

O₃ Sensor Hub



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New Product

- THINK. SENSE. SPEAK.
- ADVANCED SENSOR TECHNOLOGY
AND TOTAL ROOM INTEGRATION



O₃ Sensor Hub

New Product




 Sensor Hub

New Breakthrough Product

- LIKE A THERMOSTAT...BUT BETTER
- BREAKTHROUGH! SENSOR FUSION
- BREAKTHROUGH! EXPERIENCE
- CONNECT TO O₃ CPU
- CEILING MOUNT

New Product



 Sensor Hub

What is it?



New Name

NOT AN ACRONYM

- THINK. SENSE. SPEAK.
- ADVANCED SENSOR TECHNOLOGY
AND TOTAL ROOM INTEGRATION



○₃ Sensor Hub

Sense.



TEMPERATURE
IR | THERMISTORS

Sense.



OCCUPANCY
PIR | AUDIO | IR

Sense.



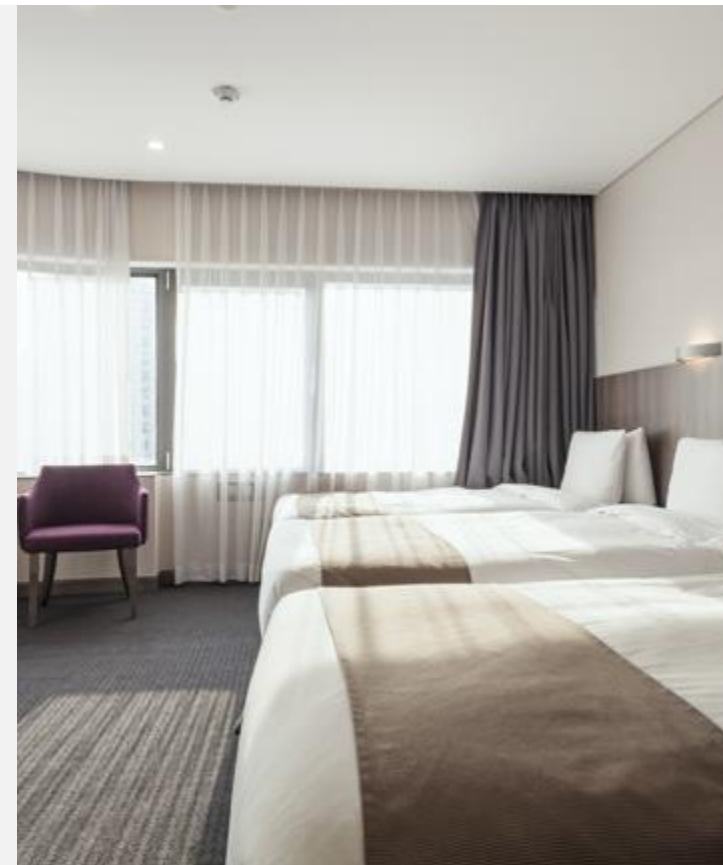
LIGHT COLOR
LIGHT INTENSITY

Sense.

