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MAINTENANCE-FREE WIRELESS SWITCHES & SENSORS

# 05

INTERNATIONAL EDITION

## REVOLUTIONARY

Selection guide for wireless standards – when to use which wireless system

## ENABLED BY ENOCEAN

SAP moves into flexible workplace comfort

## NETWORKED

WURM Systems – goods temperature metering with wireless sensor

## VISIONARY

Energy efficiency in refrigeration through the right use of automation

## CONTENTS

+++ NEWS +++ Success for company – Germany's minister of economics and technology honours EnOcean as finalist in the "Innovation Prize of the German Economy" +++ NEWS +++ Success for personnel – EnOcean one of Top 100 employers in Germany +++ NEWS +++ Success for products – readers of Elektronik-Journal magazine vote EnOcean modules as the "Most Valuable Product" at electronica 2006 +++

These symbols will help you to match the content of the articles in the magazine with the various applications of EnOcean technology:



Automotive



Building Automation



Manufacturing



Medical



Logistics



Refers to all applications

### REVOLUTIONARY

04 |

Selection guide for wireless standards – when to use which wireless system

### INNOVATIVE

08 |

Overview of EnOcean modules for general applications

11 |

Batteryless wireless switches – from flexibly installed wall switch to keyring pendant

12 |

Concept study of an energy-autonomous wireless presence detector based on EnOcean technology

14 |

Batteryless wireless switches simplify building automation – more flexible for less cost

### ENABLED BY ENOCEAN

18 |

SAP moves into flexible workplace comfort

20 |

EnOcean distributor ASP presents reference project in Brazil – 1500 sqm office floor space with wireless technology from EnOcean and Omnio

22 |

Remodelling the remodelling process

24 |

Wireless control of automation systems allows flexible configuration and adaptation of buildings

26 |

Wireless sensor technology from Thermokon arrives in New Zealand

28 |

New IBM building from Allreal in Zürich-Altstetten: minimal energy use through intelligent building automation

### NETWORKED

32 |

EnOcean at the EXPO REAL in Munich

33 |

Kieback&Peter: on the same wavelength as EnOcean  
Specifiers discuss decentralized room automation by EIB/KNX and EnOcean

34 |

Product innovations enabled by EnOcean

41 |

User overview of all products with EnOcean technology

### VISIONARY

44 |

Energy efficiency in refrigeration through the right use of automation

### INTERNATIONAL

48 |

Two new EnOcean distribution partners

49 |

EnOcean distributors network expanding - workshop in Munich

50 |

PRESS ECHO

51 |

EVENTS

52 |

DISTRIBUTION

54 |

CONTACT, IMPRINT



## Dear readers,

At the recent annual World Economic Forum in Davos one of the main topics discussed was global warming and possible countermeasures. I attended several sessions on these issues and was reminded of another fact – fossil energy reserves are shrinking. We have to lower our energy use by all means, because the next crisis isn't a question of whether but of when.

The solutions are twofold and we need both. One is to speed up the use of alternative energy resources, the other to reduce energy consumption. One way of reducing energy consumption is to change our individual behaviour, to travel less and to turn down the heating or air-conditioning. That's helpful but I don't think we want to return to caves either. A more sophisticated way is to enhance the energy efficiency of our buildings with better insulation and intelligent systems. Smart systems sense when somebody is in the room, if artificial light is required, and what level of temperature is needed to make someone in the room feel comfortable.

Smart systems need sensors to know what's going on. People don't like walking 10 metres to switch off the lights. They prefer to have a light switch close by, and a wireless motion detector to switch off the lights when nobody is in the room.

California recently passed regulations called "Title 24" mandating intelligent building automation systems.

Another example of how to enhance energy efficiency is to monitor windows. If a smart system detects that a window is open, it can immediately turn down the air-conditioning or heating. The German company Oventrop introduced such a system (see article in *perpetuum* 04), and the result is a 5% energy reduction – just with the help of a few small sensors and controls. The sensors are wireless, operating without batteries using the EnOcean standard to make them sustainable from the beginning.

Sustainable sensors for smart green buildings are the mission of EnOcean. More than 250,000 of our wireless sensors are now working in over 1,000 buildings, and in this issue of *perpetuum* you can read how market leaders such as SAP and IBM use EnOcean's wireless sensors to enhance performance while conserving energy.

Markus Brehler  
CEO and Founder, EnOcean GmbH



## REVOLUTIONARY

# SELECTION GUIDE FOR WIRELESS STANDARDS – WHEN TO USE WHICH WIRELESS SYSTEM

Compared to wired systems, wireless offers much greater flexibility and convenience in building installation. There are a variety of different systems on the market. Increasingly therefore, system integrators, electrical specifiers, architects and property owner must make a choice. Here we look at the established wireless technologies with their major performance parameters.

By Armin Anders, head of product marketing, and Frank Schmidt, CTO, EnOcean GmbH

A systematic analysis of the individual requirements for performance, cost and flexibility in the intended wireless technology will soon narrow down the choice. What follows are the major decision criteria.

### DECISION 1: HIGH OR LOW DATA VOLUME

Do you want to transmit moving pictures, network computers or operate a printer wirelessly? If so you need a wireless system with a high data rate that can carry large data quantities in a short time.

	EnOcean	Z-Wave or KNX-RF	ZigBee (802.15.4)	ZigBee (802.15.4)	Bluetooth (802.15.1)	WLAN (802.11)
Frequency (MHz)	868	868	868	2400	2400	2400
Data rate (kbyte/s)	125	9,6 / 20	20	250	720	11.000-54.000
Minimum telegram length (ms)	0,6	20	30	4	0,7	–
Energy need (incl. startup)	extremely low	low	low	low	medium	high
Basic load level of frequency band	low	low	low	high	high	high
Risk of data collision	very low	medium	medium	low	very low	high
Batteryless radio transmitter	yes	no	no	no	no	no
Life cycle costs	very good	good	good	good	good	not so good
Optimal solution for following purpose	maintenance- free batteryless wireless sen- sor systems	battery- powered wire- less sensor systems	battery- powered wire- less sensor systems	battery- powered wire- less sensor systems	computer networking with printers and PDAs	computer networking (Web, e-mail, video)

Summary of established wireless systems



The WLAN and Bluetooth standards offer this capability, but at the price of medium to high energy needs. Consequently they are unsuitable for battery powering over a long period. Most automated functions in a building however only require shortterm wireless transmission of small amounts of information. These include switching lights and devices, operating curtains and especially transmitting the information of wireless sensors like air-conditioning controls, position signalling switches and smoke detectors. So when low energy need takes priority, you can move on to the next decision to narrow down the choice of candidates.

#### **DECISION 2: MULTIPLE SIMULTANEOUSLY TRANSMITTING DEVICES**

When communication interference appears, it is invariably caused by radio transmitters in the immediate vicinity operating in the same frequency band. Given high radio density, this can result in substantial delays in time to transmit and even data losses. A safeguard against other wireless transmitters combined with fast system response can be produced by making use of a frequency

band that is less crowded. There is a very pronounced increase in the wireless networking of PCs, printers and other IT devices using the 2.4 GHz band, which is licence-free all over the world. This makes the 868 MHz band, for example, much more suitable for reliable building automation. It is also licence-free in Europe, allowing no continuous transmissions but only very short transmitted pulses. In addition, the laws of physics mean that 868 MHz radio waves have twice the range of 2.4 GHz signals and double the penetration through materials like walls and furniture.

A 2.4 GHz system consequently requires about four times more receiving nodes over its area. That increases its cost compared to an 868 MHz solution. The need for security against collision of the wireless telegrams within your own system increases with the number of transmitters. The radio data simultaneously sent by multiple transmitters can collide close to a receiver, and the latter will then be unable to decode them properly. The problems are fewer in a small installation as long as a radio channel is not overloaded by the relatively small number of wireless sensors and





# REVOLUTIONARY



EnOcean easyfit universal switch insert for 55 x 55 mm frame systems with energy-autonomous PTM 200 wireless transmitter module.

switches. But in larger installations you find very many wireless components in a confined space. So it is important to choose a wireless system that is suitably robust in its rejection of data collisions. One effective method is to keep each of the transmissions very short. Extremely short wireless telegrams of only about a thousandth redundant transmissions create excellent collision safety in the EnOcean wireless standard, safeguarding against sporadic and periodic sources of interference. As many as 500 closely located transmitters, all signalling once per minute, can be received with more than 99.9% certainty.

## DECISION 3: BATTERIES

Sensors powered by batteries must be monitored for battery condition, batteries must be stocked, changed and disposed of properly, it is possible to do away with batteries! EnOcean is currently the sole provider of such technology. What makes it possible is the extremely low energy need. The wireless protocol requires only about 0.12  $\mu$ Ws to securely transmit one bit of information over a distance of 300 metres in free space. A battery-less wireless switch consumes about 50  $\mu$ Ws for a complete radio command – some 100 times less than the more usual, battery-powered wireless switch. So a conventional wireless radio, powered by an electrodynamic generator, would require 100 times the actuating force of an EnOcean switch, and a conventional wireless sensor in a living room would need a solar cell 100 times in size.



Solar-powered room controller and door/window contact.

#### DECISION 4: INTEROPERABILITY

Of all wireless standards, batteryless EnOcean wireless technology offers the largest spectrum of end-products for building automation. To date some 50 manufacturers have created a selection totalling more than 200 compatible devices. About 250,000 devices have gone into use over the past three years, proving their ruggedness and reliability in thousands of buildings. The devices of the different manufacturers all work on the same wireless interface. So signals can be received, which are sent, for example, by wireless switches from Ad Hoc, Echoflex, Osram, Zumtobel, Bticino or Peha, thermostats from Thermokon, Stuhl or Omnio and wireless receivers from ABB, Distech, Siemens, Wago, Beckhoff, Wieland or Phoenix. Gateways provide for integration into all common building bus systems like EIB/KNX, LON, TCP/IP and BACnet. General-purpose and specific switch inserts allow integration into the switch ranges

with their different designs of all installation material producers on the German market. In addition to unidirectional switches and sensors, bidirectional wireless modules are obtainable for creating intelligent networks for instance.

#### CONCLUSION

Wireless systems are now firmly in place in building installation. But no wireless system can satisfy all the different requirements to the full. The WLAN and Bluetooth standards are more suited for data-heavy applications. Flexible control of building functions or detection of sensor data produce a need for cableless sensors or switches. This is where batteries are often not wanted or unacceptable because of the service investment. EnOcean is the only standard enabling the implementation of such batteryless plus wireless systems. With this technology it is possible to create maintenance-free systems even for large buildings with many hundred transmitting devices in one radio cell.



## OVERVIEW OF ENOCEAN MODULES FOR GENERAL APPLICATIONS



### PTM 200 – THE ULTRATHIN MINIATURIZED SWITCH MODULE

- Maintenance-free powering by finger pressure
- Optionally one or two rockers or up to four pushbuttons
- 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  $\mu$ F
- Dimensions 33 x 22 x 11 mm
- Actuating travel approx. 2 mm
- Actuating force approx. 2 N



### PTM 230 – RADIO TRANSMITTER MODULE

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



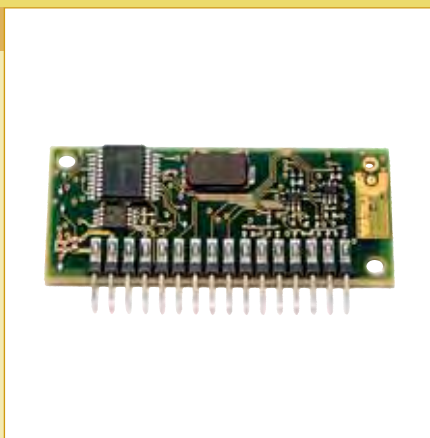
### STM 110 – THE SENSOR MODULE

- 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
- Replaces STM 100, available from May 2007



### RCM 110/120 – THE 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 Vdc voltage supply
- 25 mA current consumption
- Basic functions: switch, blinds control, dimming and serial interface for bus systems (RS232)
- Simple teaching of up to 30 wireless transmitters
- Memory function (for light and blinds scenes)







### TCM 110/120/130 – ENOCEAN BIDIRECTIONAL

- 5 Vdc 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 • Modem functionality

**TCM 130:** • Software API for TCM 120 module • Programmable in C

- Bidirectional radio • Bidirectional serial interface
- Single- and two-level repeater functionality
- Power saving modes • Four D/A inputs, four digital outputs



### PTM 250 ENOCEAN EASYFIT – UNIVERSAL SWITCH INSERT

- Surface mounting without casing
- Switch program frame flat on the wall
- 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
- Single or serial rocker
- Colours: white, aluminium, anthracite



### 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 250/255 – 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 two EnOcean STM 250 wireless window contacts can be teached. Simple connection of the line voltage and load by screw terminals.



