CONTAMINATION CONTROL

Handheld Particle Counters

AEROTRAK™ Handheld Airborne Particle Counter

Model 9303

Operation Manual

P/N 6002277, Revision B
January 2009

TRUST. SCIENCE. INNOVATION.

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Manual History

The following is a manual history of the AEROTRAK™ Handheld Airborne Particle Counter, Model 9303 Operation Manual (P/N 6002277).

Revision	Date
A	November 2008
B	January 2009

Warranty

Part Number 6002277 / Revision B / January 2009

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

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(effective July 2000)

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a. Hot-wire or hot-film sensors used with research anemometers, and certain other components when indicated in specifications, are warranted for 90 days from the date of shipment.

b. 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.

c. 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.

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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 TSI's Customer Service department at 1-800-874-2811 (USA) or +001 (651) 490-2811 (International).

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Safety Information

This section gives instructions to promote safe and proper handling of the AEROTRAK™ Handheld Airborne Particle Counters.

IMPORTANT
There are no user-serviceable parts inside the instrument. Refer all repair and maintenance to a qualified factory-authorized technician. All maintenance and repair information in this manual is included for use by a qualified factory-authorized technician.

Laser Safety

- The Model 9303 Handheld Airborne Particle Counter is a Class I laser- based instrument.
- During normal operation, you will ***not*** be exposed to laser radiation.
- Precaution should be taken to avoid exposure to hazardous radiation in the form of intense, focused, invisible light.
- Exposure to this light may cause blindness.

Take these precautions:

- ***DO NOT*** remove any parts from the particle counter unless you are specifically told to do so in this manual.
- ***DO NOT*** remove the housing or covers. There are no user-serviceable components inside the housing.

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

Labels

Advisory labels and identification labels are attached to the outside of the particle counter housing and to the optics housing on the inside of the instrument.

1. Serial Number Label (back panel)	
2. Laser Radiation Label (internal)	**DANGER!** INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM WARNING: NO USER SERVICABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL
3. European symbol for non-disposable item. Item must be recycled.	

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

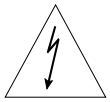
Caution
Failure to follow the procedures prescribed in this manual might result in irreparable equipment damage. Important information about the operation and maintenance of this instrument is included in this manual.

Warning

W A R N I N G
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 or Warning Symbols

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

	Warns that uninsulated voltage within the instrument may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make contact with any part inside the instrument.
	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 dissipation (ESD) and ESD protection procedures should be followed to avoid damage.
	Indicates the connector is connected to earth ground and cabinet ground.

Getting Help

To obtain assistance with this product or to submit suggestions, please contact Customer Service:

TSI Incorporated
500 Cardigan Road
Shoreview, MN 55126 U.S.A.
Fax: (651) 490-3824 (USA)
Fax: 001 651 490 3824 (International)
Telephone: 1-800-874-2811 (USA) or (651) 490-2811
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CHAPTER 1

Introduction and Unpacking

The AEROTRAK™ Model 9303 Handheld Airborne Particle Counter (particle counter) is a lightweight, handheld particle counter with a backlit LCD display. It operates on the included lithium-ion battery or AC power.

This model has a 0.1 CFM (2.83 L/min) flow rate and counts in user-adjustable bin sizes of 0.3, 0.5/1.0/2.0/2.5, and 5 microns (center channel is selectable). Up to 1500 data sets can be stored and downloaded for analysis and reporting using the TRAKPRO™ Lite utility included with the device.

Unpacking the AEROTRAK™ Handheld Airborne Particle Counter

Carefully unpack the AEROTRAK™ Airborne Particle Counter from the shipping container and verify that all the items shown in the photos below and listed in the following tables are present. Contact TSI immediately if items are missing or broken.

Model 9303 AEROTRAK™ Airborne Particle Counter Parts List

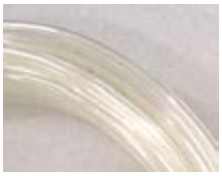
Qty.	Item Description	Part/Model	Reference Picture
1	AEROTRAK™ Airborne Particle Counter	9303-01	

Qty.	Item Description	Part/Model	Reference Picture
1	AC power adapter and country-specific plugs	700021	
1	Isokinetic inlet	700003	
1	Battery Pack	700019	
1	Computer cable, USB A to mini-B	700036	
1	HEPA zero filter	700005	
1	TRAKPRO™ Lite data download utility CD (includes manual)	7001384	
1	Operation and Service Manual	6002277	(installed on CD)
1	Calibration Certificate	N/A	

Qty.	Item Description	Part/Model	Reference Picture
1	Quick Start Guide	6002238	

Optional Accessories

The following photo and table list optional accessories. If you ordered optional accessories, make certain they have been received and are in working order.

