

# Portal Beam

The Internet of Things. Now, in One Thing.



# Overview

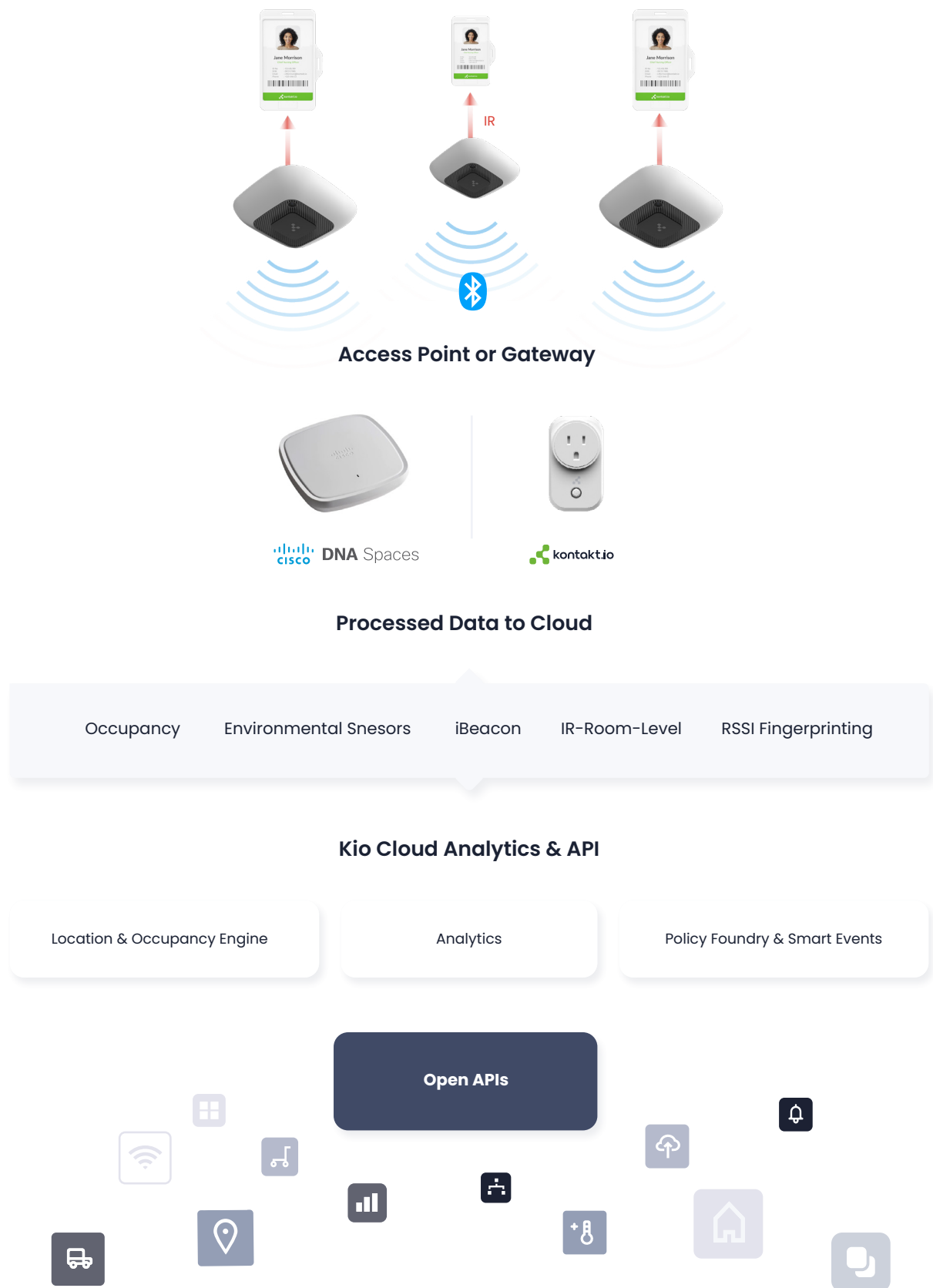
**The Portal Beam is a 9-in-1 cloud-enabled sensor platform** for quantifying rooms and delivering building insights in real-time. Portal Beam uses nine different sensors: thermal camera, temperature, humidity, air quality, light, infrared beaconing, RSSI fingerprinting, and iBeacon.

