

Wireless room sensor

QPA2822.EU



Wireless temperature, humidity and CO2 room sensor, solar-powered, LoRaWAN

- Temperature sensor
- Humidity sensor
- CO₂ sensor (NDIR)
- LUX / light sensor
- LoRaWAN Class A device
- Solar energy-powered (organic solar panel)
- Battery-free
- 1.54 " e-ink display
- Firmware Update Over-The-Air (FUOTA)

Use

The wireless room sensor is a smart building sensor for indoor environmental monitoring in:

- Commercial office buildings
- Public infrastructure
- Residential buildings

Functions

The stand-alone wireless CO₂ sensor is powered by solar energy (organic solar panels) and displays current CO₂ levels as well as historical trends. Data from the CO₂ display is compatible with any LoRaWAN systems including Building Management Systems that control ventilation systems by demand. Sensor information is transferred as data points via a special gateway to Modbus, BACnet or KNX systems either periodically or triggered manually by pressing the 'Status' button.

The sensor has a built-in sensor to measure:

- Temperature
- Relative humidity
- CO₂

Temperature

The sensor acquires the temperature via a digital temperature sensor.

The temperature signal from the sensing element is converted to wireless digital signal values, corresponding to a temperature range of 0...+50 °C.

Relative humidity

The sensor acquires relative humidity via a digital capacitive relative humidity sensor (with bandgap temperature sensor).

The electronic unit converts the humidity signal to a wireless digital signal, corresponding to a relative humidity range of 0...80%.

Carbon dioxide (CO₂) levels in indoor air (ppm)

CO₂ in the room increases with occupancy and excess. CO₂ may result in health problems, including drowsiness and lethargy, and impact productivity, concentration, and decision making.

The table below outlines the CO₂ ranges and potential health problems:

Range (ppm)	Air quality / potential health problems
400..600	Healthy
600..1000	Fair
1000..1500	Moderate
1500..2500	Unhealthy: May cause drowsiness
>2500	Poor: May cause headaches, fatigue, loss of focus

The sensor acquires CO₂ concentration by infrared absorption measurement (NDIR) using automatic baseline calibration.

The resulting wireless digital output signal (400...5000) is proportional to the CO₂ content of the ambient air, corresponding to a CO₂ concentration range of 400...5000 ppm.

Automatic baseline calibration (ABC) of CO₂ measurement

The sensor is pre-calibrated by default with the ABC function enabled and based on an 8-day period. The baseline for the CO₂ measurement is 400 ppm (fresh air).

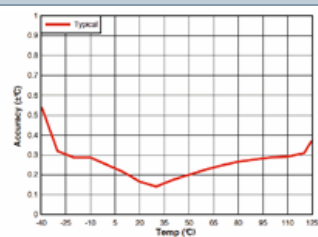
The sensor logs CO₂ values (as ppm) during the ABC period and calibrates the lowest CO₂ value logged against the baseline (400 ppm) for the next ABC period. Values below the baseline trigger the ABC function immediately, as CO₂ levels below 400 ppm are not considered possible for smart building applications.

The ABC function is suited for rooms that are not continuously occupied: When enabled, the sensor detects rooms that are not regularly occupied but linked to the outdoor air exchange and periodically performs automatic calibration. The ABC functions can be disabled in rooms that are continuously occupied (e.g. manufacturing plants).

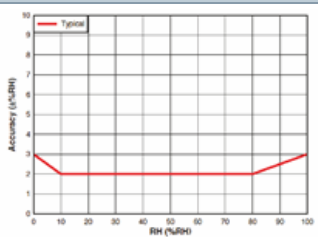
Sensor measurement accuracy

Carbon dioxide (CO ₂)	
Accuracy	±(30 ppm + 3 % of reading)
Range	400...5000 ppm

The following charts accuracy relative to temperature.

Temperature		
Resolution	0.1 °C	
Accuracy	±0.2...±0.7 °C	

The following charts accuracy relative to humidity.

Humidity		
Resolution	±2	
Accuracy	±3 % r.h.	

