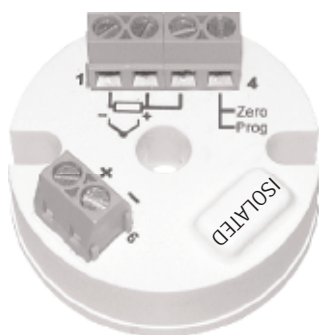# INTEMPCO's Mp200i
Digital Temperature Transmitter

INSTRUCTION MANUAL

1. Description

The Mp200i is a 2-wire temperature transmitter with galvanic isolation between input and output. Micro-processor based, it was designed for flexibility, accepting mV, Pt100 and a variety of thermocouples as the input sensor. The Mp200ii delivers a scalable linear 4-20mA output current proportional to the sensor temperature. A user-friendly configuration software is provided for parameter setup, including sensor type, temperature range, filter, etc.

2. Note

Prior to unpacking and installation, please read the operating instructions and follow them carefully. These units are to be used, serviced, and repaired only by individuals who are familiar with the operating instructions and the applicable regulations for operational safety and accident prevention.

3. Control of Units

The units are calibrated and checked before shipment and shipped in good conditions. If you detect a visible defect on the unit, we recommend that you carefully check the packing material. In the event of a defect, please immediately notify the mail service/freight forwarder, as the shipper is responsible for shipping damage.

4. Configuration

Please check the configuratin parameters programmed in the Mp200i, using the TxConfig software. A communication path needs to be established between the Mp200i and the serial port of a PC. The 1.5 m long Txconfig Adaptor is provided for this purpose. Connect its DB9 end to the PC COMM port and the other end to the transmitter as shown in *Figure 1*.

Once configured, the transmitter is ready to be installed in this process.

Note : The TxConfig Adaptor and Software can be purchased separately from Intempco or one of its distributors.

Serial port can configuration errors may occur when other devices are sharing the same port (ex.: Palm Hot Sync). Close all serial port applications prior to using the TxConfig Software.
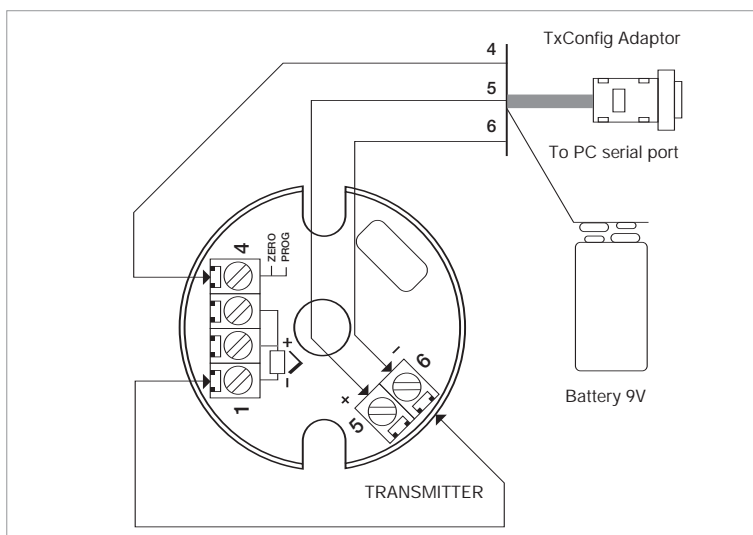

Figure 1- *Adaptor connections to the Mp200i*

The transmitter requires to be powered during the configuration. Depending on the PC use, the power can be supplied by the serial port. To assure proper communication, it is recommanded to apply external power to the Mp200i. The TxConfig Adaptor provides a 9V battery socket for powering the transmitter during the configuration.

Do not use the battery if the transmitter is being powered by another supply or connected to the process, as shown in *Figure 2*.
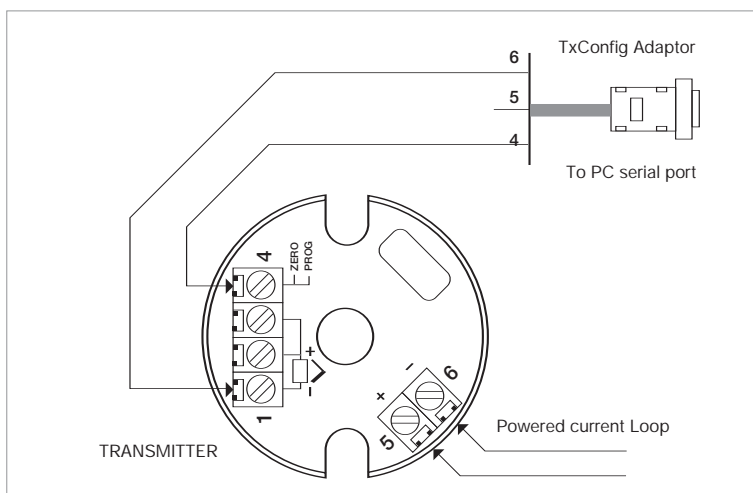

Figure 2 - *Mp200i-TxConfig Adaptor wiring (loop powered). Terminal 5 is left opened.*

