

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 information 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.
- E. THESE WARRANTIES ARE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED (INCLUDING WITHOUT LIMITATION WARRANTIES AS TO MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE), AND NO WARRANTIES, EXPRESS OR IMPLIED, NOR ANY REPRESENTATIONS, PROMISES, OR STATEMENTS HAVE BEEN MADE BY BRISTOL UNLESS ENDORSED HEREIN IN WRITING. FURTHER, THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF.
- 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 Watertown 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-employees or other parties of goods sold under said agreement.

How to return material for Repair or Exchange

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: _____

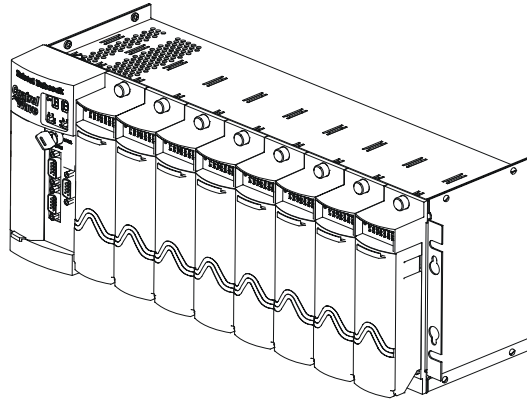
Ship prepaid to: Bristol Inc., Repair Dept., 1100 Buckingham Street, Watertown, CT 06795

Phone: 860-945-2442 Fax: 860-945-2220

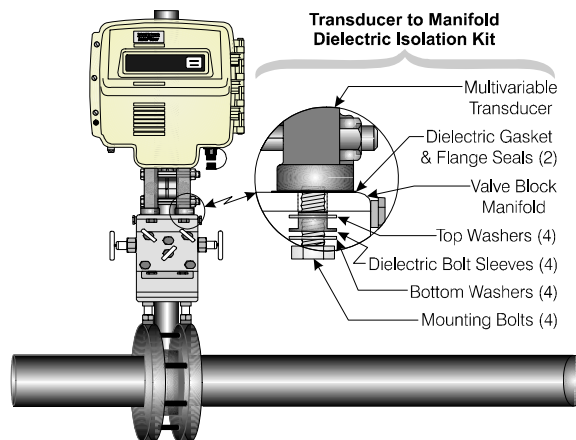
Form GBU 13.01 Rev. C 04/27/06

Bristol *Training*

GET THE MOST FROM YOUR BRISTOL BABCOCK INSTRUMENT OR SYSTEM



- 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.



As you know, a well-trained staff is essential to your operation. Bristol Inc. offers a full schedule of classes conducted by full-time, professional instructors. Classes are offered throughout the year at three locations: Houston, Orlando and our Watertown, CT headquarters. By participating in our training, your personnel can learn how to install, calibrate, configure, program and maintain any and all Bristol products and realize the full potential of your system.

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 **ControlWave** 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 **ControlWave** 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.

Visit our Site on the World Wide Web

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

Training Courses

Bristol's Training Department offers a wide variety of courses in Bristol hardware and software at our Watertown, Connecticut headquarters, and at selected Bristol regional offices, throughout the year. Contact our Training Department at **(860) 945-2343** for course information, enrollment, pricing, and scheduling.

**PIP-TIBS33XX
TRANSMITTER INTERFACE BOARDS
PT. NO. 392912-XX-X & 392523-XX-X**

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TRANSMITTER INTERFACE BOARDS

For Models

RTU-3305, RTU-3310 & DPC-3330

DESCRIPTION

Two versions of the Transmitter Interface Board (+12VDC and +24VDC) are available for models RTU-3305 and two versions are available for models, RTU-3310 and DPC-3330. The Transmitter Interface Board (TI Board) allows up to five Bristol, Series 3508 or Series 3808 Transmitters to communicate with a host DPC/RTU. The DPC/RTU polls and stores data from each transmitter and communicates with the network. Three LEDs on the TI Board (TXD, CTS and RXD) indicate the communication status.