LUX sensor

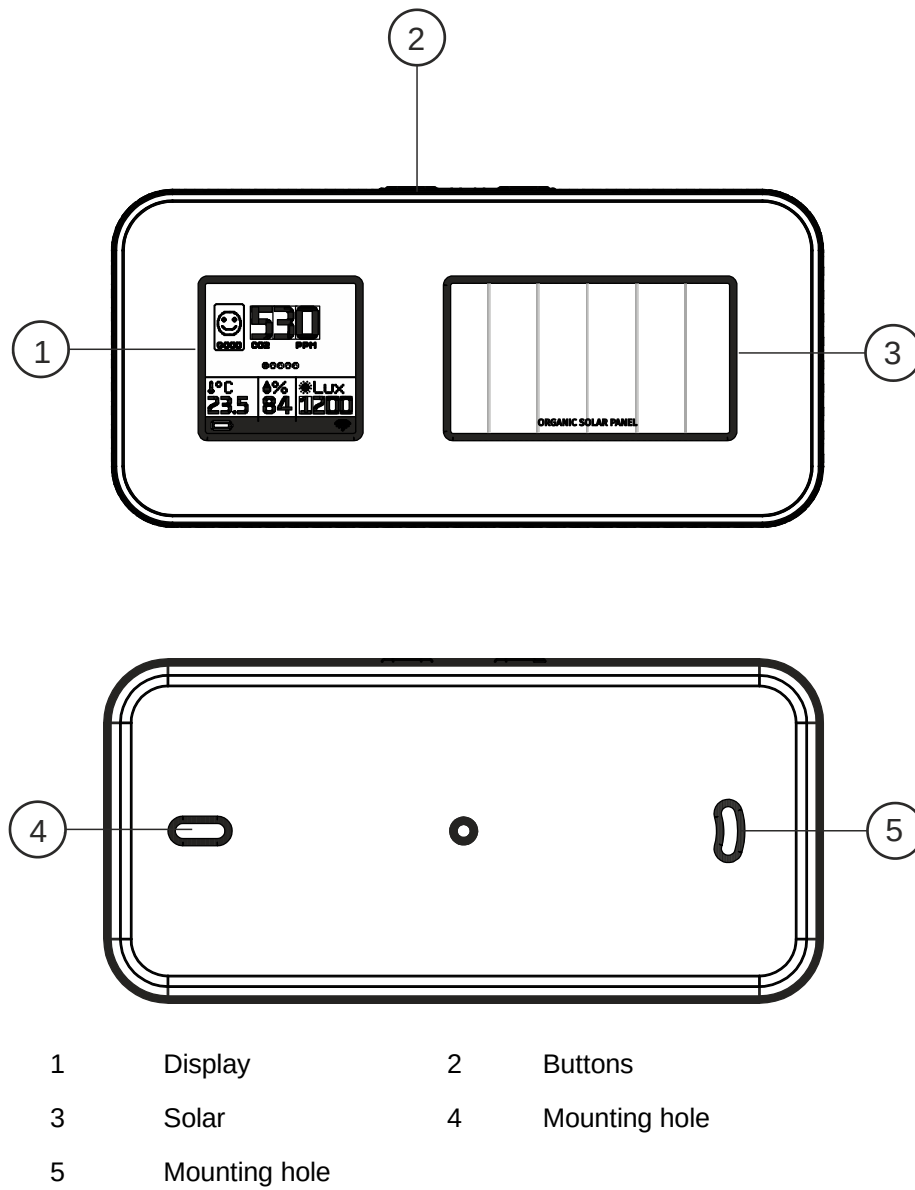
LUX	
Resolution	1 LUX
Accuracy	±10 %
Range	0...10'000 LUX

