



ENABLED BY ENOCEAN

perpetuum®

MAINTENANCE-FREE WIRELESS SWITCHES & SENSORS

2013
ISSUE
2

FUTURE ENERGY HARVESTING

INTERNET OF THINGS

New applications for EnOcean radio

ZENO CONTROLS

5-Star hotel embraces energy efficiency

TELEFUNKEN SMART BUILDING

Smartly transmitted

THERMOKON

Energy harvesting meets display

Paris, November 4–8, 2013

**intertec
+elec**
POWER & BUILDING

EnOcean Alliance: hall 1, booths C5+D5

Helvar

freedom in lighting

Wireless DALI lighting control



For the first time you can connect your EnOcean devices and controls to a complete DALI lighting control system via Helvar's 434 EnOcean Gateway.

KEY FEATURES

- Allows integration with BMS
- Simple setup with Helvar's 'Learn Mode'
- Choice of switches - wireless EnOcean or wired DALI
- Simple installation - standard DALI connection
- Up to 20 EnOcean switch devices per gateway
- Multiple gateways per DALI subnet

Visit www.helvar.com/enOcean for more information or email us at controls@helvar.com



Photo courtesy of Roca. The Roca Gallery in London, which features Helvar Lighting Control, has won numerous awards including the Lighting Design Awards 2012 and the New London Awards 2013.



Dear Reader,

This Perpetuum issue takes a look at the latest and future innovations around energy harvesting wireless solutions. But what's behind this common term "innovation"?

Generally speaking, it's a process in which, by definition, an idea develops into a technology which then ends up being pervasive in the market. Usually, such an innovation process takes time. EnOcean has successfully achieved this for energy harvesting wireless solutions within only a few years.

In 2013, we have reached a peak of our success story to date. Only in the past few months, EnOcean had tripled its revenue by quarter. This significant business growth particularly confirms: batteries are outdated; the market demands for energy harvesting to power wireless solutions.

We have achieved this because innovation is part of EnOcean's company philosophy. This is a theme that drives us from our early days: "Innovation never stops, never stop innovation". It's important to continue in research and development. This does not mean reinventing the wheel every second year but to constantly reassess your technology advantage and keep it a strength. That's exactly what our R&D team currently deals with when developing improved and new energy harvesters as well as a platform for a long-range wireless communication powered by energy out of air.

Besides the technical aspects, innovation is always built on close cooperation. The success of energy harvesting wireless technology is inseparably linked to great partnerships enabled by the EnOcean Alliance, one of the world's fastest growing technical alliances. This organization is a vital marketplace and a fundamental collaboration framework for innovation. It offers a unique platform for established market players and young start-ups to exchange experiences, build relationships, and join forces to develop new products, applications and systems.

You'll gain a fair knowledge of the innovation strength in the EnOcean ecosystem when reading this magazine. You might even be inspired, who knows. So, what's your idea of the next energy harvesting breakthrough innovation?

Yours,

Laurent Giai-Miniet
CEO of EnOcean



INTERNET OF THINGS

*New applications
for EnOcean radio*

8



ZENO CONTROLS

*5-Star hotel embraces
energy efficiency*

28

Editorial	03
Table of contents Masthead	04
The ABC of EnOcean	06
EnOcean Alliance stands for energy efficiency	07

TECHNOLOGY

On the batteryless road to the Internet of Things	08
EnOcean Pi: Raspberry Pi meets energy harvesting	12
Test EnOcean Link free of charge	12
Easier, faster – EDK 350 developer kit	13
EnOcean-Products – 868 MHz, 315 MHz, 902 MHz and 928 MHz	14
Age-appropriate	17
Energy for smart cities	18
Interview – energy harvesting in new spheres	19
EnOcean Certification – seal of quality for interoperability	20

ENOCEAN ALLIANCE

Overview of EnOcean Alliance members	22
EnOcean: Batteryless pieces of a perfect mosaic	23
YTL Technologies: A luxury dream	24
Murata: Smart hospital lighting system	26
ZENO Controls: 5-Star hotel embraces energy efficiency	28
VOLKSEN: China Europe International Business School benefits from EnOcean technology	30
JÄGER DIREKT: Glue-on intelligence	32
alphaEOS: alpha.one – proactive temperature control for reduced heating costs	34
TELEFUNKEN Smart Building: Smartly transmitted	36
Distech Controls: Personalized comfort and increased ROI	38

MASTHEAD

perpetuum – the innovative magazine for customers and partners of EnOcean GmbH
EnOcean GmbH, Kolpingring 18a,
82041 Oberhaching, Germany,
Tel: +49.89.67 34 689-0, Fax: +49.89.67 34 689-50,
perpetuum@enocean.com, www.enocean.com

Publisher EnOcean GmbH, Munich, Laurent Gai-Miniet, CEO
Editorial EnOcean GmbH, Angelika Dester, PR Manager,
angelika.dester@enocean.com

Concept and design artcollin Kommunikationsdesign,
www.artcollin.de

Photo credits

www.fotolia.com: p21 (technician)
www.istockphoto.com: title (millennium-bridge London),
p8 (people-future), p12 (chain)
www.photocase.com: p23 (mosaic)
www.thinkstock.com: p4 (Hooverdam), p5+p48 (sunflower),
p6 (dolphin), p7 (monitors), p26-27 (all), p30 (student at car),
p31 (students), p43 (background picture)
www.veer.com: p9 (trafficlights, firemen), p10 (bridge),
p11 (pipeline working man, fishes), p17 (seniors)
Wohnldes Bauer Verlag: p32-33



Smartly transmitted TELEFUNKEN SMART BUILDING



THERMOKON Energy harvesting meets display

SAUTER: EY-modulo 5 – intelligent room automation with wireless communication	39
Hubbell: wiSTAR™ at 902 MHz	40
Intesis: EnOcean into KNX – perfect fit	41
SECO: Energy and building in batteryless control	42
Helvar: One gateway for twenty switches	43
Somfy: Smart metering in smart home	44
Zodianet: ZIBASE PRO talks EnOcean	45
Mitsubishi Materials: New antennas certified for EnOcean modules	45
Eltako: Web for radio telegrams	46
ID-RF: Soft to switch	46
CNS: Driving EnOcean for Niagara networks	47
Thermokon: Energy harvesting meets display – no batteries or wires	48
PEHA: Bidirectional wireless age	49
BAB Technologie: Visualization in no time	50

Copyright Reproduction permitted stating source "perpetuum 2 | 13, EnOcean GmbH" and with voucher copy

International circulation 5,000

Appearance semi-annual

Reader service perpetuum@enocean.com,
phone +49.89.67 34 689-0



EnOcean®, easyfit® und perpetuum® are registered trademarks of EnOcean GmbH

Deutsche Nationalbibliothek has archived the electronic publication "perpetuum international edition," which is now permanently available on the archive server of Deutsche Nationalbibliothek

+++ ISSN 1862-0698

perpetuum 1 | 2014 (German and English)
will appear in March 2014
Editorial deadline: December 2013

NEWS & SERVICES

New people	51
Debflex: A new player for smart home	52
EnOcean Alliance welcomes Pressac as a new Promoter	53
Events	54
In brief... EnOcean websites	54

THE ABC OF ENOCEAN

EnOcean GmbH is the originator of energy harvesting wireless technology. The company offers its customers a complete plug&play system of energy converters, energy management, wireless transmitters, software and development tools. In March 2012, the EnOcean wireless protocol was ratified as international standard ISO/IEC 14543-3-10. With this platform, OEM partners can quickly and easily implement customized wireless switching solutions based on energy harvesting wireless technology.

By Andreas Schneider, Chief Marketing Officer, EnOcean GmbH

ENERGY HARVESTING WIRELESS EnOcean modules use energy from the surrounding environment, from linear motion, light or differences in temperature, to detect and transmit data. Thus the devices operate without batteries and are completely maintenance-free. This is enabled by the three core elements of the EnOcean technology: miniaturized energy converters, ultra-low-power electronic circuitry and reliable wireless.

ENERGY CONVERTERS Wireless modules are powered by energy converters: an electrodynamic energy converter, which uses mechanical motion, a miniaturized solar module which generates energy from light, as well as a DC/DC converter, which, when combined with a thermoelectric converter and an energy harvesting wireless module, taps heat as an energy source.

FIELDS OF APPLICATION There are several areas of application for energy harvesting solutions ranging from applications for home and building automation, the smart home, smart metering and the smart grid to solutions for industry, logistics and transportation. All EnOcean enabled products by different manufacturers are interoperable, meaning that they can communicate with one another in one and the same system.

WIRELESS MODULES The Dolphin platform is the core of the EnOcean product portfolio. It consists of uni- and bi-directional wireless modules in 315 MHz, 868 MHz, 902 MHz and 928 MHz, that can be combined with several energy converters. The ESK 300 starter kit and the EDK 350 developer kit complete the offer for developers and OEMs.

WIRELESS STANDARD EnOcean wireless standard ISO/IEC 14543-3-10 uses the 868 MHz or 315 MHz frequency band. Telegrams are just one millisecond in duration, and are transmitted at a rate of 125 kilobits per second. To exclude transmission errors a telegram is repeated a number of times in the space of 30 milliseconds. The range is 300 meters in the open and up to 30 meters inside buildings. As an open protocol, EnOcean wireless communicates with TCP/IP, WiFi, GSM, KNX, Dali, BACnet or LON.

SOFTWARE EnOcean Link is the first middleware for energy harvesting wireless technology. It provides a universal interface for wireless communication and directly converts EnOcean telegrams into data values. This enables OEMs to integrate energy harvesting wireless technology more easily and rapidly into a wide range of applications and systems. In addition, all EnOcean wireless modules come with firmware, a suitable API as well as software tools. So they can be implemented as plug&play with plenty of scope for application-specific programming.

www.enocean.com



ENOCEAN ALLIANCE STANDS FOR ENERGY EFFICIENCY

By Graham Martin, Chairman, EnOcean Alliance

In the spring of 2008, leading companies in the building sector across the globe formed the EnOcean Alliance to establish innovative automation solutions for sustainable buildings. From the very beginning, the organization's main target was to make buildings more energy-efficient, more flexible and less expensive to operate. Today energy efficiency is a worldwide trend. Due to limited energy resources and increased use of renewable energies, building automation and control is mandatory for reducing energy consumption noticeably.

When evaluating strategies for increased energy-efficiency, the sustainable, resource-saving character of the selected technology is a key point. As batteries contradict the sustainability and "green" aspect that intelligent control systems offer buildings when making them more energy efficient, energy harvesting wireless is the technology of choice.

EnOcean-based building automation sensors work without cables and batteries, bringing the sustainable and maintenance-free aspect to each single sensor. Due to these additional benefits, energy harvesting wireless technology becomes attractive for more and more solutions that contribute to a building's efficient energy management. This development also results in a constant growth of the EnOcean Alliance that today counts over 300 members who offer more than 1000 interoperable

EnOcean-based products and systems. Only recently, the Alliance could welcome the UK-based company Pressac as a new Promoter.

Another aspect of the Alliance's attractiveness is that members have the possibility of accessing 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 benefit from the international networking and Alliance marketing activities – such as joint trade shows, public relations support, advertising and lobbying.

The Alliance offers three membership classes: Promoters, Participants and Associate Members. The following nine companies are Promoters of the EnOcean Alliance: BSC Computer, EnOcean, MK Electric by Honeywell, Jäger Direkt, Pressac, ROHM, Texas Instruments, Thermokon und Verve Living Systems.

We invite you to join us as a member of the Alliance to enable you to benefit from this fast growing innovative ecosystem and the ever increasing success of the technology:

www.enocean-alliance.org/joinus




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

ON THE BATTERYLESS ROAD TO THE INTERNET OF THINGS

Energy harvesting wireless is just starting to unfold its potential. The rapid improvement of components and system design setup will open up new applications in every aspect of life. In this article, we take a look at some of the exciting prospects of this technology.

By Frank Schmidt, Chief Technology Officer, EnOcean GmbH

We are getting more and more connected in our daily life. This trend is often called “The Internet of Things” (IoT), and current expectations range from over 300 million by 2017¹ to 50 billion devices connected to the Internet by 2020².

Deploying millions of distributed devices introduces a number of questions: how should they be powered, how will they communicate? Batteries are not an answer to this problem. Not only would they burden the environment, but in fact, pose a serious economical hurdle, because of low application reliability and high maintenance cost.

At a first glance, the IoT based on energy harvesting sensors just seems to be another buzz word or even a kind of science-fiction scenario. But considering technological advancements, several scenarios are becoming apparent where the IoT is much closer to realization than expected.

BUILT ON AN ENERGY HARVESTING PLATFORM

EnOcean founders started to innovate in energy harvesting about 15 years ago. At that time, the term “energy harvesting” was not even born and only very few scientists were thinking along these lines worldwide. So, the technology, as well as all needed components for a practical integration into applications, had to start from the very beginning.

In the process, it soon became clear that powering radio sensors with all kinds of ambient energy brings technical challenges, as many crucial building blocks did not exist at all. Many parts had to be developed from scratch.