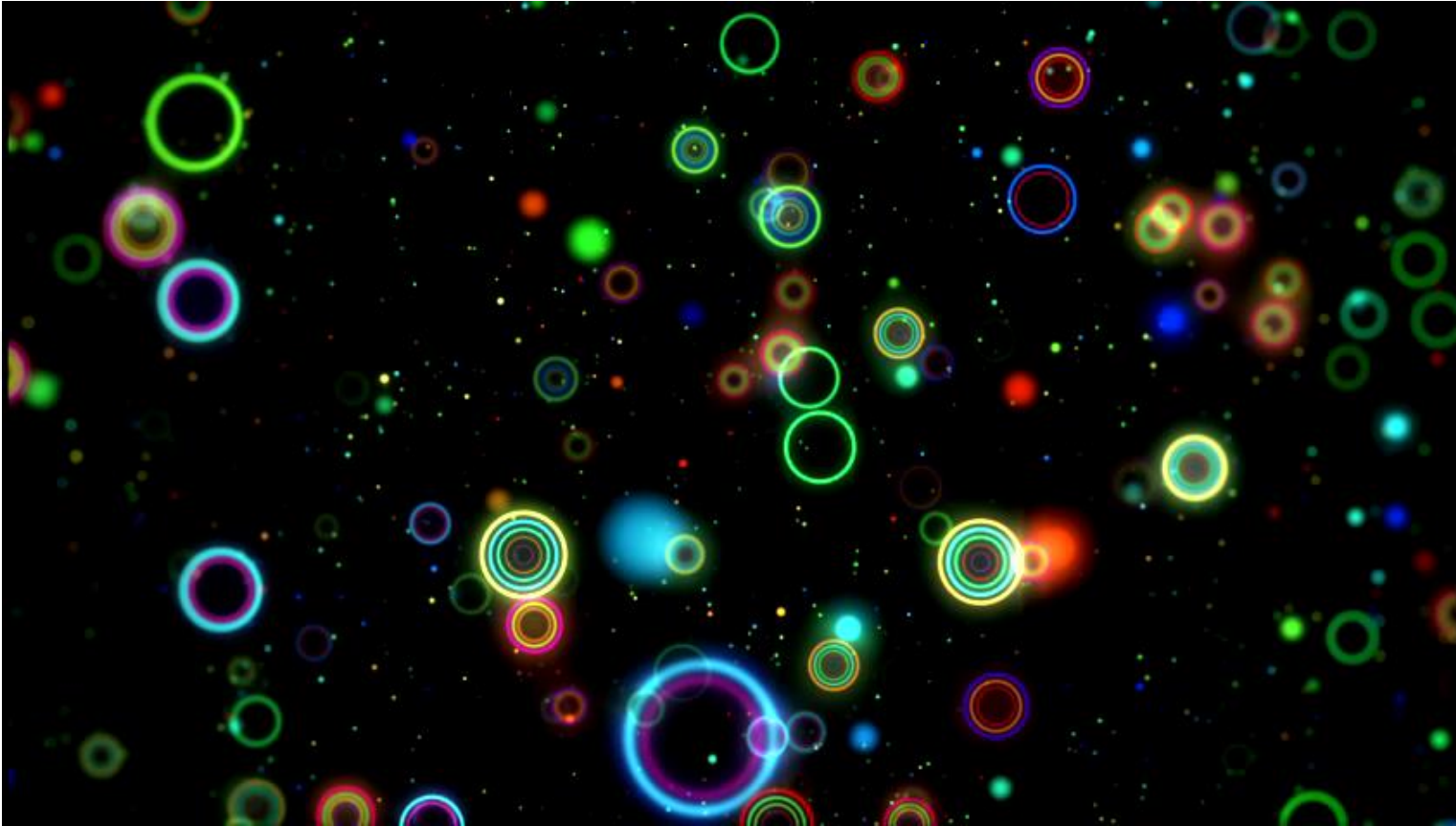


HUMIDITY

Sense.



Speak.



- WITH COLOR
- WITH MUSIC

Think.



You shouldn't do things differently just because they're different. they need to be... better.

- TEMP SENSOR FUSION
- OCCUPANT SENSOR FUSION
- O3 CONTROLLER
+ O3 APP
+ enteliWEB

Temp Sensor Fusion

O3 Sensor Hub Temperature Measurement

Overview

The O3 sensor hub uses an algorithm to monitor the temperature of a space at approximately 1 m (3 ft) off the floor. This algorithm is possible due to the sensor hub's use of sensor fusion—combining many sensor readings together with machine learning techniques to model temperatures. This document will explain in more detail how the measurements work.

Temperature Down Here, Sensor Hub Up There?

