

SR65 LI

Wireless Outdoor Light Sensor

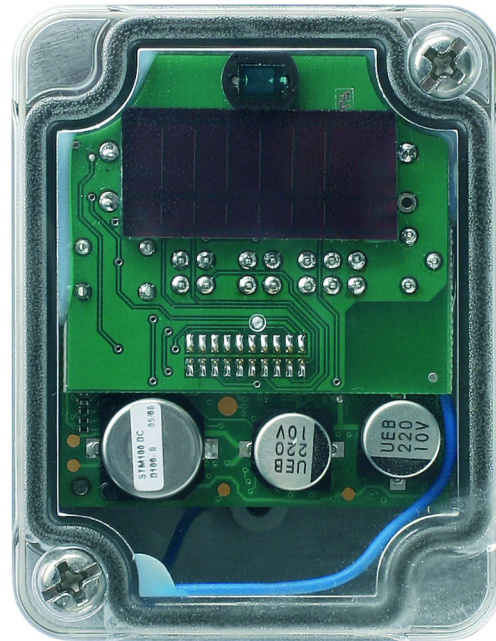


Applications

- Wireless and battery-less outdoor light sensor for detection of brightness in outdoor applications.

Features

- Integrated 868.3 MHz transmitter (transmissions conform to the EnOcean standard).
- Solar-powered. No battery required and sensor can be recharged by daylight or artificial light.
- Minimum illumination (artificial or daylight) of 400 Lux for 5-6 hours daily will fully recharge sensor's energy cell.
- Eliminate expenses for wiring plans, wire and conduit installation, electrician fees and other associated labor costs.
- Eliminate placement errors (simply correct by moving sensor(s) to better location).
- Integrated light sensor.
- Data update every 10 seconds with brightness change of > 468 to 1170 Lux.



SR65 LI

SR65 LI is a wireless and battery-less outdoor light sensor for outdoor applications.

SR65 LI communicates with wireless-enabled controllers via radio telegrams in accordance with the EnOcean standard. SR65 LI possesses an integrated light sensor and is powered by solar energy, providing a maintenance-free operation.

Product Total Quality Commitment

All Distech Controls product lines are built to meet rigorous quality standards. Distech Controls is an ISO 9001 registered company. Distech Controls' products provide both the contractor and the end user with the flexibility of using "best-of-breed" products in system design.

Selecting the Mounting Place for Solar Energy Storage

To meet special requirements concerning a correct and sufficient ambient brightness, you have to observe certain basic conditions, when selecting the mounting place.

By means of the energy-optimized EnOcean® radio technology used in our "EasySens" wireless sensors, supplying themselves with electric energy by a 2 cm² solar cell, the devices can work without batteries. Thanks to the cessation of changeable batteries the sensors are almost maintenance-free and environmentally sound.

If necessary, the solar-powered energy storage must be recharged after a longer storage of the radio sensors in darkness, e.g. during installation. In principle, however, this is made automatically during the first operating hours in daylight. If the initial charging should not be sufficient in the first operating hours, the sensor is reaching its full operating state after 3 to 4 days at the latest. The sensor is sending properly in darkness (in the night) after this period of time at the very latest.

When selecting the mounting place for the radio sensors, the following should be considered:

- The minimum illumination of 400lx should be guaranteed at the mounting place for at least 5 to 6 hours everyday regardless whether there is artificial light or daylight.
- The health and safety at work act requires a minimum illumination of 500lx for office workplaces.
- A recess that is not illuminated sufficiently in the course of a day should be avoided.
- When using collimated artificial light the angle of incidence on the solar cell should be not too steep.
- The sensors should preferably be mounted with the solar cell in window direction, whereas a direct sun radiation should be avoided. An occasionally direct sun radiation would lead to falsified measuring values with the temperature detection.

Transmitting Frequency

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

Measuring Principle and Production of Telegram

A: Event Controlled

By actuating the learning button of the device, the internal microprocessor is woken up, the measuring value for temperature is detected and a telegram to the receiver is generated.