### EPM 100 LEVEL METER / EPM 200 RADIO TEST SET

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

EPM 200 radio test set contains EPM 100 and PTM 250 EnOcean easyfit switch



### ANT ANTENNA PACKAGES

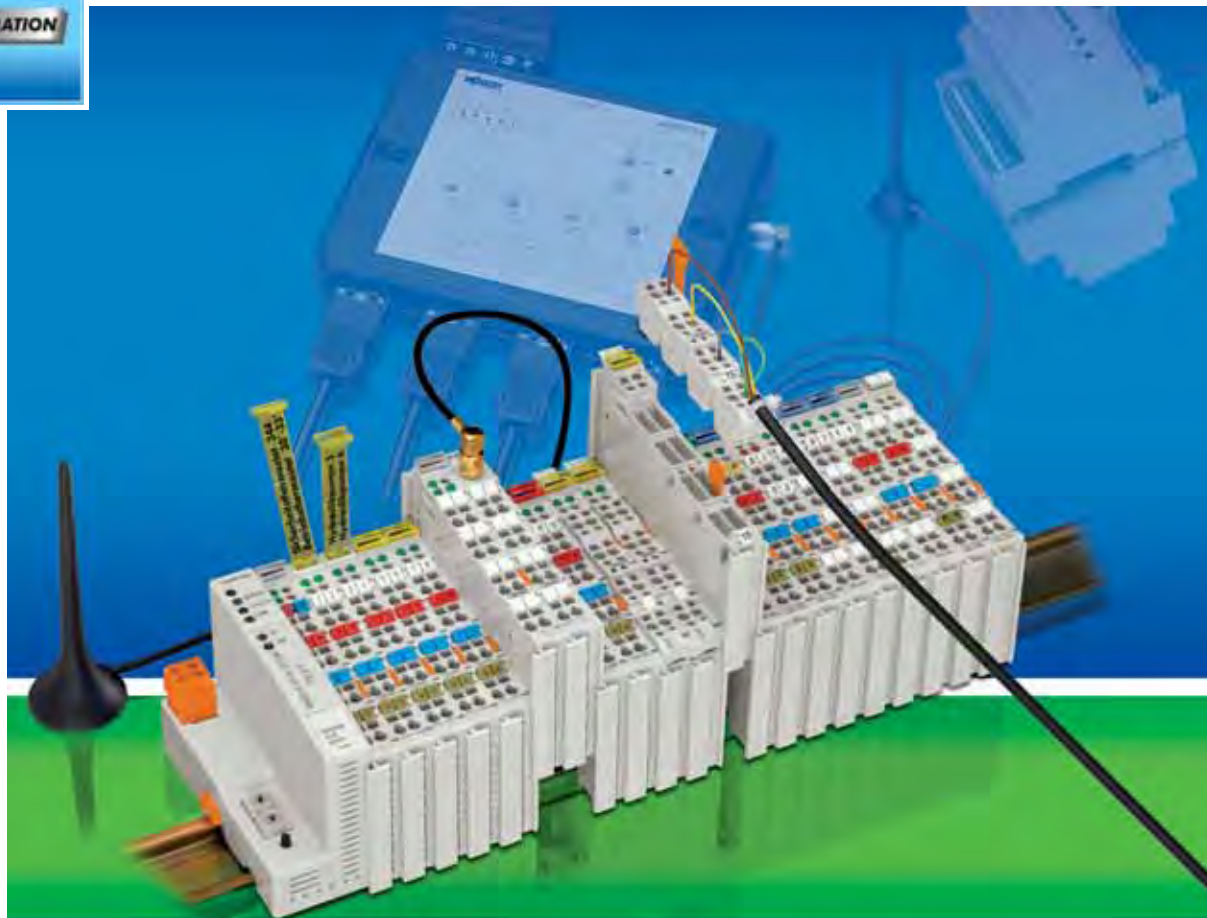
Ready wired antennas for fast and simple installation in locations with restricted reception quality.

### EVA 100 EVALUATION KIT

Test board for simple startup of EnOcean wireless modules.



# Receive-ready!



## When cable installations are inflexible and costly...

...radio systems with WAGO receivers offer adaptable and flexible automation solutions for industry and building services.

For more information please visit:

[www.wago.com](http://www.wago.com)

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INNOVATIVE CONNECTIONS



## BATTERYLESS WIRELESS SWITCHES – FROM FLEXIBLY INSTALLED WALL SWITCH TO KEYRING PENDANT

*The revolutionary idea of a batteryless wireless switch was first marketed in 2003. The basic requirement was the availability of efficient energy converters that turn the pressure on the switch into current to operate an intelligent wireless system. In addition to batteryless wireless sensing, the form factor is an important criterion when it comes to investing the technology in a project.*

By Andreas Schneider,  
Executive VP, EnOcean GmbH



A selection of switches based on batteryless EnOcean technology.



PTM 270  
concept study  
– batteryless  
and watertight  
for a variety of  
applications.

### FUNCTION IS FORM

In flat wireless switches that can be attached

directly to a wall for example, the possible form factor for a wireless module is determined to a large degree by the design of the installation switch. The trends differ depending on where you are in the world. Square surface switches dominate the scene in Germany, while small switch rockers tend to be standard in Britain and rectangular forms in the USA. Many different switch designs can now be implemented with the second generation of EnOcean technology. The batteryless PTM 200 wireless module can be found both in surface mountable switches from Busch-Jaeger's future range and in modern designs like PEHA Aura or the general-purpose EnOcean easyfit, which fits a large number of German 55 x 55 mm frame designs. What are currently the smallest switch inserts are used in modular systems like those from BTicino and Vimar.

Unlike other wireless standards like DECT or GSM, EnOcean technology is primarily used not for mobile but for flexible fixed installations. Remote controls can now also be added to enhance

convenience in residential buildings and business premises. Batteryless four-channel remote controls are obtainable from PEHA, Omnio and many other manufacturers. Since these like the wall transmitters are based on EnOcean's PTM 200 wireless module, they can be taught into all compatible light control systems.

### TREND TO MINIATURIZE

The next step in the miniaturization of wireless transmitters is now possible with discrete components. The ECO 100 energy generator for linear motion is optimized for operation with the PTM 230 single-channel wireless transmitter. The two components are so small that a single-channel handheld transmitter can now be implemented in the form factor of a key fob. EnOcean has presented the watertight PTM 270 transmitter as a concept study for use in a variety of applications, as a means of calling assistance for invalids and the elderly for instance, as a door opener or as a switch for retrieving different lighting scenarios.



## CONCEPT STUDY OF AN ENERGY-AUTONOMOUS WIRELESS OCCUPANCY DETECTOR BASED ON ENOCEAN TECHNOLOGY

*The concept study shows the possibilities of developing an energy-autonomous occupancy detector based on EnOcean wireless technology. The concept implements the following functionality: the light is manually turned on by the first person entering the room and remains on as long as somebody's presence is detected in the room; shortly after the last person has left the room, the light turns off. This produces great potential for saving energy because the light is only on when really needed.*

By Christian Bach, applications engineer, EnOcean GmbH

### ENERGY-AUTONOMOUS CONCEPT

The concept consists of two EnOcean modules: an autonomous wireless presence detector and a mains-powered wireless wall-mounted receiver with a switching actuator, presented here as a power outlet receiver with a turn-on button.

What is new is the implementation of an ultra-low-power wireless presence detector in a standard housing that is able to work on only about 60 lux

Energy-autonomous wireless occupancy detector.







Demonstrator: power outlet receiver with turn-on button.

of light. The principle is based upon ready available cabled solutions. The light is turned on manually by a button on the receiver.

An integrated timer automatically keeps the light turned on after actuation of the button for a determined period of between two and ten minutes, similarly to a staircase light control. During this period the receiver will expect further occupancy detection telegrams.

Even this short period in which the light is turned on is sufficient to charge the empty energy accumulator of the autonomous wireless presence detector through the solar cells. This upholds the functionality of sending cyclic presence telegrams when motion is detected. The transmitter is a standard EnOcean PTM 230 module.

#### **AUTOMATIC TURN-OFF SAVES ENERGY**

When a telegram is received from the connected occupancy detector during the pre-set period, this re-initializes the integrated timer of the receiver and extends the set time by four minutes for instance. So the light stays on for another four minutes and remains in this state as long as further presence telegrams continue to be received. The timer works as a missing pulse detector for light ON telegrams. Once no telegram is received, the timer automatically turns off the light when the set period ends.

After the light goes off, it can still turn on again within 30 seconds if motion is detected. Otherwise the turn-on button of the receiver needs to be manually operated.

Please contact EnOcean for further information.



## BATTERYLESS WIRELESS SWITCHES SIMPLIFY BUILDING AUTOMATION – MORE FLEXIBLE FOR LESS COST

*Building automation combined with EnOcean's batteryless wireless switches means a large measure of flexibility in the later everyday use and operation of a building. However this undeservedly has the reputation of entailing much higher project costs. Because when you compare the cost of a conventionally cabled automation system to a solution based on EnOcean technology, you quickly realize that the opposite is true.*

By Marcus Trojan, engineering sales/building automation, EnOcean GmbH

Architects and facility managers are increasingly moving over to the use of intelligent automation solutions in their specification of new industrial or commercial buildings. In particular when it comes to the cabling of lighting and sunshade controls, this technology offers the flexibility that is so important for implementing central commands in conjunction with time switches, weather stations

or other intelligent controllers. In a decentralized installation for instance, depending on the size of a building, you will find one or more automation centers (field bus nodes) cabled in a star network with luminaires, louvres and switches.

### COST COMPARISON – CABLED / WIRELESS

Building floor 30 x 15 m, lighting and blinds

#### 40 inputs (20 lights/20 blinds) – automation system with wired switches over digital (binary) inputs

Qty	Material	Product
20	Circuits	Series switches
20	Blinds	Blind control switches
60	Digital inputs	4-8 channel modules
927	Light-current wire (metres)	Installation cable
55	Price reduction for smaller cable trough € 6.40/metre	Proportionally for lighting and sunshades
40	Switch boxes	
120	Conduit in hollow wall (corr. to 3 metres/switch)	

Total cost\* approx. € 2,971

#### 40 inputs (20 lights/20 blinds) – automation system with EnOcean technology

Qty	Material	Product
20	Circuits	Series switches
20	Light switches	
1	Blind control switch	

Total cost\* approx. € 2,435

\*Project calculation example

**COST SAVING 22%**



The cabling of the necessary switches in commercial buildings shows itself to be very inflexible however. The future tenant or owner must know, right from the start, where they want to have the door hinges. In everyday business life it should be possible to transform workspace, to match it to current needs, expanding several adjacent offices into a single large one for instance, or fitting a glass dividing wall in an open-plan office to create a conference room or separate area for a manager. If extra corridor doors are then put in place or switches fitted next to a connecting door, the effort and expense involved can be quite considerable.

#### **WIRELESS SWITCHES SIMPLIFY SPECIFICATION AND INSTALLATION**

If you replace the conventional light and blind control switches by wireless switches from the very start, all the problems are simply and speedily overcome. No extra conduits and switch boxes need to be installed in the hollow walls for new doors, and no new cables have to be pulled through. Instead you just adhere or screw the flat wireless switch to the wall. The more common wireless switches still require batteries, which then have to be replaced at regular intervals. Plus, wireless transmission takes a relatively long time (about 50 to 70 ms). If there are 20 or more switches installed in one

office area on one floor, it is quite possible that two switches may be pressed at the same time. So one switching operation is lost.

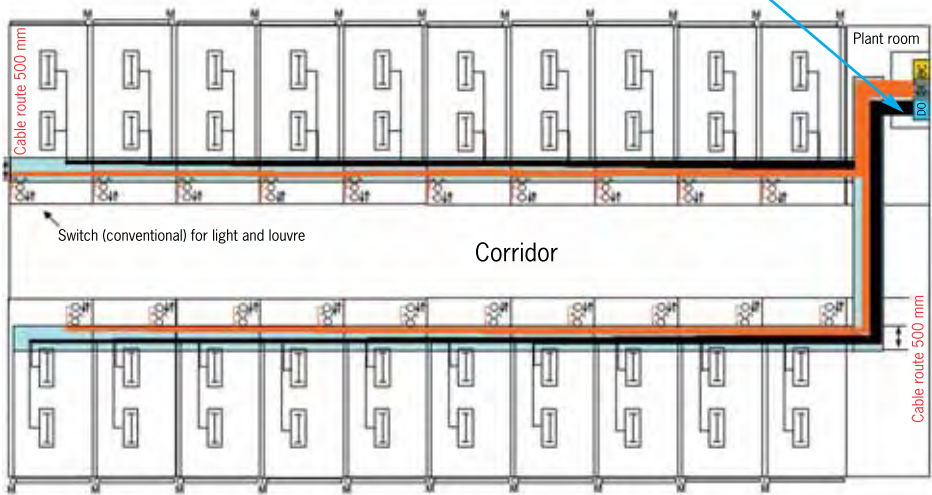
#### **CABLED VERSUS WIRELESS**

When you compare the installation costs at the input end of an automation system between the usual star-shaped switch wiring and the use of EnOcean technology, the result is quite exceptional – even if the interior of the building has hollow walls.

