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Self-powered IoT

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EnOcean: Dolphin – Self-powered solutions for the Internet of Things

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MADE IN GERMANY

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SR07 P: with set point adjuster
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SR07 P MS: with set point adjuster and slide switch (0/I oder Day/Night)

» Modern, high-grade design

» Flexible design options. Available in three colours and compatible to the most common switch programmes.

» www.thermokon.com

Dear reader,

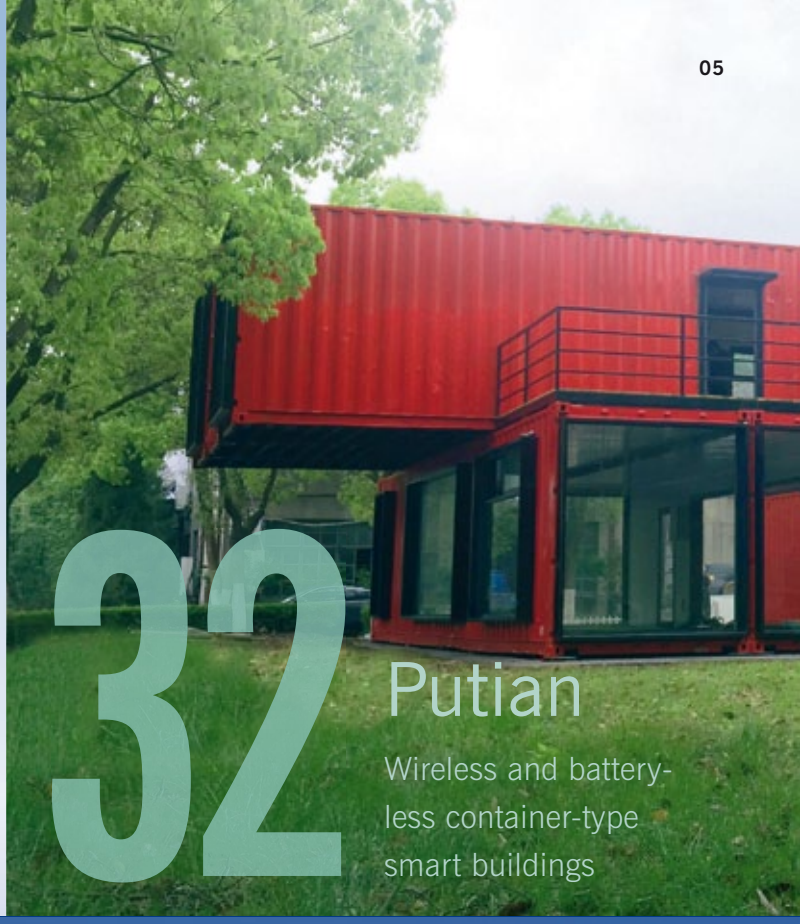
Just as a constellation is made up of many different stars, the Internet of Things (IoT) also consists of a myriad of connected devices. It has been estimated that quintillions of connected IoT sensors will be in operation as early as 2025. EnOcean's self-powered wireless sensors represent an important component of this comprehensive networking process, because energy harvesting technologies are required to operate large quantities of IoT sensors efficiently and to supply reliable data to IoT systems.

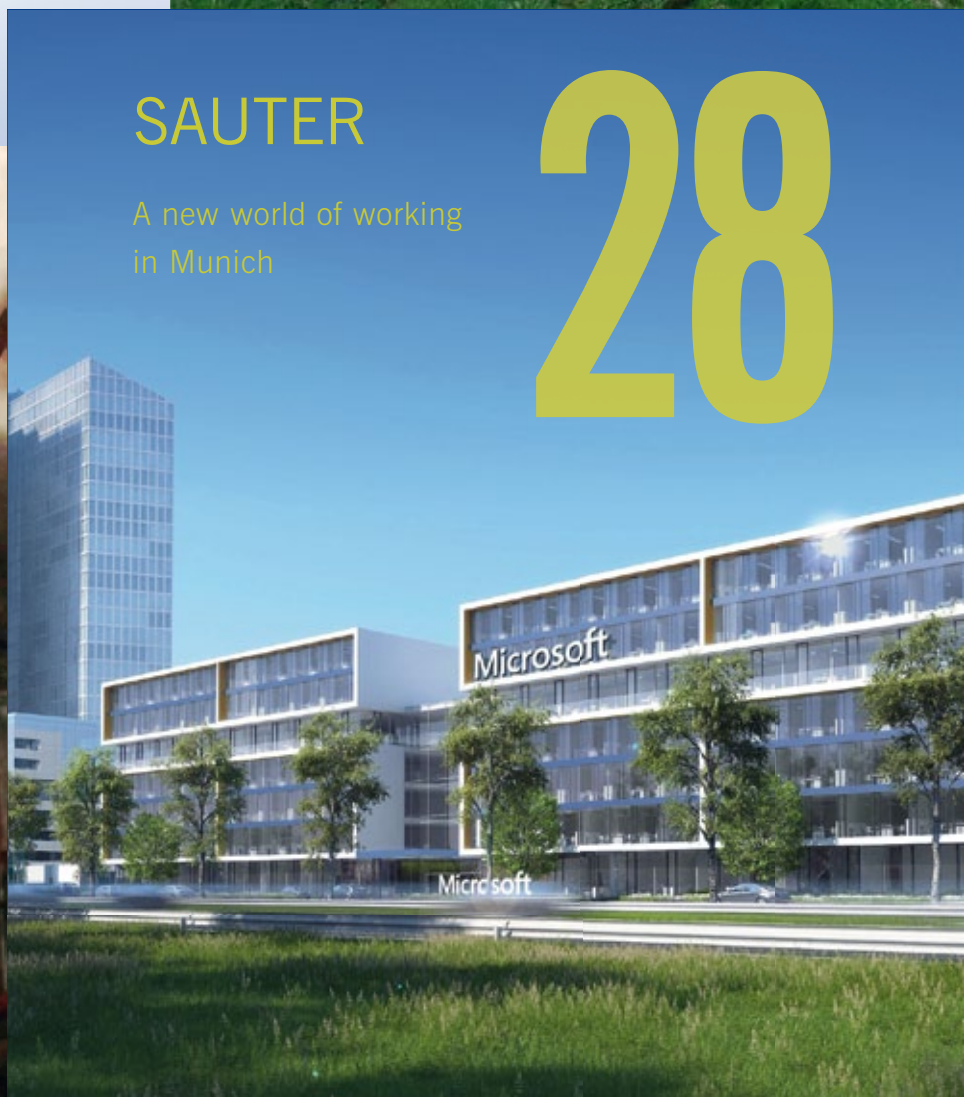
In the future, we will be offering our batteryless wireless modules and white label products under the Dolphin product brand. Concurrently with sub 1 GHz EnOcean wireless technology, the Dolphin product portfolio also offers batteryless wireless modules for use in ZigBee and BLE systems in the 2.4 GHz range. Demand for Bluetooth Low Energy (BLE) ready solutions is growing, particularly in the modern light control segment. By adding BLE-ready modules to our portfolio, we now enable product manufacturers to develop reliable and maintenance-free solutions on the 2.4 GHz frequency band for use in smart homes and modern light control all over the world.

Similarly, the EnOcean ecosystem in the sub 1 GHz range is also expanding. As a result of the continuous enhancement of system solutions with maintenance-free wireless switches and sensors, the extensive EnOcean ecosystem helps make buildings more flexible, more energy-efficient and more cost-effective. This creates the basis for excellent partnerships and projects, such as the development of a solution for the IoT sector: together with its partners, element14, Digital Concepts and IBM, EnOcean has launched a certified kit called "Intelligent Building – Self-powered IoT Solution" with batteryless EnOcean-based wireless sensors.

Last but not least, I would also like to welcome Neil Cannon as the new President of EnOcean Inc. With his extensive experience in building automation and LED light control, he will help EnOcean take advantage of the enormous growth potential in the North American market and strengthen EnOcean's position as the world's leading provider of the patented batteryless and wireless technology for self-powered applications in the Internet of Things.

Dr. Wald Siskens
Managing Director, EnOcean GmbH





EnOcean Products

Products with 868 MHz – EnOcean for Europe and other countries adopting R&TTE/RED specification
Products with 902 MHz – EnOcean for North America adopting FCC/IC specification
Products with 928 MHz – EnOcean for Japan adopting ARIB specification
Products with 2.4 GHz – for BLE & ZigBee networks (worldwide)

Energy Converter

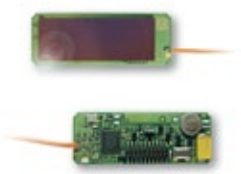
Energy converters collect and save the tiniest amounts of energy from their environment.

Energy Harvesting Wireless Switches

Energy harvesting switches use kinetic energy for switching applications in buildings and the Internet of Things.

For Energy Harvesting Wireless Sensors

Solar-powered energy harvesting sensors monitor and sense the environment to transmit this data to a wireless node.



For Controllers and Actuators

Wireless transceiver modules and products receive sensor data and also transmit values to other devices.

Tools

Starter kits and development tools help OEMs to implement energy harvesting wireless modules and products easily.

EnOcean Products: **www.enocean.com/products**

Product Finder: **www.enocean.com/en/product-finder/**

2.4 GHz BLE modules for BLE-based lighting systems from EnOcean

EnOcean is expanding its product portfolio with self-powered wireless modules with NFC functionality for 2.4 GHz BLE systems. The new modules complement the existing EnOcean wireless technology on the sub 1 GHz band and ZigBee wireless products on the 2.4 GHz frequency band.

By Matthias Kassner, Product Marketing Director, EnOcean GmbH

With the new 2.4 GHz BLE module, EnOcean technology can now also be integrated into 2.4 GHz Bluetooth systems. BLE-enabled solutions are gaining in importance in lighting applications. EnOcean GmbH now provides the right switches for BLE-based lighting systems.

Manufacturers of BLE-based systems for the 2.4 GHz band can now incorporate energy harvesting technology from EnOcean into their portfolios and develop batteryless, room-based wireless controllers. Thanks to the standardized PTM 21x form factor, switch manufacturers can easily integrate the new 2.4 GHz module into their existing product ranges and use maintenance-free BLE-systems that produce energy from motion.

Radio-based switch and sensor modules with NFC functionality

The radio-based PTM 215B switch module operates on the 2.4 GHz band and is mechanically compatible with the form factor of the sub 1 GHz PTM 21x standard module. Switch manufacturers can therefore easily migrate to a wide range of switch designs. Now that NFC functionality has been integrated for the first time, the switch can be trained through direct contact with NFC-capable devices without any manual actuation. A large number of parameters can also be configured easily and automatically, permitting, for example, protocol data to be modified or additional information to be transmitted, such as group assignments. New devices can thus be quickly and easily integrated into existing systems, substantially reducing their susceptibility to faults.

In addition to the radio-based switch module, the 2.4 GHz BLE portfolio from EnOcean also includes white label end products: energy harvesting wireless single-rocker (ESRP) and dual rocker (EDRP) switches for the American market.

Solar-based sensor modules will be added to the switch module in 2017, including a door and window sensor, a temperature/moisture sensor and a light sensor.

The battery-free Internet of Things

By adding a BLE-based wireless module to their portfolio, EnOcean has taken another important step toward fully networking devices in the Internet of Things (IoT). As the worldwide leading supplier of energy harvesting wireless technology, EnOcean enables self-powered IoT applications to be developed for use in building automation, smart homes, LED light control and industrial applications.

www.enocean.de

Self-powered solutions for the Internet of Things

DOLPHIN
Self-powered IoT by EnOcean

EnOcean will market its complete product portfolio of energy harvesting wireless modules and white label products with EnOcean wireless technology on the sub 1 GHz band and for use in ZigBee and BLE systems on the 2.4 GHz frequency band under the brand name “Dolphin – Self-powered IoT by EnOcean.”

By Andreas Schneider, Chief Marketing Officer, EnOcean GmbH

Networked devices form the basis of the Internet of Things. They process large volumes of sensor data to make our everyday lives easier, safer and more comfortable. The Dolphin modules are a key component of this extensive network: self-powered, radio-based sensors that supply the IoT systems with data. Maintenance-free wireless sensor networks increase system capacity by reducing outages caused by batteries, which means less maintenance work is required. They also help conserve resources and permit sustainable solutions, since fewer cables and batteries are needed. Batteries, in particular, are expensive to maintain, harm the environment and have to be disposed of regularly.

This comprehensive range of products from EnOcean enables product manufacturers to develop reliable and maintenance-free wireless sensor solutions for the Internet of Things. The company thus strengthens its position as the world’s leading supplier of energy harvesting wireless technology that combines energy converters with extremely energy-efficient electronics based on a variety of wireless standards.

The battery-free Internet of Things

The Dolphin modules use the energy harvesting principle, in which energy is obtained from the surroundings, to supply self-powered wireless sensor networks. As a special feature, the technology includes miniaturized energy converters that convert motion, light, or temperature differences into light energy.

Together with an efficient energy management system, the energy harvesting technology facilitates communication between maintenance-free IoT devices based on a variety of wireless standards, such as EnOcean, ZigBee and BLE. The solutions are used in building automation, smart homes, LED light control systems as well as industrial applications.

The world's leading supplier

Energy harvesting wireless sensor solutions based on the EnOcean wireless standard on the sub 1 GHz band (ISO/IEC 14543-3-1x) have been in use for the past 15 years. EnOcean technology has already been installed in more than 400,000 buildings around the world. As a partner to the EnOcean Alliance, which has more than 400 members active in the area of building automation, EnOcean offers its customers the benefits of an ecosystem consisting of interoperable energy harvesting wireless sensor solutions. Due to the continuous enhancement of system solutions with maintenance-free wireless switches and sensors, the extensive EnOcean ecosystem helps make buildings more flexible, more energy-efficient and more cost-effective.

Maintenance-free wireless sensor solutions

To make it possible to use the patented energy harvesting wireless technology worldwide, EnOcean GmbH is now expanding its Dolphin product portfolio. Starting in October 2016, the company will offer energy harvesting wireless modules for use in ZigBee and BLE systems on the 2.4 GHz band along with the sub 1 GHz EnOcean wireless technology. Thanks to the low power consumption of the EnOcean technology, the batteryless sensors and switches are perfectly suited for use in smart buildings.

The product lines "868 MHz EnOcean" for Europe, "902 MHz EnOcean" for North America and "928 MHz EnOcean" for Japan consist of batteryless, radio-based switch, sensor and receiver modules as well as various tools. They are based on the EnOcean wireless standard introduced by the EnOcean Alliance (ISO/IEC 14543-3-1X) on the sub 1 GHz band, which has proven to be a resounding success in building automation and smart homes, due to its high reliability and a radio range of up to 30 meters. Standardized sensor profiles help ensure the interoperability of more than 1,500 products from the EnOcean ecosystem, which makes it possible to develop interoperable system solutions.

