Q-Trak™ XP Indoor Air Quality Monitor

Model 7585

Operation and Service Manual

P/N 6013907, Revision D
July 2022

Shown with optional battery cover with tripod mount and tabletop tripod (P/N 800129)

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Address
TSI Incorporated / 500 Cardigan Road / Shoreview, MN 55126 / USA

Fax No.
(651) 490-3824

Limitation of Warranty and Liability (effective February 2016)
(For country-specific terms and conditions outside of the USA, please visit www.tsi.com.)

Seller warrants the goods, excluding software, sold hereunder, under normal use and service as described in the operator's manual, to be free from defects in workmanship and material for **24 months**, or if less, the length of time specified in the operator's manual, from the date of shipment to the customer. This warranty period is inclusive of any statutory warranty. This limited warranty is subject to the following exclusions and exceptions:

a. The following gas sensors are warranted for 12 months from the date of shipment - carbon dioxide, carbon monoxide, chlorine, hydrogen sulfide, nitric oxide, nitrogen dioxide, ozone, and TVOC high and low sensors;

b. The following gas sensors are warranted for 6 months from the date of shipment - ammonia and formaldehyde sensors;

c. Parts repaired or replaced as a result of repair services are warranted to be free from defects in workmanship and material, under normal use, for 90 days from the date of shipment;

d. Seller does not provide any warranty on finished goods manufactured by others or on any fuses, batteries or other consumable materials. Only the original manufacturer's warranty applies;

e. This warranty does not cover calibration requirements, and seller warrants only that the instrument or product is properly calibrated at the time of its manufacture. Instruments returned for calibration are not covered by this warranty;

f. This warranty is **VOID** if the instrument is opened by anyone other than a factory authorized service center with the one exception where requirements set forth in the manual allow an operator to replace consumables or perform recommended cleaning;

g. This warranty is **VOID** if the product has been misused, neglected, subjected to accidental or intentional damage, or is not properly installed, maintained, or cleaned according to the requirements of the manual. Unless specifically authorized in a separate writing by Seller, Seller makes no warranty with respect to, and shall have no liability in connection with, goods which are incorporated into other products or equipment, or which are modified by any person other than Seller.

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Buyer and all users are deemed to have accepted this LIMITATION OF WARRANTY AND LIABILITY, which contains the complete and exclusive limited warranty of Seller. This LIMITATION OF WARRANTY AND LIABILITY may not be amended, modified or its terms waived, except by writing signed by an Officer of Seller.

Service Policy
Knowing that inoperative or defective instruments are as detrimental to TSI as they are to our customers, our service policy is designed to give prompt attention to any problems. If any malfunction is discovered, please contact your nearest sales office or representative, or call Customer Service department at (800) 680-1220 (USA) or (1) 651-490-2860 (International).

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CONTENTS

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Safety

This section provides instructions to ensure safe and proper operation of the Q-Trak™ XP Indoor Air Quality (IAQ) Monitor Model 7585.

WARNING

- The instrument must be used in the manner described in this manual. Failure to follow all of the procedures described in this manual can result in serious injury to you or can cause irrevocable damage to the instrument.
- There are no user-serviceable parts inside the instrument. Refer all repairs to a qualified factory-authorized technician.
- The Q-Trak™ XP monitor is not rated for intrinsic safety. **DO NOT** operate the Q-Trak™ XP monitor under conditions where there is a risk of fire or explosion.

Description of Caution/Warning Symbols

Appropriate caution/warning statements are used throughout the manual and on the instrument that require you to take cautionary measures when working with the instrument.

Caution

CAUTION

Failure to follow the procedures prescribed in this manual might result in irreparable equipment damage. Important information about the operation and maintenance of this instrument is included in this manual.

Warning

WARNING

Warning means that unsafe use of the instrument could result in serious injury to you or cause damage to the instrument. Follow the procedures prescribed.

Caution and Warning Symbols

The following symbols may accompany cautions and warnings to indicate the nature and consequences of hazards:

	Warns that the instrument contains a laser and that important information about its safe operation and maintenance is included in the manual.
	Warns that the instrument is susceptible to electro-static discharge (ESD) and ESD protection should be followed to avoid damage.
	Indicates the connector is connected to earth ground and cabinet ground.

Battery Safety and Disposal

This instrument uses a rechargeable Lithium ion battery with built-in protection against safety hazards. **Always dispose of Li-ion batteries and transport Li-ion batteries in compliance with regional regulations.**

WARNING

- Use only TSI® supplied batteries in this instrument (P/N 800123).
- **DO NOT** abuse the battery in any way as the battery may rupture or catch fire.
- **DO NOT** use a substitute or non-rechargeable battery in this instrument.
- **DO NOT** short-circuit, incinerate, dismantle or mutilate Lithium ion batteries.
- **DO NOT** expose to water or heat.
- **DO NOT** use any battery which shows signs of damage, such as bulging, swelling, a swollen plastic wrap, liquid in the plastic wrap, etc.

Laser Safety

The Q-Trak™ XP Model 7585 is a Class I laser-based instrument. During normal operation, the user **WILL NOT** be exposed to laser radiation.

The following precautions should be taken to avoid exposure to hazardous radiation in the form of intense, focused, visible light.

- **DO NOT** remove any parts from the Q-Trak™ XP monitor unless you are specifically told to do so in this manual.
- **DO NOT** disassemble the Q-Trak™ XP monitor. There are no user-serviceable components inside the instrument.

WARNING

The use of controls, adjustments, or procedures other than those specified in this manual may result in exposure to hazardous optical radiation.

WARNING

If the Q-Trak™ XP monitor is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

When operated according to the manufacturer's instruction, this device is a Class 1 laser product as defined by U.S. Department of Health and Human Services standards under the Radiation Control for Health and Safety Act of 1968.

DISCLAIMER

The CO_2 measurement sensor is sensitive to radio frequency interference. Electromagnetic fields produced by items including, but not limited to, microwave ovens, Wi-Fi® routers, cellular phones, and personal communication devices, i.e., walkie-talkie, two-way radios, etc. have the potential to adversely affect the CO_2 measurement. To ensure a proper measurement these devices should be **TURNED OFF** or placed in a mode that does not transmit. If these devices are not turned off or placed in a mode that does not transmit, the accuracy of the CO_2 measurement may be compromised if these devices are located within four meters of the CO_2 measurement sensor.

Labels

Advisory and identification labels or markings are attached to the instrument.

1. Multi-sensor module

2. Base handle

3. Carbon Dioxide sensor

4. Chlorine sensor

5. Carbon Monoxide sensor

6. Hydrogen Sulfide sensor

7. Ammonia sensor

8. Nitric Oxide sensor

9. Nitrogen Dioxide sensor

10. Ozone sensor

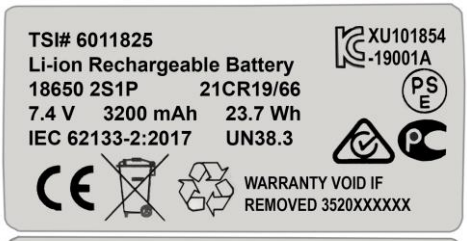
11. TVOC ppm sensor

12. TVOC ppb sensor

13. Formaldehyde sensor

14. European symbol for non-disposable item. Item must be recycled.

15. Battery pack



Reusing and Recycling

As part of TSI® Incorporated's effort to have a minimal negative impact on the communities in which its products are manufactured and used:

- **DO NOT** dispose of use batteries in the trash. Follow local environmental requirements for battery recycling.
- If instrument becomes obsolete, return to TSI® for disassembly and recycling.

CHAPTER 1
Overview

The Q-Trak™ XP Indoor Air Quality (IAQ) Monitor is designed for Indoor Air Quality and Industrial Hygiene professionals to address a wide range of indoor air quality assessments and analysis. The Q-Trak™ XP monitor combines multiple-gas and particle measurements into a single lightweight, handheld instrument that is easy to configure, maintain, and calibrate in the field. The Model 7585 includes sensors for simultaneous measurements of temperature, relative humidity, barometric pressure, mass concentration, particle concentration, carbon dioxide, and room for up to five additional pluggable gas sensors. With enough on-board memory to record data from all sensors for 100 days when sampling data once a minute.

Also included with the Q-Trak™ XP monitor is TrakPro™ Ultra software application used for posttest analysis and report generation. Refer to Chapter 10 for more information.

These Application Notes for the Q-Trak™ can be found under TSI's web site at www.tsi.com/7585.

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CHAPTER 2

Unpacking and Parts Identification

Carefully unpack the instrument and accessories from the shipping container. Check the individual parts against the list of components below. If anything is missing or damaged, notify TSI® immediately.

All standard equipment can be purchased separately if needed.

NOTICE

Optional gas sensors are shipped in individual boxes but are included in the main shipping container.

NOTICE

The lithium-ion battery is shipped in the same box as the instrument; however, it cannot be pre-installed in the Q-Trak™ XP instrument prior to shipment as required by law.

Standard Equipment

Part No.	Description	Picture
7585	Includes Q-Trak™ XP Base Meter with Multi-Sensor IAQ Module and the following sensors: • PM 2.5 sensor • Temperature and Relative Humidity sensor • Barometric Pressure sensor • Carbon Dioxide (CO_2) sensor (801399) IAQ module includes six configurable gas sensor slots	
7580	Base Meter only – Handle portion	

Part No.	Description	Picture
801430	IAQ Multi-Sensor Gas Module with Built-in Sensors: Temperature, Relative Humidity, Barometric Pressure, Particle	
801399	CO_2 (Carbon Dioxide), NDIR (Nondispersive Infrared sensor)	
800121	Carrying Case	
800123	Lithium Ion Rechargeable Battery Pack	
804001	USB Cable	
800122	AC Adapter/Power Supply	
N/A	Calibration certificates	N/A
6013907	Q-Trak™ XP User Manual (*English*: Included on USB drive)	
6013908	Q-Trak™ XP Quick Start Guide *(includes English, French, German, Simplified Chinese, and Traditional Chinese)*	

Part No.	Description	Picture
800120	Gas Sensor Calibration Cap	
7004280	USB Flash Drive with Q-Trak™ XP manuals and other literature. Included with 7585.	

Optional Gas Sensors

Part No.	Description	Picture
801399	CO_2 (Carbon Dioxide), NDIR (Nondispersive Infrared sensor)	 (801403)
801400	Cl_2 (Chlorine), EC (Electrochemical Sensor)	
801401	CO (Carbon Monoxide), EC (Electrochemical Sensor)	
801402	H_2S (Hydrogen Sulfide), EC (Electrochemical Sensor)	
801403	NH_3 (Ammonia), EC (Electrochemical Sensor)	
801404	NO (Nitric Oxide), EC (Electrochemical Sensor)	
801405	NO_2 (Nitrogen Dioxide), EC (Electrochemical Sensor)	
801406	O_3 (Ozone), EC (Electrochemical Sensor)	
801407	$TVOC_H$ (VOC ppm), PID (Photoionization Detection Sensor)	
801408	$TVOC_L$ (VOC ppb), PID (Photoionization Detection Sensor)	
801409	CH_2O (Formaldehyde), EC (Electrochemical Sensor)	

Optional Accessories

Part No.	Description	Picture
800124	Wi-Fi® dongle	
800129	Q-Trak™ XP Battery Cover with Tripod Mount and Tabletop Tripod	

Other Replacement Parts

Part No.	Description	Picture
800120	Q-Trak™ XP Gas Sensor calibration cap	
800121	Q-Trak™ XP Case: hard sided carry case	
800126	Battery Cover	

Part No.	Description	Picture
800127	Sensor Module Cover	
800125	Battery cover with tripod mount	
800128	Tabletop Tripod	N/A

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CHAPTER 3

Setting Up the Q-Trak™ XP Monitor

Installation of Gas Sensors

In addition to the standard built-in sensors, the device can accept up to six gas sensors.

Install the gas sensors as follows:

1. Ensure the instrument is powered OFF.
2. Remove the sensor module cover.

3. Position the sensor as shown, making certain the pins make good contact with the device. Gas sensors can be installed in any available slot. Listen for a click to confirm sensor is connected properly.
4. Attach cover to the sensor module.
5. To configure which sensors are shown on the display, refer to Sensors section in Chapter 5.

Providing Power to the Q-Trak™ XP

The Q-Trak™ XP monitor can be powered with provided lithium-ion battery or with the provided A/C adapter.

Operating the Instrument with the AC Adapter

The instrument can be operated with or without a battery using the A/C adapter.

To operate the instrument with AC adapter:

1. Plug the AC adapter into an electrical outlet.
2. Plug the other end into the instrument.

NOTICE

In general, TSI® recommends operating the Q-Trak™ XP monitor with a battery even when powering the instrument with an AC power supply. Having a battery installed shortens the warm-up time needed for sensors to make accurate measurements.