The +24V TIB can provide loop power for its associated transmitters directly from the +24V supply used to power the DPC 3330, RTU 3310 or RTU 3305. The +12V TIB includes an on-board DC-DC converter to provide +24V loop power for transmitters not designed to operate from a +12V source.

The +24V version of the TI Board does not contain any switches or jumpers that require configuration; however, the +12V version of the TI Board does contain three configuration jumpers which must be set to support LED operation and either of two field wiring configurations.

RTU-3305 Boards

Either of the TI Board shown in Figure 1 (24 Vdc) or Figure 2 (12 Vdc), can be mounted to an RTU-3305's Option Mounting Brackets and interfaced to the 3305's Port C via TI Board connector P1 (see Section 2.6 of the CI-3305 Instruction manual).

DPC-3330 Boards

The TI Board shown in Figure 3 (24Vdc) or Figure 4 (12Vdc) plugs into the modem utility connector (J3) on the DPC-3330's 2-Port CE Board and is assembled to the CE Board using screws and spacers. A TI Board cannot be mounted on the 4-Port Enhanced Comm. Board.

RTU-3310 Boards

The TI Board shown in Figure 3 (24Vdc) or Figure 4 (12Vdc) plugs into the modem utility connector (J7) on the RTU-3310's Multi-Function Interface Board (MFIB) and is assembled to the MFI Board using screws and spacers.

Model 3508 Transmitter Operation

Each Model 3508 Transmitter must be assigned a unique address via the SMARTKIT program as described in Section 4.2 PROGRAM LOADING AND STARTUP of the appropriate 3508 Transmitter manual. Additionally, all Model 3508 Transmitters wired to the TI Board must be operated in the minimum current mode (3.8 mA). This mode is

selected via the SMARTKIT program as described in Section 4.7 TRANSMITTER OPERATING MODES of the appropriate 3508 Transmitter manual, i.e., CI-3508-10C, CI-3508-30C or CI-3508-99C.

