



McMag³⁰⁰⁰ Battery Powered Electromagnetic Flow Meter

Quick Start Installation Guide

30121-64 Rev. 1.7
October 27, 2022

About This Quick Start Guide

This Quick Start Guide is a supplement to the Installation, Operation and Maintenance manual supplied with this meter. It is intended to be a quick reference for the basic installation and reading of the McMag³⁰⁰⁰.

It is designed to provide installation instructions when the location of the sensor installation has been predetermined.

Refer to the meter manual (30120-85 McMag³⁰⁰⁰ IOM manual) for information on these topics:

- Preparation and planning for installation
- Site location
- Software configuration
- Detailed information on external connections, external power, outputs

For information on the data logger, refer to the manual (30121-87 McLogger IOM), downloadable from www.mccrometer.com.



WARNING!

Incorrect installation or removal of meters can result in serious injury or death. Read the instructions in this guide on the proper procedures carefully.

- Any person installing, inspecting, or maintaining a McCrometer flowmeter should have a working understanding of piping configurations and systems under pressure.
- Before adjusting or removing any meter, be certain the system has depressurized completely.
- Be careful when lifting meters. Meters can cause serious injury if lifted incorrectly or dropped.

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1. Flow Meter Installation

New Installations

Saddle type meters offer simplicity of installation. A minimum round hole size of 3" should be cut into the top center of the pipe. The saddle meter is then installed as follows:

1. Loosen and remove the nuts and washers from the straps. Remove the straps from the saddle.
2. Cut or hole-saw the pipe and remove all burrs, slag, and rough edges from the inside and outside of the cutout section.
3. Place the meter assembly on the pipe with the flat gasket on the 4" models, and the "D" shaped ring gasket for larger meters in position on the bottom of the saddle. The saddle must be positioned so that the flat gasket or D-ring maintains contact with the surface of the pipe completely around the cutout opening.
4. Insert the meter probe through the hole and slide the meter forward (downstream) until the probe contacts the front edge of the pipe wall. Then slide the back away from the pipe wall 1/8" to 1/4" leaving the probe in a free state and not in contact with the pipe wall.

I Important! Insure that the meter probe is not in contact with the pipe wall when installed!

5. Install the straps from under the pipe and insert the threaded ends through the holes in the brackets on the side of the saddle.
6. For each strap bolt, replace the washers and nuts.
7. Tighten each of the U-bolt nuts evenly.



WARNING! Customers are warned that the U-Bolt nuts are to be tightened evenly to approximately 30 foot pounds torque. This is sufficient to seal the saddle to the pipeline. Additional tightening may be required to seal the saddle on rough or irregular pipe (60 FOOT POUNDS MAXIMUM).

Replacing Existing Saddle Meters

The Mc Mag³⁰⁰⁰ can be used to replace existing McCrometer saddle meters. The Mc Mag³⁰⁰⁰ can be installed with Water Specialties bolt-on saddle meter cutout templates for 6" meters and 8"-20" meters, as well as with McPropeller bolt-on saddle meter cutout templates for 12"-16" OD pipe.

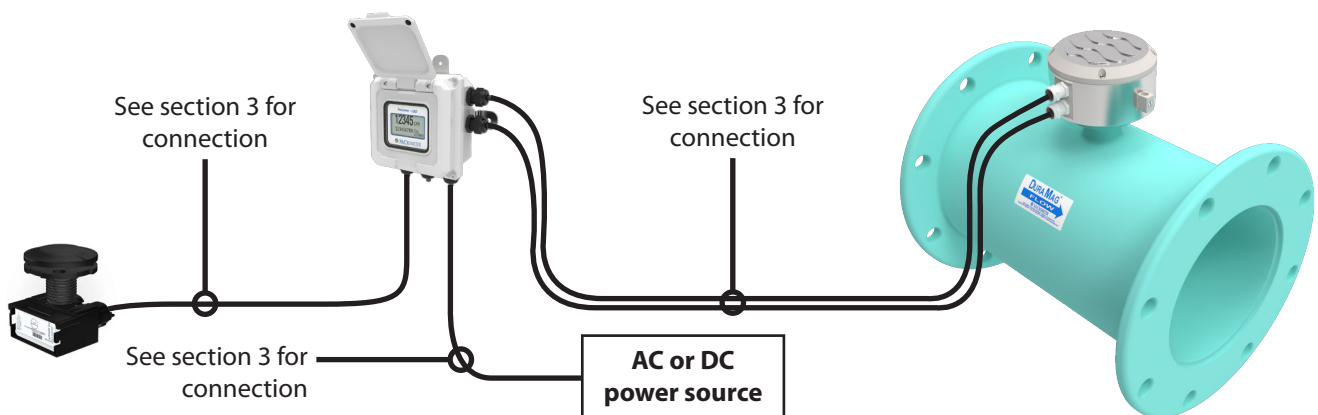


The meter CANNOT be installed with Water Specialties bolt on saddle meter cutout templates for 4" meters.