The TxConfig screen in shown in *Figure 3*. All user parameters can the seen and/or modified by either typing a value or selecting among the available options. The help menu provides futher information about the software and the transmitter.
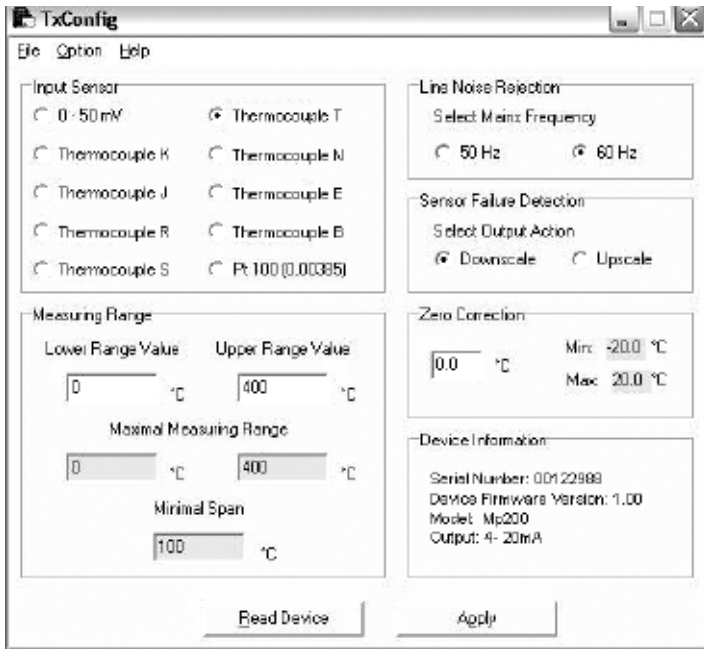

Figure 3 - *TxConfig main screen*

The fields in the screen mean :

1. **Input Sensor :** Choose the desired temperature sensor among the available options.

2. **Measuring range** : Defines the beginning and the end of the range.
   Lower Range Value : Sets the value of the input signal (temperature or mV) associated to the 4mA output.
   Upper Range Value : Sets the value of the input signal that will correspond to the 20mA output.

The values configured in these fields can be not beyond the sensor measuring range. The minimum span value has to be observed as well (see Table 1).

3. **Line Noise rejection :** The Mp200i incorporates a digital filter to cancel the induced noise from the 50 or 60 Hz systems. For better performance, select the line frequency used in your country.

4. **Sensor Failure Detection :** Establishes the transmitter output behavior (upscale or down-scale) in the presence of the sensor fail.

5. **Zero Correction :** Allows for a small sensor corrections.

6. **Read Configuration :** Brings to the screen the current Mp200i parameters configuration.

7. **Apply :** Sends a new configuration to the transmitter.

8. **Device Information :** The device Information box contains relevant data concerning a particular Mp200i transmitter. Please pass along this information when contacting the technical assistance department.

Note : The factory default configuration is (unless other otherwise specified or ordered)
• Pt100 input, o to 100°C
• 60 Hz filtering and upscale (20 mA) output for sensor fail.

5. Installation

The Mp200i transmitter is intended for in head mounting. Its drawing is presented in *figure 4*
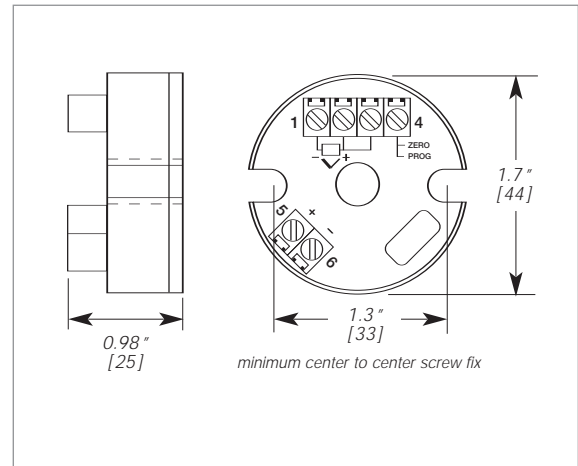

Figure 4 - *Mp200i dimensions*

6. Electrical Connections

Connector specification :

• Insulating material: Polyamide, self-extinguishing to UL 94, V-0
• Connection wire cross section: 0,14-1,5 mm_ / AWG 28-14
• Screw tightening torque: 0,8 Nm / 7.0 lb-in
• Terminal block: CuZn

It is important to follow the recommendations below :

• Signal wires should be installed in grounded conduits and away from power or contactor wires.

• The instrument should have its own power supply wires, which should not be shared with electrical motors, coils, contactors, etc.

• Installing RC filters is strongly recommended at contactor coils or any other inductors.

• System failure should always be taken into account when designing a control panel to avoid irreversible damage to equipment or people.

