

Installation Procedures for the InstroTek Universal Base Board (UBB)

June 24 2013

The UBB is designed as an easy replacement for Troxler models 3411, 3430, 3440 baseboards as well as the InstroTek 3500. Certain tools are required to install and setup the UBB for it to function correctly. The InstroTek warranty on this product requires that only authorized, trained service personnel familiar with these types of products conduct the installation and setup. Once the UBB is installed, the gauge should be re-calibrated or verified according to ASTM D2922.

Model 3401 and 3411 Baseboard Installation are covered in Section A
Model 3430 and 3440 Baseboard Installation are covered in Section B
InstroTek Model 3500 Baseboard Installation are covered in Section C
Electronic Adjustment and Setup Procedure are covered in Section D

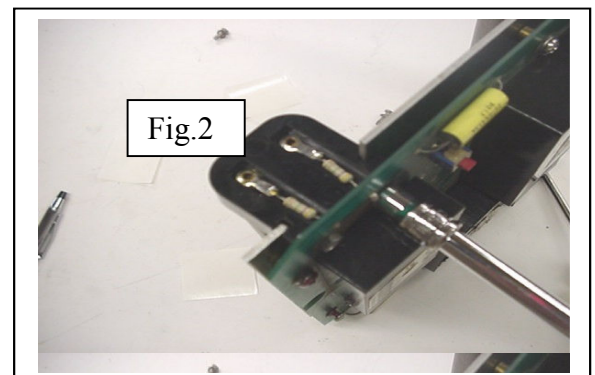
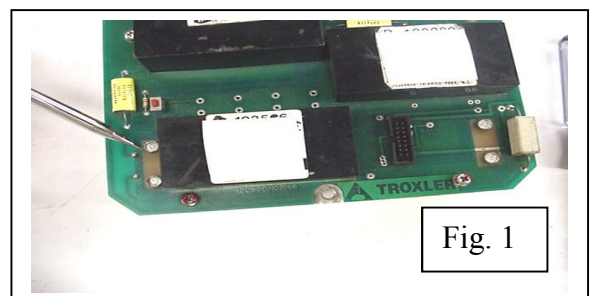
Tools Required:

- Soldering iron and solder
- De-soldering iron or solder remover (3411 only)
- Phillips screwdriver
- 5/16" nut driver
- Small jewelers screwdriver or Potentiometer adjusting screwdriver
- Oscilloscope
- Digital multi-meter (DMM)
- High voltage probe

SECTION A – Installing the UBB in a 3401 or 3411 Gauge:

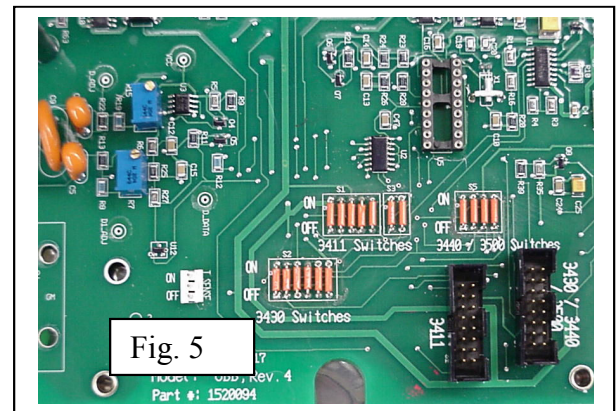
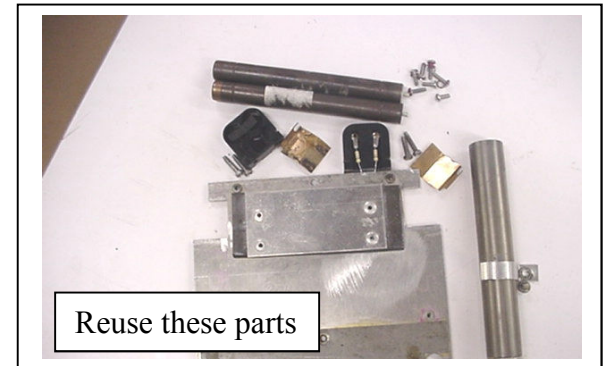
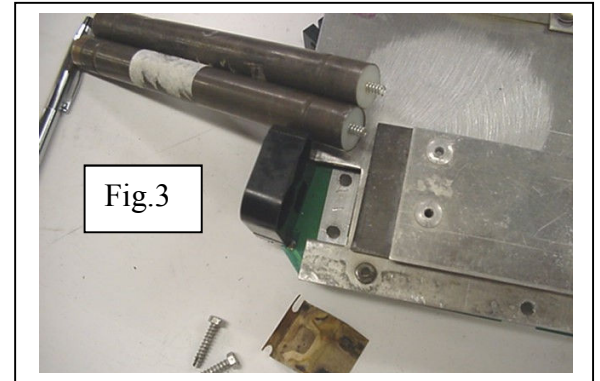
Use the following parts from the existing 3411/3401 gauge along with your new UBB to complete this task

