

Presence Sensor KL LD



Radar Presence Sensor KL LD (Version 1.0)

The Senvolon KL LD presence detector can detect people within a range of approximately 9 meters. The detection angle is 150°. The radar technology (24 GHz) used detects even the slightest movements, allowing it to detect people who are completely still or asleep. The detection sensitivity is configurable.

Furthermore, the distance to a person is measured. This also allows the system to respond to different positions within the room.

Measurements of brightness, temperature, humidity, and air pressure, as well as the configurable delay time, can be used to control automation.

The presence sensor is integrated into a Wi-Fi network and offers direct access via a web browser. The measured values can also be transmitted via MQTT for easy integration into common smart home solutions. Alternatively, the measured values can be accessed worldwide via remote access.

The integrated siren can acoustically signal detected or missing presence. The siren can also be controlled via web browser and MQTT.

Other devices can be controlled directly via a switching signal output.

Functionality

The presence sensor is based on FMCW radar technology and is therefore capable of detecting even the smallest movements (e.g. breathing). It is therefore significantly more sensitive than common infrared motion detectors. In addition, localization within the detection area of the presence sensor is possible.

Please note that localization can be influenced by various factors. Possible causes of measurement inaccuracies include:

- **Reflections** from walls, furniture, and other objects
- **Absorption** of the radar waves by certain materials
- **Interference** from other electronic devices in the surrounding area
- **Complex environments**, such as rooms with many obstacles or moving objects

To improve measurement accuracy, we recommend choosing the position of the presence sensor so that direct reflections are avoided, there is a clear line of sight to the measurement area, and sources of interference such as other electronic devices or reflective surfaces are avoided.

Notes

Before putting this device into operation, please read this safety and user information carefully. The language of the user interface can be changed under “System”.

The device is designed exclusively for the intended indoor use described in the user information. The housing is not protected against the ingress of water.

The installation location must allow safe routing of all connected cables. They must not be damaged or crushed.

Installing the Presence Sensor

The presence sensor is installed either on a wall at a height of 1.50 - 2.00 m or on the ceiling. The radar sensor is located behind the closed plastic cover and radiates into the room. The type of installation (ceiling/wall) must be defined in the settings.

Power can be supplied either via USB-C or from the rear by means of an internal connector (JST PH 2.0). The switching signal output is also routed out through the rear opening.

Open the housing by unscrewing the three hex socket screws and carefully removing the cover. Installation on a wall or ceiling is done using two screws. Then replace the cover and screw it tight again.

Make sure that you have a sufficiently strong Wi-Fi connection at the installation location.

For example, connect the presence sensor using the enclosed USB-C cable to a power supply unit that delivers at least 1 A.

Wiring connections

Inside, the presence sensor has a 4-pin JST PH 2.0 socket. This allows the presence sensor to be supplied with 5V and provides the switching signal for signaling presence.

The connections are labeled as follows:

Label	Meaning
SIG	Signal output (0V = no presence, 3V3 = presence)
3V3	3V3 output
GND	Ground
5V	5V input and output

Resetting to factory settings

To reset the presence sensor to its factory settings, press and hold the button labeled “SYS” inside the device while connecting the power supply. Keep the button pressed for at least 5 seconds. The sensor will then be back in its factory settings.

Connecting to your Wi-Fi

1: Preparation

Make sure you know your Wi-Fi network details, such as the network name (SSID) and password.

2: Connect to the Access Point

The presence sensor provides its own access point, i.e. its own Wi-Fi network. Using your smartphone, tablet or computer, search in the Wi-Fi settings for the network named “PresenceSensor-xxxxxx” and connect to it. The default password is “12345678”. The access point has the IP address 192.168.4.1.

3: Access the Configuration Interface

Open a web browser on your device that is connected to the presence sensor. Enter the address “http://192.168.4.1/wifi” in the address bar to open the configuration interface. If the configuration interface is not displayed, please make sure that you are connected to the access point and, if you are using a smartphone or tablet, also disable the mobile data connection.

4: Wi-Fi Settings

Now enter your Wi-Fi network details. Select your network or enter it under “SSID”. Under “Password”, enter the Wi-Fi network key. Under “Hostname”, assign a suitable name for your presence sensor. You can initially leave all other fields under “More” at their default settings. Make sure that you enter the correct information to establish a successful connection. Save the settings with “Save” and wait a moment while the presence sensor attempts to connect to your Wi-Fi.

Wifi Configuration

Available networks

Select network ▾

Network name (SSID)

WIFI_SSID

Password

.....

