GE
Intelligent Platforms

Programmable Control Products

PACSystems* RX3i
1GHz 64MB CPU w/Ethernet
IC695CPE330
Quick Start Guide

GFK-2941A

March 2015

Contents

1. User Features

The PACSystems* RX3i CPE330 is a richly featured programmable controller CPU equipped with a 1GHz dual-core microprocessor, 64Mbytes of built-in program memory and two independent high-speed Ethernet interfaces. It is ideally suited for multi-tier communications and for synchronizing large amounts of data. Its metal housing provides superior noise immunity.

The CPE330 is programmed and configured over Ethernet via GE's Proficy Machine Edition (PME) software. It resides in the RX3i main rack and supports all RX3i I/O and Intelligent Option modules, up to 32K I/O points.

Figure 1: IC695CPE330 Features at a Glance

- Contains 64Mbytes of user memory.
- Optional Energy Pack, IC695ACC402, allows CPE330 to instantly save user memory to non-volatile storage in the event of loss of power.
- Ability to transfer user programs and/or data to and from USB 2.0 A type Removable Data Storage Devices (RDSDs).
- Supports two independent 10/100/1000 Ethernet LANs. As shown in Figure 1, LAN1 attaches via the upper, dedicated RJ-45 connector. LAN2 attaches via the lower pair of internally-switched RJ-45 connectors.
- The embedded Ethernet interface is supported by a dedicated microprocessor core. This dedicated processing capability permits the CPU to support these two LANs with:
    o   up to 48 simultaneous SRTP Server connections,
    o   up to 16 simultaneous Modbus/TCP Server connections (April 2015).
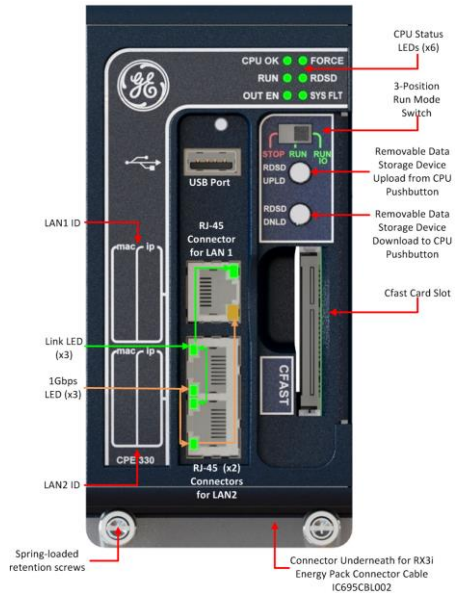   o   32 Clients are permitted; each may be SRTP or Modbus/TCP (April 2015).

- User may program in Ladder Diagram, Structured Text, Function Block Diagram, or C.
- Configurable data and program memory.
- Supports auto-located Symbolic Variables that can use any amount of user memory.
- Reference table sizes include 32k bits for discrete %I and %Q and up to 32k words each for analog %AI and %AQ. Bulk memory (%W) also supported for data exchanges.
- Supports up to 512 program blocks. Maximum size for a block is 128KB.
- For supported I/O, Communications, Motion, and Intelligent modules, refer to the *PACSystems RX3i System Manual*, GFK-2314.
- Ability to display serial number and date code in PME Device Information Details.

1.1. Switches

The Run/Stop switch and RDSD UPLD and RDSD DNLD pushbuttons are located behind the protective front door. Switch operation is given in the following table.

RDSD Pushbuttons	Function	
RDSD UPLD	Loads user program or data from CPU to RDSD.	
RDSD DNLD	Stores user program or data from RDSD to CPU.	
Run/Stop Switch Position	A three-position switch which operates as follows:	
	CPU and Sweep Mode	Memory Protection
Run I/O	The CPU runs with I/O sweep enabled.	User program memory is read only.
Run	The CPU runs with outputs disabled.	User program memory is read only.
Stop	The CPU is not allowed to go into Run mode.	User program memory can be written.

The **Run/Stop** switch is enabled by default; it can be disabled in the PME Hardware Configuration (HWC) settings. The memory protection function of this switch can be disabled separately in HWC. The memory protection functionality is disabled by default.

