IMPORTANT PRODUCT INFORMATION

GFK-1051D

Sep 2019

PACSystems™ RX3i

I/O PROCESSOR MODULES

(IC694APU305B – FIRMWARE RELEASE 1.21)

EMERSON

Warning Notes as Used in this Publication

Warning

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.
In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

Notes: Notes merely call attention to information that is especially significant to understanding and operating the equipment.

These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met during installation, operation, and maintenance. The information is supplied for informational purposes only, and Emerson makes no warranty as to the accuracy of the information included herein. Changes, modifications, and/or improvements to equipment and specifications are made periodically and these changes may or may not be reflected herein. It is understood that Emerson may make changes, modifications, or improvements to the equipment referenced herein or to the document itself at any time. This document is intended for trained personnel familiar with the Emerson products referenced herein.

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Firmware Release

Firmware release 1.21 of the I/O Processor Module firmware resolves the issues described in "Problems resolved by this Version of Product." No new features are added.

Upgrades

All previous firmware versions are replaced by this release. The new firmware is backward compatible with all previous IC693APU305/IC694APU305 hardware versions.

Firmware version 1.21 is available as a field upgrade kit that can be ordered through your distributor. This kit contains a new EPROM with the updated firmware, upgrade instructions, and the IPI. The APU305 does not support electronic firmware updates, therefore the upgrade kit is not available on the Emerson Support website https://www.emerson.com/Industrial-Automation-Controls/support.

Upgrade Kits: IC693APU305: 44A737646-G02
IC694APU305: 82A1117-MS10-000-A1

Documentation

Series 90-30 I/O Processor Module User's Manual, GFK-1028

PACSystems RX3i System Manual, GFK-2314

Functional Compatibility

Programmer Version Requirements

The IC693APU305 is compatible with these Emerson PLC programmers:

Logicmaster™ 90-30:	Version 4.5 or later
Control:	All Versions
VersaPro™:	All Versions
CIMPLICITY® Machine Edition:	All Versions
PAC Machine Edition:	All Versions

The IC694APU305 requires PAC Machine Edition version 5.0, Service Pack 2.

CPU Version Requirements

The IC693APU305 is compatible with Series 90-30 CPU firmware releases 3.52 and later.

The IC694APU305 is compatible with PACSystems RX3i CPU firmware releases 2.90 and later.

Absolute Encoder Compatibility

The APU305 can be used with an Encoder Products Company (EPC) Model 958, 1024 counts per revolution, gray code absolute encoder. However, when the APU305 is connected to this encoder and the axis speed is greater than 25,000 counts per second, the APU305 reports an "Absolute Encoder Input Error" (Error Code 001Dh) and the "Binary Data" (Position) and "Counts per Timebase" register values may be invalid. Applications using this encoder should restrict the maximum speed to 25,000 counts per second and lower.

Problems resolved by this revision of Firmware

"Total Counts" update not Scan-synchronized with "Home Found" Status Bit

At the completion of a home command sequence (home switch is asserted and marker detected) the "Total Counts" input data word may not be set to zero in the same PLC CPU scan that the "Home Found" input status bit is set to true. Instead, "Total Counts" may be set to zero in the scan immediately following the scan that the "Home Found" input status bit is set to true.

Note: *The home command is supported only in AQUADB mode.*

"Binary Data" (Position) not Preloaded with Configured Value

When the preload input is asserted while the APU305 is configured for AQUADB mode, the "Binary Data" (position) input data word is not always set to the configured preload position value.

"Binary Data" (Position) Update not Scan-synchronized with "Home Found" Status Bit

At the completion of a home command sequence (home switch is asserted and marker detected) the "Binary Data" (position) input data word may not be set to the configured home position in the same PLC CPU scan that the "Home Found" input status bit is set to true. Instead, "Binary Data" (position) may be set to the configured home position in the scan immediately following the scan that the "Home Found" input status bit is set to true.