The conventional solution calls for the installation of a normal switch and a blind control switch in each office. That means boring two round holes in the hollow wall next to the door for the switch boxes, and laying about three metres of conduit through to the installation shaft in the ceiling. In the ceiling the cable routes for the switch wires have to be scaled larger – the example assumes about 55 metres. Doing away with the many control wires makes the cable route smaller. The price difference between a cable route of 400 mm in width and one of 500 mm is about € 6.40/metre (ready fitted), which can be saved. From the switch boxes to the field bus node it is then necessary to lay and connect two control cables for lights and blinds – the example assumes € 1/metre (including laying), i.e. 927

Conventional installation

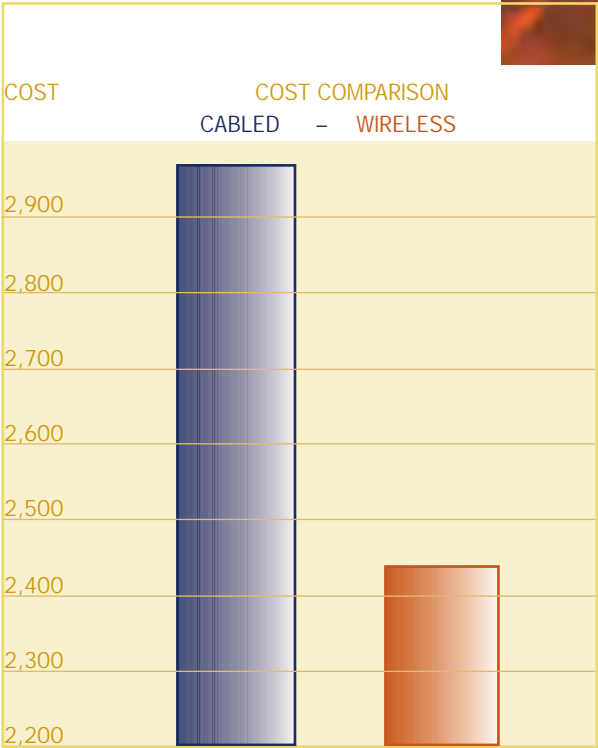
Floor 30 x 15 m with 20 office units,  
plant room with bus controller (BC), digital inputs (DI) and digital outputs (DO)



Material requirement, see table on page 14.

metres are laid. With conventional cabling you additionally need digital (binary) inputs on the automation station, four channels per room (twice light on/off and twice blind up/down). The sample installation with 20 rooms consequently requires a total of 80 inputs, and the material costs (calculated rather for a best than a worst case) would amount to about € 480 (€ 6/channel). The cabling investment on the switchgear cabinet is considerably greater because for each room, in addition to the two power lines for the light and the blind, three input lines are needed for the light switch and the blind control switch. An installation using EnOcean technology does away with digital inputs on the field bus node – instead a single wireless receiver plus antenna are needed (list price approx. € 235).

The cost of a conventional,  
cabled electrical installation is much higher  
than that of batteryless wireless technology.

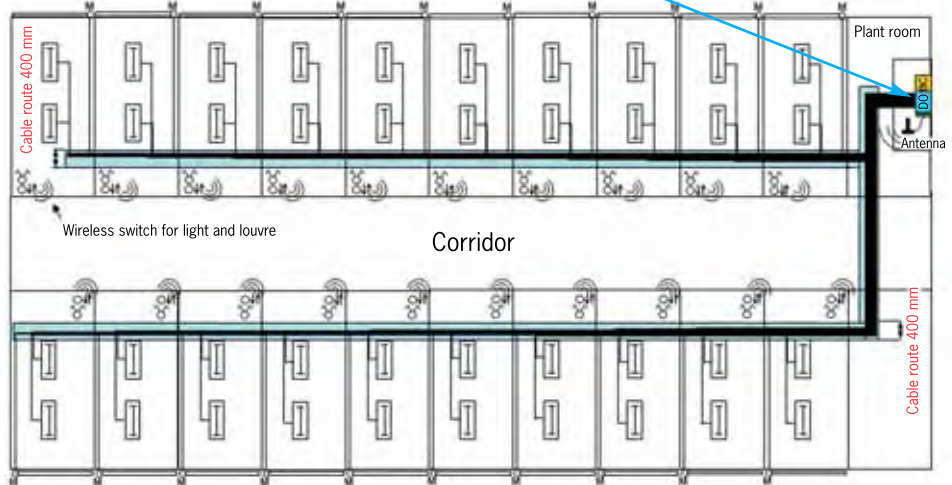






### Wireless technology

Floor 30 x 15 m with 20 office units,  
bus controller (BC) with wireless receiver and digital outputs (DO)



It is easy to see that, in addition to the narrower cable route, the space need in the plant room is also reduced. Material requirement, see table on page 14.

### 15 TO 35% SAVING THROUGH ENOCEAN WIRELESS TECHNOLOGY

The result speaks for itself. According to the calculation made by a specification office, the project cost per EnOcean switch is about € 61 compared to € 74 in a conventional installation, in other words a saving of 22%. In a building with only 20 rooms the input configuration with flexible wireless technology costs € 536 less than the usual cabling. When the technology is adopted in larger buildings, there are obviously more offices and light circuits, and room temperature may also be monitored, in which case the saving can exceed 35%. Not forgetting the advantages of flexible arrangement. Alterations in the configuration of the light circuits, often early on in the building phase, pose no problems because the final assignment of switches need not be made until a building goes into use.

### UNLIMITED FLEXIBILITY

Wireless technology also shows to advantage when changes are made during the use of a building. Wireless switches can very easily be positioned elsewhere, and extra switches can simply be installed later on without having to lay cables, without causing dust and noise, and without disturbing those working in a building.





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## SAP MOVES INTO FLEXIBLE WORKPLACE COMFORT

*In the first half of 2007 SAP will occupy a new building complex in Walldorf. More than 1,500 battery-less EnOcean wireless switches have very much simplified the cabling, showing the way to a whole new flexibility in the control of workplace lights and sunshades.*

By Peter Pernsteiner, freelance journalist

In the weeks to come, the entire personnel of SAP Germany based in Walldorf and Bensheim will move into their long awaited, new domicile. Until now the business units sales, consulting, training and marketing were distributed among a host of office blocks in the Walldorf industrial estate and in Bensheim. The new complex with some 45,000 sqm floor space consists of two imposing five-storey, star-shaped arrangements joined by an equally impressive restaurant and conference building.

### **SPEEDING UP INSTALLATION - SIMPLIFYING MODIFICATIONS**

The two star-shaped office blocks branch out in six directions with about 32 x 15 m floor space on each storey. These branches are initially intended as open-plan offices and feature single controlled sunshades and standup luminaires, supplied from floor tanks, each to evenly illuminate a group of two to four workplaces. Sunshades and luminaires are controlled through a flexibly programmed EIB/KNX building automation system with wireless EnOcean gateways implemented in gesis RC components from Wieland Electric. A major advantage of the super-flat gesis components is that they are

pluggable, which automatically excludes cabling errors, speeds up installation, and simplifies any later modifications in purpose. The central control through EIB/KNX will automatically lower all sunshades at the weekend depending on the degree of sunshine, for instance, so that the inside of a building does not heat up excessively. Upwards of a certain wind force, on the other hand, all sunshades are automatically drawn up and locked in place so that they cannot be operated manually.

Integrated into the hollow ceiling on each storey of a branch of the buildings are two wireless receivers about 15 m apart, in a redundant configuration and able to receive the signals from all wireless switches in an open-plan office. The redundancy means that all conceivable office configurations are possible, for example single offices with metal dividing walls, without causing what is called signal shadowing. This range margin was impressively demonstrated upon installation of the wireless receivers using special-purpose EnOcean level meters.

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Wieland gesis RC EIB/KNX gateway with external antenna beneath a ceiling.



### NEW FLEXIBILITY

"Batteryless wireless technology from EnOcean enables us to position light and sunshade switches wherever it suits us", says Thomas Kopf of the project team from SAP facility management, "on the side of a cabinet or even on a desk." Such freedom would not have been possible with conventional wireless switches, because then maintenance personnel would have had to root out every switch for a routine battery check or replacement. "When we were preparing to move in, we saw that part of an open-plan office would have to be split into a conference room or a separate office for a department manager to optimize procedures in that particular section of a building", continues Kopf. Given the new wireless technology and a flexible system of dividing walls, this turned



EnOcean easyfit is a seamless match for the Gira E2 range of switches chosen for the application.

out to be no problem at all. One of the walls can be put up in a few hours, causing very little dust and noise. And if a room is to have its own light switch, the switch is just teached into the wireless receiver under the ceiling and stuck to a convenient surface next to the door.



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## ENOCEAN DISTRIBUTOR ASP PRESENTS REFERENCE PROJECT IN BRAZIL – 1,500 SQM OFFICE FLOOR SPACE WITH WIRELESS TECHNOLOGY FROM ENOCEAN AND OMNIO

*The Brazilian affiliate of Sweden's Sandvik – a world leader in the production of cemented carbide for industry and tools for rock excavation – is headquartered in São Paulo, where it uses EnOcean technology throughout to control the lighting of its new, highly modern office complex.*

By Oskar Pzillas, managing director, ASP Automação Ltda

A very basic requirement in this project was maintenance-free technology. The project was implemented through successful cooperation between EnOcean's Brazilian distributor, ASP Automação Ltda in São Paulo, the highly reputed Paulo Sophia Arquiteto e Associados group of architects, and Claudionor Albernaz, Sandvik's facility manager.

Installed in the 1,500 sqm floor space for the 30 lighting circuits were 40 EnOcean wireless switches plus five Ratio® eight-channel switching actuators and two active antenna modules from Omnio of Switzerland.

What is special about this installation is the new and very interesting kind of signal transmission

advertising feature



### Building automation

Your specialist for batteryless EnOcean wireless technology



**We offer maintenance-free wireless solutions for commercial buildings, renovation and modernization**



Project planning and installation of light management systems, automation systems and EnOcean wireless solutions – **energy-autonomous and maintenance-free** –

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Tel: + 55 11 3078 5666 | Mail: comercial@aspcontrol.com.br

**ASP**

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Predial Ltda.





from the antenna modules to the switching actuators. The active UPASB/01 antenna module from Omnio transmits the radio signals received from the wall transmitters on a serial interface to as many as four Ratio® eight-channel switching actuators, integrated in the subdistributor, which drive the load circuits.

The advantage of this kind of installation is that all controlling elements are centrally located, which very much simplifies any reprogramming or connection to further automation levels or visualization systems when functional buildings in particular are modified in their purpose. The antenna modules were built into the suspended ceiling. Where they are placed is not critical in an office complex of this size.

A further requirement of the client was that the lighting circuits should automatically be matched to the space used by the flexibly configured conference room, i.e. depending on how it is split up by variable dividing walls. For this purpose the lighting circuits are cut out or switched over by a solar-powered Omnio STM 250 signalling contact installed in the ceiling. The luminaires are dimmed by an Osram DALI Touch Dim RC system. The sunblinds as well as the projection screen are controlled by user-configured and flush-mounted switching actuators from Omnio. The client marked out a time frame of two days for the installation and startup of the entire project, which was adhered to thanks to this user-friendly technology.

Oskar Pzillas, managing director of ASP, spoke to Sandvik's facility manager and project coordinator Claudionor Albernaz about his experience with the project and the solution implemented.

### **Pzillas: How did you come across EnOcean technology?**

Albernaz: Through the Paulo Sophia Arquiteto e Associados group entrusted with planning the new SMT Sandvik office. And ASP Automação Ltda of course, which fully explained to us the quality and benefits of this technology.

### **Pzillas: Why did you actually opt for a wireless solution?**

Albernaz: We realized that a wireless solution with maintenance-free EnOcean technology would mean considerable advantages if we decided to change the office layout. Sandvik is also a high-tech enterprise in every respect, and Flavio Benedini, the director of the SMT division, gave us a free hand. We were pleased at how fast everything could be installed, and we'll use the same technology for future expansion.

