

# Portal Beam

The Internet of Things. Now, in One Thing.



# Overview

**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, 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 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 time 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:** The 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.
- **Environment monitoring:** With its rich set of sensors the Portal Beam helps to provide a safer and healthier workplace, reduces building's carbon footprint, and improves the employee experience. The Portal Beam has a temperature, light, humidity, pressure and air particle filtering sensor. CO and other sensors are optional.
- **Indoor navigation:** With a built-in iBeacon, Portal Beams improve orientation inside buildings with compatible mobile indoor navigation SDKs and applications. With Portal Beams deployed in every room, there is no additional need for a standalone iBeacon infrastructure.
- **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 Badge Holder or Asset Tag 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 typology 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 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 Kontakt.io Cloud the most powerful and innovative indoor location engine in the industry.

# How it works

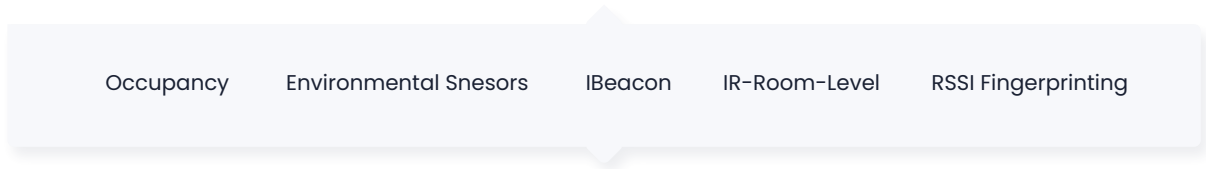


 DNA Spaces

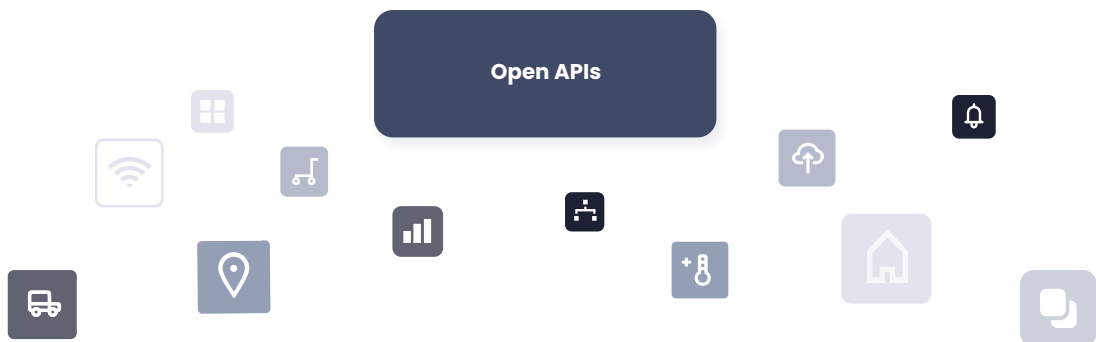
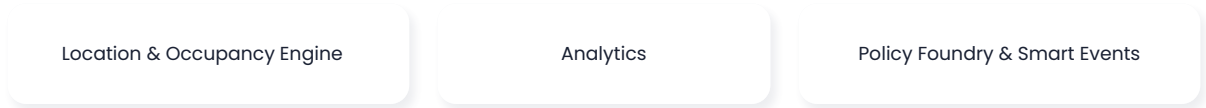


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## Processed Data to Cloud



## Kio Cloud Analytics & API



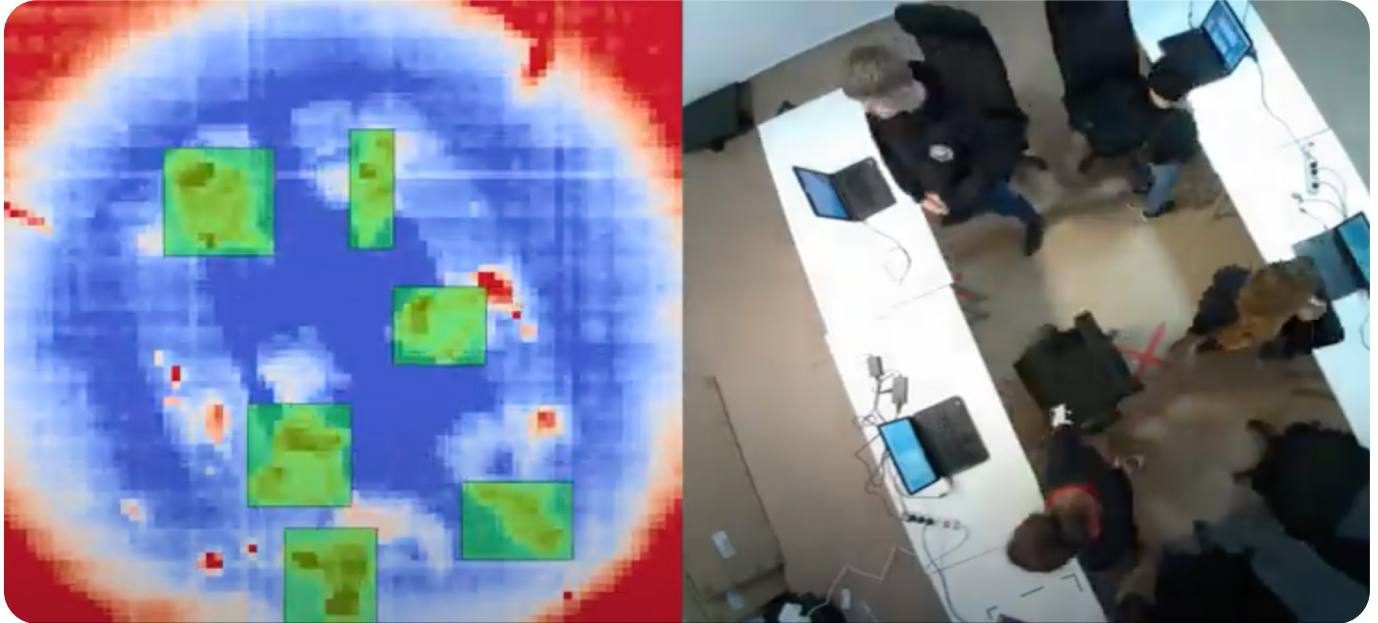
# Kio Cloud & Portal Beam Architecture Benefits

