

MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

GENERAL ELECTRIC

## IC695CMM004-E

SERIAL COMMUNICATIONS MODULE

Used with the applicable PACSystems RX3i configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: GE Fanuc GFK-2461B, CMM004 family common serial specifications

# PACSystems™ RX3i

## IC695CMM002 and IC695CMM004

### Serial Communications Modules

GFK-2461B  
August 2007

PACSystems RX3i Serial Communications modules expand the serial communications capabilities of the RX3i system.

Serial Communications module IC695CMM002 provides two independent, isolated serial ports. Serial Communications module IC695CMM004, illustrated at right, provides four independent, isolated serial ports. Up to six Serial Communications modules can be located in the main PACSystems RX3i backplane.

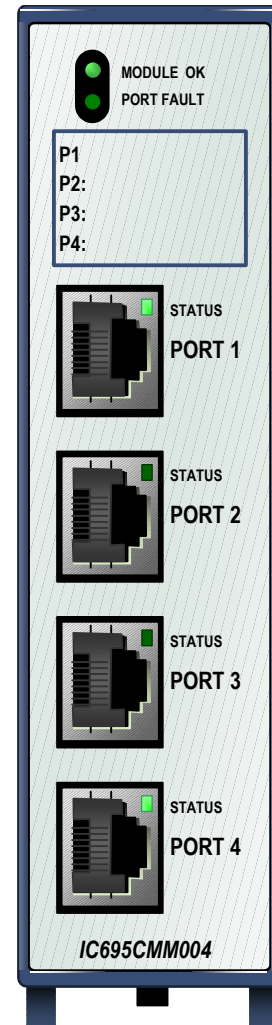
Each port can be configured for MODBUS Master, MODBUS Slave, or Serial I/O protocol. In addition, for modules that are version 1.10 or later, each port can be configured for CCM Slave protocol using Proficy Machine Edition 5.6, SIM 6 or later. For modules that are version 1.20 or later, each port can be configured for DNP3 Master or DNP3 Slave protocol using Machine Edition 5.6 SIM 10 or later. If any port is configured for DNP3 Master or Slave, the other ports on the module can only be configured for DNP3 Master or Slave.

Additional module features include:

- Port-to-port isolation and port-to-backplane isolation
- RS-232, RS-485/422 communication, software-selected
- Hardware handshake: RTS/CTS for RS-232
- Selectable Baud Rates: 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K
- Module fault status reporting (Watchdog, Ram Fail, Flash Fail)
- Module identity and status reporting, including LED status indicators
- Meets CE, UL/CUL 508 and 1604, and ATEX requirements
- Flash memory for future upgrades

These modules must be located in an RX3i Universal Backplane.

RX3i Serial Communications can be hot-inserted and removed following the instructions in the *PACSystems RX3i System Manual*, GFK-2314.



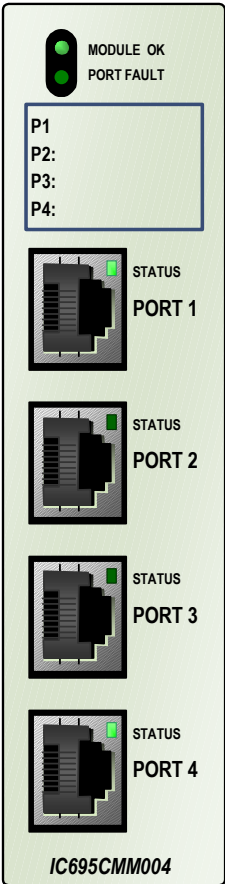
## Specifications: IC695CMM002 and IC695CMM004

