

ApexZ

AIRBORNE PARTICLE COUNTER



Operators Manual



Lighthouse Worldwide Solutions

ApexZ3 and ApexZ50

Airborne Particle Counters



Operators Manual

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Manufactured by:
Lighthouse Worldwide Solutions
1221 Disk Drive
Medford, Oregon 97501

LWS Part Number: 123456789-1 Rev 1

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Safety

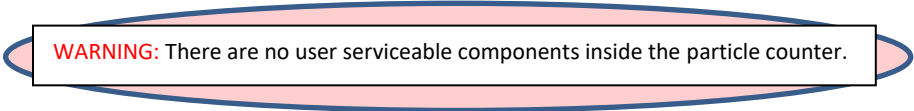
About this Manual

This manual describes the setup, operation and use of the Lighthouse Worldwide Solutions ApexZ family of Portable Airborne Particle Counters. The word “ApexZ”, “unit” or “instrument” may be used in place of a specific model in this ApexZ Operators Manual.

General Safety

Warnings and cautions are used throughout this manual and the reader should become familiar with the meaning of a warning before operating the particle counter. Most warnings will appear in the left margin of the page next to the subject or step to which it applies. Take care when performing any procedures preceded by or containing a warning. The classifications of warning are defined as follows:

- Laser – pertaining to exposure to visible or invisible LASER radiation.
- Electrostatic – pertaining to electrostatic discharge.
- Network Connection – pertaining to communication ports and instrument damage.



WARNING: There are no user serviceable components inside the particle counter.

Laser Safety

This product is considered to be a Class 1 LASER product (as defined by FDA 21 CFR, §1040.10 and IEC 60825-1:2014) when used under normal operation and maintenance. Performing service on the internal sensor can, however, result in exposure to invisible radiation. The particle counter has been evaluated and tested in accordance with EN 61010-1:2012, "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use" and IEC 60825-1:2014, "Safety of LASER Products". For further technical assistance, contact our Technical Support Team at 1-800-945-5905 (USA Toll Free), or 1-541-770-5905.



Laser Warning Label

WARNING: There are no user-serviceable components inside the particle counter. The use of controls, adjustments or procedures other than those specified within this manual may result in personal injury and/or damage to this instrument.

Battery Safety

Battery Type:

National Power Sm-Energy®

Model: SM221

Lithium-Ion Rechargeable Battery, 14.4V, 6.45Ah, 93Wh

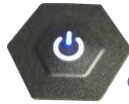


WARNING: Only use batteries provide with the ApexZ by Lighthouse Worldwide Solutions. Use of unauthorized batteries may cause damage to equipment, void warranty, and pose a threat to safety.

Power Safety

Start Up

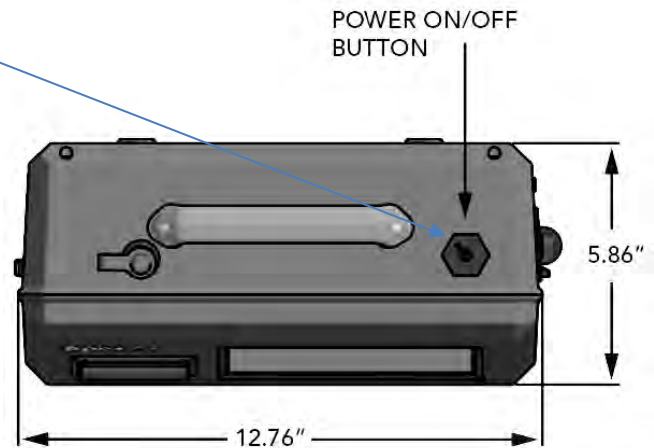
This is the Power Button.



1

Press the power button to turn on the ApexZ particle counter.

Note with a large database of 10,000 records, startup will extend while the database is being loaded.



Shut Down

2

To shut down press the power button ONCE and DO NOT hold it down.

It is permissible to shut down the ApexZ particle counter from any one of the user interface screens.

Users are not required to logout before ApexZ is shut down. If Users are enabled, shutting down the ApexZ will logout the current user and will require a user to login when the ApexZ is next started.

WARNING: DO NOT PRESS AND HOLD THE POWER BUTTON TO SHUT DOWN.
THIS WILL CAUSE A HARD POWER SHUT DOWN AND WILL CORRUPT THE DATABASE.

WARNING: If the ApexZ is shut down during a sample, that sample will not be completed or saved.

Sampling Safety

WARNING: Do not attempt to sample reactive gasses (such as hydrogen or oxygen) with this instrument. Reactive gasses create an explosion hazard in the instrument. Sampling any gas under pressure can damage the instrument and void the warranty. Sampling any gas that is not the same density as ambient air can result in inaccurate data. Do NOT allow water, solvents, or other liquids to enter the instrument via the inlet tube - the instrument will be damaged and the warranty voided.

Operating Safety

WARNING: The use of controls, adjustments or procedures other than those specified within this manual may result in personal injury and/or damage to this instrument. Attempts by untrained personnel to disassemble, alter, modify or adjust the electronics or optics may result in personal injury and damage to the instrument and will void its warranty. There are no user-serviceable components inside the particle counter. Only factory authorized service personnel should repair or service this instrument and its optical system. If replacement of the power supply or its AC power cord is required, replace it only with a power supply or cord having as good as or better ratings than specifications provided by Lighthouse Worldwide Solutions. Attempting to use an under-rated power supply or cord can expose the instrument and adjacent equipment to the user to dangerous shock and fire hazards. Failure to meet this requirement will void the CE certification, void the instrument warranty and can result in serious personal injury.

