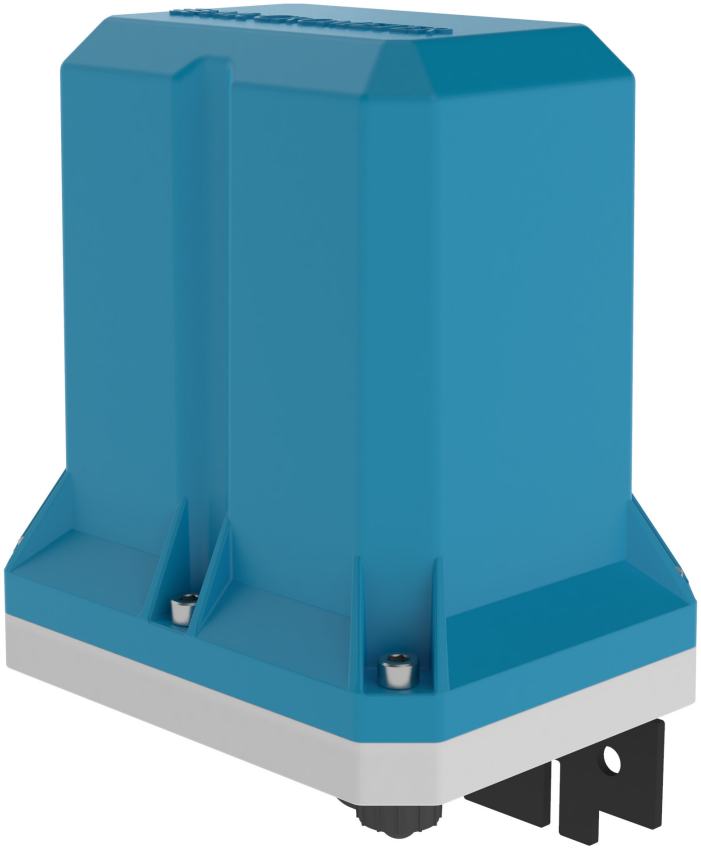
SmartTrax
Remote Telemetry Unit for Propeller and Electromagnetic Flow Meters

Installation, Operation and Maintenance Manual



30125-82 Rev. 1.2
November 1, 2023

McCROMETER

Contents

SAFETY

Safety Symbols and Warnings

Throughout this manual are safety warning and caution information boxes. Each warning and caution box will be identified by a large symbol indicating the type of information contained in the box. The symbols are explained below:

WARNING - This symbol indicates important safety information. Failure to follow the instructions can result in serious injury or death.

IMPORTANT - This symbol indicates important information. Failure to follow the instructions can result in permanent damage to the meter, other equipment, or installation site.

Personnel Safety

When installing, operating, and maintaining McCrometer equipment where hazards may be present, you must protect yourself by wearing Personal Protective Equipment (PPE) and be trained to enter confined spaces. Examples of confined spaces are manholes, pumping stations, pipelines, pits, septic tanks, sewage digesters, vaults, degreasers, storage tanks, boilers, and furnaces.

You must follow all state and local laws, as well as Occupational Health and Safety Administration (OSHA) regulations concerning Personal Protective Equipment, confined-space entry, and exposure to bloodborne pathogens. Specific requirements can be found in the OSHA section of the Code of Federal Regulations: *29 CFR, 1910.132 - 1910.140, Personal Protective Equipment; CFR Title 29, Part 1910.146, Permit-Required Confined-Spaces; and 29 CFR, 1910.1030, Bloodborne Pathogens.*

Never enter a confined space without first testing the air at the top, middle, and bottom of the space. The air may be toxic, oxygen deficient, or explosive. Do not trust your senses to determine if the air is safe. You cannot see or smell many toxic gases.

Never enter a confined space without the proper safety equipment. You may need a respirator, gas detector, tripod, lifeline, and other safety equipment.

Never enter a confined space without standby/rescue personnel within earshot. Standby/rescue personnel must know what action to take in case of an emergency.

Pressurized pipes should only be tapped, cut, or drilled by qualified personnel. If possible, depressurize and drain the pipe before attempting any installation.

Electrical Safety

Devices that incorporate electrical power (or that come into contact with materials that have the potential to be electrified) must be properly grounded to ensure the safety of personnel that come into contact with the device. The National Electrical Code (NEC) provides measures that, when fully complied with, ensure electrical safety of the device. The SmartTrax device must be grounded in a manner in compliance with the NEC (or other observed regulatory standard) in order to ensure this level of safety to personnel that come in contact with this device.

This device contains RF Module FCC ID: **2ANPO00NRF9160.**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following 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.

1.0 OVERVIEW OF THE SMARTTRAX REMOTE TELEMETRY UNIT

The SmartTrax remote telemetry unit (RTU) provides battery operated wireless telemetry of flow and sensor data. It can be used with mechanical or digital registers and converters. All it requires is a pulse output from any register/converter.

It is mounted remotely for best positioning to send the signal. The RTU uses cellular communication and features standard or rechargeable batteries that can be powered by a solar panel.

The RTU can connect to AMI compliant devices and read data from them. In pulse mode, AMI functionality is disabled and the device can read pulses from a pulse output device/meter. The RTU can accept a 0-5V signal from any sensor such as a pressure or temperature sensor. The RTU can also supply 5V to power certain sensors.

This RTU is compatible with all McCrometer flowmeters configured with AMI or pulse output, but it is designed to be used with any signal converter with AMI or pulse output also.

2.0 UNPACKING THE SHIPPING BOX

2.1 Contents

Depending on which options you ordered, the shipping box will contain some of the following:

All units include:

See Figure 1 at left and Figure 2 below.

