

A key feature of the enclosure design is its simplicity, with all components fitting together seamlessly to ensure straightforward and efficient assembly.

**Note:** Ensure you take precautions against electrostatic discharge before handling the boards.



**Step 1.** Secure the chassis by inserting the ball mount into the base and tightening the screw until the ball mount remains adjustable, with the screw insertion direction shown in the picture.

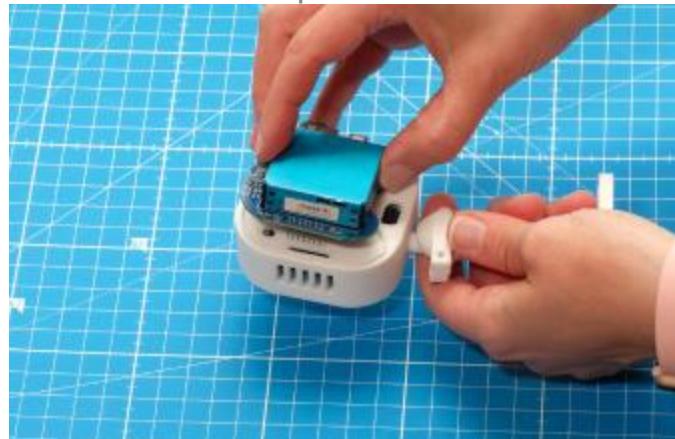
**Important:** Avoid over-tightening, as it may damage the chassis elbow.



**Step 2.** Insert the IQ board into the chassis, ensuring it is properly seated on the spacers.



**Step 3.** Attach the front lid by pressing it until all the snaps click securely into place, ensuring that the holes on the front lid are positioned on the left as shown in the picture.

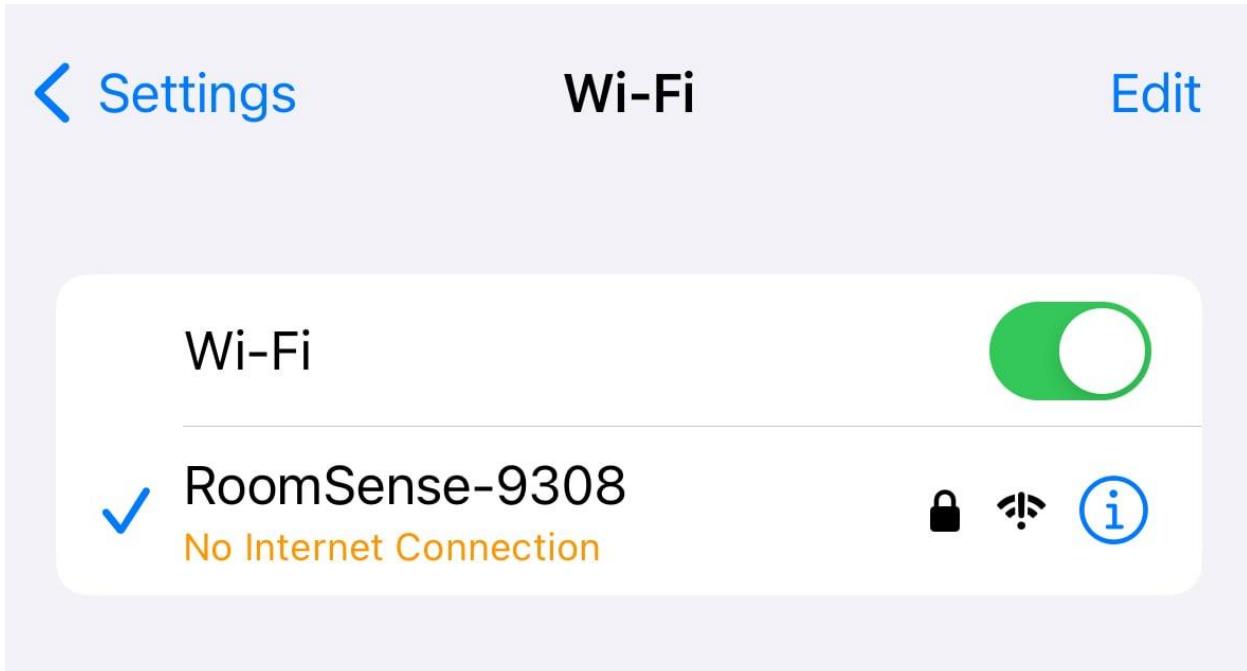


**Step 4.** To attach the climate board, position it on the backside of the chassis and carefully align the 7-pin header with the corresponding slot. Press the board firmly to ensure the 7-pin header is securely connected to the female connector and that all edges of the board are properly seated within the enclosure.



**Step 5.** Finally, position the cover over the board and press it down until all snaps engage securely.

When powered on, the device's LED indicator alternates between flashing blue and orange, indicating that it is not currently connected to any Wi-Fi network. You can setup your Wi-Fi credentials using the internal web-based interface. Please follow the steps below for the connection:



1. On your smartphone, go to Settings->Wi-Fi and connect to Wi-Fi and connect to the *RoomSense-xxxx* access point. The password is simply "password".

← → C 192.168.255.1

2. After connecting, open the browser on your phone and enter the sensor's default IP address: 192.168.255.1

## WiFi Connect

SSID

Password



Show Password

CONNECT

## WiFi Connect

myhome

.....



Show Password

CONNECT

**Connection Success!**

Connected to: myhome

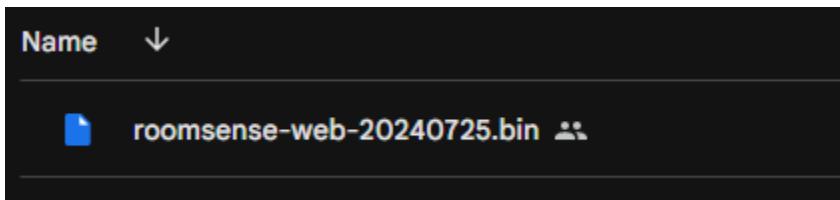
IP Address: 192.168.1.186 Netmask: 255.255.255.0

Gateway: 192.168.1.1

DISCONNECT

- Once the home page loads, find the **WiFi Connect** section and enter your home Wi-Fi credentials, then click "Connect." After a successful connection, the assigned network settings will be displayed.

Write down the IP address for later use.



- Download the latest version of the firmware to your computer using this [link](#).

# Firmware Update

Latest Firmware: Jul 25 2024 - 15:20:36

**SELECT FILE**

**UPDATE FIRMWARE**

## Firmware Update

Latest Firmware: Jul 25 2024 - 15:20:36

**SELECT FILE**

**UPDATE FIRMWARE**

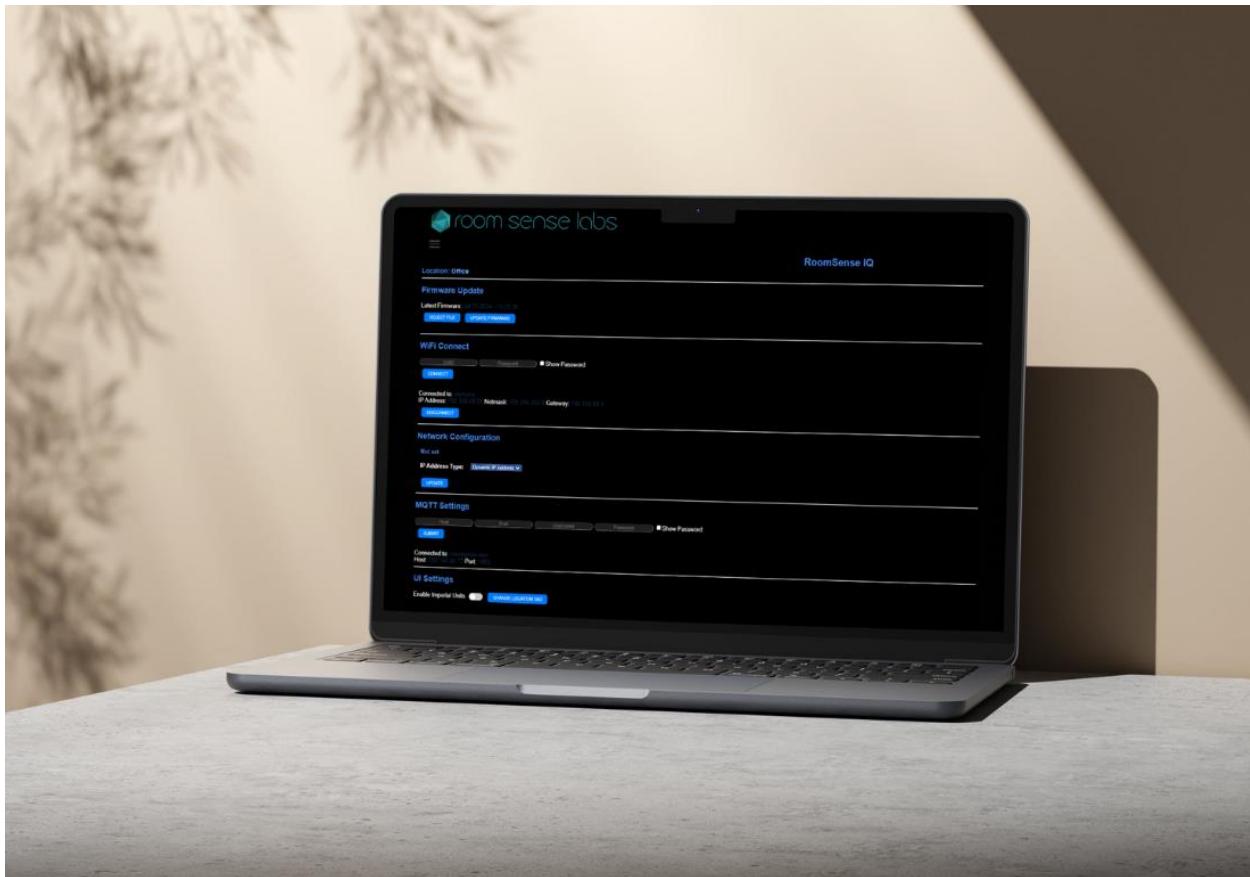
File: roomsense-web-20240725.bin

Size: 1436592 bytes

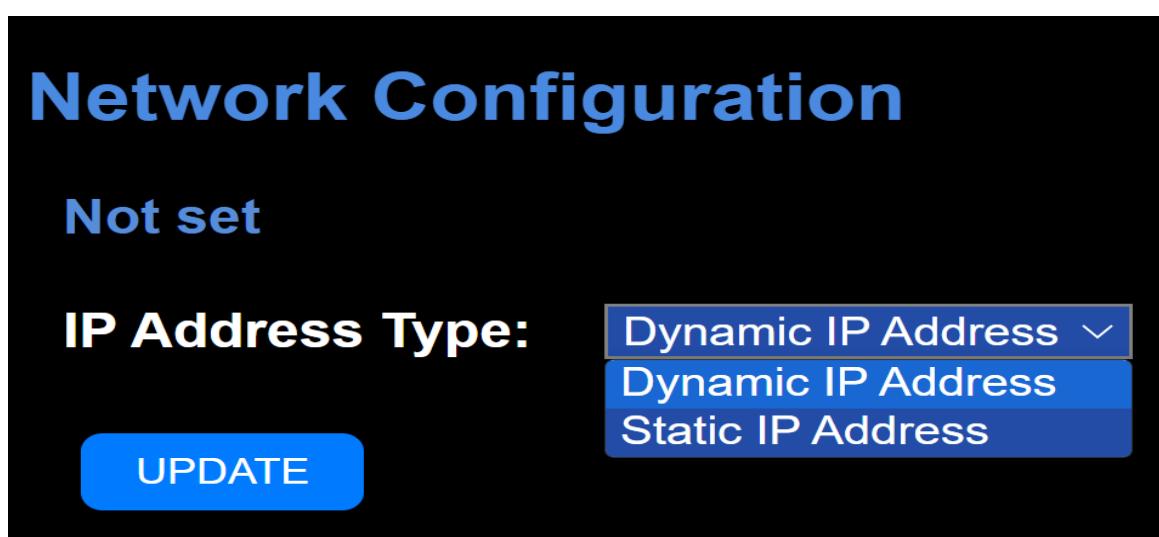
Uploading roomsense-web-20240725.bin, Firmware Update in Progress...

