PC-4000 / PC-4005

Indoor Air Quality Monitor

User's Manual

Version 0.4

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Shelton, CT 06484 USA
Phone: 203-402-0477

Products by Particles Plus, Inc. - GrayWolf PC-4000

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

Product Name: Indoor Air Quality Monitor PC-4000

Model Numbers: PC-4000

The following standards are applied only to the particle counters that are so labeled.   EMC is tested using Particles Plus' 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.

Contents

1-1 Important Safety Information

This section presents important information intended to ensure 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 in accordance with local regulatory requirements or contact GrayWolf for 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 will void all warranties
- Do no use this device for any unintended purpose other than measuring of particles in ambient environments.
- Do not operate the instrument with the inlet capped or plugged as 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 GrayWolf equipment not expressly approved by GrayWolf could void the user's authorization to operate the equipment, can risk serious injury, and will void all warranties.

Key to Symbols

The symbols in this manual are identified by their level of importance, as defined below.

Read the following carefully before handling the product.

WARNING:

Warnings must be observed carefully to avoid serious bodily injury.

CAUTION:

Cautions must be observed to avoid minor injury to yourself or damage to your equipment.

1-2 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 to use device in a freestanding mode
- Improve work procedures

1-3 Warnings for Use of Wireless Devices

Please observe all warning notices with regard to the usage of GrayWolf' 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.

Persons with Pacemakers:

- Should ALWAYS keep the device more than 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 your physician or the manufacturer of the medical device to determine if the operation of your wireless product may interfere with the medical device.

1-4 Overview

The GrayWolf PC-4000 provides a large dynamic range of particle size measurement from 0.3 μm to 25.0 μm, providing for true variable binning and allowing for channel size adjustment settings to 0.01 μm. This instrument utilizes 7 or more processors to maintain and manage the various functions of operation. It allows for the fastest, most efficient particle counting with high accuracy and resolution. The advanced processing also allows for many operations to take place simultaneously, even while the unit is sampling. This includes adding annotations to the current sample in progress, or adding annotations to *previously* recorded data while sampling is in progress.

The Real-Time Meter™ function is unique in its ability to fine tune the instrument's sensitivity in order to locate particle contamination sources with visual and audible indications. This versatile particle counter's ability to count higher than typical particle concentrations allows the Real-Time Meter to find point source contamination in cleanrooms as well as locating higher particle concentrations being generated in many industrial environments.

Theses particle counters also have a mass concentration mode, providing for particle mass monitoring of an environment for industrial health and safety regulatory purposes. The unit can measure with all (6) adjustable particle size channels or capture PM levels indicated in μg/m3 with values corrected for particle density and refractive index correction.

The Technology designed into these particle counters includes advanced power management functions. Onboard processors in the battery packs manage cell loading and battery life. Advanced power monitoring features allow for 10 hours continuous monitoring use, or the industry's first sleep mode that permits the instrument to take intermittent samples over the course of a few months on one battery charge (dependent on sample settings).

Thank you,

1-5 Specifications

Size Channels: **PC-4000**	Factory calibrated at 0.3, 0.5, 1.0, 2.5, 5.0, 10.0 µm variable binning
Size Range	0.3 to 25µm
Flow rates	0.1 CFM (2.83 LPM)
Light Source	Long life laser diode
Counting Efficiency	50% @ 0.3 µm; 100% for particles >0.45 µm per JIS
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 w/ automatic flow control
Filtered Exhaust	Internal HEPA filter
Number of Channels	6
Custom Size Channels	Calibration for custom size channels available
Audible Alarm	Adjustable built-in alarm
Battery	Removable Li-ion
Battery Recharge Time	<2 hours
Reports	ISO 14644-1, EU GMP Annex 1, FS 209E
Recipes	50 user-configurable recipes
Communication Modes	Ethernet and USB
Optional Communication Modes	Wireless 802.11 b/g, RS485 or RS232
Environmental Sensors	CO_2 Sensor: Non-dispersive Infrared Range 0 – 5000 ppm, Resolution 1 ppm, Accuracy ±1% FS, Response rate 20 seconds; TVOC Sensor: Photo-Ionization Detector (PID) Range 0-50 ppm, Minimum detection level 5 ppb, Accuracy ±1.5%, Response rate <3 seconds;), temperature and relative humidity probe 32º to 122ºF (0º to 50ºC) ±1ºF (0.5ºC), 15-90% ±2% relative humidity

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
PC-4000 Dimensions (L x W x H)	5.2" x 4.15" x 8.25" (13.3 cm x 10.5 cm x 21 cm) includes barb fittings
PC-4000 Weight	4 lb (1.8 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

1-5 Specifications (Continued)

Optional Accessories	Printed manual, carrying case, spare battery, external battery charger, external printer and isokinetic probes
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
Warranty	2 Years Limited Warranty, 1 Year for Gas Sensors

1-6 Included Accessories (PC-4000)
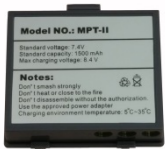
Description	Part Number	Image
Isoprobe Threaded 0.1 CFM Nickel Plated Aluminum	**PS-12041**	
Purge Filter Assembly 0.1 CFM (2.83 LPM)	**AS-99002A**	
Rechargeable Battery 55Wh	**EE-80003A**	
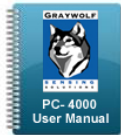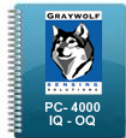
PC-4000 Carrying Case	**AS-99024**	
Power Supply 15V ~2amp 100-240VAC (Select adapter -US, -EU, -UK or -CN)	**EE-80081-XX**	
USB Cable 6' (1.8m)	**AS-99010**	
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1-7 Optional Accessories (PC-4000)

Description	Part Number	Image
Wireless 802.11 b/g Output with Internal Antenna	**EE-80092**	
Rechargeable Battery 55Wh	**EE-80003A**	
External Thermal Printer with 2 rolls of paper	**AS-99011**	
External Thermal Printer Paper - 1 Roll	**AS-99012**	
External Thermal Printer Cleanroom Paper - 10 Pack	**AS-99013**	

Description	Part Number	Image
External Thermal Printer Spare Battery	AS-99014	
Isoprobe Threaded 0.1 CFM (2.83 LPM) Stainless Steel	PS-12070	
Isoprobe Barbed 0.1 CFM (2.83 LPM) Stainless Steel	PS-12022	
1/8" Inlet Barbed Fitting Stainless Steel	PS-12005	

1-7 Optional Accessories (Continued)

Description	Part Number	Image
Sample Tubing 1/4" OD (1/8" ID) per foot	AS-99018	
CAT5 4 Pair Plenum per foot	AS-99020	
User Manual (Printed)	MN-24012P	
Validation Manual	MN-24013	
Certificate of Origin	MN-24000	

1-8 Product Views

Isokinetic Probe

Wi-Fi Antenna

RS485/RS232 Connector

Battery Compartment

Ethernet Connection
USB Host Connection
USB Client Connection
AC Adapter Connection

Power Button

PARTICLE COUNT/MASS MONITOR +
PC-4000 Series
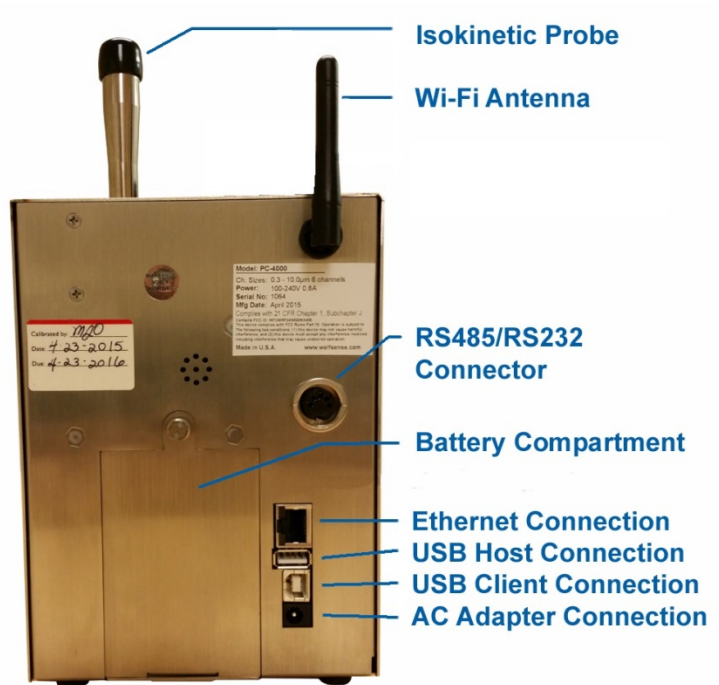
Connecting RS232 & RS485
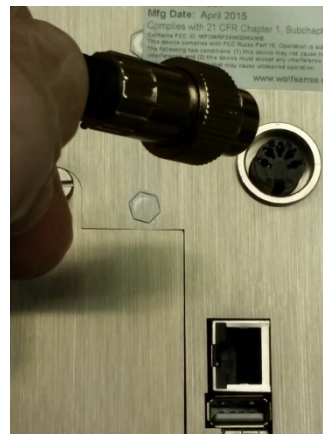
Connecting Ethernet Cable
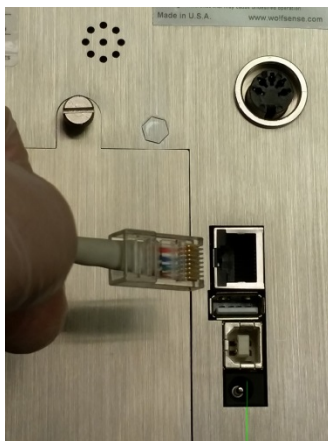
Connecting USB - B Client
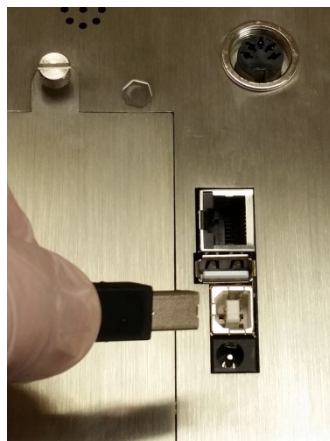
Connecting USB - A Host
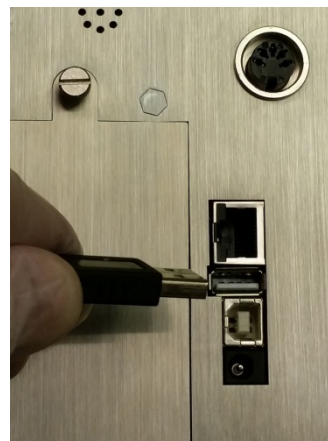
Unpacking and Preparation for Use