- RTU unit
- Owner's manual
- Input cable, female

4-20mA & DC power units:

See Figure 3 below.

- Output (Male) Cable

Solar powered units:

See Figure 4 below.

- Solar Panel: 5.1W
- Solar Panel Cable

Figure 1. RTU unit

Figure 2. Input cable (female)

Figure 3. Output cable (male)

Figure 4. Solar panel option components

2.2 Verifying the Unit Serial Number

See Figure 1 for an example of the location of the serial number tag. on device. You will also find the serial number and modem information label on the box stuffer which is needed to activate device on website.

3.0 INSTALLING THE SMARTTRAX

If this is a new installation, install the flow meter first before proceeding to the installation and activation of the RTU. according to the instructions in the owner's manual for that meter.

This manual contain instructions both new installation and after-market installation of the SmartTrax. Because there are several different possible flow meter configurations, each retrofit has its own stand-alone set of instructions. See Figure 5.

3.1 Planning the Location

I The RTU should not be over-shadowed by surrounding pumps, filters, vegetation, the optional solar panel for the RTU, or other obstructions. The antenna is located internally on the circuit board. Allow a free line of sight between the telemetry unit and the sky as your circumstances will allow.

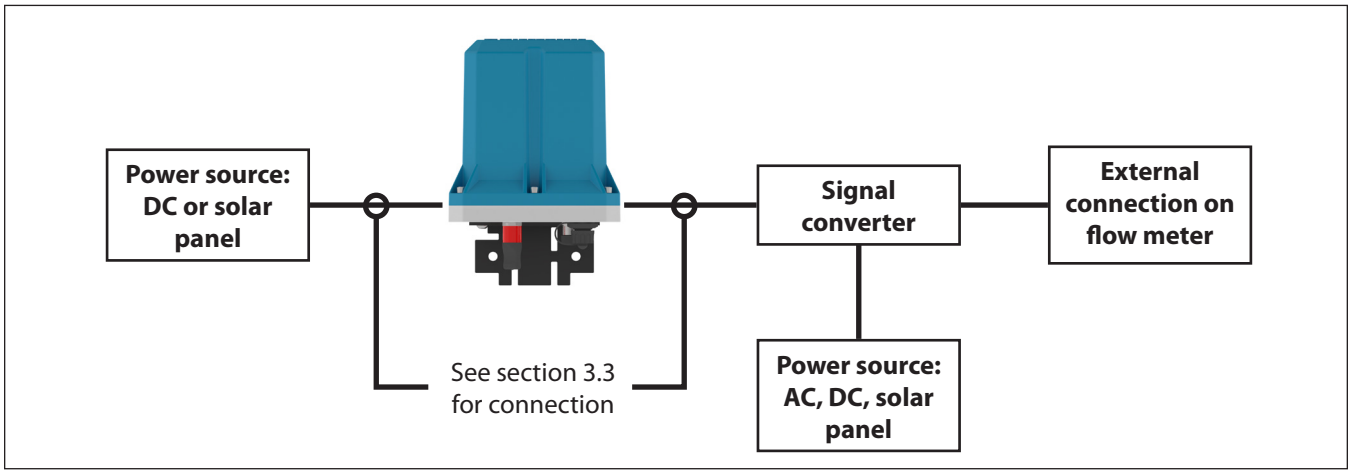


Figure 5. Example Remote Mount Configuration

3.2 Mounting the SmartTrax

> **I** If the mounting bracket is not attached, attach it to to bottom of the unit as shown in Figure 6.

Surface mount: Mount the unit to a solid flat surface with two wood screws. (Figure 7)

Pole mount: Mount the unit to a pole using two metal clamps. (Figure 8)

STEPS TO ENSURE GOOD COMMUNICATIONS

The antenna is located at the top of the device (the end opposite of the connectors). If possible, avoid mounting the device directly against large metal objects such as aluminum siding, beams, etc. for optimum antenna reception.

If it is necessary, try to maintain some line of sight towards a cell tower. If a tower is far away, do not place the device on the opposite side of a metal shed. For nearby towers this may not be necessary.

It is advisable to test signal strength before finalizing an installation.

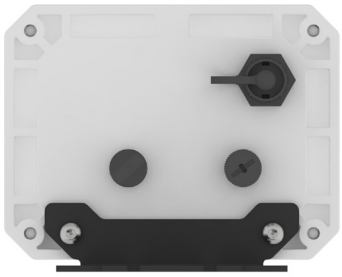


Figure 6. Mounting bracket

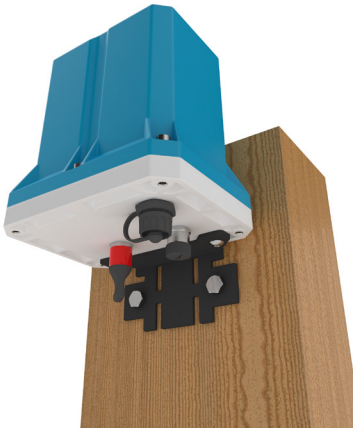


Figure 7. Attach unit to a solid flat surface

Figure 8. Mount the unit to a pole

3.3 Connecting the Cables

Figure 10, Figure 9, and Figure 11 show the connector assignments and locations for inputs and outputs. If the female connector is not used, the cap should remain on it.

