



MANUAL: SHO-FLOW® Flow Meter Operations

INSTRUCTIONS FOR SAFE OPERATION AND MAINTENANCE

⚠ WARNING

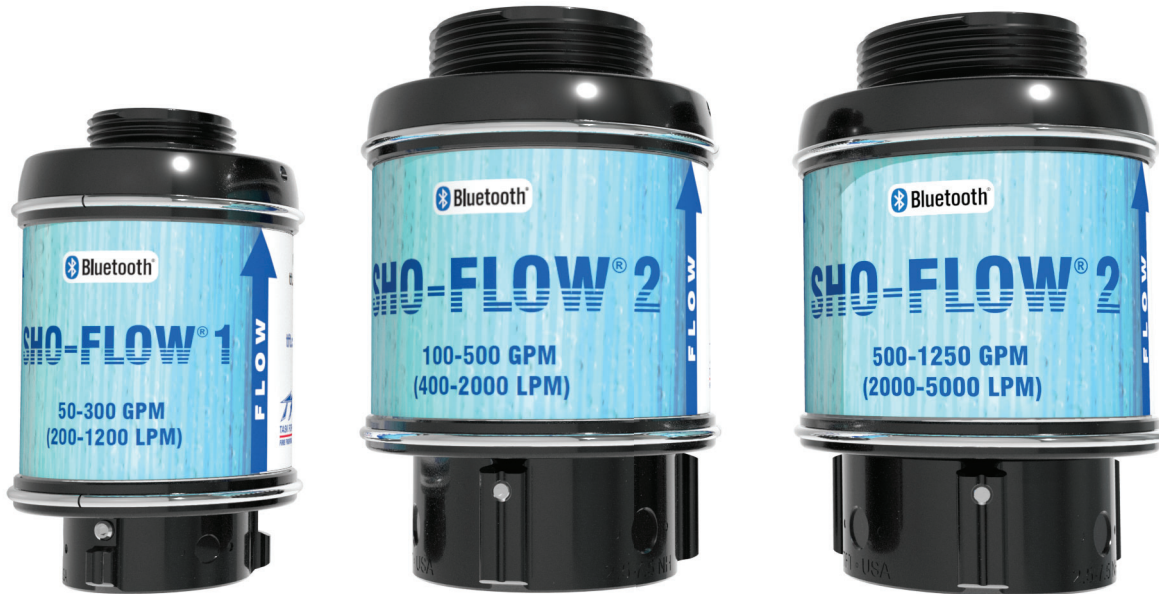
Understand manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. Obtain safety information at tft.com/serial-number

⚠ WARNING

This equipment is intended for use by trained and qualified emergency services personnel for firefighting. All personnel using this equipment shall have completed a course of education approved by the Authority Having Jurisdiction (AHJ)

NOTICE

This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing, and safety procedures associated with this product. This manual should be kept available to all operating and maintenance personnel.



SHO-FLOW 1
50-300 GPM

SHO-FLOW 2
LOW FLOW
100-500 GPM

SHO-FLOW 2
HIGH FLOW
500-1250 GPM

TASK FORCE TIPS LLC
MADE IN USA • TFT.com

3701 Innovation Way, Valparaiso, IN 46383-9327 USA
800-348-2686 • 219-462-6161 • Fax 219-464-7155



PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and /or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.







Fire and Emergency Manufacturers and Service Association
P.O. Box 147, Lynnfield, MA 01940 • www.FEMSA.org

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1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI Z535.6, the definitions of the four signal words are as follows:

-  **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
-  **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
-  **CAUTION** indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
-  **NOTICE** is used to address practices not related to physical injury.

2.0 SAFETY

-  **WARNING** Equipment may be damaged if frozen while containing significant amounts of water. Such damage may be difficult to detect visually. Subsequent pressurization can lead to injury or death. Any time the equipment is subject to possible damage due to freezing, it must be tested and approved for use by qualified personnel before being considered safe for use.
-  **WARNING** This equipment is intended for use by trained personnel for firefighting. Use of this equipment for other purposes may involve hazards not addressed by this manual. Seek appropriate guidance and training to reduce risk of injury.
-  **WARNING** This device is not rated as ignition proof, explosion proof, or intrinsically safe. Use only in locations with adequate ventilation and no hazard of flammable vapor buildup.

