Human Activity Sensors for Smart Buildings

Product Documentation

Version: v2.0 – September 2018

irlynx
SMART DETECTION

IRLYNX Sensors provide advanced data about people's activity:

True Presence, People Counting, Position & User Trajectories

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QUALITY CERTIFICATION

A. CE certification

PEOPLESENSE™ room / PEOPLESENSE™ door conforms to CE specifications and regulations. An official certification report was done by Bureau VERITAS in 2018 under the number 158806-730749-A.


DECLARATION OF CONFORMITY

B. FCC certification

PEOPLESENSE™ room / PEOPLESENSE™ door conforms to FCC specifications and regulations. An official certification report was done by Bureau VERITAS in 2018 under the number 158806-730751-A.


DECLARATION OF CONFORMITY

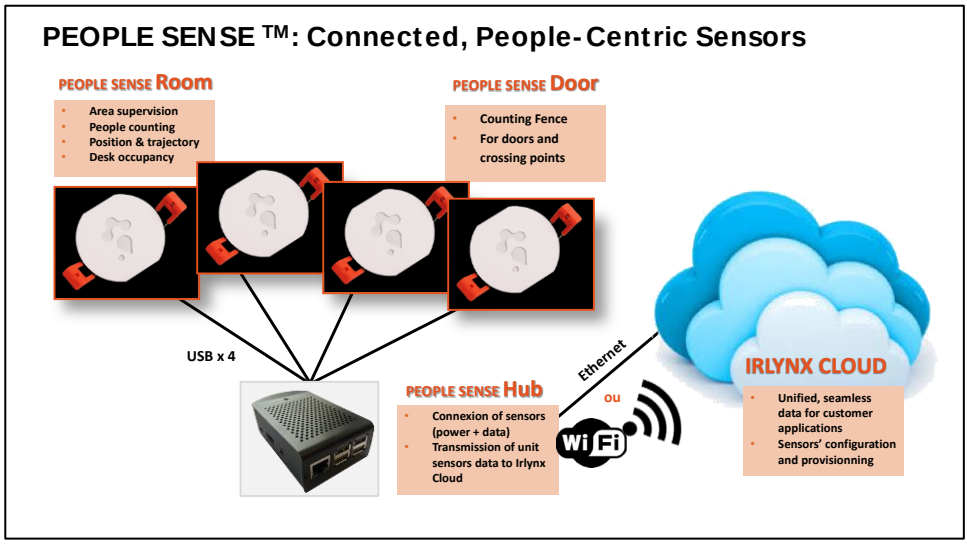
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution: the user that 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 A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

C. Overview

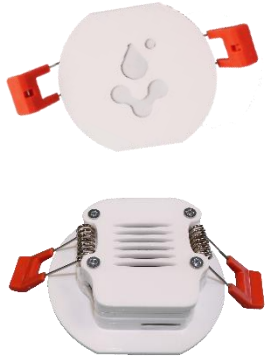
PEOPLE SENSE TM is a complete range of connected, human-centric sensors for Smart Buildings:



D. Products

The PEOPLE SENSE TM product line includes 3 connected objects allowing to cover the needs of Smart Buildings for Human activity advanced data. It consists of 2 sensors for

counting people and measure room and desk occupancy, as well as a hub allowing to power and communicate with all PEOPLE SENSE ™ sensors.

PEOPLE SENSE Room	PEOPLE SENSE Door	PEOPLE SENSE Hub
		
Sensor	**Sensor**	**Hub**
Ceiling Mount Covers a square area (size depending on ceiling height; ~11m² for a height of 2.5m)	**Ceiling Mount** (1 sensor per door or crossing point)	Compatible with all PEOPLE SENSE sensors (1 hub for up to 4 sensors)
Powered by PEOPLE SENSE Hub via USB		Powered by 230V power supply or POE (Power Over Ethernet – requires Cat. 6 cables)
Communication to Hub via USB (max distance 9.5m)		Communication with sensors via USB Internet Connection to IRLYNX Cloud: Ethernet or WIFI

	Communication with external application: API and web socket

PEOPLE SENSE ROOM ™

A. Features

Our best-in-class sensor.

Designed for ceiling mount, PEOPLE SENSE Room ™ allows to monitor the way people occupy a given area with maximum level of information and accuracy.

