Honeywell

IPC5000
Universal Programmable Controller

Analog Calibration

57-77-25-21
Analog Calibration

Overview

All calibration data for Analog Input and Analog Output is stored in non-volatile memory (flash memory) in the CPU board. Calibration data is stored for each channel of AI/O board.

Analog Input Calibration

Analog input board can accommodate four input types:

- RTD (Pt100 & jPt100)
- Thermocouple
- Volt
- 4 ~ 20 mA or 0 ~ 20 mA

Calibration values for each channel are stored in the CPU board as numeric values paired with A/D conversion counts corresponding to those numeric values. The numeric values are those identified as “REFERENCE” on the AI CALIBRATION screen.

Fig.1 indicates how an calibration device can be connected to the appropriate terminal of an analog input board. The calibration device must have the following precision characteristics.

- TC, mVolts, Volts inputs: 1 microvolt resolution
- Ohms, RTD inputs: 0.01 ohm resolution
- 4 ~ 20 mA inputs: 4 microamp resolution
For INPUT2, this is NOT available for IPC5000S.
Analog Output Calibration

A diagram of a precision ammeter connected to the terminal of an Analog output is given in Fig. 2. The specifications of the meter must be consistent with calibration requirements.

Fig. 2 Output Terminal Connections for AO calibration

For Auxiliary output 3 and 4, these are NOT available for IPC5000S.
AI and AO Calibration screen

In order to enter the screen shown on Fig.5,

- Press the right-hand corner at the bottom of the main screen and then press the left-hand corner at the bottom of the screen (see Fig. 3).

![Fig.3 Main MENU screen](image)

- Press the right-hand corner at the top of the screen as is shown on Fig. 4.

![Fig.4 CONFIGURATION screen](image)
### Fig.5 AI CALIBRATION screen

<table>
<thead>
<tr>
<th>UNIT</th>
<th>CAL 1</th>
<th>CAL 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>DC V</td>
<td>TC1</td>
</tr>
<tr>
<td>CJ</td>
<td>30.2</td>
<td></td>
</tr>
<tr>
<td>RAW VALUE</td>
<td>12193</td>
<td></td>
</tr>
<tr>
<td>HIGH VAL</td>
<td>354</td>
<td>12193</td>
</tr>
<tr>
<td>LOW VAL</td>
<td>11</td>
<td>1026</td>
</tr>
<tr>
<td>TC OFFSET</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

### Fig.6 AO CALIBRATION screen

<table>
<thead>
<tr>
<th>AO1</th>
<th>AO2</th>
<th>AO3</th>
<th>AO4</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>4 – 20 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUT VALUE</td>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOW</td>
<td>2035</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIGH</td>
<td>10213</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

-4mA ->20mA
Calibrate AI

Overview

Analog inputs are factory calibrated to +/-0.1% of span unless specifically noted in the range specifications. The factory calibration parameters are retained in non-volatile memory (flash memory) in the CPU board.

Note that you must configure a channel’s input type and range before you try to calibrate it.

Example of AI calibration

Step 1: Connect the calibrator to the channel to be calibrated (refer to Fig.1). Use a millivolt source and copper wire; do not use TC extension lead-wire.

Step 2: Select AI CALIBRATION screen.

Step 3: Press ‘CAL1’ and ‘TC1’ buttons to select INPUT.

Step 4: Connect 8.376mV to the CH1 to be calibrated (refer to Fig. 5) and adjust to ‘HIGH VAL’ in the upper portion of the screen. If the RAW VALUE and the REFERENCE are the same value, apply this value to HIGH VAL of the input.

Step 5: Connect -5.891mV to the CH1 to be calibrated (refer to Fig. 5) and adjust to ‘LOW VAL’ in the lower portion of the screen. If the RAW VALUE and the REFERENCE are the same value, apply this value to LOW VAL of the input.

Step 6: Go to Step 4 and start over again.
Calibrate AO

Overview
Analog outputs are factory calibrated to +/-0.1% of span. The factory calibration parameters are retained in non-volatile memory (flash memory) in the CPU board.

Example of AO calibration

Step 1: Connect an appropriate meter to the output terminals (refer to Fig. 2).
Step 2: Select AO CALIBRATION screen (refer to Fig. 6).
Step 3: Press ‘AO1’ buttons to select OUTPUT.
Step 4: Enter 0 (0%) to ‘OUT VALUE’.
Step 5: Measure the mA output of the AO1 being calibrated.
Step 6: Adjust to ‘Low’ in the upper portion of the screen. If the mA output of the AO1 is 4 mA, apply this value to LOW VAL of the output.
Step 7: Enter 100 (100%) to ‘OUT VALUE’.
Step 8: Measure the mA output of the AO1 being calibrated.
Step 9: Adjust to ‘HIGH’ in the lower portion of the screen. If the mA output of the AO1 is 20 mA, apply this value to HIGH VAL of the output.
Step 10: Go to step 4 and start over again.