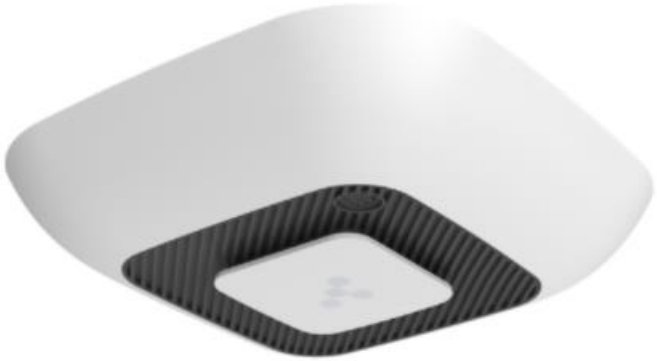
PORTAL BEAM

User Manual

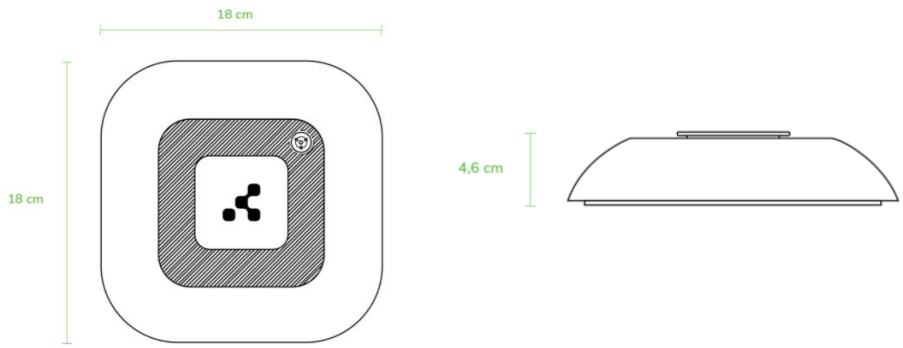


Introduction

The Portal Beam is a wireless, BLE, cloud-based, sensor platform quantifying rooms and delivering building insights in real-time. The Portal Beam uses nine different sensors: a thermal camera for occupancy and people counting, temperature, humidity, air quality, light, smoke detection, infrared beaconing, RSSI fingerprinting, and iBeacon. The Portal Beam comes with an 8-core CPU with neural network architecture and Bluetooth 5.0 readiness. Out of the box, it is compatible and seamlessly talks to any BLE-gateway. Using the 1-click, self-onboarding workflows of the Kio Cloud you can get started with it in minutes.

Features

- Configurable by mobile application
- RGB LEDs signaling device state.
- Beacon broadcasting
- IR beaconing for room level tracing
- Environmental sensing (humidity, temperature, atmospheric pressure, air quality)
- Occupancy sensing with high-reliability IR camera
- Visual/sound alerts
- Specification
- Placeholder



Specifications

Physical Specification

- Dimensions 180x180x46
- Dedicated mounting plate
- T-Bar mouting plate accesory

Electronics

- nRF52832
- IR Beam (4-directional LEDs)
- Environmental sensors humidity, pressure, temperature, air quality, light sensor
- Buzzer
- Light sensor
- Far Infrared Wide Angle therma camera
- Placeholder

Connectivity

- Bluetooth Low Energy 5.0
- Range up to 50 meters

Power

- DC 6V-24V barrel type terminal
- 6x ER14505 (2.6 mAh)

Sensors

- <u>Temperature:</u>
  Operating range: -40 to 85 c
  Typical accuracy: +- 1c
  Units: C (celsius)

- <u>Relative Humidity:</u>
  Operating range: -40 to +85°C
  Typical accuracy: +/- 1°C

- <u>Air Quality Index:</u>
  Range: 0 - 255 Value calculated based on multiple sensor readings

- <u>Pressure:</u>
  Operating range: 300-1100 hPa
  Typical accuracy: 0.6 hPa

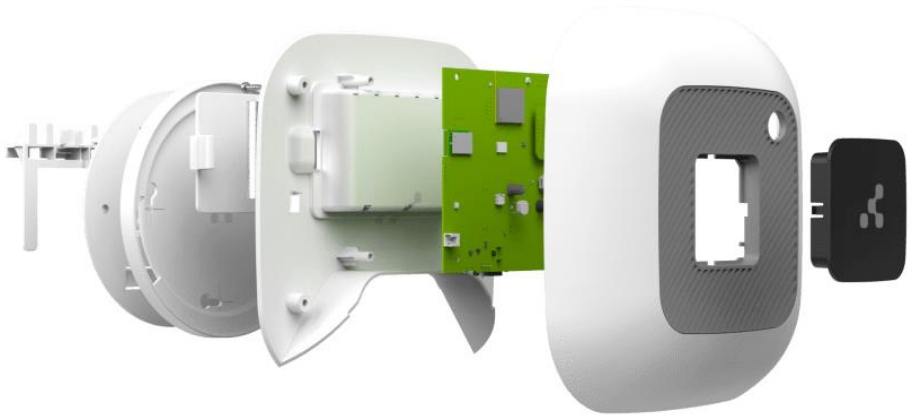
- <u>CO Sensor:</u>
  Operating range: 1-1000 ppm

- <u>Light Sensor:</u>
  Operating range: 1-100%

- <u>Power</u>
  DC 5V-24V two-wire screw terminal
  6x ER14505 (2.6 mAh)

- <u>Environmental Requirements</u>
  -40C / + 85C (-40F / +185F)
  10%~90% - non condensing

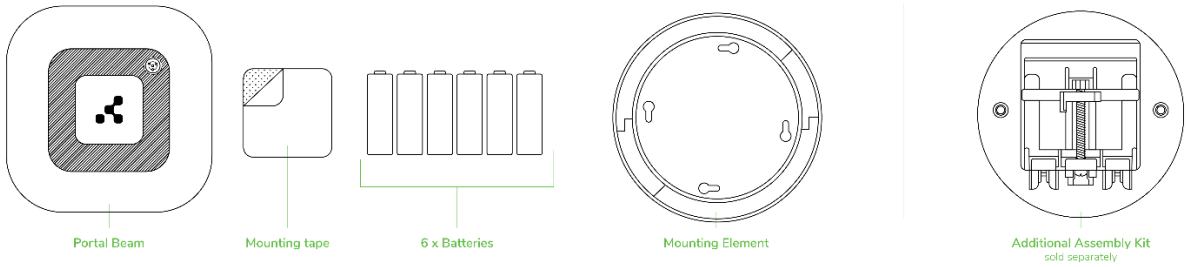
Additional features:
- Reset button
- RGB Led Device status information & alerting



Installation

This section guides you on how to correctly mount Portal Beam. There are two scenarios covered—how to mount Portal Beam for room occupancy and desk occupancy due to Portal Beam wide angle thermal camera nature. There are differences in coverage for both of these scenarios.

