

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GE PACSYSTEMS RX3i

IC695ETM001

ETHERNET INTERFACE MODULE

Used with the applicable PACSystems RX3i communications configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: IC695ETM001-LBAA.pdf

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Important Product Information

The Ethernet Interface Module, IC695ETM001, connects a PACSystems RX3i controller to an Ethernet network. It enables the RX3i controller to communicate with other PACSystems equipment and with Series 90 and VersaMax controllers. The Ethernet Interface provides Transmission Control Protocol and Internet Protocol (TCP/IP) communications with other control systems, host computers running the Host Communications Toolkit or programmer software, and computers running the TCP/IP version of the programming software. These communications use the Service Request Transport Protocol (SRTP), Modbus TCP, and Ethernet Global Data (EGD) protocols over a four-layer TCP/IP (Internet) stack.

Features of the RX3i Ethernet Interface include:

- Full programming and configuration services. Firmware upgrades from the RX3i CPU using the WinLoader software utility, which is supplied with updates to the Ethernet Interface software.
- Periodic data exchange using Ethernet Global Data (EGD).
- EGD Commands to read and write controller and EGD exchange memory over the network.
- TCP/IP communication services using SRTP.
- Support for SRTP Channels, Modbus/TCP Server, and Modbus/TCP Client
- Built-in Station Manager for on-line supervisory access to the Ethernet Interface. Dedicated Station Manager port.
- Two auto-sensing 10Base T / 100Base TX RJ45 shielded twisted-pair Ethernet ports for direct connection to either a 10BaseT or 100BaseTX IEEE 802.3 network without an external transceiver. There is only one interface to the network (only one Ethernet MAC address and only one IP Address).
- Internal network switch with Auto negotiate, Sense, Speed, and crossover detection.
- Recessed Ethernet Restart pushbutton permits manually restarting the Ethernet firmware without power cycling the system.
- LEDs: Ethernet OK, LAN OK, Log Empty, individual port activity and speed LEDs.
- Configurable stand-alone Redundant IP Addressing, which allows a single IP Address to be assigned to corresponding Ethernet modules in two different controllers. The Redundant IP Address is configured in addition to the normal unique IP Address of each Ethernet module. Under application logic control, only the Ethernet module in the active unit can use the Redundant IP Address.
- Time synchronization to SNTP Time Server on Ethernet network (when used with Release 5.00 or later CPU module).

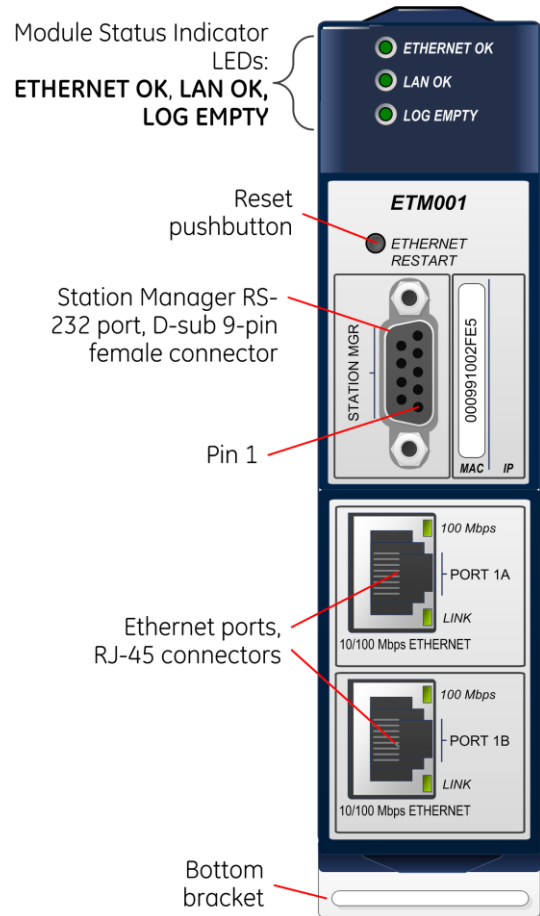


Figure 1: ETM001 Front View

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IC695ETM001 Specifications

Ethernet Processor Speed	200 MHz
Connectors	- Station Manager (RS-232) Port: 9-pin female D-connector - Two 10BaseT / 100BaseTX Ports: 8-pin female shielded RJ45
LAN	IEEE 802.2 Logical Link Control Class I IEEE 802.3 CSMA/CD Medium Access Control 10/100 Mbps
Number of IP Addresses	One
Number of Ethernet Port Connectors	Two. both are 10BaseT / 100BaseTX with auto-sensing RJ45 connection.
Embedded Ethernet Switch	Yes – Allows daisy-chaining of Ethernet nodes.
Serial Port	Station Manager Port: RS-232 DCE, 1200 – 115,200 bps.