5. Open a browser on your computer and enter the IP address you obtained in step 3.

Once the home page loads, locate the **Firmware Update** section, select the file, and initiate the update. This process may take a few minutes. Upon completion, a countdown timer will be displayed on the page.

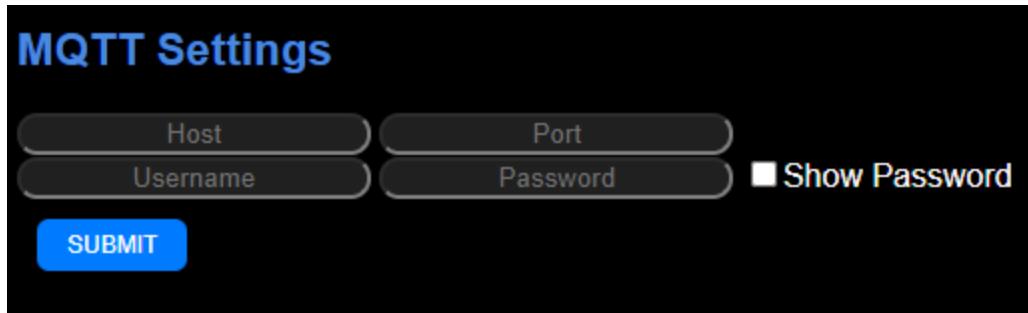


SightSense is a built-in web app designed to enhance the functionality of the RoomSense IQ sensor ecosystem. It provides an intuitive interface for managing and monitoring various RoomSense IQ sensors. This section explains the different sections of the SightSense interface.



## Network Configuration

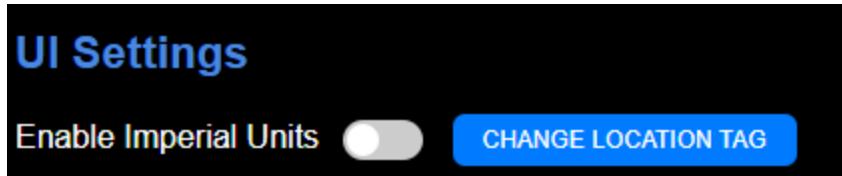
In this section you can easily switch between dynamic and static IP addresses for your device. After making the update, power cycle your device to apply the changes.



The screenshot shows a dark-themed MQTT Settings page. At the top is the title 'MQTT Settings'. Below it are four input fields arranged in a 2x2 grid: 'Host' and 'Port' in the top row, and 'Username' and 'Password' in the bottom row. To the right of the 'Password' field is a 'Show Password' toggle switch. At the bottom is a blue 'SUBMIT' button.

## MQTT Settings

In the MQTT Settings section on the settings page, you can configure the MQTT broker settings. By default, the broker's IP address is the same as your Home Assistant IP address, and the port number is set to 1883. Use the same login credentials that you use for Home Assistant to access the broker.



The screenshot shows a dark-themed UI Settings page. At the top is the title 'UI Settings'. Below it is a 'Enable Imperial Units' toggle switch, which is currently off. To the right of the switch is a blue 'CHANGE LOCATION TAG' button.

UI

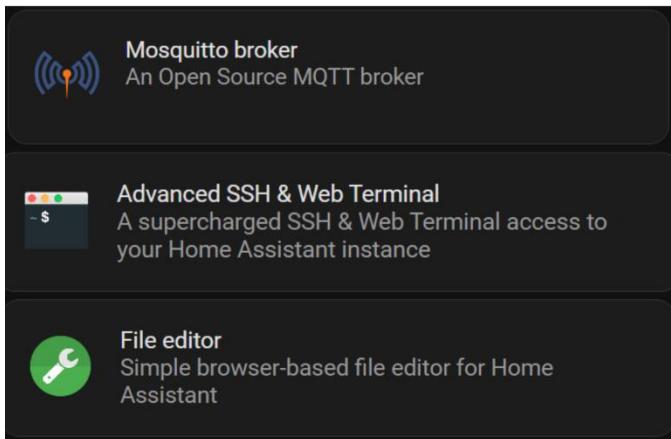
Settings

In this section, you can switch between imperial and metric units, allowing distances on the ProxiSense sliders, movement plots, maximum ranges, and temperature parameters to be displayed in feet and Fahrenheit.

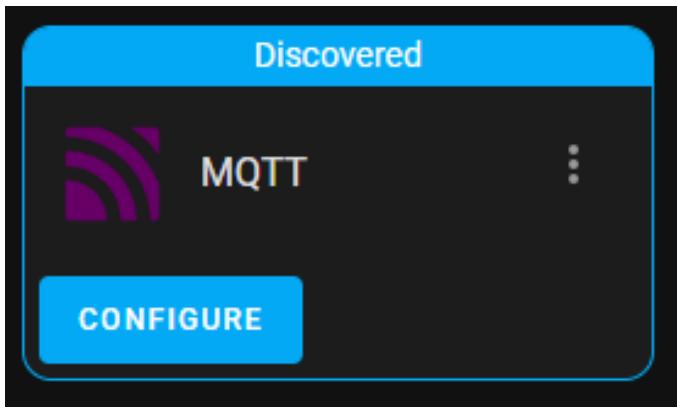
Additionally, in the same settings section, you can set the location of your sensor, specifying whether it is in your home, office, or bedroom. MQTT uses this configuration to integrate the location into entity naming across Home Assistant, making it easier to distinguish between different entities. The specified location will also be appended to the device's SSID.

RoomSense IQ supports the integration of Home Assistant through MQTT auto-discovery protocol. Follow the steps below to create the interface.

**Note:** Before proceeding, ensure that the MQTT settings are configured correctly as explained on the [settings page](#) and that the connection to the broker has been successfully established.



1. Install MQTT Mosquitto Broker add-on and run it on your HA.



2. Navigate to the "Home Assistant Settings" tab and go to "Devices & Services." Find the MQTT integration, click "configure," and then "submit." A device called "RoomSense IQ" will then appear.

	RoomSense IQ <location>-co-status-9308 <b>No Alarm</b>
	RoomSense IQ <location>-Location-9308 <location>
	RoomSense IQ <location>-Movement-Direction-9308 ...
	RoomSense IQ <location>-pm-status-9308 <b>No Alarm</b>
	RoomSense IQ <location>-CO-9308 0 ppm
	RoomSense IQ <location>-CO2-9308 0 ppm
	RoomSense IQ <location>-Dew-Point-9308 0 °C
	RoomSense IQ <location>-Distance-cm-9308 128 cm
	RoomSense IQ <location>-Distance-ft-9308 4 ft
	RoomSense IQ <location>-Humidity-9308 0 %
	RoomSense IQ <location>-Light-9308 3,174 Raw
	RoomSense IQ <location>-PIR-9308 Off

3. All entities will then be available under the RoomSense IQ device. Entity names follow this format:

*roomsense\_iq\_<location><type><serial number>*

**Note:** You may need to restart your Home Assistant to view all entities.

The tables below provide details about each entity.

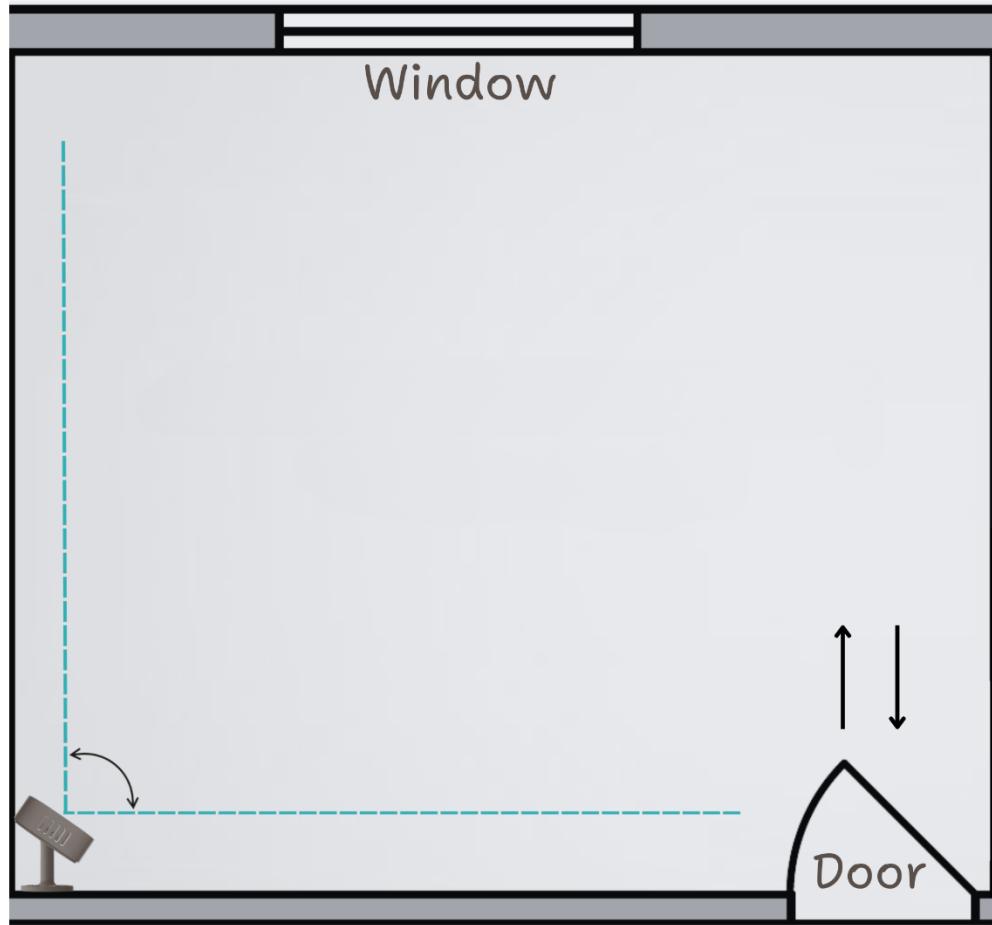
Entity Name	Unit	Description
<i>roomsense_iq_&lt;location&gt;_pir_&lt;sn&gt;</i>		Passive Infrared sensor (off = No motion, on = Motion)
<i>roomsense_iq_&lt;location&gt;_presence_&lt;sn&gt;</i>		Presence of a person in the room (pir AND radar)
<i>roomsense_iq_&lt;location&gt;_distance_cm_&lt;sn&gt;</i>	cm	Distance to an occupant in centimeters
<i>roomsense_iq_&lt;location&gt;_distance_ft_&lt;sn&gt;</i>	ft	Distance to an occupant in feet
<i>roomsense_iq_&lt;location&gt;_light_&lt;sn&gt;</i>	raw	Light levels
<i>roomsense_iq_&lt;location&gt;_location_&lt;sn&gt;</i>		Location of the sensor
<i>roomsense_iq_&lt;location&gt;_movement_direction_&lt;sn&gt;</i>		Direction of walking movement
<i>roomsense_iq_&lt;location&gt;_temperature_c_&lt;sn&gt;</i>	°C	Temperature in Celsius
<i>roomsense_iq_&lt;location&gt;_temperature_f_&lt;sn&gt;</i>	F	Temperature in Fahrenheit
<i>roomsense_iq_&lt;location&gt;_humidity_&lt;sn&gt;</i>	%	Humidity levels in the room

