PACSystems™ RX3i

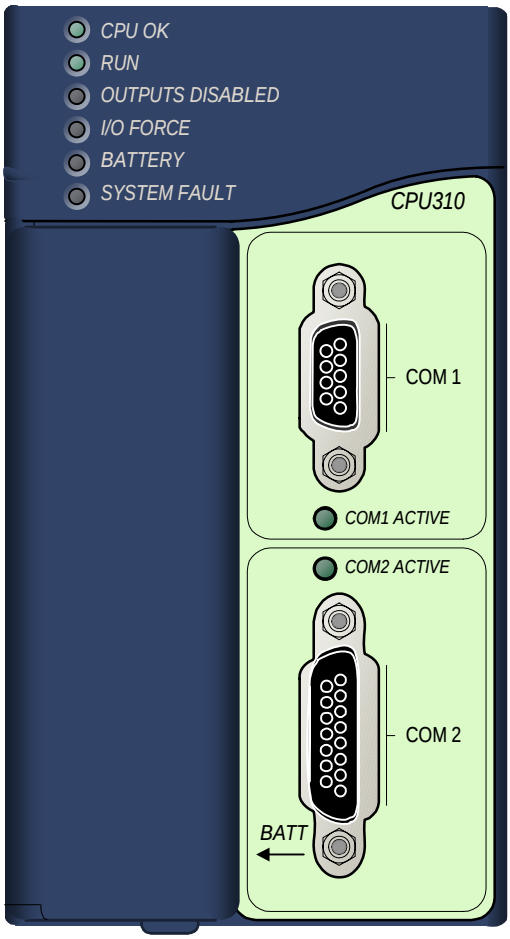
IC695CPU310

Central Processing Unit

GFK-2329X
January 21, 2009

The RX3i CPU can be used to perform real time control of machines, processes, and material handling systems. The CPU communicates with the programmer and HMI devices via a serial port using SNP Slave protocol. It communicates with I/O and Intelligent Option modules over a dual backplane bus that provides:

- High-speed, PCI backplane for fast throughput of new advanced I/O.
- Serial backplane for easy migration of existing Series 90-30 I/O.



Features

- Contains 10 Mbytes of battery-backed user memory and 10 Mbytes of non-volatile flash user memory.
- Provides access to bulk memory using reference table %W.
- Configurable data and program memory.
- Programming in Ladder Diagram, Structured Text, Function Block Diagram, and C.
- Supports auto-located Symbolic Variables that can use any amount of user memory.
- Reference table sizes include 32Kbits for discrete %I and %Q and up to 32Kwords each for analog %AI and %AQ.
- Supports most Series 90-30 modules and expansion racks. For a list of supported I/O, Communications, Motion, and Intelligent modules, see the *PACSystems RX3i Hardware and Installation Manual,* GFK-2314.
- Supports up to 512 program blocks. Maximum size for a block is 128KB.
- Bit-in-word referencing allows you to specify individual bits in a WORD reference in retentive memory as inputs and outputs of Boolean expressions, function blocks, and calls that accept bit parameters.
- In-system upgradeable firmware.
- Two serial ports: an RS-485 serial port and an RS-232 serial port.
- Ethernet communications via the rack-based Ethernet Interface module (IC695ETM001). For details on Ethernet capabilities, refer to *TCP/IP Ethernet Communications for PACSystems User's Manual,* GFK-2224.
- Time synchronization to SNTP Time Server on Ethernet network when used with an Ethernet module with firmware release 5.0 or later.

Ordering Information

Description	Catalog Number
RX3i VME 300Mhz CPU	IC695CPU310
Lithium Battery Pack	IC698ACC701
Auxiliary Battery Module (optional)	IC693ACC302
RX3i Power Supplies 40 Watt High Capacity Universal AC 40 Watt High Capacity 24 VDC For additional power supplies, see the *PACSystems RX3i System Manual,* GFK-2314.	 IC695PSA040 IC695PSD040
[Optional] RS-232 Cable	IC200CBL001
Rx3i Standard 12 Slot Rack	IC695CHS012
Rx3i Standard 16 Slot Rack	IC695CHS016

Note: For Conformal Coat option, please consult the factory for price and availability.

