770900
Handheld Particle Counter
User Guide

Document No. TB-9122

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LIMITED WARRANTY, WARRANTY EXCLUSIONS, LIMIT OF LIABILITY AND RMA REQUEST INSTRUCTIONS:
StaticControl.com/Limited-Warranty.aspx

NOTICE: The contents of this manual are subject to change without notice.

Product Name: Handheld Particle Counter

Model Number: 770900

The following standards are applied only to the particle counters that are so labeled. EMC is tested using SCS power supplies.

North America: EMI: FCC/ICES-003 Class A

FCC Compliance Statement for American Users

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

Important Safety Information, Recommendations and Warnings

This section presents important information intended to ensure the safe and effective use of this product. Please read this section carefully and store it in an accessible location.

- Do not use near explosive, flammable, or reactive gases.
- Do not attach directly to pressurized gases or liquids.
- Do not improperly discard electronic instruments, only dispose of them in accordance with local regulatory requirements or contact SCS for a trade-in option.
- Defective or non-working lithium-ion batteries must be recycled, do not throw in trash.
- This device contains a Class I laser product that is not accessible during normal operation, do not take this device apart, exposure to harmful laser radiation can occur.
- Taking the device apart voids all warranties.
- Do not use this device for any purpose other than measuring particles in ambient environments.
- Do not operate an instrument with inlet capped or plugged, this can cause damage to the vacuum pump.
- Do not allow water or any other liquid to enter the inlet of the particle counter; this will damage the unit.
- Any changes or modifications to SCS equipment not expressly approved by SCS could void the user's authorization to operate the equipment, can risk serious injury, and will void all warranties.

Symbol Key

The symbols in this manual are shown by their level of importance, as defined below. Please read the following information carefully before handling the product.

WARNING: Observe all warnings to avoid serious bodily injury.

CAUTION: Observe all cautions to avoid minor injury to yourself or damage to equipment

Note: The laser in this product is completely enclosed within a sensor with no user serviceable parts. In addition, the emission level does not exceed the AEL (Accessible Emission Limit) of Class 1 under all conditions of operation, maintenance, service, and failure.

Ergonomic Recommendations

CAUTION: In order to prevent or reduce the potential risks of ergonomic injury, follow the recommendations below. Consult with your local Health & Safety Manager to ensure that you are adhering to your company's safety programs to prevent employee injury.

- Reduce or eliminate repetitive motion.
- Maintain a natural position while holding the instrument.
- Reduce or eliminate excessive force.
- Keep objects that are used frequently within easy reach.
- Perform tasks at correct heights.
- Utilize a tripod or the built-in stand with the instrument in a freestanding mode.

Warnings for Use of Wireless Devices

WARNING: Please observe all warning notices regarding use of SCS particle counters with optional Wi-Fi communications module installed.

Safety in Hospitals

Wireless devices transmit radio frequency energy and may affect medical electrical equipment. Wireless devices should be switched off wherever you are requested to do so in hospitals, clinics, or health care facilities. These requests are designed to prevent possible interference with sensitive medical equipment.

Pacemakers

Pacemaker manufacturers recommend that a minimum of 15cm (6 inches) be maintained between a handheld wireless device and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with independent research and recommendations by Wireless Technology Research.

People with Pacemakers:

- Should ALWAYS keep the device more than six (6) inches (15cm) from the Pacemaker if turned ON.
- Should not carry the device on your chest.
- Should use the arm furthest from the Pacemaker to minimize the potential for interference.
- If you have any reason to suspect that interference is taking place, turn OFF your device.

Other Medical Devices

Please consult a physician or the manufacturer of the medical device to determine if the operation of the wireless product may interfere with the medical device.

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1.0 Introduction

Thank you for purchasing an SCS particle counter, the most advanced particle counter available. This User Guide provides a detailed explanation and instruction for the proper use, operation, and maintenance of your new feature-rich instrument.

Specifications

The following table lists the specific details and various criteria of the SCS 770900 Handheld Particle Counter.

Specification	Explanation
Size Channels	Factory calibrated at 0.3, 0.5, 1.0, 2.5, 5.0, 10.0 µm variable binning
Size Range	0.3 to 25µm
Counting Efficiency	50% @ 0.3 µm; 100% for particles >0.45 µm per JIS
Flow rates	0.1 CFM (2.83 LPM)
Light Source	Long life laser diode
Zero Count	<1 count / 5 minutes (<2 particles / ft³) (per ISO 21501-4 & JIS)
Count Modes	Automatic, manual, cumulative/differential, mass concentration, count or concentration
Count Alarms	1 to 9,999,999 counts
Calibration	NIST traceable
Display	4.3″ (10.9 cm) WQVGA (480×272) color touch screen
Printer (Optional)	External thermal printer
Vacuum Source	Internal pump with automatic flow control
Filtered Exhaust	Internal HEPA filter
Number of Channels	Six (6)
Custom Size Channels	Calibration for custom size channels available
Recipes	50 user-configurable recipes
Communication Modes	Ethernet and USB
Optional Communication Modes	Wireless 802.11 b/g, RS485 or RS232
Environmental Sensor	Includes temperature and relative humidity probe 32º to 122ºF (0º to 50ºC) ±1ºF (0.5ºC), 15-90% ±2% relative humidity (Optional for 8303 & 8503)
Alarm	Alarms on counts for all particle sizes, low battery, sensor failure, environmental sensors, and flow
Standards	ISO 21501-4 and JIS B9921
Calibration	Recommended minimum once per year
External Surface	High impact injection molded plastic
Dimensions (L x W x H)	10” x 5” x 4.5” (25.4 cm x 12.9 cm x 11.4 cm) includes handle and does not include probes
Weight	2.2 lb. (1.0 kg)
Accessories	Quick start guide, operating manual on USB flash drive, isokinetic probe, temperature relative humidity sensor, purge filter, battery, data download software, USB cable, power supply & cable (temperature and relative humidity sensor is optional for Models 8303 & 8503)

Specification	Explanation
Buffer Memory	45,000 sample records (rotating buffer) including particle count data, environmental data, locations, and times. Scrollable on screen or printout
Sample Locations	Up to 1,000 locations 20 characters long
Sample Time	1 second to 99 hours
Power	110 to 240 VAC 50/60 Hz universal in-line power supply
Operating Conditions	41º to 104ºF (5º to 40ºC) / 20% to 95% non-condensing
Storage Conditions	32º to 122ºF (0º to 50ºC) / Up to 98% non-condensing
Country of Origin	United States of America

Please note that specifications are subject to change without notice.

Accessories

Included Accessories

The following table lists the name and image of each accessory included with the purchase of the 770090 Handheld Particle Counter.

Table 1. Included Accessories

Description	Image
Isoprobe Threaded 0.1 CFM Nickel Plated Aluminum	
Purge Filter Assembly 0.1 CFM (2.83 LPM)	
Rechargeable Battery 55Wh	
Temperature / RH Probe 32-122°F (0-60°C) ±1°F (0.5°C), 15 - 90% ±2%	
Power Supply 15V ~2amp 100-240VAC Select adapter -US, -EU, -UK or -CN	
USB Cable 6' (1.8m)	
USB Key with User Manual (PDF file) and the Instrument Management Software	

Product Views

SCS Handheld Particle Counters are made of high impact injection molded plastic, measure 5.12” x 4.25” x 12.26” (including the handle but not including the probes) and weigh 2.2 pounds.

The instruments come with a temperature and RH probe, 4.3” color touch screen, stylus for use with the touch screen, and its power switch, which is also a one-touch sample button (all shown below in ***Figure 2*** below). AQM Models (shown in ***Figure 5*** and ***Figure 6***) also have CO2 and TVOC options. The included power supply and cable are shown in ***Included Accessories***. Isokinetic probes (shown in ***Figure 1*** below) and batteries are optional.

Figure 1. Handheld

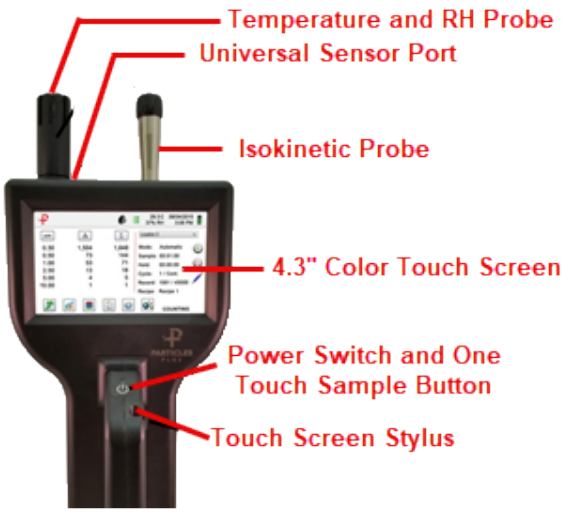


Figure 2. Front View

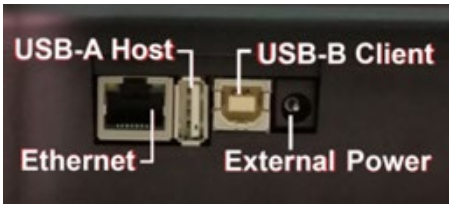


Figure 3. Left Side View - Input/Output Connection

Figure 4. Handheld Rear View

Figure 5. Handheld with AQM Front View

Figure 6. Handheld with AQM Rear View

Communication Connections

In addition, SCS Handheld Particle Counters include communications connections i.e. Ethernet (included and shown below in ***Figure 7***) and USB, (optional – shown below in ***Figure 8.*** Connecting USB - A Host) Wireless 802.11 b/g and RS485 or RS232 (included and shown below in ***Figure 9***).

Figure 7. Connecting Ethernet Cable

Figure 8. Connecting USB - A Host

Figure 9. Connecting USB B Client

2.0 Preparing Instrument for Use

Careful consideration was given to our packing material to ensure that the SCS instrument will reach you in perfect condition. If the instrument has been subject to excessive handling during shipping, there may be visible damage to the shipping carton. In the event of damage, keep the shipping container and packing material for the carrier's inspection.

Unpacking and Inspecting Instrument

Carefully unpack the instrument from its shipping container and inspect the contents for damaged or missing items. If the instrument appears damaged or something is missing, contact the carrier and SCS immediately. Please save the container and packing material in case you must return the instrument.

Contacting SCS

To order accessories, receive technical assistance, report damaged or missing items from your shipment, or get contact information for your nearest SCS authorized reseller, visit StaticControl.com/Contact-Us.aspx.

Storing and Shipping the Instrument

This instrument uses a high-quality advanced lithium-ion power cell. This must be removed from the device prior to shipping the unit. If the instrument needs to be packed and shipped for annual calibration or service, it is recommended to use the original packing materials. If they are not available, please ensure that the instrument is packaged in a box that is sturdy and that the instrument is well protected with proper packing materials to cushion and protect it from harm during transit.

To store the instrument, place it in its optional case or in a box, under cover, in an environment as stated in the ***Specifications*** section.

Power Considerations and Connecting to AC Power

The instrument comes with a power adapter line cord for AC powered operation and battery charging. The power adapter is designed to operate with line voltage from around the world. The correct plug adapter must be used to match your local AC power adapter standard. If the instrument power adapter does not have the proper plug configuration, please contact SCS or an authorized reseller for service.

Removing and Replacing AC Adapter on Power Supply

The power supply comes with the country specific adapter provided on the user's work order. To purchase a different adapter, contact SCS. Upon receipt, remove and replace the adapter as described below:

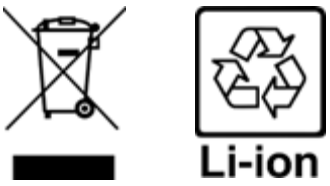
Note: Images of power supply may vary based on model.

1. Press the button in the center of the plug to release the attachment.
2. Slide the attachment up to remove it.
3. Push the new adapter on and slide it down until it clicks.
4. The plug adapter is ready for use.

Installing Rechargeable Batteries

CAUTION: The rechargeable battery is an intelligent battery pack with onboard processing to ensure proper cell loading and other functions that support the advanced power management features of this instrument. To ensure a long life for the batteries and for adherence to any local regulatory guidelines for the use, storage, and disposal of Lithium-Ion batteries, please follow these instructions carefully.

WARNING: Do not plug in or charge the lithium-ion rechargeable battery with any other power source other than the approved SCS Rechargeable External Battery Charger or Power Supply Model. Using any other charger can cause fire, shock, or serious injury.



CAUTION: Dispose of lithium-ion batteries at an approved local battery recycling center.

Installing Battery Pack

Step 1. Remove security screw using a “crosshead” screwdriver.

Figure 10. Install Battery Pack Step 1

Step 2. Pull out kickstand.

Figure 11. Install Battery Pack Step 2

Step 3. Push down latch while pulling battery compartment cover out and away.

Figure 12. Install Battery Pack Step 3

Step 4. Insert battery connector plug into matching socket on PCB board in battery compartment.

Note the dot on the connector. The dot must align with the mark on the internal connector. There is no click when connecting. Insert cable first then slide battery in.

Figure 13. Install Battery Pack Step 4

Step 5. Carefully push battery into the compartment using an upward motion until bottom of battery clears edge of the compartment and drops in freely.

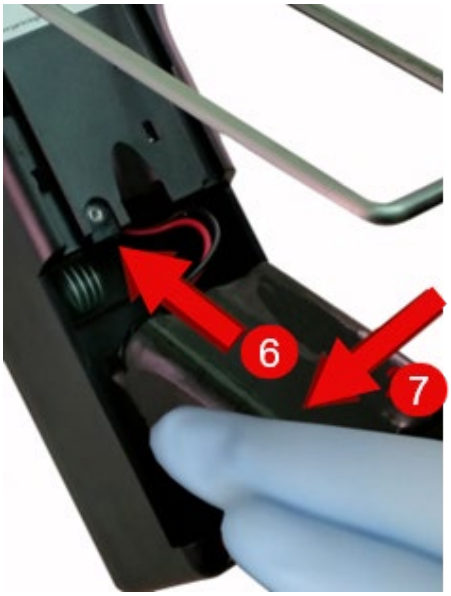


Figure 14. Install Battery Pack Step 5

Step 6. Seat the battery's compartment cover into bottom slot and push inward until the locking latch clicks. Reinstall the security screw with a screwdriver or remove it for optional battery replacement use.

Figure 15. Install Battery Pack Step 6

Charging Battery Pack

The battery pack requires charging prior to use as follows:

1. Attach power supply into the jack on the side of the handheld particle counter.
2. Plug the power cord into a corresponding outlet.

Do not plug into more than one power strip or extension cord.

Battery Charging Time

The battery pack takes approximately 4.5 hours to fully charge when fully depleted.

Battery Depletion Time

The battery pack depletion time varies based on whether the particle counter is on and in use, on and at rest or off, in addition to whether various options are in use or not.

Note: If instrument is not used for four (4) months or more, fully charge the battery to ensure its viability.

Instrument Status	Approximate Time to Next Charge
Off	8 days
Continuous Use	12 hours

Turning Unit On

Use the external one touch power and sample button on the handle to power the instrument on and off and turn sampling on and off.

The one-touch power button is located on the particle counter handle, as shown in ***Figure 16*** to allow for easy one touch operation. Holding the handle, place thumb over the button and press and hold until the particle counter turns on.

Press the one-touch button momentarily to start the pump and begin sampling.

Press the one-touch button again for one second to stop sampling.

Hold the button for 2.5 seconds to turn the instrument off. Optionally, turn the unit off from the *Power Management* screen.

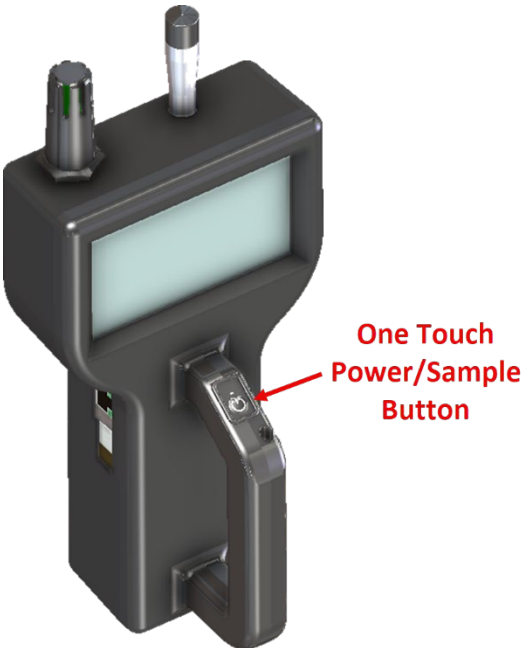


Figure 16. One Touch Power/Sample Button

Power and Charging Status LED

Power and charging status are indicated externally on the instrument in the middle of the one-touch power and sample button. The indicator provides information on the charging rates and status (shown on right).

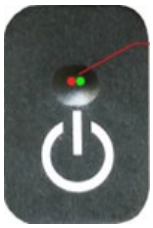


Figure 17. On/Off Button LEDs

Table 2. Power and Charging — LED Status

Unit State	LED Status
Unit Plugged into AC Power (Instrument Screen On or Off)	Charging: Red LED On Charging Complete Green LED On
Unit Not Plugged into AC (Instrument Screen On)	Battery Charge <10% Red LED blinks every three seconds
Unit Not Plugged into AC (Instrument Screen Off)	All LEDs Off

Note: No LEDs illuminate when the battery is removed and AC adapter is used.

3.0 Control and Menu Icons

The user interface has many icons, buttons, and indicators on a touchscreen. Users may access each function with their fingers, the included stylus, or another stylus like those on the end of a pen, to press the icons and buttons. Following is a list of the buttons, icons, and indicators as well as the name of their function, the screen(s) on which they are located, a description of what they do and the steps to perform the task(s).

Table 3. Control and Menu Icon Descriptions

Icon/Button/Indicator	Function Name	Location/ Screen	Function/Screen Description
SCS	SCS Logo Icon	Home Screen	The SCS Logo icon enables users to display the model number, serial number, manufacture date, last calibration date, next calibration due date, and number of channels activated on the unit. Press the icon to display the above information. Press the green *Back Arrow* icon on bottom left corner of the display to return to the *Home* screen.
	Speaker Icons	Home Screen	The speaker icon enables users to adjust the volume.  1. Press the speaker icon to bring up a pop-up slider bar. 2. Press the cross bar on the slider and move it up and down to adjust volume.  **Note**: The icon displays with a red prohibited symbol when sound is turned off or muted.
20.2 C 35% RH	Temperature and RH Indicators	Home Screen	The *Temperature* and *RH* value indicator displays the temperature and the relative humidity. Press the *Temperature* and *RH* indicator at the top of the screen. The barometric pressure value displays.  To return to the *Home* screen, press the green *Back Arrow* icon on bottom left corner of the display.  **Note**: Without the Temperature / RH Probe, temperature and relative humidity are not measured or recorded and do not display.

Icon/Button/Indicator	Function Name	Location/ Screen	Function/Screen Description
512 CO2 ppm 426 TVOC ppb	Environmental Indicators (AQM Models Only	Home Screen	Press the environmental value indicator to open a larger screen that displays the environmental variables listed above in Temperature and RH Indicators and, if applicable, the CO2 and/or TVOC (8301-AQM1 and 8301-AQM2 and 8300-AQM1 and 8300-AQM2 models only), and the current barometric pressure.  Press the green *Back Arrow* icon on bottom left corner of the display to return to *Home* screen.  **Note:** Without the AQM gas sensor module, CO2 and/or TVOC are not measured or recorded and do not display.
2024/06/17 12:30:01 PM	Time and Date Indicator	Home Screen	To change the current time and date, press the *Time* and *Date* indicators at the top of the screen.
	Power Management Icons	Home Screen	The *Power Management* icons enable users to display the current battery status screens. Press the *Battery/Power Adapter* indicator.  **Note**: If there is no battery, the battery icon does not display. If the power adapter is not plugged in, the plug icon does not display.
	USB Icon	Home Screen	If the USB drive is connected, the USB icon displays.  Press the *USB* icon to save the current record to the USB drive. The *Notice* pop-up window displays notifying user that the last data record was stored to USB drive and prompts the user to click the *OK* button.
	Printer Icon	Home Screen	If the printer is connected and has power, the printer icon displays. To print the current record, connect the printer to the USB port on the right side of the printer and to the USB port on the left side of the instrument. Press the *Print* icon. Information about the current record prints. For more information about printing, see ***Printing Reports.***
	System Warning Indicator	Home Screen	When the *System Warning Indicator* icon displays, press the icon for additional information. Please contact SCS for assistance should the icon continue to display.

Icon/Button/Indicator	Function Name	Location/ Screen	Function/Screen Description
	Alarm Indicators	Home Screen	Visual indication that the instrument has exceeded the user-defined thresholds. To silence the alarm, press the *Alarm* icon.
	Run Icon	Home Screen	To start sampling, press the *Run* icon. The *Run* icon replaces the *Stop* icon.
	Stop Icon	Home Screen	To stop sampling, press the *Stop* icon.
	Display Mode Icon	Home Screen	The *Display Mode* icon enables users to switch between the *Home* (Particles Per Second), *Real-Time Meter*, *Graphing*, *Particles Per Second* and *Environmental* screens. Press the *Display Mode* icon. The screen options display. **Note**: Users must enable *Mass Mode* on the *Channel Management* screen for all screen options to display.
	Recorded Data Icon	Home Screen	To display the saved data records page, press the *Recorded Data* icon. Access all saved records from this screen. **Note**: Also called a “Data Buffer.”
	Reports Icon	Home Screen	To display ISO 14644-1, EU-GMP Annex 1, or Federal Standard 209E, press the *Reports* icon.
	Particle Icon	Home and Recorded Data Screens	The *Particle* icon is a toggle for users to change the indicated values from particle count to count per cubic meter, count per cubic foot, or particle mass concentration. **Note**: To display particle mass concentration, the user must first enable *Mass* (Concentration) mode.  1. Click the *Settings* icon.  2. Press the *Channel Management* icon. 3. Press the *Mass Mode* radio button.

Icon/Button/Indicator	Function Name	Location/ Screen	Function/Screen Description
	Differential Δ Mode Icon	Home Screen	To toggle the differential data values on the display (on and off), press the *Differential Mode Δ* icon.
	Cumulative Σ Mode Icon	Home Screen	To toggle the cumulative data values on the display (on and off), press the *Cumulative Mode Σ* icon.
	Location Menu Icon	Home Screen	To display the *Select Location & Recipe* screen, press the *Locations & Recipes* icon. This feature allows for the input of up to 1,000 locations and up to 50 unique user-defined recipes.
Mode: Automatic	Mode Indicator	Home Screen	The *Mode Indicator* displays the current mode of operation for the instrument. The three modes are automatic, manual, and continuous.
Sample: 00:01:00	Sample Indicator	Home Screen	The *Sample* (time) indicator is the duration (in Hours:Minutes:Seconds) of the amount of time the current sample is scheduled to take. This value counts down from the set value for the sample time, displaying the amount of time left in the current sample. See ***Sampling Setup*** for more information.
Hold: 00:02:00	Hold Indicator	Home Screen	The *Hold Time* indicator is the interval between samples. The maximum hold time is 99 hours, 59 minutes, and 59 seconds. To set a hold time: 1. Press the *Settings* icon. 2. Press the *Sampling Setup* icon. 3. De-select the *Use Recipe* radio button if necessary. 4. Press the *Hold* (time) field. 5. The *Enter Time* screen displays. 6. To change the values, use the < or > to move cursor. Enter the values. 7. Press the *OK* button when complete or press *Cancel* to return to previous screen.
Cycle: 1 / 3	Cycle Indicator	Home Screen	The *Cycle* indicator displays the number of count samples that will be taken at a location in automatic mode. The maximum number of cycles is 9,999. The value displays as the sample number versus the total number of samples to be completed in this cycle. See ***Sampling Setup*** for more information.
RECORD: 1 / 45000	Record Indicator	Home Screen	The *Record* indicator displays the total number of sampling records saved in the instrument. The instrument can store 45,000 records in a rotating buffer.

