

SR06 LCD (902 MHz) from version 2.5

Wireless surface mounting room operating unit with LCD display, temperature sensor and optional humidity sensor

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

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» APPLICATION

The room sensor is designed for temperature and (optional) humidity detection, local set point and fan speed adjustment for room control in buildings. The sensor transmits its measured values wirelessly to the corresponding receivers, which process the information respectively to the centralized control unit. The configuration is done via a serial interface.

This product is intended for use as part of an automation solution for (functional) buildings. It transmits sensor data within a building over short distances unencrypted by radio to suitable receivers. No personal data or location data is transmitted.

The product cannot communicate directly with the Internet and is not intended for applications that use the Internet to forward unprocessed sensor data. Automation stations that forward data via the Internet, e.g. to visualise the building status, must ensure that the data to be forwarded is encrypted as required by law.

» TYPES AVAILABLE

Radio room operating unit temperature

- SR06 LCD 2T / 2T+
- SR06 LCD 4T

Radio room operating unit temperature + humidity

- SR06 LCD rH 2T / 2T+
- SR06 LCD rH 4T

SR06 LCD 2T	2T+Light	2T+Blind	4T Typ 1	4T Typ 2	4T Typ 3

Colours available: pure white brilliant (standard), aluminium or anthracite

» 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/sr06-lcd>

» 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

» GUIDELINES FOR DEVICES WITH SOLAR ENERGY STORAGE

Due to the energy-optimized EnOcean radio technology used in "EasySens®" wireless sensors, the devices can work without batteries and self-charge themselves using electric energy generated by integrated solar cells. This makes the devices almost maintenance free and environmentally sound due to not having to replace batteries.

For optimum use, the device should be mounted in a location with sufficient ambient brightness. Minimum illumination of **200 lx** (artificial light or ambient) is required for at least 8 hours each day. (The health and safety regulations at work require a minimum illumination of 500 lx for office workplaces).

The solar cell should be mounted facing towards the window direction if possible. If the device has a temperature sensor, then even periodic direct sun radiation should be avoided due to incorrect false temperature readings.

The mounting position should be selected so that the device will not be obstructed in the future: for example by placement areas, additional furniture or roll-fronted cupboards.

The sensor is supplied in an operational state. If the sensor has been stored in darkness for longer periods, the internal solar energy storage will most likely need to be recharged. This would normally happen automatically during commissioning or during initial start up in ambient light. If the initial charge is not sufficient, the sensor will reach its full operating state up to 3 to 4 days, if the requirements for minimum illumination per day are met. The sensor will then transmit continuously in darkness as specified f (2/3 days on factory default telegram timing). Depending on the application it is also possible for the devices to operate in darker rooms (with brightness <200 lx) by using the battery back-up option. Batteries to be used are listed in accessories.

The operating time when using batteries will depend on the transmission frequency as well as the component aging and the self-discharge of the battery. Standard operating time will be several years on factory default telegram timing. Changing of the device from solar to battery operation is done automatically by simply adding a battery to the device.

» MOUNTING ADVISE ROOM SENSORS

The Accuracy of the room sensors are influenced by the technical specifications as well as the positioning and the installation type.

During Assembly:

- Seal mounting box (if present).
- Installation type, air draught, heat source, radiation heat or direct sunlight can affect the measurement.
- Bulding material specific properties of the installation place (*brick-, concrete-, partition wall, cavity wall, ...*) can affect the measurement.

Assembly not recommendet in...

- Air draught (e.g.: close to windows / doors / fans ...)
- Near heating sources,
- Direct sunlight
- Niches / between furniture / ...

» 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 term 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.