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 integrates with any Bluetooth-based wireless infrastructure, including Enterprise Access Points from companies like Cisco, overcoming the need to install any additional expensive Gateways.

The Portal Beam is deployed in 60 seconds and easily managed and configured via the Kio Cloud platform and the **Kio Mobile Apps**. Relying solely on a BLE-radio for its wireless backhaul, the Portal Beam has a battery life of 4 years with default settings. Its value proposition supports five use-cases capabilities that turn any IT network into an IoT network

- **Occupancy monitoring:** A Portal Beam deployed on a ceiling in a meeting room or above a set of desks lets you monitor how people occupy spaces and track the occupancy of buildings, floors, rooms and desks without infringing on privacy. It uses a thermal camera sensor to count the number of people.
- **Seat occupancy:** A Portal Beam can measure the occupancy of multi-seat workstations in enclosed rooms or open spaces. Resulting in detailed, seat-level utilization data. When in Seat mode, a Portal Beam measures the count of workstation seats that are occupied and not occupied. Up to six stand-alone seats can be defined by Portal Beam.
- **Footfall traffic:** A Portal Beam can measure the people traffic in large spaces, departments, floors, or entire buildings. Resulting in building utilization data. When in Traffic mode, a Portal Beam counts people entering and exiting a space. A Portal Beam is located at each entrance or interior space and people are counted as they pass through the Portal Beam and adjustable invisible threshold line.
- **Environment monitoring:** With its rich set of sensors the Portal Beam helps to provide a safer and healthier workplace, reduces the building's carbon footprint, and improves the employee experience. The Portal Beam has a temperature, light, humidity, pressure and air quality. Other sensors are optional.
- **Infrared (IR) beaconing:** In addition to the BLE-radio, the Portal Beam includes an Infrared-array that enables 100% room-level certain location-tracking use cases such as healthcare workflows, contact tracing, pairing visitors with hosts and tracking the flow and location of valuable assets. Room-level certain tracking of assets or people requires Bluetooth-enabled Tags like the Kontakt.io Smart Badge or Asset Tag 2 that have an IR-receiver built in to transfer that data back to the Kio Cloud using the Kontakt.io telemetry packet.
- **Fingerprinting:** The Location engine in the Kio Cloud powered by machine learning improves the location accuracy of any Bluetooth-enabled device or wireless Access Point infrastructure topology with Portal Beams being deployed in each room. Every once in a while, the Portal Beam listens to its RF environment and feeds that data back into the Kio Cloud and the ML module. Combining this with BLE RSSI values from Access Points, IR information and occupancy sensor data in one Location Engine model, makes the Kio Cloud the most powerful and innovative indoor location engine in the industry.

