

FLO-Sight™ PC Software 5000 Series Companion



Operation and Service Manual

P/N 6011696, Revision C
May 2023

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- Material Design Lite (MDL): Aache 2.0 License <https://github.com/google/material-design-lite/blob/mdl-1.x/LICENSE>
- AMCharts
- Electron: MIT License (<https://raw.githubusercontent.com/electron/electron/master/LICENSE>)
- Chromium: License (<https://www.chromium.org/chromium-os/licenses>)
- NPMjs: The Artistic License 2.0 (<https://docs.npmjs.com/policies/license>).
- Boost: License (http://www.boost.org/LICENSE_1_0.txt) (<http://www.boost.org/users/license.html>)
- FreeRTOS: GPLv2 License + exceptions (<http://www.freertos.org/license.txt>)
- RapidJSON: MIT License (<https://github.com/miloyip/rapidjson/blob/master/license.txt>)
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Contents

End User License Agreement	iii
Contents	vii
CHAPTER 1 Introduction	1
System Requirements	1
Software Versions	2
CHAPTER 2 Getting Started	3
Installation and Activation.....	3
Download and Install.....	3
License Activation	3
Connecting Meter to Software.....	4
USB-C to USB-A Cable	4
USB-A to RS232 Cable.....	5
Software Architecture Overview	6
CHAPTER 3 Dashboard	7
Dashboard Overview	7
Log Button.....	7
Alert Indicator	7
Multiple Meter Operation	8
Meter GUI Card	8
Volume Tab.....	9
Meter Information.....	9
Volume and Triggers	10
Setting Triggers.....	10
Select Mode	11
Begin/End Triggers and Slope.....	11
Making Volume Measurements	12
Table View.....	13
Update Counter.....	13
Graphing.....	14
Configure Graphs.....	14
Pause Display.....	16
Graph Data Labels.....	16
CHAPTER 4 Settings	17
Settings Overview	17
Global Settings	18
Default Export	18
Meter Settings	19
General.....	19
Device Name	19
Update Rate.....	20
Device Lock	20
Using 0.5 Inch or 15-mm Ends	20
4040 Mode	21
User Gas Standard.....	21
Gas Calibration.....	21
Custom Air/Oxygen Mixture	22
Flow Direction.....	22
Display Readings	23
Alerts	23

CHAPTER 5 Logging	25
Logging Overview	25
Log Files	26
Setting Log Parameters	26
Logging Data	27
Log Details	28
Log Info	28
Table	29
Graph	30
Device Information	30
Downloading Log Files	31
Exporting Log Files	32
Deleting Log Files	34
CHAPTER 6 Help	35
Help Overview	35
Manuals and Guides	35
License Type	35
Software Version	35
Check for Update	36

CHAPTER 1

Introduction

FLO-Sight™ PC Software is a proprietary software package that communicates with and can be used to operate your TSI® 5000 Series Flow Multi-Meter. The software is designed to work with any model flow meter in the 5000 Series line.

FLO-Sight™ PC software provides the following functionality:

- Real-time measurement display
- Min, max, and average readings
- Meter setup and advanced configuration options
- Real-time graphing
- Data logging and download
- User-set alert thresholds
- Multiple Meter operation

A basic version of FLO-Sight™ PC software is included with the purchase of any 5000 Series Meter and can be downloaded from TSI.com. A version with advanced functionality is available for purchase.

System Requirements

Operating System	<ul style="list-style-type: none">• Windows® 7 and 10 operating systems are supported• Only amd64 (x64) binaries are provided for Windows® operating system. Please note, the ARM version of Windows® operating system is not supported at this time.
Hardware	<ul style="list-style-type: none">• An Intel® Pentium® 4 processor or later (SSE2 capable)• 512 MB of RAM
Other Requirements	<ul style="list-style-type: none">• Mouse or other pointing device• At least one free USB port for communication with meters

Software Versions

FLO-Sight™ PC software is offered in two version levels, Basic and Advanced. The basic version is free and can be downloaded from TSI.com. The advanced version with additional functionality can be purchased at any time and installed on up to two machines. A free two-month trial of the advanced version is included with the purchase of a 5000 Series Flow Multi-Meter.

The difference in functionality between the versions is shown below:

Features	Description	Basic Version	Advanced Version
Real-time Measurement Display	Duplicates meter GUI display.	Yes	Yes
Meter Setup and Configuration	Advanced meter setup and configuration options.	Yes	Yes
Table View	Display min, max, and average readings for any measurement parameter.	Yes	Yes
Real-time Graphing	Graph any measurement parameter.	—	Yes
Data Logging and Download	Log data to meter or computer, manage files, and view log details.	—	Yes
Set Alerts	User-set alert thresholds for any parameter.	—	Yes
Multiple Meter Operation	Operate and display data from two meters.	—	Yes

CHAPTER 2

Getting Started

Installation and Activation

Download and Install

The basic version of FLO-Sight™ PC software can be easily downloaded from [TSI.com](https://www.tsi.com). To download the software, open [TSI.com](https://www.tsi.com) in your web browser and select “**TSI Software And Firmware Wizard**” under the **SUPPORT** tab. You could also click on the link below or enter the link into your web browser:

<https://www.tsi.com/support/tsi-software-and-firmware-wizard/>

From the TSI® Software and Firmware Wizard web page, enter the model number of your 5000 Series Meter (ex. 5320), or enter the text “flow meter” then select a 5000 Series flow meter model, and click the **SEARCH** button. Click on the resulting FLO-Sight™ PC Software link to download the file to your computer. After downloading is complete, run the install file and follow the onscreen prompts.

DOWNLOAD SOFTWARE AND FIRMWARE FOR YOUR INSTRUMENT

Use our software and firmware wizard to download software, firmware, and associated documentation for your instrument.

Start by typing your instrument name, model, or material number into the search box below:

Gas Mass Flow Meter (plus Kit) 5320-2 [5320-2]

Search

5000 SERIES MASS FLOW METER

FLO-SIGHT™ PC SOFTWARE

5000 Series Companion PC Software

License Activation

The basic version of FLO-Sight™ software can be freely downloaded and functions without a license key. The advanced version of FLO-Sight software requires a license key. The purchase of a 5000 Series Flow Multi-Meter includes a license key for a two-month free trial of the advanced version.

To activate a license key:

1. Install and run FLO-Sight PC software.
2. In the software, select **Help** from the drop-down menu.
3. Enter the activation code (with dashes).
4. Select **UPGRADE**.

Connecting Meter to Software

When the software is started it will search for any meters connected over USB. The first two meters located will be shown in the software. If more than two meters are found, only the first two located will be shown.

By unplugging either of the meters that are currently shown in the software, its card will be removed and replaced with another meter if more than two meters were originally located.

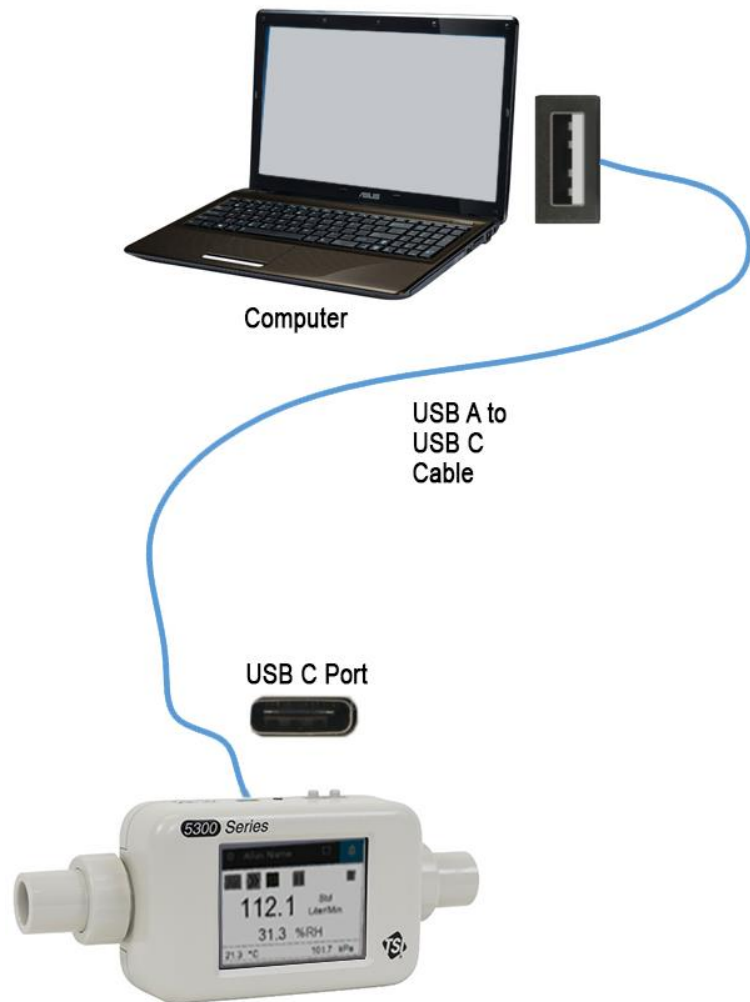
While the program is running, it will continue to monitor the USB and track the list of connected and available meters.

USB-C to USB-A Cable

In addition to supplying power, the 5000 Series USB-C to USB-A cable (5000-USBC-A) provides direct communication between the Multi-Meter and a computer. The graphic to the right shows the connection scheme.

You can view real-time measurements and control your meter through FLO-Sight™ PC Software or through an alternative program such as HyperTerminal® or PuTTY using ASCII commands.

For more details, please refer to the *Series 5200/5300 ASCII Command Set Manual*.



USB-A to RS232 Cable

To communicate via serial, you can purchase the optional USB-A to RS-232 Serial Cable Kit (5000-RS232) which is comprised of a USB-A to RS-232 serial cable and null modem converter. The cable can be connected from either USB-A port on the Meter. See the image below for connecting the Multi-Meter via RS-232.

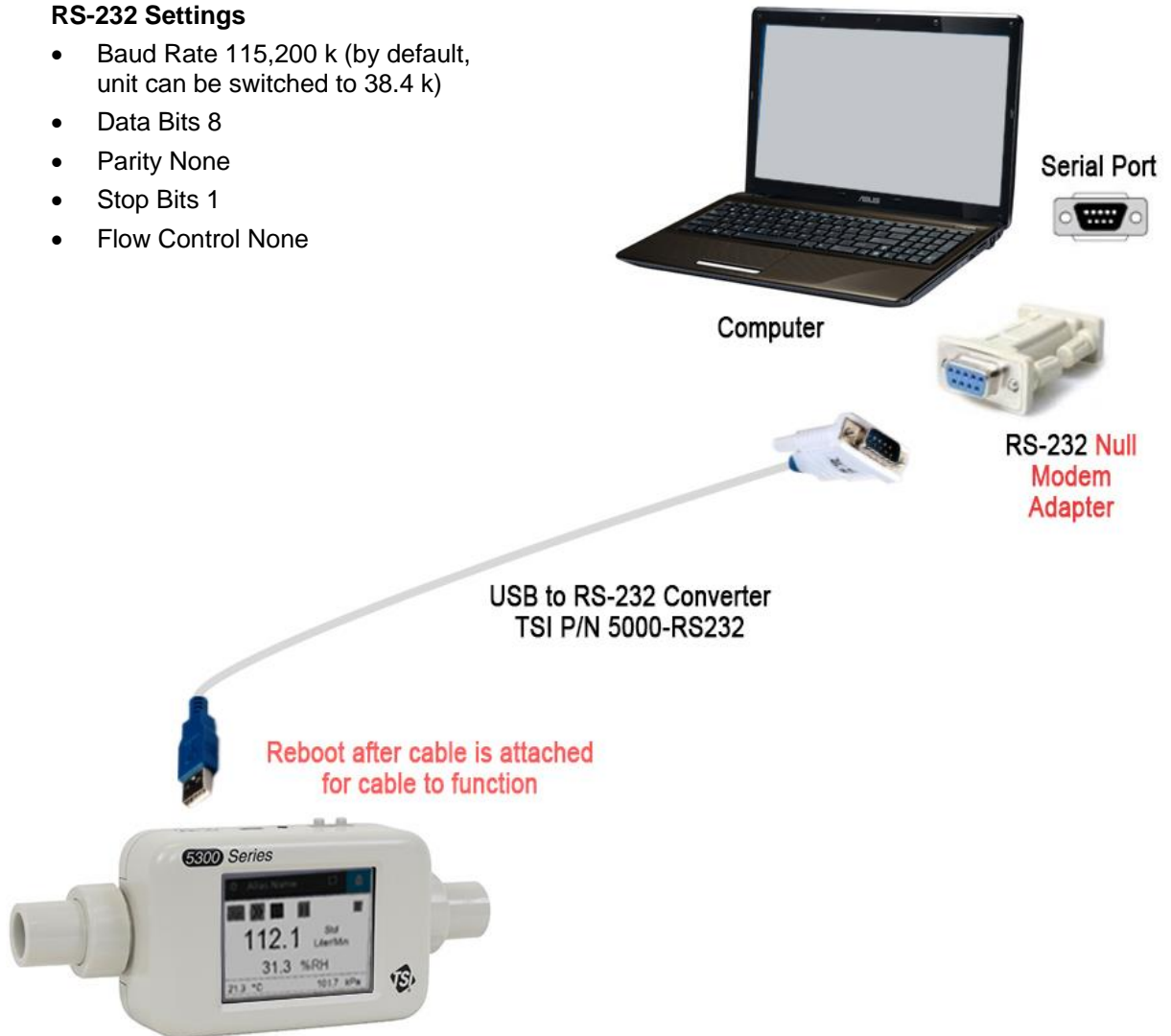
NOTICE

The Multi-Meter must be rebooted after connecting the adapter and cable in order to load the driver.