Item Description	Part/Model	Ref.
Stainless Steel Isokinetic inlet	700004	
Stainless Steel Isokinetic probe (used with tubing)	700002	
0.1 cfm Barb Inlet Fitting	700020	
Tubing, Superthane 1/8-inch ID x ¼-inch OD, Clear 100 Ft Box	700009	
Heavy Duty Carrying Case	700024	N/A

CHAPTER 2

Getting Started

This chapter provides information to help you use the Model 9303 including:

- Installing the Isokinetic Inlet
- Providing Power
- Quick Start

Installing the Isokinetic Inlet

The Isokinetic inlet smoothly accelerates air into the inlet of the instrument. To install, simply screw the probe directly onto the threaded inlet nozzle.

Installing an Isokinetic Inlet

Providing Power

The Model 9303 may be powered using its internal rechargeable lithium-ion battery or through an AC power cord.

Notes:

- When using AC power, the battery is charging when the red LED next to the power connector is on.
- Removing/changing the lithium-ion battery or disconnecting AC power does not cause the loss of data.
- You should fully charge the battery before use.

W A R N I N G
The battery supplied by TSI (700019) has built in protection against explosion and fire hazard. Do ***not*** use a substitute.

W A R N I N G
Do ***not*** use non-rechargeable batteries in this instrument. Fire, explosions, or other hazards may result.

Installing the Battery

1. The battery is shipped separately and has to be installed before use.
2. Remove the battery cover on the back side of the handle with a small, flat-blade screwdriver
3. Connect the battery to the socket as shown below.
4. Insert the battery with the connector at the top and replace the battery cover. Make sure all wires are inside and not pinched in the cover. Do ***not*** over-tighten the screw.
5. Fully charge the battery before use.

To Use AC Power

1. Remove the AC transformer parts from their package and identify the appropriate plug for your needs. Plugs are available for all common countries.

2. Remove the insert from transformer using the slide lock and tilt the insert out.

3. Tilt the appropriate plug into the transformer receptacle.

4. Make sure it locks into place.

5. Plug the DC end of the transformer cord into the counter.
6. Plug the AC end of the transformer cord into an AC outlet.
7. The Power LED lights when the battery is charging. When the Power LED is off, the battery is fully charged.
8. When the battery is charged, unplug the power supply.

Quick Start

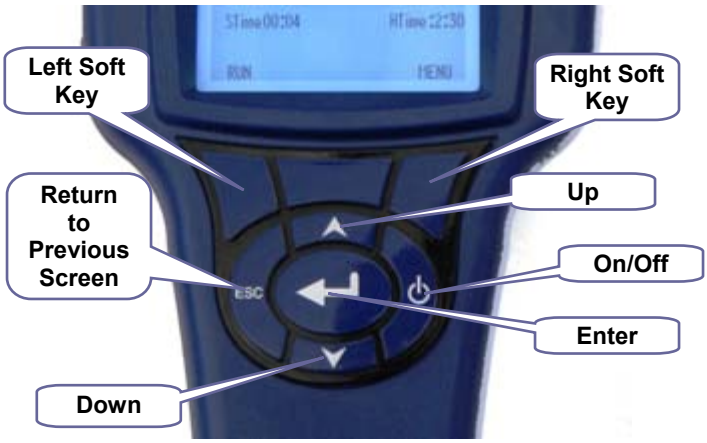
The best way to quickly get started is to refer to the printed "Quick Start Guide" included with your instrument. It will help you to quickly set up the instrument and begin sampling. Refer to the sections below for more detailed information on configuring and running the instrument.

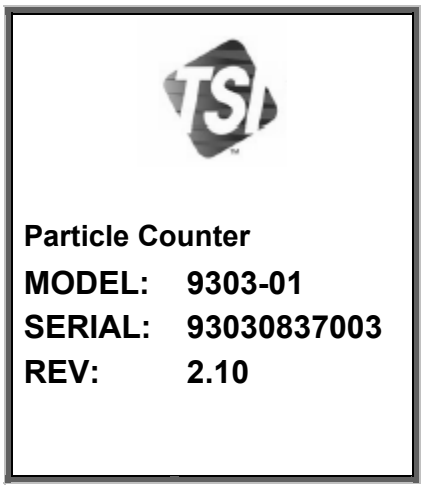
CHAPTER 3

Operation

The Model 9303 is controlled using the integral keys and the backlit display.

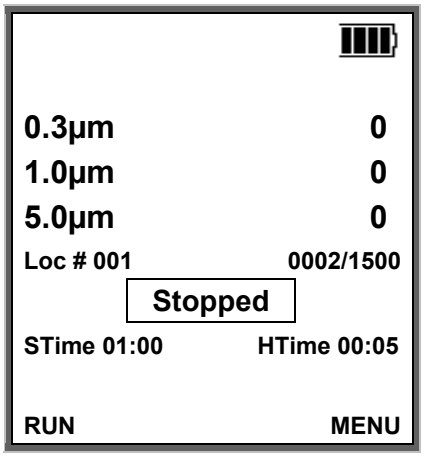
To turn on the instrument, press the **On/Off** key. A splash screen will appear for three seconds, displaying the TSI logo, model number, serial number, and firmware version number (see below).





