



RADIO FREQUENCY METER INTERFACE UNITS

WATER



SPECIFICATIONS

METER INTERFACE UNIT (MIU) - WATER

The MIUs must be compact electronic devices connected to the water meters. They shall interrogate the encoder register and transmit the meter reading and other information to a remote reading device. They shall be compatible with Neptune and Sensus absolute encoder registers. The same RF MIUs must be capable of being read by a walk-by handheld computer equipped with an RF receiver, a mobile system with an RF receiver mounted in a vehicle, and/or a targeted fixed network data collection system. This shall allow an easy migration between the three meter reading systems without any change to the MIU devices or revisiting the site. The MIUs shall be attached to new meters, or they shall retrofit existing meters in the field. The MIUs shall be manufactured in both wall and pit models. The wall MIU shall have the ability to be mounted in a basement or on the outside of a house and the pit MIU shall have the ability to be mounted in a pit or an underground vault. The wall MIU shall have a water resistant enclosure and the pit MIU shall be a fully potted submersible design.

PHYSICAL / MECHANICAL REQUIREMENTS

- Wall Unit
 - The MIU housing shall be constructed of a polycarbonate plastic compound and be capable of mounting both indoors and outdoors on wall or pole or attached directly to the meter. The device must be water-resistant and capable of exposure to spray and splash. The device must be able to withstand a 200-hour salt fog test as specified in NEMA 4 standard.
 - The device shall provide a location for a tamper deterrent seal. Tampering with the device functions or connections shall not be possible without causing visible damage to the device exterior or to the seal.
 - The device shall be capable of operating at temperatures of -22°F to 149°F (-30°C to +65°C) with a humidity factor of 0 to 95% non-condensing.
 - The circuit board and the battery will be protected by a potting material.
 - The unit must retrofit to existing installations.
 - The MIU device must be protected against static discharge without loss of data per IEC 801-2, issue 2.
- Pit Unit
 - For pit or vault applications, the MIU antenna shall be designed to be installed through the industry standard 1-3/4" hole in the pit lid with no degradation of transmission range. The MIU antenna unit will be capable of mounting to various thicknesses of pit lids from 1/2" to 2-1/2".
 - The device shall be capable of operating at temperatures of -22°F to 149°F (-30°C to +65°C) and operating humidity of 0 to 95%.
 - The range will not be affected when the pit is flooded.
 - The circuit board and the battery will be protected by a potting material.
 - The antenna shall be made of a metallic and polymer material to withstand traffic and shall have a dual seal connection to the MIU housing.
 - The MIU device must be protected against static discharge without loss of data per IEC 801-2, issue 2.

OPERATION SPECIFICATIONS

- The MIU shall operate within FCC Part 15.247 regulations for devices operating in the 902 MHz to 928 MHz unlicensed band. The output power of the devices will be governed by their conformance with these relevant FCC standards.
- To minimize the potential for RF interference from other devices, the MIU shall transmit using the Frequency-Hopping, Spread-Spectrum technique comprised of alternating pseudo-random frequencies within the 902 MHz to 928 MHz unlicensed band.
- For ease of implementation, the system shall not require any special licensing, including licenses from the FCC. The system must, therefore, operate in the 902 MHz to 928 MHz unlicensed band.
- The system must be expandable at any time without getting authorization from the FCC.
- No wake-up tone shall be necessary.

- No MIU programming shall be necessary for installation.
- Power shall be supplied to the MIU by a lithium battery with capacitor. The Vendor shall warrant that any battery provided and installed in the MIUs by the Vendor shall be free of manufacture and design defects for a period of twenty (20) years – the first ten (10) years from the date of shipment from factory without prorating, and the second ten (10) years with prorating, as long as the MIU is working under the environmental and meter reading conditions specified.
- The batteries shall be field replaceable and be designed for minimum twenty (20) years life expectancy. The MIU shall not require reprogramming if the battery discharges before it is replaced.
- The number of radio-based meter reads performed must not affect the battery life.
- The battery life shall not be affected by outside erroneous wake-up tones (i.e., other water, gas, or electric utilities reading and therefore sending out a wake-up tone).
- For reliability and meter reading integrity, the vendor shall be the sole manufacturer of the different components of the system (water meters, RF MIUs, meter reading equipment, and meter reading software), and provide a turnkey system offering to the utility.
- The MIU shall not send readings older than an hour. In the event of a cut wire, the MIU shall not send the last good read, as it can lead to mis-billing. The MIU shall transmit a trouble code in lieu of the meter reading.
- Tamper – If wiring has been disconnected, a “non-reading” shall be provided indicating wire tamper; a reading that gives the last available reading is an incorrect reading.
- The MIU shall transmit the meter reading continuously at a predetermined transmission interval for a single encoder register configuration and alternate transmissions with two networked Neptune encoder registers to maximize battery life.
- Each device shall have two unique pre-programmed identification numbers of 10 characters (meter (1) = HI side and meter (2) = LOW side). ID numbers will be permanent and shall not be altered. Each device shall be labeled with the ID number in numeric and BAR code form. The label shall also display FCC approval information, manufacturer’s designation, and date of manufacture.
- The MIU shall transmit the encoder meter reading and a unique MIU ID number.
- The MIUs must be capable of reading two networked Neptune encoder registers at one time.
- The MIU shall interface to Neptune ARB® III, IV, V, ProRead™ (ARB VI), E-Coder™ (ARB VII), or Sensus ECR® II & III (when programmed in ECR II 6-digit format) absolute encoder registers via a 3-conductor wire without need for special configuration to the MIU.
- The MIU shall be mounted per the manufacturer’s installation instructions.
- The handheld reading equipment shall provide a test mode to verify proper operation of the MIU by displaying the MIU ID number and meter reading.
- The MIU shall be capable of being received by either a handheld receiver, mobile receiver, or targeted fixed network receiver without special configuration or remanufacture.

Neptune Technology Group Inc.

1600 Alabama Highway 229
Tallahassee, AL 36078
USA
Tel: (800) 645-1892
Fax: (334) 283-7299

Neptune Technology Group (Canada) Ltd.

7275 West Credit Avenue
Mississauga, Ontario
L5N 5M9
Canada
Tel: (905) 858-4211
Fax: (905) 858-0428

Neptune Technology Group Inc.

Ejército Nacional No. 418
Piso 12, Desp. 1201-1202
Col. Chapultepec Morales
Delegación Miguel Hidalgo
11570 México, Distrito Federal
Tel: (525) 55203 5294 / (525) 55203 5708
Fax: (525) 55203 6503

