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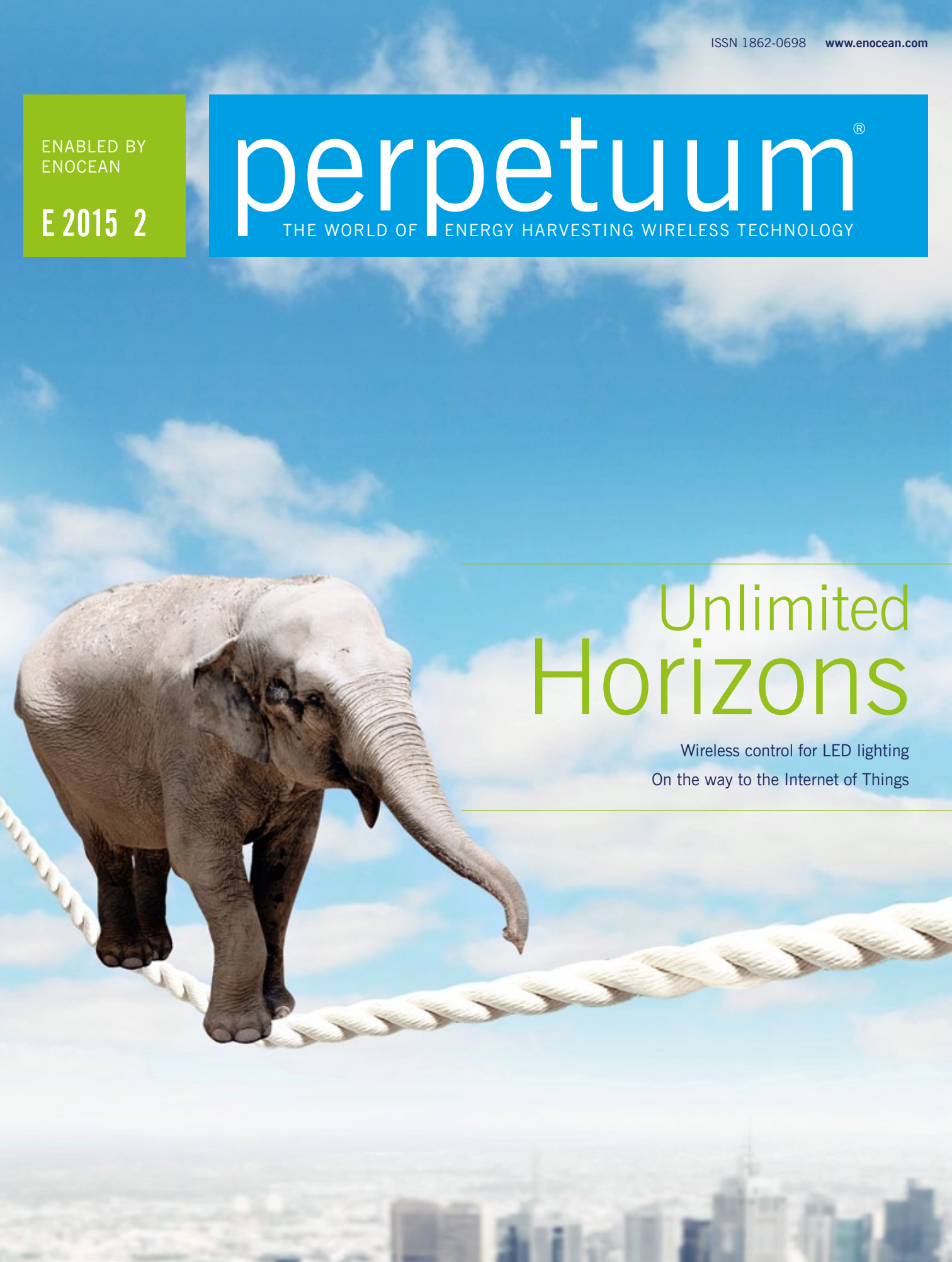
THE WORLD OF ENERGY HARVESTING WIRELESS TECHNOLOGY



Unlimited Horizons

Wireless control for LED lighting

On the way to the Internet of Things

READY TO RECEIVE WIRELESS SIGNALS!

EnOcean radio receiver for the WAGO-I/O-SYSTEM enables wireless building automation applications

Communicates with a large variety of freely programmable WAGO I/O controllers with interfaces to BACnet, KNX IP, MODBUS TCP, DALI, SMI, KNX and more ...

www.wago.com/enocean

WE INNOVATE!

WAGO®

Dear Reader,

Did you know that the EnOcean Alliance has the largest installed base of ultra-low power wireless devices in commercial buildings worldwide? I think that this is truly impressive and just one example of our community's remarkable success.

Today, the EnOcean Alliance is represented by over 400 member companies in 42 countries worldwide, from product manufacturers and distributors to building professionals and research institutions. Together, they built up the largest energy harvesting wireless interoperable product range. With ISO/IEC 14543-3-1X, the Alliance created the world's only standard for energy harvesting wireless communication.

The strong community of the EnOcean ecosystem has truly proven that the approach of open partnerships and interoperable products results in business success and market leadership.

And there is still plenty of room to grow even more. In order to further strengthen the community and to create new business opportunities for its members, we plan to invest additional resources in the EnOcean Alliance and its demand creation program.

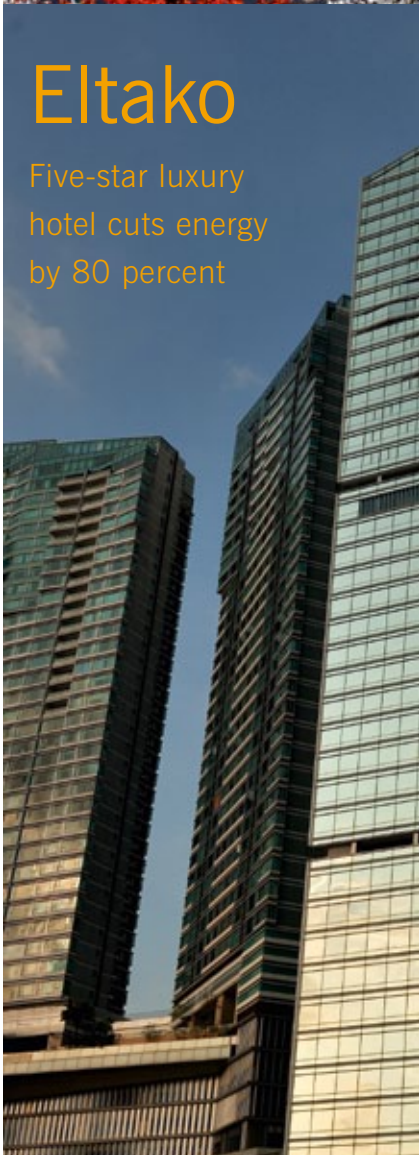
In recent years, the Internet of Things (IoT) gave birth to several new alliances as companies recognized that a connected world requires products and technologies working together. This interoperability concept has been an essential element of the EnOcean Alliance from the very beginning. It's a logical step that the EnOcean ecosystem continues to follow this partnership approach and brings the innovation of energy harvesting to other alliances in emerging markets.

The interest in energy harvesting from other alliances is significant: energy harvesting is seen as key technology for the IoT, enabling maintenance-free sensors, which provide the needed data to an intelligent system. It makes sense too, when analyst forecasts predict 25 billion connected devices and up to 10 trillion connected sensors. These staggering numbers of batteries cannot be produced, nor should they be disposed of.

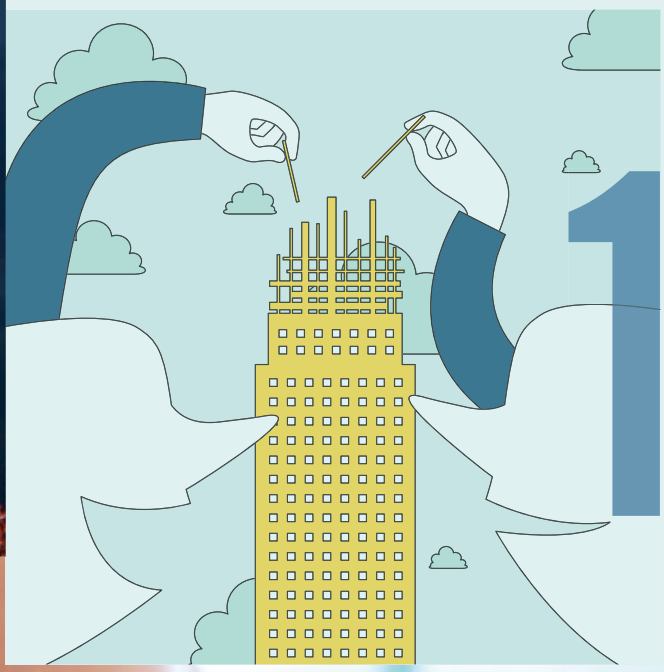
On the alliances' playing field, the EnOcean Alliance is the only energy harvesting wireless organization. It can use this unique market position not for competition but for collaboration with other alliances, to provide growth for the harvesting technology and the harvesting business of its members.

Yours,

Dr. Wald Siskens
CEO of EnOcean



EnOcean Alliance and AllSeen Alliance



HORA

Top performance perfected

Numbers of the EnOcean world

EnOcean technology frees wireless devices from batteries – a core foundation of the Internet of Things. Some figures why fewer batteries are desirable.

→ Depending on the battery technology in use, a user needs to dispose between **200** and **1,600** batteries over 20 years in a residential home with only 50 nodes.

→ It takes **6** to **10 times** more energy to reclaim metals from some recycled batteries than it does to produce it through other means, including mining.

→ A large system comprising **10,000** wireless units, each powered by 2 batteries with a lifetime of 2 years, could require the facility manager to change approximately **30** batteries each day.

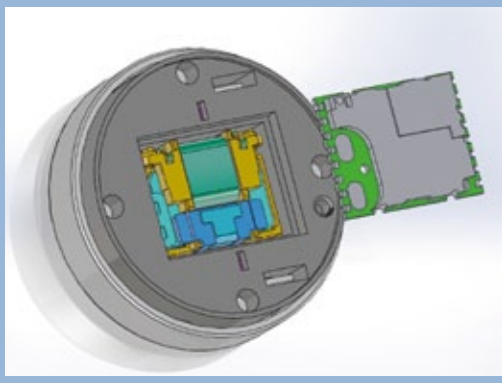
→ Up to **10,000,000,000,000** wireless sensors are expected to deliver the needed data for the Internet of Things. These would require 1,000,000 tons of lithium – the combined worldwide lithium production of **10** years. Based on a 10 year average battery life time, **10,000,000** maintenance workers would be requested to change batteries, **100,000** of them per year.

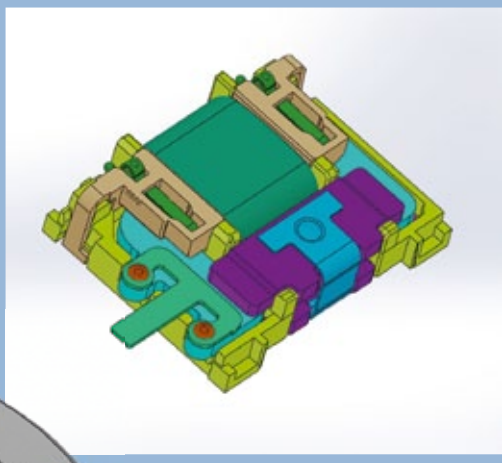
→ Visit the **battery-less EnOcean world** on the Web: **www.enocean.com** | **www.enocean-alliance.org**

3D impulse
for new switch ideas

With the combination of the ECO 200 kinetic energy generator and the PTM 330 wireless module, EnOcean offers its OEM customers an entire system for batteryless switch solutions. In addition, developers can now request comprehensive 3D data including all details of this self-powered pairing – and thus can print prototypes of new switch designs very easily and fast.

By Armin Anders, Vice President Product Development, EnOcean GmbH





With a CAD program and 3D data, new designs for batteryless switches can be realized using a 3D printer.

EnOcean already enabled numerous innovative switches for buildings, health care, transportation or industry based on the ECO 200 and PTM 330. This includes handheld transmitters, door contacts, key card switches, emergency call buttons, bus stop buttons or test switches for automotive production. Despite the variety of different applications, all switches have one thing in common: They are all based on the ECO 200/PTM 330 pairing and generate energy for sending wireless signals by the motion of pressing them with a finger. Therefore, they don't need wires and batteries.

Push for different designs

This energy harvesting principle is suitable for many more switch solutions – it just needs creative ideas. To give its OEM partners fresh impetus for product designs, EnOcean now provides 3D data including comprehensive documentation on the ECO 200 electromechanical energy converter and the PTM 330 wireless module. This clearly explains how the EnOcean components ECO (kinetic energy generator) and PTM (wireless module), both available on the market, can be used to create a new end product.

Data in all dimensions

The provided 3D data describes in details the inner interface of the converter and the module, including tolerances. Thus, product developers don't need to deal with constructing the sensor's interior but can focus entirely on the exterior design and its surface.

Based on 3D IGS data and using a CAD construction program, they can design new housings easier, faster and at lower cost while just directly printing related prototypes of different switches in a 3D printer.

There are unlimited versions of new switch forms. They can be used in buildings, consumer applications, health care, Industry 4.0 or in completely different fields. With ECO 200 and PTM 330, together with the 3D data, developers have all necessary design components readily available – all that's missing now are new ideas.

www.enocean.com

Much more than a mattress change

IQmat, a mattress specifically designed for dementia patients by the companies IQfy and Lück, includes an integrated pressure sensor. It senses changes in the weight load. The sensor technology notices when a patient leaves the bed and sends an alarm signal. By Andreas Thometzek, Managing Partner, IQfy GmbH

In the health care sector, no one can dispense with technical assistance today. It does not only make the staff's work much easier, but also provides for greater safety and comfort.