Electrostatic Safety Information

WARNING: Electrostatic discharge (ESD) can damage or destroy electronic components. Therefore, any service or maintenance work should be done at a static-free work station. A static-free work station requires an ESD consultant to evaluate the work environment and propose the equipment and apparel needed for a work station to be successful.

Compliance

FCC Notice



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Class A Digital Devices

NOTE: 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 his expense.

NOTE: Any changes or modifications not expressly approved by Lighthouse Worldwide Solutions could void your authority to operate this equipment.

FCC RF Exposure Statement

This equipment complies with FCC RF exposure limits set forth for an uncontrolled environment. This equipment was verified for RF exposure and found to comply with FCC OET-65 RF exposure requirements.

WARNING: Making changes to the antenna or the equipment is not permitted. Doing so may result in the equipment exceeding the FCC RF exposure guidelines. This equipment must not be co-located or operated in conjunction with any other antenna or radio transmitter.

CE Notice

EU CE DECLARATION OF CONFORMITY

Manufacturer's Name: Lighthouse Worldwide Solutions, Inc.

Manufacturer's Address: Lighthouse Worldwide Solutions, Inc.
1221 Disk Drive
Medford, OR 97501 USA

Declares the product:

Product Name: ApexZ
Model Number(s): ApexZ3, ApexZ50

Conforms to the following Product Specifications:

<u>SAFETY</u>	EN61010-1:2010	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Part 1: General Requirements IEC 61010-1:2010
	CAN/CSA C22.2 No. 1010.1-1992	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, Part 1: General Requirements
<u>EMC</u>	EN61326-1:2006	Electrical Equipment for Measurement, Control and Laboratory Use EN 61326-1:2006

Supplementary information

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC amended by Directive 93/68/EEC and the EMC Directive 89/336/EEC amended by Directive 93/68/EEC and carries the CE marking accordingly.

Fremont, CA. _____

Jerry Szpak – Director, Engineering

Introduction

Overview

This operating manual introduces the Lighthouse **ApexZ** portable particle counters and includes instructions for inspecting, installing, using and maintaining the instrument.



Description

The ApexZ portable particle counter comes standard with 6 particle-size channels (ApexZ3: 0.3, 0.5, 1.0, 3.0, 5.0, 10.0 microns), (ApexZ50: 0.5, 0.7, 1.0, 3.0, 5.0, 10.0 microns) and a flow rate of (ApexZ3: 1.0 CFM), (ApexZ50: 100LPM). The instrument uses a LASER diode light source and LASER beam shaping optics to illuminate a cross section of the air flow path. As particles move along this path, they cross the LASER beam and scatter light. The scattered light rays from particles cutting through the beam are steered to a photodiode using a system of collection optics. The photodiode converts the image into a current which is converted to a voltage and amplified by an electronic circuit. The amplitude of the voltage pulse is proportional to the light scattered, which in turn is proportional to the size of the particle. The voltage pulses created by the particle are then processed by additional electronics that analyze the height of each pulse and therefore, the size of each corresponding particle. The result is that the number of particles of various sizes is determined. The ApexZ is effective in both ultra-clean areas (such as ISO Class 1 or Grade A) and in more traditional clean zones rated as ISO Class 3 or higher. Refer to Specifications in this manual for additional instrument information.