Icon/Button/Indicator	Function Name	Location/ Screen	Function/Screen Description
	Settings Menu Icon	Home Screen	The *Settings* icon enables access to all aspects of the instrument's set-up, which are managed from the icon driven sub-menu (*Sampling Setup*, *Channel Management*, *Locations & Recipes*, *Configuration*, *Printer Setup*, *Communication*, *Environment*, Password Setup and Screens).
	Annotation Icon	Home Screen	The *Annotation* feature can notate up to 32 characters for each record. This action can be performed during sampling or after a sample has been taken. The green pencil indicates an annotation exists for any record.  **Note**: See ***Adding Annotations to Recorded Data*** to enable annotations.
	Plus and Minus Buttons	Home Screen	The *Plus and Minus* icons on the *Home* screen enable users to scroll through 1,000 possible locations that can be saved and uniquely identified in the *Locations Setup* screen. Press the *Plus* or *Minus* icons. Locations can have set recipes assigned to them in advance for ease-of-use during sampling.
	Flow and No Flow Indicators	Home Screen	The three horizontal arrows indicate that the pump is working and that the internal flow sensor is detecting the correct flow rate through the instrument. A red line displays diagonally through the arrows to indicate a flow error or that the pump is not running. The redline also displays while the instrument is stopped.
	Back Arrow Icon	Various Screens	Press the green *Back Arrow* icon to return to the previous screen.

4.0 Operational Flow Chart — Menu Map

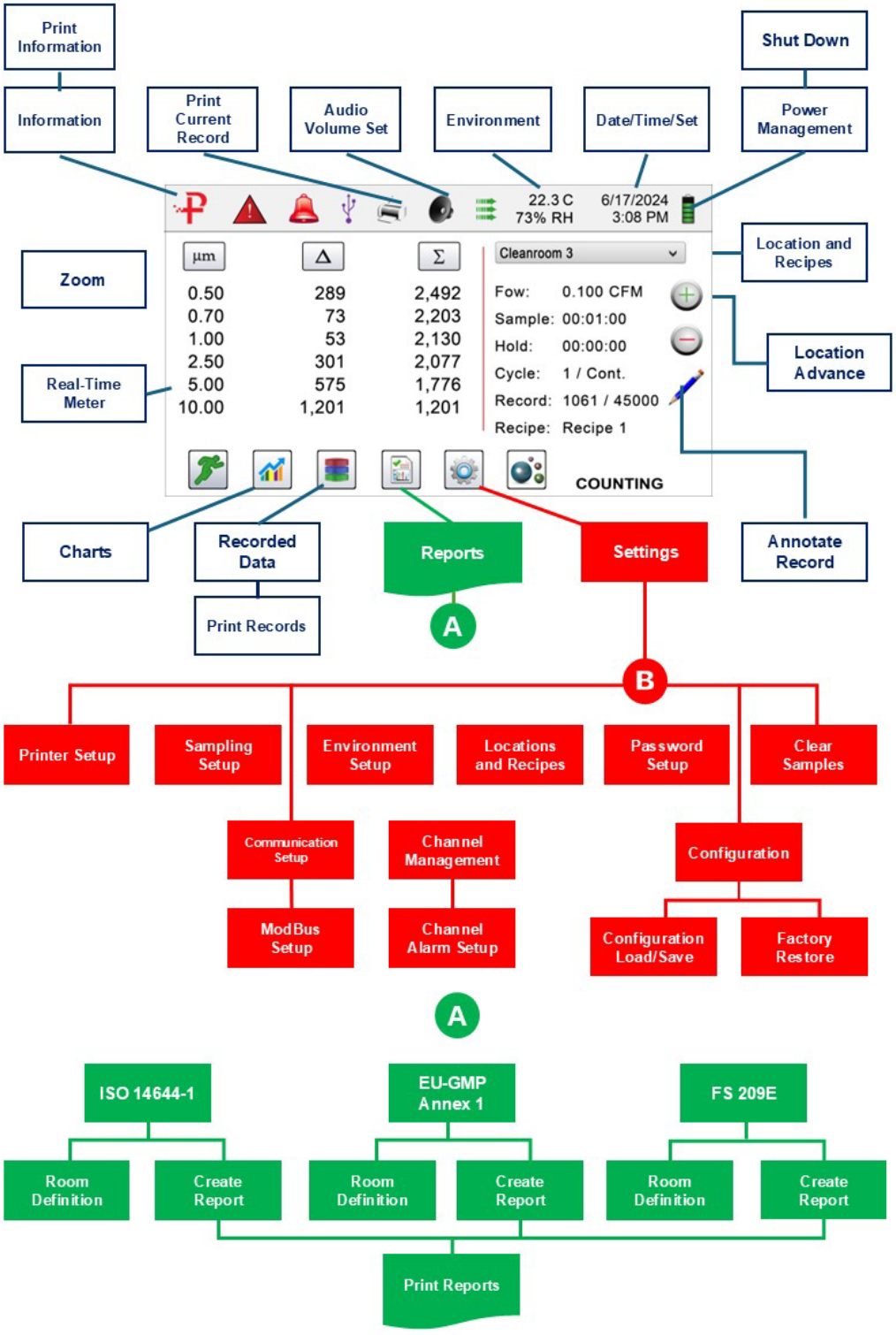


Figure 18. Operational Flow Chart - Menu Map

5.0 Operation

Initial Power Up — First Time Use

Date and Time

After the particle counter turns on for the first time, the *Date & Time* screen displays stating, “Time of Day Clock Not Set.”

To set the clock, press *OK*. The *Date & Time* screen displays as shown below in ***Figure 19.*** See ***Table 4*** for more information on setting the date and time fields.

To change these selections after the initial set-up, press the time and date section of the screen to bring up the *Date & Time* screen shown below in ***Figure 19***.

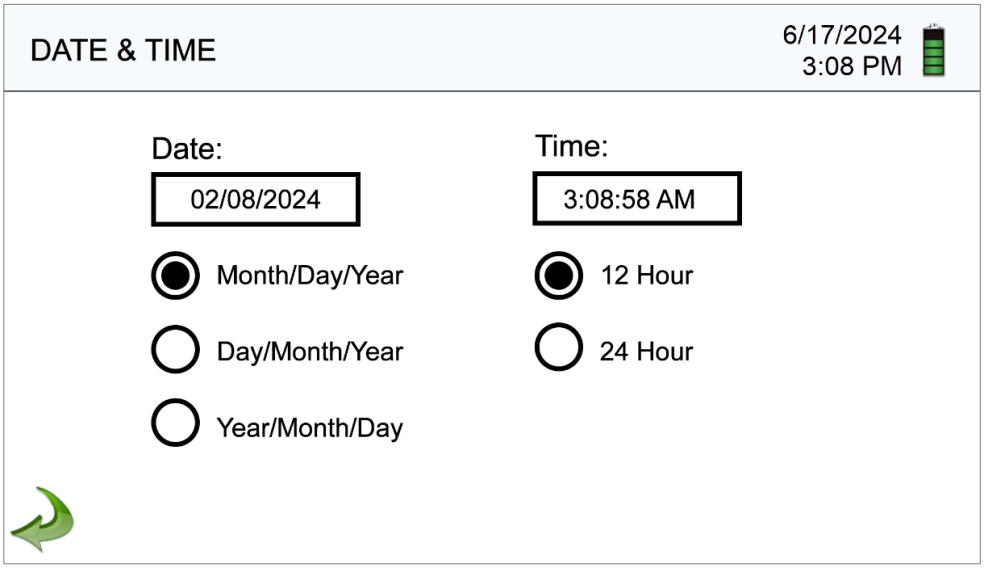


Figure 19. Initial Power Up - Date & Time

Table 4. Date and Time Setup Features

Button/Icon	Feature	Description
Month/Day/Year Day/Month/Year Year/Month/Day	Date Format Select Radio Button	To choose the format for Month/Day/Year, Day/Month/Year, or Year/Month/Day, select the corresponding radio button on the screen as shown in ***Figure 19*** above.
Date: 02/08/2024	Date: Numeric Keypad	To change the date: 1. Press the *Date* button. 2. A numeric keypad displays. 3. To change the values, use the < or > to move cursor. Enter the values.

Button/Icon	Feature	Description
		4. Press the *OK* button when complete or press Cancel to return to previous screen.
12 Hour 24 Hour	Time Format Select Button	Time can be displayed in either 12-hour format or 24-hour format. Change the 12-hour or 24-hour clock format by selecting the corresponding button on the touchscreen as shown in ***Figure 19*** above. **Note**: Use 24-hour clock format for time entry to properly indicate AM or PM.
Time: 03:08:58 AM	Time: Numeric Keypad	To change the time: 1. Press the *Time* button. 2. A numeric keypad displays. 3. To change the values, use the < or > to move cursor. Enter the values. 4. When complete, press the *OK* button. 5. Time displays AM or PM, or 24-hour format based on the selection.
	Back Arrow Icon	To return to the previous screen, to press the *Back Arrow* icon.

Display Screen

To enhance viewing, users may zoom in or out on the *Home* page by pressing any blank space on the screen. Please note that only the *Home* page has this feature.

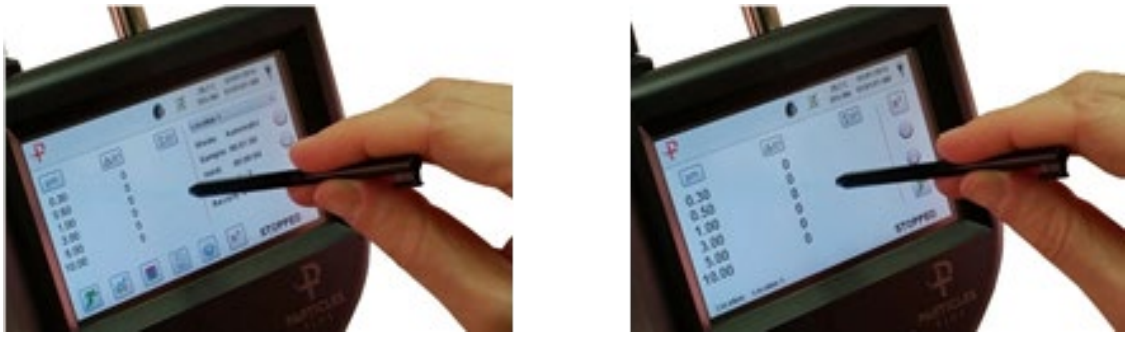


Figure 20. Display Screen - Zoom In and Out

Taking a Sample

To take a particle sample, press the one-touch *Power/Sample* button on the handle or the *Run* icon on the bottom left corner of the *Home* screen. The sampling process begins using the sampling parameters displayed on the right side of the *Home* screen as shown below in ***Figure 21***.

Note: To change sample timing, see ***Sampling Setup***.

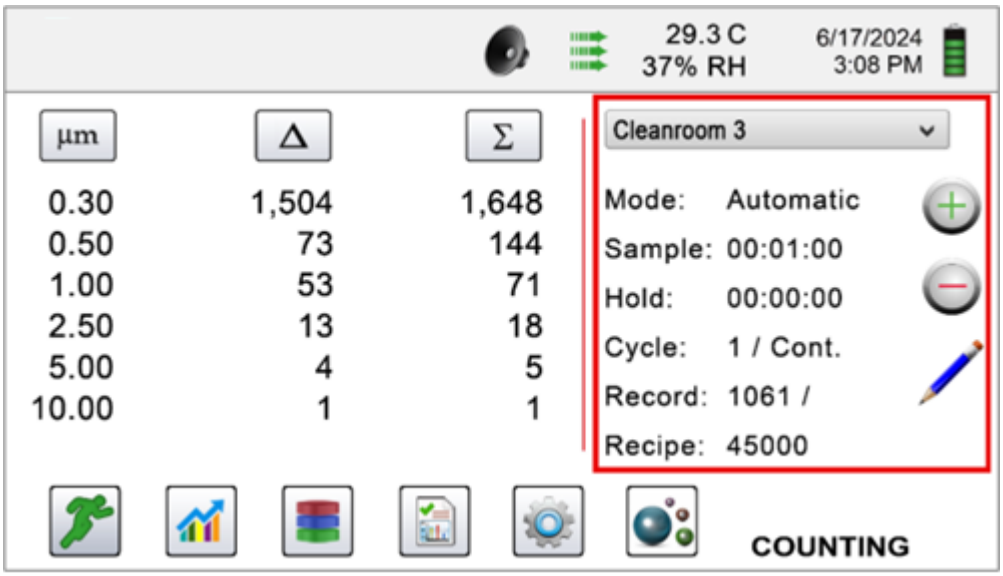


Figure 21. Main Sampling Home Screen

Stopping the Sample

To stop a sample, press the one-touch *Power/Sample* button on the handle or the *Stop* icon on the screen.

Setting the Data Unit of Measure

To change the indicated values in the *Particle Count* field, press the *Particle* icon. The field toggles between the following three options. This button displays raw data.

- *count per cubic foot* ft^3,
- *count per cubic meter* m^3, or
- *particle mass concentration* $\mu g/m^3$

Mass Mode

To display the particle mass concentration (density g/ml and refractive index), first enable the *Mass Mode* as follows:

1. Press the *Settings* icon.
2. Press the *Channel Management* icon.

Mass Mode 3. Press the *Mass Mode* radio button.

4. The *Density g/ml* and *Refractive Index* columns display. The *PM* column on the *Particles* screen is also available.

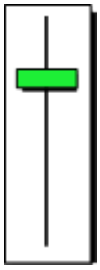
Real-Time Meter Operation

The handheld offers users a wide variety of information in real-time as the instrument is performing particle counts including the following screens:

Screens

- **Main/Particles Screen**
- **Real Time Meter Screen**
- **Particles Per Second Screen**
- **Real Time Graph Screen**
- **Environmental Screens**

Table 5. Real Time Meter Operation Features

Icon/Button	Feature	Description
	Start/Stop Sampling	The green *Start* and red *Stop* icons enable users to start and stop the sampling process from each of the *Real-Time Meter Operation* screens. Press the green *Run* icon to start sampling and the red Stop icon to stop sampling. Users may also start and stop sampling using the one-touch button on the handle. Press the button to start and again to stop.
	Channel Size Selection	The *Channel Size Selection* radio buttons enable users to select the channel size that is the focus of the particles being investigated. Click the radio button below the desired channel. The channel selected also represents the data being displayed in particles per second on the *Graph* screen.
	Range Sensitivity Adjustment Slider	The *Range Sensitivity* slider enables users to increase or decrease the instrument's sensitivity to particles. To increase sensitivity, press and slide the *Range* slider bar up towards the top of the slider. To decrease sensitivity, press and slide the *Range* slider bar down towards the bottom of the slider. As the instrument gets closer to the particle source the visual signal can increase and hit 100% of the indicator scale before the source of the contamination is found. By moving the *Range* slider bar down, the sensitivity is reduced, and the indicator decreases.
	Display Mode	The *Display Mode* icon enables users to switch between the *Main* (aka *Particles*) screen, the *Real-Time Meter*, *Graph*, *Particles Per Second* and *Environmental* screens. **Note**: To display the *Environmental* screen, users must first enable *Mass Mode*. 1. Press the *Settings* icon. 2. Press *Channel Management*. 3. Press the *Mass Mode* radio button. 4. Press the *Settings* icon.

Icon/Button	Feature	Description
		5. Press the *Screens* icon. 6. Select the desired screen(s). • *Main/Particles (Mass Concentration)* • *Real-time Meter* • *Real-time Graph* • *Particles Per Second* • *PM/Environmental*

Main/Particles (Mass Concentration) Screen

The *Main/Particles (Mass Concentration)* screen, shown below in ***Figure 22***, displays the values of the particulates in mass concentration in micrograms per cubic meter for various channel sizes.

PM is the sum of the previous channels (µg/m^3) not including that channel's size.

Example: .07 + .02 + .03 + .62 = .75 for particulate size (µm) 5.00

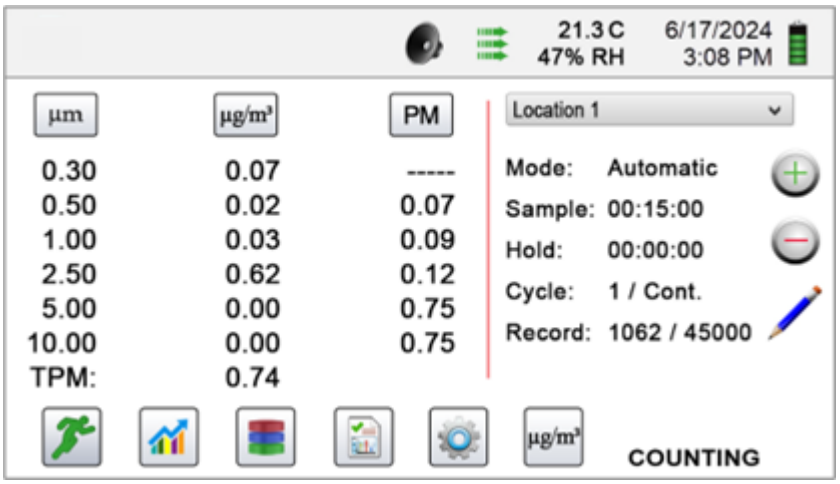


Figure 22. Main/Particles (Mass Concentration) Screen

Real-Time Meter Screen

As shown below in ***Figure 23*** and ***Figure 24***, the instrument displays a bar graph that rises and falls with the increase of particles counted per second, per channel. Use this data to pinpoint the source of particles within an area. The closer the instrument is to the source, the higher the indicator appears on the bar graph.

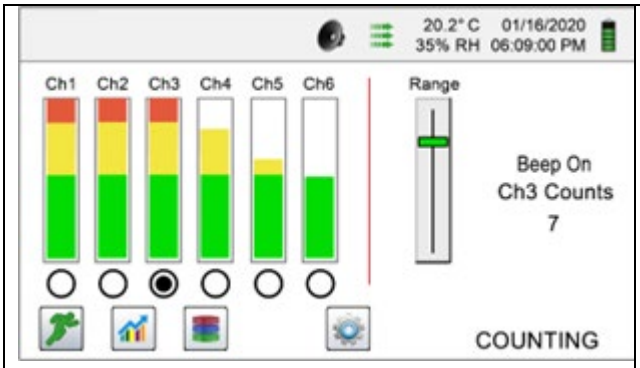


Figure 23. Channel 3 Selected and Signals at Maximum Value

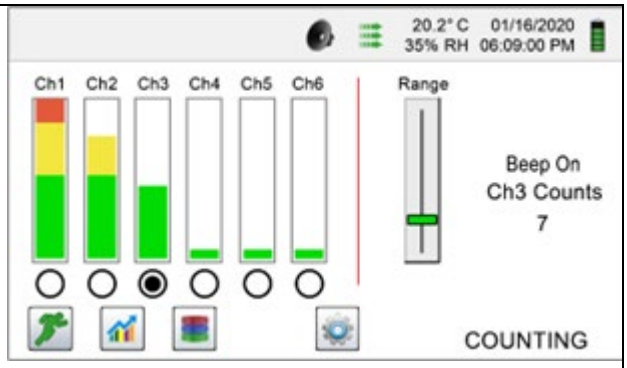


Figure 24. Range Slider Lowered to Reduce Channel 3 Value

Particles Per Second Screen

The *Particles Per Second* screen, shown in ***Figure 25*** below offers an arithmetic means of displaying current particles per second for the selected particle size (0.30, 0.50, 1.00, 2.50, 5.00 or 10.00 in µm) that can be used to help locate particulate sources.

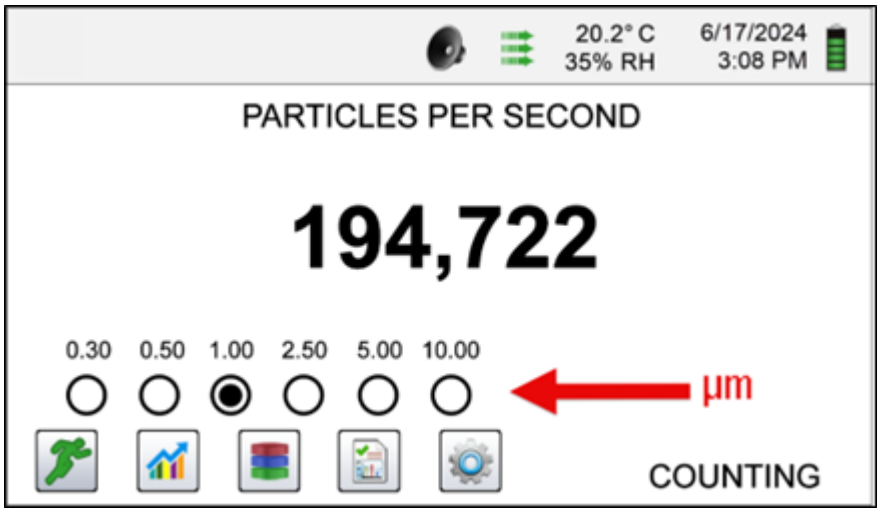


Figure 25. Particles Per Second

Real-Time Graph Screen

The *Graph* feature, shown below in ***Figure 26*** graphically displays the particles per second, making the graph's historical information useful in point-source detection.

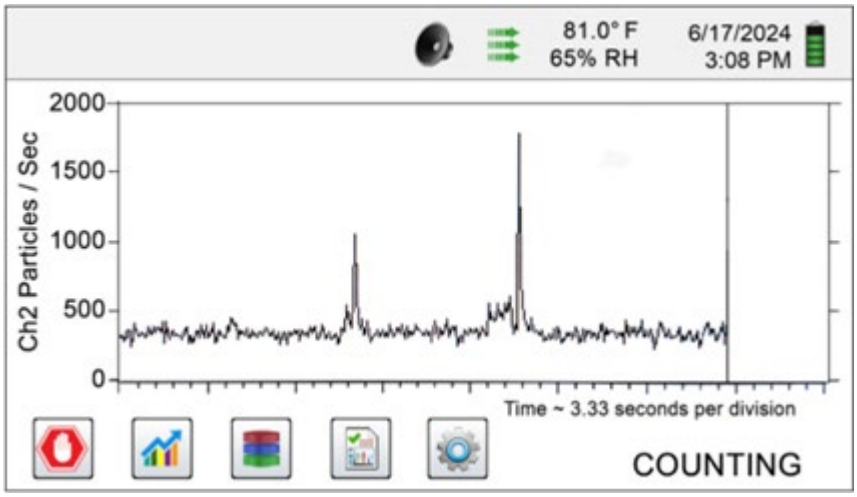


Figure 26. Real-Time Graph (Particles)

Environmental Screens

Environmental Screen

This *Environmental* screen, shown below in ***Figure 27***, displays specific PM size, temperature, and humidity.

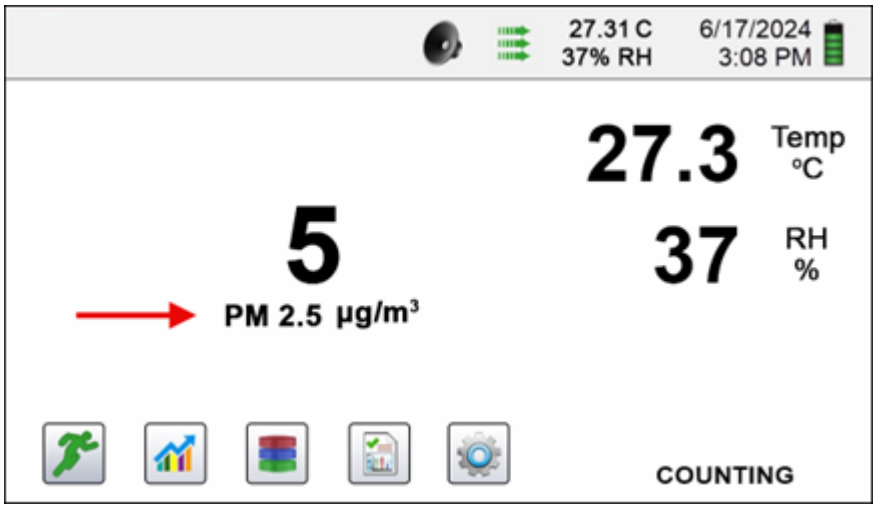
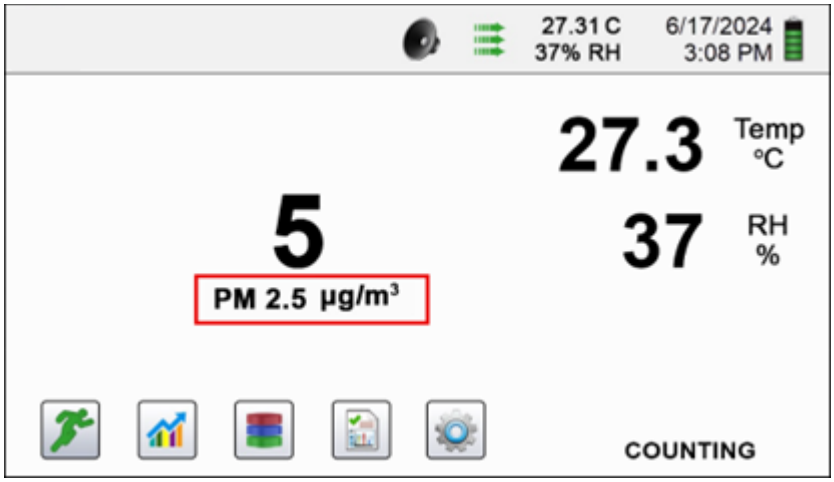


Figure 27. Environmental Screen

Environmental (PM Size) Screen Selection

The *Environmental PM Size Screen Selection* screen, shown below in ***Figure 28***, offers various radio buttons from which to select the PM size channel.

