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2015 ISSUE 1

TECHNOLOGY MEETS INTELLIGENCE

USER ACCEPTANCE OF THE SMART HOME

Cross-vendor, self-learning systems for
true intelligence

SCHNEIDER ELECTRIC

Old textile mill becomes a showpiece for
energy efficiency

SECO

Architectural landmark impresses with
building intelligence

BSC COMPUTER

Access to the Internet of Things

Frankfurt/Main, March 10–14, 2015

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PREMIERE AT

ISH

Frankfurt/Main
Hall 10.3, Stand A39



Dear Reader,

This year's CES in Las Vegas gave a taste of the EnOcean technology's great possibilities. Experiencing all these connected things – from smart homes and cars to wearables – further convinced us that it's all about data. As soon as the first bit of data is collected, fascinating applications can occur.

EnOcean provides the essential wireless technology to bring this first data bit to the intelligent Internet of Things system (IoT). It sounds simple but it is the necessary, possibly the most valuable communication leg in the intelligent network. With switches and sensors powered by ambient energy, such as the press of a button, we collect the first data bit – there wouldn't be an intelligent system to build without this.

However, it remains an exciting challenge to get EnOcean included in all the upcoming applications of the IoT while keeping the first leg of data collection simple, wireless and battery-free. This calls for the specifics of ultra-low power radio, which provides the needed data to a hub that processes it intelligently. Finally, user-friendly software will bring the application's experience to the end-user. With all these building blocks, the connected world, which impressed us at CES, will become a reality

– with EnOcean playing a significant role. The presence of the EnOcean Alliance and its member companies at ISH 2015 in March will give you an exciting insight into this development.

Being at CES on the US west coast again, seeing the attention a few of our European customers received, I was reminded of the huge market opportunity North America provides for both the EnOcean technology and the EnOcean Alliance members, in the US as well as in Europe. Promoting the unique and simple ingenuity of self-powered devices will open up new business opportunities. A great example of this is the self-powered AFRISO water leakage sensor using kinetic energy harvesting. At CES, it was seen as “the coolest product ever”. This is excellent feedback, which should encourage us to stronger promote energy harvesting wireless technology on the North American market. With the EnOcean Alliance, we already have an excellent platform to do so.

A handwritten signature in black ink, appearing to read 'Wald Siskens', written over a horizontal line.

Yours,
Dr. Wald Siskens
CEO of EnOcean

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LEADING ARTICLE

User acceptance of the smart home



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SECO

Architectural landmark impresses with building intelligence



SCHNEIDER ELECTRIC

Old textile mill becomes a showpiece for energy efficiency



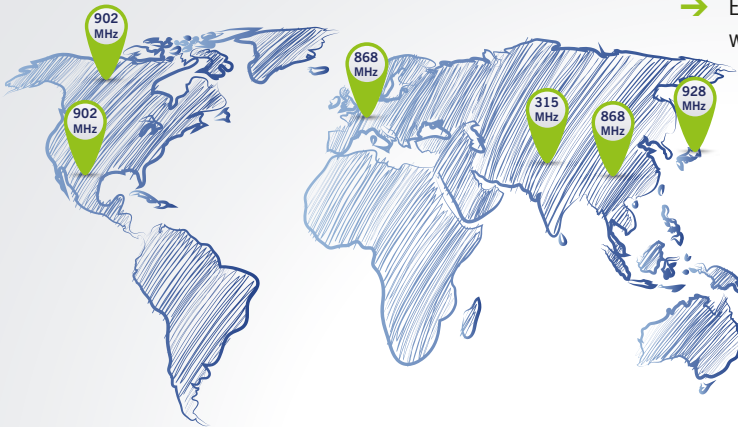
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Access to the Internet of Things

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THE ENOCEAN WORLD IN NUMBERS

Today, the EnOcean technology is in use in 37 countries worldwide. It's time to take a look at some figures of the EnOcean world.



→ EnOcean developed the first wireless standard, which is optimized for ultra-low power and energy harvesting applications. It is for worldwide use. The EnOcean Alliance has more than

350 members.

→ Over **1,500** interoperable products based on the EnOcean standard are available.

→ All together, the energy harvesting wireless technology saved **25,000** kilometers of cables up to now. This saved more than **1,000** tons of copper,

2,500 tons of PVC and, therefore, over **11,600** tons of CO₂.

→ EnOcean is the most widely used wireless technology in the field of building automation. All self-powered wireless devices, which are installed in buildings worldwide, will save approximately

50,000,000 batteries.



→ Visit the EnOcean world in the Web:
www.enocean.de www.enocean-alliance.org

FORGET ME NOT—DEVELOPER COMPETITION FOR THE INTERNET OF THINGS

Under the motto “Forget Me Not”, developers from all over the world have implemented their ideas for a connected home, based on a Raspberry Pi and energy harvesting wireless sensors, among other things. The winner is Frederick Vandebosch from Belgium, whose CaTS system was met with enthusiasm, and not only from his cats.

By Markus Kreitmair, Innovation Manager, EnOcean GmbH



In conjunction with its partners, EnOcean, Tektronix, Raspberry Pi Foundation and Eclipse Foundation, element14 called for submissions to one of the largest developer competitions in the online community's history, titled “Forget Me Not”. The partners selected the 15 best ideas, which the finalists were supposed to turn into real applications over a period of three months.

THE WINNING SYSTEM: CATS

Frederick Vandebosch from Belgium won the grand prize, a product package worth more than EUR 15 000, for his CaTS system, which includes an automatic food dispensing system for pets (“IoT Pet Care System”), an intelligent “Everything Off” master switch and status messages on room temperature and door status.

Frederick Vandebosch developed the intelligent, automatic food and water dispenser for his two cats. An integrated camera records the pets' feeding and drinking habits. Based on these parameters, pressure sensors beneath the food and water bowls precisely meter the food and water portions according to the animals' needs. A smartphone app allows the user to monitor the pets' feeding behavior at any time.

HOUSING PARTS FROM THE 3D PRINTER

Many housing parts were created on a 3D printer, including brackets for EnOcean sensors, platforms for weighing cells and mounting plates for RFID readers.

www.element14.com



FUEL TANKS MONITORING

The Italian company Bluewind develops an intelligent fuel tank monitoring system for trucks and heavy commercial vehicles, integrating EnOcean technology and communication to prevent of fuel theft.

The innovative automotive filler cap is an aftermarket device, compatible with most common trucks and heavy commercial vehicles. The fuelsensor is designed to provide existing fleet management integrators with perfect control of fuel refill location, timing and authorization. Integrating radio technology, fuelsensor communicates with the vehicle on-board (GPS) tracking unit via the EnOcean standard. This allows smart sensing to detect an open filler cap and thus send a signal to a GPS unit in the vehicle.

RELIABLE THEFT PROTECTION

From here, the data together with the truck's coordinates are forwarded to the fleet management server. In doing

so, it takes care of anti-theft, anti-burglar and safety issues. As an option, fuelsensor works with things.bluewind.it cloud server technology.



www.bluewind.it/fuelsensor



USER ACCEPTANCE OF THE SMART HOME

The business community and society have set energy efficiency as one of their major goals. Building automation is a key factor in more sustainable energy use. Numerous related products and solutions already exist on the market, increasingly also for the privacy sector. However, although these solutions achieve enormous savings of up to 30 percent, they have not yet become well established among the general public. An important component is missing: user acceptance. Flexible, intuitive and automatic systems are intended to change this situation.

By Armin Anders, Vice President Business Development and Co-founder, EnOcean GmbH

The smart home's much touted intelligent networking capability currently founders on the fact that the automation solutions use different standards for individual disciplines (light, shading, heating, multimedia), are manufacturer-specific and, above all, wired solutions can be installed and upgraded only with a great deal of effort. As a result, consumers find it difficult to choose the most suitable system from a highly fragmented assortment. Moreover, up to now they have only rarely seen added value in a smart home, since the ideal coordination between the individual components, and thus the actual usability, is still lacking. This means that the smart home has not yet been widely accepted by the users.

MANUFACTURER-INDEPENDENT APPROACH

However, the industry is beginning to rethink its approach. Increasingly, suppliers are pursuing the goal of dissolving the boundaries between products, standards and disciplines and combining them into an integrated solution. This willingness to work together calls for open systems that integrate the products of different manufacturing partners. Customers can choose from a wide range of different solutions, all of which communicate with the same control unit. As a result, all components across all standards can be controlled with a single app.

WIRELESS MAKES FOR EASY INSTALLATION

Many consumers would like to be able to easily install a startup system by themselves in an existing building. Due to this customer request, more and more wireless systems are replacing classic cabled solutions. Even in existing buildings, they can be upgraded with only a few steps and thus save complex conversion work. Wireless makes it possible to flexibly place, network and add the individual components. Modern, maintenance-free solutions also work without batteries.

"Energy harvesting" allows small energy converters to generate electricity for sensors, switches and actuators from the immediate surroundings, using motion, light and temperature differences as energy sources. These devices completely eliminate the always burdensome and frequently infeasible need to change batteries.

MULTIFUNCTIONAL, SELF-LEARNING SOLUTIONS

The products are also changing due to the use of energy harvesting wireless technology and the goal of achieving high user acceptance. Thus, solar-based wireless sensors now map several functions in one device and simultaneously measure temperature, brightness and moisture in a room.

Such multifunctional sensors often form part of self-learning systems that automatically adapt to the users' living habits as well as to various parameters. Basic solutions in this area include intelligent individual room solutions, in which a sensor detects the current room temperature as well as the presence of people. As a result, the solar-operated sensor identifies the times at which a room is used over the long term and automatically generates an individual usage profile. The sensor sends this information wirelessly to a thermal-powered, thermostatic radiator valve, which regulates the room temperature according to demand.

INTELLIGENCE MAKES FOR REAL ADDED VALUE

Advanced systems use special algorithms in the central controller. These algorithms process the data from the sensors distributed throughout the home as well as information available elsewhere, such as online weather data, in order to adapt the entire automation system to the individual habits of the people living in the home as well as changing external factors. Linking the different parameters and disciplines gives the users significant

added value. They benefit from substantial energy savings and comfort functions that adapt to their individual needs without the users having to surrender control.

DATA PROTECTION

Cloud platforms now exist that integrate the different applications for controlling lighting, heating or blinds, together with energy harvesting wireless sensors, actuators and mobile devices. In this case as well, the system uses all data in real time, takes the building properties into account and processes complex automation scenarios in the cloud background, depending on the situation.

Even with all this intelligence, data must still be protected. To keep the personal information secure, control centers transmit the data in encrypted form. Users can also determine at any time whether and which data they want to store in the cloud and which data should be stored locally in the home's control center.

FREE CHOICE FOR REAL SMART HOMES

Due to the manufacturer-independent systems, the user has a free choice of products. The central controller converts the complexity of the different technologies into easy and intuitive operation. Thanks to the energy harvesting wireless technology, the sensors and heating actuators are maintenance-free, are easy to install, can be relocated at any time and be upgraded at a later date. The result is a real smart home that seamlessly integrates comfort, energy savings and security into everyday life without requiring the user to deal with technology.

www.enocean.com



User-friendly interfaces integrate different applications.





ENERGY-SAVING HOTELS IN HAWAII

Hotel owners are under pressure when it comes to running their properties. Today, energy savings are a must, but the implementation of appropriate measures should not affect the guests' comfort. Two hotels in Hawaii realized the perfect balance between guest experience and energy savings thanks to an EnOcean-based wireless automation system.

