Presence Sensor KL LD



Radar Presence Sensor KL LD (Version 1.1)

The Senvolon Presence Sensor KL LD detects people who are present up to a range of about 9 m. The detection angle is 150°. The radar technology used (24 GHz) registers the smallest movements, so that even people who keep completely still or are asleep are detected. The sensitivity of the detection is configurable.
The distance to a person who is present is measured as well. This also makes it possible to react to different positions in the room.

The measured brightness, temperature, humidity and air pressure as well as the configurable timeout can be used to control automations.

The presence sensor joins a Wi-Fi network and can be accessed directly with a web browser. The readings can also be transmitted via MQTT for easy integration into common smart home systems. Alternatively, remote access makes the readings available worldwide.

The integrated siren can signal present or absent presence acoustically. The siren can also be controlled via web browser and MQTT. 15 sounds are available for the siren: signals, chimes and melodies.

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

How it works

The presence sensor is based on FMCW radar technology and can therefore reliably detect the smallest movements, such as breathing. It is far more sensitive than common infrared motion detectors. Beyond that, it can determine the distance within its measuring range.

Please note that the distance measurement can be influenced by various factors. Possible causes of inaccurate measurements are:

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

To improve the accuracy of the measurement we recommend choosing a position for the presence sensor that avoids direct reflections, has a clear line of sight into the area to be measured, and keeps away from sources of interference such as other electronic devices or reflective surfaces.

Notes

Please read this safety and user information carefully before putting the device into operation. The language of the user interface can be changed to German or Spanish under “System”.

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

The mounting location must allow all connected cables to be routed safely. They must not be damaged or crushed.

Mounting the presence sensor

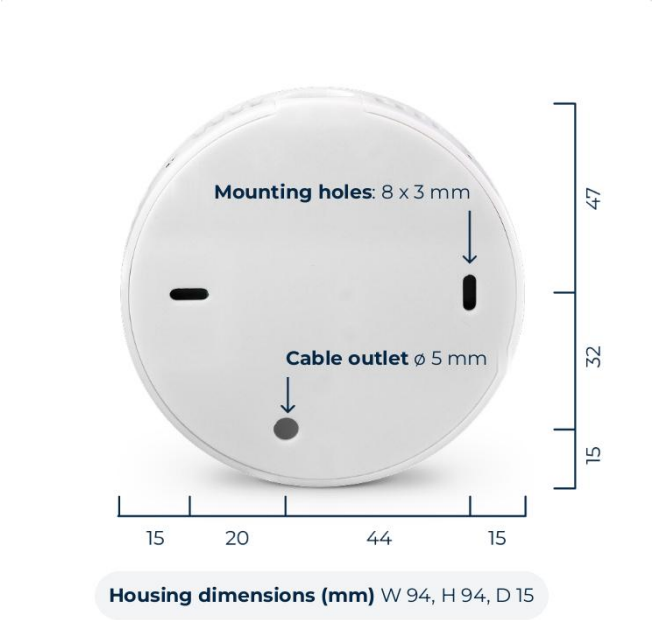
The presence sensor is installed either on a wall at a height of 1.50 – 2.00 m or on the ceiling. The radar sensor sits behind the closed plastic cover and radiates into the room. The type of installation (ceiling/wall) has to be set in the settings.

Power can be supplied either through USB-C or from behind through the connector (JST PH 2.0) inside. The switching signal output is led out through the rear opening as well.

Open the housing by removing the three hexagon socket screws and carefully lifting off the cover. The sensor is mounted on the wall or ceiling with two screws. Afterwards put the cover back on and screw it tight.

Make sure that the Wi-Fi signal at the mounting location is strong enough.

Connect the presence sensor, for example with the supplied USB-C cable, to a power supply that delivers at least 1 A.



Connections

Inside, the presence sensor has a 4-pin JST PH 2.0 socket. It supplies the presence sensor with 5 V and provides the switching signal that indicates presence.

The connections are labelled as follows:

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

Resetting to factory settings

To return the presence sensor to its factory settings, press and hold the button labelled “SYS” inside the housing while you connect the power. Please hold the button for at least 5 seconds. The sensor is then back in its factory state.

