ILLUMRA
SELF-POWERED WIRELESS CONTROLS

Installation Guide

SR04 - Room temperature sensor only

SR04P - Room temperature sensor with set point adjustment

SR04PT - Room temperature sensor with set point adjustment, presence key (pictured)

SR04PST - Room temperature sensor with set point adjustment, presence key, fan speed switch)

SR04P MS - Room temperature sensor with set point adjustment, slide switch O/I

SR04 rH (Room sensor humidity/temperature)

SR04P rH - Room sensor humidity/temperature with set point adjustmen)

SR04PT rH (Room sensor humidity/temperature with set point adjustment, presence key)

SR04P MS rH (Room sensor humidity/temperature with set point adjustment, slide switch O/I)

Wireless Room Temperature Sensor

Optional: occupied button, slide switch, set point, fan selector, humidity sensor

Overview

The ILLUMRA™ Wireless Temperature sensor detects the temperature of a room and transmits to compatible HVAC and/or humidity controllers, and/or ventilation devices. Users can also adjust temperature settings manually through its optional set point dial. For use in consistantly dark areas, it can be used with an optional lithium battery. Depending on the specific model, the SR04 comes equipped with an integrated temperature sensor, humidity sensor, rotary knob for set pont adjustment, rotary nob for fan speed adjustment, and/or a presence button or slide switch.

Compatible Devices
- RF Serial Box; E3X-232FP
- Ethernet Gateway; E3X-E18-XS1
- More

Components Included

The following items are included with this product:
- A -- (1) ILLUMRA Temperature Sensor
- B -- (1) Square of mounting tape

Tools Needed for Installation
- Screwdriver
- Screws (if a screw mount is desired)
- Needle-nose pliers (if you wish to change the Transmission Time)

Installation

To install the Temperature Sensor select a method from the options below. Follow the instructions for that method. For receiver installation instructions, see appropriate installation guide(s).

CAUTION/NOTES:

- Always follow local electrical codes when installing this device. Installation should be performed by a qualified technician.
- ILLUMRA products are intended only for use indoors, in dry locations, and with permanantly installed fixtures.
- **ILLUMRA products should NOT be installed in a location where the unit will be in close proximity to the light bulb(s) or other sources of heat, such as above a ceiling hugger fixture, particularly with higher wattage loads. Installation in close proximity to light bulbs or other heat sources may subject the receiver to temperatures exceeding the operating temperature rating (see "Operating Temperature" on specifications table).**
- Installation in metallic enclosures or near large metal objects will typically reduce radio range.
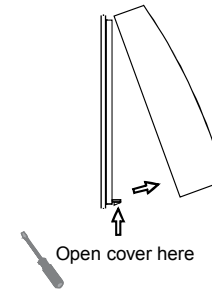
SELECT 1 OF THE FOLLOWING APPLICATIONS:

Adhesive mount

Note: If you are unsure if a desired location is suitable for the Temperature Sensor, test its functionality in that location before installation. For guidelines on choosing a location refer to the sections in these instructions entitled "Selecting the Mounting Place for Solar Energy Storage" and "Transmission Range."
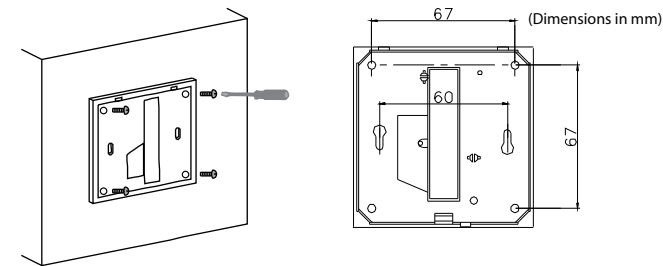
Step 1:   Peel the lining paper off of one side of the square of mounting tape (B) included.

Step 2:   Affix the exposed mounting surface squarely to the back of the Sensor.

Step 3:   Peel the lining paper off the other side of the square mounting tape.

Step 4:   Affix the exposed mounting surface squarely to the desired location.
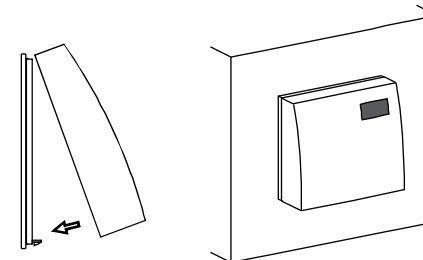
Screw mount

Step 1:   Remove the backplate as shown below.

Open cover here

Step 2:   Mount the backplate to the wall using appropriate screws (not included).

67   (Dimensions in mm)

60

67

Step 3:   Snap the Sensor onto the backplate.

