DEVICE

The battery powered LAN-WMBUS-R4 is a wireless MBUS repeater mounted with a high performance lithium battery. 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.

ANTENNA

The device either make use of two high performance internal antennas or one external antenna. The internal antennas are mounted at 90 degrees from each other, thus taking advantage of both horizontal and vertical polarizations for maximum range. This diversity is important, especially for indoor operation since meters and gateway can be mounted either to the sides or above/below the repeater. If meters have different polarization (antenna alignment) a loss of up to 30 dBm can be observed. Having two antennas at an angle also minimizes multipath problems.

Repeater models with external external SMA interface can be used when large antennas are desirable to cover larger areas.

PERFORMANCE

Once a minute a packet is sent from the repeater and contains information about the repeater, such as number of routed packets, software version, and current battery level. 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 battery lifetime is highly dependent on how many minutes per day a repeater is active. For example, 72 minutes active time per day gives an expected battery lifetime of 5 years.

The repeater is highly immune to electrical disturbances that could be generated by, for example, LED-lights in buildings.

ROUTING

The advanced collision avoidance algorithm minimizes problems with collisions and data repetition. To ensure proper functionality, a randomized 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 routing 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 support synchronization via OMS time protocol. The configuration of the repeater can be protected via a 16-byte AES-key to avoid unauthorized change of the configuration. It is always possible to read out data from the repeater even without the key.

CONFIGURATION

All repeaters can be used right out of the box but they are also highly configurable. Configuration of repeaters is performed using our Lansen Wireless M-BUS programming dongle and our program Lansen Configurator. By using our program, it is possible to see the routing from repeaters and how good the repeaters hear meters. Below is a list of a couple 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 meter)
- Meter filtering (e.g., manufacturer ID or whitelisting)
- Static routing between repeaters (multihop)
- Append RSSI value of received data

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LANSEN
WIRELESS BUILDING TECHNOLOGY
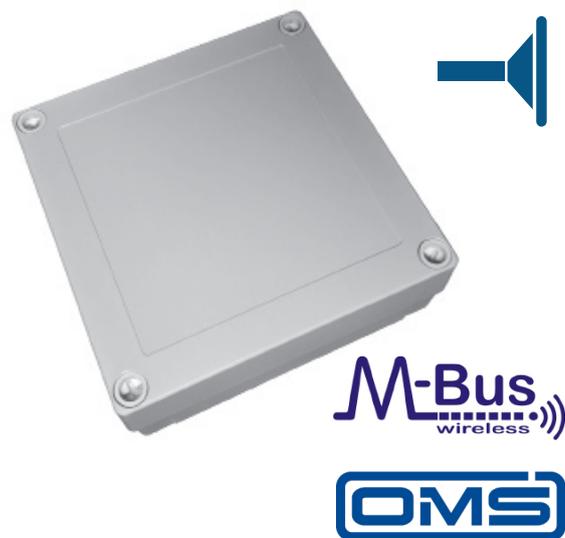
FIRMWARE

INPUT MODE	T/C-mode or S-mode (on request) (868MHz)
OUTPUT MODE	C- or T-mode (configurable) or S-mode (on request)
REPETITION	2 times* - Once on each internal antenna
	*Models with external antenna send twice on the same antenna
MAX SENSORS	R4/RX4 = 932 sensors
	µR = 100 sensors
MAX PACKET LENGTH	255 bytes
FILTERING	0-30 min suppression timer, RSSI, manufacturer, whitelisting, etc.
SECURITY	Supports routing of Security Profile A and B according to OMS 4
STATUS TX INTERVAL	60 seconds

RADIO

RECEIVER CLASS	1,5 for µR/R4-model and 2 for RX4-model
RADIATED POWER	< 14 dBm
TRANSMISSION	Listen before talk, polite spectrum access
HARDWARE FILTER	For GSM/GPRS and other disturbances:
	µR: No
	R4: No
	R4-LR: Yes
	RX4: Yes (Enhanced)

GENERAL INFORMATION

POWER SUPPLY	-M: 100-240V AC
	-M24: 24 V AC/DC
	-B: 3.6V Li-SOCl2,
STANDARDS	2014/53/EU (RED)
	EN 13757-3/4:2013, OMS 4.0.2*
	* retransmit delay time 20-100 ms
TEMPERATURE	-40^0 / $+85^0$
ENCLOSURE	R4/RX4: IP 67, 130 x 130 x 50 mm
	µR: 80 x 80 x 25 mm
MATERIAL	R4/RX4: PC (grey)
	µR: ABS (white)

ACCESSORY

LAN-WMBUS-D1-TC	Configuration dongle
LAN-PM-KIT-130-ID58-78	Pole mounting kit
LAN-OS-TILT3	Outer shell to further protect the repeater
LAN-OS-TILT3-N	Outer shell with one N-type antenna connection

	Battery	Dual Internal antenna	LTE/GSM filter	External SMA interface	Typ. sensitivity mode S/TC	Target app.	Typical lifetime expectancy	Optimized for
LAN-WMBUS-µR-B	X	X			-107/-105	Daily	10 min/day = 5 years 4 min/day = 10 years	Indoors for hard-to-get sensors
LAN-WMBUS-R4-B	X	X			-107/-105	Hourly	3 min/h = 5 years 30 min/day = 10 year	Battery lifetime and indoor multi-floor building
LAN-WMBUS-R4-M-LR		X	X		-111/-108	Always on		Indoor multi-floor building with better range
LAN-WMBUS-R4-B-LR	X	X	X		-111/-108	Daily	20 min/ day 10 years	Indoor multi-floor building with better range
LAN-WMBUS-R4-M-LR-X			X	1 TX/RX	-111/-108	Always on		Outdoor for longest range in one direction.
LAN-WMBUS-R4-B-LR-X	X		X	1 TX/RX	-111/-108	Daily	20 min/ day 10 years	Outdoor for longest range in one direction.
LAN-WMBUS-RX4-M-LR-X			XX*	1 TX + 1 RX	-113/-110	Always on		Maximum sensitivity - longest range in one direction.

*Enhanced filtering

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