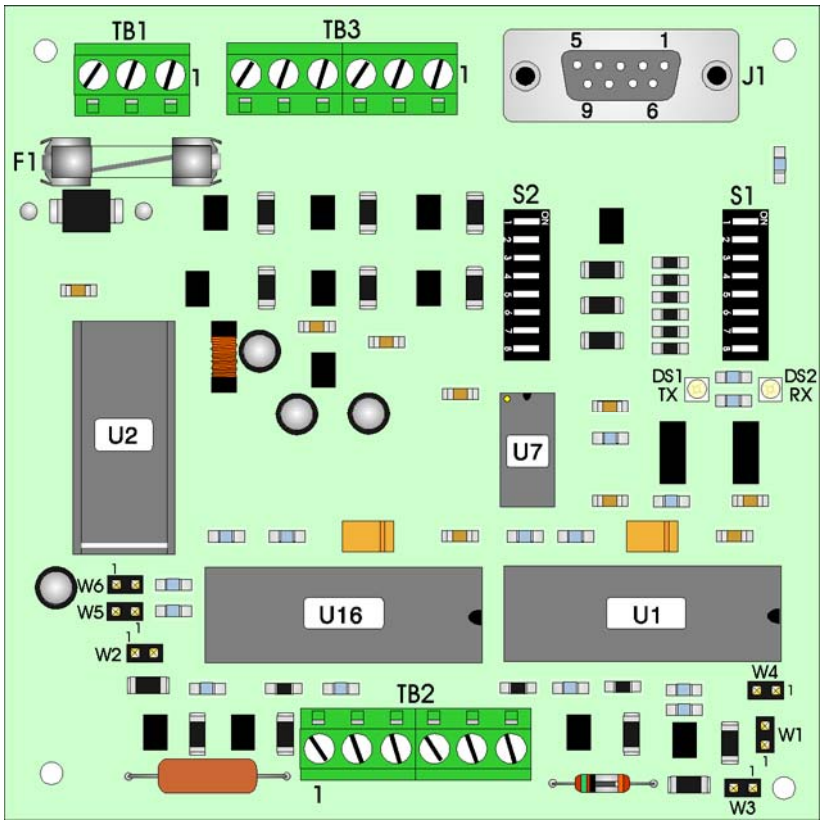
Isolated RS-485 Interface Board

For The Following Bristol Instruction Manuals:
CI-3305, CI-3310, CI-3330, CI-3335
CI-3508-XXX, CI-3530-XXX & CI-3808



IMPORTANT! READ INSTRUCTIONS BEFORE STARTING!

Be sure that these instructions are carefully read and understood before any operation is attempted. Improper use of this device in some applications may result in damage or injury. The user is urged to keep this book filed in a convenient location for future reference.

These instructions may not cover all details or variations in equipment or cover every possible situation to be met in connection with installation, operation or maintenance. Should problems arise that are not covered sufficiently in the text, the purchaser is advised to contact Bristol for further information.

EQUIPMENT APPLICATION WARNING

The customer should note that a failure of this instrument or system, for whatever reason, may leave an operating process without protection. Depending upon the application, this could result in possible damage to property or injury to persons. It is suggested that the purchaser review the need for additional backup equipment or provide alternate means of protection such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc. If additional in-formation is required, the purchaser is advised to contact Bristol .

RETURNED EQUIPMENT WARNING

When returning any equipment to Bristol for repairs or evaluation, please note the following: The party sending such materials is responsible to ensure that the materials returned to Bristol are clean to safe levels, as such levels are defined and/or determined by applicable federal, state and/or local law regulations or codes. Such party agrees to indemnify Bristol and save Bristol harmless from any liability or damage which Bristol may incur or suffer due to such party's failure to so act.

ELECTRICAL GROUNDING

Metal enclosures and exposed metal parts of electrical instruments must be grounded in accordance with OSHA rules and regulations pertaining to "Design Safety Standards for Electrical Systems," 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code).

The grounding requirement is also applicable to mechanical or pneumatic instruments that include electrically-operated devices such as lights, switches, relays, alarms, or chart drives.

EQUIPMENT DAMAGE FROM ELECTROSTATIC DISCHARGE VOLTAGE

This product contains sensitive electronic components that can be damaged by exposure to an electrostatic discharge (ESD) voltage. Depending on the magnitude and duration of the ESD, this can result in erratic operation or complete failure of the equipment. Read supplemental document S14006 at the back of this manual for proper care and handling of ESD-sensitive components.

WARRANTY

A. Bristol warrants that goods described herein and manufactured by Bristol are free from defects in material and workmanship for one year from the date of shipment unless otherwise agreed to by Bristol in writing.

B. Bristol warrants that goods repaired by it pursuant to the warranty are free from defects in material and workmanship for a period to the end of the original warranty or ninety (90) days from the date of delivery of repaired goods, whichever is longer.

C. Warranties on goods sold by, but not manufactured by Bristol, are expressly limited to the terms of the warranties given by the manufacturer of such goods.

D. All warranties are terminated in the event that the goods or systems or any part thereof are (i) misused, abused or otherwise damaged, (ii) repaired, altered or modified without Bristol's consent, (iii) not installed, maintained and operated in strict compliance with instructions furnished by Bristol, or (iv) worn, injured or damaged from abnormal or abusive use in service time.

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F. No agent of Bristol is authorized to assume any liability for it or to make any written or oral warranties beyond those set forth herein.

