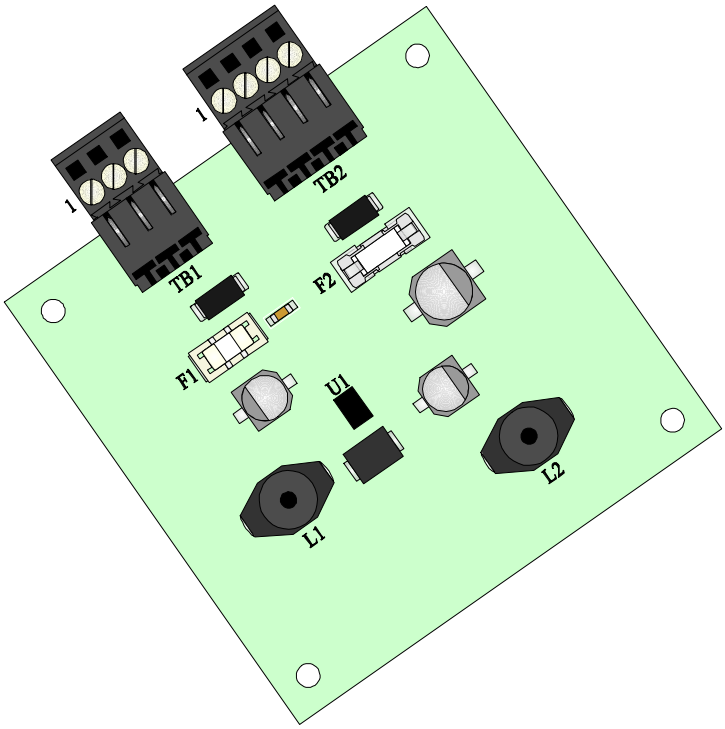
FKI Energy Technology

# 21 Volt Power Supply Board Part No. 392947-01-3

**(For TeleFlow Plus & TeleRTU Plus)**

## For The Following BBI Instruction Manuals: CI-3530-20B & CI-3530-25B




Bristol Babcock

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Additional copies of instruction manuals may be ordered from the address below per attention of the Sales Order Processing Department. List the instruction book numbers or give complete model number, serial or software version number. Furnish a return address that includes the name of the person who will receive the material. Billing for extra copies will be according to current pricing schedules.

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## 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 Babcock 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 Babcock.

## RETURNED EQUIPMENT WARNING

When returning any equipment to Bristol Babcock for repairs or evaluation, please note the following: The party sending such materials is responsible to ensure that the materials returned to Bristol Babcock 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 Babcock and save Bristol Babcock harmless from any liability or damage which Bristol Babcock 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 for proper care and handling of ESD-sensitive components.

**Bristol Babcock** 1100 Buckingham Street, Watertown, CT 06795
Telephone (860) 945-2200

## 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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Before a product can be returned to Bristol Babcock 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 Babcock 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 BBI 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 Babcock Web site (www.bristolbabcock.com) and sending it via E-Mail to brepair@bristolbabcock.com. A BBI 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 Babcock Inc.**
Repair Dept.
1100 Buckingham Street
Watertown, CT 06795

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

**D. Phone**

Calling the BBI Repair Department at (860) 945-2442. A BBI 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 Babcock Inc. Repair Authorization Form

(Providing this information will permit BBI 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 BBI'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 BBI 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 Babcock Inc., Repair Dept., 1100 Buckingham Street, Watertown, CT 06795
Phone: 860-945-2442 Fax: 860-945-3875