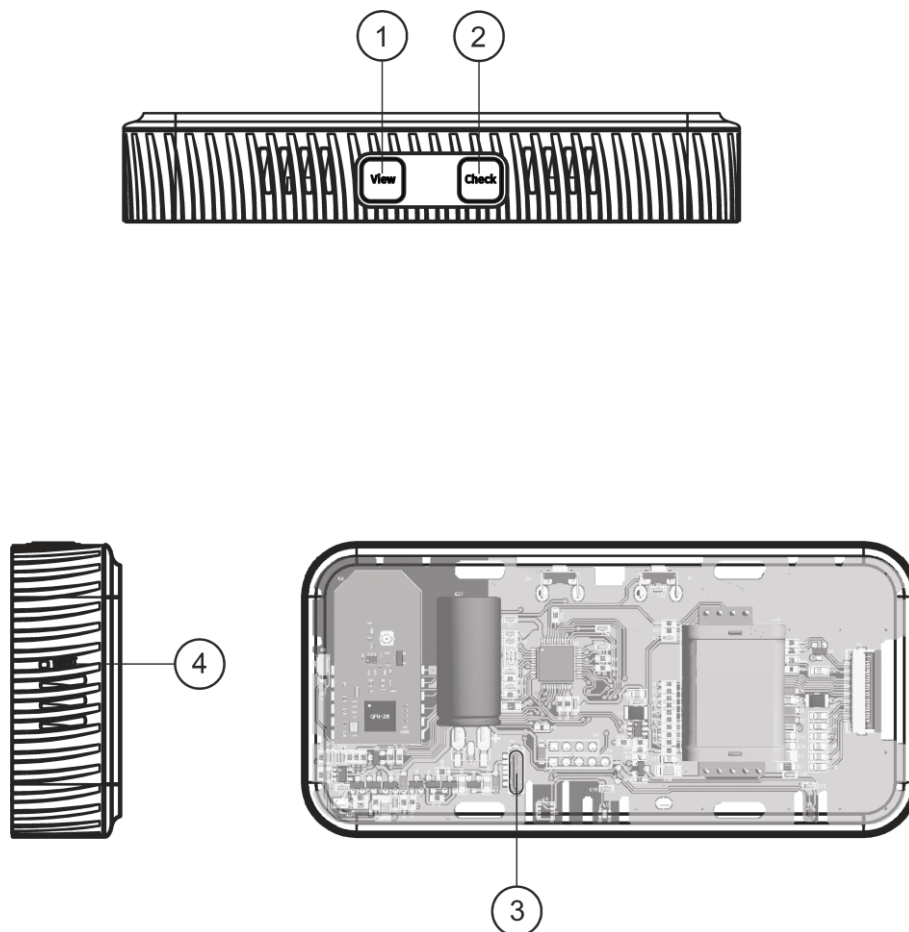
Technical design

Wireless room sensors can be for wall, flush, or tape mounting.

The device has two parts:

- Plastic housing with electronic components
- Mounting plate





- | | | | |
|---|---------------------------|---|---------------|
| 1 | Change screen view button | 2 | Status button |
| 3 | USB type C | 4 | Reset button |

Type summary

Ordering

When ordering, specify name, type and order number, e.g.:

Wireless temperature, humidity, CO₂ and LUX room sensor, QPA2822.EU, S55720-S650.

Name	Type	Order number
Wireless temperature, humidity, CO ₂ and LUX room sensor	QPA2822.EU	S55720-S650

Delivery

The wireless room sensors include the following:

Name	Quantity
Sensor	1
Wall mounting plate with adhesive tape	1
Secure bolt	1
Operating instructions	1

Title	Document ID
Operating instructions	A6V16160066

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.siemens.com/bt/download

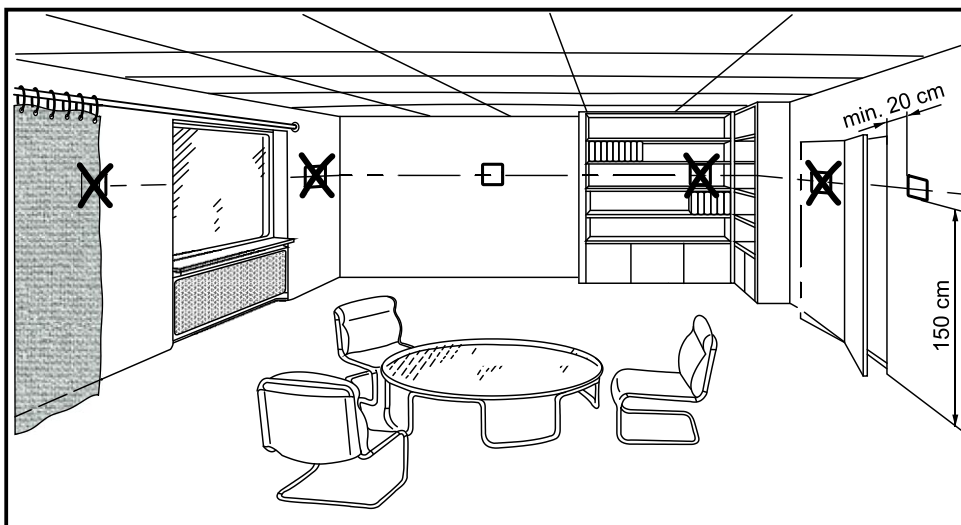
Notes

Safety

 CAUTION	
	National safety regulations Failure to comply with national safety regulations may result in personal injury and property damage. Observe national provisions and comply with the appropriate safety regulations.

Mounting

Location



The device is designed for wall, flush, and tape mounting.

