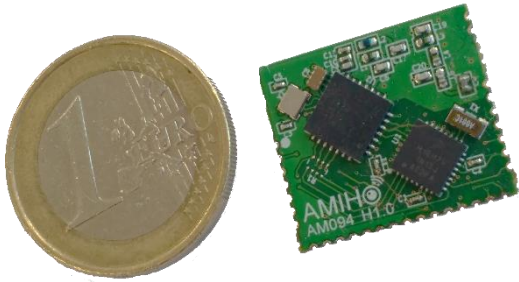


# AM094 868 MHz LoRa and Wireless Meter-Bus Module



The AMIHO AM094 is a high performance LoRa® and Wireless M-Bus module at 868 MHz, making it ideal for hard to reach IoT devices and smart meters. Featuring NXP's Kinetis® family of MCUs, it is designed specifically for LoRa and Wireless M-Bus, but is also suitable for other ISM-band applications.

The AM094 provides a highly integrated long range solution for 868 MHz applications embedded modem. It is supplied with AMIHO's EN13757-4 compliant Wireless M-Bus software stack and is also suitable for other 868 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.

## Benefits

- LoRa long range up to 15 km
- High performance, receive sensitivity to -137dBm
- Large link budget up to 151 dB
- Up to +14 dBm Max Power Output
- AES128 and AES256 encryption / decryption
- Includes EN13757-4 compliant protocol stack
- Full access to on-board MCU
- Low current standby for battery powered applications.
- Compact, standard footprint 20.3 x 17.8 mm
- Reduce time to market

## Features

### Wireless modem

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

### RF Operation

- Narrow-band operation in the 868MHz band.
- Receiver continuously optimises operating conditions to reduce packet error rate.

### Transmit RF Performance

- +14dBm at 3.3V

### Link RF Performance

- Receive sensitivity to -119dBm in FSK mode
- Receive sensitivity to -137dBm in Spread Spectrum mode

### Long-Range Operation

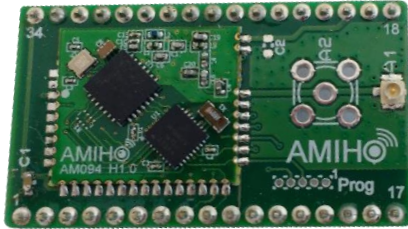
- Spread spectrum operating mode using LoRa technology
- Increases link budget by up to 25dB
- Exceptional transmission range (up to 15km)
- For use in radio-poor environments

### Hardware

- NXP Kinetis family ARM® 32-bit Cortex M0+ MCU
- Semtech SX1272 transceiver

### Software:

- Full low level platform drivers and EN13757-4:2013 Wireless M-Bus RF stack level drivers provided
- AES128 encryption and decryption
- Supports Wireless M-Bus C, R, S and T modes



AM094 module, carrier mounted.  
Fully compatible with AMIHO universal evaluation system and suitable for prototyping on 2.5mm breadboards.

## Technical Specifications

<b>RF modem</b>	SX1272 Sub-1 GHz Smart Radio
<b>MCU</b>	ARM® 32-bit Cortex M0+ MCU
<b>Program memory</b>	128 KB flash
<b>Data memory</b>	16KB RAM Dataflash emulated in program flash
<b>Supply Voltage</b>	1.8 - 3.6 V modem
<b>Max output power</b>	+14dBm at 3.3V
<b>Sensitivity</b>	-119 dBm 1.2 kbits/s FSK -106 dBm 38.4 kbits/s FSK -137 dBm (SF=12 125 kHz Bandwidth Spread Spectrum)
<b>Current Consumption</b>	
RX	12 mA
TX (13dBm)	32 mA
Deep sleep	2.2 µA
<b>Temperature range</b>	-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 M-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 868 MHz ISM-band for other applications  
Wireless M-bus C, R, S, T mode packet interface  
AES128 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



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