What's in the box



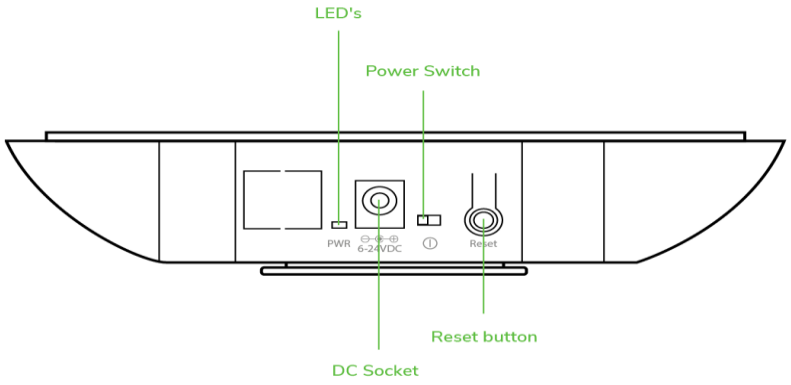
Portal Beam is shipped with 3M double-sided tape as the easiest way to mount the device, a set of batteries and a mounting kit to screw the device onto the ceiling. Also there is an additional mounting bracket available for suspended ceiling sold separately.

Features

On the side of the device you can find:

- Reset button - allows you to reset the device
- Power switch - to power on/off the device when its running on batteries
- DC socket
- LEDs that indicate state of the device

All of the above are covered by device casing, and are not visible for users.



Placement

Before you begin with Portal Beam mounting on the ceiling, remember to scan the QR code on the back of the device using the Kio Installer App.

Occupancy monitoring

For occupancy features it is crucial to calculate the coverage correctly and mount Portal Beam in the correct part of the ceiling depending on what area you need to monitor. Portal Beam is equipped with a Far Infrared Wide Angle therma camera so the coverage depends on how high it is mounted. The lowest point you can mount Portal Beam is 2,4m and the highest is 4,0m to achieve best accuracy.

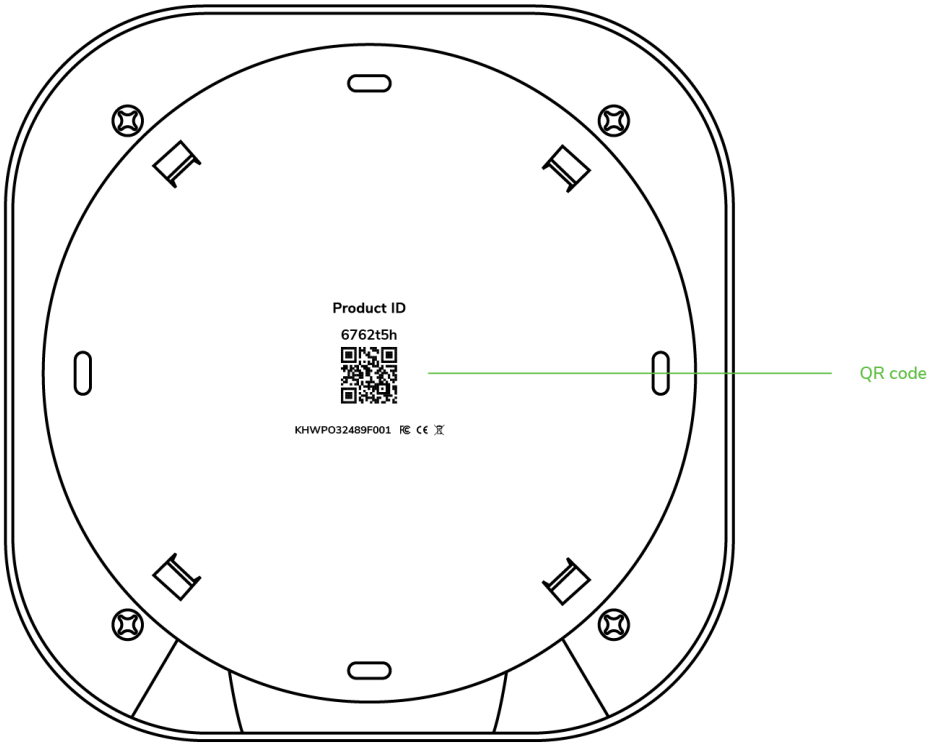
Pictures taken by the thermal camera are passed to ML based algorithms that can recognize people-based heat detection on a picture.