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

|                                                 |                                                                                                                                                                             |                                                            |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Number of Serial Ports                          | IC695CMM002: two independent serial ports<br>IC695CMM004: four independent serial ports                                                                                     |                                                            |
| Connectors                                      | RJ-45                                                                                                                                                                       |                                                            |
| Number of Serial Communications Modules per CPU | Six in the main CPU backplane                                                                                                                                               |                                                            |
| Backplane power requirements                    | IC695CMM002                                                                                                                                                                 | 0.7 Amps maximum @ 3.3 VDC<br>0.115 Amps maximum @ 5.0 VDC |
|                                                 | IC695CMM004                                                                                                                                                                 | 0.7 Amps maximum @ 3.3 VDC<br>0.150 Amps maximum @ 5.0 VDC |
| LEDs                                            | Module OK, Port Fault, Port Status (2 or 4)                                                                                                                                 |                                                            |
| Port Type                                       | RS-232 or RS-485/22. 4-wire (full duplex) or 2-wire (half-duplex) operation for RS-485/422                                                                                  |                                                            |
| Flow Control for R-232                          | Selectable: Hardware (CTS/RTS) or none                                                                                                                                      |                                                            |
| Baud rates                                      | 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2k                                                                                                                         |                                                            |
| Parity                                          | Even, odd, none                                                                                                                                                             |                                                            |
| Data bits                                       | 7, 8                                                                                                                                                                        |                                                            |
| Stop bits                                       | 1, 2                                                                                                                                                                        |                                                            |
| Operating Temperature                           | 0°C to + 60°C                                                                                                                                                               |                                                            |
| Input Impedance                                 | Zin > 96 kOhm for RS-485/422<br>3 kOhm < Zin < 7 kOhm for RS-232                                                                                                            |                                                            |
| Max Overvoltage                                 | +/- 25V                                                                                                                                                                     |                                                            |
| Channel-Channel Crosstalk                       | -55dB minimum                                                                                                                                                               |                                                            |
| Isolation                                       | Port to Backplane and to frame ground: 250 VAC continuous;<br>1500 VAC for 1 minute, 2550VDC for one second.<br><br>Port to port: 500VDC continuous, 710VDC for one minute. |                                                            |

In order to meet emission and immunity requirements for the EMC directive (CE mark), shielded cable must be used with this module.

# LEDs



The Module OK LED indicates the status of the module. Solid green indicates that the module has been configured. The Module OK LED is off, if the module is not receiving power from the R3i backplane, or if a serious module fault exists.

At powerup, the Module OK LED flashes green/off while the module is executing powerup diagnostics. It then flashes more slowly as the module receives its configuration from the CPU.

If a problem occurs, the Module OK LED flashes amber. The blink code (see below) indicates the cause of the error.

- 1 = watchdog expired
- 2 = RAM error
- 6 = Invalid CPU Master Interface version
- 7 = CPU heartbeat failure
- 8 = Failed to get semaphore

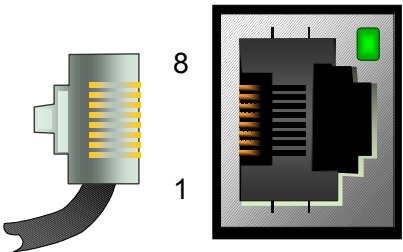
The Port Fault LED indicates the status of all ports. The Port Fault LED is green when there are no faults present on any enabled port. If this LED turns amber, there is a fault on at least one port.

A port's Status LED flashes green when there is activity on the port.

The area below the module LEDs can be used to record identifying information about each port.

# Serial Ports

Each port is a standard RJ-45 female connector with the following pin assignments. For MODBUS applications, note that these pin assignments are different than the standard MODBUS pin assignments. If the port is configured for MODBUS master or slave operation, custom cables are needed.



| <i><b>RJ-45<br/>Pin</b></i> | <i><b>RS-<br/>232</b></i> | <i><b>RS-485/422<br/>Half Duplex</b></i> | <i><b>RS-485/422<br/>Full Duplex</b></i> |
|-----------------------------|---------------------------|------------------------------------------|------------------------------------------|
| 8                           | COM                       | GND                                      | GND                                      |
| 7                           |                           |                                          | Termination 2                            |
| 6                           | CTS                       |                                          | R- (RxD0)                                |
| 5                           | COM                       | GND                                      | GND                                      |
| 4                           |                           | Termination 1                            |                                          |
| 3                           | RxD                       |                                          | R+ (RxD1)                                |
| 2                           | TxD                       | T- / R- (D0)                             | T- (TxD0)                                |
| 1                           | RTS                       | T+ / R+ (D1)                             | T+ (TxD1)                                |

Note: There is no shield or frame ground pin on the port connector.

