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MAINTENANCE-FREE WIRELESS SWITCHES & SENSORS

06

INTERNATIONAL EDITION

REVOLUTIONARY
EnOcean battery-free wireless sensor solution for intelligent green building

INNOVATIVE
STM 110 – next generation of solar-powered sensor modules

ENABLED BY ENOCEAN
Modern technology for modern homes

VISIONARY
Up to 50% energy savings – bus management in school and university buildings

CONTENTS

+++ NEWS +++ "EnOceanShop UK has been successful in winning Building Design magazine's best Building Product innovation Award 2007 at the world-famous 100% Design fair in London in September. This prestigious award, judged by architects, was presented in the presence of hundreds of international designers, specifiers and architects. The EnOcean switch beat nine other products in the running for the award which was judged at the 100% Detail show on Friday (Oct 21, 2007)." **+++ NEWS +++**

Building Automation | Residential Building | Manufacturing | Refers to all applications

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EDITORIAL

Dear reader,

When Frank Schmidt, EnOcean's chief technology officer, invented the company's batteryless wireless technology, the idea behind it was: if it's possible to dramatically reduce the power needed by wireless sensors, energy converters can be used instead of batteries, which are harmful to the environment and also more expensive longterm. Many thousands of engineering hours later, the pursuance of this idea led to the now familiar and multiply patented EnOcean technology.

Today the world is faced with the problem of global warming. Here German Chancellor Merkel is politically in line with the EU Commission: by the year 2020 CO_2 emissions are to be reduced by 20%. That sounds pretty good when you first think about it. But where is the 20% to come from? This is where you come full circle between the microjoules consumed by EnOcean technology and the pentajoules in which global energy needs can be counted. If you first substantially cut the demand through the use of new technologies, it's obviously much simpler to optimize at the energy provider end and minimize the production of CO_2.

Where do you apply the leverage to reducing energy consumption? About 38% of our energy (including transport and industry) is consumed in buildings, distributed among heating, air-conditioning and lighting. Interestingly enough, this balance is similar in both Germany and the USA. Here you multiply the actual power consumption by a factor of three because of the losses in generation and distribution.

So what's to be done? Switch off the lights and turn down the heating – effective but not exactly comfortable. The likes of energy-saving lamps and heat pumps are much more effective, and can mean savings of much as 50% depending on the situation. Turning on lights and heating only where they're really needed can produce another 40% cut, with the extra benefit that your heating can be downscaled and becomes less expensive. Just like we humans depend on our eyes and ears to perceive our surroundings, intelligent green buildings need sensors – preferably allowing flexible installation and of course working maintenance-free.

Read on, about how EnOcean solutions promote more economical and efficient use of the energy resource in buildings.

Markus Brehler,
CEO and Founder, EnOcean GmbH

REVOLUTIONARY

ENOCEAN BATTERY-FREE WIRELESS SENSOR SOLUTION FOR INTELLIGENT GREEN BUILDINGS

Architects, contractors, and property owners are constantly faced with new challenges. These include increasing demands for greater convenience, as well as stringent political directives such as the "EU Building Directive" in Europe or the "Cal Title 24" in America. Whether undertaking new construction or remodelling, it is advisable to consider a combined "intelligent green building" concept.

Armin Anders, VP Product Marketing, EnOcean GmbH

ENOCEAN IS THE KEY TO THE INTELLIGENT GREEN BUILDING

If these requirements are to be satisfied, buildings need an ever increasing number of devices to serve as the sense organs of intelligence. These sensor networks must be installed with a minimum of wiring to ensure mobility and flexibility – i.e. wireless radio technology. The EnOcean standard lays the technological foundation for systems in compliance with the principles of building biology and is thus the central key to intelligent green buildings. EnOcean defines the industry standard for "battery-free radio sensors". Unlike all other radio technologies, these radio sensors do not require batteries for operation. Due to the unique combination of miniaturized energy converters ("energy harvester") with reliable radio technology, these wireless sensor networks operate for decades without maintenance, are flexible, and ensure cost reductions and energy savings in buildings and industrial installations:

- **Building automation** optimizes energy savings and reduces operating costs by lowering total cost of ownership. Furthermore, it enhances security, protection and convenience.
- **Radio technology** is essential to the success of building automation. It permits the required number, functionality and flexibility of the necessary sensors. Radio technology minimizes installation times and reduces system costs.
- **No battery requirement** is mandatory for larger installations. The cost to monitor, replace and recycle batteries increases with the number of installed nodes. Battery-free EnOcean radio solutions are eco-friendly, comply with the principles of building biology, and save key resources.

ENOCEAN – CONVINCING BUILDING BIOLOGY SOLUTIONS

Energy harvesting avoids disposal of several billion batteries for wireless devices installed over the next years. Moreover, RF emission of a self-powered transmitter from EnOcean is 100 times lower than the compared emission of a wired light switch (source: ECOLOG Institute 2003).

EnOcean technology is used in hospitals and nurseries, and even Feng Shui enthusiasts concerned about nature and health use our technology in their self-designed buildings. EnOcean reduces electrosmog and helps create a consumer-friendly and harmless environment.

20-30% ENERGY SAVINGS WITH SINGLE-ROOM TEMPERATURE CONTROL

Intelligent sensors are required to balance the contrasting demands for occupant comfort with energy conservation. It is well known that simply lowering the average room temperature will reduce energy consumption significantly. For example, corridors and hallways as well as side rooms and bedrooms can be heated to a mere 15°C (59°F) without feeling uncomfortable. For offices and living rooms, 20-22°C (68-72°F) is sufficient. The energy consumption can be greatly reduced if the system lowers the heating temperature when an occupant leaves the room for longer periods of time. Here, central single-room controllers are an interesting option. These control systems monitor their surroundings for environment for time of day, occupancy and personal settings and adjust air temperature in different rooms from a central point.

The savings using central single-room temperature controllers are estimated at 20-30% (source: Bremer Energieinstitut). Cost-effective, easily installed wireless

REVOLUTIONARY

B/S/H company headquarters in Munich: Feng Shui and EnOcean radio systems under one roof

sensors enable solutions that only a few years ago were found exclusively in the upper price segment.
Similar observations are made in regard to air-conditioning systems. Each degree of increased room temperature results in more than 4% less energy requirement for cooling (source: LfU). The use of controls regulated by time, location and use based on effectively placed sensors (temperature, humidity, presence) is a trendsetting approach to ensuring energy savings and protection of the environment.

REDUCTION OF ENERGY REQUIREMENT BY UP TO 40% THROUGH WIRELESS WINDOW CONTACTS

Due to their frost protection system simple thermostat valves open in case of cold falling air. Permanently tilted windows above radiators should thus be avoided, especially in winter. To air a room, windows should only be opened for short periods. According to a study carried out by the IFE Krefeld, the daily energy requirement for heating can be reduced by 40% through the use of window contacts. When a window is opened, a batteryless, contact switch transmits a radio signal to set back the heating in the room. This calculation is based on the assumption that the room is aired for a total of one hour with an inside and outside temperature difference of 10 degrees.
The same applies to air-conditioning systems: when opening a window, the air-conditioning should simply be switched off. Window contacts are a reliable means to ensure this.
Window contacts show enormous energy saving potential. Fitting a building with such contacts previously proved quite complex and expensive due to the cabling required. Small radio sensors now help unlock this savings potential as an inexpensive alternative, even through retrofitting. Batteryless radio sensors are essential especially for a large number of windows, since they do not require maintenance.

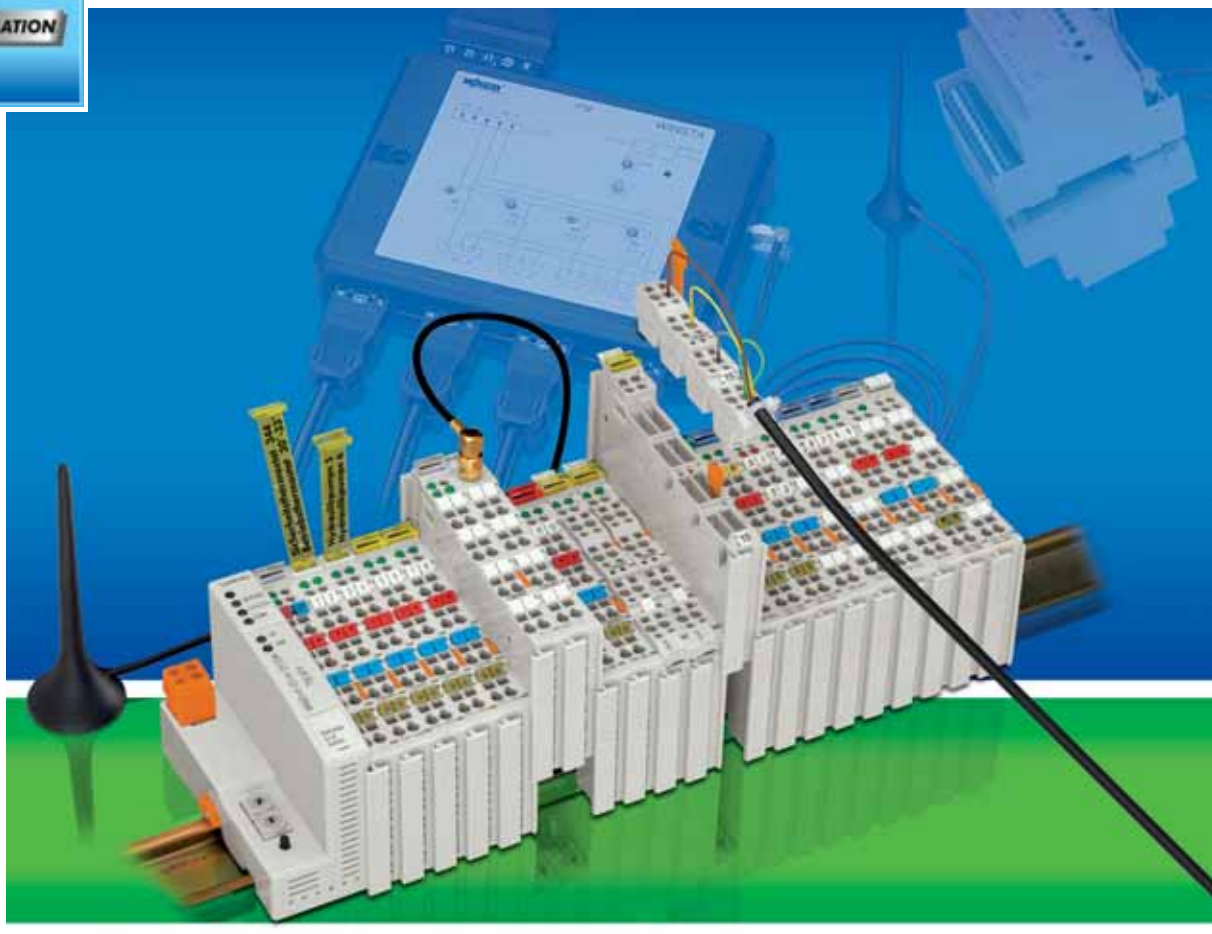
UNIQA company head offices in Vienna: 500 EnOcean radio-based room sensors on 22 floors

UP TO 70% REDUCED ENERGY REQUIREMENT FOR OFFICE LIGHTING THROUGH NEED-BASED LIGHT CONTROL

In office buildings, an average of one third of the energy is used for lighting. Typically the lights are turned on first thing in the morning and turned off when the last person leaves in the evening. In many corridors and staircases, light is on permanently, even outside working hours.
By using appropriate lamps and an intelligent lighting control system, it is possible to ensure not only a considerable improvement in personal comfort, but also a drastic reduction of energy consumption. Halogen lamps of the same wattage produce twice as much light as conventional light bulbs. Fluorescent and energy saving lamps require a mere 20% of the energy of a conventional light bulb, their cost of production and price, however, are higher. Therefore, energy saving lamps should

Receive-ready!

