User Manual
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PACSystems TCP/IP Ethernet Communications Station Manager

USER MANUAL



EMERSON

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Section 1:Introduction

This manual describes how to access and use the Station Manager features of PACSystems™ Ethernet Interface modules.

Section 1, *Introduction* is an overview of the Station Manager.

Section 2, *Getting Started* explains how to use the Station Manager and describes how the Station Manager can provide diagnostic information when setting up the Ethernet interface.

Section 3, *Station Manager Commands* provides a reference for all of the Station Manager commands.

Appendix A, *Tallies of Ethernet Tasks* describes the types of information you can display using the TALLY command. Tallies are grouped by task.

Appendix B, *Exception Log Events* describes the Exception Log events that can be displayed using the LOG and LOG Z commands. Additional status information displayed by LOG Z only is defined in the next section.

Appendix C, *Firmware Update History* documents the firmware history as it pertains to Ethernet Station Manager.

1.1 Revisions in this Manual

Rev	Date	Description
AB	Dec 2024	• Updated to support initial PACSystems Simulator release
AA	Dec 2022	• Updated to support the release of CPE200 Series controllers
Z	Jul 2022	• Added Section B3.20 Event Type 38 • Added new TCP Linger Time to the Modbus/TCP Channel Example in Section 3.3.3.
Y	Oct 2021	• Internal Release
W	Jan 2021	• Added Section OPC, OPC commands
V	Jun 2020	• Updates to Section TREND, TREND • Added error codes 61 and 62 to Section B.2.3, Event Type 02: Configuration (CFG) Events
U	Sept 2019	• Updated station manager command support for embedded ethernet devices.
T	Aug 2019	• Updated throughout for addition of the ETM001-Kxxx.
R	Sept 2018	• Updated throughout for addition of the CPL410.
Q	Feb 2018	• Updated throughout for addition of CPE302.
P	Oct 2017	• Created tables which cross-reference functions with various products (section Station Manager Commands, Modes & Product Compatibility & Tallies of Ethernet Tasks). • Updated CPE400 content. • Fixed graphics in Exception Log Events.
N	April 2017	• Added information for support of initial release of CPE400. • Added information for SNTP support on CPE305/CPE310 and CPE400 firmware version 9.20 and CPE330 version 9.21
M	Sept 2015	• Added information for support of CPE330
L	Sept 2014	• Support for Ethernet Global Data (EGD) and Simple Network Time Protocol (SNTP) provided in CPE305/CPE310 firmware version 8.2 or later. • Support for DNP3 Outstation Module (IC695EDS001).
K	Jun 2013	• New features in the RX3i and RSTi Embedded Interface Ethernet interface provided by CPU models CPE305 and CPE310. ○ TCP/IP communication services using SRTP ○ SRTP Client (Channels) ○ Modbus/TCP Server, supporting Modbus Conformance classes 0, 1, and 2. ○ Modbus/TCP Client, supporting Modbus Conformance classes 0, 1, and Function Codes 15, 22, 23, and 24 for Conformance class 2. • Ability to display Local Time Correction and Daylight Savings Time for all modes of SNTP communications (STAT N command) • SNTP time synchronization using Unicast mode

1.2 Other PACSystems Manuals

The manuals listed below provide more information about the PACSystems family of products.

- GFK-1918, PAC Logic Developer-PLC Getting Started
- GFK-2222, PACSystems CPU Reference Manual
- GFK-2223, PACSystems RX7i Installation Manual
- GFK-2224, TCP/IP Ethernet Communications for PACSystems User Manual
- GFK-2308, PACSystems Hot Standby CPU Redundancy User's Guide
- GFK-2314, PACSystems RX3i System Manual
- GFK-2439, PACSystems RX3i Ethernet NIU User Manual
- GFK-2741, PACSystems RX3i and RX7i Controllers Battery Manual
- GFK-2950, PACSystems RX3i and RSTi-EP CPU Programmer's Reference Manual

In addition to these manuals, datasheets and Important Product Information documents describe individual modules and product revisions. The most recent PACSystems documentation is available online on the Support website.

1.3 Other PACSystems Manuals

The Station Manager is a built-in function of an Ethernet interface. The Station Manager function can be used to monitor the Ethernet interface itself and check its operation on the network. If a problem occurs, the Station Manager may be used to pinpoint the source.

The Station Manager provides:

An interactive set of commands that can be used to interrogate and control the Ethernet interface.

The ability 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 function operates in background mode when the Ethernet interface is in its Operational state. It cannot be accessed during Power-up Diagnostics or when performing a firmware update. Station Manager functionality may also be unavailable during very heavy communications load.

1.3.1 Using the Station Manager

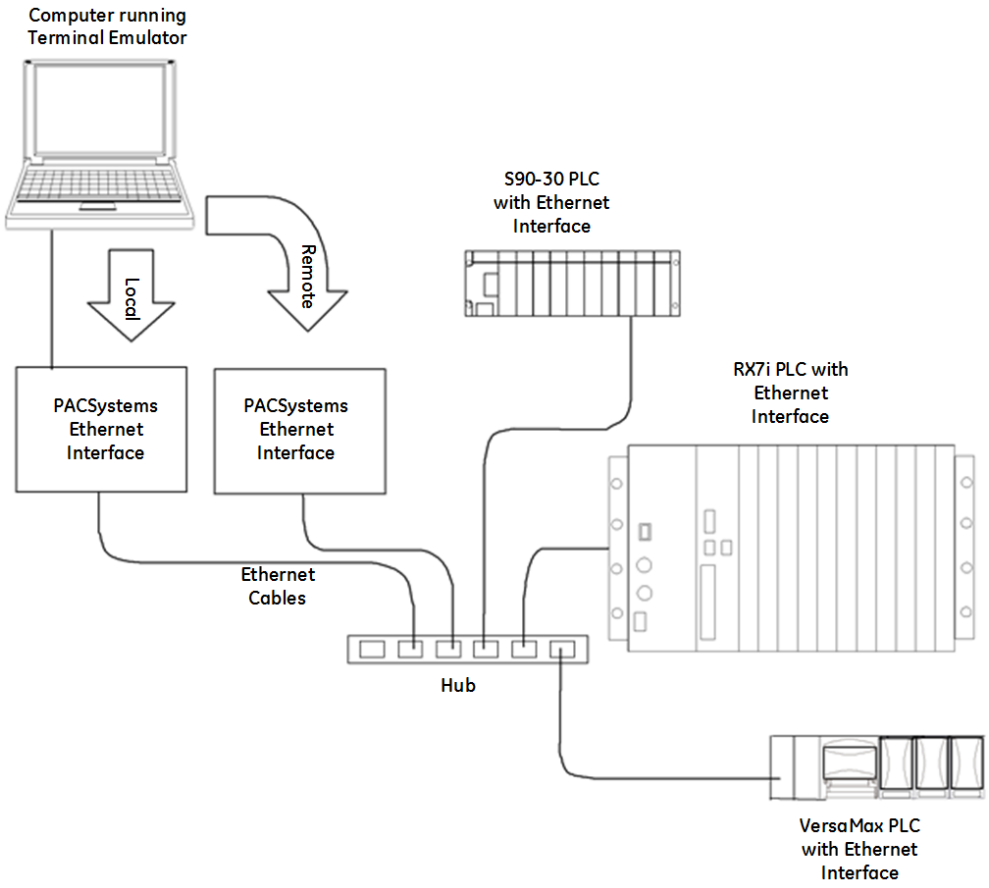
The operator interface to the Station Manager function is a computer running a terminal emulator such as the Hyper Terminal application provided with Windows® operating system software. An ASCII terminal can also be used.

The computer or terminal can connect to the Ethernet interface embedded in the RX3i ETM001-Kxxxx, CPE302, CPE305, CPE310, CPE330, CPE400, CPL410, CPS400 and EPXCPE205/2120/215/220/240 through an Ethernet network using the UDP network protocol. The RX3i and RSTi Embedded Interface do not support serial connection.

For all other PACSystems Ethernet interfaces, the computer or terminal can be connected locally at the Station Manager serial port, or it can be connected remotely at another device on the network via the UDP network protocol.

The PACSystems Simulator does not support Station Manager.

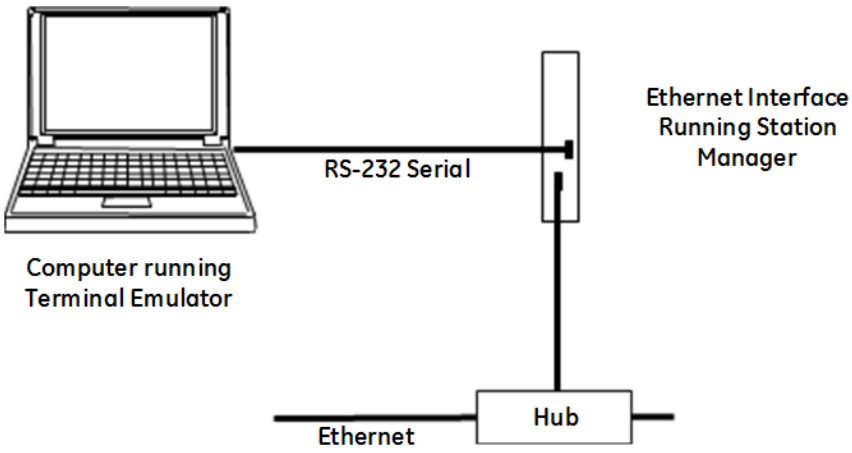
Figure 1: System Diagram Showing Station Manager on Ethernet



1.4 Other PACSystems Manuals

For local operation, connect the computer or terminal to the RS-232 Station Manager port on the PACSystems Ethernet interface, using a standard straight-through nine-pin RS-232 serial cable.

Figure 2: Station Manager Connected via RS-232 Serial Port



Connect the cable to a standard AT-style RS-232 port on the computer or terminal. The following cable is available: IC200CBL001 Cable, CPU Programming.

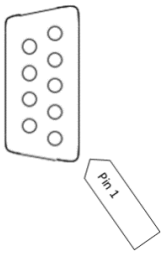
Tip

The RX3i embedded Ethernet interfaces do not support Station Manager operation via a serial connection.

1.4.1 Station Manager Port Pin Assignments

The Station Manager port pin assignments are shown below. For more information about this port, refer to the *TCP/IP Ethernet Communications for PACSystems User Manual*, GFK-2224.

Figure 3: Serial D Connector and Pin Assignments



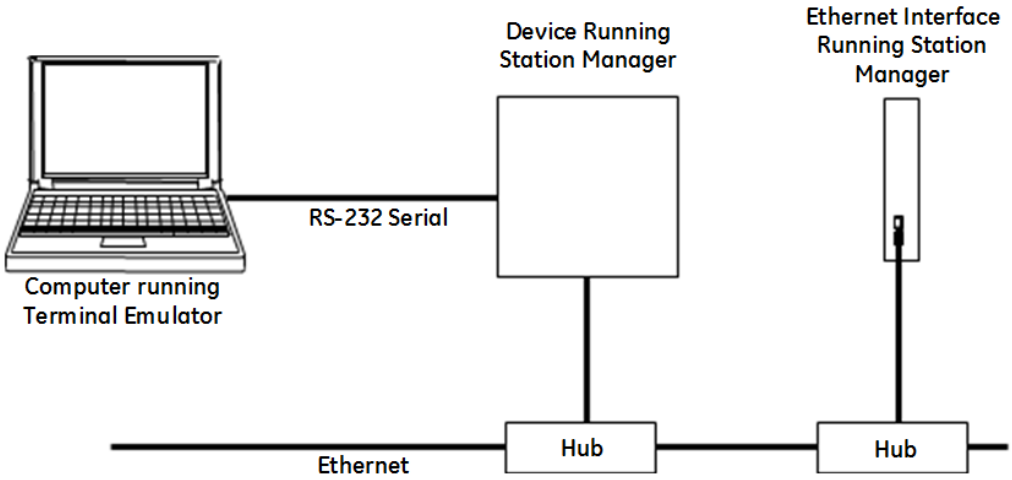
Pin Number†	Signal	Direction	Signal Name
1	DCD	IN	Data Carrier Detect
2	TX	OUT	Transmit Data
3	RX	IN	Receive Data
4	DSR	IN	Data Set Ready
5	GND		Signal Ground
6	DTR	OUT	Data Terminal Ready
7	CTS	IN	Clear to Send
8	RTS	OUT	Ready to Send
9	RI	IN	Ring Indicator

† Pin 1 is located at the bottom right of the serial port connector, as viewed from the front.

1.5 Making a Remote Connection to the Station Manager

The Station Manager function within the PACSystems Ethernet interface module can be also be accessed from a terminal that is connected to another device running the Station Manager.

Figure 4: Station Manager Operating via a Remote Serial Connection



Tip

The RX3i and RSTi-EP embedded Ethernet interfaces do not support Station Manager operation via a serial connection.

1.5.1 Communicating with the Station Manager Remotely

To communicate with the Station Manager from a terminal connected to another node on the network, use the Station Manager REMote) command[1] to establish communications with the PACSystems Ethernet interface, then enter the command to be executed by the Ethernet interface. When invoked remotely, the Station Manager software processes the command as if it had been entered locally. The Station Manager then automatically directs output from the command over the network to the station that issued the request. If another terminal is also connected to the Ethernet interface and running the Station Manager locally, there is no indication at the local Station Manager terminal that a remote command is being processed.

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

Tip

PACSystems Ethernet interfaces support Remote Station Manager operation using UDP network protocol. They do not support IEEE 802.3 Remote Station manager operation using a MAC address. They cannot be accessed remotely from CNC OSI– Ethernet Interfaces.

Network firewalls may block responses from the Remote Station Manager. It may be necessary to add a firewall exception for the Remote Station Manager program.

1.5.2 Remote Station Manager Operation in a Redundant IP System

The remote Station Manager responds to the direct IP address regardless of whether the unit is active or backup, or whether or not Redundant IP is configured. Only the active unit of a redundant pair responds to remote Station Manager commands at the Redundant IP address. The backup unit does not respond to the Redundant IP address. (Station Manager responses from the Redundant IP address can be misleading because it is difficult to determine which Ethernet interface is actually responding.)

Tip

Note that the CPE400, CPL410, and CPS400 support Redundant IP Addresses on LAN1 and LAN2 only.

[1] *Not supported on ETM001-Kxxx.*

Section 2:Getting Started

This chapter explains how to use the Station Manager and describes how the Station Manager can provide diagnostic information when setting up the Ethernet interface.

Types of Station Manager Commands

- Monitor Commands
- Modify Commands

Station Manager Commands for Monitor or Modify Mode

- Entering Commands and Reading the Display
- Entering Command Parameters
- Station Manager Display Format

Checking IP Addresses

- Checking the IP Address of the Ethernet Interface
- Verifying that the IP Address of the Ethernet Interface is Unique

Changing the Backup Parameters of the Ethernet Interface

- Changing the Backup Configuration Parameters
- Changing the Backup Advanced User Parameters

Testing Communications on the Network

- Using the Station Manager for Network Troubleshooting
- Displaying Information about a Node
- Viewing the Exception Log
- Checking the Network Connection

2.1 Types of Station Manager Commands

There are two types of Station Manager commands:

- Monitor Commands
- Modify Commands

Both types can be used either locally or remotely.

Tip

Station Manager support for the CPE330/CPE400/CPL410/CPS400 is the same for the ICRXICTL000 RXi Controller.

2.1.1 Monitor Commands

Monitor commands are available to anyone using the Station Manager. These commands provide information about the Ethernet interface and the network. Executing the Monitor commands does not affect the operation of the Ethernet interface or the network.

Accessing Monitor Mode

Press the Enter key on the computer or ASCII terminal. The Station Manager responds with the Station Manager Monitor mode prompt:

You can enter any Monitor commands from this prompt.

2.1.2 Modify Commands

Modify commands perform functions that may change the operation of the Ethernet interface. Access to Modify commands is password-protected. Password protection helps prevent inadvertent misuse of the Modify commands. 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 terminal.

At the Modify level, if no commands are executed within a configurable timeout period, the Modify login expires and you will have to log in again. By default, the timeout period is 10 minutes. It can be changed as needed using the CHLTIME command.

Accessing Modify Mode[2]

To log in to Modify mode, type from the Monitor-level ">" prompt:

```
login <RET>
```

The password prompt displays:

```
Password:
```

Type in the password and press the Enter key. The password is case-sensitive and can include special characters. The default password is "system" (lower case).

If the enter password is correct, the Modify prompt displays.

If you want to change the password or if you have forgotten the password, refer to the instructions for using the CHPARM STPASSWD command in Station Manager Commands

You can execute all Monitor and Modify commands from the Modify prompt.

Station Manager Commands, Modes & Product Compatibility

The following table lists the Station Manager commands, and shows:

a. whether they are Monitor-level (always available) or Modify-level commands and

b. whether the command itself is supported in the various products, as indicated by check marks (✓).

c. Enter the *help* command to see a list of commands supported by the firmware version in your device.

Tip

Effective with release 8.65, CPE305/CPE310 no longer support the *login* command. Therefore, these CPUs no longer support Modify commands. In addition, RX3i CPE302 /CPE330/CPE400/CPL410/CPS400, RSTi-EP CPE100/115, and EPXCPE205/210/215/220/240 do not support the *login* command.

---

[2] *Login not needed/supported on ETM001-Kxxx.*

Table 2-1: Station Manager Commands, Modes and, Product Compatibility

NOTE: Command endnotes are available at the end of the document in Event Type 38: IP Conflict Detection.

Command	Function Performed	Available in this Mode	RX3i and RSTi Embedded Interface	ETM001 (Modify serial only)	ETM001-Kxxx
bootp	Temporarily assign TCP/IP parameters	Modify		✓	
cd	Change file system working directory	Monitor and Modify		✓	
channel [1]	Display individual communication channel information	Monitor and Modify	✓	✓	✓
chist	Display a history of events for each channel	Monitor and Modify	✓	✓	✓
chltime	Change login inactivity timeout	Modify		✓	
chparm	Change backup Advanced User Parameters	Modify		✓	
chsosw	Change backup Ethernet configuration	Modify		✓	
chtime	Change internal Ethernet clock	Modify		✓	
clear	Clear selected items	Monitor* or Modify	✓*	✓	✓*
Del	Delete file from file system current working directory	Modify		✓	
Dir	Display file system directory contents	Monitor and Modify		✓	
egdcmd	Send an EGD command to remote node	Monitor and Modify		✓	✓
Egdread [2,3,4]	Display Ethernet Global Data exchange data	Modify		✓	
egdwrite	Modify Ethernet Global Data exchange data	Modify		✓	
events	Retrieve information on event control blocks and timer records	Modify		✓	
exception	Display a history of internal channels exceptions	Monitor* or Modify	✓*	✓	✓*
exs [1]	Display Extended Status for COMMREQs from controller logic	Monitor and Modify	✓	✓	✓
fatalinfo [1]	Display fatal fault information	Monitor and Modify	✓	✓	✓
?, help [1]	Display Station Manager command set	Monitor and Modify	✓	✓	✓
Killms	Delete a Modbus/TCP server connection	Modify		✓	
kills	Delete an SRTP server connection	Modify		✓	
log [1]	Display current exception log	Monitor and Modify	✓	✓	✓
login [5]	Enter Modify access level	Monitor and Modify		✓ (serial)	
Logout	Exit Modify access level	Modify		✓	
ltime [1]	Display login inactivity timeout	Monitor and Modify		✓	
mirror	Echo port traffic from one external Ethernet port to the other	Modify		✓	
mkdir	Create new file system directory	Modify		✓	
net	Force network offline/online	Modify		✓	
node [1]	Display basic identification	Monitor and Modify	✓	✓	✓

Command	Function Performed	Available in this Mode	RX3i and RSTi Embedded Interface	ETM001 (Modify serial only)	ETM001-Kxxx
ok	Reset LOG EMPTY LED (log isn't cleared)	Modify		✓	
opc all	Displays all OPC commands	Monitor	✓		
parm[1]	Display the Advanced User Parameters	Monitor and Modify	✓	✓	✓
ping	Send ICMP Echo requests	Modify		✓	
plcread[1]	Display CPU memory	Monitor and Modify		✓	
plcwrite	Modify CPU memory	Modify		✓	
pluginapp	Manage optional Ethernet plug-in applications	Modify		✓	
rem	Send command to remote node	Modify		✓	
rename	Rename a file in the current working directory	Modify		✓	
repp	Display latest ping results	Modify		✓	
restart	Restart Ethernet firmware	Modify		✓	
rmdir	Remove file system directory	Modify		✓	
sosw[1]	Display Ethernet configuration	Monitor and Modify	✓	✓	✓
stat[1]	Display various operating status	Monitor and Modify	✓	✓	✓
stopp[1]	Stop ping in progress	Modify		✓	
tally	Display various operating counters	Monitor and Modify	✓	✓	✓
time	Display internal Ethernet clock	Monitor and Modify	✓	✓	✓
xchange	Display individual EGD exchange information	Monitor and Modify	✓	✓	✓

Tip

Effective with RX3i CPE310/CPE305 Firmware Release 8.30, the CPU itself also supports EGD Class 1. Prior to that firmware release, EGD was only available in the RX3i via the RX3i Ethernet Interface module (ETM001).

Entering Commands and Reading the Display

Entering Command Parameters

In the command descriptions of Station Manager Commands brackets and braces are used to show optional or alternative parameters for a command. These brackets and braces are NOT part of a command; do not include them when entering a command.

Table 2-2: Command Parameters

Bracket Type	Indicates	Example Command	Example Entry
< >	Symbolic parameter name	tally <tasks>	tally c
[ ]	Optional parameter	log [z]	log
{ | }	Alternative parameters	net { on | off }	net on

Enter the rest of the command exactly as it is shown. Do not include extra spaces or tab characters within commands. All data entered for the command is converted to lower case unless it is enclosed in double quotes (“ ”).

Tip

The Station Manager is a low-priority task. The command response time depends on the communication load of the Ethernet interface. Extremely high load conditions may cause the loss of input or output characters. The Station Manager may not be able to process commands until the load is decreased.

Entering Numeric Values

Numeric values may be entered in decimal or hexadecimal format. For a hexadecimal value, enter a trailing “H” (either upper or lower case) as its last character.

Entering Control Characters

The Station Manager accepts the ASCII control characters listed below. Other control characters are ignored.

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

Entering a Multi-Line Command

Use the character pair \<CR> to continue a command on the next line. The \ (backslash) character is not part of any command.

Repeating a Prior Command Entry

The Station Manager stores the prior ten command lines. This stored list is cleared at restart or power-up. If you want to repeat a command, press CTRL-R. This displays the most recent of the ten stored commands first, then the command before that and so on, in reverse chronological order. Once the command you wish to repeat is being displayed in the Command window, press Enter to activate it.

Press CTRL-X to clear the current Station Manager command line.

Station Manager Display Format

The Station Manager display format depends on the type of data being displayed. The various formats are described below:

Numeric Values

Most numeric values are displayed in decimal format. A few values are displayed in hexadecimal format. Some values are displayed in both decimal and hexadecimal. Hexadecimal values are displayed with an “H” as their last character. An example of numeric output is shown below:

```
ifrag_tmr = 64 (40H)
```

Byte String Values

Byte strings represent each successive byte as a pair of hexadecimal digits enclosed in double angle brackets (<<...>>).

```
MAC Address = <<080019010842>>
```

IP Addresses

IP addresses are displayed and entered in dotted decimal format:

```
IP Address = 10.0.0.2
```

Checking IP Addresses

When setting up the system, you can check the IP address of the Ethernet interface using the Local Station Manager, and also verify that it is unique by accessing it from another device on the network. It is very important not to duplicate IP addresses.

Checking the IP Address of the Ethernet interface

With the terminal connected directly to the Station Manager port on the Ethernet interface, issue the NODE command:

```
> node
IC698 Embedded Ethernet Interface Copyright (c) 2003. All rights reserved.
Version 1.00 (21A1) TCP/IP
Version 1.00 (21A1) Loader
IP Address = 10.0.0.2     Subnet Mask = 255.255.0.0
Gateway = 0.0.0.0
MAC Address = <<080019010203>> 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

Apr 28, 2003 0:11:19.2
Date/time initialized from PACSystems CPU
```

Verifying that the IP Address of the Ethernet Interface is Unique

Make sure the Ethernet interface does not have the same IP address as another node.

1. Disconnect the LAN cable from the Ethernet interface.
2. Log on to another device on the network.
3. From the other device, ping the IP address assigned to the Ethernet interface.

If you get an answer to the ping, it means the chosen IP address is already in use by another node. You must correct this situation by assigning unique IP addresses.

Changing Backup Parameters of the Ethernet Interface

When the Ethernet interface is restarted, it runs power-up diagnostics. For rack-based embedded interfaces, the OK (or ETHERNET OK) LED blinks rapidly, while the other LEDs remain off. The Station Manager is not available during power-up. It is also not available during a software load.

After successful diagnostics, the Ethernet interface receives its configuration data from the CPU. The Ethernet interface may also receive an Advanced User Parameters file, if one has been set up for the application.

If configuration data is not received, the Ethernet interface uses its backup configuration. (Each Ethernet interface is shipped from the factory with a valid set of default backup configuration data.)

Tip

The Factory default configuration data contains default addressing data that does not permit proper Ethernet network operation. IP addressing data (IP address, subnet mask, and optional gateway IP address) must be set up prior to normal operation. Once set up, the Ethernet Interface will save the IP addressing data in its backup configuration for future use. On Ethernet modules, the default IP addressing data is valid only when the actual IP addressing data will subsequently be received from a BOOTP server on the user's network.

If necessary, the Station Manager can be used to change the backup configuration or advanced parameters for ETM001-Jx Ethernet module. These changes are only in effect until a valid configuration is received. Changing the backup configuration or advanced parameters requires access to the Modify-level commands: CHPARM and CHSOSW. Both commands are described in Station Manager Commands.

The RX3i and RSTi-EP Embedded Ethernet interfaces do not support these commands.

Changing Backup Configuration Parameters

Use the CHSOSW command to change the following backup parameters for the Ethernet interface:

- IP address
- Subnet mask
- Gateway IP address
- SNTP timestamp synchronization for Ethernet global data
- Maximum number of simultaneous FTP connections.
- Station Manager port data rate (4800, 9600, 19200, 38400, 57600, 115200)
- Station Manager port parity (NONE, ODD, EVEN)
- Station Manager port flow control (NONE, HARDWARE)

Tip

The RX3i and RSTi-EP embedded Ethernet interfaces or ETM001-Kxxx do not support the CHSOSW command.

2.2 Changing Backup Advanced User Parameters

Use the CHPARM command to change the backup Advanced User Parameters for the Ethernet interface. A complete list of the Advanced User Parameters for the Ethernet interface is included with the description of the PARM command in Station Manager Commands

. For the most part, changes to these parameters are NOT recommended. However, CHPARM might be used to temporarily change:

- The Station Manager password used to access the Modify-level commands
- The FTP password used to store Web page files to the Ethernet interface.

Tip

The RX3i embedded Ethernet interfaces or ETM001-Kxxx do not support the CHPARM command.

2.2.1 Testing Communications on the Network

During system setup, use the Station Manager to test each installed Ethernet interface to be sure that each is operational and configured with proper TCP/IP parameters. To do that:

1. Enter the LOGIN command:
   login

The password prompt displays:

Password:

2. The factory default password is:
   system (lower case)

   Enter the default password, or other password if it has been changed.

3. If the password matches the current password for the Modify level, the Modify prompt displays.

4. Use the PING command to test the ability to reach individual nodes.

The test works by sending an ICMP echo request message to a specific destination and waiting for a reply. Most nodes on TCP/IP networks implement ping.

PING can reach remote IP networks through gateways.

Enter the PING command using the IP address for the destination to be tested. A typical PING command is as follows:

```
= ping 10.0.0.2 10
Ping initiated
<<< Ping Results >>>
Command: ping 10.0.0.2 10 100 64
Sent = 10, Received = 10, No Timely Response = 0
Late/Stray Responses = 0
Round-trip (ms) min/avg/max 0/1/10
```

For more information about using PING and other Station Manager commands, refer to Station Manager Commands

2.2.2 Using the Station Manager for Network Troubleshooting

The Controller Fault Table provide useful troubleshooting information, as described in the *TCP/IP Ethernet Communications for PACSystems User Manual*, GFK-2224. In addition, the Station Manager commands can be used to identify and correct problems.

Three Station Manager commands frequently used for troubleshooting are NODE, LOG, and TALLY.

Displaying Information about a Node

Use the Monitor-mode NODE command to display identifying information about the Ethernet interface or a remote node. For example:

```
> node
IC698 Embedded Ethernet Interface Copyright (c) 2003. All rights reserved.
Version 1.00 (21A1) TCP/IP
Version 1.00 (21A1) Loader
IP Address = 10.0.0.2     Subnet Mask = 255.255.0.0
Gateway = 0.0.0.0
MAC Address = <<080019010203>> 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
Apr 28, 2003 0:11:19.2
Date/time initialized from PLC CPU
```

Viewing the Exception Log

When the Ethernet interface software detects an unusual condition, the software records information about the condition in its exception log. The exception log can be viewed using the Station Manager LOG command. For example:

```
> log
<<< Exception Log >>>
IC698 Embedded Ethernet Interface version 1.00 (21A1) Log displayed 04-
APR-2003 11:25:28.3
Log initialized using valid RAM information
Log last cleared 31-MAR-2003 09:33:46.9

  Date           Time         Event  Count  Entry 2 through Entry 6
  03-APR-2003    09:33:47.0    1H     1H     0000H 0001H 0000H 0000H 0000H
  03-APR-2003    09:33:47.0    0H     1H     MII/PHY Fail
  03-APR-2003    14:01:22.2   20H     1H     0001H 8080H 0000H 0001H 0117H
  ->03-APR-2003  09:33:47.2   2aH     1H     0004H 0000H 0000H 0004H
```

Each new (not repeating) log event is also sent to the Controller Fault Table, where it can be viewed using the Programmer or a Web browser. Exception Log Events, Exception Log Events, lists the log events, and shows how to interpret the fault entries that are displayed.

Checking the Network Connection

If the Ethernet interface is not able to send or receive communications on the network, the usual cause is some type of hardware problem. If this occurs, use the following procedure.

1. Check to be sure that the network cables are securely fastened to the Ethernet interface connector and to the network connection device (hub, switch, and so forth).
2. Use the Station Manager to check the Network Interface task using a TALLY L command. The TALLY L command displays a list of tallies for all network interface tasks and will identify specific communications errors that may be occurring.

If this station is the only one experiencing problems:

a) Verify that the network cable is properly connected to the Ethernet interface and to the network connection device.
b) Verify that the network connection device is operating properly on the network. (Are other devices operating on the same network segment?)
c) Make sure the module is seated and secured properly.
d) Replace the network cable with a known good cable.
e) Verify that the system power supply is properly grounded.

If all stations are experiencing the problem, the network is probably at fault. Contact the network administrator.

When the LOG EMPTY LED is ON (Ethernet Modules)

Sometimes problems can occur even when the LOG EMPTY LED is on, indicating normal operation. In that case, check if the LAN OK LED is steadily on, indicating that the interface is successfully attached to the Ethernet network, but there is no network activity.

To find out whether the Ethernet interface can access the CPU, issue successive TALLY C commands. If any of the following tallies: BpdAbort or PlcTmout are incrementing, there may be a hardware problem with the backplane interface. Check the Controller Fault Table entries for the Ethernet interface.

Changing Backup Advanced User Parameters

Use the CHPARM command to change the backup Advanced User Parameters for the Ethernet interface. A complete list of the Advanced User Parameters for the Ethernet interface is included with the description of the PARM command in Station Manager Commands. For the most part, changes to these parameters are NOT recommended. However, CHPARM might be used to temporarily change:

- The Station Manager password used to access the Modify-level commands
- The FTP password used to store Web page files to the Ethernet interface.

Tip

The RX3i embedded Ethernet interfaces do not support the CHPARM command.

What to do if you Cannot Solve the Problem

If you are not able to solve the problem, contact Technical Support. Please have the following information ready:

- The name and catalog number marked on the module.
- Description of symptoms of problem. Depending on the problem–you may also need the following information:
    - The application program and the controller sweep time at the time the problem occurred.
    - A list of the configuration parameters for the Ethernet interface that failed.
    - A list of reported errors. This can be the contents of the Ethernet exception log, the contents of the Controller Fault Table, or both.
    - A description of the network configuration. This should include the following:
        - The number of systems accessing the network
        - The type of network cable used (for example, twisted pair, fiber optic, Cat5, etc.)
        - The length of network cable
        - The manufacturer and quantity of hubs, and network switches used between this controller and the operational portions of the network.