### **Pzillas: What other advantages do you see, especially in functional buildings?**

Albernaz: Well, there's the flexibility of course, if we change the purpose of a building in any way. We can reposition switches, temperature and other sensors very fast, and integrate further controls in the system without a great deal of effort. The partitioning walls aren't damaged because in our case all switches, buttons and sensors are adhered to wood, glass or ceramic surfaces. And we can forget about replacing batteries, which is also an environmental benefit.



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## REMODELLING THE REMODELLING PROCESS

*EnOcean and Ad Hoc Electronics introduce a new solution to an old problem.*

By Jan Finlinson, president, Ad Hoc Electronics, USA

Despite the recent decline in new home construction, residential renovation continues to grow at a strong pace. This growth is fostered by home appreciation or pre-sale improvements to increase property value. These homeowners are not just talking about a cosmetic makeover, anticipated remodel costs typically amount to one third of the value of their property. To increase both comfort and value, new rooms, particularly bathrooms are added on. As a result, former exterior walls become interior walls. This may seem relatively minor but when it comes time to installing new switches or electrical wires this presents a challenge.

Older homes are often constructed of brick, block, or plaster and lath. Wall cavities are filled with insulation and wood block firebreaks span walls to help limit the spread of a fire. Therefore, the contractor installing a switch encounters significant problems pulling wires to the new switch location.

Troy Davis, a historic-home remodelling contractor cautioned, "We're always wary of the electrical system when taking on a remodelling project. We never know what to expect behind a wall. We recently added on to a brick home so the

former exterior wall was now a bedroom wall and naturally the owner wanted a light switch. It took us over a day to chisel in a channel for the wire and switch box. Then we had to resurface the entire wall to cover the damage. We frequently encounter fire-blocks, insulation or other obstructions that prevent us pulling wires up the wall. Naturally this leads to cutting holes in the sheetrock or plaster and subsequent patch and paint. Our electrician's rule-of-thumb is \$400 to add a switch to normal sheetrock walls, and up to \$1,000 for brick walls."

### EXISTING SOLUTIONS

Electricians use a number of different techniques to overcome this problem but each has its pros and cons. One solution is to use fish tape to force a gap to pull the wires through the wall. However, this does not work in cases where there is rigid insulation, fire-blocks and other hidden obstructions. An alternative solution is to install wire moulding to the outside surface of the wall, through which the wires are pulled. Although this solution saves time and cost compared to pulling wires behind walls, the plastic raceway is not aesthetically pleasing. If none of the above options are feasible,



the contractor must cut into the wall to run the wire and then repair the wall to hide the wires.

All of these solutions still require the contractor to install an electrical box to mount the switch on. This box requires a large space to be cut into a wall, particularly challenging with brick or block walls. These wall boxes must be anchored against studs or other rigid surfaces that limit placement options.



#### NEW SOLUTION TO AN OLD PROBLEM

Ad Hoc Electronics has developed a solution that overcomes all these obstacles and also saves time and money—a solution that requires no additional drilling or wall boxes and operates wirelessly without batteries and additional maintenance. These wireless switches look and operate like traditional decorator style switches. They can be mounted flush on virtually any wall surface with either screws or double-sided tape and feature a maintenance-free lifetime of up to 20 years. The receiver is wired inline in the light

fixture or wall junction box. This receiver can easily be programmed up with up to 30 switches. This simple programming process can empower the user to achieve a networked lighting control system where one switch can control a whole room of lights or a light can be controlled by multiple switches.





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## WIRELESS CONTROL OF AUTOMATION SYSTEMS ALLOWS FLEXIBLE CONFIGURATION AND ADAPTATION OF BUILDINGS

*Phoenix Contact's building automation concept enables lighting and heating, doors, window shutters and curtains and even the most complex automatic systems of a building to be controlled by wireless switches and/or sensors. This enhances the flexibility and modularity of a building, and does away with all the jemmying and drilling for conduits and the like. The saving of various costs, especially during installation, means that the solution is ultimately no more expensive than one where everything is cabled the traditional way.*

By Joris Huegaerts, market manager/industrial automation systems, Phoenix Contact, Belgium

### "NO CABLES IN MY WALLS"

The flexible configuration and adaptation of offices turns the cabling of light switches and sensors into quite a complicated business, creating headaches for many a specifiers. The same applies to the arrangement of conference rooms and the like with adjustable walls. When it comes to using switches or sensors on walls of glass or natural stone and integrating modern fittings in rooms and buildings of historical interest, you can hardly start jemmying and drilling.

JS Solutions knows a thing or two about this. The Belgian sales representative for Happich sealing products recently relocated its premises to an old farm in Herent. In addition to the office, the house of the managing director was integrated into the building. Specifier Alfa Plus of Mechelen were commissioned to undertake the renovation. They designed a super-modern interior with lots of glass and metal. The clients allowed no sanding, jemmying and the like in the rustic brick walls, plus they wanted a flexible and modular office arrangement.

Phoenix Contact offered Alfa Plus a unique solution with wireless switches and sensors in response to this. No cable ducts were needed, and the installation costs were ultimately no more than for a traditional concept. The building automation concept from Phoenix Contact consists of wireless switches and sensors, a number of receivers and a programmable logic controller.

### RADIO SIGNAL FROM SWITCH TO RECEIVER

Lighting, heating, air-conditioning, doors, shutters and many other systems in the building are controlled by switches and sensors (motion detectors, light meters, temperature sensors and the like), all of them wireless. An integrated adhesive paste allows their attachment anywhere and on any surface. Or they can be simply placed on a desk or even pocketed. The switches are not only wireless but also work without batteries, which would need routine replacement and disposal, i.e. a burden on the environment.



## ENABLED BY ENOCEAN



All of these switches and sensors incorporate an EnOcean wireless module. The modules match many different switch designs. Such a module transmits a digital radio signal to its receiver at a certain frequency (868.3 MHz). A single receiver can detect signals from a maximum of 50 switches and sensors. The digital signal naturally includes an on/off signal plus identification of the switch to prevent any interference between different switches.

Theoretically the signals from switches to receivers have an indoor range of up to 100 metres, and even 300 metres in the open. In practical terms however, they are influenced by the construction and the materials used for it. Phoenix Contact consequently always commences its analysis and engineering specification on the basis of the floor plan. Walls and glass present no problems for the radio signals at this frequency.

#### PROGRAMMED MODULAR CONTROLLER

The receivers are linked by serial cables to the central switchgear. Cables lead from this PLC, which is application-specific, to the various outputs – lighting fixtures, heating radiators, etc. Phoenix

Contact chose the small but powerful ILC200 for JS Solutions. Here the number of inputs and outputs are modularized, so the client only pays for what is in effect needed. Phoenix Contact delivered the PLC with the entire cabling plan ready programmed. That simplified and speeded up the connection procedure, the electricians only having to insert the right cables in the right terminals.

#### MAXIMUM FLEXIBILITY AND MODULARITY AT NO EXTRA COST

The advantages of wireless switches working by the EnOcean protocol are numerous:

- They offer maximum flexibility. You are able to attach switches, motion detectors, light sensors, temperature sensors and the like where you want to or even carry them with you.
- There is no more dust, dirt, noise or other inconvenience associated with the installation of switches.
- The modularity allows expansion of the PLC to precisely match the client's requirement.
- The ready programmed PLC is immediately operable.
- The extra flexibility and modularity come at no extra cost. The PLC and its programming mean additional costs compared to classic concepts, and the switches are also somewhat more expensive. But as a result of the especially simple and speedy installation and the smaller number of switches, the overall installation costs are the same if not less.
- The lack of batteries makes the switches absolutely maintenance-free.

Phoenix Contact's building automation concept is ideal for specifiers faced with the task of splitting floor space into a flexible configuration of offices and conference rooms.

[jhuegaerts@phoenixcontact.de](mailto:jhuegaerts@phoenixcontact.de)



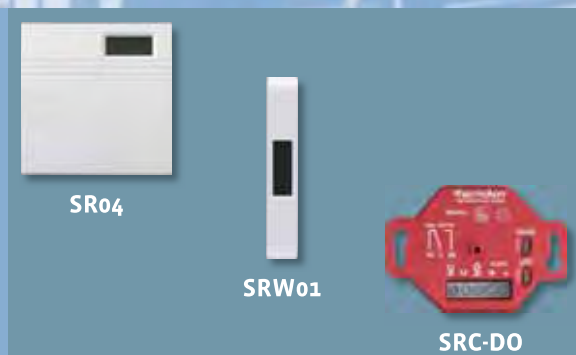
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## WIRELESS SENSOR TECHNOLOGY FROM THERMOKON ARRIVES IN NEW ZEALAND

*Presentation of the University of Canterbury, Christchurch reference project*

*The University of Canterbury (UC), founded in 1873, is one of New Zealand's major learning institutions. The modern and inviting university is centred on Christchurch, the biggest city of the south island.*

By Heike Loh, marketing, Thermokon Sensortechnik GmbH



The wide range of studies offered by the university attracts a large number of international graduates. Nor is it surprising that there is an intensive exchange program with European universities. Along with an excellent education, UC offers numerous possibilities for accommodation in the popular University Hall residence. In a great atmosphere you find comfortable facilities and a whole variety of rooms with modern fittings and furnishings, suiting different needs and means.

To improve the quality and capacity of University Hall, all rooms of the older buildings are being refurbished and thoroughly modernized by W. Arthur Fisher Ltd (WAF) of Auckland, a project partner of Thermokon. University Hall will also be reconfigured and expanded to create accommodation for more than 500 extra students. New three-storey buildings will include apartments of two, three, four or five bedrooms, each with a shared living area, and are due to be completed by mid-2007.

Batteryless SR04 wireless temperature sensors and SRW01 wireless window contacts from Thermokon are installed in each living unit to ensure efficient heating. The window contacts enable status monitoring of windows and doors in conjunction with receiver interfaces and a superordinate monitoring system without bothersome wiring. When windows are closed and a room is not warm, the heating turns on automatically. But if either the temperature gets too warm or a window is opened while the heating is on, the heating is automatically turned off again. Time-consuming and expensive installation chores such as wiring or chiselling conduits in walls are quite unnecessary. Reduced material expenditure and time savings result in a cost-effective system solution. The project optimally demonstrates the advantages of the batteryless and wireless EasySens system.

[www.thermokon.de](http://www.thermokon.de)



## > **EasySens<sup>®</sup>** **Wireless Sensor System**

„The ideal solution for modern buildings as well as for renovation and modernization.“

By means of innovative solar technology, we use light as a natural energy source for our modern wireless sensor system.

The devices have no need for battery or external power supply.

We offer a comprehensive programme of sensors, switches, room operating panels and receivers.



Room Operating Panel SR07P,  
pure white, frame Gira Esprit Glass



Wireless Switch EasySens Busch-Jaeger,  
4-channel light, alu silver, frame Future-linear



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## NEW IBM BUILDING FROM ALLREAL IN ZÜRICH-ALTSTETTEN: MINIMAL ENERGY USE THROUGH INTELLIGENT BUILDING AUTOMATION

*Close cooperation between investor and general contractor Allreal and tenant IBM produced customized, flexibly configurable and minimal-energy-use headquarters for the IT giant in Zürich's Altstetten quarter. A major contribution to the energy efficiency of the structure comes from the integral building automation designed by Comsys Bärtsch, which communicates entirely through IBM's Ethernet network.*

By Daniel Herren, sales & marketing, WAGO Contact SA, Switzerland



Conveniently situated in Zürich-Altstetten close to rail and road links, the investor and general contractor Allreal created the new headquarters of IBM Switzerland. The Swiss branch of the world's biggest producer of information technology moved into the new premises, optimized for its needs and purposes, in early 2005. The building, specified by the internationally reputed architect Max Dudler, offers 1,250 workplaces for a workforce of some 2,200 persons (only 50 firmly assigned workplaces, the remaining people use desk sharing), a customer forum, staff restaurant, auditorium, conference rooms and underground parking for 236 vehicles. The property consists of two adjoining blocks of six and 13 storeys, the latter a tower of 46 metres in height. Floor space is 57,300 sqm, 36,800 sqm is the rented space, and the investment totalled 180 million CHF.

### SWITZERLAND'S BIGGEST MINIMAL-ENERGY-USE BUILDING

A number of measures contributed to achieving minimal energy use:

- High daylight share through a large inner courtyard and atrium with roof windows.
- Back-ventilated façade of natural stone with mineral fibre damming.
- Ventilated countersash windows with integrated sunshades, outer insulation of compound safety glass and inner single-pane safety glass.
- Cooling ceilings with controlled ventilation and heat recovery.
- Lighting by energy-efficient luminaires governed by presence and daylight.
- Networked building automation for heating, ventilation, cooling, sanitary facilities and integral room automation for all mechanisms.