By Josh Alper, General Manager, ZENO Controls and Verve Living Systems

Keeping guest accommodations competitive and increasing energy costs are just some of the concerns facing the hospitality industry. For hotel owners and operators, fears of compromising guest comfort are often the greatest stumbling block when it comes to advancing energy management. The assumption that energy management solutions adversely impact guest comfort is largely unfounded.

HIGH ELECTRICITY COSTS IN HAWAII

Particularly in Hawaii, the cost of electricity fluctuates due to variations in the price of imported fuel used in power plants. In addition, while hotel owners in the United States pay somewhere between 8 to 16 cents per kWh for electricity; hotel owners in Hawaii pay around 40 cents – which is a major setback for business.

WIRELESS BALANCE BETWEEN COMFORT AND SAVINGS

Two hotels in Hawaii decided on a wireless automation system from Verve Living Systems to meet the challenges they face. GreenSavings Hawaii, an experienced systems integrator based in Hawaii, installed entry door sensors, occupancy sensors and thermostats from Verve

Living Systems to integrate room level control which automatically adapts air conditioning to the actual need and room occupation.

Based on EnOcean's energy harvesting wireless technology, the guest room energy management system was highly flexible to install and to configure in short time. This made it easy to meet the hotels' different and unique needs while balancing the guest experience with energy savings. The hotel owners saw immediate saving effects, and due to the maintenance-free, battery-less solution, they are expecting a fast return on investment (ROI) of just over one year. In addition, the hotels benefitted from rebate incentives from the local energy providers.

Immediate energy saving effects and a fast return on investment are two benefits of self-powered wireless devices.





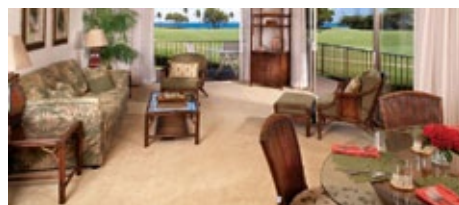
Hotel owners in Hawaii face high and fluctuating electricity prices. This makes energy-efficient measures at reasonable cost particularly important.

COURTYARD BY MARRIOTT KAUAI AT COCONUT BEACH

The Courtyard Marriott Kauai is a very popular destination and maintains a high occupancy rate. Therefore, the wireless components needed to be installed in short time to avoid taking rooms out-of-inventory. This limited the number of rooms which GreenSavings Hawaii could retrofit each week. Nevertheless, starting in January 2014, the project was completed only five months later in May. Using a self-powered wireless entry door sensor, occupancy/motion sensor and temperature sensor in each guest room, the hotel staff can now automatically determine room occupancy, set cooling setbacks and initial comfort levels without adjusting the thermostats in each single vacant room. The components were installed unobtrusively and the automated settings meet the individual needs of the guests from the very beginning; so that the guests are not even aware of the new energy management system.

However, the hotel operator is well aware of the 35 percent energy savings, as proven by on-site tests that compared identical rooms with and without the equipment. The Courtyard Kauai is now on track for a 13-month payback even without rebate incentives.

The savings go hand in hand with another benefit: located right on the water in Hawaii, the Courtyard Kauai at Coconut Beach is always concerned about preventing mold. The system integrator was able to configure the guest room thermostat settings to prevent mold while still saving energy by adapting the air conditioning to the actual need.



Using wireless technology allows the automation system to be flexibly adapted to a hotel's individual needs.

MAUI ELDORADO KAAPALI™ IN LAHAINA

GreenSavings Hawaii implemented the same Verve energy management system in the Maui Eldorado Kaanapali™ in Lahaina from January to June 2014; but tuned the settings based on actual experience and feedback. Therefore, the optimum temperature settings for initial comfort setting and cooling setbacks are different from the Courtyard Kauai, for example.

The saving effects are similarly impressive: the Maui Eldorado Kaanapali™ recorded savings of \$150 000 in its first year of employing the wireless controls. In addition, it received a rebate from its Hawaii energy provider for \$38 000.

www.vervelivingsystems.com
www.greensavingshawaii.com



A hand holding a smartphone, with a network diagram overlay showing interconnected nodes and lines, symbolizing smart building technology.

KEY TO GREATER EFFICIENCY

Smart buildings significantly reduce energy consumption. Thus, it is truly smart for all the technical components to be intelligently networked. Lanfer Automation GmbH, based in Borken, Germany, accomplishes this using WAGO controllers. The result is not just energy savings, it also opens up energy synergies.

By Jörg Gruner, Project Manager, WAGO Kontakttechnik GmbH & Co. KG

Alfred Lanfer scans a QR code on a conference room's door with his smartphone in order to prepare for the next meeting. With just one finger swipe on a tiny screen, the blinds lower, the lights dim and a projector and screen descend from the ceiling. "This is the presentation function that we were able to realize with just one switch by using EnOcean technology," explains the CEO of Lanfer Automation GmbH. The company completely renovated its headquarters in late 2013, in which the building was equipped with innovative automation technology – from cellar to ceiling – and targeted energy efficiency.

LINKING INTELLIGENT ISLANDS

Whether it's heaters, air-conditioning technology or illumination, Lanfer says each system presents good opportunities for adding intelligence to buildings and for using energy as efficiently as possible. However, since these individual building sectors in their traditional forms do not have overlapping technology and combined installations, the end result is not always optimal. "A typical example is when the heating and cooling systems work against each other. It is too warm, so the air conditioning system automatically

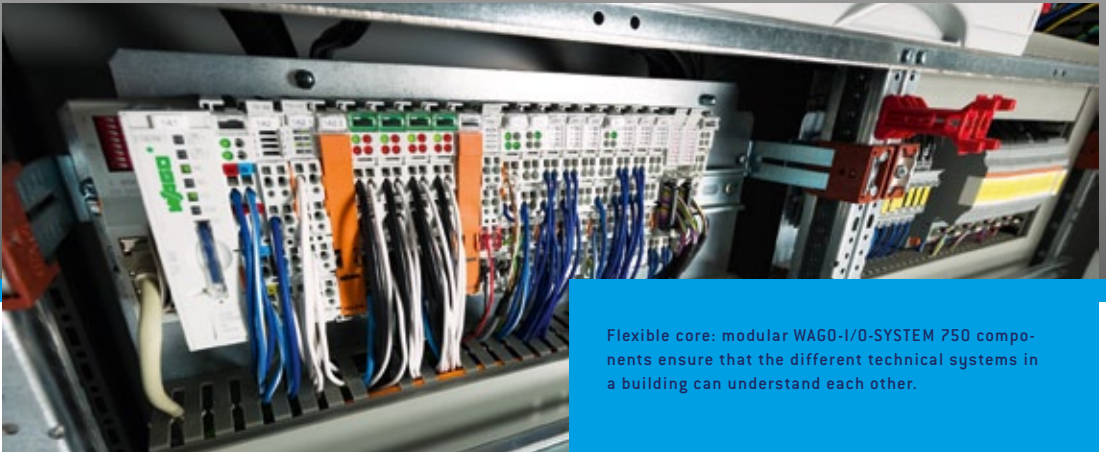
switches on; however, the heating does not switch off at the same time," explains Lanfer. An integrated concept would prevent this.

GETTING A GRIP ON INTERFACE PROBLEMS

In order to harmonize the different systems from the individual building technology sectors, each floor received its own control unit. And at the core of each case is a modular WAGO I/O-SYSTEM 750. "In the end, the customer should benefit from the intelligence of the individual technologies and not have to grapple with interface problems. This can be done," states Lanfer, "using the open and extremely flexible WAGO controllers". With the WAGO controller, there is basically only one ETHERNET interface. It functions centrally for all data and ensures that the building's technical components work together. For this purpose, the I/O modules collect information belonging to the different bus systems from the individual building sectors, such as from DALI for illumination control and from KNX for the climate system. SMI is similarly integrated for outside shading, as are EnOcean wireless touch switches and many others.



Efficiency central: all building systems and devices can be measured and controlled using proprietary software.



Flexible core: modular WAGO-I/O-SYSTEM 750 components ensure that the different technical systems in a building can understand each other.

FUTURE FUNCTIONALITIES

Lanfer Automation continues to evolve the system. Most recently, sensors were installed in a few rooms to measure the CO₂ content in the air. In the meantime, Lanfer is thinking a step ahead and he shares that, "It is conceivable for us to detect and improve not only the current consumption values, but project future energy

consumption based on the analysis." The anticipated result: utilities would make electricity and heat available at reduced rates. And that would be really smart.

www.wago.de



The heating system in the basement of the Lanfer Automation headquarters in Borken, Germany, is coupled to the air-conditioning system to provide intelligent heat.

OLD TEXTILE MILL BECOMES A SHOWPIECE FOR ENERGY EFFICIENCY



The building at 7262 Rue Marconi in Montreal is a showcase for state-of-the-art building automation, and home to Schneider Electric's research and development operations in Canada. One of the keys to the project is the use of wireless technologies based on the established standards ZigBee® and EnOcean.

By Jaimie Giarrusso, Global Marketing & Communications Manager, Schneider Electric

The space is comprised of 30 zones, each with an SE8000 wireless room controller to allow users to manage HVAC settings. Equipped with occupancy sensors, these controllers ensure that temperatures are maintained optimally, activating to appropriate set points based on whether or not the zone is occupied. The SE8000 units communicate wirelessly via ZigBee® to the Multi-purpose Manager (MPM-VA) controllers which control the variable air volume units for each zone.

EYE ON ALL ACTIVITIES

All the controllers are linked in a wireless, self-repairing mesh network using Schneider Electric MPM gateways, which in turn are integrated with Schneider Electric's StruxureWare® Building Expert software to provide web-based monitoring and control of all energy-related activities and equipment across the third floor, spanning over 30 meters.

In addition, EnOcean wireless devices are used to control lighting, and are linked to the MPMs and user-defined schedules so that lighting is adjusted automati-

cally. "There is a myth that wireless technology is too limited in terms of range for commercial use or that it's unreliable because of interference from other wireless devices such as WiFi," said Vincenzo Marcovecchio, Offer Manager for Schneider Electric's SmartStruxure™ Lite solution. "This state-of-the-art building is proof of just how much you can do with wireless today."

DRAMATIC FEATURES

While the wireless network is impressive, it only scratches the surface of the innovative energy management technologies that are in use in this old, yet brand-new, office facility. Some of the more dramatic features of the building include:

- **LED lighting.** Instead of traditional neon panels, the offices feature LED light panels from Lucibel, a Schneider Electric partner. Using ten times less energy than neon, the LED lights can be dimmed to varying degrees and all lighting is controlled wirelessly through a single MPM unit.



The daylight harvesting control creates an ideal working atmosphere, which positively influences the staff's comfort.



The presence of people is a decisive parameter of controlling light and climate in the offices.

- **Daylight harvesting.** The periphery of the building features large windows that receive generous natural light, and the offices take advantage of this by utilizing EnOcean daylight harvesting sensors that read the level of sunlight and adjust the LED lights as needed.
- **On-demand ventilation.** The renovated office in Montreal installed Veris CO₂ sensors to monitor the CO₂ levels in the offices and activate the appropriate ventilation systems only when needed – significantly reducing energy waste.

