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 it's wireless backhaul, the Portal Beam has a battery life time of 4 years with default settings. It's 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.
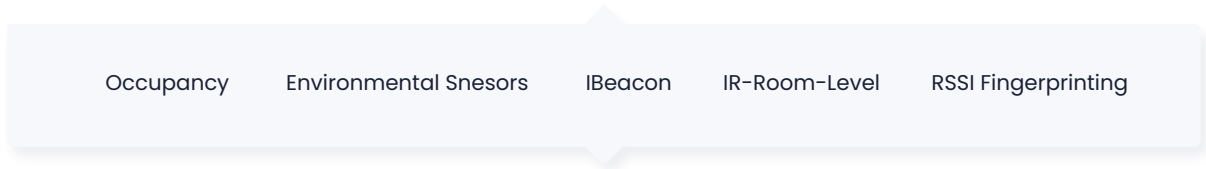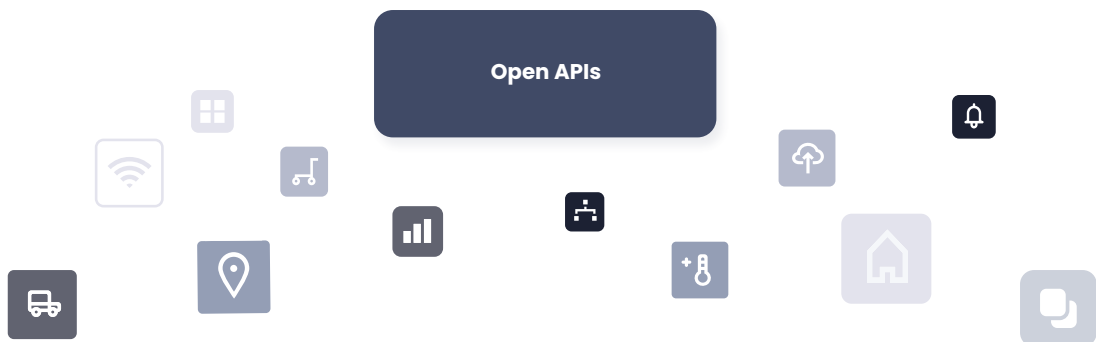
How it works

IR

Access Point or Gateway

CISCO DNA Spaces

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Processed Data to Cloud

| Occupancy | Environmental Snesors | IBeacon | IR-Room-Level | RSSI Fingerprinting |

Kio Cloud Analytics & API

| Location & Occupancy Engine | Analytics | Policy Foundry & Smart Events |

Open APIs

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Technology That Simply Works. Within Your Reach.
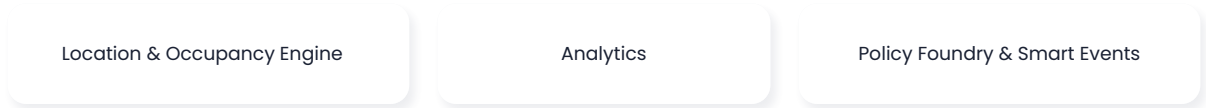
Kio Cloud & Portal Beam Architecture Benefits

Value Proposition	Benefits	Architecture
Fastest time to value	Anyone can self install the Portal Beam in less than 60 seconds per room	• 100% wireless using BLE connectivity only • No cabling or wires needed • No VPNs, added software or complexities • Users can quickly configure and customize sensors and policies / alerts in the Kio Cloud • iOS and Android Mobile Apps with installation workflows • No professional calibration needed
Most scalable solution	Seamlessly integrates with existing IT and Wifi Access Points typology using BLE	• 100% cloud enabled • Limited data throughput due to edge ML and processing • Native integration two-way communication and integration with Cisco DNA Spaces • Remote Device Management from on-boarding, securing, managing and configuration
Delivered as a Service	No CAPEX & continuous product evolvement	• Monthly Cloud and firmware releases
Open	No vendor lock-in, expand with third party software application or build your own	• Open APIs from the Kio Cloud • Compatible with any other hardware thanks to the Kontakt.io open source Connectivity SDK and firmware libraries for both gateways and end-devices
Affordable	Save money, lower total cost of ownership, higher ROI	• One Cloud pricing, no hidden features or extra costs • Free Applications within the Kio Cloud for unlimited innovation
Room-level Location Engine	Room-level certainty for hospital work-flows and other smart buildings	• AI machine learning location engine using multiple sources of data including occupancy, IR, BLE and sensor information learn and adopt to use-cases

