RHT-WM and RHT-DM Transmitter

USER GUIDE – V2.0x D

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1   SAFETY ALERTS

The symbols below are used in the device and throughout this manual to draw the user's attention to essential information related to device safety and use.

CAUTION	**CAUTION OR HAZARD**	**ATTENTION**
Read the manual fully before installing and operating the device.	Risk of electric shock.	Material sensitive to static charge. Check precautions before handling.

All safety recommendations appearing in this manual must be followed to ensure personal safety and prevent damage to the instrument or system. If the instrument is used in a manner other than that specified in this manual, the device's safety protections may not be effective.

2   PRESENTATION

RHT-WM and **RHT-DM** transmitters feature highly accurate and stable sensors for measuring relative humidity and temperature. The measured values are converted into 4 to 20 mA output signals linearly related to their readings.

The microprocessor-based circuit can be configured with the **TxConfig-USB** communication interface and **SigNow** and **TxConfig** software and **SigNow** app. It is possible to configure the measurement and humidity transmission between **Relative Humidity** and **Dew Point**.

3   INSTALLATION

3.1   MECHANICAL INSTALLATION

The **RHT-DM** (Duct Mount) model must be attached with a flange. The flange is attached to the duct wall. After this, the transmitter probe must be inserted into the flange center hole and then fixed. **Figure 1** shows the dimensions and drilling of the polyamide 6.6 flange:
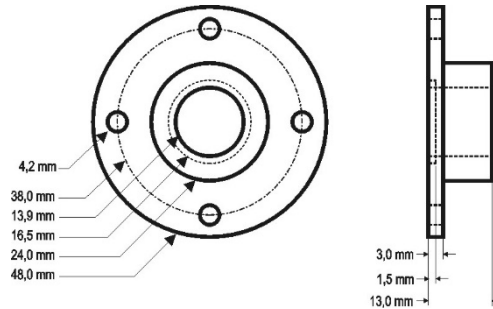

Figure 1 –   Mounting flange for **RHT-DM**

The probe is made of stainless steel, with the following lengths: 150 mm, 250 mm, or 400 mm.

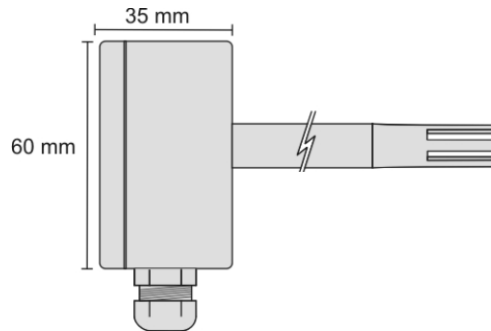**Figure 2 –**   Model **RHT-DM** dimensions

The **RHT-WM** (Wall Mount) model must be attached to the wall. By removing the transmitter cover, you can access the two fixing holes and the connector, as shown in **Figure 3**. To ensure the specified accuracy and protection degree, you must mount the transmitter with the sensor capsule facing down.
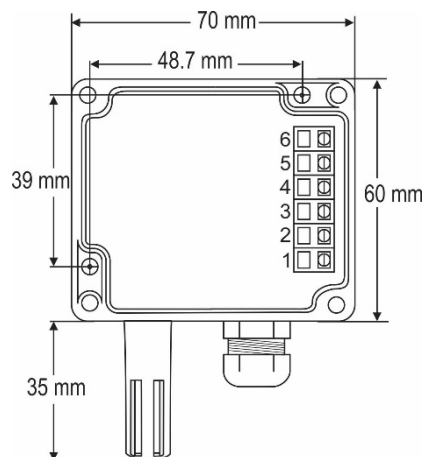

Figure 3 –   **RHT-WM** fixing holes and housing dimensions

3.2   ELECTRICAL INSTALLATION

The transmitter has a **4-20 mA** current output.

Variables can be monitored together or separately. Combinations of mobile jumpers **J4** and **J5** inside the transmitter housing define how variables will be used. The jumpers also define the transmitter terminals with available output signals.