1. On the Environmental screen, press PM / µg/m³ as shown below.



2. The *Select PM to Display* screen displays.
3. Press the appropriate radio button for the desired channel size.

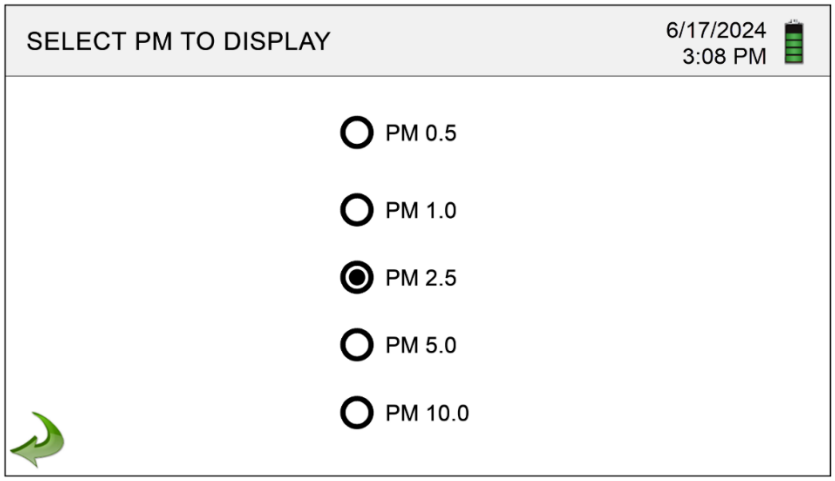


Figure 28. Environmental PM Size Screen Selection

To return to the previous screen, press the green *Back Arrow*.

AQM — Environmental Screen

This *Environmental* screen, shown below in ***Figure 27***, displays temperature, relative humidity (%) and AQM specific variables — CO2 and VOC.

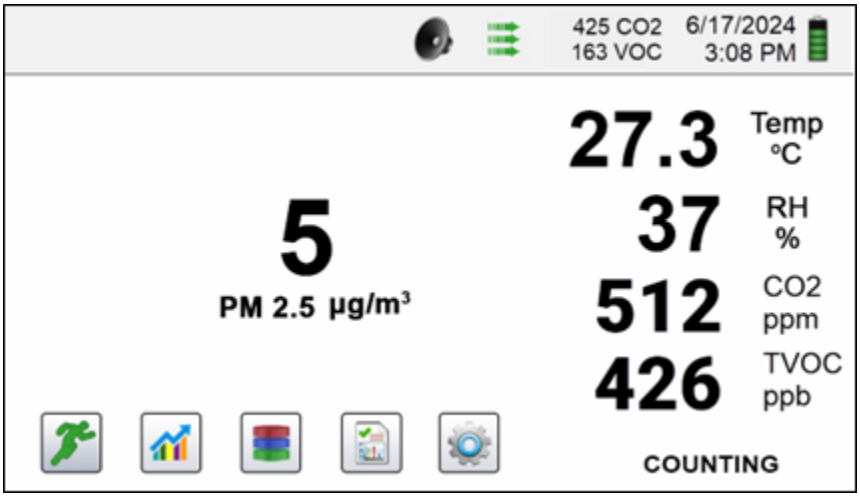


Figure 29. AQM — Environmental Screen

Recorded Data

The instrument stores up to 45,000 records that can be accessed by pressing the *Recorded Data* icon in the toolbar.

Searching Records

To scroll through stored records on the *Recorded Data* page, shown below in ***Figure 30***, use the horizontal *Slider* bar and scroll left and right through the records. For fine control in finding a specific record, press the white arrows. To scroll through large amounts of data quickly, press the *Slider* bar with the stylus and drag left or right.

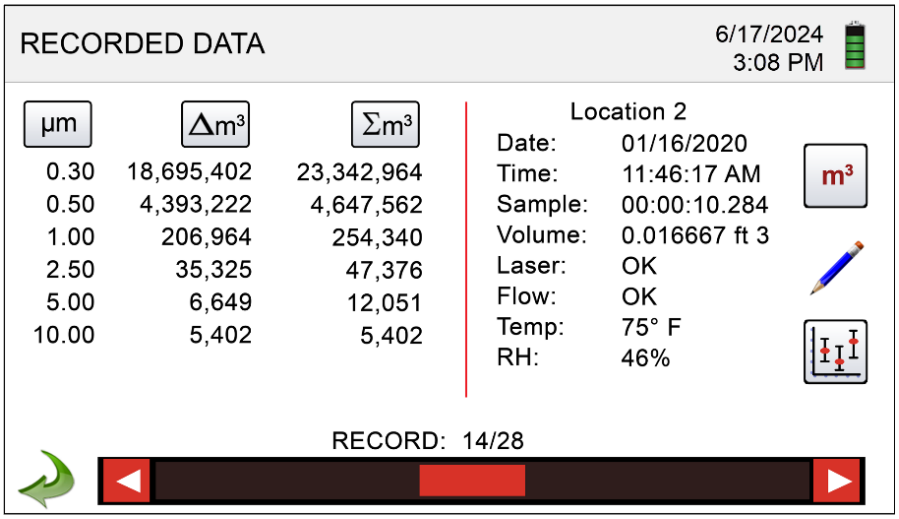


Figure 30. Recorded Data Screen

Data Capacity

The instrument records and stores 45,000 samples. Once it reaches capacity, the software deletes one block of 250 records. After the block is deleted the next record number becomes 44,751. The instrument then stores data up to 45,000 before repeating this process. Each block removed is from the oldest record first, following a first in/first out (FIFO) method.

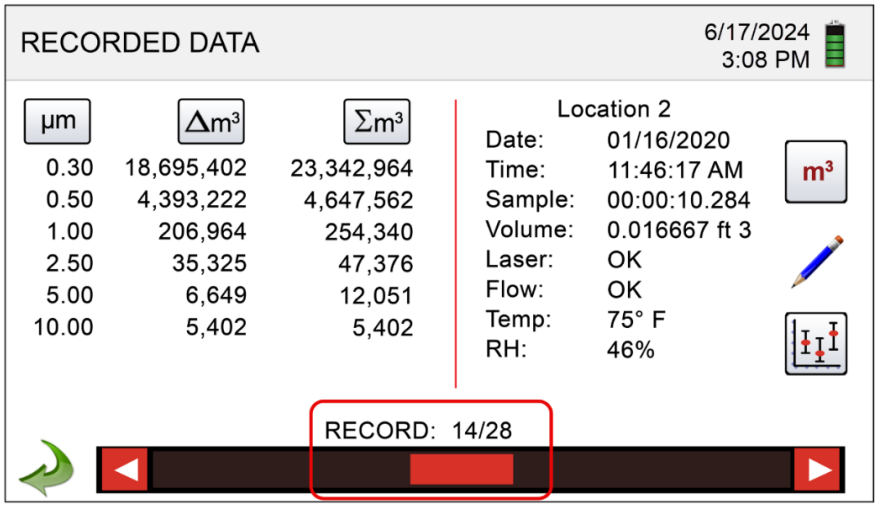


Figure 31. Number of Data Records

Printing/Saving Current Record

Users may print or save the current record as follows:

1. First attach a USB thumb drive or printer using the USB port on the left side of the instrument.
2. If printing, also connect the USB cable to the port on the right side of the printer.
3. Press the corresponding *Print* or *USB* icon to print or store the record as desired.

Note: Only the icon for the device currently attached displays.

Note: The printer prints without any prompts. To save to the USB drive, the user is prompted with a pop-up window, “Last data record stored to USB drive” OK.

Note: The printer must be set up prior to printing. See ***Printer Setup*** for more information.

Turning Differential/Cumulative Columns On/Off

To turn any/all displayed channels off or on in the differential or cumulative columns, press the desired mode icon shown in ***Figure 32*** below.

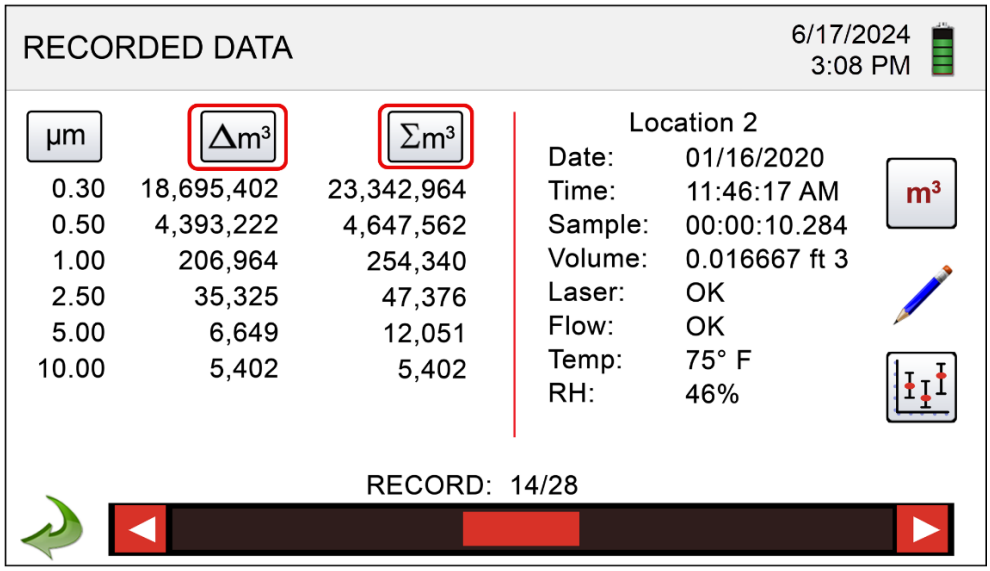


Figure 32. Toggling Channel Values

Changing the Data Units Being Displayed

Data Units that display on the *Recorded Data* screen can be changed to the corresponding calculated values by pressing the *Particle* icon, which toggles between particle count, count count per cubic foot (ft^3), per cubic meter (m^3), count per cubic foot (ft^3), or µg/m³ (if enabled).

Adding Annotations to Recorded Data

The instrument stores an annotation of up to 32 characters for each record during or after sampling.

The green pencil icon indicates an annotation exists for any record.
To enable annotations:

1. Press the *Settings* icon.
2. Press the C*onfiguration* icon.

3. Press the *Enable Annotations*.

To enter an annotation, press the blue pencil icon on the *Recorded Data* screen. Then, use the *Edit Annotation for Record #* screen to record notes as desired, as shown in ***Figure 33*** below.

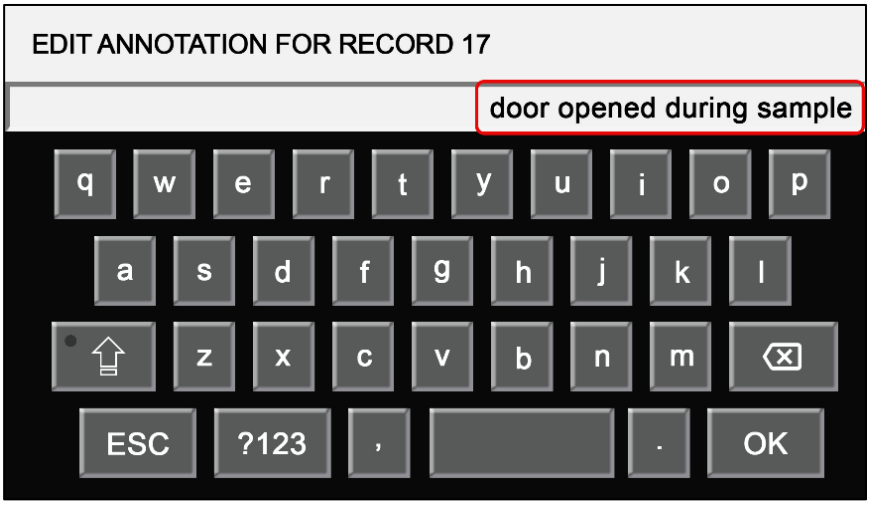


Figure 33. Keyboard Screen

Keyboard Functions

- To activate or deactivate the *Caps Lock* function, press the *Shift* key.
- To toggle the use of numbers and symbols, press the *?123* key.
- To delete text on the text line, press the *Backspace* key.

Statistics Feature

The *Statistics* feature enables users to access, save or print data stored in the instrument.

The *Statistics* icon displays on the *Recorded Data* screen. However, if a printer is plugged into the USB port on the instrument, the *Printer* icon replaces the *Statistics* icon. If a USB thumb drive is plugged into the USB port, a USB icon replaces the *Statistics* icon.

1. Click the *Recorded Data* icon.
2. Click the *Statistics* icon.

USB Drive

3. Insert the SCS provided USB drive on which to save the statistics.

Note: Users may select *All* records or a specific range up to the total number of stored records.

4. Press the *All* or the *Records* radio button as shown in ***Figure 34***.

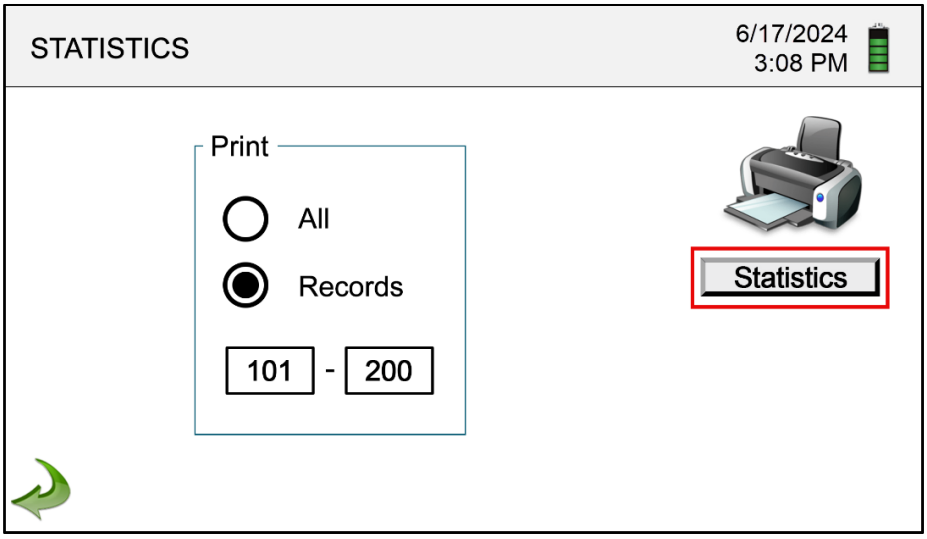


Figure 34. Statistics Screen with Statistics Button

5. Press the beginning of the range field.
6. The *Enter Start Record Number* field displays as shown below in ***Figure 35***.

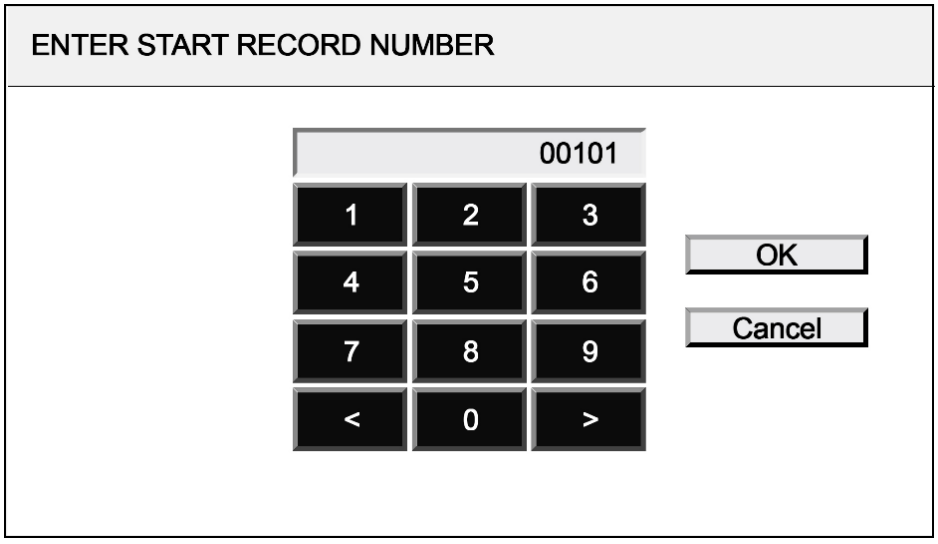


Figure 35. Enter Start Record Number Screen

7. Use the < or > arrows and the numeric keypad to enter the desired beginning record number. Enter the value.
8. Press *OK* or *Cancel* button to return to the previous screen.
9. Press the end of the range field.
10. Use the < or > arrows and the numeric keypad to enter the desired ending record number. Enter the value.
11. Press *OK* or *Cancel* button to return to the previous screen.

12. The *Statistics* screen with the *Export* button displays as shown below in ***Figure 36***.

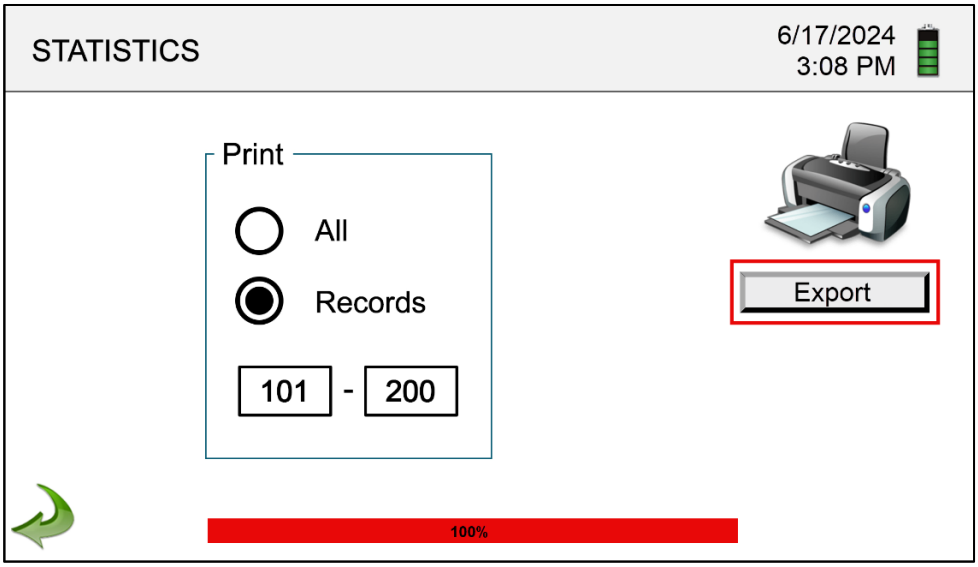


Figure 36. Statistics Screen with Export Button

13. Press the *Export* button.
14. The records process displaying a bar at the bottom that changes from grey to red upon completion.
15. The exported records are saved to a .csv file viewable on any device using software (e.g. Excel, Google Workspace, etc.) that import .csv files.

    The saved records include the following information:

    - Date
    - Time
    - Location
    - Annotation (if any)
    - Sample Duration
    - Flow Rate
    - Temperature, Relative Humidity and Barometric Pressure
    - Channel Size (s)
    - Particle Count on Channel
    - Alarm(s)
    - And more

No USB Drive or Printer Attached

1. Click the *Recorded Data* icon.

2. Click the *Statistic* icon.

3. The *Statistics* screen displays.

Note: Users may select *All* records or a specific range up to the total number of stored records.

4. Press the *All* or *Records* radio button as shown below in ***Figure 37***.

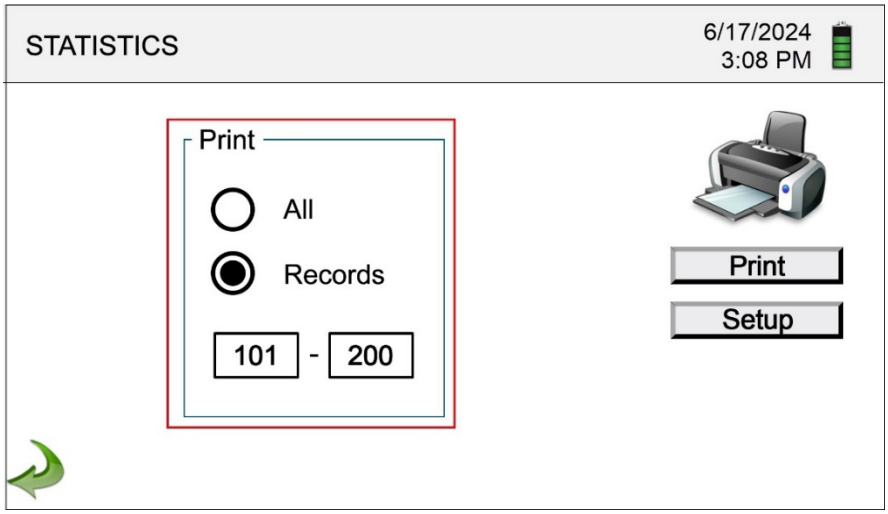


Figure 37. Statistics Screen with Statistics Button

5. Press the beginning of the range field.

6. The *Enter Start Record Number* field displays as shown below in ***Figure 38***.

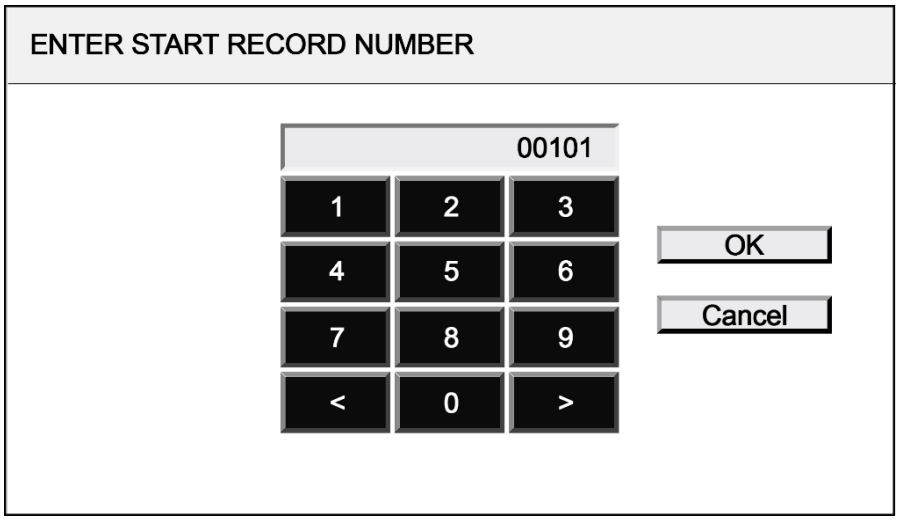


Figure 38. Enter Start Record Number Screen

7. Use the < or > arrows and the numeric keypad to enter the desired beginning record number. Enter the value.

8. Press *OK* or *Cancel* button to return to the previous screen.
9. Press the end of the range field.
10. Use the < or > arrows and the numeric keypad to enter the desired ending record number. Enter the value.
11. Press *OK* or the *Cancel* button to return to the previous screen.
12. The *Statistics* screen with the *Statistics* button displays.
13. Press the *Statistics* button.