- 1- GM tube holders and screws(2)
- 2- GM tubes with nylon spring supports and springs (2 each)
- 3- He3 tube (1)
- 4- metal base plate (1)
- 5- Copper grounding spring (2)
- 6- Curved He3 tube support and screw (1each)
- 7- Screws and washers that attach circuit board to metal plate.
- 8- Screws and washers that attach baseboard assembly to gauge



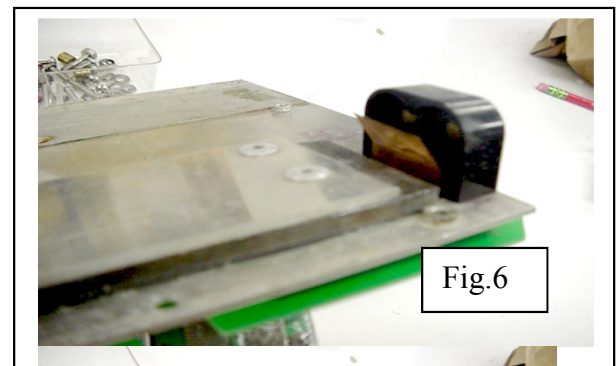
Disassembling the existing baseboard:

1. Turn off the gauge and place the gauge on a standard block. Remove the top shell, disconnect the batteries, discharge the high voltage and remove the existing baseboard and metal plate assembly.
2. Remove the He3 tube from the assembly by removing the curved support bracket and then pulling the tube downward away from the baseboard.
3. Use a 5/16 nut driver to remove the screws securing the GM tube holders. The GM tube holders are slotted and are held by the metal plate. One end of the GM tube holder will still be connected to the baseboard by soldered resistors. Slide off the other one and remove the tubes. Figs 1, 2 and 3.
4. Do not discard the copper grounding springs, as they are needed with the new UBB assembly.
5. The nylon spring supports and small coil springs are located in the resistor connected end of the GM tubes and may drop out if the tube is turned downward during removal. Save these.
6. Separate the metal base plate from the baseboard by removing the screws on the top of the baseboard.
7. Slide the metal base plate off the remaining GM tube holder.
8. From the top of the board, use a desoldering tool to disconnect the resistors from the baseboard. This will allow you to remove the remaining GM tube holder from the old baseboard.
9. You are now ready to assemble your new UBB board.