» **TECHNICAL DATA**

Measuring values	temperature, humidity (optional)	
Radio technology	EnOcean, (IEC 14543-3-10), transmission power <10 mW	
Frequency	902 MHz	
Data transmission	bidirectional, SmartACK (SmartACKNOWLEDGE), airConfig ready	
Power supply	solar cell, Lithium Polymer-battery, maintenance-free, optional: backup battery CR1632	
Measuring range temp.	0..+40 °C	
Measuring range humidity	0..100% rH non-condensing	
Accuracy temperature	±0,4 K (typ. at 21 °C)	
Accuracy humidity	±5% between 30..70% rH (typ. at 21 °C)	
Measuring interval	WakeUp time = 240 sec. (default), heartbeat cycle = 10x, configured via AirConfig or SR06ConfigSW	
Switch range Berker	S.1, B.3 aluminum, B.7 glass	
Switch range Busch-Jaeger	Busch-balance® SI, solo®, future® linear, Busch-axcent®	
Switch range Gira	E2, E3, Standard 55, Esprit, Event, F100	
Switch range Jung	A 500, AS 500, A plus, A creation	
Switch range Merten	M-Smart, M-Arc, M-Plan, M-Pure	
Control function	depending on the type, fan stages, set point, occupancy signal, day/night control, light and blind control	
No. of buttons	2T 2	2T+ 4T 4
Display	LCD 29x12 mm, monochrome	
Set point range	+15..+30 °C ±1..±10 °C	
Enclosure	PC V0, pure white brilliant, aluminium or anthracite	
Protection	IP20 according EN 60529	
Ambient condition	0..+40 °C, minimum illumination of 200 lx (8h)	
Weight	50 g	
Mounting	to be mounted flat onto the surface using adhesive foil or screws	
Notes	the devices are supplied with an integrated battery backup, for configuration an optional programming interface is necessary (refer to accessories), energy storage can be reloaded with a separate USB-cable, to use the free software airConfig (download) an usb stick, which is able to send and receive EnOcean telegrams, is necessary. We offer such a stick with the package airScan (item No. 566711 for 902 MHz)	

» **INFORMATION ABOUT EASYSENS® (RADIO) / AIRCONFIG GENERAL USAGE****EasySens® - airConfig**

Basic information about EasySens® radio and about general usage of our airConfig software, please download from our website. <https://www.thermokon.de/direct/files/airconfig-software-manual.zip>

» **INFORMATION ABOUT SMART ACKNOWLEDGE (SMARTACK)**

This bi-directional communication mechanism also allows the building system to send back data to a sensor, i.e. to overwrite SR06LCD's set point. Smart Acknowledge requires that both communication devices do support the Smart Acknowledge mechanism.

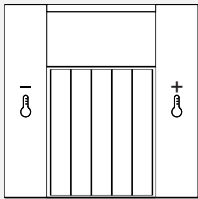
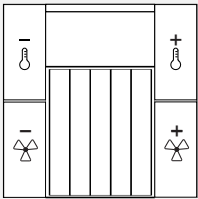
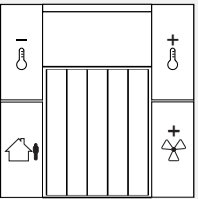
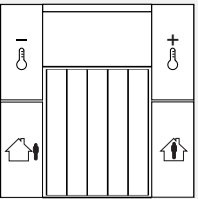
Repeaters are not supported, they delay in the telegram transmission. Sensor and gateway must communicate directly with each other.

Additional Information of the used EEP's with Smart ACK can be found using the following link:
<https://www.thermokon.de/direct/files/smartack-info-en.pdf>

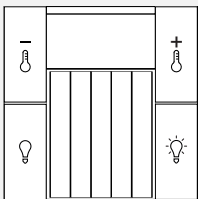
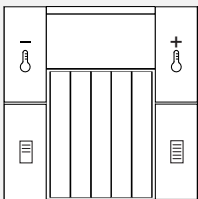
» **OVERVIEW OF THE RADIO TELEGRAMS**

The structure of the data contained in the telegram can be found in the EEP (EnOcean equipment profile) list provided by the EnOcean Alliance. <http://tools.enocean-alliance.org/EEPViewer/>

» OVERVIEW SUPPORTED EEPS (FROM VERSION 2.1)

