

SFK(H)02+ Basic RS485 Modbus

Immersion temperature sensor

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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» APPLICATION

Immersion sensor for temperature measurement of gases and liquids in pipework applications. The sensor can optionally be screwed directly into a bonded pocket (see accessories). Types SFKH02+ with a 70 mm neck pipe are designed for applications with insulation materials. The measuring insert can be exchanged without disassembling the entire sensor. Tool-free opening, closing and wiring as well as removable cable entries ensure quick and easy installation.

» TYPES AVAILABLE

Immersion sensor temperature – active BUS

- SFK(H)02+ Basic RS485 Modbus <xxx>.08

<xxx>: mounting length 1.97/3.94/5.9/7.87/9.84/17.7 in

» 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 can be found on our website
<https://www.thermokon.de/direct/en-gb/categories/sfk02plus>

» NOTES ON DISPOSAL



The crossed-out wheellie 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

» 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.

» USE ENCLOSURE WITH UV AND WEATHER RESISTANCE

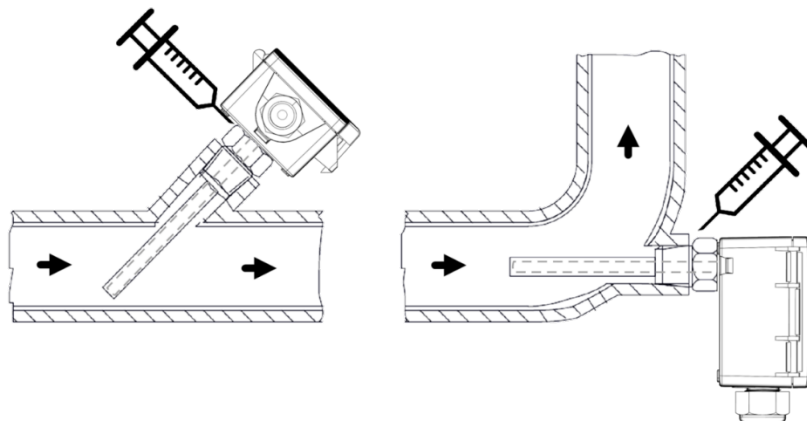
After some time, outdoor mounted plastics can lose their color and quality. Therefore, all USE housings are made of special white polycarbonate (PC). The light-stable colorants and additives are used to achieve optimum protection of the polymer while maintaining color stability. The titanium dioxide 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.

» TECHNICAL DATA

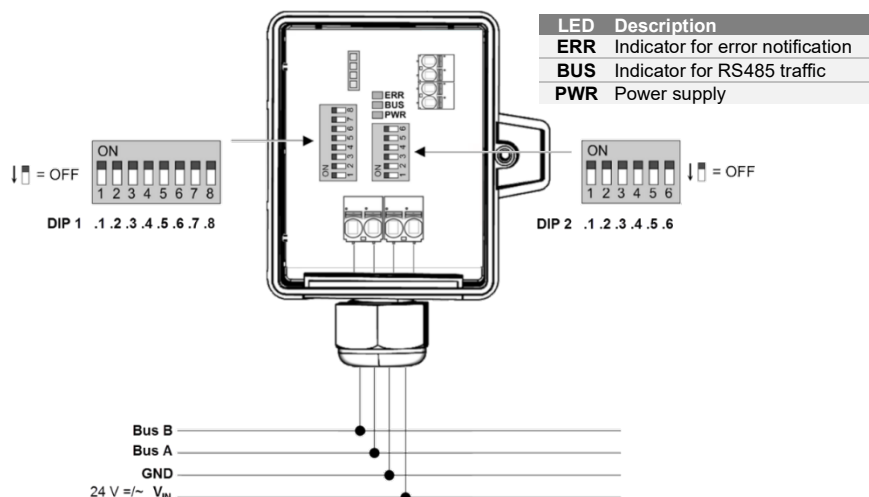
Measuring values	temperature	
Network technology	RS485 Modbus, RTU or ASCII, half-duplex, baud rate 9.600, 19.200, 38.400 or 57.600, parity: non (2 stopbits), even or odd (1 stopbit) Fail-safe biasing required	
Power supply	15..24 V = ($\pm 10\%$) (or 24 V ~ ($\pm 10\%$))* SELV	
Power consumption	max. 0,7 W (24 V =) 1,8 VA (24 V ~)	
Operating temperature range * Max. permissible operating temperature	sensor pocket -58..+320 °F optional -112..+500 °F	enclosure -31..+158 °F
Accuracy temperature	$\pm 0,5$ K (typ. at 77 °F)	
Enclosure	enclosure USE-S, PC, pure white, UV resistant	
Protection	IP65 according to EN 60529, SI-Protection	
Cable entry	Flextherm M20, for wire max. $\varnothing=0.18..0.35$ in., removable	
Connection electrical	removable plug-in terminal, max. 14AWG	
Neck pipe (optional)	stainless steel V2A, $\varnothing=0,47$ in., L=2,76 in.	
Pocket	stainless steel V4A, $\varnothing=0.31$ in., mounting length: 1.97 3.94 5.9 7.87 9.84 17.7 in., thread G 1/2"	
Ambient condition	max. 85% rH short term condensation	