REMEDIES

A. Buyer's sole remedy for breach of any warranty is limited exclusively to repair or replacement without cost to Buyer of any goods or parts found by Seller to be defective if Buyer notifies Bristol in writing of the alleged defect within ten (10) days of discovery of the alleged defect and within the warranty period stated above, and if the Buyer returns such goods to Bristol's Watertown office, unless Bristol's Water-town office designates a different location, transportation prepaid, within thirty (30) days of the sending of such notification and which upon examination by Bristol proves to be defective in material and workmanship. Bristol is not responsible for any costs of removal, dismantling or reinstallation of allegedly defective or defective goods. If a Buyer does not wish to ship the product back to Bristol, the Buyer can arrange to have a Bristol service person come to the site. The Service person's transportation time and expenses will be for the account of the Buyer. However, labor for warranty work during normal working hours is not chargeable.

B. Under no circumstances will Bristol be liable for incidental or consequential damages resulting from breach of any agreement relating to items included in this quotation, from use of the information herein or from the purchase or use by Buyer, its em-ployees or other parties of goods sold under said agreement.

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Before a product can be returned to Bristol for repair, upgrade, exchange, or to verify proper operation, form (GBU 13.01) must be completed in order to obtain a RA (Return Authorization) number and thus ensure an optimal lead time. Completing the form is very important since the information permits the Bristol Repair Dept. to effectively and efficiently process the repair order.

You can easily obtain a RA number by:

A. FAX
Completing the form (GBU 13.01) and faxing it to (860) 945-3875. A Bristol Repair Dept. representative will return call (or other requested method) with a RA number.

B. E-MAIL
Accessing the form (GBU 13.01) via the Bristol Web site (www.bristolbabcock.com) and sending it via E-Mail to brepair@bristolbabcock.com. A Bristol Repair Dept. representative will return E-Mail (or other requested method) with a RA number.

C. Mail
Mail the form (GBU 13.01) to

Bristol Inc.
Repair Dept.
1100 Buckingham Street
Watertown, CT 06795

A Bristol Repair Dept. representative will return call (or other requested method) with a RA number.

D. Phone
Calling the Bristol Repair Department at (860) 945-2442. A Bristol Repair Department representative will record a RA number on the form and complete Part I, then send the form to the Customer via fax (or other requested method) for Customer completion of Parts II & III.

A copy of the completed Repair Authorization Form with issued RA number should be included with the product being returned. This will allow us to quickly track, repair, and return your product to you.

Bristol Repair Authorization Form (off-line completion)

(Providing this information will permit Bristol to effectively and efficiently process your return. Completion is required to receive optimal lead time. Lack of information may result in increased lead times.)

Date_____ **RA #**_____**SH** **Line No.**_____

Standard Repair Practice is as follows: Variations to this is practice may be requested in the "Special Requests" section.

- Evaluate / Test / Verify Discrepancy
- Repair / Replace / etc. in accordance with this form
- Return to Customer

Please be aware of the Non warranty standard charge:

- There is a $100 minimum evaluation charge, which is applied to the repair if applicable (√ in "returned" B,C, or D of part III below)

Part I Please complete the following information for single unit or multiple unit returns

Address No. _____ **(office use only)** **Address No.** _____**(office use only)**

Bill to :_____ **Ship to:**_____

_____ _____

_____ _____

Purchase Order:_____ **Contact Name:**_____

Phone:_____ **Fax:**_____**E-Mail:** _____

Part II Please complete Parts II & III for each unit returned

Model No./Part No._____ **Description** _____

Range/Calibration _____ **S/N** _____

Reason for return: ☐ Failure ☐ Upgrade ☐ Verify Operation ☐ Other _____

1. Describe the conditions of the failure (Frequency/Intermittent, Physical Damage, Environmental Conditions, Communication, CPU watchdog, etc.)

_____

_____

_____

_____(Attach a separate sheet if necessary)

2. Comm. interface used: ☐ Standalone ☐ RS-485 ☐ Ethernet ☐ Modem (PLM (2W or 4W) or SNW) ☐Other:_____

3. What is the **Firmware** revision? _____ What is the **Software** & version? _____

Part III If checking "replaced" for any question below, check an alternate option if replacement is not available

A. If product is within the warranty time period but is excluded due to Bristol's warranty clause, would you like the product: ☐ repaired ☐ returned ☐ replaced ☐ scrapped?

B. If product were found to exceed the warranty period, would you like the product: ☐repaired ☐ returned ☐ replaced ☐ scrapped?

C. If product is deemed not repairable would you like your product: ☐ returned ☐ replaced ☐ scrapped?

D. If Bristol is unable to verify the discrepancy, would you like the product: ☐ returned ☐ replaced ☐ *see below?

* Continue investigating by contacting the customer to learn more about the problem experienced? The person to contact that has the most knowledge of the problem is: _____ phone_____

If we are unable to contact this person the backup person is: _____ phone_____

Special Requests: _____

_____

Ship prepaid to: **Bristol Inc., Repair Dept., 1100 Buckingham Street, Watertown, CT 06795**
Phone: 860-945-2442 Fax: 860-945-2220 Form GBU 13.01 Rev. C 04/27/06

Bristol
Training

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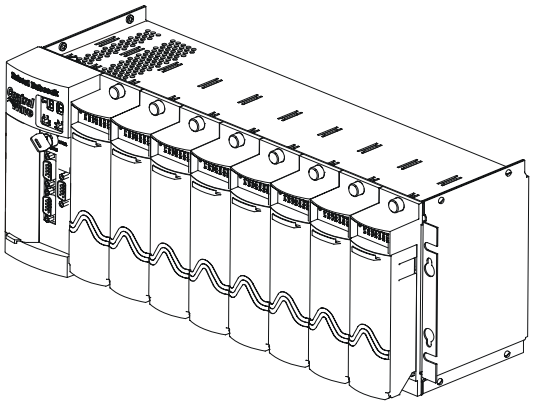
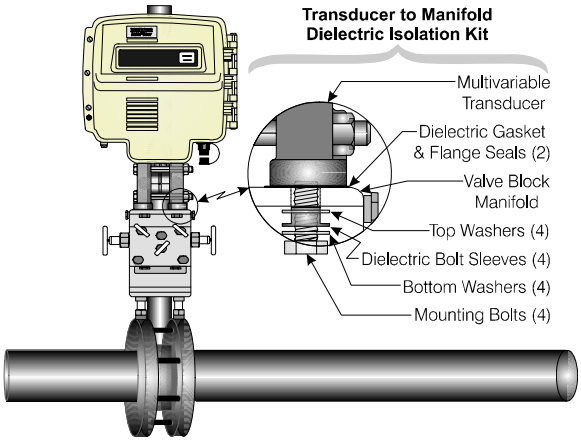


