PACSystems™ RX3i IC695CPE400 and IC695CPL410 IPI

IC695CPE400-ADBA[1][2]

IC695CPL410-ACAN[1][2]

Firmware Version 10.85

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[1] *Includes conformal coat and low temperature module variants, if available.*

[2] *The last two characters of the catalog number suffix may not increment with every firmware release beginning with IC695CPE400-ACBA and IC695CPL410-ABAN 10.30.*

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Warnings and Caution 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.

⚠ CAUTION

Caution notices are used where equipment might be damaged if care is not taken.

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

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Current Release Information

IC695CPE400 *64MB Rackless CPU w/PACEdge + Connext* and IC695CPL410 *64MB Rackless CPU w/PACEdge + WebHMI* PACSystems Firmware Release 10.85 adds support for Run Mode Store (RMS) to User Flash, SVC_REQ 63 Logic Driven Data Write to Non-Volatile Storage, three diagnostic %S bits, and Audit Trail. PACSystems Firmware Release 10.85 resolves the issues found in the *RX3i PLC: Problems Resolved in Current Release* section*.

Component		Version Number
Field Upgradable Using These Upgrade Kits: • 41G2376-FW01-000-A17 • 41G2617-FW01-000-A13	PACSystems	Release 10.85 Build ELTH
	FPGA	02.03.00
	CPLD	02.03.07
	IC695ACC403 Energy Pack Base	3.03
Field Upgradable using Ubuntu Repositories	PACEdge	For details on PACEdge revision, please consult GFK-3198, PACEdge Important Product Information.
Not Field Upgradable	UEFI	3.15.000

RX3i PLC: New Features and Enhancements in Current Release

New Features	Description
Run Mode Store (RMS) to User Flash	Enables the user to make logic changes while in run mode that will be saved to both User RAM and Flash. User RAM and User Flash equality will be maintained.
SVC_REQ 63 Logic Driven Data Write to Non-Volatile Storage	Allows logic to write up to four regions of %R, %AI, or %AQ data to non-volatile storage up to 24 times in a 24-hour period. The data is reloaded to the data tables on power up.
• %S53: #LG_CFG_SRC_RAM • %S54 #DATA_SRC_RAM • %S55: #DATA_SRC_NV	• Set to 1 if CPU logic and HWC is retrieved from User RAM at powerup. • Set to 1 if the CPU reference data is retrieved from User RAM at powerup. • Set to 1 if the CPU reference data is retrieved from any SVC_REQ 63 NV Storage locations at powerup.
Audit Trail	The CPU contains a log of user actions performed on the PLC. PACAnalyzer is used to retrieve the Audit Trail log. The log records events like web page connection, configuration download, STOP/RUN transition, clearing of fault tables, etc.

PACEdge: New Features and Enhancements in Current Release

For a complete list of new features and enhancements, please consult GFK-3198, PACEdge Important Product Information.

Field Upgrades

PACSystems CPU firmware version 10.85 is released to manufacturing for production and as a downloadable upgrade kit. PACEdge 2.2.0 is released to manufacturing for production.

PACEdge is released to manufacturing for production. **For more details on PACEdge upgradeable component, its part numbers and versioning,** please consult GFK-3198, PACEdge Important Product Information.

All production versions of the CPE400 and CPL410 are field upgradeable to this PACSystems CPU release using the upgrades available for download on the Landing Pages found at https://www.emerson.com/Industrial-Automation-Controls/Support.

Release in line with software license compliance requirements.

PACSystems CPU Upgrade

The RX3i firmware upgrade process may take up to four minutes to complete, depending on the contents of the update. During the update, the RUN and OUTPUTS ENABLED LEDs blink GREEN in unison and the CPE400 / CPL410 may automatically reset one or more times. All LEDs will be off during the automatic reset. The IC695ACC403 Energy Pack (if present) may also be updated. The energy pack blinks all LEDs GREEN and performs an automatic reset following its update.

Note: Do not manually power cycle the CPE400 / CPL410 or remove the energy pack (if present) or the cap pack from the energy pack base during the updates as this may place the CPU and energy pack in an unrecoverable and unusable state.

CPE400 PACSystems CPU Upgrade Kit

Kit Part Number: 41G2376-FW01-000-A17

Kit File Name: CPE400_FW10_85_41G2376-FW01-000-A17.zip

CPL410 PACSystems CPU Upgrade Kit

Kit Part Number: 41G2617-FW01-000-A13

Kit File Name: CPL410_FW10_85_41G2617-FW01-000-A13.zip

PACEdge Upgrade

For detailed instructions on how to upgrade PACEdge, please consult the PACEdge Important Product Information (GFK-3198) and the PACEdge User Manual (GFK-3178).

Release History

CPE400

Catalog Number[1] [2]	Date	Firmware Version (Build Number)			
		Field Upgradeable Elements			
		PAC Systems	FPGA[3]	CPLD	ACC403 EP Base
IC695CPE400-ADBA	May 2023	10.85 (ELTH)	02.03.00	02.03.07	
IC695CPE400-ADBA	Nov 2022	10.70 (EKPX)	02.03.00	02.03.06	3.03
IC695CPE400-ADBA	Sep 2022	10.70 (EKPX)	02.03.00	02.03.06	3.03
IC695CPE400-ADBA	Aug 2022	10.30 (EJYQ)	02.03.00	02.03.06	3.03
IC695CPE400-ACBA[2]	Jul 2022	10.30 (EJYQ)	02.03.00	02.03.06	3.03
IC695CPE400-ACBA	Aug 2021	10.15 (EGX2)	02.03.00	02.03.06	3.03
IC695CPE400-ACAU	May-2021	10.15 (EGX2)	02.03.00	02.03.06	3.03
IC695CPE400-ACAT	Jan 2021	10.10 (EG67)	02.03.00	02.03.06	3.03
IC695CPE400-ACAS	Jun 2020	10.05 (EEJN)	02.03.00	02.03.06	3.03
IC695CPE400-ACAR	Apr 2020	10.00 (EDNT)	02.03.00	02.03.06	3.03
IC695CPE400-ACAQ	Feb 2020	9.99 (EDAL)	02.03.00	02.03.06	3.03
IC695CPE400-ACAP	Dec 2019	9.97 (ECZ4)	02.03.00	02.03.06	3.03
IC695CPE400-ACAN	Nov 2019	9.95 (ECNH)	02.03.00	02.03.03	3.03
IC695CPE400-ACAM	Sep 2019	9.90 (EC93)	02.03.00	02.03.03	3.03
IC695CPE400-ABAL	Mar 2019	9.75 (EB8A)	02.03.00	02.03.03	3.03
IC695CPE400-ABAK	Dec 2018	9.70 (EAKR)	02.03.00	02.03.03	3.03
IC695CPE400-ABAJ	Aug 2018	9.55 (EA1Y)	02.03.00	02.03.03	3.03
IC695CPE400-ABAH	Jul 2018	9.40 (E91K)	02.03.00	02.02.00	3.03

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[3] *Prior to version 9.20, only the last two digits of the FPGA version were displayed on the Firmware Update Web Page. For example, if the FPGA version were 2.2.0, the web page would display 2.00. This issue was resolved in version 9.20 and later.*

Catalog Number[1][2]	Date	Firmware Version (Build Number)			
		Field Upgradeable Elements			
		PAC Systems	FPGA[3]	CPLD	ACC403 EP Base
IC695CPE400-ABAG	Feb 2018	9.40 (E91K)	02.03.00	02.02.00	3.03
IC695CPE400-ABAF	Oct 2017	9.30 (E8JL)	02.03.00	02.02.00	3.03
IC695CPE400-ABAE	Jul 2017	9.20[4] (E7QB)	02.02.00	02.02.00	3.03
IC695CPE400-ABAC	Apr 2017	9.20[4] (E7QB)	02.02.00	02.02.00	3.03
IC695CPE400-ABAB	Jan 2017	9.00 (E79S)	02.02.00	02.02.00	3.03
IC695CPE400-AAAA	Dec 2016	9.00 (E79S)	02.02.00	02.02.00	3.03

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[4] *The CPE400's PACSystems Runtime is Achilles Level 2 certified in R9.20.*

CPL410

Catalog Number[12]	Date	Firmware Version (Build Number)			
		Field Upgradeable Elements			
		PAC Systems	FPGA	CPLD	ACC403 EP Base
IC695CPL410-ACAN	May 2023	10.85 (ELTH)	02.03.00	02.03.07	3.03
IC695CPL410-ACAN	Nov 2022	10.70 (EKPX)	02.03.00	02.03.06	3.03
IC695CPL410-ACAN	Sep 2022	10.70 (EKPX)	02.03.00	02.03.06	3.03
IC695CPL410-ACAN	Jul 2022	10.30 (EJYQ)	02.03.00	02.03.06	3.03
IC695CPL410-ABAN[2]	Jul 2022	10.30 (EJYQ)	02.03.00	02.03.06	3.03
IC695CPL410-ABAN	Aug 2021	10.15 (EGX2)	02.03.00	02.03.06	3.03
IC695CPL410-ABAM	May 2021	10.15 (EGX2)	02.03.00	02.03.06	3.03
IC695CPL410-ABAL	Jan 2021	10.10 (EG67)	02.03.00	02.03.06	3.03
IC695CPL410-ABAK	June 2020	10.05 (EEJN)	02.03.00	02.03.06	3.03
IC695CPL410-ABAJ	Apr 2020	10.00 (EDNT)	02.03.00	02.03.06	3.03
IC695CPL410-ABAH	Feb 2020	9.99 (EDAL)	02.03.00	02.03.06	3.03
IC695CPL410-ABAG	Dec 2019	9.97 (ECZ4)	02.03.00	02.03.06	3.03
IC695CPL410-ABAF	Nov 2019	9.95 (ECNH)	02.03.00	02.03.03	3.03
IC695CPL410-ABAE	Sep 2019	9.90 (EC93)	02.03.00	02.03.03	3.03
IC695CPL410-AAAC	Mar 2019	9.75 (EB8A)	02.03.00	02.03.03	3.03
IC695CPL410-AAAB	Dec 2018	9.70 (EAKR)	02.03.00	02.03.03	3.03
IC695CPL410-AAAA	Aug 2018	9.55 (EA1Y)	02.03.00	02.03.03	3.03

