# LANSEN
Repeater RX4 series

**LAN-WMBUS-RX4-M-LR-A1/A2-X**

## DEVICE
This mains powered wireless M-Bus repeaters from Lansen is a high performance, highly configurable plug-and-play device used for extending the range between meters and a collector/ gateway and it is designed to cover large areas. The enclosure is chosen to make the repeater as discrete as possible.

## 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.

## 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.

The RX4-repeater is highly immune to electrical disturbances such as GPRS and Wi-Fi, thanks to industrial grade immunity.

Since only high performance components are used, the repeater achieves a sensitivity of typically -113 for S-mode or -110 for T-mode and C-mode.

## 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
Our 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, 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)

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## FIRMWARE

| | |
|---|---|
| INPUT MODE | T/C-mode (default) or S-mode |
| OUTPUT MODE | C-mode (default) or T-mode or S-mode |
| REPETITION | 2 times* - Once on each internal antenna<br>*Models with external antenna send twice on the same antenna |
| MAX SENSORS | R4/RX4 = 932 sensors<br>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<br>uR: Partly (Works in multihop systems if placed closest to meters) |

## GENERAL INFORMATION

| | |
|---|---|
| POWER SUPPLY | M: 85-305 VAC<br>R4-B: 2xER34615*, 38Ah, 3.6V<br>BE: 2xER34615*, 38Ah, 3.6V + supercap<br>*Lithium < 5g/cell, UN3091 class 9<br>uR-B: 2xER18505**, 7.8Ah, 3.6V<br>**Lithium < 1g/cell, UN3091 limited quantity |
| STANDARDS | 2014/53/EU (RED)<br>EN 13757-3/4:2013, OMS 4.0.2*<br>*retransmit delay time 24-148 ms<br>EN 61000-6-1 (R4/uR, 3V/m)<br>EN 61000-6-2 (R4-LR/RX4, 10V/m) |
| TEMPERATURE | M: Max: -35°/+85°, rec. -30°/+50°<br>B: Max: -20°/+85°, rec. 0°/+50°<br>BE: Max: -35°/+85°, rec. -30°/+50° |

## RADIO

| | |
|---|---|
| RECEIVER CLASS | 1,5 for µR/R4, 2 for R4-LR/RX4 |
| OUTPUT POWER | Radiated/conducted power<br>868,950 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:<br>R4/µR: No<br>R4-LR: Yes<br>RX4: Yes (Enhanced) |

## ENCLOSURE

| | |
|---|---|
| DIMENSIONS | A1/A2: 150x150x53 mm,<br>uR: 80x80x25 mm |
| IP-CLASSIFICATION | A1/uR: IP40<br>A2: IP65 & IP67 |
| COLOR | A1/A2: RAL 9003 (signal white)<br>uR: White |
| MATERIAL | A1/A2: UV-resistant PC/ABS<br>uR: ABS |
| FLAMMABILITY RATING | A1/A2: UL 94 HB<br>uR: Self-extinguishing |

## ACCESSORY

| | |
|---|---|
| LAN-WMBUS-D1-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-RX4 REPEATER

| LAN-WMBUS | - | SERIES | - | POWER OPTION | RECEIVER SENSITIVITY | - | ENCLOSURE IP-CLASS | ANTENNA TYPE |
|---|---|---|---|---|---|---|---|---|
| | | RX4<br>High performance repeater with two external antennas, one for receiving and one for transmitting | | M<br>230 VAC | LR<br>Industrial grade immunity and improved receiver sensitivity for optimal robustness and range | | A1<br>IP40. Suited for indoor use | X<br>Two SMA connector for external antennas |
| | | | | | | | **A2**<br>IP65 & IP67. Suited for indoor and outdoor use | |

| | 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<br>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<br>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 |

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*Enhanced filtering
**The expected battery lifetime stated is based on simulations and true measurements at 25 C° 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.