Splash Screen

The instrument is ready for operation when the default screen (shown below) appears.



Default Screen

Note: *To turn off the instrument, press and hold the* ***On/Off*** *key for 5 seconds. The instrument turns off.*

Performing a Zero Check

A zero check should be performed periodically. It should also be performed before conducting any important testing or certification.

To Perform a Zero Check

1. Turn on the instrument and wait until the default screen appears.
2. Unscrew the Isokinetic probe if attached. *The zero check cannot be performed when the isokinetic probe is attached to the instrument.*
3. Attach the zero filter to the inlet nozzle located on the top of the instrument by screwing the assembly onto the inlet of the instrument.

4. Refer to the section Main Menu and Basic Operation below to configure the instrument.
5. Press the **Run** key and allow the instrument to purge for three 5-minute samples **with zero seconds hold time**. If you have a hold time set with a filter, the pump stopping and starting can push particles back into the optics causing counts.
6. In accordance with JIS standards, there should be no more than 1 particle counted at any size in the middle 5-minute sample.
7. Remove the zero filter and put the inlet back on; the instrument is now ready for operation.

Note: *If the instrument does not go to zero (1 particle is allowed), refer to Chapter 6, Troubleshooting, for additional information.*

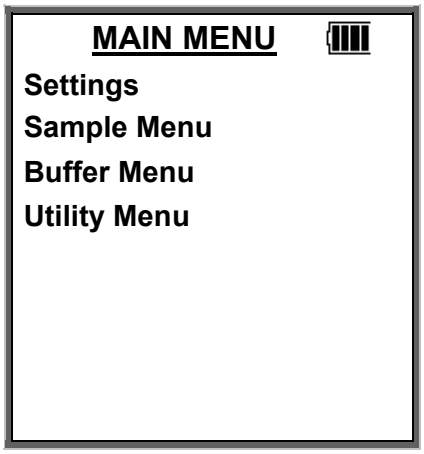
Warm-up Time

An initial warm-up period of 15 minutes is recommended before sampling with the Model 9303. The warm-up period allows time for the optics to reach a steady-state temperature. This will result in more repeatable results. Neglecting the warm-up time may result in an overestimation of particle size (approximately 10 percent). Neglecting the warm-up time will not have a significant effect on particle concentration; therefore, a zero count can still be performed without waiting for the warm-up period.

Main Menu and Basic Operation

Press **Menu** on the Default Screen to display the Main Menu.

Main Menu



Main Menu

From the Main Menu you can select other menus:

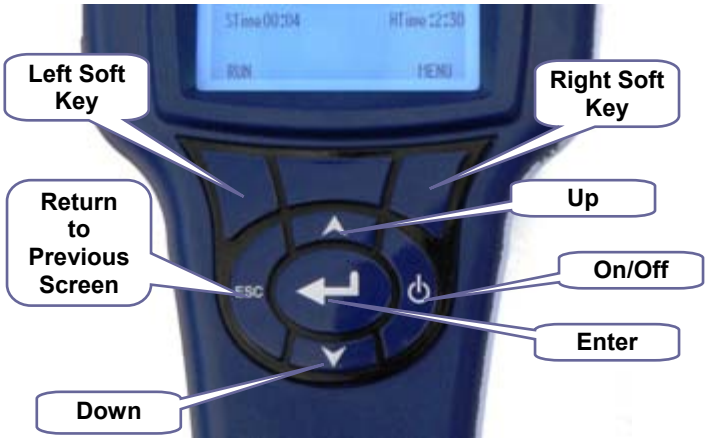
Menu	Description
Settings	Set language, time and date, time and day format, and screen settings.
Sample	Set sample mode, cycle mode, sample time, hold time, cycle count, sample units, and channel 2 size.
Buffer	View the number of records stored in the Model 9303, display buffer records, and clear the buffer.
Utility	Adjust the pump speed, turn data logging on and off, and select the sampling location.

Each of these menus is described in the remainder of this chapter.

Basic Operation

This section explains the basic operation for using the keypad and starting sampling.

Using the Keypad



Use the up and down keys to highlight a menu or a menu option then:

- If left and right arrows (< >) appear at the bottom of the screen, use the left and right soft keys to select the option you want. Generally, there will be only 2 or 3 options. Soft keys change function depending on the display above them. For instance, in the picture above, the left soft key is labeled **RUN** and the right soft key is labeled **MENU**. The center soft key is not currently used.

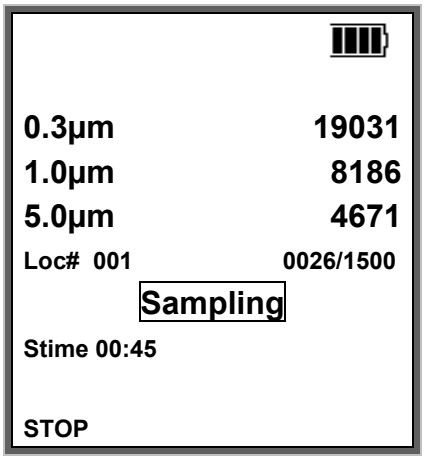
- If no arrows appear at the bottom, press the **Enter** key to bring up a secondary window from which you can make a selection or modify a setting.