# Bristol Babcock
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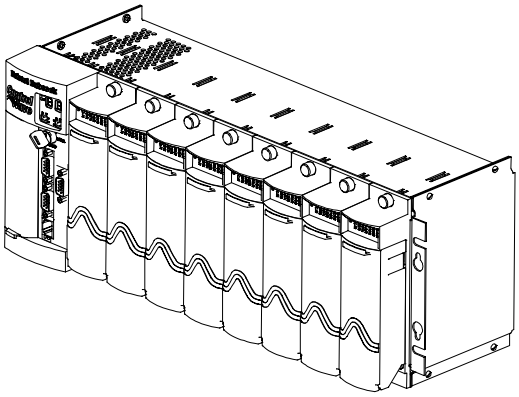
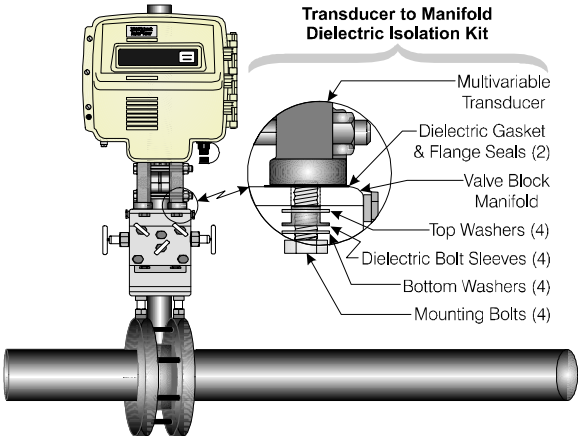


- Avoid Delays and problems in getting your system on-line
- Minimize installation, start-up and maintenance costs.
- Make the most effective use of our hardware and software.
- Know your system.

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

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### Contacting Bristol Babcock Directly

Bristol Babcock's world headquarters are 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 Babcock'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) 945-2244 or (860) 945-2286.

For technical questions regarding Bristol's **OpenEnterprise** product, call (860) 945-2501 or e-mail: **openenterprise@bristolbabcock.com**

For technical questions regarding **ACCOL** products, **Open BSI Utilities**, as well as Bristol's **Enterprise Server®/Enterprise Workstation®** 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 Babcock hardware to radios, contact Bristol Babcock's **Communication Technology Group** in Orlando, FL at **(407) 629-9463 or (407) 629-9464**.

## 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) or to your Bristol-authorized sales representative. A list of

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

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

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# PIP-353021VS
# 21V POWER SUPPLY BOARD OPTION

## TABLE OF CONTENTS



### Supplements



### Reference Documents

Low Power I/O Expansion Board Product Information Package ..... PIP-EXPI/OTF
TeleFlow Plus - Electronic Gas Measurement Computer (3530-20B) Instruction Manual CI-3530-20B
TeleRTU Plus - Remote Terminal Unit (3530-25B) Instruction Manual ..... CI-3530-25B

# *Section 1*
# *INTRODUCTION*

## 1.1 DESCRIPTION

The 21V Power Supply is a continuous mode boost switching type power supply. It is based upon a low power, low noise circuit that produces 21 Volts from a 12 Volt input. Fuse F1 (500 mA Slow Blow) is provided to protect the TeleFlow/TeleRTU power source from failures within 21V Power Supply. Fuse F2 (350 mA Fast Blow) is provided to protect the 21V Power Supply circuitry from short circuits on an output.

Power shutdown is not an option with this unit since it employs a Boost circuit; therefore, the 21V Power Supply must be powered continuously. 21V Power Supplies receive input power (12V) from connector TB3 of the Power Distribution Board. The Power Distribution Board is required because of CPU Board connector wiring capacity restrictions, i.e., the connectors only accommodate up to #14 AWG wire.

Four (4) mounting holes (one in each corner) are provided to accommodate a #4 mounting screw. However, these units are typically Snap Track mounted on a Dual PCB Mounting Bracket (see Figure 2)).

The 21V Power Supply is mainly used in conjunction with Temperature and Pressure Transmitters which require a higher than +12V but lower than 21.4V (± .8V) input supply to operate.