UNLIMITED ENERGY CONTROL

While it's too early to have specific data on energy use and savings, Schneider Electric is confident the renovation will pay dividends for a long time to come: "We've pushed the boundaries of energy control and management, and wireless technology. In many ways, our offices are better than new. The impact on our people has already been felt; the increase in productivity alone has already given us a solid ROI," concluded Frederick Morency, Vice President, Small Building Systems at Schneider Electric.

www.schneider-electric.com



Watch the project video to learn more.



AVOIDING TAP WATER DAMAGE FROM THE VERY BEGINNING

"Water damage, broken pipes, leaking appliances—that can't happen to me. After all, everything is brand-new!" This is a common misconception among new builders and homeowners. AFRISO offers smart solutions that provide long-term protection against the unpleasant consequences of tap water damage.

By Stephan Frank, Product Manager Building Automation, AFRISO-EURO-INDEX GmbH

Tap water installations have a limited lifespan of 30 to 50 years, after which time at the latest the first damage is certain to appear. However, the statistics indicate a somewhat different pattern. Massive damage to the building often occurs right in the early phase of use, due to material and product defects as well as improper installations.

DID YOU KNOW THAT:

- Many countries make it mandatory to turn off the water completely if you are to be away for more than three days in order to avoid losing insurance coverage. In Germany, insurance companies require at least turning off the water supply to dishwashers and washing machines.
- Safety valves on household appliances do not even come close to protecting against defective hoses inside the appliance.
- More than 1.5 million incidents of tap water damage are reported each year in Germany, with losses in excess of 1.7 billion euros.

WATER SENSORS GREATLY LIMIT THE CONSEQUENCES OF TAP WATER DAMAGE

Michael Bregler from Sulzfeld deliberately chose to install water sensors in his newly constructed single-family home. He was concerned primarily with protecting his assets from the very beginning; it would have been terrible for him and his family to experience water damage in their new home. "A great deal of blood,

A strong team: Shutoff valve, control unit (for up to 30 sensors), WaterSensor con and WaterSensor eco.

WaterSensor
con



Motor-controlled shutoff valve
WaterControl 01



Top: Small box – enormous impact! Master plumber Tim Heckmann explains the interplay between the WaterSensor eco water sensor and the WaterControl 01 shutoff valve.



Below right: Placement of the WaterSensor eco water sensor for monitoring the area underneath the bathtub. The sensor requires no power and is thus operational for an unlimited amount of time.

sweat and tears went into building my home,” Michael Bregler says. “The AFRISO solution gives us maximum security. The ability to conveniently shut off the water supply from a central point next to the front door when we leave the house makes us feel much more comfortable and secure.”

PLANNING, INSTALLATION AND COMMISSIONING

Since the WaterSensor eco water sensors from AFRISO work without a power supply (no cables or batteries) and are operational for an unlimited amount of time, they can be easily placed anywhere without taking additional precautions. The sensors can be installed under the shower and bathtub, in the vicinity of dishwashers and washing machines or in other critical installation zones. If a sensor reports a water leak, the WaterControl 01 shutoff valve automatically closes the

water mains. “Although water sensors cannot prevent actual leaks, they minimize the extent of the damage by automatically shutting off the water mains,” says master plumber Tim Heckmann, adding, “All the installation work can be carried out easily, quickly and at minimal cost. Compared to the small amount of materials, labor and money spent, the homeowner derives an enormous benefit.”

www.afriso.de



ACCESS TO THE INTERNET OF THINGS

With the launch of its BSC-IPG IoT access point, BSC Computer GmbH has brought a gateway to market that seamlessly connects EnOcean sensors with the Internet and processes data in real time for a wide range of applications. Based on powerful hardware from Intel, this information becomes a valuable tool for the intelligent use of energy as well as for meeting the challenges of demographic change.

By Jörg Hofmann, Managing Director, BSC Computer GmbH

Energy harvesting wireless sensors, which draw their energy from their surroundings, are far more than simply cool technology. They are indispensable when it comes to collecting data and digitizing our world. Data is an important driver of economic growth and, at the same time, facilitates more sustainable use of resources. Combined with seamless processing, data opens up new ways to shape our everyday lives independently of time and place.

PACKAGE OF POWERFUL TECHNOLOGIES

The new BSC-IPG IoT access point from BSC now offers this future-viable combination. It establishes point-to-point communication with actuators and sensors that use EnOcean wireless technology and makes this data available directly via TCP/IP, the world's most widely used data communication standard.

The access point integrates new embedded hardware from Intel together with the corresponding operating system based on the Intel Industrial Solutions System Consolidation Series for maximum reliability and comprehensive data security. The hardware thus runs only those programs that are authorized under the BSC certificate.

DATA AS A VALUABLE COMMODITY

The seamless networking of sensors and actuators with the Internet facilitates self-learning systems that adapt flexibly to changing situations and individual needs. This turns intelligently processed data into an important commodity for meeting the challenges of the world's growing and aging population, with its ever scarcer resources.

STARTER KIT FOR APPLICATION VARIETY

A wide variety of applications is possible, ranging from Ambient Assisted Living (AAL) solutions to demand-dependent energy use and even smart cities. BSC offers a starter kit for developers who would like to implement their own solutions for the Internet of Things. It contains not only the new IoT access point but also a selection of energy harvesting wireless sensors and actuators as well as the associated interface specification (API). This package permits the development, for example, of different visualizations, controls and apps for the Internet of Things.

www.bscgmbh.de



SCORING POINTS WITH ENEV 2014



The self-learning and self-sufficient individual room control “en:key” earns a five percentage-point bonus in the KfW building efficiency program.

By Uwe Asbach, Head of Property Management, Kieback&Peter GmbH & Co. KG

The German Energy Conservation Regulation EnEV 2014 requires the primary energy demand in new buildings to be 25 percent below the currently valid reference values, starting on January 1, 2016. Intelligent building automation reduces energy consumption much more economically than insulation. One measure that offers a particularly good cost/benefit ratio is a self-learning individual room control system with usage time detection.

KFW REWARDS SELF-LEARNING INDIVIDUAL ROOM CONTROL SYSTEM

The German government-owned development bank KfW has confirmed that it would recognize self-learning individual room control systems that offer presence detection and incorporate user behavior as a criterion for savings potential in its EnEV energy balance assessment for KfW efficiency homes. When performing the balance assessment required by EnEV in accordance with DIN V 18599: 2011-12, the building automation and building management systems can be defined as “Class A” systems according to Part 11. It is also



permitted, according to the KfW's FAQs, to reduce the building's thermal heat demand by five percent across the board in the calculation according to DIN V 4701-10. In a single-family home, optimizing the building services makes it possible to very economically upgrade the “simple” KfW 70 efficiency home to a “Class A” KfW 70 efficiency home solely through intelligent individual room control.

SELF-SUFFICIENT OPERATION PREFERRED

Moreover, an autonomous individual room control can save up to 20 percent of the heating costs through energy-efficiency measures. This also ensures a positive balance on the energy certificate. Using the “en:key” individual room control from Kieback&Peter makes this efficiency measure twice as lucrative. After all, the self-sufficient system also saves maintenance and installation costs, thanks to EnOcean technology.

In the FAQs on the guidelines to the KfW 151, 153 and 430 programs, the development bank indicates that “self-sufficient systems are to be given priority” in selecting self-learning individual room control systems. This includes the mass-market “en:key” system from Kieback&Peter.

www.enkey.de



INTELLIGENT SYSTEM CONTROL FOR HIGHER ENERGY EFFICIENCY

The efficiency of individual devices has been driven to the limits of optimum efficiency in recent years. Energy-efficient LED lamps and condensing boilers are the best examples. Despite all this, how can we further improve building systems?

By Michael Jüdiges, Head of Strategic Management & Building Technologies, iEXERGY GmbH



At first glance, the solution seems to be as easy as it is logical. If the efficiency of individual devices cannot be significantly improved, the interaction between all devices must be coordinated more effectively. Enormous energy savings potential currently lies dormant in intelligent system control, which can also be implemented for the first time in private homes, thanks to cross-vendor home automation solutions such as wibutler.

TEMPERATURE ACCORDING TO ACTUAL DEMANDS

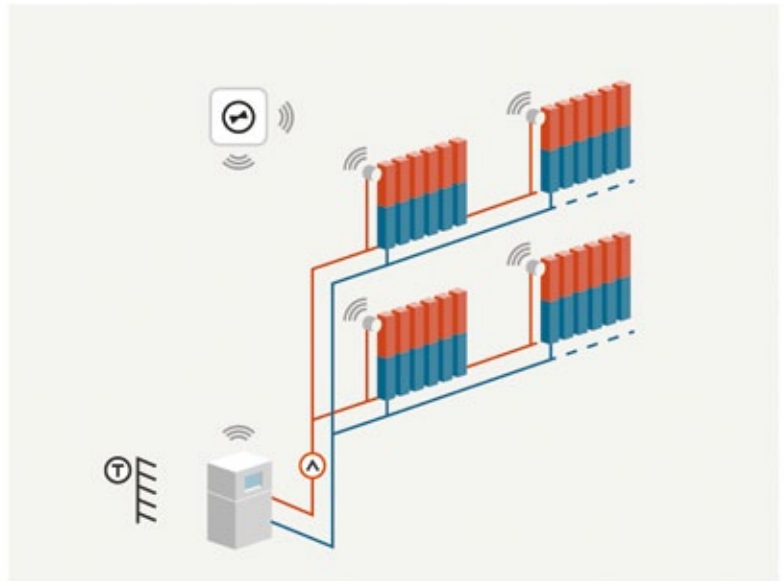
One example is the demand-driven adaptation of inlet temperature. Up to now, the heating water temperature has usually been determined based on the current out-

door temperature, without taking the heat demand of the building and its occupants into account. The heating characteristic, which reflects the ratio between outdoor temperature and heating water temperature, is usually either not set at all or set to the wrong value. As a result, the heat generation is not adjusted to the home occupants or their behavior, the specific building or the different system components.

INTELLIGENT INTERACTION BETWEEN DISCIPLINES

Although a great many intelligent components, such as self-sufficient actuators, are now available, the implementation of intelligent system controls has been made difficult by isolated solutions. Interdisciplinary and

Functional diagram of the flow temperature control according to demand using wibutler.



cross-vendor solutions now also offer the ability to integrate complex components of different manufacturers and disciplines and optimally adapt the interaction between a wide range of devices to the behavior of the building's occupants.

CONTROL STRATEGIES IMPROVE EFFICIENCY

wibutler makes it possible to implement individual room controls and to take into account influences such as the weather or the occupants' daily routines – without the home's residents being aware of it. The actuators determine the demand in the individual rooms, while the wibutler Home Server evaluates the data and automatically turns the heat up if the inlet temperature is too low or turns it down if the inlet temperature is too high. If the

intelligent system control is applied to additional home disciplines, such as shading or lighting, the enormous savings potential offered by this kind of cross-vendor and interdisciplinary solution becomes clear. In the future, the easy implementation of control strategies with the aid of integrated intelligent systems will determine the efficiency of building systems.

wibutler at ISH: Hall 10.3 B69, Hall 9.1 S06, Hall 8 B49, Hall 9.1 B49, Hall 9.1 B/C/D 46

www.wibutler.com
www.iexergy.com



STRONG: THE ALEONHEATING DEVELOPMENT PLATFORM

aleon offers aleonHeating, the development platform based on the Eclipse Smart Home Framework, specifically for companies in the heating, ventilation and air conditioning sectors. aleonHeating forms the ideal foundation for efficient, comfortable and interdisciplinary control functions based on space requirements, including the central heat generator. The smart aleon apps for Android and iOS can be customized with very little effort.