- Avoid Delays and problems in getting your system on-line
- Minimize installation, start-up and maintenance costs.
- Make the most effective use of our hardware and software.
- Know your system.



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For information or to enroll in any class, contact our training department in Watertown at (860) 945-2343. For Houston classes, you can also contact our Houston office, at (713) 685-6200.

A Few Words About Bristol Inc.

For over 100 years, Bristol® has been providing innovative solutions for the measurement and control industry. Our product lines range from simple analog chart recorders, to sophisticated digital remote process controllers and flow computers, all the way to turnkey SCADA systems. Over the years, we have become a leading supplier to the electronic gas measurement, water purification, and wastewater treatment industries.

On off-shore oil platforms, on natural gas pipelines, and maybe even at your local water company, there are Bristol Inc. instruments, controllers, and systems running year-in and year-out to provide accurate and timely data to our customers.

Getting Additional Information

In addition to the information contained in this manual, you may receive additional assistance in using this product from the following sources:

Help Files / Release Notes

Many Bristol software products incorporate help screens. In addition, the software typically includes a 'read me' release notes file detailing new features in the product, as well as other information which was available too late for inclusion in the manual.

Contacting Bristol Inc. Directly

Bristol's world headquarters is located at 1100 Buckingham Street, Watertown, Connecticut 06795, U.S.A.

Our main phone numbers are:

(860) 945-2200
(860) 945-2213 (FAX)

Regular office hours are Monday through Friday, 8:00AM to 4:30PM Eastern Time, excluding holidays and scheduled factory shutdowns. During other hours, callers may leave messages using Bristol's voice mail system.

Telephone Support - Technical Questions

During regular business hours, Bristol's Application Support Group can provide telephone support for your technical questions.

For technical questions about TeleFlow products call (860) 945-8604.

For technical questions about **Control**Wave call (860) 945-2394 or (860) 945-2286.

For technical questions regarding Bristol's **OpenEnterprise** product, call (860) 945-3865 or e-mail: **scada@bristolbabcock.com**

For technical questions regarding **ACCOL** products, **OpenBSI Utilities**, **UOI** and all other software except for **Control**Wave and **OpenEnterprise** products, call (860) 945-2286.

For technical questions about **Network 3000** hardware, call (860) 945-2502.

You can e-mail the Application Support Group at: **bsupport@bristolbabcock.com**

The Application Support Group maintains an area on our web site for software updates and technical information. Go to: **www.bristolbabcock.com/services/techsupport/**

For assistance in interfacing Bristol hardware to radios, contact Bristol's **Communication Technology Group** in Orlando, FL at **(407) 629-9463 or (407) 629-9464**.

You can e-mail the Communication Technology Group at:
orlandoRFgroup@bristolbabcock.com

Telephone Support - Non-Technical Questions, Product Orders, etc.

Questions of a non-technical nature (product orders, literature requests, price and delivery information, etc.) should be directed to the nearest sales office (listed on the rear cover of this manual) or to your Bristol-authorized sales representative.

Please call the main Bristol Inc. number (860-945-2200) if you are unsure which office covers your particular area.

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For general information about Bristol Inc. and its products, please visit our site on the World Wide Web at: **www.bristolbabcock.com**

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PIP-ISORS485
ISOLATED RS-485 INTERFACE BOARD
PT. NO. 392909-XX-X

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ISOLATED RS-485 INTERFACE BOARD

DESCRIPTION

Function

An Isolated RS-485 Interface Board allows any Bristol Network 3000 product to communicate over an isolated master/salve network. Each node on the network that incurporates an Isolated RS-485 Interface Board is optically isolated from the rest of the network, thereby eliminating ground loop and potential difference effects that may degrade network communication performance. The result is a reliable communication medium for in-plant or building to building LANs. The Isolated RS-485 Board effectively replaces the Network Interface Box (NIB).

Features

- **On-Board Power Supply**
  A power supply, operating from a bulk +9 to +35 VDC source, powers the RS-485 circuitry, generating a regulated 5VDC. A 30V transient Voltage Suppresser provides over-voltage protection on the input terminals. A separate IC provides the -5VDC required by the RS-232 transceiver. Bulk DC power is interfaced to the board on Connector TB1. The + DC Bulk is connected to TB1 Pin 1 and the VDC Return or Ground is supplied to TB1 Pin 2. TB1 Pin 3 is not used.

- **Optical Isolation**
  Optically Isolated 2-Wire or 4-Wire RS-485 circuits with 300VDC isolation eliminates ground loops and potential difference effects.

- **100Ω Isolated RS-485 Termination For 2\4-Wire Boards & Receiver Biasing**
  Installation of Jumper W1 is required at each Isolated RS-485 Board associated with an end node of a Two-wire or Four-wire RS-485 network. In the case of a Four-wire RS-485 network, the Isolated RS-485 Board's Jumper W2 must also be installed at each end node. Units installed at the master node of a 2-wire RS-485 network must also have Jumper W3 (Receiver Bias to Isolated Ground) & Jumper W4 (Receiver Bias to Isolated VCC) installed, while units installed at the master node of a 4-wire RS-485 network must also have Jumper W5 (Receiver Bias to Isolated Ground) & Jumper W6 (Receiver Bias to Isolated VCC) installed (See Section - End Node Jumpers W1 through W6).