Note: *The home command is supported only in AQUADB mode.*

Invalid "Binary Data" and "Total Counts" Values during Home Command Sequence

After a home command sequence is initiated by setting the "Home Command" control bit true, the "Binary Data" (position) and "Total Counts" input data words do not contain valid position information if one or more marker pulses occur before the home switch input is asserted.

This issue may be avoided by ensuring the "Home Command" control bit is set true after the home switch input is asserted. The marker pulse must also occur after the home switch input is asserted, after the "Home Command" control bit is set true, and before the home switch input is de-asserted.

Note: *The home command is supported only in AQUADB mode.*

Operational Notes

"Home Switch Input" Status Bit Off when "Home Found" Status Bit On

In rare cases, while executing a find home command, it is possible for the PLC CPU application to see the "Home Found" status bit turn on before the application sees the "Home Switch Input" status bit turn on. This can only happen in cases where the machine setup is such that the final marker pulse occurs 14ms or less after the home switch is asserted.

If this issue occurs, the home command completes normally and the "Binary Data" (position) register is set to the configured home position. The "Home Switch Input" status bit turns on 4ms + PLC CPU Scan Time after the "Home Found" status bit turned on. (This assumes the home switch is still asserted 4ms after the "Home Found" status bit turned on.)

Aborting a Home Command Sequence

It is not always possible to abort a home command sequence after the "Home Command" control bit is set to true:

- If the home switch input is not asserted, a home command sequence can be aborted by setting the "Home Command" control bit false.
- If the home switch input is asserted and the marker pulse has not occurred, a home command sequence can be aborted by setting the "Home Command" control bit false and reversing axis direction until the home switch input is no longer asserted.

  Note: *In this scenario, any marker pulse that occurs while the home switch is asserted will cause the home command sequence to complete, even though the "Home Command" control bit is set to false.*

- If the home switch input is asserted and the marker pulse has occurred, the home command sequence is complete and cannot be aborted.

Changes to Manuals

The following changes will be implemented at the next planned revisions of Series 90-30 I/O Processor Module User's Manual, GFK-1028 and PACSystems RX3i System Manual, GFK-2314.

New I/O Processor Error Codes Added”

These error codes will be added to Appendix A, “I/O Processor Error Codes” in GFK-1028 and the IC694APU305 “%AI Data Word Descriptions” in GFK-2314:

001Ch: Internal Home Command Sequence State Machine Error (AQUADB function only)

001Dh: Absolute Encoder Input Error (ABS Encoder Function Only)

“Minimum Strobe Input Pulse Width” Description Update

The description of the “Minimum Strobe Input pulse width” row in the “Inputs” table in Appendix B, “I/O Processor Module Specifications” in GFK-1028 and “Specifications: IC694APU305” in GFK-2314 will change as follows:

Old Text: “Minimum Strobe Input pulse width”

New Text: “Minimum Strobe Input Pulse Width (Minimum time between consecutive strobe inputs.)

“Strobe Register Resolution” Specification Added

The “Strobe Register Resolution” specification will be added to the “Inputs” table in Appendix B, “I/O Processor Module Specifications” in GFK-1028 and “Specifications: IC694APU305” in GFK-2314 :

Strobe Register Resolution (Maximum time from when the strobe input is asserted until the strobe register value is updated.)	1 ms

Installation in Hazardous Location

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

⚠ WARNING

- EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2;
- EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES
- EXPLOSION HAZARD - DO NOT 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.

Note: *Control circuit modules require one No. 14 through 22 AWG or two No. 16 through 22 AWG stranded or solid copper conductors. The tightening torque range for the control terminals is 9.6—11.5 in.-lb. Use only wire rated for 90°C. Observe any additional ratings that are provided with the modules.*

Technical Support & Contact Information

Home link: http://www.Emerson.com/Industrial-Automation-Controls

Knowledge Base: https://www.emerson.com/Industrial-Automation-Controls/support

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

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