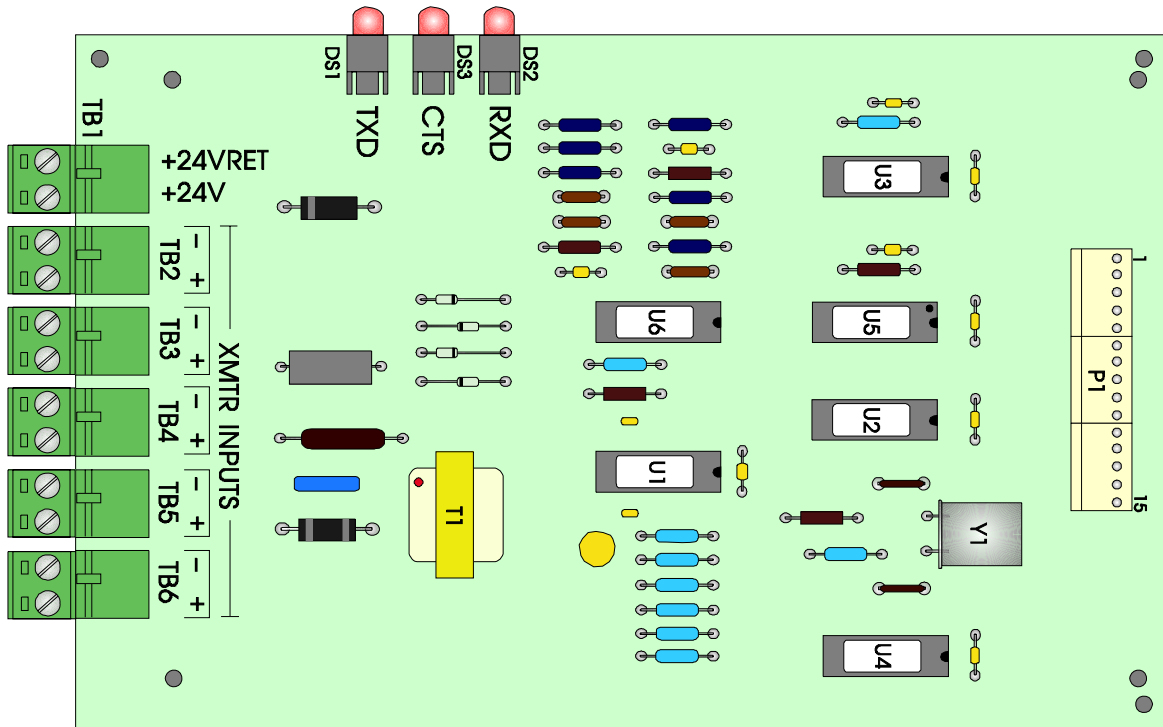


Figure 1 - 24V Transmitter Interface Board P/N 392523-02-7 for RTU 3305

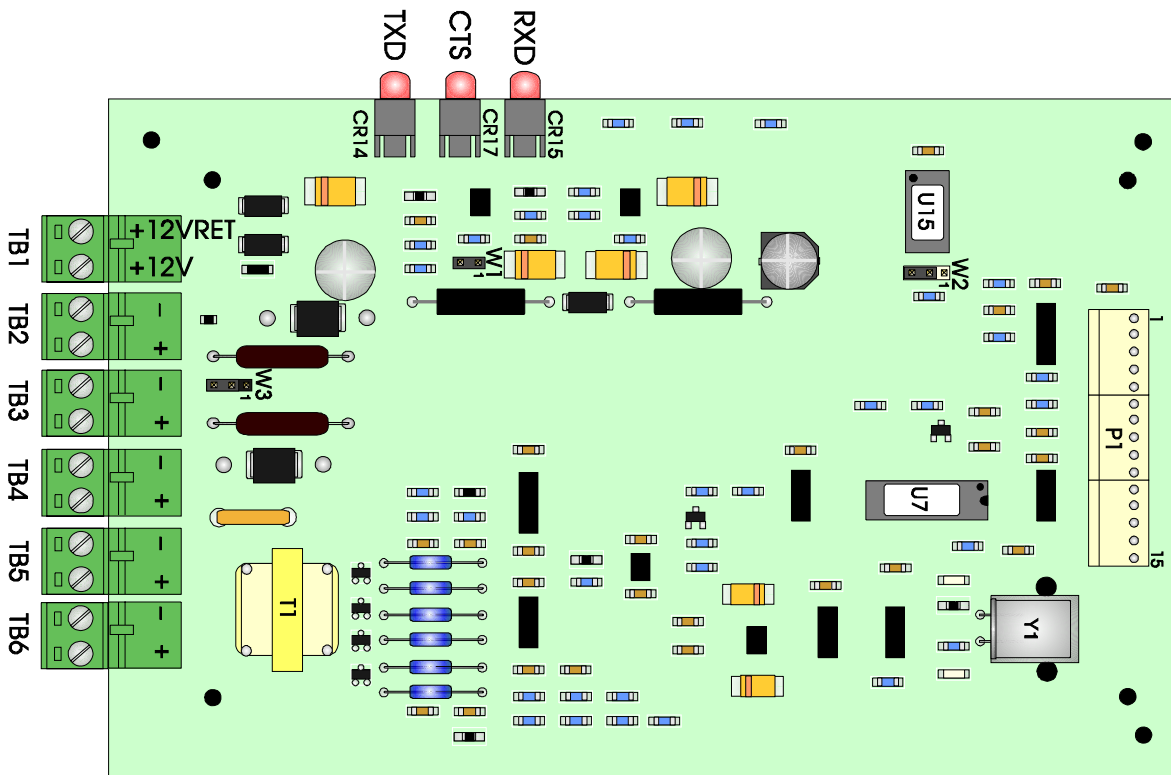


Figure 2 - 12V Transmitter Interface Board P/N 392912-02-3 for RTU 3305

Model 3808 MVT Transmitter Operation

Each Model 3808 MVT Transmitter must be assigned a unique address via the WebBSI Sign On/Off Menu (see Section 3 of Customer Instruction Manual CI-3808). Additionally, only analog versions of the 3808 MVT can be interfaced to a Transmitter Interface Board.

