ENGLISH

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MAINTENANCE-FREE WIRELESS SWITCHES & SENSORS

ISSUE

2014

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WORLD OF ENERGY

APPLICATIONS FOR ENERGY HARVESTING
Revolution in free energy

ROHM
Illuminated Buddhist temple

alphaEOS
Active house B10 research project

AFRISO
Multifunction smart home gateway

Amsterdam, November 4–6, 2014
European Utility Week
EnOcean Alliance exhibits: Hall 5, H70

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airScan
THERMOKON VISUALIZES ENOCEAN WIRELESS

» Software application for Windows-based PCs and laptops

» Structured user interface on which all EnOcean based telegrams received are clearly arranged and listed with the allocation to the respective product.

» Bidirectional communication to the EnOcean network is made via radio capable USB stick, with repeater function

» USB extension cable 3m (option)

» Receiving quality is displayed by the dB-values (traffic light colours)

» Filter function for the exclusive viewing of individual sensors

» Variable naming

» Logging function (detection of device ID, data bytes and RSSI level in dependence on data and time)

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enocean alliance
No Wires. No Batteries. No Limits.

Dear Reader,

My new role as CEO of EnOcean started in September. Excitement, pride as well as humility come to my mind when I think about this adventure.

I am excited to get involved at a stage where EnOcean on one hand has demonstrated leadership in energy harvesting wireless technology in the professional building market while on the other hand still has many new market opportunities ahead. Both vertical B2B markets, like for example structural monitoring, as well as the consumer Internet of Things market (IoT). I have lived in Silicon Valley for over ten years and have seen companies with arguably less unique technology create huge value. Being an avid consumer of Internet-connected services and devices myself, it is all the more exciting to imagine what we can create together once we set our sights on IoT.

I am proud to have been handed the opportunity to lead a company that offers switches and sensors free of wires and batteries, serving high growth technology markets while providing sustainable energy usage and preventing an unnecessary waste stream. I have had the pleasure to lead technology start-ups both on the semiconductor as well as on the green technology side, but never as nicely matched as in the case of EnOcean.

Though excited and proud, I am also humbled by the magnitude of the network consisting of the EnOcean team, its customers, its partners, its investors and not in the least the strong EnOcean Alliance. I realize that there is a lot of listening and learning ahead to get up to speed and help drive EnOcean and the eco-system to future success. I hope that all of you will have some patience and share your ambitions as well as concerns once we do get a chance to meet.

Yours,

Dr. Wald Siskens
CEO of EnOcean

APPLICATIONS FOR ENERGY HARVESTING

Revolution in free energy

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Illuminated Buddhist temple

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FSC
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ENERGY WITHOUT BATTERIES

For centuries, people have been looking for ways to store electrical energy so that it can be used later on. While batteries offer a way to do this, they also have many weaknesses. Energy harvesting, on the other hand, uses sources of energy that are available in the immediate surroundings, anywhere and anytime.

By Frank Schmidt, Chief Technology Officer, EnOcean GmbH

Many fields of research focus on achieving a combination of more powerful batteries and devices that consume less and less energy. Will these efforts soon give us batteries that deliver sufficient energy over the entire life of electronic products? If this happened, energy harvesting – a way to operate equipment without primary batteries – would become less important. However, key factors do not support such developments.

MOORE'S LAW DOES NOT APPLY TO BATTERIES

The performance and component density of processors and memory chips double approximately every 18 months. Gordon E. Moore predicted this trend back in 1965, and it continues to this day. Since that time, improvements have been made by an impressive factor of 10000. Unfortunately, Moore's law does not apply to batteries. Despite intensive research, their performance has improved by a factor of only three over the same period of time, and experts do not expect to see any quantum leaps forward.

ELECTRONIC DEVICES ARE ENERGY GLUTTONS

In the meantime, the individual components of electronic devices have significantly improved in terms of power consumption. At the same time, however, more and more powerful functions have increased the products' hunger for energy, and this development has canceled out all energy efficiency effects.

POWERFUL ENERGY CONVERTERS

Batteries have another disadvantage: They deliver much less power compared to even simple energy converters. Inside buildings, with eight hours of average light intensity (400 lux), an economical mini-solar cell with an efficiency of less than 5 % and an area of 10 cm^2 supplies approximately one ampere-hour (Ah) of energy over the course of 15 years – the same amount as five CR 2032 Li button cells. Outdoors (8000 lux), this intensity is as much as 20 Ah over the same period of time, which equals the power of more than 100 Li button cells. While in this typical example users must change the batteries of battery-operated devices every three years and every two months, respectively, energy harvesting makes equipment truly maintenance-free.

ENERGY ANYTIME, ANYWHERE

Energy converters find energy everywhere in their immediate surroundings: in movement, light and differences in temperature. Energy harvesting is aimed at doing this without chemicals and without requiring maintenance. EnOcean technology currently uses three different types of energy converters.

ENERGY FROM MOTION

The mechanical energy converter ECO 200 converts mechanical energy, the press of a switch for example, into electrical energy. It works just like a dynamo and makes the energy immediately available. Weighing less than 3 ounces and measuring just over ¼" in height, the

ENERGY

WIRELESS SENSOR MODULE

Energy Converter

Microcontroller

Energy Management

Sensor

RF Transceiver

INFORMATION

WIRELESS SYSTEM MODULE

RF Transceiver

Microcontroller

Status, measured value Control signal

Actuator/ building services
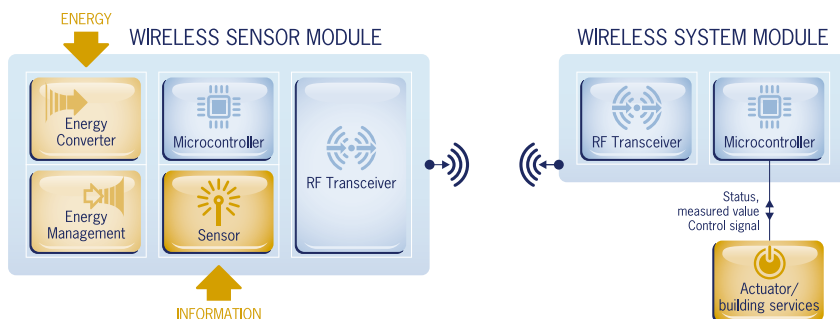
EnOcean offers a complete energy harvesting platform, consisting of energy converters, wireless modules, energy management and ultra-low power radio.

smoothly-running converter can be integrated into lightweight, slim-line devices. With an energy output of 120 µWs, a stabilized voltage of 2 V and a corresponding wireless batteryless module, it is possible to transmit three radio telegrams per operation. The return movement delivers another energy pulse. With the maximum allowed contact travel of 0.04 inches, more than 300000 switching cycles are typically completed. With shorter contact travel, even more than a million switching cycles are typical.

ENERGY FROM LIGHT

Light is an inexhaustible source of energy. Miniaturized solar modules, not larger than 13 mm x 35 mm, can even use indoor light to supply electricity for ultra-low power wireless radio modules. An example is the solar-powered STM 330 sensor module. If a measured value is transmitted every 15 minutes for example, 3.6 hours of charging in daytime and 200 Lux are adequate for an uninterrupted operation. An additional PAS charge capacitor (Poly Acenic Semiconductor) can ensure an adequate power reserve to bridge intervals when little or no light energy can be harvested. With its energy storage mechanism fully charged, the module reliably operates for several days in complete darkness.

ENERGY FROM TEMPERATURE DIFFERENCES

Temperature differences contain a lot of energy and therefore are ideally suited to power devices. Thermo-

generators, so-called Peltier elements, obtain the energy. The ECT 310 DC/DC converter already starts to resonate upwards of 20 mV input voltage. On 20 mV (about 2 K), a useful output voltage of more than 3 V is generated. At a temperature difference of only 7 K, approximately 100 µW of energy is already produced.

LOW-ENERGY WIRELESS TECHNOLOGY

In addition to efficient energy converters and wireless modules, whose power consumption is particularly low, wireless technology itself forms another important component of energy harvesting. Combined with new generations of chips, the tried-and-tested platform can run different wireless protocols with energy harvesting. As an important prerequisite, the wireless system must be optimized for especially low-power consumption. This applies to the ISO/IEC 14543-3-10 standard established in building automation as well as to sub-protocols of the 2.4 GHz band, which are used primarily in the consumer market.

ENERGY HARVESTING IS THE FUTURE

Even today, energy harvesting already offers significant advantages over batteries when it comes to ecobalance and maintenance-free operation. In the years to come, energy harvesting will increase its lead over batteries even more – in particular, since energy converters, whose development is still in the early stages, continue to improve their performance.

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THE REVOLUTION IN FREE ENERGY

The whole world is preoccupied with energy. On the macro level, society and governments must work out how to use renewable energy efficiently, how to store excess electricity and where to reduce overall energy consumption. EnOcean deals with energy on the micro level. Harvesting small amounts of energy for electronic equipment has found its way into many applications – and it plays a significant role in answering the energy questions on the macro level, among other things.

By Andreas Schneider, Chief Marketing Officer, EnOcean GmbH

Buildings are among the biggest energy gluttons, accounting for a 40 % share. Indeed, they consume more energy than even the industrial sector. Nearly all governments around the world want to substantially reduce this large share in just a few years. After all, energy efficiency is one of the most valuable sources of renewable energy and a central component of the energy transition. If we want to save energy, however, we must first determine where it is being consumed. To accomplish this, there is no way around smart sensors. Thanks to self-powered wireless technology, these sensors can be placed flexibly, and they also work without batteries and are maintenance-free. As a result, the hurdle of making a building intelligent and energy-efficient is much lower with this technology than with wired or battery-driven solutions.

SENSORS FOR BUILDINGS

These little assistants in buildings, which draw their energy from motion, light or temperature differences, come in a wide variety of products. The solutions range from window contacts and temperature, brightness and humidity sensors to presence detectors and even CO_2 metering devices. Further developing the system components of energy converters, energy-efficient wireless technology and efficient energy management now makes it possible to reproduce multiple functions in a single device. Solar-powered multifunction sensors can thus measure temperature, humidity, light and the presence of people at the same time. Networking them with a central controller leads to an intelligent system that not only saves energy but can also be used extremely efficiently to maximize user comfort.

SELF-POWERED HEATING CONTROL

Automated heating control has a particularly great impact on a building's energy efficiency. This is true for both commercial buildings and single-family homes. Energy harvesting wireless technology facilitates radiator actuators that use the difference in temperature between the heating system and the environment to provide energy for stroke changes and wireless communication. Additionally equipped with an energy store and an intelligent energy storage management system, the small servomotor can turn the radiator on and off entirely under its own power without any cables or batteries as well as adjust the required temperature with a solar-operated room sensor or a console. The self-powered heating controller is thus also attractive for the property management industry. Once installed, the system immediately saves energy and tenants don't have to be bothered with annual battery changes.

INTELLIGENT LIGHT CONTROL

Energy harvesting wireless technology originated with light control. EnOcean found its way into the first buildings over ten years ago with a light switch that converts the press of a button into energy for a wireless signal.

Today, this number has grown to hundreds of thousands of buildings. Advances in lighting control technology have also been made. Lights now communicate with each other and in groups using the EnOcean wireless standard. In doing so, the light automatically adapts, for example, to the number of people present. The communicating lamps can be integrated into different energy efficiency measures as part of the building automation system via the energy harvesting wireless system. For example, solar-powered light sensors can let the lamps know when enough sunlight is present and no artificial light is needed in the rooms. The data from the lamps can also be used to control the air conditioning according to the room's occupancy.

LED LIGHTS AT THE PRESS OF A BUTTON

EnOcean has also conquered the consumer market with a self-powered switch module that operates in the 2.4 GHz range. Users can thus control their LED light systems at home with the kinetic energy from pressing a button. The energy harvesting light switch is practical, especially when no smartphone is at hand or if it would be too much trouble to launch the app only to switch on the lights. The switch has a modern design and can be placed anywhere in the house: on the wall, next to the bed or on the coffee table. Unlike a smartphone, it never runs out of power and communicates immediately with the console for the LED lamps simply by pressing the button. The switch is thus within easy reach and ready for operation round the clock.

ALARM SYSTEMS FOR FAST ASSISTANCE

The principle of energy harvesting applies not only to energy-efficient heating or atmospheric light scenes. The vigilant sensors with energy harvesting wireless technology can also warn against danger. As a result, a simple window handle becomes a multifunction sensor that integrates an intrusion alarm, heating control, motion sensor and temperature measurement. Other warning devices monitor liquid and gas leaks. In environments with sufficient interior light, miniature solar cells also act as power generators. Mechanical energy converters can be used in fluid warning devices as well. As soon as the upwelling material comes into contact with water or oil, it triggers the motion mechanism and thus the wireless signal.

The energy harvesting wireless technology is also suitable for use in early warning systems for avalanches or for monitoring building structure. Wireless sensors operated by light, temperature differences, vibrations or motion can monitor different states continuously and trigger an alarm well in advance of damage when limit values are exceeded or deviations occur.

EVERYDAY ASSISTANTS

For the first time, the energy harvesting wireless technology also provides a wireless bus stop button and facilitates continuous, maintenance-free monitoring of logistics processes and cold chains. In smart city concepts, the self-powered sensors supply information for flexible parking space and traffic data management as well as the data for demand-driven street lighting.

Due to its special properties, energy harvesting wireless technology is an attractive solution for the flexible and maintenance-free collection and transmission of all types of data. Energy harvesting at the micro level thus turns self-powered sensors into important assistants that help us perform the larger tasks of our modern lives.

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ENOCEAN MODULES WITH ENHANCED DATA SECURITY

The company has expanded its portfolio with energy harvesting wireless modules which integrate state-of-the-art encrypted data communication to meet the requirements of specific applications such as monitoring or alert sensor systems.

By Marian Hönsch, Product Marketing – Software Architect, EnOcean GmbH

EnOcean has expanded its portfolio with a complete range of energy harvesting wireless modules allowing encrypted data communication. These enhanced security mechanisms can prevent different types of attacks, including replay or eavesdropping attacks.

The security module portfolio uses 868 MHz frequency for Europe and includes encryption decoding firmware, the TCM 310 transceiver module running EnOcean Link as security middleware for gateways, the PTM 215 switch module, the PTM 335 switch module for smaller form factors, the STM 335 temperature sensor and the STM 325 window contact. In addition to the new hardware portfolio, EnOcean offers a software API, which enables OEMs to develop encrypted data communication on their own using EnOcean standard modules.

STATE-OF-THE-ART ENCRYPTION

The enhanced security features add to the unique 32-bit identification number (ID) of the standard modules which cannot be changed or copied and therefore protects against duplication. This authentication method offers field-proven secure and reliable communication in building automation. For applications requesting additional data security, the new EnOcean module portfolio protects batteryless wireless communication with enhanced security measures to prevent replay or eavesdropping attacks and forging of messages.

One feature is a maximum 24-bit rolling code (RC) incremented with each telegram which is used to calculate a maximum 32-bit cypher-based message authentication code (CMAC). The CMAC uses the AES 128 encryption algorithm. This functionality particularly protects networks against replay attacks and forging of messages. Another mechanism is the encryption of data packets by the transmitter. The data including an optional dynamic element, for example RC, is encrypted using the AES algorithm with a 128-bit key. This way, eavesdropping attacks are prevented.