- **RS-232 or RS-485 Node Interfaces**
  Networks nodes may connect to the Isolated RS-485 Interface Board via an RS-232 or RS-485 interface. For installations where each node will include its own Isolated RS-485 Interface Board and asynchronous operation is required (38.4 KBaud max) an RS-232 interface may be used. In situations where several nodes will be mounted in close proximity, as in an equipment cabinet containing two or more DPCs, a single Isolated RS-485 Interface Board may be employed by multidropping to each slave using the RS-485 Interface Connector TB3. For LANs that will operate synchronously (187.5 KBaud to 1 MBaud), all nodes are required to have an RS-485 interface. As with the isolated LAN itself, up to 32 nodes can be included in a multidrop arrangement. The maximum distance between communicating nodes on a 2-wire 187.5 KBaud LAN is approximately

1000 feet (300 meters). The maximum distance between communicating nodes on a 4-wire 1 MBaud LAN is approximately 200 feet (60 meters).

- **Surge Protection**
  Surge suppression on input ports and on the isolated output port meets IEC-801 to isolated ground.

- **Isolated RS-485 Common-Mode Voltage Range**
  The Isolated RS-485 Port features -7V to +12V common-Mode Input Voltage range with respect to Isolated ground. The port also includes current limiting and thermal shutdown circuitry for driver overload protection.

- **Switch Selectable Termination, Operating Mode, and 2/4-Wire Configuration**
  8 position DIP switches S1 and S2 are used to configure the Isolated RS-485 Board's various operating parameters associated with port usage and LAN configuration.

- **Mounting**
  The Isolated RS-485 Interface Board measures 4.302" (10.917cm) in width x 4.230" (10.744cm) in height and may be mounted externally or to the top of an RTU 3305 via a DIN Rail and DIN Rail Mounting Base. When mounted in a DIN Rail Mounting Base the unit measures 4.375" (12.112cm) in width x 4.375" (12.112cm) in height.

- **PC LAN Functionality**
  The RS-232 Interface port allows PCs (which only have an RS-232 port) to be networked over an Isolated RS-485 LAN at asynchronous communication rates.

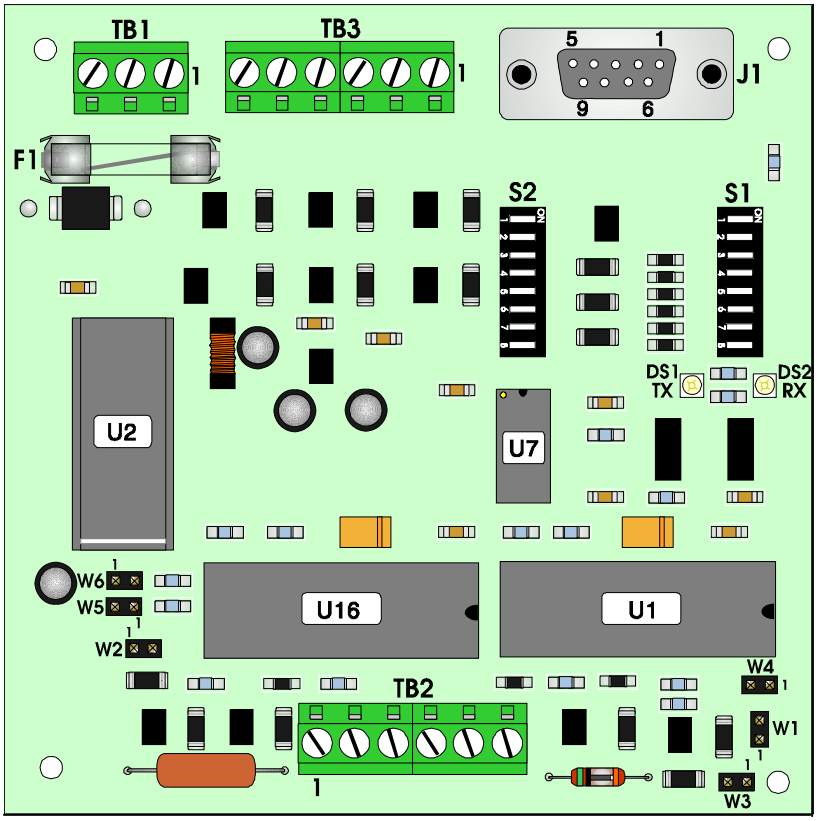


Figure 1 - Isolated RS-485 Board Component Identification Diagram

COMPONENT IDENTIFICATION

The Isolated RS-485 Interface Board has four wiring connectors; J1, TB1, TB2 and TB3, two configuration switches; S1 and S2, six 2-pin end node configuration jumpers; W1 through W6. Jumpers W1, W3 and W4 are used in on 2-wire networks and Jumpers W1, W2, W5 & W6 are used on 4-wire networks. The board is protected by an on-board fuse F1 that is rated at .25A.