Joining your own Wi-Fi network

1: Preparations

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

2: Connect to the access point

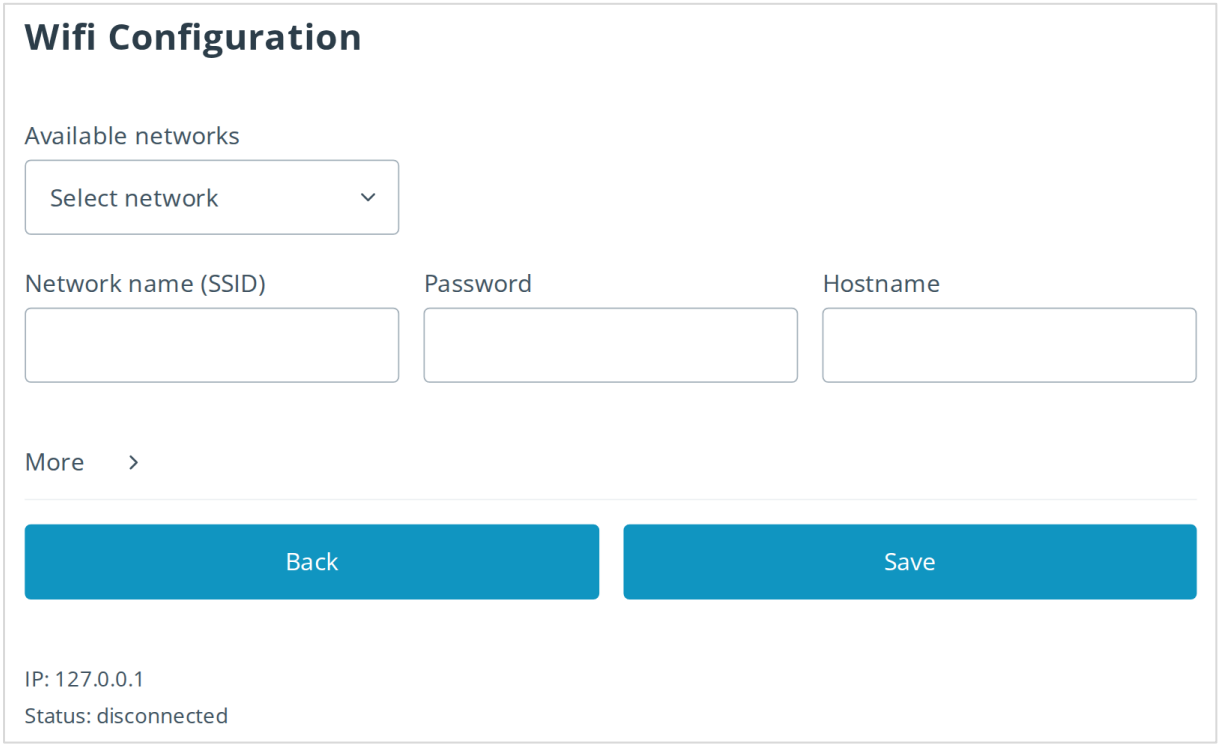
The presence sensor provides an access point of its own, that is, its own Wi-Fi network. On your smartphone, tablet or computer, look in the Wi-Fi settings for the network named “PresenceSensor-xxxxxx” and connect to it. The default password is “12345678”. The access point has the IP address 192.168.4.1.

3: Open 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 shown, please make sure that you are connected to the access point, and on a smartphone or tablet also switch off the mobile data connection.

4: Wi-Fi settings

Now enter the details of your Wi-Fi network. Select your network or type it under “Network name (SSID)”. Under “Password”, enter the Wi-Fi network key. Under “Hostname”, give your presence sensor a suitable name. All other fields under “More” can be left at their defaults for now. Make sure the information you enter is correct so that the connection succeeds. Store the settings with “Save” and wait a moment while the presence sensor tries to connect to your Wi-Fi network.



5: Check the connection

Once the connection to your Wi-Fi network has been established, the IP address of the presence sensor is shown at the bottom of the page. You can also find the IP address in the configuration area of your router, or use a network scanner on your smartphone to search your network for the name of the presence sensor.

Once the presence sensor has connected to your Wi-Fi network, you can disconnect the device you joined to the sensor's access point and connect it to your own network again. In the web browser you can now reach the presence sensor by entering its IP address. If your router supports name resolution, you can call it up by hostname: http://*hostname* (the name of the presence sensor that you assigned in the previous step). With a FRITZ!Box, for example, you call up "http://*hostname*.fritz.box".

