

# PACSystems\* RX7i

## IC698ETM001

### Ethernet Interface

GFK-2266S  
September 2011

The PACSystems<sup>†</sup> IC698ETM001 Ethernet Interface module provides high performance Ethernet communications for the RX7i control system. The Ethernet Interface provides TCP/IP communications with other GE Intelligent Platforms control systems, and host computers with software for Ethernet communications to GE Intelligent Platforms controllers. These communications use the SRTP and Ethernet Global Data (EDG) protocols over a four-layer TCP/IP (Internet) stack.

## Features

- Full programming and configuration services
- Periodic data exchange using Ethernet Global Data (EGD)
- EGD Commands to read and write controller and EGD exchange memory over the network.
- EGD Class 2 functionality (Commands) - acknowledged single command transfers (sometimes referred to as “datagrams”) and Reliable Data Service (RDS) retry mechanism to make sure a command message gets through once and only once.
- 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.
- Comprehensive station management and diagnostic tools
- Extended connectivity with IEEE 802.3 CSMA/CD 10Mbps and 100Mbps Ethernet LAN ports.
- Two full-duplex 10BaseT/100BaseT/TX (RJ-45 Connector) ports with an internal network switch providing auto-negotiated network speed, duplex mode, and crossover detection.
- Direct connection to BaseT (twisted pair) network hub or repeater without an external transceiver.
- Redundant IP addressing, which allows a single IP address to be assigned to two Ethernet modules. The two modules are in two different controllers that are configured as a redundant system. The Redundant IP Address is configured in addition to the normal unique IP address of each interface. Only the Ethernet interface in the active unit can use the Redundant IP Address.
- Protocol is stored in flash memory in the Ethernet interface and is easily upgraded through the CPU serial port.
- Communications with remote controllers and other nodes reachable through routers. The gateway IP address must be configured.
- Time synchronization to SNTP time server on Ethernet network (when used with Release 5.00 or later CPU module).



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## Specifications

For environmental specifications and compliance to standards (for example, FCC or European Union Directives), refer to Appendix A of the *PACSystems RX7i Installation Manual*, GFK-2223.

<b>Ethernet processor speed</b>	200 MHz
<b>Module Operating Voltage</b>	+5 VDC, (from power supply)
<b>Module Current Drain</b>	1.5 (+5 VDC) maximum; 1.2 A typical
<b>Module Operating Temperature</b>	0°C to + 60°C (32°F to 140°F)
<b>LEDs</b>	MODULE OK LAN ONLINE STATUS 100, LINK P1 100, LINK P2
<b>LAN</b>	IEEE 802.2 Logical Link Control Class I IEEE 802.3 CSMA/CD Medium Access Control 10/100 Mbps
<b>Number of IP addresses</b>	One
<b>Ethernet Ports</b>	Two, both are 10BaseT / 100BaseTX with auto-sensing. RJ-45 connector, 8-pin female, shielded
<b>Embedded Ethernet Switch</b>	Yes – Allows daisy chaining of Ethernet nodes
<b>Serial Port (Station Mgr Port)</b>	RS-232 DCE, 1200 - 115200 bps. D-connector, 9-pin female

## Release History

Ethernet Firmware release 6.00 provides an SRTP inactivity timeout to allow better recovery following lost communication with the programming software. See “New Ethernet Features and Enhancements” on page **Error! Bookmark not defined.** for a description of this feature.

<b>Catalog Number</b>	<b>Date</b>	<b>Firmware Version</b>
IC698ETM001-ER	Sep. 11	6.10
IC698ETM001-EP	Sep. 09	6.00
IC698ETM001-EN	Dec. 08	5.51
IC698ETM001-EM	May 08	5.50
IC698ETM001-EL	Dec. 07	5.01
IC698ETM001-EK	Oct. 07	5.00
IC698ETM001-DK	Aug. 07	5.00
IC698ETM001-DJ	Sep. 06	4.00
IC698ETM001-DH	May 06	3.81
IC698ETM001-DG	Nov. 05	3.60
IC698ETM001-CF	Apr. 05	3.00
IC698ETM001-N/A	Nov. 04	2.57
IC698ETM001-CE	Jun. 04	2.56
IC698ETM001-CD	Apr. 04	2.00
IC698ETM001-BC	Mar. 04	1.60
IC698ETM001-AC	Dec. 03	1.60
IC698ETM001-AB	Sep. 03	1.50
IC698ETM001-AA	Jun. 03	1.00

## Updates

An IC698ETM001-Ax, Bx, Cx, Dx or Ex module can be field upgraded to IC698ETM001-xR using the Winloader firmware upgrade utility and upgrade kit 44A752256-G15.