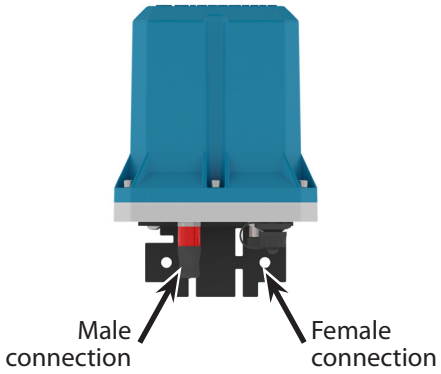


Figure 9. Connections, front view

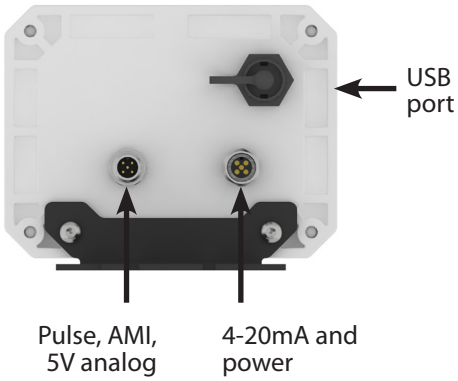


Figure 10. Connections, bottom view

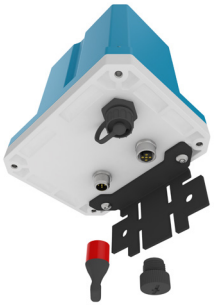


Figure 11. Connector caps

3.4 Pin-out of Male and Female Connectors

FEMALE CABLE

Pulse / AMI / 5V Analog Connector

Figure 12. Pin-out of female connector

PULSE 1 & 2	
PULSE 1	BLUE
PULSE 2	WHITE
GROUND	BLACK

AMI	
DATA	BLUE
CLOCK	WHITE
GROUND	BLACK

5V ANALOG	
5V OUTPUT	BROWN
ANALOG IN	GRAY
GROUND	BLACK

MALE CABLE

4-20mA & Power Connector

Figure 13. Pin-out of male connector

4-20mA	
4-20mA -	WHITE
4-20mA +	BROWN

DC POWER / SOLAR	
9-30 VDC+	BLUE
GROUND / V-	BLACK

3.5 Installing the Optional Solar Panel

The optional solar panel can be installed as shown in Figure 14. The solar panel is power rated as 5.1W (Figure 4). Do not use the optional the solar panel used to provide power to the ProComm GO converter.

Install the solar panel adjacent to ***and below*** the SmartTrax unit so that the two can be connected with the 6' cable. Do not allow the solar panel to overshadow the unit's antenna, which is located at the top of the unit on the PCB.

Connect the cable from the solar panel to the female connection (Figure 10).

If the cable is not connected to the solar panel, refer to the wiring diagram shown in Figure 13 above.

Figure 14. SmartTrax with attached solar panel

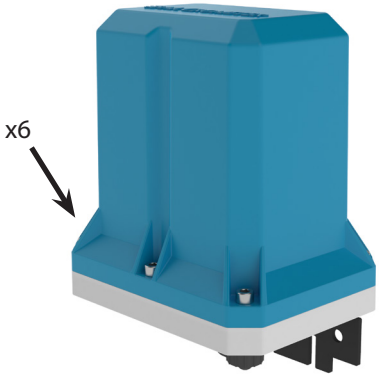
4.0 BATTERY INSTALLATION

Start-up Procedure and Battery Installation and Replacement Procedure for the SmartTrax Telemetry Unit

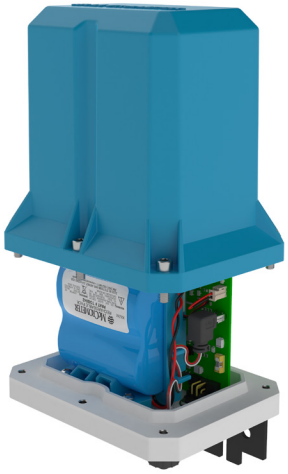
Materials Provided (shown in order of use)
One triple D battery pack
Optional rechargeable battery pack
Replacement cover gasket
Molykote lubricant
1 large zip tie

I. Removing the cover

1. Loosen the six screws that fasten the cover.



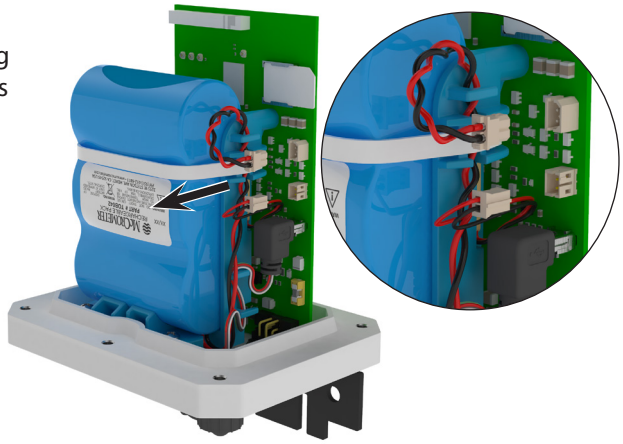
2. Remove the cover and set it aside.