The calculated heating power requirement is 1,200 kW, the cooling power requirement 3,000 kW, for a building volume of 209,000 sqm.





Right:  
light-flooded  
inner courtyard  
and atrium with  
roof windows.

Left:  
installation of the  
cooling ceilings  
with controlled  
ventilation and  
heat recovery.



### ATTRACTIVE FLEXIBILITY AND LOW MAINTENANCE COSTS

Right from the start of the project, the investor, user, architect, specifiers and specialists from other fields cooperated closely, resulting in a variety of improvements to the concept and constructional adaptations. The relative responsibilities for operation of the building and its maintenance were assigned early on to the user and owner, which produced economies in both. There was a special focus on flexibility. The two parts of the building are designed so that they can also be rented and used separately. Five vertical access zones, each with two elevators, a staircase and main facility distributors, support this concept. The internal structure exhibits a large measure of variability. Different arrangements – open-plan, group or single offices – can be implemented in all parts without any appreciable building work. Metal encapsulated double floors and non-load-bearing walls enable simple reconfiguration of the areas.

### BUILDING AND ROOM AUTOMATION AS A UNIFIED WHOLE

The entire building and room automation was delegated to Comsys Bärtsch in Rüschlikon, a company repeatedly noted for significant innovation since it was established. In recent years it has implemented integral building and room automation using Ethernet as a communication route together with the WAGO 750 I/O system as an integrator. The solution has gone into a number of large installations, backed by the fully Web-based WebVizer

management system from Softing. Here Comsys Bärtsch consulted with the specifiers to devise rational installation of the many components.

The requirements of the investor and user included:

- The entire system down to field and room level was to communicate by TCP/IP using the universal communication cabling installed in the building.
- Proprietary standards were to be avoided in as much as possible.
- Startup was to be as simple as possible using ready pluggable systems.
- An electrician should be able to inspect the installation independently of the automation system integrator.
- Operation of the management system by a Web browser (Internet) and link for teleservicing (M+W Zander Pikett), no client installations and licensing charges (operable by any client).

The following primary plant was integrated by the same Ethernet controllers:

- Heat generation with cascaded boiler of twice 1,000 kWh. The mixer valves communicate digitally from a special terminal on a Belimo multipoint (MP) bus.
- Refrigeration of three times 1,000 kWh. Maximum supply reliability is ensured by independently working coolers; closed-circuit cooling on the tower roof.
- Five air-conditioning systems with approx. 35,000 m<sup>3</sup>/h air discharge and heat recovery.



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Room conditions: tolerance  $\pm 2^{\circ}\text{C}$ , summer max.  $26^{\circ}\text{C}$  and 50% RH, winter  $22^{\circ}\text{C}$  and 40-45% RH; total heat load internally 33 W/sqm for office space of approx. 8 sqm per person; dual air exchange through the ceiling with high-induction ceiling air outlets; no routing of water or ventilation in the false floor. The ventilation in the countersash windows largely prevents any transmission of cold in the summer or heat in the winter. The inner surface temperature of the windows is similar to room temperature, ensuring a high degree of comfort.

Room automation is handled by 330 decentralized room boxes, which simply need new parameters if the size of a room is changed. All inputs and outputs are pluggable, and the connecting cables for luminaires and sunshades came ready finished for fast and correct installation. Installation fitters worked with a tool enabling them to test all inputs and outputs while live.

The room boxes govern the following mechanisms:

- More than 4,800 fluorescent lamps are automatically controlled to demand by means of light sensors and presence indicators. Each luminaire can be singly addressed on a digital addressable lighting interface (DALI), defects can be detected plus length of operation.

- Light switches are used in number of rooms that communicate wirelessly with the room boxes. They require no batteries, generating the energy to transmit simply from the pressure on the switch.
- More than 1,450 sunshades fitted inside the countersash windows. Ventilation of the windows prevents transmission of warmth. Each sunshade is controlled as a function of solar radiation.
- Valves for the cooling ceilings and flaps for ventilation. The drives for fire protection flaps and volumetric flow regulators communicate digitally on a Belimo MP bus, doing away with a considerable amount of cabling.

### DUAL NETWORK UTILITY

Early involvement of tenant IBM made it possible to exploit a further means of synergy that is otherwise generally not used – even when Ethernet is used for building automation. In this case communication was integrated in the extensive IBM network. A rack is reserved for patch distributors, switches and other components of the building automation in the distributor on each storey for the general-purpose cabling of the building. Four communication servers, one Web and one source code server of the 100 Mbyte high-performance network manage communication between the 330 room boxes, 57 storey-level





## TECHNICAL SOPHISTICATION

- Use of DALI and MP for room automation, increases functionality, enables discrete addressing and reduces cabling.
- EnOcean wireless and batteryless technology enables the flexible positioning of switches.
- All inputs and outputs are pluggable, and connecting cables for luminaires and sunshades came ready finished for fast and correct installation.
- The building automation network is provided and operated by IBM in line with Comsys Bärtsch specifications.

and 70 central controllers with a response time in the region of 20 ms, which is quasi-realtime.

The WebVizer building management software is fully Web-based, fitting seamlessly into the overall installation. This serves for optimization of operating parameters, checks, fault reporting and logging of data. All individual systems are additionally equipped with touch panels for hardware and software access. Eight mobile Web-Pads and 18 stationary touch panels are installed locally for operation of

the systems. The benefit of the extensive system integration – operation and upkeep are single source and the cost-saving is put at about 250,000 CHF per annum. The Allreal portfolio was boosted long-term by a property with a secure yield, and IBM was able to move into customized, flexibly configurable and economically attractive headquarters without having to commit capital.

[www.comsysbaertsch.ch](http://www.comsysbaertsch.ch)  
[www.wago.ch](http://www.wago.ch)





## ENOCEAN AT THE EXPO REAL IN MUNICH

21,000 people from 65 countries attended the 9th International Commercial Property Exposition in Munich from 23 through 25 October, 2006. EXPO REAL thus drew 20% more visitors than one year earlier and visitors from abroad increased by as much as 35%.



The EXPO REAL Forum offered an in-depth look at current trends and topics in commercial property. Highly reputed experts from the sector discussed investment and financing strategies, corporate governance and policy, as well as innovations in the market. For insiders the EXPO REAL Forum, which has existed since the EXPO REAL itself, is the place to find out about trends for the future.

Andreas Schneider, sales manager of EnOcean GmbH, was present to participate in a discussion on the subject **"Young users – what do startups and other entrepreneurs need?"** The well-attended event was moderated by Dirk Labusch, editor-in-chief of the magazine Immobilienwirtschaft.

Other **participants** were:

- Uwe Heinrich Suhr, chairman of the board, Europa-Center AG
- Dr. Eugen von Lackum, managing director, TLG Immobilien GmbH
- Dr. Reinhard Wieczorek, Munich city councillor and head of the labour and economy department

Schneider was able to make a valuable contribution to the discussion circle, especially as EnOcean not so long ago emerged from the status of a startup and has established itself with its innovative technology particularly in the building automation sector.



## KIEBACK&PETER:

### – ON THE SAME WAVELENGTH AS ENOCEAN

*The technoLink system, based on wireless communication, has been part of the Kieback&Peter product portfolio for three years.*

technoLink has proven very successful in both building renovation and modern buildings because of advantages like flexibility and minimal time and effort to install.

Kieback&Peter and EnOcean have now concluded a cooperation agreement aimed at expanding the system's functionality and range of applications. EnOcean has already entered into cooperation with numerous partners, supplying the technology for innovative wireless communication. Implementation

of EnOcean technology will very much enhance the interoperability of technoLink.

Products Enabled by EnOcean were presented at this year's ISH in Frankfurt, Germany (the world's leading trade show for bathroom, building, energy and air-conditioning technology and renewable energy) and will come onto the market in Q4/2007.

[www.kieback-peter.de](http://www.kieback-peter.de)







## SPECIFIERS DISCUSS DECENTRALIZED ROOM AUTOMATION BY EIB/KNX AND ENOCEAN

*In the execution of modern building projects it is increasingly important to have partnerships capable of offering and implementing the latest technologies.*

This was the focal topic of the specifiers' workshop staged by Syspa Gebäudeleittechnik of Ohu/Landshut in October 2006. Three companies from the building technologies sector reported about innovations for the market.

Syspa itself, a provider of EIB/KNX system integration, was represented by Stefan Eben and Christian Schreyer, who showed what is new in EIB (European installation bus) and KNX (Konnex) over IP. After a review of essential Internet terms, yesterday's and today's technology were compared to explain the resulting advantages in startup, visualization and maintenance. System integration plays an important role. If good quality is to be obtained, it is essential to correctly define the subsets and include them as separate items in the specifications. Solutions were suggested for this and explained by practical examples.

Wieland Electric GmbH of Bamberg, another partner enterprise, spoke about decentralized room automation. Robert Gerhäuser presented the advantages of pluggable, axis-oriented building services. Seeing as it is becoming increasingly important to respond fast and flexibly to changes in the utilization of a building at short notice, more and more office buildings are specified prefabricated. This trend was also illustrated by practical examples.

Third to come was Andreas Schneider of EnOcean GmbH, who presented batteryless wireless technology and its possible applications in buildings. EnOcean technology is right in line with the trend: its high flexibility and freedom from maintenance

support innovative specifying ideas, and it is also highly suitable for upgrading an existing electrical installation to match modern requirements. Batteryless EnOcean technology also combines excellently with EIB/KNX and solutions from Wieland.

The participants found the presentations highly interesting, particularly the variety of possible uses for batteryless wireless technology and the simplicity of its installation. The event was a complete success and further workshops will be staged at regular intervals with changing topics.

[www.syspa.de](http://www.syspa.de)





## NETWORKED

### FRENCH ENOCEAN PARTNER PYRECAP OFFERS BALLAST CONTROL RECEIVER

With the following features:

- Same package as standard receiver RCM 250
- 220 Vac or 24 Vdc power supply available
- Controls Philips ballast, HF regulator electronic ballast, part number: HFR 254 TL 5 220-240 Vac or equivalent ballast with an analog input 0-10 Vdc
- Dimming mode and memorizes last brightness value
- Compatible with standard EnOcean switches for lights or dimming light
- Last brightness value is recovered in case of power cut
- Controls up to four analog ballasts at same time in a different package, i.e.  $4 \times 2 \times 50 \text{ W} = 400 \text{ W}$  !
- Other mechanical configurations available on request

[www.pyrecap.com](http://www.pyrecap.com)



### SINGLE-HANDED DIMMING OF FOUR LIGHT GROUPS

*A new batteryless, wireless handheld control for standard lamps, flexible office configurations or conference rooms.*

By Rainer Wrenger, business development manager,  
OSRAM GmbH, Munich

Innovative QTl DALI ECG technology in its dimmable version is the nucleus of dimmer solutions with batteryless wireless technology. Manual dimming without integration in superordinate building automation is sufficient for many applications. Here it is possible to use the integrated Touch DIM function of QTl DALI ECG. The wireless receiver for batteryless wireless switches in EnOcean technology is simply connected direct to the ECG and the mains voltage is "dimmed" to the DALI input. The HTl DALI dimmer also features the Touch DIM function and allows dimming of low-volt halogen lamps up to 150 VA.

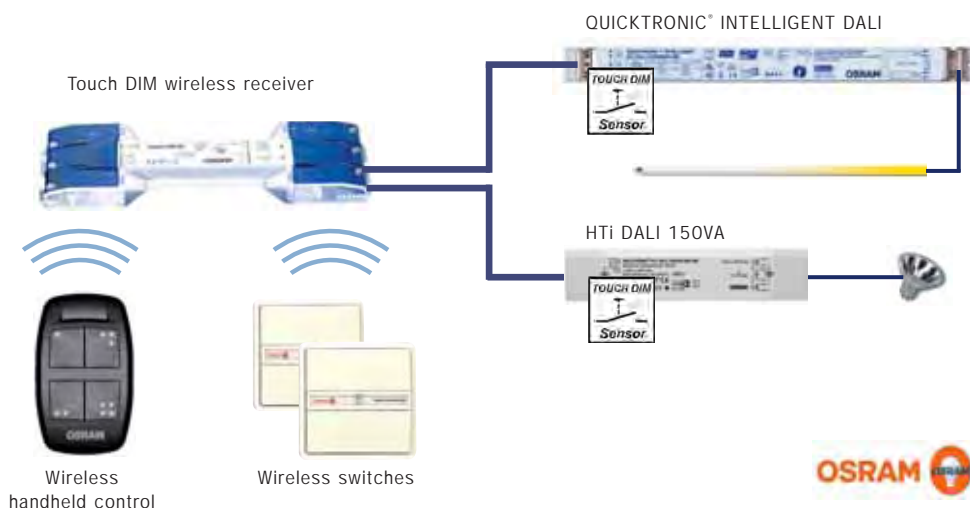
#### INDIVIDUAL LIGHT LEVEL AND FLEXIBLE ARRANGEMENT OF CONTROLS

In modern, flexible office landscapes with variable dividing walls, it is not only the lighting solution that also needs to be flexible through different fixtures. Control of it must allow the user to set a light level to suit individual taste. Just a double click saves a fixed dimming value power-fail-proof in the QTl DALI ECG or HTl DALI low-volt dimmer.

