if the module is not synchronized with a network time server.

A typical *CHTIME* command is shown below:

```
= chtime 8:03
Time = 8:03:00.0
```

CLEAR Command

The *CLEAR* command has the form:

```
CLEAR { EXS | LOG | TALLY | HEAP }
```

The *CLEAR* command sets various Ethernet Interface data structures to initial values, usually zeros.

- If the *CLEAR EXS* command is entered, the Extended Status Buffer is cleared to an initial state where the software version is non–zero, all other data are zero.
- If the *CLEAR LOG* command is entered, all log entries are discarded and the log is set to an empty state. The *CLEAR LOG* command also turns on the STAT LED on the Ethernet Interface.
- If the *CLEAR TALLY* command is entered, all tallies resettable are set to a value of zero.
- If the *CLEAR HEAP* command is entered, the minimum system buffer free count values maintained by the STAT B command are reset to the current free count values.

A typical *CLEAR TALLY* command is shown below:

```
= clear tally
Tallies cleared
```

DATE Command

The DATE command has the form:

```
DATE
```

This command causes the current system date to be displayed. This date is used in generating time stamps for exception log entries. The initial value of the date is read from the PLC CPU on restart or, if unavailable, is set to 1–JAN–1989 on restart or power–up. The Modify command *CHDATE* can be used to set the date.

The DATE command is shown below:

```
> date
Date = 28-FEB-1990
```

EXS Command

The EXS command has the form:

```
EXS
```

This command displays extended status of COMMREQs initiated by the local ladder program. This command is usually used during troubleshooting.

The EXS command is shown below:

```
> exs
<<< Extended Status >>>
Software Version         100
Last command               0 (0000H)
Last error code            0 (0000H)
Last COMM_REQ in error  0000H 0000H 00000H 0000H 0000H 0000H 0000H 0000H
```

The error codes shown in the next to last line of output are the same codes returned in the COMMREQ Status (CRS) word to the ladder program. If a non–zero error code is displayed, the last line also displays up to eight words of the COMMREQ Command Block, beginning with the Command word. See GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual* for further details on error codes and COMMREQ commands.

HELP Command

The HELP command has the form:

HELP or **?**

The HELP command (or the single character command "?") can be used to display a short reminder of the valid commands. If you are logged in to use modify commands, you will see the <<<Modify Commands>>> in the command list (see Table 4–3, "Modify Commands"). If you are not logged in, you will not see the modify command listing.

A typical HELP command when you are not logged in (that is, you are in Monitor level) is shown below:

```
>  help
<<< Monitor Commands >>>
?         channel   date      exs      help     log        login
ltime     myname    nametbl   node     parm     prog       routetbl
sntp      sosw      stat      tally    time     udis       xchange
```

A typical HELP command when you are logged in is shown below:

```
= help
<<< Monitor Commands >>>
?         channel   date      exs      help     log        login
ltime     myname    nametbl   node     parm     prog       routetbl
sntp      sosw      stat      tally    time     udis       xchange
<<< Modify Commands >>>
bootp     browseddp chdate    chltime  chmyname chnametbl  chparm
chsntp    chsosw    chtime    clear    killss   load       logout
maint     net       ok        ping     rem      report     repp
resolve   restart   stopp     stopt    test     trace
```

KILLMS Command (Series 90–30 Ethernet Interface IC693CMM321-FH and later only)

Note

This command is intended to be used only for diagnostics and maintenance.

The *KILLMS* command has the form:

```
KILLMS ALL¦<Modbus/TCP Server Endpoint> [<Modbus/TCP Server endpoint> [...]]
```

This command causes the specified Modbus/TCP server endpoint(s) to be terminated. An endpoint is identified by a number , as listed in the leftmost column of the STAT S command output. Alternately, the *KILLMS ALL* form of the command causes all established Modbus/TCP Server endpoints to be terminated. This command will not terminate endpoints that are not in the ESTABLISHED state.

A typical *KILLMS* command is shown below:

```
= killms 2
Modbus/TCP Server endpoint 2 shut down initiated
```

KILLSS Command

Note

This command is intended to be used only for diagnostics and maintenance.

The *KILLSS* command has the form:

```
KILLSS ALL¦<SRTP Server Endpoint> [<SRTP Server endpoint> [...]]
```

This command causes the specified SRTP server endpoint(s) to be terminated. An endpoint is identified by a number, as listed in the left column of the STAT V command output. Alternately, the *KILLSS ALL* form of the command causes all established SRTP Server endpoints to be terminated. This command will not terminate endpoints that are not in the ESTABLISHED state.

A typical *KILLSS* command is shown below:

```
= killss 2
SRTP Server endpoint 2 shut down initiated
```

LOAD Command

The *LOAD* command has the form:

```
LOAD
```

The *LOAD* command causes the Ethernet Interface to prepare to accept a software load as described in Appendix C, “PC Software Loader”, in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User’s Manual*. The purpose is to install a software version upgrade into the Ethernet Interface. After the *LOAD* command is entered, the module must have its software reloaded before any further processing may take place, or the LOAD state may be exited by momentarily pressing the Restart pushbutton or cycling power. Any data transfer between the Series 90 PLC and the network when the *LOAD* command is issued is permanently lost.

A typical *LOAD* command is shown below:

```
= load
Forcing software load
```

LOG Command

This command prints entries from the exception log. Log entries remain in the log until they are explicitly cleared by using the *CLEAR LOG* command or until they are overwritten by more recent data. (For the Series 90–30 Ethernet Interface only, the exception log is also cleared when power is removed from the Ethernet Interface.) The log is maintained as a circular list where new data overwrites the oldest data in the list. An arrow points to the most recently logged event.

Refer to Appendix B, "Exception Log Event Descriptions", for a complete explanation of each log event.

The LOG command has the form:

```
LOG
```

A typical LOG command is shown below:

```
> log
<<< Exception Log >>>
Log initialized using valid RAM information
Log last cleared 11-APR-1995 17:24:13.2
Date            Time          Event  Count   Entry
  12-APR-1995   00:00:00.0     1H      1H    00H 0000H 0000H 0000H 0000H 0000H
->12-APR-1995   04:37:15.3     cH     14H    00H 010aH 0000H 0000H 0000H 0000H
```

Date – The Date column contains the system date of the last occurrence of the logged event.

Time – The Time column contains the system time of the last occurrence of the logged event. The timestamp used is the current date and time of day as known by the Ethernet Interface. This is the same time that is displayed by the DATE and TIME commands and changed by the *CHDATE* and *CHTIME* commands.

Event – The Event column gives the kind of event which occurred. Events are described in Appendix B.

Count – The Count column contains a repetition count for the event. If identical events occur regularly, they might flood the log with useless entries. Instead of recording each repeated event in detail, the log simply keeps the time of the latest event and a count of the number of repetitions of the repeated event. Log entries are retained on restarts and reloads of the Ethernet Interface.

Entry – The Entry columns contain detailed information about the event and is subdivided into 6 entries, Entry 1 – Entry 6.

LOGIN Command

The LOGIN command has the form:

```
LOGIN
```

The LOGIN command will be followed by a prompt of the form:

```
Password:
```

You should enter your password (which will not be echoed). If the password matches the current password for the Modify level, you will receive a confirmation message and you will be allowed access to the Modify commands. If the password does not match, then an error message is displayed and the security level is not changed.

Please note that all characters that are typed after the password prompt, except for the Enter key, are assumed to be part of the password. Specifically, the delete and backspace characters do not have their usual meaning and are interpreted simply as password characters. Passwords are limited to 8 characters and all characters after the eighth are ignored. Unlike other inputs, the password does not need to be enclosed with double quotes to achieve case sensitivity.

The factory default password is: system (lower case). It may be changed by using the *CHPARM STPASSWD* command.

Note

There is a special variation of the LOGIN command that must be used in conjunction with the *REM* (remote) command to login on a remote system. Refer to the *REM* command for a discussion of this variation.

LOGOUT Command

The *LOGOUT* command has the form:

```
LOGOUT
```

This command causes the secure login to be terminated. Any Modify commands entered after the logout will receive an error message. Logging out causes the login timeout value to return to 10 minutes. A typical *LOGOUT* command is shown below:

```
= logout
Logged out
```

LTIME Command

The LTIME command has the form:

```
LTIME
```

This command causes the current login timeout value to be displayed. A typical LTIME command is shown below:

```
> ltime
Login timeout = 10 min
```

The login timeout value can be changed using the *CHLTIME* command.

MAINT Command

The *MAINT* command has the form:

```
MAINT
```

This command causes the Ethernet Interface to restart and then enter the Maintenance State.

A typical *MAINT* command is shown below:

```
= maint
Restarting module into Maintenance state
```

MYNAME Command

The MYNAME command has the form:

```
MYNAME
```

The MYNAME command displays the DDP Network Address Name used by this Interface for DDP operation.

The output of this command is as follows:

```
> myname
Network Address Name is "cato"
   (Network Address Name from PLC config)
```

For further information, refer to Chapter 6, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*.

NAMETBL Command

The NAMETBL command has the form:

```
NAMETBL
```

The NAMETBL command displays the Name Table. The Name Table for each Ethernet Interface is intended to be supplied by the PLC Configurator, stored into the PLC CPU and delivered to the Ethernet Interface along with Soft Switch configuration at each startup.

The output of this command is as follows:

```
> nametbl
<<< Name Table >>>
Name Table from PLC Config
Number of entries:  3
Network Address Name                          IP Address
--------------------------------------------  ---------------
cato                                          10.0.0.1
anthony                                       10.0.0.2
jerry                                         10.0.0.3
```

For further information, refer to Chapter 6, “Network Administration Support” in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User’s Manual*.

NET Command

The *NET* command has the form:

```
NET { ON | OFF }
```

This command causes the MAC task within the Ethernet Interface to either ignore incoming and outgoing Ethernet frames (when *NET OFF* is specified) or to accept incoming and outgoing Ethernet frames (when *NET ON* is specified). This can be used to remove an Ethernet Interface from the network without the need to physically disconnect it or restart the hardware.

A typical *NET OFF* command is shown below:

```
= net off
Interface off network
```

NODE Command

The NODE command has the form:

```
NODE
```

This command causes the Ethernet Interface sign–on message to be printed out on the screen.

A typical NODE command is shown below:

```
> node
IC693 PLC Factory LAN Interface
Copyright (c) 1998. All rights reserved.
Version 1.00 (28A1) TCP/IP
Version 1.00 (28A1) Software Loader
IP address = 10.0.0.2
MAC address = <<080019010688>>
```

If the Ethernet Interface is not in the Operational state, the NODE command displays an additional output that describes the current state.

OK Command

This command causes the STAT LED to turn ON. It has no effect on the contents of the exception log.

The *OK* command has the form:

```
OK
```

A typical *OK* command is shown below:

```
= ok
STAT LED modified
```

PARM Command

The PARM command displays the current value of the advanced user parameters for the specified task(s). All advanced user parameters for the specified task(s) are displayed. (Soft switch configuration parameters for the specified task(s) are not displayed; use the SOSW command to display such parameters.)

The PARM command has the form:

```
PARM {<task>(s)> | all}
```

where <task> specifies a task identifier (see Table 4–3).

A typical PARM command is shown below:

```
> parm i
<<< IP Parameters >>>
                Default Value     User-Set Value
ittl         =  64 (0040H)
ifrag_q_sz   =   5 (0005H)
imax_frag    =  23 (0017H)
ifrag_ttl    =  16 (0010H)
ifrag_tmr    = 100 (0064H)
```

A special form of this command displays all advanced user parameters:

```
> parm all
```

A complete list of all advanced user parameters is provided in Table 6–2.

Note

The output from this command may scroll off the screen.

Style A Station Manager Advanced User Parameters

There are no advanced user parameters for tasks c, h, j, m, s, u and v. Time values are in number of 10ms units and buffer sizes are in number of bytes unless otherwise specified.

Table 6-2. Style A Station Manager Advanced User Parameters

Parameter	Description	Default Value	
	System Memory Parameters (parm b)		
staudp	Remote command UDP port	18245	(4745H)
stalsap	Remote command LSAP	232	(00e8H)
stapri	Remote command priority	0	(0000H)
stpasswd	Station Manager password (only visible from MODIFY prompt)	"system"	
	Data Link Parameters (parm l)		
ldrtry	Disable automatic TX backoff/retransmission	0	(0000H)
lfduplex[3]	Selects half-duplex (0) or full-duplex (1)	0	(0000H)
lgrpmsk0–7	Group RX addresses 0–7	0=<<0100000000000>>, 1–7=0	
lmacaddr	Station MAC address	<<000000000000>>	
lmaxdb	Maximum LLC buffer size	1497	(05d9H)
lrxringlen	Size of receive ring (log2). The actual size of the ring is 2 raised to the specified power	7	(0007H)
ltxringlen	Size of transmit ring (log2). The actual size of the ring is 2 raised to the specified power	7	(0007H)
lxidtime	XID frame response timeout	100	(0064H)
	IP Parameters (parm i)		
ittl	Time–to–live parameter (hop count)	64	(0040H)
ifrag_q_sz	Fragment queue size	23	(0017H)
imax_frag	Maximum fragment size	23	(0017H)
ifrag_ttl	Fragment time–to–live parameter (hop count)	16	(0010H)
ifrag_tmr	Fragment timeout interval	100	(0064H)
	TCP Parameters (parm w)		
wmin_to	Minimum retry timeout interval	100	(0064H)
wmax_to	Maximum retry timeout interval	1000	(03e8H)
wmax_conn	Maximum number of TCP connections (informational only- this parameter is not changeable)	20	(0014H)
wretries	Maximum number of retries	10	(000aH)
wtwo_seq_lt	Two minimum segment life times	1	(0001H)
wpersist	Persist time interval	3000	(0bb8H)
wackdelay	ACK delay time interval	50	(0032H)
wdg_q_len	Maximum length of datagram input queue	2	(0002H)
winput_q	Maximum input queue length	2	(0002H)
wurg_q	Maximum urgent queue length	2	(0002H)
wsegmt_sz	Maximum segment size	1460	(05b4H)
wsend_buf	Send buffer size	2104	(0838H)

Table 6–2. Advanced User Parameters – Continued

Parameter	Description	Default Value	
wrcv_buf	Receive buffer size	2104	(0838H)
wkal_time	Keep–alive timer interval	6000	(1770H)
wmin_kal	Minimum number of keep–alive timer intervals from the last data transfer activity before sending the first keep–alive probe for the connection	4	(0004H)
wmax_kal	Maximum number of keep–alive timer intervals from the last data transfer activity before giving up on the connection	7	(0007H)
	ARP Parameters (parm f)		
fretries	Maximum number of retries when attempting to resolve an address (used with *frun_time*)	4	(0004H)
frun_time	Retry timeout (used with *fretries* parameter) and Run time interval (used with *fttl* parameter)	100	(0064H)
fttl	Time–to–live (number of f*run_time intervals* before expiration of an entry in the cache)	600	(0258H)
fcache_sz	Cache size (informational only – this parameter is not changeable)	255	(00FFH)
	Name Services Parameters (parm r)		
rddreg_to	DDP Register timeout interval (wait for any name conflicts)	200	(00c8H)
rddrsv_to	DDP Resolve timeout interval (wait for any response)	200	(00c8H)
rddrsv_dly	DDP Resolve delay interval (wait for other responses)	100	(0064H)
rddbrw_dly	DDP Browse delay interval (wait for all responses)	200	(00c8H)
rddp_udp	DDP UDP port number	18247	(4747H)
rdns_to	DNS Response timeout interval (wait for any name conflicts)	200	(00c8H)
rresv_seq	Default Name Services protocol sequence (order of precedence) 0: end of sequence (required) 1: name table look–up 2: resolve via DDP2 3: resolve via DNS	<<1, 2, 3, 0>> (= tbl, ddp, dns, end)	
	Global Data Parameters (parm g)[1, 2]		
gctl_port	UDP port for control messages	18246	(4746H)
gdata_port	UDP port for point–to–point messages	18246	(4746H)
	A UDP port and group IP address parameter is provided for each of 32 host groups. The parameter format for each host group is as follows:		
gXX_udp[4]	UDP port for multicast host group XX[4]	18246	(4746H)
gXX_addr[4]	IP group address for host group XX[4] (must be Class D group IP address)	224.0.7.XX[4]	

[1] Series 90–30 (IC693CPU364) CPU364 with Ethernet Interface only

[2] Series 90–70 (IC697CMM742) Ethernet Interface (Type 2) only

[3] Series 90-30 (IC693CMM321-FH or later) 10-Base-T type Ethernet Interface only

[4] where XX is an integer value from 01 to 32

Configuring Full-Duplex Operation on 10Base-T Style CMM321

Before setting the module to Full-Duplex operation, be certain that it is connected directly to a managed hub or switch that is manually configured for full-duplex operation on the port connected to the IC693CMM321.

The default setting for the module is Half-Duplex. The Full Duplex parameter is an "advanced user parameter" that can only be changed by using the CHPARM (Change Parameter) command in the Station Manager software (built into the Ethernet module's firmware). The following instructions briefly describe configuring Full-Duplex mode using the Windows HyperTerminal utility.

1. Connect the Ethernet Interface module's Station Manager port to your computer's serial port using cable IC693CBL316.
2. Start HyperTerminal by clicking Start, then Programs, then Accessories, then HyperTerminal.
3. You must enter the Station Manager's Maintenance State in order to change a parameter. Enter Maintenance State by holding in the Ethernet Interface module's Restart pushbutton until the module's bottom two LEDs turn ON. The HyperTerminal screen should look like the following:

```
<<< Maintenance State >>>

Invoked due to MAINT command
*
```

4. The asterisk is the HyperTerminal prompt. At this prompt, type in the following then press the Enter key:

```
chparm lfduplex 1
```

The screen should now look like the following figure:

```
<<< Maintenance State >>>

Invoked due to MAINT command
* chparm lfduplex 1
Old value =     0 (0000H)
New value =     1 (0001H)

Data backup in progress, do not restart or power
off until next prompt
```

Warning

Contrary to the recommendation of IEEE Std. 802.3, this Ethernet Interface module does NOT support auto-negotiation of half/full-duplex. Attempting full-duplex operation of this interface with a repeater or half-duplex network (including auto-negotiating hubs and switches) can cause severe network performance degradation, increased collisions, late collisions, CRC errors, and undetected data corruption.

5. Once this change is made, the Ethernet Interface module must be restarted before Full-Duplex mode can take effect, so press the Ethernet Restart pushbutton on the Ethernet Interface module. After the restart, the FDX LED will be illuminated and Full-Duplex communications will be performed.

Configuring Half-Duplex Operation on 10Base-T Style CMM321

If the module is configured in the Full-Duplex mode (see previous section above), you can change it back to its default value of Half-Duplex by using the following procedure. Refer to GFK-1186, the *TCP/IP Ethernet Communications Station Manager Manual*, for additional information on using Station Manager.

1. Connect the Ethernet Interface module's Station Manager port to your computer's serial port using cable IC693CBL316.
2. Start HyperTerminal by clicking Start, then Programs, then Accessories, then HyperTerminal.
3. You must enter the Station Manager's Maintenance State in order to change a parameter. Enter Maintenance State by holding in the Ethernet Interface module's Restart pushbutton until the module's bottom two LEDs turn ON. The HyperTerminal screen should look like the following (the asterisk is the HyperTerminal prompt):

```
<<< Maintenance State >>>

Invoked due to MAINT command
*
```

4. At the prompt (asterisk), type in the following, then press the Enter key:

```
chparm lfduplex 0
```

The screen should now look like the following figure:

```
<<< Maintenance State >>>

Invoked due to MAINT command
* chparm lfduplex 0
Old value =     1 (0001H)
New value =     0 (0000H)

Data backup in progress, do not restart or power
off until next prompt
```

5. Once this change is made, the Ethernet Interface module must be restarted before Half-Duplex mode can take effect, so press the Restart pushbutton on the Ethernet Interface module. After a restart, the FDX LED will be OFF and Half-Duplex communications will be performed.

PING Command

The *PING* command has the form:

```
PING  <node> [ <cnt> [ <sch> [ <len> ] ] ]
```

where
- <node> is the IP address of the remote node to be "pinged" (i.e., to be sent ICMP Echo Request messages). Enter in standard IP dotted–decimal form or the Network Address Name (31 characters max.).
- <cnt> is the number of times the ping is to be repeated. Default is 1. Range is 0 through ffffH.
- <sch> specifies the maximum amount of time to wait for a reply to each ping. The timeout interval is expressed in 10–millisecond units. Default is 1 (10 milliseconds). Range is 0 through 7fffH. A value of 0 results in the value of 100 (1 second) delay used.
- <len> is the number of data bytes in the Echo Request message. The actual data pattern is not changeable by the user. Default length is 64 bytes. Range is 8 through 32747 but is limited by system buffer memory.

The results of the last *PING* command are maintained until the Modify security level is exited (either by a timeout or by the *LOGOUT* command). It may be advisable to issue a *CHLTIME 0* command before initiating a *PING* command of long duration.

The *PING* command is refused if the Ethernet Interface on which you are issuing the *PING* command to has not been configured with a valid IP address. A typical *PING* command is shown below:

```
= ping 10.0.0.1 10
Ping initiated

<<< Ping Results >>>
Command:  ping  10.0.0.1 10 100 64
Sent = 10, Received = 10, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 0/1/10
```

See also the *REPP* command for detailed explanation of *PING* results.

PROG Command

The PROG command has the form:

```
PROG
```

This command causes the name of the current PLC CPU program to be displayed. A typical PROG command is shown below:

```
> prog
CPU Program Name is "JEFF914"
```

RDNIP Command (Series 90–70 Ethernet Interface (Type 2) only)

This command is reserved.

REM Command

The *REM* command has the form:

```
REM  <node> <cmd> [<cmd parms>]
```

where <node> is the MAC address of a remote GEnet Ethernet Interface, or
the IP address of the remote Interface, or
the Network Address Name (31 characters max.)
<cmd> is any Station Manager command except *REM*
<cmd parms> is a list of any parameters required by <cmd>.

The *REMote* command sends the Station Manager command which is its argument and any associated parameters to the node whose address is specified. The Station Manager on the remote node acts on the command as if it had been entered at its local serial port, but directs all output from processing the command back over the network to the station where the *REM* command originated. The results are displayed at the local station with the notation "REM" along with the prompt from the remote station to denote that the data was returned from the remote station. (A *REM* command cannot be issued to the node on which it is entered.)

A typical *REM* command is shown below:

```
= rem 080019010177 node
REM> IC693 PLC Factory LAN Interface
REM> Copyright (c) 1998.  All rights reserved.
REM> Version 1.00 (28A1) TCP/IP
REM> Version 1.00 (28A1) Software Loader
REM> IP Address = 10.0.0.1
REM> MAC Address = <<080019010177>>
```

The LOGIN command is treated as a special case when it is specified in the *REM* command. The following command is used to login to a remote device.

```
REM <node> LOGIN <password>
```

Note that this prevents the prompt for the password value and displays the remote password in a readable form.

Note

When using the *REM* command, the password should be placed in double quotes if it contains any uppercase letters because the password is case sensitive.

Do not send the REM command itself to an Ethernet Interface (i.e., `= rem <node> rem <node> <command>`)

Security is enforced on the remote system just as if the command had been entered locally. Thus the remote user and any local user of a given node all see the same security level.

REPORT Command

The *REPORT* command has the form:

```
REPORT [<page>]
```

where <page> is an optional page number which defaults to 1.

This command causes the current results of the most recent *TEST* command to be reported. It can be used to get intermediate reports for long running tests. Test results are maintained, and may be displayed until another test is started, or until the Modify security level is exited.

A typical *REPORT* command is shown below:

```
= report
<<< Test Results >>>                                    Page 1 of 1
Command: test <<080019010021>> 1H 32H 0H NULL
Init node: <<08001901001f>>  Frames sent : 1H  Nodes responding :1H
Responding nodes    Response recd   Response w/ err   No Response
<<080019010021>>              1H                0H            0H
```

Interpretation of Test Results

The line of output that begins "Command: . . ." lists all the parameters that were specified (explicitly or implicitly) in the preceding *TEST* command, in the order <node>, <cnt>, <sch>, <len>, <pat>. These numbers are displayed in hexadecimal regardless of how you entered them.

"Init node . . . " identifies the MAC address of the initiating node, how many test command frames it sent, and how many nodes responded.

Following this, there is a list (perhaps a list of one) of the responding nodes' MAC Addresses with the corresponding number of test Responses received, Responses with error, and No Responses.

"Response recd" is the total number of responses received from that node. Frames containing CRC or other communication errors are not received but are discarded.

"Response w/ err" refers to frames that were received, i.e., they were included in the count of "Responses recd". The initiating node compares the test data of all responses to the current test data (which always varies from the preceding frame because of the sequence number in the first byte position). Any received frame that does not compare is counted as a Response with error. The most common cause of this indication is that the <sch> parameter in the *TEST* command is set to too short an interval. This should be avoided by increasing <sch>. Also, some manufacturers' products, while replying to the test command, do not return the data field; this will cause all their Responses received to also tally a Response with error.

"No Response" is computed as the difference between the number of test commands sent by the initiating node minus the number of Responses received from the subject node. This number of frames were "lost" either outbound from the initiator, inbound to the initiator, or internally (e.g., lack of buffers) to either the initiator or responder.

REPP Command

The *REPP* command has the form:

```
REPP
```

This command causes the results of the *PING* command to be reported. The results may be for a currently running *PING* or otherwise the most recent *PING* command.

A typical *REPP* command is shown below:

```
= repp
<<< Ping Results >>>
Command:  ping  10.0.0.1 10 100 64
Sent = 1, Received = 1, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 0/1/10
```

Interpretation of Test Results

The line of output that begins "Command: . . ." identifies the actual *PING* command parameters used (including default values for any optional parameters not specified on the command line) to generate the results.

"Sent" indicates the number of Echo Request messages sent.

"Received" indicates the number of Echo Reply messages received within the expected response schedule of its corresponding Echo Request. The response schedule begins when an Echo Request is sent and ends when the schedule time specified in the <sch> parameter of the *PING* command elapses.

"No Timely Response" indicates the number of times that no Echo Response message arrived within the response schedule of the corresponding Echo Request; that is, when the response schedule time elapses before the corresponding Echo Response arrives.

"Late/Stray Responses" indicates the number of times an Echo Response arrived outside of the response schedule of its corresponding Echo Request or when a stray Echo Response, not corresponding to any recent Echo Request, arrives.

The line beginning "Round–trip . . ." indicates the minimum, average, and maximum delay (in units of milliseconds) measured between sending an Echo Request and receiving the corresponding Echo Response. Note that these times use 10 millisecond granularity. In the example, the *PING* required less than 10 milliseconds to complete, so zero values are reported.

RESOLVE Command

The *RESOLVE* command has the form:

```
RESOLVE  <name string>  [<protocol>]
```

where <name string> is a character string of 1 to 31 characters containing a Network Address Name. Unless specified by the optional "protocol" parameter, the Ethernet Interface uses the default name resolution protocol sequence (first Name Table, then DDP, and finally DNS). The optional "protocol" parameter directly specifies the resolution protocol to be used. Selections for <protocol> are "tbl", "ddp" and "dns".

This command resolves a given symbolic name (specified by an input character string) into an IP address using the Name Services within the Ethernet Interface.

The output of this command is as follows:

```
= resolve anthony
Symbolic name "anthony"
 was resolved to IP address 10.0.0.2  by Name Table


= resolve "Plc_01" ddp
Symbolic name "Plc_01"
 was resolved to IP address 10.0.0.6  by DDP


= resolve foo
Symbolic name "foo" is not known
```

For further information, refer to Chapter 6, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*.

RESTART Command

The *RESTART* command has the form:

```
RESTART
```

The *RESTART* command causes the Ethernet Interface to be restarted without causing the software to be reloaded. It has the same effect as pressing the Restart pushbutton on the front edge of the Ethernet Interface quickly (less than 5 seconds). Any data transfer between the Series 90 PLC and the network at the time the *RESTART* command is entered is permanently lost.

A typical *RESTART* command is shown below:

```
= restart
Restarting Module
```

ROUTETBL Command (Series 90–30 CPU364 and Series 90–70 Ethernet Interface (Type 2) only)

The ROUTETBL command has the form:

```
ROUTETBL
```

This ROUTETBL command displays the network routing table and the routing partner table. The network routing table entries are configured using the PLC Programmer during Name Resolution configuration. The routing partner table is derived from routing pair information specified using the PLC Programmer during module configuration. The routing table also specifies the source of the routing information: PLC, backup, or default.

The output of this command is as follows:

```
> routetbl
Routing Table from PLC Config

<<< Network Routing Table >>>
Destination Subnet     Subnet Mask     Next Hop IP Address   Cost
------------------   ---------------   -------------------   ----
      10.16.24.0        255.255.255.0         10.16.22.3          1
      10.16.25.0        255.255.255.0         10.16.21.2          1
      10.16.26.0        255.255.255.0         10.16.34.3          1
<<< Routing Partner Table >>>
2 routing partner(s) configured
Destination Subnet    Subnet Mask    Slot  Cost
------------------  ---------------  ----  ----
        10.16.21.0     255.255.255.0     2     1 (Default Partner)
        10.16.22.0     255.255.255.0     4     1
```

SNTP Command (Series 90–30 CPU364 and Series 90–70 Ethernet Interface (Type 2) only)

This command displays information related to SNTP operation: the current POSIX clock value, the list of servers in the manual override table, and the list of servers in the tracking table. This command does not use any input arguments.

The SNTP command has the form:

```
SNTP
```

A typical SNTP command is shown below:

```
> sntp
Current POSIX clock time: 25-JUL-1997  20:11:00.935  Status: SYNCHRONIZED
Server Selection Mode = AUTOMATIC

<<<SNTP TRACKING TABLE>>>
IP Address      Stratum Time Since Last Update Consistent
--------------- ------- ---------------------- ----------
   10.16.169.18    11               16 seconds        YES <-LOCK
   10.16.169.16    15                4 seconds         NO
2 tracked SNTP server(s)
```

Up to four servers can be present in the server tracking table.

SOSW Command

This command displays the current setting of the Ethernet Interface Soft Switches and indicates their source.

Valid sources for the Soft Switches are as follows:

- **"CPU"** - the Soft Switch settings have been received in the Ethernet Interface's configuration from the PLC CPU. Changes to the Soft Switch settings with the *CHSOSW* command are not allowed.
- **"Internal Backup"** - the Soft Switch settings have been retrieved from the Ethernet Interface's internal backup. This is expected when configuration has not been received from the PLC CPU. The *CHSOSW* command may be used to change the current Soft Switch settings.
- **"Factory Defaults"** - the Soft Switch settings have been set to factory default. This is expected when the Ethernet Interface has never received configuration from the PLC CPU (i.e., no current configuration or previously backed up configuration exists). The *CHSOSW* command may be used to change the current Soft Switch settings.
- **"Unknown"** - this is not expected.

The SOSW command has the form:

```
SOSW
```

A typical SOSW command is shown below:

```
> sosw
<<< Soft Switch Data >>>

IP Address   = 10.0.0.1      (TCP/IP values from Soft Switches)
Subnet Mask  =  0.0.0.0
Gateway      =  0.0.0.0
Name Server  =  0.0.0.0

Port 1 (Station Manager):        Port 2  (S/W Loader):
Data Rate      = 9600            Data Rate      = 19200
Parity         = NONE            Parity         = ODD
Stop Bits      = 1               Stop Bits      = 1
Flow Control   = NONE            Flow Control   = NONE
TurnA Delay    = NONE            TurnA Delay    = NONE
Timeout        = LONG            Timeout        = LONG

Source of Soft Switches:         CPU
```

STAT Command

The STAT command has the form:

```
STAT <task(s)>
```

where <task(s)> is one or more task identification letters from Table 4–3.

This command causes the current status of the task or tasks specified by the task identification letters to be displayed. An example STAT command is shown below:

```
> stat v

<<< SRTP Server Status >>>

Endpoint  Task   State         Num Requests  Client Address
--------  ----   -----------   ------------  --------------
       0    32   ESTABLISHED          10906        10.0.0.4
       1    33   ESTABLISHED          10916        10.0.0.4
       2    34   ESTABLISHED          10931        10.0.0.4
       3    35   ESTABLISHED          10911        10.0.0.4
```

STOPP Command

The *STOPP* command has the form:

```
STOPP
```

This command causes an active *PING* sequence to stop immediately and to print the results of the terminated test. It is used to terminate a long–running *PING* sequence. An example *STOPP* command is shown below.

```
= stopp
<<< Ping Results >>>
Command:  ping  10.0.0.1 10 100 64
Sent = 8, Received = 8, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 0/1/10
Note:  The ping was aborted via stopp.
```

STOPT Command

The *STOPT* command has the form:

```
STOPT
```

This command causes an active *TEST* sequence to stop at its next iteration and to print the results of the terminated test. It is used to terminate a long running test before its completion.

A typical *STOPT* command is shown below:

```
= stopt
Test stopped by operator
=                                                                    Page 1 of 1
<<< Test Results >>>
Command: test <<0800190100fb>> 100H 32H 0H NULL
Init node: <<08001901001f>>  Frames sent : 87H  Nodes responding : 1H
Responding nodes   Response recd   Response w/err   No Response
<<0800190100fb>>     87H              0H                  0H
```

TALLY Command

The TALLY command has the form:

```
TALLY <task(s)>
```

where <task(s)> is one or more task identification letters from Table 4–3.

This command causes the current value of the tallies for the specified task or tasks to be displayed. Some of these tallies simply indicate load and performance information about the station. Others can indicate whether or not there are problems either within the station or within the network.

An example TALLY command is shown below:

```
> tally c
<<< PLC Driver Tallies >>>
PlcQFull = 0000H    PlcSweep = 03c9H    MsgRcv   = 0038H    PLCReq   = 001aH
PlcAbt   = 0000H    MsgSent  = 0036H    MyAbt    = 0000H    Write    = 0023H
Read     = 0010H    Timeout  = 0000H    uCode    = 0810H
```

Refer to Appendix C, "Tally Descriptions", for a list of the tallies and their meanings.

TEST Command

The *TEST* command has the form:

```
TEST { <node> | ALL } [<cnt> [<sch> [<len> [<pat>]]]]
```

where <node> is a destination MAC address and ALL is a synonym for the broadcast address, ffffffffH.

<cnt> is an optional number specifying the number of test frames to be sent, which defaults to 1. This parameter value can range from 1 to ffffffffH (4,294,967,295)

<sch> is an optional number of 10 millisecond time intervals between consecutive test frame outputs. The default value for this parameter is 50 (500 milliseconds or 1/2 second). This parameter's value can range from 0 to 7fffH (32,767), or about 6 minutes. A value of 0 for this parameter results in the default value of 50 being used.

<len> is an optional length of user data in the test frame which defaults to 0 (no data in the test frame). The range of values for this parameter is from 0 to the value of configuration parameter lmaxdb. The test frame data length may be further modified by the <pat> parameter, as described below.

<pat> is an optional value to be used as the data pattern in the user data. This parameter's value can range from 0 to ffH (255). If a value is supplied for the <pat> parameter, each test frame will contain <len> bytes of data, and each byte of test data will be <pat>. However, if the <pat> parameter is omitted and a non–zero <len> value is supplied, a special testing byte sequence is used. In this test sequence, successive test frames are sent with an alternating data pattern (00H, 55H, aaH, ffH, and a counting pattern) and an incremental frame length of 1 byte up to <len> bytes.

For example, the data for the first six test frames would consist of: 00H (len = 1), 55H 55H (len = 2), aaH aaH aaH (len = 3), ffH ffH ffH ffH (len = 4), 00H 01H 02H 03H 04H (len = 5), and 00H 00H 00H 00H 00H 00H (len = 6).