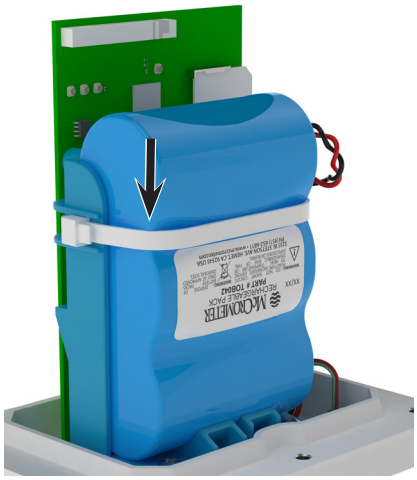
II. Removing the batteries

3. Unplug the battery or batteries.

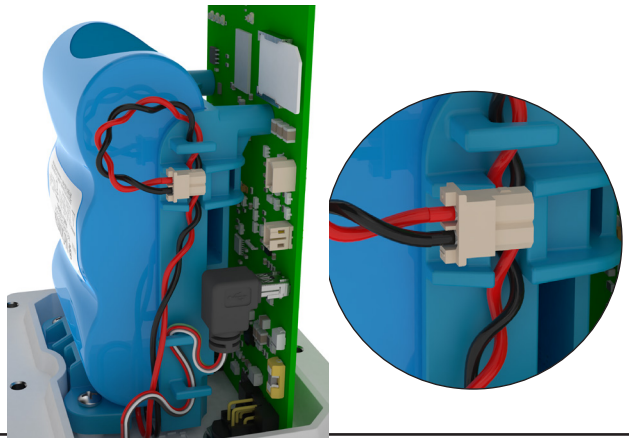
Unplug one or both batteries, depending on your transmitter's configuration and which battery you need to replace.



4. Cut the zip-tie.

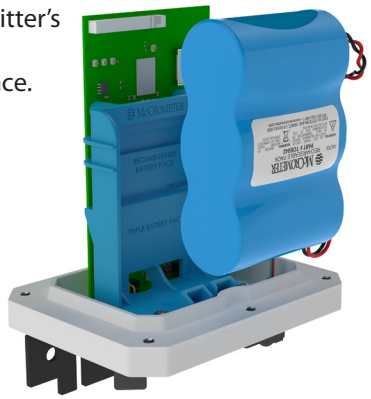


5. Release the wires from the wire guides.



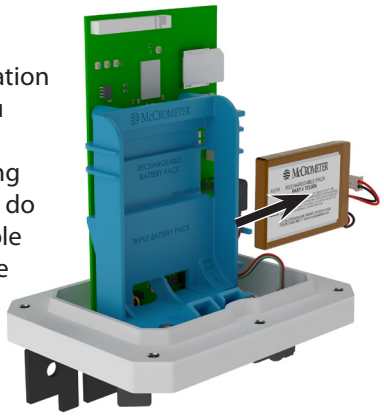
6. Remove the primary battery.

Follow steps 7 and/or 8 according to your transmitter's configuration and which battery you need to replace.

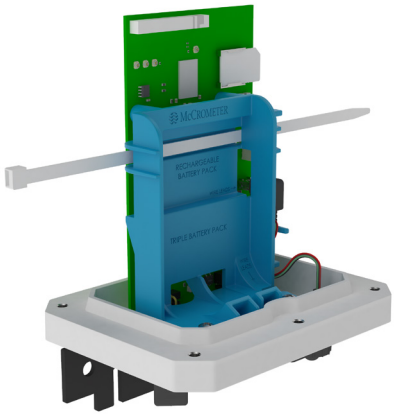


7. Remove the secondary battery.

Follow steps 7 and / or 8 according to your transmitter's configuration and which battery you need to replace.
If you are only replacing the primary battery or do not have a rechargeable battery, proceed to the next step.



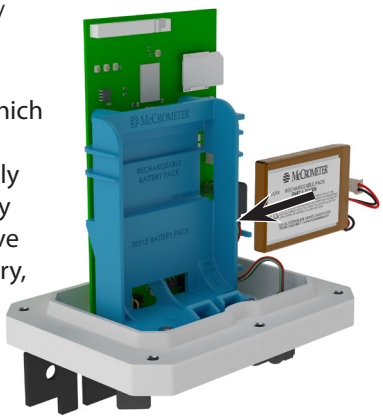
8. Place a new zip-tie.



III. Installing the batteries and restoring the power

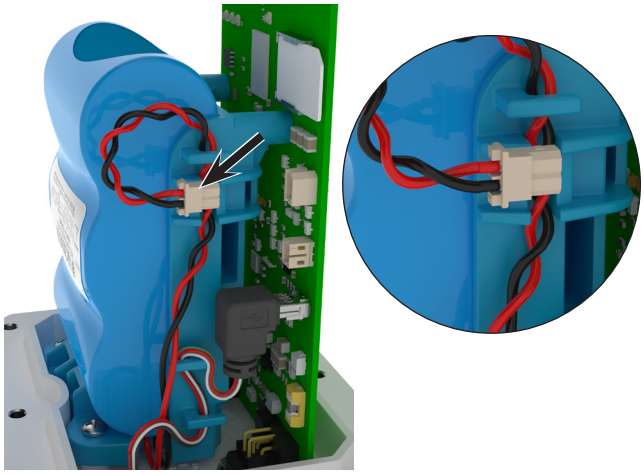
9. Place the rechargeable battery.

Follow steps 11 and / or 12 according to your transmitter's configuration and which battery you need to replace. If you are only replacing the primary battery or do not have a rechargeable battery, proceed to the next step.

