

» LI65+ RS485 Modbus

Outdoor multi-sensor

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

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» APPLICATION

Outdoor sensor measuring light, temperature, humidity and atmospheric pressure typically used in lighting applications to optimise energy efficiency through lighting control. The device is designed for outdoor areas, greenhouses, warehouses or industrial halls. The device has an integrated ambient light sensor with precise optical filtering adapted to the human eye. The devices with relay outputs for a 2-point controller or a 2-stage 2-point controller allow for a wide range of applications. Depending on the model, the sensor can be individually configured via Thermokon USEapp. Tool-free opening, closing and wiring as well as removable cable entries ensure quick and easy installation.

» TYPES AVAILABLE

Outdoor sensor light + temperature – active BUS

Li65+ Temp RS485 Modbus

Outdoor sensor light + temperature + humidity – active BUS

Li65+ Temp_rH RS485 Modbus

Outdoor sensor light + temperature + humidity + atmospheric pressure – active BUS

Li65+ Temp_rH_hPa 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.

» 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.

» APPLICATION NOTICE FOR HUMIDITY SENSORS

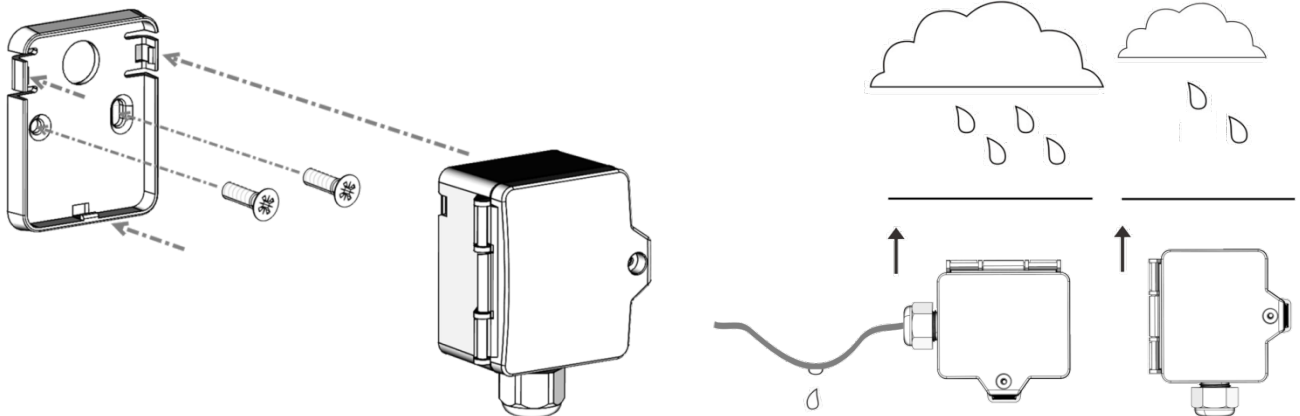
Refrain from touching the sensitive humidity sensor/element. Touching the sensitive surface will void warranty.

For standard environmental conditions re-calibration is recommended once a year to maintain the specified accuracy.

When exposed to high ambient temperature and/or high levels of humidity or presence of aggressive gases (i.e. chlorine, ozone, ammonia) the sensor element may be affected and re-calibration may be required sooner than specified. Re-calibration and deterioration of the humidity sensor due to environmental conditions are not subject of the general warranty.

» 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.



» TECHNICAL DATA

Measuring values	temperature, light, humidity, atmospheric pressure	
Output voltage	1..4x 0..10 V or 0.5 V (adjustable via jumper; live-zero configuration via Thermokon USEapp), min. load 10 kΩ	
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	typ. 0,6 W (24 V =) 1,5 VA (24 V ~)	
Measuring range temp.	-40..+60 0..+50 -20..+80 -15..+35, adjustable at the transducer, default setting: -20..+80 °C, (optional)	
Measuring range humidity (type-dependent)	Temp_rH Temp_rH_hPa 0..100% rH non-condensing, (optional)	
Measuring range light	0..200 Lux 0..1000 Lux (default) 0..2 kLux 0..10 kLux 0..20 kLux 0..50 kLux, selectable at the device	
Measuring range atm. Pressure (type-dependent)	Temp_rH_hPa 500..1500 hPa, (optional)	
Accuracy temperature	±0,5 K (typ. at 21 °C)	
Accuracy humidity	±2% between 10..90% rH (typ. at 21 °C)	
Accuracy light	±5% of measuring range	
Sensor	Ambient light sensor with precise optical filtering appropriate to the human eye	
Enclosure	enclosure USE-M, PC, pure white, cover PC, translucent	
Protection	IP65 according to EN 60529	
Cable entry	M25, for wire max. Ø=7 mm, seal insert for fourfold cable entry	
Connection electrical	Mainboard removeable plug-in terminal, max. 2,5 mm ²	Plug-in card removeable plug-in terminal, max. 1,5 mm ²
Ambient condition	-30..+70 °C, 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/>.

