



ENABLED BY ENOCEAN

perpetuum®

MAINTENANCE - FREE WIRELESS SWITCHES & SENSORS

2013
ISSUE
1

COMMUNICATION STANDARD

SMART HOME

The intelligent connected home

BSC COMPUTER

Green, smart and wireless all the way to the control center

THERMOKON

FirstRand Bank in India equipped with green technology

KIEBACK & PETER

en:key for "Smart Heating"

Frankfurt/Main, March 12-16, 2013

ISH

EnOcean Alliance exhibits: hall 10.3, booth B69



Learn more!
12.-16.3.2013, Frankfurt
Hall 10.3, Stand A39

EasySens[®]

Wireless technology for industrial HVAC applications.



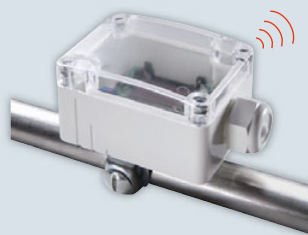
» SR65
Outdoor Temperature Sensor



» SR65 AKF
Duct Temperature Sensor



» SR65 TF
Cable Temperature Sensor



» SR65 VFG
Contact Temperature Sensor



Dear Reader,

One question the automation industry is currently facing is what will bring smart home technology out into the mass market? Or perhaps, it may be easier to ask, who will bring smart home technology out into the mass market? The short answer is there is no simple answer.

The smart home, originally driven by lighting companies, is now fully supported by many new players showcasing numerous offerings in their portfolio. There are the utility companies, who add the connected house to their energy supply, enabling the user to intelligently control their energy consumption. The telecommunications providers complement this with mobile control via smartphones and tablets – devices which are now able to communicate with your home technology. In addition, we must also consider the manufacturers of building technology. Providers of heating systems, for example, have taken to the stage to combine energy efficient heat generation with intelligent control.

Despite this market having a number of different players, there is one common ground: The smart home demands energy harvesting wireless technologies, as batteries cause too many problems in such a deeply connected system. To bring together all the different smart home services with our leading batteryless wireless standard, the EnOcean Alliance has become a member of the Home Gateway Initiative, HGI. As a result, the Alliance will actively support one of the key objectives of the HGI: to specify architecture, technical functionality and test requirements for flexible smart home service platforms.

One of the most important developments for connected home systems is to bring batteryless intelligence to the heating systems and burners. This enables them to directly communicate with a central control or with the heating valves. In addition, as a result of EnOcean's advances in thermo energy harvesting technology, our partners are now able to offer heating valves which are only powered by temperature differences. All these new innovations will be presented at ISH 2013, which takes place in mid-March in Frankfurt/Main.



2012 was a great year for EnOcean technology. The EnOcean Alliance grew to more than 300 member companies and 1000 interoperable products, a fact of which we're very proud. This year, I'm looking forward to meeting you at the EnOcean Alliance booth 10.3 B69 at ISH in Frankfurt or at Lightfair (booth 2931, Daylighting Pavilion) in Dallas, in May, to share with you further milestones in the development of the EnOcean ecosystem and technology.

The strong community of the EnOcean Alliance drives the success of energy harvesting wireless technology worldwide making it a communication standard around the world for a wide field of applications. In Japan, for example, almost 100 people attended the EnOcean Alliance member meeting in Kyoto. The amazing international interest reinforces our strategy to further develop our energy harvesting wireless technology in 2013 to meet different regional needs.

And who will finally bring the smart home to the mass market? I'm convinced that this success will be based upon strong partnerships between all players and standardized technologies that communicate seamlessly with each other, connecting batteryless devices to the wide-range networks and to the cloud. In the end, this is exactly what will pave the way to the "Internet of Things".

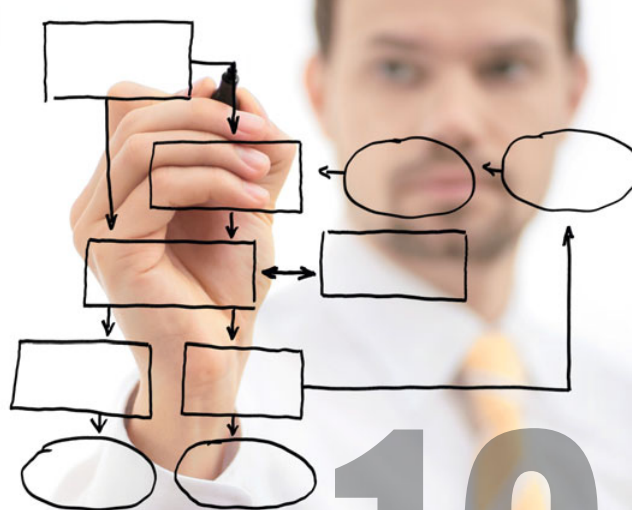
Yours,

Laurent Giai-Miniet
CEO of EnOcean

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SMART HOME

The intelligent connected home



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BSC COMPUTER

Green, smart and wireless all the way to the control center

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MASTHEAD

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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

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FirstRand Bank in India equipped
with green technology

THERMOKON



KIEBACK&PETER

en:key for "Smart Heating"

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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, 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 and 902 MHz, which can be combined with several energy converters. Starter and developer kits complete the offerings for developers and OEMs.

SOFTWARE EnOcean wireless modules always come with firmware, a suitable API as well as software tools. Thus, they can be implemented plug&play with plenty of scope for application-specific configuration.

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 oder LON.

www.enocean.com



FIVE YEARS OF ENOCEAN ALLIANCE – A WORLDWIDE ESTABLISHED ECOSYSTEM

By Graham Martin, Chairman, EnOcean Alliance



In the spring of 2008, leading companies across the globe in the building sector formed the EnOcean Alliance to establish innovative automation solutions for sustainable buildings – in order to make buildings more energy-efficient, more flexible and less expensive to operate. Within only a five year period this initiative has been developed to an established ecosystem and one of the fastest growing technical alliances. Today, the Alliance has over 300 members who offer more than 1000 interoperable products and solutions based on energy harvesting wireless technology.

Part of the success of the EnOcean Alliance is the organization's fast growing internationalization. So, in October 2012, the Alliance welcomed ROHM as its ninth promoter. In this highest membership class, ROHM will particularly promote the establishment of the energy harvesting wireless technology as the communication standard in green buildings in the Japanese market. Today, members in 34 countries worldwide represent the Alliance.

Alliance 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 approved Alliance 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, Leviton, MK Electric by Honeywell, Jäger Direkt, 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.



THE INTELLIGENT CONNECTED HOME

The home has long since ceased to be simply living space. In modern houses, windows talk to the heating system, washing machines to the power meter and smart phones to the blinds. Home utilities with communication capabilities increase security and comfort, reduce energy consumption and provide technical assistance to the elderly. Energy harvesting wireless technology makes it possible to network these intelligent homes particularly flexibly. It also makes the smart home fit for the future: thanks to energy harvesting, residents no longer have to replace batteries.

By Armin Anders, Vice President Business Development, EnOcean GmbH

The smart home is no longer a thing of fiction but an accepted fact among the general public, as proven by recent figures. By 2017, smart homes in Germany are expected to increase to more than 20 percent¹, which is equivalent to more than eight million households within the next five years – a potential billion euro market in Germany alone. The results of a survey on the attractiveness of smart homes to customers support these statements: more than 65 percent of 500 respondents found the services attractive or even very attractive.² The addressable market is therefore over 20 million households in Germany alone.

WHAT IS A SMART HOME?

At the heart of a smart home is automation for a residential building, in which the individual components, gadgets, wall switches, sensors and relay receivers, are networked to form an intelligent system. As a result, the building systems (lighting, heating and shading), security technology and other home devices can be controlled automatically as well as visualized and changed from a multimedia device. The networking of individual components and a central control makes the home more comfortable and also more secure, while saving energy at the same time.

The central control logic is to be found either in the cloud, or, as a safer option, in a separate device in the house. Decentralized intelligence makes it possible to use local emergency functions, like turning the lights on

or off, during a system failure. Residents can run the different applications from mobile devices such as smart phones or tablets. Classic controls such as light switches and hand-held transmitters are also available to the user, if he has left his smartphone in the car.

SUSTAINABILITY DUE TO ENERGY HARVESTING WIRELESS TECHNOLOGY

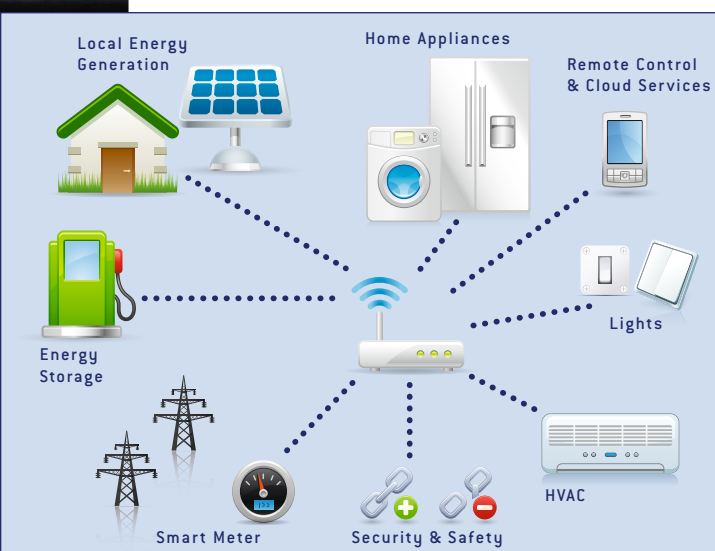
Modern smart home solutions use wireless technologies. Wireless solutions address existing buildings, which outnumber new ones, thanks to easy retrofitting, and therefore provide clear advantages against classic wired systems. Two principally different wireless technologies are needed: on the one hand, WiFi has proven to be invaluable for transferring large amounts of data from multimedia devices. WiFi uses a lot of energy though, and can only be used by permanently powered or daily recharged gadgets. On the other hand, transferring data, such as measurements or conditions, from sensors, wirelessly installed in windows, furniture or walls, as well as from integrated valves and ventilation flaps, preferably requires energy saving wireless radio.

The energy harvesting wireless technology from EnOcean has been optimized for these ultra-low-power data transfers. Instead of batteries, miniature solar cells, mechanical motion converters and thermal converters provide the necessary energy. Changing the batteries, maintenance work usually required during the most unfitting of circumstances, is no longer needed, as the technology is energy-

autonomous. The technology can also be easily connected to all systems that communicate over WiFi, as well as over Ethernet/IP, KNX, BACnet or LON via gateways.

SECURE COMMUNICATION

Based on the energy harvesting wireless technology, a wide range of energy-autonomous applications is now available for the connected home, including batteryless switches, intelligent window handles, temperature, moisture and light sensors, as well as presence sensors, relay receivers and control centers. Complete



smart home systems with energy harvesting wireless technology are also available, for example from companies such as Eltako/BSC, General Electric (GE), Honeywell/Peha, Jäger Direkt, Leviton, Telefunken and Thermokon.

Data security and reliability play a big role in the smart home. EnOcean radio already offers the basics for reliable two-way communication in home automation and uses secure frequency bands. For a higher level of data security, an encryption mechanism can be used. The data packages are encrypted with an AES algorithm with 128 bit keys. Furthermore, every telegram comes with its own rolling code. A forever changing authentication code is generated, based on the rolling code and the AES encrypted data package, and then validated by the receiving system. The same proven mechanism

also takes place by locking or unlocking a car with a wireless key. For even higher data security requirements, application-specific encryption mechanisms can be integrated, too.

GREAT POTENTIAL FOR SAVING ENERGY IN HVAC SYSTEMS

The present trend for smart home solutions is toward improved design as well as the application areas of security, comfort and saving energy. Security and comfort are seen as bare necessities for the user, and the advantages are obvious. The HVAC discipline (heating, ventilation and air conditioning) has an enormous potential for saving energy. After all, the heating system accounts for more than 70 percent of the delivered energy consumed in private households.³

The goal of intelligent heating control is to supply heat to rooms only when it is needed. Different control modules are conceivable, depending on the degree of automation and networking. In the simplest scenario, the radiator valve controls the room temperature. The valves determine the temperature itself. An optional room temperature sensor can also provide more precise measured values wirelessly. Unlike classic radiator valves, daily and weekly time-dependent as well as presence-dependent profiles can be generated for the valve. Residents have different options for setting a desired temperature: by using either an app on the smart phone or a stationary control in the building. They can also adapt the valve in the usual way.

WIRELESS HEATING VALVE WITHOUT BATTERIES

Enormous progress is being made in this part of the networked home, thanks to energy harvesting wireless technology: New heating valves use the difference in temperature between the heating system and the environment to provide energy for changes in stroke as well as for communication. Without cables or batteries, these wireless devices are especially easy to install, and they require no maintenance. They eliminate the burdensome need to change batteries once a year.

In further optimized systems, the heating boilers are also integrated into the batteryless wireless communication system. As a result, the boiler can directly communicate with the heating valve, or users can control not only the individual radiators but also the entire heating system from a smart phone, based on real-time data.

www.enocean.com



Sources:

- 1 Smart Home Systems and Service Forecast / Germany; William Ablondi; May 15, 2012
- 2 Smart Home—Future Opportunities of Different Industries; Capgemini Consulting; 2011
- 3 Division of Delivered Energy Consumption of Households According to Applications in 2007 in PJ; Bundesverband der Energie- und Wasserwirtschaft e.V.; 2008

ENOCEAN INTRODUCES 902 MHz ENERGY HARVESTING WIRELESS MODULES INTO THE NORTH AMERICAN MARKET

The additional frequency is license-free and meets legal regulation requirements. In addition, it offers a longer range, robust performance and ease product design.