AUTOMATION



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

WAGO®
INNOVATIVE CONNECTIONS

Siemens Munich:
light and blinds control
in 11 office buildings
using EnOcean radio
sensors

only be used where light needs to be on for sufficiently long periods of time. But then there are further, quite significant saving potentials: when using fluorescent lamps to light a room, motion and brightness sensors in conjunction with electronic (dimmable) ballasts can save up to 70% compared with conventional ballasts.
EnOcean allows the effective positioning of maintenance-free, wireless switches, motion detectors and photo sensors in places that provide maximum benefit, e.g. on flexible room dividers, furniture and other fittings, and on concrete ceilings and walls, also during structural alterations.

OUTSIDE SHUTTERS AND AWNINGS REDUCE INSIDE HEATING

Inside blinds reduce glare. Contrary to outside shutters and blinds, however, they are not as effective in preventing the room from heating up in summer. Outside shutters and awnings thus reduce the energy requirement for air-conditioning systems, but also require flexible operation directly at the workplace or from the living room couch. Radio controls, therefore, are winning more and more recognition. Currently, a total of 25% of all electric roller blinds and 60% of all awnings in Europe are already operated by radio control (source: IO Homecontrol).

RADIO-CONTROLLED HEAT COST ALLOCATORS ENSURE ENERGY-CONSCIOUS CONSUMPTION

In buildings with shared heating systems, 'heat allocators' monitor the energy consumed by calculating the transfer of heat from a radiator to the room. Used already in millions of buildings, these ensure an energy-conscious and economical consumption. Today, around 20% of all heat cost allocators in Germany are based on radio control, 80% are currently being installed as radio devices. Thanks to radio-controlled heat cost allocators, there is no need for meter readers to access the flats. Tenants no longer have to wait for meter readings. Landlords appreciate radio systems because they reduce administrative expenses and save costs: no alternative arrangements for meter readers, no intermediate reading on site, no reading errors, less hassle with tenants.

RADIO SENSORS REDUCE HOT WATER REQUIREMENT

In second place in terms of energy consumption in a home is water heating. The most significant hot water consumption in a home relates to personal hygiene (baths and showers). A shower requires approx. 60-120 l of hot water, a bath roughly three times as much. Intelligent EnOcean radio sensors with appropriate temperature and nozzle control make showering more comfortable and help to reduce the amount of hot water used for a shower.

CONCLUSION

An "intelligent green building" is defined as one that optimizes personal productivity and comfort, cost efficiency, environmental awareness and energy conservation. "Intelligent", here, defines buildings that accommodate mobile working environments, that adapt to changes of use (flexible, mobile and modular), that enable integrated office workstations, and that facilitate central building monitoring and control. "Green" refers to the call for conservation of materials and space, reutilization of open-plan rooms and energy efficiency, but also to ecological requirements relating to building materials and installation.

INNOVATIVE

RoHS COMPLIANT 2002/95/EC

OVERVIEW OF ENOCEAN MODULES FOR GENERAL APPLICATIONS

PTM 200 – THE ULTRATHIN MINIATURIZED SWITCH MODULE

- Maintenance-free powering by finger pressure
- Optionally 1 or 2 rockers or up to 4 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 µF
- 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

NEW!

- 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

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
- 4 D/A inputs, 4 digital outputs

PTM 250 ENOCEAN EASYFIT – UNIVERSAL SWITCH INSERT

NEW!

- 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, structured
- New: high-gloss, pure white

STM 250 – WINDOW/DOOR CONTACT

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

RCM 250/255 – 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

- **EPM 100 LEVEL METER:** The electrician's installation tool for EnOcean wireless components – for range analysis and simple detection of signal quality and sources of interference.
- **EPM 200 RADIO TEST SET** contains EPM 100 and PTM 250 EnOcean easyfit switch.

EVA 100 EVALUATION KIT

- Test board for simple startup of EnOcean wireless modules.

EVA 120 EVALUATION KIT

- Test board for quick start up with STM 110.

INNOVATIVE

STM 110 – NEXT GENERATION OF SOLAR-POWERED SENSOR MODULES

In the STM 110 EnOcean is launching the next generation of its solar-powered sensor module for battery-free and wireless transmission of a variety of data. Now the STM 110 manages with even less light. Plus there is a 315 MHz variant STM 110C immediately obtainable for the North American market.

Armin Anders, Head of Product Marketing, EnOcean GmbH

STM 110 WIRELESS SENSOR MODULE MANAGES WITH EVEN LESS LIGHT

The STM 110 is the perfect answer to needs for efficient wireless sensors, doing away with the high power requirement of a conventional radio solution and the inadequacies of a battery, such as short service life, maintenance and disposal.

The STM 110 sensor module, like its predecessor STM 100, was developed with the aim of creating a maintenance-free wireless device to transmit various kinds of sensor input. Its power comes from the accompanying solar cell, just 13 mm x 35 mm in size. An integrated energy accumulator ensures full functionality even after a number of days of complete darkness.

SIMPLE IMPLEMENTATION FOR VARIOUS APPLICATIONS

In addition to being battery-free, the STM 110 wireless sensor module emphasizes application flexibility. All major functions (A/D converter, microcontroller, wireless transmitter, antenna, energy management) are ready incorporated in the module. For the user that means very simple implementation of maintenance-free wireless sensors for temperature, brightness, humidity, vapor, gas, current, water and pressure, for example:

- Temperature and humidity sensors for HVAC
- Brightness sensors for illumination control
- Window and door contacts to supervise status and locking
- Industrial sensors for temperature and position

MAJOR FEATURES

Compared to the forerunner STM 100, the new STM 110 wireless sensor module manages with even less light. Previously the lowest operating limit was luminance of about 100 lx, but the new module works upwards of just 50 lx. This performance enhancement is the result of an improved solar cell, plus the operating range of the module, and thus the solar cell voltage was expanded to 2.2 through 5 V. The essential differences between the STM 110 and the predecessor model are as follows:

- Improved solar cell performance (operates upwards of 50 lx)
- Expanded operating voltage range (2.2 to 5 V)
- Faster wake-up timing (from 7 ms switchover time)
- ADC inputs with configurable signal trigger thresholds
- Possibility of configurable device coding: telegram transmission of device profile and producer information
- 868 MHz (Europe) and 315 MHz (North America) frequency variants

SIMPLE DEVELOPMENT SUPPORT USING THE EVA 120 EVALUATION KIT

With the EVA 120 (EVA 120C for the 315 MHz North American variant) EnOcean is offering simple development support for fast implementation of the solar-powered STM 110 sensor module (STM 110C as a 315 MHz variant for the North American market).

Armin Anders, Head of Product Marketing, EnOcean GmbH

MAJOR FEATURES

The EVA 120 evaluation kit contains an evaluation board with a PC interface, an STM 110 module and detailed technical documentation. The evaluation board is intended to enable simple and speedy examination of STM 110 product features as well as development of application-specific wireless sensor products based on EnOcean technology. The major features of the evaluation kit are as follows:

- Simple powering of the STM 110 by solar cell, battery or another external power supply
- Buttons and optocoupler inputs for immediate wake-up
- Buttons to trigger a teach-in telegram
- Plug-in jumpers to set cyclic wake and transmit times and wire digital inputs
- Potentiometers to simulate analog inputs
- LED display to indicate successful telegram transmission
- RS232 or USB interface for direct evaluation by a PC and other module configuration
- Control inputs and measurement outputs for charge and discharge cycles

EASY AND FAST DEVELOPMENT POSSIBLE

The STM 110 module together with the EVA 120 evaluation kit enables simple and very fast development of battery-free wireless sensors. In the STM 110 EnOcean has again posted a large step forwards in continuous improvement of its technology. That does not only apply to efficient generation of energy, of course. System architecture has also been further developed to ensure interoperability between the end-user solutions that are created.

INNOVATIVE

BATTERYLESS WIRELESS SWITCHES SIMPLIFY BUILDING AUTOMATION –

MORE FLEXIBLE FOR LESS COST, PART 2: ENOCEAN/DALI

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. We reported on this in issue 5. In this issue we want to tell you of another interesting solution -- how you can increase this flexibility for the use of rooms through a combination of DALI and wireless switches.
By Marcus Trojan and Thomas Köthke, Sales Building Automation, EnOcean GmbH

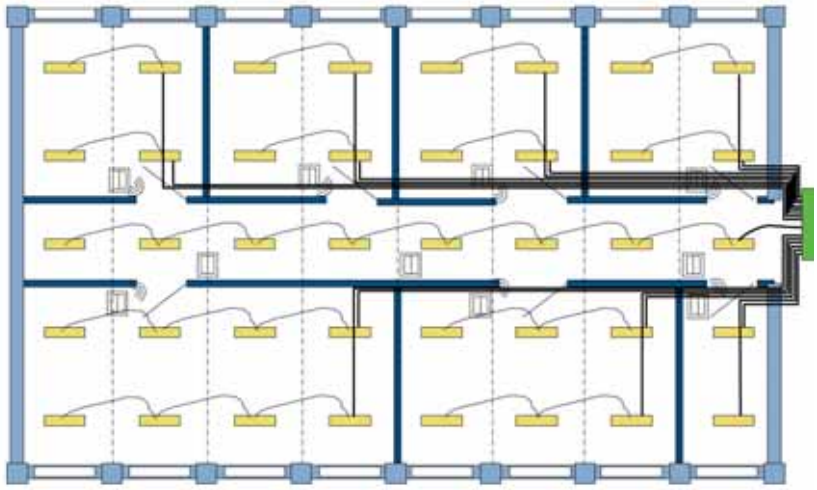
In a wireless solution there are no more switch leads, so the cabling effort is much less than with wired switches. The switches can be randomly located for later changes in room configuration.

But line powering of the lights is still very rigid because the required flexibility goes into the implementation. So very many leads have to be provided for many possible switch groups, or the leads are routed for a change of use. In most cases the latter solution is chosen, meaning that the ceilings have to be opened and the lights and grouping newly cabled for every minor change.

Fig. 1: Dependent group installation (1-10 V control gear)
- 7 offices, each with 2 switch groups + corridor (15 total)
- Switches freely positioned
- Fixed line powering of groups

Cable requirement:

approx. 255 m NYM 5 x 1.5 mm^2 to groups
approx. 100 m NYM 5 x 1.5 mm^2 to lights



The ceiling installation has to be altered to reconfigure the rooms.

UNLIMITED FLEXIBILITY WITH DALI

Light control on a DALI (digital addressable lighting interface) is a good way to avoid the burden of later installation work. A DALI controller is added, and the lights must be fitted with a DALI control gear. As a result the digital outputs or 1-10 V switch/dimming actuators can be omitted in the sub-distributor.

Simplified installation

Installation uses conventional material for 230 Vac line voltage, e.g. NYM-J 5x1.5 mm^2. The two wires not needed may be used for the DALI interface. So a separate bus line is not necessary (although possible). The control gear and control unit can be operated on different outer conductors.