RX3i PLC: Functional Compatibility

Compatibility Issue	Description	
	Feature	Minimum Version of PME Required
PAC Machine Edition Logic Developer PLC Programmer Version Requirements	Run Mode Store (RMS) to User Flash and %S53, %S54, & %S55	PACSystems RX3i CPU firmware revision 10.85 (or later). PAC Machine Edition 10.2 (or later) to configure Run Mode Store (RMS) to User Flash and view the new S bits.
	IC695CMM002/CMM004 Serial Module Support in the IC695PNS001 Bxxx/PNS101 and IC695CEP001 PROFINET Scanners	PACSystems RX3i CPUs with firmware revision 10.30 (or later) support IC695CMM002/CMM004 Serial Modules in the IC695PNS001 Bxxx/PNS101 and IC695CEP001 when configured using PAC Machine Edition 10.00. (or later)
	Legacy Client/Server Protocol Memory Access	PACSystems RX3i CPUs with firmware revision 10.30 (or later) support Legacy Client/Server Protocol Memory Access when configured using PAC Machine Edition 10.00. (or later)
	IC695CPL410 Increased PROFINET Device Support	PAC Machine Edition 9.80 SIM 7 or later is required to configure a CPL410 with up to 64 (simplex) or 32 (Hot Standby Redundancy) PROFINET I/O devices.

Compatibility Issue	Description		
	OPC UA Non-Transparent Server Redundancy	PACSystems Hot Standby Redundancy RX3i CPUs with firmware revision 10.10 or later support OPC UA Non-Transparent Server Redundancy when configured using PAC Machine Edition 9.80 SIM 5 or later.	
	OPC UA Server Logging	PACSystems RX3i CPUs with firmware revision 10.10 or later support OPC UA Server Logging when configured using PAC Machine Edition 9.80 SIM 5 or later.	
	Sequence of Events with IRIG-B	PAC Machine Edition Logic Developer PLC 9.80 SIM 5 or later is required to use Sequence of Events recording with IRIG-B time synchronization.	
	Produce EGD on Redundant IP	PAC Machine Edition Logic Developer PLC 9.50 SIM 20, 9.70 SIM 2, 9.80 SIM 2, or later is required to support EGD Production with the Redundant IP address.	
	DNP3 Outstation Configuration	PAC Machine Edition Logic Developer PLC 9.70 or later is required to support DNP3 Outstation Configuration	
	OPC UA Management and Security Provisioning	PAC Machine Edition Logic Developer PLC 9.50 SIM 16 or later is required to support OPC UA Secure (Encrypted) Connection provisioning.	
	Increased Program Block Count	PAC Machine Edition Logic Developer PLC 9.50 SIM 13 and PACSystems PLC Firmware R9.70, or later are required to support user programs with more than 512 blocks, up to a maximum of 768 blocks.	
	CPE400 Hot Standby Redundancy with PROFINET® IO.	PME 9.50 SIM 5, or later is required for the configuration of Hot Standby Redundancy with PROFINET IO.	
	CPE400 functionality including Embedded Simplex PROFINET I/O Controller	PME 9.00 SIM 8 or later is required for native configuration support of the CPE400.	
	SNTP Client Configuration	PME 9.00 SIM 10, or 9.50 SIM 2, or later	
	CPL410 Configuration	PME 9.50 SIM 10 or later	
Backward Compatibility	To convert an existing project which uses any other PLC, use the *Family Conversion* feature in PME. Be aware of the constraints involved, as will be notified in PME. For instance, the first PROFINET Controller in an RX3i CPU320 application will be assigned to the embedded PROFINET Controller feature of the CPE400 or CPL410.		
C Toolkit Compatibility	*Feature*	*Supported C Toolkit Versions*	*Note:*
	The CPE400/CPL410 support 64-bit C blocks compiled with the C Toolkit Version 8.00 or later. All pre-existing C blocks must be recompiled as a 64-bit C block before downloading to the CPE400 or CPL410.	8.00 or 9.00 and higher	The Series 90 Toolkit (IC641SWP709/719) is not compatible with PACSystems.
	The function PLCC_get_plc_version() will return a new value for the PLC_version_info->model when a toolkit app runs on the CPL410. It is 0x002C (44). The CPE400 will continue to return 0x0026 (38).		

Compatibility Issue	Description				
	Feature	*Minimum CPE400 Version*	*Minimum CPL410 Version*	*Minimum 3iPNS Version*	*Minimum CEP001 Version*
PROFINET IO Compatibility	IC695CMM002/CMM004 Serial Module Support in the IC695PNS001-Bxxx/PNS101 and IC695CEP001	10.30	10.30	3.35 (-Bxxx hw and PNS101)	2.80
	Increased PROFINET Device Support (up to 64 simplex or 32 Hot Standby Redundancy)	N/A	10.15	N/A	N/A
	SVC_REQ 20 Read Extended IO Fault Table with Remote Fault Record	9.40	9.40	N/A	N/A
	Remote Get HART Device Information COMMREQ	9.00	9.00	2.41	2.60
	Extended PROFINET Subslot Numbers	9.00	9.00	N/A	N/A
	Redundantly controlled PROFINET IO (20 Hot Standby Redundancy)	9.30	9.30	2.00	N/A
	32 Simplex (non-redundantly controlled) PROFINET IO	9.00	9.00	N/A	N/A
Hot Standby Redundancy	CPE400 firmware release 9.30 and CPL410 release 9.55 support Hot Standby Redundancy with PROFINET IO. Hot Standby Redundancy with Genius IO is supported using the IC695GCG001 RX3i Genius Communications Gateway. Hot Standby Redundancy with Ethernet Global Data (EGD) is not supported.				
LAN3 restriction	LAN3 is used only to synchronize the Primary and Secondary CPUs in a Hot Standby Redundancy configuration. No additional hardware may be attached to LAN3. Use of both ports is recommended when used in this fashion, as this provides a redundant synchronization link between the two CPUs.				
Redundant IP Support	CPE400 firmware release 9.30 and CPL410 release 9.55 support two independent Redundant IP addresses, one for LAN 1 and one for LAN 2. LAN 2 Redundant IP is supported when configured for Ethernet mode only. Redundant IP is supported by the SRTP Server, Modbus TCP Server, and EGD protocols. It is not possible to use Redundant IP with the OPC UA Server or with the Ethernet firmware update web page.				
Ethernet AUP File Support	The CPE400 and CPL410 do not support Advanced User Parameter (AUP) files for their Embedded Ethernet interfaces. Instead, use PAC Machine Edition to set the Ethernet configuration parameters for SNTP and advanced Ethernet Global Data applications.				
Service Request 56 & 57 Logic Driven Read/Write to Flash Support	The IC695ACC403 Energy Pack automatically saves user memory to nonvolatile storage when the CPE400/CPL410 is powered off and restores it to RAM when the CPE400/CPL410 is turned on. Consequently, the CPE400 and CPL410 do not support Service Requests 56 & 57 Logic Driven Read/Write to Flash. The service request function block's ENO output returns no power flow if these service requests are executed. Whenever an RX3i application that uses service requests 56 & 57 is being migrated to a CPE400 or CPL410, an IC695ACC403 Energy Pack should be used to provide equivalent functionality, since the service requests themselves will have no effect and should ideally be removed.				

Compatibility Issue	Description
HART® Pass Through	CPE400 supports HART pass-through. HART Pass Through entails the usage of PC-based applications, RX3i Analog modules with HART functionality, and (optionally) supporting PROFINET products. HART Pass Through operation is described in the *PACSystems HART Pass Through User Manual*, GFK-2929.
Embedded PROFINET Controller HART Pass-Through Support	HART Pass-Through is supported on all versions of the CPE400 and CPL410 with PACSystems HART Device Type Manager v1.1 and PACSystems HART Multiplexer v1.1.
Remote Get HART Device Information COMMREQ	The Remote Get HART Device Information COMMREQ is supported by these products: • RX3i CPUs with version 8.95 or later (which includes all versions of CPE400) • IC695PNC001 RX3i PROFINET Controller version 2.26 or later • IC695PNS001 RX3i PROFINET Scanner version 2.41 or later • IC695PNS001 RX3i PROFINET Scanner GSDML-V2.3-GEIP-RX3iPNS-20160602.xml
Supported Browsers for Firmware Update	The CPE400 and CPL410 support secure firmware updates over Ethernet using a web browser. Supported browsers are listed below along with the minimum required version: • Chrome: 62.0.3202.94 (or later) • Firefox: 57.0.2 (or later) • Microsoft Edge 38.14393.1066.0 (or later) • Safari: 11.0.2 (12604.4.7.1.6) (or later)
CIMPLICITY® OPC UA Client	PACSystems OPC UA servers support up to five concurrent sessions with up to ten concurrent variable subscriptions and up to 12,500 variables. The subscription limit is shared across all available sessions. When using CIMPLICITY OPC UA Client, ensure the total number of subscriptions does not exceed the maximum. CIMPLICITY OPC UA Client is configured to create one subscription for every 500 items by default. If, for example, a project contains 1000 monitored items, CIMPLICITY creates two subscriptions. The number of items per subscription may be modified from the Device Configuration Panel / OPC UA DA Configuration / Subscriptions / Max. Number of Monitored Items.