This all-in-one sensor provides you with the following data, in real-time (< 1 sec):

- Presence or Absence in the area
- Number of people in the area
- Position (x,y) of each person in the area
- Occupancy of any area of interest (AOI) configured in the sensor's field of view (FOV), ex. workstations

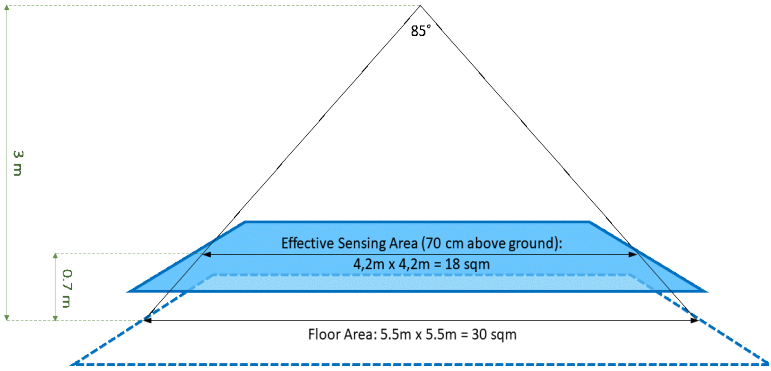
These data allow you to address multiple applications and use cases, including the following:

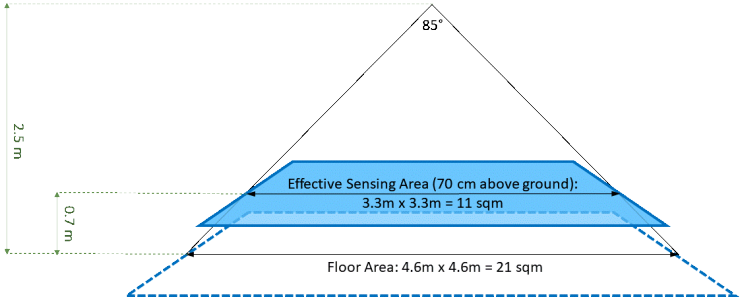
SENSOR DATA	APPLICATIONS & USE CASES	DERIVED ANALYTICS
PRESENCE/ ABSENCE	Turn on/off lights, air conditioning, heating and cooling systems, open/close blinds etc. depending on actual presence Real-time room occupancy *Ex. Find/book a free meeting room* *Ex. Check hotel rooms occupancy for cleaning services*	Occupancy rates per area / room
PEOPLE COUNTING	Manage HVAC systems depending on number of people in the room *Ex. Adapt volume of air renewal depending on the actual number of people in a room* Real-time services for occupants *Ex. Estimated waiting time at company restaurant* Queue management	Advanced occupancy and footfall analytics, workspace utilisation analytics *Ex. Average number of people in a meeting room vs room capacity*
POSITION (X,Y)	Flex Office / Desk Sharing / Hot Desking: workstation occupancy *Ex. Find a free workstation* *Ex. Is my colleague at his/her desk?* Manage automatic doors depending on users' trajectories	Flex Office analytics *Ex. Average/pic workstations' occupancy in open spaces* User trajectories inside a building *Ex. Customers trajectories and dwell time in shopping malls and shops*

B. Coverage

Our PEOPLE SENSE Room ™ sensor is designed for ceiling mount and works best for ceiling heights between 2,5 and 3 meters. Nonetheless, it can also fit with lower and higher ceilings provided algorithms adaptations. Please contact us for further details.

Each individual PEOPLE SENSE Room ™ sensor covers a square area whose size depends on the ceiling height.





The table below shows usable areas associated with standard ceiling heights:

CEILING HEIGHT	EFFECTIVE SENSING AREA (70cm above ground)
2.5 m	11 m² (3.3m x 3.3m)
2.75 m	14 m² (3.8m x 3.8m)
3 m	18 m² (4.2m x 4.2m)

C. Network of sensors

It is possible to mesh several PEOPLE SENSE Room ™ sensors and cover areas larger than the area covered by one single sensor.