CHOICE OF SECURITY

The security modules are pin-compatible devices as the additional features are included in the software. The enhanced security mechanisms are an optional functionality. Therefore, the modules can also transmit EnOcean radio without the security layer. The necessary changes of the mode can be performed in the field. Also a receiver that decodes encrypted telegrams can still process standard telegrams.

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ENOCEAN PRODUCTS

RoHS
COMPLIANT
2002/95/EC

enocean®
Wireless Standard
ISO/IEC 14543-3-10

MODULES ARE AVAILABLE FOR 868, 315, 902 AND 928 MHZ

Modules with 868 MHz frequency are suitable for Europe and other countries adopting the R&TTE specification.
Modules with 315 MHz frequency are suitable for North America and other countries adopting the FCC/IC-specification.
Modules with 902 MHz frequency are suitable for North America adopting the FCC/IC-specification.
Modules with 928 MHz frequency are suitable for Japan adopting ARIB specification.

ENERGY HARVESTING WIRELESS SENSOR MODULES

868 MHz
315 MHz
902 MHz
928 MHz

PTM 210/PTM 215 (868 MHz)
PTM 200C (315 MHz)
PTM 210U (902 MHz)
PTM 210J (928 MHz)
Ideal for energy harvesting wireless switches. The PTM 215 variant contains also rolling code functionality

868 MHz
315 MHz
902 MHz
928 MHz

ECO 200 & PTM 330/PTM 335 (868 MHz)
ECO 200 & PTM 430J (928 MHz)
The perfect combination for unique switch applications. The PTM 335 variant also contains advanced security functionality

868 MHz
315 MHz
902 MHz
928 MHz

STM 300
STM 400J (928 MHz)
Ideal for bidirectional energy harvesting wireless sensors and innovative actuators

868 MHz
315 MHz
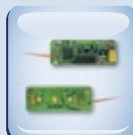
STM 312
Energy harvesting wireless sensor module – with whip antenna but without solar cell

868 MHz
315 MHz
902 MHz
928 MHz
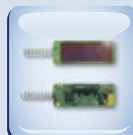
STM 320/STM 325 (868 MHz)
STM 429J (928 MHz)
Energy harvesting magnet contact transmitter module with helical antenna. The STM 325 variant also contains advanced security functionality

868 MHz
315 MHz
902 MHz
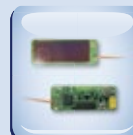
STM 330/STM 335 (868 MHz)
STM 310C/STM 330C (315 MHz)
STM 332U (902 MHz)
Energy harvesting wireless temperature sensor module with solar cell and whip antenna. The STM 335 variant also contains advanced security functionality

868 MHz
315 MHz
902 MHz
928 MHz

STM 331 (868 MHz)
STM 311C (315 MHz)
STM 333U (902 MHz)
STM 431J (928 MHz)
Energy harvesting wireless temperature sensor module with solar cell and helical antenna

ENERGY CONVERTERS

ECO 200

Mechanical
Harvests linear motion for use in wireless switches

**ECS 300/
ECS 310**

Solar
Harvests indoor light for energy harvesting wireless sensors and actuators

ECT 310

Thermo-electric
Harvests temperature differentials for energy harvesting

WIRELESS TRANSCEIVER MODULES

868 MHz
315 MHz
902 MHz
928 MHz

TCM 300
Transceiver module for programmable system components

TCM 310
TCM 410J (928 MHz)
Transceiver module for gateways

868 MHz
315 MHz
902 MHz

TCM 320
Transceiver module for programmable system components

ENOCEAN SOFTWARE

EnOcean Link

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

EnOcean Decoding Gateway

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

DEVELOPMENT TOOLS

DolphinAPI

For fast and simple development of custom specific applications (in "C")

DolphinStudio

For simple configuration and flash programming of Dolphin modules

PTM 335 Suite

For simple configuration of the PTM 335 module

Dolphin V4 API
(for 928 MHz modules)

For fast and simple development of custom specific applications (in "C")

DolphinSuite
(for 928 MHz modules)

For simple configuration and flash programming of Dolphin modules

DolphinView

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

EnOceanVisualization

For visualization of wireless communication for switches and temperatur sensors

KITS

868 MHz
315 MHz
902 MHz
928 MHz

868 MHz
315 MHz
902 MHz
928 MHz

**EnOcean Starter Kit
ESK 300/ESK 400J** (928 MHz)

The ideal entry to EnOcean technology
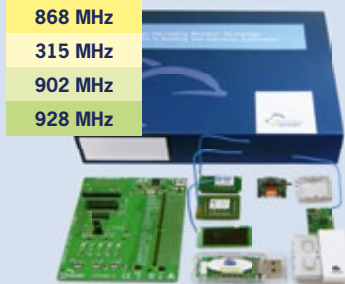
**EnOcean Developer Kit
EDK 350/EDK 400J** (928 MHz)

Developer kit for energy harvesting wireless sensor solutions

EDK 352 Thermo Developer Kit (868 MHz)

Developer Kit EDK 350 with a thermo harvester for STM 312 sensor module

EOP 350 Programmer Board

For programming and configuring EnOcean radio modules

FINISHED WHITE LABEL PRODUCTS FOR OEM CUSTOMERS

ENERGY HARVESTING WIRELESS SWITCHES AND SENSORS*

868 MHz

PTM 250
Universal switch insert – EnOcean easyfit

868 MHz
928 MHz

STM 250
Window contact

902 MHz

EDRP/ESRP
Wireless switch

868 MHz
902 MHz

EKCS
Key card switch

902 MHz

EDWS
Door and window contact

868 MHz
902 MHz
928 MHz

EOSW
Wall mounted wireless occupancy sensor

868 MHz
902 MHz
928 MHz

EOSC
Ceiling mounted wireless occupancy sensor

TRANSCEIVER PRODUCTS

868 MHz

RCM 250
Universal single-channel switch actuator – 230 V

868 MHz
315 MHz
902 MHz
928 MHz

USB 300/USB 400J (928 MHz)
USB gateway

902 MHz

EPSM
Plug-in switch module

902 MHz

EISM
In-line switch module

902 MHz

EHSM
HVAC setback module

Q4/14: 902 MHz

LEDR
LED relay dimmer 0–10V

ACCESSORIES

868 MHz
315 MHz

EPM 300
Field-intensity meter

*) further frequencies on request

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

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

THE ELECTRICAL INDUSTRY LEADS THE WAY WHEN IT COMES TO ENERGY EFFICIENCY

The energy transition is an important, future-oriented project for the German electrical industry. More than 80 % of the companies that belong to ZVEI, the German Electrical and Electronic Manufacturers' Association, share this view. With the right approach, the energy transition will strengthen the entire German economic region and secure growth and employment.

By Anke Hüneburg, Executive Vice President Energy Sector,
ZVEI – German Electrical and Electronic Manufacturers' Association

The opportunities lie, for example, in growing and new markets for products and energy services all over the world and in a decreasing price risk for fuels and CO_2. German companies are among the first worldwide to develop control expertise in handling an energy system based on renewables. As a result, they can establish themselves as global suppliers of these solutions. This approach can ultimately boost innovation, strengthen our international competitiveness and create jobs.

However, the opportunities of the energy transition do not come about all of themselves. In the end, the right political decisions are crucial. Reforming the Renewable Energy Act was an initial step in the right direction – albeit one with certain pitfalls. The high burden of private consumption can make it unattractive, in particular, to invest in efficient, local technologies.

ENORMOUS EFFICIENCY POTENTIAL

A large number of problems still need to be resolved before the energy transition can succeed. Above all, greater importance must be attached to energy efficiency. Many examples show the ways in which significant amounts of energy can be saved in the public and private spheres. In industry alone, the appropriate automation technology can cut energy consumption by 10 % to 25 %. The machines and plants would thus produce 43 million tons less CO_2 within a period of one year. The public sector offers additional savings potential: more than one third of all German streets are equipped with inefficient lighting systems from the 1960s. ZVEI estimates that the use of modern lighting technology could save 2.7 terawatt hours and 1.6 million metric tons of CO_2 each year.

Efficiency potential exists along the entire energy management value chain, from generation, transmission and distribution to consumption. The necessary products and technologies are already available today. Companies within the German electrical industry not only manufacture highly efficient technologies but also lead the way in terms of tapping efficiency potential. And they do this even though their power costs play a less significant role than those in other industries, accounting for only 0.7 % of sales revenue on average.

ENERGY EFFICIENCY PAYS OFF

In the past few years, the electrical industry has oriented its own energy supply practices to modern, intelligent and innovative systems, made appropriate investments and are covering their own power needs at least partly by generating electricity in-house. According to our 2012 member survey, more than 70 % of the companies are producing electricity from renewable energy sources, and more than half of them have introduced energy management systems. The failure to establish long-term and reliable conditions will jeopardize such investment in the future and unnecessarily delay the intelligent implementation of the energy transition.

Despite all the challenges, the reorganization of the energy system can be made successful. The energy transition offers the opportunity to secure growth and employment in Germany. It will create new markets and is becoming an important driver of innovation. We have the capability to do this. Policymakers are called upon to establish the right framework to stimulate appropriate investments. With its members, ZVEI will actively participate in these discussions.

www.zvei.org/en

Nevertheless, the companies are setting the trend when it comes to increasing energy efficiency. Nearly all companies who participated in the 2013 ZVEI member survey have invested in efficiency measures or plan to do so within one year. The success is measurable: within a period of one year, the surveyed companies cut their power consumption by 2.4 %.

ENOCEAN ALLIANCE – A COMMUNITY OF COLLABORATION

By Graham Martin, Chairman, EnOcean Alliance

The EnOcean Alliance is a consortium of more than 350 companies worldwide which joined forces to establish energy harvesting wireless solutions that improve the carbon footprint of buildings. Self-powered systems help save up to 30 % of energy in buildings. The EnOcean standard is the core technology of the EnOcean Alliance. It is the only standard in building automation that is optimized for maintenance-free devices that work without cables and batteries to add high flexibility and sustainability to an automation system. Today, batteryless solutions are already installed in several hundred thousand buildings worldwide.

From the very beginning, the EnOcean Alliance followed the approach of interoperability and open standard which allows products from different vendors to seamlessly work together in a system. For their members, the Alliance offers a unique platform that brings together established market players and young start-ups in order to exchange experiences, build relationships and join forces to develop new products, applications and systems.

This model of collaboration, interoperability and open standard is the essential basis for the worldwide success of energy harvesting wireless solutions. Today, the standard is very well-established in the commercial building automation sector and the Alliance started to transfer this approach to the residential sector as well, which will raise consumer awareness and acceptance of smart home systems. Besides this, there are many areas where energy harvesting solutions can provide additional value to our daily lives, helping with energy efficiency, safety, comfort and convenience. Combined with the large eco-system of over 1200 interoperable products, this has made the EnOcean Alliance the number one choice for sustainable building automation and smart homes.

Another aspect of the Alliance's attractiveness is that members can access new business areas with energy harvesting wireless technology. Furthermore, they can work together proactively within the Alliance Technical Working Group to implement interoperable products based on standardized application specifications, and to benefit from the international networking and Alliance marketing activities including joint trade shows, road shows, public relations support, advertising and lobbying.

The Alliance offers three membership classes: Promoter, Participant and Associate Members. The following eight companies are Promoters of the EnOcean Alliance: BSC Computer, EnOcean, Honeywell, JÄGER DIREKT, Pressac, ROHM, Texas Instruments and Thermokon.

We invite you to join us as a member of the Alliance and to benefit from the strong ecosystem and the ever-increasing success of the batteryless technology:

www.enocean-alliance.org/joinus

enocean® alliance
No Wires. No Batteries. No Limits.

OVERVIEW OF ENOCEAN ALLIANCE MEMBERS

www.enocean-alliance.org/products

enocean®

PROMOTERS

Embedded Intelligence	Green. Smart. Wireless. enocean®	Honeywell	OPUS® greenNet powered by JÄGER DIREKT
Pressac	ROHM SEMICONDUCTOR	TEXAS INSTRUMENTS	thermokon Sensortechnik GmbH

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GruppoGiordano	GSS	hansgrohe	HELLA	Helvar	HOPPE	HORA	Hanei Technology	HUBBELL
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Reliable controls	RENESAS	RUSKIN		SAUTER Für Lebensräume mit Zukunft.	SCHEIBER	Schneider Electric	schulte elektrotechnik	SECO
sensortec	SIEMENS	SII	SIMICS	sirlan	Smart Elements	SMARTHOME	SODA	somfy.
SOMMER Antriebe & Funk		spega		TAIYO YUDEN	TDP	TELEFUNKEN SMART BUILDING	TIANSU	Titus
	TOSHIBA Leading Innovation	TRIO2SYS	ubiant Creative solution for smart building	UCHIDA	U-SNAP ALLIANCE	ViCOS	VIESSMANN climate of innovation	VIMAR
vitec	Volksen	VS LIGHTING SOLUTIONS	WAGO	Waldmann	WattStopper	WEINZIERL	wieland	WIT
YAMAHA	YTion	ZUMTOBEL						

... AND MORE THAN 220 ASSOCIATE MEMBERS

REMOTE COMMISSIONING FOR ENOCEAN NETWORKS

The EnOcean Alliance offers its members a standardized process for remote commissioning of EnOcean-based devices in building automation networks. This enables installers and system integrators to remotely connect batteryless wireless devices using a central tool. At the same time, the specification allows complete documentation of existing networks and therefore offers a comfortable and practicable way to expand or change installations. This brings interoperability in building automation to the next level.

By Marian Hönsch, Remote Commissioning Team Leader, Technical Working Group, EnOcean Alliance

The Technical Working Group (TWG) of the EnOcean Alliance has developed a complete process for remote commissioning that includes initial set-up, parameterization, control, maintenance and documentation of batteryless wireless devices. The goal is to define a uniform approach for all of the listed procedures as a next level of interoperability.

COMMON RULES

Remote commissioning defines the communication between the commissioned and the target device. The basis for this is the specification of an interoperable interface that product manufacturers can integrate into their devices. It adds to the existing standardized profiles and offers an enhanced interoperability by defining the abstract structure of the commands and basic rules for remote access, configuration and a uniform procedure of parameterizing EnOcean-based devices in the field. The parameterization is based on Generic Profiles data description language that also specifies how a managing device, a smart phone for example, talks with the target device.

CONSISTENT DEVICE DESCRIPTION

In addition to the commissioning process, the TWG has introduced a standardized file for device description that describes the device and its functionalities in detail in a pre-defined electronic data sheet. It comes with a uniform device labeling which is composed of the EnOcean ID and the Product ID. The data sheets will be available on a central database. Installers or system operators can use the product ID to find the detailed electronic data sheet. That way, they have immediate access to all specifics of the product including the application profiles in use (EnOcean Equipment Profiles, EEP), operational modes and the requirements of para-meterization.

The specification is an open one so that manufacturers and service providers can develop several tools, such as apps and web interfaces, which include all functionalities of the remote commissioning.