Less workload due to pressure sensor

IQmat is such a technical assistance, a mattress with integrated sensor technology. The mattress is a high quality RHOMBO-MEDICAL® product, in which the sensor is neither visible nor palpable. Thanks to self-powered wireless technology, it uses kinetic energy and thus does not require battery replacement or maintenance. Nursing homes that have mattress in use without this sensor can retrofit it at any time.

Security with comfort

Whenever a patient leaves the bed, the sensor sends a wireless signal to both the nurse call system and the DECT telephone. As a result, the nursing staff knows immediately when to check on the patient.

The occupancy signal of IQmat can also be integrated into a home automation system and therefore control the lighting or heating depending on the room status, for example.

From practice for real life

For the development of IQmat, IQfy has followed the operation in nursing homes for several weeks, studying the nurses' work processes and consulting the management on the special needs of patients and staff.

www.iqfy.de/en

EnOcean Blog

We launched the completely new EnOcean Blog. Here, several authors would like to keep you informed about the diverse EnOcean world and show you which topics are of current importance to us as well as the possibilities of energy harvesting wireless technology today and in the future. We warmly invite you to join the discussion and share your feedback, your questions and your ideas in the EnOcean Blog's comments.

http://blog.enocean.com/

Enviromental monitoring

Hideki has specialized in the production of environmental monitoring sensors for more than 15 years. Hideki's business encompasses the globe, from Asia to Europe and North America as well as other markets and also provides OEM/ODM solutions and services. Based on EnOcean energy harvesting wireless technology, Hideki is launching a series of wireless sensors for outdoor environmental monitoring.

By Marketing Department, Hideki Electronics Co., Ltd.

Hideki designed an anemometer, a UV meter and a rain gauge for outdoor environmental monitoring. An additional soil humidity sensor will be complementing the portfolio soon. Integrating high precision sensors, Hideki devices ensure the collection of very accurate data from different fields. This comes with highly reliable software, which was continuously improved over the past decade.

Anemometer

Powered by solar energy and combined with the low power consumption of EnOcean wireless technology, the monitoring portfolio enables operation with "no wires, no batteries, no limits". The anemometer automatically transmits the wind speed, wind direction and other information to the control system or a weather station via the EnOcean protocol. The wind cup anemometer design is one of the best international industry standards, which the American Observatory invented.

UV sensor

The ultraviolet radiation impacts the risks and benefits of sun exposure on human health. This cannot be visualized. Hideki's new generation of UV sensor uses GaN-based technology, which is more accurate than the previous generation of Si-based sensors. Therefore it can collect UVA and UVB data at the same time. Thanks to EnOcean energy harvesting technology, the Hideki UV meter is solar-powered and works without batteries.

Rain gauge

The Hideki rain gauge is a tipping bucket-type sensor, which measures rainfall and sends the collected data to the control system via EnOcean radio. With a battery backup, the sensor can function outdoor for approximately five years.

www.hidekielectronics.com

Wireless control brightens the effect of LED lighting

Lighting technology has seen a huge innovation with the emergence of LEDs and OLEDs. New, sophisticated control solutions can further increase the convenience and energy savings realized with these solutions. Energy harvesting wireless solutions uniquely combine these benefits with easy installation while eliminating maintenance effort. EnOcean LED lighting solutions therefore unlock the full potential of this growth market.

By Matthias Kassner, Product Marketing Director, EnOcean GmbH

Main topic

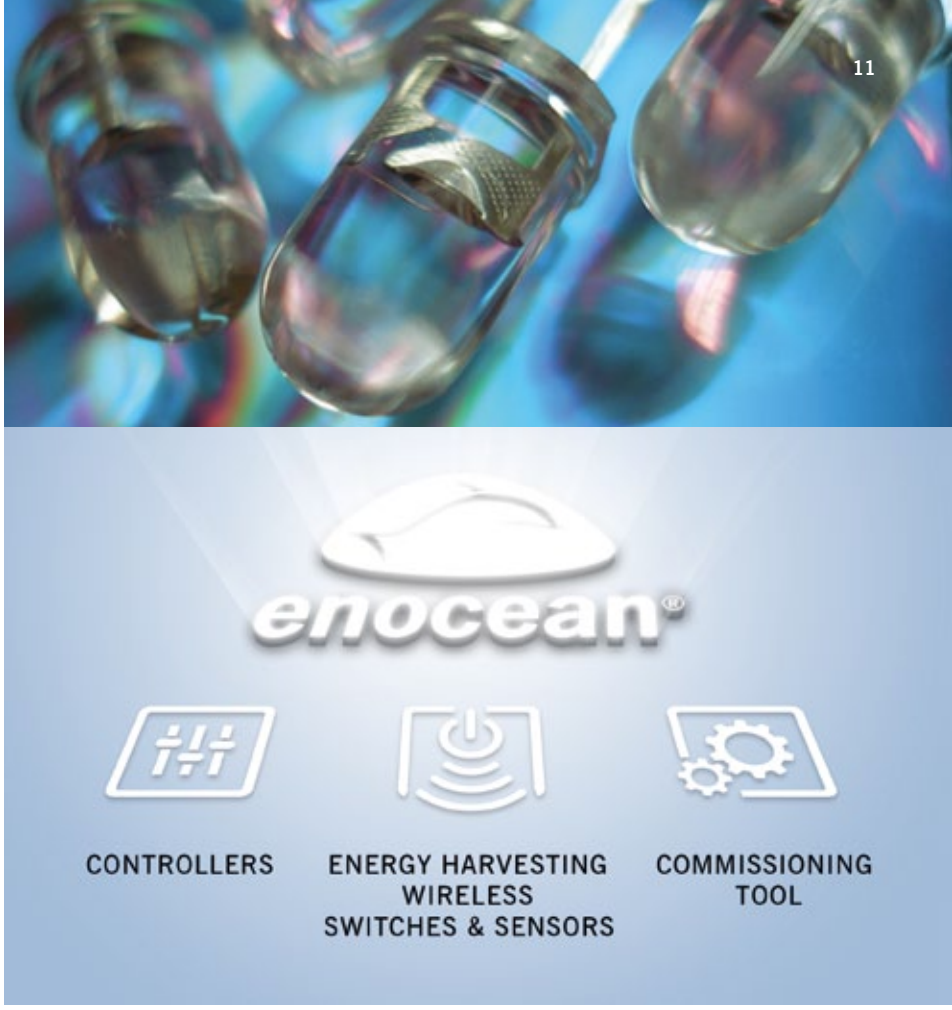
Unlimited Horizons

Lighting control is becoming a focus for building designers and owners as it is an integrated part of legal regulations. With Title 24, California set new standards for building directives. It requires, for example, that lights in unoccupied classrooms, hotels and meeting rooms automatically switch off. Such systems are required to save at least 15% of energy by adjusting the light level dynamically to the amount of available daylight or room occupancy.

In Germany, the Energy Saving Regulation 2014 (EnEV 2014) makes the automation of building services mandatory for a building's energy performance evaluation. The same applies to recognized green building certificates, such as LEED or BREEAM, where intelligent control contributes to valuable rating points.

Wireless flexibility

In addressing these new regulations at a fast return on investment (ROI), building designers need to consider which networking technology and control functionalities to use. Wireless technologies clearly have an advantage, particularly in retrofit projects, as they are more flexible and cheaper to install and to expand than wired systems.



Battery-less wireless technology offers all components for an intelligent LED control in an integrated system – from controllers, sensors and switches to a remote commissioning PC tool.

Batteryless advantage

The most established wireless standard in building automation is the EnOcean energy harvesting wireless standard (ISO/IEC 14543-3-1X). Optimized for ultra-low power communication, it allows the use of batteryless, self-powered sensors and switches, which don't require future maintenance.

Based on standardized application profiles, EnOcean energy harvesting wireless devices from different vendors can seamlessly communicate with each other. This approach of open connectivity and interoperability enables a complete solution of integrated wireless LED controls.

Complete control solution

Lighting companies have the flexibility to either develop their own EnOcean-based products or integrate a ready-to-use OEM white label LED control system of self-powered sensors and switches, LED fixture controllers, and a commissioning tool.

Due to the wireless operation, the sensors and switches can be optimally positioned in a room, even on glass walls or furniture without reconstruction. The controller receives wireless telegrams from all linked self-powered wireless switches and sensors, and adjusts its outputs accordingly.

Such a system can cover a wireless daylight harvesting application, for example, which automatically adapts the light level to the amount of available natural light in a room, measured by a light level sensor. In a typical commercial building, it is possible to save between 20% and 30% of energy with such an automated control system.

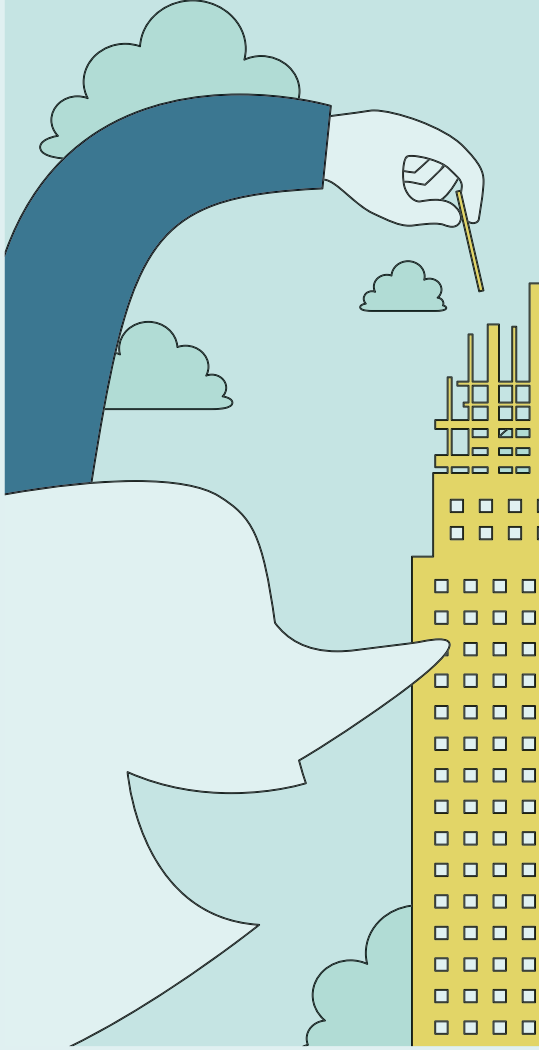
Access over the air

More advanced settings, such as thresholds, dimming levels, ramp speeds, or timers can be changed wirelessly via a Windows-based laptop computer equipped with a remote commissioning tool. An installer can locate wireless devices throughout the facility, logically connect the controller to switches and sensors, and configure settings in the controller over the air. He can also link the LED controller via a central unit to supervisory building automation systems.

More and more buildings are retrofitted with LEDs. Adding a sophisticated wireless control to these efficient lighting technologies, results in maximized energy savings and comfort.

www.enocean.com

Partners for the Internet of Everything



Early this year, the EnOcean Alliance became a member of the AllSeen Alliance to join forces for an Internet of Everything (IoE). This connects the established EnOcean ecosystem to the open source AllSeen Alliance community. We spoke with Philip DesAutels, Senior Director of AllSeen Alliance, and Graham Martin, Chairman of EnOcean Alliance, about the future scope of collaboration.

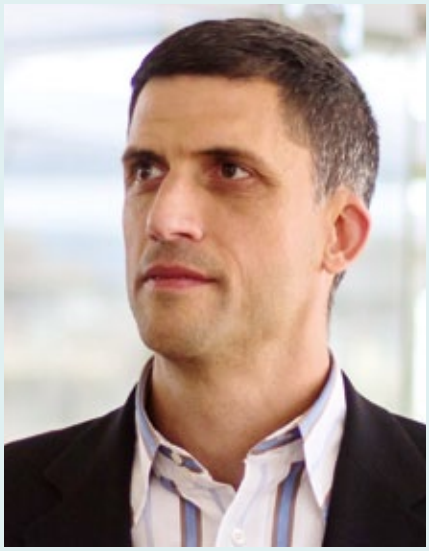
The AllSeen Alliance sees great traction and interest on its path forming the Internet of Everything. What is the fascination about an IoE?

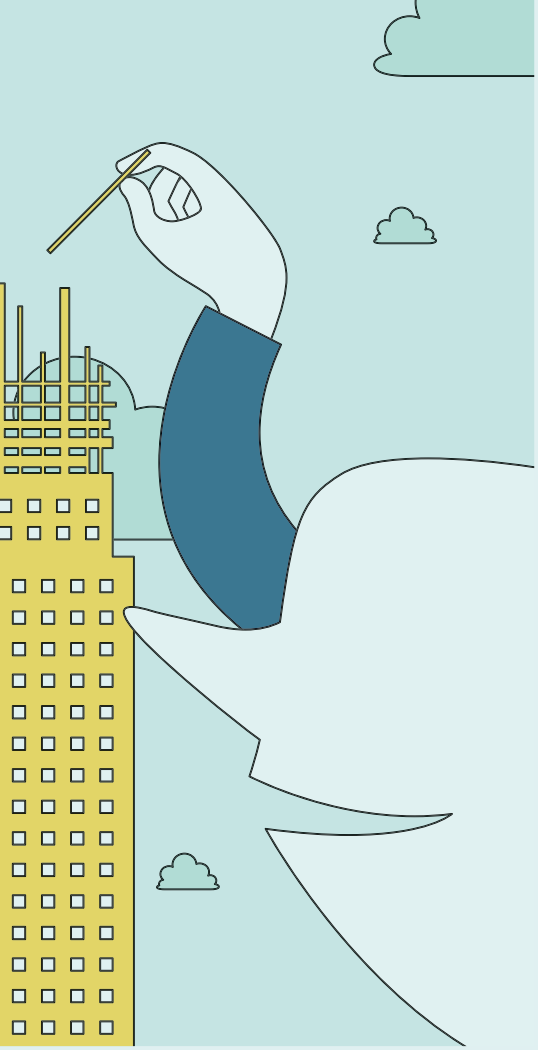
Philip DesAutels: The Internet of Everything will transform the way consumers, businesses, industries use technology. Since intelligence is everywhere, people will increasingly be surrounded by information that senses and anticipates their needs. When the Internet of Everything is fully realized, no one will wonder how it works – it just does. New products, services, companies, markets and industries will be born. The Internet of Everything promises to significantly change the way we live, work, learn, play, and relate to the world and each other.

