LI65+ RS485 Modbus

Outdoor multi-sensor

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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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

» 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/li65plus

» NOTES ON DISPOSAL

The crossed-out wheelie 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 (±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

At regular environmental condition, it is recommended to calibrate the sensor annually to check the compliance with the accuracy required in the application. The following conditions can damage the sensor element or lead in long therm to loss of the specified accuracy:

- Mechanical stress
- Contamination (e.g. dust / fingerprints)
- Aggressive chemicals
- Ambient conditions (e.g. condensation on measuring element)

Do not touch the sensor elements!

Re-calibration or exchange of the sensor element are not subject of the general warranty.

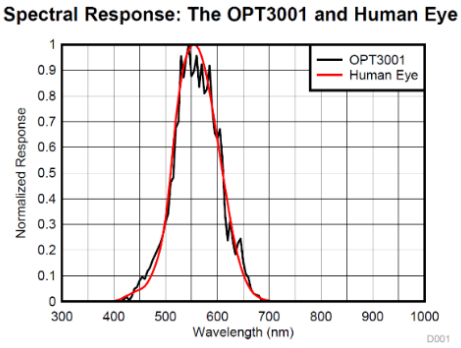
» USE ENCLOSURE WITH UV AND WEATHER RESISTANCE

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

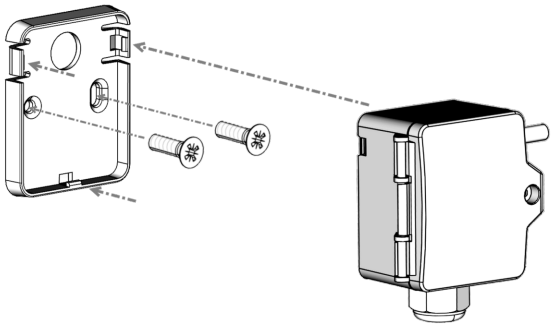
Measuring values *(type-dependent)*	temperature, light, humidity, atmospheric pressure	
Output voltage	1..4x 0..10 V or 0..5 V (adjustable via jumper; live-zero configuration via Thermokon USEapp), min. load 10 kΩ	
Network technology	RS485 Modbus, RTU, half-duplex, baud rate 9.600, 19.200, 38.400 or 57600, parity: none (2 stopbits), even or odd (1 stopbit), **Fail-safe Biasing required**	
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.	adjustable at the transducer: 0..+200 | +40..+140 | -40..+160 | 0..100 °F, default setting: 0..+100 °F	
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 70 °F)	
Accuracy humidity	±2% between 10..90% rH (typ. at 70 °F)	
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=0.28 in., seal insert for fourfold cable entry	
Connection electrical	**Mainboard** removeable plug-in terminal, max. 14AWG	**Plug-in card** removeable plug-in terminal, max. 16AWG
Ambient condition	-22..+158 °F, max. 85% rH short term condensation	

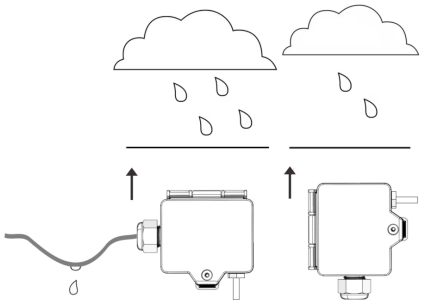
» Sensor Spectral Curve



» 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.





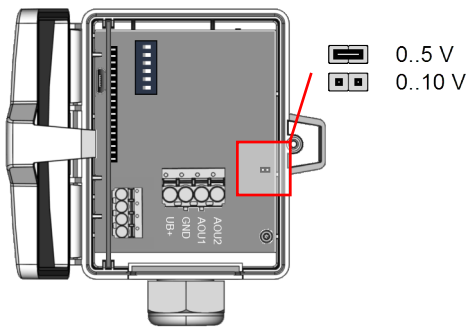
Regardless of the compass direction, the outdoor sensor should not be mounted in the following locations:

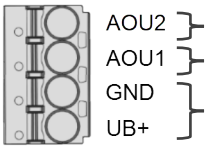
- on chimneys, under roofs, canopies or balconies
- in close proximity to an exhaust air opening
- above, below or next to windows and doors

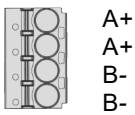
» CONNECTION PLAN

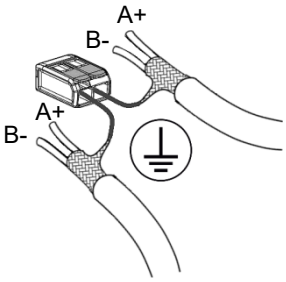
If the RS485 cable is looped through, connect both cable shields using the enclosed 2-pol. Connect terminal as shown.

