

# LC-SR04

Room sensor for temperature detection

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## Data Sheet

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## Application

Room sensor for temperature detection in illuminated room/space applications.

No operating elements are possible, transmitting intervals are not adjustable and no battery expansion is available.

## Security Advice – Caution

The installation and assembly of the device 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 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 Thermokon products contain valuable materials that should be recycled rather than disposed as domestic waste. Please note the relevant regulations for local disposal.

## Guidelines for Devices with Solar Energy Storage

By means of the energy-optimized EnOcean radio technology used in "EasySens" wireless sensors, supplying themselves with electric energy by solar cell(s), the devices can work without batteries. Due to the elimination of changeable batteries the sensors are almost maintenance-free and environmentally sound.

The device should be mounted in a location with sufficient ambient brightness. The minimum illumination of 200 lx (artificial light or ambient) is required at the mounting place for at least 3 to 4 hours every day. (The health and safety regulations at work require a minimum illumination of 500 lx for office workplaces).

It will be more effective if the solar cell is mounted facing the window direction. If the device has a temperature sensor, then even periodic direct sun radiation should be avoided due to incorrect false temperature readings.

With regard to future use of the room, the mounting position should be selected so that the device will not be obstructed: for example by placement areas or roll-fronted cupboards.

The solar-powered energy storage may have to be recharged after longer warehousing of the radio sensors in darkness. Normally this works automatically during commissioning or during the first operating phase in daylight. If the initial charging is not sufficient in the first operating hours, the sensor will reach its full operating state up to 3 to 4 days, if the requirements for minimum illumination are met, the sensor will be transmit continually in darkness as specified. Depending on the application it is also possible to operate the devices in dark rooms (with brightness <100 lx) with a battery back up option. Batteries to be used are listed in accessories.

Operating time when using batteries depends on transmission frequency as well as the component aging and the self-discharge of the battery used. Normally operating time will be several years. Changing of the device from solar to battery operation is done automatically by adding a battery to the device.

## Remarks to Room Sensors

### Location and Accuracy of Room Sensors

The room sensor should be mounted in a suitable location for measuring accurate room temperature. The accuracy of the temperature measurement also depends directly on the temperature dynamics of the wall. It is important, that the back plate is completely flush to the wall so that the circulation of air occurs through the vents in the cover. Otherwise, deviations in temperature measurement will occur due to uncontrolled air circulation. Also the temperature sensor should not be covered by furniture or similar devices. Mounting next to doors (due to draught) or windows (due to colder outside wall) should be avoided.

The temperature dynamics of the wall will influence the temperature measurement. Various wall types (brick, concrete, dividing and hollow brickwork) all have different behaviours with regards to thermal variations.

### Surface and Flush Mounting

The temperature dynamics of the wall influence the measurement result of the sensor. Various wall types (brick, concrete, dividing and hollow brickwork) have different behaviours with regard to thermal variations. A solid concrete wall responds to thermal fluctuations within a room in a much slower way than a light-weight structure wall. Room temperature sensors installed in flush boxes have a longer response time to thermal variations. In extreme cases they detect the radiant heat of the wall even if the air temperature in the room is lower for example. The quicker the dynamics of the wall (temperature acceptance of the wall) or the longer the selected inquiry interval of the temperature sensor is the smaller the deviations limited in time are.

## Registration for radio operation

The general registration for the radio operation is valid for all EU-countries as well as for Switzerland.

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:

- (1) this device may not cause harmful interference
- (2) the device must accept any interference received including interference that may cause undesired operation.

Changes or modifications made to this equipment not approved by Thermokon may void the FCC authorization to operate this equipment.

## Transmitting Frequency and Measuring Principle

The sensors send event or time controlled telegrams to the receiver.

A: event controlled

By activating the learn button of the device, the internal microprocessor is woken up, the measuring value is detected and a telegram to the receiver is generated and transmitted. Some devices, for example to measure humidity or motion, generate telegrams event controlled to the receiver.

B: time controlled

The internal microprocessor wakes up at a predefined interval according to the settings (T\_wake up) and the measuring value is detected. If the status of an input has changed more than 2% (for devices with airConfig this value can be programmed) since the last inquiry, a telegram is produced immediately. If the input value remains unchanged compared to the previous telegram, a telegram is automatically produced after expiration of the fixed sending time (approx. 16 minutes (for devices with airConfig this value can be programmed); T\_send).

After a telegram is sent, regardless whether produced by status changes or after expiration of T\_send, the times T\_wake up and T\_intervall are restarted.

A telegram always includes all information (measured data, charging voltage of energy storage,...).

## Information about EasySens (Radio)

Please refer to "Information\_Radio\_airConfig".