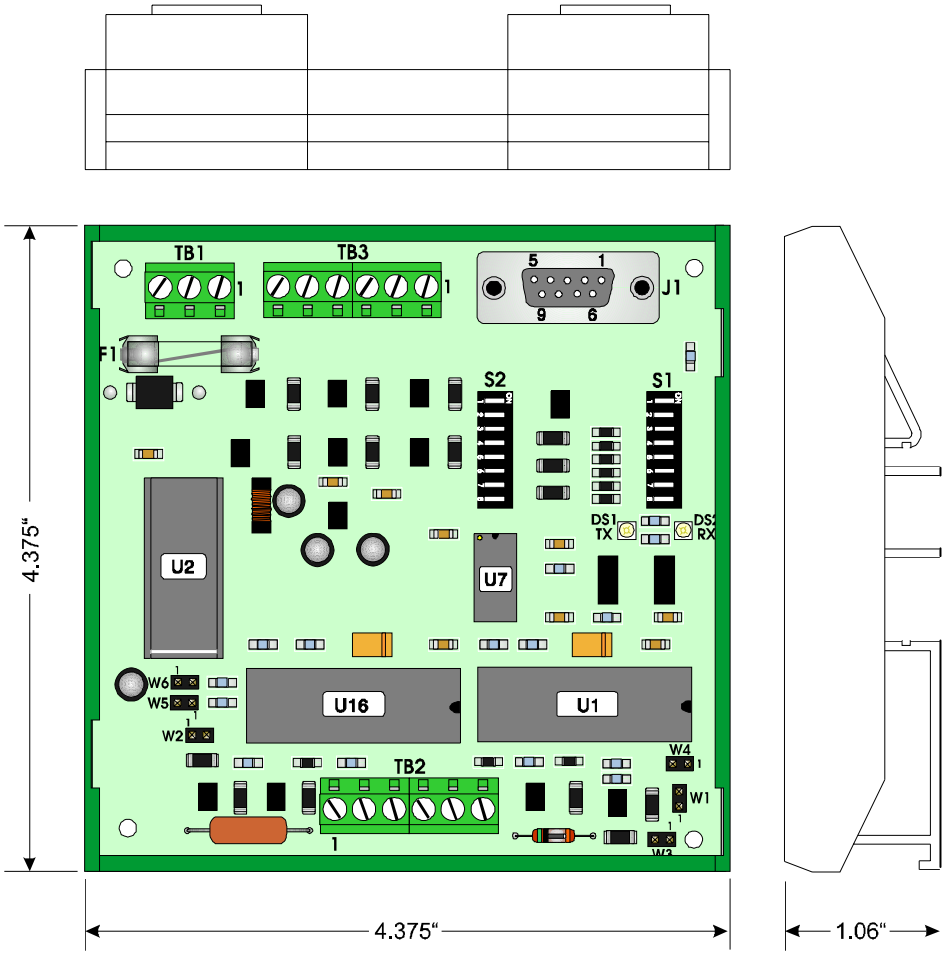


Figure 2 - Isolated RS-485 Board in a DIN Rail Mounting Base

Two-Wire End Node Jumpers W1, W3 & W4

Jumpers should be placed in an open position, i.e., installed on pin 1 or pin 2 for all nodes except the end nodes. Jumper W1 provides a 100-Ohm termination across TXD/RXD- and TXD/RXD+ at the most distant (end) nodes. Two-wire RS-485 LANs also require the use of jumper W3 to provide Tx\Rx bias to isolated ground and jumper W4 to provide Tx\Rx bias to isolated VCC. Jumpers W3 and W4 are only required at the Master Node (see Table 1 and Figure 3).

Four-Wire End Node Jumpers W2, W5 & W6

Jumpers should be placed in an open position, i.e., installed on pin 1 or pin 2 for all nodes except the end nodes. Jumper W2 provides a 100-Ohm termination across RXD- and RXD+ at the most distant (end) nodes. On these networks, W5 provides receiver bias to isolated

ground and W6 provides receiver bias to Isolated VCC. Four-wire networks use W2, W5 and W6 at the master node and W2 at the other end node, unless the network is to operate at other than 1Mbaud (synchronous), in which case jumpers W5 & W6 must also be installed at both end nodes (see Table 1 and Figure 4).

Table 1 - End Node Jumper Assignment

Network Type	Master Node Jumpers Installed	Last Node (Slave Jumpers Installed
RS-485 - 2-Wire	W1, W3, W4	W1
RS-485 - 4-Wire - 1Mbaud	W2, W5, W6	W2
RS-485 - 4-Wire - Not 1Mbaud	W2, W5, W6	W2, W5, W6

Connectors

When Connector J1 (9-Pin D-Type) of the Isolated RS-485 Interface Board is connected to a DPC/RTU, transmitter or computer communications D-Type Connector, an RS-232 interface is established. Connector TB3 of the Isolated RS-485 Interface Board is a 6-Pin Terminal Block that accommodates interface to an RS-485 port. RS-485 Input Connector TB3 can be multidropped with up to 32 other RS-485 ports. Connector TB2 provides an interface to a 2-wire or 4-wire isolated RS-485 network. Input power is provided on Terminal Block TB1. Tables 2 through 5, which follow, provide a description of each connector's functionality:

Table 2 - Power Connector TB1 Wiring List

Pin #	Signal Name	Description
1	+VDC Input	+9V to +35V DC Bulk
2	VDC Return	Bulk Return/Ground
3	Not Used	N/A

Table 3 - Isolated RS-485 Port Interface Connector TB2 Wiring List

Pin #	Signal Name	Description
1	TXD/RXD+ (2-Wire) TXD+ (4-Wire)	TXD/RXD+ Signal on 2-wire circuits TXD+ Signal on 4-wire circuits
2	TXD/RXD-(2-Wire) TXD- (4-Wire)	TXD/RXD- Signal on 2-wire circuits TXD- Signal on 4-wire circuits
3	RXD+ (4-Wire)	RXD+ Signal on 4-wire circuits
4	RXD- (4-Wire)	RXD- Signal on 4-wire circuits
5	Isolated GND	Isolated Ground
6	Chassis GND	Chassis Ground

Table 4 - RS-232 Input Port Interface Connector J1 Wiring List

Pin #	Signal Name	Description
2	TXD	RS-232 Transmit Data
4	RXD	RS-232 Receive Data
5	RTS	RS-232 Request To Send
9	GND	RS-232 Ground

