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perpetuum®

MAINTENANCE-FREE WIRELESS SWITCHES & SENSORS

ISSUE

1

2009

ENERGY EFFICIENCY

EVERYTHING THERMO OR WHAT?
Actuators without cables and batteries

ECHOFLEX SOLUTIONS:
EnOcean goes Olympic

EnOcean technology in the **WORLD'S MOST ENERGY-EFFICIENT OFFICE BUILDING**

LEVITON introduces wireless lighting control solution

LIGHTFAIR
INTERNATIONAL
The future illuminated.
2009
EnOcean Alliance at Booth no. 215

thermokon ®
Sensortechnik GmbH

Easy operation – as simple as a smile.   » www.thermokon.de

**Wireless – no batteries – very reasonable:
EasySens® in combination with LON gateways**

› SR07P room sensor

The interoperable **EasySens system** makes your operation as easy as possible. Only one LON node is enough to evaluate up to 9 different wireless sensors and switches.
No complex wiring is needed any more. Thus, you are fully flexible with regard to your interior design.

› SR04PST room operating panel

» **Advantages at a glance:**

• wireless
• no batteries
• maintenance-free
• cost-effective
• interoperable

› Wireless switch

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PROMOTER

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technic & design

Dear readers,

We're currently facing three crises - the economy, the climate and energy. Although the last two have more or less disappeared from public attention since the world economic crisis has been with us.

Even if governments of virtually all major industrial nations have already launched massive schemes to stimulate their economies, or are in the process of doing so, one thing is certain: in the years ahead it will be necessary to save wherever possible. And this promises opportunities for our industry in particular.

Because with solutions that enhance energy efficiency in buildings we're right in tune with the times. Building automation is demonstrably a cost-effective approach to better energy efficiency. And self-powered wireless reduces the costs by a further 15 percent by doing away with the cabling of sensors.

Investments on a grand scale will certainly be contained in times of seeming uncertainty, and the number of new buildings will decrease. But the necessary renovations – no matter whether in housing or functional building – have to be carried out even in times of a crisis. And in renovation there's hardly a worthwhile alternative to wireless technology. Instead of all the effort of breaking open slits in walls, wireless EnOcean technology can be reliably installed in no time at all, and without dust and dirt. In times when every investment is carefully scrutinized, there won't be much deliberation about whether it's better to lay kilometers of cable through a building or self-powered wireless technology is preferable – needing no subsequent maintenance and service.

As you can see, there are enough arguments in favor of us and our industry. We can observe these developments both in our growing order book and in the positive response from customers. I'm certain that we, together with our 80 partners of the EnOcean Alliance, will emerge from this economic crisis on a very solid footing. Numerous joint projects in this issue illustrate the success of our innovative and energy-efficient solutions. For a close-up on the many possibilities of using the EnOcean wireless standard you can visit us at the Lightfair 2009 in New York.

Markus Brehler,
CEO, EnOcean GmbH

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EVERYTHING THERMO, OR WHAT?

The EnOcean standard continues to develop with the new Dolphin system architecture.

The juwi Group is a leading developer of wind, solar and bio energy plant projects.

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ENOCEAN TECHNOLOGY IN THE WORLD'S MOST ENERGY-EFFICIENT OFFICE BUILDING

ENOCEAN GOES OLYMPIC

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Flexible lighting controls adapt to severe floor plan changes and save building owners 70% of the installation cost.

LEVITON INTRODUCES NEW WIRELESS LIGHTING CONTROL SOLUTION

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ENOCEAN AT A GLANCE

EnOcean GmbH is the originator of innovative self-powered wireless sensor technology. Headquartered in Oberhaching near Munich (Germany), the company manufactures and markets maintenance-free wireless sensor solutions for use in buildings and industrial installations. There are already wireless components in use in more than 100,000 buildings. EnOcean has received a number of awards in recent years – for example "Technology Pioneer 2006" of the World Economic Forum, the "Batimat 2007 Innovation Award" in bronze and the Elektra awards 2008: "Wireless & Telecoms Design" and "Company of the Year".

By Andreas Schneider, Executive VP and Founder, EnOcean GmbH

GREEN

The basic idea behind the innovative technology stems from a simple observation: where sensors capture measured values, the energy state constantly changes. When a switch is pressed, the temperature alters or the luminance level varies. Such operations generate enough energy to transmit wireless signals. EnOcean uses the energy from our surroundings (linear motion/ pressure, light, differences in temperature, rotation and vibration) to detect information and then transmit it wirelessly by short-range radio – entirely without batteries. Wireless switches, for instance, use the energy produced by being operated to send a telegram when they are pressed and released. Receivers interpret the signal and can then turn lights on and off or dim them.

SMART

EnOcean is a system that optimally joins a number of components: topologies of wireless sensor networks, energy management, software concept and a sensor link. Each wireless node possesses its own local processor, which captures measured data for example, controls energy management and wireless transmission, and can make its own decisions. EnOcean wireless modules are always supplied with software, programmed either so that no modifications are necessary, or offering sufficient scope for application-specific design. Wireless sensor modules from EnOcean are also very simply integrated into a large number of different sensors.

WIRELESS

The EnOcean wireless signal uses the 868 MHz and 315 MHz frequency bands, making it suitable for use worldwide. Telegrams are just one millisecond in duration, and are transmitted at a rate of 125 kilobits per second. Plus, to eliminate transmission errors, a telegram is repeated twice in the space of 30 milliseconds. Data packets are transmitted at random intervals, so the probability of collision is extremely small. The range of EnOcean wireless sensors is about 300 meters in the open and up to 30 meters inside buildings. Each EnOcean module comes with a unique 32-bit identification number to exclude any possibility of overlap with other wireless switches.

INTEROPERABLE WIRELESS STANDARD

All EnOcean modules are simply integrated by OEMs in their end-products. And the systems of different manufacturers are fully interoperable with one another. So combining switches, sensors and gateways from any OEMs is quite straightforward. The EnOcean Alliance was founded in early 2008 to establish innovative automation solutions for sustainable buildings – and so to make buildings more energy-efficient, more flexible and lower in cost. EnOcean GmbH is one of the seven promoters of the EnOcean Alliance.

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www.enocean-alliance.org

EVERYTHING THERMO OR WHAT?

ENOCEAN ALSO GETS ACTUATORS TO WORK WITHOUT CABLES AND BATTERIES

The EnOcean standard continues to develop with the new Dolphin system architecture.
Now it is also possible to implement actuators without the need for cables and batteries.

By Armin Anders, VP Product Marketing and Founder , EnOcean GmbH

Temperature differences contain a lot of energy. Just the cooling of a drop of water by 1 degree Celsius releases energy for about 20,000 EnOcean wireless telegrams. That is enough to operate both the wireless and the actuator technology. The energy is delivered by thermogenerators.

Reducing average room temperature is one of the most effective ways to save heating energy. According to figures from the Bremer Energie Institut, energy consumption can be cut by some 20 to 30 percent if a system reduces heating temperature as a function of time, place and human presence. For this purpose there are socalled single room thermostats that can regulate the temperature of the air in different rooms from a central point according to different time and temperature presettings.

WIRELESSLY CONTROLLED HEATING VALVE WITHOUT BATTERIES

Remotely controlled heating valves generally need a cable on which the controlled power supply is fed to their motor actuator. But wireless solutions are also possible. Control is by radio signals, and power is supplied by batteries. A heating valve takes a relatively large amount of energy to adjust the temperature. With the result that batteries have to be replaced every year. That is not only bothersome and costly, it is also a burden on the environment.

The alternative is batteryless or self-powered wireless solutions. Meaning that the energy needed is derived from the process itself or the environment. This is made possible by a Peltier element, an electronic component that generates electric current when there is a difference in temperature between its two sides. This is the basis on which EnOcean created a concept demonstrator (photo, page 8).

ENERGY OBTAINED FROM TEMPERATURE DIFFERENCE

The low-cost Peltier element that is used here consists of two square ceramic plates with an edge length of 15 mm and 4 mm apart. Attached between them are special metal junctions. One side is fitted to the radiator or the heater pipe. The other side requires a heatsink that is cooled by the ambient air.

A simple principle, but one that nevertheless presents a problem. The voltage of the thermoelement is very small, only about 12 mV per degree of temperature difference. And the generated power of the Peltier element is also low at about 400 µW per 5 degrees of temperature difference. So the output voltage first has to be transformed up to a few volts, and then the relatively small amounts of energy have to be collected in a capacitor. The EnOcean circuit will already work upwards of 20 mV thermovoltage. This means that a temperature difference of about 2 degrees and more on the Peltier element will enable it to function. An electronic contact cuts in the actuator

Temperature difference on Peltier element
Temperature difference from surroundings (with heatsink)
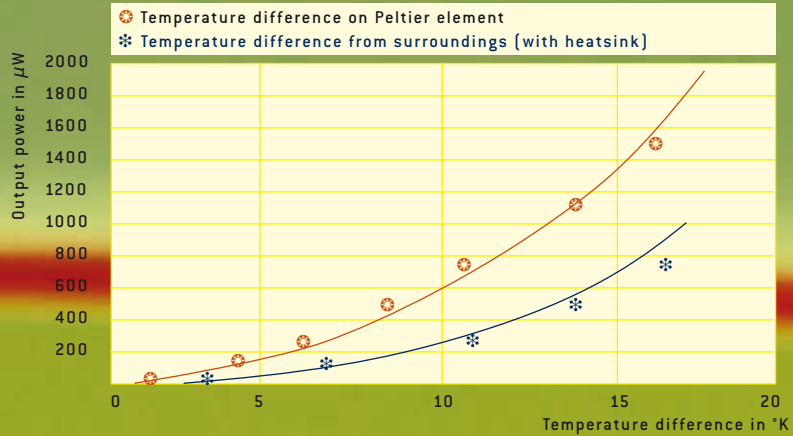
Output power of DC/DC transformer
vs temperature difference

as soon as sufficient energy is collected. The energy needed to operate the actuator is the product of power and time. So it is only necessary to wait long enough to generate sufficient energy. The energy requirement of the load must consequently be kept as low as possible to produce small control time constants.

Concept demonstrator of a wirelessly controlled heating valve powered by the radiator temperature instead of batteries.
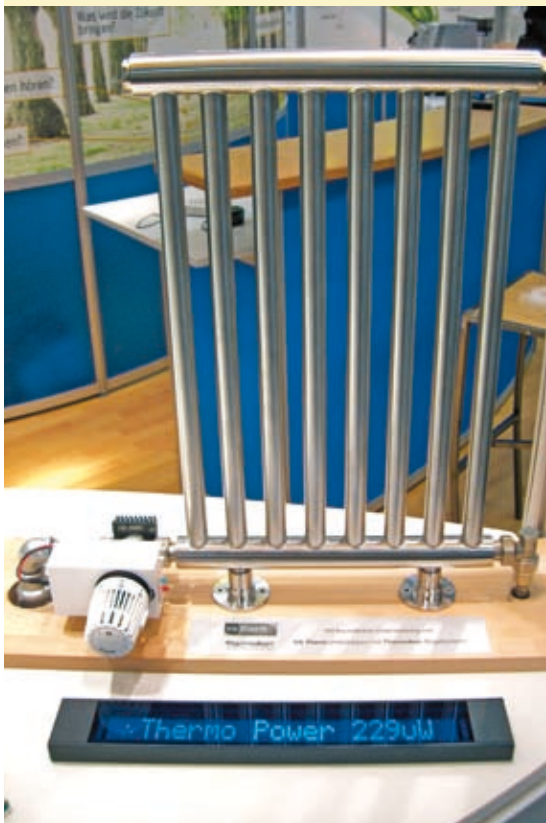
ULTRA-LOW-POWER BIDIRECTIONAL COMMUNICATION

The load consists of the motor actuator for valve control on the one hand plus the electronic circuitry to receive the control signals and drive the motor. Both the motor and the wireless receiver require a relatively large amount of energy in operation. EnOcean technology resolves this by operating the "energy-hungry" components for only a very short average time and otherwise consistently shutting them down. A permanently running wake-up timer is of ultra-low-power design. This only wakes the processor from time to time. On demand the valve is speedily adjusted, and then the actuator returns to its energy-economizing sleep for a certain time. The overall energy requirement of this actuator is minimal as long as the sleep phases are substantially dominant as a function of average time.

ENERGY BALANCE OF ENERGY-AUTONOMOUS HEATING VALVE

The following rough calculation of the energy balance illustrates the potential of the approach presented here. It should be remembered that this calculation is based on a technical example of implementation that can be matched to the details of an application and thus optimized:

A) THERMOGENERATOR

The power produced by the thermogenerator depends firstly very much on the temperature difference on the Peltier element and thus on the volume of the heatsink that is used. Secondly, the efficiency of the voltage transformer is very decisive. In the meantime EnOcean has been able to optimize this to about 30 percent. The result is output power as a function of temperature as shown in the graphic (page 8 top). For further calculation

an approximate value of 100 µW for 7 degrees temperature difference from the surroundings will be taken as the order of magnitude of the average generated power.

B) WAKE-UP TIMER AND WIRELESS COMMUNICATION

The EnOcean wake-up timer has a permanent requirement of about 100 nA at 3 V, in other words some 0.3 µW, which is negligible. The microcontroller and the wireless receiver are waked about every 2 minutes to send and receive a telegram. This takes about 10 ms, the current drain is about 20 mA. On average communication will consequently require some 5 µW (3 V x 20 mA x 10 ms/120 s).