By Jim O'Callaghan, President, EnOcean Inc.

EnOcean offers a new line of energy harvesting wireless modules communicating on the 902 MHz band for the North American market. These new products increase the effective radio frequency range, offer enhanced resistance to interference, and simplify product development efforts due to shorter antenna lengths.

The new modules add to the existing 868 MHz and 315 MHz Dolphin portfolio and include a self-powered wireless switch module (PTM 210U), a solar powered wireless sensor module (STM 300U), as well as transceiver modules for controllers and gateways (TCM 300U and TCM 320U). Additional 902 MHz solutions, such as a switch transmitter module (PTM 330U) and a solar powered temperature sensor module (STM 330U), will follow.

ENABLING SIMPLE ANTENNA DESIGN

An essential element of ultra-low power wireless communication is efficient use of energy. The 902 MHz transceiver achieves double the range of common 2.4 GHz devices for the same energy budget. Comparing new 902 MHz products to existing 315 MHz, simple wire antennas are utilized as well to conserve cost, while the shorter antenna length of the new modules allows for integration into very small product enclosures.

Interference from co-located devices such as light ballasts and LED drivers is significantly less impactful at 902 MHz. These contribute to enable an effective, robust wireless platform for applications in the building automation sector, for smart home solutions, health care products such as portable emergency buttons, as well as consumer appliances or machine-to-machine communication.



EASY DESIGN-IN

The new module line retains the same mechanical and electrical interface as EnOcean's 868 MHz and 315 MHz modules, which continue in production. Existing manufacturers (OEMs) can switch to the 902 MHz modules with minimal development effort and without changes in product design. In the majority of cases, the only requirements are an antenna adaption and minor changes in the EnOcean software settings. New OEMs benefit from the high performance of the 902 MHz frequency band and an easy design-in process based on EnOcean's unparalleled module offering and excellent development tools.

www.enocean.com/enOcean_modules_902mhz

ENOCEAN DECODED

With its new Decoding Gateway, EnOcean offers its OEM partners a firmware that decodes encrypted EnOcean telegrams right on the module side. This allows manufacturers (OEMs) to integrate encrypted data communication faster and more easily into their batteryless products, for example for safety-related and smart home applications.

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

Decoding Gateway adds an important module on the receiving side to EnOcean's security portfolio. When the PTM 215 energy harvesting wireless switch module transmits encrypted telegrams with rolling code based on the AES 128 standard, the TCM 300 transceiver module – programmed with Decoding Gateway – can decrypt these telegrams and then forward them to an external controller.

SAFETY ON A SILVER PLATTER

With this approach, EnOcean adds the entire process of data encryption and decryption to its modules. When manufacturers plan energy harvesting wireless applications with encrypted data transfer, they can save themselves a development step. The OEM's external controller no longer has to decode the telegrams, but receives them already decoded and ready for immediate use. Security functions can easily be added to existing receiving and gateway products by programming the TCM 300 transceiver module with Decoding Gateway. During the programming process, the firmware stores the rolling code together with the corresponding key on the Dolphin chip, so that no changes need to be made to the hardware. Alternatively, OEMs can also store this information on a separate EEPROM, especially for new product developments. The security information is therefore stored outside the module's program memory.

FASTER TO MARKET

The firmware makes it easier to equip energy harvesting wireless networks with additional security features. Manufacturers can therefore offer EnOcean-based applications with data encryption faster, including access and control systems or secure networking in the smart home.

INTERFACE TO THE ENOCEAN WIRELESS ENVIRONMENT

Decoding Gateway is part of EnOcean's new software portfolio, with EnOcean Link as its key component. The licensed software provides an interface to the entire world of EnOcean wireless communication in the form of middleware. It can be used for any type of transmitter and automatically interprets all telegrams according to the EnOcean profile specifications. OEMs can focus entirely on the application and save development work in the area of wireless communication.

www.enocean.com



ENOCEAN PRODUCTS

MODULES ARE AVAILABLE FOR 868, 315 AND 902 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.

In preparation: 928 MHz for Japan adopting ARIB specification.



Wireless Standard
ISO/IEC 14543-3-10

ENERGY HARVESTING WIRELESS SENSOR MODULES

868 MHz

315 MHz

902 MHz



PTM 210/PTM 215 (868 MHz), PTM 200C (315 MHz) and PTM 210U (902 MHz)

Ideal for energy harvesting wireless switches; the PTM 215 variant contains also rolling code functionality

868 MHz

315 MHz

Q2/13: 902 MHz



ECO 200 & PTM 330

The perfect combination for unique switch applications

868 MHz

315 MHz

902 MHz

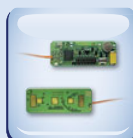


STM 300

Ideal for bidirectional energy harvesting wireless sensors and innovative actuators

868 MHz

315 MHz



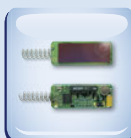
STM 312

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

868 MHz

315 MHz

Q2/13: 902 MHz



STM 320

Energy harvesting magnet contact transmitter module with helical antenna

868 MHz

315 MHz

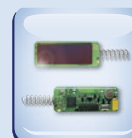
Q2/13: 902 MHz



STM 330

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

868 MHz



STM 331

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

ENERGY CONVERTERS

ECO 200



Mechanical

Harvests linear motion for use in wireless switches

ECS 300/
ECS 310



Solar

Harvests indoor light for energy harvesting wireless sensors and actuators

ECT 310



Thermo-electric

Harvests temperature differentials for energy harvesting

WIRELESS TRANSCIVER MODULES

868 MHz

315 MHz

902 MHz



TCM 300/TCM 310

868 MHz

315 MHz

902 MHz



TCM 320

TCM 300, TCM 310 and TCM 320 – ideal for permanently powered 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

**DolphinView**

EnOcean DolphinView visualizes wireless communication for starters in EnOcean technology

Variants: DolphinView Basic, DolphinView Advanced

KITS

868 MHz
315 MHz
Q2/13: 902 MHz

**ESK 300 Starter Kit**

The ideal entry to EnOcean technology

868 MHz
315 MHz
Q2/13: 902 MHz

**EPK 350 Programmer Kit**

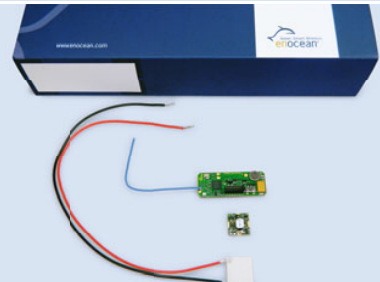
For upgrading ESK 300 Starter Kit to a developer kit

868 MHz
315 MHz
Q2/13: 902 MHz

**EDK 350 Developer Kit**

Developer kit for energy harvesting wireless sensor solutions

868 MHz
315 MHz
Q2/13: 902 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

Q2/13: 902 MHz

**EKCS**

Key card switch

Q2/13: 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

TRANSCIEVER PRODUCTS

868 MHz

**RCM 250**

Universal single-channel switch actuator –
230 V

868 MHz

315 MHz

Q2/13: 902 MHz

**USB 300**

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

(*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



ENOCEAN FOR EVERYONE

With its innovative solutions and its new outlook, MyFOX contributes to transforming security and home automation integrating energy harvesting wireless into the consumer market.

By Alban Amouroux, Usage and Community Manager, MyFOX

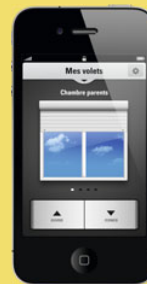
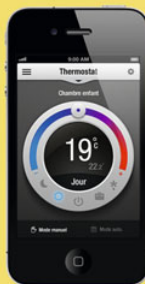


MyFOX is a solution by TAG Technologies, an independent French company, created in 2003 in the context of a research and development program conducted in partnership with LAAS-CNRS. In just a few years,

the company has established its leadership in terms of innovation in security, monitoring solutions and consumer home automation, and has become one of the main players in the sector, with almost 10000 alarm systems and more than 100000 products sold in 2012.

NEW GENERATION OF SECURITY AND HOME AUTOMATION CONTROL PANELS

MyFOX presents its new generation of home automation and security control panels. Alongside dozens of accessories that can be associated with it, HC2 has adopted an innovative concept of keys, allowing additional modules to upgrade the system to manage additional func-



tions and protocols. The MyFOX PRO control panel offers a tactile display panel for direct access to key functions. Both products offer distant control through IP and GSM/GPRS* connectivity and real-time alerts. Both can control and be controlled by EnOcean-based equipment such as switches or sensors.

By joining EnOcean Alliance, MyFOX diversifies and strengthens its offer with new products, always aiming to facilitate the installation and integration of home automation in our homes. Energy harvesting wireless products represents a major contribution to the development of a connected home that is accepted by everyone. With its clear mass market positioning, MyFOX will increase the development opportunities for EnOcean in the residential and SMB markets.



MyFOX
Home Control 2 (HC2)



MyFOX PRO

www.myfox.fr

* Service provided with an optional key for MyFOX HC2 box



GREEN, SMART AND WIRELESS ALL THE WAY TO THE CONTROL CENTER

Two promoters of the EnOcean Alliance, BSC Computer and Texas Instruments, worked together closely to combine the strengths of their software and hardware in the EnOcean BSC-BAP 3.0 TCP/IP gateway. The innovative, energy-efficient platform from BSC combines different wireless environments and thus paves the way for many batteryless applications for cloud services, ambient assisted living, the smart home and M2M communication.

By Jörg Hofmann, Managing Director, BSC Computer GmbH



BSC-BAP 3.0 is the third gateway generation from BSC and supports WiFi, GSM/UMTS and EnOcean wireless technologies on a central platform. An integrated SD and MMC card slot enables the solution to be used flexibly for a wide range of applications, such as backing up smart meter data.

MORE POWER, LESS ENERGY

The solution hardware is based on the OMAP processor family from Texas Instruments. This hardware combines high computing power with particularly low and optimized energy consumption. The processors were designed for use in industrial applications, such as industrial tablets, data terminals, secure communication, system on modules and much more. At the same time, the OMAP processors are also suitable for the low-energy solutions required by applications for smart meters, smart grids and ambient assisted living (AAL). The new BSC gateway will benefit from all these OMAP processor features.

Depending on the type of firmware installed, the following range of applications can be implemented with the BSC-BAP 3.0 platform:

■ A cost-effective and powerful building controller

with the latest BSC control and visualization software, which maps all important functions for intelligent home automation. As the control center, the controller combines energy harvesting wireless relay receivers and sensors into an intelligent system. Therefore, the BSC box combines the building automation system with all future smart home, AAL and smart grid solutions. All data remains in the integrated database on the user's premises. This means that, in future, any private home user can use these plug & play applications at affordable prices – as is currently the case with similar hardware for telephone and Internet applications.

■ A bidirectional EnOcean TCP/IP gateway

that supports GSM/UMTS and is ideally suited for integrating cloud services. All data is encrypted and transmitted to a cloud service over the Internet. The gateways connected to the BSC control and visualization software by TCP/IP can be used to control all EnOcean relay receivers and sensors in both directions – independently of the building's size and location.

■ A gateway that integrates two different EnOcean frequencies

for example 315 MHz and 902 MHz, including TCP/IP and GSM/UMTS communication. EnOcean applications that use different frequencies can be combined with each other as well as with other communication protocols on a platform, thereby forming a system quickly and easily.

■ An intelligent EnOcean repeater

which forwards the wireless signals of self-powered devices continuously, thanks to a defined routing path.

www.bscgmbh.de
www.ti.com



MACHINES IN DIALOG

An interview with ...

... Andreas Schneider, Chief Marketing Officer, EnOcean GmbH



Machine-to-machine communication, or M2M for short, is considered a future-oriented growth market. Or is this merely short-lived hype?

Andreas Schneider: M2M is indeed more than mere hype. A few years ago, it was expensive niche applications that required complex networking. But things are different today, with technological developments and the flexible capabilities of cloud services. The infrastructure and the products both, have made it possible to provide a great deal of information for M2M applications cost-effectively, using modules. There is enormous interest, since M2M solutions enable companies to organize their processes more economically, ecologically, cost-effectively and faster. These are clear advantages that set companies apart from the competition. Demand for M2M applications will therefore grow rapidly in the future.

What will make M2M successful?

A.S.: The secret to M2M's success is also one of its greatest challenges: the ability to make different communication protocols to work together. Hundreds of individual wireless nodes or sensors must communicate, not only with each other, but also with long-range wireless networks. This has to work when operating the solution in complex installations as well. In conclusion, M2M's success requires open, standardized technologies that can be seamlessly networked to form a system.

Is this the only obstacle?

A.S.: No. A minimum amount of maintenance is crucial to the long-term success of an M2M system. Supplying power to the equipment plays a key role here. The power supply of small devices, for example sensors, can become a real handicap. After all, power cables require complex installation work, and they impose too many limitations on where to place the devices. At the same time, it would be inconceivable to have to constantly change batteries in a large number of networked devices. Imagine having to regularly change the sensor batteries in hundreds of containers, in order to monitor logistics.