Refer to the *PACSystems RX3i System Manual*, GFK-2314, for product standards and general specifications.

Ethernet Interface Status Bits

Note: Unless **LAN Interface OK** (Status Bit 16) is set, the other status bits are invalid. Bit 1 is lsb.

LAN Interface Status Bits

1	Port 1A full duplex
2	Port 1A 100Mbps
3	Port 1B full duplex
4	Port 1B 100 Mbps
5	Network Time Locked
6	Redundant IP Address is active
7-8	Reserved
9	Any Channel Error (error on any channel)
10-12	Reserved
13	LAN OK
14	Resource problem
15	Module Overtemperature
16	LAN Interface OK

Channel Status Bits (two for each channel)

17	Channel 1 Status (SRTP: Data Transfer)
18	Channel 1 Status (SRTP: Channel Error)
...	...
79	Channel 32 Status (SRTP: Data Transfer)
80	Channel 32 Status (SRTP: Channel Error)

Indicator Light Emitting Diodes (LEDs)

LED	State		Indicates
ETHERNET OK		Fast Blink	Performing Diagnostics
LAN OK		Off	
LOG EMPTY		Off	
ETHERNET OK		Slow Blink	Waiting for Ethernet configuration from CPU
LAN OK		Off	
LOG EMPTY		Off	
ETHERNET OK		Slow Blink	Waiting for IP Address
LAN OK		On/Traffic/Off <i>(EOK and STAT blink in unison)</i>	
LOG EMPTY		Slow Blink	
ETHERNET OK		On	Operational
LAN OK		On/Traffic/Off	
LOG EMPTY		On/Off	
ETHERNET OK		Blink error code	Hardware failure. See chapter 11 for blink code definitions.
LAN OK		Off	
LOG EMPTY		Off	
ETHERNET OK		Slow Blink	Firmware Update
LAN OK		Slow Blink	
LOG EMPTY		Slow Blink <i>(All LEDs blink in unison; pattern same while awaiting or performing load)</i>	

Field Wiring Station Manager (RS-232) Port Pin Assignment

Pin No ¹	Signal	Direction	Description
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

¹ Pin 1 is at the bottom right of the Station Manager port connector as viewed from the front of the module (see [Figure 1](#)).

Hardware Installation

Initial Checks

Upon receiving your RX3i equipment, carefully inspect all shipping containers for damage. If any part of the system is damaged, notify the carrier immediately. The damaged shipping container should be saved as evidence for inspection by the carrier.

As the consignee, it is your responsibility to register a claim with the carrier for damage incurred during shipment. GE Intelligent Platforms will fully cooperate with you, however, should such action be necessary.

After unpacking the RX3i equipment, record all serial numbers. Serial numbers are required if you should need to contact Customer Care during the warranty period. All shipping containers and all packing material should be saved should it be necessary to transport or ship any part of the system.

Verify that all components of the system have been received and that they agree with your order. If the system received does not agree with your order, contact Customer Care.

Installation Location

This product is intended for use with the RX3i system. Its components are considered open equipment (having live electrical parts that may be accessible to users) and must be installed in an ultimate enclosure that is manufactured to provide safety. As a minimum, the enclosure shall provide a degree of protection against solid objects as small as 12mm (e.g. fingers). This equates to a NEMA/UL Type 1 enclosure or an IEC60529 IP20 rating providing at least a pollution degree 2 environment. For details about installing RX3i rack systems, refer to GFK 2314.

If you need technical help, contact Technical Support. For phone numbers and email addresses, see the back cover of this Guide.

Installation in Hazardous Areas

The following information is for products bearing the UL marking for Hazardous Areas or ATEX marking for explosive atmospheres:

CLASS 1 DIVISION 2 GROUPS ABCD

- This equipment is an open-type device and is meant to be installed in an enclosure suitable for the environment that is only accessible with the use of a tool.
- Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations, or nonhazardous locations only.



Warning – EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.



Warning – WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND



Warning – DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.



Warning – EXPLOSION HAZARD - USB PORT IS ONLY FOR USE IN NONHAZARDOUS LOCATIONS, DO NOT USE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

ATEX Zone 2

This product must be mounted in an enclosure certified in accordance with EN60079-15 for use in Zone 2, Group IIC and rated IP54. The enclosure shall only be able to be opened with the use of a tool.

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Module Installation

This module is compatible with all RX3i CPU models, except CPE400.

The ETM001 must be installed in the main (CPU) rack of an RX3i system, using a Universal Backplane such as IC695CHS007, CHS012 or CHS016.

The ETM001 supports insertion/removal while power is applied to the rack (hot swap).

