

# LI65+ LRW

Outdoor multi-sensor

**thermokon**<sup>®</sup>  
HOME OF SENSOR TECHNOLOGY

## Datasheet

Subject to technical alteration  
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### » APPLICATION

The LoRaWAN® 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. 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

##### light

– active 0..10 V LRW

- Li65+ LRW

##### light + temperature + humidity

– active 2x 0..10 V

- Li65+ Temp\_rH LRW

##### Outdoor sensor light + temperature + humidity + atmospheric pressure (opt.)

– active 2x 0..10V

- Li65+ Temp\_rH\_hPa LRW

### » 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/>

### » 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

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.**

## » APPLICATION NOTICE FOR HUMIDITY SENSORS

For standard environmental conditions re-calibration is recommended once a year to maintain the specified accuracy. A re-calibration may be required sooner than specified, or the sensor element may have to be exchanged when exposed to the following environmental conditions:

- Mechanical stress
- Contamination (dust / fingerprints e.g.)
- Abrasive chemicals
- Environmental influences (e.g. condensation on measuring element)

Re-calibration and deterioration of the humidity sensor due to environmental conditions are not subject of the general warranty.

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

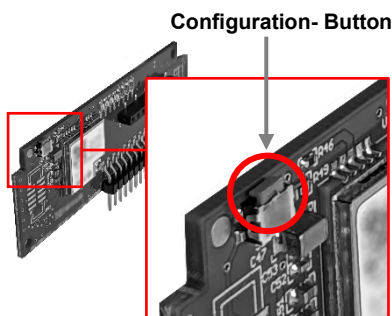
## » CONFIGURATION

**The Thermokon Bluetooth-Dongle (Item-No. 668262) is required for Communication between USEapp and USE-M/USE-L LRW-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 on the website [www.thermokon.de](http://www.thermokon.de)**



Configuration- Button

1. Connect the sensor with the power supply according to wiring diagram
2. Plug in the bluetooth dongle
3. Press the button to start configuration mode.
4. Configure the sensor using the USEapp on a mobile device.
5. Disconnect the bluetooth connection.
6. Remove the bluetooth dongle off the sensor.
7. Press the button to stop configuration mode.
8. Configuration values are saved and the device is ready for use.

## » USER ADVICE

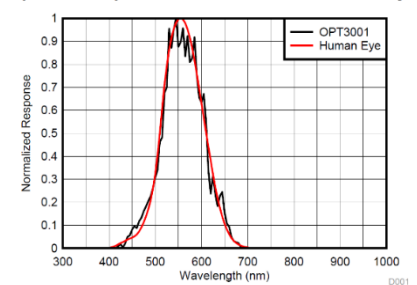


The bluetooth dongle snaps in the connector, when removing the bluetooth dongle hold the board down to prevent pulling out the board.

## » TECHNICAL DATA

Measuring values	temperature, light, humidity, atmospheric pressure
Output voltage	1..2x 0..10 V or 0..5 V, min. load 10 k $\Omega$ (live-zero configuration via Thermokon USEapp)
Power supply	15..35 V = or 19..29 V ~ SELV
Power consumption	max. 2,3 W (24 V =)   4,3 VA (24 V ~)
Measuring range temp.	default setting: -20..+80 °C, (optional configuration via Thermokon USEapp)
Measuring range humidity	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	500..1500 hPa, (optional)
Accuracy temperature	$\pm 0,5$ K (typ. at 21 °C)
Accuracy humidity	$\pm 2\%$ between 10..90% rH (typ. at 21 °C)
Accuracy light	typ. $\pm 5\%$ of measuring value
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	Flextherm M20, for wire $\varnothing=4,5..9$ mm, removable
Connection electrical	removeable plug-in terminal, max. 2,5 mm <sup>2</sup>
Ambient condition	-30..+70 °C, max. 85% rH short term condensation
Configuration	Thermokon USEapp, LoRaWAN Downlink, Jumper

Spectral Response: The OPT3001 and Human Eye



## » LoRaWAN®

Radio technology	LoRaWAN®
LoRaWAN version	1.0.2
Device class	Class A
Frequency	EU868 (863-870 MHz)
Max. transmission power	+14 dBm (25 mW)
Receiver sensitivity	-137 dBm
Antenna	Internal send- / receiver antenna, external antenna available on request
LoRaWAN Features	Over the Air Activation (OTAA), Adaptive Data Rate (ADR)
Data transmission (configurable)	Configurable transmission interval, factory default value 5 min

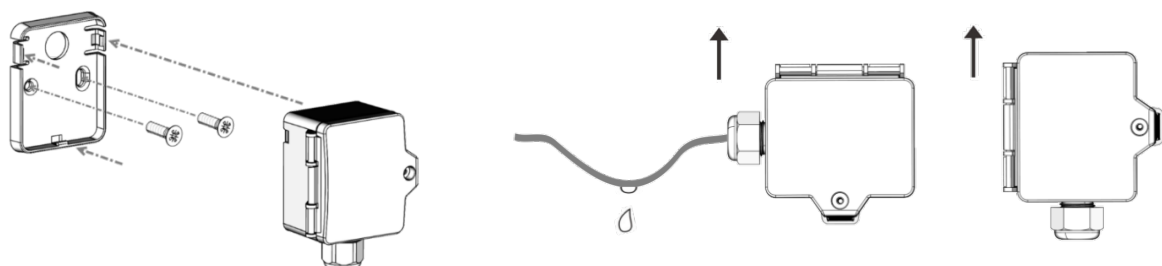
## » INFORMATION ABOUT LORAWAN SPECIFICATION



The Thermokon LoRaWAN specification can be downloaded from our website.

