



TXMINI-M12 / TXMINI TRANSMITTER

USER GUIDE – V1.0x I

1. INTRODUCTION

TxMini-M12 Transmitter is a 4-20 mA 2-wires temperature transmitter for head mount, powered by the current loop. It can be configured using **SigNow** or **TxConfig II** software or **SigNow** app.

The output current is linearized according to the selected input sensor and adjusted to the configured range.

2. SPECIFICATIONS

Sensor Input: User defined. The supported sensors are listed in **Table 1**, along with their maximum ranges.

Pt100: Type 3-wire, Excitation 0.8 mA, $\alpha = 0.00385$, according to IEC 60751 (ITS-90).

Pt1000: Type 3-wire, Excitation 0.8 mA, $\alpha = 0.00385$, according to NBR 13773. IEC 60751 (ITS-90).

For 2-wire sensors, tie terminals 3 and 4 together.

Switch-on delay: < 2.5 s. The accuracy is only guaranteed after 15 minutes.

Reference terms: Ambient: 25 °C (77 °F); voltage: 24 Vdc, load: 250 Ω ; settling time: 15 minutes.

Temperature effect: $< \pm 0.2 \% / 25 \text{ }^\circ\text{C}$.

Response time: Typical 1.6 s.

Maximum voltage allowed at input terminals no sensor: 3 V.

RTD current: 800 μA .

RTD cable resistance effect: $0.005 \text{ }^\circ\text{C} / \Omega$.

Maximum allowable cable resistance for RTD: 25 Ω .

SENSOR TYPE	TYPICAL ACCURACY	MINIMUM ACCURACY
Pt100 / Pt1000	0.1 %	0.2 %

Table 1 – Calibration error, percentage of the full measurement range

Power supply influence: 0.006 % / V typical (percentage of the full measure range).

Output: 4-20 mA or 20-4 mA current, 2-wire; linear in relation to the temperature measurement by the selected sensor.

Output resolution: 2 μA .

Power supply: 8 to 35 Vdc, across the transmitter.

Maximum load (RL): $RL (\text{max.}) = (Vdc - 8) / 0.02 [\Omega]$

Where: Vdc = Power supply voltage (8-35 Vdc)

Operating temperature: -40 to 85 °C (-40 to 185 °F).

Humidity: 0 to 90 % RH.

Electromagnetic compatibility: EN 61326-1:2006.

No electrical isolation between input and output.

Internal protection against polarity inversion.

Cold junction compensation for thermocouples.

Connection wire cross section: 0.14 a 1.5 mm²

Screw tightening: 0.8 Nm.

Housing: Polyamide.

SENSOR TYPE	MAXIMUM MEASUREMENT RANGE	MINIMUM MEASUREMENT RANGE
Pt100	-200 to 650 °C (-328 to 1202 °F)	40 °C (104 °F)
Pt1000	-200 to 650 °C (-328 to 1202 °F)	40 °C (104 °F)

Table 2 – Sensors accepted by the transmitter

Order codes:

- P/N: **8806060406:** TxMini-M12 transmitter.
- P/N: **8816021079:** TxConfig-M12 Interface.
- P/N: **8806060506:** TxMini Transmitter (transmitter can only be configured during production).
- P/N: **8806065000:** M12 Connector Cable for TxMini-M12 (accessory).

3. CONFIGURATION

The factory setting of the transmitter is for Pt100 input with a range of 0 to 100 °C and output for maximum current in case of error. When using the transmitter with this setting, no further commissioning is required. In this case, its installation can be carried out immediately.

When it is necessary to change the configuration of the equipment, you should use **SigNow** software, **TxConfig II** software, or **SigNow** app.

To configure the equipment through any of the software, you must connect the **TxConfig-M12** Configuration Interface (purchased from the manufacturer or its authorized representatives) to the USB port of the computer used and run the selected software.

To configure the device via the **SigNow** app, you need to use an OTG cable with the **TxConfig-DIN43650** Configuration Interface and proceed with the recognition process (see [SMARTPHONE CONNECTIONS](#) chapter).