How can we solve this problem?

A.S.: For an M2M system to be networked more completely and more

intelligently, it has to integrate more devices as easily as possible. This rings true, especially when measured data from many different locations must be available to an intelligent control system. This principle resembles the functionality of a building automation system. In this case, many different sensors also supply the information needed to intelligently control building technology such as heating, lights and ventilation.

In the smart home, homeowners can now integrate the building systems as well as multimedia devices and household appliances into the building automation system, network them with each other and even operate them from smart phones as needed. In both applications, energy harvesting wireless technology offers particular advantages that can also be transferred to other automation processes – which is what M2M applications are – for example in industry or logistics.

What kind of advantages?

A.S.: The EnOcean wireless modules use small energy converters instead of batteries as a power source. These devices convert movement, light or temperature differences from the environment into energy. There is no longer any need for batteries, or their maintenance – that is, to replace them at regular intervals. The wireless sensors on the other hand, are maintenance-free and can even be placed in inaccessible locations. The EnOcean wireless technology is also standardized as ISO/IEC 14543-3-10, and standard application profiles ensure that many devices of different manufacturers can work together in a system without any problem.

EnOcean Link also provides manufacturers with middleware that can prepare all information from energy harvesting wireless sensors. Mobile devices, servers and even cloud services can immediately further process this information.

These features are what make energy harvesting wireless technology the ideal communication standard to easily and reliably interconnect thousands of individual devices in an M2M system, as well as network them with other wireless protocols.



WORLDWIDE INTEROPERABILITY FOR NEW MARKETS

The EnOcean Alliance is advancing the interoperability between EnOcean-based products from different OEMs by developing the EEP 2.5 version of the "EnOcean Equipment Profiles" (EEP). More than 100 product profiles are now available for developing different batteryless and wireless solutions for home automation. New profile families now facilitate the creation and release of a new profile.

By Norbert Metzner, Director Engineering, EnOcean GmbH

One of the EnOcean Alliance's key strengths is the interoperability of EnOcean based solutions. It allows for products from different manufacturers to be able to communicate and work amongst themselves. The foundation for this are clearly defined principles and standards, as well as standardized data formats and protocols for all components. These are then defined, for various functions, in profiles. Due to the consistent implementation of these profile definitions, the receiver from manufacturer A can be combined together with the sensors made by manufacturers B and C. This allows for an essential condition to be fulfilled: to realize manufacturer-independent, product-comprehensive, intelligent and individual solutions for efficient automation systems.

IMPORTANT INNOVATION DUE TO EEP 2.5

The EEPs characterize the functionality of EnOcean-based products, irrespective of manufacturer. The specification's new version – EEP 2.5 – was developed by the EnOcean Alliance Technical Working Group (TWG) over the last 12 months. The main assignment of this group is to standardize the EnOcean technology and to secure the interoperability for different products worldwide.

The present version 2.5 of this EEP specification introduces profile families for the first time. This concept is a new guideline for product and profile development and facilitates the creation and release of new profiles ("family members") considerably. A new area for variable length data profiles (VLD, profiles with variable data content), has been created, especially for new product development and application. Therefore, products with a flexible and extensive application spectrum can be carried out with the small energy budget provided by energy

harvesting. An example would be an energy-autonomous, thermostatic radiator valve, which only uses heat as an energy source and communicates with another energy-autonomous control device.

ENCRYPTED WIRELESS COMMUNICATION

The EnOcean Alliance has specified profiles, which enable a secure line of data communication, for critical applications such as access and control systems or secure networking in a building. That way, manufacturers (OEMs) can integrate encryption mechanisms quickly and easily into their new products. Depending on the security needed and energy consumed, OEMs can vary the security levels of each solution accordingly. These security functions, for example, make it harder for others to read addresses and content, and, through data validation, help protect against repeating telegrams.

FUTURE DEVELOPMENT

The EnOcean Alliance's TWG has set itself the goal of specifying another profile convention as the next step. This one is aimed at facilitating the development of new applications. Also, the observance of system specifications is decisive for a functioning interoperability. That is why another important field of activity is the certification of applied methods, profiles and radio performance.

The public new version 2.5 of the EEP specification can be downloaded at

www.enocean-alliance.org



OVERVIEW OF ENOCEAN ALLIANCE MEMBERS

www.enocean-alliance.org/products



<p>PROMOTERS</p>				
				

PARTICIPANTS							
							
							
							
							
							
							
							
							
							
							
							
							
							
							
							
							
							

... AND MORE THAN 150 ASSOCIATE MEMBERS



SHANGHAI WORLD EXPO VILLAGE BENEFITS FROM ENOCEAN TECHNOLOGY

After the Shanghai World Expo 2010, the serviced apartment complexes of the Expo Village are being refitted into office buildings for 12 government departments.

By Marketing Department, VOLKSEN Technology Co., Ltd.

One of China's largest reconstruction projects, the Shanghai World Expo Village, is located between Expo Village Road, Xueye Road, Yinan road and Huafeng Road, initially with 7 buildings (No. 1–7) and more than 140000 m² of useful space. Another 21 identical buildings are planned for retrofitting in a later phase. In order to make better use of these buildings after the Expo, they are being turned into office centers for 12 government apartments, including the Shanghai Municipal Commission of Economy and Information Technology, the Civil Affairs Bureau, the Human Resources and Social Security Bureau and the Commission of Commerce. The retrofitted buildings should be able to fulfill the working requirements of 12 government departments and citizens' requests.

LIGHTING IN CONTROL

To build a brand new office environment, VOLKSEN Intelligent Lighting Control System was selected for its energy efficiency, easy management, sustainability and flexibility. Based on EnOcean's wireless and batteryless technology as well as MODBUS Technology, VOLKSEN Intelligent Lighting Control System helps achieve the most energy-efficient lighting control for the public area.

Seven buildings in Area D of the Expo Village are being refitted. Each building has twenty floors, with various public areas per floor (this includes a hallway, wash-



room, pantry, printing room, staircase, and elevator), and each should have lighting control. The PIR sensors and intelligent switches on the walls can be used to control lighting in these areas.

COVERING ALL THE BASES

At the same time, lighting in all public areas of the seven buildings can be controlled by centralized software in the control room. EnOcean's energy harvesting wireless occupancy sensors and switches were chosen to cover all the bases. They are then integrated into the MODBUS lighting control system. To ensure centralized control, the MODBUS Replay of every floor is connected by a TCP/IP network in each building, so that every lighting system on each floor can be monitored easily via software. Also, service time and switch frequency can be calculated and analyzed, thus reminding users to change the lamps in time before the service life expires. As a result, management efficiency also improves a great deal.



More than 1600 EnOcean energy harvesting wireless occupancy sensors and more than 200 EnOcean wireless switches were installed during this first phase of the project.

CABLE-FREE AND COST SAVING

Areas that require lighting are spread locally in each floor, so the occupancy sensors need to be placed in a very flexible way. Thanks to EnOcean wireless technology, the installation is much easier and faster than with a traditional sensor with wires. According to calculations, the installation cost is 30 % lower than for traditional intelligent control system.

MAXIMUM ENERGY SAVINGS AND MANAGEMENT EFFICIENCY

With VOLKSEN Intelligent Lighting Control system, lights in public areas can turn on or off on demand. This way, the intelligent system helps save energy and extends the service time of lamps. The software easily manages the whole lighting system, as well.

www.volkswagen.com





FIRSTRAND BANK IN INDIA EQUIPPED WITH INTELLIGENT GREEN TECHNOLOGY

In the scope of an international expansion strategy, the South African FirstRand Bank identified India as an important market for future economic growth and opened a new branch there in 2012. The FirstRand Bank is the first South African bank to be represented in India, after receiving their commercial bank license. The new subsidiary's building automation is based on flexible energy harvesting wireless technology.

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

FirstRand Bank occupies 6000 m², spread over three floors in the newly constructed TCG financial administrative building in the center of Mumbai. Sara Interiors was appointed as interior developer for the modern office design. The biggest challenge was achieving optimum energy savings, while remaining cost effective and flexible for future alterations to the office layout.

ENERGY HARVESTING WIRELESS INTELLIGENCE WINS

The investors decided to use a modern building automation system and appointed Energy Automation as the system integrator to equip the rooms with the energy efficient EnOcean-based technology from Thermokon. The wireless transmitters and receivers of the EasySens product line, which operate without batteries or wires or an external power supply, enable smart control of heating, cooling, ventilation, lighting and CO₂ levels, using energy harvesting technology.

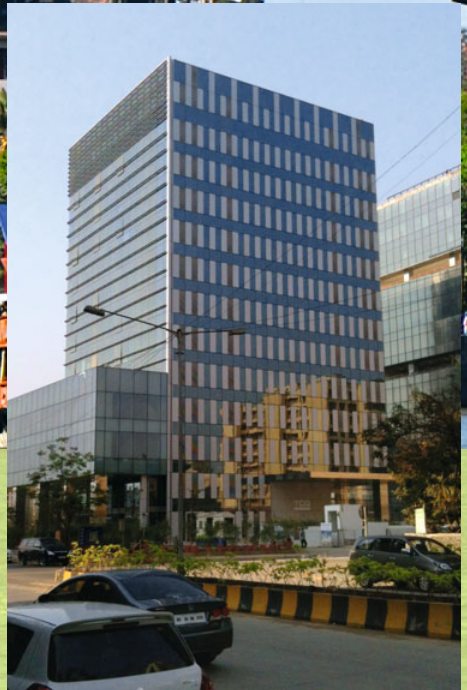
EASYSENS AND THANOS PROVIDE A PERFECT SOLUTION FOR MODERN DESIGN

Thanos, the multi-functional room operating panel installed on the executive floor, is a state-of-the-art design and a highlight of this modern building. Thanos acts as a control center and detects the current room temperature and humidity as well as enabling light and blind control.

Wireless temperature sensors, model SR04, with an integrated solar cell are installed in the employees' offices for room temperature setpoint adjustment. Occupancy detection for an energy efficient lighting control is achieved by the wireless motion sensor SR-SDS.

Conventional light switches have been replaced by the wireless EasySens switches based on EnOcean motion technology,





which sends a wireless telegram by means of a simple mechanical switch.

To achieve an optimal network for all manufacturers, a wireless EnOcean-based Thermokon gateway is used to convert the RF telegrams into a RS485 signal. The SAIA controller provides centralized control and completely transmits the system's intelligence onto a special KNX and S-Bus communication bus.

SIGNIFICANT ENERGY- AND COST-SAVINGS

The maintenance-free EnOcean-based sensor solution offers significant advantages, such as reduced installation costs due to less installation time as well as no cabling costs. Also, the ability to position the sensors and gateways flexibly provides for an attractive interior design and flexibility for future changes. At a low investment, an environmental-friendly infrastructure provides a considerable energy cost saving of approximately 40 %.

www.thermokon.com



The SR04 wireless sensors with an integrated solar cell (image above) measure temperature in the offices and adjust the setpoints.



THE QUBE – EXCEPTIONAL IN DESIGN AND SUSTAINABILITY



The Qube, formerly known as Chase Tower, has been a landmark of the Detroit skyline since 1959. Standing at 14 stories high, it also occupies the site of Detroit's first skyscraper. Having been purchased by Quicken Loans, the company moved forward on a complete remodel of the facility in 2011. The remodel was intended to bring the building up to date by adding designs that match the company's modern style as well as ensuring good indoor air quality, comfort and sustainability.

By Rob Copeland, Director of Marketing, Titus HVAC

MA Engineering was brought in to take on the mechanical engineering aspects of the project. Based in Birmingham, Mich, John Richards at MA Engineering served as the lead mechanical engineer and project manager of the renovation. His team was tasked with the complete renovation for nine of 14 floors, equaling 280000 m².

