

» MWF+ (LCD) RS485 Modbus

Average temperature sensor

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
Issue date: 23.05.2019 • A100



The following illustrations show the version with LCD

» APPLICATION

Duct averaging temperature sensor in enclosure USE-M for measuring the average temperature in air ducts. The sensor detects the applied temperature value throughout the entire length.

» TYPES AVAILABLE

Duct averaging sensor optional with Display temperature – active RS485 Modbus

MWF+ (LCD) RS485 Modbus L<x> incl. Installation kit

<x>: sensor rod length 3000/6000 mm

» 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

» NOTES ON DISPOSAL



As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

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

Temperature 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. As Thermokon transducers work with a variable operating voltage, only one operating voltage can be taken into consideration, for reasons of production engineering. Transducers 0..10 V / 4..20 mA have a standard setting at an operating voltage of 24 V =. That means, that at this voltage, the expected measuring error of the output signal will be the least. For other operating voltages, the offset error will be increased by a changing power loss of the sensor electronics. If a re-calibration should become necessary later directly on the sensor, this can be done by means of the USEapp software and an optional Bluetooth interface.

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

» TECHNICAL DATA

| | | | |
|--|---|--|-------------------------------------|
| Measuring values | temperature | | |
| Output voltage | 0..10 V or 0..5 V, min load 10kΩ (live-zero configuration via Thermokon USEapp) | | |
| 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) | | |
| Power supply | 15..35 V = or 19..29 V ~ | | |
| Power consumption | max. 2,3 W (24 V =) max. 4,3 VA (24 V ~) | | |
| Output signal range temp. *Scaling analogue output | -20..+80 °C (default setting), selectable from 8 temperature ranges -50..+50 -20..+80 -15..+35 -10..+120 0..+50 0..+100 0..+160 0..+250 °C, optionally configurable via Thermokon USEapp | | |
| Operating temperature range * Max. permissible operating temp | sensor pocket -50..+80 °C | electronic enclosure -20..+70 °C (with LCD) -35..+70 °C (w/o LCD) | mounting base -35..+90 °C |
| Accuracy temperature | ±0,5 K (typ. at 21 °C) | | |
| Display (optional) | LCD 29x35 mm with RGB backlight | | |
| Enclosure (type-dependent) | enclosure USE-M, PC, pure white, cover PC, with LCD transparent, with removable cable entry | | |
| Protection | IP65 according to EN 60529 | | |
| Cable entry | M25, for wire max. Ø=7 mm, seal insert for fourfold cable entry | | |
| Connection electrical | Mainboard removable plug-in terminal, max. 2,5 mm² | Plug-in card removable plug-in terminal, max. 1,5 mm² | |
| Sensor rod | 3000 mm, 6000 mm | | |
| Ambient condition | max. 85% rH short term condensation | | |

» PRODUCT TESTING AND CERTIFICATION



Declaration of conformity

The declaration of conformity of the products can be found on our website <https://www.thermokon.de/>.

» USE ENCLOSURE WITH UV AND WEATHER RESISTANCE

After some time, outdoor mounted plastics can lose their color and quality. Therefore, all USE housings are made of special white polycarbonate (PC). The light-stable colorants and additives are used to achieve optimum protection of the polymer while maintaining color stability. The titanium dioxide used is specially developed for polycarbonate and offers excellent UV protection through the reflection of the entire light spectrum including the UV component by 340 nm. This effectively counteracts the otherwise occurring photochemical polymer degradation. The colors stay full for a long time without fading. The material is also resistant to cold and frost.

» CONFIGURATION



The Thermokon bluetooth dongle with micro-USB is required for communication between USEapp and USE-M / USE L (Item No.: 668262). Commercial bluetooth dongles are not compatible.

Application-specific reconfiguration of the devices can be carried out using the Thermokon USEapp. The configuration is carried out in the voltage-supplied state.

The configuration-app and the app description can be found in the Google Play Store or in the Apple App Store.

» APPLICATION NOTICE



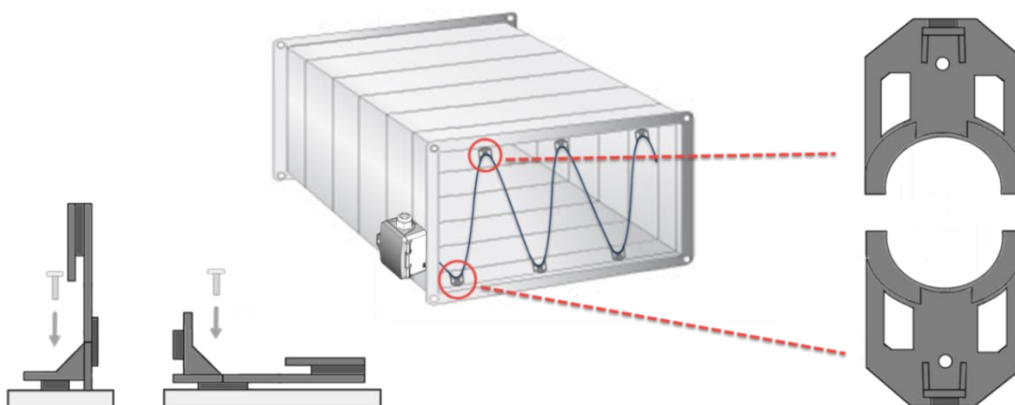
The housing cover must be completely closed in order to ensure the accuracy and reproducibility of the measured values during a test or service log via USEapp.