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Selecting the Mounting Place for Optimum Solar Energy Storage

By means of the energy-optimized EnOcean radio technology used in Wireles Temperature Sensors, the Temperature Sensor supplies itself with electric energy using a 2 cm² solar cell and can work without batteries. Without the need to supply or change batteries, the Sensors are environmentally sound and maintenance-free.

The solar-powered energy storage may need to be recharged after prolonged storage in darkness. Typically this is accomplished automatically during the first few operating hours in daylight. If the initial charging in the first operating hours is not sufficient, the sensor should reach its fully functional state in 3 to 4 days at the latest. The sensor will operate properly even in nighttime conditions after this period of time.

To make sure the Wireless Room Temperature Sensor has enough ambient light to operate, mount the product in a suitable location. When selecting the mounting place, consider the following:

- The minimum illumination of 200Ix should be guaranteed at the mounting place for at least 3 to 4 hours every day, regardless of whether this is artificial light or daylight.
- The Health and Safety at Work Act (UK) requires a minimum illumination of 500Ix for office workplaces.
- The illumination should not exceed 1000Ix in the long term.
- Mounting in any 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 not be too steep.
- The sensors should preferably be mounted with the solar cell facing a window, but direct sunlight should be avoided. A position which occasionally receives direct sun radiation could lead the device to report false temperature information.
- Be sure that your location will not be obscured in shadow by any changes you may make to the room in the future.
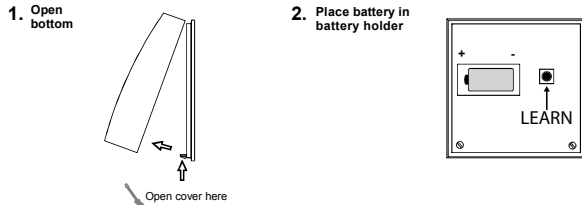
If the ambient brightness is not sufficient

The sensor is equipped with a battery holder for use in consistently unlighted areas.

Battery to be used: Lithium battery, 3.6V/1.1Ah Type LS14250 / 0.5 AA

Operating time approx. 5 to 10 years, depending on the condition and discharge rate of the battery used.

In order to change the sensor from solar to battery mode, simply put the battery into the battery holder.

1. Open bottom
Open cover here

2. Place battery in battery holder
+ -
LEARN

Transmission Range

The type of material used in a building is important in evaluating the transmitting range. Some guide ranges:

- Visual contacts: Typ. 30m range in passages, corridors. Up to 100m in halls
- Rigypsum 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 compartmentalisation

Other interference sources

Other devices that also operate with high-frequency signals (e.g. computers, audio/video systems, electronic transformers and ballasts, etc.) are also sources of interference. Keep such devices at least 0.5 m away from the Temperature Sensor.

Programming

In order to use the Wireless Room Temperature Sensor, the device must be "learned" by the receiver. This is done automatically by means of a "learn button" on the Sensor, or manually by input of the 32bit sensor ID and a special "learning procedure" between the Sensor and a receiver. The respective details are described in the corresponding documentation of the receiver. The LEARN button for the Temperature Sensor is located behind the back plate. See the section labeled "Selecting the Mounting Place for Optimum Solar Energy Storage" on the left side of this page for a picture showing how to remove the backplate and for the location of the LEARN button.

Temperature Sensing and Signal Transmission

There are two ways the Wireless Room Temperature Sensor can communicate temperature readings to other devices:

Event Controlled. When the Occupancy button on the front of the Temperature Sensor is pressed, the internal microprocessor wakes up, detects a temperature, and sends a signal conveying that reading to the receiver.

Time Controlled. The internal microproccessor wakes up at a selected interval, collecting temperature data and sending it to the receiver. If the temperature sensed is different that the previous reading by > 2%, the signal is sent immediately upon detection. If temperature has not changed, a signal is automatically sent after the selected number of wake cycles.

Setting the Transmission Time

The factory settings program the Wireless Room Temperature Sensor to send a new temperature signal approximately every 16 minutes (assuming no temperature change is detected sooner). How often the Sensor sends a signal has a direct impact on its energy use. Depending on the amount of light and energy available (or the desired life of a battery, if one is being used), it may be advantageous to adjust this setting.

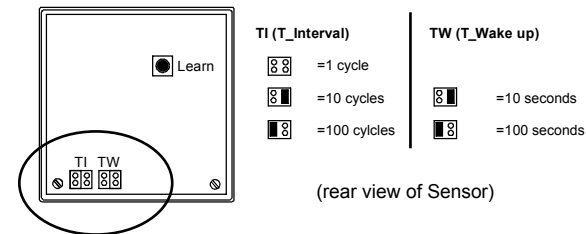Three variables control the transmission time: T_Wake up, T_Interval, and T_Send.

