PACSystems* RX3i

IC695CHS012 and IC695CHS016

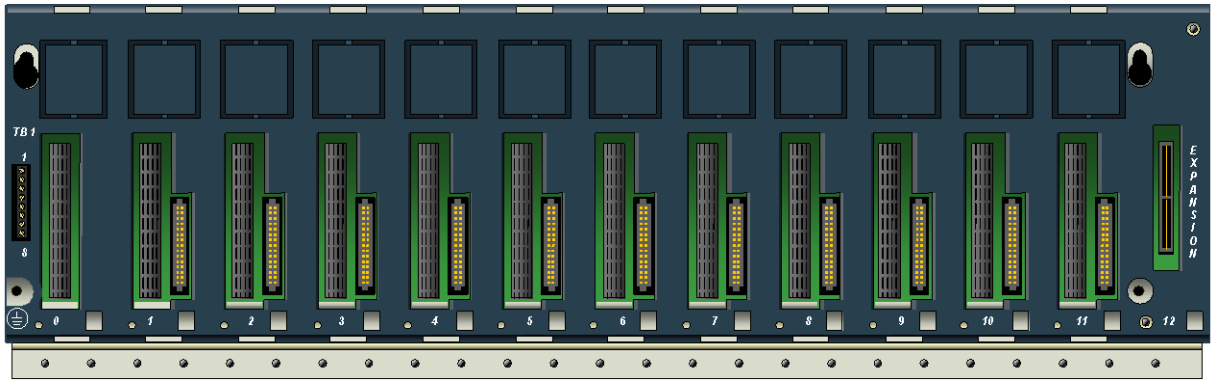
Universal Backplanes

GFK-2554A
March 2012

The PACSystems* RX3i Universal Backplanes provide a dual-bus backplane that supports PCI-based (IC695) and serial (IC693 and IC694) I/O and option modules. The RX3i Universal Backplanes also support Series 90-30 IO and option modules. See the *PACSystems RX3i System Manual*, GFK-2314 for lists of supported modules. The 16-slot Universal Backplane (IC695CHS016), and the 12-slot Universal Backplane (IC695CHS012) include the following features:

- Terminal Strip on the left end for Isolated +24V input
- Backplane grounding point
- An integral grounding bar for connecting module/shield grounds
- Serial Expansion connector for connection to Serial Expansion and Remote Backplanes
- Slot numbers printed on the backplane that can be used as a reference for configuration.

The 12-slot Universal Backplane (IC695CHS012) is illustrated below.



Release History

Catalog Number	Date	Description
IC695CHS012 / 016-DA	March 2012	Mechanical enhancements for improved module-to-connector engagement with the backplane PCI connector. For details, see “New Features and Enhancements in this Release” on page 6.
IC695CHS012 / 016-CA	April 2009	Hardware changes for EU-RoHS compliance
IC695CHS012 / 016-BAMP	February 2009	Improved immunity against environmental noise
IC695CHS012 / 016-BA	September 2007	ATEX approval for Group 2, Category 3 applications.
IC695CHS012 / 016A	August 2004	Initial product release

UL Class 1 Division 2 & ATEX Zone 2 Hazardous Area Warnings

1. EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C, D, DIV. 2 HAZARDOUS AREAS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON–HAZARDOUS LOCATIONS ONLY.
2. WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2 & ATEX ZONE 2.
3. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON–HAZARDOUS.

ATEX Zone 2 Hazardous Area Requirements

In order to maintain compliance with the ATEX Directive, an RX3i system located in a Zone 2 area (Category 3) must be installed within a protective enclosure meeting the criteria detailed below:

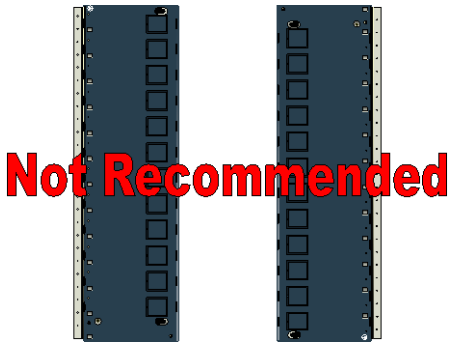
- IP54 or greater, and
- Mechanical strength to withstand an impact energy of 3.5 Joules

RX3i Universal Backplane Installation

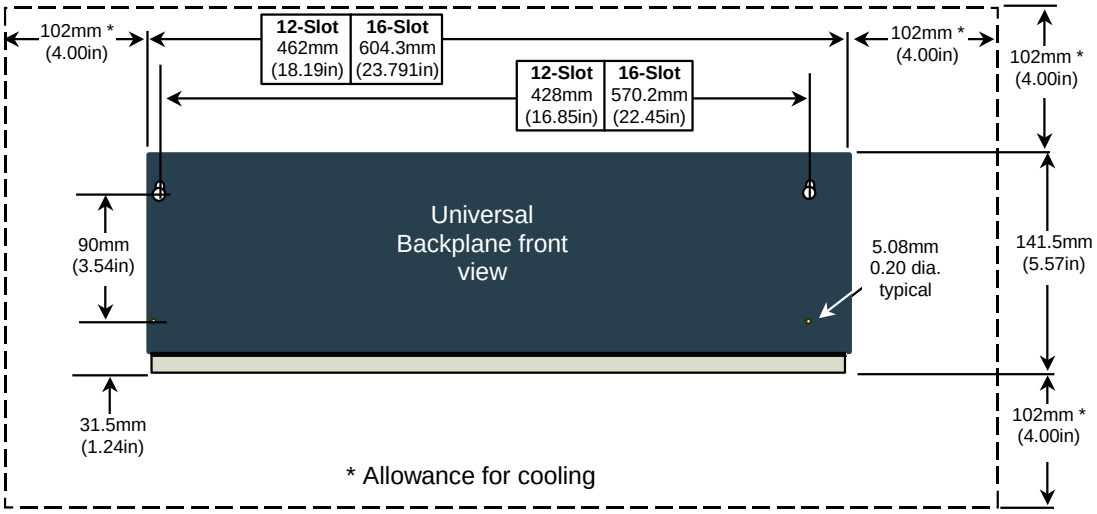
The RX3i system and its components are considered open equipment (having live electrical parts that may be accessible to users) and must be installed in a protective enclosure or incorporated into other assemblies manufactured to provide safety. As a minimum, the enclosure or assemblies must provide protection equivalent to a NEMA/UL Type 1 enclosure or an IP20 rating (IEC60529). The enclosure must be able to adequately dissipate the heat generated by all of the components mounted inside so that no components overheat. A minimum space of at least 102mm (4 inches) as shown below is required on all sides of the RX3i backplane for cooling. Additional space may be required, depending on the amount of heat generated by the equipment during operation. Please refer to the *PACSystems RX3i System Manual,* GFK-2314, for information about enclosures and heat dissipation.

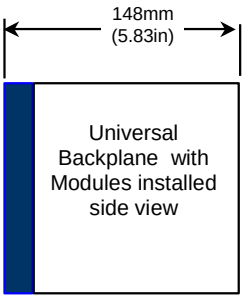
Backplane Orientation

Backplanes must be mounted horizontally to meet product performance and reliability specifications by providing adequate airflow around the modules. Other mounting orientations may affect system performance and/or reliability and are therefore not recommended.



Backplane Dimensions and Spacing





Side dimension is for standard modules with doors closed.

Side dimension does not include extra depth required for cables and connectors.

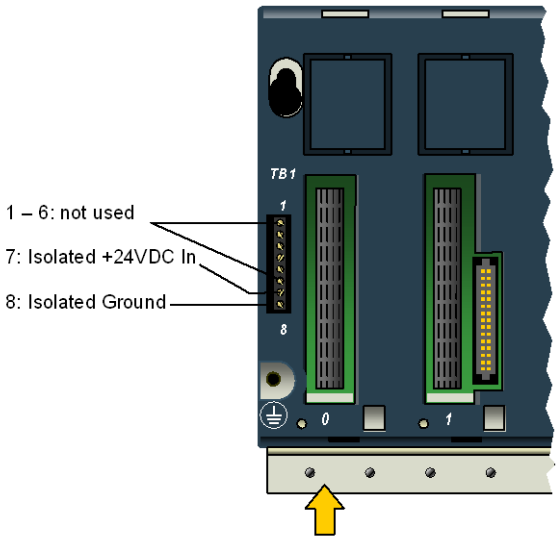
Modules with Extended High-Density Terminal Blocks (such as Terminal Block IC694TBB132) are approximately ½-inch (13mm) deeper overall.

RX3i Universal Backplane Terminals and Connectors

TB1 Input Terminals

The RX3i IC695 Power Supplies do not provide Isolated +24V output power over the backplane. TB1 input terminals 7 and 8 can be used to connect an optional external source of Isolated +24VDC, which is required for some IC693 and IC694 modules. These terminals accept individual wires from 14 to 22 AWG. If modules that require Isolated +24VDC are installed in an Expansion Backplane instead, an external Isolated +24V power supply is not required.

TB1 terminals 1 through 6 are not used.



Slot 0: Connector for RX3i IC695 Power Supply only

Slot 0

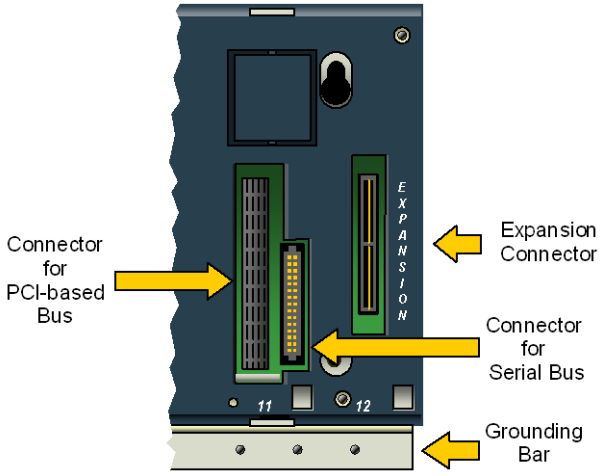
The leftmost slot in a Universal Backplane is slot 0. Only the backplane connector of IC695 Power Supplies can be installed in slot 0 (note: IC695 Power Supplies can be installed any slot).

Two-slot-wide modules that have right-justified connectors, like the CPU310, can be plugged into slot 1and also cover slot 0. The CPU is referenced for configuration and application logic by the leftmost slot occupied by the entire module, not by the slot the physical connector is located in. For example, if the CPU has its physical connector inserted in slot 3, the module occupies slots 2 and 3 and the CPU is considered to be located in slot 2. The CPU may be located in slot 0 with its connector in slot 1.

Slot 1 to Slot 11 or 15

Slots 1 through 11 or 15 have two connectors: a connector for the RX3i PCI-based bus and a connector for the RX3i serial bus. Each of these slots can accept any type of compatible module: IC695 Power Supply, IC695 CPU, or IC695, IC694 and IC693 I/O or option modules. See the *PACSystems RX3i System Manual*, GFK-2314 for lists of supported modules.

Provided the Hot Installation procedure described in the *PACSystems RX3i System Manual,* GFK2314, is carefully followed, I/O and option modules in a Universal Backplane may be removed and replaced without powering-down.



Expansion Slot (Slot 12 or 16)

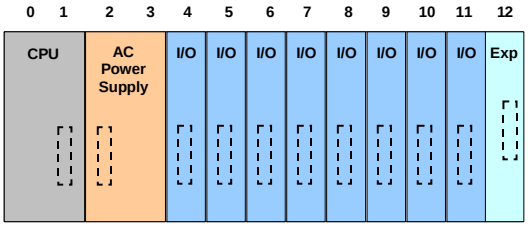
The rightmost slot in a Universal Backplane is the expansion connector. It can only be used for an RX3i Serial Expansion Module (IC695LRE001). An RX3i two-slot module cannot occupy this expansion slot.

Grounding Bar

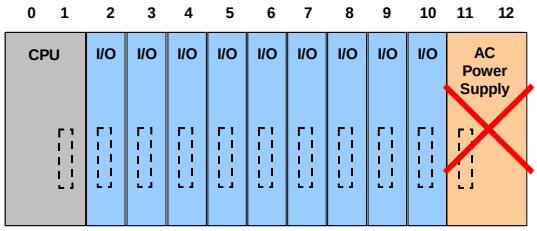
Module shield grounds can be connected to the Grounding Bar at the bottom of a Universal Backplane using size M3 screws. The recommended torque is 4 in/lb maximum.

Module Locations in a Universal Backplane

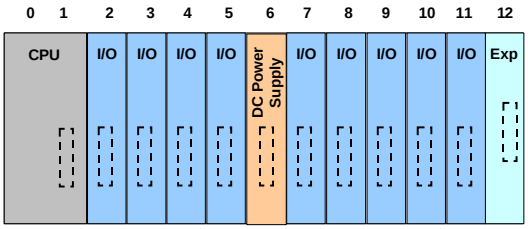
- IC695 Power Supply modules may be installed in any slot. DC Power Supplies IC695PSDx40 occupy 1 slot. AC Power Supplies IC695PSAx40 occupy 2 slots. *IC694 and IC693 Power Supplies cannot be installed in Universal Backplanes.*
- I/O and option modules can be installed in any available slot except slot 0, which can only accept IC695 Power Supplies, and the Expansion slot. Each I/O slot has two connectors, so either an RX3i PCI-based module or a serial module can be installed in any I/O slot.
- The rightmost slot is the expansion slot. It can only be used for optional serial expansion module IC695LRE001.
- An RX3i CPU can be installed anywhere in the backplane except the Expansion slot. CPU modules occupy two slots. If the CPU is installed in slot 1, only a singlewide power supply may be used in slot 0. Either DC power supply can be used. If the application must maintain a slot 1 CPU and use an AC power supply, the AC power supply must be located in a slot to the right of the RX3i CPU in slot 1. Before deciding to place the CPU in a slot other than slot 1, it is important to consider the following:
  - The configured slot location of the CPU must match the CPU's true location.
  - For Service Request #15 (Read Last-Logged Fault Table Entry) and Service Request #20 (Read Fault Tables), the location of CPU faults is the slot the CPU is located in. Logic that decodes fault table entries retrieved by these service requests may need updating.
  - COMMREQs directed to the CPU itself must use the correct CPU slot reference.
  - External devices should be checked for compatibility with CPU slot locations other than slot 1.
  - Remote Series 90 PLCs that use SRTP Channels COMMREQs expect the CPU to be in slot 1 or slot 2.



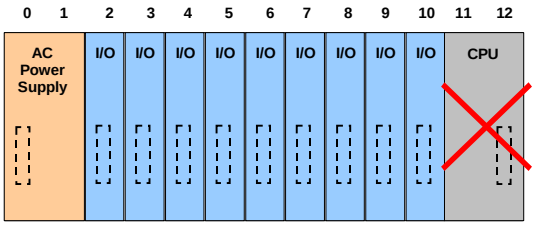
Configured as CPU in slot 0, Power Supply in slot 2



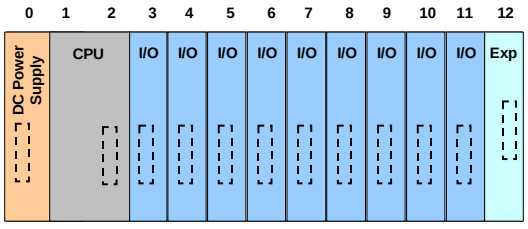
AC Power Supply cannot be in Slot 11.



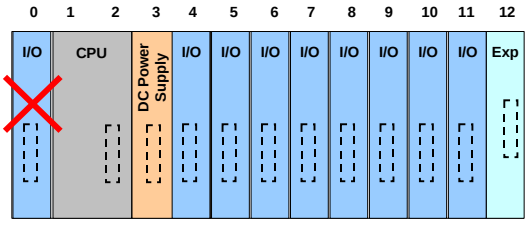
Configured as CPU in slot 0, Power Supply in slot 6



CPU cannot be configured in slot 11



Configured as Power Supply in slot 0, CPU in slot 1



Only a Power Supply can be installed in slot 0.

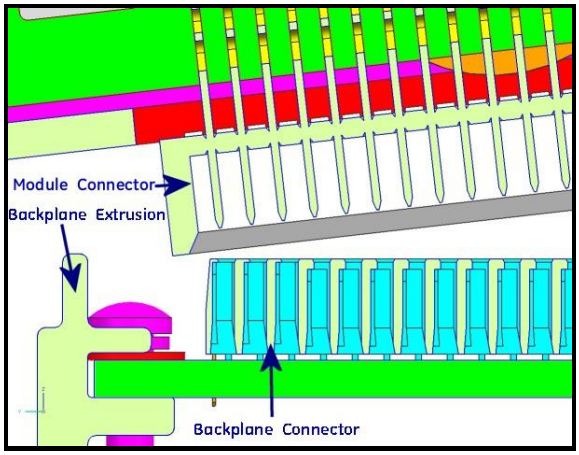
New Features and Enhancements in this Release

This release implements three mechanical enhancements to the RX3i Universal backplanes.

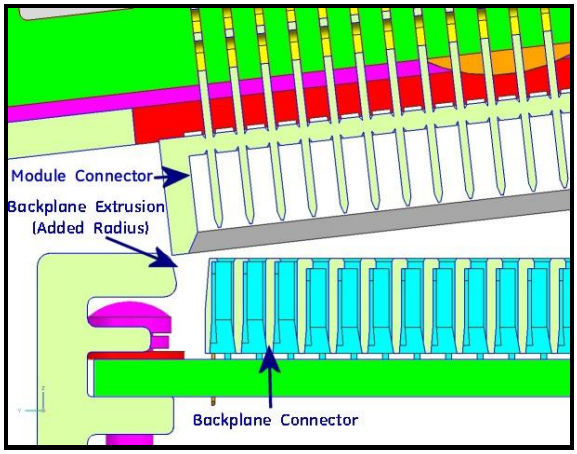
- **Added an upper ledge with a radius to the backplane extrusion.** For PCI-based (IC695XXXxxx) RX3i modules, this upper ledge helps you properly align the module vertically as it is being inserted into the backplane. This reduces the likelihood of incurring bent or recessed module backplane connector pins when inserting PCI-based modules into the backplane.

  Note that the radiused ledge reduces but does not eliminate the likelihood of incurring bent or recessed pins on PCI-based modules. To avoid damaging module pins, you should continue to exercise proper care and follow the installation instructions in the *PACSystems RX3i System Manual,* GFK-2314 when inserting modules into an RX3i universal backplane.

Prior Design



New Enhanced Design



- **Backplane PWA and backplane connectors moved 0.015 inch (3.81mm) closer to the front of the backplane.** This increases the mechanical module-to-backplane engagement, providing better connectivity.
- **Overall width of the backplane extrusion reduced by 0.070 inch (1.78mm)**, making it easier for manufacturing to install the plastic backplane cover over the extrusion.