

System Guide

D4000 MOSAIC – Water

PRELIMINARY

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Regulatory Information

United States of America, FCC:

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.

FCC ID: ODYD4000

Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

To comply with FCC RF exposure requirements, the device and the antenna for this device must be installed to ensure a minimum separation distance of 20 cm or more from a person's body. Other operating configurations should be avoided.

Canada, Industry Canada (IC)

The wireless radio of this device complies with RSS 210 Industry Canada. This Class B digital device complies with Canadian ICES-003.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website www.hc-sc.gc.ca/rpb

Introduction

The D4000 MOSAIC System is an automatic meter reading system designed for reading meter data remotely and wirelessly. This is accomplished using the Datamatic D4000 MOSAIC Meter Interface Unit (MIU) that forms a mesh network with neighboring D4000 MOSAIC MIUs, and reports data to the Home Office (HO) through strategically placed gateway devices.

The main benefits of using a D4000 MOSAIC System are:

- Real-time access to meter readings
- Built-in logging of 72+ days of consumption data
- Complete remote control of MIUs through MOSAIC Software Interface
- Meter lids do not have to be removed for reads
- Meter pits do not have to be dug out or pumped out for reads
- Increased accuracy of meter readings
- Safer meter reading procedure
- Visiting the site is not necessary for data collection

Please consult the MOSAIC Software Interface Guide for user instructions regarding data access, configuring, or upgrading the D4000 MOSAIC. After reviewing this guide you should be able to successfully deploy the D4000 MOSAIC for your application.

Equipment

D4000 MOSAIC Meter Interface Unit (MIU)

The D4000 MOSAIC Meter Interface Unit (MIU) tracks and transmits meter reading data. Each D4000 MOSAIC can be configured to record 72+ days of hourly consumption readings, thereby enabling the resolution of billing disputes. The D4000 MOSAIC signal includes the meter number, meter reading, battery voltage, tamper flag, and a leak indicator.

Battery: 3.6-volt lithium chloride D-cell

Material: Polycarbonate

Construction: Ultrasonic welding

Operating Temperature Range: -40°F to 185°F

Radio Communication Frequency: 902 - 928 MHz

D4000 MOSAIC – Optic Sensor-end

This D4000 MOSAIC uses an optical sensor unit to track meter activity. The infrared sensor is oriented so that the register needle approaches the sensor from the cable side and perpendicular to the cable. The indicators on the top side of the sensor need to be aligned with the passing sweep hand. As the needle sweeps past the sensor, it changes the light reflected back from the meter face, and an incremental count is registered. The optical sensor is affixed to the meter face using a high-bond adhesive tape.

Unique Features:

- Use existing meters.
- The D4000 MOSAIC Optic Sensor Model is the only available technology for automating meters without electronic registers
- Ultrasonically-welded, seamless construction designed to withstand constant submersion
- Leak Detection
- Tamper Detection
- Battery Status Indicator

Optical Sensor Tape Specification

Manufacturer: 3M

Part Number: 4951VHB

Minimum Application Temp: 33° Fahrenheit

Curing Time: 24 hours

Lid Lock

If the lid has a hole for the unit, use the cap and wing nut assembly (“lid lock” pictured at right). Ensure that enough space exists between the box lid and the ground for the unit to sit. If not, remove some of the dirt from the bottom of the box.

Do not over tighten lid locks.



D4000 MOSAIC Lid lock

Installation Supplies

Optic Sensor-end D4000 MOSAIC Installation Supplies

Basic Supplies:

- Razor blade tool or chisel
- Non Pumice Fast Orange 7.5 Fl. Oz Part No. 23108
15 Fl Oz. Part No 23116
- Cloth Rags
- 99% Isopropyl Rubbing Alcohol
- Lint Free Cotton Squares
- Plumber's Goop Adhesive #15112 (Purple Tube)
- Zip Ties—14"
- ¾" PVC pipe; sch. 40
- Sensor flaps
- Wire Cutter (for cutting zip ties)
- 9 Volt Battery
- 3M Adhesive Replacements

Below is an illustration of materials used with Sensor-end installations:



Installation Considerations

1. Signal distance varies depending on the location of the D4000 MOSAIC. Those installed above ground generally transmit the greatest distance.
2. The material of a pit or vault lid affects the transmission range. For example, a transmitter has a greater range sending from a pit with a plastic lid than a cast iron lid.
3. Lids with holes of a diameter of roughly 1 3/4 inches make it possible to mount the D4000 MOSAIC through the lid. This can increase transmission range significantly.
4. Complete field installation of a D4000 MOSAIC takes 5-10 minutes, depending on the meter location and mounting application.
5. If the lid has a hole for the unit, use the cap and wing nut assembly (“lid lock” pictured at right). Ensure that enough space exists between the box lid and the ground for the unit to sit. If not, remove some of the dirt from the bottom of the box. **Do not over-tighten lid locks.**



Installation Procedures

Installation Overview for Water D4000 MOSAICs

1. Perform a site survey to determine where best to install the Gateway devices and where to designate MIU mesh network areas.
2. Configure MIUs before on site installation with the unique mesh word to form a group of selected MIUs into a mesh network.
3. Prepare the meter.
4. Attach the D4000 MOSAIC.
5. Using a mobile gateway, take a reading to verify neighbor MIUs on the mesh.
6. Once the entire route is installed, verify connectivity from the installed gateway to the Home Office.