The Dolphin portfolio also includes the "2.4 GHz ZigBee" product line with energy harvesting wireless switch modules as well as a wireless receiver for ZigBee systems in the 2.4 GHz band, which can be used in smart home applications all over the world. Moreover, the "2.4 GHz BLE" portfolio includes a wireless switch module for BLE systems for modern light control. Radio-based 2.4 GHz BLE sensors will also be available, starting in 2017.

www.enocean.com

Self-powered BLE beacons: the lighthouses of the IoT

Beacons are special transmitters that emit short wireless telegrams in the briefest possible time intervals – much like a lighthouse. The use of these transmitters has been growing rapidly for a number of years now. As the number of beacons in the Internet of Things (IoT) increases, so does the demand for self-powered, maintenance-free solutions.

By Matthias Kassner, Product Marketing Director, EnOcean GmbH

Beacons are used primarily for localization i.e., to determine the position of a moving object. A typical application can be to display specific, position-dependent content. In this case, the user is offered certain information depending on his or her exact position, such as information on museum exhibits that can be accessed with a special application. This scenario employs several stationary beacons, and only the receiver moves around.

Beacons can also be used in asset tracking, thus enabling the position of mobile objects to be determined automatically. Examples include devices that need to be be deployed flexibly in different locations, such as mobile measuring instruments, projectors or medical devices (wheelchairs, infusion devices, respirators, etc.). This scenario implements multiple stationary receivers that pick up the signal from a mobile beacon.

Benefits of maintenance-free beacons

Beacons require an infrastructure with as many stationary transmitters or receivers as possible. This infrastructure can either be installed at targeted locations or be provided using existing devices. The latter option may be chosen, for example, if a BLE light control system is present, and each lamp has its own BLE transmitter and receiver.

To be able to use the beacons without complications, they should generally be very easy to install. It is usually not possible to lay power supply cables. However, the maintenance required for battery-powered solutions can be a problem, particularly in large installations. If beacons are used in environments with good lighting, self-powered, solar-based solutions should be considered to ensure reliable, problem-free operation.

Optimized use in BLE-based systems

Since beacons transmit very frequently, they require the use of an energy-optimized wireless protocol in order to maintain a long service life in devices without a continuous power supply. At the same time, the strength of the signal received should decrease significantly as the distance increases to ensure accurate positioning. The Bluetooth Low Energy (BLE) standard, which supports the energy-optimized transmission of short telegrams on the 2.4 GHz band, has therefore proven to be successful for these reasons.

First batteryless BLE beacons available as early as 2017

EnOcean GmbH is collaborating with several key customers on concepts for solar-powered BLE beacons in order to facilitate self-powered localization with additional sensor functions. These solutions are expected to be available in 2017.

www.enocean.com

Saitama Medical University Medical Center, members of the development team

Carecom – simply safe and worry-free

The use of wireless technology for ensuring secure and worry-free medical care is becoming more and more widespread. One recent example is the Nurse Call Button based on energy-harvesting wireless technology from EnOcean. By Rohm Co. Ltd.

Carecom AG is a manufacturer specializing in information and communication solutions used in social welfare and medical facilities.

Launched at Japan's high-level rescue center

In March 2016, the system was used for the first time at Japan's Saitama Medical University Medical Center, a cutting-edge emergency medicine and rescue facility. The hospital makes fast and precise treatment as well as stress-free patient care top priorities. To achieve this goal, the facility must have the best possible equipment, positioned so as to take into account patient and staff mobility. For this reason, Carecom developed the wireless and batteryless Nurse Call Button, which contacts the staff directly when activated.

A collaborative effort

For Assistant Professor Takashi Mato, who not only works in the rescue center but also came up with the design for the project, it is particularly important for a nurse call button to work without cables or batteries and to simultaneously meet the requirements of the particular facility.

When searching for the best technology to implement the Nurse Call system, the team working together with Carecom AG discovered wireless EnOcean products, which are ideally suited to meeting the strict requirements in the place of application.

To optimize the result, the researchers incorporated the opinions of the medical staff and patients into the development process. With Nurse Call, Carecom thus came out with a product that is not only wireless and batteryless, but is also very easy to use.

Special features of Nurse Call

The Nurse Call Button does not require any cables or batteries. It can also be easily used anywhere without any restrictions in the choice of location. For example, the button can be mounted right on the bed rails or be positioned freely without any additional equipment. The patient can therefore operate the button in any position, e.g. with his/her hand, elbow, knee or leg, which is safer for the patient and produces fewer false alarms for the medical staff. The system can thus be adapted to the specific needs of employees and patients, and the ideal operating position for the button can be determined.

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www.rohm.com
www.carecom.jp
www.saitama-qq.jp

Self-powered sensors for industry 4.0

Energy efficiency is enormously important to manufacturing companies. To optimize the energy consumption of production equipment, manufacturers have to record and analyze all relevant consumption data.

By Markus Kreitmair, Innovation Manager R&D, EnOcean GmbH

As part of the ESIMA research project, EnOcean joined forces with project partners from science and industry to develop solutions for optimizing resource efficiency in production through "Self-powered sensors in interaction with mobile users" (ESIMA). The sensors developed during the project are an important building block for energy management in Industry 4.0 factories.

EnOcean ESIMA 2.4 GHz transceiver modules for gateways and self-powered sensors

Optimized resource efficiency in production

A key component of the project was to develop self-powered sensors that can be easily mounted on the machines without changing the plant structure and which record all relevant consumption data during the production process. This data includes, for example, the electrical energy consumption (current, voltage, power) as well as the consumption of compressed air (pressure, flow rate). The wireless sensor systems can also record relevant environmental parameters such as temperature, humidity and CO_2 content. The measured values are subsequently preprocessed and transmitted wirelessly to a base station. Once obtained, this data is visualized with a web application developed in the project and can also be viewed on mobile devices such as smartphones and tablets.

As part of the research project, EnOcean developed a new generation of 2.4 GHz wireless modules for self-powered applications. The wireless modules can be used universally for sensors and switching applications in industrial and building automation systems. Due to their very low power consumption, the wireless modules can be operated under their own power from a solar cell or electromechanical generators. Eliminating the batteries and cables makes the system highly flexible for a wide range of applications in the area of Industry 4.0 sensors.

Project partners from science and industry

The development results obtained by the following project partners were incorporated into the ESIMA demonstrator:

- VARTA Microbattery
- Hahn-Schickard-Gesellschaft
- EnOcean GmbH
- Helmut-Schmidt-University (EMT)
- C4C Engineering GmbH
- TU Braunschweig (Institute of Machine Tools and Production Technology)
- Daimler AG (truck engines)

The joint project was funded by the German Federal Ministry of Education and Research (BMBF) as part of the IKT 2020 research program in the field of "Self-powered mobility – reliable self-powered systems for mobile people."

www.esima-projekt.de

Flexible electronic locks for lockers

Lock manufacturer BURG presents the B-Smart-Lock Corona, a card locking system for lockers that was developed specifically for the fitness and wellness industry. It is an electronic lock with EnOcean technology that operates intuitively. By BURG F.W. Lüling KG

Flexible and user-friendly

The highly compact rotating knob on the Smart-Lock Corona is fastened directly to the front of the locker door. The lock supports two different coding systems as well as a series of optional functions and can therefore be customized to the needs of the particular installation.

The integrated LED ring shows the lock status: a green LED means that the locker is available and unlocked; a red illuminated ring means that the locker is in use. To be identified by the lock system, all the user needs to do is hold up the card. Existing locker systems can be retrofitted without complications, thanks to the system's easy installation. However, the lock can also be integrated without problems into existing card systems, or a complete new lock can be mounted as an overall system.

Permanent security

The integrated radio communication system, based on EnOcean technology, with a central server makes it possible to manage previously granted authorizations and check the status of the lock system. The system can thus respond quickly to unscheduled events, such as the loss of a card.

BURG chose the EnOcean radio protocol, because it consumes very little electricity and works with standardized encryption, which offers secure operation and a long service life.

www.burg.de/e-options-en/

The easy-fit thermally powered temperature sensor

The temperature sensor allows for flexible placement and makes components exposed to high thermal stress safer.

The thermally powered temperature sensor from Pressac, which has been added to the "Pressac Sensing" product series, is used to detect the temperature of metallic surfaces and provide early warning for overheating and failure. Typical applications include measuring the temperature of a brake shoe to warn against possible brake failure at an early point, as well as measuring the temperature of drive trains, engines and ball screws.

By Jamie Burbidge, Digital Marketer, Pressac Communications Ltd

The energy harvesting sensor contains an integrated Peltier element, which converts the temperature difference between the (hot) metallic surface and the (cold) ambient air directly into electrical energy. An integrated thermistor connected to the hot surface measures the precise temperature once a sufficient temperature difference has occurred (typically 5 °C).

Early warning system for preventing brake failure

The sensor can be configured so that it takes measurements more frequently at higher temperatures and transmits the data in an EnOcean wireless telegram. This makes it possible to detect overheating faster. Either an EnOcean RS232 gateway or an EnOcean IP gateway can be used to receive the wireless telegram. Both products are available from Pressac. The temperature sensor is extremely easy to install. It can be conveniently mounted on different metallic surfaces, such as brake shoes, gearbox cases, etc., using strong, adaptable magnets.

www.pressac.com

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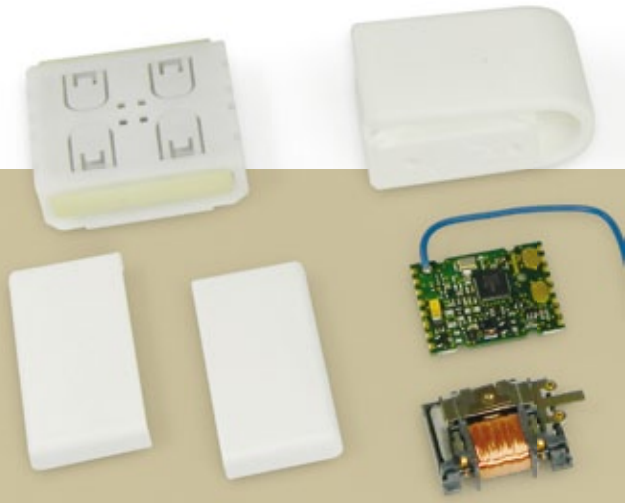
- Wireless communication via the WAGO-I/O-SYSTEM 750
- Freely programmable controllers
- Wide variety of interfaces – BACnet, KNX IP, Modbus TCP, DALI, SMI, KNX and more

www.wago.com/enocean

WE INNOVATE!

WAGO

EnOcean Switch Design Kit – for custom switch design 3D printing



The EnOcean Switch Design Kit combines the IoT with 3D printing. It permits customized switch sensor applications to be flexibly created for the Internet of Things while minimizing design work.

By Armin Anders, Vice President Business Development, EnOcean GmbH/
Jas Gohlar, Technology Development Manager, element14

Easy and cost-effective

The EnOcean Switch Design Kit (ESDK) is aimed primarily at the maker community. Makers need attractive prototypes that can be produced as quickly as possible with the least amount of effort. While the implementation of a housing used to require a design expert and an outlay of several tens of thousands of euros for building the tools, anyone can now create their own prototype over the weekend. This is made possible by a freeware CAD program and a 3D printer Internet café, where the cost of the individual parts required are as little as ten euros.

The ESDK kit contains several EnOcean switch modules as well as a few plastic switch parts as examples and gives users access to comprehensive design data. A socket switch actuator is also included, which can be controlled directly with the EnOcean switches. An unboxing video (www.youtube.com/watch?v=PVWDBdDS7aE) gives users a first glimpse of the ESDK kit.

When used with the other kits from element14, such as the "EnOcean Pi" and the 'Self-powered IoT Solution for IBM Watson IoT', the switches and tactile sensors can be easily combined with a controller and the Internet. Different IoT solutions and innovative new business opportunities can thus be implemented with little effort.

Individual design in four steps

- ➔ Select the desired switch design from the ESDK user manual and download the appropriate design data from www.enocean.com/en/products/design-data/.
- ➔ Call up the 3D data using an IGS-compatible CAD tool. Excellent tutorials for FreeCAD, for example, are available

and

on the Internet, which help you learn how to use the tool overnight.

- ➔ Edit the design, if necessary, and export the data as an STL file.
- ➔ If you do not have a printer of your own, countless numbers of print shops can be found online that will 3D-print your prototype for a small fee. For example, you can choose from among several providers at www.3YourMind.com.

The ESDK kit can be purchased from element14 and is available in the 868 MHz frequency band.

www.element14.com/EnoceanSwitchKit

UP is a credit card sized single board computer designed for makers, innovators and startups who intend to quickly upscale their prototyped ideas into mass produced solutions. Building on some of the best capabilities of existing maker and embedded boards in the market today, UP bridges the gap between the world of prototypes and the world of high-grade mass-produced embedded systems solutions.

By Fabrizio del Maffeo, Managing Director, AAEON

The build UP to your EnOcean solution has never been so quick!

UP is powered by an Intel® Atom™ x5-8350 Quad-Core 1.4/1.92Ghz 64 bit CPU with 1GB/2GB/4GB RAM, 16GB/32GB/64 eMMC, 40 GPIO expansion driven by Altera Max V CPLD, 6 USB 2.0, USB 3.0 OTG, 1 Gbit Ethernet, HDMI, DSI, and MIPI-CSI interface.

Designed to embrace as many software developer communities as possible UP supports Ubilinux (a customized Debian distribution), Yocto, Ubuntu, Phoenix OS, Microsoft Windows 10 Professional and Microsoft Windows 10 IoT Enterprise. UP users are supported by an online community (www.up-community.org) where tutorials and pro-active support forums are available. The community also provide professional services including customized derivatives.

Energy from the environment

Combined with EnOcean-based energy harvesting wireless components, it opens up the world of self-powered wireless applications to developers. Miniaturized energy converters power wireless modules using the energy directly from their surroundings – from motion, light or temperature. These modules enable users to develop a broad range of self-powered, maintenance-free products and applications, requiring no wiring or cabling. This results in highly flexible control products for a huge variety of automation purposes including smart home and IoT.

Interoperable approach

The EnOcean technology comes with another core benefit for a quick time to market: using the international wireless standard ISO/IEC 14543-3-1X and unified application profiles, all EnOcean-based products are interoperable.

UP users can easily access the EnOcean technology using the EnOcean Kinetic Design Kit or the Smart Home Kit sold in the UP Shop (www.up-shop.com), download the OS and the libraries from the community and quickly build up their solution for smart home, building automation or Internet of Things.

The EnOcean Kinetic Design Kit includes the transmitter, the energy converter, the wireless energy harvesting pushbutton, the adapter module to connect to UP.