# Kio Cloud Architecture



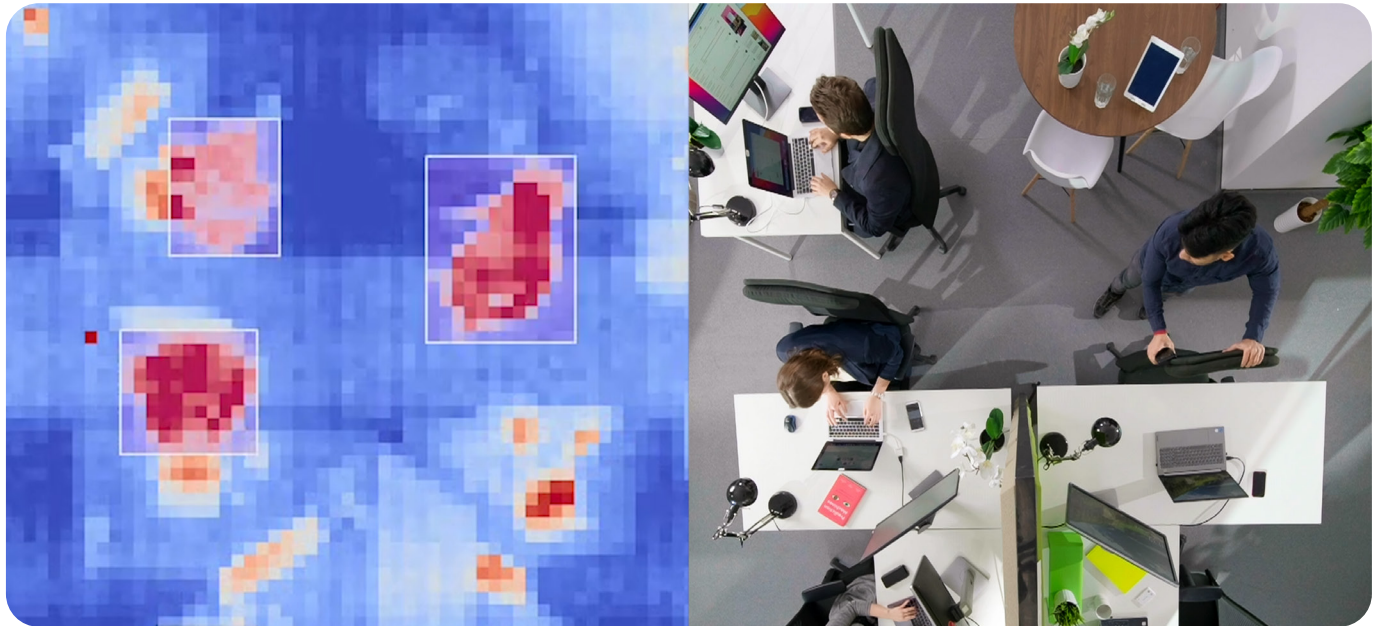
# Kio Cloud & Portal Beam Architecture Benefits

Value Proposition	Benefits	Architecture
Fastest time to value	Anyone can self install the Portal Beam in less than 60 seconds per room	<ul style="list-style-type: none"><li>• 100% wireless using BLE connectivity only</li><li>• No cabling or wires needed</li><li>• No VPNs, added software or complexities</li><li>• Users can quickly configure and customize sensors and policies / alerts in the Kio Cloud</li><li>• iOS and Android Mobile Apps with installation workflows</li><li>• No professional calibration needed</li></ul>
Most scalable solution	Seamlessly integrates with existing IT and Wifi Access Points topology using BLE	<ul style="list-style-type: none"><li>• 100% cloud enabled</li><li>• Limited data throughput due to edge ML and processing</li><li>• Native integration two-way communication and integration with Cisco DNA Spaces</li><li>• Remote Device Management from on-boarding, securing, managing and configuration</li></ul>
Delivered as a Service	No CAPEX & continuous product evolution	<ul style="list-style-type: none"><li>• Monthly Cloud and firmware releases</li></ul>
Open	No vendor lock-in, expand with third party software application or build your own	<ul style="list-style-type: none"><li>• Open APIs from the Kio Cloud</li><li>• Compatible with any other hardware thanks to the Kontakt.io open source Connectivity SDK and firmware libraries for both gateways and end-devices</li></ul>