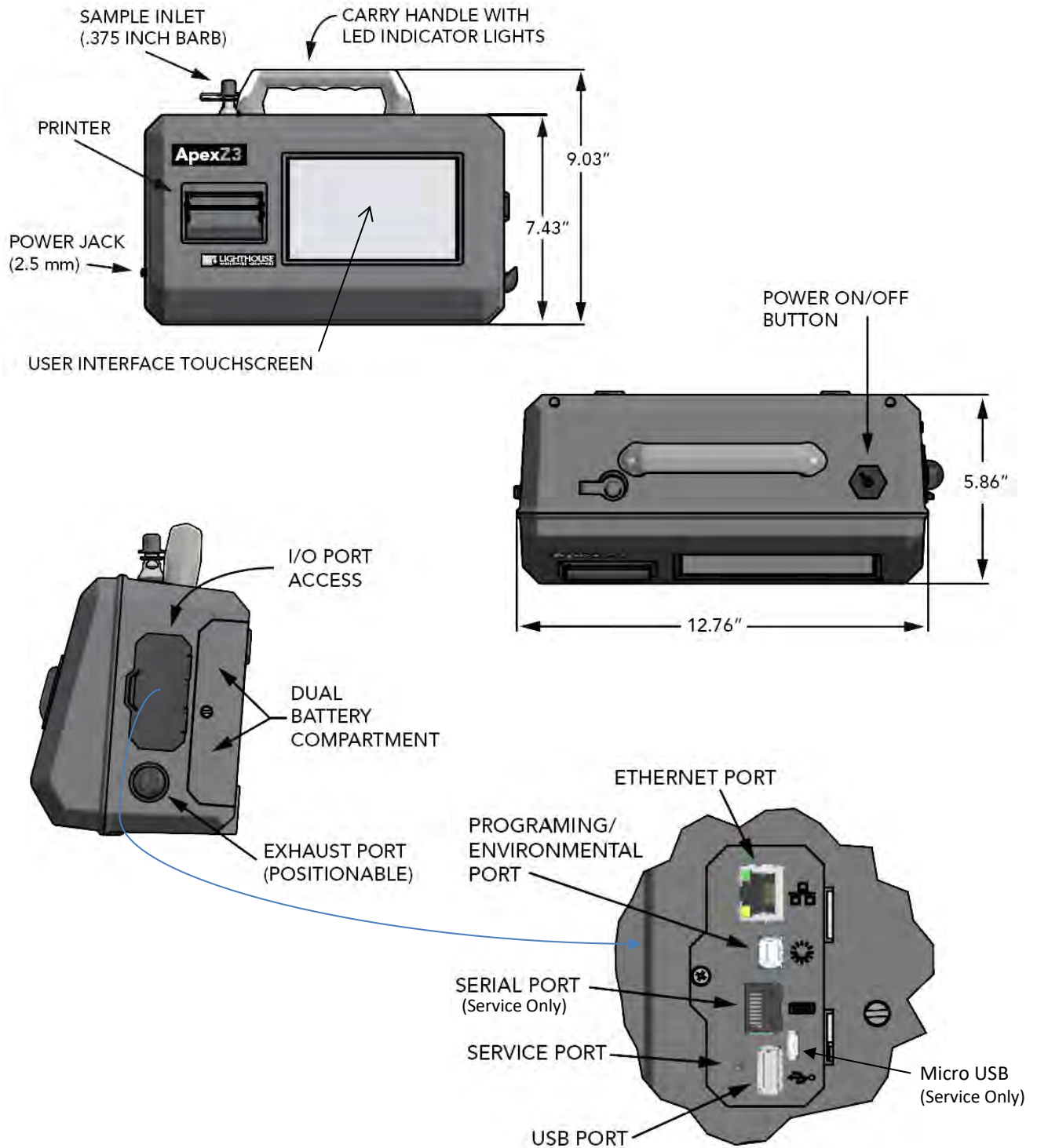
Accessories

ApexZ Includes: USB cable A to B, USB flash drive 512 MB with lanyard, tripod mini 7" telescoping, ISO probe (ApexZ3: 1 CFM, ApexZ50 100 LPM), ISP clamp, tubing (ApexZ3: 3/8" ID x 1/2" OD BevXX 10 feet, ApexZ50 1/2" ID x 5/8" OD BevXX 10 feet), Zero count filter, 24 VDC 5.0 amp power adapter and power cord, *1 Li-Ion Smart battery included (2 battery slot capacity), 2x rolls of printer paper, Calibration certificate, USB key with Datasheet, Read Me First and Operators Manual.