By Michael Conzelmann, Head of Marketing, aleon GmbH

ENOCEAN LIBRARY FOR JAVA AND OSGI

The aleonCean EnOcean library enables components from the EnOcean Alliance, such as valve actuators, sensors and thermostats, to be integrated directly into the Eclipse Smart Home Framework and thus also into the aleonHeating development platform.

Other wireless or wirebound components can also be integrated, thanks to the open Eclipse standard.

The aleonHeating platform has an extensive simulation library that allows complete buildings, heat generators and heat distribution systems to be tested under real-life conditions. "Simulating complex processes makes it

possible to implement series production for our customers smoothly, quickly and, above all, cost-effectively," says aleon CEO Armin Leonhardt.

The aleonPortal provides secure access to the building from appropriate end-customer apps and offers comprehensive measurement and analysis functions, for example for field tests. The aleonTesting system completes the development platform where automated software and system tests are concerned, guaranteeing a high standard of quality.

PLUG & PLAY WITH ALEON

The aleonHeating platform was designed so that customers can provide their applications as plug&play solutions and thus launch the installation on the market without problems through their existing distribution networks.

Small and medium-sized companies in the heating, ventilation and air conditioning sectors will also benefit from aleon GmbH's extensive experience, which enables them to innovatively enhance their products and, at the same time, adapt them to the German Energy Conservation Regulation.

aleonHeating gives companies economical access to new, smart technologies with customized apps, tried-and-tested hardware and low investment costs.



aleonTesting systems maximize software quality in many industrial sectors.

www.aleon.eu





SIMPLY THE BEST – iTRV

The self-powered thermostatic radiator valve from Micropelt, with its thermoelectric generator (TEG) and EnOcean protocol A5-20-1 valve position, facilitates particularly intelligent room temperature control.

By Robert Feldmeier, Sales Manager/Business Development Manager, Micropelt GmbH

The radiator valve produces electrical energy from the difference between the inlet temperature at the radiator and the ambient temperature, using a TEG. During the heating period, the valve produces so much energy each day that an actuation can be carried out every 10 minutes. As a result, the room temperature can be optimally controlled, and heating costs can be reduced by as much as 30 percent.

The iTRV intelligently stores the excess energy collected from the heating period in a lithium accumulator and thereby ensures that the new heating period will start smoothly after the summer months.

As a modern building solution, the actuator operates without cable or batteries and can be installed without a great deal of construction work. The iTRV can play out these advantages in different application scenarios, thereby opening up additional cost savings potential.

The self-powered radiator valve offers individual comfort temperature and reduces the heating costs at the same time.

RENOVATION AND REMODELING

When renovating and remodeling buildings, such as open-plan offices, disruptions of operations should be kept as short and infrequent as possible. With iTRV, installers can replace the old thermostats without interrupting operation. The heating costs in the building can therefore be optimized immediately without impairing office operations or exposing employees to unpleasant dirt and dust.

FLEXIBLE USE OF SPACE

The ability to make flexible use of space is another benefit. For example, if the office or shop layout changes, due to separating, converting or expanding the space, a new user/tenant profile can be created without any mounting work simply by adapting the parameters via EnOcean radio.

The iTRV has been available on the market since February 2015.

www.micropelt.com



APPLES AND ORANGES



It's easy to tell apples and oranges apart. However, different kinds of apples look and also taste entirely differently. One variety is sweeter and another more acidic. Only an individual person can decide what tastes best to him or her. However, everyone needs to know what to expect before biting into the apple.

By Prof. Dr.-Ing. Michael Krödel, Rosenheim University of Applied Sciences

Smart home systems are no different. Although a wide range of technologies and products are now available on the market, no generally applicable, systematic list of requirements characterizing a smart home system yet exists. It is therefore important to quickly and easily record the functionality in order to determine how “smart” a smart home system really is – and whether it is suitable for meeting the requirements of a planned project.

FREE ONLINE TOOL EVALUATES SYSTEMS

A free online tool lets users record the functionality themselves. They conveniently enter the data on a PC at work or using a tablet when out of the office. The tool systematically queries the capabilities of the different disciplines (heating, lighting, shading, etc.). The queries are intentionally based on capabilities and not on technological details.

QUERYING THE CAPABILITIES OF A SMART HOME

The specific capabilities of a smart home system depend to a large extent on the availability of actuators and sensors. Thus it should be possible to quickly determine this availability by consulting a manufacturer's product catalog or by talking to a company representative. It should therefore take less than 15 minutes to record a system.

Many manufacturers do not maintain all types of switch and dimmer actuators in their catalogs. One can thus

quickly get an idea of all the things that cannot be accomplished. Nevertheless, these systems may still be suitable for a project because the requirements are limited. However, such systems are inevitably not as “smart” as those that cover all options.

RECOGNIZING SEAMLESS SOLUTIONS

The tool can be found under “Online-Erfassung” (online recording) at www.igt-institut.de/smarthome/onlineerfassung (in German). When filling out the form, it is a good idea to focus on functioning systems that an end user can purchase from a supplier (either directly from the manufacturer or as a tested overall solution from a system integrator). If required sensors and actuators that are not found in the same catalog but are offered with a note that they can be connected via (tricky) couplings, this can be termed “plug and pray” rather than plug and play. □





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Are you ready for truly open systems?



The era of the Internet of Things (IoT) has arrived – a time when openness and connectivity are vital to realizing operational efficiencies in commercial buildings.

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The Niagara Framework has the power to connect diverse devices and systems in ways that have never been imagined before.

Whether you are designing for an office,

hospital or data centre this truly open platform empowers users to achieve more than they thought possible.

Join us in April 2015 to see the very latest smart, inventive and disruptive building automation technologies that are built on the Niagara Framework. The Forum is about the power of connections and community.

Now is the time to get ready for a new kind of open system that can harness the power of the Internet to create an efficient, productive and usable built environment. Register now at **www.niagaraforum.eu**.



ARCHITECTURAL LANDMARK IMPRESSES WITH BUILDING INTELLIGENCE



Wangjing SOHO in Beijing, designed by the world-renowned architect Zaha Hadid, is the first tall landmark architecture visible en route from the airport into the city, as “the capital’s first impressive landmark.” It is the place of SECO’s new office.

By Marketing Department, Beijing SECO Information Technology Co., Ltd.

The open-plan office on the 15th floor of Area A, Tower 1, Wangjing SOHO, offers 1000 m² of space. SECO’s building automation system is installed to control lighting, HVAC and shading.

when rooms with glass doors, the sensor’s position is critical. An occupancy sensor at the wrong place could turn on/off the light every time someone walks by. Using EnOcean wireless occupancy sensors allows to

A COMPLETE SOLUTION

A total of 18 EnOcean-based switches (double rockers) are used to control curtain motors and an overall 60 loops of lighting. There is a master switch near the reception desk, which can turn off all lighting, HVAC and shading in the working area and meeting rooms. The lighting at the entrance is automatically turned on when EnOcean’s wireless and batteryless occupancy sensor detects people walking in or out, and is turned off by a timer when there is nobody in that area.

23 thermostats are installed for room temperature set point adjustment to create a comfortable working environment. Connected to occupancy sensors and window contacts, an intelligent and energy-efficient control can be realized.

15 four-channel lighting controllers (maximum load of each channel is 2 000 Watt), 2 two-channel blinds controllers, and 4 transceivers are included in the whole project. At the same time, the EnOcean-WiFi Gateway allows all building automation functions to be monitored as well as displayed and operated easily on smart phones or tablets.

EASY INSTALLATION WITHOUT CABLING

An occupancy sensor is one of the most difficult sensors to install in a building as unexpected motions, which are irrelevant for the automated control in the concerned room, might cause problems. Especially

flexibly testing and moving the device to find the best position. In addition, SECO’s EnOcean occupancy sensor can work 21 days in dark after being charged.

Most of the panels in SECO’s new office are made of wood and glass, which make the wiring of traditional switches very complicated and unattractive. EnOcean technology shows great advantage here as well. The installed wireless switches use the energy generated by pushing the switch to send a radio signal to the light, in order to turn it on or off. Due to this energy harvesting approach, the system works wireless and maintenance-free.

The same convenience applies to wireless and batteryless window contacts. SECO’s window contact can operate continually at 50 lux, and it starts to charge when the light intensity is over 50 lux. When fully charged, it can operate for 5 days in the dark.

HIGHLY FLEXIBLE AND SUSTAINABLE

Based on EnOcean technology, SECO’s building automation solution not only helps lower installation costs and time and reduce energy consumption but also brings flexibility to the office space. The system could be adjusted and updated according to practical usage, and it is sustainable over time.

www.secotech.com.cn



A GREEN BUILDING FOR EFFICIENT TEAMWORK



Dynamically composed project teams require flexible workspaces. The multinational Fluor thoroughly implemented this aim when building its new Dutch headquarters. This made the building the ideal candidate for SAUTER integrated room automation and wireless EnOcean technology.

By Reinhard Huber, Room Automation Product Management, SAUTER Head Office

With branches in 81 countries, the Fluor Corporation is one of the world's biggest consultant and construction companies. It has more than 40 000 employees, who work on a highly project-oriented basis in the fields of engineering, procurement, construction and maintenance. When building a new Dutch headquarters in the municipality of Haarlemmermeer, it was therefore crucial that the offices could be easily reconfigured so that the large teams, which are composed on a project-by-project basis, could enjoy the ideal conditions for working together most efficiently. With project experience and expertise in building automation, management systems and room automation, SAUTER played a great part in realising this requirement.

BREEAM CERTIFICATE FOR A SUSTAINABLE CONCEPT

In early 2015, Fluor moved into its new headquarters, which are only ten minutes' drive from Amsterdam's Schiphol airport and offer 20 000 m² of floor space for a staff of around 900. As early as the planning phase, the building was awarded the BREEAM-NL Excellent Design Certificate for its energy-efficient concept. Fluor also intends to have the finished building certified by BREEAM in 2015.

All the functions that are crucial to energy-efficient building operation – room climate, lighting and sunshading – are directly managed by the SAUTER ecos 5 room controllers. In the office rooms, the climate is controlled



big picture: **Energy-efficient and flexible: Fluor's new Dutch headquarters** (@Paul de Ruiter Architects)

left: **Freely positionable: the SAUTER ecoUnit 1 battery-free room operating unit**

using climate ceilings, and in the conference rooms and staff canteen there is also CO₂ level-controlled ventilation to create the ideal room climate.

Most of the office spaces are located on the sunny side of the building, and the facade is shaded to allow as much light in as possible without overheating the rooms or blinding the occupants. This is an important factor for the comfort of the occupants and has a direct effect on productivity. When there is not enough daylight, the room controller regulates the artificial lighting using the DALI protocol. Integrating all room functions in the room controller and using BACnet/IP for all communication in the entire building automation not only guarantees maximum comfort but also maximum energy efficiency.