C) MOTOR ACTUATOR

A typical low-cost actuator with two 1.5-V batteries takes about 3 seconds to run down from normal operation – for an average current drain of 120 mA. So a typical rundown operation requires some 1.1 Ws (2 x 1.5 V x 120 mA x 3 s). Assuming a mean number of four setting operations per day, that means about 51 µW (4 x 1.1 Ws/24 h).

RESTARTING AFTER A SUMMER BREAK

During a break in operation the radiator assumes the temperature of its surroundings and the energy source extinguishes. To bridge a shortish period, the energy needed to start can be stored in a capacitor during the active operating phase.
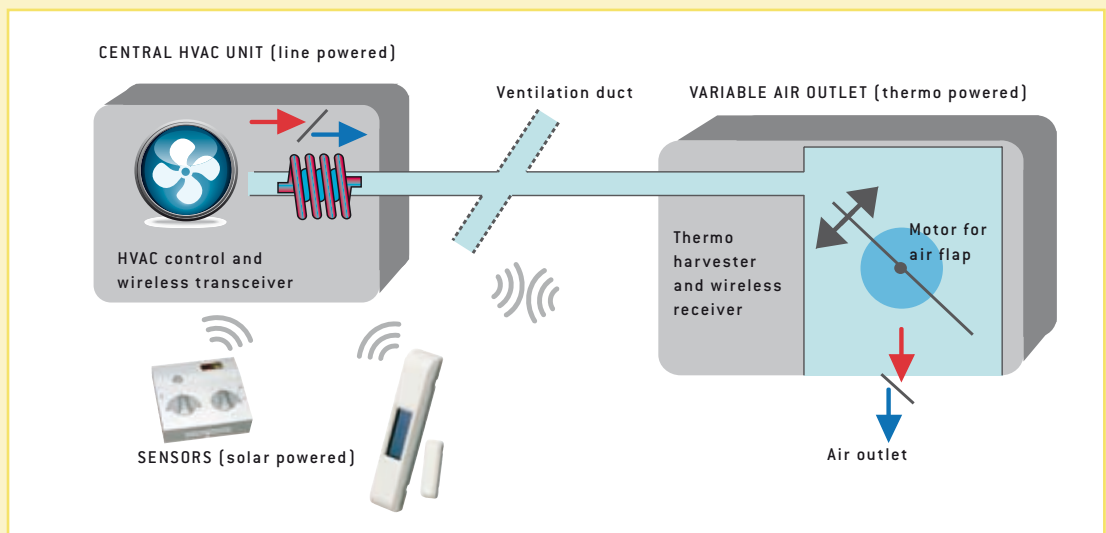
Air-conditioning with thermo powered air flap control

For energy reasons it is best not to operate the single valves in a three-step mode but to drive them about one operating point. In this way the valves can be corrected according to the need for control and the available energy.

Then, during a break in operation of the complete installation, the heating valves are not closed but instead the central circulating pump is shut down. But this also means that a single valve cannot be fully closed by a central command. Complete turn-off of a single radiator has to be performed manually – as does turning it on again.

AIR-CONDITIONING PLANT: COMPARABLE PRODUCTION OF ENERGY

What has been said up to now can also be applied to air-conditioning plant and/or mixed systems. In general the thermogenerator requires a temperature difference to produce energy. For cold the voltage polarity is simply reversed. An appropriate polarity reversal circuit for alternating cold/warm operation is currently being developed.

If a ventilating flap is to be driven instead of the fluid valve (diagram, page 9), the process of obtaining energy and control can be very similar. For a ventilating flap on the ceiling the light is also a good energy source.

FURTHER USES OF THERMO POWERED SENSORS

In building engineering there are possibilities for the use of thermo powered sensors in heating, air-conditioning and ventilation, in plumbing or in heating cost allocators and heating meters. A variety of interesting industrial applications can also be envisaged, for instance temperature or early failure monitoring.

www.enocean.com

ECT 100 THERMO EVALUATION KIT

What has been spoken of here is a concept study. The energy balance is positive and the technical feasibility is proven. For further system evaluation EnOcean is offering the ECT 100 thermokit. This is a test kit containing all components needed to evaluate the thermal converter: ECT 100 DC/DC transformer, two Peltier elements, a heatsink, a sensor evaluation board with STM 110 wireless module, and an evaluation board with RCM 120 wireless receiver module. Full documentation and software are also enclosed.

HEATING SYSTEMS – INNOVATIVE TECHNOLOGIES GAIN GROUND

The variety of possibilities for implementing EnOcean technology is constantly increasing.

By Thomas Köthke, Sales Building Automation, EnOcean GmbH

For a number of years EnOcean has already been a standard option for automation in every kind of office – business and administrative – and in housing. In the meantime there are more than 100 manufacturers worldwide in the sectors electronics, instrumentation and control offering products enabled by EnOcean's wireless technology – for example Eltako, Wago, Siemens, Kieback&Peter, Thermokon and Omnio.

Tried and tested technology from EnOcean has now also attracted attention from other sectors such as heating. Modern heating installations are becoming increasingly complex, which is why manufacturers are interested in new solutions and technologies. Furthermore there has been a marked increase in the variety of heating systems, competing with the traditional oil and gas burners that used to dominate the market. In the face of soaring prices for fossil fuels, heating systems that work on renewable fuels, for instance solar systems, heat pumps or a combination of these technologies, are very much in vogue.

POWERFUL TECHNOLOGIES FOR COMPLEX INSTALLATIONS

The more complex an installation, the more information it takes to control it. This is where innovative EnOcean wireless technology demonstrates its many advantages. The self-powered wireless sensors not only enable control and metering of temperature in very different areas,

they can also receive disturbance signals from the many pumps for example. What is more, information can be transmitted wirelessly to the heating regulator or programmer – without batteries and with no need for maintenance or servicing.

The new Dolphin platform from EnOcean shows the way to extra possibilities in this segment. A follow-on development by EnOcean technology for self-powered wireless sensors, its modular structure enables straightforward implementation of powerful networks. It ushers in the use of energy-autonomous and bidirectional wireless sensors and actuators. Central components are the Dolphin-based STM 300 and TCM 300 modules, which are simply integrated in heating regulators. The Dolphin platform is also conceived for ease of communication with ready existing EnOcean sensors implemented by different manufacturers.

Based on STM 300 and TCM 300 modules it is possible to develop sensors and actuators that transmit a whole variety of information – for instance temperature, humidity, presence, window open/closed or disturbances – to a controlling system or other building automation systems.

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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 200 – 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 100 – ENERGY CONVERTER FOR LINEAR MOVEMENT

▸ Qualified for powering PTM 230
▸ Voltage approx. 5 V at 19 µF
▸ Dimensions 33 x 22 x 11 mm

▸ Actuating travel approx. 2 mm
▸ Actuating force approx. 2 N

ECO 200 – ENERGY CONVERTER FOR LINEAR MOVEMENT

COMING IN AUGUST 2009

▸ 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
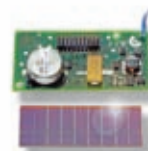
RECEIVER AND TRANSCEIVER MODULES

RCM 110/120/130/140/150 – 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

- 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

- 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 (RCM 250)/110 V (RCM 255) 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 taught. 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 100 EVALUATION KIT TEST BOARD

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

Developer kit for fast implementation of EnOcean TCM 300/320 and STM 300 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 adopting FCC specification.
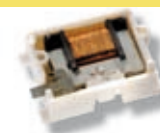
TRANSMITTER MODULES

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 Q4/2009

- 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 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

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 300C

COMING IN Q4/2009

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

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.

INTEGRATING ENOCEAN STM 110 WIRELESS SENSOR MODULE WITH MINIATURE SOLAR CELL

STM 110 is intended as a service-free wireless module to transmit a variety of sensor data. It can be powered by a solar cell, just 13 x 35 mm in size, that is supplied with it. An integrated energy accumulator ensures full functionality of the module even after a number of days of complete darkness.

By Armin Anders, VP Product Marketing and Founder, EnOcean GmbH

All major functions of the self-powered wireless sensor, i.e. A/D converter, microcontroller, transmitter, antenna and energy management, are ready incorporated in the module. That allows simple implementation of service-free wireless sensors such as temperature and humidity sensors for HVAC control, brightness and motion sensors for lighting control, of window and door contacts to detect whether they are open or closed and to lock them, as well as industrial sensors for temperature and position.

Energy balance determines for which wireless sensors the STM 100 module is suited. Basically all sensor elements are suitable for use with energy-autonomous systems that can be operated in very short measurement intervals. A typical figure is a measurement duration of

2.5 ms with a measuring current of 1 mA. At a voltage of 3 V the total energy requirement per measurement is consequently < 10 µWs. About 110 µWs are needed to send an EnOcean wireless telegram. To minimize the energy consumption of the system therefore, not every measurement should be transmitted. The solar cell produces approx. 20 µW at 400 lx during its illumination phase. That makes it possible to create sensors with STM 110 that – for average measurement cycles in the range of seconds and average transmission cycles of the order of minutes – are capable of working autonomously up to 60 hours in total darkness. The product handbook contains details of calculating energy balance.

FUNCTIONAL DESCRIPTION OF STM 110 WIRELESS SENSOR MODULE

The STM 110 module features three sensor inputs that can be wired with analog measurement sensors or potentiometers as setpoint encoders. Plus there are four digital inputs to detect circuit states.

The core of STM 110 is an ultra-low-power timer switch that manages with a quiescent current of only about 100 nA. The current drawn by the timer is important because it is the only component that is constantly in operation. This integrated timer performs a periodic wake-up of the module. All sensor inputs are then evaluated and further processed in the microprocessor of the wireless
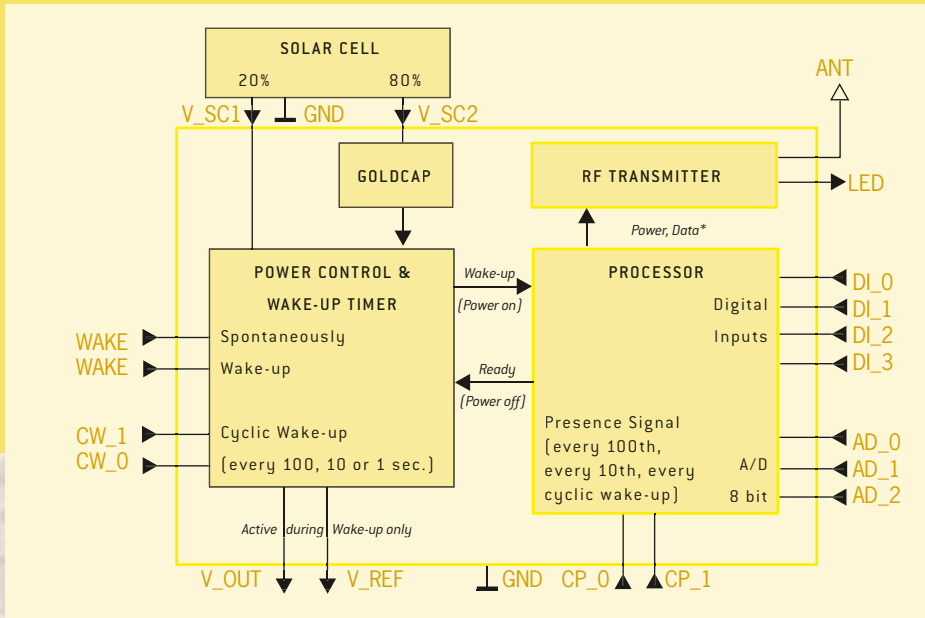
Circuit schematic of STM 110 wireless sensor module

module. If the measured values have altered, a configured time has elapsed or if an external wake-up signal orders immediate measurement and transmission, these values are sent together with the 32-bit sensor identification.

DEVICE CODING AND PROFILE STANDARDIZATION

Each sensor has its own unique 32-bit identification that is transmitted with each telegram. In addition, further information can be stored in the module for system functionality, for instance a manufacturer and a device code in the form of a sensor profile for a "room control unit". To keep telegrams as short as possible, this device code is not sent with each of them. As part of the EnOcean Alliance, a socalled learning telegram was defined that sends the device and manufacturer code together with the transmission identification instead of the momentary measured data. The receiver can record this information during the allocation process, and later recall the particular device and manufacturer data at any time in its memory using the known identification.

The profile definition for very different kinds of sensor in building automation ensures, for the future, the desired compatibility and interoperability of sensors, actuators and gateways from a variety of manufacturers.

DEVELOPMENT SUPPORT WITH EVA 120 EVALUATION KIT

The EVA 120 evaluation kit enables designers to implement STM 110 sensor modules fast and to develop application-specific wireless sensor products. The kit contains an evaluation board with PC interface and STM 110 module. Its major features include simple powering of STM 110 by a solar cell, batteries or other current sources, buttons and optocoupler inputs for immediate wake-up, buttons to trigger a learning telegram, LEDs to indicate accomplished telegram transmission, plus an RS232 or USB interface for direct measured value evaluation by PC and for module configuration by other means.