Jumper J5	Jumper J4	OUT1	OUT2
Position **A**	Position **A**	**Temperature**	**Humidity**
Position **A**	Position **B**	**Temperature**	Off
Position **B**	Position **A**	**Humidity**	Off
Position **B**	Position **B**	**Humidity**	**Temperature**

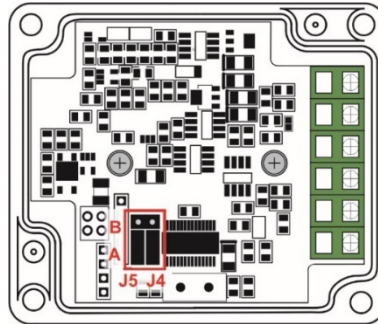**Table 1 –** OUT1 and OUT2 outputs configuration

Figure 4 –   Location of jumpers J4 and J5 inside the transmitter

Figures below shows the required electrical connections.

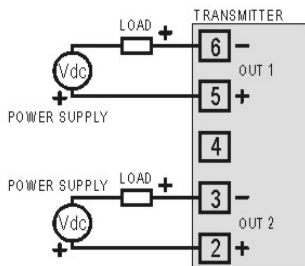⚠️ **Note that loop OUT1 must always be powered!**

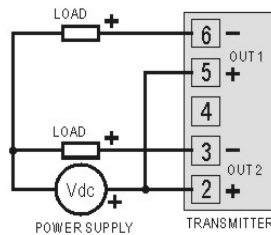**Figure 5 –**   4-20 mA connections

Figure 6 –   4-20 mA connections with a single source
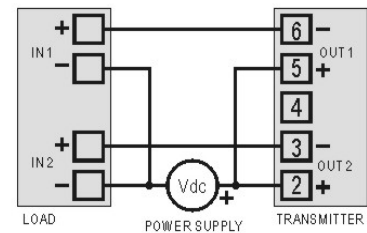
Figure 7 –   4-20 mA model with a single source and load with 2 input channels

In the figures above, **LOAD** represents the measuring instrument of the output signal (indicator, controller, register, etc.).

The connection wires go inside the transmitter trough to the cable gland mounted in the transmitter housing.

3.2.1   INSTALLATION RECOMMENDATIONS

- Electronic and analog signal conductors should run through the plant separately from the output and supply conductors. If possible, in grounded conduits.
- The power supply for electronic instruments must come from a network suitable for instrumentation.
- In controlling and monitoring applications, you must consider what can happen when any part of the system fails.
- It is recommended to use RC filters (47 Ω and 100 nF, serial) in inductor charges (contactors, solenoids, etc.).

3.2.2   SENSOR CAUTIONS

The humidity sensor calibration may change in case it is exposed to contaminating vapors or to high humidity and temperature conditions for extended periods. To speed up the calibration restoration, proceed as described below:

- Remove the sensor from the capsule.
- Wash it with deionized water in case there are solid particles on it.
- For 24 hours, place it within an 80 °C (± 10 °C) oven.
- For 48 hours, place it in a place with temperature between 20 and 30 °C (68 and 86 °F) and humidity over 75 % RH.
- Place the sensor back in the capsule.

3.2.3 SENSOR REPLACEMENT

In case of damage, the humidity and temperature sensor may need to be replaced. To perform this procedure, follow the steps below:
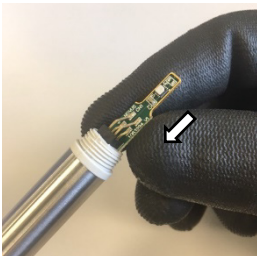
- **Step 1:** Disconnect the transmitter from the power supply. Locate the sensor protective tip.
  This example shows the sensor replacement of an **RHT-DM** transmitter. In it, the sensor is located at the end of the probe.

- **Step 2:** Remove the tip by turning it counterclockwise.
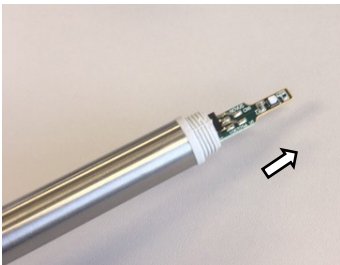
- **Step 3:** Without the tip, the sensor will be exposed. Remove it by pulling it forward to disconnect it.

- **Step 4:** Connect the new sensor to the probe tip connector using clean antistatic gloves or other measures to avoid static discharges. Avoid unnecessary handling.