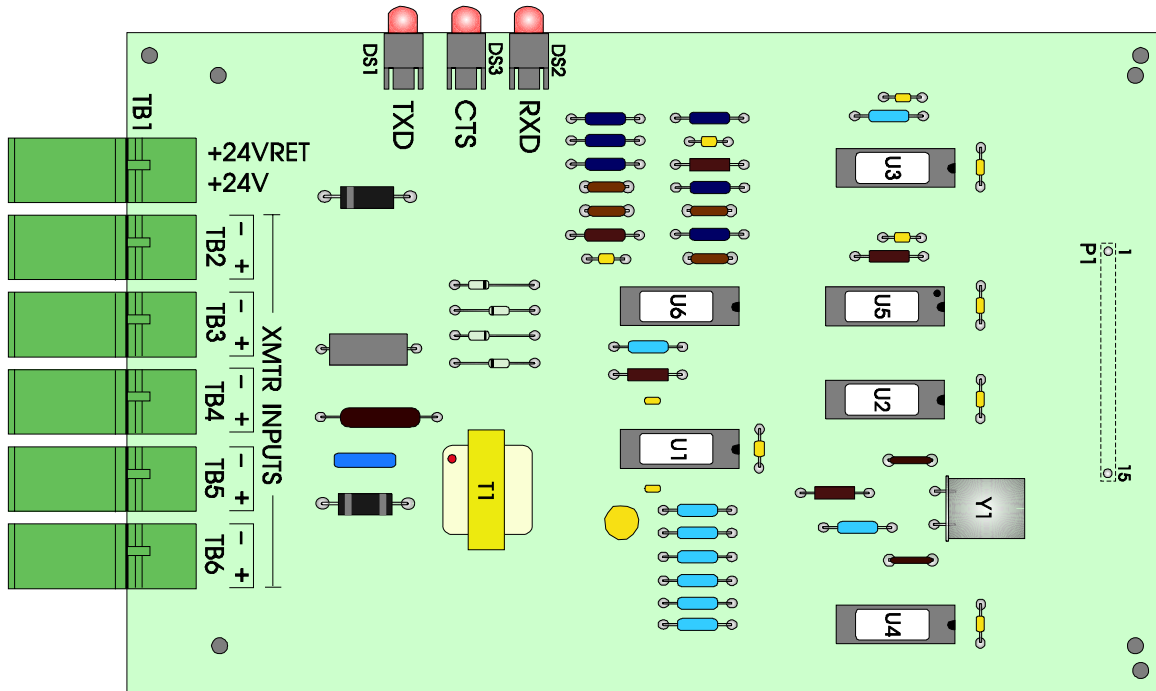


Figure 3 - 24V Transmitter Intf. Board P/N 392523-01-9 (RTU 3310 or DPC 3330)