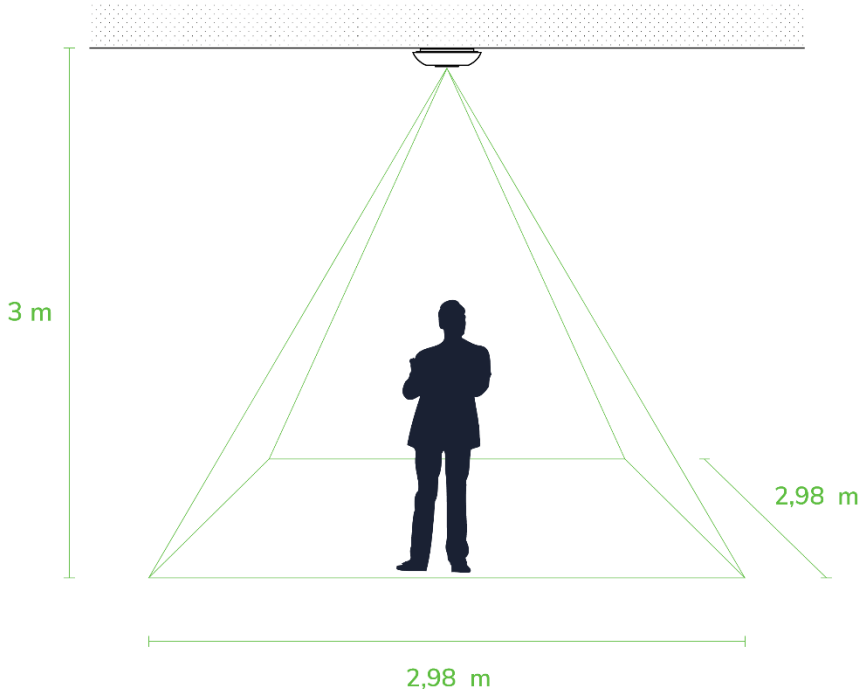
Note

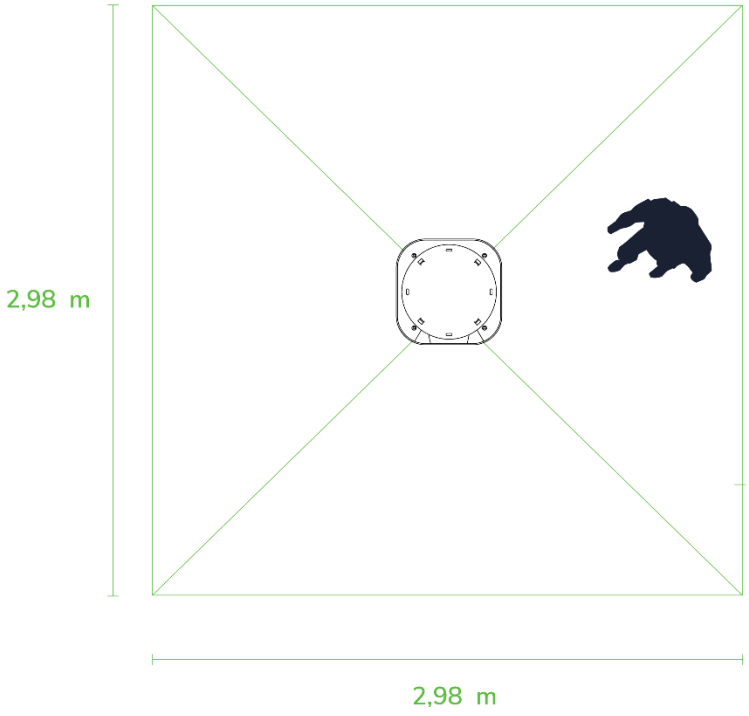
Portal Beam checks occupancy once a minute and provides full privacy. No pictures are saved on the device, the only information sent to the cloud is the number of people detected.

Room

You can use Portal Beam to monitor room occupancy. You can place a Portal Beam on the ceiling in the middle of the square that you need to monitor. Please note, as for now only one Portal Beam per room is supported.




3 m
2,98 m
2,98 m


2,98 m
2,98 m

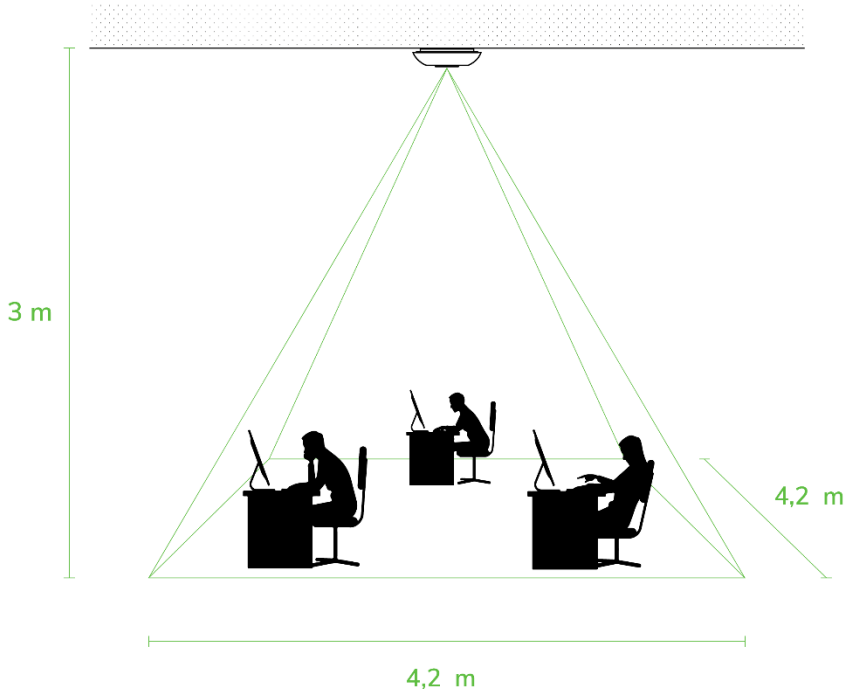
Coverage table

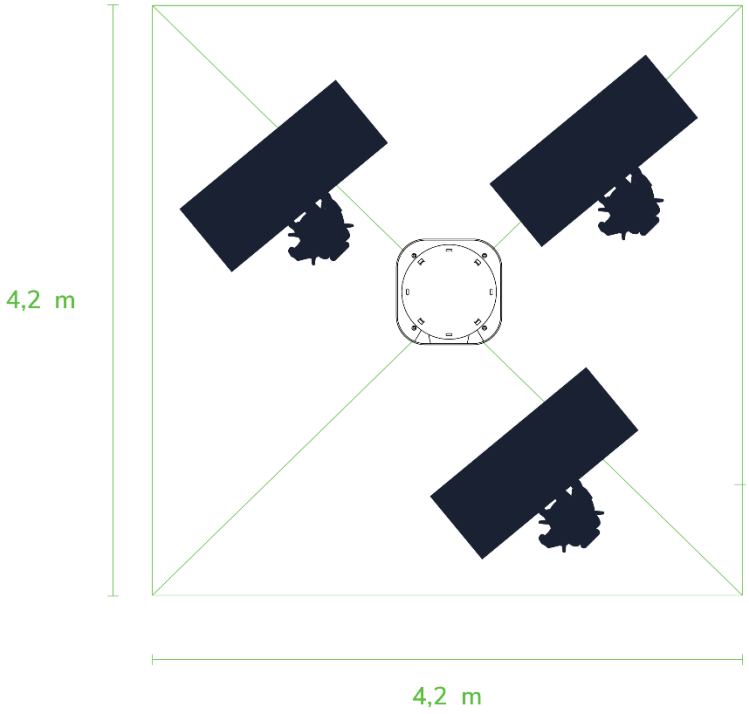
As Portal Beam needs to be able to see the thermal image of the body, please refer to the below table on what coverage is available for room occupancy scenario (standing people).

Mounting Height	Coverage
2,4m	2,27 m^2
2,6m	3,99 m^2
2,8m	6,19 m^2
3,0m	8,86 m^2
3,2m	12,02 m^2
3,4m	15,66 m^2
3,6m	19,78 m^2
3,8m	24,37 m^2
4,0m	29,45 m^2

Desk

Portal Beam can also be used to monitor desk occupancy, or just sitting people.


3 m
4,2 m
4,2 m


4,2 m
4,2 m

Coverage table

Please see reference calculations for desk occupancy, since the distance from Portal Beam to the body of sitting people is greater than for the room occupancy scenario, coverage is slightly increased.

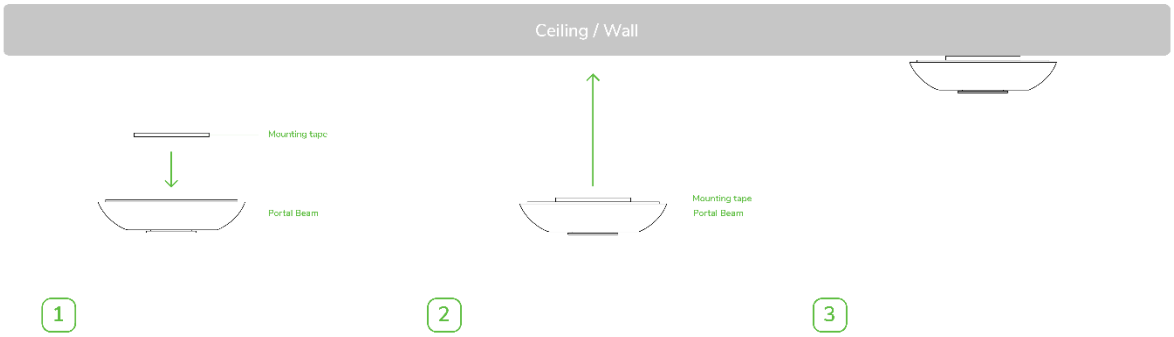
Mounting Height	Coverage
2,4m	7,47 m²
2,6m	10,38 m²
2,8m	13,78 m²
3,0m	17,66 m²
3,2m	22,01 m²
3,4m	26,82 m²
3,6m	19,78 m²
3,8m	24,37 m²
4,0m	29,45 m²

Info

Please note, all calculations are based on average people height of 185cm.