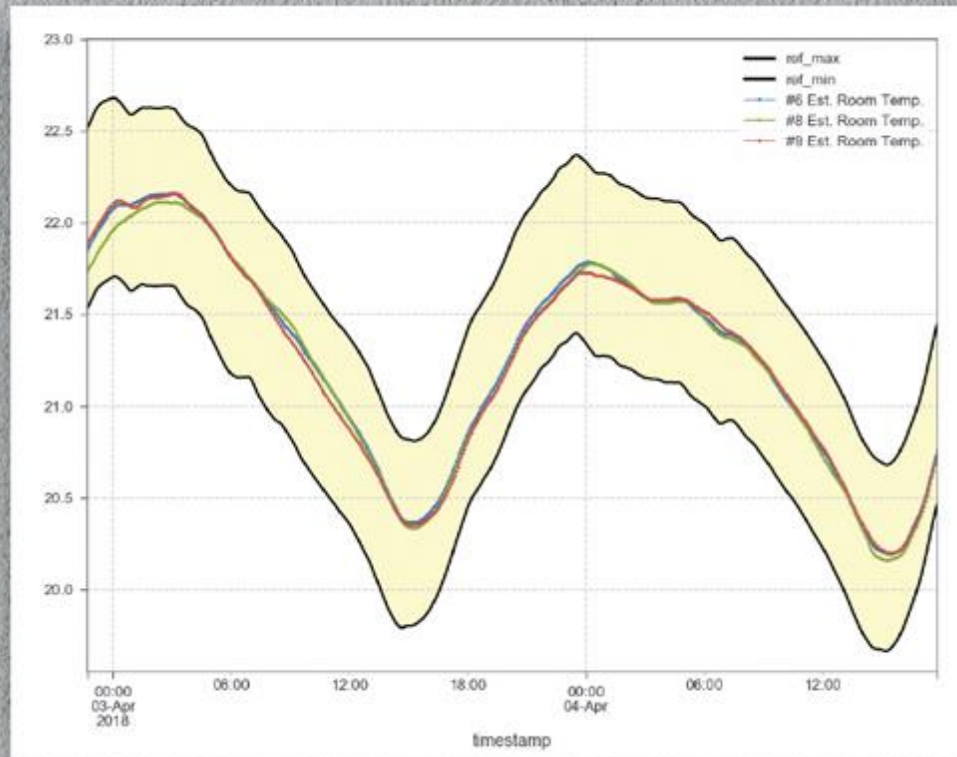
The most common question is how is it possible to measure the temperature at occupant height when the sensor hub is mounted on the ceiling?

The answer is that the sensor hub is actually modelling the occupant height temperature based on the readings it gets from the three internal temperature sensors. Two of the sensors are traditional temperature sensors. They are directly measuring air temperature up at the ceiling. The third sensor is an infrared sensor, which measures a large area directly underneath the sensor hub. The IR sensor covers an area that is roughly the diameter of the mounted height. For example, if you mount the unit on a 2.4 m (8 ft) ceiling, the IR sensor covers roughly a 2.4 m diameter. At 3 m (10 ft), it's looking at 3 m



- 3 TEMP SENSORS
 - COMBINES SENSOR READINGS TOGETHER WITH MACHINE LEARNING TECHNIQUES TO MODEL
- MACHINE LEARNING
 - KALMAN FILTERING
 - MODELLED OVER TIME

