

INSTALLATION

The transmitter is intended for DIN rail mounting. Its drawing is presented in **Figure 04**.

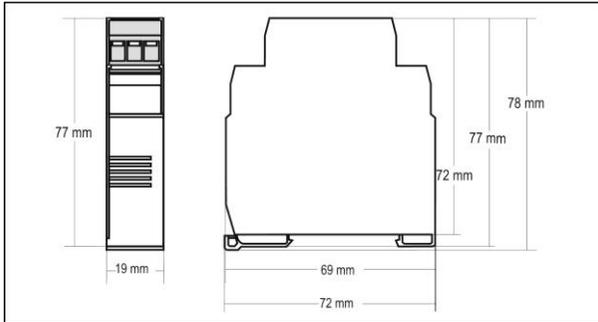


Figure 04 – Transmitter dimensions

ELECTRICAL CONNECTIONS

Figure 05 below shows the transmitter connections to the sensor and power supply. Terminals 1, 2 and 3 are used for sensor input. For 2-wire Pt100, terminals 2 and 3 shall be connected together.

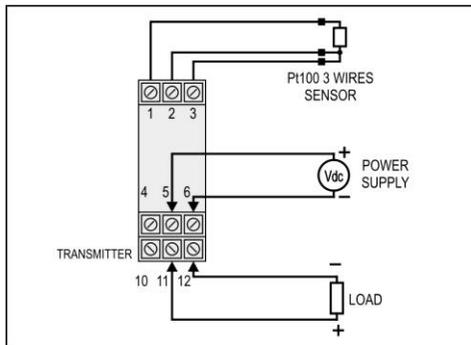


Figure 05 – Transmitter connections – Pt100

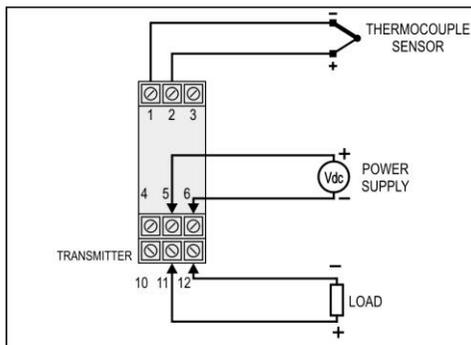


Figure 06 – Transmitter connections – Thermocouple

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.

SPECIFICATIONS

Sensor input: User defined. The supported sensors are listed in **Table 01**, along with their maximum ranges.

Thermocouples: Types J, K, R, S, T, N and E, according IEC 60584-1 (ITS-90). Impedance $\gg 1 \text{ M}\Omega$

Pt100: Excitation: 0.18 mA, 2 or 3-wire connection (for 2-wire sensors, tie terminals 2 and 3 together). $\alpha = 0.00385$, according to IEC 60751 (ITS-90)

Voltage: 0 to 50 mVdc. Impedance $\gg 1 \text{ M}\Omega$

Sensor Type	Range	Minimum measurement span
Thermocouple K	0 to 1370 °C	100 °C
Thermocouple J	0 to 760 °C	100 °C
Thermocouple R	0 to 1760 °C	400 °C
Thermocouple S	0 to 1760 °C	400 °C
Thermocouple T	0 to 400 °C	100 °C
Thermocouple N	0 to 1300 °C	100 °C
Thermocouple E	0 to 720 °C	100 °C
Pt100	-200 to 650 °C	40 °C
Voltage	0 to 50 mV	5 mV

Table 01 – Transmitter input sensors

Output: 0 to 10 Vdc, linear with respect to the measured temperature.

Total Accuracy: better than 0.3 % of the maximum range for thermocouples and 0.2 % for Pt100 and voltage (for voltage output above 100 mV).

Resolution: 0.025 V (12 bits)

Maximum Current (Load): 2 mA

Response Time: < 100 ms

Power supply: 18 to 35 Vdc

Operation Temperature: -40 to 85 °C

Humidity: 0 to 90 % RH

Protection: IP40

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

No isolation between input, voltage output and power supply.

Internal protection against polarity inversion.

Cold junction compensation for thermocouples.

Housing: ABS plastic. **Dimensions:** Refer to **Figure 04**.

TEMPERATURE TRANSMITTER

TXRAIL 0-10VDC

OPERATING MANUAL

CONFIGURATION

If the transmitter is already configured as required by the application (sensor type, range, etc), it may be installed and used right away. However, if a distinct configuration is required, this can be done through the **TxConfig software** and the **TxConfig Interface**.

The TxConfig interface and software can be purchased from the manufacturer or at its authorized distributors and representatives. Updates for the software are available at our website. To install the TxConfig software, run the **Tx_setup.exe** file and follow the instructions.

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

The TxConfig interface connects the transmitter to the PC, as shown in **Figures 01** and **02**. There are two types of interface: TxConfig-RS232 and TxConfig-USB.