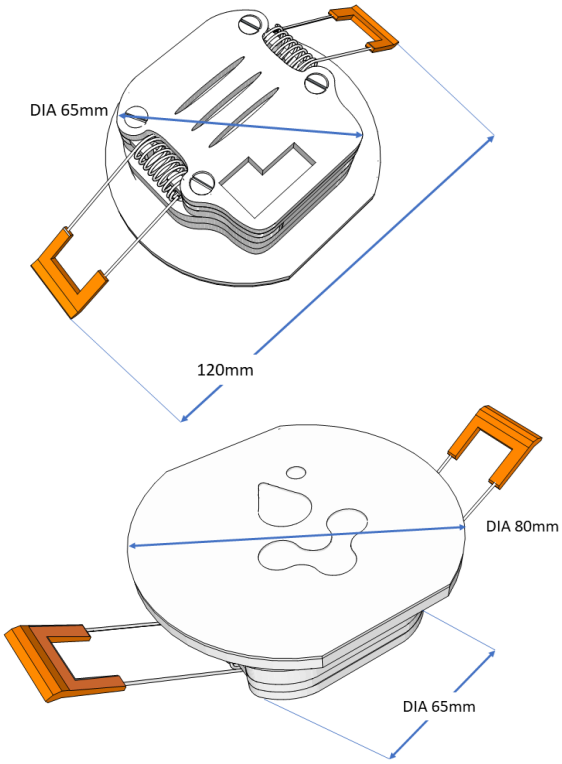
To do so, we use PEOPLE SENSE Hub ™ devices, that allow to mesh up to 4 sensors. Provided proper installation and configuration of the sensors and hub, the hub delivers a single, unified, seamless information for the total area covered by the 4 sensors. The features are exactly the same as for one singe sensor (i.e. Presence / People Counting / Position), except that data are provided for the total area.

Installation and configuration of sensors and hubs must be done by IRLYNX experts at this stage[1].

We plan to offer tools allowing IRLYNX's customers to parameter our products by themselves in the future.

[1] See "professional services" section

D. Casing design & size



PEOPLE SENSE™ Room

Dimensions

The PEOPLE SENSE Room™ sensor comes with a round assembly plastic housing of 65mm diameter and 25mm high. The front side is a round of 90mm diameter and 4mm thickness. This is the only visible part of the sensor once mounted in the ceiling.

Installation

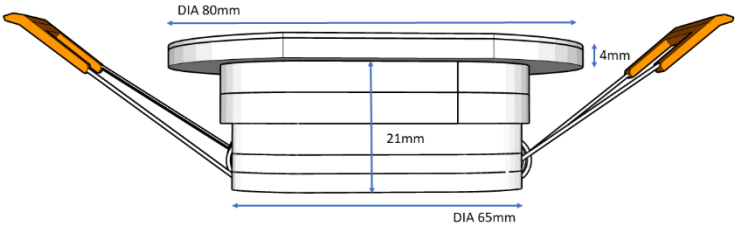
To install the sensors, a round hole of 65 mm diameter is required in the ceiling.

Weight

67g

Power consumption

Typ. 72 mA / Peak 100 mA (5V)



PEOPLE SENSE DOOR ™

A. Features

Our PEOPLE SENSE Door ™ sensors allows to count people going in and out of a given area or room through a door or crossing point. It sets a virtual counting line and provides you with data about the number of entries (+1) and exits (-1).

Data provided:

- **Number of people crossing the counting line in both directions**

B. Coverage

Our PEOPLE SENSE Door ™ sensor is designed for ceiling mount and monitors a virtual counting line. This counting line is a straight line, whose maximum width depends on the installation height.

The table below shows maximum width of counting line, depending on the height:

CEILING OR INSTALLATION HEIGHT	MAXIMUM WIDTH OF THE COUNTING LINE
2.5 m	2.3 m
2.75 m	2.8 m
3 m	3.2 m

Each individual PEOPLE SENSE Door ™ sensor needs to be installed so that its counting line corresponds to the door or crossing point you want to monitor.

C. Network of sensors

It is possible to combine several PEOPLE SENSE Door ™ sensors and count people in rooms or areas that are accessible through several entries.

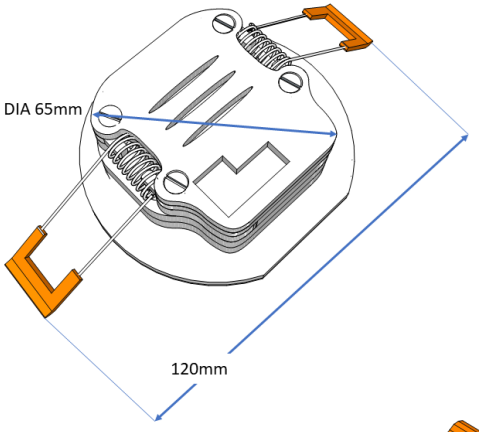
Provided proper installation and configuration of the PEOPLE SENSE sensors and hubs, IRLYNX can deliver a single, unified information of the number of people in a certain area bounded by several counting lines.

