

Technical Support Bulletin: S3-FCHVBD-01

Field Calibration of High Voltage PCB in BVS-S3/S4

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*This procedure outlines the steps required to calibrate the High Voltage Board in the BVS-S3/S4 chassis. The Chassis is located inside the lower half of the BVS enclosure.*

**Note:** Before performing this calibration, read this entire document. If you have any questions, contact BTECH Technical Support. We are here to assist you!

**ELECTROCUTION HAZARD!**

**This procedure involves working with high voltage. The voltage sensing leads and load current leads carry full battery voltage. Battery Voltage can be as high as 600Vdc depending on the battery system! If you are not trained to work with high voltage equipment, do not attempt to use this procedure!**

**Tools Required:**

Screwdriver with a 1/8" (3.2mm) flat blade  
Unit Voltage Zero Jumper  
Battery Voltage Zero Jumper  
Impedance Calibration Box  
Multimeter with Frequency measuring ability.

**Follow the steps below and refer to the attached drawing when calibrating the High Voltage PCB in your BVS-S3/S4.**

1. Unplug **ALL** of the black load current lead connector(s) from the sockets located at the top left-hand side of the cabinet. **NOTE: The button on the connector must be depressed to release the latch!**
2. Be sure the NiCad Battery switch is ON and the RUN/STANDBY switch is in the RUN position. These switches are located on the top of the right-hand side of the chassis.
3. **FREQUENCY CALIBRATION:**
  - a. Attach the black (-) lead of the Multimeter to the ground braid coming off the bottom of the High Voltage board.
  - b. Set meter to display frequency.
  - c. With the red (+) lead, measure to the second pin of the top of the 5-pin red connector (see diagram).
  - d. Adjust **Frequency Scale pot** (see diagram) to obtain the correct frequency reading (see table below). This should achieve a zero baseline impedance reading.

High Voltage PCB Assembly	AC Line Frequency (Hz)	Test Frequency (kHz)
910023-XX	50	9.720 +/- 0.05
<b>910X23-XX</b>	<b>60</b>	<b>11.610 +/- 0.05</b>
910154-XX	50	18.000 +/- 0.1
<b>910X54-XX</b>	<b>60</b>	<b>21.500 +/- 0.1</b>

#### 4. ZERO OFFSET CALIBRATION:

- a. Remove Bat Neg and VSL #1 connectors.
- b. Insert Battery Voltage Zero Jumper between the Bat Neg and VSL #1.
- c. Enter Diagnostic Mode (B-B-A-D-C) and press **8**.
- d. Adjust **Battery Voltage Offset pot** (see diagram) to obtain a 01 to 00 reading.
- e. Remove Battery Voltage Zero Jumper
- f. Insert Unit Voltage Zero Jumper into VSL #1 and #2
- g. While in Diagnostic Mode, select **Unit 1** (by pressing A) then press **1**.
- h. Adjust **Unit Voltage Offset pot** (see diagram) to obtain a .01 to .00 reading.
- i. Press **2** and adjust **Impedance Offset pot** (see diagram) to obtain a .01 to .00 reading.  
**Note:** There is a minimum 15-second delay between impedance readings.
- j. Remove Unit Voltage Zero Jumper.
- k. Reinstall Bat Neg and VSL #1 connectors.

#### 5. UNIT VOLTAGE CALIBRATION:

- a. Measure the unit voltage from VSL #1 to VSL #2 using the Multimeter. Be sure **Unit 1** is selected (by pressing A) in Diagnostic Mode (B-B-A-D-C).
- b. Check the unit voltage on the BVS by pressing **1**.
- c. Adjust **Unit Voltage Scale pot** (see diagram) to obtain a reading within +/- .01 volts of the Multimeter reading.