UP users more focused on smart home can use the Smart Home Kit powered by EnOcean technology; in the kit they will find the electrodynamic pushbutton, wireless magnet windows contact, wireless temperature sensor and contact switch. Once the solution is ready, they can share their projects with the community and sell their products through the UP Shop.

www.aaeon.com
www.up-board.org

UP-Board - UP-CHT01

UP EnOcean Kinetic Kit

UP EnOcean Smart Home Kit

Self-powered IoT sensors for building automation

Lead Topic

Self-powered IoT

The Internet of Things is more than just a buzzword in the construction sector. Smart products from EnOcean help commercial building owners protect their investments and simultaneously offer their tenants as yet undreamt-of flexibility in organizing their space. By Armin Anders, Vice President Business Development, EnOcean GmbH

Flexibility is the greatest potential that investors can tap for their commercial buildings. The days when a finished building served only one customer and one purpose are long gone. Particularly in large cities, with their fast pace of life, builders must be able to remodel commercial buildings as quickly as possible and with a minimum of effort.

Although this approach is not a new one, the reality is that it comes with a number of problems, especially in terms of cabling. Ceiling lamps and floor tanks for electricity, networks and lights may enable investors and planners to generally change the walls dynamically. However, once classic room thermostats, doorbells, switches or sensors are added, and wired in, changing the layout becomes much harder and more expensive.

A new generation of building automation solutions based on self-powered wireless switches and senors is the answer – retaining flexibility and adaptability and allowing the needs of a succession of occupiers to be addressed fully at minimal expense. They rely on modern wireless protocols for communication and, more importantly, generate the necessary electricity themselves, which means they are not dependent on batteries. As a result, they give investors unprecedented flexibility in outfitting new commercial buildings. Space whose purpose or use is not yet known can be placed into service with one or two room thermostats and a couple of transmitters and switches for lighting and shading without having to lay any new cables. A tenant can add to these systems almost at will and integrate them into the building control technology.

Smart scenarios, intelligent data analyses

Not only is this practical, it also permits entirely new, smart scenarios. For example, it is possible to mount light switches directly on workstations or place a master switch right at the entrance. In addition, economical sensors enable the room climate to be precisely monitored. All end points can transmit their data to a central system, which evaluates the information and makes decisions according to the requirements. The system is not limited to temperature. With the right sensors, for example, consumption values, air quality or usage frequency can also be

"Bau 1" in Basel sets new standards in terms of energy efficiency and maximal flexibility.

detected by the minute and made available to the building operator or tenant.

The best part is that the data itself is not tied to a specific purpose. Tenants or the operator can use the information for their analyses. Investors can do the same to track the value of their property over a long period of time. It is even possible to evaluate the data again at a later point in time, for example when technologies such as the Internet of Things make it possible to develop new business models.

EnOcean and the EnOcean Alliance: Partners to builders and investors

In addition, EnOcean-based products support common home automation standards and products via gateways, including, for example, KNX, BACnet, LON, M-Bus and Modbus.

The great benefit of adopting standards-based products is that investors not only retain flexibility in constructing the commercial building but also in their selection of the mobile devices. So what if a manufacturer's design no longer fits the purpose or the product is no longer available? No problem. The EnOcean ecosystem will offer a suitable alternative that is compatible with existing systems.

The fact that existing systems can be converted or upgraded at any time is particularly attractive to building owners. For example, if a new tenant moves in and wants to reorganize the partition walls, the amount of work involved remains minimal. The energy-harvesting wireless devices can be easily moved, placed elsewhere or added and integrated into the central building management system without problems. This approach is also beneficial if a tenant relocates. For example, it allows furniture to be planned without having to take inconvenient switches into account.

Real experience instead of big promises

Self-powered building automation systems using energy harvesting technology based on the EnOcean standard are in use in more than 400,000 buildings throughout the world now rely on products with EnOcean technology. One recent example is "Bau 1" in Basel, Switzerland. The building is a 41-story structure that operates with maximum energy efficiency and flexibility, thanks to Sauter and EnOcean products.

Both the building space and the building management system have a modular design. It takes just a few clicks of the mouse in the management system to convert individual offices, for example, into an open-plan layout. The room operating devices, a Sauter ecoUnit with EnOcean technology, are wireless and operate without batteries. The necessary energy is generated directly at the switch via highly efficient solar modules that work for up to five days even in complete darkness.

This is where flexibility comes to bear: if an office is renovated, all that is needed is to remove the switch units and remount them in the new location. Once the individual products have been moved to their new location in the central building management system and linked to the suitable control systems (for shading or temperature control, for instance), they are ready for use. This

saves a great deal of time compared to systems that depend on separate cables for electricity and data transfer.

Another specific example are the **ADAC headquarters in Munich**. More than a third of the 6,800 ADAC employees work in the new building, whose energy efficiency had to meet special requirements – especially in terms of lighting. General areas are illuminated by so-called downlights, which adapt to ambient conditions such as the time of day and amount of sunlight. Additional LED floor lamps are placed at the workstations to guarantee optimum lighting conditions.

To enable the individual areas to change quickly, the electrical installation was standardized and equipped for maximum flexibility. Alliance partner WAGO made this possible: "We equipped nearly all the switches for lighting and shading with the EnOcean wireless standard," explains Markus Lamers, who is responsible for building systems and building automation at ADAC. "We wanted to use an open system rather than a proprietary one." The company has accomplished this goal. More than 40,000 data points supply the information to the building control system, and more than 900 WAGO controllers are in use. Lamers praises the building's flexibility: "The great advantage is (...) that a suitable interface card is available for each task."

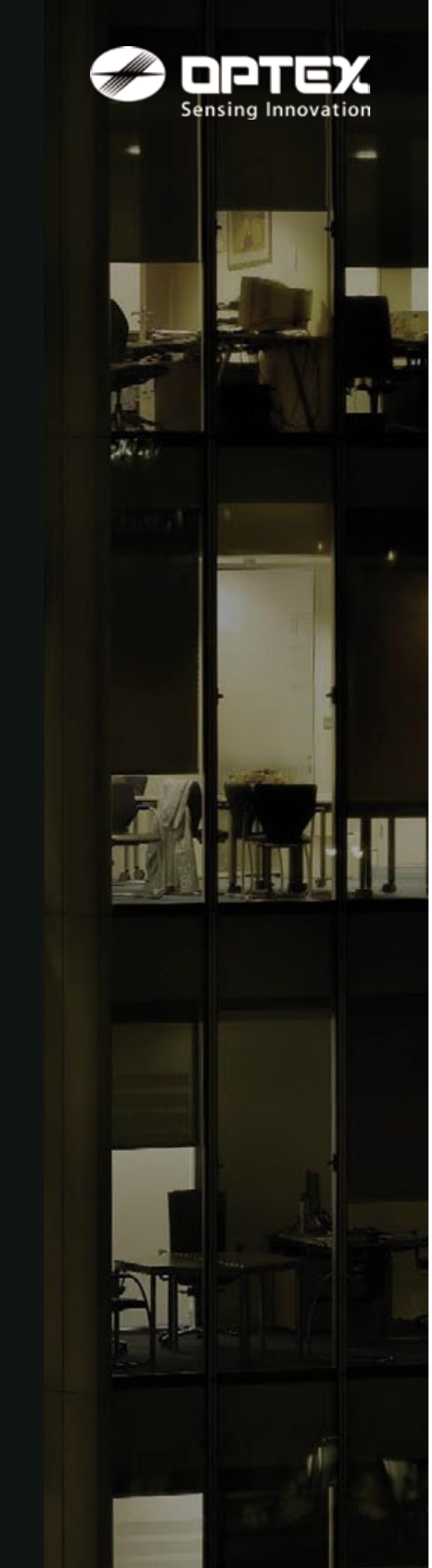
Time savings, flexibility, future viability

Studies have shown that decoupling the inner walls and electrical system alone provides significant time savings during a renovation. These time savings mean more income and fewer limitations. These factors can be expanded even further with EnOcean. Thermostats, sensors and other end points can be flexibly removed and relocated, larger systems can be stored away in the ceilings and then reused over and over again. The actual intelligence lies in the building control system and, once installed, needs to be removed only when maintenance or an upgrade is needed. When tenants change their floor plans, this can be done in the system with a minimum amount of effort, and the building systems can be adapted accordingly.

The EnOcean products impressively demonstrate how the often-quoted buzzword, "the Internet of Things," can be implemented in concrete terms. Owners of commercial buildings can thus give their tenants a flexibility that would have been unthinkable just a few years ago – and thus protect their own investments for years and decades to come.

www.enocean.com

Thanks to EnOcean technology, the energy-efficient lighting of the ADAC headquarters in Munich ideally adapts to workplace requirements.



OPTEX
Sensing Innovation

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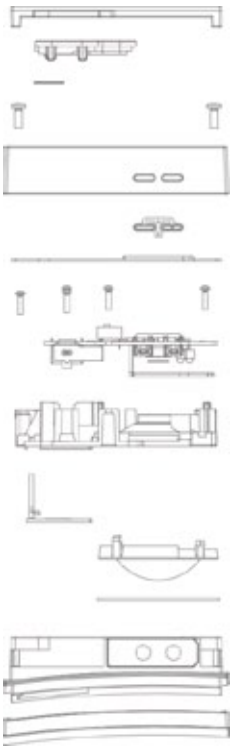

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* TEMISH(R) is product of Nitto Denko Corporation

IBM brings cognitive to the Internet of Things

The rules are that there are no rules! Traditional computing systems are designed to handle specific scenarios and data sets, but with the Internet of Things, or as it's affectionately known, "IoT", data comes together from a wide variety of sources. Data from traditional enterprise systems, images, videos, sound and the IoT devices themselves is being used with data from social media, weather or geo-location, which provides the context and relevance that sharpens insights. IBM has moved past simply collecting IoT data and is now using cognitive capabilities to put the physical world to work.

By Neil Postlethwaite, Director IBM Watson IoT Platform and Device Ecosystem

Photo above: Specific sensors monitor body functions and environmental parameters to increase safety in workplaces under extreme conditions.

IBM Watson IoT Platform

At IBM, the Watson IoT team provides capabilities specific to industries (for example automotive, electronics, insurance), horizontal applications (including building and facilities management, asset management), systems engineering tools and the IBM Watson IoT Platform that ties everything together. This is a highly secure, scalable and open platform that allows easy entry into Internet of Things initiatives for developers and engineers. With capabilities around IoT device connectivity, data and information management, risk management, and advanced analytics, IBM cannot only help companies collect and access data, but also glean insights from it that will change the way of thinking about business. This provides for a special solution when combined with the cognitive analytics capabilities from IBM, which are all available to developers over APIs.

Does end-to-end solution sound like a buzzword? Maybe. But with the Internet of Things, you need one. The IBM ecosystem of IoT partners provides value from helping to

select and connect embedded devices and creating first IoT applications, to employing solutions built for specific industry applications. Digital Concepts, element14, and EnOcean provide products for IoT kits that are "Ready for Watson IoT"-certified, indicating that they have pre-built solutions which are already integrated into the IBM Watson IoT Platform.

Intelligent cloud-based solutions

Internet of Things use cases are so varied, it is hard to pick one, or two… or three, but here are some of the recent exciting announcements from IBM:

- **Local Motors** debuted "Olli", the first vehicle to utilize the cloud-based cognitive computing capability of IBM Watson IoT to analyze and learn from high volumes of transportation data, produced by more than 30 sensors embedded throughout the vehicle. The platform leverages four Watson developer APIs – Speech to Text, Natural Language Classifier, Entity Extraction and Text to Speech – to enable seamless interactions between the vehicle and passengers. An amazing experience.

- **North Star BlueScope Steel** is applying IBM Watson Internet of Things technology and wearable devices to help protect workers in extreme environments. The IBM Employee Wellness and Safety Solution identifies potentially problematic conditions by collecting data from various sensors that continuously monitor the worker's body temperature, heart rate, galvanic skin response and level of activity, correlated with sensor data for ambient temperature and humidity. The solution then alerts North Star management so they can provide personalized safety guidelines to each employee.

- **ISS**, a leading global provider of facility services, has signed a commercial agreement with IBM to use the power of Watson IoT to transform the management of over 25,000 buildings around the world.

The possibilities are so endless; you may not know where to start. Throughout the IBM digital, self-service IoT platform, you can get going right away. Use the IBM developerWorks recipes, which let you combine elements from existing projects your peers have submitted and use them to jump-start your own. Then contribute back to the community by sharing your materials and inspiring someone else.

Check out ibm.com/iot to find the latest details on inspiring use cases, platform enhancements, ecosystem partnerships and resources for developers. Start your IoT project today!

www.ibm.com/iot
www.enocean.com/ibm-iot-kit-recipe

Thanks to the cloud-based cognitive computing function and integrated sensors, "Olli" moves all by itself.

Business Partner IBM

Ready for
IBM Watson IoT

EnOcean now "Ready for IBM Watson IoT"

EnOcean is proud to be one of the first IBM Business Partners to use the mark "Ready for IBM Watson IoT". EnOcean joined forces with element14, Digital Concepts and IBM to introduce the certified "Intelligent Building – Self Powered IoT Solution" kit, which is an Enterprise Edition using IBM Watson IoT Platform and self-powered EnOcean-based sensor solutions for Real Estate Management. This kit cleanly integrates with Watson IoT to securely connect and manage devices, analyze data, and apply cognitive services.

www.enocean.de
www.ibm.com/internet-of-things/partners/en-ocean/

Self-powered IoT solutions

Global electronics distributor and online community element14 is launching two cutting-edge Internet of Things (IoT) starter kits that tap into technologies from EnOcean and IBM. Both Entrepreneur and Enterprise editions provide out-of-the-box Pi-based solutions for both makers and industrial applications.

By Jas Gohlar, Technology Development Manager, element14

Raspberry Pi 3 model B

By Sven.petersen - Eigenes Werk, CC-BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=47335669

Both kits feature energy harvesting wireless sensors from EnOcean, and provide seamless integration into the IBM Watson IoT Platform. The Entrepreneur kit includes EnOcean self-powered sensors, a Raspberry Pi and an EnOcean Pi board, and provides access to the IBM Watson IoT Platform and BlueMix service from IBM. The Enterprise model includes a smart EnOcean Gateway from Digital Concepts and EnOcean OEM self-powered sensor, which integrate directly with the IBM Watson IoT Platform and IBM BluemiX as well as TRIRIGA, the facilities management software from IBM.

Flexible and cost-effective

Using the popular Raspberry Pi single board computer, these out-of-the-box, IoT-ready starter kits are flexible and cost-effective gateways to developing intelligent building products for hospitals, homes, airports and other venues on the way to a seamlessly connected IoT. The Entrepreneur kit is more technical in nature, for 'makers,' engineers and start-ups, while the Enterprise model caters to facilities mangers, property owners and property management companies.

Self-powered wireless devices for smart buildings

Self-powered wireless sensors and switches from EnOcean are ideal for smart building applications. No cables or batteries are required to switch lights, control blinds and acquire sensor information including temperature, humidity or presence detection. Sensors and actuators can directly communicate with each other, or they can be controlled through an central server. Users can also use them in smart building applications that require remote sensing and remote control via PC or smart phones.

