FX-WMBUS-RX4-M-LR-Ax-X

Wireless M-BUS repeater
(230 VAC, A1=IP40/A2=IP65)

> Mains powered with always-on function

> Support for AES128 encrypted Wireless M-Bus communication

> OMS 4 compatible

> Convert between different WMBUS modes

> Power supply cable entry from the back or the side

Measure to manage

The mains powered FX-WMWUS-RX4-M-LR-Ax-X is a wireless MBUS repeater mounted with AC/DC adapter in combined enclosure. The device is a plug-and-play and highly configurable repeater for extending the range between meters and a collector/gateway. The enclosure is chosen to make the repeater as discrete as possible.

Once a minute a packet is sent from the repeater and contains information about the repeater, such as number of routed packets and software version. The packet is also used for time synchronizing between repeaters in a multihop system. Furthermore, this packet can be used as an indication that the device is up and running.

The repeater do have industrial grade immune to electrical disturbances that could be generated by, for example, LED-lights in buildings.

Technical features

Temperature range:	-35..85°C
Dimensions:	150 x 150 x 53 mm
Power supply:	85-305 VAC
IP rating:	IP40 / IP65
Max. number of connected sensors:	932
Communication:	OMS standard wireless M-Bus
	0-30 min suppression timer
	Status Tx interval 60s

Firmware:

INPUT MODE	T1/C1 (868 MHz)
OUTPUT MODE	C1- or T1 mode (configurable)
REPETITION	Twice – Once on each internal antenna
MAX SENSORS	932
MAX PACKET LENGTH	255 bytes
FILTERING	0-30 min suppression timer, RSSI, manufacturer, whitelisting
SECURITY	Supports routing of security profile A and B according to OMS 4
STATUS TX INTERVAL	60 seconds
DEFAULT FACTORY SETTINGS	Output T1, 2 min suppression timer, encrypting off

Radio:

RECEIVER CLASS	1,5
RADIATED POWER	< 14 dBm
TRANSMISSION	Listen before talk, polite spectrum access
HARDWARE FILTER	Yes

Conformity:

ENVIRONMENT	RoHS (2011/65/EU) / (EU) 2015/863 RADIO / EMC RED (2014/53/EU)

General information:

TEMPERATURE RANGE	-35° to +85°C, rec. -30° to +50°C
IP RATING	A1=IP40 / A2=IP65
POWER SUPPLY	85-305 VAC
MATERIAL	UV-resistant PC/ABS
SIZE (W x L x D)	150 x 150 x 53 mm
STANDARD	EN13757-3/4:2013 / OMS 4.0.2
COLOR	RAL9003 (signal white)
FLAMMABILITY RATING	UL94 HB

Antenna:

The RX4-repeater comes with two separated external SMA interfaces, one for transmitting and one for receiving, to achieve exceptionally good sensitivity on the device. This makes this repeater suitable to use outdoors in high locations, such as masts or poles, together with large antennas to receive data from meters and sensors in a large area or to transmit data to gateways far away.

Routing:

The advanced collision avoidance algorithm minimizes problems with collisions and data repetition. To ensure proper functionality, a randomised delay is used before repeating packets.

By default, our repeaters only retransmit packets coming directly from meters and not from other repeaters. However, the repeater comes with a transparent static routing algorithm which allow controlled static multihop between repeaters. By using multihop, up to three repeaters can be used to form an extended chain between meters and gateway.

The repeater supports both short and long transport header, as well as extended link layer 1-4. Furthermore, our repeaters can be configured to retransmit non-OMS wireless MBUS packets.

Converter:

The repeater can be used to convert between different MBUS modes, for example, C-mode to S-mode.

Features:

The repeater supports synchronisation via OMS time protocol. The configuration of the repeater can be protected via a 16- byte AES-key to avoid unauthorized changes of the configuration. It is always possible to read out data from the repeater even without the key.

It is possible to configure a repeater for untouched retransmissin, i.e., retransmits without chnaging anything in the package. Repeaters are firmware upgradeable to ensure long-term reliability and to get newest features.

Configuration:

All repeaters can be used right out of the box but they are also highly configurable. Configuration of repeaters is performed using Wireless M-BUS programming dongle FX-WMBUS-D1-TC and our Configurator tool. Using this program, it is possible to see the routing from repeaters and how good the repeaters communicate with the sensors.

A non-exhaustive list of parameters which can be changed on the repeaters:

• Number of minutes to be active / not active
• Specific time during the day to activate (e.g., at 12:30)
• Specific days to be active (e.g., Mondays and Wednesdays)
• Suppression timer (limit number of packets per sensor)
• Sensor filtering (e.g., manufacturer ID or whitelisting)
• Static routing between repeaters (multihop)
• Append RSSI value of received data

Available different versions:

3 different versions of the Wireless M-BUS repeater are available either IP40 or IP65, each do have a unique hardware configuration. They are thus optimised for different situations and purposes:

Product code	IP rating	Dual Internal Antenna	External SMA interface	Typical sensitivity mode S1 / TC	Optimised for
FX-WMBUS-R4-M-LR-A1	IP40	X	-	-111/-108	Indoor multi-floor building with better range
FX-WMBUS-R4-M-LR-A2	IP65	X	-	-111/-108	Outdoor multi-floor building with better range
FX-WMBUS-R4-M-LR-A1-X	IP40	-	1 TX/RX	-111/-108	Indoor for longest range in one direction.
FX-WMBUS-R4-M-LR-A2-X	IP65	-	1TX + 1RX	-111/-108	Outdoor for longest range in one direction
FX-WMBUS-RX4-M-LR-A1-X	IP40	-	1TX + 1RX	-113/-110	Indoor maximum sensitivity - longest range in one direction.
FX-WMBUS-RX4-M-LR-A2-X	IP65	-	1TX + 1RX	-113/-110	Ourtdoor maximum sensitivity - longest range in one direction.