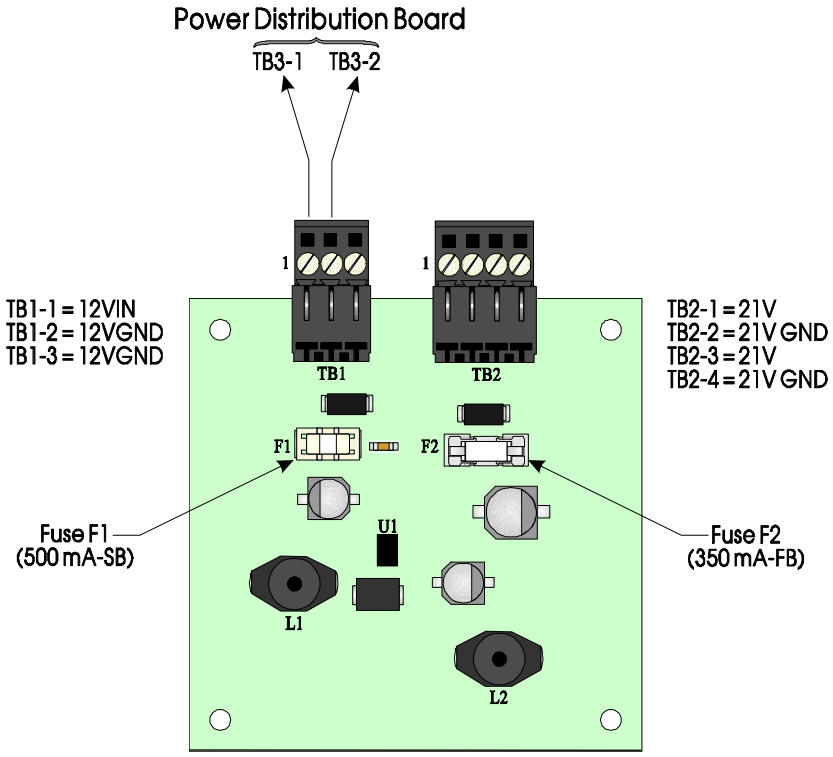


**Figure 1 - 21V Power Supply Board**

# *Section 2*
# *INSTALLATION & SERVICE*

## 2.1 REMOVAL/REPLACEMENT & INSTALLATION OF THE 21V POWER SUPPLY OPTION

### 2.1.1 Removal/Replacement of the 21V Power Supply Option

An installed 21V Power Supply option will contain the following parts:

1. 21V Power Supply Board (with removable Terminal Blocks)
2. Dual PCB Mounting Bracket
3. 2 Snap Tracks
4. Power Distribution Board (with removable Terminal Blocks)
5. Two #8-32 x ¼" SEM Screws
6. Two #8-32 x 3/8" Pan Head Screws and Two #7-32 Elastic Locking Nuts