Once the cable is connected and the Meter has been rebooted, you can communicate via serial with the ASCII commands found in the *Series 5200/5300 ASCII Command Set Manual*.

RS-232 Settings

- Baud Rate 115,200 k (by default, unit can be switched to 38.4 k)
- Data Bits 8
- Parity None
- Stop Bits 1
- Flow Control None



Software Architecture Overview

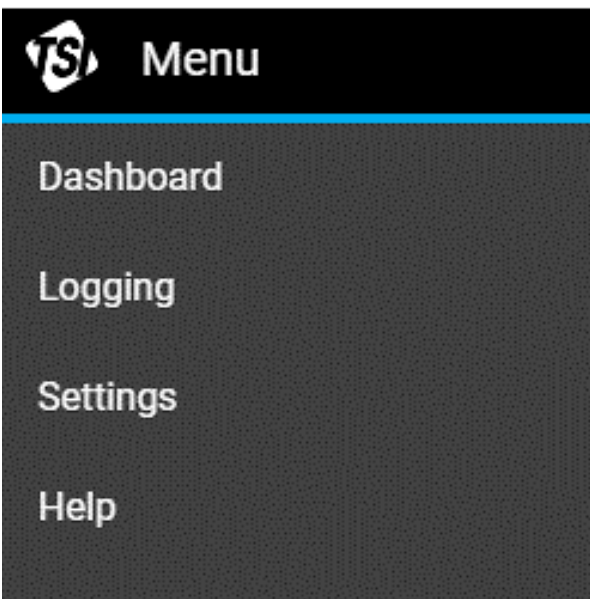
FLO-Sight™ PC Software (advanced version) is made up of four primary screens:

- [Dashboard](#)
- [Logging](#)
- [Settings](#)
- [Help](#)

To switch to a screen, click on the **Menu** icon located on the left side of the top toolbar and select the desired option from the drop-down menu.

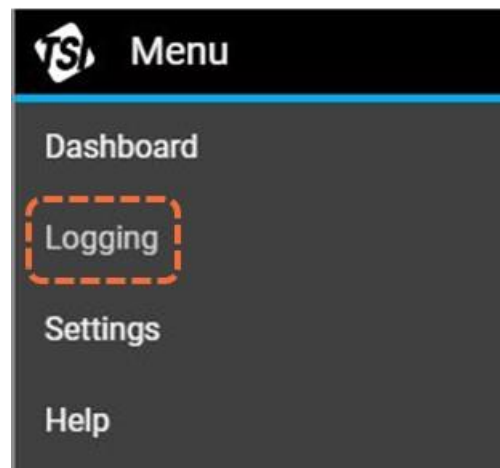
NOTICE

The TSI® icon does not have any functionality attached to it and cannot be clicked on.



NOTICE

The Logging screen option is disabled in the basic version of FLO-Sight™ PC Software.

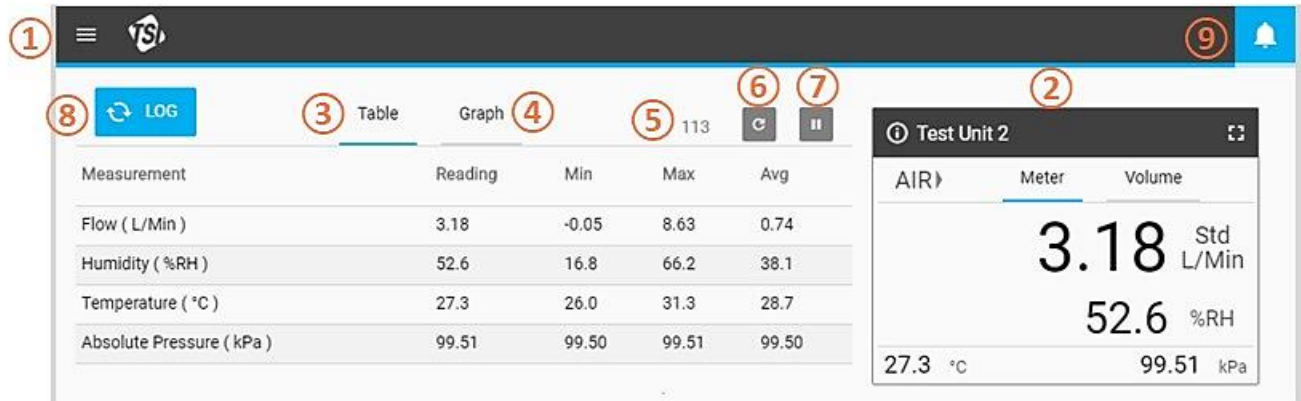


CHAPTER 3

Dashboard

Dashboard Overview

The Dashboard is used to display measurement readings and real-time graphs. The Meter's GUI screen is duplicated here and can be used to set triggers for volume measurements.



1. Menu drop-down	6. Reset Update Counter button
2. Meter GUI Card	7. Pause Display button
3. Table View tab	8. Log button
4. Real-time Graphing tab	9. Alert Indicator
5. Update Counter	

Log Button

In the advanced version of FLO-Sight™ PC Software, you have the option of starting a log session by pressing the **LOG** button located in the Dashboard. Logging can also be started from the Logging screen which is selected from the main drop-down menu. Please see [Chapter 5](#) for detailed information on logging data through FLO-Sight™ PC Software.

Alert Indicator

Displayed in the top right corner of the header bar is the **Alert Indicator** icon. With the advanced version of FLO-Sight™ PC software, you can set thresholds for different measurements that will alert in the software and on the Meter when conditions are met. Please see [Chapter 4](#) for detailed information on operating alerts.

Multiple Meter Operation

With the advanced version of FLO-Sight™ PC software, two 5000 Series Meters can be connected and operated simultaneously. If more than one Multi-Meter is connected, the software will display the Meters in the Dashboard screen in the order they were recognized. Each connected Meter will have its own place on the dashboard and operate independently of the other.

The screenshot shows the FLO-Sight PC software dashboard with two meter data cards. The top card is for 'Test 5320.129' and the bottom card is for 'Test Unit 2'. Each card displays a table of measurements and a large digital readout of the current flow rate.

Measurement	Reading	Min	Max	Avg
Flow (L/Min)	1.86	0.00	1.86	0.07
Totalizer (L)	0.229	-	-	-
Low Pressure (cmH2O)	7.32	-0.86	7.35	3.66
Temperature (°C)	26.5	26.5	28.8	27.9

Test 5320.129

AIR ▶ Meter Volume

1.86 Act L/Min

0.229 Std L

7.32 cmH2O 26.5 °C

Measurement	Reading	Min	Max	Avg
Flow (L/Min)	5.47	-0.21	7.64	0.00
Humidity (%RH)	54.0	19.1	54.0	20.2
Temperature (°C)	29.3	27.4	31.2	27.5
Absolute Pressure (kPa)	98.31	98.25	98.32	98.26

Test Unit 2

AIR ▶ Meter Volume

5.47 Std L/Min

54.0 %RH

29.3 °C 98.31 kPa

Meter GUI Card

When connected to FLO-Sight™ PC software, the GUI of the Meter will be duplicated in the dashboard. Measurement readings, gas type, and flow direction shown on the software GUI card will match those on the Meter itself. Measurement settings cannot be changed from this screen, but are instead configured by selecting the **Settings** option in the Menu drop-down.

Test Unit 2

AIR ▶ Meter Volume

3.18 Std L/Min

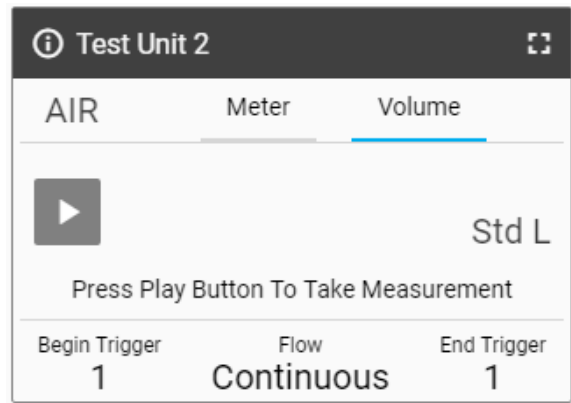
52.6 %RH

27.3 °C 99.51 kPa

Volume Tab

If Volume measurements are available, there will be two tabs visible in the GUI card: Meter and Volume. If Volume is not available, there will be no tabs present. Volume triggers are set through the Volume tab when operating the Meter through FLO-Sight™ PC software.

See the “[Volume and Triggers](#)” section later in this chapter for details on the volume measurement and setting triggers.



Meter Information

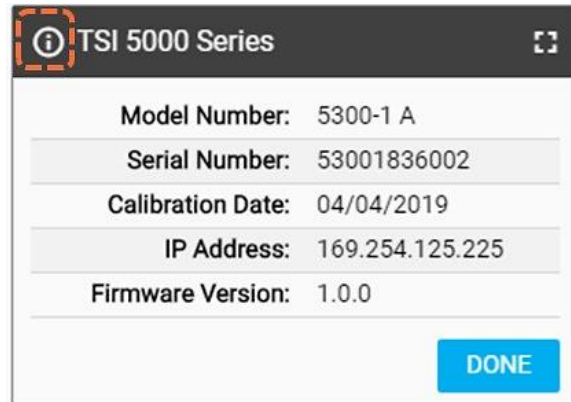
Press the **Information** icon in the top left corner of the header to display information about the Meter. Select the **DONE** button to return to the GUI card Home Screen.

Model Number

This field displays the model number of the instrument (ex. 5300). The dash number is the gas calibration of the Meter (ex. -1 above indicates an Air only calibration). There will be a letter or number after the model-dash number that represents the hardware revision (ex. “A” in the above screenshot).

Device Name

The name of the device is displayed in the Header Bar on the GUI card with the text “TSI 5000 Series” displayed as the default. The device name can be edited through the Settings screen of FLO-Sight™ PC software.



Serial Number

This is the serial number of the Meter. The naming convention is as follows: 5XXX YYWW XXX

5XXX =	Model Configuration (ex. 5320)
YY =	Year of Manufacture
WW =	Week of Manufacture
XXX =	Manufactured Unit Number

Calibration Date

The Calibration Date displays the date the Meter was last calibrated by TSI® Incorporated. TSI® recommends an annual calibration for all flow meters.

IP Address

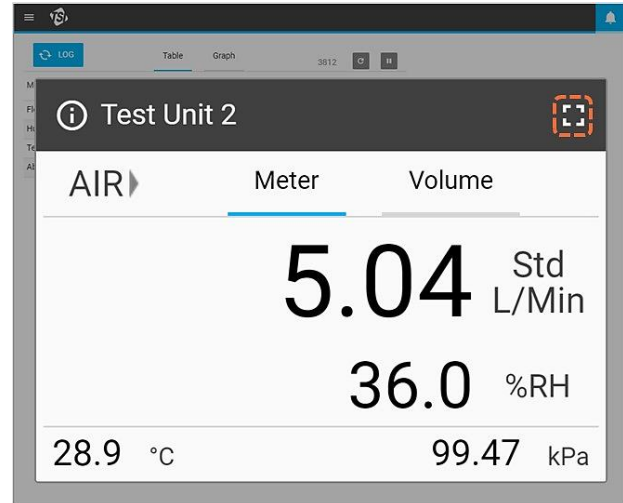
Each 5000 Series Flow Multi-Meter will have its own unique IP address. The IP address can be used in establishing communication with a PC and communicating via ASCII commands. Please see the *Series 5200/5300 ASCII Command Set Manual* for more information on communicating with ASCII commands.

Firmware Version

This field shows the current firmware version being used by the Flow Multi-Meter. TSI® may periodically release firmware updates for the 5000 Series. Firmware cannot be updated through the software; updates must be done through the Meter itself. The Device Information screen on the Meter will have a separate **Check for Update** button that is used to load firmware updates from an inserted USB drive. Please see the 5000 Series Instrument Manual for more information on updating firmware.

Expand GUI Card Size

Select the **Screen** icon from the top right corner to expand the GUI card to full size. Once expanded, click the **Screen** icon again to return the GUI card to normal size.




