SMART METERING NEEDS SMART MODULES

By Peder Martin Evjen

Radiocrafts has recently launched a compact module meeting the new Open Metering System (OMS) specification for smart meters in Germany. The new module can be used in any type of meter, as well as MUCs and repeaters, containing the RF transceiver and the wireless M-Bus protocol and application support to meet the new specification.

Radiocrafts, a leading provider of compact RF modules, has expanded its product line with a new firmware feature set (MBUS3) complying with the OMS specification. The new firmware runs on the industry leading wireless M-Bus module (RC1180-MBUS) for use in automatic meter reading (AMR) applications. This is the first all-embedded module solution compliant with the new OMS specification available in the market, and comes in addition to the well established NTA 8130/DSMR compliant feature set (MBUS2).

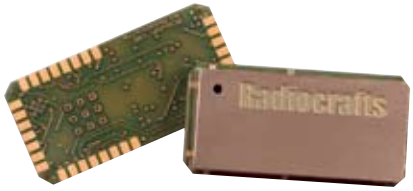
OMS, initiated by figawa, ZVEI and KNX, has specified the next generation smart metering system for Germany. The OMS primary communication interface is based on the wireless M-Bus standard (EN 13757-4:2005) and specifies the communication between a multi-utility controller (MUC, or data concentrator), and electricity, gas, water and heat meters. Radiocrafts has participated in the development of the new specification together with leading meter manufacturers and other communication technology providers in Europe.

The OMS group took on the demanding task of defining and specifying a metering system that seamlessly integrate all types of utility meters, in a way that can be realised at a low cost, with easy installation, reliable performance, while providing two-way communication, ensuring consumer privacy and data security, and being suitable for battery operation with long lifetime. The selected solution for the meter communication is based on the existing and well established wireless M-Bus standard, with refinements and additions to the application layer.

Radiocrafts has in turn developed a small compact module solution meeting these challenging demands, and integrating all these new features in a universal module. The new MBUS3 module can be configured for use as a master (in the MUC), slave (in the meter or an actuator), or repeater. The module supports S1, S2, T1 and T2 modes, handles encryption, and all time critical communication between the MUC and the meter. The power saving features gives battery lifetimes in excess of 14 years.

A master module can support up to 64 slaves, all with unique encryption keys. The master has a unique auto-message generation feature and message mailboxes supporting individual communication with several slaves in parallel.

The privacy and security aspects are met by using AES-128 encryption. By using a state-of-the art system-on-chip technology with a hardware co-processor for encryption, it has been possible to implement a time and power efficient solution in the tiny module.



RC1180-MBUS module

In order to keep battery consumption in the slave meter to a minimum, the OMS specification contains timing requirements to the master device. This has been solved by a smart auto-message feature where messages are generated, encrypted and transmitted within 2-3 ms. This allows for battery operated meters (gas, heat, water) to be wirelessly connected to the infrastructure in a cost optimised way.

A unidirectional one-hop repeater has been defined to increase the coverage area of one master. The new module's repeater functionality makes up a complete and autonomous repeater that will store and retransmit slave messages after a random delay. Multiple repeaters can be used in the same area, as the random delay prevents collisions.

The new RC1180-MBUS3 is a surface mounted high performance transceiver module measuring only 12.7 x 25.4 x 3.3 mm, and can easily be integrated into any meter due to its small size and low power consumption. A UART interface is used for serial communication and configuration. When used with quarter wave antennas a line-of-sight range of 800 m can be achieved.

By launching the first OMS compliant module in the market, Radiocrafts has again demonstrated its technological leadership in embedded wireless solutions for smart meters. Short time-to-market is now vital for meter manufactures to position themselves in the rapidly growing smart metering market. The industry leading wireless M-Bus stack makes it easy to add a fully compliant OMS solution to space limited and battery operated meters, and significantly reduce time-to-market, development and compliance testing cost. MI

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