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MAINTENANCE-FREE WIRELESS SWITCHES & SENSORS

2009 ISSUE 2

INTEROPERABILITY

thermokon®
Sensortechnik GmbH

Everything under control

» www.thermokon.de

Flexible design and highly adaptive: The BACnet multifunctional room operating panel WRF08

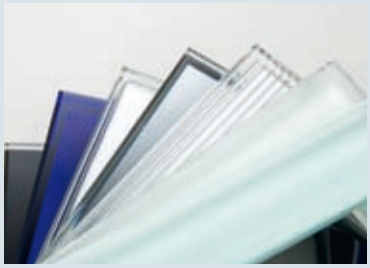
BACnet®

Combine various colours of enclosures with attractive design frames. We do not set any limits to your fantasy – just advice your individual and preferred combination of colour and material: glass, plastic, stone or wood.

Your advantages:

- » Display functions: room temperature, setpoint adjustment, operation mode, fan steps, presence
- » Operating functions: light on/off/dim, blind up/down/adjust
- » Illuminated function buttons with coloured status indication
- » BACnet MS/TP communication protocol

» **Standard colour of enclosure:** pure white, anthracite, aluminium



» **Flexible design:** Select from a variety of modern design frames.

» **NEW! The WRF08 – now with BACnet!**

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technic & design

Dear readers,

The term “smart grid“ cropped up in Wikipedia for the first time in September 2007. Today, just two years on, Google already returns more than 11 million hits for smart grid, making the term a real buzzword. Reason enough to take a look at what‘s behind it.

In simple terms, smart grid means making power networks or grids intelligent for flexible response to supply and demand. Supply becomes flexible because power not only comes from big central power stations but is also fed into a grid by millions of photovoltaic installations – with no possibility of central control. At the demand end the trend is towards electromobility. In other words, in future there will be a requirement for recharging batteries fast and anywhere – and this consumption needs to be billed correctly. Top of the list of the challenges to be mastered is therefore billing, followed by load distribution, and management of peak consumption.

A smart grid consists of the power network of the suppliers, who deliver to individual buildings, and are thus connected through the network to the individual households. The connection between a power supplier and a household might be seen as a power internet. The network within a house is comparable to the conventional LAN or an intranet.

A number of members of the EnOcean Alliance are already working on solutions aimed at transparency and cost control in buildings. Intelligent electricity meters in subdistribution will use wireless EnOcean to keep building services management informed of consumption. In this way a complete picture of the status of a building can be produced. It will also be possible to draw actuators into this to wirelessly and specifically ”control“ the consumers. Here the socalled smart meter of the power supplier will be queried over the internet and integrated into the system.

The Alliance continues to support these activities by standardizing communication between the electricity meter, the communication network of a building and the actuators – by what are called EnOcean equipment profiles (EEPs). The first version of these EEPs is due to be published by the EnOcean Alliance in the next few weeks. Ensuring that devices from different manufacturers operate together seamlessly. Today already, more than 300 interoperable devices from more than 100 different manufacturers worldwide are using the standard. Thus seen, the smart grid is already in the buildings around us – with active support from the EnOcean Alliance.

Markus Brehler,
CEO, EnOcean GmbH

ENOCEAN API

Revolutionary software concept: easy to use and flexible

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TEXT MESSAGE FROM A MOUSE

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Self-powered mouse trap sends a text message as soon as a mouse is caught

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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andreas.schneider@enocean.com,
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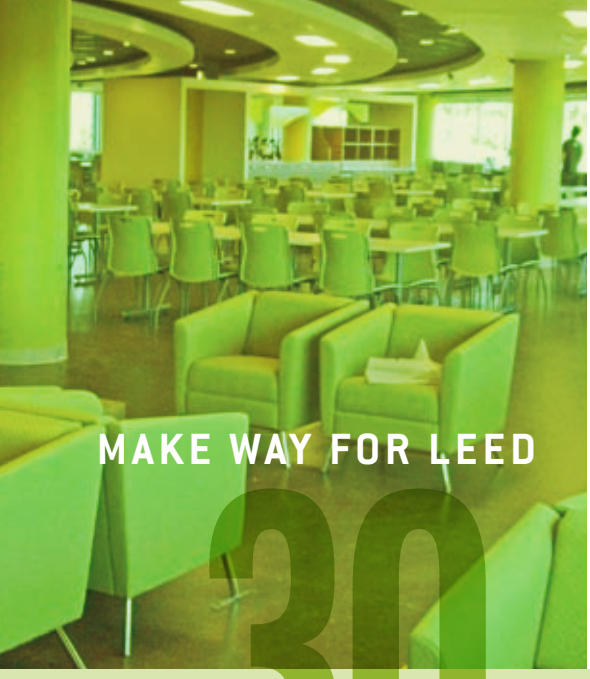

MAKE WAY FOR LEED

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EnOcean technology contributes to LEED certification of the corporate headquarters of Canada's Promutuel Group.

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THERMOKON COMBINES BACNET AND ENOCEAN

Technical symbiosis in building automation

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THE ABC OF ENOCEAN

EnOcean GmbH is the originator of patented self-powered wireless technology. Headquartered in Oberhaching near Munich, the company manufactures and markets maintenance-free wireless sensor solutions for use in buildings and industrial installations. EnOcean products are based on a combination of miniaturized energy converters, ultra-low-power electronic circuitry and reliable wireless. EnOcean wireless components are already in use in more than 100,000 buildings. EnOcean won a number of awards in recent years, for example Elektra 2008: "Wireless & Telecoms Design" and "Company of the Year".

By Andreas Schneider, Executive VP and Co-Founder, EnOcean GmbH

GREEN

The innovative enabling technology from EnOcean works entirely without batteries, and is completely service-free. To detect information and then transmit it by short-range wireless, an EnOcean solution harvests the necessary power from its surroundings: from linear motion, light or differences in temperature for example. The energy obtained in this way suffices to send a wireless signal, and turn on a light for instance. Plus, the use of wireless switches and wireless sensors very much simplifies the cabling of a building. At the same time they make for a great deal of flexibility because no new cabling is needed if alterations are due. With little effort and with no breaking into walls, EnOcean-enabled products can be placed exactly where they are of optimum use.

SMART

EnOcean is a system that optimally connects a number of components: wireless sensor networks, energy management, software and sensor link. Each wireless node possesses its own local processor to capture measured data, for instance, and control energy management or wireless transmission. EnOcean wireless modules always come with firmware set up so that no modifications are necessary. Plus there is enough scope for application-specific configuration. Added to which, wireless sensor modules from EnOcean are very simply integrated in a whole number of different sensors.

WIRELESS

The EnOcean wireless signal uses the 868 MHz or 315 MHz frequency band, meaning the technology is suitable for solutions worldwide. 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. Transmitting data packets in random intervals makes the probability of collision extremely small. The range of EnOcean wireless sensors is 300 meters in the open and up to 30 meters inside buildings. Each EnOcean module comes with a unique 32-bit identification number to eliminate any possibility of overlap with other wireless sensors.

INTEROPERABLE WIRELESS STANDARD

There are already many manufacturers using EnOcean technology in their products. More than 100 OEM partners in a variety of sectors have developed products enabled by EnOcean technology. All of these products are interoperable. So combining switches, gateways and sensors from any OEMs is quite straightforward.

www.enocean.com

Green. Smart. Wireless.
enocean®

ENOCEAN ALLIANCE – THE WIRELESS STANDARD FOR SUSTAINABLE BUILDINGS

By Graham Martin, Chairman & CEO, EnOcean Alliance

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

The EnOcean Alliance is a consortium of companies working to establish innovative automation solutions for sustainable building projects – and so to make buildings more energy-efficient, more flexible and lower in cost. The core technology of the Alliance is self-powered wireless technology from EnOcean for flexibly positioned and service-free sensor solutions. The EnOcean Alliance aims to standardize and internationalize EnOcean wireless technology, and is dedicated to creating interoperability between the products of OEM partners.

The EnOcean Alliance was officially created in April 2008. The majority of product manufacturers of EnOcean technology, suppliers to the eco-system, as well as additional major international companies developing with the technology are committed to the Alliance. More than 120 companies currently belong to the EnOcean Alliance.

The Alliance has three membership classes:

- **PROMOTORS:** innovative and key players who lead, define and drive the Alliance
- **PARTICIPANTS:** companies and suppliers providing product and services using the Alliance technology
- **ASSOCIATE MEMBERS:** building professionals, academics, smaller distribution partners and others interested in the technology, advancements, examples, training etc.

JOIN US

Become part of the world's largest Alliance for sustainable buildings and show your commitment to a better, more comfortable and energy-efficient world:

http://www.enocean-alliance.org/en/membership/

BANK ON THE ENOCEAN API AND NOT ON YOUR LUCK

I am lucky. Because I have someone at home who is technically gifted: my wife. Recently I was trying to program our video recorder – which admittedly is a little antiquated although it has proved its worth – and I was close to an outburst of rage, when along came my wife and did it in next to no time. I thought, why not design technology so that anyone can operate it easily?

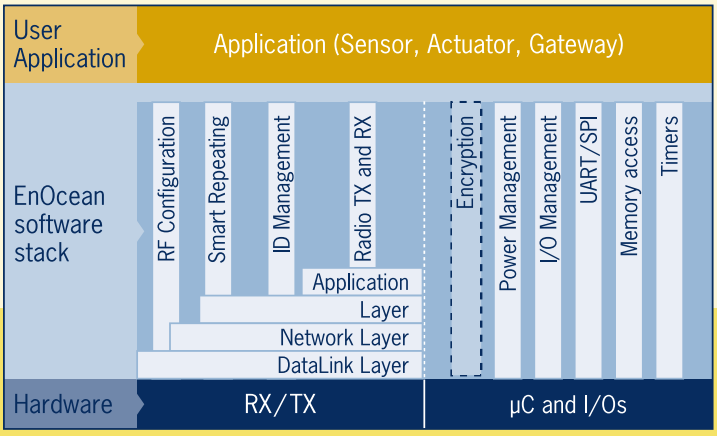
By Frank Schmidt, Chief Technology Officer, EnOcean GmbH

EnOcean customers may have asked themselves that too in the past when the ready defined standard functions of EnOcean modules did not fit the purpose. To save EnOcean's honor let it be said that it was, after all, the first attempt worldwide to create a platform for as many energy harvesting products as possible.

But the introduction of the Dolphin platform marks the beginning of a new chapter. It owes its ease of use and large measure of flexibility to EnOcean's new software concept called application programming interface (API).

WHAT DOES THE API MEAN FOR THE PRODUCT DEVELOPER?

Firstly more flexibility: It may be programmed. And in the widely used C high-level language. Until now programming was practically "forbidden". All functions were fixed and could only be configured in part by jumpers – like in the STM 110 sensor module. A few lines of code on the new platform will create a precise match with the custom application. Nor do programmers have to get into the specialties of the wireless protocol, the transmission timing or the energy balance – they have a powerful development environment in which the actual complexity remains concealed for the most part.



Simple programming with the EnOcean API

An example of bidirectionality is the wireless sensor from Sauter.

Secondly, something of interest for both the developer and the product manager, the new platform has a host of new functions. These enable configuration of components by wireless signals, for example, or the implementation of bidirectional sensors (smart acknowledge). That is important for all sensors that need a return or acknowledge signal, such as room controllers with a display or wireless actuators for heating valves. The API is modular and also offers space for future functions like encryption.

Thirdly, the familiar functions are still contained in the standard software, and can be used just as before. Because not everyone likes it when too much changes too fast.

WHAT DOES THE API MEAN FOR THE USER?

The new platform is fully backward compatible. In other words all devices remain interoperable, are easy to install and put into operation. The user must not know about or bother about the mechanisms behind the freedom from maintenance of the EnOcean modules for instance. The new functions improve the performance of the system while at the same time cutting the costs. An example: Each new transceiver module comes to standard with a repeater function that can be activated if needed. That does away with extra repeaters for difficult wireless conditions because the components ready integrated in the system handle the task.

In Dolphin EnOcean is launching a powerful platform that anyone can easily work with. In future OEM customers of EnOcean will be able to develop and market their products even faster, without special expertise or experience that does not exist inhouse and can only be created slowly and at considerable expense .

www.enocean.com

EDK 300/300C – THE SIMPLE ENTRY TO BIDIRECTIONAL, SELF-POWERED WIRELESS

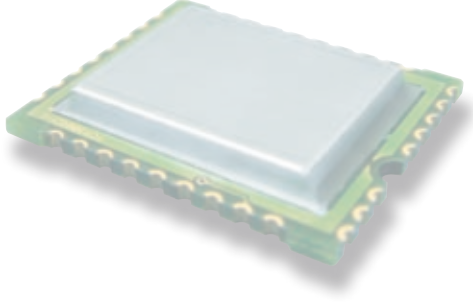
EnOcean is presenting its EDK 300/300C developer's kit for the new bidirectional Dolphin platform. The new kit enables developers to implement energy-autonomous products even easier and faster, assuring them a competitive lead to market.

By Markus Kreitmair, Innovation Manager, EnOcean GmbH

FOCUS ON ENERGY-EFFICIENT APPLICATIONS

Tougher environmental standards and soaring energy costs demand optimized concepts for the use of energy in buildings. That calls for technologies to speedily and efficiently implement such concepts – such as self-powered wireless technology from EnOcean. This transmits data using energy harvested solely from the surroundings.

In the new bidirectional Dolphin system architecture EnOcean is expanding its selection of modules for self-powered wireless technology. For the first time miniaturized transceivers can not only transmit information but also receive it. This ushers in the use of energy-autonomous wireless sensors and actuators in a variety of sectors, such as heating. A living room sensor, for instance, can indicate whether a window is open somewhere, and the heating or air-conditioning is consequently turned down.



A KIT FOR MULTIPLE BIDIRECTIONAL WIRELESS MODULES

Based on EnOcean's innovative Dolphin system architecture, all wireless modules (868 MHz and 315 MHz) of EDK 300/300C can be programmed for custom applications through the API interface. The new STM 300 scavenger transceiver is excellent for implementing energy-autonomous applications to sense temperature, light or air quality, for example. The TCM 300 and TCM 320 transceivers on the other hand are best suited for use in line-powered components such as flush-mounted actuators, repeaters or gateways. All bidirectional wireless modules come with standard firmware for building automation. However, users can also create their

CONTENTS OF EDK 300/300C

- 1x EVA 300 (TCM 3x0) evaluation board
- 1x EVA 320 (STM 300) evaluation board
- 1x TCM 300/300C with adapter board
- 1x STM 300/300C with adapter
- 1x TCM 320/320C
- 1x Self-powered switch PTM 200/200C
- 2x USB cable x Self-powered switch PTM 200/200C
- 1x Power supply
- 2x EOP 300 programmer
- 1x Software CD
- 1x Getting Started Manual

own firmware. This is transfered to a specific wireless module by DolphinStudio software and the programming adapter. Additionally, there is WinEtel software to receive, transmit, analyze and record telegrams on the air interface.