The wireless switches are simply repositioned if the layout of rooms is altered and then taught in again to the particular light groups.

#### NEW HANDHELD CONTROL FOR EXTRA APPLICATIONS

The new four-channel wireless remote control allows manual dimming of up to four light groups, e.g. in conference rooms, office groups or for flexible standard lamp arrangements with an integrated wireless receiver.



## DIMMER SOLUTIONS WITH MAINTENANCE-FREE WIRELESS TECHNOLOGY



This can be combined with wireless wall switches to expand the range of possible applications.

### LUMINAIRES WITH QTI INSIDE FOR MAINTENANCE-FREE DIMMER SOLUTIONS WITHOUT CONTROL WIRES

Suppliers of intelligent luminaire solutions with QTI inside are presented in a brochure that can be downloaded from the OSRAM home page as a PDF or requested by e-mail.

Innovative ECG technology combined with innovative wireless technology offers excellent flexibility in creating a lighting solution – from specifying through installation to later change of purpose and situation in a building.

Dimmable lighting solutions naturally come with a joint OSRAM System+ Guarantee (five years for the ECG, three years for the fluorescent lamp).

[www.osram.com](http://www.osram.com)



## NETWORKED

# GOODS TEMPERATURE METERING WITH WIRELESS SENSOR

*Wurm-Systeme is a foremost producer of automation systems for refrigeration plant and the building services management of food stores. Well-known supermarket chains and food producers throughout Europe use Wurm electronic systems to efficiently control refrigeration and achieve cost-savings. To further optimize the utilization of refrigeration plants and ensure excellent temperature profiles for goods on display, Wurm recently presented an innovative temperature sensor system based on EnOcean technology.*

- Simple, wireless installation in refrigerators
- Detection of food-goods temperature by positioning directly in the cooling compartment
- Goods-similar response of the sensor (technical certification upcoming)
- Maintenance-free powering by solar cells
- Continues to work through up to four days of darkness (no batteries)

### W-LINK PRO – THE ADAPTIVE ARTIST

W-Link pro is an innovative new wireless sensor for monitoring the temperature of goods in grocery stores. It isn't practical to run cabling directly in with the food packages, so wireless sensors were required. Only when the sensor is collocated with the food-goods can one accurately assure the temperature, and safety of the products. We call this 'goods-similar' sensing.

A second temperature sensor is housed in a chamber with a transparent opening. To simulate the response of goods packed in styrofoam trays and wrapped in foil. Certification of this "goods-similar" response by the technical inspectorate (TÜV) is due soon, and a patent is also pending. W-Link pro works does not require external power wires nor batteries, it is powered by solar cells operating under normal store light levels, energy is stored onboard the sensors to bridge several days when there is no light. It can even function for a number of days in total darkness. All wireless sensors transmit their temperature readings to a common receiving unit in a supermarket, from where they are forwarded to the Frigolink system on a CAN bus.



*W-Link pro is installed directly among the goods of the cooling compartment.*

[www.wurm.de](http://www.wurm.de)





// CONTROL TECHNOLOGY // EXPLOSION PROTECTION // MEDICAL EQUIPMENT

## Say goodbye to old habits.



Familiar with wiring cables in awkward spaces inside machinery? Re-wired and terminated tiny leads to clamps? Do you regularly replace slip rings? Stumbled over foot switch cables? Then we have news for you: The new generation of steute switchgear is now available without cable. The signal is transmitted via radio transmission, and the electrical energy is generated independently by the switch – for example via solar cell or plunger movement. Please contact us for more details. You will see: wireless means cable free!

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Please visit us at the Hannover Fair 2007: April 16<sup>th</sup> to 20<sup>th</sup>, hall 7, booth D25.

SAFE SWITCHGEAR FOR COMPLEX  
AND CRITICAL APPLICATIONS

**.steute**



## Easyclick PLUS wireless system MORE FUNCTIONS AND PARAMETERS SIMPLY SELECTED

By Werner Petritz, product marketing, PEHA Paul Hochköpper GmbH & Co. KG

Easyclick UP receivers Plus represent a new generation of receivers, substantially expanding the familiar functionality of the Easyclick system and offering the following advantages:



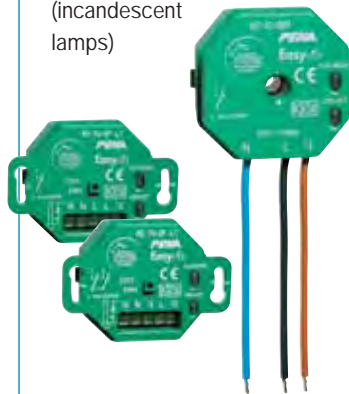
- Simple choice of device because one device commands different applications
- As many as eight integrated functions with selectable parameters
- One function individually selectable on a Plus receiver for each Easyclick transmitter
- All settings simply by button pressure on the device without PCs or programmers
- Safety function for sunblinds/shutters receiver, e.g. with window contact
- Extremely simple saving and recall of lighting scenarios
- UP socket receivers with clamp-type terminals and attachment for socket covering
- Ceiling rose receivers with finished leads and hole for ceiling hook

### 1-CHANNEL EASYCLICK UP RECEIVER PLUS

Two variants for UP socket and ceiling rose fitting  
2.500 W switching capacity  
(incandescent lamps)

### 2-CHANNEL EASYCLICK UP RECEIVER PLUS

For UP socket fitting  
2 x 500 W switching capacity  
(incandescent lamps)



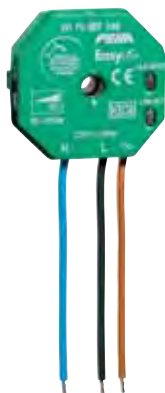
### Functions and settings

- **ON/OFF:** With two buttons (top and bottom rocker).
- **ON/OFF/ON WITH ONE BUTTON**  
For example switching of four luminaires with one 4-channel wall transmitter. This toggle function enables precise operation (ON/OFF/ON).
- **STAIRCASE LIGHT FUNCTION**  
With selectable turn-off time and advance OFF warning to signal remaining 30 s of light by short flashing after the selected time. The function can be restarted while operative.
- **AUTOMATIC TURN-OFF**  
After a preset time or premature turn-off by button pressure.
- **CONSTANT-PRESSURE SWITCH**  
Turn-on as long as the button is pressed (e.g. as door opener).
- **VENTILATOR FUNCTION**  
Delayed turn-on three minutes after button pressure, turn-off after a set running time upon further button pressure.
- **FOUR LIGHTING SCENARIOS**  
These can be saved by the user at any time by long button pressure on a separate wireless transmitter and recalled by brief button pressure. The saved lighting scenarios are not lost in a power outage.
- **VENTILATOR CONTROL WITH WINDOW MONITORING**  
A safeguard against CO<sub>2</sub> poisoning for open fireplaces together with ventilation systems. Batteryless wireless window contacts monitor the opening of windows and prevent turn-on when windows are closed. As many as 32 window contacts can be installed per application.



### 1-CHANNEL EASYCLICK CEILING-ROSE DIMMER RECEIVER PLUS

200 W phase control,  
for incandescent lamps,  
HV halogen lamps and  
electronic transformers



#### Functions and settings

- **DIM WITH MEMORY FUNCTION**  
Brighter/darker and ON/OFF with two buttons. Switching and dimming are distinguished by short and long button pressure. The memory function saves the light level at turn-off and restores it at turn-on.
- **DIM WITHOUT MEMORY FUNCTION**  
Brighter/darker and ON/OFF with two buttons. Switching and dimming are distinguished by short and long button pressure. The required light level at turn-on can be set by parameters.
- **ON/OFF OR DIM**  
With single buttons for clear-cut switching and dimming.
- **DIM WITH MEMORY FUNCTION WITH ONE BUTTON**  
Space-saving brighter/darker and ON/OFF with one button. Enables the switching and dimming of four luminaires with one 4-channel wall transmitter. Switching and dimming are distinguished by short and long button pressure.
- **STAIRCASE LIGHT FUNCTION**  
With selectable turn-off time and advance OFF warning: automatically dims to 50% brightness after the selected time to signal remaining 30 s of light. The function can be restarted while operative.
- **FOUR LIGHTING SCENARIOS**  
These can be saved by the user at any time by long button pressure on a separate wireless transmitter and recalled by brief button pressure. The saved lighting scenarios are not lost in a power outage.

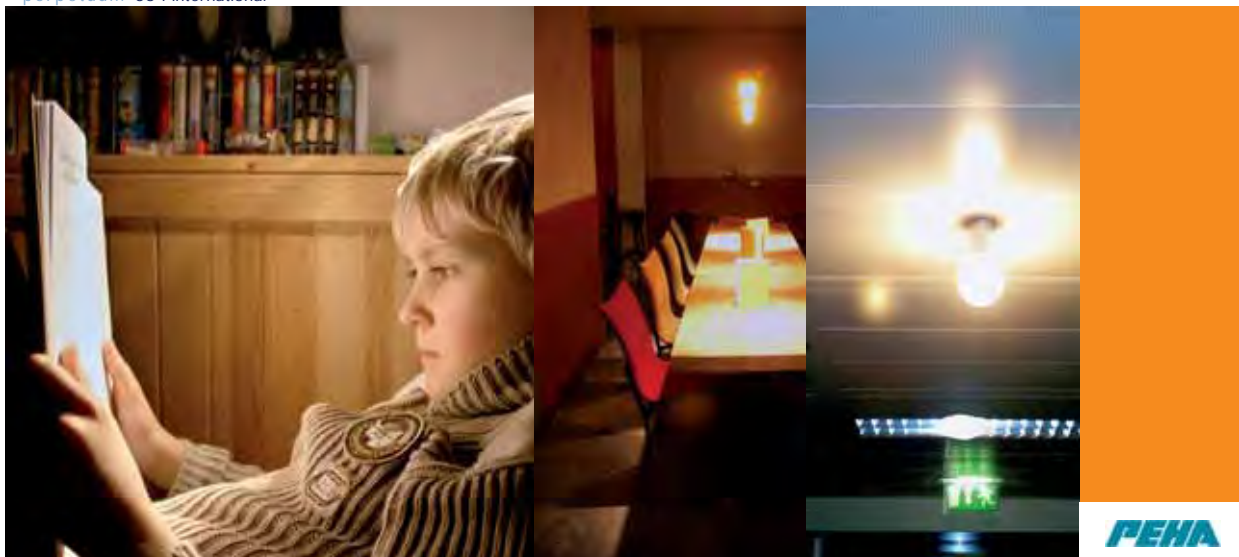
### EASYCLICK UP RECEIVER PLUS FOR SHUTTERS AND SUNBLINDS

For UP socket fitting  
600 VA switching capacity



#### Functions and settings

- **UP/STOP/DOWN/BLIND ADJUST WITH TWO BUTTONS**  
STOP/BLIND ADJUST and UP/DOWN are distinguished by short and long button pressure.
- **UP/STOP/DOWN OR BLIND ADJUST**  
With individual buttons for clear and separate operation.
- **SUNBLIND OPERATION**  
With adjustable motor running times for future solutions with brightness sensors ready integrated. Upon activation the sunblind is drawn down for a selectable time and then opened a little for indirect daylight by an automatic, short UP command.
- **ACTIVATION OF SUNBLIND FUNCTION**  
The function can be switched on or off by a separate wireless transmitter.
- **SAFETY FUNCTION**  
Upon activation, e.g. by a separate wireless transmitter, the sunblind moves up and is electrically locked in this position. Manual operation and the sunblind function are no longer possible (e.g. for maintenance and window cleaning). The use of a batteryless wireless window contact can prevent automatic moving down of the shutter on the terrace door for example, i.e. people cannot be inadvertently locked out.
- **FOUR POSITION SITUATIONS UP/DOWN**  
These can be saved by the user at any time by long button pressure on a separate wireless transmitter and recalled by brief button pressure. The saved lighting scenarios are not lost in a power outage.