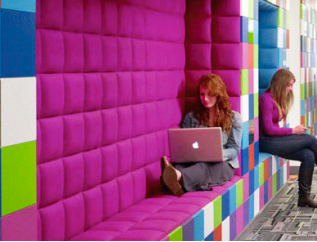
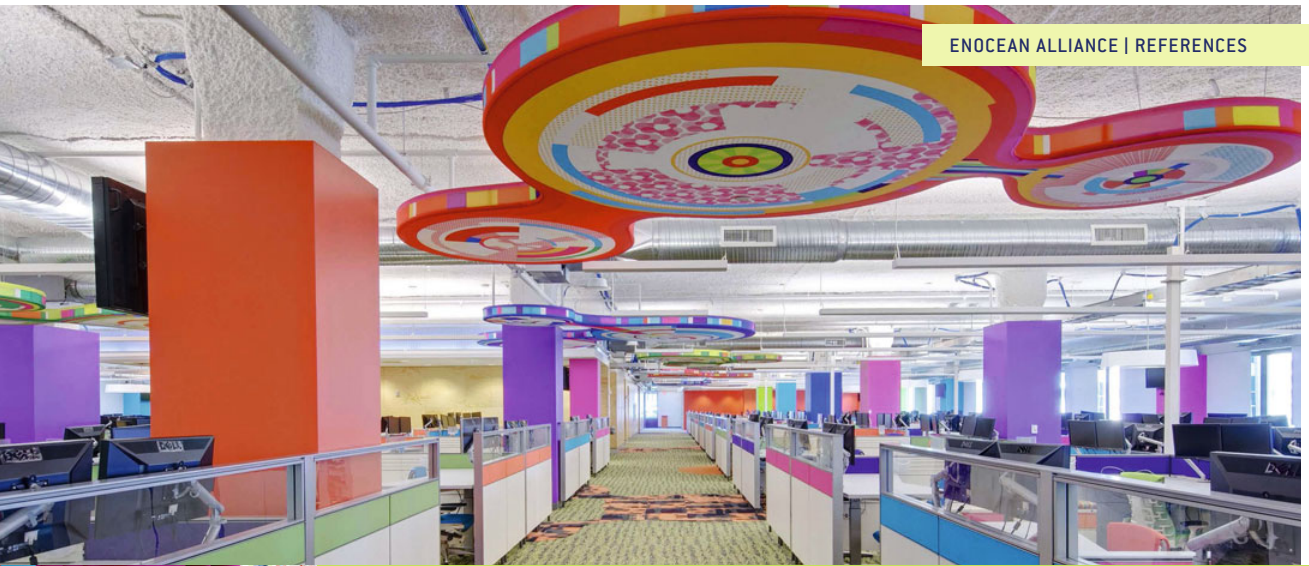
One of the renovation challenges was that the project did not call for new infrastructure. This meant that MA Engineering had to find a way to reuse the dual duct system that included all overhead air distribution. MA Engineering was concerned about occupant comfort near the windows because of a blanket of air over the building's single pane windows. Richards turned to Fontanesi and Kann, a company committed to providing the very best products, services and support to owners, contractors and design engineers through their

variety of professional project and construction management services. As a result the two approached Titus HVAC, the world leader in air distribution, to help solve the challenges with the Titus EOS.

COMFORT IN ALL MODES

The EOS is the industry's first light-powered, energy harvesting diffuser integrating EnOcean technology. With its wireless, energy harvesting technology it pushes the HVAC science of air distribution to new heights. It was designed to improve comfort and save energy while providing a solution to challenging building perimeter applications. Richards describes the overall concept of the new EOS technology: "EOS is better than typical diffusers because it has a 'brain' and can automatically adjust according to the temperature need so the area by the windows now maintains better comfort in





both heating and cooling modes.” The EOS is designed to address the imperfect split compromises that are commonly found in the perimeter of a building’s system, like the Qube. Its smart system delivers both heating and cooling by utilizing an auto-changeover function that eliminates wasteful compromise by automatically changing the air distribution pattern.

“With the EOS, the air is sent horizontally in the cooling mode and vertically down over the single pane window, creating a blanket in the heating mode. In addition, the unit runs on solar power, which makes it more appealing to the client and can also save on energy costs,” said Richards.

ADVANCING THE SCIENCE OF AIR DISTRIBUTION

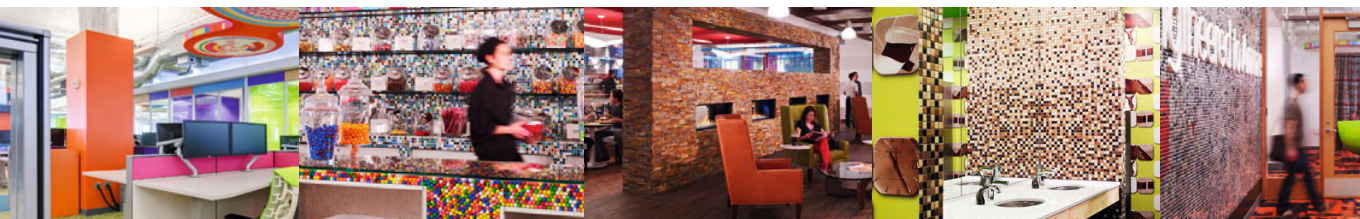
Another challenge on the project was that the office space featured an open ceiling with exposed ductwork and air diffusers. In order to make sure the cooling mode could project the air out into the space; Joe

Fontanesi worked with the Titus HVAC lab to engineer a “lip” that helped make the air projection horizontal instead of vertical. The lip would ensure that the EOS distributed air more evenly and throughout the entire building rather than just one area.

A SUSTAINABLE RESULT

Having been listed as one of the “Top Places to Work in America” for many years running, the solar aspect of EOS was important to Quicken Loans. The EOS is powered completely by natural light making this smart system cost effective and sustainable. In fact, the energy harvesting feature on the EOS can provide up to 30 % energy savings during heating over a split compromise system. Because MA Engineering had so much success with the EOS on the Qube project, they are already incorporating it into other projects as well.

www.titus-hvac.com

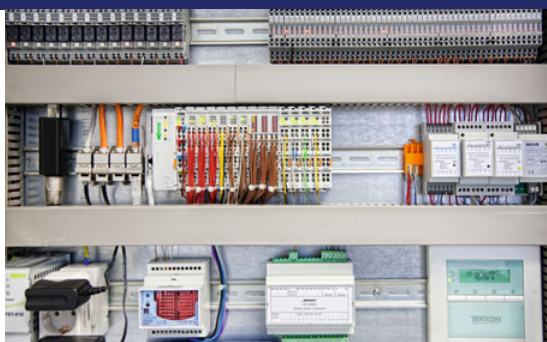




BUILDING AUTOMATION ON THE IPAD®

Low energy consumption was one of the main goals that Günther Heumann pursued when he was planning his new corporate headquarters. At the same time, he wanted to demonstrate modern building automation to his customers. A WAGO ETHERNET controller and an app for the iPad® form the basis of the building automation.

By Detlef Holfelder, Nuremberg sales office, WAGO Kontakttechnik GmbH & Co. KG



The WAGO I/O-SYSTEM with ETHERNET controller and numerous interfaces communicate with all building automation components.

The new corporate headquarters for Elektro-Service Heumann GmbH offers Managing Director Günther Heumann and his ten employees 400 m² of office and storage space. During the planning phase, a special focus was placed on guaranteeing an optimal climate in the space and keeping energy costs low. For example, the south-facing facade is nearly all glassed-in, so that the sun warms up the rooms during colder weather. Blinds ensure that the temperature does not climb too high in the summer.

An oven powered with wood and an output of 14.5 kW, provides the building with hot-air heat, if the sun's heat alone is not sufficient. In cold weather, a cross-stream heat exchanger uses the exhaust air to warm the supply air, so that very little energy is required for heating. It is also possible to cool the rooms with the supply air. For this, there are flat collectors under the parking garage,

which can cool the supply air using a brine pipeline and a heat exchanger.

CENTRAL CONTROL OF THE AIR CONDITIONING

Günther Heumann uses the WAGO I/O-SYSTEM with the 750-881 ETHERNET controller to automate climate control. The ETHERNET controller adjusts the supply and exhaust air flaps in the individual rooms, the cross-stream heat exchanger, the ventilator motors, the heating, the pump for cooling, and the SMI drives for the blinds. Temperature sensors in the rooms provide the current temperature that the controller compares to the one set by the user, in order to adjust the flaps of the ventilation accordingly. The WAGO I/O-SYSTEM controls and regulates the entire climate control. Günther Heumann and his team created the CODESYS programming themselves, in accordance with IED 61131-3.



Left: In the corporate headquarters of Elektro-Service Heumann GmbH, the company demonstrates how versatile building automation can be.

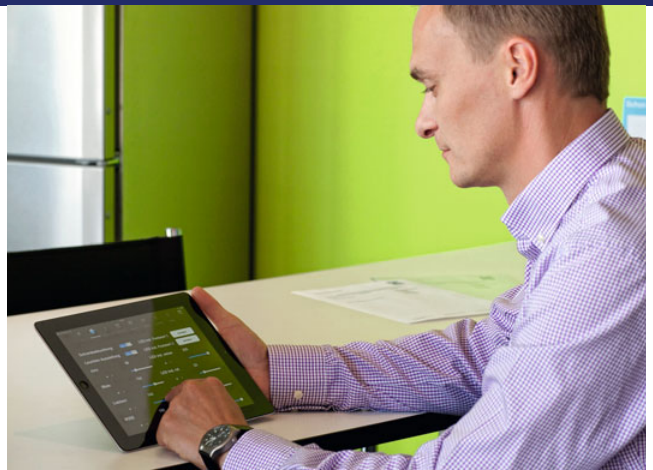
Below: All building automation functions can be programmed and operated easily using the iPad®.

LIGHT, SOUND AND VIDEO MONITORING

The building automation at Elektro-Service Heumann is also supposed to fulfill another important requirement: the company would like to demonstrate to its customers the countless possibilities of such a solution. To achieve this, all systems were incorporated into the central automation. Therefore, in addition to the room's temperature, the WAGO controller also regulates the lighting via a DMX bus, video monitoring, and a Bose multi-room sound system. Touch-panel room control panels transmit the user entries to the automation technology using EnOcean energy harvesting wireless technology. Specific sensors in the window handles also communicate via EnOcean; they indicate to the controller whether the window is open, tipped or closed.

OPERATION VIA THE IPAD®

However, the highlight of the entire automation system is the user interface on the Apple iPad®. The user can program all automation settings centrally and call up all functions individually. At the same time, the "AmbientRC" app created by Günther Heumann provides an overview of the current status of the building automation – among other things, the current electrical power consumption



of the entire building is depicted. To display the building automation information on the iPad®, the controller generates the appropriate xml files and stores them on the internal Web server. The app then visualizes the information on the iPad®.

Company owner Heumann is immensely satisfied: "From the lighting and blind control to the incorporation of sound systems, the WAGO ETHERNET controller offers a lot of possibilities, all of which we have exploited here in our own building."

www.wago.com





TOWER 185 – THE NEXT GENERATION OF A SKYSCRAPER

In the middle of Frankfurt's "Europaviertel" and centrally located between the Fair, Central Station and Financial District, Germany's fourth highest office building rises into the air: the Tower 185, built according to strict sustainability criteria. Here, HERMOS has realized an automation solution for the economically and strategically sustainable operation of the building. In addition, intelligent solutions increase the energy and operating efficiency.

By Christian Kuhles, Graduate Engineer, Supply Engineering Automation Software, HERMOS AG, and Frank Springer, Marketing and Sales, HERMOS AG



The tower, containing 50 floors, offers a rentable area of 100000 m² and has been constructed and realized as a Green Building. In particular, building automation and efficient building operation played a central role. Therefore, HERMOS realized the process and control system for heating, ventilation and air conditioning plants as well as the room automation based on the latest technologies.

CENTRAL CONTROL MEETS DECENTRALIZED INTELLIGENCE

The automation solution includes 55000 physical data points. 20000 data points account for the central systems and 35000 data points account for the room automation. Both the central systems and the room automation are controlled or regulated by the Automation

Stations (AS), made by the company Beckhoff. 170 Beckhoff-AS of the type CX9010 are used within the central system. The room automation includes 420 Beckhoff-AS of the type CX9001 and is based on the concept of "decentralized intelligence". Each system distributor combines the sensors and actuators of an office area, so that the CPU can control these units in the system distributor centrally. The field devices for heating, cooling and ventilation, the shading and the room operator units are also integrated. In addition, the lighting in special areas (conference and training rooms as well as the casino) is controlled and regulated by the system distribution. IPCs of type Beckhoff C6925 are used for dynamic room management.

ENOCEAN-BASED COMMUNICATION

The communication between the system distributor and its subunits is provided by TwinCAT ADS Communication Library. Besides binary and analog signals, DALI and EnOcean radio is used especially. All in all, the following devices integrating energy harvesting wireless technology from EnOcean are installed in the Tower: 450 terminals, 900 receivers, 3000 switches, and 1500 room sensors. The distribution systems communicate in the same manner as the automation stations of the technical centers via TwinCAT ADS with the component servers and the central building management server. The



safety controller (smoke extraction, pressure aeration) and the metering infrastructure are integrated into the overall solution. The FIS# room management system, which is implemented on the component server and the central building management server, is the basis for operation, monitoring and controlling of the systems as well as the data and report management, the metering evaluation and maintenance management.

FLEXIBLE ROOM MANAGEMENT

The system distribution concept enabling the room automation provides a high degree of flexibility for the operator. As part of restructuring measures, the operator can easily and conveniently define new rooms and the corresponding room automation function graphically, via the user interface FIS# (dynamic room management). Subsequently, the automatic download of the defined rooms and functions on automation level can

take place. In addition, all energy harvesting wireless devices can be moved flexibly. Time and cost consuming rewiring of electrical installations is no longer needed.

OPEN TO CHANGES

The open system structure regarding automation and management levels also makes it possible to integrate technological innovations seamlessly into the overall concept of Building Automation and Technical Facility Management. For example, it is possible to bring in new room automation strategies in a central way via automation stations in the distribution system, so that new or modified functions have an immediate effect in all rooms.

www.hermos.com
www.beckhoff.com





RIDING ON THE ENERGY EFFICIENCY WAVE

The Aloha Surf Hotel in Waikiki achieves significant energy savings with a key card-based automated control of HVAC and lighting in all guestrooms. The solution is based on energy harvesting wireless technology.