Entity Name	Unit	Description
<i>roomsense_iq_&lt;location&gt;_dew_point_&lt;sn&gt;</i>	°C	Dew point based on temperature and humidity
<i>roomsense_iq_&lt;location&gt;_co2_&lt;sn&gt;</i>	ppm	Carbon dioxide levels in the room
<i>roomsense_iq_&lt;location&gt;_co_&lt;sn&gt;</i>	ppm	Carbon monoxide levels in the room
<i>roomsense_iq_&lt;location&gt;_pm1_&lt;sn&gt;</i>	µg/m3	Concentration of particulate matter less than 1 micrometer in diameter
<i>roomsense_iq_&lt;location&gt;_pm2_5_&lt;sn&gt;</i>	µg/m3	Concentration of particulate matter less than 2.5 micrometers in diameter
<i>roomsense_iq_&lt;location&gt;_pm10_&lt;sn&gt;</i>	µg/m3	Concentration of particulate matter less than 10 micrometers in diameter
<i>roomsense_iq_&lt;location&gt;_tvoc_&lt;sn&gt;</i>	index	Total volatile organic

		compounds in the air
<i>roomsense_iq_&lt;location&gt;_co_status_&lt;sn&gt;</i>		Status of carbon monoxide levels (No Alarm, Carbon Monoxide Detected)
<i>roomsense_iq_&lt;location&gt;_pm_status_&lt;sn&gt;</i>		Status of particulate matter levels (No Alarm, Elevated Levels, Extremely High)

The RoomSense IQ PIR sensor has a field of view of approximately 90 degrees. For optimal performance, Mount the sensor in the corner of the room adjacent to the entrance door, ensuring it is perpendicular to the direction of movement. This placement provides the widest coverage and enhances the sensor's signal-to-noise ratio.

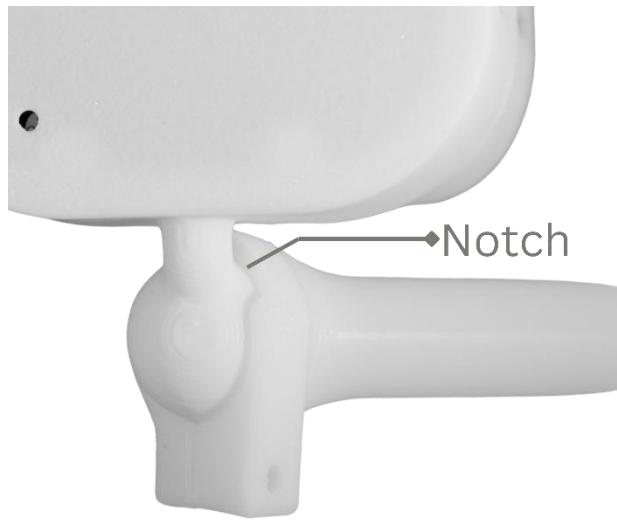
The RoomSense IQ features an innovative ball-mount system that simplifies corner mounting. Additionally, its adjustable mount allows for versatile installation on either a wall or a desk.



*The sensor corner mounted at 45° angle using adjustable mount.*

Now that we know where to mount RoomSense IQ, let's take a look at how to install it. The adjustable ball mount system of RoomSense IQ, makes the corner mount process easy. To mount the sensor, follow these steps:

1. Prepare the surface by cleaning it thoroughly to remove any dust or debris.
2. Apply the 3M adhesive strip onto the desired surface, ensuring it is securely attached and level.
3. Attach the second strip onto the base of the mount.
4. Position the base onto the mounting surface and firmly press the strips together to ensure a strong bond.



**Important:** For wall mounting, ensure the notch on the base is facing upward to allow for maximum rotation.

5. Adjust the orientation of RoomSense IQ to ensure that it is facing the room's entrance. Once the sensor has been successfully mounted, it's time to personalize the basic settings of the device in order to align them with the specific requirements of your room. Within the SightSense dashboard, click on the menu icon with three lines, then select "Main Dashboard".



## Maximum Range

The radar sensor is able to detect movements up to 6m. However, it is important to limit the detection range of the sensor to the size of the room or the desired detection area to achieve system reliability while avoiding interference. For simplicity it is better to set both Macro and Micro range to the same value. Later in the advanced feature section we will explain the differences and use case for each one.



## Timeout

Another important setting on the dashboard is the timeout setting. This tells the device how long it should wait before triggering the vacancy signal. This is an important feature because it ensures that the sensor doesn't trigger a false alarm if someone has just briefly left the room. The default value is 20 seconds.

[GET CONFIGURATION](#)[FACTORY RESET](#)

## Control Buttons

Through these buttons you can load and save configurations. With the "**Get Config**" function, you can easily read the saved configuration in the device. This is really helpful if you need to check the settings that have been saved in the past.

But what if you need to start over? Well, that's where the "**Factory Reset**" comes in. This function allows you to load the default settings of the system, essentially starting from scratch.

[BASELINE CALIBRATION](#)

## Baseline Calibration

In rare instances of false alarms in an empty room, simply press this button and wait for 10 seconds. When clicked, it scans movement signals and adjusts thresholds accordingly to prevent further false alarms. This feature is also useful for filtering out the movement of a fan or curtain.

[BLINDSPOT CALIBRATION](#)

## Blindspot Calibration

Depending on the room size and sensor placement, there may be blind spots where the radar sensor cannot accurately detect movement. To calibrate the sensor for these areas, position yourself in the blind spot, remain still, and then press the calibration button. The sensor will scan movement signals for 10 seconds and adjust thresholds and timeout to ensure that orange signals stay below the set threshold, effectively eliminating blind spots.

\* If the issue persists, increasing the timeout may resolve it.

## PIR Motion Signal

In order to ensure accurate detection while minimizing false alarms, RoomSense IQ is equipped with an advanced PIR (Passive Infrared) sensor. This intelligent component effectively filters out non-human activities, prioritizing the detection of human presence and motion. The PIR sensor, with its quick response time, is the best option for use as an automation trigger.

The entity's naming format is as follows:

*roomsense\_iq\_<location>\_pir\_<sn>*



## Occupancy

The round icon represents the ultimate occupancy signal. It changes to orange and displays occupancy status only when both the mmWave radar and the PIR sensor detect motion. If either one of them or none of them triggers, the icon remains blue and indicates that the room is unoccupied.

The entity's naming format is as follows:

*roomsense\_iq\_<location>\_presence\_<sn>*



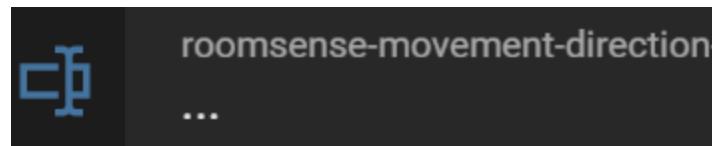
## Distance To Target and Movement Direction

Using advanced technology, RoomSense IQ accurately measures the distance to an occupant and the direction of the movement, that empowers you to establish customized automation zones which are tailored to your needs.

The naming format for the entity in centimeters and feet is as follows:

*roomsense\_iq\_<location>\_distance\_cm\_<sn>*

*roomsense\_iq\_<location>\_distance\_ft\_<sn>*

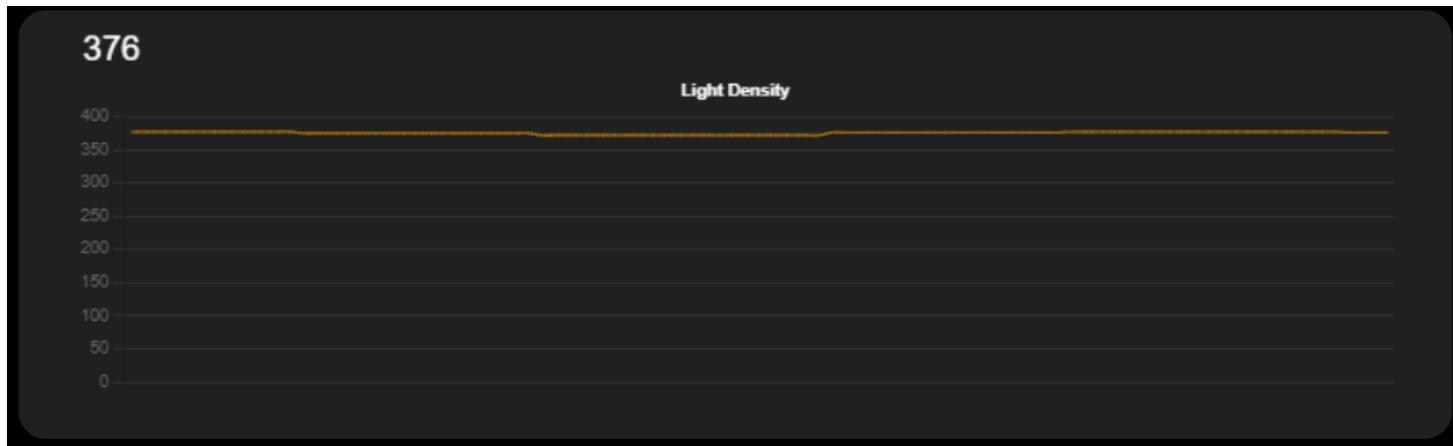


## Movement Direction

By utilizing the distance to the target, RoomSense IQ can determine the direction of movements, whether they are approaching (*Towards*) or moving away (*Away*) from the sensor.

The entity's naming format is as follows:

*roomsense\_iq\_<location>\_movement\_direction\_<sn>*



## Light Density

The built-in light sensor measures ambient light in real-time with a 1-second refresh rate, automatically adjusting the lighting to optimize energy consumption and create a comfortable environment.

The entity's naming format is as follows:

After adjusting the basic settings and familiarizing yourself with the sensor's signals and entities, it's time to get into the exciting phase of creating automation.

**Important:** Due to the rapid response time and high accuracy of the PIR sensor, it is recommended to use the PIR signal (*roomsense\_iq\_<location>\_pir\_<sn>*) to trigger automation. For detecting room vacancy, utilize the radar presence signal (*roomsense\_iq\_<location>\_presence\_<sn>*).