NOTICE

For best results, power on the instrument for 10 minutes before verifying gas sensor performance. This allows the instrument and sensors to thermally stabilize and reduces the amount of measurement drift during verification or calibration.

Operating the Instrument with the Lithium-Ion Battery

To install the battery:

1. Remove the battery compartment cover.

2. Connect the battery to the handle connector.

NOTICE
The battery pack connector is designed to prevent improper connection.

3. Insert the battery as shown in the picture, keeping the battery wires to the side and clear of the battery cover screw.

4. Attach the battery compartment cover, ensuring battery wires are clear of the screw.

IMPORTANT

Always calibrate the battery Power Gauge after installing a battery pack.

Charging the Battery and Calibrating the Power Gauge

1. With the battery installed, turn on the instrument by pressing the power button and ***run until the battery is fully discharged***. The instrument will automatically turn off when the battery is fully discharged.

NOTICE

The battery is shipped with approximately 25% to 30% charge.

2. Connect the AC adapter to the instrument and fully charge the battery. This may take up to 3 hours. Note the lightning bolt indicator when charging 50% vs fully charged 100%.

NOTICE

It is normal for the battery to feel warm as it is charging.

3. The instrument is now ready for use with the battery. This Power Gauge calibration procedure does not need to be repeated unless the battery is replaced or disconnected.

Installing and Connecting to Available Wi-Fi® (optional Wi-Fi® dongle)

To connect your device to a Wi-Fi® network, proceed as follows:

1. Install the dongle into the USB port located inside the battery compartment.

Connecting to a Computer and Installing TrakPro™ Ultra Software

To connect the Q-Trak™ XP monitor to a computer for downloading data files or when using the TrakPro™ Ultra Software application:

1. Connect the USB-C cable provided with the Q-Trak™ XP monitor to a computer.
2. From a computer, navigate to www.tsi.com/7585 and select the TrakPro™ Ultra application exe.
3. Download and install the application.
4. Launch the TrakPro™ Ultra application.

5. Refer to of the user guide in “help” menu within TrakPro™ Ultra software for operation information.

CHAPTER 4

Operational Overview

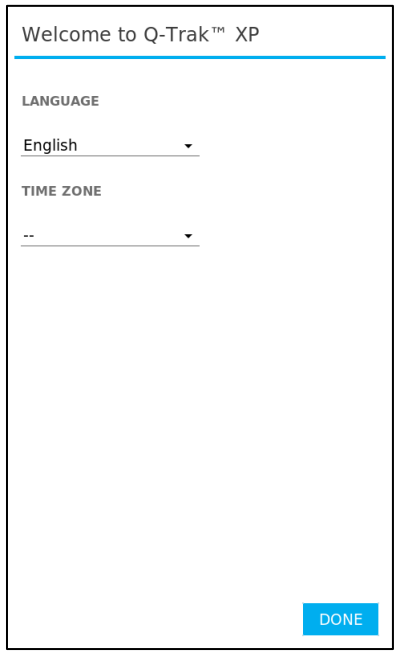
Powering ON the Q-Trak™ XP Monitor

Press and release the power button . A progress bar will appear as the instrument boots.

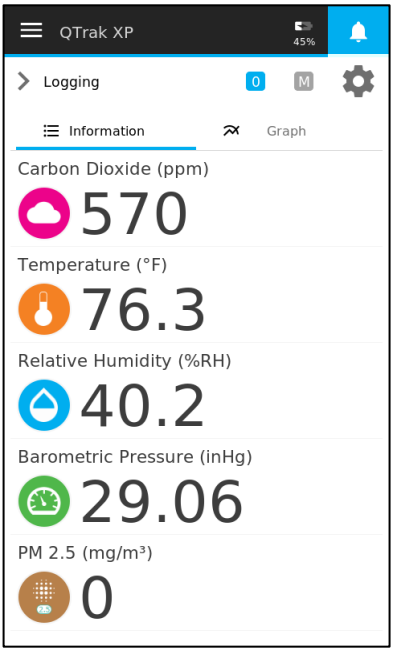
To power down the instrument, press the power button and press **shutdown** from the pop-up screen

The first time the Q-Trak XP monitor is powered ON the **Welcome to Q-Trak™ XP** page is presented. Select the appropriate **Language** and **Time Zone** then select **DONE**.

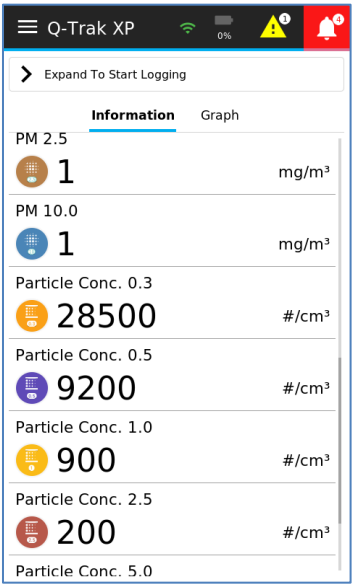
After selecting **DONE** the **Dashboard** page is displayed in *Survey* mode.

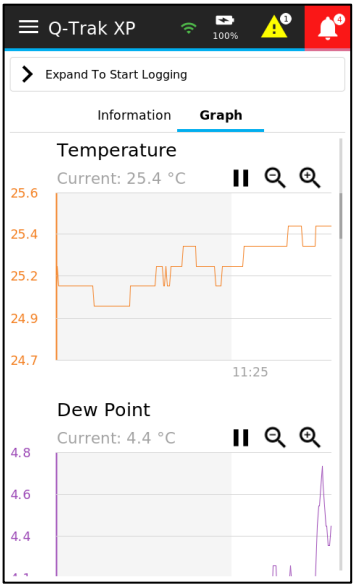


Survey mode displays real-time readings of sensors selected from the Sensors page discussed later in Chapter 5. It does not log measurements or statistics.



Selecting **Graph** presents real-time readings in a graphical format while selecting **Information** present data in a numerical format. To view sensors not shown on the page, swipe up and down.

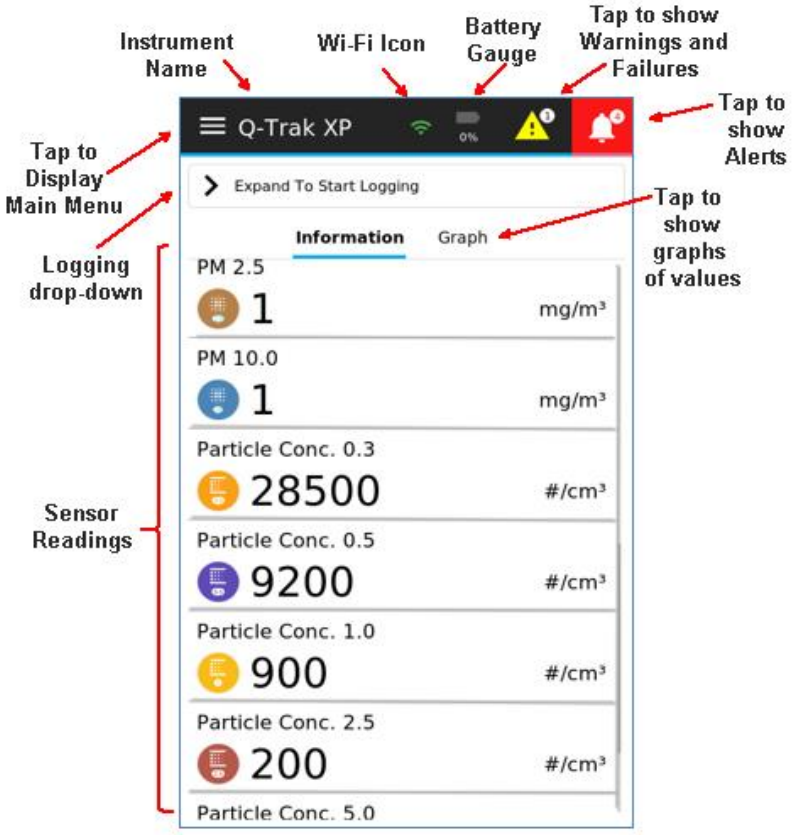




NOTICE
Sensors will only appear in the **Dashboard** page once they have been selected in the Sensors page discussed later in Chapter 5.

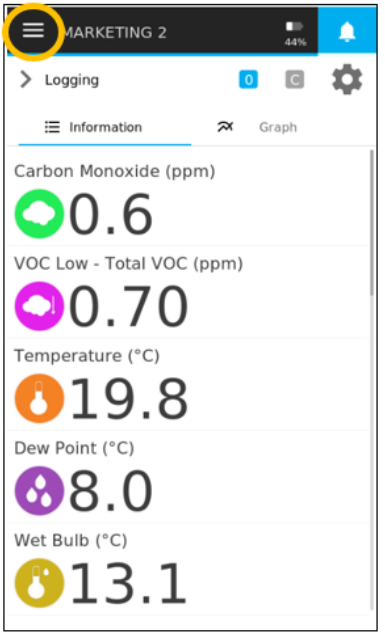
Navigating the Dashboard Page+

The following **Dashboard** diagram dissects the layout of the **Dashboard** page.



Main Menu

To display the **Main Menu**, select the ☰ icon in the upper left corner of the header on any page of the display.



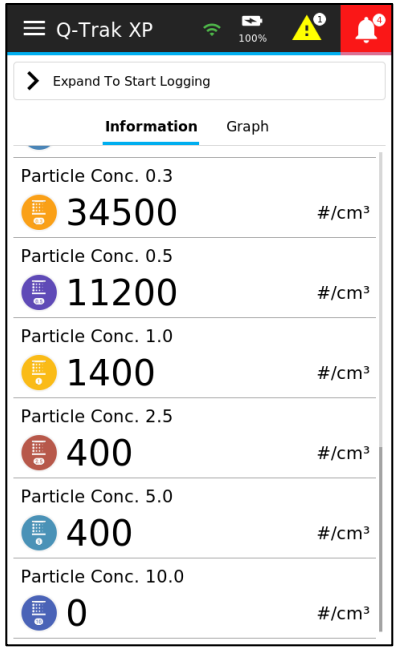
The Main Menu has seven options:

- Dashboard
- Settings
- Manage Data
- Calibration
- Workflows
- Device Information
- Help

Dashboard

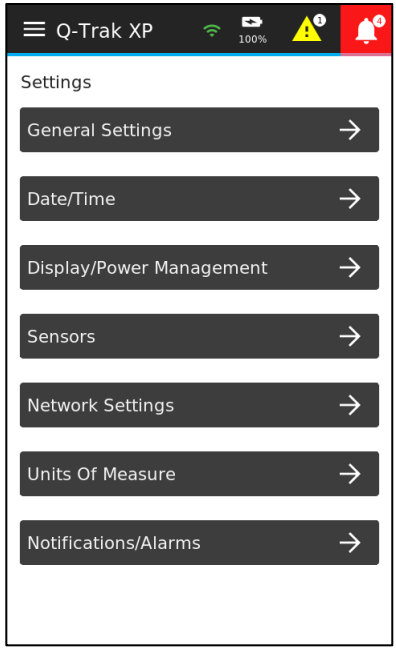
This is the main page for viewing live readings, live graphs and logging data.

Select **Dashboard** from the menu in the header any time to return to the **Dashboard** (Home) page.



Settings

Select **Settings** from the **Main Menu**, to view the **Settings** page options. Refer to Chapter 5, Settings for detailed information about the device setting options.



Manage Data

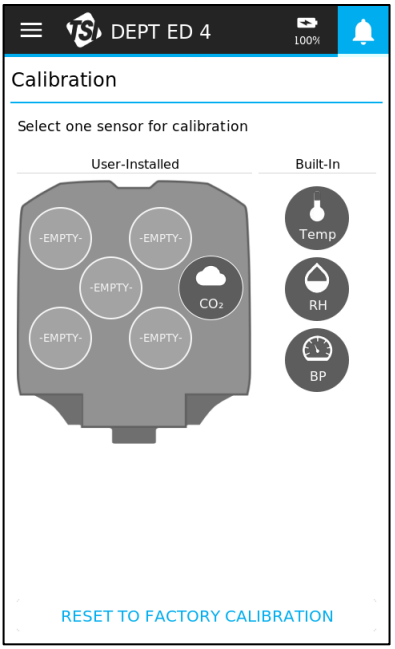
Select **Manage Data** to display logged data stored in the device. Refer to Chapter 8, Manage Data for detailed information.

Calibration

Sensors are calibrated before they are shipped from TSI®. If a sensor requires a field calibration, select **Calibration** from the **Main Menu**. The **Calibration** page presents the sensors (except the particle sensor) installed in the device.