Specifications

Battery: Memory retention	For estimated battery life under various conditions, refer to the *PACSystems CPU Reference Manual,* GFK-2222.
Program storage	Up to 10 Mbytes of battery-backed RAM 10 Mbytes of non-volatile flash user memory
Power requirements	+3.3 VDC: 1.25 Amps nominal +5 VDC: 1.0 Amps nominal
Operating Temperature	0 to 60°C (32°F to 140°F)
Floating point	Yes
Boolean execution speed, typical	0.195ms per 1000 Boolean contacts/coils
Time of Day Clock accuracy	Maximum drift of 2 seconds per day
Elapsed Time Clock (internal timing) accuracy	0.01% maximum
Embedded communications	RS-232, RS-485
Serial Protocols supported	Modbus RTU Slave, SNP, Serial I/O
Backplane	Dual backplane bus support: RX3i PCI and 90-30-style serial
PCI compatibility	System designed to be electrically compliant with PCI 2.2 standard
Program blocks	Up to 512 program blocks. Maximum size for a block is 128KB.
Memory	*%I and %Q:* 32Kbits for discrete *%AI and %AQ:* configurable up to 32Kwords *%W:* configurable up to the maximum available user RAM Symbolic: configurable up to 10 Mbytes
For environmental specifications and compliance to standards (for example, FCC or European Union Directives), refer to the PACSystems RX3i Hardware and Installation Manual, GFK-2314.	

Release History

Catalog Number	***FW Version***	***Comments***
IC695CPU310-FU	5.61	Corrects the problem described on page 4.
IC695CPU310-FU	5.60	Supports the IC695PMM335 PACMotion Multi-Axis Motion Controller and other new features, and corrects the problems listed on page 4.
IC695CPU310-FT	5.50	Introduced run-mode store of EGD and LREAL data type. See GFK-2329V for problems resolved.
IC695CPU310-FS	5.03	
IC695CPU310-ER	5.02	
IC695CPU310-EP	5.00	
IC695CPU310-EN	3.83	
IC695CPU310-EM	3.82	
IC695CPU310-EL	3.81	
IC695CPU310-DK	3.52	
IC695CPU310-DJ	3.51	
IC695CPU310-DH	3.50	
IC695CPU310-CG	3.12	
IC695CPU310-CF	3.11	
IC695CPU310-CD	3.00	
IC695CPU310-CC	2.90	
IC695CPU310-CB	2.80	
IC695CPU310-CB	2.51	
IC695CPU310-BB	2.51	
IC695CPU310-AA	2.50	Initial release.

Important Product Information for this Release

Firmware release 5.61 corrects a rarely occurring CPU condition, where the Run Line to the IO and Smart modules remains asserted with the CPU in a non-responsive (lights-out) state. For details, see page 4.

Firmware release 5.60 adds support for the PACMotion Multi-Axis Motion Controller, IC695PMM335, in addition to other new features, listed in "New Features and Enhancements" on page 4. This release also corrects the issues listed in "Problems Resolved by Release 5.60."

This release supports Proficy Process Systems (PPS) release 1.50 and later.

Updates

IC695CPU310 is field upgradeable to firmware version 5.61 using the Winloader firmware upgrade utility and upgrade kit 44A752290-G21, which can be downloaded from http://support.gefanuc.com/.