Enabled by EnOcean – products based on STM 110 wireless sensor module clockwise from top left: room sensor, motion/brightness sensor, outside brightness sensor and outside temperature sensor; and bottom right: window contact
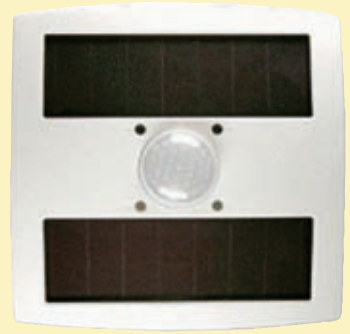
SUMMARIZING

STM 110 is a multifunctional and energy-autonomous wireless sensor system that supports many applications in creating energy-efficient buildings. The integrated solar cell, sophisticated energy management and reliable, energy-optimized wireless transmission enable service-free solutions that only require daylight to power them. EnOcean offers the EVA 120 evaluation kit and its competent application support for simple and speedy development of batteryless wireless sensors.

www.enocean.com

APPLICATION NOTES

For the latest application notes visit **www.enocean.com/application-notes**

A number of new application notes have appeared in the past few months, just in time for Lightfair 2009 in New York.

TURNING ON THE LIGHT WITH THE DOOR HANDLE

Stefan Schmechel, a product design student, is already developing control tools of a new generation.

By Thomas Köthke, Sales Building Automation, EnOcean GmbH

We have probably all been in the same situation at some time or other. You come into a room and have to start fumbling for the light switch. That could all soon be a thing of the past – thanks to a new kind of door handle.

26-year-old student Stefan Schmechel of Potsdam University of Applied Sciences started thinking about it and promptly developed a new generation of light tool called switch 2.1. This is a light control that for the first time unites the functions of door handle and light switch in one product. Pressing a button integrated in the door handle automatically turns on the light in the room you are entering by means of a flush-mounted receiver or receptacle outlet adapter.

EASY ON THE PURSE STRINGS AND THE ENVIRONMENT TOO

By the single operation of a master door handle, usually inside the door to a house or apartment, it is also possible to turn off every powered device when you leave. Turning off these devices, a cooker or iron for example, is not only a safety enhancement, it also reduces your electricity bill. Because devices on standby can consume a very large amount of power.

SMART PRODUCTS NEED SMART TECHNOLOGIES

Switch 2.1 is based on energy-autonomous wireless technology from EnOcean. The energy generated by operating the button is enough to send the wireless telegram. In other words EnOcean technology is self-powered, dispensing entirely with any battery disposal. The installation effort is also minimal because no cables need to be attached and routed.

ENOCEAN SUPPORTS INNOVATIVE IDEAS

EnOcean supported the product design student in full by providing the necessary components and offering its specialized consulting. EnOcean also created contact with its cooperating partners, such as Unitronic and Omnio, who supported the student in manufacturing the prototypes.

Switch 2.1 was awarded the first prize at the belektro 2008 exhibition. Stefan Schmechel's concept also won him third place in the Designpreis Brandenburg 2008.

www.enocean-alliance.org/switch21
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MK ELECTRIC'S ECHO LEAVES NARY A MARK ON THE MOND

Mond laboratory building at Cambridge University features MK Electric's wireless and batteryless light switches.

By Joanne Reynolds, Senior Marketing Communications Manager, MK Electric

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 wireless and batteryless light switches. The Grade II rotunda-based building was designed in the early 1930s by architect HC Hughes as a laboratory for the Russian Nobel Prize winner Leonidovich Kapitza; and is one of the best examples of Modernist architecture in Cambridge. It notably features a plaque of nuclear physicist and building sponsor Ernest Rutherford; and a crocodile carved into the external brickwork, both by the controversial Arts & Crafts sculptor Eric Gill.

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 walls. Echo – enabled by EnOcean – is a range of self-powered switches that are entirely wireless and batteryfree: MK being the first major UK manufacturer to incorporate this technology into switches. The benefits include almost instant switch installation; total location flexibility of light switches within buildings; and easy relocation, re-installation and considerable cost-savings when 'churning' spaces.

The Echo lighting system essentially comprises two components: the self-powered switch, and an RF receiver.

The receiver is installed at the lighting fixture and wired into the lighting circuit at the time of ceiling installation. The switch is then mounted, using either adhesive pads, for super-fast fixing or onto awkward surfaces like marble or glass, or with screws if additional security is necessary.

The switch is simply 'aligned' to the receiver by setting it into learn mode and pressing the rocker. The switch is now wirelessly dedicated to the fixture in question. One receiver can be programmed so it can be operated by up to 30 switches; while, conversely, any number of receivers can be activated by a single switch. Where signals may be obstructed by impervious materials such as granite or steel, repeater units are available which will divert and/ or extend transmissions around a building.

On Cambridge University's New Museums site, the Mond was subject to an extensive refurbishment in 2007. The most recent works – involving Echo – were in respect of re-arranging light fittings within a library space. The contractor was P A Collacott & Co of Cambridge; and the consulting engineer was K J Tait.

www.enocean-alliance.org/mkelectric

BSC Computer GmbH is a long-standing advocate of EnOcean wireless technology in the development of components for household automation – also when it came to automating its own corporate headquarters in Allendorf, north Hesse. The solution included window handles from HOPPE based on EnOcean wireless. The status of all sensors is visualized by BSC BoSe software on a touch panel and by a client at each workstation. BSC BoSe is also able to control all other devices, for example lights, the entire data processing installation and other loads such as coffee makers or copiers. Putting the controller PC on the internet means that all functions can be queried and controlled remotely, by SMS or e-mail.

By Patrick Mause, Software Development Manager, BSC Computer GmbH

MOBILE PHONE AS GENERAL-PURPOSE REMOTE CONTROL IN BUILDING AUTOMATION

BSC automates its own corporate headquarters with EnOcean wireless technology.

BSC BoSeMobile, a client for conventional mobile phones, enables all supervisory and controlling functions to be performed from a cellphone. Also connected to the BoSe system are IP cameras. In this way not only single shots are transmitted but also complete live video streams – by UMTS/GPRS. Access to the system requires authorization, and is protected by a key.

Lighting, heating and ventilation are governed by a step 7 controller from Siemens, connected to EnOcean components. Building automation is linked on a BSC BAP (IP gateway) to the S7. All these components are controlled by the BSC software, even the alarm system.

CLASSIC UNIDIRECTIONAL WIRELESS TRANSMISSION

The use of an air/heat pump with appropriate insulation together with the new controller cut energy costs in the corporate building of BSC by about 80 percent. The investment of some 35,000 euros pays back after just four years given such a saving.

"Building automation has not only added to our comfort, convenience and security, at the same time it's reduced energy needs and done something for the environment – by cutting out standby devices for instance", says Jörg Hofmann, managing director of BSC.

**www.enocean-alliance.org/embedded-intelligence**
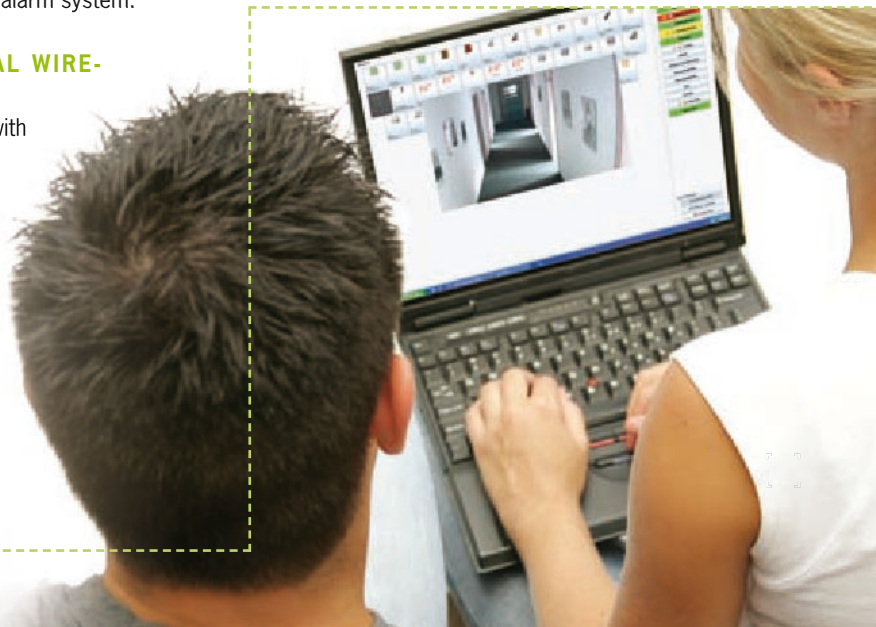
BATTERYLESS MEETS WIRED –
THERMOKON COMBINES LON AND ENOCEAN TO EXPAND CORPORATE HEADQUARTERS

By Frank Neudecker, Export Manager, Thermokon Sensortechnik GmbH and Vice Chairman Europe, EnOcean Alliance Inc.

EnOcean technology is in the meantime well established as a standard worldwide. EnOcean Alliance promoter Thermokon already recognized the potential of the technology a number of years back and commenced its first product developments. For the ongoing expansion of its own corporate headquarters Thermokon also opted for the advantages of EnOcean – combining them with LON. Because the two technologies are an optimal match. LON is the leading wired technology in intelligent building systems control with some one hundred million installations already implemented. While EnOcean leads the field worldwide in wireless-based automation technology with more than 500,000 installations to its credit.

ROOM RECONFIGURATION ANY TIME WITHOUT PROHIBITIVE CABLING COSTS

Four EasySens/LON gateways were installed in the corridors of the company building. Each communicates with a number of offices, all featuring room temperature sensors, switches to control lighting and blinds, window contacts to monitor the status of balcony doors plus multisensors to detect motion and brightness. Wireless components are installed in a number of areas: in the reception, in the kitchen, in the conference and common room, in the technical sectors and in six offices.
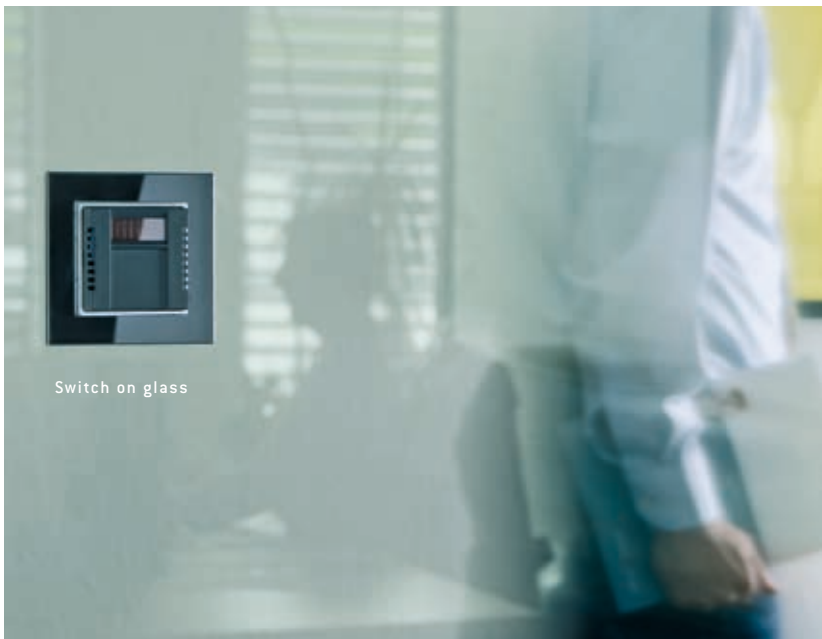
Switch on glass

Floor plan illustrating use of EasySens in building

The installation illustrates the seamless interaction of cabled LON sensors with EnOcean-based EasySens wireless components. The EasySens gateways are located above the suspended ceiling in the corridors. Apart from 230-V power outlets and the computer network, installed in recessed floor tanks, the offices are cableless. So changes in room configuration are possible any time without the expense of recabling.

AUTOMATED HEATING AND LIGHTING PROCESSES

The working of the heating and lighting in the individual offices is automated. As soon as the wired LON multisensors detect motion in an office, lighting is turned on. Either the entire lighting is turned on or single lamps, depending on ambient brightness. The setpoint of the heating, controlled by the signal of the motion detector, is ramped up from standby to normal mode when a balcony door is closed. The heating valves are controlled by Thermokon LON I/O modules that communicate with the wireless room temperature sensors and window contacts. With the availability of the new STC65-FTT bidirectional LON gateway the outside blinds, lighting and heating valves will also be wirelessly controlled by I/O modules. At present the outside blinds are still controlled manually. Further automation is planned in the form of a weather station.

www.enocean-alliance.org/thermokon

Switch on glass

ENOCEAN TECHNOLOGY IN THE WORLD'S MOST ENERGY-EFFICIENT OFFICE BUILDING

The juwi Group is a leading developer of wind, solar and bio energy plant projects. Its newly built corporate headquarters in Wörrstadt, Rhine Hesse is considered to be the world's most energy-efficient office building. The building complex was awarded the German Climate Protection Prize 2008 of the German Environment Aid. The technoLink® system from Kieback&Peter, enabled by EnOcean technology, is implemented to ensure comfort and energy efficiency.