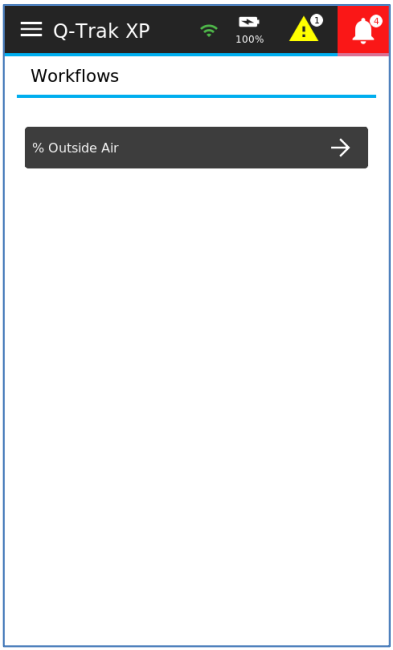
NOTICE

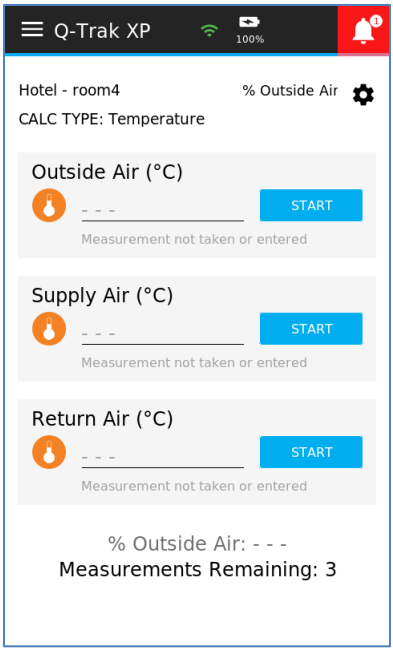
A user calibration cannot be applied to particle measurements.



Workflows

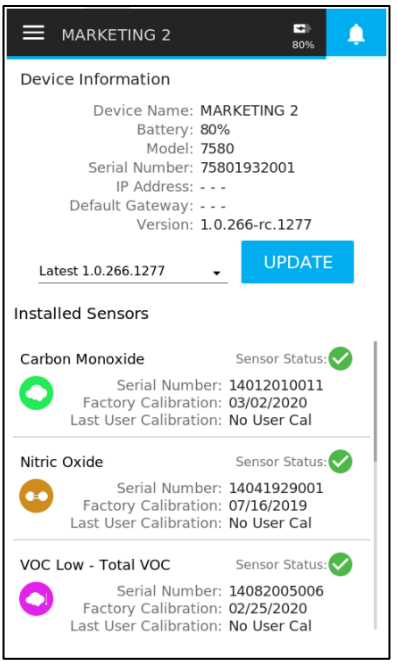
Percent of Outside Air: Select **Workflows** from the **Main Menu**, and then **% Outside Air** to begin performing a % Outside Air Calculation. Refer to Chapter 9, Workflows for details.





Device Information

To display general information about the Q-Trak™ XP monitor, select **Device Information** from the **Main Menu**. The **Device Information** page lists the device name, IP address, model number, and many other characteristics of the device as well as information about the installed sensors.



To view sensors not shown on the page, swipe up and down. This information is important for troubleshooting issues related to the operation of the device. Furthermore, the **Device Information** page includes the ability to update the software version for the Q-Trak™ XP monitor from a flash drive or computer.

To update the Q-Trak™ XP monitor software, select the down arrow from the **Device Information** page and select the latest software version then select the **Update** button. Refer to Chapter 11, Update Instrument Software for more information.

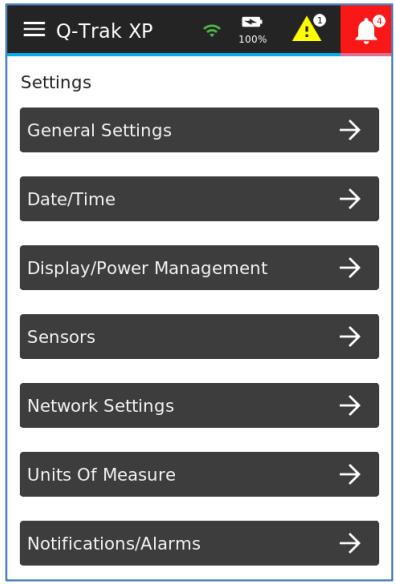
CHAPTER 5
Settings

Navigate to the **Settings** page by selecting **Settings** from the **Main Menu**.

The **Settings** page options are:

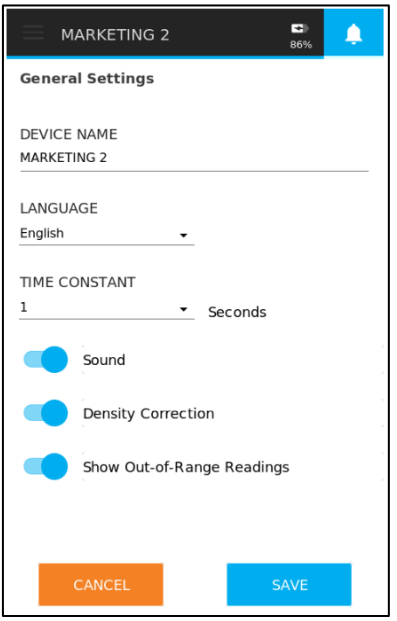
- General Settings
- Date/Time
- Display/Power Management
- Sensors
- Network Settings
- Units of Measure
- Notifications/Alarms

These options are described in the following subsections.



General Settings

The **General Settings** page is used to configure the following functions:



- **Device Name** is used to customize the name of the instrument. This feature is helpful when associating data to a specific instrument.

  NOTICE: The device will display up to 14 characters of the device name in the header of the main **Dashboard** page.

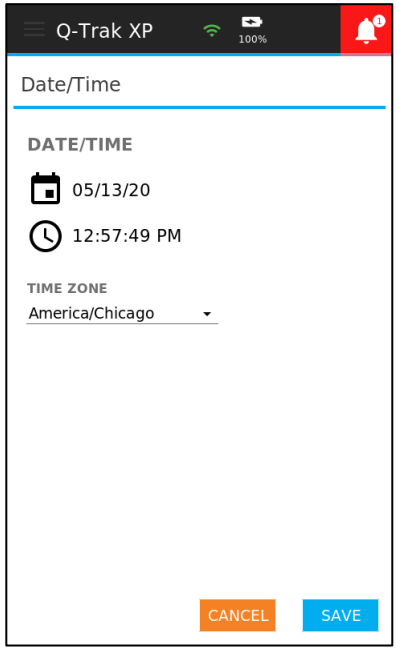
- **Language** is used to select the desired language shown on the instrument.
- **Time Constant** is used to adjust the averaging period for the readings shown on the display.
- **Sound** is used to enable or disable the beeper. A beep is emitted at the end of a **Sample Interval** when logging data or when a **Notification/Alarm** occurs.
- **Density Correction** enables or disable the application of density correction to the measurement of CO_2 and VOC.
- **Show Out-of-Range Readings** enables or disables out-of- range readings shown on the device display. An out-of-range reading is a measured value that is either less than a sensor's Minimum Detection Limit or greater than the upper recommended range. For example, a negative gas concentration reading is considered an out-of-range reading. It is recommended that this setting is **Enabled** when performing a Bump Test.

NOTICE

Time Constant is the display averaging period. The display will update every second; however, the displayed reading will be the average over the time constant period. For example, if the time constant is 5 seconds, the display will update every second, but the displayed reading will be the average of the last 5 seconds.

Date/Time

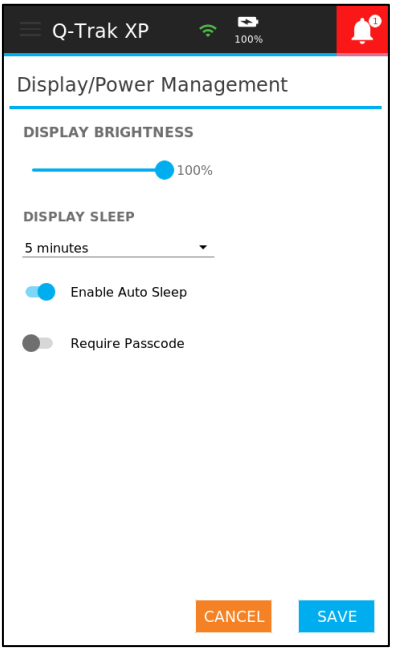
The **Date/Time** page is used to set the current date, time, and **Time Zone**. This information is critical for logging data and creating log schedules.



Display/Power Management

The **Display/Power Management** page is used to configure the following functions

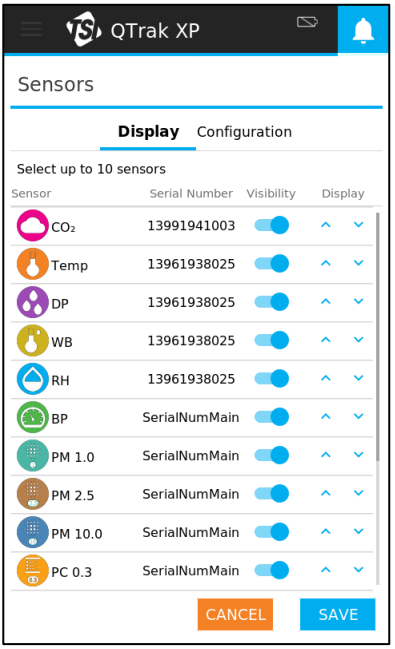
- **Display Brightness** adjusts the brightness of the display.
- **Display Sleep** sets the time when the instrument enters into sleep mode. Sleep mode is a power-saving state that darkens the display. To exit sleep mode touch the display. The selectable sleep time options are 1, 5, and 15 minutes. By default, **Display Sleep** is 1 minute.
- **Enable Auto Sleep** enables and disables sleep mode.
- **Require Passcode** enables and disables the passcode protection feature. Once the instrument enters sleep mode a passcode is required to regain access (passcode is 7585).



Sensors

The **Display** section of the **Sensors** page is used to configure what sensors are displayed on the **Dashboard** page, and the order they are displayed. To view sensors not shown on the page, swipe up and down. The list of sensors includes the following information:

- A sensor icon and name.
- A toggle button to enable or disable the **Visibility** of the sensor on the **Dashboard** page.
- Up and down arrow buttons ↑ ↓ to set the order of the sensors on the **Dashboard** page.

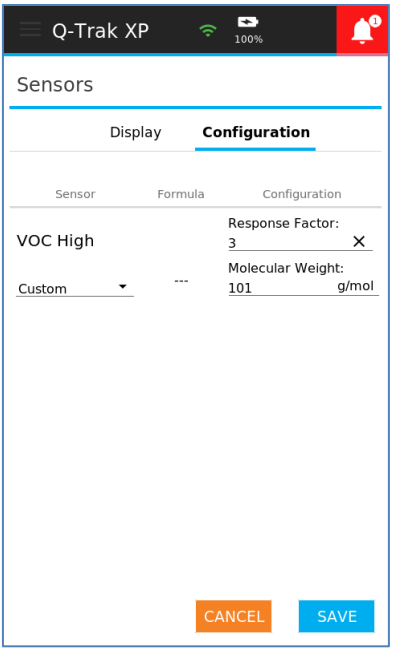


NOTICE

The order of sensors on the **Sensors** page is the order shown on the **Dashboard** page.

The **VOC Configuration** section of the **Sensor**s page is used to select a specific Volatile Organic Compound (VOC). This is done by selecting an already pre-defined VOC in the drop-down list or by selecting **Custom** and entering a **Response Factor** and **Molecular Weight**.

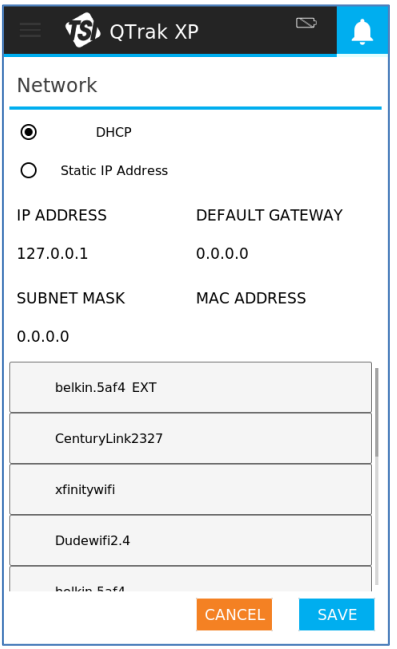
- The **Response Factor** and **Molecular Weight** are used to calculate the actual concentration of a specific VOC.