2-1 Unpacking and inspecting the Instrument

Careful consideration was given to our packing material to ensure that your GrayWolf 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. Carefully unpack the Instrument from its shipping container and inspect the contents for damaged or missing items. If the Unit appears damaged or something is missing, contact the carrier and GrayWolf immediately. Please save the container and packing material in case you have to return the Instrument.

2-2 Registering Your Product

It is important to register your product with GrayWolf to ensure that your warranty will be activated. To register your product, completely fill out the online form found at our website here: http://wolfsense.com/register.html

2-3 Contacting GrayWolf

To order accessories, receive technical assistance, report damaged or missing items from your shipment, or get contact information for your nearest GrayWolf authorized reseller, call: **1-203-402-0477**

2-4 Storing and Shipping the Instrument

This instrument utilizes a high quality advanced Lithium Ion Power Cell. This must be removed from the device prior to shipping the unit. If the unit 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 insure that the instrument is packaged in a box that is sturdy and that the unit 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 our specifications

2-5 Power Considerations and Connecting to AC Mains Power

The GrayWolf Instrument comes with a power adapter line cord for AC mains 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 GrayWolf or an authorized reseller for service.

2-6 Power Considerations & Connecting to AC Mains Power

To install the country specific plug adapter, simply slide the adapter into the power supply as shown.

2-7 Installing Batteries

CAUTION - The GrayWolf rechargeable battery model EE-80003A 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 GrayWolf Lithium-Ion rechargeable battery with any other power source other than the approved GrayWolf Rechargeable Battery External Charger - Model AS-99005A, or using the GrayWolf Power Supply Model EE-80081-XX.   Using any other charger can cause fire, shock or serious injury.

Caution: Dispose of GrayWolf lithium-ion batteries only at an approved local battery recycling center.

2-7 Installing Batteries (continued)

Install the GrayWolf Battery pack into the instrument using the following steps:
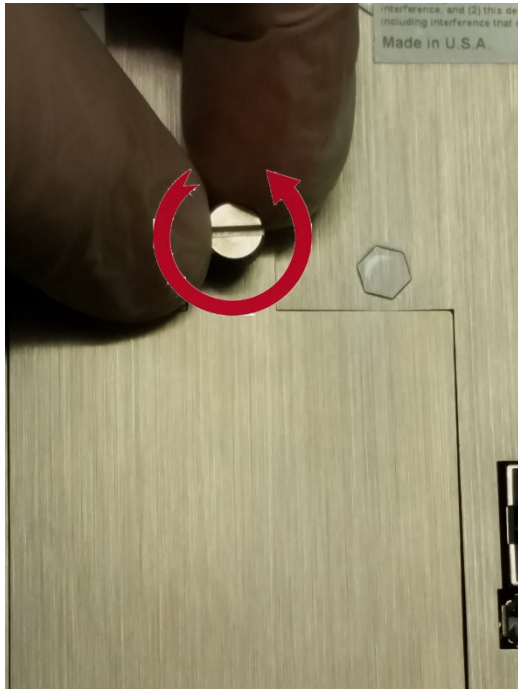
Step 1 – Loosen the Knurled Thumb-turn screw
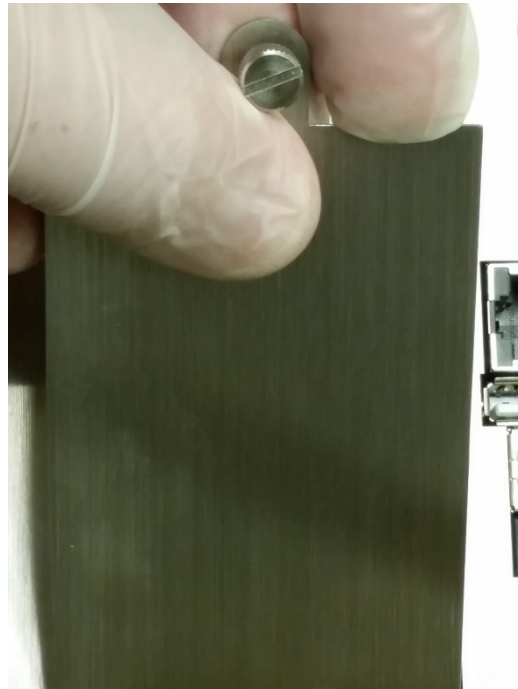
Step 2 – Remove Battery Compartment Door

Step 3 –Insert battery connector plug into matching socket on matching wired connector in the battery compartment. NOTE: leads line up color for color and socket has a keyed fit. Carefully tuck the wires neatly back in to the recess in the rear of the battery compartment.

2-7 Installing Batteries (continued)

Step 4 – Carefully push battery into the compartment
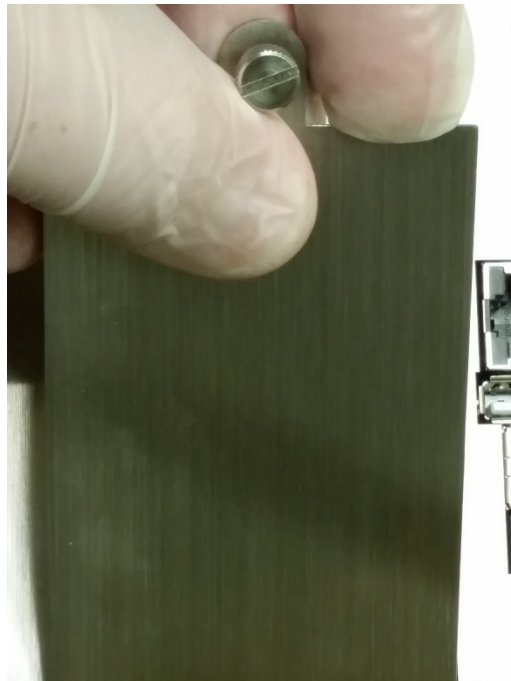
Step 5 – Replace battery compartment door and tighten thumb-turn knurled screw.

2-8 Turning the Unit On

The power button is located on the particle counter front bottom right allowing for easy one touch operation. Press until the particle counter turns on.

Pressing this button momentarily starts the pump and begins sampling.

Pressing the button again for 1 second stops the sampling.

Holding the button for 2.5 seconds turns the instrument off.

The unit can also be turned off from the power management screen with the SHUTDOWN command.

3-1 Control and Menu Icons

	Function Name	Location/Screen	Description of Function
	GrayWolf Logo Icon	Home Screen	Press logo and a Product Information Screen will appear displaying your model number, serial number, manufacture date, last calibration date, next calibration due date and number of channels activated on the unit. Press back arrow icon on bottom left corner of the display to return to home screen.
	Speaker icon	Home Screen	Speaker Icon allows for volume adjustment using a pop-up slider bar. When pressed the cross bar on slider and move up and down for volume control. Icon will have red prohibited symbol when sound is turned off or muted.
20.2 C 35% RH	**Temperature & RH indication**	Home Screen	By pressing the temperature and RH value indication the screen will change to a large indication of the current Temperature, Relative Humidity and the current Barometric Pressure. Press back arrow icon on bottom left corner of the display to return to home screen.
2015/01/15 12:30:01 PM	**Time and Date Indication**	Home Screen	To change time and date, press the date and time in the top right corner of the display and the change time and date screen will appear allowing for changes
	Power Management Icon	Home Screen	On the top right of the display is the battery/power adapter indication icon. Pressing this icon displays the battery power management screen as well as the current battery status.
	USB Communication Icon	Home Screen	If a USB drive is connected, the USB Icon will appear. When pressed from the home screen the current record displayed will be saved to the USB drive.
	Printer Indication	Home Screen	If the GrayWolf Printer is connected to USB Port, the Printer Icon will appear. When pressed from the home screen the current record on screen will be sent to the printer.
	System Warning Indication	Home Screen	When the System Warning Indication Icon appears, please contact GrayWolf technical service for assistance. When pressed, the Instrument will display additional information.