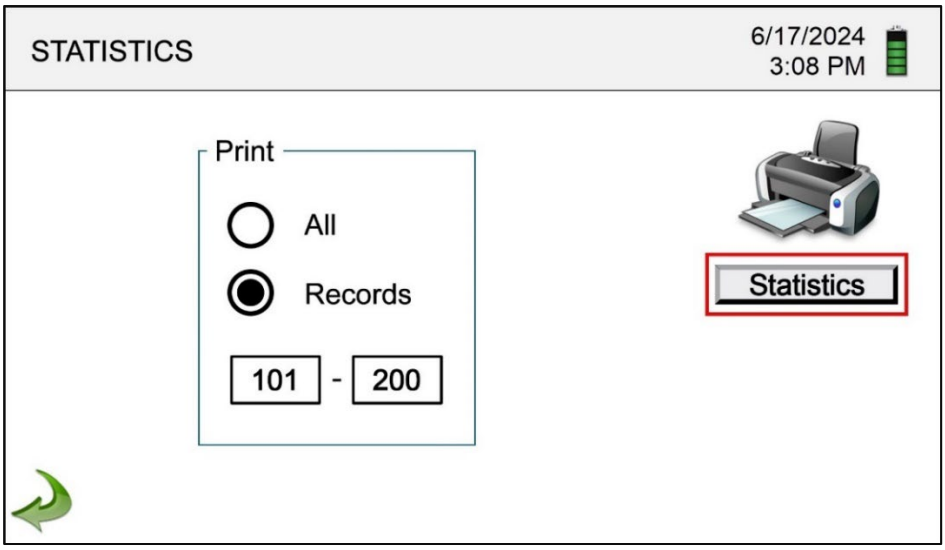


Figure 39. Statistics Screen with Statistics Button Selected

14. The records process displaying a bar at the bottom that changes from grey to red upon completion.
15. The *Statistics* screen displays as shown below in ***Figure 40***.

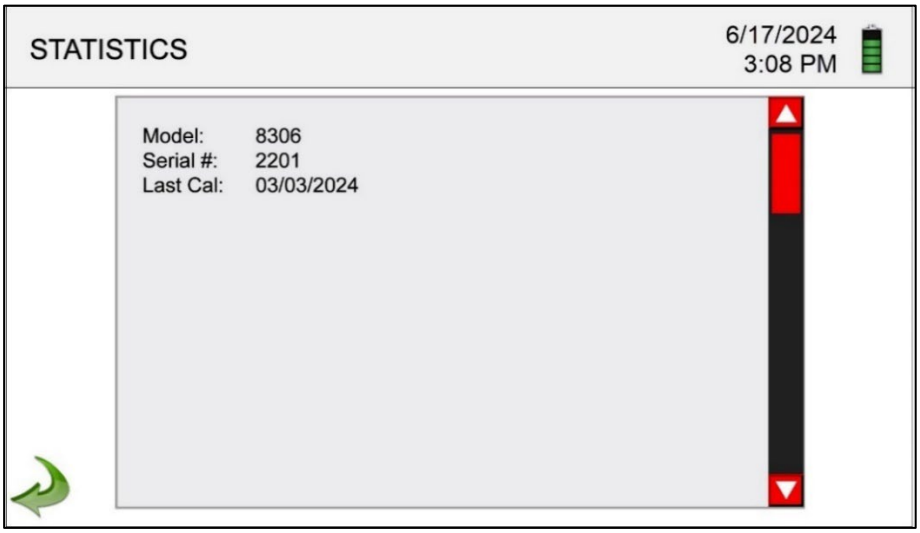


Figure 40. Statistics Output Screen

Printer Attached

Click the *Recorded Data* icon.

1. Click the *Recorded Data* icon.

2. Click the *Statistic* icon.

3. The *Statistics* window displays with the printer icon and *Statistics* button as shown below in ***Figure 41.***

Note: Users may select *All* records or a specific range up to the total number of stored records.

4. Press the *All* or the *Records* radio button as shown below in ***Figure 41***.

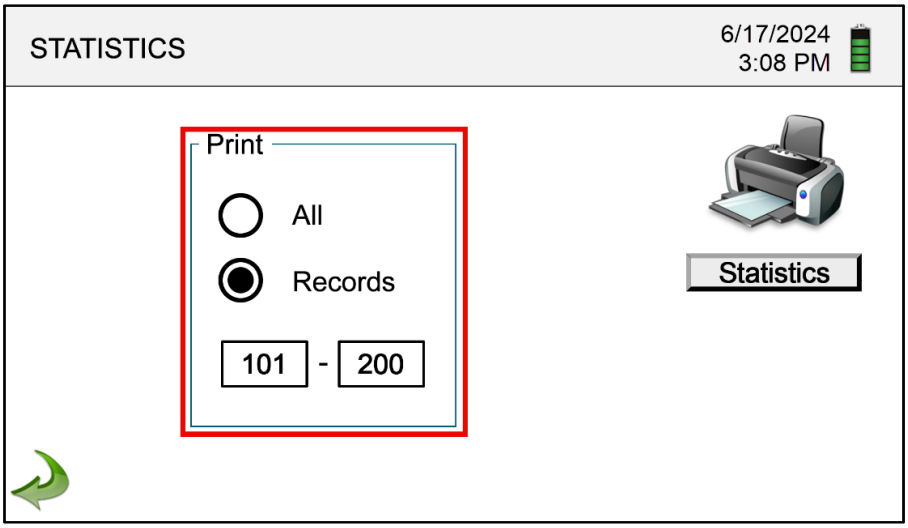


Figure 41. Statistics Screen with Statistics Button

5. Press the beginning of the range field.
6. The *Enter Start Record Number* field displays as shown below in ***Figure 42.***

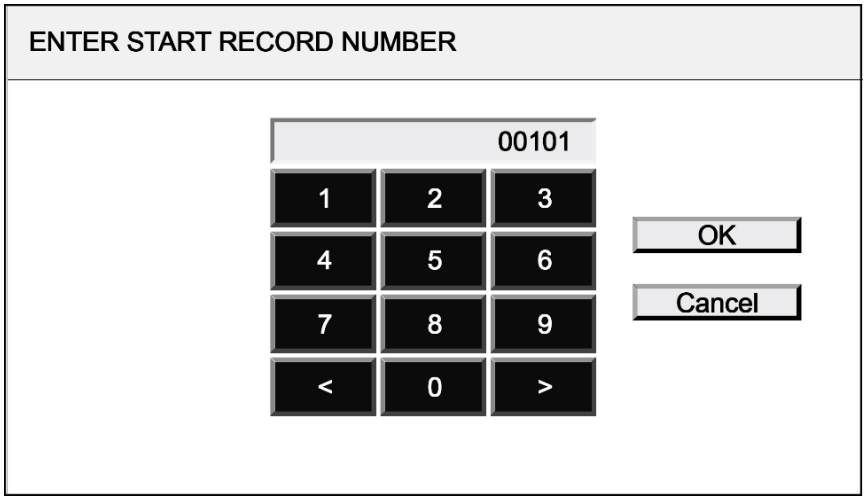


Figure 42. Enter Start Record Number Screen

7. Use the < or > arrows and the numeric keypad to enter the desired beginning record number. Enter the value.
8. Press *OK* or *Cancel* button to return to the previous screen.
9. Press the end of the range field.
10. Use the < or > arrows and the numeric keypad to enter the desired ending record number. Enter the value.
11. Press *OK* or *Cancel* button to return to the previous screen.
12. Attach the thermal printer upon which to print the statistics.
13. The *Print Data* screen with the *Print* and *Setup* buttons display.
14. The *Printer Setup* screen displays shown below in ***Figure 43***.

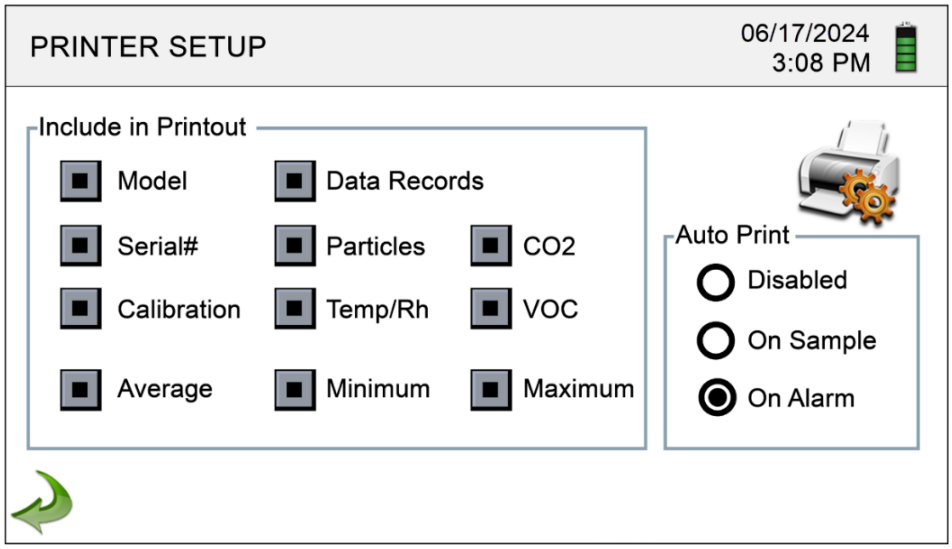


Figure 43. Printer Setup Screen

Note: CO2 and VOC are only available on AQM models.

15. Select the radio button(s) corresponding to the desired values to be printed on reports as shown below in ***Figure 44***.

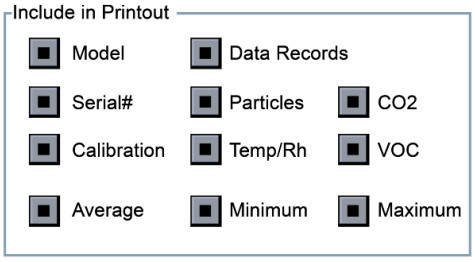


Figure 44. Include in Printout Options Screen

Note: CO2 and VOC are only available on AQM models.

16. Reports may be printed automatically if the instrument is connected to the printer. To select when reports should automatically print using the *Auto Print* radio buttons options shown below ***Figure 45.***

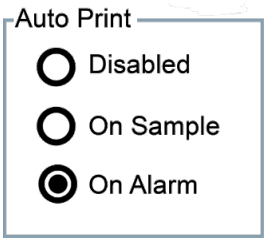


Figure 45. Auto Print Radio Options

17. Once all selections are made, press the *Green Back* icon to return to the *Standard* screen and then again to return to the *Print Data* screen.
18. The *Print Data* screen displays.
19. Press the *Print* button.

Reports

The SCS Handheld Particle Counter can produce reports to satisfy ISO, EU-GMP and US Federal standards as described below.

Table 6. Report Standards

Standard	Description
ISO 14644-1	Specifies the classification of air cleanliness in terms of concentration of airborne particles in cleanrooms and clean zones based on International Standards Organization.
EU-GMP Annex-1	Supplementary guidelines to the European Commission (EC) Good Manufacturing Practice (GMP) Guide with specific requirements of sterile medicinal products.
FS 209E	Airborne Particulate Cleanliness Classes in Cleanrooms and Clean Zones (cancelled 11/2001 and replaced with ISO 14644-1, which continues to be the standard in effect).

Room Definitions

The parameters of a room may be defined using the *Room Definition* screen. There are Room Definitions for each Report Standard listed above.

To select the input parameters to define the output of the report, press the *Room Definition* button on the corresponding *Report* screen. The *Room Definition* screen displays. The fields include *Room Size*, *Class*, *Allowed (channel) Sizes*, *Room Status* and *Air Flow* as shown below in ***Figure 46.***

Once the parameters are selected, press the green *Back* icon to return to the *Standard* screen and then again to return to the *Reports* screen.

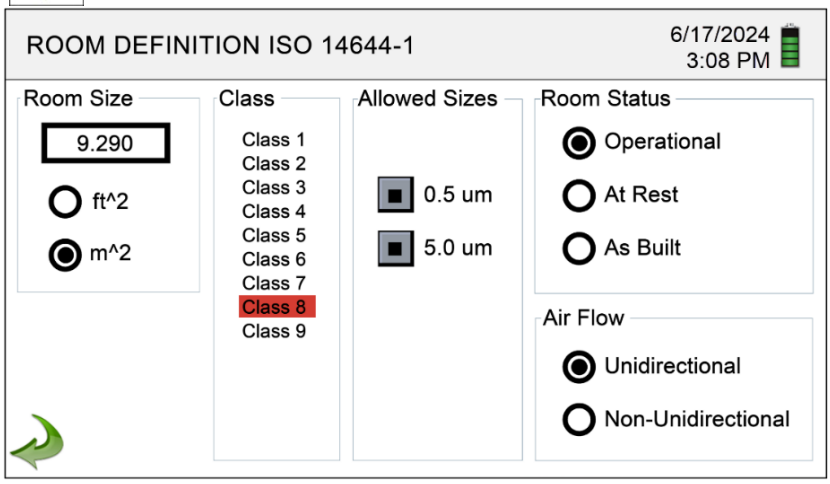


Figure 46. Room Definition ISO Screen

Creating Reports

The previously defined parameters are then used in the report generation process. To create a report:

1. Press the *Reports* icon.
2. The available *Reports* display as shown below in ***Figure 47***.

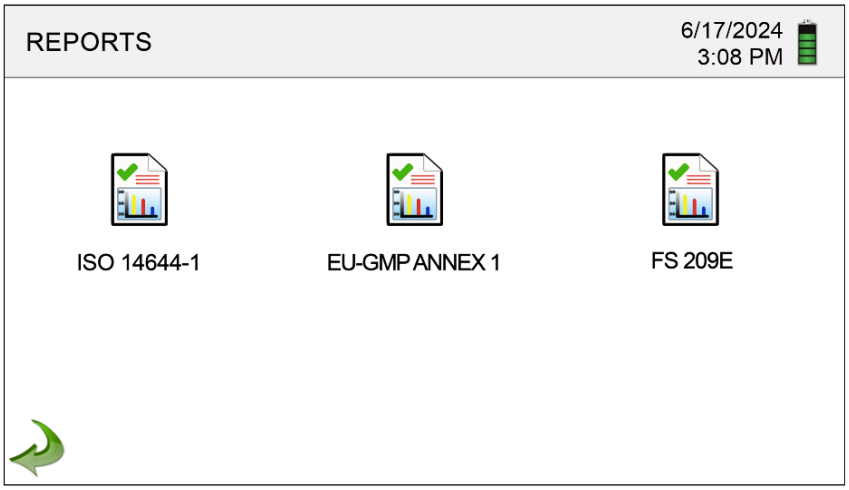


Figure 47. Reports Screen

3. Press the appropriate icon (ISO, GMP or FS) to generate the report for the desired standard.
4. Press the *Generate* button.

5. The *Test Data Created* pop-up displays as shown below in ***Figure 48***.

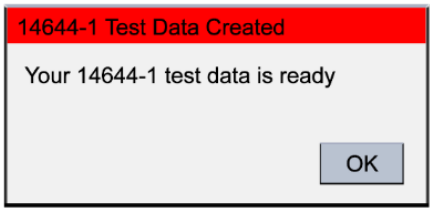
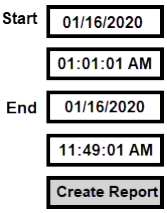


Figure 48. Test Data Created Pop Up

6. Press the *OK* button to continue.
7. The *Report Generation* screen displays.



8. To select the start and end points of the report, press the *Start* and *End* dates and times buttons. The corresponding Start/End Time/Date screens display.
9. Adjust the start/end dates and times as desired using the numeric keypad and < and > arrows. Enter the values.
10. Press the *OK* button to save the dates/times or *Cancel* to go back to the *Report Generation* screen without saving.
11. Press the *Create Report* button for five (5) seconds shown below in ***Figure 49***.

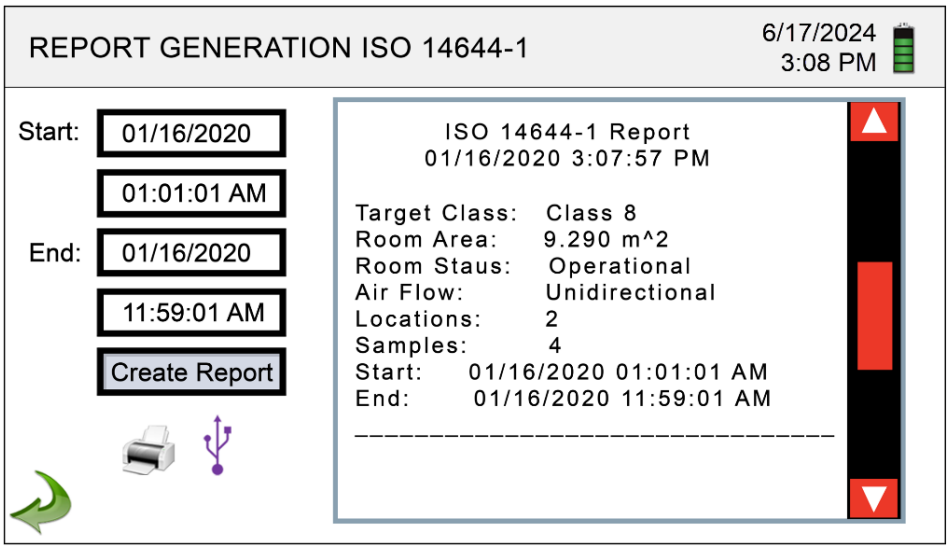


Figure 49. Report Generation (ISO Standard) Screen

Note: Incorrect count values or sampling set-up generate report errors prior to printing.

12. The sample report generates on the screen as shown below in ***Figure 50.***

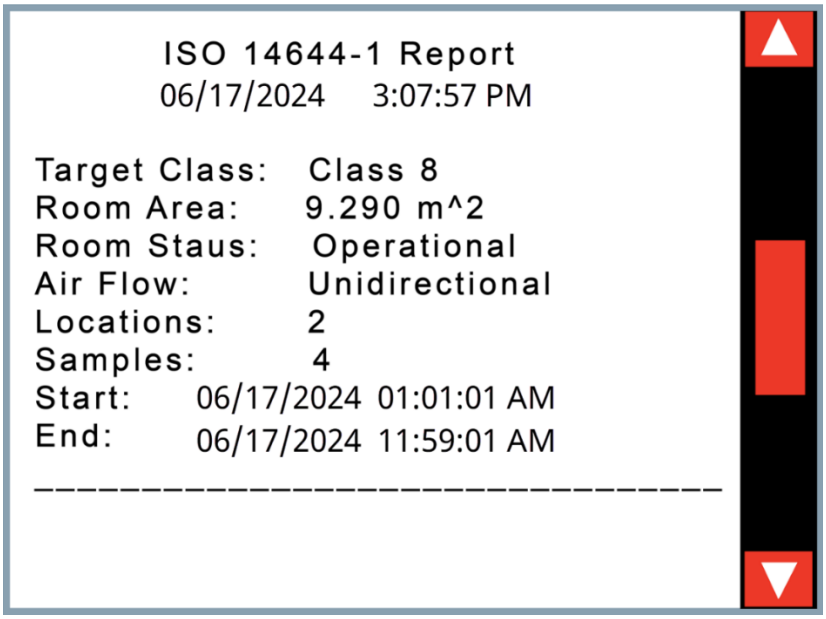


Figure 50. Sample Report Output – Screen

Note: These records are added to the recorded data so the values and information may be reviewed prior to completing the report and saving to an external source.

Excluding Outliers

The data may contain errors due to issues such as incorrect sampling location or time. These errors, called outliers, can be excluded during analysis by marking them as such. SCS instruments provide users with that option.

To exclude an outlier measurement from the report, go to *Recorded Data*, find the specific recorded data to be excluded and annotate the record by writing “EXCLUDED” or “EX.” Enter a brief description after the “EXCLUDED” or “EX” explaining why the data is being excluded.

Example Annotations: “EXCLUDED Sample Stopped Early” or “EX Equipment Failure.” See ***Adding Annotations to Recorded Data*** for more information about annotations.

Printing Reports

Reports can be saved to the USB thumb drive or printed. The USB drive or printer must be connected to the instrument to display the icons. Refer to ***Printing/Saving Current Record*** for more information.

If there is a printer connected, press the *Printer* icon. Follow the printer prompts. The report prints as shown below in ***Figure 51***.

```
       ISO 14644-1 Report
     06/02/2024 08:07:19 AM

Target Class: Class 5
Room Area:    80.000 m2
Rooo Status:  Operational
Air Flow:     Unidirectional
Locations:    9
Samples:      11
Start:    02/02/2024 06:53:01 AM
End:      02/02/2024 10:53:09 AM
--------------------------------
Class Class 5 (at 0.3)      PASS

 Class Limit:   10,200.00 p/m3
 Min Sample Vol:  0.00283   m3

 Grand Mean:             6,349.21
 Std Dev:                2,154.42
 Std Error:                718.14
 95% UCL:                7,684.94

location                Avg P/m3
14644 Test Loc 1          8,750.0
14644 Test Loc 2          6,607.1
14644 Test Loc 3          2,107.1
14644 Test Loc 4          3,785.7
14644 Test Loc 5          5,857.1
--------------------------------
Class Class 5 (at 0.5)      PASS

 Class Limit:    3,520.00 p/m3
 Min Sample Vol:  0.00568   m3

 Grand Mean:               706.35
 Std Dev:                  381.65
 Std Error:                127.22
 95% UCL:                  942.97

location                Avg P/m3
14644 Test Loc 1            750.0
14644 Test Loc 2            857.1
14644 Test Loc 3              0.0
14644 Test Loc 4            250.0
14644 Test Loc 5            785.7
--------------------------------
Unit Serial #:               1000
Last Cal:              05/01/2025
-------- End of Report ---------
```

Figure 51. Report Sample – Printer

6.0 Settings

All aspects of the instrument's setup can be managed from the icon driven *Settings* sub-menus.

Note: When the administrator password is in use, this screen is not available and may only be accessed and settings modified by the administrator.

To set up the instrument, from the *Home* Screen, press the *Settings* icon. The *Settings* screen displays as shown below in ***Figure 52***.

The following settings may require setup to fully utilize the features of the Handheld.

- ***Sampling Setup***
-
- ***Channel Management***
- ***Locations & Recipes***
- ***Configuration***
- ***Printer Setup***
- ***Communication***
- ***Environment***
- ***Password Setup***
- ***Screens***

Figure 52. Settings Screen

Sampling Setup

The *Sample Setup* screen enables users to set up sampling timing, volume units, etc. To begin setting up the sampling feature, press the *Sampling Setup* icon. The *Sample Setup* screen displays.

Note: If the *Use Recipes* box is selected, the *Sample Setup* screen displays as shown below in ***Figure 53*** with only the *Sample Volume Units* radio buttons and *Clear Samples* icon displaying.

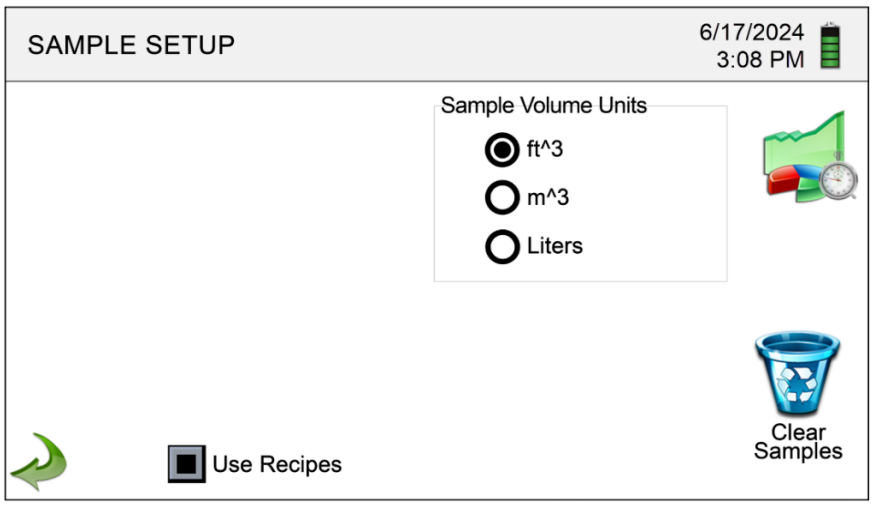


Figure 53. Sample Setup Screen (without Sample Timing)

To display the *Sample Timing* screen, de-select the *Use Recipes* radio button. The *Sample Setup* screen displays as shown below in ***Figure 54***. Use ***Table 7*** below to set up sample timing.