Temp Sensor Fusion



- COMPOSITE
- IR + THERMISTOR
- ACCURACY

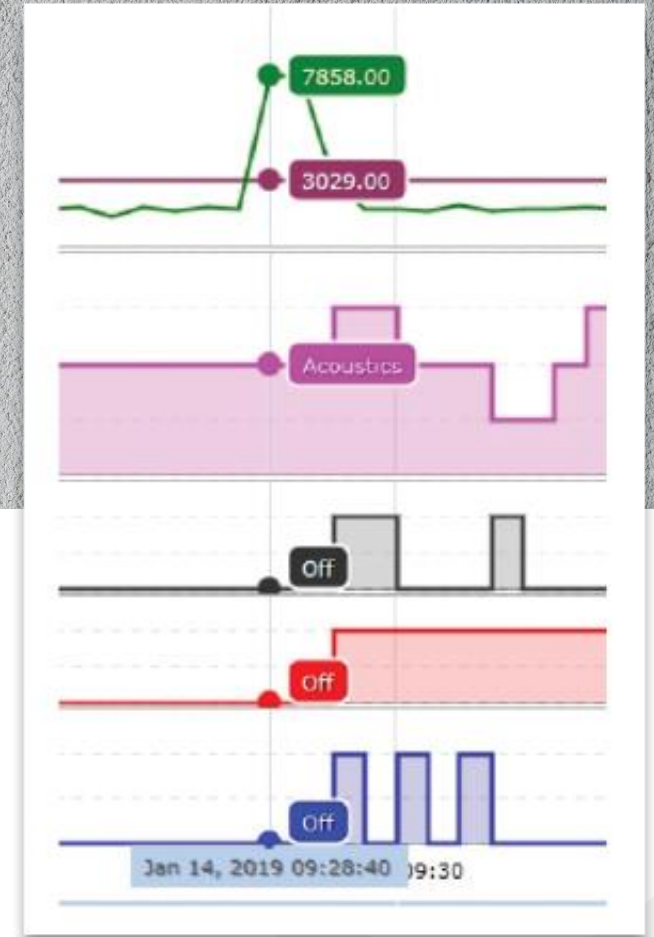
Occupancy Sensor Fusion

3 SENSORS

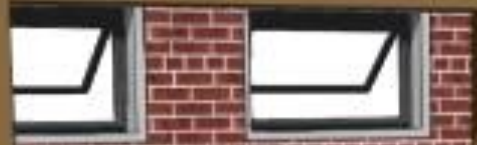
- PIR – CHECK FOR MOTION
- MICROPHONE – MEASURE NOISE
- IR – HEAT SPIKES (I.E. PEOPLE)