EDK 300/300C supports development with following EnOcean modules and modules and is available immediately:

- TCM 300 (868 MHz), TCM 300C (315 MHz)
- TCM 320 (868 MHz), TCM 320C (315 MHz)
- STM 300 (868 MHz), STM 300C (315 MHz)

A KIT FOR MULTIPLE BIDIRECTIONAL WIRELESS MODULES

EDK 300/300C gives the developers fast and full overview of the powerful Dolphin platform. In next to no time, companies are able to develop their own energy-autonomous applications for building automation and many other purposes – assuring themselves of a competitive lead.

ADVANTAGES FOR THE DEVELOPER AT A GLANCE

- Developer's kit for the entire EnOcean Dolphin platform
- Simple development of custom hardware and firmware
- Sample applications for wireless switches and sensors (temperature, brightness, charge voltage)
- PC software for configuring and recording wireless telegrams
- Sample applications, source code and technical support
- Extensive API (application programming interface) for fast and simple programming of custom applications

www.enocean.com/enocean_edk300

ENOCEAN MODULES 868 MHZ

RoHS COMPLIANT 2002/95/EC

Modules with 868 MHz frequency are suitable for Europe and other countries adopting R&TTE.

TRANSMITTER MODULES & COMPONENTS

PTM 200C – ULTRATHIN MINIATURIZED SWITCH MODULE

- Maintenance-free powering by finger pressure
- Optionally 1 or 2 rockers or up to 4 push-buttons
- Dimensions 40 x 40 x 11.2 mm
- Actuating travel 1.8 mm
- Actuating force approx. 7 N

ECO 200 – ENERGY CONVERTER FOR LINEAR MOVEMENT

COMING IN Q1/2010

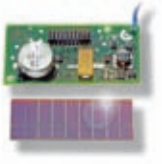
- Dimensions 29 x 20 x 7 mm
- Successor to ECO 100

PTM 230 – RADIO TRANSMITTER MODULE

- 2 digital inputs
- Dimensions: 20 x 25 x 6 mm
- Operation with ECO 100 or external energy source

STM 110 – SENSOR MODULE

- Maintenance-free sensor module
- Powered by mini-solar cell, 13 x 35 mm
- Dimensions 21 x 40 x 9 mm
- Operates for several days in total darkness
- Periodic presence signals
- 3 A/D converter inputs
- 4 digital inputs



RECEIVER AND TRANSCEIVER MODULES

RCM 100/120/122/130/140/152 – RECEIVER MODULES

- Wireless receiver module and actuator control module for receiving and decoding EnOcean wireless transmitter signals
- Dimensions 18 x 42 x 5.5 mm
- 5 V voltage supply
- 25 mA current consumption
- Basic functions: switch, blinds control, dimming and serial interface for bus systems
- Simple teaching of up to 30 wireless transmitters
- Memory function (for light and blinds scenes)

TCM 110/120/130 – ENOCEAN TRANSCEIVER MODULE

- 5 V voltage supply
- 33 mA current consumption
- Dimensions 24 x 42 x 5 mm

TCM 110:
- Single- and two-level repeater for EnOcean wireless telegrams

TCM 120:
- Bidirectional wireless
- Serial interface

TCM 130:
- Software API for TCM 120 module
- Programmable in C
- Bidirectional radio
- Bidirectional serial interface
- Single-level repeater functionality
- Power saving modes
- 4 D/A inputs, 4 digital outputs

TCM 300/320 – ENOCEAN TRANSCEIVER MODULE

COMING IN Q4/2009

- Unidirectional serial communication
- Bidirectional serial communication
- 1-channel/ 4-channel relay mode
- 1-channel dimming mode
- 1- and 2-level repeater functionality
- Programmable by API software
- Dimensions TCM 300: 19 x 22 x 3 mm
- Dimensions TCM 320: 36.5 x 18 mm

STM 300 – ENOCEAN SCAVENGING TRANSCEIVER MODULE

COMING IN Q4/2009

- Operation with external energy converter (e.g. solar cell) and energy storage
- Basic firmware for cyclic sensing and transfer of measured values
- Programmable by software API, also bidirectional radio available
- Dimensions 19 x 22 x 3 mm

OEM PRODUCTS

PTM 250 ENOCEAN EASYFIT – UNIVERSAL SWITCH INSERT

- Compatible with following designs with 55 x 55 mm rocker:
  - BERKER S1, B1, B3, B7 glass
  - GIRA Standard 55, E2, Event, Esprit
  - JUNG A500, Aplus
  - MERTEN M-Smart, M-Arc, M-Plan
- Surface mounting without casing
- Switch program frame flat on the wall
- Single or serial rocker
- Colors: white, aluminum, anthracite, structured, high-gloss pure white

STM 250 – WINDOW/DOOR CONTACT

- Maintenance-free powering by daylight
- Operates for several days in total darkness
- Immediate signal transmission as soon as window closes or opens, triggered by window magnet
- Periodic life signal
- Contact monitor (110 x 19 mm, height 15 mm) attachable to all frame profiles

RCM 250 – UNIVERSAL SINGLE-CHANNEL SWITCH ACTUATOR

EnOcean easyfit switch actuator for wireless switching of very different 230 V loads, e.g. incandescent lamps, high-volt halogen lamps or low-power motors. Up to 30 EnOcean PTM wireless switches or up to 2 EnOcean STM 250 wireless window contacts can be teached. Simple connection of the line voltage and load by screw terminals.

ACCESSORIES

EPM 100 LEVEL METER

The electrician's installation tool for EnOcean wireless components – for range analysis and simple detection of signal quality and sources of interference.

EVA 100 EVALUATION KIT TEST BOARD

for simple startup of EnOcean wireless modules.

EVA 120 EVALUATION KIT TEST BOARD

for quick startup with STM 110.

ECT 300 PERPETUUM DEVELOPER KIT

COMING IN Q4/2009

EnOcean has developed a thermal energy harvester that is able to power wireless sensor nodes from temperature differences of only a few Kelvin.

EDK 300

NEW

Developer kit for fast implementation of EnOcean TCM 300/320 and STM 300 bidirectional wireless modules and software API.

ENOCEAN MODULES 315 MHZ

RoHS COMPLIANT 2002/95/EC

Modules with 315 MHz frequency are suitable for North America and other countries

TRANSMITTER MODULES

PTM 200C – ULTRATHIN MINIATURIZED SWITCH MODULE

- Maintenance-free powering by finger pressure
- Optionally 1 or 2 rockers or up to 4 push-buttons
- Dimensions 40 x 40 x 11.2 mm
- Actuating travel 1.8 mm
- Actuating force approx. 7 N
- Newly certified for use in Japan

STM 110C/112C – SENSOR MODULE

- Maintenance-free sensor module
- Powered by mini-solar cell, 13 x 35 mm
- Dimensions 21 x 40 x 9 mm
- Operates for several days in total darkness
- Periodic presence signals
- 3 A/D converter inputs
- 4 digital inputs

TRANSCEIVER MODULES

TCM 200C/220C – ENOCEAN TRANSCEIVER MODULE

- Bidirectional transceiver modules
- 5 V (TCM 200C) / 3 V (TCM 220C) supply voltage
- Basic functions: receiver with serial interface and integrated repeater
- Programmable in C using software API
- 6 digital or analog inputs, 5 digital outputs
- Dimensions 18 x 36.6 x 5 mm

TCM 300C/320C – ENOCEAN TRANSCEIVER MODULE

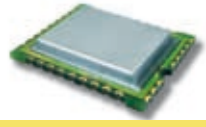
COMING IN Q1/2010

- 4 unidirectional serial communication, backward compatible with TCM 220C
- Bidirectional serial communication
- 1-channel/ 4-channel relay mode
- 1-channel dimming mode
- 1- and 2-level repeater functionality
- Programmable by API software
- Dimensions TCM 300C: 19 x 22 x 3 mm
- Dimensions TCM 320C: 36.5 x 18 mm

STM 300C – ENOCEAN SCAVENGING TRANSCEIVER MODULE

COMING IN Q1/2010

- Operation with external energy converter (e.g. solar cell) and energy storage
- Basic firmware for cyclic sensing and transfer of measured values
- Programmable by software API, also bidirectional radio available
- Dimensions 19 x 22 x 3 mm



ACCESSORIES

EPM 100C – LEVEL METER

The electrician's installation tool for EnOcean wireless components – for range analysis and simple detection of signal quality and sources of interference.

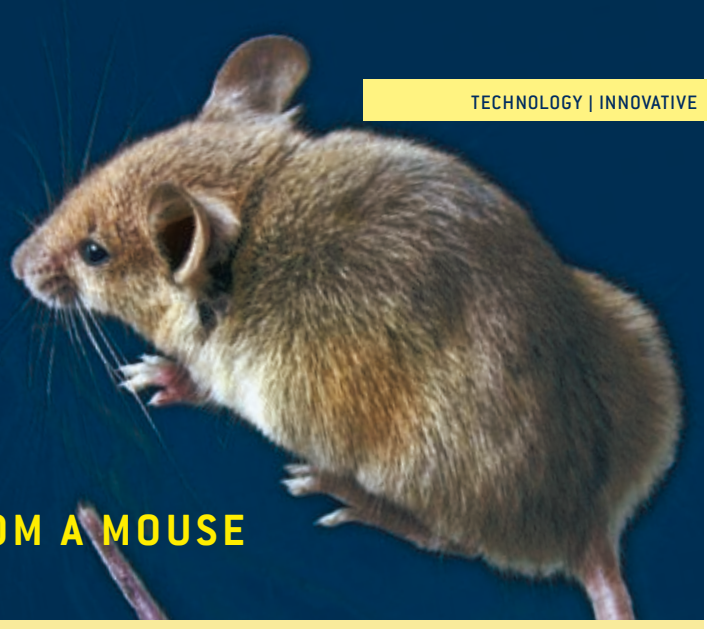
EDK 100C – DEVELOPER KIT

Developer kit for quick startup with EnOcean wireless modules PTM 200C, TCM 200C, and STM 110C/112C, including API software for TCM 200C.

EDK 300C

NEW

Developer kit for fast implementation of EnOcean TCM 300C/320C and STM 300C bidirectional wireless modules and software API.

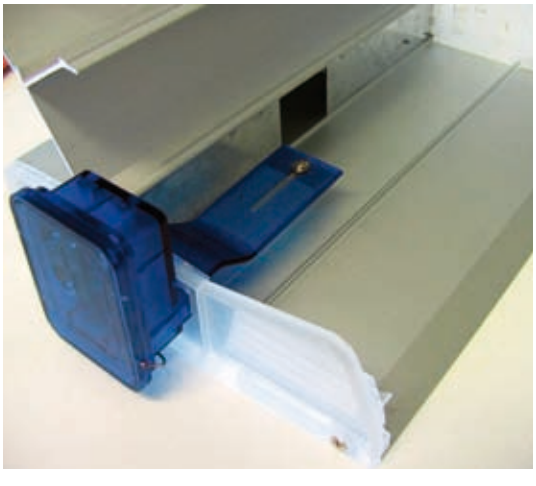


TEXT MESSAGE FROM A MOUSE

Mice that can send short messages. Sounds unbelievable but it is true. The companies BioTec-Klute and BSC Computer have developed a mouse trap that does exactly this.

By Patrick Mause, Software Development Manager, BSC Computer GmbH

The trap is based on self-powered wireless technology from EnOcean. EnOcean's PTM 230 transmitter module is used, which also features in the implementation of miniaturized wireless switches. The module itself generates the current it needs to send a wireless signal. When you press the module, a little coil moves through a magnetic field. The energy released by this suffices to emit a signal. Meaning that the high-tech mouse trap works quite independently of an external power source. The mouse generates the necessary current by stepping on the tensioned rocker in the trap and triggering a signal. This is immediately sent over the BSC BoSe system as an SMS to the setter of the trap. The mouse is not killed by the trap but is released outdoors by the trapper. The rocker is then reset and is ready to work again.



The high-tech mouse trap manages without an external power source.

A MOUSE TRAP WITHOUT POISONOUS BAIT

In foodstuffs production there are especially strict demands when it comes to properly combating rodents. Mice may not be eliminated by poison because this could accidentally make its way into production and thus into the foodstuffs. To prevent this, socalled live animal traps are employed against rodents in the foodstuffs sector. The problem here is that legislation prescribes that these live animal traps be checked every 12 hours, and that this must be registered. This results in considerable personnel costs for carrying out and registering such checks. In some countries, like Israel for instance, the entire day's production has to be destroyed if a mouse is found on the premises.

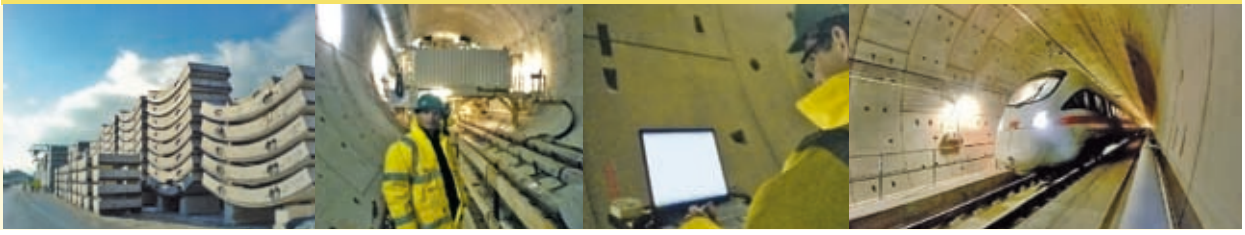
The rodent trap from BioTec-Klute complies with all legal requirements for a live trap, leaving the captured rodent space and air until it is released. Plus it saves a lot of time because it need not be checked every 12 hours like the more common live animal traps.

www.enocean-alliance.org/bsc

COMMANDING CATASTROPHES BY SMART WIRELESS SENSORS

Railroad stations, airports and tunnels are used by millions every day. Meaning that fast response is necessary in the event of occurrences like extremes of weather or serious accidents.