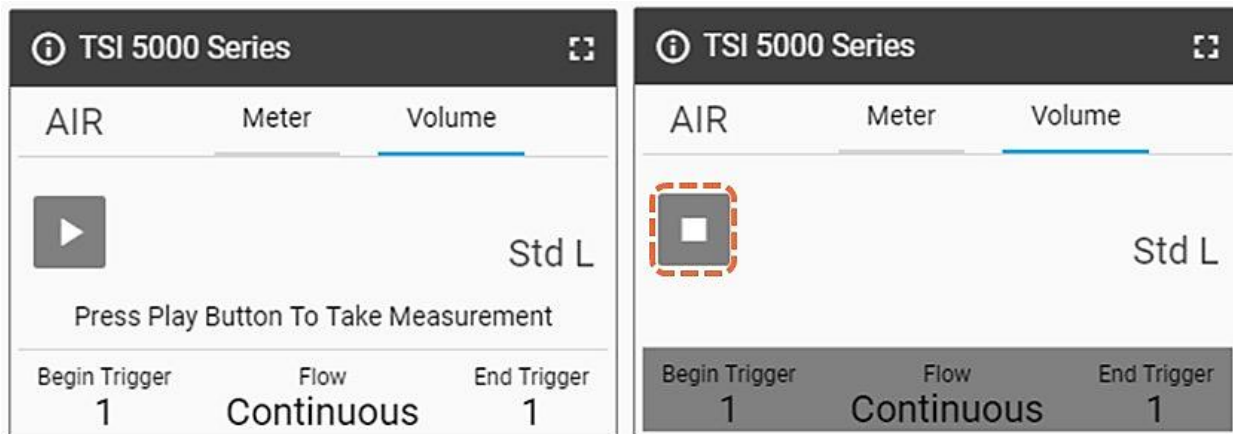
Volume and Triggers

Volume measurements integrate flow over time and are controlled through flow or pressure-based begin and end triggers. Trigger values for volume measurements can be set in the software under the **Volume** tab of the GUI card.

Setting Triggers

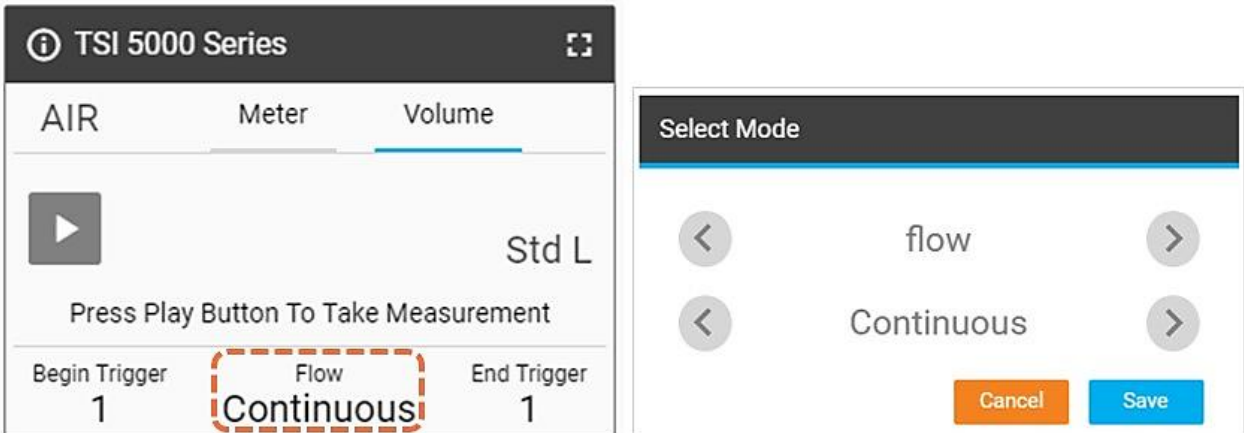
The meter must be stopped in order to edit trigger settings. On the **Volume** tab of the GUI card, confirm that the Meter is stopped (shown below left) and press on the field you would like to edit.

If a volume measurement is active (shown below right), press the **Stop**  button to cancel the measurement and allow edits to be made to trigger settings.



Select Mode

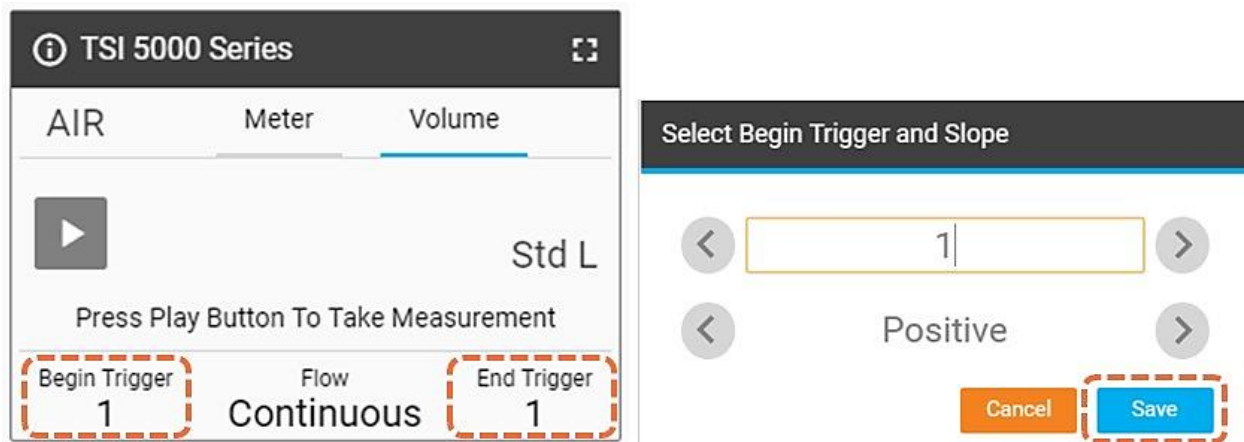
In the **Select Mode** screen, you can choose your Trigger Parameter (Flow, Absolute Pressure, or Low Differential Pressure) and Test Mode (Single or Continuous testing). Use the arrows to scroll through the selection options and click **Save** to complete.



Trigger Parameter	Flow, Absolute Pressure, or Low Pressure	
Test Mode	Single or Continuous	
	Single Test Mode:	You must press the Play button before each volume measurement is taken.
	Continuous Test Mode:	The Meter will continually make volume measurements each time the begin trigger condition is met.

Begin/End Triggers and Slope

Select the trigger text or trigger value fields on the card GUI to bring up a **Select Begin Trigger and Slope** dialog box. In this screen you can select your Begin / End Trigger Values and the Slopes of the trigger. Use the arrows to scroll between options or specify your own value trigger value. Once you have made your selections, click the **Save** button.



Begin / End Trigger Values	Select from available values
Begin / End Trigger Slopes	Positive or Negative

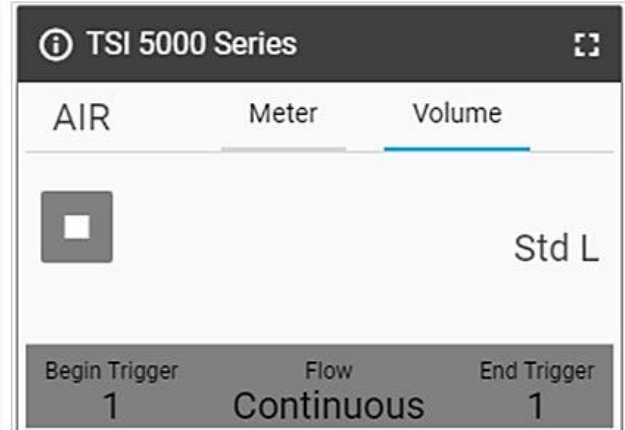
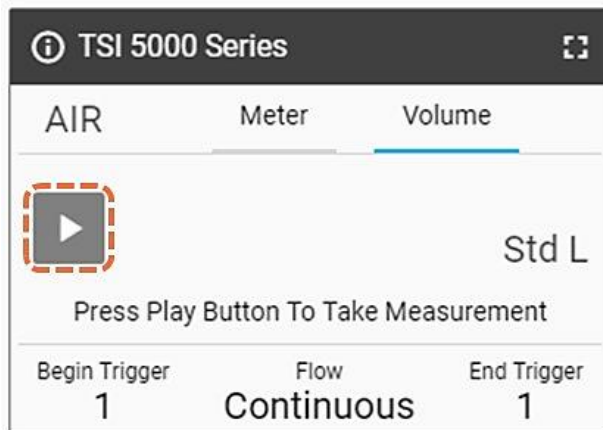
The slope of the trigger is the direction of the trigger parameter measurement reading as it passes the trigger value as defined by you. A positive slope is ascending measurement readings (ex. 1, 2, 3, 4) and a negative slope is descending readings (ex. 4, 3, 2, 1).

Please note the trigger options for the volume begin and end triggers. These are set as the default options and can't be changed by you.

Trigger	Units	Trigger Values
Flow	Std L/min	+/- 0.1, 0.5, 1, 2, 3, 5, 7.5, 10, 20
Absolute Pressure	kPa	90, 95, 98, 100, 102, 104, 107, 110
Low Differential Pressure	cmH ₂ O	+/- 0.5, 1, 2, 3, 4, 5, 10

Making Volume Measurements

After all settings have been specified and saved, press the **Play** button to disable editing and begin making volume measurements (shown below right).



With the **Play** button is pressed and flow is occurring, the Flow Multi-Meter will notify you on screen when the Begin Trigger, and then End Trigger, is reached. After the end trigger is reached, the Meter will display the calculated volume measurement.

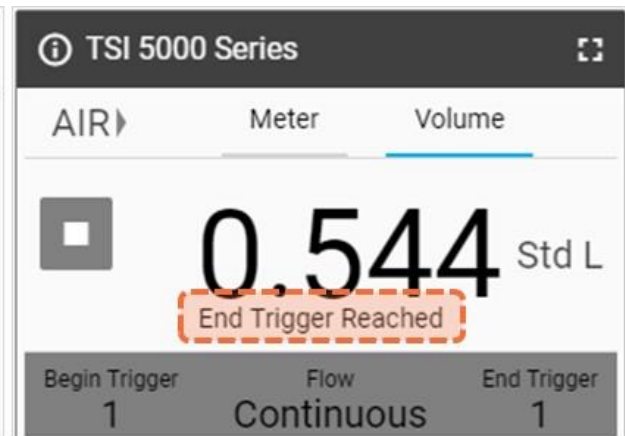
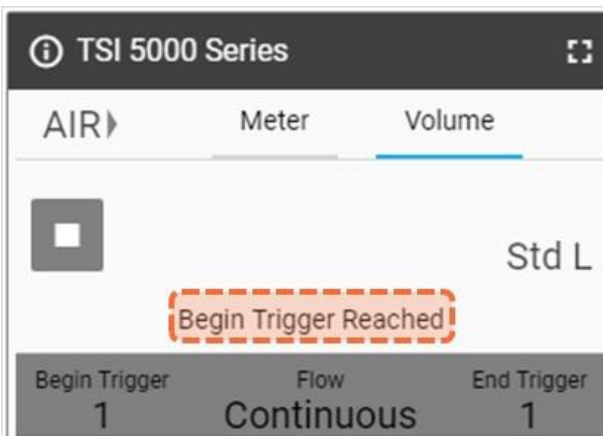
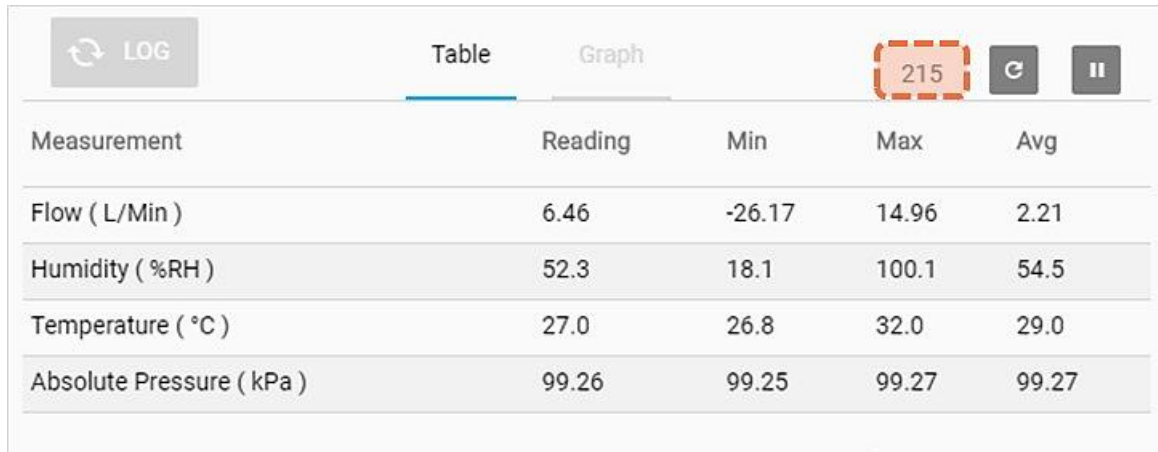


Table View

In the **Table** tab, individual readings, as well as minimum, maximum, and average values are shown for any measurement parameters that are currently displayed on the Meter (and GUI card). Reading values are the averages of 1 millisecond data for the length of time specified in the screen update rate. For example, a single reading when using a 0.5 second update rate would be the average of 500 one millisecond data points.