MACHINE LEARNING

- ONLY PIR WILL TRIGGER OCCUPANCY
- SOUND ONLY CONSIDER AFTER OCCUPANCY TO LATCH IT ON
- AMBIENT NOISE FILTERED OUT



LOCATION

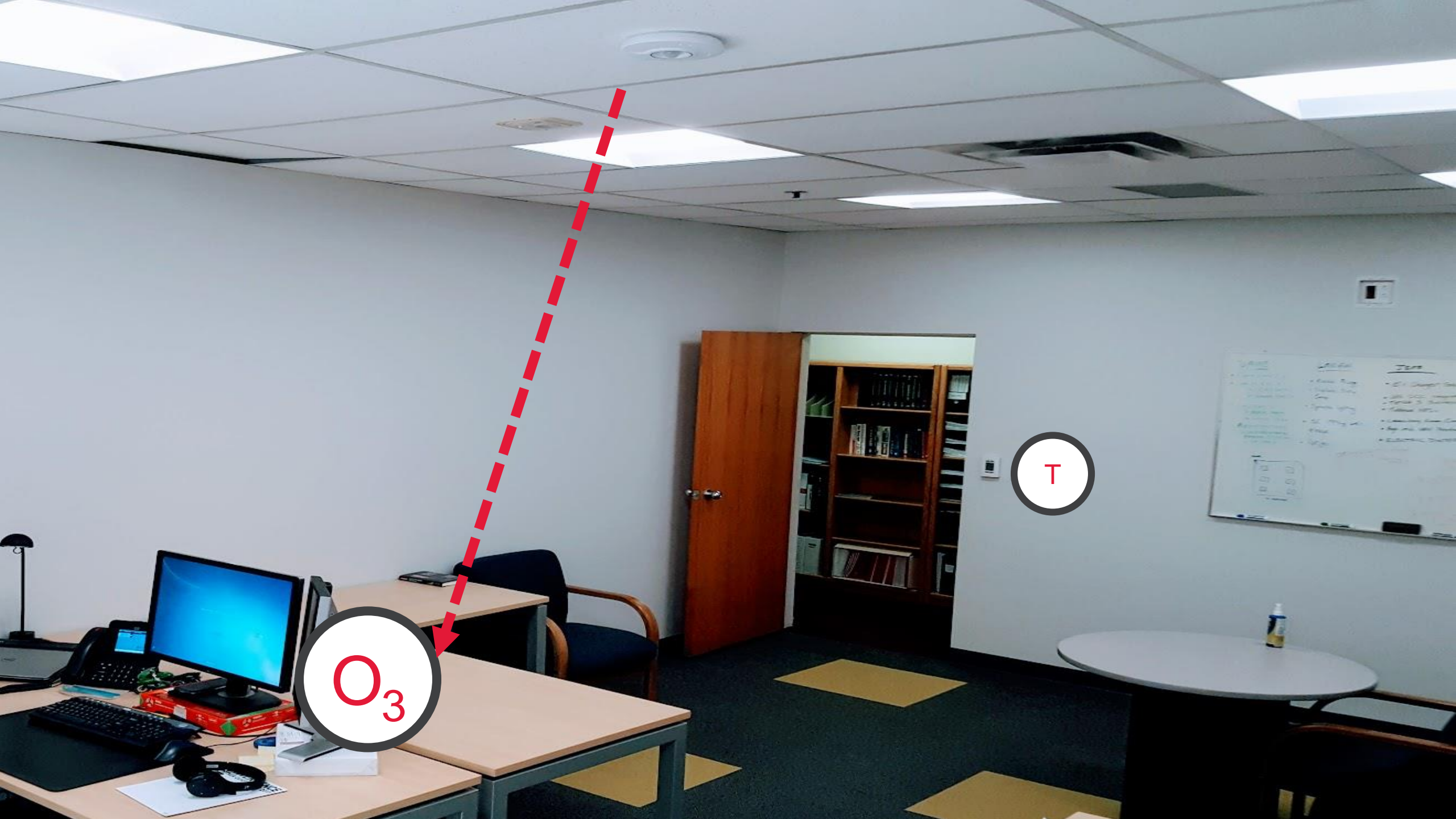




Location

- CLOSER TO OCCUPANT
- INDIRECT SUNLIGHT
- RADIO ANTENNA
- EASY TO MOVE WALLS / EQUIPMENT
- WALL ACNE

- OCCUPANCY
- TAMPER AVOIDANCE
- OPEN OFFICE CUBICLES
- T-BAR vs WALL INSTALLATION



O_3

T

Wireless



- SENSING AND CONTROL DEVICES
- GREAT FOR RETROFIT
- WINDOW / DOOR CONTACTS



- MORE ON THIS IN A MOMENT



IR BLASTER

- SENSING AND CONTROL DEVICES
- GREAT FOR RETROFIT
- WINDOW / DOOR CONTACTS

O₃ App



- ROOM LOCATION
HUBS KNOW WHEN YOU'RE NEARBY

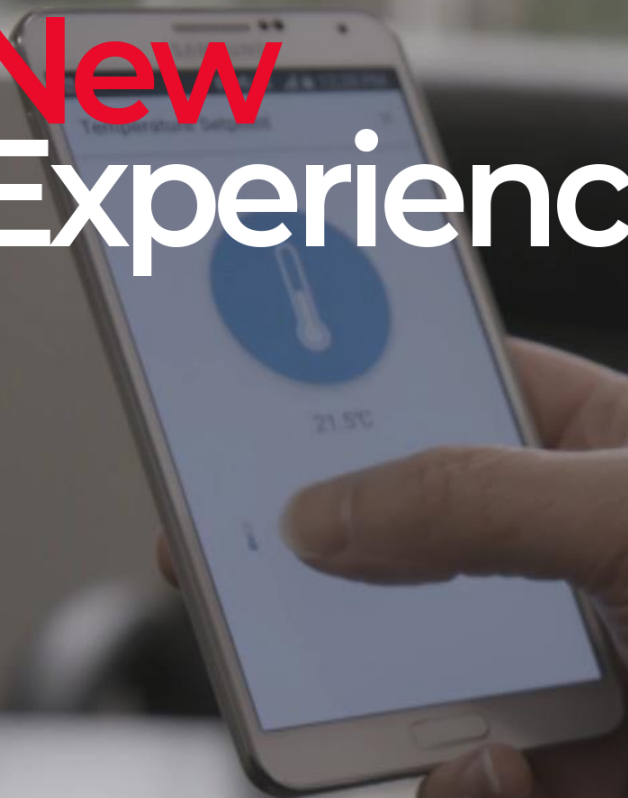
- EASY



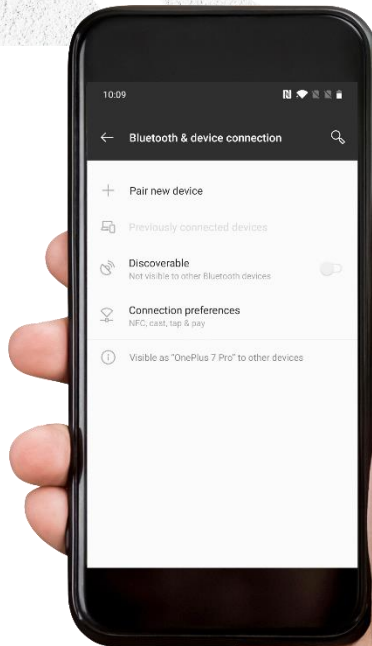
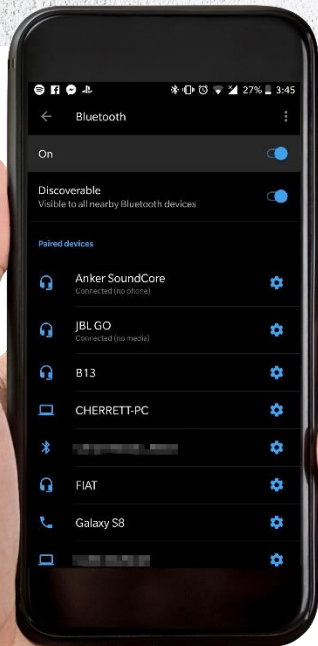
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- EXPERIENCE
ACTIVITY CONTROL
HUB FEEDBACK – LED RING, SOUND

