



## EnOcean at electronica

Dolphin - the flexible system architecture of the future for energy-autonomous sensors and wireless sensor networks

### **Oberhaching near Munich, Oct 8, 2008**

At the electronica show EnOcean is presenting the latest state of the art in energy-autonomous wireless sensor networks. Dolphin is a solution-oriented system architecture with a wide-ranging performance spectrum, application enhancing features and ground-breaking products.

From 11 through 14 November 2008 EnOcean is showing its new Dolphin platform for implementation of self-powered and wireless sensor networks. Together with the new platform the company has also further developed its EnOcean wireless standard. The central elements of the platform are Dolphin-based modules for sensors, infrastructure and controls. In the new, simply integrated STM 300 and TCM 300 sensor and transceiver modules EnOcean takes a leap ahead of all current market solutions because this Dolphin system architecture plus electronics optimized for energy harvesting set standards that satisfy all familiar demands on sensor systems, and anticipate those to be expected.

Rooted in technology for the increasingly sophisticated demands of building services, the non-proprietary and flexibly expanded Dolphin hardware and software architecture now shows the way to ambitious growth of technical building applications and an entry into industrial control and automation systems. In addition to a variety of functional innovations, the new modules of the Dolphin system architecture allow an intelligent interplay between sensor and actuator. Bidirectionality has now joined the scenario to unite the benefits of energy-efficient wireless transmission with high transmission security. But the technology retains downward compatibility with former unidirectional, self-powered wireless switches, sensors and actuators. The new modules also appear attractively low-priced and very much down-scaled.

### **TCM 300 and STM 300 – the new Dolphin signature**

In the new modules EnOcean is able to cut integration costs for product manufacturers and solution providers. That is made possible by implementing unique ultra-low-power energy management and a powerful microprocessor solution. Plus the fact that the modules are aimed at creating simple and flexible development and product cycles. This shows, for instance, in that no knowledge of RF engineering is needed to integrate the modules.

TCM 300 is a bidirectional plug & play module for Dolphin wireless systems. Compared to predecessor TCM 120, standby power consumption is more than halved by 3 V technology and other measures. Another big advance is that the processor of the module is also user-programmable; in-system too. The module offers a number of ready programmed operating modes for switching and dimming. A repeater function can additionally be activated. A bidirectional serial interface serves for integration in external logic or an automation system.

TCM 300 will be available for sampling in February 2009. Major features are:

- 8051 CPU of 16 MHz, 32 k flash and 2 kB RAM
- EnOcean unidirectional and bidirectional wireless communication (EnOcean wireless protocol, 125 kbps/ASK)
- 1- and 4-channel switching function or 1-channel dimming function
- Optional repeater function activated by pin
- 10-bit A/D converter, 8-bit D/A converter
- Low-power supply 2.5 to 3.3 V, Rx approx. 30 mA, Tx approx. 15 mA
- Simply programmed in the application and in the field because complex software functions are integrated as ready macros (e.g. SMART ACK, encryption, routing)
- TCM 300/300C (868 or 315 MHz): SMT modules for automatic insertion and flexible connection of different antennas

- TCM 310/320C: modules for vertical mounting with ready fitted wire antenna (868/315 MHz)

The bidirectional STM 300 module for energy-autonomous sensor and actuator applications offers the basic hardware functionality of TCM 300 plus the following features:

- Extensive ultra-low-power energy management (threshold switch, voltage limiter, wakeup circuit) for energy-autonomous wireless sensors (unidirectional and bidirectional wireless communication) and energy-autonomous wireless actuators
- Basic software functionality of STM 110
- Universal harvester interface (prepared for Harvester Library)
- STM 300/300C (868 or 315 MHz): SMT modules for automatic insertion and flexible connection of different antennas and energy storage mechanisms
- STM 320/320C: modules with integrated antenna, connector and energy storage mechanism

### **New software and new development environment**

Together with the new modules EnOcean is launching an operating system with a programming interface (API) that allows application-specific programs to be written in high-level C language. In addition to the protocol stack for EnOcean wireless, the API offers many powerful functions, for controlling energy management for example, use of digital or analog I/Os, access to flash memory and the continuously powered RAM 0, and control of timer functions.

EnOcean has added the powerful Dolphin Studio development environment to the API. This supports configuration of the various API modules and ensures fast time to develop. The command line program integrated in Dolphin Studio controls the programming operation, plus it is easily implemented in fabrication and T&M engineering.

### **Self-powered and wireless actuators**

In its Dolphin-based modules, EnOcean is now also implementing self-powered actuators. Actuators of this kind can be used to control heating radiator valves for example. They draw their energy through the use of Peltier elements. This is where the bidirectional Smart Acknowledge function comes in. SMART ACK allows return messages from self-powered EnOcean wireless sensors so that the processor of an actuator can communicate bidirectionally with a central control point. The processor inquires of the central point through the wireless transmitter whether there is need for action, and receives a response in a precisely defined time interval. In this way actuator components with a high power requirement only operate on demand.

### **About EnOcean**

EnOcean GmbH, established in 2001 and headquartered in Oberhaching near Munich, develops innovative, self-powered wireless sensor technology. The company manufactures and markets service-free and flexible wireless sensor solutions for use in buildings and industrial installations. The products are based on a combination of miniaturised power converters and reliable wireless transmission. More than 500,000 of the company's wireless components are already in use.

EnOcean GmbH employs more than 40 people in Germany and the USA, and cooperates with well-known manufacturers of system solutions for building and industrial installations engineering worldwide. EnOcean has won numerous awards, most recently the "Batimat Innovation Award in Bronze" at Batimat 2007, as well as the "Best innovation in green product and services" award of the Working Buildings Week Innovation Awards 2007, the "Building Product Innovation Award" at the 100% Design London Awards 2007, the "BuildingGreen's 2007 Top-10 Green Building Products" and the title "Technology Pioneer 2006" of the World Economic Forum.

EnOcean GmbH is a promoter of EnOcean Alliance Inc., established at the light+building show 2008 on April 7.

For more information, please visit [www.enocean.com](http://www.enocean.com).