This command causes one or more LLC test frames to be sent to the specified address. Test frames are output at time interval <sch> until <cnt> frames have been sent. The optional <len> and <pat> parameters can be used to specify the form of user data sent on the test frames. A lengthy *TEST* command can be terminated by using the *STOPT* command.

The *TEST ALL* command can be used to return a list of all the other stations on the network.

The results of the last *TEST* command are maintained until the Modify security level is exited (either by a timeout or by the *LOGOUT* command). It may be advisable to issue a *CHLTIME 0* command before initiating a *TEST* command of long duration. Also, the *REPORT* command can be used to view the results of a test which has been completed or the current results of a test in progress.

Caution

Care should be exercised in invoking the *TEST* command on a network in a production environment. Invoking the *TEST* command increases the load on all nodes, especially the initiating node. Be especially cautious if you are using values of <sch> smaller than the default, or values of <len> larger than the default. Also, be careful if you are using the ALL synonym, which broadcasts to all nodes in the network.

A typical *TEST* command is shown below:

```
 = test 0800190100fb 100H
Test initiated

=
<<< Test Results >>>                                    Page 1 of 1
Command: test <<0800190100fb>> 100H 32H 1H ALT
Init node: <<08001901001f>>  Frames sent : 100H  Nodes responding : 1H
Responding nodes   Response recd   Response w/err   No Response
<<0800190100fb>>        100H             0H             0H
```

TIME Command

The TIME command has the form:

```
TIME
```

This command causes the current system time to be displayed. This time is used in generating time stamps for messages which require them. This time is also used as a time stamp for events in the exception log displayed by the LOG command. The initial value of the time on restart, power up, or load is read from the local PLC CPU. If this is not available, it is set to 00:00:00.0 (midnight). Time values are based on a 24 hour clock. The Modify command *CHTIME* is used to change the time value.

A typical TIME command is shown below:

```
> time
Time = 15:46:02.3
```

TRACE Command

The *TRACE* command has the form:

```
TRACE  {<task(s)> [<minutes> [<len_ref>]] | !}
```

where <task(s)> is one or more task identifier letters from Table 4–3, or "z" to add PDU trace.

<minutes>is an optional parameter that specifies how long *TRACE* will remain active. Default is 10 minutes. This parameter is a character string that specifies an integer which can be 0, or a value from 1 to 32767. If 0 is specified then time out is not enforced. Any non–zero value specifies the duration in minutes after which the trace activity will automatically cease. Login will be maintained (automatic logout will be inhibited) until after the trace has terminated.

<len_ref> is an optional parameter that limits the amount of PDU (z) data to be displayed. The PDU display format is a character string that specifies an integer value ranging from 1 to 32767. If omitted from the command line, the value 48 will be substituted. This parameter provides the flexibility to view the PDU in its entirety or just a portion of it. Since each line of display consists of 16 bytes, and, if truncating of the PDU does take place (always at the end of a line and trailed by '...' on the next line), the actual number of bytes displayed will be rounded up to the next multiple of 16 from <len_ref>. There is, of course, a performance penalty for displaying large PDUs when they occur frequently.

The identifier "!" disables all tracing and should only be used by itself.

This command causes a diagnostic trace of the specified task or tasks to be displayed at the terminal where the *TRACE* command is invoked. This trace information shows each protocol exchange at the selected task and can be used by protocol experts to diagnose problems at the node or in a remote host.

The format of the display is the same at both the local and the remote terminal.

The *TRACE* command issued last, either locally or remotely, determines where the display takes place.

Tracing of the Data Link layer (l) is not allowed if the *TRACE* command is issued at a remote terminal. When remotely issued via UDP (by using an IP address or symbolic name), tracing of the IP (i), ICMP (j), and UDP (u) layers are also not permitted.

Caution

Enabling trace output has severe performance penalties for the communications software. This command should only be used in debugging problems. It should *NEVER* be left enabled in operational nodes.

The trace output is enabled for only the tasks specified with the most recent *TRACE* command; trace output is disabled for all tasks not specified.

Trace output is generated by the selected tasks until one of the following occurs:

- The *TRACE* command is issued again, to disable tracing or to select a new set of tasks.
- The timeout specified for the *TRACE* command has expired.

The command, *TRACE*, with no arguments shows:

- What tasks are currently printing trace information.
- The time remaining for an active trace.
- The active len_ref value.

The command, *TRACE !*, causes all tracing to be disabled.

Caution

Once trace has been initiated from a remote Station Manager, trace output continues to be sent to that remote Station Manager until terminated as described above. Trace output continues even if the remote Station Manager terminal is disconnected or logged into another station. Be sure to stop your traces.

Detailing the interpretation of the trace data is beyond the scope of this document. It requires expertise in the internal operation of the TCP/IP protocols that is not needed by most users of the network.

A typical *TRACE* command is shown below:

```
= trace i
Trace enabled for: i
minutes remaining   = 10
len_ref             = 48
```

If you attempt a trace of the Data Link layer when it is not allowed, a response similar to the example above will be displayed, followed by the message:

```
Trace not allowed for Data Link layer in remote mode.
```

UDIS Command

This command is reserved on all Ethernet Interfaces.

XCHANGE Command (Series 90–30 CPU364 and Series 90–70 Ethernet Interface (Type 2) only)

The XCHANGE command is used to print out detailed information about the configuration of a given exchange. This is a monitor–level command and has the following format:

```
XCHANGE   <producer ID> <exchange ID>
```

where <producer ID> and <exchange ID> are used to uniquely identify an Ethernet Global Data exchange.

The producer ID and exchange ID values for all defined exchanges may be displayed by using the "STAT G" command.

A typical XCHANGE command is shown below:

```
> xchange 1.2.3.4 1
<<< Individual Exchange Information >>>
        Exch. Mode:     PRODUCER
        Producer ID:    1.2.3.4
        Exchange ID     1
        Period:         1000 ms
        UDP Port:       5500
        Xfer Bytes:     2
        Exch Type:      STATIC
        Dest IP: 10.16.32.145
        Transfer Cnt:   43
        Refresh Errs:   0
```

Chapter 7 Style B Station Manager Command Descriptions

This chapter describes how to execute each Style B Station Manager command and interpret its results.

Symbols Used in the Station Manager Commands

In the descriptions below, symbols are used to denote options or alternatives in the command parameters. These symbols are used to help give a clear and complete description of the command and are not part of the command. The use of these symbols is briefly described below:

Arguments to commands are often given symbolic names that are enclosed in angle brackets (< >). For example; "<TASK>" is an argument to many commands. The command specification for "<TASK>" is described as a letter that identifies the task in the firmware. It is important to remember to enter the argument and not its symbolic name. For example, to display the SRTP Server tallies, you should enter:

```
TALLY v      – not –      TALLY <TASK>
```

Optional arguments are surrounded by square brackets, for example *LOG* [Z]. Again, the brackets should not be entered as part of the command.

Sometimes there are several *alternatives* for an argument. The alternatives are listed in the command description separated by a vertical bar (|) and enclosed in braces ({|}). For example, when using the *NET* command, only one of the alternatives should be selected:

```
NET { ON | OFF }
```

Command Input Processing

Anything in a command description that is not one of the constructs discussed above should be entered exactly as it is shown. All data entered for the command is converted to lower case unless it is enclosed in double quotes (“”). To use a double quote character within an argument string, the double quote should be entered twice, for example:
“This string would contain one ” “character.”

The Style B Station Manager accepts several ASCII control characters for various functions. The control characters accepted by the Station Manager are listed in the following table. All other control characters are ignored on normal command inputs. Illegal control characters sent to the Station Manager result in a <BEL> character being sent to the terminal.

Table 7-1. Control Characters

Control Character	Usual Keyboard Function	Function
BS	CTRL–H (Backspace)	Delete previous character
DC2	CTRL–R	Recall previous command line(s)
CAN	CTRL–X	Cancel the current input line
CR	Return (Enter)	Terminate line and execute command

If a command line becomes too long to easily type on a single display line, the character pair “\<CR>” can be used to continue the command on the next line on the display. The “\” (backslash) character will not be used as a part of any argument.

Up to the last 10 command lines are stored in a recall list. Repeated <CTRL-R> recalls up to the last 10 command lines before the list wraps around. <CTRL-X> resets back to the starting position in the recall list. The recall list is cleared upon module restart or power-up. A blank command line is returned by <CTRL-R> if the recall list is empty.

CHLTIME Command

The *CHLTIME* command has the form:

```
CHLTIME  <minutes>
```

where <minutes> is a login timeout value expressed in minutes which has a range of 0 to 32767.

The *CHLTIME* command is used to change the secure login timeout value. This change remains in effect until it is explicitly changed or until the next *LOGOUT* command is entered. If the number of minutes specified is zero, secure login timeout is not enforced.

A typical *CHLTIME* command is shown below:

```
= chltime 5

Login timeout = 5 min
```

Note that the secure logout timeout clock is suspended during execution of a *TRACE* or *PING* command.

CHPARM Command

To be able to execute this command, the Ethernet Interface must not have a configuration from the PLC. The *CHPARM* command has the form:

```
CHPARM <parm name> (<value> | def)
```

or

```
CHPARM ALL DEF
```

where <parm name> specifies the name of an advanced user parameter (see applicable table)
<value> specifies the new value for the specified advanced parameter.
"def" may be entered instead of an actual value to set the specified parameter to its factory default value

This command changes the value of a specified advanced user parameter. Advanced user parameters are configurable by the PLC Programmer configuration package using the AUP file (see in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual,* for a description of the AUP file). It is not recommended that you change advanced user parameters using the CHPARM command since any changes will be lost when a PLC hardware configuration is stored. Changes do not take effect until the Ethernet Interface is restarted or power is cycled such that the Operational state is entered.

Advanced user parameters are saved in non–volatile memory. Changes made by the *CHPARM* command are retained over restart and power cycles, until changed again by the *CHPARM* command or by storing a hardware configuration to the PLC.

Note

If you must change these parameters, record any changes made for future reference. If the changes need to be permanent, you should create an AUP file in the folder for the PLC.

A typical *CHPARM* command is shown below:

```
* chparm ittl 2
Old value = 64 (004QH)
New value = 2 (0007H)
```

Note

Use caution when setting any advanced parameter. Poor choice of settings may result in degraded Ethernet Interface operation.

What To Do If You Have Forgotten Your Password

The default Station Manager password is "system". The current password is required to access the "Modify level" of the Station Manager. If you have forgotten the current password, you may determine it by examining the AUP file. If no AUP file is in use or the AUP file does not contain an entry for the parameter "stpasswd", then the default Station Manager password is currently in use. If the AUP file contains an entry for "stpasswd", that entry describes the password currently in use.

CHSOSW Command

This command can only be executed if there is no hardware configuration stored in the PLC.

This command changes the value of the backup configuration parameters (sometimes called "Soft Switches") maintained within the Ethernet Interface. Configuration parameters are normally supplied by the PLC Programmer configuration software and stored to the PLC CPU for delivery to the Ethernet Interface at each configuration store, power–cycle, or restart. When the Ethernet Interface has received configuration parameters from the PLC CPU at the last restart, this Station Manager command is prohibited and any previous changes made using it are no longer effective. The *CHSOSW* command is used to change the backup configuration parameters used by the Ethernet Interface when configuration has not been received. Whenever the Ethernet Interface receives configuration from the PLC CPU, it replaces the configuration parameters, always overriding any user set values.

Changes made by the *CHSOSW* command do not take effect until the Ethernet Interface is restarted or power cycled. Such changes will then remain until a new configuration is supplied to the Ethernet Interface by the PLC Programmer configuration software.

The *CHSOSW* command has the form:

```
CHSOSW  {<sosw data>|def}
```

A typical set of sosw data selections is:

{ip_address <dotted–decimal IP address>|
subnet_mask <dotted–decimal subnet mask>|
gateway <dotted–decimal default gateway address>|
p1_data_rate {1200|2400|4800|9600|19200|38400|57600|115200}|
p1_parity {NONE|ODD|EVEN}
p1_flow_control|{NONE|HARDWARE}|
time_sync {0|1}

* Use 'chsosw def' to set all values to default

** All parameters are converted to lower case unless within quotes.

*** Use 0 for time_sync to select NONE, 1 to select SNTP

A typical *CHSOSW* command is shown below:

```
= CHSOSW ip_address 10.0.0.1
Parameter changes will not take effect until next powerup or restart
```

CHTIME Command

Use the *CHTIME* command to set both the time and date for the Ethernet Interface.

When modified with the *CHTIME* command, the Ethernet interface internal clock is set to "not synchronized". This command is rejected if the Ethernet interface is synchronized to an external SNTP time server.

A time value is required, date value is optional. Valid dates are JAN 01, 1998 – DEC 31, 2097. If an invalid date or time is entered, the internal clock is not changed. Changes remain in effect until the Ethernet interface in power-cycled or restarted. This command applies only to the Ethernet interface; it does not change the time kept in the PLC CPU.

CHTIME Command Format

CHTIME [< MMM DD, YYYY >] < HH [: MM [: SS]] >

<MMM>	is the month (JAN … DEC)
<DD>	is the day of the month (1-31)
<YYYY>	is the year (2002 …)
<HH>	is an hour in the range 0-23
<MM>	is an optional minute in the range 0-59, which defaults to 0
<SS>	is an optional second in the range 0-59, which defaults to 0

Leading zeros do not need to be entered.

CHTIME Command Example

```
= chtime feb 21, 2002   23:00:10
Feb 21, 2002     23:00:10.2
Date/time not synchronized
```

CLEAR Command

The *CLEAR* command has the form:

```
CLEAR { LOG | TALLY }
```

The *CLEAR* command sets various Ethernet Interface data structures to initial values, usually zeros.

- If the *CLEAR LOG* command is entered, all log entries are discarded and the log is set to an empty state. The *CLEAR LOG* command also turns on the STAT LED on the Ethernet Interface.
- If the *CLEAR TALLY* command is entered, all tallies resettable are set to a value of zero.

A typical *CLEAR TALLY* command is shown below:

```
= clear tally
Tallies cleared
```

EGDREAD Command

The EGDREAD command has the form:

```
EGDREAD <producerID> <exchangeID> [ <offset> [<len> ]]
```

This command displays the data from the EGD exchange identified by <producerID> and <exchangeID>. The <producerID> parameter should be expressed in dotted decimal notation, the exchange ID should be expressed as a number. An error will be displayed if the node does not have an exchange with the specified <producerID> and <exchangeID>. The optional offset and length can be used to display only a part of the exchange. By default the entire exchange is displayed. If an offset is specified without a length, a length value of one (1) is used. An error message will be displayed if the beginning offset is not contained within the exchange or if the offset plus the length specified exceeds the size of the exchange.

The user needs to be aware that this command displays the data for the EGD shared memory interface to the PLC. It is possible for the data in the interface not to be scanned into reference tables used by the application if, for example, the PLC is not in run mode.

The output of the command is a hexadecimal dump of the requested data in bytes. Each line of up to 16 bytes also has the ASCII representation of the data bytes displayed to right of the hexadecimal dump of the data, with a dot used for non-printable ASCII characters.

A typical EGDREAD command is shown below:

```
= egdread 10.10.10.1 1
Produced exchange  10.10.10.1 1 offset 0 length 32:
aa aa aa aa aa aa aa aa aa aa aa aa aa aa aa aa    ................
aa aa aa aa aa aa aa aa aa aa aa aa aa aa aa aa    ................
```

EGDWRITE Command

The EGDWRITE command has the form:

```
EGDWRITE <producerID> <exchangeID> <offset> <new data value> [<new data value>...]
```

This command puts the value(s) specified in <new data value> into the memory of the EGD exchange specified by <producerID> and <exchange ID> starting at the offset specified in <offset>. The <producerID> parameter should be expressed in dotted decimal notation, the exchange ID should be expressed as a number. An error will be displayed if the producer ID, exchange ID or the offset is not valid for the PLC, if the data specified would be cause writing beyond the boundaries of the exchange or if the new data values are not valid numeric values. Each data value will be placed into a consecutive byte of the exchange starting at the specified offset. If a data value is larger than 255 only the least significant byte of the data value will be used. No more than 16 data values may be specified.

A typical EGDWRITE command is shown below:

```
= egdwrite 10.10.10.1 1 1 2 3
written
```

HELP Command

The HELP command has the form:

```
HELP        or        ?
```

The HELP command (or the single character command "?") can be used to display a short reminder of the valid commands. If you are logged in to use modify commands, you will see the <<<Modify Commands>>> in the command list (see Table 4–2, "Modify Commands"). If you are not logged in, you will not see the modify command listing.

A typical HELP command when you are not logged in (that is, you are in Monitor level) is shown below:

```
> ?

<<< Monitor Commands >>>

?           egdread     help        log         login       ltime

node        parm        plcread     prog        sosw        stat

tally       time        xchange
```

A typical HELP command when you are logged in is shown below:

```
= help

<<< Monitor Commands >>>

?           egdread     help        log         login       ltime

node        parm        plcread     prog        sosw        stat

tally       time        xchange


<<< Modify Commands >>>

chltime     chparm      chsosw      chtime      clear       egdwrite

killss      logout      net         ok          ping        plcwrite

rem         repp        restart     stopp       trace
```

KILLSS Command

Note

This command is intended to be used only for diagnostics and maintenance.

The *KILLSS* command has the form:

```
KILLSS ALL|<SRTP Server Endpoint> [<SRTP Server endpoint> [...]]
```

This command causes the specified SRTP server endpoint(s) to be terminated. An endpoint is identified by a number , as listed in the leftmost column of the STAT V command output. Alternately, the *KILLSS ALL* form of the command causes all established SRTP Server endpoints to be terminated. This command will not terminate endpoints which are not in the ESTABLISHED state.

A typical *KILLSS* command is shown below:

```
= killss 2
SRTP Server endpoint 2 shut down initiated
```

LOG Command

This command prints entries from the exception log. Log entries remain in the log until they are explicitly cleared by using the *CLEAR LOG* command or until they are overwritten by more recent data. The log is maintained as a circular list where new data overwrites the oldest data in the list. An arrow points to the most recently logged event.

Refer to Appendix B, "Exception Log Event Descriptions", for a complete explanation of each log event.

The *LOG* command has the form:

```
LOG [Z]
```

A typical *LOG* command is shown below:

```
> log

<<< Exception Log >>>

IC693CPU374  Embedded Ethernet version 1.00 (15A3)

Log displayed 19-APR-2002  15:51:51.9

Log initialized using valid RAM information

Log last cleared 19-APR-2002  15:46:27.4

  Date         Time         Event Count  Entry 2 through Entry 6

->19-APR-2002  15:51:46.9    1H    1H   0000H 0001H 0000H 0000H 0000H
```

Date – The Date column contains the system date of the last occurrence of the logged event.

Time – The Time column contains the system time of the last occurrence of the logged event. The timestamp used is the current date and time of day as known by the Ethernet Interface. This is the same time that is displayed by the DATE and TIME commands and changed by the *CHDATE* and *CHTIME* commands.

Event – The Event column gives the kind of event which occurred. Events are described in Appendix B.

Count – The Count column contains a repetition count for the event. If identical events occur regularly, they might flood the log with useless entries. Instead of recording each repeated event in detail, the log simply keeps the time of the latest event and a count of the number of repetitions of the repeated event. Log entries are retained on restarts and reloads of the Ethernet Interface.

Entry – The Entry columns contain detailed information about the event and is subdivided into 6 entries, Entry 1 – Entry 6.

The **Z option** to the *LOG* command covers additional information to be displayed. This additional information causes each line of the log display to be 132 columns in width, so wrapping of lines may occur in some terminals or terminal emulators. A typical output from a *LOG Z* command is shown below.

```
> log z
<<< Extended Exception Log >>>
IC693CPU374  Embedded Ethernet version 1.00 (15A3)
Log displayed 19-APR-2002  16:23:53.3
Log initialized using valid RAM information
Log last cleared 19-APR-2002  15:46:27.4
    Remote IP Addr:Port
  Date         Time         Event Count  Entry 2 through Entry 6       SCode
or Producer ID:Exchg   Local IP Addr:Port
  19-APR-2002  16:22:38.9    1H    2H   0000H 0001H 0000H 0000H 0000H
->19-APR-2002  16:23:49.2    eH    1H   0006H 0002H 0000H 0005H 05fbH 80080001H
```

In addition to the output from the *LOG* command shown above, the following additional fields will be displayed when *LOG Z* is used:

S-Code – A 32-bit internal status code. See Appendix E for code format and values.

Remote IP Addr: Port or Producer ID Exchg – For some errors, this field contains the IP address and port of the remote node associated with the error. For EGD, this field sometimes contains the producer ID and exchange ID of the exchange associated with the error.

Local IP Addr: Port – For some errors, this field contains the IP address and port of the local end point associated with the error.

LOGIN Command

The LOGIN command has the form:

```
LOGIN
```

The LOGIN command will be followed by a prompt of the form:

```
Password:
```

You should enter your password (which will not be echoed). If the password matches the current password for the Modify level, you will receive a confirmation message and you will be allowed access to the Modify commands. If the password does not match, then an error message is displayed and the security level is not changed.

Please note that all characters that are typed after the password prompt, except for the Enter key, are assumed to be part of the password. Specifically, the delete and backspace characters do not have their usual meaning and are interpreted simply as password characters. Passwords are limited to 8 characters and all characters after the eighth are ignored. Unlike other inputs, the password does not need to be enclosed with double quotes to achieve case sensitivity.

The factory default password is: system (lower case). It may be changed by setting a password in the AUP file for the application.

Note

There is a special variation of the LOGIN command that must be used in conjunction with the *REM* (remote) command to login on a remote system. Refer to the *REM* command for a discussion of this variation.

LOGOUT Command

The *LOGOUT* command has the form:

```
LOGOUT
```

This command causes the secure login to be terminated. Any Modify commands entered after the logout will receive an error message. Logging out causes the login timeout value to return to 10 minutes. A typical *LOGOUT* command is shown below:

```
= logout
Logged out
```

LTIME Command

The LTIME command has the form:

```
LTIME
```

This command causes the current login timeout value to be displayed. A typical LTIME command is shown below:

```
> ltime
Login timeout = 10 min
```

The login timeout value can be changed using the *CHLTIME* command.

NET Command

The *NET* command has the form:

```
NET { ON | OFF }
```

This command causes the MAC task within the Ethernet Interface to either ignore incoming and outgoing Ethernet frames (when *NET OFF* is specified) or to accept incoming and outgoing Ethernet frames (when *NET ON* is specified). This can be used to remove an Ethernet Interface from the network without the need to physically disconnect it or restart the hardware.

A typical *NET OFF* command is shown below:

```
= net off
Interface off network
```

NODE Command

The NODE command has the form:

```
NODE
```

This command causes the Ethernet Interface sign–on message to be printed out on the screen.

A typical NODE command is shown below:

```
> Node
IC693CPU374  Embedded Ethernet
Copyright (c) 2000-2002.  All rights reserved.
Version 1.00 (10A2) TCP/IP
Version 1.00 (10A1) Loader
Motherboard ID = 00  Daughterboard ID = 00
IP Address = 10.0.0.2           Subnet Mask = 255.255.252.0
Gateway = 0.0.0.0
MAC Address = <<0800190063B9>>
SNTP Not Configured

Station Manager Port:
  Data Rate = 9600,  Parity = NONE,  Flow Control = NONE

Source of Soft Switches: Factory Default
Source of IP Address:    EEPROM

Mar 14, 2002  10:56:06.0
Date/time initialized from PLC CPU
```

If the Ethernet Interface is not in the Operational state, the NODE command displays an additional output that describes the current state.

OK Command

This command causes the STAT LED to turn ON. It has no effect on the contents of the exception log.

The *OK* command has the form:

```
OK
```

A typical *OK* command is shown below:

```
= ok
STAT LED modified
```

PARM Command

The PARM command displays the current value of the advanced user parameters for the specified task(s). All advanced user parameters for the specified task(s) are displayed. (Soft switch configuration parameters for the specified task(s) are not displayed; use the SOSW command to display such parameters.)

The PARM command has the form:

```
PARM {<task>(s)> | all}
```

where <task> specifies a task identifier (see Table 4–5).

A typical PARM command is shown below:

```
> parm i

<<<  IP Parameters  >>>

              Default Value     User-Set Value

ittl       =    64 (40H)*

ifrag_tmr  =     3 (0003H)*
```

A special form of this command displays all advanced user parameters:

```
> parm all
```

A complete list of all advanced user parameters is provided in Table 6–2.

Note

The output from this command may scroll off the screen.

Style B Station Manager Advanced User Parameters

There are no advanced user parameters for tasks h, j, n, u and v.

Time values are in number of 10 ms units unless otherwise specified. Buffer sizes are in number of bytes unless otherwise specified.

Table 7-2. Style B Station Manager Advanced User Parameters

Parameter	Description	Valid Range	Default value
System Memory Parameters (task 'b')			
staudp	Remote Station Manager UDP port	0 – 65535 (ffffH)	18245 (4745H)
stpasswd	Station Manager password (visible from MODIFY only)	0 – 10 chars, case sensitive; no spaces	"system"
PLC Driver Parameters (task 'c')			
crsp_tout	Response timeout for backplane requests.	10-3600 (e10H)	16 (10H)
ARP Parameters (task 'f')			
fflush	ARP cache timeout interval (in seconds)	0 – 604800(93a80h)	600 (0258h)
Ethernet Global Data Parameters (task 'g')			
gctl_port	UDP port for EGD control messages	0 – 65535 (ffffH)	7937 (1f01H)
gdata_port	UDP port for point-to-point (unicast) EGD messages	0 – 65535 (ffffH)	18246 (4746H)
gbcast_ttl	IP time-to-live for global broadcast messages (hop count)	0 – 255 (00ffH)	1 (1H)
gucast_ttl	IP time-to-live for point-to-point (unicast) messages (hop count)	0 – 255 (00ffH)	16 (10H)
gp_phase	Production phase for produced exchanges (in milliseconds)	0-255(00ffH)	0
EGD provides a UDP port parameter and host group IP address parameter for each of 32 possible host groups (0 – 31). The parameter formats for each host group are as follows, where "XX" specifies the host group (0-31):			
gXX_udp	UDP port for host group XX	0 – 65535 (ffffH)	18246 (4746H)
gXX_ttl	IP time-to-live for host group (multicast) messages (hop count)	0 – 255 (00ffH)	1 (1H)
gXX_addr	IP group address for host group XX (must be Class D address)	224.0.0.2 – 239.255.255.255	224.0.7.XX
SRTP Channels Parameters (task 'h')			
(none)			
IP Parameters (task 'i')			
ittl	IP header default time-to-live (hop count)	0 – 255 (00ffH)	64 (0040H)
ifrag_tmr	IP fragment timeout interval (in seconds)	0 – 65535 (ffffH)	30 seconds
ICMP/IGMP Parameters (task 'j')			
(none)			
Network Interface Parameters (task 'l') *(formerly "Data Link" in CPU364)*			
lduplex0	Interface duplex setting (0=auto-detect, 1=half, 2=full) for the internal port that connects the switch to the Ethernet controller.	0,1,2	0
lduplex1	Interface duplex setting (0=auto-detect, 1=half, 2=full) for Port 1.	0,1,2	0
lduplex2	Interface duplex setting (0=auto-detect, 1=half, 2=full) for Port 2.	0,1,2	0
lspeed0	Interface operating speed (0=auto-detect, 1=10Mbit, 2=100Mbit) for the internal port that connects the switch to the Ethernet controller.	0,1,2	0
lspeed1	Interface operating speed (0=auto-detect, 1=10Mbit, 2=100Mbit) for Port 1	0,1,2	0
lspeed2	Interface operating speed (0=auto-detect, 1=10Mbit, 2=100Mbit) for Port 2	0,1,2	0
SNTP Parameters (task 'n')			
(none)			
UDP Parameters (task 'u')			
(none)			
SRTP Server Parameters (task 'v')			
(none)			
TCP Parameters (task 'w')			
wnodelay	TCP nodelay option (0= inactive; 1 = active)	0, 1	0
wkal_idle	TCP keepalive timer value (in seconds)	0 – 65535 (ffffH)	7200 seconds (= 2.0 hours)
wkal_cnt	TCP keepalive probe count	0 – 65535 (ffffH)	8
wkal_intvl	TCP keepalive probe interval (in seconds)	0 – 65535 (ffffH)	75 seconds
wsnd_buf	TCP send buffer size (in bytes)	0 – 32767 (7fffH)	4096 (1000H)
wrcv_buf	TCP receive buffer size (in bytes)	0 – 32767 (7fffH)	4096 (1000H)

PING Command

The *PING* command has the form:

```
PING  <node> [ <cnt> [ <sch> [ <len> ] ] ]
```

where
- <node> is the IP address of the remote node to be "pinged" (i.e., to be sent ICMP Echo Request messages). Enter in standard IP dotted–decimal form.
- <cnt> is the number of times the ping is to be repeated. Default is 1. Range is 0 through ffffH.
- <sch> specifies the maximum amount of time to wait for a reply to each ping. The timeout interval is expressed in 10–millisecond units. Default is 1 (10 milliseconds). Range is 0 through 7fffH. A value of 0 results in the value of 100 (1 second) delay used.
- <len> is the number of data bytes in the Echo Request message. The actual data pattern is not changeable by the user. Default length is 64 bytes. Range is 8 through 32747 but is limited by system buffer memory.

The results of the last *PING* command are maintained until the Modify security level is exited (either by a timeout or by the *LOGOUT* command). It may be advisable to issue a *CHLTIME 0* command before initiating a *PING* command of long duration.

The *PING* command is refused if the Ethernet Interface on which you are issuing the *PING* command to has not been configured with a valid IP address. A typical *PING* command is shown below:

```
= ping 10.0.0.1 10
Ping initiated

<<< Ping Results >>>
Command:  ping  10.0.0.1 10 100 64
Sent = 10, Received = 10, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 0/1/10
```

See also the *REPP* command for detailed explanation of *PING* results.

PLCREAD Command

The PLCREAD command has the form:

```
PLCREAD <address> [<len> ]
```

This command displays the data from the PLC memory specified by <address>. An error will be displayed if the address is not valid for the PLC. The syntax of the address is %<selector><offset> where <selector> is one of the character sequences 'AI', 'AQ', 'I', 'G', 'M', 'Q', 'R', 'S', 'SA', 'SB', 'SC' and 'T', and <offset> is a numeric value in the range of 1 to the size of the reference table being displayed. Example addresses are %R1, %AI003 and %AQ1000. For discrete tables such as %I and %Q, the entire byte containing the requested address will be displayed, i.e. specifying the values %I1, %I4 and %I8 will all display the same data. The length is expressed in terms of words for word oriented tables such as the %R, %AI and %AQ tables and in terms of bytes for the other tables. It defaults to the value one (1). An error message will be displayed if address plus the length specified exceeds the memory of the PLC.

The output of the command is a hexadecimal dump of the requested data. Each line of up to 16 bytes also has the ASCII representation of the data bytes displayed to right of the hexadecimal dump of the data, with a dot used for non-printable ASCII characters.

A typical PLCREAD command is shown below:

```
> plcread %R1 2
01 00 02 00 ....
```

PLCWRITE Command

A new modify level station manager command PLCWRITE will be introduced to allow selected parts of the memory of the PLC to be changed to the new value specified in the command. The PLCWRITE command has the form:

```
PLCWRITE <address> <new data value> [<new data value> ... ]
```

This command puts the value specified in <new data value> into the PLC memory specified by <address>. An error will be displayed and the data from the command will not be written to the PLC if the address is not valid for the PLC or if the new data value is not a valid numeric value. One byte will be written for addresses that are in the discrete and a word will be written when a analog input, analog output table, or register table address is specified. No more than 16 data values may be specified.

The syntax of the address is %<selector><offset> where <selector> is one of the character sequences ''AI', 'AQ', 'I', 'G', 'M', 'Q', 'R', 'S', 'SA', 'SB', 'SC' and 'T' and <offset> is a numeric value in the range of 1 to the size of the reference table being accessed. Example addresses are %R1, %AI003 and %AQ1000.

A typical PLCWRITE command is shown below:

```
= plcwrite %R1 2
written
```

PROG Command

The PROG command has the form:

```
PROG
```

This command causes the name of the current PLC CPU program to be displayed. A typical PROG command is shown below:

```
> prog
CPU Program Name is "FRED374"
```

REM Command

The *REM* command has the form:

```
REM  <node> <cmd> [<cmd parms>]
```

where <node> is the the IP address of the remote Interface
<cmd> is any Station Manager command except *REM*
<cmd parms> is a list of any parameters required by <cmd>.

The *REMote* command sends the Station Manager command which is its argument and any associated parameters to the node whose address is specified. The Station Manager on the remote node acts on the command as if it had been entered at its local serial port, but directs all output from processing the command back over the network to the station where the *REM* command originated. The results are displayed at the local station with the notation "REM" along with the prompt from the remote station to denote that the data was returned from the remote station. (A *REM* command cannot be issued to the node on which it is entered.)

A typical *REM* command is shown below:

```
= rem 10.0.0.1 node
REM> IC693 PLC Factory LAN Interface
REM> Copyright (c) 1998.  All rights reserved.
REM> Version 1.00 (28A1) TCP/IP
REM> Version 1.00 (28A1) Software Loader
REM> IP Address = 10.0.0.1
REM> MAC Address = <<080019010177>>
```

The LOGIN command is treated as a special case when it is specified in the *REM* command. The following command is used to login to a remote device.

```
REM <node> LOGIN <password>
```

Note that this prevents the prompt for the password value and displays the remote password in a readable form.

Note

When using the *REM* command, the password should be placed in double quotes if it contains any uppercase letters because the password is case sensitive.

Do not send the REM command itself to an Ethernet Interface (i.e., `= rem <node> rem <node> <command>`)

Security is enforced on the remote system just as if the command had been entered locally. Thus the remote user and any local user of a given node all see the same security level.

REPP Command

The *REPP* command has the form:

```
REPP
```

This command causes the results of the *PING* command to be reported. The results may be for a currently running *PING* or otherwise the most recent *PING* command.

A typical *REPP* command is shown below:

```
= repp
<<< Ping Results >>>
Command:  ping  10.0.0.1 10 100 64
Sent = 1, Received = 1, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 0/10/10
```

Interpretation of Test Results

The line of output that begins "Command: . . ." identifies the actual *PING* command parameters used (including default values for any optional parameters not specified on the command line) to generate the results.

"Sent" indicates the number of Echo Request messages sent.

"Received" indicates the number of Echo Reply messages received within the expected response schedule of its corresponding Echo Request. The response schedule begins when an Echo Request is sent and ends when the schedule time specified in the <sch> parameter of the *PING* command elapses.

"No Timely Response" indicates the number of times that no Echo Response message arrived within the response schedule of the corresponding Echo Request; that is, when the response schedule time elapses before the corresponding Echo Response arrives.

"Late/Stray Responses" indicates the number of times an Echo Response arrived outside of the response schedule of its corresponding Echo Request or when a stray Echo Response, not corresponding to any recent Echo Request, arrives.

The line beginning "Round–trip . . ." indicates the minimum, average, and maximum delay (in units of milliseconds) measured between sending an Echo Request and receiving the corresponding Echo Response. Note that these times use 10 millisecond granularity. In the example, the *PING* required less than 10 milliseconds to complete, so zero values are reported.

RESTART Command

The *RESTART* command has the form:

```
RESTART
```

The *RESTART* command causes the Ethernet Interface to be restarted without causing the software to be reloaded. It has the same effect as pressing the Restart pushbutton on the front edge of the Ethernet Interface quickly (less than 5 seconds). Any data transfer between the Series 90 PLC and the network at the time the *RESTART* command is entered is permanently lost.