	Hold the sensor by the connector or its surroundings. Avoid handling the sensor by the thinner end. Do not touch the sensor. **For this procedure, it is recommended to use clean antistatic gloves.**
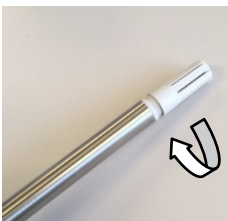
- **Step 5:** Place the protection tip again and turn it clockwise to secure it to the device.

4   CONFIGURATION

If the default configuration or the ordered configuration satisfies the application, then no further configuration is necessary, and the transmitter is ready to be used. When it is necessary to change the configuration of the equipment, you should use **SigNow** software, **TxConfig** software, or **SigNow** app.

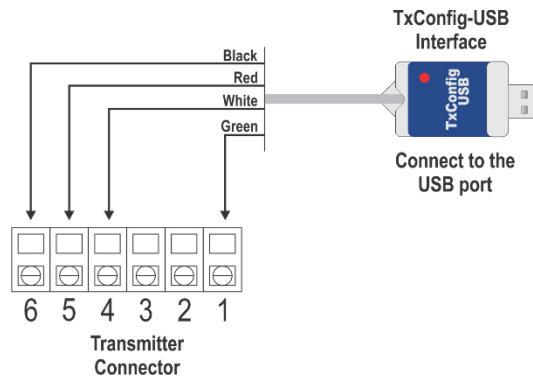To configure the equipment through any of the software, you must connect the **TxConfig-USB** Configuration Interface (purchased from the manufacturer or its authorized representatives) to the USB port of the computer used and run the selected software, as shown in **Figure 8**:

Figure 8 –   TxConfig-USB Interface connections

To configure the device via the **SigNow** app, you need to use an OTG cable with the **TxConfig-USB** 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 *TxConfigSetup.exe* and follow the instructions in the installer.

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

4.1   SOFTWARE AND APP

4.1.1   SIGNOW SOFTWARE

When running the **SigNow** software and connecting to the device, the following screen will appear:
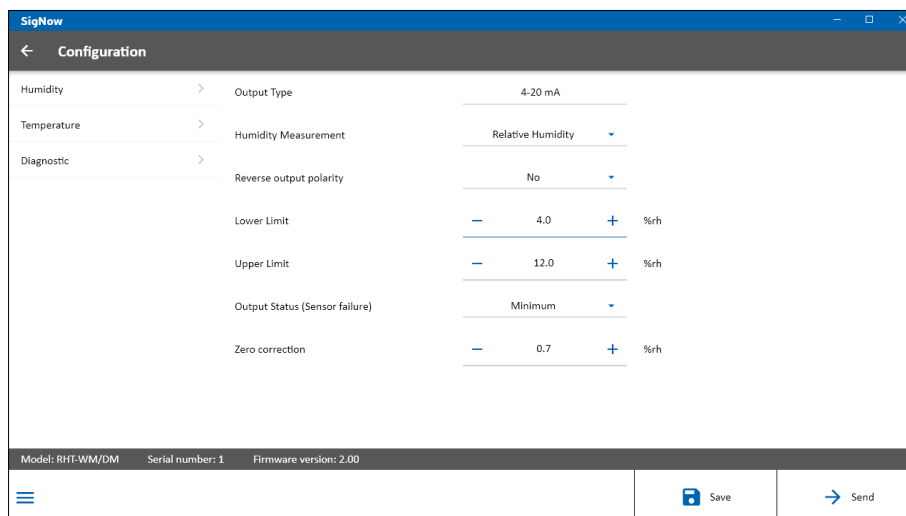
Figure 9 –   SigNow configuration screen

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

The configuration screen is divided into 3 sections: Humidity, Temperature and Diagnostic.

In the Humidity (see above) screen, you can configure the device by setting values and information for the following parameters:

1. **Output type:** Allows you to define the equipment output type.
2. **Humidity measurement:** Allows you to define the humidity measurement. The **Relative Humidity** option is configured by default.
3. **Reverse output polarity:** Allows you to reverse the output polarity.
4. **Lower limit**: Allows you to define the minimum desired temperature for the output type configured.
5. **Upper limit**: Allows you to define the maximum desired temperature for the output type configured.
6. **Output status (Sensor failure)**: Allows you to establish the transmitter output behavior (upscale or down-scale) in the presence of a sensor fail.