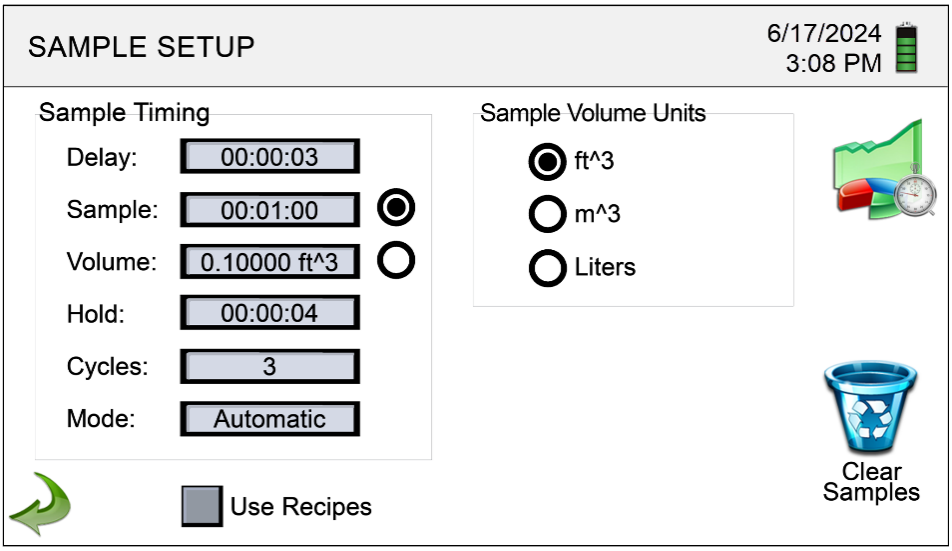
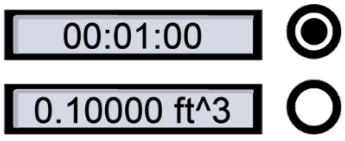
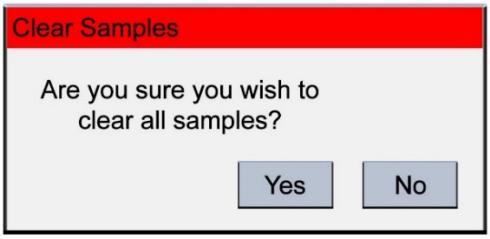
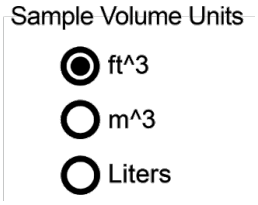


Figure 54. Sample Setup Screen (with Sample Timing)

Table 7. Sample Setup Screen Features

Button	Feature	Description
00:00:03	Delay	To enter/change the time delay and allow the operator to leave an area before sampling begins: 1. Press the *Delay* field button. 2. The *Enter Time* screen displays. 3. Use the < or > arrows and the numeric keypad to change the hours, minutes and seconds (HH:MM:SS) as appropriate. Enter the values. 4. Press the *OK* button. **Note**: The maximum delay time is 99 hours, 59 minutes, and 59 seconds. **Note:** This field does not display if *Use Recipes* is selected.
00:01:00	Sample	To set the time at which to take the sample: 1. Press the *Sample* field button. 2. The *Enter Time* screen displays. 3. Use the < or > arrows and the numeric keypad to change the hours, minutes and seconds (HH:MM:SS) as appropriate. Enter the values. 4. Press the *OK* button. **Note**: The maximum delay time is 99 hours, 59 minutes, and 59 seconds. **Note:** This field does not display if *Use Recipes* is selected.

Button	Feature	Description
	Volume	To control the length of time per sample to achieve the desired sample volume, 1. Press the *Volume* field button. 2. The *Enter Sample Volume* screen displays. 3. Use the < or > arrows and the numeric keypad to achieve the desired volume. 4. Press the *OK* button. **Note:** Field does not display if *Use Recipes* is selected.
	Hold	To control the amount of time the instrument waits between samples while in automatic mode: 1. Press the *Hold* field button. 2. The *Enter Time* screen displays. 3. Use the < or > arrows and the numeric keypad to change the hours, minutes and seconds (HH:MM:SS) as appropriate. Enter the values. 4. Press the *OK* button. **Note**: The maximum hold time is 99 hours, 59 minutes, and 59 seconds. **Note:** Field does not display if *Use Recipes* is selected.
	Sample or Volume Selection	Samples can be collected for a specific amount of time (hours, minutes and seconds) or for a specific amount of air (e.g. one cubic meter, which equals 23 minutes and meets the clean requirement certification requirement). To select a time-based sample, press the *Sample* button next to the *Sample* field. To select a volume of air-based sample, press the *Volume* button next to the *Volume* field.
	Cycles	This feature offers users the ability to control the number of sampling cycles to be taken at a specific location when the unit is in automatic mode: 1. Press the *Cycles* field button. 2. The *Enter Cycles* screen and numeric keypad display. 3. Use the < or > arrows and the numeric keypad to select the number of cycling samples at a specific location or zeroes for continuous sampling. Enter the values. 4. Press the *OK* button. **Note:** The *Cycles* field does not display if *Use Recipes* is selected.

Button	Feature	Description
	Mode	This feature offers users the ability to run the instrument at will or on a schedule. To change the mode from automatic to manual or manual to automatic: 1. Press the *Mode* field button. 2. The *Select Sample Mode* screen displays. 3. Press the desired *Sample Mode* radio (*Automatic* or *Manual*) button. 4. Press the *OK* button. **Note:** Field does not display if *Use Recipes* is selected.
	Clear All Samples	This action is not reversible, and all data is cleared from the instrument. This feature deletes all sample records stored on the instrument. To delete all sample records on the instrument: 1. Press the *Clear Samples* icon. 2. The *Clear Samples* window displays as shown below.  3. Press the *Yes* button to confirm.
	Sample Volume Units	To select the unit of measurement used for the sample volume, select the Cubic Feet (*ft^3*), Cubic Meters (*m^3*) or *Liters* radio button.
	Use Recipes	The *Use Recipes* feature causes stored recipes associated with locations to be used instead of general settings from the *Sample Setup* screen. Press the *Use Recipe* button on the *Sample Setup* screen under *Sample Timing* to activate the feature. **Note**: When the *Use Recipe* radio button is selected, the *Sample Timing* screen does not display. **Note**: The *Use Recipe* button is also available for activation on the *Channel Management* and *Location & Recipes* screens.

Button	Feature	Description
	Back	To return to the previous or *Home* screen (as appropriate), press the *Back Arrow* icon on bottom left corner of the display.

Channel Management

The *Channel Management* screen controls many of the Handheld's features such as enabling or disabling channels, setting custom channel sizes, enabling, or disabling alarms by channel, and the setting of the alarm thresholds. To use the *Channel Management* screen features:

1. Press the *Settings* icon.
2. The *Settings screen* displays.
3. Press the *Channel Management* icon.
4. The *Channel Management* screen displays as shown below in ***Figure 55***.

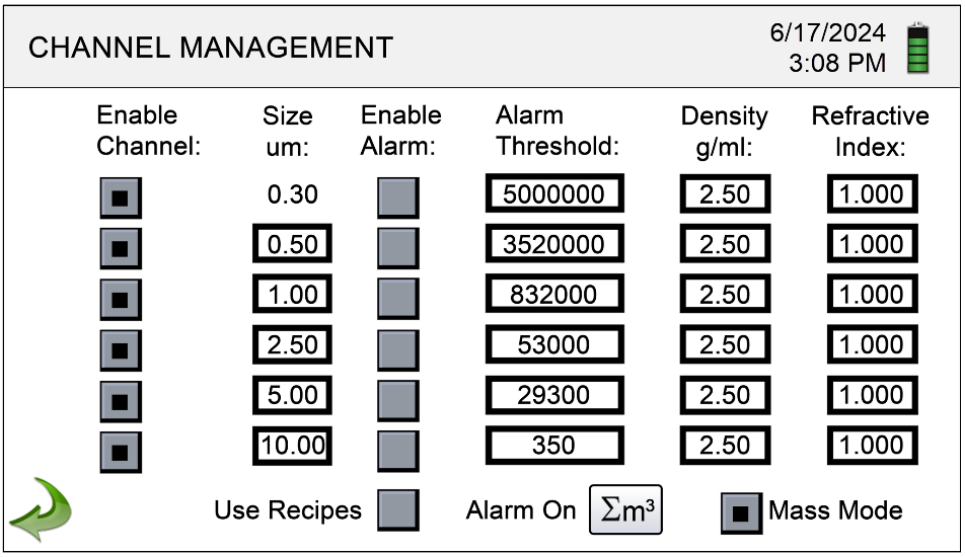
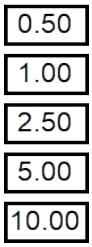
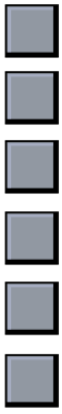
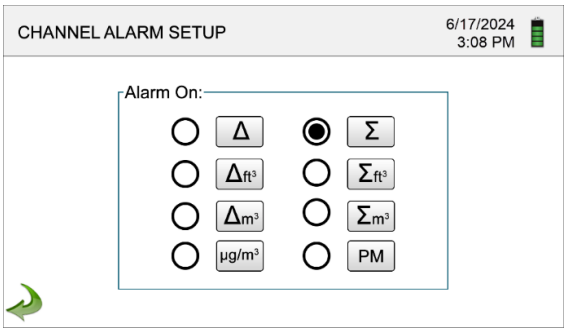


Figure 55. Channel Management Screen

4. Make changes to the channels as described in ***Table 8*** below.

Table 8. Channel Management Screen and Features

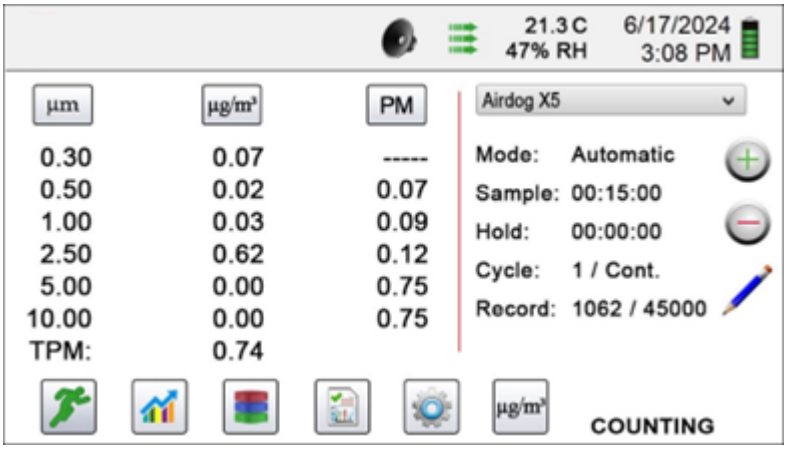
Field/Button	Feature	Description
Enable Channel 	Enable Channel	The Handheld Particle Counter has 6 channels. To turn each channel on or off, press the corresponding radio button. When a channel is turned on, values are recorded and displayed. When the channel is turned off all values related to that channel are ignored. They are not displayed or recorded.
Size µm: 0.30 	Size µm	The *Size µm* feature controls the particle size measured and recorded for the selected channel. It is also known as variable binning and is ideal for focusing on specific particle sizes. To change the particle size: 1. Press the *Size µm* field. 2. The *Enter Channel Size* screen displays. 3. Use the < or > arrows and the numeric keypad to change the particle size measurement. Enter the values. 4. Press the *OK* button when complete.
Enable Alarm 	Enable Alarm (does not display when Use Recipes is active)	This feature turns on the alert for the desired channel corresponding to the alarm. To turn on the alarm, press the radio button located between the desired channel and alarm threshold.
Use Recipes 	Use Recipes	This button applies the recipes used within the channel specifications and turns them on for use by the particle counter.
Alarm On 	Alarm On	These alarms alert users to particle counts that are outside the parameters set in *Alarm Threshold*. The *Alarm On* indicator displays the alarm that is currently selected. To select the alarm to be turned on: 1. Press the *Alarm On* button.

Field/Button	Feature	Description
		2. The *Channel Alarm Setup – Alarm On* screen displays as shown below in ***Figure 56.***  **Figure 56. Channel Alarm Setup - Alarm On** 3. Press the radio button corresponding to the desired alarm: • Δ (Differential Count), • Δft³ (Differential Cubic Feet), • Δm³ (Differential Cubic Meter), • Σ (Cumulative Count), • Σft³ (Cumulative Cubic Feet Count), • Σm³ (Cumulative Cubic Meter Count), • PM (µg/m³). **Note**: Only one alarm may be selected at a time. 4. To return to the previous or *Home* screen (as appropriate), press the green *Back Arrow* icon on bottom left corner of the display.
Alarm Threshold: 5000000 3520000 832000 53000 29300 350	Alarm Threshold	This feature works in conjunction with *Alarm On* for the user to set the parameters for the alarm(s) being triggered for individual channels. To set the alarm threshold: 1. Press the *Alarm Threshold* field for the appropriate channel. 2. The *Enter Alarm Threshold* screen displays. 3. Use the < or > arrows and the numeric keypad to select the parameters for that channel's alarm. Enter the desired values. 4. Click the *OK* button. 5. The *Channel Management* screen displays.

Field/Button	Feature	Description
Density g/ml: 2.50 2.50 2.50 2.50 2.50 2.50	Density g/ml (only displays when Mass Mode is active)	The *Density* field refers to the mass of the particles including the spaces between them, divided by the total volume occupied. To the enter the density: 1. Press the *Density g/ml* field for the appropriate channel. 2. The *Enter Density Factor* screen displays. 3. Use the < or > arrows and the numeric keypad to select the parameters for that channel's alarm. Enter the desired values. 4. Click the *OK* button. 5. The *Channel Management* screen displays.
Refractive Index: 1.000 1.000 1.000 1.000 1.000 1.000	Refractive Index (only displays when Mass Mode is active)	The *Refractive Index* field indicates a ratio of the velocity of light in a vacuum to its velocity in a specified medium. To enter the refractive index for the specified channel: 1. Press the *Refractive Index* field for the appropriate channel. 2. The *Enter Refractive Index* screen displays. 3. Use the < or > arrows and the numeric keypad to select the parameters for that channel's alarm. Enter the desired values. 4. Click the *OK* button. 5. The *Channel Management* screen displays.
■ **Mass Mode**	Mass Mode (enables Density g/ml and Refractive Index fields)	The *Mass Mode* (mass concentration mode) feature is a calculation based on the particle size, refractive index, and density. When enabled, the instrument displays particle count data as calculated particle mass concentration in weight/volume units. The international SI unit for mass is (kg/m^3), which can be translated to micrograms per milliliter (µg/ml). 1. To enable *Mass Mode*, press the *Mass Mode* radio button. 2. The *Density g/ml* and *Refractive Index* fields display.

Table 9. Home Screen Calculated Values for Mass (Concentration) Mode

Field	Description
$\mu g/m^3$	When *Mass (Concentration) Mode* is selected, $\mu g/m^3$ is the measured value in the first column. $\mu g/m^3$ = micrograms (one-millionth of a gram) per cubic meter air The mass value for a channel size is the particle count between that channel and the next larger channel, calculated using the average particle size of the two channels. **Example**: The value in the 0.50 µm data field represents the mass of all particles counted between this channel and the next highest channel, calculated as the mass of a particle that is 0.75 µm.

Field	Description
PM (Particle Mass)	**Note**: To enable the Particle Mass (PM) value, press the *Particle* icon on the *Home* Screen and toggle to µg/m³. *PM* displays at the top of the third column. When *Mass (Concentration) Mode* is enabled, µg/m³ is the measured value in the second column of the *Home* screen.  **Figure 57. Mass Concentration** The column labeled *PM* displays the total particle mass of particles that are less than the displayed channel size. **Example**: The value displayed in the *PM* field for the 2.5 µm channel is the particle mass (µg/m³ column) of all particles with a size less than 2.5 µm, referred to as PM 2.5.

Locations & Recipes

A sampling recipe is a set of instructions (including the number of samples, sample time, intervals, etc.) used in particle counting. Up to 1,000 unique location names can be created and up to 50 unique recipes can be created and assigned to any number of locations.

1. To open the *Select Location & Recipes* screen, press the *Settings* icon.
2. The *Settings screen* displays.
3. Press the *Location & Recipe* icon.
4. The *Select Location & Recipe* screen displays as shown below in ***Figure 58***.

Note: The *Recipe* and *View* tabs only display when the *Use Recipes* radio button is activated.

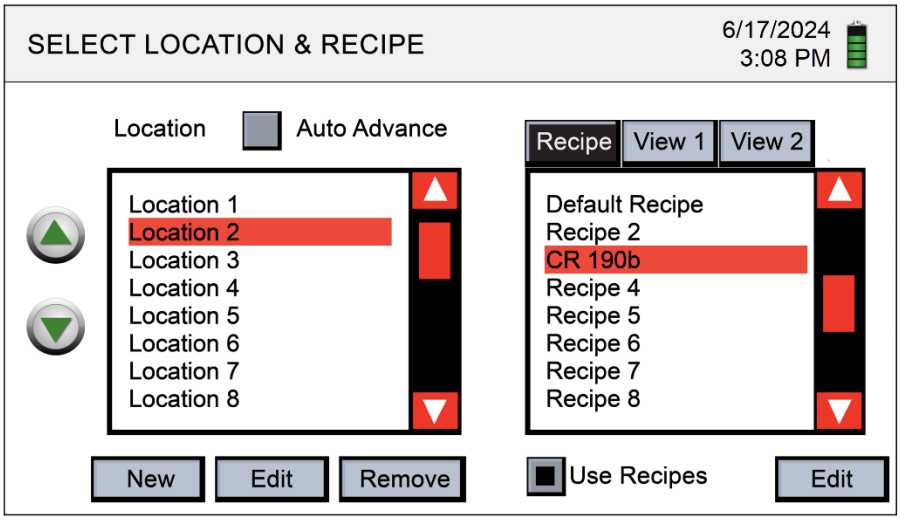
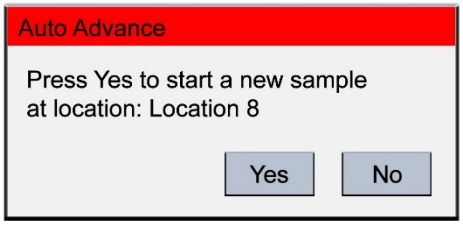
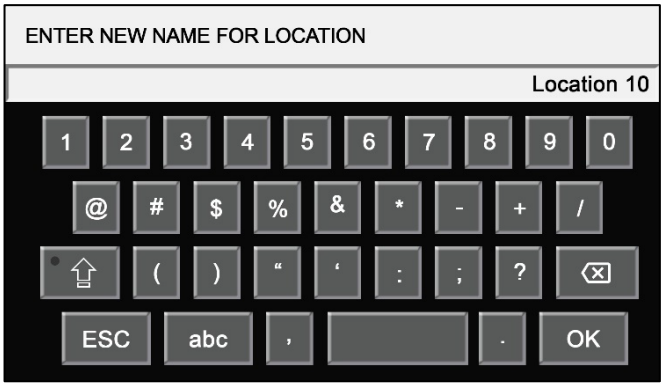


Figure 58. Location & Recipes Screen

5. Use the location and recipe features as described in ***Table 10*** below.

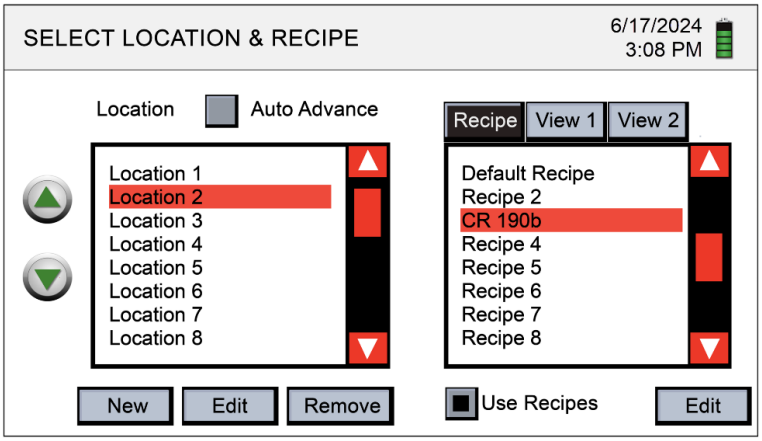
Table 10. Select Location & Recipe Screen Features — Location

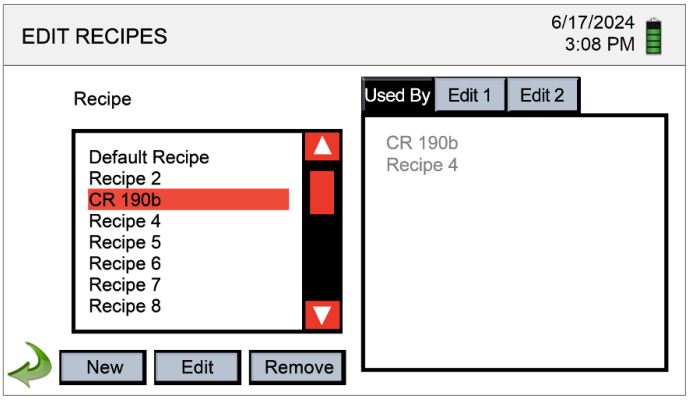
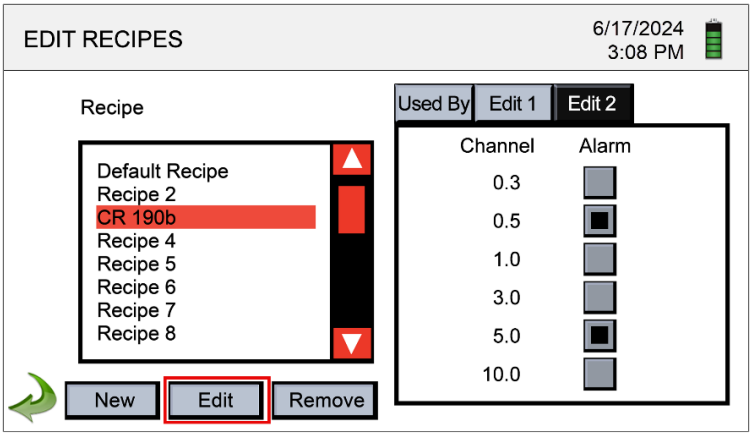
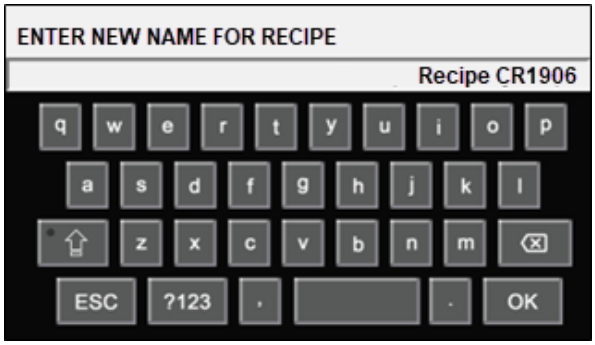
Field/Button	Feature	Description
☐ Auto Advance	Location Auto Advance	Enabling the *Auto Advance* feature causes sampling to advance from one sampling location to the next without intervention. **Note:** To use this feature, first verify there are multiple locations and the *Use Recipes* (shown above ***Figure 58***) is enabled. Press the *Auto Advance* radio button to enable the feature. **Note**: Locations do not need custom names for this feature to function. The device uses the default names. **Note**: If there are no recipes defined for a particular location, the instrument uses the default settings. With the *Auto Advance* feature enabled, during sampling the instrument prompts for confirmation between locations as shown below in ***Figure 59.*** When prompted, press the *Yes* button to continue to the next location. Press the *No* button to stop sampling.  **Figure 59. Auto Advance Confirmation Prompt**

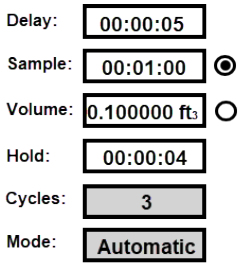
Field/Button	Feature	Description
	Slider	The *Select Location & Recipe* screen enables scrolling through the various locations displayed on the left side. To view the various locations, 1. Use the vertical slider to the right of the location names for scrolling. 2. Use the white arrows for fine control. 3. Use the red slider bar with the provided stylus or a finger to navigate through large numbers of locations.
	Change Sequence of Locations	The green up and down arrow buttons enable users to change the sequence of the listed locations and, thus, the order particle counts are conducted when in *Auto Advance* mode. 1. Press the green up arrow to move a location up in order of those to be tested. 2. Press the green down arrow to move a location down in the order.
	New Location Entry	Users may add up to 1,000 locations as follows: 1. To add a new location, press the *New* button. The *Enter Name for New Location* screen displays using a default name.  2. Enter a name using the keyboard screen.  **Note**: There is a 20-character limit. 3. Press the *?123* button to enter numerals. 4. Press the *Back* button to erase typed characters. 5. Press the *Up*-arrow button to capitalize a letter. 6. Press the *Esc* button to return to the previous screen without saving the location name. 7. Press the *OK* button to save the location name.
	Edit (Location Name)	Users may change the name of the location as follows: 1. To edit the name of a location, use the red slider or white arrows to advance to the desired location. 2. Press the *Edit* button. 3. The *Enter New Name for Location* screen displays including the current name. 4. Use the keyboard screen described in the ***New Location Entry*** feature above.