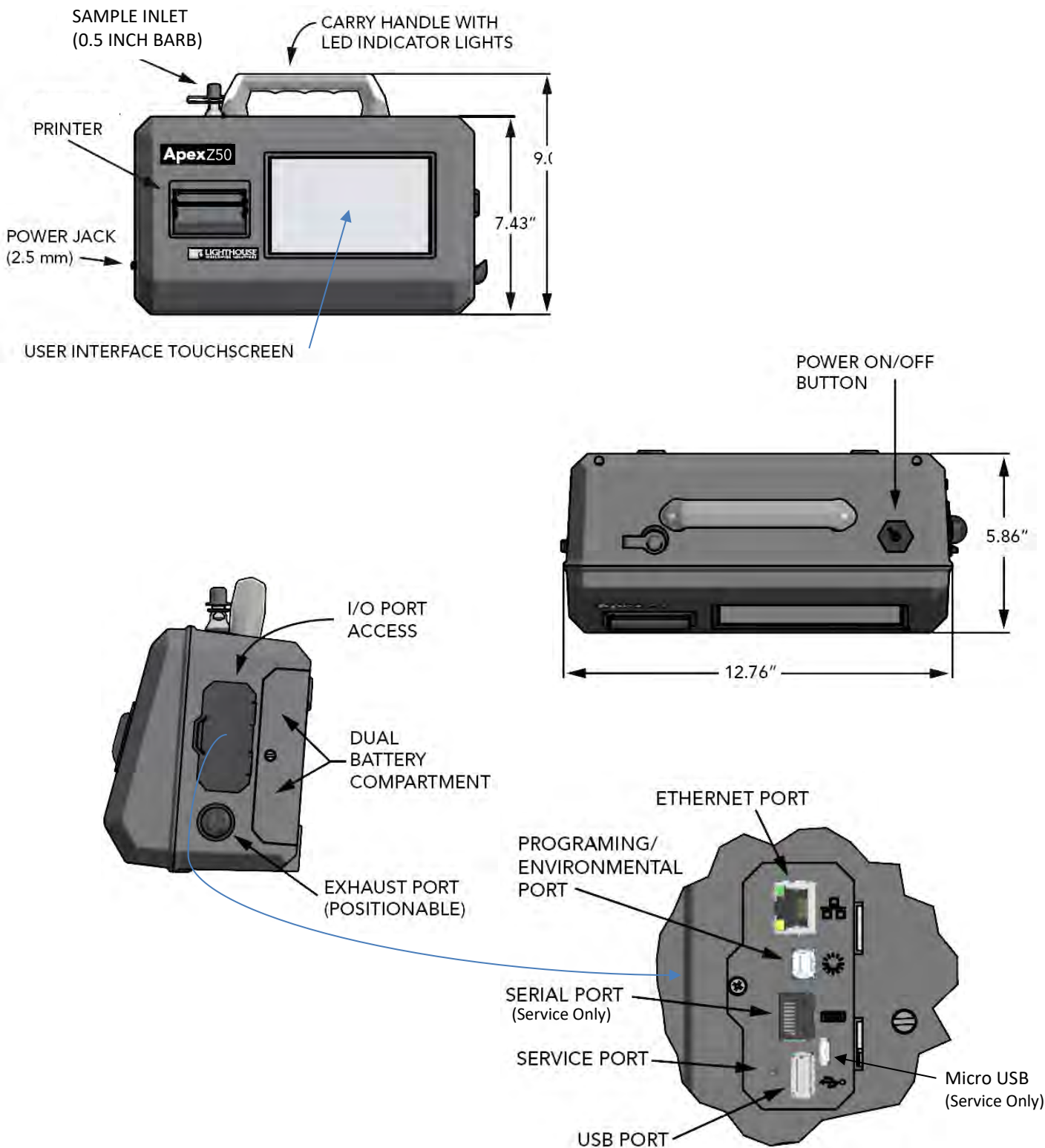
Specifications

Size Range	ApexZ3: 0.3 - 10.0 µm; ApexZ50: 0.5 – 10.0 µm.
Standard 6 Channels	ApexZ3: 0.3, 0.5, 1.0, 3.0, 5.0, 10.0 µm; ApexZ50: 0.5, 0.7, 1.0, 3.0, 5.0, 10.0 µm.
Flow rate	ApexZ3: 1.0 CFM (28.3 LPM), ApexZ50 100 LPM.
Laser Source	Laser Diode.
Zero Count Level	< 1 count / 5 minutes (per ISO 21501-4).
Concentration Limits	1,000,000 particles / ft ³ @ 10% coincidence loss suitable for ISO classes 1-8 cleanrooms.
Counting Efficiency	50% @ 0.3 µm; 100% for particles > 1.5 X first channel particle size.
Calibration	Designed for ISO 21501-4 compliance.
Self-Diagnostics	Laser power/current/supply, flow out-of-range, no flow, PA background/supply/health.
Count Modes	Sample, Concentration, Beep, Custom Recipes and Certification Modes.
Data Storage	10,000 sample records, 1,000 locations, 50 recipes, 50 report sessions, 25 users.
Communication	Ethernet, Wi-Fi (802.11 a/b/g/n)
Supporting Software	LMS Express, LMS Express RT
Environmental Sensors	Temperature/relative humidity probe: 32-122 °F(0-50°C)+/-1°F(0.5°C),15-90%+/-2%RH.
Touch Screen Display	7.0 inch (8.89 cm), 1200 x 800 IPS color touch screen.
Speakers	2x adjustable up to 70 dB to indicate status and alerts.
Carry Handle	With RGB LED's for status and alarms.
Printer	Embedded panel-mount printer.
Reports	EU GMP, FED-209E, ISO-14644-1:1999, and ISO-14644-1:2015 regulatory pass/fail reports displayed on screen or printed.
Alert	User configurable warnings and alarms.
Sample Inlet	ApexZ3: 3/8 inch Inlet nozzle; ApexZ50: ½ inch inlet nozzle.
Sample Output	Internally filtered to HEPA standard (>99.97% @ 0.3 µm); with rotatable exhaust fitting for directed flow.
Vacuum Source	Internal blower, automatic flow control
Enclosure	Chemically Resistant Polycarbonate blend, conductive lining, VHP compatible
Power	External power supply: 24 VDC, 5 A max draw
Battery	2x Li-Ion, removable and rechargeable
Battery Run Time	ApexZ3: 2 batteries 11 hours nominal use, 50% duty cycle no printing ApexZ50 2 batteries 8 hours nominal use, 50% duty cycle no printing
Dimensions	12.76" (l) x 6.23" (w) x 8.88" (h), (32.41 x 15.82 x 22.55 cm)
Temperature Range	50°F to 104°F (10°C to 40°C), 20% to 95% relative humidity, non-condensing
Weight	7.05 lbs. (3.19 kg) without batteries, battery weight 1.35 lbs. (0.61 kg)
Languages	English (U.S.)

Enclosure and Ports – ApexZ3



Enclosure and Ports - ApexZ50



Printer Paper Installation

Load the printer paper with the paper coming from the back side of the roll.

Open Printer Door

- 1 Pinch the left and right printer door tabs and gently pull open the printer door.