1.2. Light-Emitting Diode Indicators (LEDs)

Status Indicators

LED	*LED State*		*Operating State*
CPU OK	🟢	On Green	CPU has passed its power-up diagnostics and is functioning properly. *(After initialization sequence is complete.)*
	⭘	Off	Power is not applied or CPU has a problem, which may be indicated by blink pattern.
	✳	Blinking Other LEDs off	CPU in Stop-Halt state; possible watchdog timer fault. If the programmer cannot connect, cycle power with charged Energy Pack attached and refer to fault tables.
RUN **OUT EN**	✳ ✳	Blinking in unison	CPU is updating an internal programmable hardware device.
RUN	🟢	On Green	CPU is in Run mode.
	⭘	Off	CPU is in Stop mode.
OUT EN	🟢	On Green	Output scan is enabled.
	⭘	Off	Output scan is disabled.
FORCE	🟠	On Amber	Override is active on a bit reference.
	⭘	Off	No Overrides active in I/O Reference Tables.
RDSD	🟢	On Green	USB Device detected (No Activity)
	✳	Blinking Green	Port activity detected on USB Interface
	⭘	Off	No port activity detected on USB Interface
	🔴	On Red	RDSD Failure
	✳	Blinking Red	Target name mismatch: Press same RDSD pushbutton again to dismiss.
SYS FLT	🔴	On Red	CPU is in Stop/Faulted mode: a fatal fault has occurred.
	⭘	Off	No fatal faults detected.

CPE330 Ethernet Indicators

LED	LED State		Operating State
LINK (upper)	🟢	On Green	The corresponding link is physically connected.
	🌠	Blinking Green	Traffic is detected at the corresponding port.
	○	Off	No connection detected at corresponding port.
1Gbps (lower)	🟠	On Amber (LAN1) or	Corresponding network data speed is 1 Gbps.
	🟢	On Green (LAN2)	
	○	Off	Corresponding network data speed is 100 Mbps or 10 Mbps.

1.3. Ethernet Ports

LAN1 connects to the uppermost RJ-45 connector. It is not switched. LAN2 connects to the two lower RJ-45 connectors. They are switched internally. Record the IP Address of each LAN in the space provided (Figure 1).

Each of the embedded Ethernet interfaces automatically senses the data rate (10 Mbps or 100 Mbps or 1 Gbps), communications mode (half-duplex or full-duplex), and cabling arrangement (straight-through or crossover) of the attached link.

For improved performance, the two Ethernet LANs are serviced by a dedicated microprocessor core. In addition, each Ethernet LAN is serviced by a dedicated Network Interface Controller (NIC). In this way, the servicing of the Ethernet ports is independent of the controller logic and I/O scanning. This superior level of servicing is required at the higher communications rates.

Any of the embedded Ethernet ports may be used to communicate with the PME programming software using the Service Request Transport Protocol (SRTP, a proprietary GE protocol, used primarily for communication with the programmer).

To establish Ethernet communications between the PME programming and configuration software and the CPU, you *first* need to set an IP address. Use the Set IP Address tool (refer to *PACSystems RX3i and RX7i CPU Reference Manual, GFK-2222V*) or use the factory-shipped default settings:

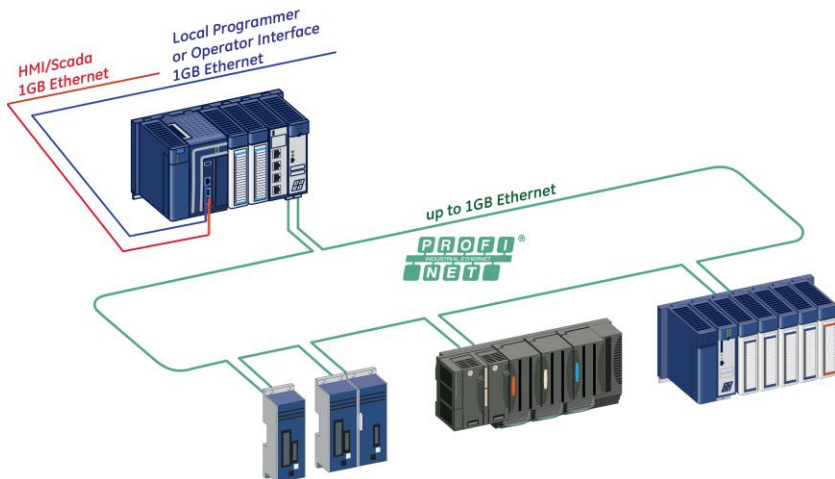|	**CPE330 LAN1**	**CPE330 LAN2**
IP Address:	192.168.0.100	10.10.0.100
Subnet Mask:	255.255.255.0	255.255.255.0
Gateway:	0.0.0.0	0.0.0.0