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

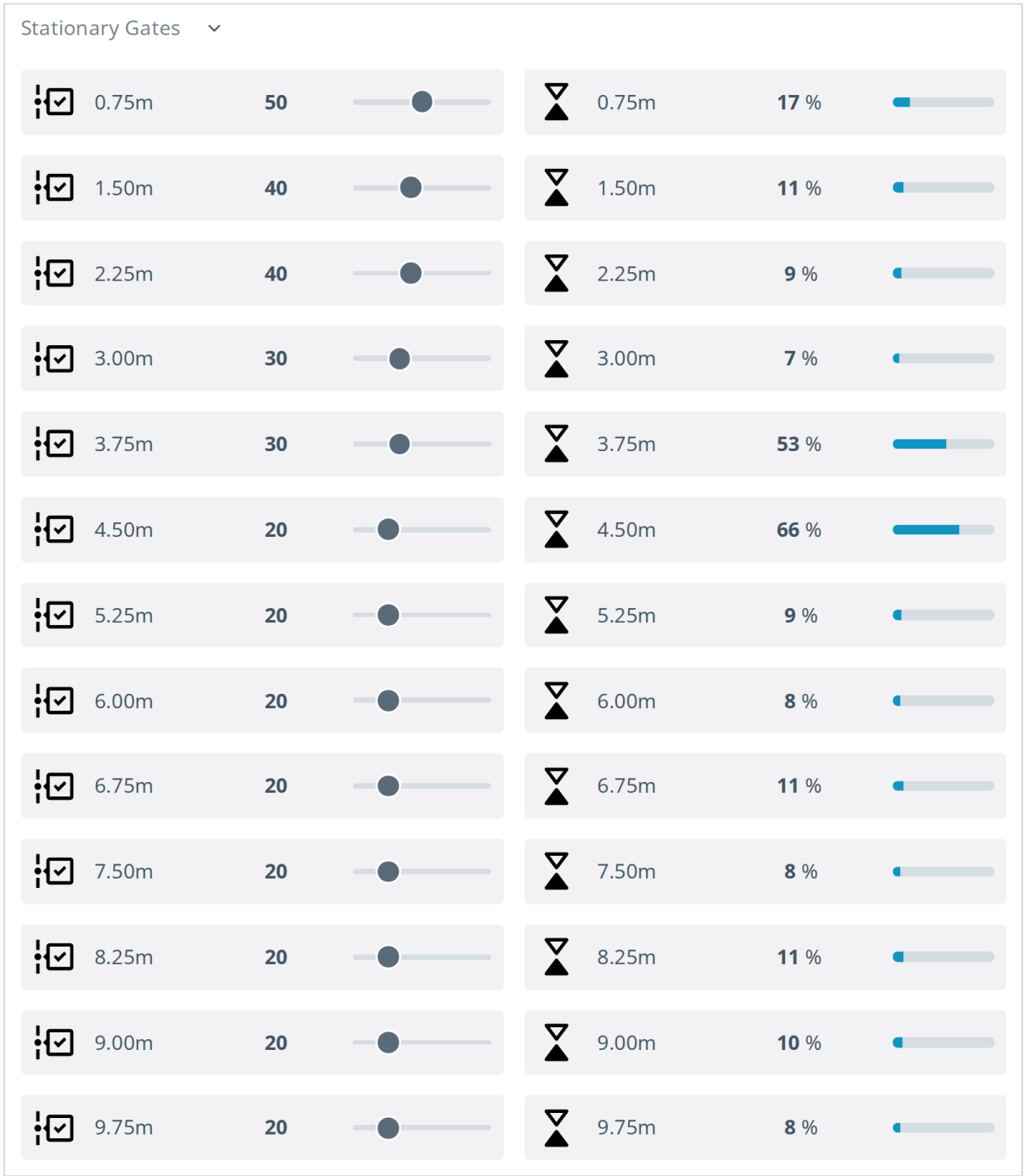
Setting up the presence sensor

The preset values suit most scenarios with wall mounting and should only be adapted to the surroundings if needed. Detection of presence is started by **a single detection of motion**.
The presence sensor continuously registers motion and stationary presence, including the distances. Motion and stationary presence are configured separately under "Motion Gates" and "Stationary Gates". Settings on the main page take effect immediately; there is no need to save them.

Sensitivity

The sensitivity of the presence sensor can be adapted to the environment. The whole measuring range is divided into individual gates. The sensitivity for detecting motion and stationary presence is set per gate. Measurements below a defined threshold are ignored.

The current values for motion and stationary presence are shown continuously to make configuration for different detection scenarios easier.



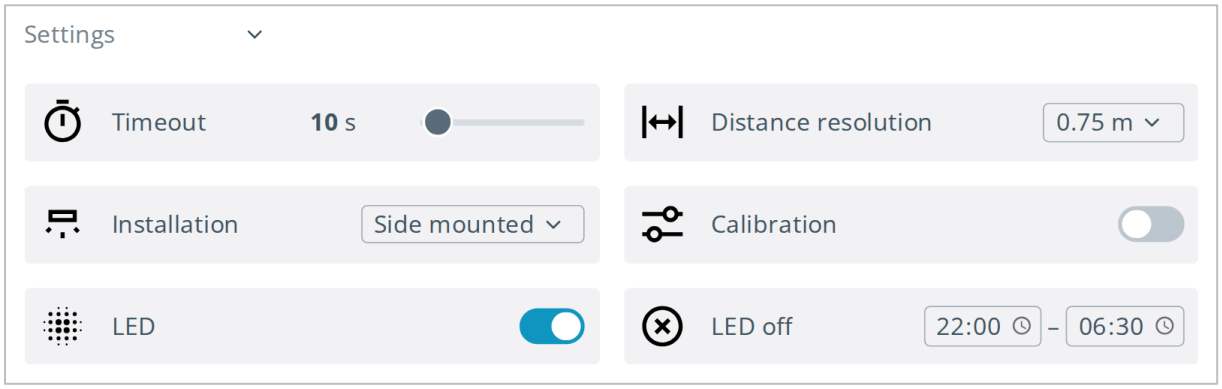
Please note that other moving objects in the room (moving curtains or pets, for example) can influence detection. To suppress detection in a certain distance range, set the threshold there to 100.

In the browser the values can be set quickly and precisely as follows:

- Click the slider with the mouse button and keep it pressed
- Set the desired value roughly
- Fine-tune with the right and left arrow keys

Distance resolution

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



Please note that radar also penetrates walls and glass panes. People outside a room may therefore be registered as well unless the range is adjusted.

Timeout

The timeout defines how long detected presence keeps being signalled after nobody is detected any more. A timeout prevents, for example, a light control from switching the lights on and off when someone leaves the detection area only briefly. It can be set from 5 to 300 seconds.

Installation

“Installation” sets the type of installation (ceiling/wall). Please choose the type of installation you have used.

LED

The “LED” switch turns on the continuous display of the sensor status by a multicolour LED. If the switch is off, the LED is switched off automatically 90 s after the sensor starts. While the LED is on, it lights pink as long as presence is detected. Every 10 s the colour of the status flashes briefly.

Under “LED off” you can additionally set a period during which the LED stays off, e.g. at night from 22:00 to 06:00. If both times are the same, the LED stays on all the time. The times can be set as long as the “LED” switch is on. An alert with siren is shown even while the LED is switched off.

LED colour	Meaning
White	Start
Yellow	Reset
Turquoise	Access point / no Wi-Fi connection
Blue	Wi-Fi connected
Green	MQTT connected
Purple	Firmware update
Red	Siren active
Pink	Presence detected

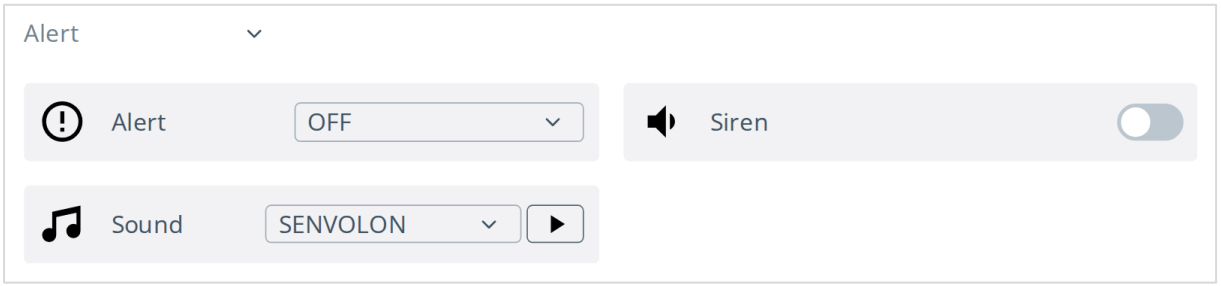
Calibration

In environments with motion that should not be detected (for example rooms with ventilation or air conditioning), it can be masked out by a calibration. Leave the room before carrying out the calibration and only enter it again once the calibration has finished.
Once activated, the calibration starts after 10 s and is finished within 3 minutes. During this time, presence and distance values are not updated. A running calibration cannot be cancelled.