By Hermann Josef Pilgram, TEMA Technologie Marketing AG
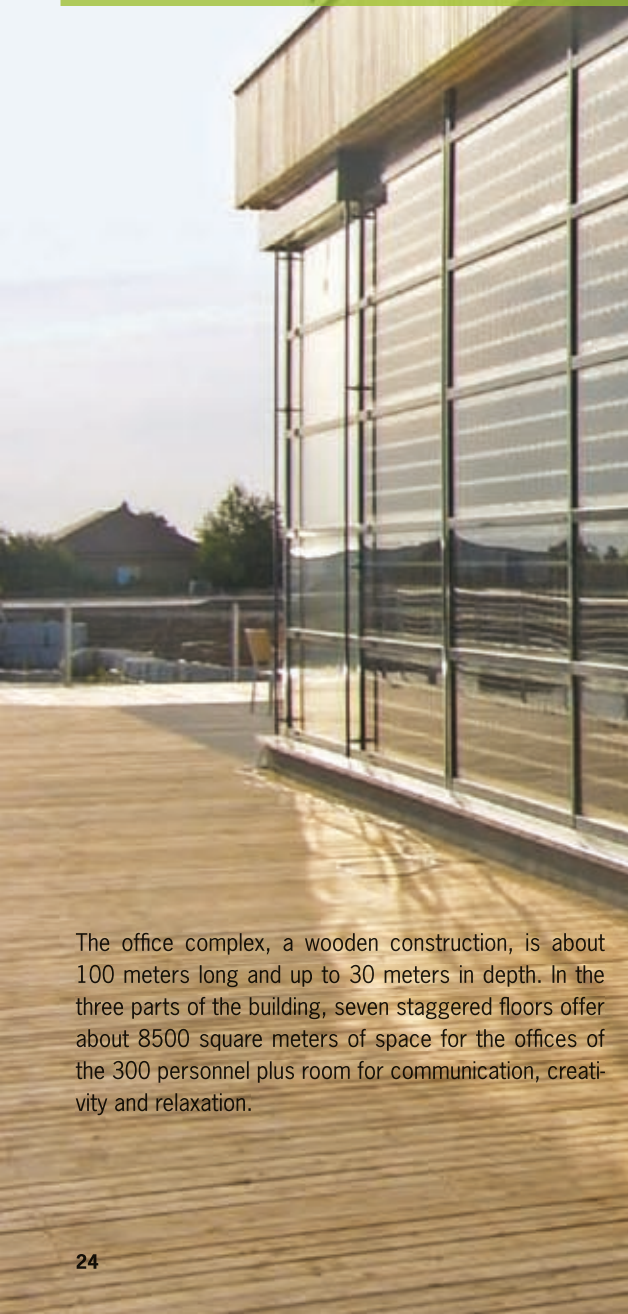
ENERGY EFFICIENCY AND SUSTAINABILITY

The architecture, fittings and operation of the building are fully attuned to energy efficiency and sustainability. The aim is to generate more energy in the building in the course of a year than is consumed in it. The entire requirement – for electricity, heating and cooling – is produced on the spot from regenerative energy. 2100 square meters of photovoltaic modules deliver about 220,000 kilowatt-hours annually. A solar thermal plant, a pellets burner and three cogenerating stations with Stirling engines produce the necessary heat. Cooling is through the underfloor heating. The ventilation has a heat recovery rate of 80 to 90 percent. The entire energy generation and consumption of the building are constantly monitored by an energy management system.

The office complex, a wooden construction, is about 100 meters long and up to 30 meters in depth. In the three parts of the building, seven staggered floors offer about 8500 square meters of space for the offices of the 300 personnel plus room for communication, creativity and relaxation.

Room temperature sensor TCF22

ROOM AUTOMATION WITH ENOCEAN WIRE-LESS TECHNOLOGY AND TECHNOLINK®

What is important for energy efficiency and comfort is the control of room temperature and air-conditioning in the office building. The technoLink® system from Kieback&Peter, based on EnOcean wireless technology, was installed for this purpose. Some 200 room temperature sensors of the type TCF22 and TC22 communicate wirelessly with the FBR03-FTL room controllers, which regulate the underfloor heating by more than 600 thermal actuators.

Four DDC3002 automation stations from Kieback&Peter administer the data of the FBR room controllers. These also control the cooling and the RLT systems for the kitchen.

INTEGRATION IN NEUTRINO-GLT

The automation system is centrally operated and monitored by the Neutrino-GLT building systems control from Kieback&Peter. The GLT can regulate the temperature for each part of the building by a weekly program. Fault messages are also indicated on the GLT. The data of the weather station on the roof are administered by the GLT and forwarded to the autonomous lighting and blinds control.

www.enocean-alliance.org/kieback-peter

The Swiss cooperative Gleis 70 opted for the wireless system from Omnio when it decided to renovate a commercial property in Zurich that is at the same time the headquarters of the cooperative.

TURNING OLD INTO NEW – SIMPLE BUILDING RENOVATION WITH PRODUCTS FROM OMNIO

By Christian Genter, Managing Director, Omnio AG

The increasing price of energy has an immediate impact on the costs of operating an office building. As a rule you can even say that energy consumption accounts for half of the costs. Which is why you find more and more owners and users of commercial property searching for suitable solutions that will enable them to reduce such costs.

The constant increase in operating costs, especially for heating the building, was the main reason why the Swiss cooperative decided to renovate its own headquarters. The outer façade, the windows and the blinds of the more than 50-year-old building were fully renewed. After a brief consulting phase the architect and the electrical facilities designer chose to implement the RATIO wireless system from Omnio.

NO NOISE AND RUBBLE

The challenge was to plan and carry out the renovation so that businesses using the building were not disturbed while work was in progress. Consequently a makeshift wooden façade was first erected on the interior, the outer façade was broken down, and the new outer façade was built up in modular stages. The new system for controlling the blinds was also to be flexible. This meant that any reconfiguration of the rooms was to be possible without altering the installation. To reduce heating costs, it was to be possible to raise and lower the blinds floor by floor and in the entire building timed by a switch.

For local control a flush-mounted actuator with the appropriate wall transmitter for single and group control was installed for each set of blinds. A cable was laid in the riser zone so that the entire building can be wirelessly controlled. Connected to this cable on each floor is a pushbutton interface with two binary inputs: IN1 for the central manual switch and IN2 for the timer. If a change is detected on one of these two inputs, an appropriate wireless telegram "Up" or "Down" is immediately sent.

Corridor with cable route
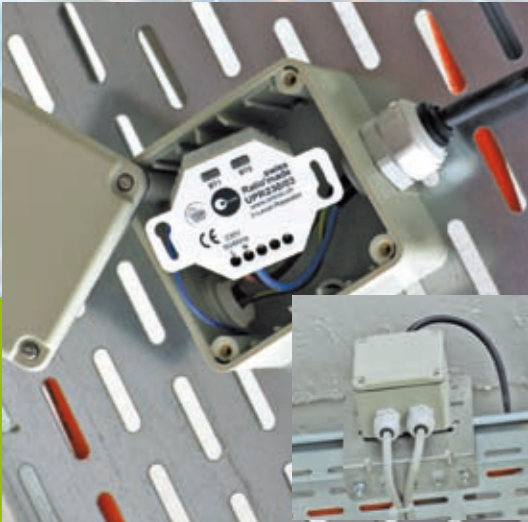
Top:
repeater in socket

Insert:
socket with integrated pushbutton interface

Below:
socket for blinds at window edge

teached into the actuators at Omnio. The entire startup consequently only took half a working day.

The RATIO wireless bus is a complete system for apartments, homes and commercial buildings that enables energy-efficient, flexible and sustainable electrical installation.

For efficient and straightforward startup on the job, the ID numbers of the pushbutton interfaces were ready

www.enocean-alliance.org/omnio

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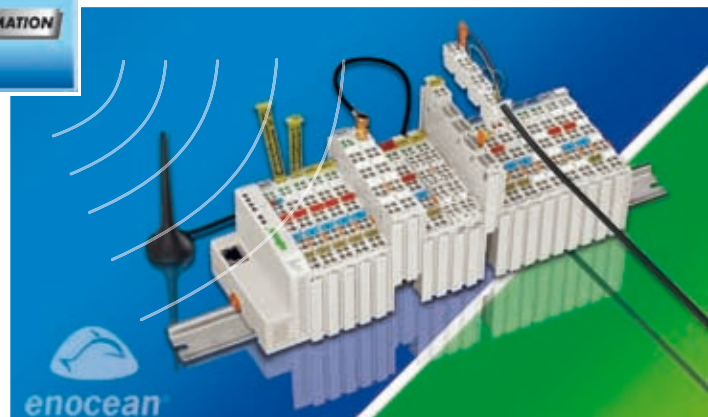
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myHomeControl

INTELLIGENT LIVING IN ONE PACKAGE

The Richiger family moved into their new home just over three years ago. While building was going on, they considered a number of different bus systems for the electrical installation before choosing a solution based on EnOcean technology.

By Peter Hartmann, Managing Director, BootUp GmbH

ONE SOLUTION FOR MULTIPLE PROCESSES

The Richigers' timber frame house has a large number of windows fitted with blinds. These serve both as a light shield and as heat insulation. The whole house also features indirect lighting, with a total of 38 dimming circuits. All rooms have individual heat regulating circuits. Wireless room temperature sensors produce the setpoint and actual temperature, and actuators control the heating valves accordingly. The entire inhouse automation is implemented with myHomeControl® visualization and control software. A touchscreen panel PC is positioned at a central point. The screen shows temperatures and the momentary status of lamps, blinds, windows and the garage door. From here it is also possible to directly operate all comfort and convenience functions. In the absence of the family, myHomeControl® continues to govern various processes and automatically lowers the temperature.

PROPER SHADE AT ANY TIME

Automatic control of shade was especially important for the Richigers because of the house's many windows and glass fronts. myHomeControl® shades the individual rooms automatically according to the altitude of the sun (time of the day and year) and light intensity. All blinds are lowered or raised singly and fully automatically. This active shading function enhances living comfort besides supporting temperature regulation and reducing the energy requirement.

EASILY LEFT ALONE

When the family is away, myHomeControl® lowers the temperature in the house. But it is possible to raise it again in good time before the occupants return so that the house is pleasantly warm.

When the whole family is out of the house, the solution creates the impression that someone is at home. To achieve this, it automatically lowers the blinds after dusk. Then light "wanders" through the house, with myHomeControl® turning the lights on and off in different rooms at random intervals. After dawn the blinds are raised again.

CONTROL SOFTWARE COMBINES SECURITY

When you leave the house, you often wonder whether all the windows are closed and all household appliances are switched off. myHomeControl® centrally administers the status of the windows and electric loads. A glance at the touchscreen panel PC is enough to assure you that everything is closed and switched off. The panel tells you which lights are still on or which windows are still open.

Window contacts, window handle sensors and presence detectors are combined with the absence function to create a security system. If a window is opened or a light turned on while you are away for example, myHomeControl® will send you a text massage.
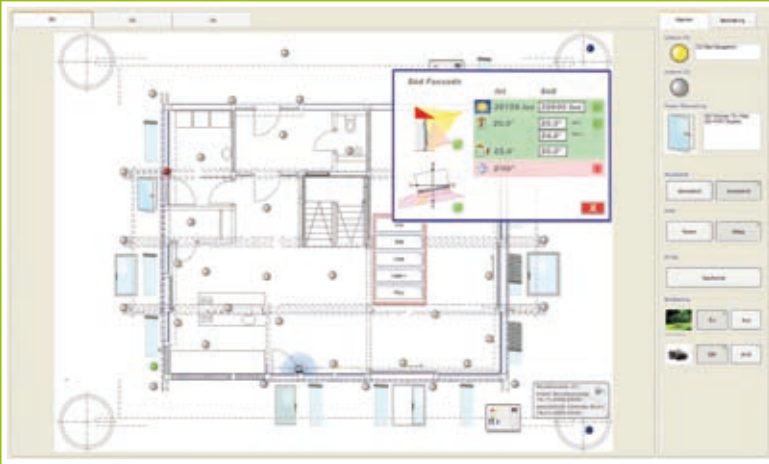
Display of the ground floor, on the left the plan with the visualization and operating elements, on the right the superordinate functions: the dialog to control the shade is open.

During absence

Automatic shade control
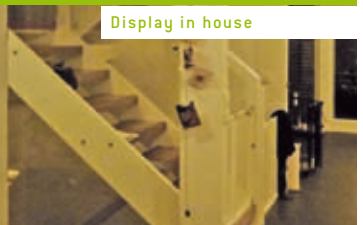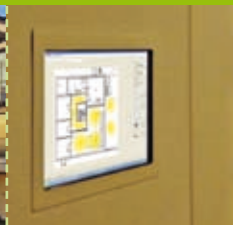
Display in house

AN INVESTMENT THAT PAYS

myHomeControl® requires a PC that is constantly running. This will need approx. 30 W, meaning an annual consumption of about 263 kWh or 20 euros.
The Richigers' electricity bill is still smaller, despite this expense.

The installation costs – including the EnOcean-enabled devices and the myHomeControl® management system – were only about one quarter of those for a conventional KNX/EIB solution.

www.enocean-alliance.org/bootup
www.enocean-alliance.org/myhomecontrol

ENOCEAN ENABLES HIGH-TECH FLEXIBILITY ON BRAZILIAN YACHTS

With the support of ASP Automação in Brazil, Spirit Ferretti is fitting its luxury yachts with EnOcean wireless technology. The limited conditions on boats and yachts obviously call for highly capable techno-logies that allow flexible use of the space that is available. That was one of the main reasons why Spirit Ferretti chose an EnOcean-enabled solution for its Ferretti 830 luxury yacht. Wireless switches based on EnOcean technology can be adhered straight to cabin paneling or other surfaces, which substantially increases the useful space onboard.

By Oskar Pzillas, Managing Director, ASP Automação Ltda.

RIGHT LIGHTING BY WIRELESS

Lights, blinds, ventilators and a hydraulically operated landing stage on the 27-meter-long Ferretti 830 are controlled by actuators from Omnio, while light scenes can be dimmed using controllers from PEHA. 27 circuits are installed for the lighting, five of which can be dimmed. Operating voltage is 24 Vdc with 220 Vac for the light scene dimmers.

