

## IoT for BMS

Manage comfort and security  
while decreasing electric bills  
with cutting edge technology

Rajant's Reios **IoT-based Building Management System (BMS)** is a flexible and responsive system able to collect and elaborate multiple dynamic parameters of the environment, to consider the impact of human activities and to reduce energy usage of a building while maintaining the best level of comfort for the occupants.

### Benefits

#### PEOPLE COMFORT

##### Putting people at the heart

Boost comfort and minimize cost by detecting occupants' presence and acting on the environmental parameters accordingly (e.g. turn on /off A/C or heating to reach a desired temperature where there are people).

##### Flexibility of spaces

Cater for climate variations, indoor areas rearrangements or usage patterns changes (e.g. work from home, preferred break or meeting areas) to ensure best working and living conditions.

##### Environment and devices monitoring

Keep all environmental parameters under control (e.g. luminosity, temperature, humidity, indoor air quality, noise) and monitor all devices through one platform, prompt-fixing faults to avoid occupant's discomfort.

#### EASIER BUILDING MANAGEMENT

##### Easy interfacing with existing BMS

Enhance legacy BMS into a hybrid, more flexible and dynamic solution with situational awareness (people presence, room reservations, external weather and light conditions).

##### Meeting higher ESG standards

With easy monitoring and reporting capabilities, data about your building(s) are your fingertips for ESG reporting and certifications.

#### BUILDING SUSTAINABILITY

##### Energy consumption reduction

Smartly determine the energy usage behavior of each area, identifying with IoT sensors different energy and environment related parameters, analyzing the health of the building, and establishing the best energy and thermal requirements.

##### Partitioning and room level management

Wireless sensors and actuators are used for a room-level management of each component, such as electricity or HVAC, making it extremely more efficient.

##### Wireless and low cost

Being wireless the system has implicitly lower set-up and operating costs, also allowing to easily retrofit older or existing buildings with significant cost and regulatory constraints.

#### CONTINUOUS LEARNING AND IMPROVEMENT

##### Continuous learning and improvement

Building state and general environment is continuously checked while the behavior of each element is managed in real-time through learned actions, continuously adapting to new information and parameters.

##### Scalability

The flexibility of the system allows to add new parameters and functionalities as per need of building management.

### Fields of application



Offices



Residential Complexes



Hotels & Leisure Venues



Industrial Plants



Public Buildings

Control Blocks	Functions	Technical Approach Adopted
<b>Human Detection</b>	Facilitate energy consumption modelling by monitoring the number of people or detecting occupancy in a room	Combining wearable devices, PIR, sDesk, sSquare and IR the platform displays the number of occupants in any area or room
<b>Light Control</b>	Achieve the required illumination conditions (natural + artificial) with lower electricity consumption by using sensor-based data	Combining lighting sensors, PIR, wearable devices and noise sensors, the platform sets the lighting intensity through dimming and RGB
<b>HVAC and Air Quality Control</b>	Reducing HVAC system electricity consumption in a building without affecting privacy and comfort level of the occupants of the building	Air quality, temperature, humidity, noise, PIR & presence devices are combined, and data is elaborated to set HVAC parameters
<b>Flexible Load</b>	Monitoring and scheduling of electricity consumption by flexible loads within a building to reduce electricity costs	Smart equipment and specific sensors send and receive IoT data to control units for a flexible management
<b>Diagnostic and Predictive Maintenance</b>	Advance predictive maintenance, fault detection and diagnostics applications of systems based on data gathered through IoT	Kalman filtering, gray box models

## IoT for BMS in Details

### Integration with legacy BMS

Rajant's Reios IoT for BMS is a technology agnostic system. It can perform by itself or, it can easily interface legacy BMS via standard communication protocols (e.g. MQTT, DeviceNet, SOAP, XML, BACnet, LonWorks, Modbus, KNX).

### Devices and sensors

#### ED Server

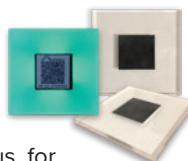
Device that configures, manages and monitors all system devices. Connected via LAN, it stores MySQL database, MQTT broker and the virtualization protocol.



#### sSquare® - The emotional IoT Assistant

Wall or ceiling mounted Wi-Fi / BLE gateways that can be associated to any area to enable IoT features.

Equipped with LED visual interface, these devices provide a sensorial feedback showing each area's status, for example, if a meeting room or an area is available, if there are environmental anomalies such as high or low temperature or any other pre-set information.



#### sSquareDesk®

Specifically designed to be placed on desks, tables or other flat supports, these sensors provide the same functions & sensorial feedback as sSquare Emotional IoT Assistant.



#### Sensor fusion and AI

Sensor fusion and edge computing allow to collect enormous amounts of data points from on-site sensors. The data sets are then elaborated and, thanks to machine learning and artificial intelligence, IoT for BMS reacts in real time, through the use of actuators, to adjust any deviated value.

#### sTag®

BLE devices, equipped with MEMS sensors, performing tracking and telemetry functions. Interacting with other sensors sTag signals people presence, allows to book meeting rooms or desks, to open restricted area doors or to track movement within a building, for safety and security purposes.



#### Actuators

Wi-Fi/BLE actuators perform the actions required by the system, taking action when and where necessary (e.g. opening shutters in a room before a booked meeting, switching on/off HVAC depending on a meeting attendance, etc)



#### Environmental Sensors

Wireless devices that detect the level of luminosity, people presence and passage, air quality, temperature, humidity and any other parameter. All type of environmental sensors are Ultra-Low-Power and use BLE protocol to communicate with the platform.