By Markus Kreitmair, Innovation Manager, EnOcean GmbH



Energy-autonomous wireless sensors in structures could register occurrences like fires or explosions in realtime and help rescue crews to initiate appropriate measures.

As part of the AISIS project (automated information retrieval and safeguarding of critical infrastructure in a catastrophe) EnOcean together with other enterprises is developing a suitable wireless sensor platform. This collaborative project within the "Research for Civil Security" program of the Federal German government is being sponsored by the Ministry of Education and Research as part of the high-tech strategy. The project executing organization is the VDI Technology Center.

PROPERLY DIRECTED AND NEED-ORIENTED RESCUE MEASURES

The objective of AISIS is to communicate concentrated information about the extent of damage on the spot to rescue and relief forces in the event of a catastrophe. In this way rescue measures could be properly directed and conducted where they are most needed. The focus is on information retrieval after a catastrophe-like event and preventing substantial structural damage by specific material and building development.

EnOcean's contribution to the project includes the development of durable, energy-autonomous wireless sensor nodes for concrete walls, failproof information transmission on a minimal energy budget, linking the crash sensor unit to wireless sensor nodes, and the development of tools for the installation, monitoring and diagnostics of energy-autonomous wireless systems.

The AISIS consortium is headed by Ed. Züblin AG. Numerous partners from industry and the field of research are involved in the project:

- Federal Agency for Technical Relief (THW)
- Emergent Actio KG
- Fraunhofer Institute for Information and Data Processing (IITB)
- Fraunhofer Institute for High-speed Dynamics – Ernst Mach Institute (EMI)
- University of Freiburg – Institute for Microsystems Technology (IMTEK)
- University of Freiburg – Institute for Psychology, Department for Rehabilitation Psychology
- University of Freiburg – Jurisprudence Faculty, Institute for Public Law
- University of Karlsruhe – Institute for Soil Mechanics and Rock Mechanics (IBF)
- University of Karlsruhe – Institute for Solid Structure and Building Materials Technology (IfMB)
- Rekers Betonwerk
- Securiton GmbH

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www.aisis-innovation.org

WIRELESS MAXIMIZES ENERGY EFFICIENCY IN BUILDING AUTOMATION

By Armin Anders, VP Product Marketing and Co-founder, EnOcean GmbH

A major ambition when automating building facilities is to achieve significant energy savings. The potential for this is really substantial when you think that thermal heat, hot water and lighting alone account for about 40 percent of overall primary energy needs. Temperature control for single rooms or light on demand are indispensable in modern building management. Because building automation tailored to the situation and requirement is not only a way of cutting energy costs, it also makes environmental sense. Self-powered wireless technology is an especially purposeful approach. For one thing it very much simplifies the cabling of a building. At the same time it makes for enhanced flexibility of room configuration because no new cabling needs to be laid and routed if alterations are made. The planning effort is reduced as are system costs.

EnOcean delivers an innovative technology for the purpose, drawing its power from the energy found in its surroundings. It works without batteries, making it absolutely free of maintenance. It is easily integrated into an existing infrastructure, and is simple to operate. LON, BACnet, KNX and TCP/IP gateways link the service-free wireless solution to established automation systems and innovative IT applications.

ENERGY-EFFICIENT BUILDING AUTOMATION

The expected return on investment when automating a building is of course decisive if the user is to derive financial benefit from reduced energy consumption. The technology that is used will hardly make sense if investment or operating costs eclipse the savings potential that it presents. The use of EnOcean technology in building automation means a sharp reduction in operating and acquisition costs. Employing energy converters instead of batteries is a unique approach, cutting system error rate and maintenance costs considerably – especially in large installations.

FOCUS ON THE FUTURE

In the new Dolphin platform EnOcean expands its selection of self-powered wireless modules. It ushers in the use of energy-autonomous and bidirectional wireless sensors and actuators in various sectors such as heating. In future sensors can briefly stay “awake” after sending information for instance, and receive information returning from the network. A living-room sensor can indicate whether a window is open somewhere, and the heating or air-conditioning is consequently turned down. Also new is that ultra-low-power timers can be integrated in receivers. That makes it possible to implement energy-autonomous heating radiator actuators for instance. They draw their energy from the difference in temperature between the heating and their surroundings, and fetch their settings in cycles from a central station. In future it will be possible to wirelessly control a heating radiator valve.

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HAWAIIAN HOTEL COUNTERS RISING COST OF ELECTRICITY WITH INNOVATIVE ENOCEAN TECHNOLOGY

By Troy Davis, OEM Sales North America, EnOcean Inc.

Contrary to what you might believe, the sun does not always shine for hotel owners in Hawaii. They are not only feeling the present economic slump, the price of electricity has reached a record level and obviously shows as a big minus on their balance sheet. Figures released by the US Department of Energy show that the basic price for electricity in Hawaii is almost three times that of the national average. That has a lot to do with the fact that the island's electricity is generated by burning expensive, imported crude oil. Instead of watching their profits virtually go up in smoke because of the price of power, the management of Hawaii's Kahana Falls Hotel looked for a way of cutting cost and reducing their consumption of valuable raw materials. In this way they came across EnOcean's self-powered wireless technology.

POWER CONSUMPTION DOWN AND CARBON FOOTPRINT SMALLER

The project involved retrofitting 106 rooms with energy-saving solutions that work on alternative sources. The new energy management system enables the Kahana Falls Hotel to both reduce its power consumption and help do something against climate change. 20 percent less power consumption enables the system implemented here to reduce annual carbon emissions by 145,000 kg.

The hotel rooms were fitted with wireless key card switches, presence detectors and door sensors. The wireless key card switch from Echoflex Solutions functions as a master switch for the hotel rooms. A presence detector automatically cuts out the air-conditioning as soon as a guest takes their key card out of the dock and leaves a room. A door sensor, powered by a solar cell, recognizes the status of doors and windows and will also switch off the air-conditioning for example, after a set length of time, if the door to a balcony is open. Signals for the cableless and batteryless light switches and sensors are converted into switching functions by relay receivers from ILLUMRA.

SPEED OF INSTALLATION PREVENTS OPERATING LOSS

Given the financial and ecological benefits, shortterm shutdowns for the purpose of installation were easily accepted. The hotel did not have to be closed for any lengthy period because attachment of the EnOcean-enabled cableless sensors and switches is so fast and straightforward. Almost all rooms were ready booked, so the loss through installing cabled switches and sensors would have canceled out the immediate gain resulting from the project. Not forgetting all the effort, discomfort and inconvenience involved in routing cables through concrete walls and ceilings. A further advantage of the new EnOcean technology is the fact that the sensors and switches are self-powered, so they need no maintenance, i.e. battery replacement, for their entire lifetime.

AN INVESTMENT THAT PAYS BACK

Taking power consumption, occupancy statistics and installation costs all into consideration, an investment with sponsoring by the state will have paid back within eight months – or 16 months without state promotion. Then there are the ecological advantages of course, through less air pollution and reduced consumption of raw materials.

www.enocean-alliance.org/echoflex
www.enocean-aliance.org/illumra

ARE YOU STILL PAYING OR ALREADY MODERNIZING?

Energy-efficient modernization of buildings with EnOcean-enabled products.

By Marcus Trojan, Sales Building Automation, EnOcean GmbH

Radiators were subsequently fitted with electric adjustment drives controlled by an EnOcean switching actuator housed in a floor duct.

Modern heating regulation can save a lot of money in residential and office buildings. There is further savings potential in the use of window contacts to automatically reduce heating when windows are open. In existing buildings with somewhat older heating installations the retrofitting of this kind of energy-saving technology usually involves extensive conversion work however. Slotting mills are generally used to invisibly lay the necessary cables in brickwork, masonry and the like. That means a lot of noise, dust and dirt while modernization is in progress, and is actually only acceptable while houses or offices are unoccupied.

MODERNIZING DURING BUILDING USE

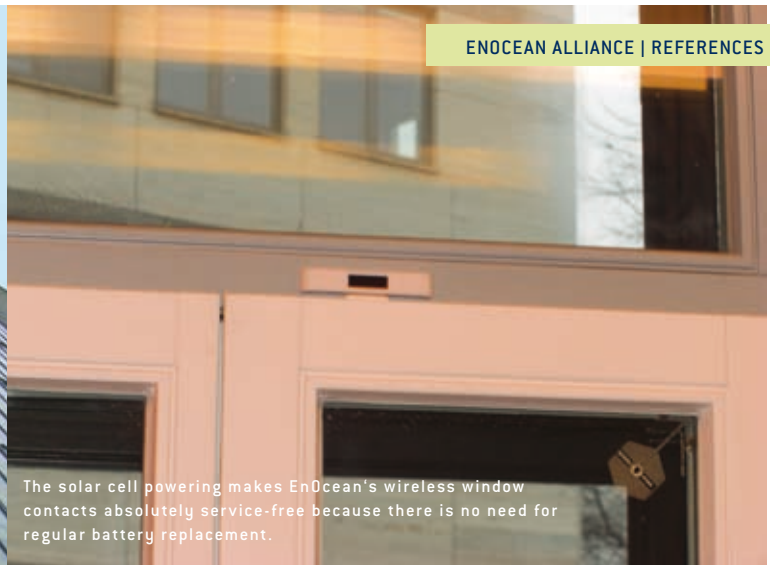
The seven-floor office block was originally built for the pension fund administration of Wacker Chemie. From summer 2007 through August 2008 the block with its some 8000 square meters of office space underwent extensive modernization. This also involved energy-saving automation of the heating installation. The building was to remain in use by the tenants during modernization, so the MANEUM property management searched for solutions that would simplify the installation work in as much as possible. Internet research brought EnOcean and its technology to MANEUM's attention.

The wireless sensor technology is characterized by extremely short telegrams with random control of its multiple transmission. In this way hundreds of wireless sensors can operate in tight confines without mutual interference, and even in large office complexes. Plus, EnOcean sensors have extremely low power consumption that is easily covered by a tiny solar cell with a buffer accumulator, for example, and in low-lit rooms.

To save energy when rooms are being ventilated, no less than 800 of EnOcean's wireless window contacts were installed in the Wacker Chemie offices. All window contacts of each room were teached into a flush UPS 230 wireless switching actuator produced by Omnio. The output of a switching actuator signals to a Priva regulator with direct digital control (DDC), housed invisible in the dropped ceiling of a room, if one or more windows in the room are open. The DDC will then immediately ensure that all radiator valves of a room are set for anti-frost protection.

ELECTRIC VALVE ADJUSTMENT DRIVES

EnOcean technology also made installation of the some 800 electric valve adjustment drives very simple. There were already floor ducts running all round for power outlets close to the windows, so it was only necessary to place a UPS 230 switching actuator in a floor duct at a suitable point. This feeds up to six adjustment drives, and is activated by an EnOcean transmitter



The solar cell powering makes EnOcean's wireless window contacts absolutely service-free because there is no need for regular battery replacement.

(TST 230 from Omnio) connected to the DDC. This transmitter regulates the radiators as a function of the temperature given by the room controller connected to the DDC.

The DDC of each room is also linked to the building installation center of MANEUM, so here it is possible to detect whether and when windows are open. In this way, at winter weekends, the facility manager can immediately see whether a tenant has accidentally left a window open, and a room threatens to cool down too much.

FAST AND STRAIGHTFORWARD MODERNIZATION

EnOcean technology made it unnecessary to work with slotting mills in modernization of the Wacker Chemie office block. And installation caused no damage to the window frames and embrasures. Plus, there was no subsequent need for fresh plastering of the walls. Modernization was consequently speedy and without hitches, so that the occupants were able to remain on the premises virtually undisturbed.

www.enocean-alliance.org/omnio

SCHOOL CAMPUS MAXIMIZES COMFORT AND EFFICIENCY WITH TAC BUILDING MANAGEMENT SYSTEM AND ENOCEAN

Supported by a teaching staff of 250 persons, the General Vocational College in the Swiss city of Basel offers vocational training and further education for some 4000 students in 50 professions. The college campus, designed by the Basel architect Hermann Baur in the 1950s and in the meantime a listed property, was brought right up-to-date in the course of extensive technical refurbishment. EnOcean's self-powered wireless technology was selected to satisfy the objectives set by Basel Corporation for energy efficiency, sustainability, comfort and convenience.

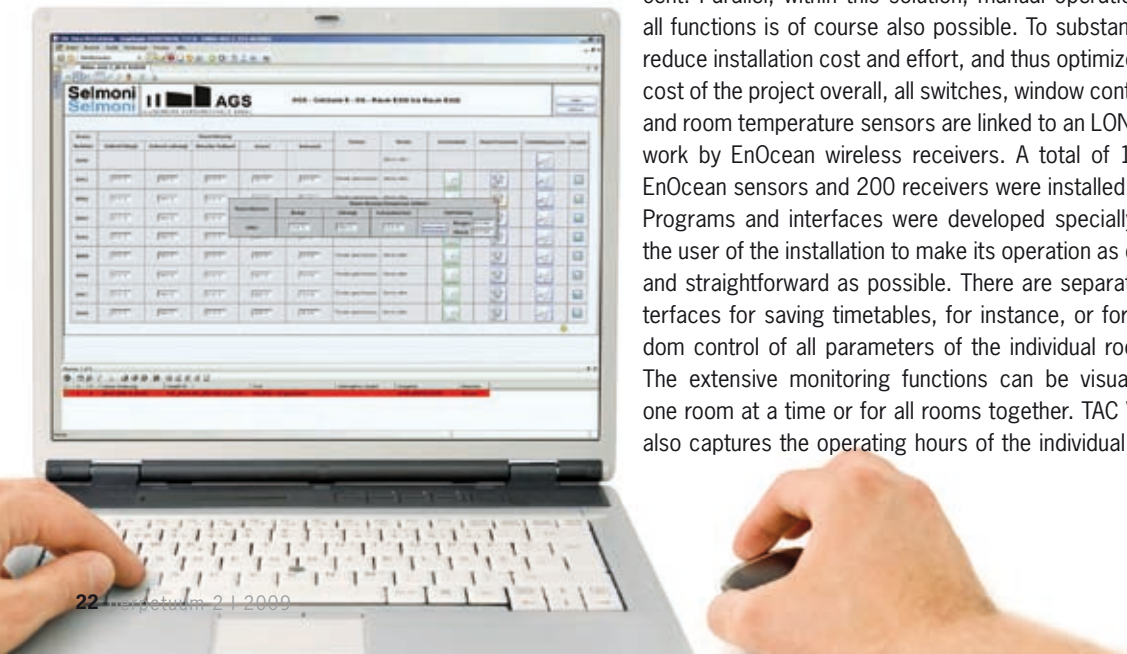
By Stefan Kellenberger, Head of Department Building Automation, Selmoni Ingenieur AG

The basic demand of Basel Corporation as the owner and investor of the seven blocks to be refurbished was that everything should run smoothly, without disturbing or hindering the daily teaching schedule. Further to that Selmoni AG, the responsible TAC system partner, was set demanding targets – economically and ecologically – in terms of energy efficiency. Investment costs and the scale of any changes to the actual construction of the buildings were naturally expected to be reduced, and the result was to be a modern and comfortable educational environment. Another major requirement was flexibility when it came to possible modifications of the buildings in the future.