Siren

The internal siren can signal either detected or absent presence acoustically.

Under “Sound” you choose the sound of the siren. Signals, chimes and melodies are available. The ▶ button next to the selection plays the chosen sound as a preview.



Zones

The presence sensor can divide the room into zones. They are configured in the “Zones” section.



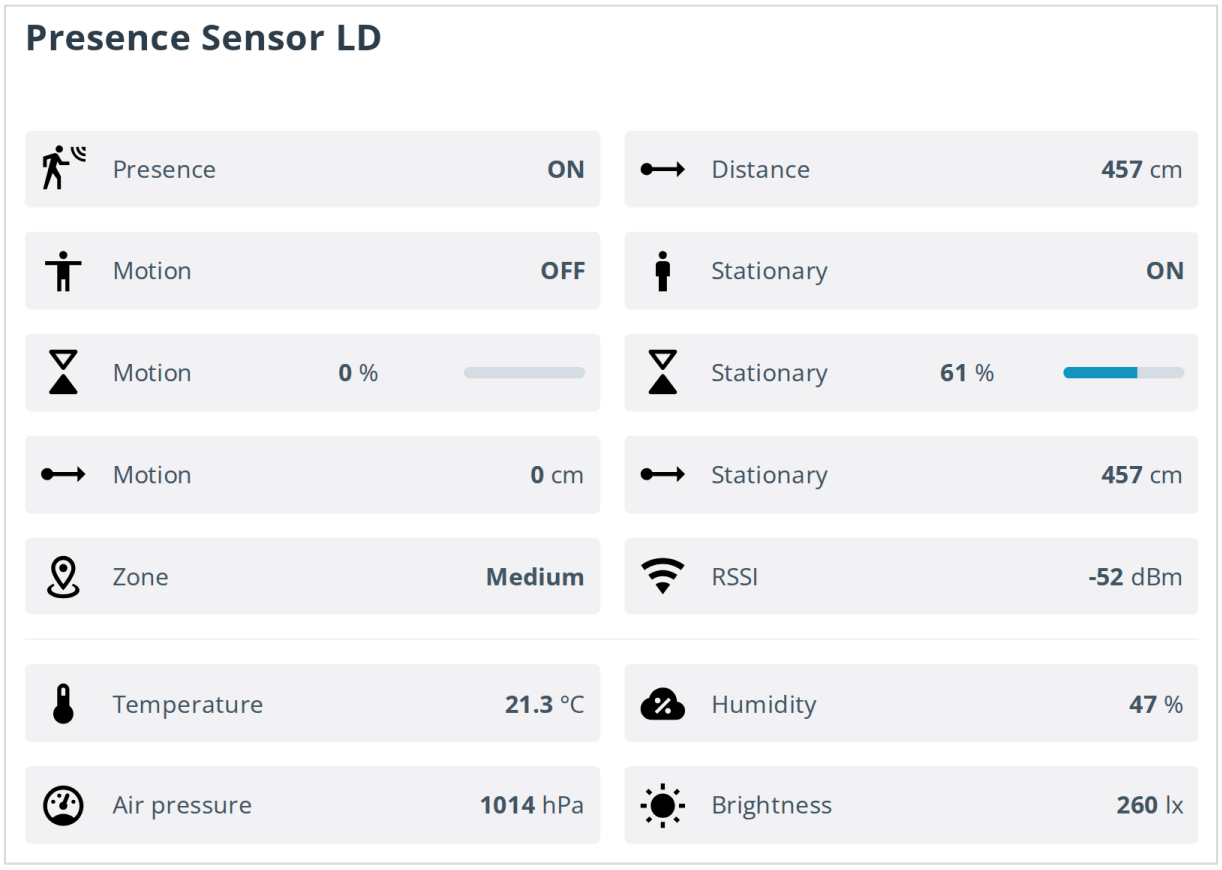
Up to five zones can be defined. Each zone has its own name (for example dining table or sofa). The size of a zone is defined by its start and end distance (in cm) as seen from the presence sensor. A zone is only valid if it is completely defined. Zones are checked for a person from top to bottom.

Five zones are already defined in the factory settings. To delete a zone, remove its start and end distance.

All settings only take effect with “Save”.