Section 3:Station Manager Commands

This chapter presents an alphabetic reference to Station Manager commands available for use with PACSystems Ethernet interface modules.

3.1 BOOTP

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the BOOTP command to simulate a BOOT Reply from a BOOTP server on the network. Like an actual response from a BOOTP server, the simulated BOOT Reply temporarily assigns an IP address and other TCP/IP parameters to an Ethernet Interface. Once an actual or simulated BOOT Reply is processed, further BOOTP commands are rejected.

The BOOTP-supplied parameters remain in effect only until the Ethernet Interface receives a proper configuration or the Ethernet Interface is restarted.

3.1.1 BOOTP Command Format

```
BOOTP < IP address > [ < subnet mask > [ < gateway > ] ]
```

<IP address>	Dotted–decimal IP address
<subnet mask>	Dotted–decimal subnet mask
<gateway>	Dotted–decimal default gateway IP address

3.1.2 BOOTP Command Example

```
= bootp 10.0.0.1 255.255.0.0 0.0.0.0
```

Tip

BOOTP data will not be saved over restart or power cycle.

3.2 CD

Available in *Monitor and modify* mode.

Interfaces: ETM001-Jx

Use the CD command to set a new working directory for file system access.

This command changes the working directory to the path specified. When the directory is successfully changed, the new working directory is displayed.

3.2.1 CD Command Format

CD < path >

<path>	Use a forward slash (‘/’) to separate directories.

	The path dot (‘.’) refers to the current directory.
	The path ‘..’ refers to the directory immediately up in the hierarchy.
	Using the CD command with no path displays the current working directory (last example below).

3.2.2 CD Command Examples

```
= cd /pages
/pages
= cd images
/pages/images
= cd
/pages/images
```

3.3 CHANNEL

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the CHANNEL command to show detailed information about a specified communication channel that was activated by a Channel COMMREQ command originating within the local PACSystems controller. The channel number specified by the user in the Channel COMMREQ command block identifies each communication channel.

3.3.1 CHANNEL Command Format

```
CHANNEL < channel number >
```

<channel number>	Number assigned during channel activation via a Channel COMMREQ command

The channel number for all active SRTP or Modbus/TCP channels can be displayed with the STAT H or STAT M commands, respectively.

3.3.2 CHANNEL Command Example 1: SRTP Channel

In this example, the user's application logic has initiated an SRTP Establish Read Channel command (2003) for channel number 4. The Station Manager command *channel 4* displays information for channel 4:

```
> channel 4
<<< Individual Channel Information >>> 13-Dec-2004 14:12:49.0
Protocol: SRTP
State: AWAIT_PERIOD DCSD Status: 0001H DCSD Flags: 0001H Transfers
Completed: 17
Number of Channel Errors: 0
Channel COMMREQ Details:
Type: READ
CRSW Reference Address (zero-based): 00008:00000
Command Code: 2003
Channel Number: 1
Repetitions: 0
Period Time Unit Code: 3, Number of Period Units: 1
Transfer Timeout: 50 10ms tics
Local Reference Address: 00008:00500
Remote Reference Address: 00008:00100
Number of Remote References to Access: 10
Remote Network Address Type: 1
Remote Network Address Length: 4
Remote Network Address: 10.10.0.4
```

3.3.3 CHANNEL Command Example 2: Modbus/TCP Channel

In this example, the user's application logic has initiated an Open Modbus/TCP Client Connection command (3000) for channel number 1; there have been no data transfers yet on this connection. The Station Manager command *channel 1* displays information for channel 1:

```
> channel 1
<<< Individual Channel Information >>> 29-Aug-2005 10:13:02.2
Protocol: Modbus/TCP Channel Number: 1
State: EST_IDLE
Remote Network Address: 10.10.0.20
TCP Linger Time (seconds): 60
Requests Sent: 0
Requests Succeeded: 0
Requests Errored: 0
COMMREQs Issued: 1
COMMREQs Processed: 1
Last Modbus Error/Exception:     0H:    0H
Channel COMMREQ Details:
Type: OPEN
CRSW Reference Address (zero-based): 8:398
Command Code: 3000
Channel Number: 1
Active COMMREQ Reported CRSW:  1H
Active COMMREQ Current CRSW:  1H
```

3.3.4 CHANNEL Command Example 3: Inactive Channel

In this next example, the Station Manager command "channel 2" has been issued, but channel 2 is closed: there is no channel open on channel 2.

```
> channel 2
<<< Individual Channel Information >>> 07-APR-2005 14:14:33.0
Channel 2 does not exist
```

3.4 CHIST

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the CHIST command to display a history of events retained for each channel. It is intended as a diagnostic tool. The interpretation of the output of this command requires detailed knowledge of the channels implementation and thus must be done by Technical Support. The output provides details that allow a better understanding of channel internal behavior.

Tip

The channels event history covers only the communication channels. The channels event history is maintained only until the Ethernet interface is restarted or power is turned off, and may not be cleared from the Station Manager.

3.4.1 CHIST Command Format

CHIST [channel number]

<channel number>	Number assigned during channel activation via a Channel COMMREQ command

The channel number for all active SRTP or Modbus/TCP channels can be displayed with the STAT H or STAT M commands, respectively.

Execute the CHIST command without specifying a channel number to see the channel history of all 32 possible channels.

3.4.2 CHIST Command Example

```
> chist 1
<<< Channel History >>> 09-JAN-20050 02:52:03.0
============ CHANNEL HISTORY - Channel: 01 ============
EVENT DESCRIPTION        DATA1      DATA2
```

3.5 CHLTIME

Available in *Modify* mode .

Interfaces: ETM001-Jx

Use the *CHLTIME* command to change the inactivity timeout period for the present session of Modify mode. The default timeout is 10 minutes. If no commands are entered during the timeout period, the Station Manager automatically switches back to Monitor mode. It is necessary to re-enter the password to access *Modify* mode again.

The change is temporary; the new timeout period is used only until the specified time passes, until the timeout period is changed during the same Modify mode session, or until the LOGOUT command is used. Timeout reverts to the default of 10 minutes the next time *Modify* mode is entered.

The login inactivity timeout clock is suspended during execution of a TRACE or PING command.

3.5.1 CHLTIME Command Format

CHLTIME <minutes>

<minutes>	Is the login inactivity timeout value (in minutes).
	The range is 0 to 32767.
	If the number of minutes specified is 0, the login inactivity timeout is not enforced.

CHLTIME Command Example

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

3.6 CHPARM

Available in *Modify* mode.

Interfaces: ETM001-Jx

Before a CPU configuration has been stored into the CPU, you can use the *CHPARM* command to change the value of a specific Advanced User Parameter. However, it is not recommended that you change any Advanced User Parameter other than *stpasswd*. Be careful when setting any Advanced User Parameter. Poor choice of settings may result in degraded Ethernet interface operation. If you change these parameters, record the original values for future reference.

Changes do not take effect until the Ethernet interface is restarted or power is cycled. 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.

After the CPU configuration has been stored into the CPU, the *CHPARM* command is prohibited and any previous changes made with it are no longer effective. Permanent changes to the default Advanced User Parameter values must be made in the Advanced User Parameter file. Refer to *TCP/IP Communications for PACSystems User's Manual,* GFK-2224, for details.

3.6.1 CHPARM Command Format

```
chparm < parm name > { < value > | def }
```

OR

```
CHPARM all def
```

<parm name>	The name of an Advanced User Parameter (these are listed in the PARM command description later in this chapter).
<value>	The new value for the specified parameter.
"def"	May be entered instead of an actual value to set the specified parameter to its factory default value.

3.6.2 CHPARM Command Example: Changing the Station Manager Password

```
= chparm stpasswd newpass
```

The default Station Manager password is "system". The normal way to change the password is via the "stpasswd" parameter in the Advanced User Parameter file.

If a CPU configuration has not been stored into the CPU, the Station Manager password can be changed by the CHPARM command; the parameter name is *stpasswd*. In order to use the CHPARM command, the current password is required to access the *Modify* level of the Station Manager. Note that the Station Manager new password parameter value will be converted to lowercase unless you enclose the value within double quotes.

3.6.3 What to Do if You Have Forgotten Your Password

If the Station Manager password has been set to a non-default value and you have forgotten the current password, you will not be able to enter Modify mode or use the modify level CHPARM command. In that case, you must either examine the *stpasswd* parameter in the Advanced User Parameter file for this CPU to determine the actual password, or store another Advanced User Parameter file with a known password to the CPU.

3.6.4 Changing the Ethernet Network Port Advanced User Parameters

⚠CAUTION

The IEEE 802.3 standard strongly discourages the manual configuration of duplex mode for an Ethernet network port (as would be possible using Advanced User Parameters). Before manually configuring duplex mode for a port using AUP, be sure that you know the characteristics of the link partner and are aware of the consequences of your selection. In the words of the IEEE standard: "Connecting incompatible DTE/MAU combinations such as full duplex mode DTE to a half-duplex mode MAU, or a full-duplex station (DTE or MAU) to a repeater or other half duplex network, can lead to severe network performance degradation, increased collisions, late collisions, CRC errors, and undetected data corruption."

Tip

If both speed and duplex mode of an Ethernet interface port are forced using Advanced User Parameters, that port will no longer perform automatic cable detection. This means that if you have the Ethernet interface port connected to an external switch or hub port you must use a crossover cable. If you have the Ethernet interface port connected to the uplink port on an external switch or hub, or if you have the Ethernet interface port directly connected to another Ethernet device, you must use a normal cable.

3.7 CHSOSW

Available in *Modify* mode.

Interfaces: ETM001-Jx

Before a configuration has been received from the CPU, you can use the CHSOSW command to change the backup configuration parameters of the Ethernet interface. Changes made by the CHSOSW command do not take effect until the Ethernet interface is restarted or power-cycled. The changes remain in effect only until a configuration is supplied by the CPU.

After the Ethernet interface receives a configuration from the CPU, the CHSOSW command is prohibited and any previous changes made with it are no longer effective.

3.7.1 CHSOSW Command Format

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

def	Sets all values to their defaults
ip_address	Dotted–decimal working IP address
subnet_mask	Dotted–decimal subnet work mask
gateway	Dotted–decimal default gateway IP address
p1_data_rate	Station Manager port data rate (4800, 9600, 19200, 38400, 57600, 115200)
p1_parity	Station Manager port parity (NONE, ODD, EVEN)
p1_flow_control	Station Manager port flow control (NONE, HARDWARE)
ftp_max_conn	Maximum number of simultaneous FTP connections (0 to 16, in multiples of 2). Each FTP client requires two FTP connections. Setting this parameter to 0 disables the FTP server.
time_sync	Time sync option (0 = none, 1 = SNTP)

3.7.2 CHSOSW Command Example 1: IP Address

This example supplies the IP Address of the Ethernet interface:

```
= chsosw ip_address 10.0.0.2
```

Tip

Parameter changes will not take effect until next power-up or restart.

3.7.3 CHSOSW Command Example 2: Number of Connections

These two commands change the number of web server (HTTP) connections and FTP connections:

```
= CHSOSW web_max_conn
= CHSOSW ftp_max_conn
```

The total number of web server connections plus FTP connections must not exceed 16. Each FTP client requires two connections.

3.7.4 CHSOSW Command Example 3: SNTP Time Synchronization

This example selects SNTP time synchronization:

```
= CHSOSW time_sync SNTP
```

3.8 CHTIME

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the *CHTIME* command to set the time and date the Ethernet interface.

Tip

In the RX3i Ethernet interface, this command changes the CPE's Real Time Clock. This embedded Ethernet interface does not have an independent clock feature.

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; a date value is optional. Valid dates are JAN 01, 2000 – 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 is power-cycled or restarted. This command applies only to the Ethernet interface; it does not change the time kept in the CPU.

3.8.1 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 (2000 . . .)
<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 zeroes need not be entered.

3.8.2 CHTIME Command Example

```
= chtime feb 21, 2003 23:00:10
Feb 21, 2003 23:00:10.2
Date/time not synchronized
```

3.9 CLEAR

Available in *Monitor** or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx* RX3i Embedded Interfaces*

Use the *CLEAR* command to set specified Ethernet interface data to its initial values, usually zeros. The desired data is specified by command arguments.

Use the *CLEAR LOG* command to clear the exception log.

Use the *CLEAR TALLY* command to clear tallies for all tasks (see TALLY command). Clearing tallies in the system affects EGD operation as viewed by STAT G or XCHANGE commands. When tallies are cleared, various counters that are unique to each exchange are cleared (transfer count, errors, etc.). With EGD run-mode store capability, you may want to use *CLEAR TALLY* to clear indications of past failures.

Use the *CLEAR ARP* command to immediately clear the internal ARP cache.

Use the *CLEAR EXS* command to clear the Extended Status data (see EXS command). Use the *CLEAR FILES ALL* command to clear all files stored in the file system.

Tip

Except for the default web home page, CLEAR FILES ALL clears all other web pages and related files used by the web server. Those files should be saved elsewhere before using CLEAR FILES ALL, or they will be lost.

3.9.1 CLEAR Command Format

```
CLEAR {log | tally | arp | exs | files all}
```

Task	Description	Supported by
log	Discards all log entries and sets the log to an empty state. On RX3i Ethernet modules, it also resets the LOG EMPTY LED on the Ethernet interface to green.	All
tally	Sets all resettable tallies to zero.	All
arp	Clears the internal ARP cache.	RX3i Ethernet Interface Modules
exs	Sets all resettable Extended Status data to zero.	All
files all	Clears the content of the file system. Entering just CLEAR FILES will result in the prompt shown in Example 2 below.	RX3i Ethernet Interface Modules

3.9.2 CLEAR Command Example 1

```
= clear tally
Tallies cleared
```

3.9.3 CLEAR Command Example 2

```
= clear files
```

Enter CLEAR FILES ALL if you really want to delete all files.

```
= clear files all
```

Files cleared.

3.10 DEL

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the DEL command to delete a specified file from the current working directory in the file system. Only one file may be deleted per command, using the exact name of the file. Wildcards and regular expressions cannot be used.

After the file is deleted, a confirmation is displayed. If the file does not exist, the command returns an error message instead.

The DEL command cannot delete a directory. Use the RMDIR command to delete a directory.

3.10.1 DEL Command Format

```
DEL <file name>
```

3.10.2 DEL Command Example

```
= del myfile
myfile deleted.
```

3.11 DIR

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx

Use the DIR command to display the list of files from the current working directory or the specified path in the file system.

3.11.1 DIR Command Format

```
DIR [ <path>]
```

<path>	Use a forward slash (‘/’) to separate directories.
	The path dot (‘.’) refers to the current directory.
	The path ‘..’ refers to the directory immediately up in the hierarchy.
	Using the DIR command with no path displays the current working directory, as shown in the example below.

3.11.2 DIR Command Example

= dir

-rwxrwxrwx 1 0 0 8666 Jan 1 02:38 file1.htm

-rwxrwxrwx 1 0 0 8666 Jan 1 02:38 file2.htm drwxrwxrwx 1 0 0 8666 Jan 1 2003 images/

3.12 EGDCMD

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx

Use the EGDCMD command to send one of several Ethernet Global Data commands to a remote device. The EGDCMD command displays an error message if the specified remote device cannot be reached in the network, or if the specified exchange does not exist at the remote device.

3.12.1 EGDCMD Command Format

The EGDCMD command performs several types of EGD commands; the desired EGD command must be specified. The general format of EGDCMD is:

EGDCMD <cmd> <target IP address> <parameter(s)>

The following four types of EGD commands are supported:

Cmd Type	Description
CO	Retrieve Configuration data for a specified EGD exchange at a remote device.
SU	Retrieve Summaries of all EGD exchanges configured at a remote device, starting at a specified exchange index. The number of exchange summaries in the response may be truncated to fit within a single EGD message. If the response does not contain all summaries, the remaining exchange summaries may be retrieved by subsequent Summary commands with larger exchange index.
CA	Retrieve EGD Capabilities data from a remote device.
ST	Retrieve Statistics data for a specified EGD exchange at a remote device.

3.12.2 EGDCMD Command Formats

The specific formats of each command type are:

```
EGDCMD CO <ip address> <producer ID> <exchange ID> EGDCMD SU <ip address>
[<exchange IDx>]
EGDCMD CA <ip address>
EGDCMD ST <ip address> <producer ID> <exchange ID>
```

<IP address>	The IP address of the remote target device.
<producer ID>	The Producer ID of the Ethernet Global Data exchange, expressed in dotted decimal format.
<exchange ID>	The Exchange ID of the Ethernet Global Data exchange, expressed as a number.
<exchange idx>	Optional zero-based starting index for exchanges in the Summary command. A value of zero indicates the first configured exchange. If this parameter is not entered, the starting index defaults to zero. Exchange index values are identified in the Summary output display. For remote devices, exchange index values are also displayed as in the STAT G output from that remote device.

3.12.3 EGDCMD Command Example

This example reads the ST (statistics) of EGD Exchange 2 from Producer ID 10.0.0.1: (the remote target device uses IP Address 10.0.0.1)

```
> egdcmd st 10.10.0.1 10.10.0.1 2
Statistics for 0x0a0a0001(10.10.0.1):2
Configuration time = 0
Sample due time = FRI MAY 21 10:32:09 2004
Exchange state = 1 (PRODUCING/HEALTHY) Exchange length = 100
Sample count = 491182
Missed sample count = 0
Refresh error count = 0
```

3.13 EGDREAD

Available in *Modify* mode.

Interfaces: ETM001-Jx[2,3]

Use the EGDREAD command to display the data for a specified Ethernet Global Data exchange as it currently exists in the shared memory interface to the CPU. Each line of up to 16 bytes returned by this command is displayed in hexadecimal format, followed by its ASCII representation. Non-printable ASCII characters are shown as dots. Note that this command is not the same as the Read EGD Exchange command described in the *TCP/IP Communications for PACSystems User Manual,* GFK-2224. The Read EGD Exchange command reads from the internal memory of a Class 2 producer or consumer device, not from the EGD shared memory location.

The Ethernet Global Data in the Ethernet interface may not to be scanned into the reference tables used by the application - for example, if the CPU is not in Run mode.

The EGDREAD command displays an error message if the node does not have an exchange with the specified producerID and exchangeID, or if the beginning offset is not contained within the exchange, or if the offset plus the length exceeds the size of the exchange.

3.13.1 EGDREAD Command Format

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

<producerID>	This producer of the Ethernet Global Data, expressed in dotted decimal format.
<exchangeID>	The exchange ID of the Ethernet Global Data, expressed as a number.
<offset>	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 of one (1) is used.
<len>	

3.13.2 EGDREAD Command Example

This example reads the entire Ethernet Global Data exchange with Producer ID 10.10.10.1 and Exchange ID 1:

```
= 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 ................
```

3.14 EGDWRITE

Available in *Modify* mode.

Interfaces: ETM001-Jx

Tip

This command is intended solely for use with consumed exchanges and is not the same as the Write EGD Exchange command described in the T*CP/IP Ethernet Communications for Series 90-30 CPU372 and CPU374 PLUS User Manual*, GFK-2382. (While not forbidden for produced exchanges, the specified data will be overwritten at the next sample production.)

Use the EGDWRITE command to write up to 16 data values into the memory of a specified local Ethernet Global Data consumed exchange. Updating memory within the local Class 2 device, the values will persist until subsequent sample consumption on this exchange from the network overwrites the specified values.

The data values are placed into consecutive bytes of the exchange starting at the specified offset. If a data value is larger than 255 (ffH), only the least significant byte of the data value is used. An error is displayed if the producer ID, exchange ID, or offset is not valid, or if the data specified would cause writing beyond the boundaries of the exchange, or if the new data values are not valid numeric values.

3.14.1 EGDWRITE Command Format

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

<producerID>	This producer of the Ethernet Global Data, expressed in dotted decimal format.
<exchangeID>	The exchange ID of the Ethernet Global Data, expressed as a number.
<offset>	The offset within the EGD exchange to write the new data.
<new data value>	The byte value to be placed in Ethernet Global Data memory in the Ethernet interface.

3.14.2 EGDWRITE Command Example

This example writes the two data values 2 and 3 into byte offsets 100 and 101 within the shared memory use by the EGD consumed exchange identified by Producer ID 10.10.0.1, and Exchange ID 1:

```
= egdwrite 10.10.10.1 1 100 2 3
```

3.15 EXCEPTION

Available in *Monitor**and *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx* RX3i Embedded Interfaces*

Use the EXCEPTION command to display a history of internal channels exceptions that have occurred since the Ethernet module has been powered on or restarted. It is intended as a diagnostic tool. The interpretation of the output of this command requires detailed knowledge of the channels implementation and can only be done by Technical Support. The output provides details that allow a better understanding of channel behavior.

Tip

The channels exception history, displayed by the EXCEPTION command, is different from and independent of the Ethernet exception log, which is displayed via the LOG command. The channels exception history covers only the communication channels. Unlike the Ethernet exception log, the channels exception history is maintained only until the Ethernet interface is restarted or power is turned off, and may not be cleared from the Station Manager.

3.15.1 EXCEPTION Command Format

```
EXCEPTION
```

3.15.2 EXCEPTION Command Example

```
> exception
<<< Enet Exception Trace >>> 09-JAN-2000 03:35:05.0
SubSys EventID ModuleID Line Num Status Message
======= ======== ======== ======== ============
```

3.16 EXS

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the EXS command to display Extended Status for COMMREQs initiated by the local controller logic program. This command is usually used during troubleshooting.

3.16.1 EXS Command Format

```
EXS
```

3.16.2 EXS Command Example

```
> exs
<<< Extended Status >>> 05-MAY-2004 21:18:33.0
Software version   251
Last command       4000 (0fa0HH)
Last error code          0 (0000H)
Last COMMREQ in error           0000H 0000H 0000H 0000H 0000H 0000H 0000H
0000H
                           0000H 0000H 0000H 0000H 0000H 0000H 0000H 0000H
```

The EXS output displays the most recent COMMREQ command sent to this Ethernet interface, together with additional data on the most recent COMMREQ that generated an error. The error codes displayed in the EXS output are the same error codes returned to the controller logic program in the COMMREQ Status (CRS) word. If a non-zero error code is displayed, the EXS output also displays the first 16 words of the COMMREQ Command Block.

The EXS output data is retained until the Ethernet interface is restarted or power is cycled. The EXS data may be cleared by using the CLEAR EXS command.

3.17 FATALINFO

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use FATALINFO RTOS to display information collected after a fatal run-time fault.

This command is useful in most cases where an unrecoverable hardware or runtime failure has occurred on the Ethernet module. Use of this command and its output requires a detailed understanding of the hardware and internal operation of the Ethernet interface. This command should only be used in conjunction with detailed guidance from Technical Support.

Tip

Fatal fault information is maintained over power cycles and Ethernet interface restarts.

3.17.1 FATALINFO Command Format

```
FATALINFO {rtos} {opc}
```

rtos	Displays run-time fatal fault information.
opc	Displays OPC UA log file saved during the last run-time fatal fault. (See 'opc log' command for

3.17.2 FATALINFO Command Example

```
= fatalinfo rtos
```

3.18 HELP

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the HELP command (or enter the single character command "?") to display a list of the Station Manager commands that can be accessed in the present mode.

3.18.1 HELP Command Format

```
HELP
or
?
```

3.18.2 HELP Command Example 1: Monitor Mode

If you are not logged in, you will see only the Monitor-level commands.

```
= help
<<< Monitor Commands >>>
```

?	channel	chist	egdcmd	exs	fatalinfo
help	log	ltime	node	parm	sosw
stat	tally	time	xchange		

HELP Command Example 2: Modify Mode

If you are logged in to use Modify commands, you will also see all Monitor–level commands in the command list.

```
= help
```

<<< Monitor Commands >>>

?	channel	chist	egdcmd	exs	fatalinfo
help	log	ltime	node	parm	sosw
stat	tally	time	xchange		

<<< Modify Commands >>>

bootp	chltime	chparm	chsosw	chtime	clear
del	egdread	egdwrite	exception	login	logout
killms	killss	mkdir	net	ok	ping
plcread	plcwrite	pluginapp	rem	rename	repp
restart	rmdir	stopp	trace		

3.19 KILLMS

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the KILLMS command to delete an established Modbus/TCP server connection. This command disrupts the communication on a Modbus/TCP server connection. It should be used for diagnostics and maintenance only.

An endpoint number, as listed in the leftmost column of the STAT o output, identifies a connection. See the description of STAT later in this chapter for examples of Modbus/TCP endpoints.

3.19.1 KILLMS Command Format

```
KILLMS { all |<Modbus Server Endpoint> [<Modbus Server Endpoint> [...]] }
```

<Modbus/TCP Server Endpoint>	Endpoint number of the connection to be terminated.
All	Terminates all established Modbus Server endpoints.

3.19.2 KILLMS Command Example

```
= killms 4 5 15
Modbus Server connection 4 shutdown initiated.
Modbus Server connection 5 shutdown initiated.
Modbus Server connection 15 shutdown initiated.
```

3.20 KILLSS

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the KILLSS command to delete an established SRTP server connection. This command does not delete connections that are not in the established state. This command disrupts the communication on an STRP server connection. It should be used only for diagnostics and maintenance.

A connection is identified by an endpoint number, as listed in the leftmost column of the STAT v command output. See the description of STAT later in this chapter for examples of SRTP endpoints.

3.20.1 KILLSS Command Format

```
KILLSS { all | < SRTP Server Endpoint> [<SRTP Server Endpoint> [...]] }
```

<SRTP Server Endpoint>	Endpoint number of the connection to be terminated.
All	Terminates all established SRTP Server endpoints.

3.20.2 KILLSS Command Example

```
= killss 2 3 6
SRTP Server endpoint 2 shut down initiated
SRTP Server endpoint 3 shut down initiated
SRTP Server endpoint 6 shut down initiated
```

3.21 LOG

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the LOG command to display the exception log without any internal status code data. Use the LOG Z command to display the exception log including the additional status code data. The LOG Z command requires a 132-column display format. See the example below for the data displayed by the two forms of the LOG command.

Tip

Beginning with PACSystems Release 2.00, the additional exception log status data is always displayed by the basic LOG command. This provides complete exception log data each time the exception log is displayed without use of the optional "z" parameter.

The exception log is a circular list; a new event overwrites the oldest event in the list. An arrow points to the most recent event. Events stay in the log until they are cleared with the CLEAR LOG command or until they are overwritten. For RX3i Ethernet modules, the exception log is maintained in non-volatile memory; the exception log contents are retained over normal power outage. In RX3i and RSTi Embedded Interface interfaces (CPE302/CPE305/CPE310), the log is maintained in volatile memory, which is not maintained when power is lost, unless memory is preserved by the use of an Energy Pack.

Refer to appendix B, *Exception Events* for detailed information about the information returned by the LOG command.

3.21.1 LOG Command Format

```
LOG [ z ]
```

Z	Display additional status and addressing data

3.21.2 LOG Command Example

The LOG (prior to Release 2.00) command lists the current exceptions by time and date. Exceptions are identified by an "event" code, and a count is given for each type. The information on the right describes the event, as explained in Exception Log Events, Exception Log Events.

```
> log
<<< Exception Log >>>
IC698 Embedded Ethernet Interface version 1.00 (21A1)
Log displayed 04-APR-2003 11:25:28.3
Log initialized using valid RAM information
Log last cleared 31-MAR-2003    09:33:46.9
```

Date	Time	Event	Count	Entry 2 through Entry 6
03-APR-2003	09:33:47.0	1H	1H	0000H 0001H 0000H 0000H 0000H
03-APR-2003	09:33:47.0	0H	1H	MII / PHMII/PHY Fail
03-APR-2003	14:01:22.2	20H	1H	0001H 0000H 0000H 0001H 0117H
03-APR-2003	09:33:47.2	2aH	1H	0004H 0000H 0000H 0004H 0192H

3.21.3 LOG Z Command Example

For LOG Z (and LOG for Release 2.00 and higher), the information on the left is the same as for LOG, as shown above. Extra status data for some types of events appears on the right.

```
> log z
<<< Exception Log >>>
IC698 Embedded Ethernet Interface version 1.00 (21A1) Log displayed 04-
APR-2003 11:25:28.3
Log initialized using valid RAM information
Log last cleared 31-MAR-2003 09:33:46.9
```

Date	Time	Event	Count	Entry 2 through Entry 6	SCode	Remote IP Addr:Port or Producer ID:Exchg	Local IP Addr:Port
03-APR-2003	09:33:47.0	1H	1H	0000H 0001H 0000H 0000H 0000H			
03-APR-2003	09:33:47.0	0H	1H	MII/PHY Fail	80010605H		
03-APR-2003	14:01:22.2	20H	1H	0001H 0000H 0000H 0001H 0117H			
->03-APR-2003	09:33:47.2	2aH	1H	0004H 0000H 0000H 0004H 0192H			

3.22 LOGIN

Tip

Effective with release 8.65, CPE305/CPE310 no longer support the *login* command. Therefore, none of the RX3i CPUs support *Modify* commands.

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx

Use the *LOGIN* command to access the Modify commands of the Station Manager.

3.22.1 LOGIN Command Format

```
LOGIN
```

The *LOGIN* command is followed by the password prompt:

```
Password:
```

Enter the password (it is not echoed). Except for the Enter key, all keys pressed after the prompt are considered part of the password. The delete and backspace characters are interpreted as part of the password. The password may not include tabs or spaces. Passwords are limited to 8 characters and all characters after the eighth are ignored.

If the password matches the current password for the Modify level, a confirmation message appears and you can access the Modify commands. If the password does not match, an error message appears and the security level does not change.

Entering a Password at the Local Station Manager

When using the Local Station Manager terminal, the password does NOT need to be enclosed in double quotes to be case-sensitive.

Entering a Password via a Remote Station Manager

Tip

As a security safeguard, the PACSystems Ethernet interfaces do not permit the LOGIN command from a remote network location unless the Station Manager password has been set to a non-default value. The Station Manager password can be configured via an AUP file (refer to the *TCP/IP Communications for PACSystems User's Manual,* GFK-2224, for details – specifically Appendix A: "Configuring Advanced User Parameters").

When using the REM command to send a LOGIN command to log into a remote system, you must enter the password value along with the LOGIN command:

REM <node> LOGIN <password>

If the password contains any uppercase letters, place it in double quotes; passwords are case sensitive.

3.22.2 LOGIN Command Example (Local)

```
> login
Password: system
Logged in
```

```
=
```

The Default Password

The factory default password is:

system (lower case)

The password is normally changed using the Advanced User Parameters. It can be changed temporarily with the CHPARM command.

3.23 LOGOUT

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the LOGOUT command to exit Modify mode and return to Monitor mode. Modify commands entered after the logout receive an error message. If the inactivity timeout period was changed during the current session of Modify mode, logging out causes the timeout period to return to the default of 10 minutes for the next login.

3.23.1 LOGOUT Command Format

```
LOGOUT
```

3.23.2 LOGOUT Command Example

```
= logout
Logged out
>w
```

3.24 LTIME

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx

Use the LTIME command to display the current login inactivity timeout value.

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

3.24.1 LTIME Command Format

```
LTIME
```

3.24.2 LTIME Command Example

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

3.25 MIRROR

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the MIRROR command to echo port traffic from one external Ethernet port to the other. This is useful for monitoring network traffic with an Ethernet network analyzer connected to the mirror output port. The MIRROR command argument specifies the mirror output port.

Note that the port being used for mirror output traffic is also used normal network communications. In a heavily loaded system, the extra mirror output traffic could exceed the port's capacity and result in dropped packets.

3.25.1 MIRROR Command Format

MIRROR [{top | bot | off}]

top	Network traffic on the bottom Ethernet port (1B) on the interface will be echoed at the top port (1A).
bot	Network traffic on the top Ethernet port (1A) on the interface will be echoed at the bottom port (1B).
off	Turn port mirroring off.

Using the MIRROR command with no argument displays the current mirror status.