By Mike Giorgi, CEO of Magnum Energy Solutions

The Aloha Surf Hotel in Waikiki is part of Hawaii's first boutique hotel chain, Aqua Hotels & Resorts, offering a collection of 15 boutique and budget-friendly hotels in Honolulu and 6 Hawaiian resorts on Maui, Kauai, Molokai and Lanai. As part of their commitment to Waikiki's revitalization efforts, the management at Aqua Hotels has instituted a plan to minimize their impact on the environment. Part of their green initiatives included the installation of Green Key Switches, also referred to as "key cards," in all 204 guestrooms at the Aqua Aloha Surf in Waikiki.

ENERGY UNDER CONTROL

Magnum Energy Solutions (MES) provided the energy management solution, which utilizes a key card switch to automatically control both the HVAC and the lighting in the guest's room. When the guest enters their room, they place their key card into the key card switch located inside the entry way, thereby activating the thermostat control unit, bringing it into "occupied" mode.

When the guest leaves the room, they remove their key card from the key card switch and both the thermostat and the lights return to energy saving mode. Most rooms also have a batteryless, wireless balcony door sensor. When the balcony door is opened, a signal is sent to the in-room HVAC unit, which switches off, until the balcony door is closed.

SIGNIFICANT ENERGY SAVINGS

The key card-based energy management system has been in place since January 2012 and the savings are significant. With respect to lighting, the system has resulted in an average of 45 % energy savings. The energy savings for the HVAC system, which is where the larger load exists, is about 50 %.

FAST INSTALLATION

The core of Magnum's in-room solution utilizes an innovative EnOcean radio chip. The products based on this technology collect the energy they need for wireless communication from the surrounding environment, using motion, indoor light, or temperature differentials. The principle of energy harvesting enables sensor networks to operate without cables and batteries. Therefore, Magnum's solution is both wireless and batteryless, which meant a fast installation completed by the hotel's staff. The team was able to complete about 15 rooms per day, which meant little to no disruption to daily hotel operations – an important factor for the hotel's management and facilities team.

www.magnumenergysolutions.com





INTEGRATION OF ENOCEAN SENSORS IN BACNET NETWORKS: A HOTEL CASE STUDY

Hotels consume more energy per square foot than any other type of commercial building. As such, many are considering retrofit projects to add a building automation system to their facility. A cost-efficient method to bypass the challenges of high cost of wiring and the impact of the installation process is to swap the traditional wired devices with wireless EnOcean standard-based ones that can be integrated to BACnet – enabling a faster, cleaner retrofit that minimizes downtime and inconvenience for building stakeholders.

By Louis Hamer, Vice President, Product Strategy, SCL Elements/CAN2GO Inc., and EnOcean Alliance Marketing Chair, and by Marc Dugré, President, Regulvar Inc.



The Albert at Bay Hotel in Ottawa is the #3 ranked hotel in the city according to TripAdvisor. It also won the Travelers' choice 2011 and 2012 awards for family oriented hotels. Despite all the accolades, the hotel management wasn't satisfied with the HVAC system of its 197 large suites. They set targets to improve occupant comfort and reduce their energy bills by performing an energy efficiency retrofit based on wireless communication. By this, the hotel avoided difficult and costly wiring in the concrete and disruptions to daily operations. Regulvar was the system integrator chosen for the project for its combined wireless and BACnet expertise.

which have embedded gateway functionalities. Networking between controllers is achieved using the existing telecom risers. One CAN2GO unit per riser is connected to the LAN, making all the aforementioned points available for management using the hotel's BACnet system. Created by Regulvar, the control sequences of the system modulate heating, air conditioning and ventilation according to room occupancy and precise local sensing data. The overall result is reduced energy consumption with increased occupant comfort. Because wireless devices were used, inventory downtime was minimized and wiring costs were greatly reduced.

ENOCEAN TO BACNET

The control solution chosen for the project combined a BACnet management system, CAN2GO wired and wireless controllers, and a wide variety of end devices communicating over EnOcean, ZigBee and Modbus. In each suite, a CAN2GO controller is connected directly to the local heat pump. The controller is also connected to a Modbus thermostat and two EnOcean wireless sensors: a motion sensor and a temperature sensor. Multi-protocol conversion to BACnet is performed by the controllers,

THE MISSING LINK

Integrating EnOcean energy harvesting wireless devices into BACnet systems is a simple and cost-effective way of retrofitting hotels. Not only does it reduce installation costs, it ensures fast deployment and short downtime to minimize revenue loss from unavailable hotel rooms. This was the missing link the hotel industry had been looking for to enable energy efficiency retrofit projects.

www.can2go.com

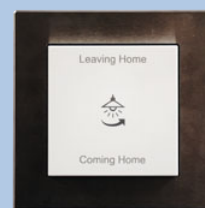




SECURITY IS PARAMOUNT IN BUILDING A NEW HOME

When Alfons Horn joined forces with his family, Viebrockhaus AG and Gregor Wendt Electrical Engineering from Gröditz to plan his new home in Hanau, he was certain of one thing from the start: the technology in the house had to be just right. As a manager of a large company in a construction-related business, he naturally has a penchant for modern building systems, and he and his family were looking for practical and future-oriented application solutions.

By Ina Trautmann, Marketing Director, JÄGER DIREKT



JETTE JOOP EUROPE LIFE HOUSE DESIGN FROM VIEBROCKHAUS AS THE "TECHNOLOGY CARRIER"

The attractive house design is modern and unusual. The state-of-the-art kitchen is fully integrated into the building systems, and it is the communication hub on this level. The upper floor is the family's private domain, with en-suite bathrooms and separate entrances for the children and their parents.

TECHNOLOGY WHOSE TIME HAS COME

Viebrockhaus AG has developed the "Wohnen 2.0" (Living 2.0) package with the OPUS® greenNet system, an intelligent and environmentally conscious building control system based on energy harvesting wireless technology. This package meets the home-builder's desire for affordable, environmentally friendly and comfortable technology.

TECHNOLOGY WITH A HEART

The Horn family chose Viebrockhaus's standard technology package first. But it soon became clear that additional features would be needed. For example, the family integrated an alarm concept that would keep the home secure, even while the residents were away. Energy efficiency was also an important concern. The "Leaving Home" function disconnects all defined loads, such as the gas stove and standby devices, from the power supply when the residents leave the house. The "Coming

Home" function deactivates the alarm and activates a predefined lighting concept that sets the tone for a comfortable evening with just the right atmosphere. The ViToo visualization software, which is installed on iPads®, enables the building systems 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.

CAMERA WITH OPTICAL AND ACOUSTIC SIGNALS

The builder was also extremely creative in his use of the Wohnen 2.0 package. He took the camera that came with the package and which uses acoustic and optical detection technology and turned it into a security camera that monitors the entrance to the home. The camera sends a notification when it detects movement or noise in this area while the family is away from home.

CUSTOMER SATISFACTION WITH A FUTURE

The Horn family is happy with their system, and plans to integrate additional functions are already underway. "I am looking forward to discussing new solutions with the JÄGER DIREKT manufacturer and Wendt, our electrician," says Alfons Horn. "The innovative energy harvesting technology, in particular, which makes this solution independent of batteries and cables, is a definite plus point for new home builders and even more so for retrofit projects."

www.OPUSgreen.Net



FULL WIRELESS COVERAGE FOR BUILDINGS

The series 14 actuators easily permit central and intelligent installation in a building's distribution system, where the consumers can be controlled from a central point. Eltako thus launches a new approach toward the central installation of wireless actuators.

By Anja Krombholz, Technical Sales Assistant, Eltako GmbH

This approach is based on the Eltako RS485 bus. The incoming wireless signals from the sensors reach the RS485 bus and control the equipment via the bidirectional FAM14 antenna module, which has an integrated power unit. The actuators respond directly, thanks to the additional bidirectional functionality.

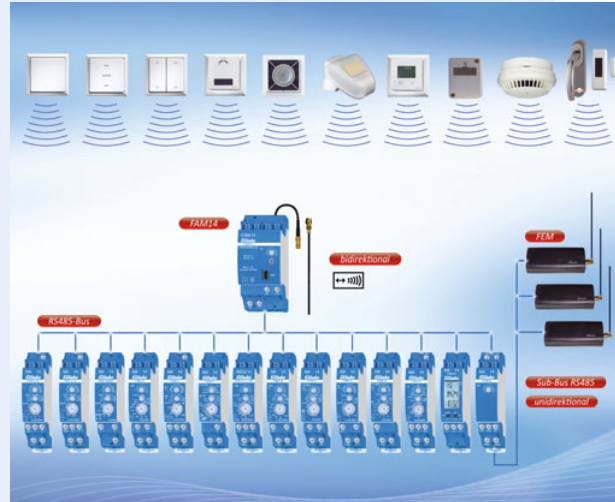
The RS485 bus is mounted above the actuators using cross-wiring. This is done by snapping the supplied connectors onto the actuators. This configuration supplies 12V DC power and the bus signal to the actuators. External antennas help optimize the receipt of the wireless telegrams. In addition to the main antenna on the wireless antenna module, up to three more antennas can be integrated – located, for example, on another floor.

FLEXIBLE EXPANSION

Installing the device in a central subdistributor is extremely flexible and can be varied. Thanks to the modular configuration, actuators for additional functions can be added to the end of a row, either on the left or the right, or mounted on another support rail, and conveniently integrated into the system. Multiple support rails are connected to a distributor with bus couplers, from where they can branch to distributors on other floors, for example.

PC-BASED CONFIGURATION

An additional PC tool allows the actuators to be configured with software. This tool can be used to store actuators and sensors in a database, together with the desired functions. The configuration is loaded to the actuators over the connection to the FAM 14 antenna



module, using a mini-USB port. Not only does this facilitate programming, but it is particularly useful later if changes are made or if the actuators need to be replaced. Existing configurations can be easily transferred to new actuators.

ENCRYPTED DATA TRANSFER

With the new EnOcean modules, wireless transmissions can be encrypted as needed, preventing usable information from being intercepted outside the building. The system is therefore absolutely secure even if a user wishes to access the building externally from a smart phone.

The system provides a much wider range of automation functions than the current installation. The series 14 built-in wireless devices can be used for all switching, dimming, control and regulating processes in a building. Combined with a wide range of sensors for installation both indoors and outdoors, they provide full wireless coverage for buildings.

The GFVS 3.0 control and visualization software for wireless building systems can be added to this equipment as needed, providing a completely new, intuitive user interface and voice control capabilities.

www.eltako.com



BUILDING AUTOMATION, SECURITY TECHNOLOGY AND PROCESS OPTIMIZATION FROM AFRISO

AFRISO integrates EnOcean's energy harvesting wireless sensors with a modern design for saving energy and increasing both security and comfort.

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



ROOM TEMPERATURE CONTROL FOR FLOOR HEATING SYSTEMS

The ultra-flat room sensors from AFRISO do not need any cables or batteries, can be placed anywhere in the home and are maintenance-free. The humidity and temperature values transmitted by EnOcean wireless technology (target and actual temperature) are used primarily for controlling temperature and can also be displayed and monitored from a smartphone/smartpad. The sensors detect open windows or doors, so that appropriate energy-efficient measures can be introduced. If needed, the sovereignty over the targeted temperature setting can be taken over from the room sensor to the smartphone/smartpad and back again.

DETECTING LEAKS AND PREVENTING WATER DAMAGE

Various batteryless and wireless water detectors from AFRISO report water leaks in such areas as washing machines, under the bathtub (also in complete darkness), in the kitchen or in the bathroom. The EnOcean wireless signal immediately causes the main water pipeline or the affected supply line to shut off. A notification is sent to the smartphone/smartpad at the same time. The water valve can be opened and closed independently of leakage notifications on the smartphone/smartpad.

BAD ATMOSPHERE IN THE CONFERENCE ROOM OR CLASSROOM

When several people occupy a closed room, the CO₂ concentration in the air rises noticeably, and it becomes

difficult to focus on one's work. The compact CO₂ measuring system from AFRISO measures CO₂ concentration in the air between 0 and 2000 ppm and transmits the latest measured value with EnOcean wireless technology. The air quality is displayed on the measuring system in green, yellow and red, and on the smartphone/smartpad in ppm. Air conditioners/ventilation systems can be controlled via the ppm value according to demand. People in the room can determine the air quality from the color codes. A data concentrator documents the transmitted ppm values.

AFRISO WATCHDOG ALARM UNITS WITH ENOCEAN REMOTE NOTIFICATION TO SMART PHONES

Home and building technology is subject to countless risks, which can be monitored. AFRISO WATCHDOG alarm units (for pressure, temperature, humidity, fill level, leakage, gas and smoke alarms) report unwanted events, hazards and emergency situations at an early point, both locally and globally, on a smartphone/smartpad, and initiate appropriate countermeasures. Events, alarms and measured values are documented. Parameters of installations and systems such as heating, solar systems, etc. are recorded and used to optimize efficiency. Deviations from optimum settings (waste of energy) are detected in time.

www.afriso.com



EN:KEY: NEW KIEBACK&PETER PRODUCT LINE FOR “SMART HEATING”



en:key is a new product line from Kieback&Peter that is aimed entirely at efficient energy use in residential buildings. The first two devices, the en:key room sensor and the en:key valve controller, are based on EnOcean's energy harvesting wireless technology. They form an intelligent, self-learning system for controlling individual rooms, one that takes full advantage of the energy savings potential of a demand- and use-driven room control system. The system requires minimal investment and installs quickly and easily, ensuring significant energy savings immediately, thanks to "Smart Heating".