INSTALLING WITHOUT HINDERING

The necessary measures were split into two stages to disturb the ongoing teaching schedule as little as possible. A major share of the work was carried out during the college vacations, for example.

To optimize comfort and convenience in the working environment, more than 300 classrooms were fitted with individual room controllers for heating, lights and shade. The technology is planned and implemented to allow later adaptation to room use simply, speedily and cost-effectively.



Timetables are held centrally in the TAC Vista management system for every single room, determining automatically whether a room is in an energy-saving mode, or in a normal mode where its climate is then automatically controlled matching outside conditions. In this way room conditions satisfy all requirements for a perfect teaching environment, and as soon as students enter the room. The energy savings achieved amount to some 15 percent. Parallel, within this solution, manual operation of all functions is of course also possible. To substantially reduce installation cost and effort, and thus optimize the cost of the project overall, all switches, window contacts and room temperature sensors are linked to an LON network by EnOcean wireless receivers. A total of 1430 EnOcean sensors and 200 receivers were installed.

Programs and interfaces were developed specially for the user of the installation to make its operation as clear and straightforward as possible. There are separate interfaces for saving timetables, for instance, or for random control of all parameters of the individual rooms. The extensive monitoring functions can be visualized one room at a time or for all rooms together. TAC Vista also captures the operating hours of the individual fluo-

rescent lamps, reporting any need for maintenance in good time so that classes are not disturbed by servicing work.

FLEXIBILITY MADE TO MEASURE

Self-powered wireless technology from EnOcean is gathering pace in building automation. Besides simplifying the cabling of a building, it also allows faster response to the need for changes in how a building is internally configured. Plus these sensors require no kind of regular servicing. Basel's General Vocational College benefits from the modern technology in now being able to present itself in a teaching environment that satisfies all requirements for comfort, convenience and flexibility. Optimized in investment cost with the promise of reduced operating costs for the future, the education center is set to meet both the ecological and economical standards set for the project by Basel Corporation.

www.enocean-alliance.org/selmoni

IKEA – ENERGY-EFFICIENT CLIMATE CONTROL IN INDUSTRIAL WAREHOUSE

Temperature control in large enclosed spaces - such as goods warehouses or aircraft hangars – presents a huge challenge to conventional technologies. As such, this type of environment is very expensive to heat or cool and uncomfortable to work in. Innovative wireless technology can provide the answer.

By Marc Dugré, President, Regulvar

A HARSH ENVIRONMENT FOR MAN AND MACHINE

The North American distribution center at Brossard, Quebec, Canada is the largest such IKEA facility worldwide. Consisting of four warehouses, with the largest one covering an area of 300 x 200 meters (or 1000 x 600 feet), it serves the whole of Canada and Eastern United States. With virtually no interior walls, and with a layout subject to frequent change, conventionally wiring such a building presents huge difficulties – many miles of wiring would have to be pulled in an expensive, disruptive and time-consuming effort to connect all the temperature sensors needed for efficient climate control.

Once done, it would be virtually impossible to restructure space in keeping with IKEA's shifting operational requirements. An ever-changing product mix – with varying packaging dimensions – has to be stocked efficiently, dictating minimal fixed partitioning within the warehouse. For IKEA, the priority was very much on employee comfort and energy saving. Another priority concerns a reduction in the company's environmental impact and carbon footprint

THE INTELLIGENT SOLUTION

The EnOcean-based and BACnet-based system from Regulvar, using state-of-the-art wireless and batteryless sensors from Thermokon, allows for enhanced energy management through centralized HVAC monitoring and control. It also switches to the most economically viable form of energy depending upon the time of day (be it gas or electricity, or night-time storage heating).

Installation of the maintenance-free system took just a few days and did not hamper normal operations at the facility. A network of sensors, receivers and repeaters, often placed atop metal structures and sometimes spanning distances of up to 70 meters/200 feet, reliably

Central HVAC monitoring and control system enables efficient energy management

transfers data despite the huge amount of metal present in the building (mainly as storage racks). The low ambient light levels have no negative impact upon the solar-powered thermostats, with the temperature sensors dependably bridging distances of up to 40 meters or 100 feet to their receivers despite the huge number of metal structures – a harsh environment for wireless devices.

"We're delighted with the way the system was installed. We hardly noticed the work being done, and our people are really happy about the clear improvement in temperature comfort. As a company, of course we appreciate the big saving in energy cost and we're proud about making such a relatively small impact on the environment despite the size of our warehouse complex here in Quebec", says Jean Nolin, Facility Manager at IKEA in Brossard.

www.enocean-alliance.org/regulvar

COMFORT AND FLEXIBILITY FOR ARNHEM CITY COUNCIL

The offices in the new "stadskantoor", the administrative building of the city council in Dutch Arnhem, feature room automation enabled by EnOcean technology. The Eusebiushof, completed in 2008, is a large office complex close to the city center. The property includes a 60-meter multi-storey block and two further buildings, with a total of 29,000 sqm office space. The municipality of Arnhem rents some 12,000 sqm of this for its administration, the remaining space being used by other tenants.

By Hermann Josef Pilgram, TEMA Technologie Marketing AG

MODERN BUILDING AUTOMATION

Both the realty developer and the tenants emphasized their requirement for modern and efficient building automation. The solution was implemented by Kieback&Peter Nederland, the Dutch representatives of Kieback&Peter in Germany. The latter's DDC4000 and DDC3000 automation systems were installed. These allow simple monitoring and control of heating, ventilation and air-conditioning. To further optimize energy efficiency in the building, use is also made of waste heat by integrating this into the automation.

COMFORT, FLEXIBILITY, ENERGY EFFICIENCY

The technoLink room automation system from Kieback&Peter produces a high level of comfort in the offices. Based on EnOcean technology, the system requires no cabling for communication and its energy supply. In this way transducers can be positioned where they work best. This provides for optimal regulation. technoLink also offers a large measure of flexibility. Changes in the floor plan and office layout for new work structures or new tenants are possible at any time and with little effort and expense.

The entire building services, including fire alarm and extinguisher facilities, are linked to the Neutrino-GLT management system from Kieback&Peter, comprising a total of 15,000 data points.

www.enocean-alliance.org/kieback-peter

SELF-POWERED WIRELESS TECHNOLOGY CASTS OFF IN PORT OF HAMBURG

The times when wireless transmitters were only used as an emergency solution in smallish living areas are long past – at the latest since EnOcean's self-powered and service-free wireless transmitters appeared on the market. In the meantime they do service in large numbers in many purpose-dedicated properties – such as in Quayside Warehouse D in Hamburg.

By Achim Paulick, Systems Consultant, PEHA Paul Hochköpper GmbH & Co. KG

Quayside Warehouse D, a listed brick building in the Port of Hamburg built in 1924, was thoroughly modernized in early 2008 and fitted with its own means of flood protection. The offices of the three-floor building are now occupied by different tenants. Common to all of them are their very exclusive and modern appointments. Glass walls and doors were fitted throughout the building to produce optimal incidence of light.

SWITCHES SIMPLY STUCK TO THE GLASS

The engineering office IGN in Hamburg opted for EnOcean-enabled transmitters from PEHA for the electrical fittings. These need no complicated cabling to switch the ceiling luminaires, are service-free and can be attached anywhere without difficulty. Another determining factor was the flat design of the Aura series produced by PEHA, which goes very well with the modern appointments of the building. For installation the flat transmitters were simply stuck to the glass. They switch the dual-row luminaires in series through receivers fitted for the most part above the cable raceways. The transmitters used are two-channel with a continuous rocker. The receivers work by a single contact, i.e. pressing the button at the top changes between on/off for channel 1, and pressing the button at the bottom operates channel 2 in the same way.

The offices also include ceiling floodlights produced by Spittler Lichttechnik, which come ready fitted with EnOcean receivers. That means they can also be operated by the PEHA transmitters. There are currently about 100 transmitters and receivers in use. Further devices will be installed step by step.

A wireless circuit is also due to be implemented in the building, connecting the staircase lighting by wireless to the PEHA house control system. In this way the lighting can always be switched on dimmed to about 90 percent. That goes easy on the luminaires and considerably lengthens their useful life.

www.enocean-alliance.org/peha

THE INTELLIGENT RETIREMENT HOME

EnOcean technology enhances comfort and reduces power consumption in a retirement home in north-Spanish Bilbao. Next to hospitals, old people's and nursing homes rank among the public buildings with the highest power consumption. The reasons include constant occupancy of the rooms, higher indoor temperatures than in a private household, and special health requirements of course.

By Pascual Castellanos, Product Manager, Nibblewave Electronics S.L.

Ground plan of the Ibarrekolanda retirement home in Bilbao.

To keep proper tabs on their energy and operating costs right from the start, the realty developers of a retirement home in the north-Spanish city of Bilbao decided on the assistance of EnOcean's wireless technology. This works entirely without batteries, making it fully service-free. "An extra advantage is that products enabled by EnOcean technology can be repositioned at any time without even minor building work", says Javier Beroiz, project manager of SIP TEC Soluciones Integrales and responsible for building services. "So you're flexible when deciding where to place a temperature controller, for instance, if a room is altered or converted."

CONVINCING PERFORMANCE

EnOcean-enabled products were installed in all 24 rooms of the retirement home: solar-powered presence detectors, window contacts, temperature controllers and EnOcean/LON gateways. A presence detector, for example, means that lighting is controlled to match the need and ecologically, because it is only turned on in the presence of an occupant. Wireless window contacts ensure that heating or air-conditioning are turned off as soon as a window is opened. The air temperature in a number of rooms, bathrooms for instance, is controlled separately according to specified times and temperatures by a thermostat.

The wireless sensor technology from EnOcean was installed in a combination with other technologies – DALI, LON and H-LINK – to create a powerful integrated solution. This centers on an LON backbone that can be accessed through a web interface. The HVAC system (Hitachi VRV) was connected to the LON backbone and is controlled over the H-LINK bus.

"We're more than satisfied with the result", sums up Beroiz. "The use of EnOcean-enabled products not only allows efficient control of the home's power consumption, it also improves the living comfort plus attractiveness of the entire building."

www.enocean-alliance.org/nibblewave

RELIVING TRADITION WITH MODERN TECHNOLOGY

EnOcean technology is chosen for flexibility, safety and energy efficiency in a 500-year-old timber-frame house in Embrach, Switzerland. Restoring listed buildings is often a very complicated process because strict legal requirements mostly apply. The Erny-Grob family in Switzerland was not deterred when it undertook restoration of its timber-frame house.

By Richard Staub, Specialized Journalist for Building Automation, BUS-House

In 2004 the former choirmaster's house, dating from the year 1521, was fully restored and extended by an annex. The building is a listed property so the authorities imposed strict requirements. For the owners it was important to keep as much of the old substance as possible, but they also wanted to venture something new. In the ground-floor apartment, for instance, an old brick wall was integrated into the modern kitchen, and the old paintings on the ceilings and the tiled stoves were professionally restored. When it came to the control of lighting, shade and heating the owners opted for innovative products from Omnio instead of a conventional electrical installation. These very much reduce the installation effort, besides offering the residents attractive advantages in terms of comfort, flexibility, safety plus energy efficiency.

LEADLESS AND BATTERYLESS

The contracted electrician was already acquainted with Omnio products from an earlier project, and was very much taken by the simply installed and flexible method of communication used here.

The batteryless wireless sensors from Omnio, based on EnOcean technology, harvest and store minimal amounts of energy from their surroundings, enabling them to save the values they detect and transmit them wirelessly. Useful ambient energy can be produced by linear motion, pressure, light or differences in temperature. The pressure of a finger on a switch, for instance, generates enough energy to send a wireless telegram to a receiver and turn on a light. Another example is that of a temperature sensor with a setpoint adjuster powered electrically by a miniature solar cell. Batteryless, i.e. self-powered, products simplify electrical installation, enhance comfort, convenience and safety. Plus, they are environmentally friendly and extremely economical.

The power and control in a conventional electrical installation use the same lead, every extra function needs an additional control lead. As soon as more than the basics

are wanted, conventional installation practice starts to become more complicated and costly. In a solution with Omnio Ratio on the other hand, it is only necessary to fix the wall and ceiling outlets for luminaires and motor-powered blinds, and specify a sufficiently large fuse box per floor in the planning phase for receptacle outlets, blank and splitting boxes. So in the former choirmaster's house, instead of conventional flush-type switches at fixed locations, flat wireless switches and wireless sensors were attached to the wall or ceiling, wherever they fitted best. These communicate with actuators in the splitter or in sockets and convert the wireless signals into electrical action controlling light, blinds or a heating valve.

TRANSMITTING WITHOUT ELECTROMAGNETIC POLLUTION

Initial concerns about electromagnetic radiation were fast done away with. Early on, EnOcean commissioned the Institute for Socioecological Research and Education (ECOLOG) with measuring the typical emission field strength of EnOcean wireless switches in real conditions of use. Here it was found that the high-frequency fields emitted by EnOcean wireless switches are one hundred times less intense than those of conventional light switches. What is more, the intensity of shortterm radio-frequency emission from EnOcean wireless switches is up to ten thousand times less than that of the permanent radio-frequency emission from mobile radio base stations in residential areas.

At the beginning of the year the first tenants moved into the house, delighted by the way in which the traditional and the modern had been fused. They were also impressed by the technical aspects of the modernization, for instance the way in which blinds and lights can be effortlessly controlled by batteryless wireless technology. The old electrical fittings are kept in the cellar as a "historical document", as a reminder of progress in electrical engineering practice.

www.enocean-alliance.org/omnio

MAKE WAY FOR LEED

EnOcean technology contributes to LEED gold certification of the corporate headquarters of Canada's Promutuel insurance group.