Li65+ **RS485 Modbus**

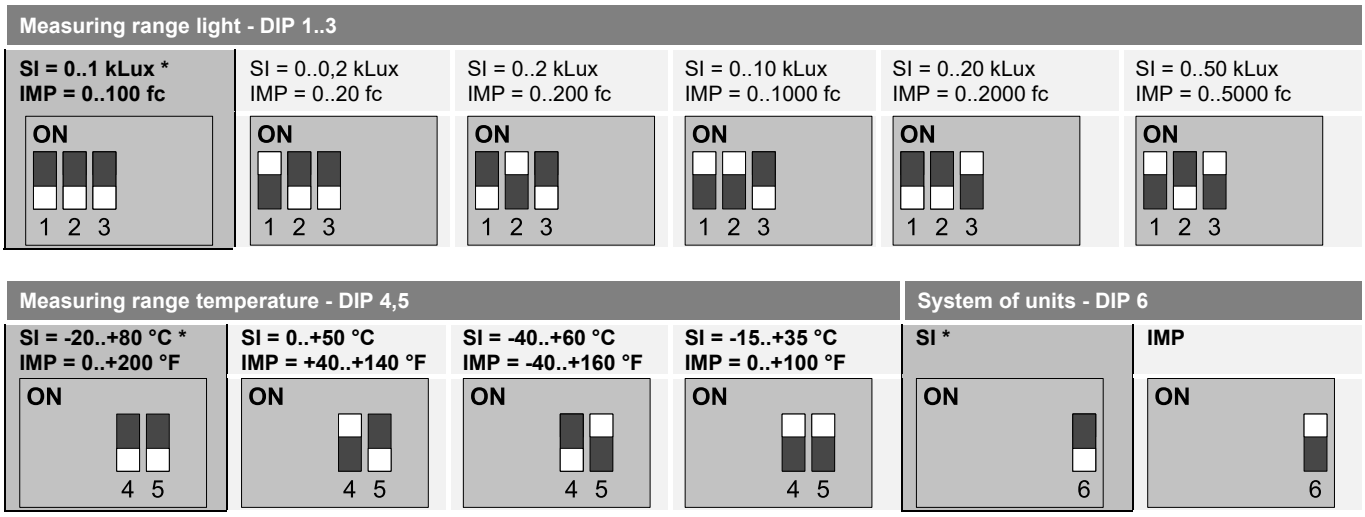








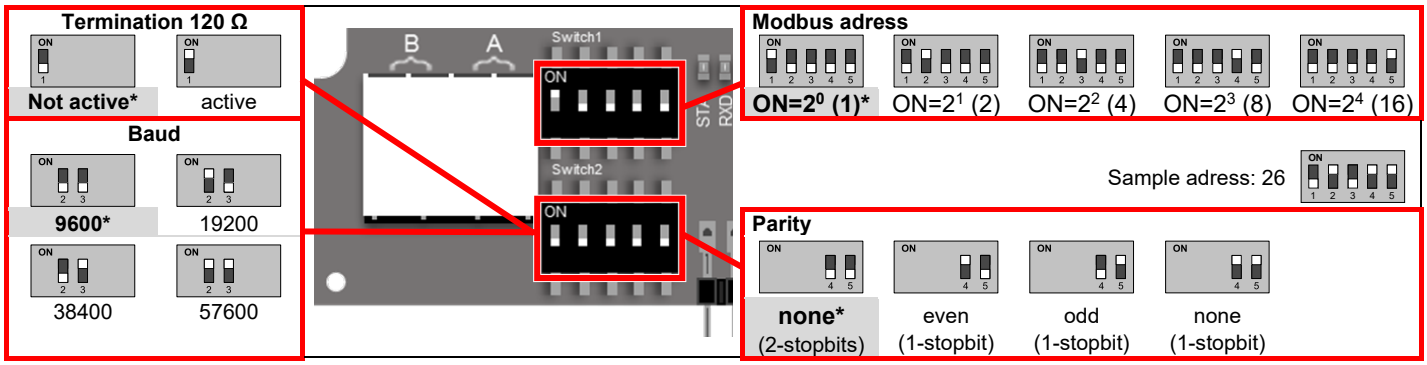
» DIP SWITCH CONFIGURATION (MAINBOARD)



» DIP SWITCH CONFIGURATION, PLUG-IN CARD

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.