	Function Name	Location/Screen	Description of Function
	Alarm Indication	Home Screen	Visual indication of alarm condition if the particle count exceeds the user defined thresholds. When pressed this will silence the alarm.
	Run Icon	Home Screen	The Run Icon starts the instrument sampling. Once pressed the Run Icon will be replaced by the Stop Icon.
	Stop Icon	Home Screen	The Stop Icon stops the instrument from sampling.
	Real-Time Meter & Graphing Icon	Home Screen	When pressed the Real-Time Icon switches between the Real-Time Meter mode, graphing of pulse/seconds, The PM Environmental screen and the Main Screen.
	Recorded Data Icon	Home Screen	When pressed, the Recorded Data Icon will display the saved data records page. All saved records can be accessed from this screen.
	Reports Icon	Home Screen	When pressed, the Reports Icon will display the standards options page, where ISO 14644-1, EU-GMP Annex 1, or Federal Standard 209E modes can be selected.
	Particle Data Selection Icon	Home Screen	When pressed, the Particle Data Icon changes the indicated values from particle count, count per cubic meter, or count per cubic foot and particle mass concentration (activated in channel management). These values are displayed simultaneously as differential and cumulative counts.
	Differential Mode Icon	Home Screen	When pressed, the Differential Mode Icon toggles the differential data values off and on the display during or after sampling.
	Cumulative Mode Icon	Home Screen	When pressed, the Cumulative Mode Icon toggles the cumulative data values off and on the display during or after sampling.
	Location Menu Icon	Home Screen	When pressed, the Location Menu Icon displays the Location and Recipe set up pages. This feature allows for the input of up to 1000 locations 20 characters long and up to 50 unique user-defined recipes.

	Function Name	Location/Screen	Description of Function
Mode: Automatic	**Mode Indication**	Home Screen	The Mode Indication displays the current mode of operation the instrument is set to. These modes include automatic, manual, and continuous.
Sample: 00:01:00	**Sample Indication**	Home Screen	The Sample Time Indication displays the current sample time duration (Hours:Minutes:Seconds). This value will countdown from the set value for the sample time, displaying the amount of time left in the current sample. See Sampling Setup in Settings Menu.
Hold: 00:02:00	**Hold Indication**	Home Screen	The Hold Time Indication displays the current hold time, as an interval between samples. The maximum hold time is 99 hours, 59 minutes and 59 seconds. See Sampling Setup in Settings Menu.
Cycle: 1 / 3	**Cycle Indication**	Home Screen	The Cycle Indication displays the number of count samples that will be taken at a location in automatic mode. The maximum number of possible cycles that can be set is 9,999. The value is displayed as the sample number vs. the total number of samples to be completed in this cycle. See Sampling Setup in Settings Menu.
Record: 1 / 45000	**Record Indication**	Home Screen	The Records Indication is a display of the total number of sampling records saved in the Instrument out of the total number of records the instrument is capable of storing -- 45,000 possible saved records (rotating buffer) including particle count data, environmental data, locations and times per record.
	Settings Menu Icon	Home Screen	When pressed, the Settings Menu Icon brings you to the Settings Screen. All aspects of the Instrument's set-up can be managed from the icon driven sub-menus.
	Annotation Icon	Home Screen	The Annotation Icon, displays as a **blue** pencil. When pressed, written notation (up to 32 letters, can be added to a record during the time of the sampling, or after a sample has been taken. Advanced processing allows for annotations to be inserted while the unit is sampling with no interruption to the operation. The **green** pencil denotes that an annotation exists on that record. This feature can be disabled from the Configuration screen in Settings.

	Function Name	Location/Screen	Description of Function
	Plus and Minus Button	Home Screen	When pressed, these icons scroll through 500 possible locations that can be saved and uniquely identified in the Locations set-up screen. Locations can have set recipes assigned to them in advance for ease-of-use during sampling.
	Green Flow & No Flow Indication	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. If a red line appears diagonally through three green arrows, it is an indication no flow.
	Back Arrow Icon	Various Screens throughout program	Press back arrow Icon to return to the previous screen.

4-1 Operational Flow Chart – Menu Map


```
Print Information

Information    Print Current Record    Audio Volume Set    Environment    Date / Time Set    Power Management    Shut Down

Zoom                                                                                                        Location & Recipes

Real-Time Meter                                                                                             Location Advance

Charts    Recorded Data    Reports    Settings    Annotate Record

Print Records                          A
```

Main display shown:
- 23.9° C 11/09/2012
- 52% RH 2:28 PM
- cleanroom 25
- Mode: Automatic
- Sample: 00:00:20
- Hold: 00:00:04
- Cycle: 1 / 9999
- Record: 1521 / 40000
- Recipe: isolator recipe
- Counting…

µm	Σ	Δ
0.3	523469	523469
0.5	393464	393464
1.0	37378	37378
3.0	8965	8965
5.0	543	543
10.0	32	32

Settings branch:
```
Sampling Setup    Channel Management    Locations & Recipes    Configuration

Printer Setup    Communications Setup    Environment Setup    Password Setup    Clear Samples

Modbus Setup    Channel Alarm Setup                          Configuration Load/Save    Factory Restore
```

Reports branch (A):
```
                         A

ISO 14644-1        EU-GMP Annex 1        FS 209E

Room Definition    Report Generate    Room Definition    Report Generate    Room Definition    Report Generate

                         Print Report
```

Legend:
- Admin Password Not Required
- Admin Password Required to Edit
- Admin Password Required to View

20

5-1 Operation – Initial Power Up – First Time Use

After the Particle Counter turns on for the first time a window will appear stating "Time of Day Clock Not Set". Press OK to Set Clock.
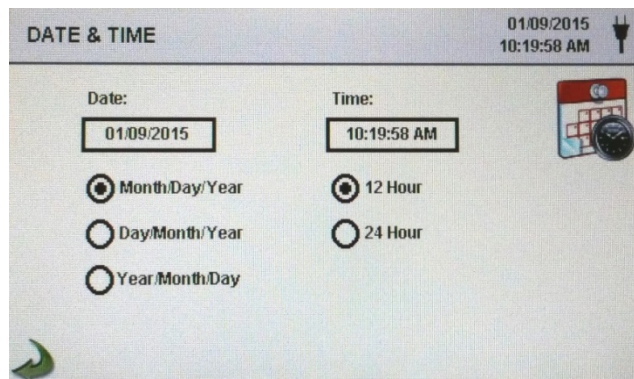
Date Format Select Button	Choose format for - Month/Day/Year, Day/Month/Year, or Year/Month/Day indication by selecting the corresponding button on the touchscreen.
Numeric Keypad	Touch date window, a numeric keypad will appear to allow for date change. For change or correction of input values navigate using < or > to move cursor. When complete press OK button
Time Format Select Button	Choose 12 hour or 24 hour clock indication by selecting the corresponding button on the touchscreen.
Numeric Keypad	Touch time window, a numeric keypad will appear to allow for time change. Use 24 hour clock format for time entry to properly indicate AM or PM. For change or correction of input values navigate using <or> to move cursor. When complete press OK button- Time will display with AM/PM or in 24 hour format based on format selection.
Back Arrow Icon	Press back arrow Icon to return to the previous screen.

5-2 Display

The large color touch screen can zoom in and out on the home page at any time simply by touching any blank space on the screen.
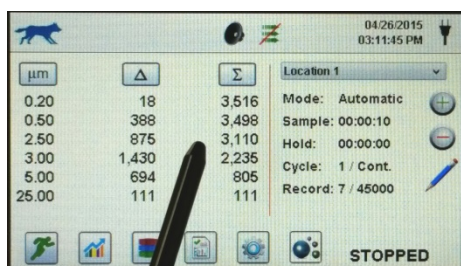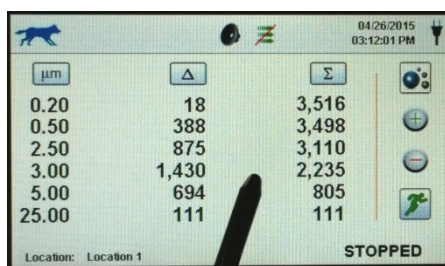
Un-Zoomed View   Zoomed View

5-3 Taking a Sample

Main Sampling Home Screen
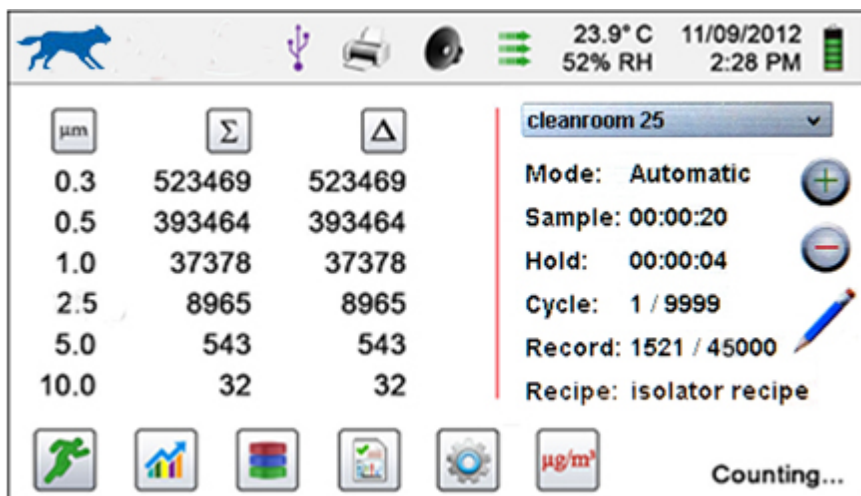
| | Taking a Sample | Using the start sample Icon on the display begins the sample. | To take a sample, select the start sample icon on the display. This will begin the sample according to the sampling set up parameters displayed on the right side of the home display. The sample setting can be changed in the settings sub-menus. |

| | Stopping the Sample | Using the Stop Sample Icon on the display | To stop sampling press the stop icon on the display. |

| | Data Unit of Measure Selection | The instrument can display the active sample or any recorded and saved record in count, counter per cubic meter, count per cubic foot, or micrograms per cubic meter (in mass mode, if enabled from the Channel Management Screen). This can be changed on the fly by pressing the icon, rotating through the data output indication options. |

5-4 Real-Time Meter, Graphing Function and Environmental PM Display

The Instrument will display a bar graph visualization that rises and falls with the increase of pulses counted per second, per channel. This allows for the pinpointing of the cause of the contamination that is being detected in the environment. The closer the instrument is to the source, the higher the indication appears on the bar graph. This feature also graphically displays the pulses per second if the graph function is chosen, making the graph's historical information useful in point source detection.

