RXT | ROOM TEMPERATURE TRANSMITTER/ SWITCH

Mounting and operating instructions

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SAFETY AND PRECAUTIONS

Read all the information, the datasheet, mounting and operating instructions and study the wiring and connection diagram before working with the product. For personal and equipment safety, and for optimum product performance, make sure you entirely understand the contents before installing, using, or maintaining this product.

For safety and licensing (CE) reasons, unauthorised conversion and / or modifications of the product are inadmissible.

The product should not be exposed to abnormal conditions, such as: extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentration can affect the product performance. Make sure the work environment is as dry as possible; avoid condensation.

All installations shall comply with local health and safety regulations and local electrical standards and approved codes. This product can only be installed by an engineer or a technician who has expert knowledge of the product and safety precautions.

Avoid contacts with energised electrical parts; always treat the product as if it is live. Always disconnect the power supply before connecting, servicing or repairing the product.

Always verify that you apply appropriate power supply to the product and use appropriate wire size and characteristics. Make sure that all the screws and nuts are well tightened and fuses (if any) are fitted well.

Recycling of equipment and packaging should be taken into consideration and these should be disposed of in accordance with local and national legislation / regulations.

In case there are any questions that are not answered, please contact your technical support or consult a professional.

PRODUCT DESCRIPTION

The RXT is a combined room temperature transmitter / switch. It provides four pre-defined ranges, one user-definable range, Modbus RTU (RS485) communication, an analog output and a relay output.

ARTICLE CODES

Code	Supply	Connection
RXT-G	15—24 VAC ±10 % 18—34 VDC	3 - wire
RXT-F	18—34 VDC	4 - wire

INTENDED AREA OF USE

- Temperature control in HVAC applications
- For indoor use only

TECHNICAL DATA

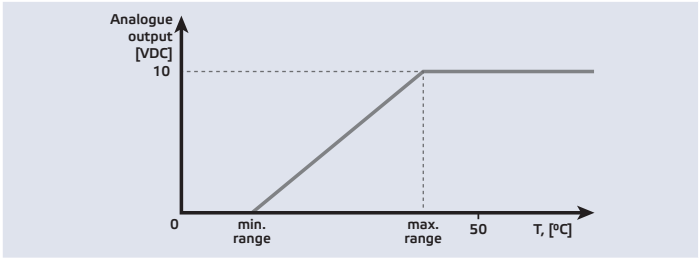
- Analog output: 0—10 VDC/ 0—20 mA
- Relay output: C/O (230 VAC/ 2 A)
- Power consumption:
  - no load: max. 25 mA
  - full load: max. 45 mA
- Load resistance:
  - 0—10 VDC mode > 500 Ω
  - 0—20 mA mode < 500 Ω
- Selectable temperature ranges: 0—30 °C/ 10—40 °C/ 20 – 50 °C/ 0—50 °C
- Free selectable temperature range via Modbus: 0—50 °C
- Selectable switching point: 0—50 °C
- Selectable hysteresis: 1/ 2/ 3/ 4 °C (and 5 °C only via Modbus)
- Enclosure:
  - rear lid: plastic ABS, black (RAL9004)
  - front cover: ASA, ivory (RAL9010)
- Protection standard: IP30 (according to EN 60529)
- Operating ambient conditions:
  - temperature: 0—50 °C
  - rel. humidity: < 95 % rH (non-condensing)
- Storage temperature: -40—50 °C

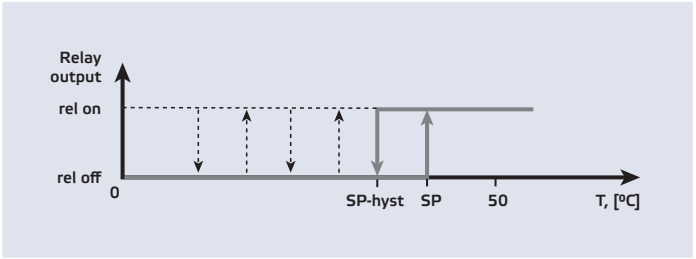
STANDARDS

CE

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- RoHs Directive 2011/65/EU

OPERATIONAL DIAGRAMS





WIRING AND CONNECTIONS

Vin	Positive DC voltage / AC ~
GND	Ground / AC ~
A	Modbus RTU (RS485) signal A
/B	Modbus RTU (RS485) signal /B
Ao1	Analog output (0—10 VDC / 0—20 mA)
GND	Ground
NO1	Normally open contact
COM1	Common contact
NC1	Normally closed contact
Connections	Cable cross section: max. 1,5 mm^2

MOUNTING & OPERATING INSTRUCTIONS IN STEPS

Before you start mounting the RXT transmitter / switch, read carefully "Safety and Precautions". Choose a smooth surface for an installation location (a wall, panel and etc.).