B: Time Controlled

The internal microprocessor is woken up within a time interval of approx. 10 seconds (T_wake up) and the measurement for brightness is detected. If the status of an input has changed since the last inquiry (brightness change > 468 lux respectively 1170 lux) a telegram is produced immediately. If the brightness remains unchanged compared to the previous telegram, a telegram is automatically produced after expiration of the fix transmission time of approx. 16 minutes (T_send) at the latest.

Information: Brightness value

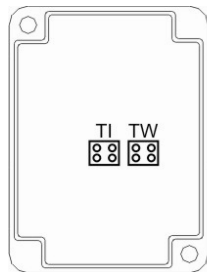
Telegram-Production: Time controlled

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 re-started.



A telegram includes all information (temperature value etc....)

Setting of Transmission Time



TI (Tintervall)	TW (Twake up)
=1	=1
=10	=10
=100	=100

Manufacturer's Adjustment

T_wake up: 10, T_interval: 100

T_send = 10sec. wake up x 100 interval = 1000sec. = approx. 16 Min.

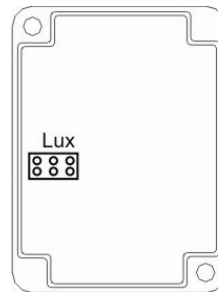


The sending frequency has a direct influence on the operation energy available in the energy storage. Thus, it also affects the discharge time of the energy storage during running operation.

Description Radio Telegram

ORG	7 dec. Always (EnOcean module type "4BS")
Data_byte2	Brightness value 300.30000, Lux linear n=0...255
Data_byte1	Brightness value 600.60000, Lux linear n=0...255
Data_byte0	Bit D3 Learn Button (0=Button pressed)
ID_Byte3	device identifier (Byte3)
ID_Byte2	device identifier (Byte2)
ID_Byte1	device identifier (Byte1)
ID_Byte0	device identifier (Byte0)

Measuring Range Adjustment



300...30000 Lux

600...60000 Lux

Mounting Advice

The devices are supplied in an operational status. Probably, the internal solar energy storage must be recharged after a longer storage of the radio sensors in darkness. In principle, the recharging process is done automatically during the first operating hours in daylight. For this purpose, please refer to the remarks "solar energy storage".

An optimum daylight measurement is reached when mounting the light sensor with its front in daylight direction.

The mounting height should be more than 2.5 m in order to avoid unfavorable actions of light, shadowings or vandalism.

For an optimum location and receiving range, please see the "Information on Wireless Technology" on the following pages.



Installation

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.



Learning-in of a telegram with button actuation

Information on Wireless Sensors

Transmission Range

As the radio signals are electromagnetic waves, the signal is damped on its way from the sender to the receiver. That is to say, the electrical as well as the magnetic field strength is removed inversely proportional to the square of the distance between sender and receiver ($E, H \sim 1/r^2$).

Beside these natural transmission range limits, further interferences have to be considered: Metallic parts, e.g. reinforcements in walls, metalized foils of thermal insulations or metalized heat-absorbing glass, are reflecting electromagnetic waves. Thus, a so-called radio shadow is built up behind these parts.

It is true that radio waves can penetrate walls, but thereby the damping attenuation is even more increased than by propagation in the free field.

Penetration of radio signals:

Material	Penetration
Wood, gypsum, glass uncoated	90...100%
Brick, pressboard	65...95%
Reinforced concrete	10...90%
Metal, aluminum pasting	0...10%

For the practice, this means that the building material used in a building is of paramount importance for the evaluation of the transmitting range. For an evaluation of the environment, some guide values are listed:

Radio path range/-penetration:

