

Manual Calibration

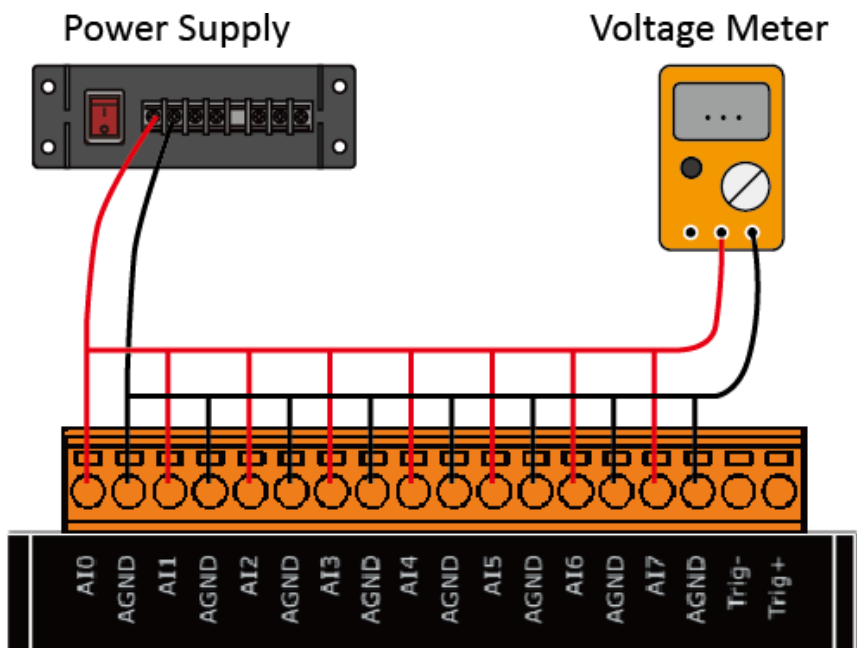
When shipped from the factory, PET-7H16M is already fully calibrated, including the calibration coefficients that are stored in the onboard EEPROM. For a more precise application of voltages in the field, the procedure described below provides a method that allows the board installed in a specific system to be calibrated so that the correct voltages can be achieved for the field connection. This calibration allows the effects of voltage drops caused by IR loss in the cable and/or the connector to be eliminated.

At first the user has to prepare the equipment for calibration

- Precise multi-meter (The more precise meter is better)
- Stable power supply
-

The calibration procedure will be described in detail in the following.

Connect the AI channels to the meter and power supply, as shown below:



Step 1: Entering the IP and Port, and click Connect

Form1

IP 1. 10.1.0.123 3. Connect

Port 2. 9999

Firmware DisConnect Meter 1 Point_1 Meter 2 Point_2 ShowGainOffset

Step 1: input IP,Port and click 'Connect' button

exit clear clear clear clear

After the connection is successful, the firmware version will be read back.

Form1

IP 10.1.0.123 Connect

Port 9999

Firmware 02 DisConnect Meter 1 Point_1 Meter 2 Point_2 ShowGainOffset

Step 1: input IP,Port and click 'Connect' button
Connect server ok
Step 2: output voltage to ch0-ch7 and meter
Step 3: input number of meter and click 'Point 1'

exit clear clear clear clear

Step 2 : Output voltage 4.8V to ch0 ~ ch7 and the meter, and select +/-5V in Gain combo box. Enter the value reading from the meter in Meter 1 textbox (the following example is 4.7990)

The screenshot shows a software window titled "Form1" with the following elements:

- IP: 10.1.1.123
- Port: 9999
- Firmware: 02
- Gain: +/- 5V (dropdown menu)
- Meter 1: 4.7990
- Point_1 (button)
- Meter 2: (empty)
- Point_2 (button)
- ShowGainOffset (button)
- exit, clear, clear, clear, clear (bottom buttons)

Instructions in the text area:

Step 1: Input IP ,Port and click 'Connect' button
*Connect server successful
Step 2: Output a voltage to ch0-ch7 and voltage meter
Step 3: Select the gain , input the number of the meter and click Point 1

Tips & Warnings



The range of output voltage is 5V~0V and it's better to output voltage value near to 5V.