In addition, the market had no experience in how to use those components to create reliable systems. Consequently, EnOcean had to develop subsystems that included all the innovative parts in order to use batteryless modules easily. The result is a complete platform of energy converters, wireless transmitters, energy management, software-, and development tools as well as an energy-saving, very reliable radio protocol. In addition, as of the spring of 2012, the EnOcean radio is standardized as ISO/IEC 14543-3-10, which is the only wireless standard optimized for ultra-low power energy harvesting applications.

OPEN FOR INNOVATION

In establishing this comprehensive platform and due to close collaboration with product developers and manufacturers (OEMs), EnOcean has managed to keep integration barriers extremely low. This allows for a simple integration process in existing or new products without having to deal with the complexity of batteryless technology.

In addition, EnOcean and its partners have adopted an approach of open innovation and initiated the EnOcean Alliance. This organization builds a unique platform for

its members on which they can exchange experience and build up partnerships. In this context, the EnOcean Alliance defines standardized application profiles, which ensure the interoperability of all EnOcean-enabled devices. These key principles form the basis for a strong ecosystem, allowing more than 300 partners to bring in technical innovation and new applications.

ESTABLISHED IN BUILDING AUTOMATION

Based on its specific characteristics and the idea of open innovation, energy harvesting wireless technology is already very well established in the building automa-

EnOcean is further improving the energy harvesting wireless technology. This includes improvements in components as well as in system design, software and radio protocols.

LONGER RANGE RADIO CONNECTION

While state of the art 802.15.4 radio transmission range is up to 100 meters line of sight, current EnOcean technology bridges up to 300 meters today – which is fine for building applications and keeps the component count low. The next generation of radio technology, which EnOcean is currently developing, will enable over ten times longer



tion sector, bridging the control of light, HVAC and other fields of building technology to smart home, smart metering and energy management systems.

The wireless devices are highly flexible to install, so that individual components such as wall switches, sensors and relay receivers can be networked easily to form an intelligent system without complex cabling. In addition, dispensing with batteries eliminates the burdensome need to maintain the devices' energy supply in a regular time period, which can be up to once each year.

TECHNOLOGY FOR THE FUTURE

But building automation applications is not where energy harvesting wireless stops, rather it is a first starting point. The unique approach of a platform technology and open innovation can be transferred to many other applications where data capturing and processing are combined with wireless communication. In the long term, we will see some revolutionary developments to actuate further applications that lead to solutions where batteryless sensors are consequently set to play an increasingly important role in solving everyday problems.

NEXT GENERATION TECHNOLOGY PLATFORM

For upcoming or even already existing requirements,

radio ranges – to wirelessly transmit data via a distance of more than three kilometers – and enabling new applications with high range requirements outside of the building. Can we supply the increased energy need of such long distance communication with energy harvesting at all? The answer is yes – however only by realizing significant progress in the other building blocks at the same time.

HIGHER EFFICIENCY HARVESTERS

The kinetic energy source is almost inexhaustible, as motion can be found anywhere, for example in the movement of doors, windows or machine components, the vibration of motors, the pressing of door handles or switches etc. EnOcean's electro-mechanical converter operates very robustly and is therefore extremely versatile.

In near future, EnOcean will provide new types of mechanical energy harvesters that make use of the energy of flowing gases and liquids in particular. These harvesters will be used to power metering applications and help keep batteries out of millions of these devices. Light will remain one of the most frequently used energy sources. Next product generations will combine better efficiency solar cells with improved performance under low light conditions, in particular. While the limit of operation is light intensities of about 100 lux at 5 % efficiency

today, next generation solar cells based on organic material or dye-sensitized technology will operate down to 10 lux light intensity with more than 10 % efficiency.

Combined with lower leakage and higher capacity energy storage, solar-powered devices will run in complete darkness for several months in a year. This feature is most desired in indoor applications, where we have longer phases of low light in the winter time.

Temperature differences contain a lot of energy and are therefore ideally suited as an energy source to power devices. Just the cooling of a drop of water by 1 degree Celsius releases energy for about 25000 EnOcean wireless telegrams. This energy harvesting technology is only at the beginning of its possibilities. One new option is to harvest energy from temperature differences between day and night for outdoor applications. These harvesters, which already work in the laboratory, will allow the building of very robust sensor nodes, independent of light and therefore not sensitive to dirt.

LOWER ENERGY CONSUMPTION

The lower the energy consumption a device has, the better the chances of applying energy harvesting strategies successfully. So, for new applications, especially for the most critical functions such as sleep mode of the sensor nodes and receiver current, it is an absolute requirement that energy demand is reduced significantly. EnOcean works with a special focus on these topics – and has for example shown a factor of 10 lower timer currents for the next generation of sensor modules already.

HIGHER CAPACITY ENERGY STORAGE

Besides the energy need, research is evaluating improved storage components. The target is to store harvested energy from weeks to several months without new ambient energy impulses. In future, there will be batteryless sensors which can “sleep” for a much longer period of time, keeping their energy until an incident wakes them up to measure and send signals. This is particularly interesting for alarm systems in dark environments, for example in a forest or in dimly lit areas.

FUTURE APPLICATIONS FOR ENERGY HARVESTING WIRELESS

As the technology advances, new application fields become feasible. In almost any field of industry, energy harvesting wireless can contribute its specific benefits to improve existing systems or develop new ones. Let's have a look at the most interesting of them.

STRUCTURAL MONITORING

Built fabric of large structures such as bridges, tunnels, dams or drilling platforms have to resist extreme forces like weather, earthquakes or traffic. Today, in the US



alone, nearly 25 % of all bridges are deemed structurally deficient or functionally obsolete. In numbers, these are more than 150000 bridges³. Radio sensors, powered by light, temperature changes, or vibrations that permanently monitor critical parameters, can warn against non-conformance and prevent break downs. These sensors would monitor parameters related to structural health, such as integrity, position, and vibrations and act as an early warning system.

HEALTHCARE

Another wide field of application is making our life easier, more secure and comfortable. This includes new solutions for monitoring vital functions as well as an autonomous and healthy lifestyle. There are already bracelet prototypes that can monitor vital functions by using body-heat as a source of energy to transmit wireless signals.

The demographic change necessitates modern technology for the elderly, when it comes to being able to live at home independently for as long as possible or if sickness occurs. Ambient assisted living systems can provide data on a tenant's activities and send a notification to a care-giver or relative if there is a remarkable change in daily routines or not enough activity. Alarm systems such as portable emergency buttons complement the system. In regards to flexibility and low maintenance effort, the common requirement for all components is to be wireless and batteryless.

TRANSPORTATION AND TRAFFIC

By 2030, 60 % of people will live in a city. 20 years later, it is predicted to increase to 70 % – almost 6.5 billion people⁴. This development will present a major challenge and will determine humans' future life.





Intelligent control will be needed to coordinate people's daily life and prevent a city from collapsing. This is especially true for logistics and traffic and needs solutions already starting today. In this context, the term "smart cities" is frequently used. The concept of a smart city intends to provide automated control of traffic, street lights, energy supply or transportation of needed goods as well as waste disposal.

This can only be realized with millions of sensor nodes collecting and delivering the data needed. Malfunctions of battery-powered sensors could cause chaos in such a deeply connected system. But cables are no alternative either, as they are too complex and too costly to install. In contrast, energy harvesting-powered devices can overcome both issues. Solar-powered occupancy sensors, for example, notify when someone is walking in the street and send a signal to activate the street light. The same can function with motion-powered sensors in the streets' surface when a vehicle passes. Other fields of application are cold chain monitoring for food transportation or the notification and automated repeat order when goods in a store run out.

AGRICULTURE AND ENVIRONMENT

In 2050, the human population on earth is expected to grow to almost 9 billion people⁵. To avoid collapse, food and agricultural production needs to change as well as the protection of the environment to preserve the earth's ecosystem.

Long range energy-autonomous wireless sensors could be placed over large areas to provide early warnings or to monitor farm animals and plants in order to react very quickly to changing conditions. Temperature sensors, for instance, could send position data and an alarm signal when they measure the heat of a fire. Via a central gateway, a notification is immediately sent to the near-

est fire station and/or via SMS to the smartphone of a person in charge. Such an early warning system could prevent the spread of forest fires, allowing them to be extinguished promptly. In agriculture, similar sensors could measure the degree of humidity or soil nutrients for an optimal supply of water and care for plants.

RESOURCES

Closely related to the future challenges of feeding a constantly growing world population is the sustainable usage of resources. Whether it's water, gas or oil – all resources on earth are limited and therefore need to be protected and used carefully.

Batteryless sensor networks can support this by providing the needed data to monitor water in terms of quantity and quality or the movement of schools of fish. In addition, detectors can use miniaturized solar cells or motion energy converters to power wireless signals that report water, oil or gas leaks to a gateway controller or directly to a valve. The energy harvesting technology prevents system malfunctions that otherwise could be caused by battery failures.

STANDARD FOR FUTURE COMMUNICATION

As energy harvesting wireless technology advances, possibilities are emerging for using energy-autonomous, maintenance-free wireless modules for numerous applications. In all these scenarios above, wired or battery-powered systems would be too elaborate in their technology and by no means cost-effective. In the future, each end node, that is, each sensor device, should at least have a virtual IP address in the network creating the IoT. Due to its special features, energy harvesting wireless technology has the potential to become established as the standard for the first communication level. This would enable billions of sensors, reporting relevant data into the internet – for improved processes, security, health and convenience.

www.enocean.com



Sources:

- 1 Berg Insight, *The Global Wireless M2M Market – 4th Edition*, April 2012
- 2 Cisco Systems, 2013
- 3 The American Road & Transportation Builders Association based on Federal Highway Administration data, 2012
- 4 World Health Organization, Global Health Observatory [GHO], "Urban population growth", http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/
- 5 United Nations, Department of Economic and Social Affairs, "World Population to 2300", New York 2004, www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf

ENOCEAN PI: RASPBERRY PI MEETS ENERGY HARVESTING

EnOcean Pi connects energy harvesting wireless devices with the Raspberry Pi.

By John Corbett, Sales Director UK, EnOcean GmbH



Just by putting the new EnOcean Pi board on the Raspberry board, OEMs can very easily realize a low-cost gateway box that can connect to the complete automation portfolio of the EnOcean ecosystem – in fact more than 1000 interoperable products and solutions. The combination of Raspberry Pi and EnOcean Pi can be used for several wireless applications integrating batteryless automation into cloud services, multimedia, smart home systems or other central controls. element14 offers EnOcean Pi at www.farnell.com. The new Pi accessory is supplied with free to download EnOcean Link Trial version middleware that allows users to quickly develop and integrate applications.

ONE STEP TO A SMART HOME BOX

Developers and OEMs can easily design low-cost gateways for embedded applications, such as smart home solutions. Instead of developing new products from scratch, developers can use the EnOcean Pi and Raspberry Pi to create a ready-made smart home box, which can process and visualize data from batteryless wireless sensors and provide central control of a wireless connected house. Other applications are gateways for cloud services or low-cost building automation with an interface to all EnOcean-based solutions.

www.element14.com



TEST ENOCEAN LINK FREE OF CHARGE

The EnOcean Link middleware provides a universal interface for the energy harvesting wireless technology. A trial version, free of charge, enables manufacturers (OEMs) to test the basic functions of the software according to their own specific needs.

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

OEMs can use this solution in order to integrate batteryless wireless technology directly into different applications and networks, regardless of the communication standard they use. The middleware's complete version is made up of all application profiles for batteryless wireless technology (EnOcean Equipment Profiles, EEPs) and offers data encryption as well as remote management. Using EnOcean Link, OEMs can save valuable resources by not having to program specific software on their own

in order to interpret EnOcean telegrams. The free test version of EnOcean Link Trial, available for download at the EnOcean website, offers a small selection of application profiles as well as instructions for testing the basic functionality of the software.

For download:

www.enocean.com/en/enocean-software/enocean-link

EASIER, FASTER – EDK 350 DEVELOPER KIT

EnOcean's new developer kit for a fast integration and configuration of batteryless wireless technology is available now in three frequencies: 902 MHz, 868 MHz and 315 MHz.

By Markus Kreitmair, Innovation Manager, EnOcean GmbH



The EDK 350 developer kit covers the entire product range, from energy harvesting and wireless modules to ready-made product solutions. Using the kit, developers can create a comprehensive range of energy harvesting wireless applications, including switches, temperature sensors, reliable relay receivers as well as efficient RF repeaters and transceivers. For worldwide use, the developer kit is now available in the frequencies 902 MHz (EDK 350U), 868 MHz (EDK 350) and 315 MHz (EDK 350C).

PRINT YOUR PRODUCT

Part of EnOcean's concept for developers is to combine individual configuration and programming with ready-made products for fast end product integration. With the kit, and combined with the latest 3D printing services, manufacturers can easily develop new prototype product enclosures at low cost, integrating EnOcean in various form factors. For this, they can use 3D data of the EnOcean kit's ready-made components, which are available in the product information at the EnOcean website, to include in a digital 3D model of a product enclosure. Based on this data, modern 3D printing services, using the latest printing and CAD solutions, can print a functioning prototype which can incorporate the energy harvesting wireless components. This is particularly interesting for manufacturers who plan to replace batteries in an existing wireless device with energy harvesting.

www.enocean.com



Advertisement



BEST

Lithium Ion Capacitors

Safety and high temperature reliability
Very low self discharge

ENERGY

Features

High capacitance : 270F – 40F / Wide temperature range : -25°C – +85°C
High voltage : 3.8V / High cycle times : over 10,000 cycles

SOLUTION

Easy charge
Easy use

TAIYO YUDEN

www.yuden.co.jp/eu/

ENOCEAN PRODUCTS



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 specification.