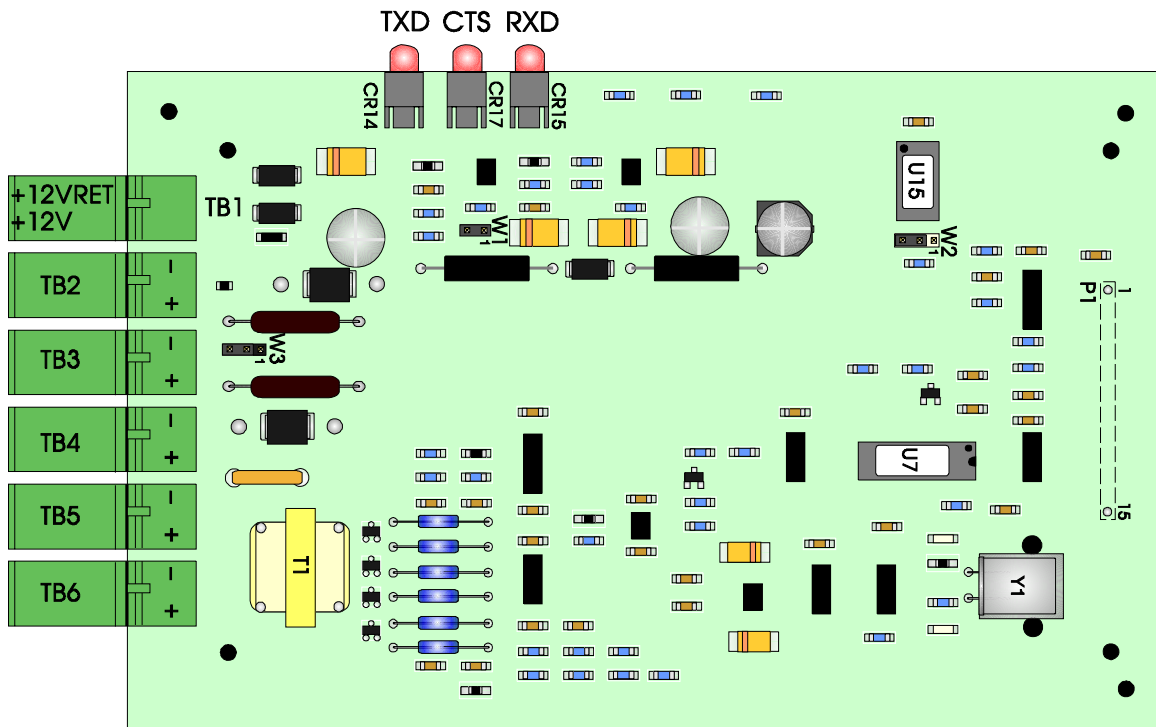


Figure 4 - 12V Transmitter Intf. Board P/N 392912-01-5 (RTU 3310 or DPC 3330)

CONFIGURATION & WIRING

Wiring Connections

TI Boards are equipped with six dual-terminal blocks for field wiring connections. Terminal block TB1 connects to the transmitter power source, while TB2 through TB6 connect to the signal/power inputs of the transmitters. Two field wiring conventions are supported by the TI Boards; Internally Powered (see Figure 5) and Externally Powered (see Figure 6).