Field/Button	Feature	Description
		Note: There is a 20-character limit.
Remove	Remove Location	Users may delete stored locations as follows: **Note**:There is no confirmation before deleting a location. 1. To delete a stored location, use the red slider or green arrows to advance to the desired location. **2.** Press the *Remove* button. **3.** The location is deleted.

Table 11. Select Location & Recipe Screen Features — Recipes

Field/Button	Feature	Description
Use Recipes	Use Recipes	The *Use Recipes* feature causes stored recipes associated with locations to be used instead of general settings from the *Sample Setup* screen. Press the *Use Recipe* button to activate the feature. **Note**: The *Use Recipe* button is also available for activation on the ***Channel Management*** and *Sample Setup* screens. To assign a recipe to a specific location, select the location and then select one of up to 50 available recipes as shown below in ***Figure 60.***  **Figure 60. Selection Location & Recipe/View-By-Screen**
Edit	Edit (Recipe Name)	The *Edit* feature enables users to edit the name of recipes as follows: **Note**: Press *Use Recipes* on *Sample Setup* or *Select Location & Recipe* screen to use Recipe features if not already activated. Recipe 1. Press the *Recipe* tab (if not already selected) on the *Location & Recipe* screen.

Field/Button	Feature	Description
		2. Scroll using the red slider bar and select the desired recipe. 3. Press the *Edit* button. 4. The *Edit Recipes* screen displays as follows.  **Figure 61. Edit Recipes Screen - Used By** 5. To edit the name of the selected recipe, under the *Recipe* window, press the *Edit* button under the list of recipes on the left side of the screen.  **Figure 62. Edit Recipes Screen - Edit** 6. The *Enter New Name* for Recipe screen displays.  **Figure 63. Enter New Name for Recipe**

Field/Button	Feature	Description
		7. Enter a name using the keyboard screen. **Note**: There is a 15-character limit. 8. Press the *?123* button to enter numerals. 9. Press the *Back* button to erase typed characters. 10. Press the *Up*-arrow button to capitalize a letter. 11. Press the *Esc* button to return to the previous screen without saving the location name. 12. Press the *OK* button to save the location name.
Edit	Edit (Recipe)	Users may edit recipes as follows: **Note:** To use the *Recipe* features, press *Use Recipes* on the *Sample Setup* screen or the *Select Location & Recipe* screen if not already activated. 1. On the *Select Location and Recipe* screen, press the *Recipe* tab (if not already selected) on the right side. 2. Scroll using the red slider bar and select the desired recipe. 3. Under the *Recipe* slider bar on the right side of the screen, press the *Edit* button. 4. The *Edit Recipes* screen displays. 5. Under the *Recipe* window, the recipe selected in Step 2 is highlighted. The *Used By* and *Edit 1 and Edit 2* tabs also display. Used By 6. On the *Used By* tab, the locations that use the selected recipe display in gray. 7. See the steps below to edit the variables on the ***Edit 1*** and ***Edit 2*** tabs.
Edit 1	Edit 1 (Edit Recipe Variables)	The *Edit 1* recipe variables display as follows:  **Figure 64. Edit 1 Variables** To edit these variables, see ***Table 7. Sample Setup Screen Features*** for more information.
Edit 2	Edit 2 (Edit Recipe Variables)	1. Click the *Edit 2* tab.

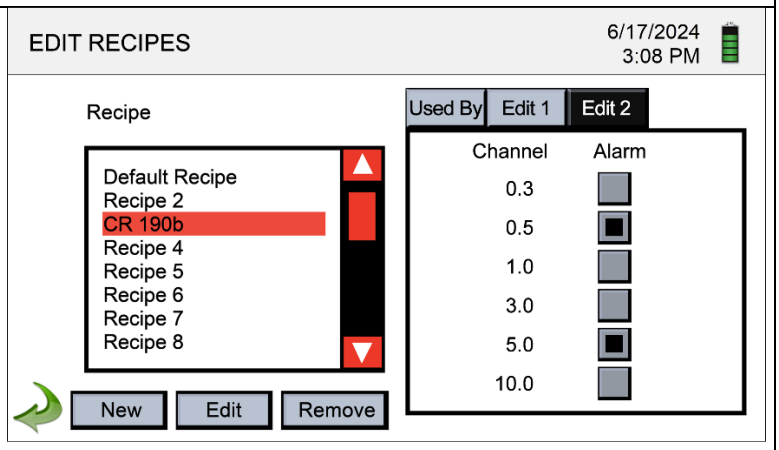
<table>
<tr><th>Field/Button</th><th>Feature</th><th>Description</th></tr>
<tr><td></td><td></td><td>


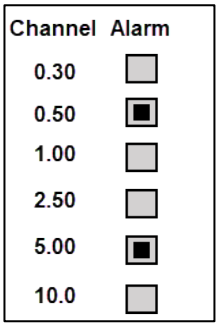
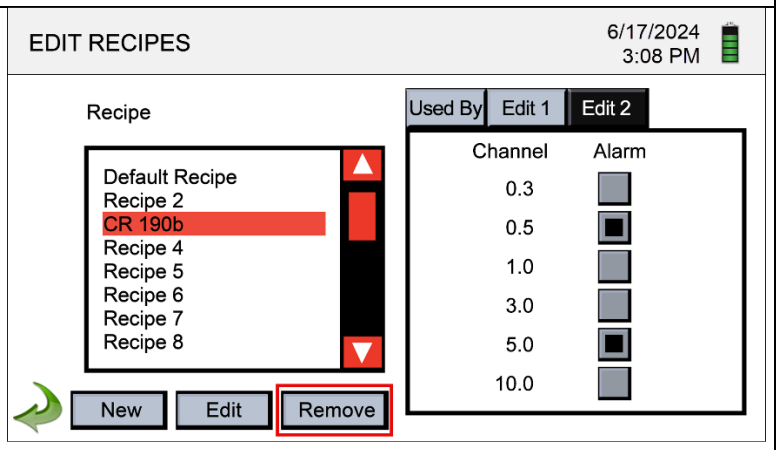
Figure 65. Edit 2 Selected
2. The Edit 2 recipes variables display as follows:


Figure 66. Edit 2 Channel Alarms
3. To turn a channel alarm On or Off, press the Alarm radio button corresponding to the channel.
</td></tr>
<tr><td>Remove</td><td>Remove Recipe</td><td>
To remove a recipe from the list:
1. On the Home Screen, press the Locations & Recipes icon.
Recipe 2. On the Selection Locations & Recipes screen, on the Recipes tab, select the appropriate recipe.
3. Select the Edit button under the scroll bar on the right side under the Recipe tab.
4. The Edit Recipes screen displays.
5. On the Recipe window, verify the correct recipe is selected.
6. Press the Remove button.
</td></tr>
</table>

Field/Button	Feature	Description
		 **Figure 67. Edit Recipes Screen - Edit** 7. The recipe is deleted. **Note:** The recipe is deleted without any confirmation or warning.

7.0 Configuration

The *Configuration* screen provides users with the ability to configure various aspects of the instrument such as: selecting the language the instrument displays, whether the instrument stores partial samples, enabling alarm acknowledgement and annotations, changing the number format, saving the configuration to the USB drive, and restoring the device to the original factor set-up.

To change the configuration parameters, press the *Configuration* button. The *Configuration* screen displays below in ***Figure 68.*** See a description of the features and how to use them in ***Table 12*** below.

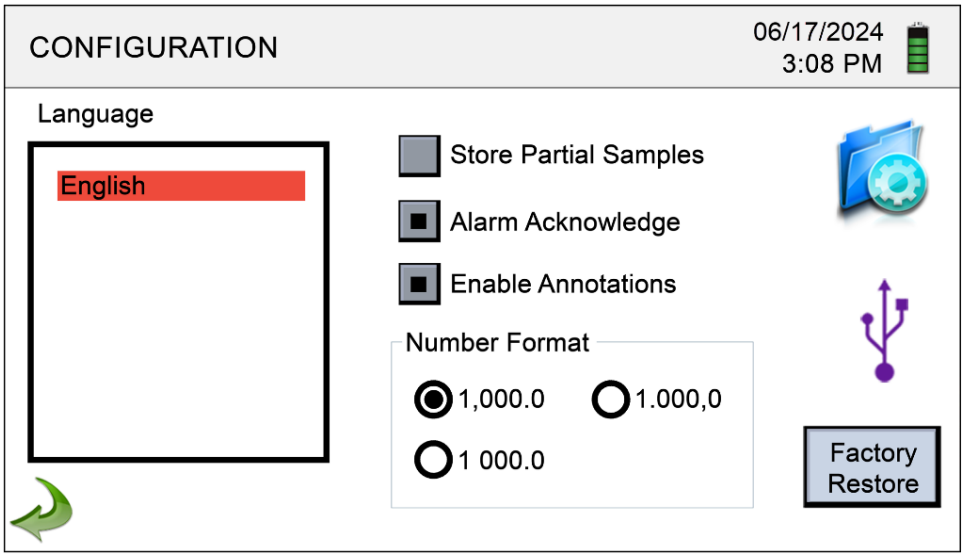
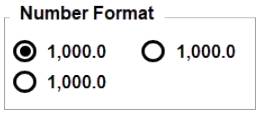
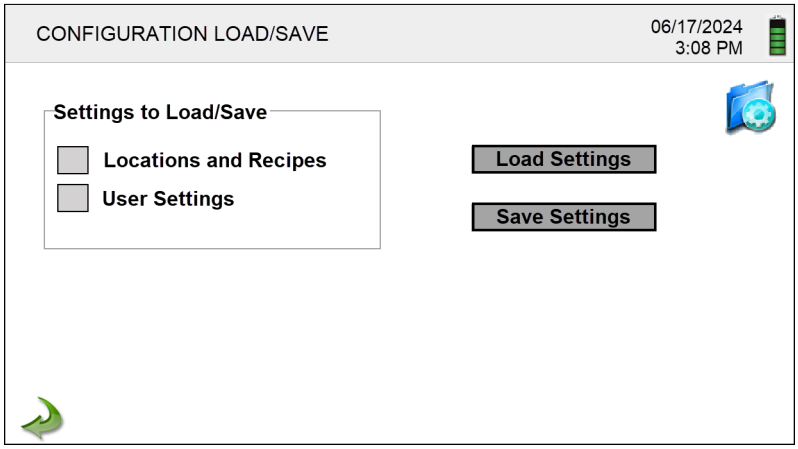


Figure 68. Configuration Screen

Table 12. Configuration Screen Features

Field/Button	Feature	Description
Language English	Language	The *Language* screen lists the instrument's available languages.
Store Partial Samples	Store Partial Samples	Left unchecked, the instrument ignores values from prematurely ended samples (i.e., partial sampling events). To store partial samples, press the *Store Partial Samples* button.
Alarm Acknowledge	Alarm Acknowledge	When alarms sound and display, users may wish to require a response before they stop. To require an alarm be acknowledged by a user, press the *Alarm Acknowledge* button. **Note**: When enabled, the audible sounder continues to sound until the alarm bell icon is pressed on the *Home* screen.
Enable Annotations	Enable Annotations	Users may enter annotations as described in ***Adding Annotations to Recorded Data.*** This button enables this *Annotation* feature.

Field/Button	Feature	Description
	Number Format	Users may select from three number formats including: with decimal points, commas, or spaces. Press the radio button matching the desired format.
	Save Settings to USB	Users may save the instrument's configuration including User Settings and Locations and Recipes to a USB device to upload them to any other SCS Handheld Particle Counter. 1. Plug in a USB thumb drive into the USB port on the side of the instrument. 2. The *USB* icon displays. 3. Press the *USB* icon. 4. The *Configuration Load/ Save* screen displays as follows.  **Figure 69. Configuration Load/Save Screen** 5. Select either or both the *Locations and Recipes* or *User Settings*.  6. Press the *Save Settings* button. 7. The *Confirm Load* dialog box displays. 8. Press the *Yes* button to confirm overwriting the existing data or press *No* to cancel.
	Factory Restore	Users may reset the instrument's settings to the original factory-set condition as follows: 1. Press the *Settings* icon. 2. Press the *Configuration* screen. 3. Press the *Factory Restore* button. 4. The *Confirm Factory Restore* screen displays. 5. Select *Locations and Recipes*, *User Settings* or Retain *Language Setting* from the radio button options. 6. Press the *Confirm* button to complete.
	Back	To return to the previous or *Home* screen (as appropriate), press the *Back Arrow* icon on bottom left corner of the display.

8.0 Printer Setup

Users may print various values and reports on the optional thermal printer as discussed in ***Printing/Saving Current Record*** and ***Creating Reports*** using the optional thermal printer. Prior to using the printer, set it up as follows:

1. Connect the hardware and cables as follows.

Note: Printer comes with both a battery and an AC adapter.

a. Slide open battery compartment button on back of printer.
b. The compartment door releases.
c. Remove battery from battery compartment.
d. Remove protective cover from battery.
e. Reinsert battery (lettering side up – connector is middle left on battery).
f. Lock battery compartment.
g. Plug AC adapter into the side of printer.
h. Plug AC adapter into wall to charge battery before using printer on battery power.

Note: User may also use printer while plugged into AC adapter.

i. Plug USB cable into side of printer and into USB connector on side of the Handheld.
j. Press *the Power* button on printer for five seconds.
k. The green *Mode* LED button displays.
l. The green *Battery LED* button displays when AC adapter is plugged in.

2. From the *Settings* screen, press the *Printer Setup* icon.
3. The *Printer Setup* screen displays as shown below in ***Figure 70***.

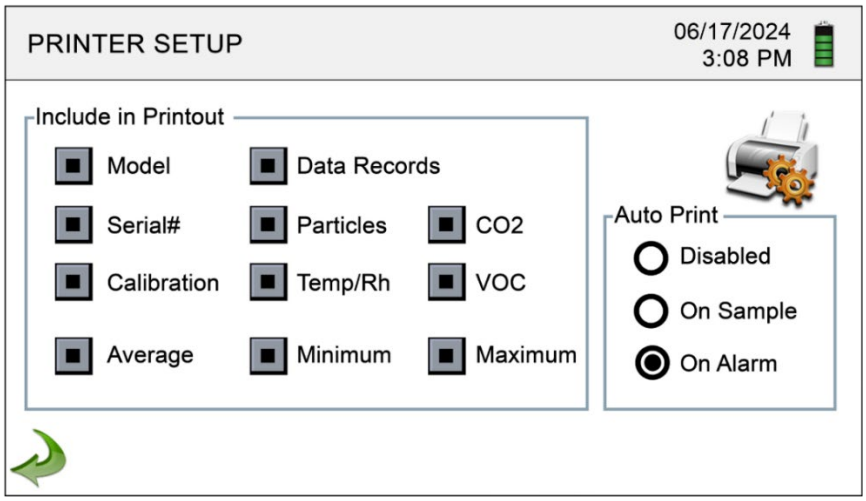


Figure 70. Printer Setup Screen

4. Press the button(s) corresponding to the desired values to be printed on reports as shown below in ***Figure 71***.

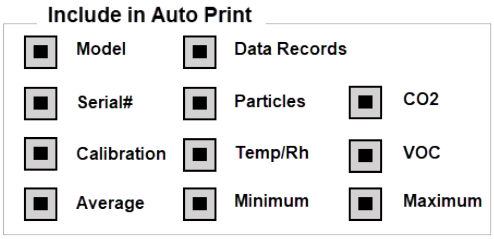


Figure 71. Include in Printout Options

5. Reports may be printed automatically if the instrument is connected to the printer. To select when reports should automatically print using the *Auto Print* radio buttons options shown below ***Figure 72.***

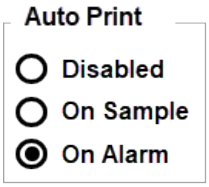


Figure 72. Auto Print Options

9.0 Communication

The SCS Handheld Particle Counter offers multiple modes of communication connections for uploading or downloading data or operational configurations.

Those options include: ethernet, RS485, RS232, USB host or client, and an optional Wi-Fi connection.

Ethernet and Wi-Fi Setup

Press the *Communication* icon to open the *Communications* screen as shown below in ***Figure 73***.

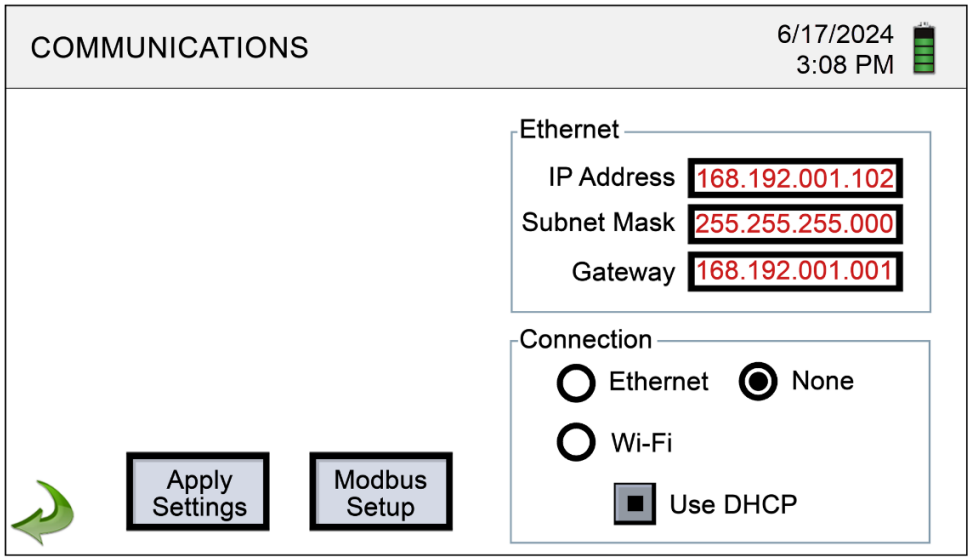
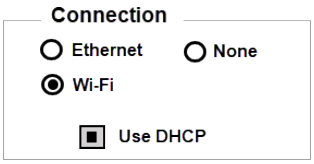
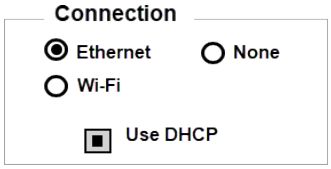
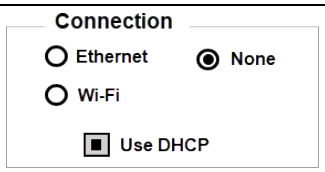


Figure 73. Communications Screen

Table 13. Communications Screen Features

Field/Button	Feature	Description
	Connection: Wi-Fi	To connect the instrument to the network using the wireless connection, press the *Select Wi-Fi* radio button.
	Connection: Ethernet	To connect the instrument to the network using the RJ45 cable, press the *Select Ethernet* radio button.
	Connection: None	To use the instrument in a standalone mode, press the *None* radio button.

Field/Button	Feature	Description
■ Use DHCP	Use DHCP Radio Button	Dynamic Host Configuration Protocol (DHCP) is a networking protocol that automatically assigns IP addresses and other configurations to devices when they connect to a network. DHCP can assign IP addresses, Domain Name System (DNS) addresses, subnet masks, and default gateways. To automatically populate the *IP address*, *Subnet Mask* and *Gateway* fields from the router, to use either the Wi-Fi or Ethernet connections, press the *Use DHCP* radio button.
IP Address 168.192.001.135	IP Address (Wi-Fi and Ethernet)	A unique string of characters that identifies each computer using the Internet Protocol to communicate over a network. When displayed in red on the device, it was automatically populated by the *Use DHCP* feature. When displayed in black, it requires manual entry. 1. To manually enter, press the IP Address field. 2. The *Enter Ethernet IP Address* screen displays. 3. Using the numeric keyboard, enter the assigned IP Address. 4. Press the *OK* button to save or *Cancel* to exit out of screen without saving. 5. The *Communication* screen displays.
Subnet Mask 255.255.255.000	Subnet Mask (Wi-Fi and Ethernet)	A number that distinguishes the network address and the host address within an IP address (i.e., a network within a network). It is required in connecting the instrument to the network using both Wi-Fi and an ethernet connection. When displayed in red on the device, it was automatically populated by the *Use DHCP* feature. When displayed in black, it requires manual entry. 1. To manually enter, press the *Subnet Mask* field. 2. The *Enter Ethernet Subnet Mask* screen displays. 3. Using the numeric keyboard, enter the assigned Subnet Mask. 4. Press the *OK* button to save or *Cancel* to exit out of screen without saving. 6. The *Communication* screen displays.

Field/Button	Feature	Description
Gateway 168-192.001.001	Gateway (Wi-Fi and Ethernet)	A number that distinguishes a computer on a network that provides the interface between two applications or networks that use different protocols. When displayed in red on the device, it was automatically populated by the *Use DHCP* feature. It is required in connecting the instrument to the network using both Wi-Fi and an ethernet connection. When displayed in black, it requires manual entry. 1. To manually enter, press the *Gateway* field. 2. The *Enter Ethernet Gateway IP Address* screen displays. 3. Using the numeric keyboard, enter the assigned Gateway IP Address. 4. Press the *OK* button to save or *Cancel* to exit out of screen without saving. 5. The *Communication screen* displays.
SSID Your SSID	SSID (Wi-Fi only)	A public name given to a wireless network so users can easily find and connect to the network with an electronic device. It is case sensitive. 1. To enter the SSID, press the *Your SSID* field. 2. The *Enter WI-FI SSID* screen displays. 3. Using the keyboard, enter the assigned SSID. 4. Press the *OK* button to save or ESC to exit out of the screen. 5. The *Communication screen* displays.
Password Your Password	Password (Wi-Fi only)	A string of letters, numbers and/or special characters authenticate an identity or authorize access. 1. To enter the password, press the *Your Password* field. 2. The *Enter WI-FI Password* screen displays. 3. Using the keyboard, enter the assigned password. 4. Press the *OK* button to save or ESC to exit out of the screen. 6. The *Communication* screen displays.
Apply Settings	Apply Settings	To apply the communication settings, press the *Apply* button.
Modbus Settings	Modbus Setup	To set up the Modbus settings, press the *Modbus Setup* button and proceed to the next section.

Modbus Setup

Modbus is a legacy, open source, data communication protocol developed by a company called Modicon. It uses what is called the “master-slave” relationship where one device initiates commands to other devices, which respond accordingly. Modbus is still widely used in manufacturing/industrial applications. Modbus is often used to connect a plant/system supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition (SCADA) systems.

Modbus Setup Screen

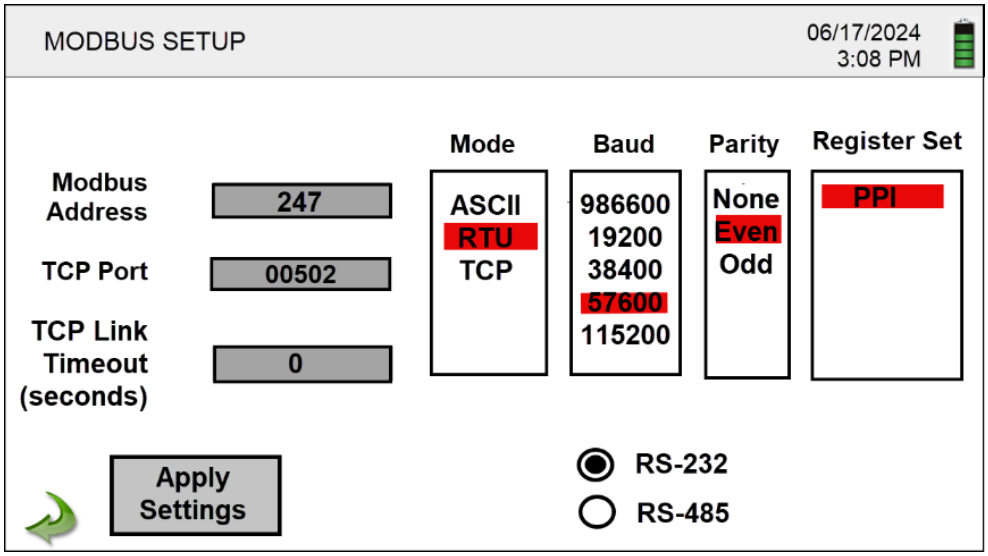


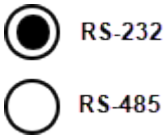
Figure 74. Modbus Setup Screen

The *Modbus Setup* screen, unlike the Ethernet and Wi-Fi screens, has no auto populate capability. Therefore, users need to complete/select the variables in each of the setup screen fields as discussed below in ***Table 14***.