Modules with 902 MHz frequency are suitable for North America adopting the FCC specification.

Modules with 928 MHz* frequency are suitable for Japan adopting ARIB specification.



Wireless Standard
ISO/IEC 14543-3-10

ENERGY HARVESTING WIRELESS SENSOR MODULES

868 MHz
315 MHz
902 MHz
Q4/13: 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 also contains rolling code functionality

868 MHz
315 MHz
902 MHz
Q4/13: 928 MHz



ECO 200 & PTM 330
ECO 200 & PTM 430J* (928 MHz)

The perfect combination for unique switch applications

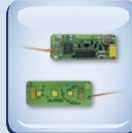
868 MHz
315 MHz
902 MHz
Q4/13: 928 MHz



STM 300
STM 400J* (928 MHz)

Ideal for bidirectional energy harvesting wireless sensors and innovative actuators

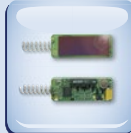
868 MHz
315 MHz



STM 312

Energy harvesting wireless sensor module – with whip antenna but without solar cell

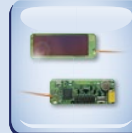
868 MHz
315 MHz
902 MHz
Q4/13: 928 MHz



STM 320
STM 420J* (928 MHz)

Energy harvesting magnet contact transmitter module with helical antenna

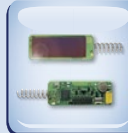
868 MHz
315 MHz
902 MHz



STM 330 (868 MHz)
STM 310C/STM 330C (315 MHz)
STM 332U (902 MHz)

Energy harvesting wireless temperature sensor module with solar cell and whip antenna

868 MHz
315 MHz
902 MHz
Q4/13: 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

ECT 310



Thermo-electric

Harvests temperature differentials for energy harvesting

WIRELESS TRANSCIVER MODULES

868 MHz
315 MHz
902 MHz
Q4/13: 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

**DolphinAPI**

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

DEVELOPMENT TOOLS

**DolphinStudio**

For simple configuration and flash programming of Dolphin modules

**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

KITS

868 MHz
315 MHz
902 MHz
Q4/13: 928 MHz

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

The ideal entry to EnOcean technology

868 MHz

**EPK 350 Programmer Kit**

For upgrading ESK 300 Starter Kit to a developer kit

868 MHz
315 MHz
902 MHz
Q4/13: 928 MHz

**EDK 350/EDK 400J*** (928 MHz) **Developer Kit**

Developer kit for energy harvesting wireless sensor solutions

868 MHz

**EDK 352 Thermo Developer Kit**

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

FINISHED WHITE LABEL PRODUCTS FOR OEM CUSTOMERS

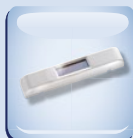
ENERGY HARVESTING WIRELESS SWITCHES AND SENSORS**

868 MHz

**PTM 250**

Universal switch insert –
EnOcean easyfit

868 MHz

**STM 250**

Window contact

902 MHz

**EDRP**

Wireless switch

868 MHz

902 MHz

**EKCS**

Key card switch

902 MHz

**EDWS**

Door and window contact

868 MHz

902 MHz

**EOSW**

Wall mounted wireless
occupancy sensor

868 MHz

902 MHz

**EOSC**

Ceiling mounted wireless
occupancy sensor

TRANSCIVER PRODUCTS

868 MHz

**RCM 250**

Universal single-channel switch actuator –
230 V

868 MHz

315 MHz

902 MHz

Q4/13: 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

ACCESSORIES

868 MHz

315 MHz

**EPM 300**

Field-intensity meter

*) available from our distributor ROHM

**) further frequencies on request

SUPPORT

Further support materials can be found here:

www.enocean.com/support

www.enocean.com/product-finder

CONTACT

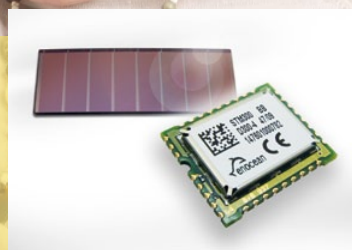
Our value-added distributors provide customers with
application support and technical expertise.

www.enocean.com/distributor

AGE-APPROPRIATE

Scientists and companies have come together for the research project AMENAMIN – Ambient Energy for Ambient Intelligence, to develop new technological assistance for self-determined living for the elderly. Energy harvesting is a common theme for the whole project.

By Frank Schmidt, Chief Technology Officer, EnOcean GmbH



These days, 16 million Germans are already 65 years or older. In thirty years, this amount is expected to rise to 24 million. But also diseases such as Dementia or Alzheimer are a new challenge for society and medicine.

Modern technology will play a significant role in future for the elderly, when it comes to being able to live independently for as long as possible or if sickness occurs. It will help those affected by being able to live in an accustomed environment, by retaining their dignity and increasing their security. Simultaneously, alarm systems are made more effective, and costs and effort for nursing will be reduced.

PROGRESS WITHOUT BATTERIES

The research project AMENAMIN has the aim to develop an innovative total system, which aids senior citizens or sufferers of dementia in clinics, homes and assisted living environments. One of the central requirements was that all solutions should be wireless and, wherever possible, batteryless, too. That way, health risks and the effort for changing and disposing batteries are to be avoided.

SELF-SUFFICIENT FALL SENSOR

One part of this system is a self-sufficient, wireless fall sensor, which works without batteries and thus offers higher reliability. For this solution, EnOcean integrated a solar powered wireless STM 300 module together with

the ECS 310 solar cell and a 3-axis acceleration sensor into a robust casing with a belt clip. A charging capacitor secures the continued function of the sensor, even during several days in darkness. If the person wearing the sensor on the belt falls, it will send the fall message via EnOcean wireless directly to a central, IT-based system. This system will then record and evaluate the message as well as data concerning place and time and alarm the nursing staff.

PROJECT WITH PARTNERSHIP

Furthermore, EnOcean is responsible for directing the technical concept, aids project partners for other solutions – for example a self-sufficient interaction ball, a nappy sensor, or sensor-based scales – or during the development of a system concept for wireless data broadcast, use of a wireless sensor platform and with the implementation of energy harvesting components and the required energy-optimised switches.

In total, the following partners are involved in the AMENAMIN project: the Charité Universitätsmedizin Berlin, the Gesellschaft zur Förderung angewandter Informatik e.V. (GFai), EnOcean GmbH, Alpha board GmbH, SHK Spree Hybrid and Kommunikationstechnik GmbH as well as die SMI GmbH.

www.amspr.gfai.de



ENERGY FOR SMART CITIES

The City Switch developed by Agora Energy integrates EnOcean modules, in order to remotely and wirelessly activate street lighting in a participatory way. One solution is dedicated to vehicles and bicycles and the other one to pedestrians.

By Samuel Jouzel, Business Developer, Agora Energy

Cities have the choice of three different scenarios when using the innovative system from Agora Energy:

- One Agora energy receiver is installed in the central electrical cabinet which controls the whole line of street lighting.
- Each spotlight is controlled with one Agora energy receiver which can repeat the signal.
- If a control system for street lighting is already installed, only one Agora energy receiver is installed in the spotlight that is nearest to the switch.



LIGHT UP BY WHEEL

Agora Energy has integrated the switch into two different solutions. One is a sensor for bikes or cars, which is mounted on the street's surface. When a bike or a car passes the sensor switch, it is activated by the pressure

and sends a signal to the street lighting to activate or to increase the luminosity. As long as the sensor "sleeps", the lighting also "sleeps" as well and is only activated when a vehicle passes by.

LIGHT UP BY HAND

Another application is the integration of the switch in a pillar with a height of about 90 cm. This pillar is installed on the pavement so that pedestrians can easily push the button to activate or increase the brightness of street lights. The switch uses the same EnOcean radio as the version for cars and bicycles. The energy harvesting principle makes installation easy, as there are no cables required for the wireless communication. Working battery-less, the switches even don't require any maintenance, which keeps the lifecycle costs extremely low.



SPOTLIGHT ON SMARTGRIDS AWARD

With the City Switch, Agora Energy brings a competitive and efficient answer to energy efficiency for street lighting. For the innovation strength of this solution, Agora Energy was awarded the special jury prize of the SmartGrids competition at the Innovative City Convention 2013 in Nice.

www.thecityswitch.com
www.agoraenergy.fr



ENERGY HARVESTING IN NEW SPHERES



An interview with ...

*... Matthias Poppel, Chief Operation
Officer, EnOcean GmbH*

Industry experts agree that the potential of energy harvesting has by no means been fully exploited yet. What is EnOcean's Research & Development working on at the moment?

Matthias Poppel: Currently, our developments are going into two directions: on the one hand, we are developing new solutions for the building automation industry. Here, batteryless wireless technology is already a staple, and defined as a standard for energy efficient buildings. New application areas arise for example through LED lighting. This technology is revolutionising the lighting industry and creates completely new market conditions. Due to EU guidelines and worldwide goals on energy efficiency, lots of building owners are switching their light technology in favour of energy-saving LEDs. But changing lighting alone isn't enough. The user requires suitable operating elements and an intelligent control. The batteryless radio sensors and actuators, based on EnOcean technology, are the ideal addition here. Available in different frequencies and therefore worldwide deployable, they are maintenance-free and flexibly positionable, which means easy retrofitting. At the same time, energy harvesting fits in with the sustainable characteristics of LED technology. So, we bring "green" LEDs together with "green" sensors.

And where is the second direction headed?

M.P.: The second direction consists of new ways to enable the environmental monitoring of tomorrow. In concrete terms, this means reliable measurement technology, an ability to continuously record changes in the air, ground, water or materials spread out over large areas. That way, it is possible to see at once if threshold values have been surpassed and then take appropriate measures for the safety of humans and the environment. Such systems only work with hundreds of sensors, deployed over an expansive area at often hard to reach measurement points, which work in a failsafe manner. Cables or battery-driven solutions are unthinkable here. Only batteryless wireless technology can fulfil all of these

requirements. That is why we are researching energy harvesting solutions with a more than ten times higher range. Together with high performance energy converters for illumination, wind, tidal, or kinetic energy, this results in sensor solutions that can also

continuously work under strenuous environmental conditions, collect data, and transmit it via radio over long distances.

That sounds exciting. But the step from building automation to outdoor applications is a big one, isn't it?

M.P.: That step isn't as big as one would think at a first glance. Openness to further development – that's probably our biggest secret of success. That means, our energy harvesting platform is designed so that the components can be optimized or expanded for different conditions and applications. Over the past few years, we have successfully implemented this multiple times. Thus, the batteryless wireless technology works in different sub GHz frequencies today. As a result, it is operable worldwide despite regional differences. At the same time, we are continuously evaluating more frequency areas for new operational fields such as the LED lighting technology. With the outdoor systems, we are consistently following up on this approach. For outdoor functionality we are adapting the relevant components appropriately. Our measurements and prototypes here are already very promising.

Which energy harvesting technology is next in line?

M.P.: We are only scratching the surface with today's applications. The energy harvesting principle has enough space for us to develop new methods of energy generation. At the moment, we are testing the principle of our electromagnetic energy converter for further translational movement and we have developed a new harvester specifically for rotary movement. One energy harvesting technology, which at first glance doesn't seem very innovative, is currently going through a huge leap forward in development: the usage of light. The next generation of products combines smaller solar cells with higher output for a much better luminous efficiency. At the same time, it allows for a secure operation during long periods of darkness of several months up to a year – in numbers, that means the running time in the dark is 50 times as high as before.



ENOCEAN CERTIFICATION – SEAL OF QUALITY FOR INTEROPERABILITY

The interoperability of devices based on the EnOcean technology is the foundation for the build-up of building management systems across a range of manufacturers and thus secures such investment for some time. Interoperability means: EnOcean-based devices of different manufacturers communicate wirelessly across a certain distance, understand each other correctly and allow for the correct execution of distributed functionality – provided the valid system specifications will be applied as defined.

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

In a technical sense, interoperability requires the air interface of devices to comply with the EnOcean wireless standard ISO/IEC 14543-3-10 and the radio range to exceed a defined minimum. Furthermore, compliant timing and sequence of the messages exchanged, correct coding and decoding of the information transported and proper interpretation of the pay-load data communicated are indispensable requirements for practical interoperability. For energy-autonomous devices, interoperability also requires the ability to collect sufficient energy from the ambient environment over a certain period of time and, thus, secure proper operation of the device for a specified minimum time frame.

INTEROPERABILITY SUPPORTING GROWING MARKETS

Planners, system integrators, and users can identify reliably, and apply with only little effort, the interoperability of EnOcean-based devices by the EnOcean-Certification – in combination with adequate product labelling – in particular within a continuously growing market of suppliers and products. At the same time, the manufacturers obtain development objectives which stabilize the development process and secure achievement of product goals.

