NXP Wireless M-Bus solution based on UBX100 Sub-GHz transceiver and MCX MCU Series

The NXP® UBX100 radio frequency transceiver brings Wireless M-Bus bidirectional meter communication to the NXP's MCX portfolio.

Wireless M-Bus is an open standard developed for ultra-low power smart metering and advanced metering infrastructure (AMI) applications, and it is quickly spreading in Europe for automatic electricity, gas, water and heat meter reading applications.

The proven solution scales across the full MCX processor portfolio and complements NXP's broad, scalable connectivity solutions.

The NXP UBX100 transceiver is designed for a wide range of industrial and home applications requiring a very high link budget for bi-directional RF communication. The transmitter has a high dynamic range of -25 dBm to +14 dBm and an efficient power-ramping power amplifier (PA) that complies with ETSI, FCC and ARIB regulations. Configured to operate with low active and standby power, the transceiver is ideal for battery-powered applications.

Key features

- Supports W-MBus modes S, C and T
- Ultra-low RX power at 11 mA
- Up to +14 dBm output power at 29 mA
- Deep sleep down to 600 nA
- Sensitivity
  - -109 dBm at 32.768 kbit/s @ 360 kHz BW
  - -106 dBm at 100kbit/s @ 360 kHz BW
- Automatic on-chip radio configuration
- SPI up to 2 Mbit/s
- HVQFN48 package (7 x 7 mm²)
- Operating temperature range: -40° C to +85° C Complemented by Wireless M-Bus protocol stack, drivers and middleware with extensive examples running on NXP MCX MCU series

Target applications

- Electricity Meters
- Gas Meters
- Heat metering
- Water Meters
- Energy gateway
- In-home energy display
- Broadband modem and residential gateway
- Solar photovoltaic (PV) energy generation

MCX series features

The MCX portfolio offers a comprehensive selection of general-purpose to industrial IoT and application-specific Arm Cortex-M based microcontrollers offering expanded scalability with breakthrough product capabilities, simplified system design and a developer-focused experience through the widely adopted MCUXpresso suite of software and tools.

- Expanded scalability with MCUs up to 4 MB Flash and 1 MB SRAM
- Low active power and leakage
- Optimized for power-critical applications
- Extra flexibility with a comprehensive peripheral offering
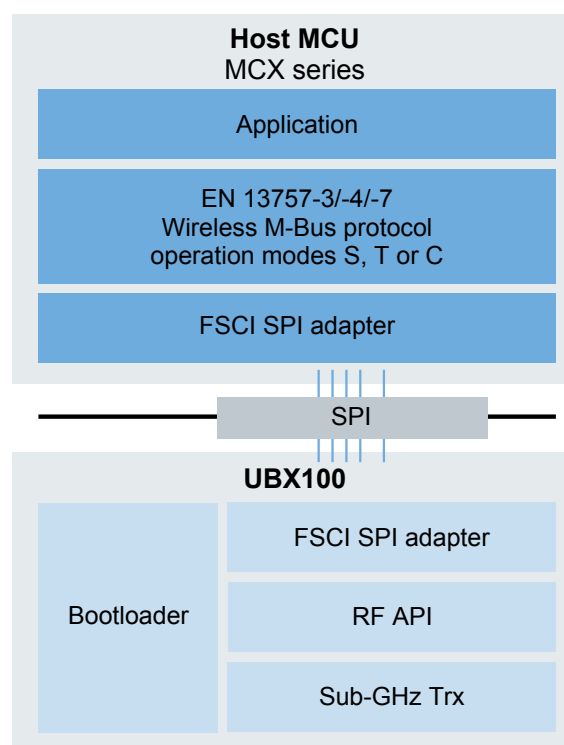
Comprehensive developer experience

The MCX MCU portfolio is supported by the MCUXpresso Developer Experience to optimize, ease and help accelerate embedded system development. To speed up prototyping the UBX100 transceiver MikroBUS add on-board seamlessly integrates with the MCX FRDM board ecosystem. NXP provides the Wireless M-Bus protocol stack as evaluation library including drivers and middleware with comprehensive examples, and further complemented by a wide range of compatible middleware from NXP's partner ecosystem, allowing rapid development of a broad range of end applications.

Protocol stack features

Stackforce OMS® version 4.5.1 protocol stack for end devices is a proven software solution for metering applications and comes with some new features in OMS® version 4.5.1.

The stack implements all the protocol elements required for Wireless M-Bus compliance and covers a large part of the options and features specified in EN 13757 and its sub-standards. The stack is optimized for small footprint, excellent modularity, and scalability, while still rich in features.

Solution block diagram