A typical *RESTART* command is shown below:

```
= restart
Restarting Module
```

SNTP Command

Unlike the Style A Station Manage, Style B Station Manager does not have an SNTP command. Use the STAT N command to get the information that is displayed by a Style A Station Manager in the SNTP command.

SOSW Command

This command displays the current setting of the Ethernet Interface Soft Switches and indicates their source.

Valid sources for the Soft Switches are as follows:

- **"CPU"** - the Soft Switch settings have been received in the Ethernet Interface's configuration from the PLC CPU. Changes to the Soft Switch settings with the *CHSOSW* command are not allowed.
- **"Internal Backup"** - the Soft Switch settings have been retrieved from the Ethernet Interface's internal backup. This is expected when configuration has not been received from the PLC CPU. The *CHSOSW* command may be used to change the current Soft Switch settings.
- **"Factory Defaults"** - the Soft Switch settings have been set to factory default. This is expected when the Ethernet Interface has never received configuration from the PLC CPU (i.e., no current configuration or previously backed up configuration exists). The *CHSOSW* command may be used to change the current Soft Switch settings.
- **"Unknown"** - this is not expected.

The SOSW command has the form:

```
SOSW
```

A typical SOSW command is shown below:

```
= sosw
<<< Soft Switch Data >>>
IP Address        = 10.0.0.2    (TCP/IP values from Soft Switches)
Subnet Mask       = 255.255.255.0
Gateway           = 0.0.0.0
SNTP Not Configured

Station Manager Port:
Data Rate    = 9600
Parity       = NONE
Flow Control = NONE

Source of Soft Switches: PLC Configuration
Source of IP Address:    Configuration
```

STAT Command

The STAT command has the form:

```
STAT <task(s)>
```

where <task(s)> is one or more task identification letters from Table 4–5.

This command causes the current status of the task or tasks specified by the task identification letters to be displayed. An example STAT command is shown below:

```
> stat v

<<< SRTP Server Status >>>

Endpoint  Task   State          Num Requests  Client Address
--------  ----   -----------    ------------  --------------
       0    32   ESTABLISHED          10906        10.0.0.4
       1    33   ESTABLISHED          10916        10.0.0.4
       2    34   ESTABLISHED          10931        10.0.0.4
       3    35   ESTABLISHED          10911        10.0.0.4
```

STOPP Command

The *STOPP* command has the form:

```
STOPP
```

This command causes an active *PING* sequence to stop immediately and to print the results of the terminated test. It is used to terminate a long–running *PING* sequence. An example *STOPP* command is shown below.

```
= stopp
<<< Ping Results >>>
Command:  ping  10.0.0.1 10 100 64
Sent = 8, Received = 8, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 0/1/10
Note:  The ping was aborted via stopp.
```

TALLY Command

The TALLY command has the form:

```
TALLY <task(s)>
```

where <task(s)> is one or more task identification letters from Table 4–3.

This command causes the current value of the tallies for the specified task or tasks to be displayed. Some of these tallies simply indicate load and performance information about the station. Others can indicate whether or not there are problems either within the station or within the network.

An example TALLY command is shown below:

```
> tally v

<<< SRTP Server Tallies >>>   21-APR-2002  16:07:38.0

InPDU   =00000000H  OutPDU  =00000000H  BadPDU  =00000000H  InConRq =00000000H

OutConRp=00000000H  InDatRq =00000000H  OutDatRp=00000000H  InUncRq =00000000H

OutUncRq=00000000H  InErrRq =00000000H  OutErrRq=00000000H  InDisRq =00000000H

OutDisRq=00000000H  InSesRq =00000000H  OpenTO  =00000000H
```

Refer to Appendix C, "Tally Descriptions", for a list of the tallies and their meanings.

TRACE Command

The *TRACE* command has the form:

```
TRACE !

          or

TRACE  <task> [(<qual>)] [<task(s)>] [<minutes> [<len_ref>]]
```

where <task(s)> is up to 8 task identifier letters chosen from ‘c’, ‘g’, or ‘v’ as described in Table 4–5, or “z” to add PDU trace. Each task letter may be followed by a qualifier that restricts tracing to a specified entry with a task. The qualifier must be enclosed in parenthesis and immediately follow the task letter. The qualifier for task ‘c’ specifies a mailbox task ID. The qualifier for task ‘g’ specifies an exchange index as displayed in the ‘stat g’. The qualifier for task ‘v’ specifies a connection ID as shown in the ‘stat v’. Multiple trace qualifiers for the same task may be given.

<minutes>is an optional parameter that specifies how long *TRACE* will remain active. Default is 10 minutes. This parameter is a character string that specifies an integer which can be 0, or a value from 1 to 32767. If 0 is specified then time out is not enforced. Any non–zero value specifies the duration in minutes after which the trace activity will automatically cease. Login will be maintained (automatic logout will be inhibited) until after the trace has terminated.

<len_ref> is an optional parameter that limits the amount of PDU (z) data to be displayed. The PDU display format is a character string that specifies an integer value ranging from 1 to 32767. If omitted from the command line, the value 48 will be substituted. This parameter provides the flexibility to view the PDU in its entirety or just a portion of it. Since each line of display consists of 16 bytes, and, if truncating of the PDU does take place (always at the end of a line and trailed by ’...’ on the next line), the actual number of bytes displayed will be rounded up to the next multiple of 16 from <len_ref>. There is, of course, a performance penalty for displaying large PDUs when they occur frequently.

The identifier “!” disables all tracing and should only be used by itself.

This command causes a diagnostic trace of the specified task or tasks to be displayed at the terminal where the *TRACE* command is invoked. This trace information shows each protocol exchange at the selected task and can be used by protocol experts to diagnose problems at the node or in a remote host.

The format of the display is the same at both the local and the remote terminal.

The *TRACE* command issued last, either locally or remotely, determines where the display takes place.

Caution

Enabling trace output has severe performance penalties for the communications software. This command should only be used in debugging problems. It should *NEVER* be left enabled in operational nodes.

The trace output is enabled for only the tasks specified with the most recent *TRACE* command; trace output is disabled for all tasks not specified.

Trace output is generated by the selected tasks until one of the following occurs:

- The *TRACE* command is issued again, to disable tracing or to select a new set of tasks.
- The timeout specified for the *TRACE* command has expired.

The command, *TRACE*, with no arguments shows:

- What tasks are currently printing trace information.
- The time remaining for an active trace.
- The active len_ref value.

The command, *TRACE !*, causes all tracing to be disabled.

Caution

Once trace has been initiated from a remote Station Manager, trace output continues to be sent to that remote Station Manager until terminated as described above. Trace output continues even if the remote Station Manager is disconnected or logged into another station. Be sure to stop your traces.

Detailing the interpretation of the trace data is beyond the scope of this document. It requires expertise in the internal operation of the TCP/IP protocols that is not needed by most users of the network.

A typical *TRACE* command is shown below:

```
= trace g
Trace enabled for: g
minutes remaining   = 10
len_ref             = 48
```

XCHANGE Command

The XCHANGE command is used to print out detailed information about the configuration of a given exchange. This is a monitor–level command and has the following format:

```
XCHANGE   <producer ID> <exchange ID>
```

where <producer ID> and <exchange ID> are used to uniquely identify an Ethernet Global Data exchange.

The producer ID and exchange ID values for all defined exchanges may be displayed by using the "STAT G" command.

A typical XCHANGE command is shown below:

```
> xchange 1.2.3.4 1
<<< Individual Exchange Information >>>
Exch. Mode: PRODUCER
Producer ID:       1.2.3.4
Exchange ID 1
Period:            1000 ms
UDP Port:  5500
Xfer Bytes: 2
Exch Type:  STATIC
Dest IP:   10.16.32.145
Transfer Cnt:      43
Refresh Errs:      0
```

Appendix A Glossary

In communications, a number of special terms are used, and many of these terms are referenced by acronyms.

This appendix contains a concise, alphabetized listing of conventional communications terms and (where applicable) their associated acronyms. Most of these terms (but not necessarily all) are used in this manual.

Commonly Used Acronyms and Abbreviations

This is a listing of acronyms, and their derivation, that are commonly used throughout this manual.

API	Application Program Interface
ARP	Address Resolution Protocol
AUI	Attachment Unit Interface
AAUI	Apple Attachment Unit Interface
BOOTP	Boot Strap Protocol
BPS	Bits Per Second
CCU	Communication Configuration Utility
CPU	Central Processing Unit
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
DCE	Data Communications Equipment
DCS	Detailed Channel Status
DDP	Distributed Directory Protocol
DIB	Directory Information Base
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DTE	Data Terminal Equipment
EGD	Ethernet Global Data
GSM	GEnet System Manager
H	Hexadecimal
HEX	Hexadecimal
ICMP	Internet Control Message Protocol
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Management Protocol
IP	Internet Protocol
ISO	International Organization for Standardization
K	1024
KB	Kilobyte (1024 bytes)
LAN	Local Area Network
LED	Light Emitting Diode
LIS	LAN Interface Status
LLC	Logical Link Control
LSAP	Link Layer Service Access Point
MAC	Medium Access Control
MB	Megabyte (1,048,576 bytes)
PDU	Protocol Data Unit
PLC	Programmable Logic Controller
RAM	Random Access Memory
RFC	Request for Comments
SNTP	Simple Network Time Protocol
SQE	Signal Quality Error
SRTP	Service Request Transfer Protocol
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
UDP	User Datagram Protocol

Glossary of Terms

Adapter Name A name assigned to locally identify a module (e.g., an Ethernet Interface) in the local station. (See also Network Address Name.)

Address Administration The assignment of LAN addresses locally or on a universal basis.

Address Field The part of a Protocol Data Unit (PDU) that contains an address.

Address Resolution Protocol (ARP) The Internet Protocol that binds dynamically a high–level Internet Address to a low–level physical hardware address such as a MAC address.

Apple Attachment Unit Interface (AAUI) A lower power, smaller connector adaptation of the IEEE 802.3 AUI.

Attachment Unit Interface (AUI) In a network node on a Local Area Network, the interface between the medium attachment unit (MAU) and the data terminal equipment. Often called "transceiver cable".

AUI/AAUI Port A connector on the network interface.

AUI/AAUI Cable The cable between the AUI/AAUI port and the transceiver (some transceivers plug directly into the AUI/AAUI port, thus requiring no separate cable).

BOOTP BOOTP is a bootstrap protocol that allows a TCP/IP network node (such as a Series 90 PLC with Ethernet Interface) to discover its own IP address, and other configuration information. This information is supplied from a BOOTP Server device on the network.

Bridge A functional unit that interconnects two Local Area Networks (LANs) that use the same logical link control protocol, but may use different medium access control protocols. A bridge connects network nodes at the Data Link layer, ISO layer 2.

Broadcast Sending of a frame that is intended to be accepted by all other nodes on the same Local Area Network.

Broadcast Address A LAN group address that identifies the set of all nodes on a Local Area Network.

Bus Network A Local Area Network in which there is only one path between any two network nodes and in which data transmitted by any node is immediately available to all other nodes connected to the same transmission medium. NOTE: A bus network may be linear, star, or tree topology.

Carrier Sense In a Local Area Network, an ongoing activity of a network node to detect whether another node is transmitting.

Carrier Sense Multiple Access with Collision Detection (CSMA/CD) A bus network in which the medium access control protocol requires carrier sense and in which exception conditions caused by collisions are resolved by retransmission.

Channel An association in a client PLC between the PLC application program and an Ethernet Interface in that same PLC. The ladder program initiates the channel when it issues a Communications Request (COMMREQ) to its local Ethernet Interface. In turn, this local Ethernet Interface initiates a *connection* to a remote server and then makes periodic data transfers between the client and server PLCs. (See also Connection.)

Channel Status Bits The Channel Status bits comprise bits 17–80 (64 bits) of the status indication area. For SRTP Channels, these bits consist of an *error* bit and a *data transfer* bit for each of the channels that can be established. For Modbus/TCP Channels, there is a Connection Open bit and one reserved bit for each possible channel. (32 channels for the Series 90–70 Ethernet Interface, 16 channels for the Series 90–30 Ethernet Interfaces.) Status bits for unused channels are always set to zero.

Client A node that requests network services from a server. A client PLC initiates a communications request. (See also Server.)

Collision A condition that results from concurrent transmissions by two or more nodes on the transmission medium.

Collision Domain A single CSMA/CD network. If two or more nodes are within the same collision domain and both transmit at the same time, a collision will occur. Nodes separated by a repeater are within the same collision domain. Nodes separated by a bridge are within different collision domains.

Command Dictionary Provides an alphabetical listing of the LAN Interface commands.

Command Field That part of a protocol data unit (PDU) that contains commands, as opposed to the address field and information field.

COMMREQ Function Block The COMMREQ Function Block is the Series 90 PLC ladder instruction used to initiate a communications request.

COMMREQ Status Word (CRS Word) The 16–bit CRS word receives the initial status of the Series 90 PLC communication request from the Series 90 module to which the communication request was addressed. The location of the CRS word is assigned, for each COMMREQ function, in the common area of the COMMREQ Command Block.

Communication Configuration Utility A utility used by the Windows-based PLC programming software and the Host Communications Toolkit to configure local communication parameters for connecting to PLCs.

Communications Window A part of the PLC scan that provides an opportunity for the LAN Interface to read and write PLC memory. The window is executed automatically once per PLC scan.

Connection An association between a client and server on a network, used to reliably transfer data between the two. Here, usually refers to a TCP or an SRTP connection, where the client, server, or both are PLCs. (See also Channel.)

Consumer In Ethernet Global Data, a device (such as a PLC) that receives a data exchange from a Producer. (See also Producer, Exchange.)

CRS Word See COMMREQ Status Word.

CSMA/CD See Carrier Sense Multiple Access with Collision Detection.

Data Communications Equipment (DCE) Examples: Modems and transceivers. Distinct from DTE, Data Terminal Equipment.

Data Link Layer In Open Systems Interconnection architecture, the layer (Layer 2) that provides services to transfer data over a physical link between open systems. Consists of the LLC and MAC sublayers.

Data Terminal Equipment Examples: computers, terminals, printers. Distinct from DCE, Data Communications Equipment.

DCS Words See Detailed Channel Status Words.

Detailed Channel Status Words Two status words containing detailed information on a single Series 90 SRTP channel. The DCS words are retrieved using the Retrieve Detailed Channel Status Command.

Directory Information Base (DIB) A collection of information used for directory services (like name resolution). In this document DIB refers to the DDP database which is actually distributed among all DDP devices instead of in a single name server. (See also Distributed Directory Protocol (DDP)).

Distributed Directory Protocol (DDP) The GE Fanuc proprietary protocol used to provide distributed name service on a TCP/IP Ethernet network. The distributed nature of DDP means that there is no centralized name server.

Domain Name System (DNS) The predominant name service protocol used by the Internet. DNS is primarily used to resolve a name into an IP address.

Dotted–Decimal The notation for IP, gateway, and name server addresses as well as the subnet mask. It consists of 4 decimal numbers (0–255) separated by periods. Example IP address: 10.0.0.1

Duplex The ability to send and receive data simultaneously (full duplex) or not (half duplex).

Dynamic Host Configuration Protocol (DHCP) A superset of the BOOTP protocol (See BOOTP).

Ethernet Global Data (EGD) A proprietary protocol that provides efficient connectionless periodic data transfer over an Ethernet network. Operates over the UDP protocol.

Ethernet Interface The general term used in this manual to identify the GE Fanuc hardware module, with or without software, that connects a PLC (or CNC) to a network. It may also appear in the shortened form, “Interface”. (See also LAN Interface.)

Exchange In Ethernet Global Data, a set of variables or memory locations within the PLC or other device to be transferred from a Producer to a Consumer. (See also Producer, Consumer.)

Exchange ID In Ethernet Global Data, a numerical value assigned by the user to identify a specific data exchange to be sent by the producing device. (See also Producer, Consumer, Exchange.)

Exchange Status Word The 16-bit Exchange Status word continuously indicates the status of an Ethernet Global Data exchange.

Extended Netid See Subnet Id.

Flash Memory A type of read–only memory that can be erased and reprogrammed under local software control. It is used to store data that must be preserved when power is off.

Frame A data structure that consists of fields, predetermined by a protocol, for the transmission of user data and control data.

Gateway A special purpose, dedicated computer that attaches to two or more (sub)networks and routes packets from one to the other. In particular, an Internet gateway routes IP datagrams among the networks to which it connects. Gateways route packets to other gateways until they can be delivered to the final destination directly across the physical (sub)network. (Also sometimes referred to as a router.) A gateway connects network nodes at the Network Layer, ISO layer 3.

Global Address Administration Address administration in which all LAN individual addresses are unique within the same or other Local Area Networks. (See also Local Address Administration.)

Global Data See Ethernet Global Data.

Group Address An IP multicast address that identifies a group of network nodes on a Local Area Network.

Host A computer or workstation that communicates with stations such as PLCs or CNCs across a network, especially one that performs supervisory or control functions. Note that this same term is widely used in TCP/IP literature to refer to any network node that can be a source or destination for network messages. (See also Hostid.)

Host Group A group IP address used to receive multicast IP messages from the network. Host group addresses must be valid Class D (multicast) IP addresses.

Hostid The hostid is the part of the IP address identifying the host on the network. (See also Netid.)

Hub See Repeater.

IEEE 802 The IEEE 802 LAN series of standards are as follows:

IEEE 802 Overview and Architecture.

IEEE 802.2 The Logical Link Control (LLC) sublayer of OSI Data Link Layer common above all IEEE 802 Medium Access Control (MAC) sublayers.

IEEE 802.3 CSMA/CD (Ethernet) MAC and Physical Layer standard.

IEEE 802.4 Token Bus (MAP LANs) MAC and Physical Layer standard.

IEEE 802.5 Token Ring (IBM) MAC and Physical Layer standard.

Information Field That part of a protocol data unit (PDU) that contains data, as opposed to the address field and command field.

Initiating Station The station from which an instance of communication (a transaction) originates. Also referred to as “client”.

Interface Shortened form for “Ethernet Interface”. The general term used in this manual to identify the GE Fanuc hardware module, with or without software, that connects a PLC (or CNC) to a network. (See also LAN Interface.)

Internet Any collection of networks and gateways that use the TCP/IP protocols and function as a single, cooperative virtual network, specifically, the world–wide *Connected Internet.*

Internet Address A unique Internet address identifies each node on an IP network (or system of connected networks). The Internet address is assigned to the node by the user. (Also known as an IP address.) (See also Physical Address.)

Internet Control Message Protocol (ICMP) The Internet standard protocol that handles error and control messages.

Internet Group Management Protocol (IGMP) The Internet standard protocol that handles multicast group management messages.

Internet Protocol (IP) The Internet standard protocol that defines the Internet datagram and provides the basis for the Internet packet delivery service. (See also Transmission Control Protocol (TCP).)

Inter Repeater Link (IRL) A mechanism for interconnecting two and only two repeater units. The Inter Repeater Link acts at the Physical Layer, ISO layer 1.

IP Address See Internet Address.

Jabber A transmission by a network node beyond the time interval allowed by the protocol.

LAN Interface A term used in this manual to identify the GE Fanuc hardware module, with or without software, that connects a PLC or CNC to a network.

LAN Interface Status Bits (LIS Bits) The LIS bits comprise bits 1–16 of an 80–bit status bit area. The location of this 80–bit status area is assigned using the PLC programming software in the "Status Address" field. The LIS bits contain information on the status of the Local Area Network (LAN) and the Ethernet Interface itself.

Linear Topology A network topology in which nodes are each connected at a point along a common continuous cable which has no loops and only two endpoints.

Link Service Access Point (LSAP) A Data Link layer SAP. A single byte that identifies the routing of data received by the network node.

LIS Bits See LAN Interface Status Bits.

Local Address Administration Address administration in which all LAN individual addresses are unique within the same Local Area Network. (See also, Global Address Administration.)

Local Area Network (LAN) A computer network located on a user's premises within a limited geographical area.

Local Broadcast A transmission which is directed to every available receiver in the local IP subnet of the transmitter. A local broadcast is never routed to LANs outside of the local IP subnet.

Local Station The station at your immediate location, i.e., "here". (See also Remote Station.)

Log Events Events recorded in the system exception log for the LAN Interface. The maximum number of events in the exception log is 16.

Logical Link Control (LLC) Protocol In a Local Area Network, the protocol that governs the exchange of frames between network nodes independently of how the transmission medium is shared.

MAC Address The Medium Access Control (MAC) address is a 12-digit hexadecimal number that identifies a node on a local network. Each Ethernet Interface has its own unique MAC address.

Medium Access Control (MAC) In a local area network (LAN), the part of the protocol that governs write (or transmission) access to the transmission medium independently of the physical characteristics of the medium, but taking into account the topological aspects of the network, in order to enable the exchange of data between network nodes. The MAC layer is the lower sublayer of the Data Link Layer, ISO layer 2.

Medium Attachment Unit (MAU) In a network node on a Local Area Network (LAN), a device used to couple the data terminal equipment (DTE) to the transmission medium. Often called "transceiver". The MAU may be built into the DTE or it may be a separate unit that attaches to the DTE through an AUI.

Modbus A data transfer protocol. Called **Modbus/TCP** when Ethernet media is used, called **Modbus/RTU** (or simply "**Modbus**") when serial media is used.

Multicast The transmission scheme in which a limited group of multiple receivers are the intended target of a transmission.

Multicast Address A LAN group address that identifies a subset of the network nodes on a Local Area Network.

Multiple Gateway Routing The capability of an Ethernet Interface to route a received message to either the default gateway or one of additional gateways configured at the Ethernet Interface.

Name A character string used to identify and address something.

Name Resolution A "hidden" process that permits application programs to address network nodes using a symbolic name (Network Address Name) in lieu of a numeric (IP) address.

Netid The netid is the part of the IP address identifying the network on which the node resides. (See also Hostid.)

Network An arrangement of nodes and interconnecting branches.

Network Adapter The device, such as the Ethernet Interface, providing communications services for a particular network.

Network Address Name A character string that is used in lieu of an IP address. The client and/or server device uses Name Resolution to resolve this symbolic name into the actual IP address. This name represents the address on the network of a particular network adapter. Also referred to as "Adapter Name".

Network Switch An Ethernet device that dynamically connects two communicating nodes without propagating the data to other Ethernet devices also connected to the switch.

Node The physical module that connects a node to the network. The Ethernet Interface is an example of a node. It connects a station (PLC or CNC) to a network (Factory LAN). A station may contain more than one Ethernet Interface and therefore contains more than one node.

Octet A group of 8 bits operated on as a single unit.

One–Way Propagation Time See Transmission Path Delay.

Path The sequence of segments and repeaters providing the connectivity between two DTEs. In CSMA/CD networks, there is one and only one path between any two DTEs.

Peer Another entity at the same level (layer) in the communication hierarchy.

Peer–Peer Communication between nodes at the same level or layer in the hierarchy.

Physical Address The unique physical layer address associated with a particular node on the Local Area Network (LAN). Ethernet physical addresses are typically assigned by the manufacturer. (See for comparison, Internet Address.)

Producer In Ethernet Global Data, a device (such as a PLC) that periodically produces new samples of data (data exchange). (See also Consumer, Exchange.)

Producer ID In Ethernet Global Data, a dotted–decimal number used to uniquely identify a Producer device (such as an entire PLC system) on the network. (See also Producer, Consumer, Exchange.)

Protocol A set of rules for exchanging messages between two communicating processes.

Protocol Data Unit (PDU) Information that is delivered as a unit between peer entities of a local area network (LAN) and that contains control information, address information, and may contain data.

Remote Station A station located elsewhere on the network. (See also Local Station.)

Repeater In a Local Area Network (LAN), a device that amplifies and regenerates signals to extend the range of transmission between network nodes or to interconnect two or more segments. A repeater connects network nodes at the Physical Layer, ISO layer 1.

Responding Station A station which generates a message in response to a command that was directed to the station.

Round–Trip Propagation Time Twice the time required for a bit to travel between the two most distant nodes in a bus network.

NOTE: In a network using carrier sense, each frame must be long enough so that a collision or jam signal may be detected by the transmitting node while this frame is being transmitted. Its minimum length is therefore determined by the round-trip propagation time.

Router A device similar to a bridge that allows access to multiple LANs. Also known as a gateway in Internet terminology. A router connects network nodes at the Network Layer, ISO layer 3. (See also Gateway.)

Server A network node that provides specific services to other network nodes (clients). (See also Client.)

EXAMPLE: File server, print server, name server, time server.

Service Request Transfer Protocol (SRTP) A proprietary protocol that encodes Series 90 "Service Requests", the native language of the Series 90 PLC CPUs, to provide general purpose communications with a Series 90 PLC. SRTP is presently available over 802.3/Ethernet networks. SRTP is also used by the PLC programming software to communicate over an Ethernet network.

Signal Quality Error (SQE) An indication from the MAU (transceiver) to the Ethernet Interface to indicate any of three conditions: 1) improper signals received from the medium, 2) collision detected, or 3) SQE message test.

Simple Network Time Protocol (SNTP) The Internet standard protocol used to synchronize the real-time clocks of hosts over the network. (See also Time Synchronization.)

Slot Time (in a CSMA/CD network) Minimum bitrate-dependent unit of time which, in case of collision, is used to determine the delay after which network nodes may attempt to retransmit. [Slot time for all IEEE 802.3 10 Mbps implementations is 51.2 ∝sec (512 bit times)].

Soft Switches Basic system information set up by the PLC programming software and transferred to the LAN Interface upon powerup or restart.

Station A computer, PLC, or other device that connects to one or more networks. (See also Node.)

Station Address Each node on an Ethernet network must have a unique MAC address which is different from all other nodes on the network. This is a 12-digit hexadecimal MAC address. (See also MAC Address.)

Station Manager A part of the basic Ethernet Interface communications software that executes as a background activity on the Ethernet Interface. The Station Manager provides interactive supervisory access to the Ethernet Interface. The Station Manager may be accessed locally via the serial port, or remotely over the LAN.

Stratum The number provided by an SNTP server that indicates the server's relation to a "true" time source. The lower the stratum number, the closer that particular SNTP server is to a "true" time source. A "true" time source is usually based on an atomic clock such as the broadcast signal transmitted by the Naval Observatory or GPS (Global Positioning System) satellite signals. If configured for SNTP synchronization, Series 90 Ethernet Interfaces automatically synchronize to the SNTP server with the lowest stratum number.

Subnet, Subnet Id, Subnet Mask The subnet mask is a mechanism to logically divide a large network into smaller *subnets* according to your local assignment of IP addresses to nodes on the network. Nodes on the network which have their IP addresses alike for the bits specified in the subnet mask can talk to each other *directly*; nodes whose IP addresses are not alike in these same bits must talk *indirectly*, via an intermediate gateway or router.

As described in an appendix to your Ethernet Interface's user manual, the 32 bits of an IP address are divided between a *net id* part and a *host id* part. (The *class* of the IP address determines how many bits are in the *net id* and how many are in the *host id.)* In general, the *net id* portion of the IP address (on the left) is assigned by the Internet authorities. The *host id* portion (on the right) is assigned by your local network administrator. *Subnetting* is locally optional and consists of designating some (any number) of the *host id* bits as an extended *net id*, or *subnet id*. The added *subnet id* bits are normally taken from the *host id* bits adjacent to the *net id,* and the **subnet mask** identifies these bits. In your Ethernet module configuration, you specify these bits as one (1) and the remaining *host id* bits as zero (0).

For further information, refer to Chapter 5, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*.

Tally Counters kept by the LAN Interface to indicate load and performance information.

TCP/IP Commonly refers to the entire suite of protocols that run over IP. Includes, but is not limited to, IP, TCP, ARP, UDP, ICMP, and IGMP.

Time Synchronization The ability to synchronize the internal time clock of an Ethernet Interface to time signals from a remote time server on the network. Time synchronization is useful in conjunction with Ethernet Global Data.

Topology The pattern formed by the physical medium interconnecting the nodes of a network.

Transceiver See Medium Attachment Unit (MAU).

Transceiver Cable See Attachment Unit Interface (AUI).

Transmission Control Protocol (TCP) The Internet standard connection–oriented transport level protocol. (See also Internet Protocol (IP).)

Transmission Path Delay The time required for a bit to travel between the two most distant network nodes in a bus network.

Type A Station Manager The Station Manager type used with the CMM321, CMM742, and CPU364 modules.

Type B Station Manager The Station Manager type used with the CPU374 module.

Unicast The transmission scheme in which exactly one receiver is specified as the target of a transmission.

Universal Address Administration See Global Address Administration.

User Datagram Protocol (UDP) The Internet standard connectionless transport level protocol.

Word A measurement of memory length, usually 4, 8, 16, or 32 bits long. In the Series 90 PLC, a word is always 16 bits.

Appendix B Exception Log Event Descriptions

This section defines the events that may be captured in the event log.

- Exception Log Events
  - Exception Log Event Definitions
  - Reference for Log Events, Style A and Style B Station Manager
- Exception Log Event Codes for Style A Station Manager (table B-2)
- Exception Log Event Codes for Style B Station Manager (table B-3)
  - Powerup Event Entry Codes for Style B Station Manager.(table B-4)
  - Configuration Event Entry Codes for Style B Station Manager (table B-5)
  - Operating System Error Event Entry Codes for Style B Station Manager (table B-6)
  - PLC Driver (BPD) Event Entry Codes for Style B Station Manager (table B-7)
  - Error Handler Event Entry Codes for Style B Station Manager (table B-8)
  - Station Manager Event Entry Codes for Style B Station Manager (table B-9)
  - Common Utility Event Entry Codes for Style B Station Manager (table B-10)
  - SRTP Server Event Entry Codes for Style B Station Manager (table B-11)
  - Network Interface Event Entry Codes for Style B Station Manager (table B-12)
  - Ethernet Global Data (EGD) Event Entry Codes for Style B Station Manager (table B-13)
  - SNTP Event Entry Codes for Style B Station Manager (table B-14)
  - Run-time Diagnostic Event Entry Codes for Style B Station Manager (table B-15)

Exception Log Events

The error codes in Table B–1 appear in the Event column of a log event. To view the log, issue the LOG command from the Station Manager, then refer to Table B–2 for a description of the log event.

Table B-1. Exception Log Event Definitions

Log Event	Cause
0	Power up diagnostic events.
1	Power up. A log entry of this event will appear every time the Ethernet Interface is Restarted or powered up.
2	System events
8	PLC driver events
c	LLC events
d	ERR events
e	Station Manager events
f	Common utility events
11	IP events
12	TCP events
13	Toolkit XTI events
14	Toolkit shell events
15	Toolkit user events
16	ARP events
18	ICMP events
1a	Application specific events
1b	SRTP Server events
1c	Channel API events
1d	IGMP events
1e	Modbus/TCP Channel API events [1]
1f	Modbus/TCP Server events [1]
26	Non–volatile memory backup events
27	Naming Services events
28	Ethernet Global Data events
29	SNTP events
2a	Runtime Diagnostics evetns

[1] Series 90-30 Ethernet Interface IC693CMM321-FG or later only

Figure B-1. Visual Reference for Log Events within the Series 90 Ethernet Interface Software for Style A Station Manager

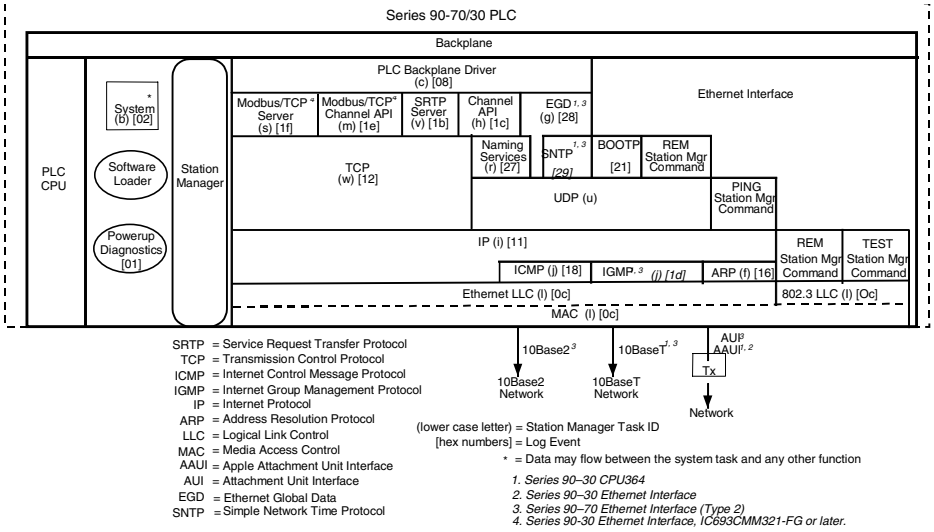
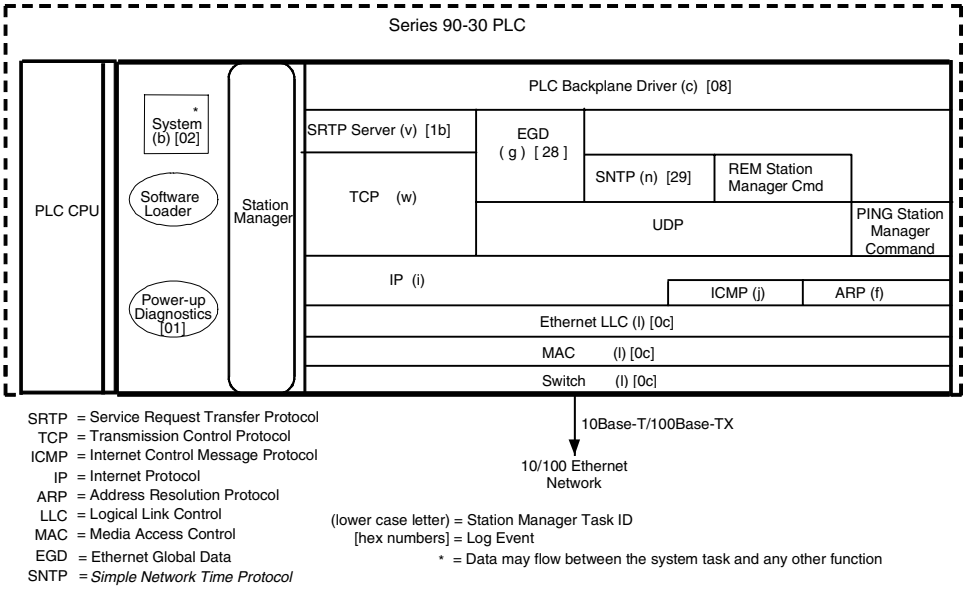


Figure B-2. Visual Reference for Log Events within the Series 90 Ethernet Interface Software for Style B Station Manager



Exception Log Event Codes for Style A Station Manager

Table B-2. Exception Log Event Codes for Style A Station Manager

Log Event Code	Possible Cause and Resolution
Event "1" Power up	This is an event logged on every initialization of the Ethernet Interface. This event is meant to indicate the boundaries between Restarts. By checking the count for this event, you may find how many Restarts are occurring. This event never causes the STAT LED to go OFF nor is it reported to the PLC Fault Table. **Entry 2** indicates the type of system initialization, as described below: 0 Normal Ethernet Interface startup (Operational state). 5 Maintenance State selected. **Entry 3** indicates the event that caused the system initialization to occur: 0 Normal power up. 1 Restart request through pushbutton. 2 Load request through pushbutton. 3 Station Manager restart request. 4 Station Manager load request. 5 Automatic restart due to system error (see preceding log event 2). 6 Automatic load due to system error (see preceding log event 2). 7 Startup after software load. 8 Station Manager maintenance utility request. 9 Maintenance utility request through pushbutton. a Load request aborted through pushbutton. b Load request due to corrupted primary software. c Automatic restart due to Watchdog Timer expiration. d Automatic restart due to Storing changed configuration data for the Ethernet Interface into the PLC. (The Ethernet Interface restarts in order to use the new configuration data.) e Automatic restart due to restart command from PLC CPU. (This may occur after loss of communication with the PLC CPU.) f Automatic reinitialization due to storing identical configuration while internal backup was in use. **Entry 5** provides the reason for entering the loader, upon system initialization after exiting the Software Load state: 0 Normal power up. 2 Load request through pushbutton. 4 Station Manager load request. 6 Automatic load due to system error (see preceding log event 2). b Load request due to corrupted primary software. (Other **Entry 5** values are unexpected; refer to the values for **Entry 3**.)