## Light Automation

In this part we create a basic light automation using the occupancy entity called *roomsense-movement-serialnumber*. This automation enables the control of a TP-Link smart bulb based on the presence of individuals in the room. When the room is occupied, the light will be turned on. And, when the room becomes unoccupied for a duration of 20 seconds, the light will be automatically switched off. Follow the steps below to implement this automation:



## Automations & Scenes

Automations, scenes, scripts and blueprints



1. In your Home Assistant go to Settings → Automations & Scenes

[+ CREATE AUTOMATION](#)

2. Create new automation.

Triggers

When roomsense-movement-f412fae8c878 changes from '0' to '2'

Entity

Entity: roomsense-movement-f412fae8c878

Entity

Attribute (optional)

From (optional)

0

To (optional)

2

For

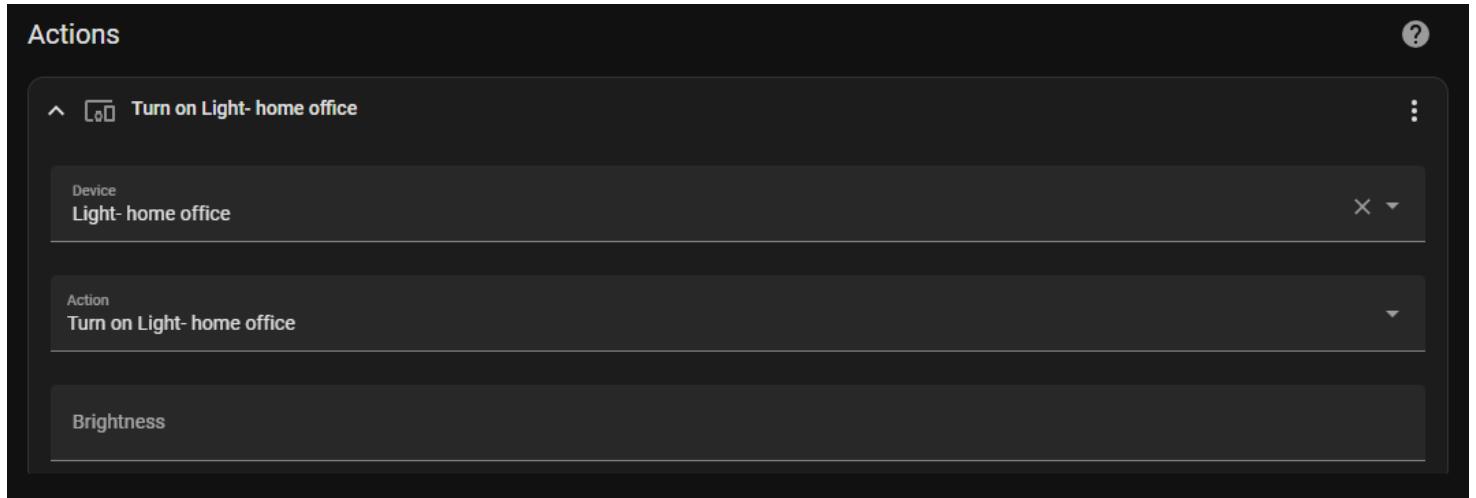
0 : 00 : 00

?

⋮

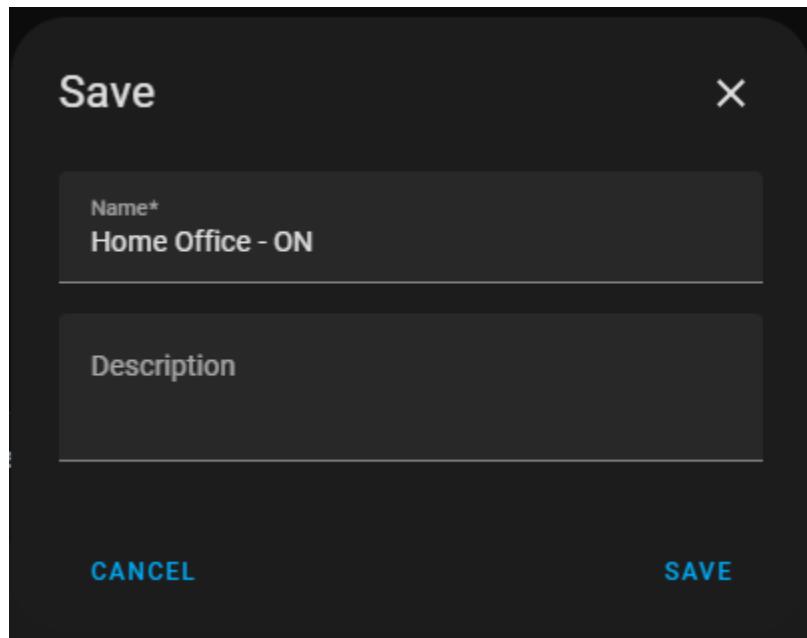
### 3. Add Trigger --> State

- **Entity:** roomsense\_iq\_</location>\_pir\_<sn>
- **From:** Off
- **To:** ON

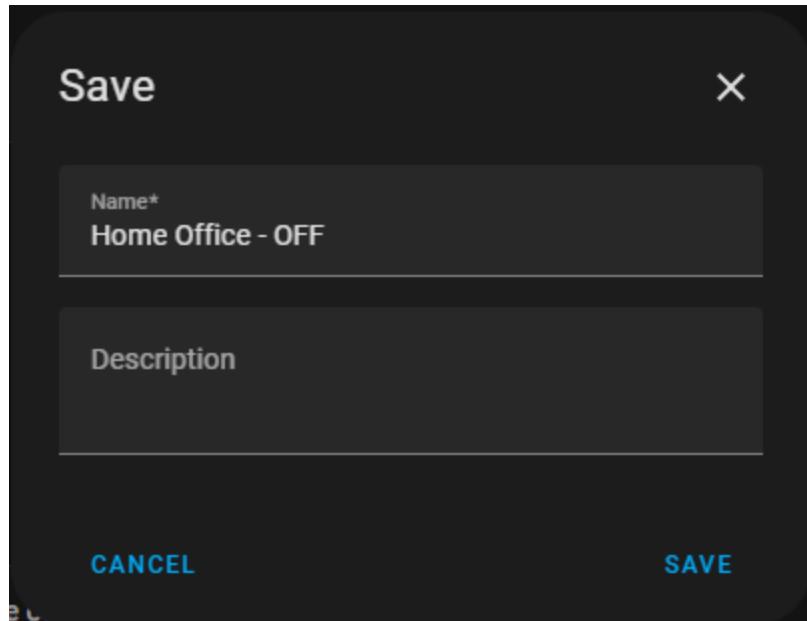


### 4. Add Action --> Device

- **Device:** Select the light you want to control
- **Action:** Turn on the light
- **Brightness:** 100



5. Choose a descriptive name for your automation and save it.



6. Repeat steps 1 to 5 to create the turning OFF automation.

Use `roomsense_iq_<location>_presence_<sn>` as trigger value from 1 to 0.

## Automation for TV Watching

Using advanced technology, RoomSense IQ accurately measures the distance to an occupant, that empowers you to establish customized automation zones which are tailored to your needs. This capability can be integrated into a smart home automation system to enhance the TV watching experience. The sensor detects the presence and distance of occupants in a room, specifically focusing on the seating area. When a person sits on a couch located approximately 250 cm away from the sensor, the system triggers an automation that dims the lights and turns on the TV. In this use case we take advantage of the Distance To Target entity `roomsense-distance-<serial-number>`.



## Automations & Scenes

Automations, scenes, scripts and blueprints



1. In your Home Assistant go to Settings → Automations & Scenes

+ CREATE AUTOMATION

2. Create new automation.

Triggers

When something changes

Entity

Entity: sensor.roomsense\_movement\_f412fae8c830

Attribute (optional)

From (optional)

To (optional)

For

hh mm ss  
0 : 00 : 00

?

⋮

This screenshot shows the 'Triggers' configuration screen in the Home Assistant UI. The main title is 'When something changes'. Below it, there is a 'Entity' field containing the identifier 'sensor.roomsense\_movement\_f412fae8c830'. There are several optional fields: 'Attribute (optional)', 'From (optional)', 'To (optional)', and a 'For' section with a timer set to '0 : 00 : 00'. The interface is dark-themed with light-colored text and buttons.

### 3. Add Trigger --> State

- **Entity:** *roomsense\_iq\_</location>\_pir\_<sn>*

The screenshot shows the 'Conditions' configuration interface for a trigger. The top bar has a question mark icon and a 'Conditions' label. Below the bar, a header shows '123 Confirm sensor.roomsense\_distance\_f412fae8c830 is below 249'. The main area is divided into sections: 'Entity\*' (set to 'sensor.roomsense\_distance\_f412fae8c830'), 'Attribute' (set to 'None'), 'Above mode' (set to 'Fixed number' with value '249'), 'Below mode' (set to 'Fixed number' with value '249'), and 'Value template' (set to '1'). The interface uses a dark theme with light-colored text and buttons.

### 4. Add Condition

- **Entity:** *roomsense-distance-<serial-number>*
- **Below mode:** *Fixed number*
- **Below:** *300 (to add an extra margin)*

\*Note: Choose 'Above mode' for undimming.

## Actions



^ Turn on Light- home office ⋮

Device

Light- home office X ⋮

Action

Turn on Light- home office ⋮

Brightness

## 5. Add Action --> Device

- **Device:** Select the light you want to control
- **Action:** Turn on the light
- **Brightness:** 5 (Dim)

\*Note: Set Brightness 100 for undimming.

^ Media player: Turn on PARSA58CM5.680KG ⋮

Service

Media player: Turn on X ⋮

Turn a media player power on. ?

### Targets

What should this service use as targeted areas, devices or entities.