3.25.2 MIRROR Command Example

The following example will (in the following order) echo data from top port to the bottom port, check the mirror status, turn port mirroring off and check the status again.

```
= mirror bot
```

Top Port traffic will be echoed on the Bottom Port

```
= mirror
```

Top Port traffic will be echoed on the Bottom Port

Usage: mirror [{top | bot | off }]

ex: Typing "mirror top" will echo all data on the bottom port to the top port

```
= mirror off
```

Port mirroring cleared

```
= mirror
```

Port mirroring is disabled

Usage: mirror [{top | bot | off }]

ex: Typing "mirror top" will echo all data on the bottom port to the top port

3.26 MKDIR

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the MKDIR command to create a new directory in the current working directory.

MKDIR Command Format

```
MKDIR <directory name>
```

<directory name>	Name of the new directory to be created

3.26.1 MKDIR Command Example

This example creates the directory "images":

```
= mkdir images
```

“images” directory created.

3.27 NET

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the *NET* command to cause the Ethernet interface to either ignore incoming and outgoing Ethernet frames (NET OFF) or to accept incoming and outgoing Ethernet frames (NET ON). This command can be used to remove an Ethernet interface from the network without disconnecting or restarting the module.

3.27.1 NET Command Format

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

off	Take the Ethernet interface off the network
on	Attempt to put the Ethernet Interface on the network

3.27.2 NET Command Example

```
= net off
```

Interface off network

3.28 NODE

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the NODE command to display the Ethernet interface sign-on message. The NODE command shows the SNTP time synchronization status and source of the IP address being used in the node. Possible sources of the IP address are: Configuration, Backup configuration, EEPROM, Default, Network, and BOOTP. The status of any loaded Ethernet plug-in applications will appear in the NODE display. Also, SNTP configuration information: configured, Not configured, Unicast or Multicast/Broadcast modes. As well, device uptime and Energy pack status (CPU Embedded Ethernet only).

3.28.1 NODE Command Format

NODE

3.28.2 NODE Command Example

```
> node

IC698 Embedded Ethernet Interface
Copyright (c) 2003-2005. All rights reserved. Version 1.00 (21A1) TCP/IP
Version 1.00 (21A1) Loader
Version 1.00 Hardware
IP Address = 10.0.0.2     Subnet Mask = 255.255.0.0
Gateway = 0.0.0.0
MAC Address = <<080019010203>>
SNTP Configured
Station Manager Port:
Data Rate = 9600, Parity = NONE, Flow Control = NONE

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

Ethernet Plug-in Applications:
ExProtocol (Running)

Apr 28, 2003 0:11:19.2
Date/time not synchronized
```

3.29 OK

Available in *Modify* mode.

Interfaces: ETM001-Jx

The LOG EMPTY LED is turned off when an entry is placed into the exception log. You can use the OK command to turn this LED on again. This command has no effect on the contents of the exception log.

If you want to turn on the LOG EMPTY LED and also clear the exception log, use the CLEAR LOG command instead.

3.29.1 OK Command Format

```
OK
```

3.29.2 OK Command Example

```
= ok
```

3.30 OPC

Available in *Monitor* mode.

Interfaces: RX3i Embedded Interfaces

Use the **opc all** command to display all OPC_commands :
status certs mem events aux rdn log end perf

Each subcommand can be strung together on the command-line, separated by a space. The user must specify at least one of them.

Note: *Some command output has changed depending on if the model and firmware release in use supports Single vs. Dual Logging Config Format. Additional* ***opc*** *station manager commands are also available on units that support Single Logging Config Format. See GFK-2224AG section* ***Model Comparison for OPC UA Server Capabilities*** *identify if your specific model and firmware version support Single or Dual Logging Config Format.*

Command	Description
opc all	Displays all commands: **status certs mem events aux rdn log end perf startupdata** The **opc all** command will output the current log file at the end of the command. Starting with PACSystems Firmware release 11.01, for models that support Single Logging Config Format, the log at the end will only include the most recent 100 lines of log output. The full log output is available with the 'opc log' command.

Command	Description
opc status	Displays the following status information about the OPC UA server: 1. Stop/Starting/Running status 2. Server Statistics a. Number of Starts / Stops / Restarts / Clears b. Number of real-time tasks that the server is using c. Count of the number of times the server status and config status has been requested by PME, ladder logic, and Station Manager. 3. Session Statistics[3] a. ActiveSessions b. CummulativeSessions c. MaxSessions / MaxSessions Time 4. Subscription Statistics[3] a. ActiveSubscriptions b. CummulativeSubscriptions c. MaxSubscriptions / MaxSubscriptions Time d. CurMonitoredItemCount e. MaxMonitoredItemCount / MaxMonitoredItemCount Time f. CurrentDataChanges g. MaxDataChanges / MaxDataChanges Time 5. Address Space Info[3] a. Published Variables b. Maximum Elements Allowed c. Published Elements d. Address Space Status 6. Sweep Statistics[3] a. A variety of internal timers and counters available, see **GFK-2224AG - Figure 100: OPC UA Address Space – Application Information – Extended** for specific definitions. 7. Current Subscription Status[3] a. A detailed table of subscription information including sampling time intervals, monitored items count in each interval, sampling counts, and update times for given intervals. b. Monitored Item, Queued Data Changes, and Cumulative Data Samples counts. 8. The Current Server Time[4] 9. Server Uptime Statistics[5] a. The Server Start Time b. The Current Server Uptime in days / hours / minutes / sec 10. Configuration status, including whether the hardware configuration in use is from PME Hardware Configuration or from default values. 11. Server Assert Info[3] a. Expected to be No Records recorded 12. Logging Info[3] a. Information regarding log files on disk.
opc certs	Displays information about OPC UA certificates.

[3] *Available on Models that support Single **Logging Config Format***
[4] *Available in models with CPU Firmware 10.05 or later*
[5] *Available in models with CPU Firmware 10.10 or later*

Command	Description
opc mem (***FW 11.01 or later***[3])	Displays internal server memory usage for the given configuration.
opc events	Displays a certificate event log. This is used to debug problems with OPC UA certificate operations.
opc aux	Displays some internal file information related to OPC UA server.
opc rdn (***FW 10.10 or later***)	This command is available only on PLCs that are configured for hot-standby CPU Redundancy. It displays the IP addresses that the remote PLC uses for OPC UA communication.
opc log (***FW 10.10 or later***)	This command prints out the entire OPC UA log. This log includes details about the operation of the OPC UA stack. It can get very large depending on the log level settings in the OPC UA hardware config tab in PME. By default, no log data is collected. If log data is needed for troubleshooting, the user must select the level of detail that is desired on the OPC UA hardware config tab and downloading that hardware configuration to the PLC. For more specific information about the log file and the log configuration settings please refer to the *TCP/IP Ethernet Communications for PACSystems User Manual*, GFK-2224.
opc log end [N] (***FW 11.01 or later***[3])	Will display the most recent N lines of the most recent log file. N is optional and if omitted it will default to 100.
opc perf (***FW 11.01 or later***)	Displays most recent OPC UA server startup time in milliseconds, along with the count of variables and count of elements in the server address space.

3.30.1 OPC Command Format

Request usage information for **opc** command on controller with Single Logging Config Format:

```
> opc

USAGE: opc all | [status] [aux] [certs] [events] [log] [log end] [log end <n>] [perf]

     : opc all | [mem]
```

3.30.2 OPC Command Example 1

Use the **opc all** command on a controller supporting Dual Logging Config Format:

```
opc all
    OPC-UA Server Status: (0x0002) Running
    Config Status: (0x0002) Exists

    Server Statistics:
    Starts = 6
    Stops = 3
    Restarts = 4
    Config Clears = 0
    Running Task Count = 36
    Server Status Reqs = 3713
    Config Status Reqs = 3705

    Current Server Time: 16:08:41 2021-01-11
    Server Uptime Statistics:
    Server Start Time: 16:07:07 2021-01-11
    Current Server Uptime: 94.252 seconds
    OPC UA Config File:
    Format Version: 1.02
    Fixed Header: Hardware Config
    V1.01 Config: Hardware Config
    V1.02 Config: Hardware Config
    Certificate Expiration Handling: Dates Ignored

    Certificate display disallowed by configuration!

    Certificate Events
    0 events recorded.
    -- Status -- Depth -- Len ----- Time Stamp -----
    1. 0x00000000 0 0 1970-01-01 00:00:00
    2. 0x00000000 0 0 0-00-00 00:00:00
    3. 0x00000000 0 0 0-00-00 00:00:00
    4. 0x00000000 0 0 0-00-00 00:00:00
    …
    14. 0x00000000 0 0 0-00-00 00:00:00
    15. 0x00000000 0 0 0-00-00 00:00:00
    16. 0x00000000 0 0 0-00-00 00:00:00

    OPC UA Configured Logging Levels: SDK = Disabled (0) Stack = Disabled (0)
```

3.30.3 OPC Command Example 2

Use the **opc status** command on a controller supporting Single Logging Config Format:

```
> opc status

 OPC-UA Server Status: (0x0002)  Running
        Config Status: (0x0002)  Exists
 Variable Definitions: (0x0000)  PVT Table
 g_ServerRestartingFlag = 0   g_ServerShutdownFlag       = 0
 g_ServerRunningFlag    = 1   g_serverConfigClearingFlag = 0

 Server Statistics:
        Starts                     = 1
        Stops                      = 0
        Restarts                   = 1
        Config Clears              = 0
        Internal Server Exit Count = 0
        Running Task Count         = 1
        Server Status Reqs         = 18327158
        Config Status Reqs         = 18327155

 Session Statistics:
        ActiveSessions           = 0
        CumulativeSessions       = 0
        MaxSessions              = 0
        MaxSessions Timestamp:          2024-11-13T16:08:30.41907Z

 Subscription Statistics:
        ActiveSubscriptions      = 0
        CumulativeSubscriptions  = 0
        MaxSubscriptions         = 0
        MaxSubscriptions Timestamp:     2024-11-13T16:08:30.41907Z
        CurMonitoredItemCount    = 0
        MaxMonitoredItemCount    = 0
        MaxMonitoredItem Timestamp:     2024-11-13T16:08:30.41907Z
        CurrentDataChanges       = 0
        MaxDataChanges           = 0
        MaxDataChanges Timestamp:       2024-11-13T16:08:30.41907Z

 Address Space Info:
                                  Published Variables =          225
                                     Maximum Elements =        25000
                                   Published Elements =        12513
                                 Address Space Status = All Elements Published to Address Space
 Sweep Statistics:
                         Cached Variable Read Time Us =            0
                     Cached Variable Read Time Max Us =           20
                            Total Timers Scan Time Us =            9
                        Total Timers Scan Time Max Us =           42
                          Protocol Processing Time Us =         9135
                      Protocol Processing Time Max Us =         9758
                    Master Process Processing Time Us =         9121
                Master Process Processing Time Max Us =         9753
                          Longest Timed Read Region Us =            0
                      Longest Timed Read Region Max Us =            0
              Number of Elements Read in Last Update =              0
          Number of Timed Read Regions in Last Update =             0
                   Sweep Count to Complete Server Loop =           20
               Sweep Count to Complete Server Loop Max =           20
                     Sampling Engine Execution Time Us =            2
                 Sampling Engine Execution Time Max Us =           23
```

```
 Current Subscription Status:
Index Sampling Time (ms) timer_id monitoredItemCount samplingRequestCount samplingActualCount samplesAl-
lowed  RecentUpdateTime(microseconds) MaxUpdateTime(microseconds) queuedDataSamples
0      100    2      0      41684  0      0      0      0      0
1      250    3      0      16777  0      0      0      0      0
2      500    4      0      8406   0      0      0      0      0
3      1000   5      0      4205   0      0      0      0      0
4      2000   6      0      2103   0      0      0      0      0
5      5000   7      0      841    0      0      0      0      0
6      10000  8      0      420    0      0      0      0      0
     Current Monitored Item Count:                    0
     Total Queued Data Changes:                       0     (queued data changes waiting to be pub-
lished)
     Cumulative Data Samples Count:                   0     (all samples created including samples dis-
carded due to filtering or enqueue discards)


   Server Build Time: 2024-09-13T12:01:35Z
 Current Server Time: 2024-11-13T17:18:39.723276Z
 Server Uptime Statistics:
   Server Start Time: 2024-11-13T16:08:30.418887Z
   Current Server Uptime: 01:10:09 (h:m:s)
 OPC UA Config File:
        Format Version: 1.02
        Fixed Header: Hardware Config
        V1.01 Config: Hardware Config
        V1.02 Config: Hardware Config
        Certificate Expiration Handling: Dates Ignored
 OPC UA Server Assert Information:
 No OPC UA Server Assert Records recorded

 OPC UA Logging Configuration:
     Facilities = 'TRACE_FAC_ALL' (0x7FFFFF)
     Level      = 'TRACE_LEVEL_NOTICE : Informational' (0xE0)
 OPC UA Normal Log File Info:
  0. OPC UA Server Log File srvTrace.1.log (46787 bytes) (last modified time: 2024-11-13T16:08:28Z)
  1. OPC UA Server Log File srvTrace.2.log (3167 bytes) (last modified time: 2024-11-13T16:08:30Z)
  There currently are 2 Normal OPC UA Log Files.
 OPC UA Fatal Log File Info:
  There currently are 0 Fatal OPC UA Log Files.
```

3.31 PARM

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the PARM command to display the current value of the Advanced User Parameters (listed on the following pages) for specified tasks. All Advanced User Parameters for the selected tasks are displayed. Pending changes may cause data to scroll off some screens. Soft switch configuration parameters for the specified tasks are not displayed; use the SOSW command to display those parameters.

The AUP values returned as currently active are part of the configuration that is currently downloaded to the controller. If a currently active AUP is invalid, an e/3 event (Failure storing / setting AUPs in the Station Manager subsystem) may be logged. For more information, refer to Exception Log Events, Exception Log Events.

Note: This command only displays AUP parameters; it does not modify them. To modify a parameter, use the CHPARM command.

3.31.1 PARM Command Format

```
PARM { < tasks > | all }
```

All	Displays all advanced user parameters for the following tasks. Tasks not listed below do not have advanced user parameters.	
<tasks>	Applications	
	g	Ethernet Global Data (EGD)
	h	SRTP Client (Channels)
	t	FTP Server
	v	SRTP Server
	Internal Operation	
	b	System Memory
	c	PACSystems Controller Driver (BPD)
	f	ARP
	i	IP
	n	SNTP
	w	TCP
	l	Network Interface
	q	Ethernet Redundancy

3.31.2 PARM Command Example

This example displays the IP parameters (task i):

```
= parm i
<<< IP Parameters >>>
Default Value    User-Set Value
ittl            =      64                    (40H)*
ifrag_tmr  =       3                    (0003H)*
* An asterisk identifies the currently active value.
Pending local changes (must power-up or restart to activate):
ifrag_tmr   =       4                    (0004H)
```

Advanced User Parameters (AUPs)

Tip

The RX3i CPE302/CPE305/CPE310 embedded Ethernet interfaces do not support all AUPs listed. AUPs that can be used with CPE302/CPE305/CPE310 are indicated by a footnote. Other PACSystems Ethernet interfaces support the use of all AUPs listed in the following table. The CPE302, CPE330, CPE400,CPL410, CPS400 and EPXCPE205/210/215/220/240 only support the Monitor part of this command.

Table 3-1: AUP Parameters List

System Memory Parameters (task b)		Default	Range
staudp[1]	Remote command UDP port	18245 (4745H)	1 – 65535 (ffffH) Only the gdata_port and gXX_udp parameters may share the same UDP port number. All other UDP port number parameters in the AUP file must use unique port numbers.
stpasswd[1]	Station Manager password (only visible from MODIFY prompt)	"system"	0 – 8 characters, case sensitive, no spaces
Backplane Driver Parameters (task c)		**Default**	**Range**
crsp_tout[1]	CPU response timeout. Amount of time to wait for the CPU to respond to a request sent through the PLC Driver.	60 seconds	10 – 3600 (E10H)

chct_comp[1]	HCT compatibility option. (Rel 2.57 and later) Allows Ethernet interface to ignore SRTP header errors (typically generated by remote HCT devices) that were not detected in previous Series 90 products. 0 = HCT compatibility disabled (= report all errors) 1= HCT compatibility enabled (= ignore some errors)	0 (0H)	0, 1
cstorm[1]	COMMREQ storm onset threshold. Establishes a number of COMMREQs per second at or above which the PLC application is considered to be sending COMMREQs so rapidly that the Ethernet interface cannot continue normal operation. Setting this parameter to 0 disables COMMREQ storm error detection.	500 (01F4H)	0 – 10,000 (2710H)
cnostorm	COMMREQ storm end threshold. Establishes the number of COMMREQs per second at or below which the COMMREQ storm condition (see above) is considered to have ended. If the cstorm parameter is not set to 0, this parameter should always be less than cstorm. If cstorm is set to 0, this parameter is ignored.	100 (0064H)	0 – 10,000 (2710H)
RDS Parameters (task d)		**None**	**None**
ARP Parameters (task f)		**None**	**None**

Ethernet Global Data Parameters (task g)		Default	Range
gctl_port	UDP port for EGD control messages	7937 (1f01H)	1 – 65535 (ffffH) Only the gdata_port and gXX_udp parameters may share the same UDP port number. All other UDP port number parameters in the AUP file must use unique port numbers.
gdata_port	UDP port for point-to-point (unicast) EGD messages	18246 (4746H)	1 – 65535 (ffffH) Only the gdata_port and gXX_udp parameters may share the same UDP port number. All other UDP port number parameters in the AUP file must use unique port numbers.
gbcast_ttl	IP time-to-live for global broadcast messages (hop count)	1 (1H)	0 – 255 (00ffH)
gucast_ttl	IP time-to-live for point-to-point (unicast) messages (hop count)	16 (10H)	0 – 255 (00ffH)
gp_phase	Startup delay time in ms for successive produced exchanges	0 (0H)	0 – 65535 (ffffH)
gcmd_pri	EGD command processing priority relative to data production. 0 = EGD commands have lower priority. 1 = EGD commands have equal priority. 2 = EGD commands have higher priority.	0 (0H)	0, 1, 2
gc_accel	Enable consumed exchange acceleration. 0= Acceleration disabled; 1= Acceleration enabled.	1 (1H)	0, 1
gnostale	When bit zero in the “Production Status” field of the PDU of a consumed sample is set, sample is stale. 0 = allow status to be sent to the application when exchange status indicates stale data. 1 = prevent the new status from being sent to the application if exchange status indicates stale data.	0 (0H)	0, 1
EGD provides a UDP port parameter and host group IP address parameter for each of 32 possible host groups (1-32). The parameter formats for each host group are shown below. XX specifies host group 1-32.			

Ethernet Global Data Parameters (task g)		Default	Range
gXX_udp	UDP port for host group XX	18246 (4746H)	1 – 65535 (ffffH) Only the gdata_port and gXX_udp parameters may share the same UDP port number. All other UDP port number parameters in the AUP file must use unique port numbers.
gXX_addr	Multicast host group IP Address (must be Class D address)	224.0.7.XX	224.0.0.2 – 239.255.255.255
gXX_addr2	Multicast group IP address for LAN 2.	224.0.7.XX	224.0.0.2 – 239.255.255.255
gXX_ttl	deprecated		
gmcast_ttl	IP time-to-live for LAN1 host group (multicast) messages (hop count) New parameter that replaces the gXX_ttl for each multicast group on LAN 1.	1 (1H)	0 – 255 (00ffH)
gmcast_ttl2	IP time-to-live for LAN2 host group (multicast) messages (hop count). New parameter.	1 (1H)	0 – 255 (00ffH)
Note: If you configure different values for EGD exchanges with Unicast and Broadcast destination types, the largest value will be used for all Unicast and Broadcast exchanges. If you configure multiple gXX_ttl values for different Multicast exchanges, the smallest value among the configured parameters will be considered used for all exchanges. This applies only to PACS Ethernet Interface modules.			

SRTP Client (Channels) Parameters (task h)		Default	Range
hconn_tout	TCP Connect timeout (in milliseconds)	75000 (124F8H)	10 – 75000 (124F8H)
IP Parameters (task i)		**Default**	**Range**
lttl[1]	IP header default time–to–live (hop count)	64 (0040H)	0 – 255 (00ffH)
ifrag_tmr	IP fragment timeout interval in seconds	3 (0003H)	0 – 65535 (ffffH)
ICMP/IGMP Parameters (task j)		**None**	**None**
Network Interface Parameters (task l)		**Default**	**Range**

lduplex0	Ethernet duplex for Controller (0=auto-detect, 1 = half, 2= full)	0	0,1,2
lduplex1a[1]	Ethernet duplex for Port 1A (0=auto-detect, 1=half, 2=full)	0	0,1,2
lduplex1b	Ethernet duplex for Port 1B (0=auto-detect, 1=half, 2=full)	0	0,1,2
lspeed06	Ethernet speed for Controller (0=auto-detect, 1=10Mbit, 2=100Mbit)	0	0,1,2
lspeed1a[1]	Ethernet speed for Port 1A (0=auto-detect, 1=10Mbit, 2=100Mbit)	0	0,1,2
lspeed1b	Ethernet speed for Port 1B (0=auto-detect, 1=10Mbit, 2=100Mbit)	0	0,1,2
Modbus TCP/IP Server Parameters (task m)		**None**	**None**
SNTP Time Transfer to CPU Parameters (task n),7		**Default**	**Range**
ncpu_sync	Configures this Ethernet interface to support CPU TOD clock synchronization with network timeserver. (0=Not supported; 1=Supported)	0	0, 1

Unicast SNTP AUP Parameters (task n)4		**Default**	**Range**
Nmode	SNTP Mode of operation 0 = Multicast and Broadcast mode 1 = Unicast mode This parameter is required when unicast mode is used.	0	0-1.
Nprimary	IP address of the primary time server in dotted decimal format. (xxx.xxx.xxx.xxx) This parameter is required when unicast mode is used.	None	Any valid unicast IPv4 address
nsecondary	IP address of the secondary time server in dotted decimal format. (xxx.xxx.xxx.xxx) This parameter is optional.	None	Any valid unicast IPv4 address
npoll_interval	Poll interval of Unicast Period, in seconds, at which new time requests are sent to the server. The specified period will be rounded to the nearest power of 2. This parameter is optional.	32	16 - 1,024
npoll_count	Number of retransmissions that will be sent when no timely response is received from the server. This parameter is optional.	3	1 – 100
npoll_timeout	The time, in seconds, that the module will wait for a response from the server. This parameter is optional.	2	1 – 100.
SNTP Local Time Corrections (LTC) and Daylight Savings Time (DST) Parameters (task n) 4		Default	Range

[6] *ETM001-Kxxx will ignore the 10Mbit designation for parameter* lspeed0.

[7]

Unicast SNTP AUP Parameters (task n)[4]		**Default**	**Range**
nltc_offset	This signed value indicates the hours and minutes of the offset of local time from UTC. The minutes must be specified by one of four values, 0, 15, 30, or 45.	0:00	-12:45 to +14:45
ndst_offset	The offset between DST and standard time in hours and minutes, where the minutes are limited to the values 0, 15, 30, and 45.	None	0:15 to 1:00
ndst_start_month	The month when DST begins.	None	1 – 12
ndst_start_day	The day of the week upon which DST begins. 1 = Sunday 7 = Saturday	None	1 – 7
ndst_start_week	The number of the occurrence of ndst_start_day in the month. (1 is the first occurrence.)	None	1 – 4
ndst_start_time	The time, in hours and minutes, when DST begins.	None	0:00 – 23:59
ndst_ref_zone	Indicates the time zone of reference for ndst_start_time and ndst_end_time. L = Local Time U = UTC	None	L or U
ndst_end_month	The month upon which DST ends. Note that in the southern hemisphere, this value will be smaller than the start value.	None	1 – 12
ndst_end_day	The day of the week when DST ends. 1 = Sunday 7 = Saturday	None	1 – 7
ndst_end_week	The number of the occurrence of ndst_end_day in the month. (1 is the first occurrence.)	None	1 – 4
ndst_end_time	The time, in hours and minutes, upon which DST ends.	None	0:00 – 23:59

Modbus TCP/IP Client Parameters (task o)		**None**	**None**
Ethernet Redundancy Parameters (task q)[8]		**Default**	**Range**
rdipckival	Interval between additional checks for Redundant IP address in use (in milliseconds). When activating the Redundant IP address, the ETM sends a burst of three ARP requests at 20ms intervals. If the ETM receives an SRP response, it delays for the interval specified by rdipckival, plus an additional 20ms. After the specified interval has passed, the ETM tries again, repeating the cycle of three ARP requests. The ETM repeats the request cycle after each SRP response; however, the delay interval after a response is received doubles each cycle, to a maximum of 2.0 seconds.	100 (0064H)	1 – 1000ms
rdiparpivl	Interval between gratuitous ARP requests sent by the backup unit on behalf of the new active unit (in ms).	100 (0064H)	1 – 1000ms

[8] *These settings are part of the Advanced User Parameter (AUP) file which is not supported by EPXCPE205/210/215/220/240, CPE330, CPE400, CPL410, or CPS400. For these CPUs, the settings cannot be changed and are fixed to their default values.*

rdipnumarp	Number of gratuitous ARP requests to send out during Redundant IP activation process.	1 (0001H)	1 – 25
rdiparplog	Number of gratuitous ARP requests to send by backup unit before a “Redundant IP not available” exception is logged. (The backup unit continues to send ARP requests as long as it receives network packets addressed to the Redundant IP Address.)	5 (0005H)	1 – 25

FTP Parameters (task t)		**Default**	**Range**
tpassword	Password for login for FTP access.	“system”	0 to 8 characters

UDP Parameters (task u)	**None**	**None**

SRTP Parameters (task v)		**Default**	**Range**
vconn_tout[1]	SRTP inactivity timeout (in seconds). Amount of time to wait before cleaning up an abandoned privileged SRTP server connection. Any non-zero value is rounded up to the next multiple of 5 seconds. Refer to SRTP Inactivity Timeout in Chapter 1 for details. All privileged connections initially use the SRTP inactivity timeout specified by this AUP parameter. Inactivity timeouts established by an SRTP Client on an individual connection will override any AUP specified inactivity timeout on that connection. 0 = SRTP Inactivity Timeout disabled.	30 seconds	0 - 420 seconds
TCP Parameters (task w)		**Default**	**Range**
Wnodelay[1]	TCP nodelay option (0= inactive; 1 = active)	1 (1H)	0, 1
wkal_idle[1]	TCP keepalive timer value (in seconds)	240 seconds (=4 mins)	1 − 65535 (ffffH)
wkal_cnt[1]	TCP keepalive extra probe count	2	0 − 65535 (ffffH)
wkal_intvl[1]	TCP keepalive probe interval (in seconds)	60 seconds	1 − 65535 (ffffH)
wsnd_buff[1]	TCP send buffer size (in bytes)	65535 (ffffH)	0 − 65535 (ffffH)
wrcv_buff[1]	TCP receive buffer size (in bytes)	4096 (1000H)	0 − 32767 (7fffH)

3.32 PING

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the *PING* command to generate ICMP Echo requests to validate network connectivity.

The *PING* command is refused if the Ethernet interface on which you are issuing the *PING* command has not been configured with a valid IP address.

Login is maintained (automatic inactivity logout is inhibited) until the *PING* sequence has ended.

The results of the last *PING* command are maintained until the Modify-level login is exited. Use the REPP command to display the results of the most recent *PING* command. Only one *PING* command can be active at a time.

3.32.1 PING Command Format

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

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

3.32.2 PING Command Example

This example pings the node with IP address 10.0.0.2 ten times.

```
= ping 10.0.0.2 10
Ping initiated
<<< Ping Results >>>
Command: ping 10.0.0.2 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.

3.33 PLCREAD

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx

Use the PLCREAD command to display data from a specified address in CPU memory, program data block memory, or local data block memory.

The data is displayed in bytes. Each line of up to 16 bytes shows the data in hexadecimal format, followed by its ASCII representation. Dots are used for non-printable ASCII characters. For discrete tables such as %I and %Q, the entire byte containing the requested address is displayed. For example, specifying %I1, %I4 or %I8 in the command would all display the same data.

An error message is displayed if the address is not valid, or if address plus the length specified exceeds the memory of the CPU.

3.33.1 PLCREAD Command Format

To read CPU memory, enter the address and optional length:

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

To read program block or local data block memory, enter the address, pathname, and optional length:

```
PLCREAD <%P address> <progname> [ <len>]
PLCREAD <%L address> <progname> <blockname> [ <len>]
```

<address>	The address is %<selector><offset> The selector is AI, AQ, I, G, L, M, P, Q, R, S, SA, SB, SC, T, or W. The 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.
<len>	The length is words for word oriented tables such as the %R, %AI, %AQ, %P. %L, and %W tables. The length is bytes for the other tables. Length defaults to 1 (byte or word).
<progname> <blockname>	If the address selector type is %L (local data block memory) or %P (program data block memory), a program name is required. For %L, the block name is also required.

3.33.2 PLCREAD Command Example 1

This example reads two words of %R (register) memory beginning at register 1:

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

3.33.3 PLCREAD Command Example 2: %W

This example reads eight words of %W memory beginning at word 2000:

```
> plcread %W2000 8
01 00 02 00 03 00 04 00 05 00 06 00 07 00 08 00
```

3.33.4 PLCREAD Command Example 3: Program Block Memory

This example reads four words of %P (program block) memory from the program block prog01. The data to be read starts at word 128:

```
> plcread %P128 prog01 4
01 00 02 00 03 00 04 00
```

PLCREAD Command Example 4, Local Data Block Memory

This example reads six words of %L (local data block) memory from the local data block located at: prog01\blk001. The data to be read starts at word 88:

```
> plcread %L88 prog01\blk001 6
05 00 06 00 07 00 08 00 09 00 0a 00
```

3.34 PLCWRITE

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the PLCWRITE command to write up to 16 byte or word values into a specified location in CPU memory, program block memory, or local data block memory. An error is displayed and the data from the command is not written if the address is not valid for the CPU, or if the new data is not a valid numeric value.

PLCWRITE Command Format

To write data to CPU memory, enter the address and new data values:

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

To write data to program block or local data block memory, enter the address, program name, block name for %L and new data values:

```
PLCWRITE <%Paddress> <progname> <new data> [ <new data> ...]
PLCWRITE <%Laddress> <progname> <blockn
ame> <new data> [ <new data> ...]
```

<address>	The address is %<selector><offset> The selector is AI, AQ, I, G, L, M, P, Q, R, S, SA, SB, SC, T, or W. The offset is a numeric value in the range of 1 to the size of the reference table being written. Example addresses are %R1, %AI003 and %AQ1000.
<new data value>	A byte or word of data to be written.
<progname> <blockname>	If the address selector type is %L (local data block memory) or %P (program data block memory), a program name is required. For %L, the block name is also required.

PLCWRITE Command Example 1: %W Memory

This example writes the five words of data to %W memory beginning at word 2000.