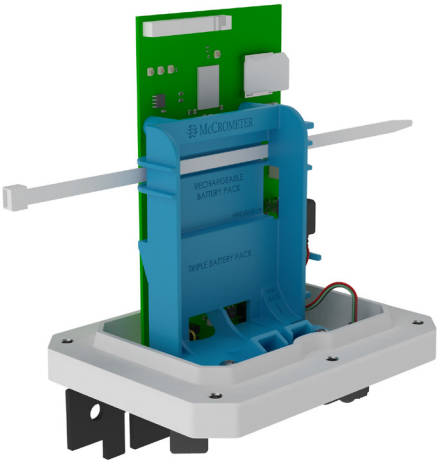


10. Place the primary battery.

11. Pass wires through the wire guides.

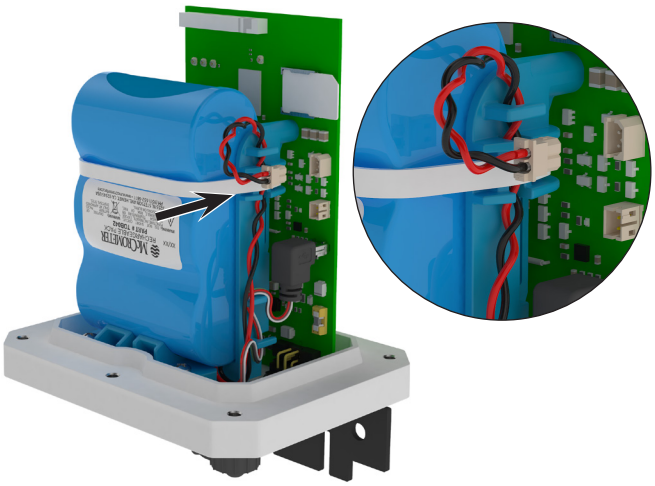


12. Secure the zip-tie and cut off the excess.



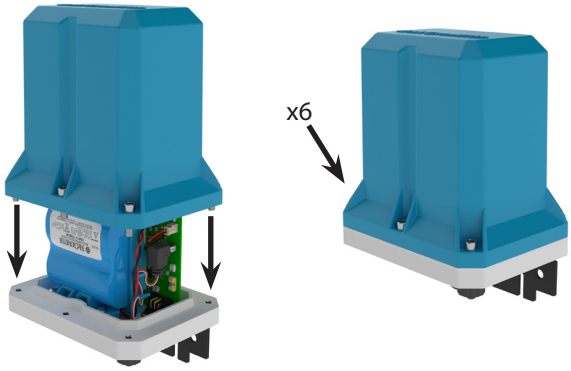
IV. Plugging in the batteries

13. Plug in one or both batteries, starting with the primary.



V. Replacing the cover

14. Replace cover securely and tighten the screws.



5.0 OPERATION

5.1 Configuring the Telemetry Unit

Drivers, software, and instructions for installation and configuration the telemetry unit can be found in two locations:

McCrometer file repository:

https://mccrometer.box.com/s/rz32abhqyv2hkbuecqny1mc2hwgewlgx

McCrometer Web site:

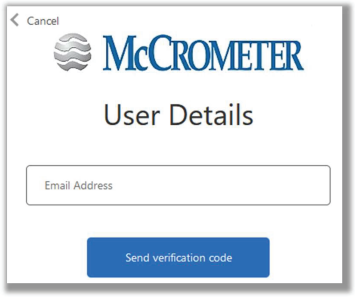
https://data.mccrometer.com/

5.2 Accessing the Data

STEP 1: Create Account

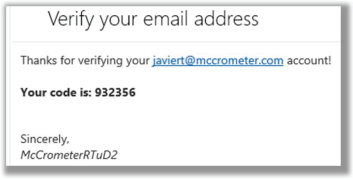
1. Use the following link: https://data.mccrometer.com
2. Click on "Sign up now".

3. Enter your email address, then click on "Send Verification Code".



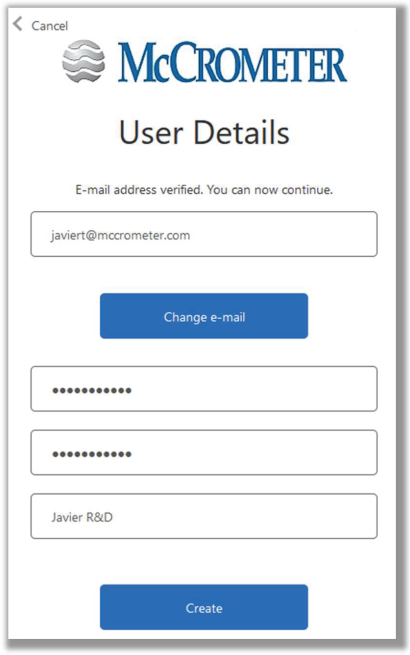
4. Sign-in to your email to verify your account.

   While you're creating your account, you'll get an email from Microsoft on behalf of McCrometer. Open the email and find the verification code.



5. To finish creating your account, enter the verification code and click on "Verify Code".

6. Enter "New Password", Re-enter password, "Confirm New Password", enter preferred "Display Name" as it will show on the website and Click "Create".



STEP 2: Log-in to your account

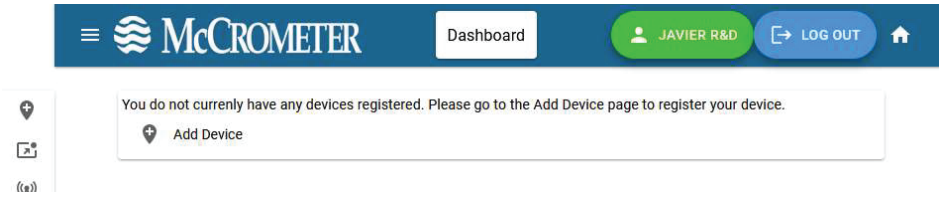
1. Use the following link:

https://data.mccrometer.com

2. Enter your email address & Password and click on "Sign in".

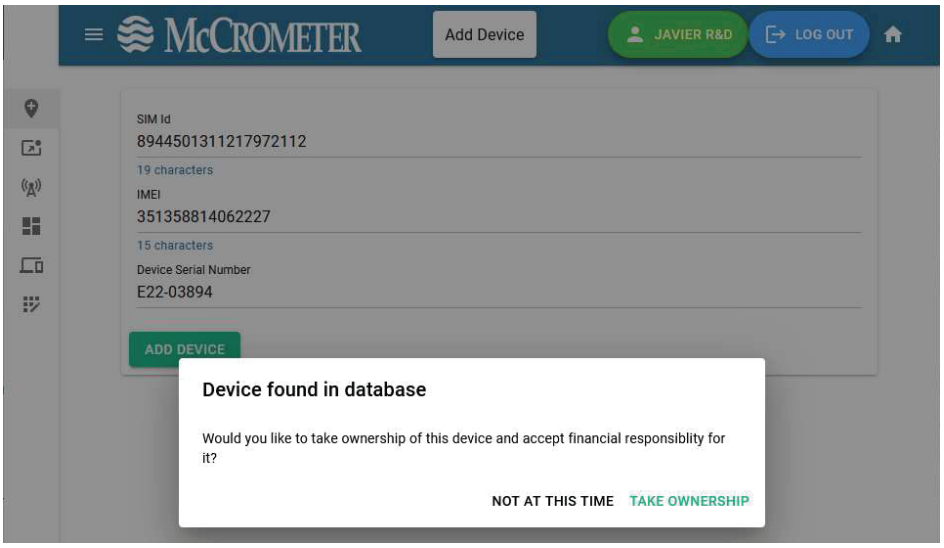
STEP 3: Add SMARTTRAX Unit

1. Click on "Add Device".



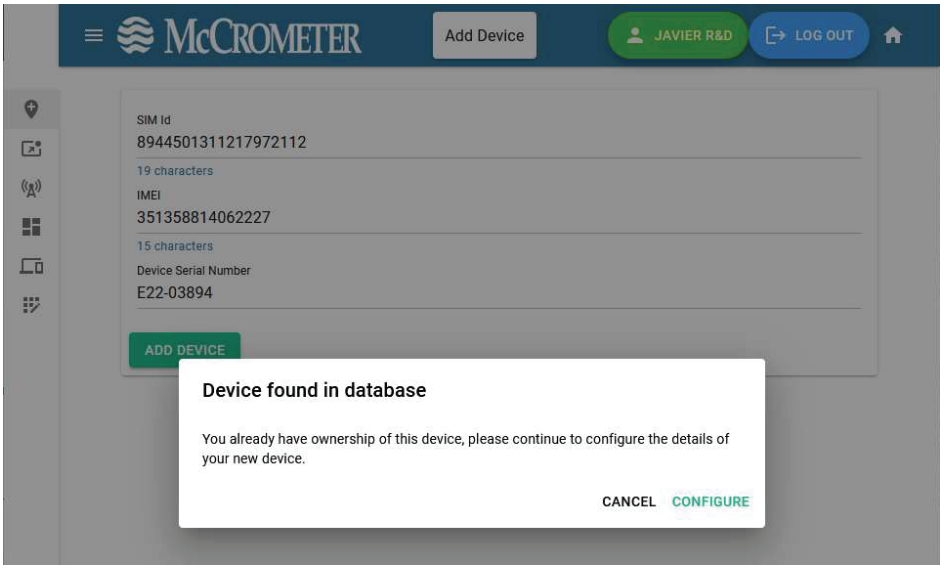
2. Enter "SIM Id", "IMEI" and "Device Serial Number" provided with device. If information is lost, please contact customer service.
3. Click on "ADD DEVICE"

4. Click on "TAKE OWNERSHIP" if you will be responsible for reoccurring data fees. Each device has a 30-day grace period following activation. Ownership can be transferred via the website anytime.