The Bluetooth dongle snaps into the socket easily. When removing, please fix the plug-in card (option PCB) so that it is not unintentionally pulled out.

» MOUNTING ADVICES

Model MWF can either be mounted directly on the ventilation duct by means of a mounting flange or by screws. By means of the mounting brackets included the sensor rod is braced to the ventilation duct.

Note: Please pay attention to the sensor rod while mounting and protect it from mechanical damage!

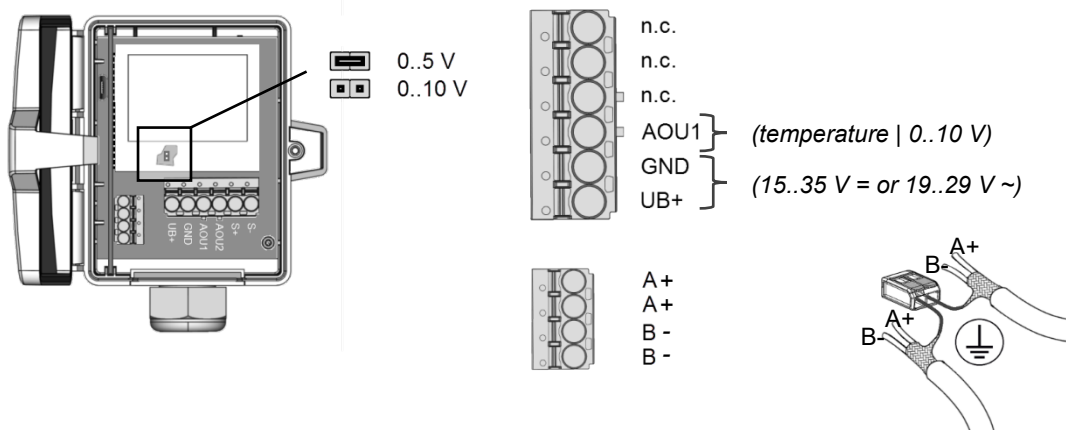


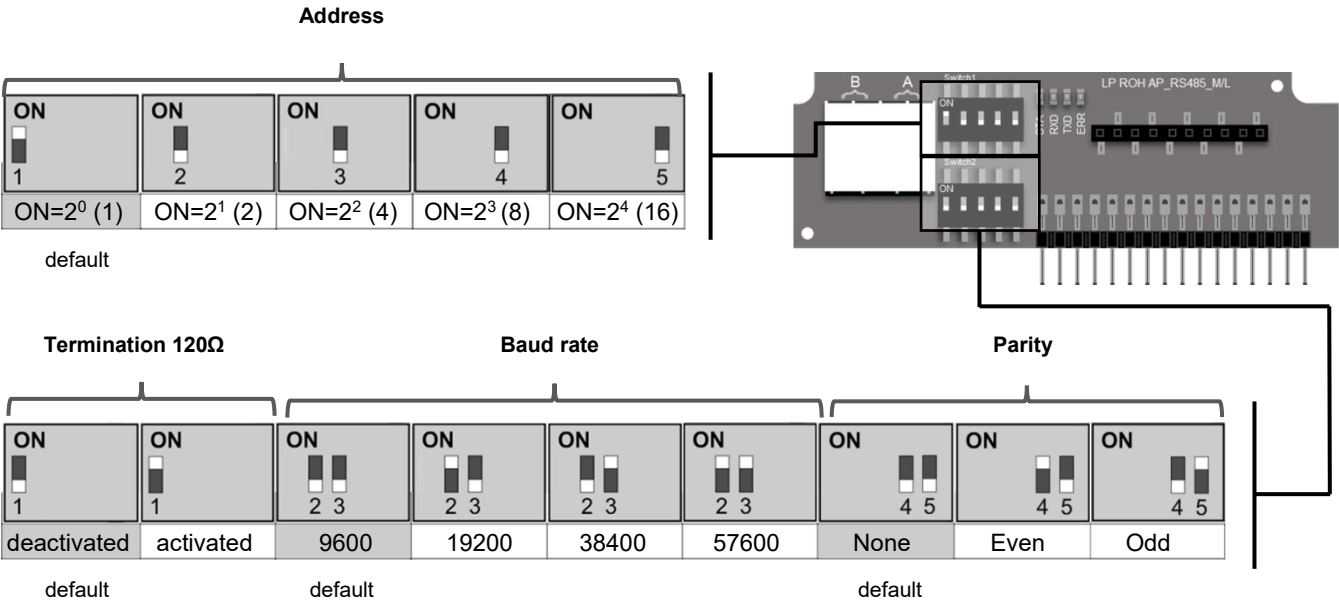
Vertical mounting Horizontal mounting

» CONNECTION PLAN

To change the output voltage range (default 0..10 V to 0..5 V) via jumper, the display must be removed from the board first. If the RS485 cable is looped through, connect both cable shields using the enclosed 2-pol. Connect terminal as shown.