Use the up and down keys to perform operations such as increasing a value. Use the right soft key and left soft keys to move right and left.

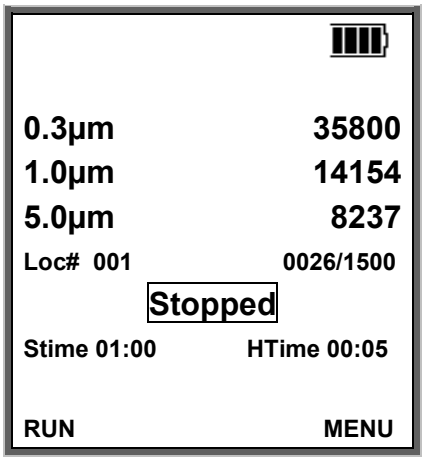
The ESC key always brings you back to the previous screen.

Start Sampling

To start sampling, press the **left** soft key (below "RUN"). The Model 9303 begins collecting samples immediately if set to manual mode or according to the parameters you have set for automatic mode.

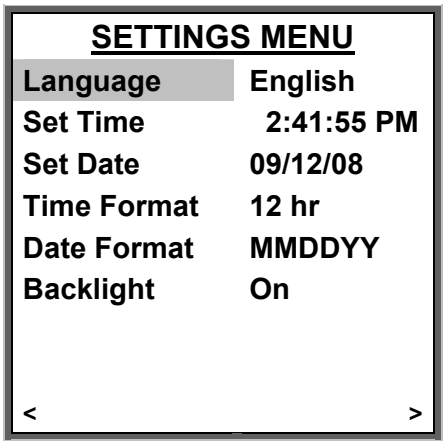


To stop sampling at any time, press the **STOP** soft key.



Settings Menu

The Settings Menu lets you set language (supported in future), current time and date, select the time and day format, and set certain screen settings.



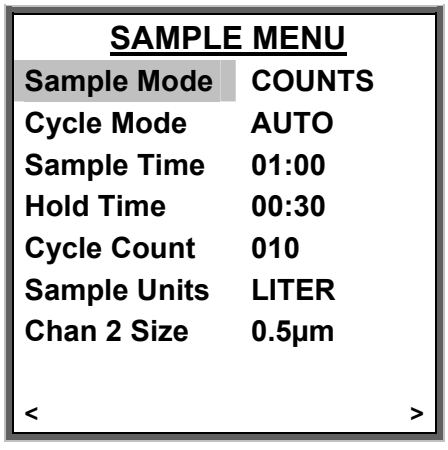
Settings Menu

The following table describes the options of this menu and the parameters you can set.

Option	Description	Parameters
Language	Use **<** and **>** to set the language in which information is displayed.	English (other languages may be offered)
Set Time	Press the **Enter** key to go to a secondary screen where you can set the current time.	Hours, minutes, seconds
Set Date	Press the **Enter** key to go to a secondary screen where you can set the current date.	Day, month, year
Time Format	Use **<** and **>** to set the time format in which time is displayed (and saved in the sample records).	12 hr; 24 hr
Date Formats	Use **<** and **>** to set the date format in which the date is displayed (and saved in the sample records).	DD/MM/YY; MM/DD/YY
Backlight	Use **<** and **>** to set whether the backlight on the display is on or off. Note that battery life is approximately 15% less with the backlight enabled.	On – backlight is always on Off – backlight is always off

Sample Menu

The Sample Menu sets sample mode, cycle mode, sample time, hold time, cycle count, sample units, and channel 2 size.



Sample Menu

The following table describes the options of this menu and the parameters you can set.

Option	Description	Parameters
Sample Mode	Use **<** and **>** to set the sampling mode.	Concentration (see note below); counts
Cycle Mode	Use **<** and **>** to set the sampling mode.	Manual – the counter will start when the RUN soft key is pressed and stop only when the STOP soft key is pressed. Auto – the counter will start when the RUN soft key is pressed and turn on and off automatically to follow the sample time, hold time and cycle count parameters below.
Sample Time	Press the **Enter** key to go to a secondary screen where you can set the sample time.	Minutes and seconds up to 99:59 (see note below)
Hold Time	Press the **Enter** key to go to a secondary screen where you can set the time between samples.	Minutes and seconds up to 99:59
Cycle Count	Press the **Enter** key to go to a secondary screen where you can set the number of samples to take.	1-999
Sample Units	Use **<** and **>** to set the sampling units.	Liter; cubic feet
Cannel 2 Size	Use **<** and **>** to set the bin size for channel 2. (This is the only channel that can be set to more than one value.)	0.5, 1.0, 2.0, 2.5 µm

N o t e

When concentration sample mode is used with short sample times (less than 30 seconds), the concentration may not be accurate due to the poor counting and timing statistics associated with a short sample.