CPU Functional Compatibility

Subject	*Description*
Programmer Version Requirements	Proficy® Machine Edition Logic Developer 5.9 is required to use the new Release 5.60 features with the RX3i CPU. Proficy® Machine Edition Logic Developer 5.8 is required to use the new Release 5.50 features with the RX3i CPU. Proficy® Machine Edition Logic Developer 5.7 is required to use the new Release 5.0 features with the RX3i CPU. Proficy Machine Edition Logic Developer 5.5 with Service Pack 2 Sim 4 is required to use the new CMM serial modules with the RX3i CPU. Proficy Machine Edition Logic Developer 5.5 with Service Pack 1 is required to use the 8 ETM feature with the RX3i CPU. Proficy Machine Edition Logic Developer 5.5 or later must be used to for new features in PACSystems 3.50 and later. Proficy Machine Edition Logic Developer 5.0 or later must be used to configure and program the RX3i. Service Pack 3 is required to support the new features in PACSystems 3.00.
C Toolkit Compatibility	C Toolkit Release 5.50 is required to use the new LREAL data type. C Toolkit Release 5.00 Build 16C1 is required when the PACSystems CPU contains firmware Release 5.00 or later. C Toolkit Release 3.50 Build 34A1 is required for new features in PACSystems Release 3.50 and later (Use of variables in C Blocks). The C Toolkit for PACSystems is also distributed with Proficy® Machine Edition Logic Developer 5.0 or greater. Toolkit Release 2.50 build 50A1 or later is required for use with the RX3i. Please note: The Series 90 Toolkit (IC641SWP709/719) is not compatible with PACSystems. **Note:** ***All*** C blocks must be recompiled using the new toolkit before downloading to a RX3i CPU that contains Release 5.00 firmware.
Backplanes, power supplies and system modules	As listed in the *PACSystems RX3i System Manual,* GFK-2314C or later.
Series 90-30 Expansion Rack Compatibility	The PACSystems RX3i supports Series 90-30 expansion racks, both local and remote. PACSystems RX3i CPUs do not operate in a Series 90-30 Rack.
Series 90-30 Main Rack Compatibility	Series 90-30 Main Racks cannot be used in a PACSystems RX3i system. Series 90-30 CPUs do not operate in PACSystemsRX3i Racks.
Isolated 24V power	In applications that use the IC69xALG220/221/222, consult *PACSystems RX3i Hardware and Installation Manual*, GFK-2314 for details of wiring the 24V power.

Subject	Description
COMMREQ to PBM300	In Release 3.0, the behavior of the COMMREQ fault output on a COMMREQ sent to the PROFIBUS master module IC695PBM300 was changed to be compatible with the Series 90-30 CPU366 PROFIBUS Master. Previously, the fault output was enabled when the module received a COMMREQ and it was busy. Now, the busy condition does not result in the fault output being enabled.
Recommended IC200ALG240 revision	When a VersaMax™ system Genius® Network Interface Unit (IC200GBI001) operates with a Genius Bus Controller located in a PACSystems controller, and the VersaMax system contains an IC200ALG240 Analog Input Module, it is recommended to update the IC200ALG240 firmware to Revision 1.10 or later. Use firmware update kit 44A752313-G01, available in Knowledge Base Article i023269 at globalcare.gefanuc.com.
Configuration of IC694MDL754	Always configure 16 bits of module status when using this module. Configuring 0 bits of module status will result in invalid data in the module's ESCP status bits.

Problems Resolved by Release 5.61

Subject	Description
Output modules now go to their configured state when CPU is non-responsive (lights out).	In previous releases, under rare CPU lights-out conditions the Run signal to the IO and Smart modules remained asserted. When this condition occurred, the IO did not revert to the configured default state. RX3i release 5.61 and later versions correct this issue.

Problems Resolved by Release 5.60

Subject	Description
Errors when downloading a DSM324 Local Logic program.	In previous versions, an attempt to download a Local Logic program file with a length that is a multiple of the transfer buffer size will fail. When this happens, the error codes *31 group 16* and *140 group 121* are displayed and the DSM324's module status code reports the error 0XF0A3, "Local Logic Program Constant Terminator Error." Release 5.6 fixes this issue.
Erroneous logging of Constant Sweep Time Exceeded faults when using multiple GBCs in an RX3i with Constant Sweep window mode.	When using multiple GBCs in an RX3i with window mode set for Constant Sweep, Constant Sweep Time Exceeded faults are reported. The revision addresses erroneous logging of the fault, however there are cases where the fault will occur.
Attempting a run-mode store, upload, or verify of a large project may result in Machine Edition disconnecting.	For projects with long block names and a large number of program blocks, run-mode store, upload or verify operations over an Ethernet connection may fail and Machine Edition may disconnect with "Error 8097: Server Error - Transfer Error: Remote disconnect has occurred. [0x6A][0x02]" This issue has been resolved in release 5.6.