Note: Connector Pins 1, 3, 6, 7 & 8 are not used on Connector J1

Table 5 - TB3 RS-485 Input Port Interface Connector TB3 Wiring List

Pin #	Signal Name	Description
1	TXD+	RS-485 Input Interface Signal Transmit Data Plus (+)
2	TXD-	RS-485 Input Interface Signal Transmit Data Minus (-)
3	RXD+	RS-485 Input Interface Signal Receive Data Plus (+)
4	RXD-	RS-485 Input Interface Signal Receive Data Minus (-)
5	RTS+	RS-485 Input Interface Signal Request To Send Plus (+)
6	RTS-	RS-485 Input Interface Signal Request To Send Minus (-)

Switches

Two eight position DIP Switches are provided for board and network configuration. The functionality of these switches are provided in Tables 6 and 7 below:

Table 6 - Switch S1 Configuration Settings

Position	Setting	Function
1	ON	Select RS-232 Input Port
1	OFF	Select RS-485 Input Port
3 & 4	ON	Enable RS-485 Terminator for TXD+/-
3 & 4	OFF	Disable RS-485 Terminator for TXD+/-
5 & 6	ON	Enable RS-485 Terminator for RTS+/-
5 & 6	OFF	Disable RS-485 Terminator for RTS+/-
7 & 8	ON	Enable RS-485 Terminator for RXD+/-
7 & 8	OFF	Disable RS-485 Terminator for RXD+/-

Table 7- Switch S2 Configuration Settings

Position	Setting	Function
1, 3 & 5	ON	Select RS-232 Input Port
1, 3 & 5	OFF	Select RS-485 Input Port
2, 4 & 6	ON	Select RS-485 Input Port
2, 4 & 6	OFF	Select RS-232 Input Port
7	ON	4-Wire Network
7	OFF	2-Wire Network
8	ON	2-Wire Network
8	OFF	4-Wire Network

Indicators

There are Two LEDs on the Isolated RS-485 Interface Board. LED DS1 will be illuminated when data is being transmitted and LED DS2 will be illuminated when data is being received.

WIRING

RS-232 Interface Between Isolated RS-485 Intf. Board and the Host Node

When it is desired to establish an RS-232 Interface between the Isolated RS-485 Interface Board and the Host DPC/RTU, transmitter or computer a 24-gauge conductor cable, such as

Belden 9535 should be used. It should be noted that the Isolated RS-485 Interface Board provides 15KV surge protection per IEC-801 on all signals associated with this interface.

RS-485 Interface Between Isolated RS-485 Intf. Board and the Host Node

When it is desired to establish an RS-485 Interface between the Isolated RS-485 Interface Board and the Host DPC/RTU or transmitter a low capacitance 24-gauge 3-twisted pair communications grade cable, such as Belden 9843 should be used. It should be noted that the Isolated RS-485 Interface Board provides 15KV surge protection per IEC-801 on all signals associated with this interface.

Isolated RS-485 Port Interface to LAN

Two-wire or four-wire RS-485 networks are supported. For two-wire applications, a low capacitance 24-gauge communications grade 2-twisted pair cable, such as Belden 9842, should be used. The cable shield should be connected to the Chassis Ground terminal, i.e., TB2 Pin 6 (at one end only). For four-wire applications a similar 3-twisted pair cable, such as Belden 9843, should be used. Again, the cable shield should be connected to the Chassis Ground terminal (at one end only). It should be noted that the Isolated RS-485 Interface Board provides 15KV surge protection on all signals associated with this interface.

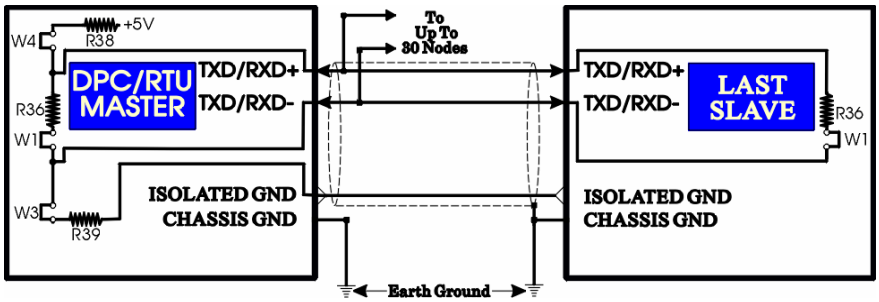
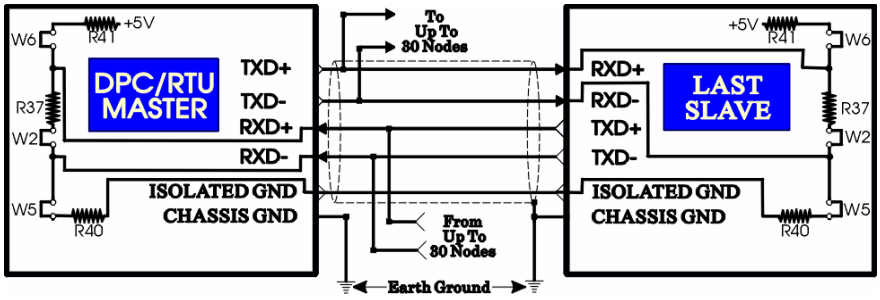


Figure 3 - 2-Wire RS-485 LAN using Isolated RS-485 Interface Boards



Note: Jumpers W5 & W6 aren't required at the most distant Slave Node unless the LAN is operating at other than 1Mbaud; however, they aren't detrimental if they are installed.