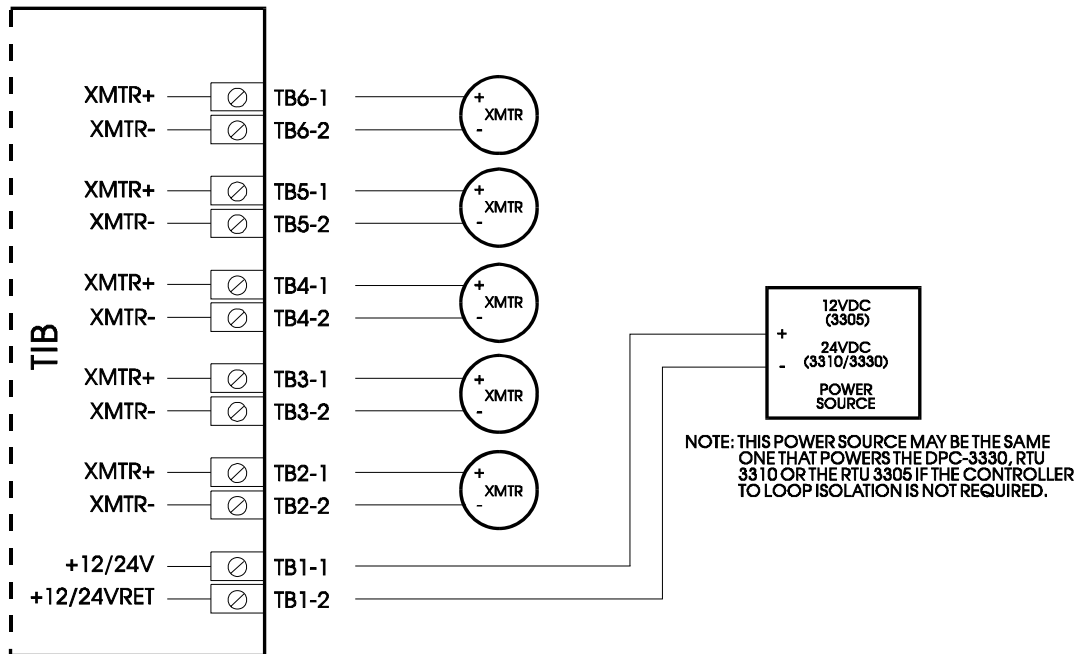


Figure 5 - Internally Powered Transmitter Field Wiring

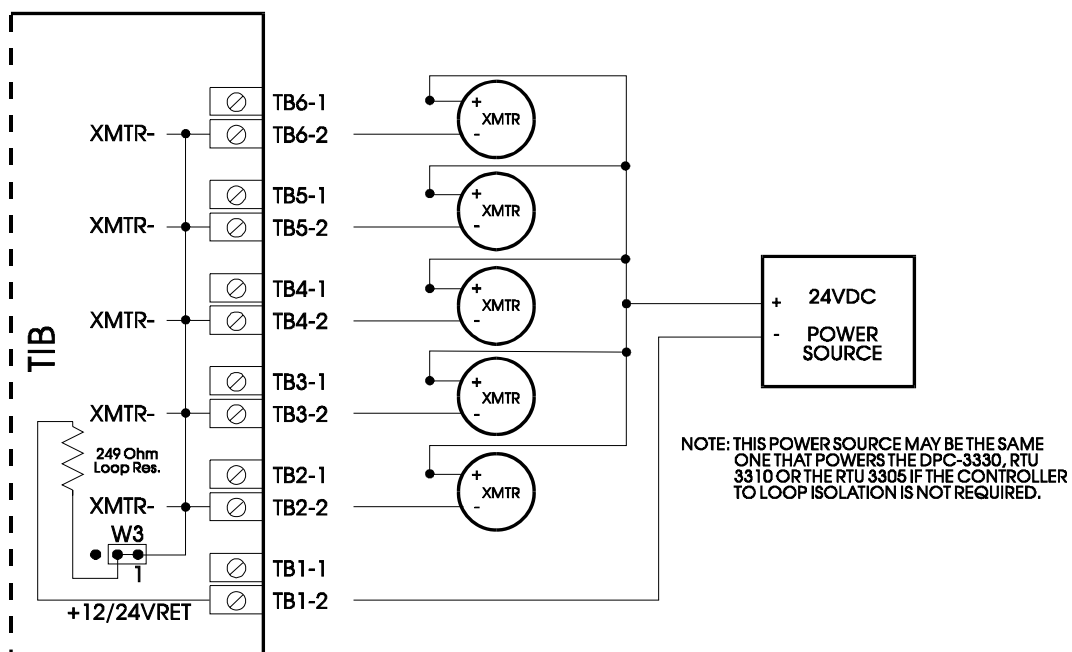


Figure 6 - Externally Powered Transmitter Field Wiring

In the case of an Internally Powered Transmitter (powered from TIB's on-board +24V Supply/Regulator) an external +24 Vdc or +12 Vdc power supply is wired to the TI Board connector TB1 as shown in Figure 5. The supply is wired across the +24V EXT and +24V RETEXT (+12V EXT and +12V RETEXT) terminals. The input voltage range for a 24V TIB is +22Vdc to +28Vdc. The input voltage range for a 12V TIB is +9Vdc to +15Vdc.

In the case of an Externally Powered Transmitter the -24Vdc side of the Transmitter Power Source is connected to the TIB's +12V/24VRET Terminal (TB1-2) as shown in Figure 6

The 12V TI Board contains jumpers that must be configured to support the field wiring option. The 24V TI Board; however, doesn't contain jumpers. Both versions of the TI Board (12V and 24V) contain an internal loop resistor and therefore external ones are not required.

12V Transmitter Interface Board Jumper Configuration

Two-position Jumper W1 enables or disables the Internal 24V Power Supply/Regulator. Jumper W1 is installed, to disable power supply "shutdown" for "Internally Powered Transmitters". For "Externally Powered Transmitters," Jumper W1 must be stored in position 1 or 2.