Network Settings

The **Network Settings** page is used to connect the Q-Trak™ XP monitor to a wireless network.

1. Select the **Connect to Network** radio button.
2. Select a **Wireless Network** down arrow to view the list of available networks.
3. Select the desired network.

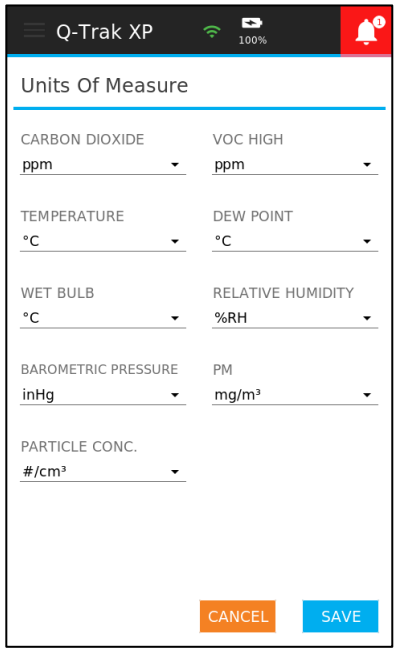


4. Enter the network password in the **Network Password** field.
5. Select the **CONNECT** button to connect the Q-Trak™ XP monitor to the network.
6. Once connected the Connection Status, IP Address, Subnet Mask, Connection Type, Default Gateway, and MAC Address will populate.
7. Select the **Done** button to exit the **Network Settings** page.

Units of Measure

The **Units of Measure** page is used to set the units of measure for the installed sensors.

1. Select ▼ icon to view the list of available units of measure.
2. Select the desire unit of measure.
3. Select **SAVE** button to save changes.



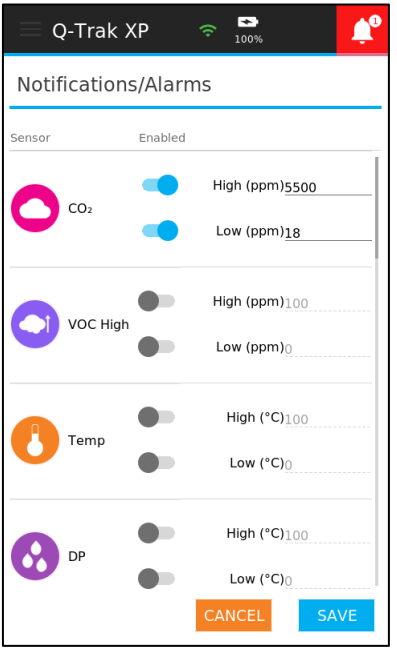
NOTICE

The units of measure for all PM mass concentration measurements (PM 1, PM 2.5, and PM 10) are set by the **PM** drop-down list. Similarly, the units of measure of all particle concertation measurements (PC 0.3, PC 0.5, PC 1.0, PC 2.5, PC 5.0, PC 10.0) are set by the **Particle Conc.** Drop-down list.

Notifications/Alarms

The **Notifications/Alarms** page is used to enable and disable notifications/alarms of the list of sensors as well as setting their trigger thresholds. The following is included in this page.

- Toggle buttons to enable or disable **Notifications / Alarms.**
- Text fields to enter **Notifications / Alarms** thresholds.
- Lastly, to view sensors not shown on the page, swipe up and down.



NOTICE

If two or more of the same sensor type is installed, only one will trigger an alarm.

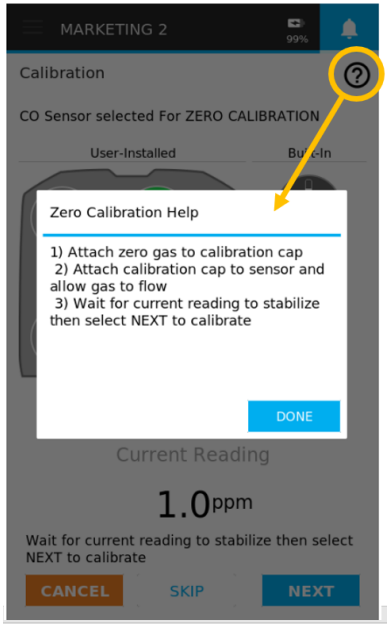
CHAPTER 6
Calibration

Gas Sensors

TSI® recommends testing the accuracy of gas sensor measurements each time the instrument is used. This is a common practice within the gas measurement community which includes IAQ consultants and industrial hygienists. Due to the nature of the sensors along with other environmental factors such as altitude, temperature, and relative humidity, the zero value and sensor sensitivity can shift over time requiring you to perform a field calibration.

Gas Sensor Verification

Verifying the accuracy and performance of a sensor can easily be accomplished in the field by comparing it to certified ZERO and SPAN calibration gases (also referred to as a “Bump Test”). To do this, attach a calibration cap to a bottle of the recommended ZERO gas and place the cap onto the gas sensor being checked. If the probe reads a number outside of the sensor accuracy after the measurement has stabilized, the sensor has drifted and needs to be recalibrated. Perform the same procedure with the recommended SPAN gas to check the sensor measurement against the certified SPAN bottle concentration and determine if a user calibration is necessary. See Table 1 for recommended ZERO and SPAN gases.



NOTICE

For best results, power on the instrument for 10 minutes before verifying gas sensor performance. This allows the instrument and sensors to thermally stabilize and reduces the amount of measurement drift during verification or calibration.

NOTICE

Specific instructions for the calibration of each sensor are available during calibration. To access the help for a sensor, select ⓘ and a pop-up appears with information to guide you through specific sensor calibrations.

The following table shows the recommended calibration gases and their respective concentrations (in ppm) for each gas sensor. ***Calibration gases are available globally through local distributors.***

Table 1: Calibration Gases and Concentrations

Carbon Dioxide (CO_2)	Carbon Dioxide (CO_2)	5000	Nitrogen	
TVOC – High	Isobutylene (C_4H_8)	100 2000	Zero Air or Nitrogen	100 ppm is the first span 2000 ppm is the second span
TVOC - Low	Isobutylene (C_4H_8)	20	Zero Air or Nitrogen	
Carbon Monoxide (CO)	Carbon Monoxide (CO)	400	Zero Air	
Nitrogen Dioxide (NO_2)	Nitrogen Dioxide (NO_2)	20	Nitrogen	
Nitric Oxide (NO)	Nitric Oxide (NO)	20	Nitrogen	
Chlorine (Cl_2)	Nitrogen Dioxide (NO_2)	20	Zero Air	Nitrogen Dioxide (NO_2) is used as a surrogate SPAN calibration gas
Ozone (O_3)	Nitrogen Dioxide (NO_2)	20	Zero Air	Nitrogen Dioxide (NO_2) is used as a surrogate SPAN calibration gas

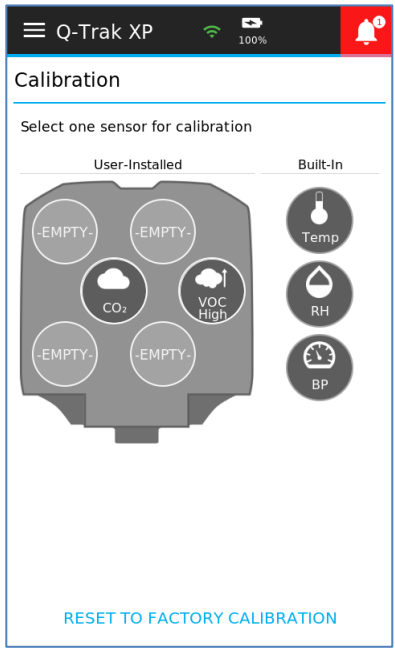
Table 1: Calibration Gases and Concentrations

Hydrogen Sulfide (H_2S)	Hydrogen Sulfide (H_2S)	50	Zero Air	
Ammonia (NH_3)	Ammonia (NH_3)	100	Zero Air	
Formaldehyde (CH_2O)	Formaldehyde (CH_2O)	10	Zero Air	

Gas Calibration Procedure

To perform a gas calibration, required accessories and material include a calibration cap, ZERO calibration gas, SPAN calibration gas, gas regulator, and tubing. The gas regulator used to control the flow should be capable of providing 0.3 L/min.

Select **Calibration** from the **Main Menu** and the **Calibration** page will appear showing the available sensors for calibration. All sensors appear grayed out until you select the sensor they would like to calibrate.

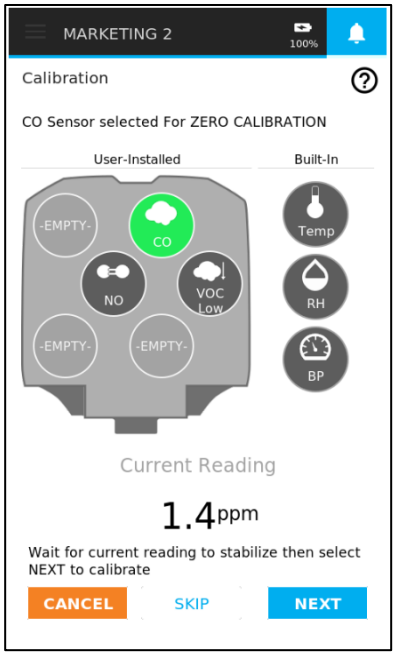


Step 1 – Select a Gas Sensor for Calibration

Remove the sensor module cover.

Step 2 – Place the calibration cap onto the gas sensor you want to calibrate

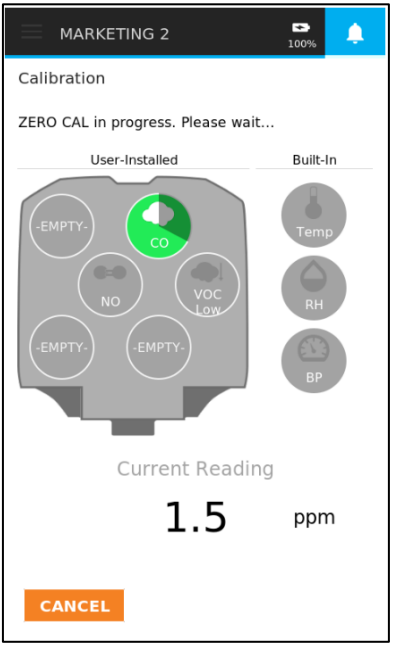
Step 3 - Select the sensor to be calibrated on the instrument display



NOTICE
You have the ability to “SKIP” either the *ZERO* and/or *SPAN* gas calibration steps during the calibration process.

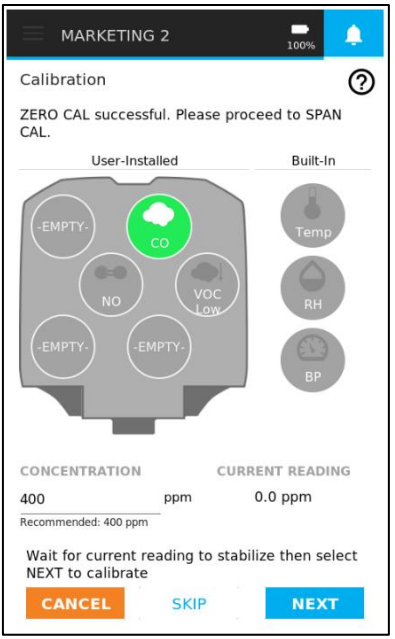
Step 4 - Perform ZERO Capture

1. Connect the ZERO gas regulator to the calibration cap and start the flow of ZERO gas. Wait for the measurement to stabilize.
2. Once the ZERO concentration looks stable, select **Next** to perform a ZERO concentration capture. An illuminated dial will appear on the sensor icon showing the time remaining.



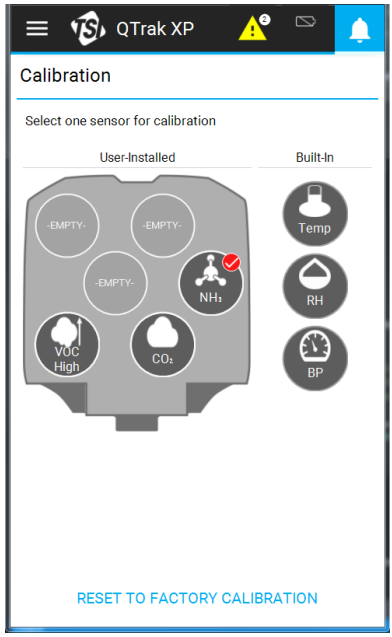
Step 5 – Perform SPAN Capture

1. Enter the SPAN gas bottle concentration into the reference concentration field using the numeric keypad.
2. Connect the SPAN gas regulator to the calibration cap and start the flow of SPAN gas. Wait for the measurement to stabilize.
3. Once the span concentration looks stable, select **Next** to perform span concentration capture. An illuminated dial will appear on the sensor icon showing the time remaining.