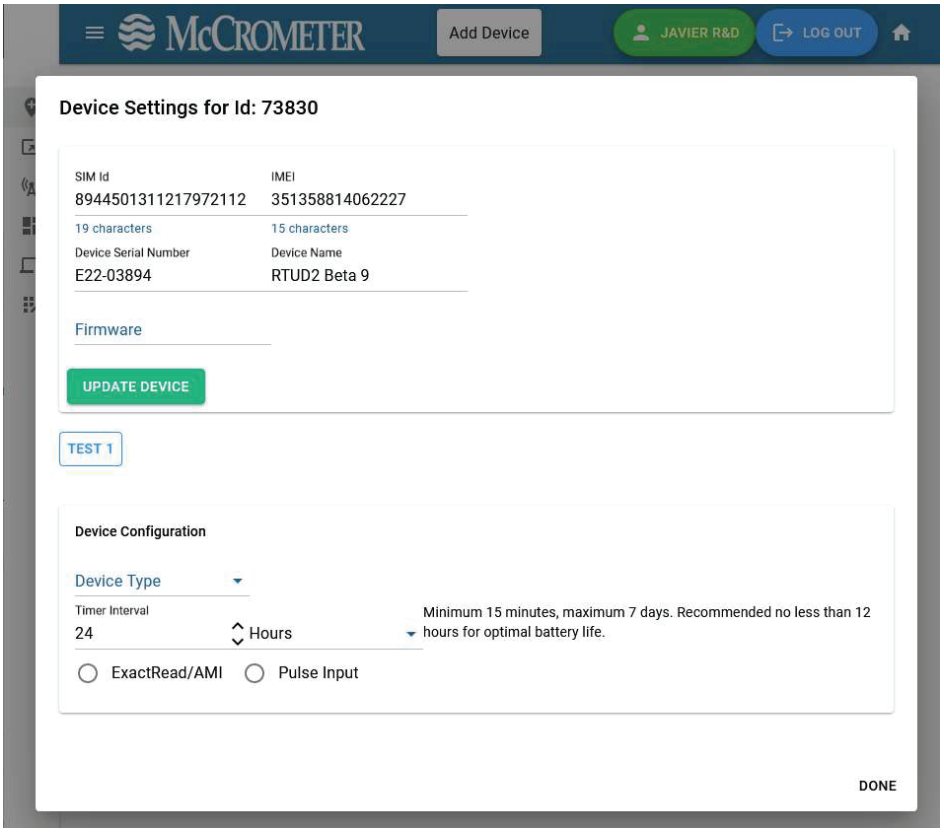


5. Click on "CONFIGURE" to set-up and activate device.

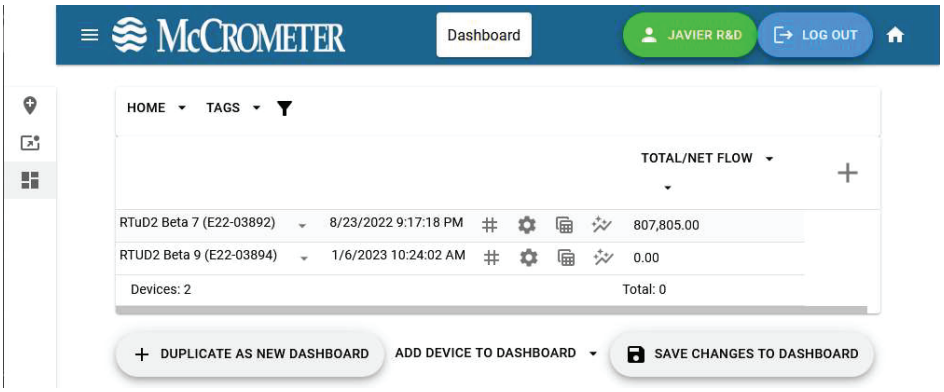
Note: Device configuration can be re-entered or changed anytime on the settings menu of your device.