ELEMENTS OF A SUCCESSFUL COMMUNICATION

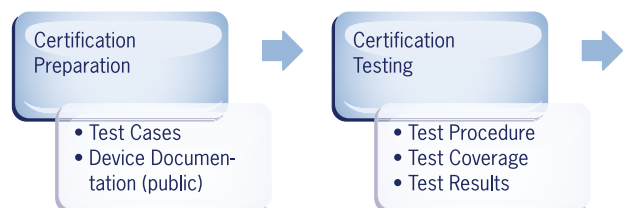
The EnOcean Alliance is currently engaged in a comprehensive certification program of EnOcean-based devices. This certification program will cover all ele-

ments essential for reliable communication: the air interface, the radio performance, the communication profiles and the energy harvesting performance. Designed as self-certification by the device manufacturer – comparable with the European CE Declaration – an expansion of the program is envisaged by an additional verification through an independent test laboratory accredited for EnOcean Certification.

STANDARDIZED TEST PROCEDURE

The EnOcean self-certification consists of a number of steps which can be performed by the manufacturer as an integral part of the verification of its development

EnOcean Self-Certification Process



process without significant additional effort (graph). In preparation for the certification, the tests relevant for a device under test will have to be selected, and the device-specific documentation needs to be compiled. In particular all information required for interoperability has to be reflected in the device-specific documentation to be published; thus, this information becomes an essential element of the certification. The individual certification tests are executed in accordance with the test specifications of the EnOcean Alliance. By doing so, the EnOcean Alliance secures all devices performing identical test procedures. Test coverage as well as test results will become comparable and repeatable, independent of the individual device manufacturer.

DOCUMENTATION AS SEAL OF QUALITY

The result of each certification test will be documented following the “EnOcean Self-Certification Documentation”, defined by the EnOcean Alliance. This official document is to be generated by the device manufacturer and sub-

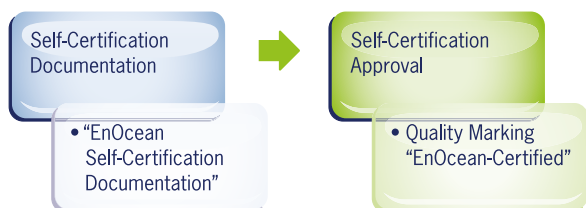
mitted to the EnOcean Alliance for self-certification approval. Alternatively, the manufacturer may decide to go for additional testing by an independent test laboratory accredited for the EnOcean Certification. On the basis of the test results, the test laboratory will compile the “EnOcean Certification Documentation” and submit it for approval to the EnOcean Alliance. The endorsement of a certification documentation by the EnOcean Alliance empowers the manufacturer to label its product and the associated documents with the seal of quality, e.g. “EnOcean-Certified”.

STEP ONE: RADIO PERFORMANCE

Releasing the specification for Radio Performance Certification in September 2013, the Technical Working Group of the EnOcean Alliance achieved a first major milestone for the roll-out of the EnOcean certification program. From now on, manufacturers can verify and proof their devices communicating wirelessly at least over the radio range mandatory for interoperability. As a next step, the EnOcean Certification Task Group (ECTG) focuses on the specification for “Communication Profiles”, “Air Interface” and “Energy Harvesting of Energy-autonomous Devices”. In parallel, the EnOcean Alliance will generate an “EnOcean Certification Handbook” and select capable test laboratories as independent accredited certification institutes.

Till mid-year 2014, first complete EnOcean-certification runs are expected from EnOcean-based device manufacturers. The ECTG welcomes all members of the EnOcean Alliance to join this activity and contribute their competencies to the definition and completion of the certification process.

www.enocean-alliance.org



OVERVIEW OF ENOCEAN ALLIANCE MEMBERS

www.enocean-alliance.org/products



PROMOTERS				
				

PARTICIPANTS							
							
							
							
							
							
							
							
							
							
							
							
							
							
							
							
							
							
							

... AND MORE THAN 150 ASSOCIATE MEMBERS



BATTERYLESS PIECES OF A PERFECT MOSAIC

Mosaïque house (Mosaic) in Saint-Dié-des-Vosges, France, offers a living area which is specialized for multi-handicapped and autistic adults. 400 EnOcean-based sensor solutions, connected with a building automation system, offer comfort and security for the tenants and save energy at the same time.

By Emmanuel François, Sales Manager West Europe, EnOcean GmbH



The Mosaïque house is a project of the Turbulences Association, a pro bono organization. From the very beginning, the building was intended to meet the most stringent demands for high energy efficiency, climate comfort, and residential quality on 4000 m². A main part of this concept is realized by an intelligent building automation system, which controls the building's technical areas and provides technical assistance for the tenants' and caregivers' daily life.

SWITCH FOR ALL REQUIREMENTS

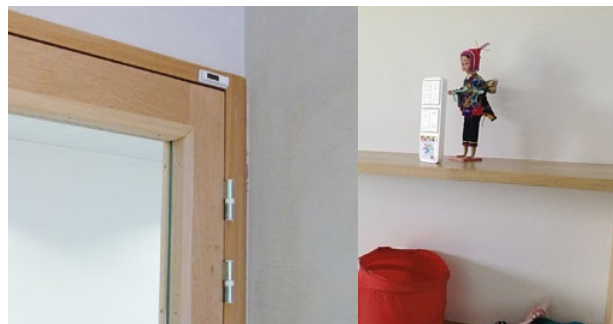
The system's switches, temperature sensors, occupancy sensors and window contacts are based on the EnOcean energy harvesting wireless technology and work without cables and batteries. The batteryless devices meet central requirements: They can be flexibly positioned at the most suitable place and can be repositioned at any time. This is a particular advantage for Mosaïque house, where each tenant has his or her specific needs. Light switches, for example, can be flexibly mounted at any height on the wall, on glass or furniture, or can be used as a handheld switch. The solar-powered window contacts form a part of the shutter control system and natural ventilation during the winter while they also inform the caregivers when a window was opened and a tenant might have left the room. Once installed, the devices don't need any maintenance, saving operation costs and time. Furthermore, the batteryless and

wireless technology dispense with electric cables, which is an important aspect for the tenants' safety.

VISUALIZED NEEDS

An additional strength of the solution is the flexible device programming and visualization. Via the central Beckhoff control, the same switch can be configured with eight different functions or more. Users can do the programming by using tablets or one of the two screens installed in the house. The same visualization enables the staff to see the status of lighting and doors or windows in all rooms at a glance remotely operate certain functions if necessary. The combination of intelligent control and batteryless wireless technology significantly contributes to the unique concept of comfort in Mosaïque house.

www.enocean.com





A LUXURY DREAM

Guoao Group, the company who constructed the Olympic Village for the Beijing Olympics 2008, has built a luxury residential resort in Chengdu called Dream World 2008. It offers an area of high-end villas including the latest innovations in home automation. Part of this is YTL's eKontrol, a state of the art intelligent lighting control system for residential buildings.

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



SHINING TECHNOLOGY

In the high-end villas' heart there is the latest home automation technology offering highest comfort and energy efficiency. YTL installed a modern lighting control system into the houses and the reception building of the resort. The tenants benefit from a new way to set, configure, and use home lighting control. Users can conveniently use smart terminals, such as Android-based smart phones and tablets, iPhones®, iPads® or PCs, to configure and control lights based on lights, areas, or scenes in any way they like.

Chengdu is situated in the middle of Sichuan Province, the West Sichuan Plain. The city is famous for being a pioneer in the fields of economy, science and technology, and for its human culture. Chengdu is also one of the most important scientific and educational centers in southwest China. The Dream World 2008 area reflects this city's cultural offerings and economical strength which provides citizens a high quality of life. In the residential resort, hundreds of high-end houses and apartments are arranged in a delicate green oasis with children's playground and a clear blue lake in its heart.





The solution comes with energy harvesting wireless switches and occupancy sensors offering a comfortable user experience. One touch could control all lighting in a house or one light may also be controlled by multiple switches or occupancy sensors.

PUT ON MARBLE AND GLASS

In the Dream World's reception building, there is a lot of marble and glass – thanks to the EnOcean technology, the switches were simply attached with an adhesive, instead of having to cut the marble stone or pull cables

down the glass walls. In addition, the switches have a transparent acrylic glass holder which is a perfect fit with the villas' luxury design. They can be removed and used as a remote control which offers a specific user-friendly functionality.

CUSTOMIZABLE CONTROL MODES

The YTL system allows lighting control with several scenes and dimming which helps to increase comfort and reduce energy in the residential resort. Users may customize lighting control modes based on areas, scenes or time periods. At the start of the day, the system activates a morning scene at 7:00 am for a natural waking process. When the tenant leaves for work, eKontrol turns off all the lights at a pre-defined time.

A getting-home scene can be configured the same way. At bedtime, it switches to a goodnight-mode, where the bedroom light is turned on but all others are turned off. All in all, users can customize different lighting control modes creatively and use them in daily life, which helps making living much easier and smarter.

www.ytlcn.com





SMART HOSPITAL LIGHTING SYSTEM

The Saitama Cancer Center Hospital will be completely rebuilt to cope with state-of-the-art cancer care. Part of this concept is a next generation intelligent lighting system. It creates lighting sceneries and atmospheres to increase the patients' comfort to a maximum level and in accordance with the human circadian rhythm.

By Hiroyuki Niwa, Solution Service Dept., Connectivity Products Division, Murata Manufacturing Co., Ltd.

Saitama Cancer Centre was established in November, 1975. Since that time, the Centre has been striving to raise the level of medical care throughout the region. This year, the hospital's complete rebuild was started to expand the Cancer Center to 500 beds over an area of 62046 m². In July, the first of 12 floors was completed, incorporating a next generation illumination system, including energy harvesting wireless components. The system was planned and implemented by three companies: Murata Manufacturing, Toda Co. and Ushio Lighting.



OPTIMIZED SUNSHINE

The concept of the new hospital is to respond to changing trends in medical advances and provide patients with an environment of recuperation. For this, the indoor lighting was examined from the point of view of the circadian rhythm, taking the different sunshine conditions in the west and east wing into account.

In the newly constructed floor, a LED lighting system was installed which is composed of a central control including a remote management option, gateways and

The lighting automatically adapts to changing conditions and ensures highest comfort for the patients. As a result, the lighting concept is an integrated part of the hospital's care.

batteryless EnOcean-based switches. The system adopts a hybrid approach, combining manual operating elements using EnOcean radio and 802.14.5 radio for the lighting control. The intelligence of this system enables the user to respond very quickly to changing needs and conditions such as LED dimming at a sudden weather change. Murata has developed a dimming solution that is integrated into the wireless communication and can be configured via the web server without the need for special software. In addition, the intelligent control also significantly saves energy.

BIOLOGICAL RHYTHM

The LED lighting system can simulate the day-night variation in the rooms in accordance with the natural biological rhythm for stabilizing the patient's life cycle. There are five different day scenes: sunrise (morning), during the day (morning, afternoon), sunset (evening), at night (before bedtime), midnight (dark). These are completed with sceneries of artificial sky lighting, balancing the four seasons in a year for an optimal comfort environment.

Currently, the LED system is in a test phase. The system planners use the collected data of the first floor installation to validate the optimal light environment before the construction is completed. This gives the hospital owners the assurance that the lighting system creates the best terms for the patients' comfort.

www.murata.com





5-STAR HOTEL EMBRACES ENERGY EFFICIENCY

Salvatores Grand Hotel in Buffalo, NY, maintained its 5-Star guest experience while retrofitting their facility with Verve wireless guestroom controls, ZENO gateway products and InnPoint front desk/BACnet interfacing software.

By Josh Alper, General Manager, ZENO Controls LLC and Verve Living Systems

Like most hotel retrofits, this project began with the promise of reducing energy consumption when sold and unsold guestrooms are left vacant. The Salvatores Grand Hotel guestrooms were fitted with a Verve self-powered wireless keycard based system enabled by EnOcean energy harvesting technology to achieve this objective. Heating and air-conditioning units (PTACs) and bedside lamps were setback and turned off respectively in response to the occupancy status of the room.

In addition, the Salvatores opted to network the in-room control systems together so that the guestrooms could be controlled remotely through the cloud and at the hotel front desk. The added functions, flexibility and control were enabled by the ZENO InnPoint Gateway Platform. For example at check-in, the hotel front desk can now touch a button on a computer screen to set a guestroom in "Welcome Mode" prior to the guest's entry.

ZENO INNPOINT GATEWAY PLATFORM

Zeno Controls LLC has released a new hotel network front-end solution called InnPoint. The new software/hardware configuration is designed to remotely facilitate the control of room lighting, heating and cooling for improved energy savings and customer service.

The resulting multi-technology platform supports EnOcean wireless communications, while also supporting other existing communication protocols such as BACnet, Modbus, TCP/IP, ZigBee and multiple interfaces like Mitsubishi's CMCN (City Multi Controls Network).





The platform also supports other wireless communication protocols in order to propagate wireless signals throughout a building.

ENERGY SAVING THROUGH REMOTE CONTROL

This technology delivers faster, simpler commissioning and installation of energy saving technologies while extending the functionality of Verve devices by making it possible for a hotel's front desk to remotely control the guestroom equipment. Based on occupancy, front desk staff can put a stop to energy waste by turning on or off room lighting and HVAC when guests are not in their rooms. This not only reduces energy costs, but it is respectful of the guest experience. In addition, because these controls are managed in the cloud, it is possible to monitor energy consumption online from anywhere in the world.