Fig. 2: Independent DALI installation – variant 1 (DALI control gear)
- 7 offices + corridor
- Switches freely positioned
- Free grouping, powering through DALI

Cable requirement:

approx. 165 m NYM 5 x 1.5 mm^2 to lights

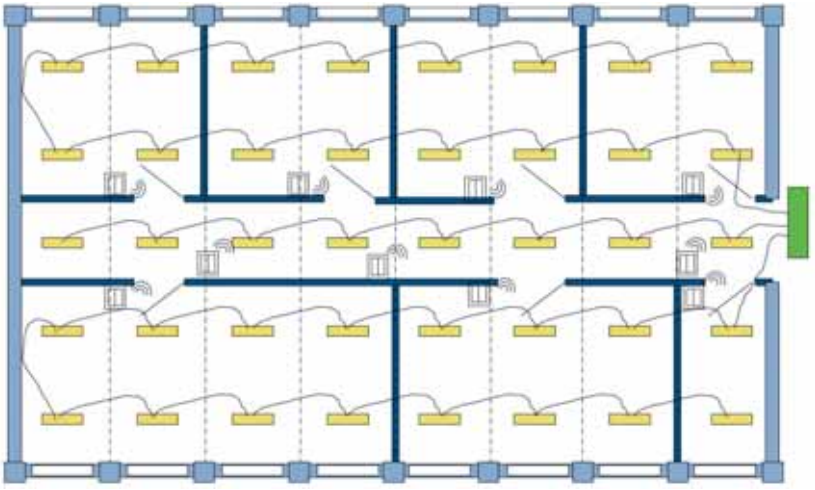
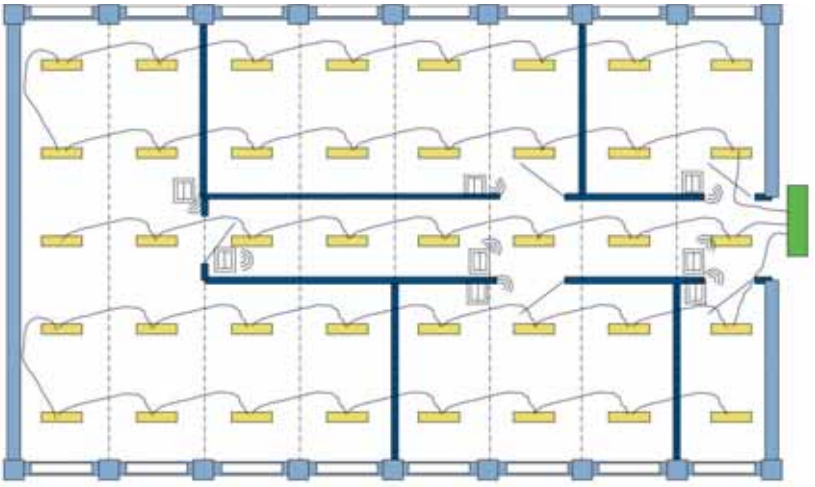


Fig. 3: Independent DALI installation – variant 2
- 5 offices + corridor
- Switches freely positioned
- Free grouping, powering through DALI

Cable requirement:

approx. 165 m NYM 5 x 1.5 mm^2 to lights



Compared to variant 1 the ceiling installation remains unaltered.

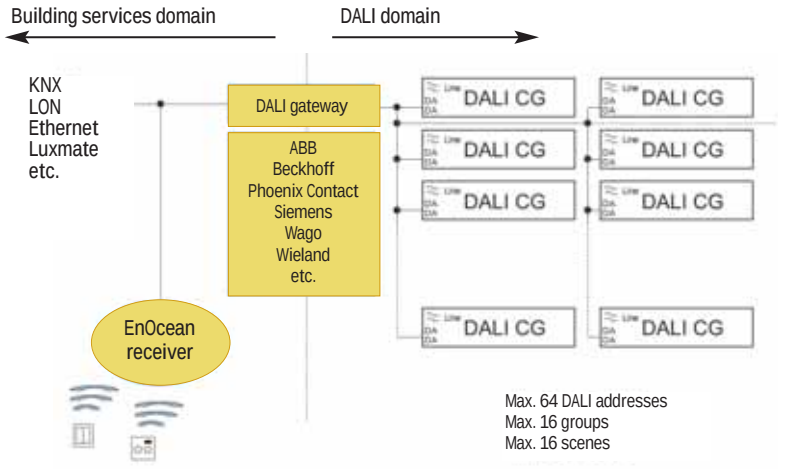


Fig. 4: Schematic of DALI light subsystem in building services management

NO WIRING BY GROUPS

Each DALI control gear can be individually and digitally addressed. Each control gear is allocated to a group at startup, and each can belong to as many as 16 groups, even several at the same time. A control gear is turned on and off digitally, so no external switching relay is needed. This eliminates a frequent source of malfunctioning.

DALI IN BUILDING SYSTEMS ENGINEERING

The use of DALI opens up new possibilities in building systems engineering:

- Wiring independent of groups
- Reduced turn-on current (no switching relay necessary)
- Grouping and alteration by software
- Parameters held in DALI control gear
- Feedback (e.g. lamp defect) from every control gear

EnOcean wireless technology can mean even more flexibility. DALI enables free wiring in the ceiling, and EnOcean releases installation from the wall. The enormous advantages are obvious:

- No more alterations during planning
- Switch points need not be defined until completion
- Switches can be attached to walls, glass, fair-faced concrete, partitions, etc
- Flexibility without empty conduits or unused leads
- Less time to plan
- No more replanning through changes in rented area or room size

REDUCED FIRE LOAD

Another and very positive effect of this kind of installation is that the fire load is very much reduced by the far fewer number of leads. Expressed in figures this means:

The fire load for an NYM cable of 5 x 1.5 mm^2 is 0.58 kWh/m:

- In classic cabling (one lead per switch group)
  355 m x 0.58 kWh/m = 205.9 kWh fire load
- In the DALI variant
  163 m x 0.58 kWh/m = 94.54 kWh fire load

DALI consequently more than halves the fire load of the light installation.

HIGH FLEXIBILITY THAT PAYS

The better technology is often relatively costly compared to a conventional solution. For this reason we have looked at the two from a cost aspect: a floor with a fixed arrangement of switch groups with 1-10 V control gear (see Fig. 1) compared to the DALI variant (Fig. 2 and 3) where the room/group arrangement is unimportant.

Bus EnOcean control, 7 offices
15 switch groups (per office 2 + corridor), fixed arrangement

Qty	Material		
1	Bus basic components	Power supply, line coupler or bus controller, etc	520.00
1	Wireless receiver		250.00
15	Switch dimmer channels (line and 1-10 V)	(e.g. 2 switch/dimmer actuators x 8)	1,100.00
355 m	NYM cable	NYM 5 x 1.5 mm^2	461.50
7	Wireless switch	Switch x2	385.00
3	Wireless switch	Switch x1	165.00
			2,881.50

Bus DALI/EnOcean control, 5 or 7 offices
Variable switch groups

Qty	Material		
1	Bus basic components	Power supply, line coupler or bus controller, etc	520.00
1	Wireless receiver		250.00
1	DALI controller		240.00
40	Extra price for lights with DALI control gear	(approx. € 10 per light)	400.00
165 m	NYM cable	NYM 5 x 1.5 mm^2	214.50
7	Wireless switch	Switch x 2	385.00
3	Wireless switch	Switch x 1	165.00
			2,174.50

The result is worth noting because in this example it shows a price saving upon first-time installation of € 707 with the flexible DALI variant compared to the rigid group division with normal 1-10 V control gear. This means that no extra costs are incurred upon first-time installation for the high flexibility that is expected today of modern office buildings, and that there are substantial cost, time and logistic savings if offices are later reconfigured and altered.

ENABLED BY ENOCEAN

MODERN TECHNOLOGY FOR MODERN HOMES

In residential building you see an increasing number of houses that are striking not just for their modern architecture but also for the modern technology invested in them. This includes self-powered wireless technology from EnOcean, creating future-oriented and flexible systems.

By Zeljko Angelkoski, Marketing Manager, EnOcean GmbH and Dr.-Ing. Bernd Weiler

Self-powered transmitters in EnOcean technology

The house is sited on the fringe of a small town near Stuttgart. Those who built it, a young family, wanted a structure with clear lines in fair-faced concrete. So the architects designed a compact building with rooms and levels that flow into one another. The ground floor with kitchen, living, dining and hospitality areas is open with large glass surfaces, the upper floor with its narrow windows conceals the private sphere of the occupants.

WELL CONCEIVED INSTALLATIONS

The installations of the house are unconventional and future-oriented. The heating is underfloor from a heat pump, for which two holes were bored, each 136 meters deep. Air-conditioning comes from a central ventilation system with heat recovery. In summer it is also possible to cool through the ventilation by means of a small air heat pump, and to heat moderately if needed in the spring and autumn. As an option it is possible to use rain water with a cistern and separate installation chain for the toilets.

FLEXIBLE SOLUTION WITH SELF-POWERED WIRELESS TECHNOLOGY

The electrical installation initially looked like being complex and costly. The large window areas required 30 blinds mechanisms. Plus, the subtle light planning throughout the house with ceiling spotlights, uplights and downlights, pendant and specular reflector luminaires and indirect lighting in suspended ceilings meant that there were more than 40 lighting points to be switched. Furthermore, to which the fair-faced concrete allowed no later corrections in the interior.

A PHC bus from PEHA was consequently chosen, which is operated by self-powered Easyclick transmitters. The two systems - transmitters and bus system - are linked by a 940 FU-C interface. The heating is regulated by Thermokon SR07P wireless room sensors and SRC-ADO BCS receivers. Only the power outlets were installed conventionally. Matching the fair-faced concrete, AURA glass aluminum switches were selected.

ENABLED BY ENOCEAN

For the sake of simplicity, electricity distributors were installed on both the ground floor and upper floor and connected by a bus cable. In each there is an Easyclick receiver and antenna in the center of the floor. Sockets were also provided on each floor for the installation of repeaters. But despite the reinforced concrete construction it was possible to dispense with the repeaters entirely. Installation presented no problems for an experienced contractor. The owner of the house himself was able to program the bus system and teach the wireless transmitters.

The result is a future-oriented system offering flexible use. Because what is now the office of the lady of the house may later become a child's room. And the electrical installation can take it all in its stride.

www.peha.de
www.thermokon.de

ENABLED BY ENOCEAN

WIRELESS WINDOW HANDLES FROM HOPPE PREVENT DAMAGE TO BLINDS

EnOcean technology simplifies everyday work in Würzburg's Music Academy, because blockout blinds in seminar rooms no longer need to be secured by keylock switches. The Horst Zink engineering office installed self-powered wireless window handles from Hoppe as an effective safeguard against damage to the expensive blinds.

By Peter Pernsteiner, Freelance Journalist

The history of Würzburg Music Academy may go back to the late 18th century, but it nevertheless prides itself on being technically right up-to-date and possesses all the latest operating means such as digital sound studios and computer workstations. In October 2006 the City of Würzburg completed full-scale restoration and expansion of the former music conservatory, which was then handed over to the academy for its use. This historical building is now the home of the department of elementary music education, where many students receive broad-based instruction in teaching music to children. The use of acoustic objects and light effects plays a special role in this. Such modern didactic methods can only be taught and learnt properly if you are able to eliminate ambient light in the rooms where they are practised.

For this reason and, of course, for the purpose of conducting courses and seminars supported by an overhead projector and/or beamer, three of the newly available seminar rooms were fitted with electrically operated blockout blinds on their 11 windows. To prevent defacing the historical architecture, it was not possible to place the blinds on the outside of the windows, instead they had to be fitted inside, built into the window bays. The blockout blinds came from the Brichta company, these already having been installed in numerous lecture rooms of the academy and in the ballet studio.