Readings

The following readings are provided:



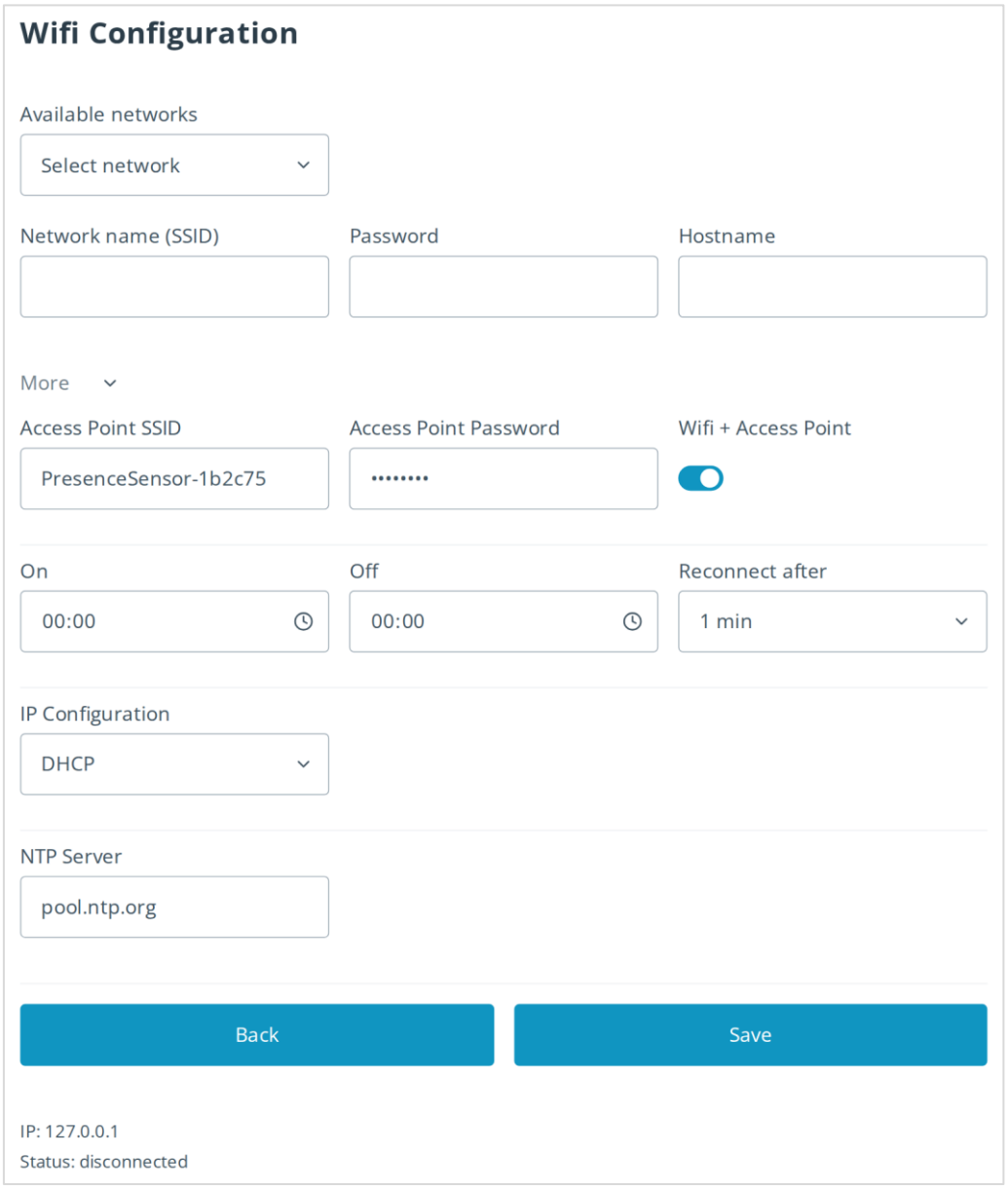
- **Presence**: presence of a person, taking the timeout into account where applicable
- **Presence distance**: last measured distance to a person who is present
- **Motion detection**: motion of a person
- **Stationary detection**: stationary person
- **Motion intensity**: intensity of the detected motion of a person
- **Stationary intensity**: intensity of the detection of 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 the sensor is switched on it takes at least **30 minutes** until the correct values for temperature and humidity are shown. If needed, the values can be calibrated with an offset under “System”.

RSSI	Wi-Fi signal quality
> -50 dBm	Excellent
-50 to -60 dBm	Good
-60 to -70 dBm	Adequate
< -70 dBm	Weak

Wi-Fi configuration

Besides the credentials for your own Wi-Fi network and for the access point of the presence sensor, a time window for switching the Wi-Fi on can be configured under “More”. For this, the start and end time for switching the Wi-Fi on have to be given. For uninterrupted Wi-Fi operation, set the start and end time to the same value. If the Wi-Fi network cannot be reached, the presence sensor tries to reconnect regularly. The interval until a new attempt can be set as well.



The device joins the network by DHCP by default. Assigning a static IP address is possible as well.

The NTP server is set to “pool.ntp.org” by default. A different server can be entered if needed.

If no Wi-Fi network is available, the presence sensor sets up a network of its own. Its name and password are configurable. The IP address is always 192.168.4.1. In the factory settings, the access point also stays active alongside the Wi-Fi connection (“Wifi + Access Point”) and can be switched off. If you keep it on, change the password of the access point.

