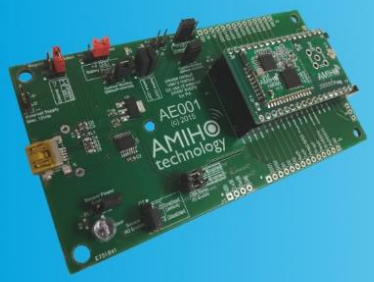

AMIHO technology
intelligent wireless

AM091 LoRa and Wireless Meter-Bus 169MHz High Power Module


LoRa®
M-Bus wireless

The AMIHO AM091 is a high performance Wireless M-Bus and LoRa module at 169 MHz, making it ideal for hard to reach meters and devices. Using NXP's Kinetis® family of MCUs, it is also suitable for other ISM-band applications.

Benefits

- LoRa ® extended range beyond 15 km
- High performance, receive sensitivity to -148dBm
- Massive link budget up to 175 dB
- Upto +28.5 dBm Max Power Output
- Power amplifier on board
- AES128 and AES256 encryption / decryption
- Includes EN13757-4 compliant protocol stack
- Full access to on-board MCU
- Compact, standard footprint 20.3 x 17.8 mm
- Speed time to market

The AM091 provides a highly integrated, cost-effective solution for 169 MHz applications, is configurable for up to 700 mW transmission power output, embedded modem. It is supplied with an EN13757-4 compliant Wireless M-Bus software stack and is also suitable for other 169 MHz ISM-band communications standards. The module uses an AT command interface and supports very low current standby for battery powered applications.

Key applications include connectivity for **Smart Metering**, **Internet of Things**, **Smart Homes, battery operated devices** and similar.

Features

Wireless modem
- Use in stand-alone modem mode, or embed user application on-board

RF Operation
- Narrow-band operation in the 169 MHz band.
- Receiver continuously optimises operating conditions to reduce packet error rate.

Transmit RF Performance
- +27dBm at 3.3V (700 mW at 169 MHz)
- Up to +28.5 dBm max output
- Output power fully controllable.

Link RF Performance
- Receive sensitivity to -123dBm in FSK mode.
- Receive sensitivity to -148dBm in Spread Spectrum mode.

Long-Range Operation
- Spread spectrum operating mode using LoRa technology
- Increases link budget by up to 25dB
- Exceptional transmission range (up to 15km)
- For use in radio-poor environments

Hardware
- ARM® 32-bit Cortex M0+ MCU
- Semtech SX1278 transceiver
- NXP Kinetis

Software:
- Full low level platform drivers and EN13757-4:2013 Wireless M-Bus RF stack level drivers provided
- AES-256 encryption and decryption
- Supports Wireless M-Bus N mode
- Suitable for Italian CIG specification

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Technical Specifications

RF modem	SX1278 Sub-1 GHz Smart Radio
MCU	ARM® 32-bit Cortex M0+ MCU
Program memory	128 KB flash
Data memory	16KB RAM Dataflash emulated in program flash
Supply Voltage	2.4 - 3.6 V modem
PA Voltage	2.7 - 4.2 V (+27dBm at 3.3V)
Max output power	up to +28.5dBm (power amplifier included on board)
Sensitivity	
1.2 kbits/s FSK 38.4 kbits/s FSK 7.8KzBW	-123 dBm -109 dBm -148 dBm (SF=12 Spread Spectrum)
Current Consumption	
RX TX (13dBm) TX (27dBm) Sleep (RTC running) Deep sleep	16 mA 33 mA 380 mA TBD µmA TBD µmA
Temperature range	- 40 °C / + 85 °C

Physical Dimensions

20.3 x 17.8 x 2.5 mm size (standard footprint)

1.27mm half-holes for mass production

External edge RF connection

Hardware

CMOS UART interface

16 bit high-speed ADC

12 bit high-speed DAC

Additional GPIO and interrupts, with software-configured Count and Wake-up inputs

SWD debug interface

Software

EN13757-4:2013 Wireless Meter-Bus stack

AT command interface for stand-alone modem operation, optional binary mode for reduced compact modem communications

Built-in profiles for rapid mode switching

Software-definable frequency bandwidth and power level within entire 169 MHz ISM-band for other applications

M-Bus N mode packet interface

AES 256 encryption and decryption

API to add higher layer M-Bus protocol

API to allow other protocols to be added

Packet sniffer and network formation modes

Power management

Example gas meter application

EN13757-4:2013 Wireless M-Bus stack

OMS®

partner of NXP

SEMTECH

LoRa™ Alliance Member

M-Bus wireless

AM091 0916 V1.2

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