» 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 performed using the Thermokon USEapp. The configuration can be performed only when the device is powered.



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



» APPLICATION NOTICE



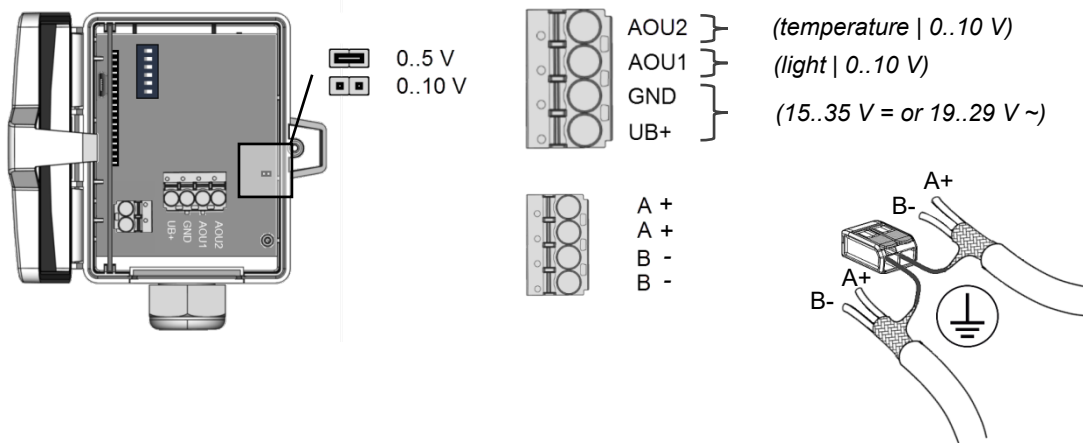
The housing cover must be completely closed in order to ensure the accuracy and reproducibility of the measured values during a test or service log via USEapp.

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.

» **CONNECTION PLAN**

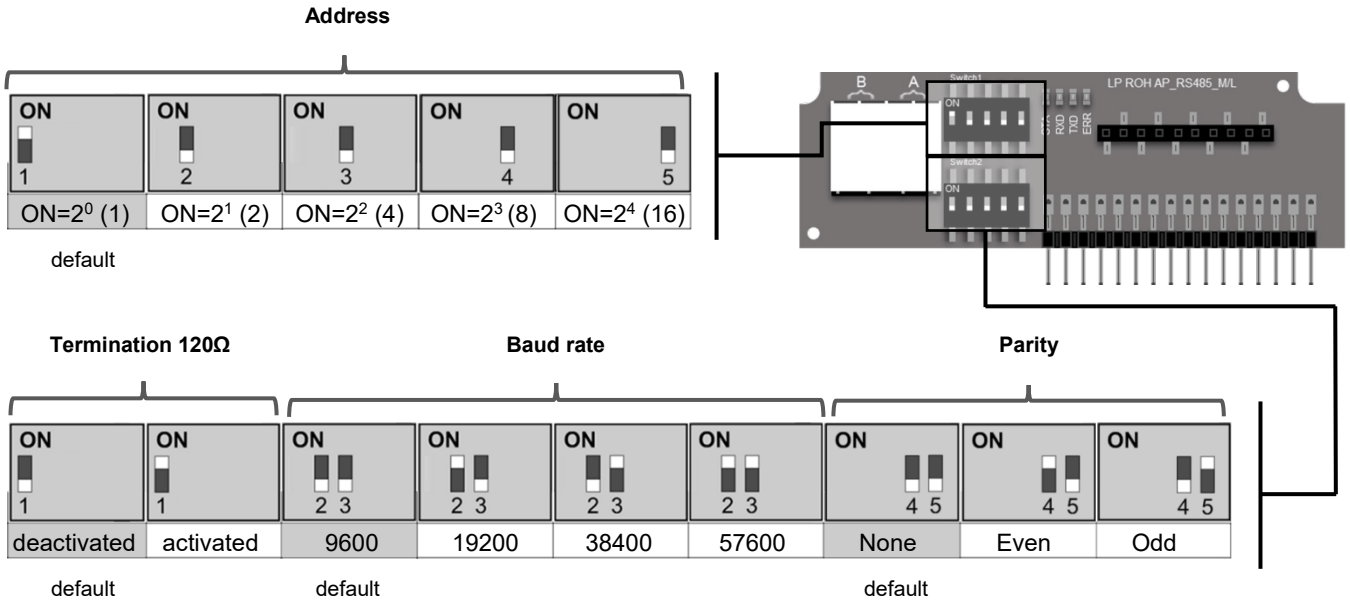
If the RS485 cable is looped through, connect both cable shields using the enclosed 2-pol. Connect terminal as shown.