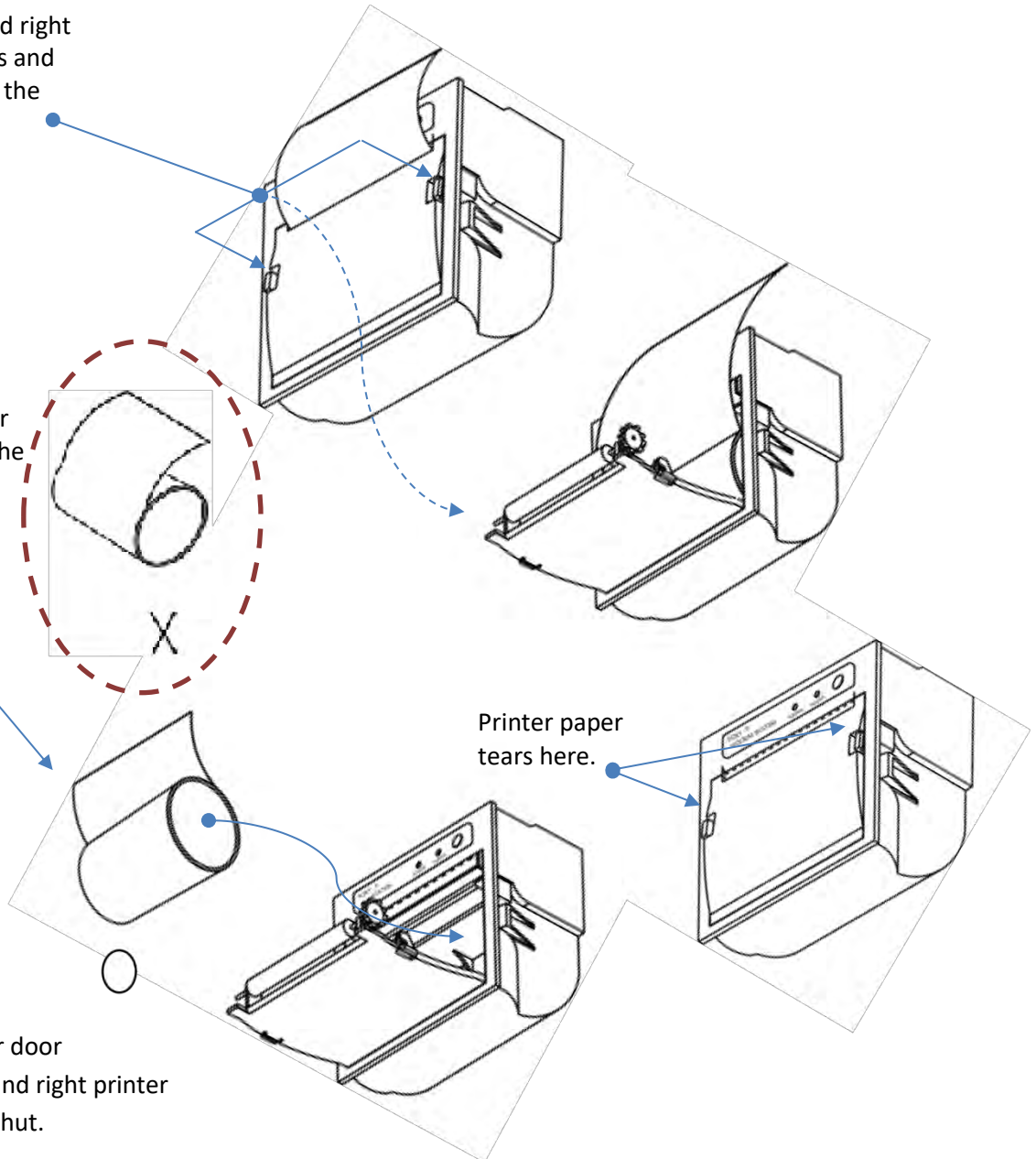
Load Printer Paper

- 2 Insert the printer paper roll with the paper feeding from the back of the roll.

Printer paper tears here.

