



RHT-P10 Transmitter

INSTRUCTIONS MANUAL - V2.0x A

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1 PRESENTATION

RHT-P10 transmitter features a highly accurate and stable sensor for measuring relative humidity and temperature. The measured values are converted into 4 to 20 mA output signals linearly related to their readings. Optionally, the outputs can be offered in 0 to 10 Vdc voltage.

The microprocessor-based circuit enables full configuration of output range when used with the **TxConfig** PC interface and the Windows software. Humidity measurement and transmission can be configured between **Relative Humidity** and **Dew Point**.

2 INSTALLATION

2.1 MECHANICAL INSTALLATION

The electronics module of the **RHT-P10** must be fixed to the wall. The remote sensor module, on the other hand, must be inserted into a threaded flange.

By removing the cover of the transmitter electronic module, the user has access to the two fixing holes, as shown in the figure below:

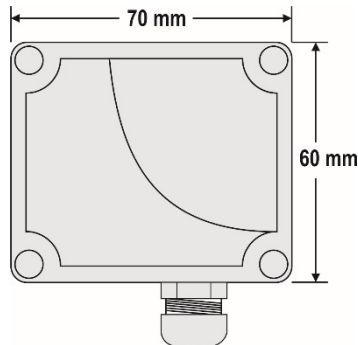


Figure 1 – Electronic module dimensions

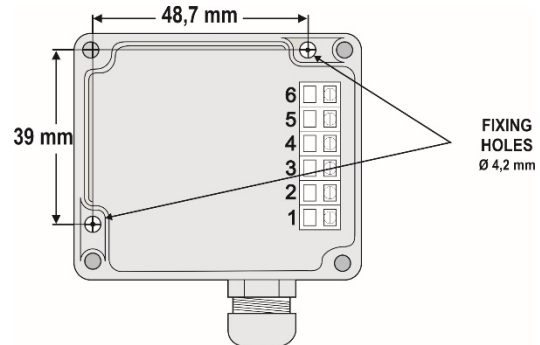


Figure 2 – Fixing holes

The figures below show the dimensions of the remote sensor module and the mounting flange:

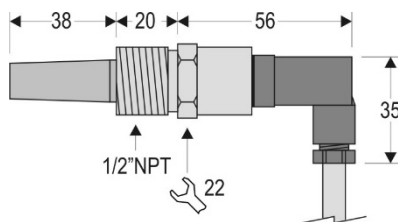


Figure 3 – Remote sensor module

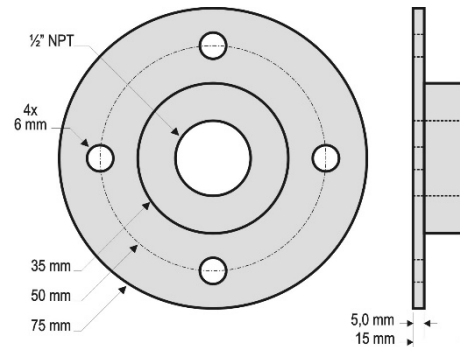


Figure 4 – Mounting flange

Note: The mounting flange is not included with the transmitter. It must be purchased separately.

2.2 ELECTRICAL INSTALLATION

The transmitter can be ordered as **4-20 mA** current output or **0 to 10 Vdc** voltage output. The output signal type is defined at the time of purchase of the transmitter and cannot be changed later.

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

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 configuration

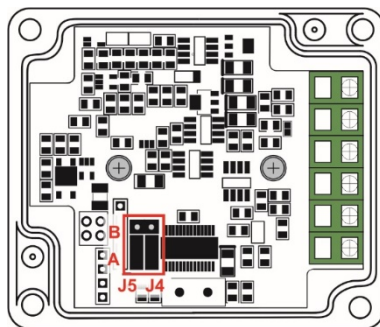


Figure 5 – Location of J4 and J5 jumpers inside the transmitter

The figures below show the required electrical connections.



The loop OUT1 must always be powered in the 4-20 mA model!

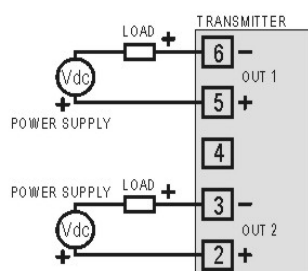


Figure 6 – 4-20 mA connections

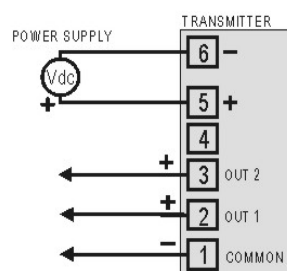


Figure 7 – 0-10 Vdc connections

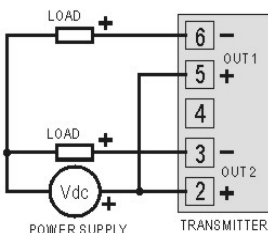


Figure 8 – 4-20 mA connections (one power supply)

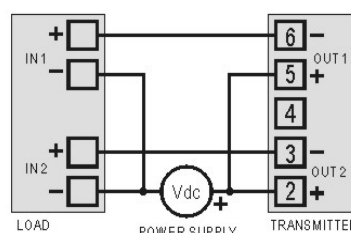


Figure 9 – 4-20 mA connections (one power supply and load with 2 input channels)

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.