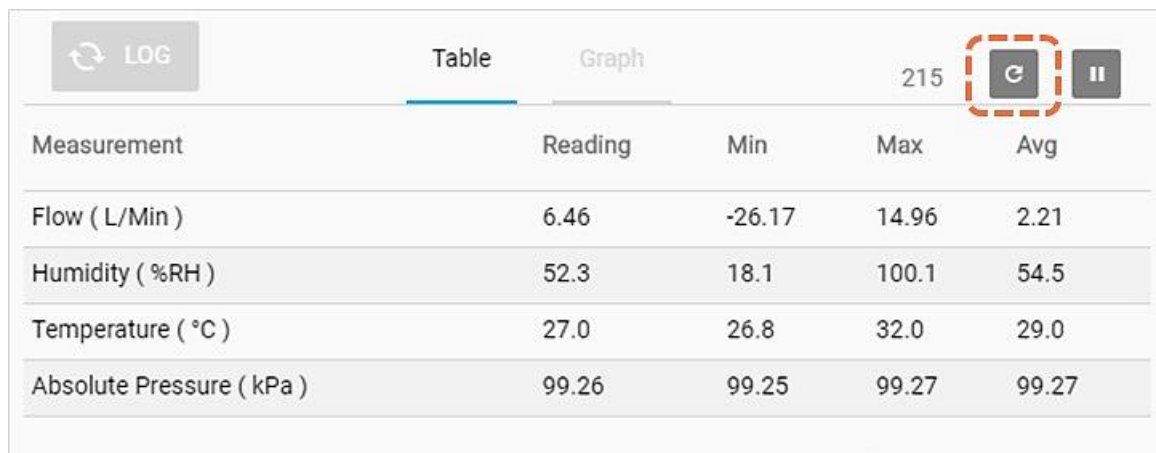
Update Counter

The **Update Counter** displays the number of readings that have been incorporated into the Table View tabulations as determined by the Screen Update Rate setting. For example, a screen update rate of 500 ms would mean the table data is updating 2 times per second and the counter would increase at this same rate. See [Chapter 4](#) for more information on the Screen Update Rate setting.



Measurement	Reading	Min	Max	Avg
Flow (L/Min)	6.46	-26.17	14.96	2.21
Humidity (%RH)	52.3	18.1	100.1	54.5
Temperature (°C)	27.0	26.8	32.0	29.0
Absolute Pressure (kPa)	99.26	99.25	99.27	99.27

Click the **Reset Counter** icon to the right of the Update Counter to clear all existing values for minimum, maximum, and average. Once reset, these tabulations will automatically start again.

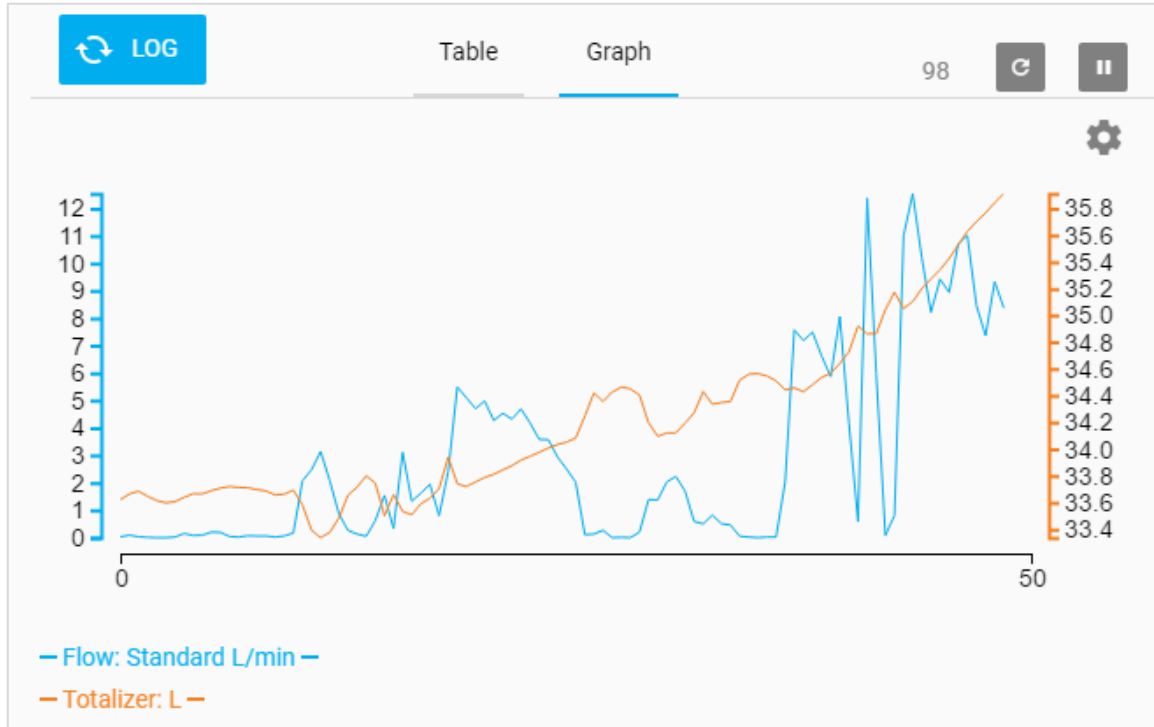


Measurement	Reading	Min	Max	Avg
Flow (L/Min)	6.46	-26.17	14.96	2.21
Humidity (%RH)	52.3	18.1	100.1	54.5
Temperature (°C)	27.0	26.8	32.0	29.0
Absolute Pressure (kPa)	99.26	99.25	99.27	99.27

Graphing

Graphing is an advanced feature of FLO-Sight™ PC software that provides real-time data visualization for any available measurement parameter. Up to two measurement parameters can be graphed at a time. The graph displays data for 100 readings at a time on a rolling basis, and the speed of graphing window will adjust depending on the selected Data Rate.

All graph settings are specified in the **Configure Graph** screen. Note that the settings selected for graphing are independent of device settings, and you do not need a measurement parameter to be displayed on the GUI to be graphed in the software.

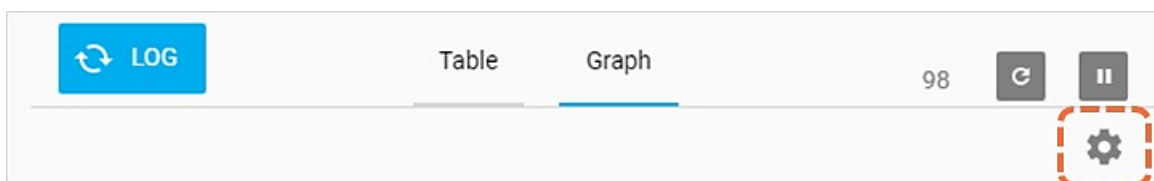


The two values present at the beginning and end of the X-axis show the time (in seconds) of the data that is currently displayed in the graph. For example, a data rate of 500 ms would graph 2 data points per second and the graph window would display 50 seconds worth of data (100 total readings).



Configure Graphs

To configure the graph, select the **Gear** icon to bring up the **Configure Graph** dialog box.



In the **Configure Graph** dialog box, click on the field you want to edit and select the desired option from the drop-down menu. Click the **Save** button once complete to close the dialog box and apply any changes.

Configure Graph

Series A	Unit	Factor
Flow	L/min	Standard

Series B	Unit
Low Pressure	kPa

Series A - Auto Scale Y-axis

Series B - Auto Scale Y-axis

Data Rate

500

CANCEL **SAVE**

Graphing defaults to Auto-Scaling for both series on the graph. To set a custom Y-axis, click the slider to the left and input any numerical value into the Min and Max fields.

Series A - Auto Scale Y-axis

Y-axis Min	Y-axis Max
-2	2

Series B - Auto Scale Y-axis

The Data Rate is shown in milliseconds. To set the Data Rate, input any numerical value greater than or equal to 1 ms. Note that this data rate applies to graphing only and does not affect the Meter's screen update rate.

Data Rate

500

CANCEL **SAVE**

Pause Display

On the Dashboard is a **Pause** button that can be used to pause the display updates. When the pause button is pressed, all measurement values currently displayed in the Table View or Graphing will freeze and remain unchanged. Measurements that continue to be taken by the Meter will not be integrated into Table View tabulations or the Graph.

NOTICE

Although the software is paused, the Meter will still be making measurements and the display on the Meter will continue to update. Any active data log sessions will be unaffected by pausing the display.

When paused the button's Pause icon will change to a Play icon, and you are free to switch between screens and work within the software. To resume display updates, click on the button again (now with a Play icon).



Graph Data Labels

When the **Pause Display** function is active, you can navigate to the Graph tab (if available) and view data labels on the graphs. Hover your mouse pointer over different points along the graph to display data labels. When complete, press the **Play** button to resume real-time graphing.



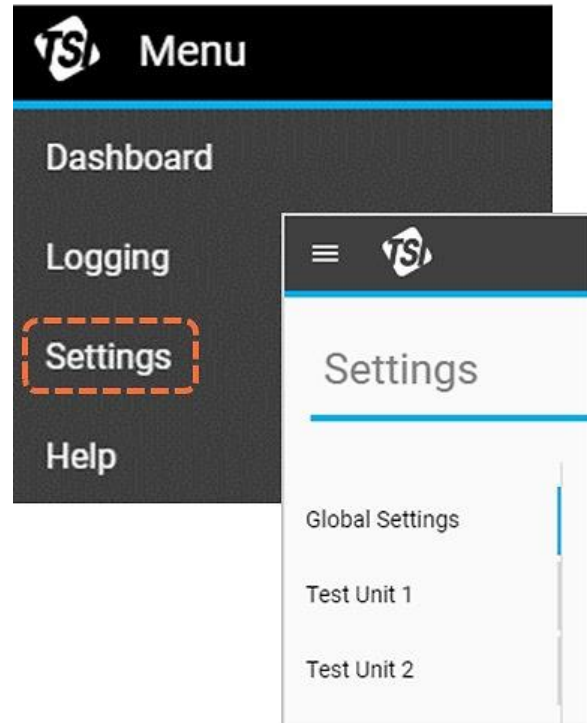
CHAPTER 4

Settings

Settings Overview

The **Settings** screen enables you to configure software settings as well as provide advanced configuration options for any connected 5000 Series Meters. Navigate to the Settings screen by selecting the **Settings** option from the drop-down menu.

The Settings screen contains a left navigation panel that enables selecting between Global Settings options and individual Meter settings options. If more than one Flow Multi-Meter is connected to the software, this is where you can select between them. The selected tab will be highlighted with a vertical blue line as shown.



Global Settings

The **Global Settings** screen contains settings that apply to the software as a whole and not individual Meters. In this screen you can change the language and the default export parameters.

Default Export

The **Default Export** settings control what logged measurement data is exported to the computer and how the data in the exported csv files will be displayed. For example, data may have been logged for multiple parameters, but you may only be interested in exporting humidity data. Or flow data may have been logged with standard conditions (Std. L/min), but you want to export the data as volumetric flow instead (actual temperature and pressure).

To make changes:

1. Select the **Edit** button.
2. Specify the settings using the + and – buttons and drop-down menu.
3. Click **Save** once complete.

NOTICE

The “Measurement” and “Unit” fields cannot be changed.

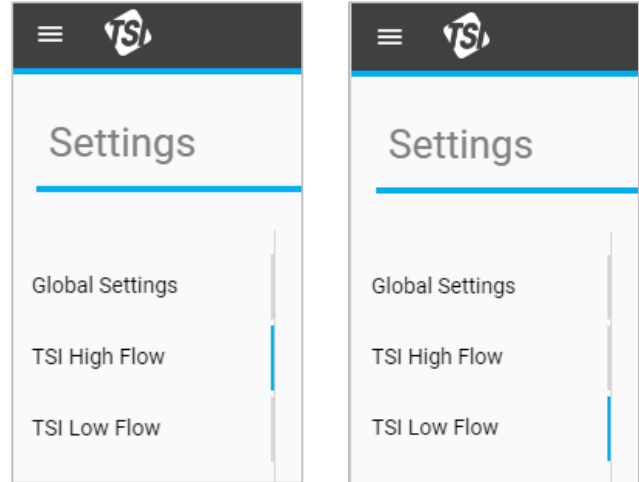
The screenshot shows the 'Default Export' configuration window. At the top, there are two dropdown menus for 'Measurement' (set to 'Time') and 'Unit' (set to 'Seconds'). Below this is a table of measurement parameters:

Measurement	Unit	Factor
flow	L/min	Standard
absPressure	kPa	
temperature	°C	
flow	L/min	Standard

A dropdown menu is open for the 'flow' parameter, showing a list of options: 'totalizer', 'absPressure', 'flow', 'humidity', 'lowPressure', and 'temperature'. The 'totalizer' option is currently selected. At the bottom right, there are two buttons: 'CANCEL' and 'SAVE'. The 'SAVE' button is highlighted with a dashed orange border.

Meter Settings

Selecting an individual Meter from the left navigation panel will bring up the settings screen for that unit. Any changes made to these settings will be applied to the Meter itself. Changes cannot be made to multiple Meters simultaneously. The Settings screen for Meters may contain different elements depending on the features of the particular model connected.