WIRELESS ROOM OPERATING UNITS FOR MAXIMUM FLEXIBILITY

All room functions can be controlled using the 220 SAUTER ecoUnit 1 room operating units with bidirectional EnOcean communication, temperature sensor and LCD. With no need for wires or batteries, these operating units make a great contribution towards the flexible room concept. Using the SAUTER novaPro Open building management system, the division of rooms can be adapted to the needs of the team at the click of a mouse. The operating units can be easily relocated without any expensive and time-consuming rewiring. This means new floor plans can be instantly created, and individually air-conditioned, shaded and lit.

By using the most state-of-the-art building automation technology, Fluor meets its aim of combining energy efficiency at the new site with a productive and happy workforce.

www.sauter-controls.com





NEW YORK CITY INNOVATION PROGRAM CHOOSES ENOCEAN TECHNOLOGY

The highly flexible, wireless solutions from Illumra help the city to achieve reduced energy consumption at 30 percent by 2017. The Thomas Jefferson Recreation Center and the NYC Department of Sanitation are the first-mover retrofit projects.

By Tom James, Business Development Director North America, EnOcean Alliance

New York City's Office of Sustainability estimates that of the 950 000 buildings in the city today 85 percent will still be standing in 2030. The majority of this aging building stock was constructed before the establishment of energy sensitive building codes; hence these buildings will continue to negatively affect the city's energy utilization profile well into the foreseeable future. To help the city meet its urgent goal of reducing energy consumption and greenhouse gas emissions of 30 percent by 2017, the NYC Department of Citywide Administrative Services (DCAS) created and launched the Innovative Demonstrations for Energy Adaptability (IDEA) program.

A SUSTAINABLE IDEA

The IDEA program seeks to identify new emerging energy technologies and evaluate their potential for

deployment across NYC's larger building portfolio. The initial program focus was on building controls, and in June of 2014, DCAS engaged Building Energy & Sustainable Technologies, Inc. (BEST Energy), a forward-thinking environmental/energy solutions firm, to develop a lighting control solution that could overcome the significant retrofit challenges presented by the majority of NYC buildings built in the last century.

THE BEST CHOICE

BEST Energy designed an occupancy-based lighting control system based on EnOcean's self-powered wireless technology. The EnOcean technology made it easy to layer and integrate controls without costly, time consuming construction efforts. In addition, the large ecosystem of EnOcean products allowed BEST to specify the top products from different manufacturers that

easily interoperate. The system was already realized in the two following historical buildings, ideally meeting their specific requirements:

THOMAS JEFFERSON RECREATION CENTER

The Thomas Jefferson Play Center opened in the summer of 1936. As a NYC historical building, it was constructed with WPA funding following the Great Depression. The facility utilized low-cost building materials such as brick and cast concrete, and employed the curvilinear architecture of the 1930's Art Modern style. Most public areas had no local light switches, which meant occupants had to use circuit breakers for basic on-off control. Furthermore, the concrete masonry demising walls and plaster ceilings made conventional retrofit wiring strategies extremely difficult or impossible.

The Rec Center project utilized Illumra EnOcean-based relays to convert the circuit breakers from manual on/off operation to automatic, occupancy-based lighting control throughout the building. In some areas, Illumra relays were inserted into lighting fixtures to reconfigure the lighting circuits and deliver more granular control than what was originally designed almost 80 years ago.

NYC DEPARTMENT OF SANITATION

The NYC Department of Sanitation's early 1900's office building had been reconfigured many times over the years to suit the changing human resource needs of the agency. It did have local lighting switches for manual control; however, the original lighting circuits did not match the current floor plan usage throughout the twelve-story building. Moreover, the z-spline ceiling

prevented access to the ceiling plenum so that conventional rewiring strategies would be near impossible and cost prohibitive.

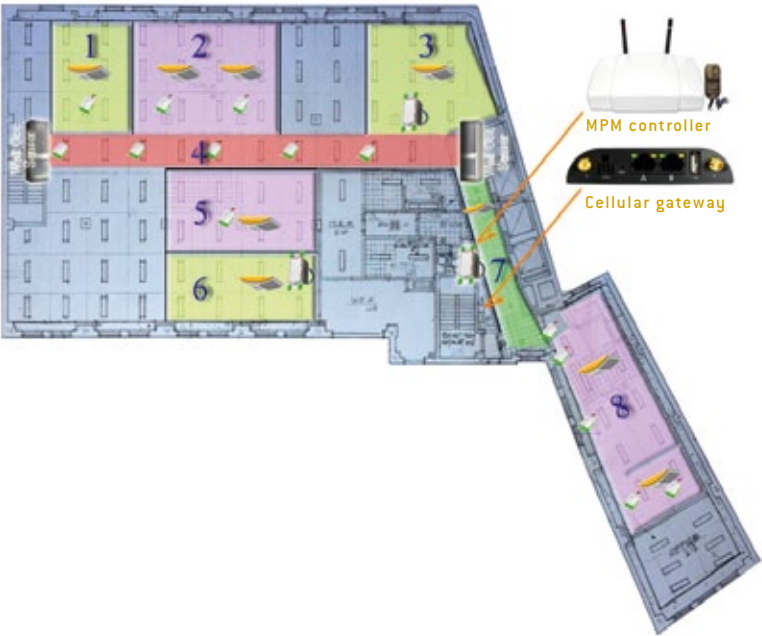
The Dept. of Sanitation lighting control project utilized wireless switch receiver from Leviton in combination with Illumra's wireless wall and ceiling occupancy sensors. The Leviton wireless switch replaced the conventional single-pole wall switches. After pairing the wall switch with the self-powered occupancy sensors, the wall switch automatically shuts off lights when the room is vacant. Conversely, the wall switch will automatically activate the lights upon occupancy detection when in auto-on mode.

SAVINGS UNDER CONTROL

Both projects utilized Schneider Electric's unique MPM controller solution to network the various EnOcean devices and give the City agencies the ability to trend, and deliver measurement and verification to DCAS. The MPM also allows the EnOcean devices to be connected to the City's larger BACnet-based building management system (BMS) if desired.

In time, DCAS will share the successful results of these projects with its 80 sister agencies to advance larger-scale deployments city wide. The hope is that these wireless technologies will hasten New York's broader carbon reduction goals and transform their 19th century buildings into 21st century buildings.

www.illumra.com





SMART HOME SQUARED

LIXIL Corporation, the global leader in housing and building materials, products and services, has realized a research project named "U²-Home", which allows visitors to experience a real life smart home.

By Midori Ogura, Department for Public Relations, LIXIL Corporation



The project aims to develop the ideal connected home that meets the needs of different generations. Energy harvesting wireless sensors and switches are the system's core elements providing the data required for security, safety, energy savings as well as comfort and connectivity functions.

HELP IN ANY CASE

Self-powered sensors, distributed in and outside the house, monitor the presence of people and alert the tenants via smart phone if a door or window was left open. If an unauthorized person tries to access the house, the shutters close automatically while the system triggers an audiovisual alarm.

Elderly people can activate a panic button in the toilet room when they need help. In addition, the system recognizes if there was too less movements in the house, or somebody sits on the toilet for a remarkable long time. In the case that the tenant doesn't respond to the system request, the house robot will send an alarm notification to call for help.



INTERCONNECTED INTELLIGENCE

For comfort and energy-saving purposes, the heating and air conditioning system is automatically adapted to the actual weather as well as to the temperature and air quality in the house. In addition, a smart ventilation system calculates wind direction and weather data in real time to intelligently control the opening of the windows for optimized room temperature and ventilation conditions without using the air conditioning unit. A self-powered current clamp monitors the energy consumption of devices to show additional saving potential.

LIXIL's smart home research project consists of several demo houses. The houses are connected to each other via gateways and can therefore exchange data in real time. This allows the tenants of one house to monitor, for example, whether their parents in the other house are doing well or need help.

<http://global.lixil.co.jp>





CHINESE TRADITION MEETS MODERN TECHNOLOGY



COURS-ET-PAVILLONS in downtown Beijing, is a small boutique hotel, offering extraordinary housekeeping style service in traditional Chinese architecture with sophisticated facilities. The hotel is equipped with room control system from Volksen, to realize highest comfort and energy efficiency.

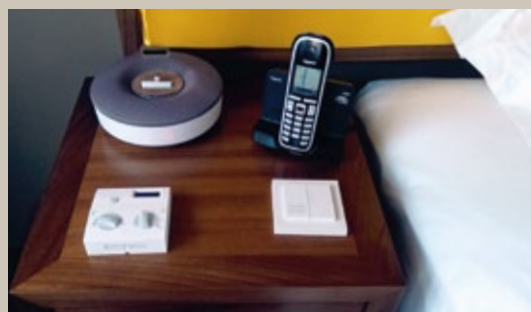
By Marketing Department, Volksen Technology Co., Ltd.

COURS-ET-PAVILLONS Hotel is located at No. 26 Weijia Hutong, Dongcheng District, which is best known for the cultural experience in this 700-year old neighborhood where there are still traditional Hutong homes. Set among urban sophistication and history, COURS-ET-PAVILLONS Hotel, a tranquil sanctuary within strolling distance to the formidable Forbidden City, is housed in the lovingly restored and artfully renovated SiHeYuan (traditional Beijing Hutong Villa) with a garden courtyard. The hotel's interior design reflects a blend of traditions with modern spirit of the time.

INSTALLATION WITHOUT DAMAGE OR MESS

As the hotel was retrofitted from a SiHeYuan with most of the structures made of wood, concerns were raised about damage to the wood and mess caused by wiring. However, EnOcean switches and thermostats gave the hotel the best way to solve the problem as they require no wiring or batteries and work maintenance-free.

The system combines MODBUS actuator units and EnOcean gateways which are modularly installed. EnOcean wireless switches and thermostats are placed on one side of the bed to control lighting and air-conditioning in the room. For each room, one batteryless wireless master switch is installed on one side of the



bed to control all the lighting (in the room, bathroom and Mini-Bar). After the "central-off" switch has been used, light can be turned on via any button of the switch.

OUTSTANDING ENERGY EFFICIENCY AND COMFORT

Thanks to the intelligent room control system from Volksen, more than 30 per cent of air-conditioning energy is saved, and there is over 40 per cent energy saving on lighting. At the same time, the system provides an outstanding guest experience in this historical hotel, combining maximum comfort with most advanced building automation.

www.volksen.com



FURNISHING A HOME IN STYLE: ULTRAMODERN CEILING CANOPIES

Simple and effective ceilings equipped with LED lights add a special ambiance to any room.

By Ina Trautmann, Marketing Director, JÄGER DIREKT

"Cocooning" is in vogue again, with consumers investing a great deal of time and creativity in furnishing their own four walls – as comfortable islands that invite the whole family to relax. While homeowners select furniture, carpets, wall colors and more with care, they often neglect to create a homey light atmosphere. Special effects can be achieved with relatively simple materials, which electrical installation firms successfully offer to end consumers. A prime example is a design object for ceilings, implemented with the VitalCONTOUR system solution.



BENEFITS AND DECORATION

LED drywall profiles are true jacks of all trades, implementing a wide range of solutions and simultaneously acting as decorative elements in home environments as well as in offices, shops, foyers and other commercial buildings. The planners and installers with LED Profilelement GmbH from Mühlhausen, Germany, thus faced a challenging task. They were to develop a solution for a private residence which would not only improve the lighting in the living room but simultaneously serve as an eye-catching design element in its own right.