On **NOVUS** website, you can download the configuration software for free. To install it, simply run the file **SigNowSetup.exe** or the file **TxConfigIISetup.exe** and follow the instructions in the installer.

The **SigNow** setup application can be downloaded for free from the *Google Play Store* or the *App Store*.



The communication interface TxConfig-M12 is not electrically isolated from the transmitter input.

3.1 SOFTWARE AND APP

3.1.1 SIGNOW SOFTWARE

When you run the **SigNow** software and make the connection to the equipment, the following screen will be displayed:

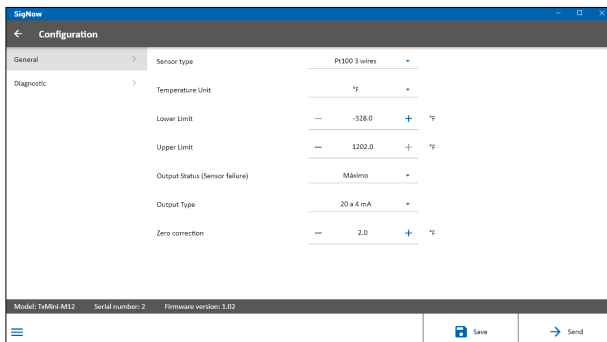


Figure 1 – SigNow settings screen

The bottom part of the screen displays information about the model, serial number, and firmware version.

The configuration screen is divided into 2 sections: General and Diagnostics.

In the General screen (shown above), you can configure the equipment by setting values and information for the following parameters:

1. **Sensor type:** It allows you to select the type of sensor to be used. See [Table 1](#).
2. **Temperature unit:** It allows you to set the temperature unit to be used.
3. **Lower limit:** It allows you to set the minimum limit for the transmitter measurement range.
4. **Upper limit:** It allows you to set the minimum limit for the transmitter measurement range.
5. **Output status (Sensor failure):** It allows you to establish the output behavior when the transmitter indicates a failure.
6. **Output type:** It allows you to define the type of output to be used: 4 to 20 mA or 20 to 4 mA.
7. **Zero correction:** It allows you to correct small deviations presented in the transmitter output, for example, when replacing the sensor.

In the **SigNow** manual, available on **NOVUS** website, you can find more information about the diagnostic process.

3.1.2 TXCONFIG II SOFTWARE

When you run the **TxConfig II** software and make the connection to the equipment, the following screen will be displayed:

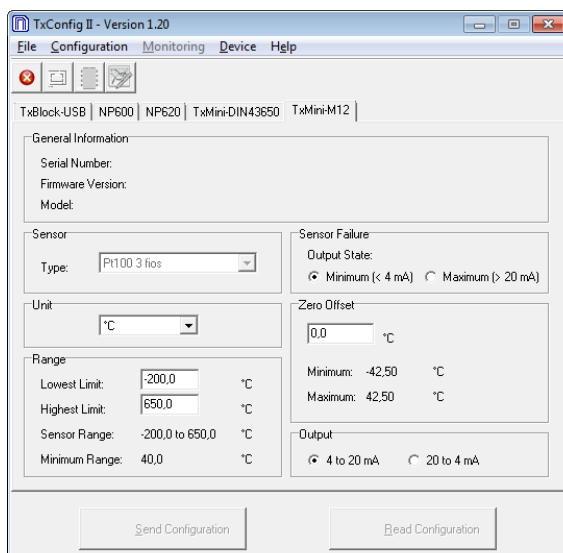


Figure 2 – TxConfig II software main screen

The fields in the screen mean:

1. **General Information:** This field shows information that identifying the transmitter. This information should be sent to the manufacturer in an eventual request for technical assistance.
2. **Sensor:** It allows you to select the type of sensor to be used. See [Table 1](#).
3. **Measuring Range:** It allows you to set de measurement range of the transmitter.
 - Lower Range Limit:** Equivalent temperature for a 4-mA current.
 - Upper Range Limit:** Equivalent temperature for a 20-mA current.
 - Sensor Range:** The values chosen cannot exceed the **sensor range** shown in this field. See [Table 1](#).
 - Minimum Range:** Do not set a lower band (span) that the **Minimum Range** indicated below in this same field. See [Table 1](#).
4. **Sensor Failure:** It allows you to establish the output behavior when the transmitter indicates a failure:
 - Minimum:** The output current goes to < 3.8 mA (down-scale). Typically used for refrigeration.
 - Maximum:** The output current goes to > 20.5 mA (up-scale). Typically used for heating.
5. **Zero Correction:** It allows you to correct small deviations presented in the transmitter output, for example, when replacing the sensor.
6. **Send Configuration:** It allows you to apply the new setup. Once sent, the setup will be immediately adopted by the transmitter.
7. **Read Configuration:** It allows you to read the current setup in the transmitter connected. The screen now presents the current setup that may be changed by the user.

3.1.3 SIGNOW APP

When using an OTG cable and the **TxConfig-M12** Configuration Interface to connect the equipment to your smartphone and run the **SigNow** app (see [SMARTPHONE CONNECTIONS](#) chapter), you must first enable the use of **TxConfig-M12**.

The interface will act as an intermediary for the connection:

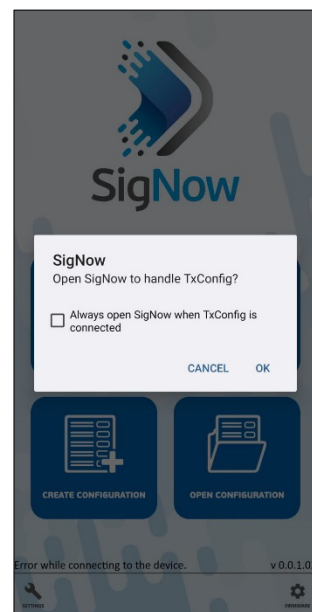


Figure 3 – Using TxConfig-M12

After that, the app will recognize the equipment and show the main screen:

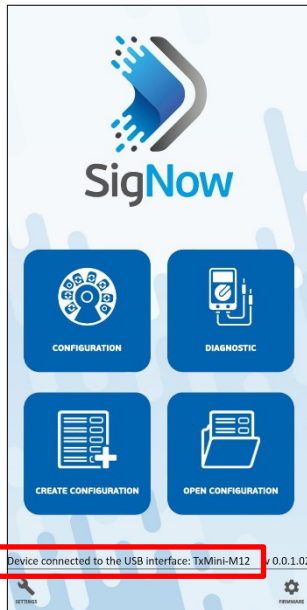


Figure 4 – Main screen

To configure the equipment, just click the **Configuration** button. Then, the app will show the main screen of the TxMini-M12 Configuration section:

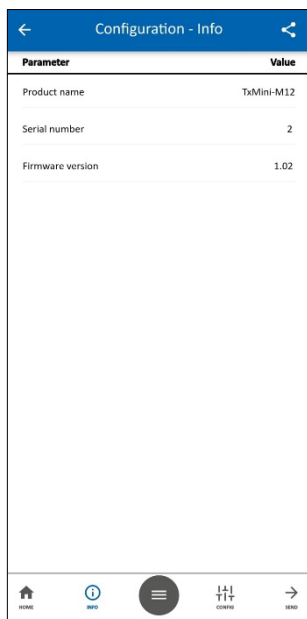


Figure 5 – Information screen

This screen shows information about the equipment, such as name, serial number, and firmware version.

When you open the **Config** section, you can configure the parameters displayed in the [SIGNOW SOFTWARE](#) section.

In the **SigNow** manual, available on **NOVUS** website, you can find more information about the buttons and the diagnostic process.

3.2 FACTORY SETTING

- Sensor: Pt100 3-wire, range 0 to 100 °C.
- Sensor failure: Upscale (maximum).
- 0 °C zero correction.
- Unit: °C.
- Output: 4 to 20 mA.