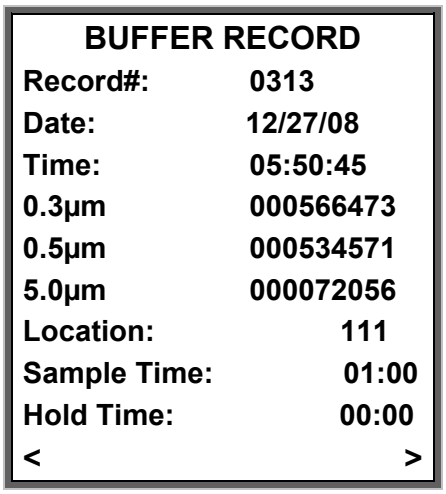
Buffer Menu

The Buffer Menu lets you view the number of records stored in the Model 9303, display buffer records, and clear the buffer.

Buffer Menu

The following table describes the options of this menu and the parameters you can set.

Option	Description	Parameters
# of Records	Shows the number or sample records stored in the Model 9303.	None
Show Buffer Record	Press the **Enter** key to go to a secondary screen where you can select the record (by sample number) of the record you want to view.	Any record number (up to 1500)
Clear Buffer	Press the **Enter** key to clear all samples in the buffer. You will be asked to confirm your request.	None



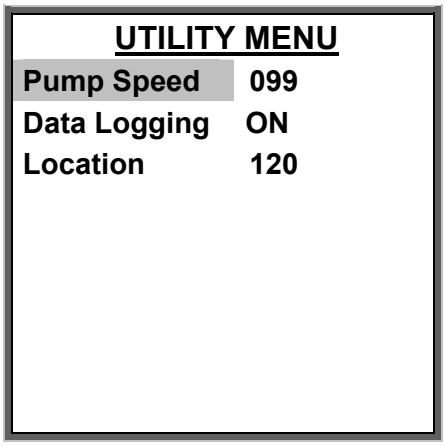
Example of a Buffer Record

Use the < and > softkeys to scroll through the records, Enter to go back one screen and ESC to go back to the Buffer Menu.

Note
If the buffer is filled to its capacity of 1500 records, the instrument will continue to count and save records but the next record after 1500 will be saved in record number 1, then 2, etc. This way the most recent 1500 records are always preserved.

Utility Menu

The Utility Menu lets you adjust the pump speed, turn data logging on and off, and select the sampling location.



Utility Menu

The following table describes the options of this menu and the parameters you can set.

Caution
If you turn Data Logging off, no data will be saved to the buffer.

Option	Description	Parameters
Pump Speed	Press the **Enter** key to go to a secondary screen where you can increase or decrease the pump speed. (The pump may slow down with age, or it may be necessary to increase the speed if there are flow restrictions – such as long tubing). Use a flowmeter to check the flow when taking critical measurements, and adjust the pump speed as necessary.	0–255
Data Logging	Use < and > to turn data logging on and off.	ON; OFF
Locations	Press the **Enter** key to go to a secondary screen where you can select a location number.	0–250

CHAPTER 4

Data Handling

USB Computer Communication

Mini USB Port

The Model 9303 is equipped with a USB-compatible cable for uploading and downloading information to a PC. The cable plugs into the left side of the instrument as shown above.

Installing Software

The TRAKPRO™ Lite Data Transfer utility comes on a CD that loads software and communications drivers for the particle counter. Installation consists of two parts:

- Installation of TRAKPRO™ Lite software.
  Run “setup.exe” from the provided CD and follow on-screen instructions.
- Installation of FTDI Virtual Serial Port driver. This installation is executed transparently during the setup process and does not require user input. Once installation is finished drivers are ready for use.

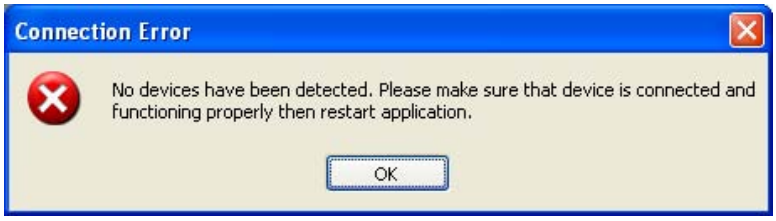
Restart computer for changes to take effect. When Model 9303 is connected and powered on, system will automatically locate installed drivers.

Downloading Data

To transfer data from an instrument to a computer via the USB connection for further analysis and report generation.