Figure 4 - 4-Wire RS-485 LAN using Isolated RS-485 Interface Boards

Field Terminations for RS-485

The maximum number of nodes that can be connected to a RS-485 network is 32 including the master. For maximum protection against unwanted interference, noise and spurious

emission, the shield of each LAN segment should be terminated to the Chassis Ground at one end only. This practice will eliminate the formation of ground loops, thereby minimizing ground induced noise currents in the LAN. A Chassis Ground connection is provided on each Isolated RS-485 Interface Board at TB2 - Pin 6. In addition, the chassis of each Isolated RS-485 Interface Board should be connected to the nearest earth ground via a short length of 12-gauge stranded copper wire in order to take advantage of the built-in surge protection capability. The Isolated Ground terminal (TB2-5) of all nodes on the two-wire RS-485 LAN must be connected via a third wire (within the second twisted pair).

For four-wire LANs 3-twisted pairs of wires are required. Shielding is not required (but is recommended). The maximum network length for the available asynchronous speeds (up to 38.4 KBaud) is 4000 feet (point to point) 1000 feet (for multiple nodes). For LANs utilizing synchronous speeds up to 187.5 KBaud (for two-wire LANs) or up to 1 MBaud (for four-wire LANs) the maximum network length is 1000 feet (300 meters) or 200 feet (60 meters) respectively. The Isolated Ground terminal (TB2-5) of all nodes on the four-wire RS-485 LAN must be connected via a fifth wire (within the third twisted pair).