5-4 Real-Time Meter and Graphing Function (continued)
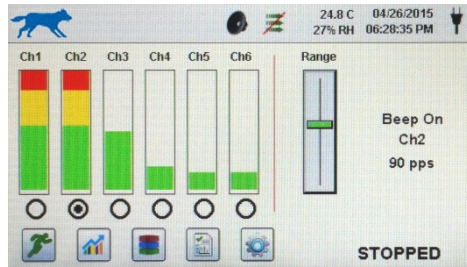
Channel 3 selected & signal at maximum value
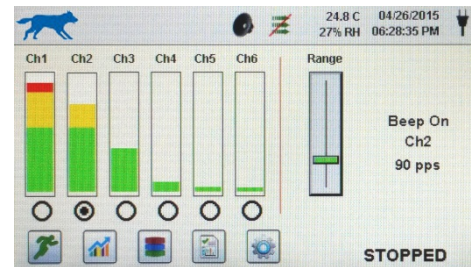
Range Slider Lowered to reduce Channel 3 value

While on Real Time Meter Page, the following steps allow for the features operation.

	Start/Stop Sampling while on Real-Time Meter or Pulse Per Second Screen	The Sampling can be started or stopped from this screen using the Start/Stop icon buttons, or by using the one touch button on the handle.
	Channel Select – Radio Button	Select the channel size that is the focus of the contamination being investigated by clicking on the radio select button on the bottom of each channel. The channel selected also represents the data being displayed in the pulses per second graph mode.
	Range – Sensitivity Adjustment Slider	Using the touchscreen, drag the green Range slider bar up towards the top of the slider. This allows for the greatest sensitivity and signal from the contamination within the test area. As the unit gets closer to the concentration source the visual signal can increase and hit 100% of the indicated scale long before the actual source of the contamination is found. By pulling the Range Slider down, the sensitivity is reduced and the indication scaled down. This allows for more precise detection when getting closer to the contamination source. This procedure can be repeated until the source is identified.
	Switch to Particles Per Second Screen, or to Environmental PM2.5 Display	Pressing the Real-Time Meter Icon again, switches to the Particles per second graphical display page. Pressing it one more time displays the Environmental PM2.5 Air Quality Display. Pressing the Icon one more time returns the display to the home screen.
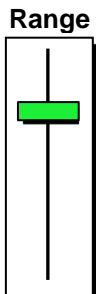
Real-Time Meter Particles/Second Graph
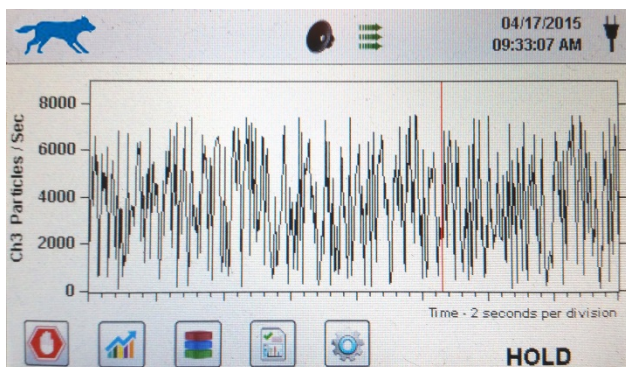
PM 2.5 Environmental Conditions Display
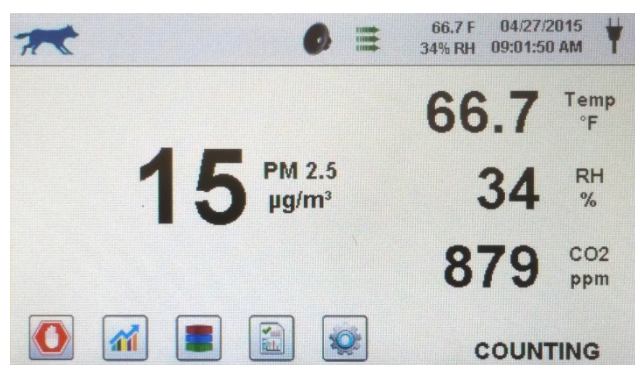
5-5 Recorded Data

 The Particle counter will save up to 45,000 records. These records can be accessed by selecting the recorded data icon. The Recorded data page uses a horizontal slider bar that allows scrolling left and right through all records. Click on the white arrows for fine control in locating a specific record. Press the slider button with the stylus and drag left or right to navigate through large amounts of records quickly.

 Recorded Data Screen

 Print or Save the Current Record being displayed

If a Printer or USB thumb drive is attached to the instrument, the current record on the Recorded Data Screen can be downloaded or printed by pressing the corresponding Printer or USB Icon.

 Turn off Indicated Cumulative or Differential value Columns

All displayed channel values can be turned off or back on from the recorded sample record by toggling the mode icons.

 Change Indicated Data Units

The Recorded data indication can be changed to the corresponding calculated values by pressing the Particle Data Selection Icon. Press the icon to change view between particle count, count per cubic meter, count per cubic foot, or micrograms per cubic meter (if enabled for mass concentration mode in Channel Management).

 Adding Annotation To Recorded Data

5-5 Recorded Data (continued)

To add an annotation to an existing record, click on the **Blue** Pencil Annotation Icon. This allows for the inclusion of a written notation for the current sample record selected. The Annotation Keyboard will be displayed and the note can be entered. The **Green** pencil denotes that an annotation exists on that record. This feature can be disabled from the Configuration screen in Settings.

Annotation Keyboard
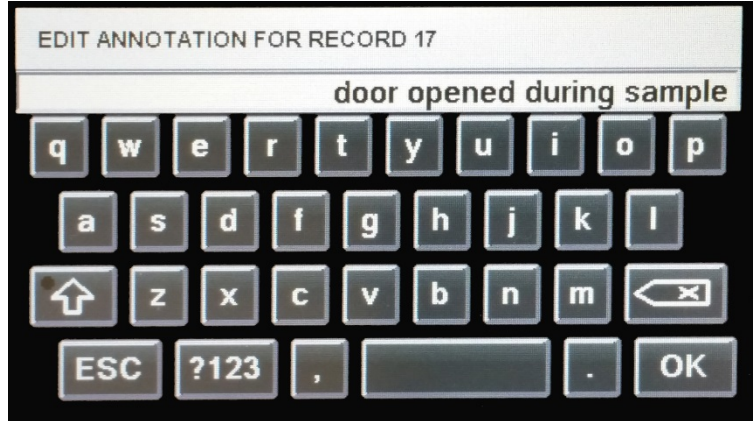
Saved Annotation Indication and Icon	The green pencil denotes that an annotation exists on that record. The annotation can be accessed or edited at a later time.
Special Notes – Cap Locks and Delete	Holding down the Shift button will activate or de-activate the cap locks functions. Holding down the backspace key will delete all text entered on the text line.

5-6 Reports

Accessing ISO, GMP, or Federal Standard Report Functions	
ISO 14644-1	Selecting this report icon allows for the generation of a report based on the parameters and guidelines of the ISO standard.
EU-GMP Annex-1	Selecting this report icon allows for the generation of a report based on the parameters and guidelines of the European GMP Annex-1 standard.
FS 209E	Selecting this report icon allows for the generation of a report based on the parameters and guidelines of the US Federal Standard 209E.
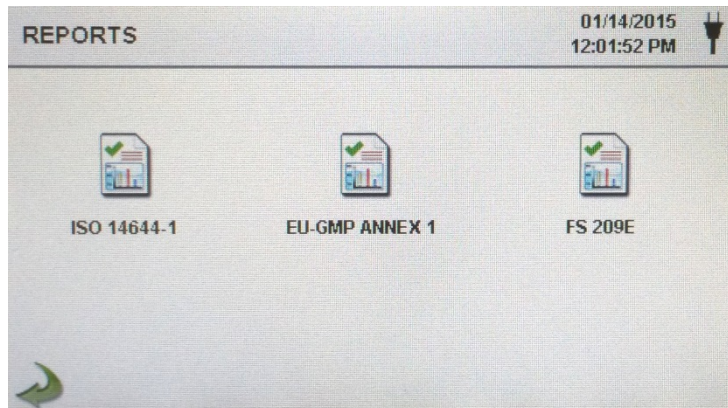
5-6 Reports (continued)

Selecting the specific report icon from the Reports Screen displays information for the chosen standard. The room parameters can be defined by pressing the Room Definition Button. To generate a report, select the Generate Report button. This creates a report document that can be saved to an external thumb drive, or printed to a connected printer.

By holding down the Create Report Button for 5 seconds, a sample report will be displayed with the current test records. These records will be added to the system's recorded data so that the values and information can be reviewed prior to actually completing the report and saving to an external source.