Hostname

bathroom

More >

Back

Save

IP: 192.168.168.55

Status: connected

5: Verify the Connection

If the connection to your Wi-Fi has been established successfully, the IP address of the presence sensor is displayed at the bottom of the page. Alternatively, you can find the IP address of the presence sensor in your router's configuration area, or use a network scanner on your smartphone to search your Wi-Fi for the name of the presence sensor.

After the presence sensor has established a connection to your Wi-Fi, you can disconnect the device that was connected to the presence sensor's access point and reconnect it to your own Wi-Fi. In the web browser, you can now connect to the presence sensor by entering its IP address. If your router supports name resolution, access is via the hostname `http://hostname` (the name of the presence sensor that you assigned in the previous step). If you are using, for example, a FRITZ!Box, call "`http://hostname.fritz.box`".

If the presence sensor is available neither in your Wi-Fi nor in access point mode, briefly disconnect it from power and check the connection again.

Setting up the Presence Sensor

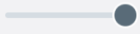
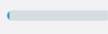
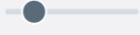
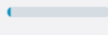
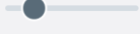
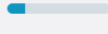
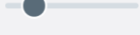
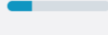
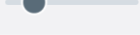
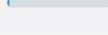
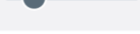
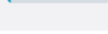
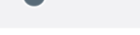
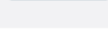
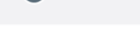
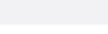
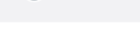
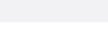
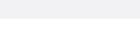
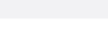
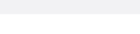
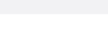
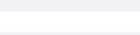
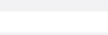
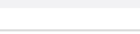
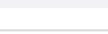
The default settings are suitable for most wall-mounting scenarios and should only be adjusted to the environment if necessary. Presence detection is **triggered by a single instance of motion detection**. The presence sensor continuously detects motion and stationary presence, including the distances. "Motion" and "Stationary presence" are configured separately.

Sensitivity

The sensitivity of the presence sensor can be adjusted according to the environment. The entire measuring range is divided into individual gates. The sensitivity for detecting movement and stationary presence is set separately for each gate. Measurements below a defined threshold are ignored.

The current values for movement and stationary presence are displayed continuously to simplify configuration for different detection scenarios.

Stationary Gates ▾

 0.75m	100		 0.75m	2 %	
 1.50m	15		 1.50m	3 %	
 2.25m	15		 2.25m	17 %	
 3.00m	15		 3.00m	24 %	
 3.75m	15		 3.75m	2 %	
 4.50m	15		 4.50m	3 %	
 5.25m	15		 5.25m	2 %	
 6.00m	15		 6.00m	4 %	
 6.75m	15		 6.75m	3 %	
 7.50m	15		 7.50m	3 %	
 8.25m	15		 8.25m	2 %	
 9.00m	15		 9.00m	1 %	
 9.75m	15		 9.75m	1 %	

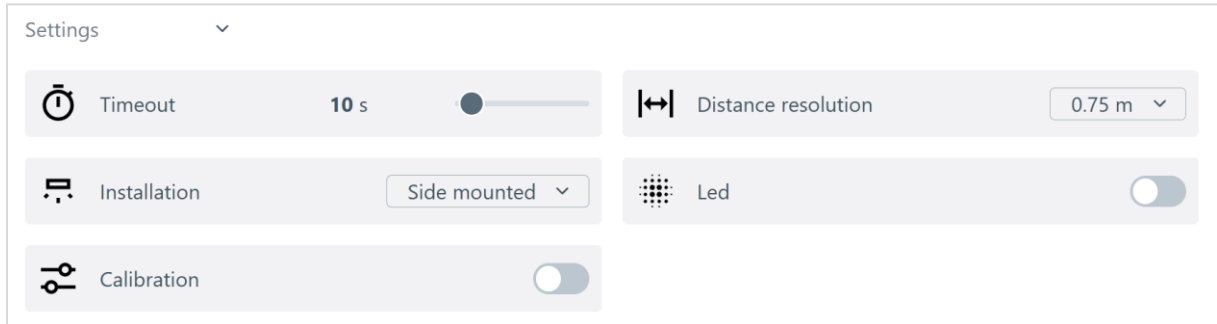
Please note that other moving objects in the room (e.g. moving curtains or pets) can affect detection. To suppress detection in a specific distance range, set the threshold there to 100.

A quick and precise adjustment of the values is possible in the browser as follows:

- Click and hold the slider with the mouse button
- Set the desired value roughly
- Fine-tune using the left and right arrow keys

Distance resolution

The distance between two levels can be 0.75 m, 0.5 m or 0.2 m. For wall mounting, a spacing of 0.75 m or 0.5 m is recommended. For ceiling mounting, a spacing of 0.2 m is recommended.