2T / rH 2T	4T / rH 4T Typ 1	4T / rH 4T Typ 2	4T / rH 4T Typ 3
			
A5-10-03: temperature, set point	A5-10-04: temperature, set point, fan stages	A5-10-02: temperature, set point, occupancy*, fan stages	A5-10-06: temperature, set point, occupancy*
A5-10-12: temperature, humidity, set point	A5-10-22: temperature, humidity, set point, fan stages	A5-10-23: temperature, humidity, set point, occupancy*, fan stages	A5-10-11: temperature, humidity, set point, occupancy*
SmartACK D2-11-01 D2-11-02 (+ rH)* temperature, *humidity, set point	SmartACK D2-11-03 D2-11-04 (+ rH)* temperature, *humidity, set point, fan stages	SmartACK D2-11-05 D2-11-06 (+ rH)* temperature, *humidity, set point, fan stages, occupancy*	SmartACK D2-11-07 D2-11-08 (+ rH)* temperature, *humidity, set point, occupancy*

*Occupancy: ECO-comfort control

2T+ / rH 2T+Light	2T+ / rH 2T+Blind
	
A5-10-03: temperature, set point	A5-10-03: temperature, set point
A5-10-12: temperature, humidity, set point	A5-10-12: temperature, humidity, set point
 F6-02-01: Light and blind control 	 F6-02-01: Light and blind control 
SmartACK D2-11-01 D2-11-02 (+ rH)* temperature, *humidity, set point	SmartACK D2-11-01 D2-11-02 (+ rH)* temperature, *humidity, set point

» MOUNTING ADVICES

(1) Base plate attachment:

Installation is made 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 raw plugs and screws.

(2) Attach frame:

The respective switch program frame is clipped onto the base plate together with the intermediate frame (optional accessory).

(3) Sensor attach:

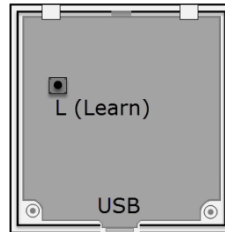
Finally, the sensor is clipped into the frame centre.

» COMMISSIONING

After delivery the room operating unit might be in default shipping mode, in this case press the learn button for more than 1 second at the rear of the device.

In order to ensure correct evaluation of the measured values by the receiver, it is necessary to have the devices learned in by the receiver. This is done automatically with a **short** keystroke (<<1 sec.) of the "learn button" at the back side of 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 for the receiver.

Reverse side of the PCB



airConfig

The sensor's set-up (Display LCD, set point adjustment ...) can be conducted with the airConfig configuration software. For this purpose a **long** keystroke (>1 sec.) is necessary, so that the SR06LCD appears in the device-list.



SR06 LCD Config SW

An additional configuration possibility is available via a separate configuration tool. For configuration of the SR06 LCD with SR06 Config SW a programming interface is required, which is not included in the delivery.

The software and the software description can be found in the download area of our webpage:

<https://www.thermokon.de/direct/files/sr06lcd-configsoftware.zip>

» CHARGE VIA USB

The internal, rechargeable battery can be charged through your computer's USB port, through a powered USB hub, or through a separate USB AC adapter / charger. Full charging of the internal battery takes approximately 8 hours via USB.