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "2" System events	This event is logged by the system when a catastrophic system event occurs. **Entry 2** (hexadecimal) codes are as follows: System Error: 02 (Not Reported to PLC Fault Table) The Ethernet Interface firmware does not meet the minimum version level required by the PLC CPU firmware. **Entry 3** indicates the actual installed Ethernet Interface firmware version. System Error: 09 "LAN system–software fault; resuming" Unable to set the Ethernet Interface date and time to the same values as the PLC CPU. This error may occur at system startup. The Ethernet Interface time and date are initialized to 00:00:00, 01–JAN–1989. **Entry 3** indicates the reason for this error: 0 Unable to retrieve information from the PLC CPU. This error will occur if the Ethernet Interface is not configured in the PLC CPU via the PLC Prorammer Configuration Software. **Entry 4** contains the BPD status code. 1 Invalid date/time value retrieved from the PLC CPU. The Ethernet Interface cannot accept dates prior to 01–JAN–1989. Check that the current date and time are established in the PLC CPU via the Configuration Software. System Error: 0a (Not Reported to PLC Fault Table) The PLC CPU firmware does not meet the minimum version level required by the Ethernet communications software. **CAUTION: No communication with PLC CPU; PLC Programmer–TCP/IP or SRTP applications may not work properly. Entry 3** indicates the actual installed CPU firmware version. **Entry 4** indicates the lowest required CPU firmware version. System Error: 0c "LAN system–software fault; resuming" This error indicates the Ethernet Interface is unable to set local privilege level to permit write–access to the PLC memory. The Ethernet Interface is unable to return COMMREQ status. COMMREQ operation will not be permitted. **Entry 3** indicates the following: 0 The request to set privilege level failed. **Entry 4** contains the BPD status code. (See the BPD/MBU error status code list at the beginning of Log Event "8".) 1 The privilege level was not raised to level 2 to permit memory write access. **Entry 4** contains the actual PLC privilege level. Check that local PLC memory is not protected by a level 2 password. System Error: 0d "Unsupported feature in configuration" This version of the Interface does not support one or more operations specified in the PLC configuration. Check the Interface firmware version and order an upgrade kit for the Ethernet Interface if necessary. System Error: 10 "LAN system–software fault; resuming" Task #0 is unable to create its buffer pool. The Ethernet Interface is unable to communicate with the PLC CPU.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “2” System events (Continued)	**Entry 2** codes (Continued) System Error: 11 “LAN system–software fault; resuming" Task #0 is unable to register with the PLC Backplane Driver. The Ethernet Interface is unable to communicate with the PLC CPU. **Entry 3** contains the BPD error status code. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) A value of zero indicates that BPD is not communicating with the Service Request Processor; in this case, **Entry 4** will be 1). System Error: 13 “LAN system–software fault; resuming" A COMMREQ was received for Task #0 that was too large. A COMMREQ may not exceed 250 bytes. System Error: 14 “LAN system–software fault; resuming" Unable to allocate a data buffer for Task #0. The Ethernet Interface is unable to communicate with the PLC CPU. **Entry 3** contains the size of the requested buffer. System Error: 16 “Comm_req–Wait mode not allowed" A WAIT–mode Comm–Req was received. The Ethernet Interface supports only NOWAIT–mode COMMREQs. Check the contents of the COMMREQ. **Entry 3** contains a message type code. System Error: 18 “LAN system–software fault; resuming" The Service Request Processor in the PLC CPU has returned an error to a Task #0 request. **Entry 3** contains the request code; **Entry 4** contains the response error code. System Error: 19 “LAN system–software fault; resuming" An unexpected response was received at Task #0. **Entry 3** contains the sequence number of the response. System Error: 1a “LAN system–software fault; resuming" Unexpected additional response data was received at Task #0. **Entry 3** contains the sequence number of the response. System Error: 1b “LAN system–software fault; resuming" Unexpected traffic was received at Task #0. **Entry 3** identifies the traffic type. System Error: 1c “LAN system–software fault; resuming" An unexpected session was established with the CPU when one already existed. The extra session should have no effect on normal operation. System Error: 1d “LAN system–software fault; resuming" An error was detected during a service request from the PLC to the Ethernet Interface. **Entry 3** identifies the failure: 01 = Unable to allocate a data buffer. 02 = Failure from BPD while retrieving more data. **Entry 4** contains the BPD error code (See the BPD/MBU error status code list at the beginning of Log Event “8”.)

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "2" System events (Continued)	**Entry 2** codes (Continued) System Error: 20 "LAN system–software fault; resuming" The Ethernet Interface has received a zero IP Address, and an error has occurred while using BOOTP protocol to obtain an IP Address from a remote server on the network Unable to obtain an IP address; the Ethernet Interface remains in "Wait for IP Address state." **Entry 3** contains a status code. System Error: 21 "LAN system–software fault; resuming" Task #0 failed to retrieve control information from the PLC CPU. System Error: 22 "LAN system–software fault; resuming" Task #0 failed to receive session control feature information from the PLC CPU. System Error: 23 "LAN system–software fault; resuming" Task #0 failed to retrieve PLC program name. System Error: 24 "LAN system–software fault; resuming" Task #0 failed to login to PLC CPU as a null programmer. System Error: 25 "LAN system–software fault; resuming" System timer error during BOOTP operation. Unable to obtain an IP address from remote server. System Error: 31 "LAN PROM/software mismatch, running soft Sw util" The Interface detected that it may be about to use a possibly obsolete IP address in the Operational state. This error forces restart into Maintenance state. This is because the IP address did not arrive from the configuration in the PLC CPU and the backup IP address retrieved is possibly not the latest copy. User Action: Verify correct IP address (e.g., with NODE command). If incorrect, set with *CHSOSW* command and restart the Interface. If correct, force a backup of Soft Switches by changing a Soft Switch Configuration parameter via the *CHSOSW* command. For example, you could change your name–server IP address to the Ethernet Interface's IP address. Then restart the Interface, login, and issue the *MAINT* command. Restore the name server IP address and restart again. System Error: 32 "LAN IF can't init–check parms; running soft Sw Utl" The Interface deliberately replaced Advanced Parameter customizations with factory defaults due to an upgrade in the factory defaults. This event causes the Ethernet Interface to restart into the Maintenance state. User Action: You must restore any customizations with the *CHPARM* Station Manager command. System Error: 33 "LAN system–software fault; resuming" Unable to initialize data file delivery; Ethernet Interface cannot receive any data files. (Name Resolution File was not received from PLC Configuration.) **Entry 3** is a code identifying the software component which reported the exception. **Entry 4** is a detailed internal error code. (See the BPD/MBU error status code list at the beginning of Log Event "8".)

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "2" System events (Continued)	**Entry 2** codes (Continued) System Error: 34 "LAN system–software fault; resuming" A failure occurred while receiving a data file from the PLC CPU; the file data is not available. **Entry 3** is a code identifying the software component which reported the exception. **Entry 4** is a detailed internal error code. (See the BPD/MBU error status code list at the beginning of Log Event "8".) System Error: 35 "Unsupported feature in configuration" The PLC Configuration contains too many data files for the Ethernet Interface; file delivery cannot occur. Check that PLC Configuration is correct. This fault normally puts the PLC into STOP/FAULT mode. **Entry 3** is a code identifying the software component which reported the exception. **Entry 4** is an internal code that specifies all data files in the PLC Configuration. The upper byte contains the number of Name Resolution files. The lower byte contains the number of Application Data files. System Error: 36 "LAN system–software fault; resuming" An OMF checksum error was detected in a received data file; the contents of the data file are not available. **Entry 3** is a code identifying the software component which reported the exception. **Entry 4** indicates the file in error: 0-7 = Application specific data file. 100 = Name Resolution file. (This file may include Name, Multiple Gateway Routing, or Redundant IP configuration data.) System Error: 37 "LAN system–software fault; resuming" An improperly formatted or corrupt configuration file was received; the contents of the file are not available. Some module configuration data may have been lost. Try to store the configuration again. If the error persists, contact GE Fanuc Automation-NA. **Entry 3** is a code identifying the software component which reported the exception. **Entry 4** indicates the file in error. (See **Entry 4** description for System Error: 36.) System Error: 38 "LAN system–software fault; resuming" An unsupported request message was received from the PLC CPU. The request is rejected. **Entry 3** is a code identifying the software component which reported the exception. **Entry 4** is a detailed internal error code. System Error: 385 "LAN data memory exhausted–check parms: resuming" This error occurs when a request is made for memory and no heap memory of the requested size or larger is available. The size of the request is stored in **Entry 3** of the log event. This error can be caused by: – Misconfigured memory pool sizes or percentages. – Misconfigured advanced user parameter, lmaxdb, causing excessive LLC demands for memory on the Ethernet Interface. – True exhaustion of memory resources due to insufficient processing capacity at the station, excessively long PLC scan time, or excessive network traffic addressed to the station. – System software error.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "2" System events (Continued)	**Entry 2** codes (Continued) System Error: 386 "LAN system–software fault; restarted LAN I/F" This error is caused by a request to release a buffer which is not a recognizable buffer from the system. This is a catastrophic system software error and should be reported to GE Fanuc Automation– NA. The Ethernet Interface is automatically restarted. NOTE: If this error occurs within 5 minutes of a prior restart, the LAN Interface will be forced into the Maintenance Utility. System Error: 387 "LAN system–software fault; restarted LAN I/F" This error occurs when the Ethernet Interface has exhausted all internal memory buffers. Since continued operation may not be reliable, the Ethernet Interface is automatically restarted. The size of the request when this condition occurred is given in **Entry 3**. This error is caused by too many COMMREQs for this Ethernet Interface, insufficient processing capacity at the Ethernet Interface, excessive network traffic for this Ethernet Interface, or an excessively long PLC scan time. System Error: 3e7 "LAN system–software fault; restarted LAN I/F" This error is caused by a request to release a buffer which is either still on a queue or not on an even boundary. This is a catastrophic system software error and should be reported to GE Fanuc Automation – NA. The Ethernet Interface is automatically restarted. NOTE: If this error occurs within 5 minutes of a prior restart, the LAN Interface will be forced into the Maintenance Utility. System Error: cccc "Module software corrupted; requesting reload" This error occurs when the system detects an incorrect checksum in the primary software loaded into flash memory. This is a catastrophic error. The Ethernet Interface is restarted with entry into the Software Load state. NOTE: This fault is NOT written to the Exception log; however, it is transmitted to the CPU for entry to the PLC Fault Table. **Entry 3** indicates the correct checksum value. **Entry 4** indicates the actual computed value.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "8" PLC Driver events	This event is logged by the PLC Backplane Driver when an unexpected event occurs. **Entries 1** and **6** of the event log will be zero. For some events **Entry 3** usually contains a code uniquely identifying the software component which reported the exception. **Entries 4** and **5** contain additional information on the event. In particular, PLC Backplane Driver or Mailbox Utility error status codes may be displayed. These BPD/MBU error status codes are listed below: 2 The Backplane Driver could not access the PLC CPU. 3 Invalid binding on the message sent to the Backplane Driver 4 Message could not be sent because the mailbox was not open. 5 Maximum number of transfers to the destination are already active. 6 Maximum number of transfers of this transfer type are already active. 7 Cannot obtain a Dual–Port RAM buffer. 8 Cannot obtain resources (other than Dual–Port RAM buffer). 9 Connection ID or Block Transfer ID is not valid. a Timed out waiting for response from PLC CPU. b The PLC CPU aborted the request. c An invalid message type was specified. d The specified task is not registered. e The specified mailbox offset is invalid. f Argument "msg_rsp" may not be NULL. 10 Argument "unsol_rsp" may not be NULL. 11 Parameter pointer is unexpectedly NULL. 12 Maximum byte length exceeded for a single transfer. 13 Bad sequence number in request. 14 Invalid command in request. 15 Actual response length size unexpected. 16 Service Request Processor in PLC CPU is unavailable. 17 No text buffer available. ffff (–1) Temporarily unable to obtain semaphore; try again later. fffe (–2) PLC CPU is not available. fffd (–3) Internal resources already allocated on MBU OPEN. fffc (–4) PLC CPU mail queue is temporarily full; try again later. fffb (–5) Invalid task ID in mailbox message. fffa (–6) No mailbox communication with PLC CPU. fff9 (–7) Internal resources do not exist for specified task ID. fff8 (–8) Responses still outstanding during attempted MBU close. fff7 (–9) Input mail still outstanding during attempted MBU close. fff6 (–10) Connection still outstanding during attempted MBU close. fff5 (–11) Bad text buffer address in Dual–Port memory. fff4 (–12) Invalid interrupt mask. fff3 (–13) Invalid rack number in mailbox message source/dest address. fff2 (–14) Invalid slot number in mailbox message source/dest address. fff1 (–15) Invalid rack/slot in mailbox message source address. fff0 (–16) Invalid number of destinations in mailbox message. ffef (–17) Invalid text data length in mailbox message. ffee (–18) Invalid input queue size in MBU open. ffed (–19) Invalid alarm code in mailbox message. ffec (–20) Text buffer allocation from Dual–Port memory failed.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event ”8" PLC Driver events (Continued)	ffeb (–21) Out of mail buffers; mail traffic was lost. ffea (–22) Missing internal resources; mail traffic was lost. ffe9 (–23) No user response specified; mail traffic was lost. ffe8 (–24) Invalid Dual–Port address (not paragraph aligned). ffe7 (–25) Invalid traffic type in mailbox message. ffe6 (–26) All sequence numbers already in use; unable to send command. ffe5 (–27) Dual–Port allocation error: requested size is invalid. ffe4 (–28) Dual–Port allocation error: requested memory is not available. ffe3 (–29) Dual–Port deallocation error: specified memory was not allocated. ffe2 (–30) Mail queues are stopped by the PLC CPU. ffe1 (–31) Dual–Port deallocation error. ffc4 (–60) Internal send mail queues not initialized. ffc3 (–61) Invalid mailbox argument. ffc2 (–62) Invalid function argument. ffc1 (–63) Invalid text buffer argument. ffc0 (–64) Send mail queue is full; mail was not sent. ff81 (–127) Response busy. Values not listed above represent other internal errors. **Entry 2** of the event log is an exception code which indicates what error occurred. In general, **Entry 2** codes 1 – 1F are PLC backplane communication faults, codes 20 – 2F are resource errors, and codes 30 and up are miscellaneous errors. **Entry 2** may have the following values: 1 *Series 90–30:* “Backplane communications with PLC fault; lost request" The PLC CPU did not initialize communication with the Ethernet Interface. 1 *Series 90–70:* “Backplane communications with PLC fault; lost request" Could not open VME mailbox. Entry 4 contains the MBU error status code. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) Entry 5 contains the number of open attempts that were made. It is likely that a power cycle of the PLC is required before the CPU will again recognize the Ethernet Interface. 2 *Series 90–30:* “Backplane communications with PLC fault; lost request" Mail communication was not established to the PLC CPU. The CPU did not deliver Wakeup mail to initiate mail communication. Data transfer (including COMMREQs) cannot occur. 2 *Series 90–70:* “LAN system–software fault; resuming" Could not enable interrupt capability for incoming mail. Entry 4 contains the MBU_ENAB_INT error status code. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 3 “LAN system–software fault; resuming" Mail packets from PLC for a read response are out of order. Entry 3 contains the received packet sequence number. Entry 4 contains the expected packet sequence number. 4 “LAN system–software fault; resuming" PLC completed a response earlier than expected. Entry 4 contains the current transfer state: 1 Idle 2 Waiting to receive more request data from user 3 Waiting for response from PLC CPU 4 Waiting to deliver more response data to user 5 Waiting to deliver more PLC request data to user 6 Waiting for response from user 7 Waiting to receive more response data from user

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event ”8" PLC Driver events (Continued)	Entry 2 codes (Continued) 5 “Comm–Req–Bad task ID programmed" COMMREQ from PLC for unknown Ethernet Interface task; the COMMREQ was ignored without response. **Entry 4** contains the task ID received from the PLC. 6 “LAN system–software fault; resuming" Received PLC response for unknown request. Entry 4 contains the mailbox sequence number of the stray response. 7 “LAN system–software fault; resuming" Bad message type from PLC. **Entry 4** contains the message type code received. 8 “LAN system–software fault; resuming" Timed out waiting for PLC response. **Entry 4** contains the mailbox sequence number for this transaction. **Entry 5** contains the task ID for this transaction. 0b “LAN system–software fault; resuming" Request from PLC CPU contained an invalid SRTP command value. **Entry 3** contains the command number. 0c “LAN system–software fault; resuming" Request from PLC CPU contained an invalid SRTP message type value. **Entry 3** contains the message type number. 0d (Not reported to PLC Fault Table) Request from a local task to free a dual–port buffer for DVME transfers failed. **Entry 3** contains a code that identifies the software component where the error was detected. **Entry 4** contains an MBU error status code. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 10 “LAN system–software fault; resuming" Request received from PLC for an unknown Ethernet Interface task. **Entry 4** contains the task ID received from the PLC. **Entry 5** contains the sequence number of the Request. 11 “LAN system–software fault; resuming" Request received from PLC for a registered BPD user task that cannot accept a PLC–initiated Request. **Entry 4** contains the task ID received for the PLC. **Entry 5** contains the sequence number of the Request. 12 “LAN system–software fault; resuming" BPD user task did not respond to a PLC Request. **Entry 4** contains the task ID received for the PLC. **Entry 5** contains the sequence number of the Request. 16 (Not reported to PLC Fault Table) Ethernet Interface has lost sync with PLC CPU during a restart. The PLC considers the Ethernet Interface failed and will not resume communications until the next powerup cycle. 18 “LAN system–software fault; resuming" Improper sequence of Mail backplane commands received from the PLC CPU.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “8” PLC Driver events (Continued)	**Entry 2** codes (Continued) 19 “Backplane communications with PLC fault; lost request" Internal error occurred while delivering LAN Interface Status data to the PLC CPU. 1a Backplane communication to the PLC CPU has been lost. Usually, the PLC cannot re–establish backplane communication; the Ethernet Interface must be restarted to restore communication. **Entry 4** identifies the type of communication failure as a combination of one or more of the following errors: 01 I/O scan failure. LAN Interface Status cannot be delivered to PLC. 02 Mail failure. Channels and SRTP Server are inoperative. 04 CPU Heartbeat failure. PLC CPU is unavailable. 20 “LAN I/F can’t init–check parms; running soft Sw Utl" QCreate call failed. 21 “LAN I/F can’t init–check parms; running soft Sw Utl" PoolAlloc call failed. 22 “Backplane communications with PLC fault; lost request" QAlloc call failed. **Entry 4** contains the byte size requested. 23 “Backplane communications with PLC fault; lost request" BuffAlloc call failed. **Entry 4** contains the byte size requested. 24 ”Backplane communications with PLC fault; lost request" Circular mail queue is full and incoming message was lost. **Entry 4** contains the number of lost mailbox entries. **Entry 5** contains the number of lost mail data entries. (**Entry 5** not used by Series 90-70.) 25 “LAN I/F capacity exceeded; discarded request" Unable to allocate dual port memory; all dual port memory is already in use. May occur when a remote SRTP host attempts to establish connection to this Ethernet Interface, or when starting Ethernet Global Data exchanges. Use fewer server connections or reduce the size and/or number of Ethernet Global Data exchanges. **Entry 3** contains the MBU error status code. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 26 “Backplane communications with PLC fault; lost request" Internal error. Attempt to free a dual port memory buffer that is out of range. 27 “Backplane communications with PLC fault; lost request" Internal error. Attempt to free a dual port memory buffer that is not allocated.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "8" PLC Driver events (Continued)	**Entry 2** codes (Continued) 28 "Backplane communications with PLC fault; lost request" " Internal error. Unable to free dual port memory. **Entry 3** contains the MBU error status code. (See the BPD/MBU error status code list at the beginning of Log Event "8".) 29 "Backplane communications with PLC fault; lost request" A requested operation that uses dual port memory is rejected because the required dual port memory was not previously allocated. Usually caused by error when establishing an SRTP server connection, or failure to request dual port allocation. 30 "Backplane communications with PLC fault; lost request" Could not generate work queue entry. **Entry 4** contains the event that was trying to be scheduled, which is one of the following: **Entry 4** Description 1 Mail message received from PLC 2 Ethernet Interface timed out waiting for a response from the CPU 3 Received mail message for diagnostics task 4 Circular queue full, mail message dropped 5 Retrying mailbox initialization **Entry 5** contains additional information related to the event type. 31 "Backplane communications with PLC fault; lost request" Backplane Driver scheduled with illegal event. **Entry 4** contains the event code received. 33 "Module state doesn't permit Comm_Req; request discarded" COMMREQ received outside of normal system operation (e.g., when IP address is 0.0.0.0 or module is in the Maintenance state). The ladder program should not have issued a COMMREQ while in this state (Bit 16, LANIFOK, in the LAN Interface Status bits is 0). 34 "LAN system–software fault; resuming" Backplane Driver initializing without Soft Switches from the CPU. This will occur if the LAN Interface is not configured in the PLC via the PLC Programmer Configuration Software.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “8” PLC Driver events (Continued)	**Entry 2** codes (Continued) 35 (Not reported to PLC Fault Table) Ethernet Interface/CPU communications timeout during restart or load. 36 “Module state doesn’t permit Comm_Req; request discarded" The Ethernet Interface does not accept COMMREQS when the Interface has not been configured via the PLC Configuration software. Configure the Ethernet Interface prior to sending COMMREQS to the Interface. Also, the ladder program should not have issued a COMMREQ while in this state (Bit 16, LANIFOK, in the LAN Interface Status bits is 0). 37 “LAN system–software fault; resuming" A message was received from the PLC for an unknown Ethernet Interface task; the message was ignored without response. **Entry 4** contains the task ID received from the PLC. 38 “LAN system–software fault; resuming” A Backplane driver user’s request attempt to send a message to the PLC CPU failed. **Entry 3** indicates the error code returned. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 39 “Backplane communications with PLC fault; lost request" An attempt to release CPU text buffers failed. **Entry 3** indicates the MBU error status code. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 40 “Backplane communications with PLC fault; lost request" Backplane driver’s attempt to send a message to the PLC CPU failed. **Entry 3** indicates the error status code returned. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 41 “LAN system–software fault; resuming” " Backplane driver could not find a state machine for an unsolicited message. 42 “LAN system–software fault; resuming" Backplane driver could not find a state machine for a response message. 43 (Not reported to PLC Fault Table) Backplane driver detected that the CPU firmware revision is too low for some requested operations. CPU firmware must be upgraded to permit full functionality. **Entry 4** indicates your CPU’s firmware revision level while **Entry 5** indicates the revision level needed for proper operations. 50 “LAN system–software fault; resuming" Backplane driver is unable to send I/O Scanner Response message to the PLC CPU. **Entry 3** indicates the error status code returned. (See the BPD/MBU error status code list at the beginning of Log Event “8”.)

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “c” LLC events	This event is logged when the LLC layer encounters an unexpected condition. **Entry 2** (hexadecimal) codes are as follows: 102 “LAN transceiver fault; OFF network until fixed" Either the Transceiver or Transceiver cable failed or became disconnected. Reattach the cable or replace the Transceiver or cable. If SQEErr is incrementing but LostCarr is not, the Transceiver SQE test switch may be set incorrectly. Transceivers used on GEnet must have the IEEE 802.3 SQE_TEST enabled. Use the TALLY L command to distinguish whether the SQE test, done on each transmitted frame, failed (SQEErr) or the transceiver lost carrier while transmitting (LostCarr). Online operation should resume within 10 seconds after repair. 103 “LAN data memory exhausted; check parms; resuming" The MAC device discarded an excessively long receive frame that required chaining of multiple buffers because there was no buffer to receive the frame into. If the advanced user parameter *lrxringlen* was reduced from the default value, use the *CHPARM* command to increase the value of this parameter in order to provide more input buffers. 105 “LAN controller Tx underflow; attempting recovery" During transmission, the MAC was unable to get data from memory quickly enough. This indicates a transient LAN Interface hardware failure; it should not occur. This error may cause loss of both tx and rx messages that are in process, since the MAC must be reinitialized (done automatically). Online operation should resume within 10 seconds after repair. If the error persists, replace the LAN Interface. 106 “Bad remote application request; discarded request" An incoming frame was received that exceeded the size specified by the advanced user parameter, *lmaxdb*. For frame types other than TEST frames, the frame was discarded; for TEST frames, the data within the frame was discarded and the frame was processed without data. Check the remote (sending) station for correct frame length. The remote stations MAC address is shown in **Entries 3 – 5**. 107 “Bad remote application request; discarded request" An unsolicited XID response frame was received. This can be caused by a protocol error in a remote station. The remote stations MAC address is shown in **Entries 3 – 5**. 108 “Bad remote application request; discarded request" An unsolicited TEST response frame was received. This is usually caused when a remote station responds too slowly to a *TEST* Station Manager command from the reporting station. The remote stations MAC address is shown in **Entries 3 – 5**. Increase the value of the *TEST* <sch> parameter. If the problem persists and the reporting station is not sending a TEST cmd, then some remote station on the network is generating a protocol error. 10a “LAN severe network problem; attempting recovery" Repeated collisions caused the transmitter to fail 16 attempts to send a message. If the LAN stays Offline for more than 10 seconds, it is likely caused by a disconnected, damaged, or unterminated network cable. (This report may also occur under normal network operation if your network has hundreds of nodes or is exceptionally busy. In this case, operation continues, but the transmitted message is lost. If this occurs too often, you may need to redesign your network to limit collisions.)

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “c” LLC events (Continued)	**Entry 2** codes (Continued) 10b “LAN severe network problem; attempting recovery" During attempted transmission, either some external condition prevented transmission of a message for at least one second (MacErr) or a late collision (LateColl) occurred. Use the TALLY L command to distinguish. If MacErr is incrementing every 10 seconds, the transceiver is likely hearing constant carrier on the network. This can be caused by disconnection of the transceiver from the network or by a faulty connection of the transceiver to the network; it can also be caused by test equipment attached to the network, or by an unterminated trunk cable. Are other nodes reporting the same fault? LateColl indicates that your Ethernet cable is longer than permitted or contains an excessive number of repeaters/hubs (normally limited to 3 between any two nodes-certain exceptional conditions permit a maximum of 4); the transmitted frame will be lost. Online operation should resume within 10 seconds after repair. Both MacErr and LateColl may rarely occur under normal network operations if there is a temporary heavy burst of network traffic. 10e “LAN controller underrun/overrun; resuming" During receiving, the MAC was unable to write data into memory quickly enough. This indicates a transient LAN Interface hardware failure; it should not occur. The frame being received is discarded. Online operation continues. If the problem persists, replace the LAN Interface. 10f “LAN network problem exists; performance degraded" Excessive backlog of transmission requests due to excessive traffic on the network. For a sustained period, the MAC was unable to send frames as quickly as requested. 110 “Bad local Application Request; discarded request" The LLC rejected a local application request to send a frame because the frame length was invalid. IEEE 802.3 frames must not exceed 1497 bytes of LLC data. Ethernet frames must contain 46–1500 bytes of LLC data. 111 “LAN severe network problem; attempting recovery" A frame was received in which the Source Address was the same as this station’s MAC Address. All stations on a network must have a unique MAC address. Immediately isolate the offending station; it may be necessary to turn it off or disconnect it from the network. This station remains Online unless you intervene to take it Offline. 121 *Series 90–30 PLC CPU364 Ethernet Interface:* “LAN controller fuse blown; off network" The AAUI port fuse (FU1) on the LAN Controller board, which protects the PLC Power Supply from overload from the external transceiver, is blown. This problem may be caused by a defective transceiver, shorted network or transceiver cable, or a defective Ethernet Interface. Isolated and correct the cause of the problem, and then replace the fuse or the Ethernet Interface. For fuse type and replacement procedures, refer to GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User’s Manual.*