By Marc Dugré, President, Regulvar

Global climate change and rising energy prices mean that efficiency, sustainability and flexibility in building are becoming increasingly important. To successfully implement these prerequisites, more and more operators and owners of buildings are investing in modern automation. The aim is to automate various functions – such as control of lighting, shading or heating – with the aid of innovative technologies and sustainable solutions, thus making them simpler and more economical. The user benefits from extra comfort and convenience, the operator or owner of a building has an object they can lease for an attractive return. Sustainable building can be made measurable and transparent by the award of an LEED certificate.

LEED (Leadership in Energy and Environmental Design) certification was developed by the US Green Building Council in 1998 as a suite of standards to classify the sustainability of buildings. It is a voluntary certification procedure to promote environment-friendly and economical building. Rating is by a points system, these being awarded for sustainable site, water efficiency, energy and atmosphere, materials and resources plus indoor environmental quality. There are four levels of LEED qualification: certified, silver, gold and platinum. The commonest recipients of LEED certification are office buildings, schools and universities. One example of LEED gold level certification is the corporate headquarters of the Canadian Promutuel insurance group.

BUILDING AUTOMATION UNENCUMBERED BY CABLES AND BATTERIES

To make its head office in Quebec really sustainable, the Canadian insurer decided to have the new building LEED certified. To achieve this, it installed innovative technologies such as EnOcean wireless. This works entirely without batteries, so it can operate with no need at all for servicing or maintenance. The current it needs is harvested from the energy in its surroundings: from linear motion, light or differences in temperature for example. A further advantage of the innovative solution is its speedy and straightforward installation – no cables have to be routed. That alone means savings of as much as ten percent.

ENERGY-EFFICIENT LIGHTING AND HEATING

A total of 800 EnOcean-enabled products from various manufacturers were installed – including energy-autonomous presence detectors and light sensors from Servodan, light switches and receivers from Echoflex Solutions plus EnOcean-based and BACnet-based gateways from Regulvar. All products integrating EnOcean technology are interoperable, enabling them to communicate with one another in any application.

Significant savings by using lighting systems controlled by daylight and human presence are possible

To prevent energy waste and carbon emissions right from the start, an intelligent lighting and shading control system which also increases comfort levels throughout the building was installed. The lighting is automatically dimmed or finally turned off according to given levels of daylight – assisted by light sensors. When the daylight levels reach a higher level, the window blinds are gradually automatically closed to ensure that the lighting levels within the building remain constant throughout the day and to reduce the temperature increase inside the building, which in turn reduces the cooling energy requirements significantly. Maintenance-free and energy-autonomous presence detectors were also installed to control the lighting in the building to match the requirement by sensing whether a room is actually occupied by someone. Movement information is transmitted wirelessly to a receiver, which automatically turns off lights if no more movement is registered before a set time interval has elapsed. If required, users are still able to adjust their lights manually.

EnOcean-enabled light switches were also put in place in the various rooms. These generate the energy to operate from finger pressure: a miniature dynamo uses this to produce an electric voltage. Requiring no cables, they are simply screwed or stuck to a wall or another suitable surface.

The individual components are linked by BACnet to the building management system. The system is programmed so that lighting and heating or air-conditioning are automatically turned down or off outside of office hours. If someone is nevertheless in the office, they can turn on the light by simply pressing the switch. The EnOcean-based and BACnet-based systems from Regulvar also allow central control and monitoring over the internet.

The entire installation was completed in just a few weeks. Regulvar was the executive partner and consultant for the entire duration of the project.

NEW POSSIBILITIES IN PLANNING AND ROOM CONFIGURATION

The implementation of batteryless wireless technology in the Promutuel building showed the way to significant savings in energy and operating costs, and without in any way degrading the company's performance. At the same time there are whole new possibilities in planning and room arrangement because any later changes can be made with no need to lay new cabling. A further advantage is the fact that the products can be speedily and simply removed or placed elsewhere for later renovations. Smart building automation solutions here clearly demonstrate their leadership in energy and environmental design.

www.enocean-alliance.org/regulvar

TECHNICAL SYMBIOSIS IN BUILDING AUTOMATION – THERMOKON COMBINES BACNET AND ENOCEAN

Why use only one of the numerous network technologies in building automation? Thermokon has been engaged in this question for some time and is pleased to offer now a possibility to combine the advantages of several network technologies by means of the new SRC65-BACnet. The company counts on the well-established BACnet system. Combined with EnOcean-enabled wireless automation technology the user can benefit by a wide range of solutions to create energy-efficient and eco-friendly "Green Buildings".

By Nico Gotthardt, Development & Technical Product Management, Thermokon Sensortechnik GmbH

BACNET – THE STANDARD IN BUILDING AUTOMATION

Supervised by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) BACnet was developed in the 90s. Their aim to create a neutral standard for data communication in buildings was already realized in 1995 with the ANSI/ASHRAE 135. In 2003 registration as ISO standard 16484-5 followed. Over the years BACnet became a standard in building automation.

The interoperability of the devices plays an important role for the positive trend of BACnet. During the development of new products the standardized BIBBs (BACnet interoperability building blocks) should be met. Thus, devices from different manufacturers can work together in the same network. The BIBBs define which services and procedures must be supported by servers and clients for achieving the requested criteria. Furthermore the ISO standard defines groups of services for communication in the network, e.g. common data use.

WIRELESS MEETS WIRED

Without doubt, these standards were of paramount importance for Thermokon during the development of the SRC65-BACnet. Thus, smooth interoperability is guaranteed and already existing projects can be easily modified. In this case, the SRC65-BACnet serves as a gateway between the wireless low-power technology from EnOcean and BACnet.

The function of the new product also includes a radio receiver for EnOcean radio telegrams and always operates in combination with other BACnet automation systems or control technologies, such as BACnet operating work stations. All parameterization and configuration properties can be set over the BACnet network. The used protocol is the international standardized BACnet MS/TP. It affords connection to a corresponding remote station like an automation station or BMS. The transmission parameters are according to the standard 8N1 (8 data bits, no parity, 1 stop bit) whereas the baud rate is arbitrary (9600, 19200, 38400, 57600, 76800, 115200) and adjustable with a DIP switch.

The RS485 standard works as an interface on the bus side and is applied especially for digital wired data transmission. The transceiver can be connected with a twisted-pair cable. The maximum number of bus sharing units without the use of a repeater is preset by the RS485 transceiver. It can handle 128 devices per bus segment. For a direct optical analysis of the device status relating to function, bus and radio activity etc. the SRC65-BACnet is equipped with four LEDs directly observable through the transparent cover of the case.

The gateway works with the device profile BACnet Application Specific Controller. Pertaining to the function as a radio receiver 32 EnOcean-enabled devices, like the SR04 from Thermokon, can be learned in and used. The learn-in procedure is handled in a very comfortable way with the given tools from the manufacturers of automation systems or B-OWS.

At this the senders send a wireless telegram after pushing a special button. With this telegram the new

devices can be added to the network. A software checks the ORG-Byte (describing the characteristics of the device) to prevent a mix up of the telegrams during the learn-in procedure.
After a positive announcement of the devices and the SRC65-BACnet combined operation of both network technologies is possible.

To operate with networks means an immense step of technical evolution. Different systems are working together and problems are solved in a collective way. Now this symbiosis enters building automation also and the SRC65-BACnet by Thermokon connects wireless network technology with the pros of a bus system, seamlessly.

www.enocean-alliance.org/thermokon

ENOCEAN GATEWAY FROM VICOS :

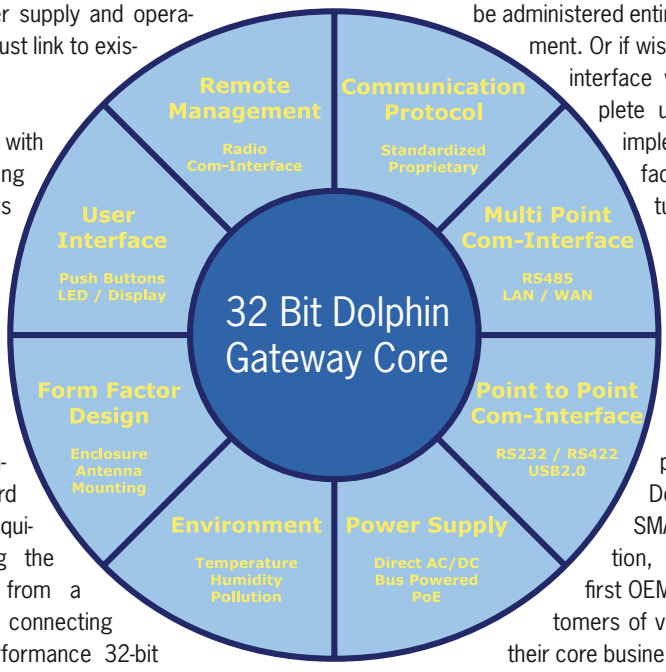
DOLPHIN-COMPATIBLE PLATFORM FOR OEMS

Many EnOcean gateways today are de facto EnOcean modems and an excellent solution for the intended purpose. With the new Dolphin platform and the bidirectionality of energy-autonomous sensors and actuators, new Dolphin-compatible gateways are also hitting the market that enable use of full Dolphin functionality – such as the new gateway platform from vicos.

By Wolfgang Klier, Managing Director, vicos GmbH

An increasing number of vicos' customers are calling for new devices that will enable seamless communication between the new Dolphin platform and their own systems. These should take into consideration the special demands of the power supply and operating philosophy, and must link to existing bus systems.

At the end of 2008, with the intention of offering its OEM customers distinct benefits in terms of cost and time to market, vicos decided to create a Dolphin-compatible gateway platform. The new platform enables OEMs to implement straightforward solutions to their requirements by selecting the necessary functions from a modular system, and connecting these to the high-performance 32-bit Dolphin gateway core from vicos.



Different kinds of power supply are available: from separate feeding with AC or DC through custom bus feeding to power over Ethernet (PoE). The link to the superordinate controller works by rugged serial point-to-point (RS232/RS422) and bus (RS485) connections, TCP/IP or the USB terminal of a computer. If bus systems common in building services such as EIB/KNX or LON are used, it is possible to integrate the implementation that an OEM customer already has in place. A Dolphin gateway needs no direct user interface because it can be administered entirely by remote management. Or if wished, a human/machine interface with display and complete user guidance can be implemented. Design, form factor and antenna structure can also be customized.

ALREADY OPERATIVE

The new gateway platform is already a proven solution for new Dolphin functionality and SMART ACK communication, implemented by the first OEMs. It enables OEM customers of vicos to concentrate on their core business, and integrate the latest technology from EnOcean in their systems virtually risk-free. In this way they are also able to get their products to market faster.

www.enocean-alliance.org/vicos

KEEPING AN EYE ON ENOCEAN WIRELESS SIGNALS

OceanView from IPcontrols detects all received EnOcean wireless signals and displays their content.

By Michael Bartels, Member of the Executive Board, IPcontrols AG

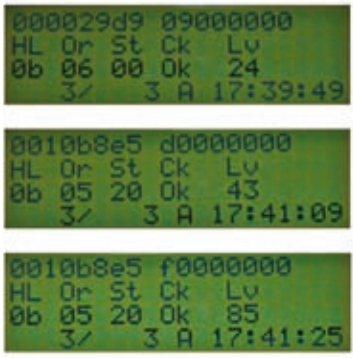
When you are installing EnOcean wireless technology it is always an advantage if you can find out, as early and simply as possible, the content of wireless packages that are going to be transmitted. IPcontrols based in Marburg, Germany has developed a device that can show telegram quality and the entire content of a wireless package: OceanView.

New OceanView display device

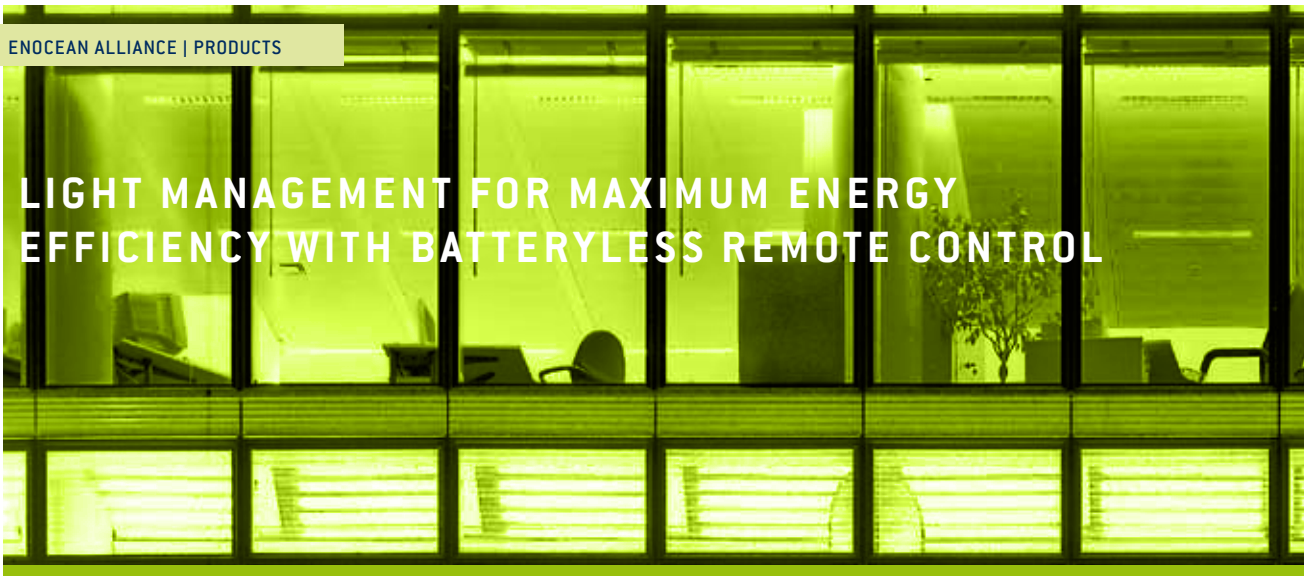
All received EnOcean wireless packages are saved on an SD card. This can be taken out for use in computers, PDAs or similar units. OceanView comes with a battery, recharged by the included power supply, and allowing at least ten hours of operation.

The last three packages received, reported acoustically if wished, can be called up on the display. This presents the content of the wireless packages in abbreviated format. A received signal strength (RSS) figure is also output. This function is especially suitable when it comes to determining how sure wireless transmission is likely to be at a particular point, and where repeaters might be needed.