Figure 2: Typical Multi-Tier LAN Application

A typical application will take advantage of the two independent LANs. The dedicated LAN1 port will be used for communications with plant-level or supervisory layers. The switched LAN2 will typically be used to communicate with devices within the manufacturing cell or process, including local HMI devices and micro-controllers.

2. Hardware Installation

2.1. Initial Checks

Upon receiving your RX3i equipment, carefully inspect all shipping containers for damage. If any part of the system is damaged, notify the carrier immediately. The damaged shipping container should be saved as evidence for inspection by the carrier.

As the consignee, it is your responsibility to register a claim with the carrier for damage incurred during shipment. GE Intelligent Platforms will fully cooperate with you, however, should such action be necessary.

After unpacking the RX3i equipment, record all serial numbers. Serial numbers are required if you should need to contact Customer Care during the warranty period. All shipping containers and all packing material should be saved should it be necessary to transport or ship any part of the system.

Verify that all components of the system have been received and that they agree with your order. If the system received does not agree with your order, contact Customer Care.

2.2. Installation Location

This product is intended for use with the RX3i system. Its components are considered open equipment (having live electrical parts that may be accessible to users) and must be installed in an ultimate enclosure that is manufactured to provide safety. At a minimum, the enclosure shall provide a degree of protection against solid objects as small as 12mm (e.g. fingers). This equates to a NEMA/UL Type 1 enclosure or an IEC60529 IP20 rating providing at least a pollution degree 2 environment. For details about installing RX3i rack systems, refer to the *PACSystems RX3i System Manual,* GFK-2314.

If you need technical help, contact Technical Support. For phone numbers and email addresses, refer to the back cover of this Guide.

2.3. Installation in Hazardous Areas

The following information is for products bearing the UL marking for Hazardous Areas or ATEX marking for explosive atmospheres:

CLASS 1 DIVISION 2 GROUPS ABCD

- This equipment is an open-type device and is meant to be installed in an enclosure suitable for the environment that is only accessible with the use of a tool.

- Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations, or nonhazardous locations only.

⚠ **Warning** – EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

⚠ **Warning** – WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES.

ATEX Zone 2

This module must be mounted in an enclosure certified in accordance with EN60079-15 for use in Zone 2, Group IIC and rated IP54. The enclosure shall only be able to be opened with the use of a tool.

2.4. Grounding

The RX3i rack into which this product will be mounted must be grounded per the instructions provided in *PACSystems RX3i System Manual,* GFK-2314. Also, if an Energy Pack (IC695ACC402) is connected, its ground-strap must be grounded as described in *PACSystems RX3i Energy Pack IC695ACC402 Quick Start Guide,* GFK-2939.

3. Module Start-up

3.1. You Will Need:

- An RX3i Universal Backplane: IC695CHS007, IC695CHS012 or IC695CHS016.
- This PACSystems RX3i CPU. This CPU occupies two backplane slots.
- An RX3i rack-mounted Power Supply Module and compatible power source (AC[†] or DC).
- A computer running Proficy Machine Edition (PME) configuration and programming software, version 8.50 or later.
- Ethernet cable for connecting the PME programmer computer to the RX3i CPU.
- Phillip's head screwdriver.
- Very small slotted screwdriver (1.4mm jeweler's size).

3.2. Basic Installation Steps:

For startup and configuration of the CPE330, complete the following steps. For full details on CPE330 operation, refer to the *PACSystems RX3i and RX7i CPU Reference Manual,* GFK-2222V or later.

1. Turn power off at the RX3i rack and install the CPE330 in a double-slot which is CPU-compatible (refer to *PACSystems RX3i System Manual,* GFK-2314 Chapter 3). Typically, the CPU is located in the left-most slot pair, or in the pair of slots to the right of the power supply module.

