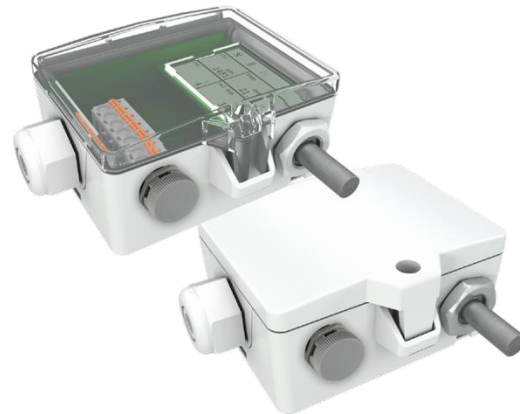


Datasheet

Subject to technical alteration
Issue date: 24.08.2018 • A002



The following illustrations show the version with LCD

Application

Air quality sensor for measuring CO2 and temperature in outdoor areas with 2 0..10 V output. LCD models with RGB background light have a transparent cover. Display configuration and threshold values for color changes can be parameterized via Thermokon USEapp.

Types Available

Outdoor sensor CO2 + temp – active RS485 Modbus MS/TP | LCD

LA+ CO2 Temp RS485 Modbus

LA+ CO2 LCD Temp 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

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.

General remarks concerning sensors

Especially with regard to passive sensors in 2-wire conductor versions, the wire resistance of the supply wire has to be considered. If necessary the wire resistance has to be compensated by the follow-up electronics. Due to self-heating, the wire current affects the measurement accuracy, so it should not exceed 1 mA.

When using lengthy connection wires (depending on the cross section used) the measuring result might be falsified due to a voltage drop at the common GND-wire (caused by the voltage current and the line resistance). In this case, 2 GND-wires must be wired to the sensor - one for supply voltage and one for the measuring current.

Sensing devices with a transducer should always be operated in the middle of the measuring range to avoid deviations at the measuring end points. The ambient temperature of the transducer electronics should be kept constant. The transducers must be operated at a constant supply voltage ($\pm 0,2$ V). When switching the supply voltage on/off, onsite power surges must be avoided.

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 a trimming potentiometer on the sensor board.

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

Information about Indoor Air Quality CO₂

EN 13779 defines several classes for indoor air quality:

Category	CO ₂ content above the content in outdoor air in ppm		Description
	Typical range	Standard value	
IDA1	<400 ppm	350 ppm	Good indoor air quality
IDA2	400.. 600 ppm	500 ppm	Standard indoor air quality
IDA3	600..1.000 ppm	800 ppm	Moderate indoor air quality
IDA4	>1.000 ppm	1.200 ppm	Poor indoor air quality

Information about Self-Calibration Feature CO₂

All gas sensors are subject to drift caused by components. This fact results generally in the need to recalibrate the sensors regularly.

With dual channel technology Thermokon integrates automatic self-calibration for different fields of operation. In contrast to common used ABC-Logic sensors with self-calibration dual channel are suitable for applications operating 24 hours, 7 days a week as for example hospitals.

Manual calibration is not necessary!

Technical Data	
Measuring values	CO2 + temperature
Output voltage	2x 0..10 V or 0..5 V, min. load 10 kΩ (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 ~)
Measuring range temp.	0..+50 °C (default setting), optionally configured via Thermokon USEapp
Measuring range CO2	0..2000 ppm (default), 0..5000 ppm (optionally configured via Thermokon USEapp)
Accuracy temperature	±0,5 K (typ. at 21 °C)
Accuracy CO2	±50 ppm +3% of reading (typ. at 21 °C, 50% rH)
Calibration	self-calibration, Dual Channel
Sensor	NDIR (non-dispersiv, infrared)
Display (optional)	LCD 29x35 mm with RGB backlight
Enclosure (type-dependent)	enclosure USE-M, PC, pure white, with removable cable entry LCD cover PC, transparent
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 mm ² Plug-in card removable plug-in terminal, max. 1,5 mm ²
Pocket	stainless steel V2A, Ø=6 mm, L=25 mm
Ambient condition	0..+50 °C, max. 85% rH short term condensation
Mounting	installation is also possible using mounting base