Generate	**Create Report**

After selecting Generate, the Report Generation screen displays.
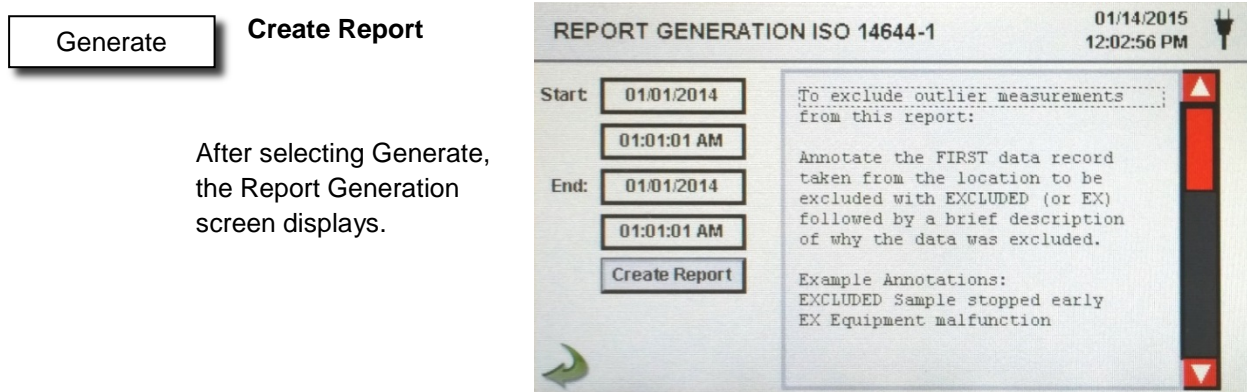
Create Report

The Start/End time and date are selected to enter the values. The report is created using the Create Report Button. If the values of the count or sampling set-up are incorrect, the report will indicate the errors prior to the report being generated. To exclude outlier measurements from the report:

Annotate the FIRST data record taken from the location to be excluded with EXCLUDED (or EX) followed by a brief description of why the data was excluded.

Example Annotations: EXCLUDED Sample stopped early or EX Equipment failure.

Room Definition
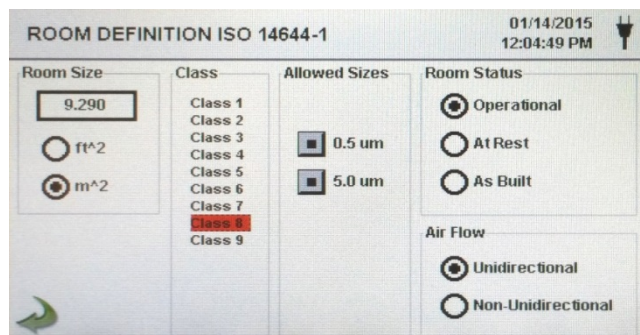
Each report standard has a Room Definition page that allows for information to be input defining the output of the generated report. Room size is input in square feet or square meters. The ISO class of the cleanroom being tested is selected, and the allowable sizes may be included or excluded in the report. The Room Status is selected as being Operation, At Rest, or As Built per the standard specification requirements. Airflow is recorded as being Unidirectional or Non-Unidirectional.

5-6 Reports (continued)

Sample of Report Output

```
                                          01/14/2015
REPORT GENERATION ISO 14644-1             12:06:22 PM

Start   01/14/2014              ISO 14644-1 Report
                              01/14/2015 12:05:57 PM
        01:01:01 AM
                           Target Class: Class 8
                           Room Area:    9.290 m^2
End:    01/14/2014          Room Status:  Operational
                           Air Flow:     Unidirectional
        11:59:01 AM         Locations:    2
                           Samples:      4
        Create Report       Start:   01/14/2014 01:01:01 AM
                           End:     01/14/2014 11:59:01 AM
                           -------------------------------
```

Printed Report Sample

```
|       ISO 14644-1 Report
    01/16/2015 06:54:08 AM

Target Class: Class 5
Room Area:    80.000 m^2
Room Status:  Operational
Air Flow:     Unidirectional
Locations:    9
Samples:      11
Start:   01/16/2015 06:53:01 AM
End:     01/16/2015 06:53:09 AM
-------------------------------
Class Class 5 (at 0.3)      PASS

 Class Limit:  10,200.00 P/m^3
 Min Sample Vol: 0.00283   m^3

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

Location              Avg P/m^3
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/m^3
 Min Sample Vol: 0.00568   m^3

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

Location              Avg P/m^3
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:           05/15/2014
-------- End of Report ---------
```

Printing or Saving a Report — To Print a report on screen, or save it to an installed thumb drive, press the corresponding icon on the.
Note: a thumb drive or printer must be connected to the instrument to display these icons.

6-1 Settings

Settings Screen   Select the Settings Icon to enter the main configuration menu. All settings for the instrument are accessed through this Settings screen. When the administrator password is in use, this screen is not available to regular users and may only be accessed and settings modified by the administrator.

6-2 Sampling Setup

Settings Screen   The Sampling Setup Icon displays the Sample Timing, Sample Volume Units and Pump Start Timing selection windows. The option to utilize recipes instead of the general Sample Timing setup values is also accessed on this page with a selection box.
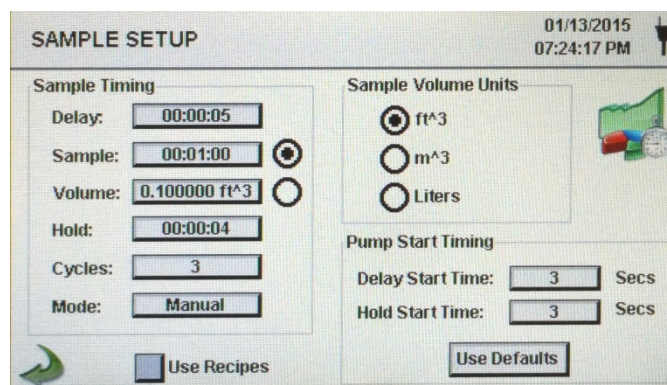
Delay   Pressing the Delay time box opens the Enter Time screen. The numeric touchpad is used to enter the amount of time the counter will wait before starting a sample in automatic mode.

The entry is made in Hours:Minutes:Seconds (HH:MM:SS). The maximum delay time is 99 hours, 59 minutes and 59 seconds. This feature is ideal to allow the operator to leave the area before the sampling begins.

Sample	Pressing the Sample Button opens the Enter Time screen with numeric touchpad for the entry of the amount of time the counter will sample in automatic mode. The entry is made in Hours:Minutes:Seconds (HH:MM:SS). The maximum sample time is 99 hours, 59 minutes and 59 seconds.
Volume	Pressing Volume displays the numeric touchpad for the entry of the desired volume to be sampled. The volume will correspond to the units selected in the Sample Volume Units Selection on the Sample Setup Screen. The volume value entered will control the length of time per sample to achieve the desired sample volume.
Hold	Pressing the Hold Button opens the Enter Time screen with numeric touchpad for the entry of the amount of time the counter will hold between samples in automatic mode. The entry is made in Hours:Minutes:Seconds (HH:MM:SS). The maximum Hold delay time is 99 hours, 59 minutes and 59 seconds.
Cycles	Pressing Cycles displays the Enter Cycles Screen with numeric touchpad for entry of the number of sampling cycles to be taken at a specific location when the unit is in automatic mode.
	Enter ZERO (0000) to activate Continuous Sampling Mode.
Mode	The Mode icon opens the Select Sample Mode page. Select Automatic mode or Manual Mode. After making a selection, press OK to accept and return to the previous page, or select cancel.
Sample Volume Units selection	Choose from three different sample volume units: Cubic Feet (ft^3), Cubic Meters (m^3) or Liters.
Use Recipes Button	The Use Recipes button activates the Recipe Setup Page. Recipes associated with locations will be utilized in place of the general settings from the Sample Timing Setup screen.
Pump Start Timing – Delay Start Time	The Pump Delay Start Time is the length of time during the initial delay before the pump turns on, prior to sampling.
⚠	**NOTE: The value must be less than the delay time, but greater than 3 seconds to avoid a pump/laser warning error.**
Pump Start Timing – Hold Start Time	During the hold time between samples, The Pump Hold Start Time determines the amount of time before the pump will turn back on before the next sample begins.
⚠	**NOTE: The value must be less than the hold time, but greater than 3 seconds to avoid a pump/laser warning error.**
Back Arrow Icon	Press back to last screen arrow on bottom left corner of the display to return to main settings screen.

6-3 Channel Management

This screen allows for many rich features to be controlled, including enabling or disabling channels, setting custom channel sizes, enabling or disabling alarms by channel and the setting of the alarm thresholds. The mass concentration mode may also be activated to allow entry of particle density and refractive index values by channel.

Channel Management Screen

Enable Channel:	Size µm:	Enable Alarm:	Alarm Threshold:	Density g/ml:	Refractive Index:
Ch 1	0.30		5000000		
Ch 2	0.50		3520000		
Ch 3	1.00		832000		
Ch 4	3.00		3000		
Ch 5	5.00		29300		
Ch 6	10.00		350		

Use Recipes ☐   Alarm On Σft^3 ☐ Mass Mode

Enable Channel: Each channel can be turned on or off by pressing the corresponding radio button. When the channel is turned off all values related to that channel are ignored and will not be displayed or recorded.

Size (micron - µm) The individual channels (2 - 6) can have their target size adjusted, by pressing the corresponding Size µm field and entering the desired value with the numeric keypad.
This feature is also known as variable binning, and is ideal for focusing on specific, known particle sizes.

Enable Alarms Each channel can have an alarm enabled or disabled by pressing the selection button for the channel. The Alarm Threshold can be entered by pressing this field and entering a numerical value on the Enter Alarm Threshold Screen. This displays a numeric touchpad in order to enter the desired value. Once the value is entered, click ok, or cancel to return to the Channel Management screen.

Σ^{ft^3}

Alarm On By selecting the Cumulative Mode Icon the Channel Alarm Setup Screen is displayed. The Alarm On Threshold values will correspond to the eight (8) options listed on the Channel Alarm Setup page.