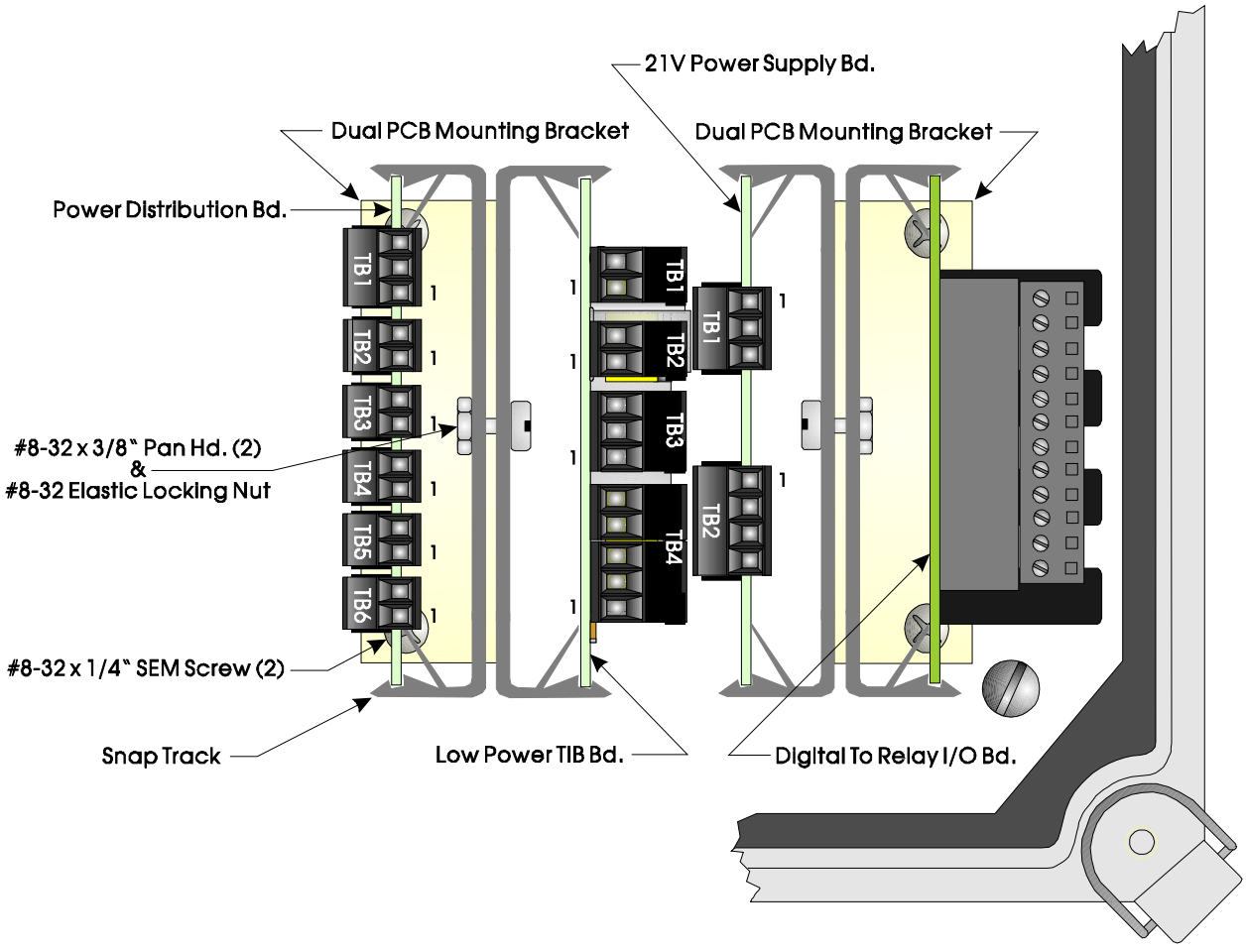


**Figure 2 - 21V Power Supply Option Major Components**
**TeleFlow Plus or TeleRTU Plus with Power Distribution Board**

To remove the optional 21V Power Supply, follow steps 1 through 4 below. To replace the 21V Power Supply follow steps 2 and 3 below in reverse order, installing rather than removing the item in question and then perform step 4.

1. Open the Instrument Front Cover (Door).

2. Unplug the removable Terminal Blocks (with wiring harnesses installed) from the optional 21V Power Supply Board.

3. Slide the 21V Power Supply Board toward the front of the unit and out of the Snap Track.

   ***Note:*** ***If a replacement 21V Power Supply Board is available follow steps 2 through 3 in reverse order, installing rather than removing the item in question.***