Table 14. Modbus Setup Screen Features

Field/Button	Feature	Description
	Modbus Address	The *Modbus Address* is a text string that defines the location of data. 1. To enter the address: 2. Press the *Modbus Address* field. 3. The *Enter Modbus Address* screen with a numeric keypad displays. 4. Use the < or > arrows and the numeric keypad to enter the address. Enter the values. 5. Press the *OK* button. 6. The MODBUS *Setup* screen displays.
	TCP Port	The *TCP Port* field is a text string identifying the port for the network. To enter the port number: 1. Press the *TCP Port* field. 2. The *TCP Port* screen with a numeric keypad displays.

Field/Button	Feature	Description
		3. Use the < or > arrows and the numeric keypad to enter the address. Enter the values. 4. Press the *OK* button. 5. The MODBUS Setup screen *displays*.
TCP Link Timeout (seconds) 0	TCP Link Timeout	The *TCP Link Timeout* (seconds) field is a numeric field in which users can identify the amount of time in which a connection can be automatically reestablished if, for example, the remote computer is absent for longer than expected (due to a router connection drop). To enter the number of seconds, 1. Press the *TCP Link Timeout* field. 2. The *Enter MODBUS TCP Link Timeout* screen with a numeric keyboard displays. 3. Use the < or > arrows and the numeric keypad to enter the address. Enter the values. 4. Press the *OK* button. **Note:** Setting the *TCP Link Timeout* to 0 disables the timeout function.
Mode ASCII RTU TCP	Mode	There are three main communication modes in the MODBUS protocol as displayed in the *Mode* button screen: ASCII (American Standard Code for Information Exchange), RTU (Remote Terminal Unit) and TCP (Transmission Control Protocol /Internet Protocol). To select the desired mode press ASCII, RTU or TCP from the *Mode* window as shown.
Baud 986600 19200 38400 57600 115200	Baud	Baud is the rate at which information is transferred in a communication channel. To select the appropriate network speed, press 9600, 19200, 38400, 57600 or 115200 from the *Baud* window as shown.
Parity None Even Odd	Parity	Parity is a technique that checks whether data has been lost or written over when it is moved or transmitted between devices. To select the appropriate type of parity, press *None*, *Even* or *Odd* on the *Parity* window as shown.
Register Set PPI	Register Set	A register set is a small set of data holding places that may hold an instruction, a storage address, or any kind of data. The default *Register Set* is a default defined by SCS.

Field/Button	Feature	Description
	RS-232- or RS-485	RS-232 and RS-485s are network connections. They vary in the speed of data they can transmit and the distance to which they can extend. Press the correct radio button.
	Apply Settings	When all selections are made, press the *Apply Settings* button.
	Back	To return to the previous or *Home* screen (as appropriate), press the green *Back Arrow* icon on bottom left corner of the display.

10.0 Environment

The SCS Handheld Particle Counter offers such environmental features as temperature, relative humidity, barometric pressure and more. AQM models also offer CO2 and TVOC sensor options. The *Environment Settings* screen allows users to adjust the environmental features that display, as well as enable and set alarms, as shown below in ***Figure 75 - Figure 76***.

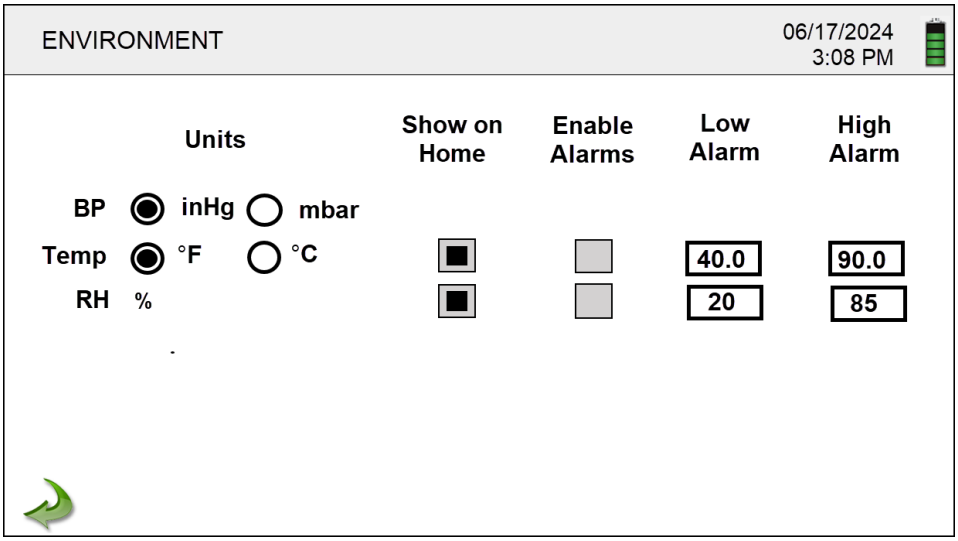


Figure 75. Environment Settings Screen

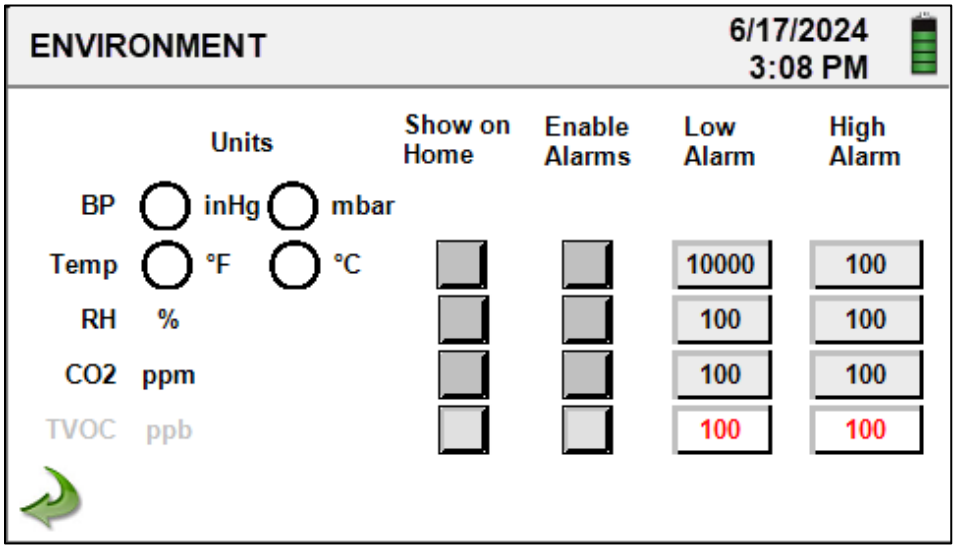
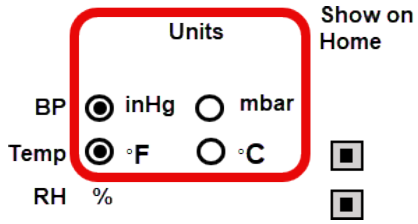
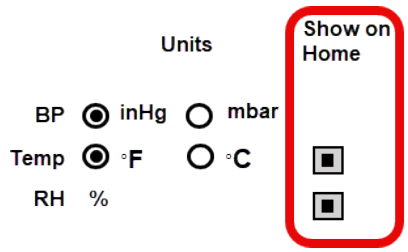
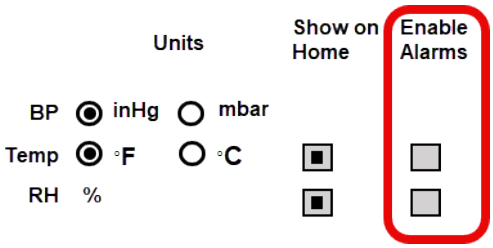
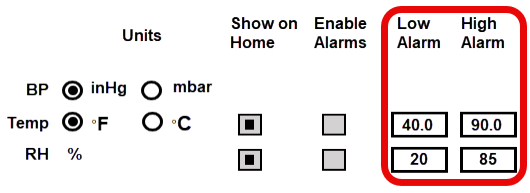
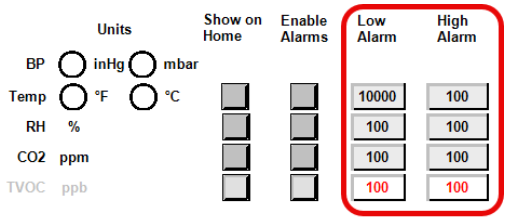


Figure 76. (AQM Models Only) — Environment Settings Screen

Note: Options not available on a particular instrument are greyed out as shown in ***Figure 76*** above.

Table 15. Environment Screen Settings

Field/Button	Feature	Description
	Units	The instrument senses and reports on the *Home* screen (when enabled) and in every stored record, temperature, relative humidity and barometric pressure. Barometric pressure measures the weight of the air at a specific location and can be measured in inHg (inches of Mercury) or mbar (millibar). Temperature is the degree of heat or cold present and displays on SCS instruments in either Fahrenheit (°F) or Celsius (°C) as selected by the user. Relative humidity is the amount of water vapor present in the air and is reported as a % of the amount needed for saturation at the same temperature. To select the desired measurement unit, press the radio button under *Unit* and next to *BP* (barometric pressure) and/or *Temp* (temperature). Humidity is only reported as a %.
	Show on Home	When enabled, the instrument may display temperature and relative humidity on the *Home* screen. To enable the feature, press the *Show or Home* radio button next to temperature and/or relative humidity.
	Enable Alarms	When enabled, the instrument may alarm when temperature and relative humidity are outside designated parameters. To enable the feature, press the *Enable Alarms* radio button next to Temp (Temperature) or RH (Relative Humidity).
	Low and High Alarm	In conjunction with the *Enable Alarms* feature, users must enter low and high alarm thresholds. To enter/change the thresholds: 1. Press the *Alarm value* field(s). 2. A numeric keypad displays to enter the low/high threshold. 3. To change the values, use the < or > to move cursor. 4. Press the *OK* button when complete or press *Cancel* to return to previous screen.

Field/Button	Feature	Description
	CO2 and TVOC Alarms (AQM Models Only)	Press the environmental value indicator to open a larger screen that displays Temperature, Relative Humidity, the current Barometric Pressure and, on AQM models, CO2 and TVOC. 1. To display the environmental indicators on the *Home* screen, press the *Show on Home* radio button. 2. To enable an alarm, press the *Enable Alarm* radio button and set the low and high alarm values as follows. 3. Press the *Alarm value* field(s). 4. A numeric keypad displays to enter the low/high threshold. 5. To change the values, use the < or > to move cursor. 6. Press the *OK* button when complete or press *Cancel* to return to previous screen. 7. Press the green *Back Arrow* icon on bottom left corner of the display to return to the *Home* screen.

11.0 Passwords

Password Setup

The SCS Handheld Particle Counter is equipped with the ability to enable and use both Admin and User passwords as shown below in ***Figure 77***.

Passwords Setup Screen

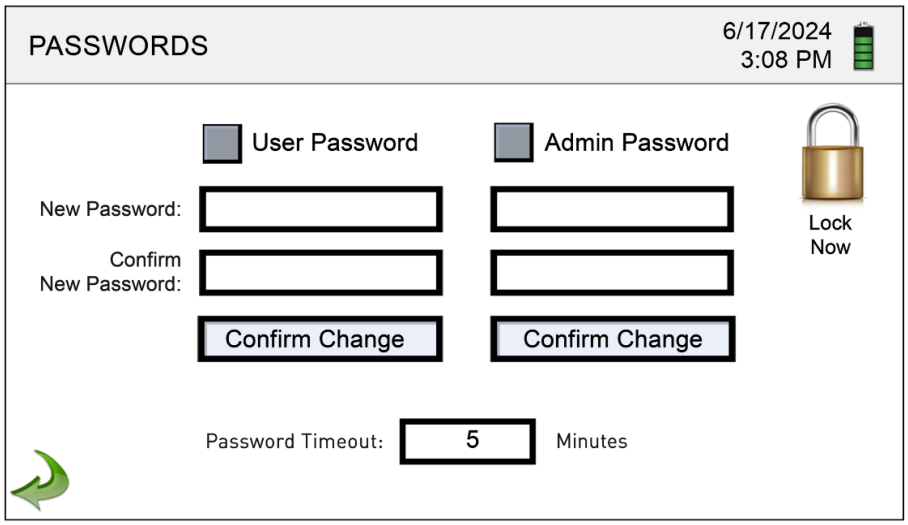


Figure 77. Password Setup Screen

Table 16. Password Screen Features

Field/Button	Feature	Description
User Password	User Password	To enable the *User Password* feature and require users to enter the password prior to using the instrument, press the *User Password* radio button shown above in ***Figure 77***.
User Password New Password	New Password (User)	To create a new user password, press the *New Password* field. The *Enter New User Password (4-15 Chars)* screen displays. 1. Enter a name using the keyboard screen. 2. Press the *?123* button to enter numerals. 3. Press the *Back* button to erase typed characters. 4. Press the *Up*-arrow button to capitalize a letter. 5. Press the *Esc* button to return to the previous screen without saving the password. 6. Press the *OK* button to save the password.
Confirm New Password	Confirm Password (User)	To confirm the newly created (User) password, press the *CONFIRM NEW PASSWORD* field. Repeat steps 1-6 above.
Confirm Change	Confirm Change (User)	After the new user password is confirmed, press the *Confirm Change* button.

Field/Button	Feature	Description
Admin Password	Admin Password	To enable the *Admin Password* feature and require admins to enter the password prior to using the instrument, press the *Admin Password* radio button. **Note**: Use of an Admin password prohibits users from see/using: *Settings*, Time/Date, and *Configuration* screens.
Admin Password	New Password (Admin)	To create a new Admin password, press the *NEW PASSWORD* field. The *Enter New User Password (4-15 Chars)* screen displays. 1. Enter a name using the keyboard screen. 2. Press the *?123* button to enter numerals. 3. Press the *Back* button to erase typed characters. 4. Press the *Up*-arrow button to capitalize a letter. 5. Press the *Esc* button to return to the previous screen without saving the password. 6. Press the *OK* button to save the password.
Confirm New Password	Confirm New Password (Admin)	To confirm the newly created (Admin) password, press the *CONFIRM NEW PASSWORD* field. Repeat steps 1-6 above.
Confirm Change	Confirm Change (Admin)	After the new *Admin* password is confirmed, press the *Confirm Change* button.
Password Timeout: Minutes	Password Timeout (Minutes)	The instrument can be set to timeout due to inactivity (i.e. go to sleep). To use this feature: 1. Press the *Password Timeout* (minutes) field. 2. A numeric keypad displays to enter the low/high threshold (1-99 minutes) 3. To change the values, use the < or > to move cursor. Enter the desired values. 4. Press the *OK* button when complete or press *Cancel* to return to previous screen.
Lock Now	Lock Now (Enabled)	Press the *Lock Now* icon to immediately lock the instrument. **Note**: The *Lock Now* feature only displays when either or both the User or Admin Password(s) are enabled.

Lost Password

If user or admin passwords are setup and misplaced, please contact SCS during normal business hours. An SCS representative issues a temporary password that expires at the end of the day it is issued. Please reset your password before the temporary password expires.

12.0 Power Management

The SCS Handheld Particle Counter has two power sources: AC power adapter and battery.

Note: Use only an AC adapter that matches the following specifications.

Input: 100-240 V ~ 0.8A 50-60 Hz

Output: 15V ⎓ 2A

Power Management Screen

Regardless of whether the battery is inserted, or the instrument is plugged in with the AC adapter, the *Power Management* screen is accessible.

If the instrument is on battery power and the AC adapter is NOT plugged in, the *Battery* icon displays.

If the AC adapter is using AC power, the *Plug* icon displays.

To display the *Power Management* screen, press the *Battery* or *Plug* icon. The *Power Management* screen displays as follows.

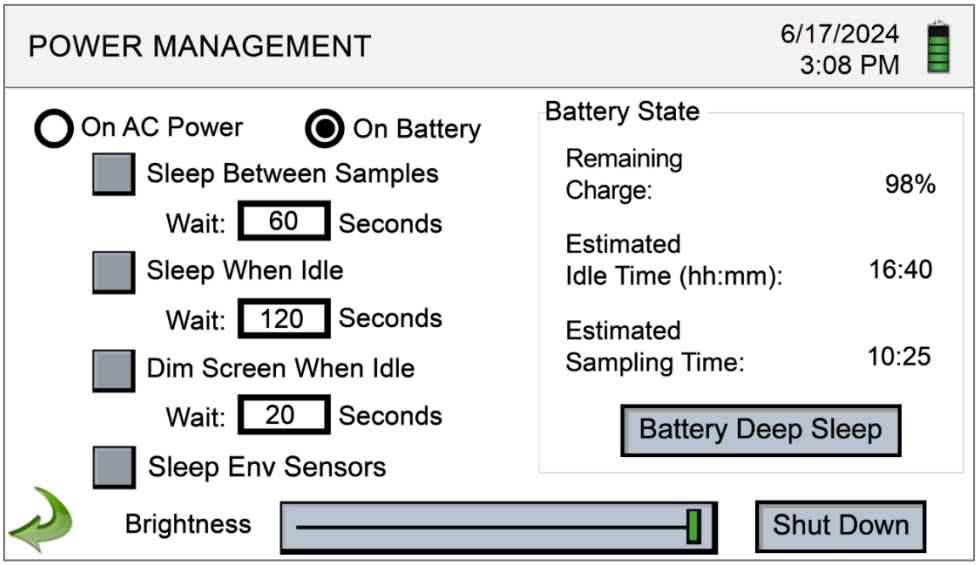
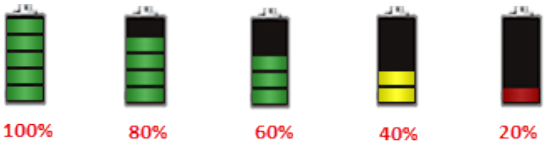
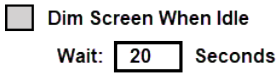
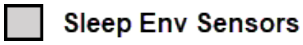


Figure 78. Power Management Screen

Table 17. Power Management Screen Features

Field/Button	Feature	Description
	Battery Indicator Icon	The *Battery Indicator* icon displays when the instruments are running with battery power. The icon also serves as a visual sign of the battery's power level. The battery power level icon displays based on remaining battery power as shown below. 
Battery State Remaining Charge 98%	Remaining Charge	Estimated remaining battery level by percentage.
Estimated Idle Time (hh:mm): 16:40	Battery State Estimated Idle Time	Estimated amount of battery level time remaining if the instrument is powered on without sampling in hours and minutes.
Estimated Sampling Time: 10:25	Battery State Estimated Sampling Time	Estimated amount of battery level time remaining if the instrument is sampling in hours and minutes.
Battery Deep Sleep	Battery Deep Sleep	When the instrument is expected to not be used for four (4) months or more, press the *Battery Deep Sleep* button in order to mitigate loss of battery life from non-use.
○ On AC Power ◉ On Battery	On AC Power or On Battery	Allows user to toggle between sleep and dim settings when the instrument is on AC or battery power.
☐ Sleep Between Samples Wait: 60 Seconds	Sleep Between Samples	This feature powers down the instrument between samples to conserve battery life. To activate the feature: 1. Press the *Sleep Between Samples* radio button. 2. Press the *Wait ## Seconds* button. 3. The *Enter Wait Time* screen and a numeric keypad display. 4. Use the < or > arrows and the numeric keypad to enter the desired value in seconds from 0 to 65,535. 5. When complete, press the *OK* button. **Note:** A hold time must be set for a minimum of 38 seconds in order to activate *Sleep Between Samples*.
☐ Sleep When Idle Wait: 120 Seconds	Sleep When Idle	This feature powers down the instrument powering down the instrument when idle to conserve battery life. To activate the feature: 1. Press the *Sleep When Idle* radio button.

Field/Button	Feature	Description
		2. Press the *Wait ## Seconds* button. 3. The *Enter Wait Time* screen and a numeric keypad display. 4. Use the < or > arrows and the numeric keypad to enter the desired value in seconds from 0 to 65,535. 5. When complete, press the *OK* button.
	Dim Screen When Idle	This feature dims the instrument's screen when idle to conserve battery life. To activate the feature: 1. Press the Dim Screen When Idle radio button. 2. Press the *Wait ## Seconds* button. 3. The *Enter Wait Time* screen and a numeric keypad display. 4. Use the < or > arrows and the numeric keypad to enter the desired value in seconds from 0 to 65,535. 5. When complete, press the *OK* button. **Note:** The minimum *Dim Screen When Idle Wait Time* is 10 seconds.
	Sleep Environmental Sensors	This feature puts the environmental sensors into sleep mode to conserve battery life. To activate, press the *Sleep Env Sensors* button.
	Brightness Slider	To increase or decrease how bright the screen is, press and drag the *Brightness* slider.
	Shut Down Button	To turn off the instrument, press the *Shutdown* button.
	Back Arrow Icon	Press the *Back* Arrow icon to return to the previous screen.

13.0 Volume Control

The SCS Handheld Particle Counter has audio tones for alarms, etc. Users may adjust the volume control using the slider bar as follows:

1. Press the *Volume Control* icon.

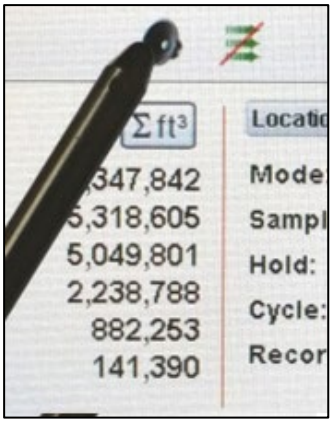


Figure 79. Volume Control Icon

2. Slide the *Volume Control Slider* bar to adjust the volume.
3. A numeric value displays at the bottom of the slider indicating relative volume.

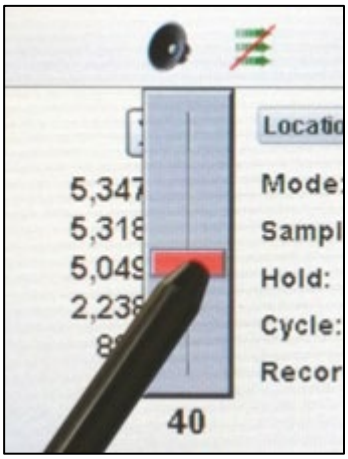


Figure 80. Volume Control Slider

Note: Moving the *Volume Control Slider* bar to 0 mutes the instrument.

14.0 Instrument Management Software (IMS)

The instrument includes a copy of a PC-based software utility for real-time graphing, downloading data from the instrument, field calibration of sensors, firmware updates, remote diagnostics direct to a service technician, and more.

Note: Detailed instructions for the use of the IMS software are contained in the IMS User Manual on the provided USB thumb drive.

Software Installation

Plug the provided thumb drive into your Windows PC used with your instrument. Select the IMS web installer application file. Follow the installation prompts.

Start Software

When installation is complete, use the *IMS* icon in the program folder or on the desktop to start the program.

Connection Indicator

Connect the instrument directly (not to a hub) to a PC with the provided USB cable to connect the IMS software and the instrument.

When a connection has been established, the green *USB Connection* indicator displays.

If no connection is made, the red *No Connection* indicator displays.

15.0 Remote Operation

The SCS Handheld Particle Counter is accessible using a remote connection on a device such as a personal computer, laptop, tablet, or phone via either an ethernet or Wi-Fi connection.

With the software, users may:

- ***start sampling*** and ***stop sampling***,
- change ***Data Units***,
- scroll ***locations***, and
- turn ***displayed channels off or on***

remotely, as if they were using the instrument.