Download Data

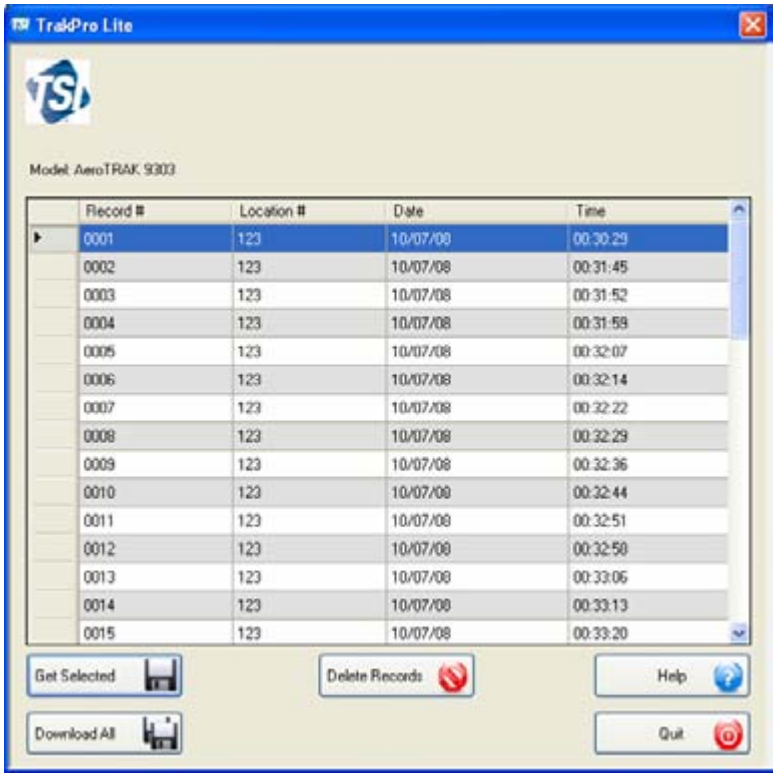
- Make sure that AEROTRAK™ particle counter is attached to the computer and turned on.
- Start the application. If the AEROTRAK™ particle counter is not connected or discovered by the application, the following message appears:



- Make sure that the AEROTRAK™ particle counter is:
  1. Connected.
  2. Turned on (power with AC adapter if battery is low).
  3. In the main screen.
  4. No samples are running and pump is off.
- Restart the application.

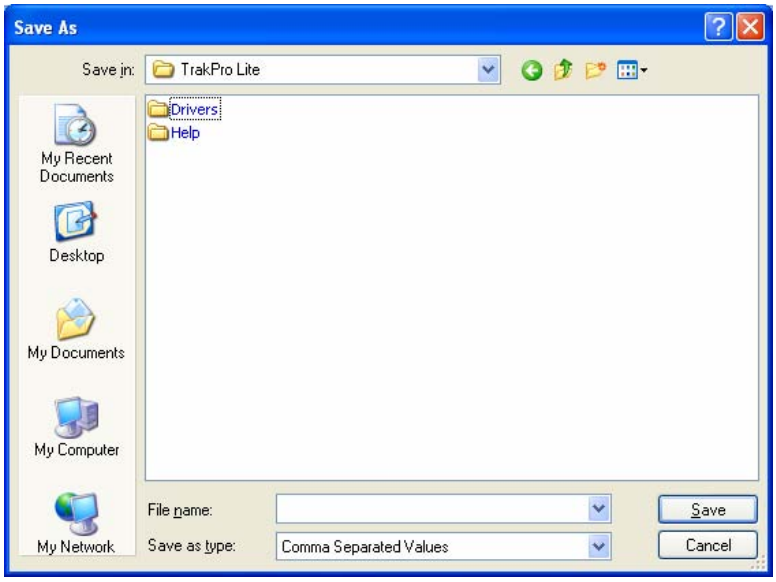
When communication with AEROTRAK™ particle counter has been established, the following screen appears:

Once data is downloaded the main application screen will appear:



1. There are two options for downloading data:
   - Download only user selected records:
     Hold down the **CTRL** key and use the mouse to click on the records you want to retrieve. When you have selected the records, press the **Get Selected** button to retrieve only the selected records from the device.
   - Download all records:
     Press the **Download All** button to retrieve all the records from the device.

2. After you press either the **Get Selected** or **Download All** buttons, the following dialog appears to allow you to select the folder where data will be saved:



- To cancel the data transfer, select **Cancel**.
- To accept the data transfer, enter file name in which you want data stored and select **Save**.
- Data is stored in a .CSV file that can be opened by most spreadsheet programs such as Microsoft® Excel® spreadsheet software.

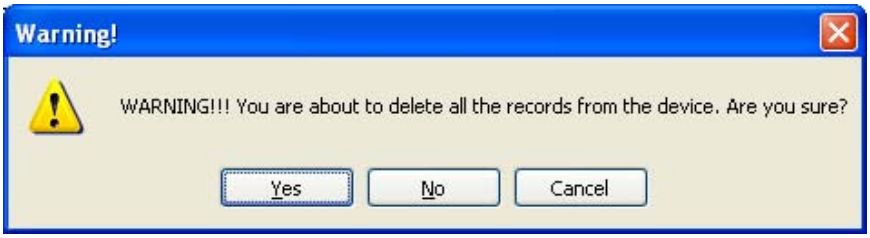
File Edit View Insert Format Tools Data Window Help