    When selecting the **Minimum** option, the output current is < 4 mA (down-scale). Typically used for refrigeration.

    When selecting the **Maximum** option, the output current is > mA (up-scale). Typically used in heating systems.
7. **Zero correction**: Allows you to make small sensor corrections.

In the **SigNow** manual, available on **NOVUS** website, you can get more specific information about the buttons and the process of diagnostics and firmware update.

4.1.2   SIGNOW: DEW POINT RETRANSMISTTING

To use **RHT** and transmit dew point instead of relative humidity, the **Dew Point** option should be selected in the **Humidity Measurement** parameter. At this point, the scale values will be converted to the dew point unit, that is, degrees (Celsius or Fahrenheit, as selected).

You must proceed with the rest of the configuration and send it to the equipment via the **Send**.
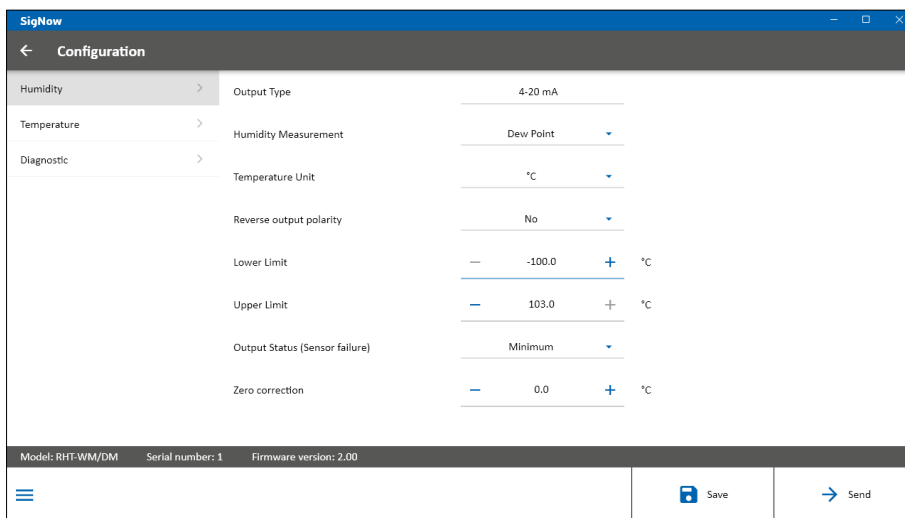

Figure 10 –   Dew point

4.1.3   TXCONFIG SOFWARE

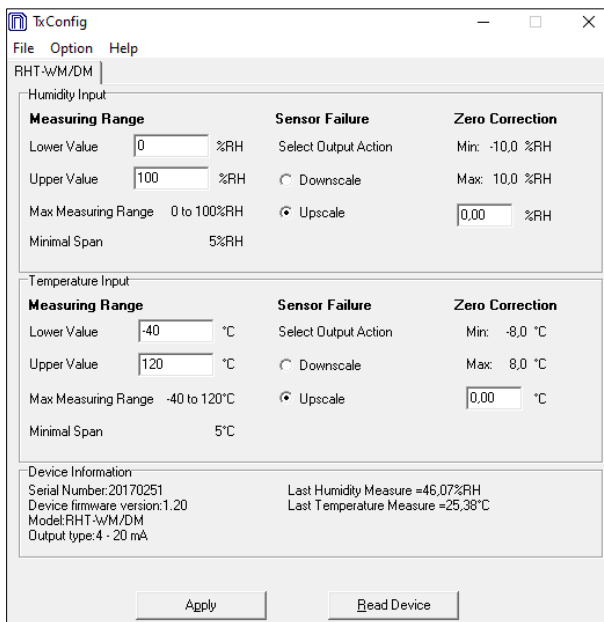When running the **TxConfig** software and connecting to the device, the following screen will appear:

Figure 11 –   **TxConfig** software main window

The fields in the screen mean:

1. **Measuring Range**: Allows you to define the transmitter humidity and temperature measurement ranges, indicating a **Lower Limit** value and an **Upper Limit** value.