Affordable	Save money, lower total cost of ownership, higher ROI	<ul style="list-style-type: none"><li>• One Cloud pricing, no hidden features or extra costs</li><li>• Free Applications within the Kio Cloud for unlimited innovation</li></ul>
Room-level Location Engine	Room-level certainty for hospital workflows and other smart buildings	<ul style="list-style-type: none"><li>• AI machine learning location engine using multiple sources of data including occupancy, IR, BLE and sensor information learn and adopt to use-cases</li></ul>

# Technical Specifications

Electronics		nRF52832 IR Beam (4-directional LEDs) Environmental sensors: humidity, pressure, temperature, air quality, light sensor Buzzer (optional) Far-Infrared wide-angle thermal camera
Connectivity	Bluetooth Range	Bluetooth Low Energy 5.0 Up to 50 meters
Sensors	Temperature	Operating range: -40°C to 85°C Typical accuracy: +/- 1°C
	Relative Humidity	Operating range: 0-100% Typical accuracy: 20-80% r.H., 25°C
	Air Quality Index	Range: 0 - 255 Value calculated based on multiple sensor readings
	Pressure	Operating range: 300-1100 hPa Typical accuracy: 0.6 hPa
	CO Sensor	Operating range: 1-1000 ppm
	Light Sensor	Operating range: 1-100%
Power	Input Voltage Batteries	DC 6V-24V barrel type terminal 6x ER14505 (15.6 Ah), DC 3.6V)
Environmental Requirements	Operation Temperature Operation Humidity	-40°C / + 85°C   -40°F / +185°F 10%-90% - non condensing
Physical Specification	Dimensions Mounting	18x18x4.6 cm Dedicated mounting plate Reset button (factory reset button) RGB LED (device status information & alerting)

# Thermal Camera Sensor Module



**What The Portal Beam thermal sensor sees:**  
Heat signature that are detected by Edge & Cloud AI.  
No Personal Identification Information.

