Clearview Intelligence
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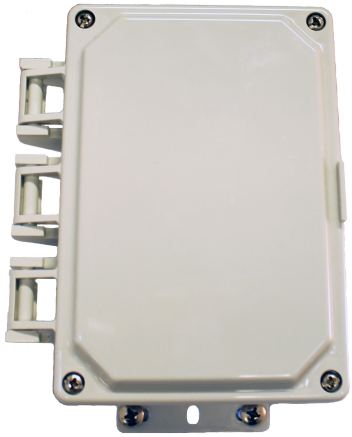
Product Specification
M115 Flex
Repeater Unit

M115 Flex Repeater Unit



In cases where installed M100 sensors are out of range of the nearest access point, one or more M115 repeater units can be used to provide a two-way relay between the out of range sensors and the access point. A repeater is pole mounted by the roadside and is positioned so that both the sensors and the tandem repeater or access point are within the view and within range.

The M115 Flex Repeater is a single pole mounted battery powered repeater with a 7-year life. As a battery powered standalone unit there is no need for cabling, ducting or wiring. This version of the repeater represents significant advantages over the previous model, as the repeater is housed in a robust enclosure that provides IP65 protection.

The M115 Flex battery powered repeater has a connector for an external antenna, allowing for greater flexibility in providing a two-way relay between sensors and the access point.

Functions / Features

Relay of radio communications

- To / from wireless sensors (downlink)
- To / from access points (uplink)
- To / from another repeater (uplink or downlink)

Extension of range and coverage of the access point

- Tandem operation – one repeater and its supported sensors can communicate with another repeater and then to the access point.
- Maximum single-hop range of 400m with a long range external antenna.
- Maximum single-hop range of 35m from sensors with a long range external antenna.

Fully wireless operation – no cable connections

Radio signal quality measurements (of each link to wireless sensors or tandem repeater)

- Receive signal strength indicator (RSSI in dBm)
- Link quality index (LQI, figure of merit 40-99)

Enclosure

- Provides IP65 protection

Simple installation

- Any roadside location that provides adequate height and line of sight to sensors and the access point or repeater
- External connector and indicator to activate unit
- No special requirements regarding setback, relative angle of the sun or mounting stability

No calibration or adjustment required

Firmware upgrades over-the-air from access point

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Product Specification
M115 Long Life
Repeater Unit

Functional Specifications

Interfaces	To/from sensors via 802.15.4 PHY radio To/from repeaters via 802.15.4 PHY radio To/from access point via 802.15.4 PHY radio
Over-the-air protocol	Custom TDMA protocol
Physical layer protocol	IEEE 802.15.4 PHY
Modulation	Direct Sequence Spread Spectrum Offset Quadrature Phase-Shift Keying (DSSS O-QPSK)
Transmit/ receive bit rate	250 kbps
Frequency band	2405 to 2480 MHz (ISM unlicensed band)
Frequency channels	16
Channel bandwidth	2 MHz
Internal antenna type	Microstrip patch antenna (behind front face panel)
Antenna field-of-view	+60º (Azimuth & elevation)
Nominal output power	+3 dBm
Spurious emissions	30-1000 MHz: <-36 dBm 1-12.75 GHz: <-30 dBm 1.8-1.9 GHz: <-47 dBm 5.15-5.3 GHz: <-47 dBm
Typical receive sensitivity	-101 dBm (PER < 1%)
Saturation (Max input level)	> 10 dBm

Power, Physical & Environmental

Power Supply	Li-SOCl2 3.6V battery pack Nominal capacity 171 Ah
Recommended system replacement/ battery unit	Battery replacement every 7 years
Dimensions	7.75”x 6.5”x 5.37” (19.68cm x 16.51cm x 13.65cm)
Weight	3.93 lb (1.78 Kg)
Environmental	Designed for weatherproof, outdoor operation NEMA type 4 enclosure IP65 ingress protection
Operating Temperature	-40ºF to +176ºF / -40ºC to +80ºC

Compliance

Safety	2006/95/EC
EMC	FCC: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and, (2) this device must accept any interference received, including interference that may cause undesired operation. CE0678 2004/108/EC

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