New Experience



New Experience



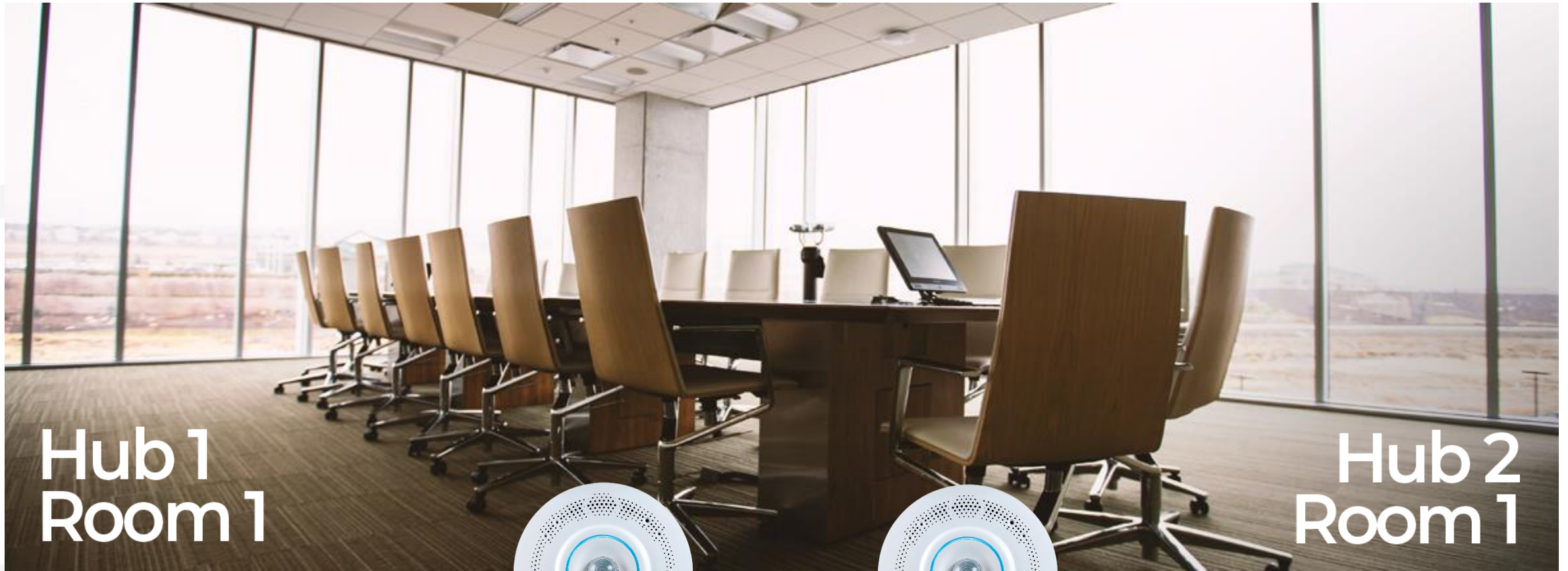
- BEACON BROADCASTS MESSAGES TO NEARBY DEVICES
- MOBILE DEVICES DISPLAY LOCATION-BASED MESSAGES