PROBLEMS WITH INTERIOR BLOCKOUT BLINDS

An obvious problem with interior blockout blinds is that they should not be lowered when windows are ajar or tilted. "If a blind hits a window and gets stuck, the expense can easily mount up", says Thomas Schreck, the academy's building services manager. "Rumpled blinds are the least worry. The real problems start if a blind stays stuck and we can't correct it by our own means. First you have the repair costs, which are usually quite hefty. And then you're unable to use the room with the right light blockout for at least two or three days." For this reason it was only possible to operate the blockout blinds by keylock switches, and the keys were issued only to lecturers and assistants, appropriately instructed on damage prevention. The use of keylock switches was hardly a convenient solution in everyday teaching and practise however, because the rooms are often occupied by students at short notice.

THE SOLUTION – WIRELESS WINDOW HANDLES

The Horst Zink engineering office in Würzburg is regularly consulted by the academy and was able to come up with an answer. "At our first meeting when I heard of the problem I already started to think of using self-powered EnOcean technology", recalls Detlef Basler of the engineering office. "Because having reed contacts fitted in the windows by a carpenter, wiring them up tidily concealed with building services management and programming the whole thing to work obviously mean a lot of expense." Basler soon realized "that the new wireless window handles from Hoppe were not only ideal for the purpose technically but also much more cost-attractive."

SIMPLE INSTALLATION IN NEXT TO NO TIME

To implement cutout of blinds when a window is open, all that was necessary was to replace the window handles and fit an EnOcean receiver behind the blinds

switch in each seminar room to interrupt the down-motion contact of the blinds switch. Thomas Schreck is more than satisfied because "installation was carried out during the semester, and entirely without dust and noise. The rooms were shut off for less than an hour at a time while the work was going on. The wireless window handles mean that expensive repairs are a thing of the past, and the seminar rooms are constantly available."

ENABLED BY ENOCEAN

RATIO SOLUTION IN SWITZERLAND'S FIRST ZERO-ENERGY OFFICE BUILDING

At the beginning of the year Marché International, a subsidiary of the Mövenpick Group and a top-niche restaurant operator at expressway roadhouses and airports for example, moved into its new office building in Kemptthal near Winterthur, Switzerland. Known for its high gastronomy standards, Marché International was no less ambitious in the construction of its new business headquarters. Ecology was a major focus, with the result that this is the first zero-energy office building in Switzerland.

By Christian Genter, Managing Director, Omnio AG

Zero energy means that the balance in the course of a year is such that the building puts as much power into the public grid as it draws from it. So the grid serves in fact as an energy accumulator. A photovoltaic system on the roof generates so much energy through an inverter that a large part of it is fed into the public grid during the summer. In the winter the energy from this photovoltaic system and the heat dissipated by the building's technical plant – especially the PC servers – is used to heat the rooms. Energy can still be drawn from the public grid if there is an additional heating requirement.

FIRST ZERO-ENERGY BUILDING USES ENOCEAN TECHNOLOGY

Distributor with REG device

The building is provided with roller blinds to produce shade, controlled by the Ratio® wireless bus system based on EnOcean technology. This was chosen because the transmitters are self-powered and maintenance-free, and also because Ratio® is a complete system enabling a variety of applications. Each workplace is fitted with an R101 handheld transmitter that drives a channel of a series REGJ24/01 blind actuator. These REGJ24/01s are contained in plastic sockets in the outer façade so that there are as few passages through the wall as possible. Otherwise the objective of zero energy would not be possible. A superordinate PLC controller sends up/down group commands on a TST230/01 switch interface as a function of wind, outdoor brightness, outdoor temperature and the time. An RS232/RS485 transceiver could have been used instead of this interface, but the chosen solution is lower in cost for just these two commands.

Startup went off smoothly, but the furniture created problems in subsequent operation where the range was concerned. An elegant solution was devised by installing a 1-level repeater on the outer façade in the region of the roof and a 2-level repeater on the ground floor. The devices used are: R101 wireless handheld transmitter, RTF102 room temperature sensor, REGJ24/01 blind actuator and TST230/01 switch interface.

www.omnio.ch

Switch interface

ENABLED BY ENOCEAN

KIEBACK&PETER OPTS FOR ENOCEAN'S SELF-POWERED WIRELESS TECHNOLOGY IN TRI-HOUSE

The Tri-House in Arnsberg-Neheim, Germany, gets its name from its triangular architecture. The 1,200 sqm of available floor space in the building can be flexibly allocated both within and between the separate floors.

By Hermann Josef Pilgram, TEMA Technologie Marketing AG

Real flexibility means that changes should be possible without a great deal of effort. Control of the room functions must easily accomodate room changes. If walls are shifted, for instance, no elaborate recabling should be necessary.

TECHNOLINK SYSTEM WITH ENOCEAN

The second phase of construction of the Tri-House consequently saw installation of the technoLink system from Kieback&Peter, which is based on EnOcean's solar-powered wireless sensors. No cabling is necessary to power the sensors or for data transfer within the system. Matching the particular room design, sensors and room controls can be placed and relocated with virtually no effort at all.

This building automation solution is set up with Kieback&Peter's DDC3000 system with a DDC3550-L station, a number of input/output modules on an SBM switch cabinet bus module plus I/O modules on an FBM field bus. The system communicates via a LON with the two heat pumps that are environmentally friendly and inexpensively provide the building with its cooling and heating. The system also controls ventilation, the combined underfloor heating and cooling plus the sun blinds. Neutrino-GLT building services management, which is also remotely controllable, supervises and optimizes the system. As a result of this building automation solution the heating energy demand of approx. 36 kWh per sqm and annually is 50% lower than required by the old energy saving stipulation (EneV) of 2002.

Tri-House (photo: architects Banz & Riecks)

www.kieback-peter.de

OVERVIEW OF INTEGRATION PARTNERS (OEMS) USING ENOCEAN TECHNOLOY

Overview of Products "Enabled by EnOcean": www.enocean.com/products

PEHA INNOVATIONS FOR EASYCLICK

At the ELEKTROTECHNIK 2007 show in Dortmund PEHA presented new additions to its Easyclick wireless system.

By Werner Petritz, Product Manager, PEHA Paul Hochköpper

EASYCLICK TIMER

The Easyclick timer is a central wireless transmitter for as many as eight receivers or receiver groups that are timed manually or automatically. It is simply inserted in an existing grounding-type receptacle. Programming and operating entries are made on a few keys and appear on an LCD. This enables automatic and timed control of roller blinds and lights. The Easyclick timer has eight programmable wireless channels, allowing individual assignment of a maximum of 95 times. Changeover from winter to summer time is either automatic or manual, ahead of national holidays the times programmed for Sundays can be activated. The automatic function can also be deactivated at any time, for example for servicing or as a party function. The Easyclick timer additionally features a repeater function.

Simulated presence is another application for which the Easyclick timer is optimal. Permanently closed roller blinds are an open invitation, especially when the occupants of a house are vacationing. The "Vacation" function of the Easyclick timer randomly varies all automatic commands by up to 15 minutes to give the impression that someone is at home and deter unwelcome visitors.

Easyclick Timer

EASYCLICK REPEATER 2-LEVEL

Easyclick repeaters extend the range of transmitters, receiving their wireless signals, checking them and sending them with maximum transmitted power to the receivers for which they are intended. The transmitted telegram is identified by the repeater to exclude collision of identical signals. Easyclick repeaters come as a flexibly positioned plug package or for flush mounting, and may also be changed to 2-level mode. In this case the wireless signal is forwarded by a maximum of two repeaters. Startup requires no configuration effort, the repeater is simply inserted in a grounding-type receptacle.

Easyclick repeater 2-level

EASYCLICK ADAPTER RECEIVER PLUS

These Easyclick adapters are a new generation of receiver devices that substantially expand the capability of a system by performing up to eight different functions. The functions can be saved direct on the particular device

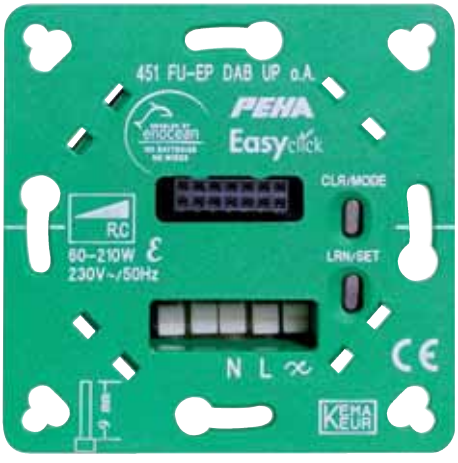
Easyclick flush receiver for roller blinds with local control

Easyclick adapter switching receiver

by pushbutton together with the fine settings. Two versions are available:

- Easyclick adapter switching receiver, functions: on/off, staircase light, automatic off, constant-pressure switch, ventilation, saving and recall of four lighting situations, fan control with window supervision

- Easyclick adapter dimming receiver, functions: dimming with and without memory function and 1- or 2-button operation, on/off/dim, staircase light, saving and recall of four lighting situations



Easyclick flush-mounted dimming receiver

EASYCLICK FLUSH RECEIVER WITH LOCAL CONTROL

Expansion of conventional circuits is now especially cost-attractive with flush receivers for switching, dimming and blinds control. The Easyclick flush receiver is installed instead of the switch and fitted with the appropriate button cap for switching and dimming or a double button cap with blinds symbols. In this way the familiar switch point is kept and is expanded at minimal cost into a two-way or intermediate switch circuit. Additional wall or handheld transmitters can be assigned and placed anywhere. The full functionality of the Easyclick plus receiver is maintained, and the button cap only has to be taken off for access to the programming keys. For these new flush receivers with up to eight different functions there are button caps available from the current STANDARD, DIALOG and AURA ranges from PEHA.

www.peha.de

SOFTWARE GATEWAY BETWEEN ENOCEAN AND HOME AUTOMATION

The disadvantage of many home automation systems on the market today is that they are too closely tied to a particular product or manufacturer. In other words you can only use the components of this one manufacturer, and others are in many cases incompatible. Overcoming problems of compatibility can be impossible, or cause high costs, or result in restricted functionality. IP-Symcon on the other hand is software that is free of proprietary ties, and consequently able to unite very different systems under a common surface.

By Michael Steiner, Managing Director, Computer- und Steuerungstechnik Steiner (CSS)

OPEN AND FLEXIBLE SYSTEM

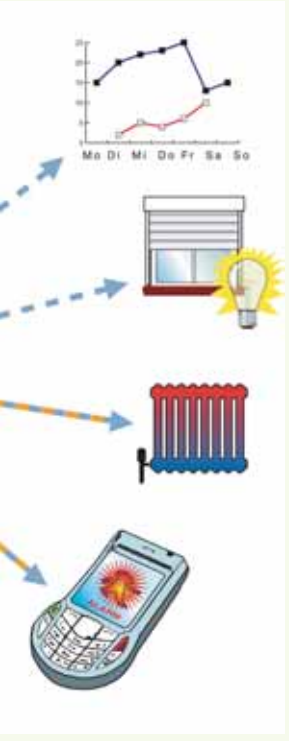
IP-Symcon control software, available on the market since 2005, enables you to close awnings in good time through the data of a weather station, for example, if a storm is approaching. Switching commands from a wireless remote control of manufacturer A activate a group of lamps from manufacturer B as part of a lighting scenario from manufacturer C. IP-Symcon allows devices that are normally incompatible to work together properly.