REGS 24 actuators from Omnio control the lighting circuits, extractor hoods, blinds and various other units. The REGS 24 is currently the only user-programmable switching actuator available on the market. Each output can be separately programmed with familiar functions such as on/off, pulse, pushbutton and timing relay.

As a minor highlight, an active antenna from Omnio is installed on the fley so that it is possible to activate the interior lighting, for example, or other fixtures from the pier by an EnOcean handheld transmitter when returning during the night. This has a range of about 100 meters.

Dimming uses high-tech controllers from PEHA, making it possible to set up any number of dimmer circuits. The set scenes can be saved by simply pressing a button,
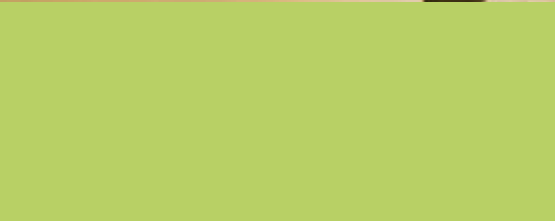
and are recalled by a four-channel wall-mounted or handheld transmitter. Other functions can be switched at the same time as recalling light scenes. The dual-quad actuators and dimmers are installed in two control cabinets, in the bow and in the engine room.

HIGH CONVENIENCE
– LITTLE INSTALLATION EFFORT

Many lights are switched from multiple points, so the wireless switches reduce the installation effort and the cabling by all of 70 percent. The entire control is also possible over a wireless gateway using an automation unit or with software from the BootUp company.

ASP also offers this system for yachts up to 46 feet in a 12-V version. Matching requirements, ready wired switchgear in the 12-V or 24-V version can be supplied with 8, 16, 24, 32 or 64 outputs. A complete automation system with BootUp software is also possible.

www.enocean-alliance.org/aspcontrol
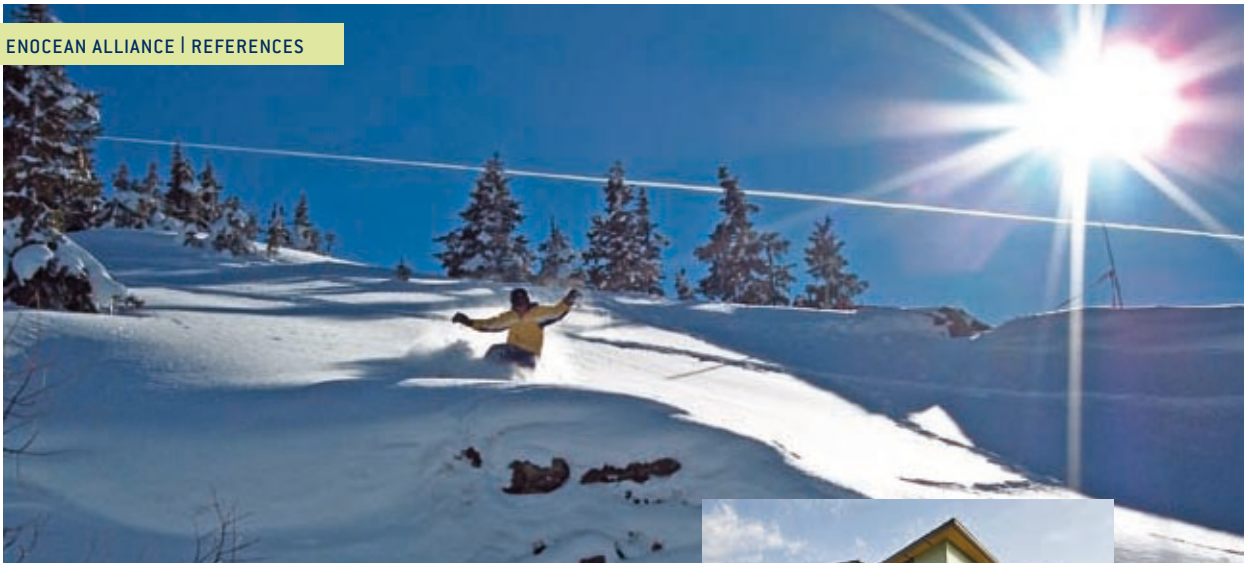
ENOCEAN GOES OLYMPIC

Flexible lighting controls adapt to severe floor plan changes and save building owners 70 percent of the installation cost.

By Shawn Pedersen, President, Echoflex Solutions

Whistler is the host mountain resort of the Vancouver 2010 Winter Olympic and Paralympic Games. Cheakamus Crossing, a residential community located in Whistler, reconfigured its walls to accommodate the athletes who will compete in the upcoming Olympic games. New walls were introduced into the town homes that converted living areas into bedrooms for the athletes. Where wired and alternative lighting solutions failed, EnOcean-enabled lighting controls shined.

INSTALLATION COST SAVINGS UP TO 70 PERCENT

The living, dining and kitchen areas were converted to bedrooms by introducing new walls between them (new walls indicated in orange color). When the 2010 Winter Olympic and Paralympic Games are over, the walls will be removed and the residences will revert to their original design.

Challenges surfaced when the installed wireless lighting controls failed to function properly (these were not EnOcean-enabled). Light switches in one unit were turning the lights on and off in neighboring town homes. The malfunctioning controls were caused because there were too few channels available. When looking for solutions to the problem, it was estimated that it would cost $75,000 US ($1000 US per unit, 75 total units) to fix the problem using traditional wired methods.

The installers then found Echoflex Solutions and thereafter learnt that they could save 70 percent of the installation cost by integrating EnOcean-enabled controls. Even after negative experience with wireless controls, the installers were nevertheless willing to give wireless another try when they learned that the EnOcean-enabled controls would reliably operate and fix the problem at a fraction of the cost of wired solutions.

SIMPLE INSTALLATION

75 self-powered light switches and 75 relay receivers were the solution. The unique IDs that EnOcean provides corrected the misplaced transmission issue and it is estimated that the use of wireless will save approximately 70 percent of the cost of renovating after the Olympics are over. What Echoflex calls its "Anywhere Switches" were mounted on the newly created walls and provided the lighting control required by the application. The relay receivers were installed in the light fixtures located in each bedroom.

Because the light switches operate without wires and batteries, the process of restoring the town homes to their original state will be greatly simplified. The remodelers will be able to remove and re-mount the switches without having to worry about any wiring. The solution kept the installers from having to run wires through the walls and ceilings and subsequently saved time and money when compared to other solutions.

www.enocean-alliance.org/echoflexsolutions

ENOCEAN TECHNOLOGY HELPS CREATE RIGHT ATMOSPHERE IN KEMPINSKI HOTEL IN UNITED ARAB EMIRATES

By Bjorn Martenson, Managing Director, Interior Automation

A hotel must serve the needs of different kinds of guests – from the person on business through to the vacationer. In addition to the service offered by a hotel, style and ambience play an important role. To survive in the hard-fought market on the Arabian Gulf and to offer its guests a pleasant atmosphere as soon as they come through the door, the five-star Kempinski Hotel in Ajman decided to retrofit its entrance and bar area with the wireless technology from EnOcean.

Kempinski hotels have embodied exemplary hospitality and perfect service for decades already. The Kempinski here has a total of 189 rooms and suites, a tastefully decorated lobby, several restaurants and bars, a private beach plus a shopping arcade.

LOOKING FOR A SMART SOLUTION
Renovations in a hotel always place a lot of demands – they have to be carried out without interrupting daily routine for too long and disturbing hotel guests. That calls for both planning skills and smart technology.

What was very important for the Kempinski in this case was that the new lighting system should not only enhance the atmosphere of well-being for guests but also be energy-efficient. Plus, the solution was to be flexible, simple to service, and have no impact on existing systems.

RELIABLE TECHNOLOGY IN THE BACK-GROUND
All these requirements were satisfied by a wireless system enabled by EnOcean technology. Installed in the reception area are solar-powered lux sensors as well as a remote control – for automatic operation and facility management.

The existing fittings were replaced by new fittings with a more efficient aluminum reflector and provided with electronic control for a compact fluorescent lamp that enabled the wattage in the lobby to be reduced from 80 W to 18 W with an increase in light output. Furthermore, to increase energy efficiency, a combination of lux sensor field devices was introduced, enabled by batteryless and wireless EnOcean communications with centralized phase-dimming controls of the existing lighting circuits for the halogen areas.

The innovative wireless technology fits very well into the overall concept of the Kempinski. The luxury hotel can offer its guests a very appealing and pleasant atmosphere immediately upon entering and at the same time increase its energy efficiency.

www.enocean-alliance.org/interiorautomation

SCHOOL RENOVATED – ENERGY AND COSTS SAVED

Renovation undertaken at an elementary school in Canada enabled it to cut energy costs by some 30 percent.

By Marc Dugré, President, Regulvar Inc.

There are various reasons for renovating a building. Of course, a major reason is cutting the high cost of energy. Which explains why an increasing number of builders as well as owners and property managing companies have started thinking about renovation. Older buildings in particular are often veritable energy guzzlers because

they have little or inadequate insulation. Renovating a building with a view to improving energy efficiency inevitably saves money in the long term. What is important is selecting the right system. At St. Joseph elementary school in Lacolle, Quebec (Canada), the decision makers opted for EnOcean technology for the room temperature sensing devices.
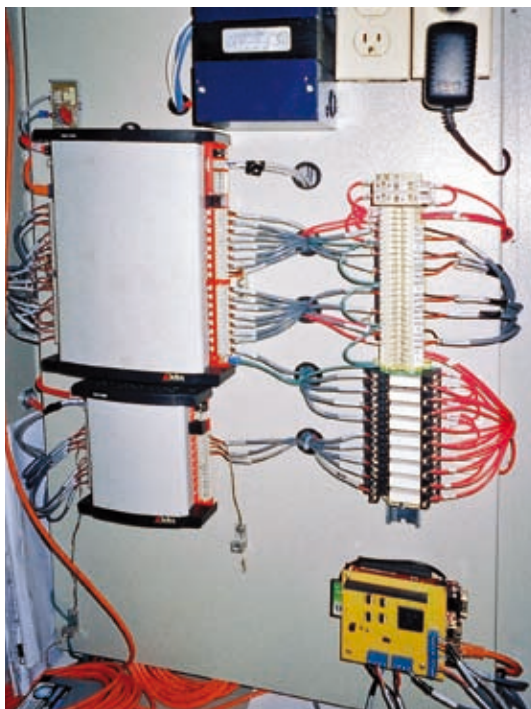
SAVINGS POTENTIAL OPTIMALLY TAPPED

Before its renovation, St. Joseph elementary school had no individual temperature regulation system but what could be called a dual-zone regulation for the entire school. As a result, it was often too cold in one half of the school and too warm in the other – depending on the intensity of sunshine. This also meant that the school's energy consumption was very high.

To cut the energy needed by heating and air-conditioning, and for extra comfort, the school decided in summer 2008 to install a system based on self-powered wireless technology from EnOcean. Sensors were put in place in 28 rooms, using light as their natural energy source and requiring neither batteries nor any external power supply. All room sensors are linked to a central BACnet system, controlling the temperature in individual rooms. The project was implemented by Regulvar, which served the school as consultant for the entire duration

The new system implemented by Regulvar now allows metering and monitoring of energy consumption.

Individual temperature regulation uses light as its natural energy source (in 28 classrooms).

CONVINCING ARGUMENTS

The main argument in clear favor of the EnOcean-enabled products was, in addition to speedy integration and simple planning, the attractive price compared to cabled solutions. The room sensors have enabled the school to enhance comfort and substantially reduce its energy needs. Plus, the new system implemented by Regulvar now allows metering and remote monitoring of energy consumption via internet, e.g. on behalf of the education authority.

A further key argument was that the entire installation could be carried out without interrupting the normal running of the school. Something that is out of the question with a cabled solution due to the need to break open the walls for laying ducts needed to route the cabling.

Vizualization of room temperature sensors on the second floor.

SPEEDY AND SIMPLE IMPLEMENTATION

Installation of the whole system took just one week during October 2008 – including installation of the central control system for the monitoring and government of energy consumption. As everything had to be in place and operational before winter sets in, the simplicity and speed of installation was a huge bonus for the school.

As it turned out, the biggest challenge was finding the right positioning of the room sensors because the school has thick walls of concrete and steel – normally a big challenge for wireless systems but no problem for the EnOcean devices.

A GOOD INVESTMENT

Choosing EnOcean's self-powered wireless technology saved the St. Joseph elementary school 20 percent in installation costs alone. The cost of implementing this wireless solution was 6000 Canadian dollars lower than for a comparable – but disruptive — cabled installation. Together with the significant energy savings, the school expects a return on investment within two years. "To start with I admit that we were a little skeptical about this new technology", says Christine Halpin, Principal of St. Joseph elementary school. "But now we're very glad we chose it. We have more comfort, and we've cut our energy costs by a good 30 percent."

www.enocean-alliance.org/regulvar

15-DAY PROJECT:
MODERN TECHNOLOGY CHALLENGES
OLD SCHOOL INSTALLATION METHODS

A modern-day Paul Bunyan story – installers show how new technologies and processes are ready to replace traditional methods.

