

INSTRUCTIONS FOR 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.

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).

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

25-125 GPM or 50-300 GPM
 100-500 L/min or 200-1200 L/min



SHO-FLOW 2

100-500 GPM or 500-1250 GPM
 400-2000 L/min or 2000-5000 L/min

Flow range specified at time of order.

DANGER

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 on 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.

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FEMSA

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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

-  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.
-  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.
-  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 VARIOUS MODELS AND TERMS

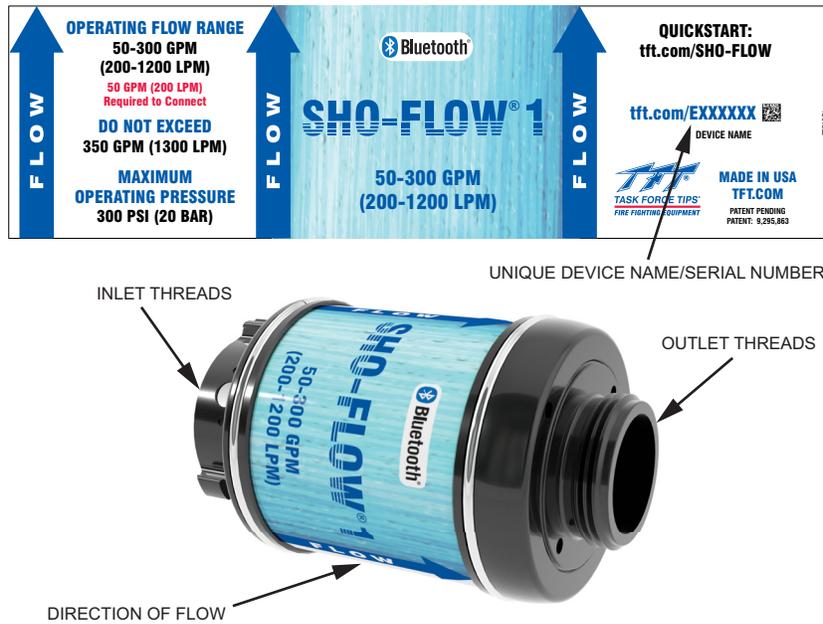


Figure 3.1

3.2 SPECIFICATIONS

3.2.1 DEVICE SPECIFICATIONS

Model Name	SHO-FLOW 1		SHO-FLOW 2	
Operating Flow Range	25-125 GPM (100-500 L/min)	50-300 GPM (200-1200 L/min)	100-500 GPM (400-2000 L/min)	500-1250 GPM (2000-5000 L/min)
Maximum Flow Range	150 GPM (600 L/min)	350 GPM (1300 L/min)	600 GPM (2300 L/min)	1350 GPM (5200 L/min)
Minimum Flow Rate Required to Connect	25 GPM (100 L/min)	50 GPM (200 L/min)	100 GPM (400 L/min)	500 GPM (2000 L/min)
Waterway Diameter	1.5" (38 mm)	1.5" (38 mm)	2.5" (65 mm)	2.5" (65 mm)
Flow Accuracy	+/-2.5% Full Scale			
Non-recoverable Pressure Loss @ Maximum Flow	10 PSI @ 125 GPM (0.7 BAR @ 500 L/min)	15 PSI @ 300 GPM (1 BAR @ 1200 L/min)	10 PSI @ 500 GPM (0.7 BAR @ 2000 L/min)	10 PSI @ 1250 GPM (0.7 BAR @ 5000 L/min)
Maximum Operating Pressure	300 PSI (20 bar)			
Hydrostatic Test Pressure	900 PSI (62 bar)			
Operating Temperature - Electronics	-20 to 140°F (-30 to 60°C)			
Length	6.3" (160 mm)		7.4" (188 mm)	
Width	3.9" (99 mm)		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			

Table 3.2.1

3.2.2 APP SPECIFICATIONS

Wireless Communication	Bluetooth® Version 4.1
Display	SHO-FLOW Smart Phone App
Flow Units	GPM, L/min, GPS, L/sec
Pressure Units	PSI, BAR, kPa
Force Units	lbf, kgf

Table 3.2.2

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 waterway connections may cause equipment to leak or uncouple under pressure. Failure could result in injury. Equipment must be mated to matched connections.

CAUTION Dissimilar metals coupled together can cause galvanic corrosion that can result in the inability to uncouple the connection, or complete loss of engagement over time. Failure could cause injury. Per NFPA 1930, if dissimilar metals are left coupled together, an anti-corrosive lubricant should be applied to the connection 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.



Figure 4.0

NOTICE Turbulence can cause inaccurate readings. Installing the device adjacent to turbulence causing plumbing like elbows, partially gated valves, eductors, and flat adapters is not recommended. The best accuracy is assured when the device 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.)
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 "Explore Connected Devices" button becomes active. Press this button to review gauge readings.