Follow these steps:

1. Open the white cover by releasing the locking plates on both sides of the cover and remove it. (See **Fig. 1** *Locking plates release*.)
2. Insert the cables through the cable opening of the enclosure rear lid. (See **Fig. 2** *Mounting dimensions*.)
3. Fix the unit to the wall/ panel taking into account that the unit has to be installed at a minimum height of 1,5 m and the air flow has to pass through it free. Mind the correct mounting position and unit dimensions. See **Fig. 2** and **Fig. 3**.

Fig. 1 Locking plates release

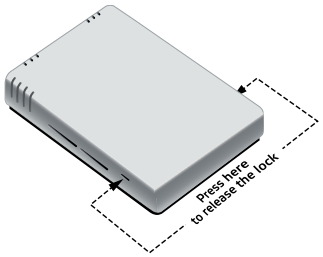


Fig. 2 Mounting dimension

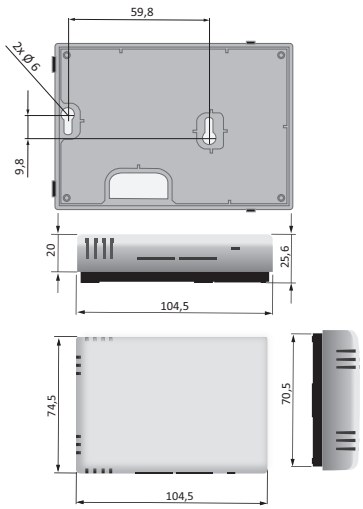
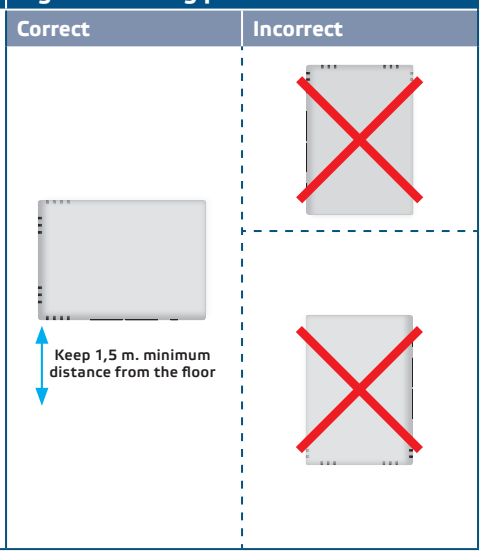
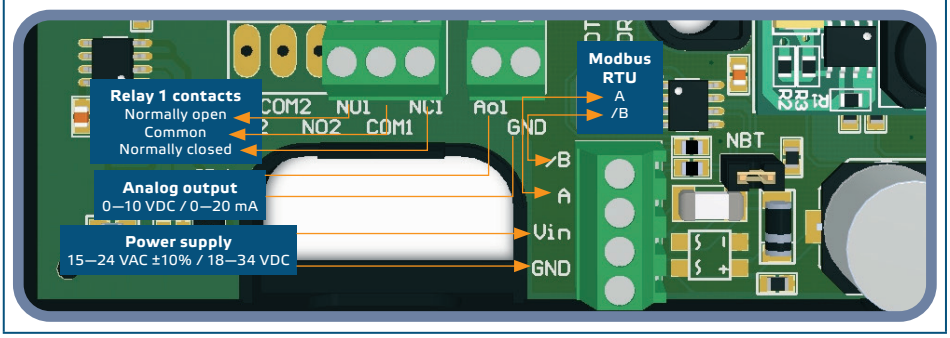


Fig. 3 Mounting position



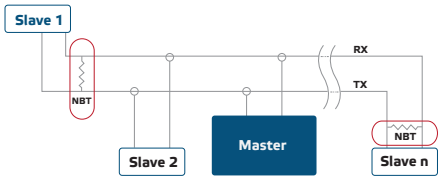
4. Do the wiring according to the wiring diagram (see **Fig. 4**) using the legend information from section **"Wiring and connections"**.