**What regular security cameras and other sensors see:**  
Regular pictures in colour. 100% Personal Identification Information.

- By default the thermal Sensor takes a picture every 60 seconds
- A Convolutional Neural Network on the device using a separate GAP-8 chip and an extension of the same model in the cloud analyze both single and series of pictures to predict the number of people capture by the sensor
- The picture taking rate is adjustable in the Kio Cloud
- The accuracy for detecting both sitting and standing people in normal environments is 95%+ or higher
- Large hot objects including warm windows can impact the algorithm performance
- We constantly update the algorithm with new training data and provide OTA Firmware and Cloud updates on an ongoing basis
- The thermal sensor has a Field of View (FOV) of 120 degrees. The detection of people thus depends on the installation height of the sensor and the height of people. For more instructions regarding installation, visit the Kontakt.io Help Center [here](#)
- Portal Beam has three modes: occupancy mode, seat level occupancy mode, and traffic mode.

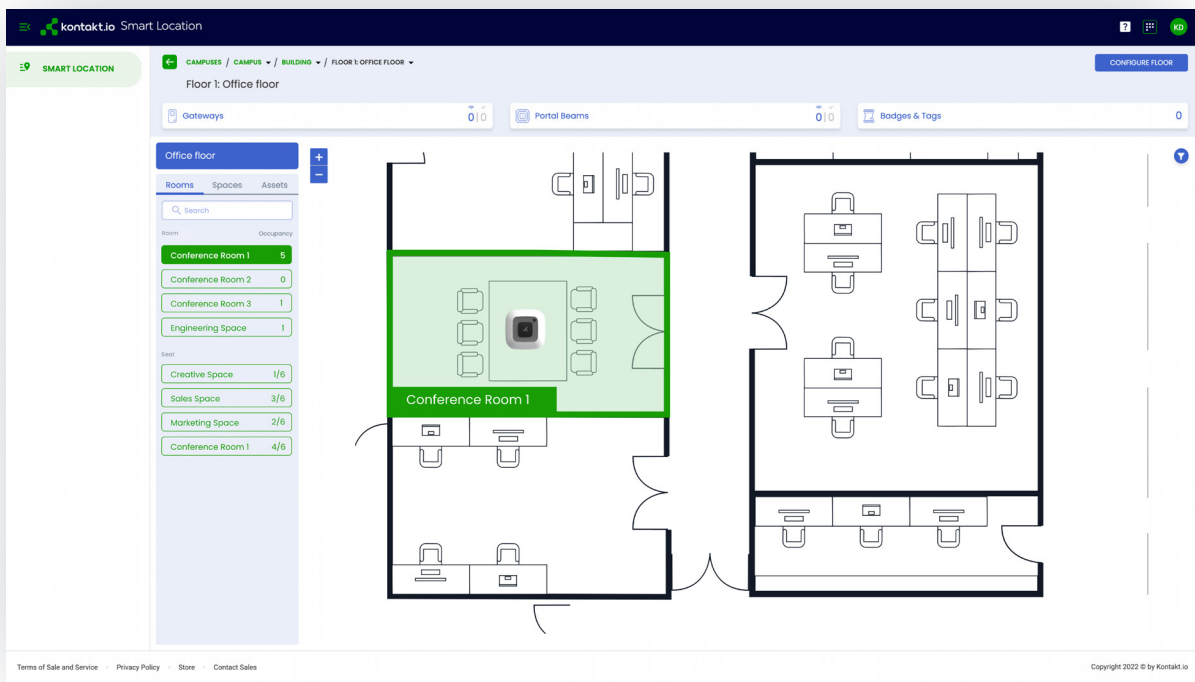
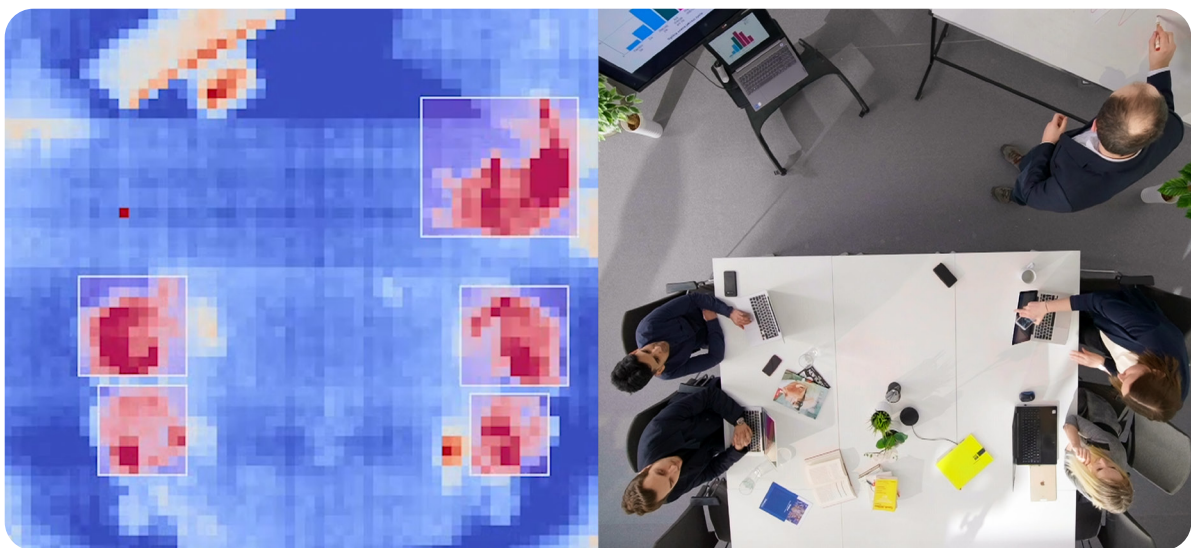
# Portal Beam Modes & Infrastructure Requirements