InnPoint uses a Supervisory Control and Data Acquisition (SCADA) system that collects data points from anywhere in the building and displays them in a programmable graphic user interface designed to optimize the ZENO/Can2Go Gateway.

EnOcean-based wireless controls networked with front-end software interface and other communication protocols.

OPEN SYSTEM ARCHITECTURE

InnPoint can interface with the PMS to automatically update the room status for housekeeping data and/or transmit temperature/environmental data to other building systems. The InnPoint SCADA is built on a Windows 7 platform and is a combination hardware/software solution that can reside on any hotel network. The wireless devices in the room can be linked with other wireless technologies because ZENO uses a "Dual Technology" gateway that supports multiple end-devices standards.

In addition to its truly open architecture, this modular system in-a-box offers a web browser based SCADA system, allowing the end user to monitor, operate and maintain a building remotely from anywhere through any available personal computer or smart phone that is connected to the internet.

50% UTILITY REBATE

In addition to the energy and maintenance savings inherent to the wireless controls, Salvatores Grand Hotel was also rewarded with a 50% rebate from the local utility company in New York. Using the rebate expertise of Zeno Controls, Salvatores was able to secure a rebate that cut the payback period of the system in half.

www.zenocontrols.com





CHINA EUROPE INTERNATIONAL BUSINESS SCHOOL BENEFITS FROM ENOCEAN TECHNOLOGY

China Europe International Business School (CEIBS) is the leading China-based international business school, established under an agreement between the Chinese government and the European Commission. Dormitories in Phase III of the Shanghai campus are equipped with room control system from VOLKSEN, to control lighting, and room service info. EnOcean-based wireless key card switches also help to save energy.

By Tomme Wang, Marketing Director, VOLKSEN Technology Co., Ltd.

Phase III of the China Europe International Business School (CEIBS) Shanghai campus is open for use in March 2013, the expansion has doubled the size of the Shanghai campus to 7.5 million m². VOLKSEN Intelligent Room Control System was selected for the starred dormitories in Phase III. Based on EnOcean's energy harvesting wireless technology as well as MODBUS technology, VOLKSEN Intelligent Room Control System helps to control light-

ing and room service info (including doorbell, do-not-disturb, and please clean).

HIGH STANDARD

In Phase III of the Shanghai campus, there are two dormitory buildings with 216 rooms in total, which are all constructed under starred hotel standard. VOLKSEN Intelligent Room Control System provides better and more convenient living environment for the students, and also contributes to the energy saving and environment protection on behalf of the school.

As the system combines both MODBUS technology and EnOcean wireless technology, all MODBUS actuator units and EnOcean gateways are modularly installed. EnOcean wireless switches are mounted on one side of the bed, and control lighting in the room via EnOcean gateways and MODBUS actuator units.





The students can control the apartment's complete lighting with one single batteryless switch mounted beside the bed.



MAXIMUM ENERGY EFFICIENCY

Thanks to the intelligent room control system, more than 30% heating and air-conditioning energy are saved, and there is over 40% energy saving on lighting. At the same time, key card switches can also help reduce energy waste effectively.

CONVENIENCE WITH MORE FUNCTIONS

An EnOcean-based wireless switch is installed on one side of the bed, just within the reach of the guest. With only one click of the switch, all lights can be easily

turned off. At night, after the "central-off" switch has been used, light in the bathroom can be turned on via any buttons of the switch. Convenience is highly improved by this kind of setting. In total, each wireless switch has four functions: central on/off control, lighting in room, lighting in bathroom and lighting in Mini-Bar.

The successful application of the VOLKSEN Intelligent Room Control System in CEIBS Shanghai campus expansion project once again shows the perfect combination of EnOcean and MODBUS technology, as well as VOLKSEN's mission: better technology, better life.

www.volkswagen.com





GLUE-ON INTELLIGENCE

Smart Home solutions in a construction kit system: modern concepts allow homeowners to decide when they want to switch to intelligent technology, and even retrofit all solutions at a later stage.

By Ina Trautmann, Marketing Director, JÄGER DIREKT

The collaboration between home constructor Viebrockhaus, the magazine WOHNIDEE and numerous other partner such as alpina Farben, nolte Küchen or Villeroy & Boch, results in a stylish and modern house that depicts current living and technical trend: The WOHNIDEE-House. For the third time already, JÄGER DIREKT has equipped a WOHNIDEE-House with OPUS® greenNet. Thanks to passion, belief and professional know-how, a real technical dream home was created in Bad Fallingbommel.

MODULAR SYSTEM CHARACTERISTICS

Next to quality and design, which is always the centre of attention, there was also a focus on the innovative En-Ocean-based technology. A lot of smart minds have checked the most current technologic trends to see if they were sustainable. The result: a construction kit system with green wireless technology. The wire- and batteryless building technology has low emissions of electro smog and an open, manufacturer-independent system.

The house has an intelligent infrastructure and lots of specific solution tailored to the project. Building owners can arbitrarily expand two, three or five years later, depending on their need or financial resources. The electronic technology built into the WOHNIDEE-House such as switches, sockets, smoke alarms, room control units, and

audio components are provided by OPUS® greenNet. The trend scouts' goal was to bring indoor comfort and security into the house, next to innovation and sustainability.

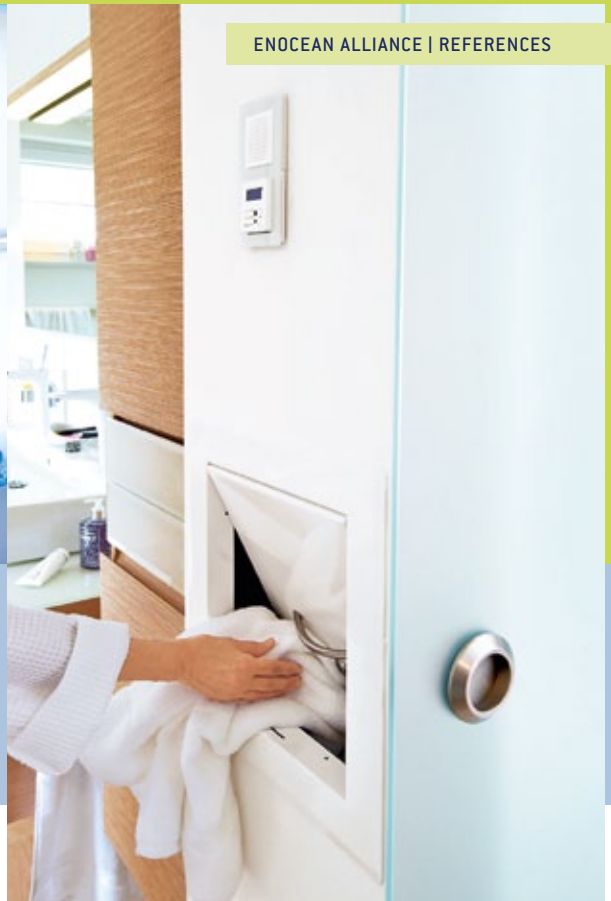
In addition to clever gadgets in separate rooms, the house also has common basic functions that can be used by all family members throughout the house. They can all be controlled by different control elements: for example, the lights can be switched on or off by freely positionable switches.

WIRE- AND BATTERYLESS TECHNOLOGY

The freely positionable switches in the building don't need cables or batteries, and are more than environmentally friendly and energy-efficient. They can easily be glued on or attached to walls. If, after a couple of years for example, pieces of furniture have to be moved, or when the children start moving out, everything can be flexibly converted. In the future, elaborate renovations involving a lot of dirt, such as slots for subsequent switch installation, will be history thanks to wire- and batteryless technology. Visualization software, installed on the iPad®, allows the building services to be accessed from any room in the house. The family can also access these systems from an iPhone® or Blackberry® while they are away from home – for the safety of builders and the house.



Music from the socket: The audio system is particularly simple and designed for space-saving music enjoyment. The system's core is not larger than an electrical outlet and fits into the existing switch frame. Whether as a radio in the kitchen, in the bathroom or in the children's room, the system is a true all-rounder.



EVERYTHING AT A GLANCE

Another small extract from the OPUS® greenNet catalogue is a stylish touch screen enabled room control unit. With it, residents can centrally control the temperature and lights as well as the blinds. If needed, all functions can be transferred to a touch PC. Controlling the gadget is very easy and allows access to all electric consumers in the household (lights, blinds and heating). The current status of the blinds (up/down) and the room temperature can be checked and changed at a glance. For example, the heating is turned off automatically when a window is opened.

SECURE AND INTELLIGENT

Networked smoke alarms ensure extra security, as they are connected with the light and blind control, and in an emergency utilise this to show escape paths and clear obstacles. The products' intelligence can be integrated into visualization software without a problem, so that, in case of an emergency, a message can be sent to a smartphone. All solutions can be expanded without a lot of effort. The smoke alarms are also glued on and therefore can be re-positioned at a later date.

FORGOT TO TURN OFF THE LIGHTS?

Saving energy costs is a big theme, now more than ever. Motion detectors are an important core element for that. Flexibly mountable, they are "energy guards" by day and alarm indicators by night or in the absence of the occupants. In a staircase, cellar, or in the children's bedroom, for example, a freely positionable, solar powered wireless motion detector can be a big help.

BEING ABLE TO REACT TO CHANGED REQUIREMENTS

The OPUS® greenNet system can be changed at any time to suit new requirements or different challenges. That way, the family is well prepared for the future with an investment that pays off. Amendments or changes, for example monitoring the windows, a burglar alarm, or just a new switch, are always possible.

www.OPUSgreen.Net



Video clip: "The System"





ALPHA.ONE – PROACTIVE TEMPERATURE CONTROL FOR REDUCED HEATING COSTS

Three decisive factors decide, how high the annual heating bill turns out to be – the weather, the quality of the building and the circadian cycles of its inhabitants. None of these can be changed, but a temperature control, which can adapt itself optimally to these three factors, can lower the consumption of heating energy by 40 %. Higher living comfort and healthy living climate are an added bonus.

By Susanne Hügel, Product Manager, alphaEOS AG

The alpha.one system's unique adaptability is made possible by a self-learning algorithm, which analyses the heating and cooling process and thus gains more knowledge in regards to the building's physical characteristics and the workings of the heating system. It also takes local weather forecasts into account and responds independently to external climate conditions.

PERFECT TRIO

alpha.one is made up of three components: one sensor, one central control unit and one actuator, which replaces the thermostatic head of the radiator. alpha.one is operated by a free app for smart phones and tablets. The sensor measures temperature, humidity, and luminosity, and transfers this data via radio to the central control unit – alpha.one's "brain" – which is connected to the internet. The unit then calculates the exact time when a certain radiator has to be heated up to a certain temperature by the actuator, so that, for example, when the resident returns, the living room has the exact temperature as specified in the app. If he

arrives an hour or two later or earlier, a push of a button in the app is enough for the system to react accordingly.





alpha.one is an easily upgradeable, individual room control, which adapts itself perfectly to the weather, the building, and the daily routine of its inhabitants. With its intelligent and proactive temperature control, alpha.one provides for a comfortable living climate with minimal energy consumption.



INTELLIGENT FUNCTION INSTEAD OF MOISTURE DAMAGE

Standard integrated eco-pilot function and airing notifications prevent an unhealthy room climate and mould formation. alpha.one independently lowers the temperature at night, and when no one is at home, to a level where costs are maximally reduced without resulting in moisture damages. As such, both tenant and landlord profit from this.

CLICK AND WARM

The wireless system is easily installed in accordance with plug&play principle, without the need for any tools. Installation does not require interference with the present heating system, or changes to the building. Thanks to powerful system architecture and interoperable EnOcean wireless technology, alpha.one is scalable and future-proof. Light, blind, and ventilation control can be integrated as needed, and alpha.one can be turned into a complete smart home system.

ALPHA.SENSE IN WOODCUBE

The IBA project Woodcube sets new standards with its holistic building philosophy – and also with regard to energy balance. The multi-storey prototype was realised

using only ecological, massive wooden construction and includes a networked energy management system, which minimises and optimises expenditures. Also included: alpha.one.

SENSOR FOR THE HIGHEST QUALITY DEMANDS

The building owner was especially enthralled by the batteryless and wireless room climate sensor alpha.sense. The connection between precise technical measurement of room temperature, humidity and luminosity and elegant design was also convincing. Practical considerations also spoke for the multi functional sensor. In just a few minutes after finishing the building, it was installed without any tools, both on the massive timber walls and on the unplastered concrete core of the Woodcube.

The EnOcean wireless technology fits into the Woodcube concept due to its low electromagnetic emissions: the building meets the highest biologically orientated standards and is completely CO₂-neutral and pollutant-free, both in production and in usage.

www.alphaeos.com
www.woodcube-hamburg.de



SMARTLY TRANSMITTED

TELEFUNKEN Smart Building GmbH (TSB) launches new products on the smart home market. In addition to the presentation of the Underfloor Heating Controller FBH8 and the Room Temperature Controller RT1, the Joonior App also offers many new features. At the Intersolar trade fair in June 2013 in Munich, TSB has now also presented a completely new solution for owners of photovoltaic systems: the Photovoltaic-Manager.