New Experience



- BEACONS ARE ABOUT PROXIMITY
- CLOSEST ROOM IS LISTED ON TOP
- MULTIPLE HUBS CAN BE BOUND TO ONE ROOM, FOR OPEN OFFICES

New Experience



Hub 1
Room 1

Hub 2
Room 1

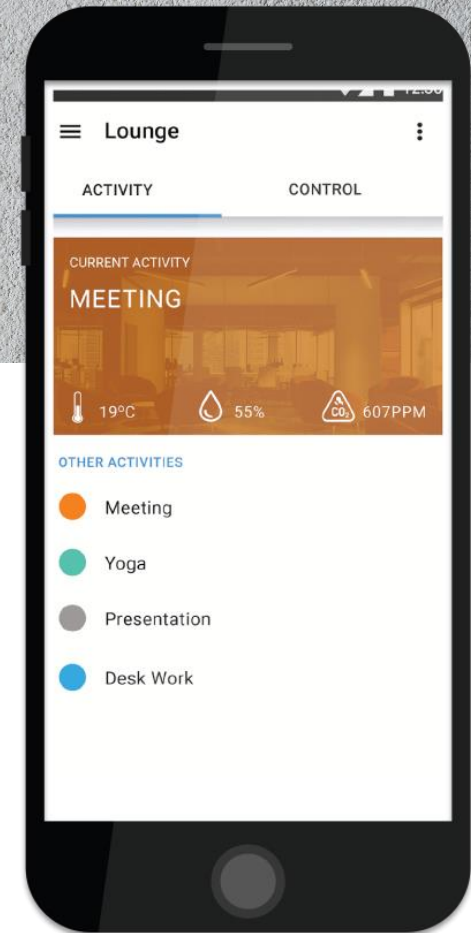
○ — ○ Near
○ — ○ Far



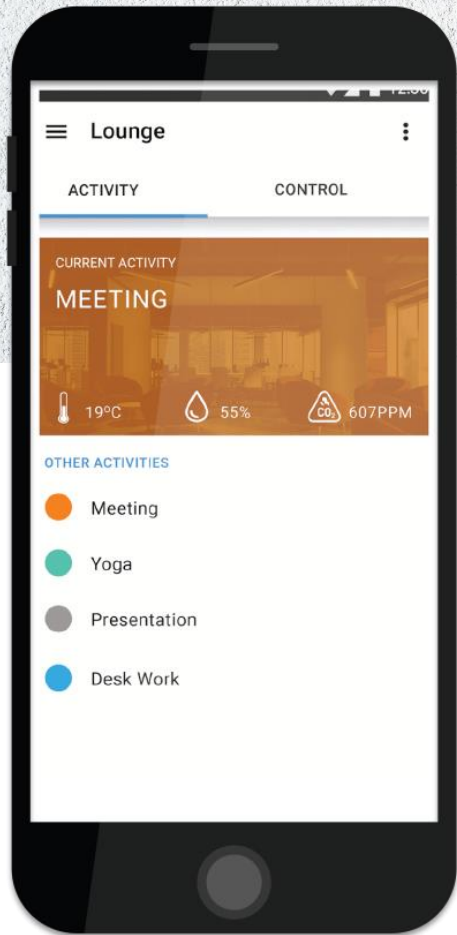
Far ○ — ○
○ — ○ Near

Activity Based Control

- ONE-TOUCH CONTROL
LIGHT LEVEL, BLIND POSITION, TEMP SETPOINT
- CUSTOMIZED
NOT “CANNED”
PROGRAM CUSTOM ACTIVITIES
- RE-USABLE
STORED IN EWEB
CREATE ONCE USE IN MULTIPLE ROOMS