By Warren Reeder, Marketing Specialist, ILLUMRA

	TARGETS	RESULTS
INSTALLATION PERIOD	**3 weeks** The installers sought to implement modern processes to enable its team to complete in 3 weeks what traditionally required 10-12 weeks.	**3 weeks** The project was completed in 3 weeks, due in part to ILLUMRA being easy to install.
COST	**Within 10%** Complete the project within 10% of the cost of traditional construction.	**< 10%** Factoring reductions in materials needed (less wire) materials and labor required (installation was fast), there was no cost premium incurred by using ILLUMRA
ENERGY	**40%** Reduce energy consumption by a minimum of 40%.	**40% +** Estimates predict that the project will exceed goals by automatically turning lights off when spaces are unoccupied. The "after data" has not yet been collected.
FLEXIBILITY	**50%** Reduce cost and time for reconfiguration of space by 50%.	**75%** Anticipated time and cost reduction of over 75% with 100% of the ILLUMRA materials being reusable
SUSTAINABILITY	**Gold** Design the project to LEED certifiable standards.	**Gold** ILLUMRA helped the building qualify for a gold LEED rating.

SMART FLOORS – DUMB WALLS

Leggat McCall Properties, a large regional real estate development company headquartered in New England, viewed the relocation of its own corporate offices as an opportunity to challenge traditional construction standards. Thereby the space needed to look like and function as traditional office space. Starting with a frame and shell, the company completed a full interior fit-out, a project that normally takes 12 weeks, in just 15 days. All power was installed under the floor. There was virtually no wiring in walls. The company used lLLUMRA controls to help complete project goals. Installer was the McDonald Electrical Corporation.

Self-powered wireless switch in smart floors

MANUAL AND AUTOMATED CONTROL OF LIGHTS

The solution included self-powered wireless switches and occupancy sensors that were used to provide manual control of lights in addition to automating control in unoccupied spaces. The following products (315 MHz) were used: decorator style batteryless wireless light switches, three-wire single-channel relay receivers, five-wire single-channel relay receivers, manual on/off, auto off room controllers, wired occupancy sensors and self-powered wireless motion sensor.
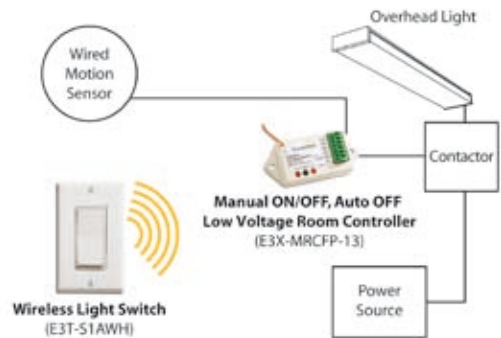
www.enocean-alliance.org/illumra

Diagram: Manual ON/OFF; Automatic OFF

SAVE COSTS AND SPARE THE ENVIRONMENT –
WITH WIRELESS ROOM UNITS FROM SIEMENS

Thanks to energy-efficient wireless technology, solar cells can be used in place of batteries to power new wireless room units from Siemens. The products consequently offer energy-saving and environment-friendly room temperature control.

By Sven Flanz, Product Manager, Siemens Building Technologies

Solar-powered QAX95.1 and QAX96.1 room units from Siemens Building Technologies support weather- and room-compensated temperature control in buildings. They acquire the room temperature and transmit the data to the room controller by wireless making use of energy-efficient EnOcean technology. The necessary power is supplied by solar cells. This means that periodic exchange and disposal of batteries are no longer required, resulting in cost savings and less strain on the environment.

FLEXIBILITY THANKS TO SIMPLE
AND LOW-COST INSTALLATION
The new solar-powered room units complement the Desigo RXB and RXC individual room controllers. Information about the current room temperature or setpoint adjust-

ments is exchanged via gateway. Using EnOcean gateways for LonWorks (RXZ95.1/LON) and KNX (RXZ97.1/KNX), other room automation devices, such as presence detectors or light switches, can be integrated. What is more, the wireless room units offer a high level of flexibility thanks to straightforward and affordably priced mounting, with no need for wiring. For this reason, the products are especially suited for mounting on surfaces that are difficult to rework, such as sandstone or glass walls, or for small system extensions, since costly reworking or openings in the wall are not required. The units can be fitted to glass surfaces with the help of adhesive pads, for instance.

www.enocean-alliance.org/sbt

NEW ENERGY-AUTONOMOUS PIR SENSOR / RECEIVER SAVES TIME AND MONEY

Servodan, Danish front-runner in intelligent lighting control, has released a new series of sensors and receivers, adding to its existing range of battery and wireless products like pushbutton switches.

By Per Eggen, Marketing Manager, Servodan A/S

Battery and wireless PIR motion sensor, solar, 41-580

Wireless receiver 230 Vac, 70-100

Pushbutton 76-922

REDUCING CO$_2$

Especially in Denmark, the focus is very much on energy savings and reduced CO$_2$ emissions. So energy-efficient solutions are much in demand by industry as well as government organizations. The new, entirely energy-autonomous PIR motion sensor (type 41-580) and receiver (type 70-100) are connected by wireless EnOcean technology – supplementing the range of highly energy-efficient solutions supplied by Servodan.

SIMPLE INSTALLATION, ZERO MAINTENANCE

The new PIR (passive infrared) motion sensor 41-580 is powered by a solar cell. The zero-energy sensor is fitted with a lens containing more than 400 fields symmetrically distributed for optimal detection, This makes the PIR sensor suitable for detecting persons in a 360° detection area, which is approx. 38 sqm at a mounting height of 2.5 meters. It is the perfect choice for indoor zero-energy solutions in offices, corridors, in connection with retrofit and in general office layouts, where focus is set on design of open spaces with glass or other materials, making traditional wiring difficult.

Lights are switched on by the battery and wireless pushbutton switch (e.g. type 76-922). The motion sensor will transmit wireless RF information to the receiver, when detecting persons and thus saving energy by switching off light again, when no movement is detected and the programmed time delay is reached. Of course, lights can always be switched off again with a single push.

Mounting and installation of the wireless setup is easily performed and the receiver, sensor and pushbutton are connected simply by choosing learn mode and and enabling the elements to connect within seconds. The result is highly energy-efficient lighting control and an entirely maintenance-free application that will control the lighting for years to come.

www.enocean-alliance.org/servodan

EASYCLICK PRODUCT FAMILY FROM PEHA CONTINUES TO GROW

In 2009 PEHA again presents interesting new additions to the Easyclick product portfolio.

By Werner Petritz, Product Manager, PEHA Paul Hochköpper GmbH & Co. KG

EASYCLICK WIRELESS TRANSMITTER, PC CONTROLLED

The Easyclick wireless transmitter is simply connected to a PC by an accompanying USB cable. Copy in the supplied software and the screen shows a graphic display of the Easyclick transmitter. Loads can then be switched wirelessly by mouse click through Easyclick receivers. First the PC transmitter just has to be teached to the receivers. System requirement is Windows XP/Vista (32 bits).

EASYCLICK TRANSMITTER MODULE 230 V/24 V

The Easyclick transmitter module is activated by applying a supply voltage. The voltage can be switched by conventional buttons, switches or motion detectors. Using wireless switches it is possible to use Easyclick Plus receivers with a pushbutton or single-channel function. Either the 230 V or 24 V terminals can be used to switch on and off.

EASYCLICK RECEIVER PUSHBUTTON 1-CHANNEL

Different loads can be switched with the Easyclick pushbutton. If an Easyclick wall-mounted or handheld transmitter is teached to the pushbutton, the latter is switched on by pressing the transmit button and off by releasing it. The slim dimensions of approx. 114 x 21 x 25 mm allow installation in a longish lamp housing for example.

EASYCLICK RECEIVER 2-CHANNEL

The Easyclick receiver has two separately programmable channels to switch lighting or other electric loads with a dual button function. The slim dimensions allow installation in a longish lamp housing for example.

EASYCLICK ENTRANCE STOP/GO LIGHT SET

The set with the flush-mounted Easyclick stop/go light serves for indicating whether a room is occupied or vacant.

The accompanying Easyclick transmitter sends the status to the entrance light. This can signal "Occupied" or "Vacant". The set consists of an Easyclick entrance stop/go light for flush mounting with printed translucent central board and a single-insert frame in AURA design plus an Easyclick wall-mounting transmitter in AURA design with a single-insert frame. Rocker imprint: occupied (red)/vacant (green).

EASYCLICK ENTRANCE STOP/GO LIGHT MOBILE

The mobile Easyclick entrance stop/go light in a grounding-type plug housing serves for indicating whether a room is vacant or not. As with the flush-mounted version, an Easyclick transmitter sends the status to the entrance light. The mobile Easyclick entrance stop/go light is especially suitable as an addition to the stop/go light set and is plugged in so that it is visible to the user of the transmitter. In this way the latter can see the color of the entrance stop/go light.

www.enocean-alliance.org/peha

SOCKETS THAT REGISTER ABSENCE TO AUTOMATICALLY CUT OUT DEVICES ON STANDBY

Saving energy should not stop at the office door. After all, there are many standby devices in there unnecessarily running, like printers, copiers, monitors and coffee-makers. That means enormous potential for saving energy and reducing your carbon footprint.

By Klaus Kleine, Managing Director, Funkstuhltechnik

USB transmitter USB motion detector Adjustable 0–15 min cutout delay

Variant 1   Variant 2   Variant 3
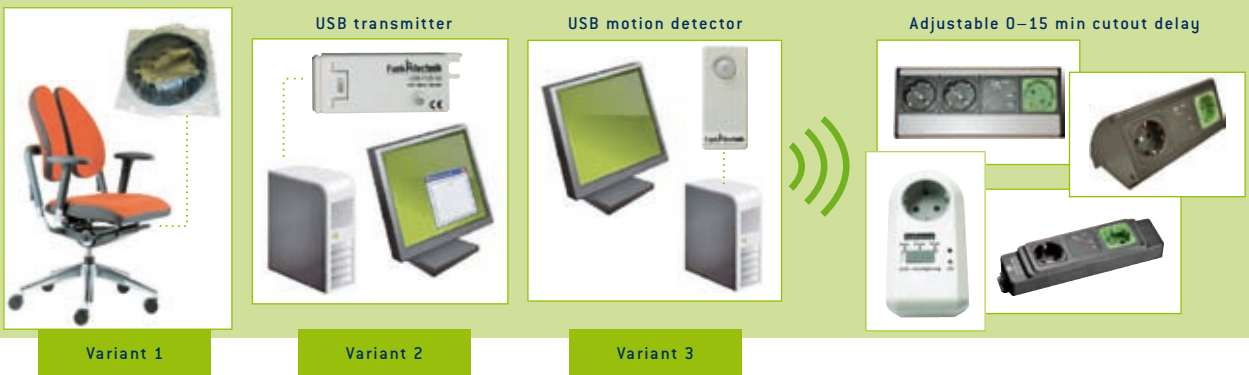
To meet such a requirement, the Funkstuhltechnik company together with A. & H. Meyer GmbH of Dörentrup developed a number of socket outlet solutions that automatically cut out standby devices when a workplace or room is unoccupied. That can be controlled by a variety of presence detectors – an office chair for instance. It is simply necessary to fit it with a pressure sensor. Just about any office chair can be retrofitted with such a sensor. When someone takes a seat the socket is automatically turned on, and turned off after a time delay when they get up again.

TURNING A SOCKET ON OR OFF
WITH A USB SENSOR

As an alternative to an office chair, there are two USB sensors in the new MultiFunkSystem from Funkstuhltechnik to control devices on standby. First there is a USB transmitter that generates a presence signal from the activity of a computer, and checks the screen saver or operating status of a PC to tell it whether to turn a socket on or off. Once the screen saver has been active for say ten minutes, an off signal is automatically sent to the appropriate socket outlets. In addition to this

function, it is also possible to switch a socket manually by mouse click from the screen. The USB transmitter is supported by PC software.

USB MOTION DETECTOR
FOR MORE ENERGY EFFICIENCY

The USB motion detector manages without software, connected by cable to a vacant USB socket on the PC and attached to the monitor by an adhesive pad. Detected motion turns the socket outlet on, and absence causes it to be turned off after the set time delay. Both USB components are very small and inconspicuous.

A further component of the MultiFunkSystem for optional integration is the multi-outlet assembly to the master. In this way a wireless master/slave combination can be set up. All socket outlet systems can of course still be switched conventionally by handheld or wall transmitters.

www.enocean-alliance.org/funkstuhl
www.enocean-alliance.org/ah-meyer
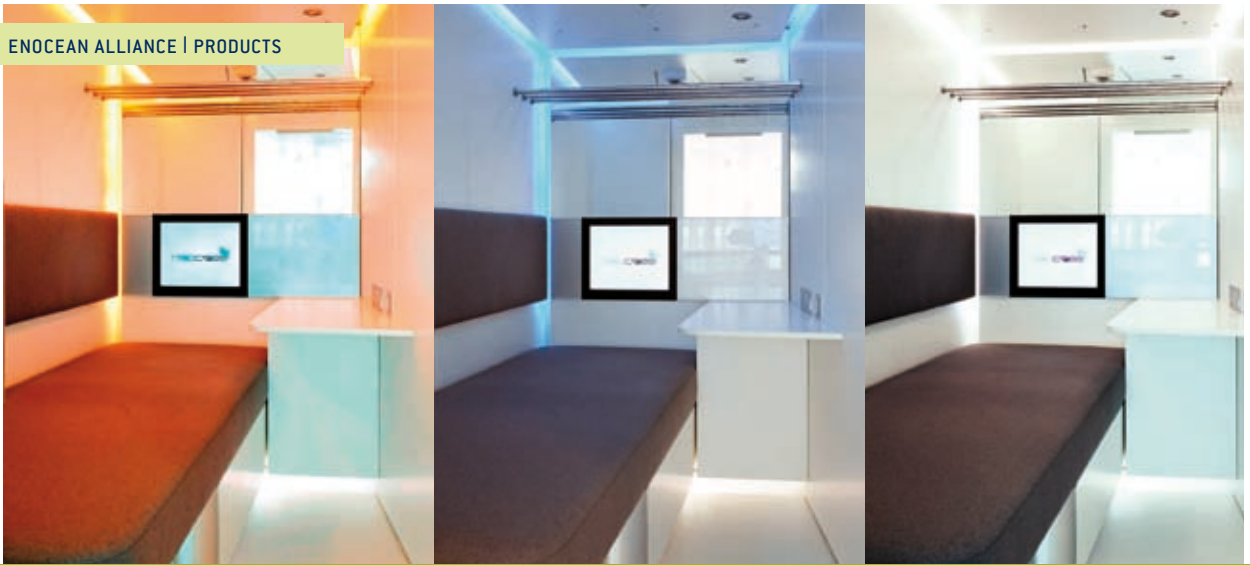
DYNAMIC LIGHTING SOLUTIONS MADE EASY BY FLEXIBLE WIRELESS CONTROL

Dynamic lighting solutions for RGB (red-green-blue) applications with LEDs or fluorescent lamps as well as daylight simulation with white fluorescent lamps of different color temperature are especially simple to implement with the EASY Color Control system from OSRAM.