OceanView also boasts an Ethernet interface, enabling you to control and read it remotely. It is possible to send the received data direct to a server. A DHCP client can be started. Data are sent in Syslog format, which is supported by many programs. An integrated date/time function produces chronological ordering of the received data. The two accompanying antennas (a 3 cm stub and a detached antenna with a 1.5 meter cable) are connected by an FME male and simply exchanged.



www.enocean-alliance.org/ipcontrols

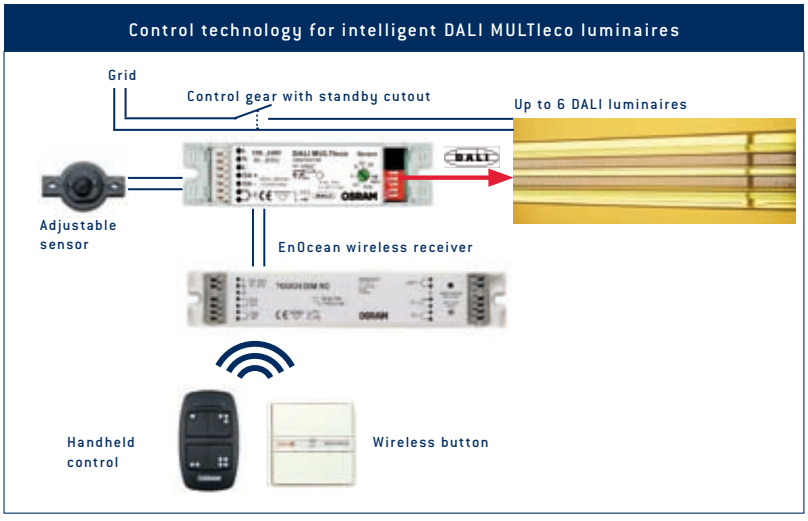


LIGHT MANAGEMENT FOR MAXIMUM ENERGY EFFICIENCY WITH BATTERYLESS REMOTE CONTROL

The ongoing debate on climate protection, drastic increases in the price of energy and new directives for more energy-efficient devices and systems create big challenges for operators of building facilities in the years to come. This calls for new approaches wherever possible – for example in the operation of lighting installations that make use of daylight. Of particular interest of course are solutions that will pay for themselves within a few years by cutting the operating costs. Energy savings of as much as 60 percent are possible with the new DALI MULTIeco light management system from OSRAM compared to switched ECG luminaires.

By Rainer Wrenger, Market Development Manager/Light Management Systems, OSRAM GmbH

With its intelligent control algorithm the new DALI MULTIeco light management system produces optimal utilization of daylight by precisely maintaining a given level of brightness. Working as a function of presence, lighting is dimmed after a preset length of absence and finally turned off. There is more savings potential through the 14 project-specific operating modes, simply activated by DIP switches. The selection ranges from automatic control in offices as a function of daylight and presence through to a corridor function with soft start and timed light value reduction and/or turning off. An integrated standby relay contact isolates a luminaire from the grid



Schematic of DALI MULTIeco light management system with standby cutout and batteryless wireless control

once it is turned off. This cuts the standby power consumption of the MULTIeco plus ECG system to less than 500 mW because of the extremely low-loss switch-mode power supply.

Lighting solutions with the MULTIeco light management system thus already satisfy all specifications of both the existing MINergie directive and the upcoming Ecodesign directive of the EU.

INDIVIDUAL LIGHTING LEVEL WITH SERVICE-FREE WIRELESS OPERATION

In systems for daylight-dependent control of lighting with a presence function, it is especially important that the individual user should be able to influence the lighting level. Using a batteryless remote control with EnOcean technology it is possible to match the lighting level at any time to personal needs. A wireless receiver is combined with the DALI MULTIeco control gear for this purpose. This wireless receiver can be integrated in the luminaire direct by the manufacturer, or be installed separate from the luminaire in the false ceiling.

EnOcean wireless technology, already proved in its flexibility and freedom from maintenance in many other projects, can now also be implemented in high-efficiency light management systems such as DALI MULTIeco from OSRAM.

www.enocean-alliance.org/osram

ELTAKO SPREADS ITS WIRELESS SELECTION

Combining Eltako's 60 years of experience in switchgear with EnOcean's intelligent wireless technology creates a system that satisfies demands for building automation, energy saving, reduced operating costs, freedom from maintenance and convenience. For a number of years already, Eltako has focused on the subject of energy efficiency, resulting in the manufacture of switchgear with reduced standby losses. Products are now also emerging enhanced by wireless.

By Reinhold Faiss, Sales Director Germany, Eltako GmbH

DOUBLE AND TRIPLE FRAMES FOR ADDED FLEXIBILITY

To save the trouble of ordering extra, Eltako now ships its momentary-contact switches accompanied by all necessary parts such as frames or mounting plates. In this way the installer can decide on the spot, and depending on what the customer wants, which rocker to fit into which frame. That does away with the kind of extra orders that had to be made from wholesalers because of the low stock turnover and returns. Double and triple frames mean more flexibility in switch ranges and design. That makes for straightforward integration of conventional CEE-7/4 receptacles.

MOTION AND BRIGHTNESS SENSOR AND SOLAR CELL

Joining the wireless sensors is a new motion and brightness sensor for the 55 mm switch ranges. The sensor is powered by a solar cell module or by 12 Vdc.

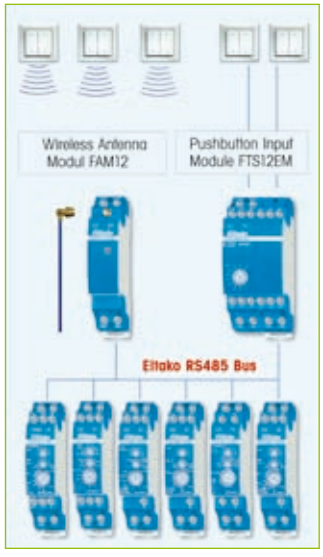
SPECIALLY FOR THE SWISS MARKET

The FT4-CH momentary-contact switch has been added to the range for the 60 switch dimensions from Feller, Hager and ABB-Normelec that are common on the Swiss market.

ELTAKO RS485 BUS/WIRELESS ANTENNA MODULE FAM12-12VDC

The FAM12 wireless antenna module with exchangeable antenna and standby loss of only 0.4 W is supplied by a 1DE-wide 12 V power supply SNT12-12VDC. The module receives and checks all signals of EnOcean wireless transmitters and repeaters in its range. These are produced for the Eltako RS485 bus, and sent to follow-up actuators. Up to 128 channels can be connected to the RS485 bus.

ELTAKO RS485 BUS SWITCHING ACTUATORS



All actuators can be switched and controlled by the EnOcean signals by simply connecting to the RSA and RSB terminals of the RS485 bus. Conventional momentary-contact switches can also be integrated by the FTS12EM pushbutton input module. Every common switching and dimming functionality is available, through to automation by the actuators. The actuators are aligned on existing procedures as in a traditional installation. The momentary-contact and switching commands are converted to the loads. The flexibility of the EnOcean wireless system means that more automation functions can be implemented than in installations to date.

CONSTANT LIGHT CONTROLLER

New from Eltako is a lighting controller that works as a function of motion and brightness with one or more integrated wireless sensors. This also allows for both different driving of the luminaires and different wavelengths of the radiated light. In this way it is possible to offer a controller for ECGs with a 1 to 10 V input for purpose-dedicated buildings, or a constant light controller for filament, halogen or dimmable energy-saving lamps.

LIGHT SCENE CONTROL

Light scene control is a frequent requirement in rooms where events and conferences take place. The new FLS12 light scene control unit can save as many as 40 light scenes, which can then be recalled at the push of a button. With this Eltako offers a unit to control ECGs with 1 to 10 V, and another for filament, halogen or dimmable energy-saving lamps.

ELTAKO RS485 BUS CONNECTOR

When wireless signals need to be transmitted over a considerable distance, it is common to use a number of repeaters. This increases the equipment outlay of course. Alternatively the different RS485 bus systems can be joined by a two-wire line, for example with the FBV12 bus connector. This reduces installation cost and increases reliability.

COST-ATTRACTIVE SOLUTION AND INSTALLATION

If lines are too short, the user may not benefit from the full flexibility of a wireless system. But existing cable networks can be combined with a wireless installation. A powerful and at the same time cost-attractive solution is the pushbutton input module that Eltako offers for the RS485 bus. This provides ten inputs for a universal control voltage. Standby loss is 0.3 W. Five control inputs each can be connected to two different potentials from 8 to 230 V. Control commands driven by 230 V and small voltage are thus easily implemented. The pushbutton input module serves both as an add-on to Eltako wireless and as a basic unit for the FTS12 remote system.

WIRELESS ACTUATORS BUILT-IN AND SURFACE-MOUNTED, FOR CEILINGS AND CABLE LEADS

In cases where the lamp leads are not routed into the distribution, it is essential to install decentral actuators. Eltako is now offering eight actuators from the 61 series for built-in and surface-mounted solutions. New too is the 70 series. This covers specifications calling for an enclosed case. This enables simple incorporation of the functionality of pulse relays and universal dimmers in ceilings or cable leads.

THE NEW STANDARD OF THE FUTURE – REMOTELY CONTROLLED DISTRIBUTION

Eltako continues to develop new products and expand its wireless range, for example in remotely controlled distribution. In this way the kind of remote controllability that has long been standard in entertainment electronics will benefit building services too.

www.enocean-alliance.org/eltako

PROBARE P30: QUALITY IN ENOCEAN INSTALLATIONS

To achieve the best possible result in the planning, installation and startup of EnOcean technology, only a few points have to be observed – professionally scaled radio links plus correct teach-in of EnOcean devices by their EnOcean equipment profile (EEP).

By Thomas Rieder, Managing Director, PROBARE

Both when first starting an EnOcean installation and making changes to an EnOcean network already in operation, there are some chores that repeatedly occur, like teach-in of EnOcean devices without direct access to an actuator, controller or gateway. This opens up substantial cost-saving potential, especially in the case of devices based on Dolphin or 315 MHz wireless modules. The P30 field test set from PROBARE makes it possible, for the first time, to conduct all chores with a single piece of equipment, and to save all relevant data on a USB stick.

RADIO LINK TEST

A professionally scaled radio link ensures reliably functioning wireless communication between two devices. Particularly in the absence of a line of sight between the locations of devices, it is obviously advisable to verify the quality of a radio link. For this purpose the P30 not only uses the signal level at the point of reception, it also judges all relevant parameters of a bidirectional wireless interface. The different propagation paths in the installation of one or two repeaters are considered in doing this, as are the requirements of the new Dolphin platform. So instead of many details, the user obtains the important link quality as a single easily understood figure.

ENOCEAN REPEATER WITH SMART ACK SUPPORT

Using the P30, planners or installers can immediately determine the optimal position for an EnOcean repeater. They only have to switch the P30 to repeater mode and optionally set the repeater level. Ready for Dolphin means that the P30 fully supports the functionality of the new EnOcean platform. In addition to repeating wireless telegrams, the set can serve as a postmaster to test SMART ACK communication of energy-autonomous bidirectional sensors and actuators.

RADIO NETWORK ANALYSIS

Analysis of the communication in EnOcean networks is a complex requirement serving for documentation and network optimization. In addition to radio link quality, the P30 assesses application-specific parameters for this purpose. Its display shows current values, min/max information and the time response of a device to be analyzed. If the entire occupancy of an EnOcean wireless channel is to be documented for hours or even days, this can be produced on a USB stick, also logging occupancy of the channel by non-EnOcean users.

REMOTE MANAGEMENT/REMOTE LEARN

This functionality is available on the TCM 200C/220C wireless modules and on all Dolphin-based applications. With its intelligent menu guidance the P30 supports simple operation of the remote learn function in particular. This allows systematic teach-in of devices on a PTM 200 base in the case of actuators, controllers and gateways that cannot be operated direct. In addition to EEP-based remote learn, the P30 commands secure device access plus the uploading and downloading of configuration tables. The P30 is small, lightweight and rugged. It can be powered by batteries or a USB power supply as an alternative. The set communicates with a PC over USB, and also supports the WinEtel program from EnOcean. It is available for 315 MHz and 868 MHz.

www.enocean-alliance.org/probare

UNOTECH COMBINES DALI AND ENOCEAN FEATURES

By Henrik Norén, Managing Director, Unotech AIS

DALI – DIGITAL ADDRESSABLE LIGHT INTERFACE

The interest for installations using the DALI protocol is rapidly increasing and to meet this demand Unotech introduces the module Rxe DALI. This device features an embedded EnOcean receiver providing wireless remote control using the batteryfree and wireless pushbuttons and e.g. solarcell-powered PIR presence and activity sensors.

SIMPLE INSTALLATION

The design focus is on simplicity in installation – the Rxe DALI for instance is simply supplied directly from the DALI bus.

When "learning" the assignment of the batteryfree and wireless pushbutton functions, selector switches determine if a group or a lighting scene operation is to be activated. All of the 16 groups and lighting scenes available within the DALI protocol are supported by the Rxe DALI. The same uncomplicated procedure is used when "learning" the assigmnment of the presence and activity sensors.

www.enocean-alliance.org/unotech

"TITLE 24": INTERVIEW WITH TOM LEONARD, LEVITON

Innovative technologies - such as self powered technology from EnOcean - become more important in the USA. They are the key to green buildings - cutting the costs of operation and purchases, as well as substantially reducing the energy consumed in buildings.

Perpetuum spoke with Tom Leonard, Director of Marketing and Product Management at Leviton, about the US building market and his experience with EnOcean technology.

Leviton has implemented the innovative batteryless wireless technology based on the EnOcean standard for some time now. What was the key deciding factor for this technology?

Tom Leonard: Using EnOcean wireless technology allows Leviton to be at the forefront of making innovative solutions available to our customers. Wireless opens the door for retrofit opportunities that would not be possible with conventional wired products. The ability to have interoperability between the devices produced by the other Leviton promoters is an added bonus for applications that involved more then just lighting control. Having all the devices self powered is a big plus for our customers, no batteries that need to be maintained and reduced overall operating costs helps Leviton to offer solutions that other companies don't have available.

You launched your first product line based on EnOcean technology at the beginning of this year. Can you give us the first reactions and feedback from the market?

The reaction and acceptance of Leviton's new wireless offerings have been very positive. Our customers understand the value proposition that wireless technology offers in terms of labor and time savings to install lighting controls. In terms of sales, our results have exceeded our initial forecasts and that tells us our customers appreciate the benefits of using the wireless products.

Leviton is one of the largest producers of electronic switches and control units in North America. Can you give us some insight as to the current status of the building market USA?

