LANSEN
Repeater R4 series

LAN-WMBUS-R4-B/M-(LR)-A1/A2-(X)

DEVICE
The battery or mains powered wireless M-Bus repeaters from Lansen are highly configurable plug-and-play devices used for extending the range between meters and a collector/gateway. The enclosure is chosen to make the repeater as discrete as possible.

ANTENNA
The repeater can either make use of two high performance internal antennas or one external antenna, depending on the model. The internal antennas are mounted at 90 degrees from each other to take advantage of both horizontal and vertical polarizations for maximum range while minimizing multipath problems. The antenna diversity is important to prevent losses due to different polarization, especially indoors since meters and gateway can be mounted both to the sides and above/below the repeater.

Repeater models with external SMA interface are suited when large antennas are desirable to cover larger areas or long distances.

PERFORMANCE
Once a minute a packet is sent by the repeater with information about the repeater, such as number of routed packets and current battery level. This packet is used for time synchronizing between repeaters in a multihop system and can also be used as an indication that a repeater is fully functional.

Our battery powered repeaters use a high performance lithium battery to ensure longest possible battery lifetime. For example, the expected battery lifetime for our standard repeater with default configuration is 5 years and can be made even longer with minor configuration changes.

Our repeaters are highly immune to electrical disturbances that could be generated by, for example, LED lights, and our long-range repeaters models comes with industrial grade immunity.

ROUTING
Our 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. To retransmit from other repeaters, simply use our transparent static routing algorithm which allow controlled static routing between repeaters - This allows up to four repeaters 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. Our repeaters can also be configured to retransmit non-OMS wireless M-Bus packets.

CONVERTER
The repeater can be used to convert between different wireless M-Bus modes, for example, C-mode to S-mode.

FEATURES
The repeater supports 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.

It is possible to configure a repeater for untouched retransmission, i.e., retransmits without changing anything in the packet.

All repeaters from Lansen are firmware upgradeable to ensure long-term reliability and to get the newest features.

CONFIGURATION
All repeaters can be used right out of the box and are highly configurable to fit specific needs. Configuration is easiest with a Lansen Wireless M-Bus programming dongle together with our program, Lansen Configurator. However, our repeaters can just as easily be configured using other wireless M-Bus transmitters, such as, gateways.

With Lansen Configurator it is easy to view routing between repeaters and how well repeaters hear meters.

The list below displays 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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FIRMWARE

INPUT MODE	T/C-mode (default) or S-mode (max bit rate error ± 3%)
OUTPUT MODE	C-mode (default) or T-mode or S-mode
REPETITION	2 times* - Once on each internal 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
MULTIHOP SUPPORT	R4/RX4: Yes uR: Partly**

GENERAL INFORMATION

POWER SUPPLY	M: 85-305 VAC R4-B: 2xER34615***, 38Ah, 3.6V BE: 2xER34615***, 38Ah, 3.6V + supercap uR-B: 2xER18505****, 7.8Ah, 3.6V
STANDARDS	2014/53/EU (RED) EN 13757-3/4:2013, OMS 4.0.2***** EN 61000-6-1 (R4/uR, 3V/m) EN 61000-6-2 (R4-LR/RX4, 10V/m)
TEMPERATURE	M: Max: -35°C/+85°C, rec. -30°C/+50°C B: Max: -20°C/+85°C, rec. 0°C/+50°C BE: Max: -35°C/+85°C, rec. -30°C/+50°C

*Models with external antenna send twice on the same antenna
**Works in multihop systems if placed closest to meters, doesn't work between uR
***Lithium < 5g/cell, UN3091 class 9
****Lithium < 1g/cell, UN3091 limited quantity
*****Retransmit delay time 24-148 ms
******Enhanced filtering
*******The expected battery lifetime stated is based on simulations and true measurements at the stated recommended temperatures and is valid to the best of our ability but not a guarantee. The calculations and measurements can be sent upon request for your reference and measurements can be sent upon request for your reference.

RADIO

RECEIVER CLASS	1.5 for µR/R4, 2 for R4-LR/RX4
OUTPUT POWER	Radiated/conducted power 868.95 T/C-mode, 868.3 S-mode < 14 dBm
TRANSMISSION	Listen before talk, polite spectrum access
HARDWARE FILTER	For LTE/GSM/GPRS and other disturbances: R4/µR: No R4-LR: Yes RX4: Yes (Enhanced)

ENCLOSURE

DIMENSIONS	A1/A2: 150x150x53 mm, uR: 80x80x25 mm
IP-CLASSIFICATION	uR-B: IP40 M: IP40 (A1), IP65 (A2) B(E): IP40 (A1) B(E): IP65 (A2), external antennas B(E): IP67 (A2), internal antennas
COLOR	A1/A2: RAL 9003 (signal white) uR: White
MATERIAL	A1/A2: UV-resistant PC/ABS uR: ABS
FLAMMABILITY RATING	A1/A2: UL 94 HB uR: Self-extinguishing

ACCESSORY

LAN-WMBUS-D2-TC	Configuration dongle
LANSEN CONFIGURATOR	Configuration software
LAN-A-PMB-KIT-ID58-78	Pole mounting kit
LAN-MAG-R4	Magnet with telescopic shaft
LAN-R4-IP-KIT	Sealing kit for A2 enclosure

OPTIONS FOR LAN-WMBUS-R4 REPEATER

LAN-WMBUS - SERIES - POWER OPTION - RECEIVER SENSITIVITY - ENCLOSURE IP-CLASS - ANTENNA TYPE

SERIES	POWER OPTION	RECEIVER SENSITIVITY	ENCLOSURE IP-CLASS	ANTENNA TYPE
R4 Standard repeater	**B** 3.6V/38Ah	**(Blank)** Standard sensitivity	**A1** IP40. Suited for indoor use	**(Blank)** Dual internal antenna
	BE 3.6V/38Ah+supercap for extended use in lower temperatures	**LR** Industrial grade immunity and improved receiver sensitivity for optimal robustness and range	**A2** IP65 & IP67. Suited for indoor and outdoor use	**X** SMA connector for external antenna
	M 230 VAC			

	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-B-LR	X	X	X		-111/-108	Daily	20 min/day = 10 years	Indoor multi-floor building with better range
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-R4-M-LR		X	X		-111/-108	Always on		Indoor multi-floor building with better range
LAN-WMBUS-R4-M-LR-X			X	1 TX/RX	-111/-108	Always on		Outdoor for long range in one direction
LAN-WMBUS-RX4-M-LR-X			XX******	1 TX + 1 RX	-113/-110	Always on		Outdoor for longest range in one direction

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