Mounting options

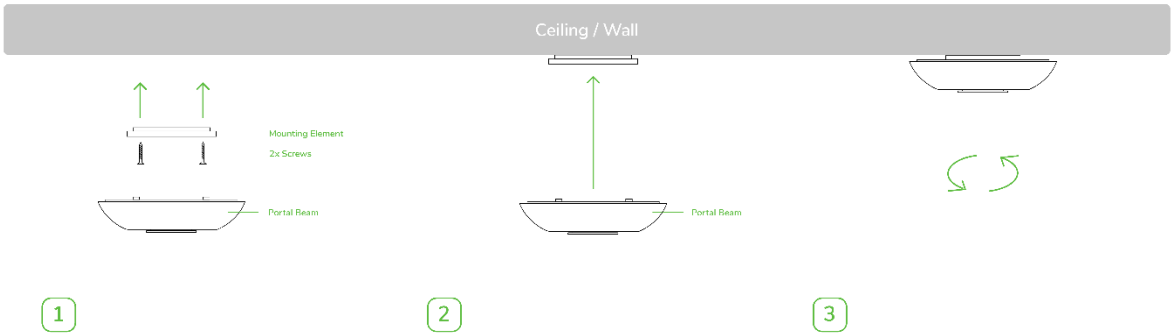
Tape Mount



- Step 1: Peel one side of mounting tape and stick it to the back of Portal Beam
- Step 2: Peel other side of mounting tape and stick it to the ceiling
- Step 3: Ready

Ceiling-mount

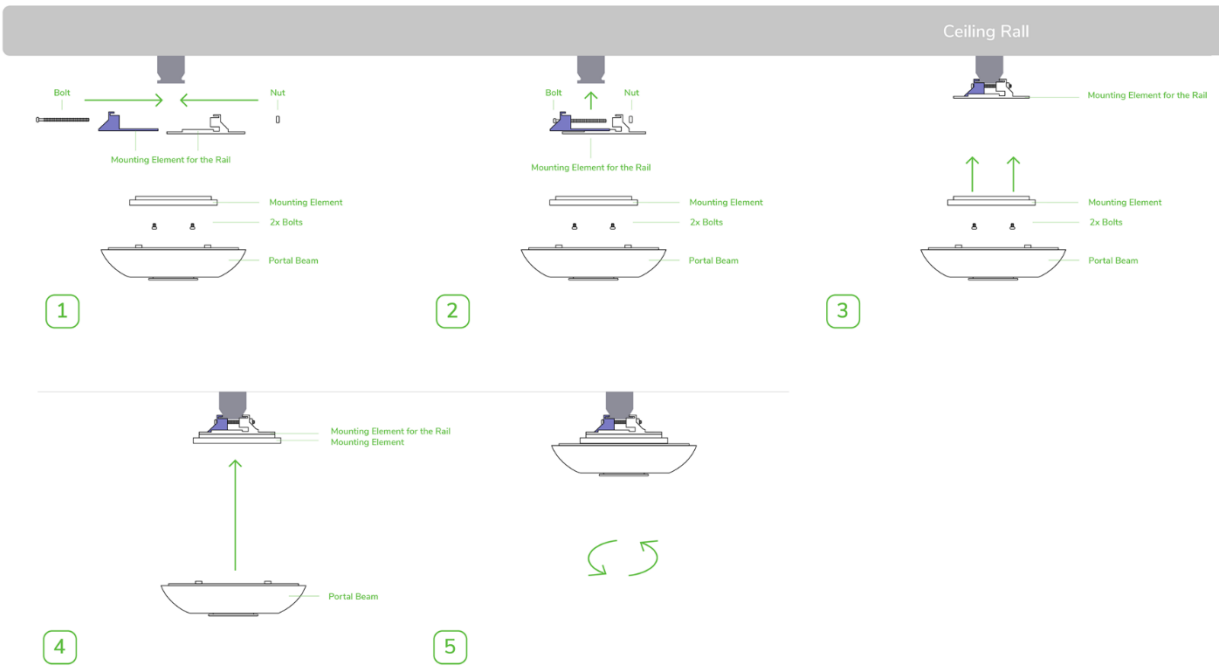
Standard mount needs to be screwed to the ceiling.



- Step 1: Put wall plugs in drilled holes.
- Step 2: Put the mounting kit against the ceiling and screw it in.
- Step 3: Put Portal Beam to the mounting kit and rotate it gently to lock it.

T-rail mount

T-rail mount allows you to mount Portal Beam easily to a suspended ceiling.



- Step 1: Put all elements together
- Step 2: Lock trail to the suspended ceiling bar
- Step 3: Screw standard mount to t-rail mount
- Step 4: Put Portal Beam to the standard mount
- Step 5: Rotate it gently to lock it.

Configuration

This section explains how to configure your Portal Beams. Make sure you have already configured the location, building and floor, if not please see: Smart Location section.

Configuration options

There are two options available for Portal Beam to be configured, you can either add Portal Beams to rooms using Kio Cloud or use the mobile application.