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "c" LLC events (Continued)	**Entry 2** codes (Continued) 121 *Series 90–30 PLC Ethernet Interface:* "LAN Interface hardware failure; switched off network" The AAUI Fuse on the LAN Controller board, which protects the PLC Power Supply from overload from the external transceiver, is blown. This fuse is not field replaceable. This problem may be caused by a defective transceiver, shorted network or transceiver cable, or a defective Ethernet Interface. Correct the external fault and replace the Ethernet Interface. 121 *Series 90–70 PLC Ethernet Interface (type 2):* "LAN controller fuse blown; off network" Either AUI port fuse (FU3) or 10Base2 port fuse (FU1) is blown. **Entry 3** indicates the defective fuse. 1 Fuse FU3 (AUI port; field replaceable) 2 Fuse FU1 (10Base2 port; not field replaceable) This problem may be caused by a defective transceiver, shorted network or transceiver cable, or a defective Ethernet Interface. Isolate and correct the cause of the problem, and then replace the fuse or the Ethernet Interface. For fuse type and replacement procedures, refer to GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*. 122* "LAN controller fault; restarted LAN I/F" or 123* "LAN Interface hardware failure; switched off network" The MAC chip failed its internal loopback test. Replace the LAN Controller board. 124* "LAN controller fault; restarted LAN I/F" or 125* "LAN Interface hardware failure; switched off network" The MAC chip failed to initialize. Replace the LAN Controller Board. 126* "LAN controller fault; restarted LAN I/F" or 127* "LAN Interface hardware failure; switched off network" The MAC reported a "babble" fault; more than 1518 bytes of data have been transmitted in a frame. Replace the LAN Controller board. 128* "LAN controller fault; restarted LAN I/F" or 129* "LAN Interface hardware failure; switched off network" The MAC reported a handshaking error in accessing the LAN Controller memory. Replace the LAN Controller board. 12a* "LAN controller fault; restarted LAN I/F" or 12b* "LAN Interface hardware failure; switched off network" The MAC reported a broken "chain" of buffers in a transmit frame. Since the LAN Controller does not chain buffers, this should not occur. Replace the LAN Controller board. If this fault recurs, please report it to GE Fanuc.
	* Same fault for both reports. It is remotely possible that error codes 122 – 12b may occur due to a transient system fault. Because of this possibility, an attempt is made to recover without manual intervention, by restarting the LAN Controller (thus rerunning power–up diagnostics). If a hardware fault is detected, the LAN Controller will be held in reset. To prevent repeated restarts and to protect the network, the LAN IF will instead Switch Offline from the Network (rather than Restart) if this fault occurs within 5 minutes of startup.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "11" IP events	This event is logged by the IP layer. **Entry 3** of any IP exception is a code uniquely identifying the software component of IP which reported the exception. **Entry 2** (hexadecimal) codes are as follows: 1 "Config'd gateway addr bad; can't talk off local net" Configured default gateway address does not have same network ID as the Interface's IP address. During initialization, the netid part of the "Gateway Address" (configured for this station) was found to be different from the netid part of the "IP Address" (configured for this station). Since the gateway must be on the same local network as this station, there is an error in configuration; this error must be corrected using the PLC Programmer Configurator. How to determine the netid: When a Subnet Mask is configured, the station's netid is found by ANDing the Subnet Mask with the IP Address. Likewise, the gateway's netid is found by ANDing the Subnet Mask with the Gateway Address. When a Subnet Mask has not been configured (equals 0.0.0.0), the netid of the station and netid of the gateway are determined by the address class. For further information on IP addressing, see Chapter 5, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual*. 2 "Config'd gateway addr bad; can't talk off local net" An outgoing IP datagram was addressed to a host that is not on the local network. A match for its destination subnet could not be found in the routing table, and no default gateway or routing partner is configured. **Entries 5 & 6** contain the IP address bytes of the unreachable destination displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. The user should verify that the IP address of the remote host is correct. If correct, then the Gateway Address must be configured using the PLC Programmer Configurator. Refer to Chapter 5, "Network Administration Support" in GFK–1541, *TCP/IP Ethernet Communications for the Series 90 PLC User's Manual* for more information on IP addressing.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "11" IP events (Continued)	**Entry 2** codes (Continued) 3 "LAN system–software fault; resuming" Internal error: An IP request to send an ICMP message failed. **Entry 4** Description 3 Destination Unreachable 11 Time Exceeded **Entries 5 & 6** contain the IP address bytes of the node to which the ICMP message would have been sent and displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. 4 "LAN system–software fault; resuming" Internal error: An attempt to set a timer with STIMreq failed. **Entry 4** contains the time interval requested. 5 "Local request to send was rejected; discarded request" An attempt to send an Ethernet frame with EDATreq failed. Possible Ethernet cable problems. Check that the LAN LED is ON or Blinking. **Entry 4** contains the value used for the Ethernet protocol type field. 6 "LAN system–software fault; resuming" Internal error: An attempt to join an IP multicast group failed. **Entries 5 & 6** contain the IP multicast group address displayed as two hexadecimal words. For example, 224.0.0.1 would be shown as E000H 0001H. 7 "LAN system–software fault; resuming" Internal error: An attempt to leave an IP multicast group failed. **Entries 5 & 6** contain the IP multicast group address displayed as two hexadecimal words. For example, 224.0.0.1 would be shown as E000H 0001H. 8 "Backplane communications with PLC fault; lost request" An attempt to exchange routing configuration information with partner failed. **Entry 4** is the VME slot number of the partner at fault. 9 "LAN system–software fault; resuming" The VME slot number of a configured routing partner is invalid. Valid range is 2-9. 0a–11 "LAN system–software fault; resuming" Internal System Error: An error occurred in the Redundant IP subsystem. These log events are reserved. This system software error should be reported to GE Fanuc Automation-NA. 12 "LAN system-software fault; resuming" Internal error: an attempt to allocate a new ARP table entry failed. The error should be reported to GE Fanuc Automation-NA.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event ”12" TCP events	This event is logged by the TCP layer. **Entry 1** will always be zero. **Entry 2** (hexadecimal) codes are as follows: 1 “LAN I/F capacity exceeded; discarded request" Unable to allocate a TCB in tcpmopen. **Entry 3** contains the endpoint identifier number used in the tcpmopen call. 2 “LAN system–software fault; resuming" Internal error: NULL event function pointer used in call to tcpmopen. **Entry 3** contains the endpoint identifier number used in the tcpmopen call. 3 “LAN system–software fault; resuming" Internal error: Lqsize size parameter of tcpmopen call used in tcpmopen call is invalid. **Entry 3** contains the endpoint identifier number used in the tcpmopen call. **Entry 4** contains the offending lqsize parameter value. 4 “LAN system–software fault; resuming" Internal error: Invalid itcb parameter in tcpaccept call. **Entry 4** contains the offending itcb parameter value. 5 “LAN system–software fault; resuming" Internal error: Empty listen queue when tcpaccept was called. 6 “LAN system–software fault; resuming" Internal error: Invalid itcb parameter used in tcpattach call. **Entry 3** contains the endpoint identifier number used in call. **Entry 4** contains the offending itcb parameter value. 7 “LAN system–software fault; resuming" Internal error: TCB not in ESTABLISHED state when tcpattach was called. **Entry 3** contains the endpoint identifier number used in call. **Entry 4** contains a code indicating the current state of the TCP connection. Valid state codes are listed in the description of **Entry 2** = f. 8 “LAN system–software fault; resuming" Internal error: Illegal parameter specified in call to tcpread. **Entry 3** contains an internal error code of interest to developers. 9 “LAN system–software fault; resuming" Internal error: TCB not in ESTABLISHED state when tcpread was called. **Entry 4** contains a code indicating the current state of the TCP connection. Valid state codes are listed in the description of **Entry 2** = f. **Entry 5** contains an internal error code of interest to developers. a “LAN system–software fault; resuming" Internal error: Illegal parameter specified in call to tcpwr**.** **Entry 3** contains an internal error code of interest to developers. b “LAN system–software fault; resuming" Internal error: TCB not in ESTABLISHED state when tcpwr was called. c “LAN system–software fault; resuming" Internal error: Invalid itcb parameter used in tcpclose call. **Entry 3** contains the offending itcb parameter value. d “LAN system–software fault; resuming" Internal error: Invalid itcb parameter used in tcpclose call. **Entry 3** contains the offending itcb parameter value.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "12" TCP events (Continued)	**Entry 2** codes (Continued) e "LAN system–software fault; resuming" Internal error: TCP function called before TCP task was initialized. f "Connection to remote node failed; resuming" This error is reported when an RST has been received. If the error persists, verify that applications are using proper IP addresses and that the remote host is not experiencing resource limitations. **Entries 3** and **4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. The lower byte of **Entry 5** is the TCP state of the connection; the upper byte contains TCP flags. TCP state values are: 1 = CLOSED 2 = LISTEN 3 = SYN–SENT 4 = SYN–RECEIVED 5 = ESTABLISHED 6 = FIN–WAIT–1 7 = FIN–WAIT–2 8 = CLOSE–WAIT 9 = LAST–ACK a = CLOSING b = TIME–WAIT 10 "Connection to remote node failed; resuming" This error is reported when a TCP connection has been aborted. The TCP layer has retransmitted a segment the maximum number of times and the remote host has failed to ACK the segment. Check network connectivity and the remote host's operational status. **Entries 3 and** 4 are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. **Entry 5** is the number of retransmissions. 11 "Connection to remote node failed; resuming" This error is reported when a connection has been aborted after the remote host failed to respond to "keep–alive" probes. Check network connectivity and the remote host's operational status. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. **Entry 5** is the TCP state of the connection. (TCP states are listed under **Entry 2** = f.) 12 "Connection to remote node failed; resuming" This error is reported when a SYN has arrived in an improper state. If the error persists, verify that applications are using proper IP addresses and that the remote host is not experiencing resource limitations. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H The lower byte of **Entry 5** is the TCP state of the connection; the upper byte contains TCP flags. (TCP states are listed under **Entry 2** = f.) 13 "LAN system – software fault; resuming" Internal error: An attempt to bind a remote TCP/IP endpoint to a TCP connection failed because a connection was already open to that endpoint. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. **Entry 5** is the local TCP port number. **Entry 6** is the TCP port number on the remote node.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "12" TCP events (Continued)	**Entry 2** codes (Continued) 14 "LAN system–software fault; resuming" Internal error: A memory allocation error occurred while attempting to open a server connection requested by a remote node. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H **Entry 5** is the local TCP port number. **Entry 6** is the TCP port number on the remote node. 15 "LAN system–software fault; resuming" Internal error: An error occurred while attempting to send a reply when a server connection was requested by a remote node. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. **Entry 5** is an internal software error code. 16 "LAN system–software fault; resuming" Internal error: The software attempted to deallocate data for a TCP connection before the connection was closed. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. **Entry 5** is the TCP state of the connection. (TCP states are listed under **Entry 2** =f.) 17 "Connection to remote node failed; resuming" A packet was received with an inappropriate field value for the current state of the TCP connection. RST was sent to the remote endpoint. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H The lower byte of **Entry 5** is the TCP state of the connection; the upper byte contains TCP flags. (TCP states are listed under **Entry 2** = f.) 18 "Connection to remote node failed; resuming" A SYN packet was received when an ACK was expected. RST was sent to the remote endpoint. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. The lower byte of **Entry 5** is the TCP state of the connection; the upper byte contains TCP flags. (TCP states are listed under **Entry 2** = f.) 19 "LAN I/F capacity exceeded; discarded request" A remote node attempted to establish a new TCP connection when all TCP connections were already in use. RST was sent to the remote endpoint. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. The lower byte of **Entry 5** is the TCP state of the connection; the upper byte contains TCP flags. (TCP states are listed under **Entry 2** = f.) 1b "Connection to remote node failed: resuming" Unable to establish a connection to a remote node because the internal listen queue is full. **Entries 3 and 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. **Entry 5** is the local port number.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “13" Toolkit XTI events	Internal System Error: An error occurred in the generic transport layer interface. This system software error should be reported to GE Fanuc Automation – NA.
Event ”14" Toolkit shell events	Internal System Error: An error occurred in the application protocol toolkit shell as a result of an internal error. This system software error should be reported to GE Fanuc Automation – NA.
Event “15" Toolkit user events	Internal System Error: An error occurred in the application protocol toolkit shell as a result of an invalid application protocol request. This system software error should be reported to GE Fanuc Automation – NA.
Event “16” ARP events	This event is logged by ARP. **Entry 1** will always be zero. **Entry 3** of any ARP exception is a code uniquely identifying the software component of ARP which reported the exception. **Entry 2** (hexadecimal) codes are as follows: 2 “Local request to send was rejected; discarded request" Internal error: An attempt by ARP to send an Ethernet frame with EDATreq() failed. Possible Ethernet cable problems. Check that the LAN LED is ON or Blinking. 3 “LAN system–software fault; resuming" Internal error: An attempt by ARP to register itself as an Ethernet user with EREGreq() failed. 4 “LAN system–software fault; resuming" Internal error: An attempt by ARP to set a timer with STIMreq() failed. 5 “LAN data memory exhausted– check parms; resuming" Internal error: An attempt by ARP to allocate a buffer with BuffAlloc() failed.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “16” ARP events (Continued)	**Entry 2** codes (Continued) 6 ”Can’t locate remote node; discarded request” This error is reported when ARP is unable to resolve an IP address to a MAC address. **Entry 4** is the number of attempts to resolve the IP address. **Entries 5 & 6** are the unresolved IP address bytes displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. This error may indicate that the remote host is not operational on the network. Verify that the local and remote nodes are both connected and that both applications are specifying proper IP addresses. 7 “Bad remote application request, discarded request" Received a response from more than one remote node when resolving an IP address to a MAC address. This means two remote nodes have the same IP address. Reconfigure the remote nodes to use unique IP addresses. **Entries 5 & 6** are the offending IP address displayed as hexadecimal values. 8 “LAN system–software fault; resuming" Unable to add a new entry into ARP cache. 9 “Bad remote application request, discarded request" Received an ARP message from a remote node with this local node’s IP address. This means there is an IP address conflict. Reconfigure the nodes to use unique IP addresses.
Event “18" ICMP events	This event is logged by ICMP. **Entry 3** of any ICMP exception is a code uniquely identifying the software component of ICMP which reported the exception. **Entry 2** (hexadecimal) codes are as follows: 2 “Can’t locate remote node; discarded request" A remote IP entity returned a “Destination Unreachable ICMP message.” It was unable to route the message to the destination. **Entry 4** indicates the ICMP message code field value present in the message. (See an ICMP reference document for a description of field code values.) **Entries 5 & 6** contain the IP address bytes of the unreachable destination displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. Verify that the local and remote nodes are both connected and that both applications are specifying proper IP addresses. 6 “Local request to send was rejected; discarded request" A call to icmp_out failed. Possible Ethernet cable problems. Check that the LAN LED is ON or Blinking. **Entry 4** contains a message type code for Echo Response (0). **Entries 5 & 6** contain the IP address bytes of the node to which we are responding displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H. 8 “LAN data memory exhausted–check parms; resuming" A call to BuffAlloc failed. 9 “Local request to send was rejected; discarded request" Internal error: An attempt to send an IP datagram with ipsend failed. Possible Ethernet cable problems. Check that the LAN LED is ON or Blinking. **Entry 4** contains the length of the datagram. **Entries 5 & 6** contain the IP address bytes of the destination IP address of the datagram displayed as two hexadecimal words. For example, 10.0.0.1 would be shown as 0A00H 0001H.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1a" Application–specific events	**Entry 2** = 0c00 ”Unsupported feature in configuration" An unexpected application–specific data file (Protocol File) was received which is not supported by this version of the Ethernet Interface firmware; the contents of the unexpected Protocol File are discarded. Check that the Ethernet Interface Files are specified in the Ethernet Interface configuration. **Entry 3** is a detailed error code. Any Event 1a other than **Entry 2** = 0c00 is generated by the user application.
Event “1b” SRTP Server events	This event is logged by the SRTP Server module when an exceptional condition occurs. **Entry 1** will always be zero. **Entry 2** contains a code unique to each type of unexpected event. **Entry 3** contains a code identifying the SRTP Server software component which logged the event. **Entries 4, 5, and 6** identify additional information specific to the type of event described in entry 2. **Entry 2** (hexadecimal) codes are as follows: 1 “LAN data memory exhausted–check parms; resuming" Internal error: QCreate failed to create a queue header. 2 “LAN data memory exhausted–check parms; resuming" Internal error: Failed to QAlloc a buffer. **Entry 4** contains the buffer size in bytes. 3 “LAN I/F can’t init–check parms; running soft Sw Utl" Internal error: Failed to PoolAlloc a buffer pool. 4 “LAN data memory exhausted–check parms; resuming" Internal error: Failed to BuffAlloc a buffer. **Entry 4** contains the buffer size in bytes. 6 “LAN system–software fault; resuming" Internal error: An endpoint identifier other than that of the parent has appeared in a context in which a parent endpoint is expected. **Entry 4** contains the offending endpoint identifier. 7 “LAN system–software fault; resuming" A TCP error event was issued to the SRTP Server. In many cases there may be a log entry immediately preceding this one which has an event code of 12H; this entry may indicate the reason for sending the TCP error event. **Entry 4** contains the number of the local endpoint (0H–0fH) to which the error was issued. 8 “LAN system–software fault; resuming" Internal error: Failed to tcpmopen a parent endpoint as part of SRTP Server task initialization. As a result, any incoming TCP connections to SRTP will be rejected by TCP (via RST). 9 “LAN system–software fault; resuming" Internal error: Failed to tcpaccept an incoming TCP connection. a “LAN system–software fault; resuming" Internal error: Failed to tcpattach an endpoint identifier to an incoming TCP connection. b “LAN system–software fault; resuming" An attempt to tcpread from a TCP connection failed. **Entry 4** contains the number of bytes requested to read. **Entries 5 and 6** are a segment: offset base address of the memory to receive the read bytes.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1b” SRTP Server events (Continued)	**Entry 2** codes (Continued) c “LAN system–software fault; resuming" An attempt to tcpwr to a TCP connection failed. **Entry 4** contains the number of bytes requested to write. **Entries 5 and 6** are a segment:offset base address of the memory to supply the written bytes. d “LAN system–software fault; resuming" Internal error: Detected a NULL mailbox pointer. e – 13 “Backplane communications with PLC fault; lost request" The Backplane (PLC) Driver module returned bad status in response to a request. The specific value of **Entry 2** is internally significant. **Entry 4** contains the status code returned by the Backplane Driver. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 14 “LAN system–software fault; resuming" Internal error: Unexpected event indication routine call. 15 “LAN system–software fault; resuming" Internal error: Unrecognized TCP event code. **Entry 4** contains the TCP endpoint identifier. **Entry 5** contains the unrecognized TCP event code. 16 “LAN system–software fault; resuming" Internal error: Event routine indication for an endpoint identifier that should not receive such an indication. **Entry 4** contains the endpoint identifier. 18 “LAN system–software fault; resuming" An event has arrived to an SRTP Server state machine and no transition exists for the event in the machine’s current state. **Entry 4** contains an internally–significant event code. 19 “LAN system–software fault; resuming" Internal error: NULL transaction machine pointer detected. 1a “LAN system–software fault; resuming" Internal error: NULL connection machine pointer detected. 1c “LAN system–software fault; resuming" Internal error: NULL pointer was detected. 20 “LAN system–software fault; resuming" Internal error: A work block with NULL transaction and connection machine pointers was detected. **Entry 4** contains the event code associated with the work.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1b" SRTP server event (Continued)	**Entry 2** codes (Continued) 21 “Bad remote application request; discarded request" A PDU arrived in a state in which the SRTP connection cannot handle it. **Entry 4** contains a code indicating the PDU type. Valid PDU type codes are as follows: 0 Connect Request 1 Connect Response 2 Data Request 3 Data Response 4 Unconfirmed Request 5 Error Request 6 Destinations Request 7 Destinations Response 8 Session Request **Entry 5** contains a code indicating the state of the SRTP connection. Valid state codes are as follows: 0 IDLE 1 OPENING 2 ESTABLISHED 3 READONLY 4 CLOSING 5 TERMINATE 22 “LAN I/F capacity exceeded; discarded request" An SRTP connection could not be created due to either the enforcement of a maximum limit on the number of SRTP connections or system resource exhaustion. In the latter case, other log entries should indicate the exhaustion of such resources. The maximum limit of SRTP connections can be viewed with the PARM command. See Chapter 6, “Command Descriptions”. 23 “LAN system–software fault; resuming" Internal error: Failed to map a TCP endpoint identifier to a connection machine. **Entry 4** contains the offending endpoint identifier. 24 “LAN system–software fault; resuming" Internal error: Failed to map a Backplane (PLC) Driver task identifier to a connection machine. **Entry 4** contains the offending task identifier. 25 “LAN system–software fault; resuming" Internal error: No read was active on a transaction machine when one was expected. 26 “Bad remote application request; discarded request" A PDU arrived with a **version** field number higher than the SRTP protocol version supported by the SRTP Server. **Entry 4** contains the version number of the PDU. **Entry 5** contains the SRTP version supported by the SRTP Server.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1b" SRTP server event (Continued)	**Entry 2** codes (Continued) 27 “Bad remote application request; discarded request" A PDU arrived with an invalid **pdu_type** field code. The value of the **pdu_type** field is contained in **Entry 4**. Valid PDU type codes are listed in the description of **Entry 2** = 21H. 28 “Bad remote application request; discarded request" A PDU arrived with a non–zero **data_length** field, but was of a class of PDU’s which must have zero (0) in this field. **Entry 4** contains the PDU’s type code. Valid PDU type codes are listed in the description of **Entry 2** = 21H. The value of the **data_length** field is contained in **Entries 5 and 6**. 29 “Bad remote application request; discarded request" An Error Request PDU arrived from a remote SRTP endpoint. **Entry 4** contains the SRTP error code. **Entry 5** contains the invoke ID of the SRTP PDU causing the Error Request to be sent. 2b “Bad remote application request; discarded request" A valid SRTP PDU arrived, but the SRTP Server does not support handling it. The value of the **pdu_type** field is contained in **Entry 4**. Valid PDU type codes are listed in the description of **Entry 2** = 21H. 2c “LAN system–software fault; resuming" Internal error: An attempt to write an SRTP Connect Response was made prematurely. 2d “LAN system–software fault; resuming" Internal error: More response data arrived from the Backplane (PLC) Driver when more data was unexpected. **Entry 4** contains the SRTP PDU type associated with the response data. Valid PDU type codes are listed in the description of **Entry 2** = 21H. 2e “LAN system–software fault; resuming" Internal error: A mismatched Backplane (PLC) Driver transfer identifier was detected in the context of reading TCP data. **Entry 4** contains the transfer identifier. 2f “LAN system–software fault; resuming" Internal error: Failed to allocate a new transaction machine. 30 “LAN system–software fault; resuming" Internal error: Failed to find a transaction machine on the send queue matching the desired Backplane (PLC) Driver task identifier and transfer identifiers. **Entry 4** contains the task identifier, and **Entry 5** contains the transfer identifier. 31 “LAN system–software fault; resuming" Internal error: An attempt was made to activate an idle PDU machine. 32 “LAN system–software fault; resuming" Internal error: A PDU machine was in an unexpected state. 33 “LAN system–software fault; resuming" An attempt to read more TCP data for a transaction machine failed. 34 “LAN system–software fault; resuming" Internal error: Failed the setup required to read the data field of an SRTP PDU.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1b” SRTP Server events (Continued)	**Entry 2** codes (Continued) 35 “LAN system–software fault; resuming" An attempt to write more TCP data for a transaction machine failed. 36 “LAN system–software fault; resuming" Internal error: Failed to allocate a work block. 38 “LAN system–software fault; resuming" An attempt was made to use the SRTP Server task when it was not initialized. 39 “LAN system–software fault; resuming" Internal error: Failed to QAlloc a buffer. **Entry 4** contains the buffer size in bytes. 3a “LAN system–software fault; resuming" Internal error: An attempt to allocate a new session tracking structure failed. 3b “LAN system–software fault; resuming" A service request processor address of 0 was detected in the context of automatic session termination. Such an address is the result of the use of 0 in the DEST field of a session establish mailbox. SRTP Server can not support the use of DEST address 0 with automatic session termination. 3c “LAN system–software fault; resuming" Internal error: An attempt to automatically terminate a dangling session failed. **Entries 5 and 6** contain the DEST address of the service request processor with the session. 3d “LAN system–software fault; resuming" Internal error: Failed to synchronize SRTP Server operating parameters with configured values. 3e “LAN system–software fault; resuming" Internal error: An event arrived to a transaction machine in an invalid state. **Entry 4** contains the offending state code. **Entry 5** contains the event code. 3f “LAN system–software fault; resuming" Internal error: An event arrived to a connection machine in an invalid state. **Entry 4** contains the offending state code. **Entry 5** contains the event code. 40 “LAN system–software fault; resuming" Internal error: An attempt to set a timer with STIMreq failed. 41 “LAN system–software fault; resuming" No connection found for task ID contained in mailbox. 42 “LAN system–software fault; resuming" An unknown PLC request was recevied. **Entry 4** is the traffic type and **Entry 5** is the service request code of the offending mailbox.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1c” SRTP Channel API events	**Entry 6** of any SRTP Channel API exception is a code uniquely identifying the software component of the SRTP Channel API which reported the exception. **Entry 2** (hexadecimal) codes are as follows: 1 “LAN system–software fault; resuming" Internal error: The Channel API software encountered an internal use (as opposed to user application use) of a channel number that is out–of–range. **Entry 3** contains the offending channel number. 3 “LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a buffer failed. **Entry 3** contains the channel number. **Entry 4** contains the number of bytes the Channel API was attempting to allocate. 4 “LAN system–software fault; resuming" Internal error: The Channel API detected the improper internal use of a NULL pointer to a channel machine. 5 “LAN system–software fault: aborted assoc. & resuming" Internal error: A Channel API event arrived in a channel machine state that is not intended to handle the event. **Entry 3** contains the aborted channel number. **Entry 4** contains a code uniquely identifying the event. Valid event codes are: 1 TCP_DATA_RDY 2 TCP_ERROR 3 TCP_CONN_OK 4 TCP_FIN_RCVD 5 TCP_USER_RESET 6 TCP_CONN_IND 7 TCP_OKTOSND 8 BPX_FRESH_DATA 9 BPX_WR_DATA_ACK a CMD_EC b TIMER_INTERVAL c TIMER_TIMEOUT d XFER_ERROR e END_OF_SWEEP f UPDATE_WAIT_EXPIRE 6 “Backplane communications with PLC fault; lost request" Internal error: An attempt to write to the user–specified reference address to be used to hold the COMMREQ Status Word failed internally. **Entry 3** contains the CRS word value to be written. **Entry 4** contains the Segment Selector of the reference addressed. **Entry 5** contains the (zero–based) Offset of the reference address.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1c” SRTP Channel API events (Continued)	**Entry 2** codes (Continued) 7 “LAN system–software fault: aborted assoc. & resuming" Internal error: An attempt to set a timer failed. **Entry 3** contains the aborted channel number. **Entry 4** contains the high word of the time value used in the attempt to set the timer. **Entry 5** contains the low word of the time value used in the attempt to set the timer. 8 “LAN system–software fault: aborted assoc. & resuming" Internal error: An attempt to set a timer failed. **Entry 3** contains the aborted channel number. **Entry 4** contains the time value used in the attempt to set the timer. a “LAN system–software fault: aborted assoc. & resuming" Internal error: A channel machine’s write PDU submachine was accessed in its IDLE state. **Entry 3** identifies the channel number of the aborted channel machine. b “Bad remote application request; discarded request" An SRTP PDU arrived to the Channel API having an unexpected value in its version field. This suggests that the remote SRTP endpoint may be running software that is incompatible with your version of the Channel API. **Entry 3** contains the aborted channel number. **Entry 4** contains the version number found in the arrived PDU. **Entry 5** contains the version number expected by the Channel API. c “Bad remote application request; discarded request" An SRTP PDU arrived with a non–zero data field; however, the PDU is of the type where data is not allowed. **Entry 3** contains the aborted channel number. **Entry 4** contains the PDU type code. Valid PDU type codes are: 0 Connect Request 1 Connect Response 2 Data Request 3 Data Response 4 Unconfirmed Request 5 Error Request 6 Destinations Request 7 Destinations Response **Entry 5** contains the low word of the data field. d “Bad remote application request; discarded request" An SRTP PDU arrived with a PDU type code that the Channel API does not support. At present, the Channel API only supports the arrival of the following PDU types: Connect Response, Data Response, and Error Request. **Entry 3** contains the aborted channel number. **Entry 4** contains the offending PDU type code. e “LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a buffer failed. 11 “LAN system–software fault; resuming" The Channel API software was accessed by other internal software, but the Channel API has not yet been initialized.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "1c" SRTP Channel API events (Continued)	**Entry 2** codes (Continued) 12 "LAN system–software fault; resuming" Internal error: An attempt to find the channel machine corresponding to a given TCP connection has failed. **Entry 3** contains the TCP endpoint identifier of the particular TCP connection. 13 "LAN system–software fault: aborted assoc. & resuming" Internal error: An attempt to allocate a work block failed. **Entry 3** contains the aborted channel number. 14 "LAN system–software fault; resuming" Internal error: Additional unsolicited mail or service response data arrived from the Backplane (PLC) Driver when such data was unexpected. 15 "LAN system–software fault; resuming" Internal error: A mailbox buffer pointer was found to be NULL. 17 "LAN system–software fault: aborted assoc. & resuming" The Backplane (PLC) Driver returned bad status in response to a request. **Entry 3** may contain the aborted channel number or "c0" if no channel was aborted. **Entry 4** contains a status code indicating the type of failure. **Entry 5** uniquely identifies the request that failed. (See the BPD/MBU error status code list at the beginning of Log Event "8".) 18 "LAN system–software fault: aborted assoc. & resuming" Mailbox traffic of unwanted type arrived from the Backplane (PLC) Driver. **Entry 3** may contain the aborted channel number or "c0" if no channel was aborted. **Entry 4** identifies the offending traffic type. 19 "LAN system–software fault: aborted assoc. & resuming" Internal error: The Channel API received a backplane transfer response of an unwanted transfer class. **Entry 3** contains the aborted channel number. **Entry 4** contains a code identifying the class. Valid class codes are: 0 UNKNOWN 1 READ_DATA 2 WRITE_DATA 3 WRITE_DCS 4 WRITE_CRSW 5 WRITE_CSB 1a "LAN system–software fault; resuming" Internal error: A Backplane (PLC) Driver event indication routine was invoked, but the Channel API does not have any use for such an event. **Entry 4** contains a Backplane (PLC) Driver task identification. **Entry 5** contains a request identification number. 1c "LAN system–software fault: aborted assoc. & resuming" Internal error: A NULL buffer pointer was detected. **Entry 3** can contain the aborted channel number. 1d "Backplane communications with PLC fault; lost request" Internal error: A request to notify the Channel API of the next CPU scan failed. 1e "LAN system–software fault: aborted assoc. & resuming" Internal error: An attempt to allocate a new channel machine failed. **Entry 3** contains the requested channel number. 1f "Bad local application request; discarded request" A COMMREQ arrived to the Channel API containing a command code that was not recognized as a Channel API command. **Entry 3** contains the command code.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1c” SRTP Channel API events (Continued)	**Entry 2** codes (Continued) 20 “Backplane communications with PLC fault; lost request" Internal error: An attempt to write to the user–specified reference address to be used to hold the Detailed Channel Status Words failed internally. 21 “LAN system–software fault; resuming" The Service Request Processor component of client PLC CPU rejected a request. **Entry 3** contains the major–minor error code of the request.**Entry 4** contains a unique request identification number. 22 “LAN system–software fault; resuming" Internal error: An attempt to find the channel machine corresponding to a given channel number has failed. **Entry 3** contains the particular channel number. 23 “LAN system–software fault; resuming" Internal error: An attempt to synchronize Channel API operating parameters with those configured by the user failed. 24 “Backplane communications with PLC fault; lost request" Internal error: An attempt to register with the Backplane (PLC) Driver failed. **Entry 3** contains an error status code describing the failure. (See the BPD/MBU error status code list at the beginning of Log Event “8”.) 25 “LAN IF can’t init–check parms; running soft Sw Utl" Internal error: An attempt to allocate a queue header failed. 26 “LAN IF can’t init–check parms; running soft Sw Utl" Internal error: An attempt to allocate a buffer pool failed. 27 “LAN system–software fault: aborted assoc. & resuming" Internal error: A Channel Machine was issued an event when in an invalid state. **Entry 3** identifies the aborted channel number. **Entry 4** identifies the state. **Entry 5** identifies the event. Valid state and event codes are defined in the description for **Entry 2** = 5. 28 “Backplane communications with PLC fault; lost request" Internal error: An internal attempt to send a request to the Backplane (PLC) Driver failed. **Entry 3** contains an error status code describing the failure. (See the BPD/MDU error status code list at the beginning of Log Event “8”.) **Entry 4** contains the backplane transfer class code associated with the transfer. Valid class codes are defined in the description for **Entry 2**=19H 29 “LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a new backplane transfer tracking structure failed. **Entry 3** contains the backplane transfer class code to be used with the transfer**.** Valid class codes are defined in the description for **Entry 2**=19H. 2a “Backplane communications with PLC fault; lost request" Internal error: An attempt to allocate a status update structure failed. 2b “LAN system–software fault; resuming" Internal error: A NULL COMMREQ data block pointer was detected. 2c “Bad remote application request; discarded request" Mailbox traffic of unexpected type arrived from the remote Service Request Processor. **Entry 3** identifies the aborted channel number. **Entry 4** identifies the traffic type. 2d “Bad local application request; discarded request" A segment selector that the Channel API does not support was used in specifying the COMMREQ Status Word reference address. **Entry 3** contains the offending segment selector code value. **Entry 4** contains the COMMREQ command value of the command using the offending segment selector.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1c” SRTP Channel API events (Continued)	**Entry 2** codes (Continued) 2f “Bad local application request; discarded request" Could not write the CRS word of an Establish Channel COMMREQ command. **Entry 3** identifies the channel number. You should check your application to make sure it is using a legal CRS word pointer in its Establish Channel command for the indicated channel. 30 “LAN system–software fault; resuming" Internal software error: The internal channel state machine is trying to establish a new channel while it is not in a state which is suitable for this operation. **Entry 3** contains the channel number, **Entry 4** contains a code identifying the current machine state for this channel. 31 ”LAN system–software fault; aborted assoc. & resuming" Internal error: An attempt to allocate a buffer failed. **Entry 3** contains the channel number. 32 “LAN system–software fault; resuming" An indication from the Naming Services subsystem was received which does not correspond to any request made by the Channel API subsystem. 33 ”LAN system–software fault; aborted assoc. & resuming" A request by the Channel API subsystem to resolve a network address name was rejected by the Naming Services subsystem. 34 ”LAN system–software fault; aborted assoc. & resuming" The Channel API subsystem received an incoherent indication from the Naming Services subsystem. 35 “Bad local application request; discarded request" An invalid PLC request was received from the PLC. 36 “LAN system–software fault; resuming" Internal software error: reserve channel number failed
Event “1d” IGMP events	This event is logged by IGMP. **Entry 3** of any IGMP exception is a code uniquely identifying the software component of IGMP which reported the exception. **Entry 2** (hexadecimal) codes are as follows: 1 “Bad remote application request; discarded request" Internal error. The IGMP handler was asked to generate an unsupported IGMP message. 2 “Load request to send was rejected; discarded request" Call to igmp_out failed; unable to send an IGMP Reply message. Possible Ethernet cable problems. Check that the LAN LED is ON or blinking. **Entry 4** contains a message type code for IGMP Reply. **Entries 5 and 6** contain the multicast host group IP address for the IGMP Reply’ displayed as two hexadecimal words. For example, 224.0.0.1 would be shown as E000H 0001H. 3 “LAN data memory exhausted-check parms; resuming" Internal error. A call to BuffAlloc failed; unable to generate an IGMP reply message. 4 “LAN data memory exhausted-check parms; resuming" Internal error: Unable to generate IGMP Reply for specified multicast host group. **Entry 4** contains an internal random reply delay value. **Entries 5 and 6** contain the multicast host group IP address for the IGMP Reply, displayed as two hexadecimal words. For example, 224.0.0.1 would be shown as E000H 0001H.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "1e" Modbus/TCP Channel API events	This event is logged by the Modbus/TCP Channel API when an exceptional condition occurs. **Entry 1** will always be zero. **Entry 2** contains a code unique to each type of unexpected event. **Entry 3** contains a code identifying the Modbus/TCP Channel software component which logged the event. **Entries 4, 5, and 6** identify additional information specific to the type of event described in entry 2.
	Entry 2 (hexadecimal) codes are as follows: 1 "LAN system–software fault; resuming" Internal error: The Channel API software encountered an internal use (as opposed to user application use) of a channel number that is out–of–range. **Entry 3** contains the offending channel number. 3 "LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a buffer failed. **Entry 3** contains the channel number. **Entry 4** contains the number of bytes the Channel API was attempting to allocate. 4 "LAN system–software fault; resuming" Internal error: The Channel API detected the improper internal use of a NULL pointer to a channel machine. 5 "LAN system–software fault: aborted assoc. & resuming" The application program may have issued a subsequent COMMREQ before a previous COMMREQ has completed, indicated by receipt of the COMMREQ Status Word. Alternately, an internal error may have occurred. A Channel API event arrived in a channel machine state that is not intended to handle the event. **Entry 3** contains the aborted channel number. **Entry 4** contains a code uniquely identifying the event. Valid event codes are: 1 TCP_DATA_RDY 2 TCP_ERROR 3 TCP_CONN_OK 4 TCP_FIN_RCVD 5 TCP_USER_RESET 6 TCP_CONN_IND 7 TCP_OKTOSND 8 BPX_FRESH_DATA 9 BPX_WR_DATA_ACK a CMD_OPEN b CMD RW c XFER_ERROR d END_OF_SWEEP e INVALID WORK EVENT 6 "Backplane communications with PLC fault; lost request" Internal error: An attempt to write to the user–specified reference address used to hold the COMMREQ Status Word failed internally. **Entry 3** contains the CRS word value to be written. **Entry 4** contains the Segment Selector of the reference addressed. **Entry 5** contains the (zero–based) Offset of the reference address. a "LAN system–software fault: aborted assoc. & resuming" Internal error: A channel machine's write PDU submachine was accessed in its IDLE state. **Entry 3** identifies the channel number of the aborted channel machine. e "LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a buffer failed.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "1e" Modbus/TCP Channel API events (continued)	**Entry 2** codes (Continued) 11 "LAN system–software fault; resuming" The Channel API software was accessed by other internal software, but the Channel API has not yet been initialized. 12 "LAN system–software fault; resuming" Internal error: An attempt to find the channel machine corresponding to a given TCP connection has failed. **Entry 3** contains the TCP endpoint identifier of the particular TCP connection. 13 "LAN system–software fault: aborted assoc. & resuming" Internal error: An attempt to allocate a work block failed. **Entry 3** contains the aborted channel number. 14 "LAN system–software fault; resuming" Internal error: Additional unsolicited mail or service response data arrived from the Backplane (PLC) Driver when such data was unexpected. 15 "LAN system–software fault; resuming" Internal error: A mailbox buffer pointer was found to be NULL. 17 "LAN system–software fault: aborted assoc. & resuming" The Backplane (PLC) Driver returned bad status in response to a request. **Entry 3** may contain the aborted channel number or "c0" if no channel was aborted. **Entry 4** contains a status code indicating the type of failure. **Entry 5** uniquely identifies the request that failed. (See the BPD/MBU error status code list at the beginning of Log Event "8".) 18 "LAN system–software fault: aborted assoc. & resuming" Mailbox traffic of unwanted type arrived from the Backplane (PLC) Driver. **Entry 3** may contain the aborted channel number or "c0" if no channel was aborted. **Entry 4** identifies the offending traffic type. 19 "LAN system–software fault: aborted assoc. & resuming" Internal error: The Channel API received a backplane transfer response of an unwanted transfer class. **Entry 3** contains the aborted channel number. **Entry 4** contains a code identifying the class. Valid class codes are: 1 READ_DATA 2 WRITE_DATA 4 WRITE_CRSW 1a "LAN system–software fault; resuming" Internal error: A Backplane (PLC) Driver event indication routine was invoked, but the Channel API does not have any use for such an event. **Entry 4** contains a Backplane (PLC) Driver task identification. **Entry 5** contains a request identification number. 1c "LAN system–software fault: aborted assoc. & resuming" Internal error: A NULL buffer pointer was detected. **Entry 3** can contain the aborted channel number. 1d "Backplane communications with PLC fault; lost request" Internal error: A request to notify the Channel API of the next CPU scan failed. 1e "LAN system–software fault: aborted assoc. & resuming" Internal error: An attempt to allocate a new channel machine failed. **Entry 3** contains the requested channel number. 1f "Bad local application request; discarded request" A COMMREQ arrived to the Channel API containing a command code that was not recognized as a Channel API command. **Entry 3** contains the command code.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "1e" Modbus/TCP Channel API events (continued)	**Entry 2** codes (Continued) 21 "LAN system–software fault; resuming" The Service Request Processor component of client PLC CPU rejected a request. **Entry 3** contains the major–minor error code of the request. **Entry 4** contains a unique request identification number. 24 "Backplane communications with PLC fault; lost request" Internal error: An attempt to register with the Backplane (PLC) Driver failed. **Entry 3** contains an error status code describing the failure. (See the BPD/MBU error status code list at the beginning of Log Event "8".) 25 "LAN IF can't init–check parms; running soft Sw Utl" Internal error: An attempt to allocate a queue header failed. 26 "LAN IF can't init–check parms; running soft Sw Utl" Internal error: An attempt to allocate a buffer pool failed. 27 "LAN system–software fault: aborted assoc. & resuming" Internal error: A Channel Machine was issued an event when in an invalid state. **Entry 3** identifies the aborted channel number. **Entry 4** identifies the state. **Entry 5** identifies the event. Valid state and event codes are defined in the description for **Entry 2** = 5. 28 "Backplane communications with PLC fault; lost request" Internal error: An internal attempt to send a request to the Backplane (PLC) Driver failed. **Entry 3** contains an error status code describing the failure. (See the BPD/MDU error status code list at the beginning of Log Event "8".) **Entry 4** contains the backplane transfer class code associated with the transfer. Valid class codes are defined in the description for **Entry 2**=19H 29 "LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a new backplane transfer tracking structure failed. **Entry 3** contains the backplane transfer class code to be used with the transfer**.** Valid class codes are defined in the description for **Entry 2**=19H. 2a "Backplane communications with PLC fault; lost request" Internal error: An attempt to allocate a status update structure failed. 2b "LAN system–software fault; resuming" Internal error: A NULL COMMREQ data block pointer was detected. 2f "Bad local application request; discarded request" Could not write the CRS word of an Establish Channel COMMREQ command. **Entry 3** identifies the channel number. You should check your application to make sure it is using a legal CRS word pointer in all commreq command blocks for the indicated channel. 31 "LAN system–software fault; aborted assoc. & resuming" Internal error: An attempt to allocate a buffer failed. **Entry 3** contains the channel number. 35 "Bad local application request; discarded request" An invalid PLC request was received from the PLC. 36 "LAN system–software fault; resuming" Internal software error: reserve channel number failed