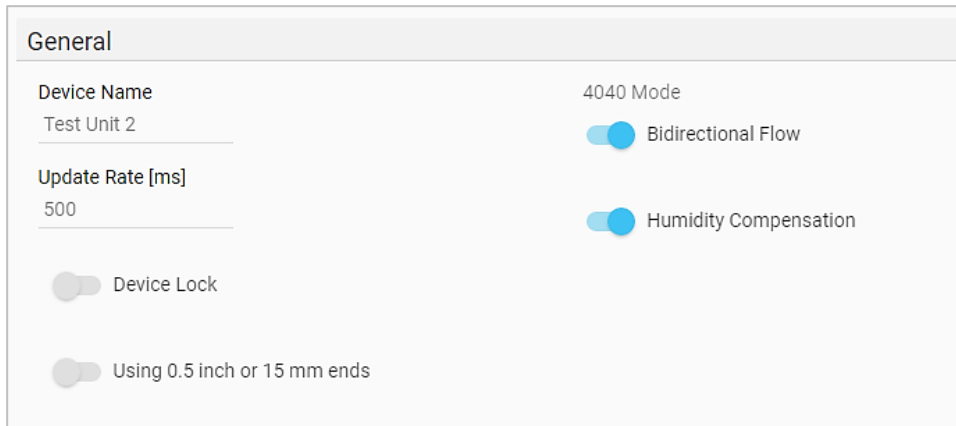


General

The **General** section enables you to edit a number of important setting options for your Meter. To change any of these settings, select the **Edit** button and then click **Save** when complete.

NOTICE

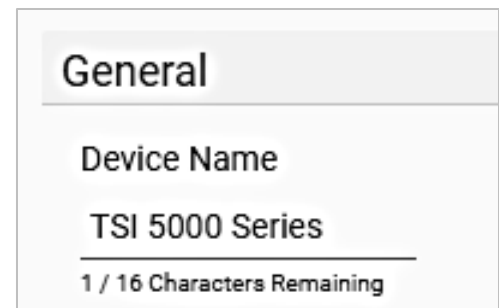
The Humidity Compensation toggle will only be available on Meter models with integrated humidity sensing.



Device Name

You can change the **Device Name** to specify a unique identifier for each Meter. This field could also be used to display messages or instructions that correspond to the Meter. The Device Name field is displayed in the GUI card on the Dashboard, in the left navigation panel of the Settings screen, in the Logging screen, in logged data files, and on the top header bar of the Meter itself.

The Device Name can only be edited through FLO-Sight™ PC software. The Device Name has a 16-character max limit and is set to display “TSI 5000 Series” as its default. When editing the Device Name field, a counter will appear under the field to inform you on the length of the string entered.



Update Rate

Update Rate sets the rate at which readings are displayed on the Meter. The Update Rate can be changed from the Meter itself by choosing from preset options, but FLO-Sight™ PC software allows you to input any value between 500 and 5000 milliseconds.

Note that data displayed on the Meter GUI is averaged based on the update rate. For example if the update rate were set to 500 ms, the data shown on the display would be the average of 500 one millisecond readings.

Device Lock

The 5000 Series Multi-Meter includes device lock feature that prevents you from being able to change measurement parameters, units of measurement, and gas type directly from the Meter's touchscreen. The **Device Lock** function must be enabled and disabled through FLO-Sight™ PC Software. The 5000 Series sets the device lock feature to disabled as its default.

To enable, make sure the device you want to lock is selected, press the **Edit** button and click the toggle switch. With the device lock function enabled, if operating through the Meter touchscreen, you must first unlock the Meter before you can configure measurement settings. The unlocking and locking is done on the Meter GUI itself and can be found in the header of the Menu drop-down screen.

Using 0.5 Inch or 15-mm Ends

When using a 5300 Series Meter with 0.5 inch or 15-mm tube end adapters, if the filter is connected as shown then no further action is needed.



If the 0.5 inch or 15-mm tube ends are connected directly to the instrument, select the "Using 0.5 inch or 15 mm ends" Toggle Switch in the Meter's Settings screen.



NOTICE

The 5300 Series Flow Multi-Meter will still measure within its published accuracy specification even if this recommendation is not followed, but selecting the toggle switch with this setup ensures the most accurate flow measurement readings.

4040 Mode

The 5000 Series incorporates the option to disable bidirectional flowing sensing and humidity compensation (if available), which in effect would return the flow measurement to a state similar to the 4000 Series flow meter. Both of these options are set to “enabled” as their default.

With Bidirectional Flow disabled, the Meter will still measure flows from both directions, but all flow readings will show as positive values and the flow directional arrow will always point left to right →.

With **Humidity Compensation** disabled, the Meter will provide a flow measurement independent of gas humidity levels.

User Gas Standard

TSI® flow meters are considered mass flow meters and indicate flow rates with reference to a set of standard conditions. Standard flow rate is the equivalent flow rate the gas would be moving if the temperature and pressure were at standard conditions. It is usually the most useful measure of gas flow because it defines the mass flow, number of molecules, and heat-carrying capacity of the gas.

For TSI® instruments, standard conditions are defined as 21.1°C (70°F) and 101.3 kPa (14.7 psia). FLO-Sight™ PC Software provides the option of changing gas standard conditions to any specified value.

User Gas Standard	
Temperature [°C]	Pressure [kPa]
21.11	101.3

Gas Calibration

The 5300 Series is capable of measuring Air, Oxygen, Air/Oxygen Mix, Carbon Dioxide, or Nitrogen gas depending on the model. The Gas Type field displays the active gas calibration selected for the instrument. It can be configured through FLO-Sight™ PC software as well directly from the Meter’s touchscreen.

To change the gas type:

1. Click the **Edit** button.
2. Select the appropriate gas calibration from the drop-down menu.
3. Click **Save**.

The screenshot shows a 'Gas Calibration' window. At the top, it says 'Gas Calibration'. Below that, the current selection is 'Air'. A dropdown menu is open, showing four options: 'Air' (highlighted in blue), 'Oxygen', 'Air/O: Mixture', and 'Nitrogen'.

Custom Air/Oxygen Mixture

The preset air/oxygen mixture for TSI® flow meters is a 21% oxygen mix. FLO-Sight™ PC software provides the ability for you to input a custom air / oxygen mixture. When the Air/O₂ Mixture option is selected from the Gas Calibration drop-down, an additional Air/Oxygen Concentration field will appear. Edit the number in this field to input a custom mix.

Gas Calibration	
Gas Calibration	Air/Oxygen Concentration
Air/O ₂ Mixture ▼	21

Flow Direction

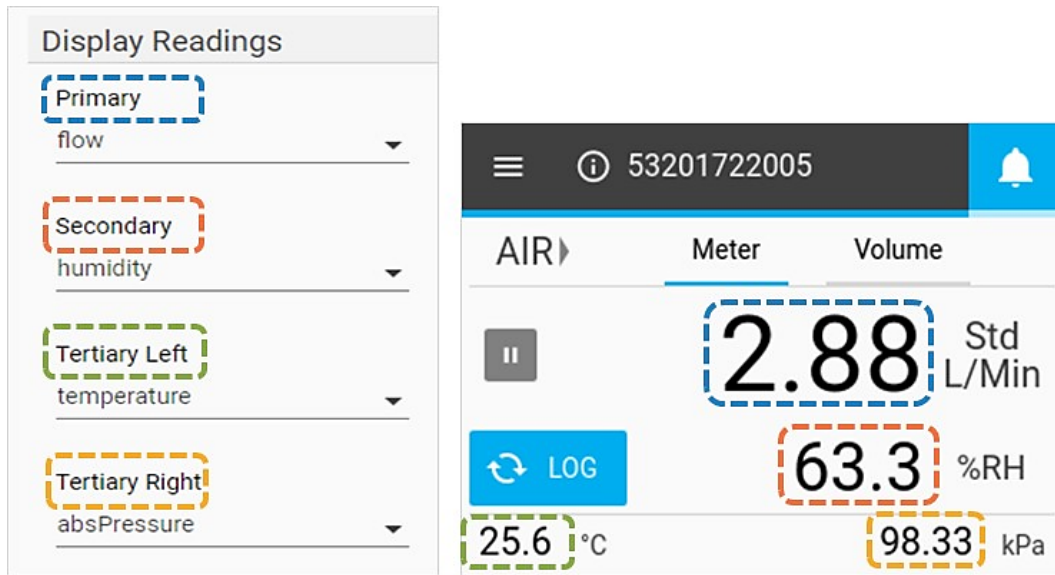
Flow rate readings are shown on the Meter display as positive (no sign, ex. 12.5 Std L/Min) when flowing from left to right → through the Meter or as negative (negative sign, ex. -12.5 Std L/Min) when flowing from right to left ← through the Meter.

Some users, however, may think of flow direction in the context of expiratory and inspiratory flows. FLO-Sight™ PC software provides the option for you to change flow readings from positive → and negative ← values to expiratory (e) → and inspiratory (i) ← instead.

Flow Direction	
Flow Direction Indicator	
<input checked="" type="radio"/> + or -	<input type="radio"/> i or e

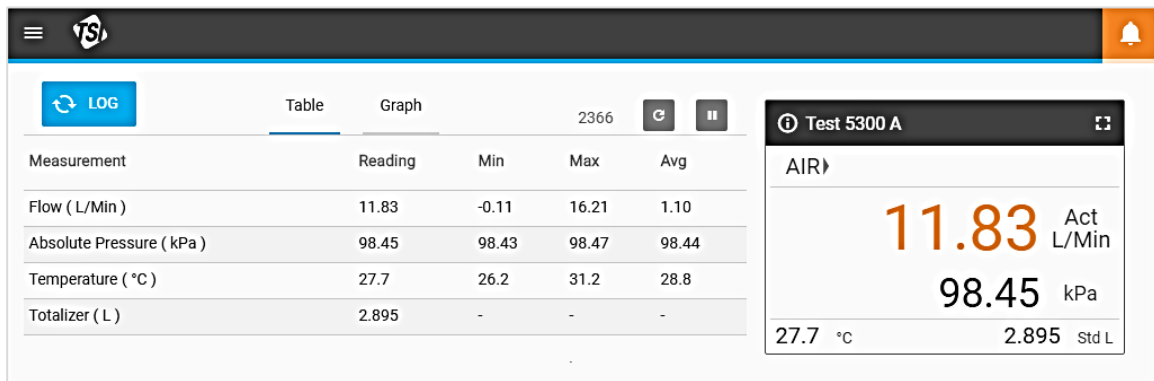
Display Readings

The **Display Readings** settings are used to configure the measurement parameters and units of measurement displayed on the Meter and software GUI card. Up to four parameters can be displayed at the same time. To remove a parameter from a location, click that location's parameter and select **blank** from the drop-down menu.



Alerts




With the advanced version of FLO-Sight™ PC software, you can set thresholds for different measurements that will alert in the software and on the Meter when certain conditions are met. In the software and on the Meter, the Alert Indicator (Bell icon) is displayed in the top right corner of the header bar. When an Alert condition is met, the Bell icon, as well as the reading of the parameter responsible for the alert, will change color to orange. When the threshold is no longer met, the alert will cease and the colors will change back to normal.



Alerts can be set for any parameter available on the Meter. A maximum of 10 alerts can be active at one time. To set an Alert:

1. Click the **Edit** button.
2. Click the green “+” icon that appears.
3. Select the Threshold sign (ex. >, >=, <, <=) and the Value of threshold.
4. Click **Save** once complete.

Alerts

	Measurement	Threshold	Value
	flow <input type="text" value="flow"/>	Less Than (<) <input type="text" value="Less Than (<)"/>	<input type="text" value="200"/>
	flow <input type="text" value="flow"/>	Greater Than (>) <input type="text" value="Greater Than (>)"/>	<input type="text" value="250"/>
			

CHAPTER 5

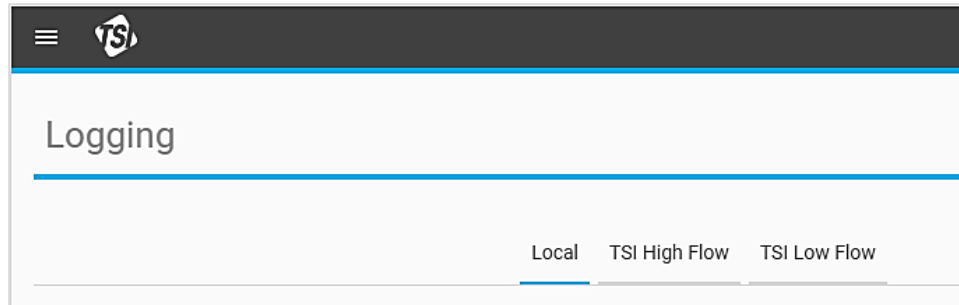
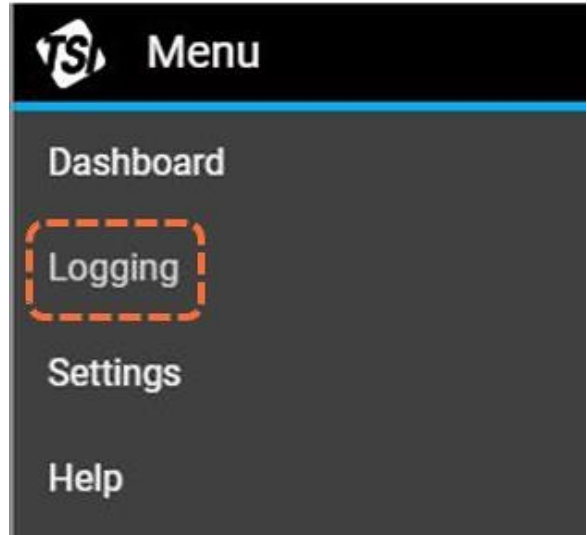
Logging

Logging Overview

The **Logging** screen allows you to set logging parameters, start and stop data log sessions, view log details, and manage individual log files. Navigate to the Settings screen by selecting the **Settings** option from the drop-down menu.