**Unique with Easyclick UP receivers is the light convenience:**

**Up to four lighting scenarios** can be recalled with a wireless transmitter or mini handheld transmitter. First the UP receivers Plus are individually set as required by the transmitters. This lighting scenario is then saved with one of the buttons on the wireless transmitter. Common lighting scenarios will be TV, reading, eating, visitors, for example. The shutter position situations UP/DOWN can also be included. The user is of course able to alter the tone of a lighting scenario whenever wished.

Easyclick wall transmitters in DIALOG and AURA design can be installed. With AURA in particular it is possible to cover the entire lighting scale from discrete to representative with the same design. The white, anthracite or aluminium rockers, socket pots and other central plates are based on the same form. Their combination with frames of glass, stone and plastic matches rooms perfectly and reflects an optical continuity.

The ergonomic mini handheld transmitter in a closed case is designed as a remote control with four buttons. So it would be possible to open the garage door and activate a welcoming light scenario when arriving home in the evening.

[www.peha.de](http://www.peha.de)

## AITECH SOLUTION PRESENTS UNIVERSAL SWITCH INSERT FOR ITALIAN FRAME DESIGN

At LivinLuce 2007, the new INTEL show in Milan, the Italian company Aitech solution from Rovereto (TN) presented a light switch based on EnOcean's PTM 200 push button module, which fits to several designs of VIMAR and MASTER switches. Furthermore Aitech launched a new catalogue which includes several products of other EnOcean partner companies like PEHA, SERVODAN, THERMOKON and WAGO. Andrea Pegoraro, managing director of Aitech solution, is very optimistic to find a strong demand for the energy autarkic

products on the Italian market.

[www.aitechsolution.it](http://www.aitechsolution.it)

[www.eccabacus.it](http://www.eccabacus.it)







## NEW HANDY BOOKLET AS USER OVERVIEW OF ALL PRODUCTS WITH ENOCEAN TECHNOLOGY

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EnOcean Munich: +49-89-6734689-30 or [info@enocean.com](mailto:info@enocean.com).



## Cableless freedom in mechanical engineering AUTONOMOUS BALLUFF SENSOR USES ENOCEAN TECHNOLOGY

*By Michael Wally, product marketing, Balluff GmbH*

Defective cable connections and contacts among sensors and actuators are the most common cause of machine downtime in automation. The collector rings on robot grippers and even special high-elasticity trailing cables can only withstand the high stresses for a limited time and eventually have to be replaced.

German sensor specialist Balluff GmbH recognized the problem and, in its Balluff Wireless

Transmission (BWT) system, is first to market a wireless-based solution for multi-position switches. For unidirectional data transfer to the machine controller it uses patented EnOcean wireless technology in the licence-free and no-charge 868 MHz ISM frequency band.

### SECURELY DETECT POSITION – SET COMMAND

Rugged multi-position switches from Balluff are widely used in mechanical engineering. Reliable command signalers for automatic controllers, they are especially common for positioning and limit switch-off on machine tools, transfer lines and transport devices for instance.



The wireless signal transmission means special advantages for the user, making it an attractive solution for industrial purposes. It does away with wiring and the laying of cables to the sensor, and also requires no power supply.

### AUTONOMOUS AND MAINTENANCE-FREE

Very noteworthy is the way in which energy is generated. The mere switching operation, i.e. the actuation of the plunger, generates an inductive field to produce the necessary voltage for sending the transmit pulse. Any extra energy supply from batteries or external sources is thus unnecessary. So the system is both maintenance-free and fully autonomous, which is important considering that the wireless multi-position switches are built for at least one million operating cycles. But even after that the replacement of a complete Balluff cam switch is only necessary in exceptional cases, meaning cost-savings. And all switch components continue to be available from the producer after years and even decades.

At the opposite end, the four-channel wireless receiver of IP20 class with a receiving antenna is simply attached to a hat rail in the control gear cabinet and connected to the 24 V supply.



*Left: the four-channel wireless receiver has multi-network capability.*

*Right: the wireless transmitter generates its own energy without any external source.*

**NETWORKED**

Startup is simplicity itself – the user reports the transmitters to the receiver in a teach-in, and an integrated LED display shows the status for each channel. Safety functions like a programming jumper and a range limit to 0.5 metres in programming mode protect against unintentional teaching and the wrong signals.

**LONG RANGE – SIMPLE HANDLING**

The typical range of the wireless-supported solution is up to 30 metres indoors and 300 metres outdoors. Interference in the simultaneous operation of a number of BWT sensors is virtually impossible. Each sensor has its own 32-bit ID, which would theoretically allow as many as 4.3 billion sensors to work at the same time and without influencing one another.

Mechanically and in terms of packaging the BWT system does not differ from Balluff's cabled electromechanical multi-position switches, marketed by the sensor specialist under the name BNS.



*Example of a BWT wireless application at MCM in Italy – the wireless switch can be seen top right (light-blue cover).*

Consequently there are no differences in installation, startup and functioning. The user can also choose between different plunger versions in the wireless models. One thing is common to all of them and unique on the market – they possess a maintenance-free and ring-lubricated bearing bush of tin bronze, ensuring unparalleled service life.

[www.balluff.com](http://www.balluff.com)

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## ENERGY EFFICIENCY IN REFRIGERATION THROUGH THE RIGHT USE OF AUTOMATION

*Against a political and legal backdrop such as implementation of the EU directive on the energy performance of buildings, the subject of energy efficiency is also assuming more importance in refrigeration. Here a significant contribution is called for on the part of the refrigeration and air-conditioning sector.*



By Prof. Dr. Ing. Martin Becker, department of building technology, building climate control and building automation, Biberach University of Applied Sciences



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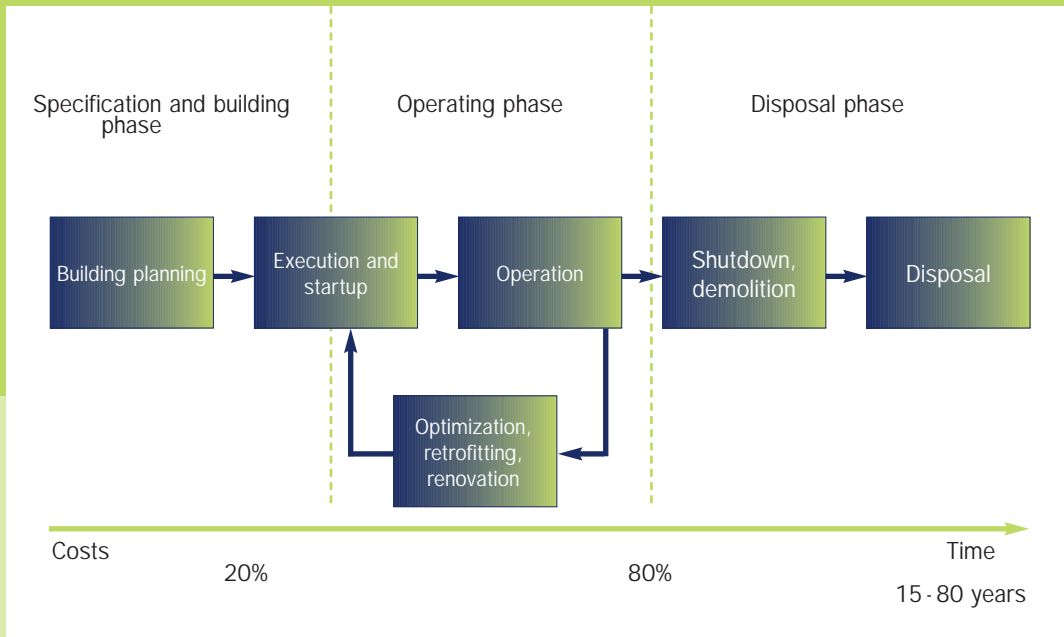
Energy-efficient refrigeration is becoming increasingly important, driven by rising energy costs and political and legal endeavours such as the directive on the energy efficiency of buildings. The sustainability idea, the subject of energy-efficient building and facility operation, consideration of the overall energy performance of buildings and a holistic approach to the life cycle of a building and its facilities consequently take on more profile. This in turn reinforces the role of modern building automation. Because only such automation and the information management that goes with it can enable energy-efficient working of buildings and their facilities. The possibilities but also the limitations of modern automation technology need to be explored in economical and ecological terms.

### POTENTIAL FOR ENERGY EFFICIENCY IN REFRIGERATION PLANT

Refrigeration plants can make an important contribution to achieving rationalised energy use and reduced energy costs. In addition to improvements in the construction of the individual components, such as compressors, heat exchanging pipes and







*Life cycle facets and costs.*

expansion valves, optimised control of the entire process is decisive. Better automation strategies and their integration into automation systems purpose-configured for refrigeration plants are a major step towards operating efficiently. The use of refrigeration has become so widespread that we are seldom aware of where and to what extent it actually adds up as part of our overall energy consumption. Refrigeration for cooling purposes in supermarkets, for instance, typically accounts for 40 to 60% of the entire energy need. And where refrigeration makes up a large share of the overall energy consumed that is obviously the right place to use the required cooling energy as efficiently as possible. In addition to the primary purpose of refrigeration plants, namely providing cold for a process that is to be cooled, we should never lose sight of the objective of minimising energy use through optimised plant engineering and management. By considering the overall system consisting of the generator of cold and the system that makes use of it, you find substantial potential for optimising and saving energy. Basically energy efficiency can be implemented in a number of steps.

### 1ST STEP – ENERGY EFFICIENCY THROUGH ENERGY SAVING

At the start of an energy economising campaign there are often significant savings through a change in user behaviour – 5 to 20% is by no means illusory. But then, perhaps just as often, things revert to what they were before and energy consumption goes up again. So energy saving must be a continuous process of optimisation, transparent for everyone involved, ensuring constant feedback about both positive and negative effects of user behaviour. This process can be supported by active energy management, showing performance indicators and user behaviour by registering appropriate energy engineering variables. The purpose of automation technology is to detect suitable data and to condition them into substantive information (e.g. energy index quantity, energy signature).



## 2ND STEP – ENERGY EFFICIENCY THROUGH OPTIMISED PLANT AND COMPONENTS

An obvious requirement when it comes to fully exploiting energy saving potential is optimal design and management of plants. This will not only take the worst case conditions defined in planning as a design criterion. Instead, plants should be able to adapt dynamically and as optimally as possible to what can be very different operating conditions.

That calls for high-grade components (e.g. motors and heat exchangers) plus continuous-action controllers for ventilators, compressors and expansion valves to match the momentary cooling to what the user demands (load profile). Practical experience has demonstrated 10 to 60% saving potential for amortization between two and ten years.

Whether and when such investment is worthwhile naturally has to be examined in individual cases. Looking at it in terms of life cycle costs is helpful because it makes the relationships transparent.

## 3RD STEP – ENERGY EFFICIENCY THROUGH MODERN AUTOMATION

Automation technology properly configured for plants is what really exploits all the physical and technical potential for optimisation. In terms of automation itself, three stages can be distinguished, setting up one on the other. The first comprises the automation of single components, e.g. in open-loop and closed-loop control devices for vaporizers, condensers, compressors. These are basic measurement, control and supervision tasks to ensure safe and reliable operation of a component or part of the plant with the utmost availability. The next stage is concerned with automating and optimising the interaction of all components in a refrigeration circuit or plant as a function of the governing boundary factors like refrigeration load and ambient conditions. The third stage of automation goes a step further in integrating the plant into an overall energy network that uses additional information like momentary weather data and forecasts, times of use, user profiles. Here the refrigeration plant is part of the total optimisation of a whole building or industrial process for which it is responsible for an energy-efficient cooling supply. A necessity here is that all energy-relevant data be available in a superordinate building automation facility. The data from plant engineering are transmitted on communication systems such as LON, Modbus, Ethernet/IP for use in an all-encompassing optimisation strategy.



Integration of building systems to transmit all relevant process information on open bus and communication systems such as EIB, DALI, LON, Modbus, BACnet

### CONSIDERATION OF LIFE CYCLE

Decisions about an investment will often neglect subsequent, and inevitable, operating costs for energy, maintenance, repair and the like. In building technology there is also a familiar 80/20 rule. In relation to life cycle costs this says that only 20% are incurred during the planning and building phase, while 80% are the later costs of operation, control, maintenance, renovation and ultimately disposal. Put another way: the ongoing operating costs of a commercial or office building will exceed the investment after five to eight years. In technically high-grade or specially fitted buildings this time may even be substantially shorter. Building automation and building management systems present an opportunity – aimed at efficiency – of continuously adapting and optimising requirements for operation and use, which naturally do not stand still, within a framework of what is technically and economically feasible. Increasingly therefore, investors demand from planners a presentation of overall costs during the operating phase, and for different technical configurations. In this way energy-efficient technologies and their economical attractiveness become transparent and can be justified.