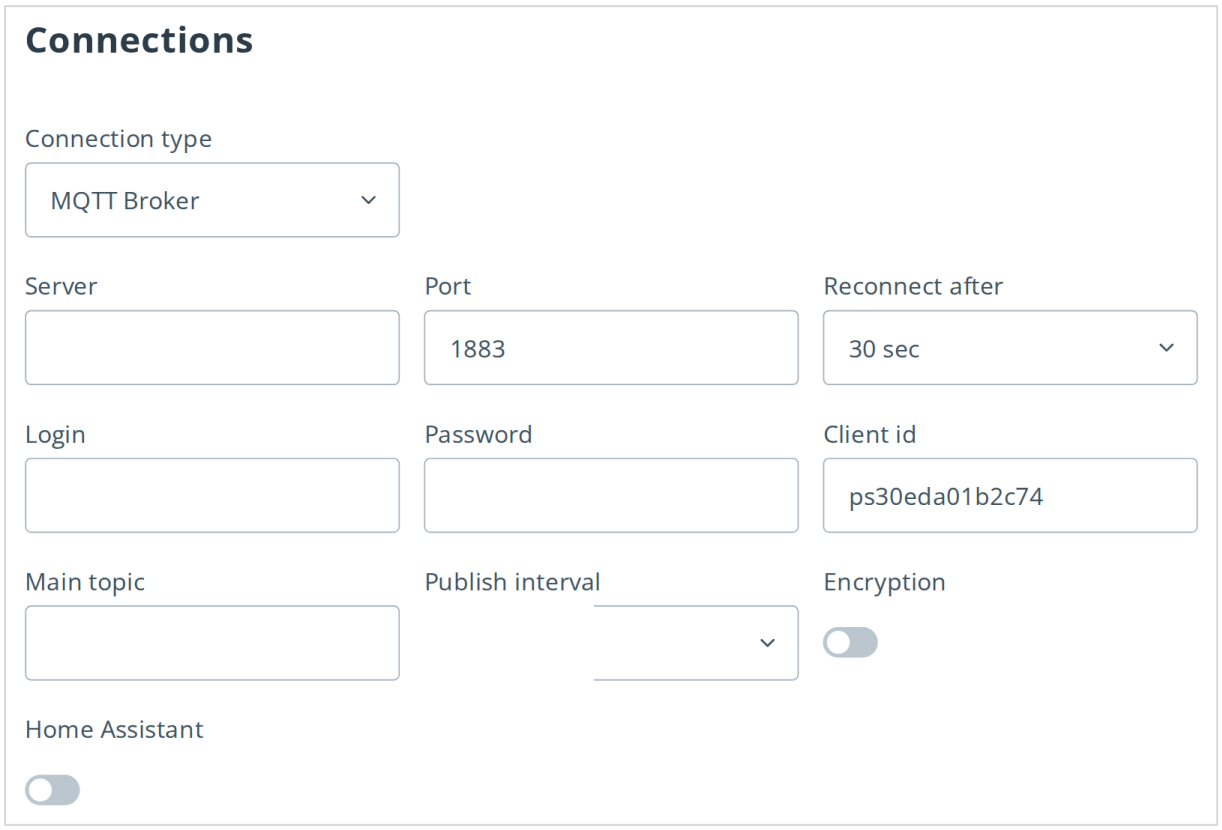
All settings only take effect with “Save”.

Connection via MQTT or remote access

The presence sensor can be connected either to an MQTT broker to exchange data or to Senvolon remote access. Remote access makes the readings available on devices that are not on your Wi-Fi network but are connected to the internet.

MQTT configuration

Under “Connections”, choose the configuration “MQTT Broker”. Besides the name or IP address and the port (default: 1883) of the MQTT broker, the interval after which a new connection attempt is started can be set. If the broker requires a login and a password, enter them here. The “Client id” identifies the presence sensor as an MQTT client and has to be unique for every client.
The field “Main topic” defines the topic under which the data of the sensor is published.
The “Publish interval” defines how often all measured, configuration and status values are sent to the broker in JSON format.
The connection can be encrypted with SSL/TLS (default port: 8883).



If you tick “Home Assistant”, MQTT Discovery for Home Assistant is switched on. A presence sensor connected to the broker is found and configured by Home Assistant automatically. Through the entity “Sound notification”, Home Assistant plays the sounds of the siren, for example as a doorbell – optionally for a set duration. An alert takes priority.

All settings only take effect with “Save”.

MQTT communication uses the Tasmota scheme:

- “tele/{Main topic}/STATE”: sends the current status of the presence sensor
- “tele/{Main topic}/LWT”: availability of the presence sensor
- “stat/{Main topic}/*VALUE*”: transmits the state of a particular value
- “cmnd/{Main topic}/*VALUE*”: sends a particular value to the presence sensor

Example:

“cmnd/{Main topic}/SIREN” switches the built-in siren on or off

Configuration values/commands

Value/command	Description
WIFI_ON	HH:MM - e.g. 6:00
WIFI_OFF	HH:MM - e.g. 22:00
MQTT_PUBLISH_INTERVAL	In seconds - e.g. 300 = 5 minutes
DISTANCE_RES	Distance resolution (0 = 0.75 m, 1 = 0.5 m, 2 = 0.2 m)
DETECTION_TIMEOUT	Timeout in seconds, at least 5 - e.g. 60
INSTALLATION	Installation (0 = ceiling, 1 = wall)
LEDS	LED (ON/OFF)
LEDS_OFF	LED off from HH:MM - e.g. 22:00
LEDS_ON	LED off until HH:MM - e.g. 06:30
UPDATE	Sends the current device status
CALIBRATION	Start calibration (ON) - the presence sensor reports when it has finished
SIREN	Siren (ON/OFF)
BUZZER	Alert (0 = off, 1 = with presence, 2 = with no presence)
SOUND	Sound of the siren (0-14, in the order of the selection list)
PLAY	Play a sound: 0-14 (once) or {"sound": 4, "duration": 30} (for 30 s, at most 600 s); ON = selected sound, STOP ends playback