3.0 GENERAL INFORMATION

The SHO-FLOW is a water-powered fire ground flow meter that measures the flow rate in a hose line and transmits flow data using a Bluetooth wireless connection. Data is received by a paired device and displayed using a smart phone app. The SHO-FLOW does not have a display. Flow meter power is generated whenever flow causes its turbine to rotate. Data is automatically transmitted whenever flow is present, and stops when flow stops. An arrow indicates the direction of flow.

The SHO-FLOW is intended for intermittent use with clean fire water or solutions of water and foam concentrate. It is not intended for use with pure foam concentrate, compressed air foam, hydrocarbons, or other types of liquid. Turbine bearings are subject to wear. The SHO-FLOW is not intended for continuous outdoor storage, use with heated fluids, in permanently piped installations, 24/7 wet conditions, or in extended service conditions (non-fire ground).



Figure 3.0

3.1 PART IDENTIFICATION AND TERMS

FLOW	OPERATING FLOW RANGE 50-300 GPM (200-1200 LPM) 50 GPM (200 LPM) Required to Connect	FLOW	Bluetooth SHO-FLOW® 1 50-300 GPM (200-1200 LPM)	FLOW	QUICKSTART: tft.com/SHO-FLOW
	DO NOT EXCEED 350 GPM (1300 LPM) MAXIMUM OPERATING PRESSURE 300 PSI (20 BAR)				tft.com/EXXXXXX <small>DEVICE NAME</small> MADE IN USA TFT.COM <small>PATENT PENDING</small> <small>PATENT: 9,295,863</small>

UNIQUE DEVICE NAME/SERIAL NUMBER



Figure 3.1

3.2 SPECIFICATIONS

3.2.1 DEVICE SPECIFICATIONS

Model Name	SHO-FLOW 1	SHO-FLOW 2 (Low Flow)	SHO-FLOW 2 (High Flow)
Operating Flow Range	50-300 GPM (200-1200 LPM)	100 - 500 GPM (400 - 2000 LPM)	500 - 1250 GPM (2000 - 5000 LPM)
Max Flow Range	350 GPM (1300 LPM)	600 GPM (2300 LPM)	1350 GPM (5200 LPM)
Min Flow Rate Required to Connect	50 GPM (200 LPM)	100 GPM (400 LPM)	500 GPM (2000 LPM)
Waterway Diameter	1.5" (38mm)	2.5" (65mm)	2.5" (65mm)
Flow Accuracy	+/-2.5% Full Scale		
Non-recoverable Pressure Loss @ Max Flow	15 PSI @ 300 GPM	10 PSI @ 500 GPM	10 PSI @ 1250 GPM
Max Operating Pressure	300 PSI (20 bar)		
Hydrostatic Test Pressure	900 PSI (62 bar)		
Operating Temperature - Electronics	-20-140°F (-30-60°C)		
Length	6.3" (160mm)	7.4" (188 mm)	
Width	3.9" (99mm)	4.9" (125 mm)	
Weight	2.8 lbs (1.3 kg)	4.2 lbs (1.9 kg)	
Materials	Aluminum 6000 series hard anodized MIL8625 class 3 type 2, stainless steel 300 series, POM, nitrile rubber, and CPVC		
IP Rating	IP65		
Power Supply	Self-powered, Water Flow Energy Harvesting		
Backup Battery	CR2032 enabled in app		

3.2.2 APP SPECIFICATIONS

Wireless Communication	Bluetooth® Version 4.1
Display	SHO-FLOW Smart Phone App
Flow Units	GPM, LPM GPS, LPS
Pressure Units (for calibration)	PSI, BAR, KPA

3.3 COUPLINGS

The SHO-FLOW 1 is offered with standard hose threaded connections: 1.5" NH, 1.5" BSP, or 1.5" NPSH. The SHO-FLOW 2 is offered with standard hose threaded connections: 2.5" NH, 2.5" BSP, or 2.5" NPSH. Inlets are rigid female threaded couplings. Fluid is sealed using a hose gasket. Do not use thread sealant. Outlets are rigid male threads. Maximum torque 20 ft-lb (27 Nm).