Upon purchase order, you can define a specific setup.

4. SMARTPHONE CONNECTIONS

Smartphones with *On the Go* (OTG) technology can be directly connected to the device via the Micro-USB input. Using the **TxConfig-M12** Configuration Interface, it is possible to recognize and configure a **TxMini-M12** by running the **SigNow** app.

To do this, as shown in **Figure 6**, you need to observe how to connect the OTG cable to the equipment:

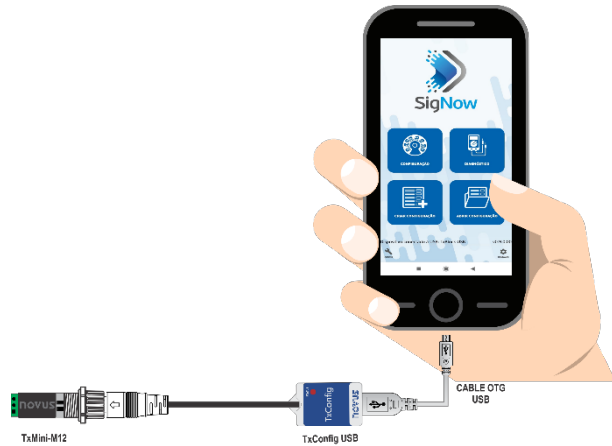


Figure 6 – OTG cable



Incorrect positioning of the cable tip can cause the equipment not to be recognized by the app.

5. MECHANICAL INSTALLATION

TxMini-M12 Transmitter was designed to be installed in tubes and other small places.

Vibrations, moisture and extreme temperatures, electromagnetic interference, high voltage, and other interferences can permanently damage the equipment and could cause error in the measured value.

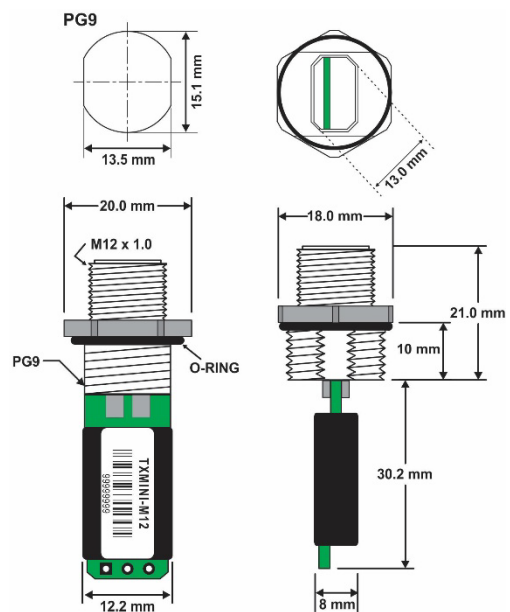


Figure 7 – Dimensions of the transmitter

6. ELECTRICAL INSTALLATION

- Polyamide housing.
- Section of the cable used: 0.14 to 1.5 mm².

6.1 INSTALLATION RECOMMENDATIONS

- Sensor signals conductors must go through the plant system separate from power leads (loop). If possible, in grounded conduits.
- The instruments must be powered from the instrumentation power supply circuit.
- In control and monitoring applications is essential to consider what can happen when any part of the system fails.
- It is recommended the use of suppressors in contact coils, solenoids and any inductive load.

6.2 POWER AND COMMUNICATION CONNECTION

Terminal 2 is used to communicate with the transmitter (TxConfig-M12 Configuration Interface must be used).

Terminal 4 can be connected to cable shield, if needed.

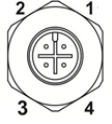
	1	LOOP +
	2	COMM
	3	LOOP -
	4	SHIELD

Table 3 – Power supply

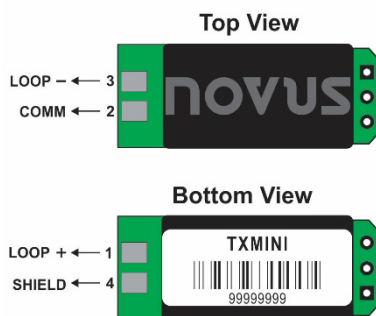


Figure 8 – Output 4-20 mA (without M12)

Note: This model has no configuration interface and can only be configured during production.