Step 6 – Save or Discard Calibration

A **CALIBRATION ADJUSTMENT %** is displayed after the SPAN capture that informs you how much the sensor's calibration slope has changed from the factory calibration slope.

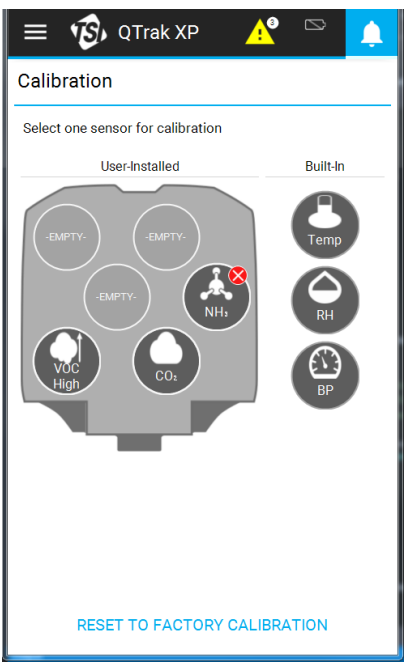


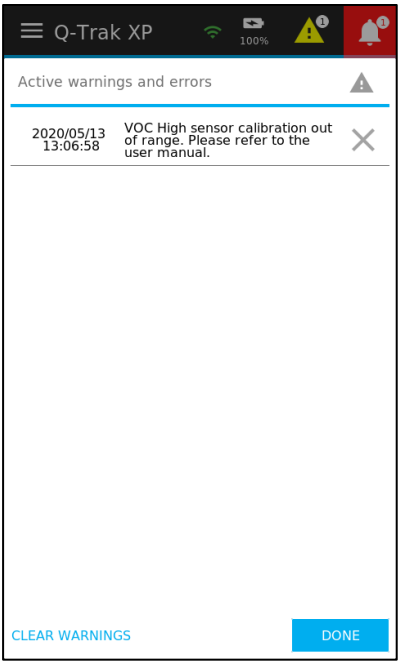
1. Select **Save** to accept the calibration.
2. Select **Cancel** to quit the calibration procedure and discard calibration.
3. A successful calibration will be indicated by a ✓ near the sensor icon.
4. If the calibration reading completes but the *Reference Calibration* gas concentration is out-of-range than what is recommened by the device, the page displays a ✓ near the sensor icon and a warning notice is sent to the Notice list ⚠ in the heading bar of the instrument.

   An Out-of-Range error during the calibration of a sensor means the sensor's offset or calibration slope adjustment has drifted outside of the TSI® recommended specification for continued use. Sensor should be replaced or sent to TSI® for re-calibration.

Gas Calibration Unsuccessful

If a sensor has drifted beyond the TSI® recommended calibration adjustment specification, a ⊗ is displayed by the sensor icon and a warning notice is sent to the Notice list ⚠ in the heading bar of the instrument. TSI® recommends replacing the sensor. However, the sensor *is* calibrated and can still be used. See Out of Range in Appendix B, Definitions for more information.





Built-in Sensor Calibration: Temperature, Relative Humidity, and Barometric Pressure Sensors

To calibrate the Temperature, Relative Humidity, and Barometric Pressure sensors:

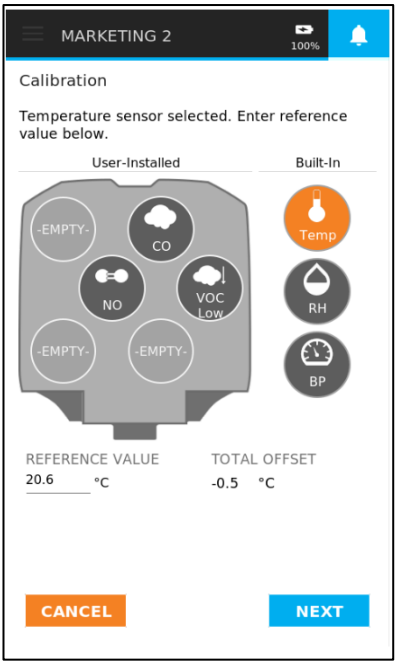
Select either the Temperature, Relative Humidity, or Barometric Pressure sensor icon on the Calibration page. A **Reference Value** for the sensor will appear.

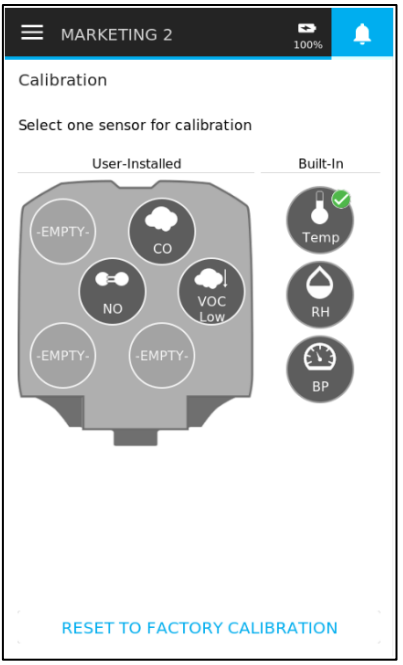
The **Reference Value** is the current reading of the sensor. This reading can be changed by selecting on the **Reference Value** text field and entering the desired value and select <✓>. Select **Next** then **Save** and the new value is displayed as the **Reference Value**.

The **Total Offset** is the adjustment from the original factory calibration for that sensor. This lets you track the overall drift of the sensor.

If the drift exceeds the factory allowable tolerance, a is displayed by the sensor icon and a warning notice is sent to the Notice list in the heading bar of the instrument that instructs you to return the unit to TSI® for service.

Calibration that is within the factory allowable tolerance, a is displayed by the sensor icon.

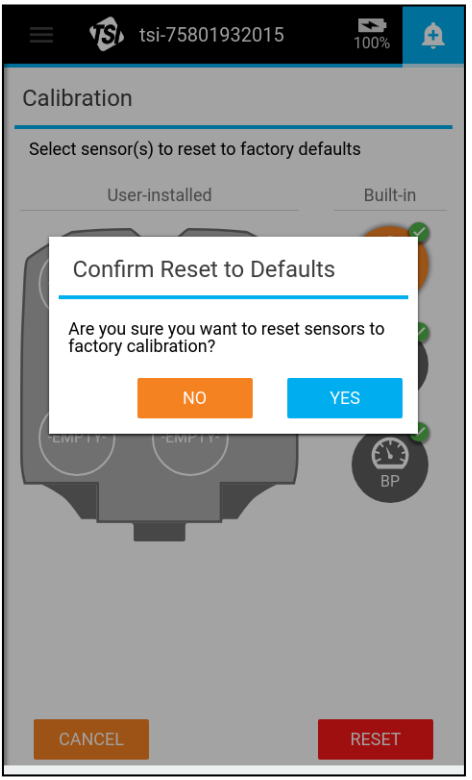




Reset Sensors to Default Calibration

To reset the sensors to their factory defaults,

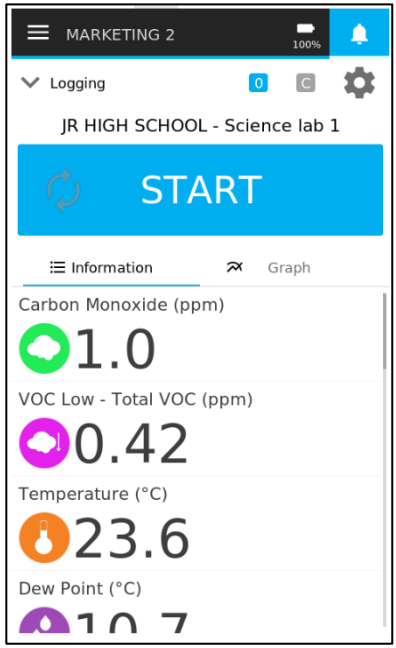
1. Return to the **Calibration** page and select **Reset to Factory Calibration** at the bottom of the page.
2. Select the sensor(s) to be reset.
3. When the selected sensor(s) are highlighted, select **RESET**.
4. Select **Yes** or **No**. Selecting **Yes** resets the sensor(s) to the factory calibration.



CHAPTER 7

Logging Data

From the **Main Menu** select **Dashboard** then select **> Logging** at the top of the page. This leads to the **Dashboard** page with the **Start** button as shown below.



From this page either select **Start** to begin logging data based on the selected **Logging Profile** or define a **Logging Profile** by selecting ⚙.

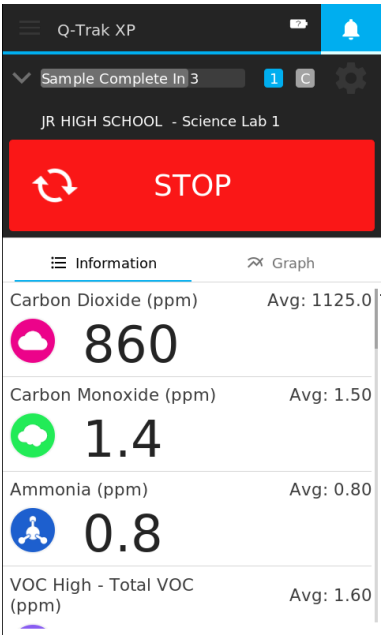
NOTICE

When selecting **START** before creating a **Logging Profile** the Q-Trak™ will log data based on a default **Logging Profile** and log a single reading from all available sensors using a sample interval of 1 second.

Logging Data

To begin logging data, select **START**.

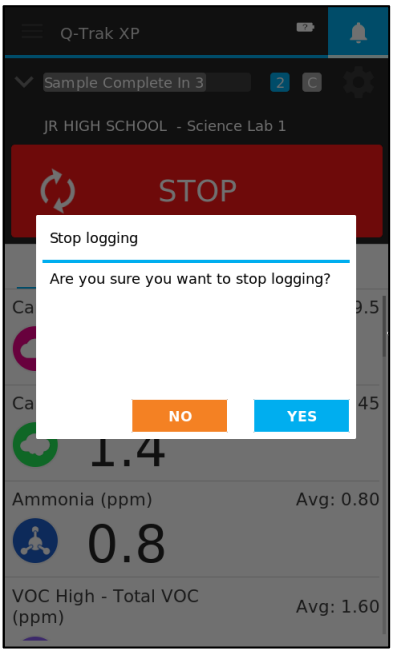
When logging is initiated, the **Dashboard** page displays second by second measurement readings next to the sensor icons while the **Avg** value is the average of all readings in the log file.



NOTICE

On-board memory is capable of storing data from all available sensors for 100 days when sampling data once a minute.

You can log data with **Manual Save**, **Continuous Save**, or **Scheduled Save** (see figure). To stop logging at any time, select **STOP** then select **Yes**.

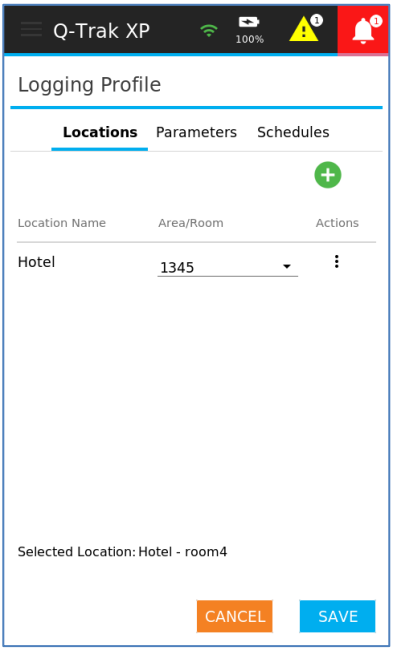


NOTICE

The Q-Trak™ always logs data from all available sensors.

Logging Profiles

Selecting the ⚙ from the **Dashboard** page leads to the **Logging Profile** page where you define and select a logging profile. A logging profile is composed of a **Locations** and **Settings** such as **Logging Mode.** If **Scheduled Save Logging Mode** (see figure) is selected then a schedule must be defined.



The following subsections describe how to add/change **Locations**, **Settings**, and **Schedules**.

