

WHAT IS THE CALIBRATION PROCEDURE FOR THE MULTIPRO?

The MULTIPRO instrument is shipped completely pre-calibrated. The drift characteristics of the input circuits are excellent but from time to time adjustment may be necessary to maintain a high degree of accuracy.

ANALOG INPUT CALIBRATION.

There are three analog inputs and a cold junction compensation sensor on the MULTIPRO. The input level and input features for each input are determined by changeable daughter boards that are mounted piggy back on the analog input board. There are several types of input daughter boards: thermocouple input, auxiliary input, 4 to 20 mA input, 0 to 10 V linear, RTD, and slide wire input.

The standard factory configuration is for input A to be a thermocouple input, input B to be an Oxygen probe input (auxiliary input) board, and input C to be another thermocouple input. If the instrument to be calibrated does not have the standard factory configuration, then identifying the configuration is necessary so that the proper procedure for each input board can be followed. For daughter board types see the SETUP & CONFIGURATION section.

PREPARING FOR CALIBRATION

Before placing the MULTIPRO into calibration mode, check to be sure that for each input:

- The proper thermocouple type has been selected, and
- Cold Junction compensation has been selected, if required.

The MULTIPRO should be operating for at least 30 minutes before calibration to ensure that input circuits have stabilized.

For each input of the MULTIPRO, follow the calibration procedure by the type of input board installed for that input. Once an input has been calibrated, be sure to select SAVE to ensure that the latest calibration factors are stored.

CALIBRATION OF THE THERMOCOUPLE BOARD

This calibration procedure assumes that a thermocouple has been selected and internal cold junction compensation is being used. If this is not true, follow the procedure for the auxiliary board using a 0 to 40 millivolts signal. The calibration procedure is as follows:

CALIBRATION PROCEDURE

1. Connect a thermocouple simulator to TB-D terminal 1 and 2 using the proper type of thermocouple wire.
2. Select the CALIBRATION page from the Full Menu.
3. Set the CALBR MODE to ZERO.
4. Set the simulator to the zero value shown in the table for the thermocouple type selected.
5. Use the knob to select Input A and press Enter.
6. Use the knob to adjust the Input A reading to equal the simulator output.
7. Press Enter to save the value.
8. Set the simulator to the span value shown in the table for the thermocouple type selected.
9. Set the CALBR MODE to SPAN.
10. Use the knob to select Input A and press Enter.
11. Use the knob to adjust the Input A reading to equal the simulator output.
12. Press Enter to save the value.
13. Repeat steps 3 through 12 until no additional change is needed.
14. Set the CALBR MODE to SAVE (The data will be saved and then the CALBR MODE will return to OFF).
15. Select another input to calibrate or exit from the calibration page.

Thermocouple type	Zero °F(°C)	Span°F (°C)
B	200 (90)	3000 (1800)
C	32 (0)	3000 (1800)
E	32 (0)	1300 (900)
J	32 (0)	1300 (900)
K	32 (0)	2300 (1200)
N	32 (0)	2300 (1200)
NNM	32 (0)	2000 (1100)
R	300 (150)	3000 (1800)
S	300 (150)	3000 (1800)
T	32 (0)	700 (350)

The usable ranges of the thermocouple types are shown in the table above. If having a high accuracy over a specific operating range is desirable then the input should be calibrated over that range. Follow the calibration procedure for normal calibration with the following changes. Use the low end of the desired range as the zero value and the high end as the span value. There will be more interaction between zero and span with this method. The desired operating range must fit with the limits of the table.

O2 AUXILLARY INPUT DAUGHTER BOARD CALIBRATION

PARTS REQUIRED

- 1 – 0-2volt dc power supply. (for input voltage simulation)
- 1 – set of twisted pair copper wire. (for input voltage simulation)
- 1 – jumper (to short out the input)
- 1 – digital voltmeter. (to determine the amount of input voltage)

SETUP FOR CALIBRATION

NOTE

For simplicity the following procedure will be referring to input B, this may not apply to all instrument configuration. (Please substitute the appropriate input for this procedure)

1. Determine which inputs are auxiliary inputs; the part number should let you know. (For example, a FDM121-4.0 has an auxiliary input on input B)
2. Set the input type to linear for the board(s).

CALIBRATION PROCEDURE

1. Place a jumper from TB-D terminal 4 to terminal 5 (shorting input B).
2. Select the CALIBRATION page from the Full Menu.
3. Set the CALBR MODE to ZERO.
4. Use the knob to select Input B and press Enter.
5. Use the knob to adjust the Input B reading to 0000.
6. Press Enter to save the value.
7. Remove the jumper and connect the twisted copper wire to the voltage simulator and to Input B.

8. Set the simulator to 1.500volts dc.
9. Set the CALBR MODE to SPAN.
10. Use the knob to select Input B and press Enter.
11. Use the knob to adjust the Input B reading to 1500.
12. Press Enter to save the value.
13. Repeat steps 3 through 12 until no additional change is needed.
14. Set the CALBR MODE to SAVE (The data will be saved and then the CALBR MODE will return to OFF.)
15. Select another input to calibrate or exit from the calibration page.

O2 FOR OXYGEN INPUT DAUGHTER BOARD CALIBRATION

PARTS REQUIRED

1. 1 – 0-100 millivolts dc power supply. (for input voltage simulation)
2. 1 – set of twisted pair copper wire. (for input voltage simulation)
3. 1 – jumper (to short out the input)
4. 1 – digital voltmeter. (to determine the amount of input voltage)

SETUP FOR CALIBRATION

NOTE

For simplicity the following procedure will be referring to Input B, this may not apply to all instrument configurations. (Please substitute the appropriate input for this procedure.)

1. Determine which inputs are auxiliary inputs; the part number should let you know. (For example, a FDM171-4.0 has an o2 for oxygen input on Input B.)
2. Set the input type to linear for the board(s).

CALIBRATION PROCEDURE

1. Place a jumper from TB-D terminal 4 to terminal 5 (shorting Input B).
2. Select the CALIBRATION page from the Full Menu.
3. Set the CALBR MODE to ZERO.
4. Use the knob to select Input B and press Enter.
5. Use the knob to adjust the Input B reading to 0000.
6. Press Enter to save the value.
7. Remove the jumper and connect the twisted copper wire to the voltage simulator and to Input B.
8. Set the simulator to 100 millivolts dc
9. Set the CALBR MODE to SPAN.
10. Use the knob to select Input B and press Enter.
11. Use the knob to adjust the Input B reading to 100.
12. Press Enter to save the value.
13. Repeat steps 3 through 12 until no additional change is needed.
14. Set the CALBR MODE to SAVE (The data will be saved and then the CALBR MODE will return to OFF.)
15. Select another input to calibrate or exit from the calibration page.