

RDF18+ Temp_rH RS485 Modbus

Room sensor temperature and humidity, flush mounting at ceiling

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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» APPLICATION

Ceiling sensor for unobtrusive humidity and temperature measurement in the ceiling area of room and office spaces. Designed for control and monitoring applications.

» TYPES AVAILABLE

Ceiling sensor temperature + humidity – active BUS

- RDF18+ Temp_rH RS485 Modbus

Ceiling sensor with display temperature + humidity – active BUS

- RDF18+ Temp_rH LCD RS485 Modbus

» SECURITY ADVICE – CAUTION



The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

» PRODUCT TESTING AND CERTIFICATION



Declaration of conformity

The declaration of conformity of the products are available on our website
<https://www.thermokon.de/direct/en-gb/categories/rdf18plus>

» BUILD-UP OF SELF-HEATING BY ELECTRICAL DISSIPATIVE POWER

Sensors with electronic components always have a dissipative power, which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. This dissipative power has to be considered when measuring temperature. In case of a fixed operating voltage ($\pm 0,2$ V) this is normally done by adding or reducing a constant offset value.

Thermokon transducers can be operated with variable operating voltages. The transducers are set at the factory with a reference operating voltage of 24 V =.

At this voltage, the expected measuring error of the output signal will be the least. Other operating voltages, can cause a measurement deviation changing power loss of the sensor electronics.

A recalibration can be carried out directly on the unit or via a software variable (app or bus).

Remark: Occurring draught leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

» APPLICATION NOTICE FOR HUMIDITY SENSORS

For standard environmental conditions re-calibration is recommended once a year to maintain the specified accuracy. A re-calibration may be required sooner than specified, or the sensor element may have to be exchanged when exposed to the following environmental conditions:

- Mechanical stress
- Contamination (dust / fingerprints e.g.)
- Abrasive chemicals
- Environmental influences (e.g. condensation on measuring element)

Re-calibration and deterioration of the humidity sensor due to environmental conditions are not subject of the general warranty.

Refrain from touching the sensitive humidity sensor/element. Touching the sensitive surface will void warranty.

» TECHNICAL DATA

Measuring values	temperature, humidity (humidity output configurable)	
Network technology	RS485 Modbus, RTU, half-duplex, baud rate 9.600, 19.200, 38.400 or 57600, parity: none (2 stopbits), even or odd (1 stopbit) Fail-safe Biasing required	
Output voltage	2x 0..10 V or 0..5 V, min. load 10 k Ω (live-zero configuration via Thermokon USEapp)	
Power supply	15..35 V = or 19..29 V ~ SELV <i>With alternating voltage, the correct polarity must be ensured</i>	
Power consumption	max. 0,4 W (24 V =) 0,8 VA (24 V ~)	
Measuring range temp.	+40..+240 °F (default setting), optionally configurable via Thermokon USEapp	
Measuring range humidity	0..100% rH non-condensing, optionally configurable via Thermokon USEapp (enthalpy, absolute humidity, dew point)	
Accuracy temperature	$\pm 0,3$ K (typ. at 70 °F)	
Accuracy humidity	$\pm 2\%$ between 10..90% rH (typ. at 70 °F)	
Display (optional)	LCD 1.14x1.38 in. with RGB backlight	
Enclosure	enclosure USE-M, PC, pure white, with removable cable entry	with LCD Display (optional) cover PC, transparent
Protection	Enclosure IP65 according to EN 60529	sensor head IP30 according to EN 60529
Cable entry	M25 for cable max. $\varnothing=0.24$ in., seal insert for fourfold cable entry	
Connection electrical	removable plug-in terminal (Mainboard: max. 14 AWG / Plug-in card: max. 16 AWG); connection wire sensor head to plug RJ12: PVC 6 in.; connection wire bush RJ12 to enclosure: PVC 10 ft.	
Sensor head	ABS, white, $\varnothing=1.18$ in.	
Ambient condition	-4..+158 °F, short term condensation	

