

PACSystems* RX3i

IC695PNC001

PROFINET Controller Module

GFK-2573
July 2011



The PACSystems* RX3i PROFINET Controller (PNC) module, IC695PNC001, connects a PACSystems RX3i controller to a high-speed PROFINET local area network. It enables the RX3i controller to communicate with IO-Devices on the LAN. The PNC module provides all the functions, services, and protocols required for certification as a PROFINET IO Version 2.2 IO Controller, running at both 100 Mbps and 1 Gbps.

The PNC supports 10/100/1000 Mbps Copper, 100/1000 Mbps Multi-mode Fiber, and 100/1000 Mbps Single-mode Fiber. The LAN can include media interfaces of more than one type. PROFINET communications on the LAN require 100 and 1000 Mbps link speed. 10 Mbps cannot be used for PROFINET communications. However, 10 Mbps can be used for other types of Ethernet traffic such as ping and telnet.

Features of the RX3i PNC include:

- Full programming and configuration services for the PROFINET Controller, VersaMax PROFINET Scanner and third-party IO-Devices using Proficy Machine Edition .
- Firmware upgrades using the WinLoader software utility.
- Built-in Command Line Interface function that provides direct monitoring and partial configuration via the micro USB port or using telnet.
Note: The USB port is for system setup and diagnostics only. It is not intended for permanent connection.
- Support for star, ring, and daisy-chain/line network topologies.
- Four switched Ethernet ports - two 8-conductor RJ-45 shielded twisted pair 10/100/1000 Mbps copper interfaces and two Small Form-factor Pluggable (SFP) cages for user-supplied SFP devices.
- Internal clock synchronized with the RX3i CPU for time-stamped diagnostics entries.
- Restart pushbutton to manually restart the module without power cycling the system.
- LEDs: OK, LAN, STATUS, CONFIG, ACTIVE, USB, and four Port LEDs.
- Compliant with EU RoHS Directive using the following exemptions identified in the Annex: 7c-I and & 7c-III.

Ordering Information

IC695PNC001	PACSystems RX3i PROFINET Controller Module 10/100/1000, 4 Ports - 2 SFP connections, 2 Copper
IC200PNS001	VersaMax PROFINET Scanner, 10/100, 2 Ports, Copper
IC200PNS002	VersaMax PROFINET Scanner, 10/100, 2 Ports, Multimode Fiber
IC695SPC100**	RX3i 10/100/1000base-TX (CAT5 100m) SFP
IC695SPF002**	RX3i 100Base-FX (fiber 2 km) SFP

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** Available at a later date.

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PNC Specifications

PROFINET Support	PROFINET Version 2.2 General Class A IO-Controller
CPU Compatibility	Requires CPU315 or CPU320, with firmware version 7.0 or higher.
Power Requirements	3.3 V: 0.5 A with no SFP devices installed 1.2 A maximum (two SFP devices installed, 0.35 A per SFP device)
	5 V: 1.5 A maximum
Operating Temperature Range	0 to 60°C maximum surrounding air temperature without a fan. A lower maximum temperature may be required depending on PNC location and SFP population. Refer to "Operating Range for Air Temperature" on page 3.
Number of Port Connectors	Two RJ-45 and Two SFP Cages (Not included, available separately)
Micro USB Connector	One, for communication with a computer using Command Line Interface.
LAN	IEEE 802.2 Logical Link Control Class I IEEE 802.3 CSMA/CD Medium Access Control 10/100/1000 Mbps
Maximum I/O Memory	128 Kbytes of combined input/output memory per PROFINET Controller
CPU Status Bits	32
PROFINET I/O Device Data Update Rates on the PROFINET LAN	Configurable: 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms and 512 ms
Number of IP addresses	One
Number of MAC Addresses	Five. One per external port and one internal.
System Maximum Limits	
PROFINET Controllers per RX3i CPU	4. Must be located in main rack. Cannot be located in a remote node.
IO-Devices per IO-Controller	64 per PROFINET Controller
IO-Devices per Network	128 per network, spread across up to 8 IO-Controllers
IO-Devices per RX3i CPU	128 per RX3i CPU, spread across up to 4 PROFINET Controllers
IO-Controllers per network	8
Number of PROFINET Slots per device	256
Number of PROFINET Subslots per slot	256
Number of PROFINET Submodules per RX3i CPU	2048
Programmer Limits	
Number of IO-Controllers	128 (32 RX3i CPU targets × 4 IO-Controllers per RX3i CPU)
Number of IO-Devices	2048 (128 per network × 16 PROFINET networks)
Total number of devices	2176 (does not include backplanes, power supplies, or I/O modules)
Hot-swappable	Yes

For product standards, general operating specifications, and installation requirements, refer to the *PACSystems RX3i System Manual*, GFK-2314.

Operating Range for Surrounding Air Temperature

Baseline Installation	0 to 60°C surrounding air temperature under the following installation: <ul style="list-style-type: none"> ▪ 12-slot panel mounted backplane ▪ Two PNC modules in adjacent slots per backplane ▪ 1 GB Fiber SFPs ▪ All four ports active
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The following installation exceptions are cumulative:

Installation Exceptions	Reduces maximum operating temperature: <ul style="list-style-type: none"> ▪ If 7 slot backplane, then reduce by 2°C ▪ If air mounted (rack mount), then reduce by 2°C ▪ If three or four PNCs per backplane, then reduce by 1°C ▪ Either/or: <ul style="list-style-type: none"> - If 100 MB Fiber SFPs installed, then reduce by 5°C - If Copper SFPs operating at 1 GB, then reduce by 6°C
	Increases maximum operating temperature to an upper limit of 60°C: <ul style="list-style-type: none"> ▪ If only one PNC per backplane, then increase by 2°C ▪ If PNC in non-adjacent slots, then increase by 1°C ▪ If Copper SFP operating at 100MB, then increase by 4°C ▪ If RJ45 ports unused, then increase by 0°C ▪ If 16 slot backplane, then increase by 0°C

Example - Calculating Maximum Operating Temperature with Installation Exceptions

Baseline Installation	60°C
7 slot Backplane	-2°C
Two PNC modules in non-adjacent slots	+1°C
Copper SFPs operating at 1 GB	-6°C
Maximum operating temperature after installation exceptions	53°C

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Sweep Impact of PNC and PROFINET I/O

The PLC CPU sweep impact for a PROFINET I/O network is a function of the number of PNCs, the number of PROFINET devices, and the number of each PROFINET device's I/O modules. The table below shows the measured sweep impact of the RX3i PROFINET Controller, supported VersaMax PROFINET devices, and I/O-modules.

Sweep Impact (μs)

	CPU315/CPU320
RX3i PROFINET Controller (PNC)	50
VersaMax Product Family	
Profinet Scanner (PNS) (IC200PNS001)	40
Discrete Input Module (8/16/32 pt.)	23
Discrete Output Module (8/16/32 pt.)	18
Analog Input Module (15 channel)	59
Analog Output Module (12 channel)	21
CMM020 (64AI/64AQ)	204

To calculate the total expected PLC sweep impact for a PROFINET I/O network, add the individual sweep impact times for each PROFINET Controller, PROFINET Device, and PROFINET Device I/O module, using the times provided above.

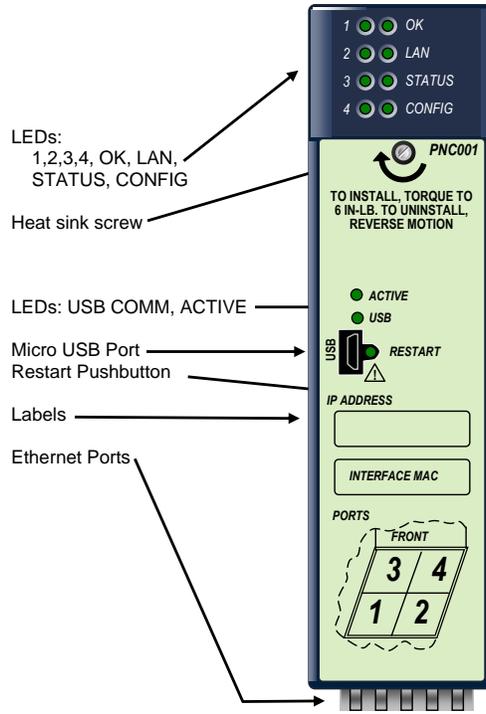
Example

For a PROFINET I/O network that consists of one PNC and one VersaMax Profinet Scanner that has both an 8 point input and an 8 point output module:

$$\begin{aligned} \text{Expected PLC sweep Impact} &= 50 \text{ (PNC)} + 40 \text{ (PNS)} + 23 \text{ (8pt. Input)} + 18 \text{ (8pt. Output)} \\ &= 131 \mu\text{s}. \end{aligned}$$

PNC Controls and Indicators

The illustration below shows the front of the RX3i PROFINET Controller module and calls out its controls and indicators.



LEDs on the PNC Module

The table below summarizes LED functions. For detailed information about error indications and special blink patterns refer to the *PACSystems RX3i PROFINET Controller Manual*, GFK-2571.

OK	Indicates whether the module is able to perform normal operation.
LAN	Indicates network packets are being processed by the network interface (not just passing through the embedded switch).
STATUS	Indicates the condition of the PROFINET Controller during normal operation. It indicates whether an entry other than the startup event is present in the module's local log. STATUS can also indicate whether any of the MAC addresses are invalid.
CONFIG	Indicates whether the module has received its configuration from the RX3i CPU.
ACTIVE	Indicates the status of PROFINET connections.
USB	Indicates activity on the USB port.
Port LEDs	Indicate link speed, link connection and link activity corresponding to the four possible external Ethernet ports.

Restart Pushbutton

The Restart pushbutton is used to manually restart the module without cycling power. The restart operation starts when the pushbutton is released.

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Installation

The back of the PROFINET Controller module has an exposed heat sink and backplane connector. Before inserting the module into the backplane, remove the plastic knockout in the slot where the module will be placed. The installation slot must match the slot that is selected in the module's hardware configuration.

After installing the PNC module in the backplane, tighten the heat sink screw on the front of the module into the threaded hole in the backplate to 6 in-lbs, using a flat-tip screwdriver.

Installation in Hazardous Areas

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

- EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C & D, DIV. 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS LOCATIONS ONLY
- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2;
- WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND
- WARNING - EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
-  WARNING - EXPLOSION HAZARD - USB PORT IS ONLY FOR USE IN NONHAZARDOUS LOCATIONS, DO NOT USE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

ATEX Marking

 II 3 G Ex nA IIC T5 X Ta: 0 - 60C

Hot Insertion and Removal

Modules in a Universal Backplane (IC695CHS007, CHS012 or CHS016) can be installed or removed while power is applied to the system. This includes backplane power and field power supplied to the module.

The PROFINET Controller must be properly seated with the latch engaged and all pins connected within 2 seconds. For removal, the module must be completely disengaged within 2 seconds. It is important that the module not remain partially inserted during the insertion or removal process. There must be a minimum of two seconds between the removal and insertion of modules.

Warning

Inserting or removing a module with power applied to the system may cause an electrical arc. This can result in unexpected and potentially dangerous action by field devices. Arcing is an explosion risk in hazardous locations. Be sure that the area is non-hazardous or remove system power appropriately before removing or inserting a module.

If the surrounding air operating temperature of the PNC module is greater than 40 C (104°F), SFP devices could have operating temperatures over 70°C (158°F). Under these conditions, for your safety, do *not* use bare hands to remove an SFP device from the SFP cage. Use protective gloves or a tool (needle-nose pliers) to avoid handling the hot SFP device directly when removing the SFP device.

Caution

If an RX3i PNC module is extracted from a powered RX3i backplane, it loses power immediately which may result in data loss. Do not remove or insert the device while downloading hardware configuration to the system.

When the module is plugged back into a powered backplane, the PNC restores data from the internal non-volatile memory. If however, the RX3i CPU has configuration data for the PROFINET Controller, it re-delivers the data to the module, superseding parameters previously stored in non-volatile memory.

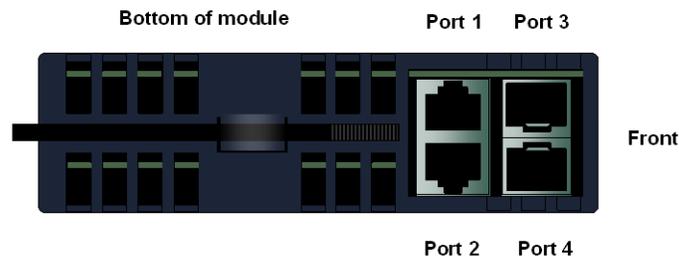
Ethernet Port Connections

Caution

Do not connect two or more ports on the PNC to the same device, either directly or indirectly, unless Media Redundancy is enabled in the PNC's configuration.

If Media Redundancy will be used, do not close the network ring until after the Media Redundancy configuration which contains one node as a Media Redundancy Manager (MRM) has been downloaded to the PNC module. If a Media Redundancy Manager is not present, packets can continuously cycle on the network, using up significant network bandwidth.

The PNC connects to an I/O LAN via one of its four external switch ports. Two eight-conductor RJ-45 shielded twisted pair 10/100/1000 Mbps copper interfaces and two Small Form-factor Pluggable (SFP) cages provide flexibility in media selection for the I/O LAN and the ability to use redundant media for the I/O LAN. Use of redundant media must first be set up in the module configuration.



The module is assigned five Ethernet MAC addresses: four for the external Ethernet ports and one for internal switch operation.

Each external switch port has an associated link-up/link-down status bit that can be monitored by the RX3i CPU to check the operating status of the port. Four LEDs on front of the module provide visual indication of port status. Each port on an RX3i PNC module operates independently, so devices at different speeds and/or duplex modes may be attached to the ports. Each port automatically detects the attached cable and functions properly with either straight-through or crossover cables.

For more information about Media Redundancy, see the *PACSystems RX3i PROFINET Controller Manual*, GFK-2571.

High-Speed I/O LAN Connections

High-speed I/O LAN connections to the PNC can be made using standard cables. The PNC module can be connected to one High-Speed I/O LAN. However, different devices on the same LAN can be connected using more than one port.

Note: Shielded cable is required for 1 Gbps operation.

Other Ethernet Connections

The PNC module's RJ-45 ports can also be used for general Ethernet communications on either a 10BaseT, 100BaseTX or 1000BaseT IEEE 802.3 network. Typical switches, hubs, or repeaters support 6 to 12 nodes connected in a star wiring topology.

10BaseT: Uses a twisted pair cable of up to 100 meters in length between each node and a switch, hub, or repeater.

100BaseTX: Uses a cable of up to 100 meters in length between each node and a switch, hub, or repeater. The cable should be data grade Category 5 or better unshielded twisted pair (UTP) or shielded twisted pair (STP) cable.

1000BaseT: Uses a cable of up to 100 meters in length between each node and a switch, hub or repeater. The cable should be Category 5e or better UTP or STP cable.

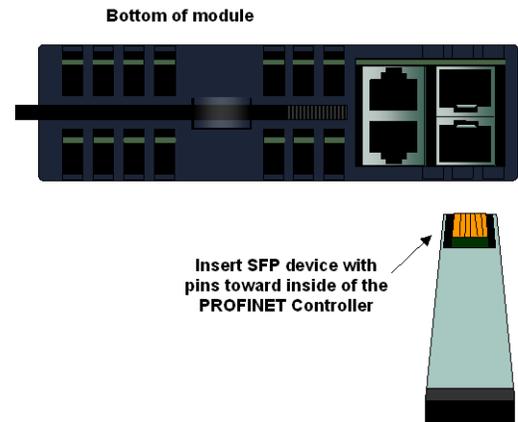
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Installing SFP Devices

SFP (Small Form-factor Pluggable) devices can be installed in Port 3 and Port 4 of the PNC. The specific SFP module installed in each cage must be defined in the Proficy Machine Edition configuration of the PNC module.

Each SFP cage on the bottom of a PNC module can accept a 10/100/1000 Mbps copper SFP, 100 Mbps Single-Mode Fiber SFP, 100 Mbps Multi-Mode Fiber SFP, 1000 Mbps Single-Mode Fiber SFP, or 1000 Mbps Multi-Mode Fiber SFP. SFP modules can be removed/replaced during module operation.

Keep the protective plug installed in the SFP device. Following the manufacturer's installation instructions, insert the device with its pins oriented toward the inside of the PNC module until it clicks into place. Remove the protective plug to install the cable.



Warning

Optical SFPs use an invisible laser to generate a fiber-optic signal. Always keep the port covered if a cable is not installed. Do not look into the open port if a cable is not installed.

When the PNC module powers up, it automatically detects devices plugged into the SFP cages, their type (fiber, copper, etc.) and their link speed. If an SFP device has been included in the configuration but is not present in the specified cage, the PNC module logs a loss of network port entry to its local log table. If possible, it also logs a fault to the associated controller's fault table. The module continues to operate with a loss of network port.

If the installed SFP device is different from what has been configured, the PNC module logs a mismatch entry to its local log table. If possible, it also logs an informational fault to the associated RX3i controller's fault table. The module tries to configure and use the SFP if it is compatible. If the PNC detects an unsupported SFP type on power-up or when the SFP is inserted, the PNC adds an entry into its local log table and RX3i controller's fault table (if possible) and turns its associated port LED red.

Removing SFP Devices

Warning

If the surrounding air operating temperature of the PNC module is greater than 40 °C, SFP devices could have operating temperatures over 70 °C (158 °F). Under these conditions, for your safety, do *not* use bare hands to remove an SFP device from the SFP cage. Use protective gloves or a tool (needle-nose pliers) to avoid handling the hot SFP device directly when removing the SFP device.

Remove the cable from the SFP device. If the device has a latching mechanism such as a bale clasp, open it gently. Do not pull on the latching mechanism. Hold the sides of the SFP device and pull it out of the PNC port.

Supported SFP Types

The RX3i PROFINET Controller supports the SFP devices listed below. An SFP type other than those listed below may be configured as a GENERIC SFP in Proficy Machine Edition. The RX3i PNC will attempt to operate with a generic SFP that identifies itself as an Ethernet SFP. Since SFP types other than those listed below have not been validated, correct operation cannot be guaranteed.

SFP Type	Wavelength (nm)	Media Type	Core Size (μm)	Modal Bandwidth (MHz – Km)	Distance (m)
100BASE-FX †	1300	MMF	62.5	500	2 – 2,000 (Full-Duplex) 2 – 400 (Half-Duplex)
			50	400	
			50	500	
100BASE-LX10	1300	SMF	9	-	2 – 10,000
1000BASE-SX	850	MMF	62.5	160	2 – 220
				200	2 – 275
			50	400	2 – 500
				500	2 – 550
1000BASE-LX	1300	SMF	9	-	2 – 10,000
1000BASE-ZX	1550	SMF	9	-	2 – 70,000
10/100/1000BASE-T †	-	CAT5/CAT5e/CAT6	-	-	100 (maximum)

† Available from GE Intelligent Platforms at a later date.

Installing the USB Port Driver

The PNC module provides a micro USB port for connection to a computer running Windows 2000, Windows XP, Windows Vista, or Windows 7 operating system. The computer can access the PNC's Command Line Interface function using a terminal application like Hyperterm. The PNC is provided with a driver-install application that can be used to enable a computer to communicate with a PNC module via its USB port. Instructions for using the driver application are given in the *Command Line Interface Manual*, GFK-2572.

Set up use of the module's USB port in either of these ways:

- Run the provided driver-install application before connecting the computer's USB port to the PNC module's USB port the first time.
- With the provided installation files accessible on either a local or network drive, attach the PC USB port to the Rx3i IO LAN USB port.
 - Windows opens a New Hardware Found Wizard dialog. Within the wizard application, enter the location of the provided installation files.
 - Windows then installs the USB driver compatible with the USB port.

The computer automatically assigns a serial port name for the PNC module's USB port. (Note: a unique serial port number will be used for each PNC module). The serial port name is COM followed by the next available number from 1 to 256. After the computer assigns the module's USB port a COM port name, it uses the same name each time it connects to the module (except for a special case described below).

If the computer has already assigned all its available port names (COM1 through COM256), the next device to attach is assigned a previously-used COM Port name:

- If the last assigned COM port name was COM256, the next COM port name assigned is the first *unconnected* COM port after the physical serial communications ports.
- If the last assigned COM port name was not COM256, the next COM port name assigned is the first unconnected COM port in sequence.

After the initial installation process, the same computer can be attached to the other RX3i PNC modules without additional installation steps. The virtual serial port name is automatically assigned when the device is attached to the computer.

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Important Product Information for this Release

Release History

Version	Firmware Revision	Date	Comments
IC695PNC001-AA	1.00	June 2011	Initial release. Supports GSDML Version 2.2 and previous.

Compatibility

The PNC module requires the following CPU firmware, programming software and backplane hardware versions:

RX3i CPU firmware	Models CPU315 or CPU320, with firmware version 7.0 or higher
Programmer software	Proficy Machine Edition version 7.0 SIM 1 or later
RX3i backplane hardware	The following backplane hardware revisions must be used: IC695CHS012-BAMP IC695CHS016-BAMP IC695CHS012CA-BAMP IC695CHS016CA-BAMP or IC695CHS012-CA (or later) IC695CHS016-CA (or later) IC695CHS012CA-CA (or later) IC695CHS016CA-CA (or later) or IC695CHS007-AA (or later)

Restrictions and Open Issues

Restrictions and Open Issues related to PNC operational behavior

Subject	Description
Unintended LED blink pattern	When an overtemperature condition occurs, the PNC001 will blink this pattern: PORT 1, PORT 2, and STATUS LEDs on red for 0.5 seconds (all other LEDs off), then PORT 3 and PORT 4 LEDs on red for 0.5 seconds (all other LEDs off). This is not the correct pattern, as documented in the <i>PACSystems RX3i PROFINET Controller Manual</i> (GFK-2571).
Unexpected Loss of Device faults	Loss of Device faults for currently connected devices may appear in the PLC I/O Fault table and/or PNC local log when the PNC is reset via its reset pushbutton.
Occasional Loss of Device when storing large configuration	When storing a hardware configuration containing a large number of Versamax PROFINET devices, sometimes (~5%) the PNC will not successfully complete a connection to one of the devices. A Loss of Device fault will be logged (with no subsequent Add of Device). Storing the same configuration again will cause the PNC to restart itself and then it typically connects to all devices. A manual restart, via the pushbutton or the CLI command, will also result in successful reconnection.
Unintended operation of PNIO_DEV_COMM function block	The power flow output of the PNIO_DEV_COMM function block provides validation of the input parameters and confirms that the PNC 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 PNC 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.

Restrictions and Open Issues related to the Command Line Interface

Subject	Description
Page function not available	The output paging function, as described in the <i>shConfig</i> command, is not currently functioning.
Response to invalid command entry	The error message displayed in response to an invalid show port help command does not provide useful information. Example: show port fdp help is an invalid command. To see a list of valid parameters for the <i>show port</i> command, type <i>show port ?</i>
"telnetd" command response	The CLI does not echo the new number of max connections in its response to the <i>telnetd <maxconnections></i> command. However, the command still functions properly, and updates the maximum number of telnet connections.
"log details" command response	When displaying numerous local log table entries using the <i>log details</i> command, sometimes erroneous blank characters appear within the display. Use the <i>log details <log entry number></i> command to view the disrupted log table entry. Example: <i>log details 99</i> .
"term" command response	Occasionally, the CLI does not respond to the "term" command. To recover, restart the terminal emulation program.

Operational Notes

Subject	Description
Ring network configuration and parameter considerations for bumpless PROFINET IO Device operation with Media Redundancy Protocol (MRP)	<p>Use of the Media Redundancy Protocol (MRP) allows a user's ring network to automatically heal itself in the event of a single break of the ring network. If a user's application requires the PROFINET IO Devices to operate bumplessly through ring network recovery (no observed loss and subsequent addition of PROFINET IO Devices while the ring network recovers), the following network and application design guidelines must be observed:</p> <ol style="list-style-type: none"> 1. If only one PNC is in the ring acting as the Media Redundancy Manager (MRM) and all of the Media Redundancy Clients (MRCs) are VersaMax PROFINET Scanners, customers can set minimum IO Update Rates as follows and expect PROFINET IO to operate bumplessly through ring network recovery: <ul style="list-style-type: none"> ▪ Using the fixed copper ring ports on the PNC, 1 ms IO Update Rate minimum ▪ Using SFPs on the PNC, 4 ms IO Update Rate minimum 2. If multiple PNCs are in the ring (one PNC acting as the MRM and other PNC(s) as MRC(s)) where VersaMax PROFINET Scanners are the only PROFINET IO Devices, customers can set minimum IO Update Rates as follows and expect IO to operate bumplessly through ring network recovery: <ul style="list-style-type: none"> ▪ 16 ms IO Update Rate minimum, regardless of ports utilized, and must set MRP Test Packet Interval to 10 ms and MRP Test Packet Count to 2. 3. If 3rd party MRCs are in use in the ring, customers can set a minimum IO update rate to the larger of the options that follow and expect IO to operate bumplessly through ring network recovery: <ul style="list-style-type: none"> ▪ Minimum IO Update Rate configurable in PME that is at least 1/3 the time of the worst-case ring recovery stated by 3rd party manufacturer, regardless of ports utilized. (i.e. if a manufacturer states their worst-case ring recovery is 90 ms, then the minimum IO update rate allowed would be $90/3 = 30 \text{ ms} \sim 32\text{ms}$.) or ▪ 16 ms IO Update Rate minimum, regardless of ports utilized, and must set MRP Test Packet Interval to 10 ms and MRP Test Packet Count to 2.

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Subject	Description
Storing updated media redundancy protocol (MRP) configurations to large operating MRP ring networks with fast io update rates configured can result in PROFINET IO device Loss/Add faults	When storing Media Redundancy Protocol (MRP) configuration updates to an operating MRP ring network, users may infrequently observe one or more pairs of "Loss of Device" and subsequent "Addition of Device" faults regarding PROFINET IO Device faults on the network. This is expected behavior and is more likely to occur on ring networks with a large number of PROFINET IO Devices acting as MRCs with very fast IO Update Rates configured. Because changing MRP configuration settings requires each MRC to break and reconnect its own connections to the ring network, IP packets on the network may be lost as this flurry of connection breaks/ reconnects occur on the network. Since a PROFINET IO Device is considered lost if it misses three consecutive IO data transactions, if three consecutive IO data packets from a particular PROFINET IO Device are lost due to network reconfiguration, the device will appear to be lost to the PNC and a Loss of IO Device is logged. When the network stabilizes, the PNC will be able to reestablish connection with the lost IO Device and an Addition of IO Device fault will be logged.
Data packets arriving on ports blocked by Media Redundancy Protocol (MRP) still forwarded over mirrored ports	When a network is configured for MRP operation, MRCs and Media Redundancy Managers (MRMs) can put one of their ring ports into a "Blocking" state. MRP uses this blocked port state to break the continuous ring and allow only MRP management traffic to pass through the blocked port. All of the non-MRP management traffic is blocked from ingress or egress of the blocked port. If the port has been set up using the port mirroring "monport" command, to monitor traffic on the blocked port, <u>all</u> of the traffic that arrives at the blocked port is mirrored to the configured monitor port regardless of whether or not the traffic is MRP management traffic. This makes it appear that the traffic is being sent or received on the blocked port even though it is not.
Network monitoring devices should be directly connected to mirrored PNC ports	When using the port mirroring "monport" command to monitor Ethernet traffic, you should directly connect your PC/Laptop to the port on the PNC that is monitoring the traffic. If there is an intervening switch in the mirrored path, the mirrored traffic will corrupt the intervening switch's routing table. A corrupted routing table can cause dropped Ethernet packets, resulting in the loss of PROFINET IO and/or other Ethernet communication.
Momentary overtemperature indication in some power up conditions	When the PNC powers up in warm (>70°C) conditions, the overtemperature LED pattern may blink for 1–2 seconds as the module is calibrating its onboard temperature sensor.

References

For additional information, please refer to the manuals listed below. Manuals can be downloaded from the Support website, <http://support.ge-ip.com>.

PACSystems RX3i PROFINET Controller Manual, GFK-2571

PACSystems RX3i PROFINET Controller Command Line Interface Manual, GFK-2572

VersaMax PROFINET Scanner User's Manual, GFK-2721

PACSystems CPU Reference Manual, GFK-2222

PACSystems RX3i System Manual, GFK-2314