Which approach does AllSeen follow to realize an IoE – in other words, the key differentiator, which will make the world adopt the AllSeen standard for the IoE?

Philip DesAutels: The AllSeen Alliance is hosted in a neutral forum under The Linux Foundation as a Collaborative Project. The Linux Foundation provides the essential collaborative and organizational framework so that the AllSeen Alliance can focus on IoE innovation and the AllJoyn open source project.

The AllSeen Alliance community was built to be an open source project from the ground up. Rather than having an organization that spends a lot of time debating specs and writing hundreds of pages of docs, the AllSeen Alliance members instead focus on what contributions of code they want to make to advance the protocol. Companies who have ideas for new service frameworks or new





interfaces simply propose those and the output of our Alliance is actual implementation (not just specs). This enables us to run at a faster speed to the ever evolving IoE.

What are the major challenges?

Philip DesAutels: Interoperability is among all the "things" that make up the Internet of Everything ecosystem. Right now, the industry is facing a major challenge to achieving interoperability: duplication of effort and technology. The issues impeding interoperability are largely due to proprietary business models. There have been attempts at better interoperability among devices in homes, but the execution has been limited because only the individual vendor's devices communicate with each other. That may be fine for vendors' smart phones, tablets and TVs, but how do you bring in other things such as refrigerators, coffee pots or home security systems? The AllSeen Alliance is the first real, large-scale attempt for companies to develop a truly interoperable solution via the open source software model.

The EnOcean Alliance is an AllSeen Alliance member for some months now. What is the partnership about?

Graham Martin: The cooperation of AllSeen Alliance and EnOcean Alliance aims to connect the EnOcean standard with the open AllJoyn framework. This framework brings together all needed communication standards and levels in an IoE: energy harvesting wireless sensors to collect the needed data, control units to process the information, a supervisory system for intelligent networking and the app for a user-friendly handling. The fundamental technologies for an Internet of Everything already exist today. It's the collaboration of all involved players, technologies and standards under the umbrella of the AllSeen Alliance to realize a seamless communication.

What role does wireless building automation play in an IoE?

Graham Martin: Building automation is a role model for the IoE. In building automation systems, it is very common that different standards communicate with each other to offer the most suitable solution. Here, a deep connection of standards and interoperable devices from different vendors already enable intelligent, self-learning automated systems. That's why smart buildings can be seen as integral part of the IoE.

Why is it so important to connect different standards?

Graham Martin: For the IoE framework it is inevitable that technology standards work together. Obviously, no single standard alone can cover all the thousands of different applications we see today and in the future. A battery-less sensor offers the needed flexibility to collect data but it cannot communicate via energy-hungry protocols like WiFi. However, it doesn't need to. It can transmit telegrams using the ultra-low power EnOcean standard and gets access to IPv6, for example, via gateways.

Philip DesAutels: As an industry, we need to drive more interoperability and less fragmentation. The technology industry today – from the consumer electronics market to the enterprise – needs a shared framework that allows devices and systems to connect with each other regardless of manufacturer or OS. An open source software framework like AllJoyn promises to do just this. Once realized, consumers and businesses alike will have a simple, seamless experience in connecting and interacting with devices, systems and services regardless of brand or manufacturer.

https://allseenalliance.org
www.enocean-alliance.org

The SAUTER ecoUnit 1 room operating units communicate with the SAUTER ecos5 room automation stations wirelessly using the EnOcean protocol.

Affordable individual solutions for premium commercial property

Even in the fashionable Zurich banking district, cost efficiency counts. When modern technology remains affordable and can still smoothly replace the tried-and-tested, even the most demanding tenants are impressed.

By Werner Schraner, Regional Manager Zurich, SAUTER Schweiz, Sauter Building Control Schweiz AG

Just a few steps away from Zurich's renowned Bahnhofstrasse, one of the most expensive streets in the world, stands the prestigious "Thalhof" commercial property. Comprising several buildings, the property provides shop and office space to a large number of companies. In carrying out comprehensive modernization work on the property, SAUTER has recently brought the building technology up to the latest standards.

The goal was to install modern technology that would meet the requirements of the next two decades. The solution also had to fulfill specific needs and enable demand-led room conditioning in the individual areas. The SAUTER EY-modulo 5 family of systems with its components based on BACnet/IP proved to be ideal.

From cable to wireless

The building has heat generation with integrated control and a chiller for cooling. A system supplies conditioned air to the office floors. To activate the air-conditioning technology, the existing cabinets were upgraded with the latest components from the SAUTER BACnet EY-modulo 5 family of systems.

The individual rooms and open-plan areas are conditioned by means of radiators and chilled ceilings. The temperature, humidity and occupancy values are recorded and controlled by the SAUTER ecos5 room automation station, which is integrated via BACnet/IP.

At the tenant's request, the existing individual rooms on one floor were converted into

The use of EnOcean wireless technology provides demand-led, individual controlling in the open-plan offices, regardless of the current room division.

open-plan offices. Because the interior walls were removed, many of the previous installation areas for sensors were no longer available. The use of EnOcean wireless technology provides needs-driven, individual controlling.

The ecoUnit 1 room operating units communicate with the ecos5 BACnet room automation stations wirelessly using the EnOcean protocol. Bi-directional communication ensures that the room automation station always knows the current values in the room and can compare them with the desired setpoints. All automation stations – both for energy generation and usage in the room – are part of the SAUTER EY-modulo 5 family of systems and all communicate via BACnet/IP.

Automatic notification and remote access

All the HVAC installations and intelligent unitary controls – 675 hardware data points in total – are combined with SAUTER moduWeb Vision to create a central system on the BACnet web server. This web-based visualization software enables the building management systems to be monitored and controlled remotely without connecting to a system. Any alarms that occur are forwarded reliably via e-mail. Remote access to the system is via GSM modem, and the integrated firewall provides maximum security.

The modernization work was carried out over a period of five months while the building was still being operated. Today, the owners and tenants can rely on a flexible system at all levels that can be dovetailed to various requirement profiles. Using modern components from SAUTER EYmodulo 5 systems and established communication standards, such as BACnet/IP or EnOcean, ensures that operation is reliable and resource-efficient in the long term.

www.sauter-controls.com

Every morning and evening, guests of the Mandarin Oriental Hotel in Macau enjoy a spectacular color and light show over the bay of this southern Chinese metropolis. The lights and curtains in the stylish rooms are controlled by an automation system from Eltako. Self-powered wireless technology brings energy efficiency and comfort into perfect harmony.

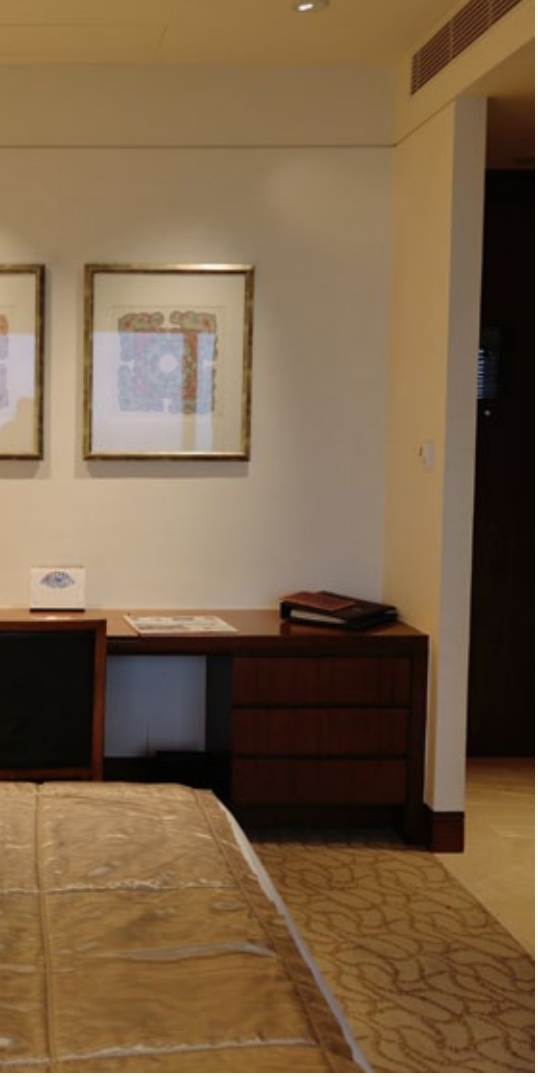
By Bettina Goss, Export Sales Manager, Eltako GmbH

Five-star luxury hotel cuts energy by 80 percent

With its unique waterfront location and luxurious furnishings, the five-star Mandarin Oriental Hotel provides visitors to Macau with a very special experience during their stay. The room design reflects the city's fascinating ambiance, with its famous shopping district, vibrant night life and modern lifestyle, and offers an exciting mix of style and comfort.

The best of everything

For guests of the Mandarin Oriental, the perfect stay also includes cutting-edge technology that meets the highest standards of pleasant atmosphere and the sustainable use of resources. The same applies to building automation. When it came to modernizing its light and curtain control system, the hotel therefore wanted a solution that would fit perfectly with the design and atmospheric



room lighting while simultaneously making efficient use of energy.

Flexibility and experience

Another challenge was to find a technology that could be seamlessly integrated into the existing INCOM system. Moreover, the modernization work was not to negatively affect guest comfort in any way.

The Mandarin Oriental chose a solution from Eltako, which was able to meet all of the five-star hotel's requirements, thanks to self-powered wireless technology and a modern product design. TELCS Ltd, Theuer Eurolighting Consultancy, planned and supervised the project. The local Eltako partner won over the customer with its many years of project experience, extensive specialized knowledge and flexibility in meeting the requirements.

Comfort by pressing a button

1,900 switches and 3,400 actuators in the Eltako 14 series were deployed in a total of 213 rooms and suites, including the Presidential Suite. The switches work without cables or batteries, thanks to the EnOcean technology. The energy needed for the wireless signal is generated simply by pressing a button. As a result, the switches could be placed flexibly in the desired locations and on all surfaces. They are also maintenance-free and operate reliably without interruption, eliminating the possibility of outages. In addition, the hotel staff does not need to disturb the guests by changing batteries. Guests will find the switch's function engraved on its surface.

Perfect communication

The actuators receive the information from the wireless switches and control the lights and shades in the room without delay. The INCOM signal is tapped in the distribution panel and converted to scenes for controlling the lights and curtains. Conventional switches are linked in the wireless installation with the FTS14 remote sensing system.

By using self-powered wireless technology, TELCS was able to reduce the amount of cabling required in the rooms and thus minimize construction noise and dirt. Time was also a major advantage of the system. The entire implementation in all rooms took just four months.

Optimum level of automation

The modern automation system now opens and closes the curtains automatically, depending on the time of day and as soon as a guest enters or leaves the room. During the day, the light-weight curtains remain closed and create a pleasant lighting atmosphere in the room, while simultaneously providing privacy. At sundown, all curtains open as though by magic when someone enters the room and provide a view of the magnificent sea of lights over the bay of Macau.

Not only do these settings create an agreeable ambiance, they also maintain the room temperature at a constant, comfortable and energy-efficient level. The lights furthermore automatically generate cozy lighting scenes to welcome the guest. All lights turn off when the room is not being used, thereby saving additional energy.

Guests can operate the curtains and the lights individually with separate bedside switches or turn the lamps on and off in all rooms, including the bathroom (FSR14). They can also use the same switches to dim the lights as needed (FUD14).

Successful effects

The hotel operators were thrilled with the results delivered by the new automation system. The lighting scenes fully support the guests' sense of well-being and allow them to conveniently control all functions in the room without getting out of bed. The Eltako solution even surpassed the expected energy savings by using 80% less power than the previous system.

The project's success is persuasive: TELCS will soon install Eltako wireless technology in another Mandarin Oriental Hotel in Hong Kong.

www.eltako.com
www.telcs-design.com

FAM14
Wireless antenna module

FSR14-4x
4-channel impulse switch with integrated relay function

FUD14
Universal dimmer switch

FT55-al
Wireless pushbutton

When talking about increasing of energy efficiency in buildings and improving indoor climate, systematic data processing is of paramount importance. climaView displays all relevant measuring values – from temperature and brightness to CO_2 – through one system.

Siegfried Gaida, Managing Director of Thermokon GmbH/Austria, and Frank Neudecker, CTO of Thermokon Sensortechnik GmbH, explained the details in conversation.

climaView – smart solution for monitoring energy and climate

Mr. Gaida, Mr. Neudecker what is the approach of climaView?