Channel Alarm Setup Page Δ - Differential count,   Δft³ - Differential cubic feet, Δm³ - Differential cubic meter, Σ - Cumulative count, Σft³ - Cumulative cubic feet,   Σm³ - Cumulative cubic meter,   µg/m3 - micrograms per cubic meter, or PM - Particle Mass

**Mass Mode
Settings**

CHANNEL MANAGEMENT				01/15/2015 01:53:24 PM	
Enable Channel:	Size µm:	Enable Alarm:	Alarm Threshold:	Density g/ml:	Refractive Index:
▣ Ch 1	0.30	▢	5000000	2.50	1.000
▣ Ch 2	0.50	▢	3520000	2.50	1.000
▣ Ch 3	1.00	▢	832000	2.50	1.000
▣ Ch 4	3.00	▢	3000	2.50	1.000
▣ Ch 5	5.00	▢	29300	2.50	1.000
▣ Ch 6	10.00	▢	350	2.50	1.000

Use Recipes ▢   Alarm On Σ ft³   ▣ Mass Mode

▣ **Mass Mode**

Mass Mode Enable

The Mass Mode button allows the instrument to display particle count data as calculated particle mass concentration in weight/volume units. The international SI unit for mass is (kg/m3), which can be translated to micro grams per milliliter (µg/ml) This is indicated as an accepted value for particle mass monitoring for environmental as well as health & safety applications.

Density g/ml:

The density of the particles to be measured can be entered to allow for higher accuracy and correlation to the actual mass concentration values. To do so, select the numeric field corresponding to the particle size channel and enter the desired density value in g/ml with the numeric touch pad. Press OK or cancel to return to the Channel Management Screen.

Refractive Index

The refractive index of the particles to be measured can be entered in mass concentration mode. To do so, select the numeric field corresponding to the particle size channel and enter the desired density refractive index value with the numeric touch pad. Press OK or cancel to return to the Channel Management Screen.

Calculation of displayed Values on Main Screen for Mass Concentration Mode

µg/m3 Indicated Values Explained

When Mass Concentration Mode is selected, µg/m3 is the measured value in the first column. 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. For 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.

**Particle Mass Indicated Valued Explained**

The column labeled PM shows the total particle mass of particles that are less than the displayed channel size. For example, the value displayed in the PM column for the 2.5µm channel is the particle mass (µg/m³ column) of all particles with a size less than 2.5µm, generally referred to as PM2.5.

6-4 Locations & Recipes

Pressing the Locations Icon opens the Select Location & Recipes screen. Up to 1000 unique location names can be created. This screen also provides for Location-specific recipes which utilize preset sample times, delays, hold times, cycles, etc. Over 50 unique recipes can be created to correspond to any number of locations.

Select Location &

Recipe Screen
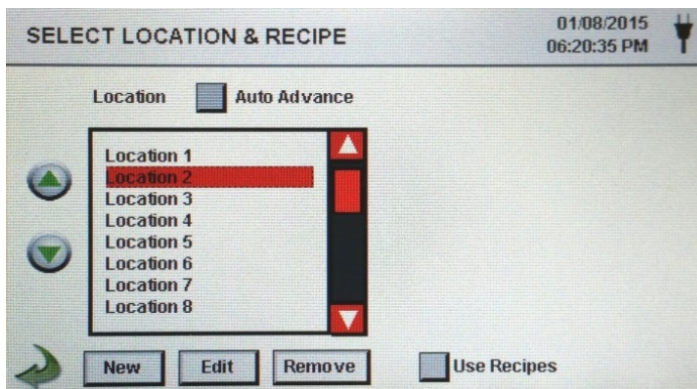
	Location Auto Advance	When a sample is completed and the instrument is set to automatic mode, Pressing this button auto advances to the next location.
	Navigate up or down through location list	Navigate with the up and down white arrows on the right side of the list. The red slider button can also be pressed and dragged up or down with a stylus or finger to navigate quickly up and down the list.
	Move Selected Location Up / Down through List Order	Move the selected location up or down using the Silver and Green up and down arrow buttons on the left side of the locations list. Locations can be moved in order to group common areas to be tested for more convenient selection during setup, prior to a sampling event.
	New Location Entry	Press the New button to create a new location on the Location list. Selecting this button will display the Enter Name For New Location screen. Use the touchscreen keyboard to enter the name of the new location. Press OK to return to the previous screen.
	Edit Location	Press the Edit button to modify the location highlighted on the Location list. Selecting this button will display the Enter New Name For Location screen. Use the touchscreen keyboard to modify the name of the existing location. Press OK to return to the previous screen.
	Remove Location	Press the Remove button to delete the currently highlighted location.
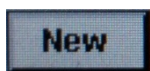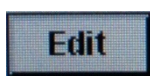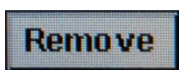
6-4 Locations & Recipes (continued)

	Use Recipes	Pressing this button displays the Recipes settings portion of the page. By selecting the Location on the left box, then setting the recipes from the right box, the location is configured with one of 50 possible user defined sampling setups.
	Edit Recipe for Selected Location	Press the Edit button on lower right hand side of screen under recipe setup window, to enter the Recipe setup.

Recipe Information Appears on Right Side of Screen
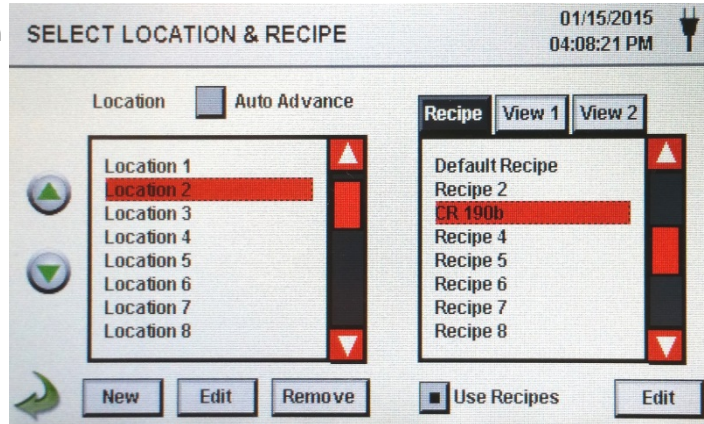
The instructions that follow are related to the illustration on the top of page 36
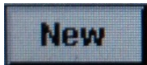
	New Recipe Entry	Press the New button to create a new recipe. The Enter Name For New Recipe screen will appear. Use the touchscreen keyboard to enter the name of the new recipe. Press OK to return to the previous screen.
	Edit Recipe	Press the Edit button to modify the existing recipe highlighted on the Location list. Pressing this button will display the Enter New Name For Recipe screen. Use the touchscreen keyboard to modify the name of the existing recipe. Press OK to return to the previous screen.
	Remove Recipe	Press the **Remove** button to delete the recipe that is highlighted on the Location list.
	Used By Tab	The Used By window displays all locations currently set to use the current recipe when sampling.
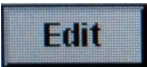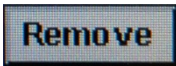
6-4 Locations & Recipes (continued)

Edit 1 Tab

The Edit 1 tab allows for the sampling settings, including the delay time, sampling time, cycles and mode that can be set for that recipe.
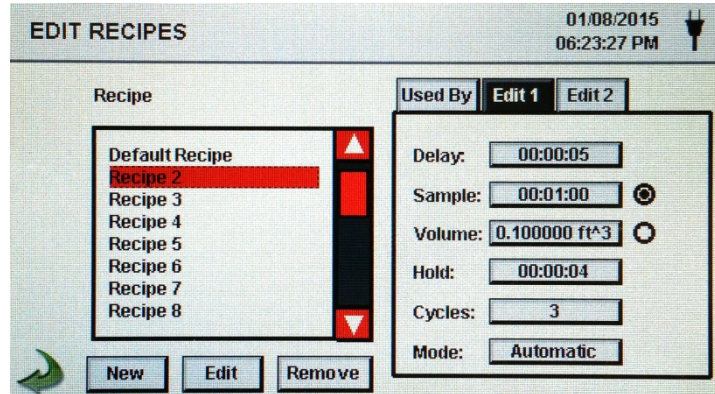
Edit Recipe Tab 1 - Delay

Pressing the Delay time box opens the Enter Time screen. The numeric touchpad is used to enter the amount of time the counter will wait before starting a sample in automatic mode.

The entry is made in Hours:Minutes:Seconds (HH:MM:SS). The maximum delay time is 99 hours, 59 minutes and 59 seconds.

Edit Recipe Tab 1 - Sample

Pressing the Sample Button opens the Enter Time screen with numeric touchpad for the entry of the amount of time the counter will sample in automatic mode.

The entry is made in Hours:Minutes:Seconds (HH:MM:SS). The maximum sample time is 99 hours, 59 minutes and 59 seconds.

Edit Recipe Tab 1 - Volume

Pressing Volume displays the numeric touchpad for the entry of the desired volume to be sampled. The volume will correspond to the units selected in the Sample Volume Units Selection on the Sample Setup Screen. The volume value entered will control the length of time per sample to achieve the desired sample volume.

Edit Recipe Tab 1 - Sample or Volume selection buttons

Selecting Sample will cause the sample to be time based on the Sample time value entered. Selecting Volume will cause the sample to be based on the actual volume of air sampled to be measured and achieved before finishing the event.

Edit Recipe Tab 1 - Hold

Pressing the Hold Button opens the Enter Time screen with numeric touchpad for the entry of the amount of time the counter will hold between samples in automatic mode.