	A	B	C	D	E	F	G	H	I	J	K	L
1	Record#	Location#	Date	Time	SampleTime	HoldTime	Ch1		Ch2		Ch3	
2												
3	1	118	1/15/2000	2:08:20	1:00	0:00	0.3um	75628	2.5um	71882	5.0um	1264
4	2	111	1/15/2000	2:09:59	0:05	0:00	0.3um	6314	2.5um	6014	5.0um	1279
5	3	111	1/15/2000	2:10:06	0:05	0:00	0.3um	5960	2.5um	5665	5.0um	1246
6	4	111	1/15/2000	2:10:12	0:05	0:00	0.3um	6465	2.5um	6144	5.0um	1195
7	5	111	1/15/2000	2:10:18	0:05	0:00	0.3um	6476	2.5um	6155	5.0um	1285
8	6	111	1/15/2000	2:39:44	0:05	0:00	0.3um	6410	2.5um	6106	5.0um	1493
9	7	111	1/15/2000	2:40:34	0:05	0:00	0.3um	5900	2.5um	5617	5.0um	1237
10	8	111	1/15/2000	2:40:40	0:05	0:00	0.3um	6226	2.5um	5923	5.0um	1298
11	9	111	1/15/2000	2:40:47	0:05	0:00	0.3um	6314	2.5um	5983	5.0um	1325
12	10	111	1/15/2000	2:40:53	0:05	0:00	0.3um	6015	2.5um	5729	5.0um	1264
13	11	111	1/15/2000	2:41:26	0:05	0:00	0.3um	6006	2.5um	5704	5.0um	1279
14	12	111	1/15/2000	2:46:21	0:05	0:00	0.3um	6035	2.5um	5753	5.0um	1246
15	13	111	1/15/2000	2:46:27	0:05	0:00	0.3um	5989	2.5um	5719	5.0um	1195
16	14	111	1/15/2000	2:46:34	0:05	0:00	0.3um	6041	2.5um	5750	5.0um	1285
17	15	111	1/15/2000	2:46:40	0:05	0:00	0.3um	5875	2.5um	5597	5.0um	1219
18	16	111	1/15/2000	2:46:46	0:05	0:00	0.3um	5883	2.5um	5634	5.0um	1229
19	17	111	1/15/2000	2:46:53	0:05	0:00	0.3um	5920	2.5um	5633	5.0um	1223
20	18	111	1/15/2000	2:46:59	0:05	0:00	0.3um	6001	2.5um	5731	5.0um	1270
21	19	111	1/16/2000	22:40:22	0:05	0:00	0.3um	1446	2.5um	1411	5.0um	678
22	20	111	1/17/2000	3:22:11	0:05	0:00	0.3um	6873	2.5um	6593	5.0um	3008
23	21	111	1/17/2000	3:22:17	0:05	0:00	0.3um	9623	2.5um	9204	5.0um	3656
24	22	111	1/21/2000	20:12:29	0:05	0:00	0.3um	16033	2.5um	15231	5.0um	4209
25	23	111	1/21/2000	20:12:35	0:05	0:00	0.3um	16113	2.5um	15304	5.0um	4209
26	24	111	1/21/2000	20:12:42	0:05	0:00	0.3um	16426	2.5um	15663	5.0um	4228

Data record file opened in Microsoft Excel

Delete Data

In order to delete data from the device click **Delete Records** button. The following warning will appear:



If **Yes** is selected, TRAKPRO™ Lite software will erase data from the device and also from application memory.

W A R N I N G
Deleting data is an irreversible operation. Download and save data before deleting in order to have a copy for future use.

CHAPTER 5

Maintenance

Note
There are no user-serviceable parts inside this instrument. Opening the instrument case may void the warranty. TSI recommends that you return the AEROTRAK™ Airborne Particle Counter to the factory for any required maintenance or service not described in this manual.

Maintenance Schedule

TSI recommends annual factory cleaning and calibration for the AEROTRAK™ Airborne Particle Counter. See Chapter 7, "Contacting Customer Service" for service/calibration.

Recommended Field Maintenance Schedule

Item	Frequency
Zero check	Daily (or as defined by application).
Factory cleaning and calibration	Annually.
Cleaning the instrument enclosure	As needed

Zero Check

The zero check ensures that the instrument is properly assembled and free from leaks, residual particles and electronic noise. Please see Chapter 3, "Operation" for detailed instructions on performing the zero check.

Cleaning the Instrument Enclosure

To clean the enclosure, dampen a lint-free cloth and gently wipe the surface until surface contamination is removed.