A Portal Beam has several occupancy measurement capabilities. These capabilities are defined by each of three available modes, including Room Occupancy, Seat Level Occupancy, and Traffic.

Each mode also includes environmental monitoring capabilities that measures room temperature, humidity, light level, and air quality. A Portal Beam is also equipped with IR beaconing that provides location based capabilities for tracking assets and the flow and location of people.

The following provides the details of each mode and the default mode settings.

## Room Occupancy mode



# Portal Beam Modes & Infrastructure Requirements

Measures the number of people in a room.

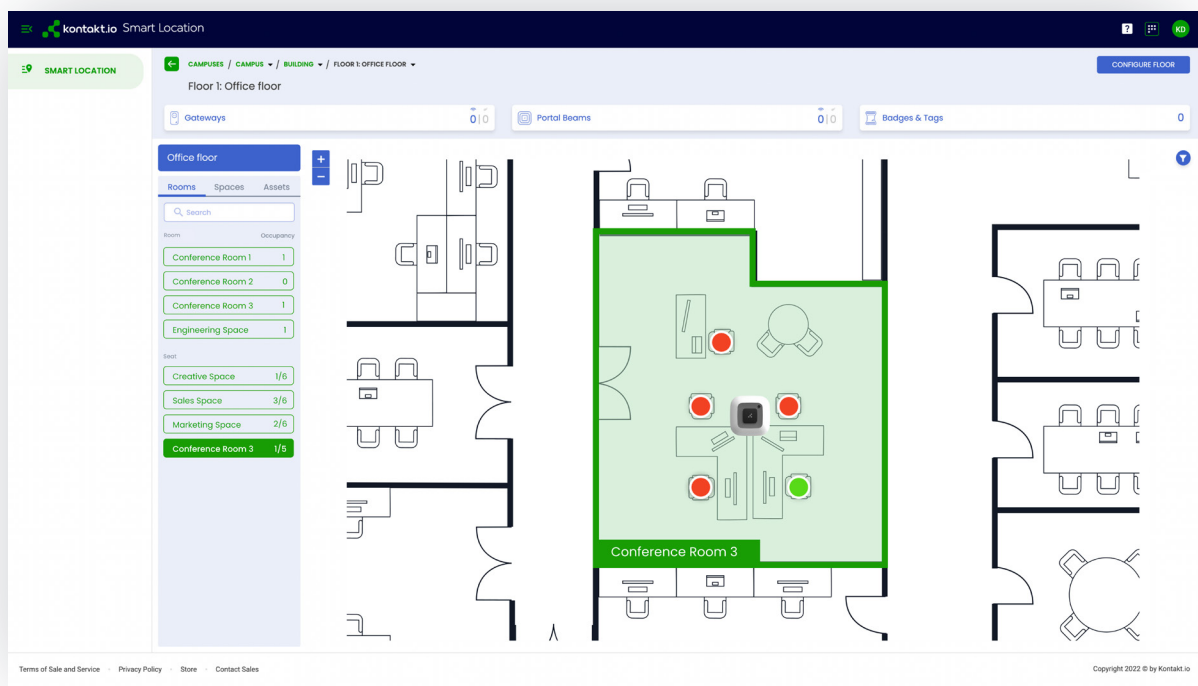
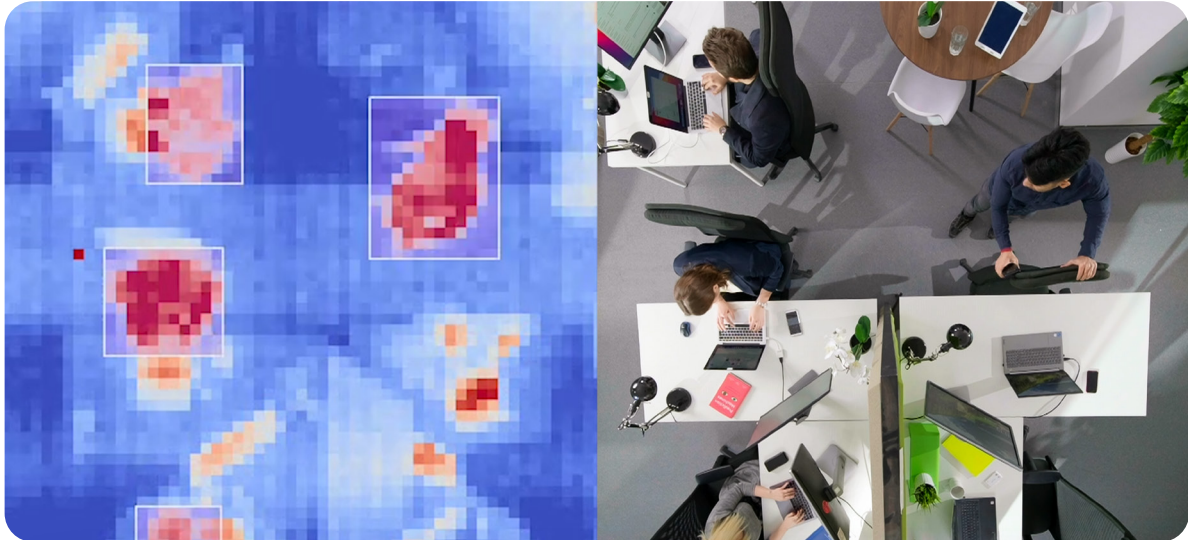
- Measure and capture historical occupancy levels of buildings and their floors.
- Measure and capture historical occupancy levels of floor parts separately – for example, dividing a floor into separate wings or departments and capturing occupancy for each.
- Measure utilization of specific rooms, areas in open spaces.
- Measure utilization of very large rooms such as training centers or lecture rooms.