In the logging screen, data log file records are organized according to the location where the measurement data was saved. You can switch between log file locations by selecting the tabs.

The **Local** tab is for log files that were saved to the Local PC. There will always be a Local tab option. There will also be a tab for each Meter that is currently connected to FLO-Sight™ PC software, allowing you to view and manage any logged files saved to the Meter's memory. These Meter tabs display the Device Name of the individual connected Meter.



Log Files

The **Log Files** are records of individual data logging sessions. FLO-Sight™ PC software enables you to view the log details, export, or delete individual log files. Information about the log file is displayed for each log file record.

Log Files									
<input type="checkbox"/>	Serial Number	Log Name	Start	Test Length	Sample Time	Status	Actions		
<input type="checkbox"/>	53201829001	Test4-01	04/01/2019 11:54:28	10 Sec	0.01 Sec				
<input type="checkbox"/>	53201829001	Logging 4-19	04/19/2019 07:44:44	5 Sec	0.1 Sec				
<input type="checkbox"/>	53101835005	Logging 4-19	04/19/2019 07:44:44	5 Sec	0.1 Sec				
<input type="checkbox"/>	53201829001	Test Log #5	04/19/2019 07:47:14	8.6 Sec	0.1 Sec				

The Status indicator options for logged files are:

Complete		The log session was successfully completed.
Cancelled		The log session was cancelled. Partial data may be available in the log file.
Failed		The log session failed. It is unlikely that data will be available in the log file.

Setting Log Parameters

While on the Logging screen, press the button to open the **New Log** dialog box (shown below).

New Log

Log Name

18 / 18 Characters Remaining

Sample Rate

Minutes Seconds Milliseconds

Test Length

Hours Minutes Seconds

Log From Log To

Both Computer
 TSI High Flow Device
 TSI Low Flow

Description

63 / 63 Characters Remaining

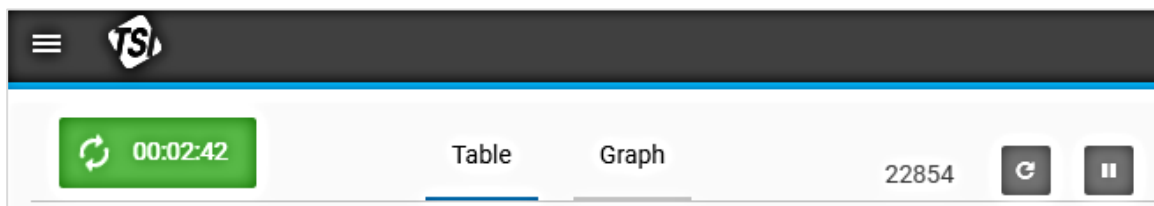
Parameter	Description
Log Name	Enter the text string you want to use to identify the logged data file. This is a required field and has a maximum length of 18 characters.
Sample Rate	The sample rate determines the rate at which the Flow Multi-Meter will store measurement data points. All data points are the average of 1 ms readings. For example, a 50 ms sample rate would log 20 data points per second with each data point being comprised of the average of 50 one-millisecond readings. The maximum sample rate is 60 minutes and the minimum rate is 1 millisecond.
Test Length	The test length determines the duration of the data logging session. The maximum test length is 24 hours and the minimum length is 1 second.
Log From	If more than one Flow Multi-Meter is connected to FLO-Sight™ Software, you can select from which Meter the data will be logged. You can select to log data from a single Meter or to simultaneously log data from both connected Meters.
Log To	FLO-Sight™ PC software allows you to save measurement data to either your local computer or to the internal memory of the connected Meter(s). You can access the logged data through FLO-Sight™ PC software whether the measurement data is saved to the local computer or to the Meter itself.
Description	This field enables you to add a description to the data log file. This description can be viewed in the Log Details screen within the FLO-Sight PC software. This is an optional field with a maximum length of 63 characters.

NOTICE


The 5000 Series is programmed to save log data for all measurement parameters available on the Meter. You can specify the measurement parameters and units you want to export to your computer in the **Default Settings** screen in the software. See the [Global Settings](#) section in Chapter 4 of this manual for more information of the export settings.

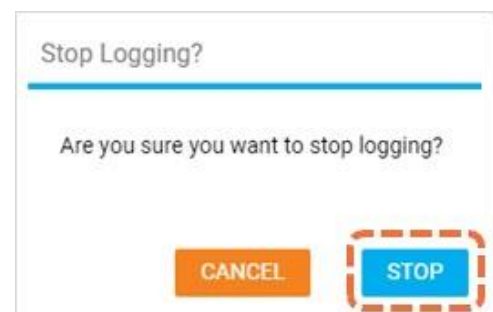
Logging Data

After setting the logging parameters in the New Log screen, select the **START** button to initialize a logging session. While actively logging data, the **LOG** button will turn from blue to green in color and display a count-down from the set test length to zero.




This button is visible on the Dashboard and Logging screens in the software and on the Meter's touchscreen display. Once the logging is complete, the button will turn back to blue with **LOG** displayed.

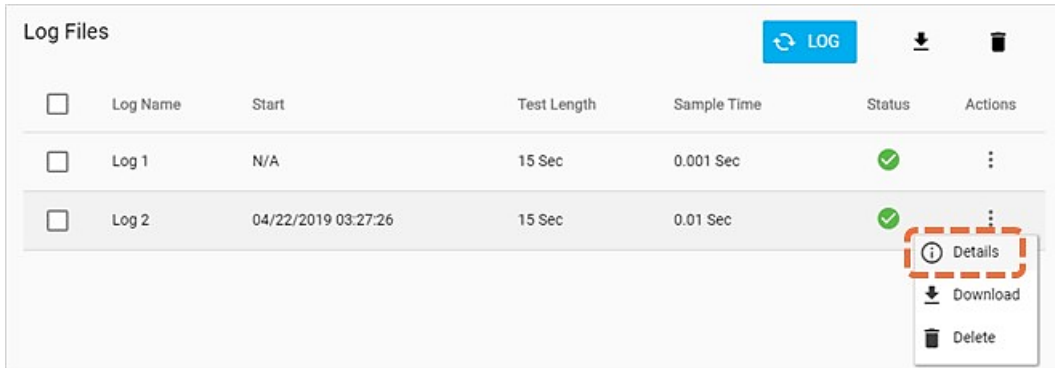
To cancel an active data logging session, press the log countdown button  to bring up the “Stop Logging?” dialog box. Select **STOP** to cancel the data log session.



Log Details

FLO-Sight™ PC software allows you to view information and data for individual data log files prior to exporting to your computer. Log details include information on the log session settings and the Meter as well as measurement data in both table and graph form.

To view the log details, in the Logging screen click the **Actions** icon  of a log file and select **Details**.

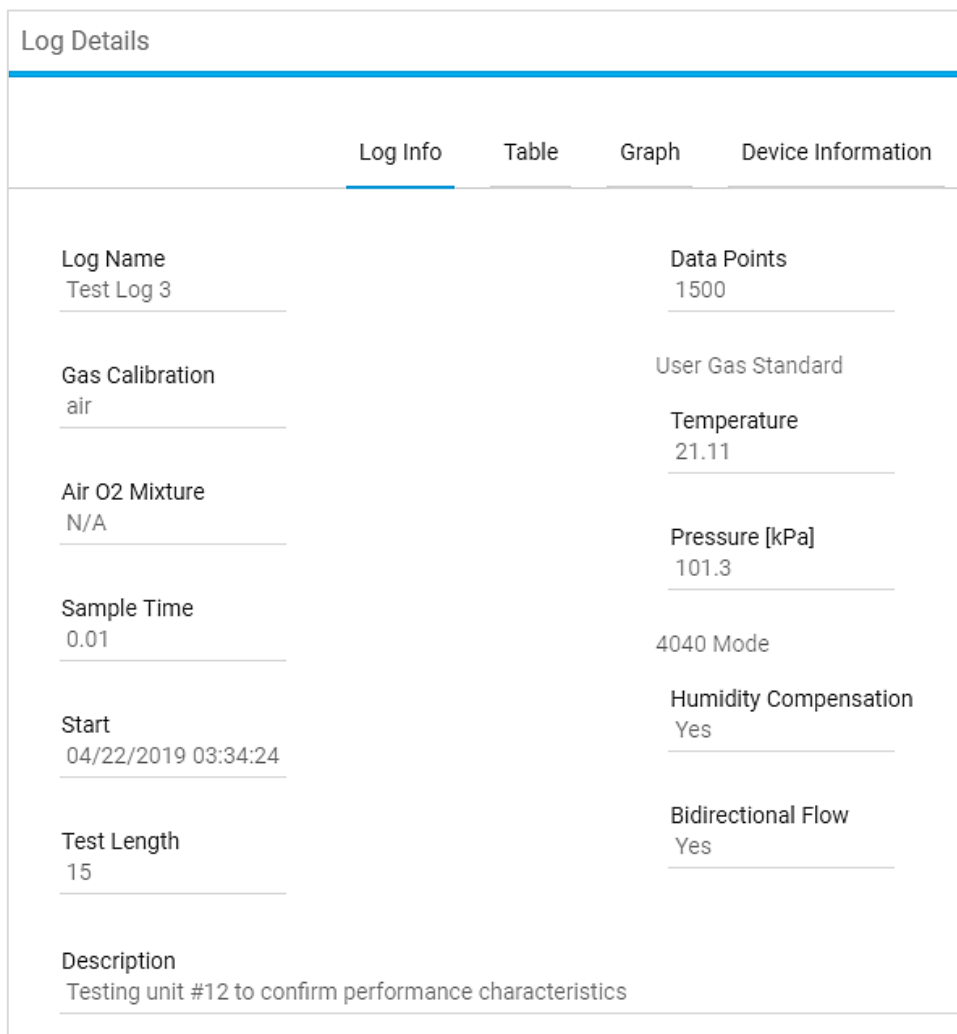


<input type="checkbox"/>	Log Name	Start	Test Length	Sample Time	Status	Actions
<input type="checkbox"/>	Log 1	N/A	15 Sec	0.001 Sec	✓	⋮
<input checked="" type="checkbox"/>	Log 2	04/22/2019 03:27:26	15 Sec	0.01 Sec	✓	⋮

- Details
- Download
- Delete

Log Info

The **Log Info** tab in the Log Details screen provides information pertaining to the individual log session.



Log Details			
Log Info	Table	Graph	Device Information
Log Name Test Log 3	Data Points 1500		
Gas Calibration air	User Gas Standard		
Air O2 Mixture N/A	Temperature 21.11		
Sample Time 0.01	Pressure [kPa] 101.3		
Start 04/22/2019 03:34:24	4040 Mode		
Test Length 15	Humidity Compensation Yes		
Description Testing unit #12 to confirm performance characteristics	Bidirectional Flow Yes		

Table

The **Table** tab in the Log Details screen displays measurement data for all available parameters in tabular form. Press the arrows at the bottom of the screen to scroll between pages.

Log Details

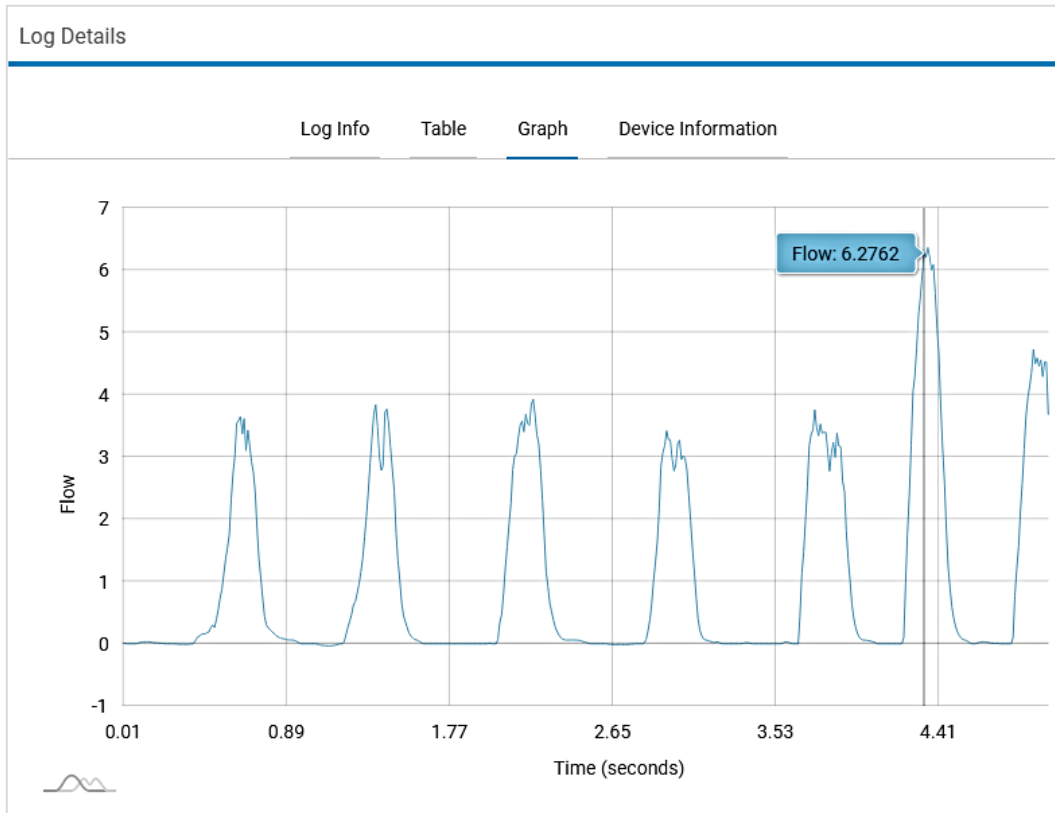
Log Info **Table** Graph Device Information