## Technical Data

Measuring values	Temperature
Radio technology	EnOcean (IEC 14543-3-10), STM, EEP A5-02-05
Frequency	868 MHz
Power supply	Solar cell, internal gold cap, maintenance-free
Measuring range temp	0..+40 °C
Accuracy temperature	±0,5 K at range +17..+27 °C
Measuring interval	every 100 sec. typ. ±0,1% rH
Transmission interval	every 100 sec. at change >0,8 K, every 1000 sec. at change <0,8 K
Enclosure	ASA, pure white
Protection	IP30 according to EN 60529
Ambient condition	-25...+65 °C, max. 85% rH non-condensed
Weight	approx. 50 g
Mounting	To be mounted flat onto the surface using adhesive foil or screws
Notes	Telegram intervals not adjustable, no battery backup available, no operating elements possible

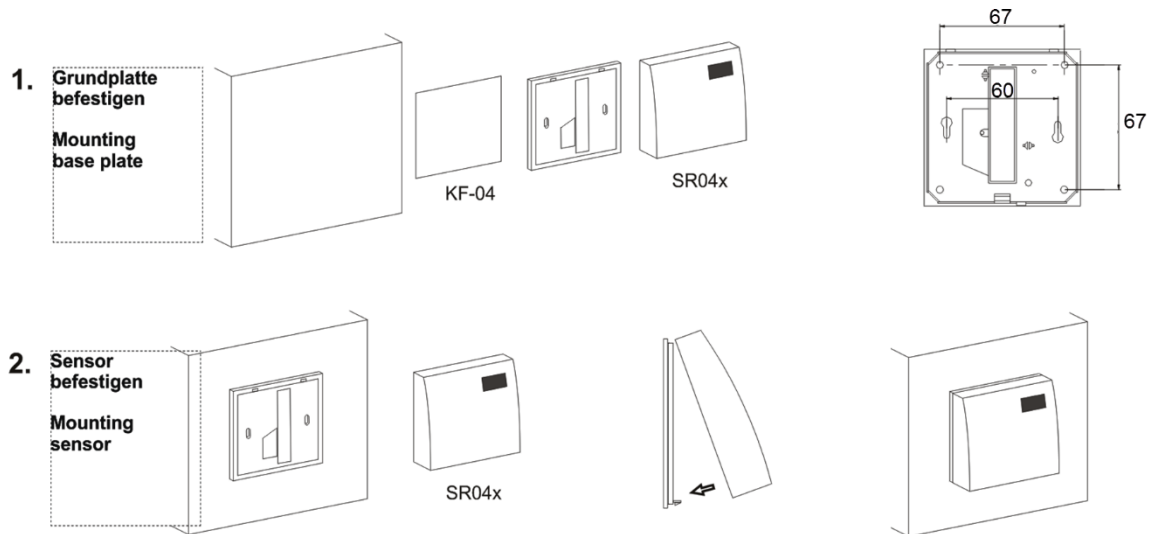
## Description radio telegram

ORG	7 dec. always (EnOcean device type "4BS")		
Data_byte3	0, not used	ID_Byte3	device ID (Byte3)
Data_byte2	0, not used	ID_Byte2	device ID (Byte2)
Data_byte1	Temperature 0..+40 °C, linear n=255..0	ID_Byte1	device ID (Byte1)
Data_byte0	Bit D3 learn button (0 = button pressed)	ID_Byte0	device ID (Byte0)

## Mounting advices

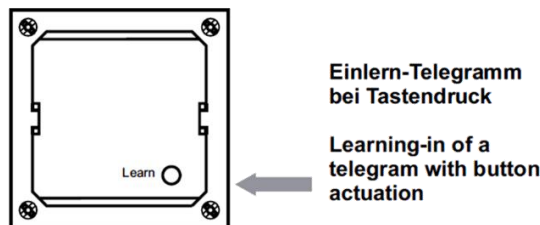
Installation is done by gluing the sensor base plate to the smooth wall surface by means of the adhesive tape included. If required, the base plate can also be fixed by means of rawl plugs and screws. Finally, the sensor is put on the sensor base plate.

The sensor is supplied in an operational status. Probably, the internal solar energy storage has to be recharged after a longer storage of the radio sensors in darkness. The recharging process is done automatically during the first operating hours in daylight. For this purpose, please refer to the remarks "Guidelines for Devices with Solar Energy Storage".



## Commissioning

In order to assure a correct evaluation of the measuring values by the receiver, it is necessary to have the devices learned by the receiver. This is done automatically by means of a "learn button" at the sensor or manually by input of the 32bit sensor ID and a special "learning procedure" between sender and receiver. The respective details are described in the corresponding software documentation of the receiver.



## Dimensions (mm)