T_Wake up. This determines how long the unit waits between each temperature reading to wake it back up for another.
T_Interval. This determines how many wake cycles the unit will perform before sending a new signal even though the temperature has not changed.
T_Send. This is determined by multiplying T_Wake up and T_Interval together (T_Wake up x T_Interval = T_Send). It is the total time between signals (assuming temperature change is not detected sooner).

To change the Transmission Time, follow these steps:

Step 1: Remove the unit from the backplate.

Step 2: Locate the jumpers. These are small black brackets placed over pins in the lower left corner of the Sensor (see below).

Step 3: Use a pair of needle-nose pliers to gently lift the jumpers off the pins and replace them in the proper formation to create the desired settings (see table below). Be sure to keep any unused jumpers in a safe place.

Step 4: Re-attatch the unit to the backplate.

Learn

TI (T_Interval)
=1 cycle
=10 cycles
=100 cylcles

TW (T_Wake up)
=10 seconds
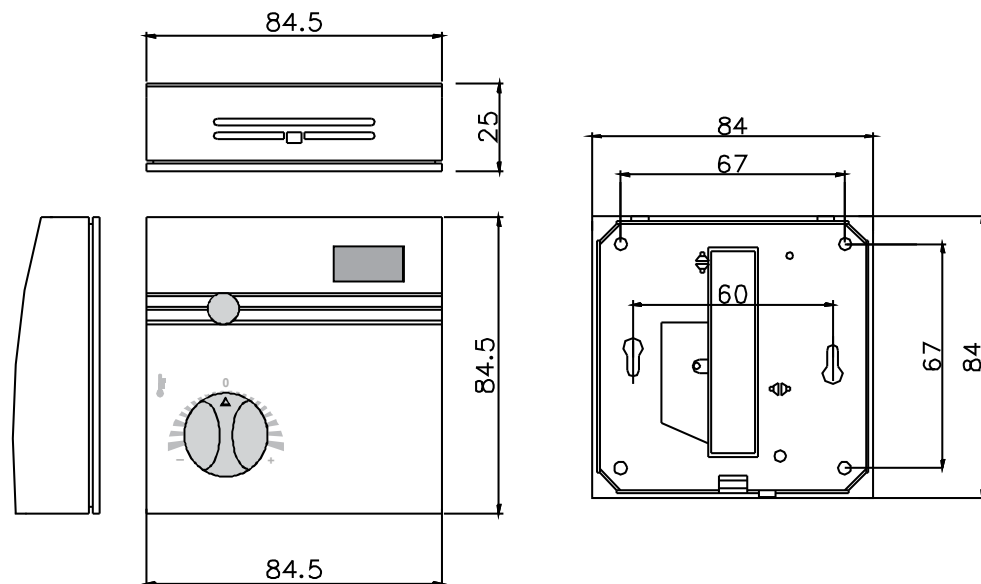=100 seconds

TI TW

(rear view of Sensor)

Factory Settings

T_Wake up: 100 seconds T_Interval: 10 cycles.

(T_Wakeup 100 seconds) x (T_Interval 10 cycles) = T_Send: 1000 seconds or about 16 minutes.

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Specifications

		SR04PTxx
Technology		Enocean, STM
Transmitting Frequency		315.0 MHz
Antenna		Type: Helix, Gain: -3dBi
Transmitting Range		approx 50-150 feet in buildings
Temperature Detection	Range	0°C to 40°C
	Resolution	0.15 K
	Absolute Accuracy	typ. +/-0.4K
Optional Humidity Sensor	Range	0-100% rH
	Resolution	0.4% rH
	Absolute Accuracy	+/-3% range 30%... 80%
	1 Point Calibration	50%
Optional Set Point Adjustment P	Range	0 to 270° angle of rotation
	Resolution	1.1°
Rotary Switch S		Number of switching steps 5 (A, 0, I, II, III)
Slide Swtch MS (optional with button T)		Number of switching steps 2 (O/I)
Measuring Value Detection		Every 100 seconds
Sending Interval (defaults)		...every 100 seconds if changes >0.8K or >3° angle of rotation or switch step rotary switch or slide switch ...every 1000 seconds if changes <0.8K or <3° angle of rotation
Energy Generator		Solar cell, internal goldcap, maintenance-free
Enclosure		ABS (ASA) color pure white similar to RAL 9010
Protection		IP20 according to EN60529
Ambient Temperature		-25°C to 65°C
Transport		-25°C to 65° C / max. 70% rH, non-condensed
Weight		50g

Dimensions (measurements in mm)

Contains FCC ID: S3N-SR04XX
Contains IC: 7953A-SR04XX

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications made to this equipment not expressly approved by Thermokon may void the user's authority to operate this equipment.

This device complies with Industry Canada RSS-210 Issue 7.

enocean alliance
No Wires. No Batteries. No Limits.

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