

WIRELESS SMART METERING MODULES

By Peder Martin Evjen

The trend in AMR and smart metering is to go wireless, because of the lower cost of installation and maintenance, higher reliability and ease of use. In multi-utility systems reading battery operated gas, heat and water meters, wireless communication is the ideal solution. The Wireless M-Bus standard dominates the European market; ZigBee and proprietary solutions in other parts of the world. Compact off-the-shelf modules are now available for complete wireless smart metering systems.

Radiocrafts offers a complete range of embedded wireless solutions for the smart metering and smart grid market. Based on strong industrial experience in high reliability radio communication systems, the company has developed a line of tiny pin-compatible modules, supporting standards such as Wireless M-Bus and ZigBee.

All the RF circuitry and lower level protocol are integrated in an easy-to-use system-in-package measuring only 12.7 x 25.4 x 3.3 mm. This approach reduces the cost and shortens the time to market, which is now vital in the rapidly growing smart metering market. The modules can be used in meters, repeaters, concentrators or gateways. A UART interface for API commands and data, or a pulse output, is all it takes to make any meter a wireless smart energy device. Low power features enable battery lifetimes of 15-20 years.

WIRELESS M-BUS

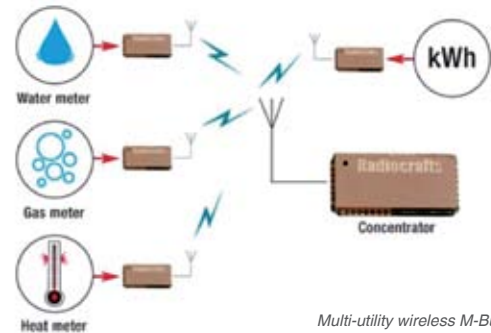
Radiocrafts, a leader in wireless M-Bus solutions, offers modules compliant with the Dutch Smart Metering Requirements (DSMR) and Open Metering System (OMS) specification. EN 13757-4 is the only European norm for wireless meter reading. Both the DSMR and OMS are based on this norm. The OMS is a complete system specification for a two-way multi-utility meter reading system (electricity, gas, water, heat) providing very efficient reading of battery operated meters. A repeater has been defined to extend the coverage of each concentrator (MUC).

ZIGBEE SMART ENERGY

A new ZigBee module series supports ZigBee PRO and the Smart Energy profile, and can be used in any type of meter, energy service interfaces (ESI) and routers. The module contains an RF transceiver, PA, LNA, ZigBee network protocol, and the encryption algorithms for security and data integrity. The ZigBee modules form a mesh network connecting all devices to the ESI, which is connected to the backbone/internet through Ethernet broadband, GPRS or PLC.

RETRO-FIT PRODUCTS AND GATEWAYS

A replacement of all the meters in an area



Multi-utility wireless M-Bus system

represents a large cost and investment. A better solution can be to upgrade the meters. Radiocrafts offer a wide range of application specific modules that can be used to add smart metering capabilities to "dumb" meters. The Wireless M-Bus Pulse Counter module connects to pulse outputs of gas and water meters, transmitting meter readings at scheduled intervals. Electricity meters and heat meters are interfaced through local optical or electrical data ports, and are read directly by the wireless M-Bus module. Customised modules, boards or boxes can be mounted directly in the existing meters. Large cost advantages are achieved by simply adding smart metering communication modules, compared to replacing the whole unit. Frequent transmitters or polling receivers are available for walk-by and drive-by meter reading.

Radiocrafts also offer GPRS and Ethernet gateways. These are equipped with either wireless M-Bus or ZigBee modules, and will convert the data to IP packets, using the internet for communication to the back-end.

Summary

Radiocrafts provides a wide range of radio modules for smart metering, compliant to different standards and local radio regulations (see Table). Radiocrafts is therefore the perfect partner for meter manufacturers and systems integrators that want to enter the smart metering market and take the benefits of these easy-to-integrate and easy-to-use wireless solutions. ■

Product	Frequency band	Market	Features
RC1180-MBUS1	868 MHz	Europe	Wireless M-Bus, general module
RC1180-MBUS2	868 MHz	Europe, The Netherlands	Wireless M-Bus, DSMR/NTA 8130 compliant
RC1180-MBUS3	868 MHz	Europe, Germany	Wireless M-Bus, OMS compliant
RC2400-ZNM-SE	2.45 GHz	Worldwide	ZigBee Smart Energy network module
RC2400HP-ZNM-SE	2.45 GHz	Worldwide	ZigBee Smart Energy network module, high power
RC1140-MBUS1	433 MHz	Worldwide	Wireless M-Bus
RC1160-MBUS3	869 MHz	Russia	Wireless M-Bus
RC1170-MBUS3	867 MHz	India	Wireless M-Bus
RC1170HP-MBUS3	867 MHz	India	Wireless M-Bus, high power module
RC1170TX-MBUS1	867 MHz	India	Wireless M-Bus, low cost, unidirectional module
RC11x0-MPC1	433/867/868/869/915 MHz	Worldwide	Wireless M-Bus pulse counter module



ABOUT THE AUTHOR:

Peder Martin Evjen is a co-founder and Managing Director of Radiocrafts.

ABOUT THE COMPANY:

Radiocrafts is a leading RF module design and manufacturing company. Radiocrafts' standard RF modules provide compact, easy-to-use, low cost, low power and high performance RF solutions for a large number of wireless applications using license-free ISM bands. Radiocrafts also offers custom and application specific product development, supporting customers from initial project ideas to volume product delivery.

sales@radiocrafts.com / www.radiocrafts.com