Compatibility Issue	Description
PACSystems Energy Pack Compatibility	The only energy pack compatible with the IC695CPE400 and CPL410 is the IC695ACC403. The CPE400 and CPL410 are not compatible with the ICRXIACCEPK01 RXi Controller Energy Pack, the IC695ACC400 CPE305/310 Energy Pack, or the IC695ACC402 CPE330 Energy Pack. • It is not possible to connect the CPE400/CPL410 and the IC695ACC400 CPE305/310 Energy Pack together. • It is possible to connect the ICRXIACCCPK01A RXi Capacitor Pack to the IC695ACC403 Energy Pack Base. If this occurs, the capacitor pack operates normally. • It is possible to connect the IC695ACC403 CPE400/CPL410 Energy Pack and IC695ACC413 Capacitor Pack to an ICRXICTL000 controller. If this occurs no errors are logged however user memory may not be preserved under all conditions **Do not use the CPE400 Energy Pack or Capacitor Pack with the RXi Controller.** • It is physically possible to connect the IC695ACC403 CPE400/CPL410 Energy Pack to an IC695CPE330 controller. If this occurs, no errors are logged. However, it will not allow any future firmware updates to the ACC403 Energy Pack. **Do not use the ACC403 Energy Pack with the RX3i CPE330 Controller.** • It is physically possible to connect the IC695ACC402 CPE330 Energy Pack and IC695ACC412 Capacitor Pack to an IC695CPE400 or CPL410 controller. If this occurs no errors are logged. However, it will not allow any future firmware updates to the ACC402 and the capacitors will reach their end-of-life threshold faster than the RX3i Capacitor Pack IC695ACC413. **Do not use the ACC402 Energy Pack or ACC412 Capacitor Pack with the RX3i CPE400 or CPL410 Controller.** • It is physically possible to connect the ICRXIACCEPK01A RXi Energy Pack to an IC695CPE400 or CPL410 controller. If this occurs no errors are logged. However, it will not allow any future firmware updates to the EPK01A and user memory may not be preserved under all conditions. **Do not use the EPK01A RXi Energy Pack with the RX3i CPE400 or CPL410 Controller.**
Ethernet Station Manager Compatibility	Ethernet Station Manager Utility Version 1.3 Build 2 or later is recommended for use with the CPE400 and CPL410. Earlier versions are compatible; however, they may not display all the Ethernet parameters after issuing a *parm all* command. Should this issue occur, pressing *enter*, or issuing another command will cause the station manager to display the remaining parameters.
Set Temporary IP Address not supported	Since the configured IP Addresses may be viewed using the CPE400/CPL410 OLED display, the Set Temporary IP Address tool in PME is not required for CPE400/CPL410 and is therefore not supported for CPE400 and CPL410.
RDSD Support	RDSD support using a USB memory stick or a micro SD card is not available with the current release.
Supported Primary and Secondary CPUs	The Primary and Secondary CPUs in a redundant system must be the same model. For example, two CPE400s may be paired together as the Primary and Secondary CPUs. Likewise, two CPL410s may be paired together. Pairing CPE400 and CPL410 as Primary and Secondary CPUs in a redundant system is not permitted.
Display Port is not operational	The Display port, located on the underside of the CPE400 and CPL410 is not operational.
USB Ports	The CPE400's left USB port is assigned to PACEdge. The right USB port is reserved. The CPL410's left USB port is assigned to PACEdge. The right USB port is reserved.
Micro SD Card	The Micro SD Card Slot is reserved and not available for use.
Serial IO Protocol	Serial IO Protocol is supported on the CPE400 effective with firmware release 9.40 and the CPL410 effective with release 9.55.

Compatibility Issue	Description
Cimplicity and RX3i Subscription Size Incompatibility	The RX3i OPC UA server supports up to 10 subscriptions with up to 12,500 monitored items each. Cimplicity OPC UA driver supports an unlimited number of subscriptions with a default limit of 500 monitored items per subscription, and a hard limit of 32,767 bits of data in a subscription. This means that it is not possible to subscribe to all 12,500 variables of the RX3i PLC with a Cimplicity HMI. The effective monitored item limit in Cimplicity is dependent on the size of the data being subscribed to. Other OPC UA clients with a larger monitored item per subscription limit can subscribe to the entire address space of variables, such as UA Expert.
Network and Memory Performance Monitor PACS Analyzer Requirements	PACSystems RX3i CPUs with firmware revision 10.05 or later support Network and Memory Performance Monitoring when used with PACS Analyzer version 4.3 or later.

Sequence of Events with IRIG-B	Sequence of Events recording with IRIG-B time synchronization is available when used with these SoE-enabled components:
	• Support for up to four IC695PNS101 Advanced PROFINET Scanner modules
	   o IC695CPE400/IC695CPL410 Release 10.10 or later
	   o IC695PNS101 Release 3.26 and GSDML-V2.3-IntelligentPlatformsLLC-RX3iPNS-20191010.xml or later
	• Support for up to five IC695PNS101 Advanced PROFINET Scanner modules
	   o IC695CPE400/IC695CPL410 Release 10.15 or later
	   o IC695PNS101 Release 3.30 and GSDML-V2.3-IntelligentPlatformsLLC-RX3iPNS-20191010.xml or later
	• SoE_App C Block version 1.08 or later
	• Irig_Diag C Block version 1.00 or later
	• UDT IRIG_DIAG_DATA.UDT (no version)

Field Agent Support	The CPE400 Embedded Field Agent is no longer supported beginning with firmware release 10.15. The Embedded Field Agent will not function after upgrading to this release. Downgrading a CP400 with release 10.15 to an earlier firmware version does not re-enable Field Agent Support.

PACEdge: Functional Compatibility

Note: For a complete list of PACEdge functional Compatibility, please consult GFK-3198, PACEdge Important Product Information.

RX3i PLC: Problems Resolved in Current Release

Subject	ID code	Description
Cyber Security Updates	DE9500 DE9617 SFDC 02002236	Added security enhancements to harden the product against a malicious actor.

Subject	ID code	Description
Clear All clears PLC_BAT and masks Energy Pack failures	DE715	A Clear All operation clears the values of all %S bits. After this operation, the PLC_BAT status bit value might not reflect the actual status of the Energy Pack. For example, an Energy Pack in a failed state before the Clear All operation will remain in the failed state after the Clear All operation has completed. However, the PLC_BAT status bit will then indicate a good state. This has been fixed.

PACEdge: Problems Resolved in Current Release

Note: For a complete list of PACEdge Problems resolved in current release, please consult GFK-3198, PACEdge Important Product Information.

RX3i PLC: Restrictions and Open Issues
CPE400 & CPL410 CPUs & Embedded Ethernet

Open Issue	ID code	Description
Firmware Update Login Timeout	DE196 DE205 DE2626	The CPU enforces a 2-minute login activity timeout on the *Firmware Update* web page. Selecting an update package on the *Firmware Update* page and pressing the *Upload File* button after the timer expires initiates a firmware update. However, instead of displaying the firmware update status, one of these scenarios may occur: • Another login page is presented. After entering the user name and password the update status is displayed. • The web browser loses connection with the CPE400 and is unable to display the update status because the CPU is automatically resetting while applying the firmware update. After the reset completes, pressing the refresh button in the browser shows the installed firmware version. • An error message is displayed indicating the firmware update was not successful however, returning to the firmware update home page shows that the new firmware version was installed. These timeout issues may be avoided by having the firmware file ready so that the firmware update can be initiated immediately after logging in.
Running applications with fatal faults from flash	DE86	If an application that generates a fatal fault (such as a watchdog timeout) is stored to flash, the controller is configured to power up from flash and go to RUN, and the RUN/STOP switch is disabled, the application may become stuck in an endless loop. (Power-up from flash, go to RUN, watchdog timeout, repeat.) It is recommended that users thoroughly test their application before writing it to flash and disabling the RUN/STOP switch. RX3i CPUs that experience this issue must be returned to Emerson Automation Solutions for repair.
Using OEM Passwords with Enhanced Security Disabled	DE755	Single-character OEM passwords are not supported when enhanced security is disabled.
PME cannot display reference tables with Enhanced Security Enabled and OEM Locked	DE781	When Enhanced Security is enabled, and OEM protection is engaged, only reference areas specified within the Access Control List can be viewed by a programmer, or HMI, regardless of privilege level. For example, if viewing %R memory from words 1 to 400 then the Access Control List must include read access to %R words 1 to 400. A custom reference view table with smaller reference sizes may also be used.
Controller Communication Window Timer settings below 10 ms are ignored	DE845	Normal sweep allows the configuration of the Controller Communications Window Timer for Limited operation and a time range from 0 to 255 ms (default 10 ms). However, the system is currently ignoring settings in the 0 to 9 ms range which results in an effective window time of 10 ms for this configuration range. This means a sweep impact of up to 10 ms may occur for some complex Controller Communication Window operations. If this operation is undesired then it is recommended to use a different sweep mode, such as Constant Sweep or Constant Window.
Dual Hardware Configuration Not Created When Uploading Redundant CPE400/CPL410 Application	DE3052	A dual hardware configuration is not automatically created in PME when uploading a redundant CPE400/CPL410 application. Before uploading the primary application, dual hardware configuration must be manually enabled by setting the CPE400 or CPL410's *Enable Redundancy* target property to *True*. The secondary application may then be uploaded.

