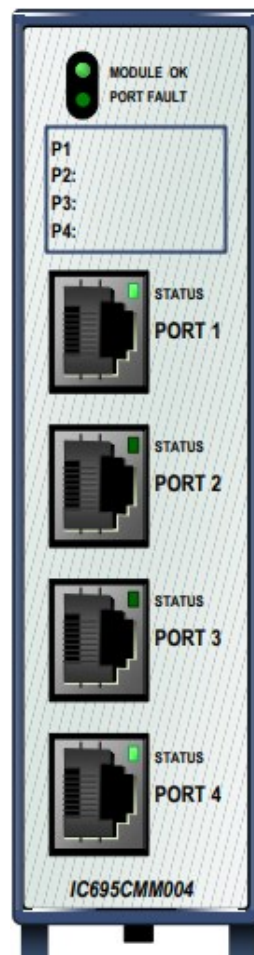# PACSystems™ RX3i

SERIAL COMMUNICATION MODULES
(IC695CMM002 & IC695CMM004)

EMERSON™

Product Description

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[1].

Up to four modules can be located in each remote rack that is managed by a PACSystems RX3i PROFINET Scanner. Up to one module can be located in each remote node that is managed by a PACSystems RX3i CEP Carrier.

The IC695CMM00xCA modules are the conformal-coated versions of the IC695CMM00x modules. The IC695CMM004LT version is for low-temperature applications (-40°C).

Each port can be configured for MODBUS Master, MODBUS Slave, CCM Slave, DNP3 Master, DNP3 Slave, or Serial I/O protocol. 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. When located in a remote rack that is managed by a PACSystems RX3i PROFINET Scanner or CEP Carrier, only MODBUS Master or MODBUS Slave protocol configurations are supported.

For modules with firmware version 1.32 or later, half-duplex flow control can be configured using PAC Machine Edition Release 5.90, SP1, SIM 6, or later. Otherwise, flow control defaults to full-duplex.

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, RFR/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 most recent version of the PACSystems RX3i System Manual, GFK-2314.

For complete installation information, please refer to RX3i and Series 90-30 Installation and Maintenance Requirements document, GFK-2975

[1] *Not compatible with Rackless CPUs, such as CPE400, unless configured in a remote rack that is managed by a PACSystems RX3i PROFINET Scanner.*

Release Information

Release	Firmware Version	Upgrade Kit	Comments
IC695CMM002CA-GK IC695CMM002-GK IC695CMM004CA-GK IC695CMM004-GK IC695CMM004LT-GK	2.12 2.12	41G2459-FW01-000-A3 41G2460-FW01-000-A3	Product labels have been updated to show compliance with new certifications. For updated certifications, please refer to https://emerson-mas.force.com/communities/en_US/Article/Certifications-and-Agency-Approvals-Landing-Page
IC695CMM002-FK IC695CMM002CA-FK IC695CMM004-FK IC695CMM004-FK	2.12 2.12	41G2459-FW01-000-A3 41G2460-FW01-000-A3	This FW change fixes a DNP3 Time and Date word swap issue. In DNP3 mode, a write operation for the Time and Date Target Object results in swapped words and bytes relative to V1 units. This issue was introduced with FW v2.00 and is corrected with FW v2.12. Following Emerson's acquisition of this product, changes have been made to apply appropriate branding and registration of the product with required certification agencies. No changes to the material, process, form, fit, or functionality
IC695CMM002-EJ IC695CMM004-EJ	2.02 2.02	41G2459-FW01-000-A2 41G2460-FW01-000-A2	This FW change implements a unique system ID for each module to support future RX3i expansion. No change in functionality, performance, or compatibility.
IC695CMM002-EH IC695CMM004-EH	2.01 2.01	41G2459-FW01-000-A1 41G2460-FW01-000-A1	This FW change fixes a bug in the RS232 serial ASCII communication mode.
IC695CMM002-EG IC695CMM004-EG	2.00 2.00	41G2459-FW01-000-A0 41G2460-FW01-000-A0	This HW/FW change addresses a component obsolescence issue and meets EU RoHS compliance.
IC695CMM002-DF IC695CMM004-DF	1.34	N/A	This change updated compliance markings on the packaging.
IC695CMM002-CF IC695CMM004-CF	1.34	N/A	This change addresses a component obsolescence issue. No change in functionality, performance, or compatibility.
IC695CMM002-BF IC695CMM004-BF	1.34	N/A	Label change only. No change in functionality, performance, or compatibility.