PARSA58CM5.680KG X

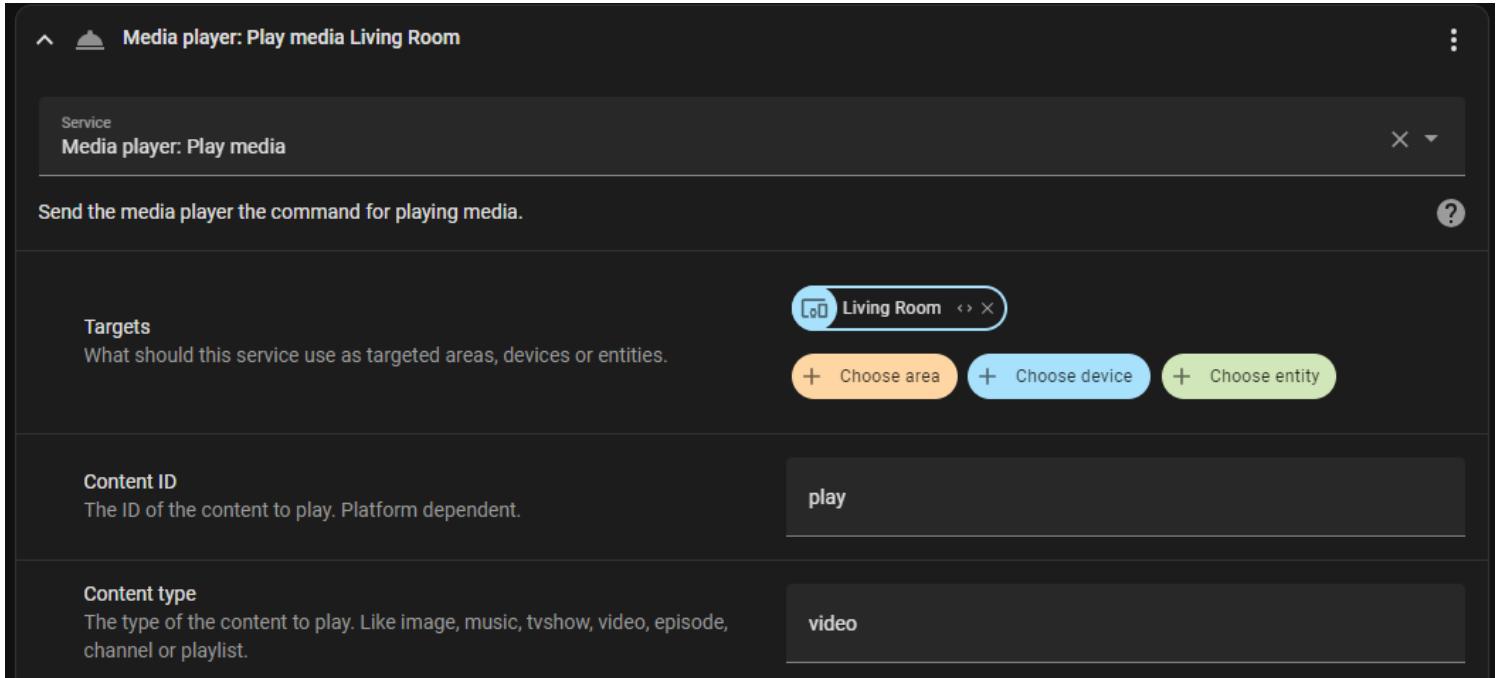
+ Choose area

+ Choose device

+ Choose entity

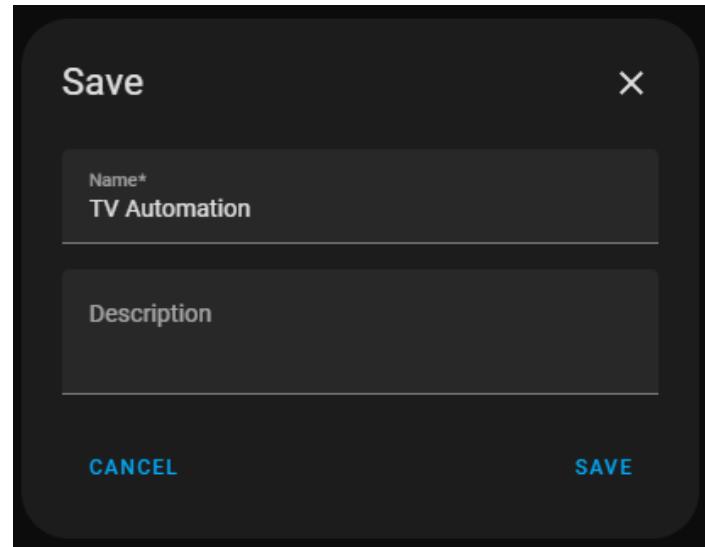
## 6. Add Action --> Call Service

- **Service:** *Media player: Turn on*
- **Targets --> Choose Entity --> your TV**



## 6. Add Action --> Call Service

- **Service:** *Media player: Play media*
- **Targets --> Choose device --> your player like Apple TV**
- **Content ID:** *Play*
- **Content Type:** *Video*



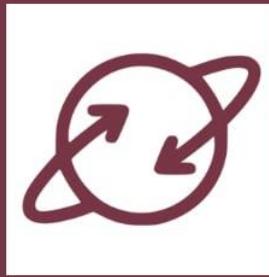
## 6. Choose a descriptive name for your automation and save it.

*\* In the Pro Features section we will discuss ProxiSense which is a better option for Proximity-Based Automation.*

## Amazon Alexa - Let Music Follow You Room to Room

In this particular scenario, we establish a connection between Amazon Alexa and RoomSense IQ to enable the playing of music based on our presence in a room. We use IFTTT integration and Virtual buttons in order to trigger Amazon Alexa routines.



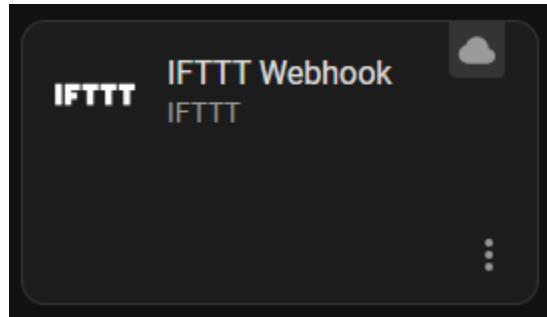


## Alexa Actions by mkZense

Send Actions to your Alexa device from IFTTT.  
Your Alexa speaker can respond to this action  
using Alexa routines.

1. Connect the [mkZense skill](#) to your IFTTT in order to establish a connection between IFTTT and your Alexa app.

Note: The skill is free for the first 3 button triggers and \$5 per year for unlimited and creates a virtual device that Alexa will detect which can then be added to routines.



2. In your Home Assistant go to Settings --> Devices & Services and add the IFTTT integration

## Triggers

When roomsense-movement-f412fae8c878 changes from '0' to '2'

### Entity

Entity

roomsense-movement-f412fae8c878

### Entity

### Attribute (optional)

From (optional)

0

To (optional)

2

### For

hh	mm	ss
0	: 00	: 00

### 3. Create Automation and Add Trigger →

- **Entity:** roomsense\_iq\_<location>\_pir\_<sn>
- **From:** Off
- **To:** On

Actions

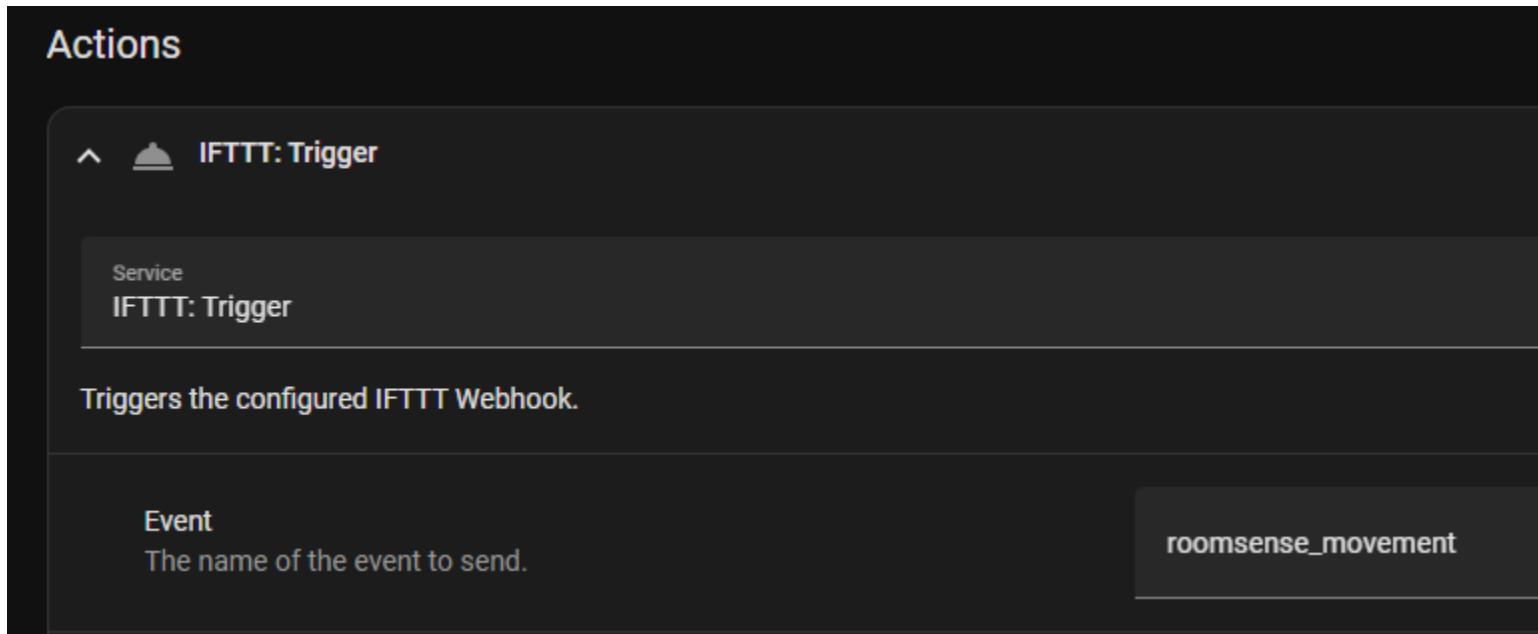
IFTTT: Trigger

Service  
IFTTT: Trigger

Triggers the configured IFTTT Webhook.

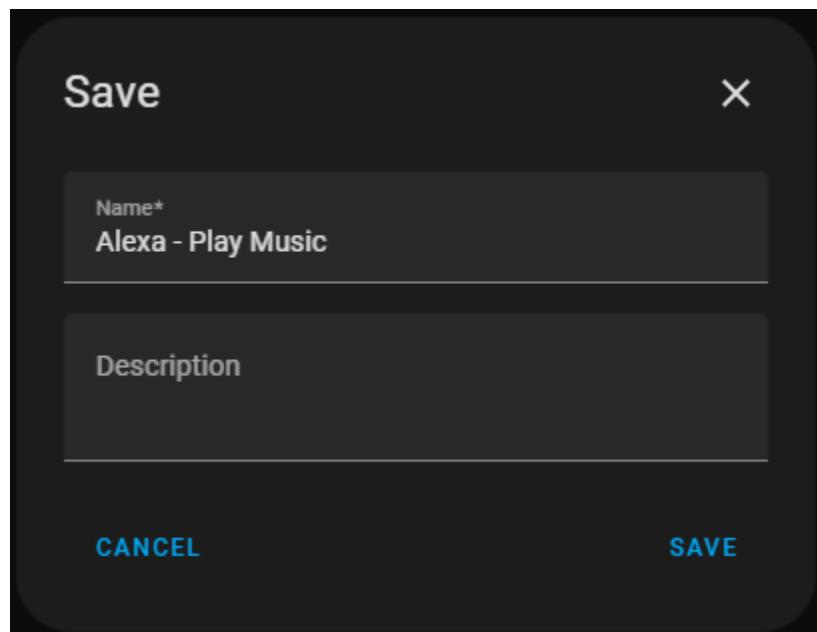
Event  
The name of the event to send.