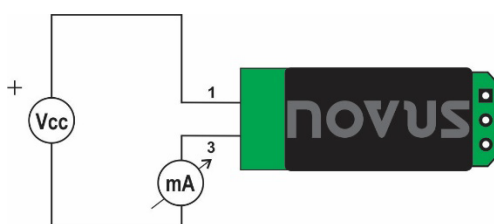


Figure 9 – TxMini-M12 / TxMini connection diagram

6.3 SENSOR CONNECTION

Terminals 1, 2, and 3 are dedicated to sensor connection. Terminals 1 and 2 must be shorted, as shown in the figure below:

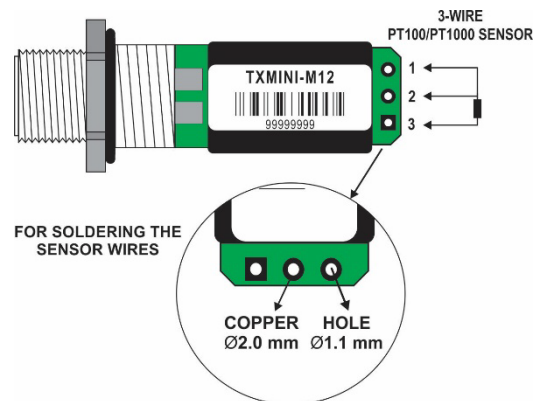


Figure 10 – Input 3-wire Pt100 / Pt1000

M12 CABLE CONNECTION

The information below shows how to make or buy an M12 cable:

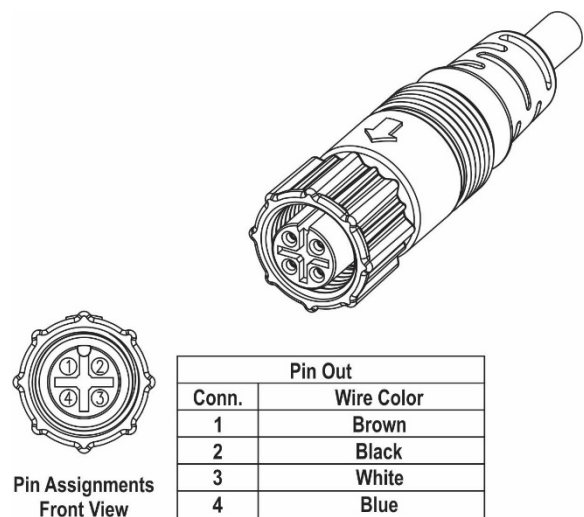


Figure 11 – Connecting pins for M12 cable mounting

For appropriate cable resistance compensation, the same cable type should be used for all terminals. Maximum wire resistance is 25 Ω .

It is recommended to use 3- or 4-wire with conductors of equal length and gauge (cable not supplied).

7. OPERATION

You can change the sensor Offset via **SigNow** and **TxConfig II** software or the **SigNow** app.

You must select the sensor and most suitable range to the process. The chosen range must not exceed the maximum range specified for that sensor and should not be narrower than the minimum range for that same sensor.

It is important to note that the transmitter accuracy is based on the maximum range of the sensor used, even when a narrower range is programmed. **Example:**

- The Pt100 input has a max. range of -200 to $+650$ °C. Its accuracy is 0.2 % of the full range, resulting in a maximum allowed error of 1.7 °C (0.2 % of 850 °C).
- This error may be present even when a narrower range is configured for the sensor (for example: 0 to 100 °C.).

Note: When Pt100 simulators are used with the transmitter, make sure the excitation current of the simulator is compatible with the Pt100 excitation current of the transmitter, which is 0.8 mA.

8. WARRANTY

Warranty conditions are on our web site
www.novusautomation.com/warranty.