ONE SPECIFICATION FOR SEVERAL TASKS

The standardized interfaces and processes of remote commissioning are intended to further optimize the control and configuration of building automation networks by using software that automates the support for EnOcean-based devices.
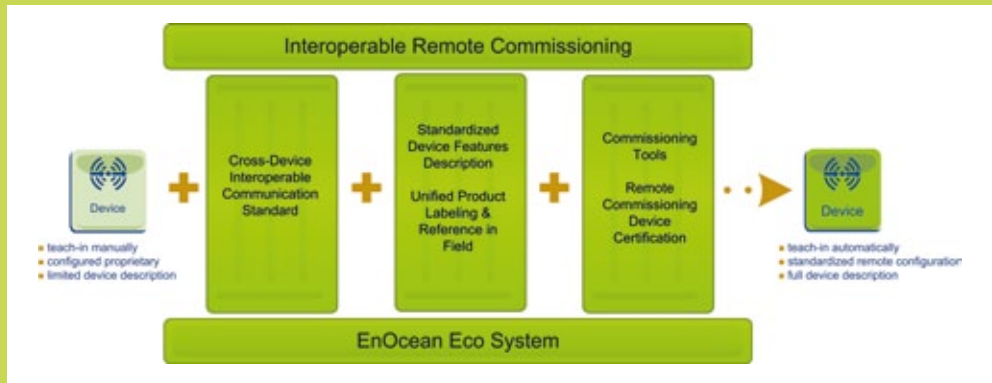
ALL TOGETHER, REMOTE COMMISSIONING HAS THE FOLLOWING TASKS:

- In a network, devices can be identified by their unique EnOcean ID, by radio and device label.
- The connection between devices (network structure) can be fully documented and edited (add/change/delete).
- The devices' operating parameters are commissionable and documentable.
- A device that replaces a previous device (e.g. because of a malfunction) can be remotely configured using commissioning to match the functionality of the replaced device.
- A device is either commissionable in the field or also pre-commissionable on- and off-site of the installation.
- All functionalities of the installed devices are still configurable after the installation has been finished.
- A factory reset to defaults is available.
- The radio link/range can be remotely tested using the commissioning tool.
- A device that supports remote commissioning is remotely commissionable without physical access to the device.

CENTRAL TEACH-IN PROCESS

The functionalities of remote commissioning help to centralize and record the teach-in process and confirm the result. This not only eases the implementation and networking of energy harvesting wireless devices, it also enables system planners to reproduce the implementation at any time, even after years. When a new network is installed, all parameterization can be done by one central commissioning tool.

ADJUSTMENTS OF AN EXISTING NETWORK

In an already installed network, the existing devices can be commissioned afterwards. Another scenario is the change of control parameters of intelligent actuators, for example thresholds and timers in local HVAC equipment or if the room structure in office buildings is changed. The complete process of re-configuration can be done during operation via remote control without touching a single device.

SERVICE AND MAINTENANCE

The comprehensive documentation as a vital part of the remote commissioning process can also be used to set up a comprehensive monitoring application to visualize and actively control a live network. For this, visualization tools provide an overview of the documented system structure (plans, drawings, descriptions, tables etc.).

As of now, manufacturers can integrate remote commissioning specification into their devices and develop tools for central control, configuration and troubleshooting – for further optimized control of smart buildings.

www.enocean-alliance.org

ENOCEAN CERTIFICATION – QUALITY SEAL FOR RELIABLE INTEROPERABILITY

Interoperable devices with EnOcean technology have enabled the construction of building management systems for quite some time and will secure the investments made for many years to come. Interoperability, as defined, will result in smooth communication between EnOcean-based devices made by different manufacturers over a certain distance and, thus, enable implementation of distributed functionality – provided that the existing system specifications of the EnOcean Alliance are consistently applied.

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

In technical terms, interoperability requires devices which perform as specified and in a repeatable manner on all layers. Specifically:

- on the physical layer, the air interface has to be compliant with the EnOcean standard ISO/IEC 14543-3-10 and a defined minimum transmission range has to be achieved
- on the communication layer, the scheduling and the logical compliance with defined communication flows
- on the application layer, the correct coding and decoding of communication content, the compliance to defined schedules and a conformal processing of transmitted data.
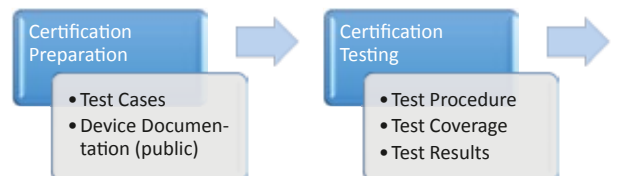
For self-powered devices, interoperability additionally means the ability to collect energy from the ambient environment over a certain timeframe to secure proper operation of the device over a defined period beyond.

INTEROPERABILITY – ENABLER OF VERSATILE SOLUTIONS

System planners, system integrators and customers demand reliable devices and procedures which facilitate the implementation of versatile solutions with an increasing offer of use cases of EnOcean technology. The EnOcean Certification Program – linked with a corresponding marking on devices – will secure interoperability of EnOcean-based devices without major additional effort. The Certification Program will cover all elements of the communication adequately defined and will be designed for self-certification by the device manufacturer – similar to the European CE declaration. In addition, an extension for a supplementary verification by an independent and accredited test laboratory is foreseen right from the beginning.

EnOcean Self-Certification Process

Certification Preparation	Certification Testing
• Test Cases • Device Documentation (public)	• Test Procedure • Test Coverage • Test Results

EnOcean Device Manufacturer

UNITIZED TEST EXECUTION

An EnOcean self-certification requires several steps to be performed by the manufacturer of the device which can be performed without significant additional effort as part of the verification of the product development, which is required in any case (refer to graphic, please). In preparing for the certification, the certification tests on the different layers are to be defined and device-related documents are to be compiled. Especially, all information relevant to interoperability are to be reflected in the public documentation of the device; that way, this will become an integral part of the certification. The execution of the individual certification test cases will follow the test specifications developed by the EnOcean Alliance. By this means, it will be ensured that all devices will undergo an identical test process and the test coverage as well as the test results will be comparable and reproducible independently from the individual device manufacturer.

INTEROPERABILITY ON THE PHYSICAL LAYER

A first major step towards the EnOcean Certification was achieved by releasing the "Radio Performance" specification in August 2013. Since then, manufacturers can prove radio range sufficient for interoperability of their devices. A release of the specification for the certification of the air interface, based on the EnOcean standard ISO/IEC 14543-3-10, is scheduled for the fourth quarter 2014. The defined tests and procedures ensure the conformance of the separate signals and their chronological performance.

INTEROPERABILITY ON THE COMMUNICATION LAYER

In the same time, the Technical Working Group (TWG) of the EnOcean Alliance is furthering the specification for the certification of the "Communication Profiles". This specification focuses on the verification of the link protocol chosen – EEP or Generic Profiles.

The system specifications of the EnOcean Alliance – the EEP specification (current version 2.6.1) and the specification of Generic Profiles – are the basic information for this specification. By means of defined data containers, the test result will be documented and reproducibility of test cases will be achieved.
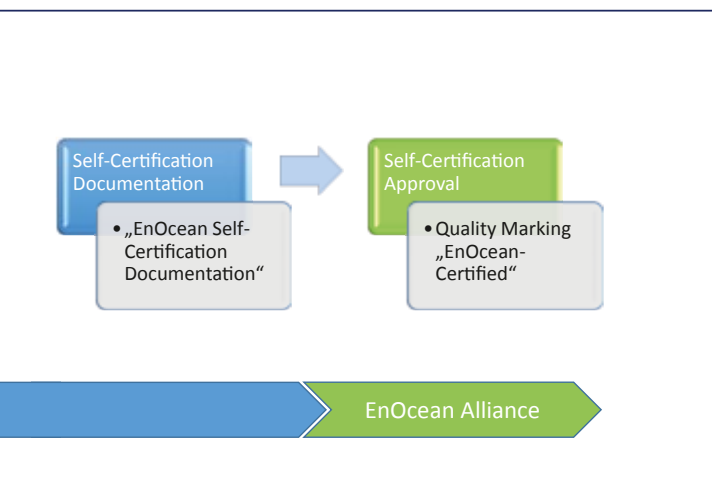
INTEROPERABILITY AT APPLICATION LEVEL

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

GUIDELINE AND DOCUMENTATION

The smooth flow of the certification will be supported by the "EnOcean Certification Handbook" currently being developed by the TWG. This handbook will support as well the unification and traceability of the certification's documentation. Moreover, the TWG will select a set of qualified test laboratories as independent certification bodies which could be appointed alternatively or supplementary to the self-certification.

The certification specifications existing so far can be applied already. Thus, the EnOcean Alliance substantiates step by step its promise of interoperability and secures a high level of quality of EnOcean-based products. The Technical Working Group welcomes all members of the EnOcean Alliance to join this activity and contribute their expertise to the definition and completion of the certification process – a key value of the EnOcean Alliance.

www.enocean-alliance.org

Self-Certification Documentation
• „EnOcean Self-Certification Documentation"

Self-Certification Approval
• Quality Marking „EnOcean-Certified"

EnOcean Alliance

AUTOMATION AT ADAC: INTEGRATED APPROACH, HIGH EFFICIENCY

The demands on automation systems for modern office buildings are correspondingly high. In the ideal situation, building automation should include all trades and systems. This type of integrated solution enables easy operation, flexibility in use of spaces and high energy efficiency for the user as well as for technical personnel. When setting up the new association headquarters in Munich, ADAC selected building automation components and systems from WAGO for this very reason.

By Florian Tremmel, Projektvertrieb Gebäudetechnik, WAGO Kontakttechnik GmbH & Co. KG

With more than 19 million members, ADAC is the largest automobile club in Europe and the second largest in the world. ADAC currently has around 6800 employees, and more than one-third of them work in the new center in Munich. The building, located on Hansastraße, was purchased in 2012 by the workers in Munich, who were previously scattered across the city at various locations. ADAC placed special emphasis on energy efficiency. Various solutions were ultimately integrated into one single concept in order to achieve the lowest possible energy consumption.

MODERN AUTOMATION TECHNOLOGY

"Above all, we didn't want a proprietary system, but an open one," says Markus Lamers, who is responsible for building automation in the building services department at ADAC. This helps to explain their selection of controllers and suitable modules from the WAGO-I/O-SYSTEM, which can be accommodated in a system housing, together with a mains adaptor, and which can be easily connected using pluggable connections. Each of these system distribution boxes takes control of the heating, ventilation, air conditioning, shading and lighting systems along one of eight axes of ADAC's office building in Munich.

In order to optimally adapt to the external environmental conditions, an additional controller is linked to the weather station installed on the building's roof.

ADAPTING LIGHTING CONTROL

Energy efficiency is also a component in the lighting of the ADAC building: in general, downlighting is installed that can be adjusted to the corresponding environmental conditions. Naturally, the level of direct sunlight and the time of day play important roles. An additional LED floor lamp is available at each workstation in the office areas, providing optimal illumination for ergonomic comfort.

Big picture: The new ADAC center can be counted among the most impressive new constructions in the Bavarian state capital.
Top right: WAGO controllers automate the different systems, like here in the HVAC control station.
Bottom right: Standardized system distribution boxes control technical systems, heating, shading and lighting along the individual building axes. Markus Lamers (left) discusses the details with WAGO's Florian Tremmel.

AUTOMATION FOR FLEXIBLE USE OF SPACES

An essential specification during planning, in addition to the high energy-efficiency requirements, was to ensure that the building spaces could be easily adapted to a variety of uses. In order to react quickly to changing needs, floor areas should be easy to rededicate. The electrical wiring is therefore standardized and also flexibly executed. "We equipped almost all of the switches for lights and blinds with the EnOcean wireless standard," explains Lamers. This allows switches to be easily allocated to another use, without requiring work on the electrical system. EnOcean communication uses corresponding interfaces in the WAGO-I/O-SYSTEM.

OVER 40000 DATA POINTS ARE CONNECTED TO THE BUILDING CONTROL TECHNOLOGY

ADAC employs an autonomous network within the building for its automation technology, which is completely separated from the IT infrastructure. All automation systems are connected to the control technology using Modbus/TCP on this total building automation (TBA) network. More than 900 WAGO controllers are in use: they are installed within office spaces for control tasks and are among the components used in the building control center. Lamers explains, "The great advantage in using the WAGO-I/O-SYSTEM is that a suitable interface card for almost every automation task already exists." In addition to DALI and EnOcean, M-Bus and KNX interfaces, as well as digital/analog inputs and outputs are deployed throughout the ADAC building. In total, more than 40000 data points are connected to the building control technology.

www.wago.de

A SMOOTH TAKE-OFF AND LANDING ON ENERGY SAVINGS

The Wayne County Airport Authority (WCAA) operates Detroit's Metropolitan Wayne County Airport (DTW) and nearby Ypsilanti's Willow Run Airport. Throughout its history, WCAA has invested in numerous capital improvement projects to enhance the travel experience. Recently it sought to improve behind-the-scenes operations to move closer towards achieving its sustainability goals. Leviton developed a plan to reduce WCAA's energy use and operating expenses.

By Cheryl De Los Santos, Marketing Manager Lighting & Energy Solutions, Leviton Manufacturing Co., Inc.

The WCAA is one of the busiest airport authorities in the country. It has a big job tending to the safe passage of more than 30 million annual travelers heading to 160 destinations through its 145 gates, six jet runways and two Federal Inspection Services facilities. In conjunction with experts from Leviton's Lighting and Energy Solutions team, WCAA launched a comprehensive energy audit of two of its maintenance facilities. The audit showed that it could significantly reduce its energy consumption, trim utility bills and benefit from a quick payback by installing energy-savings occupancy sensors in key areas.

OCCUPANCY SENSORS FOR SEAMLESS PERFORMANCE

Working alongside WCAA's Maintenance Services Department, the lighting efficiency experts at Leviton designed the installation plan, selecting the best sensor technology for each application area. A combination of passive infrared and multi-technology ceiling-mount sensors were chosen for hallways and enclosed office areas. The multi-technology sensors use both infrared and ultrasonic detection technology to respond to occupancy without false triggering and were the ideal choice in areas where additional detection was required. Over 30 occupancy sensors were installed to provide seamless performance in the open spaces and enclosed office areas of the two maintenance buildings.

ENERGY HARVESTING WIRELESS FOR SPECIFIC REQUIREMENTS

In equipping rest room and locker room areas with an automated lighting control solution, a different approach was needed. The cinderblock construction and asymmetrical layout of these areas prevented a standard hard-wired sensor installation. Fortunately, Leviton's LevNet RF radio frequency-based sensors, which require no wiring, cleared this part of the project for

"The LevNet RF Wireless Sensors made it possible for us to implement an energy management program in our maintenance area. Today, we have an install-and-forget system that provides handsfree lighting control while reducing our carbon footprint and helping us save on energy costs – all without having to add any new wiring."
Dave Garrett, Electrical Manager, Wayne County Airport

take-off. The installation challenges posed by the block construction and floor plan of the rest rooms were easily and cost effectively overcome using LevNet RF's energy harvesting wireless technology.