roomsense\_movement

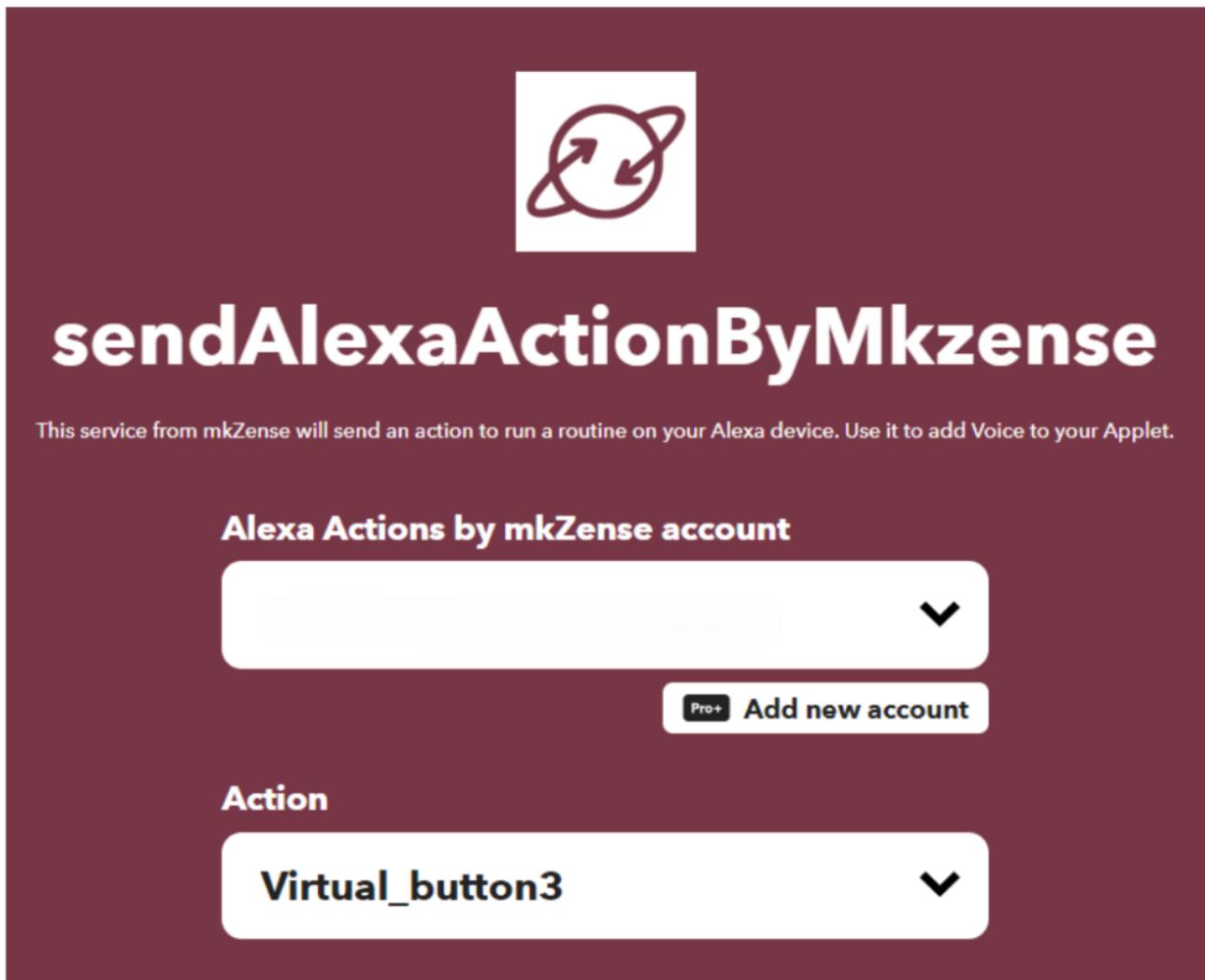
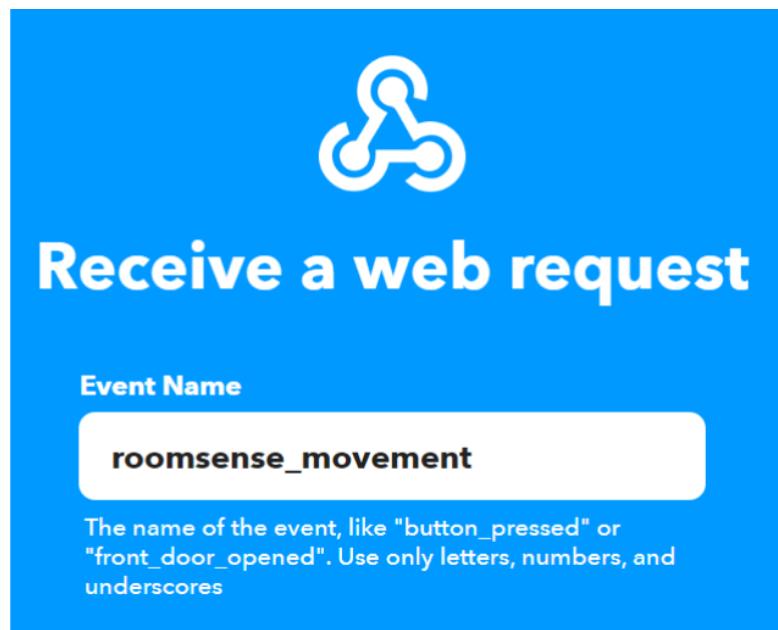


### 4. Add Action --> Call Service

- **Service:** IFTTT: Trigger
- **Event:** Pick a name for the event to send

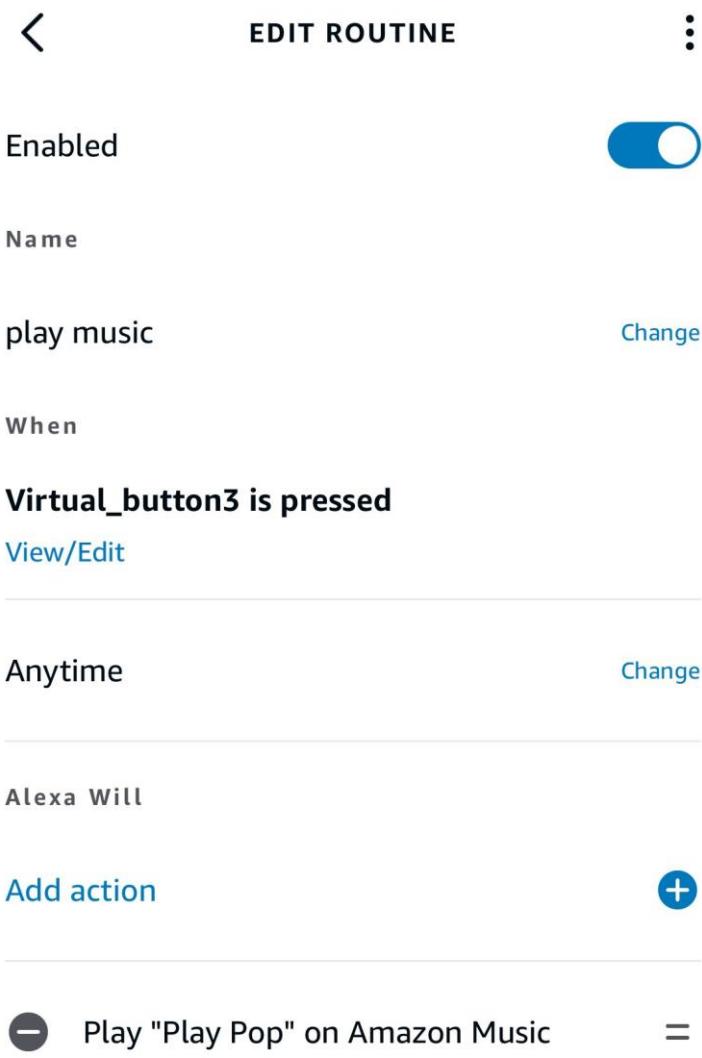


5. Choose a descriptive name for your automation and save it.



6. Go to your IFTTT account and create a new Applet.

- *If This → Search for Webhooks → Receive a web request → Event Name → Put the same name you chose in step 4.*
- *Then That → Search for mkZense → choose sendAlexaActionsByMkZense → Select your account and the Virtual button*



7. Go to your Alexa app and create a new routine.

- **when:** choose the same virtual button in step 6.
- **Add action:** *Play "Play Pop" on Amazon Music*

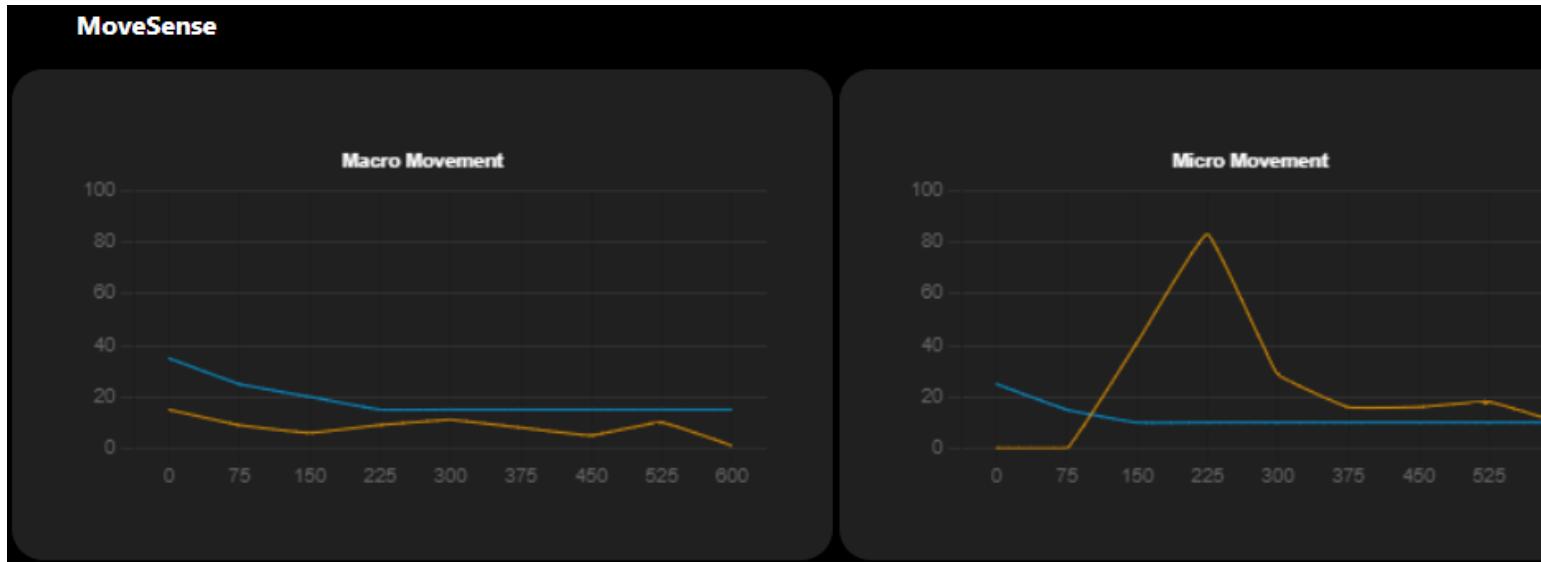
*Note: For vacant room you can choose "Stop audio on my Echo device"*

[← Monitoring & Control](#)

[Pro Features & Settings →](#)

The basic features explained in the previous section can be used for an easy and quick start. However, The SightSense dashboard provides a range of Pro and advanced functionalities that allow for further customization and fine-tuning of the device to suit specific use cases.