Remote Mount Installation

You will need to prepare the location where you will install the remote converter. The location cannot be further from the flow meter than the length of the 25' cable. This must be planned in advance because the cable cannot be lengthened. Doing so will alter the calibration accuracy between the meter and the converter and void the warranty.

Install the flow meter as required. Mount the converter and connect the cable to the meter's junction box and the converter's external connection.



I IMPORTANT: The example shown above does not include grounding installation. Depending on your requirements, the meter will need to be grounded according to the methods shown in section 4.

2. Remote Mount Converter Installation

Mounting the ProComm GO Converter

Note: *This applies to the remote mount converter only.*

If possible, mount the converter in an electronics shed or environmental enclosure. The sun shield should be oriented in a direction to reduce sun damage and ensure readability.

Mount the converter to a solid surface using four bolts. This electronic unit is rated IP67 for temporary flooding.

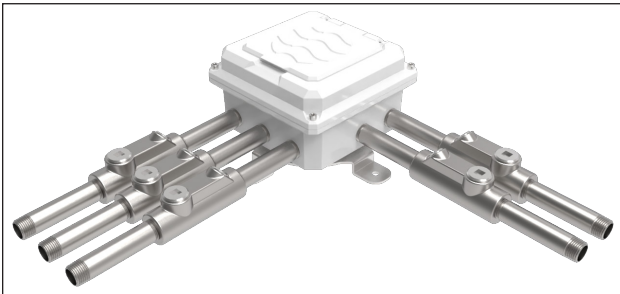


Installing Cables through Cable Glands and Conduit

All electrical cables enter the converter through compression fittings or optional customer-supplied conduit located on the side or bottom of the converter. Ensure that all compression glands are properly tightened and all unused fittings are plugged so the case remains sealed.

The power cable and wiring harnesses are each assigned specific cable glands where they will pass through into the converter. See section 3 for cable gland assignment for wiring harnesses and wiring diagrams.

All cable compression glands must be properly tightened to prevent moisture intrusion and maintain the IP67 rating. To insure IP67 rating, use only round cable 0.24" to 0.47" in diameter.



Attaching conduit directly to the enclosure may introduce dangerous gasses and moisture into the enclosure creating a dangerous condition, and will remove the enclosure's IP67 rating. **Damage caused by attaching conduit to the enclosure or altering the enclosure in any way is not covered by the warranty.**



IMPORTANT: Do not cut or alter the cable length on power or signal cables!

Connections to the sensor must be made with cable supplied by McCrometer specifically for that purpose. Do not substitute the supplied cable with other types of cable, even for short runs. For repairs or added lengths of cable, the entire cable between the sensor and the converter must be replaced. (Consult factory for replacement cable.)

3. Converter Wiring and Connection

External Output Connectors

The flow meter is configured at the factory for the optional outputs and requested by the customer at the time of order. The external cables attach through a permanent cable gland (standard) or through a screw locking-type waterproof connector (quick connect option).



IMPORTANT:

When not in use, always keep the attached cap firmly screwed into the connector to insure a water-tight seal. Also, keep the contacts in the cable connector clean and dry during assembly.



Standard cable gland



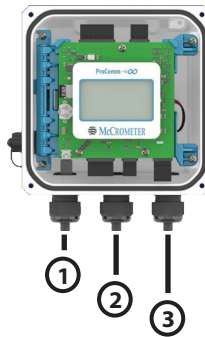
Quick connect connectors

See next page for wiring diagram for each terminal block.