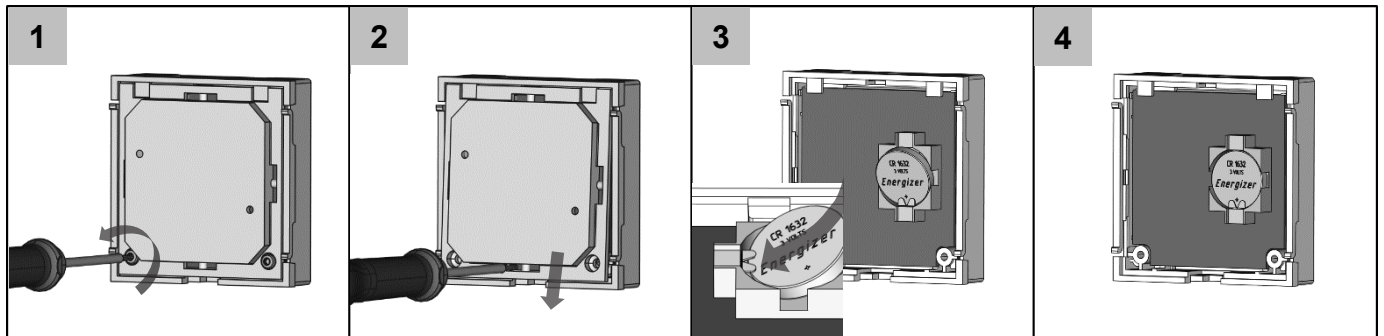


Li-ion batteries (power banks) are not suitable for charging.

The output voltage of the power bank is switched off, as the minimum charging current is undercut. Please only use the button cell in combination with a full charged internal battery.

» BATTERY CHANGE

When inserting or replacing the battery, make sure that the battery is inserted correctly "under" the contact spring of the battery holder. An incorrect insertion leads to bending or breaking of the contact spring and thus to the destruction of the device.



» CONFIGURATION VIA AIRCONFIG

Generic

Device configuration

Generic | Display | Temperature | Fanstages

WakeUp Time (s)

SmartAck

Heartbeat Cycle

Checksum

LSB-Hysteresis Temperature

Auto Occupancy

LSB-Hysteresis Humidity

Device Info

Device type:

Firmware version:

Has battery: ☒

Device Control

WakeUp Time (s)

The WakeUp time defines the time between two successive measurements.

Heartbeat Cycle

Defines the maximum number of wake ups without transmitting the temperature in case of no temperature change. Receivers monitor this interval to detect missing sensor signals.

LSB-Hysteresis Temperature/Humidity

Defines the minimum temperature change required since the last transmission to send a new telegram (**LSB- Last Significant Bit**).

Example calculation LSB:

Temperature range according to EEP:

0..40 °C (Resolution 0..255_{dez})

1 LSB = 40 °C/255 = 0,16 °C

5 LSB = 0,16 °C * 5 = 0,78 °C

SmartACK

The option enables bi-directional communication to allow the BMS to send data to the sensor or to set back the settings.

Checksum

1st generation of receivers do not support the checksum type CRC8. In order to work with legacy receivers the easy checksum can be configured.

Auto Occupancy

Devices which display the room occupancy will switch to occupied upon pressing any button, when auto occupancy is enabled

Device Info

Information about type, firmware version and existing battery will be shown.

Device Control

The device can be set back to factory default settings or for further shipment in delivery state.

Display

The 'Display' tab contains the following settings:

- Display Delay (s):** A numeric input field set to 3.
- Display Occupancy:** A dropdown menu set to 'not active'.
- Display Toggle Values:** A group box containing three checkboxes: 'Temperature' (checked), 'Humidity' (unchecked), and 'Fanstage' (checked).
- Display State:** A dropdown menu set to 'on by button push'.
- Displayed value 'always on':** A dropdown menu set to 'Setpoint'.

Display Delay (s)

Defines the duration of time the display will remain on after the last action. (1-6 sec)

Display Toggle Values

An alternating display of multiple serial messages of the actual values is selectable and is activated by holding the button. The values will appear successively after the display wakeup.

Display Occupancy

The display can only be on permanently if a battery is inserted. Without battery the display will be activated by pressing a button.

Display State

Without battery the display will be activated by pressing a button. The display can only be on permanently if a battery is inserted. In this case, the display is switched off for energy reasons in case of insufficient ambient light intensity.

Displayed value "always on"

Use the drop-down menu to choose which value shall be shown when the display is activated permanently.

Temperature

The 'Temperature' tab contains the following settings:

- Basestpoint (°C):** A numeric input field set to 25.
- Temperature Unit:** A dropdown menu set to '°C'.
- Setpoint Correction +/- (°C):** A numeric input field set to 10.
- Setpoint Type:** A dropdown menu set to 'absolute'.
- displayed value:** A text field showing '21°C'.