» MOUNTING ADVICES

For risk of condensate permeation in the sensor tube respectively in the immersion pocket the bushing must be installed in a position that occurred condensate can run off. Mounting with immersion pocket for usage in liquid media. Use contact fluid for better heat transfer between sensor and measuring medium.



» CONNECTION PLAN AND CONFIGURATION



*Power supply

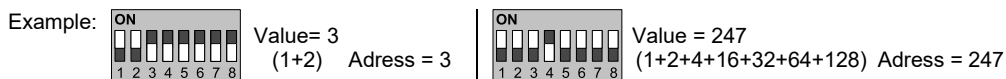
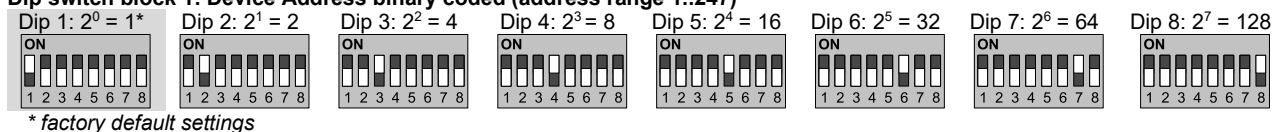
When several BUS devices are supplied by one 24 V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) (=reference potential) are connected together (in-phase connection of field devices).

In 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.

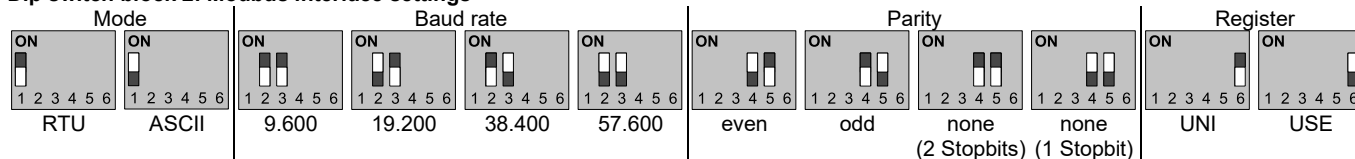


Pay attention to correct wiring.

Dip switch block 1: Device Address binary coded (address range 1..247)



Dip switch block 2: Modbus interface settings



Factory default

Device address: 1 | RTU | Baud rate: 9.600 | Parity: even | Register addressing: USE

Register compatibility to USE (Valid from firmware version 1.4, Jan. 2020)

Via dipswitch 2.6 it is possible to change between the previous register addressing of the UNI-Modbus board to a USE compatible register assignment. The function of the device does not change.

When using ASCII mode, parity must be set to EVEN or ODD. „No Parity“ (no) is not available in ASCII mode.