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "1f" Modbus/TCP Server events	This event is logged by the Modbus/TCP Server module when an exceptional condition occurs. **Entry 1** will always be zero. **Entry 2** contains a code unique to each type of unexpected event. **Entry 3** contains a code identifying the Modbus/TCP Server software component which logged the event. **Entries 4, 5, and 6** identify additional information specific to the type of event described in entry 2. **Entry 2** (hexadecimal) codes are as follows: 1 "LAN data memory exhausted–check parms; resuming" Internal error: QCreate failed to create a queue header. 2 "LAN data memory exhausted–check parms; resuming" Internal error: Failed to QAlloc a buffer. **Entry 4** contains the buffer size in bytes. 3 "LAN I/F can't init–check parms; running soft Sw Utl" Internal error: Failed to PoolAlloc a buffer pool. 4 "LAN data memory exhausted–check parms; resuming" Internal error: Failed to BuffAlloc a buffer. **Entry 4** contains the buffer size in bytes. 6 "LAN system–software fault; resuming" Internal error: An endpoint identifier other than that of the parent has appeared in a context in which a parent endpoint is expected. **Entry 4** contains the offending endpoint identifier. 7 "LAN system–software fault; resuming" A TCP error event was issued to the Modbus/TCP Server. In many cases there may be a log entry immediately preceding this one which has an event code of 12H; this entry may indicate the reason for sending the TCP error event. **Entry 4** contains the number of the local endpoint (0H–0fH) to which the error was issued. 8 "LAN system–software fault; resuming" Internal error: Failed to tcpmopen a parent endpoint as part of Modbus/TCP Server task initialization. As a result, any incoming TCP connections to Modbus/TCP will be rejected by TCP (via RST). 9 "LAN system–software fault; resuming" Internal error: Failed to tcpaccept an incoming TCP connection. d "LAN system–software fault; resuming" Internal error: Detected a NULL mailbox pointer. e "Backplane communications with PLC fault; lost request" The Backplane (PLC) Driver module returned bad status in response to a request. **Entry 4** contains the status code returned by the Backplane Driver. (See the BPD/MBU error status code list at the beginning of Log Event "8".) f "Backplane communications with PLC fault; lost request" The Backplane (PLC) Driver module returned bad status in response to a task registration request. **Entry 4** contains the status code returned by the Backplane Driver. (See the BPD/MBU error status code list at the beginning of Log Event "8".) **Entry 5** contains the ID of the task for which the registration failed. 14 "LAN system–software fault; resuming" Internal error: Unexpected event indication routine call. 15 "LAN system–software fault; resuming" Internal error: Unrecognized TCP event code. **Entry 4** contains the TCP endpoint identifier. **Entry 5** contains the unrecognized TCP event code.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "1f" Modbus/TCP Server events (continued)	**Entry 2** codes (Continued) 16 "LAN system–software fault; resuming" Internal error: Event routine indication for an endpoint identifier that should not receive such an indication. **Entry 4** contains the endpoint identifier. 18 "LAN system–software fault; resuming" An event has arrived to a Modbus/TCP Server state machine and no transition exists for the event in the machine's current state. **Entry 4** contains an internally–significant event code. 19 "LAN system–software fault; resuming" Internal error: NULL transaction machine pointer detected. 1a "LAN system–software fault; resuming" Internal error: NULL connection machine pointer detected. 1c "LAN system–software fault; resuming" Internal error: NULL pointer was detected. 20 "LAN system–software fault; resuming" Internal error: A work block with NULL transaction and connection machine pointers was detected. **Entry 4** contains the event code associated with the work. 22 "LAN I/F capacity exceeded; discarded request" An Modbus/TCP connection could not be created due to either the enforcement of a maximum limit on the number of TCP connections or system resource exhaustion. In the latter case, other log entries should indicate the exhaustion of such resources. The maximum limit of Modbus/TCP connections can be viewed with the PARM command. 23 "LAN system–software fault; resuming" Internal error: Failed to map a TCP endpoint identifier to a connection machine. **Entry 4** contains the offending endpoint identifier. 24 "LAN system–software fault; resuming" Internal error: Failed to map a Backplane (PLC) Driver task identifier to a connection machine. **Entry 4** contains the offending task identifier. 25 "LAN system–software fault; resuming" Internal error: No read was active on a transaction machine when one was expected. 2e "LAN system–software fault; resuming" Internal error: A mismatched Backplane (PLC) Driver transfer identifier was detected in the context of reading TCP data. **Entry 4** contains the transfer identifier. 2f "LAN system–software fault; resuming" Internal error: Failed to allocate a new transaction machine. 30 "LAN system–software fault; resuming" Internal error: Failed to find a transaction machine on the send queue matching the desired Backplane (PLC) Driver task identifier and transfer identifiers. **Entry 4** contains the task identifier, and **Entry 5** contains the transfer identifier. 31 "LAN system–software fault; resuming" Internal error: An attempt was made to activate an idle PDU machine. 33 "LAN system–software fault; resuming"

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “1f” Modbus/TCP Server events (continued)	**Entry 2** codes (Continued) 35 “LAN system–software fault; resuming" An attempt to write more TCP data for a transaction machine failed. 38 “LAN system–software fault; resuming" An attempt was made to use the Modbus/TCP Server task when it was not initialized. 3e “LAN system–software fault; resuming" Internal error: An event arrived to a transaction machine in an invalid state. **Entry 4** contains the offending state code. **Entry 5** contains the event code. 3f “LAN system–software fault; resuming Internal error" An event arrived to a connection machine in an invalid state. **Entry 4** contains the offending state code. **Entry 5** contains the event code. 41 “LAN system–software fault; resuming" No connection found for task ID contained in mailbox. 42 “LAN system–software fault; resuming" An unknown PLC request was received. **Entry 4** is the traffic type and **Entry 5** is the service request code of the offending mailbox. 43 “Backplane communications with PLC fault; lost request” Internal error: Additional service response data arrived from the Backplane (PLC) Driver when such data was unexpected. 44 “LAN system–software fault; resuming" Unexpected protocol ID in Modbus/TCP request. Modbus/TCP requires protocol ID of 0. 45 “LAN system–software fault; resuming" PDU length greater than Modbus/TCP message size limit of 255 bytes. 46 “LAN system–software fault; aborted assoc. & resuming" Internal Error: Unwanted traffic. Invalid mailbox type received from the CPU.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "26" Backup events	**Entry 3** of any Backup exception is a code uniquely identifying the software component of Backup which reported the exception. **Entry 2** (hexadecimal) codes are as follows: 0 "Memory backup fault; may lose config/log on restart" An attempt to start a sector erase with FLASH_start_sector_erase failed. **Entry 4** contains a status code of interest to developers. If the error persists, replace the LAN Interface. 1 "Memory backup fault; may lose config/log on restart" A check on sector erase using FLASH_check_sector_erase failed. **Entry 4** contains a status code of interest to developers. If the error persists, replace the LAN Interface. 2 "Memory backup fault; may lose config/log on restart" A write of flash done using FLASH_write failed. **Entry 4** contains a status code of interest to developers. If the error persists, replace the LAN Interface. 3 "Memory backup fault; may lose config/log on restart" The backup task entered an illegal backup state. **Entry 4** identifies the offending state code. This is an internal error; please notify GE Fanuc Automation – NA. 4 "Memory backup fault; may lose config/log on restart" A call to a backup task entry point was made before backup task initialization. This is an internal error; please notify GE Fanuc Automation – NA. 5 "Memory backup fault; may lose config/log on restart" An attempt to initialize the BOOT flash chip using FLASH_init failed. **Entry 4** contains a status code of interest to developers. If the error persists, replace the LAN Interface. 6 "Memory backup fault; may lose config/log on restart" An attempt to read backup data from flash was made while the flash was being erased. 7 "Memory backup fault; may lose config/log on restart" At least 1 of the 3 backup copies of configuration (soft switch)/advanced user parameters was lost. For advanced parameter users or users who have not configured the Interface with the PLC Programmer, operation may be affected. Such users should verify proper settings with the PARM and/or SOSW Station Manager commands.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "27" Naming Services events	This event is logged by the Naming Services subsystem when an exception condition occurs. E**ntry 3** of any Naming Services exception is a code uniquely identifying the software component which reported the exception. E**ntry 2** (hexadecimal) codes are as follows: 1 "LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a buffer failed during initialization of the Naming Services subsystem. 2 "LAN data memory exhausted–check parms; resuming" Internal error: An attempt to allocate a buffer failed during normal operation. 3 "LAN system–software fault; resuming" An event was found in the internal work queue which does not correspond to any one of the active Naming Services requests. 4 "LAN system–software fault; resuming" Internal error: An unknown resolution method was requested. 5 "LAN system–software fault; resuming" Internal error: Maximum number of Naming Services requests already in process. Try again later. 6 "LAN system–software fault; resuming" Unable to open UDP ports used for Naming Services operations. 7 "LAN system–software fault; resuming" Unable to register this networks adapter's network name in DDP2 protocol. **Entry 4** (hexadecimal) contains the reason for this failure: 1 Internal software error, e.g., failure to allocate a timer, buffers... 2 Error encountered trying to open UDP port. 3 Incomprehensible parameter given to the DDP subsystem. 28 Too many simultaneous DDP name resolution requests. 29 Buffer allocation failure. 2a Expected DDP response not received. 2b Another DDP name already in use. 2c Cannot handle all DDP browse responses. 2d DDP subsystem not yet on–line. 2e DDP registration cancelled by user. ffd8 Device/Adapter name in question is invalid. ffd7 DDP subsystem unable to generate an event. ffd6 DDP subsystem unable to create a timer event. ffd5 Buffer allocation error. ffd4 Another device attempted to register with our DDP Network Adapter Name. (See corrective action for **Entry 2** = 8 listed below.) ffd3 Invalid DDP message received.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “27” Naming Services Events (Continued)	8 “LAN system–software fault; resuming" There was a conflict in the DDP network adapter name that this adapter tried to register on the network; the name was not registered. Find the other network adapter with the identical network adapter name, and correct the situation. 9 “LAN system–software fault; resuming" DDP protocol error. a (Not reported to PLC Fault Table) A cancel request was made with an invalid transaction ID. b (Not reported to PLC Fault Table) A cancel request was made with an unused transaction ID. c (Not reported to PLC Fault Table) DNS Server unreachable. 10 “LAN system–software fault; resuming" General internal error.
Event “28” Ethernet Global Data (EGD) events	This event is logged by the Global Data Subsystem. **Entry 5** is an index number that identifies a particular Global Data exchange, if known. This value corresponds to the location within the Global Data exchange table displayed by the ”stat g” Station Manager command. **Entry 6** uniquely identifies the software component within the Global Data subsystem which reported the error. **Entry 2** (hexadecimal) codes are as follows: 1 ”LAN system–software fault; resuming" An unwanted event arrived from the Backplane Driver. 2 “LAN system-software fault; resuming" An unwanted BPX tracking structure class arrived into the subsystem. **Entry 4** contains a code identifying the backplane transfer class. Valid class codes are: 0 UNKNOWN 1 ESTABLISH 2 CANCEL 3 READ_DATA 3 “LAN system-software fault; resuming" A matching BPX structure could not be found for a backplane message. **Error 5** may contain a BPD error status code. 4 “Backplane communications with PLC fault; lost request" Backplane message was received with a bad status value. 5 “Backplane communications with PLC fault; lost request" Mailbox field within a backplane message was NULL. 6 “Backplane communications with PLC fault; lost request" The more data flag used by backplane driver was set unexpectedly. **Entry 3** is the transfer ID. 7 “LAN data memory exhausted-check parms; resuming" Call to allocate a queue item failed. **Entry 3** is an internal status code. 8 “LAN data memory exhausted-check parms; resuming" Call to allocate a pool item failed. **Entry 3** may contain the type code of the PDU. 9 “LAN system-software fault; resuming" A bad pointer was used within a call to abort a machine structure.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “28” Ethernet Global Data (EGD) events (Continued)	**Entry 2** codes (Continued) a “LAN system-software fault; resuming" An event occurred which had no transition capability. b “LAN system-software fault; resuming" A machine entry was found in an invalid state. **Entry 3** is the type code of the PDU. **Entry 3** is the current state code. **Entry 4** is the current event code. c “LAN I/F capacity exceeded; discarded request" Open call for UDP port failed. **Entry 3** is the UDP port number. d “LAN system-software fault; resuming" Function called before system fully initialized. e “LAN data memory exhausted-check parms; resuming " A new work event could not be allocated. **Entry 3** may contain the type code of the PDU. f “LAN data memory exhausted-check parms; resuming" A new transaction machine could not be allocated. **Entry 3** may contain the type code of the PDU. 10 “Backplane communications with PLC fault; lost request" An unknown command was received in a CPU message. **Entry 4** is the command code from the PLC. 11 “Backplane communications with PLC fault; lost request" An unsupported mailbox type was received within a CPU message. 12 “Backplane communications with PLC fault; lost request" A message was received which contained unknown Ids. **Entry 3** may contain the type code of the PDU. **Entry 4** may contain the internal PLC handle. 13 “LAN system-software fault; resuming" A bad index value into the machine table arrived. 14 “Backplane communications with PLC fault; lost request" A bad handle within mail from the CPU arrived. 15 “Local request to send was rejected; discarded request" A DGRAM request failed. 16 “Bad remote application request; Discarded request" An unexpected PDU arrived at the UDP in function. **Entry 3** is the type code of the PDU 17 “Bad remote application request; Discarded request" A UDP frame arrived with an unexpected UDP port. **Entry 3** is the type code of the PDU. 18 “LAN system-software fault; resuming" Registration of task with backplane driver failed. **Entry 3** contains the status code returned by the Backplane Driver. (See the BPD/MBU error status code list at the beginning of Log Event“8”.) 19 “Backplane communications with PLC fault; lost request" Attempt to send message to backplane driver failed. **Entry 3** contains the status code returned by the Backplane Driver. (See the BPD/MBU error status code list at the beginning of Log Event“8”.)

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event “28” Ethernet Global Data (EGD) events (Continued)	**Entry 2** codes (Continued) 1a (Not reported to PLC Fault Table) Allocation of dualport memory failed when setting up an EGD exchange. **Entry 3** is the internal status code. 1b “Backplane communications with PLC fault; lost request" Freeing of dualport memory failed. **Entry 3** is the internal status code. 1c “User Application Fault” or “EGD exchange config invalid; discarded request” A config request was received with invalid information. **Entry 3** may contain the address type. 1d “LAN data memory exhausted-check parms; resuming" Allocation of new BPX structure failed. 1e “LAN system-software fault; resuming" Attempt to join host group failed. 1f “Bad remote application request; Discarded request" A packet was received (attempt to consume) that had an invalid size. **Entry 3** = size of received exchange (in bytes). **Entry 4** = configured size of the local consumer exchange (in bytes). 20 ”LAN I/F capacity exceeded; discarded request" Allocation of dualport memory failed when setting up an EGD exchange. 21 ”LAN system–software fault; resuming" An attempt to leave an IP multicast group failed. **Entries 3** & **4** contain the multicast group’s IP address. 22 ”LAN system–software fault; resuming" An attempt to close a UDP port failed. **Entry 4** contains the UDP port number. 23 “LAN data memory exhausted – check parms; resuming" An attempt to allocate a software timer failed.
Event ”29" SNTP events	This event is logged by the SNTP Protocol Subsystem. **Entry 3** uniquely identifies the software component within the SNTP protocol subsystem which reported the error. **Entry 2** (hexadecimal) codes are as follows: 1 “User Application Fault” or “Remote protocol server fault detected; resuming" No suitable time server was found within the time-out period while the module is in the unsynchronized state. 2 “User Application Fault” or “Remote protocol server fault detected; resuming" The lock on the time server was lost. The module has switched to another time server, and it is still in synchronized state. **Entries 5 & 6** contains the IP address of the lost server in hexadecimal format. For example, the address 10.0.0.1 is shown as 0A00H 0001H. 3 “LAN system-software fault; resuming" The module failed a request to allocate a software timer. This is an internal resource problem. The module may not detect conditions until a new software timer is successfully allocated. **Entries 5 & 6 *may*** contain the IP address of the server for which the allocation was intended for, if applicable. The address is shown in hexadecimal format. For example, the address 10.0.0.1 is shown as 0A00H 0001H.

Table B–2. Exception Log Event Codes for Style A Station Manager – Continued

Log Event Code	Possible Cause and Resolution
Event "29" SNTP events (continued)	**Entry 2** codes (Continued) 4 "LAN system-software fault; resuming The module failed to open the UDP port dedicated to SNTP service. The SNTP feature will be automatically disabled. 5 "LAN system-software fault; resuming The module was unable to close the UDP port dedicated to SNTP service. The SNTP feature may not work properly again until the module is restarted. 6 "LAN system-software fault; resuming The module was unable to join the multicast group dedicated to SNTP service. The SNTP feature will be automatically disabled. 7 "LAN system-software fault; resuming The module was unable to leave the multicast group dedicated to SNTP service. The SNTP feature will be automatically disabled and may not function properly again until the module is restarted. 8 "LAN system-software fault; resuming An unrecognized synchronization status code was detected. This is an internal software error. The SNTP feature may not work properly again until the module is restarted. 9 "LAN system-software fault; resuming An unrecognized software timer identifier was detected. This is an internal software error. a "LAN system-software fault; resuming An unrecognized software timer sequence number was detected. This is an internal software error. **Entries 5 & 6** contains the invalid sequence number. b "User Application Fault" or "Remote protocol server fault detected; resuming The lock on the time server was lost. The module is no longer synchronized to any time servers. **Entries 5 & 6** contains the IP address of the last locked server in hexadecimal format. For example, the address 10.0.0.1 is shown as 0A00H 0001H. c "LAN system-software fault; resuming An internal time computation error was detected. The module is forced into the unsynchronized state. **Entries 5 & 6** contains the IP address of the last known lock-on server in hexadecimal format. For example, the address 10.0.0.1 is shown as 0A00H 0001H.

Exception Log Event Codes for Style B Station Manager

Table B-3. Exception Log Event Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "0" Powerup Diagnostics	This event is logged when a powerup diagnostic error occurs. Unlike other exception log events that specify additional data in Entries 2-6, powerup diagnostic errors are reported as short text messages that are self-explanatory. Diagnostic events do not use a **SCode** status value. Power diagnostic events usually indicate a hardware failure. All Diagnostic events generate PLC Fault "*Module hardware fault*" Diagnostic exception log events are listed below: "Undefined Fail" "Enet HW Fail" "Enet RAM Fail" "SMI Init Fail" "SMI Diag Fail" "Enet CRC Fail" "MAC Addr Fail (CRC)" "Bad MAC Addr" "MII/PHY Fail" "PHY T/O Fail" "Serial Failure" "Ethernet Failure" "Runtime Failure"

Table B-4. Powerup Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "1" Powerup events	This event is logged on every initialization of the Ethernet Interface. This event indicates the boundaries between restarts. As restarts are not necessarily error conditions, this event does not change the STAT LED; this event is not reported to the PLC Fault Table. **Entry 2** is always zero. **Entries 5 and 6** are not used. Powerup events do not use a **SCode** status value. **Entry 3** indicates the condition that caused the system initialization to occur: 0 Normal power up. 1 Restart via Ethernet Restart pushbutton. 2 Preemptive restart via Ethernet Restart pushbutton when a previous restart attempt did not complete. 3 Station Manager restart request. 4 Automatic restart after changing MAC address. 5 Automatic restart due to system error (see preceding exception log event). 7 Automatic restart after firmware update completion. 8 Restart after power failure c Automatic restart due to Ethernet watchdog timer expiration. e Automatic restart due to restart command from PLC CPU firmware. This code may also be displayed on power up if the board was not powered down long enough to clear RAM. ff Restart due to unknown reason. When restarting after exit from the firmware loader, **Entry 4** indicates the reason for entering the firmware loader: b Firmware load due to corrupted Primary Ethernet firmware. 10 Firmware load requested by user via CPU serial port.

Table B-5. Configuration Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "2" Configuration (CFG) events	This event is logged when a System exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most Configuration events contain a **SCode** status value. **Entry 2** (hexadecimal) values are: 0 "*LAN system-software fault; resuming*" A failure occurred during primary firmware initialization. **Entry 3** contains an internal error code indicating the subsystem that failed. The details are found in the SCode value. This exception event will only be logged if that individual subsystem has not already logged an exception. 1 "*LAN system-software fault; resuming*" Configuration subsystem task 0 failed to properly register with the PLC Driver subsystem. There is no communication with the CPU. The details are found in the SCode value. 2 "*LAN system-software fault; resuming*" A failure occurred attempting to send a logon request to the PLC CPU. The CFG subsystem will no longer receive change notification mail. This will cause the LED's to not properly display a configuration store or clear. The details are found in the Scode value. 3 "*LAN system-software fault; resuming*" The PLC CPU sent an unrecognized request to the Configuration subsystem. *Entry* **3** may contain an internal error code indicating the type of the request. 4 "*LAN system-software fault; resuming*" PLC CPU sent an unrecognized message to the Configuration subsystem. **Entry 3** contains an internal code indicating the type of mail message for an unrecognized Unsolicited mail message, or the sequence number for an nrecognized response message. 5 "*LAN system-software fault; resuming*" The Configuration subsystem failed attempting to respond to a PLC CPU request. **Entry 3** contains the response message type. **Entry 4** contains the response message sequence number. 6 "*LAN system-software fault; resuming*" A failure occurred processing the Ethernet configuration. This error is due to an invalid configuration being stored. In the case of an invalid Advanced User Parameters file, **Entry 3** will contain the line number where the error occurred. Note: The Configuration processing stops at the first error detected. 7 "*LAN system-software fault; resuming*" A failure occurred in configuration timeout processing. The details are found in the Scode value. If no Scode value exists, the configuration was not received from the PLC CPU in a timely manner. Otherwise, an operating system error occurred attempting to send a message or event to perform the timeout processing. The last configuration stored will beretrieved from backup memory. If no configuration exists in backup, the default configuration will be used. 8 "*LAN system-software fault; resuming*" Failure attempting to retrieve backup configuration data from non-volatile memory. The backup configuration data has been corrupted. The default configuration will be used. 9 "*LAN system-software fault; resuming*" Failure attempting to store backup configuration data into non-volatile memory. The details are found in the Scode value.

Table B-5. Configuration Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "2" Configuration (CFG) events	**Entry 2** codes (Continued) a "*LAN system-software fault; resuming*" An unknown system event confirmation was received. **Entry 3** contains the confirmation type received. b "*LAN system-software fault; resuming*" A failure was returned by the PLC Driver while attempting to send a request to the PLC CPU to retrieve the PLC CPU date/time. The details are found in the Scode value. c "*LAN system-software fault; resuming*" A failure occurred attempting to remove a Task from the event notification list. The details are found in the SCode value returned by the UTL subsystem. d "*LAN system-software fault; resuming*" An unrecognized event was received by the timeout task. **Entry 3** contains the event code. f "*LAN system-software fault; resuming*" An unidentified subsystem attempted to vote on the module OK status. 10 "*LAN system-software fault; resuming*" Failure attempting to process a station manager command. **Entry 3** contains an internal error code. The details are found in the SCode value. If no SCode value exists, an invalid station manager command was attempted. 11 "*LAN system-software fault; resuming*" A failure was encountered when attempting to retrieve the internal system time from the DIAG subsystem. This will cause unreliable operation of the STAT LED. 12 "*LAN system-software fault; resuming*" An internal operating system error occurred while retrieving or updating the current time value in shared memory. This may cause unreliable timestamp values in produced EGD exchanges. **Entry 3** may contain an internal error code, which indicates a failure occurred while converting to POSIX time. The details are found in the SCode value. 13 "*LAN system-software fault; resuming*" A failure occurred receiving confirmation from one or more subsystems during the restart sequence. The restart will still occur. **Entry 3** may contain an internal error code. The details are found in the SCode value. 14 "*LAN system-software fault; resuming*" A failure occurred receiving confirmation from one or more subsystems during enter sequence into factory diagnostics. Factory diagnostics will still occur. **Entry 3** may contain an internal error code. The details are found in the SCode value. 15 "*LAN system-software fault; resuming*" A failure occurred attempting to allocate space to insert a Task into the notification list for system events. **Entry 3** contains an internal error code, which indicates the system events being registered. 16 "*LAN system-software fault; resuming*" A failure occurred while allocating memory for the Advanced User Parameters file received from the PLC. The details are found in the SCode value returned from the UTL subsystem.

Table B-5. Configuration Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "2" Configuration (CFG) events (continued)	**Entry 2** codes (Continued) 17 "*LAN system-software fault; resuming*" A failure occurred attempting to register a subsystem for system event notification. **Entry 3** contains an internal error code, which indicates the system events being registered. The details are found in the SCode value returned from the UTL subsystem. 18 "*LAN system-software fault; resuming*" A failure occurred attempting to deregister a subsystem for system event notification. **Entry 3** contains an internal error code, which indicates the system events being deregistered. The details are found in the SCode value. 19 "*LAN system-software fault; resuming*" A system event notification error occurred. The notification could not be sent due to an operating system error, or the notification occurred before the event notification user list was created. **Entry 3** may contain an internal error code, which indicates the system event being sent. The details are found in the Scode value. 1a "*LAN system-software fault; resuming*" An operating system error occurred while the CFG main task was receiving messages from other tasks. The details are found in the Scode value. 1b "*LAN system-software fault; resuming*" Cannot perform autoconfiguration due to an error while allocating space for the backup configuration in non-volatile memory, or while retrieving the backup configuration from non-volatile memory. **Entry 3** contains an internal error code. The details are found in the Scode value. 1d "*LAN system-software fault; resuming*" Unable to update Advanced User Parameters File during a station manager "chparm" command processing. A failure occurred while allocating space for the new parameter, or while retrieving the current Advanced User Parameter file from non-volatile memory. The details are found in the Scode value. 1e "*LAN system-software fault; resuming*" An error response message was returned from the CPU for a Logon request. **Entry 3** contains the response message type. **Entry 4** contains the response message sequence number. The details are found in the Scode value returned from the BPD subsystem. 1f "*LAN system-software fault; resuming*" An error response was returned from the CPU for a Get Date/Time request. **Entry 3** contains the response message type. **Entry 4** contains the response message sequence number. The details are found in the Scode value returned from the BPD subsystem. 21 "*LAN system-software fault; resuming*" An error response was returned from the CPU for a Get Program Name request. **Entry 3** contains the response message type. **Entry 4** contains the response message sequence number. The details are found in the Scode value returned from the BPD subsystem. 23 "*LAN system-software fault; resuming*" An invalid value was used for the Data Rate, Parity or Flow Control configuration parameters for serial port. **Entry 3** contains an internal error code. **Entry 4** contains the invalid value. 24 "*LAN system-software fault; resuming*" An internal system error occurred while a Task was attempting to enter or exit a critical region. The details are found in the Scode value.

Table B-5. Configuration Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "2" Configuration (CFG) events (continued)	**Entry 2** codes (Continued) 26 "*LAN system-software fault; resuming*" An internal system error occurred attempting to initiate a Restart sequence.The restart will **not** occur. The details are found in the Scode value. 27 "*LAN system-software fault; resuming*" An unrecognized Restart sequence command was received.**Entry 3** contains an internal error code. 2a "LAN system-software fault; resuming" The active SNTP server has changed. **Entries 3 and 4** contain the IP address of the previous SNTP server, displayed as two hexadecimal words. (For example, 3.0.0.1 would be shown as 0300H 0001H) 2b "LAN system-software fault; resuming" An operating system error occurred while canceling a timer. The failure occurred during the status task shutdown while preparing to enter factory diagnostics operation. The details are found in the Scode value. 2c "LAN system-software fault; resuming" A failure occurred in shared memory while responding to a firmware update request. The restart sequence will still occur and the module will restart into software load mode. The details are found in the Scode value. 2d "LAN system-software fault; resuming" A failure occurred attempting to write to flash to place the module into software load mode. The module will not accept a firmware update. 2e "LAN system-software fault; resuming" A failure occurred attempting to read PLC memory. 2f "LAN system-software fault; resuming" A failure occurred attempting to write to PLC memory. 30 "LAN system-software fault; resuming" A failure occurred attempting to register with the PLC for notification when a clear of faults occurs. Fault table updates may be missed if this error. 31 "LAN system-software fault; resuming" An unrecognized notification message was received from the PLC. The message is ignored. 32 "LAN system-software fault; resuming" A failure occurred in attempting to write the IP address to non-volatile storage. No non-volatile IP address will be available. 33 "LAN system-software fault; resuming" A failure occurred trying to set the IP address from the network. The IP address of the module was not set. 34 "LAN system-software fault; resuming" A failure occurred trying to process AUP information for a protocol. The protocol may not operate properly.

Table B-6 Operating System Error Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "3" Operating System Error events	This event is logged when the Operating System (RTOS) detects an unrecoverable error. Normal operation cannot continue. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. **Entry 2** (hexadecimal) values are: 1 "*LAN system-software fault; restarted LAN I/F*" A fatal Operating System error has occurred. The Ethernet Interface will be automatically restarted. **Entries 3** contains the hardware exception vector. for the failure. Note: The PLC Fault Table entry for this error is generated only after the restart has completed.

Table B-7. PLC Driver (BPD) Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "8" PLC Driver (BPD) events	This event is logged when a PLC Driver exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most PLC Driver events contain a **Scode** status value. **Entry 2** (hexadecimal) values are: 1 *No PLC Fault Table entry for this error.* PLC Driver subsystem was not initialized after a PLC powerup or Ethernet restart. There is no communication with the PLC CPU. 2 *No PLC Fault Table entry for this error.* Mailbox communication was not established with PLC CPU after a PLC powerup or Ethernet restart. There is no communication with the PLC CPU. **Entry 3** contains an internal error code. 3 "*Backplane communications with PLC fault; lost request*" Service Request Processor (within PLC CPU) is not come online after a PLC powerup or Ethernet restart. There is no mailbox communication with the PLC CPU. 4 "*Backplane communications with PLC fault; lost request*" Mailbox packets were received from PLC CPU in wrong order. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 5 "*Comm-Req Bad task ID programmed*" A COMMREQ was received from PLC CPU for an unknown or unregistered BPD User task. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 6 "*Backplane communications with PLC fault; lost request*" A mailbox message (other than a COMMREQ) was received from the PLC CPU for an unknown or unregistered BPD User task. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 8 "*Backplane communications with PLC fault; lost request*" PLC Driver timed out after 10 seconds waiting for an expected response from the PLC CPU. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 9 "*Backplane communications with PLC fault; lost request*" PLC Driver timed out after 10 seconds waiting for an expected response from a BPD User task to a request from the PLC CPU. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. a "*Backplane communications with PLC fault; lost request*" PLC Driver timed out after 10 seconds waiting for completion of a multipacket unsolicited transfer from the PLC CPU. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 10 *No PLC Fault Table entry for this error.* PLC Driver has stopped due to a fatal internal error. 11 "*LAN system-software fault; resuming*" Error starting internal operating timers. **Entry 3** contains an internal timer identification code. 12 "*LAN system-software fault; resuming*" Error registering a new BPD User task. **Entry 3** contains the task number; **Entry 4** may contain a memory allocation size.

Table B-7. PLC Driver (BPD) Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "8" PLC Driver (BPD) events	Entry 2 values (continued) 13 "*LAN system-software fault; resuming*" Error de-registering a BPD User task. **Entry 3** contains the task number. 14 "*LAN system-software fault; resuming*" Error receiving a mailbox transfer from a BPD User task. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 15 *(No PLC Fault for this exception)* Error sending a mailbox transfer to the PLC CPU. **Entry 3** contains either the task number or an internal error code; **Entry 4** contains the mailbox sequence number. 16 "*LAN system-software fault; resuming*" Error receiving a mailbox transfer from the PLC CPU. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 17 "*LAN system-software fault; resuming*" Error sending a mailbox transfer to a BPD User task. **Entry 3** contains eitherthe task number or an internal error code; **Entry 4** contains the mailbox sequence number. 18 "*LAN system-software fault; resuming*" Error flushing a mailbox transfer. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 19 "*LAN system-software fault; resuming*" Error handling internal transfer timeout timers. **Entry 3** contains either the task number or an internal error code; **Entry 4** contains the mailbox sequence number. 1a "*LAN system-software fault; resuming*" Error freeing an internal transaction record. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 1b "*LAN system-software fault; resuming*" Error generating Station Manager output data. **Entry 3** contains an internal error code; **Entry 4** contains the Station Manager command code. 1c "*LAN system-software fault; resuming*" Unknown Station Manager command was received. **Entry 3** contains the unknown Station Manager command code. 1d "*LAN system-software fault; resuming*" Error starting PLC Sweep timer task. 1e "*LAN system-software fault; resuming*" Error during PLC Sweep or PLC State Change notification. **Entry 3** contains the notification type code. 1f "*LAN system-software fault; resuming*" Error updating Ethernet Status Data. 20 "*LAN system-software fault; resuming*" Reject mail received from PLC CPU. **Entry 3** contains the task number; **Entry 4** contains the mailbox sequence number. 2a "*LAN system-software fault; resuming*" General non-fatal internal error. 30 "*LAN system-software fault; resuming*" Error during PLC Driver shutdown. **Entry 3** contains an internal error code.

Table B-8 Error Handler Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "d" Error Handler (ERR) events	This event is logged when an Error Handler exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. **Entry 2** (hexadecimal) values are: 1 "*LAN system-software fault; resuming*" An invalid exception index was passed to Error Handler. **Entry 3** is the invalid index. 2 "*LAN system-software fault; resuming*" Registration for CFG event notification failed. 3 "*LAN system-software fault; resuming*" A memory allocation failed. 4 "*LAN system-software fault; resuming*" Corrupted data was detected in the exception log, and the log was repaired. If **Entry 3** is 0001H, the log header was corrupted, and the entire previous content of the log was discarded. If **Entry 3** is 0002H, one or more exceptions were corrupted, and only the corrupted exceptions were discarded; **Entry 4** contains the number of discarded exceptions. 5 "*LAN system-software fault; resuming*" A hardware failure was detected in battery-backed non-volatile RAM while repairing a corrupted exception log. The repaired log was moved to volatile RAM. The entire content of the log will be lost when the module is powered off.

Table B-9. Station Manager Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "e" Station Manager (STA) events	This event is logged when a Station Manager exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most Station Manager events contain a **SCode** status value. **Entry 2** (hexadecimal) values are: 1 *"LAN system-software fault; resuming"* Failure to initialize / start-up the Station Manager subsystem. **Entry 3** is an internal identification code. 2 *"LAN system-software fault; resuming"* Failure creating / starting a Station Manager subsystem task. **Entry 3** is an internal identification code. 3 *"LAN system-software fault; resuming"* Failure storing / setting advanced user parameters in the Station Manager subsystem. **Entry 3** is an internal identification code. 4 *"LAN system-software fault; resuming"* Another network application is communicating on the same UDP port as the remote Station Manager. **Entry 3** is an internal identification code. 5 *"LAN system-software fault; resuming"* An attempt to send data to the remote Station Manager failed. **Entry 3** is an internal identification code. 6 *"LAN system-software fault; resuming"* An error in processing a PING has caused the PING to be aborted.

