

**Temperature converter
TR_PT-ICR-01
User manual for calibration**

Content

1	About this document.....	3
2	Required equipment.....	3
3	Calibration	3
3.1	Input for temperature measurement.....	3
3.1.1	Pt100	3
3.1.2	Pt1000	4
3.2	Current input	4
3.3	Current output	5
4	Modifications	7

1 About this document

This document presents the necessary steps and equipment calibration TR_PT-ICR-01 temperature converter. The device has analog inputs for measuring temperature and currents as well as the current output.

The aforementioned inputs and outputs is necessary to calibrate to ensure accurate measurement and assigning outputs. As input for temperature probe works in two ranges it is for his case to be done two calibrations.

2 Required equipment

For calibration devices need the following equipment:

1. Moderate resistor values around 100, 200, 1000 i 2000 Ω . Resistor should be temperature –stable in order to avoid a change in resistance during calibration
2. Ampere meter
3. Current transmitter with a range from 0 to 20mA (instead of the current is possible to use two moderate streamer generator with a current output of about 4 and 16 mA)
4. PC computer with RS232 COM ports (It is possible to use USB to RS232 converter). On the computer should be installed applications „*Temperature Transmitter Configurator*“ or *Modbus Pool*.
5. RS232 to RS485 converter

3 Calibration

Calibration is just in case presented for each case. If a calibration of all input and output steps 1 to 3 (on and connect to the computer) is required only during the first calibration.

3.1 Input for temperature measurement

Input for temperature measurement works in two ranges: 0 to 300 Ω (for Pt100 probes) and from 0 to 3000 Ω (for Pt1000 probe).

3.1.1 Pt100

Calibration inputs for Pt100 probes is done in two points. Calibration points must be in the range of 0 to 300 Ω although it is recommended to be approximately the first 100 and the second around 200 Ω .

Calibration is performed using the following steps:

1. Connect the device to your computer via the serial port and the necessary converters.
2. Turn on the device power.

3. Using an appropriate application to communicate with the device.
4. Input for temperature probe set in Pt100 mode with higher volumes by entering the value in the register 2 Input Type (adr 10)
5. in Pt100 mode with higher volumes by entering the value in the register 2 Input Type (adr 10).
6. Connect the smaller calibration resistor.
7. In register **Calibration value** (adr 26) write value connected resistor multiplied by 100.
8. In **Command register** (adr 34) write value 1.
9. Disconnect first calibration resistor and in its place attach a second calibration resistor.
10. In register **Calibration value** (adr 26) write resistance value connected resistors multiplied by 100.
11. In **Command register** (adr 34) write value 2.

This calibration process is completed. It is desirable to check the channel measuring the resistance of the resistor test or calibration resistor. The value of resistance of the device measure can be read in the registry **Measured resistance (adr 28)**. The measured value is multiplied by 100. When checking wait to establish value.

3.1.2 Pt1000

Calibration inputs for Pt1000 probes is done in two points. Calibration points must be in the range of 0 to 3000 Ω although it is recommended to be approximately the first 1000 Ω and the second around 2000 Ω .

Calibration is performed using the following steps:

1. Connect the device to your computer via the serial port and the necessary converters.
2. Using an appropriate application to communicate with the device.
3. Input temperature probe set in PT1000 mode by entering the value 14 in the register **Input Type** (adr 10).
4. Connect the smaller calibration resistor.
5. In register **Calibration value** (adr 26) write value connected resistor multiplied by 10.
6. In **Command register** (adr 34) write value 4.
7. Disconnect first calibration resistor and in its place attach a second calibration resistor.
8. In register **Calibration value** (adr 26) write value connected resistor multiplied by 10.
9. In **Command register** (adr 34) write value 8.

This calibration process is completed. It is desirable to check the channel measuring

the resistance of the resistor test or calibration resistor. The value of resistance of the device measure can be read in the registry **Measured resistance (adr 28)**. The measured value is multiplied by 10. When checking wait to establish value.

3.2 Current input

Calibration of the current input is performed in two points. Calibration points must be in the range of 0 to 20mA, but is recommended to be approximately the first 4 and the second around 15mA.

Calibration is performed using the following steps:

1. Connect the device to your computer via the serial port and the necessary converters.
2. Turn on the device power.
3. Using an appropriate application to communicate with the device.
4. The device set in the current measurement mode by entering the value 21 in the register **Input Type** (adr 10).
5. Connect the current input with amperemeter.
6. The input current set lower value.
7. In register **Calibration value** (adr 26) write value of input current. The value to be entered in mA * 100.
8. In **Command register** (adr 34) write value 256.
9. The input current set lower value.
10. In register **Calibration value** (adr 26) write value of input current.
11. In **Command register** (adr 34) write value 512.

This calibration process is completed. This calibration process is completed. It is desirable to check the channel current measurement in an arbitrary point. The value of the measured currents can be read in the registry **Measured input current** (adr 31). The measured value is mA multiplied by 100. When checking wait to establish value.

3.3 Current output

Calibration of the current output is carried out in two points. During calibration, the device will set up two amperage at its output a person who performs the calibration is required that these values are entered into the device.

Calibration is performed using the following steps:

1. Connect the device to your computer via the serial port and the necessary converters.
2. Turn on the device power.
3. Using an appropriate application to communicate with the device.
4. Connect amperemeter on current output.

5. In **Command register** (adr 34) write value 16.
6. In register **Calibration value** (adr 26) write value of measured currents . The value to be entered in mA * 100.
7. In **Command register** (adr 34) write values 32.
8. In register **Calibration value** (adr 26) write value of measured currents . The value to be entered in mA * 100.
9. In **Command register** (adr 34) write value 64.

4 Modifications

Rev.	Dat. rev	Description changes	Autor
1.0	01/02/15	The initial versiona	Uglješa Tomanović