6. Make changes to Configuration as needed and click on "DONE" to return to Dashboard.



7. Unit has been added to your Account successfully.



6.0 SPECIFICATIONS

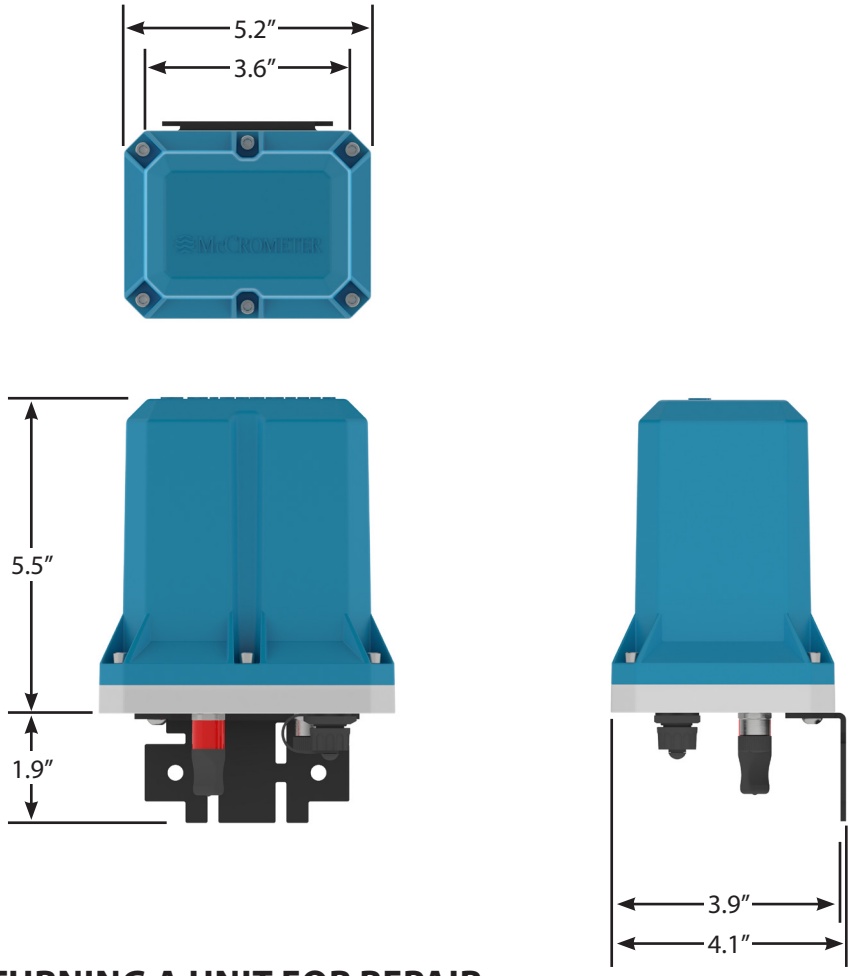
6.1 Product Specifications

Communication	
Network Type	Cellular (using AT&T, Verizon, and T-Mobile networks)
Operating Frequency (MHz)	824–849 869–894 1850–1910 1930–1990 1710–1755
Antenna	Internal LTE antenna
Power	
Batteries	**Primary Battery:** Three primary D-Cells 3.6V 13Ah **Rechargeable:** One1200 mAh 3.7V rechargeable Lithium ion. Batteries can be replaced by user on-site (both batteries need to be replaced at the same time)
External Power	Requires rechargeable battery configuration listed above.
Recommended Battery Replacement Interval	**Battery Only:** 3 years (daily report interval) **Rechargeable:** 4 years
Environmental	
Operating Temperature	-4° to 140° F (-20° to 60° C)
Environmental Protection	Ingress protection (dust tight / water tight) to IP67
Other Characteristics	
External Interface	USB Mini type B port
Inputs	One 0-5V analog sensor input with 5V supplied power to sensor
Outputs	**Analog output:** 4-20mA: Galvanically Isolated, 16 Bit resolution. DC power required
Data Collection Method	Pulse Inputs: SmartTrax can receive two pulse inputs (forward and reverse total)from any open collector pulse output device. AMI Input: SmartTrax can receive a digital total from any AMI compatible device output. AMI Input with ProComm Go Converter: SmartTrax can receive Rate, Total(s), meter and diagnostic information using McCrometer's proprietary communication.
Dimensions	
Unit Enclosure Size	5.2" W x 4.1" D x 7.4" H
Packaged Dimensions	11" x 11" x 11"
Packaged Weight	6 lbs. with solar panel (4 lbs. with no solar panel)

Accessories

Serial Accessories	USB cable: EA200-USB	
Power Accessories	**Solar Panel:**	**Solar Cable:**
	5.1W: 200.733.522	TEL-CBL-006-5F
Sensor Accessories	**Input Cables:**	**Power/ Output Cables:**
	6 ft: TEL-CBL-F-006-OE	25 ft: TEL-CBL-M-025-OE
	25 ft: TEL-CBL-F-025-OE	50 ft: TEL-CBL-M-050-OE
	50 ft: TEL-CBL-F-050-OE	

6.2 Dimensions



7.0 RETURNING A UNIT FOR REPAIR

If the unit needs to be returned to the factory for repair, please do the following:

Prior to calling for a return authorization number, determine the model number, serial number (located inside the front panel of the converter), and reason for return.

- Contact McCrometer Customer Service Department and ask for a Return Authorization (RA) number.
  - Telephone: 1-800-220-2279
  - Email: customerservice@mccrometer.com
- Ship the meter in the original packaging, if possible. Do not ship manuals, power cords, or other parts with your unit unless required for repair.
- Please make sure the meter is clean and free from foreign debris prior to shipping.
- Write the RA number on the outside of the shipping box. All return shipments should be insured.
- Address all shipments to:

  McCrometer, Inc.
  RA #
  3255 W. Stetson Avenue
  Hemet, CA 92545

WARRANTY

Manufacturer warrants all products of its manufacture to be free from defects in workmanship and material under normal use and service. This warranty extends for a period of twelve (12) months after date of shipment, unless altered by mutual agreement between the purchaser and manufacturer prior to the shipment of the product. If this product is believed to be defective, purchaser shall notify manufacturer and will return the product to the manufacturer, postage paid, within twelve (12) months after date of shipment by the manufacturer. If the purchaser believes the return of the product to be impractical, manufacturer shall have the option, but will not be required, to inspect the product wherever located. In any event, if the purchaser requests the manufacturer visit their location, the purchaser agrees to pay the non-warranty expenses of travel, lodging and subsistence for the field service response. If the product is found by the manufacturer's inspection to be defective in workmanship or material, the defective part or parts will either be repaired or replaced, at manufacturer's election, free of charge, and if necessary the product will be returned to purchaser, transportation prepaid to any point in the United States. If inspection by the manufacturer of such product does not disclose any defect of workmanship or material, manufacturer's regular service repair charges will apply. Computing devices sold but not manufactured by McCrometer, Inc. are covered only by the original manufacturer's written warranty. Hence, this warranty statement does not apply.

THE FOREGOING WARRANTY IS MANUFACTURER'S SOLE WARRANTY, AND ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE NEGATED AND EXCLUDED. THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, GUARANTEES, REPRESENTATIONS, OBLIGATIONS OR LIABILITIES ON THE PART OF THE MANUFACTURER.

Purchaser's sole remedy and manufacturer's sole obligation for alleged product failure, whether under warranty claim or otherwise, shall be the aforestated obligation of manufacturer to repair or replace products returned within twelve months after date of original shipment. The manufacturer shall not be liable for, and the purchaser assumes and agrees to indemnify and save harmless the manufacturer in respect to, any loss or damage that may arise through the use by the purchaser of any of the manufacturer's products.

If you experience problems with your FlowCom register, please contact your local factory representative for assistance. You may also contact Customer Service at the factory directly at 951-652-6811. Be prepared to provide the serial number off of your meter or FlowCom register (this information is located on the lid of the register).

When returning McCrometer products to the factory for repair or warranty consideration, a return authorization number (RA) must be obtained from the factory and referenced on the outside of the box of the products you are returning. The products should be shipped back to the factory at:

McCrometer
3255 West Stetson Avenue
Hemet CA 92545

OTHER McCROMETER PRODUCTS INCLUDE:

Propeller Flow Meters

- Water Specialties Propeller Meters
- Propeller Meter

Magnetic Flow Meters

- FPI Mag™
- Ultra Mag
- SPI Mag™
- Dura Mag
- Field Mag®
- Vera Mag®
- Vera FPI Mag™
- Mag3000™
- Mag2000™

Differential Pressure Flow Meters

- √Cone®
- V-Cone®
- Wafer-Cone®

Digital Register

- FlowCom™

Mag Meter Flow Converters

- ProComm GO 3000
- ProComm 5000

Connected Solutions

- FlowConnect™
- Smart Output™
- SmartTrax
- McCrometer Connect®

3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078
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