

Mar 2001

TC2BIP Case removal, probe resistor pack replacement and calibration

Orientation

The **TC2BIP** should be oriented so that the front panel is facing you.

Case removal

Peel off the small square rubber buffers and unscrew the 4 screws holding the feet. Note the orientation of the feet for the tilt bail at the front of the **TC2BIP**. Gradually lift upper part of case away from lower part while at the same time holding down the front and rear panels with any spare fingers. The top of the case will come away and you have access to the **TC2BIP**.

Probe resistor pack replacement

To remove a resistor pack place a small screwdriver beneath the socket and put a small finger on the other side. Gently lever the socket out. There are currently 3 resistor packs for the three probes. The indentation in the socket should be at the top. The resistors go in the top 3 positions. They **MUST** be 1% resistors and the correct value given below or you won't be able to calibrate the probe input.

	R2-5	R2-6	R2-8
TH-1	1,370	63.4K	39.2K
TH-2Km	1,690	68.1K	63.4K
TH-10Km	7,500	12.1K	61.9K

To install the new resistor pack press the pack in making sure that pins are in register with the socket on the PC board. You will need to recalibrate the **TC2BIP** (see manual) if you change the resistor pack. Calibration resistance values are given with the **TH-1**. For the other probes the calibration resistance values are:-

	Meter reads	Meter reads
	5.0C	45.0C
TH-2Km	5,721	984
TH-10Km	25,390	4,369

Case reassembly

Make sure the cables are not going to be in the way of the metal posts. This can happen on the left and right rear posts. If you crush the cables they may short and be damaged. Slide the case onto the front and rear panels (there are grooves to accommodate them) making sure the front and rear panel decals don't get damaged. If they catch on the edge of the groove use your nails to smooth them and use them like a shoe horn to make sure that the decals get into the groove. Once the box fits together screw on the feet using the 4 Phillips screws. Don't tighten the feet excessively as it is possible to crack the case. Put back the rubber buffers.

Calibration

Follow the calibration procedure in the **TC2BIP** manual or use the **TC2BIP** probe calibrator (**TC-PCBA**). We can also send you the calibrator PCB at no charge. The schematic and assembly directions (including parts) are included in the document in the customer support section at the website.

Using calibrator(TC-PCBA)

The **TC-PCBA** is normally shipped set for the **TH-10Km** and **TH-2Km** probes. Plug the BNC connectors into the correct probe inputs on the **TC2BIP** and turn on the **TC2BIP**. Set the display switch to the Main position and the switch on the **TC-PCBA** to 5C position. Switch between the 5C and 45C positions and adjust the **Span** (upper) potentiometer (above **Ext In**) until you have a 40C temperature difference (eg. 5.7 and 45.7). Then adjust the **Offset** potentiometer until the readings are 5C and 45C. If you are using different calibration temperatures (eg. 10C and 60C) then you will need to set the appropriate resistances on the **TC-PCBA** but the procedure (ie. Setting the **Span** and then adjusting the **Offset**) will be the same.

For TH-1

Adjust the resistance values on the **TC-PCBA** to the 5C and 45C values given in the calibration sheet for the probe. To do this connect the BNC using a BNC to banana plug adapter to a resistance meter set to the 20kohm scale. Set the switch to the 45C position and adjust **VR3** (rightmost trimpot) to the 45C value (in example 1091ohms). Set the switch to the 5C position and adjust **VR4** (second from left) to the 5C value (in example 4309ohms). Now connect the lead marked 1/2Km to the probe input on the **TC2BIP** and follow the procedure above in **Using calibrator**.

Calibration example

```
Temperature data - File:          t15
  T      R   Rcalc  resid
  4.1   4480  4474  -1.4E-03
  22.2  2228  2240   5.1E-03
  38.7  1320  1311  -6.5E-03
  52.9   875   877   2.7E-03

          Coeffs          Error
          0.120065        1.023E+00  Constant term
          1839.195923      4.607E+02
          35078264.000000    1.370E+07

Correlation coefficient  .999974
beta(@25C) alpha(@25C)  Rth@  0C    5C    25C    45C  50C  125C
3024.22   -3.40550         5330  4309  2033  1091  949  200
```