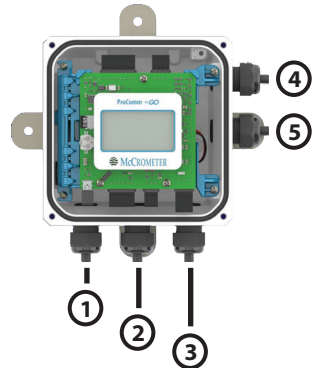
Port assignment

- 1 - Outputs
- 2 - Outputs
- 3 - Power
- 4 - Coils
- 5 - Electrodes

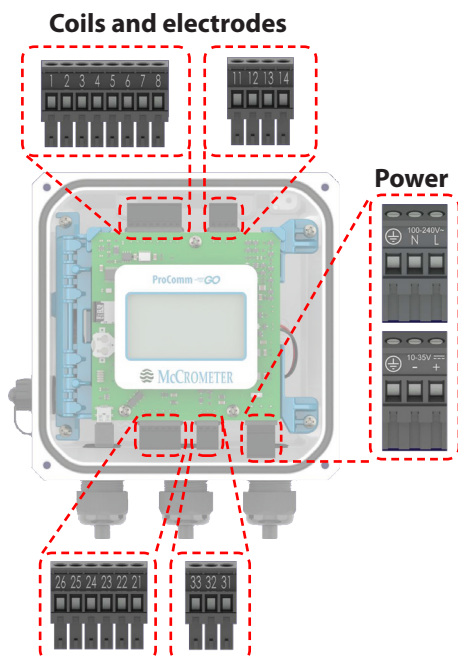
Meter mount view



Remote mount view



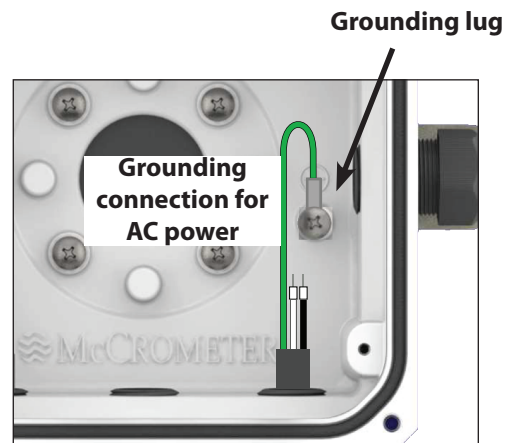
Cable Gland Assignment for Wiring Harnesses