INSTALLATION RECOMMENDATIONS

- Conductors of small electric signals must be separated from activation conductors or higher current or power in the system plan. If possible, in grounded conduits.
- The instrument supply must come from a network proper for instrumentation.
- In control and monitoring applications, it is essential to consider what may happen when any part of the system fails.
- It is recommended to use RC FILTERS (47 Ω and 100 nF, series) in parallel with coils of contactors and solenoids, etc.

CARE WITH THE SENSORS

The calibration of the humidity sensor 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 water in case there are solid particles on it.
- Place it within an 80 °C (176 °F) (± 10 °C) oven for 24 hours.
- Place it for 48 hours in a place with a temperature between 20 °C (68 °F) and 30 °C (86 °F) and humidity over 75 % RH.
- Place the sensor back in the capsule.

3 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. If a new setting is desired, this can be accomplished by the **TxConfig** and sent to the transmitter through the **TxConfig USB** interface.

The **TxConfig** interface and software compose the **Transmitter Configuration Kit**, with can be purchased separately from the manufacturer or one of its distributors. The latest release of this software can be downloaded from our website. To install it, run the **Tx_setup.exe** and follow the instructions.

The **TxConfig** interface connects the transmitter to the PC, as shown in the figure below:

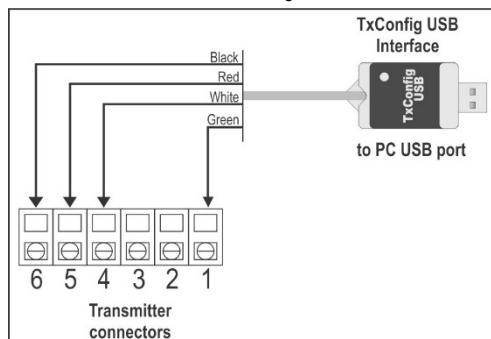


Figure 10 – TxConfig Interface USB connections

Once the connection is accomplished, the user must run the **TxConfig** software and, if necessary, use the **Help** topic to arrange the transmitter configuration.

The figure below shows the **TxConfig** software main screen:

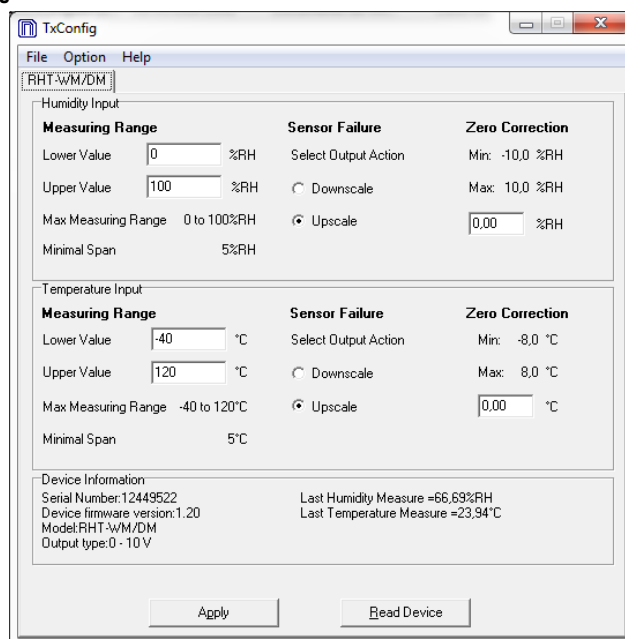


Figure 11 – TxConfig software main window

The fields in the screen mean:

1. **Measuring Range:** 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 or 10 ~ 0 V).
2. **Sensor Failure:** Establish the transmitter output behavior in the presence of a sensor fail. When **Minimum** is selected, the output assumes its minimum value (4 mA / 0 V) (down-scale). When **Maximum** is selected, it assumes its maximum value (20 mA / 10 V) (up-scale).
3. **Zero Correction:** Correct, in the output value, small measurement errors presented by the transmitter.
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 (32 to 212 °F) and 0 to 100 % RH.
- 0 °C (32 °F) of correction zero.

- Output at maximum value for sensor failures.

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 (77 °F), as shown in **Figure 13**. 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.

Serial port configuration error may occur when other software uses the same serial port. Finalize all software that uses the serial port specified for TxConfig before using it.

3.1 RETRANSMITTING THE DEW POINT

To use the **RHT-P10** and transmit the dew point instead of relative humidity, you must follow the steps below:

- Connect the device to the **TxConfig** interface and run the software.
- The software will recognize the **RHT-P10** model, read its configuration, and make it available to the user.
- In the "Options" menu, enter "Humidity Reading Type" (only available when an **RHT-P10** model is detected) 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 rest of the configuration and send the device via the "Apply" button.