Connected to the cloud

The IBM Watson IoT Platform allows organizations to securely and easily connect devices, ranging from chips and intelligent appliances to applications and industry solutions. Scaling through cloud-based services and using rich analytics, the IBM Watson IoT Platform provides organizations with new insight for innovation and transformation. IBM TRIRIGA provides a single system to manage the lifecycle of facilities. Its integrated workplace management system increases the operational, financial and environmental performance of facilities.

www.element14.com

Internet of Things – identifying trends and seizing opportunities

Consider the following: a major manufacturer of DSL routers upgrades its products so that they support the EnOcean wireless protocol. Or Z-Wave. Or digitalstrom. Or Bluetooth. Or all protocols at once and even others. As a result, this router can communicate directly with corresponding sensors and actuators in the building. If a small application program is also added to the router, making it possible to visualize states and turn actuators on and off from an app, this router then becomes a versatile smart home controller.

By Prof. Dr. Michael Krödel, Head of Institut für Gebäudetechnologie GmbH

Smart devices

When you buy a new TV or HDD recorder these days, they usually already come with an integrated WLAN interface. There are lamps that communicate via wireless protocols. In the near future, every coffee machine, every stove and every motor for blinds will presumably come with an integrated wireless or powerline interface as a standard feature. Intelligence and the ability to communicate are thus migrating to devices. Instead of being placed in front of a coffee maker or stove, a switch actuator becomes part of the appliance. The user benefits from much higher functionality, since the integrated actuator allows the appliance to be turned on directly.

The central universal device does not necessarily have to be a router. In many cases, a separate device may make more sense. As a result, a number of alliances are being formed in the struggle for the integration platform "at the core," such as the AllSeen Alliance, the Open Interconnect Consortium, the Thread Alliance and EEBus, to name just a few.

The future of IoT

Rather than the technical functions, it is the marketing strategies and access to the end customers that determine the winners and how the market shares are divided up. Although this development will not completely push aside the current trends in bus systems or dedicated smart home controllers, the IoT scenario will nevertheless carve out its market share, even if it is still unclear who will hold the the majority share in the particular technologies five or ten years from now. One thing, however, is certain: to become successfully established in the IoT segment, it must be possible to integrate the products into cross-standard solutions (as is possible with EnOcean technology). Ultimately, the IoT trend cannot be ignored and should be taken into account in business strategies.

www.igt-institut.de

A new world of working in Munich

In 2016, 1,900 employees at Microsoft move into its new German headquarters in Munich. As one of the most modern office buildings in Germany and offering multifunctional rooms and spaces, it represents the workplace of the future. LEED certification underscores the sustainability of this green building, and the integrated room automation solution from SAUTER plays a major role in this achievement.

By Bernd Joachimsthaler, Sales Systems, SAUTER Deutschland, Sauter-Cumulus GmbH

The cutting-edge, new atrium building at Parkstadt Schwabing in Munich has a floor space of around 31,000 m². Reflecting the motto "A new world of working", it creates the perfect backdrop for modern-day staff collaboration, deploying the latest technology and fostering employees' skills. This is made possible through open spaces, meeting places for exchanging ideas and quiet areas in which to concentrate or simply relax.

Live integration in a mock-up construction

The building contractor opted for integrated, easy-to-use building management. This means that the office building operates at maximum energy efficiency and users enjoy a comfortable room climate. A modular, scalable solution based on SAUTER's EY-modulo 5 system range was chosen.

With SAUTER supplying the building and room automation systems, the new building features sustainability and optimum climate control.

With SAUTER providing a sample version of the solution proposed, the clients could test the system live and see its performance and user-friendliness for themselves...

A web client for room users and facility managers

When the contractors selected the monitoring and control solution, key requirements included easy and direct operation of the building management system. This was achieved through smart integration of SAUTER Vision Center with SAUTER moduWeb Vision – providing users with the exact level of functionality needed. Operated intuitively, the SAUTER moduWeb Vision solution allows office users to adjust room conditions, such as temperature, lighting and sunshade, directly from the browser on their work PC or tablet. At overall system level, the SAUTER Vision Center visualisation and control solution enables facility managers to regulate each HVAC installation from any location and at any time.

Lower running expenses through automation

To meet employees' individual needs, cable-free room operating units SAUTER ecoUnit110 – with EnOcean wireless technology – are also installed. In 800 or so rooms spread over the nine storeys – two underground and seven overground – 280 SAUTER ecos504 and ecos500 room automation stations create the ideal climate using the BACnet/IP network protocol.

Building administrators also benefit: the solution offers, for example, demand- and presence-controlled lighting. Around 1,600 DALI light sensors automatically switch the energy-saving lights on and off. This ensures that there is always adequate lighting with minimum electricity consumption. SAUTER's integrated room automation package also regulates the heated and chilled ceilings and uses the sun's position to adjust the shading. Because all equipment systems are completely automated, running costs are reduced further. This intelligent solution provides employees with comfortable office conditions. As the LEED certification testifies, energy demand is kept to a minimum. All in all, a sustainable win-win situation.

www.sauter-cumulus.de

The cutting-edge, new atrium building at Parkstadt Schwabing in Munich radiates a transparent, friendly atmosphere.

Bespoke lighting control system à la carte

The Italian company NTK Europe has engaged Helvar S.r.l. to adapt and modernize the company standards as well as the lighting. They developed a lighting control system that can be integrated into other automation systems to reduce operating costs and increase the comfort of employees.

By Maria Chiara Salvanelli, Public Relations, Helvar S.r.l. Italy

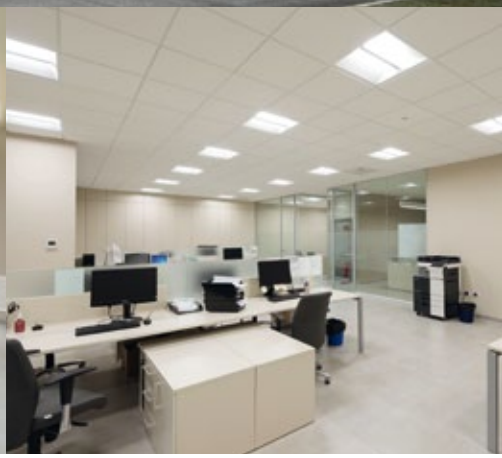
Founded in 1997, the Italian company NTK Europe specializes in producing high-precision mechanical components from customer drawings and operates mainly in the hydraulic applications segment.

The company has two buildings in operation in Brandico, near Brescia, in Italy, housing production and administration facilities.

From pilot project to company standard

The lighting project – made by Alessandro Baresi – kicked off with a preliminary study on the economic costs of management that led to the decision to use high efficiency dimmable LED sources, almost everywhere in the areas, and regulate them through a control system.

The work started with an initial pilot project, which involved the newest plant. The results were more than satisfactory, so the company decided to continue and upgrade all lighting at the NTK headquarters. A competition won by everybody working in the team showed the company management that a flexible and adaptable system can be more effective and efficient when it comes to energy savings and visual comfort.



Batteryless and wireless solutions provide optimal and energy-efficient lighting.

Centralized system

The manufacturing plant and office building on the premises are managed from one centralized system, which is interposed with two Helvar 910 and 905 DIGIDIM routers. They actuate the luminaires via the DALI bus. The light output is controlled by dimmers. Light and presence sensors also allow for the lighting scenarios to be adjusted on the fly, especially in the various production sections, which are divided into several areas. They are regulated and managed separately using light and presence sensors, depending on the production requirements on the shop floor.

The end result transforms NTK into a switchless company, where everyone can enjoy the same visual comfort and work in an environment offering the highest quality standards.

Another positive aspect of the Helvar control system is that it communicates with the alarm system via the intrusion control unit: the person who switches on the alarm at night automatically switches off the lights and vice-versa in the morning when turning it off.

For Helvar, NTK is a synonym for high quality products, customized design and support and a futuristic vision fully shared by the entire company.

Self-powered and wireless solutions

The executive offices at NTK Europe are made of glass and plasterboard walls and are managed in wireless mode using two 434 EnOcean gateways and seven 18xx EnOcean switch panels.

The EnOcean Gateways are mounted on the ceiling, and connect to the DALI network via a standard 2-wire DALI cable. It is simple to integrate EnOcean wireless and batteryless switches into a Helvar lighting network and the “434 gateways” are controlled by seven “18xx” EnOcean switch panels” that are used as user interfaces for managing the light switching functions and recalling different lighting scenarios. The switch panels, made of stainless steel frame, are also self-powered and integrated into the router system via the “434 EnOcean Gateway”.

www.helvar.com

Wireless and batteryless container-type smart buildings

As a new architectural form, container architectures are now more and more widely applied to the construction field. The advantages of fast installation and stackable features make architecture more creative and flexible. **By the Marketing Department, Nanjing Putian Telecommunications CO., Ltd.**

The investment center located in Putian's industrial park adopts this kind of architectural form full of modern flavor. The whole building also features a wide variety of wireless and batteryless products from EnOcean, such as switches, dual channel actuators, occupancy sensors, temperature and humidity sensors, door contacts, CO_2 sensors and also a gateway, which can reduce energy consumption, save on lots of cables and are also easy to install when the architectural layout changes.

Automatic building control

In the exhibition room on the first floor, the lighting system can be controlled automatically by occupancy sensors. When visitors enter, the lights are turned on automatically and are turned off after the visitors leave. When the indoor temperature (or lighting) level increases, the electric curtain, controlled by temperature and humidity sensors and light intensity sensors, wind down automatically to save on air condition energy consumption. The windows are opened if CO_2 sensors detect a high concentration of carbon dioxide. All the sensor and actuator statuses are visible on an iPad or smart TV with the data transmitted over a gateway and controlled by an app on the smartphone.

In meeting rooms and other office areas, more wireless products from EnOcean have been installed in order to provide convenience and save energy at the same time.

For homes and small offices, Putian develops an app named "EasyHome" and an EnOcean WiFi gateway. Users can control

Efficient energy management thanks to the illumination sensor with EnOcean technology.

The self-powered radio-based switches can be positioned flexibly – even on glass surfaces.

the actuator or view the sensor status remotely. This app lets users create automatic scenes using time, location, sensor, status and other options. After the setting process is complete, users no longer need to operate the phone and can simply benefit from automatic control. This system achieves intelligence with ease!

www.putian.com

The EnOcean-based products used by Putian.

Production Hall of Fame

DALI and WAGO light management systems make production hall lighting flexible and efficient

It measures 25,000 square meters, making it approximately the same size as three soccer fields. WAGO invested approximately 20 million euros in its new punching shop. The building, where furniture was built until the end of 2014, has been completely gutted over the past few months. The production hall also received a new lighting system during the course of the renovations.

Automation is the basis for light control

The WAGO light management system is based on the new generation of PFC200 controllers, to which I/O modules from the WAGO I/O SYSTEM 750 series were added. The key element in this interplay is the DALI bus terminal, which integrates up to 64 DALI luminaires and up to 16 DALI sensors into the system. Along with up to ten DALI bus terminals that can be operated on one controller, additional I/O modules can be connected in series for each task or each signal, for example to measure energy in three-phase power grids, for EnOcean energy-harvesting wireless pushbuttons or digital input/output signals.

Due to the total area of WAGO's production hall in Minden, a total of four automation systems are used for lighting in the facility. The four controllers are installed in separate control cabinets on the equipment platform in the middle of the building. The controllers communicate with each other and with the control center via Modbus TCP.

Modern web visualization

WAGO has implemented a special, user-friendly application on each controller that eliminates the need for users to do any programming. All settings are made with a click of the mouse during commissioning as well as during operation. Because the graphical user interface is accessed with a standard browser, there is no need to install software locally on a PC.

During the first configuration step, DALI addresses are assigned to all DALI users: the luminaires, sensors, switches and pushbuttons. They are then linked to EnOcean wireless pushbuttons or digital input and output values. The luminaires can also be grouped in so-called virtual rooms – in the Minden production hall, for example, these are the traffic routes or areas with production machines.

Workplace lighting systems must meet strict requirements. They have to be reliable and efficient and also create an optimum atmosphere as needed. Powerful automation technology offers additional benefits by eliminating programming work during commissioning and assisting technicians when it comes to repurposing and maintaining the systems. WAGO recently implemented a solution of this type in its new punching shop in Minden, Germany.

By Dirk Röscher, WAGO Kontakttechnik GmbH & Co. KG

A wide range of functions

The control software of the WAGO light management system provides a wide range of options during operation that contribute to energy efficiency, comfort and occupational safety. In addition to the standard functions of dimming and turning the lights on and off, ingenious features can be implemented in connection with corresponding sensors:

- A daylight controller, for example, dims the lights depending on the current ambient brightness, while presence detectors ensure that the lights are on only when someone is actually in the illumination zones.
- Not least, a scheduler lets users define detailed light scenarios for any day of the week and for any time of day, for example a central "lights off" scenario for the end of the work day.

Combined with DALI, the WAGO light management system offers benefits that go beyond actual light control – for maintenance, to give one example. Operating hour counters for each luminaire, for instance, permit predictive planning in predefined intervals. The luminaires also report defective lamps on request. The lamp installed in each luminaire is stored in the software, as well as an indication of which tool is needed to replace it.

Flexible light management

EnOcean technology is used, for example, in the flexible office zones and in the production areas in the WAGO facility in Minden. Among other things, the upgradable window contacts communicate with the control system in this manner.

The main reasons for using EnOcean technology are that the components are easy to upgrade and can also be easily repurposed later on. For example, pushbuttons for lights are mounted wherever the people actually go – for example, in the hallway leading to the break room and at the outer door. If these routes change over time, the EnOcean components are also flexible. This approach works so well because the systems are wireless and batteryless and permit a free logical assignment of functions.

www.wago.com

Fire department

STC-DO flush-mounted switch actuator SR04PT room operating unit

Youth club

Movie theater

Reliable, wireless and energy-efficient

Enoco AS, the Norwegian building automation specialist, uses Thermokon sensors and EnOcean technology to significantly cut energy consumption in various public buildings in Stjørdal. The savings average around 40 percent.

By Thorsten Kresin, Head of Marketing, Thermokon

Comfort, security and more efficiency – there are good reasons for building owners and operators to rely on modern building automation solutions. This is even true when one considers cost: wireless systems allow for initial installations that save both time and money while also making them flexibly adaptable to changing conditions at any time. The well-designed planning and smart positioning of sensors, receivers and antenna also guarantees flawless transmitting ranges in concrete and steel buildings. Enoco AS, the Norwegian supplier of sustainable building automation systems, successfully relies on solutions from Thermokon and EnOcean.

Demand-optimized heating made easy

Enoco came up with a powerful solution that allowed the Stjørdal fire department to dramatically lower its service charges. A manually operated heating system generated enormous service charges, for example because the heater kept running at full blast even when doors were open or at high outdoor temperatures. A modern, high-end

Stjørdal focuses on sustainable building automation in order to increase the security and energy efficiency of their buildings.