MWF+ RS485 Modbus





Register 400 = 1 (unit SI)

| Address | Access | Description | Resolution / Unit | | |
|---------|--------|-------------|-------------------|-----|----|
| 0 | R | Temperatur | SI | 0.1 | °C |

Register 400 = 2 (unit Imperial)

| Address | Access | Description | Resolution / Unit | | |
|---------|--------|-------------|-------------------|-----|----|
| 0 | R | Temperatur | Imperial | 0.1 | °F |

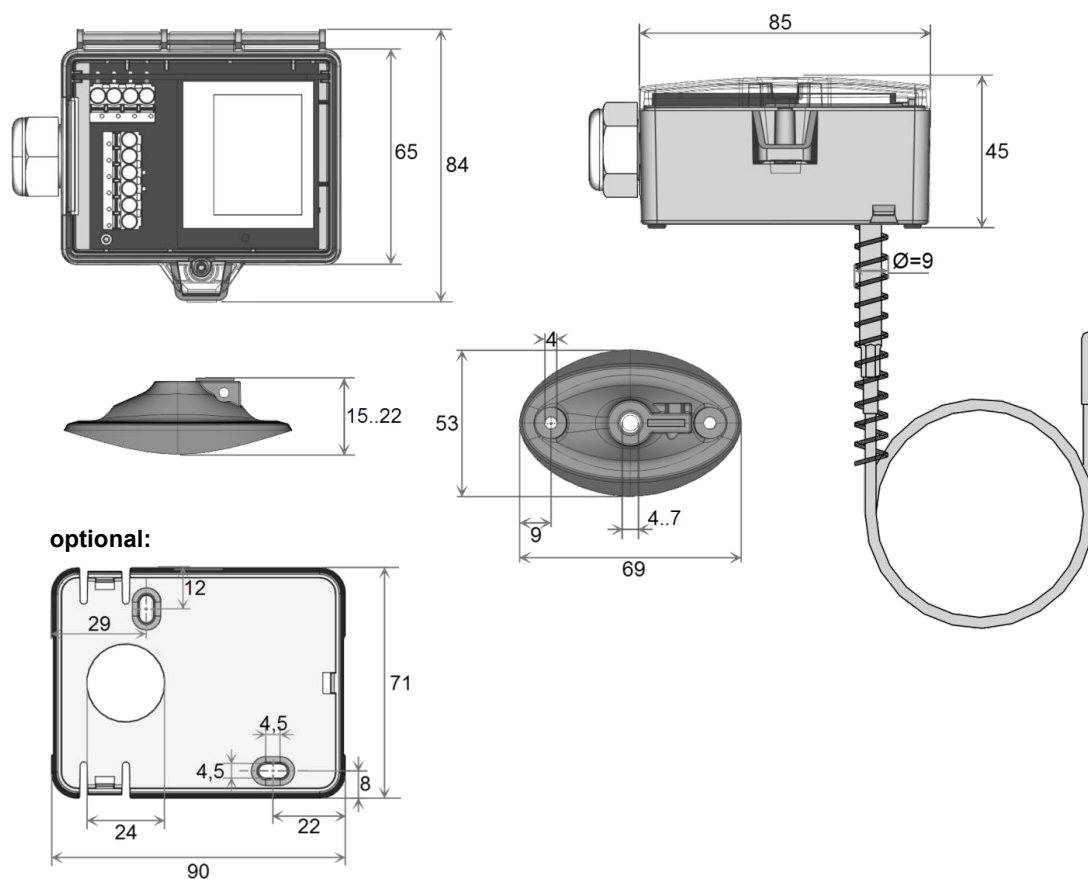
The modbus address of the device is set in the range of 1 ... 31 (binary encoded) using a 5-pole DIP switch. With address 0 via DIP, an extended address range (32..247) is available via USEapp.



Modbus addresses:
USE-RS485 Modbus Interface

A detailed description of the Modbus addresses can be found under the following link:
→ [Download](#)

» DIMENSIONS (MM)



» ACCESSORIES (INCLUDED IN DELIVERY)

Mounting angle set
 Mounting flange MF6 flexible (incl. inserts for $\varnothing=4$ | 6 | 7 mm)
 Mounting kit universal
 • Cover screw + screw cover • 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 458399
 Item No. 399098
 Item No. 698511

» ACCESSORIES (OPTIONAL)

Bluetooth dongle
 Cable entry M25 USE white, sealing insert 4x $\varnothing=0.28$ in. (4 pcs)
 Mounting base

Item No. 668262
 Item No. 641364
 Item No. 631228