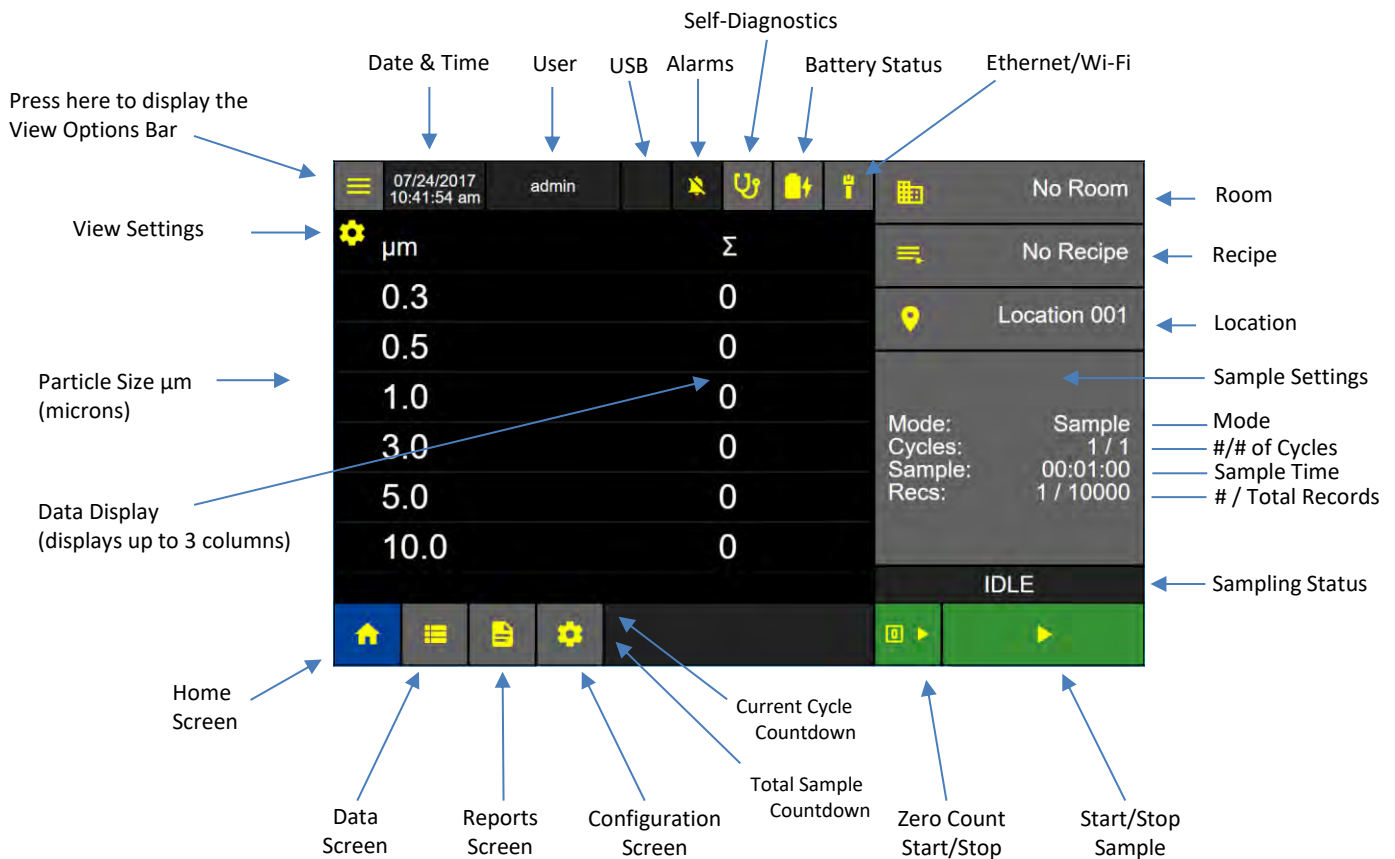
Close Printer Door

- 3 Close the printer door so that the left and right printer door tabs snap shut.



Welcome to the ApexZ

The Home Screen on the ApexZ can be thought of as your particle counting dash board. You have access from the Home Screen to all functions of the ApexZ portable particle counter. Let's take a tour of the major functional areas of the ApexZ Home Screen User Interface.



Running a Sample from the Home Screen

Home

. To run a sample from the Home Screen select a Room, a Recipe, a Location and then press START.

Select a Room

- 1 Press the Room button to select a room from the configuration room list.

Select a Recipe

- 2 Press the Recipe button to select a recipe from the configuration recipe list.

Select a Location

- 3 Press the Location button to select a location from the recipe location list.

Ready to Start Sample!

- 4 Press the start button to START the sample.
- 5 To stop a sample, press the STOP button.



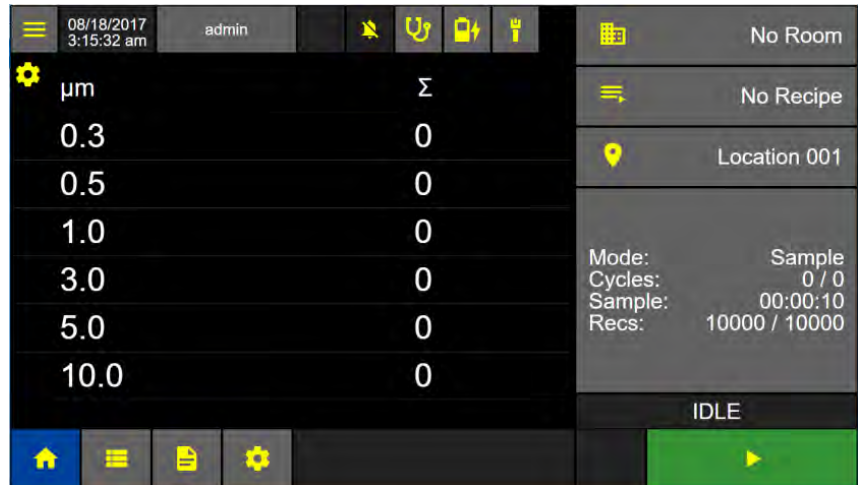
View Options

While a sample is running particle count data may be viewed through multiple View Options. Data, while being sampled can be viewed in a Data Table, on a Histogram, Grid, or Graph, or be viewed as it is being sampled.