Siegfried Gaida: By means of our wireless EasySens sensors we took several measurements in schools. Instead of various individual values, we were eager to offer a comfortable overall summary to our customers. As a web based solution, climaView enables a compact display and analysis of the different components and building technology data on a PC. This data was previously detected via our EasySens transmitters and receivers.

Frank Neudecker: To comprehensively monitor the indoor climate, the advantages of this kind of compact data processing system are not to be sneezed at. Especially in big buildings people very often complain about the climate being "too warm, too cold, too dry". climaview provides objective data and summarizes it clearly. This forms the basis for sound monitoring of energy efficiency according to DIN 50001.

Siegfried Gaida: Nontheless, climaView is much more than an instrument for monitoring energy efficiency. People spend almost 90% of their life in buildings. Therefore, it is very important to create a convenient indoor climate, focusing on the well-being and health of people. For example, a workplace with 800 lux meets the common requirements, but in fact people require an increased level of brightness to feel well and work efficiently.

What are the main features of climaView?

Frank Neudecker: climaView works holistically. It provides several data in one single system, makes contexts recognizable and leads to convincing results. For example climaView shows whether a drop in temperature in a room has a technical cause or if a window was opened.

During development, we focused on the best possible simplicity and effectiveness: As the climaView wireless solution can be installed

within a very short time. Thanks to the wireless connection, an optimum location of the sensors is no problem at all – even on glass surfaces or in the middle of the room, where more reliable data of the indoor room temperature can be received than at the entrance door.

Moreover, it is possible to carry out remote commissioning via airConfig – our software adapted for our EasySens product line. Various parameters of every device can be comfortably configured on the PC and wirelessly transmitted to the receiver, including transmitting the same configuration to several receivers, which saves time and reduces possible sources of error.

Who is the target group for climaView?

Frank Neudecker: climaView is an ideal solution for energy consultants, building operators and planners as well as real property owners and facility managers. climaView does not only enable valuable information for the analysis of single buildings but also allows a direct comparison of different properties. Bigger companies might thus identify the reasons why location A is more energy-efficient than location B.

Siegfried Gaida: We do not want to limit climaView to this target group. People are more conscious of their health. They would like to know what kind of environment they live in and how to increase their well-being. Therefore, climaView might also be an interesting solution for owner-occupied houses and flats.

Are there any initial plans for a real-life test of climaView?

Siegfried Gaida: Absolutely, for example, an Austrian textile chain plans to investigate howf the climatic conditions in their shops influence the buying patterns of their clients. No one wants to stay in a place where the air is bad, and it's no fun to try on clothes if the changing rooms are too hot.

Have you thought about extending the climaView range of features?

Siegfried Gaida: Indeed, we are already working on adding new features. Topics such as fine dust and noise are important subjects for the future and make it difficult to open windows in large cities with high traffic volumes. for such applications, we are discussing, internally as well as with potential users, the development of new sensors that would be worthwhile additions to the climaview concept. for example, one of our clients came up with the idea of launching a project that would deal with noise protection.

www.thermokon.com

Top performance perfected

In offering the wireless SmartDrive MX radiator thermostat, HORA is setting new standards in heat regulation functionality and design. Clear lines and a large display make the unit attractive for any home environment. Its plug & play capability allows it to be started up at the press of a button. It is the only thermostat on the market that supplies information on the inlet temperature and the exact valve lift position, thereby building an intelligent bridge to efficient system regulation.

By Ulrike Krüger, Key Account Manager, HORA Holter Regelarmaturen GmbH & Co. KG

The SmartDrive MX draws the eye right from the first glance with an attractive, streamlined housing of a modern design, which adds visual appeal to any classic radiator. The thermostat's design is thus reason enough to switch to an energy-efficient heating control system. It can replace conventional controllers in just a few steps, thanks to its wireless operation. The large display also makes it easy to read the set target temperature, which can be increased and decreased at any time either with a smart phone app or manually by following the customary steps for a classic valve. If multiple radiators are installed in a room, all drives automatically adjust to the new, desired temperature.

Quiet as a mouse

The SmartDrive MX appeals to more senses than just the eye. Actuating the valve produces a steady, low noise that does not exceed 30 decibels. This volume is no louder than a whisper and much quieter than the usual sounds that occur in a home, such as the rumbling of a refrigerator (50 decibels). It therefore does not disturb the peace in sensitive areas of the home, such as the children's and adults' bedrooms.

In addition to the visual, haptic and acoustic features, the thermostat will also win over users and installers with its impressive inner qualities. Indeed, the device is a true powerhouse inside an attractive package.

Two steps is all it takes

At the press of a button, the SmartDrive MX adapts to any commercial valve and precisely detects the particular lift travel. Transmitting the precise lift values, combined with the inlet and outlet temperature, are fundamental items of information for meaningful energy monitoring.

The SmartDrive MX communicates over EnOcean's reliable, energy-efficient wireless technology. By pressing a button on the device a second time, the installer sends the training telegram containing the EnOcean equipment profile to a home server or gateway a single time. The server or gateway immediately detects the SmartDrive MX and begins to exchange data in both directions. This simple training process is always the same, regardless of the number of radiators. As a result, intelligent heat regulators can be installed by plug & play even in large buildings.

Installers can also add other self-powered devices to the network, such as window contacts, using EnOcean wireless technology. However, the room temperature sensor is already integrated into the SmartDrive MX, so that there is no need for an additional external sensor or a room control unit in each room.

HORA has built a reliable network of partners around the SmartDrive MX, allowing planners and installers to choose from a wide range of gateways and highly intelligent home servers that are the right fit for their particular project.

Smart effects

The inlet temperature sensor integrated into the SmartDrive MX adds even more benefits. An optimum inlet temperature adjustment can be calculated on the basis of the room temperature, the exact lift detection and the system inlet temperature.

Today's systems in Central Europe are controlled by outdoor temperature (-10 °C / -12 °C). In Germany, these conditions are only valid 6% of the year. The combination of inlet and room temperature sensing as well as the feedback signal of the heating valve's exact position enable a demand-based inlet temperature adjustment throughout the year. Thus, the heating valves can be set to a maximum lift in order to optimize the hydraulic efficiency.

With this function, the only one of its kind on the market, the SmartDrive MX supplies important data for an efficient heating strategy and thereby generates far higher energy efficiency effects than does a classic individual room controller.

Smart access

Intelligent networking also allows users to access data and time profiles for the heat regulator with an app that runs on a smart phone or laptop. Preset programs can be activated, for example a program for reducing the room temperature when no one is home. Thanks to the EnOcean wireless technology, this functionality can also be implemented with a self-powered central switch located near the front door. When the home's occupant presses the switch, the actuators control the radiators according to the preset target value.

Energy harvesting outlook

The SmartDrive MX still uses commercial lithium batteries, which give it an extraordinarily long operating time of approximately four years. Three weeks before the power runs low, the app lets the user know that it's time to change the batteries. HORA plans to present an energy harvesting version already next year. With this development, it will no longer be necessary to change the batteries, making the device even more convenient when it comes to saving energy intelligently.

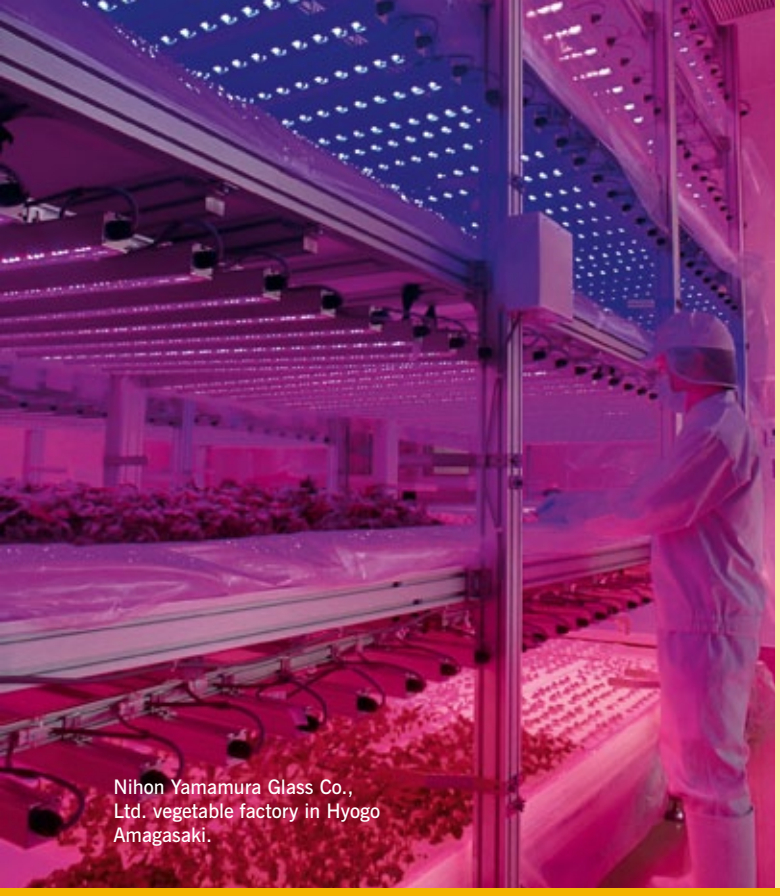
www.hora.de/en

LED controls let plants grow

EnOcean transmitter module (TCM 410J) implemented inside the LED strips. Microcomputer with dimming control signal output function by Lapis Semiconductor (lower right).

Rohm's EnOcean-based solution was integrated into the wireless control system of Ushio Lighting's LED strips, which were applied in vegetable factories solely operating with artificial light. About 10,000 LED strips were already put into operation in the factory.

By Koji Taniuchi, Group General Manager Research and Development Headquarters, Rohm Semiconductors



Nihon Yamamura Glass Co., Ltd. vegetable factory in Hyogo Amagasaki.

This system's benefits at a glance

1. Easy dimming and timing with wireless communication
2. Reduction of an initial construction costs by easy and reduced wiring
3. PC-based changes to layout or control patterns independent of the luminaires
4. Integrated repeater functionality of the luminaires for the wireless communication (currently applying for a patent)

In recent years, vegetable factories have gotten lots of attention due to their stable crop yield and the possibility of avoiding agrochemicals. Until now, in most vegetable factories, the control of dimming functions or the scheduled on/off switching of the LED strips was either not supported or is realized by line-powered applications.

Limits of wires

There are many different plants, which do not all grow under the same light conditions. However, the flexible adaption of the available line-powered control systems would have been too complicated due to the need for many cables. Furthermore, the precise setting and control of the lights, depending on the vegetables' growth stage, costs lots of time and money.

Demand for wireless solution

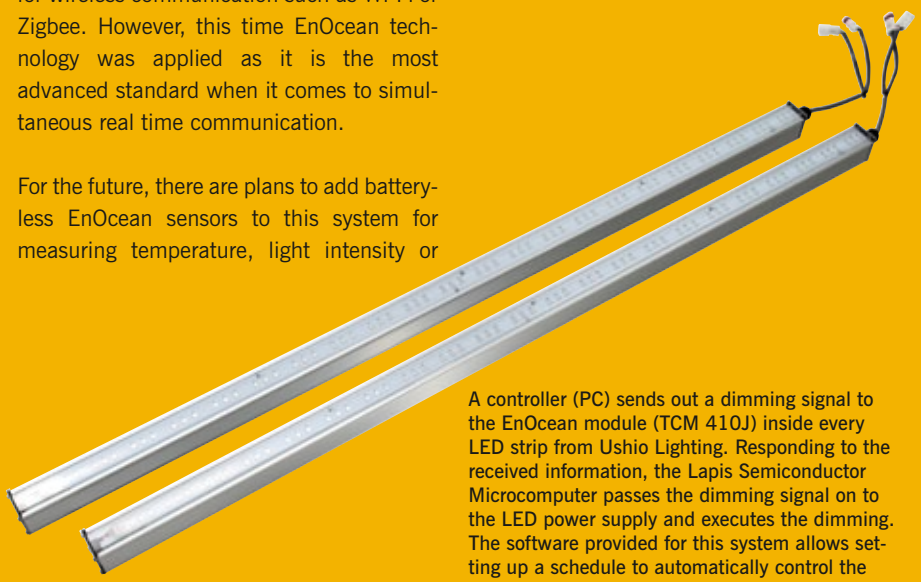
Therefore, the market strongly demanded a wireless system to control dimming and timing functions of LED lights. Ushio Lighting responded to this market demand by combining their know-how in LED radiation, the implementation of LED components and optical planning with EnOcean wireless technology provided by Rohm. The result is a wireless control system for LED vegetable grow lights, which is already available on the market.

Control in real time

In vegetable factories, over 10,000 LED strips need to be controlled simultaneously and in real time. There are many standards for wireless communication such as Wi-Fi or Zigbee. However, this time EnOcean technology was applied as it is the most advanced standard when it comes to simultaneous real time communication.

For the future, there are plans to add batteryless EnOcean sensors to this system for measuring temperature, light intensity or concentration of CO_2, for example, for added value to the whole vegetable grow system. Currently, the wireless control system for LED grow lights is being further developed for other frequencies covering countries like China, the US and Europe.

www.rohm.com
www.ushiolighting.co.jp/en



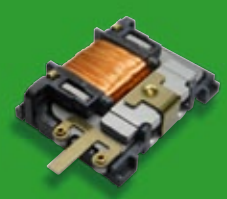
A controller (PC) sends out a dimming signal to the EnOcean module (TCM 410J) inside every LED strip from Ushio Lighting. Responding to the received information, the Lapis Semiconductor Microcomputer passes the dimming signal on to the LED power supply and executes the dimming. The software provided for this system allows setting up a schedule to automatically control the LED dimming.