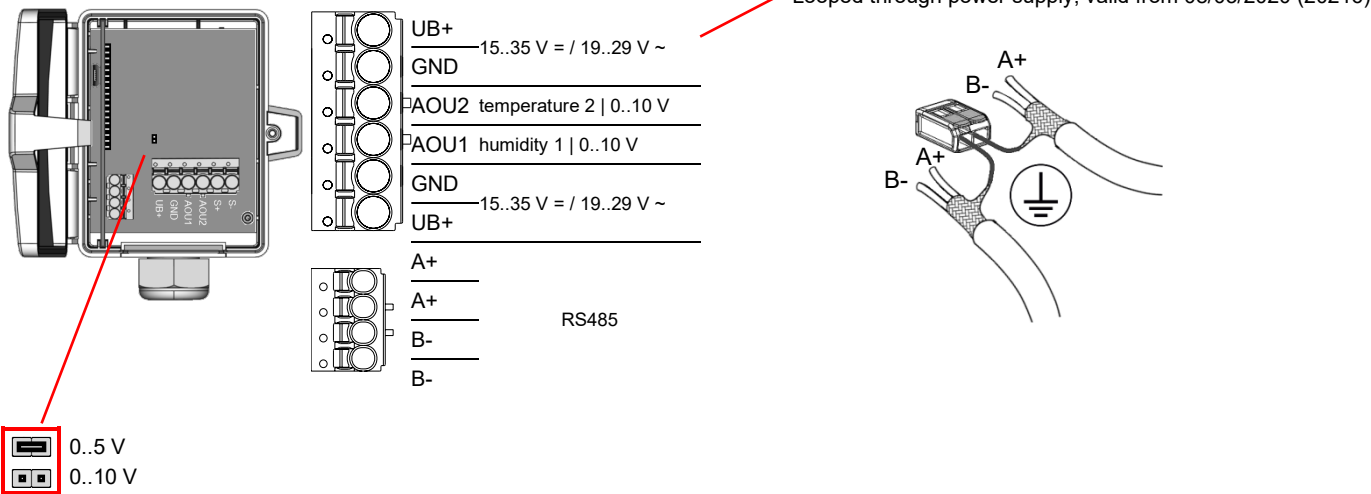
When several BUS devices are supplied by one 24 V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected and all "negative" operating voltage input terminals (-) (=reference potential) are connected (in-phase connection of field devices). In the case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device.

The consequential short-circuit current flowing through this field may cause damage to it. Therefore, pay attention to correct wiring.

» CONNECTION PLAN

If the RS485 cable is looped through, connect both cable shields using the enclosed 2-pol. Connect terminal as shown.

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» DIP-SWITCH-SETTINGS

Termination 120 Ω

☐ Not active* ☐ active

Baud

☐ 9600* ☐ 19200

☐ 38400 ☐ 57600

Modbus address

☐ ON=2⁰ (1)* ☐ ON=2¹ (2) ☐ ON=2² (4) ☐ ON=2³ (8) ☐ ON=2⁴ (16)

Sample address: 26

☐ ☐ ☐ ☐ ☐

Parity

☐ none* (2-stopbits) ☐ even (1-stopbit) ☐ odd (1-stopbit) ☐ none (1-stopbit)

The modbus address of the device is set in the range of 1 ... 31 (binary encoded) using a 5-pole DIP switch. With address 0 via DIP, an extended address range (32..247) is available via USEapp.

Address	Access	Description	Resolution / Unit
1	R	relative humidity	0.1 %rF

		Register 400 = 1 (Unit SI)				Register 400 = 2 (Unit Imperial)			
Address	Access	Description	Resolution / Unit			Resolution / Unit			
0	R	Temperature	SI	0.1	°C	Imperial	0.1	°F	
2	R	Absolute humidity	SI	0.01	g/m ³	Imperial	0.01	Gr/ft ³	
3	R	Enthalpy	SI	0.1	kJ/kg	Imperial	0.1	BTU/lb	
4	R	Dew point	SI	0.1	°C	Imperial	0.1	°F	