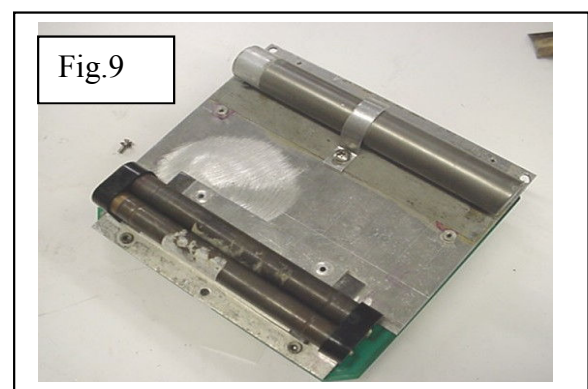
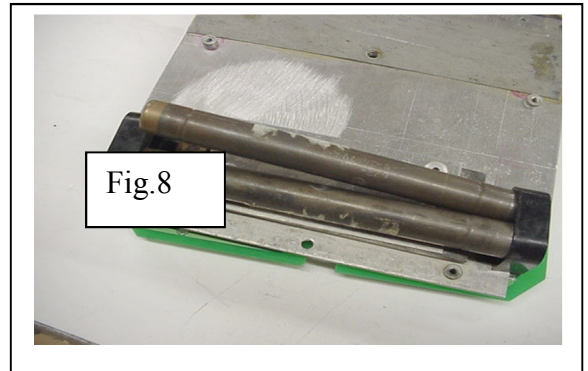
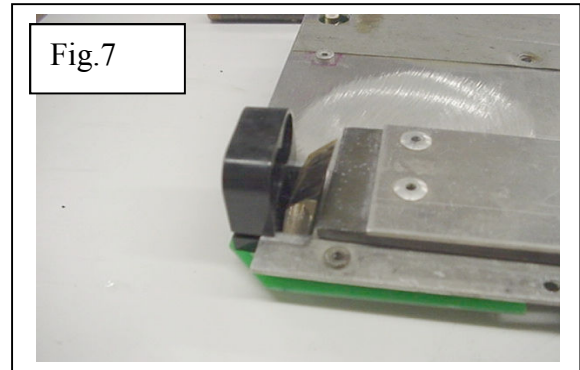
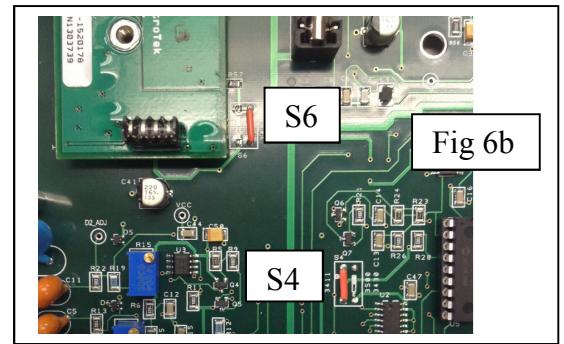


Assembling the new UBB baseboard:

1. Remove the metal cover from the UBB by removing the screws.
2. Locate the 3 groups of jumpers on the UBB. Fig 5.



3. The groups of jumpers are marked as “3411” “3430” or “3440/ 3500” switches.
4. To configure the UBB for operation as a 3401/3411baseboard, **only the group of jumpers marked as 3411 switches need to remain shorted by means of the jumpers. Carefully remove all of the jumpers from the groups marked as 3430 switches and 3440/3500 switches by cutting them with wire cutters.**
5. Locate the groups of jumpers marked S4 and S6. Leave the jumpers marked 3411. **Cut the jumpers marked 3500/3430.**Fig 6b
6. Place one copper grounding spring between the bottom side of the UBB and the GM tube holder with the resistors. Ensure the resistor leads from the GM tube holder extend through the solder holes of the UBB. Secure the GM tube holder with the mounting screws. Solder the resistor leads to the UBB at GM1 and GM2 points. Fig.6.
7. Slide the metal base plate into the grooves on the GM tube holder.
8. Secure the UBB to the metal base plate with the screws taken out.
9. Place the GM tubes into the secured GM tube holder making sure the end of the GM tube with springs and nylon spring supports are the end inserted into this connector.
10. Install the other copper ground spring and GM tube holder by sliding it onto the metal base plate and securing it to the UBB with the appropriate screws. Fig. 7 and 8.
11. Reinstall the He3 tube and mounting bracket. Fig.9.
12. Place the complete assembly back into the gauge and secure it with the appropriate screws.
13. Connect the batteries and control board (front panel) to the UBB.
14. The UBB assembly is now complete and ready for electrical adjustment and setup.
15. Proceed to Section D.



SECTION B – Installing the UBB in a 3430 or 3440 Gauge:

NOTE: In addition to the UBB, the UBB Base Board Kit, part #1520103, is required to replace baseboards in Troxler Model 3430 and 3440 gauges.