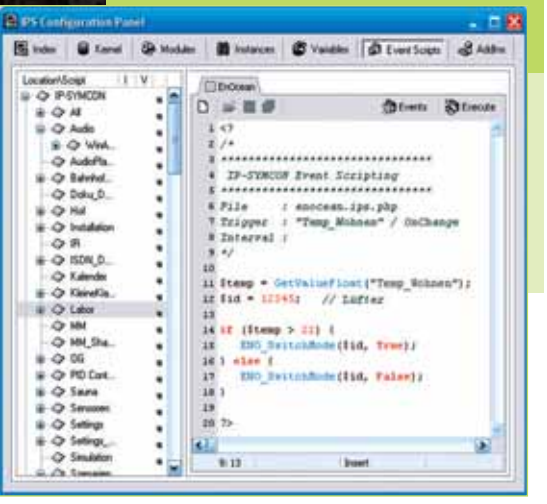
A constantly growing library of modules enables IP-Symcon to communicate with very different systems. Instead of a mass of proprietary details, all the user sees is a development environment reduced to the essentials. This simplifies familiarization and is grasped fast by those who are new to the software.

IP-Symcon takes two approaches to solving control applications. The first is aimed at the newcomer with little experience. Aided by what are called bricks, you are able to formulate a solution graphically using just the mouse. Sensors, actuators, timers and logic devices can be interconnected and the result then checked in a simulation. The second approach is more for the professional who wants to master problems calling for more detailed treatment. A PHP script can be written direct in the development environment.

The IP-Symcon Designer was created for the purpose of influencing a device or controller, or obtaining information about it. This enables you to generate a user interface tailored to a particular task. Typical Windows-like tools are available for the purpose, e.g. buttons, edit fields, labels, dropdown lists. Graphical output is also possible with the Image tool. In this way user interfaces can be created that even an amateur could work with.

IP-Symcon system





IP-Symcon sends commancs via PHP to an RCM 250 wireless switching receiver

PERFECT INTERFACE WITH ENOCEAN SENSORS

IP-Symcon is the ideal agent between high-efficiency EnOcean sensors and the many different systems used in home automation and building services management. Actuating a self-powered PTM 200 wireless switching module will trigger an action in a home bus system like EIB or LCN for example, or an STM 250 (solar-powered magnetic contact wireless module) can tell you that a window or door is still open when you leave the house.

EnOcean components are integrated in IP-Symcon by appropriately configuring an instance of the particular module (e.g. Hoppe window handle). In most cases it is sufficient to assign the instance the necessary variables (e.g. "Window1_open", "Window1_tilted", "Window1_closed"). For a wireless room temperature sensor from Thermokon the temperature variable could be "DiningRoom_Temperature". It also works in the reverse direction of course, with IP-Symcon sending commands to an RCM 250 wireless switching receiver or OPUS Funk plus dimmer. The open EnOcean wireless protocol means that newly appearing devices are included fast in the constantly growing IP-Symcon module library.

www.ip-symcon.de

NETWORKED

NEW SOLUTION FOR ENERGY OPTIMIZATION IN EXISTING AND NEWLY PLANNED OFFICES, TRAINING AND CONFERENCE ROOMS

George Jones, facility supervisor of Nuts & Screws, Inc. in Bespoke Valley, walks along the corridors of the company in the evening, turning off lights in nearly every third office. It is 18:00 h and he is feeling pretty sour. He used to be on the way home at this time, but now he will not be leaving the company until at least 18:30 h because his boss wants him to make these extra rounds in an effort to cut the high electricity bill.

By Christian Genter, Managing Director, Omnio AG

A similar scene to this is enacted in many administrations and private enterprises. The lights are usually switched on in the morning and left on until the evening when someone like George has to come round and turn them off. The result is naturally high and unnecessary energy costs.

The management of Nuts & Screws, Inc. decided to look around for other solutions because having George stay late every day was neither entirely satisfactory nor economical. A number of options were examined and the company was particularly impressed by the Ratio® wireless bus system from Omnio, which is based on EnOcean technology. The self-powered and maintenance-free transmitters plus the new batteryless wireless motion detectors of the PIR10x series showed to be an extremely economical and environment-friendly answer to the problem. No kind of breaking work is necessary for installation, which hardly disrupts ongoing operations either.

BATTERYLESS MOTION DETECTORS

The motion detectors of the PIR10x series are powered by a solar cell that is adequate and works reliably in rooms with one window and daily background brightness of 400 lux. For corridors and rooms without windows there are versions with a battery or for operation on 24 Vdc.

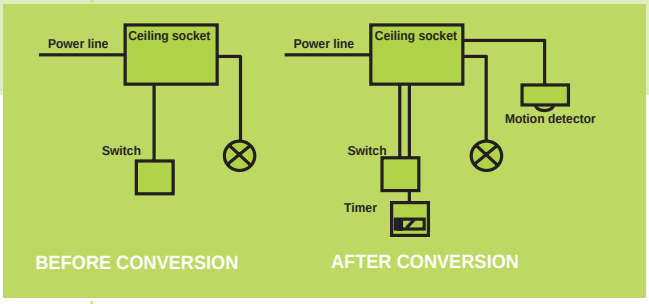
The motion detectors feature a PIR element and a brightness sensor. They respond to motion in a radius of 6 meters as a function of the value measured by the brightness sensor in a semiautomatic and fully automatic mode. Semiautomatic means that the lighting is turned on manually (by one or more wireless transmitters). The motion detector is only responsible for switching off, either when a room is bright enough, or no more motion is detected during a defined period. In fully automatic mode the detection of movement also causes the lighting to be turned on.

OPTIMAL SOLUTION AS OFFICE RETROFIT

Proceeding from lighting that is turned on and off by a switch, the user wants a solution that turns off the lights based on demand.

The conventional solution: Install a motion detector with pulse output to the ceiling and a timer relay with turn-off delay in an extra socket, e.g. next to the switch. Replace the switch by a button. Route cable to the motion detector, wire the timer relay and button.

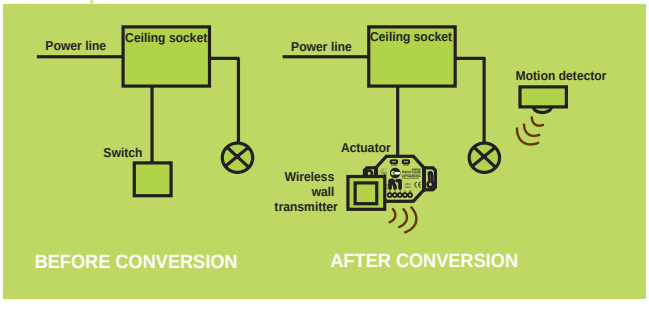
PIR101 Motion Detector



Labor and material costs: approx. 800 to 1,000 Euros

The Omnio solution: Attach the wireless and batteryless PIR101 motion detector to the wall or ceiling, maximally 3 meters from the window front. Replace the existing switch by a wireless wall transmitter and fit a switch actuator in the switch socket or where the lamp is.

In addition to the huge saving on installation costs, there is also the possibility of simple expansion by a central switch for example, or of integration into a building management system.



Labor and material costs: approx. 400 Euros

The offices were retrofitted without any hitches, the lighting is now switched by a motion detector in each office in a semiautomatic mode. It is 18:00 h and George can leave for home. The tiresome rounds are a thing of the past and the electricity bill is now a lot less.

PIR10x MOTION DETECTORS

The motion detectors, due to appear in October 2007, integrate seamlessly into the broad product range of the Ratio wireless bus system. Omnio has already added the TST101 interface to its program, which gives conventional switches and buttons wireless capability. Also new in the range are the bidirectional receiver and transmitter modules of the APG series for wall and ceiling fitting with an RS232 or RS485 interface for PLC and PC systems. These are available with easy-to-use programming and startup software.

www.omnio.ch

NETWORKED

EASYSENS – NEW WAYS TO LON

The self-powered EasySens wireless sensor system from Thermokon Sensortechnik GmbH, using EnOcean's interoperable wireless technology, has become a virtual standard in modern building automation since its launch in 2003. It offers a genuine alternative to wired systems both in new and renovated buildings.

By Heiko Schnaubelt, Dipl.-Ing.,
Development, Thermokon Sensortechnik GmbH

A large variety of products calls for extensive functionality and high flexibility on the part of wireless receivers. The new LON wireless receivers consequently feature an FT3150 neuron processor with external memory offering substantially more capacity for application programs compared to the FT3120. This means that more flexible and powerful software applications are available. A LNS plug-in will be obtainable soon for simple programming and configuration of the receivers.

Two different designs can be chosen depending on installation requirements. The SRC04 with a fixed external antenna is recommended for wall fitting. For installation in a suspended ceiling for example there is the SRC65 receiver. Here the antenna is set up where reception is favorable and then linked to the receiver by a 2.5-meter-long cable with an FME connector. Both use the same software application, so their networking is identical.

The user has predefined sensor objects to which individual self-powered wireless sensors or switches can be assigned. The received wireless telegrams are then forwarded through standard network variables to controllers, control systems or switching actuators. In each of these sensor objects the SNVT types can be set individually for two of the output variables and thus matched to different physical measured variables.

Assignment of the sensors to output variables is similar to the startup of LON devices. Each sensor or switch transmits a unique identification number in its wireless telegram. This ID can either be entered directly into the appropriate configuration property, or be saved automatically by operating the Learn button on the sensor.

ROOM SENSORS AND ROOM OPERATING PANELS FOR HVAC APPLICATIONS

Measured variables such as temperature and relative humidity plus fixed settings or ventilator levels are transmitted to superordinate control systems. A presence switch or alternatively a slide switch serves for entering the momentary HVAC room occupancy.

Room sensors and room operating panels for HVAC applications

Switches for lighting and shutter

SWITCHES FOR LIGHTING AND SHUTTER

Wireless switches with different inscriptions for lighting and shutter applications are available in current designs from Berker, Busch-Jaeger, GIRA, Jung and PEHA. The functions of the output variables allow flexible selection for switching or dimming groups of lights, for controlling or shutters.

OUTDOOR SENSORS FOR TEMPERATURE OR BRIGHTNESS

Brightness and temperature sensors for outdoors are offered in weatherproof enclosures with IP54 or IP65 ingress protection. Here the output variables are set to types "SNVT_lux" and "SNVT_temp_p".

www.thermokon.de

Outdoor sensors for temperature or brightness

thermokon®
Sensortechnik GmbH

› EasySens®
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.



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www.thermokon.de

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

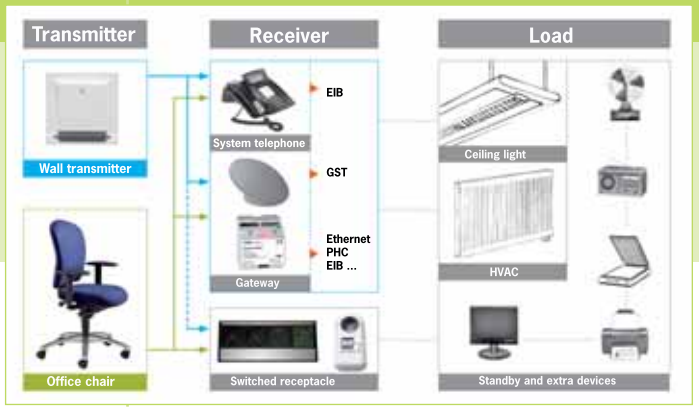
Wireless Switch EasySens Busch-Jaeger,
4-channel light, alu silver, frame Future-linear

technic & design

SAVE ENERGY, ADD COMFORT, ENHANCE SECURITY IN NEW CONSTRUCTION AND IN RETROFITTING

Constantly increasing energy costs naturally impact on the office too. So it makes sense to "personalize" office chairs, standby devices, lighting, heating, air-conditioning and the like with a presence detector. During your absence the temperature in a room is lowered, lights are switched off, together with all stand-by and extra devices that need not keep running. An office chair can switch functions directly or operate through building systems management.