Connect Instrument

To connect the instrument:

1. Placed the instrument in Ethernet or optional Wi-Fi mode as described in ***Ethernet and Wi-Fi Setup***.
2. On the *Communications* screen, press the ***Use DHCP*** Radio Button.
3. Enter the IP address into any device with browser access as shown below in ***Figure 81.***
4. The *Remote* screen displays as follows:

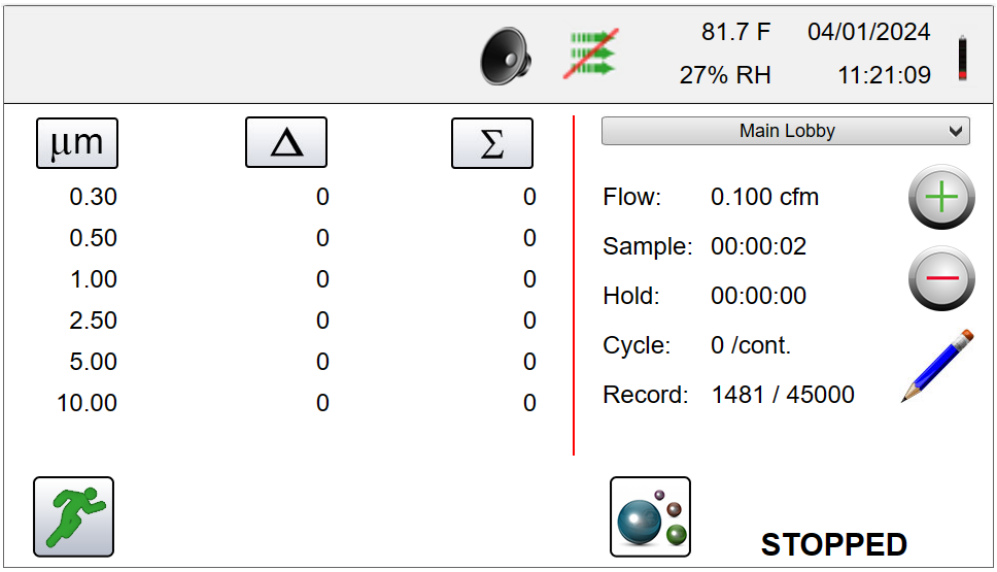


Figure 81. Remote Screen

16.0 Maintenance

Ensuring Vacuum Longevity

Proper vacuum pump management is essential to ensuring the longevity of internal-pump instruments.

To reach the expected life expectancy of the vacuum pumps in your particle counter, we recommend the following sample and hold times at the following Liters Per Minute (LPM).

2.83 LPM (0.1 CFM)

- Pumps running continuously: 1 year life expectancy.
- 1 minute sample, 4-minute hold time: Up to 5 years life expectancy.
- 1 minute sample, 9-minute hold time: Up to 10 years life expectancy.

1.2 LPM

- Pumps running continuously: 2.5 years life expectancy.
- 1 minute sample, 4-minute hold time: Up to 12.5 years life expectancy.
- 1 minute sample, 9-minute hold time: Up to 25 years life expectancy.

Factors Affecting Expected Performance

Elevated temperatures reduce life expectancy. Running at room temperature or below is optimum.

- Adding a restriction to the inlet (i.e., long tubing) makes the pump work harder and reduces life expectancy.
- Working in very dirty air loads the internal filters and makes the pump work harder. If this is your condition, there are options for most of our instruments to have the exhaust filter mounted externally for service.

Proper care and management of your internal vacuum pumps ensures optimum life expectancy and performance.

Cleaning Instrument

CAUTION: The instrument contains no user-serviceable parts. To avoid electric shock, injury, or damage to the meter, do not open the meter.

Periodic cleaning of the particle counter case may be necessary. To do so, use only lint-free wipes dampened with no more than a 70% isopropyl alcohol concentrate, wipe down the unit.

CAUTION: Do not spray instrument with ANYTHING.

CAUTION: Do not use glass cleaner, acetone, soap, or any other cleansers.

17.0 RMAs and Packing Instruments for Shipping

SCS customers need to return instruments for periodic calibration or potentially for repairs. Following are the steps to request a Return Material Authorization (RMA) for either calibration or repair and the do's and don'ts of packing and shipping instruments for shipping.

How to Submit a Request for an RMA or Calibration

To submit a calibration or repair request, contact SCS Customer Service.

Next Steps

If possible, users should perform backup of user settings and/or locations/recipes prior to shipping as described in *Pre-Calibration Back-up and Restoration*.

Packing the Instrument(s)

Instruments exposed to any hazardous, radioactive or biological events must be sufficiently decontaminated prior packing the instrument for return.

Prepare the instrument for packaging by removing the:

- Isoprobe
- Temperature/RH probe and
- Rechargeable battery

from the instrument and wrapping them in plastic or the original bag(s).

DO be sure to carefully pack the instrument in its storage case (if available) and then to pack the storage case in a box (preferably the original box). Use foam inserts or other sturdy packing material (e.g., bubble wrap or air pillows).

Do NOT use packing peanuts, shredded paper or any other material that may release damaging particulates.

Be sure to follow all local, state and international shipping regulations, particularly of lithium-Ion batteries as described by the following commonly used shipping companies.

UPS – How to Safely Pack and Ship Batteries

DHL – Battery Shipping Policy

Fed Ex – Lithium Battery Shipping Overview

If the packaging is too damaged for SCS to reuse for safe return of the instrument(s) to the user, we will repackage at a cost per box.

18.0 Pre-Calibration Back-up and Restoration

SCS recommends calibrating the Handheld Particle Counter on an annual basis. Our highly trained and professional calibration and service team members provide service and calibration that meet ISO 17025 requirements.

Important: It may be necessary for technicians to delete user settings during calibration of your instrument, therefore, SCS highly recommends backing up all user settings, locations/recipes to the specially formatted SCS provided USB thumb drive.

Performing Backup of User Settings and/or Locations/Recipes

After submitting a calibration request for your instrument(s), and before shipping the instrument back to SCS, back up the user settings and locations/recipes as follows:

1. Plug in a USB thumb drive into the USB port on the side of the instrument.
2. Press the *Settings* icon as shown below in ***Figure 82***.

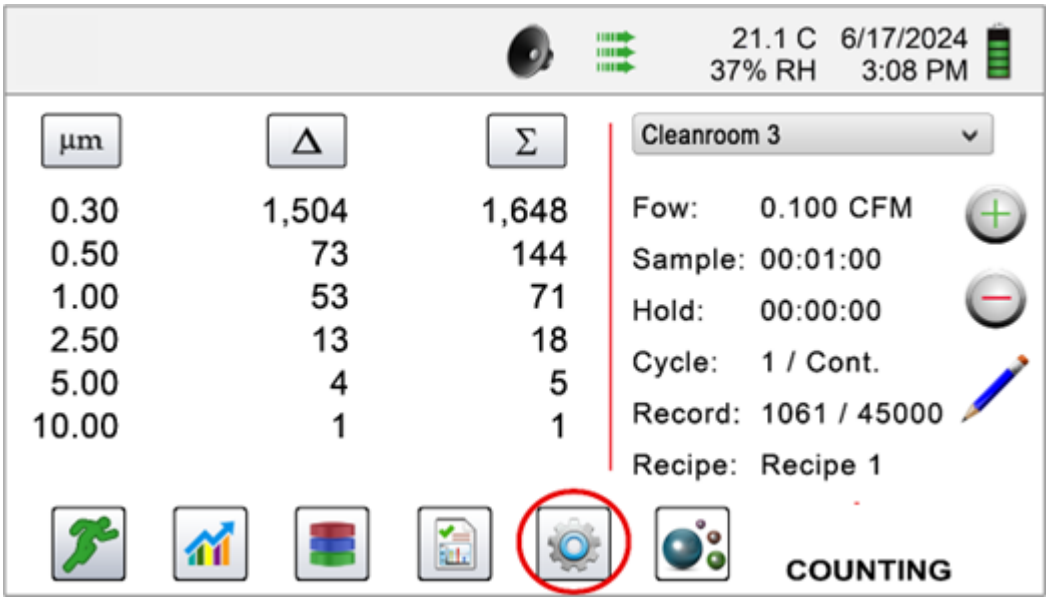


Figure 82. Home Screen with Settings Icon Selected

3. Press the *Configuration* icon shown below in ***Figure 83.***

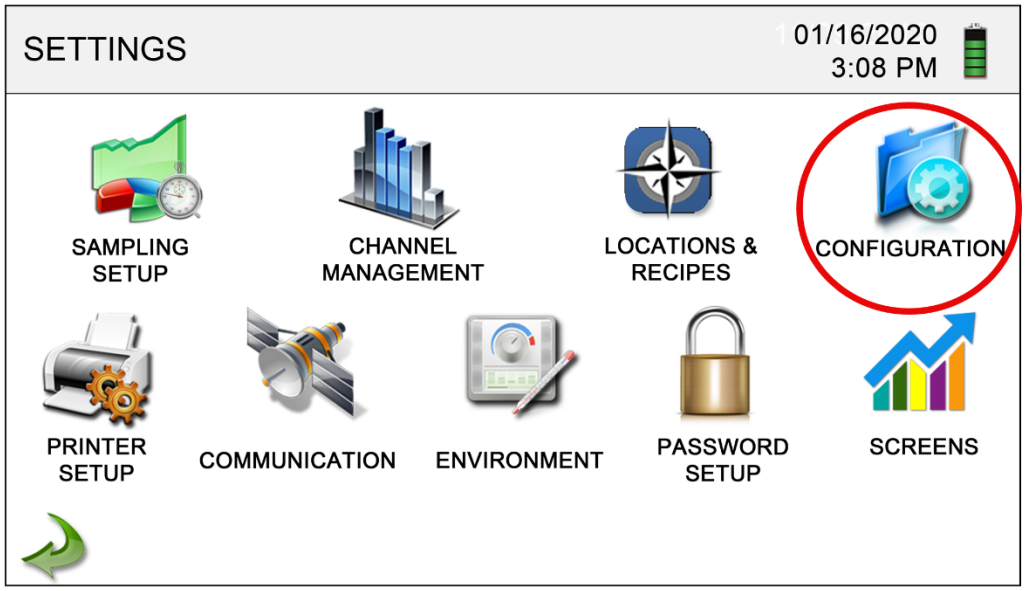


Figure 83. Configuration Icon Selected

4. The *Configuration* screen with the *USB* icon displays as shown below in ***Figure 84.***
5. Press the *USB* icon as shown below in ***Figure 84.***.

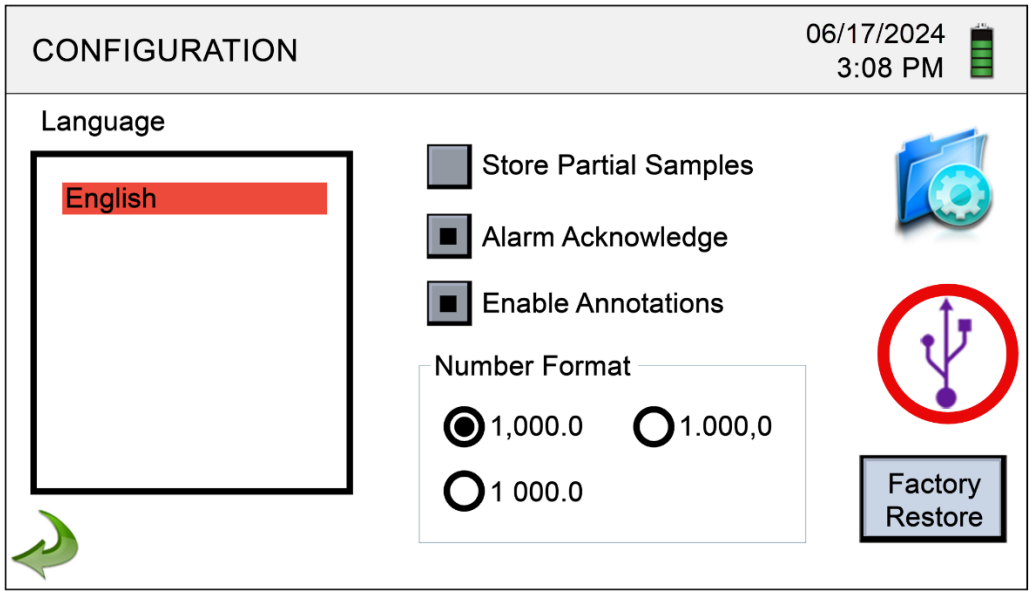


Figure 84. Configuration with USB Icon Selected

6. The *Configuration Load/Save* screen displays as shown below in ***Figure 85***.

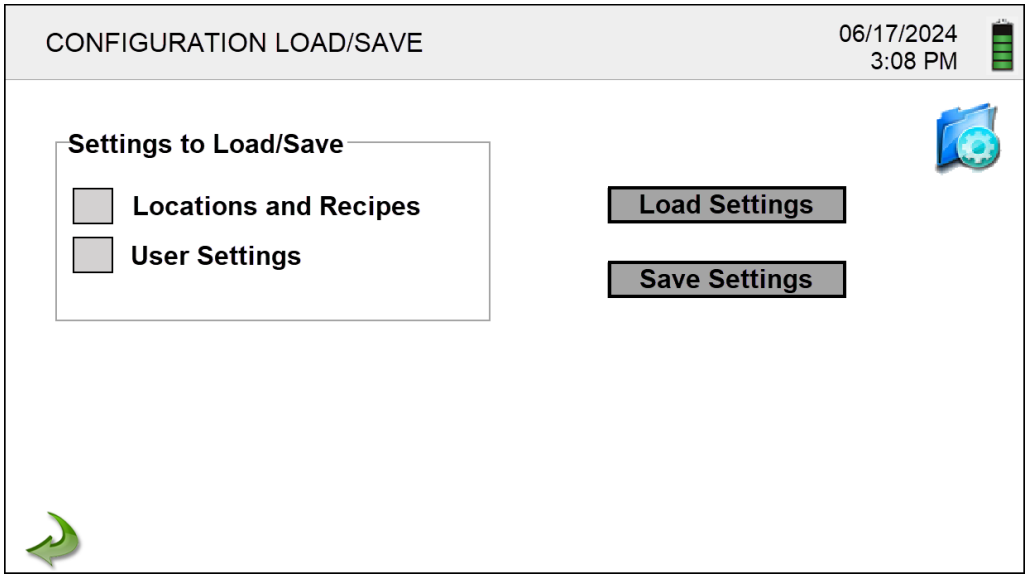


Figure 85. Configuration Load/Save Screen

7. Press either or both the *Locations and Recipes* or *User Settings* buttons.
8. Press the *Save Settings* button as shown below in ***Figure 86.***

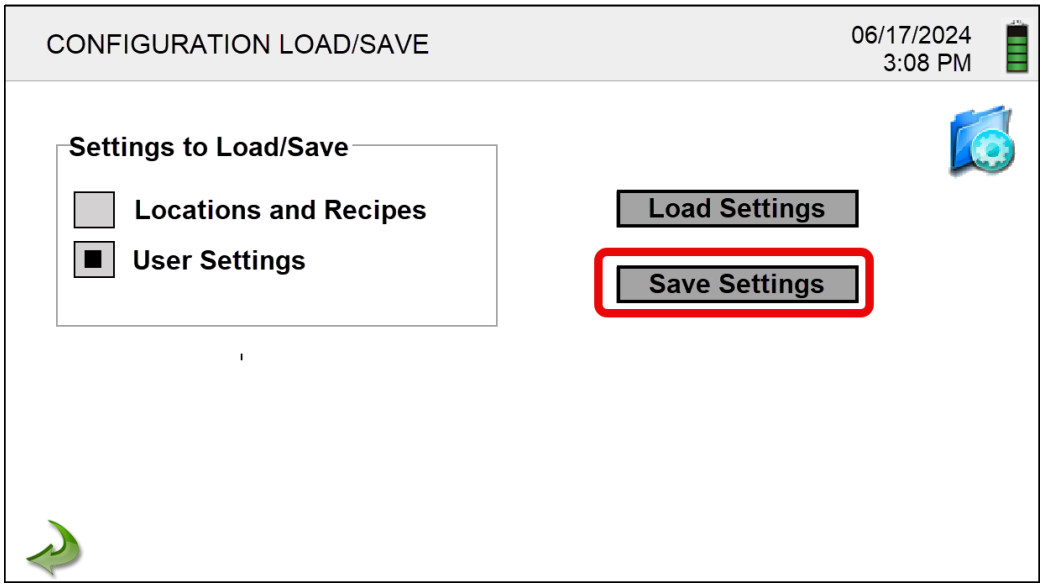


Figure 86. Save Settings

9. The *Confirm Load* dialog box displays.
10. Press the *Yes* button to confirm overwriting the existing data or press *No* to cancel.

Restoring User Settings and/or Locations/Recipes

After receiving your newly calibrated instrument back and determining whether the user settings, locations and/or recipes were deleted, restore them, if necessary, as follows:

1. Plug in a USB thumb drive into the USB port on the side of the instrument.
2. Press the *Settings* icon as shown below in ***Figure 87***.

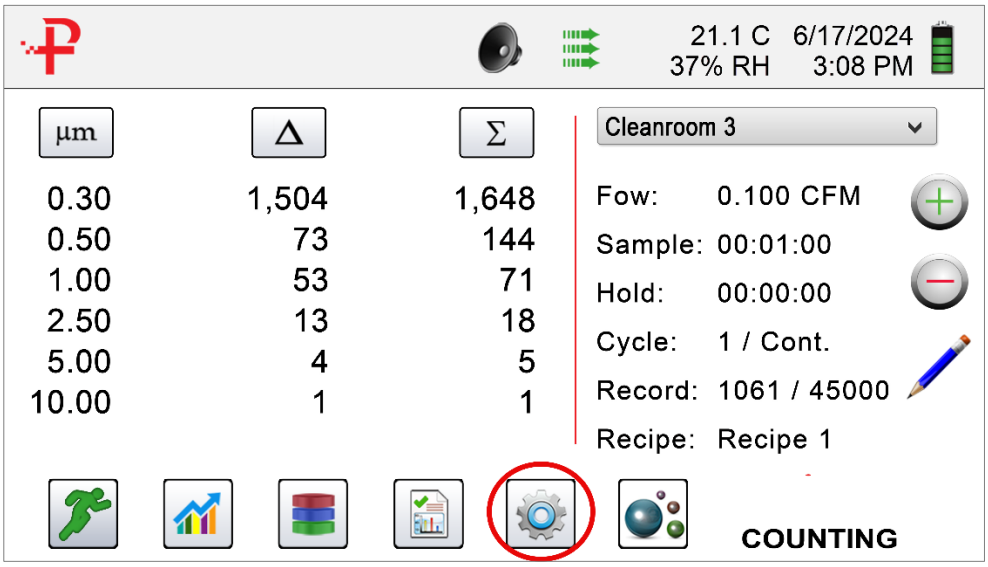


Figure 87. Home Screen with Settings Icon Selected

3. Press the *Configuration* icon shown below in ***Figure 88***.

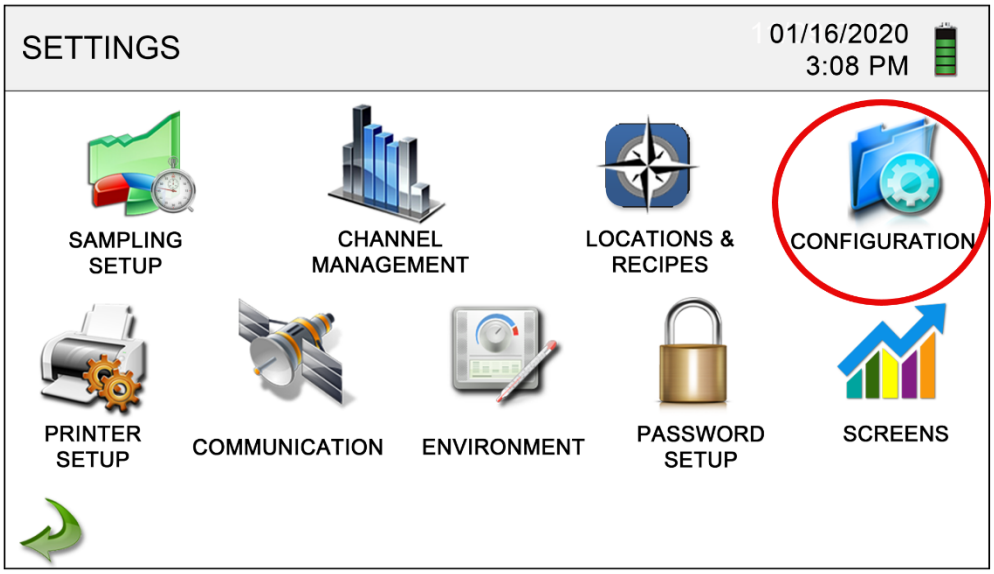


Figure 88. Configuration Icon Selected

4. The *Configuration* screen with the *USB* icon displays as shown below in ***Figure 89.***

5. Press the *USB* icon shown below in ***Figure 89***.

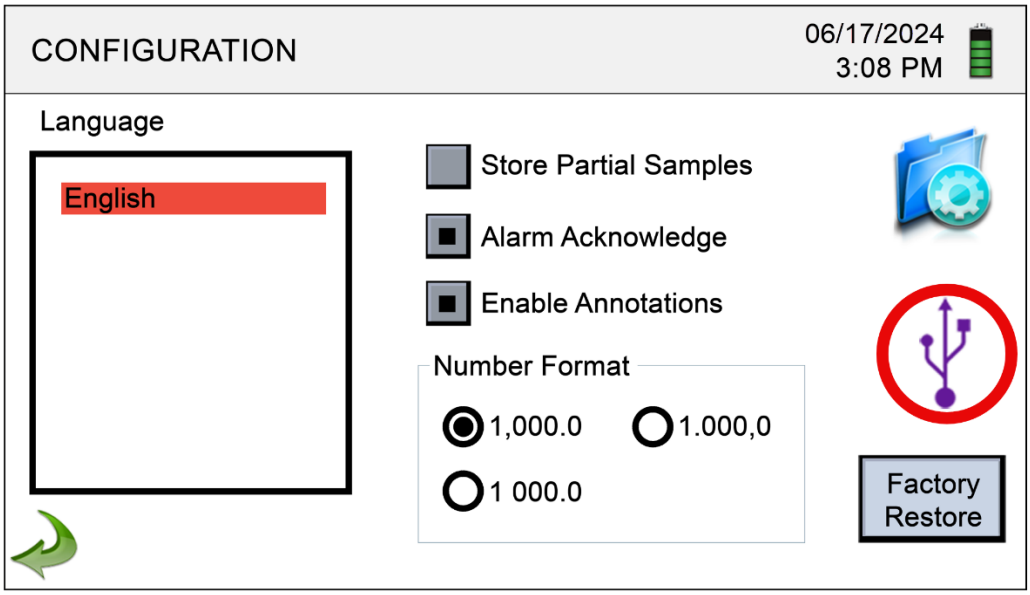


Figure 89. Configuration with USB Icon Selected

6. The *Configuration Load/Save* screen displays as shown below in ***Figure 90***.

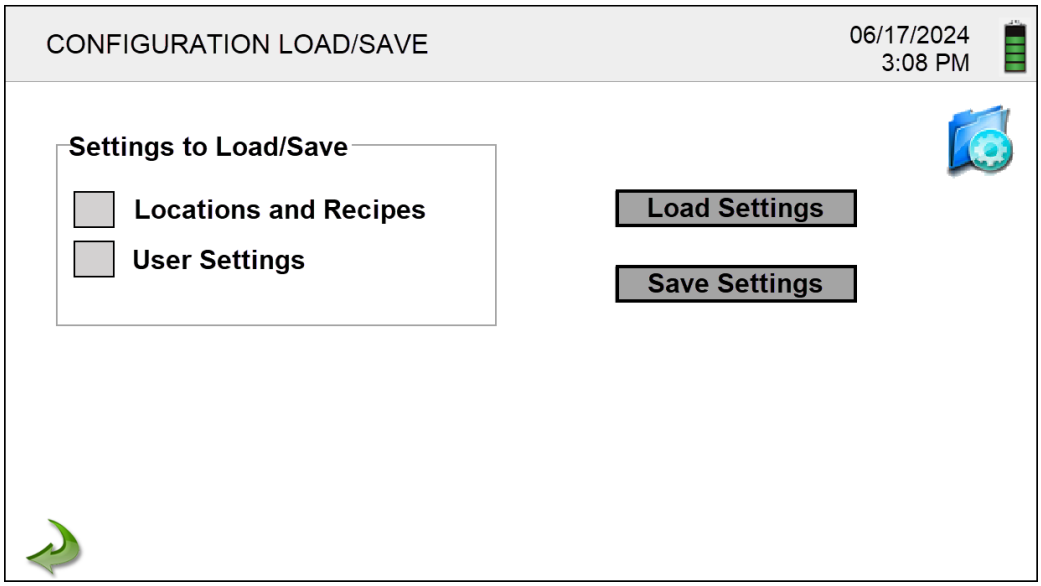


Figure 90. Configuration Load/Save Screen

7. Press the *Load Settings* button shown above in ***Figure 90.***
8. The user settings and/or locations and recipes are restored as appropriate.

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