As a result, LED Profilelement GmbH's planners and installers combined LED drywall profiles and LED stripes into what is literally a unique design object for a private residence. The installers integrated both the direct and indirect lighting into a suspended ceiling canopy made of drywall elements, which measures 180 cm x 280 cm. The element thus creates a wide range of lighting moods and also draws the eye with its rectilinear, trendy design.

EASY INSTALLATION

As a significant benefit to installation, the LED stripes



from InnoGreen®, with their comfortable white light, have magnetic backs that allow them to be installed especially quickly and easily. The LED stripes, which are available in seven different lengths (5 cm–500 cm), can thus be easily inserted into the profile and finely adjusted as needed. Thanks to the ingenious plug connections, the stripes can be mounted without soldering. Due to the LEDs' lifespan of approximately 30 000 hours, combined with a two-year warranty, the homeowner also gets an energy-efficient and long-lasting lighting solution.

INTELLIGENT NETWORKING

Combined with OPUS® greenNet, the solution opens up a wide range of individual control options. The freely positionable, energy harvesting EnOcean wireless switches enable the homeowner to turn the system solution lights on and off or dim them according to his personal preferences. Another benefit is that OPUS® greenNet makes it possible to integrate the VitalCONTOUR system solution directly into the intelligent home control system, including visualization and intuitive operation, for example from an iPad®.

A WIDE RANGE OF VARIANTS

In addition to the floating effect created by the suspended ceiling, the LED stripes can also be used in many other applications, in new buildings as well as in simple upgrades. For example, the so-called "Pantoffel" (slipper) light is especially popular and easy for electrical retailers to market to end consumers. In this case, the profile is installed low down as a wall finishing strip in order to provide orientation lighting on hallway floors.

www.OPUSgreen.Net



Innovative Building Automation

L-ENO Interface – EnOcean Integration made easy

- Supports all common EnOcean Profiles (EEPs)
- Web UI for teach-in, signal strength, and value test
- Support of multi-channel EnOcean devices
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 **LOYTEC**

HARNESS THE POWER OF BIG DATA

The magnitude of intelligent devices and Internet technologies now installed in our buildings has created a proliferation of data. Such is the increase in volume, velocity and variety of data produced that Big Data is becoming the new frontier in building energy management. The flood of information produced by today's building management systems can be the power behind usable and actionable information that saves energy and money.

By Roger Woodward, Vice President and Managing Director EMEA, Tridium Europe Ltd.

Buildings and their components such as lighting, chillers and air handling units now have the capability, through sophisticated building energy management systems (BEMS), to produce information on energy consumption, performance and maintenance. Today's building manager is presented with a host of facts and figures about the performance of every facet of the space he or she oversees. By its very definition, Big Data is too large and complex to manipulate or interrogate with standard methods or tools. A recent study in the US by Forrester Research concluded that most companies are analyzing just 12 per cent of the data at their disposal.

DATA FOR OPTIMIZED BUILDING OPERATIONS

But there is a growing recognition by building owners that data on energy use should be treated as business-critical information. Large amounts of information now flowing into the energy management field are set to give building owners and operators in-depth knowledge about building performance and the power to optimize it.

BRIDGE BETWEEN ENERGY MANAGEMENT AND IT

One hurdle to overcome is the challenge of linking together disparate systems from different manufacturers. Different sectors of the building services industry use different protocols, or even proprietary communica-

tions protocols, so there can be difficulty in pulling these strands together to achieve fruitful analysis of Big Data.

Solutions such as Tridium's Niagara Framework offer an IT solution for the BEMS industry that makes the task of gathering data

from pulse or smart meters and across numerous protocols much more straightforward. Reaching across all common platforms, open and proprietary, Niagara forms a bridge between energy data and the end-user. This is truly where BEMS and IT are crossing paths successfully to bring data that was once lodged firmly in the plant room to web-based tools with simple user interfaces.

POSSIBILITIES OF DATA ANALYZES

The benefits to the business of this ability to collate and use data become clear. Each lighting fixture in a building may have within it at least 40 data and command points.





This presents a host of opportunities for data analysis that previously may not have existed and affords the building manager a level of control that can mean faster energy monitoring and reduced response times to changes that need to be made.

Similarly, in a project whereby environmental control is a critical issue, such as in data centers, a monitoring framework is required, which can oversee the performance of chillers, air handling units and identify where server racks are beginning to rise or fall outside the optimal conditions. It must then send that information directly to the BEMS to act on it. This is not only a tool that provides a safeguard against downtime issues, but also shows the route to a higher level of energy efficiency.

EFFICIENCY FOR SUCCESS

Such advantages are helping the industry to acknowledge Big Data not as a reservoir of unfathomable information but more as an asset to the bottom line. All it takes is the right tool to harness it. Not only can Big Data identify energy savings, it can also help to introduce efficiencies across the business as a whole.

www.tridiumEurope.com



ALTECON

Altecon Interfaces and Controllers for HVAC and Lighting
IP Controllers with embedded Web Server
Standard EnOcean Thermostats and/or Temperature Probes
are used to control HVAC

Split IR Interface
SH320AC
Suitable for any brands



Fan Coil Interface
SH324AC
3 Speeds 1 or 2 Valves
Fan Coil Inverter Interface
SH323AC
0-10V speed control, 1 or 2 Valves



Radiator Interface Fil Pilote
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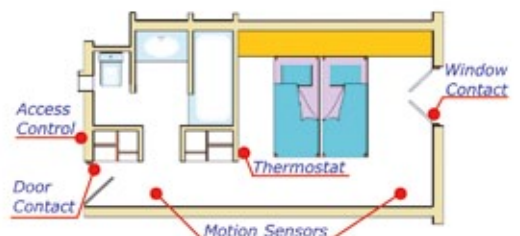
Altecon Controllers, with EnOcean Technology and Web Server, manage also Thermostats, Motion Sensors, Windows and Doors Contact and Access Controls to perform complete solutions of Building Automation in Hotels, Offices and Homes.

HVAC and Lights in Office Automation



An employee, by his own PC Browser, is able to interact With Controller to change temperature and lights.
No HW or SW are needed, only an Altecon Controller and a Temperature Probe.

HVAC, Lights and Access Control in Hotel Automation



Choosing EnOcean devices and Altecon Controllers, retrofitting Hotel Rooms is efficient and cost-effective.
From 30' to 2 hours are enough to update a room.
Central supervision is easy with Altecon Gateway from EnOcean to Wi-Fi.

ISH 2015 Hall 10.3 B69

ALTECON SRL Vimercate (ITALY)
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sales@altecon.it www.altecon.eu

AIRCONFIG – WIRELESS ENOCEAN CONFIGURATION

Almost one year after the successful launch of the universal field strength test tool airScan, Thermokon presents its new remote commissioning tool airConfig on the occasion of ISH 2015. Remote commissioning means the parameterization of devices in a network without direct interaction, for example, of inaccessible devices.

By Frank Neudecker, Export Manager, Thermokon Sensortechnik GmbH

airConfig is based on the EnOcean RF technology for parameterizing the devices by special remote commissioning commands. Therefore, either the EnOcean transceiver USB 300 or the airScan USB transceiver is needed.

EASY FUNCTION

First, the user selects the product type to be parameterized in airConfig. AirConfig sends an inquiry "Who is," to which all devices of this type answer with their corresponding EnOcean ID ("I am"). Thanks to this mechanism, Thermokon ensures that all devices can be clearly identified, even in projects with some hundreds of products. After all devices have replied, the user selects the corresponding product for communication.

Finally, the parameters are wirelessly transmitted to the requested device. airConfig supports the bulk configuration by which the same setting is transmitted to different devices. The configuration of the flush-mounting actuators, valve actuators or the new bi-directional BACnet IP Gateway is similar.

NEW POSSIBILITIES FOR SENSORS

Also for sensors, airConfig offers new possibilities. As for the successor model of the light and motion sensor SR-MDS Solar the EEP can be changed to assure the compatibility to the receiver. The sensor can be used as a pure light sensor, as a motion sensor or as a combined light and motion sensor. Both, EEP with 8-bit resolution of the light value as well as the new 10-bit resolu-

tion are supported. The integrated LED can be activated remotely in order to start a walk test.

airConfig saves the settings of all devices internally and enables them to be saved to a project file. In case a device fails over time, the settings from the project file, including the allocated sensors and the EnOcean ID, can be reloaded in the replacement device.

COMFORTABLE SUPPORT

Even service and support in the EnOcean network can be easily realized via airConfig – either in the project on-site or from the office or from home by remote control. All system information is transparent and centralized, without the devices having passed into the network.

All advantages of the EasySens series can be tested free of charge in the download center under:

www.thermokon.de/en



ENOCEAN ENABLES UNFORSEEN FLEXIBILITY IN FINNISH HOUSING PRODUCTION



EKE is building an apartment building for the 2015 Finnish housing fair, which utilizes EnOcean technology and EKE's own home automation system.

By Jorma Zielinski, Director, EKE Home Automation Business Unit

The building is a modern interpretation of open building principles thus offering its residents flexibility in layout planning and modern technology to monitor and control the building systems. Furthermore, the apartments are handed over to the customers with plain, unfinished surfaces and no kitchen furniture allowing more individual homes than the standard housing production.

FLEXIBLE ARRANGEMENT

The building is equipped with floor heating and forced ventilation, each apartment having its own energy-efficient AHU. The residents can adapt the layouts of the apartments, and the wireless EnOcean technology enables easy-to-install and flexible implementation of the lighting, ventilation and room temperature control.

The EnOcean sensors and actuators are integrated into the Smarthome by EKE home automation system.

"Smarthome technology introduced true flexibility in EKE's Loft apartments, as the residents now can change the number of rooms according to their living situation, and the electrical and HVAC systems allow this without extensive re-cabling, as was the case earlier. Also from this aspect EKE Loft exceeds what our competitors are currently offering in Finland," said Tea Ekengren-Saurén, CEO of EKE-Construction Ltd.

www.eke.fi/loft
smarthome.eke.com
www.asuntomessut.fi/en



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- Switch actuator in DIN-rail mountable enclosure for individual application in distribution/switch cabinets
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ENOCEAN CONTROLLERS WITH EMBEDDED WEB SERVER MAKE RETROFITS EASY

In hotels and offices, the necessity to operate quickly with minimum interruption in services is an essential factor. EnOcean devices such as occupancy sensors, temperature sensors, actuators, etc. managed by EnOcean controllers with embedded web server not only are quick to install but also realize local and central control.

By Piergabriele Cabrini, General Manager, ALTECON SRL

Reference projects prove that the time required for retrofitting a hotel room with EnOcean technology ranges between half an hour and two hours, meaning that the room will be available the same day. An additional major request in retrofit project is the visualization of controlled rooms or offices; this is useful to program operation modes and temperature set-points as well as to control energy consumption, comfort and warnings.

WEB-BASED CONTROL

The ALTECON SH024WS-EO web server allows users to control temperature and lights via their own PC. The screen visualizes switching on/off and dimming lights; a virtual thermostat allows for changing set-point and speeds. The virtual thermostat can operate like a real one but it only needs a low-cost temperature sensor. In a hotel room, the guest is authorized to directly control lights and temperature via the web server. When the guest leaves the room, all lights will be switched off and the temperature set-points changed to energy-saving mode.