## Important Product Information for this Release

Ethernet firmware release 6.10 resolves several issues that caused the Ethernet interface to lose communication with remote devices. These issues were indicated by the Ethernet OK (EOK) LED displaying blink code 2-5. For details, see page 3.

### Ethernet Functional Compatibility

<b>Subject</b>	<b>Description</b>
<b>Programmer version requirements</b>	<ul style="list-style-type: none"> <li>▪ Proficy* Machine Edition Logic Developer PLC 6.0 or later must be used for Release 6.00 new features,</li> <li>▪ Proficy Machine Edition Logic Developer 5.8 or later must be used to perform Run-mode Store of EGD exchanges and Redundancy Transfer Lists.</li> <li>▪ Proficy Machine Edition Logic Developer 5.7 or later must be used for Release 5.00 new features</li> <li>▪ Proficy Machine Edition Logic Developer 5.5 Service Pack 2 or later must be used for Release 4.00 new features.</li> <li>▪ Proficy Machine Edition Logic Developer 5.0 Service Pack 3 or later must be used to program the CPU for Modbus/TCP Server operation.</li> </ul>
<b>CIMPLICITY* plant edition version requirements</b>	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.
<b>SRTP and EGD performance differs from Series 90-70</b>	<p>SRTP and EGD performance in the RX7i differs slightly from the Series 90-70. Each RX7i Ethernet Interface supports a greater number of SRTP connections and EGD exchanges.</p> <p>Please also note that the RX7i currently has several SRTP and EGD operational restrictions when compared to the Series 90-70. When migrating Series 90-70 Ethernet applications to the RX7i, please carefully read the "Operational Notes" section on page 8.</p>
<b>Series 90-70 LAN Interface Modules (IC697CMM741 and IC697CMM742) not supported by RX7i</b>	Please note that the Series 90-70 LAN Interface Modules (IC697CMM741 and IC697CMM742) are not supported by the RX7i and should not be placed in an RX7i rack. The RX7i CPU contains an embedded Ethernet Interface. If additional Ethernet Interfaces are required, the RX7i Ethernet Module (IC698ETM001) should be used.

### Ethernet Problems Resolved in Ethernet Firmware Release 6.10

<b>Subject</b>	<b>Description</b>
<b>Internal system event causing Blink Code 2-5/Event 3H Issue</b>	<p>Previous versions exhibit an error condition where the Ethernet module could display a blink code 2-5 error. (The Ethernet OK LED displays the repeating pattern: 2 blinks, a short pause, 5 blinks, and a long pause.) This condition occurs in a 10 minute window after a 3 month period (3 months after a reset and/or power cycle).</p> <p>Failures could occur outside this 10 minute window, but are much less likely. The quantity of TCP traffic (Modbus/SRTP/SNTP) during the 10 minute window influences the likelihood of the issue occurring.</p> <p>Please note that blink code 2-5 is a general error. Ethernet firmware 6.10 corrects several underlying issues that caused the blink code.</p>
<b>Modbus query with exception causing Blink Code (2-5) / Event 3H Issue</b>	When the Ethernet module is communicating with Proficy Machine Edition and it receives a Remote Modbus client request with exception, the Ethernet module displays a 2-5 blink code. (The Ethernet OK LED

<b>Subject</b>	<b>Description</b>
	displays the repeating pattern: 2 blinks, a short pause, 5 blinks and a long pause.) This problem has been resolved in Ethernet firmware versions 6.10 and later.
<b>Multiple ARP frames observed on Network</b>	In previous versions, after a 3 month period (3 months after a reset and/or power cycle), there is a 10 minute window where it is possible for each packet sent by the Ethernet Module to be preceded with an ARP packet. This problem has been resolved in Ethernet firmware version 6.10 (and later)