Step 3: Click Point_1 button and get the raw data of each channel as following

The screenshot shows a software interface titled 'Form1'. At the top, there are input fields for IP (10.1.1.123), Port (9999), and Firmware (02), along with 'Connect' and 'DisConnect' buttons. A 'Gain' dropdown is set to '+/- 5V'. Below these are 'Meter 1' (4.7990) and 'Point_1' (selected), and 'Meter 2' (empty) and 'Point_2'. A 'ShowGainOffset' button is also present. The main area contains a list of raw data for channels 0-7, highlighted with a red box: ch 0 +/- 5V Raw Data 7996, ch 1 +/- 5V Raw Data 7991, ch 2 +/- 5V Raw Data 7995, ch 3 +/- 5V Raw Data 7997, ch 4 +/- 5V Raw Data 7992, ch 5 +/- 5V Raw Data 7997, ch 6 +/- 5V Raw Data 7996, and ch 7 +/- 5V Raw Data 7990. On the left, there are instructions for steps 1 through 5. At the bottom, there are 'exit' and 'clear' buttons for each section.

Step 4 : Output a voltage, -4.8V to ch0 ~ ch7 and the meter, enter the value reading from meter in Meter 2 textbox (the following example is -4.7916)

The screenshot shows the same software interface as in Step 3. In this step, 'Meter 2' is now filled with '-4.7916' and 'Point_2' is selected. The raw data list for channels 0-7 remains the same as in Step 3. The instructions on the left are updated to reflect Step 4: 'Output a minus voltage to ch0-ch7 and voltage meter' and Step 5: 'Input the number of the meter and click Point 2'. The 'clear' buttons at the bottom are still present.

Step 5: Click Point_2 button and get the raw data of each channel as following

Form1

IP: 10.1.1.123 Gain: +/- 5V

Port: 9999 Meter 1: 4.7990 Meter 2: -4.7916

Firmware: 02

Step 1: Input IP ,Port and click 'Connect' button
*Connect server successful

Step 2: Output a voltage to ch0~ch7 and voltage meter

Step 3: Select the gain , input the number of the meter and click 'Point 1'

Step 4: Output a minus voltage to ch0~ch7 and voltage meter

Step 5: Input the number of the meter and click Point 2

+/- 5V Write Gain Offset Finished!!
Choose another gain and repeat Step 2 ~ Step 5

ch 0 +/- 5V Raw Data 7996	ch 0 +/- 5V Raw Data 86A1
ch 1 +/- 5V Raw Data 7991	ch 1 +/- 5V Raw Data 86A2
ch 2 +/- 5V Raw Data 7995	ch 2 +/- 5V Raw Data 86A2
ch 3 +/- 5V Raw Data 7997	ch 3 +/- 5V Raw Data 869C
ch 4 +/- 5V Raw Data 7992	ch 4 +/- 5V Raw Data 86A2
ch 5 +/- 5V Raw Data 7997	ch 5 +/- 5V Raw Data 869C
ch 6 +/- 5V Raw Data 7996	ch 6 +/- 5V Raw Data 86A2
ch 7 +/- 5V Raw Data 7990	ch 7 +/- 5V Raw Data 869C

Step 6: Select +/- 10V in Gain combo box.

Step 7: Repeat the Step2 ~ Step5, and the upper limit voltage outputs 9.8V in Step 2 and the lower limit voltage outputs -9.8V in Step 5.

The calculated Gain Offset will be stored in the EEPROM. The calibration is completed after the message appears “Calibration Finished!!!”

Form1

IP: 10.1.1.123 Gain: +/- 10V

Port: 9999 Meter 1: 9.8020 Meter 2: -9.7991

Firmware: 02

Step 1: Input IP ,Port and click 'Connect' button
*Connect server successful

Step 2: Output a voltage to ch0~ch7 and voltage meter

Step 3: Select the gain , input the number of the meter and click 'Point 1'

Step 4: Output a minus voltage to ch0~ch7 and voltage meter

Step 5: Input the number of the meter and click Point 2

+/- 5V Write Gain Offset Finished!!
Choose another gain and repeat Step 2 ~ Step 5
+/-10V Write Gain Offset Finished!!