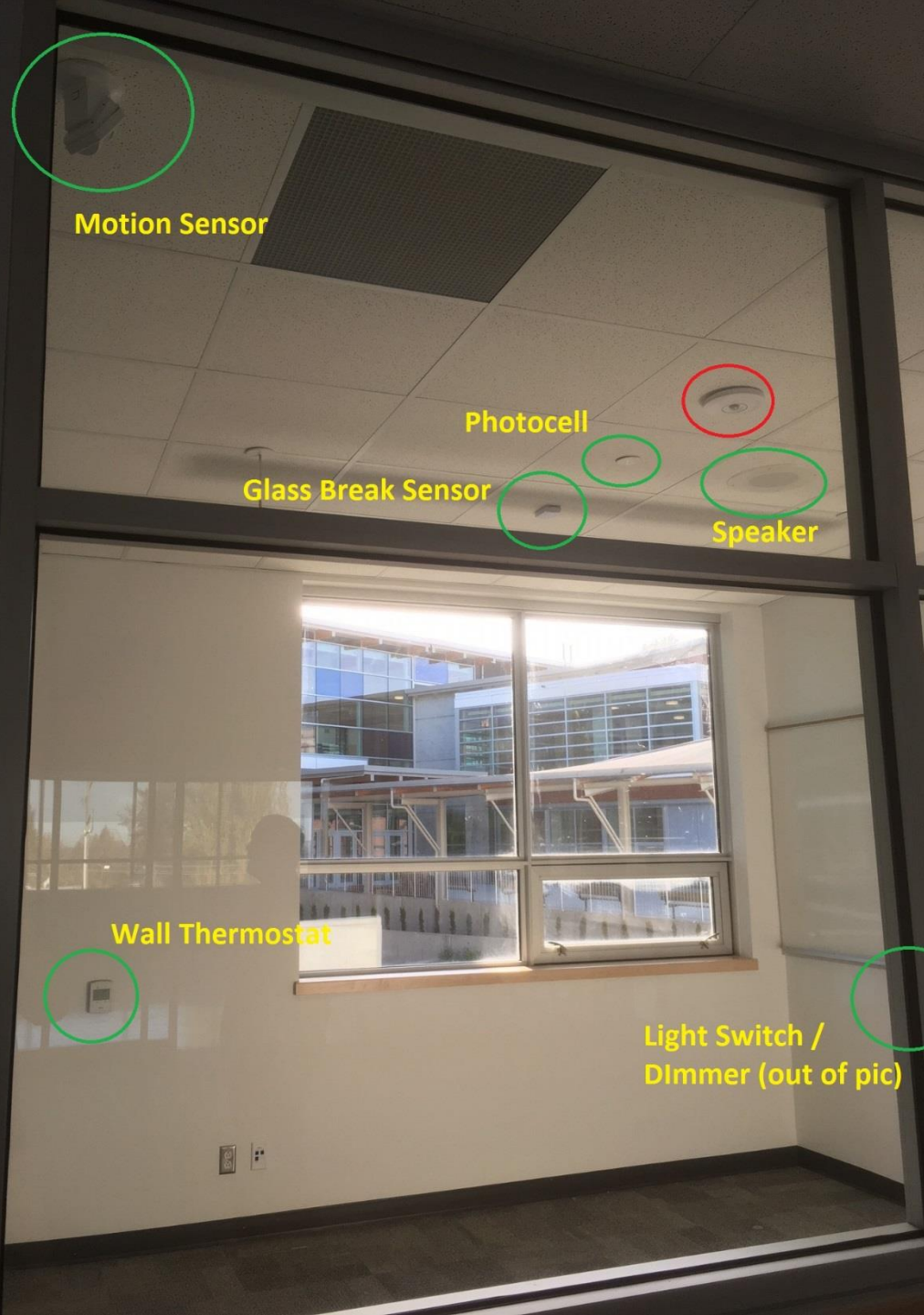


Take Control



- EXPLICIT CONTROL
LIGHT LEVEL, BLIND POSITION, TEMP SETPOINT
- ROOM SPECIFIC
ONLY EQUIPMENT IN ROOM IS DISPLAYED
- OCCUPANT RULE
PERMISSIONS IN EWEB

Target Room



- SCHOOL:
COULD REPLACE 6 DEVICES WITH ONE O3 HUB

Most Advanced Device in a Room

Think.

- Sensor Fusion
- Instant Occupancy
- Activity Based Control
- Programmable O3 CPU

Sense.

- IR + Thermistor
- PIR + Sound
- Light Intensity + Color
- Humidity
- EnOcean
- One Sensor – HVAC,
- Lighting, Access

Speak.

- Play Sounds
- Color Ring
- Mobile App

Benefits for Everyone

Partner Cost.

- Multi-sensor cluster
- Installation in ceiling
- Twist-in mounting plate
- Free to move office walls, equipment, etc

Experience.

- Control temperature at occupant location
- Bluetooth beacon
- Mobile app
- Trust – light & sound interaction
- No wall acne

Owner Savings.

- Energy - Instant occupancy
- Energy - Indirect light sensing (daylighting)
- Tamper avoidance
- Free to move office walls, equipment, etc