1. RX3i rack power may be off or on ("hot insertion").
2. Holding the module firmly, align the module with the correct slot and connector, then swing the module down until the module's connector engages the backplane's backplane connector. Visually inspect the module to be sure it is properly seated.
3. Insert the two provided M3x5mm machine screws through the module's bottom bracket into threaded holes in the bottom of the backplate and screw them several turns using a #1 Phillips screwdriver. Tighten to 0.7 N-m (6 in-lbs).

Related Documents

For additional information about the Ethernet Interface Module, refer to the following publications:

<i>PACSystems RX7i, RX3i and RSTi-EP CPU Reference Manual</i>	GFK-2222
<i>PACSystems RX7i, RX3i and RSTi-EP CPU Programmer's Reference Manual</i>	GFK-2950
<i>PACSystems RX7i, RX3i and RSTi-EP TCP/IP Ethernet Communications User Manual</i>	GFK-2224
<i>PACSystems TCP/IP Ethernet Communications Station Manager User Manual</i>	GFK-2225
<i>PACSystems Hot Standby CPU Redundancy User Manual</i>	GFK-2308
<i>PACSystems Battery and Energy Pack Manual</i>	GFK-2741
<i>Proficy Machine Edition Logic Developer Getting Started</i>	GFK-1918
<i>PACSystems RXi, RX3i, RX7i and RSTi-EP Controller Secure Deployment Guide</i>	GFK-2830
<i>PACSystems RX3i System Manual</i>	GFK-2314
<i>PACSystems RX3i Ethernet Network Interface Unit User's Manual</i>	GFK-2439

Additional Support

For support and information, visit GE Intelligent Platforms' website at www.geautomation.com. The files for this manual and other related documentation are available there. Additional region- and language-specific websites and telephone numbers are found there as well.

Important Product Information for this Release

A number of firmware issues have been resolved, as documented in *Problems Resolved by this Release*.

The hardware change (from -H to -J) was necessitated by component obsolescence. There is no change to form, fit or functionality arising from the hardware change.

Updates

The IC695ETM001 is field-upgradeable using the firmware upgrade utility. To upgrade an existing ETM001 to firmware version 6.42, you will need the upgrade kit 44A753032-G20, which can be downloaded from www.geautomation.com/support.

The hardware cannot be upgraded in the field.

Functional Compatibility

Functional Compatibility	
Subject	Description
Hot Swap requires CPU firmware 2.51	Do not remove or insert the IC695ETM001 while powered unless the CPU is running firmware release 2.51 or higher. This firmware is available in upgrade kit 44A752290-G01.
SRTP and EGD performance differs from Series 90*-30	SRTP and EGD performance in the RX3i differs slightly from the Series 90-30. Each RX3i Ethernet Interface supports a greater number of SRTP connections and EGD exchanges. The RX3i currently has several SRTP and EGD operational restrictions compared to the Series 90-30. When migrating Series 90-30 Ethernet applications to the RX3i, please carefully read the <i>Ethernet Operational Notes</i> .
Series 90-30 LAN Interface module (IC693CMM321) not supported by RX3i	The Series 90-30 LAN Interface Module (IC693CMM321) is not supported by the RX3i and should not be placed in an RX3i rack. (Series 90-30 CPUs with embedded LAN Interface, IC693CPU364 and IC693CPU374, like any Series 90-30 CPU, should not be placed in an RX3i rack.)
Modbus/TCP support	Release 3.60 of the PACSystems Ethernet Interface adds Modbus/TCP Client Channels capability. It supports Modbus Conformance Class 0 function codes 3 and 16, Conformance Class 1 function codes 1, 2, 4, 5, 6, and 7, and Conformance Class 2 function codes 15, 22, 23, and 24. PACSystems Ethernet supports 32 client connections shared between all client protocols. For example, if 16 client connections are used for SRTP channels, there are 16 client connections available for Modbus/TCP channels. Any given channel can be assigned to only one protocol at a time.
Programmer version requirements	Proficy* Machine Edition Logic Developer 5.8 or later must be used to perform Run Mode Store of EGD exchanges. Proficy Machine Edition Logic Developer 5.7 or later must be used for Release 5.00 new features. Proficy Machine Edition Logic Developer 5.5 Service Pack 2 or later must be used for Release 4.00 new features. Proficy Machine Edition Logic Developer 5.0 Service Pack 3 or later must be used to program the RX3i CPU for Modbus/TCP Server operation.
CIMPLICITY* Plant Edition version requirements	CIMPLICITY Plant Edition 6.1 Service Pack 1a with Update 040204_s90tcp_6101 or Service Pack 2 or later must be used for Ethernet communications with PACSystems.

New Features and Enhancements in this Release

Subject	Description
Cyber Security	Security enhancements have been made to harden the product against an attacker.