Readings

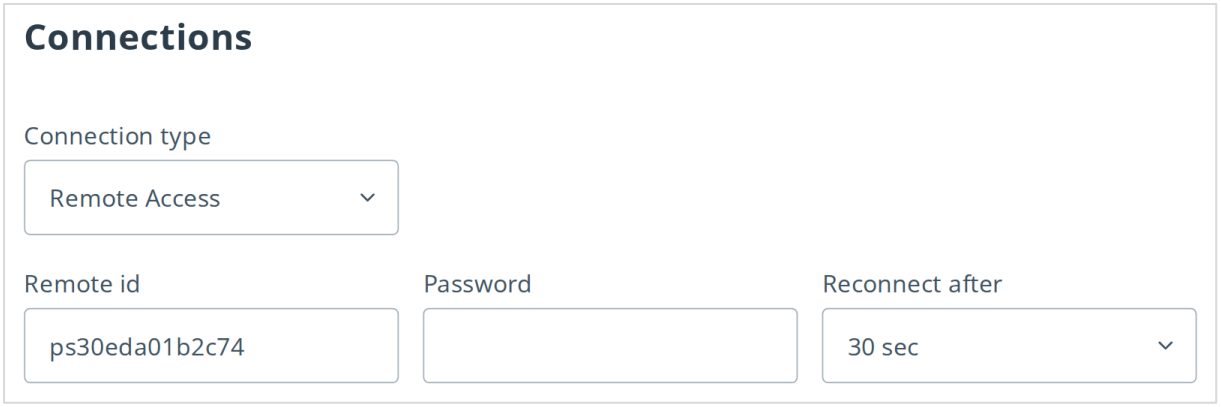
Value	Description
PRESENCE	Presence (True/False)
DETECTION_DIST	Distance - e.g. 220 cm
MOVING	Motion (True/False)
MOVING_TARGET_DIST	Motion distance - e.g. 200 cm
STATIONARY	Stationary presence (True/False)
STATIONARY_TARGET_DIST	Stationary presence distance - e.g. 210 cm
ZONE	Detected zone - e.g. Dining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

Status

Value	Description
IP	IP address - e.g. 192.168.178.50
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/ES)
VERSION	Firmware version - e.g. 1.1.1 / 1.26.1
BOOT	Start time - e.g. 27.09.2025 20:53
NAME	Name - e.g. Presence Sensor

Remote access

Under “Connections”, choose the configuration “Remote Access”. It works worldwide through “remote.senvolon.de”. To log in you need the “Remote id” shown there and a password of at least eight characters, which you choose yourself.



If remote access cannot be reached, the presence sensor tries to reconnect regularly. The interval until a new attempt can be set.

Web app on iOS

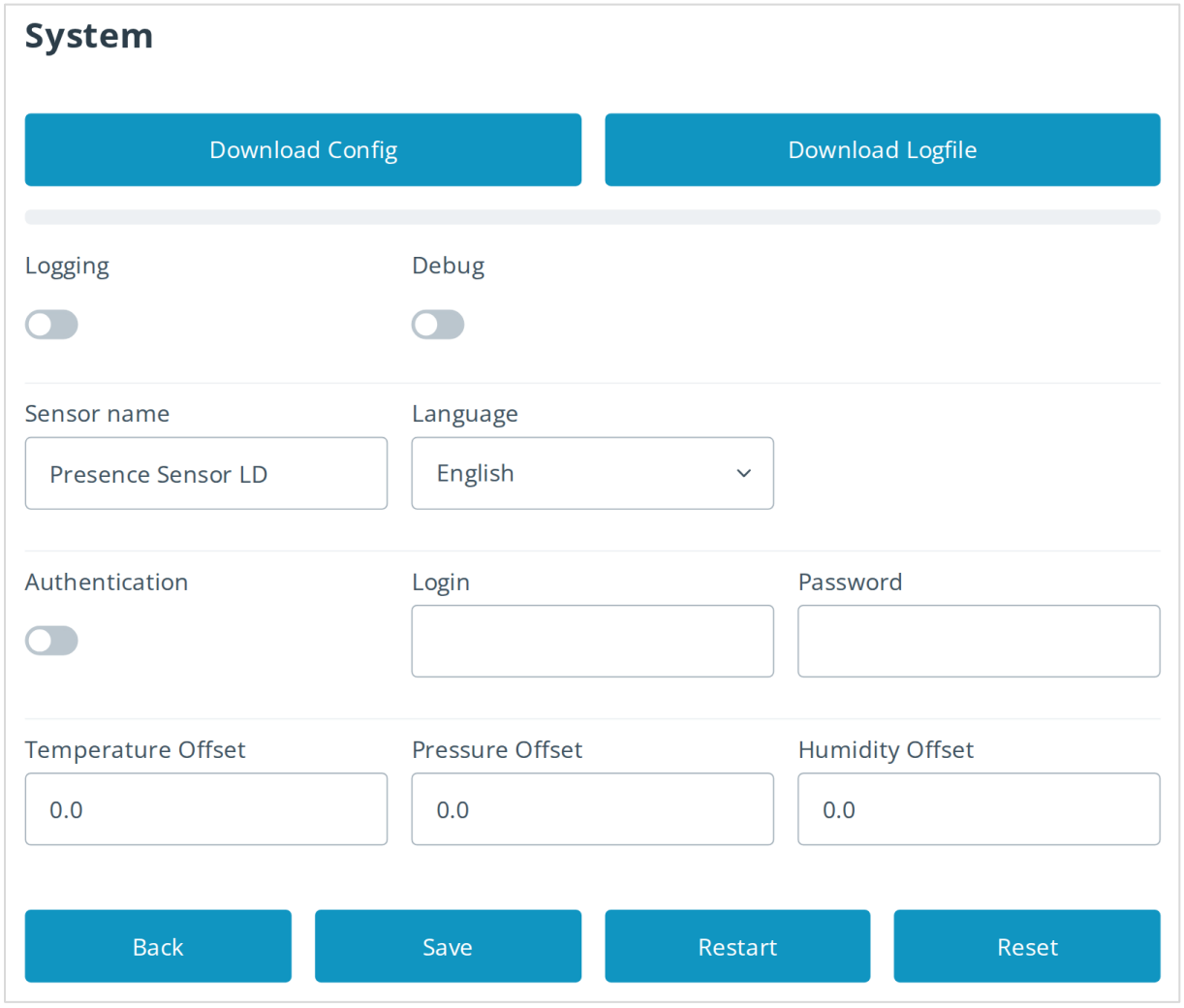
Log in at “https://remote.senvolon.de” in the browser (Safari). As soon as the page with the readings is shown, tap the share symbol. It looks like a square with an arrow pointing upwards and is at the bottom of the screen (on the iPhone) or in the top right corner (on the iPad). Then scroll down in the share menu and choose “Add to Home Screen”. Tap “Add” in the top right corner and you have direct access to the sensor data in the form of an app. You can also switch on push messages for when 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 readings is shown, tap the menu symbol (three vertical dots) in the top right corner of the screen. Then scroll down in the menu and choose “Add to Home screen”. Tap “Add” and you have direct access to the sensor data in the form of an app. You can also switch on push messages for when presence is detected.