    The defined range cannot exceed the **Sensor Measuring** shown in this same field, and cannot establish a range with a span less than the **Minimum Range** indicated below in this same field.

    When the **Lower Limit** is set to a value higher than the **Upper Limit**, the output current has a decreasing behavior (20 ~ 4 mA).

2. **Sensor Failure**: Allows you to define the transmitter output behavior in the presence of a sensor fail.

    When **Minimum** is selected, the output assumes its minimum value (4 mA) (down-scale).

    When **Maximum** is selected, it assumes its maximum value (20 mA) (up-scale).

3. **Zero Correction**: Allows you to make small sensor corrections.

4. **Device Information**: This field contains data that identifies the transmitter and is important in any queries to the manufacturer.

5. **Read Device**: When selected, allows you to read the configuration present on the connected transmitter.

6. **Apply**: When pressed, allows you to send the configuration to the connected transmitter.

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

    - Measuring ranges: 0 to 100 °C and 0 to 100 % RH.
    - Correction zero: 0 °C.
    - Upscale when sensor fails.

It is important to notice that the transmitter accuracy is always based on the total span of the used sensor, even if a narrower range is configured.

Example:

    The humidity sensor has a maximum range of 0 to 100 % RH and an accuracy of 3 % at 25 ° C, as shown in **Figure 17**. We can have an error of up to 3 % RH in any adopted range.

    This error is even in a wide range as the maximum (0 to 100 % RH) or in a narrower range, such as 20 to 80 % RH.

A serial port configuration error may occur when other software uses the same serial port. Before using it, you must terminate all software that uses the serial port specified for TxConfig.

4.1.4 TXCONFIG: DEW POINT RETRANSMITTING

To use the **RHT** and transmit the dew point instead of relative humidity, you must follow the following steps:

- Connect the device to the **TxConfig-USB** Configuration Interface and run the software.
- The software will recognize the **RHT** model, read its configuration and make it available to the user.
- In the **Options** menu, enter **Humidity Reading Type** and select the **Dew Point** option. At this point, the values of the scales will be converted to the dew point unit, i.e., degrees (Celsius or Fahrenheit, as selected).
- Proceed with the configuration and send it to the device via the **Apply** button.
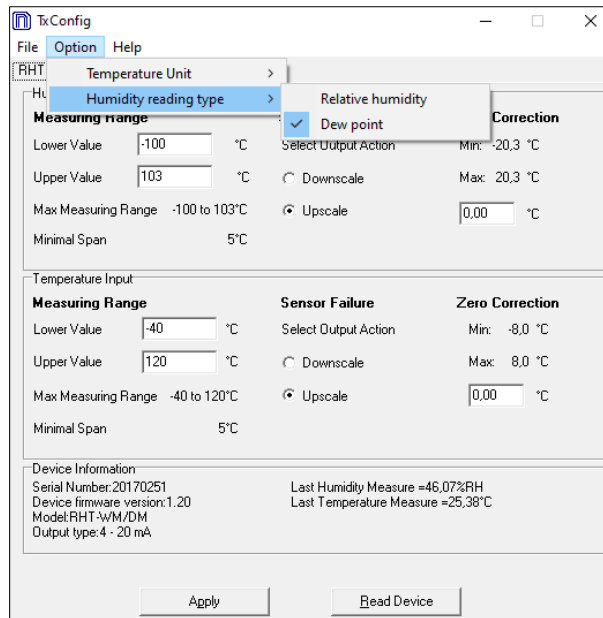
Figure 12 – Dew point

If the **Humidity Reading Type** option does not appear even after the **RHT** transmitter is correctly detected, the **TxConfig** software version is probably old and does not support this feature. In this case, download and update the latest version.

4.1.5 SIGNOW APP

When using an OTG cable and the **TxConfig-USB** 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-USB**.