### **Ethernet Restrictions and Open Issues**

<b>Subject</b>	<b>Description</b>
<b>Station Manager “PARM” command help text is wrong</b>	Although the “parm v” Station Manager command works correctly, the “v” subsystem code (SRTP server) is not shown as supported by the online help.
<b>SRTP connections remain open after IP address changed</b>	The Ethernet Interface does not terminate all open SRTP connections before changing its IP address. Once the local IP address has changed, any existing open TCP connections are unable to normally terminate. This can leave SRTP connections open until their underlying TCP connections time out. If quicker recovery of the SRTP connection is needed, modify the “wkal_idle” Advanced User Parameter to reduce the TCP keep alive timer down to the desired maximum time for holding open the broken connection. Refer to <i>TCP/IP Ethernet Communications for PACSystems</i> , GFK-2224, for details.
<b>Reporting of duplicate IP address</b>	The RX7i does not log an exception or a fault in the Controller Fault Table when it detects a duplicate IP address on the network.
<b>REPP does not save results of aborted PING</b>	The station manager REPP command does not retain the results of a PING that is aborted due to error. The PING results are reported when the PING is aborted, but subsequent REPP commands give the results of the last successfully terminated PING.
<b>Multiple log events</b>	The Ethernet Interface sometimes generates multiple exception log events and Controller Fault Table entries when a single error condition occurs. Under repetitive error conditions, the exception log and/or Controller Fault Table can be completely filled with repetitive error messages.
<b>Intermittent SNTP loss of synchronization</b>	Under moderately heavy EGD traffic load, the Ethernet Interface may occasionally lose synchronization with its SNTP time server and generate exception log event 29, entry 2=bH.
<b>SRTP communication delays</b>	Average latency of communications on SRTP channels may vary considerably due to TCP retransmissions. SRTP client applications should be designed to take this variance into account. In particular, SRTP client applications migrating from Series 90-70 SRTP Servers to RX7i may need to lengthen SRTP timeout parameters.
<b>Spurious ‘Ethernet Failure’ error</b>	On rare occasions, the error “Module hardware fault” may be reported on the Ethernet daughterboard. The corresponding fault in the exception log is Event = 1, followed by text “Ethernet failure”. This fault is a nuisance fault and may be ignored.
<b>Spurious Ethernet fault</b>	In rare instances, after power cycle, the Ethernet Interface may log the following fault, Event = 28H, Entry 2 = 000eH. This fault can be safely ignored.