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

EASY Color Control enables variable driving of as many as 256 RGB channels and convenient setting of up to 16 light scenes by self-explanatory PC configuration software. Uninterrupted sequences can be created – from fast to slow – to match the application.

In addition to straightforward installation and startup, the user will want ease of operation in particular. True to the motto "a light control system is only as good as its simple and self-explanatory operation", OSRAM has created an open interface for a variety of operating possibilities. Depending on the application, standard buttons can be connected to the system for example, presence detectors or EnOcean wireless buttons.

ACTIVATE DIFFERENT COLORS BY PUSHBUTTON

When applications call for a lot of bothersome wiring, buttons in batteryless and thus service-free EnOcean wireless technology are obviously a practical solution. This produces the desired flexibility in later use.

A wireless handheld transmitter can be integrated in addition to a wireless wall transmitter. At exhibitions

OSRAM presents visitors to its booth with dynamically driven LED color tiles for instance. The wireless handheld transmitter can also serve as a remote control for shop, gastronomy or home applications. Different colors or sequences can be activated as needed at the push of a button.

EnOcean technology offers flexible and simple possibilities of operation – no matter whether for dynamic lighting solutions with biological effect or in RGB light effect applications for presentation purposes.

www.enocean-alliance.org/osram

EFH Bank Zurich, conference room with dynamic daylight simulation

REMOTE CONTROL FOR SHOWER

With iControl mobile, the new solution from Hansgrohe, shower systems can now be operated wirelessly.

By Jan Heisterhagen, Product Manager, Hansgrohe AG

With the launch of its wide-span Rainmaker shower head system, Hansgrohe already opened up a new dimension in bathroom pleasure. The company in the Black Forest now goes a step further, enabling users to control showers by wireless.

The Rainmaker and Rainfall systems can now be operated by iControl mobile, offering one or two wireless remote controls. To date they could only be operated mechanically. Round and in chrome, the controls are no larger than a powder compact. Plus they are waterproof. So they can easily be taken with you when you go into the shower.

NO BATTERIES, NO MAINTENANCE

iControl mobile, developed together with the design house vicos, is based on the PTM 200 module from EnOcean. Pressing the switch is enough to supply the wireless transmitter with energy, so it was possible to make the casing of the remote control absolutely water-

tight. Both the shower program and the lighting can be conveniently controlled by four button positions.

PLUG & SHOWER – FAST AND SIMPLE INSTALLATION

The electronic receiver circuitry necessary for the product fits seamlessly into the flush-mounted iBox universal installation concept from Hansgrohe. The receiver, processor and power stages come in a compact housing that is fully encapsulated and thus very well suited for professional sanitary purposes. Installation is by a special cabling and plug concept requiring no tools. For first-time installation the plumber simply has to attach the housing to the wall and plug in the receiver, and the system is then ready to go.

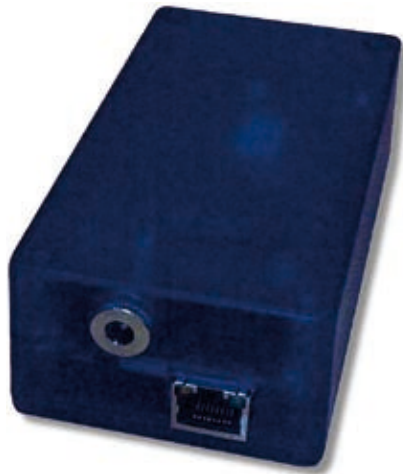**www.enocean-alliance.org/hansgrohe**
www.enocean-alliance.org/vicos

STRAIGHTFORWARD MONITORING AND REMOTE CONTROL OF WIRELESS NETWORKS

Monitoring and remotely controlling wireless networks is a constant challenge. This applies in particular where you find largish and distributed installations, like EnOcean networks using repeaters.

By Prof. Axel Sikora, Steinbeis Transfer Center for Embedded Design and Networking, Cooperative University Baden-Württemberg/Professional Academy Lörrach

To meet this challenge, the Steinbeis Transfer Center for Embedded Design and Networking (stzedn) at the Professional Academy Lörrach developed a platform that is now obtainable as the EnOcean Web 2.0-Based Sniffer (EWBS). The stzedn, a member of the EnOcean Alliance, has been cooperating with EnOcean GmbH for a number of years in the field of wireless protocol development.

REMOTE ACCESS POSSIBLE TOO

This platform is based on the lean emBetter web server, which is operated together with a standard-conformant embedded TCP/IP protocol stack on a low-cost ColdFire single-chip Ethernet microcontroller. It is connected on the one hand to an EnOcean wireless module (TCM 130) that can receive and send data packets. Additionally the server can be accessed by a conventional JavaScript-capable web browser (HTTP client). This access is possible in a local home or company network or through the public internet.

CONSISTENT USE OF WEB 2.0

What is innovative about the chosen approach is the consistent use of Web 2.0 technology. That enables presentation by any computer that has a web browser at its disposal. So in addition to conventional PCs, PDAs or mobile phones can also be used as control units. No further installation is needed on these control units because the entire functionality is downloaded with the web site. The use of XML reduces data traffic to the actual data fields. All operations such as filtering or sorting, for example, are executed on the web browser. That takes load off the web server and minimizes network traffic.

NO NEED FOR PROGRAMMING SKILLS

The EWBS allows uncomplicated and efficient execution of multiple applications – such as following network traffic during protocol and product development of EnOcean nodes, observing network traffic during startup or remotely controlled operation of objects. Supported by the PC-aided emBetter Management and Configuration suite, custom web sites and functions can also be developed and integrated very simply with no knowledge at all of embedded programming.

SECURITY WITH CAPITALS

Particular attention was paid to security in linking to a network. On the web server it is possible to integrate an efficient, standard-conformant SSL module for instance, also developed at the stzedn. This allows authentification at both ends plus secure encryption of network traffic.

www.enocean-alliance.org/stzedn

LEVITON INTRODUCES WIRELESS LIGHTING CONTROL SOLUTION FOR COMMERCIAL MANAGEMENT

Stylish new offering eliminates wires, batteries and performance issues.

By Pamela Winikoff, Corporate Public Relations Manager, Leviton

Leviton Manufacturing Company has entered into a strategic partnership with EnOcean GmbH, a worldwide leader in wireless building automation technology, to offer a revolutionary line of self-powered occupancy sensors that dramatically increase energy efficiency and require absolutely no new wiring. The high-performance occupancy sensors combine Leviton's legendary styling and superior performance features with EnOcean's reliable wireless technology. The result is a commercial product offering that offers significant energy-saving benefits and reduced installation time and expense.

"We're very excited to be introducing this new technology as part of the Leviton energy management product line," says Tom Leonard, Director of Product Management for Leviton's Lighting Energy Management business. "This is the perfect time- and labor-saving solution for Leviton commercial customers who want to retrofit existing buildings for increased energy efficiency."

Leviton's new wireless offering includes occupancy sensors, remote switches, wall switches and integrated wireless receivers that automatically turn lights on when occupancy is detected and off when a room is no longer occupied. The products provide long service-free and trouble-free "install and forget" operation. They are suitable for a wide range of commercial applications, including use in conference rooms, classrooms, open areas of buildings and private office spaces.

Ideal for retrofit applications, the wireless sensors, which can also be used in new construction applications, make installation fast, easy and highly affordable. "With no wires to run, installation costs can be as much as 50 percent less than conventional hardwired systems. The installer simply replaces the existing wall switches with the wireless receiver switches and installs the matching occupancy sensor and the installation is completed. It's that easy," adds Leonard.

For flexible operation, the wireless sensors include an automatic shutoff feature that lets users set the time-to-shut-off to match their precise requirements. The sensors also include an integrated solar cell that provides power from the ambient light in the room, eliminating the need for batteries. The receiver switches are rated up to 10 amps, 120-277 V, 50/60 Hz and are available in white, ivory, grey, brown, black and light almond.

www.enocean-alliance.org/leviton

THE KEY TO HIGHER VOLUMES

As an independent EnOcean design and manufacturing company, vicos GmbH specializes in OEM development, industrialization and series production of EnOcean solutions. Managing director Wolfgang Klier speaks about the urgent need for cross-vendor interoperability, as created by the Dolphin platform.

perpetuum: In Dolphin EnOcean has developed a universally deployable platform for energy-autonomous wireless sensors - what advantages does such a component offer you and other providers of this technology?

Wolfgang Klier: Until now we often had to accept limitations of functionality when creating compact sensors and actuators for OEM customers. So we were forced to develop extremely divergent system solutions for a number of EnOcean applications. The new Dolphin now enables us to implement an extremely broad spectrum of product ideas more cost-effectively. The much improved energy management of this ASIC additionally opens up completely new perspectives for us; we can now build self-powered sensors and actuators that use bidirectional wireless communication.

perpetuum: But at the same time, doesn't bidirectional communication make much greater demands on the interaction between sensors and actuators of different vendors?

Wolfgang Klier: Interoperability within a heterogeneous sensor landscape is a big challenge of course. But it's also urgently necessary because it's the only way to ensure that many different components reliably communicate with each other. That was one of the reasons for founding the EnOcean Alliance in early 2008, which now numbers over 70 members.

perpetuum: Does this alliance of vendors and manufacturers also promote standardization?

INTEROPERABLE WIRELESS STANDARD

The ingredient logo standing for interoperability is to be found on all EnOcean modules. In other words different manufacturers can simply integrate them in their end-products, and their systems are interoperable. So combining switches, gateways and sensors from any manufacturer is no problem at all.
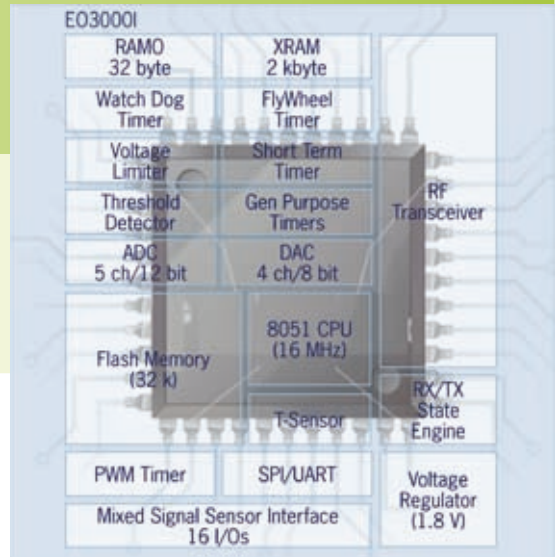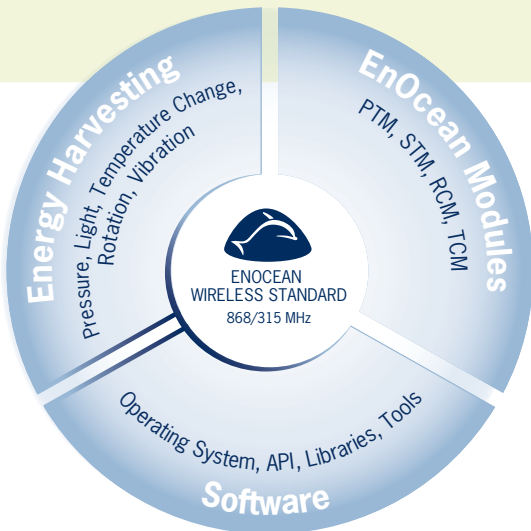
formity for its EnOcean applications. Analogous to a CE marking, the manufacturer affirms in this way that relevant RF parameters are complied with and that EnOcean Equipment Profiles clearly specified by the Alliance for the application layer are fulfilled.

Wolfgang Klier: That's obviously one of the goals the Alliance has set itself. The Technical Task Group Interoperability was established to work toward this. A second working group is devoted to integration of the EnOcean de facto standard in international standardization.

perpetuum: Is there such a thing as a manufacturer-independent test institute to certify interoperability?

Wolfgang Klier: No, this would hinder the development of innovative sensors and actuators more than promoting it. The Alliance has adopted the policy that each manufacturer must issue a binding declaration of con-

perpetuum: Does EnOcean offer the appropriate test tools to verify these requirements?