SOLAR-POWERED FLEXIBILITY

The wireless implementation consisted of the installation of LevNet RF WSC15 and WSC04 ceiling-mount sensors and companion WSS10 Advanced Wall Switch Receiver

units. Ideal for the most challenging retrofit applications, both sensor models feature a built-in solar cell collector that absorbs sunlight and ambient light which are converted into the DC voltage needed to power the unit. The solar cell technology bypasses the need for batteries or wiring, enabling WCAA to save on the cost of the installation as well as on its ongoing lighting costs.

AUTOMATED LIGHTING CONTROL

The Wall Switch Receivers provided a quick installation, mounting easily in single-gang wall boxes in each rest room, without any new wiring. Responding to signals from the wireless sensors, the receiver switches automatically activate lighting in the rest rooms when someone enters and deactivate lighting after the room is vacated for a specified time period.

VALUABLE SAVING EFFECTS

The LevNet RF wireless implementation provided WCAA with a no wires, no batteries energy management solution even in the most difficult to retrofit areas. Today, WCAA is able to benefit from the convenience of an install-and-forget, hands-free lighting control solution that helps it conserve energy and reduce operating costs.

www.leviton.com

ROHM ILLUMINATES A BUDDHIST TEMPLE WITH ENOCEAN SWITCHES

ROHM Co., Ltd. introduced a wireless, batteryless and maintenance-free switch system into "Taimadera", a Buddhist Temple in the Nara Prefecture. It is the first time that EnOcean switches have been installed in a Japanese temple. In January 2014, the installation work for the LED lighting system in the three halls of the temple, which harbors national treasures and important cultural heritage objects, was completed. The system was widely praised for not damaging the historically valuable building.

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

Taimadera was built in the Asuka period (538 to 710 CE) and its construction style is typical for temple buildings of this era. In its "Kondo" (the hall which enshrines the principal image), the temple has many historically important treasures like a Buddha statue or a statue of the four big gods, representing the culture and art of this time in Japanese history.

PRESERVATION OF HISTORY

From April to June 2013, a special event was organized, for which LED lights were installed in the three halls of the temple (the main hall, Kondo, the lecture hall). As this event was extremely well received, it was decided to permanently implement the lighting system in the temple. Concerns were raised about damage to the historical building by the installation. However, by using self-powered EnOcean switches, no long wiring work or batteries were needed. Therefore, the Ministry of Culture gave its approval for the construction. The installed switches use the energy generated by pushing the switch to send a radio signal to the light, in order to turn it on or off. Due to the energy harvesting approach, the system works maintenance-free.

The Conventional Switch

The Wireless Switch

Relay

Wiring is necessary and visible

Power generating and sending a wireless signal by switching

Switch power generator and radio transmitter unit (EnOcean)
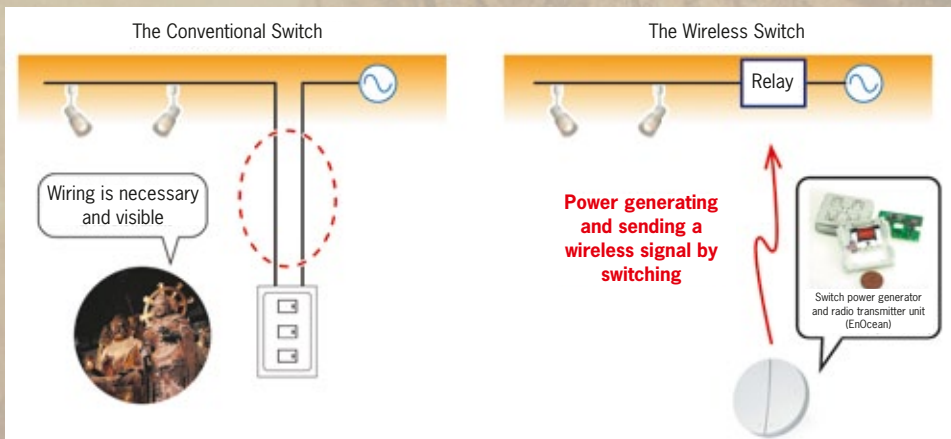
Due to the self-powered EnOcean switch module, the lighting control in the temple can work without wires and batteries.

SHINING BUDDHA STATUE

The lighting consultancy company "Light Meister Co. ltd.", which implemented the LED system, decided to use CCS Corporation's natural light LED, which is frequently used in museums. With this lighting system, national treasures like the altar containing the Taima Mandala and the sitting statue of Miroku Butsuza (literally, Future Buddha) can be seen more clearly. Visitors can discover new expressions of the Taimadera Buddha and have a more fascinating experience.

The chief priest of Taimadera Temple, Kokyo Kawanaka, comments on the installation: "Until now, we did not have sufficient lighting installed in the halls of the temple, which is why the halls were always pretty dark. The principal image of Buddha in Taimadera is a picture of the Mandala, which cannot be seen clearly in the dark. We wanted visitors to clearly see the Mandala and the Buddha statues and therefore installed an LED system. For the lights, it was possible to install wires in hidden places on the ceiling or beams, however, the switches always have to be installed near the entrance and it usually becomes necessary to wire these switches. But the light switches from Rohm do not need wires and it is not even necessary to put batteries inside. Not only is this cultural treasure protected, but I also think that the design of the switches fits in perfectly with the historical building."

www.rohm.com

RESEARCH HOUSE DEMONSTRATES THE TRENDS OF TOMORROW
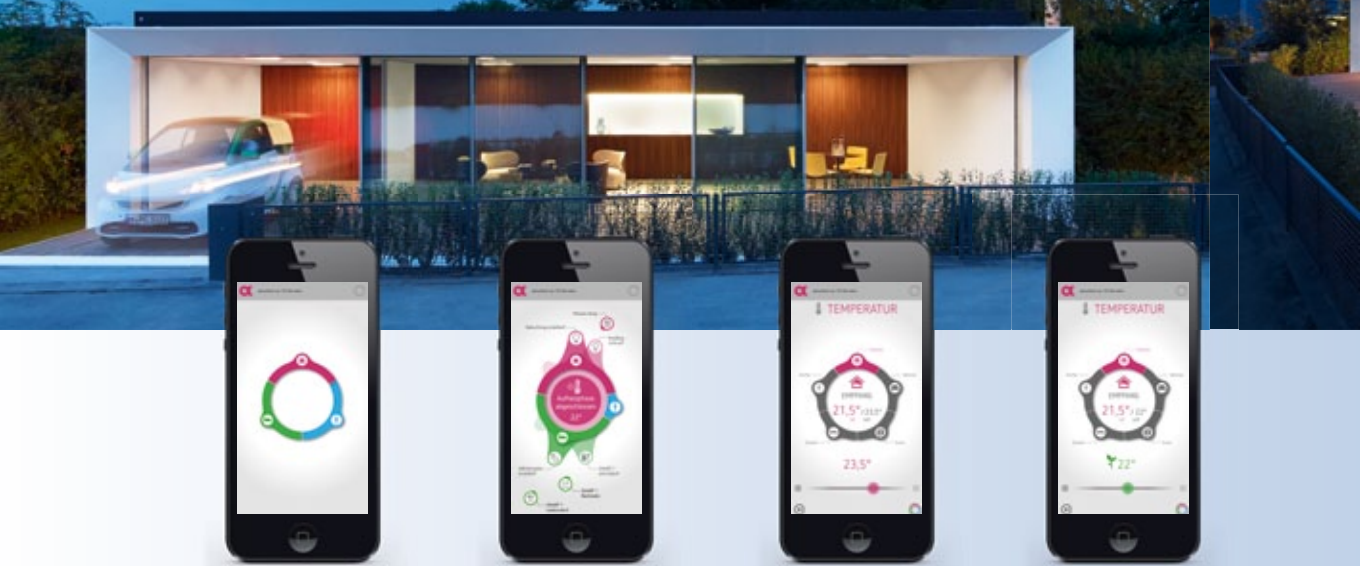
alphaEOS AG has further developed its innovative heating control technology into a self-learning smart home system. The predictive energy management system, which uses EnOcean technology to communicate with sensors and actuators in the home, is being used for the first time in a research facility: the world's first active house, which was planned by Werner Sobek.

By Annika Rehbein, Marketing Manager, alphaEOS AG

The B10 active house is an 86 m^2 flat-roofed building with a glass front facing the street. With its architectural and technical innovations, the house fits in perfectly with the well-known Weißenhof development, situated not far from downtown Stuttgart. This development based on the designs of various world-renowned architects, such as Le Corbusier, was built in Killesberg in 1927 to demonstrate ways in which people would be building homes and living in the future. The B10 active house, which will remain in its temporary location for a period of three years, officially opened its doors in July, thus continuing Weißenhof's tradition of trend-setting building construction.

The heart of the innovative B10 active house is a predictive and self-learning energy management system from alphaEOS AG. The alphaEOS system networks all technical systems in the house, including the power storage unit, heat pump, heating system, lights and the stove as well as two Daimler electric cars and two pedelecs. "By closely networking electromobility and home control systems, we will make everyday life more comfortable in the future," says Jonathan Busse, CEO of alphaEOS. "If I have to leave the house in a hurry, the alphaEOS system automatically makes sure that all doors and windows are closed, the stove is off and only a minimum amount of energy is consumed during my absence. When I approach the active house in my car, the gate opens and the lighting and room temperature are just the way I like them." The alphaEOS system thus predictively meets the residents' comfort and mobility needs, based on their daily routines, weather data and personal requirements, and keeps on learning.

DYNAMIC, CONTEXT-DEPENDENT APP

The buildings' users benefit from the new alphaEOS app, which makes the smart home easier to use. In addition to the classic user interface, the app now also has a dynamic, context-dependent one. "When it gets dark outside, the elements for controlling the lights shift to the front," Busse reports. When the last resident leaves the building, anything that isn't needed is automatically switched off. Even the heating is turned down several degrees to save energy.

The active house generates its energy sustainably. A photovoltaic system with integrated solar thermics (PVT module) is installed on the roof and supplies both thermal energy and approximately 8300 kilowatt hours of electricity. The calculated power demand for all loads in the house, along with that of two electric vehicles, is approximately 4000 kilowatt hours. The building thus generates 200 % of its own energy demand. To minimize power losses, the terrace in front of the building and facing the street can be flipped up automatically – at night, or when no one is home, this architectural element dynamically adapts the building to different usage situations.

PERFECTLY INTEGRATED INTO THE NEIGHBORHOOD

Connecting a house to a virtual power plant, which is being implemented for the first time, allows power to be drawn from the grid only when electricity prices are particularly low, due to an excess supply. "It is also possible to establish a balance in the neighborhood by locally coordinating supply and demand with nearby buildings," says Busse. The future-oriented energy management system turns the house into an active part of the future energy system: the smart grid. Targeted infeed of excess power can thus help balance out the load peaks of weaker buildings in the neighborhood.

The alphaEOS system communicates with its actuators and sensors in the house via an EnOcean wireless network (868 MHz). The EnOcean wireless technology, which meets international standards, establishes smooth communication between all components with a range of 30 meters. The project also uses EEBus as a standardized and consensus-oriented concept for networking the smart grid with the smart home. The goal is to promote the use of the EEBus standard for connecting the largest possible number of building engineering installations and appliances. The goal is to further standardize smart home technology.

The use of an office in the research house will be tested during its first year of operation. For this purpose, alphaEOS set up a Future Living Lab with four research topics/workspaces, for which students and junior researchers can apply at http://futurelivinglab-b10.de/. After a period of one year, the building will be renovated for use as a residence. The B10 active house is part of the Electromobility Showcase Initiative, with alphaEOS AG acting as a research partner and consortium leader.

www.alphaeos.com/aktivhaus-b10

WIRELESS TECHNOLOGY FOR ENERGY-SAVING RETROFITS IN CHINA

EnOcean-enabled wireless and batteryless solutions from Lutuo transformed a twelve story building in Hangzhou, the capital of Zhejiang Province, into an intelligent energy-efficient office building, without impacting the daily work schedule.

By Tony Berges, General Manager, Lutuo Technology Co.,Ltd

Lutuo, a company designing, developing and manufacturing smart, reliable, eco-friendly solutions for the building automation industry, designed a complete product line of EnOcean-enabled intelligent energy harvesting wireless devices. This portfolio provides energy-saving solutions to existing buildings while minimizing installation effort, cost and time. In the Zhejiang Provincial Government Building 8, Lutuo's designs replaced the traditional retrofit wired solutions which were inflexible, disruptive and time consuming.

NO "NEUTRAL" AVAILABLE

The Zhejiang Provincial Government Building 8 was built in 1999 with heating, ventilation and air-conditioner fans controlled via local Siemens mechanical thermostats. A neutral wire was not available since the mechanical thermostat was only required to switch on "line" or "hot" wire for each fan. However, upgrading with a typical "smart" controller would have required rewiring each office thermostat to accommodate the additional "neutral" wire. This is a costly and time-consuming effort that also disturbs the daily office workflow.

DIRECT REPLACEMENT

To avoid this effort, the building owners decided for Lutuo's batteryless, wireless solution. Lutuo's unique no-neutral heating, ventilation, air-conditioning and lighting controllers are the world's first direct replacements for existing thermostats and wall switches. They transform an ordinary office into an intelligent network by integrating wireless sensors without modifying the structure or interrupting the daily work flow. The time that needs to be spent for retrofitting the office is less than for cleaning it.

Lutuo's intelligent controllers provide coordinated control of lighting, temperature, humidity or CO_2 levels using either built-in sensors or EnOcean-enabled wireless and batteryless, maintenance-free remote sensors.
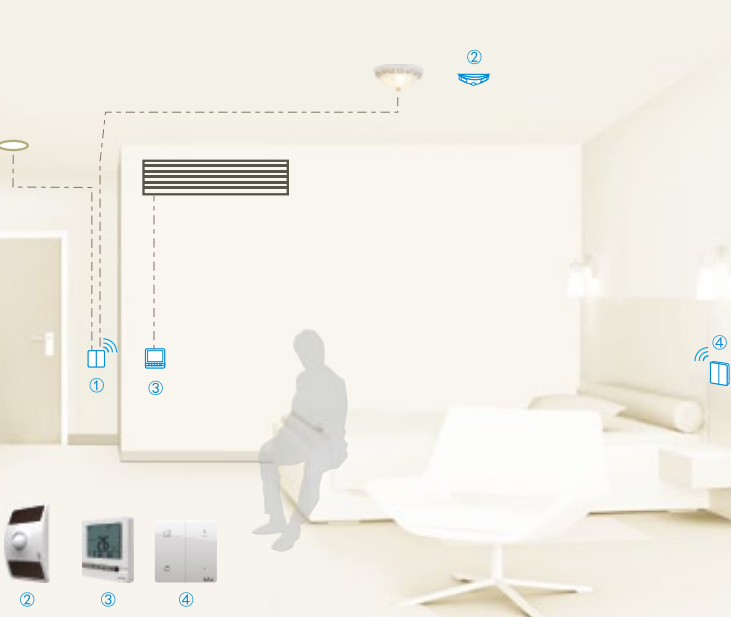
Top left: Lutuo's batteryless wireless LTHB occupancy sensors in the Government Building 8.
Bottom left: All sensor data can be controlled via mobile devices.
This page: Lutuo's intelligent system doesn't require a neutral wire and can be retrofitted without additional wiring.