By Klaus Kleine, Managing Director, Funkstuhltechnik



Office chair and building systems management

SAVING ENERGY WITH SMART SEATING

The office chair with a self-powered transmitter can inform a room controller, for instance, that there is no longer anyone at the desk, so that it reduces room temperature by two or four degrees after about one hour. An additional window contact shuts off the heating if a window is open.

Added to the energy saving and the security that power is off during your absence, combination with a system telephone means extra convenience. The telephone uses the presence signal to automate call diversion. When you are not present to take it, an incoming call can be sent straight to a switchboard or forwarded to your cellphone. Through the telecom system the presence signal can also be made available to EIB-based building systems management.

In parallel the presence signal thus reaches all assigned actuators and gateways. Devices at the workplace can then be switched off by power socket solutions implemented in or on the office desk. Ceiling lighting and HVAC installations are controlled by building systems management that receives the presence signal from the bus gateway or the telephone system. A wall switch turns on the lighting and heating when you enter the office. When they are switched off is determined by how long you remain seated plus a set delay. Printer, monitor, radio and the like can be activated by your sitting down. Extra functions needed for work standing up can be called up by the wall switch or a handheld transmitter.

Automatic temperature regulation

Automatic call diversion

www.funkstuhl.de

EXTENT™ – DOOR ENTRY PHONES WIRELESSLY EXTENDED

TCS has devoted a whole product series to the purpose of simply installing modern systems even in older buildings and creating solutions offering later flexibility.

By Andreas Kriebel, Marketing Manager, TCS AG

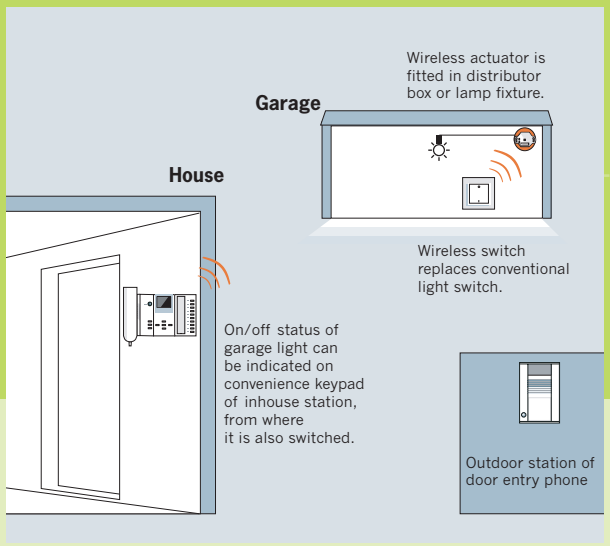
Installation of a new door entry phone in the course of building modernization is usually accompanied by the wish for other more ambitious house and home functions. And in many cases it should be possible to display and operate them centrally. To

date new cabling was virtually inevitable. But in the growing market for modernization it is now often difficult to win approval for new cabling, especially as it can mean high costs. Added to which, a cabled installation is simply a static solution, and one that you find hard to modify later on.

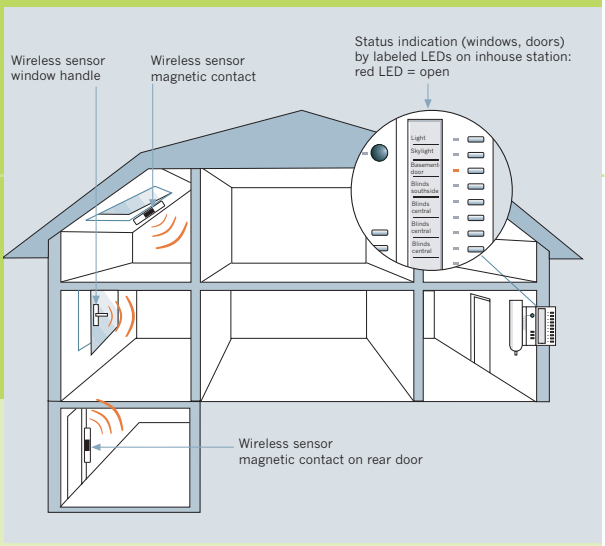
FUNCTIONS SIMPLY ADDED TO DOOR ENTRY PHONES

The extent™ series offers a wireless EnOcean interface with the TCS: BUS system and wireless components to add the display and switching of home functions to door entry phones. The inhouse station of the TCS door entry phone shows you whether a window in the attic is open for example, or a light is still on in the garage or basement. You need not actually go to the light to turn it off, you do it quite simply from the convenience keypad of the door entry phone.

With extent™ it is possible to switch electric loads or groups of them centrally on the door entry phone, and to check the status on LED displays. The wireless magnetic contacts of extent™ indicate whether an attic window or door at the rear of the house is open. If the doorbell rings for instance, you can stay seated and operate the door opener with your wireless remote control or turn on the outside lights, no matter where you are in the house or garden.



Central light switching



Central Off for electric loads

COST AND USE BENEFITS

extent™ applications use sensors that can be installed without any wiring because of their self-powered and wireless EnOcean technology. The immediate benefit is the comparatively low installation costs - as opposed to renovation costs. The longterm benefit, unbeatable by wired systems, is the flexible location of sensors, offering a means of control that can be matched to needs at any time.

When you leave the house, you can press the "Central Off" button on the door entry phone for all connected electrical loads and drive away reassured.

MAXIMUM OPERATING FREEDOM - CENTRALLY, LOCALLY OR MOBILE

Besides remote control of the door entry phone, extent™ also allows you to operate a number of other defined and combined home functions centrally from the door entry phone, locally with extent™ wireless switches or mobile with the extent™ wireless remote control.

INHOUSE STATION AS BIDIRECTIONAL DISPLAY AND CONTROL CENTER

Central display of extent™ functions by LEDs and operation by the convenience keypad on the inhouse station of the door entry phone are a unique solution on the door communication market and one that is gaining in popularity on the building market. No place is more suitable than the door entry phone in the entrance of a house for focusing and combining the extra functions of door communication (e.g. forwarding of door calls to another phone or cell during absence) with the display and operation of home functions on one user interface.

The user friendliness of extent™ profits from the clear arrangement of the LED display, the function buttons and the inscription panel of the modern IMM series of inhouse stations. Adding the display and control of home functions to a door entry phone using self-powered wireless technology is an entirely new approach to effectively merging door communication with attractively priced home automation.

In future a door entry phone will have to do more than just open the door. extent™ shows the way to adopting customized functionality. A wireless and self-powered technology presents cost and use benefits both short-term and longterm on a growing and attractive market for building renovation.

The simple retrofitting of a TCS door entry phone with extent™ functionality offers huge potential for gaining access to and presenting individual and cost-effective automation solutions on a mass market.

www.tcshome.de/extent
www.tcs-germany.com

NOVA CONTROL - POWER LED CONTROLLER FOR INNOVATIVE LIGHTING CONCEPTS

Light-emitting diodes are products in semiconductor technology that have ushered in a revolution in lighting. A focus of current development activity is the creation of high-performance LEDs with three or more different colored diodes in one package.

The best known variant is the RGB LED covering the largest spectrum with its three colors red, green and blue. It is an ideal tool for modern light design in residential and commercial building.

The NOVA CONTROL power LED controller exhausts all the possibilities of RGB power LEDs. Additive color mixing makes it possible to generate virtually any color mood, dynamic color compositions and variable color temperatures in white light. As a further option the controller enables freely programmable light pulse shaping (e.g. visualization of sounds).

The modular concept, consisting of a logic device with microcontroller, configurable power output and interface, is now EnOcean addressable. Four channels are available for all common kinds of RGB power LED. On the fourth channel there is the option of integrating an additional monochrome LED.

Lighting manufacturers who already use LED technology or intend to adopt it can obtain the power LED controller with EnOcean interfacing as an OEM component.

www.nova-d-sign.de

Controller

ELETTRA80 OF ITALY PRESENTS VERSATILE SOLUTION FOR BUILDING AUTOMATION

UBI FREE is an automation system for residential and industrial buildings based on wireless EnOcean technology. Due to the modular design the system can be adapted and enlarged according to the users' requirements. The single modules can be used as a standalone solution or can be connected to the entire system which is controlled by a central touch screen. Furthermore, by using the interface card, there is an option to connect UBI FREE to conventional cabled installations. It is possible to use UBI FREE switches parallel with switches produced by familiar-name companies. The result is that UBI FREE modules can be added step by step to an existing electrical installation.

UBI Free light switches and dimmers

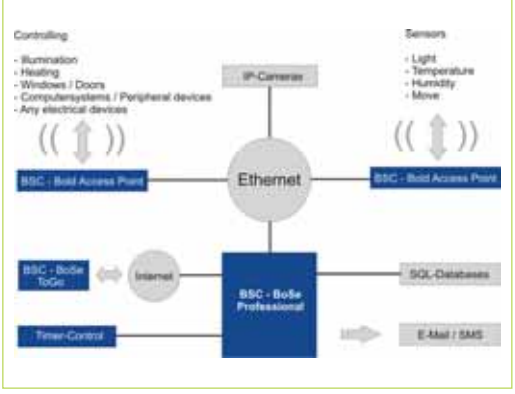
Available devices are light switches and dimmers, shutter controls and timer solutions. With UBITER and UBI GSM gateways are available for HVAC and GSM systems. Moreover, UBI FREE is certified CE and TÜV Nord, according to the European Standards 73/23/CEE - 2004/108/CEE - 93/68/CEE.

www.ubifree.it

ALL-OVER BUILDING INFRASTRUCTURE FROM BSC

Access points (BSC-BAP, BSC-BoR) and visualization and control software (BSC-BoSe) developed by BSC present a cost-attractive solution for integrating terminals using EnOcean wireless technology in home automation and facility management.

In addition to comfort and convenience aspects, a major focus of BSC is active conservation of resources, e.g. reduction of energy consumption and elimination of standby powering. Access points use the Ethernet cabling that is normally found in the object of interest to convey received data to a server. The company has also developed a transmitter/receiver module for USB connectivity.



BSC software serves as an interactive switching center. Enhancing the visualization and control of installations and appliances, it offers features like the following:

- Timed switching functions
- Secure shutdown of computer systems
- Physical separation of appliances from a power grid
- Interaction of different components (window open = heating off)
- Visualization and control on the Internet
- Notification by Email and SMS
- Data pooling in an SQL database
- Integration of network cameras

Low starting costs and very high potential for savings mean that an investment of this kind pays for itself within a very short time. Regular updates ensure compatibility between BSC products and future additions or acquisitions.

www.embedded-intelligence.de

NETWORKED

PYRECAP INTRODUCES NEW AUTOMATIC TELEGRAM TRANSMITTER

The product is powered by 220 Vac 50/60 Hz using a removable connector. A red LED indicates the operation status. A test pushbutton enables generation of a telegram based on the PTM230 and programming of RCM 250, RCM 110, RCM 120 receivers.
The second connector links with a computer which controls the closing and opening of a contact in order to send telegrams at programmed intervals. Thus, it enables the user to control lighting while being absent. This product is configurated for ON or OFF with an internal jumper on the PCB.

www.pyrecap.com

LIGHTING CONTROL & DEVICES WITH WIRELESS SWITCH FOR HE US MARKET

This wireless digital switch controls relays or dimmers in centralized or distributed control panels. It can be stuck or screw mounted onto any flat surface giving instant control of any of LC&D's lighting control systems.

