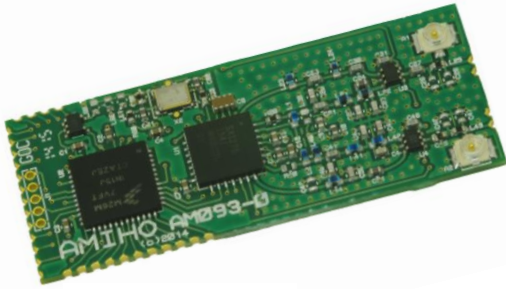




# AM093 Dual-Band LoRa and Wireless Meter-Bus Module

## Versatile 169 and 868 MHz Module



### Benefits

- Dual-band 169 / 868 MHz
- LoRa® long range up to 15 km
- High performance: receive sensitivity to -148dBm
- Low risk proof of concept
- Faster product development
- AES128 and AES256 encryption / decryption
- Full access to on-board MCU to add your own application code

The AMIHO AM093 module provides high performance with multiple options including Wireless M-Bus and long range LoRa and dual channels at sub-1 GHz. Using NXP's Kinetis® family of MCUs and Semtech's LoRa® technology, it allows customers to evaluate both multi-band Wireless Meter-Bus and ISM communications for hard-to-reach devices.

The AM093 is capable of configuration for up to 100mW transmission power output, low-power, embedded modem. It provides a highly integrated, cost-effective solution for sub-1GHz applications. It is supplied with an EN13757-4 compliant Wireless M-Bus software stack and is also suitable for other 169 and 868 MHz ISM-band communications standards including KNX. 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 and wideband operation throughout 868MHz ISM band
- Narrow-band operation in the 169MHz band
- Receiver continuously optimises operating conditions to reduce packet error rate

#### Transmit RF Performance:

- 25mW at 868 MHz, 100 mW at 169 MHz
- Either frequency band may be production selected for 100mW operation

#### 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 SX1276 modem

#### 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 N, S, R, T and C modes with OMS extensions for metering

## Specifications

<b>RF modem</b>	SX1276 Sub-1 GHz Smart Radio
<b>Micro</b>	ARM® 32-bit Cortex M0+ MCU
<b>Program memory</b>	128kB flash
<b>Data memory</b>	16KB RAM Dataflash emulated in program flash
<b>Supply Voltage</b>	1.8-3.6 V
<b>Maximum output power</b>	+20 dBm
<b>Sensitivity</b>	
<b>1.2 kbits/s FSK</b>	-123 dBm
<b>38.4 kbits/s FSK</b>	-109 dBm
<b>250 kbits/s FSK</b>	-96 dBm
<b>7.8KHzBW</b>	SF=12 Spread Spectrum -148dBm
<b>Current Consumption</b>	
<b>RX</b>	16 mA
<b>TX (13dBm)</b>	33 mA
<b>TX (20dBm)</b>	124 mA
<b>Deep sleep</b>	TBD $\mu$ A < 2.2 $\mu$ A
<b>Temperature range</b>	-40 °C to +85 °C

## Physical

42 x 17 x 2.5 mm size

1.27mm half-holes for mass production

ON-board UFL connections for RF

External edge RF connection

## Hardware

ARM® 32-bit Cortex M0+ MCU with built-in 128KB Program flash

CMOS-level 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 868MHz ISM-band for other applications

M-bus N, S, R, T & C mode packet interface

AES128 encryption and decryption

API to add higher layer Meter-Bus protocol

API to allow other protocols to be added

Packet sniffer and network formation modes

OMS support with resources to implement pulse meter functionality

Power management

Example gas meter application



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