SR04PT wireless and batteryless room operating unit from Thermokon with EnOcean technology

Window contacts for increasing energy efficiency

building automation system (BAS) with wireless temperature and PIR sensors, coordinated receivers and an intelligent energy control system came to the rescue.

The new system automatically adapts to changing room parameters and thus heats the building as required. Open windows and doors are reported directly to the system control center via wireless window contacts, immediately adjusting the heating power. This approach has a noticeably positive effect on the service charges particularly at extremely low temperatures.

The new system also takes into account the fact that the fire department only uses its office space sporadically. The PIR sensors from Thermokon used by Enoco automatically detect when rooms are unoccupied and lower the heat, taking the current outdoor temperature into account. This establishes the requirements for demand-based power supply, which is additionally optimized by the wireless 0-10 V controllers for the return air valves and the wireless on/off controller. A positive conclusion after two years of operation: the system works flawlessly and reliably, thereby significantly improving energy efficiency.

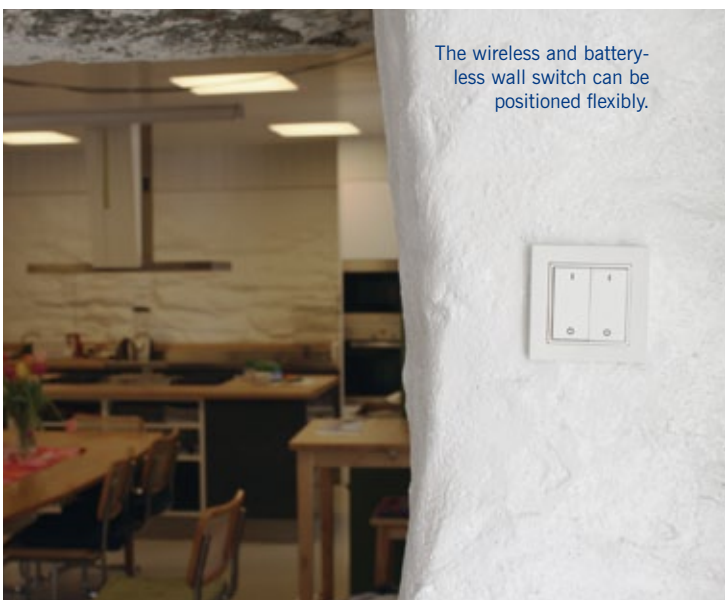
Hybrid solution for the youth center

It turned out to be a challenge to integrate wireless technology into the Stjørdal youth center, which was built in the 1960s, due to the building's mainly concrete construction, making it difficult to use wireless systems. Enoco therefore came up with a hybrid solution that combines wireless data acquisition, using Thermokon sensors and EnOcean technology, with wirebound control of the actuators. All measurements, including the CO_2 values, are now collected and processed by the wireless server and the programmable logic controller, while the floor heating system continues to be operated with local cabling. Once again, the energy savings are in the high double-digit range.

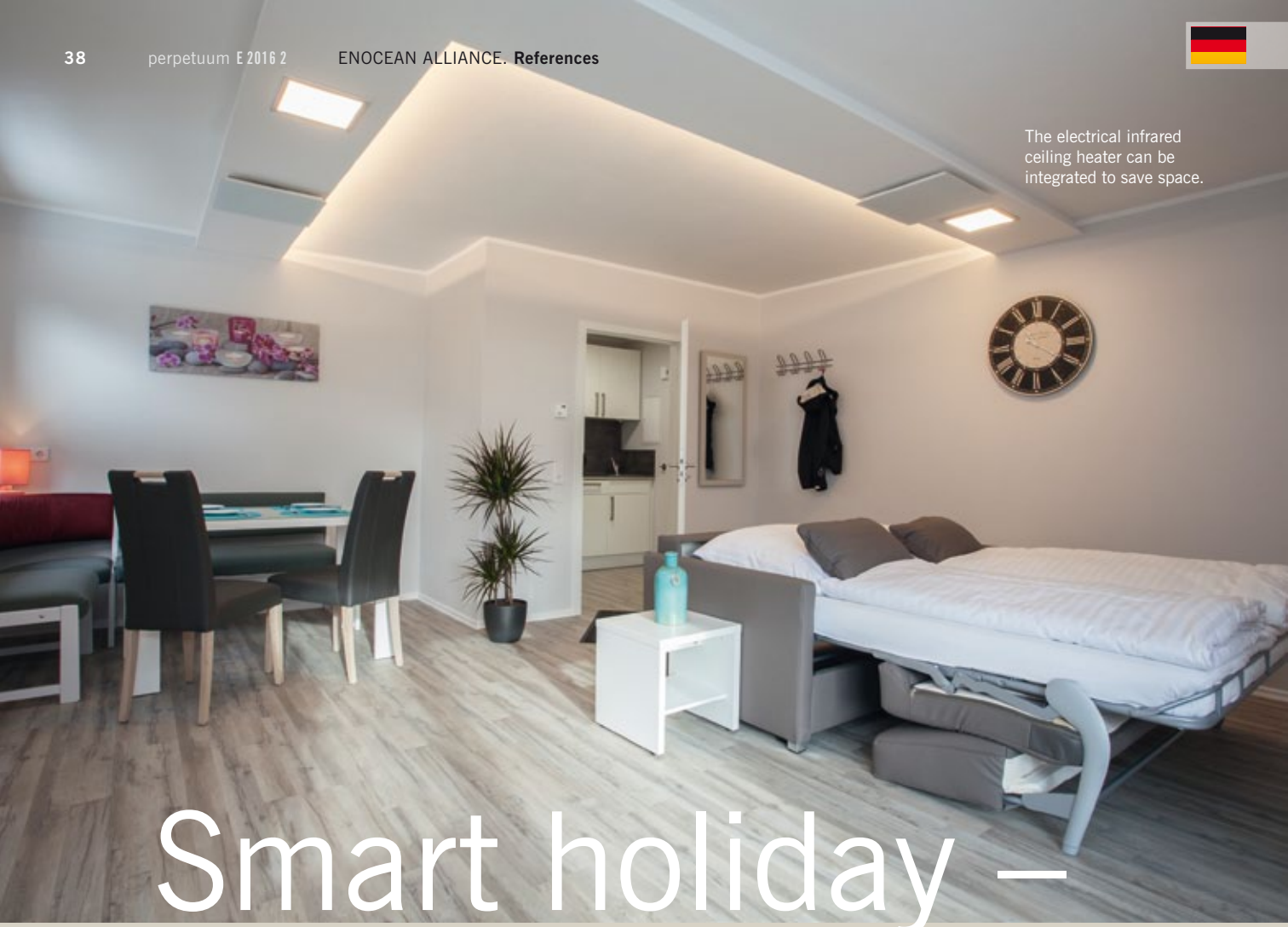
Intelligent combination of heating and ventilation

Visitors to the Stjørdal movie theater, which Enoco also updated to the state of the art when it comes to energy efficiency, can also watch movies while breathing the freshest air and enjoying pleasant temperatures. The sustainable building automation specialist extensively modernized the heating and ventilation system in the 40-year-old building and installed wireless temperature and CO_2 sensors. As a result, the operators are more than satisfied. Recycling the used air significantly helps save energy by as much as 50 percent.

www.thermokon.com



The wireless and batteryless wall switch can be positioned flexibly.



The electrical infrared ceiling heater can be integrated to save space.

Smart holiday – EnOcean technology optimizes holiday park

Word has gotten around that smart homes not only improve security and comfort, but can also lower energy costs. The following project shows that this technology can be successfully applied to existing vacation spots as well.

By Günther Ohland, freelance journalist and book author in Paderborn, Germany

A holiday park consisting of several half-timber houses with 40 apartments, built in the 1980s, was about to undergo extensive renovations in Winterberg, North-Rhine Westphalia. The old, uneconomical night storage heating system needed to be replaced. Situated in the Hochsauerland district, Winterberg is not a secure snow region. When snow falls, crowds of avid skiers spontaneously arrive from the neighboring Netherlands to spend a few days on the slopes. This is a difficult situation for night storage systems, since the night storage furnace has to be turned on the night before in order to heat the apartment to a comfortable temperature, i.e. without the owner knowing

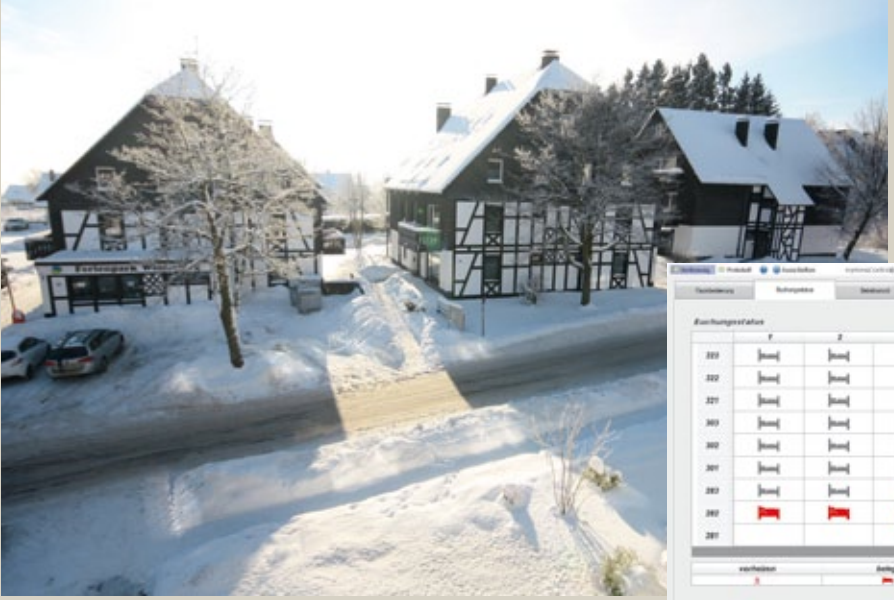
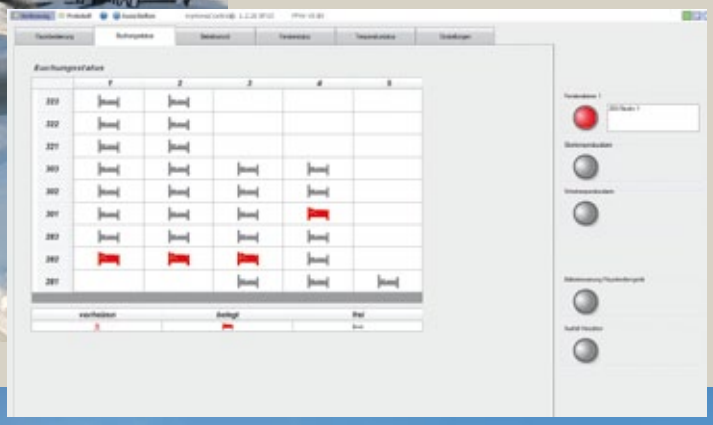
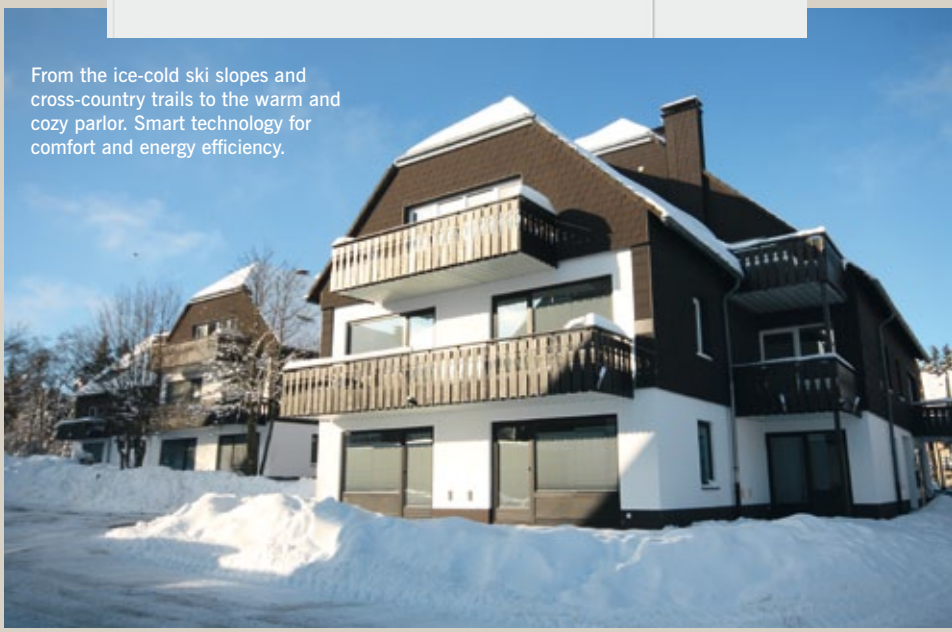


Photo left: The holiday park was able to lower its energy costs by successfully upgrading its heating system.

Photo bottom: The reception is always “in the picture,” thanks to EnOcean and myHomeControl.



whether the space is actually going to be rented. In carrying out the renovations, the only choice was an electrical heating system, since a hot water heater would have significantly increased the cost of the project. GdS Energie GmbH, which owns the property, quickly decided to go with a fast-acting infrared heater from Vitramo. The operator wanted to be able to turn this heater on and off from the online reservation system. At the same time, the guests should have the option of setting a comfortable temperature on their own.



From the ice-cold ski slopes and cross-country trails to the warm and cozy parlor. Smart technology for comfort and energy efficiency.

Intelligent building management

The contractor, NTT GmbH from Wünnenberg-Haaren, chose sensors and actuators from Thermokon, based on EnOcean energy-harvesting wireless technology, and the myHomeControl control software offered by the Swiss manufacturer BootUp. A temperature sensor with an integrated setpoint generator was installed in every room. This sensor allows guests to adjust the target temperature set by the system by +/- 3°C. In addition, the rooms are equipped with window sensors that enable the electrical heating system to be turned off automatically when the window is open. The sensors are taught in directly on the actuators, which switch the infrared heaters, as well as in the BootUp central system. This ensures that the heaters in each room continue to operate if the central computer fails. The function of the myHomeControl central system is to receive data from the online reservation system and to switch the heating actuators for the booked rooms so that the holiday apartment is heated to a comfortable temperature when the guests arrive. After the guests check out, myHomeControl lowers the heat in the relevant holiday apartments to the standby temperature.

Flexible & scalable

A monitor for visualizing and operating the individual room control system is placed at the reception. The server running the myHomeControl software receives the data from the booking portal via an API interface. The software makes it possible to evaluate problematic situations such as “room temperature too hot or too cold” or “window opened” in an unoccupied room. When choosing the software, the owner went with myHomeControl not least because of its flexibility and scalability. This software is independent of hardware manufacturers and supports all EnOcean products as well as other standards, such as Modbus for photovoltaics, battery storage and heat pumps, the CAN bus and CAN-Open, 1Wire, IP, XML and SOAP. Other systems, such as KNX and Allnet, are in preparation. All planned upgrades can thus be both implemented and maintained under a single programming and user interface.

www.ntt24.de
www.myhomecontrol.ch

EnOcean lighting solution contributes to the preservation of cultural assets

Looking ahead to the 2020 Olympic Games in Tokyo, Japan has turned its attention to the tourism industry and urban renewal in particular. In the latter case, data transmission using EnOcean technology offers numerous advantages, such as a reduction in construction work and significant energy savings.