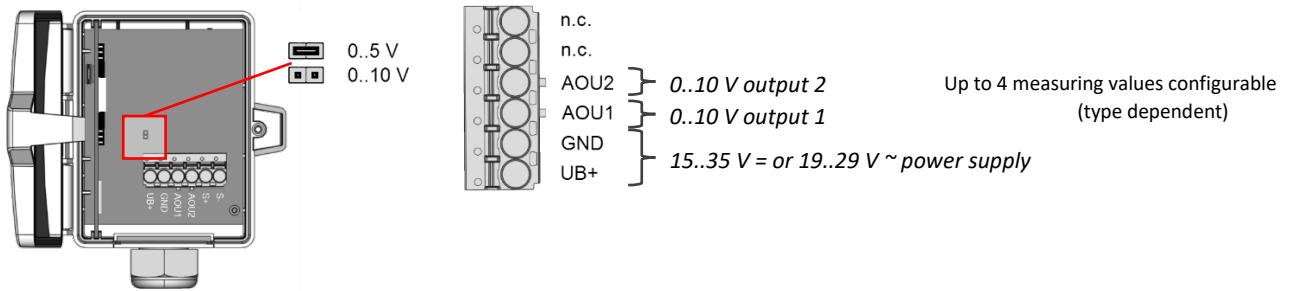
## » MOUNTING ADVICES

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



» CONNECTION PLAN

Switch off the power (or disconnect the plug in terminal) to change the output voltage range (default: 0..10 V to 0..5 V). The jumper has to be moved in de-energized state. The set output value range is ready approximately 2 seconds after restart of the device.

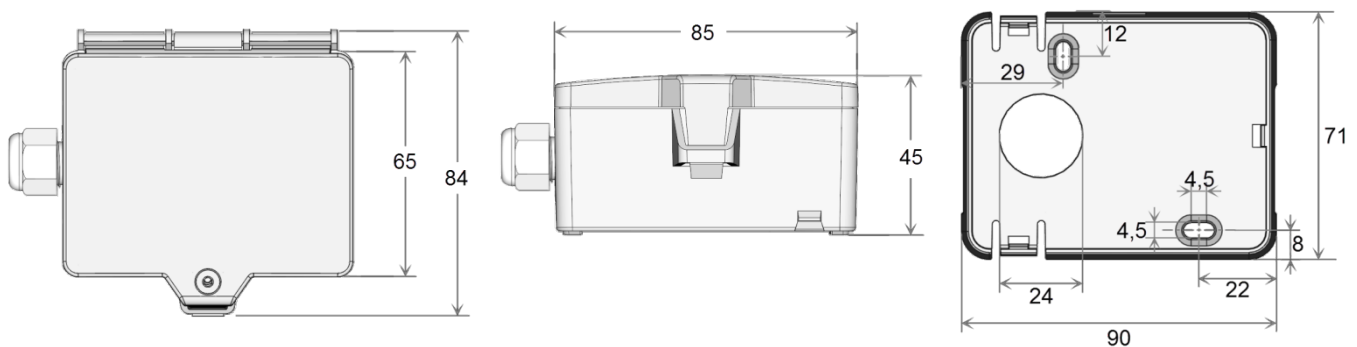


» DIP SWITCH CONFIGURATION

Measuring range light - DIP 1..3					
<b>SI = 0..1 kLux *</b> <b>IMP = 0..100 fc</b> 	<b>SI = 0..0,2 kLux</b> <b>IMP = 0..20 fc</b> 	<b>SI = 0.2 kLux</b> <b>IMP = 0..200 fc</b> 	<b>SI = 0..10 kLux</b> <b>IMP = 0..1000 fc</b> 	<b>SI = 0.20 kLux</b> <b>IMP = 0..2000 fc</b> 	<b>SI = 0.50 kLux</b> <b>IMP = 0..5000 fc</b> 
Measuring range temperature - DIP 4,5				System of units - DIP 6	
<b>SI = -20..+80 °C *</b> <b>IMP = 0..+200 °F</b> 	<b>SI = 0..+50 °C</b> <b>IMP = +40..+140 °F</b> 	<b>SI = -40..+60 °C</b> <b>IMP = -40..+160 °F</b> 	<b>SI = -15..+35 °C</b> <b>IMP = 0..+100 °F</b> 	<b>SI *</b> 	<b>IMP</b> 

\*default factory values

» 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 M20 USE white, sealing insert 2x Ø=7 mm (for 2 wire; PU 10 pcs)

Item No. 668262  
Item No. 641333