New CPU Features and Enhancements in Release 5.60

- **New Module Support** - The IC695PMM335 motion module and FTB001 Fiber I/O Terminal Block are now supported.
- **Diagnostic Logic Block** - To assist with commissioning and diagnostics, the Proficy Machine Edition software provides the capability to program one diagnostic logic block that can be downloaded to the RX3i CPU and executed without altering the main program logic.
- **MOVE_DATA and EQ_DATA function blocks** – These functions enable data in structured variables to be copied and compared.
- **PLCopen Compliance** – The RX3i CPU and PMM335 motion modules now support 56 new PLCopen compliant motion functions and function blocks. Details of these function blocks can be found in the *PACMotion Multi-Axis Motion Controller User's Manual,* GFK-2448.

Restrictions and Open Issues in Release 5.61

Subject	***Description***

The Ethernet module fails to exchange EGD properly during power cycling	Very rarely, after experiencing multiple rapid power cycles, the CPU may fail to establish communication with one or more modules in the backplane at power up. When this occurs a "Loss of, or missing option module" fault will be logged in the controller fault table. The user can power cycle again to recover from this issue.
	The following faults will be logged if this issue occurs:
	`Loss of, or missing option module`
	`Error Code 31`
	`Group 4`
	`Action 3:Fatal`
	`Task Num 9`
	
	`Reset of option module`
	`Error Code 11`
	`Group 8`
	`Action 2:Diagnostic`
	`Task Num 9`
	
	`Loss of, or missing option module`
	`Error Code 94`
	`Group 4`
	`Action 3:Fatal`
	`Task Num 9`

Switching between Serial & PCI modules in a slot causes module to not be recognized.	If a Serial module (IC694) is physically installed in the slot where a PCI (IC695) module is configured, a module mismatch fault will be logged. To correct this condition the configuration must match the module that is physically present in the rack ***and*** the system must be power cycled. Simply downloading the new configuration will not correct this issue.

Loss of Power Supplies after firmware update	A Loss of Power Supplies after firmware update may occur. This does not happen with all firmware updates and will not occur if the system is power cycled after the firmware upgrade has completed. The following fault is displayed when this issue occurs:
	`Loss of, or missing option module`
	`Error Code 36`
	`Group 4`
	`Action 3:Fatal`
	`Task Num 9`
	`Fault Extra Data:  01 58 02 4f 80 08 0a 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00`
	To correct this condition, power cycle the system.