HVAC CONTROL

The ALTECON SH324 fan coil controller connects fan coils that need three outputs for speeds and one or two outputs for valves; a 0-10V output is available for the inverter type. Two analog inputs for probes measure the ambience temperature (to perform the thermostat function) and pipe temperature (to recognize warming or cooling). Splits are normally controlled by an IR remote control. The ALTECON SH320AC-R EnOcean Split con-



troller sends IR commands to the split. That way, the original remote control is substituted for another one that sends commands to the central controller that will repeat, if permitted, to the split.

LIGHTING CONTROL

The EnOcean controller is able to control the switching of lights depending on the actual need. In hotel rooms, lighting is only switched on if people are detected. The same functionality applies for an office scenario: the lighting is switched and dimmed depending on the presence of people. The advanced ALTECON SH445 and SH445LMRP controllers can detect people, measure light levels and control switch mode and/or dimming.

The SH445 slave is equipped with two 0-10V outputs, one 230V/3A power output (hybrid relay: static and electromechanical), one input line to verify if the controlled lights operate properly, one interface to EnOcean that receives commands from light sensors or the SH445LMRP controller. The SH445LMRP (master) is also equipped with a luxmeter and motion sensor to detect people and/or vehicles.

www.altecon.eu



INTELLIGENT MAINS LOADS CONTROL

Pressac Communications is continuing to develop the Pressac Sensing range and bring innovation to the Building Management Systems market – providing tools to help facilitate improved energy performance in buildings, leading to reduced running costs. The latest product addition to the Pressac Sensing portfolio is the Intelligent Relay.

By Caroline Smith, Marketing Manager, Pressac Communications

The Pressac Sensing Intelligent Relay is a universal, programmable single channel wireless device, capable of sensing and switching mains loads – enabling users to integrate with existing lighting products using its mains switching and detection facility. Fully EnOcean compliant, it will interact with standard devices such as window contacts and wireless switches. The product's unique mains sensing feature enables further integration with existing wired systems and installations.

EFFICIENT ENERGY MANAGEMENT

The Relay facilitates the straightforward control of plant equipment, appliances, lighting and HVAC systems – enabling efficient energy management of facilities, and cost control. During the next phase of product development, the Relay will enable integration with further devices such as PIRs and key cards, and will facilitate remote programming to create and modify functions within buildings – via a logic engine.

www.pressac.com



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- Radio receiver integrated into the WAGO-I/O-SYSTEM for building and industrial automation applications
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- Universal receiver 750-642 for all battery-free and wireless EnOcean radio sensors

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INTEGRATION OF ENOCEAN IN KNX

With the KNX/EnOcean Gateway, ABB enables a complete and natural integration of EnOcean devices into KNX control systems and vice versa.

By Torben Rösel, Junior Product Manager Building Control, ABB STOTZ-KONTAKT GmbH

Batteryless wireless sensors offer high flexibility for intelligent building control. Working without wires and batteries, they can be placed everywhere in the building and don't require any maintenance. Installers can now integrate self-powered wireless sensors in a KNX system using the new ABB KNX/EnOcean Gateway (supports 868 MHz for Europe). That way, they combine flexible wireless solutions with the established bus system.

BIDIRECTIONAL COMMUNICATION ON 32 CHANNELS

The gateway offers bidirectional transmissions of signals and telegrams and supports up to 253 KNX communication objects. All together, 32 simultaneous channels or device nodes are available for the internal OR-interconnection of up to five devices each. The product's reduced dimensions allow a quick and easy installation without the need of an external power supply. The gateway is supplied through the KNX bus solely.

INTEGRATED EASY INSTALLATION

Installers can use the ABB solution to integrate EnOcean-based gateways for air conditioning, light actuators or batteryless devices such as window contacts or room controllers via several interfaces. For this, a strong ETS plugin with no need of any external software is available.

A new version of the device catalog (supported EnOcean Equipment Profiles EEP) can easily be processed through an update of the catalog file.

EYE ON STATUS AND SIGNAL

The gateway's internal LCD eases the setup of EnOcean devices. In addition, the LCD shows and monitors quality signal reception and functionalities of the batteryless devices. A special feature of the KNX/EnOcean Gateway is the integration in the ABB i-bus Tool for diagnosis and commissioning support. Via the i-bus Tool, the received EnOcean telegrams' signal strength can be visualized and analyzed to determine whether the data sent from the EnOcean devices reach the gateway with a sufficient signal power. There is no need for an additional field intensity meter. Multiple objects for control and status (bit, byte, characters) with KNX standard data point types are available.

www.abb.com/knx



DYE-SENSITIZED SOLAR CELLS FOR ENERGY HARVESTING APPLICATIONS

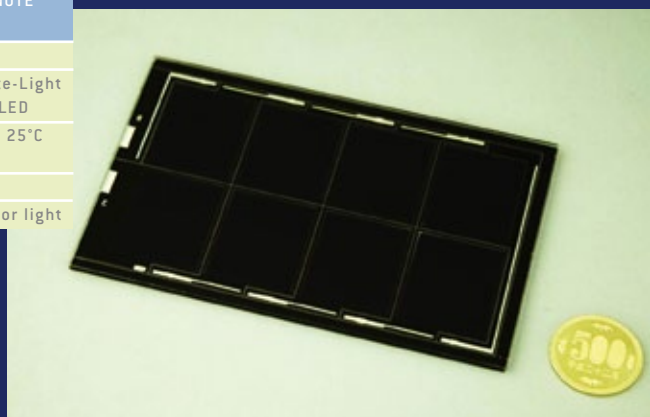
Fujikura has developed high-performance dye-sensitized solar cell (DSC) modules for indoor use and started to supply test samples for customers.

By Hiroshi Matsui, Group Manager Environment and Energy Laboratory, Fujikura Ltd.

ITEM	FDSC - FSC1 (4 series-connected type)	FDSC - FSC3 (8 series-connected type)	NOTE
Size	91 x 56 [cm ²]	130 x 84 [cm ²]	
Maximum Power [P _{max}]	140 W [min], 170 W [typ]	340 W [min], 385 W [typ]	White-Light LED
Operation Voltage [V _{ope}]	1.5 V [min] 1	3.0 V [min]	Ta 25°C
Operation Temperature	from -30°C to +50°C		
Illumination	less than 100 lux		Indoor light

Due to its unique characteristics, the DSC's energy conversion efficiency does not decrease very much at high incident angles of light and does not decrease or rather increase under low light conditions such as a shady spot and an indoor place. The Fujikura DSC sample module provides higher power output compared to conventional a-Si solar cells under indoor light conditions.

The module can be stably used in a dim environment such as a warehouse with low light intensity of less than 100 lux, but also in a bright environment such as an



ordinary office and a show room. The module can be used as a power source for a temperature and humidity sensor, a motion sensor, a CO₂ sensor and other devices.

www.fujikura.co.jp/eng/



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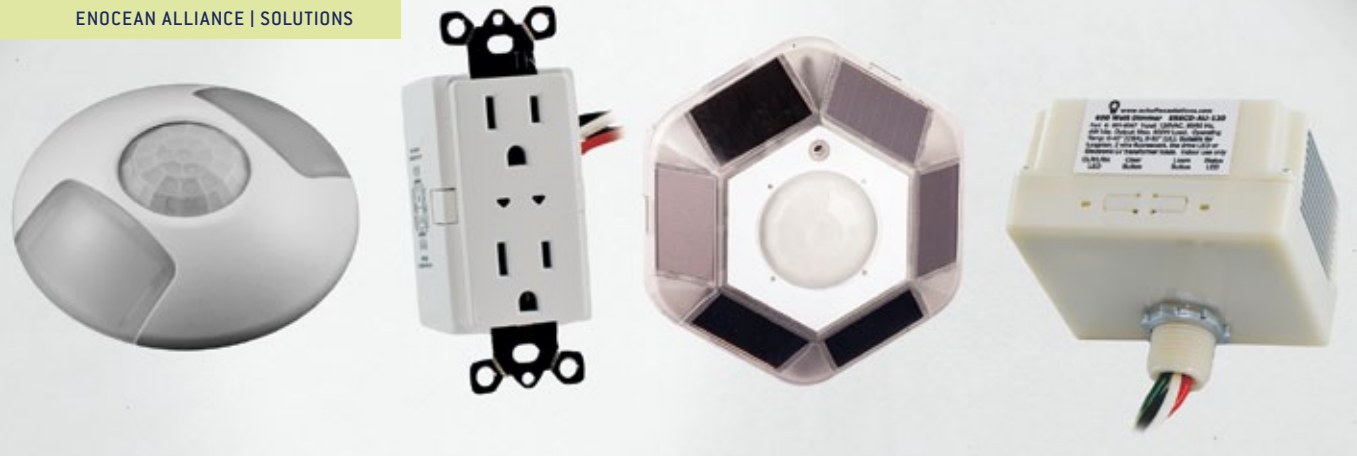
- Switch actuator in WISTA® connector system for fast, pluggable and cost-saving electrical installations
- Universal receiver for all battery-free and wireless EnOcean radio switches (PTM)
- Available as 4-channel light control 770-629/101-000 or 2-channel sunblind control 770-629/102-000

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FOUR IN ONE GO

Echoflex introduces four new products for intelligent building control to the market.

By Shawn Pedersen, President, Echoflex Solutions Inc.

ECHOFLEX RVS – VACANCY SENSOR

The Echoflex RVS is a solar-powered, passive infrared, wireless vacancy sensor. Combining a sleek, non-intrusive design with advanced power management circuitry to minimize solar harvesting requirements, the RVS will operate in low light conditions within 2 minutes at 65 lux or 6 foot-candles. The sensor also supports auto-on occupancy sensor applications for up to 10 years with the addition of a single battery.

The RVS is a key component in Echoflex's Smart Space Solutions with support for range confirmation and remote management features for easy project commissioning.

ECHOFLEX MOS-21C – HIGH BAY PIR SENSOR

The MOS-21C is the newest addition to our award winning MOS series of occupancy sensors. The sensor is powered using solar energy harvesting and comes equipped with a backup battery to accommodate low light conditions often found in high bay applications. The sensor provides 360 degrees of motion coverage and is optimized for ceiling heights of 40 feet or less. The wireless MOS sensor provides a quick installation solution for occupancy detection for warehouse and factory applications.

ECHOFLEX ERNR – WIRELESS PLUG LOAD CONTROLLER

The Echoflex ERNR split receptacle load controller has one 15A switched outlet and one constant voltage outlet. An auxiliary output allows other standard 120 VAC receptacles to be controlled by the internal relay minimizing the number of control devices needed for each space. The ERNR operates with the complete line of Echoflex wireless switches and sensors. The ERNR is compatible with Echoflex's many commissioning systems including Smart Click, Simple Tap and Garibaldi remote commissioning software.

ECHOFLEX ER6CD – 600 WATT PHASE ADAPTIVE DIMMER

The ER6CD is a wireless, phase adaptive, line voltage lighting controller that delivers 120 or 277 VAC dimming. Automatically providing reverse or forward phase dimming to tungsten, two-wire fluorescent, dimmable LED and electronic low-voltage transformer loads, the ER6CD makes upgrading to wireless effortless. The ER6CD is compatible with Echoflex's many commissioning systems, including Smart Click, Simple Tap and Garibaldi remote commissioning software, and is a key component in Echoflex's Smart Space Solutions.

www.echoflexsolutions.com



HOUM.IO: FUTURE OF LIGHTING CONTROL

Houm.io is an innovative lighting control system that works with new smart LED lights, traditional light sources and interfaces with existing bus systems. Integrating EnOcean-based switches and sensors, it enables a new level of lighting and control.