<i>Subject</i>	<i>Description</i>
<b>Unexpected EGD COMMREQ status</b>	EGD Commands may return COMMREQ Status 9590H (= internal error) instead of the expected B190H (= Can't locate remote node) when unable to locate a remote device on the network.
<b>Very heavy EGD production/consumption at server may cause EGD command timeouts</b>	Very heavy EGD production and/or consumption at a server device may cause EGD command timeout errors when another device attempts to send EGD commands to that server. If EGD commands must preempt normal production, you may set the "gcmd_pri" Advanced User Parameter to 2 (see GFK-2224, Appendix A). Note that by doing so, EGD exchange production may be delayed.
<b>SRTP server errors can cause timeouts at channels client</b>	<p>The SRTP Server in the PACSystems Ethernet Interface can encounter various errors when the remote Series 90 client takes down an SRTP connection and then establishes a new connection. This can cause unexpected channel timeout errors 0190H or 0290H at the client.</p> <p>The SRTP server errors in the Ethernet exception log are identified as Event = 2; Entry 2 may be 001cH, or 0021H.</p>
<b>EGD command range failure can write partial data to bit memory</b>	<p>When an EGD Command attempts a write operation to a bit-mode CPU reference memory range (%I, %Q; %T, %M, %SA, %SB, %SC) where the amount of data to be written exceeds the configured size of that reference memory, the command will return failure status but partial data may be written into the reference memory. The amount of partial data written depends upon the starting bit memory location and the data length as follows:</p> <ul style="list-style-type: none"> <li>▪ If data starts on a byte boundary (location = (8*n) + 1), no partial data is written.</li> <li>▪ If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by 8 or more bits, partial data is written from the starting location to the next byte boundary after the starting location.</li> <li>▪ If data does not start on a byte boundary (location = (8*n)+1) and data exceeds the configured reference memory by less than 8 bits, partial data is written from the starting location to the end of configured reference memory.</li> </ul> <p>For a Write PLC Memory command, this can occur when writing data into the target PLC. For Read PLC Memory or Read Exchange commands, this can occur when writing data received from the target controller into the local memory. The logic application must not use any data returned to the local controller if the EGD command status indicates failure.</p> <p>To avoid writing partial data to the local or remote controller, be sure that bit memory data transfers do not exceed the configured reference memory sizes at the appropriate CPU.</p>
<b>No CPU fault logged when Ethernet Interface in fatal blink code</b>	The CPU does not log any Controller or I/O Faults when the Ethernet Interface has a fatal blink code. The user's application should monitor the LAN interface OK status bit to detect loss of module.
<b>EGD I/O has unexpected variability under heavy load</b>	EGD I/O has intermittent unexpected variability under heavy load. For a Produced Exchange, EGD samples may occasionally be delayed by as much as a production period or more.
<b>Clear of large hardware configurations may cause log event 08/20</b>	A Log event 08/20 may occur when very large hardware configurations are cleared and transfers are active on other Server connections. This log event can be safely ignored.
<b>COMMREQ Status Word of 0x54A0 occasionally returned for EGD commands</b>	Occasional COMMREQ Status Word values of 0x54A0 are returned to COMMREQs for EGD commands when the previously transferred command has experienced retries in the network. Executing the COMMREQ again results in successful transfer of the command.

<b>Subject</b>	<b>Description</b>
<b>Modbus/TCP channel aborted during power cycle</b>	After powering up an RX7i running Modbus/TCP client channels, the establish connection occasionally fails because the server occasionally rejects the "open" from the client. The connection will then succeed if the application retries the open when it sees a 0x9690, 0xAA90, or B490H response to an open request or to the first write request.
<b>RX7i response timeout errors (8/08) in Ethernet exception log under extremely heavy SRTP traffic</b>	Under extremely heavy SRTP traffic conditions, the Ethernet Interface may log an event in the Ethernet exception log (Event 8, Entry 2 = 08H) indicating an overload condition. This error terminates the SRTP connection. If this event appears, either the traffic load should be reduced, or the application should use an alternate communications method to verify that critical data transfers were not lost due to the overload.
<b>SRTP channel transfers may take up to 20 seconds after power cycle</b>	When SRTP communications are interrupted by a power cycle, the Ethernet interface may require up to 20 seconds to reestablish TCP connection used for SRTP communications.
<b>"rmdir" Station Manager command does not work for multi-level directory path</b>	The "rmdir" Station Manager command does not operate properly with a multi-level directory path. Instead, first change to the parent directory, then delete the target directory without specifying a path. For example, the "rmdir dir1/dir2" results in "RMDIR Failed, dir1/dir2 does not exist". Instead, first do "cd dir1" and then "rmdir dir2".
<b>Intermittent Ethernet log event 8H/15H after power cycle</b>	When starting after a power cycle, the Ethernet Interface may intermittently log an exception (entry 8H, Entry 2 = 15H, Entry 3 = 0000H, Entry 4 = 00aaH). This exception is benign and may be ignored.
<b>Intermittent Modbus/TCP Server log events when using "killms" Station Manager command</b>	When using the "killms" Station Manager command to manually terminate an active Modbus/TCP server connection, the following Modbus/TCP errors may occur in the Ethernet exception log: Event 2fH, Entry 2 = 209H, 212H, 21bH, or 221H. These errors may be ignored.
<b>A890 Commreq status after multiple Modbus open command attempts</b>	When using a Commreq to open a Modbus/TCP Channel to a remote server, if the initial Commreq returned an AA90 status, future Open Commands may return an A890 status. This indicates that local networking resources have been consumed and are not available for further connection attempts. If this occurs, the application must wait at least 60 seconds before making the next connection attempt. This will allow networking resources to be released and made available for the next Modbus Open Command.
<b>Modbus/TCP Request Packets</b>	The Modbus/TCP server expects to receive each Modbus/TCP request in a separate TCP packet. If multiple requests are sent in a single packet, the server may or may not send a response to each request. If responses are sent to the client, they will be sent in separate TCP packets.
<b>EGD production delayed after RMS of EGD</b>	When a produced EGD exchange is added or modified by a Run-mode Store, the exchange will not be produced until one production period of time has elapsed after the completion of the run-mode store.
<b>Station Manager PING commands</b>	When initiating ICMP echo requests from the PLC via Station Manager's PING command, the operation occasionally fails and an exception is logged (Event eH, Entry 2 = 6H).
<b>Station Manager "referr" tally</b>	The EGD Station Manager "referr" tally may be incremented twice when an exchange timeout occurs. Exchange status word reporting works correctly and is not impacted.
<b>"wkal_idle" AUP parameter should not allow zero</b>	Zero is allowed for the "wkal_idle" (TCP keep alive timer) but it is an invalid value.