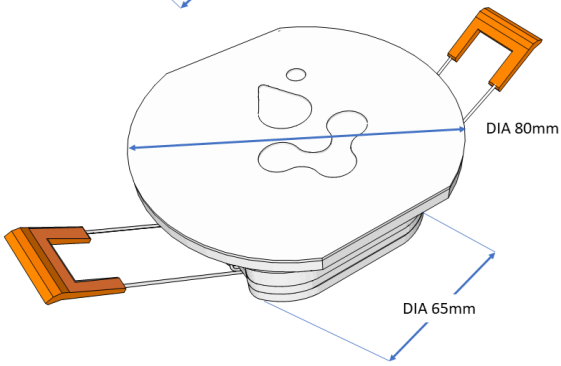
Installation and configuration of sensors and hubs must be done by IRLYNX experts at this stage[2].

We plan to offer tools allowing IRLYNX's customers to parameter our products by themselves in the future.

[2] See "professional services" section

E. Casing design & size





PEOPLE SENSE™ Door

Dimensions

The PEOPLE SENSE Room™ sensor comes with a round assembly plastic housing of 65mm diameter and 25mm high. The front side is a round of 90mm diameter and 4mm thickness. This is the only visible part of the sensor once mounted in the ceiling.

Installation

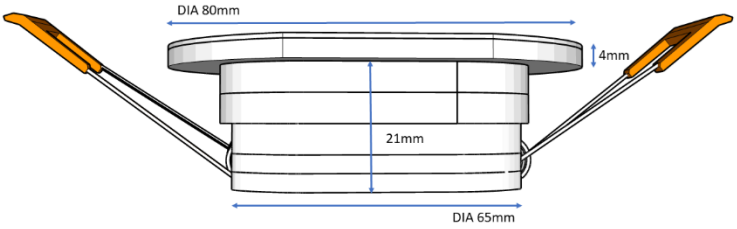
To install the sensors, a round hole of 65 mm diameter is required in the ceiling.

Weight

67g

Power consumption

Typ. 72 mA / Peak 100 mA (5V)



PEOPLE SENSE HUB ™

A. Features

Our PEOPLE SENSE Hub ™ have 2 functions:

- Power the sensors
- Collect data from the sensors and send them to IRLYNX Cloud Servers

Each PEOPLE SENSE Hub™ allows to collect data from up to 4 sensors and communicates the data to IRLYNX Cloud Servers. To do so, the PEOPLE SENSE Hub ™ requires an Internet connexion to communicate with IRLYNX Cloud Servers. The connexion uses either an Ethernet link or a WIFI connexion.

B. Installation

Each PEOPLE SENSE Hub ™ requires a power supply, as well as an Internet connexion. Hereafter are the available options:

	POWER	NETWORK
OPTION 1	POE (Power Over Ethernet) – Cat. 6 cable	
OPTION 2	Power Wire (220 – 240V)	LAN (Ethernet)
OPTION 3	Power Wire (220 – 240V)	WIFI

Each PEOPLE SENSE Hub ™ connects up to 4 PEOPLE SENSE sensors, using USB cables of max 9.5m.

C. Data from sensors

Each PEOPLE SENSE Hub ™ collects data from every sensor it is connected to.

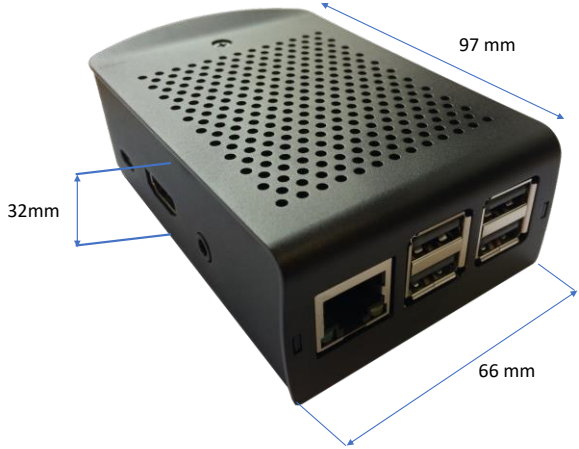
At this level, data remain at each individual sensor's level, with no data consolidation for areas covered by several sensors.