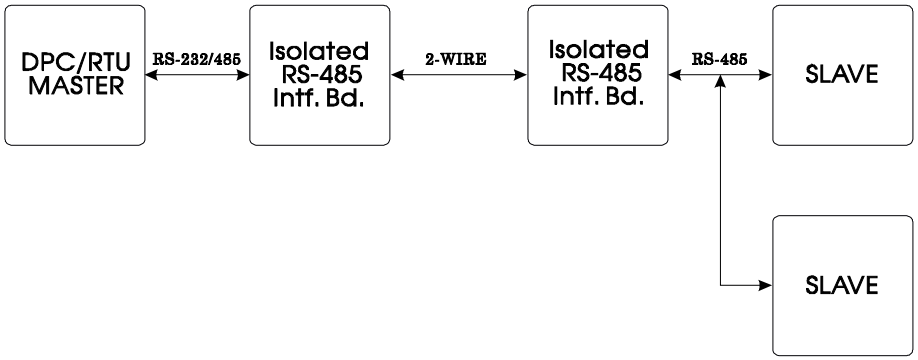


Figure 5 - Typical 2-Wire Asynchronous RS-485 LAN

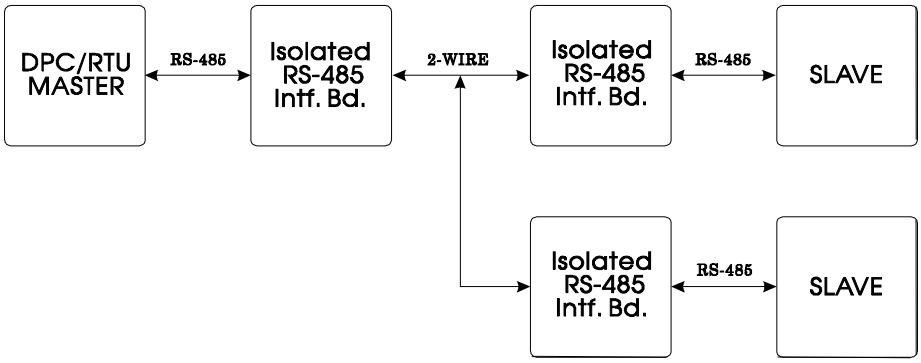


Figure 6 - Typical 2-Wire Synchronous 187.5KBaud RS-485 LAN

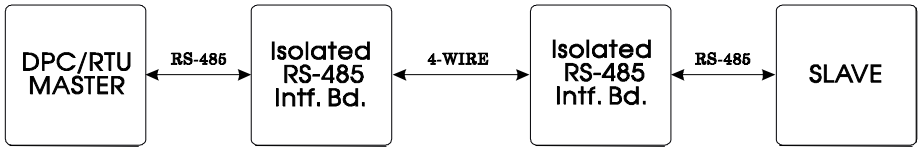


Figure 7 - Typical 4-Wire Synchronous 1MBaud RS-485 LAN

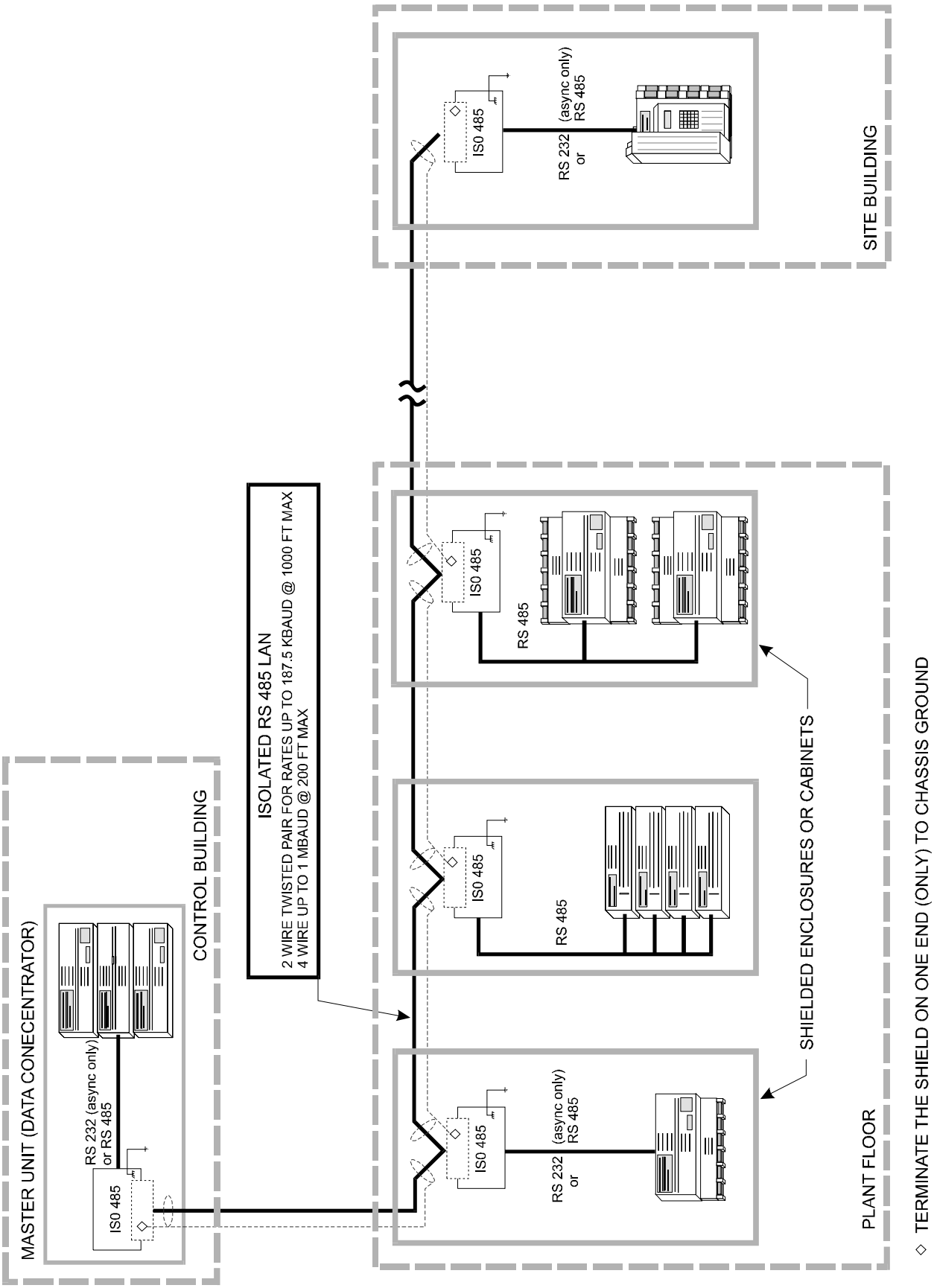


Figure 8 - Isolated RS-485 LAN - Typical Installation

ISOLATED RS-485 INTERFACE BOARD SPECIFICATIONS

Performance Specifications

Baud Rate (Max.):	38.4K Asynchronous (2-wire or 4-wire) 187.5K Synchronous (2-wire), 1M Synchronous (4-wire)
Multidrop (Max.):	32 Nodes
Network Termination:	100 Ohm Resistors for TX and RX Circuits on End Nodes
Topology:	Master/Slave: (TXD+ to RXD+) & (TXD- to RXD-)
Isolation:	Optically Isolated Data Signals
Common Mode Range:	-7 Volts to +12 Volts (DC) (With respect to Isolated Ground)
Surge Protection:	Meets IEC-801 (To Isolated Ground)
Isolated Ground	Terminal Provided for Local Connection to Cable Shield (one end of shield only)
Surge Path:	Terminal Provided for Local Connection from Isolated Chassis Ground to Earth Ground through a 280V Sealed Surge Absorber
Input Voltage:	+9 to +35 VDC
Input Power:	(4-Wire) 65 mA @ 24 VDC (1.56 watt) (2-Wire) 40 mA @ 24 VDC (1 watt)

Environmental Specifications

Operating Temperature:	-40° to +70° (C) [-40° to +158° (F)]
Storage Temperature:	-40° to +85° (C) [-40° to +185° (F)]
Humidity:	5% to 95% (Non-condensing)
RFI Susceptibility:	Per SAMA Standard PMC 33.1-1978, Using Field of 10V/Meter (From 20 MHz to 500 MHz)
Vibration:	10-150 Hz, 1g 150-2000 Hz, 0.5g

Part Numbers

Two-wire Isolated RS-485 Interface Board:	With DIN Base:	392909-01-4
	Without DIN Base:	392909-02-2
Four-wire Isolated RS-485 Interface Board:	With DIN Base:	392909-03-0
	Without DIN Base:	392909-04-9

Isolated RS-485 Interface Board
Special Instructions for Class I, Division 2 Hazardous Locations

1. The Bristol, Inc. Isolated RS-485 Interface Board is listed by Underwriters Laboratories (UL) as nonincendive and is suitable for use in Class I, Division 2, Groups A, B, C and D hazardous locations and non-hazardous locations only. Read this document carefully before installing a nonincendive Bristol Isolated RS-485 Interface Board. In the event of a conflict between the Isolated RS-485 Interface Board User Manual (PIP-ISORS485) and this document, always follow the instructions in this document.

2. All power and I/O wiring must be performed in accordance with Class I, Division 2 wiring methods as defined in Article 501-4 (b) of the National Electrical Code, NFPA 70 for installations within the United States, or as specified in Section 18-152 of the Canadian Electrical Code for installation in Canada.

3. **WARNING: EXPLOSION HAZARD - Substitution of components may impair suitability for use in Class I, Division 2 environments.**

4. **WARNING: EXPLOSION HAZARD - When situated in a hazardous location, turnoff power before servicing/replacing the unit and before installing or removing I/O wiring.**

5. **WARNING: EXPLOSION HAZARD - Do Not disconnect equipment unless the power has been switched off or the area is known to be nonhazardous.**

Isolated RS-485 Interface Board - 33XX, 3508, 3530 & 3808

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