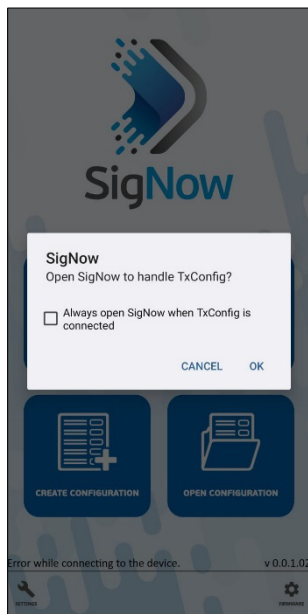The interface will act as an intermediary for the connection:

Figure 13 – Using **TxConfig-USB**

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

Figure 14 – Main screen

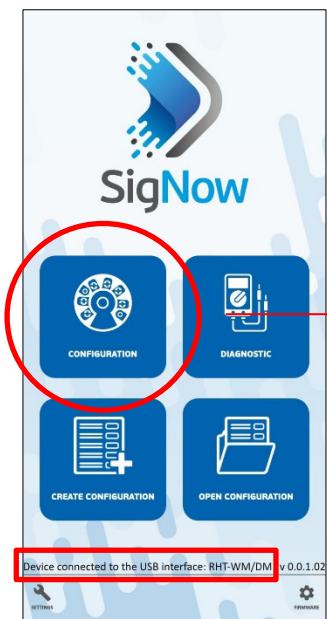Just click the **Configuration** button to show the main screen of **RHT** Configuration section:

Figure 15 – 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.

4.2 SMARTPHONE CONNECTIONS

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

To do this, as shown in **Figure 16**, you need to observe how to connect the OTG cable to the equipment:
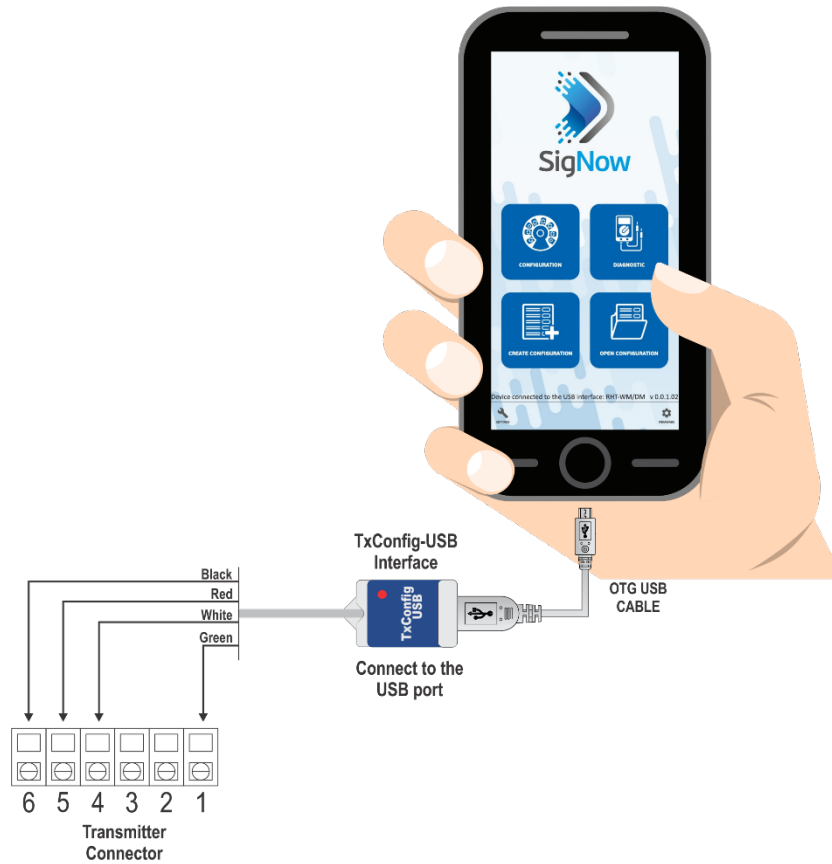

Figure 16 – OTG cable

⚠	**If you position the cable end incorrectly, it is possible that the device will not be recognized by the application.**