Visual contacts: Typ. 30m range in passages, corridors, up to 100m in halls

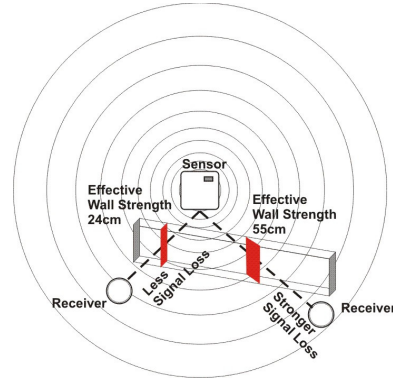
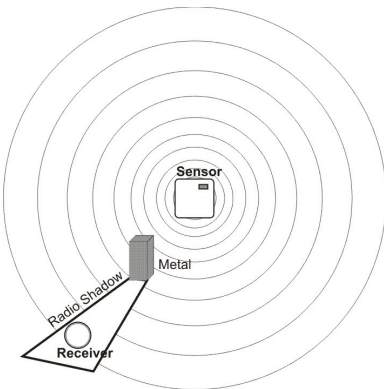
Gypsum walls/wood: Typ. 30m range through max. 5 walls

Brick wall/Gas concrete: Typ. 20m range through max. 3 walls

Reinforced concrete/-ceilings: Typ. 10m range through max. 1 ceiling

Supply blocks and lift shafts should be seen as a compartmentalization

In addition, the angle with which the signal sent arrives at the wall is of great importance. Depending on the angle, the effective wall strength and thus the damping attenuation of the signal changes. If possible, the signals should run vertically through the walling. Walling recesses should be avoided.



Other Interference Sources

Devices that also operate with high-frequency signals, e.g. computer, audio-/video systems, electronic transformers and ballasts etc. are also considered as an interference source. The minimum distance to such devices should amount to 0,5m.

Find the Device Positioning by Means of the Field Strength Measuring Instrument – EPM 100

EPM 100 is a mobile tool for measuring and indicating the received field strength (RSSI) of the EnOcean telegrams and disturbing radio activity at 868.3 MHz. It supports electrical installers during the planning phase and enables them to verify whether the installation of EnOcean transmitters and receivers is possible at the positions planned.

It can be used for the examination of interfered connections of devices, already installed in the building.

Proceeding for determination of mounting place for wireless sensor/ receiver:

Person 1 operates the wireless sensor and produces a radio telegram by key actuation

By means of the displayed values on the measuring instrument, person 2 examines the field strength received and determines the optimum installation place, thus.

High-Frequency Emission of Wireless Sensors

Since the development of cordless telephones and the use of wireless systems in residential buildings, the influence of radio waves on people's health living and working in the building have been discussed intensively. Due to missing measuring results and long-term studies, very often great feelings of uncertainty have been existed with the supporters as well as with the critics of wireless systems.

A measuring expert's certificate of the institute for social ecological research and education (ECOLOG) has now confirmed that the high-frequency emissions of wireless keys and sensors based on EnOcean technology are considerably lower than comparable conventional keys.

Thus, it is good to know, that conventional keys do also send electromagnetic fields, due to the contact spark. The emitted power flux density (W/m^2) is 100 times higher than with wireless sensors, considered over the total frequency range. In addition, a potential exposition by low-frequency magnet fields, emitted via the wires, is reduced due to wireless keys. If the radio emission is compared to other high-frequency sources in a building, such as DECT-telephones and basis stations, these systems are 1500 times higher-graded than wireless keys.