CAUTION Mismatched or damaged threads may cause equipment to leak or uncouple under pressure. Failure could result in injury. Equipment must be mated to matched threads.

CAUTION Dissimilar metals coupled together can cause galvanic corrosion that can result in the inability to unscrew the threads, or complete loss of thread engagement over time. Failure could cause injury. Per NFPA 1962, if dissimilar metals are left coupled together, an anti-corrosive lubricant should be applied to the threads and the coupling should be disconnected and inspected at least quarterly.

3.4 USE WITH SALT WATER

Use with salt water is permissible provided the equipment is thoroughly cleaned with fresh water after each use. The service life of the equipment may be shortened due to the effects of corrosion, and is not covered under warranty.

4.0 INSTALLATION

SHO-FLOW should be installed with the FLOW arrows on the label pointing in the direction of water flow. Published accuracy is assured when the flow meter is installed in conditions with minimal turbulence; between two lengths of hose with the same size couplings as the flow meter. Avoid locations where the flow meter or adjacent hose are used as a step.



NOTICE

Turbulence can cause inaccurate readings. Installing the flow meter adjacent to turbulence causing plumbing like elbows, partially gated valves, eductors, and flat adapters is not recommended. The best accuracy is assured when the flow meter is paired between two sections of straight hose.

NOTICE

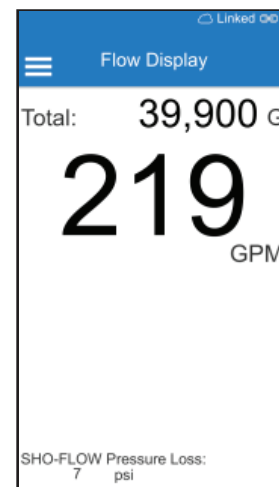
Reverse installation will result in incorrect readings and will damage the device over time. Always ensure the FLOW arrows on the device point in the direction of flow.

5.0 OPERATION

A smartphone app is required to view the flow rate of the SHO-FLOW. Please download the app from either the Google Play Store or the Apple App Store before proceeding. Search SHO-FLOW in either store



- 1) Create a flow greater than or equal to the minimum rated flow rate through the SHO-FLOW to turn on the device and start transmitting the Bluetooth signal.
- 2) If the app is not already open, find and press the SHO-FLOW app icon from your list of apps, which will launch the app. (The TFT logo is displayed while opening and the app will bring you to the main Flow Display screen.)
 - a. (FOR ANDROID ONLY) If the app is not already on the home screen you can choose to place it on the home screen if desired by holding down on the icon until the phone gives you the ability to drag it onto the screen.
- 3) Allow app to use location if prompted. (This is required for use)
- 4) If a Bluetooth connection has not already been set up refer to section 5.2.
- 5) Once a connection is established the flow rate will be displayed on the Flow Display screen (Section 5.1)



5.1 FLOW DISPLAY

The Flow Display screen is used to notify the user of the current flow rate in the hose line in real time when a SHO-FLOW is connected. Whenever the app is opened this screen will open as default.

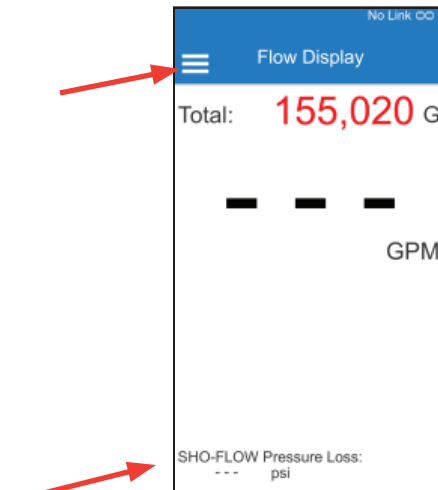
1) To access this screen, press the MENU button.