Li65+ **RS485 Modbus**



» **DIP SWITCH CONFIGURATION**

Measuring range light - DIP 1..3	
	<p>#0 (factory default) SI = 0..1 kLux IMP = 0..100 fc</p>
	<p>#1 SI = 0..0,2 kLux IMP = 0..20 fc</p>
	<p>#2 SI = 0..2 kLux IMP = 0..200 fc</p>
	<p>#3 SI = 0..10 kLux IMP = 0..1000 fc</p>
	<p>#4 SI = 0..20 kLux IMP = 0..2000 fc</p>
	<p>#5 SI = 0..50 kLux IMP = 0..5000 fc</p>
Measuring range temperature - DIP 4,5	
	<p>#0 (factory default) SI = -20..+80 °C IMP = 0..+200 °F</p>
	<p>#8 SI = 0..+50 °C IMP = +40..+140 °F</p>
	<p>#16 SI = -40..+60 °C IMP = -40..+160 °F</p>
	<p>#24 SI = -15..+35 °C IMP = 0..+100 °F</p>
System of units - DIP 6	
	<p>#0 (factory default) SI</p>
	<p>#32 IMP</p>



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

Register 400 = 1 (Unit SI)

Address	Access	Description	Resolution / Unit
0	R	Temperature	SI 0.1 °C
2	R	Absolute humidity	SI 0.01 g/m ³
3	R	Enthalpy	SI 0.1 kJ/kg
4	R	Dew point	SI 0.1 °C
12	R	Atmospheric pressure	SI 1.0 hPa
60 (Low)	R	Illumination (32 Bit)	SI 1.0 Lux
61 (High)	R		SI 1.0 Lux

Register 400 = 2 (Unit Imperial)

Address	Access	Description	Resolution / Unit
0	R	Temperature	Imperial 0.1 °F
2	R	Absolute humidity	Imperial 0.01 gr/ft ³
3	R	Enthalpy	Imperial 0.1 BTU/lb
4	R	Dew point	Imperial 0.1 °F
12	R	Atmospheric pressure	Imperial 1.0 inWC
60 (Low)	R	Illumination (32 Bit)	Imperial 1.0 fc
61 (High)	R		Imperial 1.0 fc

Available measured values are type-dependent. 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.



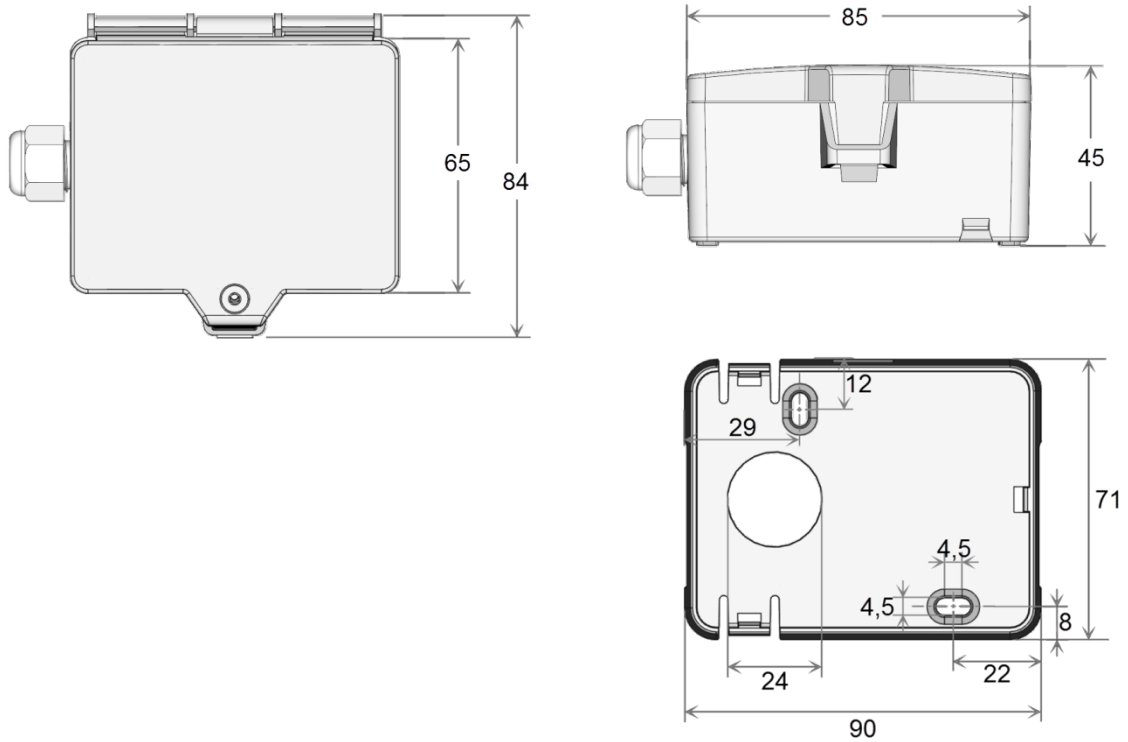
Modbus addresses:

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 base
 Mounting kit universal
 • Cover screw + screw cover • 2 Rawlplugs • 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