5   SPECIFICATIONS

FEATURES	RHT-DM / RHT-WM
Humidity measurement	**Total accuracy**: See **Figure 17**. **Response time (1/e (63 %))**: 8 seconds @ 25 °C (is slow moving air 1 m/s). **Measurement range**: Configurable between 0 and 100 % RH or -100 and 103 °C (-148 to 217.4 °F) for dew point.
Sensor temperature measurement	**Total accuracy**: See **Figure 17**. **Response time (1/e (63 %))**: Up to 30 s (is slow moving air 1 m/s). **Measurement range:** • **DM Model:** Configurable between -40 and 120 °C (-40 and 248 °F). • **WM Model:** Configurable between -10 and 60 °C (14 and 140 °F).
Transmitter operating temperature	**Operating temperature:** -10 to 65 °C (14 to 149 °F), 0 to 95 % RH **Storage temperature:** -20 to 80 °C (-4 to 176 °F)
Power supply	12 Vdc to 30 Vdc
Sensor reading range	< 1.5 seconds
Outputs	4-20 mA or 20-4 mA current, 2-wire loop power supply.
Output Load (RL)	RL (Ohms max.) = (Vdc - 12) / 0.02 let: Vdc = Power supply in Volts.
OUT1 output resolution	0.006 mA (4-20 mA)
OUT2 output resolution	0.022 mA (4-20 mA)
Isolation between loops	4-20 mA outputs are isolated from each other.
Provides protection against power supply polarity inversion	Yes
Protection	**Electronic circuit case:** IP65. **Sensor capsule**: IP40.
Cable entrance	Cord grip PG7.
Operating limits	**Sensor and Probe (RHT-DM)**: See **Figure 17**.

Table 2 – Technical specifications

IMPORTANT

The transmitter sensor may be damaged or lose calibration if it is exposed to aggressive atmospheres with high concentrations as Chloride Acid, Nitride Acid, Sulfuric Acid, and Ammonia. Acetone, Ethanol, and Propylene Glycol may cause reversible measurement errors.
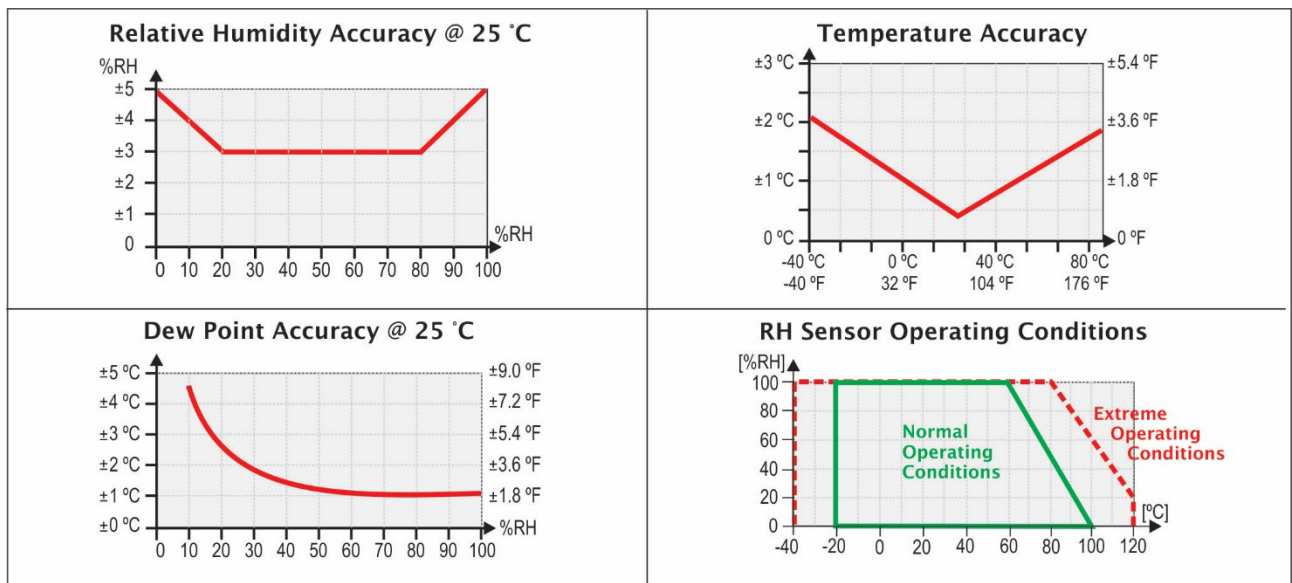
5.1   MEASURES ACCURACY AND SENSOR OPERATING LIMITS

Figure 17 –   Humidity and temperature accuracies

5.2   CERTIFICATIONS

CE Mark

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

6   WARRANTY

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