



MiNode-Water6
Installation Manual

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FCC Information:

Changes or modifications not expressly approved by the Mueller Systems could void the user's authority to operate the equipment.

IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

“NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

IC Information

This equipment complies with RSS-102 radiation exposure limits set forth for an uncontrolled environment and meets the RSS-102 radio frequency (RF) exposure guidelines. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body.

This device contains license-exempt transmitters/receivers that comply with Innovation, Science and Economic Development Canada's license-exempt RSS standards. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause the undesired operation thereof.

Cet équipement est conforme aux limites d'exposition aux radiations RSS-102 établies pour un environnement non contrôlé et répond aux directives d'exposition aux radiofréquences (RF) RSS-102. Cet équipement doit être installé et utilisé en maintenant le radiateur à au moins 20 cm ou plus du corps de la personne.

Cet appareil est conforme aux normes RSS exemptes de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences pouvant entraîner un fonctionnement indésirable.

Integration Instructions for Modular Transmitter

1. Hardware Integration:

- Power Supply Regulation:

The modular transmitter (FCC ID: SM6-MINODE6A) is authorized as a limited module and does not have its own power supply regulation. It requires the host equipment to supply a regulated 3.6V supply. Ensure that the host equipment complies with power supply requirements to ensure proper operation of the modular transmitter.

2. RF Exposure Considerations:

- RF Exposure Compliance:

- The modular transmitter must comply with FCC regulations regarding RF exposure.

- Separation Distance:

- Ensure that the antenna used with the modular transmitter is installed to provide a separation distance of at least 20 cm from all persons, as per FCC RF exposure guidelines.

- Co-location Restrictions:

- Do not co-locate the modular transmitter with any other antenna or transmitter, as this may affect RF exposure levels and compliance with regulatory requirements.

3. Labeling Instructions:

- The integrator shall follow the instructions detailed in Clause 5 and 6 of this manual.

1. Introduction

The Mueller Systems MiNode-Water6 is intended for indoor and outdoor use as an unattended Advanced Metering Infrastructure (AMI) and control device. The MiNode-Water6 is fully self-contained and battery powered device with no user-accessible controls.



The MiNode-Water6 for Residential Metering (“MiNode-Water6”) is a device that incorporates a microcontroller, 915MHz ISM band transceiver (simplex operation), and battery (DC power supply) for the purpose of logging and forwarding water meter readings to the Mueller Systems servers. The readings are forwarded to server via other MiNode-Water6 devices or repeaters, Mi.Hub data collectors, or a LoRaWAN network at assigned times. The MiNode-Water6 will also autonomously send messages to the server when various events or alert conditions are detected, such as potential leak or theft of service.

Meter reading interval is remotely settable. Information retrieved from the meters’ registers are temporarily stored within the Mi.Node solid-state memory. On a specified interval, the MiNode-Water6 will automatically transmit this information to the Mueller Systems AMI server via other meters or Mi.Hubs using the Radio Frequency (RF) network. The Mueller Systems AMI server analyzes and archives the readings.

The contents of this installation manual are intended for technically qualified personnel of water and energy distribution utilities who have been trained and are technically qualified in local safety procedures for installation of the device.

2. Construction

The MiNode-Water6 product consists of a printed circuit board which is encapsulated to provide complete protection against shock and water intrusion. The enclosure is made of UV-stable, high density thermoplastic and is completely waterproof. The UV-stable, thermoplastic housing design provides a compact, waterproof enclosure that is lightweight and easy to handle and install. The MiNode-Water6 has integral mounting brackets for both pit and wall installations. One lithium primary battery with 3.6V nominal voltage provides plenty of power for reading the register and sending RF data.

- In order to protect the AMI device electronics from moisture ingress the design incorporates the use of thermoplastic injection molded housings, rubber seals, a potting compound that completely encases the internal electronics and a coated circuit board which combine to provide a formidable barrier of protection against water intrusion.
- Internal wire strain relief has been built into the housing to protect the wire connections against damage. Please note that meters or registers should never be carried while supported only by the Mi.Node-Water 6 transmitter or wiring.
- A monopole antenna is located in the upper housing to provide powerful RF communication.
- A single lithium primary battery with 3.6V nominal voltage is located in the lower housing which provides power for register interrogation and data transmission for a calculated battery life of up to 20 years.

- There are no customer serviceable parts inside the Mi.Node-Water6 housing. Batteries are not replaceable.
- The electronic design utilizes the latest RF microchip technology which increases reliability when compared to older RF designs.

3. Installation

MiNode-Water6 modules support two mounting options, either mounting to a ½" PVC pipe for pit set installations or affixed to the side of a building. Pit set installations require no drilled holes through the lid and are mounted beneath the polymer meter box lid for security and ease of installation on PVC pipe. Surface mounts are easily accomplished with the integral mounting brackets and two screws (not included).