<i>Subject</i>	<i>Description</i>
<b>TCP connection may time out early if the timeout is set above 10 minutes</b>	If the TCP connection timeout is set higher than 10 minutes, the connection may timeout before the configured value. The connection timeout is derived from three AUP parameters: $wkal\_idle + (wkal\_cnt + 1) * wkal\_intvl$ .

## Operational Notes

<b>Subject</b>	<b>Description</b>
<b>MAC Address</b>	Each IC698ETM001 Ethernet module has an assigned MAC address. The MAC address label is located on the side of the Ethernet board. This label is visible when the module is removed from the rack.
<b>Configuration of IP address is required before using Ethernet communications</b>	<p>The Ethernet Interface within the CPU module cannot operate on a network until a valid IP address is configured. The necessary Ethernet addressing information must be configured prior to actual network operation, or to recover from inadvertent changes to the Ethernet addressing data at the Ethernet Interface. Use one of the following methods to initially assign an IP address:</p> <ul style="list-style-type: none"> <li>▪ Connect a serial terminal to the Station Manager port of the PACSystems RX7i . Then use the CHSOSW command to enter the desired IP address. For details, see the <i>PACSystems TCP/IP Communications Station Manager Manual</i>, GFK-2225.</li> <li>▪ Temporarily assign an IP address to the module using the SetIP tool over the Ethernet network. For details, see <i>TCP/IP Ethernet Communications for PACSystems</i>, GFK-2224.</li> <li>▪ The Ethernet Interface automatically obtains a temporary IP Address from a BOOTP server on the network. For details, see <i>TCP/IP Ethernet Communications for PACSystems</i>, GFK-2224.</li> </ul> <p>Once a temporary IP address has been set up, the Ethernet Interface can be accessed over the network (such as by the Machine Edition programming software). The programmer should then be used to configure the proper IP address for the Ethernet Interface.</p>
<b>Default IP address (0.0.0.0) attempts to set IP Address via BOOTP</b>	The default IP address value (0.0.0.0), whether obtained from HW Configuration or backup configuration, causes the Ethernet Interface to request a temporary IP address from a BOOTP server device on the network.
<b>LAN must be tree, not ring</b>	The two Ethernet network ports on the PACSystems RX7i Ethernet Interface must not be connected, directly or indirectly, to the same network device. The hub or switch connections in an Ethernet network must form a tree and not a ring; otherwise duplication of packets and network overload may result. In this situation, the RX7i Ethernet modules will continually reset.
<b>Multiple zero period egd exchanges may not produce similar numbers of samples</b>	If more than one EGD produced exchange is configured for a production period of zero, the exchanges may not produce similar numbers of samples. Due to the way that scheduling occurs when multiple exchanges are scheduled "as fast as possible," some zero period exchanges may produce significantly more samples than others. For more consistent EGD production, configure the produced EGD exchanges with non-zero production periods.
<b>Changing IP address while SRTP connection open may generate log events</b>	Open SRTP Server connections established with a remote SRTP client are not terminated as expected when the RX7i's IP address is changed (typically by storing a new HW Configuration to the RX7i). A Series 90 SRTP client ("SRTP channels") reports either a 9690H or 0190H status; the SRTP connection may remain open until the connection is terminated as a result of a client timeout. Please refer to <i>Open Ethernet Problems</i> , Internal Problem ID Code CR-1434 for more information.
<b>Series 90-70 datagrams are not supported</b>	Series 90-70 datagrams are not supported. This means that Series 90-70 – format variable list requests from Host Communications Toolkit applications will fail. (Series 90-30 – format datagrams are supported, but cannot access %P or %L memory in the RX7i.)
<b>AUP parameter should not be changed</b>	The Advanced User Parameter "wsnd_buf" should not be changed by the user. Changing the value of this parameter may cause the LAN led to go out and the Ethernet Interface to drop connection.
<b>Heavy load can block station manager</b>	As explained in <i>TCP/IP Communications for PACSystems RX7i Station Manager Manual</i> , GFK-2225, Chapter 1, a heavy EGD and/or SRTP load can block Station Manager operation.