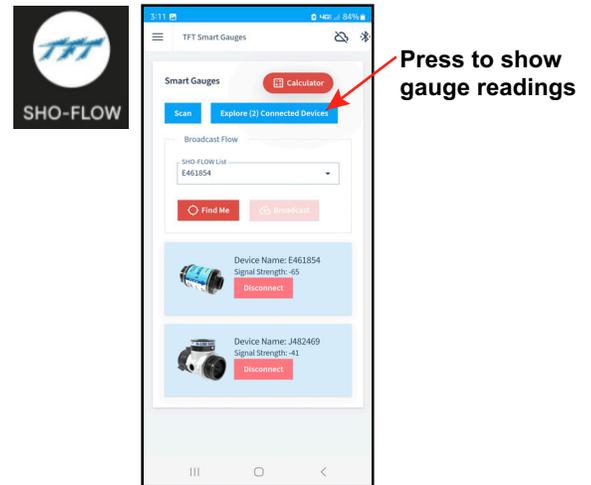


Figure 5.0

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.

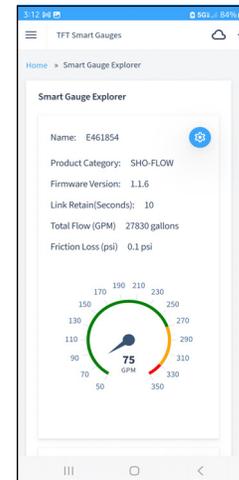


Figure 5.1

5.2 DEVICE CONNECTION

Smart Gauge connections are managed on the home page. To find devices if none are present, scan for devices. Press "Connect" on each gauge to start Bluetooth communications.

The Bluetooth connection can be released for another user to connect to the SHO-FLOW by one of the following methods:

- Press the DISCONNECT button on the HOME page
- Completely close the app

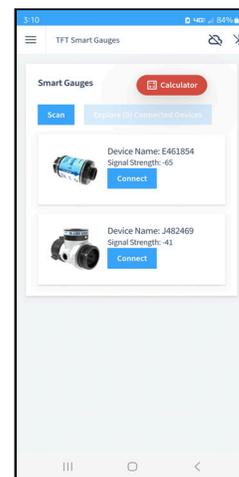
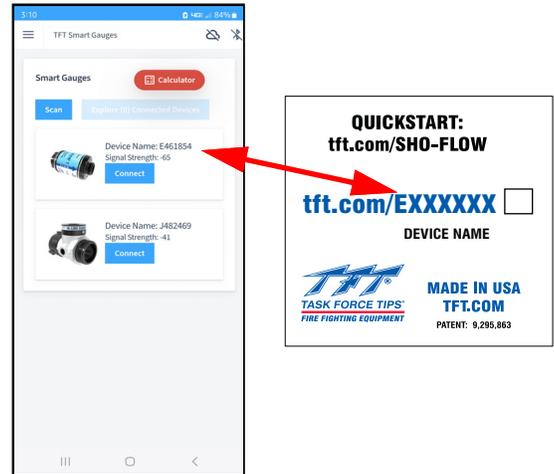


Figure 5.2

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 SCAN button to begin searching for SHO-FLOW.
3. Press button with the matching device name to connect.
4. Press CONNECT button.
(the name on the SHO-FLOW will match the listed device on the screen)



5. Once communication has been checked for proper data transfer:
 - Top bar will display the Bluetooth Icon

NOTE: The app will remember this device name. When the app is disconnected, it will automatically search and connect to that device if it is available.

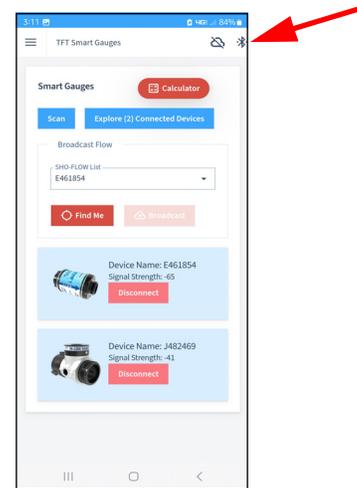


Figure 5.3

5.4 SETTINGS

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

1. To return to this screen, press the MENU button.
2. Then, press the SETTINGS button.

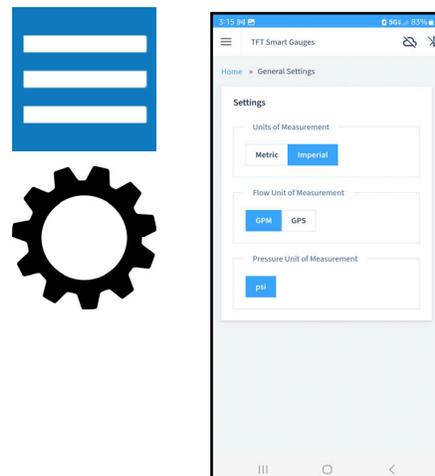


Figure 5.5

5.4.1 GAUGE SPECIFIC SETTINGS

To view gauge settings, press the gear button next to the desired equipment.