By Michael Conzelmann, Head of Marketing, TELEFUNKEN Smart Building GmbH

This year, TELEFUNKEN Smart Building GmbH will launch two new products to supplement the already established Joonior System – the underfloor heating controller FBH8 and the room temperature controller RT1.

This means that, when the next heating period arrives, there will be an opportunity to control your own underfloor heating system conveniently, using the Joonior System. Thanks to the removable upper shell, the Underfloor Heating Controller FBH8 can be employed either as a stand-alone unit or as an integrated element in the electrical distributor box. This assures the highest level of flexibility, both in new builds and reconstructions. The FBH8 is suitable for 24 V and 230 V servo controllers. In this way, all systems established on the market and their servomotors can be connected without trouble.

FURTHER TECHNICAL HIGHLIGHTS OF THE FBH8

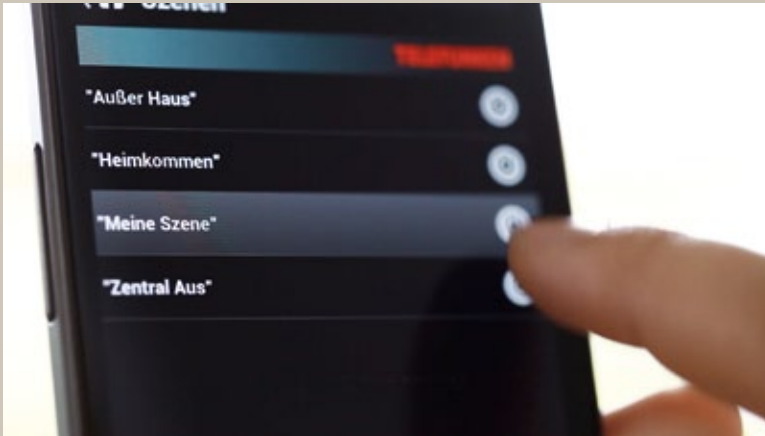
- controls up to 8 heater circuits
- status indicated via LEDs
- each channel can be actuated separately
- 1 x supply temperature detector global
- 1 x return temperature detector global
- 8 x return temperature detectors (1 per channel)
- 1 x SO inputs for counter data detection
- 1 x M-Bus for counter data detection
- communication via EnOcean or Ethernet
- can be used for AC valves (24 V or 230 V) and for DC valves (24 V)

CHOICE FOR COMFORT

With the second new component – the Room Temperature Controller RT1 – room temperatures can be adjusted particularly quickly and easily to meet personal needs. To do this, there are three different main operating modes. For example, “snowflake mode” can be selected if the room is left unoccupied for extended periods. In “thermostat mode”, a personal comfort temperature can be set with just a turn of the hand, and with “heating program mode”, the heating program pre-selected on the Joonior App will work with purely user-defined specifications.

ONE APP FOR ALL CASES

In its latest version, the Joonior App has also been equipped with new functions. From now on, users can add a convenient single room regulator in order to set a comfortable temperature for one specific room in just a few seconds. Furthermore, there is an adjustable holiday program that lowers the temperature in the whole house during longer periods away from home. Additional so called “scenes” can now be added and configured by the user with the aid of the Joonior App. Scenes are user-defined processes in which various components can be linked or matched to each other automatically. In this way, for example, light and shade control can be set during a romantic TV night with just the press of a button.



Top left and right: The components of the Joonior Smart Building System can be controlled via the Joonior App.

Left: The Photovoltaic-Manager allows an optimized usage of the produced solar electricity – with the aim: own consumption instead of feed-in.



The Joonior App is also available as a demo version to anyone who is interested, and can be downloaded and tested free of charge from the App Store®.

OWN ENERGY FOR YOUR OWN HOME

The highlight for owners of photovoltaic systems is the new Photovoltaic-Manager, soon to be launched on the market. It was presented for the first time at the Intersolar trade fair in Munich in June 2013. With the Photovoltaic-Manager, it is now possible to utilise self-generated energy optimally in your own home. The Joonior App's user interface can also be used easily to view details about the current weather, mains feed, and mains draw or, in future, even the charge status of the energy accumulator. To achieve ideal distribution of the locally-generated power, the system takes into account

the present and forecast amount of locally-generated power, the latest energy price, the present charge status of the accumulator and all connected consumers.

www.telefunken-sb.de





PERSONALIZED COMFORT AND INCREASED ROI

Distech Controls' new Integrated Room Control Solution is an end-to-end system for the control of HVAC room terminal equipment, lighting, and sunblinds, achieving the highest levels of comfort for occupants while increasing savings in operating costs, from installation time and wiring/material requirements to energy consumption. It is a unique, modular solution designed for local or room applications, such as offices, hotel rooms, patient rooms, dorms, military housing, etc.

By Marlène Fléchet, Marketing & Communication Coordinator, Distech Controls SAS

Indoor environmental quality (IEQ) in a commercial building has a significant impact on employees' performance, influencing everything from their concentration and absenteeism to overall satisfaction. With this much at stake, the Integrated Room Control product line is an essential solution for building owners and facility managers to keep their commercial buildings consistently comfortable for occupant welfare and productivity.

A SOLUTION OF SYNERGIES

The end-to-end solution simplifies design, installation and integration of multi-application systems including HVAC room terminal equipment, lighting, and sunblind control. These three functions can be configured through one seamless interface, so that there are no additional identification, connections, or commissioning required. In addition, it can be fully customized through EC-gfxProgram to meet the most advanced energy efficient application requirements.

LOWEST TOTAL INSTALLED COST

The lighting and sunblind expansion modules are connected to the extended HVAC controller on a subnetwork and can easily be installed near the equipment they control, reducing wiring and installation costs. The expansion modules do not require additional nodes on LON or BACnet networks. Motion and luminosity sensing information are shared across all three functions, providing optimal performance with only one sensor.

ENERGY SAVINGS DELIVERED

The integrated solution delivers efficient energy savings using occupancy-based control strategies and daylight harvesting. It is tested and certified by eu.bac, the European association responsible for the development, standardisation, and application of energy-efficient technologies. The Integrated Room Control Solution has been proven to help save a minimum of 15 % in energy costs in buildings!

THE INTEGRATED ROOM CONTROL SOLUTION INCLUDES

- **A multi-sensor** combining motion and luminosity (lux) sensors and equipped with an infrared receiver
- **An extended BACnet® or LONWORKS® HVAC Programmable Controller** for terminal equipment applications (VAV, fan coil, chilled beam, heat pumps etc.) with built-in features and logic for lighting and sunblind control
- **Lighting and Sunblind expansion modules** to control lights (on/off or dimming) and sunblinds (up/down and angle rotation)
- **A Room Sensor** for increased occupant comfort settings using four integrated sensors for temperature, humidity, CO₂ and motion
- **An EnOcean wireless personal remote control** for increased occupant comfort

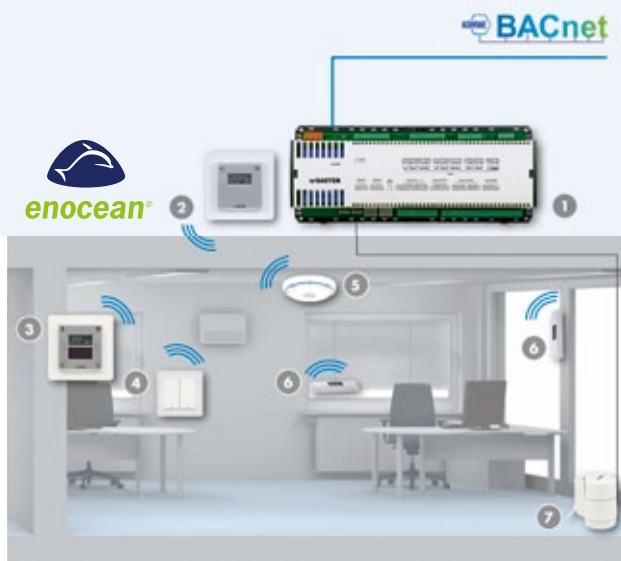
www.distech-controls.eu



SAUTER EY-MODULO 5: INTELLIGENT ROOM AUTOMATION WITH WIRELESS COMMUNICATION

Does the customer want to use the open BACnet technology? Does the customer have modern glass architecture, flexible open-plan offices or a historic building, and therefore requires an automation solution that is as inconspicuous as possible? Would the customer like to save energy and cut operating costs without compromising comfort? Thanks to room automation solutions from SAUTER, this is not a contradiction in terms, but an actual fact.

By Reto Stämpfli, Market Manager, SAUTER Head Office



1. Room automation station
2. Wireless interface
3. Operating unit with 6-fold function assignment
4. 4-channel light switch [commercially available]
5. Motion detector [commercially available]
6. Window contacts [commercially available]
7. Valve actuator

and operation; thanks to the bi-directional communication, users can see what is really happening in the room in regards to energy. The energy harvesting principle is the basis for the entire operation of the new product, which is supplied with power by a miniature solar cell. Maintenance is easy, since the device requires no batteries, and its wireless technology also cuts installation costs.

ecoUnit 1, the latest generation of room operating units developed by SAUTER, is attractive and, in terms of technology, represents state of the art wireless technology. It is also energy-autonomous, easy and cost-efficient to install and maintain, and simple to operate. Thanks to the innovative EnOcean wireless technology using the STM 300 module based on the Dolphin platform, the sensors communicate with each other bi-directionally, so users benefit from a helpful dialogue. For example, as well as sending the set fan speed for a room to a central control facility, a room operating unit can also receive and display room status information from a central point.

POWERED BY A MINIATURE SOLAR CELL

The display of the new ecoUnit 1 uses easily comprehensible symbols to indicate the actual value/setpoint, humidity, luminous intensity, air quality, operating modes, fan speeds and information on heating, cooling

HOMOGENEOUS COMMUNICATION FROM ENOCEAN TO BACNET

With the addition of the ecoUnit 1 room operating units, the pure BACnet philosophy implemented by SAUTER in its current EY-modulo 5 family of systems has now gained another unique selling proposition. There is currently no option more elegant for linking the forward-looking EnOcean technology with the established BACnet world. The data used via EnOcean in the room operating units are automatically converted into BACnet objects via the room automation station. Similarly, any commercially available EnOcean component, such as a motion detector, window contacts etc., can be detected via the wireless interface. This makes all the data and status messages that are essential for the efficient control of a building available to every BACnet device.

www.sauter-controls.com



WISTAR™ AT 902 MHZ

As a new member of the EnOcean Alliance, the industry leader Hubbell Building Automation puts lighting control on the EnOcean standard with its self-powered wiSTAR™ line.

By Tom Braz, Vice President and General Manager, Hubbell Building Automation, Inc.



By becoming a participant member of the EnOcean Alliance, Hubbell Building Automation has released its wiSTAR™ Wireless Lighting Controls, based on energy harvesting wireless technology from EnOcean.

The wiSTAR™ Wireless Lighting Controls are designed specifically for indoor lighting applications and include an in-line switch module, single and dual rocker switches, a key card switch, ceiling and wall mounted occupancy sensors, a light sensor, and a plug-in switch module. The switch and sensor products work completely without batteries, powered only by energy converters, which make them maintenance-free and highly flexible to install.

FUTURE OF ENERGY-EFFICIENT LIGHTING

Energy harvesting wireless technology represents the future of energy-efficient lighting control systems for building automation. The batteryless technology offers unique benefits such as the elimination of maintenance and lower overall lifetime cost. In addition, EnOcean technology is the only standard that enables environmentally friendly, sustainable products combining energy efficiency plus comfort and convenience in a building. For Hubbell, as a market leader in lighting control for building automation, it was the next logical step to embrace the innovative EnOcean technology and join the strong ecosystem of the EnOcean Alliance.

All wiSTAR™ products use the new 902 MHz frequency, which EnOcean has recently introduced to the North American market for its self-powered wireless technology. It offers greater range and robust performance enabling lighting control with reliable, long-range wireless and batteryless communication.

www.hubbell-automation.com

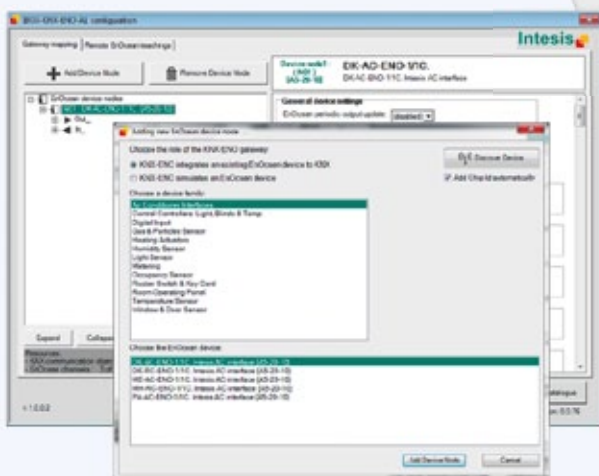


ENOCEAN INTO KNX: PERFECT FIT

Intesis introduces its brand new IBOX-KNX-ENO-A1/A1C, a very powerful gateway that connects both KNX and EnOcean technologies in a bidirectional way.