#### 6. BATTERY VOLTAGE CALIBRATION:

- a. Measure the Battery voltage between VSL #1 and the Bat Neg terminal.
- b. Check the Battery voltage on the BVS by pressing **8** while in the Diagnostic Mode.
- c. Adjust the **Battery Voltage Scale pot** (see diagram) to obtain a reading within +/- 0.5 volts of the Multimeter reading.  
**Note:** No decimal point will appear, it is assumed that last number represents a tenth of a volt.

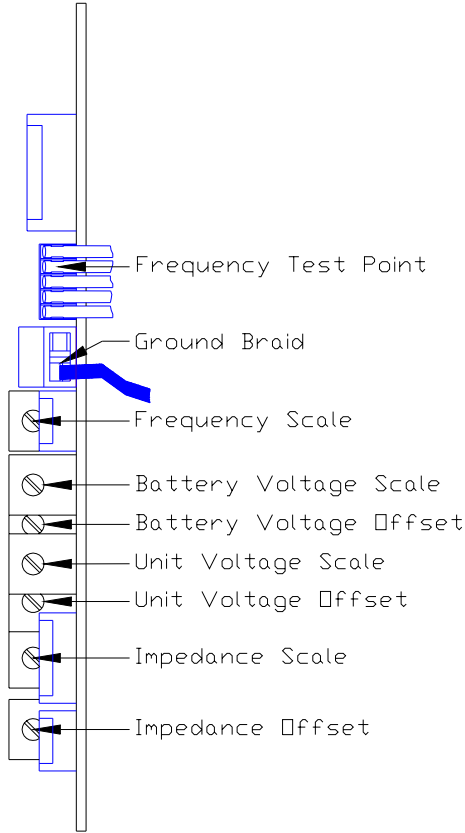
#### 7. IMPEDANCE CALIBRATION (Performed only if an Impedance Calibration Device is available):

- a. Remove current control plug from chassis.
- b. Insert the input (green, 5 pin connector) of the Impedance Calibration Device into the current control socket located on the chassis.
- c. Insert the output of the Impedance Calibration Device into Relay Card #1, VSL #1-3.
- d. In the Diagnostic Mode, select Unit 1 and then press 2 to measure impedance.
- e. Adjust **Impedance Scale pot** (see diagram) to obtain a 2.00 +/- 0.02 reading.  
**Note:** A setting of "2.00" is with all the Impedance Multipliers set to **100%**  
**Note:** There is a minimum 15-second delay between impedance readings.
- f. Remove the Impedance Calibration Device and reconnect the current control and #1 relay card plugs.

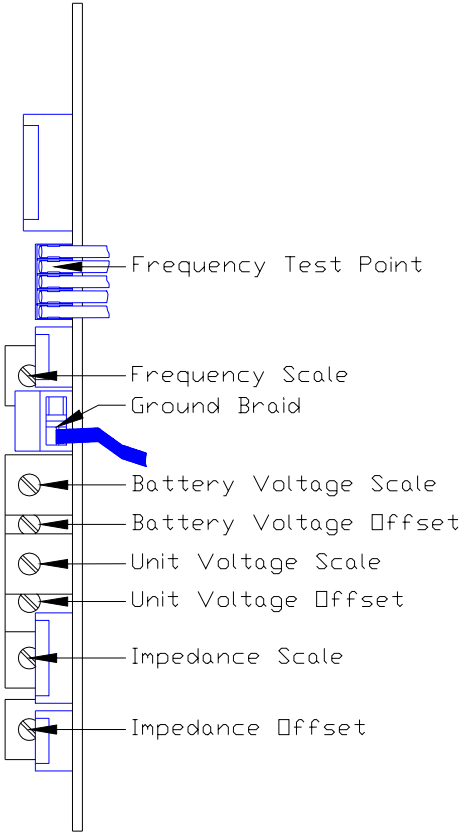
8. Reconnect **ALL** of the black load current lead connector(s) from the sockets located at the top left-hand side of the cabinet.

Please call **BTECH Inc.** Technical Support if any questions arise.

**High Voltage Board  
Pot Location Diagram**



910054



910023