Home Screen

1

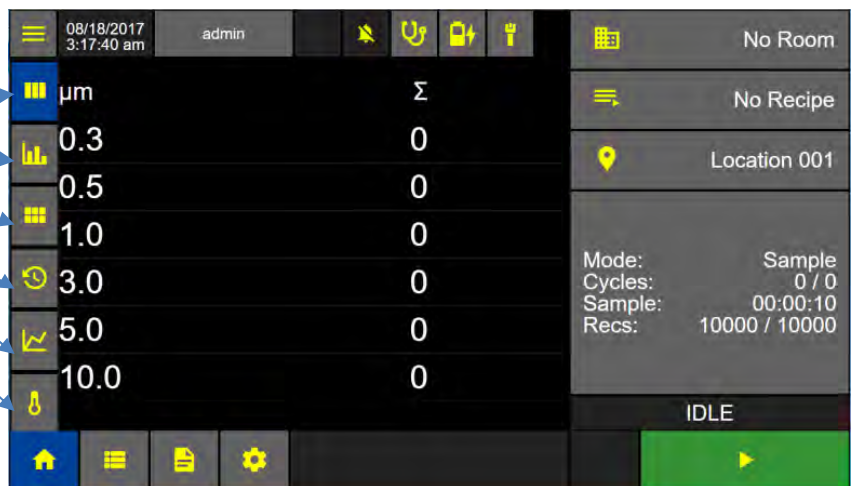
Press the View Options button to display the View Setting Menu.



View Options Bar Displayed

The View Setting Menu contains buttons for the following Views

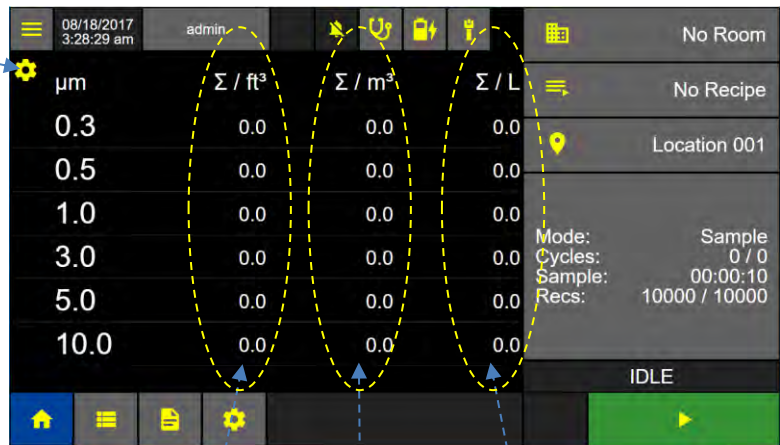
- Data Table
- Histogram
- Grid
- History
- Graph
- Environmental



Data Table View

Home Screen

- 1 Press the gear button, while the Data Table view is displayed, to view the settings available for the Data Table.



The Data Table view allows the instrument to display 1-3 columns of sampling data.

Data Table View Settings Screen

The user can select the following parameters:

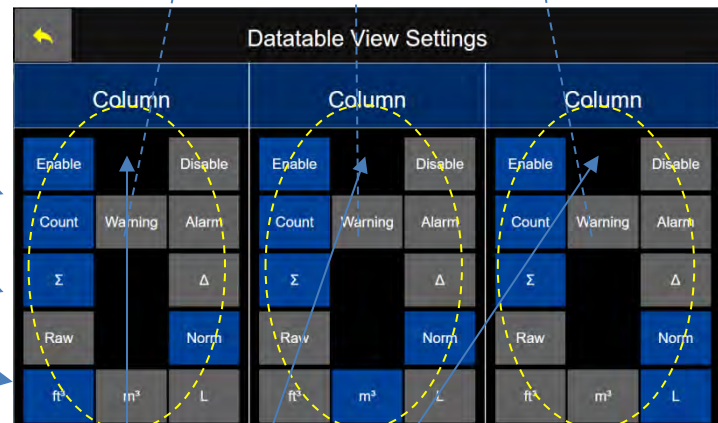
- 2 Enable or Disable a column

- 3 Count or Alarm

- 4 Cumulative or Differential

- 5 Raw or Normalized

- 6 Units for Normalized
 ft^3 – cubic feet
 m^3 – cubic feet
 L - liters



Column: 1 2 3

Histogram View

The Histogram View displays real time particle count data as a Histogram.

Home Screen Data View

- 1 Press the View Options Menu button.
- 2 Press the Histogram View Button to display the Histogram View Screen.

Histogram View Screen

- 3 To change how data is displayed on the histogram, press the gear button to view the Histogram Settings Screen.

Histogram Settings Screen

Select

- 4 Linear or Logarithmic
Cumulative or Differential
Raw or Normalized
- 5 Press the Back Arrow Button to save Histogram View settings.

Grid View

When the user is running a recipe, the Grid View can be used to keep the user, at a glance to see the status, state and progress of the recipe.

Grid View displays a location button for each location assigned to the currently selected recipe. The background color of each button indicates if the location is selected, and if it has been sampled, passed, failed or in fault. ApexZ will move to the next sequential location by default after the current location is complete. Alternatively the user may manually select a different location by pressing the desired location button.

Home Screen with View Options Bar

- Press the View Options Menu button.
- Press the Grid View Button to display the Grid View Screen.