Open Issue	ID code	Description
Memory Not Preserved After Turning CPE400/CPL410 Off with Power Button	DE3975	The CPE400 and CPL410 do not preserve user memory when the *Power Button* is used to turn the CPU off while an energy pack is connected. At this time, it is recommended to turn off power to the circuit powering either the CPE400 / CPL410 or its associated Energy Pack to allow for orderly shutdown procedures to occur.
Multibit ECC Memory Error Causes Hardware Watchdog	DE4181	The CPE400 and CPL410's hardware watchdog timer expires and the CPU reboots into STOP HALT mode if an uncorrectable (multi-bit) ECC memory error is detected. Correctable (single-bit) errors are automatically repaired as expected. No ECC memory faults are logged in the fault table whenever either occurs.
Sequence Store Failure Downloading Redundant Hardware Configuration	DE4254	It is possible to download a redundant hardware configuration with a non-zero %W transfer list length to a CPE400 or CPL410 which has no %W memory configured. The downloaded configuration is not valid since no %W memory is configured, so none should be allowed in the transfer list. If this occurs, the CPU enters STOP / FAULT Mode and a Sequence Store Failure is listed in the PLC Fault Table. PAC Machine Edition's Feedback Zone shows Error 8097: Controller Error - Controller program reference exceeds configured reference [0x05][0x90] [0x80310015] This issue may be resolved by correcting the hardware configuration to either remove %W memory from the transfer list or allocate %W memory in the CPU corresponding to the length configured in the transfer list. Once corrected, place the CPE400 or CPL410 into STOP / NOIO Mode by clearing the *PLC Fault Table* and downloading the hardware configuration again.
Run Mode Store of EGD Causes Sequence Store Failure & CPU Software Event Faults	DE4130 SFDC 00406176	Performing a RUN Mode Store of a project where the total number of variables in EGD exchanges is near the maximum of 30,000 may result in a Controller Sequence Store Failure (Group: 137; Error Code 4) and CPU Software Event fault. (Group: 140; Error Code 145) If this occurs, the project may be successfully downloaded while the controller is in STOP Mode.
SRTP and Modbus TCP Client Retries	DE5687	SRTP and Modbus TCP Client COMMREQs may require multiple TCP retries to establish a connection when a gateway is configured on both LAN 1 and LAN 2. Once a TCP connection is established, client operations proceed normally. Client communications occur without multiple retries if only one of the LANs has a gateway configured or if there are no gateways configured.
PLC Fault Table Empty After Restart Due to Fatal Error	DE6573	PAC Machine Edition may not display any faults in the PLC fault table if it is connected to a controller when it encounters a fatal error that results in an automatic restart. (STOP/HALT) Should this occur, the fault table is empty and the PME Fault Table Viewer indicates zero faults out of X number of faults displayed. (EX: Displaying 0 of 11 faults, 11 Overflowed) Closing and re-opening the PME Fault Table View displays the faults correctly.
PLC Fault Table Faults Not Shown in Chronological Order	DE6574	Faults in the PLC Fault Table may not be listed in chronological order following an automatic controller restart due to a fatal error.

Open Issue	ID code	Description
PME Error Programmer already attached	DE8016	When connected to a target, there is a field called the request timeout, which can be up to 240s. If you are connected to PME via a LAN2 port, and you remove the ethernet cable and then re-attach it to a LAN2 port, reconnect to PME, and try to enter programmer mode, the operation will fail. To enter programmer mode, you must wait for the request timeout amount of time to be able to enter programmer mode. You will see the following error in PME when trying to enter the programmer before the request timeout has expired: Error 8085: Programmer already attached [{PC name}\{user name}] To recover, you can wait for the request timeout amount of time, or you can restart the PLC. To avoid this issue, make sure you press "Disconnect" before removing the ethernet cable from the LAN2 port, or else, you will have to wait for the configured request timeout before you can re-enter the programmer mode.
OPC UA Server Non-Transparent Redundancy ApplicationDescriptions for Remote ServerURI Not Available On Local FindServers Request	DE8313	The OPC UA Server in PACSystems controllers with firmware versions 10.10 and later, on controllers that are configured for OPC UA Non-Transparent Redundancy (IC695CPE330, IC695CPE400, and IC695CPL410) and in a redundant server pair, do not populate the information necessary to automatically connect to the remote OPC UA server using the built-in OPC UA FindServers service. If configuring an OPC UA Client for Non-Transparent Redundancy to communicate with the PACSystems OPC UA servers on a redundant system, the DiscoveryURLs for both servers must manually be configured into the OPC UA Client. The default method of configuration with Cimplicity software is to manually configure both DiscoveryURLs for local and remote redundant servers and is not impacted by this defect. Some OPC UA clients may not offer manual configuration of both DiscoveryURLs and will have a compatibility issue when configuring for OPC UA Non-Transparent Redundancy with a PACSystems OPC UA server.
Failure To Publish All Expected Variables to OPC UA Address Space	DE9888 SFDC02016781	Variables with their "Publish" property set to "Internal" are incorrectly counted against the CPU's OPC UA address space limit but not actually published. This causes some variables with their "Publish" property set to "External Read/Write" or "External Read-Only" to not be present the OPC UA address space. If variables do not have their "Publish" property set to "Internal", or if an internally published variable comes alphabetically after any externally published variables, then this issue does not occur.
Incorrect Data for "Application Information" Variable "Address Space Status" in OPC UA Address Space	DE9900	In the OPC UA address space folder "Application Information" the "Address Space Status" can incorrectly state that "All Elements Published to Address Space" when they were not. This may occur when the total number of internal and external published variables exceeds the externally published variable limit for the controller.
OPC UA Server Sessions May Not Expire Correctly When PLC Clock Set to Date Prior to Year 2010	DE9942 SFDC02004019	If the PLC Clock is set to a day prior to the year 2010, the OPC UA server will negotiate session timeouts during session creation, but if the attached OPC UA client stops responding to the OPC UA protocol the session timeout will not be enforced, consuming a session incorrectly. Restarting the OPC UA server will reclaim the abandoned sessions. If the PLC clock is set to any date in the year 2010 or later, including the correct time/date, the problem will not occur.

Open Issue	ID code	Description
Ethernet COMMREQs not always delivered on the first logic sweep	ISS183540	In certain instances, where User Logic is of sufficient size and a COMMREQ is issued on the first logic sweep, a race condition exists between the determination of the CPU Run/Stop state and logic-driven issuance of a COMRREQ which may cause the COMMREQ to be aborted before its transmission is attempted. To the user, it would appear as if the COMMREQ was never issued. The condition is much more observable on COMMREQs issued from the CPU's embedded Ethernet port. To avoid the possibility of encountering this condition, users should avoid issuing COMMREQs on the first logic sweep.
Ethernet Disconnect During Word-for-Word Change	CR-2234	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 since it thinks another programmer is currently attached. To correct the issue, go offline and then back online again.
Simultaneous Clears, Loads, and Stores Not Supported	CR-3118 CR-3300	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 PLC are allowed.
Hardware Configuration Not Equal After Changing Target Name	CR-3181	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.
PLC and IO Fault Tables May Need to be Cleared Twice to Clear Faulted State	CR-3191	Both PLC 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	CR-3317	Once a *Force On* or *Force Off* has been stored in the PLC, 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 *Force Off* by another download.
Second programmer can change logic while in Test & Edit mode	CR-4223	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 PLC.
Must have Logic if Powering up from Flash	CR-4633	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.
Extended Memory Types for IO Triggers	CR-5952 CR-6319	%R, %W, and %M cannot be used as IO triggers.
Possible PME inability to connect	CR-6067	Infrequently, an attempt to connect a programmer to a PLC 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.
Do not attempt to store logic and configuration to a PLC from multiple targets	CR-6450	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, PME reports hardware configuration and logic are *not equal*.