Table B-10 Common Utility Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "f" Common Utility (UTL) events	This event is logged when a Common Utility exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most Common Utility events contain a **SCode** status value. **Entry 2** (hexadecimal) values are: 1 "*LAN system-software fault; resuming*" Error in an operating system request. Details of the error are found in the SCode value. 2 "*LAN system-software fault; resuming*" Error in memory allocation request. 3 "*LAN system-software fault; aborted assoc. & resuming*" Error entering or leaving a critical region. 4 "*LAN system-software fault; resuming*" Error generating Station Manager output data. 5 "*LAN system-software fault; resuming*" Unknown Station Manager command was received. **Entry 3** contains the unknown Station Manager command code. 6 "*LAN system-software fault; aborted assoc. & resuming*" A command to the Ethernet physical interface did not complete. The LAN interface status bits relating to the network are not reliable. 7 "*LAN system-software fault; resuming*" Error registering for event notification from CFG subsystem. 8 "*LAN system-software fault; resuming*" Error entering or leaving a critical region within UTL main task. 9 "*LAN system-software fault; resuming*" Error processing an internal event request. a "*LAN system-software fault; resuming*" Internal event processing error. b "*LAN system-software fault; resuming*" Internal software error.

Table B-11. SRTP Server Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "1b" SRTP Server events	This event is logged when a SRTP Server exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most SRTP Server events contain a **SCode** status value. **Entry 2** (hexadecimal) values are: 1 "*LAN I/F can't init-check parms; running soft Sw Utl*" SRTP Server subsystem was not initialized after a PLC powerup or Ethernet restart. Servicing of SRTP communication requests will fail. **Entry 3** contains a code indicating the reason for the failure. 2 "*LAN system-software fault; resuming*" Error requesting an operating system service. 3 "*LAN system-software fault; resuming*" SRTP Server was not able to close the listen socket when the maximum number of SRTP Server connections was established. Subsequent attempts to establish an SRTP Server connection will fail until the PLC is restarted. 4 "*LAN system-software fault; resuming*" SRTP Server was not able to re-open a listen port upon termination of an SRTP connection. Subsequent attempts to establish an SRTP Server connection will fail until the PLC is restarted. 5 "*LAN system-software fault; resuming*" SRTP Server lost the internal mechanism necessary to handle changes in module configuration and to process the keep-alive timer that will terminate an SRTP connection that enters a state it cannot exit. 6 "*LAN system-software fault; resuming*" SRTP Server lost the keep-alive timer mechanism. This timer is necessary to terminate an SRTP connection that enters a state it cannot exit. 7 "*LAN system-software fault; resuming*" SRTP Server detected an invalid connection identifier while attempting to process an event. **Entry 3** contains the connection ID. 8 "*LAN system-software fault; resuming*" An invalid command was received by an SRTP Server task. **Entry 3** contains a code representing the task command received. 9 "*LAN system-software fault; resuming*" An attempt to accept an incoming TCP connect request failed. Subsequent attempts to establish an SRTP Server connection will fail until the PLC is restarted. a "*LAN system-software fault; resuming*" An attempt to start a trace on an SRTP Server connection being established has failed. b "*LAN system-software fault; resuming*" An attempt to receive an SRTP PDU from the remote SRTP endpoint failed. The SRTP connection has been terminated. c "*LAN system-software fault; resuming*" An attempt to send an SRTP PDU to the remote SRTP endpoint failed. **Entry 3** contains the PLC Driver (BPD) user identification number and the transfer identification number for the SRTP PDU that failed.

Table B-11. SRTP Server Event Entry Codes for Style B Station Manager -continued

Log Event Code	Possible Cause and Resolution
Event "1b" SRTP Server events (continued)	**Entry 2** codes (Continued) d "*LAN system-software fault; resuming*" An attempt to process an SRTP PDU that was received from the remote SRTP endpoint failed. **Entry 3** contains the PLC Driver (BPD) user identification number and the transfer identification number for the SRTP PDU that failed; **Entry 4** contains a code indicating the type of SRTP PDU that could not be processed. e "*Backplane communications with PLC fault; lost request*" An attempt to register a connection with the PLC Driver (BPD) failed. Communication with the PLC CPU on the SRTP Server connection cannot occur. **Entry 3** contains the PLC Driver (BPD) user identification number that failed to register. f "*Backplane communications with PLC fault; lost request*" An attempt to de-register a connection with the PLC Driver (BPD) failed. Any subsequent attempts to establish this SRTP Server connection may fail. **Entry 3** contains the PLC Driver (BPD) user identification number that failed to be de-registered. 10 "*Backplane communications with PLC fault; lost request*" An attempt to send a request to the PLC Driver (BPD) failed. SRTP Server will initiate the error service that will result in termination of the SRTP connection. 11 "*Backplane communications with PLC fault; lost request*" An attempt to send a message to the PLC Driver (BPD) failed. SRTP Server will initiate the error service that will result in termination of the SRTP connection. 12 "*Backplane communications with PLC fault; lost request*" The PLC Driver (BPD) was not able to process a request from SRTP Server or the corresponding response. **Entry 3** contains the PLC Driver (BPD) user identification number and the transfer identification number of the request that failed. 13 "*LAN system-software fault; resuming*" An unexpected request was received from the PLC CPU. **Entry 3** contains the PLC Driver (BPD) user identification number and the transfer identification number of the unexpected request. 14 "*LAN data memory exhausted-check parms; resuming*" An attempt to allocate a resource failed. **Entry 3** may contain the PLC Driver (BPD) user identification number and the transfer identification number of the request during which the failure occurred. 15 "*LAN system-software fault; resuming*" An attempt to free a resource failed. **Entry 3** may contain the PLC Driver (BPD) user identification number and the transfer identification number of the request during which the failure occurred. 16 "*LAN system-software fault; resuming*" An attempt to abort a request sent to the PLC Driver (BPD) failed. **Entry 3** may contain the PLC Driver (BPD) user identification number and the transfer identification number for the request that failed to be aborted.

Table B-11. SRTP Server Event Entry Codes for Style B Station Manager - continued

Log Event Code	Possible Cause and Resolution
Event "1b" SRTP Server events (continued)	**Entry 2** codes (Continued) 17 "*LAN system-software fault; resuming*" An error was detected in SRTP Server that failed to be processed. **Entry 3 & Entry 4** contain a code indicating the error that failed to be processed. 18 "*LAN system-software fault; resuming*" An unexpected event has arrived on an SRTP Server connection. No state transition exists for the event in the connection's current state. **Entry 3** contains the event code. 19 "*LAN system-software fault; resuming*" An internal error occurred that prevented SRTP Server from sending an SRTP PDU. SRTP Server failed to understand the type of SRTP PDU that needed to be sent. **Entry 3** contains a code indicating the reason for the send SRTP PDU request. 1a "*LAN system-software fault; resuming*" An attempt to add tracking of an open SRP session on an SRTP Server connection failed. SRTP Server will be unable to terminate the session when the connection is closed. Any subsequent attempts to open this connection will fail until the PLC is power-cycled. **Entry 3** contains the session's service request processor address. 1b "*LAN system-software fault; resuming*" An attempt to delete tracking of an SRP session on an SRTP Server connection failed. **Entry 3** contains the session's service request processor address. 1c "*LAN system-software fault; resuming*" An attempt to automatically terminate a dangling session with the service request processor failed. Any subsequent attempts to establish this SRTP Server connection may fail. **Entry 3** contains the session's service request processor address. 1d "*LAN system-software fault; resuming*" SRTP Server failed to synchronize operating parameters with the configuration received from the PLC CPU. 1e "*LAN system-software fault; resuming*" A valid event has arrived on an SRTP Server connection that is in an invalid state. **Entry 3** contains a code indicating the current state of the SRTP Server connection. 1f "*LAN system-software fault; resuming*" An internal error occurred while attempting to delete an SRTP Server task. 20 "*LAN system-software fault; resuming*" SRTP Server was unable to find a record of a transaction that was sent to the PLC CPU when the PLC Driver (BPD) notified SRTP Server that activity occurred on that transaction (either the response was received or an error occurred on that transaction). **Entry 3** contains the PLC Driver (BPD) user identification number and the transfer identification number of the request without a matching transaction record.

Table B-11. SRTP Server Event Entry Codes for Style B Station Manager - continued

Log Event Code	Possible Cause and Resolution
Event "1b" SRTP Server events (continued)	**Entry 2** codes (Continued) 21 "*LAN system-software fault; resuming*" A PDU arrived in a state in which the SRTP connection cannot handle it. SRTP Server will initiate the error service that will result in termination of the SRTP connection. **Entry 3** contains a code indicating the PDU type. Valid PDU type codes are as follows: 0 Connect Request 1 Connect Response 2 Data Request 3 Data Response 4 Unconfirmed Request 5 Error Request 6 Destinations Request 7 Destinations Response 8 Session Request **Entry 4** contains a code indicating the state of the SRTP connection. Valid state codes are as follows: 1 IDLE 2 OPENING 3 ESTABLISHED 4 CLOSING 5 TERMINATE 22 "*LAN I/F capacity exceeded; discarded request*" An SRTP connection could not be created due to either the enforcement of a maximum limit on the number of SRTP connections or an internal error that prevents processing of an establish connection request, such as system resource exhaustion. 23 "*LAN system-software fault; resuming*" An attempt to increment an SRTP Server tally failed. **Entry 3** contains the ID of the tally that failed to be incremented. 24 "*LAN system-software fault; resuming*" SRTP Server dropped a keep-alive timer tick. Timing of keep-alive timer processing may be temporarily skewed. 25 "*LAN system-software fault; resuming*" An attempt to restart SRTP Server failed. 26 "*Bad remote application request; discarded request*" A PDU arrived with a **version** field number higher than the SRTP protocol version supported by SRTP Server.**Entry 3** contains the version number of the PDU; **Entry 4** contains the SRTP version supported by the SRTP Server. 27 "*Bad remote application request; discarded request*" A PDU arrived with an invalid **pdu_type** field code. **Entry 3** contains the value of the **pdu_type** field. Valid PDU type codes are listed in the description of **Entry 2** = 21H.

Table B-11. SRTP Server Event Entry Codes for Style B Station Manager - continued

Log Event Code	Possible Cause and Resolution
	28 "*Bad remote application request; discarded request*" A PDU arrived with a non-zero **data_length** field, but was of a class of PDU's which must have zero (0) in this field. **Entry 3** contains the PDU's type code. Valid PDU type codes are listed in the description of **Entry 2** = 21H. **Entry 4** contains the lower 16 bits of the **data_length** field. 29 "*Bad remote application request; discarded request*" An Error Request PDU arrived from a remote SRTP endpoint. The SRTP connection will be terminated. **Entry 3** contains the error code in the Error Request PDU. 2a "*LAN system-software fault; resuming*" An attempt to shutdown SRTP Server failed. 2b "*Bad remote application request; discarded request*" A valid SRTP PDU arrived, but the SRTP Server does not support handling it. **Entry 3** contains the value of the **pdu_type** field. Valid PDU type codes are listed in the description of **Entry 2** = 21H. 2c "*LAN system-software fault; resuming*" An error occurred in establishing internal event processing. 2d "*LAN system-software fault; resuming*" An error occurred trying to terminate the Keep Alive timer for the connection. 2e "*LAN system-software fault; resuming*" The SRTP connection timed out.

Table B-12. Network Interface Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "20" Network Interface events	This event is logged when a Network Interface exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most Network Interface events contain a **SCode** status value. **Entry 2** (hexadecimal) values are: 1 "*LAN transceiver fault; OFF network until fixed*" Ethernet Interface is Offline and cannot communicate on the Ethernet network. This is usually caused by disconnection from the network. Check the network cable and connection to the network hub or switch. 2 "*LAN system-software fault; aborted assoc. & resuming*" Error updating LAN Interface Status (LIS) bits (the first 16 bits of the 80-bit Ethernet Status data). **Entry 3** and **Entry 4** are the AND mask and OR mask values used to modify the LIS when the failure occurred. 3 "*LAN system-software fault; aborted assoc. & resuming*" The network switch could not be accessed since it was autonegotiating. Usually this is a transient error due to a disconnected cable. If the error persists, check the network cable and connection.

Table B-13 Ethernet Global Data (EGD) Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "28" Ethernet Global Data (EGD) events	This event is logged when an Ethernet Global Data (EGD) exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most Ethernet Global Data events contain a **SCode** status value. For many of the errors, the exchange that experienced the error is identified in the extended data available using the 'log z' command using the producer ID and exchange ID of the exchange. **Entry 2** (hexadecimal) values are: 1 "*LAN system-software fault; resuming*" Error in an operating system request. Details of the error are found in the **SCode**. **Entry 3** and **Entry 4** may contain additional internal error codes. 2 "*LAN system-software fault; resuming*" Error initializing EGD. No EGD exchanges will be processed until the power to the module is cycled. 3 "*LAN system-software fault; resuming*" Error retrieving the soft switch or advanced user parameters data. EGD may be operating with unexpected parameter settings. 4 "*LAN system-software fault; resuming*" Unable to register for PLC data transfers. EGD will be inoperative until this problem is fixed. 5 "*Backplane communications with PLC fault; lost request*" An unknown internal message was received by EGD main task. **Entry 3** and **Entry 4** contain the initial portion of the unrecognized massage. 6 "*LAN system-software fault; resuming*" Error in a PLC request to establish an EGD exchange. The exchange with this error will not be created. This is an internal error and should be eported to GE Fanuc for corrective action. 7 "*LAN data memory exhausted-check parms; resuming*" Error in allocating memory to hold the state of an exchange. The exchange in question will not transfer any data. 8 "*LAN I/F capacity exceeded; discarded request*" A request to allocate shared memory to communicate the exchange data to the PLC failed. The exchange in question will not transfer any data. **Entry 3** contains the size of the connection area to be allocated. 9 "*LAN system-software fault; resuming*" The internal identifier used by the PLC to identify the exchange was not valid. **Entry 3** is the internal exchange handle; **Entry 4** is the internal connection ID. This is an internal error and should be reported to GE Fanuc for corrective action. a "*LAN system-software fault; resuming*" The name format in the exchange is not supported. **Entry 3** contains the producer name format; **Entry 4** contains the consumer name format. This is an internal error and should be reported to GE Fanuc for corrective action. c "*LAN system-software fault; resuming*" Error releasing shared memory. Details of the error are found in the **SCode**. **Entry 3** contains the shared memory offset. d "*LAN system-software fault; resuming*" Error freeing the state information for an exchange. **Entry 3** is the exchange number. e "*LAN system-software fault; resuming*" Error in accessing the semaphore for an exchange. Details of the error are found in the **SCode**. f "*Backplane communications with PLC fault; lost request*" An unexpected PLC service has been received. **Entry 3** is an internal identification code. This is an internal error and should be reported to GE Fanuc for corrective action.

Table B-13 Ethernet Global Data (EGD) Event Entry Codes for Style B Station Manager - continued

Log Event Code	Possible Cause and Resolution
Event "28" Ethernet Global Data (EGD) events (continued)	Event 2 entries (continued): 10 "*Backplane communications with PLC fault; lost request*" An unrecognized message has been received from the PLC. **Entry 3** contains the command code from the unrecognized message. This is an internal error and should be reported to GE Fanuc for corrective action. 11 "*Backplane communications with PLC fault; lost request*" An improperly formed message has been received from the PLC. **Entry 3**contains the size of any data with this message. This is an internal error and should be reported to GE Fanuc for corrective action. 12 "*LAN data memory exhausted-check parms; resuming*" Error in allocating memory for internal EGD communication. **Entry 3** contains the size of the requested allocation. 13 "*LAN system-software fault; resuming*" An unrecognized message has been received from the PLC. **Entry 3** contains he command code from the unrecognized message. This is an internal error and should be reported to GE Fanuc for corrective action. 14 "*LAN system-software fault; resuming*" Error return from a request to scan EGD consumed data. Details of the error are found in the **SCode**. One or more samples will be lost or delayed in being transferred to the PLC application. This error may be logged during a normal shutdown if a request occurs simultaneously with the power shut off. 15 "*Backplane communications with PLC fault; lost request*" Error in sending mail to the PLC. Typically this will result in the PLC CPU generating a "loss of module" fault on the Ethernet module. 16 "*LAN system-software fault; resuming*" Error in generating Station Manager output. Details of the error are found in the **SCode**. **Entry 3** contains an additional internal error code. 17 "*LAN system-software fault; resuming*" Error in printing tally output. Details of the error are found in the **SCode**. 18 "*LAN system-software fault; resuming*" Unknown Station Manager command was received. **Entry 3** contains the unknown Station Manager command code. 19 "*LAN system-software fault; resuming*" Error in identifying the state of a produced exchange. This is an internal error and should be reported to GE Fanuc for corrective action. 1a "*LAN system-software fault; resuming*" Error in communicating between EGD tasks. **Entry 3** and **Entry 4** contain additional internal error codes. This is an internal error and should be reported to GE Fanuc for corrective action. 1b "*LAN system-software fault; resuming*" Unrecognized data received on the EGD data port. **Entry 3** contains the unrecognized command code; **Entry 4** contains the PDU version. The data in the received message is ignored. 1c "*LAN system-software fault; resuming*" The signature field in a sample is invalid. **Entry 3** contains the signature. This indicates that the producer and the consumer may not agree on the format of the data. The exchange having the error is identified in the extended data available using the 'log z' command. 1d "*LAN system-software fault; resuming*" The length of the sample received for a consumed exchange does not match the length configured for the exchange. **Entry 3** contains the received data length. This usually means that the producer and the consumer of the data don't agree on its format. The exchange having the error is identified in the extended data available using the 'log z' command.

Table B-13 Ethernet Global Data (EGD) Event Entry Codes for Style B Station Manager - continued

Log Event Code	Possible Cause and Resolution
Event "28" Ethernet Global Data (EGD) events (continued)	Event 2 entries (continued): 1e "*LAN system-software fault; resuming*" Error return from a request to scan EGD consumed data. Details of the error are found in the **SCode**. One or more samples will be lost or delayed in being transferred to the PLC application. This error may be logged during a normal shutdown if a request occurs simultaneously with the power shut off. 1f "*LAN system-software fault; resuming*" Error retrieving information about the shared memory between the PLC and the Ethernet module. Details of the error are found in the **SCode**. 20 "*LAN system-software fault; resuming*" Invalid adapter index encountered in an exchange. **Entry 3** contains the adapter index. 22 "*LAN system-software fault; resuming*" The length field in a received sample does not match with the length of the sample packet. **Entry 3** contains the received data length. This normally indicates an error in the producer of the data. 23 "*LAN system-software fault; resuming*" Error in a mail request received from the PLC. 24 "*LAN system-software fault; resuming*" Internal error in the EGD subsystem. 25 "*LAN system-software fault; resuming*" Error in entering or leaving a critical region. Details of the error are found in the **SCode**. 26 "*LAN system-software fault; resuming*" Error processing a consumed exchange time out. All subsequent timeout processing is suspect. 24 "*LAN system-software fault; resuming*" Error processing internal events within EGD.

Table B-14. SNTP Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "29" SNTP events	This event is logged when a SNTP exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most SNTP events contain a **SCode** status value. **Entry 2** (hexadecimal) values are: 1 "*LAN system-software fault; resuming*" SNTP client failed to lock onto a valid SNTP time server within the timeout. 2 "*LAN system-software fault; resuming*" A locked-on SNTP server was lost and the time server was changed. 6 "*LAN system-software fault; resuming*" An attempt to join the multicast host group failed. 9 "*LAN system-software fault; resuming*" An invalid timer identification value was detected. This is an internal software error. b "*LAN system-software fault; resuming*" the lock on the time server was lost. The module is no longer synchronized to any time servers c "*LAN system-software fault; resuming*" An internal time computation error was detected. 10 "*LAN system-software fault; resuming*" An error occurred in an operating system request. This is an internal software error. 11 "*LAN system-software fault; resuming*" An error occurred in registering for configuration. This is an internal software error. 12 "*LAN system-software fault; resuming*" An error occurred in retrieving configuration. This is an internal software error. 13 "*LAN system-software fault; resuming*" Internal configuration error. 14 "*LAN system-software fault; resuming*" Internal messaging error. 15 "*LAN system-software fault; resuming*" Internal error processing a station manager request. 16 "*LAN system-software fault; resuming*" Error producing output for a station manager command 17 "*LAN system-software fault; resuming*" Error in producing station manager tally output.

Table B-15. Run-time Diagnostic Event Entry Codes for Style B Station Manager

Log Event Code	Possible Cause and Resolution
Event "2A" Run-time Diagnostic events	This event is logged when a run-time exception event occurs. **Entry 2** values are listed below. **Entries 5 and 6** contain an internal location identification code. Most events contain a **SCode** status value. **Entry 2** (hexadecimal) values are: 2 "*LAN System-Software Fault; Resuming*" Run-time diagnostic initialization failed. 3 "*Module Software Corrupted; Requesting Reload*" Run-time CRC verification failed. The module firmware must be reloaded. 4 "*LAN System-Software Fault; Resuming*" CPU heartbeat time-out occurred. **Entry 3** contains previous heartbeat service interval, **Entry 4** contains the timeout clock value at the time of the failure. This fault causes EGD to be disabled. 5 *"LAN System-Software Fault; Resuming"* CPU I/O timeout occurred. Entry 3 contains previous I/O service interval, Entry 4 contains the timeout clock value at the time of the failure. 6 "*LAN System-Software Fault; Resuming*" Error entering factory test mode; unable to shut down the Network Interface. 7 "*LAN System-Software Fault; Resuming*" Run-time diagnostic operating system service error. 8 "*LAN System-Software Fault; Resuming*" Error in internal event processing request.

Appendix C Tally Descriptions

The tables in this section list the tallies and their meanings (see the TALLY command in Chapter 6/7, "Command Descriptions").

- Tallies for Style A Station Manager
  - PLC Driver Tallies (Tally c) (table C-1)
  - ARP Tallies (Tally f) (table C-2)
  - Channel API Tallies (Tally h) (table C-3)
  - IP Tallies (Tally i) (table C-4)
  - IP Router Tallies (part of Tally i) (table C-5)
  - Redundant IP Tallies (part of Tally i) (table C-6)
  - ICMP Tallies (Tally j) (table C-7)
  - IGMP Tallies (part of Tally j) (table C-8)
  - Data Link Tallies (Tally l) (table C-9)
  - MAC Layer Tallies (part of Tally l) (table C-10)
  - Modbus/TCP Channel API Layer Tallies (Tally m) (table C-11)
  - Name Resolution Tallies (Tally r) (table C-12)
  - Modbus/TCP Server Layer Tallies (Tally s) (table C-13)
  - UDP Tallies (Tally u) (table C-14)
  - SRTP Server Tallies (Tally v) (table C-15)
  - TCP Tallies (Tally w) (table C-16)
  - EGD Tallies (Tally g) (table C-17)
- Tallies for Style B Station Manager
  - Tally Counters
  - System Memory Tallies (task b) (table C-18)
  - PLC Driver Tallies (task c) (table C-19)
  - SMI Driver Tallies (part of task c) (table C-20)
  - SRTP Server Tallies (task v) (table C-21)
  - Ethernet Global Data Tallies (task g) (table C-22)
  - Network Interface Tallies (task l) (table C-23)
  - ARP Tallies (task f) (table C-24)
  - IP Tallies (task i) (table C-25)
  - ICMP/IGMP Tallies (task j) (table C-26)
  - TCP Tallies (task w) (table C-27)
  - UDP Tallies (task u) (table C-28)
  - SNTP Tallies (task n) (table C-29)

In some tables there are two names (one enclosed in parentheses). The first name is the name displayed by the Station Manager. The name in parentheses is the SNMP (Simple Network Management Protocol) variable name, included here for reference (SNMP is not currently supported by the Ethernet Interface).

Tallies for Style A Station Manager

Table C-1. PLC Driver Tallies (Tally c)

Tally	Meaning
PlcQFull	Count of the number of times a request of the PLC was retried because of congestion in the PLC.
PlcSweep	Count of the number of executive windows received by the Ethernet Interface.
MsgRcv	Count of the number of messages received from the CPU.
PlcReq	Count of the number of COMMREQs received from the application program.
PlcAbt	Count of the number of times the CPU aborted a data transfer.
MsgSent	Count of the number of times the CPU sent a message.
MyAbt	Count of the number of times the Ethernet Interface aborted a data transfer.
Write	Count of the number of times the Ethernet Interface successfully wrote to the PLC memory.
Read	Count of the number of times the Ethernet Interface successfully read from the PLC memory.
Timeout	Count of the number of times the Ethernet Interface timed out waiting for a response from the CPU.
uCode	The microcode revision level of the firmware in the CPU.

Table C-2. ARP Tallies (Tally f)

Tally	Meaning
InReq	The number of ARP requests received by ARP.
InRsp	The number of ARP responses received by ARP.
InErrors	The number of ARP packets received where the protocol or hardware types do not match the types of this entity.
OutReq	The number of ARP requests sent by ARP.
OutRsp	The number of ARP responses sent by ARP.
Filtered	The number of ARP packets ignore because they were not addressed to this node.

Table C-3. Channel API Tallies (Tally h)

Tally	Meaning
InPDU	The number of new incoming SRTP PDUs that have arrived.
OutPDU	The number of outgoing SRTP PDUs that were sent.
BadPDU	Some detected error prevented handling an STRP PDU.
OutConRq	The number of Connect Request STRP PDUs that were sent.
InConRp	The number of Response SRTP PDUs that have arrived.
OutSesRq	The number of Session Request SRTP PDUs that were sent.
OutDatRq	The number of Data Request SRTP PDUs that were sent.
InDatRp	The number of Data Response SRTP PDUs that have arrived.
InErrRq	The number of Error Request SRTP PDUs That have arrived.
OutDisRq	The number of Disconnect Requests that were sent.
InDisRq	The number of Disconnect Requests that have arrived.
InCmd	The number of COMMREQs that have arrived.
BadCmd	The number of COMMREQs that have arrived with an unrecognized command.

Table C-4. IP Tallies (Tally i)

Tally	Meaning
Forward (ipForwarding)	The indication of whether this entity is acting as an IP gateway with respect to the forwarding of datagrams.
DefltTTL (ipDefaultTTL)	The default value inserted into the Time–To–Live field of the IP header of datagrams originated at this entity.
InRecv (ipInReceives)	The total number of input datagrams received from interfaces, including those received in error.
InHdrErr (ipInHdrErrors)	The number of input datagrams discarded due to errors in their IP headers.
InAdrErr (ipInAddrErrors)	The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity.
ForwDgms (ipForwDatagrams)	The number of input datagrams for which this entity was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. (Not used)
InUnkPro (ipInUnknownProtos)	The number of locally–addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
InDiscds (ipInDiscards)	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (e.g., for lack of buffer space).
InDelivs (ipInDelivers)	The total number of input datagrams successfully delivered to IP user–protocols (including ICMP).
OutReq (ipOutRequests)	The total number of IP datagrams which local IP user–protocols (including ICMP) supplied to IP in requests for transmission.
OutDiscd (ipOutDiscards)	The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (e.g. for lack of buffer space).
OutNoRts (ipOutNoRoutes)	The number of IP datagrams discarded because no route could be found to transmit them to their destination.
ReasmTO (ipReasmTimeout)	The maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity. (Not used)
ReasmReq (ipReasmReqds)	The number of IP fragments received which needed to be reassembled at this entity.
ReasmOKs (ipReasmOKs)	The number of IP datagrams successfully re–assembled.
ReasmFai (ipReasmFails)	The number of failures detected by the IP re–assembly algorithm (for whatever reason: timed out, errors, message size too big, etc.).
FragOKs (ipFragOks)	The number of IP datagrams that have been successfully fragmented at this entity.
FragFail (ipFragFails)	The number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could no be, e.g., because their "Don't Fragment" flag was set.
FragCrea (ipFragCreate)	The number of IP datagrams that have been generated as a result of fragmentation at this entity.
Filtered	The number of IP datagrams ignored because they were sent to an unreachable IP user and not directly addressed to this "node".

Table C-5. IP Router Tallies (part of Tally i)[1]

Tally	Meaning
ToPtDel	Number of packets sent to routing partner.
ToPtDsc	Number of packets discarded before delivery to routing partner.
FrPtDel	Number of packets from routing partner received for this node.
FrPtNoQ	Number of packets from routing partner discarded (input queue full).
ToNetDel	Number of packets from routing partner sent over network to a non-gateway destination.
NoPtDsc	Number of packets from network discarded because destination not in routing partner table. (Note: only used in Release 2.5 or earlier)
FrPtTyp	Number of packets from routing partner discarded (unknown packet type).
FrPtGwy	Number of packets discarded because gateway address is invalid. (Note: only used in Release 2.5 or earlier)
TTLzero	Number of routed frames discarded because time–to–live has been decremented to zero.
NtGWDel	Number of packets from the network or originating locally sent to a gateway identified in the routing table.
NtDGDel	Number of packets from the network or originating locally sent to the default gateway.
PtGWDel	Number of packets from routing partner sent to a gateway in the routing table.
PtDGDel	Number of packets from routing partner sent to the default gateway.
PtFwdDg	Number of packets from a routing partner which should be forwarded.

[1] Series 90–70 Ethernet Interface (Type 2) only

Table C-6. Redundant IP Tallies (part of Tally i)[1]

These tallies are reserved.

[1] Series 90–70 Ethernet Interface (Type 2) only

Table C-7. ICMP Tallies (Tally j)

Tally		Meaning
InMsgs	(icmpInMsgs)	The total number of ICMP messages received.
InErrors	(icmpInErrors)	The number of ICMP messages received that have errors (bad checksums, etc.).
InDstUnr	(icmpInDestUnreachs)	The number of ICMP Destination Unreachable messages received.
InTimeEx	(icmpInTimeExcds)	The number of ICMP Time Exceeded messages received.
InParmPr	(icmpInParmProbs)	The number of ICMP Parameter Problem messages received.
InSrcQch	(icmpInSrcQuenchs)	The number of ICMP Source Quench messages received.
InRedir	(icmpInRedirects)	The number ICMP Redirect messages received.
InEchos	(icmpInEchos)	The number of ICMP Echo (requests) messages received.
InEchoRp	(icmpInEchoReps)	The number of ICMP Echo Reply messages received.
InTmSp	(icmpInTimestamps)	The number of ICMP Timestamp (request) messages received.
InTmSpRp	(icmpInTimestampReps)	The number of ICMP Timestamp Reply messages received.
InAdrM	(icmpInAddrMasks)	The number of ICMP Address Mask Request messages received.
InAdrMRp	(icmpInAddrMaskReps)	The number of ICMP Address Mask Reply messages received.
OtMsgs	(icmpOutMsgs)	The total number of ICMP messages attempted to send.
OtErrors	(icmpOutErrors)	The number of ICMP messages not sent due to problems discovered within ICMP.
OtDstUnr	(icmpOutDestUnreachs)	The number of ICMP Destination Unreachable messages sent.
OtTimeEx	(icmpOutTimeExcds)	The number of ICMP Time Exceeded messages sent.
OtParmPr	(icmpOutParmProbs)	The number of ICMP Parameter Problem messages sent.
OtSrcQch	(icmpOutSrcQuenchs)	The number of ICMP Source Quench messages sent.
OtRedir	(icmpOutRedirects)	The number of ICMP Redirect messages sent.
OtEchos	(icmpOutEchos)	The number of ICMP Echo (request) messages sent.
OtEchoRp	(icmpOutEchoReps)	The number of ICMP Echo Reply messages sent.
OtTmSp	(icmpOutTimestamps)	The number of ICMP Timestamp (request) messages sent.
OtTmSpRp	(icmpOutTimestampReps)	The number of ICMP Timestamp Reply messages sent.
OtAdrM	(icmpOutAddrMasks)	The number of ICMP Address Mask Request messages sent.
OtAdrMRp	(icmpOutAddrMaskReps)	The number of ICMP Address Mask Reply messages sent.
Filtered		Number of ICMP messages ignored because they were not directly addressed to this node, or because this node has detected an invalid address for an incoming IP or ICMP message.

Table C-8. IGMP Tallies (part of Tally j)[1,2]

Tally	Meaning
InMsgs	Number of messages received (all types, includes msgs with errors).
InQuery	Number of valid query messages received.
InReply	Number of valid reply messages received.
InError	Number of messages received with checksum errors.
OutQuery	Number of query messages sent.
OutReply	Number of reply messages sent.

[1] Series 90–30 CPU364 only

[2] Series 90–70 Ethernet Interface (Type 2) only

Table C-9. Data Link Tallies (Tally l)

Tally	Meaning
Unreg	Number of 802.3 frames received and discarded because the destination LSAP was not configured in the node.
Lsap0	Number of frames received and discarded because the destination LSAP had the value zero.
LsapOfl	Number of LLC service requests rejected due to lack of LSAP table space. A non–zero value in this tally indicates an Ethernet Interface system software error and should be reported to GE Fanuc Automation immediately.
EthUnreg	Number of Ethernet frames received and discarded because the destination Protocol was not configured in the node.
MacErr	A severe network fault prevented transmission of a frame for more than one second. See Exception Log, Event c, Entry 2 = 10b.
BufProb	A received LLC frame was lost due to the inability of the LLC software to acquire a system buffer. This may indicate a memory configuration problem or a temporary overload of traffic at the station.
UnrecPdu	Number of 802.3 frames received and discarded because the LLC control field is invalid.
TstRcvd	Number of test frames received.
TstResp	Number of test frame responses sent.
PadErr	Number of frames received which had a padding and the padding was more than 48 bytes.

Table C-10. MAC Layer Tallies (part of Tally l)

Tally	Meaning
SQEErr	Number of times the SQE test failed. On a 10 Base–T network, this indicates missing link pulses.
MisdPack	The number of packets a receiver lost due to a lack of receive buffers.
FrameErr	The number of incoming packets that did not contain a multiple of eight bits.
SuccOne	The number of times a successful transmission was made with exactly one retry.
CrcErr	The number of incoming packets detected with a CRC error.
RbufErr	The number of times the next buffer was unavailable while receiving a chained data packet.
LateColl	The number of times a collision occurred after the slot time of the channel had elapsed.
LostCarr	The number of times the carrier was lost during a transmission.
BsyCarr	The number of times the transmitter had to wait because it sensed a busy carrier signal.
NoRtry	The number of times a successful transmission was made with no retries needed.
SuccMore	The number of times a successful transmission was made with more than one retry.
FRtry	The number of times the transmission failed despite using the maximum of 15 retries.

Table C-11. Modbus/TCP Channel API Layer Tallies (Tally m)[1]

Tally	Meaning
InPDU	The number of new incoming Modbus/TCP PDUs that have arrived.
OutPDU	The number of outgoing Modbus/TCP PDUs that were sent.
BadPDU	The number of incoming Modbus/TCP PDUs that contained an error, such as invalid function code, invalid message length, message too long, response received doesn't match request issued, response doesn't contain correct number of data bytes (or 0 data bytes), unrecognized protocol ID in message,
OutConRq	The number of connection requests that were sent.
InConRp	The number of connection responses that have arrived.
OutDatRq	The number of data transfer requests that were sent.
InDatRp	The number of data transfer responses that have arrived.
InErrRp	The number of responses that have arrived with the error indicator set.
OutDisRq	The number of disconnection requests that were sent.
InDisRp	The number of disconnection responses that have arrived.
InCmd	The number of COMMREQs that have arrived.
BadCmd	The number of COMMREQs that have arrived with an unrecognized command.