The Base Board Kit Includes:

1. Metal base plate assembly (1)
2. GM tube interface circuit board (1)
3. 4-40 screws (4 each)
4. 6-32 x .500 (6 each)
5. 6-32 x .375 (3 each)
6. Interface board header (1)
7. # 4 lock washer (4 each)
8. # 6 lock washer (9 each)
9. metal cover box

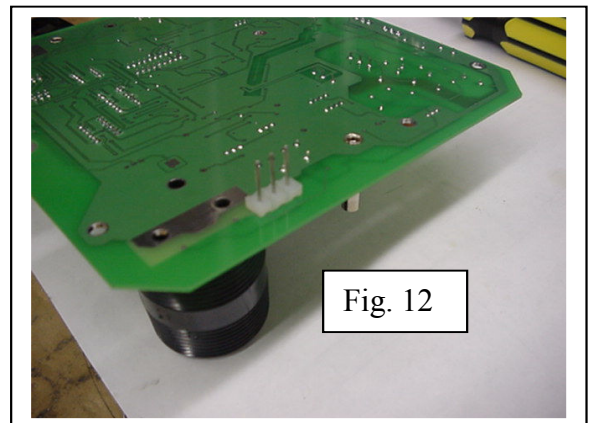
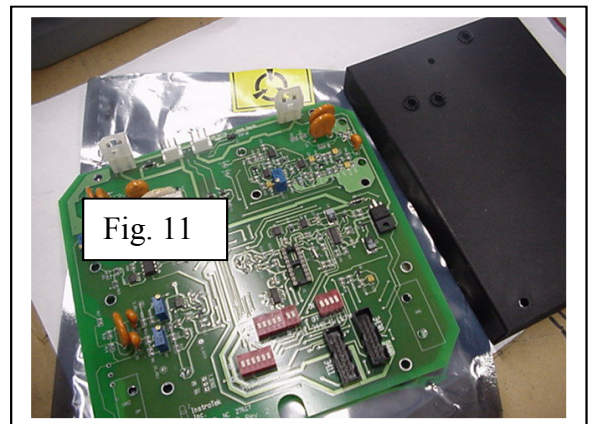
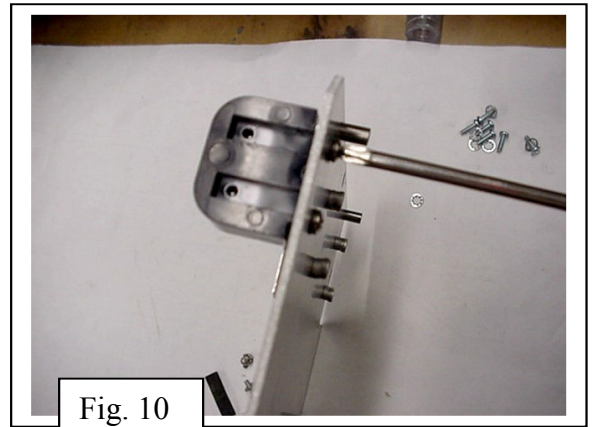
Installing the UBB in a 3430 or 3440 gauge:

Use the following parts from the existing 3430/3440 gauge along with your new UBB and Base Board kit to complete this task.

1. GM tubes (2)
2. GM tube holder and screws(1)
3. He3 tube (1)
4. Curved He3 tube support and screw
5. Screws and washers that attach circuit board to metal plate.
6. Screws and washers that attach baseboard assembly to gauge.
7. Small angle bracket at GM tube end.

Disassembling the existing baseboard:

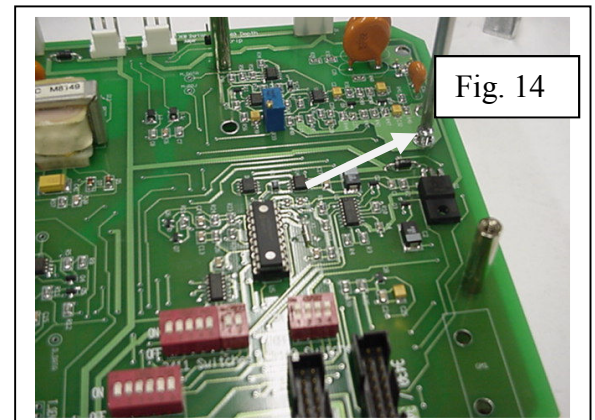
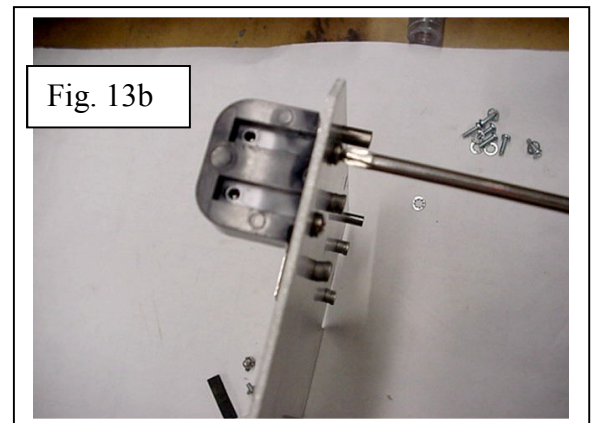
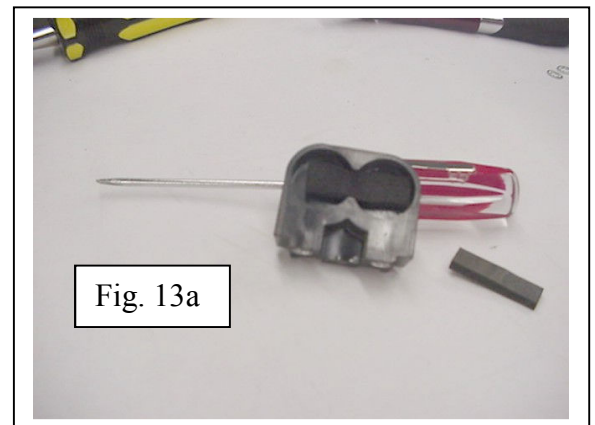
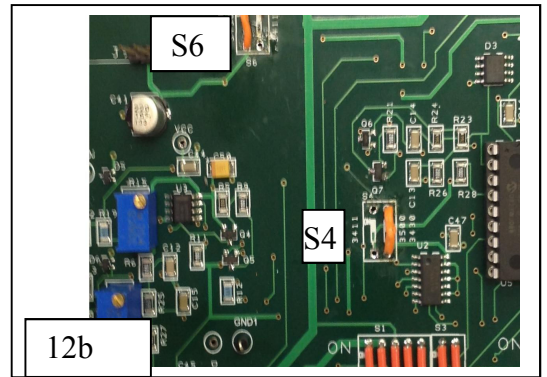
1. Turn off the gauge, place the gauge on a standard block, remove the top shell, disconnect the batteries, discharge the high voltage and remove the existing baseboard/base plate assembly.
2. Remove the He3 tube from the existing baseboard by removing the metal bracket and



- pulling the tube downward away from the existing baseboard.
3. Remove the screws securing the plastic GM tube holder. (Fig 10)
 4. Carefully remove the GM tubes by prying them out of the connectors with a small flat screwdriver.

Assembling the new UBB baseboard:

1. Remove the metal cover from the UBB by removing the 3 screws and washers. Fig. 11.
2. Locate the 3 groups of jumpers on the UBB. See Fig. 5.
3. The groups of jumpers are marked as “3411” “3430” or “3440/ 3500” switches. To configure the UBB for operation baseboard of your choice, **only the group of jumpers for your selection of baseboard need to remain shorted by means of the jumpers. Carefully remove all jumpers of the remaining 2 groups by cutting them with wire cutters.**
4. Locate the groups of jumpers marked S4 and S6. Leave the jumpers marked 3500/3430. **Cut the jumpers marked 3411.** Fig 12b
5. Looking down on the UBB with the jumpers at the bottom section of the board, locate the 3 holes on the left side. Solder the GM assembly header on the underside the board at this location. The header should sit flush on the board. Fig. 12.
6. Attach the small angle bracket to the new metal base plate. Fig 13a & 13b.
7. Secure the UBB to the base plate with the appropriate screws. Use the provided flat washers under the lock washers. Fig 14.
8. Carefully press the GM tubes into the contacts on the GM tube interface board.
9. Slide the GM tubes into the GM tube holder mounted on the metal base plate and attach the GM tube interface board to the baseboard mounted header. Fig. 15.
10. Secure the GM tube interface board with the provided 4-40 screws and washers. Fig. 16.



11. Reinstall the He3 tube and mounting bracket.
12. Place the complete UBB assembly back into the gauge and secure it.
13. Connect the batteries and scaler to the UBB.
14. For 3440 gauges connect the depth strip to the header on the upper edge of the UBB. Fig. 16.
15. The UBB assembly is now complete and ready for setting up.