Open Issue	ID code	Description
Sequence Store Failure	CR-6586 ISS176888	When downloading projects with very large hardware configurations or which use large amounts of user memory, it is possible to encounter a *PLC Sequence Store Failure* error when writing the project to flash. To work around this error, either or both of the following actions may be helpful: 1. Perform an explicit clear of flash before performing the write. 2. Increase the operation timeout used by PME before performing the write. This is done by expanding the Additional Configuration in the Inspector window for the target controller and adjusting the Request Timeout. The timeout may need to be increased to as much as 60000 ms, depending on the amount of memory used and the condition of the flash memory.
C Toolkit PlcMemCopy Documentation Incorrect	CR-7082	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.
Logic and HWC are not equal after the power cycle	ISS168431	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*, are 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 re-store the Logic and Hardware Config from Target 2.
Multiple Log Events	CR-2014	The Ethernet Interface sometimes generates multiple exception log events and PLC Fault Table entries when a single error condition occurs. Under repetitive error conditions, the exception log and/or PLC Fault Table can be filled with repetitive error messages.
Spurious Ethernet Fault	CR-4104	In rare instances, after the power cycle, the Ethernet Interface may log the following fault, Event = 28H, Entry 2 = 000eH. This fault can be safely ignored.
Clear of large hardware configurations may cause log event 08/20	CR-6577	A Log event 08/20 may occur when very large hardware configurations are cleared, and transfers are active on other Server connections. This log event can be safely ignored.
PLC response timeout errors (8/08) in Ethernet exception log under extremely heavy SRTP traffic	ISS010006	Under extremely heavy SRTP traffic conditions, the Ethernet Interface may log an event in the Ethernet exception log (Event 8, Entry 2 = 08H) indicating an overload condition. This error terminates the SRTP connection. If this event appears, either the traffic load should be reduced, or the application should use an alternate communications method to verify that critical data transfers were not lost due to the overload.
SRTP channel transfers may take up to 20 seconds after the power cycle	ISS155214	When SRTP communications are interrupted by a power cycle, the Ethernet interface may require up to 20 seconds to re-establish the TCP connection used for SRTP communications.
Intermittent Ethernet log event 8H/15H after power cycle	ISS163056	When starting after a power cycle, the Ethernet Interface may intermittently log an exception (entry 8H, Entry 2 = 15H, Entry 3 = 0000H, Entry 4 = 00aaH). This exception is benign and may be ignored.
Station Manager *parm* command help text is wrong	ISS181788	Although the *parm v* Station Manager command works correctly, the "v" subsystem code (SRTP server) is not shown as supported by the online help.

CPE400 & CPL410 Embedded PROFINET Controller Restrictions & Open Issues:

Open Issue	ID code	Description
IP Address changes to Embedded PROFINET Controller may cause Loss of Communications with PNS & GCG	DE3423	Downloading a new hardware configuration with a different IP Address for the CPU's embedded PROFINET interface to a CPU that already has a PROFINET configuration may cause configured PNSs and GCGs to disconnect from the embedded PROFINET interface. (This issue is observed when using both PME 8.6 SIM 12/13 and PME 9.0 SIM 4.) If this issue occurs, disconnect PME from the CPU, remove the Energy Pack if one is attached to the CPU, and cycle power to the main rack. Then reconnect PME and download the hardware configuration again.
Embedded PROFINET Controller indicates premature MRP Ring closure and logs extra Ring Closed/Ring Open faults when network cable reconnected	DE1461	Two scenarios can cause the Embedded PROFINET Controller to indicate that an MRP Ring is closed when in fact it is still open. The scenarios are: 1. When either an RX3i PNS or PROFINET Controller that participates in the MRP ring as an MRP Client communicating via Copper or Fiber SFPs is powered-up in the MRP ring, extra Ring Closed/Ring Open faults are logged in the I/O fault table. A Ring Closed fault occurs during the initial stage of the PNS/PNC power-up, followed by a Ring Open fault in the middle of the PNS/PNC power-up sequence, and finally a Ring Closed fault occurs when the PNS/PNC completes the power-up (OK LED on). 2. When the first of two MRP ring breaks is restored, extra Ring Closed/Ring Open faults are logged in the I/O fault table. Upon restoration of the first ring break, a Ring Closed fault occurs, followed by a Ring Open fault. Then upon restoration of the second ring break, a final Ring Closed fault occurs. The duration between faults is a function of the PNC's configured MRP Default Test Interval and Test Monitoring Count. When either of the two scenarios is invoked, the user sees extra Ring Closed/Ring Open faults in the IO Fault Table. The extra Ring Closed/Ring Open fault may be ignored.
STXPNS001 Firmware revision is not displayed correctly when viewed using PME PROFINET Explorer	DE568 ISS182843	Firmware revision information for the STXPNS001 does not display correctly using PAC Machine Edition. The correct firmware revision information can be viewed on the module using HyperTerminal.
Loss of IOC and *Backplane Communications* Faults after Clearing Hardware Configuration with Mismatched STXPNS001 Configuration	DE569 ISS182293	Clearing the CPU's hardware configuration after downloading a mismatched RSTi STXPNS001 PROFINET Network Adapter configuration causes a Loss of IOC and Backplane communications with Controller fault; lost request fault to be recorded in the fault table. Communication with PAC Machine Edition is also lost. If this issue occurs, power cycle both the CPU and STXPNS001. (When power cycling the CPU, disconnect its energy pack if one is connected.) Then, correct the STXPNS001 hardware configuration in PME so that it matches the physical hardware in the IO node and download the updated hardware configuration to the CPU.
Loss of IO Device following hot insertion of mismatched VersaMax I/O module	DE579	In very rare cases, the hot insertion of a mismatched VersaMax I/O module (i.e., MDL650 is a slot configured for an MDL640) into the VersaMax PNS can cause a loss of connection between the PNS and the Embedded PROFINET Controller. No user action is required. When this behavior is seen, the Embedded PROFINET Controller will automatically re-connect to the VersaMax PNS.

Open Issue	ID code	Description
IOC SW Fault with large configurations	DE838	When storing a PROFINET configuration that is close to the upper limit of the CPU's user memory the store may fail with an IOC Software Fault logged in the I/O Fault Table. Clearing the PLC's existing Hardware Configuration (and I/O Fault Table if the controller is Faulted) before attempting the store should allow the store to succeed.
Breaking & reconnecting an MRP ring by pulling either of the 2 MRM ports causes extra ring open/close faults	DE1140	In some cases, if the network is broken and repaired at either of the two ring ports of a CPU configured to be the MRM, extra "I/O Bus Fault-Redundant Ethernet network ring broken (open)" and "I/O Bus Fault-Redundant Ethernet network ring okay (closed)" faults are logged in both the I/O Fault Table and the PROFINET Controller Local Log when the ring is repaired. These additional faults may safely be ignored as long as the last fault to be logged is the *I/O Bus Fault-Redundant Ethernet network ring okay (closed)*.
Unexpected Loss & Addition of Redundant PROFINET Device	DE4239	The Primary CPE400 or CPL410 in a redundant system may log *Loss & Addition of Device* faults for its PROFINET IO if it is in *STOP* Mode when the Secondary is unit powered *ON* and configured to go to *RUN* Mode on power-up. Should this issue occur, the Primary unit may be placed in *RUN* Mode to resume synchronization with the Secondary unit and become the Backup controller.
INFO CPU SOFTWR – CPU Software Event Fault	DE3792	Rarely, a CPE330, CPE400, or CPL410 may log an INFO_CPU_SOFTWR – CPU software event fault. (Group140; Error 430; Extra Data 01 28 0a 91 80 4a 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00) Should this issue occur, the CPE400/CPL410 continues to run normally. No additional action is required, and the fault may be cleared from the fault table.
IC695CPL410 causes MRP ring break when MRP is disabled	DE9890	If a CPL410 is placed in an MRP ring with the Media Redundancy setting set to None, the ring MRM will indicate that it the ring is open because the CPL410 does not pass MRP traffic when MRP is disabled. The ring is not physically broken to any other traffic and the presence of the CPL410 will result in a closed loop and a network storm on the ring.
Unintended operation of PNIO DEV COMM function block	ISS181379	The power flow output of the PNIO_DEV_COMM function block provides validation of the input parameters and confirms that the Embedded PROFINET Controller has locally processed the configuration of the specified I/O Device. As currently implemented, the power flow output will not turn ON until after the Embedded PROFINET Controller has made its first attempt to connect to the specified I/O Device. Therefore, we recommend the user not rely on power flow output for parameter validation.

PACEdge Restrictions and Open Issues

For a complete list of restrictions and open issues, please consult GFK-3198, PACEdge Important Product Information.

Operational Notes: CPE400/CPL410 CPU & Embedded Ethernet

Operational Note	Description
Default IP Addresses for Embedded Ethernet	The IP Address of any CPE400/CPL410 LAN may be viewed via the OLED menu. The default IP Addresses programmed at the factory are: LAN1 LAN2 LAN3 IP Address: 192.168.0.100 10.10.0.100 N/A Subnet Mask: 255.255.255.0 255.255.255.0 N/A Gateway: 0.0.0.0 0.0.0.0 N/A
Connecting to the Embedded Ethernet when IP Addresses are not Known	If the IP addresses of the CPE400 or CPL410's embedded LAN 1 and LAN 2 Ethernet interfaces are not known, communication may be established by using the OLED display to read the currently configured IP addresses.
C Block support	C Programmer's Toolkit Rel 8.00 provides C Block support for the CPE400 and CPL410. To compile a project, use the command "compileCPACRX". This will create a .gefElf64 file in the plc directory. Add the .gefElf64 file to a CPE400/CPL410 project using the "Add C Block…" option. Existing 32-bit C blocks (.gefElf files) must be rebuilt as 64-bit for the CPE400 and CPL410. Once the rebuild is complete, simply update the block. To build C blocks for other RX3i products continue to use C Programmer's Toolkit Rel 7.10.
Unable to Download C Blocks	When downloading an application containing C Blocks to a CPE400 or CPL410, PME may display an error indicating that the CPE400/CPL410 does not support 32-bit C Blocks. This occurs even if the project validates successfully and all the C Blocks in the application are 64-bit. If this issue occurs, select *Clean Build Folders* from the *Target* ribbon and re-download to successfully store the application.
Ethernet Event Log not Preserved Across Power Cycle	The CPU's Ethernet event log for its embedded Ethernet interfaces is not maintained across a power cycle. Ethernet log events will be reported in the PLC Fault Table as with other RX3i CPUs. The PLC Fault Table entries will be preserved if an Energy Pack is attached.
Station Manager Commands	The CPU's embedded Ethernet interfaces support a subset of Station Manager Commands (monitor-only commands). Refer to *PACSystems TCP/IP Ethernet Communications Station Manager Manual,* GFK-2225, for details. Beginning with CPE400 R9.30, the *plcread* and *egdread* commands are no longer supported by the Ethernet Station Manager. (All versions of the CPL410 do not support these commands.) PAC Machine Edition may be used to read data in reference memory and EGD exchanges.
Power-up Time	The CPE400 and CPL410 power up as follows: - When an IC695ACC403 Energy Pack is not connected, the CPU requires approximately 75 seconds to complete power-up. When power is applied, all the Ethernet Port LEDs turn on and the status indicator LEDs on the front of the unit flash several times and turn off. Next, the PWR LED turns green, and the SSD LED flashes. After approximately 60 seconds, the Ethernet port LEDs flash and then indicate the port mode. The OE LED will turn on and then off. When power-up is complete, the OK LED turns on and the OE LED turns off. - When an energy pack is connected, the CPU requires up to 135 seconds to complete the power-up. The CPU's power-up sequence begins after the energy pack is fully charged. Charging may require up to 60 seconds depending on the capacitor pack's initial charge. (The energy pack's STAT LED blinks green while it is charging and turns solid green when charging is complete.)