By Rohm Co. Ltd.

At the same time, it also results in many benefits for the tourism industry. Japan is very proud of its tourist attractions such as shrines and temples. The EnOcean lighting solution is the optimum option for lighting and staging these cultural assets. The lighting not only provides attractive illumination, but also contributes to the preservation of the national treasures in the long term, doing away with concerns about conservation.

Cultural treasures include not only Buddhist statues, but also floors, walls and pillars. Thanks to the company's own LED lighting technology and EnOcean's batteryless wireless technology, Rohm Co., Ltd. is now able to offer a lighting solution that optimally illuminates cultural assets while at the same time preserving them.

The special features of the EnOcean lighting solution are as follows:

- ➔ LED lighting produces a minimal amount of UV rays, which slows down the deterioration process of the cultural goods.
- ➔ The light falls in a way that it is comfortable to the eye and reminiscent of the light of a candle.
- ➔ Cables do not have to be installed, so that the view of the cultural treasures is not impaired.
- ➔ The use of cables could damage the cultural goods and increase the fire risk.
- ➔ Batteryless switches do not require any maintenance work.
- ➔ It represents the best solution for situations in which the light-staging aspects need to be changed.

Such a system, which facilitates the preservation of cultural assets, is highly valued in Japan. For this reason, use of such a lighting

Shimogamo shrine

solution for cultural treasures is expected to become more popular.

Rohm Co., Ltd. is a manufacturer of electronic components headquartered in Kyoto, Japan. The company will continue to offer solutions that contribute to the preservation and expansion of cultural assets in Kyoto.

Taima Temple, Nara prefecture

The Taima Temple was built during the Asakusa period (552-646), and includes a large temple complex in the style of the Hakuho/Nara era. The main hall is home to the statues of Maitreya (Buddha) and the four heavenly kings, as well as art pieces from the Hakuho era, which represent historic treasures of the temple (where they are also stored).

In January 2014, the EnOcean lighting solution was used in the three main halls of the temple (Hondo, Kondo, Koudo). Previously, it was very dark in the main hall, but now visitors can finally see the mandala of the Buddhist altar (national treasure) in all its glory, including the details.

Kamigamo Shrine, Shimogamo Shrine, Kyoto prefecture

From October 30 to November 8, 2015, the Kyoto Heritage Preservation Association held an event for the 51st time at the Kamigamo and Shimogamo shrines (among others), where the EnOcean lighting solution was used for night lighting purposes.

This event, which started in 1965, aims to raise public awareness for the preservation of cultural assets. This was the first time that night lighting was used at two locations (Kamigamo and Shimogamo shrines). Two traditional dances were also performed at both shrines. An EnOcean switch was used for the change-over of stage lighting. The different light scenarios had the effect of making the dances much more vivid.

www.rohm.co.jp

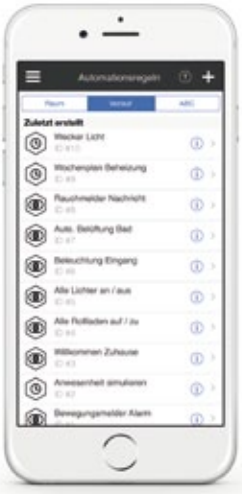
Taima-temple

Kamigamo shrine

New model house with smart home control

Schwabenhaus has opened a new model house in Villingen-Schwenningen, a light-filled structure that elegantly combines the prefab home manufacturer's Da Capo and Fame programs. The house's special layout is both modern and classic in appearance and also comes with an intelligent home control system as well as an innovative energy concept.

By Schwabenhaus GmbH & Co. KG



The “Comfort” smart home comes with remote control and a router (“wibutler”). The “wibutler” system allows the entire building automation technology to be monitored and controlled from a smart phone or tablet. Residents can then control devices individually at any time, even on the go, and program individual scenarios and workflows.

Smart home control

More and more builders are focusing their construction efforts on smart homes. To meet its customers’ requirements, Schwabenhaus offers all its environmentally friendly houses with a smart home basic package, including the control of lights and blinds, as standard equipment. Thanks to this basic package, builders can sample other system components easily and at little extra cost if they so desire, or they can add them at a later time. Schwabenhaus has divided the add-on options into three smart home groups: “Efficiency,” “Security” and “Comfort.” In coming up with its smart home concept, the company selected the energy harvesting wireless technology from EnOcean, which features low energy consumption and a broad range. The new two-story model house in Villingen-Schwenningen also has the smart home system, which visitors can try out for themselves right on site – thanks to its ease of use. Along with the smart home technology, the 180 square meter building also has modern furnishings and creates a unique sense of space by combining a classic pitched roof with a cubic, flat-roofed porch structure. A future-oriented heating system rounds out the special design.

Innovative energy concept

Every environmentally friendly home from Schwabenhaus comes with a geothermal heating system as standard equipment. If boreholes for downhole heat exchangers, which are generally used for geothermal heating, are not permitted, the prefab house manufacturer offers intelligent alternatives: like in the model house in Villingen-Schwenningen, where an air-to-water heat pump with a cooling function is used. The high savings potential of this innovative concept is due to its consistent use of environmental heat from the outdoor air. The house also features a controlled ventilation system with at least 90 percent heat recovery as well as a floor heating system.

The home furthermore meets the strict KfW funding guidelines and is classified as an Efficiency House 55. It can also be built as an Efficiency House 40, if desired. To meet this standard, Schwabenhaus uses an additionally insulated ground slab, known as an efficiency ground slab.

www.schwabenhaus.de

Interoperability and efficiency in smart homes

The connectivity of different product portfolios and the control and monitoring of products via remote access plays an important role in intelligent buildings as well as interoperability of products from different manufacturers.

By Matthieu de Broca, International Business Development Director, Overkiz

Using the Overkiz Cloud platform, the multi-protocol DIN RAIL is a perfect central hub at the "technical" heart of the smart home
Image center: Bouyguess Immobilier Flexom program

With its deployable connectivity solutions, Overkiz allows more interoperability and efficiency in intelligent buildings. The company presents its white label products mainly in two product categories: multiprotocol hubs/Gateways and an IoT virtualization platform Infrastructure.

Collective housing is now natively connected

Among its customers, Overkiz helps real estate developers plan tens of thousands of natively connected homes. For instance, Overkiz and its partners are supporting Bouygues Immobilier to launch "Flexom". Based on Overkiz infrastructure and multiprotocol gateway, it consists in various packages of services and products – from basic controls, using switches and scenario programming, to combinations of lighting/shading or heating controls, to premium features like security surveillance, air quality monitoring, leakage detection or predictive energy consumption.

Overkiz EnOcean Minibox

Build around a standardized EnOcean portfolio of self-powered wireless switches and sensors, which signifcantly reduce maintenance costs. Today, Flexom packages include an option for an IO home control module. Overkiz modular solutions also support and combine various other protocols like Z-Wave, RTS, ModBus, Opentherm products. More protocols are scheduled to be added soon. All products can interact together locally without Internet connectivity whatever their technology.

With its capabilities to add protocols on-the-fly, even when products are already installed, and to add up and activate services wirelessly, Overkiz solutions are key tools for reducing follow-up costs and increasing revenues.

Economical, simple and modular

The new Overkiz DIN Rail modular box fits perfectly into the electrical cabinet, in addition to the data/voice/Internet enclosure. No need for digital skills: with an easy pairing procedure designed to simplify the installer's task, it can support up to four different protocols in parallel, added and activated at practically any time. Overall, reduction of both installation time and cabling costs allows Bouygues Immobilier to propose "smart" building at almost the same price as a regular furnished building.

www.overkiz.com

Showrooms and model houses for smart homes are no longer anything new. Those who wish to check out building technology for themselves now have an overabundance of options to choose from. Most of the technology in the model houses is based on the KNX bus system and can be connected and managed using impressive demonstration systems from well-known manufacturers.

By Oliver Fischer, Managing Director, Digital Concepts

Smart networking – showroom connects environments

The combination of EnOcean-based products with modules from Crestron enables users to easily control devices from a smartphone, tablet or by wireless remote control.

The demand for retrofits has grown at least at the same pace as the demand for new building projects. As far as Digital Concepts was concerned, it therefore made perfect sense to install energy harvesting wireless solutions from EnOcean in its new Bulthaup showroom.

As a certified Platinum partner to Crestron Inc., one of the objectives of Digital Concepts was to combine both EnOcean and Crestron technologies. The Crestron modules provide all Crestron system integrators with easy access to the EnOcean world. The modules are designed to be seamlessly integrated into an existing Crestron environment. All EnOcean devices can be addressed and controlled from the Crestron controller so that users can easily control different products from an iPhone, Apple Watch, iPad or by wireless remote control.

www.digital-concepts.eu

The OPUS BRiDGE has an integrated wireless module and paves the way for the smart home.

Bridging the gap between familiar and smart technology

The new OPUS® BRiDGE product series for lighting and shading from JÄGER DIREKT combines the benefits of wirebound installations with the freedom of EnOcean wireless technology and thereby provides easy and fast access to the smart home without a lot of planning.

By Ina Fischbach, Marketing Director, Jäger Direkt

The OPUS® BRiDGE switch makes it possible to position smart devices easily and effortlessly during routine installation work. The switch also has an EnOcean wireless module for classic flush-mounted installation. The OPUS® BRiDGE not only optimizes the radio range and operating haptics, but is also more economical overall than combining flush-mounted actuators with wall transmitter modules.

Demand-based wireless retrofits

One practical approach in new buildings is to always install the wirebound OPUS® BRiDGE switch at the door to the room – this spot is nearly always available regardless of the floor plan and room use. The wireless module in the OPUS® BRiDGE switch makes it possible to easily add more EnOcean switches and sensors to the room as desired.

There is no need for complex wiring for a cross circuit or a motion sensor, for example. Furniture placement is also flexible, and no additional cables are required. For retrofits in an existing building, the old switch only needs to be replaced with an OPUS® BRiDGE. Freely positionable wireless switches or motion sensors are then integrated to turn the existing installation into a smart one.

Prefabricated sets for easy starter installations

The electrical installer performing the work will find prefabricated, pre-trained sets easy to handle. Electrical installation firms can thus get started in the world of smart homes without any expensive training or complicated, individual building plans. Users can choose between various sets for lighting and blinds/louvers, which are shipped to the electrical installer already configured.

Starting in spring 2017, end customers will be able to use an app on their smartphones,

while a configuration tool with numerous setting options is already available for installers. This PC tool makes it easy to read out data from the switches and to link them to other components right on the screen, eliminating the need to manually interconnect the components.

The road to the Internet of Things

The next phase of development is the Internet of Things. Software visualization, remote access from mobile devices, integration of intercoms and the ability to control devices from gadgets such as a smart watch will further network the smart home. Other products available on the market, such as the Apple HomeKit and Philips Hue, can also be networked as desired.

Wide range of applications

Comfortable functions already exist in preconfigured operating modes. The new product series offers a wide range of setting options. The timer function automatically turns off the lights after a certain period of time to save energy. A daytime program can be used to easily automate the shades. Typical applications can be in entrance areas, living rooms, guest bathrooms, children's rooms and bedrooms as well as in offices, hotels or other commercial buildings. It is conceivable, for example, to add additional switches for lights and blinds in the living room. An OPUS® BRiDGE switch can be connected to the blinds motor and used to individually control the shades at each window. A freely positionable central switch can control all blinds at the same time if necessary – without any cables or batteries.

www.jaeger-direkt.com

Easy monitoring of power consumption

The solution developed by Inlon Engineering SRL enables monitoring the power consumption in small and medium-sized industrial plants in order to provide companies energy balances and key performance indicators (KPI). By Paolo Laganà, R&D Manager, Inlon Engineering S.r.l.

One of the main requirements was that the measures undertaken take over control of compressed air (kWh, Nm3 air), water (kWh, liters) and aspirators (kWh, operating hours) via standard protocols such as Modbus and M-Bus. Additionally, the solution should be capable of processing more than just trends and data. Another requirement was to generate performance indicators, such as for compressed air, water, and aspirators. Finally, the solution should perform reporting and dashboard visualization.

Wireless monitoring for industrial sites

To achieve these goals, and avoid wiring, which would still cause a delay in the implementation of the solution, Inlon Engineering used RF power meters from EnOcean, then converted to Modbus for integration into the fieldbuses used by the power measuring devices.

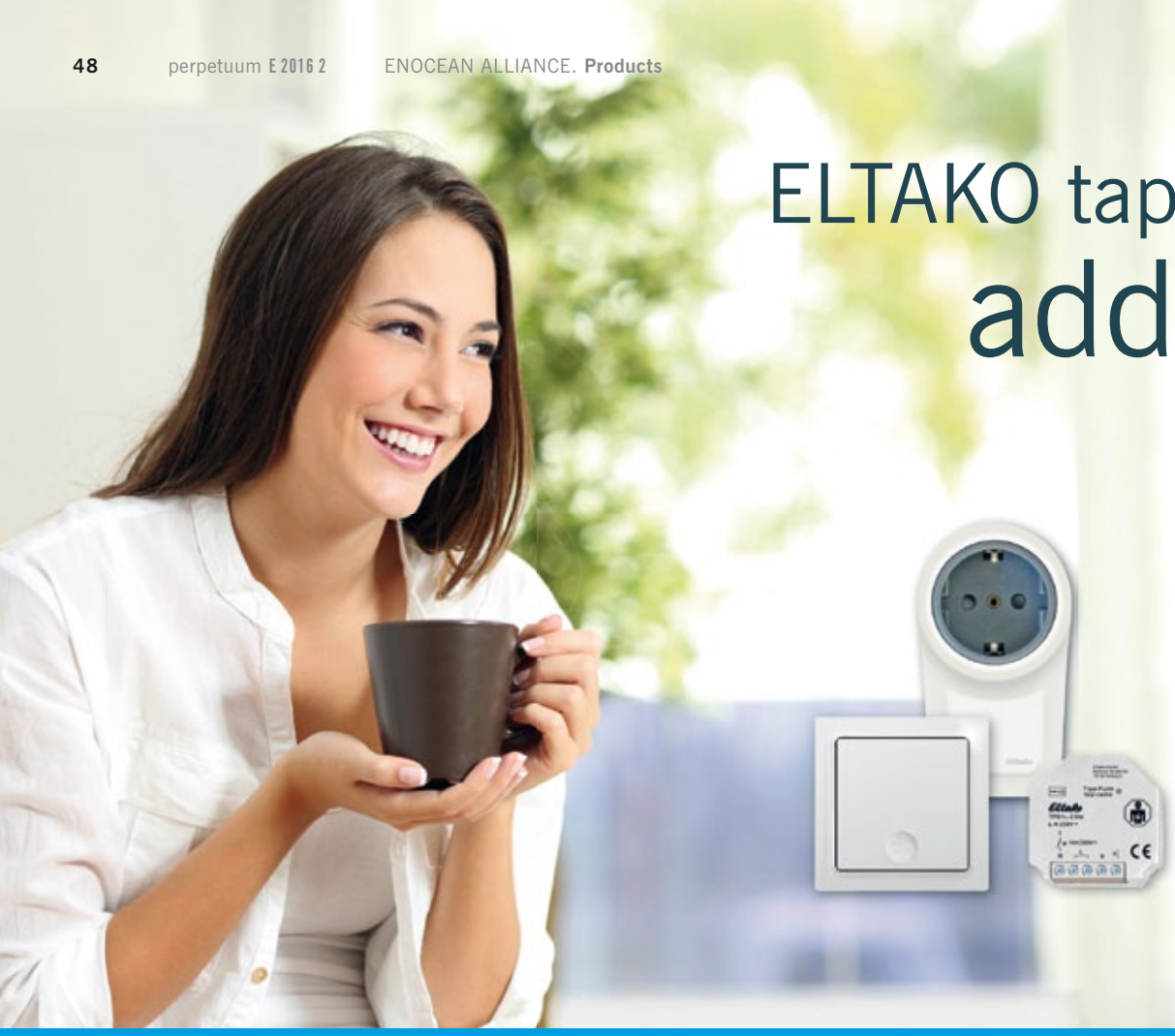
The device used is the Pressac Sensing wireless CT Clamp. Powered from the measured conductor itself, the measured current value is reported every 10 seconds (or every 30 seconds if the current is found to be below 3A) using the industry standard wireless EnOcean protocol. Capable of measuring currents up to a maximum of 63A (50 Hz or 60 Hz), the Pressac Sensing Wireless Current Transducer is easily installed with no disturbance to the measured conductor.