Three-position Jumper W2 enables LED operation when installed in position 1 to 2. To disable LED operation, install Jumper W2 in position 2 to 3.

Jumper W3 must be installed in position 1 to 2 to connect the 249-Ohm Loop Resistor used for Internally Powered Transmitters. When wiring to Externally Powered Transmitters, Jumper W3 must be installed in position 2 to 3 to remove the 249-Ohm Loop Resistor.

LED INDICATORS

The board contains three LEDs which have the following functions: Transmit Data (TXD), Receive Data (RXD), and Clear to Send (CTS). When the board is sending data, TXD and CTS are on and RXD is off. Conversely, when the board is receiving data, TXD and CTS are off and RXD is on. 12V versions of the TI Board contain a two-position Jumper (W2) which is used to enable or disable the LEDs.

SPECIFICATIONS

12V TIB

Communication Interface:	TTL
3508/3808 Interface:	FSK Modem - Bell 202 Compatible (1200 Hz/2200 Hz modulation)
24V Output:	24.4Vdc \pm 6.5% 180mV pk/pk ripple
Power Consumption Internal +5V:	8.5mA
Power Consumption Internal -5V:	2mA

Power Consumption External +9V:	14mA Per Transmitter
Power Consumption External +15V:	8mA Per Transmitter
Operating Temperature:	-40°C to +70°C (-40°F to +152°C)
Storage Temperature:	-40°C to +85°C (-40°F to +185°C)
Relative Humidity:	15% - 95% Non-condensing
Vibration:	1G for 10Hz to 150Hz 0.5G for 150Hz to 2000Hz
RFI Susceptibility:	10V/meter - 20MHz to 500MHz
Part Numbers:	392912-02-3 (for RTU-3305) 392912-01-5 (for DPC-3330 & RTU-3310)

24V TIB

Communication Interface:	TTL
3508/3808 Interface:	FSK Modem - Bell 202 Compatible (1200 Hz/2200 Hz modulation) Baud rate is 1200
24V Output:	External 24V Supply 22 - 28Vdc
Power Consumption Internal +5V:	4mA
Power Consumption External +24V:	4mA Per Transmitter
Operating Temperature:	-40°C to +70°C (-40°F to +152°C)
Storage Temperature:	-40°C to +85°C (-40°F to +185°C)
Relative Humidity:	15% - 95% Non-condensing
Vibration:	1G for 10Hz to 150Hz 0.5G for 150Hz to 2000Hz
RFI Susceptibility:	10V/meter - 20MHz to 500MHz
Part Numbers:	392523-02-7 (for RTU-3305) 392523-01-9 (for DPC-3330 & RTU-3310)

Transmitter Interface Boards
Special Instructions for Class I, Division 2 Hazardous Locations

1. The Bristol Transmitter Interface Boards (TIBs) part numbers 392912-01-5, 392912-02-3, 292523-01-9 & 392523-02-7 are listed by Factory Mutual (FM) as nonincendive and are suitable for use in Class I, Division 2, Groups A, B, C and D hazardous locations or non-hazardous locations only. Read this document carefully before installing a nonincendive Bristol TIB Board. In the event of a conflict between the TIB Board User Manual (PIP-TIBS33XX) and this document, always follow the instructions in this document.
2. 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, turn off 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.**

Transmitter Intf. Bd. Part Nos. 392912-XX-X & 392523-XX-X

**Emerson Process Management
Bristol, Inc.**

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**Emerson Process Management
BBI, S.A. de C.V.**

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Col. Morales Polanco
11540 Mexico, D.F.
Mexico
Phone: (52-55)-52-81-81-12
Fax: (52-55)-52-81-81-09
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**Emerson Process Management
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Fax: +61 (8) 8 9725-2955
www.EmersonProcess.com/Bristol

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If you have comments or questions regarding this manual, please direct them to your local Bristol sales representative, or direct them to one of the addresses listed at left.

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