SECTION C – Installing the UBB in an InstroTek 3500 Gauge:

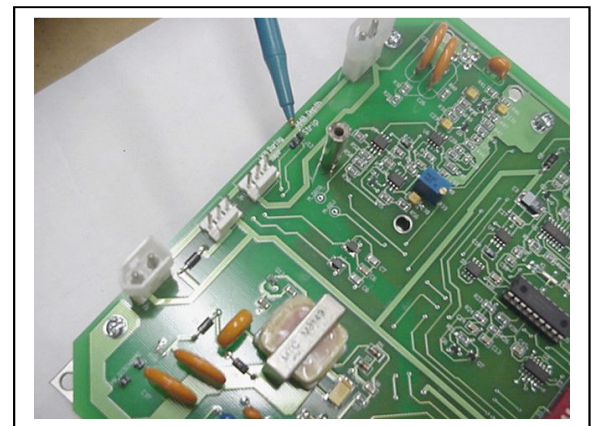
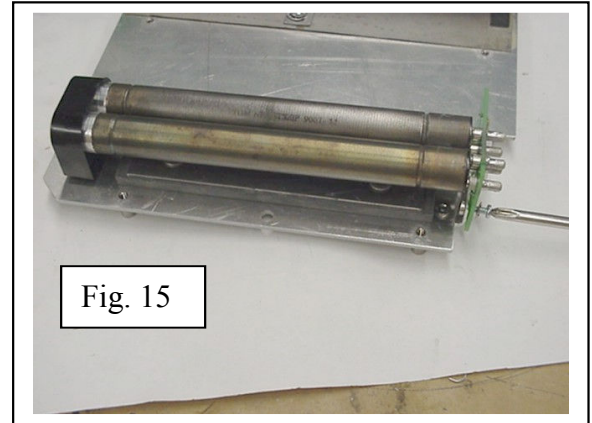
All existing hardware from the presently installed 3500 baseboard is utilized for the replacement baseboard.

Disassembling the existing baseboard:

1. Turn off the gauge, place the gauge on a standard block, remove the top shell, disconnect the batteries, and remove the 3 screws securing the metal cover from the top of the existing baseboard. Discharge the high voltage by shorting the pins on the upper left side of the baseboard.
2. Remove the 6 screws securing the existing Base board to the base plate.
3. Using both hands, gently pull the baseboard directly upward removing it from the base plate.

Assembling the new UBB baseboard:

1. Align the HE3 tube with the connector on the new UBB and firmly press the UBB downward. Verify the HE3 tube makes a secure connection to the UBB connector.
2. Gently raise the lower left side of the UBB and visually align the GM pins on the UBB with the GM header assembly connected to the baseplate.
3. Press down on the UBB seating the GM pins into the GM tube header.
4. Secure the UBB to the baseplate with the 6 baseboard securement screws.



5. Before installing the metal UBB cover verify the setup procedure in Section D.

SECTION D - Electronic Adjustment and Setup Procedures

1. Place the gauge on the standard block. Turn on the gauge.

Setting up the moisture signal:

2. Set the oscilloscope to 200 mV scale, ac coupled and very small $\mu\text{sec(s)}$ time base.
3. Locate the test point “**M-ADJ**” on the UBB. This is located at the upper right of the UBB below the battery connections.
4. Place the scope probe in the test point and connect the ground lead of the probe to the gauge aluminum base.
5. Using the scope and small screwdriver, adjust potentiometer **R33** until you have a moisture signal at this test point with peak amplitude of 600 mV.

Setting up the Density signal:

6. Locate the test point “**D2-ADJ**” and “**D1-ADJ**” on the UBB. These are located on the lower side of the UBB left of the jumpers.
7. Place the scope probe in one test point and connect the ground lead of the probe to the aluminum gauge base.
8. Using the scope and small screwdriver, adjust potentiometer **R15 (for “D2-ADJ”)** and **R7 (for “D1-ADJ”)** until you have a density signal for each of these test points with a peak amplitude of 600 mV.

Reassemble the gauge:

9. Turn off the gauge and discharge the high voltage circuit by shorting the “**HV-Discharge**” pins on the upper left corner of the UBB with an insulated metal object such as a screwdriver.
10. Place and secure the metal cover on the UBB.
11. Reassemble the gauge.
12. The gauge will need to re-calibrated or verified for accurate results according to ASTM D2922.