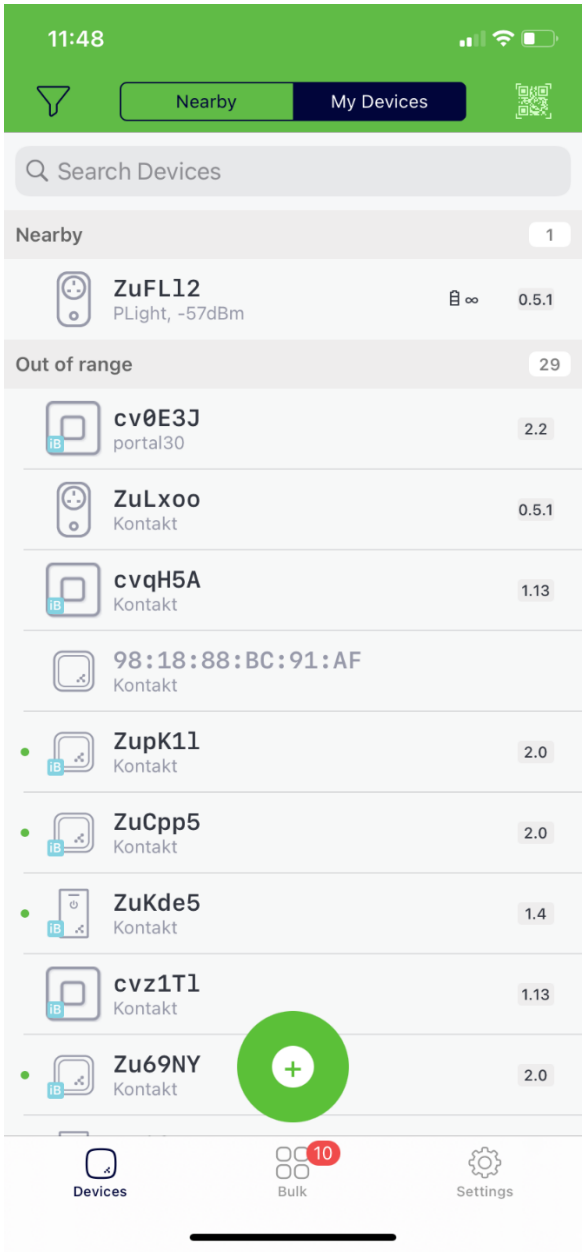
Kio Installer App

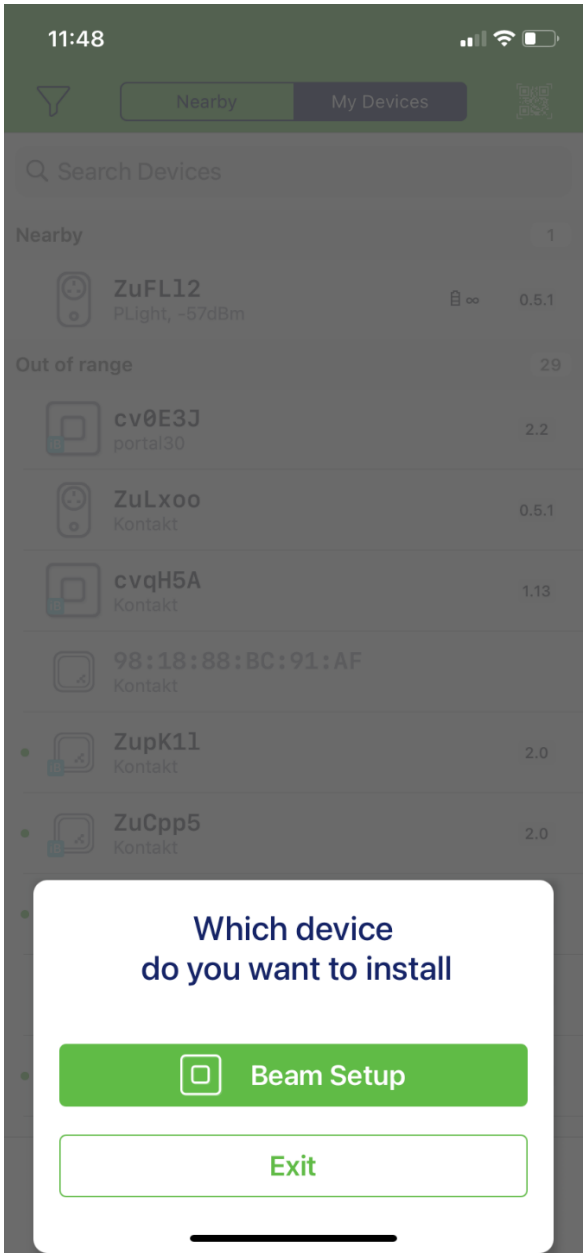
Scan Portal Beam QR code

Kio Installer App allows you to add Portal Beams to the room easily. It's available for Google Android and Apple iOS. After you download it you need to log in with your Kio Cloud account, then click on the + icon and select Beam Setup. Click on the navy blue bar at the top of the screen to activate the QR reader and scan QR code that is printed on the back of Portal Beam

Note

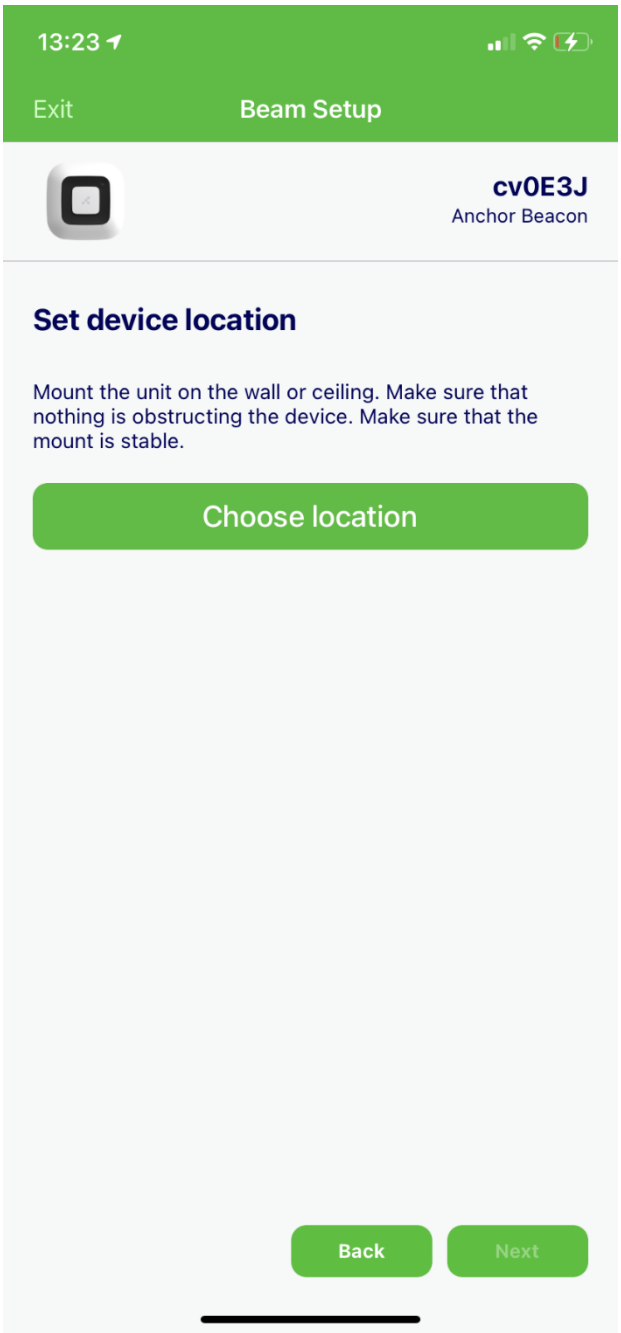
Make sure you scan the QR code before you mount Portal Beam on the ceiling.