EnOcean Energy Harvesting, KNX and data security

The smart home, and thus the building systems engineering of the future, would be inconceivable without wireless technology that offers secure data transmission. Suitable KNX/EnOcean gateways can help by allowing installers to seamlessly integrate data-secure and simultaneously self-powered wireless sensors into a KNX system. The result is an integrated system composed of powerful building systems with secure wireless communication.

By Armin Anders, Vice President Business Development, EnOcean GmbH

The KNX bus standard controls heating, lighting, blinds, ventilation and security systems across disciplines and according to demand. A future-oriented control concept also requires a large number of sensors that detect building states and measured values. "Energy harvesting" is therefore an ideal addition to building systems engineering. The wireless sensors are thus completely maintenance-free and their placement is flexible. At the same time, the wireless communication is encrypted. As a result, they meet even today's secure data transmission requirements in smart homes.



The kinetic ECO 200 energy generator enables wireless switches with secure data communication.

Data security – high requirements

Unwanted data collection and system manipulation are challenges that need to be taken seriously, especially in the critical smart home mass market.

Therefore, both transmission security and data security play a key role in wireless communication. A radio frequency that has high channel availability guarantees transmission security. The EnOcean wireless technology uses license-free frequency bands sub 1 GHz for this purpose. Multiple telegram transmissions establish redundancy, either by sending telegrams multiple times as a precaution (with unidirectional transmission) or by using energy-efficient "Smart Acknowledge" processes, depending on success. A one-time identification number of the wireless transmitter (32-bit ID), which cannot be changed or copied, also prevents duplicates.

Self-powered wireless technology also makes data more secure with "enhanced security." This approach adds rolling code and AES 128 encryption to the established radio protocol. A 24-bit rolling code (RC), which is incremented with each telegram, is used as a basis for calculating a 32-bit cipher-based message authentication code (CMAC). The CMAC uses the 128-bit AES encryption algorithm. The sender encrypts the data packets by enciphering the data with a 128-bit AES algorithm.

Energy harvesting and data security – accustomed haptics and range of an EnOcean wireless switch

A high data rate is important for secure data transmission, since more data has to be transmitted than with a protocol that provides only transmission security. Since EnOcean's 124 kbit/s wireless technology also significantly optimizes the telegram overhead, the EnOcean switch telegram only needs 1.2 ms for transmission, including encryption and rolling code (CMAC).

The energy demand of the transmitting electronics is a minimal 120 µJ. The actuation energy at the converter is thus typically approximately 1.25 mJ. When the button is operated, the actuating force rises to approximately 8 N over a distance of around 2 mm, typical for the haptics of building switches. The actuating haptics of an EnOcean wireless switch, including data encryption and full transmitter range, is thus within the customary range of an established light switch.

The efficiency of an electrodynamic energy converter cannot be increased very much within this energy range. Nor can the mechanical idiosyncrasy of the "switch" system be significantly changed. Telegrams that are longer than 1.2 ms, such as those used in EnOcean wireless technology, inevitably result in higher forces or longer actuating paths. A wireless telegram that has, for example, a much lower data rate, would have to overcome physical limits for an energy harvesting switch.

Gateway – the link between the KNX bus and data-secure energy harvesting wireless systems

A wide range of switches, sensors and actuators that support encrypted EnOcean wireless technology have been available since early 2015. Corresponding wall switches, remote controls, window contacts and actuators can be purchased wholesale. In addition, several providers plan to expand their KNX EnOcean gateways with encrypted wireless communication.

Along with security, downward compatibility is also important. Both the new EnOcean wireless transmitters and the new wireless receivers are designed to optionally send and receive the previous transmission-secure radio telegrams as well as the new telegrams with additional data security. A KNX gateway that decodes encrypted telegrams can also continue to process standard telegrams.

www.enocean.com

Zooming in

on the smart home

Is it the fun factor what customers are looking for in a smart home? That's all in the past. Smart home systems have long since had to offer functions that do a lot more than just entertain. Security and heath are high on the list of customer benefits. The solutions have to be reliable, easy to use and competitively priced. Secure data transmission is also a matter of course. BSC Computer has now integrated EnOcean wireless technology into an IP camera. The first real smart home camera forms the ideal basis for offering all desired properties of a networked home in a single package. By Jörg Hofmann, Managing Director, BSC Computer GmbH

The smart home camera connects all basis components of an intelligent control – without a separate box.

In its basic version, a smart home system needs to have only a few components: a smart phone, multiple window/door contacts, a camera with an integrated motion sensor and a suitable app. These components alone give the user on-demand control over the home even when he/she is out of the house.

Up to now, a gateway has established the smart connection between the phone app and the sensors. But not every new smart home customer wants to install a separate box in the house, due to the costs involved.

The camera acts as a universal interface

BSC has therefore integrated the encryptable, EnOcean energy harvesting wireless technology into an IP camera. The network-enabled camera allows the residents to monitor their home when they are out of the house. At the same time, the camera handles communication between the existing Internet connection and the sensors and actuators, which use the extremely energy-efficient EnOcean wireless technology.

The user gains access to all these functions directly through the smart home camera –

without having to install any additional hardware. The integrated solution therefore establishes a direct link between EnOcean and the Internet of Things.

In doing so, it meets all customer requirements for a smart home solution:

Easy startup
All components communicate by radio and are trained in the application using a QR code and the smart phone app.

Reliability
The self-powered EnOcean switches and sensors can be placed anywhere in the house. Once installed, they require no maintenance.

User-friendliness
Users can run all functions from the individual components or a smart phone. Instead of installing a gateway, they only have to connect the camera and the existing Internet.

Attractive price
First-time smart home users receive all basic functions in a single package. The communication system integrated into the camera eliminates the need for an additional gateway, which saves money.

Data security
The encrypted data is transmitted from the EnOcean wireless system to the app over the Internet connection along the entire communication path.

Flexibility
If needed, the user can add more sensors and actuators, such as a water detector, to the system at any time. A smart home server can also be installed if the user would like to build a more complex system with a wider range of functions, such as access authorization or the ability to evaluate consumption data.

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www.bscgmbh.de

Interoperability – foundation for successful products

It is one of the EnOcean Alliance's missions to secure the interoperability of devices based on EnOcean technology – enabling cross-vendor building management systems at a safe investment. The foundation for this key property of a device is laid during its design-phase. The certification specifications of the EnOcean Alliance provide guidance and assistance to the product development team to secure a product's characteristics.

By Norbert Metzner, Chairman Technical Working Group, EnOcean Alliance, and Head of R&D, Viessmann Hausautomation GmbH, and Thomas Rieder, CEO, ViCOS GmbH

Interoperability, as defined, will result in fluent communication between EnOcean-based devices made by different manufacturers over a certain distance and thus enable implementation of distributed functionality – provided that the existing system specifications are consistently applied at all levels.

In technical wording, interoperability requires products to be made in compliance with existing specifications and to perform in a repeatable manner at all layers:

- **Physical layer:** compliance of the air interface with the EnOcean standard ISO/IEC 14543-3-1X and a defined minimum transmission range
- **Communication layer:** scheduling and logical compliance with communication flows
- **Application layer:** correct coding/decoding of communication content, compliance with defined schedules and conformal processing of transmitted data
- **In addition for self-powered devices:** the ability to collect energy from the ambient environment over a certain timeframe to secure proper operation of the device over a defined period beyond this timeframe

EnOcean certification program

System planers, system integrators and customers demand reliable devices and procedures, which facilitate the implementation of versatile solutions with an increasing offer of use cases of EnOcean technology. The EnOcean Certification Program – linked with a corresponding marking on devices – is THE tool for the EnOcean Alliance to secure interoperability of EnOcean-based devices without major additional effort. The EnOcean Alliance's Technical Working Group (TWG) develops all components of the Certification Program till the end of the year 2015. The objective is a self-declaration of the device manufacturer, similar to the European CE declaration. In addition, a supplementary verification by an independent and accredited test laboratory is part of the program.

Step by step towards the goal

An EnOcean self-certification requires several steps to be performed by the manufacturer of the device, which can be done without significant additional effort as part of the already required product development verification (see graphic). Applied already during the design-phase of a product, the certification specifications will support the achievement of the design goals. Supporting a device's development process, the test cases relevant to the certification will be defined at each step of the process and device-related documents will be compiled. Especially, all information relevant to interoperability is to be reflected in the public device documentation; that way, this will become an integral part of the certification. The correct and consistent use of the test specifications ensures that all devices will undergo an identical test process, and the test coverage as well as the test results will be comparable and reproducible independently of the individual device manufacturer.

Verification of the air interface

A first major step towards the EnOcean Certification was achieved by the release of the "Radio Performance" specification in August 2013. This specification is applied already by quality-focused device manufacturers. By this, non-sensitive radio receivers and low-range transmitters are things of the past; and those manufacturers ensure a sufficient transmission range supporting interoperability.

These days, the TWG defines the specification for the certification of the air interface, based on the EnOcean standards ISO/IEC 14543-3-1X with the aim of releasing it by the end of 2015. In combination with the "Radio Performance Certification Specification" this will ensure that radio implementations of different manufacturers will communicate reliably with each other.

Reference data for communication profiles

A parallel effort of the TWG is the development of the specification for the certification of the "Communication Profiles". This comprehensive specification will provide procedures and reference data to verify the implementation of the communication protocol chosen – EEP or Generic Profiles. It will be based on the system specifications available by the EnOcean Alliance – the *EEP specification* (current version 2.6.3), the specification of *Generic Profiles* and *Remote Commissioning*. By means of defined data containers, the test result will be documented and reproducibility of test cases will be achieved.

Reliable end-to-end performance

The proof of performance according to the specification of a particular device remains the responsibility of the manufacturer. The result of this proof is a mandatory component of the EnOcean Certification to deliver a reliable end-to-end performance of functionality to operators and customers. At this level, self-powered devices will be supplemented by a validation of the energy concept. Only by this, the performance of a device over a defined period of time can be adequately ensured with energy collected from the ambient surroundings.

Handbook as guideline

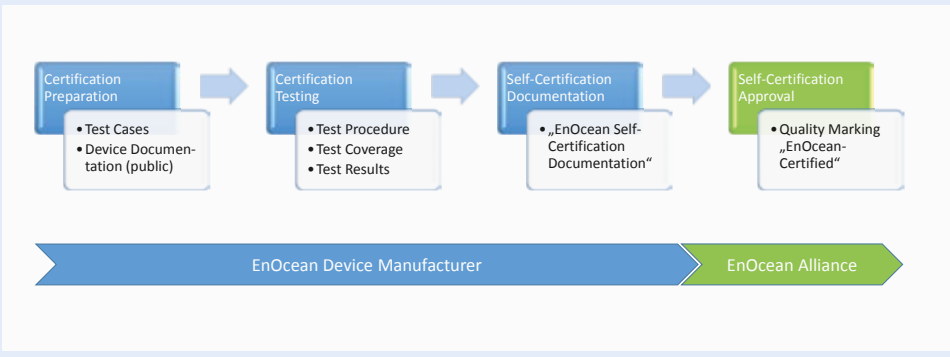
The "EnOcean Certification Handbook" (available early 2016) will be a kind of a bracket for the entire process and will secure a smooth execution of the certification process. On the one hand, it will support the unification and by this traceability of the certification's documentation. On the other hand, it will be a guideline for the product development process.

Long-lasting high quality

The certification specifications existing so far can already be applied today. The TWG revises and updates these specifications continuously and thus incorporates the latest insights resulting from development activities of members of the EnOcean Alliance and latest requirements by the markets. Thus, the EnOcean Alliance substantiates and progresses step by step its promise of interoperability and secures the high level of quality of EnOcean-based products.

The Technical Working Group welcomes all members of the EnOcean Alliance to contribute their expertise to the definition and completion of the certification process.

www.enocean-alliance.org



Easy retrofits

The Hotel Blesius Garten uses thermostatic radiator valves from Micropelt to lower its heating costs. The energy-efficient solution works with EnOcean wireless technology and is especially suitable for existing buildings. By Denis Bittner, Application Engineer, Technical Support, Micropelt GmbH

Historic buildings add atmosphere to our cities. However, old buildings also consume a great deal of heating energy – approximately 200 KWh per m^2 according to Fraunhofer Allianz Bau. This is a key factor when it comes to making operating costs economical.

Historic ambiance consumes too much energy

The Hotel Blesius Garten was also facing these challenges. The family-run, 4-star hotel is located in Trier, Germany, near the Imperial Baths. The hotel's 60 rooms and restaurant are housed in a historic building that preserves a sense of stylish elegance. However, the older structure was less energy-efficient, especially when it came to heating.

With decorative wooden grates covering the radiator nooks, guests and staff could not access the hand wheels and thermostat knobs. As a result, the room temperature could be adjusted only via the inlet temperature and a simple time profile for lowering the heat at night. All rooms were warm while the heat was on, even if they were not occupied.

Immediate impact in 20 rooms

In early December 2014, the hotel therefore installed an individual room control system and equipped 20 rooms on the first floor with Micropelt thermostatic valves. The building automation system with self-powered, wireless thermostatic radiator valves from Micropelt is an easily upgradable, energy-efficient solution for existing buildings. The individual room control system can cut heating costs by as much as 30%, depending on the extent to which the building has been renovated. This type of building control system requires little investment. It can be installed in just a few hours without any construction work.

Ready for operation in fewer than 8 hours

The Hotel Blesius Garten continued to operate throughout the installation work. It took just 2.5 hours to mount and train the 20 thermostatic valves and 5 hours to program the KNX system for central control.