```
= plcwrite %W2000 1 2 4098 64000 4444H
written
```

PLCWRITE Command Example 2: Program Block Memory

This example writes four words of data to %P (program block) memory in program block prog01. The location to receive the data starts at word 128

```
= plcwrite %P128 prog01 01 02 03 04
written
```

PLCWRITE Command Example 3, Local Data Block Memory

This example writes two words to %L (local data block) memory in the local data block located at: prog01\blk001. The location to receive the data starts at word 88:

```
= plcwrite %L88 prog01\blk001 100 256
written
```

3.35 PLUGINAPP

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the *PLUGINAPP* command to manage optional Ethernet plug-in applications. This command may be used to display a list of the active plug-in applications, enable or disable automatic startup of individual plug-in applications, start any plug-in applications that were not already started, or delete any plug-in application images from non-volatile storage. This command is typically used during Ethernet plug-in application development. There are four forms of the *PLUGINAPP* command:

The *PLUGINAPP LIST* command displays a list of all plug-in applications that have been loaded into this Ethernet interface.

PLUGINAPP LIST Command Format

```
PLUGINAPP LIST
```

PLUGINAPP LIST Command Example

A typical PLUGINAPP LIST command and its output are shown below:

```
= pluginapp list
<<< Ethernet Plug-in Applications >>>
```

Number	Name	Type	Startup	Status	Text	Data	BSS
1	PluginApp1	Rel	Auto	Running	0x01234567	0x00604320	0x00024680

The *PLUGINAPP STARTUP* command enables or disables a specified plug-in application for automatic startup when the Ethernet interface is restarted. (If not automatically started, the plug-in application can be started later via the PLUGINAPP RUN command.) The plug-in application startup setting is only used when the Ethernet interface is restarted via pressing the restart pushbutton or issuing a Station Manager reset command. This setting defaults to AUTO after a power-cycle.

PLUGINAPP STARTUP Command Format

```
PLUGINAPP STARTUP <> {AUTO | OFF}
```

<app num>	Ethernet plug-in application number (1, 2 or 3).
{AUTO | OFF}	AUTO enables automatic startup. OFF disables automatic startup.

PLUGINAPP STARTUP Command Example

A typical PLUGINAPP STARTUP command and its output are shown below:

```
= pluginapp startup 1 off
```

Application 1 will not be run at startup

The *PLUGINAPP RUN* command manually starts a specified plug-in application that was not previously started.

PLUGINAPP RUN Command Format

```
PLUGINAPP RUN <app num>
```

<app num>	Ethernet plug-in application number (1, 2 or 3).

PLUGINAPP RUN Command Example

A typical PLUGINAPP RUN command and its output are shown below:

```
= pluginapp run 1
```

Application 1 started successfully

The *PLUGINAPP DELETE* command removes a specified plug-in application image from non-volatile storage. Once deleted, the plug-in application will not be available the next time that the Ethernet interface is started or restarted.

PLUGINAPP DELETE Command Format

```
PLUGINAPP DELETE <app num>
```

<app num>	Ethernet plug-in application number (1, 2 or 3).

PLUGINAPP DELETE Command Example

A typical PLUGINAPP DELETE command and its output are shown below:

```
= pluginapp delete 1
```

Application 1 was successfully deleted from FLASH

Restart the Ethernet module to unload the active instance from RAM.

3.36 REM

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the *REM* command to send a Station Manager command to a remote Ethernet interface for processing. The Station Manager on the remote node acts on the command as if it had been entered locally, 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. An Ethernet interface cannot use the *REM* command to send any command to itself.

3.36.1 REM Command Format

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

<node>	The IP address of the remote Ethernet interface
<cmd>	Any Station Manager command except REM
<cmd parms>	A list of any parameters required by <cmd>

Do NOT send the REM command itself to an Ethernet interface:

```
= rem <node> rem <node> <command>
```

3.36.2 REM Command Example

This example sends a NODE command to the node with IP Address 10.0.0.2:

```
= rem 10.10.0.5 node
    IC695 Peripheral Ethernet Interface
    Copyright (c) 2003-2005. All rights reserved.
    Version 3.00 (15A1) TCP/IP
    Version 2.51 (20A1) Loader
    Version 6.00 Hardware
    IP Address = 10.10.0.5 Subnet Mask = 255.255.255.0
    Gateway = 0.0.0.0
    MAC Address = <<000991408C31>>
    SNTP Not Configured
REM>
    Station Manager Port:
    Data Rate = 9600, Parity = NONE, Flow Control = NONE
REM>
    Source of Soft Switches: Backup
    Source of IP Address: Configuration
    Jan 5, 2000 4:59:40.5
    Date/time initialized from CPU
```

3.36.3 Logging into a Remote System

To send a Modify-level command to a remote Station Manager, you must first log into the remote Station Manager. Use the REM command to send a LOGIN command to log into a remote system. You must also enter the password for the remote station:

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

If the password contains any uppercase letters, place it in double quotes; passwords are case-sensitive.

3.37 RENAME

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the RENAME command to rename a file in the current working directory.

3.37.1 RENAME Command Format

```
RENAME <old file name> <new file name>
```

<old file name>	The filename to be changed.
<new file name>	The new name for the file.

3.37.2 RENAME Command Example

This example renames the file "index.html" to be "old_index.html":

```
= rename index.html old_index.html
-rwxrwxrwx 1 0 0 8666 Jan 1 02:38 old_index.html
```

3.38 SOSW

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM-001-Kxxx RX3i and RSTi Embedded Interface

Use the SOSW command to show the current setting of the Ethernet configuration data (“Soft Switches”) and to indicate their source.

SOSW Command Format

```
SOSW
```

3.38.1 SOSW Command Example

```
> sosw
<<< Soft Switch Data >>>
IP Address      = 10.0.0.2 (TCP/IP values from Soft Switches)
Subnet Mask     = 255.255.0.0
Gateway         = 0.0.0.0
Max Web connections = 4
Max FTP connections = 6
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
Pending local changes (must power-up or restart to activate):
p1_data_rate = 38400
```

Sources for the Soft Switches are:

PLC Configuration	Settings received in the configuration from the PACSystems controller.
Backup	Settings retrieved from the Ethernet interface's internal backup. This is expected when configuration has not been received from the PACSystems controller.
Factory Default	Settings are factory defaults. This is expected when no current configuration or previously backed up configuration exists.

Sources for IP address are:

Configuration	IP address from Ethernet configuration (PACSystems controller or Backup)
EEPROM	IP address from EEPROM (Backup configuration is invalid)
Network	Temporary IP address set over network via SetIP utility.
BOOTP	Temporary IP address set over network from BOOTP server.
Factory Default	IP address is zero. (Backup configuration and EEPROM are invalid.)

3.39 STAT

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the STAT command to show the current status of the specified task(s). The STAT output display format varies according to the task being displayed.

3.39.1 STAT Command Format

The RX3i embedded Ethernet interface does not support all STAT tasks listed. Tasks that can be used are indicated by a footnote. Other PACSystems Ethernet interfaces support the use of all the tasks listed in the following table.

```
STAT <task(s)>
<task(s)> may be one or more of the following task identifiers.
```

Table 3-2: Stat Command Format

Task	Description	Supported by
a.	Display Module Settings and Status	RX3i DNP3 Outstation Module
b.	System Memory	All
c.	Backplane Driver (BPD)	All
d.	RDS	RX3i Ethernet Interface Modules
f.	ARP	All
g.	Ethernet Global Data (EGD)	All
h.	SRTP Client (Channels)	All
I.	IP	All
J.	ICMP, IGMP (for multicast)	RX3i Ethernet Interface Modules
l.	Network Interface	All
m.	Modbus/TCP Client (Channels)	All
n.	SNTP	All
o	Modbus/TCP Server	All
q.	Ethernet Redundancy	RX3i Ethernet Modules
s.	Flash File System	RX3i Ethernet Modules
t.	FTP Server	RX3i Ethernet Modules
u.	UDP	All
v.	SRTP Server	All
w.	TCP	All

3.39.2 STAT G Command Example

This example displays the status of the Ethernet Global Data task (g).

Exchanges that have Produce in backup mode enabled are identified by a '+' character immediately after the mode display, as shown in the following sample report.

```
> stat g
<<< EGD Status >>> 01-JAN-2000 00:14:46.0
```

Ndx	Producer ID	Exchange ID	Mode	State	Xch Sts	Transfers Completed
0H	10.10.0.1	1	PRODUCER	ACTIVE	01H	78
1H	10.10.0.1	2	PRODUCER+	ACTIVE	01H	78

Plus (+) indicates exchange configured as 'Produce in backup mode'

Number of exchanges (current + added by RMS) = 2

Number of producer tasks = 2

Tip

When a produced or consumed exchange has been updated in an RMS so that it is incompatible, it is normal to see exchange status values of 0xE or 14 until the RMS is completed and the exchanges are again compatible. Once this has occurred, STAT G will indicate that SMI transfer errors (mismatched lengths, etc.) have occurred by displaying an asterisk for that exchange. The only way to clear this indication in a newly updated system without restarting the module is a CLEAR TALLY command.

3.39.3 STAT V Command Example

This example displays the status of the SRTP Server task (v):

```
> stat v
<<< SRTP Server Status >>> 03-JAN-2003 16:10:22.0
```

Endpoint	Task	State	Num Requests	Client IP Address:Port	Timeout
0*	32	ESTABLISHED	10906	10.0.0.4:1659	30 sec
1*	33	ESTABLISHED	10916	10.0.0.4:1660	30 sec
2	34	ESTABLISHED	10931	10.0.0.4:1661	
3	35	ESTABLISHED	10911	10.0.0.4:1662	

Total connections used by SRTP = 4

Asterisk (*) indicates privileged SRTP Server connection.

Sharp (#) indicates CPU slot1-to-slot2 translation enabled.

CPU Slot1-to-Slot2 redirection allowed.

Tip

An SRTP Inactivity Timeout interval is displayed if the Inactivity Timeout is enabled for a connection.

3.39.4 STAT N Command Example

This example displays the current time of the Ethernet interface and identifies which SNTP Server it is synchronized with. It displays Local time correction value (LTC) time and Day Light Savings Time (DST) applied to the system.

```
10.10.21.130> stat n
<<< SNTP Status >>> 25-APR-2013 15:01:48.0 (+6:00) DST
Current POSIX clock time: 25-APR-2013 15:01:48.6 (+6:00) DST
Status: UNSYNCHRONIZED
<<< SNTP TRACKING TABLE >>>
Time Since

 Server Address          Stratum      Update           Consistent
10.10.21.100            4            9 seconds        YES
 1 tracked SNTP server(s)
```

3.39.5 STAT W Command Example

This example displays the number of active connections for Protocol TCP.

```
> stat w

 <<< TCP Status >>>   24-JUN-2020 11:40:38.0 (+0:00)
 Min Retran T/O = 1000, Max Retran T/O = 60000, Retran Alg = 4,
 Max Conn = 2048, Current Conn = 4
```

Protocol	Recv-Q	Send-Q	Local Address	Foreign Address	State
TCP	0	0	0.0.0.0.502	0.0.0.0.*	LISTEN
TCP	0	0	0.0.0.0.443	0.0.0.0.*	LISTEN
TCP	0	0	0.0.0.0.80	0.0.0.0.*	LISTEN
TCP	0	0	0.0.0.0.18245	0.0.0.0.*	LISTEN
TCP	0	0	192.168.0.2.18245	192.168.0.50.53684	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53697	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53699	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53700	TIME_WAIT
TCP	0	0	192.168.0.2.80	192.168.0.50.53701	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53702	TIME_WAIT
TCP	0	0	192.168.0.2.80	192.168.0.50.53703	TIME_WAIT
UDP	0	0	0.0.0.0.161	0.0.0.0.*	
UDP	0	0	0.0.0.0.53248	0.0.0.0.*	
UDP	0	0	0.0.0.0.34964	0.0.0.0.*	
UDP	0	0	0.0.0.0.49152	0.0.0.0.*	
UDP	0	0	10.10.0.25.49808	0.0.0.0.*	
UDP	0	0	192.168.0.2.54100	0.0.0.0.*	
UDP	0	0	0.0.0.0.18246	0.0.0.0.*	
UDP	0	0	0.0.0.0.18245	0.0.0.0.*	
Protocol	Recv-Q	Send-Q	Local Address	Foreign Address	State
TCP	0	0	0.0.0.0.502	0.0.0.0.*	LISTEN
TCP	0	0	0.0.0.0.443	0.0.0.0.*	LISTEN
TCP	0	0	0.0.0.0.80	0.0.0.0.*	LISTEN
TCP	0	0	0.0.0.0.18245	0.0.0.0.*	LISTEN
TCP	0	0	192.168.0.2.18245	192.168.0.50.53684	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53697	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53699	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53700	TIME_WAIT
TCP	0	0	192.168.0.2.80	192.168.0.50.53701	ESTABLISHED
TCP	0	0	192.168.0.2.80	192.168.0.50.53702	TIME_WAIT
TCP	0	0	192.168.0.2.80	192.168.0.50.53703	TIME_WAIT
UDP	0	0	0.0.0.0.161	0.0.0.0.*	
UDP	0	0	0.0.0.0.53248	0.0.0.0.*	
UDP	0	0	0.0.0.0.34964	0.0.0.0.*	

3.40 STOPP

Available in *Modify* mode.

Interfaces: ETM001-Jx

Use the STOPP command to immediately stop an active PING and view the results. This command is used to terminate a long–running PING sequence.

3.40.1 STOPP Command Format

```
STOPP
```

3.40.2 STOPP Command Example

```
= stopp
<<< Ping Results >>>
Command: ping 10.0.0.2 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.
```

3.41 TALLY

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the TALLY command to show the current value of the tallies for the specified tasks. Some tallies indicate load and performance information. Others can show whether there are local or network problems. Refer to Tallies of Ethernet Tasks, Tallies of Ethernet Tasks for a list of the tallies and their meanings. All tallies are displayed as 32-bit hexadecimal numbers.

3.41.1 TALLY Command Format

Tip

The RX3i embedded Ethernet interfaces do not support all TALLY tasks listed. Tasks that can be used with CPE302/CPE305/CPE310 are indicated by a footnote. Other PACSystems Ethernet interfaces support the use of all the tasks listed in the following table.

```
TALLY <task(s)>
<task(s)> May be one or more of the following task identifiers.
```

Task	Description	Supported by
a	Retrieve & Display Engineering Diagnostics	DNP3 Outstation Module (EDS001) only
c	Backplane Driver (BPD)	All
d	Reliable Datagram Service (RDS)	ETM001-Jx and ETM001-Kxxx
g	Ethernet Global Data (EGD)	All
h	SRTP Client (Channels)	All
I	IP	All
j	ICMP, IGMP (for multicast)	All
l	Network Interface	All
m	Modbus/TCP Client (Channels)	All
n	SNTP	All
o	Modbus/TCP Server	All
p	OS Events	All
q	Ethernet Redundancy	ETM001-Jx
s	Flash File System	ETM001-Jx
t	FTP Server	ETM001-Jx
u	UDP	All
v	SRTP Server	All
w	TCP	All

3.41.2 TALLY Command Example

```
> tally v
<<< SRTP Server Tallies >>> 03-JAN-2003 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 InDstRq =00000000H OutDstRp=00000000H
```

```
InPrvRq =00000000H OutPrvRp=00000000H InIToRq =00000000H OutItoRp=00000000H
OpenTO =00000000H InactTo =00000000H
```

3.42 TIME

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the TIME command to display the current system time. This time is used in generating time stamps for messages that require them. It 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 CPU. If this is not available, it is set to 00:00:00.0 (midnight). Time values are based on a 24-hour clock.

3.42.1 TIME Command Format

```
TIME
```

3.42.2 TIME Command Example

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

Tip

The command CHTIME can be used to change the date/time value.

3.43 TREND

Use the TREND command to show the current resource usage values of different metrics (Controller Specific).

```
> trend
> Usage: trend <param>
> Where <param> includes any of the following
> h - Trend Header d - Trend Data
```

The below example displays the trend header and trend data Info. Header and Data metrics will change depend on the controller.

```
> trend h
PlcTime, CatalogNum, SerailNum, FwVer, BuildId, FreeBytesInPart,
FreeBlksInPart, MaxFreeBlkSize, AllocBytesInPart, AllocBlksInPart,
SystemHeapSize, SysHeapTotalBlks, SharedHeapAvail, SharedHeapLargeAlloc,
SharedHeapUse, SrtpConn,MbusConn ,LAN1MbufFree, LAN1MbufUse, LAN2MbufFree,
LAN2MbufUse, EthP1Off, EthP2Off, EthP3Off, EthP4Off, pktRate[LAN1],
max_pkt_rate[LAN1], timestamp[LAN1], pktRate[LAN2], max_pkt_rate[LAN2],
timestamp[LAN2],

> trend d
24-JUN-2020 11:40:44.0,EPSCPE115-AAAA, CPE115, 10.05, EEJN, 3253204, 78,
1052624, 177967852, 19421, 181221056, 19499, 2082816, 1042432, 14336, 1 ,
0, 255, 129, 255, 1691, 0, 0, 0, 0, 0, 0, 01-JAN-1970 00:00:00.0, 7, 226,
24-JUN-2020 11:40:32.0
```

NOTE: If you observe "01-JAN-1970 00:00:00.0" as data for any timeStamp[LANx] metric, Which means there is no Ethernet Cable connection/Activity on Particular LAN interface.

3.44 XCHANGE

Available in *Monitor* or *Modify* mode.

Interfaces: ETM001-Jx ETM001-Kxxx RX3i and RSTi Embedded Interface

Use the XCHANGE command to show detailed information about the configuration of a specified Ethernet Global Data exchange. Every exchange is uniquely identified by its producer ID and exchange ID.

3.44.1 XCHANGE Command Format

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

<producer ID>	The ID of the device that produced the exchange
<exchange ID>	The ID of the exchange

The producer ID and exchange ID values for all defined exchanges can be displayed with the STAT G command.

Tip

XCHANGE counters cannot be manually reset during operation.

When a produced or consumed exchange has been updated in an RMS so that it is incompatible, it is normal to see exchange status values of 0xE or 14 until the RMS is completed and the exchanges are again compatible. The only way to clear this indication in a newly updated system without restarting the module is a CLEAR TALLY command.

XCHANGE Command Example

This example displays information about EGD exchange ID #1 for the device with address: 1.2.3.4:

```
> xchange 1.2.3.4 1
<<< Individual Exchange Information >>>
Exch Mode:    PRODUCER
Producer ID:    1.2.3.4
Exchange ID:    1
Exchange State:    ACTIVE
Exchange Status:    01
Current DP Status:    01
RMS State:    NORM_OP
RMS Scan Flag:    01
Exchange Signature: 0.0
Producer State:    STARTED
Period:    1000 ms
Dest UDP Port:    18246
Xfer Bytes:    0
Exch Type:    STATIC
Dest IP:   224.0.7.2
Transfer Cnt:   83651
Refresh Errs:    0
SMI Xfer Errors:
```

Appendix A Tallies of Ethernet Tasks

This appendix describes the types of information you can display using the TALLY command. Tallies are grouped by task.

The following table indicates which products provide support for the listed functions.

Table 3-3: Tallies of Ethernet Tasks

Tally Function	Task	RX3i ETM001	CPE302/CPE305/ CPE310 embedded	CPE330/CPE400 /CPL410 /CPS400 EPXCPE205/210 /215/220/240 embedded
Backplane Driver Tallies	task c	✓	✓	
SMI Driver Tallies	task c	✓	✓	✓
Reliable Datagram Service (RDS) Tallies	task d	✓		
Web Server Tallies	task e	ETM001-Jx only		
ARP Tallies	task f	none	none	none
Ethernet Global Data (EGD) Tallies	task g	✓	✓	✓
SRTP Client (Channels) Tallies	task h	✓	✓	✓
IP Tallies	task i	✓	✓	✓
ICMP/IGMP Tallies	task j	✓	✓	✓
Network Interface Tallies	task l	✓	✓	✓
Modbus/TCP Client (Channels) Tallies	task m	✓	✓	✓
SNTP Tallies	task n	✓		
Modbus/TCP Server Tallies	task o	✓	✓	✓
OS Event Tallies	task p	✓		✓
Ethernet Redundancy Tallies	task q	✓		
Flash File System (FFS) Tallies	task s	ETM001-Jx only		
FTP Server Tallies	task t	ETM001-Jx only		
UDP Tallies	task u	✓	✓	✓
SRTP Server Tallies	task v	✓	✓	✓
TCP Tallies	task w	✓	✓	✓

A.1 Ethernet Global Data Tallies (task g)

Use the command: `> tally g` to display the tally data for these Ethernet operations:

Table 3-4: Ethernet Global Data Tallies

Tally	Description
ActvAdd	Add Exchange RMS requests received. (Redundant Capable units only)
ActvDel	Delete Exchange RMS requests received. (Redundant Capable units only)
AlinErr	CMP error responses due to alignment error.
BadPort	UDP port not setup for exchange received from network.
CfRpSnt	CMP Retrieve Configuration replies sent to network.
CfRqRcv	CMP Retrieve Configuration requests received from network.
Cleanup	Cleanup Exchange RMS requests received. (Redundant Capable units only)
ConnRdy	Global Data connection area is ready messages received from CPU.
DataRx	Global Data production packets received from network.
DataRxE	Global Data packets received with expedited handling. (ICETM001-Jx only)
DataTx	Global Data production packets sent to network.
DisabOut	Disable production requests received from CPU.
EnabOut	Enable production requests received from CPU.
EstConRp	Establish Global Data connection area replies sent to CPU.
EstConRq	Establish Global Data connection area requests received from CPU.
EstMCnRq	Establish Modify Exchange requests received (Redundant Capable units only)
MissdCEx	Missed Consume Exchange Event Count.
MrkTrmRq	Termination of Exchange Requests received. (Redundant Capable units only)
RefrErr	Refresh errors encountered.
RmsCmdRp	RMS Exchange command responds sent. (Redundant Capable units only)
SigErr	Non-Command error responses due to signature error in request .
Stale	Produced exchanges sent without fresh CPU data.
SuspAdd	RMS Exchanges added in suspended mode. (Redundant Capable units only)
SuspDel	RMS Exchanges suspended pending deletion. (Redundant Capable units only)
TermRp	Terminate Global Data connection area replies sent to CPU.
TermRq	Terminate Global Data connection area requests received from CPU.

A.1.1 EGD Command Tallies (part of EGD Tallies)

Table 3-5: EGD Command Tallies

Tally	Description
AlinErr	Number of alignment errors.
CfRpSnt	Configuration responses sent to network.
CfRqRcv	Configuration requests received from network.
CpRpSnt	Capabilities responses sent to network.
CpRqRcv	Capabilities requests received from network.
ExchErr	Number of exchange errors.
LenErr	Number of packet data length errors.
OffErr	Number of data offset errors.
PduErrm	Number of packets received containing incorrect protocol version number.
RdRpRcv	Read responses received from network
RdRpSnt	Read responses sent to network.
RdRqRcv	Read requests received from network.
RdRqSnt	Read requests sent to network.
RejRcv	Number of reject packets received.
RejSnt	Number of reject packets sent.
SigErr	Number of signature errors.
SmRpSnt	Summary responses sent to network.
SmRqRcv	Summary requests received from network.
StRpSnt	Statistics responses sent to network.
StRqRcv	Statistics requests received from network.
Timeout	Number of timeouts occurred.
TooLong	Number of packets exceeding max data length (1400 bytes)
WrRpRcv	Write responses received from network
WrRpSnt	Write responses sent to network.
WrRqRcv	Write requests received from network
WrRqSnt	Write requests sent to network.

A.2 Modbus/TCP Server Tallies (task o)

Use the command: `> tally o` to display the tally data for these Ethernet operations

Table 3-6: Modbus/TCP Server Tallies

Tally	Description
BadPdu	Bad PDUs received from network.
FC01	Number of Read Coils requests received from network.
FC02	Number of Read Discrete Inputs requests received from network.
FC03	Number of Read Holding Registers requests received from network.
FC04	Number of Read Input Registers requests received from network.
FC05	Number of Write Single Coil requests received from network.
FC06	Number of Write Single Register requests received from network.
FC07	Number of Read Exception Status requests received from network.
FC08	Number of Diagnostics requests received from network.
FC15	Number of Write Multiple Coils requests received from network.
FC16	Number of Write Multiple Registers requests received from network.
FC20	Number of Read File Record requests received from network.
FC21	Number of Write File Record requests received from network.
FC22	Number of Mask Write Register requests received from network.
FC23	Number of Read/Write Multiple Registers requests received from network.
InConRq	Number of TCP Connection Requests received from network.
InDatRq	Number of Data Request PDUs received from network.
InDisRq	Number of Disconnect Requests received from network.
InPdu	Total Modbus/TCP PDUs received (good and bad) from network.
OutConRp	Number of TCP Connection Responses sent to network.
OutDatRp	Number of Data Response PDUs sent to network.
OutDisRq	Number of Disconnect Requests sent to network.
OutErrRp	Number of Error Response PDUs sent to network.
OutPdu	Total Modbus/TCP PDUs sent to network.

A.3 Modbus/TCP Client Tallies (task m)

Use the command: `> tally m` to display the tally data for these Ethernet operations:

Table 3-7: Modbus/TCP Client Tallies

Tally	Description
BadCmd	Number of unrecognized Channel COMMREQs received.
BadPdu	Bad PDUs received from network.
InBpdEr	Number of BPD transfer failures while receiving from local CPU.
InClose	Number of Close (3001) Channel COMMREQs received.
InCmd	Number of Channel COMMREQs received.
InConRp	Number of TCP Connection Responses received from network.
InDatRp	Number of Data Response PDUs received from network.
InDisRq	Number of Disconnect Requests received from network.
InErrRp	Number of Error Response PDUs received from network.
InMskWr	Number of masked Write Data (3009) Channel COMMREQs received.
InOpen	Number of Open (3000) Channel COMMREQs received.
InPdu	Total Modbus/TCP PDUs received (good and bad) from network.
InRdData	Number of Read Data (3003) Channel COMMREQs received.
InRdWr	Number of Read/Write (3005) Channel COMMREQs received.
InWrData	Number of Write Data (3004) Channel COMMREQs received.
OutBpdEr	Number of BPD transfer failures while sending to local CPU.
OutConRq	Number of TCP Connection Requests Responses sent to network.
OutDatRq	Number of Data Request PDUs sent to network.
OutDisRq	Number of Disconnect Requests sent to network.
OutPdu	Total Modbus/TCP PDUs sent to network.

A.4 RDS Tallies (task d)

Use the command: `> tally d` to display the tally data for these Ethernet operations:

Table 3-8: RDS Tallies

Tally	Description
RdDup	Number of duplicate requests received. (The reply is sent from execute-once queue.)
RpImm	Number of immediate replies sent.
RpNonImm	Number of non-immediate replies sent.
RpRecv	Number of replies received.
RqFlush	Number of incoming requests flushed without processing.
RqRecv	Number of incoming requests received.
RqRetry	Number of requests retried
RqSent	Number of requests sent.
RqTmOut	Number of requests timed out without response.
SessEnd	Number of sessions terminated.
SessStrt	Number of sessions started.

A.5 SRTP Client (Channels) Tallies (task h)

Use the command: `> tally h` to display the tally data for these Ethernet operations:

Table 3-9: SRTP Client Tallies

Tally	Description
BadCmd	Number of invalid channel command blocks received from CPU.
BadPdu	Number of Bad PDUs received from network.
InBpdEr	Number of Backplane Driver Transfer failures while receiving from CPU.
InCmd	Number of channel command blocks received from CPU.
InConRp	Number of Connect Response PDUs received from network.
InDatRp	Number of Data Response PDUs received from network.
InDisRq	Number of Disconnect Requests received from network.
InDstRp	Number of Destination Response PDUs received from network.
InErrRq	Number of Error PDUs received from network.
InPdu	Total SRTP PDUs received (good and bad) from network.
InSesRp	Number of Session Response PDUs received from network.
OutBpdEr	Number of Backplane Driver Transfer failures while sending to CPU.
OutConRq	Number of Connect Request PDUs sent to network.
OutDatRq	Number of Data Request PDUs sent to network.
OutDisRq	Number of Disconnect Requests sent to network.
OutDstRq	Number of Destination Request PDUs sent to network.
OutErrRq	Number of Error PDUs sent to network.
OutPdu	Total SRTP PDUs sent to network.
OutSesRq	Number of Session Request PDUs sent to network.
OutUncRq	Number of Unconfirmed Requests sent to network.

A.6 SRTP Server Tallies (task v)

Use the command: `> tally v` to display the tally data for these Ethernet operations:

Table 3-10: SRTP Server Tallies

Tally	Description
BadPDU	Bad PDUs received from network.
InactTO	Inactive SRTP connection timeouts in ESTABLISHED state.
InConRq	Connect Request PDUs received from network.
InDatRq	Data and Session Request PDUs received from network.
InDisRq	Disconnect requests received from network.
InDstRq	Destinations Request PDUs received from network.
InErrRq	Error Request PDUs received from network.
InIToRq	Inactivity Timeout Request PDUs received from network.
InPDU	Total SRTP PDUs received (good and bad) from network.
InPrvRq	Privileged Connection Request PDUs received from network.
InSesRq	Session Request PDUs received from network.
InUncRq	Unconfirmed Request PDUs received from network.
OpenTO	SRTP connections timed out in OPENING state.
OutConRp	Connect Response PDUs sent to network.
OutDatRp	Data Response PDUs sent to network.
OutDisRq	Disconnect requests sent to network.
OutDstRp	Destinations Response PDUs sent to network.
OutErrRq	Error Request PDUs sent to network.
OutIToRp	Inactivity Timeout Response PDUs sent to network.
OutPDU	Total SRTP PDUs sent to network.
OutPrvRp	Privileged Connection Response PDUs sent to network.
OutUncRq	Unconfirmed Request PDUs sent to network.

A.7 Web Server Tallies (task e)

Use the command: `> tally e` to display the tally data for these Ethernet operations:

Table 3-11: Web Server Tallies

Tally	Description
UrlReq	Number of URL requests received.
UrlSrvd	Number of URL requests responded to with data.
UrlUnkn	Number of requests for an unknown URL.
WebByte	Number of bytes returned to clients.
WebRef	Number of times a URL request has been refused due to lack of a connection.

A.8 FTP Server Tallies (task t)

Use the command: `> tally t` to display the tally data for these Ethernet operations:

Table 3-12: FTP Server Tallies

Tally	Description
LgnsRejc	Number of logins rejected by the server.
LgnsSucc	Number of successful logins handled by the server.

A.9 Backplane Driver Tallies (task c)

Use the command: `> tally c` to display the tally data for these Ethernet operations:

Table 3-13: Backplane Driver Tallies

Tally	Description
BadMbQIf	Mailbox requests received from BPD Users with mailbox qualifier error (bad message type or command value).
BpdAbort	Transfers aborted by BPD.
BsyRetry	Automatic retries due to CPU busy.
Cmrq	COMMREQs received from CPU.
CmrqDscd	COMMREQs discarded for BPD Users. (This tally indicates that the controller application is sending COMMREQs faster than the Ethernet interface can process them.)
CmrqStrm	Onset of a COMMREQ Storm. The controller application is sending COMMREQs so fast that the Ethernet interface cannot continue normal operation.
PktFmPlc	Total mailbox messages received from CPU.
PktToPlc	Total mailbox messages sent to CPU.
PktUnreg	Messages received for unregistered user.
PlcReq	Service requests from CPU to BPD users.
PlcRsp	Service request responses to CPU.
PlcSweep	Total CPU Sweeps.
PlcTmout	Timeouts awaiting response from CPU.
UnsolMsg	Unsolicited transfers from CPU to BPD users.
UsrMsg	Messages from BPD users to CPU.
UsrReq	Service requests from BPD (backplane driver) users to CPU.
UsrRsp	Service request responses to BPD users.
UsrTmout	Timeouts awaiting response from user.

A.9.1 Shared Memory Interface Tallies (also part of task c)

Table 3-14: Shared memory Interface Tallies

Tally	Description
BadMbQIf	Mailbox requests received from BPD Users with mailbox qualifier error (bad message type or command value).
BpdAbort	Transfers aborted by BPD.
BsyRetry	Automatic retries due to CPU busy.
Cmrq	COMMREQs received from CPU.
CmrqDscd	COMMREQs discarded for BPD Users. (This tally indicates that the controller application is sending COMMREQs faster than the Ethernet interface can process them.)
CmrqStrm	Onset of a COMMREQ Storm. The controller application is sending COMMREQs so fast that the Ethernet interface cannot continue normal operation.
PktFmPlc	Total mailbox messages received from CPU.
PktToPlc	Total mailbox messages sent to CPU.
PktUnreg	Messages received for unregistered user.
PlcReq	Service requests from CPU to BPD users.
PlcRsp	Service request responses to CPU.
PlcSweep	Total CPU Sweeps.
PlcTmout	Timeouts awaiting response from CPU.
UnsolMsg	Unsolicited transfers from CPU to BPD users.
UsrMsg	Messages from BPD users to CPU.
UsrReq	Service requests from BPD (backplane driver) users to CPU.
UsrRsp	Service request responses to BPD users.
UsrTmout	Timeouts awaiting response from user.
CmdRHMsg	Number of high-priority message interrupt commands received.
CmdRLMsg	Number of normal-priority message interrupt commands received.
CmdRSRst	Number of soft reset interrupt commands received.
CmdRTest	Number of test interrupt commands received.
CmdRUnsp	Number of unsupported interrupt commands received.
CmdSHMsg	Number of high-priority message interrupt commands sent.
CmdSHRst	Number of hard reset interrupt commands sent.
CmdSLMsg	Number of normal-priority message interrupt commands sent.
CmdSSRst	Number of soft reset interrupt command sent.
CmdSTest	Number of test interrupt commands sent.
IntRcv	Number of interrupts received.
IntSent	Number of interrupts sent.
IoInSet	Number of times input data has been updated in shared memory.
IoIScans	Number of input scans detected.
IoTimSet	Number of times timestamp has been updated in shared memory.
MtMbRcv	Number of mailbox message received from the PACSystems controller.
MtMbRsnd	Number of mailbox message resent to the PACSystems controller.
MtMbSend	Number of mailbox message sent to the PACSystems controller.
MtSndAbt	Number of aborted attempts to send a mailbox message to the PACSystems controller.
SmhAlloc	Number of shared memory heap buffers allocated.
SmhDblFr	Number of shared memory heap buffers freed multiple times.

Tally	Description
SmhFree	Number of shared memory heap buffers freed.

A.10 ARP Tallies (task f)

There are no ARP tallies

A.11 IP Tallies (task i)

Use the command: `> tally i` to display the tally data for these Ethernet operations:

Table 3-15: IP Tallies

Tally	Description
Filtered	IP packets ignored because not addressed to this node and destination is unreachable.
ForwDgms	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)
FragCrea	The number of IP datagrams that have been generated as a result of fragmentation at this entity.
FragFail	The 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.
FragOKs	The number of IP datagrams that have been successfully fragmented at this entity.
InAdrErr	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.
InDelivs	The total number of input datagrams successfully delivered to IP user–protocols (including ICMP).
InDiscds	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).
InHdrErr	The number of input datagrams discarded due to errors in their IP headers.
InRecv	The total number of input datagrams received from interfaces, including those received in error.
InUnkPro	The number of locally–addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
OutDiscd	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	The number of IP datagrams discarded because no route could be found to transmit them to their destination.
OutReq	The total number of IP datagrams which local IP user–protocols (including ICMP) supplied to IP in requests for transmission.
ReasmFai	The number of failures detected by the IP re–assembly algorithm (for whatever reason: timed out, errors, message size too big, etc.).
ReasmOKs	The number of IP datagrams successfully re–assembled.
ReasmReq	The number of IP fragments received which needed to be reassembled at this entity.
ReasmTO	The maximum number of seconds that received fragments are held while they are awaiting reassembly at this entity. (Not used)

A.12 TCP Tallies (task w)

Use the command: `> tally w` to display the tally data for these Ethernet operations:

Table 3-16: TCP Tallies

Tally	Description
ActOpens	The number of times TCP connections have made a direct transition to the SYN–SENT state from the CLOSED 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 to the LISTEN state from the SYN–RCVD state.
CurEstab	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).
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.
InErrs	TCP segments received in error.
InSegs	The total number of segments 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.
PasOpens	The number of times TCP connections have made a direct transition to the SYN–RCVD state from the LISTEN state.
RtranSeg	The total number of segments retransmitted – that is, the number of TCP segments transmitted containing one or more previously transmitted bytes.
SndRsts	TCP segments sent with RST flag.

A.13 UDP Tallies (task u)

Use the command: `> tally u` to display the tally data for these Ethernet operations:

Table 3-17: UDP Tallies

Tally	Description
InDatagm	Number of incoming datagrams validated and accepted by the UDP stack.
InErrors	Number of incoming datagrams discarded by the UDP stack because they are invalid datagrams, e.g., invalid checksums, etc.
NoPorts	Number of incoming datagrams discarded by the UDP stack because the destination UDP ports were not initialized for reception.
OtDatagm	Number of outgoing UDP datagrams sent by the UDP stack to remote hosts.

A.14 Network Interface Tallies (task l)

The command: `> tally l` displays the tally data for the following Ethernet operations.

Tip

The **tally l** command provides statistics about operation and performance of the Ethernet Interface and the embedded Ethernet network switch.

A.1.1 PACSystems RX3i Ethernet Modules

Table 3-18: Ethernet Module Network Interface Tallies

Tally	Description		
DiscPkt	Received packets discarded by Network Interface.		
sRcvError	Error packets received from network.		
RcvMcPkt	Multicast packets received from network.		
RcvUniPk	Unicast packets received from network.		
SndDscd	Outbound packets discarded.		
SndError	Outbound packets discarded due to errors.		
SndMcPkt	Multicast packets sent to network.		
SndUniPk	Unicast packets sent to network.		
UnkProto	Received packets discarded due to unknown protocol.		
The following are Detailed Network Interface Tallies		**ETM001-Jx**	**ETM001-Kxxx**
EmacRst	Number of times EMAC restarted (for error recovery).	X	
MalErr	Number of MAL system errors detected (restarts EMAC).	X	
Rx2Long	Number of packets received that were greater than 1537 bytes.	X	
RxAlign	Number of packets received with a non-integral number of bytes.	X	X
RxBadPkt	Number of times a bad packet was received.	X	
RxCrCer	RX CRC error count		X
RxError	Number of packets received with an RX error from MAC.		X
RxFCS	Number of packets received with a checksum error.	X	
RxFcUnSp	Number of FC received unsupported		X
RxFrag	Number of Rx fragments		X
RxGiant	Number of Rx giants		X
RxJabber	Number of Rx jabber errors		X
RxLenErr	Number of Rx length errors		X
RxLong	Number of packets received with an out-of-range error.	X	
RxMgt	Number of Tx mgmt frames sent		X
RxMgtDrp	Number of Rx mgmt frames dropped		X
RxMisPkt	Number of missed packet count		X

Tally	Description		
RxNoBuf	Rx frames drop due to no buffers		X
RxOvr	Number of times RECEIVE failed due to an overrun condition.	X	
RxPause	Number of times a PAUSE frame was received.	X	
RxPhyDv	Number of times the PHY receive DV signal was too short.	X	
RxRntPkt	Number of packets received that were less than 64 bytes.	X	X
RxShrt	Number of packets received with an in-range error.	X	
RxSymErr	Number of Rx symbol errors		X
RxXoff	Number of Rx XOFF received		X
RxXon	Number of Rx XON received		X
TxCarErr	Number of Tx carrier extension errors		X
TxColl	Number of Tx collisions		X
TxDead0	Number of transmit packets failed due to transmit or SQE errors.	X	
TxErr0	Number of transmit packets failed due to a transmit error.	X	
TxExsCol	Number of packets that were not transferred due to excessive collisions.	X	X
TxExsDef	Number of packets that were not transferred due to excessive deferrals.	X	X
TxLatCol	Number of packets that experienced a late collision.	X	X
TxLosCar	Number of times detected a loss of carrier.	X	X
TxMgmt	Number of Tx mgmt frames sent		X
TxMulCol	Number of transmitted packets that saw multiple collisions.	X	X
TxNoDsc	Number of times unable to transmit a packet due to a lack of transmit ring descriptors.	X	
TxSeqErr	Number of Tx sequence errors		X
TxSngCol	Number of transmitted packets that saw a single collision	X	X
TxSqe0	Number of transmit packets failed due to an SQE error.	X	
TxTcpFal	Number of Tx TCP segmentation context failures		X
TxTcpSeg	Number of TCP segmentation context sent count		X
TxUnr	Number of transmitter under-run conditions detected (restarts EMAC).	s	
TxXoff	Number of Tx XOFF transmissions		X
TxXon	Number of Tx XON transmissions		X
The following are tallies associated with each switch port			
RxAlign	Number of packets received with a non-integral number of bytes.	X	
RxBadBy	Number of bytes in packets rejected as bad due to CRC, an RX error, less than 64 bytes, or more than 1536 bytes.		X
RxBcPkt	Broadcast packets received from network.	X	X
RxDrop	Number of packets dropped in the receiver due to lack of space in the switch.	X	
RxErr	Number of packets received with an error, but with valid size (64 to 1536 bytes). CRC may or may not be valid.		X
RxExcSiz	Number of packets received that were greater than 1537 bytes.	X	X
RxFcsErr	Number of packets received with a checksum error.	X	X

Tally	Description		
RxFrgmnt	Number of packets received that were less than 64 bytes.	X	X
RxGoodBy	Number of good bytes received.		X
RxJabber	Number of times a jabber condition was detected by the receiver.	X	X
RxLong	Number of packets received whose length was greater than 1522 bytes.	X	
RxMcPkt	Multicast packets received from network.	X	X
RxPause	Number of times a PAUSE frame was received by the port.	X	
RxSaChng	Number of times the source address of packets changed.	X	
RxShort	Number of packets received that were less than 64 bytes.	X	X
RxSymErr	Number of times an invalid symbol was encountered in the data stream.	X	
RxUniPkt	Unicast packets received from network.	X	X
TxBcPkt	Broadcast packets sent to network.	X	X
TxBytes	Number of bytes in frames transmitted.		X
TxDefer	Number of packets whose transmission was delayed due to the medium being busy.	X	
TxDrop	Number of transmit packets dropped for lack of resources.	X	X
TxEDrop	Number of packets dropped early. This is often an issue that an internal memory or FIFO has been overflowed. For example, if sending on internal 1Gbps connection to an external 100mbps connection, data can backup and overflow internal resources.		X
TxExcCol	Number of packets that were not transferred due to excessive collisions.	X	
TxFrmDsc	Number of packets that were discarded due to lack of output space within the switch.	X	
TxLatCol	Number of packets that experienced a late collision (more than 512 bit times into the transmission).	X	
TxMcPkt	Multicast packets sent to network.	X	X
TxMulCol	Number of transmitted packets that saw multiple collisions.	X	
TxPause	Number of PAUSE frames transmitted by the port.	X	
TxSngCol	Number of transmitted packets that saw exactly one collision.	X	
TxTotCol	Number of collisions seen by the port.	X	
TxUniPkt	Unicast packets sent to network.	X	X

Tally	Description
DiscPkt	Received packets discarded by Network Interface.
RcvError	Error packets received from network.
RcvMcPkt	Multicast packets received from network.
RcvUniPk	Unicast packets received from network.
SndDscd	Outbound packets discarded.
SndError	Outbound packets discarded due to errors.
SndMcPkt	Multicast packets sent to network.
SndUniPk	Unicast packets sent to network.
UnkProto	Received packets discarded due to unknown protocol.

Tally	Description		
The following are Detailed Network Interface Tallies		ETM001-Jx	ETM001-Kxxx
EmacRst	Number of times EMAC restarted (for error recovery).	X	X
ExError			X
MalErr	Number of MAL system errors detected (restarts EMAC).	X	X
Rx2Long	Number of packets received that were greater than 1537 bytes.	X	X
RxAlign	Number of packets received with a non-integral number of bytes.	X	X
RxBadPkt	Number of times a bad packet was received.	X	X
RxCrCer	RX CRC error count		X
RxFCS	Number of packets received with a checksum error.	X	X
RxFcUnSp	Number of FC received unsupported		X
RxFrag	Number of Rx fragments		X
RxGiant	Number of Rx giants		X
RxJabber	Number of Rx jabber errors		X
RxLenErr	Number of Rx length errors		X
RxLong	Number of packets received with an out-of-range error.	X	X
RxMgt	Number of Tx mgmt frames sent		X
RxMgtDrp	Number of Rx mgmt frames dropped		X
RxMisPkt	Number of missed packet count		X
RxNoBuf	Rx frames drop due to no buffers		X
RxOvr	Number of times RECEIVE failed due to an overrun condition.	X	X
RxPause	Number of times a PAUSE frame was received.	X	X
RxPhyDv	Number of times the PHY receive DV signal was too short.	X	X
RxRntPkt	Number of packets received that were less than 64 bytes.	X	X
RxShrt	Number of packets received with an in-range error.	X	X
RxSymErr	Number of Rx symbol errors		X
RxXoff	Number of Rx XOFF received		X
RxXon	Number of Rx XON received		X
TxCarErr	Number of Tx carrier extension errors		X
TxColl	Number of Tx collisions		X
TxDead0	Number of transmit packets failed due to transmit or SQE errors.	X	X
TxErr0	Number of transmit packets failed due to a transmit error.	X	X
TxExsCol	Number of packets that were not transferred due to excessive collisions.	X	X
TxExsDef	Number of packets that were not transferred due to excessive deferrals.	X	X
TxLatCol	Number of packets that experienced a late collision.	X	X
TxLosCar	Number of times detected a loss of carrier.	X	X
TxMgmt	Number of Tx mgmt frames sent		X
TxMulCol	Number of transmitted packets that saw multiple collisions.	X	X
TxNoDsc	Number of times unable to transmit a packet due to a lack of transmit ring descriptors.	X	X
TxSeqErr	Number of Tx sequence errors		X

Tally	Description		
TxSngCol	Number of transmitted packets that saw a single collision	X	X
TxSqe0	Number of transmit packets failed due to an SQE error.	X	X
TxTcpFal	Number of Tx TCP segmentation context failures		X
TxTcpSeg	Number of TCP segmentation context sent count		X
TxUnr	Number of transmitter under-run conditions detected (restarts EMAC).	X	X
TxXoff	Number of Tx XOFF transmissions		X
TxXon	Number of Tx XON transmissions		X
The following are tallies associated with each switch port			
RxAlign	Number of packets received with a non-integral number of bytes.		
RxBcPkt	Broadcast packets received from network.		
RxDrop	Number of packets dropped in the receiver due to lack of space in the switch.		
RxExcSiz	Number of packets received that were greater than 1537 bytes.		
RxFcsErr	Number of packets received with a checksum error.		
RxFrgmnt	Number of packets received that were less than 64 bytes.		
RxJabber	Number of times a jabber condition was detected by the receiver.		
RxLong	Number of packets received whose length was greater than 1522 bytes.		
RxMcPkt	Multicast packets received from network.		
RxPause	Number of times a PAUSE frame was received by the port.		
RxSaChng	Number of times the source address of packets changed.		
RxShort	Number of packets received that were less than 64 bytes.		
RxSymErr	Number of times an invalid symbol was encountered in the data stream.		
RxUniPkt	Unicast packets received from network.		
TxBcPkt	Broadcast packets sent to network.		
TxDefer	Number of packets whose transmission was delayed due to the medium being busy.		
TxDrop	Number of transmit packets dropped for lack of resources.		
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.		
TxLatCol	Number of packets that experienced a late collision (more than 512 bit times into the transmission).		
TxMcPkt	Multicast packets sent to network.		
TxMulCol	Number of transmitted packets that saw multiple collisions.		
TxPause	Number of PAUSE frames transmitted by the port.		
TxSngCol	Number of transmitted packets that saw exactly one collision.		
TxTotCol	Number of collisions seen by the port.		
TxUniPkt	Unicast packets sent to network.		

A.1.2 PACSystems RX3i (CPE302/CPE305/CPE310/CPE330/CPE400/CPL410/CPS400) and PACSystems RSTi-EP (EPSCPE100/115, EPXCPE205/210/215/220/240) Embedded Ethernet Interface

Table 3-19: Embedded Ethernet Network Interface Tallies

Tally	Description
DiscPkt	Received packets discarded by Network Interface.
RcvError	Error packets received from network.
RcvMcPkt	Multicast packets received from network.
RcvUniPk	Unicast packets received from network.
SndDscd	Outbound packets discarded.
SndError	Outbound packets discarded due to errors.
SndMcPkt	Multicast packets sent to network.
SndUniPk	Unicast packets sent to network.
UnkProto	Received packets discarded due to unknown protocol.
The following are Detailed Network Interface Tallies	
RxAlign	Number of Rx frame alignment errors
RxCRCEr	Number of Rx CRC errors
RxError	Number of Rx errors
RxFcUnSp	Number of Rx FC received unsupported
RxFrag	Number of Rx fragments
RxGiant	Number of Rx giants
RxJabber	Number of Rx jabber errors
RxLenErr	Number of Rx length errors
RxMgt	Number of Rx mgmt frames
RxMgtDrp	Number of Rx mgmt frames dropped
RxMisPkt	Number of Rx missed packet counts
RxNoBuf	Number of Rx frames dropped due to no buffers
RxRntPkt	Number of Rx runts
RxSymErr	Number of Rx symbol errors
RxXoff	Number of Rx XOFF received
RxXon	Number of Rx XON received
TxCarErr	Number of Tx carrier extension errors
TxColl	Number of Tx collisions
TxExsCol	Number of Tx excessive collisions
TxExsDef	Number of Tx deferred
TxLatCol	Number of Tx late collisions
TxLosCar	Number of Tx carrier sense lost
TxMgmt	Number of Tx mgmt frames
TxMulCol	Number of Tx multiple collisions
TxSeqErr	Number of Tx sequence errors
TxSngCol	Number of Tx single collision
TxTcpFal	Number of Tx TCP segmentation context failures
TxTcpSeg	Number of Tx TCP segmentation context sent
TxXoff	Number of TX XOFF transmitted count

A.15 ICMP/IGMP Tallies (task j)

Use the command: `> tally j` to display the tally data for these Ethernet operations:

Table 3-20: ICMP/IGMP Tallies

Tally	Description
InAdrM	Number of ICMP Address Mask Request messages received.
InAdrMRp	Number of ICMP Address Mask Reply messages received.
InDstUnr	Number of ICMP Destination Unreachable messages received.
InEchoRp	Number of ICMP Echo Reply messages received.
InEchos	Number of ICMP Echo (requests) messages received.
InErrors	Number of ICMP messages received that have errors (bad checksums, etc.).
InMsgs	Number of ICMP messages received.
InParmPr	Number of ICMP Parameter Problem messages received.
InRedir	Number ICMP Redirect messages received.
InSrcQch	Number of ICMP Source Quench messages received.
InTimeEx	Number of ICMP Time Exceeded messages received.
InTmSp	Number of ICMP Timestamp (request) messages received.
InTmSpRp	Number of ICMP Timestamp Reply messages received.
OtAdrM	Number of ICMP Address Mask Request messages sent.
OtAdrMRp	Number of ICMP Address Mask Reply messages sent.
OtDstUnr	Number of ICMP Destination Unreachable messages sent.
OtEchoRp	Number of ICMP Echo Reply messages sent.
OtEchos	Number of ICMP Echo (request) messages sent.
OtErrors	Number of ICMP messages not sent due to problems discovered within ICMP.
OtMsgs	Number of ICMP messages attempted to send.
OtParmPr	Number of ICMP Parameter Problem messages sent.
OtRedir	Number of ICMP Redirect messages sent.
OtSrcQch	Number of ICMP Source Quench messages sent.
OtTimeEx	Number of ICMP Time Exceeded messages sent.
OtTmSp	Number of ICMP Timestamp (request) messages sent.
OtTmSpRp	Number of ICMP Timestamp Reply messages sent.

A.16 SNTP Tallies (task n)

Use the command: `> tally n` to display the tally data for these Ethernet operations:

Table 3-21: SNTP Tallies

Tally	Description
Nincons	Number of SNTP packets discarded due to an inconsistent time.
Nlenbad	Number of SNTP packets received with an invalid length.
Nlokcons	Number of SNTP packets received with the locked-on server that were consistent.
Nloktot	Number of SNTP packets received from the locked-on server.
Nrqpkt	Number of requests sent to Primary and Secondary Servers.
Nstrater	Number of SNTP packets received with an invalid stratum number (outside the range 0-15).
Nsvrchng	Number of times the locked on SNTP server was changed.
Ntimout	Number of times an SNTP server timed out by not sending a packet within 150 seconds.
Ntppkt	Number of SNTP packets received (from any server).
Nver3	Number of SNTP packets received with version 3.
Nver4	Number of SNTP packets received with version 4.
Nverbad	Number of SNTP packets received with an invalid version.
Nverold	Number of SNTP packets received with an old version (1 or 2).

A.17 Flash File System Tallies (task s)

Use the command: `> tally s` to display the tally data for these Ethernet operations:

Table 3-22: Flash File System Talies

Tally	Description
ActvReq	Number of requests received to activate the Redundant IP address.
ActvRsp	Number of times the Redundant IP address has been successfully activated.
ArpRtry	Number of ARP retries required to verify that Redundant IP is not in use.
BadActv	Number of times the Redundant IP address activation failed.
CpuErr	Number of times a failure has been detected with the CPU resulting in an attempt to deactivate the Redundant IP address.
DeactReq	Number of requests received to deactivate the Redundant IP address.
RcvPkFwd	Number of packets that were received (and forwarded) on the Redundant IP address when the Redundant IP address was deactivated.
RecatRsp	Number of times the Redundant IP address has been successfully deactivated.

A.18 Ethernet Redundancy Tallies (task q)

If Redundant IP is configured, use the command: **`> tally q`** to display the Redundant IP tallies.

These tally values are retained through role switches. They MUST be explicitly cleared.

Table 3-23: Ethernet Redundancy Tallies

Tally	Description
ActvReq	Number of requests received to activate the Redundant IP address.
ActvRsp	Number of times the Redundant IP address has been successfully activated.
DeactReq	Number of requests received to deactivate the Redundant IP address.
RecatRsp	Number of times the Redundant IP address has been successfully deactivated.
BadActv	Number of times the Redundant IP address activation failed.
CpuErr	Number of times a failure has been detected with the CPU resulting in an attempt to deactivate the Redundant IP address.
ArpRtry	Number of ARP retries required to verify that Redundant IP is not in use.
RcvPkFwd	Number of packets that were received (and forwarded) on the Redundant IP address when the Redundant IP address was deactivated.

A.19 OS Events Tallies (task p)

Use the command: **> tally p** to display the tally data for internal OS Events operations:

Table 3-24: OS Events Tallies

Tally	Description
ClosEcb	Removed an event control block entry.
ClosEvnt	Request to stop using events. Removes event control block & timer record list entry.
ClosTmr	Removed a timer record list entry.
CnclEvnt	Request to remove an entry from the timer record list.
OpenEvnt	Request to use events. Creates an entry in the event control block.
RxEvnt	Request to receive operating system events.
RxEvTmot	Receive an event with a timeout. Creates an entry in the timer record list.
SndEvAft	Send an operating system event after a specified timeout. Creates an entry in the timer record list.
SndEvEvr	Send an operating system event on a periodic schedule. Creates an entry in the timer record list.
SndEvnt	Send an operating system event.

Appendix B Exception Log Events

This section describes the Exception Log events that can be displayed using the LOG and LOG Z commands. Additional status information displayed by LOG Z only is defined in the next section.

- Viewing the Exception Log
- Descriptions of Event Types

B.1 Viewing the Exception Log

Events stay in the exception log until they are cleared with the CLEAR LOG command, or until they are overwritten by more recent data.

For RX3i Ethernet modules, the exception log is maintained in non-volatile memory; the exception log contents are retained over normal power outage. RX3i and RSTi Embedded Interface maintain the exception log in volatile memory.

Use the Station Manager LOG command to view the current contents of the exception log. (Prior to Release 2.00, the LOG command only displayed basic information; use the LOG Z command to display the internal status information.) In addition to being accessible to the Station Manager, most exception log events also cause a fault message to be placed in the Controller Fault Table.

B.1.1 LOG Command Example

```
> log
<<< Exception Log >>>
IC695ETM001-KAAA Ethernet Interface version 7.00 (EC07)
Log displayed 04-APR-2003     11:25:28.3
Log initialized using valid RAM information
Log last cleared 09-APR-2019 17:17:09.7 (+0.00)