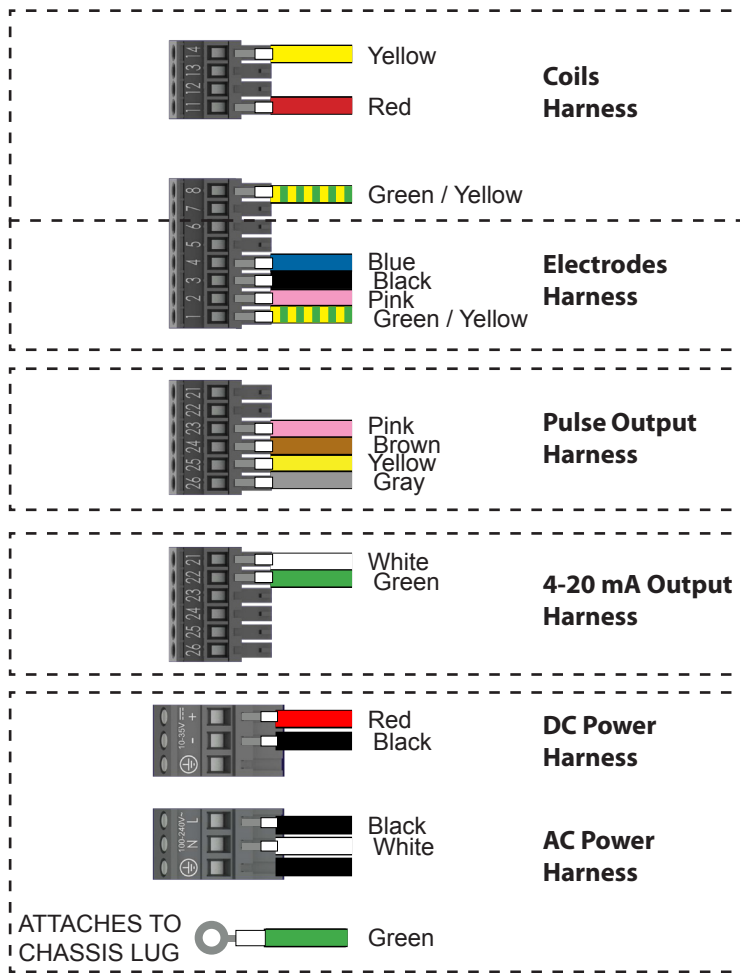
Pulse / 4-20 mA outputs

AMI outputs

Terminal Block Diagram and Grounding Lug



Wiring Diagrams



TERMINAL BLOCK ASSIGNMENTS

| Terminal | Port | Wire Color |
|----------|------|--------------|
| 8 | 4 | Green/Yellow |
| 11 | 4 | Red |
| 14 | 4 | Yellow |

| Terminal | Port | Wire Color |
|----------|------|--------------|
| 1 | 5 | Green/Yellow |
| 2 | 5 | Pink |
| 3 | 5 | Black |
| 4 | 5 | Blue |

| Terminal | Port | Wire Color |
|----------|------|------------|
| 23 | 1 | Pink |
| 24 | 1 | Brown |
| 25 | 1 | Yellow |
| 26 | 1 | Gray |

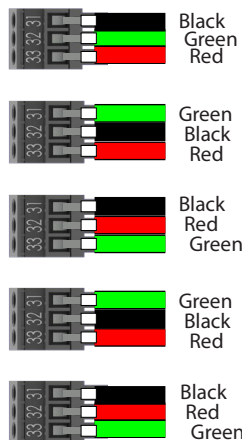
| Terminal | Port | Wire Color |
|----------|------|------------|
| 21 | 1 | White |
| 22 | 1 | Green |
| Negative | 3 | Black |

| Terminal | Port | Wire Color |
|----------|------|------------|
| Positive | 3 | Red |
| Ground | 3 | Green |

| Terminal | Port | Wire Color |
|----------|------|------------|
| Negative | 3 | White |
| Load | 3 | Black |

To complete AC power connection, connect green ground jumper as shown at left.

Optional Smart Output Hook Up



| | Sensus | Itron | Badger | Neptune | Elster |
|----|--------|-------|--------|---------|--------|
| 31 | Black | Green | Black | Green | Black |
| 32 | Red | Black | Red | Black | Green |
| 33 | Green | Red | Green | Red | Red |

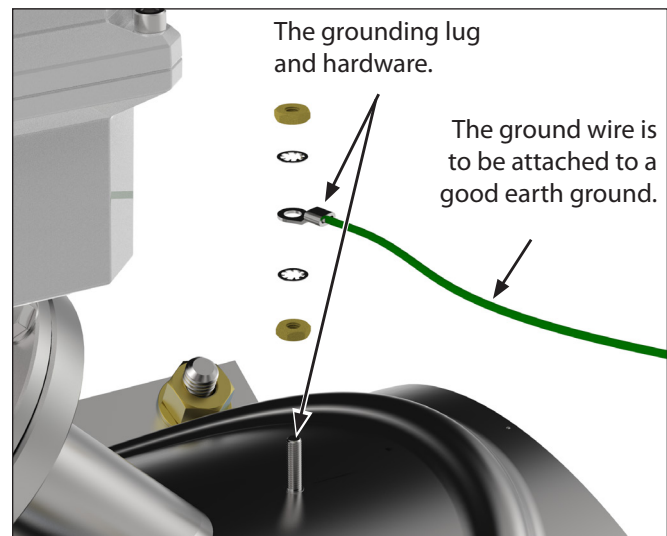
The converter comes pre-wired with an interconnection that should readily connect to most AMI transceivers. Where interconnective devices are not mechanically compatible or where non-standard wiring is encountered, the installer can opt to remove the connector from the end of the converter's interface cable and make direct connection via the wiring table shown at right.

- Signals and associated wire colors in the McCrometer SmartOutput™ interface cable are identified together in the top row of the table above.
- Corresponding wire colors for transceivers from each compatible AMI vendor are identified in the columns under the top row.

4. Grounding

The Mc Mag3000 is fitted with a grounding lug on the saddle for proper grounding. For typical installations the lug can be connected to an earth ground and/or the metal pipe in which it is installed.

For electrically noisy installations connect the grounding lug to a dedicated, low impedance earth ground. Low impedance is 10 Ohms or less.