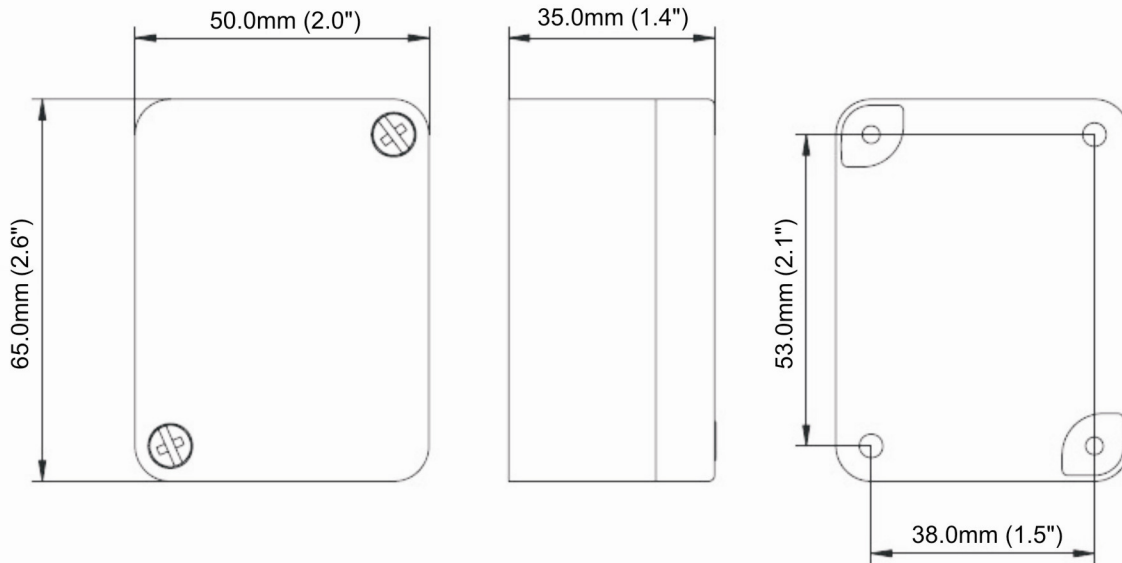
Optional Accessories

D+S 1 Set (each 2 pieces) rawl plugs and screws

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Product Specifications



Power	Features
Energy Generator: Solar cell, internal goldcap, maintenance-free	Light Brightness Detection: - Range 1 300 to 30000 Lux Resolution – 117 Lux - Range 2 600 to 60000 Lux Resolution – 234 Lux
Protection: IP65 according to EN60529	
Environmental	Electromagnetic Compatibility
Operating Temperature: -20°C to 55°C; -4°F to 131°F	CE -Conformity: 89/336/EWG Electromagnetic compatibility R&TTE 1999/5/EC Radio and Telecommunications Terminal Equipment Directive Standards: ETSI EN 301 489-1: 2001-09 ETSI EN 301 489-3: 2001-11 ETSI EN 61000-6-2: 2002-08 ETSI EN 300 220-3: 2000-09 FCC: ID: S3N-SRXX This device complies with Part 15 of the FCC rules
Storage Temperature: -20°C to 55°C; -4°F to 131°F	
Relative Humidity: 0 to 70% Non-condensing	
General	
Technology: EnOcean, STM	
Transmitting Frequency: 868.3 MHz	
Approx. Transmitting Range: 30m / 98.4' in buildings, 300m / 984.3' in free propagation	
Measuring Value Detection: Every 10 seconds	
Sending Interval: ...every 10 seconds If changes > 468 Lux in range 1 If changes > 1170 Lux in range 2 ...every 1000 seconds If changes < 468 Lux in range 1 If changes < 1170 Lux in range 2	
Enclosure	
Material (Bottom part): PC	
Color: Grey	
Material (Top Cover): PC	
Color: Crystal clear	
Dimensions overall: 50.0mm x 65.0mm x 35.0mm (2.6" x 2.01" x 1.4")	
Shipping Weight: 0.06kg (0.13lbs)	



- The general registration for the radio operation is valid for all EU-countries as well as for Switzerland.
- Operation is subject to the following two conditions:
 - This device may not cause harmful interference
 - This device must accept any interference received, including interference that may cause undesired operation.



- Changes or modifications made to this equipment not expressly approved by Distech Controls may void the FCC authorization to operate this equipment.
- The installation and assembly of electrical equipment may only be performed by a skilled electrician.
- The modules must not be used in any relation with equipment that supports, directly or indirectly, human health or life or with applications that can result in danger for people, animals or real value.

Specifications subject to change without notice.

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