CHAPTER 6

Troubleshooting

Symptom	Possible Cause	Corrective Action
Counts are too low	Instrument is being operated outside temperature or relative humidity specifications	Operate instrument within specifications
	Internal parts have been damaged because instrument was stored at a temperature greater than 122 °F (50 °C) or shipped with battery installed and turned on causing excessive heat	Return to factory for service
	Instrument has contamination on the optics due to condensation or excessive loading	Return to factory for service
	Laser or pump is damaged	Return to factory for service
	Unit is due for calibration	Return to factory for service
Instrument does not turn on	On/off switch is not being pressed properly	Press and hold on/off switch for one second
	Battery is dead	Recharge battery or connect to AC power
	AC cord is not plugged into unit	Connect AC cord

Symptom	Possible Cause	Corrective Action
Instrument does not meet zero count specification (<1 particle/5 min)	HEPA filter is not connected properly and room air is leaking into the HEPA filter assembly	Check that the HEPA filter has been tightly connected to the inlet. Check that rubber O-ring (black) on the inlet is in place
	Residual particles from previous samples are shedding off internal parts and into the optics	Purge instrument by running the instrument for 10–15 minutes or longer before attempting zero count test
	The filter assembly or inlet are dirty or contaminated with particles	Clean the HEPA filter fitting or run an extended test to clean out particles
	An internal component has been damaged due to operation outside of temperature specifications or one ore more excessive bumps or jolts, and electronic noise is inducing false counts	Return to factory for service
	A leak has developed in the aerosol flow path	Return to factory for service
	Internal optics have become dirty	Return to factory for service
Battery does not charge	The battery may not be installed or is disconnected	Check battery
Low Battery Indicator	Low battery	Recharge battery or connect AC cord
Software doesn't connect to unit	No connection or power	Check that USB is connected to instrument and instrument is turned on
	Unit is running a sample or in a sub menu	Stop sample and make sure screen shows main view

CHAPTER 7

Contacting Customer Service

This chapter gives directions for contacting people at TSI Incorporated for technical information and directions for returning the AEROTRAK™ Handheld Airborne Particle Counter for service.

Technical Contacts

- If you have any difficulty setting up or operating the AEROTRAK™ Model 9303, or if you have technical or application questions about this system, contact an applications engineer at TSI Incorporated, 1-800-874-2811 (USA) or (651) 490-2811 or e-mail technical.service@tsi.com.
- If the AEROTRAK™ Model 9303 does not operate properly, or if you are returning the instrument for service, visit our website at http://rma.tsi.com, or contact TSI Customer Service at 1-800-874-2811 (USA) or (651) 490-2811.

International Contacts

Service

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Returning the AEROTRAK™ Handheld Airborne Particle Counter for Service

Visit our website at http://rma.tsi.com or call TSI at 1-800-874-2811 (USA) or (651) 490-2811 for specific return instructions. Customer Service will need this information when you call:

- The instrument model number
- The instrument serial number
- A purchase order number (unless under warranty)
- A billing address
- A shipping address

Use the original packing material to return the instrument to TSI. If you no longer have the original packing material, seal off any ports to prevent debris from entering the instrument and ensure that the display and the connectors on the instrument front and back panels are protected.

APPENDIX A

Specifications

All specifications meet or exceed JIS B 9921. They are subject to change without notice.

Size Range	0.3–10 µm
Channel Sizes	0.3 µm and 5.0 µm fixed; 0.5, 1.0, 2.0, or 2.5 µm selectable middle channel.
Counting Efficiency	50% at 0.3 µm; 100% for particles > 0.45 µm (per JIS)
Concentration Limits	2,000,000 particles/ft^3 at 5% coincidence loss
Light Source	Laser diode
Zero Count Level	<1 count / 5 minutes, Meets JIS B9921
Flow Rate	0.1 CFM (2.83 L/min)
Calibration	NIST traceable
Sample Probe/Tubing	Isokinetic sampling probe
Sampling Modes	Manual and automatic
Sampling Time	1 second to 99 minutes 59 seconds
Sampling Frequency	1 to 999 cycles or continuous
Sample Output	Internal HEPA filter
Vacuum Source	Internal pump
Communication Mode	USB serial output
Data Storage	1,500 sample records
Status Indicators	Low battery and service
Display	3.6-inch 160 x 160 monochrome LCD
External Surface	High impact injection molded plastic
Power	110 to 240 VAC 50-60 Hz Universal in-line power supply with country specific plugs
Battery	Rechargeable Li-Ion
Battery Life	Up to 4.5 hours of continuous use
Recharge Time	< 3 hours
Dimensions (L x W x H)	9.1 x 6.3 x 2.4 in. (23 x 11 x 6.2 cm) (without isokinetic inlet)
Weight	1.3 lbs (0.58 kg) with battery
Standards	CE, JIS B9921, ISO 21501-4
Warranty	1 Year. Extended warranties available
Operating Conditions	41° to 95°F (5° to 35°C) temperature and 20% to 95% non-condensing relative humidity

Storage Conditions	32° to 122°F (0° to 50°C) temperature and up to 98% non-condensing relative humidity
Included Accessories	Operating manual on CD, power supply, battery, isokinetic inlet, purge filter, USB cable and TRAKPRO™ Lite data download software
Optional Accessories	Isokinetic probe, sample tubing and carrying case

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Contact your local TSI Distributor or visit our website **www.tsi.com** for more detailed specifications.

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