Time (Sec)	Flow (L/Min)	Humidity(%RH)	Temp (°C)	Absolute Pres (kPa)	Low Pressure(cmH2O)
0.01	0.0046	35.9201	23.205	98.7062	0.0035
0.02	0.003	35.8965	23.2157	98.7016	-0.0039
0.03	0	35.8791	23.2182	98.6992	0.0035
0.04	0	35.8901	23.2069	98.7039	0.0035
0.05	0	35.9129	23.1969	98.6969	-0.0039
0.06	0	35.9311	23.1875	98.7015	-0.0039
0.07	-0.001	35.9072	23.1822	98.7016	-0.0185
0.08	0.0013	35.7108	23.1916	98.6991	-0.0185
0.09	0.0098	35.6901	23.2013	98.6992	-0.0185
0.1	0.0223	35.6721	23.2107	98.6967	-0.0405
0.11	0.0269	35.6466	23.2197	98.7063	-0.0258
0.12	0.0298	35.6327	23.2272	98.7039	0.2159
0.13	0.031	35.7191	23.2353	98.7062	0.2232

> **DONE**

Graph

The **Graph** tab in the Log Details screen displays flow rate data in graph form. You can hover your mouse over the graph to callout individual data points. Press the arrows at the bottom of the screen to scroll between pages.





Device Information

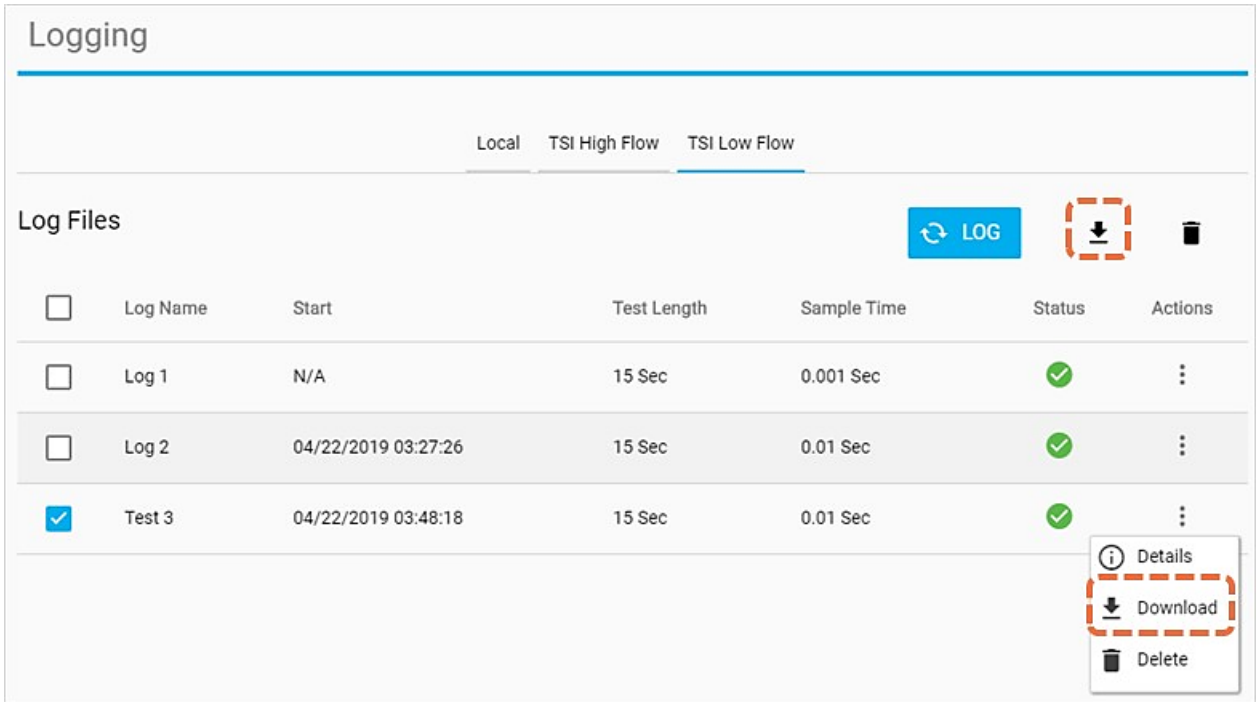
The **Device Information** tab in the Log Details screen displays information about the Flow Multi-Meter that was used to log the measurement data.

Log Details				
Log Info	Table	Graph	Device Information	
Device Name	TSI High Flow		Calibration Date	2019-04-05T00:00:00.
Model Number	532002		Firmware Version	1.0.0-release.552
Serial Number	53201829001		Hardware Version	1

Downloading Log Files




Log files that are saved to the Meter’s internal memory can be exported to a computer through the software. To do this, the file must first be “downloaded” from the Meter’s internal memory to the software Local tab before it can be exported to the computer. This only needs to be done to files stored on a Meter, if you logged the data to the Local tab in the software, this step would not be necessary.







To download a log file to the **Local** tab in the software, click the **Actions** icon  of the log file and select **Download**. An alternative way to do this is to select the check box associated with a log file and click the Download icon .






Logging

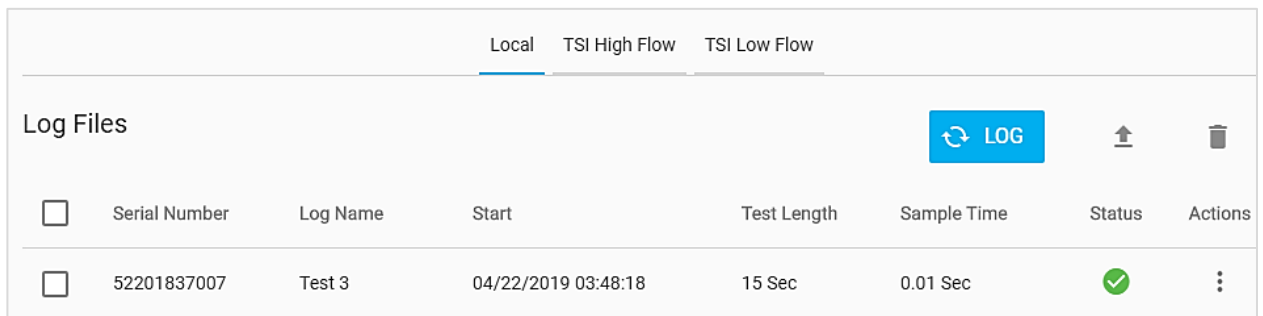
Local TSI High Flow TSI Low Flow

Log Files   




<input type="checkbox"/>	Log Name	Start	Test Length	Sample Time	Status	Actions
<input type="checkbox"/>	Log 1	N/A	15 Sec	0.001 Sec		
<input type="checkbox"/>	Log 2	04/22/2019 03:27:26	15 Sec	0.01 Sec		
<input checked="" type="checkbox"/>	Test 3	04/22/2019 03:48:18	15 Sec	0.01 Sec		



-  Details
-  Download
-  Delete

Once the log has finished downloading, a “Done” message will be displayed and the log file will be copied to the Local tab in the software. The downloaded log file is now available to be exported to your computer through the “Export” function in FLO-Sight™ PC software.





Local TSI High Flow TSI Low Flow

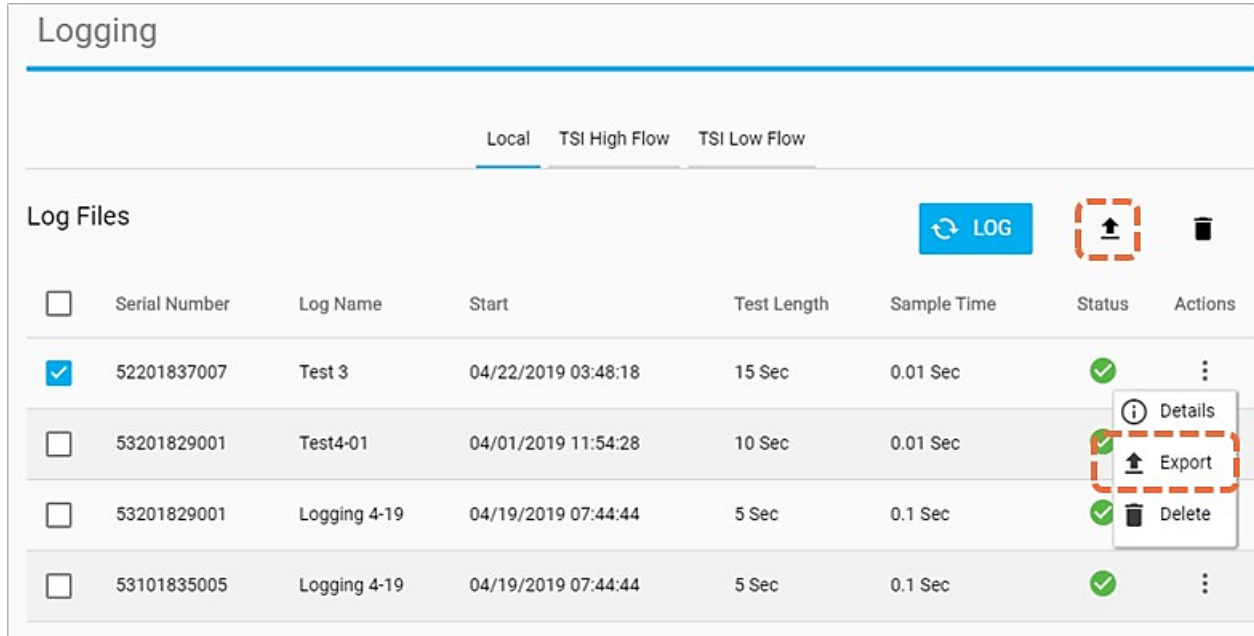
Log Files   

<input type="checkbox"/>	Serial Number	Log Name	Start	Test Length	Sample Time	Status	Actions
<input type="checkbox"/>	52201837007	Test 3	04/22/2019 03:48:18	15 Sec	0.01 Sec		

Exporting Log Files

Log files can be exported to the computer through FLO-Sight™ PC software or from the Meter itself. See the Owner's Manual for more information on exporting data files directly from the Flow Multi-Meter.

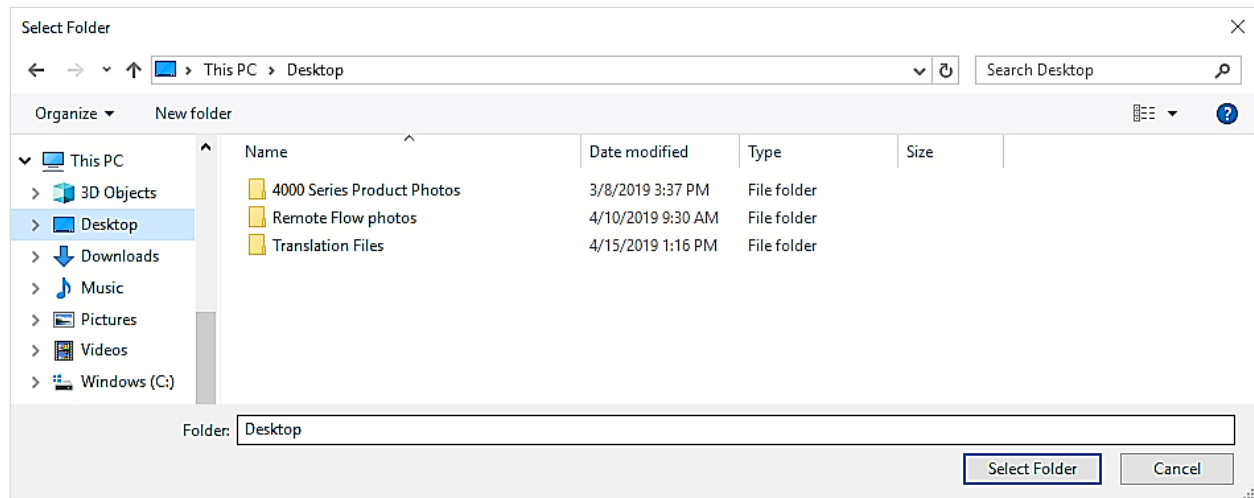
To export a log file to your computer, click the **Actions** icon  of the log file and select the **Export** option. An alternative way to do this is to select the check box associated with the log file and click the Export icon .