*By Isaac Gual, Sales Area Manager,
Intesis Software*

Supporting up to 253 communication objects and 32 simultaneous device types (channels), this gateway merges the KNX power with the EnOcean versatility. The setup is done by using a very easy and intuitive ETS plugin, without the need for any other external software. It allows easy discovery of



EnOcean-based devices, avoiding having to find out which profiles the device is using.

ONE CLICK FOR NEW DEVICES

Importing an XML file makes it possible to add new EnOcean-based devices to the gateway without the need to change its firmware or database. Also the implemented LCD display allows the user to teach/learn and erase energy harvesting wireless devices and also shows useful information for the integrator.

www.intesis.com



Advertisement

Your comfort is our motivation...
The low-noise valve actuator SAB02



EasySens®

Contact us! Tel. +49 2772/6501-0

thermokon®
Keep in touch with the future

- » Low-noise operation
- » Extremely short opening/closing time (0-100% in less than 10 seconds)
- » Long battery lifetime of 2 heating cycles (standard setting)
- » Wireless
- » www.thermokon.de



ENERGY AND BUILDING IN BATTERYLESS CONTROL

As a leading company working to further develop and promote self-powered wireless monitoring and control systems for sustainable buildings integrating the EnOcean interoperable wireless standard, SECO introduces a full range of EnOcean-based solutions.

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

SMART METER

The device directly interfaces to existing metering infrastructures (oil, gas, electric, heat) via either optical or wired connector, transforming them into “smart meters”. It records electricity factor and power consumption in real time and provides table or graphic statistic analysis. This system is fully compliant with EnOcean-based networks.

WIRELESS OCCUPANCY SENSOR

The wireless ceiling-mounted occupancy sensor can save energy and adds convenience by accurately detecting when an area is occupied or vacant. It is wireless, self-powered by an indoor solar cell, and uses a passive infrared sensor to detect motion. In addition, it transmits EnOcean radio telegrams to lighting and HVAC to use energy more efficiently and can also be combined with batteryless window contacts and illumination sensors for enhanced occupancy tracking.

WIRELESS WINDOWS CONTACT SENSOR

The wireless self-powered sensor can be used to detect the open and closed status of doors or windows, or it can be paired with an occupancy sensor to accurately detect whenever someone enters or exits a room.



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 LED screen displays the working state and automatically turns off when the room is not occupied. The temperature control mode provides three levels: rental one mode, rental unattended mode, and economic mode. Connected with occupancy sensor, window contact and key-card sensor, an intelligent control can be realized.

www.secotech.com.cn



ONE GATEWAY FOR TWENTY SWITCHES

Shortly after joining the EnOcean Alliance, Helvar launched its first EnOcean-based product: the 434 EnOcean Gateway – a new module which allows for the integration of EnOcean controls and sensors into a Helvar DALI lighting network.

*By Rebecca Ryan, Marketing Co-ordinator –
Lighting Control, Helvar Ltd.*

The 434, which can be wall or ceiling-mounted and is connected to a DALI network via a standard 2-wire cable, will deliver a wealth of energy saving and installation potential for lighting specifiers, designers and installers. Up to twenty EnOcean switches can be integrated into one 434 Gateway and the module opens up the potential for integration with other BMS technologies, such as automated blinds and HVAC.

KEY STEP

Helvar recently joined the EnOcean Alliance and the 434 Gateway is the first product the company has launched in a dedicated range currently under development. The launch of the 434 is a key step in Helvar's mission to develop energy harvesting wireless control systems that are simple to install, easy to use and guarantee energy savings for all types of organisation.

www.helvar.com



Advertisement

Excellent design –
energy-efficient technology
High-end room operating panel

thanos®



thermokon®
Keep in touch with the future

- » Control of automated HVAC applications by simple touch operation
- » Integrated temperature measurement (optional: humidity detection)
- » Touch-sensitive glass surface and clip made of brushed aluminium

» www.thermokon.de

Contact us! Tel. +49- 2772/6501-0



SMART METERING IN SMART HOME

The manufacturer, Somfy, has extended its home automation system, TaHoma Connect, with a function to measure the use of electricity in the home. Users can read via PC, tablet and smartphone which consumers need how much electricity in the house.

By Janik Bachleitner, Product Manager Home Automation, Somfy GmbH



The curve on the TaHoma surface shows the energy consumption for different times.

Keeping a check on electricity consumption is a good way for households to save money and at the same time do something for the environment, because in many buildings there are still numerous power guzzlers hiding somewhere. With smart metering systems, they can be identified and replaced. Somfy has integrated this functional option in its Smart Home Technology, TaHoma Connect. Alongside roller shutters, sun protection, roof windows, lighting and so on, electricity consumption can now be controlled via an easy-to-use and handy operating surface.

EYES ON THE AMOUNT OF ELECTRICITY

The central interface of this technology is the TaHoma Connect-Box. As a gateway, it enables connectivity between the internet and products in the house which are to be controlled. A radio receiver is positioned in the box via a USB connection – the TaHoma EnOcean-Module. It works on the basis of the battery-free, wireless technology, EnOcean, and receives signals from transmitting

modules for wireless energy meters of the manufacturer, Eltako. They are available as in-wall versions for switch sockets, or as elements to mount on rails.

In this way, the amount of electricity, as well as the energy for individual users, or the power consumption of circuits in selected rooms, can be determined. Via Smartphone, PC and tablet, the consumption curve is shown on the TaHoma user surface by clicking on the sensor symbol. The level of usage can be called up per day, week, month or year.

AUTOMATICALLY EXPANDABLE

Configuration is very simple and the new sensors can be easily added through the TaHoma operating surface – the system recognizes them automatically! With this new electricity measuring function, Somfy takes a further step in completing its Smart Home catalogue.

www.somfy.com



FOR SMARTER HOMES: ZIBASE PRO TALKS ENOCEAN

French smart home company Zodianet has introduced a brand new model of its home box ZiBASE: ZiBASE PRO. This version now supports EnOcean-based devices at 868 MHz for the integration of this sustainable technology in intelligent connected homes. ZiBASE works like a home server and is connected to the peripherals in a house and the internet. This enables users to control their smart home from anywhere with mobile devices.



The integration of EnOcean energy harvesting wireless sensors and relay receivers into an existing ZiBASE network is very easy: users just need to put the new EnOcean dongle in the serial interface of the box. Another benefit: the system does not require a particular configuration, so that home owners can start communicating with their home via EnOcean radio right away.

www.zodianet.com

NEW ANTENNAS CERTIFIED FOR ENOCEAN MODULES

Mitsubishi Materials' AM11DG series surface mount antenna has been given FCC limited modular approval for the EnOcean STM 300U, TCM 300U and TCM 310U modules and the EDK 350U developer kit (all 902 MHz). This type of an antenna is perfect

for applications where there is too little space for a large antenna or due to aesthetic concerns. Applications are as diverse as remote control, measuring and control equipment, emergency and security applications, real-time tracking, hand-held terminals, and many others. This antenna can also be used in European applications at 868 MHz by only changing a few inductors. As a service, Mitsubishi Materials can do testing in their dedicated 3m anechoic chamber to optimize PCB layout.

www.mmea.com



Advertisement

New design – fantastic functionality The wireless room operating panel SR06/SR07

NEW



SR06LCD



SR07P

EasySens®

thermokon®
Keep in touch with the future

- » Power supply via solar cell
- » Integrated temperature and humidity sensors
- » For switch frames 55x55mm or 63x63mm (without intermediate frame)
- » Constant temperature and humidity display (SR06LCD)
- » www.thermokon.de



WEB FOR RADIO TELEGRAMS

Different aspects of building technology come together in a smart home – for example the lighting, shading controls, and heating – to be networked in an intelligent system. The complete house technology can now be easily managed by the visualization and control software GFVS 3.0.

By Anja Krombholz, Technical Sales Assistant, Eltako GmbH

Like a spider in the web, the GFVS-Safe II server records every radio telegram in the whole building. The server and its assistants cannot only listen and record data patiently (e.g. meter data from the solar plant), but can also actively send orders and information into the Eltako building radio system, for example regarding the energy supply of the building, providing fresh air, controlling shading elements optimally, or operating the lighting centrally.

MULTIPLY CONNECTED

The GFVS-Safe II server can be connected to every Internet-enabled device, via WiFi, LAN or a M2M data link. This could be an extra PC or a touchpad. Even a smartphone can be remodelled into a mobile control centre, with the respective app. For iPhone®, iPad® and all

devices using Android software, the free apps can be downloaded in the web stores from Apple and Google.

DIVERSE FUNCTIONALITIES

- Switching on/off and dimming lights
- Controlling blinds/shutters/awnings
- Single room temperature control
- Light scenes
- Time controlled Astro functions
- Report and control via e-mail
- Analysis of energy meters via the energy-cockpit with currency selection
- Monitoring functionality with up to five cameras

www.eltako.com



SOFT TO SWITCH

Based on the EnOcean PTM 210/215 module, Soft Remote from ID-RF is waterproof, shockproof, and of course needs no batteries.

By Thomas Gauthier, General Manager, ID-RF

The fresh new four-button remote control switch has a modern design; soft-touch silicone material gives it a user-friendly style. The interchangeable soft skin can be adapted, customized and modified in order to adapt Soft Remote to any type of environment. At the same time, its water- and shockproof properties allow for care-free, rugged use. Additionally, Soft Remote has an embedded magnet so it can be attached to any metallic surface without affecting radio performances.

CAPABILITIES FOR MASS MARKET

The new four-button switch is part of ID-RF's smart devices portfolio for home and building automation. The



Soft Remote has been nominated for the French design award "Observateur du Design 2014" and will be exhibited at "Cité des Sciences" in Paris from November 2013.

Franco-Chinese company focuses on constant technological innovation in order to provide low-cost, high-end products intended for mass market retailers. Being an ODM and OEM solutions provider, all IDRF's products are available in white label versions. The company takes advantage of a R&D Center for mechatronics and manufacturing capabilities in Europe and China.

www.id-rf.net

DRIVING ENOCEAN FOR NIAGARA NETWORKS

Control Network Solutions has introduced a native Niagara AX driver for EnOcean networks and devices. The CNS-EnOcean driver allows internet-enabled Niagara applications full access to EnOcean energy harvesting wireless devices.

By Mike Welch, Managing Director, Control Networks Solutions



The CNS-EnOcean Ethernet transceiver driver for Niagara AX brings web technology platforms built on Niagara AX and energy harvesting wireless networks together, without the need for third party commissioning tools. The fully integrated driver allows Niagara system integrators to easily discover, commission and manage EnOcean-based energy harvesting wireless devices using only the familiar Niagara AX environment.

HIGH SYSTEM FLEXIBILITY

The driver enables easy configuration and management of EnOcean-based devices in Niagara AX, such as battery-less switches, temperature, humidity and CO₂ sensors or heating valve actuators. As there is no data I/O mapping or labelling required, the CNS-EnOcean driver significantly reduces commissioning time and risk.

The solution offers users significantly more flexibility in devising the ideal building automation system for each individual building's requirements. M&E contractors benefit from less risk and less costs, while at the same time

needing fewer suppliers. And finally, system integrators can plan and implement building automation and management systems more easily, enabling an improved customer offering and higher margins.

BENEFITS AT A GLANCE

- Reduced hardware
- Reduced installation costs
- Single tool commissioning
- No I/O mapping or labelling
- Reduced commissioning time, risk and cost
- Reduced CO₂ emissions, even before the system is powered up
- Reduced parasitic power consumption
- Reduced maintenance
- Vendor independence, both at point of delivery and subsequent operation & maintenance
- Re-use of existing Niagara AX skills and personnel

www.CNS-EnOcean.com



ENERGY HARVESTING MEETS DISPLAY – NO BATTERIES OR WIRES

The EasySens product line SR06/07 presents sleek, innovative and state-of-the-art technology. The re-designed room operating units are in line with the “thanos” design characteristics.

By Nico Gotthardt, M.A., Head of Product Management and Marketing, Thermokon Sensortechnik GmbH



A continual indication of temperature and humidity, set points, fan stages, presence and window statuses without user wake-up is displayed, and the ability to control room comfort levels with set point and fan stages buttons is also provided.

SR06 is a combined room temperature and humidity sensor with a display.

SR07 is available with set point adjustment, day/night time mode and a multi-function push button.

HIGHLIGHT VIA SOLAR CELL

SR06 LCD is the highlight of this new and innovative series. With its maximum power energy management, the unit operates without external supply voltage. The custom solar cell powers the device independently; the energy is harvested by artificial or natural light sources in a room.

Via the EnOcean bi-directional “Smart Acknowledgement” technology, the device offers an external reset option and the integration of external data such as occupancy or window status.

DESIGN VARIANTS

Besides the standard 55 mm x 55 mm grid dimension of switch manufacturers, the SR06/07 is also available with 63 mm x 63 mm, therefore no intermediate frame is required and an impeccable design is preserved.

www.thermokon.com



BIDIRECTIONAL WIRELESS AGE

With the new bidirectional flush-mounted receiver Easyclick from PEHA by Honeywell a new wireless age has begun. Integrating the latest wireless technology from EnOcean, it is now possible to directly visualize the status response for all automation functions in operation, for example on the Easyclick comfort handheld transmitter.