Data consolidation is done at the IRLYNX Cloud Servers level.

Data available at each individual sensor's level include:

TYPE OF SENSOR	CONFIGURATION	DATA AVAILABLE	MODES
PEOPLE SENSE DOOR ™	Counting Fence	+1 / -1	Websocket
PEOPLE SENSE ROOM ™	1 sensor = 1 area	# of people in the sensor's FOV	
		Position (x,y) of every person detected in the sensor's FOV	
	Areas of Interest (AOI) configured inside the sensor's FOV	Occupancy (0/1) of each configured AOI	

D. Casing design & size



PEOPLE SENSE™ Hub

Dimensions

The PEOPLE SENSE Hub TM is included into a rectangle shape.

Size: L 97 mm x l 66 mm x H 32 mm

Installation

In the ceiling

Weight

203g

Power consumption

Typ. 250 mA / Peak 380 mA (5V)

IRLYNX CLOUD

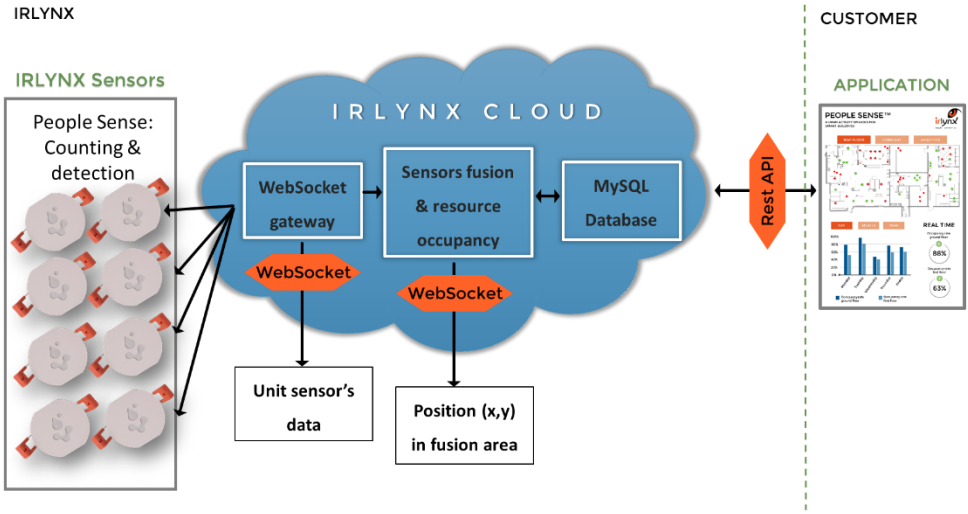
A. Introduction

IRLYNX CLOUD collects data from PEOPLE SENSE™ Sensors through PEOPLE SENSE™ Hubs and provides 2 main functions:

- Translate unit sensors data into building resources data (for example transform 4 individual sensors data into one single room data)
- Make those data available for your applications and dashboards through our REST API (data stored in IRLYNX CLOUD's database) and through our web sockets (real-time data).

B. Architecture

The following picture describes IRLYNX CLOUD's architecture:



People Sense sensors are connected, via People Sense Hubs, to a web socket gateway. Web socket is used to send real time data from each sensor to IRLYNX CLOUD.

IRLYNX CLOUD offers multiple services including:

- Merge data from several sensors installed in the same room (for example a meeting room) to get one global information for the room.
- Merge data from several PEOPLE SENSE™ Door sensors positioned at a given area's various entry points and provide the total number of persons currently in the area. The area can be an open space, a floor, or a complete building for instance.
- Define areas of interest (AOI), for example work stations, and provide occupancy information for each AOI.
- Provide access to real-time data through web sockets
- Store data in a database and provide access to these data through a REST API

C. Features & Data

IRLYNX CLOUD allows you to access data through web sockets (real-time data) and REST API (data stored in IRLYNX database).