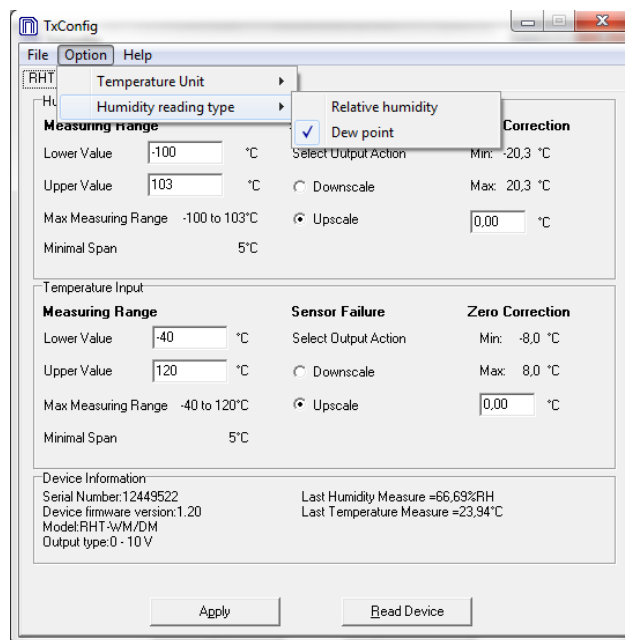


Figure 12 – Dew point

If the "Humidity Reading Type" option does not appear even after the **RHT-P10** transmitter is correctly detected, the **TxConfig** software version is old and does not support this feature. In this case, download and update the latest version.

4 SPECIFICATIONS

Humidity measurement	Total accuracy: See Figure 13. Measuring range: Configurable between 0 and 100 % RH or -100 and 103 °C (-148 and 217.4 °F) for dew point. Response time (1/e (63 %)): 8 seconds @ 25 °C (is slow moving air 1 m/s).
Temperature measurement	Total accuracy: See Figure 13. Total accuracy: Configurable between -40 and 120 °C (-40 and 248 °F). Response time (1/e (63 %)): up to 30 s (is slow moving air 1 m/s).
Power supply	4-20 mA model: 12 Vdc to 30 Vdc 0-10 V model: 18 a 30 Vdc / 15 mA max.
Sensor reading range	< 1.5 seconds
Outputs	4-20 mA or 20-4 mA current, 2-wire loop power supply. 0-10 Vdc tension / 2 mA max.
Output Load (RL)	4-20 mA model: $RL \text{ (Ohms max.)} = (Vdc - 12) / 0.02 \text{ let: } Vdc = \text{Power supply in Volts.}$ 0-10 Vdc model: 2 mA max.
OUT1 output resolution	0.006 mA (4-20 mA) or 0.003 V (0-10 V).
OUT2 output resolution	0.022 mA (4-20 mA) or 0.015 V (0-10 V).
Isolation between loops	The 4-20 mA outputs are isolated from each other. The 0-10 V outputs are not isolated from each other.
Provides protection against power supply polarity inversion	Yes
Protection	Electronic circuit housing: IP65 Sensor capsule: IP40
Cable entrance	Compress fitting PG7.
Operating limits	Sensor (RHT-P10): See Figure 13. Maximum differential pressure: 10 Bar (145 PSI).
Electronic circuit	Electronic circuit (RHT-P10): Operating temperature: -10 to 65 °C (14 to 149 °F), 0 to 95 % RH Storage temperature: -20 to 80 °C (-4 to 176 °F)
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.

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.

4.1 MEASUREMENT ACCURACY AND OPERATIONAL LIMITS OF THE SENSORS

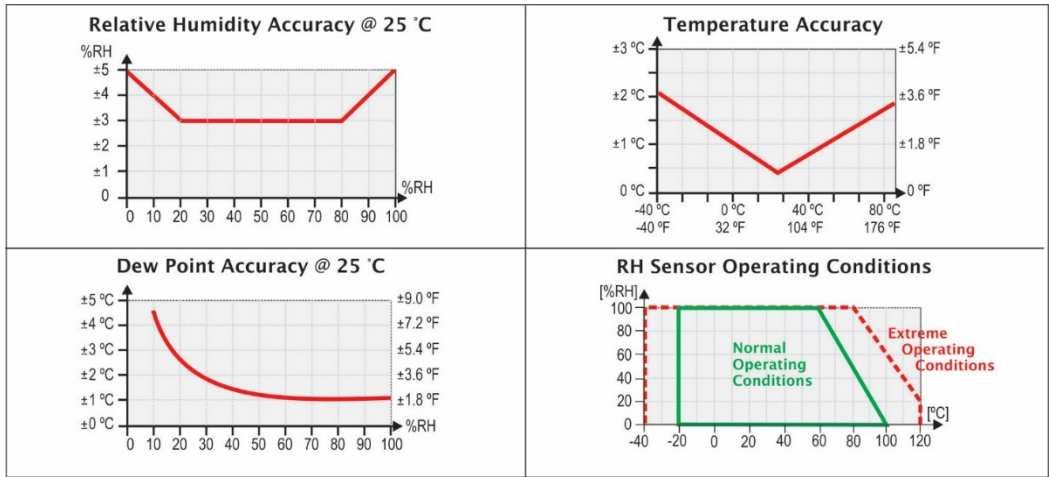


Figure 13 – Humidity and temperature accuracies

5 WARRANTY

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