2) Then press the FLOW DISPLAY button.



Current SHO-FLOW pressure loss.



5.2 DEVICE CONNECTION

The Wireless Connection screen is used to connect to a SHO-FLOW. This connection process will only need to be done one time per phone. The app will remember the device it was connected to and attempt to connect to that unit whenever it is available. (App will only connect to one SHO-FLOW at a time).

If you wish to connect to a different SHO-FLOW, press the UNPAIR button and find the device you wish to connect to in the device list. The Bluetooth connection can be released for another user to connect to the SHO-FLOW by one of the following methods:

- Press the UNPAIR button on the Wireless Connection page
- Completely close the app

1) To access this screen press the MENU button.



2) Then press the BLUETOOTH CONNECTION button.

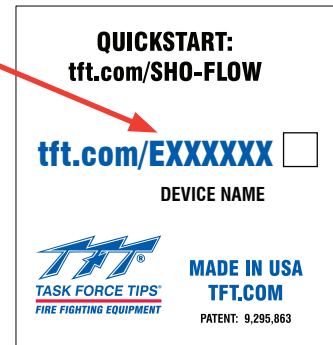


5.3 ESTABLISHING A BLUETOOTH CONNECTION

1) Ensure the SHO-FLOW is flowing the minimum rated flow rate to turn on the device and start transmitting the Bluetooth signal.

2) Press button with the matching device name to connect

(The name on the SHO-FLOW will match the listed device on the screen.)



3) Once communication has been checked for proper data transfer:

- Top bar shall display "Linked"
- The Device Name will update to the connected device
- The Status will update to "Linked" in all locations
- The SHO-FLOW type will be displayed



NOTE: The app will remember this device name. At start up or anytime it is disconnected, it will automatically search and connect to that device if it is available.

5.4 SETTINGS

The Settings screen is used to configure the app display using the desired flow units and other configuration values, and viewing Firmware Revisions.

1) To return to this screen press the MENU button.



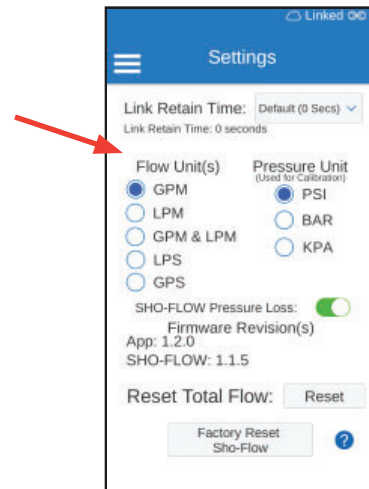
2) Then press the SETTINGS button.



Flow Units

Select the **Flow Units** to show on the Flow Display:

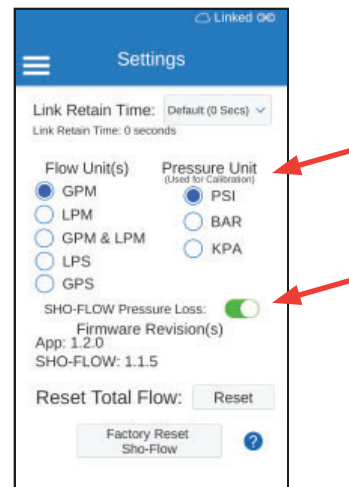
- GPM (Default)
- LPM
- Both GPM & LPM
- LPS
- GPS



Pressure Units

Select the Pressure Units to show for calibration and device pressure loss:

- PSI (Default)
- BAR
- KPA



SHO-FLOW Pressure Loss

Enabled by default, this setting allows the user to view the calculated pressure loss from the SHO-FLOW device in real time on the Flow Display screen.

To hide this information on the Flow Display screen press the toggle button which will hide the pressure loss information until it is enabled again by the user.

Link Retain Time

Anytime you stop the flow (eg. to talk or adjust the set-up), the power stops and the Bluetooth link is broken. Typically, it should take less than 5 seconds to reconnect automatically.