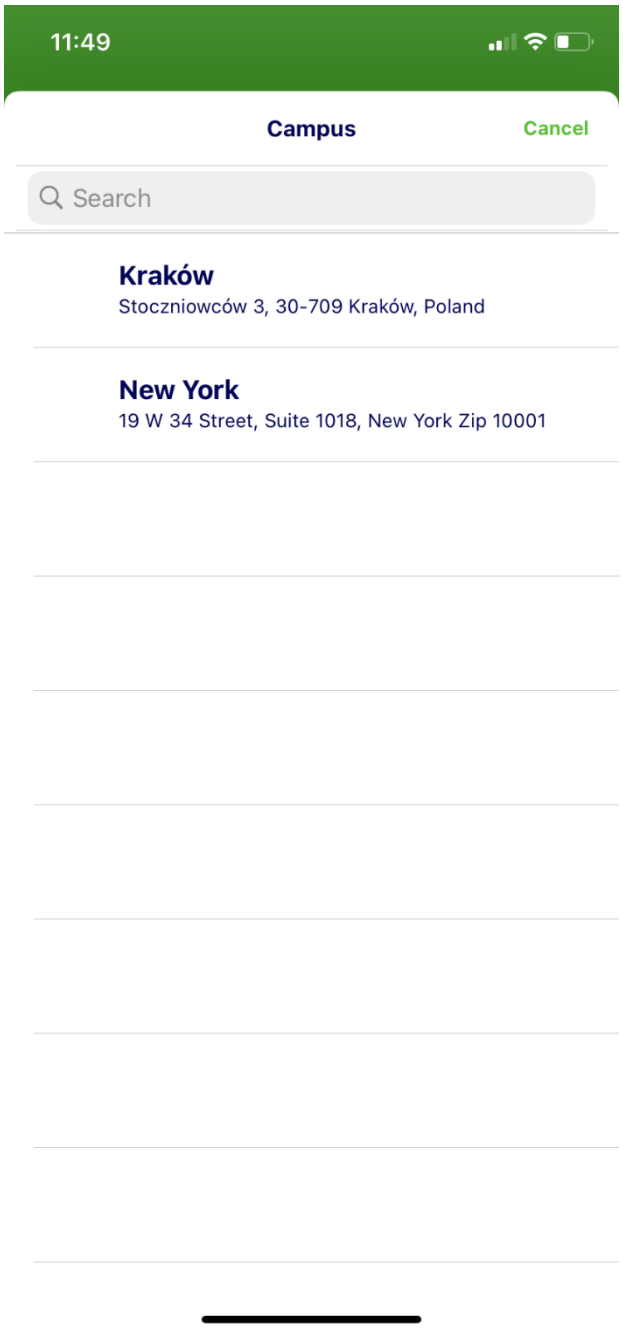


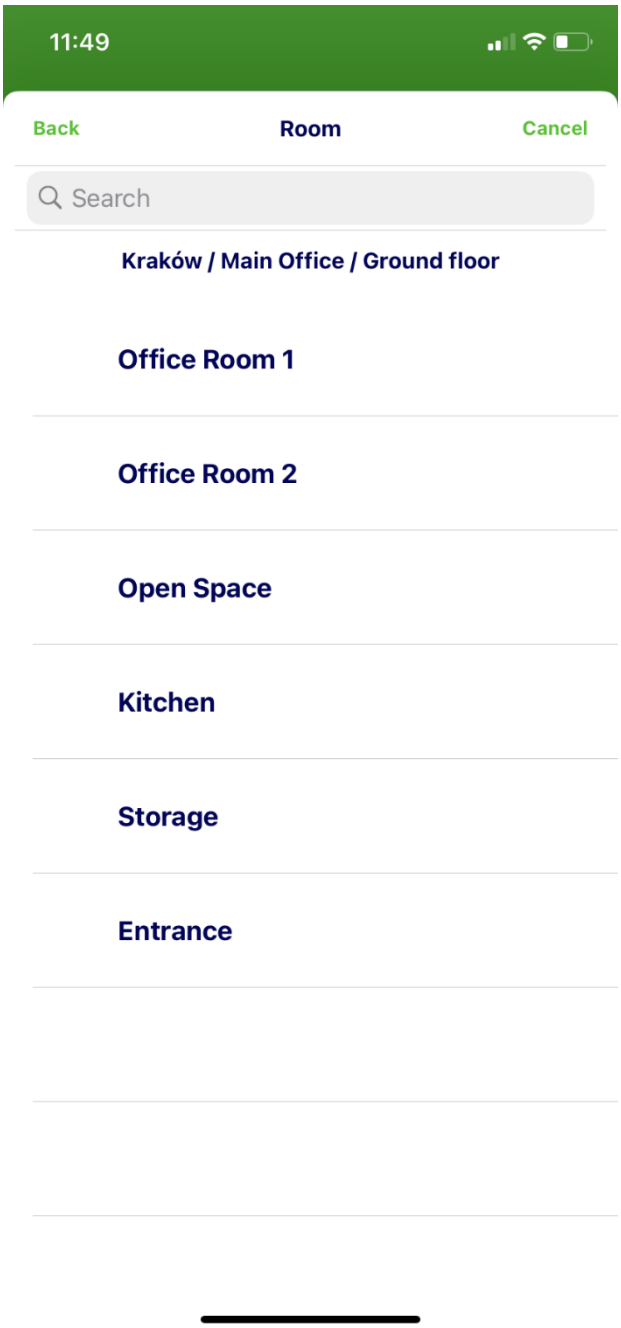


Select room

After the QR code on the back of Portal Beam is scanned, the Installer Application can recognize a device and prompts you to choose a location that you would like to add Portal Beam to. Click on Choose location, select location, building and room.


13:23
Exit
Beam Setup
cv0E3J
Anchor Beacon
Set device location
Mount the unit on the wall or ceiling. Make sure that nothing is obstructing the device. Make sure that the mount is stable.
Choose location
Back
Next

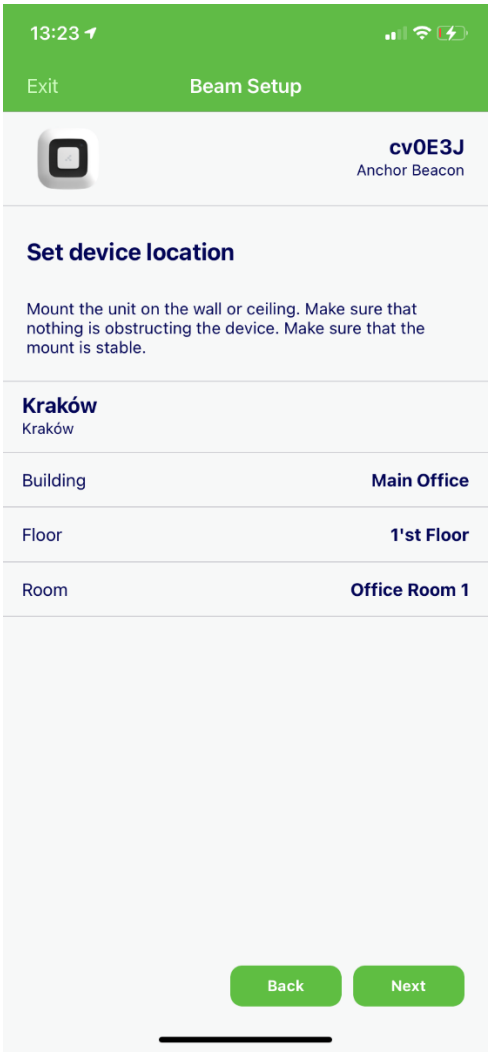

11:49
Campus
Cancel
Search
Kraków
Stoczniowców 3, 30-709 Kraków, Poland
New York
19 W 34 Street, Suite 1018, New York Zip 10001