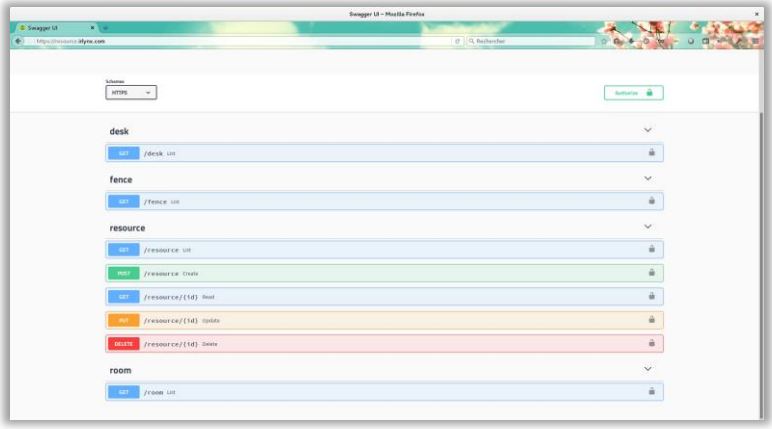
The table below details which data are available in which mode:

	Web Socket	REST API
Sensors Unitary Data	• Number of people in a selected sensor's FOV • Position (x,y) of each person in a selected sensor's FOV	X
Building Resources Data (Areas: Floor, Room, Open Space etc.) (AOI: Areas of Interest: Desk, Box, Sofa etc.)	• Position (x,y) of each person in a selected area	• Number of people in a selected area • Occupancy (0/1) of selected AOI

To access data in the database, several options are available:

- Send a request using a REST API. Access is secured using login and password. Resources are defined for each area (for example ROOM1 for a meeting room, DESK1 for a work station).
  Example of request to check occupancy of desk ref. “DESK1”:
  {"desk":{"columns":["presence"],"records":[[1]],"results":10573}}

- Subscribe to a call-back using an HTTP request. After subscribing, a call-back will be sent to your URL every time that the resource’s status changes.
- A graphical interface can be used to visualize data available in the database



D. On-Premise variant

For customers with specific security policies or technical requirements, it is possible to setup an On-Premise version of IRLYNX CLOUD.

On-Premise offer is subject to a specific quotation depending on customer’s requirements.

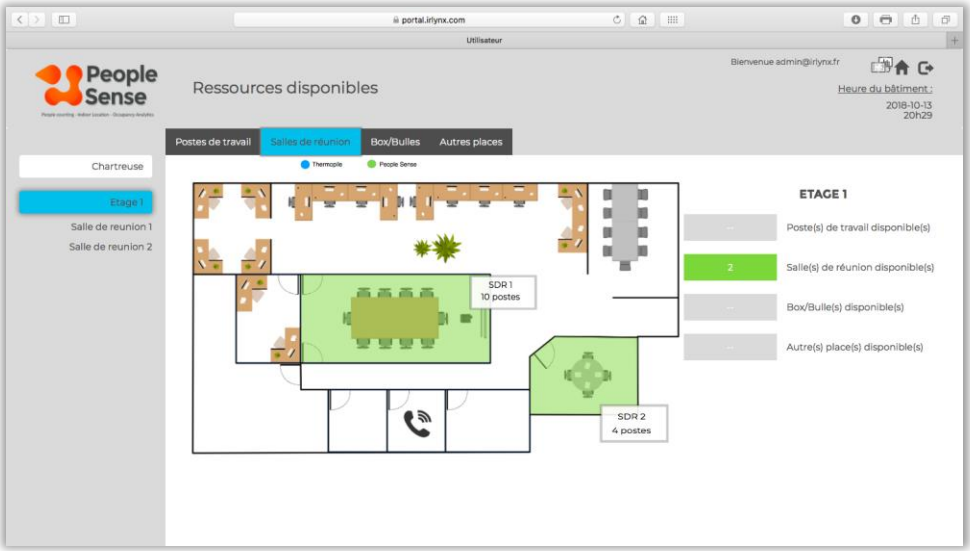
E. Starter Application

We offer our “Starter Application” as an option. This application allows to display the data from IRLYNX sensors, and comes with 2 interfaces:

- **Occupants Interface**

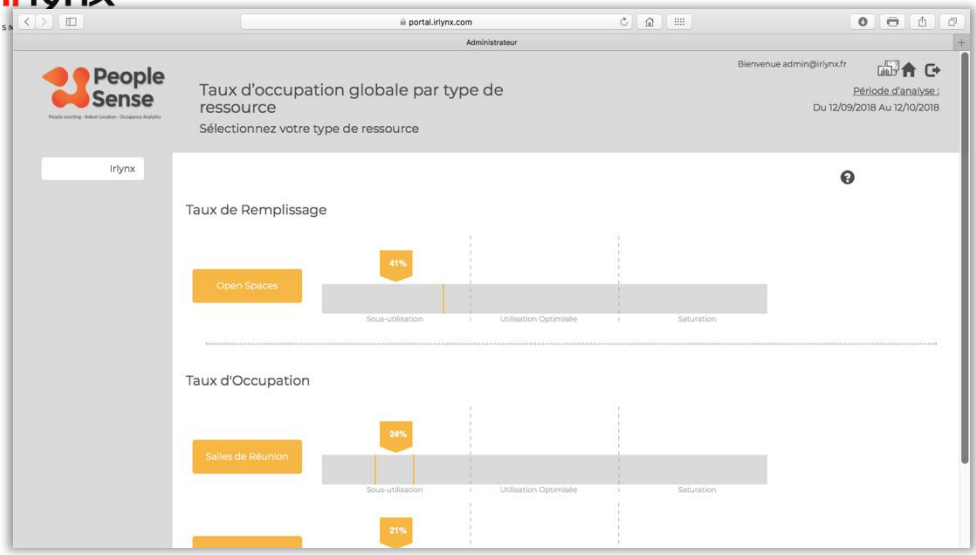
This interface allows occupants to identify any free resource in the building. 4 kinds of resources are displayed: Meeting Room / Box / Workstation / Other seat.

The screenshot below shows free meeting room in a building’s 1st floor:

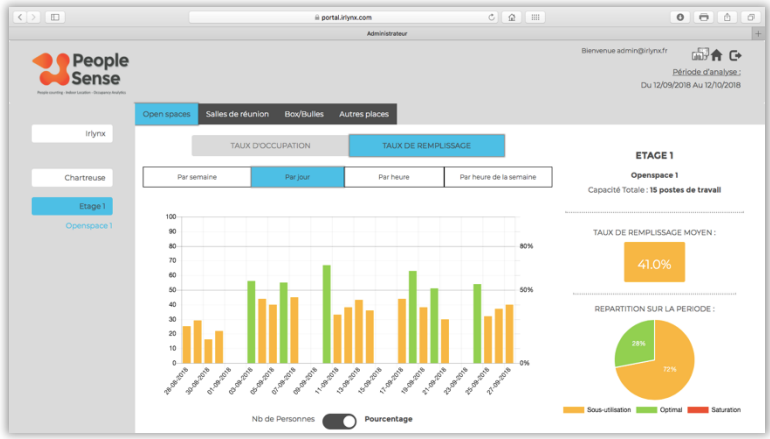


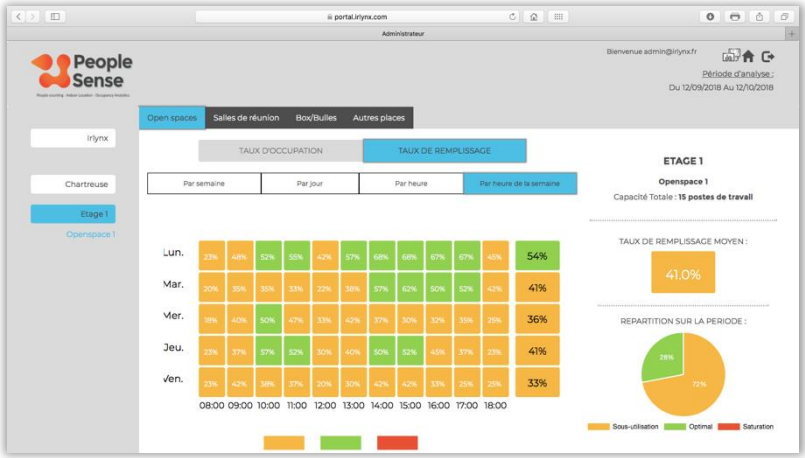
- **Facility Manager**

This interface allows building and facility managers to get analytics about the spaces’ occupancy over the last month.