Comfortable heating according to the guest's needs

The radiators are now turned off when a room is unoccupied. The reception staff turns on the radiator in the room via the central control shortly before the guest is expected to arrive in order to reach the target temperature of 20 °C. The control system's savings potential became quickly apparent.

Individual heating without maintenance

Every radiator in 20 rooms can now be controlled individually with a room controller and the Micropelt thermostatic valves. The temperature can be adjusted flexibly, depending on whether the room is occupied and according to the guest's heating needs. Since the Micropelt thermostatic valves use energy harvesting, there is no need to change batteries, which would be made particularly difficult by the radiator cladding.

Saving heating costs throughout the hotel

Klaus Tonkaboni, the managing director of the Hotel Blesius Garten, was so pleased with the benefits of the individual control system with Micropelt thermostatic valves that the installation will now be extended to the rest of the hotel. "We were skeptical at first, but our concerns quickly evaporated. We can save a lot of money once everything is finished," is his assessment.

www.micropelt.com/itrv.php
http://elektro-bloeck.de

At a glance

Benefits of the individual room control system with Micropelt thermostatic valves

- ➔ Can be installed quickly, a single morning is all it takes
- ➔ No construction work needed (wireless operation); hotel operations can continue without restrictions
- ➔ Compatible with a wide range of room control systems, due to the EnOcean protocol
- ➔ Building automation system with radiator control is easy to install; creates a new business field for many electricians
- ➔ Low investment; pays for itself quickly; immediately lowers heating costs for hotel operators

Large photo: Hotel Blesius Garten. Elektro Bloeck from Trier, with Mark Dort as the project manager, planned and installed the hotel's building automation system.

Left: The radiator nook in a hotel room with a Micropelt thermostatic radiator valve.

Right: A facade that matches the decor conceals both the radiator and the thermostatic valve, which now automatically controls the radiator according to the guest's individual needs and based on room occupancy.

Data center under climate control

Wireless Thermokon sensors monitor temperature and humidity for optimized climate control.

Thermokon's EasySens-based sensors and receivers are securely controlling and monitoring temperature and humidity for Infomart data center project located in Dallas, Texas (USA); successfully installed by LSI Controls.

By David Alliband, Sales Manager, Thermokon Americas

Infomart is one of the largest and distinctive buildings in Dallas, Texas. It was the world's first and only information processing marketing center. It is home to more than 110 technology and telecommunication companies and leading providers of IT infrastructure solutions using areas with various data processing centers, having latest USV plants as well as a powerful energy-efficient cooling system. A constant temperature and the control of humidity are of paramount importance for optimum functioning.

Easy set-up step by step

To meet these demands as simply as possible, Infomart decided to use EnOcean-based RF technology. To monitor temperature and humidity, the system integrator in charge of the project, Logical Solutions Inc. from Richardson, Texas, installed battery-less and wireless Thermokon EasySens RF transmitters and receivers:

- → SR65-TF25 Wireless Cable Temperature Sensor
- → SR04 rh Wireless Combined Humidity and Temperature Sensor
- → Wireless Receiver SR65-BACnet

Step by step since autumn 2014, the data processing centers of Infomart were equipped with wireless sensors and gateways.

Energy-efficiency and secure transmission

The energy required for the transmission of a telegram is generated from the ambient light levels by energy harvesting technology. As a result, there is no need for time-consuming wiring or tiresome battery changes. It is also possible to adjust the transmission times of the radio telegrams according to individual needs. The sensors are securely monitoring large areas in the data processing centers with minimal transmission power. The values are transmitted to the control system via the BACnet receivers.

Direct mounting

The RF EasySens sensor system from Thermokon won over with a simple, fast and wireless installation to any monitoring point, with high flexibility of the sensor/receiver mounting locations and with low maintenance costs. The project's most labor-intensive piece was to fix the magnets on the back of the interoperable and wireless sensors for mounting purposes. For the end-user it is now extremely simple to relocate the sensors or to optimize the mounting positions.

Thanks to battery-less, wireless technology, Infomart could easily meet individual customer demands.

High flexibility

Jeff Wistl of Logical Solutions from Texas was very enthusiastic: "All in all, this is a great system meeting the most different demands. Everything is working great. The RF system convinced us and the customer to use due to the flexibility of the EasySens devices with changing room layouts as well as significant cost savings thanks to a wireless installation."

www.thermokon.com

Wireless control for high-end London property

With **cns**-enocean™, the wireless energy harvesting device network solution for Niagara, Control Network Solutions (**CNS**) brought extra control to a high-end residential property in the borough of Kensington & Chelsea in London. Imperium Building Systems Limited used this innovative solution to install an EnOcean wireless control system that fully integrates with the existing building systems into a seamless control solution.

By Mike Welch, Managing Director, Control Network Solutions Ltd.


EnOcean wireless temperature and humidity sensor


EnOcean wireless valve actuator


cns-enocean connectivity kit

Imperium Building Systems Limited, a specialist building technology contractor, was tasked with designing and implementing a system to take control of the radiator heating and air conditioning control throughout the property. The new system was also required to link to an existing AV home automation system, all whilst causing minimum disturbance to the building owners and the fabric of the building.

Request for integrated control

Before Imperium upgraded the system, the high-end residential project with twenty rooms across five floors had multiple control solutions: a Niagara system controlling the base HVAC plant, an air conditioning control system and an AV/Home Automation solution with none of them interacting with each other.

The new system was required to link all the elements together so they could communicate as one. The solution also needed to be wireless so it would cause minimal disruption to the homeowner and the building.

Seamless connection

Imperium chose solar-powered EnOcean Wireless Mini Temperature/Humidity Sensors, which accurately sense the temperature and humidity within a room space and report back to the Niagara system with minimal maintenance requirements. Battery-powered Thermokon Wireless Actuators were also installed, which communicate directly with the Niagara system and control the heating system. The **cns**-enocean wireless connectivity kits for Niagara provide seamless Ethernet connection between the EnOcean wireless device network and the Niagara control system.

"Once the **cns**-enocean connectivity kits were adequately positioned, the thermostatic radiator valves on every radiator were replaced with the EnOcean wireless control actuators. The Niagara system was then updated so the room temperature could be accurately controlled. The air conditioning and AV system was also interfaced into the existing Niagara solution at the same time using BACnet, so everything could work in harmony," says Steven Crocombe, Director at Imperium Building Systems Limited.

Savings in cost and energy

Now the property operates as one seamless system. By using a Niagara native wireless solution, an estimated £25,000 has been saved compared to using a traditional wired system. The homeowner has saved on the installation cost as well as reaping the energy and cost savings associated with an integrated control system.

www.control-network-solutions.co.uk
www.imperium.systems

Cutting a considerable amount of CO_2

The Daiwa House multi-tenant distribution center (DLP Sagamihara), which was established in December 2013, is gathering attention as an environmental friendly distribution center, cutting a considerable amount of CO_2 compared to conventional facilities. By Naoto Tanizawa, Smart Building Division, Uchida Yoko Co. Ltd.

The five floor building encompasses an area of 100,000 m^2 and integrates the Daiwa Logistics Energy Management System (D-LEMS), which not only measures the energy consumption for electricity and water supply but also supervises and controls lighting, air-conditioning and ventilation, securing an energy-efficient operation.

Originally, there was no integrated management system interconnecting the whole facility, making an efficient operation very difficult. Therefore, Daiwa House Industry and Uchida Yoko jointly developed the D-LEMS system, based on Uchida Yoko's Network Building Intelligent System, NBIS. Using this system, a building control network, such as LONWORKS, can be seamlessly connected to a TCP/IP network and devices from different manufacturers with different specifications can be connected and controlled in the same network topology all at once.

Managing the facility via tablet

In DLP Sagamihara the facility managers and the tenants get a tablet PC, by which they can monitor and manage all facilities

inside their rented area. Inside the building's warehouse even the shortest distance from one end to the other is 70.5 meters, in certain cases the distance is as long as 249.6 meters. This means that it takes quite an effort for the tenants to walk to the switches installed on the walls. Therefore, all facilities, including lighting or ventilation, can be controlled from anywhere inside the building using a tablet PC connected to the wireless LAN. In addition, there are plans to reduce the building's energy consumption by always switching off lights when not needed, for example.

Integrated management

For ventilation, an air backflow system is set in place, where the air is drawn into an underground pit and cycles from there to the upper floors. This system is connected to the D-LEMS and can therefore also be controlled remotely. The upper floors' temperature is thereby lowered by approximately one to three degrees Celsius in the hot summer months, so that air conditioning becomes more effective and energy-efficient. However, the installation of an additional air-conditioning is optional. The system's flexible design allows the tenant to integrate and control air-conditioning by D-LEMS, even if it is added later on.

Temperature and humidity measurement

In the logistics sector, the traceability of the warehouse environment is highly important, for example regular temperature and humidity are measured to prevent dew formation due to increased humidity. In the past, temperature and humidity were usually measured by wired and analog solutions, which restricted a later expansion or the movement of sensors.

In addition, the points of measurement differ from tenant to tenant depending on the type of product stored in the warehouse and the tenant's overall business conditions. The EnOcean-based sensors were the best solution. They require no wires or batteries and can therefore be flexibly placed without the need for regular battery changes. The number of installed sensors can be adjusted anytime, so that the building management is adapted to the tenants' needs.

Experience an integrated management platform

D-LEMS, which was installed in the DLP Sagamihara, is an integrated monitoring and building control system. In order to control the facility properly, all information, including temperature and humidity values, needs to be measured appropriately and the controlled computers or switches have to be handled flexibly. The EnOcean devices and connected NBIS use open technology and can therefore be implemented easily. Further information on this system and practical examples can be experienced in the Uchida Yoko showroom.

www.uchida.co.jp

The battery-less wireless switches could be mounted at glass walls without disturbing the luxury design.

Next generation lighting control system

Rayos is the Japanese distributor of Helvar with headquarters in Finland, a manufacturer of lighting control systems based on DALI. Rayos uses the 928 MHz frequency band for their EnOcean Helvar products designed for the Japanese market.

By Tomikazu Kitada, CEO of Rayos

The Helvar EnOcean Gateway seamlessly connects the standards DALI and EnOcean.

DALI is the abbreviation for Digital Addressable Lighting Interface. It is an IEC international standard that was created in 1990 in order to enable communication between products of different manufacturers. Rayos combines energy harvesting wireless systems with universal, extendable DALI systems to provide an environmental-friendly lighting control system.

Control system with EnOcean and DALI

By connecting the Helvar EnOcean Gateway to a DALI network, a battery-less switch can control individual luminaires or groups of luminaires with different dimming techniques (DALI, phase-cut, PWM etc.). By adding more modules, users can also operate curtains, realize an audio-visual operation and connect the system to an alarm or ventilation system.

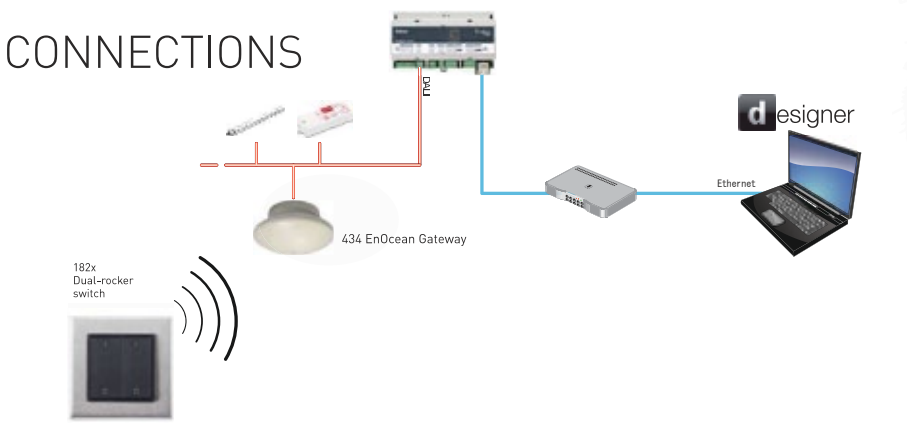
Luxury urban residence

A luxury apartment tower in a large city's cultural district, well known for luxury brand shops, fashionable cafes and hotels and bustling city life, was equipped with EnOcean lighting control.

The project's focus was rather set on creating a luxurious atmosphere similar to that of a hotel room than on residential functions. EnOcean energy harvesting wireless technology was introduced as part of this concept.

Bathroom combining beauty and luxury

A custom made Rayos EnOcean switch was placed on the glass wall of the bathroom, a room that is also considered to be particularly important from a design perspective. Refusing to be bound by conventional concepts, this exceedingly appealing bathroom includes new ideas and techniques, not stopping at lighting control, but also integrating an intelligent fan operation. It can be seen as a first step towards next generation design, including energy harvesting wireless technology.



Main functions of the Helvar EnOcean Gateway

- Up to 20 EnOcean switches can be connected to one gateway
- Various gateways can be connected to one DALI subnet (one subnet can have up to 64 addresses)
- Receiving area within a radius of 30m (depending on the switch cover and barriers)
- 928MHz radio frequency
- Based on the international standard ISO/IEC 14543-3-1X

www.rayos.jp
www.helvar.com

Academic secondary school sets an example in energy efficiency

Bernau is located in the middle-order center of the Barnim district in the German State of Brandenburg, approximately ten kilometers northeast of Berlin. By installing the en:key individual room control system, the Barnim district resolutely implemented the Brandenburg-instituted program known as "Energy Strategy 2020 of the State of Brandenburg."

By Uwe Asbach, Head of Property Management, Kieback&Peter GmbH & Co. KG

The property and school administration of the Barnim district, based in Eberswalde, aims to significantly lower the high heating costs of the Paulus Praetorius Gymnasium, an academic secondary school. By installing the en:key individual room control system, Barnim District is embracing the Brandenburg-instituted program titled "Energy Strategy 2020 of the State of Brandenburg" with the goal of cutting both heating costs and CO_2 emissions.

