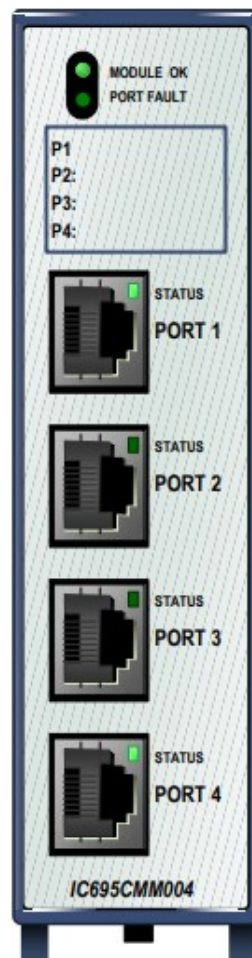


# PACSystems™ RX3i

## SERIAL COMMUNICATION MODULES (IC695CMM002 & IC695CMM004)



# 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<sup>1</sup>.

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

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<sup>1</sup> 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- GL IC695CMM002-GL IC695CMM004CA- GL IC695CMM004-GL IC695CMM004LT- GL	2.16 2.16	41G2459-FW01-000-A4 41G2460-FW01-000-A4	<p>This firmware update fixes the following defects:</p> <ul style="list-style-type: none"> <li>Reduces the frequency of SPL script halts on EXREAD and/or EXWRITE w/ mail timeout error</li> <li>HW Control (RTS/CTS) works on v1.34 modules and does NOT work on v2.0 modules</li> <li>SPL TIMER and ELAPSED functions may in rare instances return a negative value</li> </ul>
IC695CMM002CA-GK IC695CMM002-GK IC695CMM004CA-GK IC695CMM004-GK IC695CMM004LT-GK	2.12 2.12	41G2459-FW01-000-A3 41G2460-FW01-000-A3	<p>Product labels have been updated to show compliance with new certifications. For updated certifications, please refer to <a href="https://emerson-mas.force.com/communities/en_US/Article/Certifications-and-Agency-Approvals-Landing-Page">https://emerson-mas.force.com/communities/en_US/Article/Certifications-and-Agency-Approvals-Landing-Page</a></p>
IC695CMM002-FK IC695CMM002CA-FK IC695CMM004-FK IC695CMM004-FK	2.12 2.12	41G2459-FW01-000-A3 41G2460-FW01-000-A3	<p>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.</p> <p>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</p>
IC695CMM002-EJ IC695CMM004-EJ	2.02 2.02	41G2459-FW01-000-A2 41G2460-FW01-000-A2	<p>This FW change implements a unique system ID for each module to support future RX3i expansion. No change in functionality, performance, or compatibility.</p>

Release	Firmware Version	Upgrade Kit	Comments
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.
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 v2.16 kit	41G2459-FW01-000-A4	41G2460-FW01-000-A4	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

## New Features with this Release

Features	Description
N/A	N/A

## Problems Resolved in this Release

Subject	ID Code	Description
SPL script halts on EXREAD and/or EXWRITE w/ mail timeout error	01808281 DE7021	Changes were made to reduce the frequency of SPL EXREAD and EXWRITE mail timeout errors which caused SPL script execution to halt.
HW Control (RTS/CTS) works on v1.34 modules and does NOT work on v2.0 modules	01349160 DE6077	Restores hardware flow control (RTS/CTS) operation that was broken in the 2.00 release.
SPL function TIMER or ELAPSED returned a negative value	19703	Changes to prevent rare instances of the TIMER and ELAPSED SPL functions returning a negative number.

## Restrictions and Open Issues with this Release

### SPL

SPL	
ISS168929 – Module rejects program file with a literal string length greater than 127.	The module will reject an SPL program file containing a literal string of length greater than 127. The SPL port will return the status in the status byte of 61.
ISS168932 – Static checker misses pairing of FOR and NEXT statements.	Static file checker can miss pairing NEXT and FOR statements. In the event a NEXT statement is missing from the program execution will continue without looping back to the FOR statement. Users should check their FOR/NEXT statements before downloading. It can also be caught using the CLI debug interface.

## Other

Other	
DNP3 Protocol uses restricted to DNP3 protocol only on the module.	For modules that support DNP3, each port can be configured for DNP3 Master or DNP3 Slave protocol using Machine Edition. 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
ISS096201 - GE Fanuc Special Modbus Commands Not Supported	The special 32-bit Modbus Operations for use with a Daniels Flow Computer are not available.
ISS096013 - PLC Reference Address and Reference Length Parameters - Do not support bit length/start	Bit and Non-Byte Length operations must begin on a byte boundary.
ISS107447 - CCM Slave Read Scratchpad Operations May Fail	<p>When performing a read scratchpad operation via the CCM protocol, the first attempt will be rejected by the module if it is immediately after one of the following conditions and is not preceded by another read or write operation</p> <ol style="list-style-type: none"> <li>1) A new configuration was just stored to the PLC via PME</li> <li>2) The system was just power cycled</li> <li>3) The module was just hot inserted</li> </ol> <p>In each of these cases, a follow-up read scratchpad operation will be successful and all future read scratchpad operations will be successful until one of the events 1-3 operations occur (then the initial read will fail and the subsequent ones will be successful, etc...)</p>
ISS163204 - DNP3 Slave has problems with link layer confirmations	The DNP3 slave has problems using the link layer to validate frame receipt. The DNP3 organization encourages users not to do this.
ISS177390 - Change event read responses are not sent immediately after a confirmation of an unsolicited response	<p>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.</p> <p>The module appears to always wait until the timeout expires, even if the unsolicited message has been confirmed, to send the read response.</p> <p>Normally, messages are responded to within milliseconds, but the read response does not occur for up to 2 seconds after the confirmation message is sent.</p>



## 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 node 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  
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Any escalation request should be sent to [mas.sfdcescalation@emerson.com](mailto: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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