| 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 typology 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

|                                   |                                                           |                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Electronics</b>                |                                                           | nRF52832<br>IR Beam (4-directional LEDs)<br>Environmental sensors:<br>humidity, pressure, temperature, air quality, light sensor<br>Buzzer (optional)<br>Far-Infrared wide-angle thermal camera                                                                                                                                         |
| <b>Connectivity</b>               | <b>Bluetooth Range</b>                                    | Bluetooth Low Energy 5.0<br>Up to 50 meters                                                                                                                                                                                                                                                                                             |
| <b>Sensors</b>                    | <b>Temperature</b>                                        | Operating range: -40°C to 85°C<br>Typical accuracy: +/- 1°C                                                                                                                                                                                                                                                                             |
|                                   | <b>Relative Humidity</b>                                  | Operating range: 0-100%<br>Typical accuracy: 20-80% r.H., 25°C                                                                                                                                                                                                                                                                          |
|                                   | <b>Air Quality Index</b>                                  | Range: 0 - 255<br>Value calculated based on multiple sensor readings                                                                                                                                                                                                                                                                    |
|                                   | <b>Pressure</b>                                           | Operating range: 300-1100 hPa<br>Typical accuracy: 0.6 hPa                                                                                                                                                                                                                                                                              |
|                                   | <b>CO Sensor</b>                                          | Operating range: 1-1000 ppm                                                                                                                                                                                                                                                                                                             |
|                                   | <b>Light Sensor</b>                                       | Operating range: 1-100%                                                                                                                                                                                                                                                                                                                 |
| <b>Power</b>                      | <b>Input Voltage</b><br><b>Batteries</b>                  | DC 6V-24V barrel type terminal<br>6x ERI4505 (15.6 Ah), DC 3.6V                                                                                                                                                                                                                                                                         |
| <b>Environmental Requirements</b> | <b>Operation Temperature</b><br><b>Operation Humidity</b> | -40°C / + 85°C (-40°F / +185°F)<br>10%-90% - non condensing                                                                                                                                                                                                                                                                             |
| <b>Physical Specification</b>     | <b>Dimensions</b><br><b>Mounting</b>                      | 18x18x4.6 cm<br>Dedicated mounting plate<br>Reset button (factory reset button)<br>RGB LED (device status information & alerting)                                                                                                                                                                                                       |
| <b>Features</b>                   | <b>Battery Operating Mode</b>                             | RGB LEDs signalling device state.<br>Over-the-Air update/cloud management<br>Beacon broadcasting<br>Environmental sensing tracking: temperature, relative humidity, light, atmospheric pressure, carbon monoxide, room air quality, particle density<br>Occupancy sensing<br>IR beaconing for room level tracing<br>Visual/sound alerts |

# 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 are analyzing both single and series of pictures to predict the number of people captured 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 are constantly updating the algorithm with new training data and are providing OTA module updates and cloud 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 Knowledge Base here <https://knowledgebase.kontakt.io/hardware/devices/beam/installation-guide/>
- In Q3-2021 we are launching Counting Mode, a cloud feature for counting people going in and out of doors and hallways. A Portal Beam in Counting Mode will require the Portal Beam to be constantly connected to power since the Beam is taking multiple pictures per seconds to understand movement

# Power Consumption

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

| Use-Case                | Settings                                                                                         |
|-------------------------|--------------------------------------------------------------------------------------------------|
| Occupancy monitoring    | Taking a picture every 60 seconds. Kontakt.io Telemetry Packets enabled at 350ms and TX Power 3. |
| Environment monitoring  | Sensor probing interval of 1 min.                                                                |
| Indoor navigation       | iBeacon packets enabled at 350ms and 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.         |

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.



# Get in Touch

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