#1 Preparation Of the Meter

1. Remove meter box lid.
2. Survey the meter, checking lid, hole depth, and overall cleanliness.
3. Check for meter disqualification.
4. Place sensor flap onto D4000 MOSAIC cable.
5. Flip lid back and pre-clean meter face/lens using Fast Orange non-pumice cleaner and a cloth or cotton swab to remove residue.
6. Clean meter face/lens with 99% isopropyl alcohol and a **NEW** lint-free cotton swab.
7. Re-wipe the surface of the meter lens with a clean, new cotton swab each time until the swab comes up clean, and the clean lens squeaks when wiped.
8. After cleaning, ensure that the lens is *completely dry*; allow time for the alcohol to evaporate.

NOTE: Only use isopropyl rubbing alcohol marked “99% by volume”. Lower concentrations, such as the commonly available 91%, do not clean or evaporate well and adversely affect sensor-to-meter bond.

#2 Placement of the Sensor

1. Insert sensor cable through sensor flap.
2. Remove the adhesive backing from the high-bond tape on the optic sensor face.
3. Orient the sensor so the water meter needle approaches the sensor from the cable side and perpendicular to the cable. There are indents on each side of the sensor base that are to be in line with the needle when it passes. **Do not place the sensor over any moving part or the sweep hand of the register.** Normally, place sensor along outer edge of register.

NOTE: Do not place the sensor over any moving part or the sweep hand of the register. Normally, place sensor along outer edge of register.

Here is an example of correct Sensor Placement:



#3 Pressure – To the Sensor on the Meter

NOTE: Since the 3M tape provides a **pressure sensitive seal**, the installer must apply 15 lbs. of pressure to the D4000 MOSAIC optical sensor immediately after attaching to the lens surface for a minimum of 60 seconds.

1. **Very Important:** Press the adhesive down for **60+ seconds** using **15 lbs of pressure**. Allow 24-96 hours to cure.
2. Fasten the cable to the register with a zip tie.
3. Place Goop-Plumber's Adhesive #15112 (purple tube) around the metal edge sensor and under the tail of the sensor. Do not squirt the adhesive UNDER the 3M seal. The goal is to provide a temporary water barrier between the meter face and the metal edge of the sensor, so that the 3M adhesive can cure properly.
4. Position the flap at the base of the sensor so that it folds over and "hangs" above the register to try to keep most of the stray light out while it processes through AutoCAL. The flap will be "pulled" over the sensor snugly lying flatter on the meter during the Read and Verify procedure that will be discussed later.

Final Optic Sensor-end D4000 MOSAIC Installation Steps

1. A full cure on the seal is achieved in 24-96 hours. Do not touch, pull, move, or handle the sensor in any way during this period.
2. Mount the D4000 MOSAIC box with the threaded neck pointing up.
3. Mounting can be accomplished by attaching to a wall, stake, or through a hole in the meter box or vault.
4. Typical meter pits will use an 18" long 3/4" PVC stake. Push the stake into the ground approx. 6" deep, adjacent to the meter register.
5. Attach the D4000 MOSAIC to the stake with the zip ties (6" or 14").
6. If utilizing a lid lock, make certain not to over-tighten the D4000 MOSAIC within the lock.
7. Check for lid clearance; be sure to never rest the weight of the meter lid on the D4000 MOSAIC.

D4000 MOSAIC Installation pictures:



Example of a GOOD Sensor-end Installation.



Example of a BAD Sensor-end Installation.
What is wrong here? _____



Example of a BAD Sensor-end Installation.
What is wrong here? _____



Example of a BAD Sensor-end Installation.
What is wrong here? _____

Contacting Datamatic

Datamatic, Ltd. offers the following benefits to customers under the RouteSTAR MVP Meter Reading System maintenance agreement.

- 24-hour telephone support for MOSAIC Interface Software.
- Two-hour response time on telephone calls.
- Preventative maintenance on system hardware.
- Best effort turn-around time for repairs.
- Software updates.

System Support during Business Hours

Support is available to customers of Datamatic, Ltd. from 8:00 AM to 5:00 PM CST. The toll-free customer support number is (888) 326-5032.

System Support after Business Hours

- Customers requiring assistance after Datamatic business hours can leave a message for the appropriate group. Emergency assistance is available 24 hours a day.
- If this is an emergency, press **2** at the greeting to page a Customer Support Representative.
- If this is not an emergency and can wait until the next business day, listen for the options to leave a message.
- Leave your name, number, and message at the prompt.
- A customer support representative should return your call the next business day.

Paging a Support Representative after Business Hours

- Call the Customer Support number above.
- Press **2** to leave an emergency message.
- Leave your name, number, and message at the prompt.
- A support representative will be paged and return your call within two hours.

For the most timely response, call the Toll Free number (888) 326-5032 from 7:30am to 5:30pm CST or submit an email. If you call after that time you can leave a message, and someone will call you back within two hours.

**Current customers may contact
Customer Support via:**

Toll-free: 888/326-5032

Phone: 214/540-5200

Fax 214/540-5027

support@datamatic.com

There is also the Support Request Form, which you can fill out and submit. You will receive a response back from support regarding the information you have entered on this page.