Date            Time         Event Count Entry 2 through Entry 6
07-JUN-2019     09:33:47.0   1H    1H    0001H 0000H 0060H 0001H 013aH
07-JUN-2019     09:33:47.0   0H    1H    0000H 0008H 0000H 0000H 0000H
07-JUN-2019     14:01:22.2   20H   1H    0001H 0000H 0060H 0001H 013aH
->07-jun-2019   09:33:47.2   2aH   1H    0000H 0008H 0000H 0000H 0000H
```

B.1.2 Event Date and Time

The exception log is a circular list; a new event overwrites the oldest event in the list. An arrow points to the most recent event. Each entry is identified by Date and Time.

B.1.3 Event Count

The Count column shows how many errors of that type have occurred. Instead of recording each repeated event in detail, the log keeps the time of the latest event and a count of the number of repetitions of that event type.

At most 65536 (= 10000H) repetitions are counted in each entry. When the count reaches 65536, the displayed count will be shown as 0. A subsequent repetition will cause a new entry to be created in the log with a count of 1.

B.1.4 Types of Exception Events

In the LOG, the type of event that has occurred is indicated by a hexadecimal value:

Table 3-25: Types of Exception Events

Event Type	Event Group
00H	Power up diagnostics events
01H	System startup event
02H	Configuration (CFG) event
03H	Operating system (RTOS) event
08H	PLC Driver (BPD) event
0dH	Error handler (ERR) event
0eH	Station Manager (STA) event
0fH	Common Utility (UTL) event
1bH	SRTP Server (SRTP) event
1cH	SRTP Client (Channels) event
20H	Network Interface event
28H	Ethernet Global Data (EGD) event
29H	SNTP event
2aH	Run-time Diagnostics (DIAG) event
2bH	Reliable Datagram Service (RDS) event
2cH	Web Server event
2dH	FTP Server event
2eH	Flash File System (FFS) event
2fH	Modbus/TCP Server event
30H	Shared Memory Interface event
31H	Common SRTP (Client and Server) event
32H	Channel Framework event (used by all channel protocols)
33H	OS Abstraction event
34H	General Ethernet System event
35H	Modbus/TCP Client (Channels) event
37H	DNP3 Outstation Event

B.1.5 Additional Fault Information in Entries 2 through 6

Entries 2 - 6 provide detailed information about the exception. The tables that follow in this section describe this additional information for each event type.

B.1.6 Additional Internal Status Information

In addition to Entries 2 – 6, many exceptions also contain an internal Status Code (SCode) value. Some exceptions contain additional information, such as identification of individual network connections or exchanges.

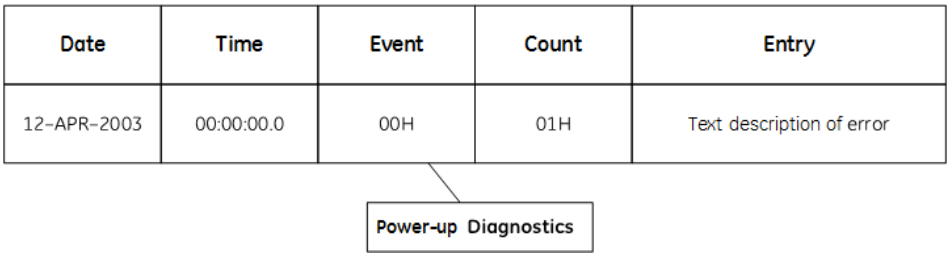
B.1 Descriptions of Event Types

B.1.7 Event Type 00: Power-Up Diagnostics Events

Event Type 00 is a power-up diagnostic error. Power-up diagnostic errors are reported as short text messages.

LOG Command Display for Event Type 00

Unlike all other exception log events, Power-up Diagnostics events are displayed as text strings instead of numeric codes in Entries 2-6. The LOG or LOG Z command display for Event Type 00 is shown below.



Text Descriptions of Power-up Diagnostic Events

The following table shows the Power-up Diagnostic events.

All Power-up Diagnostic events generate the Controller Fault Table entry “Module hardware fault.”

Table 3-26: Power-Up Diagnostic events

Text Description	Exception Event that has Occurred
“Bad MAC Addr”	The unique MAC address is invalid.
“Enet CRC Fail”	Ethernet Controller self-test has failed.
“Enet HW Fail”	Non-specific hardware failure.
“Enet RAM Fail”	RAM memory test has failed.
“Ethernet Fail”	Ethernet Controller test has failed.
“MAC Addr Fail (CRC)”	The unique MAC address is corrupted.
“MII/PHY Fail”	Error communicating to internal PHY.
“PHY T/O Fail”	PHY did not respond to command.
“Runtime Fail”	Runtime diagnostic failure.
“Serial Failure”	UART serial port test has failed.
“SMI Diag Fail”	Controller-CPU interaction test has failed.
“SMI Init Fail”	Shared memory initialization has failed.
“Undefined Fail”	General hardware diagnostic failure.

B.1.8 Event Type 01: Power-up Events

Event Type 01 is logged at every initialization of the Ethernet interface. Checking the count for Event Type 01 shows how many restarts have occurred. Restarts may not indicate error conditions; power-up events do not change the LOG EMPTY LED on RX3i Ethernet modules.

No Fault Table Reporting for Power-up Events

Power-up events are not reported to the Controller Fault Table. The CPU may generate a Controller Fault Table entry when the Ethernet interface is restarted.

LOG Command Display for Event Type 01

Power-up events do not use a Status Code (SCode) value, so the LOG Z command does not show additional information for these events. The LOG or LOG Z command display for Event Type 01 is shown below.

Date	Time	Event	Count	Entry 2	Entry 3	Entry 4	Entry 5	Entry 6
12-APR-2003	00:00:00.0	01H	01H	0000H	0000H	0000H	0000H	0000H

Power-up Event

Always zero

Restart Reason Code

Used After Restart

Descriptions of Power-up Events

The following table shows the Power-up events. For Power-up events, there are no Controller Fault Table entries. Entry 2 is always zero (see below). Entry 3 contains a restart reason code for the event. Entry 4 is only used when restarting after using the firmware loader. Entries 5 and 6 are not used.

Table 3-27: Power-Up Events

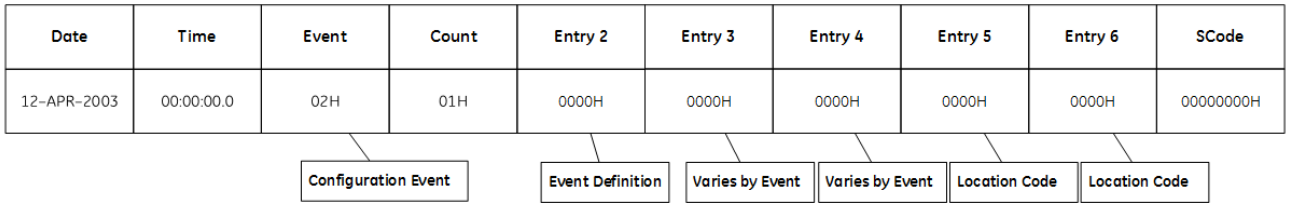
Entry 3	Description
0	Normal power-up.
1	Restart via Ethernet Restart pushbutton.
2	Pre-emptive restart via Ethernet Restart pushbutton when a previous restart attempt did not complete.
3	Station Manager restart request.
4	Automatic restart after changing MAC address.
5	Automatic restart due to system error (see preceding exception log event).
7	Automatic restart after firmware update completion. Entry 4: b Firmware load due to corrupted Primary Ethernet firmware. 10 Firmware load requested by user via CPU serial port.
8	Automatic restart due to ACFAIL glitch or brown-out.
c	Automatic restart due to Ethernet watchdog timer expiration.
e	Automatic restart due to restart command from CPU firmware. This code may also be displayed on power-up after a very brief power outage.
10	Restart via Ethernet Restart pushbutton while in Software Load mode.
11	Automatic restart due to overtemp.
ff	Restart due to unknown reason.

B.1.9 Event Type 02: Configuration (CFG) Events

Event Type 02 indicates a configuration exception event.

LOG Command Display for Event Type 02

Most Configuration events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type 02 is shown below.



Configuration Events and Corresponding Controller Fault Table Entries

The following table shows the Configuration events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Configuration event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-28: Configuration Events

Entry 2	Description
0	LAN system-software fault; resuming A failure occurred during primary firmware initialization. Entry 3: Internal error code indicating the subsystem that failed.
1	LAN system-software fault; resuming Configuration subsystem task 0 failed to properly register with the PACSystems controller Driver subsystem. There is no communication with the CPU.
2	LAN system-software fault; resuming A failure occurred attempting to send a logon request to the CPU. The CFG subsystem will no longer receive change notification mail. This will cause the LEDs to not properly display a configuration store or clear.
3	LAN system-software fault; resuming The 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 The CPU sent an unrecognized message to the Configuration subsystem. Entry 3: Internal code indicating the type of mail message for an unrecognized unsolicited mail message, or the sequence number for an unrecognized response message.
5	LAN system-software fault; resuming The Configuration subsystem failed attempting to respond to a CPU request. Entry 3: Response message type. Entry 4: Response message sequence number.

Entry 2	Description
6	LAN system-software fault; resuming A failure occurred processing the Ethernet configuration. This error is due to an invalid configuration being stored. The Configuration processing stops at the first error detected. If processing a configuration received from CPU, the Ethernet interface will process the backup configuration. Entry 3: For Advanced User Parameter errors, the line number within the Advanced User Parameter file where the error occurred.
7	LAN system-software fault; resuming A failure occurred in configuration timeout processing. If no Status Code value exists, the configuration was not received from the 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 be retrieved 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.
a	LAN system-software fault; resuming An unknown system event confirmation was received. Entry 3: Confirmation type received.
b	LAN system-software fault; resuming A failure was returned by the Driver while attempting to send a request to the CPU to retrieve the CPU date/time.
c	LAN system-software fault; resuming A failure occurred attempting to remove a Task from the event notification list.
d	LAN system-software fault; resuming An unrecognized event was received by the timeout task. Entry 3: 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. Details are found in the Status Code. If no Status Code value exists, an invalid station manager command was attempted. Entry 3: Internal error code.
11	LAN system-software fault; resuming A failure was encountered when attempting to retrieve the internal system time from the DIAG subsystem. On RX3i Ethernet modules, this will cause unreliable operation of the Ethernet Restart pushbutton and the LOG EMPTY 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.
13	LAN system-software fault; resuming A failure occurred while receiving confirmation from one or more subsystems during the restart sequence. The restart will still occur. Entry 3: May contain an internal error code.

Entry 2	Description
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.
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: Internal error code indicating system events.
16	LAN system-software fault; resuming A failure occurred while allocating memory for the Advanced User Parameters file received from the PACSystems controller.
17	LAN system-software fault; resuming A failure occurred attempting to register a subsystem for system event notification. Entry 3: Internal error code indicating system events being registered.
18	LAN system-software fault; resuming A failure occurred attempting to de-register a subsystem for system event notification. Entry 3: Internal error code that indicates the system events being deregistered.
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 system event code (USB) Entry 4: May contain an internal system event code (LSB)
1a	LAN system-software fault; resuming An operating system error occurred while the CFG main task was receiving messages from other tasks.
1d	LAN system-software fault; resuming Unable to update Advanced User Parameters File during 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.
1e	LAN system-software fault; resuming An error response message was returned from the CPU for a Logon request. Entry 3: Response message type. Entry 4: Response message sequence number.
1f	LAN system-software fault; resuming An error response was returned from the CPU for a Get Date/Time request. Entry 3: Response message type. Entry 4: Response message sequence number.
21	LAN system-software fault; resuming An error response was returned from the CPU for a Get Program Name request. Entry 3: Response message type. Entry 4: Response message sequence number.
23	LAN system-software fault; resuming An invalid value was used for the Data Rate, Parity or Flow Control configuration parameters for the Station Manager serial port. Entry 3: Internal error code. Entry 4: 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.

Entry 2	Description
26	LAN system-software fault; resuming An internal system error occurred attempting to initiate a Restart sequence. The restart will not occur.
27	LAN system-software fault; resuming An unrecognized Restart sequence command was received. Entry 3: Internal error code.
2a	LAN system-software fault; resuming An operating system error occurred while getting the current settings for the Station Manager serial port. This error prevents the serial port from being configured.
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.
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.
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.
30	LAN system-software fault; resuming A failure occurred attempting to register with the PACSystems controller for notification when the controller state changes, clear of faults occurs, and soft switch configuration changes. The Ethernet Interface will not respond to controller state changes.
31	LAN system-software fault; resuming An unrecognized notification message was received from the PACSystems controller. 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 temporary IP Address. The IP address of the module was not set. Entry 3 and 4: IP Address displayed as two hexadecimal words. (For example,10.0.0.2 would be shown as 0A00H 0002H)
34	LAN system-software fault; resuming A failure occurred trying to process AUP information for a protocol. The protocol may not operate properly.
35	LAN system-software fault; resuming A failure occurred attempting to read controller memory. Entry 3: May contain an internal code
36	LAN system-software fault; resuming A failure occurred attempting to write controller memory. Entry 3: May contain an internal code
37	LAN system-software fault; resuming A failure occurred attempting to send a reply to the controller after receiving a request to get revision information. Communication with the controller will no longer be available. Initiate a power cycle or Ethernet restart to attempt recovery.
38	LAN system-software fault; resuming A failure occurred attempting to send a reply to the controller after receiving a request to invalidate firmware. The software load attempt will fail. Power cycle the CPU and retry the software load.

Entry 2	Description
39	LAN system-software fault; resuming A failure occurred as a result of processing a response from the PACSystems controller that returns control information. Entry 3: May contain the type of the mailbox message Entry 4: May contain the sequence number of the mailbox message
3a	LAN transceiver fault; OFF network until fixed Network interface not running when attempting to install configuration. Configuration processing will continue without network connectivity.
3b	LAN system-software fault; resuming A failure occurred while processing BOOTP. Configuration from a BOOTP server may have been lost.
3c	LAN system-software fault; resuming A failure occurred while processing a BOOTP request or response. Configuration from a BOOTP server may have been lost.
3d	LAN system-software fault; resuming A failure occurred while waiting for other subsystems to confirm notification that SYSFAIL has been detected and handled. Entry 3: Internal code
3e	LAN system-software fault; resuming A failure occurred attempting to notify that a SYSFAIL has been detected.
3f	LAN system-software fault; resuming A failure occurred attempting to notify that an ACFAIL has been detected.
40	LAN system-software fault; resuming Attempt to send a service request to the controller failed. Entry 3: Mailbox type Entry 4: Mailbox sequence number
41	LAN system-software fault; resuming Unable to allocate memory for the Module Configuration file.
42	LAN system-software fault; resuming Error parsing the Module Configuration file. Entry 3: May contain parameter record code where error occurred Entry 4: May contain parameter record length
43	LAN system-software fault; resuming Error initializing the Ethernet Redundancy feature.
44	LAN system-software fault; resuming Generic internal Ethernet Redundancy error. Entry 3 may contain internal error code
45	LAN system-software fault; resuming Error attempting to activate the Redundant IP address. (This may occur if the Redundant IP address is already active.)
46	LAN system-software fault; resuming Error attempting to deactivate the Redundant IP address.
47	LAN system-software fault; resuming Error attempting to install the Redundant IP address.
48	LAN system-software fault; resuming Error attempting to uninstall the Redundant IP address.
49	LAN system-software fault; resuming Error attempting to notify the system that a Redundancy role switch has occurred. Entry 3: May contain redundancy state code
4a	LAN system-software fault; resuming Error registering for Redundancy role switch notification from CPU.

Entry 2	Description
4b	LAN system-software fault; resuming One or more remote devices on the network are sending Redundant IP packets to the backup device instead of the active device. This may occur after a redundancy role switch when the ARP cache in a remote device may still contain old information prior to the role switch. This may also occur if the remote device is using a static ARP cache entry for the Redundant IP address.
4c	LAN system-software fault; resuming Configuration files were received from the CPU in incorrect sequence.
4d	LAN system-software fault; resuming Error registering for a communication channel. The channel is not available for use. Entry 3: Channel number
4e	LAN system-software fault; resuming Error deregistering for a communication channel. Entry 3: Channel number
4f	LAN system-software fault; resuming Error occurred while processing a Task 0 service request response from the CPU. Usually indicates an error updating a COMMREQ Status Word. Entry 3: Mailbox sequence number Entry 4: Mailbox type
50	LAN system-software fault; resuming The module has detected an over-temperature condition.
51	LAN system-software fault; resuming Internal error creating an error report message queue.
52	LAN system-software fault; resuming Error occurred processing a COMMREQ from the CPU. This usually indicates an unsupported COMMREQ command code, or an invalid COMMREQ Status Word address. Entry 3: (Optional) COMMREQ command number Entry 4: (Optional) Value of invalid status word segment selector
53	LAN system-software fault; resuming Internal error reading a message from the error report message queue.
54	LAN system-software fault; resuming Error occurred writing a COMMREQ Status Word to the CPU.
55	LAN system-software fault; resuming An unsupported feature was configured in the Module Config file. Entry 3: Parameter record code of unsupported feature. Entry 4: Parameter record length
56	LAN system-software fault; resuming Internal error occurred in the BPD COMMREQ flow control interface. The Ethernet interface may be unable to process further COMMREQs received from the CPU.
57	LAN system-software fault; resuming Internal error occurred in processing a COMMREQ.
58	LAN system-software fault; resuming Internal error attempting to send COMMREQ Status to the CPU. The COMMREQ Status update was not delivered to the controller application.
59	LAN system-software fault; resuming Internal error starting an Ethernet plug-in application. Entry 3: Index of the plug-in application (0..2)
5a	LAN system-software fault; resuming Internal error deleting an Ethernet plug-in application. Entry 3: Index of the plug-in application (0..2)
5b	LAN system-software fault; resuming Internal error occurring providing Manufacturing Data (serial number and date code) to the CPU.

Entry 2	Description
5c	LAN system-software fault; resuming AUP entry not processed since no longer supported. Entry 3: Line number within the Advanced User Parameter file that was not processed.
5e	IP Setup Mode entered
5f	IP Setup mode exited Entry 3: Reason for exit: 0x1 – Setting temporary IP Address failed 0x2 – CPU state changed 0x3 – In mode timeout expired 0x4 – New hardware config applied
60	IP Setup Mode unable to enter Entry 3: Invalid CPU mode: 0x0 – Run/Enabled 0x1 – Run/Disabled 0x6 – Stop/IO Enabled
61	Unable to set the temporary IP address.
62	Unable to send a Gratuitous ARP message to the network with the current owner of the Redundant IP address.

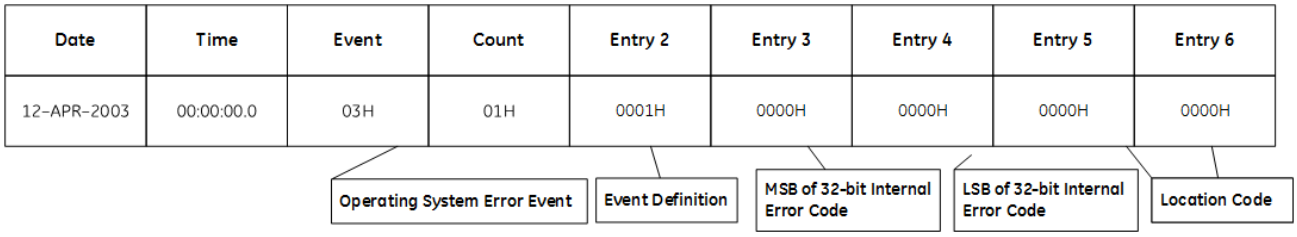
B.1.10 Event Type 03: Operating System Error Events

Event Type 03 is logged if the operating system detects an unrecoverable error. Normal operation cannot continue.

The Controller Fault Table entry for an Operating System Errors is generated after the restart has completed.

LOG Command Display for Event Type 03

Operating System Error events do not use a Status Code (SCode) value. The LOG or LOG Z command display for Event Type 03 is shown below.



The following table shows the Operating System Error events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Operating System Error event. Entries 3 and 4 contain a 32-bit internal error code. Entry 3 contains the most significant 16 bits; Entry 4 contains the least significant 16 bits. Entries 5 and 6 contain an internal location identification code.

Table 3-29: Operating System Error Events

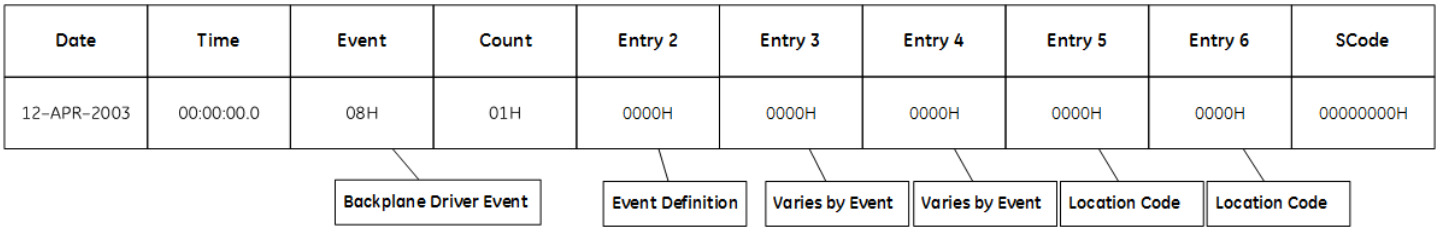
Entry 2	Description
1	LAN system-software fault; restarted LAN IF Fatal operating system error. Entry 3: Internal error code. (Most significant 16 bits) Entry 4: Internal error code. (Least significant 16 bits)

B.1.11 Event Type 08: PACSystems Controller Driver (BPD) Events

Event Type 08 indicates a Driver exception event.

LOG Command Display for Event Type 08

Most Driver events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type 08 is shown below.



PACSystems Controller Driver (BPD) Events Codes and Descriptions

The following table shows the Driver events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Driver event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-30: Driver Events

Entry 2	Description
1	No Controller Fault Table Entry for this error. PACSystems controller Driver subsystem not initialized after controller power-up or Ethernet restart. No communications with CPU.
2	No Controller Fault Table Entry for this error. Mailbox communication was not established with CPU after a controller power-up or Ethernet restart. There is no communication with the CPU. Entry 3: Internal error code.
3	Backplane communications with controller fault; lost request Service Request Processor (within CPU) did not come online after a controller power-up or Ethernet restart. There is no mailbox communication with the CPU.
4	Backplane communications with controller fault; lost request Mailbox packets were received from CPU in wrong order. Entry 3: Task number. Entry 4: Mailbox sequence number.
5	COMMREQ Bad task ID programmed COMMREQ was received from CPU for unknown or unregistered BPD User task. Entry 3: Task number. Entry 4: Mailbox sequence number.
6	Backplane communications with controller fault; lost request A mailbox message (other than a COMMREQ) was received from the CPU for an unknown or unregistered BPD User task. Entry 3: Task number. Entry 4: Mailbox sequence number.

Entry 2	Description
8	Backplane communications with controller fault; lost request Driver timed out waiting for an expected response from the CPU. This exception may occur when COMMREQs or other mail are sent faster than the Ethernet interface can process them. Driver timeouts may also be caused by extremely heavy EGD command traffic; this is indicated by CPU faults in Controller Fault Table preceding the timeout faults. Entry 3: Task number. Entry 4: Mailbox sequence number.
9	Backplane communications with controller fault; lost request Driver timed out waiting for an expected response from a BPD User task to a request from the CPU. Entry 3: Task number. Entry 4: Mailbox sequence number.
a	Backplane communications with controller fault; lost request Driver timed out waiting for completion of a multi-packet unsolicited transfer from the CPU. Entry 3: Task number. Entry 4: Mailbox sequence number.
b	Backplane communications with controller fault; lost request Driver is unable to detect controller state changes.
10	No Controller Fault Table Entry for this error. Driver has stopped due to a fatal internal error.
11	LAN system-software fault; resuming Error starting internal operating timers. Entry 3: Internal timer identification code.
12	LAN system-software fault; resuming Error registering a new BPD User task. Entry 3: Task number. Entry 4: May contain memory allocation size.
13	LAN system-software fault; resuming Error de-registering a BPD User task. Entry 3: Task number.
14	LAN system-software fault; resuming Error receiving a mailbox transfer from a BPD User task. Entry 3: Task number. Entry 4: Mailbox sequence number.
15	No Controller Fault for this exception Error sending a mailbox transfer to the CPU. The CPU may be in an error state or otherwise not receiving mail; look for CPU faults in the Controller Fault Table. Entry 3: Either the task number or an internal error code. Entry 4: Mailbox sequence number.
16	LAN system-software fault; resuming Error receiving a mailbox transfer from the CPU. Entry 3: Task number. Entry 4: Mailbox sequence number.
17	LAN system-software fault; resuming Error sending a mailbox transfer to a BPD User task. Entry 3: Either the task number or an internal error code. Entry 4: Mailbox sequence number.
18	LAN system-software fault; resuming Error flushing a mailbox transfer. Entry 3: Task number. Entry 4: Mailbox sequence number.

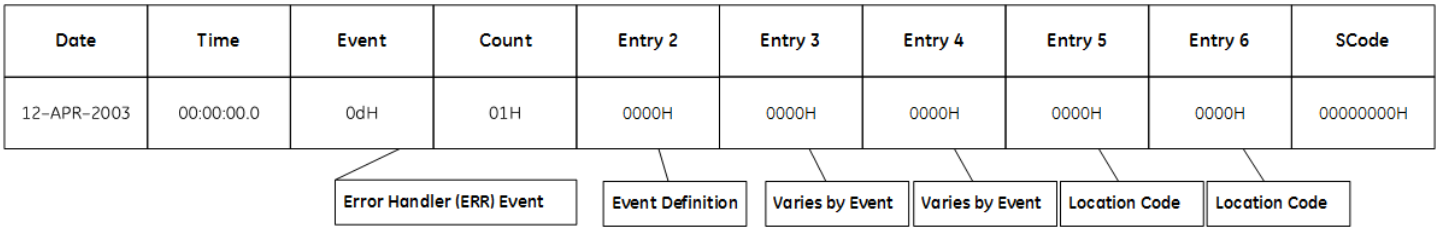
Entry 2	Description
19	LAN system-software fault; resuming Error handling internal transfer timeout timers. Entry 3: Either the task number or an internal error code. Entry 4: Mailbox sequence number.
1a	LAN system-software fault; resuming Error freeing an internal transaction record. Entry 3: Task number. Entry 4: Mailbox sequence number.
1b	LAN system-software fault; resuming Error generating Station Manager output data. Entry 3: Internal error code. Entry 4: Station Manager command code.
1c	LAN system-software fault; resuming Unknown Station Manager command was received. Entry 3: Unknown Station Manager command code.
1d	LAN system-software fault; resuming Error starting PACSystems Sweep timer task.
1e	LAN system-software fault; resuming Error during Sweep or Controller State Change notification. Entry 3: Notification type code.
1f	LAN system-software fault; resuming Error updating Ethernet Status Data (includes LIS word).
20	LAN system-software fault; resuming Reject mail received from CPU. Entry 3: Task number. Entry 4: Mailbox sequence number.
2a	LAN system-software fault; resuming General non-fatal internal error.
30	LAN system-software fault; resuming Error during Driver shutdown. Entry 3: Internal error code.
32	LAN system-software fault; resuming Error retrieving Advanced User Parameter data.
40	Mailbox queue full – COMMREQ aborted A COMMREQ storm has occurred. The controller application is sending COMMREQs so rapidly that the Ethernet interface cannot continue normal operation. Network communication may be adversely affected. Check to make sure that the logic application is not sending COMMREQs faster than the Ethernet Interface can process them. Reduce the rate at which the application is sending COMMREQs to the Ethernet interface.

B.1.12 Event Type 0d: Error Handler (ERR) Events

Event Type 0d indicates an Error Handler exception event.

LOG Command Display for Event Type 0d

Most Error Handler Events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type 0d is shown below.



Error Handler Events and Corresponding Controller Fault Table Entries

The following table shows the Error Handler events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Error Handler event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

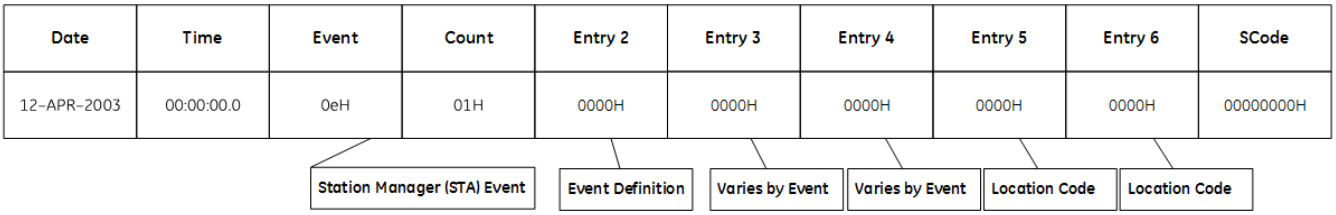
Entry 2	Description
1	LAN system-software fault; resuming An invalid exception index was passed to Error Handler. Entry 3: Invalid index
2	LAN system-software fault; resuming Registration for CFG event notification failed.
3	LAN system-software fault; resuming A memory allocation failed.
4	LAN system-software fault; resuming Corrupted data was detected in the exception log; the exception 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 exception log will be lost when the module is powered off.

B.2 Event Type 0e: Station Manager (STA) Events

Event Type e indicates a Station Manager exception event.

LOG Command Display for Event Type 0e

Most Station Manager events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type e is shown below.



Station Manager Events Codes and Corresponding Controller Fault Table Entries

The following table shows the Station Manager events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Station Manager event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-31: Station Manager Events

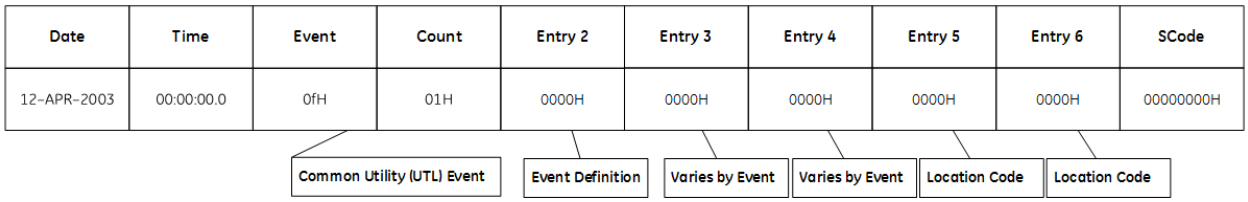
Entry 2	Description
1	LAN system-software fault; resuming Failure to initialize / start-up the Station Manager subsystem. Entry 3: internal identification code.
2	LAN system-software fault; resuming Failure creating / starting a Station Manager subsystem task. Entry 3: internal identification code.
3	LAN system-software fault; resuming Failure storing / setting Advanced User Parameters in the Station Manager subsystem. Entry 3: 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: internal identification code.
5	LAN system-software fault; resuming An attempt to send data to remote Station Manager failed. Entry 3: internal identification code.
6	LAN system-software fault; resuming An error in processing a PING has caused the PING to be aborted. Entry 3: internal identification code.
7	LAN system-software fault; resuming Internal error generating the user prompt string.
8	LAN system-software fault; resuming Internal Station Manager priority timer error.
9	LAN system-software fault; resuming Station Manager priority has been elevated.
a	LAN system-software fault; resuming Internal error: Invalid Station Manager priority was requested.

B.1.13 Event Type 0f: Common Utility (UTL) Events

Event Type 0f indicates a Common Utility exception event.

LOG Command Display for Event Type 0f

Most Common Utility events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type 0f is shown below.



Common Utility Events and Corresponding Controller Fault Table Entries

The following table shows the Common Utility events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Common Utility event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-32: Common Utility Events

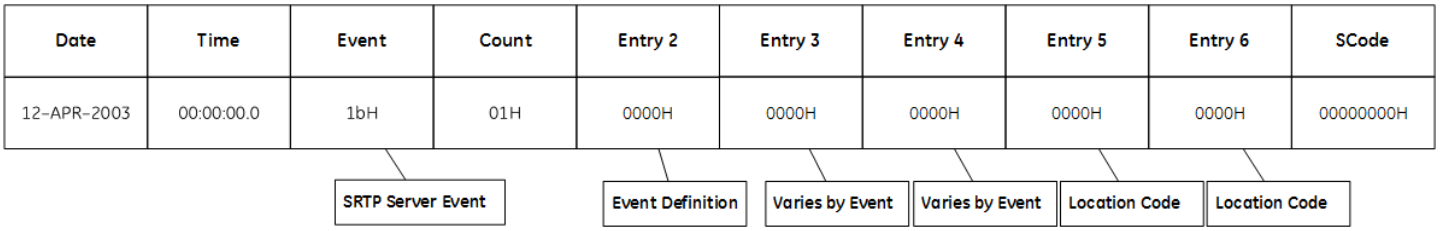
Entry 2	Description
1	LAN system-software fault; resuming Error in an operating system request.
2	LAN system-software fault; resuming Error in memory allocation request.
3	LAN system-software fault; aborted assoc. & resuming Error entering or leaving a critical region.
4	LAN system-software fault; resuming Error generating Station Manager output data.
5	LAN system-software fault; resuming Unknown Station Manager command was received. Event 3: Unknown Station Manager command code
6	LAN system-software fault; aborted assoc. & resuming A command to the Ethernet network 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.

B.1.14 Event Type 1b: SRTP Server Events

Event Type 1b indicates an SRTP Server exception event.

LOG Command Display for Event Type 1b

Most SRTP Server events contain an optional Status Code (SCode), remote end-point, and local end-point values. Remote and local end-point values are displayed as IP Address: TCP port. The LOG or LOG Z command display for Event Type 1b is shown below.



SRTP Server Events and Corresponding Controller Fault Table Entries

The following table shows the SRTP Server events and corresponding Controller Fault Table entries. Entry 2 identifies the particular SRTP Server event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Entry 2	Description
1	LAN I/F cannot init-check parms; running soft Sw Utl SRTP Server was not initialized after controller power-up or Ethernet restart. Servicing SRTP communication requests will fail. Entry 3: Internal error code
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 controller 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 controller 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 invalid connection identifier while attempting to process event. Entry 3: Connection ID
8	LAN system-software fault; resuming An invalid command was received by an SRTP Server task. Entry 3: Task command code
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 controller is restarted.

Entry 2	Description
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: Backplane Driver (BPD) user task number and the transfer identification number for the SRTP PDU that failed
d	LAN system-software fault; resuming An attempt to process an SRTP PDU that was received from the remote SRTP endpoint failed. Entry 3: Backplane Driver (BPD) user task number and the transfer identification number for the SRTP PDU that failed Entry 4: Code indicating the type of SRTP PDU that could not be processed
e	Backplane communications with controller fault; lost request An attempt to register a connection with the Backplane Driver (BPD) failed. Communication with the CPU on the SRTP Server connection cannot occur. Entry 3: Backplane Driver (BPD) user task number that failed to register
f	Backplane communications with controller fault; lost request An attempt to de-register a connection with the Backplane Driver (BPD) failed. Any subsequent attempts to establish this SRTP Server connection may fail. Entry 3: Backplane Driver (BPD) user task number that failed to be de-registered
10	Backplane communications with controller fault; lost request An attempt to send a request to the Backplane Driver (BPD) failed. SRTP Server will initiate the error service that will result in termination of the SRTP connection.
11	Backplane communications with controller fault; lost request An attempt to send a message to the Backplane Driver (BPD) failed. SRTP Server will initiate the error service that will result in termination of the SRTP connection.
12	Backplane communications with controller fault; lost request The Backplane Driver (BPD) was not able to process a request from SRTP Server or the corresponding response. Entry 3: Backplane Driver (BPD) user task number and the transfer identification number of the request that failed