Release	Firmware Version	Upgrade Kit	Comments
IC695CMM002-AF IC695CMM004-AF	1.34	44A753277-G06 44A753278-G06	Adds DNP3.0 Master and Slave Unsolicited Reporting functionality. The release also adds the ability to configure the DNP3.0 Slave Analog Input Event Variation and fixes three issues in the DNP3.0 firmware
IC695CMM002-AE IC695CMM004-AE	1.32	44A753277-G05 44A753278-G05	See GFK-2461E for new features and problems resolved.
IC695CMM002-AD IC695CMM004-AD	1.30	44A753277-G04 44A753278-G04	Supports Serial Protocol Language (SPL) scripting. Corrects DNP3 Slave Bit Write issue. Please refer to M050803 - IC695CMM002_004 Product Safety Bulletin for more information.
IC695CMM002-AC IC695CMM004-AC	1.20	44A753277-G03 44A753278-G03	Supports DNP3 Master and DNP3 Slave Protocol
IC695CMM002-AB IC695CMM004-AB	1.10	44A753277-G02 44A753278-G02	Supports CCM Slave Protocol
IC695CMM002-AA IC695CMM004-AA	1.00	N/A	Initial Release

Upgrades

The following upgrade kits may be downloaded from https://www.emerson.com/Industrial-Automation-Controls/support.

Kit Name	IC695CMM002 Kit #	IC695CMM004 Kit #	Notes
FW v2.12 kit	41G2459-FW01-000-A3	41G2460-FW01-000-A3	CMM00x Versions -PDF or earlier can only use v1.xx firmware. They cannot be updated to v2.xx firmware due to HW design differences.

Compatibility

Programmer Version Requirements

PAC Machine Edition Logic Developer 10.0 or newer is required to use CMM002/004 modules in a remote rack that is managed by a PACSystems RX3i PROFINET Scanner or CEP Carrier.

PAC Machine Edition Logic Developer 6.00 with SIM 12 or later version is required for DNP3 Unsolicited Response functionality and Analog Input Event Variation configuration.

PAC Machine Edition Logic Developer 5.9 SP1 with SIM 6 is required for half-duplex flow control.

PAC Machine Edition Logic Developer 5.8 with SIM 2 or newer is required to use SPL.

PAC Machine Edition Logic Developer 5.6 with SIM 10 or newer is required to use DNP3.

PAC Machine Edition Logic Developer 5.6 with SIM 6 or newer is required to use the CMM.

CPU Firmware Version Requirements

Firmware Version Compatibility Requirements to Use CMM002/004-EJ Modules	Minimum Firmware Version Required
IC695CPE302/305/310-Axxx	10.30
IC695CPE302/305-Bxxx	10.40
IC695CPE330	10.30
IC695CPE400/410	10.30
Systems Programming Language (SPL)	5.50
DNP3 Master to Timestamp Sync	5.00
CMM in an RX3i systems	3.83

PROFINET Controller Firmware Version Requirements

Note: Please verify that the hardware being used has a -Bxxx after its part number. This is required for its compatibility.

PROFINET Controller Firmware Version Requirements to Use CMM002/004-EJ Modules	Minimum Firmware Version Required
IC695PNC001-Axxx	N/A
IC695PNC001-Bxxx	3.20

PROFINET Scanner Firmware Version Requirements

Note: Please verify that the hardware being used has a -Bxxx after its part number. This is required for its compatibility.

PROFINET Scanner Compatibility	Minimum Firmware Version Required
IC695PNS001-Axxx	N/A
IC695PNS001-Bxxx & PNS101	3.35
IC695CEP001	2.80

Problems Resolved in this Release

New Features with this Release

Features	Description
N/A	N/A

Restrictions and Open Issues with this Release

SPL

The module rejects an SPL program file containing a literal string of length greater than 127. The SPL port will return status in the status byte of 61.

The static file checker can miss paired NEXT and FOR statements. If a NEXT statement is missing from the program, execution will continue without looping back to the FOR statement. Users should check FOR/NEXT statements before downloading. A missing NEXT statement can also be detected by debugging using the CLI debug interface.

Other

Each port can be configured for DNP3 Master or DNP3 Slave protocol. 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.

These modules do not support Emerson special MODBUS commands for use with a Daniels Flow Computer.

PLC Reference Address and Reference Length parameters only allow bit-based memory values that are aligned to a byte boundary.