<i>Subject</i>	<i>Description</i>
<p><b>One-time delay of EGD Production (and possibly Consumption) if more than 24 SRTP Server Connections are started simultaneously</b></p>	<p>If more than 24 SRTP Server connections are established simultaneously, EGD Production may be briefly delayed for each connection after the 24<sup>th</sup> when the connections are first made after power is applied. If EGD consume acceleration has been disabled, then EGD Consumption will also be delayed. The delay only occurs once when the SRTP Server connection is established for the first time after Powerup. No delay is experienced for the first 24 SRTP Server connections.</p>
<p><b>AUP parameter name change</b></p>	<p>Beginning with Release 2.00, the following Advanced User Parameters have been renamed to match the Ethernet hardware port identification:</p> <ul style="list-style-type: none"> <li>“lduplex1” is changed to “lduplex1a” (Ethernet Port 1A duplex state)</li> <li>“lduplex2” is changed to “lduplex1b” (Ethernet Port 1B duplex state)</li> <li>“lspeed1” is changed to “lspeed1a” (Ethernet Port 1A network speed)</li> <li>“lspeed2” is changed to “lspeed1b” (Ethernet Port 1B network speed)</li> </ul> <p>The old parameter names are no longer supported; use of an obsolete parameter name will result in a configuration processing error and an Ethernet exception (Entry = 2, Entry 2 = 06).</p> <p>Existing AUP files using the obsolete parameter names will have to be changed to use the new parameter names.</p>
<p><b>SRTP application timeouts must accommodate network connection overhead</b></p>	<p>The application timeouts within SRTP Channels also include the time needed to establish and maintain the underlying network and SRTP connection. Examples are establishing the TCP connection for a new channel, establishing communication with the remote device, and TCP retransmissions during Channel operations. If the time needed for TCP connection establishment or maintenance exceeds the user-specified channel application timeout values, an application timeout will occur. Channel application timeouts are temporary errors; the channel continues to run.</p>
<p><b>Client channels TCP resource management</b></p>	<p>The OS Network stack hangs on to the TCP resources associated with a connection for a period of time after the connection is closed. It applies to the initiator of the close, which is almost always the client side. This time is referred to as the “TCP Linger Period”. Once the TCP Linger Period expires (60 seconds in the current OS implementation), the TCP resources are released. Application developers using client channels need to be aware of this behavior when designing their logic. A finite number of TCP resources are allocated to client channels, and if channel connections are brought up and down so fast that these resources are depleted, the application may have to wait until a TCP resource frees up in order to establish another client channel (a COMMREQ Status of 0xA890 is returned if no TCP resources are currently available; application should wait and retry again).</p> <p>SRTP Client Channels provides features that help the user preserve TCP connections. These include a “period time” where one can establish an SRTP Channel and specify the channel to run at a given interval, or run as fast as possible. One can also specify a number of iterations, or allow the channel to run forever. Additionally, SRTP Channels allows re-tasking of an active channel to the same remote device, where the parameters of an active channel, such as the channel command type (Read/Write), number of repetitions, time periods, local memory address, remote memory address, etc. can be changed. SRTP Channels also allows channel re-tasking of an active channel to a different remote device (changing the remote device’s IP address, etc.). However, re-tasking to a different remote device will neither conserve TCP connections, nor save on the time it takes to create a channel.</p>

