Case Study: STEINEL Solutions AG

Building Automation: Achieving energy savings of over 90 percent with smart lighting sensors and Bluetooth® mesh

Intelligent sensors are becoming increasingly important in building technology. Modern sensor technology with high-performance communication hubs can help commercial properties from office buildings to event halls operate in a sustainable and cost-saving way. Networks based on Bluetooth® mesh are optimized for the control and communication of sensors and the establishment of large-scale device networks. The latest-generation SENSOTEC sensors from STEINEL Solutions AG, can be easily integrated into existing lighting solutions thanks to their compact design. They register presence, luminous intensity and many other parameters with zonal accuracy, as the basis for building automation, plant tracking and other IoT solutions.

As an OEM partner, STEINEL Solutions offers its customers a service package including consulting, product development and industrialization from the initial idea to the finished product. The company pioneered the first sensor light and is now the technology leader for motion and presence detectors throughout Europe with our electronics experts in the fields of sensor technology, communication, low power and the development of customer-specific solutions at the Swiss development site in Einsiedeln. Thanks to the affiliation with the STEINEL Group, customers can access a Europe-wide network for series production, depending on the product life cycle and market success. In Germany, STEINEL is headquartered with a research and logistics center in Herzbrock-Clarholz, Westphalia.

Due to their small size, STEINEL's sensor solutions can be easily installed in lighting fixtures. Early on, these modules for commercial lighting were equipped with solutions to detect movement in parts of the building and to commission and parameterize the individual luminaires. However, there was an issue with these different, proprietary approaches: They were not compatible with each other. To be functional, these sensors needed additional gateways. Data exchange and central data analyses were associated with a high level of effort.

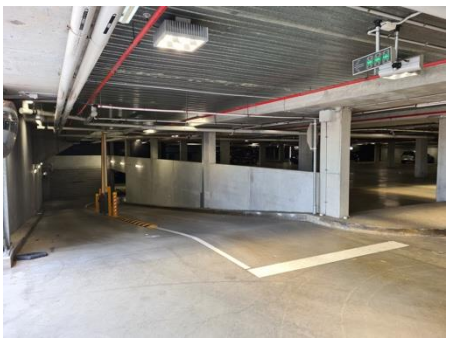
STEINEL achieves interoperability with Bluetooth mesh, developed by the Bluetooth Special Interest Group (SIG). Two criteria were particularly decisive in the selection process. "In addition to its high reliability, the great advantage of the Bluetooth standard is its widespread use and connectivity via smartphones," explains Manuel Siegrist, Sales & Product Manager SENSOTEC at STEINEL Solutions AG. "This allows us to offer a control app for our sensors that any facility manager can use without complications." This app makes STEINEL's solution not only easy to use, but also sustainable in the long term. This is because the company offers regular further developments for the control of its sensor networks via the app – very simple via firmware updates.

The advantages of Bluetooth mesh

Bluetooth mesh offers the highest reliability, scalability and interoperability for commercial building automation. All product types from STEINEL's SENSOTEC NET portfolio can be configured via Bluetooth technology to form a Bluetooth mesh network. Wireless networking also brings a major advantage in the retrofit sector: if a lighting system is to be modernized, it can be retrofitted without having to make adjustments to existing installations. Previous wired lighting systems with their high installation costs and expenses for replacements are thus a thing of the past.

The integration of Bluetooth technology into lighting systems has also made it easier to prepare the installation offline and then commission the luminaires online on site in a short time. The initialization and configuration of the sensors takes place via the web and mobile app of the software specialist and cooperation partner SILVAIR. The app also enables free definition of luminaire groups with configurable behavior. For example, only certain required areas are illuminated. SILVAIR offers innovative IoT solutions and provides lighting control systems to reduce energy consumption in commercial buildings.

Use Case: Intelligent lighting solution for underground & parking garages



Until now, the lighting underground garages and parking garages has guaranteed one thing above all for operators: it is cost-intensive. Especially because lighting is required 24/7. Innovative and intelligent lighting systems can improve energy efficiency immensely by only switching on the lighting when it is actually needed. SENSOTEC sensors installed in linear luminaires provide a Bluetooth based intelligent modern lighting solution for underground garages and parking garages. The intelligent lighting system detects pedestrians or cars and illuminates frequented zones for a defined period of time. In the remaining time, areas without presence are illuminated with dimmed comfort light of 10-50 percent or switched off completely.

Energy savings, efficient processes, better use of space

With Bluetooth enabled sensors from STEINEL, building operators are provided with numerous smart optimization options:

- **Energy-efficient facility management**: energy data and consumption can be measured with pinpoint accuracy. This directly reveals unnecessary power consumption and saves costs. Some customers achieve more than 90 percent energy savings and thus operate their buildings more efficiently and in a more environmentally friendly manner.
- **Optimize space utilization**: Heat maps provide accurate information about the actual volume of people in commercial properties. They show where there are opportunities to optimize space utilization. For example, data for the utilization of flexible office workstations can be collected and evaluated from the information provided by Bluetooth mesh sensor networks. This allows a reliable overview of actual demand and more efficient building utilization.
- **Optimizing process flows**: STEINEL customers also use data from sensor technology to redesign their processes. In a hotel, for example, cleaning staff receive information via Bluetooth mesh as to whether a guest has already left their room. Accordingly, cleaning procedures are planned

automatically. The staff does not have to search for free rooms and can thus work faster and more efficiently.

Outlook: Lighting systems as IT infrastructure for smart building applications

In the future, all information potentially received by Bluetooth sensors can be centrally collected and analyzed via networked luminaires. «Our vision for the future is lighting installations as central IT backbones for a wide range of building automation requirements», says Manuel Siegrist. «With Bluetooth mesh and intelligent lighting sensor technology, a higher-level IT infrastructure is created. This then includes, for example, the control of heating, ventilation and air conditioning, shading by blinds and controls via window contacts».

Feedback from STEINEL customers who are already working with Bluetooth mesh in lighting sensor technology is extremely positive. In addition to savings that can be achieved in the short term through greater energy efficiency, the simple, reliable handling of the sensors via a smartphone app is also impressive. It also creates the basis for future wireless IoT networking and building automation.