By Timo Lukumaa, CEO, Houm.io

Houm.io is all about lighting. The app was designed with interior and lighting designers and is very simple and intuitive. Adding lights, scenes and schedules is a piece of cake – something anyone can do. Designers can now focus on creating perfect lighting scenes.

HIGH USABILITY LEVEL

The Houm.io app runs on any device. Together with EnOcean switches and sensors, which can be placed anywhere and work maintenance-free, it offers a new level of usability. Combined with smart LEDs, the control solution is great for retrofit projects and significantly saves wiring and installation costs. Houm.io Pro adds DALI, DMX and KNX support and is suitable for centralized DIN-rail installations. The user can flexibly change scenes, switches and schedules in accordance with his needs.

Houm.io had a rocket start with over 150 installations, ranging from homes to restaurants and offices. Houm.io is a Finnish design and software company and is looking for international partners and suppliers of quality hardware.

<http://houm.io>



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The best combination of technology and design.

Best readability

- Clear LCD display can be viewed from different angles

Great performance

- 5 days' reserve operation during darkness thanks to intelligent energy management and large buffer memory
- Optimised for low ambient light thanks to large solar cell

Optimal flexibility

- Free positioning thanks to EnOcean wireless technology
- Suitable for many different frame and design ranges



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ALL BUILDING BLOCKS FOR WIRELESS LED CONTROL

For the North American market, EnOcean offers a new comprehensive LED control portfolio based on the widely adopted energy harvesting wireless standard, including transceiver module, LED controllers, accessories and commissioning tool.

By Matthias Kassner, Product Marketing Director, EnOcean GmbH



EnOcean enables OEM customers to bring comprehensive LED control to the market quickly, cost effectively and based on one of the most widely adopted wireless standards in commercial lighting control. For this purpose, the leading provider of energy harvesting wireless solutions has introduced a complete LED control portfolio onto the North American market consisting of:

- LED controller family: the transceiver module (TCM 330U) for integration into drivers and modules as well as LED Fixture/Zone Controllers with relay and 0-10V output (LEDR), and without relay (LEDD).
- Comprehensive application firmware enabling dimming, occupancy, daylighting and Title 24-compliant controls right out of the box.
- Navegan, an easy-to-use commissioning tool to link devices and setup parameters over the air from a graphical user interface (GUI).
- EnOcean's established line of white label self-powered wireless switches, occupancy and light level sensors.

FASTER TIME TO LED MARKET

With this offering, EnOcean's OEM customers benefit from significantly shorter development timelines, reduced investment, enabling them to focus on the quickly evolving LED market opportunities. Employing EnOcean modules, OEMs can develop products on their own; leveraging established LED control applica-

tions. Those OEMs seeking a ready to use solution can employ finished products to speed time to market and reduce development effort.

WIRELESS CONTROL AND DAYLIGHT HARVESTING

The new LEDR/LEDD uses wireless technology to communicate at 902 MHz with other self-powered EnOcean-based products. It provides a simple solution for dimming control of a single or a zone of multiple daisy-chained LED fixtures. In addition, it supports daylight harvesting scenarios, occupancy control and manual dimming by processing data from EnOcean-based self-powered wireless occupancy sensors, light level sensors and switches. The compact size enables flexible installation inside or next to electrical boxes and fixtures so it can be easily wired out of sight using standard wiring practices. In addition, users can connect the LED controller to a central controller or a gateway to integrate lighting control into building automation systems.

EASY REMOTE CONFIGURATION

For LED lighting commissioning, EnOcean offers the easy-to-use wireless Navegan remote commissioning tool. Using Navegan, installers can easily and centrally configure the controller and the accessories and adapt lighting control to on-site requirements.

www.enocean.com



ENOCEAN-PRODUCTS

MODULES ARE AVAILABLE FOR 868, 902 AND 928 MHZ




Modules with 868 MHz frequency are suitable for Europe and other countries adopting the R&TTE specification.
Modules with 902 MHz frequency are suitable for North America adopting the FCC/IC-specification.
Modules with 928 MHz frequency are suitable for Japan adopting ARIB specification.



ENERGY HARVESTING WIRELESS SENSOR MODULES

<div><div>868 MHz</div><div>902 MHz</div><div>928 MHz</div></div> <div></div> <div><p>PTM 210/PTM 215 (868 MHz) PTM 210U (902 MHz) PTM 210J (928 MHz)</p><p>Ideal for energy harvesting wireless switches. The PTM 215 variant contains also rolling code functionality</p></div>	<div><div>868 MHz</div><div>902 MHz</div><div>928 MHz</div></div> <div></div> <div><p>ECO 200 & PTM 330/PTM 335 (868 MHz) ECO 200 & PTM 430J (928 MHz)</p><p>The perfect combination for unique switch applications. The PTM 335 variant also contains advanced security functionality</p></div>	<div><div>868 MHz</div><div>902 MHz</div><div>928 MHz</div></div> <div></div> <div><p>STM 300 STM 400J (928 MHz)</p><p>Ideal for bidirectional energy harvesting wireless sensors and innovative actuators</p></div>	
<div><div>868 MHz</div></div> <div></div> <div><p>STM 312</p><p>Energy harvesting wireless sensor module – with whip antenna but without solar cell</p></div>	<div><div>868 MHz</div><div>902 MHz</div><div>928 MHz</div></div> <div></div> <div><p>STM 329 (868 MHz) STM 320U (902 MHz) STM 429J (928 MHz)</p><p>Energy harvesting magnet contact transmitter module with helical antenna. The STM 329 variant also contains advanced security functionality</p></div>	<div><div>868 MHz</div><div>902 MHz</div></div> <div></div> <div><p>STM 330 STM 332U (902 MHz)</p><p>Energy harvesting wireless temperature sensor module with solar cell and whip antenna. The STM 330 variant also contains advanced security functionality</p></div>	<div><div>868 MHz</div><div>902 MHz</div><div>928 MHz</div></div> <div></div> <div><p>STM 331 (868 MHz) STM 333U (902 MHz) STM 431J (928 MHz)</p><p>Energy harvesting wireless temperature sensor module with solar cell and helical antenna. STM 331 variant also contains advanced security functionality</p></div>

ENERGY CONVERTERS

 <p>ECO 200 Mechanical Harvests linear motion for use in wireless switches</p>	 <p>ECS 300/ ECS 310 Solar Harvests indoor light for energy harvesting wireless sensors and actuators</p>	 <p>ECT 310 Thermo-electric Harvests temperature differentials for energy harvesting</p>
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WIRELESS TRANSCIVER MODULES

<p>868 MHz 902 MHz 928 MHz</p>  <p>TCM 300 Transceiver module for programmable system components</p>	<p>868 MHz 902 MHz</p>  <p>TCM 320 Transceiver module for programmable system components</p>
<p>TCM 310 (868 MHz)/TCM 310U (902 MHz) TCM 410J (928 MHz) Transceiver module for gateways</p>	

ENOCEAN SOFTWARE



EnOcean Link

Linux-based library for EnOcean radio stack (e.g. ESP3, EEP)



EnOcean Decoding Gateway

TCM 300-compatible firmware for decoding of EnOcean telegram with rolling code

DEVELOPMENT TOOLS



DolphinAPI

For fast and simple development of custom specific applications (in "C")



DolphinStudio

For simple configuration and flash programming of Dolphin modules



PTM 335 Suite

For simple configuration of the PTM 335 module



Dolphin V4 API

(for 928 MHz modules)

For fast and simple development of custom specific applications (in "C")



DolphinSuite

(for 928 MHz modules)

For simple configuration and flash programming of Dolphin modules



DolphinView

EnOcean DolphinView visualizes wireless communication for starters in EnOcean technology. Variants: DolphinView Basic, DolphinView Advanced



EnOceanVisualization

For visualization of wireless communication for switches and temperature sensors

KITS

868 MHz
902 MHz
928 MHz



EnOcean Starter-Kit

ESK 300/ESK 400J (928 MHz)

The ideal entry to EnOcean technology

868 MHz
902 MHz
928 MHz



EnOcean Developer Kit

EDK 350/EDK 400J (928 MHz)

Developer kit for energy harvesting wireless sensor solutions



EOP 350 Programmer Board

For programming and configuring EnOcean radio modules

FINISHED WHITE LABEL PRODUCTS FOR OEM CUSTOMERS

ENERGY HARVESTING WIRELESS SWITCHES AND SENSORS*

868 MHz



PTM 250

Universal switch insert – EnOcean easyfit

868 MHz
928 MHz


STM 250 STM 255J (928 MHz)

Window contact. Both variants also contain advanced security functionality

902 MHz



EDRP/ESRP

Wireless switch (double/single)

868 MHz
902 MHz


EKCS

Key card switch

902 MHz



EDWS

Door and window contact

868 MHz
902 MHz
928 MHz


EOSW

Wall mounted wireless occupancy sensor

868 MHz
902 MHz
928 MHz


EOSC

Ceiling mounted wireless occupancy sensor

Q1/15: 902MHz



ELLS

Light level sensor

TRANSCIVER PRODUCTS

868 MHz



RCM 250

Universal single-channel switch actuator – 230 V

868 MHz
902 MHz
928 MHz


USB 300/USB 400J (928 MHz)

USB gateway

902 MHz



EPSM

Plug-in switch module

902 MHz



EISM

In-line switch module

902 MHz



EHSM

HVAC setback module

Q1/15: 902MHz



LEDR

LED controller - dimming with relay 0–10V

Q1/15: 902MHz



LEDD

LED controller - dimming w/o relay (0–10V)

Q1/15: 902MHz



Navigan NWC 300U

With Navigan Wireless Commissioner, you can easily configure EnOcean controllers EISM, LEDR and LEDD.

ACCESSORIES

868 MHz



EPM 300

Level meter

*) further frequencies on request

SUPPORT

Further support materials can be found here:

www.enocean.com/support

www.enocean.com/product-finder

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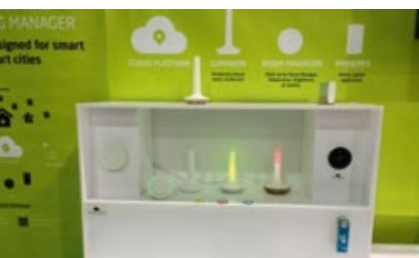
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ENOCEAN AT CES 2015



This year's CES, the world's largest electronics show, focused on the "Internet of Things". Many members of the EnOcean Alliance also presented their solutions based on EnOcean's wireless technology.



MASTHEAD

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OVERVIEW OF ENOCEAN ALLIANCE MEMBERS

www.enocean-alliance.org/products



PROMOTERS			

PARTICIPANTS									

... AND MORE THAN 220 ASSOCIATE MEMBERS

SMART ERLEBEN

CONNECTING WORLDS. WITHOUT WIRES.
SIMPLY SMART.



DIGITAL
CONCEPTS

SMART ENOCEAN GATEWAY

- certified EnOcean interface
- web - interface for easy user interaction
- easy to use with every IP controller
- support for standardized EnOcean products
- EnOcean Equipment Profiles, current version
- multiple client connections possible
- update capability for future EnOcean products
- import/export of the settings for backup
- dual API: simple string API and JSON API
- caching of the current state of the EnOcean devices
- no limits regarding the amount of sensors
- control of up to 128 dedicated actuators per gateway