For example, for a port using MODBUS Slave with coils mapped to %Q memory, the %Q memory address must start on a byte boundary in %Q. (Target Address 1 can be mapped to %Q00001 or %Q00009, but it can not be mapped to %Q00007.)

CCM Slave Read Scratchpad operations may fail when a port is configured for CCM Slave protocol and:

a new configuration is stored to the PLC using PAC Machine Edition, or

the system is power-cycled, orthe module is hot-inserted

If the first query received from the CCM Master is a Read Scratchpad request, the module will reject that request. All subsequent Read Scratchpad requests will be successful unless one of the above conditions occurs again.

The DNP3 slave port has problems using the link layer to validate frame receipt. The DNP3 organization encourages users not to do this.

Change Event Read responses are not sent immediately after confirmation of an unsolicited response.

If a read request is received after sending an unsolicited response, the slave is required to wait to respond to the reader until either the unsolicited timeout expires, or the unsolicited message is confirmed.

The module waits until the timeout expires, even if the unsolicited message has been confirmed, to send the read response.

Normally, messages are responded to within milliseconds, but the reader response does not occur for up to 2 seconds after the confirmation message is sent.

Operating Notes

Due to the re-designed nature of the obsolescence change, minor performance differences may exist between the V1.xx and V2.00 hardware/firmware versions.

SPL

In the error message, brackets [ ] are printed only around the key failing token. When looking at the error message the entire line should be interpreted.

> Example:
>
> ```
> --- Script file ---
> i = 128 )
> --- Error output---
>  Error [3184]: line 1
> i = [128] )
> ```

An SPL wrong error is reported when a "(" is in an IF statement. IF statements only support comparisons of variables and constants. Using () to enclose operations (like arithmetic operations or comparisons) will result in a syntax error. The module will report this error as an unknown identifier for the () symbols rather than a syntax error.

If the SPL program writes to memory that is invalid in the PLC the write will fail and the SPL program will halt.

Other

Power up and reset recovery time for release Ex and later may take up to 45 seconds.

DNP3.0 configurations with Unsolicited Response support enabled or Analog Input Event Variations set to other than 16 Bit Values Without Time, will result in a System Configuration Mismatch fault. If any of these configurations are downloaded to a module with firmware earlier than Release 1.34, the module configuration will fail.

The maximum resolution for the MODBUS drop delay is 420µs, so the minimum time for a drop delay is 420µs.

If retentive memory is used for Port Control Data, when a power cycle with battery or hot-swap of the CMM module occurs, all exchanges whose control bit is in the ON state will be re-executed on the next PLC output scan or output DO I/O. To prevent this, all exchange control bits must be cleared by the application logic on the initial PLC logic scan or upon detection of CMM module removal.

When the CMM is installed in a compatible PACSystems RX3i main rack or remote note that's controlled by a CPU configured with a Privilege Level 2 password and **Legacy Client/Server Protocol Memory Access** is configured as "Authenticated" (the default configuration), if the module or attached clients attempt to write to User Memory, password access failed fault will appear in the PLC fault table. The module or attached clients will be unable to write the data tables. When "**Legacy Client/Server Protocol Memory Access** is configured as "Unauthenticated", **Access Control Lists** on the CPU must also be updated to allow the CMM appropriate access.

General Contact Information

Home link: http://www.emerson.com/industrial-automation-controls

Knowledge Base: https://www.emerson.com/industrial-automation-controls/support

Technical Support

Americas
Phone: 1-888-565-4155
                        1-434-214-8532 (If toll-free option is unavailable)

                        Customer Care (Quotes/Orders/Returns): customercare.mas@emerson.com
                        Technical Support: support.mas@emerson.com

Europe
Phone: +800-4444-8001
                        +420-225-379-328 (If toll-free option is unavailable)
                        +39-0362-228-5555 (from Italy - if the toll-free 800 option is unavailable or dialing from a mobile telephone)

                        Customer Care (Quotes/Orders/Returns): customercare.emea.mas@emerson.com
                        Technical Support: support.mas.emea@emerson.com

Asia
Phone: +86-400-842-8599
                        +65-6955-9413 (All other Countries)

                        Customer Care (Quotes/Orders/Returns): customercare.cn.mas@emerson.com
                        Technical Support: support.mas.apac@emerson.com

Any escalation request should be sent to mas.sfdcescalation@emerson.com

Note: If the product is purchased through an Authorized Channel Partner, please contact the seller directly for any support.

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