Wolfgang Klier: That would scarcely make sense for EnOcean as a technology manufacturer. Instead PRO-BARE, an independent company within the EnOcean Alliance, devises test tools for development, production and field deployment, and additionally offers its services for test engineering and compliance testing.

www.enocean-alliance.org/vicos

The newly elected executive of the ZVEI in Bavaria (from left): Horst Widmaier, Carl-Horst Poensgen, Michael Vohrer, Stephanie Spinner-König, Markus Brehler, Marianne Futterknecht, Dr. Wolfgang Hastenpflug, Prof. Anton Kathrein, Dr. Alexander Zimmermann, Dr. Stefan Schlutius and Frank Wöhner

MARKUS BREHLER ELECTED TO EXECUTIVE OF ZVEI BAVARIA

Markus Brehler, CEO of EnOcean, has joined the executive of the Bavarian branch of the German Electrical and Electronic Manufacturers Association (ZVEI). He was elected by the general assembly at the end of November 2008.

"Together with the other members of the executive I'd like to contribute to increasing commitment by our industry in the region. I think we've long been going the right way, and we have to continue and expand", says Brehler.

The ZVEI Bavaria is the regional link to the central association and its professional groups, representing the common interests of the Bavarian electrical and electronics industry. The regional association has some 200 member companies.

www.enocean-alliance.org/zvei

ENOCEAN ALLIANCE FORUM – AN ANSWER TO EVERY QUESTION

December 2008 saw the start of the EnOcean Alliance Forum. Here the EnOcean Alliance is offering a "port of call" not only for developers/designers but all other users of EnOcean's self-powered wireless technology. The forum has a suitable answer to every kind of question – no matter whether it is about the different categories of EnOcean technology, products enabled by EnOcean, or a question about installation, project planning and energy saving.

The official forum of the EnOcean Alliance is online in both English and German. No matter where you are in the world, if you have a question you can benefit from

the wide-ranging knowledge of EnOcean Alliance members, developers, product manufacturers, planners and installers. The EnOcean Alliance Forum comes with many useful features. In addition to private messaging between registered users, you can arrange to be informed by e-mail when there are new entries. You can search certain topics for key words, and label the individual forums as favorites.

www.enocean-alliance.org/forum

ENOCEAN SCORES DOUBLE VICTORY AT ELEKTRA 2008

Winner of Wireless & Telecoms Design and Company of the Year awards

EnOcean GmbH was presented with European Electronics Industry awards – Elektra – in Munich on November 10, 2008. The company received the Wireless & Telecoms Design award for its self-powered wireless sensor modules, and subsequently scooped the Company of the Year award in recognition of its technology innovation and business success in the building automation market.

New for 2008, the award in the Wireless & Telecoms Design category, was open to companies or research organizations that could demonstrate how they have successfully applied component and software technologies in a wireless or telecoms product or application.

The Company of the Year award was chosen from the winners of the individual categories. "The range of business success and technical innovation on view this year was impressive", said the judging panel. EnOcean stood out for its forward-thinking business professionalism and commitment to delivering world-class technology.

www.enocean.com/press

Jeff Stelling, Andreas Schneider (EnOcean), Amanda Weaver (publishing director of IET Engineering & Technology Magazine), Zeljko Angelkoski (EnOcean), Richard Wilson (editor of Electronics Weekly)

AHR EXPO 2009: DISTECH CONTROLS, ENOCEAN AND THERMOKON AWARDED

Distech Controls and EnOcean received awards in the Green Building category of the AHR Expo Innovation Awards 2009.

The EasySens LON wireless receiver from Thermokon took the LonMark Award 2008 Infrastructure. Presenting the prize to Frank Neudecker, export manager of Thermokon Sensortechnik, Ron Bernstein of LonMark International said the EnOcean-enabled solution was a true solution for green buildings, doing away with batteries and wiring and minimizing fire risks.

www.ahrexpo.com

OUR NEW PEOPLE

SLAVICA SIMUNOVIC, PR Manager, EnOcean GmbH
has been responsible for press and PR at EnOcean GmbH since November 1, 2008. She came to EnOcean from the Munich branch of an internationally operating agency network. There her responsibilities included supporting a number of both national and international companies from the IT sector, for instance HP, Citrix Systems and Materna. The focus of her activity at EnOcean is on coordinating PR activities, expanding media presence in Germany and Europe, and editorial of the customer magazine perpetuum. Slavica studied German and Spanish at University of Bonn and graduated with a MA. During her studies she spent two years abroad to perfect her knowledge of Spanish plus English. She also speaks fluent Croatian and has basic knowledge of Italian.

e-mail: **slavica.simunovic@enocean.com**

TROY DAVIS, OEM Sales Nort America, EnOcean Inc.
Troy Davis spent 12 years managing a commercial and residential construction company. He discovered EnOcean when seeking efficient retrofit solutions, ultimately leading him to start a new company LessWire, focused on EnOcean-enabled products. LessWire sold one of the largest EnOcean installations to date in the US, a 50-story hotel project in New Jersey. Troy recently developed a hotel energy conservation solution that has attracted significant interest from a major thermostat manufacturer. His primary focus will be selling EnOcean modules to OEMs of HVAC equipment. He will work from the Utah office.

e-mail: **troy.davis@enocean.com**

ISH 2009: NEW POSSIBILITIES FOR HEATING APPLICATIONS WITH ENOCEAN TECHNOLOGY

Energy efficiency was the keyword at this year's ISH, the world's leading trade fair for bathroom, building, energy, air conditioning technology and renewable energies, held from March 10 through 14 in Frankfurt, Germany. The EnOcean Alliance was represented by a number of its members sharing a booth. In addition to EnOcean GmbH itself, Alliance members BootUp, BSC Computer, Distech Controls, HAUTAU, Omnio, PEHA and Thermokon informed visitors about products and solutions enabled by self-powered wireless technology from EnOcean. The focus was on energy efficiency plus HVAC. The foundation technology for EnOcean self-powered wireless sensors offers optimal energy efficiency improvements in heating and ventilation applications.

www.ish.messefrankfurt.com

EVENTS

MARCH

Mar 30 - 31, 2009
Beaumont, Old Windsor, England
EnOcean Alliance partners Distech Controls and Thermokon exhibit

Mar 31 - Apr 3, 2009
Amper 2009, Prague, Czech Republic
EnOcean with its distributor WMocean exhibit.
www.amper.cz

APRIL

Apr 26 - 28, 2009
EnOcean Alliance Member Meeting, Berlin, Germany

MAY

May 5 - 7, 2009
Lightfair 2009, New York, NY, USA
EnOcean Alliance and partner exhibit at booth no. 215.
www.lightfair.com

SENSOR + TEST 2009
DIE MESSTECHNIK-MESSE
The Measurement Fair

May 26 - 28, 2009
SENSOR+TEST 2009, Nuremberg, Germany
Presentation by Markus Kreitmair (EnOcean) on the topic "Construction Kit for Self-Powered Sensors"
www.sensor-test.de

OCTOBER

WORKING BUILDINGS 2009

Oct 8 - 9, 2009
M&E - The Building Services Event, London, United Kingdom
EnOcean Alliance and partners exhibit at booth no. C105.
www.buildingservicesevent.com

NOVEMBER

BATIMAT 2009

Nov 2 - 7, 2009
Batimat, Paris, France
EnOcean Alliance and partners exhibit.
www.batimat.com

GREENBUILD

Nov 11 - 13, 2009
GreenBuild Expo, Phoenix, AZ, USA
EnOcean Alliance partner exhibt at booth no. 5125.
http://www.greenbuildexpo.org/Expo/

SOUTHWARDS – ALONG THE ANDES FROM LIMA TO TIERRA DEL FUEGO (PART 2)

Continuation of the account of a journey through South America from perpetuum issue 13: Peru and Bolivia are already behind us. Join me as I travel on through Chile, Argentina and into the south of Brazil. Highlights along the way are the bubbling metropolises Buenos Aires and Rio de Janeiro.

By Heiko Noll, Project Manager, EnOcean GmbH

ACROSS THE ANDES TO ARGENTINA

I started off in the Chilean oasis of San Pedro de Atacama, the last outpost of civilization in the borderland with Bolivia and Argentina. I explored the wonderful canyons of the surroundings by mountain bike together with a fellow-traveler. We cycled through a labyrinth formed by erosion with towers and narrow portals. It was the middle of November, late spring at the edge of the Atacama Desert, and the temperatures were still bearable. Sweating, nevertheless, I looked up to the icy peak of the Licancabur Volcano on which I had stood just one day earlier.

But I wanted to move on to Argentina, and that was on the other side of the main ridge of the Andes. There is a bus every few days, but the tickets were already sold out. So I had to hitch a ride for the seven-hour journey, and ended up in the cab of a truck. Roque the driver was somewhat skeptical at first, but we broke the ice after a while. He told me some tales from his life, and showed me photos of his children. He crosses the Andes twice a week, and is still fascinated by the expanse and variety of the landscape. But his attention still focused on the road – there are too many graves along the way reminding you of the accidents that have occurred. "It

was usually the brakes", he said and crossed himself every time. Way up at the top we reached the frontier station, in the middle of a bleak no-man's land. It made me think of a song by U2 "high on a desert plain, where the streets have no name".

After a brief stop we carried on, past icy summits and salt lakes, but with occasional green meadows in between where lamas and alpacas could be seen grazing. My next station was the tiny village of Purmamarca, famous for its Seven Colors Hill. In the surroundings you can go hiking between wonderful rock formations and giant cacti. After that I was attracted to the wine-growing country about Cafayate, where I enjoyed the Argentinian steaks – especially after the often austere fare up in the Andes. Eventually I tore myself away from northern Argentina to arrive punctually in Buenos Aires on December 1 when my girlfriend was due to land. Together we explored this huge city in all its variety – the quarter dating from the first settlers with its somewhat morbid flair, the wide boulevards and pedestrian precincts. Then we flew south across the pampas.

PATAGONIA

More than two thousand kilometers later we landed in El Calafate, in the Argentinian part of Patagonia. Alone the name Patagonia is for many people synonymous with vast expanses and famous rock massifs, with constant rain and snow. The Patagonian ice field feeds giant glaciers and is the source of the processes that determine the weather here at the southernmost point of the conti-

nent. On the very next day we were looking down on the 60-meter-high and 5-km-wide face of the Perito Moreno Glacier. It disappears more than 30 km in the distance, in the white of the ice and the swathes of cloud and mist. The weather meant well with us during a three-day hike in the Los Glaciares National Park, and we were able to see the famous Fitz Roy and Cerro Torre peaks.

Long distances call for good planning, and that is not always easy when you are making all your own arrangements. Even where the tourism industry is as well developed as it is in Patagonia. The opening hours of ticket counters and bus departure times tend to be irregular, so we were glad when we did manage to get our bus tickets across to Chile. We loaned a tent and camping stove, stocked up with provisions and rambled through the Torres del Paine National Park. Here we encountered all the facets of Patagonian weather: gale-force winds, spring-like sunshine with swarms of mosquitoes, and a day of never-ending rain. At the end of the tour the famous Torres del Paine shone in the evening light to reward us for all our effort.

The next destination was Punta Arenas on the Strait of Magellan – once a prospering trading town before the opening of the Panama Canal. For us this was the st-

arting point of a ship's journey lasting one and a half days. Twice a week a ferry weaves through the islands to the southwest of Tierra del Fuego carrying supplies to Puerto Williams, the last Chilean bastion before the Antarctic. We passed fjords and glaciers, spending as much time on deck as the icy wind permitted. Now we were no longer far from Cape Horn, but we wanted to head back north. Across the narrow Beagle Channel we came to Ushuaia in Argentina – a tourist attraction as one of the world's southernmost settlements. There we enjoyed the long summer evenings before flying back to Buenos Aires on Christmas Eve. We celebrated Christmas in fitting style at an evening tango show.

Our next and final stop was Rio de Janeiro, with the Copacabana, the Sugarloaf Mountain and Corcovado with its statue of Christ. The inner city was also very interesting with its colonial Portuguese architecture besides modern glass façades. It all presents an extreme contrast with the bitter poverty in the slums, the favellas round about. We celebrated New Year in a small place along the beach. Before flying back to Germany we looked back on all the fascinating impressions.

My long cherished dream of discovering South America for myself had become reality. I have to thank the EnOcean team for making the journey possible. I think the EnOcean Alliance slogan "No Wires. No Batteries. No Limits." has taken on a very special meaning for me.

COVERING THE WORLD – ENOCEAN CONTINUES TO EXPAND ITS DISTRIBUTION NETWORK

By Michael Gartz, International Sales Manager, EnOcean GmbH

To successfully offer its technology worldwide, together with the necessary service, EnOcean GmbH works through its own sales team in Germany and the USA but also maintains very close contact with all its distribution partners. These support customers personally on the spot, delivering information and products, and offering consultation in every phase of a project. In the meantime the EnOcean distribution network encompasses 35 active partners in 27 countries.

Mainstays in the EnOcean distribution network are the Swedish Lagercrantz Group and the Abacus Group headquartered in the UK. Partners also include independent enterprises like Pyrecap in France. All distribution partners of EnOcean offer customers technical consulting and support in new development projects in addition to the sale of self-powered wireless modules. Some companies have additionally qualified as system providers, and are thus able to offer custom solutions.

In a number of countries the distributors work in very close contact with national OEMs who develop and manufacture products based on EnOcean technology. ASP in Brazil, for instance, has become a reliable contact for the regional construction industry, and has delivered building automation solutions for a number of major projects.

EnOcean continues to expand its distribution network. The Japanese market was successfully opened up in 2008, and there are already three distributors in the country selling EnOcean technology. Plus a new distributor has been added to the network for the Spanish market.

www.enocean.com/distributor

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