

INSTALLATION

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

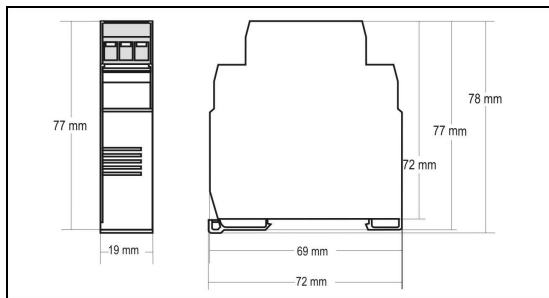


Figure 04 – Transmitter dimensions

ELECTRICAL CONNECTIONS

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

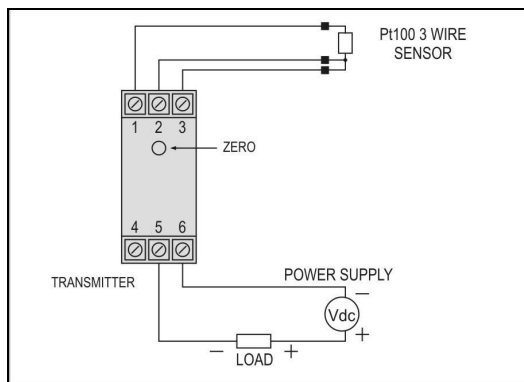


Figure 05 – Transmitter wiring (Pt100)

Figure 06 below shows the thermocouple wiring.

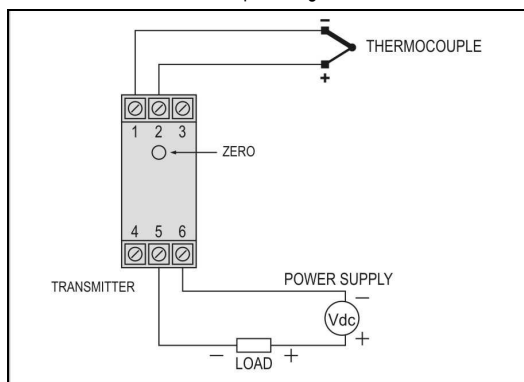


Figure 06 – Transmitter wiring (Thermocouple)

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

Electrical Connections – 0-10 Vdc Input

For 0-10 Vdc input, the transmitter requires an internal hardware configuration change. Please open the instrument case and change the jumper shown in **Figure 07**.

- Position 1-2 : 0-10 Vdc input
- Position 2-3 : all other input types (factory setting).

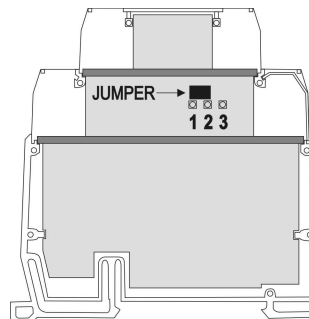


Figure 07 – Jumper position for 0-10Vdc input

OPERATION

All input types and the 4-20 mA output current are factory calibrated.

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 3 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: 1,2°C (0,15 % of 800 °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 (0.18mA) is compatible with the simulator specification.

MICROPROCESSOR

BASED TEMPERATURE TRANSMITTER

TxIsoRail 4-20mA

INSTALLATION AND OPERATING MANUAL

novus
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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, E and B to IEC 60584 (ITS-90). Impedance >> 1 MΩ
- Pt100:** Excitation: 180 μA, 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 to 50 mVdc, 0 to 10 Vdc. Impedance >> 1 MΩ.
* **Note:** 0-10 Vdc input type requires an internal jumper switching.
0 to 20 mA, 4 to 20 mA. Impedance 15,0 Ω (+ 1,9 Vdc).

Sensor Type	Range	Minimum measurement span
Thermocouple K	-150 to 1370 °C	100 °C
Thermocouple J	-100 to 760 °C	100 °C
Thermocouple R	-50 to 1760 °C	400 °C
Thermocouple S	-50 to 1760 °C	400 °C
Thermocouple T	-160 to 400 °C	100 °C
Thermocouple N	-270 to 1300 °C	100 °C
Thermocouple E	-90 to 720 °C	100 °C
Thermocouple B	500 to 1820 °C	400 °C
Pt100	-200 to 600 °C	40 °C
Voltage	0 to 50 mV	5 mV
	* 0 to 10 V	1 V
Current	0 to 20 mA	2 mA
	4 to 20 mA	2 mA