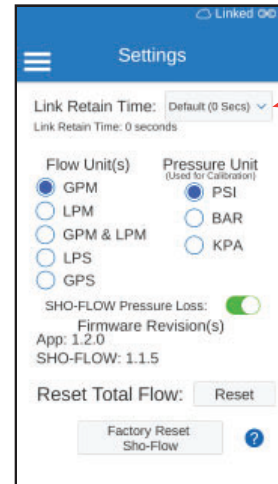
If you plan to start and stop the flow often and do not wish to wait the 5 sec for the automatic reconnection to occur, it is possible to set a **Link Retain Time**. Doing this keeps the SHO-FLOW powered and the Bluetooth connection active when water is not flowing through the device for a short amount of time.

Flow meters come factory equipped with a standard non-rechargeable lithium-ion battery having a 10-year storage lifespan, which can be used to extend Bluetooth connection times. The default setting for this battery is the disabled condition (Bluetooth stops immediately after flow stops). This battery can be enabled in app to allow for the Bluetooth connection to be maintained when water is not flowing. Storage in direct sunlight or hot conditions can shorten battery life. Consult factory when battery replacement is necessary.

The current setting for **Link Retain Time** is displayed below the drop down.

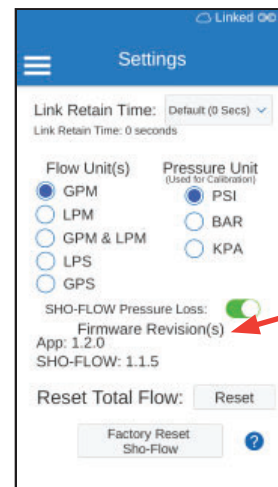
The time can be set by selecting an option from the drop down:

- 0 sec (Default)
- 10 sec
- 30 sec
- 60 sec



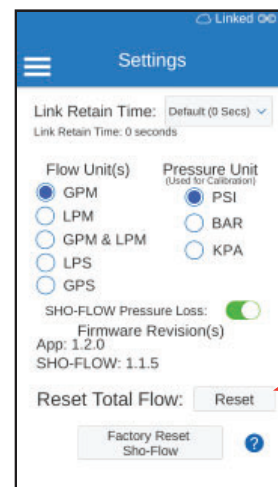
Firmware Revision

When connected to a SHO-FLOW the **Firmware Revisions** will read what code revision is currently on the board. App Revision will always be displayed.



Reset Totalizer

When resetting the totalizer to zero, a connection to the desired SHO-FLOW is required. Press the **Reset** button and the totalizer will begin again at zero.



Return to Flow Display

When all settings are as desired, return to the **Flow Display** screen by pressing the MENU button and selecting **Flow Display**.



5.5 CALIBRATION

NOTICE

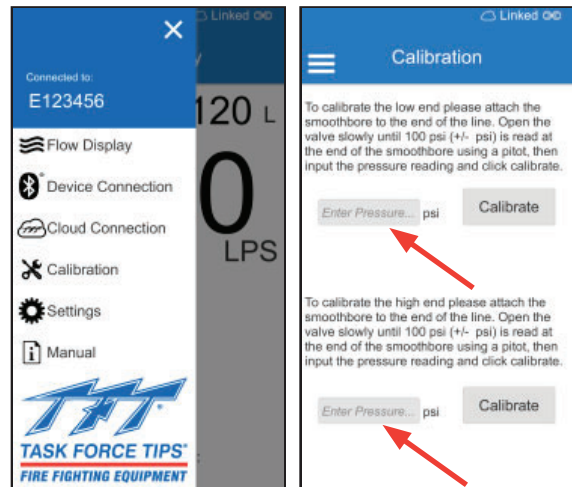
SHO-FLOW accuracy is dependent on the accuracy of the gauge used to perform calibration.

The Calibration screen is used to calibrate the SHO-FLOW in the unlikely event of incorrect readings. The SHO-FLOW is calibrated at the factory. Calibration is not required under normal circumstances.

1. If you wish to return to this screen, press the **MENU** button.



2. Then, press the **Calibration** button.



- Follow the directions and enter the measured pressure readings.