Operational Note	Description
Insertion of Cap-Pack during Controller Power-up could cause Failed Battery Fault	If the Energy Pack is powered on without a Cap Pack and a Cap Pack is then inserted during the power-up of the CPU, the CPU could log a failed battery fault. The CPU expects the Energy Pack to report fully charged within a certain amount of time. This time limit may not be met if the Cap Pack is absent at power-up.
Avoid Overlapping IP Subnets when Configuring Embedded LAN IP Address and Subnet Mask	The CPU contains two LAN interfaces, each one supporting a unique IP Address. Care must be taken when assigning IP Addresses and subnet masks to each LAN so that an overlapping IP subnet is not created. Intermittent or no Ethernet communication may result if an overlapping IP subnet is created and the two interfaces are NOT connected (cabled) to the same physical network. By default, PME prohibits configuring both LAN interfaces on an overlapping IP subnet. (This may be changed by going to Controller General Options and changing the *Multiple Embedded LANs on the Same Subnet* to *Show as Warning*.)
Avoid Overlapping Remote IP Networks when Configuring Embedded LAN IP Addresses and Subnet Mask	The CPU contains multiple LAN interfaces, each one supporting a unique IP address. Care must be taken when assigning IP Addresses and subnet masks to each LAN so that each network does not overlap any remote subnets in the network infrastructure. Intermittent or no Ethernet communication may result if the local networks on the CPU overlap a remote subnet.
Embedded Ethernet Gateway Operation	The CPU allows the configuration of an Ethernet gateway on the Embedded LAN interfaces. Since the CPU contains two LAN interfaces, each one supporting a unique IP Address, only one gateway is active at a time: • If a gateway is configured on only one of the LAN interfaces and the other is not configured (0.0.0.0) then, the single gateway is shared by both interfaces. • If a gateway is configured on multiple LAN interfaces, then the LAN1 gateway is given priority over the LAN2 gateway as long as LAN1 is functional. If, for example, the LAN1 cable is disconnected then the CPU will use the LAN2 gateway as a backup.
Embedded Ethernet Protocols & Performance	The rackless CPUs have four independent Ethernet LANs with six auto-negotiating, full-duplex 10/100/1000 Ethernet Ports: LAN 1 & LAN 2 support two IP Addresses and the following protocols: • OPC UA Server with support for up to 5 concurrent sessions with up to 10 concurrent variable subscriptions and up to 12,500 variables • SRTP Server with support for up to 48 simultaneous connections • Modbus/TCP Server with support for up to 16 simultaneous server connections • SRTP and Modbus/TCP Client with support for up to 32 clients; each may be SRTP or Modbus/TCP • Ethernet Global Data (EGD) Class 1 LAN 3 is used to synchronize the Primary and Secondary CPUs in a Hot Standby Redundancy configuration. No other LAN devices are permitted on LAN 3 in this configuration. Use of both LAN 3 ports is recommended since this provides a redundant communications path between the two CPUs. Applications using Ethernet communication should be validated to ensure adequate throughput is available to meet the needs of the application.

Operational Note	Description
Multiple Consumptions of Multicast EGD Exchanges	If the Embedded LANs are physically connected to the same Ethernet network then any multicast EGD consumer exchanges may be consumed multiple times (once per each Ethernet interface) if the LAN interfaces use the same multicast IP addresses. These multiple consumptions occur because the CPU has more than one LAN interface and it is possible for the CPU to see duplicate multicast packets (one from each interface) and consume each. If this occurs, issuing a *stat g* station manager command shows that the multicast consumer exchange updates at a rate that is faster than the producer sends it. To avoid this issue, connect each Embedded LAN to physically separate Ethernet networks (i.e. no Ethernet switches in common).
PME Connection Lost After Configuration Download that Swaps IP Addresses Between LAN 1 & LAN 2	PAC Machine Edition may lose connection with a CPE400 or CPL410 that has PROFINET enabled on LAN 2 if a configuration that swaps the IP addresses between LAN 1 and LAN 2 is downloaded. Even though the connection is lost, the store operation completes successfully. Re-connecting using the newly configured IP addresses shows the hardware configuration and logic are equal.
LAN Interface Status Bits	The CPE400 and CPL410 use the same LAN Interface Status Bit definition as the IC695CPE330. Refer to Section 12.6 Monitoring the Ethernet Interface Status Bits in PACSystems RX3i and RSTi-EP TCP/IP Ethernet Communications User Manual, GFK-2224P (or later) for additional information.
Reserved IP Subnet 192.168.180.x	The IP subnet 192.168.180.x is reserved and is not available for configuration on any of the CPU's Ethernet ports.
OPC UA Server Start-up Time	The OPC UA server takes up to fifteen minutes to start if the server's configuration files and certificates need to be generated. This occurs the first time the server is started on a new CPU or after the server is cleared. While the OPC UA server is starting, the OPC UA *SERVER_STATUS* service request returns 0010h *OPC UA Server Starting*.
Modbus/TCP & SRTP Client COMMREQ Function Block SYSID & TASK	Modbus/TCP and SRTP Client Channels are supported. Set the COMMREQ SYSID to 0x0000 and TASK to 0x10000 to use these functions on the CPU.
Secondary CPE400/CPL410 Redundancy CPU Power-up Wait Time	During power-up, when a CPE400 or CPL410 is configured as a secondary redundancy CPU, it waits up to 70 seconds to detect the primary unit. (The CRU320 waits 30 seconds.) If the primary unit is not detected within this wait time, the secondary unit assumes the primary unit is not present. In this case, if the second unit is configured to transition to Run on power-up, it becomes an active unit without a backup unit.
STOP to RUN Transition in CPE400/CPL410 Redundancy System with PROFINET I/O	A Primary CPE400/CPL410 waits a maximum of 20 seconds during power-up for PROFINET device connections when there is no redundant link with the secondary unit. As soon as one PROFINET device connection is established (and no secondary PROFINET device connection exists) the Primary CPU can power up in RUN mode. Otherwise, the Primary CPU powers up in STOP mode. If a PROFINET connection is established after the timeout period expires, the standalone Primary CPU must be manually switched from STOP to RUN mode. In comparison, the CRU320 waits 3 seconds during power-up before attempting to go to RUN, which is not enough time to establish connections to its PROFINET devices. This means that a standalone Primary CRU320 always powers up in STOP mode.
Using OPC UA Server with Limited Communications Window	When running an OPC UA Server with a Limited Communications Window, the Server can process enough requests to use the entire window which will add that time to your PLC Logic sweep. For example, a 100 ms Limited Backplane Communications Window could add the full 100 ms to your PLC Logic Sweep. Caution should be taken to ensure the Communication Window is configured within the tolerances of the system.