The broadcast range is 50-100 feet and will punch through typical wood construction partitioning. Since it uses a 32 bit signature, switches may be located in close proximity and will not cross or cancel each other. Up to 28 switch buttons may be associated with a receiver. The receiver is typically located in the ceiling and sits on the GR 2400 bus. Each button may be programmed to perform a different function and can be changed via the bus.

www.lightingcontrols.com

Light switches from the MODENA range

SELF-POWERED WIRELESS SWITCHES NOW FROM SCHNEIDER ELECTRIC

As a result of successful cooperation between Schneider Electric Brasil and EnOcean's Brazilian distributor ASP, modular wireless switches brandnamed "prime" were launched in early 2007. The switches, comparable to a design otherwise only produced in Italy, are aimed primarily at a booming South-American market. In the MODENA range the user has a choice of 13 different colors and versions. The switches have already gone into initial projects in building services automation and ship building.

www.primeletrica.com.br **www.aspcontrol.com.br**

ECOSWITCH BY ABACUS TDC

Abacus TDC offers a new range of EnOcean-based switches, a smaller form factor, and lower cost than existing switch design with a bezel and front plates. The switches are available in single and double rocker versions, in white only and either with a plain rocker, or with arrows (shutter control). The plastics are as simple as possible with just the bezel which mounts to the wall via fixing holes and the rocker. They operate in the same way as other batteryless radio switches, using a PTM 200 as the heart of the product.

www.tdc.co.uk/index.php?key=ecoswitch

MK SWITCHES WITH ENOCEAN TECHNOLOGY

MK is leading the way in the UK market by introducing EnOcean technology into its popular Logic Plus, Masterseal and added value ranges. By introducing battery-free wireless switches MK is providing its customers with a quicker installation and sustainable building environment.
For more information on these exciting developments contact Jennifer MacDougall:

jennifer.macdougall@honeywell.com

UP TO 50% ENERGY SAVINGS – BUS TECHNOLOGY IN SCHOOL AND UNIVERSITY BUILDINGS

By Prof. Dr.-Ing. Manfred Mevenkamp, Bremen University of Applied Sciences, Informatics/Automation Engineering, Modeling and Simulation, Sensor and Actuator Technology

HOCHSCHULE BREMEN
UNIVERSITY OF APPLIED SCIENCES

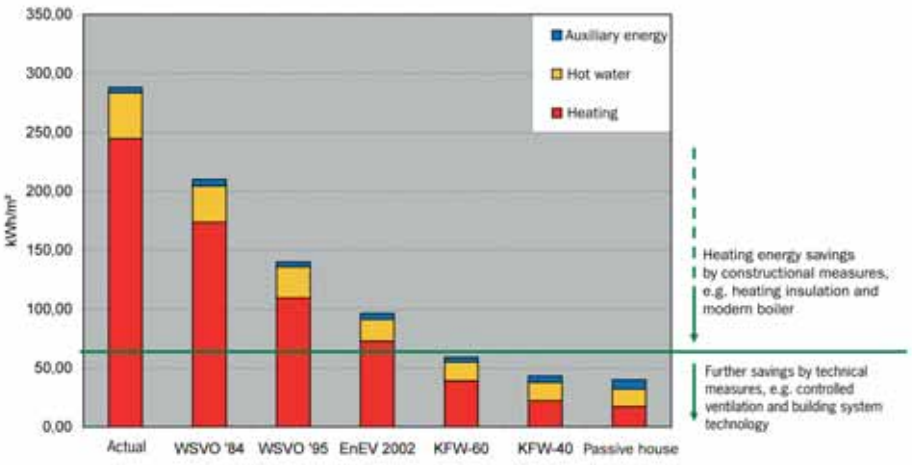
ENERGY SAVING POTENTIAL

Reducing the energy needs of buildings plays a key role in achieving climate protection goals in Germany. The biggest potential for savings is in the consumption of heating energy. The latter currently accounts for about a third of our total energy requirement. In commercial buildings and other purpose-built structures the lighting is also an important factor, responsible for some 20% of overall power consumption in this sector.

In addition to protection of the environment, there are also sound economic reasons that compel us to act. This applies in particular to public buildings such as schools and universities, whose escalating operating and energy costs make a big dent in the budgets of communities and states.

The savings potential is huge particularly where older buildings are concerned. In many cases the demand for heating energy can be halved by constructional measures alone, such as more effective heat insulation. Savings beyond this call for technical measures, including the use of renewable energy sources, controlled ventilation and building systems engineering. A current study by Bremen University shows that even in newer buildings the heating energy needed for seminar rooms can be reduced by as much as 50% through bus managed automation. The project was funded by Bremer Energie-Konsens GmbH.

The effect of such automation in this context is especially large because the high rate of user fluctuation and lack of personal responsibility for the rooms lead to different forms

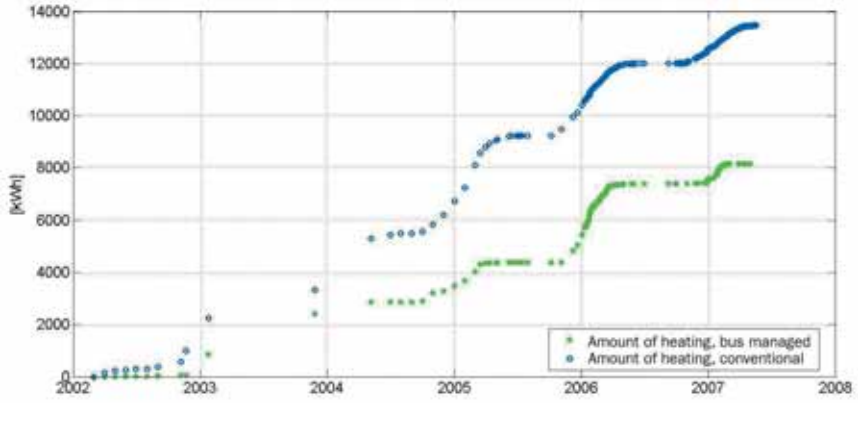


of energy waste (e.g. lights left switched on unnecessarily, heating while windows are open). Appealing to users for more energy awareness only tends to produce temporary improvement. Intelligent automation on the other hand has a lasting impact, and can pay for itself fast depending on the scale of implementation.

SEMINAR ROOMS COMPARED

At the center for information and media technology (ZIMT) of Bremen University of Applied Sciences an experiment has been under way to compare the energy consumption of two adjacent seminar rooms. One is fitted with conventional radiator thermostats, while the other is linked to a building services bus with room temperature regulator, controlled heating valves and window contacts that trigger closing of the valves when windows are opened. The heat consumed by the two rooms is separately registered, however an adjoining laboratory is also connected to the heating circuit of the room with bus management.

Measured figures are available for the five years since the building was completed in 2002. At the end of this period the heat consumed by the seminar room plus laboratory with bus control is about 60% of that used by the conventionally fitted room alone. Corrected by the consumption of the adjacent laboratory, a direct comparison of the two seminar rooms shows that the heating energy requirement is halved.



DAYLIGHT CONTROLLED LIGHTING

The seminar rooms of the ZIMT are fitted with modern specular louver lights, making them already highly energy-efficient in that respect. But a further substantial reduction of their electricity needs is still possible through bus managed automa-

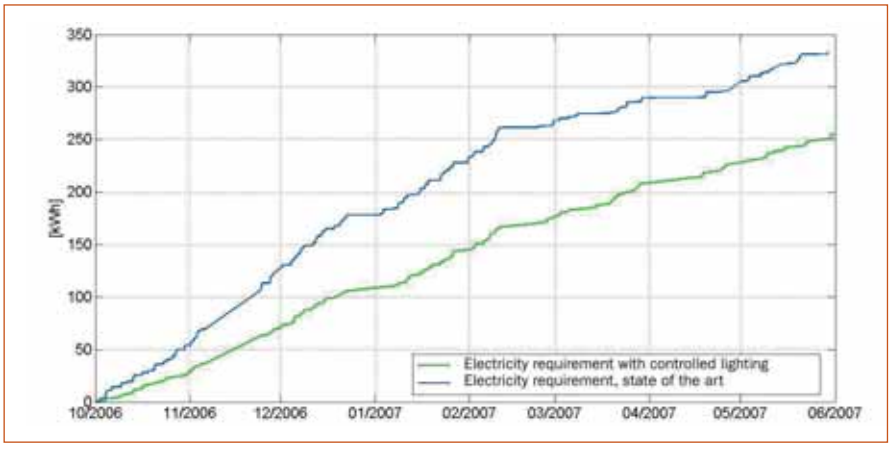
Center of informatics and media technology at Bremen University of Applied Sciences

tion. Lighting on demand and governed by daylight was implemented with the aid of presence detectors, brightness sensors and dimmer actuators. In the period concerned the saving was almost 25%. The energy need could be cut by as much as 40% if the standby losses of dimmable electronic light ballasts were also reduced or avoided.

NETWORKED INTELLIGENT SYSTEMS

Intelligent building systems engineering makes it possible to network the subsystems and functions of different facilities, showing the way to even more energy efficiency in buildings. Information systems can contribute to energy awareness among users. The integration of central control units offers the possibility of heating seminar rooms according to the occupancy indicated by a timetable. Control of the central heating boiler according to outdoor temperature and heating curves is replaced by a form of control that responds to information about the momentary heating requirement in the particular rooms.

The functions of a building that are relevant in terms of economizing on energy - heating, ventilation, cooling, lighting, providing shade - can only be optimally attuned in a networked system. Integration is simpler and less complex if it is based on a uniform bus technology. If this is not the case, like when networking wireless and wired devices, flexible and powerful interfaces are required. On such a basis intelligent automation systems are destined to make a major contribution to energy efficiency, and not only in school and university buildings.



www.iia.hs-bremen.de/ KNX-Energieeffizienz

INQUISITIVE

OUR NEW EMPLOYEES

VICE PRESIDENT "STRATEGIC ALLIANCES"

EnOcean appointed Graham Martin as Vice President Strategic Alliances in July this year. Graham is responsible for integrating technology and market strategy for the rapidly growing EnOcean Alliance community.

Graham Martin brings 25 years of experience as an executive and visionary in the wireless semiconductor and electronics industry. He joins EnOcean from Chipcon, a Norwegian low-power RF IC company recently purchased by Texas Instruments, where he was responsible for business development and the promotion of standards and alliances such as IEEE 802.15.4 & ZigBee. In addition, Graham served as President of stack provider Figure8Wireless in San Diego and as Vice Chairman and Board Director of the ZigBee Alliance.

E-mail: graham.martin@enocean.com

COMMUNICATIONS

Zeljko Angelkoski (34), our new Marketing Manager for Global Communications, joined EnOcean in March 2007. He will push marketing activities by promoting the EnOcean brand through all channels, thus increasing brand awareness. He is responsible for EnOcean's communication strategy as well as for all operational marketing activities such as the Internet, the company magazine perpetuum, public relations, promotion, advertising and events.

E-mail: zeljko.angelkoski@enocean.com

INTERNATIONAL

OUR NEW PARTNER IN POLAND

ACTE Sp. z o.o. has been present on the Polish market since 1999. The company is part of a Scandinavian group of electronic components suppliers – Lagercrantz Group AB - which was set up within Bergman&Beving AB.