Basestpoint

Can be selected from +15..+30 °C. Basic set point defines the centre of the set point range.

Setpoint Correction +/- (°C)

Defines range by which the set point can be increased/decreased. Ranges from $\pm 1.. \pm 10$ °C.

Temperature Unit

If required the dimensional unit can be set to Celsius or Fahrenheit to display the temperature set point and room temperature

Setpoint Type

The displayed set point can be specified as absolute or the relative value.

Absolute = Basic Set point $\pm$ Set point Shift

Relative = Set point Shift

Displayed value

An example of the shown value.

Fanstages

The 'Fanstages' tab contains the following settings:

- Auto:** A checked checkbox.
- Stage 0:** A checked checkbox.
- Stage 1:** A checked checkbox.
- Stage 2:** A checked checkbox.
- Stage 3:** A checked checkbox.

Fanstages

The settings contain the parameter for controlling a fancoil up to 3 fan stages and an automatic fan control mode.

»ENERGY STATUS (SIGNAL TELEGRAM)

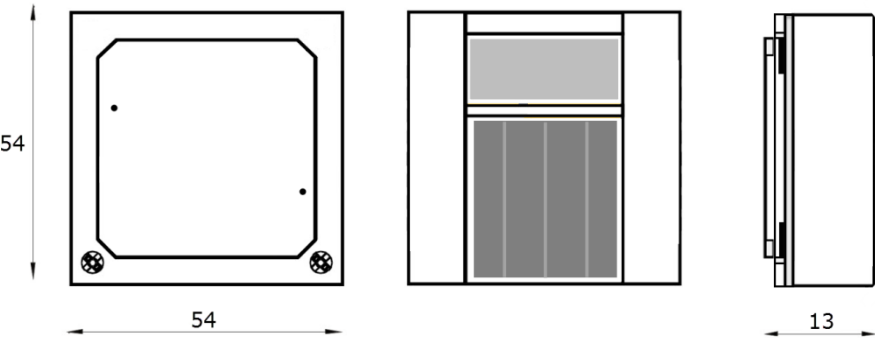
The device is primarily supplied from the internal energy storage. An inserted battery supports and recharges the internal energy storage. If the energy state is low, an additional signal telegram (SIG) - [06 01] is sent every 2nd transmission interval. Ensure sufficient ambient brightness, change the battery or insert a battery for support due to insufficient ambient brightness.

Offset	Size	Data	Shortcut	Description	
0	8	Message index	MID	Enumeration: 0x06 – Energy status of the device	
8	8	Energy	ERG	Description	Telegram (SIG)
				0..100 %	
				100: Energy level good	hex(06 64)
				1: Energy level low	hex(06 01)
				0: Energy level critical	hex(06 00)

If the energy state reaches a critical level, an additional signal telegram (SIG) - [06 00] is sent out 15 times with each transmission interval. After the last transmission interval, the device falls into the shipping mode to prevent the device from irreversible damage to the energy storage by deep discharge. The device can now only be retrieved from the shipping mode by pressing the learn button. Please recharge the device for a long time in sufficient ambient light or via the optionally available programming interface (see accessories), or insert a new battery. If the energy status is good after awakening from the shipping mode, an additional signal telegram with the energy state 100% is transmitted with the respective first 3 transmission intervals (SIG) - [06 64].

Signal telegrams (SIG) can be received with an STC65+ Modbus (from V4.7.0), STC-Bacnet IP (from V3.0.3.4) or a STC-IoT Gateway and evaluated by the superior control unit (BMS).

»DIMENSIONS (MM)



»ACCESSORIES (OPTIONAL)

Coin cell CR1632 (Lithium Mangan)	Item No. 597814
Thermokon USB interface (for configuration and charging)	Item No. 597838
EnOcean usb transceiver for airConfig/airScan (incl. licence)	Item No. 566711

»NOTES ON DISPOSAL



The crossed-out wheeled 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