Individual control for every room

The project's special challenge was to control the supply of heat to the school's 58 classrooms according to use with a single hydraulic heating circuit. It was not possible to reduce the temperature in all rooms uniformly from a central point, since the district adult education center continues to use some of the rooms after school lets out in the afternoon. Against this background, an individual room control system turned out to be the only way to tap the efficiency potential.

Self-learning all the way

The Barnim district chose to install the en:key self-learning and energy harvesting control system. The classrooms are now heated to the desired temperature during use without complex wiring, service interruptions, dust or dirt and without complicated programming. Economy mode is activated when the rooms are unoccupied.

As a result, the district adult education center enjoys the wished-for comfortable temperature in the afternoon and evening, while the rest of the classrooms in the Paulus Praetorius Gymnasium automatically run in economy mode. The district administration thus saves money and helps protect the environment.

www.enkey.de

Benefits:

- Room control on demand, even with a central heating circuit
- Can be upgraded without interfering with school operations
- Savings are felt immediately
- No wires/no battery change thanks to energy harvesting

Wireless savings at attractive design

River Row Condominiums are a collection of four, three-storey residential structures in Chatham, Ontario adjacent to the Thames campus of Saint Clair College. The buildings are thirty years old. Reliable Controls Authorized Dealer, Postma Heating & Cooling, successfully completed a retrofit installation of a monitoring system. By Karina Wright, MarCom Writer, Reliable Controls

In somewhat of a pilot project, Postma installed a wireless monitoring solution into the 30-year old condos at a total area of 30,000 m^2 that had previously been running without a controlled building automation system (BAS). With energy costs on the rise, one building in the complex was singled out as a test case.

Smart temperature control

The installation is centered around four MACH-ProZone™ controllers that host six SMART-Sensor™ EnOcean access points to monitor space temperature and provide local set point adjustment control for modulating heating hot water valves in each of the 31 condos. The onsite mechanical equipment consists of two boilers, two boiler pumps, one building pump and 31 modulating radiant valves.

In addition, 31 solar-powered SPACE-Sensors EnOcean provide a highly flexible and maintenance-free temperature sensor solution. For Postma, EnOcean wireless sensing allowed for an easy retrofit installation, whereas standard, wired installation would have been cost and labor prohibitive. Final installation has proven to be drastically more appealing from a cosmetic perspective and more economical.

30 percent energy rebate

The local utility provider is establishing guidelines for energy savings rebates and it is anticipated that up to 30% of the project cost could be recuperated in rebates.

www.reliablecontrols.com

A comprehensive smart home solution

Sinobel has strong capabilities in the field of product development, manufacturing and global distribution. The company's core concept is to create the best customer experience and facilitate daily life with a full range of intelligent control and diversified services platforms. EnOcean wireless standard is used in all of Sinobel's intelligent control applications. By Marketing Department, Beijing Sinobel Technology Co., Ltd.

Sinobel's EnOcean-based products include a battery-less wireless switch, a temperature and humidity sensor, a door/window contact, a PIR sensor, a CO sensor, a PM2.5 sensor, a thermostat, a curtain motor, a gateway and a controller. The core of this new generation of smart home solution is the EnOcean-WiFi gateway. It manages the control instructions and data acquisition of EnOcean sensors and stores it in the cloud.

One source control

The system also provides an app for control via smart phone or tablet and cloud-management via a computer. Through an integrated infrared control interface, the EnOcean-WiFi gateway can control TV and air conditioning from everywhere. Users can achieve intelligent control from one source, making their lives more comfortable and convenient.

Channel power

The multi-channel controller, including an EnOcean and WiFi interface, can control ON/OFF through a battery-less wireless switch and the app. The four-channel controller comes with a maximum load of 6600VA per channel (for 30m^2 floor heating) and can be used for heating system control or the control of high current devices.

The eight-channel controller provides a maximum load of 2200VA for each channel (for 10 x 100W lighting) and can be used for lighting control or the control of low current devices. Combined with the learning function of a battery-less wireless switch, the controller can achieve one to one, one to more or more to one control.

Flexible in use and installation

The intelligent loop controller, based on battery-less wireless technology, can be flexibly used for various purposes such as lighting and HVAC. In addition, it significantly contributes to reduce the wiring and construction labor costs. Without wiring or batteries, EnOcean-based switches and sensors can help minimizing energy consumption.

www.sinobel.com

Sinobel's smart home system includes all components for an intelligent control of heating and lighting at home.

Open, tilted, closed?

SecuSignal® shows the positions of windows and glass doors.

By Holger Renger, Product Manager for Mechatronics, HOPPE AG

SecuSignal® provides a solution for central, wireless monitoring of window positions in a building. This saves, for example, time-consuming checking routines – an aspect that is especially attractive for large buildings, such as schools or government agencies.

Complete overview per radio

By connecting such information to automatic heat regulations or shutter controls in building automation systems, SecuSignal® can also help save energy or increase security.

A SecuSignal® system consists of SecuSignal® window handles with self-powered, maintenance-free wireless transmitters based on EnOcean technology and an EnOcean receiver unit that will process the transmitted information. Replacing an old handle with a new SecuSignal® one is only a matter of minutes.

Remote monitoring via smart phone

Once the teach-in process has been completed, the wireless transmitter will communicate the handle's position upon turning – i. e. the position of the window or glass door – to the receiver unit as well as to any connected devices, such as tablets and smart phones. This way, windows and glass doors can be monitored even from remote locations.

Like all HOPPE brand-name door and window hardware, SecuSignal® handles are high-quality products made in Europe.

www.hoppe.com

New room controller for more comfort and energy efficiency

The new SAUTER ecos504 seamlessly integrates the automatic lighting and sunshade control into the room climate regulation. The energy consumption is therefore reduced considerably while the comfort for the room user is also increased.

By Reinhard Huber, Product Management Room Automation, SAUTER Head Office

In modern buildings, most of the energy is used for cooling. The energy consumption can be drastically reduced through automated sunshade, lighting and room ventilation control with CO_2 sensors. Additionally, the new room controller from SAUTER is seamlessly integrated into the building management system and the primary energy preparation system using BACnet/IP.

Flexibility through modularity

The SAUTER ecos504 is a modular room controller, with which remote ecoLink I/O modules can be combined as required. The controller supports up to eight fixed rooms or flexible room segments. EnOcean wireless technology allows SAUTER ecoUnit 1 room operating units with bidirectional communication and LCD to be connected, as well as window contacts, switches and other EnOcean devices from third-party manufacturers.

KNX interface as connector to the electrical equipment system

The direct connection of KNX field devices to the ecos504 significantly expands the selection of room operating units, actuators and sensors that can be used. With open communication in all directions, the HVAC world and the electrical equipment systems combine to create a harmonious overall solution for the room user, the building operator and the investor.

www.sauter-controls.com

Mission smart home

Who wouldn't like these scenarios? You get up in the morning and go to the kitchen, which is already illuminated according to your particular preferences. In bed at night, you use your iPad® to check whether the basement light is still on. Or while far away on vacation you make it look as though your house is occupied by controlling the lights and blinds. Homission from Bruck, the complete building automation solution, enables lights, blinds and many more functions to be easily operated by "remote control" from an iPad® or iPhone®. By Dirk Wortmeyer, Product Management, Bruck GmbH & Co. KG

Homission is an intelligent solution that efficiently and comfortably places control technology on an iOS device, making it possible to automatically design the home environment literally with one hand. The app bearing the same name is easy to install, intuitive to operate and sustainable. All one needs is an iPad® or iPhone®, a WLAN router and switches, sensors (such as motion, light and temperature sensors) and actuators (such as luminaires and blinds). No additional PC software is required.

Security and quality of life

Homission provides many options. In addition to controlling lights that, for example, show arriving guests the way to the entrance with automated outdoor lighting, it can also control heating, air-conditioning and ventilation systems by remote access. This makes Homission a valuable link between users and their living space, one that noticeably increases the quality of life. For example, the ability to simulate a home's occupancy while the residents are on vacation by turning on the lights or raising and lowering the blinds is a downright priceless advantage, particularly considering the alarmingly high burglary rates and shamefully poor success in solving such crimes.

Operation on request

Homission's "brain" is a so-called home server in the form of a small box. It receives and processes radio signals from the switches and sensors, using them to control the actuators. The system implements EnOcean's energy harvesting wireless technology.

Alternatively, Homission can be operated with conventional or wireless switches. The system functionality can be expanded at any time according to the customer's requirements, and future software enhancements can also be added.

www.bruckinternational.com/en/homission/

A perfectly connected building system

Nanjing Putian Telecommunications CO., Ltd., one of the largest professional manufacturers of telecommunication products with profound technical experience in the field of telecom and intelligent architecture in China, has launched its new intelligent building control and smart home system solutions based on the EnOcean energy harvesting wireless standard.

By Marketing Department, Nanjing Putian Telecommunications CO., Ltd.

Split type wireless switch

The dimension of the switch is 86 mm x 86 mm and complies with the Chinese standard. It can be used on the wall or as a remote control. By using the internal magnet, the switch can be installed and disassembled very conveniently. It is suitable for different applications such as lighting and shutter control, garage door control and home security. Customized in different colors, it easily matches with the environmental style. In addition, the switch also can be used with a sling to avoid a loss.

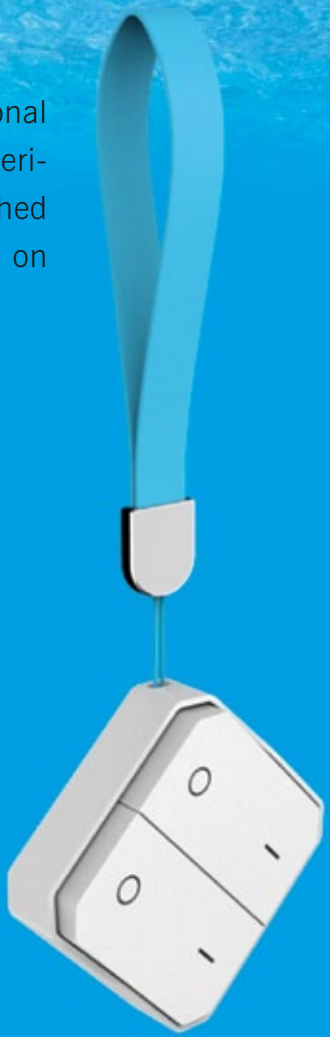
Multifunctional dual-channel actuator

The actuator can be used together with a double-rocker switch to control two-channel lighting with multimode selection. Each channel can be paired with a PIR sensor and the switch in manual and auto mode including different optional time-delay functions. Two actuators can be used together in order to control four lighting channels at the most.

Wireless occupancy sensor

The sensor is for lighting control and human motion detection. It can be powered by solar energy or external electricity for a very wide range of applications. The solar-powered version continuously works for five days in total darkness.

easyhome@postel.com.cn



The intelligent connection
between the car and the house

With myGEKKO Slide & Drive, users can take home today's eMobile concepts and add a variety of attractive options: from time-controlled home automation functions using informative trend recordings and the optimized use of energy resources in the house to load management of their own electric cars (eMobile). By Hartwig Weidacher, Member of the Executive Board, Ekon GmbH

myGEKKO Slide & Drive seamlessly integrates the car into the building by connecting all load management functionalities with the systems in the house. Thus, users can take advantage of synergies and optimally manage and use available resources. Additional information like "How much energy do I currently use in my house?" or "How much energy will be produced in the coming days?", for example, enable a more efficient and better calculable charge and energy management.

Sun in the tank

Residents can increase the yield of their photovoltaic system by using directly produced energy for charging the car. Based on the weather forecast, they also receive a forecast on the expected energy production for the next few days. Thus, the load cycles can be handled more cost-effectively and efficiently.

Household under control

In addition to intelligent and efficient load management, electric devices can be connected via wireless smart plugs. myGEKKO takes over the function of the device manager: it organizes and distributes the available energy and capacity and ensures smooth, efficient and cost-effective charge and household workflows (washing machine, dryer etc.).

Energy in balance

Energy consumption and associated costs are clearly displayed in trend curves and in weekly or monthly reports. Thus, users can get an overview of the energy balance, can save energy efficiently and can quickly identify and eliminate energy guzzlers.

Standby devices can be easily and automatically switched off, for example, via time clocks or when leaving the house. In addition to energy conservation, the devices' deactivation reduces the electromagnetic pollution in the rooms, which is particularly recommended for the bedroom and children's rooms.

The tenants can conveniently manage and control all load, energy and devices management functionalities at home or remotely via smart phone.

www.my-gekko.com
bmw.my-gekko.com

OPUS® Kubus: timeless elegance

Elegant, timeless lines and a high quality look: the design of the new OPUS® Kubus frame is satisfying from the very first glance. With the new frame design, JÄGER DIREKT adds an attractive variant to its line of switches.

By Ina Trautmann, Marketing Director, JÄGER DIREKT

There are almost unlimited possible combinations. Thus, the switch meets every individual taste.

OPUS® Kubus harmonizes with all colors, shapes and built-in devices belonging to the proven 55 system. The new designer frames, with their markedly narrow dimensions, are available in polar white, silver and coal gray.

"OPUS® Kubus closes the gap between the existing InForm line of switches, with its rounded edges, and Fusion, with its floating effect," says Managing Director Thomas Jäger.

Varied color combination

The new designs give the user every flexibility. They can be put together in any color combination, thus creating a pretty bi-color effect. Of course, the frame design also matches the wall transmitters of the intelligent OPUS® greenNet building technology.