For monitoring, the Loytec platform was used, with a web server that allows taking data from the fieldbus, preparing it for display on the monitoring PC with a dedicated graphics management software.
This architecture allows the local area network (LAN), already available for business management applications, to be used to access the graphics display pages via the Internet remotely, making it easy to use and store the company's systems management data, thus allowing for considerable savings in time and money.

www.inlon.it

The batteryless and wireless CT clamp allows for simple and reliable monitoring of the power consumption without cutting off the current.

ELTAKO tap-radio® addition



Convenient and upgradable

The intuitive socket actuators from the Eltako 'Private' series give end users a wide range of options for economically controlling their home electrical installations without requiring assistance from trained specialists. All actuators are optimally designed for their specific task so that simply tapping the pushbutton conveniently teaches it in on actuators with different functions, without requiring any rotary switches, thanks to the tap radio technology. The tap-radio® system can easily be enhanced with the 'Professional' series. Once installed by an electrician, new buttons, window contacts, motion sensors and temperature controllers can be taught in on tap-radio® actuators already installed in flush-mounted sockets without any further manual intervention.

The Eltako tap-radio® series can be easily and economically added to your existing electrical installation.

– convenient

to home electrical installations

The easy-to-install technology gives users a simple and cost-effective addition to their home electrical installations. All tap-radio® pushbuttons are wireless, some of them even batteryless, and can be glue- or screw-mounted at any desired location. By Stephan Rüth, Head of Advertising, Eltako GmbH

PLUG IN TEACH IN SWITCH ON

Comprehensive building automation

The Eltako tap-radio® leaves nothing to be desired, even where building control is concerned. The powerful wibutler pro home server is the command center for an interdisciplinary tap-radio® home automation solution with visualization capabilities. It combines a wide range of wireless sensors and actuators and can even operate in offline mode via an integrated access point without an online connection. Tap-radio® devices can be networked, automated and controlled with just a few clicks in the wibutler app. You can thus create refined lighting scenarios from the comfort of your couch. The system can also be used to conveniently and automatically control the blinds when the residents are away, monitor the room temperature, windows and doors and also keep an eye on the home via a camera while on the road. The tap-radio® makes all this and much more possible via remote access from a smart phone or tablet running the wibutler app.

www.eltako.com
www.tap-radio.com

Tapping the wireless pushbutton easily and quickly teaches it in on the actuator.

Smart lighting

Digital lamps from Bruck feature versatile control options: as a starter solution with EnOcean push buttons, or as a complete solution for the smart home with the Homission gateway. By Dirk Wortmeyer, Development and Product Management, Bruck

"If it works with a smartphone, it has to be smart..." According to this motto, the market is flooded with quick solutions for controlling the lights. However, if the smartphone is being used for another purpose at that particular moment, this approach can be inconvenient. More than one user might wish for the good old days of the ordinary light switch. This is the reason why Bruck has taken a different, sustainable approach. Once again, tablets and smartphones play an important role – but only if the user wants them to.

Individual lighting

The Horizon luminaire from Bruck comes with the EnOcean interface built right in. This permits the user to control the light color individually, from daylight white to candlelight at 2000 K. The light can also be dimmed, and it is easily controlled with a double pushbutton. Nothing else is needed for the moment. However, other options are available, depending on the customer's needs.

Combined with the Homission gateway from Bruck, the luminaire becomes part of the smart home. The light color selected at dinnertime belongs to a predefined light scene that can be conveniently called up. It can be operated without complications from a smartphone or with a pushbutton.

The individual light within the system

Not just the one luminaire, but also the entire home system offers this convenience. Homission can be upgraded as desired to handle the entire lighting system, blinds and much more. The uncomplicated upgrade makes the system a good choice for both new buildings and renovations, piece by piece or as a complete solution, depending on the requirements. The Homission gateway is absolutely flexible.

The Homission gateway from Bruck gives homeowners a flexible and customized lighting system in the smart home.

www.bruck.de

Connect your home in minutes

The extensive product range from NodOn® provides solutions for lighting, heating and the remote control of electrical devices, sensors and handheld transmitters with advanced wireless technology (Z-Wave, EnOcean, Bluetooth, etc.). Thus creating a smart home within minutes.

By Thomas Gauthier, CEO, NodOn

The In-Wall module created by NodOn® allows you to connect any wired electrical circuit, such as a wall switch, lamp or power outlet, into an EnOcean based Smart Home network.

The NodOn® in-wall module can be easily and efficiently controlled by all EnOcean-compatible devices, such as wall switches, remote controllers, sensors, window handles, card switches or compatible home automation gateways.

Easy to install device connection

With its compact design of 40 x 45 x 17 mm, the in-wall module fits inside the smallest 2 Channels EnOcean receiver on the market. Thanks to its small size, the NodOn® in-wall module can be installed anywhere in your wall or ceiling (behind an existing wire wall switch, behind a power outlet, in the suspended ceiling, etc.). Once mounted, it will allow you to control your electrical installations or appliances through wireless and batteryless EnOcean controllers or sensors.

The benefits at a glance:

- → Control power outlet without any outlook change
- → Transform any power outlook on the market into a smart socket
- → Quick installation in 10 minutes without any wiring
- → Scalable to add any device at any time as you want
- → Compatible with existing wired switch, then work as a toggle switch combining its original features with smart functions
- → 2 independent channels (1.1 kW each) in a very small footprint

Accessible smart home solution

Already available on the European Market, the In-Wall module is CE-certified. It has been highly appreciated and appointed by the biggest French property developer for more than 10,000 apartments in 2017. Mounted at the back of a standard wired switch or power outlet, the In-wall module by NodOn® gives anyone the ability to conveniently transform their home into a smart home in minutes without any change in appearance!

www.nodon.fr

SecuSignal® – more than just opening and closing

Window handles from HOPPE can do a whole lot more than just open and close windows. SecuSignal® window handles with wireless communication, for example, transmit an EnOcean radio signal when they are turned – without any need for batteries or maintenance! Therefore, they are an ideal convenience component for smart home or industrial automation systems.

By Holger Renger, Product Manager for Mechatronics, HOPPE AG

For example, if the SecuSignal® window handle transmits a notification that it is in the opening position, the heat or air conditioning could be automatically turned down. If the shades, blinds or lights are automatically controlled, the SecuSignal® window handles can contribute to a more efficient and more convenenient functioning.

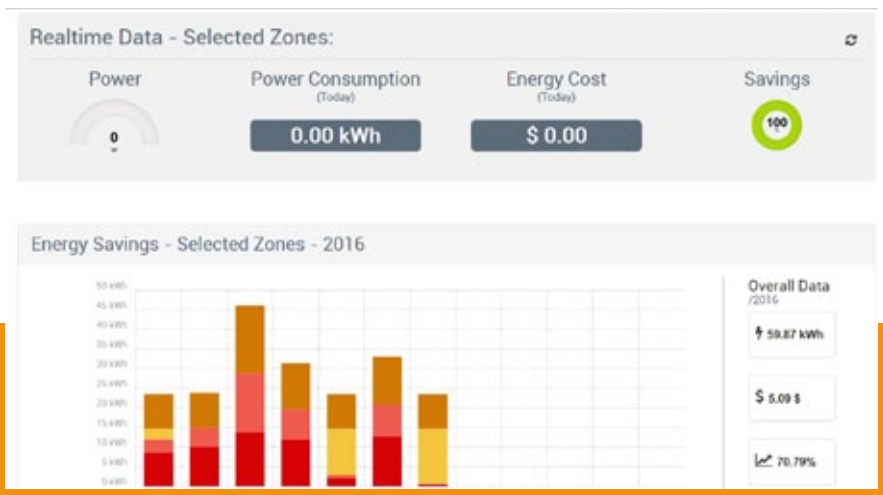
The useful wireless SecuSignal® window handles have also been made much more compact. A smaller circuit board makes it possible to hide the wireless transmitter entirely under the full cover of the rosette. Protection against break-ins has also been provided: SecuSignal® window handles are available in lockable versions that come with the tried and tested HOPPE Secu100® + Secustik® anti-break-in technology.

www.hoppe.com

Multi-functional gateway for cloud-based commissioning

OBX Computing Corporation introduces a multi-function gateway which provides remote commissioning, monitoring and control of EnOcean energy-harvesting wireless sensor solutions from any authenticated, Internet-connected device (e.g., IPhone, Android, Tablet, Laptop, PC, etc.).

By Ara Bederjikian, CEO & President,
OBX Computing Corporation



Monitoring and administration of devices per drag & drop.

The Universal Gateway System (UGS) provides wireless control of lighting and other environmental systems, surveillance system integration, data storage and Wi-Fi hotspots via a single, small-form factor device. The system is vendor-agnostic and integrates with any LED, sensor or surveillance camera manufacturer.

Flexible & easy to use solution

The multi-function UGS offers customers multiple services that enhance business productivity, flexibility and time savings.
A single UGS controls EnOcean devices within a 30-meter range and multiple UGSs can be networked together via secure 802.11 wireless mesh, Ethernet, and Cellular connectivity options to control thousands of devices at multiple locations.

The user-friendly GUI provides monitoring and control from virtually anywhere at any time. Customizable views allow the importation of building floorplans, topology diagrams, and photos of control areas. The managed-light groups and devices are simply dragged and dropped into the preferred areas on the user's view.

Furthermore, scenes and lighting rule sets can be easily configured based on parameters such as time of day, multiple sensor inputs, and manual-override options for local control. Users can monitor, measure, and report on sensor data (motion, ambient light, temperature, humidity, etc.), LED run times, real-time and historical power consumption, and energy costs. They can also export the data to third-party systems for analytics.

Distinct user profiles provide authentication and restrict access to only authorized menus, anti-replay measures are implemented, and all control traffic and data stores are encrypted. The remote management process allows EnOcean devices to be configured and maintained through the air interface using radio or serial telegrams.

Open platforms

The UGS seamlessly translates the EnOcean protocol to the Internet Protocol allowing smooth communication between EnOcean equipment profiles (EEP) and IP. This forms the basis for integrating the data from EnOcean energy-harvesting wireless sensors represented in the content of EEPs into cross-standard, open platforms that the IoT can interact with for control, data analytics collection, and analysis.

The UGS is a secure wireless mesh access point providing connectivity, access, and control of the complete family of 902 MHz EnOcean products. Other EnOcean frequency (868 and 928 MHz) integration is under development.

www.obxcc.com

EnOcean device management.

Reliable. Standardized. Independent

EnOcean devices are easy and fast to install. Although they feature a wide range of functions, they are intuitive to configure and do not require any manufacturer-specific knowledge. This avoids configuration errors, and installers need only one step to meet their goal of making customers happy in the long term.

By Thomas Rieder, CEO, ViCOS GmbH

Mission accomplished without worries using cutting-edge technology: EnOcean device management

These are the expectations of the market for smart homes and the Internet of Things. On top of this come the electronic planning and documentation of the EnOcean installation. This approach simplifies initial installations and makes extension work efficient in the first place. It is aimed at providing a unique product identification across manufacturers, an electronic product description, a standard teach-in process and wireless confguration without any manual device operation. Other priorities are data consistency and software support for the installer. Proprietary solutions from individual device manufacturers are no longer necessary.

Standardized and easy configuration of EnOcean devices

The EnOcean Alliance has defined the technical requirements: Product ID, Product Label, Device Description File (DDF) and Remote Commissioning have been standardized by the Technical Working Group and are available to all members for developing their products. The product ID identifies an EnOcean product and its manufacturer throughout the world. It references an electronic data sheet, the DDF, which contains all information on EnOcean communication and on configuring the device functions. The product label is specific to each device. It contains the product ID, EnOcean ID and security code and ensures electronic readability via a QR code. Finally, remote commissioning standardizes wireless access to EnOcean devices as well as the teach-in process and the configuration of all device parameters.

Different manufacturers have now launched products that make consistent use of these options. For example, ViACT from ViCOS is a family of EnOcean actuators that apply the EnOcean Alliance's standardization work in mass market products. Each actuator consists of a ViACT Power Cube and a ViACT Radio Controller. The Power Cube contains the output switching channels and the power supply, while the Radio Controller includes the application logic and the EnOcean wireless technology. An actuator within the ViACT product family can be fully configured and managed via the remote

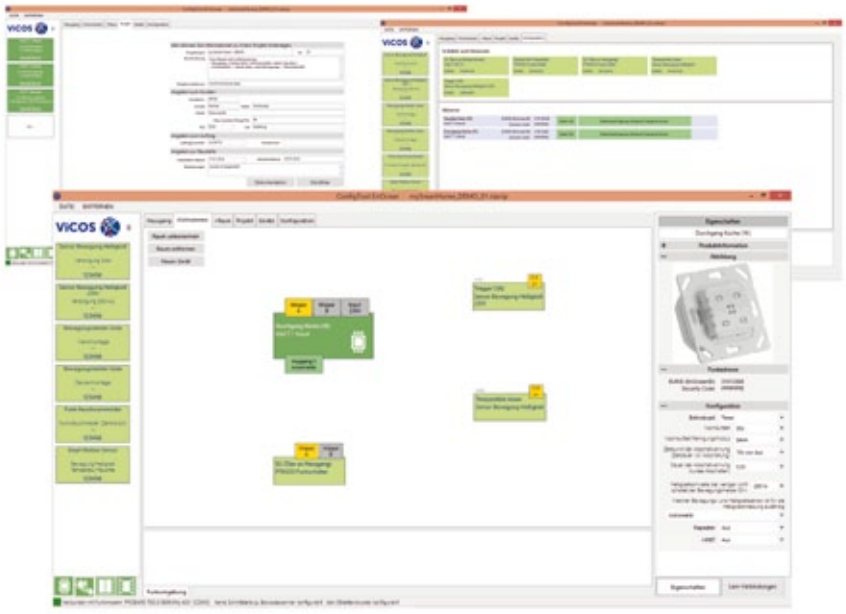
of the manufacturer.