Once the user selects a range of spaces (among the 4 available ones), he or she gets an overview of the occupancy of all these spaces and can get more detailed analytics about any space:




portal.irlynx.com
Administrateur
People Sense
Bienvenue admin@irlynx.fr
Période d'analyse :
Du 12/09/2018 Au 12/10/2018
Open spaces
Salles de réunion
Box/Bulles
Autres places
Irlynx
Chartreuse
Etage 1
Openspace 1
TAUX D'OCCUPATION
TAUX DE REMPLISSAGE
Par semaine
Par jour
Par heure
Par heure de la semaine
ETAGE 1
Openspace 1
Capacité Totale : 15 postes de travail
TAUX DE REMPLISSAGE MOYEN :
41.0%
REPARTITION SUR LA PERIODE :
Lun. 23% 48% 52% 55% 42% 57% 68% 68% 67% 67% 45% 54%
Mar. 20% 35% 35% 33% 22% 38% 57% 62% 50% 52% 42% 41%
Mer. 18% 40% 50% 47% 33% 42% 37% 30% 32% 35% 25% 36%
Jeu. 23% 37% 57% 52% 30% 40% 50% 52% 45% 37% 23% 41%
Ven. 23% 42% 38% 37% 20% 30% 42% 42% 33% 25% 25% 33%
08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00
28%
72%
Sous-utilisation
Optimal
Saturation

PROFESSIONAL SERVICES

IRLYNX offers a range of professional services to best accompany you in the installation, configuration, maintenance and operation of your PEOPLE SENSE ™ solution.

Our services include:

- Site Survey: we first work on floor maps and evaluate the best places where to install the sensors and hubs for covering your selected areas and delivering the required data. If necessary, we also come on-site to confirm and fine-tune this study depending on constraints that can only be seen on-premise.
    - Pre-requisites: For the study on paper, we need an up-to-date floor map with the furniture's location, and ideally a ceiling map with existing devices (lighting fixtures, air vents, sensors...) location.
    - Deliverables:
        - At the end of this step, we confirm our quote (or deliver a final quote if needed) and determine the location of every sensor, hub, power supply and/or Ethernet cables. Everything is noted on a floor map that we send you so that your service provider can carry out the installation. We also brief your service provider by phone before the works.
        - We ship the hardware (sensors, hubs and USB cables) to the installation site.

Wiring, Hardware Installation and Network setup

Not included in our services: These works are performed under the responsibility - and at the expenses of - the Customer.
You will generally use your existing electrical service provider for wiring and hardware installation, and your IT department for network setup.
Your IRLYNX Project Manager will be available to support you and your providers during this phase.

- Remote Network Check: Once your service provider (or IT department) in charge of setting up network connections has completed this work, we remotely check that every hub and sensor effectively gets a working Internet connection.
    - Pre-requisites: IRLYNX must be noticed once the works are completed, and your service provider (or IT department) must be available for assisting us during our remote network tests.
    - Deliverables: At the end of this step, we validate that all the devices are properly connected to the IRLYNX Cloud.

- Sensors and Cloud Configuration: our experts configure your sensors and your specific service in the IRLYNX Cloud.
    - Pre-requisites:
        - Sensors and hubs are installed at the right location, with the right direction (for sensors), according to the layout plan.
          (Note: In case some devices are not mounted at the right location, IRLYNX may have to repeat the "Sensor Configuration" operation, at Customer's expense).
        - Network connexions are up and running.
    - Work performed:
        - We configure all your PEOPLE SENSE devices
        - We configure sensors' fusion and setup your specific database in IRLYNX Cloud. Each "Building Resource" (i.e. buildings, floors, rooms and areas of interest) is named according to your specific classification.
        - Fine-tuning: Once the sensors are configured, our system will enter a fine-tuning process. This fine-tuning period can last between 2 and 3 weeks depending on the site attendance. Once completed, your data will reach their best level of accuracy.
    - Deliverables: your data are accessible in the IRLYNX Cloud.

- Starter Application Configuration: Optionally, we can provide an application allowing you to visualize your occupancy data, both in real-time and in the form of dashboards and analytics.
  You may prefer to use your own application and dashboards, or you may wish to use one of our partners' applications for advanced occupancy analytics, resource management and many more... Depending on your needs, we will put you in contact with our partners.

- Specific Projects: we can tailor our products and software depending on your specific needs and requirements. For example, setting up on-premise servers to collect and store data from IRLYNX sensors and hubs instead of using IRLYNX Cloud. Please contact us for further information.

More information:
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