ACTE concentrates on wireless technology products and solutions, cooperating with global leaders. It attempts to be perceived as a leading partner bringing added value in relations between producer and customer. A professional team of sales engineers, field application engineers, logistics and customer service provide a high level of service for partners.

www.acte.pl

WE ARE WHAT WE DO

Recently I discovered something interesting on the Internet: We Are What We Do, a movement inspiring people to use their everyday actions to improve the world. It is based on the firm conviction that every one of us can achieve something through small changes in our attitude and our daily life, and that together we can thus change the world.

By Zeljko Angelkoski,
Marketing Manager, EnOcean GmbH

We Are What We Do, an independent non-profit-making enterprise, is not a charity organization nor is it an institution. Instead it is a new kind of movement, one with a clear standpoint. It aims to inspire people to change the world through simple, everyday actions. No matter who they are. And no matter where they are. The conviction behind this is that every individual, through small changes in their attitude and daily life, can achieve something, and that together they can all change the world for the better.

SMALL ACTIONS X MANY PEOPLE = BIG CHANGE

We Are What We Do has thought up 50 simple actions that are good for us, our health, the environment, society in general and in particular. The attraction of participating is the happy, rewarding feeling that we can all make a contribution, no matter how small.

I tried it out straight away and really got involved in one or the other action. Luckily our technology can help you, like in the action "Turn off unnecessary lights" (no. 21) - simply by self-powered wireless sensors in presence detectors. But there are still plenty of actions that I have to tackle by myself. That evening, after I had read my children a story (no. 2), I tried, but without much success, to learn a good joke (no. 19).

www.wearewhatwedo.com

PRESS ECHO

■ Battery-Free Joins Peel 'n Stick to Resolve Concerns - August 1, 2007

"Tens of millions of square feet of existing space need upgrading, but there's reluctance to install high- performance lighting controls because of the high cost of installation, disruption to operations and complexity… Battery-free EnOcean technology coupled with easy peel and stick installation of OEM-designed switches, monitors, sensors and personal lighting controls hurdle that reluctance." **www.lightboard.com**

■ Wirless Switching without batteries - July 18, 2007

"'In the past, designers have been reluctant to take up radio frequency control for switching applications due to the need for switches with batteries, which obviously have a limited life,' said Mark Redfern of Wieland. 'Historically, therefore, radio control has been seen as an increased burden for the building operator. However, with EnOcean, because there is no power supply required, there are no maintenance requirements. By providing simple to program switching units combined with the plug-and-play gesis installation system, the EnOcean technology becomes a quick to install and cost effective solution for building and room control.'"
www.connectingindustry.com

■ Harvest Time for Wireless Sensors - July 12, 2007

"Boeing aims to use the same kind of design in its aircraft to replace miles of cabling that is currently needed to support the communication between switches in a passenger's armrest and the lights and alarms they control….The plan is to use wireless, self-powererd switches to transmit RF signals to sensors mounted in the ceiling that are powered from a 9V mounting rail. Trials are just beginning using customised switches developed by EnOcean." **www.theiet.org**

■ Sensors Insight - July 12, 2007

"Vibration isn't the only waste energy source being tapped—companies are converting light and heat into electricity, too. EnOcean, for instance, uses solar cells coupled with a storage device to power wireless sensors from ambient light. For links to other companies working on energy harvesting, the Energy Harvesting Forum is a good place to start." **www.sensorsmag.com**

■ Lighting Up New York - June 28, 2007

"Echoflex solutions, a manufacturer and distributor of lighting and HVAC control solutions introduced self-powered wireless switches and sensors. Using the EnOcean technology (a spin-off of Siemens AG), these switches and sensors provide the solution to wireless controls. The EnOcean technology generates energy derived from the environment and has a range of about 100 feet. When the wall switch is pressed, a piezoelectric crystal provides the power to send a signal to remote fixtures. Other environmentally derived methods include solar and electrodynamics. Watch this technology. I believe it is the sleeper technology that will jump start the wireless control revolution." **www.energyandpowermanagement.com**

■ Green Chips, Blood Logs, Sickis and Folksonomic Futurism, May 2, 2007

"It's still only 2007. Apple has not yet shipped a single iPhone. We don't have Windows with Wheels and Eyeballs either. But self-powered green chips? The Germans, in the unlikely global stronghold of wind and solar, are very busy on ambient power: unlike Apple and Microsoft, nobody's ever heard of EnOcean. It's a start-up specializing in wireless doodads that can harvest and store the tiniest traces of environmental energy: a flux in daylight, a change of air pressure. Green-powered micronetworks – no more batteries." **www.worldchanging.com**

■ Energy for free - April 2007

"Energy harvesting and low-power wireless are being hailed as the 'The Next Big Thing'. … EnOcean currently ships transmitters that are powered by energy harvested from piezo, thermal, solar and electrodynamic sources." **Components in Electronics**

DISTRIBUTION

AUSTRIA
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Simon Taylor — web.sales@tdc.co.uk

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

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

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

EVENTS

OCTOBER

Oct 18, 2007: Jefferies 4th Global Clean Technology Conference, London, UK
EnOcean exhibits – www.jefferies.com

NOVEMBER

November 5-10, 2007: Batimat 2007, Paris, France
EnOcean exhibits – www.batimat.com

November 14/15, 2007: Telemobility Forum 2007 in Monza, Italy
EnOcean Distributor Abacus Ecc Italy exhibits – www.telemobilityforum.com/eng/

November 5-7, 2007: MEMS Executive Congress 2007, San Diego/ California, USA
Presentation by EnOcean – www.memsindustrygroup.org/executivecongress2007

November 7-9, 2007: Greenbuild 2007, Chicago/ Illinois, USA
EnOcean exhibits – www.greenbuildexpo.org

JANUARY

January 22-24, 2008: AHR Expo, New York City, USA
EnOcean exhibits – www.ahrexpo.com

FEBRUARY

February 5-8, 2008: Interclima 2008, Paris, France
EnOcean Partners exhibit – www.interclimaelec.com

February 25-28, 2008: Embedded World 2008, Nuremberg, Germany
EnOcean Partner Unitronic exhibits – www.embedded-world.de

February 13-16, 2008: International Builders' Show 2008, Orlando/ Florida, USA
EnOcean Partner exhibits – www.buildersshow.com

APRIL

April 1-4, 2008: Amper 2008, Prague, Czech Republic
EnOcean Partner WM Ocean exhibits – www.amper.cz

April 6-10, 2008: Light+Building 2008, Frankfurt, Germany
EnOcean exhibits in Hall 9.1, booth C41 – www.light-building.messefrankfurt.com

MAY

May 22, 2008: Builconn Americas, Santa Clara/ California, USA
EnOcean exhibits – www.builconn.com

May 28-30, 2008: LightFair 2008, Las Vegas/ Nevada, USA
EnOcean exhibits – www.lightfair.com

Building automation with EnOcean

EnOcean

www.vipa.de | www.speed7.com | www.vipa.de | www.speed7.com | www.vipa.de | www.speed7.com | www.vipa.de

EnOcean Shortcuts

- Operation in building automation, industry, logistics and medicine
- Flexible application: no wiring, easy installation and
- Time-saving: fast integration, installation and configuration
- Quality improvement: maintenance-free, without battery
- Maximum transmission reliability
- Vast transmission range
- Easy expansion
- Flexible adjustment to different data structures and volumes
- Optional data encryption

VIPA®
art of automation

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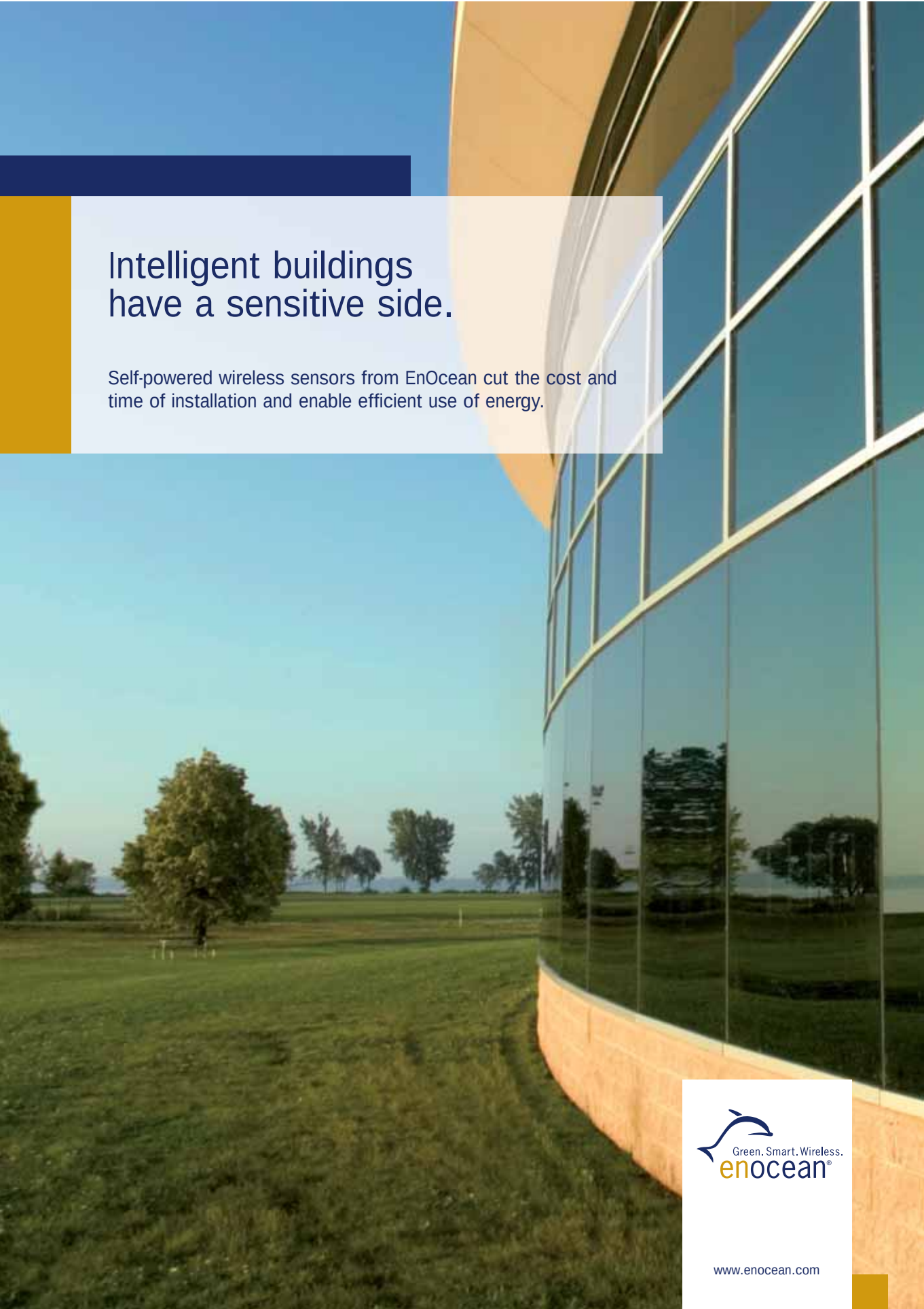

Intelligent buildings have a sensitive side.

Self-powered wireless sensors from EnOcean cut the cost and time of installation and enable efficient use of energy.

Green. Smart. Wireless.
enocean®

www.enocean.com