Subject	Description
Battery installation	When installing a battery, when there currently is no battery installed, the battery must be installed while the CPU has power. Failing to follow this procedure could result in the CPU not powering up. If a battery is installed while power is off (and there was no battery previously installed), and the CPU fails to power up, simply remove the battery, power cycle the CPU and then install the battery.
Hot Swapping some Analog modules slowly may result in modules not being recognized	Occasionally during a hot insertion (hot swap) of IC695 Non-Isolated Analog Input Modules, input channels may take up to 2 seconds to reflect actual input values after the module OK bit is enabled in the module status word. This delay has only occurred when the hot insertion has been done slowly (i.e. approximately 1.5 seconds to insert the module)
Ethernet Disconnect During Word-for-Word Change	If the Ethernet connection is broken during a word-for-word change, the programmer may not allow a subsequent word-for-word change after reconnecting due to the fact that it thinks another programmer is currently attached. If this occurs, you should go offline and then back online again.
Simultaneous Clears, Loads and Stores Not Supported	Currently, PACSystems CPUs do not support multiple programmers changing CPU contents at the same time. The programming software may generate an error during the operation. Simultaneous loads from a single CPU are allowed.
Hardware Configuration Not Equal After Changing Target Name	If the user stores a hardware configuration to flash that sets “Logic/Config Power up Source” to “Always Flash” or “Conditional Flash” and then subsequently changes the name of the target in the programming software, the hardware configuration will go Not Equal and will not Verify as equal.
Controller and IO Fault Tables May Need to be Cleared Twice to Clear Faulted State	Both **Controller** and IO fault tables may need to be cleared to take the CPU out of Stop/Fault mode. If one of the tables contains a recurring fault, the order in which the tables are cleared may be significant. If the CPU is still in Stop/Fault mode after both tables are cleared, try clearing the fault tables again.
Setting Force On/Off by Storing Initial Value	Once a force on or force off has been stored to the RX3i, the user cannot switch from force on to force off or vice-versa directly by downloading initial values. The user can turn off the force by doing a download, and then change the force on or off by another download.
Number of Active Programs Returned as Zero	The SNP request Return Controller Type and ID currently returns the number of active programs as zero.
Serial I/O Failure at 115K During Heavy Interrupt Load	Rare data corruption errors have been seen on serial communications when running at 115K under heavy interrupt load on the RX3i. Under heavy load applications, users should restrict serial communications to 57K or lower.
SNP ID not always provided	Unlike the Series 90-30, the RX3i CPU’s SNP ID will not appear in the Machine Edition programmer Show Status display. Service Request 11 will always return zeros.
Second programmer can change logic while in Test & Edit mode	While currently active in a Test and Edit session using Machine Edition on one PC, Machine Edition running on another PC is not prevented from storing new logic to the RX3i.
Must have logic if powering-up from flash	If the application will configure the CPU to retrieve the contents of flash memory at power-up, be sure to include logic along with hardware configuration when saving to flash memory.
CPU may not detect low-battery condition	A battery with very low capacity may still have a terminal voltage high enough to report that it is a good battery. In this case, when the battery starts supplying the memory power (battery backup), the battery voltage quickly drops to unacceptable levels, with little warning to the user before failure. To insure against data loss, users should replace batteries in accordance with the guidelines provided in the CPU Reference Manual, GFK-2222. Additionally, users could save logic and hardware configuration to flash.
Two loss of module faults for Universal Analog Module	Occasionally, the hot removal of the Universal Analog Input Module (IC695ALG600) results in two “Loss of I/O Module” faults instead of one.

Subject	*Description*
Power up of Series 90-30 HSC module may take as long as 20 seconds	As power is applied to a 90-30 High-Speed Counter, the "module ready" bit in the status bits returned each sweep from the module may not be set for as long as 20 seconds after the first sweep, even though there is no "loss of module" indication. I/O data exchanged with the module is not meaningful until this bit is set by the module. For details, see “Data Transfer Between High Speed Counter and CPU” in the *Series 90-30 High Speed Counter User’s Manua*l, GFK-0293C.
Informational fault at power up	Intermittently during power-up, an Informational non-critical CPU software fault may be generated with fault extra data of 01 91 01 D6. This fault will have no effect on the normal operation of the RX3i. But, if the hardware watchdog timer expires after this fault and before power has been cycled again, then the outputs of I/O modules may hold their last state, rather than defaulting to zero.
Extended memory types for IO triggers	%R, %W and %M cannot be used as IO triggers.
Possible Machine Edition inability to connect	Infrequently, an attempt to connect a programmer to an RX3i via Ethernet will be unsuccessful. The normal connection retry dialog will not be displayed. Rebooting the computer that is running the programmer will resolve the behavior.
SNP Update Datagram message	If an Update Datagram message requests 6 or less bits or bytes of data, the RX3i will return a Completion Ack without Text Buffer. The protocol specifies that the returned data will be in the Completion Ack message, but it may not be.
GBC30 may not resume operation after power cycle	In rare instances, a GBC30 in an expansion rack may not resume normal operation after a power cycle of either the expansion rack or the main rack.
Configuration of third-party modules	Do not specify a length of 0 in the configuration of a third-party module. The module will not work properly in the system.
Power supply status after CPU firmware update	The CPU will report a “Loss of or missing option module” fault for the IC695PSD140 RX3i power supply following an update of CPU firmware. Also, the slot will appear empty in the programmer’s online status detail view. The power supply continues to operate normally. Power cycle to restore normal status reporting.
Power supply status after power cycling	Rarely, turning a power supply on or off may not result in an add or loss fault. Also, the slot will appear empty in the programmer’s online status detail view. The power supply continues to operate normally. Power cycle to restore normal status reporting.
Don’t use multiple targets	In a system in which the hardware configuration is stored from one target and logic is stored from a different target, powering-up from flash will not work. The observed behavior is that, following a power up from flash, ME reports hardware configuration and logic "not equal".
Missing “Loss of terminal block” fault	The IC695ALG600/608/616 analog input modules do not produce a “Loss of terminal block” fault when hardware configuration is stored or the module is hot-inserted, and the terminal block is not locked into place.
Sequence Store Failure	In systems with very large hardware configurations, it is possible to encounter a “Sequence Store Failure” error when writing the configuration to flash. To work around this error, either: 1. Perform an explicit clear of flash prior to performing the write. 2. Increase the operation timeout used by Machine Edition software prior to performing the write.
IC694MDL754: Must configure module status bits	Always configure 16 bits of module status when using this module. Configuring 0 bits of module status will result in invalid data in the module’s ESCP status bits.
IC695ALG600 Lead Resistance Compensation setting	A configuration store operation will fail if a channel is configured for 3-wire RTD and Lead Resistance Compensation is set to Disabled. A Loss of Module fault will be logged in the I/O Fault table at the end of the store operation. To recover the lost module, the configuration must be changed to enable Lead Resistance Compensation and module must be power cycled.
C Toolkit PlcMemCopy Documentation Incorrect	This routine does allow the destination and source pointers to be outside of reference memory. If the destination points to discrete reference memory, overrides and transitions will be honored. Note that the header for PlcMemCopy has been updated in Release 3.50 of the C toolkit.