The entry is made in Hours:Minutes:Seconds (HH:MM:SS). The maximum Hold delay time is 99 hours, 59 minutes and 59 seconds.

6-4 Locations & Recipes (continued)

Edit Recipe Tab 1 - Cycles	Pressing Cycles displays the Enter Cycles Screen with numeric touchpad for entry of the number of sampling cycles to be taken at a specific location when the unit is in automatic mode.
	Enter ZERO (0000) to activate Continuous Sampling Mode.
Edit Recipe Tab 1 - Mode	The Mode icon opens the Select Sample Mode page. Select Automatic mode or Manual Mode. After making a selection, press OK to accept and return to the previous page, or select cancel.
Edit Recipe Tab 2 - Select Channel Alarm	Select the channels to activate the alarm threshold values set in the **Channel Management Screen**.
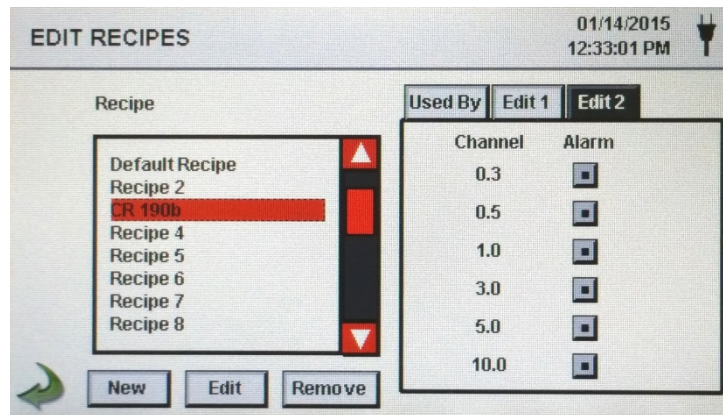
Back Arrow Icon	Press back to last screen arrow on bottom left corner of the display to return to the last screen, repeat this action to return to the settings screen or twice to return to the main home screen.

6-5 Configuration

Pressing this Icon opens the Configuration screen. Various parameters can be set from this page including language settings, USB configuration save options, and factory restore to default parameters.

Configuration Screen

Language	Select and highlight the language to be used with your device. English is the Default.
Store Partial Samples	Select this option to save values from a prematurely ended sampling. If this option is left unchecked, the Instrument will ignore partial sampling events.
Alarm Acknowledge	During an alarm, the visual alarm bell and the audible sounder will continue to sound until the alarm bell icon is pressed when this option selected. If this option is not selected, then the alarm sounder and visual alarm indicator will function normally. Once the next sampling cycle starts (in automatic mode) the alarm indications will reset themselves.
Enable Annotations	Selecting this option to allow annotations (notes) to be entered on to the sample record while it is taking place, or after the fact in the records history. These notes will be included in downloaded record data. If this is unchecked, the feature is disabled.
Number Format	This selection box allows for setting the number formats: 1,000.0 - 1.000,0 - 1 000,0
Factory Restore	This option will display the Factory Restore screen. Use this screen to restore Locations and Recipes, User Settings, and Retain Language Settings. You must hit the Confirm button to enact this feature.
USB Icon	When a USB Thumb drive or mass storage device is plugged into the USB host port on the particle counter, the USB Configuration Save/Load Icon appears on the right side of the main Configuration screen. The Configuration Load/Save feature allows for saving the current configuration, including Recipes, locations and settings, from the meter to the thumb drive. The feature can be used to restore the saved configuration back to any other GrayWolf handheld Particle Counter.

Configuration Load/Save Screen
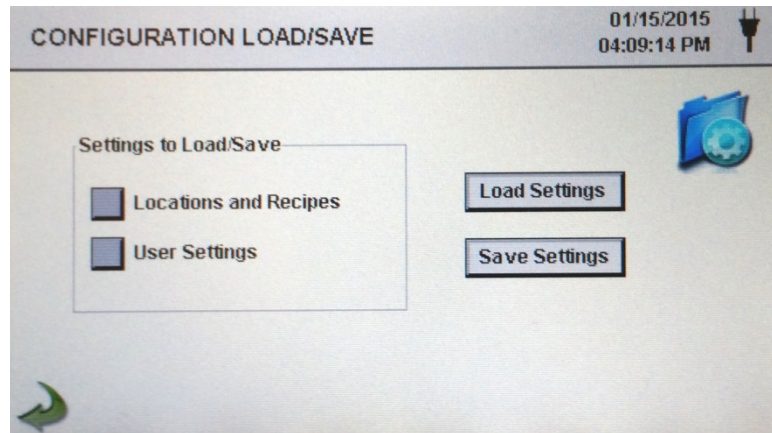
Settings to Load/Save   Use the two check boxes to select Locations and Recipes or User Settings for loading or saving with the USB thumb drive.
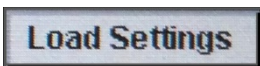
Load Settings   This button initiates the loading of a previously saved settings configuration into the current meter.
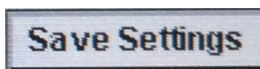
Save Settings   This button will save the current configuration settings to the attached thumb drive or mass storage device.

back arrow Icon   Press the back to last screen arrow on bottom left corner of the display to return to the previous screen

6-6 Printer Setup

This screen allows for the configuration of your printing options.
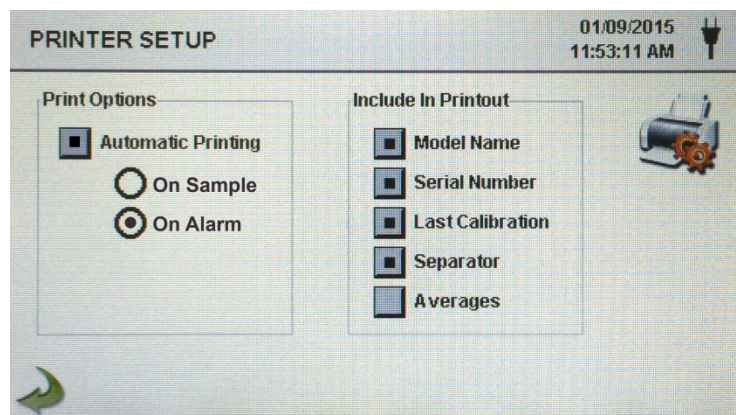
Automatic Printing   Selecting this option gives additional options to choose if the meter will print automatically 'On Sample' or 'On Alarm'

Include in Printout   Select each item of information to include with printed values and reports - Model Name; Serial Number; Last Calibration (date), Separator; and Averages

6-7 Environment

The Environment screen allows for the setting of the temperature, humidity and barometric pressure units, and to allow the instrument to activate an alarm associated with the sensors.

Environment Setting Screen

Enable Alarms Selecting the enable alarm function for Temperature or Relative Humidity will allow the meter to indicate if a low or high threshold for either environmental parameter is exceeded or dropped below the minimum set threshold.

Low Threshold The low threshold value fields allow for the low threshold to be entered for either temperature, relative humidity, or both. When the field is selected a numeric keypad appears allowing for the values to be entered and saved.

High Threshold The High Threshold value fields allow for the high threshold to be entered for either temperature, relative humidity, or both. When the field is selected a numeric keypad appears allowing for the values to be entered and saved.

Units This section allows for selection of metric or standard values for temperature and barometric pressure.

6-8 Passwords

The Password Setup Screen allows for the secure operation of the instrument by authorized users, and configuration and setup changes by administrators in accordance with 21 CFR 11.

Password Setup Screen

6-8 Passwords (continued)

Admin Password	Selecting this radio button activates the administrative password function for 21 CFR 1 compliance preventing any settings, time/date, or configurations to be changed by lower level users.
Admin Password - New Password / Confirm New Password	The two password entry fields allow for the password to be entered and saved. By selecting these fields it will bring up an alpha-numeric keyboard allowing for the user to enter a new administrator password. The default administrator password from the factory is **4321**
User Password	Selecting this radio button activates the user password function preventing any unauthorized use of the particle counter. User level access allows for using the meter in its current configuration, and saving samples.
User Password - New Password / Confirm New Password	The two password entry fields allow for the password to be entered and saved. By selecting these fields it will bring up an alpha-numeric keyboard allowing for the user to enter a new user level password. The default user password from the factory is **1234**
Password Timeout	Password timeout is the length of time in minutes there is no activity on the particle counter. If the unit is operating and inactive for more than the amount of time entered, the next operation will require a User or Administrator password to continue. The default is 5 minutes.
Lock Now	The lock now icon puts the meter immediately to the password enter screen. No activity is possible without entering the password to unlock the meter.
IMPORTANT NOTES	At any time during the operation of the particle counter, while passwords are active, the administrative password can be entered even if the user password is being requested. This will cause the unit to allow all administrative access to features, settings and configuration changes screens.

If at any time the administrative password is lost or forgotten, you can call GrayWolf for a temporary password that will be valid only for that day the password is requested. This is a unique password that will automatically expire at the end of the day it is issued.

6-9 Clear All Samples

All records on the instrument can be cleared with this function. CAUTION – This is not reversible and all data will be lost. Back up all data to a PC or USB Memory device before using this function.
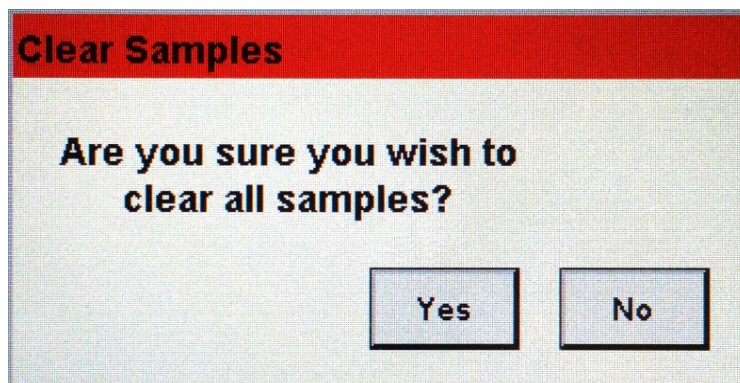
Confirmation Screen

By selecting the Clear Samples Icon in the Settings Screen, the confirmation screen will appear asking if the request should be completed. Selecting Yes will delete all recorded samples. Selecting No returns the display to the settings screen.