EnOcean product label with QR code – on a ViACT Radio Controller in this case

commissioning interface of the Radio Controller. A ViACT product label with a QR code gives smart home and IoT gateways the unlimited ability to manage devices via the product ID and associated device description file.

Functional and efficient: the ViCOS ConfigTool

The ViCOS ConfigTool, a comprehensive toolbox developed specifically for planners and installers, gives these users a very convenient way to manage an EnOcean system. Aimed at functionality and efficiency, this software makes it possible to plan complete installations, preconfigure devices based on individual rooms or floors and automatically and completely document an EnOcean installation during the course of commissioning. EnOcean QR codes are captured with mobile phones and transmitted by Bluetooth to the ViCOS ConfigTool. New EnOcean devices can thus be scanned and thereby added to an installation. All it takes is a click of the mouse to link them to other devices and also configure the device parameters. Configuration mistakes in individual devices within an EnOcean installation are unerringly avoided, and all information is reliably transferred to each individual device.



Easy planning, configuration and documentation with the ViCOS ConfigTool

Interoperable and upgradable

Because the ViCOS ConfigTool is based on the EnOcean Alliance standard, it is in no way limited to the management of ViCOS products. Interoperable devices from other manufacturers are listed in the integrated product catalog, and users of the ViCOS ConfigTool can rest assured that all these devices work together flawlessly. New devices can be added to the product catalog at any time.

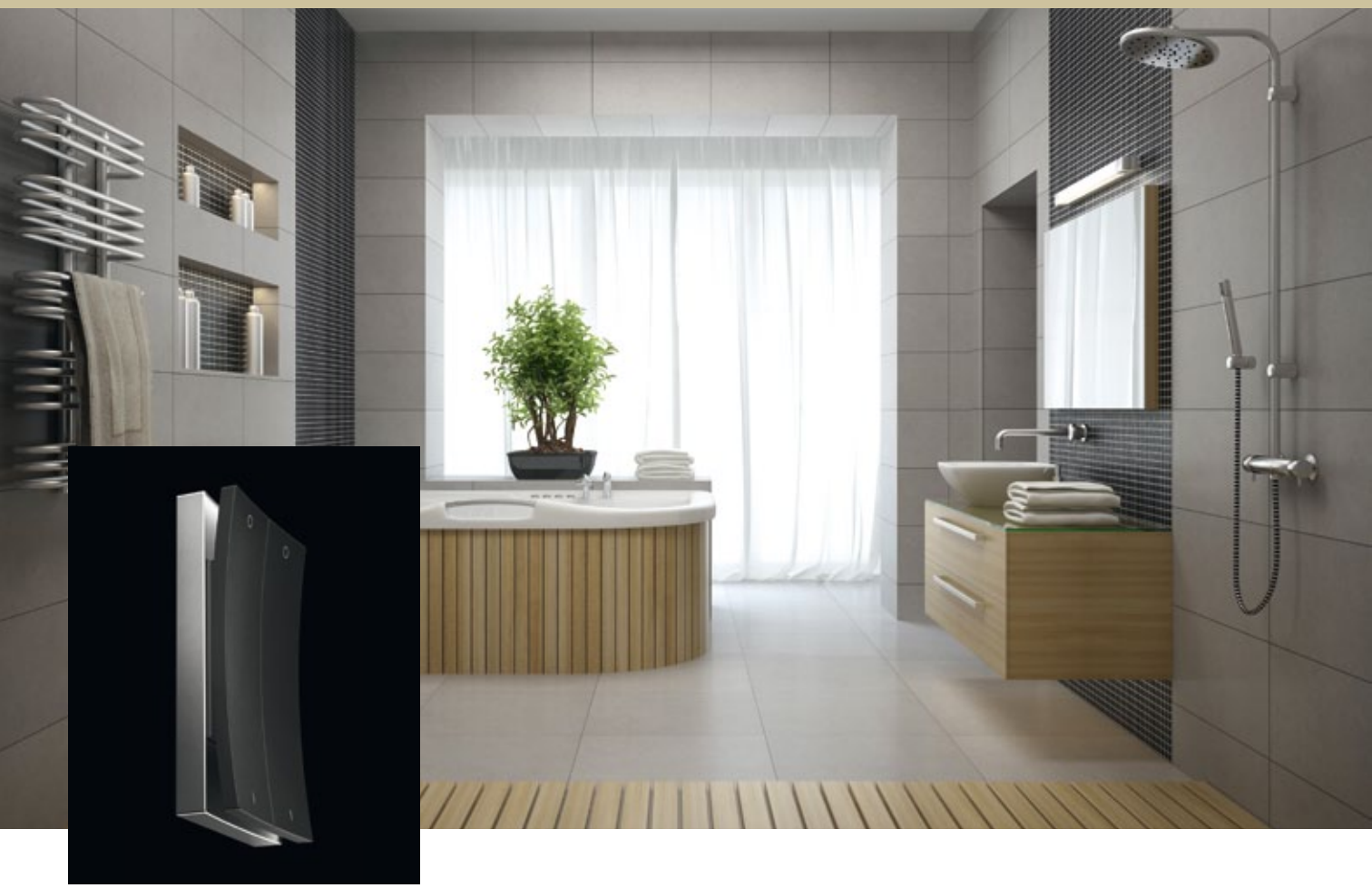
The ViCOS ConfigTool documentation function completely describes an EnOcean system using an open file format. These files can be read and interpreted by gateways, central controllers or software products for further processing. Adding a smart home or IoT gateway to an existing ViACT installation later on thus becomes an easy and quickly managed task without requiring any special knowledge – mission accomplished!

www.vicos.at/en

Standard but extraordinary –

motion detectors and switches

You walk into your bathroom. Automatically, the room illuminates and the ventilator turns on. If you need privacy, at the touch of a wireless-enabled switch, you can simply lower or close a blind. EnOcean can make all this real with a few challenges along the way to ensure long sustainable applications. By OPTEX Co. Ltd.



Will detectors and switches withstand splashes of water? Will solar panels of detectors provide sufficient power during nights? How do you reduce unnecessary detections led by periodical ventilations in absence of people? Over a course of time, answers to these questions become significant for planning efficient energy management systems.

OPTEX Co., Ltd. (Shiga, Japan) is known worldwide for development and manufacture of security and automated door sensors. The company is now launching a new 'C-series' range of motion detectors and switches for facility control applications. OPTEX C-series are IPX5 rated indoor/outdoor multi-purpose* EnOcean compatible products. Ready to be deployed within buildings, houses, in gardens, terraces and the etc. These products perfectly complement the product portfolios of lighting equipment suppliers and building maintenance/ electrical contractors.

www.optex.net

* C-series must avoid exposure to steam and condensations

New people

Neil Cannon, President EnOcean Inc.

Neil Cannon was appointed President of EnOcean North America in September 2016. In this position, he will further develop EnOcean's business in the North American market and strengthen the company's position as worldwide leading supplier of patented energy harvesting wireless technology for self-powered Internet of Things applications. Before joining EnOcean, he was the Chief Marketing and Innovation Officer at Terralux Corp. where he started the LEDSENSE program of building and lighting controls. Before Terralux he was a Board member and the EVP of Business Development for Albeo Technologies which was acquired by GE Lighting in 2012. Prior to Albeo and GE, he was VP of Advanced development at Picolight Corp. Under Neil's direction Picolight innovated the first 10G SFP+ fiber optic modules. This innovation

led to design-ins at Google and other networking companies. Earlier in his career Neil held senior management positions at Infineon Fiber Optics, Iolon Corp. and OR technologies. He holds a BA and MS in Engineering from Dartmouth College.

neil.cannon@enocean.com

Matthew Arneson, OEM Sales Manager for Central United States, EnOcean Inc.

As the new OEM Sales Manager at EnOcean Inc for North America, Matt Arneson is supporting the EnOcean-Team in developing and growing the Central region of the United States. Before joining EnOcean Matt was working as account manager for a company called Proto Labs. He was responsible for helping clients with their design needs before they order prototypes and managed large accounts such as Harley Davidson, Marvin Windows, H.E. Williams and many others.

matthew.arneson@enocean.com

Figures for the EnOcean ecosystem

The ocean of unused energy – this source reveals the batteryless, wireless technology from EnOcean. How much energy is in an EnOcean switch or sensor? This page provides a small insight into the microcosm of energy harvesting.

→ The EnOcean Alliance has more than 400 members.

→ Over 1,500 interoperable products based on the EnOcean standard are available.

→ Today, the EnOcean technology is in use in 37 countries worldwide.

→ Enocean technology has already been installed in more than 400,000 buildings around the world. This saves approximately 50,000,000 batteries.

→ All together, the energy harvestingt wireless technology has saved 25,000 kilometers of cables up to now. This has saved more than 1,500 tons of copper, 2,500 tons of PVC and, therefore, over 11,600 tons of CO_2.

→ The Enocean wireless standard for worldwide usage: 868 MHz for Europe and China, 902 MHz for North America and 928 MHz for Japan.

Visit the self-powered EnOcean world on the web: **www.enocean-alliance.org**

MASTHEAD

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Overview of the EnOcean Alliance members

www.enocean-alliance.org/products

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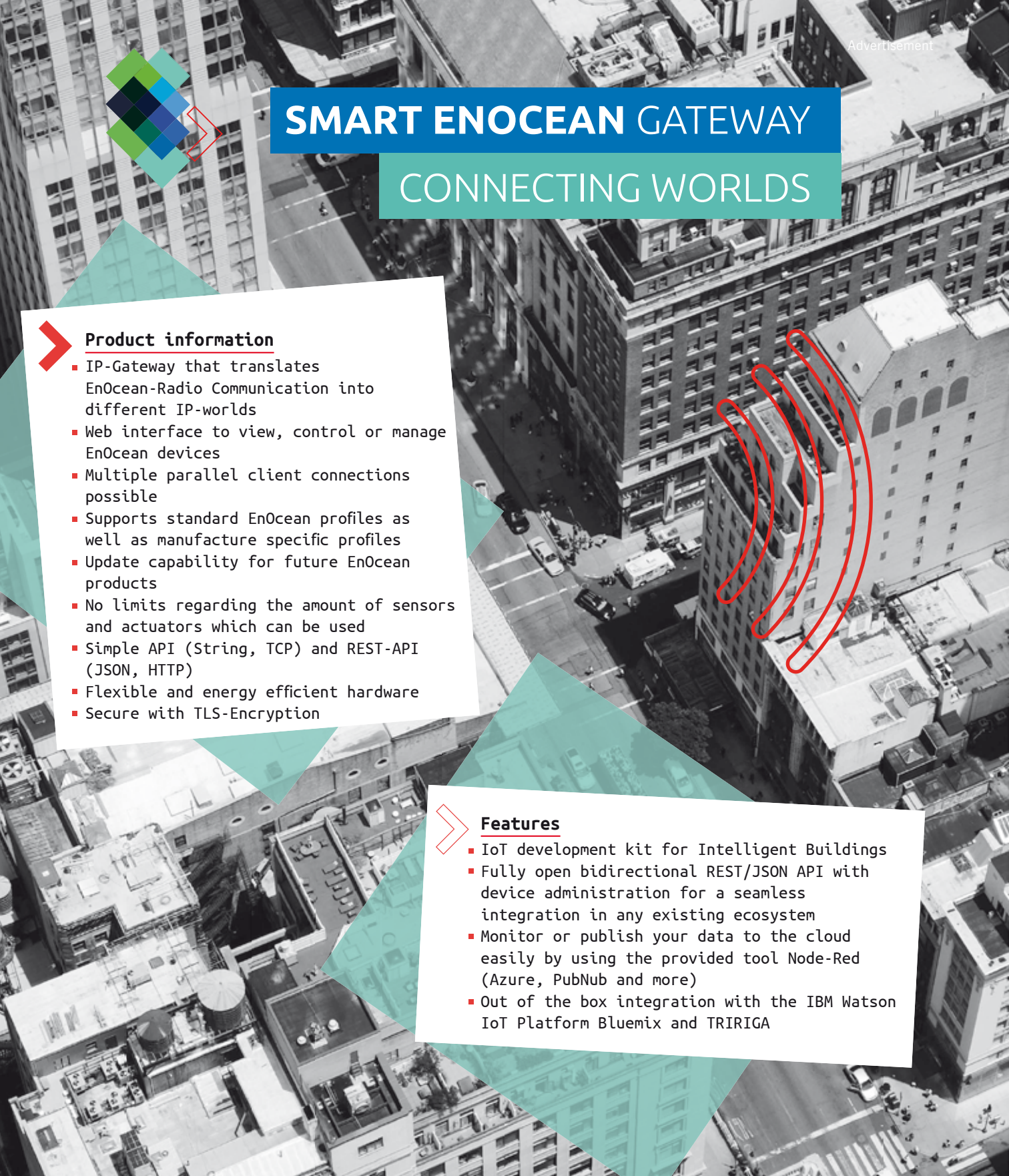
wibutler	wieland	Winshine Network Technologies	WIT	Wuerfel	YAMAHA	ZUMTOBEL				

…and more than 230 associate members

SMART ENOCEAN GATEWAY

CONNECTING WORLDS



Product information

- IP-Gateway that translates EnOcean-Radio Communication into different IP-worlds
- Web interface to view, control or manage EnOcean devices
- Multiple parallel client connections possible
- Supports standard EnOcean profiles as well as manufacture specific profiles
- Update capability for future EnOcean products
- No limits regarding the amount of sensors and actuators which can be used
- Simple API (String, TCP) and REST-API (JSON, HTTP)
- Flexible and energy efficient hardware
- Secure with TLS-Encryption

Features

- IoT development kit for Intelligent Buildings
- Fully open bidirectional REST/JSON API with device administration for a seamless integration in any existing ecosystem
- Monitor or publish your data to the cloud easily by using the provided tool Node-Red (Azure, PubNub and more)
- Out of the box integration with the IBM Watson IoT Platform Bluemix and TRIRIGA

DIGITAL CONCEPTS

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