Note: If the pressure reading is out of range adjust the valve until you get a reading in the range to activate calibration option.

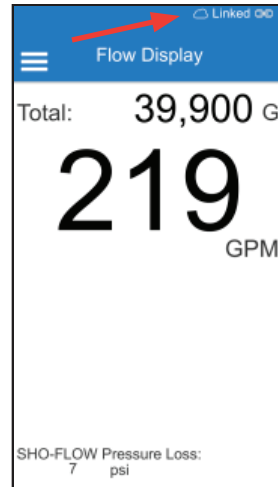
- Always calibrate for both the low and high end flows to ensure the best possible accuracy.

5.6 ESTABLISHING A BROADCASTER CONNECTION

NOTE: To use this functionality, you must allow the app to use your device's location.

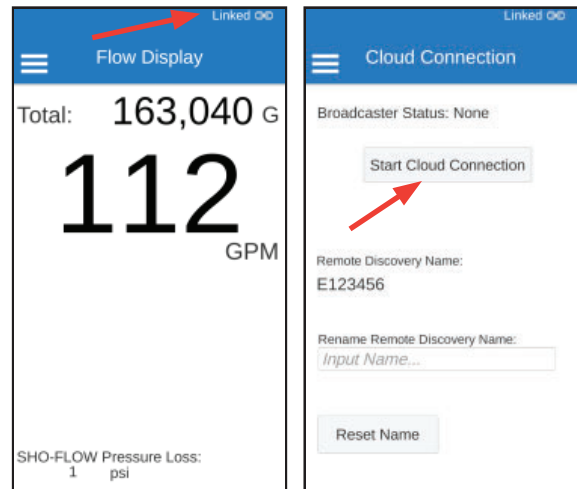
A Broadcaster connection will be automatically initiated immediately after the Bluetooth connection has been established when Internet is available (Wi-Fi or cellular). You should see the Cloud icon appear when you are actively broadcasting.

The purpose of the Broadcaster is to share flow rate data (current flow rate and totalized flow) to multiple remote viewers in real time. This can be used to extend the range of the flow rate data to users up to ¼ mile away.



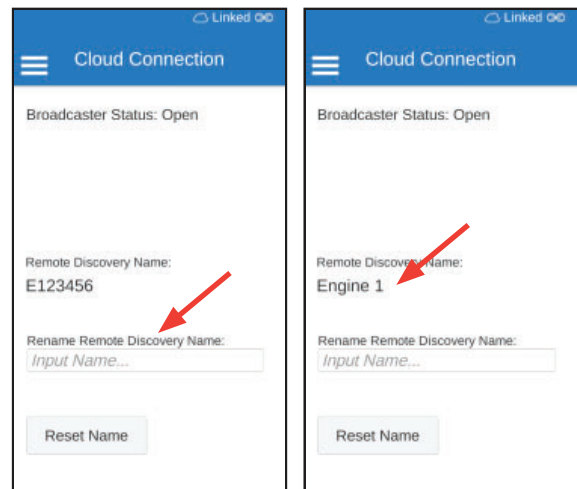
Reestablishing Broadcaster Connection

If network connection is lost, broadcasting will end and the Cloud icon will disappear. Once the network has been restored, the broadcaster will need to press the Start Cloud Connection button, found under the Cloud Connection screen to begin broadcasting again.



Broadcaster Remote Discovery Name

The default name for the Remote user to discover the broadcasting SHO-FLOW will be the SHO-FLOW's Bluetooth device name. If you wish to change the Remote Discovery Name to something with more meaning, simply input the name into the input field (max 20 characters). In this example we renamed the Remote Discovery Name to "Engine 1". The reset name button will reset the Remote Discovery name to the SHO-FLOW Bluetooth Device name.