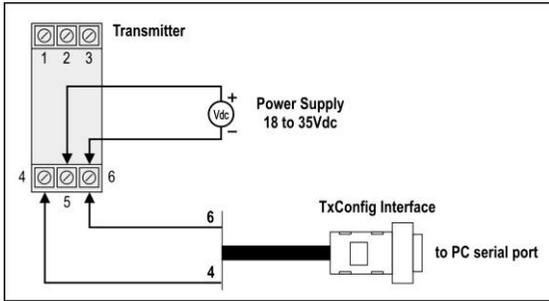


Figure 01 – TxConfig Interface connections model RS232

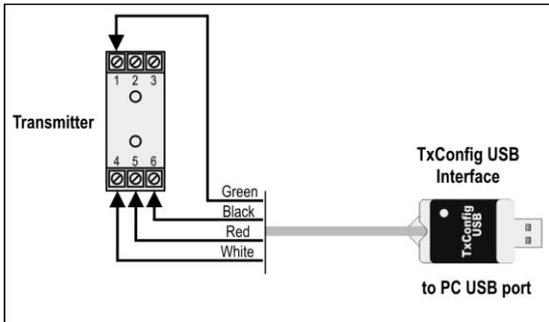


Figure 02 – TxConfig Interface USB connections



The TxConfig interfaces contain dedicated circuitry for proper communication between transmitters and computer. Always make use of the TxConfig interfaces for configuration purposes, otherwise the transmitters may get damaged, voiding the warranty.

Once the connection is accomplished, the software shows the configuration options of the transmitter model attached. Access the **Help** for usage instructions.

The TxConfig screen is shown in **Figure 03**.

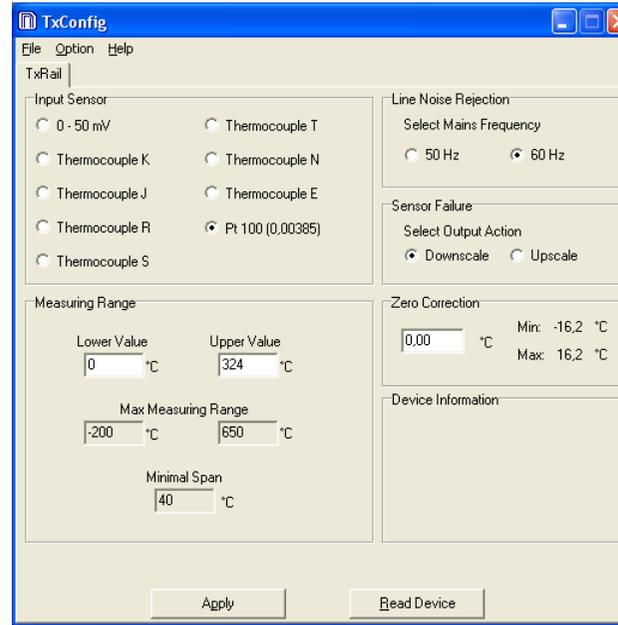


Figure 03 – TxConfig main screen

The fields in the screen mean:

- Input Sensor:** Choose the desired temperature sensor among the available options. See **Table 01**.
- 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 0 V output.
 - Upper Range Value:** Sets the value of the input signal that Will correspond to the 10 V output.

When the Lower Range Value is configured with a value higher than the Upper Range Value, the voltage output will have a decrescent behavior (10-0 Vdc).

The values configured in these fields can not be beyond the sensor measuring range. The minimum span value has to be observed as well. See **Table 01**.
- Line Noise Rejection:** The transmitter 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.
- Sensor Failure Detection:** Establishes the transmitter output behavior (Upscale or Downscale) in the presence of a sensor fail.
- Zero Correction:** Allows for small sensor corrections. See item Operating.
- Device Information:** The *Device Information* box contains relevant data concerning a particular transmitter. Please pass along this information when contacting the technical assistance department.
- Read Device:** Brings to the screen the current transmitter parameters configuration.
- Apply:** Sends a new configuration to the transmitter.

Note: The factory default configuration is (unless otherwise specified or ordered):

- Pt100 input, 0 to 100 °C;
- 60 Hz filtering and up scale (10 Vdc) output for sensor fail.

OPERATION

All input types and the 4-20 mA output current are factory calibrated and have no need for user adjustment.

However, if desired by the user, a manual offset trim is implemented to provide fine adjustments to the signal in the field. This is accomplished by the front keys ZERO+ and ZERO-, located under the frontal label in order to avoid accidental adjustments. Using a small tool (2 mm diameter), press and hold the desired key for at least 2 seconds to increase or decrease the output current. When the output current is reached, the key must be released.

The offset correction can also be accomplished by the TxConfig software. See in **Figure 03** the **Zero Correction** field for this purpose. The serial adaptor can be connected to the transmitter while it is operating in the process.

The user must choose the sensor and configure the sensor span which best suit the application. The sensor span must not exceed the maximum range supported by the transmitter for a particular sensor, neither be lower than the minimum span.

It is important to note that the transmitter accuracy is related to the total sensor span of a sensor, regardless of the output scale (span) configured. Example:

- Pt100; maximum input span of -200 to +650 °C, 0.2 % accuracy.
- Maximum error: 1.7 °C (0.2 % of 850 °C)
- This error is the same no matter if total span is used (-200 to 650 °C) or a narrower user-defined span is used, like 0 to 100 °C.

Note: When using a Pt100 simulator, make sure the transmitter Pt100 excitation current (0.18 mA) is compatible with the simulator specification.

The transmitter must be powered in order to be configured. The TxConfig-USB interface provides the necessary power. The TxConfig-RS232 interface, however, requires an auxiliary supply to guarantee a reliable communication with the computer. A recommended solution is to power the transmitter by an external power supply (18-35 Vdc), as shown in **Figure 01**.