## MoveSense: Movement Classification



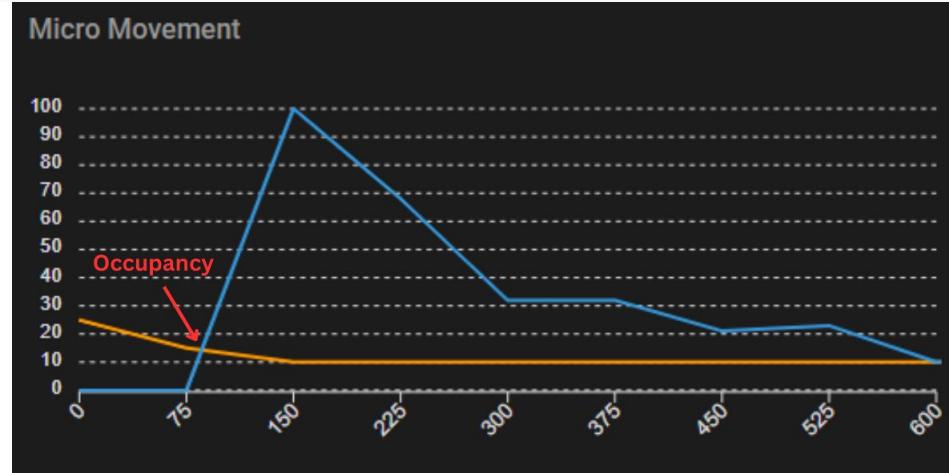
RoomSense IQ offers a remarkable capability to detect and classify two distinct types of activities: moving (**Macro**) activities and stationary (**Micro**) activities. Moving activities refer to various forms of physical motion, such as walking, running, and macro gestures. These macro movement signals are particularly valuable for applications such as Intrusion Detection, where the identification of large-scale movements is crucial.

In contrast, Micro signals relate to subtle or small-scale movements occurring within the monitored area. These movements include micro gestures, breathing or sleeping patterns. Micro movement signals hold significant importance in applications such as Vital Sign Monitoring or tracking sleeping patterns.

On each MoveSense diagram, there are two curves: The energy level of the activities are displayed in **blue curves**. These energy levels are plotted versus 8 distance bins, facilitating easy analysis and providing specific insights for each category.

The **orange curves** on the MoveSense diagrams represents the sensitivity threshold of the radar in each distance bin. The threshold levels are adjustable by the slide controls. **Presence detection** occurs when the energy level (the blue curve) surpasses the sensitivity threshold (the orange curve) in any distance bin.

The blue energy level signals are disabled by default but can get enabled using the **CalSense** switch.

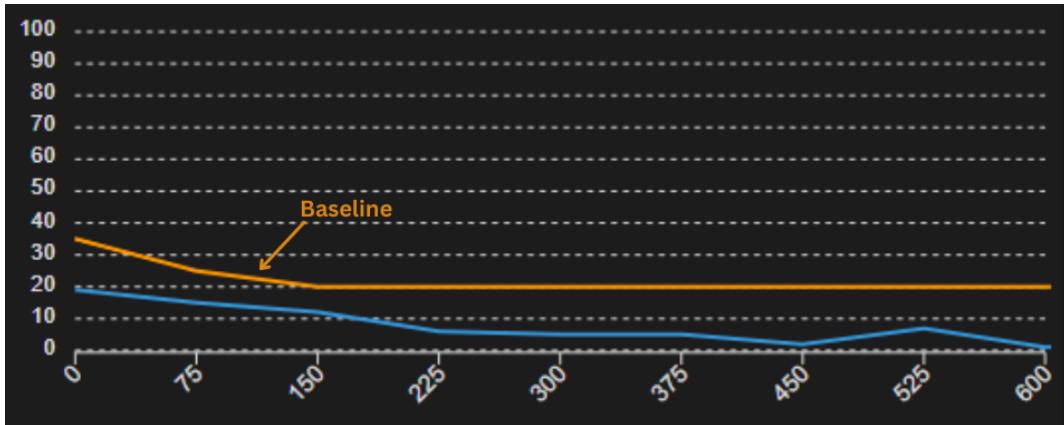


## ProxiSense: Proximity-Based Detection

ProxiSense allows you to customize your detection area based on your specific needs. If you want to avoid or ignore movements in a particular distance bin, you can simply click on the blocker box related to that bin. The blocker sets the threshold of that bin to the maximum of 100. This means the sensor won't detect any movement, such as a fan or a curtain, in that distance bin. Or suppose you only want to define automation around your desk, which is located 3 meters away from the sensor. In that case, you can block all bins except the 3-meter bins.



## CalSense: Baseline Calibration



The macro and micro signals inherently contain background noise that can occasionally cause a slight increase in signal amplitude, leading to false alarms in vacant rooms. By making use of the available slide controls, you can finely adjust the sensitivity thresholds, establish a fresh baseline, and guarantee that the blue curves do not intersect with the orange curves when the room is unoccupied.

**Note:** The baseline calibration button described on the [basic settings page](#) initiates an automated calibration process.

## BedSense: Enhance Your Sleep Experience



BedSense introduces a new level of automation based on presence in bed. By putting RoomSense IQ in this mode, the PIR sensor becomes inactive, and the occupancy signal is generated solely based on radar detection. This mode empowers you to trigger various routines to enhance your sleep experience.

Imagine your room adjusting its temperature, your devices entering sleep mode, and a soothing bedtime routine automatically initiated—all tailored to your individual preferences.

[← Automation Use Cases](#)

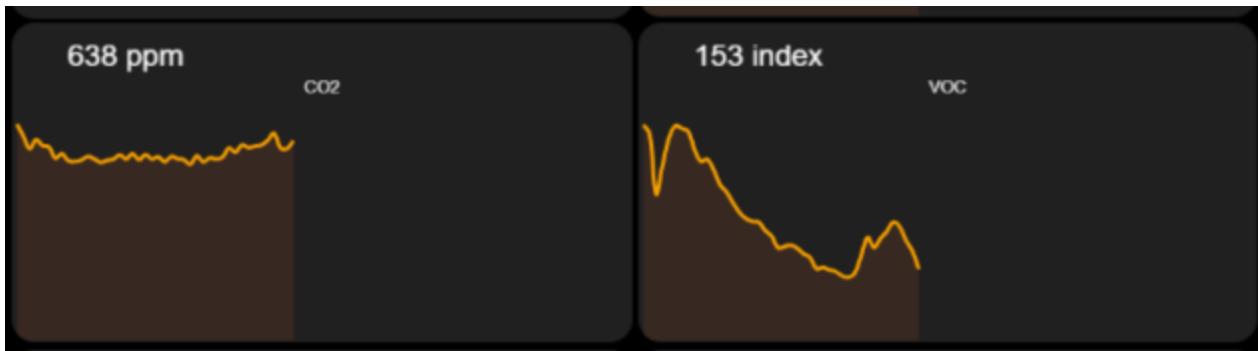
[ClimateSense →](#)

**Indoor**

**Climate**

**Control**

Climate control is a vital consideration for comfortable living and efficient resource management. The device is equipped with additional temperature and humidity sensors, providing comprehensive climate data. This allows for intelligent climate control systems, optimizing energy usage and enhancing occupants' comfort. In the ClimateSense dashboard, you can view eight different air-related parameters, including real-time values and trends over the past 24 hours. This provides detailed, granular insights into your indoor air quality.



## Real-Time Values & Data Trends

The ClimateSense dashboard provides detailed monitoring of 8 airborne parameters, offering both real-time data visualization and comprehensive trend analysis over the past 24 hours. This allows for continuous tracking and assessment of environmental conditions.

ACTION POINTS	
Humidity:	Normal
CO2:	Like Fresh Air
VOC:	Normal
CO:	No Alarm
PM:	Elevated Levels
Mold Risk:	Minimal

## Action Points

While having real-time values is crucial, it is equally important to interpret them correctly and derive actionable insights. This is where action points come into play. The internal algorithm, based on indoor air quality standards such as ASHRAE 62.1, analyzes real-time values and provides actionable insights based on sensor readings.

## CO2 SENSOR CALIBRATION

### **Notice:**

Sensor must be in outdoor air for calibration. Takes 3 mins. Ready to begin?

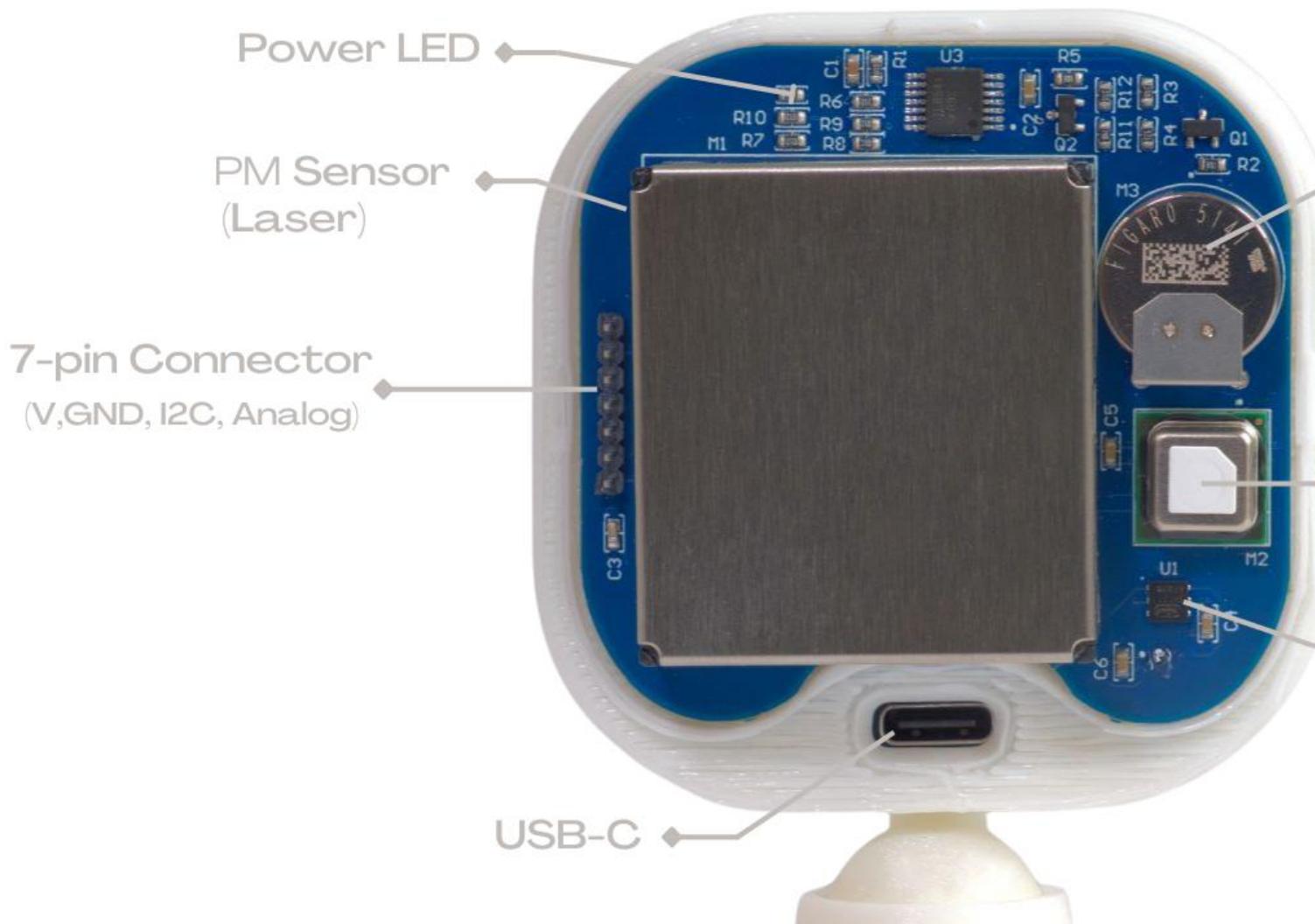
CLOSE

OK

## CO2 Sensor Infield-Calibration

Proper calibration is crucial for ensuring accurate CO2 level measurements. To calibrate the sensor, place it in fresh outdoor air and press the calibration button. This initiates a calibration process lasting approximately 3 minutes. Once completed, the sensor establishes a proper baseline for accurate CO2 level measurements.

