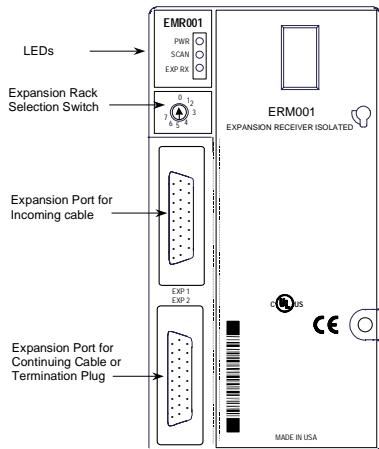# Isolated Expansion Receiver Module

February 2010

GFK-1525C

## Module Description

Isolated Expansion Receiver Module IC200ERM001 / BXIOXRAK01 interfaces an expansion "rack" to an I/O bus in a PLC or NIU I/O Station system. The expansion rack can include up to eight I/O and special-purpose modules. A power supply installed on the Expansion Receiver Module provides operating power for the modules in the expansion rack. The Isolated Expansion Receiver Module provides up to 500VDC isolation.

The Isolated Expansion Receiver Module must be used with an Expansion Transmitter Module (*ETM001) in the PLC or I/O Station.

### Expansion Connector

The Expansion Receiver has two 26-pin female D-shell expansion ports. The upper port receives the cable from an Expansion Transmitter or upstream Expansion Receiver Module. The lower port is used to daisy-chain the I/O bus cable to the next expansion rack or to attach the terminator plug at the last rack. The Expansion Receiver must always be installed in the leftmost position of the rack (slot 0).

The maximum overall length of the expansion bus depends on whether any Non-Isolated Expansion Receivers are used:

15 Meters: any Expansion Receivers* ERM002 on the bus
750 Meters: Isolated Expansion Receivers *ERM001 only
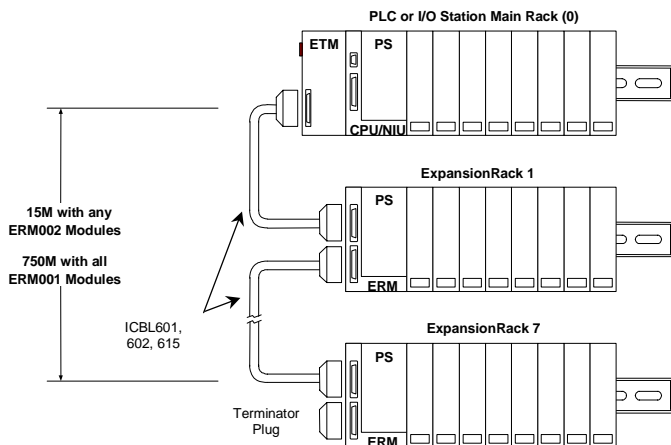
### LED Indicators

The LEDs on the Expansion Transmitter show the status of power to the module and the status of the expansion port.

## Module Specifications

| Module Characteristics | |
|---|---|
| LED indicators | PWR LED indicates 5VDC power status |
| | EXP RX LED indicates status of the expansion bus |
| | SCAN indicates whether CPU/NIU is scanning I/O in expansion racks |
| Backplane current consumption | 5V output: 430mA maximum |
| | 3.3V output: 20mA |

| Cable Specifications | |
|---|---|
| Maximum cable length | 250 meters (if configured for higher data rate) |
| | 50 meters (default distance) |
| Effective data rate | 1 Mbits/sec (configurable if less than 250 meters) |
| | 250 Kbits/sec (default data rate) |
| Electrical Isolation | 500 VDC isolated differential communications |

## Compatibility

All I/O and communications modules can be used in expansion racks. Some analog modules require specific module revisions as listed below. The date code is a 3-digit number on the outside of the module and on the shipping box.

| Module | Module Revision | Module Date Code Range |
|---|---|---|
| *ALG320 | B or later | Any |
| *ALG321 | B or later | Any |
| *ALG322 | B or later | Any |
| *ALG430 | C or later | Any |
| *ALG431 | C or later | Any |
| *ALG432 | B or later | Any |
| *ALG230 | A or later | *CPU or NIU Revision 1.5:* Date code must begin with a number other than 9 and must be 011 or greater. |
| | Any | *CPU or NIU Revision 2.0 or later:* Any date code. |
| *ALG260 | A or later | *CPU or NIU Revision 1.5:* Date code must begin with a number other than 9 and must be 011 or greater. |
| | Any | *CPU or NIU Revision 2.0 or later:* Any date code. |

## Product Revision History

| Rev | Date | Description |
|---|---|---|
| IC200ERM001D BXIOXRAK01D | October 2008 | Updated Power Supply OK signal circuitry. |
| IC200ERM001C | April 2004 | Changed to V0 plastic for module housing. |
| BXIOXRAK01C | January 2004 | Changed to V0 plastic for module housing. ATEX approval for Group 2 Category 3 applications. |
| IC200ERM001B | January 2004 | ATEX approval for Group 2 Category 3 applications. |
| IC200ERM001A BXIOXRAK01A | November 1999 | Initial product release. |

# Isolated Expansion Receiver Module

## Installation in Hazardous Locations

- 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 DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.