By Jörg Bachmann, Kieback&Peter GmbH & Co. KG

The room sensor and valve controller are powered without power supply and battery through energy harvesting. The room sensor uses a high-efficiency solar module, combined with a high-end energy store. Power is supplied to the valve controller via a thermogenerator, which generates electricity from the thermal energy of the heating water.

SELF-LEARNING SINGLE ROOM CONTROL

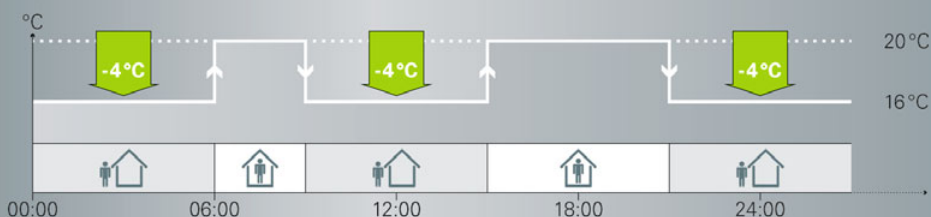
The room sensor uses a PIR sensor to continuously record the room use. It autonomously and dynamically learns a time-in-use profile that distinguishes between "room in use" and "room not in use." The profile constantly updates automatically, for example when the daily routine and therefore the room use change. The room sensor display shows the room and en:key status.

Like with a thermostat valve, the user turns a knob on the valve controller to set the most comfortable temperature. The room sensor wirelessly transmits the room use status to the valve controller.

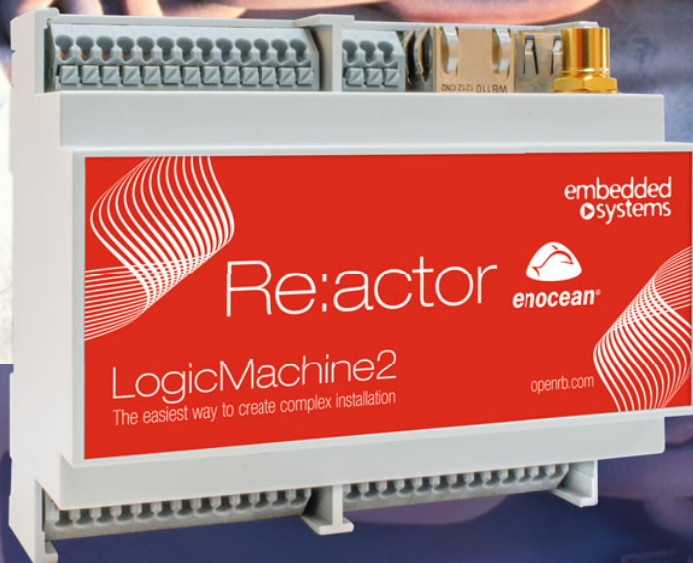
HIGH DEGREE OF ENERGY SAVINGS

By opening and closing the radiator valve, the valve controller precisely adjusts the heat feed to the room's use. Thereby, en:key differentiates between two temperature levels: the comfort temperature set by the user and the efficiency temperature in "room not in use" mode, which is 4 °C lower. Reducing the temperature by one degree Celsius in the home saves heating energy by as much as 6 %. Thus, around 20 % less heating energy is used during the low-heat phase.

www.kieback-peter.com



THE LINKAGE IN ENOCEAN INSTALLATIONS



The newly designed platform from Embedded Systems allows easy and seamless integration of EnOcean technology into conventional bus system. Combined with freely customizable visualization and programming logic it can overcome any challenge.

By Andrey Schmakov, CEO, Embedded Systems SIA

Nowadays, the EnOcean wireless technology is used in many large and complex projects. In most cases, wireless automation and various wired systems such as KNX, BACnet, Modbus and Dali are used together. In addition, integration with Internet services and complex logic scenarios are required. All of this can be accomplished by the new multi-interface “LogicRevolution” platform from Embedded Systems.

INTEGRATED VISUALIZATION AND BUILT-IN LOGGING

The solution eases the integration of several systems and significantly reduces installation efforts. The product already includes freely programmable software combined with visualization, which makes it possible to display statuses and control the installation from a smartphone, tablet or PC. In addition, built-in visualization

supports smart TVs, which brings the EnOcean technology much closer to the consumer. Thanks to 4GB built-in memory, the device can store logs for more than 20 years and export them to external servers at any time.

EASY SOLUTION FOR COMPLEX TASKS

“LogicMachine Re:actor” features 37 baseboard I/O ports, which can be extended with a line of additional I/O devices and gateways. The compact design allows placing the solution in each distribution box and makes it possible to complete the installation with only one single control device.

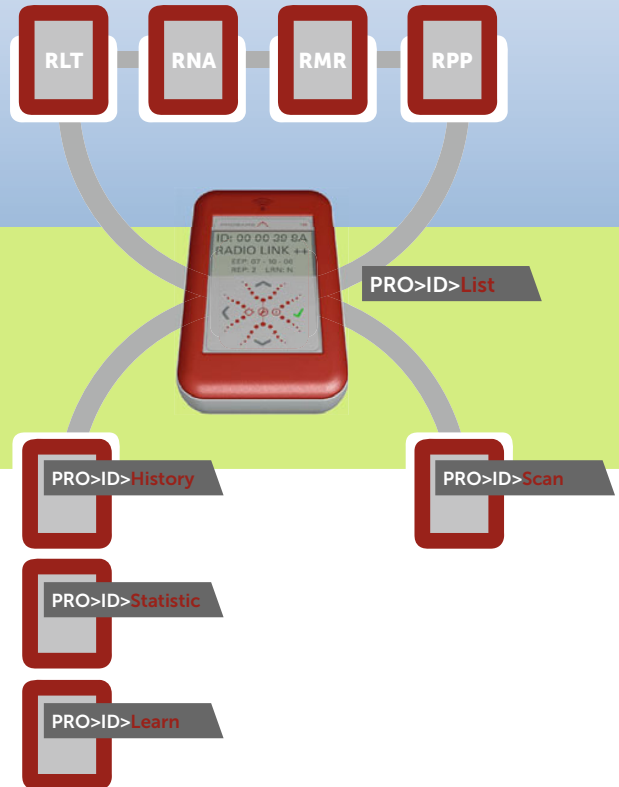
www.openrb.com



A DEEP INSIGHT INTO ENOCEAN NETWORKS

The latest version of the PROBARE P30 firmware provides the device with exciting new features that all users will soon find indispensable to their everyday work.

By Thomas Rieder, ViCOS



THE UNIQUE PRO>ID ANALYSIS

Building on the central PRO>ID>List of received EnOcean IDs, this function makes the PRO>ID>History, PRO>ID>Statistic and PRO>ID>Learn analysis tools available right on the PROBARE P30. It visualizes every important detail of an EnOcean network, even without the use of a PC.

The PRO>ID>List is filled by logging the EnOcean wireless traffic in the Radio Network Analysis (RNA) application area, by logging in the Radio Link Test (RLT) and Repeater Postmaster (RPP) application areas and by accessing remote-configurable EnOcean devices in the Remote Management over Radio (RMR) application area.

THE TRAILBLAZING PRO>ID>SCAN FUNCTION

This function lets the user look deeply into the hidden EnOcean devices. Individual EnOcean devices are analyzed and clearly identified with regards to their manufacturer and functional scope (EnOcean Equipment Profile, EEP), based on the P30's PRO>ID>List. Devices that support this functionality can also be localized directly with the P30, in case their structural position is unknown.

LINKED WITH ENOCEAN DOLPHINVIEW

DolphinView can be used to prepare the data received and stored by PROBARE P30, using the known graphic method, popular among system specialists and developers. This data can be e-mailed; logging and problem solving take place nearly simultaneously, yet both are no longer tied to a specific location.

AVAILABILITY

The new firmware will begin shipping in March 2013. Every PROBARE P30 already in the field will receive a free update.

www.vicos.at/newsP30



WIRELESS FLEXIBILITY AND BUS-BASED RELIABILITY

The new bidirectional KNX EnOcean gateway 63x brings EnOcean and KNX closer together. The gateway now makes it possible to control EnOcean actuators from KNX.

By Dr. Thomas Weinzierl, Managing Director, WEINZIERL ENGINEERING GmbH



The KNX EnOcean gateways KNX ENO 630, 632 and 634 are the successors to the tried and tested KNX ENO series from Weinzierl. Based on a new platform, the equipment series comes in a new attractive housing for mounting on the wall.

DIALOG-CAPABLE COMMUNICATION

While the KNX ENO 630 basic version is used as a gateway for sensor signals from EnOcean to the KNX bus, the 632 and 634 devices work bidirectionally. As a result, EnOcean relay receivers can now be controlled from KNX. The new devices comply with the EnOcean Equipment Profiles (EEPs), making them compatible with nearly all EnOcean-based equipment on the market.

The devices also have different logic and control functions. In addition to simple linking and time functions, complex algorithms for lighting control and heating regulation are also available.

CLEARLY STRUCTURED

The devices have a channel structure. The KNX ENO 634 thus provides a total of 32 channels, which can be configured individually via the KNX bus, using the ETS software. For programming the EnOcean equipment, the gateway has a back-lit graphical display that is easy to read even in the dark. It displays the number and name of each channel, which can be set as a parameter

in the ETS software. An icon also indicates the channel's EnOcean profile and function. During normal operation, the display shows the channel assignment and signal strength for each wireless telegram received.

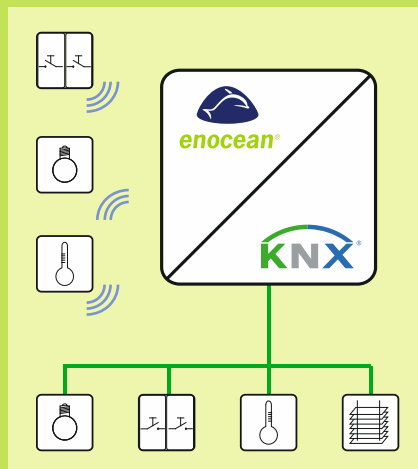
CONVENIENT ACCESS

An optional Windows program is available that allows the device to be conveniently operated from a PC, enabling the configuration and RF links to be read out. The links can be edited and stored with the tool. The program also features a remote control function, so that a gateway can be placed in programming mode, for example, to program additional wireless sensors.

MONITORING THE BUS

The integrated bus monitor provides special startup assistance for both EnOcean and KNX telegrams. The devices also have a wireless repeater. The antenna was integrated into the circuit board for optimum wireless connection. Power is supplied from the KNX bus.

www.weinzierl.de/en



DOOYA TUBULAR MOTOR TALKS ENOCEAN

With the theme of "green, no pollution, energy saving", Dooya offers green shade products and intelligent systems. Now, the leading tubular motor manufacturer is offering the world's first EnOcean motor.

By Ivan Zhang, Chief Technology Officer, Dooya Mechanic and Electronic Technology Co., Ltd.

Dooya produces tubular motors, curtain motors as well as door and window motors for sun-shading, based on a quiet and low-power consumption technology. Its intelligent system covers multiple areas of smart homes, commercial buildings, hotels and public buildings, applicable to a wide variety of engineering and home solutions.

QUIET AND STRONG

The DC motors support solar batteries and can be used for advertisement and windows where there is no electrical power. The quiet AC motor provides a low noise target of 25 dbm. The tubular motor is available with diameters of 17, 24, 25, 35, 45, 55, 59 or 92 mm and offers a maximum torque of 100 Nm and an output of 150 kg. The curtain motor has a power output of 25,

45, 60 and 75 Watt and drive curtains of max. 50 kg. The EnOcean motor uses the 868 MHz frequency band and supports the standard EnOcean protocol.

IN AND OUT

Dooya provides EnOcean green solutions for smart homes, indoor motorized sun-shading (include curtains, roller blinds, venetian blinds, ceiling curtains and vertical blinds), outdoor motorized sun-shading (include shutters, awnings, window openers and roller doors) and other motorized products, such as motorized projection screens, projector lifts, clothes racks etc. which can save up to 28 % of energy in buildings.

www.dooya.com



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BENEFIT FROM UNPRECEDENTED ADAPTABILITY



The new LonWorks & BACnet controllers in the RCL-PFC & RCB-PFC series is the most advanced, yet cost-effective solution for Integrated Room Control, and has been recently awarded Best LonMark Certified Device of the Year. This modular concept allows the process control of all office comfort functions such as HVAC (heating, ventilation & air conditioning), lighting and sunblinds.

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

Installed close to the equipment to limit wiring costs, expandable with lighting and sunblind add-on modules and compatible with wireless EnOcean products, the RCL/RCB-PFC series enables accurate and efficient control of your projects.

IRC CONCEPT BENEFITS

All configurable RCL/RCB-PFC HVAC controllers are expandable with lighting and sunblind add-on modules (RCx-Light and RCx-Blind) to control up to 4 lights and 4 sunblinds, creating a single modular system for optimal energy savings.

The IRC is a global solution, simple and quick to install which allows cable length and energy savings for a multi-function application, compared to a "classic" solution (mono task function). IRC configuration is defined for each office and can be easily duplicated in all other offices using the same application.