Subject	Description
WinLoader may stop operating	On computers running Windows 2000 and using some versions of Symantec Antivirus protection, WinLoader will fail if used in advanced mode. Recovery requires cycling the computer's power.
Logic and HWC not equal after power cycle	If the Hardware Config from Target 1, with Logic/Configuration Power-up Source and Data Source both set to “Always from Flash,” is stored in Flash, then Logic and Hardware Config from Target 2, with Logic/Configuration Power-up Source both set to “Always from RAM,” is stored to RAM and there is a good battery, then when power is cycled the programmer may show that Logic and Hardware Config are not equal. The remedy is to clear Flash and then store the Logic and Hardware Config from Target 2.

Operational Notes

Subject	Description
Undefined Symbols in C Blocks	In Release 5.00 or later, if an attempt is made to download a C block containing undefined symbols, the download will fail. Machine Edition will display the following message in the Feedback Zone: Error 8097: Controller Error – Controller aborted the request [0x05][0xFF] Prior to Release 5.00, C blocks containing undefined symbols could be successfully downloaded, but if they were executed the CPU would transition to Stop/Halt mode.
Length of Serial I/O buffer	(Release 5.0 or later) The "Set Up Input Buffer Function" always allocates a buffer containing 2049 bytes. This is one byte more than previous PACSystems releases.
Changing IP Address of Ethernet Interface While Connected	Storing a hardware configuration with a new IP address to the RX3i while connected via Ethernet will succeed, then immediately disconnect because the RX3i is now using a different IP address than the Programmer. You must enter a new IP address in the Target Properties in the Machine Edition Inspector window before reconnecting.
Duplicate Station Address for Modbus Will Conflict with Other Nodes	The default serial protocol for the RX3i is Modbus RTU. The default Station Address is 1. If the RX3i is added to a multi-drop network, care must be taken that the RX3i is configured with a unique Station Address. Nodes with duplicate Station Addresses on the same network will not work correctly.
Timer Operation	Care should be taken when timers (ONDTR, TMR, and OFDTR) are used in program blocks that are NOT called every sweep. The timers accumulate time across calls to the sub-block unless they are reset. This means that they function like timers operating in a program with a much slower sweep than the timers in the main program block. For program blocks that are inactive for large periods of time, the timers should be programmed in such a manner as to account for this catch up feature. Related to this are timers that are skipped because of the use of the JUMP instruction. Timers that are skipped will NOT catch up and will therefore not accumulate time in the same manner as if they were executed every sweep.
Constant Sweep	Constant Sweep time, when used, should be set at least 10 milliseconds greater than the normal sweep time to avoid any over-sweep conditions when monitoring or performing on-line changes with the programmer. Window completion faults will occur if the constant sweep setting is not high enough.
Large Number of COMMREQs Sent to Module in One Sweep Causes Faults	A large number of COMMREQs (typically greater than 8) sent to a given board in the same sweep may cause Module Software faults to be logged in the RX3i fault table. The fault group is MOD_OTHR_SOFTWR (16t, 10h) and the error code is COMMREQ_MB_FULL_START (2). When this occurs, the “FT” output of the function block will also be set. To prevent this situation, COMMREQs issued to a given board should be spread across multiple sweeps so that only a limited number (typically 8 or less) of COMMREQs are sent to a given board in each sweep. In addition, the FT output parameter should be checked for errors. If the FT output is set (meaning an error has been detected), the COMM_REQ could be re-issued by the application logic.
C Block Standard Math Functions Do Not Set errno	In C Blocks, standard math functions (e.g. sqrt, pow, asin, acos) do not set errno to the correct value and do not return the correct value if an invalid input is provided.