## Installation Instructions

Carefully inspect all shipping containers for damage. If any equipment is damaged, notify the delivery service immediately. Save the damaged shipping container for inspection by the delivery service. After unpacking the equipment, record all serial numbers. Save the shipping containers and packing material in case it is necessary to transport or ship any part of the system.

### DIN Rail Installation
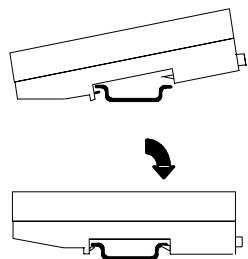
All modules and carriers must be installed on the same section of 35mm x 7.5mm DIN rail.  The rail must have a conductive (unpainted) finish for proper grounding.  For best stability, the DIN rail should be installed on a panel using screws spaced approximately 6 inches (5.24cm) apart.

The module snaps easily onto the DIN rail. No tools are required for mounting or grounding to the DIN rail.

### Panel-Mounting

If excessive vibration is a factor modules should also be screwed down to the mounting panel.

Note 1. Tolerances are +/- 0.13mm (0.005in) non-cumulative.

Note 2. 1.1-1.4Nm (10-12 in/lbs) of torque should be applied to M3.5 (#6-32) steel screw threaded into material containing internal threads and having a minimum thickness of 2.4mm (0.093in).
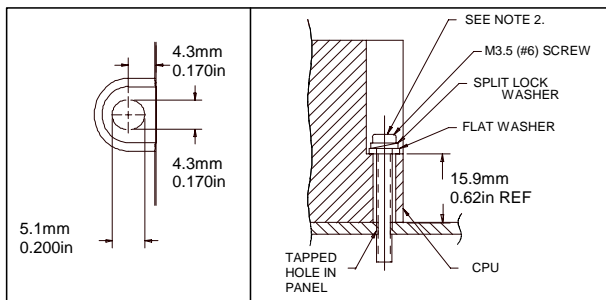
### Expansion Rack Power Sources

Power for module operation comes from the Power Supply installed on the Expansion Receiver Module. If the expansion rack includes any Power Supply Booster Carrier and additional rack Power Supply, it must be tied to the same source as the Power Supply on the Expansion Receiver Module.
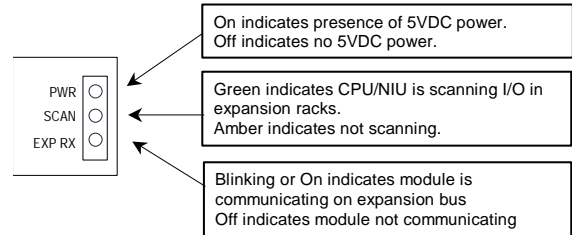
### Installing the Isolated Expansion Receiver Module

The Expansion Receiver Module must be installed in the leftmost slot of an expansion "rack".

1. Insert the label inside the small access door at the upper left corner of the module.
2. Attach the module to the DIN rail at the left end of the expansion rack.
3. Select the expansion rack ID (1 to 7) using the rotary switch under the access door at upper left corner of the module.
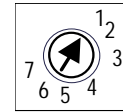
4. Install a Power Supply module on top of the Expansion Receiver.
5. Attach the cables and terminator plug as described at right.
6. After completing any additional system installation steps, apply power and observe the module LEDs.

On indicates presence of 5VDC power. Off indicates no 5VDC power.

Green indicates CPU/NIU is scanning I/O in expansion racks. Amber indicates not scanning.

Blinking or On indicates module is communicating on expansion bus Off indicates module not communicating

### Removing the Expansion Receiver Module
1. Make sure rack power is off.
2. Un-install the Power Supply module from the Expansion Receiver Module.
3. Slide the Expansion Receiver Module on DIN rail away from the other modules.
4. Using a small screwdriver, pull down on the tab on the bottom of the module and lift the module off the DIN rail.

### Connecting the Expansion Cable: RS-485 Differential

Connect the cable from the expansion port on the Expansion Transmitter to the Expansion Receivers as illustrated on the previous page.

### Terminator Plug

The expansion bus must be terminated with terminator plug *ACC201 (included with the Expansion Transmitter). Spare Terminator Plugs may also be purchased separately as part number *ACC201 (qty 2). The Terminator Plug installs in the lower port on the last Expansion Receiver.

### RS-485 Differential Inter-Rack Connection *CBL601, 602, 615)
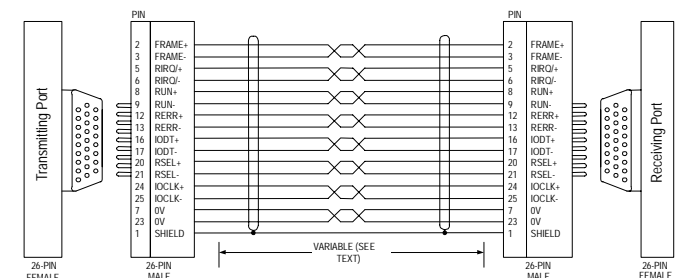
### Building a Custom Expansion Cable

Custom expansion cables can be built using Connector Kit *ACC202, Crimper AMP 90800-1, and Belden 8138, Manhattan/CDT M2483, Alpha 3498C, or equivalent AWG #28 ($0.089mm^2$) cable.