



Mi.Node - Water
Installation Manual

880-0037-001

Document Rev 0.2



Document Information

Title:	MI.NODE - WATER (Mi.Node Water) Installation Manual
Version:	0.2
Created:	05/28/2009
Last Modified On:	05/29/2009
Author:	Tom Cullinan
Technical Lead:	
Contributors:	

Revision History

Version	Date	Author	Comments
0.1	05/28/09	TC	<ul style="list-style-type: none"> Initial draft, submitted for review
0.2	05/29/09	TC	<ul style="list-style-type: none"> Incorporated comments from review, changed product name to Mi.Node - Water
			<ul style="list-style-type: none">

Reviewers

Reviewed By	Title	Date Reviewed

Table of Contents

1.	Introduction	1
2.	Construction	1
3.	Installation	2
3.1	PIT SET INSTALLATION	2
3.2	EXTERIOR WALL MOUNTING	2
3.3	WIRING	3
3.4	VERIFICATION	3
4.	Maintenance	3
5.	Product Labeling	3
5.1	PRODUCT IDENTIFICATION	3
5.2	FCC IDENTIFICATION	4

Table of Tables

TABLE 1.	MI.NODE - WATER METER INTERCONNECT	3
----------	--	---

Table of Figures

FIGURE 1.	PRODUCT IDENTIFICATION LABEL	3
FIGURE 2.	MI.NODE - WATER FCC LABEL	4

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.

"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.

1. Introduction

The Mueller Systems MI.NODE - WATER is intended for indoor & outdoor use as an unattended automatic metering Infrastructure (AMI) & control device. The MI.NODE - WATER is fully self-contained and battery powered device with no user accessible controls.



The MI.NODE - WATER for Residential Metering (“MI.NODE - WATER”) is a device that incorporates a microcontroller, 915MHz ISM band 2-way radio (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 MI.NODE - WATER, Mi Gates, or SmartMeter at assigned times. The MI.NODE - WATER will also autonomously send messages to the server when various events or alert conditions, such as potential leak or theft of service, are detected.

Meter reading interval is remotely settable. Information retrieved from the meters registers are temporarily stored within the MI.NODE - WATER’s solid-state memory. On a specified interval, the MI.NODE - WATER will automatically transmit this information to the Mueller Systems AMI server via. other meters or Mi.Gate 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 MI.NODE - WATER product consists of a compact 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 MI.NODE - WATER has integral mounting brackets for both pit and wall installations. One D size lithium battery 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 incases 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 transmitter or wiring.
- A monopole antenna is located in the upper housing to provide powerful RF communication.
- A single D cell long life Lithium battery 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 - WATER 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

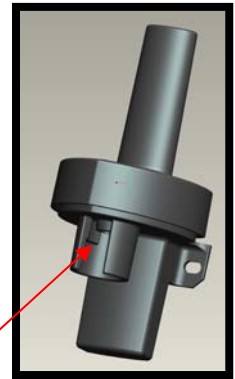
MI.NODE - WATER modules support two mounting options, either mounting to a ½" PVC pipe for pit set installations or affixed to the side of a building. Pit set installations require no drilled holes through the lid and are mounted beneath the polymer meter box lid for security and ease of installation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

3.1 Pit Set Installation


 Please note that meters or registers should **never** be carried while supported only by the AMR 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 - WATER to change position. The MI.NODE - WATER 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 - WATER 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.



½" PVC

 **Never hammer MI.NODE - WATER onto the stake** since this may result in damage to the electronic components inside the unit.

3.2 Exterior Wall Mounting

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

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. Mi.Node - Water can be directly mounted to almost any flat surface by using the holes shown and common screws in most instances.



Mounting Holes

- 3. Orientation of the device vertically is required to maximize RF performance.

3.3 Wiring

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

MI.NODE - WATER	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 - WATER 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 MI.NODE - WATER. The battery is sealed within the module and is not replaceable.

No cleaning is required.

5. Product Labeling

5.1 Product Identification

This label is affixed to the face of the MI.NODE – WATER unit. This allows the installer to easily scan the label with the Mi.Tech hand-held during the installation process. This label includes the Date of Manufacture, the Hardware Version and the MI.NODE–WATER /Serial Number (Node ID) that is used to uniquely address the device and Assembled in Mexico.



Figure 1. Product Identification Label

5.2 FCC Identification

The text specified below is engraved into the bottom of the MI.NODE – WATER enclosure and indicates the FCC ID number of the product.

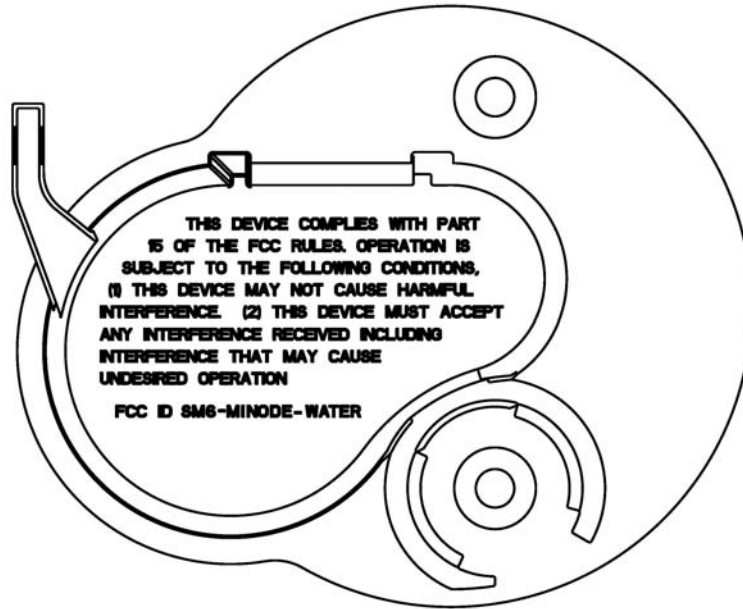


Figure 2. MI.NODE-WATER FCC ID text