BETTER PERFORMANCE WITH LESS EFFORT

The primary objective of the building's upgrade was to match the government's initiatives on energy savings, emission reduction and resource conservation. Lutuo's innovative solutions helped meet these objectives, while improving system management and user comfort.

The transformation was accomplished quickly without damage to the building, without construction dust or noise and without requiring office employees to stop working. In addition to a 20 % energy saving, each office can be controlled locally, or the entire building can be coordinated by areas, departments or individual floors on a PC software.

After the retrofit, the government building now offers the users a local temperature and humidity display in each room. The heating and cooling can be scheduled for optimum comfort. In addition, the integrated platform allows complex operations, centrally controlled, including mobile device management and a comprehensive energy efficiency analysis.

MANUAL AND AUTOMATED COMFORT

The manual functionalities of the new system include adjustment of heating, cooling, fan speed and temperature via the local no-neutral thermostat controllers and manual lighting control via the local no-neutral wall switches. Furthermore, users can control the wireless smart power strip, e.g. of the water dispenser, and use remote batteryless wireless switches for personalized control functions.

Besides this, the solution offers a range of automated functionalities which offers high comfort and energy-saving rates without manual intervention. Batteryless occupancy sensors maximize energy savings by controlling the light depending on human presence and natural light levels as well as presentation modes in meeting rooms. They also activate heating and cooling when a room is occupied. When an area is unoccupied, all consuming devices are automatically turned off and a room enters the energy-saving mode. The same applies for the heating and cooling functions of the drinking water dispenser.

INTELLIGENT TWO-WAY COMMUNICATION PLATFORM

For a highly user-friendly control of the system, Lutuo developed software applications for desktop and mobile devices that coordinate the controller and sensor data such as temperature, humidity, fan speed, occupancy status, door and window status. The aim is to provide an integrated system that learns and adapts to the users' preferences, delivering the best user experience.

Pre-defined priorities by area, floor, office or individual device further optimize the demand/response requirements during high peak power periods and automatically reduce non-critical lighting or adjust air conditioning settings. For example, storage areas, hallways, mailrooms or conference rooms can have different light levels and temperature settings to prevent punitive tariffs during peak load periods.

www.lutuotech.com

GROUP COMMUNICATION BETWEEN FREE-STANDING LUMINAIRES

In the exact place where research is conducted to learn about the effects of different environments and working methods, the employees themselves are now able to benefit from the implementation of a future-oriented office concept: in the Center for Virtual Engineering, ZVE, Waldmann implemented an intelligent lighting solution integrating energy harvesting wireless technology.

By Silke Weidenfeld, Marketing, Herbert Waldmann GmbH & Co. KG

The Fraunhofer IAO has built the "Center for Virtual Engineering ZVE" in Stuttgart. The building received the Certificate in Gold from the German Sustainable Building Council (DGNB) for exemplary efficiency, environmental friendliness and conservation of resources. The provided infrastructure at the work stations is exactly customized to the individual requirements. Flexible work stations make it possible to physically integrate different knowledge bearers depending on the project.

THE LIGHTING SOLUTION: FLEXIBLE AND INTELLIGENT

All this requires flexible lighting solutions that can be adjusted to individual requirements depending on the working situation and the workstation user. A solution from Waldmann is being used on "Level 2". It combines efficiency, lighting quality and convenience. The combination of ATARO LED free-standing LED luminaires with both the PULSE HFMD and PULSE TALK lighting management systems makes it possible – with a daylight sensor system, presence sensor technology and wireless group communication. The flexible free-standing luminaire solution can be adjusted to new work station configurations at any time.

## GROUP COMMUNICATION BY LIGHTING CONTROL

If the office is completely full, each work station features individually desired work lighting. If only individual employees are present, the level of lighting is reduced to basic lighting in the places where there are no longer people. This reduces energy consumption without forgoing a pleasant lighting atmosphere. If an employee returns to a station, the surrounding lights adjust accordingly. The lighting adjusts itself to their presence, even while they are on their way to the work station. This works because the luminaires are assigned to groups which exchange presence information. The efficient area light management is realized with the PULSE TALK lighting management system. The luminaires learn automatically.

THE SPECIFICS OF PULSE TALK

PULSE TALK uses the EnOcean wireless standard for communication. This makes the system interoperable. Using external wireless switches, certain luminaires can be turned on/off or dimmed, together or individually. Additional room functions can also be realized. One luminaire in the group can take over the master function and the corridor lighting, which is equipped with an EnOcean-compatible wireless actuator. In addition, it is possible to further tap energy-saving potential by using an EnOcean gateway to connect to building automation. Because the system works in two directions, the building or room automation can also influence the luminaire network.

www.waldmann.com
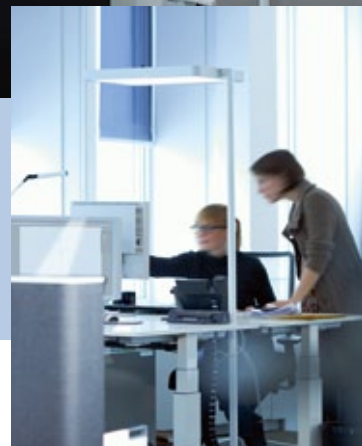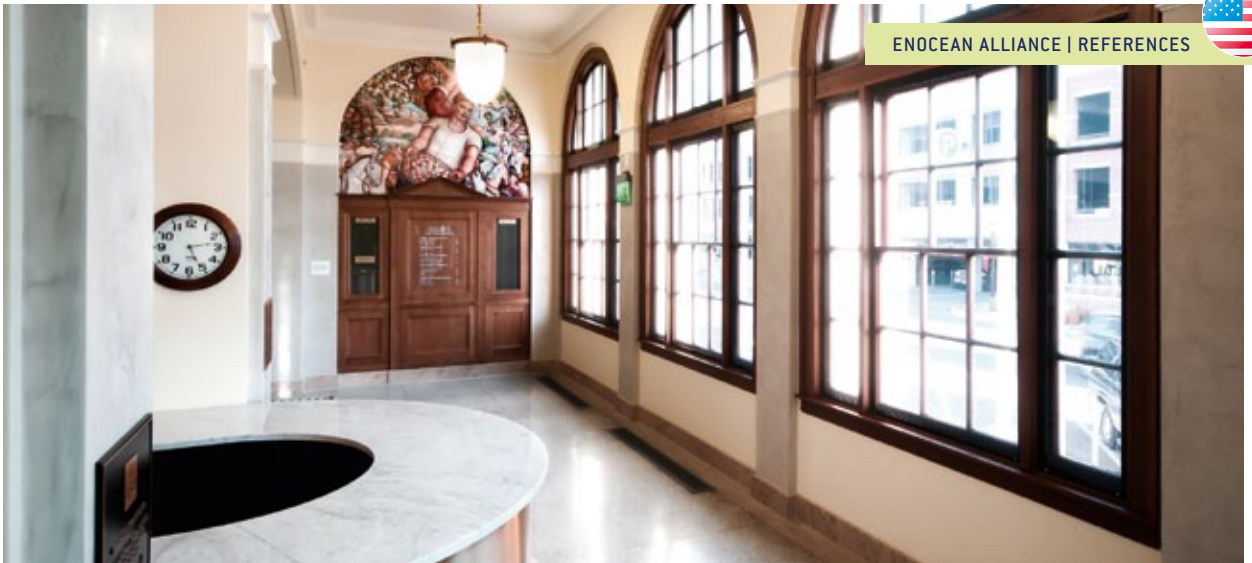
INNOVATIVE WIRELESS LIGHTING CONTROLS

Magnum Energy Solutions is involved in GSA's first targeted Site Net Zero, certified LEED platinum building located in Grand Junction, Colorado.

By Cory Vanderpool, Business Development Director, Magnum Energy Solutions

Funded by the American Recovery and Reinvestment Act, the $15M modernization and high performance green building renovation not only preserved an anchor in the Grand Junction community. It also converted the 1918 landmark into one of the most energy-efficient and sustainable historic buildings in the country.

INTEGRATED LIGHTING CONTROL STRATEGY

Magnum Energy Solutions provided the innovative wireless lighting control strategy that was deployed in the building. This lighting solution consists of motion sensors for occupancy-based lighting control, as well as LUX sensors which measure ambient light to accomplish daylight harvesting. Lighting relays, wireless and battery-less light switches, outdoor LUX sensors and power-strips were also incorporated into the project.

INDIVIDUAL OCCUPANCY RULES

The entire lighting system was integrated into the building's existing Tridium-based building automation system. In addition to the various controls implemented in office areas, the common space lighting is dimmed down during periods of unoccupancy and brought up to required light levels automatically when occupancy is detected. In addition to the individualized controls, there are master schedules associated with each of the building's tenants. The occupancy-based data that the sensors collect is also provided to the mechanical systems in the building for optimized HVAC-related control.

SUSTAINABLE TECHNOLOGY SCORES

What sets this wireless lighting control system apart is that the devices utilized are not only wireless, but also batteryless. By utilizing the open, interoperable EnOcean radio protocol, occupancy sensors utilized in the building are "powered" from small solar cells that harvest available light in the space, which is a much more sustainable solution. With no wires to run and no batteries to replace, Magnum's technology allowed for the building to achieve additional LEED-related points and will have substantially less ongoing maintenance than a wireless solution requiring batteries.

www.magnumenergysolutions.com

TAKING AAL TO THE NEXT LEVEL

With meinPAUL, a technical aid for assisted living in old age, OPUS® greenNet makes technology even more accessible to the elderly. The ambient assisted living (AAL) system allows seniors to live independently in their own homes for a longer period of time.

By Ina Trautmann, Marketing Director, JÄGER DIREKT
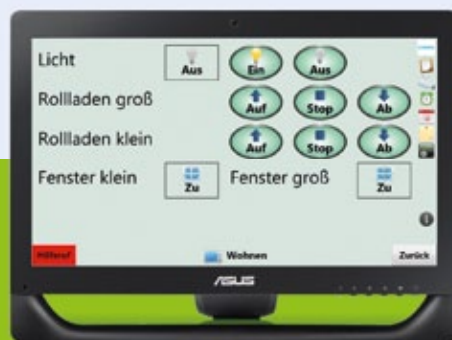
How will we live in old age? This is a question that everyone deals with sooner or later. Over and over again, surveys demonstrate that most people would prefer to spend their twilight years living within their own four walls – provided they have obstacle-free furnishings and user-appropriate building technology. The number of technical solutions is growing steadily under the concept of ambient assisted living. As a result, simple assistance solutions are as common today as special applications – for example, confirmation that pills were taken or detecting a fall. JÄGER DIREKT demonstrates the targeted and conceptual ways in which such solutions work.

MEINPAUL – THE PERSONAL ASSISTANT

meinPAUL, the personal assistant for assisted living, is a simple add-on for OPUS® greenNet. At the user's end, meinPAUL embodies a touch PC that performs visualization and control functions. In addition to a central mini-server, a number of EnOcean sensors and actuators form important parts of the system. The use of OPUS® greenNet offers the benefits of energy harvesting wireless technology that are typical of EnOcean products: meinPAUL has a modular design, is adaptable and can be easily and conveniently added to existing residential units.

BEYOND SUPPORTING SENSORS AND ACTUATORS

meinPAUL users benefit from a special, simplified and age-appropriate user interface, which is easy to operate from a touch PC. The corresponding app can be used to operate standard building automation functions such as lighting, shade elements and even heating from a central point. The integrated front door controller, including an IP camera, reduces the need to constantly walk to the door. In addition, the user can receive only welcome guests.

Functions that influence the user's safety are added to the ever vigilant smoke detector and motion and water sensors. For example, the inactivity detector automatically registers the fact that no usage-typical movements have taken place in the home over a long period of time and first issues an internal alarm via meinPAUL. If the resident fails to deactivate this alarm manually, the system triggers an automatic call for help, which is sent to either the children's or the neighbors' cell phones or an emergency service.

Along with the safety aspects, meinPaul also pays special attention to the social factors of everyday life. Age-appropriate games provide entertainment, exercise instructions keep the user fit, an integrated media library collects family photos and a radio and TV function is also available.

SIMPLIFYING INVESTMENT FOR INITIAL USE

The system's upgradability and EnOcean's modular concept make it very easy to begin using the PAUL system. Even the basic starter solution makes everyday life much easier. The system can be conveniently upgraded with additional safety functions, IP cameras or simply more solutions. JÄGER DIREKT has achieved the best results in the property management business. "The primary goal of property owners is to rent units faster, better or simply for a longer period of time. Offering the PAUL system makes the property more lucrative, establishes trust among the tenant's relatives, while a leasing concept under development will make learning the technology even easier in the future," says Thomas Jäger, company founder and managing partner, JÄGER DIREKT.

www.OPUSgreen.Net/produkte/meinpaul

Left: The user interface of meinPAUL is particularly user-friendly and clearly arranged. Right: The modular system adapt to changing requirements. Top: Even starter packages can already make the daily routine easier.

Video clip:
The system for
the elderly (AAL)

SMARTLY CONNECTED

The Smart Eco System links various electronic devices and energy areas of a building and thus becomes a modern energy manager. Whether rolling shutters or blinds are in tune with a dimmer lighting system or the heating or hot water supply should react to individual conditions – the possibilities of the Smart Eco System are diverse.

By Wolfgang Luth, Sales Director Smart Home, Diehl AKO Stiftung & Co. KG
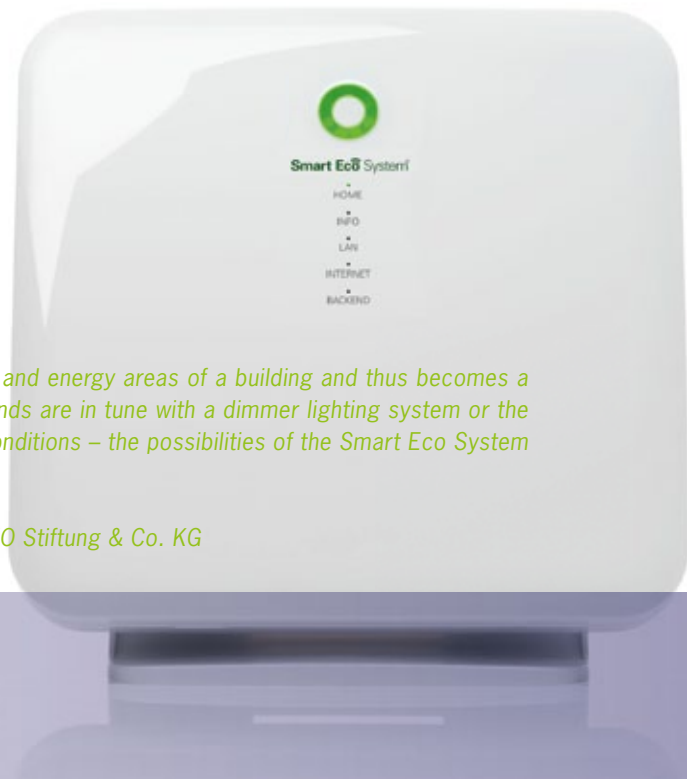
The special advantage of the Smart Eco System is the principle of the open integration platform. Thus, products and components from other manufacturers can be integrated according to the plug&play principle and for the most part without bothersome cabling. These are, for instance, the products from the Smart Eco System Alliance and the open wireless standards EnOcean, Z-Wave etc. In addition, the system can be expanded with further technologies, for example, via the robust integrated Powerline Communication.