Another advantage is that the special granulate used makes it possible to apply a high-end, waterproof and nonabrasive laser engraving to the new frame. This finishing process makes it possible to integrate function descriptions, logos or motifs.

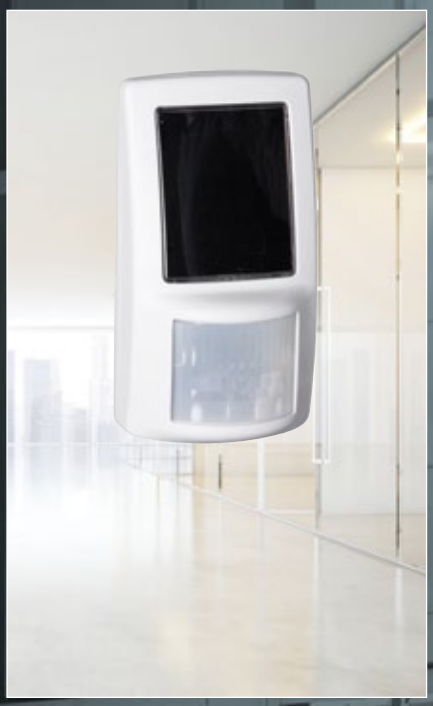
Robust, premium material

Kubus is available in frame configurations from single to quintuple. The series is PVC-free and made of 100% polycarbonate, which makes the material extremely impact-resistant and shatterproof.

The new OPUS® Kubus design is available immediately and is sold exclusively by electricians, JÄGER DIREKT's well-known sales channel.

www.Jaeger-Direkt.com

Smart sensor for all spaces



Echoflex has expanded its portfolio of smart solutions with the Resonate Occupancy Sensor (ROS). The solar-powered, passive infrared sensor is a key component for energy savings in classrooms, open office spaces and corridors. By Paul Greening, Sales and Marketing Manager, Echoflex Solutions, Inc.

Echoflex's philosophy is based on providing clean technology that employs natural energy sources to power devices whenever possible. The new ROS occupancy sensor fits perfectly with this sustainable approach as it offers reliable high performance without requiring a battery to operate.

Detection from everywhere

The ROS is a wireless, self-powered sensor that detects motion in room and office spaces. Available in all EnOcean frequencies – 902 MHz, 868 MHz, 928 MHz, 315 MHz, it features an excellent transmission range, advanced diagnostics and efficient solar power utilization in hallway, corner mount and wide angle models. Available in three coverage patterns, the sensor satisfies a variety of applications and operation environments.

Full power of light

The ROS wirelessly transmits an occupancy state to an Echoflex wireless controller for automated lighting and HVAC control, enabling an Auto-On/Auto-Off or Manual-On/Auto-Off operation. LED indication of radio signal and solar harvesting performance levels (patent pending) assists in determining the correct installation location.

With the ROS sensor, Echoflex designed one of the most technically advanced sensors in the wireless controls industry. It uses low light levels of less than 2.5 foot-candles and operates on a full charge for over 200 hours in total darkness.

The ROS features:

- Solar-powered PIR occupancy sensor
- Charges on natural and artificial light
- Occupancy/vacancy control
- Continuous operation in low light conditions
- Corner, wide angle, and hallway lens options
- Low maintenance, battery-free
- Range and solar harvesting confirmation indication

www.echoflexsolutions.com

The EnOcean boutique

In the city center of Belfort in France, the first EnOcean boutique has opened its doors; additional boutiques in Lyon and Lille will follow soon. The shop "Design-On La Boutique" demonstrates a smart home based on energy harvesting wireless technology. Visitors experience the benefits of different products and the possibilities of making their homes smart the wireless way.

The Boutique's concept follows two major targets:

A point of contact for product demonstrations and tests

The furniture and the shop floor are designed as totally interactive areas. People can touch all EnOcean products and test the benefits of battery-less, wireless connectivity "hands-on".

A point of contact for laboratory purposes

In the boutique, customers can experience how easy it is to install a smart home functionality using EnOcean-based products. After choosing the switches and sensors to control lighting, heating or shutter in a house, they learn how to teach in and connect the devices to an intelligent system of their dreams in a few simple steps.

www.design-on.fr/belfort.html

Thermokon Americas wins 'Best Wireless Product of the Year' at ControlTrends Awards

David Alliband, Thermokon Americas, receives the award at the ControlTrends event at AHR 2015 (3rd right).

Thermokon Americas is the winner of the 2014 ControlTrends Awards Vendor of the Year – "Best Wireless Product" for the EasySens product range.

The 3rd successful Control Trends Awards program was held in Chicago during the AHR expo. It was even bigger and well attended than ever before and recognized the major automation products within the building automation and HVAC controls industry.
The awarded Thermokon EasySens products use the self-powered EnOcean technology and allow easy integration of wireless devices into major building management systems through BACnet, LON, Modbus, KNX or Ethernet.

www.controltrends.org, www.thermokon.com

EnOcean and the Internet of Things

IFA is the world's leading trade show for consumer electronics and home appliances. This year at the AllSeen Alliance booth, visitors could experience EnOcean-based devices communicating with household appliances and multimedia. The Smart EnOcean Gateway of Digital Concepts linked the different worlds.

By Oliver Fischer, CEO, Digital Concepts

At ISH 2015 in March, the EnOcean Alliance successfully demonstrated that EnOcean sensors can be controlled via Apple HomeKit. At IFA, the building alliance has now shown how the EnOcean radio interacts with AllJoyn, the technical framework of the AllSeen Alliance.

Understanding worlds

The Smart EnOcean Gateway of Digital Concepts is the basis for this seamless communication, which connects the world of energy harvesting wireless technology with IP, and therefore with the Internet of Things. Based on the IP standard of the EnOcean Alliance, which is currently being defined, all EnOcean devices can be integrated into the Internet of Things using easy-to-develop interfaces.

Thus, at IFA, battery-less wireless EnOcean sensors could "talk" to other devices, such as white goods and multimedia, via the AllJoyn protocol.

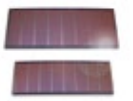
www.digital-concepts.eu

EnOcean Products

RoHS COMPLIANT 2002/95/EC

enocean Wireless Standard ISO/IEC 14543-3-1X

Products with 868 MHz are suitable for Europe and other countries adopting R&TTE specification.
Products with 902 MHz are suitable for North America adopting FCC/IC specification.
Products with 928 MHz are suitable for Japan adopting ARIB specification.

Energy converters			
Kinetic Energy Converter	**ECO 200**		Harvests linear motion for use in energy harvesting wireless switches.
Solar Cells	**ECS 300** **ECS 310**		Harvests indoor light for energy harvesting wireless sensors.
Themo-Electric Energy Converter	**ECT 310**		Harvests temperature differentials for energy harvesting wireless sensors and actuators.

868 MHz For Europe and other countries adopting the R&TTE specification.

868 MHz	Wireless Sensor Modules		
Energy Harvesting Wireless Sensor Modules	**PTM 210** **PTM 215**		Ideal for energy harvesting wireless switches. The PTM 215 variant also contains rolling code functionality.
	ECO 200 & **PTM 330/335**		The perfect combination for unique switch applications. The PTM 335 variant also contains advanced security functionality.
	STM 300		Ideal for bidirectional energy harvesting wireless sensors and innovative actuators.
	STM 312		Energy harvesting wireless sensor module – with whip antenna but without solar cell.
	STM 329		Energy harvesting magnet contact transmitter module with helical antenna. STM 329 contains advanced security functionality.
	STM 330		Energy harvesting wireless temperature sensor module with solar cell and whip antenna. STM 330 contains advanced security functionality. STM 330 is suitable for the plug-in humidity sensor module HSM 100.
	STM 331		Energy harvesting wireless temperature sensor module with solar cell and helical antenna. STM 331 contains advanced security functionality.

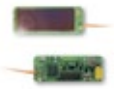
868 MHz Wireless Sensor Modules

Wireless Transceiver Modules	**TCM 300**		Transceiver module for programmable system components.
	TCM 310		Transceiver module for gateways.
	TCM 320		Transceiver module for programmable system components.
EnOcean Kits	**EnOcean Starter Kit ESK 300**		The ideal entry to EnOcean technology.
	EnOcean Developer Kit EDK 350		Developer kit for energy harvesting wireless sensor solutions.

868 MHz Finished White Label Products for OEM Customers

Energy Harvesting Wireless Switches and Sensors	**PTM 250**		Universal switch insert – EnOcean easyfit.
	STM 250		Wireless window contact with advanced security functionality.
	EKCS		Wireless key card switch.
	EOSW		Wall mounted wireless occupancy sensor.
	EOSC		Ceiling mounted wireless occupancy sensor.
Transceiver Product	**USB 300**		USB gateway.

902 MHz For North America adopting the FCC/IC specification.

902 MHz	Wireless Sensor Modules		
Energy Harvesting Wireless Sensor Modules	**PTM 210U**		Ideal for energy harvesting wireless switches.
	ECO 200 & PTM 330U		The perfect combination for unique switch applications.
	STM 300U		Ideal for bidirectional energy harvesting wireless sensors and innovative actuators.
	STM 320U		Energy harvesting magnet contact transmitter module with helical antenna.
	STM 332U		Energy harvesting wireless temperature sensor module with solar cell, whip antenna and LRN button on the side. STM 332U is suitable for the plug-in humidity sensor module HSM 100.
	STM 333U		Energy harvesting wireless temperature sensor module with solar cell and helical antenna. STM 333U is suitable for the plug-in humidity sensor module HSM 100.
Wireless Transceiver Modules	**TCM 300U**		Transceiver module for programmable system components.
	TCM 310U		Transceiver module for gateways.
	TCM 320U		Transceiver module for programmable system components.
	TCM 330U		Transceiver module for programmable LED zone controller.
EnOcean Kits	**EnOcean Starter Kit ESK 300U**		The ideal entry to EnOcean technology.
	EnOcean Developer Kit EDK 350U		Developer kit for energy harvesting wireless sensor solutions.

902 MHz	Finished White Label Products for OEM Customers		
Energy Harvesting Wireless Switches and Sensors	**EDRP/ESRP**		Wireless switch (double/single).
	EKCS		Wireless key card switch.
	EDWS		Wireless door and window contact.
	EOSW		Wireless wall mounted wireless occupancy sensor.
	EOSC		Ceiling mounted wireless occupancy sensor.
	ELLS		Wireless light level sensor.
Wireless Transceiver Products	**EPSM**		Plug-in switch module.
	EISM		In-line switch module.
	EHSM		HVAC setback module.
	LEDR		LED controller – dimming with relay (0–10V).
	LEDD		LED controller – dimming w/o relay (0–10V).
	NWC 300U		With Navigan™ Wireless Commissioner you can easily configure EnOcean controllers EISM, LEDR and LEDD.
	USB 300U		USB gateway.

928 MHz For Japan adopting ARIB specification.

928 MHz	Wireless Sensor Modules		
Energy Harvesting Wireless Sensor Modules	**PTM 210J**		Ideal for energy harvesting wireless switches.
	ECO 200 & PTM 430J		The perfect combination for unique switch applications.
	STM 400J		Ideal for bidirectional energy harvesting wireless sensors and innovative actuators.
	STM 429J		Energy harvesting magnet contact transmitter module with helical antenna.
	STM 431J		Energy harvesting wireless temperature sensor module with solar cell and helical antenna. STM 431J is suitable for the plug-in humidity sensor module HSM 100.
Wireless Transceiver Module	**TCM 410J**		Transceiver module for gateways.
EnOcean Kit	**EnOcean Developer Kit EDK 350U**		Developer kit for energy harvesting wireless sensor solutions.

928 MHz	Finished White Label Products for OEM Customers		
Energy Harvesting Wireless Sensors	**STM 255J**		Wireless window contact with advanced security functionality.
	EOSW		Wall mounted wireless occupancy sensor.
	EOSC		Ceiling mounted wireless occupancy sensor.
Transceiver Product	**USB 400J**		USB gateway.

EnOcean Software

EnOcean Link
Linux-based library for EnOcean radio stack (e.g. ESP3, EEP).

EnOcean Decoding Gateway
TCM 300-compatible firmware for decoding of EnOcean telegram with rolling code.

Development Tools

DolphinAPI
For fast and simple development of custom specific applications (in “C”).

DolphinStudio
For simple configuration and flash programming of Dolphin modules.

Dolphin V4 API (for 928 MHz modules)
For fast and simple development of custom specific applications (in “C”).

DolphinSuite (for 928 MHz modules)
For simple configuration and flash programming of Dolphin modules.

DolphinView
EnOcean DolphinView visualizes wireless communication for starters in EnOcean technology. Variants: DolphinView Basic, DolphinView Advanced.

PTM 335 Suite
For simple configuration of the PTM 335 module.

Support

Further support materials can be found here:
www.enocean.com/support
www.enocean.com/product-finder

Contact

Our value-added distributors provide customers with application support and technical expertise.
www.enocean.com/distributor

Shining green
at the world's trade shows

The EnOcean Alliance booth is easily visible at every trade show. The shining green color catches the visitors' attention in the halls in a magical way. The presented products and solutions integrating the "magical" energy harvesting wireless technology reward their curiosity.

Find here some impressions of ISH 2015 in Germany, Lightfair 2015 in the United States and Guangzhou Electrical Building 2015 in China.

MASTHEAD

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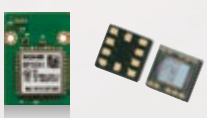

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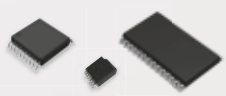

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