By Christine Marquardt, Marketing Communication, PEHA by Honeywell

Besides the visual display of light and dimmer on/off, the brightness of the receiver dimming from 0 to 100% and the upper and lower position of the shutter actuators can be displayed. The visualization of the window open/close/tilt positions is also possible. In addition, specific Easyclick receivers with integrated current measurement functions can capture energy values of the connected loads which can also be displayed via the Easyclick comfort handheld transmitter.

FUTURE-PROOF

A well arranged diagram shows the consumption by the hour and the week as well as the overall consumption and cost. Users can activate the receiver's integrated repeater functionalities on demand (level 1 and level 2). This means cost savings for longer radio ranges. The receivers are also characterized by a lower power consumption (<0.5 W) and are a future-proof investment due to the use of new the EnOcean standard protocols.

INDIVIDUAL FUNCTIONALITIES

As already known from the previous receivers, with the new bidirectional devices, users can select a variety of functions and parameters for each channel. In addition to the standard functions such as on/off, the devices offer features such as lighting scenes or the integration of occupancy sensors. This range provides more comfort and energy efficiency. All new Easyclick transmitters are certified according to the PEHA standard KEMA.

www.peha.de



Advertisement

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

WAGO®

VISUALIZATION IN NO TIME

So far, the programming of high-quality visualizations for building automation was time-consuming and expensive, so that not every user was ready to dig deep into his/her purses. With a new application, these problems belong to the past: thanks to CubeVision of Dortmund BAB Technologie GmbH, everybody can now realize high-quality visualization with ease.

By Sonja Pfaff, Freelance Journalist, Altena



CubeVision is designed as a cube. The rooms of a building are the respective sides. Through vertical and horizontal gestures, one can move from one room or storey to the next. The graphics were specifically designed for CubeVision and can be arbitrarily used for visualization purposes.



As the name suggests, CubeVision arranges rooms like the sides of a cube. Special feature: The visualization is created virtually by itself! The Cube is automatically created by the set-up of the building structure; the control elements do not need to be designed but only linked with the corresponding devices. If requested, a favorite feature takes over the elements' correct order by determining the frequency of use and automatically arranging all elements.

INNOVATIVE MENU NAVIGATION

For those wanting to use complex applications, extended views can be opened at the touch of a finger. Here, for example, music can be controlled, current weather forecast or live feeds of an external camera can be shown. In addition, there is also the possibility to display graphics with consumption data which can be compared in a few steps using the innovative menu. The Quick Navigation, a completely new way of navigation, allows changing rooms in seconds. This function can also be created automatically.

MAXIMUM OF FLEXIBILITY

As a part of the eibPort software, CubeVision does not have to do without the sophisticated services for automating other systems, or comprehensive solutions designed to integrate such systems. Thus, the costs are kept to a minimum, while a maximum of flexibility is guaranteed.

If you want to use CubeVision, you will require the eibPort Version 3. Firmware updates are free. More information, a demo and a video are available at:

www.cubevision.info



NEW PEOPLE



HUGO LIU, FIELD APPLICATION ENGINEER CHINA, ENOCEAN

In April, Hugo Liu joined the EnOcean team in China as Field Application Engineer. In this position, he is responsible for customer application and design support in China (Hong Kong, Taiwan). Most recently, he worked for Digital China Network and Zhongke FeiHong Science and Technology in Beijing, where he has designed several RF channels for GPS receivers and transmitters, RF transmission interference devices and five-receivers-one-transmit communication devices that used DSSS and HFSS. Hugo has also designed and tested full-duplex RF transceiver channels, hopping filters and tested a number of antennas and radio systems. Hugo graduated in Communication Engineering from the University of Electronic Science and Technology of China.

E-Mail: hugo.liu@enocean.com



MATTHIAS KASSNER, PRODUCT MARKETING DIRECTOR, ENOCEAN

In March, Matthias Kassner joined EnOcean as Product Marketing Director. He is responsible for defining highly innovative future EnOcean products and product marketing activities for the current portfolio. Before joining EnOcean, Matthias worked 12 years at Texas Instruments (TI) in various positions ranging from Wireless Field Application Engineer to EMEA Product Marketing Manager for TI's OMAP Application Processor Platform. OMAP is a high performance, low power wireless multimedia platform used in a wide range of products including tablets, eReaders, smartphones, home automation controllers, robots, watches, smart glasses and even one of the world's smallest wireless TV cameras. Matthias holds the degree of Diplom Ingenieur in Electrical Engineering from Technical University Ilmenau.

E-Mail: matthias.kassner@enocean.com

Advertisement

Ready to Receive!

Switch actuator in DIN-rail mountable enclosure for individual application in distribution/switch cabinets

Universal 4-channel radio receiver for battery-free and wireless EnOcean industrial sensors and EnOcean radio switches

Available with relay outputs as 4-make 789-601 or 4-changeover contact version 789-602



www.wago.com

WAGO®

LOOKING FOR EXCLUSIVE AND SEGMENT PARTNERS WORLDWIDE

Our **VdS-certified ALARM WINDOW HANDLE**, applied for patent for the world's most important markets, has revolutionized security and home automation technology by integrating alarm, wireless, HVAC and many other sensor functions.

Our product stands out distinctly from its competitors and combines comfort with easy handling as well as high performance. Since the market entry, we were able to sell more than 50,000 units in Germany alone within 18 months.

We are looking for **your company** as an exclusive partner in those countries, in which our alarm window handle is not yet available.

You have several years of experience in direct sales, establishment of sales, B2B and B2C? You have contacts and an appropriate sales network in the window and security industries, even in the DIY? Then, **you** could be the right partner for us.

Based on highly attractive purchase prices, we offer a long-term partnership with a modern and innovative company.

Contact:
SODA GmbH
Dipl.-Kffr. Heike Bedoian / Managing Director
hbedoian@soda-gmbh.de
Tel: +49.271.810 290 11



A NEW PLAYER FOR SMART HOME

Debflex, French manufacturer of electrical wiring devices and leader in France on the market of DiY, has decided to develop a full range of devices for the smart home environment exclusively based on EnOcean.



As its major customers like Leroy Merlin, Brico Depot or Mr Bricolage are now in the position to bring smart home solutions to the market, Debflex made the choice of EnOcean's batteryless wireless and interoperable international standard. As EnOcean becomes the most carried protocol by smart home boxes in Europe, Debflex is bringing the right offer to the market in terms of design, functionalities and prices.

Debflex already offers a wide range of switches (single and double rocker), window contact, temperature and humidity sensor, switching module one and two channels as well as plugs. Each of its receivers integrates both metering and diming functionalities. Debflex has also developed a white label portfolio to respond to the needs of telecommunication companies, utilities or key players interested in quickly obtaining EnOcean-based devices.

www.debflex.com



ENOCEAN ALLIANCE WELCOMES PRESSAC AS A NEW PROMOTER

Pressac Communications Ltd has become a new Promoter member of the EnOcean Alliance. With this step, the established supplier for leading companies in the automotive and telecom industry enters the building automation market.

By Graham Martin, Chairman, EnOcean Alliance



enocean® alliance
PROMOTER

The UK-based company is now a key player in the Alliance, actively supporting to bring the EnOcean energy harvesting wireless standard for energy-efficient building solutions forward. As a Promoter, Pressac will contribute to the EnOcean Alliance with its long-standing experience in mechanical and electronic design as well as network cabling solutions.

In 2013, Pressac acquired Seamless Sensing to expand its market presence into sensor, monitoring and control solutions for intelligent energy-saving buildings. Under the Cloud Buildings brand, Seamless Sensing has developed a comprehensive portfolio of energy harvesting wireless sensors and control systems for sustainable buildings.

COMMERCIALISING PROCESS

Pressac is currently re-engineering its initial portfolio of battery-

less wireless sensors, monitoring and control solutions for volume manufacture and OEM customization. The target is to develop the basic products together with partners of the EnOcean ecosystem into a wider portfolio of energy harvesting wireless solutions and systems which provide greater control and significant cost savings for intelligent buildings and other industries.

www.presscomm.co.uk



Advertisement

Now, Ready to Receive in „The Squire“!

Radio receiver integrated into the WAGO-I/O-SYSTEM for building and industrial automation applications

Communicates with a large variety of freely programmable WAGO controllers, such as BACnet, KNX IP, LON®, ETHERNET MODBUS TCP, PROFIBUS, ...

Universal receiver 750-642 for all battery-free and wireless EnOcean radio sensors

www.wago.com

WAGO®





OCTOBER 2013



15–17 European Utility Week,
Amsterdam, Netherlands
www.european-utility-week.com

23–24 3. Energie&Technik Smart Home & Metering Summit, Munich, Germany
www.smart-home-summit.de

29–31 HI-TECH BUILDING,
Moscow, Russia
www.hitechbuilding.ru

NOVEMBER 2013



04–08 Interclima+Elec 2013,
Paris, France
www.interclimaelec.com

05–08 Interlight Moscow, Moscow, Russia
www.interlight.messefrankfurt.ru

DECEMBER 2013

05–06 China International Energy Harvesting Summit 2013, Shanghai, China
www.demand-led.com/eh

JANUARY 2014



21–23 AHR Expo, New York, USA
www.ahrexpo.com

MARCH 2014

08–09 Ener.Com 2014, Rheinau-Lynx, Germany
www.messe-ener.com

light+building

Mar 30–Apr 4 Light+Building, Frankfurt/Main, Germany
www.light-building.messefrankfurt.com

JUNE 2014

03–05 LIGHTFAIR International,
Las Vegas, USA
www.lightfair.com

09–12 Guangzhou Electrical Building Technology, Guangzhou, China
www.messefrankfurt.com.hk

IN BRIEF ...

... EnOcean's websites now speak four different languages: English, German, Japanese and Chinese.
Just click to enter the entire EnOcean world:



www.enocean.com



www.enocean.de



www.enocean.com/jp



www.enocean.com/cn

SMART ENERGY MANAGEMENT SOLUTIONS



AREAS OF APPLICATION



INTELLIGENT BUILDINGS • HOTELS • RESIDENTIAL • RETAIL
SCHOOLS • HISTORICAL BUILDINGS

Energy monitoring & control solutions support you in achieving your energy saving targets.

Our typical solution can deliver:

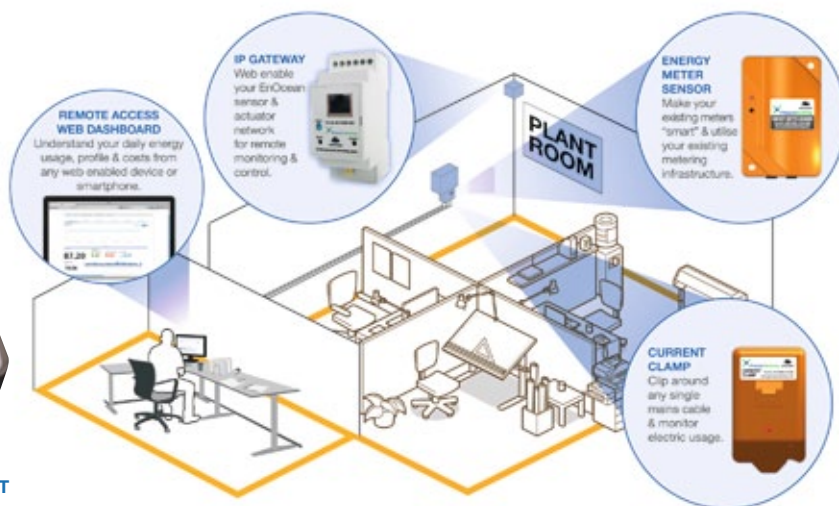
- 15% cost saving in new construction
- 70% cost saving in retrofits
- 40% overall energy saving

A full range of EnOcean interoperable sensors are available (Energy, Climate (temp, humidity, Co2), Motion, Lux, PIR, Radiator Controls).

These sensors feed data wirelessly into an IP gateway (up to 100 sensor inputs) that allows complete analysis and control via a web based user interface (over TCP IP).



ENERGY MANAGEMENT DEMONSTRATION KIT



User benefits:

- Energy harvesting wireless radio technology sensors
- Batteryless sensors
- Flexibility and zero maintenance
- Simple install (cost and time saving)
- Secure wireless standard & interoperable solutions
- Tailored energy monitoring and control solutions

Contact us to discuss your solution requirements:

Jasper Spencer on sales@pressacsensing.com
or +44 (0)115 936 5242

Glaisdale Drive West, Bilborough, Nottingham, NG8 4GY, UK



Supporting global manufacturing through ROHM innovation



High-speed switching high voltage products, including SiC



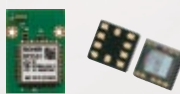
Power Devices

High quality, high reliability products, from chip LEDs to LED lighting solutions



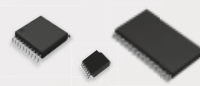
LED Lighting

Connecting man, machine, and society through sensing and wireless communication

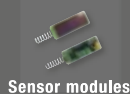


Sensing Solution

Promoting energy conservation by utilizing a variety of power control ICs



Analog Power ICs



ROHM Co., Ltd.
www.rohm.com