To comply with FCC RF exposure compliance requirements, the MiNode-Water6 modules must be installed to provide a separation distance greater than 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

3.1 Pit Set Installation

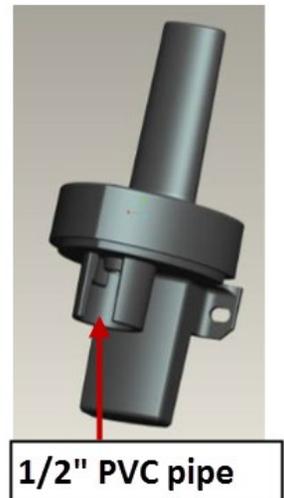
⚠ Please note that meters or registers should **never** be carried while supported only by the AMI transmitter or wiring.

Tools Required: Length of ½" PVC pipe for pit depth, hammer

1. PVC pipe should be cut to the proper length and installed deep enough in the floor of each meter box that subsequent flooding will not allow the stake and Mi.Node-Water6 to change position. The Mi.Node-Water6 includes a ½" female PVC pipe fitting for easy pit installation.
2. For maximum radio performance, once installed, the top of the transmitter should be located approximately ½" inch below the pit lid in the center of the meter box to maximize RF performance.
3. Once the PVC stake is installed, the Mi.Node-Water6 should be pushed down onto the stake by hand until the interference fit engages securely. Two solid stops are molded into the PVC Installation Slot in order to prevent the wire from being pinched when installed.

⚠ **Never hammer MiNode-Water6 onto the stake** since this may result in damage to the electronic components inside the unit.

4. Always mount the MiNode-Water6 in a vertical orientation, with the antenna compartment on top and the battery compartment on the bottom.



3.2 Exterior Wall Mounting

⚠ Tools required: 1 – 1 1/2 inch galvanized, or stainless wood or sheet metal screws (2 per), Phillips screwdriver

1. The open ended wire from the device permits routing through interior walls for external wall mounting when required or direct mounting to exposed floor joists above grade level.
2. MiNode-Water6 can be directly mounted to almost any flat surface by using the holes shown and common screws in most instances.
3. Vertical orientation of the device is required to maximize RF performance.



3.3 Wiring

Tools Required: 3M-2Y connectors, splitting tube, and a 3M Crimping Tool

MiNode-Water6	Red	Green/White	Black
Translator Register	Red	Green/White	Black
Badger ADE Register	Red	Green	Black
Sensus ECR and ICE Registers	Red	Green	Black
Neptune PRORead, AUTORead, E-Coder Registers	Black	Red	Green

Table 1. Mi.Node-Water6 Meter Interconnect

3.4 Verification

Following installation the Mi.Tech Hand-held should be used to verify proper installation and operation. Please refer to the Mi.Tech manual.

4. Maintenance

There are no user serviceable items within a MiNode-Water6. The battery is sealed within the module and is not replaceable. No cleaning is required.

5. Product Labeling

5.1 Product and FCC/IC Identification

This label is affixed to the face of the MiNode-Water6 unit. This allows the installer to easily scan the label with the Mi.Tech handheld computer during the installation process. This label includes the Date of Manufacture, the Hardware Version and the MiNode-Water6/Serial Number (Node ID) that is used to uniquely address the device and Assembled in USA. The FCC ID is SM6-MINODE6A.

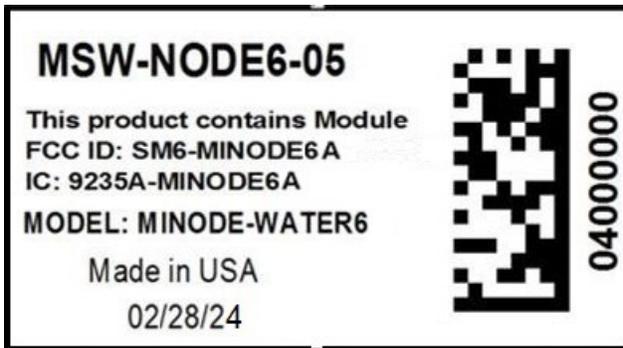


Figure 1. Sample Product Identification Label

5.2 IC Information

This AMI transmitter model operates in the license exempt 902 MHz to 928 MHz ISM band and is certified for operation in Canada. The IC ID is 9235A-MINODE6A. Information pertaining to the certification can be found on the web at <http://www.ic.gc.ca/eic/site/ceb-bhst.nsf/eng/home>.

6. Label Generation by Manufacturing

The manufacturing should follow the Unit Label spec to create the product label.

MiNode6 RADIO FINISHED GOODS LABEL, 130-0034-005