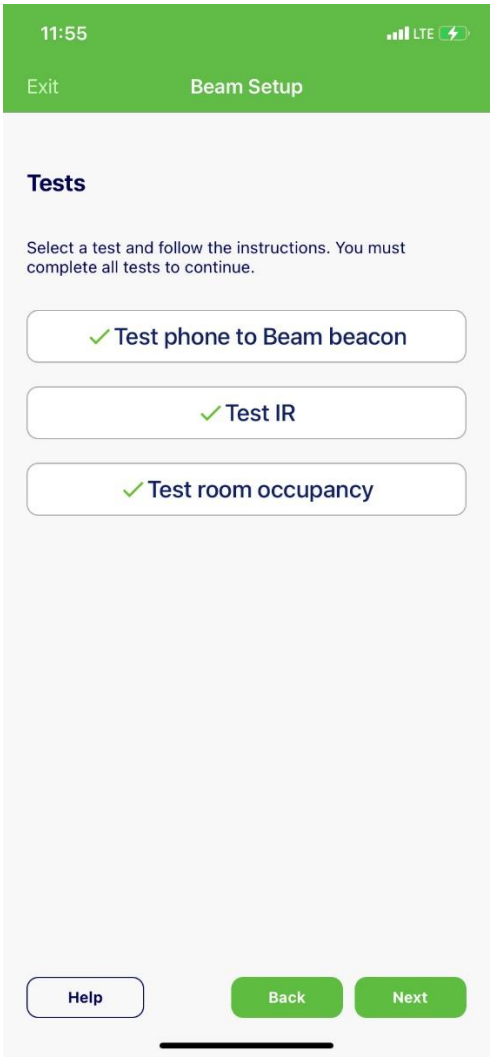


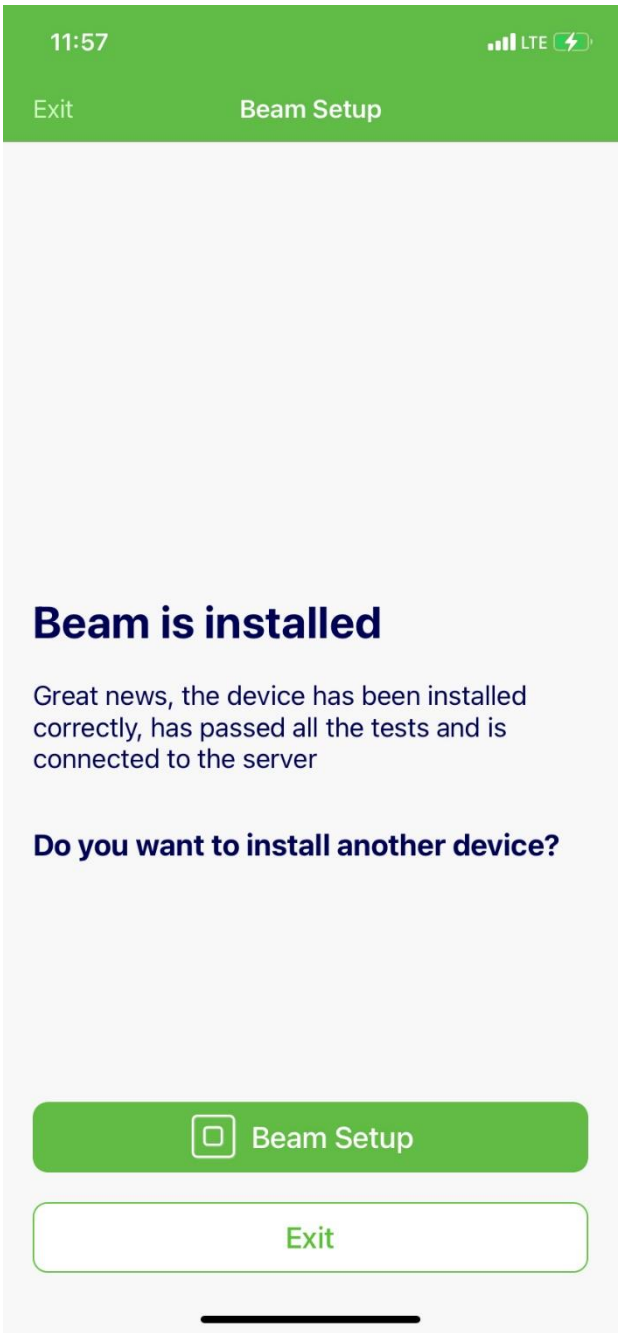
Perform Portal Beam tests

After you choose a room for Portal Beam a summary page appears for you to confirm your choices. After you click Next series of tests needs to be done. The first test checks if the Installer App can connect to Portal Beam, after the connection is successful the Portal Beam LED will blink green. The next test checks if Portal Beam broadcasts the correct room number. For the last test, please stand under the Portal Beam for at least 20 seconds to allow Portal Beam to recognize you and update the occupancy counter. After this time you can tap on Test room occupancy.

If all tests were successful, Portal Beam is correctly added to a room. You can either choose Beam setup again to add the next Portal Beam or click on exit. You can always open Beam Setup again by clicking + button on Installer App.