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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		Bluetooth Low Energy 5.0
	Range		Up to 50 meters
Sensors	Temperature		Operating range: -40ºC to 85ºC
			Typical accuracy: +/- 1ºC
	Relative Humidity		Operating range: 0-100%
			Typical accuracy: 20-80% r.H., 25ºC
	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		DC 6V-24V barrel type terminal
	Batteries		6x ER14505 (15.6 Ah), DC 3.6V
Environmental Requirements	Operation Temperature		-40ºC / + 85ºC (-40ºF / +185ºF)
	Operation Humidity		10%~90% - non condensing
Physical Specification	Dimensions		18x18x4.6 cm
	Mounting		Dedicated mounting plate
			Reset button (factory reset button)
			RGB LED (device status information & alerting)
Features	Battery Operating Mode		RGB LEDs signalling device state.
			Over-the-Air update/cloud management
			Beacon broadcasting
			Environmental sensing tracking: temperature,
			relative humidity, light, atmospheric pressure,,
			room air quality, particle density
			Occupancy sensing
			IR beaconing for room level tracing
			Visual/sound alerts

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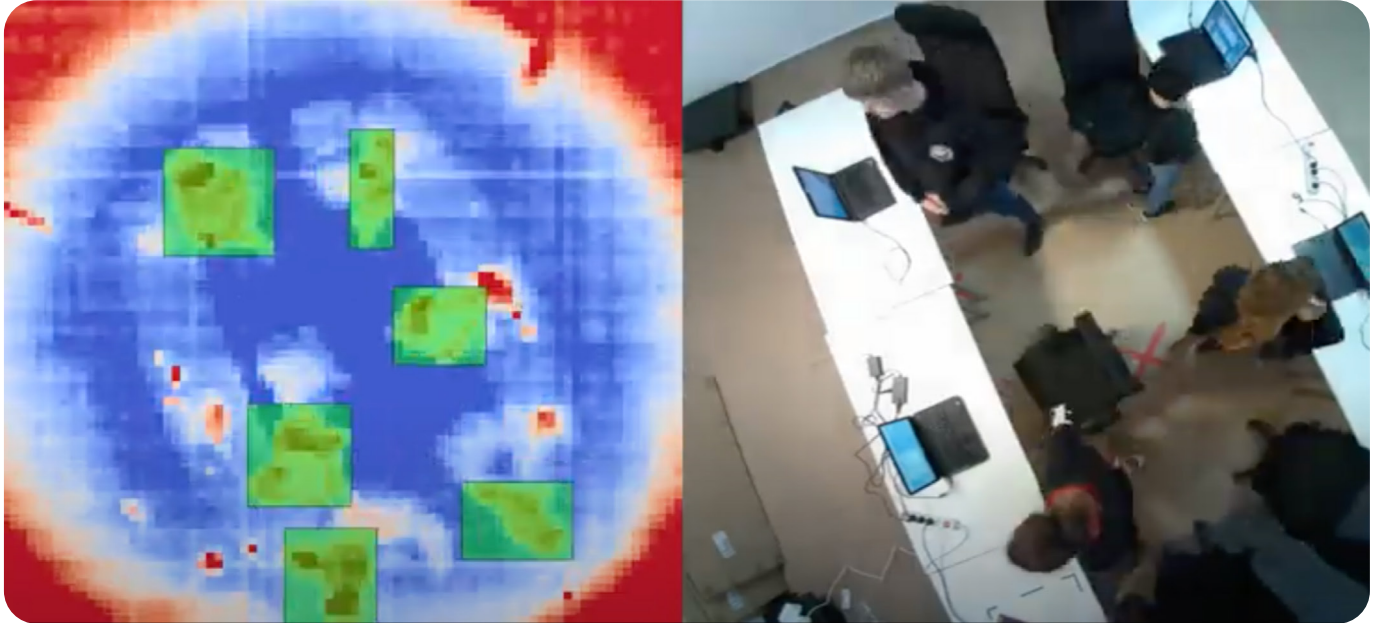
What The Portal Beam thermal sensor sees:
Heat signature that are detected by Edge & Cloud AI.
No Personal Identification Information.

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 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 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 regardign 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.

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