

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, 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



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 *Models with external antenna send twice on the same antenna |
| MAX SENSORS | R4/RX4 = 932 sensors μ R = 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 (Works in multihop systems if placed closest to meters) |

GENERAL INFORMATION

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

RADIO

| | |
|-----------------|--|
| RECEIVER CLASS | 1,5 for μ R/R4, 2 for R4-LR/RX4 |
| OUTPUT POWER | Radiated/conducted power 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: R4/ μ R: No R4-LR: Yes RX4: Yes (Enhanced) |

ENCLOSURE

| | |
|---------------------|---|
| DIMENSIONS | A1/A2: 150x150x53 mm, uR: 80x80x25 mm |
| IP-CLASSIFICATION | A1/uR: IP40 A2: IP65 & IP67 |
| 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-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-R4 REPEATER

| LAN-WMBUS | 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 | | | |

| *Enhanced filtering ** In normal operating temperature | Battery | Dual Internal antenna | LTE/GSM filter | External SMA interface | Typ. sensitivity mode S/TC | Target app. | Typical lifetime expectancy** | Optimized for |
|---|---------|-----------------------|----------------|------------------------|----------------------------|-------------|--|--|
| LAN-WMBUS- μ R-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 |