4. Close and secure the Door.

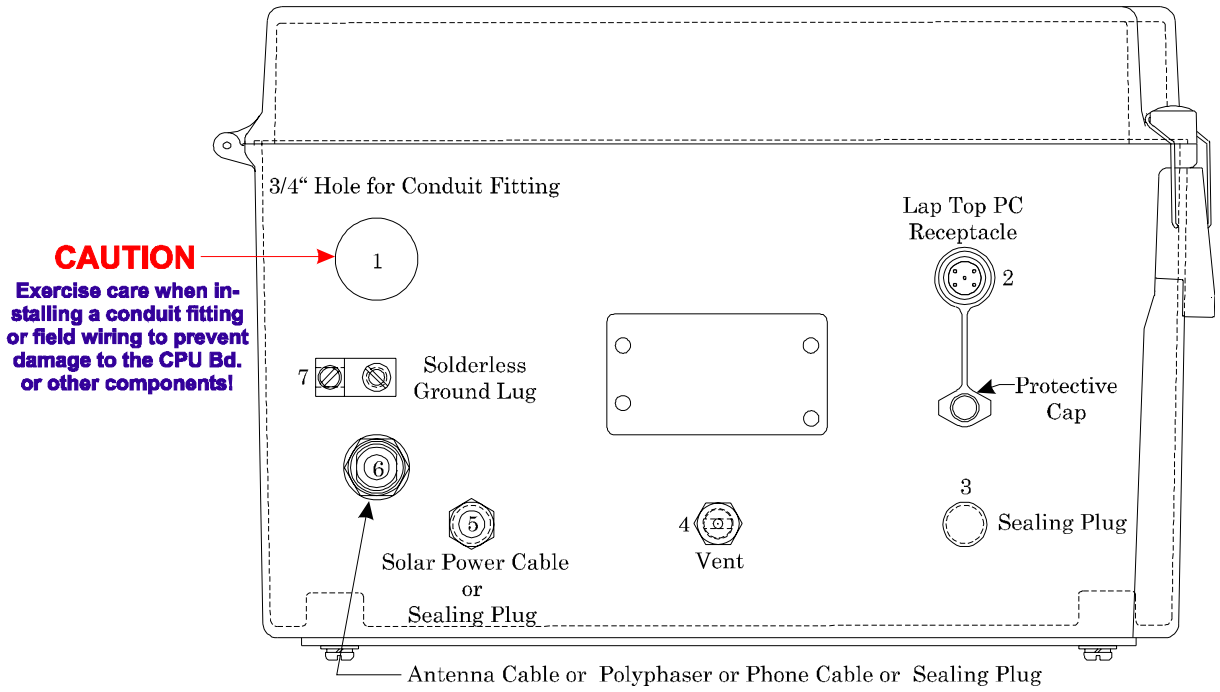


**Figure 3 - Bottom View of TeleRTU Plus (Similar to TeleFlow Plus)**

### 2.1.2 Installation of the 21V Power Supply Option

1. Open the Instrument Front Cover.

2. If the unit in question already contains a Power Distribution Board, but only has one Snap Track, the other Snap Track will have to be installed. This will require removal of the two (2) #8-32x3/8” Pan Head Screws and the two (2) #8-32 Elastic locking Nuts which secure the Power Distribution Board’s Snap Track to the Dual PCB Mounting Bracket. Secure the second Snap Track to the Dual PCB Mounting Bracket as shown in Figure 2 using two (2) #8-32 x 3/8” Pan Head Screws and two (2) #8-32 Elastic Locking Nuts. Slide the Power Distribution Board into the Snap Track as illustrated in Figure 2.

3. Connect power wiring (14 AWG) between the Power Distribution Board (PDB) and the 21V Power Supply Board's input terminals and between the 21V Power Supply's output terminals and the appropriate terminals on the Low Power I/O Expansion Board (LPI/OEB) (see Table 1 and Figure 4). Route field wiring cable(s) (14 AWG) associated with the item to be powered, e.g., a 3508B Transmitter into the TeleFlow Plus or TeleRTU Plus through a ¾" conduit fitting (user supplied) on the bottom of the enclosure (see Figure 3). Connect Transmitter wiring to the appropriate LPI/OEB terminals (see Figure 4).

4. Close and Secure the Instrument Front Cover.

## 2.2 FIELD WIRING

The device uses compression-type terminals that accommodate up to #14 AWG wire. A connection is made by inserting the bared end (1/4 inch Max.) into the clamp beneath the screw and then securing the screw. Insert the bared end fully to prevent short circuits.

Allow some slack in the wires when making terminal connections. The slack makes the connections more manageable and minimizes mechanical strain on the printed circuit boards and harnesses.

### 2.2.1 Terminal Connections

21V Power Supply Boards contain two terminal blocks that accommodate interface connections to the 3530-20B or 3530-25B, power and field wiring connections. TB1 is a three-position terminal block that provides input power connection from the Power Distribution Board. Four-position Terminal Block (TB2) provides +21V power and ground to the Low Power I/O Expansion Board (LPI/OEB) (see PIP-EXPI/OTF) which will power external devices requiring 21V power such as 3508B Transmitters.