» RS485 MODBUS REGISTER

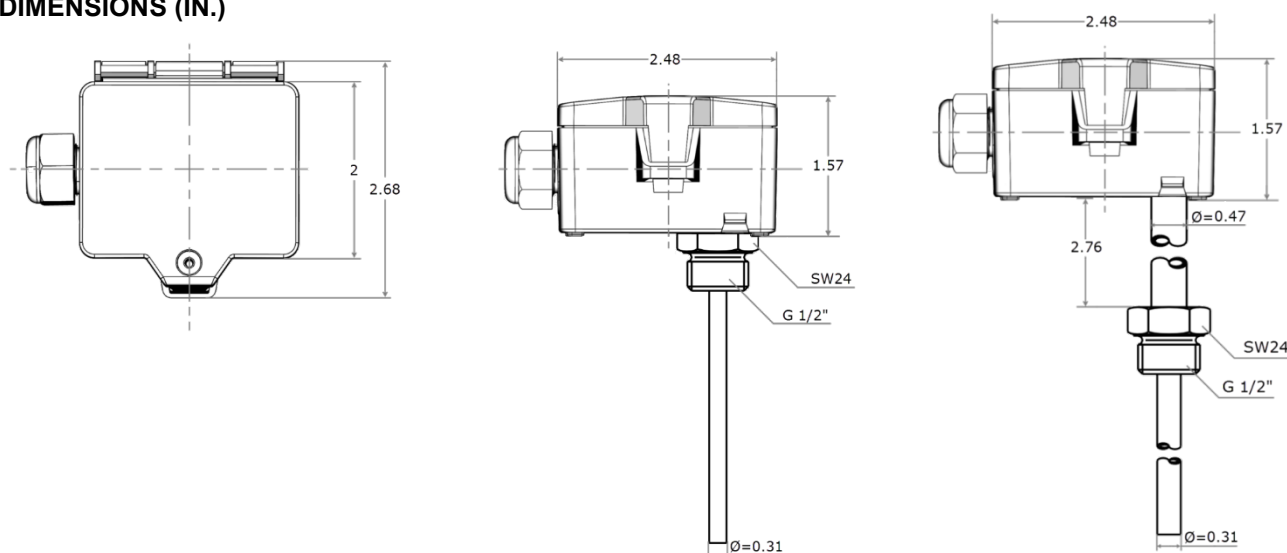
Variant 1 (UNI-Modbus) DIP 2.6 = OFF

Data address (holding register)	Read Read/Write	Description	Type
0 _{dec} 0x0000 _{hex}	R	Firmware z.B.: 0x1000 = Version 1.0.0.0	SIGNED 16 Bit
1 _{dec} 0x0001 _{hex}	R/W	Device Location	SIGNED 16 Bit
580 _{dec} 0x244 _{hex}	R	Temperature [1/100] °C	SIGNED 16 Bit
581 _{dec} 0x245 _{hex}	R	Temperature [1/100] °F	SIGNED 16 Bit
5 _{dec} 0x0005 _{hex}	R/W	Offset temperature [1/100] K	SIGNED 16 Bit

Variant 2 (USE-Modbus) DIP 2.6 = ON

Data address (holding register)	Read Read/Write	Description	Type
503 _{dec} 0x01F7 _{hex}	R	Firmware version i.e.: 0x1300 = Version 1.3.0.0	SIGNED 16 Bit
400 _{dec} 0x0190 _{hex}	R/W	Unit system 1 = SI 2 = Imperial	SIGNED 16 Bit
0 _{dec} 0x0000 _{hex}	R	Temperature [1/10] °C/°F	SIGNED 16 Bit
100 _{dec} 0x0064 _{hex}	R/W	Offset temperature [1/10] K	SIGNED 16 Bit

» DIMENSIONS (IN.)



» ACCESSORIES (INCLUDED IN DELIVERY)

Mounting kit universal

• Cover screw + screw cover • 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 698511

» ACCESSORIES (OPTIONAL)

RS485 Biasing Adapter

USB RS485 Modbus RTU Logger

USB Interface RS485 (incl. driver CD)

Item No. 811378

Item No. 809917

Item No. 668293

Bonded pocket St52-3 type ESH110

Bonded pocket St52-3 type ESH160

Bonded pocket St52-3 type ESH210

Bonded pocket St52-3 type ESH260

Sealing insert M20 USE white, 2x Ø=0.28 in. (for 2 wire; PU 10 pieces)

Item No. 103459

Item No. 103466

Item No. 103473

Item No. 173247

Item No. 641333