System

Under “System” you call up various information about the operation of the presence sensor. Besides the option to download the complete configuration in JSON format for backup purposes, the log file is available as well. Logging can be switched on and off. If needed, debug information can be written to the log file too. The log file is shortened automatically once it reaches a certain size.



The name of the presence sensor shown on the main page can be changed.
Under “Language” you set the preferred user language (English, German or Spanish).

To protect against unauthorised access, authentication with login and password can be switched on.

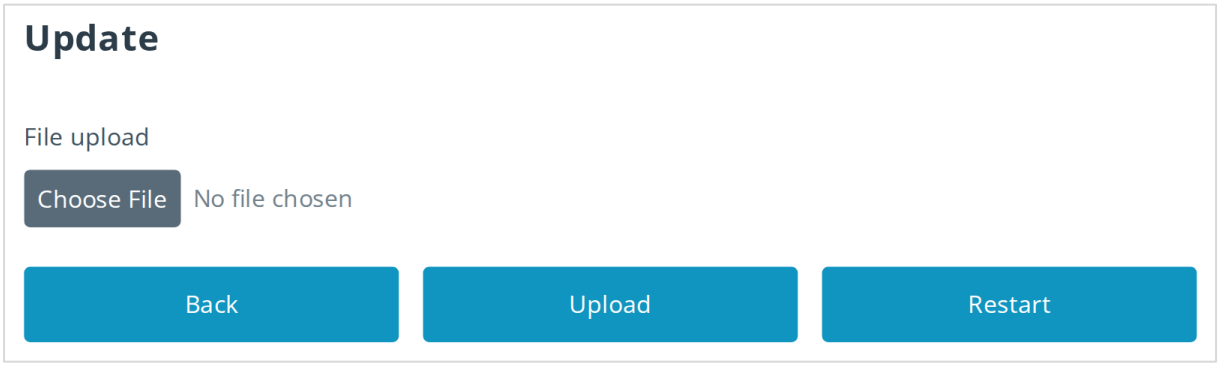
For the environmental values temperature, air pressure and humidity, calibration by setting an “offset” is possible. The offset corrects the measured value upwards or downwards.

“Restart” restarts the system.
“Reset” returns the presence sensor to its factory settings.

All settings only take effect with “Save”.

Update

The update function offers the possibility to update the firmware. A saved configuration can also be loaded. For this, the file “config.json” of the presence sensor has to be uploaded. First select the file with the button “Choose File” under “File upload” and then click “Upload”. After “config.json” has been uploaded, the presence sensor restarts and applies the configuration.



Reading the measurements over HTTP

Calling up “http://*hostname*/measurements” gives you the current readings in JSON format.

Controlling the siren over HTTP

Calling up “http://hostname/siren?turn=on” switches the siren on, “http://hostname/siren?turn=off” switches it off. The answer gives the current status of the siren in JSON format.

If something does not work

If you have trouble with the Wi-Fi or MQTT connection, or if you want to analyse how the sensor behaves, please switch on logging under “System”. All relevant events and errors are then recorded. You get even more information if you switch on the option “Debug”.

The most recent entries are shown directly. You can also download the log.

In normal operation you should switch off both logging and the debug function.

Our support will be glad to help you as well, at **support@senvolon.de**.

Technical data

Power supply	5V DC
Power consumption	0.8 W
Wi-Fi frequency range	2400-2483.5 MHz
Wi-Fi max. transmit power	20 dBm EIRP
Radar frequency range	24.0-24.25 GHz
Radar max. transmit power	20 dBm EIRP
Antenna beam width	+/- 75°
Modulation	FMCW
Weight	59 g
Dimensions (dia. x h)	94x15 mm
Max. distance	9.75 m
Distance resolution	0.2 / 0.5 / 0.75 m

Contact

SENVOLON GmbH
Dolomitstr. 37
50226 Frechen, Germany

www.senvolon.de
Email: info@senvolon.de

Conformity

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

Radio and radar information

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

The radiated power is below the legally defined limits for human exposure. There is no health risk when the device is used as intended.

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

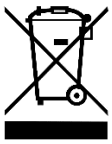
The device also contains a radio module for Wi-Fi in the 2.4 GHz frequency range and a Bluetooth module in the 2.4 GHz frequency range.

Details of the frequency bands and the maximum transmit power are given in the section “Technical data”.

Disposal information

Disposal of waste electrical equipment (WEEE / ElektroG)

This device is marked with the symbol of the crossed-out wheeled bin. It must not be disposed of with household waste.
Waste electrical equipment has to be handed in separately from household waste at a collection or take-back point.



Data protection

If the device has stored personal data (network or user information, for example), delete it before disposal.

Manufacturer information

Manufacturer: SENVOLON GmbH
WEEE reg. no. DE: 93352512