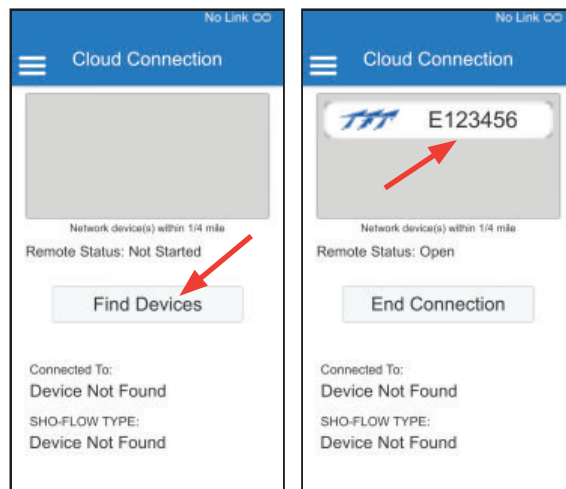
5.7 ESTABLISHING A REMOTE VIEWER CONNECTION

NOTE: To use this functionality, you must allow the app to use your device's location.

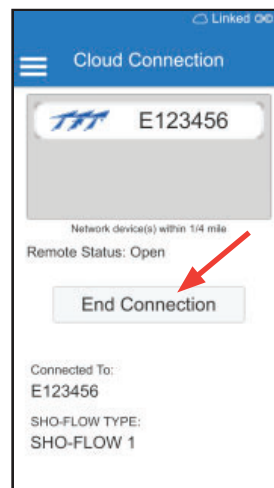
A remote viewer is any person that is connected to a SHO-FLOW device through the Cloud Connection. This person is able to view the flow rate of a broadcasting device up to 1/4 mile (400M) away.

To start the connection:

1. Open the Cloud Connection screen. If Internet is available (Wi-Fi or cellular) you will begin to see nearby devices populate the Network Device(s) List with the Remote Discovery Name the Broadcaster selected. If scanning fails, you may need to press the Find Devices button.
2. Press the button of the device you wish to connect to.



3. Once the connection is completed:
 - You will begin seeing the same flow rate data as the broadcasting device.
 - The Cloud icon appears with the Linked symbol.
 - The Device Name will update to the connected device.
 - The status will update to Linked.
 - The SHO-FLOW type will be displayed.
4. To disconnect, press the End Connection button.



6.0 MAINTENANCE

No maintenance is required. Calibration is not required under normal circumstances. If needed, see section 5.5. If unit becomes damaged and does not display correct data, send it back to the factory for service.



Any alterations to the product or its markings could diminish safety and constitutes a misuse of this product.

7.0 TROUBLESHOOTING

Bluetooth Connection

SHO-FLOW:

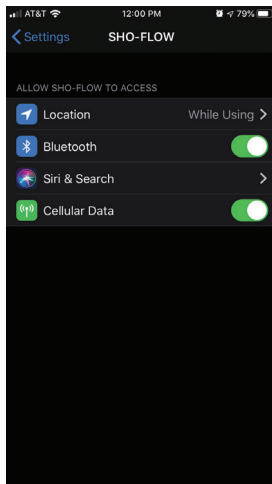
In a case that the SHO-FLOW device is not discoverable by the App it may be necessary to stop flowing for a period of up to one minute (depending on Link Retain Settings) to allow the SHO-FLOW to power down fully. After one minute has elapsed you can begin flowing water again and connect to the SHO-FLOW.

Create a flow greater than the minimum rated flow rate through the SHO-FLOW to turn on the device and start transmitting the Bluetooth signal.

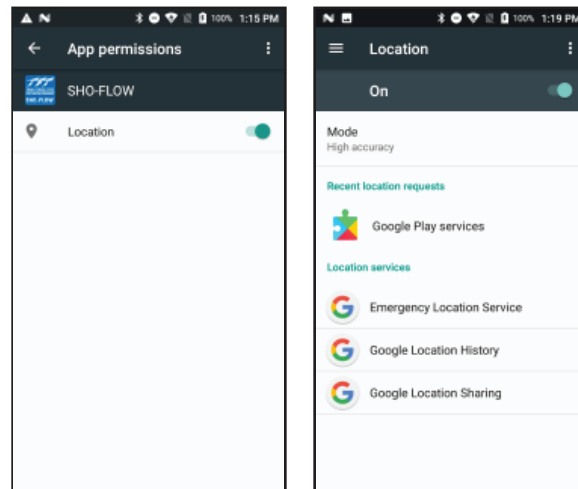
App:

The SHO-FLOW App requires the user to allow the App to use the device's location and Bluetooth services. If you deny the usage of either of these services, the App may not function as it is intended. Depending on operating system, you can verify these services are enabled.

iOS: Settings > SHO-FLOW



Android: Settings > Apps > SHO-FLOW > Permissions
Also, Settings > Locations



Cloud Connection

A network connection (Wi-Fi or cellular) is required for this functionality to work. Allow this App to use the network connection if requested.

Broadcaster

If the Cloud icon is present on the screen and Remote viewers are unable to find the SHO-FLOW, the Broadcaster's location may not have pulled the most current location. To correct this the broadcaster should return to the Wireless connection screen and press the Unpair button. This will disconnect from the SHO-FLOW. Once the SHO-FLOW becomes available again in the device list, you may select and connect to the device. This will then pull your device location again and reconnect to the Cloud.

Remote Viewer

The Remote Viewer's location may not have pulled the most current location. To correct this, press the End Connection Button. Then, press the Find Devices button to begin scanning again with the new location.

If you are still encountering any issues it may be necessary to restart the App.

If none of the above work, a restart of your device may be necessary.

8.0 WARRANTY

Task Force Tips LLC, 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA ("TFT") warrants to the original purchaser of its products ("equipment"), and to anyone to whom it is transferred, that the equipment shall be free from defects in material and workmanship during the five (5) year period from the date of purchase. TFT's obligation under this warranty is specifically limited to replacing or repairing the equipment (or its parts) which are shown by TFT's examination to be in a defective condition attributable to TFT. To qualify for this limited warranty, the claimant must return the equipment to TFT, at 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA, within a reasonable time after discovery of the defect. TFT will examine the equipment. If TFT determines that there is a defect attributable to it, TFT will correct the problem within a reasonable time. If the equipment is covered by this limited warranty, TFT will assume the expenses of repair.

If any defect attributable to TFT under this limited warranty cannot be reasonably cured by repair or replacement, TFT may elect to refund the purchase price of the equipment, less reasonable depreciation, in complete discharge of its obligations under this limited warranty. If TFT makes this election, claimant shall return the equipment to TFT free and clear of any liens and encumbrances.

This is a limited warranty. The original purchaser of the equipment, any person to whom it is transferred, and any person who is an intended or unintended beneficiary of the equipment, shall not be entitled to recover from TFT any consequential or incidental damages for injury to person and/or property resulting from any defective equipment manufactured or assembled by TFT.

It is agreed and understood that the price stated for the equipment is in part consideration for limiting TFT's liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

TFT shall have no obligation under this limited warranty if the equipment is, or has been, misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or if it has been repaired or altered by someone else.

THIS IS A LIMITED EXPRESS WARRANTY ONLY. TFT EXPRESSLY DISCLAIMS WITH RESPECT TO THE EQUIPMENT ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THERE IS NO WARRANTY OF ANY NATURE MADE BY TFT BEYOND THAT STATED IN THIS DOCUMENT.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state

9.0 OPERATION AND INSPECTION CHECKLIST

BEFORE EACH USE the device must be inspected to this checklist

1. There is no obvious damage such as missing, broken or loose parts, damaged labels, etc.
2. The waterway is clear of obstructions and the turbine is free of debris.
3. Coupling is tight and leak free.

BEFORE BEING PLACED BACK IN SERVICE, device must be inspected to this checklist;

1. There are no broken or missing parts.
2. There is no obvious damage to the device that could impair operation (e.g. dents, cracks, corrosion, or other defects).
3. The thread and gasket are in good condition.
4. The waterway is clear of obstructions and internal turbine is free of debris.
5. Device is clean and markings are legible.
6. Coupling is retightened properly.



WARNING

Equipment failing any part of the checklist is unsafe for use and must have the problem corrected before use or being placed back into service. Operating equipment that has failed the checklist is a misuse of this equipment.