Fig. 4 Wiring and connections



5. Check if your unit starts or terminates the network (see **Example 1** and **Example 2**). If it does not, set the NBT jumper to OFF position. (See **Fig. 5**).

Example 1



Example 2

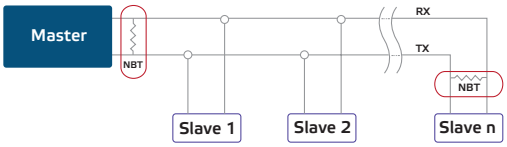


Fig. 5 Network bus resistor jumper

ON position

ATTENTION

If an AC power supply is used with any of the units in a Modbus network, the GND terminal should NOT BE CONNECTED to other units on the network or via the CNVT-USB-RS485 converter. This may cause permanent damage to the communication semiconductors and/ or the computer!

6. Customise the standalone settings to the desired ones (if necessary).
   - 6.1 To select the analog output mode, use jumper JP4. The factory setting is 0—10 VDC mode. (See **Fig. 6** *Analog output selection jumper.*)
   - 6.2 To select the sensor range, use jumper JP2. The factory preset is 0—30 °C (See **Fig. 7** and the enclosed information.)

Fig. 6 Analog output selection jumper

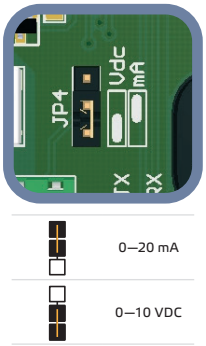
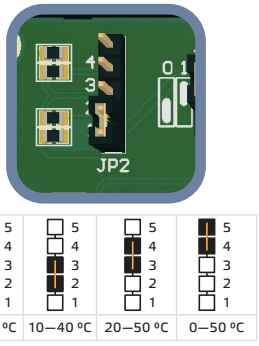


Fig. 7 Sensor range selection jumper



6.3 To reset the Modbus settings, put and hold jumper P1 for 20 seconds. (See **Fig. 8** *Modbus reset jumper*.)
6.4 To select a hysteresis value, use jumpers JP3 and JP5. The factory preset is 4 ºC. (See **Fig. 9** and the jumper combinations.)
6.5 To select the setpoint, use trimmer VR1 (**Fig.10**). The factory preset the middle of the range.

Fig. 8 Modbus reset jumper

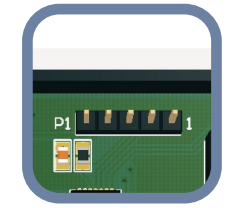


Fig. 9 Hysteresis selection jumpers

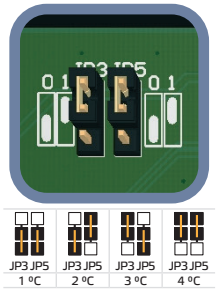


Fig. 10 Setpoint trimmer

7. Close the enclosure and fix the cover.
8. Switch on the power supply.

⚠ ATTENTION

Do not exceed the maximum power supply rating! Measure before installation! Unregulated 24 VAC supply units provide higher nominal output voltage and activate the integrated fuse protection.

⚠ ATTENTION

If a G-type article is using the same AC power supply source (transformer) as F-type article, a SHORT CIRCUIT may result when the power supply and analog signal terminals are connected to the same common ground! In this case always connect different article types to separate AC transformers or use the same article version.

9. Customise the factory settings to the desired ones, through 3SModbus software (if necessary). For the default factory setting see **Table** *Modbus register maps*.

MODBUS REGISTER MAPS

INPUT REGISTERS

		Data type	Description	Data	Values
1	Temperature level	signed int.	Actual temperature level		250 = 25,0 °C
2-10			Reserved, returns 0		
11	Analog output value	signed int.	Value of the analog output	0—1.000	0 = 0 % 1.000 = 100 %
12	Relay status	signed int.	Relay status. When it is **On**, the contact between COM1 and NO1 is closed.	0—1	0 = Off 1 = On
13	Temperature range	signed int.	Temperature working range selected by jumper or a holding register	1—5	1 = 0—30 °C 2 = 10—40 °C 3 = 20—50 °C 4 = 0—50 °C 5 = Custom
14	Setpoint	signed int.	Setpoint selected by trimmer or a holding register	0—500	250 = 25,0 °C
15	Hysteresis	signed int.	Hysteresis for the relay switching selected by jumpers or a holding register	1—5	1 = 1 °C 2 = 2 °C 3 = 3 °C 4 = 4 °C 5 = 5 °C
16	Setpoint out of range	signed int.	Flag that shows if the temperature setpoint is out of the working range	0—1	0 = No 1 = Yes
17-20			Reserved, returns 0		