Modbus addresses:
USE-RS485 Modbus Interface

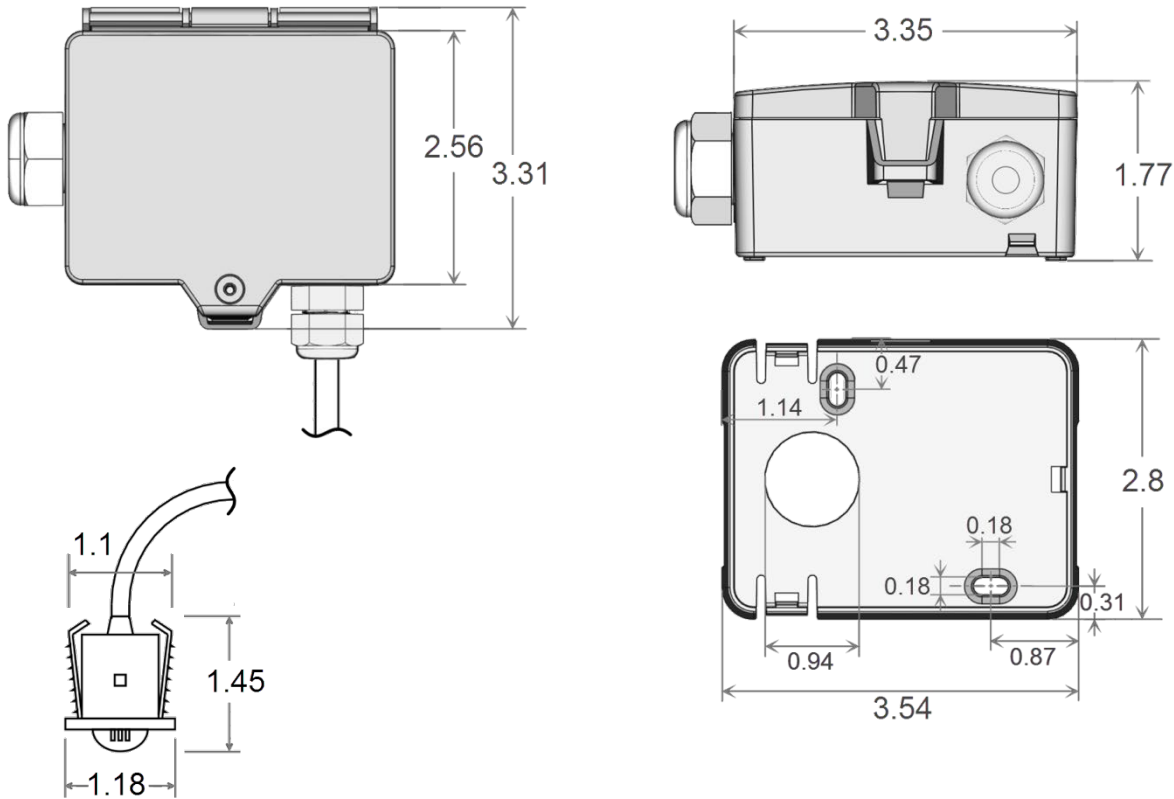
A detailed description of the Modbus addresses can be found under the following link:
<http://thermokon.de/direct/files/use-rs485-modbus-manual.zip>

»NOTES ON DISPOSAL



The crossed-out wheeled bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: www.thermokon.com

»DIMENSIONS (IN.)



»ACCESSORIES (INCLUDED IN DELIVERY)

Mounting base	Item No. 631228
Mounting kit universal	Item No. 698511
• Cover screw + screw cover • 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)	

»ACCESSORIES (OPTIONAL)

Cable entry M25 USE white, sealing insert 4x Ø=0.28 in. (4 pcs)	Item No. 641364
Filter stainless steel, wire mesh	Item No. 231169
RS485 Biasing Adapter	Item No. 811378
USB RS485 Modbus RTU Logger	Item No. 809917
USB Interface RS485 (incl. driver CD)	Item No. 668293

M16 Sealing inserts cable entry (packaging unit 10 pcs.)

for wire with Ø	5/16"
Item No	641340