EU.BAC CERTIFICATION: UP TO 15 PERCENT OF ENERGY SAVINGS

The eu.bac Certification Mark assures users the conformity of products and systems defined in European directives and European standards. eu.bac certified products, such as the RCL-PFC-207, allow savings of up to 15 % of energy costs in buildings.

KEY FEATURES

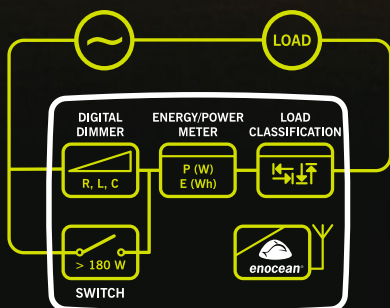
- Save energy and integration time, thanks to the all-in-one HVAC, lighting and sunblind control
- LonMark and WSPCert (BACnet) certified
- Open and interoperable products for more flexibility
- Best in class energy consumption with the lowest coefficient in eu.bac certification
- When adding an EnOcean radio receiver, the RCL/RCB-PFC series is fully compatible with a large choice of EnOcean room devices and EnOcean switches



www.distech-controls.eu



INTELLIGENT POWER CONTROL



Due to its Smart Control Components, permundo enables direct control and monitoring of electrical appliances in a home or office environment via EnOcean radio.

By Gregor Aumann, Managing Director, permundo GmbH

The Smart Mini Plugs are sufficiently small to be mounted in standard electrical wall mounts. They detect the type of electrical load connected to them and choose the optimal control mode.

The Smart Plugs act as a universal dimmer for incandescent lamps, dimmable CFLs and LEDs and as a switch when a vacuum cleaner, coffee machine, printer or any other non-dimmable appliance is plugged in.

STAND-ALONE OR CONNECTED

The control modules can function as a stand-alone or can

be integrated in an intelligent wireless network (EnOcean).

Each Smart Plug measures the energy consumption and gives feedback on the actual load status and classification of each application. The user immediately knows which device is still switched on or which lamp is defective and needs to be replaced. Load recognition and identification, combined with the energy monitoring function, allow for the specification of the energy consumption in a detailed and useful way.

www.permundo.com



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ENOCEAN INTEGRATED INTO KNX VIA SOMFY

- *EnOcean signals can now be transmitted to a KNX bus system, thanks to a new wireless card from Somfy. This means that sun shield technology, lights and other applications can be easily controlled wirelessly and without batteries.*

By Dirk Mommaerts, Marketing Manager Large Objects, Somfy GmbH

As part of its strategy to design open wireless systems so that building operators and users can network their systems effectively and economically, Somfy is now launching its new animeo KNX EnOcean wireless card onto the market.

EASY INSTALLATION

The card is very easy to install. It can be integrated into a Somfy KNX motor control unit via a plug connection – without a great deal of time or effort. Thanks to the Somfy card, building operators who have an existing KNX system and wish to equip some rooms with EnOcean wireless functions for lighting and sun shields can do so without problem.

FLEXIBLE INTEGRATION

Once the wireless function has been activated, the system does not need an additional physical KNX address. The address is already set in the motor control unit and applies to the wireless card as well. animeo KNX EnOcean can be integrated into all Somfy motor control units, regardless of the drive, from 230-volt and 24-volt drives to 24-volt drives with incremental encoders.

EXTENSIVE FUNCTIONALITY

All common designs of the engine control units are available, and they can be used as multifunction elements in a complex bus system, due to their simple plug connections. In addition to intelligently controlling sunscreen blinds, they can be upgraded to wireless technology, and their switch inputs can be used as binary inputs for integrated components such as temperature sensors.

The new Somfy wireless card is compatible with the EnOcean PTM 200 and PTM 210 energy harvesting wireless switch modules.

www.somfy.com



Wireless control of lights and sun shields can be easily retrofitted, thanks to the animeo KNX EnOcean wireless card.

DESIGNED FOR DIFFERENT BUILDING REQUIREMENTS

In December 2012, Enoluz launched a new CO₂, temperature and humidity wireless sensor that includes EnOcean radio for DVC and IAQ applications.

By Pascual Castellanos, Sales and Product Management, Enoluz



This new sensor has a system for measuring the CO₂ concentration in indoor buildings and requires no calibration or the need for the building to be unoccupied for measuring CO₂ concentration reference. In addition, it ensures high reliability and long-term stability due to use of the NDIR technology for CO₂ measuring. The sensor transmits the standard communication profile A5-09-04 EEP, ensuring a standard radio transmission and interoperability for communication with all types of receivers and gateways from other manufacturers within the EnOcean Alliance.

quality parameters such as the concentration of CO₂, which is recommended to be below 1000 ppm. The measurement also contributes to energy savings, as the ventilation system is only activated when the sensor notifies an insufficient air quality.

The detection and alarm levels can be configured individually via radio communication to meet different regional legislative requirements. This also makes the sensor solution ideally suited for the retrofitting of commercial buildings, hotels and offices.

The sensor is designed for the building automation market, where it is increasingly important to control the air

www.enoluz.com



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ROOM CONTROL WITH SELF-POWERED INTELLIGENT THERMOSTATIC RADIATOR VALVE –

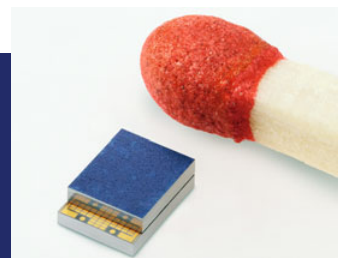
THE MICROPELT THERMOGENERATOR MAKES IT POSSIBLE



Tiny Micropelt MPG-D655 thermogenerator powers intelligent thermostatic radiator valve.

In residential and commercial buildings, numerous heating radiators can now be operated by a room controller in combination with a new self-powered and maintenance-free intelligent thermostatic radiator valve (iTRV). The Micropelt thermogenerator makes this battery-free wireless solution possible by supplying electricity to control the servomotor and operate the EnOcean transceiver module.

By Peter Kauf, Head of Business Unit Systems, Micropelt GmbH



Scientific studies show that a single room controller can reduce heating costs by up to 30 %. Until now, however, electric valve actuators were needed that were either connected via cable or powered by batteries. Both options have major drawbacks, since installing a cable is always highly cost-intensive, and batteries must be changed regularly.

SMART COLLABORATION

By using the efficient Micropelt thermogenerator, Micropelt engineers, together with specialists in drive technology from Precision Motors Deutsche Minebea GmbH and EnOcean Alliance promoter Thermokon, have succeeded in developing a completely self-powered intelligent thermostatic radiator valve. Thanks to clever mechanical design, the temperature difference between the water flowing through the radiator and the air in the room can be used to harvest power. The tiny Micropelt thermogenerator converts the temperature difference into electrical energy and supplies an intelligently controlled DC booster, which in turn powers the EnOcean module and the actuator electronics.

ENERGY EVEN OUTSIDE OF WINTER MONTHS

Economical microprocessors combined with energy-optimized control and communication algorithms from EnOcean ensure that average consumption of electronics is kept at a minimum. As a result, the valve actuator can regularly communicate with the room controller. Moreover, the intelligent thermostatic radiator valve has

a rechargeable storage element to store surplus energy, which means that the valve actuator can also work during the transitional months of spring and fall, despite the lower heating flow temperature. In the summer, the valve actuator automatically enters sleep mode but wakes up again as soon as the heating is turned back on.

CONTROL WHEN REQUIRED

For the single room controller, the valve actuators (acting as receivers) are connected to a Thermokon MSG server, which receives the control parameters from EnOcean-based room sensors, window contacts or handles and uses them to periodically calculate the valve positions for the desired room temperature. The target temperatures are retrieved from the MSG server using time profiles as well as presence detection: the comfort temperature is used when the rooms are occupied and the lower energy-saving temperature is used when they are not or the windows are open. The MSG server sends the appropriate position commands to the valve actuators, which then accurately adjust the heat flow for each radiator.

Thanks to its independent functionality, the battery-free intelligent thermostatic radiator valve is essential for the single room controller, especially when it comes to renovation and modernization work. With its high-quality housing, the heating controller is perfect for even the most refined spaces and living environments.

www.micropelt.com



INTELLIGENTLY CONNECTED

The development of building automation is led by the demand for comfortable, sustainable, secure and affordable buildings. Companies in the building technology industry have responded by developing solutions designed to achieve optimal results throughout the entire building. With the open operating system from mivune, those vendors can now take advantage of intelligence across and within their control system.

By Bettina Methner, Marketing Communications, mivune AG

Operating systems are used in almost all devices that require software. There has also been a steady increase in the use of operating systems in the building automation sector, to control the overall applications of a building. Most commercial buildings require blinds that automatically adjust to lighting conditions and air conditioning that adapts to the outside temperature as a standard function. The difficulty lies in the coordination of every function in a building. This requires an open interface. The mivune OS has now opened up a way to bring isolated systems together into an integral architecture.

WEB-BASED CONFIGURATION

mivune OS is the perfect OEM partner for lighting, shading, HVACs, ICT and the automation industry. The cross-platform operating system is open to all customer needs and can be configured and controlled in real time through a web browser. Application layers are accessed

via open Web standards. Using this API, clients can create customized services and applications.

OPEN OPERATING SYSTEM

Intelligence distributed across the automation and field levels enables fast response times and guarantees functional and operational safety. It also means that the system is scalable and can be integrated into multi-controller systems. The mivune OS can also connect and control important fieldbus systems such as EnOcean, DALI, digitalSTROM and Modbus at the same time. In addition to the pure data model and the generic software components, various visualization and configuration components can also be individually developed to customers' needs.

www.mivune.com



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Ready to Receive!

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

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

Available as 4-channel light control 770-629/101-000
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www.wago.com

WAGO®
INNOVATIVE CONNECTIONS

DESIGNED FOR INDIVIDUAL NEEDS

SiMICS develops modules for the use in various types of sensors and touch panels integrating EnOcean wireless communication.

By Kazuo Kawaguchi, System Division, SiMICS Co., Ltd.



The touch panels are based on capacitance, resistive or piezoelectric. The sensor modules are used for motion sensors, photo sensors or accelerometers. The SX-E01A tapping switch is a batteryless wireless switch comprised of a piezoelectric panel, dye-sensitized solar cell and EnOcean STM 3xx wireless module. The piezoelectric touch panel requires no standby power as it generates electricity only by tapping it. The solar panel can charge the super capacitor with, besides natural light, fluorescent and LED light.

The full super capacitor lasts for about four days without sunlight and is capable of changing its capacitance when used in products desired to last longer. The top section of the main switch is a small five centimeter square and can be changed together with the size and look of the surrounding frame according to the desired product design. The size and design of the dye-sensitized solar cell of this product can also be changed. The product will be available around April 2013.

www.simics.co.jp



ENOCEAN-ENABLED WIRELESS RELAY TRANSCEIVERS

Functional Devices has introduced the latest in U.S.-manufactured wireless relay transceiver technology, as it teams up with EnOcean to bring consumers a series of bidirectional relay transceivers to the building controls market, which accepts a control signal from a controller or switch transmitter and switches a load wirelessly.

By Hannah Martin, Marketing & Design, Functional Devices

The new, network-compatible design with two-way communication allows users to control loads and receive status on the network with just one relay for most applications.

The main features are:

- EnOcean interoperability: works in conjunction with other EnOcean-enabled products

- Provides status feedback: includes a dry contact input for use with current sensor or other remote sensors
- 24 Vac/dc input for use with controllers: 120, 208, 240, 277 Vac input models
- Built-in repeater function: signal is rebroadcast to the next relay transceiver
- 20 Amp relay for full switching capabilities



The wireless capabilities of these new bidirectional transceivers are great for use in retrofit building automation projects and applications where the structural or historical integrity of a building cannot be compromised.

www.functionaldevices.com



CO₂ BATTERYLESS WIRELESS SENSING

SolarPrint has the ability to tune its solar modules to match the spectrum characteristics of indoor light to provide the highest power output of any commercially available light energy harvesting technology under low and artificial illuminance conditions.

By Greg Jackson, Electronic Engineering Lead, SolarPrint Ltd

SolarPrint's patented high performance, indoor solar module known as the SP5848 can enable and enhance self-powered multi-sensor wireless devices that can be designed to operate on the EnOcean system architecture.

SELF-POWERED MONITORING AND CONTROL

The product is targeted to enable high performance multi-functional sensor devices in the emerging market of self-powered building monitoring and control Wireless Sensor Networks (WSN), for indoor air quality, occupancy detection, access control, security detection and low-power displays, finding application in sectors as diverse as horticulture and industrial safety as well as general building automation.

NEW SENSING SYSTEMS

Recent advances in other WSN device components (microcontrollers, power management circuits and sensor head units) together with developments of standards by EnOcean have led to sensing systems traditionally considered too great in power consumption to be suitable for energy harvesting now being within the powering capability of the SP5848.