CENTRAL CORE

The central unit is the heart of the Smart Eco System and was developed by Diehl Controls as an OEM solution. Various partners use the modular system to offer individual OEM solutions. The central unit manages all actions in the house and can also be controlled by numerous end devices such as tablet PCs, smartphones, desktop PCs or Smart TVs using the same control app. Data can be requested and evaluated via remote access, at home or offline. In addition to the highest safety standards, the central unit also features connections to international wireless standards such as Z-Wave and EnOcean. This can also be expanded easily. Developed for the mass market, the central unit of the Smart Eco System

can be branded. Due to its many functionalities and an attractive design, the product is particularly attracting companies of the energy supply, telecommunication or lighting and building industry, to name only a few.

ONE APP, ALL FUNCTIONALITIES

Just one app controls the entire house. Immediately after starting up the app, the end user has all major control and energy consumption data on the Home Screen in a compact overview. The user can create individual scenarios and rooms, group connected devices and evaluate it all with a diagram. When using photovoltaic and heat pump systems, the Smart Eco App allows an efficient energy management and, therefore, also an increased self-consumption rate. It is available for all conventional Android and Apple devices but can also be identically used with a conventional desktop PC.

MORE SIGNALS

The Extender is the ingenious expansion for the central unit, whether for additional wireless standards or an increased range. Plugged into an outlet in a building, it receives the PLC signal from the Smart Eco System central unit through the power line, transforms this wireless signal and transfers it to the devices. Conversely, the Extender sends the data for evaluation back to the central unit. The Extender has a continuous current of 14 A; and with the integrated plug-in socket, ideally, no plug slot is lost for other devices.

Top left: The central unit is the heart of the Smart Eco System.
Left: The Extender receives the central unit's signals through the power line.
Top: The Smart Eco System connects different plug&play devices
to an integrated energy management solution.

ENERGY CONSUMPTION UNDER CONTROL

With the plug actuator, electric appliances such as floor lamps or washing machines can be switched and their energy consumption measured. In combination with the Smart Eco System central unit, the device can analyse the monthly electricity costs, create individual switch scenarios and enables the user to react to power tariffs. An application-specific LED informs about the most important functions and can also be used as an "energy traffic light". The plug actuator, offering many unique features, is available for radio standards EnOcean or Z-Wave and offers an automatic overload relay as well as a child proof socket. The switching current is 16 A, continuous current up to 14 A possible. Key quality feature: all Diehl Smart Home products are VDE-certified.

**www.diehl.com/en/diehl-controls/
smart-home.html
www.smarteco-system.com**

Advertisement

SECURITY IN BUILDINGS

e-Security from YTL is based on energy harvesting wireless technology. Therefore it does not require any wire or battery, which makes it easy and quick to set up by plug&play. The system sends short alarm messages in real time if an emergency situation occurs that needs immediate attention. In addition, e-Security system also includes a central monitoring and management console for users to activate and monitor each subsystem.

By Yao Wu, Vice President of Engineering, YTL Technologies Ltd.

The wireless call buttons of the e-Security system can be flexibly placed anywhere. As they do not need batteries to work, there is no need for any maintenance and the devices will never run out of power. This guarantees a 24/7 operation.

ALERT FOR STORES

The alarm system can be widely deployed, for instance, for monitoring a store during the night. When the store owner leaves for home in the evening, he or she can activate the system via the e-Security app installed on a smartphone. After typing in a predefined password, the system will be activated after 30 seconds and trigger an alarm if an occupancy sensor detects a movement or if a window/door sensor detects that a door or window is opened. The store owner can remotely control the system's status and activate it at any time using the app on the smartphone.

It is also possible to set an e-Security installation to send heartbeat messages to the user in a predefined period of time. This function ensures that the system works properly when the user leaves the store or the home for a long vacation, for example.

ALWAYS PREPARED

e-Security includes an emergency call function. Even when the system is not in an activated mode, users can still push a call button to trigger a SOS wireless signal in the case of an emergency. Besides this, multiple e-Security systems can be connected to a central monitoring and management console (including an IM module and the monitoring application). The application is easy to set up and use. It receives messages via the IM module sent by the e-Security systems and displays the messages on a screen or generates an alarm sound.

The console can also be used to process and response to emergency requests. All data of activity will be stored in a log file and can be reviewed later on. Its management function monitors and reports the status of the managed e-Security systems while configuring the reception of different type of messages.

www.ytlcn.com

THERMOKON VISUALIZES ENOCEAN WIRELESS TECHNOLOGY

For the first time, the specialist for sensors in the building automation presented its new planning tool for the visualization of EnOcean-based radio telegrams on the occasion of Light+Building 2014 fair in Frankfurt/Main. By means of airScan, Thermokon offers a simple and clear possibility for the planning and integration of EnOcean-based devices.

By Nico Gotthardt, Director of Product Management and Marketing, Thermokon Sensortechnik GmbH

Being a software application for Windows-based PCs and laptops, airScan can be installed on the PC. A wireless-enabled USB stick, which can be mounted in all designated transmitter and receiver positions with a USB extension cable, handles communication with the EnOcean network.

GAINING A QUICK OVERVIEW

Installers and planners benefit from the software which offers a structured surface on which all EnOcean-based telegrams received are clearly arranged and listed with the allocation to the respective product. The receiving quality, which is displayed by the dB-values in traffic light colors, enables a clear statement of the perfect mounting place of transmitters and receivers.

A filter function for the exclusive viewing of individual sensors as well as the variable naming of sensors in the general list offer a very good transparency.

Along with the device ID and the name of the manufacturer, the corresponding detailed view of the device displays the profile used and the contents of the last telegram in decimal notation (e.g. temperature in Celcius degrees, depending on the EnOcean profile).

LONG-TERM TRENDS

airScan comes with a logging function that makes it possible to record data over a selected, longer period of time. This function records the device ID, data bytes and RSSI level, depending on the date and time. The information logged can be exported in the formats CSV, XML or XLS or can be further processed.

INTEGRATED REPEATER FUNCTION

A repeater function rounds out the portfolio of airScan functions. In this working mode, the bi-directional USB stick acts as a receiving unit that captures all EnOcean based telegrams, processes and outputs them as a repeated signal.

Doubtlessly, airScan is a well thought-out and useful tool for planners and integrators of EnOcean-based networks. Range planning and the ideal transmitter and receiver positions are no longer any obstacles. Thanks to airScan, this is a real step in the right direction toward creating green buildings with EnOcean technology.

www.thermokon.com

ENERGY MONITORING FROM VARIOUS SOURCES

Pressac Communications, a Promoter of the EnOcean Alliance, has introduced its range of innovative Pressac Sensing products for smart energy monitoring, that provides BMS professionals with the tools to monitor and improve energy performance, and help facilitate reduced running costs for buildings.

By Caroline Smith, Marketing Manager, Pressac Communications

All Pressac Sensing products support the internationally recognized EnOcean standard, which is becoming an integral part of today's building management systems. Following its first phase launch of energy monitoring devices, Pressac Communications' latest phase of new product introduction includes:

WEB-BASED DASHBOARD

The Pressac Sensing Dashboard is a web-based analytics platform that provides energy usage alerting and reporting, which delivers a rapid and simple method of identifying inefficiencies and diagnosing issues within buildings. The Dashboard is cloud-based, meaning there is no software to install, and its appearance can be individually configured to suit the user's specific requirements – delivering the extra advantage of a bespoke solution for any type of environment. The Dashboard, in conjunction with the Pressac Sensing product range, provides an effective energy monitoring solution to monitor the parameters in a building environment – including energy consumption, and levels of CO_2, temperature and humidity.

ROOM-LEVEL MONITORING

The Mini Temperature and Humidity Sensor is a solar-powered sensor which provides peel and stick deployment for room-level monitoring in buildings. The sensor is fully wireless – for easy and low cost installation, and is powered by ambient light and so requires no maintenance.

INTELLIGENT CONTROL

The Intelligent Relay will be introduced to the market in three staged phases: the first product phase will enable users to integrate with existing lighting products, using its mains switching and detection facility. The second phase will enable integration with other devices such as PIRs and keycards. And finally the third phase will facilitate remote programming, and the logic engine will enable users to create and modify functions within building controls – such as HVAC.

WIRELESS ELECTRICITY MEASURING

For electricity measuring purposes, Pressac offers the patent pending wireless current transducer (CT) Clamp. The CT Clamp doesn't require batteries, wiring or interruption to the power supply and can simply be clipped around an AC cable to measure the current flowing in a single mains conductor. Using this product, energy or facility managers can understand the operational costs of appliances on a daily basis. The CT Clamp is suitable for plant energy monitoring, energy reduction targeting, sub metering or HVAC optimization.

AIR QUALITY

For air quality monitoring within buildings, Pressac offers a range of sensors, including the solar-powered CO_2, Temperature and Humidity Sensor. This fully wireless, solar-powered room sensor is powered by ambient light from the surrounding environment, and allows fast and easy installation with minimal disruption for retrofits.

www.presscomm.co.uk

E-DESIGN – SMART AND TIMELESS

With its new e-design for pushbuttons and sensors, Eltako offers the perfect combination of productive functions and timeless design.

By Anja Allmis, Technical Sales Assistant, Eltako GmbH

The new Eltako e-design for wireless pushbuttons and sensors blends user-friendly functions with a sleek design. Combined with universal wireless technology for buildings, it creates a complete system – with individual functions and endless possibilities.

ALWAYS THE RIGHT FIT

The new e-design pushbuttons and sensors provide the right solution for every function and fit in perfectly with any room, thanks to their timeless design. The new flat rocker dimensions (65 x 65 mm) also make for a large contact surface.

THE RIGHT CHOICE FOR ANY LOCATION

Thanks to the wireless technology, the pushbuttons can be easily mounted on walls, glass or furniture. Wherever the user needs them to be. The remote controls are used to conveniently control the lights or shades, and offer additional flexibility.

www.eltako.com

Advertisement

RELIABLE ROOM OPERATION WITH A STYLISH DESIGN

SAUTER launches the second generation of the ecoUnit 1 battery-free wireless room operating unit. The new room operating units combine improved performance and functionality, stylish design and optimal availability and reliability. They are the best in their class.

By Lidia Randazzo, Corporate Communication Management, SAUTER Head Office

A new feature of the SAUTER ecoUnit 1 is that the LCD display and the solar cell are further to the front of the unit. As a result, the display of the room operating units is not affected by shadowing effects, thus improving its readability, and the solar cell can make the best use of the available light as it is positioned nearer to the surface.

OPTIMUM AVAILABILITY

At a typical workplace, the lighting level during a working day of eight hours is approx. 500 lx. The average basic lighting in functional buildings is around 300 lx. Thanks to its bigger solar cell, the new SAUTER ecoUnit 1 basic unit only requires a minimum lighting level of 250 lx for five working hours per day in order to operate flawlessly. In combination with the enhancement module, it can even be used at a level of only 125 lx.

FIVE DAYS OF RELIABILITY

The new low power mode and the bigger buffer memory provide reserve operation when the room is in darkness for up to 120 hours. Full functionality is available continuously for 60 hours of darkness, and for a further 60 hours basic functionality is active in the low power mode. This equates to five days of continuous operation – making the unit also ideal for rooms that are not used over long weekends.

www.sauter-controls.com

WIRELESS MODULE FOR INDUCTIVE SENSORS

Many designers in the fields of mechanical and systems engineering are familiar with the problem: finding a way to mount an inductive sensor on a moving machine part, for example to detect a position. Routing the power and signal lines is a highly complex process, one that can be accomplished only with trailing cable units or cable loops. steute overcomes this obstacle with a new wireless solution.

By René Scherer, Head of E-Marketing, steute Schaltgeräte GmbH & Co. KG

A new development from steute's "Wireless" division makes it easy to perform this task in practice. The solution uses a tried-and-tested inductive sensor from steute's product line, combined with a new wireless transmitter module that plugs into the sensor.

PROXIMITY ALLOWS FOR WIRELESS CAPABILITY

The module, which is as compact as it is robust, can be mounted close to the sensor. Using the proven, industry-specific EnOcean protocol, it transmits the signals output by the sensor to a receiving unit, which is usually installed in the switchgear cabinet. For this purpose, steute offers different variants with one, two or four channels. A repeater can also be used.

RELIABLE TRANSMISSION

The distance between the transmitter module and receiver can be up to 30 meters in buildings and up to 300 meters outdoors. The transmitter module is powered by a long-life battery.

The wireless steute sensors ensure highly reliable transmissions even under poor conditions with reflective surfaces and other wireless systems, which are often present in industrial environments.

The wireless inductive sensors are cylindrical and come in three sizes – M12, M18 and M30 – each of which has a flush-mounted and non-flush-mounted version. The universal transmitter module can also be connected to other types of switchgear and sensors, making them wireless.
www.steute.de/en

SMART PARTNERSHIPS LEADING TO SMART HOMES

As a major contribution to smart home technology, iEXERGY introduces its future-proof, universally compatible, manufacture-independent wibutler system and focuses on smart partnerships that give equal benefits to participating manufacturers, craftsmen and users.

By Margarete Sackarend, PR & Community Manager, iEXERGY

CREATING VALUE FOR USERS THROUGH PARTNERSHIPS

In the fragmented market of smart home technology, consumers find it difficult to find the right solution for their home. Most systems are manufacturer-specific, have to be operated with multiple apps or focus on specific trades. This inspired the idea of a holistic, all-in-one solution that scores with its compatibility and ease of use. wibutler users can connect a vast array of devices, control their entire home with one single app and easily configure the system via smartphone or tablet. Smart products and automation scenarios are intuitively integrated into daily life by including familiar switches and remote controls.

This open system empowers users with unlimited possibilities – possibilities that manufacturers benefit from as well. Manufacturers that integrate their smart products and devices into the wibutler system can extend their market by having consumers combine and use their products in a new way. This creates an innovative and holistic advantage for individual customers as well as a competitive differentiation for manufacturers.

TAKING ADVANTAGE OF MARKETING SYNERGIES

The advantages of the wibutler system extend beyond the technology itself. The emphasis on partnerships cre-

ates win-win situations in marketing, from which all partners benefit. The wibutler label marks partner products as compatible, creates additional purchasing incentives and strengthens the wibutler brand as much as the partnering brands.