*** factory default settings**



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

Adress	Access	Description	Resolution / Unit					
			Register 400= 1			Register 400= 2		
0	R	**Temperature**	SI	0.1	°C	Imperial	0.1	°F
2	R	**Absolute humidity**	SI	0.01	g/m³	Imperial	0.01	Gr/ft³
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
12	R	**Atmospheric pressure**	SI	1.0	hPa	Imperial	1.0	inWC
60 (Low)	R	**Illumination (32 Bit)**	SI	1.0	Lux	Imperial	1.0	Fc
61 (High)	R							

Available measured values are type-dependent.

Modbus addresses:
USE-RS485 Modbus Interface
A detailed description of the Modbus addresses can be found under the following link: → **Download**

»APPLICATION NOTICE

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.

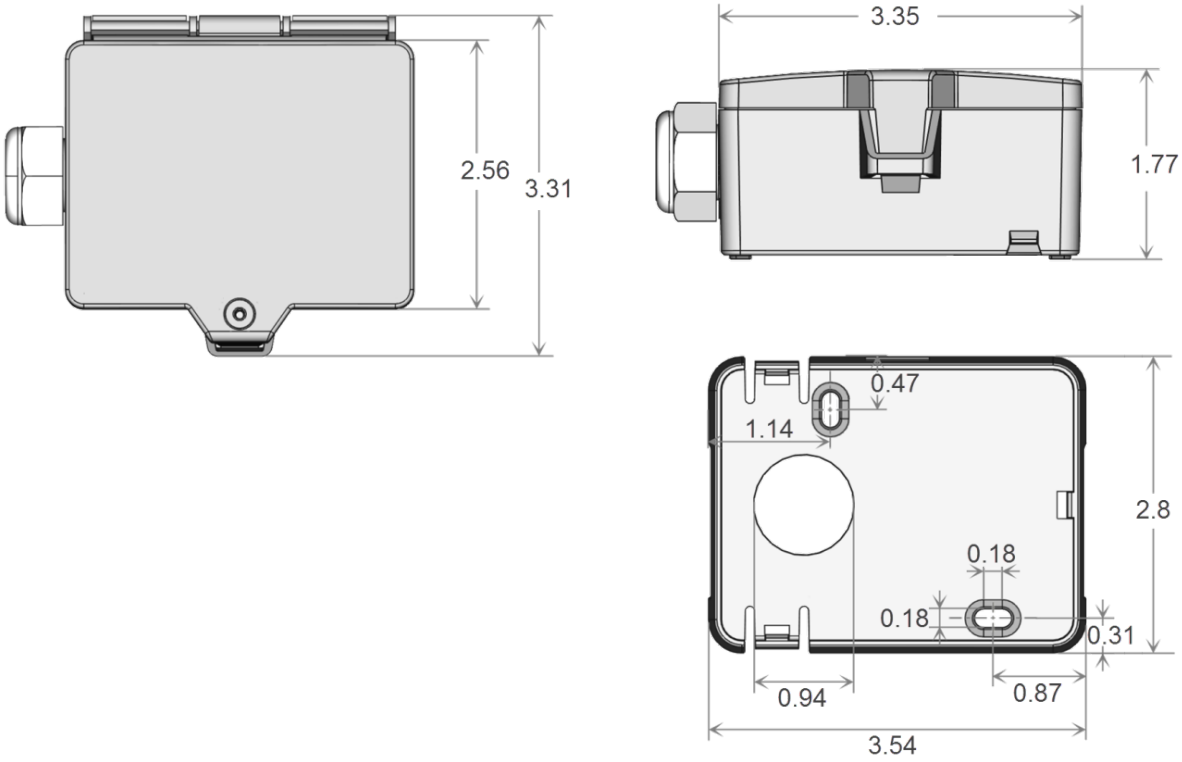
»CONFIGURATION

The Thermokon bluetooth dongle with micro-USB (Item No.: 668262) is required for communication between USEapp and USE-M / USE L products. 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.

»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)

Bluetooth dongle	Item No. 668262
Cable entry M25 USE white, sealing insert 4x Ø=0.28 in. (4 pcs)	Item No. 641364
USB-Interface RS485 (inkl. Treiber CD)	Item No. 668293
USB RS485 Modbus RTU Logger	Item No. 809917
RS485 Biasing Adapter	Item No. 811378