Specifically, this has opened up an exciting opportunity for self-powered carbon dioxide wireless multi-sensors, featuring accurate air quality monitoring combined with one or more additional functions such as light, temperature, humidity or occupancy sensing.

www.solarprint.ie



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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

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www.wago.com

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INNOVATIVE CONNECTIONS

JÄGER DIREKT PRESENTS A NEW SWITCH DESIGN

New "InForm" series added to the size 55 switch line

Known as a full service provider to electrical equipment retailers, JÄGER DIREKT has added a new design variant to its OPUS® 55 line of switches, which was presented at Light+Building 2012. After fine-tuning the design, the injection molding tools are ready for in-house production. "With our new 'InForm' series, we have created another mass-market line of standard products for our customers," says Managing Director Thomas Jäger. The modern design is based on the OPUS® Kanto switches, which the company has been producing since 2005, and it is suitable for the standard 55 mm x 55 mm size.

The OPUS® 55 switch series provides retailers of electrical equipment a powerful line of switches that can be purchased directly from the manufacturer. The medium-sized company from southern Hesse has been producing switches since 1999 under the OPUS® brand, and it markets them exclusively through retailers of electrical equipment. The new "InForm" switch design replaces the "VIVA" variant.



www.OPUSgreen.Net

WORKING TOGETHER FOR SUCCESS IN JAPAN

EnOcean and ROHM have agreed on a strategic partnership. Through this cooperation, the two worldwide industry leaders intend to further establish EnOcean's energy harvesting wireless technology in the Japanese market and strengthen the presence of EnOcean in the Asian region.

Following the partnership with EnOcean and as a promoter of the EnOcean Alliance, ROHM will support further development of energy harvesting wireless technology as an international communication standard, as well as strengthen the marketing and sales of EnOcean modules on the Japanese market.

ROHM's long-standing experience in wireless communication as well as low-power ICs and modules establishes the perfect basis to further help develop EnOcean's technology in the future and to address the needs of Japanese customers.

ROHM offers Large Scale Integration (LSI) systems, discrete components and module products, utilizing the latest semiconductor technology. The company's product portfolio offers a wide range of applications and solutions, including products for wireless sensor networks, for example, various types of sensors, low-power ICs such as nonvolatile logic, modules and high efficiency dye-sensitized solar cells.

www.rohm.com
www.enocean.com



CURTAINS UP ...

... for the new web presences of the EnOcean Alliance in Japanese and Chinese. According to the motto "international on Internet", the Alliance takes another step towards internationalization. The Alliance website is now available in the language versions



The two new sites can be found at:

www.enocean-alliance.org/jp

www.enocean-alliance.org/cn

SOCIAL MEDIA

By the way: EnOcean and the EnOcean Alliance are also present online on several channels and platforms of the Social Web. There, you'll find further information, interesting links, news, images and videos.

Meet, experience and follow at:



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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

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INNOVATIVE CONNECTIONS

WIRELESS AND BATTERYLESS LIGHTING MODULES

SCHEIBER's range of EnOcean DC power modules is now available with the new tool free "PICOMAX" connectors from WAGO.

The modules operate from 10 to 34 VDC and provide six 5A outputs on separate WAGO Picomax connectors (outputs available on TYCO MAT&LOCK connectors on request). The MASTER module integrates an EnOcean transceiver module and use a CAN bus to link with the SLAVE modules. Each output is electronically protected against short circuit and overload and is dimmable from all its paired EnOcean switches (at a maximum of 128 switches per module). Bus connectors can link several modules together in order to drive more than 48 outputs on a network. In addition, the one "BYPASS" input can set all six outputs to "On" to test the wiring before pairing or backup drive. One "Learn" and one "Clear" switch are directly positioned on the modules.

NEW DISTRIBUTION PARTNER HELLA MARINE

EnOcean-based products and network modules from SCHEIBER will be distributed worldwide by Hella marine (www.hellamarine.com).

www.scheiber.fr



NEW PEOPLE



LENA LIN, MARKETING MANAGER CHINA, ENOCEAN ALLIANCE

Since July 2012, Lena Lin has joined us full time at EnOcean Alliance (China) based in Beijing. She is responsible for supporting our members in China, for organizing various marketing events & shows and for creating EnOcean Alliance material in Chinese. Furthermore she supported the realization of the Chinese EnOcean Alliance website. Lena is a mathematics graduate of Renmin University of China in Beijing. During her studies she worked at Ford Motor Company and at the Beijing Olympics. Lena speaks excellent English.

E-Mail: lena.lin@enocean-alliance.org



NATHAN LEE, OEM SALES MANAGER, ENOCEAN INC.

Nathan Lee is the new East Coast OEM Sales Manager for EnOcean Inc. His main responsibility is to assist, develop and grow all North America customers east of the Mississippi. Prior to joining

EnOcean Inc, Nathan was the Global Technical Solution Manager for Future Energy Solution, a division of Future Electronics. During his time at Future Electronics, Nathan developed the industry leading Energy Harvesting Platform and created the technical strategy to address the needs of the Energy Harvesting market. Nathan was also responsible for growing defined tier 1 customers globally. Before Nathan joined Future Energy Solutions, Nathan held various positions in sales, marketing and engineering at Freescale Semiconductor and Motorola. Nathan Lee has a B.Sc. with honors in Computer Engineering and a B.Sc. with honors in Electrical Engineering from the University of Florida.

E-Mail: nathan.lee@enocean.com

SPARTAN WINS CIPHEX 2012 NEW PRODUCT AWARD

Spartan was awarded the NEW PRODUCT AWARD at CIPHEX 2012 for its ME8300 Wireless actuator with WT313F temperature sensor. One of the many features that were highlighted was "All aspects of this control valve kit promotes sustainability."

Spartan Peripheral Devices's new wireless batteryless WT313F temperature sensor with set-point will proportionally control an ME8300 wireless bidirectional communicating control valve actuator based on the EnOcean protocol to be used as point to point or as part of the BAS network and can be installed on our complete line of 2- and 3-way terminal unit control valve bodies. This product will open opportunities to convert old building towards LEED energy efficiency.

www.spartan-pd.com

TITUS HVAC WINS 2013 AHR EXPO INNOVATION AWARD

Titus HVAC won the AHR Expo 2013 Innovation Award in the "Green Building" category for its displacement ventilation system, the Titus solar Plexicon, which uses light-powered energy harvesting wireless technology from EnOcean.

The Plexicon received the award for its contribution to increasing energy efficiency and comfort in buildings using an eco-friendly, sustainable technology. Titus solar Plexicon is a combination displacement/mixed air diffuser which controls the distribution of warm and cool air in a room. It uses energy harvesting wireless technology from EnOcean to power the auto-changeover action when changing to the cooling or heating mode.

www.titus-hvac.com

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www.vicos.at



A PRACTICAL TEST: INTESIS PROVES ENERGY SAVINGS WITH ENOCEAN

With "Energie Efficace" EDF Group and its subsidiary Edelia, in partnership with Intesis Software, S.L. and others, have chosen a region of France as a laboratory for innovation, in order to reduce the growth of electricity demand, diversifying the sources of energy production and facilitate changes in individual and collective behavior. A major part of this advanced energy-saving program is the intelligent automation system from Intesis.

By Intesis Software SL

Since its launch in September 2009, "Energie Efficace" addresses an energy savings of 1.5 million kWh in a six year time period, which is the equivalent of the power consumption of 300000 inhabitants. Through this test, EDF seeks to analyze the behavior of customers facing a device capable of keeping the electricity production at a very low level of CO₂ generation.

To achieve such significant energy savings, good construction, good insulation and energy efficient heating or cooling units are necessary. But all best practices in building and installation can be spoiled if the user doesn't operate the HVAC installation properly. So the need for automated monitoring and control over the heating and cooling systems is evident.

ENOCEAN-ENABLED TECHNOLOGY

Here, EDF chose the highly flexible, easy to install automation system from Intesis, which integrates EnOcean energy harvesting wireless technology. The Intesis products are used to manage the control and supervision of the air conditioner units. The equipment installed at every home participating in this project consists of a wireless EnOcean-enabled gateway, provided by Intesis, connecting the heat pump to an EDF communication module, while energy harvesting wireless sensors monitor the temperature of the room. The data is collected and sent out to EDF via Internet.



REMOTE CONTROL

One IntesisBox is installed in each indoor unit. Several of them are learned in the IntesisBox USB-ENO-ASCII connected to the Energy Efficace gateway. In order to ensure full coverage with EnOcean wireless communication in the house, each of the air conditioner gateways can be configured as a repeater. The Intesis system sets and manages the comfort temperature of the heat pumps during peak time consumption periods (winter and summer). If needed, the equipment can be controlled remotely in order to adjust the temperature of the heat pumps.

www.expeenergieefficace.fr
www.intesis.com



ENOCEAN TECHNOLOGY MAKES CLUB MED A WINNER



In 2012, the French energy giant EDF and various partners called for submissions to the national "Energie Intelligente" competition. They were seeking projects and solutions that broke new ground in more efficient use of energy. The "Intelligently Optimized Energy in a Hotel Room" project carried out by Club Med, Distech Controls and EnOcean was among the nine winners.

By Emmanuel François, Sales Manager West Europe, EnOcean GmbH

Together, the three project partners installed an intelligent room automation system, based on EnOcean's energy harvesting wireless technology, in two hotel rooms at Club Med Opio Provence. The automated control system includes lighting, heating/air conditioning, power outlets and the television in one room. An EnOcean receiver processes a wide range of data detected by the energy harvesting wireless sensors, including presence detectors, thermostats, outdoor temperature sensors, light sensors, window and door contacts as well as energy-independent switches. The energy harvesting wireless solutions had such a high degree of flexibility that it took Club Med only 15 minutes to install all sensors in a hotel room. In addition, so few cables were required for the actuators that the installers needed only another 30 minutes to implement the entire control system.

COMFORTABLE INTELLIGENCE

The intelligent system controls the consuming devices in the hotel room, depending on whether the guest is present or absent. In the past, for example, when the guest opened the window, the electric heater in the bathroom simply kept on running. But now, the heater is automatically turned down via an EnOcean-based temperature sensor. When the room is unoccupied, all consuming devices are set to minimum operation. When a guest opens the door, a door contact reports the presence of this person. The control system then resets the heating, fan, air conditioning and other consuming devices in the room to comfort mode.

60 PERCENT ENERGY SAVED

The amount of energy saved in the test rooms exceeded all expectations. Over a period of two months, the hotel consumed 122 kWh of electricity for the automated room, but in the comparison room, which had no intelligent control system, the hotel guests used 307 kWh over the same period of time. As a result, the intelligent control system saved 60 % of the energy. EDF presented the "Energie Intelligente" award for this impressive result. In addition to reducing energy consumption and costs, Club Med also achieved long-term savings in operating the EnOcean-based room automation system, since all sensors are maintenance-free. This saves the trouble of having to change the batteries every year or two.

www.enocean.com





► MARCH 2013

02–03 Ener.Com 2013, Rheinau, Germany, EnOcean Alliance exhibits.
www.weberhaus.de

05–07 Ecobuild, London, UK, EnOcean Alliance and members exhibit.
www.ecobuild.co.uk

12–16 ISH 2013, Frankfurt/Main, Germany, EnOcean Alliance and members exhibit.
ish.messefrankfurt.com

► APRIL 2013

17–18 Energy Harvesting and Storage Europe 2013, Berlin, Germany, EnOcean presents.
www.idtechex.com/energy-harvesting-europe

23–25 LIGHTFAIR 2013, Philadelphia, USA, EnOcean Alliance and members exhibit.
www.lightfair.com

► MAY 2013

28–30 CapUrba, Lyon, France, EnOcean Alliance exhibits. www.capurba.com

► JUNE 2013

04–06 Smart Grid Paris, Paris, France, EnOcean Alliance members exhibit.
www.sgparis.fr

04–06 ANGACOM, Cologne, Germany, EnOcean presentation. www.angacom.de

09–12 Guangzhou Electrical Building Technology, Guangzhou, China, EnOcean Alliance and partners exhibit. www.mshk-emo.com/gebt

► JULY 2013

17–19 Techno Frontier, Tokyo, Japan, EnOcean Alliance exhibits.
www.jma.or.jp/tf/en

► SEPTEMBER 2013

25–26 IBS 2013, Paris, France, EnOcean Alliance exhibits.
www.ibs-event.com

25–27 Shanghai Intelligent Building Technology, Shanghai, China, EnOcean Alliance exhibits.
www.messefrankfurt.com.hk

► OCTOBER 2013

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

29–31 Hi Tech Building & House, Moscow, Russia, EnOcean Alliance exhibits.
www.hitechbuilding.ru/en/hthb/

► NOVEMBER 2013

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

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

... see you at

ISH 12th to 16th March 2013
Hall 10.3, Stand C55

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In addition to **37** baseboard I/O ports, you can extend it with a line of external I/O devices based on open protocols

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Speak in all languages at the same time – **EnOcean, KNX/EIB, Modbus, BACnet, DMX, GSM** and more

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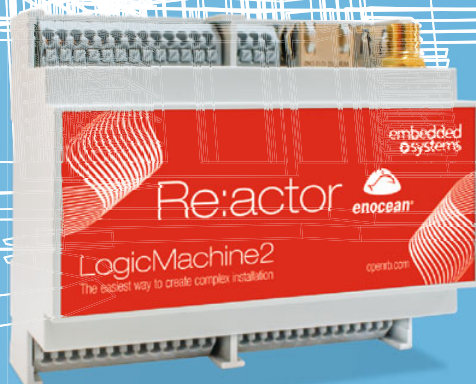
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Please see **page 36** for more details

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