The screenshot shows the 'Logging' interface with tabs for 'Local', 'TSI High Flow', and 'TSI Low Flow'. Below the tabs is a 'Log Files' section with a 'LOG' button and an 'Export' icon. A table lists log files with columns for Serial Number, Log Name, Start, Test Length, Sample Time, Status, and Actions. The first row is selected, and its Actions menu is open, showing 'Details', 'Export', and 'Delete' options.

<input type="checkbox"/>	Serial Number	Log Name	Start	Test Length	Sample Time	Status	Actions
<input checked="" type="checkbox"/>	52201837007	Test 3	04/22/2019 03:48:18	15 Sec	0.01 Sec	✓	⋮
<input type="checkbox"/>	53201829001	Test4-01	04/01/2019 11:54:28	10 Sec	0.01 Sec	✓	⋮
<input type="checkbox"/>	53201829001	Logging 4-19	04/19/2019 07:44:44	5 Sec	0.1 Sec	✓	⋮
<input type="checkbox"/>	53101835005	Logging 4-19	04/19/2019 07:44:44	5 Sec	0.1 Sec	✓	⋮

Select the folder on your computer that you would like the log file to be exported to and press the **"Select Folder"** button. The log file will be saved to this location.



The screenshot shows a 'Select Folder' dialog box with the path 'This PC > Desktop' selected. The file list shows three folders: '4000 Series Product Photos', 'Remote Flow photos', and 'Translation Files'. The 'Folder:' field at the bottom contains 'Desktop', and the 'Select Folder' button is highlighted.

Exported log files are saved to your computer in .csv format. The .csv log file displays data for the selected measurement parameters and includes information specific to the individual log file.



NOTICE

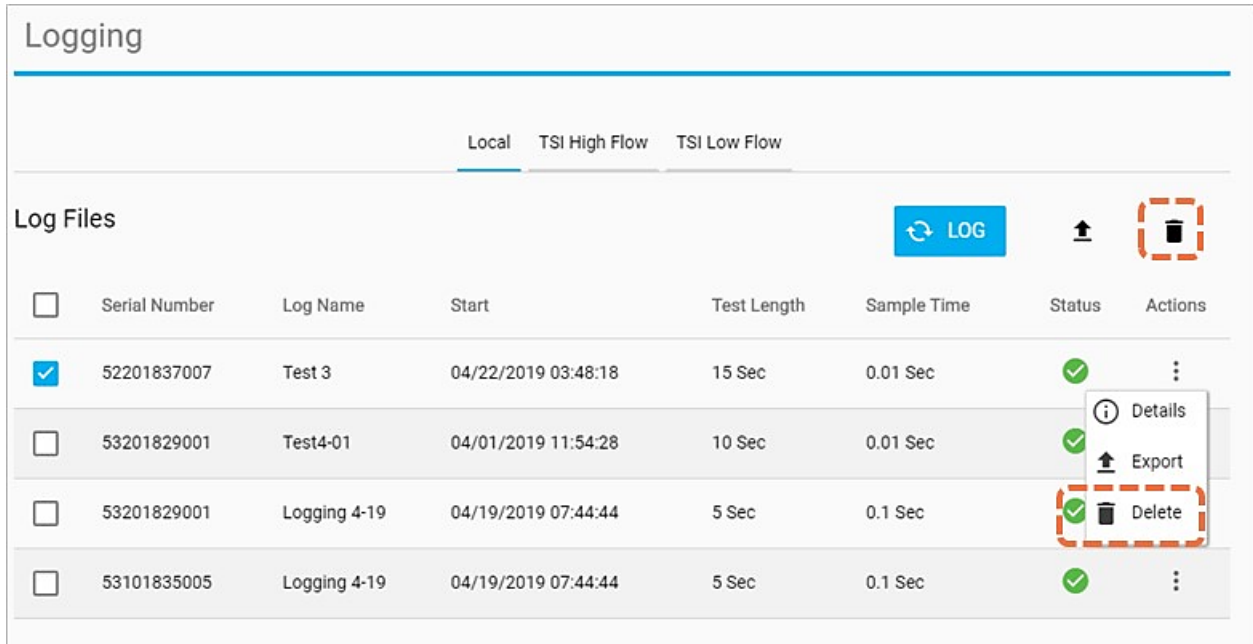
The 5000 Series is programmed to save log data for all measurement parameters available on the Meter. You can specify the measurement parameters and units you want to export to your computer in the **Default Settings** screen in the software. See the [Global Settings](#) section in Chapter 4 of this manual for more information of the export settings.

	A	B	C	D	E	F
1	Device Model	522009				
2	Serial Number	52201837007				
3	Device Name	TSI Low Flow				
4	Log Name	Test 3				
5	Gas Calibration	air				
6	Air/O2 Mixture	N/A				
7	Humidity Comp	Yes				
8	Bidirectional Flow	Yes				
9	User Gas Standard (Temp)	21.11				
10	User Gas Standard (Pres)	101.3				
11						
12	Time	Flow	Absolute Pressure	Temperature	Low Pressure	Humidity
13	[Second]	[Standard L/min]	[kPa]	[C]	[cmH2O]	[%RH]
14	0.01	0.0046	98.7062	23.205	0.0035	35.9201
15	0.02	0.003	98.7016	23.2157	-0.0039	35.8965
16	0.03	0	98.6992	23.2182	0.0035	35.8791
17	0.04	0	98.7039	23.2069	0.0035	35.8901
18	0.05	0	98.6969	23.1969	-0.0039	35.9129
19	0.06	0	98.7015	23.1875	-0.0039	35.9311
20	0.07	-0.001	98.7016	23.1822	-0.0185	35.9072
21	0.08	0.0013	98.6991	23.1916	-0.0185	35.7108
22	0.09	0.0098	98.6992	23.2013	-0.0185	35.6901
23	0.1	0.0223	98.6967	23.2107	-0.0405	35.6721
24	0.11	0.0269	98.7063	23.2197	-0.0258	35.6466
25	0.12	0.0298	98.7039	23.2272	0.2159	35.6327
26	0.13	0.031	98.7062	23.2353	0.2232	35.7191
27	0.14	0.0307	98.7087	23.2434	0.2305	35.7371

Deleting Log Files

Through FLO-Sight™ PC software, you can delete log files stored in either the software or on the Meter’s internal memory. The Local tab lists the log files saved to the software and the Meter tab(s) list the log files stored on that Meter.

To delete a log file from the software or a Meter, click the **Actions** icon  of the log file and select **Delete**. An alternative way to do this is to select the check box associated with the log file and click the Delete icon .

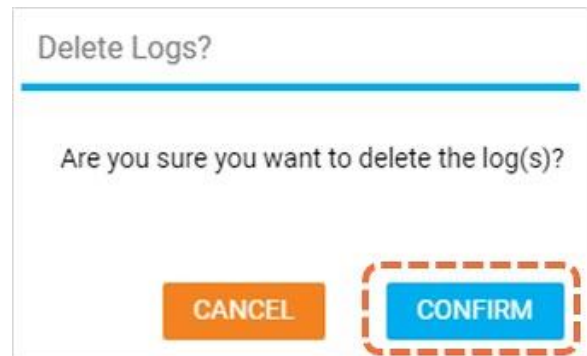


The screenshot shows the 'Logging' interface with tabs for 'Local', 'TSI High Flow', and 'TSI Low Flow'. Below the tabs is a 'Log Files' section with a table. The table has columns for Serial Number, Log Name, Start, Test Length, Sample Time, Status, and Actions. The first row is selected, and its Actions menu is open, showing 'Details', 'Export', and 'Delete' options. The 'Delete' option is highlighted with a red dashed box.

Serial Number	Log Name	Start	Test Length	Sample Time	Status	Actions	
<input checked="" type="checkbox"/>	52201837007	Test 3	04/22/2019 03:48:18	15 Sec	0.01 Sec	✓	⋮
<input type="checkbox"/>	53201829001	Test4-01	04/01/2019 11:54:28	10 Sec	0.01 Sec	✓	⋮
<input type="checkbox"/>	53201829001	Logging 4-19	04/19/2019 07:44:44	5 Sec	0.1 Sec	✓	⋮
<input type="checkbox"/>	53101835005	Logging 4-19	04/19/2019 07:44:44	5 Sec	0.1 Sec	✓	⋮

A “Delete Logs?” dialog box will appear.

Click the **CONFIRM** button to confirm the deletion of the log file.



The dialog box is titled 'Delete Logs?' and contains the question 'Are you sure you want to delete the log(s)?'. At the bottom, there are two buttons: 'CANCEL' and 'CONFIRM'. The 'CONFIRM' button is highlighted with a red dashed box.

Help

Help Overview

The **Help** screen provides information and enables you to configure software settings as well as provide advanced configuration options for any connected 5000 Series Meters.

Navigate to the Help screen by selecting the **Help** option from the drop-down menu.

Manuals and Guides

This is an embedded web link that will open your browser to a flow webpage on TSI.com that contains helpful materials pertaining to the 5000 Series Flow Multi-Meter.

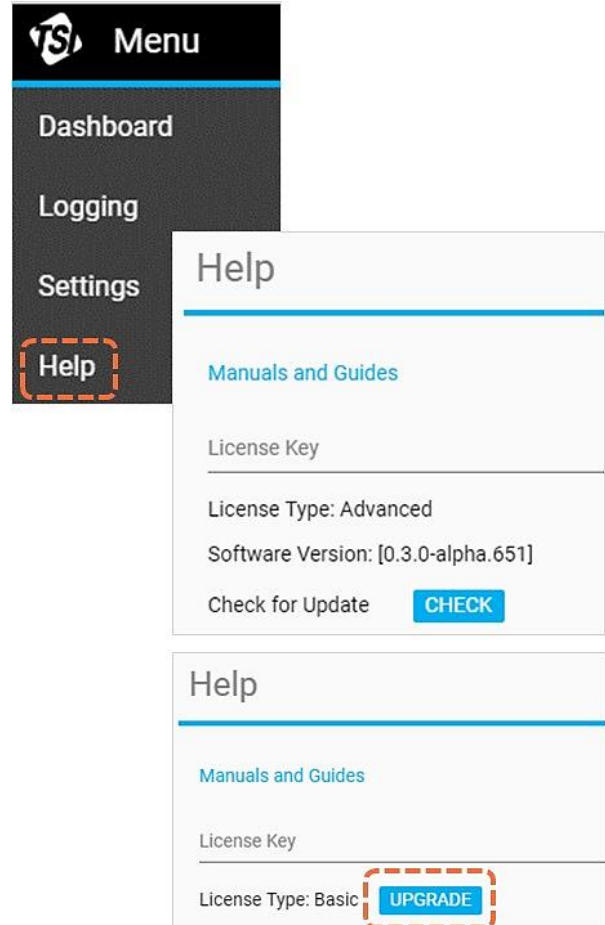
License Type

Displays the active FLO-Sight™ PC software license, either “Basic” or “Advanced.” If the software license is “Basic” then there will be an **UPGRADE** button visible next to the license type.

To upgrade to the “Advanced” version of FLO-Sight™ PC software or to activate a free trial, enter the activation code (with hyphens) into the license key field and press **UPGRADE**.

Software Version

This field displays the version of FLO-Sight™ PC software that is running on the computer.



Check for Update

Selecting the **CHECK** button will open your browser to the Software and Firmware Wizard on [TSI.com](https://www.tsi.com). Use the wizard to check for newer software versions or firmware updates that have been released. Search for updates by typing in the model of your instrument or the name “Flow Multi-Meter.”

The screenshot shows the TSI website's support page for the Software and Firmware Wizard. The page features a navigation menu at the top with links for DISCOVER TSI, SOLUTIONS, SUPPORT, LEARN, and CONTACT US. A breadcrumb trail indicates the user is in Home > Support > TSI Software And Firmware Wizard. A sidebar on the left lists various support options, with 'TSI SOFTWARE AND FIRMWARE WIZARD' highlighted. The main content area is titled 'TSI SOFTWARE AND FIRMWARE WIZARD' and includes a sub-header 'DOWNLOAD SOFTWARE AND FIRMWARE FOR YOUR INSTRUMENT'. Below this, there is a brief description of the wizard's purpose and a search box with a 'SEARCH' button. A note at the bottom of the search section suggests contacting support if downloads fail.

UNDERSTANDING. ACCELERATED

DISCOVER TSI SOLUTIONS SUPPORT LEARN CONTACT US

Home > Support > TSI Software And Firmware Wizard

Share < Print

SUPPORT

- REQUEST REPAIRS & CALIBRATIONS
- TSI SOFTWARE AND FIRMWARE WIZARD**
- REGISTER A PRODUCT
- DISCONTINUED / LEGACY PRODUCTS
- SERVICE AND CALIBRATION AGREEMENTS
- PAYMENTS, RETURNS & REPAIRS
- PRIVACY POLICY
- SOFTWARE LICENSING

TSI SOFTWARE AND FIRMWARE WIZARD

DOWNLOAD SOFTWARE AND FIRMWARE FOR YOUR INSTRUMENT

Use our software and firmware wizard to download software, firmware, and associated documentation for your instrument.

Start by typing your instrument name, model, or material number into the search box below:

SEARCH

If you are unable to successfully download software or firmware, please [contact us](#).

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Knowledge Beyond Measure.

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P/N 6011696 Rev C

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Printed in U.S.A.

