

Mi.Net Repeaters

Features

OVERVIEW: Repeater components of the **Mi.Net[®]** Mueller Infrastructure Network for Utilities provide a bridge between **Mi.Node** devices and the **Mi.Hub** collector, increasing the maximum distance between the meter and the collector. Multiple repeaters can be installed to further extend the range. Implementing these repeaters reduces the network cost and complexity.

REAL TIME DATA: The repeaters periodically collect data retrieved from each **Mi.Node** within its range before forwarding the data to an upstream **Mi.Hub** data collector or to other repeaters. The repeaters can also be instructed to retrieve “On Demand” meter readings in real-time from one or all meters in their range when a user requests them, offering true two-way communication between the user and all meters in the network.

SECURE AND ROBUST: The innovative repeater design provides robust multi-path RF coverage and is capable of storing **Mi.Node** data for surrounding meters in internal memory and transmitting it to other devices within the **Mi.Net** System, such as the **Mi.Hub** and other nearby repeaters or nodes. All communications are protected with advanced encryption algorithms to ensure data privacy and prevent intrusion.

Benefits

- Enhances access to information about water and electric utilization and increases operational efficiency
- Reduces operating cost and dramatically decreases installation and maintenance expense by reducing backhaul requirements
- Facilitates instant remote access to usage and demand data
- Large data capacity provides weeks of data storage across thousands of meters
- Seamless interoperability with all existing **Mi.Net** devices
- Backup battery keeps system fully operational even during power outages
- Optional solar photovoltaic module eliminates need for external power

Repeater products provide a versatile and robust network across all areas of the community.



MI.NODE OWL: The Owl infrastructure repeater conveniently installs in existing street lights, minimizing installation complexity and cost. The Owl repeater takes advantage of the daylight sensor's available power source and utilizes this existing socket without hindering the sensor's operation. The Owl requires no dedicated wiring for installation and is unobtrusive in appearance, completely blending into the existing neighborhood landscape. The Owl repeater is built in a weatherproof enclosure for robust, all-season operation.



MI.NODE AC REPEATER: This AC-powered repeater installs onto virtually any solid surface, such as a pole, wall or tower. It is powered by an external AC power source. It also contains an internal backup battery pack for operation during short power outages. The repeaters are housed in weather proof enclosures for robust, all-season operation.



MI.NODE DC REPEATER: This DC-powered repeater installs onto virtually any solid surface, such as a pole, wall or tower. It is equipped with a high-capacity battery pack, providing an exceptionally long lifetime of 10-15 years between battery replacements. It incorporates multiple vapor barriers such as a weather proof enclosure, coated electronic board and potting compound, all of which eliminate moisture intrusion in even the harshest environments.



MI.HYDRANT XR: The **Mi.Hydrant XR** consists of an enclosed, weatherproof transceiver that is unobtrusively fixed under the rim of the most common fire hydrants. The repeater does not hinder the hydrant's operation and comes equipped with an extended range high-gain antenna, which provides a dual function as a hydrant marker during extreme snow and weather related events. **Mi.Hydrant XR** is equipped with a high-capacity battery pack providing an exceptionally long lifetime of 10-15 years. The **Mi.Hydrant XR** unit incorporates multiple vapor barriers such as a weather proof enclosure, coated electronic board and potting compound, all of which eliminate moisture intrusion in even the harshest environments.



MI.HYDRANT: Mi.Hydrant is a small repeater component that is completely embedded within the pumper cap of standard-sized fire hydrants and is completely invisible to the landscape. It is a self-contained system equipped with a battery pack and antenna encased in a pumper cap that replaces pumper caps of existing hydrants. It does not alter the operation of the fire hydrant, and incorporates multiple vapor barriers which help eliminate moisture intrusion. It is best utilized in areas where **Mi.Node** devices are in relatively close proximity to fire hydrants.

See Specifications on next page

Specifications:

(Specifications subject to change)

	Mi.Node Owl	Mi.Node AC Pole Mount	Mi.Node DC Pole Mount	Mi.Hydrant XR	Mi.Hydrant
POWER					
Power Dissipation	>1W typical, 5W max	>1W typical, 5W max	<0.01 W typical when idle; <3 W typical when transmitting	<0.01 W typical when idle; <3 W typical when transmitting	<0.01 W typical when idle
Power Source	AC Line Voltage; 110-277 VAC; 60/50Hz Internal battery backup for up to 8 hours operation during outage	AC Line Voltage; 110-277 VAC; 60/50Hz; Internal battery backup for up to 8 hours operation during outage	Sealed Lithium battery pack. Minimum 10 years battery life	Sealed Lithium battery pack. Minimum 10 years battery life	Sealed Lithium Ion battery pack. Minimum 5 years battery life
PHYSICAL					
Dimensions	6" x 5.5" x 4.5" (15.2 cm x 14.0 cm x 11.4 cm) Light Sensor: 2" x 5.5" x 4.5" (6.8 cm x 14.0 cm x 11.4 cm)	5.0" x 5.0" (12.7" cm x 12.7 cm) x 3.0" (7.6 cm) Power cable : 3 conductor 16 AWG RF cable: LMR240 with type N male connectors	10.5" x 5.0" x 3.5" (26.7 cm x 12.7 cm x 8.9 cm) Antenna : 54.0" tall (137.2 cm) x 0.75" diameter (1.9 cm)	10.5" x 5.0" x 3.5" (26.7 cm x 12.7 cm x 8.9 cm) Antenna : 54.0" tall (137.2 cm) x 0.75" diameter (1.9 cm) with a 4.0" diameter spring base (10.2 cm)	3.75" (9.5 cm) diameter x 4.0" (10.1 cm) deep Embedded antenna
Color	Grey polymer	White polymer	Grey powder coating	Grey powder coating	Fire Hydrant Red
Weight	1.2 lbs (0.5 kg) Light sensor: 0.2 lbs (0.1 kg)	1.0 lb (0.5 kg) (without antenna & bracket) 5.5 lbs (2.5 kg) (with antenna & bracket)	5.0 lbs (2.3 kg) (without antenna & bracket) 9.5 lbs (4.3 kg) (with antenna & bracket)	5.0 lbs (2.3 kg) (without antenna & bracket) 9.5 lbs (4.3 kg) (with antenna & bracket)	<0.5lb, without pumper cap
I/O	None	Green AC; Power Led	None	None	None
RF RADIO					
Frequency	915MHz ISM Band Operation Frequency Hopping/Spread Spectrum Operation				
Output Power	1W Transmit				
Antenna	External 2.5 dBi Antenna, included	External 3.0 dBi Antenna, included	External 2.5 dBi Antenna, included	External 4.0 dBi Antenna, included	Internal
Approximate Range	2 miles, typical configuration. Up to 3 miles, potential direct line of sight to MiHub XR-R device				1500 feet, typical
ENVIRONMENTAL	-30 to +70°C Operating; -40 to +85°C Storage; 5 to 95% Relative Humidity NEMA-4 Weather Proof Enclosure				
DATA	Collect and store data from up to 2000 meters, 2MB Solid-state Flash Memory for dedicated storage of readings Mesh protocol with up to 5 Redundant Links Packet data up to 28.8 kbps , End-to-end 128bit RC4 encryption Infrastructure or ad hoc networking ICMP and SNMP for remote diagnostics and monitoring Remote configuration capability				
CERTIFICATIONS	CC 47 Part 15, Unintentional Radiators UL/TUV 61010, CSA-C22.2 Compliant ANSCI C136.10-2010 IC RSS-210 FCC 47 CFR Part 15.247				