Figure 5 shows the Mp200i connections to the sensor and power supply. Terminals 1, 2 e 3 are used for sensor input. For 2-wire Pt100, terminals 2 and 3 shall be connected together.
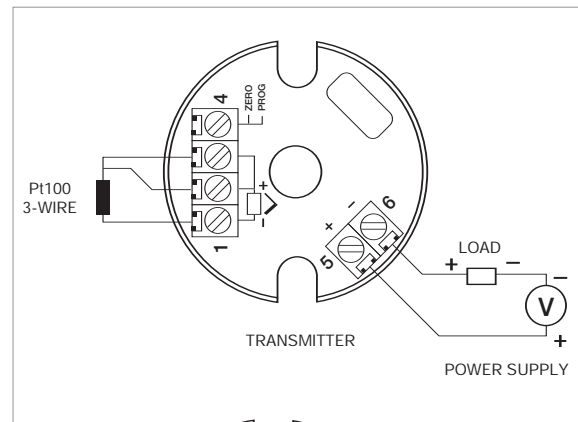

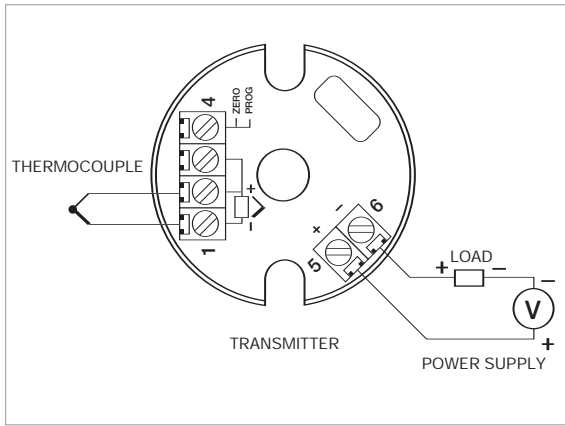
Figure 5 - *Mp200i wiring (Pt100)*

Figure 5 - *Mp200i wiring (Thermocouple)*

The LOAD represents the input shunt of an instrument measuring the 4-20 mA current loop.

7. Installation

All input types and the 4-20mA output current are factory calibrated. However, a manual offset trim is implemented to provide fine adjustments to the signal in the field. This is accomplished by means of short circuiting terminals 4 (Zero) and 1(-). The transmitter waits 2 seconds before it starts changing the offset. The offset adjustment is capable of varying the output current by an amount equal to ±0.80mA relative to the original calibration. After reaching the maximum value (0.80mA above the original current), the output is driven instantly to –0.80mA below the original current, and continues increasing. When the desired output current (offset) is reached, opening the jumper will cause the Mp200i to acknowledge the new offset value. Fine trimming is possible with momentary (2s minimum) jumper contact.

The offset correction can also be accomplished by the TxConfig software. See in Figure 3 the Zero Correction field for this purpose. The serial adaptor can be connected to the transmitter while it is operating in the process.

Note : when using a Pt100 simulator, make sure the Mp200i Pt100 excitation current (0.17mA) s compatible with the simulator specification.

The input types are listed in Table 1, along with the maximum and minimum ranges accepted by each one. The TxConfig software will allow only configurations that are consistent with the data in this table.

Please note that the specified accuracy is referenced to the maximum span of each input type. For instance, for the Pt100 input, the 0.2% accuracy results in 1.7ºC total accuracy [(650 – (-200)) x 0.2].

8. Specifications

Sensor input : User defined. The supported sensors are liste in table 1, along with their maximum ranges.

Thermocouples : Types J, K, R, S, T, N, E and B, according to IEC 60584 (ITS-90). Impedance >> $1M\Omega$

Pt100 : Excitation : 180 uA. 2 or 3-wire connection (for 2-wire sensors, tie terminals 2 and 3 together). α = 0.00385, according to IEC 60751(ITS-90).

Voltage : 0 a 50mVdc. Impedance >> $1M\Omega$

Sensor Type	Range	Min. SPAN
Thermocouple K	-150 to 1370°C (-238 to 2500 °F)	100°C
Thermocouple J	-100 to 760°C (-148 to 1400 °F)	100°C
Thermocouple R	-50 to 1760°C (-58 to 3200 °F)	400°C
Thermocouple S	-50 to 1760°C (-58 to 3200 °F)	400°C
Thermocouple T	-160 to 400°C (-256 to 752 °F)	100°C
Thermocouple N	-270 to 1300°C (454 to 2372 °F)	100°C
Thermocouple E	-90 to 720°C (-130 to 1328 °F)	100°C
Thermocouple B	500 to 1820°C (932 to 3308 °F)	400°C
Pt100	-200 to 600°C (-328 to 1112 °F)	40°C
Voltage	0 to 50mV	5mV

Table 1 – MP200i series input sensor

Total accuracy : better than 0,3% of the maximum range for thermocouples and 0,2% for Pt100 and voltage;

Response Time : < 500 ms;

Output : 2-wire 4-20mA, linear with respect to the measured temperature.

Resolution: 0,001mA (14 bits).

Power supply : 12 to 35Vdc, across the transmitter;

Maximum load (RL) : RL (max.)= (V supply – 12) / 0,02 [Ω]

Operating Temperature : -40 to 85°C

Humidity : 0 a 90% RH

Electromagnetic compatibility : EN 50081-2, EN 50082-2

Isolation : 1000Vac for 1 min. between sensor input and the 4-20mA loop

Cold Junction Compensation for Thermocouples