Operational Note	Description
Redundant Link Communication Failure Fault During Dual Synchronization	When both CPE400s or CPL410s in a redundant system are powered on at the same time and perform a dual synchronization, it is possible for the secondary unit to log *Redundant Link Communication Failure* faults if it completes power up before the primary unit. In this scenario, these faults occur because the primary unit is not yet online and do not indicate a redundant link failure. As soon as the primary unit completes power up it takes control and normal system operation begins with the primary controlling I/O and the secondary in standby mode.
RUN & *OE* LED Operation During Firmware Update	During a firmware update, the *RUN* and *OE* LEDs blink in unison to indicate that the FPGA is being updated. Occasionally, instead of blinking in unison, the *RUN* and *OE* LEDs blink alternately. If this occurs, no additional action is required. The firmware update will complete successfully.
Setting the Time-of-Day Clock	The CPU's Time-of-Day Clock may be set by the PACSystems Runtime or the PACEdge operating system: • The clock may be set from PACSystems using utilities in PAC Machine Edition. • The CPL410's clock may be set using standard Linux commands or a network time server. • Regardless of whether the clock is set from the PACSystems Runtime or the PACEdge operating system, the CPU must be rebooted after the clock is set so that the time change is applied across all applications.
LAN 3 Redundant Synchronization Link Failure Faults on Active Unit Power Loss	Powering off the Active CPE400 or CPL410 in a redundant system causes the Backup unit to log any of these faults as the LAN 3 redundant synchronization links fail due to the loss of power: 1. Redundant Link Communication Failure 2. Redundant Link has Timed Out 3. Fail Wait Time Exceeded In this scenario, these faults indicate a *Redundant Link Communication Failure* and require no user action.
Restoring LAN 3 Redundant Synchronization Link when Backup Unit has No Connectivity to Redundant IO Devices	If the CPE400 or CPL410's LAN 3 redundant synchronization link is lost while the backup unit has no connectivity to its redundant IO devices, both controllers will become Non-Synchronized Active Units (NSAU). To restore synchronization, do one of the following: 1. Restore connectivity between the backup and its devices first, then restore the LAN 3 redundant synchronization link. In this scenario, the backup unit will become active and the active will transition to *STOP* Mode. 2. Restore the LAN 3 redundant synchronization link first, then transition the backup unit from *STOP* to *RUN* Mode. In this scenario, the backup will transition from NSAU to backup, and the active will remain active.
LAN System Software Fault After Redundant Unit Role Switch when Using Redundant IP	In a redundant system, when Redundant IP is configured on either the CPU's Embedded Ethernet interface or a *LAN System Software Fault; Resuming* message may be logged in the fault table when a role switch occurs between the *Active* and *Backup* units. This fault indicates that SRTP connections on the previously active Ethernet interface were terminated due to the role switch. This fault does not impact normal operation and no additional action is necessary should this occur.
CPE400 Background Window Does Not Execute by Default when Redundancy is Enabled	PAC Machine Edition versions before 9.50 SIM 6 set the *Background Window Timer* to *0ms* by default in CPE400 redundancy projects. This prevents the Background Window from running CRC memory tests on the user logic. It is recommended that the *Background Window Timer* is set to a minimum of *5ms* in both the Primary and Backup CPE400 hardware configurations. The *Background Window Timer* setting may be found on the *Scan* Tab in the CPE400's hardware configuration. PAC Machine Edition versions 9.50 SIM 6 or later resolve this issue by generating a validation warning if the *Background Window Timer* is set to a value less than *5ms*.

Operational Note	Description
Length of Serial I/O buffer	The *Set-Up Input Buffer Function* will always allocate a buffer containing 2097 bytes.
"ECC jumper should be disabled but is enabled" Fault After Downloading Configuration	A "System Configuration Mismatch" or "ECC jumper should be disabled but is enabled" fault is recorded in the PLC fault table after downloading hardware configuration to a CPE400/CPL410. This fault indicates an issue with the CPE400/CPL410 hardware which must be replaced to resolve the fault.
Oversweep Alarm When Using SoE or DNP3 With Constant Sweep	PACSystems firmware version 10.10 and later adds additional synchronization between redundant controllers that support Sequence of Events or DNP3 Outstation protocol. The additional synchronization may result in a slightly higher sweep time (every sweep) when SoE, DNP3, or both are enabled. During a redundant role switch, controllers with DNP3 enabled may also experience a higher sweep time for the one sweep where the two controllers switch roles. This time is application dependent and is related to the amount of DNP3 that must be synchronized during the role switch. When upgrading to firmware version 10.10 or later, redundant applications that use Constant Sweep Mode may experience an Oversweep alarm if the actual sweep time is close to the configured Constant Sweep Timer setting. Should an Oversweep alarm occur, adjust the constant sweep timer to factor in the time necessary for the additional synchronization per sweep and, if DNP3 is enabled, perform a role switch.
Abrupt Power Down Fault	An "Abrupt power down detected at power-up" fault is recorded in the PLC Fault Table if both the "Logic/Configuration Power-up Source" and "Data Power-up Source" in the hardware configuration are set to "Always Flash" or "Conditional Flash" and the PLC is turned off without an energy pack connected. This fault indicates that user memory was not preserved across the power cycle and does not interfere with normal operation because the application is already configured to power up from flash if there is no energy pack connected.
Linux Impact on the Controller Communications	In conditions when the PLC controller communication load is greater than 90%, PACEdge Linux runtime load approaches 100%, and SRTP / Modbus TCP protocols are in use, if the PACEdge Linux runtime is rebooted, it is possible that the interaction between the PLC Controller runtime and the PACEdge Linux runtime on the CPL410/CPE400 multi-core microprocessor can cause delays in processing those PLC controller communications. No other PLC controller communication protocols are affected. As a test, a network sniffer can be used to monitor the TCP traffic while simultaneously rebooting the PACEdge Linux runtime to see if any delays in SRTP / Modbus TCP communications are occurring. If delays are occurring and impact the control application unacceptably, reduce the PLC Controller communications load. Alternately, other unaffected communication protocols, such as OPC UA, PROFINET, or EGD, can be used instead. To reboot Linux, - Connect to Linux via SSH or Web browser and type the reboot command. - Access the cockpit & click reboot.

Operational Notes: All RX3i CPUs

The following apply generically to any RX3i CPU:

Operational Note	Description
SRTP or Modbus Channel COMMREQ Error Response with Gateway	SRTP & Modbus TCP Channel commands on RX3i CPUs with embedded Ethernet (IC695CPE3xx and IC695CPE4xx) and the IC695ETM001 RX3i Ethernet module provides different COMMREQ error codes whenever a request is sent to an unreachable server. When an Ethernet gateway is configured, the COMMREQ returns error code 0290H; when a gateway is not configured, the COMMREQ returns error code AA90H.
OPC UA Client Commissioning	If an OPC UA client device fails to connect to an RX3i PLC due to an incorrect OPC UA security certificate, the PLC will add that device to its reject list. This will prevent any future communication between the client and the PLC. To get the PLC to communicate with that client in the future, you must generate a new private key for the client and re-provision it with the GDS, using the Security Console.
Cannot Clear Controller Passwords Loaded in Flash	**⚠ CAUTION** Passwords loaded to Flash (including OEM Password) cannot be cleared using clear Flash or by downloading new firmware. Users MUST document the password as it is not possible for the user to restore a unit to the default, no passwords condition (NULL).
OEM Protection is not enforced on power-up from User Flash unless engaged before the power cycle.	The OEM Protection Lock must be explicitly set before power down to ensure the OEM lock will be set on power-up regardless of the type of security being used.
When passwords are set with Enhanced Security, connecting with PME or establishing SRTP connections can cause a temporary increase in sweep times.	Due to the complex math involved with Enhanced Security authentication, creating SRTP connections and changing privilege levels will take additional sweep time (several milliseconds) not required when passwords are set with legacy security. If consistent sweep time is important to the application, then it is recommended to configure the sweep mode for Constant Sweep. Alternately, Constant Window or a Normal Sweep with both Limited Backplane Window and Limited Controller Comm Windows can be configured. These sweep modes will limit the sweeping impact of Enhanced Security authentication and result in authentication processing across multiple sweeps.
C Toolkit Application Compatibility	Beginning with Rel 7.00 of the C Toolkit writing to %S memory will now fail to compile where in previous releases a compilation warning was issued. This affects the use of the PACSystems C Toolkit macros Sw(), Si(), and Sd().
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] Before 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.
LD-PLC operations	Machine Edition LD-PLC no longer supports a function that connects to the PLC, downloads, and then disconnects from the PLC. The connect and download functions are now separate. To perform a download to the PLC, you must first connect to the PLC.
Logic Executed in Row Major instead of Column Major	Logic execution in PACSystems RX3i is performed in row-major order (similar to the Series 90™-30). This is different from Series 90-70 which executes in column-major order. This means that some complicated rungs may execute slightly differently on PACSystems RX3i and Series 90-70. For specific examples, see the programming software online help.

Operational Note	Description
NaN Handled Differently than in S90-30	The PACSystems RX3i CPU may return slightly different values for *Not A Number* as compared to Series 90-30 CPUs. In these exception cases (e.g., 0.0/0.0), power flow out of the function block is identical to Series 90-30 operation and the computed value is still Not A Number.
PID Algorithm Improved	The PID algorithm used in PACSystems has been improved and therefore PID will function slightly differently on PACSystems RX3i than on the Series 90-30. The differences are that the elapsed time is computed in 100 µS instead of 10 mS units. This smoothes the output characteristic, eliminating periodic adjustments that occurred when the remainder accumulated to 10mS. Also, previous non-linear behavior when the integral gain is changed from some value to 1 repeat/second was eliminated.
Some Service Requests different from 90-30 or No Longer Supported	- Service Requests 6, 15, and 23 have slightly different parameters. Refer to *PACSystems RX3i and RSTi-EP CPU Programmer's Reference Manual,* GFK-2950. - PACSystems PLCs support Service Request 26/30 functionality via fault-locating references. - Service Request 13 requires a valid value in the input parameter block (Refer to *PACSystems RX3i and RSTi-EP CPU Programmer's Reference Manual,* GFK-2950 for details). On Series 90-30 and Series 90-70, the parameter block value was ignored. - Service Requests 48 and 49 are no longer supported (there is no auto-restart) because most faults can be configured to be *not fatal*.
IL and SFC	IL and SFC are not available.
DO I/O Instruction	The Series 90-30 Enhanced DO I/O instruction is converted to a standard DO I/O instruction (the ALT parameter is discarded and ignored.)
END Instruction	The Series 90-30 END instruction is not supported. Alternate programming techniques should be used.
Non-nested JUMP, LABEL, MCR, & ENDMCR Instructions	Non-nested JUMPs, LABELs, MCRs, & ENDMCRs are translated to the corresponding nested JUMPs, LABELs, MCRs, & ENDMCRs when converting from Series 90-30 to PACSystems RX3i.
Changing the IP Address of the 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.
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, 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 ms greater than the normal sweep time to avoid any over-sweep conditions when monitoring or performing online changes with the programmer. Window completion faults will occur if the constant sweep setting is not high enough.