The screenshot shows a 'Settings' menu with a dropdown arrow. It contains several settings cards:

- Timeout:** Set to 10 s with a slider control.
- Distance resolution:** Set to 0.75 m with a dropdown menu.
- Installation:** Set to 'Side mounted' with a dropdown menu.
- Led:** A toggle switch that is currently turned on.
- Calibration:** A toggle switch that is currently turned off.

Please note that radar can also penetrate walls or glass panes. Accordingly, persons outside a room may also be detected unless the range is adjusted.

Timeout

Configuring a timeout determines how long the signaling of detected presence should be maintained when no person is detected anymore. A timeout can prevent, for example in a lighting control application, the lights from switching on and off when the detection area is left only briefly.

Installation

“Installation” determines the type of installation (ceiling/wall). Please select the installation type you have chosen here.

Led

The “Led” switch activates continuous display of the sensor status via a multicolor Led. If the switch is deactivated, the Led is automatically turned off 90 s after the sensor starts.

Led Color	Meaning
White	Start
Yellow	Reset
Cyan	Access point / no Wi-Fi connection
Blue	Wi-Fi connected
Green	MQTT connected
Purple	Firmware update
Red	Siren activated

Calibration

In environments where movement is present but should not be detected (e.g., rooms with ventilation or air conditioning), this movement can be suppressed during calibration. Leave the room before performing the calibration and do not re-enter until the calibration is complete.

Once calibration is activated, it will begin in 10 seconds and will be completed within 3 minutes. No measurement values will be transmitted during this time.

Alert

The internal siren can acoustically indicate either detected presence or missing presence.

Alert


Alert

OFF


Siren

☐

Zones

The presence sensor allows the room to be divided into zones. Configuration is carried out in the “Zones” section.

Zones Configuration

Zone name	From	To
Very Short	0	180
Zone name	From	To
Short	180	360
Zone name	From	To
Medium	360	540
Zone name	From	To
Long	540	720
Zone name	From	To
Very Long	720	900

A maximum of five zones can be defined. Each zone has its own name (e.g. dining table or sofa). The size of the zone is defined by the start and end distance from the perspective of the presence sensor. A zone is only valid if it is fully defined. The check whether someone is located in a zone is performed from top to bottom.

In the factory settings, five zones are already defined. If you want to delete a zone, remove the start and end distance.

All settings only take effect after clicking “Save”.

Measured values

The following measured values are provided:

Presence Sensor

 Presence ON	 Distance 0 cm
 Motion OFF	 Stationary ON
 Motion 0 %	 Stationary 0 %
 Motion 0 cm	 Stationary 0 cm
 Zone Short	 RSSI - dBm
 Temperature 21.3 °C	 Humidity 51.3 %
 Air pressure 1014.4 hPa	 Brightness 320.8 lx

- **Presence:** Presence of a person, possibly taking the run-on time into account
- **Presence distance:** Last measured distance to a present person
- **Motion detection:** Movement of a person
- **Stationary detection:** Stationary person
- **Motion intensity:** Intensity of detecting a person's movement
- **Stationary detection intensity:** Intensity of detecting a stationary person
- **Motion distance:** Last measured distance when motion was detected
- **Stationary distance:** Last measured distance to a stationary person
- **Zone:** Detected zone
- **RSSI:** Wi-Fi signal strength
- **Temperature:** Ambient temperature
- **Humidity:** Relative humidity
- **Air pressure:** Current air pressure
- **Brightness:** Measured brightness

Please note that after switching on the sensor, it takes at least 30 minutes until the correct values for temperature and humidity are displayed. If required, the values can be calibrated using an offset under "System".

RSSI	Wi-Fi Signal Quality
> -50 dBm	Excellent
-50 bis -60 dBm	Good
-60 bis -70 dBm	Sufficient
< -70 dBm	Weak

Wi-Fi Configuration

In addition to the access data for your own Wi-Fi and the presence sensor's access point, time-controlled activation of Wi-Fi can be configured under "More". For this, the start and end time for activating Wi-Fi must be specified. For uninterrupted Wi-Fi operation, the start and end time must be set to the same value. If Wi-Fi is unavailable, the presence sensor regularly attempts to reconnect. The duration until a new connection attempt can also be defined.

Wifi Configuration

Available networks

Select network

Network name (SSID)

WIFI_SSID

Password

.....

Hostname

bathroom

More

Access Point SSID

PresenceSensor

Access Point Password

.....