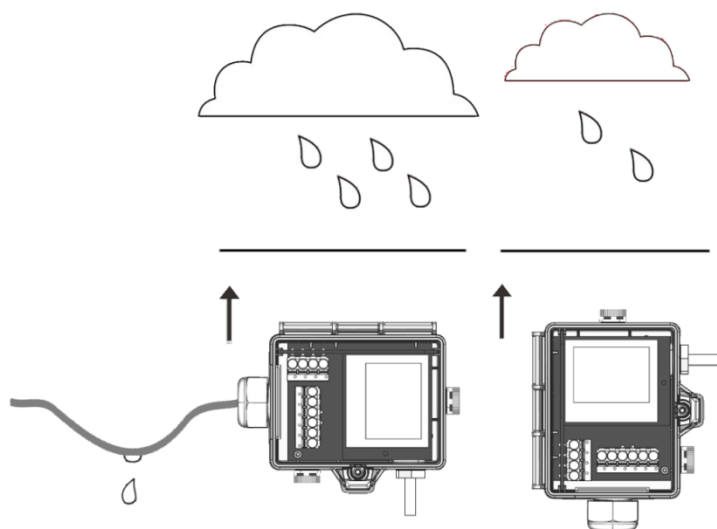


Declaration of conformity

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

Mounting Advices

In case of outdoor installation avoid direct rain and sun contact. Probably use sun respectively rain protection. Cable entry from bottom or side. For side cable routing set loop so that precipitation can drain defined. Observe permissible ambient condition.



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.

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.

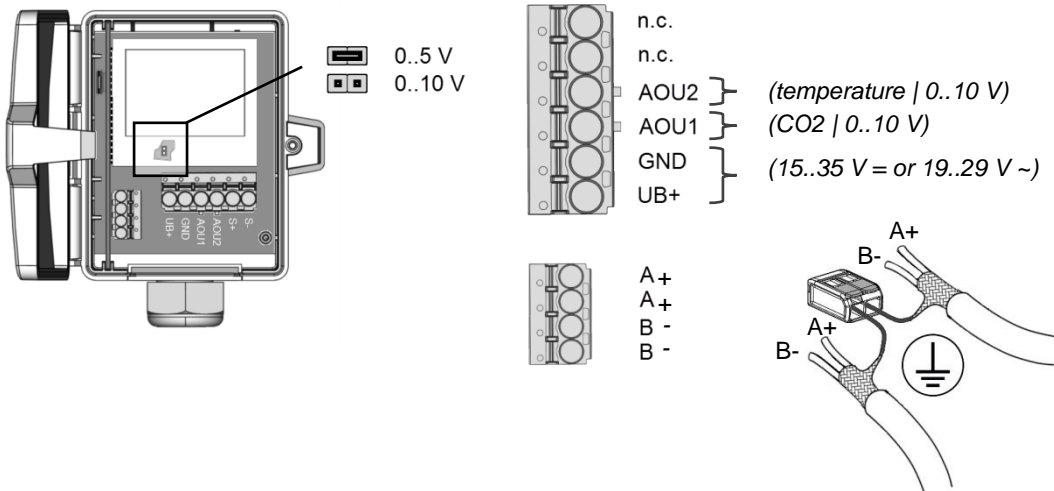


The configuration-app and the app description can be found in the Google Play Store or in the Apple App Store.

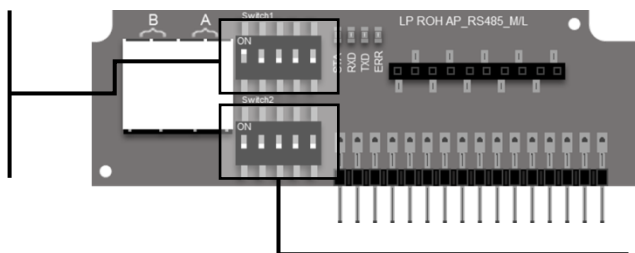
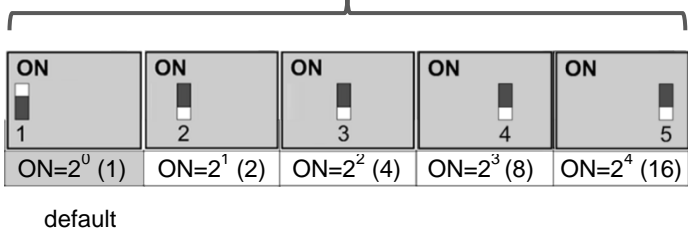
Connection Plan

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.