Locations

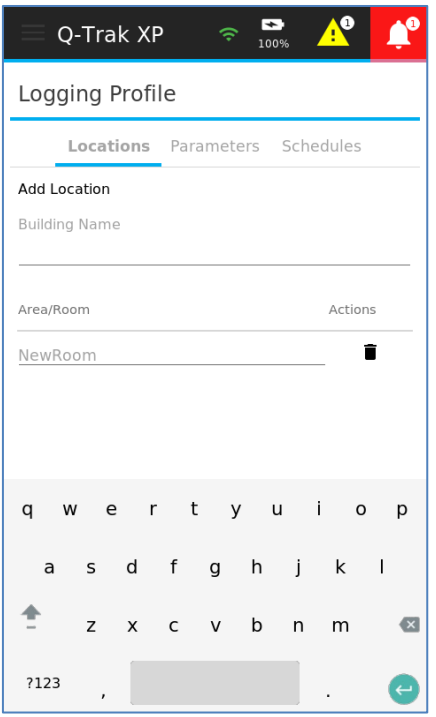
A location is composed of a **Location Name**, typically a building, and an **Area/Room** in the building. The highlighted location is the currently selected location. To change the current location, select another location in the list.

NOTICE
The list of locations can exceed the number of locations that are visible on the display. To view additional locations swipe up or down.

On the **Logging Profile** page select **Locations**.

To create a new location:

1. Select to create a new location.
2. Enter a **Building Name**.
3. Enter **Area/Room**.
4. Select and select **Done** to add a location.
5. Select **Save** to save the location.



To edit an existing location:

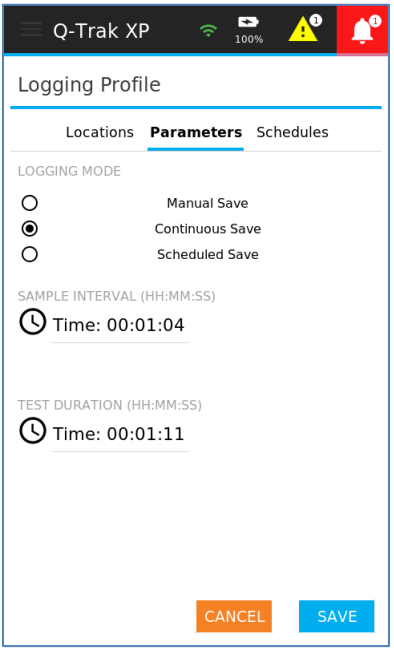
1. Select and select **Edit** for the location.
2. Edit the **Building Name** and/or **Area/Room** for the Location.
3. Select and select **Done** to complete editing.
4. Select **Save** to save the change.

To delete a location:

1. Select and select **Delete** for the Location.
2. Select **SAVE** to delete the location.

Settings

Settings include **Logging Mode**, **Sample Interval**, **Test Duration**, and other items such as **Select Logging Schedule**.



Logging Mode

There are three logging modes:

- Manual Save
- Continuous Save
- Scheduled Save

Manual Save logging mode averages measurements collected during the sample interval and records the average value in the log file. Once the sample is complete the application prompts you to either select **START** or **DONE**. Select **START** to take another sample or **DONE** to end the logging session.

Selecting the **View Before Save** toggle button to ON, **Manual Save** prompts you to either SAVE or DISCARD once the sample is complete. Swipe up or down to view the collected data then select **SAVE** or **DISCARD** to save or discard the data. After selecting **SAVE** or **DISCARD** the page will display START or DONE. Select **START** to take another sample or **DONE** to end the logging session.

Continuous Save logging mode averages measurements collected during the sample interval and records the average value in the log file. Unlike **Manual Save** mode, **Continuous Save** mode continues logging data until the **Time Duration** time has elapsed. In this mode, the sample data is automatically saved to memory at the end of the sampling interval and you are not given the option to view the data before saving.

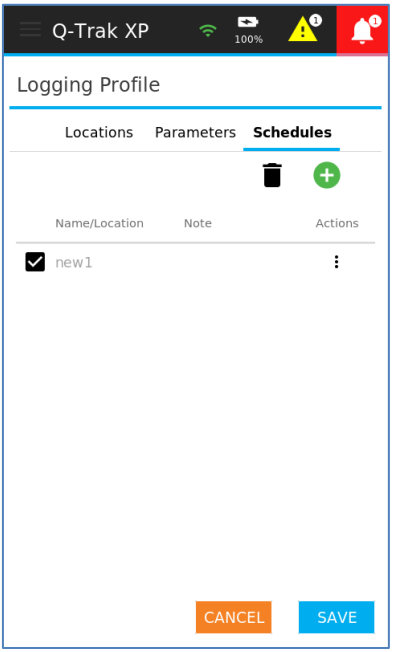
Schedule Save collects data according to a user-defined schedule with a specific start and end date and time. Moreover, this logging mode averages measurements collected during the sample interval and records the average value in the log file like the previous logging modes. Lastly, the data is automatically saved without user intervention.

Sample Interval

Sample interval is used in all three logging modes to set the time between samples. It can be as short as one second or as long as 99 hours, 59 minutes, and 59 seconds.

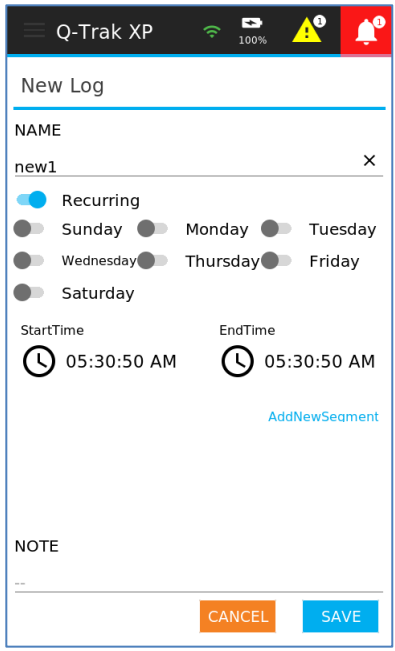
Schedules

To set up schedules for logging, Select **Schedules** from the **Logging Profile** page.



To create a new logging schedule:

1. Select ⊕ to create a logging schedule.
2. Enter a schedule name.
3. If this is a recurring logging profile, select **Recurring** and select the days of the week to log data.
4. Enter start times and end times as desired.
5. If an additional time segment is desired, select **Add New Segment** and enter a start time and end time.
6. Repeat step 5 to add more time segments.



7. Add **Notes** to the schedule if desired.
8. Select **DONE** to finish editing and select **SAVE** to save changes.

NOTICE

The list of time segments can exceed what is shown on the display. To view additional time segments swipe up and down.

To edit an existing logging schedule:

1. Select ⋮ and then select **Edit**.
2. Modify the schedule as desired.
3. Select **DONE** to finish editing and select **SAVE** to save changes.

To delete an existing logging schedule:

1. Select ⋮ and select **Delete**.
2. Select **Yes**.

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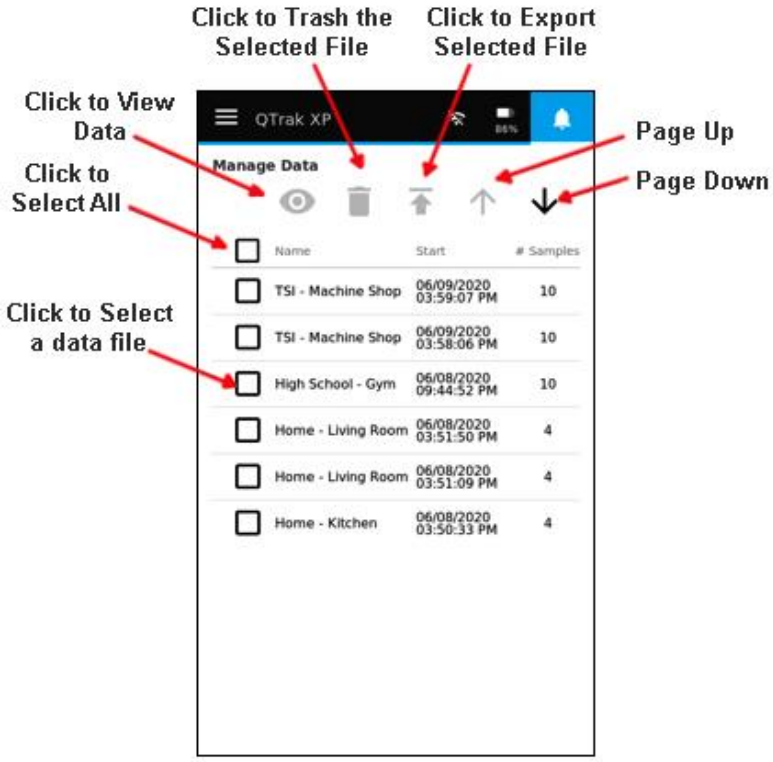
CHAPTER 8

Manage Data

From the **Main Menu** select **Manage Data.**

The **Manage Data** page contains all logged files on the device. You can select a log file for viewing, deleting, exporting, and editing. As well as scrolling through a list of log files.

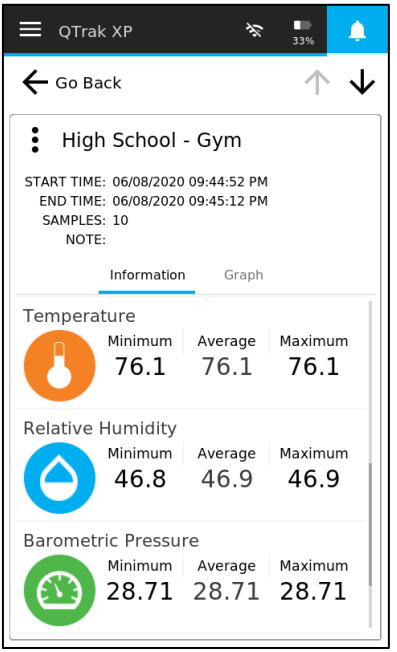


Selecting Log Files

Select a log file by selecting a checkbox. Multiple log files can be selected by selecting additional checkboxes while all log files can be selected by selecting the checkbox at the top of the page.

View Log Files

To view a log file select the checkbox then select the icon. To view all the data in a log file swipe up and down and to view data over time select **Graph**. If more than one log file is selected for viewing, select the up and down arrows to view the other log files.



Delete Log Files

Select a log file then select the icon to delete it. Next select **YES**.

NOTICE
Deleted log files **cannot** be recovered.

Alternatively, when viewing a log data file select then select the icon.

Export Log Files

Logged data files can be exported to a USB flash drive or to a PC via TrakPro™ Ultra Software.

Exporting to USB Drive

Attach a USB flash drive (thumb drive) to the Q-Trak™ monitor via the USB port next to the power jack. Select a log file from the menu and then select icon.

Alternatively, when viewing a logged data file, select the menu and then select to export the file to the flash drive.

Files will be transferred to the USB drive in .CSV format for use with spreadsheets on a computer.

Exporting Files to a PC

Connect the instrument to a computer via Wi-Fi® or the USB-C Cable supplied with the instrument.

Open TrakPro™ Ultra Software on the PC (see TrakPro™ Ultra Software user manual) and select a log file from the menu and then select icon.

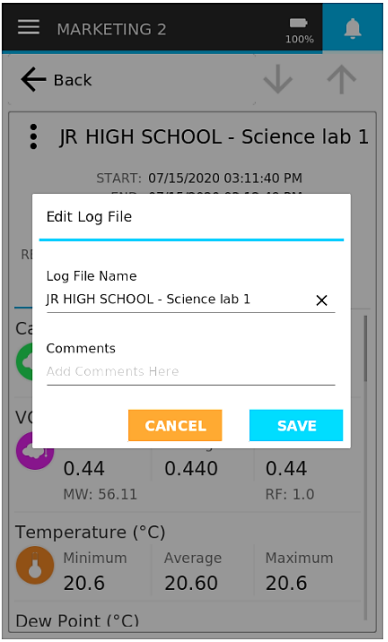
Alternatively, when viewing a logged data file, select the menu and then select to export the file to the PC in a .db File format for use with TrakPro™ Ultra Software. Files can then be exported as .csv or other file formats for use with other software.

NOTICE

If exporting data to a USB flash drive, and there is not enough space on the drive to house the file, or if some other error occurs during the export, the following warning message will appear: "**Data Export Failed – Please Check USB Drive**." This warning will persist unit it is dismissed.

Edit Log File Names

When viewing a log file, select the ⋮ icon and then select **Edit**. Enter a new **Log File Name** and add a comment if desired.



Scrolling Through Data List

When the list of log files exceeds what can be viewed on the display, select ↑ ↓ icons to scroll through the list of log files.

CHAPTER 9
Workflows

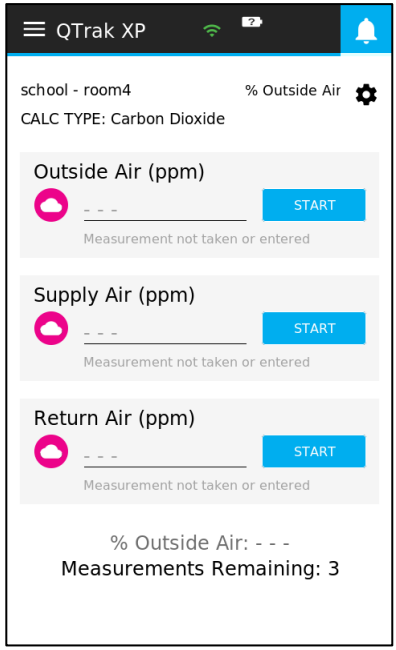
The following workflows are available:

- % Outside Air (%OA) calculation procedure.