13	LAN system-software fault; resuming An unexpected request was received from the CPU. Entry 3: Backplane Driver (BPD) user task number and the transfer identification number of the request that failed
14	LAN data memory exhausted-check parms; resuming An attempt to allocate a resource failed. Entry 3: May contain Backplane Driver (BPD) user task number and the transfer identification number of the request that failed
15	LAN system-software fault; resuming An attempt to free a resource failed. Entry 3: May contain the Backplane Driver (BPD) user identification number and the transfer task number of the request during which the failure occurred
16	LAN system-software fault; resuming An attempt to abort a request sent to the Backplane Driver (BPD) failed. Entry 3: May contain the Backplane Driver (BPD) user identification number and the transfer task number for the request that failed to be aborted
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

Entry 2	Description
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: 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: 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 controller is power-cycled. Entry 3: 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: 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. Subsequent attempts to establish this SRTP Server connection may fail. Entry 3: 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 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: 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 CPU when the Backplane 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: Backplane Driver (BPD) user task number and the transfer identification number of the request without a matching transaction record.

<table>
<tr><th>Entry 2</th><th>Description</th></tr>
<tr><td>21</td><td>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.
<table>
<tr><th colspan="2">Entry 3: Code indicating the PDU type.</th><th colspan="2">Entry 4: Code indicating the state of the SRTP connection.</th></tr>
<tr><td>0</td><td>Connect Request</td><td>1</td><td>IDLE</td></tr>
<tr><td>1</td><td>Connect Response</td><td>2</td><td>OPENING</td></tr>
<tr><td>2</td><td>Data Request</td><td>3</td><td>ESTABLISHED</td></tr>
<tr><td>3</td><td>Data Response</td><td>4</td><td>CLOSING</td></tr>
<tr><td>4</td><td>Unconfirmed Request</td><td>5</td><td>TERMINATE</td></tr>
<tr><td>5</td><td>Error Request</td><td colspan="2" rowspan="9"></td></tr>
<tr><td>6</td><td>Destinations Request</td></tr>
<tr><td>7</td><td>Destinations Response</td></tr>
<tr><td>8</td><td>Session Request</td></tr>
<tr><td>9</td><td>Privileged Connection Request</td></tr>
<tr><td>a</td><td>Privileged Connection Response</td></tr>
<tr><td>b</td><td>Inactivity Timeout Request</td></tr>
<tr><td>c</td><td>Inactivity Timeout Response</td></tr>
</table></td></tr>
<tr><td>22</td><td>LAN I/F capacity exceeded; discarded request
An SRTP connection could not be created due to either enforcement of a maximum limit on the number of SRTP connections or an internal error that prevents processing an establish connection request, such as system resource exhaustion.</td></tr>
<tr><td>23</td><td>LAN system-software fault; resuming
An attempt to increment an SRTP Server tally failed.
Entry 3: ID of the tally that failed to be incremented</td></tr>
<tr><td>24</td><td>LAN system-software fault; resuming
SRTP Server dropped a keep-alive timer tick. Timing of keep-alive timer processing may be temporarily skewed.</td></tr>
<tr><td>25</td><td>LAN system-software fault; resuming
An attempt to restart SRTP Server failed.</td></tr>
<tr><td>26</td><td>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: The version number of the PDU
Entry 4: The SRTP version supported by the SRTP Server</td></tr>
<tr><td>27</td><td>Bad remote application request; discarded request
A PDU arrived with an invalid pdu_type field code.
Entry 3: Code indicating the PDU type as listed above for Entry 2 = 21.</td></tr>
<tr><td>28</td><td>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: Code indicating the PDU type as listed above for Entry 2 = 21
Entry 4: The lower 16 bits of the data_length field</td></tr>
<tr><td>29</td><td>Bad remote application request; discarded request
An Error Request PDU arrived from a remote SRTP endpoint. The SRTP connection will be terminated.
Entry 3: Error code in the Error Request PDU</td></tr>
<tr><td>2a</td><td>LAN system-software fault; resuming
An attempt to shut down SRTP Server failed.</td></tr>
</table>

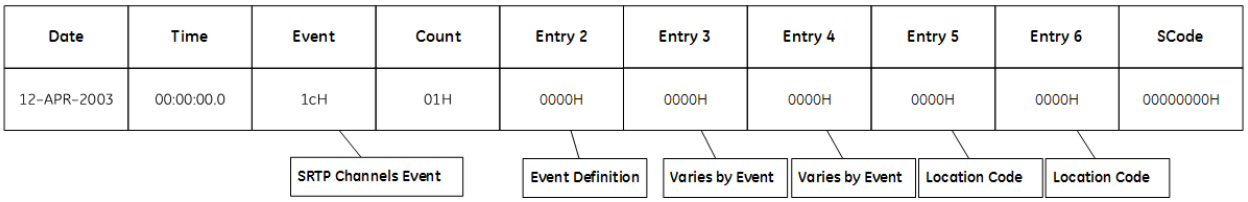
Entry 2	Description
2b	Bad remote application request; discarded request A valid SRTP PDU arrived, but the SRTP Server does not support handling it. Entry 3: Code indicating the PDU type as listed above for Entry 2 = 21
2c	LAN system-software fault; resuming An error occurred in establishing internal 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.
2f	LAN system-software fault; resuming An error occurred while processing the Destinations Service.
30	LAN system-software fault; resuming An error occurred while processing the Privileged Connection Service.
31	LAN system-software fault; resuming The SRTP Server was unable to process unsolicited mail from the CPU.
32	LAN system-software fault; resuming The SRTP Server was unable to process a service request from the CPU.
33	LAN system-software fault; resuming An error occurred trying to take down an SRTP Server connection that uses the Redundant IP address.
34	Bad remote application request; discarded request Internal error opening a pipe for use by new server connection.
35	Bad remote application request; discarded request Internal error creating a pipe for use by new server connection.
36	Bad remote application request; discarded request Internal error attempting to send a message on a pipe when reconfiguring or closing an SRTP server connection.
37	Bad remote application request; discarded request Internal error reading a message on a pipe.
38	LAN system-software fault; resuming Abandoned SRTP server connection was terminated by SRTP Inactivity Timeout.

B.1.15 Event Type 1c: SRTP Client (Channels) Events

Event Type 1c indicates an SRTP Client (Channels) exception event.

LOG Command Display for Event Type 1c

Most SRTP Client (Channels) events contain an optional Status Code (SCode), remote end-point, and local end-point values. Remote and local end-point values are displayed as IP Address: TCP port. The LOG or LOG Z command display for Event Type 1c is shown below.



SRTP Client (Channels) Events and Corresponding Controller Fault Table Entries

The following table shows the SRTP Client (Channels) events and corresponding Controller Fault Table entries. Entry 2 identifies the particular SRTP Client (Channels) event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-33: SRTP Events

Entry 2	Description
1	LAN system-software fault; resuming SRTP Client was not initialized after controller power-up or Ethernet restart. SRTP Client (Channels) COMMREQs cannot be processed. Entry 4: Internal error code
2	LAN system-software fault; resuming An error occurred requesting an operating system service.
3	LAN system-software fault; resuming An error occurred processing a Station Manager command.
6	LAN system-software fault; resuming An error occurred freeing an internal SRTP Client (Channels) transaction record. Entry 3 optionally specifies an individual service request in the format UUSS where UU and SS specify BPD task number and sequence number, respectively.
b	LAN system-software fault; resuming Internal error in the SRTP Client (Channels) state machine. Invalid state entered.
27	LAN system-software fault; resuming An error occurred while updating the COMMREQ Status Word. The status value may not have been delivered to the controller.
28	LAN system-software fault; resuming An error occurred while processing SRTP Client mail received from the CPU. Entry 3: Channel number
2d	LAN system-software fault; resuming Internal error in the SRTP Client State Machine. An internal consistency test failed.
41	LAN system-software fault; resuming The SRTP Client received an unexpected service request from the CPU. Entry 3 specifies an individual service request in the format UUSS where UU and SS specify BPD task number and sequence number, respectively.

Entry 2	Description
4a	LAN system-software fault; resuming An error occurred receiving service response mail from the CPU. Entry 3 specifies an individual service request in the format UUSS where UU and SS specify BPD task number and sequence number, respectively.
4c	LAN system-software fault; resuming An error occurred processing an SRTP Client COMMREQ received from the CPU.
52	LAN system-software fault; resuming An error occurred attempting to abort a service request previously sent to the CPU.
54 55 56 57 58 59	LAN system-software fault; resuming The SRTP Client (Channels) state machine detected an internal error.
5a 5b	LAN system-software fault; resuming An error occurred while in the IDLE state.
5c 5d	LAN system-software fault; resuming An error occurred while in one of the CONNECTING states.
5e 5f	LAN system-software fault; resuming An error occurred while in one of the ESTABLISHED states.
60	LAN system-software fault; resuming An error occurred in the CLOSING state while trying to adjust the Channel Status bits.
61 62	LAN system-software fault; resuming An error occurred while attempting to halt the channel.
63	LAN system-software fault; resuming An error occurred in the SRTP Client state machine while attempting to respond to or report a previous error (e.g. while setting status word or channel status error bit).
64	LAN system-software fault; resuming An error occurred processing a Station Manager command.
65	LAN system-software fault; resuming An error occurred while attempting to get the Advanced User Parameters from the configuration.
66	LAN system-software fault; resuming An SRTP Destinations response was received/processed that didn't include a default destination. A malfunctioning SRTP Server is the usual cause.
67 68 69	LAN system-software fault; resuming An internal error occurred.
6a	LAN system-software fault; resuming An error occurred while attempting to register an SRTP Client COMMREQ handler during startup of SRTP Client (Channels). One or more kind of SRTP Client COMMREQ cannot be processed.
6b	LAN system-software fault; resuming An error occurred while attempting to unregister the SRTP Client COMMREQ handlers.
6c	LAN system-software fault; resuming An error occurred while attempting to notify the SRTP Client (Channels) state machine that the COMMREQ Status Word was updated. This could cause that Channel to get stuck in the "SET_STATUS_OK" state until an ABORT COMMREQ is issued to the channel.
6e	LAN system-software fault; resuming An internal error occurred while attempting to validate the IP address in an SRTP Client (Channels) COMMREQ.

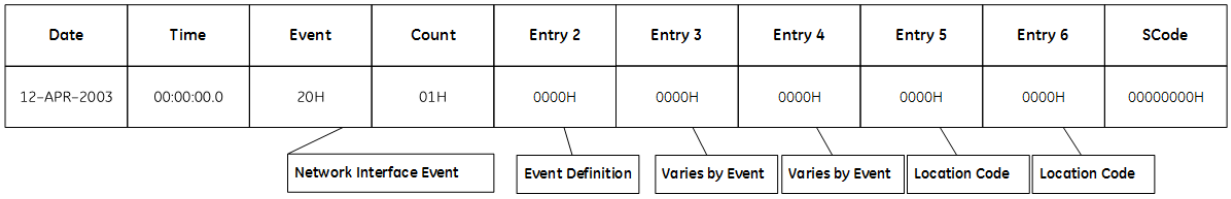
Entry 2	Description
6f	LAN system-software fault; resuming An internal error occurred during SRTP Client (Channels) startup, while attempting to register for communications with the local PACSystems controller.
71	LAN system-software fault; resuming An internal error occurred while attempting to send a request to the local PACSystems controller.
72	LAN system-software fault; resuming An internal error was detected when a channel was being closed, while terminating communications between that channel and the local PACSystems controller. Note that the actual problem probably occurred earlier than where it was detected here.
73	LAN system-software fault; resuming The maximum number of requests was still outstanding to the local PACSystems controller when another request to it was initiated.
74	LAN system-software fault; resuming The maximum number of requests was still outstanding to a remote controller (for a single channel) when another request to it was initiated.
75	LAN system-software fault; resuming An SRTP Destinations response was received that didn't include a destination. A malfunctioning SRTP Server is the usual cause.
76	LAN system-software fault; resuming An internal error occurred while attempting to send a request to a remote controller. The Invoke ID on the PDU is already in use/outstanding.
77	LAN system-software fault; resuming An SRTP response was received that doesn't match up to an outstanding request.
78	LAN system-software fault; resuming An internal error occurred while attempting to send a request to the local PACSystems controller. The sequence number on the request is already in use/outstanding.
7a	LAN system-software fault; resuming An error occurred while attempting to stop a channel (e.g. close the SRTP connection, terminate the TCP connection, etc.).
7b	LAN system-software fault; resuming An internal error occurred.
7c	LAN system-software fault; resuming An internal error occurred while processing data received from the remote controller. This could cause an SRTP Client channel to hang until an ABORT COMMREQ is issued for the channel.
7d	LAN system-software fault; resuming An error occurred while attempting to close a channel (generally during internal cleanup).
7e	LAN system-software fault; resuming The amount of value data provided by the controller (either local or remote) doesn't match the amount that is required in order to completely perform the transfer.
7f	LAN system-software fault; resuming Internal error in the SRTP Client (Channels) state machine. An internal data length consistency check failed.
80	LAN system-software fault; resuming An internal error occurred while preparing to begin the process of establishing a connection.
81	LAN system-software fault; resuming An error occurred while attempting to update the COMMREQ Status Word for a COMMREQ that was received while the channel was in the process of being closed.

B.1.16 Event Type 20: Network Interface Events

Event Type 20 indicates a Network interface exception event.

LOG Command Display for Event Type 20

Most Network Interface events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type 20 is shown below.



Network Interface Events and Corresponding Controller Fault Table Entries

The table below shows the Network Interface events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Network Interface event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-34: Network Interface Events

Entry 2	Description
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 the 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 mask value used to modify the LIS when the failure occurred Entry 4: OR mask value used to modify the LIS when the failure occurred
3	LAN system-software fault; aborted assoc. & resuming The network switch could not be accessed because it was auto-negotiating. Usually, a transient error caused by a disconnected cable. If the error persists, check the network cable and connection.
4	Link status change: Link down on Port 1 The Ethernet link on port1 got changed. The link is down on port1.
5	Link status change: Link up on Port 1 The Ethernet link on Port1 got changed. The link is up on Port1.
6	Link status change: Link down on Port 2. The Ethernet link on Port2 got changed. The link is down on Port2.
7	Link status change: Link up on Port 2. The Ethernet link on Port2 got changed. The link is up on Port2.

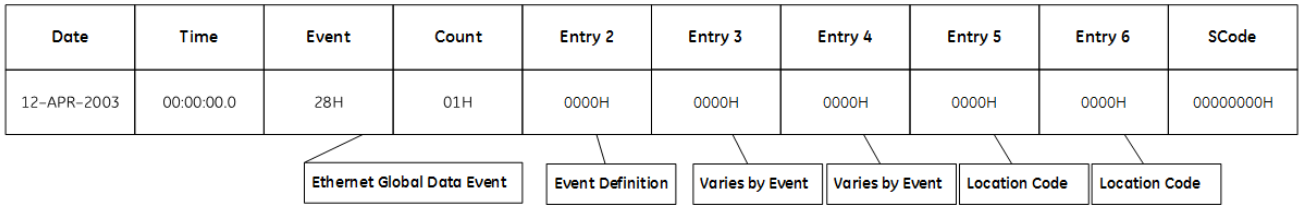
Entry 2	Description
8	Link status change: Link down on Port 3 The Ethernet link on Port3 got changed. The link is down on Port3.
9	Link status change: Link up on Port 3 The Ethernet link on Port3 got changed. The link is up on Port3.
10	Link status change: Link down on Port 4 The Ethernet link on Port4 got changed. The link is down on Port4.
11	Link status change: Link up on Port 4. The Ethernet link on Port4 got changed. The link is up on Port4.

B.1.17 Event Type 28: Ethernet Global Data (EGD) Events

Event Type 28 indicates an Ethernet Global Data (EGD) exception event.

LOG Command Display for Event Type 28

Most Ethernet Global Data events contain an optional Status Code (SCode) and exchange identifier values. The EGD exchange is identified by its Producer ID and Exchange ID. The LOG or LOG Z command display for Event Type 28 is shown below.



Ethernet Global Data Events and Corresponding Controller Fault Table Entries

The following table shows the Ethernet Global Data events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Ethernet Global Data event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-35: Ethernet Global Data Events

Entry 2	Description
1	LAN system-software fault; resuming Error in an operating system request. Entry 3: May contain additional internal error code. Entry 4: May contain additional internal error code. Note: This exception may also occur when attempting to produce an EGD exchange to a non-existent unicast IP address. An exception occurs when the Operating System is unable to resolve the consumer IP address for network transmission.
2	LAN system-software fault; resuming Error initializing EGD. No EGD exchanges will be processed until the module is power-cycled or restarted.
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 PACSystems controller data transfers. EGD will be inoperative until this problem is fixed.
5	Backplane communications with controller fault; lost request An unknown internal message was received by EGD main task. Entry 3 and 4: Initial portion of the unrecognized message.

Entry 2	Description
6	LAN system-software fault; resuming Error in a controller request to establish an EGD exchange. The exchange with this error will not be created. This is an internal error and should be reported to Technical Support 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 controller failed. The exchange in question will not transfer any data. Entry 3: Size of the connection area to be allocated
9	LAN system-software fault; resuming Internal identifier that indicates the exchange was not valid. This is an internal error and should be reported to Technical Support for corrective action. Entry 3: Internal exchange handle Entry 4: Internal connection ID.
a	LAN system-software fault; resuming The name format in the exchange is not supported. This is an internal error and should be reported to Technical Support for corrective action. Entry 3: Producer name format Entry 4: Consumer name format
c	LAN system-software fault; resuming Error releasing shared memory. Entry 3: Shared memory offset
d	LAN system-software fault; resuming Error freeing the state information for an exchange. Entry 3: Exchange number
e	LAN system-software fault; resuming Error in accessing the semaphore for an exchange.
f	Backplane communications with controller fault; lost request An unexpected controller service request has been received. This is an internal error and should be reported to Technical Support for corrective action. Entry 3: Internal identification code
10	Backplane communications with controller fault; lost request Unrecognized message received from the controller. This is an internal error and should be reported to Technical Support for corrective action.
11	Backplane communications with controller fault; lost request Improperly formed message received from the controller. This is an internal error and should be reported to Technical Support for corrective action. Entry 3: Contains the size of any data with this message
12	LAN data memory exhausted-check parms; resuming Error in allocating memory for internal EGD communications. Entry 3: The size of the requested allocation
13	LAN system-software fault; resuming Unrecognized message received from the controller. This is an internal error and should be reported to Technical Support for corrective action. Entry 3: Command code of the unrecognized message

Entry 2	Description
14	LAN system-software fault; resuming Error return from a request to scan EGD consumed data. Details are given in the status data. One or more samples will be lost or delayed in being transferred to the controller application. In some cases, this exception can occur during normal power down; if so, it does not indicate a problem.
15	Backplane communications with controller fault; lost request Error in sending mail to the controller. Typically this will result in the CPU generating a “loss of module” fault on the Ethernet module.
16	LAN system-software fault; resuming Error generating Station Manager output. Details are given in the status data. Entry 3: Additional internal error code
17	LAN system-software fault; resuming Error printing tally output. Details are given in the status data.
18	LAN system-software fault; resuming Unknown Station Manager command was received. Entry 3: The unknown Station Manager command code
19	LAN system-software fault; resuming Error identifying the state of a produced exchange. This is an internal error and should be reported to Technical Support for corrective action.
1a	LAN system-software fault; resuming Error communicating between EGD tasks. This is an internal error and should be reported to Technical Support for corrective action. Entry 3: Additional internal error code. Entry 4: Additional internal error code
1b	LAN system-software fault; resuming Unrecognized data received on the EGD data port. The data in the received message is ignored. Entry 3: The unrecognized command code. Entry 4: PDU version
1c	LAN system-software fault; resuming The signature field in a sample is invalid. 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. Entry 3: The signature
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. 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. Entry 3: The received data length
1e	LAN system-software fault; resuming Error return from a request to scan EGD consumed data. Details are given in the status data. This error can be logged under a normal shutdown if a request occurs simultaneously with the power shutoff. One or more samples will be lost or delayed in being transferred to the controller application.
1f	LAN system-software fault; resuming Error retrieving information about the shared memory between the CPU and the Ethernet interface. Details are given in the status data.
20	LAN system-software fault; resuming Invalid adapter index encountered in an exchange. Entry 3: The adapter index

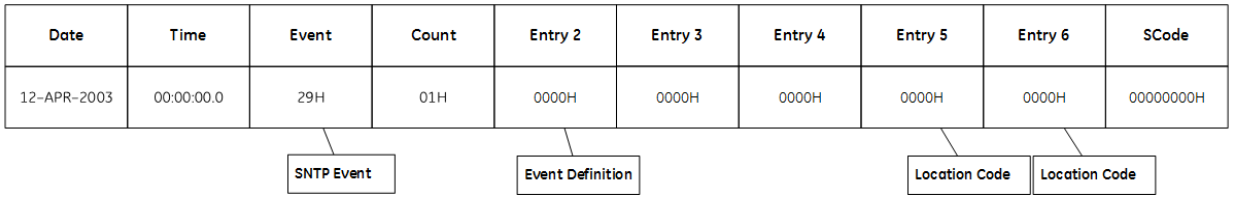
Entry 2	Description
22	LAN system-software fault; resuming The length field in a received sample does not match with the length of the sample packet. This normally indicates an error in the producer of the data. Entry 3: The received data length
23	LAN system-software fault; resuming Error in a mail request received from the controller.
24	LAN system-software fault; resuming Internal error in the EGD subsystem.
25	LAN system-software fault; resuming Error entering or leaving a critical region. Details are given in the status data.
26	LAN system-software fault; resuming Error processing a consumed exchange time out. All subsequent timeout processing is suspect.
27	LAN system-software fault; resuming Error processing internal events within EGD. Entry 3: Additional internal error code
28	LAN system-software fault; resuming Error attempting to start EGD production.
29	LAN system-software fault; resuming Error registering for Shared Memory Interface services.
2a	LAN system-software fault; resuming Error executing an EGD command (client or server),
2b	LAN system-software fault; resuming An invalid parameter was detected in an EGD command COMMREQ.
2d	LAN system-software fault; resuming Error giving an EGD command reply to RDS for delivery to the remote client. Entry 3: (Optional) RDS handle for this EGD command request Entry 4: (Optional) Reply PDU size
2e	LAN system-software fault; resuming Local EGD command timeout waiting for response from CPU.
2f	LAN system-software fault; resuming EGD command client task received an unrecognized reply message from the remote server.
30	LAN system-software fault; resuming Unable to allocate internal hashing table.
31	LAN system-software fault; resuming Error inserting a key into the internal hashing table.
32	LAN system-software fault; resuming Error deleting a key from the internal hashing table.
33	LAN system-software fault; resuming Error searching for a key in the internal hashing table.
34	Cannot locate remote node; discarded request Unable to locate the unicast produced exchange destination device on the network.
35	LAN system-software fault; resuming Unrecognized bit(s) in EGD exchange flags. Ethernet firmware may be out of date.
36	LAN system-software fault; resuming Error replacing a key in the internal hashing table.

B.1.18 Event Type 29: SNTP Events

Event Type 29 indicates an SNTP exception event.

LOG Command Display for Event Type 29

Most SNTP events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type 29 is shown below.



SNTP Events and Corresponding Controller Fault Table Entries

The following table shows SNTP events and corresponding Controller Fault Table entries. Entry 2 identifies the particular SNTP event. Entries 3 and 4 are not used. Entries 5 and 6 contain an internal location identification code.

Table 3-36: SNTP Events

Entry 2	Description
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 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.

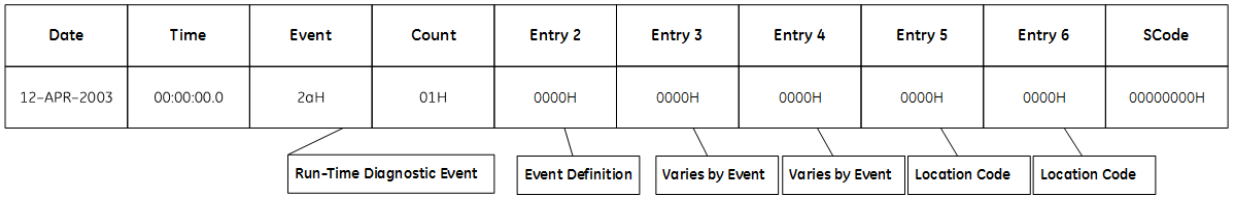
Entry 2	Description
16	LAN system-software fault; resuming Error producing output for a station manager command
17	LAN system-software fault; resuming Error in producing station manager tally output.
18	Backplane communications with controller fault; lost request An attempt to register a connection with the Backplane Driver (BPD) failed. SNTP cannot receive COMMREQs from the CPU.
19	Backplane communications with controller fault; lost request Invalid or unexpected mail received from CPU, or error sending COMMREQ Status update mail to CPU.
1a	LAN system-software fault; resuming Error retrieving Advanced User Parameter (AUP) data. SNTP time transfer cannot be configured for use.
1b	Backplane communications with controller fault; lost request CPU f/w version does not support CPU TOD synchronization.
1c	Backplane communications with controller fault; lost request Error processing COMMREQ Status update. COMMREQ Status value is not returned to the controller.
1d	Backplane communications with controller fault; lost request Unrecognized COMMREQ command received from CPU.
1e	LAN system-software fault; resuming Error updating the Network Time Locked LIS bit.
1f	LAN system-software fault; resuming Invalid AUP Parameters specified
20	LAN system-software fault; resuming This is not an error but represents the change of State of Synchronization
21	LAN system-software fault; resuming Internal error while handling time parameters.

B.1.19 Event Type 2a: Runtime Diagnostic Events

Event Type 2a indicates a runtime exception event.

Log Command Display for Event Type 2a

Most Runtime Diagnostic Events contain an optional Status Code (SCode) value. The LOG or LOG Z command display for Event Type 2a is shown below.



Runtime Diagnostic Events and Corresponding Controller Fault Table Entries

The following table shows the Runtime Diagnostic events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Runtime Diagnostic event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-37: Diagnostic Events

Entry 2	Description
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 Error entering factory test mode, unable to shut down the Ethernet interface.
5	LAN System-Software Fault; Resuming An attempt to register with the PACSystems controller Driver (BPD) failed. Communication with the CPU cannot occur.
6	LAN System-Software Fault; Resuming Error attempting to register for internal event notification.
7	LAN System-Software Fault; Resuming Runtime diagnostic operating system service error.
8	LAN System-Software Fault; Resuming Error in internal event processing request.
9	LAN System-Software Fault; Resuming Unknown mailbox message received from the Driver (BPD). Entry 3: Mailbox message type
a	LAN system-software fault; resuming An unexpected request was received from the Driver (BPD).
b	LAN System-Software Fault; Resuming Request sent to the CPU failed. Entry 3: Sequence number of the request that failed
c	LAN System-Software Fault; Resuming Processing error due to invalid internal data.

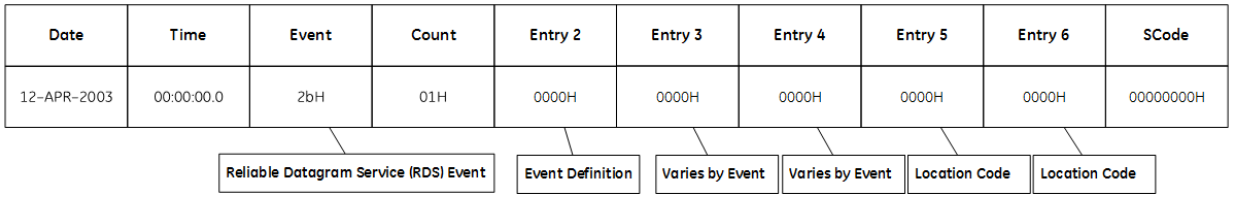
Entry 2	Description
d	LAN System-Software Fault; Resuming Error writing data to the controller.
e	LAN System-Software Fault; Resuming Invalid COMMREQ type received from the controller.
f	LAN System-Software Fault; Resuming Error detected during conversion of data.
10	LAN System-Software Fault; Resuming Error writing data to the controller.
11	LAN System-Software Fault; Resuming Error preparing for network testing.
12	LAN System-Software Fault; Resuming Error assigning temporary MAC address for network testing.
13	LAN System-Software Fault; Resuming Checksum error on data stored in non-volatile memory.

B.1.20 Event Type 2b: Reliable Datagram Service (RDS) Events

Event Type 2b indicates a Reliable Datagram Service (RDS) exception event.

LOG Command Display for Event Type 2b

Most RDS events contain an optional Status Code (SCode) and exchange identifier values. The LOG or LOG Z command display for Event Type 2b is shown below.



Reliable Datagram Service and Corresponding Controller Fault Table Entries

The following table shows the Reliable Datagram Service events and corresponding Controller Fault Table entries. Entry 2 identifies the particular RDS event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-38: Reliable Datagram Service

Entry 2	Description
1	LAN system-software fault; resuming RDS subsystem was not initialized after controller power-up or Ethernet restart. EGD command client and server (which use RDS services) will not operate.
2	LAN system-software fault; resuming Error attempting to send a message to the network.
3	LAN system-software fault; resuming Error attempting to receive a message from the network.
4	LAN system-software fault; resuming Error allocating internal memory or taking an internal semaphore.
5	LAN system-software fault; resuming Error extracting reply data from a message received from the network.
6	LAN system-software fault; resuming Error obtaining an event descriptor.
7	LAN system-software fault; resuming Error receiving system notification events.
8	LAN system-software fault; resuming Error setting up client or server communication.
9	LAN system-software fault; resuming Client error attempting to process a reply datagram.
b	LAN system-software fault; resuming Client error attempting to process a request retry.
c	LAN system-software fault; resuming Server error attempting to process a query request.
d	LAN system-software fault; resuming Server error attempting to process an execute-once request.

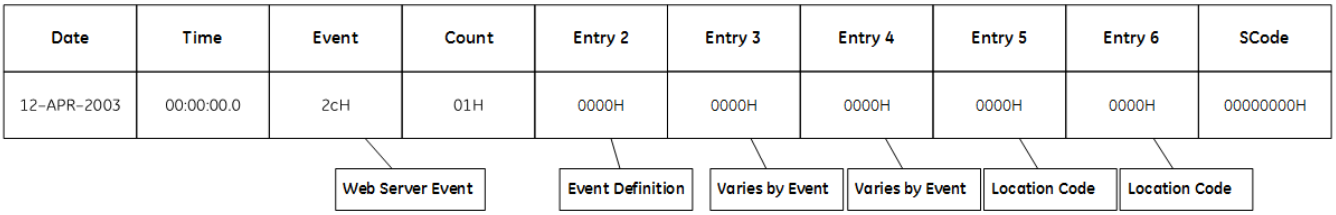
Entry 2	Description
e	LAN system-software fault; resuming A data callback function was not installed at RDS server.
f	LAN system-software fault; resuming An error reply callback function was not installed at RDS server.
10	LAN system-software fault; resuming Server error processing a reply datagram.
11	LAN system-software fault; resuming Server error processing an error reply datagram.
12	LAN system-software fault; resuming Reply datagram received at the client is too small.
14	LAN system-software fault; resuming Error using an operating system service. The service is identified in the SCode value.
15	LAN system-software fault; resuming Error attempting to output data to the Station Manager.
16	LAN system-software fault; resuming Error during the client reply callback notification.
17	LAN system-software fault; resuming Error starting the client request timeout timer.
18	LAN system-software fault; resuming Error converting an IP address into character string for Station Manager output.
19	LAN system-software fault; resuming Error accessing the server's pending request queue.
1a	LAN system-software fault; resuming Error accessing the server's execute-once request queue.
1b	LAN system-software fault; resuming Error obtaining a client session record.
1c	LAN system-software fault; resuming Invalid task priority level.
1d	LAN system-software fault; resuming Error registering for configuration delivery notification.
1e	LAN system-software fault; resuming Error retrieving AUP configuration data.
1f	LAN system-software fault; resuming Error terminating an RDS client session. Entry 3: RDS session ID

B.1.21 Event Type 2c: Web Server Events

Event Type 2c indicates a Web Server exception event.

LOG Command Display for Event Type 2c

Most Web Server events contain an optional Status Code (SCode), remote end-point, and local end-point values. The LOG or LOG Z command display for Event Type 2c is shown below.



Web Server Events and Corresponding Controller Fault Table Entries

The following table shows the Web Server events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Web Server event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-39: Web Server Events

Entry 2	Description
1	LAN System-Software Fault; Resuming Web server subsystem was not initialized after controller power-up or Ethernet restart. Servicing web requests will fail.
2	LAN System-Software Fault; Resuming Error requesting an operating system service.
3	LAN System-Software Fault; Resuming Unable to read a file from the file system required to service a web request.
4	LAN System-Software Fault; Resuming An attempt to allocate a resource failed.
5	LAN System-Software Fault; Resuming An attempt to free a resource failed. Entry 3: Internal code to help identify the resource that failed
6	LAN System-Software Fault; Resuming Unable to send response data to web client. This fault should be considered informational, as this event could be logged under normal operation if the user clicks multiple times on any link in the web pages.
7	LAN System-Software Fault; Resuming Unable to process an HTTP request received from a web client.
8	LAN System-Software Fault; Resuming Unable to register an HTTP transaction with the web server connection manager. This may be due to insufficient web server connection resources.
9	LAN System-Software Fault; Resuming Unable to get data from the internal HTTP server needed to process a request.
a	LAN System-Software Fault; Resuming Error detected while parsing a web page to identify function tags. Controller data not available in the served web page.
b	LAN System-Software Fault; Resuming Unable to collect data from the controller. Controller data not available in the served web page.