2. If used, mount the compatible RX3i Energy Pack (IC695ACC402) within 3 feet of the CPU. The dedicated interconnect cable attaches to the underside of CPE330. Follow interconnect and grounding instructions in *PACSystems RX3i Energy Pack IC695ACC402 Quick Start Guide,* GFK-2939. Secure the two retention flat-head screws with a very small slotted screwdriver.

[†] Note: on lightly-loaded racks, use IC695PSA040H or later, or IC695PSA140D or later, otherwise power-up may be unsuccessful. Alternately, fill out the empty slots in the rack so as to draw more current.

3. Set the pair of hook tabs at top rear of the CPU module into two adjacent notches on the alignment rail of the RX3i rack backplane. This aligns the module with the intended slots in the main rack and with the right-side connector of this pair.

4. Swing the module down until the rear connector on the CPU module engages the mating backplane connector. Firmly engage the connectors.

5. Visually inspect the module to be sure it is properly seated.

6. Using a Phillip's head screwdriver, secure the two captive M3x5 machine screws into the matching threaded holes in the backplate of the RX3i I/O rack. The two screws are located at the bottom rear of the CPU module. Tighten.

7. Apply power to the rack.

Note: When the ACC402 Energy Pack is powered up, a period of time is required to charge it up to its operating level. During this time, the Energy Pack will indicate this condition via its LEDs (refer to *PACSystems RX3i Energy Pack IC695ACC402 Quick Start Guide,* GFK-2939).

The CPE330 will begin its boot cycle once ACC402 is charged. This typically takes 90 seconds or less. In the event the ACC402 is faulty or is not communicating, CPE330 commences operation without the Energy Pack.

3.3. Removable Data Storage Device (RDSD)

The CPE330 user program may be saved to a USB device via the RDSD UPLD pushbutton or loaded into the CPU from a USB device via the RDSD DNLD pushbutton. Similarly, data can be selected and saved. In this way, an application may be cloned and copied from one device to another.

4. Periodic Maintenance

4.1. Real-Time Clock Battery

The CPE330 is shipped with a real time clock (RTC) battery installed (see Figure 3). Over time, this battery will need to be replaced. No action is required during initial installation.

Should the RTC battery fail, the CPU date and time will be reset to 12:00 AM, 01-01-2011 at start-up. The CPU operates normally with a failed or missing RTC battery; however, the initial CPU time-of-day (TOD) clock information will be incorrect.

There are no diagnostics or indicators to monitor RTC battery status. The RTC battery has an estimated life of 5 years and must be replaced every 5 years on a periodic maintenance schedule.

For complete procedure, refer to *Replacement of Real-Time Clock Battery on CPE330* in *PACSystems RX3i and RX7i CPU Reference Manual,* GFK-2222V or later.

Figure 3: RTC Battery

4.2. Spare Parts

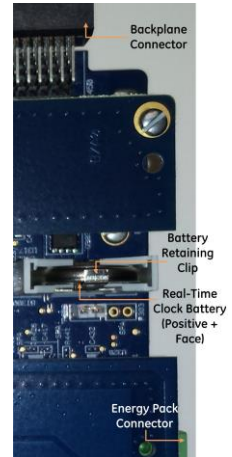IC690ACC001   Battery, Lithium BR2032-BA Coin Cell 3V 190mAh -40°C to +85°C

5. Additional Information

Proficy* Logic Developer-PLC Getting Started, GFK-1918

PACSystems* RX3i & RX7i CPU Reference Manual, GFK-2222

PACSystems* RX3i & RX7i TCP/IP Ethernet Communications User's Manual, GFK-2224

PACSystems* RX3i System Manual, GFK-2314

PACSystems* RX3i Energy Pack IC695ACC402 Quick Start Guide, GFK-2939

PACSystems* RX3i IC695CPE330 CPU Important Product Information, GFK-2942

PACSystems* RX3i and RX7i CPU Programmer's Reference Manual, GFK-2950

User manuals, product updates and other information sources are available on the Support website, http://www.ge-ip.com/support, under *Controllers and IO*, *RX3i Controllers.*

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Contact Information
Americas: 1-800-433-2682 or 1-434-978-5100
Global regional phone numbers are available on our web site

www.ge-ip.com

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