It's no secret that the building markets in the US (and many other markets) are down from the previous year. The commercial building market has fared somewhat better then the residential market and certain parts of the commercial market have remained relatively strong. The healthcare sector and government infrastructure have remained the strongest segments. One of the key opportunities has been in retrofitting for existing structures; the wireless products are a natural solution for this application.

How do you see the building market developing over the next years? What influence will the recently announced US Government programs have in this field?

We feel that the overall building market will rebound starting next year; certain segments will have faster growth than others. The stimulus programs from the US Government are already showing a positive influence for creating new building opportunities and also for retrofitting of government offices and other facilities to improve their energy efficiency. The federal government program to improve the energy efficiency of their properties sets a great example for the private sector to follow.

Leviton is a global leader in electrical and electronic wiring devices, lighting energy management solutions and commercial data infrastructure products. Leviton offers a product line that includes more than 25,000 devices for virtually every conceivable residential, commercial and industrial wiring device need. Leviton is a promoter of EnOcean Alliance.

What role do you see Government Regulations playing here - for example the Californian Title 24? Could you also please explain the major relevant features of Title 24 to us?

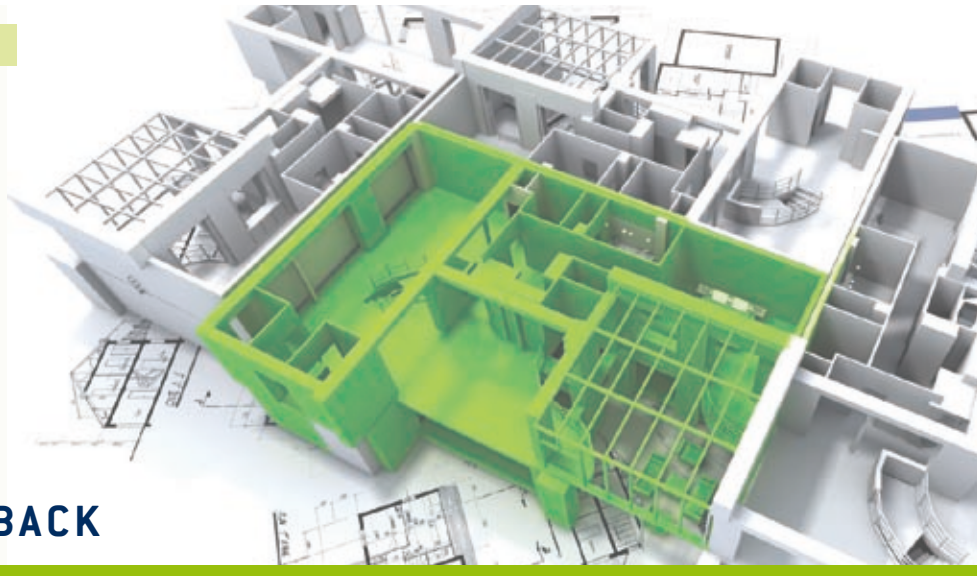
Title 24 of the California Code of Regulations, known as the California Building Standards Code or just "Title 24", contains the regulations that govern the construction of buildings in California. There are 12 sections covered under Title 24 for both residential and non-residential building, the section that is relevant to lighting is Building Energy Efficiency Standards. Basically, Title 24 requires that new contruction in California must meet certain standards of energy efficiency and lighting controls are one of the tools to accomplish this goal. Title 24 was implemented in 2001 to reduce energy usage for California and they calculate that they will save $23 billion overall by 2013. California has been a leader in adoption of energy reduction standards and other states have modeled some of their codes on Title 24.

The federal government has played an important role in promoting energy efficency by offering tax rebates and stimulus funds for both new contruction and retrofitting of existing buildings to reduce energy use.

You are one of the seven promoters of the EnOcean Alliance. Why in your opinion does EnOcean technology play such an important role in sustainable green buildings?

EnOcean-enabled wireless products allow for retrofitting existing buildings to use lighting and HVAC controls without the expense of rewiring. This is the most cost-effective method with the fastest return on investment for the building owner. To use a line from one of our advertisements, EnOcean wireless technology makes it easy to be green.

www.enocean-alliance.org/leviton



USING EPACT TO SPEED PAYBACK

The Energy Policy Act of 2005 (EPAct) is a complicated government method that encourages integrators to make US buildings more energy-efficient. It is a multi-billion dollar benefit that less than 1% of eligible buildings owners or leaseholders have taken advantage of.

By Carol Hayward, Director Of Public Relations, Engineered Tax Services, Inc.

The US government does a lot of good things to encourage more efficient building; unfortunately the process is cumbersome and requires third-party engineering certification. This comprehensive tax legislation is where we find the $1.80 per square foot tax benefit we all talk about and we'll attempt to clarify the process and increase the awareness of this very important benefit.
The elusive $1.80 that EPAct holds can be broken down into three categories: Lighting, HVAC and Building Envelope. Each is worth $0.60/SF in tax benefit. The EPAct

relies on the ASHRAE 90.1-2001 specification as a baseline to calculate savings percentages. To qualify for the full $1.80 the building must be 50% more efficient than this 2001 standard. To qualify for the partial incentive, the savings must be 16 2/3% better than 90.1-2001 in the respective categories.

LIGHTING

Lighting consumes approximately 40% of the energy in commercial buildings, the goal is to rein in this energy hog. By using a $0.60 per SF tax benefit, EPAct encourages the use of more efficient fixtures and controls. In order to qualify for the lighting portion of the available deductions, lighting energy consumption must beat the ASHRAE 90.1-2001 specifications for efficiency by 16 2/3%. If the building is undergoing a lighting retrofit or adding controls, it is worth investigating whether or not this new system will qualify for the $0.60 lighting deduction. In majority of cases the lighting savings level is achieved and can be introduced to your ROI calculations - win, win.

HVAC

HVAC is the second largest energy consumer in commercial buildings and can be very tricky to retrofit without major renovation and disruption to the space. The addition of new controls has the ability to bring the system energy consumption down by 16 2/3% in order to achieve the second tax benefit of $0.60/SF

This total of $1.20/SF could be included in the ROI calculations for your building owner. In a 100,000 SF building

this could be as high as $120,000 in tax benefits. Unlike tax credits, deductions don't translate dollar for dollar, rather they are calculated as part of your tax return. The numbers add up fast and can make the purchase decision for your building owner easier.

ARCHITECTS AND DESIGNERS

The benefits get even better for the architect and specifying segment of the market. The Government doesn't pay tax, so what happens when the tens of thousands of Schools, Federal and State Buildings are upgraded? Prior to 2008 this tax benefit was simply lost, or wasted. The government quickly realized that in order to encourage architects and designers to implement energy efficiency in Federal buildings they had to provide encouragement. The EPAct was amended to run until 2013 and included a provision that for all public, government or non-profit buildings the EPAct tax benefit would go back to the designer of the specifications which could be the architect, designer or lighting contractor. This has resulted in approximately $25M per month in tax benefits being discovered by one engineering/tax firm alone.

ENGINEERED TAX SERVICES HELPS TO REDUCE PAYBACK TIME

Engineered Tax Services, (ETS), one of a handful of US companies specializing in EPAct deductions and credits, has the expertise to be the third-party evaluation that the IRS requires. ETS can perform all the necessary steps to allow your building owner to realize more value in your projects and receive the tax benefits they are currently missing out on. ETS is a professionally licensed engineering firm dedicated to the education of EPAct Benefits. Engineered Tax Services is a member of the EnOcean Alliance, The United States Green Building Council and an Energy Star Partner.

www.enocean-alliance.org/ets

BF 72 RT command device

CABLELESS COMMAND DEVICE ADDS FLEXIBILITY TO INDUSTRIAL BUILDING AUTOMATION

The BF 72 RT command device from steute looks like a conventional control used in building services and in industry – to open doors and flaps for example, to turn on fans or to start machines. But there is a major difference, namely that it requires neither external power nor a cable for signal transmission.

By René Scherer and Rainer Lumme, steute Schaltgeräte GmbH & Co. KG

The BF 72 RT can be simply attached to a wall quite independently of cable ducts and power sources. It is easily positioned somewhere else, as and when needed, with little effort and without having to lay any cables. This is made possible by innovative EnOcean wireless technology, which steute has already implemented in other series of switchgear. It uses a wireless protocol that ensures maximum reliability through a data link with multiple transmission of the information.

The switchgear produces the power needed to send a signal itself, by means of an electrodynamic generator that converts movement of the plunger into electric energy. The wireless signal is to be transmitted exactly when the switch is pressed, so an energy storage mechanism is unnecessary. The maximum range of the signal is 300 meters in the open and 30 meters inside a building. A repeater can be used to enable longer range. The device has multi-network capability, and is simply programmed through the receivers.

steute has wide-ranging experience with EnOcean technology, using it in wireless pull switches to operate factory gates for example. This experience is now being invested in other kinds of switches.

WIRELESS SOLUTIONS DESPITE EXPLOSION RISK

steute is currently opening up another field of application in explosion protected devices. The explosion protection division has obtained certification to the directives of the European Union (ATEX) for gas ex zones 1 and 2 plus dust ex zones 21 and 22 for its energy-autonomous switchgear.

Here wireless technology enables considerable simplification because no cables have to be laid. In this way signal evaluation can be located separately from switchgear in a non-ex area for example. Additional explosion protected components such as cable connections or connectors can thus be dispensed with. steute offers a number of device series in explosion protected design: ex position switch (EEx F 95), ex command device (EEx F 95 RS SW), ex pull-wire switch (EEx F 95 WH/90°) and ex foot switch (EEx F GFS).

www.enocean-alliance.org/steute

60 1949–2009 YEARS OF INNOVATION

Eltako ELECTRONICS

Constant light controller FKR12 – The automatic energy savers

Dimming actuator FKR12/1-10 V

1 channel, 1 NO contact not potential free 600 VA and 1-10 V control output 40 mA. Only 0.9 watt standby loss.

Motion-dependent and brightness-dependent light control with the wireless motion/brightness sensor FBH.

Dimming actuator FKR12UD-12 V DC

1 channel, Power MOSFET up to 500 W, ESL up to 100 W. Only 0.3 watt standby loss.

Motion-dependent and brightness-dependent light control of dimmable Energy Saving Lamps ESL and incandescent and halogen lamps with the wireless motion/brightness sensor FBH or wireless outdoor brightness sensor FAH.

Wider variety

Frames R, R2 and R3

Single frame R, 80x80 mm external dimensions, double frame R2, 80x151 mm external dimensions, and triple frame R3, 80x222 mm external dimensions.

Supplied colours same as for push-button FT4. Internal frame dimensions 55x55mm, 15 mm high.

Socket outlet front SDO

For German socket outlets (CEE-7/4) with earthing contact with child protection.

Supplied colours same as for pushbutton FT4.

This socket outlet front fits socket boxes by manufacturers Berker, Elso, Giro, Jung, Siemens and Merlen.

A socket outlet intermediate frame SZR (same colour) comes with the socket outlet front.

Wireless pushbuttons FT4

80x80 mm external dimensions, internal frame dimensions 55x55 mm, 15 mm high. The scope of supply comprises the frame, one large rocker, one double rocker, one intermediate frame (all same colour), the mounting base, the wireless module and one adhesive foil.

Available in 8 colours: electric grey, white, black, pure white, anthracite, pure white glossy, black glossy, coated/aluminium paint.

Wireless pushbuttons FT4CH, Swiss design

internal frame dimensions 60x60 mm, 15 mm high.

For Swiss design frames from Feller, Hager and ABB.

Scope of supply same as for FT4 but without frame.

ONE TECHNOLOGY – SEVERAL WINNERS

ECHOFLEX SOLUTIONS ANNOUNCED ENOCEAN "DISTRIBUTOR OF THE YEAR 2008"

EnOcean has awarded Echoflex Solutions the distinction of distributor of the year in 2008. The award stems from the giant strides Echoflex has taken to engineer energy-efficient building automation solutions. The impact of Echoflex engineering has been manifested in terms of fast automation system installations, reduced energy consumption in hotels and commercial buildings and fast paybacks. EnOcean's award program was introduced to demonstrate the importance of developing strategic relationships with its network of distributors who are invaluable for business development. Not only do they bring EnOcean's innovative wireless sensor technology to major international markets through selling modules and offering design-in; they also conduct large-scale projects with OEMs in the fast-growing building automation industry. The award program provides EnOcean's distributors with a complete set of services including second-level support by EnOcean field application engineers, yearly distribution meetings and training. EnOcean also provides technology updates, market data and assistance with OEM projects.

LEVITON WIRELESS OCCUPANCY SENSOR NAMED BEST LIGHTING CONTROL PRODUCT OF THE YEAR BY CONSULTING SPECIFYING ENGINEER MAGAZINE

Leviton Manufacturing Company's wireless lighting control products were chosen by Consulting-Specifying Engineer (CSE) magazine as one of the Best Products of the Year. The high-performance occupancy sensors combine Leviton's legendary styling and superior performance features with reliable wireless technology. The result is a "green building product" that offers significant energy savings and reduced installation costs for both retrofit and new construction applications.
The Product of the Year competition illuminates the products design engineers and specifiers are valuing for MEP systems in non-residential buildings. In this tough economy, construction and operating budgets are under stress while sustainability issues for energy, water, and materials are growing. Flexibility, modularity, efficiency, and durability seemed to be factors shared by many of this year's winners," said Michael Ivanovich, editor-in-chief at CSE.

ENERGY HARVERSTING AWARD FROM IDTECHEX GOES TO MK ELECTRIC'S SELF POWERED WIRELESS AND BATTERY-FREE SWITCHES

MK Electric-Honeywell was the winner in the field of best application. MK Electric's 'enabled by EnOcean' Echo range of self-powered switches involves no wires, no batteries and no fuss. The benefits of the EnOcean technology combined with MK Electric's market leading wiring devices and accessories include almost instant switch installation; total location flexibility of light switches within buildings; and easy relocation, re-installation

and considerable cost-savings when 'churning' commercial spaces.

The important Mond Laboratory building at Cambridge University has become the first educational establishment in the UK to feature MK Electric's Echo range of self-powered, wireless and batteryless light switches. The constraints of working with listed buildings - such as the Mond - made MK Electric's Echo switches an ideal solution; as they obviate the need for chasing - or any wiring in the walls.

ENERGY-AUTONOMOUS PRESENCE DETECTOR FROM PEHA WINS DOUBLE AWARD AT M&E 2009

The EnOcean-enabled SENSOLUX system from PEHA was awarded in two categories – 'Best innovation in green product or service' and 'Best innovation in building services'.