LA+ CO2 Temp LCD RS485 Modbus



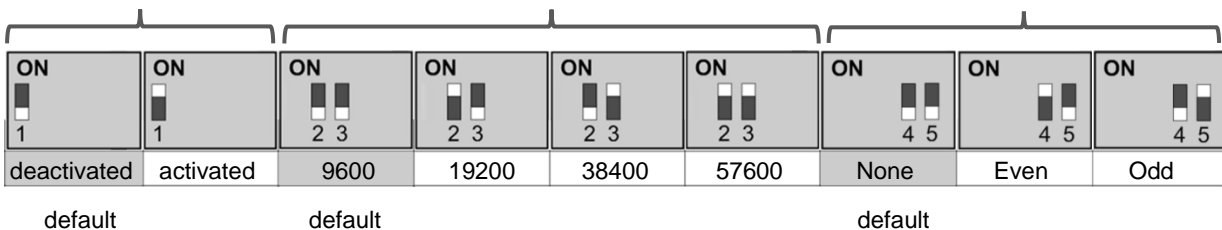
Address



Termination 120Ω

Baud rate

Parity



Address	Access	Description	Resolution / Unit	
5	R	CO2	1.0	ppm

Register 400 = 1 (Unit SI)

Address	Access	Description	Resolution / Unit	
0	R	Temperature	SI	0.1 °C

Register 400 = 2 (Unit Imperial)

Address	Access	Description	Resolution / Unit	
0	R	Temperature	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.



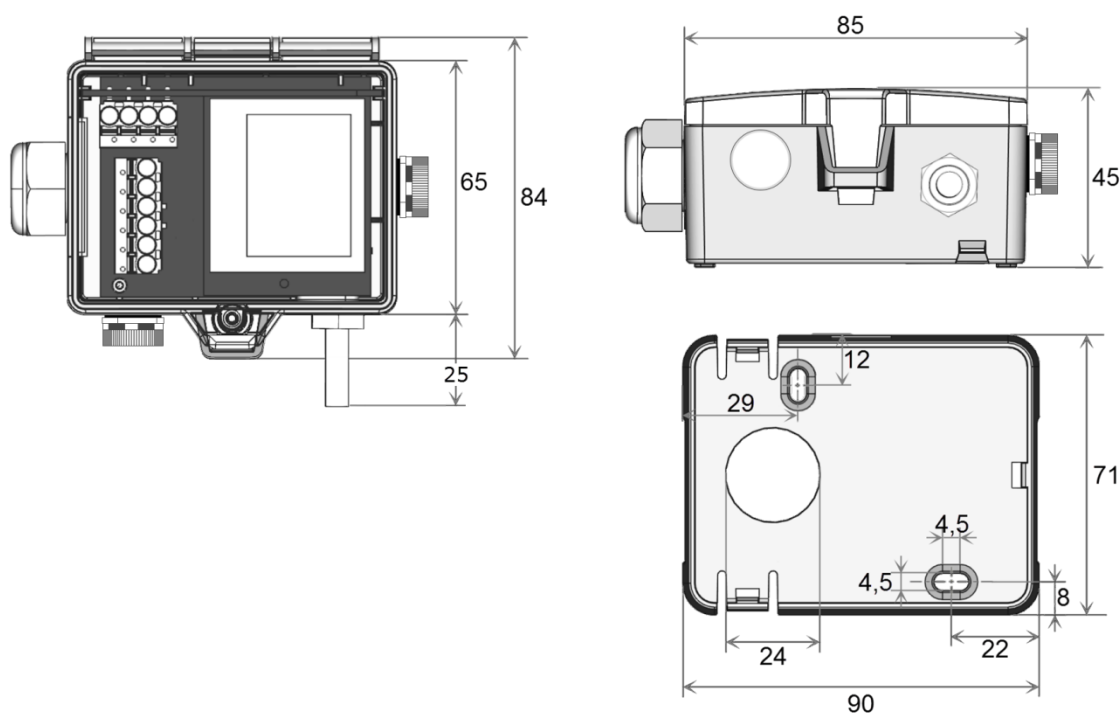
Modbus addresses:

USE-RS485 Modbus Interface

A detailed description of the Modbus addresses can be found in our downloadcenter:

→ [Download](#)

Dimensions (mm)



Accessories (included in delivery)

- Mounting base
- Mounting kit universal
- Cover screw + screw cover • 2 Rawplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 631228
Item No. 698511

Accessories (optional)

- Bluetooth dongle
- Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)

Item No. 668262
Item No. 641364