<b>Subject</b>	<b>Description</b>
<b>Client Channels and Redundant IP</b>	In a Redundancy System, Client Channel COMMREQs can only be initiated from the unit that owns the Redundant IP address. Therefore, the user application logic should use Bit 6 in the LAN Interface Status bit area, "Redundant IP Active" as part of their enabling logic that drives a client channel COMMREQ.
<b>Idle Modbus/TCP connection between a Series 90 and a PACSystems may be prematurely terminated</b>	<p>An idle Modbus/TCP connection between a Series 90 and a PACSystems may be prematurely terminated. There is an incompatibility between the TCP "Keep-Alive" timer values on the PACSystems Ethernet Interfaces and Series 90 Ethernet Interfaces. The issue is that the default value of the keep-alive timer for the Series 90 modules is set to a much higher value than for the PACSystems.</p> <p>To keep TCP connections open between a Series 90 Ethernet Interface and a PACSystems Ethernet Interface, the Series 90 Interface Advanced User Parameter <code>wkal_time</code> should be set to the value 750 to match that of the PACSystems. With this change, TCP connections remain open indefinitely. Note that this same issue occurs for SRTP Client Channels that have infrequent traffic and can be resolved by using the same technique.</p>
<b>An attempt to open 17 or more Modbus server connections may appear successful</b>	If more than the maximum 16 supported Modbus Server Connections are attempted, the TCP connection may succeed, but no data may be subsequently transferred.
<b>SRTP connections remain open after IP address changed</b>	The Ethernet Interface does not terminate all open SRTP connections before changing its IP address. Once the local IP address has changed, any existing open TCP connections are unable to normally terminate. This can leave SRTP connections open until their underlying TCP connections time out. If quicker recovery of the SRTP connection is needed, modify the "wkal_idle" Advanced User Parameter to reduce the TCP keep alive timer down to the desired maximum time for holding open the broken connection. Refer to <i>TCP/IP Ethernet Communications for PACSystems</i> , GFK-2224, for details.
<b>EGD timestamps taken from CPU time after changing Ethernet Interface time via Station Manager</b>	When the Ethernet Interface date/time is changed via the "chtime" Station Manager command, EGD exchanges produced at that Ethernet interface continue to use the current CPU time, instead of the Ethernet Interface time as stated in the Station Manager manual.
<b>CPU time used for produced EGD timestamps</b>	Changing the Ethernet interface time via the CHTIME command does not affect the timestamp value within EGD exchanges produced from this Ethernet interface. The EGD timestamp value reflects the current CPU time. In Series 90-70 products and the Series 90-30 CPU364, EGD timestamps are taken from the Ethernet interface and do reflect CHTIME modifications.
<b>ENIU stale data during run mode store of EGD</b>	In a large PPS system running 20 ENIUs, when a Run-mode Store is performed that deletes the EGD exchanges for 10 of the ENIUs, the other ENIUs will see the status on their exchanges indicate consumption timeouts during the RMS. At the completion of the RMS, the exchanges operate normally.

## Ordering Information

<i>Description</i>	<i>Catalog Number</i>
Ethernet Interface for RX7i	IC698ETM001
[Optional]: Station Manager cable for Ethernet Interface	IC200CBL001

## Product Documentation

*PACSystems RX7i CPU Reference Manual, GFK-2222*

*PACSystems RX7i Installation Manual, GFK-2223*

*TCP/IP Ethernet Communications for the PACSystems RX7i, GFK-2224*

*PACSystems RX7i TCP/IP Ethernet Communications Station Manager Manual, GFK-2225*

*Proficy Machine Edition Logic Developer Getting Started, GFK-1918*

## Installation in Hazardous Areas

**The following information is for products bearing the UL marking for Hazardous Areas:**

- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
- WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES.
- WARNING - EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
- EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C, & D, DIV. 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS LOCATIONS ONLY.