HOLDING REGISTERS

		Data type	Description	Data	Default	Values
1	Device slave address	unsigned int.	Modbus device address	1—247	1	
2	Modbus baud rate	unsigned int.	Modbus communication baud rate	1—4	2	1 = 9.600 2 = 19.200 3 = 38.400 4 = 57.600
3	Modbus parity	unsigned int.	Parity check mode	0—2	1	0 = 8N1 1 = 8E1 2 = 8O1
4	Device type	unsigned int.	Device type *(Read only)*	RXT-X = 1012		
5	HW version	unsigned int.	Hardware version of the device *(Read only)*	XXXX		0 x 0110 = HW version 1.1
6	FW version	unsigned int.	Firmware version of the device *(Read only)*	XXXX		0 x 0130 = FW version 1.3
7	Operating mode	unsigned int.	Enables Modbus control and disables the jumpers and trimmers	0—1	0	0 = Standalone mode 1 = Modbus mode
8	Output overwrite	unsigned int.	Enables the direct control over the outputs. *Always settable. Active only if holding register 7 is set to 1.*	0—1	0	0 = Disabled 1 = Enabled
9-10			Reserved, returns 0			
11	Temperature range	signed int.	Selects the temperature working range. *Always settable. Active only if holding register 7 is set to 1.*	1—5	1	1 = 0—30 °C 2 = 10—40 °C 3 = 20—50 °C 4 = 0—50 °C 5 = Custom
12	Minimum custom temperature range	signed int.	Minimum value of the custom temperature range. *Always settable. Active only if holding register 7 is set to 1 and register 11 is set to 5.*	0—Max	0	100 = 10,0 °C
13	Maximum custom temperature range	signed int.	Maximum value of the custom temperature range. *Always settable. Active only if holding register 7 is set to 1 and register 11 is set to 5.*	Min—500	500	500 = 50,0 °C
14	Setpoint	signed int.	Selects setpoint for the relay switching. *Always settable. Active only if holding register 7 is set to 1.*	0—500	250	250 = 25,0 °C
15	Hysteresis	signed int.	Selects the hysteresis for the relay switching. *Always settable. Active only if holding register 7 is set to 1.*	1—5	4	1 = 1 °C 2 = 2 °C 3 = 3 °C 4 = 4 °C 5 = 5 °C
16-20			Reserved, returns 0			
21	Analog output overwrite value	signed int.	Overwrite value for the analog output. *Always settable. Active only if holding registers 7 and 8 are set to 1.*	0—1.000	0	0 = 0 % 1.000 = 100 %
22-30			Reserved, returns 0			

If you want to find out more about Modbus over serial line, please visit: *http://www.modbus.org/docs/Modbus_over_serial_line_V1_02.pdf*

VERIFICATION OF INSTALLATION INSTRUCTIONS

Check the status of the blue ON/OFF LED after you switch on the power supply. (See **Fig. 11**.) The ON/OFF LED should blink during the initialization period (30 s) at equal intervals. Then it should give out continuous blue light. If this is not the case, check the connections again.

Check if both LEDs (LEDTX and LEDRX) blink after you switch on your unit. (See **Fig. 12** *Communication detection indication*.) If they do, your unit has detected Modbus network. If they do not, check the connections again.

Fig. 11 Operating indication

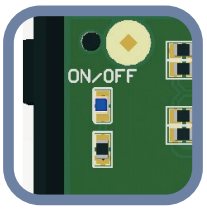


Fig. 12 Communication detection indication

⚠ ATTENTION

The status of both LEDs (LEDTX and LEDRX) can be checked only when the unit is energised. Take the relevant safety measures!

TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packing.

WARRANTY AND RESTRICTIONS

Two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the date of publication relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

MAINTENANCE

In normal conditions this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.