1. Mount in indoor environments (device is not suitable for outdoor use).
2. Do not mount the device in recesses, shelves, behind curtains or doors, or above or near heat sources.
3. Do not mount the device in a cabinet or metal container.
4. Avoid direct solar radiation and drafts.
5. Mount the device about 1.5 m above the floor, and at least 20 cm away from the next wall.
6. Seal the conduit box or the installation tube if any, as air currents can affect sensor readings.

7. Mount the device at least 5 m away from operable windows, air filters, and fresh air diffusers. **NOTICE! In areas where this is not possible, center your device between windows and place your monitor closer to return air and further away from air diffusers.**

Installation



Operating instructions are enclosed in the package.

Disposal



This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.
For additional details, refer to [Siemens information on disposal](#).

Power supply

Mechanical specification	
Weight	0.096 kg
Dimensions (L x W x H)	122 x 58 x 22 mm
Enclosure	PC / ABS
Mounting options	Screws and dowels or double-sided tape (included), anti-theft bracket with secure screw

Operating conditions	
Temperature	0...+50 ° C
Humidity	0...80 % r.h. (non-condensing)

Power supply	
Power supply	Solar-powered lithium-ion capacitor (LIC) and / or USB
Operating voltage	DC 2.5...3.8 V powered by solar panel, DC 5 V powered from USB
Expected battery life	Indefinite powered by solar

Radio / Wireless	
Wireless technology	LoRaWAN® 1.0.3
Wireless security	LoRaWAN® end-to-end encryption (AES-CTR)
LoRaWAN device type	Class A device
Supported LoRaWAN features	OTAA, ADR, adaptive channels setup
Supported LoRaWAN regions	EU868
Link budget	130 dB
RF transmission power	14 dB
Frequency range	863...870 MHz

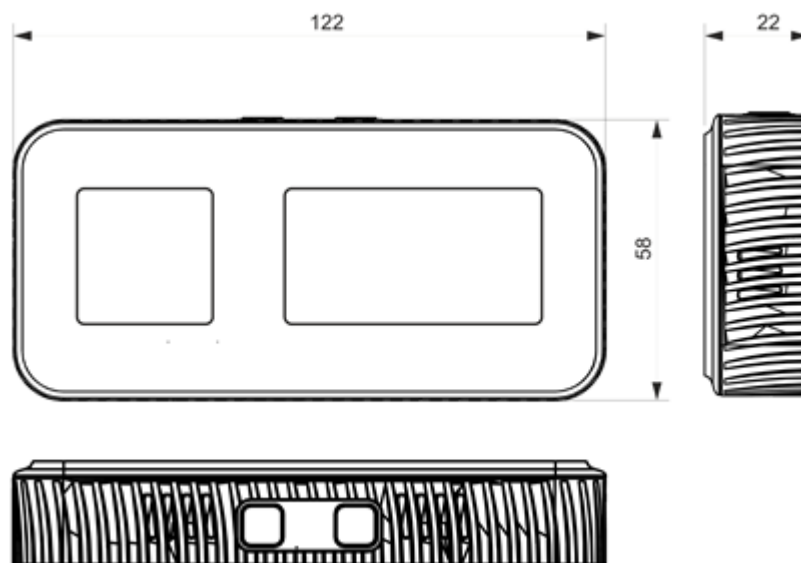
Ambient conditions	
Climatic ambient conditions • Transport and storage (in packaging) as per IEC/EN 60721-3-2 / -3-1 • Operation as per IEC/EN 60721-3-3	• Class 2K12 / 1K22 Temperature -40...+70 °C (-40...+158 °F) Air humidity 5...95 %. (non-condensing) • Class 3K23 Operation in dry locations with no temperature or humidity control Temperature -5...+50 °C (23...122 °F) Air humidity 5...95 % (non-condensing)
Mechanical ambient conditions • Transport (in transport packaging) as per IEC/EN 60721-3-2 • Operation as per IEC/EN 60721-3-3	Class 2M4 Class 3M11

Protection classification	
Degree of protection of housing as per EN 60529	IP20

Standards, directives and approvals	
Product standard	IEC/EN 62381-1 Information Technology Equipment
Electromagnetic compatibility	For residential, commercial, and industrial environments
EU conformity (CE)	See EU declaration of conformity *)
Environmental compatibility	The product environmental declaration () contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

*) The documents can be downloaded at <https://www.siemens.com/bt/download>.

Dimensions



Dimensions in mm

Regulatory compliance information

European Union conformity

Contact for regulatory topics: (EU) Siemens AG, Berliner Ring 23, DE-76437 Rastatt

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