



# IBM & EnOcean: Self-powered Wireless Sensors and Switches for Cognitive Buildings

# Hotel & Campus Projects



#### PROBLEM

Most hotel rooms and student rooms are unoccupied over two-thirds of the time, but heating/cooling and other appliances are often still switched on, wasting a huge amount of energy.

#### **IMPLICATION**

Higher running costs and unnecessary environmental pollution (CO<sub>2</sub>)

### SOLUTION

Existing rooms can be easily retrofitted using maintenance free wireless sensors without affecting the normal running of the building resulting in 30% to 40% reduction in in-room energy usage.

### SOLUTION IN DETAIL

Batteryless wireless **occupancy sensor** adjusts temperature and turns off lights when a room is not in use.



Batteryless wireless **switches** control lighting and shading.

Batteryless wireless **position sensors** setback HVAC when windows are opened.

**CO<sub>2</sub>** and **humidity sensor** measures air quality.



Batteryless wireless **key card switch** controls access to a room and turns on heating and lighting when entering a room.

Batteryless wireless **room temperature sensor** for minimal energy consumption and maximum comfort.





# Ambient Assisted Living Projects

### → EnOcean/IBM Gateway

#### PROBLEM

Global population is aging creating an imbalance between elderly people and the amount of available (affordable) care.

#### **IMPLICATION**

Cost and availability of elderly health care and care homes is now at prohibitive levels.

### SOLUTION

It is essential to enable people to live as independently as possible for as long as possible without invasive monitoring (cameras). "Fit and forget" easily installed maintenance free wireless sensors can provide raw data to enable monitoring, profiling and as necessary alerting relatives or carers.

## SOLUTION IN DETAIL

Batteryless wireless occupancy sensor adjusts temperature and turns off lights when a room is not in use.

Batteryless wireless switches control lighting and shading.

Attracting immediate attention in the case of an emergency with call buttons.

Batteryless wireless position sensors setback HVAC when windows are opened.



CO<sub>2</sub> and humidity sensor measures air quality.



**Pressure sensor** detects weight changes and registers a bed exit.

Batteryless wireless room temperature sensor for minimal energy consumption and maximum comfort.



Identify status of appliances (e.g. cooker) with CT clamps.



Identify status of electric, gas, water meters with pulse counter.







# **Restroom Projects**

#### PROBLEM

Optimal maintenance according to actual usage is virtually impossible to predict.

### **IMPLICATION**

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Very often restrooms are not cleaned as required nor paper, soap etc. refilled, resulting in customer frustration.

### SOLUTION

Restroom actual usage can be monitored using easily retrofitted, maintenance free wireless sensors enabling optimal cleaning and staffing, resulting in optimized costs and customer satisfaction.

## SOLUTION IN DETAIL

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EnOcean/IBM Gateway

# Office Room Projects

#### PROBLEM

Floor space is at a premium (up to \$50 per square meter). Many office spaces are utilized less than 70% (conference rooms, canteens, storage space, hot space work areas etc.).

### **IMPLICATION**

This creates unnecessary costs (floor area, heating, lighting, maintenance, running costs etc.) which runs into \$ millions p.a.

#### SOLUTION

"Fit and forget" easily installed maintenance free wireless sensors can provide raw data to allow analysis by IBM back-end systems to inform customers of utilization and therefore optimization potential

## EnOcean/IBM Gateway

## SOLUTION IN DETAIL





enocean

# **Insurance Projects**

Water leak detection and area monitoring in residential homes.

#### PROBLEM

Late recognition of problems such as water leakage, heat damage or unwanted building intrusion.

### **IMPLICATION**

Costs the insurance companies billions every year, which in itself is reflected on the ever increasing insurance premiums paid by the customers.

### SOLUTION

Easily installed, maintenance free wireless sensors providing immediate data in case of flooding, fire and/or unwanted intrusion which also alerts the customer and insurance company.

## EnOcean/IBM Gateway



## SOLUTION IN DETAIL

Water leak detectors and shut off valve in kitchen and bathroom



Batteryless and wireless **position sensors** monitor if windows are opened.

**Smoke detector** sets an alarm if smoke is detected in the kitchen or living room.



Batteryless wireless **room temperature sensor** for minimal energy consumption and maximum comfort.



Batteryless wireless **occupancy sensor** adjusts temperature and turns off lights when a room is not in use.

Perimeter monitoring e.g. garden fence.





# IBM & EnOcean: Self-powered Wireless Sensors and Switches for Cognitive Buildings

With IBM joining the EnOcean Alliance as a promoter member in 2016, the organization strengthened its program in building automation and the Internet of Things. For its Watson IoT ecosystem and cognitive buildings solutions, IBM relies on the energy harvesting EnOcean technology in sub 1 GHz.

Together with IBM's Watson IoT Platform, a fully managed, cloud-hosted service, self-powered EnOcean-based sensors enable maintenance-free solutions for Real Estate Management to increase operational, financial and environmental performance of facilities. EnOcean's self-powered wireless sensors are the eyes and ears of the IoT, as they collect the required data to operate large numbers of IoT devices efficiently, without any need of a battery.

In close collaboration, the EnOcean Alliance, EnOcean Alliance members and IBM define and expand standards for self-powered solutions for the IoT. These solutions can be used in various cases from asset management, ambient assisted living projects, insurance or hotel and campus projects, giving maintenance-free wireless switches and sensors based on EnOcean technology.

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