As an independent platform, the wibutler website garners trust from customers and offers the possibility to market products effectively and to get in touch with interested consumers. Partners can strengthen their e-commerce by using the wibutler shop to distribute their products online. In addition, they have the choice to distribute a selective assortment of Pro Products via the established 3-tier distribution model. Prominent placement on the wibutler website and integration in advertising activities economically extends the manufacturer's reach.
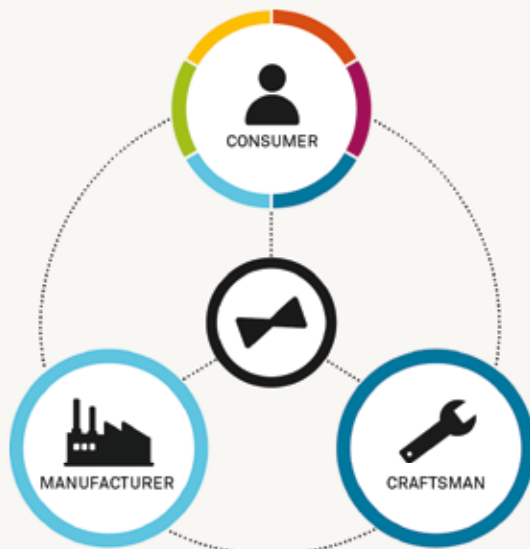
CRAFTSMEN AS EXPERT PARTNERS

If requested by the customer, certified and trained crafts-men can give advice on Pro Products and assist with their integration into the system. Craftsmen can appreci-ate how the wibutler system, after a simple installation, will simplify their daily work. The execution of hydraulic compensation, the integration of a central switch to save energy and the implementation of demand-based tem-perature flow are simplified considerably and can be pre-sented as additional purchase incentives.

"We believe in the principle: 'Only those who are willing to share will gain'. We want to build synergies from which all participating parties can benefit. The implementation of the Internet of Things can only be achieved with an open, holistic and cooperative system. This is why we offer every interested manufacturer the opportunity to join our alliance as a wibutler partner," says Arne Feldmeier, CEO of iEXERGY.

www.iexergy.com   **www.wibutler.com**

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Ready to Receive!

- Switch actuator in *WINSTA®* connector system for fast, pluggable and cost-saving electrical installations

- Universal receiver for all battery-free and wireless EnOcean radio switches (PTM)

- Available as 4-channel light control 770-629/101-000 or 2-channel sunblind control 770-629/102-000

www.wago.com

WE! INNOVATE! **WAGO**®

MAKE YOUR HOME READY FOR AUTOMATION! – AFRISO'S NEW JACK OF ALL TRADES

Multifunction smart home gateway and innovative building automation app from AFRISO

*By Dr. Ulrich Aldinger,
Managing Director,
AFRISO-EURO-INDEX
GmbH*

AFRISO has made a name for itself in the past with EnOcean-based sensors and actuators. The company is now launching a universal smart home gateway for home automation. The gateway has a modular design, can be expanded on all levels and is therefore future-proof.

INTERNET AND RADIO STANDARDS

On the Internet side, the AFRISO home gateway is equipped as standard with LAN and WLAN for connection to an existing router. If a router is not available at the installation site, an optional quad-band GSM module may be used for Internet access. If necessary, two independent channels can be implemented redundantly, for example in applications requiring security.

On the building wireless side, the AFRISO home gateway is equipped as standard with EnOcean wireless technology. Other wireless standards, such as Z-Wave, ZigBee and wireless M-Bus (water and power meters) can additionally be integrated. Along with the ability to use all products offered by members of the EnOcean Alliance (EnOcean Link), users can also easily access products under other common wireless standards (multiprotocol) without having to be aware of the different standards. The user interface of the AFRISO home app no longer

makes any distinction between the different wireless standards.

SECURE DATA

The data transmitted to and received from all trained sensors and actuators is stored in the gateway along with the date and time (local data logging). As a result, the data is located only on the user's system and is protected against access by unauthorized third parties, creating trust and security.

Memory can be added with a micro SD card or a USB stick. Active speakers can be connected with a stereo jack, which facilitates convenient text-to-speech messages and Internet radio functionality.

ONE APP FOR EVERYTHING

The AFRISO home app is the user interface for the AFRISO home gateway. It can be used to train sensors and actuators, display sensor data and switch actuators. Data stored over time, such as temperature curves, can be displayed graphically. The AFRISO home app can be automated individually, which means that

Left: The universal Smart Home Gateway of AFRISO is designed as a modular concept and can be extended at any time.
Bottom: The user can control all system components via one app.
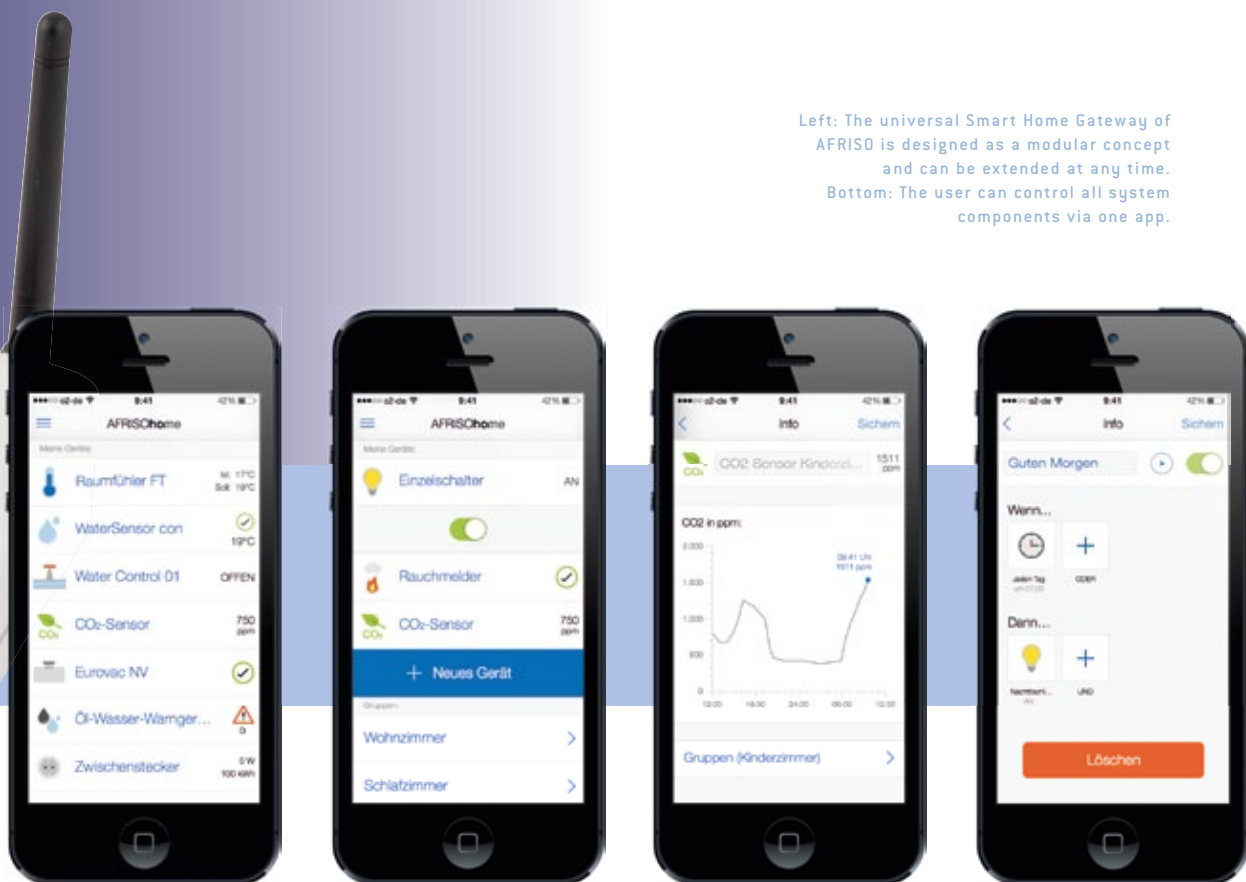
users can easily program their own "if – then" logic operations and thus generate automatic workflows. The app is easy to use and intuitive. Special attention was paid to an appealing and clearly organized graphic design. The AFRISO home app has been optimized for Android and iOS devices.

CUBE GATEWAY

The AFRISO home gateway's little brother, the modular "Homee" cube gateway was launched in June 2014 (http://hom.ee). The white basic cube, with edges measuring 50 mm in length, has a Linux system, including WLAN capability. Wireless cubes of different colors can be mounted, and each color represents a different wireless building standard, such as EnOcean, Z-Wave, ZigBee or wireless M-Bus.

www.afriso.de

The modular cube gateway "Homee" can integrate different wireless building standards.

INDOOR ENVIRONMENT AND ENERGY CONTROLLED BY ENOCEAN STANDARD

SECO, the world's leading low-carbon advocates, provide wireless and batteryless products. The products cover controllers, thermostats, sensors, wireless switches, gateways, protocol converters, power energy management and integrated control software.

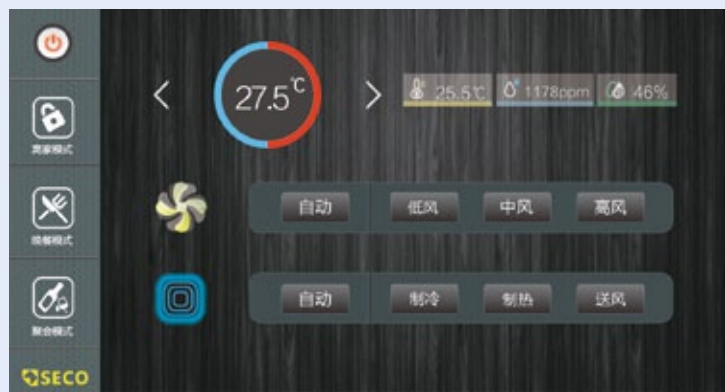*By Marketing Department, Beijing SECO Information Technology Co., Ltd.*

AIR QUALITY IMPROVEMENT WITH MULTI-FUNCTION SENSOR

Batteryless wireless EnOcean multi-function environment monitoring sensors combine wireless temperature and humidity with CO_2 sensing. Integrating the EnOcean wireless standard protocol, the intelligence of this sensor enables the user to respond very quickly to the current parameters of the environment, including temperature, humidity and CO_2 level in a building. In addition, the sensor's data can be used to automatically switch on the air-conditioning to improve air quality. This sensor can also be combined with an intelligent thermostat to establish a typical environment monitoring system, which can automatically improve air quality without manual operation.

ENERGY SAVINGS WITH INTELLIGENT THERMOSTAT

Relying on the smart thermostat, the device can be used to control heating as well as most of refrigeration and ventilation equipments in commercial buildings, residential homes or hotels. A large touch-screen provides a good human-computer interaction interface. SECO's smart home system can save energy, offers simple commissioning and installation of energy-saving technologies while extending the functionality of multi wireless devices.

A clear touch screen shows all system functionalities on a single interface.

Big picture: The multi-function sensor combines temperature, humidity and CO_2 sensing.
Right: The intelligent thermostat controls heating, air conditioning and ventilation.

The system integrates occupancy sensors, window contacts or wireless switches to automatically turn on or off room lighting and HVAC when the guest leaves the hotel room. This not only reduces energy costs, but it also enhances the guest experience. Thanks to the intelligent room control system, more than 30 % of heating and air-conditioning energy are saved, and there is over 40 % energy saving on lighting.
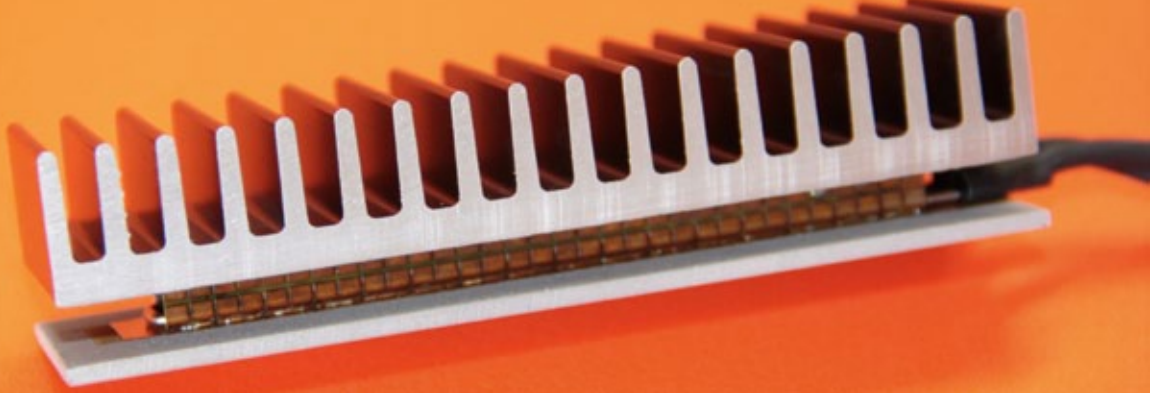
ENERGY MONITORING AND MANAGEMENT METER

SECO's smart energy meter can add to an existing metering infrastructure via either an optical or wired connector. It can transfer existing meters into "smart meters" and record electricity figures or power consumption in real time, including tables or graphic statistic analysis. Users can download the power consumption data or the analysis to a smartphone, giving the user easy access to the existing monitoring system.

www.secotech.com.cn

A TRUE GREEN BUILDING SOLUTION

Tongfang Technovator is a leading building, energy-saving solutions provider of the energy management systems market. Its Techcon wireless and batteryless series is the perfect solution to meet the high standards elaborated by the Chinese government for an improved carbon footprint of buildings.

By Marketing Department, Tongfang Technovator Int. (Beijing) Co., Ltd.

The wireless and batteryless room temperature sensors are designed to communicate with Techcon09 controllers via radio telegrams in accordance with the EnOcean standard. All Allure sensor models possess an integrated temperature sensor for precise local temperature sensing. In addition, some models feature a rotary knob for set point adjustment, fan speed setting and a push button for occupancy override. All models are powered by solar energy, providing maintenance-free operation.

NUMEROUS BENEFITS

The alluring, slim profile enclosure is suitable for classrooms, hotels, executive areas, office spaces and commercial areas. A separate sub-base allows it to be mounted on any surface with double-sided adhesive tape.

A true green building solution, Techcon offers many benefits for building automation, from flexibility and adaptability, to cost and time reduction at installation, to improved tenant comfort.

www.techcon.thtf.com.cn

HEAT TO POWER A SENSOR IS EVERYWHERE

O-Flexx Technologies launches a new era of powering wireless sensors and actuators by introducing a revolutionary light-weight and efficient thermoelectric generator (TEG) package which allows an as yet unknown simplification in system design even when harvesting across larger areas.

By Heiko Rother, Director Sales & Business Development, O-Flexx Technologies GmbH

WSN (wireless sensor networks) and IoT (Internet of Things) are boosting trends which offer significant advantages to many different OEMs and end users. Conventional sensors and modules require batteries and maintenance – not always the most economical approach. Especially in industrial applications thermal harvesters are the preferred solution as they generate electric power perpetually.

UTILIZING HEAT WHERE IT HAS NOT BEEN POSSIBLE BEFORE

The new *O-Flexx Power Strap*™ is a thin, light-weight and solderable TEG package leveraging all advantages of in-plane heat flux and thus overcomes limitations of the traditional TEG. Furthermore this worldwide unique design eliminates any needs for thermal paste or clamping mechanism, which reduces not only costs and complexity but additionally optimizes the overall system efficiency. Besides that, it allows the highest possible scalability based on one standard component, which enables low and high temperature harvesting even across large thin structures.

PERFORMANCE AND EFFICIENCY

But that's not all: O-Flexx is currently working on industrializing a patented pn-junction technology and implementing it into their existing TEG package to boost the performance even further. Important to say that the *O-Flexx Power Strap*™ concept follows a high-volume production approach and is manufactured on standard machinery as it is used in today's electronics industry, which is beneficial to quality and cost efficiency.