**TABLE 1 - 21V POWER SUPPLY BOARD TERMINAL DESIGNATIONS**

| 21VPS TB# | TB ASSIGNMENT | CONNECTION to PDB. | CONNECTION to LPI/OEB |
|---|---|---|---|
| TB1-1 | +12VIN | TB3-1 | N/A |
| TB1-2 | 12VGND | TB3-2 | N/A |
| TB1-3 | CHASSISGND | N/A | N/A |
| TB2-1 | +21V | N/A | TB1-1 |
| TB2-2 | 21VGND | N/A | TB1-2 |
| TB2-3 | +21V | N/A | N/A |
| TB2-4 | 21VGND | N/A | N/A |

21V Power Supply Boards may be connected to transmitters that require a higher than +12V but lower than 21.4V (± .8V) input supply to operate. The supply is wired across the +12VIN and 12VGND terminals of the 21V Power Supply Board. The input voltage range is +10.8Vdcc to +16Vdc.

The +21V Power Supply Option is typically powered from the 3530's power source (battery). Because of power distribution restrictions (CPU Board connector wiring capacity), power must be routed through a Power Distribution Board (see Figures 2 & 4). Power Distribution Boards are mounted to the 3530 in question using a Snap Track and Dual PCB Mounting

Bracket identical to the ones used for the LPTIB Board and the Digital to Relay I/O Board options.