GFK-2461B

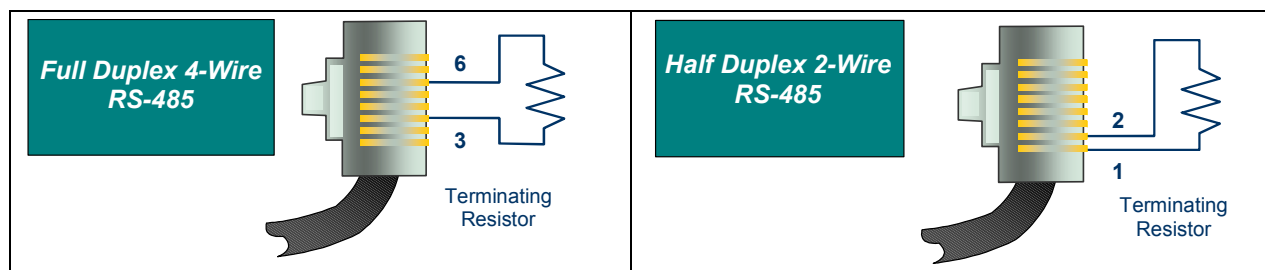
If the Serial Communications module is communicating with a Series 90-30 CPU363 or external PACSystems RX3i CPU, the connections are:

| RX3i Serial Module |    | CPU363/RX3i |
|--------------------|----|-------------|
| T+                 | To | RD('B')     |
| T-                 | To | RD('A')     |
| R+                 | To | SD('B')     |
| R-                 | To | SD('A')     |

## Termination

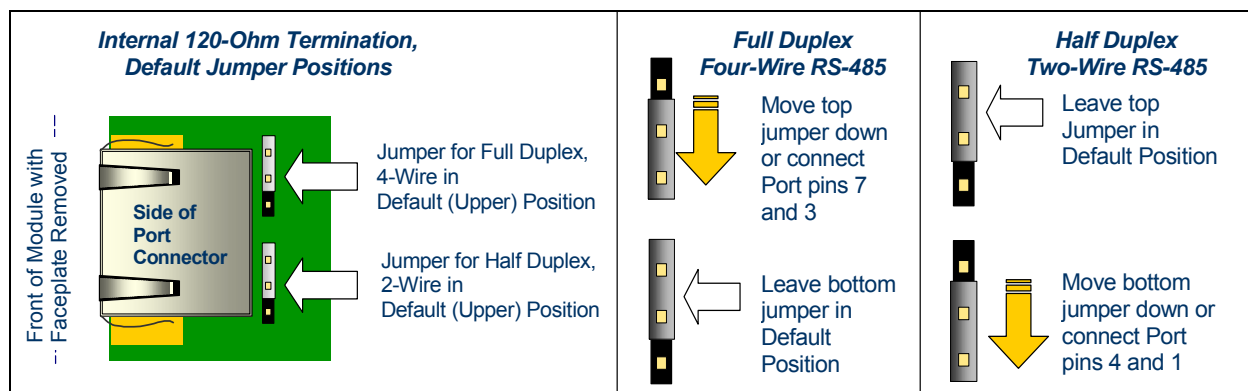
By default, each port is set for no termination. Termination is needed if the module is the first or last device on an RS-485 network, even if there is only one other device on the network. Termination can be provided using either an external resistor as shown below or the port's built-in 120-Ohm termination. If line termination other than 120 Ohms is required, an appropriate external resistor must be supplied.

### User-Supplied Termination for RS-485



### Built-in Termination for RS-485

Termination using the built-in 120-Ohm resistor can be provided by either setting the appropriate RS-485 termination jumper *OR* by installing shorting jumpers on the RS-485 cable connector that attaches to the serial port.



To set 120-Ohm termination internally:

1. Remove the module's faceplate by pressing in on the side tabs and pulling the faceplate away from the module.
2. With the module oriented as shown, move *either* the upper or lower jumper: