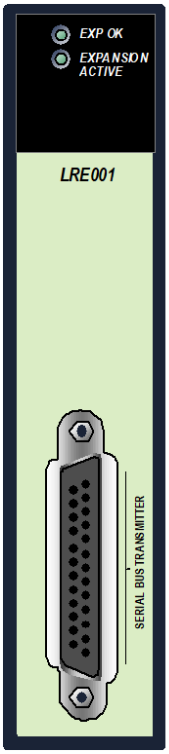
IMPORTANT PRODUCT INFORMATION

GFK-2553D

Oct 2021

PACSystems™ RX3i

SERIAL BUS TRANSMITTER MODULE (IC695LRE001)



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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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Introduction

The RX3i Serial Bus Transmitter Module, IC695LRE001, provides communications between a PACSystems RX3i Universal Backplane (IC695-model number), and serial expansion and remote backplanes (IC694- or IC693-model numbers). It translates the signal levels present in the Universal Backplane to the signal levels required by a Serial Expansion Backplane.

The Serial Bus Transmitter Module must reside in the special expansion connector on the right end of the Universal Backplane.

Two green LEDs indicate the operating status of the module and the status of the expansion link.

- The EXP OK LED is lit when backplane 5V power is applied to the module.
- The Expansion Active LED indicates the status of the expansion bus. This LED is ON when the Expansion module is communicating with expansion backplanes. It is OFF when they are not communicating.

The connector on the front of the module is used to attach the expansion cable.

For more information about this module, please refer to the PACSystems RX3i System Manual, GFK-2314.

Module Specifications

Specification	Description
Current Required from Backplane	5.0V: 132mA
Maximum Total Expansion Cable Length	15 meters (50 feet) – Expansion Backplanes
Effective Data Rate	213 meters (700 feet) – Remote Backplanes
Electrical Isolation	500k Bytes per second

Cable Specifications

Connector part numbers are provided for reference only. Any part meeting the same specifications could be used for making custom cables.

Item	Specification
Cable	Computer cable, overall braid over foil shield, twisted–pair
Belden 8107 only (no substitutes):	30 volt/80°C (176°F), 24 AWG (.22mm2) tinned copper, 7 x 32 stranding
25 Pin Male Connector	Velocity of propagation = 70%, Nominal impedance = 100 Ohms
25 Pin Female Connector	Crimp Plug = Amp 207464–7; Pin = Amp 66506–9

Expansion Module Installation

The Serial Bus Transmitter Module must reside in the special expansion connector on the right end of the Universal Backplane. This module may NOT be hot-inserted in the backplane; power must be removed before installing or removing the Expansion Module. In addition, the expansion cable may not be attached or removed if the expansion rack has power applied.

Powering Down Individual Expansion or Remote Backplanes

Expansion and Remote Backplanes can be powered-down individually without affecting the operation of other backplanes; however, powering off a backplane generates a loss of module (LOSS_OF_MODULE) fault in the PLC Fault Table for each module in the backplane. When this fault condition occurs, and until the backplane is powered back on and all modules recovered, the lost I/O modules are not scanned.

Installation in Hazardous Locations

The following information is for products bearing the UL marking for Hazardous Locations:

⚠ WARNING

- EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2;
- EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND
- EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
- EQUIPMENT LABELED REGARDING 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.

Release History

Catalog Number	Date	Description
IC695LRE001CAG IC695LRE001G	Oct 2021	The product's labels have been updated to show compliance with new certifications. For updated certifications, please refer to https://emerson-mas.force.com/communities/en_US/Article/Certifications-and-Agency-Approvals-Landing-Page.
IC695LRE001F	Sep 2020	Manufacturing update. No change to form, fit, or function.
IC695LRE001E	Sep 2019	Following Emerson's acquisition of this product, changes have been made to apply appropriate branding and registration of the product with required certification agencies. No changes to material, process, form, fit or functionality.
IC695LRE001D	Oct 2014	Backplane engagement and manufacturability improvements
IC695LRE001C	Oct 2008	Hardware changes for EU-RoHS compliance
IC695LRE001B	Sep 2007	ATEX approval for Group 2, Category 3 applications.
IC695LRE001A	Aug 2004	Initial product release

I/O Bus Expansion Cables

I/O Bus Expansion Cables are used to connect a Serial Bus Transmitter Module (IC695LRE001) in a Universal Backplane (IC695CHS012 or IC695CHS016) to a Serial Expansion Backplane (IC694/693CHS392 or IC694/693CHS398). These cables are also used to interconnect additional expansion and remote backplanes in the system. This section describes several types of prefabricated cables that are available (part numbers IC693CBL300, 301, 302, 312, 313). Custom cables can also be made, as described in the PACSystems RX3i System Manual, GFK-2314.

Expansion Port Pin Assignments

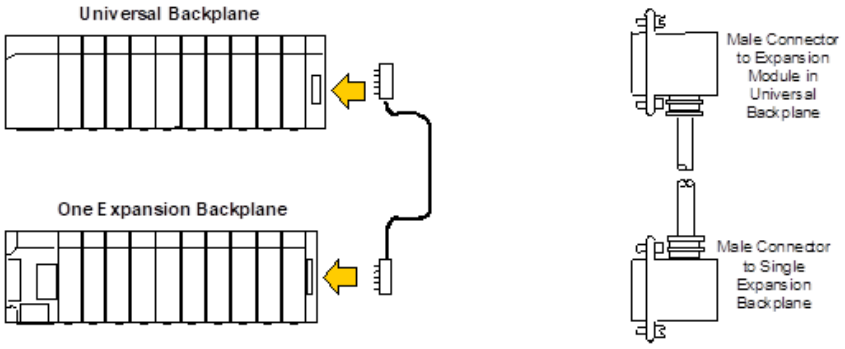
All connections between cables are point–to point, that is, pin 2 of one end to pin 2 of the opposite ends, etc.

Pin Number	Signal Name	Function
16	DIODT	I/O Serial Data Positive
17	DIODT/	I/O Serial Data Negative
24	DIOCLK	I/O Serial Clock Positive
25	DIOCLK/	I/O Serial Clock Negative
20	DRSEL	Remote Select Positive
21	DRSEL/	Remote Select Negative
12	DRPERR	Parity Error Positive
13	DRPERR/	Parity Error Negative
8	DRMRUN	Remote Run Positive
9	DRMRUN/	Remote Run Negative
2	DFRAME	Cycle Frame Positive
3	DFRAME/	Cycle Frame Negative
1	FGND	Frame Ground for Cable Shield
7	0V	Logic Ground

Cable with Two Connectors

Cable IC693CBL302 is 15 meters (50 feet) long and has one male connector on each end. This cable has I/O bus terminating resistors built into the end connector on the cable. It does not require a separate termination block. It can only be used in a system having just one expansion backplane.

Figure 1: Cable with Connectors



Cable with Three Connectors

Cables IC693CBL300, 301, 312, and 313 have a male and female connector on one end and a male connector on the other end ("wye" cables). These cables are the same except for their lengths:

- IC693CBL312: 0.15 meter (0.5 feet)
- IC693CBL300: 1 meter (3 feet)
- IC693CBL301: 2 meters (6 feet)
- IC693CBL313: 8 meters (25 feet)

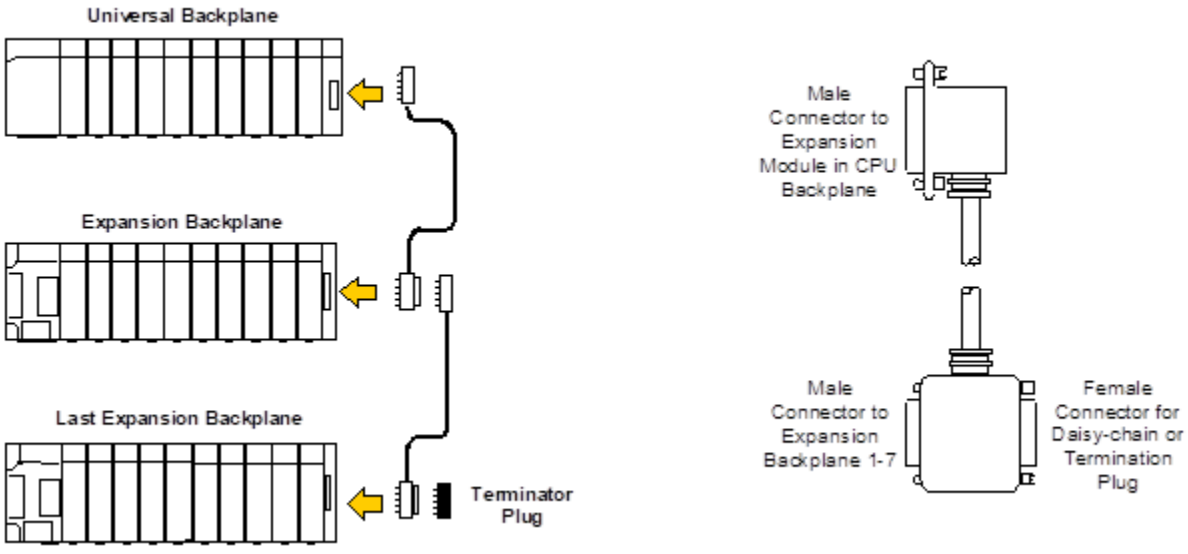
Combinations of these cables can be used to daisy-chain up to seven expansion backplanes to the main backplane. Custom cables can also be made. Wiring information is given in the PACSystems RX3i System Manual, GFK-2314.

These cables can also be used to provide connection points for custom point-to-point cables (IC693CBL300 is often used for this).

These cables do not have built-in termination. The last cable in the expansion system must be terminated as shown. Terminator Plug IC693ACC307 can be used for this purpose.

The maximum number of cables that can be included in an I/O expansion system is seven, and the total maximum cable length between the Universal Backplane and the last expansion backplane is 50 feet (15 meters). Failure to observe these limits could result in erratic system operation.

Figure 2: Cable with 3 Connectors



Termination Requirement for Expansion or Remote System

When two or more backplanes are connected via the I/O Bus Expansion System, the I/O Expansion Bus must be properly terminated. The most common method of terminating the I/O Expansion Bus is by installing a termination resistor pack (IC693ACC307) on the open connector on the last (most distant from the CPU) expansion or remote backplane in the system. The resistor pack is physically mounted inside of a connector. Although a termination resistor pack is shipped with each backplane, only the last backplane in the chain needs to have this termination connector installed. Unused termination packs can be discarded. The prewired 50foot (15 meter) cable (IC693CBL302) has termination resistors wired inside the connector on one end of the cable. This cable can be used if only one expansion rack is needed in a system and a 50foot cable link is required (the IC693ACC307 resistor pack is not needed in this case). Also, a custom-built cable with built-in resistors would eliminate the need for the IC693ACC307 resistor pack. When using a custom cable, each signal pair must be terminated with 120-ohm, 1/4-watt resistors wired between the appropriate pins: 16 – 17; 24 – 25; 20 – 21; 12 – 13; 8 – 9; 2 – 3.

General Contact Information

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