# ClimateSense Module



## Sensors Specifications

- **Sampling interval:** 5 minutes
- **Temperature sensitivity:**  $\pm 0.3 \text{ }^{\circ}\text{C} / \text{F}$
- **Humidity sensitivity:**  $\pm 2\%$
- **CO<sub>2</sub>**
  - Measurement range: 400 -2000 ppm
  - Accuracy:  $\pm (50 \text{ ppm} + 5\% \text{ of reading})$
- **VOC**
  - Measurement index range that can be directly used for indoor air-quality applications: 1 - 500
  - The Gas Index Algorithm adapts to the sensor's surroundings.

- **Particulate matter**

- Laser scattering based optical particle counter
- Particle size detection range: 300 nm to 10 µm
- Range: 0~1000 µg/m<sup>3</sup>
- Measurement error (PM2.5): ±10µg/m<sup>3</sup> (@ 0 ~100 µg/m<sup>3</sup>), ±10% (@,100 ~200 µg/m<sup>3</sup>)

## Sensor Guideline Thresholds

	Too Low	Borderline	Good	Borderline	Too High
<b>Particulate Matter (PM2.5)</b>			<10 µg/m <sup>3</sup>	≥10 and <25 µg/m <sup>3</sup>	≥25 µg/m <sup>3</sup>
<b>Carbon Dioxide (CO<sub>2</sub>)</b>			<800 ppm	≥800 and <1000 ppm	≥1000 ppm
<b>Airborne Chemicals (VOC)</b>			<250 ppb	≥250 and <2000 ppb	≥2000 ppb
<b>Carbon Monoxide (CO)</b>					≥9 ppm
<b>Humidity</b>	<25%	≥25 and <30%	≥30 and <60%	≥60 and <70%	≥70 %
<b>Temperature (°F)</b>		<64 °F ~cool	≥64 and ≤77 °F	>77 °F	
<b>Temperature (°C)</b>		<18 °C ~cool	≥18 and ≤25 °C	>25 °C	

Welcome to the Reference Guide for RoomSense IQ! We're delighted to have you on board and excited to assist you in maximizing your experience with this innovative offering. This guide is designed to provide you with clear and comprehensive instructions, ensuring that you can effortlessly navigate and make the most of all the features and functionalities RoomSense IQ has to offer. Whether you're a seasoned user or just getting started, this guide will serve as your go-to resource, empowering you to unlock the full potential of your device. Let's embark on this journey together, discovering the ins and outs of this amazing sensor device.

- [Hardware](#)
- [Assembly](#)
- [Firmware Update](#)
- [SightSense Web App](#)
- [Home Assistant Interface](#)
- [Placement & Positioning](#)
- [Basic Settings](#)
- [Monitoring & Control](#)
- [Automation Use Cases](#)
- [Advanced Settings and Pro Features](#)
- [ClimateSense](#)

# Introduction

RoomSense IQ allows smart-home enthusiasts to automate household infrastructure based on their physical presence. It makes your heating, cooling, ventilation, lighting, entertainment, air-filtration, home-security, and emergency-alert technology—among other essential services—smarter, easier to manage, and more efficient. Create a truly harmonious living environment that knows where you are, and has a pretty good idea what you're up to, but does not share that information with a third party unless you tell it to. You remain in control without having to manage so many...controls.

If indoor air-quality monitoring isn't on your list of priorities for home-automation, it probably should be. Poor air quality can lead to respiratory issues such as asthma and allergies, and carbon-monoxide buildup can be life threatening. Our ClimateSense modules integrate seamlessly with RoomSense IQ to monitor indoor-climate conditions like temperature, humidity, CO<sub>2</sub> levels, smoke, and other such indicators. ClimateSense provides actionable insights to help you keep your living and working spaces healthy, comfortable, and productive.

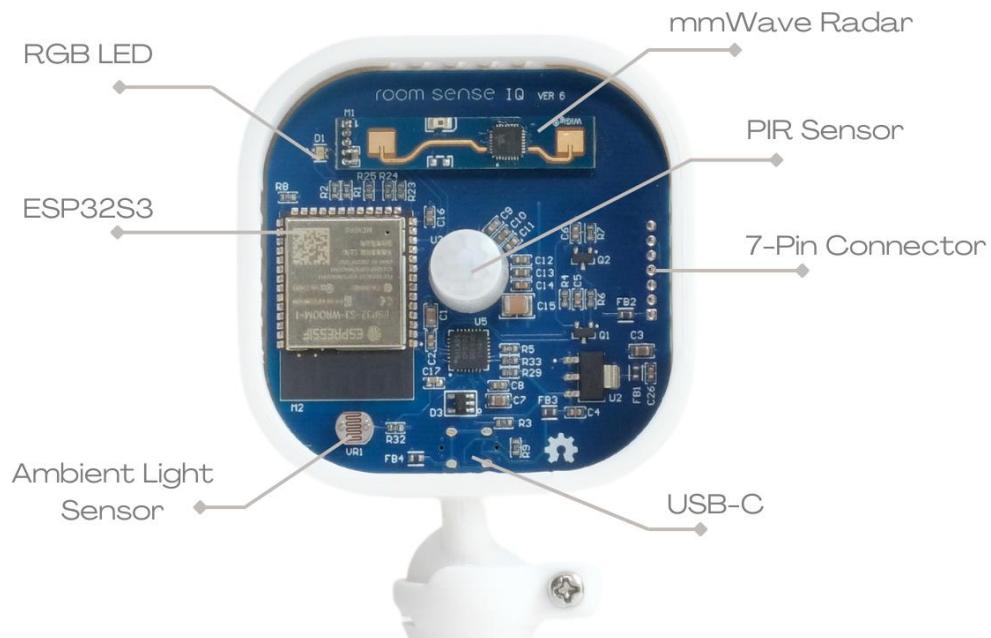


## Hardware

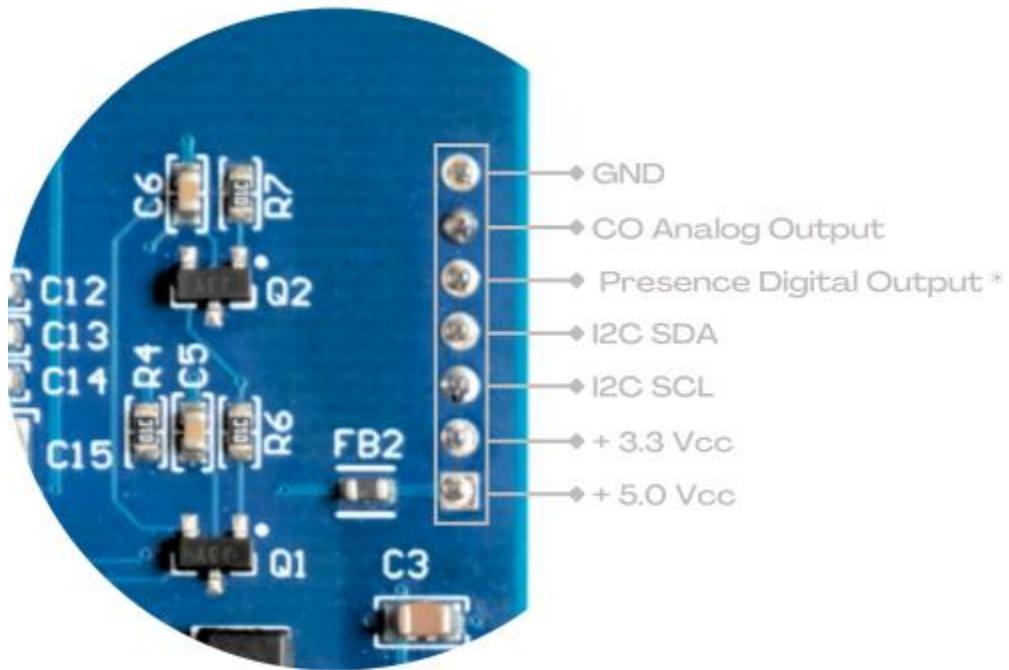
RoomSense IQ is built around the the powerful **ESP32-S3 SoC**, which supports Wi-Fi connectivity and enables seamless integration with existing IoT networks and other systems that facilitate realtime data transmission and remote monitoring. It utilizes **mmWave radar** to detect presence and movement, within a 120° arc, at ranges of up to six meters. To ensure precise detection and reduce false positives, RoomSense IQ is also equipped with a **passive infrared (PIR) sensor** that filters out non-human activities such as spinning fans and wind-blown curtains.

By accurately measuring ambient illumination, the built-in **light sensor** can automatically adjust lighting conditions to optimize energy consumption and create a more comfortable environment. A **multi-purpose RGB LED** conveys at-a-glance status information, and a **USB Type-C** interface draws power and handles serial communication. Finally, our **ball-mount enclosure** allows you to orient the sensors in any direction. Maximize coverage by positioning RoomSense IQ in a corner of the room it's monitoring or accommodate unique deployment with custom placement.

## IQ Main Components



# 7-Pin Connector



\* The Presence Digital Output pin is an open-collector type, controlled by occupancy status. It turns ON when the room is occupied and OFF when it's vacant, capable of driving a load of up to 1W. This makes it ideal for hard-wired automation applications.

## Key Features

- Web-based dashboard interface for baseline calibration and movement classification
- Home Assistant integration via MQTT over Wi-Fi
- Compatible with Amazon Alexa, Apple HomeKit, and Google Home through IFTTT
- Distance-based zone detection & blacklisting
- Movement classifier with a refresh rate of 25 Hz
- Baseline calibration for false-alarm management
- Pet-friendly calibration
- Realtime and trend values
- Support for over-the-air (OTA) firmware updates
- Configurable IP addresses and MQTT port

## Technical Specifications

- ESP32-S3 SoC with Wi-Fi connectivity

- Multi-purpose RGB LED
- USB Type-C for power and serial communication
- Thermally isolated enclosures for optimal sensor accuracy
- A ball-mount enclosure design that allows you to orient sensors in any direction
- Power consumption: 80 mA at 5 V
- Board dimension: 5.5 x 5.5 cm (2.1 x 2.1 inches)

The table below explaining the different colors of the RGB LED and their meanings:

<b>LED Color</b>	<b>Meaning</b>
Flashing Blue/Orange	<i>Looking for WiFi connection</i>
Flashing Blue	<i>Looking for MQTT broker connection</i>
Solid Blue	<i>Room vacant</i>
Solid Orange	<i>Room occupied</i>
Flashing Red	<i>Hardware issue</i>
* Flashing Yellow	<i>Elevated airborne condition</i>
* Flashing Purple	<i>Extreme airborne condition</i>

\* Only for ClimateSense.