Table 01 – Transmitter input sensors

- Output:** 2-wire 4-20 mA, linear with respect to the measured signal.
- Resolution:** 0,001 mA (14 bits)
- Total Accuracy:** Better than 0,3 % of the maximum range for thermocouples and 0,2 % for Pt100 and voltage;
- Response Time:** < 500 ms
- Isolation:** Between the sensor and the 4-20mA loop (1000 V / 1 min).
- Power Supply:** 12 to 35 Vdc, across the transmitter;
- Maximum Load (RL):** RL (max.)= (Vdc – 12) / 0,02 [Ω]
Were: Vdc= Power supply voltage
- Operating Temperature:** -40 to 85 °C
- Humidity:** 0 to 90% UR
- Electromagnetic Compatibility:** EN 50081-2, EN 50082-2
- Internal protection against polarity inversion.**
- Cold junction compensation for thermocouples.**
- Housing:** ABS plastic. **Dimensions:** Refer to **Figure 04**.

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.

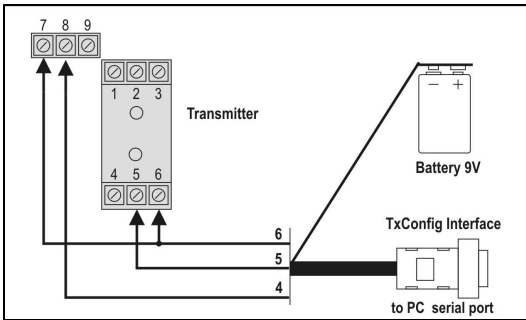


Figure 01 – TxConfig Interface connections model RS232

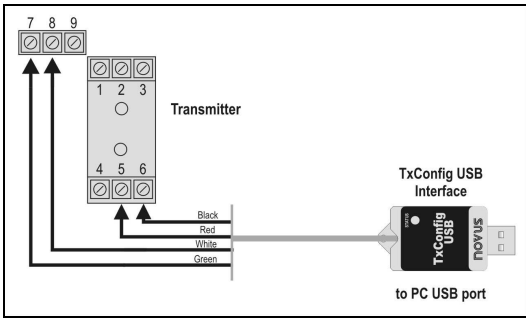


Figure 02 – TxConfig Interface USB connections

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**.

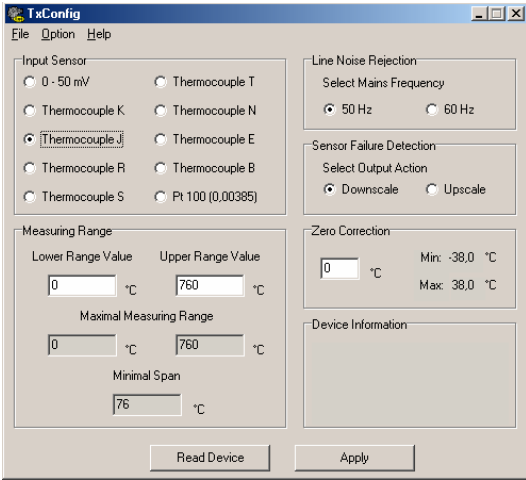


Figure 03 – TxConfig main screen

- The fields in the screen mean:
- 1. Input Sensor:** Choose the desired temperature sensor among the available options. See **Table 01**.
 - 2. Measuring Range:** Defines the beginning and the end of the range.
When the Low Scale Limit is configured with a value higher than the Full Scale Limit, the current output will have a decrescent behavior (20~4 mA).
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**).
 - 3. 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.
 - 4. Sensor Failure Detection:** establishes the transmitter output behavior (upscale or down-scale) in the presence of a sensor fail.
 - 5. Zero Correction:** Allows for small sensor corrections.
 - 6. Read Configuration:** Brings to the screen the current transmitter parameters configuration.
 - 7. Apply:** Sends a new configuration to the transmitter.
 - 8. Device Information:** The *Device Information* box contains relevant data concerning a particular transmitter. Please pass along this information when contacting the technical assistance department.

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

- Pt100 input, 0 to 100 °C
- 60 Hz filtering and upscale (20mA) output for sensor fail.

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.

An external 9V battery can be used for this purpose (Figure 01). An alternative is to configure the transmitter while it is in operation; this way, the needed energy is supplied by the current loop, as in Figure 04.

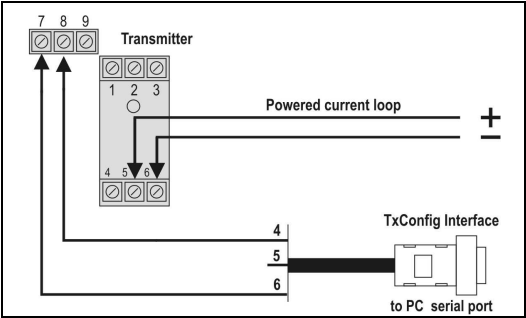


Figure 04 – TxConfig Interface connections – Loop powered

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.