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Table C-12. Name Resolution Tallies (Tally r)

Tally	Meaning
RegReqTx	DDP Registrations attempted (local or network).
RegSucc	DDP Registrations or Deregistrations successful.
RegReqRx	DDP Register PDUs received from network (= other registration attempts).
DeregReq	DDP Deregistrations attempted.
RsvReqTx	DDP Resolves attempted (local or network).
RsvRspRx	DDP Resolve Responses recieved (local or network).
RsvReqRx	DDP Resolve Req PDUs received from network (= other registration attempts).
RsvRspTx	DDP Resolve Rsp PDUs sent (we resolved a remote resolve request).
BrwReqTx	DDP Browse attempted.
BrwAckRx	DDP Browse Response received (local or network).
BrwReqRx	DDP Browse Res PDUs received from network (=other browse attempt).
BrwAckTx	DDP Browse Ack PDUs sent (we responded to remote browse request).
RsvNoRsp	DDP Resolve Response not received.
BrwNoRsp	DDP Browse Response not received.
CnflctRx	DDP Conflict PDM received.
CnflctTx	DDP Conflict PDM sent.
DNSreqTx	DNS Request sent.
DNSrspRx	DNS Response received.
DNSnoRsp	DNS Response not received.

Table C-13. Modbus/TCP Server Layer Tallies (Tally s)[1]

Tally	Meaning
InPDU	The number of new incoming Modbus/TCP PDUs that have arrived.
OutPDU	The number of outgoing Modbus/TCP PDUs that were sent.
BadPDU	The number of incoming Modbus/TCP PDUs that contained an error, such as invalid function code, invalid message length, message too long, invalid PLC address, invalid data length for the destination memory type, or invalid data for the destination memory type.
InConRq	The number of connection requests that have arrived.
OutConRp	The number of connection responses that were sent.
InDatRq	The number of data transfer requests that have arrived.
OutDatRp	The number of data transfer responses that were sent.
OutErrRp	The number of responses that were sent with the error indicator set.
InDisRq	The number of disconnection requests that were sent.
OutDisRp	The number of disconnection responses that have arrived.

[1] Series 90–30 Ethernet Interface IC693CMM321-FH or later only

Table C-14. UDP Tallies (Tally u)

Tally	Meaning
InDatagm	Number of incoming datagrams validated and accepted by the UDP stack.
NoPorts	Number of incolming datagrams discarded by the UDP stack because the destination UDP ports were not initialized for reception.
InErrors	Number of incoming datagrams discarded by the UDP stack because they are invalid datagrams, e.g., invalid checksums, etc.
OtDatagm	Number of outgoing UDP datagrams sent by the UDP stack to remote hosts.

Table C-15. SRTP Server Tallies (Tally v)

Tally	Meaning
InPDU	The total number of SRTP PDUs received (both good and bad PDUs).
OutPDU	The total number of SRTP PDUs sent.
BadPDU	The number of bad PDUs received.
InConRq	The number of Connect Request PDUs received.
OutConRp	The number of Connect Request PDUs sent.
InDatRq	The number of Data Request and Session Request PDUs received.
OutDatRp	The number of Data Response PDUs sent.
InUncRq	The number of Unconfirmed Request PDUs received.
OutUncRq	The number of Unconfirmed Response PDUs sent.
InErrRq	The number of Error Request PDUs received.
OutErrRq	The number of Error Request PDUs sent.
InDisRq	The number of disconnect requests received.
OutDisRq	The number of disconnect requests sent.
InDstRq	The number of Destinations Request PDUs received.
OutDstRp	The number of Destinations Response PDUs sent.
InSesRq	The number of Session Request PDUs received.
OpenTO	The number of times connection timed out in OPENING state.

Table C-16. TCP Tallies (Tally w)

Tally	Meaning
RtoAlgm (tcpRtoAlgorithm)	The algorithm used to determine the timeout value used for retransmitting unacknowledged bytes.
RtoMin (tcpRtoMin)	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds.
RtoMax (tcpRtoMax)	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds.
MaxConn (tcpMaxConn)	The limit on the total number of TCP connections the entity can support.
ActOpens (tcpActiveOpens)	The number of times TCP connections have made a direct transition to the SYN–SENT state from the CLOSED state.
PasOpens (tcpPassiveOpens)	The number of times TCP connections have made a direct transition to the SYN–RCVD state from the LISTEN state.
AtmptFai (tcpAttemptFails)	The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN–SENT state or the SYN–RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN–RCVD state.
EstabRes (tcpEstabResets)	The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE–WAIT state.
CurEstab (tcpCurrEstab)	The number of internal TCP data structures currently in use. This value corresponds to the number of entries displayed via the “STAT W” command including the LISTEN entry).
InSegs (tcpInSegs)	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
OutSegs (tcpOutSegs)	The total number of segments sent, including those on current connections but excluding those containing only retransmitted bytes.
RtranSeg (tcpRetransSegs)	The total number of segments retransmitted – that is, the number of TCP segments transmitted containing one or more previously transmitted bytes.
NoPorts	The number of incoming TCP messages for a new connection that have been discarded because all TCP connections are already in use.

Table C-17. EGD Tallies (Tally g)[1, 2]

Tally	Meaning
EstabRq	Request to establish a Dynamic Exchange sent to CPU.
EstabRp	Reply to establish a Dynamic Exchange received from CPU.
CancelRq	Request to cancel a Dynamic Exchange sent to CPU.
CancelRp	Reply to cancel a Dynamic Exchange received from CPU.
ReadRq	Request to read Static Exchange Definition sent to CPU.
ReadRp	Reply to read Static Exchange Definition received from CPU.
EstConRq	Request to establish Global Data connection area received from CPU.
EstConRp	Reply to establish Global Data connection area sent to CPU.
TermConn	Request to terminate Global Data connection area received from CPU.
EnabOut	Request to enable I/O received from CPU. (Start producing/consuming)
DisabOut	Request to disable I/O received from CPU. (Stop producing/consuming)
ConnRdy	Message received from CPU signaling Global Data connection area ready.
UnRecID	Global Data message received with unrecognizable producer or exchange ID.
BadPort	Global Data message received at invalid UDP port.
CfgRq	Global Data Dynamic Exchange Configure Request received.
CfgRp	Global Data Dynamic Exchange Configure Reply sent.
RtrCfgRq	Global Data Read Configuration Request received.
RtrCfgRp	Global Data Read Configuration Reply sent.
DelCfgRq	Global Data Dynamic Exchange Cancel Configuration Request received.
DelCfgRp	Global Data Dynamic Exchange Cancel Configuration Reply sent.
RtrSumRq	Global Data Retrieve Summary Request received.
RtrSumRp	Global Data Retrieve Summary Reply sent.
CapQuRq	Global Data Capabilities Query Request received.
CapQuRp	Global Data Capabilities Query Reply sent.
StartRq	Global Data Start Production Request Received.
StopRq	Global Data Stop Production Request Received.
DataRx	Global Data Production Packet Received.
DataTx	Global Data Production Packet Transmitted.
DAckRx	Global Data Production Packet with Acknowledgment Received.
DAckTx	Global Data Production Packet with Acknowledgment Transmitted.
IdleData	Global Data Production Packet received while data input disabled.
GetStsRq	Global Data Get Statistics Request received.
GetStsRp	Global Data Get Statistics Reply sent.
RefrErr	A refresh error was encountered for a given exchange.
SemaErr	An error was encountered with the Semaphore locking mechanism.
ECRpRtry	Number of retries attempted when sending Establish Connection Response mailboxes back to the CPU.
ECRpAbrt	Number of aborted Establish Connection Response mailboxes. The Ethernet Interface had given up sending these aborted mailboxes due to backplane problems.
ECRpTO	Number of Establish Connection Response mailboxes which had timed out while being sent back to the CPU.
TMAbort	Number of EGD Transaction Machines which had been aborted or terminated. Each Transaction Machine corresponds to one EGD Exchange. The Transaction Machine is aborted if a fatal error is encountered, and is terminated when the Exchange is terminated.

[1] Series 90–30 CPU364 only
[2] Series 90–70 Ethernet Interface (Type 2) only

Tallies for Style B Station Manager

Tally Counters

Table C-18. System Memory Tallies (task 'b')

Tally	Description
(none)	

Table C-19. PLC Driver Tallies (task 'C')

Tally	Description
UsrReq	Service requests from BPD users to PLC.
UsrRsp	Service request responses to BPD users.
UsrMsg	Messages from BPD users to PLC.
UnsolMsg	Unsol transfers from PLC to BPD users.
PlcReq	Service requests from PLC to BPD users.
PlcRsp	Service request responses to PLC.
Cmrq	COMMREQs received from PLC.
CmrqDscd	COMMREQs discarded for BPD Users.
PlcSweep	Total PLC Sweeps.
PktToPlc	Total mailbox messages sent to PLC.
PktFmPlc	Total mailbox messages received from PLC.
PktUnreg	Messages received for unregistered user.
BsyRetry	Automatic retries due to PLC busy.
BpdAbort	Transfers aborted by BPD.
PlcTmout	Timeouts awaiting response from PLC.
UsrTmout	Timeouts awaiting response from the BPD user.

Table C-20. SMI Driver Tallies (also part of task 'C')

Tally	Description
SendObtn	Mailbox messages obtained from send queue.
MBSend	Mailbox messages successfully sent to PLC.
MBResend	Mailbox messages successfully resent to PLC.
SndAbort	Mailbox message send obtains aborted.
MBAvail	MB_AVAILABLE commands received from PLC.
RecvObtn	Mailbox messages obtained from receive queue.
MBRecv	Mailbox messages successfully received from PLC.
RcvAbort	Mailbox message receive obtains aborted.
Busy	BUSY commands received from PLC.
Idle	IDLE commands received from PLC.
Hrtbeats	HEARTBEAT commands received from PLC.
ClrDbCfg	CFG_BD_CFG commands received from PLC.
FactCmd	Factory Test commands received from PLC.
FactRsp	Factory Test responses sent to PLC.
EgdProd	EGD_PROD_CMP commands received from PLC.
UnknCmd	Unknown commands received from PLC.
HpAlloc	Shared memory heap buffer allocations.
HpFree	Shared memory heap buffer frees.
DblFree	Shared memory heap buffer double-frees.

TableC-21. SRTP Server Tallies (task 'v')

Tally	Description
InPDU	Total SRTP PDUs received (good and bad) from network.
OutPDU	Total SRTP PDUs sent to network.
BadPDU	Bad PDUs received from network.
InConRq	Connect Request PDUs received from network.
OutConRp	Connect Response PDUs sent to network.
InDatRq	Data and Session Request PDUs received from network.
OutDatRp	Data Response PDUs sent to network.
InUncRq	Unconfirmed Request PDUs received from network.
OutUncRq	Unconfirmed Request PDUs sent to network.
InErrRq	Error Request PDUs received from network.
OutErrRq	Error Request PDUs sent to network.
InDisRq	Disconnect requests received from network.
OutDisRq	Disconnect requests sent to network.
InSesRq	Session Request PDUs received from network.
OpenTO	SRTP connections timed out in OPENING state.

Table C-22. Ethernet Global Data Tallies (task 'g')

Tally	Description
EstConRq	Establish Global Data connection area requests received from PLC.
EstConRp	Establish Global Data connection area replies sent to PLC.
ConnRdy	Global Data connection area is ready messages received from PLC.
EnabOut	Enable production requests received from PLC.
DisabOut	Disable production requests received from PLC.
TermRq	Terminate Global Data connection area requests received from PLC.
TermRp	Terminate Global Data connection area replies sent to PLC.
DataRx	Global Data production packets received from network.
DataTx	Global Data production packets sent to network.
RdRqRcv	CMP Read requests received from network.
RdRpSnt	CMP Read replies sent to network.
WrRqRcv	CMP Write requests received from network.
WrRpSnt	CMP Write replies sent to network.
RdRqSnt	CMP Read requests sent to network.
RdRpRcv	CMP Read replies received from network.
WrRqSnt	CMP Write requests sent to network.
WrRpRcv	CMP Write replies received from network.
CfRqRcv	CMP Retrieve Configuration requests received from network.
CfRpSnt	CMP Retrieve Configuration replies sent to network.
SmRqRcv	CMP Summary requests received from network.
SmRpSnt	CMP Summary replies sent to network.
CpRqRcv	CMP Capabilities requests received from network.
CpRpSnt	CMP Capabilities replies sent to network.
StRqRcv	CMP Statistics requests received from network.
StRpSnt	CMP Statistics replies sent to network.
IdleData	Global Data production packets received while data input is disabled.
RefrErr	Refresh errors encountered.
SemaErr	Semaphore locking errors encountered.
ECRpRtry	Retries when sending Establish Connection reply to PLC.
ECRpAbrt	Establish Connection replies aborted (due to backplane communication problems).
ECRpTO	Establish Connection replies timed out (due to backplane communication problems).
TMAbort	Global Data transaction machines aborted or terminated. Each transaction machine corresponds to one EGD exchange. A transaction machine is aborted if a fatal error is encountered, and is terminated when the exchange is terminated (as when storing a new configuration).
UnRecID	Consumed exchange not configured for exchange recvd from network.
BadPort	UDP port not setup for exchange received from network.

Table C-22. Ethernet Global Data Tallies (task 'g'), continued

Tally	Description
AlinErr	CMP error responses due to alignment error.
ExchErr	CMP error responses due to invalid exchange specified in request.
SigErr	CMP error responses due to signature error in request.
LenErr	CMP error responses due to length error in request.
OffErr	CMP error responses due to invalid data offset in request.
TooLong	CMP error responses because response is too large for UDP packet.
PduErr	CMP error responses due to PDU encoding error.
RejRcv	CMP Reject responses received from network.
RejSnt	CMP Reject responses sent to network.
Timeout	CMP application timeouts
UnscC	Number of times data from the network was overwritten before being transferred to the PLC.
Stale	Produced exchanges sent without fresh PLC data.
StatErr	Number of samples that were discarded due to an invalid status in the message.

Table C-23. Network Interface Tallies (task 'I')

Tally	Description
RcvUniPk	Unicast packets received from network.
RcvMcPkt	Multicast packets received from network.
DiscPkt	Received packets discarded by Network Interface.
RcvError	Error packets received from network.
UnkProto	Received packets discarded due to unknown protocol.
SndUniPk	Unicast packets sent to network.
SndMcPkt	Multicast packets sent to network.
SndError	Outbound packets discarded due to errors.
SndDscd	Outbound packets discarded.
	The following are Detailed Network Interface Tallies
RxCntOvr	Number of FIFO overflows in the receiver.
EthCint	Number of Ethernet Controller Interrupts detected.
TxComp	Number of completed transmissions.
TxDscAct	Number of transmissions that encountered an unexpected inactive descriptor. This may result in a partial transfer of a frame.
TxUnder	Number of transmitter underrun conditions detected.
RxFrmInt	Number of receive frame interrupts processed.
RxDscAct	Number of receive frames lost due to lack of a descriptor.
RxFifoOv	Number of receive FIFO overflow conditions detected.
TxIllLen	Number of times a transmit frame length was less than 4 bytes.
NoCar	Number of times a no carrier condition was detected on transmission.
LossCar	Number of times a loss of carrier condition was detected on transmission.
TxCol	Number of times a collision was detected during a transmission.

Table C-23. Network Interface Tallies (task 'I') continued

Tally	Description
TxRtryOv	Number of times a packet was discarded due to exhausting the retries for transmission.
RxMc2Stk	Number of received multi-cast packets delivered to the stack.
RxResBit	Number of times a residual bit frame was received.
RxLngStk	Number of times a packet greater than 1519 bytes was received.
RxShtStk	Number of times a packet less than 64 bytes was received.
RxPhyErr	Number of times an error was reported from the PHY.
RxCRC	Number of receive CRC error conditions detected.
	The following are tallies associated with each switch port
TxDrop	Number of transmit packets dropped for lack of resources.
TxTotCol	Number of collisions seen by the port.
TxSngCol	Number of transmitted packets that saw exactly one collision.
TxMulCol	Number of transmitted packets that saw multiple collisions.
TxDefer	Number of packets whose transmission was delayed due to the medium being busy.
TxLatCol	Number of packets that experienced a late collision (more than 512 bit times into the transmission).
TxExcCol	Number of packets that were not transferred due to excessive collisions.
TxFrmDsc	Number of packets that were discarded due to lack of output space within the switch.
TxPause	Number of PAUSE frames transmitted by the port.
RxShort	Number of packets received that were less than 64 bytes.
RxPause	Number of times a PAUSE frame was received by the port.
RxLong	Number of packets received whose length was greater than 1522.
RxJabber	Number of times a jabber condition was detected by the receiver.
RxAlign	Number of packets received with a non-integral number of bytes.
RxFcsErr	Number of packets received with a checksum error.
RxDrop	Number of packets dropped in the receiver due to lack of space in the switch.
RxSaChng	Number of times the source address of packets changed.
RxFrgmnt	Number of packets received that were less than 64 bytes.
RxExcSiz	Number of packets received that were greater than 1537 bytes.
RxSymErr	Number of times an invalid symbol was encountered in the data stream.

Table C-24. ARP Tallies (task 'f')

Tally	Description
(none)	

Table C-25. IP Tallies (task 'i')

Tally	Description
InRecv	Number of input datagrams received from interfaces, including those received in error.
InHdrErr	Number of input datagrams discarded due to errors in their IP headers.
InAdrErr	Number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity.
ForwDgms	Number of input datagrams for which this entity was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination (not used).
InUnkPro	Number of locally addresssed datagrams received successfully but discarded because of an unknown or unsupported protocol.
InDiscds	Number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (e.g. for lack of buffer space).
InDelivs	Number of input datagrams successfully delivered to IP user protocols (including ICMP).
OutReq	Number of IP datagrams which local IP user protocols (including ICMP) supplied to IP in requests for transmission.
OutDiscd	Number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (e.g. for lack of buffer space).
OutNoRts	Number of IP datagrams discarded because no route could be found to transmit them to their destination.
ReasmTO	The maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity.
ReasmReq	Number of IP fragments received which needed to be reassembled at this entity.
ReasmOKs	Number of IP datagrams successfully reassembled.
ReasmFai	Number of failures detected by the IP reassembly algorithm (for whatevere reason: timed out, errors, message size too big, etc.)
FragOKs	Number of IP datagrams that have been successfully fragmented at this entity.
FragFail	Number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could not be, e.g., because their "Don't Fragment" flag was set.
FragCrea	Number of IP datagrams that have been generated as a result of fragmentation at this entity.
Filtered	IP packets ignored because not addressed to this node and destination is unreachable.

Table C-26. ICMP/IGMP Tallies (task 'j')

Tally	Description
InMsgs	Number of ICMP messages received.
InErrors	Number of ICMP messages received that have errors (bad checksums, etc.).
InDstUnr	Number of ICMP Destination Unreachable messages received.
InTimeEx	Number of ICMP Time Exceeded messages received.
InParmPr	Number of ICMP Parameter Problem messages received.
InSrcQch	Number of ICMP Source Quench messages received.
InRedir	Number of ICMP Redirect messages received.
InEchos	Number of ICMP Echo (requests) messages received.
InEchoRp	Number of ICMP Echo Reply messages received.
InTmSp	Number of ICMP Timestamp (request) messages received.
InTmSpRp	Number of ICMP Timestamp Reply messages received.
InAdrM	Number of ICMP Address Mask Request messages received.
InAdrMRp	Number of ICMP Address Mask Reply messages received.
OtMsgs	Number of ICMP messages attempted to be sent.
OtErrors	Number of ICMP messages not sent due to problems discovered in ICMP.
OtDstUnr	Number of ICMP Destination Unreachable messages sent.
OtTimeEx	Number of ICMP Time Exceeded messages sent.
OtParmPr	Number of ICMP Parameter Problem messages sent.
OtSrcQch	Number of ICMP Source Quench messages sent.
OtRedir	Number of ICMP Redirect messages sent.
OtEchos	Number of ICMP Echo (request) messages sent.
OtEchoRp	Number of ICMP Echo Reply messages sent.
OtTmSp	Number of ICMP Timestamp (request) messages sent.
OtTmSpRp	Number of ICMP Timestamp Reply messages sent.
OtAdrM	Number of ICMP Address Mask Request messages sent.
OtAdrMRp	Number of ICMP Address Mask Reply messages sent.

Table C-27. TCP Tallies (task 'w')

Tally	Description
ActOpens	Number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
PasOpens	Number of times TCP connections have made a direct transition to the SYN-RCVD state from the listen state.
AtmptFai	The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition ot the LISTEN state from the SYN-RCVD state.
EstabRes	The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
CurEstab	The number of internal TCP data structures currently in use.
InSegs	The total number of segements received, including those received in error. This count includes segments received on currently established connections.
OutSegs	The total number of segments sent, including those on current connections but excluding those containing only retransmitted bytes.
RtranSeg	The total number of segments retransmitted – that is, the number of TCP segments transmitted containing one or more previously transmitted bytes.
InErrs	TCP segments received in error.
SndRsts	TCP segments sent with RST flag.

Table C-28. UDP Tallies (task 'u')

UDP Tallies (task 'u')	
Tally	**Description**
InDatagm	Number of incoming datagrams validated and accepted by the UDP stack.
NoPorts	Number of incoming datagrams discarded by UDP because the destination UDP port for the packet was not initialized for reception.
InErrors	Number of incoming datagrams discarded by UDP because they were invalid datagrams (e.g. invalid checksums, etc.)
OtDatagm	Number of outgoing UDP datagrams sent by the UDP stack to remote hosts.

Table C-29. SNTP Tallies (task 'n')

SNTP Tallies (task 'n')	
Tally	**Description**
ntppkt	Number of SNTP packets received (from any server)
nstrater	Number of SNTP packets received with an invalid stratum number (outside the range 0-15).
nverold	Number of SNTP packets received with an old version (1 or 2)
never3	Number of SNTP packets received with version 3.
never4	Number of SNTP packets received with version 4.
nverbad	Number of SNTP packets received with an invalid version.
nlenbad	Number of SNTP packets received with an invalid length.
nincons	Number of SNTP packets discarded due to an inconsistent time.
ntimout	Number of times an SNTP server timed out by not sending a packet within 150 seconds.
nsvrchng	Number of times the locked on SNTP server was changed.
nloktot	Number of SNTP packets received from the locked-on server.
nlokcons	Number of SNTP packets received with the locked-on server that were consistent.

Appendix D IP Address Assignment for Style B Station Manager

This appendix discusses assigning an IP address for a Module using the Style B Station Manager. Each Ethernet interface has a 12-digit MAC address, provided on a label on the module. This address is required in order to assign an IP address.

IP Address Assignment Using Telnet

Obtain the MAC address from the label on the module, then follow the procedure below for assigning the IP address to the Ethernet Interface, remotely, over the network. In order for an IP address assignment to be performed over the network, the PLC must be in Stop/No I/O mode. IP address assignment over the network will not be processed until the PLC is stopped and is not scanning I/O.

1. On a PC, associate the IP address for the module to the MAC address of the module using the following method. In a command (DOS) window, enter the following command:

   > ARP –s *ip_address mac_addres [interface]*

   where ip_address is the IP address the user wants to assign to the Ethernet Interface, and the mac_address is the MAC address from the label on the PLC whose IP address is being assigned. The optional interface parameter is the IP address of the interface that should be used. This parameter should be specified when the PC has multiple network interfaces.

2. Next, telnet to the IP address (ip_address) being assigned to the Ethernet Interface:

   > telnet ip_address 1.

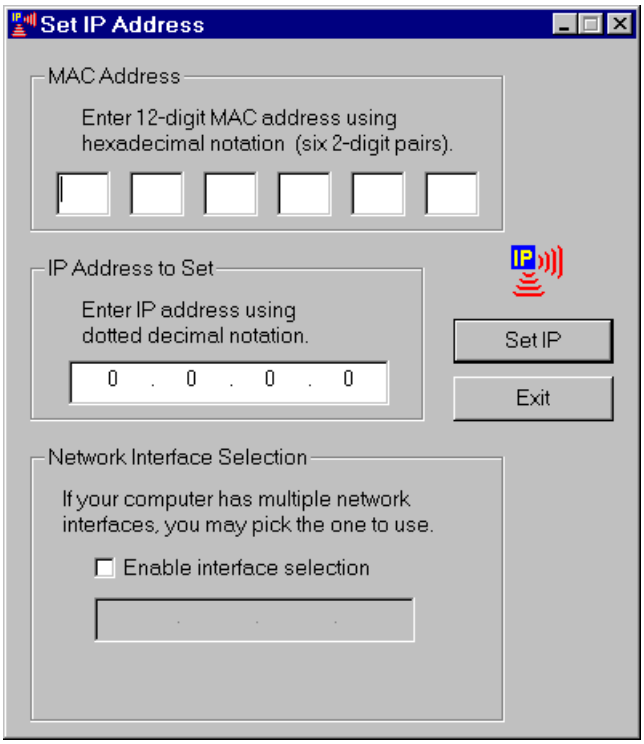
   This telnet command will fail, but the IP address provided with the telnet command will be set on the Ethernet Interface until the next restart of the module or until a hardware configuration is stored to the PLC.

Note that a temporary IP address can be assigned even if the PLC has been previously configured by the Programmer. The IP address assigned over the network remains in effect until the PLC is power-cycled or until the configuration is explicitly stored or cleared. The intended usage of this IP address assignment mechanism is to permit initial communication to the programmer. Once connected, the intended IP address should be permanently stored to the PLC via the configuration data.

The ‘setip’ Utility

The GE Fanuc Windows programmers (Control, Logic Developer and VersaPro) provide a utility to simplify the assignment of IP addresses over the network. This utility is located in the ‘tools’ directory of the programmer and is called ‘setip’. In Windows, you can double-click on this file or activate it from the Start->Run menu. When run, the utility will present a simple dialog that allows the entry of a 12-digit MAC address and an IP address for the node. When the ‘Set IP’ button is pressed, the utility attempts to assign the IP address to the node with the specified MAC address using the procedure described above.

The setip utility dialog is shown below.

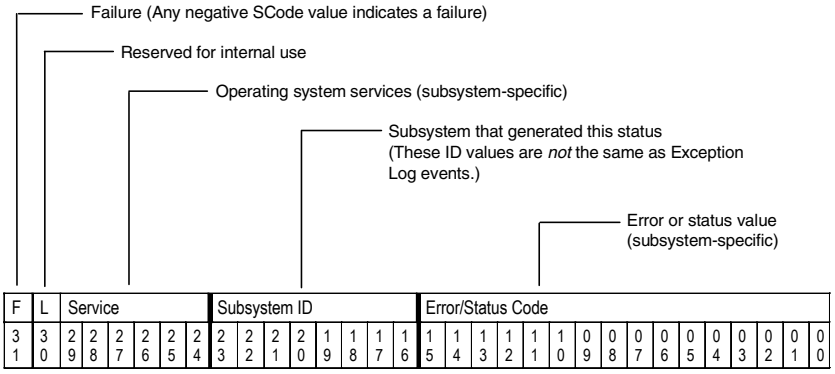


Appendix E

Status Codes in the Exception Log

For Style B station manager modules, most events in the Exception Log include a Status Code (SCode). This Status Code reports the internal status of the Ethernet firmware when the exception occurred. Status Codes are only displayed when using *LOG Z*.

The Status Code is a 32-bit value. It is organized into the following fields:



SCode Subsystem ID Definitions

Table E-1. SCode "Subsystem ID" Definitions.

Value	Description
0x01	Diagnostic (DIAG) subsystem
0x02	Board Support Package (BSP) subsystem
0x03	Error Handler (ERR) subsystem
0x04	Shared Memory (SMI) subsystem
0x05	PLC Backplane Driver (BPD) subsystem
0x06	Configuration Handler (CFG) subsystem
0x07	Non-volatile memory (NVM) subsystem
0x08	Station Manager (STA) subsystem
0x09	SRTP Server (SRTPS) subsystem
0x0a	Ethernet Global Data (EGD) subsystem
0x0b	Utility (UTL) subsystem
0x0d	Name Resolution (NRES) subsystem
0x11	Time Synchronization (SNTP) subsystem
0x41-0x5c	Operating System services

SCode Error/Status Definitions for Subsystems

SCode **Service** values identify particular Operating System services, and are used only when reporting Operating System errors (Subsystem ID values 41H – 5CH). SCode **Service** values are detailed internal information of use to GE Fanuc Automation.
SCode **Error/Status** values depend upon the Subsystem ID value, as shown in the tables below:

Error/Status Definitions for DIAG Subsystems

The following SCode **Error/Status** identifiers are used with the DIAG subsystem (ID = 01H). Error/Status values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-2. SCode "Error/Status" Definitions for DIAG Subsystem.

Value	Error/Status Condition
0x0000	General failure.
0x0201	Powerup diagnostics initialization failure.
0x0202	Powerup diagnostics CRC self-test failure.
0x0501	Shared Memory initialization failed.
0x0601 – 0x061e	Ethernet Controller diagnostic failure.
0x0701 – 0x071e	Serial Port UART diagnostic failure.
0x0801 – 0x0806	Error reporting a powerup diagnostic failure to the Ethernet exception log.
0x0a01 – 0x0a02	Error creating or starting the watchdog timer (WDT).
0x0b03	CRC error over loaded Ethernet firmware was detected by runtime diagnostics.

Error/Status Definitions for ERR Subsystem

The following SCode **Error/Status** identifiers are used with the ERR subsystem (ID = 03H). Error/Status values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-3. SCode "Error/Status" Definitions for ERR Subsystem.

Value	Error/Status Condition
0x0001	No communication with PLC CPU; unable to log exception in PLC Fault Table.
0x0003	Memory allocation error.
0x0004	Invalid date/time received from PLC CPU or network; unable to update timestamp of events in the exception log.
0x0005	Saved exception log contents in NVRAM are corrupted.
0x0006	Unable to rebuild exception log in NVRAM; NVRAM does not retain data.

Error/Status Definitions for SMI Subsystem

The following SCode **Error/Status** identifiers are used with the SMI subsystem (ID = 04H). Values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-4. SCode "Error/Status" Definitions for SMI Subsystem.

Value	Error/Status Condition
0x0002	Destructive RAM test failure during shared memory diagnostics.
0x0004	Unable to notify PLC CPU that shared memory diagnostics have failed.
0x0005	Incompatible CPU, Ethernet firmware versions prevent shared memory communication.
0x0008	Shared memory interface was not properly configured for use.
0x0009	Timeout sending a shared memory command to PLC CPU.
0x000a	PLC CPU is busy; unable to send shared memory command to PLC CPU.
0x000d – 0x000e	Error obtaining a mail buffer in shared memory.
0x000f	Cannot send mail to PLC CPU; shared memory mail queue is full.
0x0010	Cannot get mail from PLC CPU; shared memory mail queue is empty.
0x0011	Error allocating memory buffer from shared memory heap.
0x0012 – 0x0013	Error freeing memory buffer to shared memory heap.
0x0015	Unknown Station Manager command was received.
0x0016	PLC CPU is unavailable while updating its firmware.

Error/Status Definitions for BPD Subsystem

The following SCode **Error/Status** identifiers are used with the BPD subsystem (ID = 05H). Values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-5. SCode "Error/Status" Definitions for BPD Subsystem.

Value	Error/Status Condition
0x0001	BPD subsystem was not successfully initialized.
0x0002	Mail communication via shared memory was not established.
0x0003	Service Request Processor within PLC CPU is not available.
0x0004	BPD subsystem is shutdown pending an Ethernet restart or firmware update.
0x0008	User task is not registered with BPD subsystem; request cannot be processed.
0x0009	User task is already registered for use.
0x000a	BPD user task or individual transaction was not found.
0x000b	Transaction rejected; sequence number is already in use.
0x000c – 0x000e	Invalid request from BPD user task.
0x0020 – 0x0021	Memory allocation error.
0x0022	Error sending mail to PLC CPU.
0x0023	Error receiving mail from PLC CPU. (May be invalid message type.)
0x0024	Packet sequence error in mail messages received from PLC CPU.
0x0025	Error sending mail to PLC CPU; unable to obtain shared memory mail queue.
0x0026	Error sending mail to PLC CPU; unable to send mail command to PLC CPU.
0x0027	Timeout waiting for expected response from PLC CPU.
0x0028	Timeout waiting for expected response from BPD user task.
0x0029	Unexpected response received from PLC CPU; the response is discarded.
0x002a	Timeout waiting to receive entire PLC Request from PLC CPU; request is discarded.
0x002d	PLC CPU has rejected a mail transfer from the Ethernet Interface.
0x0030	Commreq mail was received for a BPD user task that does not support Commreqs.
0x0041	Unknown Station Manager command was received.

Error/Status Definitions for CFG Subsystems

The following SCode **Error/Status** identifiers are used with the CFG subsystem (ID = 06H). Error/Status values not listed below are internal errors and should be reported to GE Fanuc

Table E-6. SCode "Error/Status" Definitions for CFG Subsystem.

Value	Error/Status Condition
0x0005 – 0x0006	Memory allocation error.
0x0007	Invalid configuration data received from PLC CPU.
0x0009 – 0x000a	Invalid configuration parameter or value.
0x000b	Advanced User Parameter file is too large.
0x000e	A new configuration is being Stored to the PLC; cannot process until Store completes.
0x0012	Unknown Station Manager command was received.
0x0018	Unable to read saved Advanced User Parameters from NVRAM; NVRAM is corrupt.
0x0019	Improper CPU response received.
0x001a	Ethernet Interface has not been configured.

Error/Status Definitions for NVM Subsystem

The following SCode **Error/Status** identifiers are used with the NVM subsystem (ID = 07H). Error/Status values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-7. SCode "Error/Status" Definitions for NVM Subsystem.

Value	Error/Status Condition
0x0001	No data has been saved into NVRAM.
0x0002	NVRAM data is corrupt. Saved backup data has been lost.

Error/Status Definitions for STA Subsystem

The following SCode **Error/Status** identifiers are used with the STA subsystem (ID = 08H), Error/Status values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-8. SCode "Error/Status" Definitions for STA Subsystem.

Value	Error/Status Condition
0x0001	General failure.
0x000c – 0x000d	Memory allocation error.
0x0014	Out of message blocks; unable to transmit to network.
0x0015	Unable to retrieve local IP address; cannot issue ping request.
0x0017	Remote device is unreachable; cannot issue ping request.

Error/Status Definitions for SRTP Server Subsystem

The following SCode **Error/Status** identifiers are used with the SRTP Server subsystem (ID = 09H). Error/Status values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-9. SCode "Error/Status" Definitions for SRTP Server Subsystem.

Value	Error/Status Condition
0x0032	Error obtaining Advanced User Parameter data.
0x0034 – 0x0035	Memory allocation error.
0x0036	Expected send or receive task was not found for an SRTP connection.
0x0037	Error obtaining new mail message sequence number.
0x003a	Invalid reason code in outgoing SRTP PDU; PDU was not sent.
0x0048	Unknown Station Manager command was received.
	Error/Status codes 0x8000 – 0x8fff may be returned to the remote SRTP client device.
0x8001	General failure.
0x8002	No communication to local PLC CPU.
0x8005	Unrecognized SRTP PDU was received.
0x8006	Data received with PDU type that does not support data.
0x8008	SRTP action not allowed in current connection state.
0x8009	Unable to send service request to local PLC CPU.
0x800a	Recognized but unsupported SRTP PDU was received.
0x800b	SRTP transaction was lost; service request was not completed.
0x800c	Error sending SRTP PDU to remote device on network.

Error/Status Definitions for EGD Subsystem

The following SCode **Error/Status** identifiers are used with the EGD subsystem (ID = 0aH). Error/Status values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-10. SCode "Error/Status" Definitions for EGD Subsystem.

Value	Error/Status Condition
0x0003	Unknown Station Manager command was received.
0x0004	Error obtaining Advanced User Parameter data.

Error/Status Definitions for UTL Subsystem

The following SCode **Error/Status** identifiers are used with the UTL subsystem (ID = 0bH). Error/Status values not listed below are internal errors and should be reported to GE Fanuc Automation.

Table E-11. SCode "Error/Status" Definitions for UTL Subsystem.

Value	Error/Status Condition
0x0001	Memory allocation error, or other general resource error. May also be operating system resource error.
0x0006	Unknown Station Manager command was received.

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