5. Activating The Display

The Dura Mag comes pre-configured from the factory based on the installation parameters provided to McCrometer at the time of order. Other than activating the display, there is nothing required of the user for the basic operation of the flow meter.

The display is activated when the lid is opened. The display will remain active for 30 seconds. The various parts of the interface screen is shown below.

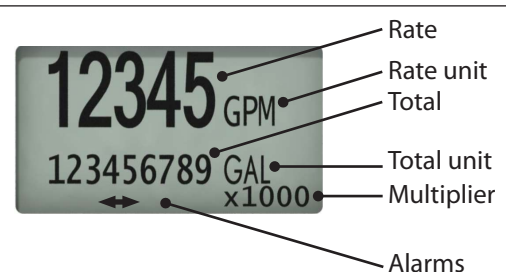


If the lid is broken off, contact the factory for a lid replacement kit. In the meantime, set the lid on the meter in its proper position and use the boot to hold it in place.



The converter display is light activated and requires a minimum amount of light to appear. Environments where light is low, such as in dimly lit buildings or outdoors after sundown may prevent the display from appearing when the lid is raised.

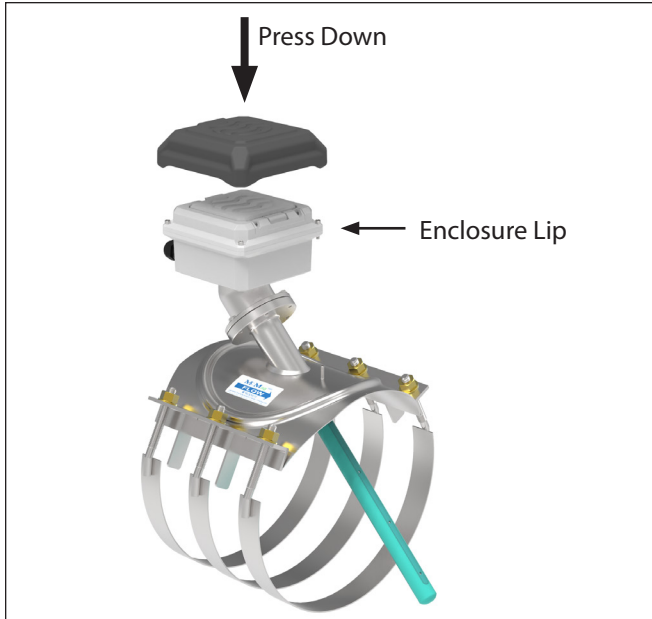
There is an optical sensor embedded in the display located under the McCrometer "swirl" logo at the lower left. If the display does not appear, a flashlight will provide sufficient light to bring it up.



6. Converter Boot

The Mc Mag3000 comes with a boot to help protect the meter.

The boot simply slips over the electronics enclosure. When installing the boot insure the corners of the boot fit snugly over the lip of the enclosure.



To remove the boot, grip two corners and pull them away from the lip of the enclosure and then pull upwards.

NOTE

NOTE:

It is HIGHLY recommended that the boot be utilized at all times when the meter is not being read. The boot adds protection to the meter and insures proper closure of the lid, insuring the maximum battery life.

To remove, pull away and lift from two corners.



7. Converter Configuration

The converter can be programmed to customize how the data is measured and stored. The configuration tool runs only on Windows 7, 8, or 10 and requires a computer with a USB port. You must have your flow meter's serial number before you begin.

See the manual for instructions on using the configuration software.



8. Error Messages for Troubleshooting

| DISPLAY MESSAGE | Troubleshooting |
|-----------------|---|
| BAT LOW | Battery replacement Kit is needed to replace batteries. The batteries Should last approximately 6-9 months from the time the warning is shown. |
| 420 ERR | The 4-20 circuit is not wired correctly. Check the wiring diagram and ensure 9-30VDC power is supplied to the circuit. The output is not source powered. |
| COIL XCT | There is an issue with the electro magnetic coils. Check that the internal wiring is correct in the converter for the coil wires. |
| ADC CLIP | The meter signal exceeds the limit of the converter, likely due to noise. Check the meter grounding meets the IOM guidelines and identify any sources of noise. |
| HIGH HUM | Humidity inside converter housing has exceeded limits. Check for any loose connections on converter housing that could be creating a leak. |
| COIN LOW | Datalogger time backup battery is low. This is part of the battery replacement kit and should be replaced with the main battery packs. |