Calibration Finished!!!!
Click ShowGainOffset' button to check Gain Gffset

ch 0 +/- 5V Raw Data 7996	ch 0 +/- 5V Raw Data 86A1
ch 1 +/- 5V Raw Data 7991	ch 1 +/- 5V Raw Data 86A2
ch 2 +/- 5V Raw Data 7995	ch 2 +/- 5V Raw Data 86A2
ch 3 +/- 5V Raw Data 7997	ch 3 +/- 5V Raw Data 869C
ch 4 +/- 5V Raw Data 7992	ch 4 +/- 5V Raw Data 86A2
ch 5 +/- 5V Raw Data 7997	ch 5 +/- 5V Raw Data 869C
ch 6 +/- 5V Raw Data 7996	ch 6 +/- 5V Raw Data 86A2
ch 7 +/- 5V Raw Data 7990	ch 7 +/- 5V Raw Data 869C
ch 0 +/-10V Raw Data 7C2A	ch 0 +/-10V Raw Data 83DC
ch 1 +/-10V Raw Data 7C2A	ch 1 +/-10V Raw Data 83DD
ch 2 +/-10V Raw Data 7C2E	ch 2 +/-10V Raw Data 83DD
ch 3 +/-10V Raw Data 7C2E	ch 3 +/-10V Raw Data 83DE
ch 4 +/-10V Raw Data 7C2E	ch 4 +/-10V Raw Data 83DC
ch 5 +/-10V Raw Data 7C2C	ch 5 +/-10V Raw Data 83DC
ch 6 +/-10V Raw Data 7C29	ch 6 +/-10V Raw Data 83DF
ch 7 +/-10V Raw Data 7C2A	ch 7 +/-10V Raw Data 83DE

Step 8: After completing the calibration, click on ShowGainOffset button to read Gain and Offset value.

The screenshot shows a software window titled "Form1" with the following components:

- IP:** 10.1.1.123
- Port:** 9999
- Firmware:** 02
- Gain:** +/- 10V
- Meter 1:** 9.8020
- Point_1:** (empty)
- Meter 2:** -9.7991
- Point_2:** (empty)
- ShowGainOffset:** (highlighted button)

Instructions:

- Step 1: Input IP, Port and click 'Connect' button
*Connect server successful
- Step 2: Output a voltage to ch0~ch7 and voltage meter
- Step 3: Select the gain, input the number of the meter and click 'Point 1'
- Step 4: Output a minus voltage to ch0~ch7 and voltage meter
- Step 5: Input the number of the meter and click 'Point 2'

Calibration Status:

- +/- 5V Write Gain Offset Finished!!
- Choose another gain and repeat Step 2 ~ Step 5
- +/-10V Write Gain Offset Finished!!
- Calibration Finished !!!!!
- Click 'ShowGainOffset' button to check Gain Offset

Channel Data:

Channel	Voltage	Raw Data	Gain	Offset
ch0	+/- 5V	Raw Data 7996	33112	-3
ch1	+/- 5V	Raw Data 7991	33109	-3
ch2	+/- 5V	Raw Data 7995	33115	-1
ch3	+/- 5V	Raw Data 7997	33113	-3
ch4	+/- 5V	Raw Data 7992	33110	-3
ch5	+/- 5V	Raw Data 7997	33108	-1
ch6	+/- 5V	Raw Data 7996	33106	-2
ch7	+/- 5V	Raw Data 7990	33112	-1
ch0	+/-10V	Raw Data 7C2A	33108	-1
ch1	+/-10V	Raw Data 7C2A	33108	0
ch2	+/-10V	Raw Data 7C2B	33112	-3
ch3	+/-10V	Raw Data 7C2B	33109	-4
ch4	+/-10V	Raw Data 7C2B	33112	3
ch5	+/-10V	Raw Data 7C2C	33109	1
ch6	+/-10V	Raw Data 7C29		
ch7	+/-10V	Raw Data 7C2A		

Buttons: exit, clear, clear, clear, clear