Infrastructure	Requirement
Kio Cloud Smart Location	<p>Campus, buildings, building floors, floor plans, rooms.</p> <p>Each Portal Beam is placed into a Smart Location room at its exact install location.</p>
Portal Beam Setup	<p>Portal Beam firmware: version 2.5.xx</p> <p>Completed from the Kio Gateway Installer app at the time of installation.</p> <ul style="list-style-type: none"><li>• Mode set to Room Occupancy.</li><li>• Portal Beam assigned to its Smart Location to map its exact install location.</li><li>• Any area detected in a room that does not represent a person is set to an exclusion area.</li><li>• Install height provided (floor to ceiling measurement).</li><li>• In-app automated testing completed.</li></ul>
Portal Beam Installation	<p>Portal Beam is located in each room and/or open space requiring room level occupancy measurements.</p> <p>Portal Beam within Bluetooth range of a Kontakt.io Portal Light or BLE-enabled Access Point.</p> <p>A maximum of two Portal Beams in a single room or corridor.</p> <p>Room with two Portal Beams: distance between beams 11.25 ft (3.4 m).</p>



# Portal Beam modes

## Seat Level Occupancy mode



Measures the seat occupancy in a workstation space.

- Measure utilization of specific seats in multi-person workstations.
- Show availability of specific seats in multi-desk workstations.

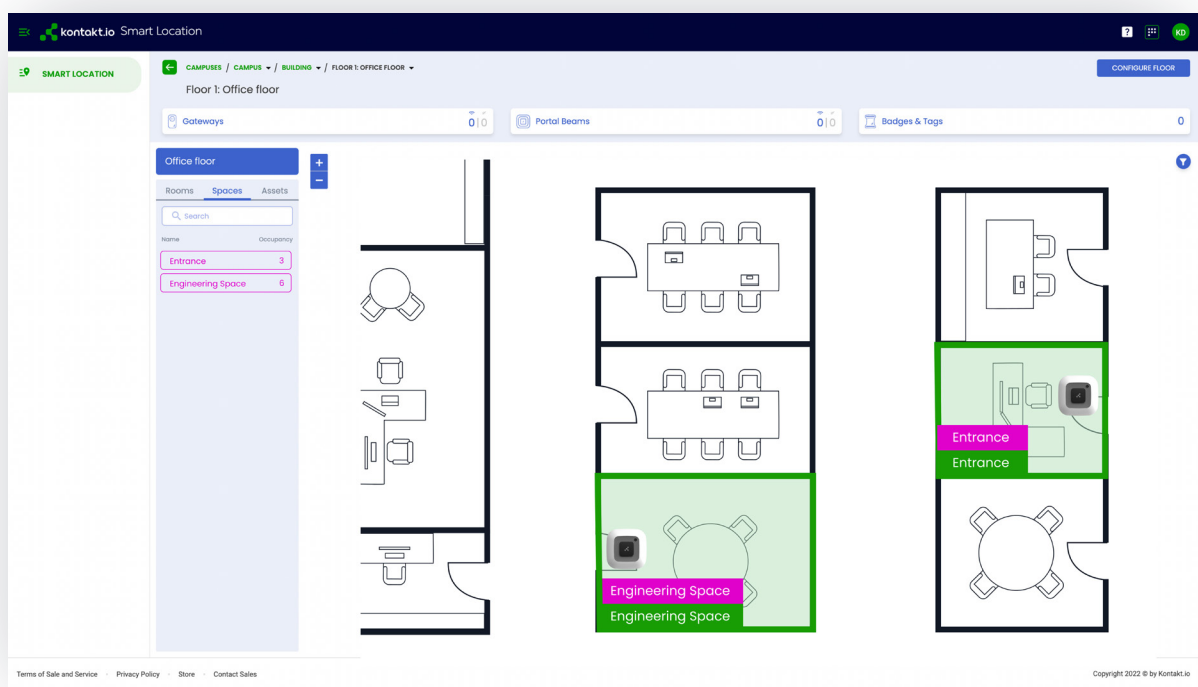
# Portal Beam modes

## Seat Occupancy infrastructure requirements

Infrastructure	Requirement
Kio Cloud Smart Location	<p>Campus, buildings, building floors, floor plans, rooms.</p> <p>Each Portal Beam is placed into a Smart Location room at its exact install location.</p> <p>Seats are added to each room.</p>
Portal Beam Setup	<p>Portal Beam firmware: version 2.5.xx</p> <p>Completed from the Kio Gateway Installer app at the time of installation.</p> <ul style="list-style-type: none"><li>• Mode set to Specific Seats.</li><li>• Portal Beam assigned to its Smart Location to map its exact install location.</li><li>• Install height provided (floor to ceiling measurement).</li><li>• Portal Beam assigned to the Smart Location seats at its install location.</li><li>• In-app automated testing completed.</li></ul>
Portal Beam Installation	<p>Portal Beam located in each room or open space requiring seat level occupancy measurements.</p> <p>Portal Beam within Bluetooth range of a Kontakt.io Portal Light or BLE-enabled Access Point.</p>

# Portal Beam modes

## Traffic mode



Measures the number of people entering and exiting a space.