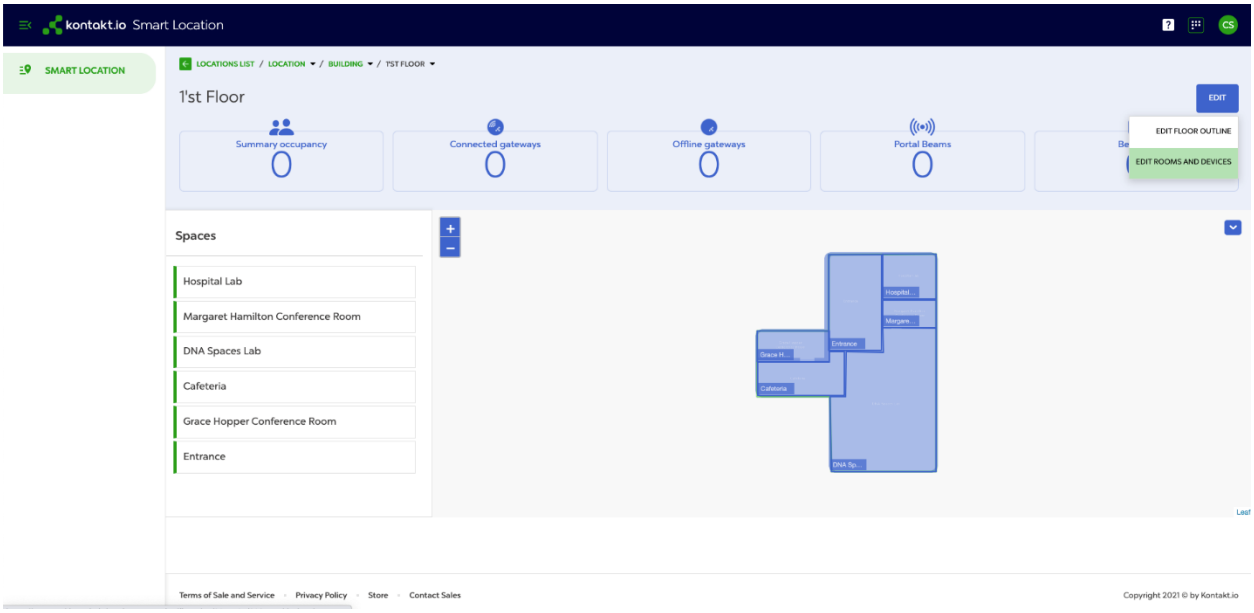




Smart Location

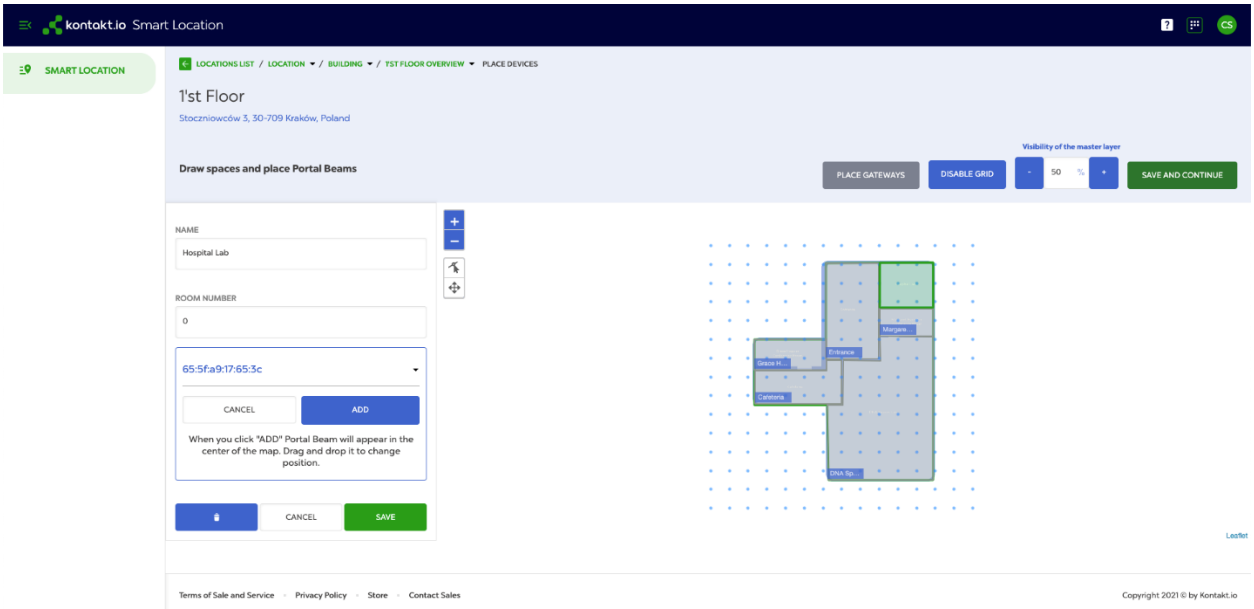
Select room

Smart Location also allows you to add Portal Beams to rooms, go to Smart Location -> Locations List -> Location -> Building Floor - and click on Edit Rooms and Devices



Add Portal Beam

Select a room that you would like to add Portal Beam to and select Portal Beam MAC Address, click on Add than Save.



Info

You can check Portal Beams MAC Address on Beacons -> Beacon list -> Select Beams unique id you need to check MAC Address.

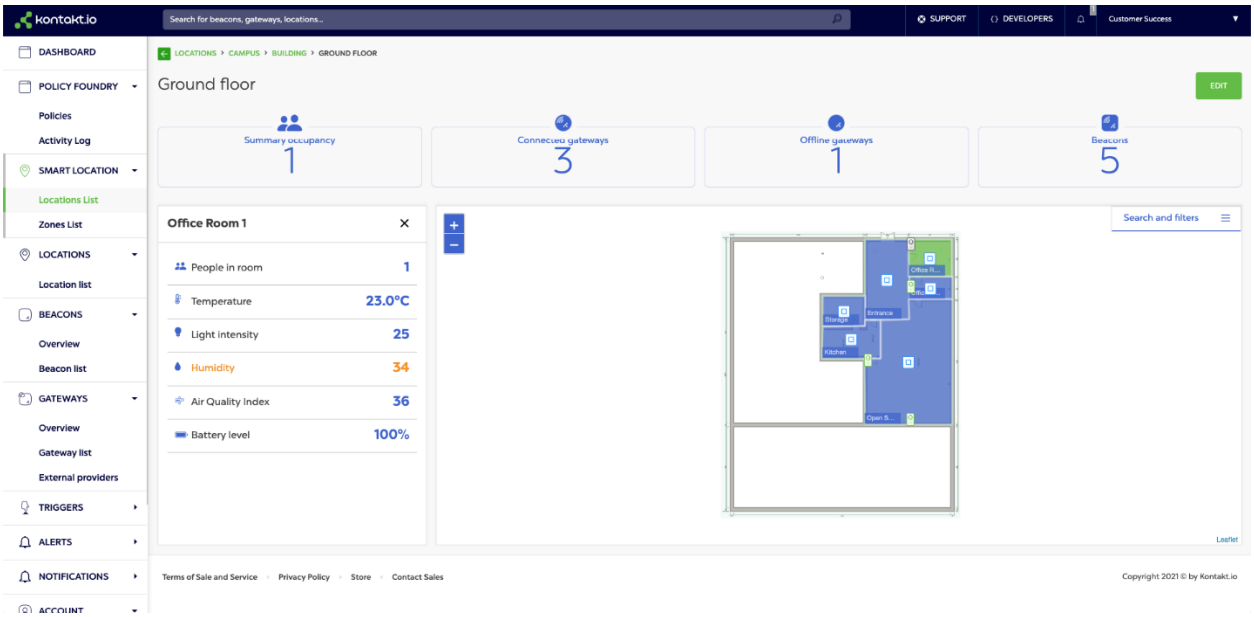
After you add all your Portal Beams click on Save and Continue

Warning

Portal Beam requires a Portal Light or Cisco access point to send data to the Kio Cloud.

Preview Portal Beam environmental sensors on Kio Cloud

After you have successfully added Portal Beams to rooms you can click on the room to see its information.



- People in room - number of people detected by Portal Beam Occupancy feature
- Temperature - Temperature captured by Portal Beam sensors
- Light intensity - measured in %
- Humidity - measured in %
- Air Quality Index

FCC Caution：

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.