Wifi + Access Point

☒

On

00:00

Off

00:00

Reconnect after

1 min

IP Configuration

DHCP

NTP Server

pool.ntp.org

Back

Save

IP: 192.168.168.55
Status: connected

By default, integration into the network is performed via DHCP. However, it is also possible to assign a static IP address.

The NTP server is set to "pool.ntp.org" by default. If required, another server can be stored.

If Wi-Fi is unavailable, the presence sensor creates its own Wi-Fi network. The corresponding name and password can be configured. The IP address is always 192.168.4.1. The availability of the access point in parallel with the Wi-Fi connection can be activated.

All settings only take effect after clicking “Save”.

Connection via MQTT or Remote Access

The presence sensor can be connected either to an MQTT broker for data exchange or to Senvolon remote access. Remote access allows measured values to be read on devices that are not connected to your Wi-Fi but are connected to the internet.

MQTT Configuration

Under “Connection type”, select the “MQTT Broker” configuration. In addition to the name or IP address and port (default: 1883) of the MQTT broker, the interval after which a new connection attempt should be started can also be set. If the broker requires a login and password, these must be entered here. The “Client id” is used to identify the presence sensor as an MQTT client and must be unique for each client.

The “Main Topic” field defines the topic under which sensor data is published (e.g. “PresenceSensor”).

The “Publish interval” defines the time interval at which all measurement, configuration, and status values are sent to the broker in JSON format.

The connection can be encrypted via SSL/TLS (default port: 8883).

Connections

Connection type

MQTT Broker

Server

192.168.168.68

Port

1883

Reconnect after

30 sec

Login

Login

Password

.....

Client id

ps64e8337eac48

Main topic

bathroom

Publish interval

5 min

Encryption

☐

Home Assistant

☒

If you select “Home Assistant”, MQTT Discovery for Home Assistant is activated. A presence sensor connected to the broker is automatically found and configured by Home Assistant.

All settings only take effect after clicking “Save”.

MQTT communication uses the Tasmota scheme:

- “tele/{Sensor Name}/STATE”: Sends the current status of the presence sensor
- “tele/{Sensor Name}/LWT”: Availability of the presence sensor
- “stat/{Sensor Name}/VALUE”: Transmits the status of a specific value
- “cmdn/{Sensor Name}/VALUE”: Sends a specific value to the presence sensor

Example:

“cmdn/{Sensor Name}/SIREN” activates or deactivates the built-in siren

Configuration Values/Commands

Value/Command	Description
WIFI_ON	HH:MM – z.B. 6:00 Uhr
WIFI_OFF	HH:MM – z.B. 22:00 Uhr
MQTT_PUBLISH_INTERVAL	In seconds - e.g. 300 = 5 minutes
USE_THRESHOLD	Brightness threshold (OFF/LESS THAN/GREATER THAN)
THRESHOLD	Threshold - e.g. 15
DISTANCE_RES	Distance levels (0.75 m/0.2 m)
DETECTION_TIMEOUT	Run-on time - e.g. 60 s
MAX_MOVING_GATES	Number of movement levels (0-8)
MAX_STATIONARY_GATES	Number of stationary levels (0-8)
INSTALLATION	Installation (0 = ceiling, 1 = wall)
LEDS	LED (ON/OFF)
UPDATE	Send current device status
CALIBRATION	Calibration (ON/OFF)
SIREN	Siren (ON/OFF)

Measured Values

Value	Description
PRESENCE	Presence (ON/OFF)
DETECTION_DIST	Distance - e.g. 220 cm
MOVING	Motion (ON/OFF)
MOVING_TARGET_DIST	Motion distance - e.g. 200 cm
STATIONARY	Stationary presence (ON/OFF)
STATIONARY_TARGET_DIST	Stationary presence distance - e.g. 210 cm
ZONE	Detected zone - e.g. dining table

Status

Value	Description
IP	IP address - e.g. 192.168.4.1
SIGNAL	RSSI - e.g. -73 dBm
LWT	Availability - e.g. online
TEMPERATURE	Temperature - e.g. 22° C
HUMIDITY	Humidity - e.g. 45%
PRESSURE	Air pressure - e.g. 1,010 hPa
BRIGHTNESS	Brightness - e.g. 550 lx
LANGUAGE	Language (DE/EN)
VERSION	Firmware version - e.g. 3.0.0 / 1.26.1
BOOT	Start time - e.g. 27.09.2025 20:53
NAME	Name - e.g. Presence Sensor

Remote Access

Under “Connection type”, select the “Remote access” configuration. This is available worldwide via “remote.senvolon.de”. To log in, in addition to the displayed Remote id, a password with at least eight characters is required, which you define yourself.