### INTEGRATION INTO ENERGY AND BUILDING MANAGEMENT

Energy-efficient working of plant and/or buildings requires that all necessary information be detected, transmitted to an appropriate point, filed and visualised. An economical solution to producing these data is enterprise-wide information management based on open bus and communication structures. In this way it is possible to implement not only supervisory and optimising functions, it is also a framework for linking to non-operative tasks such as superordinate energy, maintenance and building management, materials and human resources planning. Creating such structures allows consistent, transparent and flexible access to all relevant information at any point of an enterprise. It is important to put open communication interfaces in place early on in the planning of refrigeration plants so that the latter can be integrated into an automation and management concept spanning all facilities of a building. This allows you to fully exploit the potential for energy-efficient operation of the plant. The visualisation of plants in operation and momentary process data on dynamic displays is an excellent basis for monitoring correct working of a plant.

## INTERNATIONAL

### TWO NEW ENOCEAN DISTRIBUTION PARTNERS

#### SPAIN – ALBEDO DESIGN S.L.



Albedo Design S.L. was incorporated in February 2004. Although relatively young, the Barcelona-based company can nevertheless boast about 40 years of experience in professional electronics. Its founders, Juan Beneyto and Juan Luis Montore, are highly reputed specialists in the Spanish electronics industry, and established ICT Electronics S.A. about 18 years back, which is

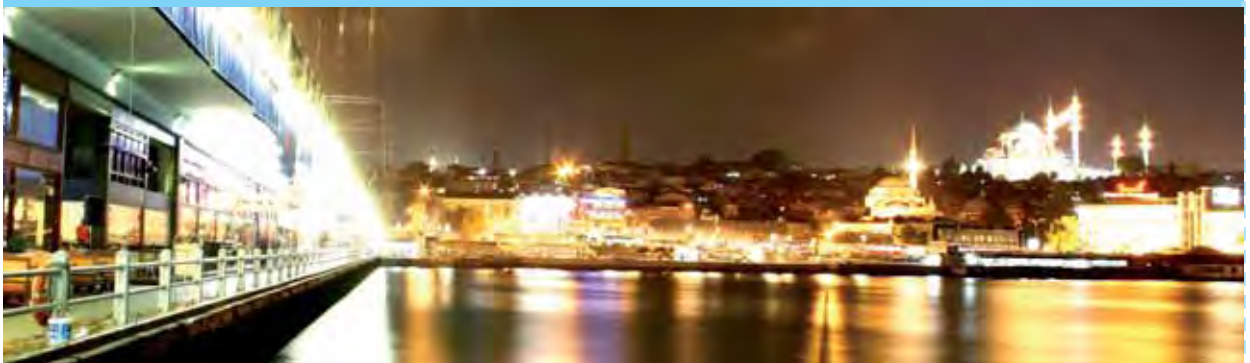
now part of the British Trend Communications group.

Albedo Design S.L. specializes in selling modules and components for building automation, industrial automation and multimedia on the Spanish and Portuguese markets.

[www.albedo.biz](http://www.albedo.biz)



#### TURKEY – EKOM LTD.



Istanbul-based Ekom was established in 1997 as a representative and distributor for electronic components in Turkey. A longterm partner of leading international companies, it sells a wide selection of semiconductors, passive and electromechanical components, displays and electronic modules.

Ekom offers front-to-end project support, cooperating closely with customers' R&D and purchasing departments to ensure fast time to market.

[www.ekom-ltd.com](http://www.ekom-ltd.com)





## ENOCEAN DISTRIBUTOR NETWORK EXPANDING – WORKSHOP IN MUNICH FOR FIELD APPLICATION ENGINEERS

*EnOcean distributors are the local contact persons for product manufacturers. In addition to sales, technical support for our customers is obviously an essential factor in successfully implementing EnOcean technology.*

By Michael Gartz, international sales manager, EnOcean GmbH



Now that EnOcean is represented by distribution partners in 25 countries, it was time to tackle a major objective, namely advanced training in particular of application engineers working in the field. Right in time for the opening of the electronica 2006 show, EnOcean consequently invited the technical consultants of its distributors to Munich.

In addition to experiencing Bavarian *savoir vivre*, the participants were given detailed technical insight into EnOcean wireless modules in real-life applications. An informative workshop was followed by a convivial evening highlighted by the "1st EnOcean World Games". The right scenario was found in a local physical education academy, which was home to Paraguay's team during the recent World Soccer Cup. This time, though, the winners came from Denmark, the Netherlands and Hong Kong.

Michael Gartz, international sales manager of EnOcean GmbH, was pleased with the staging of the event:

*"In February we familiarized the sales and marketing specialists of our distributors with the latest status in batteryless wireless technology, following which this offer of an in-depth engineering refresher was much appreciated. It creates the basis for sustained international selling success."*

The participants were fairly fascinated by the possible uses for EnOcean modules and will now be able to better motivate and advise their customers. The event was rounded off by a visit to the electronica show, where EnOcean was also represented at its own booth.

For international distribution queries, contact **michael.gartz@encean.com**

## PRESS ECHO

### ■ AutomatedBuildings.com – October 2006

**WHAT'S THE BEST RADIO SYSTEM FOR BUILDING AUTOMATION.** This is a question which systems integrators, electrical installation specifiers and even architects and private house builders are having to consider more and more often. There are many aspects to bear in mind, and the decision is complicated by the wide range of systems on offer and the large number of relevant performance parameters. This article looks at a selection of radio technologies and considers the most important performance parameters – What are the key factors to watch out for?

### ■ IEC Magazine – November 2006

**WHY ELECTRICIANS NO LONGER NEED WIRES.** The evolution of electricity dates back all the way to 600 B.C. when the Greeks first discovered static electricity. Of course everyone knows about Benjamin Franklin and his discovery that lightning is made of electricity. Since then, electricity has evolved to become one of the most important parts of our lives, one that most people could not live without...

### ■ Wearable Technology Magazine – November 2006

**PUSH BUTTON IN SHIRT CONTROLS BUILDING AUTOMATION.** EnOcean GmbH world wide leading manufacturer for modules and components for batteryless radio technology, presents concept studies for the application of maintenance-free radio technology that meets the living requirements for the disabled and aged. Wireless products offer ideal solutions for varied tasks that arise from adjusting the surroundings to new basic conditions.

### ■ Log Home Living – December 2006

**NO STRINGS ATTACHED.** A new technology makes the age-old headache of wiring your log home for lighting a thing of the past. On the inside, the log homes of today don't have much in common with their pioneer predecessors - the cast-iron pot over the fire has been replaced with a state-of-the-art range, and oil lanterns have given way to fancy track lighting. On the outside, though, it's a different story, as the basic design of log cabins has remained virtually unchanged for centuries. And therein lies the dilemma: how to outfit a structurally old-fashioned home with modern amenities.

### ■ Bus Systems – January 2007

**APPLICATION OF ENOCEAN TECHNOLOGY ACROSS TRADES.** Sensors become increasingly more important in residential and commercial buildings. Even the simple act of "turning on the lights" requires the action of a sensor – the light switch. More complex control systems require different sensor information like temperature and humidity to control the indoor climate, to minimize the energy consumption of a building or to control access systems and to show their status at the central building control system.

### ■ BMS Building Automation, essecome – January 2007

**VIA LE BATTERIE TRADIZIONALI GRAZIE A ENOCEAN.** Da diversi anni, EnOcean (www.enocean.com) è diventato uno standard consolidato ovunque nel settore del wireless. Il suo maggiore punto di forza consiste proprio nel notevole risparmio energetico sui consumi. Vediamo, quindi, anche se schematicamente, in soli 10 punti, le caratteristiche principali di questa tecnologia...

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**MARCH 2007**

**March 27-30 – Amper 2007, Prague, Czech Republic**  
**15th International fair for electrotechnology and electronics,**  
 EnOcean Partner WM Ocean exhibits.  
[www.amper.cz](http://www.amper.cz), [www.wmocean.com](http://www.wmocean.com)



**March 27-29 – RF & Hyper 2007, Paris, France**  
**Fair for radio and optical signal transmission**  
 EnOcean Partner Pyrecap exhibits.  
[www.rfhyper.com](http://www.rfhyper.com), [www.pyrecap.com](http://www.pyrecap.com)




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**APRIL 2007**

**April 17 - Essential Cleantech 2007, London, United Kingdom**  
 Presentation by Markus Brehler (Chief Executive Officer and Founder EnOcean)  
[www.libraryhouse.net](http://www.libraryhouse.net)

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**MAY 2007**

**May 8 -10 – Lightfair International 2007 – New York, USA**  
 EnOcean exhibits at booth 1769 in the Daylighting Pavillon.  
[www.lightfair.com](http://www.lightfair.com)




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**JUNE 2007**

**June 4-6 – nanoPower Forum, San Jose, California, USA**  
 Two presentations by Armin Anders (Vice President PM EnOcean).  
 Title 1: Energy Harvesting as Power Source for Wireless Sensors.  
 Title 2: Self-Powered Wireless Sensor Networks – Best Practice Cases.  
<http://nanopower.darnell.com>

**June 11-13 – Sensors Expo 2007, Rosemont, Illinois, USA**  
 Presentation by Armin Anders (Vice President PM EnOcean)  
 Title: Develop & Deploy Wireless Sensors Powered by Energy Harvesting: Solar, Piezo, Inductive, Thermal Energy Converters.  
 June 12, 15:00 to 15:45 h. EnOcean exhibits in booth 1012.  
[www.sensorsexpo.com](http://www.sensorsexpo.com)




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**SEPTEMBER 2007**

**September 18-19 – 9th Wireless Technologies Congress 2007, Stuttgart, Germany**  
 EnOcean presentation by Armin Anders (Vice President PM EnOcean) [www.mesago.de](http://www.mesago.de)

**For appointments or visitor tickets, please send an email to [info@enOcean.com](mailto:info@enOcean.com)**

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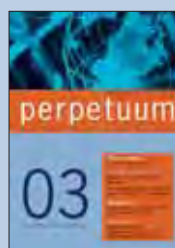
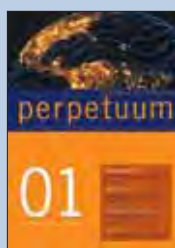
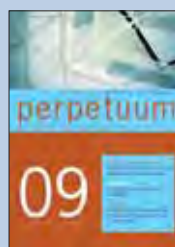
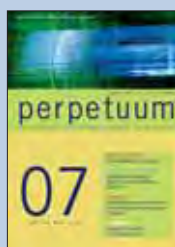
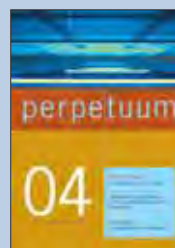
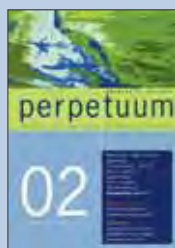
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perpetuum 11 (German) will appear in October 2007 | editorial deadline July 27, 2007

perpetuum 06 international will appear in November 2007 | editorial deadline September 2007

**perpetuum** – the innovative magazine for customers and partners of EnOcean GmbH **Publisher** EnOcean GmbH, Munich, Markus Brehler CEO

**Editorial** EnOcean GmbH, Andreas Schneider, sales manager, [andreas.schneider@enocean.com](mailto:andreas.schneider@enocean.com)

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**Concept and design** artcollin Kommunikations-Design, Munich, [www.artcollin.de](http://www.artcollin.de) **Print** RMO, Munich

**Photocredits** p5: momosu@www.photocase.com, p6/7: G.Redmann@www.pixelquelle.de, p10/11: background: emma75@www.photocase.com, p12/13: db@www.photocase.com, p14/15: botta@www.photocase.com, p20/21: Sao Paolo-Marginal: André Stefano, p22/23: Lounge: sisa@www.photocase.com, p26: sims.seeger@www.photocase.com, p33: background: derschmock@www.photocase.com, p36: gunsbo.rentsch@www.photocase.com, p38: photocase.com/copyright Peter Ehmann, p41: boy: wickelbar@www.photocase.com, table: blxa55@www.photocase.com, corridor: yoschi@www.photocase.com, p44: supermarket: kumbpel@photocase.com, p52: Barcelona: atreju@www.photocase.com, Istanbul: seniorcoconut@www.photocase.com, p53: simonruel@www.photocase.com

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**International circulation** 5000 **Appearance** semi-annual **Reader service** [perpetuum@enocean.com](mailto:perpetuum@enocean.com), phone +49 89 67 34 689-0

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