Percent Outside Air (%OA) Calculation Procedure

For those unfamiliar with Percent Outside Air (%OA) Calculation and its use, please read TSI® Application Note TI-138, which is found on the TSI® website at https://www.tsi.com. It is important to understand what % Outside Air is, why it is important, and how to use this instrument to calculate %OA.

After selecting **Workflows** from the **Main Menu**, select **%Outside Air** to view the **% Outside Air** room.

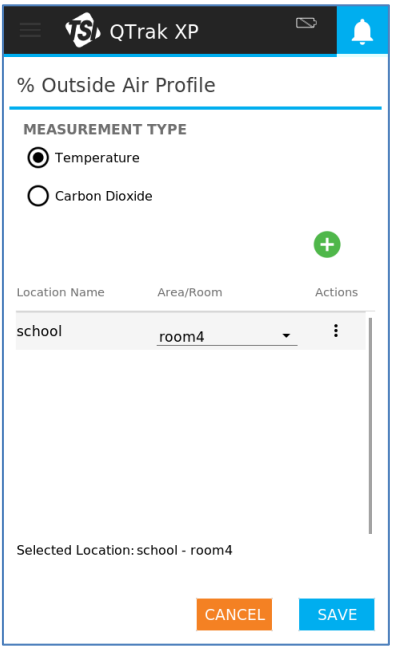


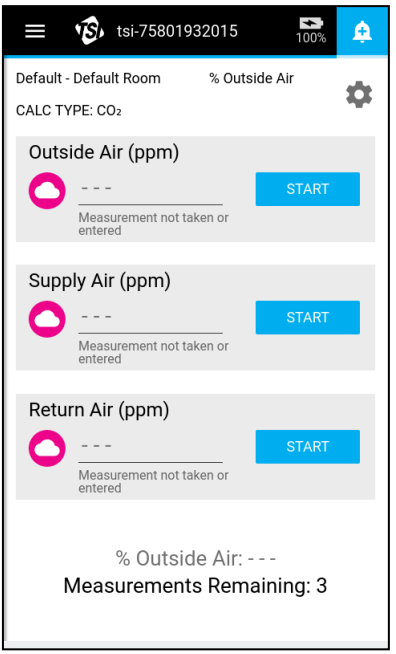
Three measurements are necessary for % Outside Air calculations - **Outside Air**, **Supply Air**, and **Return Air**. The measurements may be taken in any order. The calculation is performed once the final measurement is taken.

Before taking a measurement select ⚙ icon to create a **% Outside Air Profile**.

From the **% Outside Air Profile** page, you can:

- Select a **CO_2** or **Temperature** as the **Measurement Type**. If necessary, review the application note TI-138 to determine which option to use.
- Add a new location by selecting ⊕ icon and enter a **Building Name** and **Area/Room.** Similar to what was done in Chapter 7 Logging Data.
- **Edit** or **Delete** existing logging profile locations by selecting ⋮ icon. Similar to what was done in Chapter 7 Logging Data.
- Select **Save** or **Cancel** as desired to return to the **%Outside Air** page.



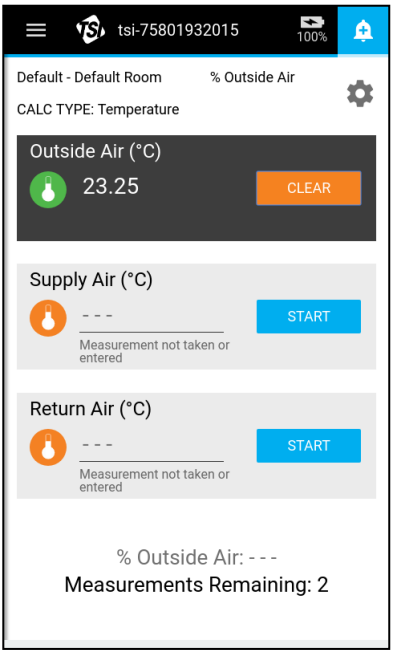


As mentioned above, three measurements are necessary for **% Outside Air** calculations - **Outside Air**, **Supply Air**, and **Return Air**. The measurements may be taken in any order. The calculation is performed once the final measurement is taken.

IMPORTANT NOTICE

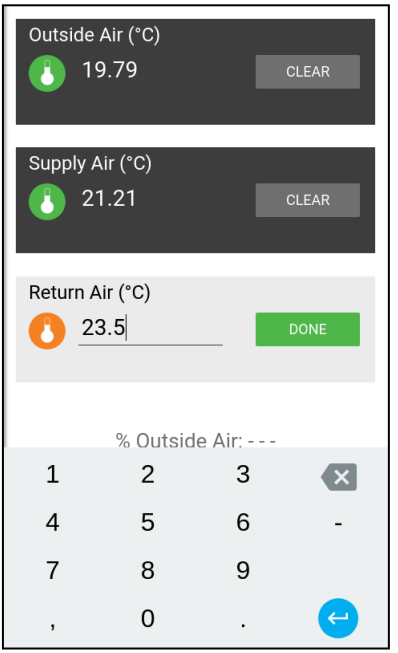
The Q-Trak™ XP instrument is intended for indoor use only. Care should be taken when taking % of Outdoor Air measurements so that the instrument is not exposed to rain, sleet, hail, snow or other inclement weather conditions as exposure to these elements will void the factory warranty.

1. Position the Q-Trak™ monitor outside to perform the **Outside Air** measurement, select **START**, and wait until the measurement is complete.
2. The **% Outside Air** page shows the number of outstanding readings needed before a calculation can be made.
3. Position the Q-Trak™ monitor in the supply vent to perform the **Supply Air** measurement, select **START**, and wait until the measurement is complete.
4. Lastly, position the Q-Trak™ monitor by the return vent to perform the **Return Air** measurement, select **START**, and wait until the measurement is complete.



5. If a measurement (Outside Air, Supply Air, or Return Air) needs repeating select **CLEAR** then select **START**.
6. Once the measurements are complete, the % Outside Air is calculated and shown on the bottom of the page.

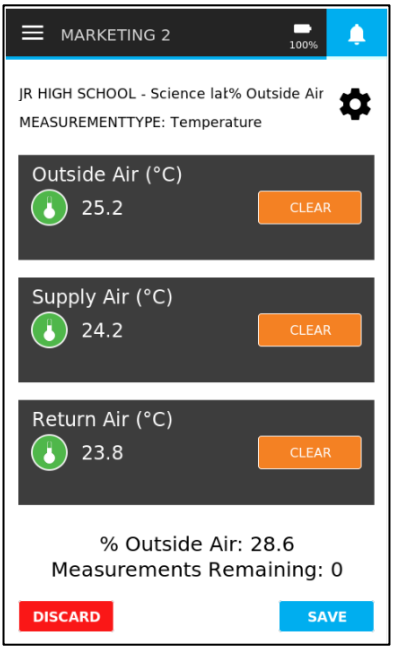
7. Select **DISCARD** to discard all measurements or select **SAVE** to save the % Outdoor Air Calculation.
8. After saving the % Outdoor Air Calculation you can perform another % Outdoor Air calculation or select the ☰ icon to exit the **% Outside Air** page.



Instead of making measurements, you have the option of entering values for **Outside Air**, **Supply Air**, or **Return Air** by selecting --- and typing the appropriate value.

Select **DONE** when finished. The calculation is then made using entered value(s).

Lastly, if the % Outside Air calculation cannot be made using the measurements / entered values, an error message is shown along with a **DISCARD** button.



Selecting **DISCARD** clears all measurements/entered values and you may start over.

Alternatively, you can select **Clear** to clear a single measurement/entered value and repeat taking the measurement or entering a new value.

CHAPTER 10

TrakPro™ Ultra Software

Post-test analysis and report generation is performed using the TrakPro™ Ultra software application.

To install TrakPro™ Ultra Software:

1. Using a web browser, navigate to https://tsi.com/support/tsi-software-and-firmware/ and enter the search term **Q-Trak XP**.
2. Download the TrakPro™ Ultra software application by following the on-screen instructions.

NOTICE
The manual for TrakPro™ Ultra Software is embedded in the application.

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CHAPTER 11

Update Instrument Software

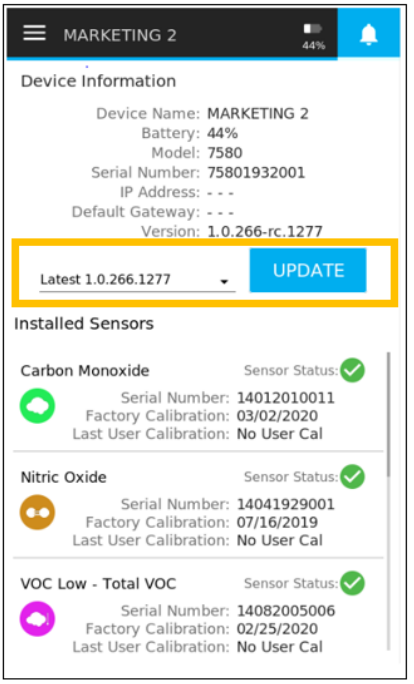
The **Device Information** page allows you to update the Q-Trak™ XP software without having to return the instrument to TSI® Incorporated.

To update the firmware:

1. Access the TSI® website site at www.tsi.com and navigate to: **SUPPORT / TSI Software and Firmware Wizard** from your computer.
2. Enter "**Q-Trak XP**" into the search block and select "**Q-Trak XP Indoor Air Quality (IAQ) Monitor 7585 [7585]**" from the drop-down list.
3. Click the "**Search**" button.
4. Click the blue box with "**Q-Trak XP Firmware Version…**" The firmware "ZIP file" package will be downloaded to the "Download" folder you have selected on your computer.

5. Insert a USB-drive into your computer.
6. Extract (open) the ZIP file.
7. Copy the .SWU file on to the USB-drive.
8. Remove the USB-drive from your computer and insert into the USB port on the end of the Q-Trak™ XP instrument and turn the instrument on.

9. Select **Device Information** from the **Main Menu**.
10. Select the drop-down arrow to view all available software versions.
11. Select the latest version of the software.
12. Select the **UPDATE** button.
13. The instrument will shut down while updating. Allow the update to complete before attempting to perform any operations.
14. The instrument will reboot after updating the software and is ready to use with the updated software.
15. Remove the USB Drive from the instrument.



16. The instrument has now been updated with the new firmware. This can be verified on the “Device Information” page in the ‘Version:” field at the top of the page.

CHAPTER 12

Maintenance

Replacing Sensors

Replacement sensors are sold separately and available through TSI® Incorporated. Refer to Chapter 2 for replacement parts.

Recalibration

See Chapter 6. Calibration for information on how to calibrate sensors.

Removing the Sensor Module from the Handle of the Q-Trak™ XP Monitor.

To remove the sensor module from the handle of the instrument, proceed as follows:

1. Turn the instrument **OFF**.
2. Turn the instrument over and press upward on the release tab just above the back-cover screw as shown in the picture.

3. Turn the instrument over and hold it as shown while continuing to press on the release tab as previously described.

4. Press downward with both thumbs while holding the release tab above the back-cover. This requires some steady force.

5. Continue to press down until the sensor module is free from the handle.
6. Separate the sensor module from the handle.

7. Separation complete.

Storage

When storing the instrument for extended periods, remove the battery after fully charging before storage. Also, remove the sensors and store them in their original “snap cap” containers. When re-installing the battery, refer to the initial battery instillation process for calibrating the battery status gauge.

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CHAPTER 13

Troubleshooting

Table 2 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the Model 7585. If your symptom is not listed, or if none of the solutions solves your problem, please contact TSI® Incorporated.

Table 2: Troubleshooting the Model 7585

Symptom	Possible Causes	Corrective Action
Blank display	Depleted battery	Plug in AC adapter to charge battery
	Damaged display unit	Return to TSI® for service
Battery will not charge	Damaged battery	Replace battery
	Battery disconnected	Connect battery in battery compartment
Touch screen display not responding	Instrument software issue	Press the power button for 10 to 12 seconds to turn off the instrument. Then press the power button to turn the instrument back on.
	Damaged display unit	Return to TSI® for service.
Gas sensor is installed, but not visible in the **Sensors** page	Sensor was installed while the instrument was powered.	Power cycle the instrument.
	Damaged sensor	Install sensor in another location in the sensor module. If the sensor continues not be detected. Contact TSI® to service or replace the sensor. If the warranty period has expired it may be necessary to purchase a new sensor.