7-1 Power Management
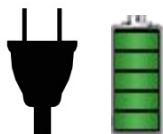
The instrument utilizes advanced power management function that are unique to GrayWolf. Please be certain to read the battery and power safety instructions at the beginning of this manual.

Power Management Screen
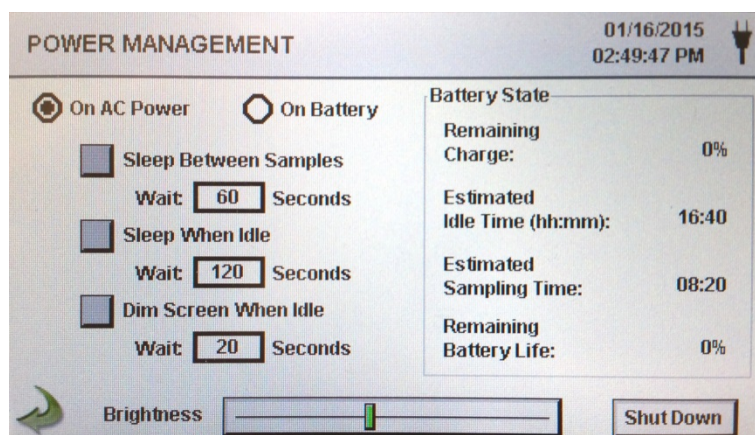
AC Adapter Icon

This Icon is visible when the instrument is plugged into AC mains power and pressing this icon brings you to the Power management screen.

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7-1 Power Management (continued)

Battery Level Indicator/Icon	This icon also allows for access to the Power Management screen, and also serves as a visual indication of the battery's power level
Icon	The battery power level icon will display differently depending on the amount of battery power that is left in a percentage (20% to 100%)

The Power Level Indication is displayed as follows:

100%   80%   60%   40%   20%

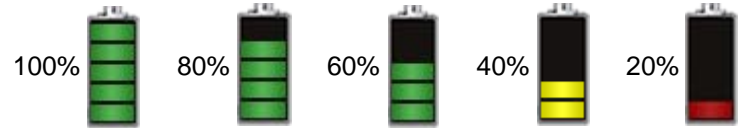|	
Remaining Charge	(0 to 100%) - this is the percent of battery life left for this current charge displayed as a percent
Estimated Idle Time	(hours:minutes) - this is the amount of time in hours and minutes left for this current battery charge if the unit remains in the on power state, and without sampling.
Estimated Sampling Time	(hours:minutes) - this is the amount of time in hours and minutes left for this current battery charge if the unit is on, the pump is running and the unit is sampling.
Remaining Battery Life	This is a percent indication of the total life left on this battery pack during the life of the battery. This is useful for monitoring when to replace your power cells.
On AC Power Option	When Selected, all dimming timers, sleep mode timers and screen brightness bar settings will be valid when the unit is plugged into mains power using the AC adapter.
On Battery Option	When Selected, all dimming timers, sleep mode timers and screen brightness bar settings will be valid when the unit is not attached to mains power and operating on the removable internal batteries.
Sleep Between Samples	Selecting this button activates the feature for power down operation to conserve battery life. A timer window will appear, allowing for the input value of the amount of time, after completing a sample, before the system will go to sleep. This value is input by selecting the time input window box. This will bring up the numeric keypad allowing for the input, in seconds from 30 to 65,535 seconds after entering value press ok to return to last screen. (Please note that the minimum time possible for the sleep mode will be 30 seconds, and if sampling delay time is also selected, that time is automatically added to this value.)

Sleep When Idle Option	Selecting this button activates the timer box for this option to count the number of seconds after the unit is idle, with no activity, to go into sleep mode conserving battery power. The amount of time to wait before going to sleep is entered by selecting the time input window box. This will bring up the numeric keypad allowing for the input of the idle time value, in seconds from 1 to 65,535 seconds. After entering the value press ok to return to last screen. (Please note that the default value is 120 seconds.)
Dim Screen When Idle	Selecting this button allows the instrument to save power by dimming the display brightness after the touch screen is not pressed for the selected time. The amount of time to wait before dimming the screen is entered by selecting the time input window box for this option. This will bring up the numeric keypad allowing for the input of the wait to dim screen when idle time value, in seconds, from 20 to 65535 seconds. After entering the value press ok to return to last screen. (Please note that the default value is 20 seconds.)
Brightness Select Slider	Selecting the slider green vertical cross bar, move the slider to the left to decrease and to the right to increase the screen brightness.
Shutdown Icon	Power down the instrument through the interface immediately with this icon. The instrument can also be turned off from the power switch on the back of the unit.
Back Arrow Icon	Press back to last screen arrow on bottom left corner of the display to return to main home screen.

8-1 Volume Controls

Volume Control Icon	By selecting the icon a volume slider control appears. Select the bar on the slider and increase or decrease the volume. Decreasing the slider to zero, mutes the speaker. A numerical value of the volume level appears at the bottom of the slider.
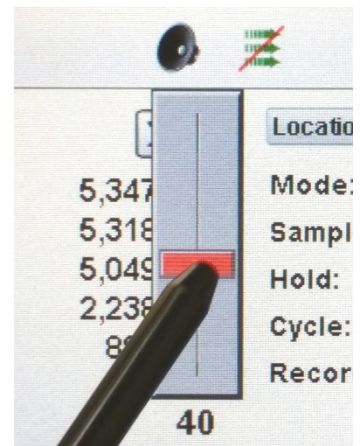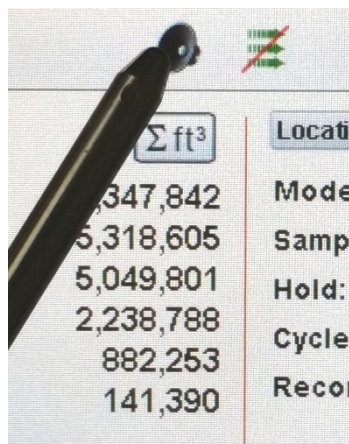
9-1 WolfSense PC

The Air Quality Monitor also includes a PC based software utility that allows for the remote access to download data, and field calibration for sensors.

Please note that detailed instructions for the use of the WolfSense PC software are contained in the WolfSense PC Manual

Load/Install to PC	To load the WolfSense PC Software, install the provided file to your PC with the Windows (7™, 8™ and 10™) operating system. Open the thumb drive folder and select the WolfSense PC installer application file. Follow the installation prompts. Allow permissions with your PC and virus protection software during the installation process.
Start Software	Use the WolfSense PC Icon in the program folder or from the desktop to start the program.
Transfer data	Click File>Transfer from PC-3500/PC-4000 Particle Counter and follow the prompts. Make sure to use the Red labeled cable for calibrations to connect to PC.
Calibrate Sensors	Click File>Calibrate PC-4000 Series Meter… and follow the prompts. Make sure to use the Blue labeled cable for calibrations to connect to PC.

WolfSense PC

File   Options   Window   Help

Open...
Open from GrayWolfLive...
Compare Location Files...
Create Table from Site...
Advanced Reporting...
Export Entire Site to CSV...
NIOSH Dampness and Mold Summary...

Transfer from GrayWolf Meter...
Transfer from Zephyr/Surveyor Classical Line Instruments...
Transfer from PC-3016 Particle Counter...
Transfer from PC-3500/PC-4000 Particle Counter....
Transfer from pDR-1000/1500 Particulate Meter...
Transfer from FM-801 Formaldehyde Meter...
Transfer Experiment Files from GrayWolf Meter...

Calibrate PC-4000 Series Meter...

Create Sites/Locations and Upload to GrayWolf Meter...

Recent Files...

Exit

Download from GrayWolfLive Cloud-based System
Advanced Report Generator
Print
Export to Excel
Comparative Stats

Note Manager
Energy Savings IAQ Balance
Create Sites and Locations for Upload to Meter
Set Graph Options
Email Technical Support Request

Download from PC-3500/PC-4000 Particle Counter
Calibrate PC-4000 Series Particle Counter
Download from PC-3016 Particle Counter
Download from pDR-1500 Particulate Meter
Edit High and Low Alarms

Set Time Format
Add 'K' Correction Factors
Transcribe Text Notes with Dragon Naturally Speaking
View GrayWolf Video Help

APPS MENU   DATA

Instrument Management Software 2.0.1.0

File   Edit   Instrument   Help

Data File Content

Download Data
Select Columns
Real-Time Graph

Filename:
Model:
Serial #:
Last Cal:
Channel Count:
Record Count:

Selected Record

Location:
Date:
Time:
Sample Time:
Sample
Laser:
Flow:
Temp:
RH:
BP:
Annotation:

Channel Size	Differential Count	Cumulative Count	PM µg/m³

USB Connection

No Connection

USB Connection

Connection Indication

When the instrument is connected to the PC by the provided USB cable, and the software has successfully linked with the device, a Green USB Connection indication will appear on the bottom left side of the program window. A No Connection indication will be displayed when no device is connected or detected.

Appendix – A