Subject	*Description*
Upgrading Firmware	Upgrading the CPU firmware with the WinLoader utility may fail when multiple IO modules are in the main rack, due to the time it takes to power cycle the rack system. If the upgrade process fails, move the CPU to a rack without IO modules and restart the upgrade process. Winloader initial connect baud rate is fixed at 19200 baud. Note that the firmware download will occur at 115.2K baud by default. Note that if you have hyperterm open on a port, and then try to use Winloader on the same port, Winloader will often say "Waiting for Target" until the hyperterm session is closed.
Hot Swap	Hot Swap of power supplies or CPUs is not supported.
Serial Port Configuration COMMREQs	With the following combination of circumstances, it is possible to render serial communications with the CPU impossible: User configuration disables the Run/Stop switch User configures the power up mode to Run or Last Logic is stored in FLASH and user configures CPU to load from FLASH on power up User application issues COMMREQs that set the protocol on both of the serial ports to something that does not permit communications to the ME programmer.
Incorrect COMMREQ Status For Invalid Program Name	The program name for PACSystems is always "LDPROG1". When another program name is used in a COMM_REQ accessing %L memory, an Invalid Block Name (05D5) error is generated.
FANUC I/O Master and Slave operation	Scan sets on the master do not work properly for the first operation of the scan set after entering RUN mode. They do work properly for subsequent scans. After downloading a new hardware configuration and logic, a power cycle may be required to resume FANUC I/O operation. Use controllers of similar performance in FANUC I/O networks. If a master or slave is located in an RX3i system, the other controllers should be RX3i or Series 90-30 CPU374. Repeated power up/down cycles of an expansion rack containing FANUC I/O slaves may result in failure of the slaves' operation, with the RDY LED off.
Lost count at power up for Serial IO Processor	The serial IO Processor (IC693APU305) will lose the first count after every power up or every time the module receives a configuration.
COMMREQ Status Words Declared in Bit Memory Types Must Be Byte-Aligned	In previous releases, the CPU allowed configuration of COMMREQ Status Words in bit memory types on a non-byte-aligned boundary. Even though the given reference was not byte-aligned, the firmware would adjust it the next-lowest byte boundary before updating status bits, overwriting the bits between the alignment boundary and specified location. To ensure that the application operates as expected, release 3.50 requires configuration of COMMREQ Status Words in bit memory types to be byte-aligned. For example if the user specified status bit location of %I3, the CPU aligns the status bit location at %I1. Release 3.50 firmware requires the user to specify the appropriate aligned address (%I1) to ensure that the utilized location is appropriate for their application. Note that the actual reference location utilized is not changed, but now is explicitly stated for the user.

Installation in Hazardous Locations

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;
- WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND
- 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
- The tightening torque range for the control terminals is 9.6-11.5 in. lb. Use only wire rated for 90°C. Be sure to observe any additional ratings that are provided with the modules.
- Batteries: Replace Battery with Matsushita Part No. BR2477A Only. Use of another battery may present a risk of fire or explosion.” “Caution, Battery may explode if mistreated. DO NOT recharge, disassemble or dispose of in fire.” The correct battery type is available as Accessory Kit IC698ACC701.