Connections

Connection type

Remote Access ▼

Remote id

pt30eda038cc14

Password

Reconnect after

30 sec ▼

If remote access is unavailable, the presence sensor regularly attempts to reconnect. The duration until a new connection attempt can be defined.

Web App on iOS

Log in at “https://remote.senvolon.de” in the browser (Safari). As soon as the page with the measured values is displayed, tap the Share icon. It looks like a square with an upward-pointing arrow and is located at the bottom of the screen (on iPhone) or in the upper right corner (on iPad). Then scroll down in the Share menu and select “Add to Home Screen”. After that, click “Add” in the upper right corner and you will get direct access to the sensor data in the form of an app. You can also activate push notifications in the event that presence is detected.

Web App on Android

Log in at “<https://remote.senvolon.de>” in the browser (Chrome). As soon as the page with the measured values is displayed, tap the menu icon (three vertical dots) in the upper right corner of the screen. Then scroll down in the menu and select “Add to Home screen”. After that, click “Add” and you will get direct access to the sensor data in the form of an app. You can also activate push notifications in the event that presence is detected.

System

Under “System”, you can access various pieces of information about operation of the presence sensor. In addition to the download option for the complete configuration in JSON format for backup purposes, the log file is also available. Logging can be switched on and off. Debug information can also be recorded in the log file if required. Once the log file reaches a certain size, it is automatically truncated.

System

Download ConfigDownload Logfile

Logging

Debug

☐

☐

Sensor name

Language

Authentication

Login

Password

☐

Temperature Offset

Pressure Offset

Humidity Offset

Back

Save

Restart

Reset

The name of the presence sensor displayed on the main page can be customized.

Under “Language”, set the preferred user language.

To protect against unauthorized access, authentication via login and password can be activated.

For the ambient values temperature, air pressure and humidity, calibration is possible by setting an “offset”. The offset corrects the measured value upward or downward.

“Restart” restarts the system.

“Reset” resets the presence sensor to factory settings.

All settings only take effect after clicking “Save”.

Update

The update function provides the option of updating the firmware. A saved configuration can also be imported. To do this, upload the presence sensor’s “config.json” file. First select the corresponding file using the “Choose file” function and then click “Upload”.

Update

File upload

Choose File

No file chosen

Back

Upload

Restart

Retrieving measured values via HTTP

Calling “http://hostname/measurements” returns the current measured values in JSON format.

Controlling the siren via HTTP

Calling “http://hostname/siren?turn=on” activates the siren and “http://hostname/siren?turn=off” deactivates it. The current status of the siren is returned in JSON format.

If something isn't working

If you are experiencing issues with the Wi-Fi or MQTT connection, or if you would like to analyze how the sensor is functioning, please enable logging under “System.” All relevant events and errors will then be logged. You can obtain even more information by enabling the “Debug” option.

The most recent entries are displayed immediately. You can also download the log.

During normal operation, you should disable both logging and the debugging function to ensure a long service life for the internal flash memory.

Our support team is also happy to assist you at support@senvolon.de.

Technical Data

Power supply	5V DC (USB-C)
Power consumption	0.8 W
Wi-Fi frequency	2.4 GHz
Radar frequency	24 GHz
Modulation	FMCW
Weight	59 g
Dimensions (D x H)	94x15 mm
Max. distance	9.75 m
Distance levels	0.2 / 0.5 / 0.75 m

Contact

SENVOLON GmbH

Dolomitstr. 37

50226 Frechen

www.senvolon.de

Email: info@senvolon.de

Conformity

This product complies with the essential requirements of the applicable EU directives.



Radio and Radar information

The device contains a millimeter-wave radar for presence detection in the 24 GHz frequency range.

The emitted power is below the legally defined limits for human exposure. When used as intended, there is no health risk.

Modifications to the device are not permitted and will void the radio approval. The device is intended for indoor operation only.

In addition, the device contains a radio module for Wi-Fi in the 2.4 GHz frequency range as well as a Bluetooth module in the 2.4 GHz frequency range.

Details on frequency bands and maximum transmit power can be found in the “Technical Data” section.

Disposal information

Disposal of Waste Electrical Equipment (WEEE / ElektroG)

This device is marked with the symbol of a crossed-out wheeled bin. It must not be disposed of with household waste.

Waste electrical equipment must be taken separately from household waste to a collection or return point.



Data protection

If the device has stored personal data (e.g. network or user information), delete this data before disposal.

Manufacturer information

Manufacturer: SENVOLON GmbH

WEEE registration no. Germany: DE 93352512