All this makes the *O-Flexx Power Strap*™ an absolutely exceptional TEG showing new ways for thermal powering of sensors and actuators.

www.o-flexx.com

FOR ANY CASE OF EMERGENCY

The Japanese companies ITEC and NS Tech have introduced a waterproof, floating batteryless emergency call button. It integrates the PTM 430J switch module which uses kinetic energy to power reliable communication in 928 MHz, the Japanese radio frequency for energy harvesting wireless solutions.

The wireless emergency button is particularly suited for any case of emergency in the home, in the hospital or in a nursing home. The small form factor allows placing the switch in the bathroom, at the bedside or even carried on the person. If someone needs help he or she can just press the yellow button. By doing this, an alarm signal is immediately sent to a gateway, which forwards the alarm message to the mobile phone of a close family member or the caregiver. If required, this person could activate a room camera to check the status of the emergency. The panic button comes with a waterproof, floating shell, so that it still works and can easily be picked up even if it falls in the bathtub. The batteryless operation ensures that the switch never runs out of power and is always working – the most important specification of an emergency device.

www.ermine.biz
http://ns-t.biz

WHERE IP MEETS ENOCEAN

The Digital EnOcean Gateway from Digital Concepts combines the world of energy harvesting wireless technology with IP. It is the first intelligent EnOcean TCP/IP gateway aimed specifically at the system integration market. Digital Concepts received the SmartHome Deutschland Award 2014 in the "Startup" category for its innovative product strategy.

By Oliver Fischer, Managing Director, Digital Concepts

Digital Concepts develops individual control concepts for the smart home and smart business markets. The objective of these solutions is to build a bridge between different standards and technologies, resulting in an integrated network of disciplines for maximum comfort and functionality. The technical overall solutions are always tailored to the individual needs of the customer or the project.

FAST STARTUP

The Digital EnOcean Gateway was developed specifically to meet the needs of system integrators, who can install the gateway in just half a day. This saves an enormous amount of time over the installation of conventional tunnel gateways, which usually require an integration period of up to two months. The commands and the interface (API) are quickly mastered and can be easily integrated into different control systems thanks to the two-way TCP/IP socket communication. The user can choose between simple, string-based commands and a comprehensive JSON implementation (JavaScript Object Notation).

EASY COMMUNICATION

The integrated EnOcean Link middleware can connect all EnOcean-based products for IP-based control independently of the manufacturer. EnOcean Link converts the bits and bytes of an EnOcean telegram directly into data values. In doing so, the middleware automatically takes into account all specifications of the EnOcean protocol stack and the EnOcean Equipment Profiles (EEPs) of the EnOcean Alliance as well as encryption mechanisms. The Digital EnOcean Gateway supports the EEP 2.5 and EEP 2.6 equipment profiles and can thus connect energy harvesting wireless solutions without separate modules on the client side. The energy harvesting wireless products are implemented via the EEP profiles on the devices. The gateway can integrate energy harvesting devices as well as devices with power supplies.

EXTENSIVE NETWORKING

The hardware itself is robust and energy-efficient. It integrates the EnOcean TCM 310 transceiver module and a TCP/IP socket server for incoming and outgoing queries. The gateway supports IPv4. The internal SQL database stores all device information and continuously synchronizes the controller with EnOcean-enabled devices. Users can easily configure the network and search for errors via the internal http server. The server also

Visualized functions based on the example of a Crestron controller.

enables all functions to be operated via PCs or mobile devices, using a web interface.

Integrators can define different message types for controlling the EnOcean devices and the gateway. The data is always encrypted when transmitted and thus meets high standards of data protection and privacy.

APP IN THE WORKS

To make operation particularly user-friendly, Digital Concepts will be offering an iOS app in the future, which will connect directly to the gateway. This app visualizes all devices trained in the gateway on a smartphone. The user can thus run all network functions from an app without requiring a large control console.

CONNECTING TO CRESTRON TECHNOLOGY

As a certified Platinum partner to Crestron Inc., one of Digital Concepts' objectives was to connect both EnOcean and Crestron technologies. Digital Concepts thus developed modules for the Crestron controller that integrate the EnOcean devices. As a result, the end customer can operate different hardware technologies on a single user interface.

www.digital-concepts.eu

WIRELESS ALARM HANDLE FOR WINDOWS WINS MULTIPLE AWARDS

Thanks to its technology and design, SODA's innovative product has won two prestigious prizes: the SmartHome Deutschland Award and the Plus X Award 2014.

PLUS X AWARD 2014

The S8 wireless alarm handle for windows received the seal of quality in five categories of the Plus X Award 2014: best product in innovation, high quality, design, ease of use and functionality. SODA won over the judges with its high-quality, functional product and cutting-edge design.

SMARTHOME DEUTSCHLAND AWARD

The SmartHome Deutschland Initiative also named the wireless alarm handle for windows as the best product in the SmartHome Deutschland Award for outstanding achievements in the areas of smart homes and smart buildings. Along with its level of innovation, the product was rated for its performance in the categories of "energy efficiency," "environment" and "self-reliant living at any age." The 2014 award was presented under the patronage of Sigmar Gabriel, Germany's Federal Minister of Economic Affairs and Energy.

Both awards singled out the S8 wireless alarm handle for windows due to its ability to integrate different sensors such as alarming, window opening, brightness, temperature and humidity. The product is a true innovation when it comes to energy and security technology.

www.soda-gmbh.de

CALEFFI LAUNCHES ENOCEAN WIRELESS VALVE

In 2014, Caleffi became a member of the EnOcean Alliance. Along with the membership, Caleffi launched its new smart heating control system WiCal® which is based on the EnOcean wireless standard.

By Domenico Mazzetti, Analysis and Market Research Manager, CALEFFi S.p.A.

Caleffi has been investing in the development of products that ensure comfort and reduction of energy consumption. The summer issue of the Idraulica Magazine focuses on the upgrade of existing systems and introduces the heating control WiCal® among the most effective technical solutions with that purpose. EnOcean is also a topic in the magazine as WiCal® integrates its technology and fits perfectly into its overall approach.

RELIABLE WIRELESS COMMUNICATION

The complete WiCal® product line allows for automatically adapting the heat to pre-defined setpoints and the users' needs thus saving valuable energy. Due to the wireless operation, the components can be easily integrated into a building automation system, creating more flexibility in system planning and implementation as well as cutting energy use.

Idraulica is a Caleffi educational magazine for hydronic professionals to support them in system design as well as in the selection and use of components. This publication is written by engineers and oriented towards innovative design techniques with a commitment to continuous education of HVAC players. Idraulica is issued for specific markets such as Italy, North America, France and Portugal.

www.caleffi.com

EMPOWERING BUILDING MANAGEMENT WITH INTELLIGENT SYSTEMS

Intel worked with BSC Computer and EnOcean to bring powerful and efficient solutions to Eltako's home automation business.

As part of the drive to reduce energy consumption, costs and carbon, demand for building management and home automation is increasing rapidly. Working with Intel, BSC and EnOcean, Eltako is developing innovative, intelligent solutions that inspire smart, energy-efficient buildings throughout Europe.

ON THE WAY TO AN INTERNET OF THINGS

Building automation is a rapidly growing sector, as developers, facilities managers and owners look to central control of critical building functions to reduce energy consumption and carbon emissions while increasing comfort and security. But the smart building is also an example of the Internet of Things in action.

The gateway offers a complete end-to-end solution, from hardware and communications to smartphone apps and analytics, and was developed on Intel® architecture to ensure the highest levels of performance. At the heart of the gateway design is the Intel Atom processor. The gateway also uses Intel® Smart Connect Technology to interact with the communications channel and update data while it is in sleep mode.

The BSC gateway handles three key wireless communication technologies: Wi-Fi for transferring large amounts of data to the external WAN; GSM/UMTS to enable remote access and control from any device in any location; and, finally, the ISO/IEC 14543-3-10 protocol for transferring control and measurement data from EnOcean sensors.

POWER AND PERFORMANCE FOR INTELLIGENT SYSTEMS

BSC had been collaborating with Intel to develop a cost-effective and powerful network gateway that incorporates the latest control and visualization software and machine-to-machine (M2M) communication techniques. Importantly, the gateway also introduces the idea of managing all building control elements – such as heating, electricity, water and security – through a single solution.

INTEGRATED AUTOMATION SOLUTION

For Eltako, the collaboration among Intel, BSC and EnOcean has enabled it to deliver an extensive range of building automation services to a wide variety of clients. In addition to its self-powered applications – such as batteryless switches, intelligent window handles, temperature, humidity and light sensors, relay receivers and control centers – the company sells complete smart home systems.

www.intel.com
www.eltako.com
www.bscgmbh.de

ALWAYS PREPARED FOR ALARM

Inlon Engineering, an Italian specialist for open automation systems, has compiled an integrated alarm system based on the EnOcean wireless standard which can easily be retrofitted and ensures reliable operation.

By Paolo Laganà, Research and Development Manager, INLON Engineering srl

Emergency call solutions for bathrooms, required by law for disabled people as well as in in all public facilities with shared bathrooms (schools, clinics, nursing homes, bars, offices, hotels) must obey some basic requirements: reliability, but also the certainty for those seeking relief that the alarm was received. At the same time, the system needs to work always and everywhere, even in the event of a power failure. In addition, the solutions must be installed quite often in accommodations and/or protected houses which already have an alarm system in operation.

The solution from Inlon Engineering exploits the wireless technology with RF protocol EnOcean and, therefore, can be applied anywhere, without the need for new wiring and construction works. In the same time, this solution allows a complete integration with all subsystems already installed.

FIELD-PROVEN COMPONENTS

The system's components are from ELTAKO which allows to taking advantage of a wide range of products that cover most automation needs: from lighting control and regulation (including LED) to consumption monitoring, shutter and fan coil control. It can also help to ensure an immediate expansion of the system's functionality, while preserving the components that are already in the field.
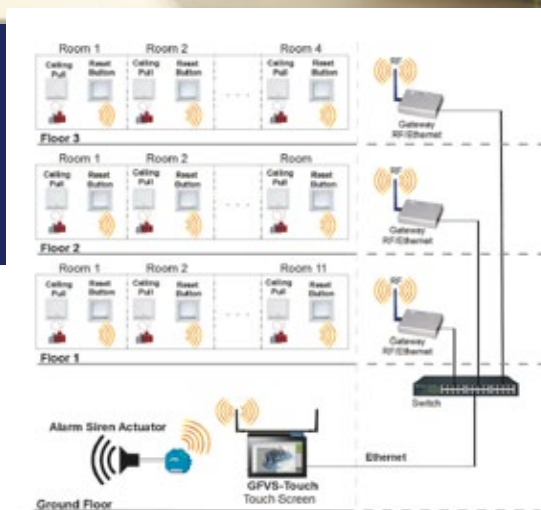
INTEGRATED SYSTEM

The system includes a tie rod in bathrooms (FZS-rw) with integrated RF interfaces can be used to trigger an alarm. The BSC-BAP gateway reports the received information via Ethernet to the reception or to any device that collects and displays alarm telegrams. The FMZ61-230V module which activates the siren or any other optical/acoustical indicator uses the same wireless message.

The telegram from the alarm reset button (FFT55Q-rw) is sent through a BSC-BAP gateway to the desk and reaches the module FMZ61-230V for silencing the alarm signal. The received data is available on the Touch Screen Operator Interface and can be optionally visualized on a tablet or smartphone. The signal repeaters are always available to guarantee that the required signal is covered in all required areas.

www.inlon.it

GLASS HOUSE SHINES WITH ENOCEAN TECHNOLOGY

ChinaRedStar Macalline, the largest retailer of home furniture and construction products in China, works together with the EnOcean Alliance to integrate intelligent control system to the spectacular Glass House in Shanghai. The aim is to turn the Glass House into a demo building for wireless and batteryless products from EnOcean Alliance member companies.

By Lena Lin, Marketing Manager China, EnOcean Alliance

The Glass House was built near the Century Avenue in Pudong, close to the Shanghai Central Business District. The modern looking "hemisphere" building has glass walls all over and offers more than 800 m^2 of useful space. Switches, sensors, controllers, tubular motors, heating valves, gateways and a smartphone app from global and local Chinese EnOcean Alliance members will be installed to facilitate the operation of energy-efficient lighting, HVAC and shading solutions while increasing system flexibility and user comfort.

POWER OF THE ECO-SYSTEM

Thanks to energy harvesting wireless technology, EnOcean-based solutions are ideally suited for the Glass House, allowing for greater wireless control options, but also for reducing installation time and cost. Over 1200 interoperable products available from more than 350 Alliance members also give ChinaRedStar Macalline perfect flexibility to choose the most suitable products.

The overall indoor design is made by Shanghai Psi Intelligent Technology Co., Ltd. The Glass House is still under construction. Later this year, ChinaRedStar Macalline, together with the EnOcean Alliance, will hold an opening ceremony to unveil this unique and smart building. We welcome you to visit the Glass House at that time.

www.chinaredstar.com

▶ SEPTEMBER 2014

Sep 3-5, Shanghai Intelligent Building Technology (SIBT), Shanghai, China
www.building.messefrankfurt.com.cn

Sep 24-25, IBS Paris, Paris, France
www.ibs-event.com

▶ OCTOBER 2014

Oct 21, Convention EEB (Efficience Energétique du Bâtiment), Paris, France
www.convention-eeb.fr

Oct 22-23, 1st EnOcean Alliance University Session, Lyon, France
http://serveur-infocom.fr/enocean/invit_univ_2014/index.html

Oct 29-31, Hi Tech Building, Moscow, Russia
www.en.hitechhouse.ru

▶ NOVEMBER 2014

Nov 4-6, European Utility Week, Amsterdam, Netherlands
www.european-utility-week.com

Nov 11-14, Interlight Moscow, Moscow, Russia
www.interlight.messefrankfurt.ru

▶ JANUARY 2015

Jan 6-9, International CES 2015, Las Vegas, USA
www.cesweb.org

Jan 26-28, AHR Expo 2015, Chicago, USA
www.ahrexpo.com

▶ FEBRUARY 2015

Feb 24-26, Strategies in Light, Las Vegas, USA
www.strategiesinlight.com

▶ MARCH 2015

Mar 5-6, LEDucation 9, New York City, USA
www.leducation.org

Mar 10-14, ISH 2015, Frankfurt/Main, Germany
www.ish.messefrankfurt.com

FURTHER INFORMATION ...

Interesting links, news, images and videos from EnOcean and the EnOcean Alliance can be found at:

WHICH MODULE FOR WHICH PRODUCT?

The EnOcean Product Finder answers this question online and always up-to-date **www.enocean.com/product-finder**

PRODUCT FINDER

Advertisement

Supporting global manufacturing through ROHM innovation
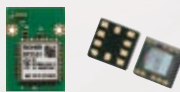

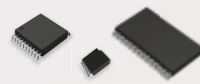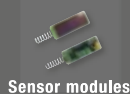| High-speed switching high voltage products, including SiC	High quality, high reliability products, from chip LEDs to LED lighting solutions	Connecting man, machine, and society through sensing and wireless communication	Promoting energy conservation by utilizing a variety of power control ICs
Power Devices	LED Lighting	Sensing Solution	Analog Power ICs

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