c	LAN System-Software Fault; Resuming Invalid state of an HTTP transaction detected. Entry 3: State of the HTTP transaction
d	LAN System-Software Fault; Resuming Unable to flush an HTTP transaction.
e	LAN System-Software Fault; Resuming Unable to de-register an HTTP transaction with the web server connection manager.

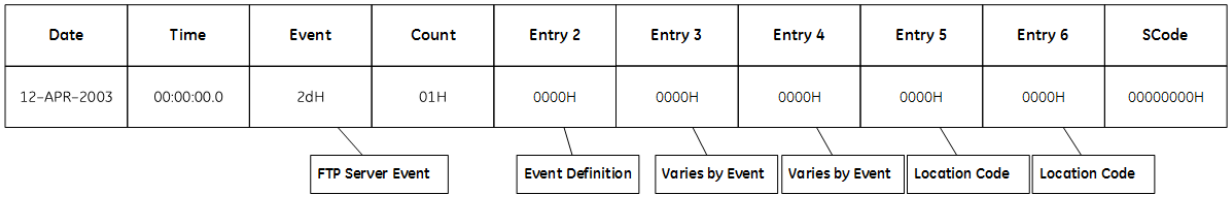
Entry 2	Description
f	LAN System-Software Fault; Resuming Loss of resource detected due to an internal processing error.
10	LAN System-Software Fault; Resuming Invalid handle for an HTTP transaction detected.
11	LAN System-Software Fault; Resuming Error while processing a response mailbox message from the controller. Entry 3: Driver (BPD) user task number of the request that failed Entry 4: Driver (BPD) transfer identification number of the request that failed.
12	LAN System-Software Fault; Resuming An unexpected unsolicited mailbox message was received from the controller.
13	LAN System-Software Fault; Resuming An unexpected request was received from the controller. Entry 3: Driver (BPD) user task number and the transfer identification number of the unexpected request
14	LAN System-Software Fault; Resuming Unable to flush a request that has already been sent to the controller.
15	LAN System-Software Fault; Resuming Unable to flush a collector used to collect data from the controller.
16	LAN System-Software Fault; Resuming Error detected while attempting to empty garbage in a controller data collector.
17	LAN System-Software Fault; Resuming Invalid type of garbage detected in a controller data collector. Entry 3: Internal value used to identify the invalid garbage
18	LAN System-Software Fault; Resuming Unable to close a file in the file system.
19	LAN System-Software Fault; Resuming Error detected while processing fault data received from the controller.
1a	LAN System-Software Fault; Resuming An attempt to increment a web server tally failed. Entry 3: ID of the tally that failed to be incremented
1b	LAN System-Software Fault; Resuming An attempt to cleanup a Service Request Processor (SRP) user failed. Entry 3: Driver (BPD) user task number of the request that failed Entry 4: Driver (BPD) transfer identification number of the request that failed.
1c	LAN System-Software Fault; Resuming An attempt to get soft switch configuration data failed.
1d	LAN System-Software Fault; Resuming Internal error enabling trace operation for Web Server.
1e	LAN System-Software Fault; Resuming Internal error generating trace output for Web Server.

B.1.22 Event Type 2d: FTP Server Events

Event Type 2d indicates an FTP Server exception event.

LOG Command Display for Event Type 2d

Most FTP Server events contain an optional Status Code (SCode). The LOG or LOG Z command display for Event Type 2d is shown below.



FTP Server Events and Corresponding Controller Fault Table Entries

The following table shows the FTP Server events and corresponding Controller Fault Table entries. Entry 2 identifies the particular FTP Server event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-40: FTP Server Events

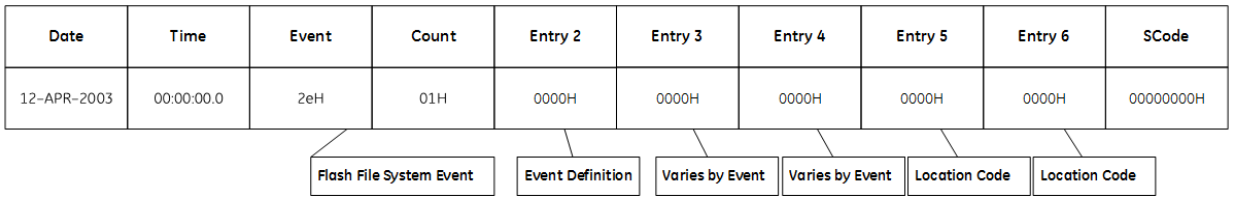
Entry 2	Description
1	LAN System-Software Fault; Resuming FTP server subsystem was not initialized after controller power-up or Ethernet restart. Servicing FTP requests will fail.
2	LAN System-Software Fault; Resuming Error requesting an operating system service.
3	LAN System-Software Fault; Resuming The FTP server task that processes FTP requests failed to start.
4	LAN System-Software Fault; Resuming An attempt to increment an FTP server tally failed. Entry 3: ID of the tally that failed to be incremented
5	LAN System-Software Fault; Resuming An attempt to get Advanced User Parameters (AUP) failed.
6	LAN System-Software Fault; Resuming Invalid soft switch configuration data received. Entry 3: Maximum number of FTP connections in the soft switch configuration
7	LAN System-Software Fault; Resuming An attempt to get soft switch configuration data failed.
8	LAN System-Software Fault; Resuming An internal error was detected while attempting to receive an event notification.

B.1.23 Event Type 2e: Flash File System Events

Event Type 2e indicates a Flash File System (FFS) exception event.

LOG Command Display for Event Type 2e

Most Flash File System events contain an optional Status Code (SCode). The LOG or LOG Z command display for Event Type 2e is shown below.



Flash File System Events and Corresponding Controller Fault Table Entries

The following table shows the Flash File System events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Flash File System event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-41: Flash File System Events

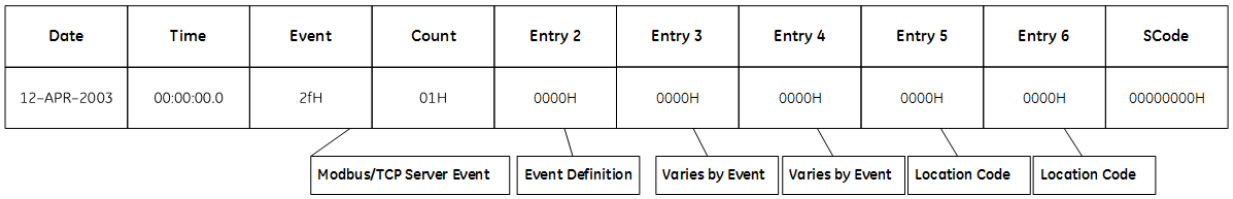
Entry 2	Description
1	LAN System-Software Fault; Resuming Flash File System was not initialized after controller power-up or Ethernet restart. Servicing FTP requests will fail.
2	LAN System-Software Fault; Resuming Error requesting an operating system service.
3	LAN System-Software Fault; Resuming An attempt to increment a Flash File System tally failed. Entry 3: ID of the tally that failed to be incremented

B.1.24 Event Type 2f: Modbus/TCP Server Events

Event Type 2f indicates a Modbus/TCP Server exception event.

LOG Command Display for Event Type 2f

The LOG command display for Event Type 2f is shown below.



Modbus/TCP Server Events and Corresponding Controller Fault Table Entries

The following table shows the Modbus/TCP Server events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Modbus/TCP Server event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-42: Modbus/TCP Server Events

Entry 2	Description
0202	LAN System-Software Fault; Resuming Internal error occurred while processing a message from the CPU module.
0203	LAN System-Software Fault; Resuming Internal error occurred while processing a message from the CPU module.
0204	LAN System-Software Fault; Resuming Internal error occurred when attempted to send a message to the CPU module.
0205	LAN System-Software Fault; Resuming Failed to initialize communications with the CPU module. Modbus server off-line.
0206	LAN System-Software Fault; Resuming Internal error while processing an unexpected message from the CPU module.
0207	LAN System-Software Fault; Resuming Internal error detected by the Modbus/TCP server.
0208	LAN System-Software Fault; Resuming TCP connection with the remote device timed-out. Entry 3: Endpoint number where timeout occurred.
0209	LAN System-Software Fault; Resuming Internal error occurred when deleting a Modbus/TCP server task.
020a	LAN System-Software Fault; Resuming Internal error occurred during timer processing.
020b	LAN System-Software Fault; Resuming Internal error occurred while updating a Modbus/TCP tally. Tallies may not be accurate.
020c	LAN System-Software Fault; Resuming Internal error occurred while processing a Modbus/TCP server Station Manager command.
020d	LAN System-Software Fault; Resuming Internal error occurred when processing a message from the CPU module.

Entry 2	Description
020e	LAN System-Software Fault; Resuming An error occurred while closing a TCP connection.
020f	LAN System-Software Fault; Resuming Internal error occurred when processing a fault on a Modbus/TCP connection.
0210	LAN System-Software Fault; Resuming Internal error occurred while processing configuration data stored from the programming device.
0211	LAN System-Software Fault; Resuming Internal error occurred in a Modbus/TCP connection's state machine.
0212	LAN System-Software Fault; Resuming Internal connection numbering error.
0213	LAN System-Software Fault; Resuming Internal error occurred that causes a Modbus/TCP response to not be sent.
0214	LAN System-Software Fault; Resuming Internal error occurred when starting a Modbus/TCP task. This could prevent all Modbus/TCP communications or just a failure on a single connection.
0215	LAN System-Software Fault; Resuming An error during a Redundant CPU role-switch from active to backup prevented the closing of a connection that was using the Redundant IP address.
0216	LAN System-Software Fault; Resuming An error prevents the Modbus/TCP server from listening for incoming TCP connection requests. The server will not respond to any connection requests.
0217	LAN System-Software Fault; Resuming An internal error prevents the Modbus/TCP server from sending inter-task events.
0218	LAN System-Software Fault; Resuming An error prevents a Modbus/TCP task from running.
0219	LAN System-Software Fault; Resuming Internal error in the server's connection state machine.
021a	LAN System-Software Fault; Resuming Internal error occurred when starting a Modbus/TCP task.
021b	LAN System-Software Fault; Resuming Internal error prevented processing of requests on a particular connection.
021c	LAN System-Software Fault; Resuming An internal error prevents the server from receiving inter-task events.
021d	LAN System-Software Fault; Resuming Internal operating system error occurred.
021e	LAN System-Software Fault; Resuming An inconsistent condition exists that prevents a connection from processing additional Modbus/TCP requests. Entry 3: Modbus function code being processed when error was detected.
021f	LAN System-Software Fault; Resuming An error occurred while attempting to translate a Modbus/TCP request into a data request for the CPU module. Entry 3: Connection where the Modbus/TCP request was received. Entry 4: Modbus function code being processed when error was detected.
0220	LAN System-Software Fault; Resuming Internal error occurred when applying new AUP configuration parameters.
0221	LAN System-Software Fault; Resuming Internal error occurred during Modbus/TCP request processing. Entry 4: Modbus function code in the request.
0222	LAN System-Software Fault; Resuming An error occurred when attempting to receive inter-process events.

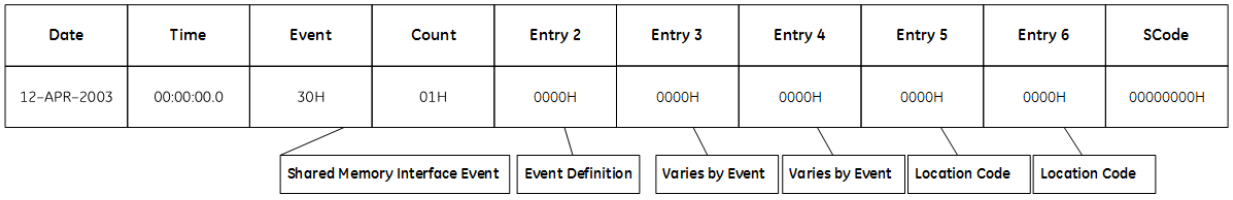
Entry 2	Description
0223	LAN System-Software Fault; Resuming An error occurred while attempting to read a Modbus/TCP request from the network. Entry 3: Connection endpoint where the error occurred.
0224	LAN System-Software Fault; Resuming An internal error prevents the Modbus/TCP server from accepting connections from clients on the network.
0225	LAN System-Software Fault; Resuming An internal error occurred that may cause the Modbus/TCP server to stop accepting connections from clients on the network.
0226	LAN System-Software Fault; Resuming An error prevents the sending of a Modbus/TCP response and may cause the TCP connection with the client to be closed.
0227	LAN System-Software Fault; Resuming An internal error prevented the server from shutting down a connection to a client.
0228	LAN System-Software Fault; Resuming An error is preventing tracing of Modbus/TCP data.
0229	LAN System-Software Fault; Resuming An internal error prevented the startup of the Modbus/TCP server or prevented the startup of a connection with a single client.
022a	LAN System-Software Fault; Resuming An internal error occurred during the closing of a TCP connection that prevented inter-task event notification.
022b	LAN System-Software Fault; Resuming The Modbus/TCP server received an unexpected message from the CPU module.
022c	LAN System-Software Fault; Resuming A PDU received by the Modbus/TCP server specified a non-Modbus protocol in its MBAP header's Protocol ID field. The connection with the client is closed. Entry 3: Connection number Entry 4: Protocol ID
022d	LAN System-Software Fault; Resuming An unexpected error type was received from the CPU module in response to a request to read or write data to service a Modbus/TCP request. Entry 3: CPU Major Error Code Entry 4: CPU Minor Error Code
022e	This value reserved for future use.
022f	This value reserved for future use.
0230	LAN System-Software Fault; Resuming An unexpected event occurred during the store of configuration data.
0231	LAN System-Software Fault; Resuming An unknown event occurred during the store of configuration data.
0232	LAN System-Software Fault; Resuming An operating system error prevents network communications with a remote device.
0233	LAN System-Software Fault; Resuming An operating system error prevents network communications with a remote device.
0234	LAN System-Software Fault; Resuming An unrecognized inter-process event was received.
0235	LAN System-Software Fault; Resuming The length field in a Modbus/TCP request's MBAP header contained an illegal value. An exception response is sent to the client and the connection is closed. Entry 3: Connection number Entry 4: The data length specified in the header.

B.1.25 Event Type 30: Shared Memory Interface (SMI) Events

Event Type 30 indicates a Shared Memory Interface (SMI) exception event.

LOG Command Display for Event Type 30

Most Shared Memory Interface events contain an optional Status Code (SCode). The LOG or LOG Z command display for Event Type 30 is shown below.



Shared Memory Interface Events and Corresponding Controller Fault Table Entries

The following table shows the Shared Memory Interface events and corresponding Controller Fault Table entries. Entry 2 identifies the particular SMI event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-43: Shared Memory Interface Events

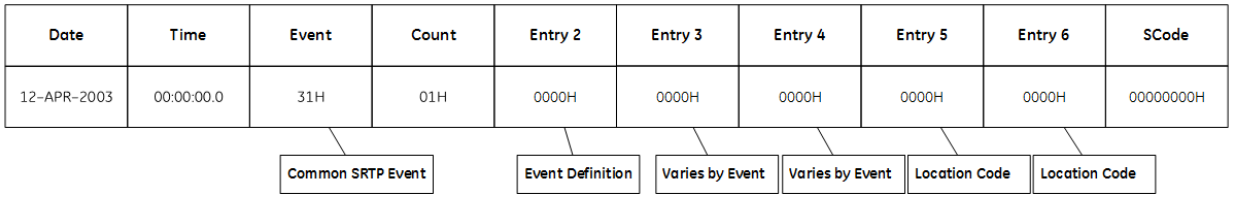
Entry 2	Description
1	LAN System-Software Fault; Resuming Shared Memory Interface was not initialized after controller power-up or Ethernet restart. There is no communication with the CPU.
2	No Controller Fault Table Entry for this error. (RX3i only) BMI circular queue overflow. Entry 3: Number of interrupts (upper word) Entry 4: Number of interrupts (lower word)
3	No Controller Fault Table Entry for this error. (RX3i only) BMI count was zero.
4	No Controller Fault Table Entry for this error. (RX3i only) BMI queue head pointer out of range. Entry 3: Invalid pointer value (upper word) Entry 4: Invalid pointer value (lower word)

B.1.26 Event Type 31: Common SRTP Events

Event Type 31 indicates a Common SRTP exception event. These exception codes may be used by both the SRTP Server and the SRTP Client.

LOG Command Display for Event Type 31

Most Common SRTP events contain an optional Status Code (SCode). The LOG or LOG Z command display for Event Type 31 is shown below.



Common SRTP Events and Corresponding Controller Fault Table Entries

The following table shows the Common SRTP events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Common SRTP event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-44: SRTP Events

Entry 2	Description
1	LAN system-software fault; resuming A PDU arrived with a version field number higher than the SRTP protocol version supported by SRTP Server Entry 3: The version number of the PDU Entry 4: The SRTP version supported by the SRTP Server
2	LAN system-software fault; resuming A PDU arrived with an invalid pdu_type field code. Entry 3: Code indicating the PDU type as listed above for Entry 2 = 21.
3	LAN system-software fault; resuming A PDU arrived with a non-zero data_length field, but was of a class of PDU's that must have zero (0) in this field. Entry 3: Code indicating the PDU type as listed above for Entry 2 = 21 Entry 4: The lower 16 bits of the data_length field
4	LAN system-software fault; resuming Unknown internal data or message type.
5	LAN system-software fault; resuming SRTP startup error. Either SRTP client, server, or both, will be unavailable.
6	LAN system-software fault; resuming An error occurred receiving events.
8	LAN system-software fault; resuming Error installing module configuration data to SRTP subsystem components.
9	LAN system-software fault; resuming An error occurred closing an event descriptor.
a	LAN system-software fault; resuming An error occurred allocating a common resource such as a transaction record.

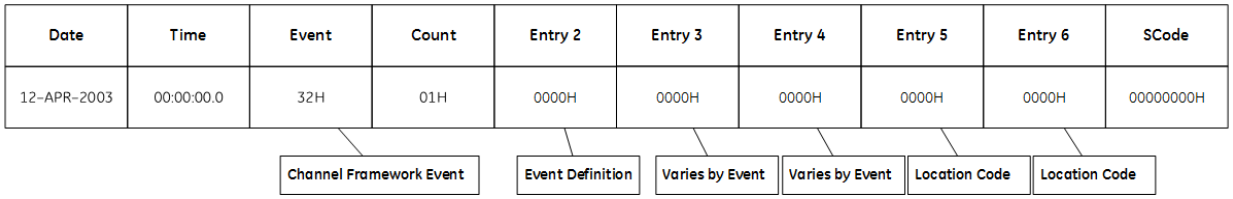
Entry 2	Description
b	LAN system-software fault; resuming An error occurred freeing a common resource such as a transaction record.
c	LAN system-software fault; resuming An error occurred processing a Station Manager command. Entry 3: Internal code for the attempted Station Manager command
d	LAN system-software fault; resuming Unable to locate the appropriate transaction record. Entry 3 optionally specifies an individual service request in the format UUSS where UU and SS specify BPD task number and sequence number, respectively.
e	LAN system-software fault; resuming Error processing response mail received from the CPU. Entry 3 optionally specifies an individual service request in the format UUSS where UU and SS specify BPD task number and sequence number, respectively.

B.1.27 Event Type 32: Channel Framework Events

Event Type 32 indicates a Channel Framework exception event. These events can be generated by any channels protocol.

LOG Command Display for Event Type 32

Most Channel Framework events contain an optional Status Code (Scode). The LOG or LOG Z command display for Event Type 32 is shown below.



Channel Framework Events and Corresponding Controller Fault Table Entries

The following table shows the Channel Framework events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Channel Framework event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-45: Channel Framework Events

Entry 2	Description
1	LAN system-software fault; resuming Error occurred during framework startup
2	LAN system-software fault; resuming Error occurred requesting an operating system service
3	LAN system-software fault; resuming Internal error occurred while creating an event
4	LAN system-software fault; resuming Internal error occurred while processing a station manager command
5	LAN system-software fault; resuming Runtime error occurred while processing a station manager command
6	LAN system-software fault; resuming Internal runtime error occurred
7	LAN system-software fault; resuming Error occurred while unregistering a channel
8	LAN system-software fault; resuming Internal error occurred while registering for channel addition/removal notification
9	LAN system-software fault; resuming An error occurred while queuing an event to a channel. Generating channel events faster than they can be processed is the usual cause.
a	LAN system-software fault; resuming Internal error occurred while registering the local connection
b	LAN system-software fault; resuming Internal error occurred while registering the remote connection
c	LAN system-software fault; resuming Internal error while registering with the connection watcher (Duplicate registration)

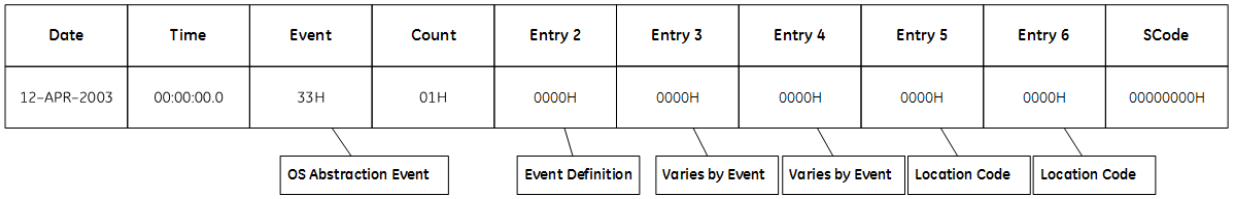
Entry 2	Description
d	LAN system-software fault; resuming Internal error while registering with the connection watcher (Other registration error)
e	LAN system-software fault; resuming Internal runtime error within the connection watcher
f	LAN system-software fault; resuming Internal initialization error within the connection watcher
10	LAN system-software fault; resuming Internal error due to an invalid file handle
11	LAN system-software fault; resuming Internal error while clearing a connection watcher entry
12	LAN system-software fault; resuming Internal error due to an unexpected NULL pointer
13	LAN system-software fault; resuming Internal error occurred while abruptly shutting down a channel
14	LAN system-software fault; resuming Internal error occurred while processing channel events
15	LAN system-software fault; resuming Internal error occurred while queuing event to channel
16	LAN system-software fault; resuming Internal error occurred while updating channel status bits
17	LAN system-software fault; resuming Internal error occurred while copying channel status bits to shared memory
18	LAN system-software fault; resuming Internal error occurred while unregistering from input scan notification
19	LAN system-software fault; resuming No mailbox sequence number available; unable to send mail to CPU.
1a	LAN system-software fault; resuming Unable to fetch controller state; channel cannot be established.

B.1.28 Event Type 33: OS Abstraction Events

Event Type 33 indicates an OS Abstraction exception event.

LOG Command Display for Event Type 33

Most OS Abstraction events contain an optional Status Code (SCode). The LOG or LOG Z command display for Event Type 33 is shown below.



OS Abstraction Events and Corresponding Controller Fault Table Entries

The following table shows the OS Abstraction events and corresponding Controller Fault Table entries. Entry 2 identifies the particular OS Abstraction event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-46: OS Abstraction Events

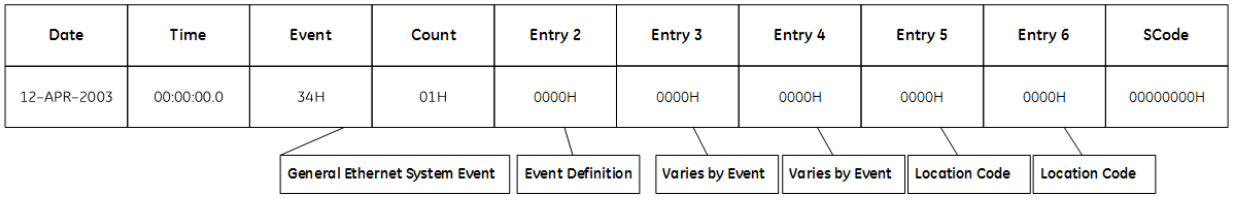
Entry 2	Description
1	LAN system-software fault; resuming Network error occurred
2	LAN system-software fault; resuming Error allocating memory
3	LAN system-software fault; resuming Internal error occurred due to an invalid parameter
4	LAN system-software fault; resuming Internal error occurred due to an unsupported operation
5	LAN system-software fault; resuming Internal general runtime error occurred
6	LAN system-software fault; resuming Internal runtime error occurred due to a bad cast exception
7	LAN system-software fault; resuming Internal runtime error occurred due to a NULL pointer
8	LAN system-software fault; resuming Internal error occurred due to a timer issue
9	LAN system-software fault; resuming Internal thread error
a	LAN system-software fault; resuming Internal error occurred while updating available connection pool information
b	LAN system-software fault; resuming Internal error occurred within IPC abstractions

B.1.29 Event Type 34: General Ethernet System Events

Event Type 34 indicates a General Ethernet System exception event.

LOG Command Display for Event Type 34

Most General Ethernet System events contain an optional Status Code (SCode). The LOG or LOG Z command display for Event Type 34 is shown below.



General Ethernet System Events and Corresponding Controller Fault Table Entries

The table following shows the General Ethernet System events and corresponding Controller Fault Table entries. Entry 2 identifies the particular General Ethernet System event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Entry 2	Description
1	LAN system-software fault; resuming Internal error occurred while processing a station manager command
2	LAN system-software fault; resuming Runtime error occurred while processing a station manager command
3	LAN system-software fault; resuming Internal error indicating memory tracking issue
4	LAN system-software fault; resuming General Ethernet System not initialized after controller power-up or Ethernet restart
5	LAN system-software fault; resuming Internal error within mailbox abstraction
6	LAN system-software fault; resuming Internal error processing Modbus response at Modbus/TCP Client.
7	LAN system-software fault; resuming Not enough data within Modbus/TCP response or sub-response at Modbus/TCP client. Entry 3: Modbus function code Entry 4: Response or sub-response length (bytes)
8	LAN system-software fault; resuming Incomplete data within Modbus/TCP response or sub-response at Modbus/TCP client.
d	LAN system-software fault; resuming Invalid file type within Modbus/TCP response or sub-response at Modbus/TCP client. Entry 3: Modbus function code Entry 4: File type
e	LAN system-software fault; resuming Modbus/TCP response too long or contains too many sub-responses at Modbus/TCP client. Entry 3: Modbus function code Entry 4: Response length (bytes)
f	LAN system-software fault; resuming Invalid sub-function code within Modbus/TCP response at Modbus/TCP client. Entry 3: Modbus function code Entry 4: Sub-function code

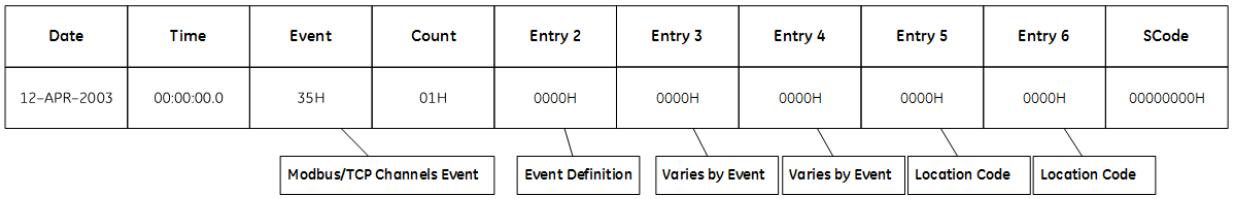
Entry 2	Description
10	LAN system-software fault; resuming Invalid function code within Modbus/TCP response at Modbus/TCP client. Entry 3: Modbus function code

B.1.30 Event Type 35: Modbus/TCP Client (Channels) Events

Event Type 35 indicates a Modbus/TCP Client (Channels) exception event.

LOG Command Display for Event Type 35

Most Modbus/TCP Client (Channels) events contain an optional Status Code (SCode), remote end-point, and local end-point values. Remote and local end-point values are displayed as IP Address: TCP port. The LOG or LOG Z command display for Event Type 35 is shown below.



Modbus/TCP Client (Channels) Events and Corresponding Controller Fault Table Entries

The following table shows the Modbus/TCP Client (Channels) events and corresponding Controller Fault Table entries. Entry 2 identifies the particular Modbus/TCP Client (Channels) event. Entries 3 and 4 may vary according to each particular event. Entries 5 and 6 contain an internal location identification code.

Table 3-47: Modbus/TCP Client Events

Entry 2	Description
9	LAN system-software fault; resuming An error occurred processing a Modbus/TCP COMMREQ.
a	LAN system-software fault; resuming An internal error occurred processing a Station Manager command. The command was not completed. Entry 3: Internal processing identifier
c	LAN system-software fault; resuming Error registering to receive a Modbus/TCP COMMREQ command code. COMMREQs containing this command cannot be recognized. Entry 3: COMMREQ command code
d	LAN system-software fault; resuming Error deregistering a Modbus/TCP COMMREQ command code. Entry 3: COMMREQ command code
e	LAN system-software fault; resuming Error sending a COMMREQ Status value to the PCL CPU. The COMMREQ Status value was not delivered.
f	LAN system-software fault; resuming Error registering with Backplane Driver subsystem. The Modbus/TCP client cannot transfer data to/from reference memory.
11	LAN system-software fault; resuming Internal error: An unexpected Null pointer was encountered.
12	LAN system-software fault; resuming Internal error: An unexpected exception was encountered.

Entry 2	Description
13	LAN system-software fault; resuming Internal state machine failure. Entry 3: Zero or COMMREQ command code
14	LAN system-software fault; resuming Internal error: No state machine transition defined.
15	LAN system-software fault; resuming Internal error processing a state machine state change.
16	LAN system-software fault; resuming Error executing a Station Manager command. The Modbus/TCP client cannot complete the command.
17	LAN system-software fault; resuming Error receiving a service request response from the CPU. Entry 3: Backplane Driver transfer ID
18	LAN system-software fault; resuming Internal error: Attempting to close a Modbus/TCP connection when none are open.
19	LAN system-software fault; resuming Internal error: Service request transfer ID already in use. Entry 3: Backplane Driver transfer ID
1a	LAN system-software fault; resuming Error sending service request to CPU.
1b	LAN system-software fault; resuming Error receiving PDU from remote server. Entry 3: Function code (occurs when PDU contains too much data) or zero (= internal error)
1c	LAN system-software fault; resuming Error flushing pending COMMREQ Status updates when abruptly closing a Modbus/TCP channel. Entry 3: Zero or internal event type
1d	LAN system-software fault; resuming Unexpected mail received from CPU. Entry 3: XXYY, where XX = BPD user ID, YY = BPD transfer ID
1e	LAN system-software fault; resuming Unrecognized COMMREQ command code. Entry 3: COMMREQ command code
1f	LAN system-software fault; resuming Modbus/TCP response is too large. Entry 3: Response length
20	LAN system-software fault; resuming Modbus/TCP response contains invalid Protocol ID value. Entry 3: Protocol ID
21	LAN system-software fault; resuming An unexpected Modbus/TCP request or response was received. Entry 3: Function code
22	LAN system-software fault; resuming Error writing data to local CPU. Entry 3: COMMREQ command code, or XXYY where XX = num units and YY = response length
23	LAN system-software fault; resuming Invalid response length. Entry 3: XXYY where XX = num units and YY = response length

B.1.31 Event Type 37: DNP3 Outstation Events

Event Type 37 indicates DNP3 Outstation exception event.

LOG Command Display for Event Type 37

The CPE400 DNP3 Outstation module will internally log messages to the CPU log. Most of these faults are not fatal. The following tables describes common faults. Fatal and other recurrent faults should be reported to technical support.

DNP3 Outstation Events and Corresponding Controller Fault Table Entries

The following table shows the DNP3 Outstation) events and corresponding Controller Fault Table entries. Entry 2 identifies the DNP3 Outstation event. Entries 3 and 4 may vary according to each event. Entries 5 and 6 contain an internal location identification code.

Entry 2	Description
1	Error occurred during DNP3 Configuration validation Scode: 815000000 -Invalid Command number 815000001 - Invalid Configuration Block 815000002 - Invalid no of masters configured 815000005 - Invalid PLC Memory Type configured 815000006 - Invalid DNP3 Outstation LLA configured 815000009 - Invalid Port number configured 81500000a - Invalid Configuration block type 81500000b - Invalid Configuration type (neither PME nor SVCREQ)
3	Error occurred when starting the DNP3 Outstation Application
4	Error occurred when processing the DNP3 Configuration Scode: 81500000c - Internal Error in mapping the SVCREQ parameters to CFG Block 81500000d - Internal Error in processing the PME Configuration 8150000b0 - File format version not supported 8150000b2 - Internal Error, invalid PME configuration block Offset 8150000b3 - Internal Error, invalid PME configuration block type
5	Error occurred when processing DNP3 Application state machine Scode: 815000020 - Error in DNP3 Application 815000021 – Internal Error in Setting the Firewall
9	Error occurred when processing the User Session functionality
b	Error occurred while clearing the Configuration data
c	Error occurred when processing Controller Read / Write request
d	Error occurred due to invalid Point Push Record count
e	Error occurred due to invalid DNP3 Point Index in Point Push record
f	Error occurred due to invalid DNP3 Object in Point Push record
10	Error occurred while processing Point Push record data
12	Error occurred when processing API stack wrapper Scode: 815000070 - Internal Error 815000071 - Internal Error in malloc memory allocation 815000072 - Error in getting the Date and Time 815000073 - Error in setting the Date and Time
13	Error occurred when processing DNP3 Group Objects

Entry 2	Description
15	Error occurred when initializing the TCP/IP Channel for DNP3 Communication Entry 4: Port number to connect on server
16	Error occurred when processing the connection to socket in TCP DNP3 Server Entry 3: Error code returned by API when fails Entry 4: Port number to connect on server
17	Error occurred when processing the listen for connection on socket in TCP DNP3 Server Entry 3: Error code returned by API when fails Entry 4: Port number to connect on server
18	Error occurred when processing the TCP transmit request from DNP3 Server Entry 3: Error code returned by API when fails Entry 4: Port number to connect on server
19	Error occurred when processing the connection to socket in UDP Connection Entry 4: Port number to connect on server
1a	Error occurred when processing the data received from UDP socket connection Entry 3: return value of API Entry 4: Port number to connect on server
1b	Error occurred when processing the UDP transmit request from Server Entry 3: Error code returned by API when fails Entry 4: Port number to connect on server
1c	Error occurred when processing the TCPIP initialization stack API
1d	Error occurred when processing the Redundant functionality Entry 4: DNP3 Class mask, Event Object Type and size of packet during transfer between active and backup modules. Scode: 8150000d2 -Internal error in malloc memory allocation 8150000df -Internal error in event synchronization between active and backup units

B.1.32 Event Type 38: IP Conflict Detection

Event type 38 indicates detection of a duplicate IP with the PLC on the specified LAN. The MAC address of the other device with the duplicate IP is reported.

These faults are reported on the PLC fault table as well as the ETM fault table.

IP Conflict Detection Events and Corresponding Controller Fault Table Entries

The following table shows the IP Conflict Detection events and corresponding Controller Fault Table entries. Entry 2 identifies the IP Conflict Detection event. Entries 3 and 4 may vary according to each event. Entries 5 and 6 contain an internal location identification code.

Entry 2	Description
31	Duplicate IP address detected on LAN 1 Remote IP addr:Port or Producer ID:Exchg column reports the MAC address of the other device.
32	Duplicate IP address resolved on LAN 1 Remote IP addr:Port or Producer ID:Exchg column reports the MAC address of the other device.
33	Duplicate IP address detected on LAN 2 Remote IP addr:Port or Producer ID:Exchg column reports the MAC address of the other device.
34	Duplicate IP address resolved on LAN 2 Remote IP addr:Port or Producer ID:Exchg column reports the MAC address of the other device.
35	Duplicate IP address detected on LAN 3 Remote IP addr:Port or Producer ID:Exchg column reports the MAC address of the other device.
36	Duplicate IP address resolved on LAN 3 Remote IP addr:Port or Producer ID:Exchg column reports the MAC address of the other device.
37	IP Conflict Detection Interface error

Appendix C Firmware Update History

[1] Supported by CPE302/CPE305/CPE310/CPE330/CPE400/CPL410/CPS400 and EPXCPE205/210/215/220/240 embedded Ethernet interface – Monitor only

[2] Support for this command was added in CPE305/CPE310 firmware release 8.30; however, with release 8.65 Modify is no longer supported. COE302 does not support Modify mode.

[3] Support for Monitor-only functions of this command was added in CPE330 firmware release 8.60, CPE400 release 9.30 and is supported in CPL410/CPS400 and EPXCPE205/210/215/220/240.

[4] These commands are now supported in Modify Mode only, effective with RX3i CPE302 and CPL410/CPS400 and with CPE305/CPE310/CPE330/CPE400 version 9.30 & ETM001 version 6.42, and EPXCPE205/210/215/220/240. Modify requires a login. They are no longer supported in Monitor Mode.

[5] Support for login command was removed in CPE305/310 firmware release 8.65. Modify commands are no longer supported by the embedded Ethernet interfaces in these CPUs. Nor do CPE302/CPE330/CPE400/CPL410/CPS400, and EPXCPE205/210/215/220/240 support the login command.