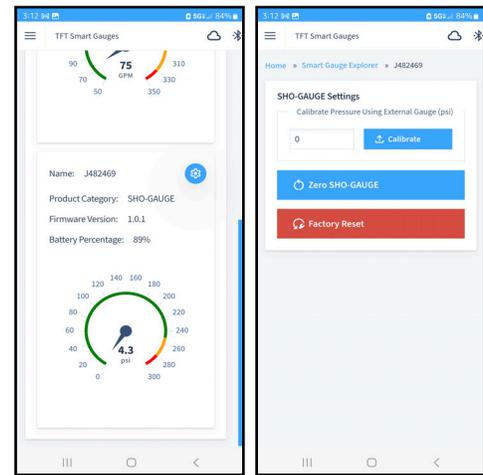


Figure 5.5.1

5.5 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. If the link retain time is exceeded, a popup will pause the flow session. To continue the session, raise the flow higher than the device minimum and click the continue button.

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

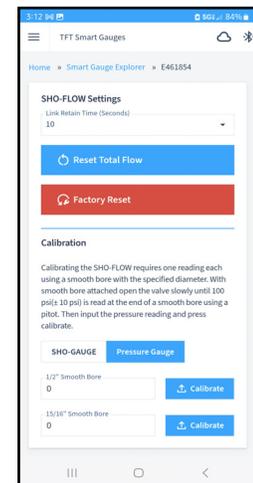


Figure 5.6

5.6 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. Press Remote Viewer from menu.
2. Open the Remote Viewer 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.
3. Press the button of the device you wish to connect to.
4. Once the connection is completed:
 - Return to the Flow Display screen to view the same flow rate data as the broadcasting device.
 - The Cloud icon appear.
 - The Device Name will update to the connected device.
5. To disconnect, press the DISCONNECT button.

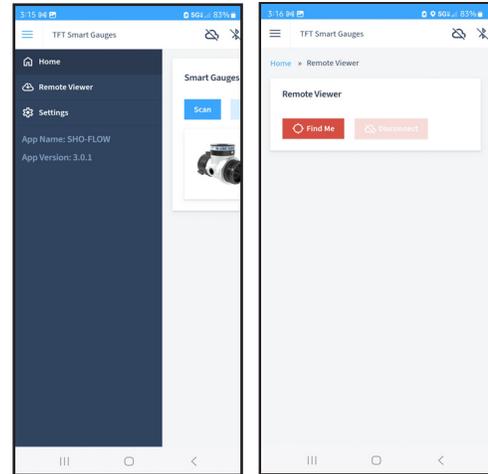


Figure 5.6

5.6.1 PUBLISHING FLOW

To begin sharing flow:

1. Select the device for which data will be published from the list of connected devices.
2. Confirm that internet service is available.
3. Press The CLOUD ICON to publish.

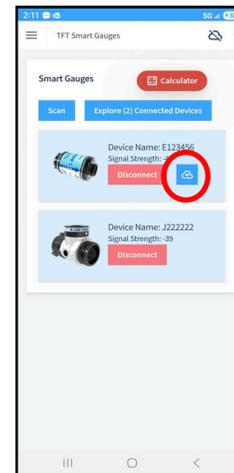


Figure 5.6.1

6.0 MAINTENANCE

No maintenance is required. Calibration is not required under normal circumstances. 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.



All replacement parts must be obtained from the manufacturer to assure proper performance and operation of the device.

7.0 TROUBLESHOOTING

Bluetooth Connection

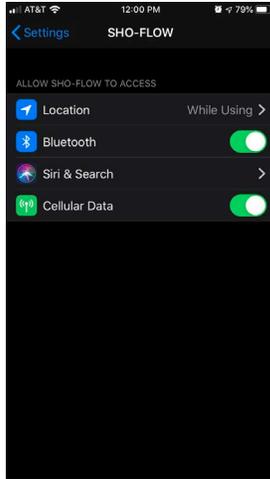
SHO-FLOW:

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. If this does not solve you issues, ensure that you are within operating range of the SHO-FLOW and the flow is over the minimum required for the SHO-FLOW model.

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

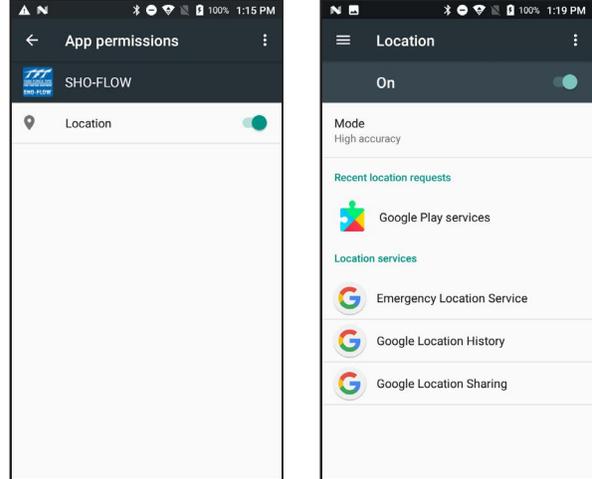


Figure 7.0

Cloud Connection

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

Go to tft.com for all warranty information.

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, the device must be inspected to this check list:

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.



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.