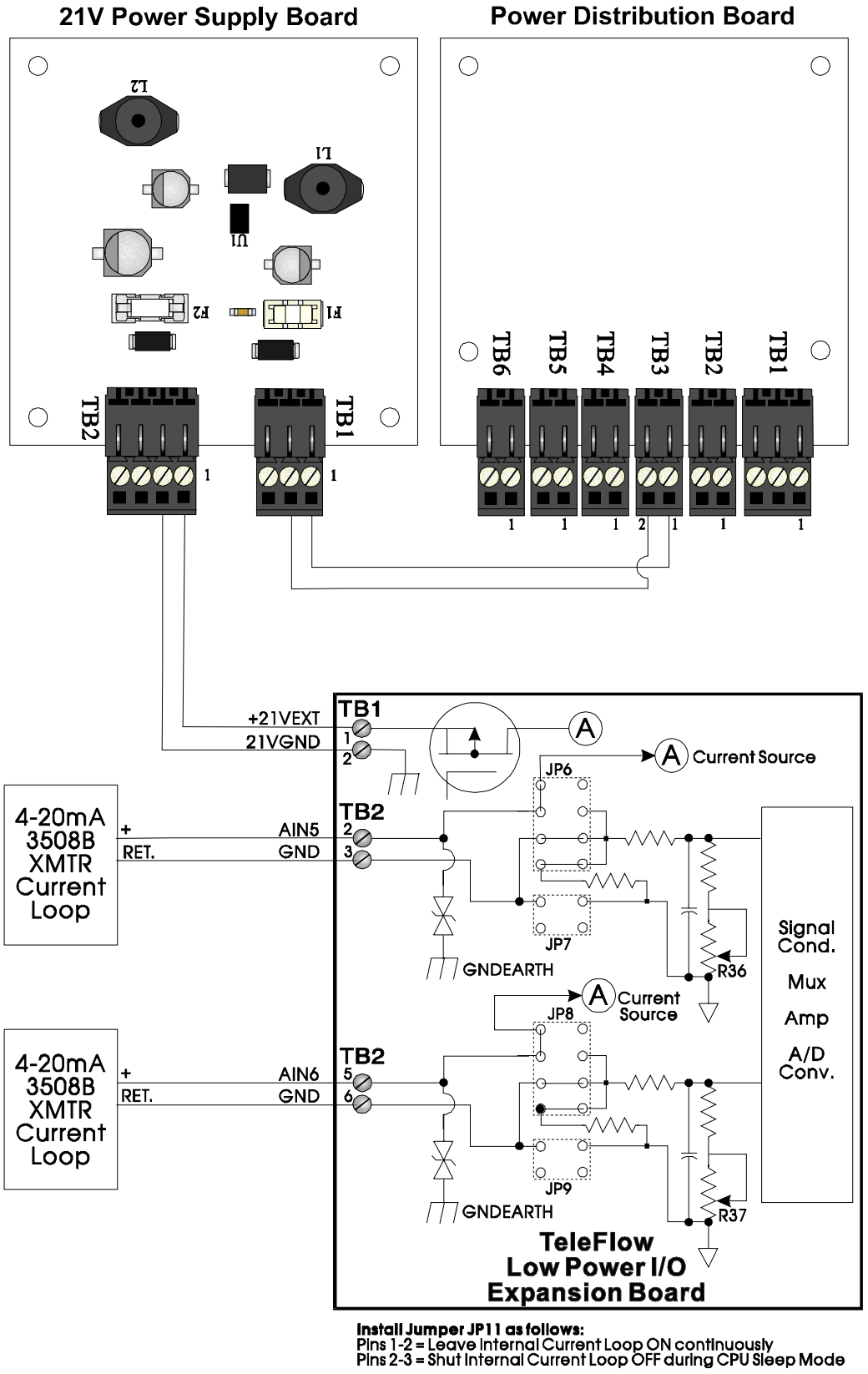


**Figure 4 - 21V Power Supply Board Field Wiring**

# *Section 3*
# *SPECIFICATIONS*

## 3.1 GENERAL SPECIFICATIONS

| | |
|---|---|
| ESD Susceptibility: | Field connected circuits are designed to meet the requirements of IEC 801-2 for ESD withstand capability up to 10KV. |
| EMI Compatibility: | Designed to coexist within a shielded enclosure with the TeleFlow (3530-20B) or the TeleRTU (3530-25B) electronics. EMI radiation is insignificant and susceptibility is comparable or superior to associated electronics. |
| Transient Susceptibility: | Field connected circuits are designed to meet the requirements of ANSI/IEEEC37.90-1998 (Formerly IEEE 472) for surge withstand capability. |

## 3.2 PERFORMANCE SPECIFICATIONS

| | |
|---|---|
| Input Voltage (Vin): | 10.8V to 16V (dc) |
| Input Current (Iin): | 100 mA (Typ. @ 12V & 50mA load)<br>140 mA (Max. over Temp. @ 50 mA load) |
| Output Voltage (Vout): | 21.4V ±0.8V |
| Output Current (Iout): | 50 mA (Max.) |
| Ripple/Noise: | 20mV (Max. P-P) |
| Efficiency: | 88% (Typ.) |
| Short Circuit Protection Fuses: | F1 = 500 mA (Slow Blow)<br>F2 = 350 mA (Fast Blow) |

## 3.3 ENVIRONMENTAL SPECIFICATIONS

| | |
|---|---|
| Operating Temperature: | -40°C to +60°C (-40°F to +140°F) |
| Storage Temperature: | -40°C to +85°C (-40°F to +185°C) |
| Relative Humidity: | 15% - 95% Non-condensing |
| Vibration: | 1G for 10Hz to 500Hz per PMC-31-1<br>(without damage or impairment) |

**21 Volt Power Supply Board**
**Special Instructions for Class I, Division 2 Hazardous Locations**

1. The BBI 21 Volt Power Supply 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 BBI 21 Volt Power Supply Board. In the event of a conflict between the BBI 21 Volt Power Supply Board User Manual (PIP-353021VS) 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, 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.**

# READER RESPONSE FORM

Please help us make our documentation more useful to you! If you have a complaint, a suggestion, or a correction regarding this manual, please tell us by mailing this page with your comments. It's the only way we know we're doing our job by giving you correct, complete, and useful documentation.

DOCUMENT NUMBER: PIP-353021VS
TITLE: *21V Power Supply Board Option Product Information Package*
ISSUE DATE: JAN., 2003
COMMENT/COMPLAINT:

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