For the 'Best innovation in green product or service' award judges were looking at products and services that have a significant effect on the environmental impact of a working building. The 'Best innovation in building services' award was open to exhibitors that have introduced an innovative product or service to the building services market within the last 12 months. Entries were required to display how their product provides a practical and sustainable solution for a building services issue.

The service-free and energy-autonomous SENSOLUX solar detector enables control of lighting according to demand and is governed by the presence of occupants. It registers the presence of persons, measures the momentary light level and then transmits the data wirelessly to a switching actuator capable of managing up to eight presence detectors and eight wireless switches. As soon as the last person has left a room the lights are turned off. Lights also go off once a specified level of daylight is reached. If desired, users can intervene at any time and set their preferred level of lighting manually. In addition to stand-alone applications, the SENSOLUX presence detector will integrate into building management on a number of different bus gateways.

This detector is based on EnOcean's STM 110 module which derives its energy from powerful indoor solar cells. It is batteryless meaning that no cables need to be laid, and it can be relocated in a matter of minutes with no troublesome dirt and dust or noise disturbance.

www.enocean-alliance.org/awards

ENOCEAN SOFTWARE ENGINEER WINS YOUNG RESEARCHER AWARD

Attila Strba, a software engineer at EnOcean, has won the BALTAZÁR FRANKOVIC YOUNG RESEARCHER AWARD of Budapest Institute of Technology for a paper on "Challenges in the development of an operating system for embedded wireless systems with autonomous power supply".

His award winning paper looked at the fundamentals of an embedded wireless system with energy harvesting before moving on to the special problems involved in the development of an operating system for applications of this kind.

Attila has worked as a software engineer at EnOcean since 2006. He graduated in engineering sciences from the Slovakian Technical University Bratislava, and is currently working for his PhD on the subject of software development for embedded wireless systems with autonomous power supply.

ENOCEAN ALLIANCE - IT´S ALL ABOUT SPEED!

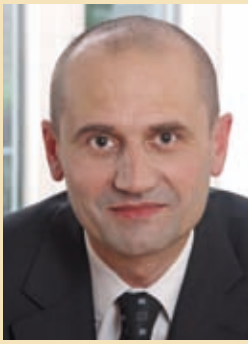
The EnOcean Alliance is now one of the advertising sponsors of US speed skater Catherine Raney-Norman who specializes in medium and long race distances. Catherine has won the US National Championships four times and holds two national records in 3000m and 5000m. She has represented USA in three Olympics - 1998, 2002 and 2006 - and is currently training for Vancouver 2010.

OUR NEW PEOPLE

WOLFGANG BIHLMAYR,
Application Engineer,
EnOcean GmbH

Since the beginning of March, 2009 Wolfgang Bihlmayr has been working at EnOcean GmbH as a technical specialist and customer contact in matters of the Dolphin platform, and supports the integration of Dolphin modules in custom applications. This covers circuit integration, the software development cycle with the associated development tools, plus system concepts such as Smart Acknowledge. Support is properly rounded off by the generation of customer documentation like application notes, and performance of training. Wolfgang has more than ten years' experience in microcontrollers and embedded software, both the user aspect in telecommunications and the chip designer aspect in the automotive sector.

e-mail: wolfgang.bihlmayr@enocean.com



KLAUS WELTSCH,
Head of Quality Management,
EnOcean GmbH

Klaus Weltsch has been the head of quality management at EnOcean GmbH since April 2009. He is the contact person for all inquiries concerning the QM system, responsible for assuring and constantly optimizing product quality and manufacturing processes. Klaus has more than 15 years' practical experience in quality management. He was previously quality manager for a leading manufacturer of innovative security technology. Klaus holds a degree in precision engineering.

e-mail: klaus.weltsch@enocean.com

ENOCEAN GOES SOCIAL MEDIA – DIALOG INSTEAD OF ONE-WAY COMMUNICATION

The social web is growing fast. Social networks like Twitter, XING or YouTube are at the focus of interest. Unlike traditional media, social media revolve around interaction and dialog. EnOcean is quite open-minded when it comes to social networks, and plays an active role in those relevant for the company. **Join in and become part of the EnOcean community:**

twitter is a social network, started in 2006, in which registered users can enter and publicize text messages of maximally 140 characters. Twitter is an easy-to-use realtime medium for presenting messages of private or business import. The medium serves both for exchanging information, thoughts and experience as well as for communication. EnOcean twitters at **www.twitter.com/enocean**

LinkedIn is a business-oriented social networking platform. The site also offers numerous community functions, such as searching for areas of interest, forums or specialized groupings. Persons interested in a particular topic meet in a LinkedIn group. A LinkedIn group serves primarily for exchanging shared interests. You can find EnOcean's LinkedIn group at **www.linkedin.com**

YouTube is easily the best known and most used platform for videos on the web. It is used not only by private persons but also by companies, politicians and their parties. You can find videos from EnOcean on our YouTube channel at **www.youtube.com/enocean**

The Haberjazzband celebrates its 30th anniversary with 150 friends and fans.

THE HABERJAZZBAND LOOKS BACK ON 30 YEARS

By Andreas Schneider, Executive VP and Co-founder, EnOcean GmbH - plays trumpet in the Haberjazzband

"Oh when the saints …", this traditional song, played so often, brought three pupils of Munich's Michaeli High School together in early 1979. It did not take long before other pupils were infected by their passion for jazz, and very soon a complete eight-man band took to the stage: clarinet, trumpet, saxophone, trombone, guitar, piano, bass and drums.

For 30 years now the band has been playing directed by Thomas Haberzeth, who gave the band its name. The repertoire includes oldtime jazz in two-beat rhythm, modern sounds from the swing era through to jazz numbers of the 1960s.

Together with its fans and friends the Haberjazzband celebrated its anniversary, close to where it all started off, in the Munich-Trudering Culture Center. In addition to the popular jazz renditions there was a photo gallery plus video documentation to illustrate the history of the band and what had become of its members. The schoolboys of 30 years ago have grown (up) with the band. Five of the original musicians are occasionally joined by professionals, some of whom are younger than the band itself. Jam sessions with all former musicians and helpers leave no doubt that jazz is an international language that people love to play and love to listen to.

Children of the band's members have taken to the stage in the meantime. Together with the Haberjazzband, five young girls and lads between seven and 18 years old swung into a tune at the jubilee celebration, an old familiar one that got the audience swinging with them: "Oh when the saints …".

www.haberjazzband.de
www.conti-bistro.de

After-work jazz. You can catch the Haberjazzband live, every first Wednesday of the month, in Munich's Conti-Bistro.

SUCCESSFUL ROADSHOW IN SWITZERLAND

A roadshow staged in Switzerland by EnOcean and its partners (Omnio, Boot Up, Carl Geisser AG, the Building Network Initiative and WAGO) was a resounding success. In seven cities the visitors had the opportunity of gathering information in full about batteryless wireless technology from EnOcean – both theory and practice – by way of a variety of examples. Each of the events commenced with a lecture on the fundamentals of EnOcean's energy harvesting wireless technology. This was followed by a presentation of system solutions and practical examples from individual partners. A guest speaker also attended every event to present a project on the subjects of green building and sustainability. Finally those attending were able to ask questions and discuss matters of interest in a discussion round.

EVENTS

NOVEMBER 2009

4 November:
Workshop on Energy Harvesting, Barcelona, Spain
EnOcean Alliance partner Nibblewave presents.

09/10 November:
EnOcean Alliance members meeting, Phoenix, AZ, USA

11-13 November:
GreenBuild Expo, Phoenix, AZ, USA
EnOcean Alliance partners are exhibiting at booth 5125.
www.greenbuildexpo.org

12 November:
Building Efficiency 2009, Frankfurt, Germany
EnOcean Alliance and partners are exhibiting.
www.gebaeudesysteme2009.de

JANUARY 2010

25-27 January:
AHR Expo 2010, Orlando, FL, USA
EnOcean Alliance and partners are exhibiting.
www.ahrexpo.com

FEBRUARY 2010

09-12 February:
Interclima 2010, Paris, France
EnOcean Alliance partners are exhibiting
www.interclimaelec.com

APRIL 2010

11-16 April:
Light & Building 2010, Frankfurt, Germany
EnOcean Alliance and partners are exhibiting.
www.light-building.messefrankfurt.com

MAI 2010

10-14 May:
Lightfair 2010, Las Vegas, NV, USA
EnOcean Alliance and partners are exhibiting.
www.lightfair.com

ENOCEAN TECHNOLOGY GATHERING SPEED IN SPAIN

By Michael Gartz, International Sales Manager, EnOcean GmbH

Nibblewave Electronics is a specialist for EnOcean modules plus EnOcean-enabled products on the Spanish and Portuguese markets. Nibblewave operates with professionals in their various sectors, with more than ten years' experience on the telecommunications market and as consultants for major lighting and building automation projects.

"We see tremendous potential ahead of us for EnOcean technology in Spain", says Pascual Castellanos of Nibblewave. "Because this innovative technology helps create solutions for smart green buildings whether new or modernized." Since early 2009 already, a number of Spanish companies have been developing products enabled by EnOcean technology, for example Intesis Software, Microcom and ISDE Ingenieria. Catalonian-based Intesis Software develops EnOcean-enabled products for climate control. Microcom has developed a GSM gateway with six digital inputs, one analog input and four digital outputs that evaluates data from EnOcean-enabled thermostats and motion detectors, and can send them wirelessly to EnOcean receivers. ISDE Ingenieria focuses on batteryless solutions with EnOcean wireless sensor technology for purposes of building automation.

POSITIVE PROSPECTS FOR PORTUGUESE MARKET

In addition to Spain, Nibblewave also serves customers in Portugal. Here, since January 2009, energy certification has been legally prescribed for all buildings. As a result, in the near future, improved energy efficiency will be a requirement in many buildings. "I'm convinced EnOcean technology is well set to establish itself on the Portuguese market for building automation", reckons Castellanos. "After all, without batteries and cables it's a cost-attractive solution to installation and operation."

Nibblewave is an associate member of the EnOcean Alliance.

www.enocean-alliance.org/nibblewave

Green. Smart. Wireless.
enocean®

AUSTRIA
Novatronic GmbH — **www.novatronic.at**
Marco Etzel — marco.etzel@novatronic.at

BELGIUM
Alcom electronics nv/sa — **www.alcom.be**
Nourdine Hammadi — nourdine.hammadi@alcom.be

BRAZIL
ASP Automação e Segurança Predial — **www.aspcontrol.com.br**
Oskar Pzillas — aspcontrol@aspcontrol.com.br

CANADA
Echoflex Solutions Inc. — **www.echoflexsolutions.com**
Shawn Pedersen — shawn_p@echoflexsolutions.com

CHINA/HONGKONG
Suffice Industrial Technology Ltd. — **www.suffice-group.com**
Dick Yiu — dick@suffice.com.hk

CZECH REPUBLIC
WM OCEAN s.r.o. — **www.wmocean.com**
Pavel Maruna — pavel.maruna@wmocean.com

DENMARK
Trident Avnet Nortec A/S — **www.avnet-embedded.eu/trident**
Morten Møller — morten.moller@avnet-embedded.eu

FRANCE
Pyrecap/Hycosys — **www.pyrecap.com**
Sylvaine Goeusse — pyrecap@pyrecap.com

GERMANY
MODULES & END-PRODUCTS
Unitronic AG — **www.unitronic.de**
Michael Braun — michael.braun@unitronic.de

PRODUCTS FOR INSTALLERS
Hagemeyer Deutschland — **www.hagemeyerce.com**
Richard Albrecht — richard.albrecht@hagemeyerce.de

END-PRODUCTS
abcshop24.de — **www.abcshop24.de**
Alexandros Chrissochou — shop@abcshop24.de

ISRAEL
Semix Engineering & Marketing Ltd. — **www.semix.co.il**
Beni Kovalsky — beni@semix.co.il

ITALY
Avnet Embedded Italy — **www.avnet-embedded.eu**
Fabio Norfo — fabio.norfo@avnet-embedded.eu

JAPAN
Moritani & Co., Ltd. — **sales.moritani.co.jp**
Tomotsugu Sakanashi — sakanashi.tomotsugu@moritani.co.jp

KAGA Electronics Co., Ltd. — **www.taxan.co.jp**
Keiichi Kijima — k_kijima@taxan.co.jp

KOREA
Woorin Inter-Corp Co., Ltd. — **www.woorin.com**
J.W. Kim — jwkim@woorin.com

NETHERLANDS
Alcom electronics bv — **www.alcom.nl**
Mark Korsloot — markk@alcom.nl

NORWAY
Trident Avnet Nortec A/S — **www.avnet-embedded.eu/trident**
Morten Møller — morten.moller@avnet-embedded.eu

POLAND
ACTE Sp. z o.o. — **www.acte.pl**
Marek Naumowicz — marek.naumowicz@acte.pl

RUSSIA
ATLAS Group — **www.atlasgroup.ru**
Konstantin Galenko — info@atlasgroup.ru

SINGAPORE
Acetone Solutions — **www.acetone-solutions.com**
Quentin Goh — sales@acetone-solutions.com

SLOVENIA
ELSYST d.o.o. — **www.elsyst.si**
Janez Mohoriã — elsyst@siol.net

SPAIN / PORTUGAL
Nibblewave Electronics S.L — **www.nibblewave.com**
Pascual Castellanos — info@nibblewave.com

SWEDEN
Trident Avnet Nortec AB — **www.avnet-embedded.eu/trident**
Björn Brenick — bjorn.brenick@avnet-embedded.eu

SWITZERLAND
Telion AG — **www.telion.ch**
Andre Spring — aspring@telion.ch

Secos GmbH — **www.secos.ch**
Beate Habiger — habiger@secos.ch

TURKEY
Ekom Ltd — **www.ekom-ltd.com**
Zafer Sahin — zafer.sahin@ekom-ltd.com

UNITED KINGDOM
MODULES
TDC – an Avnet Embedded Business — **www.tdc.co.uk**
Simon Taylor — web.sales@tdc.co.uk
also available at Farnell

END-PRODUCTS
EnOceanShop (UK) — **www.enoceanshop.co.uk**
Also available at RS Components and Farnell

USA
EnOcean Inc. — **www.enocean.com**
Jim O'Callaghan — jim.ocallaghan@enocean.com

Ad Hoc Electronics — **www.adhocelectronics.com**
Jan Finlinson — sales@adhocelectronics.com

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