Operational Note	Description
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 PLC 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 COMMREQ 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 invalid input is provided.
Reporting of Duplicate IP Addresses	The PACSystems RX3i does not log an exception or a fault in the PLC Fault Table when it detects a duplicate IP Address on the network.
SRTP Connections Remain Open after IP Address Changed	The Ethernet Interface does not terminate all open SRTP connections before changing its IP Address. Once the local IP Address has changed, any existing open TCP connections are unable to normally terminate. This can leave SRTP connections open until their underlying TCP connections time out.
Send Information Report (COMMREQ 2010) requests may fail at minimum intervals of less than 200 ms from the embedded Ethernet port.	*Send Information Report* COMMREQ requests, with a minimum interval between host accesses of 200 ms or less, may fail if issued from the CPU's embedded Ethernet port. A COMMREQ Status Word value of 0290H, *Period expired before transfer completed; still waiting on transfer* indicates this condition occurred. To work around this issue, the user can set the *minimum interval between host accesses* to a value greater than 200 ms if issuing a *Send Information Report* COMMREQ from the embedded Ethernet port of the CPU.
Modbus/TCP Client Channels require at least a 10 ms delay between bulk channel close and bulk channel open processing	On CPUs with embedded Ethernet ports, a delay of at least 10 ms must occur between logic-driven attempts to close sixteen Modbus/TCP Channels simultaneously and then re-open sixteen Modbus/TCP Channels. This delay is necessary to provide external Modbus/TCP Servers sufficient time to close all channels before the Client issues channel open requests.
Incorrect COMMREQ Status for Invalid Program Name	The program name for PACSystems is always *LDPROG1*. When another program name is used in a COMMREQ accessing %L memory, an Invalid Block Name (05D5) error is generated.
COMMREQ Status Words Declared in Bit Memory Types must be Byte-Aligned	In previous releases, the CPU allowed the 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 to the next-lowest byte boundary before updating status bits, overwriting the bits between the alignment boundary and the specified location. To ensure that the application operates as expected, release 3.50 requires the 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.

Operational Note	Description
STOP and RUN Mode Transition Priority	The PACSystems CPU receives requests to change between a stop and run mode from many different sources. These include (but are not limited to) PAC Machine Edition, HMIs, the user application, and the RUN/STOP switch. Since there are many potential sources for a mode change request, it is possible to receive a new mode change request while another is already in progress. When this scenario occurs, the CPU evaluates the priority of the new mode change request with the mode change that is in progress. If the new mode change request has an equal or higher priority than the one already in progress, the CPU transitions to the new mode instead of the one in progress. If, however, the new mode change request has a lower priority than the one in progress, the new mode request is discarded and the CPU completes the mode change that is in progress. The sweep mode priorities are (listed from highest to lowest priority) STOP HALT, STOP FAULT, STOP, and RUN. (NOTE: The IO ENABLED/DISABLED state is not part of the mode priority evaluation.) For example, a CPU is in RUN IO ENABLED mode, and a Service Request 13 function block is executed to place the CPU into STOP IO DISABLED mode. Before the transition to STOP IO DISABLED is completed, the RUN/STOP switch is changed from RUN IO ENABLED to RUN IO DISABLED. In this case, the CPU ignores the new request from the RUN/STOP switch to go to RUN IO DISABLED mode because it is already processing a request to go to STOP IO DISABLED mode, and STOP mode has a higher priority than RUN mode.
Suspend IO Function Block does not Suspend EGD	In an S90-70 the SUSPEND_IO function block suspends EGD in addition to IO Scan. In PACSystems controllers the SUSPEND IO only suspends IO Scan.
Uploaded Controller Supplemental Files lose date and time	Controller Supplemental Files uploaded from the CPU are time-stamped as 8/1/1980 at 12:08 AM regardless of PC or PLC time.
CPU Parameters Reset to Default Values After Replacing CPU Module in PME	When replacing CPU modules in PAC Machine Edition, some parameters may be reset to default values. After replacing a CPU module, it is recommended that all parameters are evaluated for application compatibility including the *Controller Communication Window Mode*, *Controller Communications Window Timer*, *Backplane Communication Window Mode*, and *Backplane Communications Window Timer*.
OPC UA Sessions, Subscriptions, & Variables	PACSystems OPC UA servers support up to five concurrent sessions with up to ten concurrent variable subscriptions and up to 12,500 variables. The subscription limit is shared across all available sessions.

Operational Notes: Embedded PROFINET Controller

Operational Note	Description
PROFINET Command Line Interface	The Embedded PROFINET Controller does not support the Command Line Interface (CLI).
Mirroring Redundant CPE400 Hardware Configuration Creates Multiple MRMs	Mirroring a Primary CPE400's hardware configuration to the Secondary in PAC Machine Edition (PME) version 9.50 SIM 6 or earlier results in a hardware configuration containing two Media Ring Managers (MRM) if the Primary is configured as an MRM in a PROFINET MRP ring. Validating the project in PME is successful and it may be downloaded to both the Primary and Secondary CPE400s however, they enter *STOP / FAULTED* mode because only one MRM is allowed in an MRP ring. If this occurs, change one of the CPE400s to a Media Ring Client (MRC), clear the fault tables, and re-download the configuration to both controllers. PME version 9.50 SIM 7 or later resolves this issue so that the Secondary CPE400 is automatically configured as an MRC.
PROFINET DCP – Direct Connection indicates that "no valid Ethernet adapters are available for PROFINET DCP discovery (must run PME as Administrator to use this feature)"	The PME PROFINET DCP tool requires elevation to administrator privilege to run when it is launched by right-clicking on a PROFINET Controller. Since the PME installation does not set up PME or any of its internal tools to run at the administrator privilege level, you will have to inform Windows that you want it to run PME as an administrator. There are two ways to do this: 1. Right-click on the PME icon (and any other shortcuts associated with PME) and select properties. Then select the Compatibility tab and check the checkbox for "Run this program as an administrator." 2. Right-click on the PME icon and select properties. Then select the Advanced button and check the checkbox "Run as administrator." This method shows "Run as administrator" in **bold** when you right-click on the icon in the future. You may also launch the PROFINET DCP tool from the Utilities tab menu in PME. However, this launch method does not provide the full functionality of the tool. That is, it does not compare I/O devices found to any configuration in the PME Project. Also, if PME was not launched as an administrator, this method of launching the DCP tool requests the user's permission to elevate access to administrator privilege.
PNIO_DEV_COMM Function Block Usage	The *PNIO_DEV_COMM* function block may require multiple logic scans to return the status of an I/O device. It must continue to receive power flow until: • The *ENO* output turns on indicating that the function block's parameters are successfully validated and the PROFINET Controller completed its first attempt to connect to the specified I/O device or; • The *OK* output turns on indicating the PROFINET Controller is successfully communicating with the I/O device

Operational Note	Description
Monitoring Remote IO Device Availability	Applications using PROFINET IO should monitor the availability of remote IO devices and take appropriate action if the device becomes unavailable due to a network connectivity issue, power failure at the remote device, etc. PROFINET IO device status is available by monitoring the Controller's *All Devices Connected* status bit, using the *PNIO_DEV_COMM* function block, or monitoring the CPU's IO Fault Table for *Loss of Device* faults. Individual IO modules within a PROFINET IO device should also be monitored so that appropriate action may be taken if the IO module becomes unavailable. The status of input modules may be monitored by enabling point faults and monitoring the fault contact within the application. Outputs may be monitored by looping critical points to an input module and verifying the output value.
Loss / Add of IO Device during dual power up	If both IO Controllers of a PNSR system is powered up at the same time and attempt to connect to redundant PROFINET IO devices at the same time, the second of the two connection attempts will be rejected until the first connection completes. This rejection will cause a Loss of IO Device fault. When the retry is attempted, it will succeed, and an Addition of IO Device fault will be issued. This is an expected operation. If one system is powered on slightly before the other, this condition does not occur.

Operational Notes: PACEdge

For a complete list of operational notes, please consult GFK-3198, PACEdge Important Product Information.

Product Documentation

PACSystems RX3i CPU Reference Manual	GFK-2222
PACSystems RX3i CPU Programmer's Reference Manual	GFK-2950
PACSystems RX3i System Manual	GFK-2314
PACSystems TCP/IP Ethernet Communications User Manual	GFK-2224
PACSystems TCP/IP Ethernet Communications Station Manager User Manual	GFK-2225
PACSystems Hot Standby CPU Redundancy User Manual	GFK-2308
PACSystems RX3i PROFINET IO Controller User Manual	GFK-2571
PACSystems RXi and RX3i Controller Secure Deployment Guide	GFK-2830
PROFINET I/O Devices Secure Deployment Guide	GFK-2904
Field Agents User Guide	GFK-2993
Field Agent Secure Deployment Guide	GFK-3009
Field Agents Upgrade Guide	GFK-3017
PACSystems Rackless CPUs with PACEdge Quick Start Guide	GFK-3053
PACSystems RX3i CPU with Linux Secure Deployment Guide	GFK-3055
PACSystems HART Pass Through User Manual	GFK-2929
C Programmer's Toolkit for PACSystems User Manual	GFK-2259
PACSystems DNP3 Outstation User Manual	GFK-3103
PACSystems RX3i Sequence of Events User Manual	GFK-3050
PACEdge Important Product Information	GFK-3198
PACEdge User Manual	GFK-3178

User manuals, product updates, and other information sources are available on the Emerson support site. Please see the link located at the end of this document.

Support Links

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

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