- Show availability of rooms such as offices, meeting rooms or patient examination rooms.
- Show occupancy levels of large rooms or spaces. For example, showing the number of patients currently in a waiting room.

# Portal Beam modes

## Traffic infrastructure requirements

Infrastructure	Requirement
Kio Cloud Smart Location	<p>Campus, buildings, building floors, floor plans, rooms.</p> <p>Each Portal Beam is placed into a Smart Location room at its exact install location.</p> <p>Each room is assigned to a space. A space is a collection of rooms.</p>
Portal Beam Setup	<p>Portal Beam firmware: version 2.5.xx</p> <p>Completed from the Kio Gateway Installer app at the time of installation.</p> <ul style="list-style-type: none"><li>• Mode set to Traffic.</li><li>• Portal Beam assigned to its Smart Location to map its exact install location.</li><li>• Install height provided (floor to ceiling measurement).</li><li>• In-app automated testing completed.</li></ul>
Portal Beam Installation	<p>Portal Beam located in each room requiring traffic measurements.</p> <p>Portal Beam is powered by AC power. Battery power is for backup power purposes only; operates for up to ten days on continuous battery backup power.</p> <p>Portal Beam within Bluetooth range of a Kontakt.io Portal Light or BLE-enabled Access Point.</p> <p>Portal Beam camera oriented to face the interior of the room.</p>

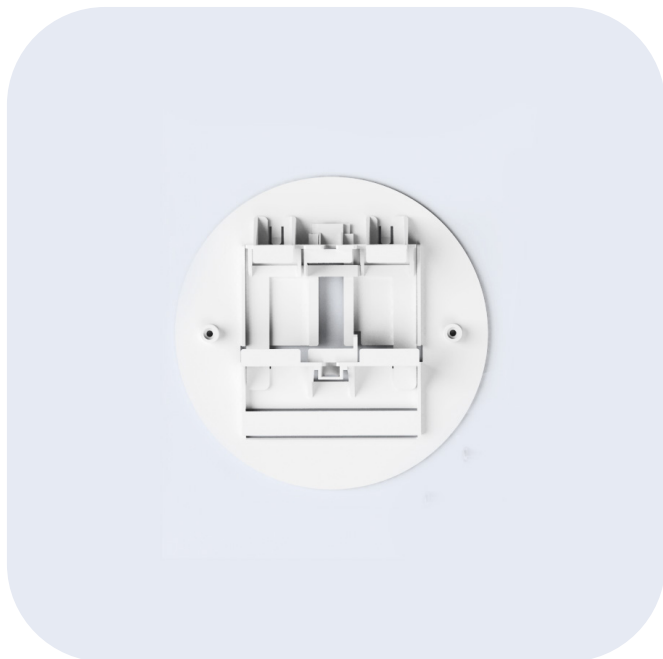
# Power Consumption

With the following default settings the device has a battery life time of 4 years.

Use-Case	Settings
Occupancy monitoring	Portal Beam takes a picture every 60 seconds. Konakt.io Telemetry Packets enabled at 350ms and -12dBm TX Power (3).
Environment monitoring	Sensor probing interval of 1 min.
Indoor navigation	iBeacon packets enabled at 350ms and -12dBm TX Power (3).
Infrared (IR) beaconing	IR blink interval every second.
Fingerprinting	Active.
Power Saving Mode	Power saving mode based on working hours is switched on and defined at 12 working hours per day.

Changing the IR or occupancy sensor interval can significantly impact the battery lifetime. Please consult any changes with the Kontakt.io pre-sales team prior to rolling them out.

## Accessories



T-Bar



Mounting plate

To learn more about the Portal Beam accessories contact us at  
[www.kontakt.io/contact-us](https://www.kontakt.io/contact-us)



# Get in Touch

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