Symptom	Possible Causes	Corrective Action
Gas sensor is installed, but not visible in the **Sensors** page *(cont.)*	Damaged gas sensor module	Install sensor in another location in the sensor module. If the sensor is detected. Contact TSI® to service or replace the sensor module. If the warranty period has expired it may be necessary to purchase a new sensor module.
Gas sensor fails calibration	Wrong gas is being used to calibrate sensor.	Verify the correct gas is being used.
	Calibration cap is attached to wrong sensor.	Verify the calibration cap is attached to the correct sensor.
Fan no longer rotating	Fan is jammed by dust, dirt, or other contaminant	Clean the fan while instrument is powered off with compressed air
	Damaged fan or module	Return to TSI® for service
Sensors not visible on the Dashboard	Sensor not turned on in the **Sensors** page.	From the **Main Menu** select **Settings** then select **Sensors.** Once in the **Sensors** page **s**elect the appropriate toggle button to make the sensor visible on the **Dashboard**.
Density correction warning	Faulty Barometric Pressure or Temperature sensor(s)	Return to TSI® for Service
		From the **Main Menu** select **Settings** then select **General Settings**. Once in the **General Setting** page select **Density Correction** toggle button to turn off Density Correction.

Symptom	Possible Causes	Corrective Action
While powering the Q-Trak™ XP monitor the instrument unexpectedly powers off.	Battery power is fully discharged.	Charge battery with supplied power supply.
		Replace battery.
	Battery temperature sensor measures a temperature greater than 60°C.	Place the Q-Trak™ monitor in a cooler environment and wait approximately 15 minutes. Then power instrument.
		Replace battery.
	Battery temperature sensor measures a temperature less than -20°C.	Place the Q-Trak™ monitor in a warmer environment and wait approximately 15 minutes. Then power instrument.
		Replace battery.
Unable to connect TrakPro™ Ultra software to Q--Trak™ XP monitor via USB-C cable.	USB-C cable is damaged.	Use another USB-C cable.
	Q-Trak™ XP monitor is connected to a Wi-Fi® network.	Disconnect Q-Trak™ XP monitor from Wi-Fi® network then connect TrakPro™ Ultra to Q-Trak™ XP monitor via USB-C cable.
		Alternatively, use Wi-Fi® network to connect TrakPro™ Ultra to the Q-Trak™ XP monitor.
Unable to connect TrakPro™ Ultra software to Q-Trak™ XP monitor via Wi-Fi®.	Router assigned the same IP address to the Q-Trak™ XP monitor and another device.	Reboot the Q-Trak™ XP monitor.

Symptom	Possible Causes	Corrective Action
Unexplained rapid changes in CO_2 measurement.	Radio frequency interference.	Identify whether the following electronic devices capable of transmitting radio waves are nearby: microwave ovens, Wi-Fi® routers, cellular phones, or personal communication devices, i.e., walkie-talkie, two-way radios.
		If one of these devices is present, turn them off or place them in a mode that does not transmit. Alternatively, increase the distance between the Q-Trak™ monitor and transmitting device unitl the problem is no longer present.
		NOTICE: Other electronic devices capable of transmitting radio waves may also adversely impact the CO_2 measurement.

Error Messages

Message	Definition
<SensorType> is in error. ERRCODE: Corrupt Reading	Cannot calculate measurement value due to erroneous User Calibration or missed measurement.
<SensorType> is in error. ERRCODE: No Reading	Cannot execute sensor due to sensor being removed or faulty sensor electronics.
Density correction warning	Cannot compensate for density changes due to faulty Barometric Pressure or Temperature sensor(s).
PID electronics error. Service or replace VOC sensor	VOC sensor's electronics (Bulb and/or Stack) is faulty.

Message	Definition
Sensor error. Service or replace <SensorType> sensor	Cannot initialize sensor due to corrupt sensor memory or faulty electronics.
Battery is faulty. Please replace battery.	Battery has been depleted to unsafe level.
The battery is too cold to run. Saving data and shutting down…	Battery temperature has dropped below -20°C and is unsafe to operate.
The battery is too hot to run. Saving data and shutting down…	Battery temperature has exceeded 60°C and is unsafe to operate.
Battery too cold to charge	Battery temperature is between -20°C and 0°C and cannot safely charge.
Battery critically low. Plug in charging cable. Device will shut down in <30 Second Timer>	Apply AC power and allow battery to charge.
Battery low. Plug the power cord into the instrument or auto shutdown will occur soon.	Battery has less than 15 minutes of runtime remaining.
Fan error. Service sensor module.	Sensor module fan is blocked or faulty.
Temperature sensor error. Service sensor module.	Temperature sensor is faulty.
Barometric pressure sensor error. Service sensor module.	Barometric Pressure sensor is faulty.
Measurement Value = 88888888	Cannot calculate measurement value possibly due to erroneous User Calibration, faulty sensor, or sensor removed.

Message	Definition
<SensorType> sensor calibration out of range. Please refer to the user manual.	Sensor has drifted beyond the TSI® recommended calibration adjustment specification.
Entered value is out of range. Please refer to the user manual for recommended ranges.	Reference value used for calibrating temperature, relative humidity or barometric pressure is outside of sensor's detectable limits.

CHAPTER 14

Help

TSI® Technical Support/Service

Please contact one of TSI® Incorporated's offices or your local distributor to make service arrangements and to receive a Service Request number. To fill out an online Service Request form, visit TSI® Incorporated's website at tsi.com/service and reference the Model and Serial Numbers on the rear of the instrument for the 7580 and/or 801430 along with the individual gas sensors to process the service request.

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APPENDIX A

Specifications

Specifications are subject to change without notice.

The Q-Trak™ XP Indoor Air Quality Monitor Model 7585 arrives from the factory with the following preset technical specifications.

Logging Capability	73 million data points
Operating Temperature	41 to 104°F (5 to 40°C)
Storage Temperature	-4 to 140°F (-20 to 60°C)
Humidity	0 to 95% RH (non-condensing)
Altitude	Up to 4000 meters when using AC adapter
Meter Dimensions	3.8 in. × 8.3 in. × 2.1 in. (9.7 cm × 21.1 cm × 5.3 cm)
Weight with Batteries	1.2 lbs./0.55 kg
Power Requirements	Li-ion battery – 7.4V 3200 mAh AC Adapter – **Input**: 100–240 VAC, 50–60 Hz **Output**: 12 VDC 3A
Battery Runtime	8+ hours with 7585 base configuration
Languages Supported	English, German, French

Installed Sensors	
Particulate Mass	
Sensor Type	Optical Particle Counter (OPC)
Particulate Mass (PM)	PM1.0, PM2.5, PM10
Range	0 to 500 µg/m^3
Accuracy	±10 µg/m³ (0 – 100 µg/m³), ±10% of reading 100 to 500 µg/m³
PM Resolution	1 µg/m^3, 0.001 mg/m^3
PM Units	µg/m^3, mg/m^3
Particle Counts (PC)	PC0.3, PC0.5, PC1.0, PC2.5, PC5.0, PC10.0
PC Resolution	0.01/cm^3, 1/ft^3, 1/L
PC Units	#/cm^3, #/ft^3, #/L
Response Time	<10 seconds

Installed Sensors	
Carbon Dioxide	
Sensor Type.....	Nondispersive Infrared (NDIR)
Range	0 to 5000 ppm
Accuracy	±50 ppm
Resolution	1 ppm
Response Time (t90).....	<40s @ 20°C ambient
Temperature	
Sensor Type.....	Thermistor
Range	32 to 140°F (0 – 60°C)
Accuracy	±1.0°F (0.5°C)
Resolution	0.1°F (0.1°C)
Response Time (t90).....	<15 seconds to 90% of the actual temperature
Relative Humidity	
Sensor Type.....	Capacitive
Range	0 to 100% RH
Accuracy	±3% RH
Resolution	0.1 % RH
Response Time (t63).....	8 Seconds to 63% of the actual relative humidity
Barometric Pressure	
Sensor Type.....	Piezoresistive
Range	7.7 to 37.2 in hg (196.0 to 945.0 mmHg)
Accuracy	±0.12 in. Hg (±3.0 mmHg)
Resolution	0.01 in. Hg (0.1 mmHg)
Response Time (t63).....	>2 seconds to 63% of the actual barometric pressure

Optional Gas Sensors	
All sensors are pre-calibrated and include a certificate of calibration.	
Carbon Dioxide (CO_2) sensor - P/N 801399	
Sensor Type.....	NDIR (Non-dispersive Infrared)
Range	0 – 5000 ppm
Accuracy[1].....	±50 ppm
Resolution	1 ppm
Response Time (t90).....	<40s @ 20°C ambient

Optional Gas Sensors	
Carbon Monoxide (CO) sensor - P/N 801401	
Sensor Type.....	Electrochemical
Range.....	0 to 400 ppm
Accuracy	±2% of reading ±1 ppm
Resolution	0.1 ppm
Response Time (t90).....	<30 seconds from zero to 10 ppm
TVOC Sensor (ppb) sensor - P/N 801408	
Sensor Type.....	PID (Photo Ionization Detector)
Range.....	0 to 20 ppm
Resolution	0.01 ppm
Response Time (t90).....	<3 seconds
TVOC Sensor (ppm) sensor - P/N 801407	
Sensor Type.....	PID (Photo Ionization Detector)
Range.....	0 to 2000 ppm
Resolution	0.1 ppm
Response Time (t90).....	<3 seconds
Formaldehyde (CH_2O) sensor - P/N 801409	
Sensor Type.....	Electrochemical
Range.....	0-10 ppm
Accuracy	±0.3 ppm
Resolution	0.01 ppm
Response Time (t90).....	<90 seconds
Ozone (O_3) sensor - P/N 801406	
Sensor Type.....	Electrochemical
Range.....	0 to 20 ppm
Accuracy	±0.3 ppm
Resolution	0.01 ppm
Response Time (t90).....	<80 seconds from zero to 1 ppm
Chlorine (CL_2) sensor- P/N 801400	
Sensor Type.....	Electrochemical
Range.....	0 to 20 ppm
Accuracy	±0.3 ppm
Resolution	0.01 ppm
Response Time (t90).....	<60 seconds from zero to 10 ppm

Optional Gas Sensors	
Ammonia Sensor (NH_3) sensor - P/N 801403	
Sensor Type.....	Electrochemical
Range	0 to 100 ppm
Accuracy	±1 ppm
Resolution	0.1 ppm
Response Time (t90).....	<45 seconds
Hydrogen Sulfide (H_2S) sensor - P/N 801402	
Sensor Type.....	Electrochemical
Range	0 to 50 ppm
Accuracy	±0.5 ppm
Resolution	0.01 ppm
Response Time (t90).....	<60 seconds from zero to 2 ppm
Nitric Oxide (NO) sensor - P/N 801404	
Sensor Type.....	Electrochemical
Range	0 to 20 ppm
Accuracy	±0.2 ppm
Resolution	0.1 ppm
Response Time (t90).....	<25 seconds from zero to 2ppm
Nitrogen Dioxide (NO_2) sensor - P/N 801405	
Sensor Type.....	Electrochemical
Range	0 to 20 ppm
Accuracy	±0.5 ppm
Resolution	0.01 ppm
Response Time (t90).....	<80 seconds from zero to 2ppm

t90: Time to achieve 90% of the actual concentration

[1] CO_2 accuracy based on density correction activated

APPENDIX B

Definitions

Out-of-Range (Calibration)	An Out-of-Range error during the calibration of a sensor means the sensor's offset or calibration slope adjustment has drifted outside of the TSI® recommended specification for continued use. Sensor should be replaced or sent to TSI® for recalibration.
Test Duration	The time over which the data will be logged while in **Continuous Save** mode. The test duration can be set from 1 second to 99 hours: 59 minutes: 59 seconds.
Sample Interval	The sample interval is the time period where data is collected and averaged to produce a single value. For example, if the sample interval is set to 1 minute, each 1 second sample will be averaged over the minute and result in a single value. The sample interval can be set from 1 second to 99 hours: 59 minutes: 59 seconds. However, the sample interval cannot be greater than the test duration.
Time Constant	The time constant is an averaging period for the readings shown on the display. It is used to dampen fluctuations in the measurement to make it easier to read. If there are significant fluctuations in the readings, a longer time constant setting will reduce the fluctuations. The display will update ever second; however, the displayed reading will be the average over the time constant period. For example, if the time constant is 5 seconds, the display will update every second, but the displayed reading will be the average of the last 5 seconds.

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Knowledge Beyond Measure.

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