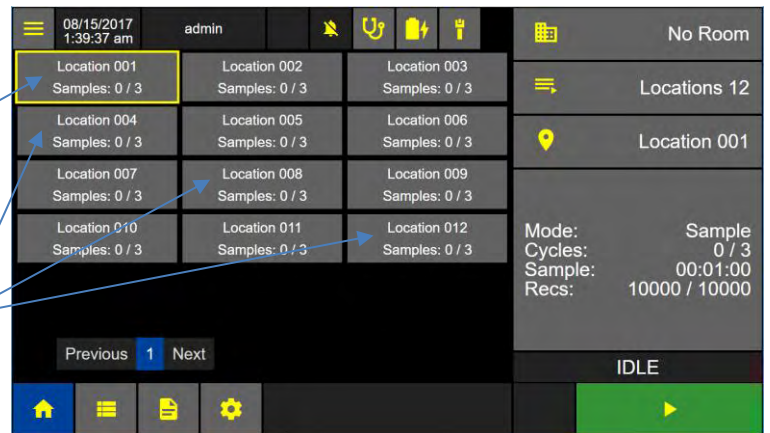
Grid View Screen

- When the user is running a recipe, the Grid View can be used to keep the user, at a glance to see the status, state, and progress of the recipe.

Grid View Screen

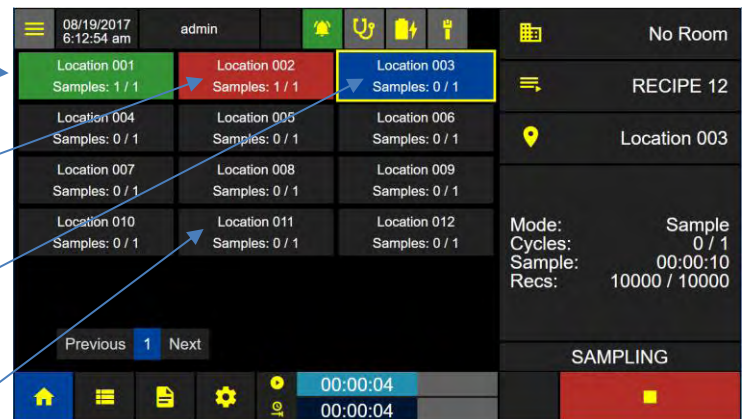
Location Background Color

- 1 **Yellow Outline:**
Press a location button to select that Location. The yellow outline indicates that the location has been selected.
- 2 **Grey:**
The grey background location button indicates that location has not been sampled yet and is available to be selected as the next location.



Press Start to start sampling at the selected location.

- 3 **Green:**
Location Sample Completed/**PASSED**.
- 4 **Red:**
Location Sample Completed/**FAILED**.
- 5 **Blue:**
Location currently sampling – No errors (no over limit, no instrument fault)
- 6 **Dark Grey:**
Location not sampled, locked during active sampling.



Note: When a Recipe is being run the user will be prompted to start each sample at each location. The user may select any of the available locations from that Recipe to be the next location. When the desired next location has been selected and the sample probe is at the matching location, the user may press Start to begin sampling at that location.

Grid View Button Colors

When ApexZ is in the following states, buttons representing the locations associated with the current recipe will display as follows:

Idle - When the ApexZ is idle and not running.

Grey Not sampled yet, location is available to select for next sample.

Sampling – when the ApexZ is actively sampling.

Red: Location sample completed - failed.

Yellow: 1 or more samples are over the limit.

Blue: Currently sampling and no errors.

Green: Completed sample passed no errors.

Dark Grey: Not sampled yet, locked during sampling.

Sample Completed – Immediately after an ApexZ sample has been completed.

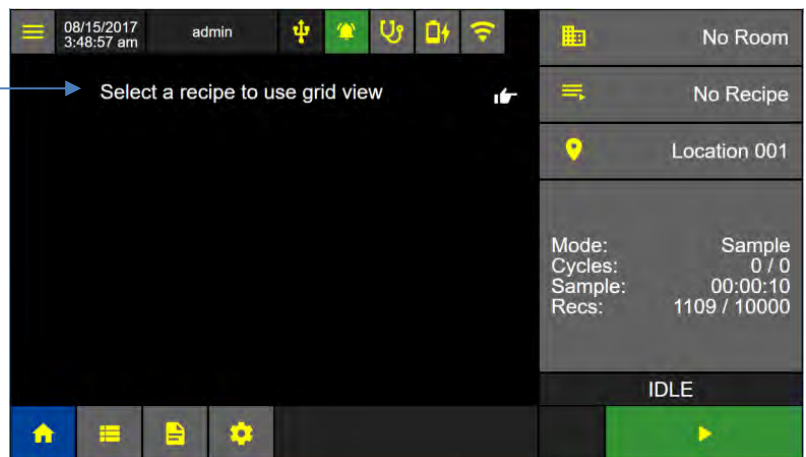
Red: Sample over the limit and/or Instrument fault.

Green: Sample passed limits, no instrument faults.

Grey: Not sampled yet, available to select for next sample.

Note: The Grid View will only be available while a recipe is being run. If No Recipe is selected then the Grid View will not display and locations.

This is an example of Grid View when “No Recipe” has been selected.



History View

The History View displays the last 5 recorded data records. The user can customize up to 3 columns of data to be displayed on the History View.

From History View

History View Screen

- 1 Press the gear button to view the History View Settings screen.

Time	Σ 0.3	Σ 0.5	Σ 5.0	
6:36:49 am	0	0	0	
6:36:39 am	0	0	0	
6:36:29 am	0	0	0	
6:36:19 am	0	0	0	
6:36:09 am	7	2	1	

No Room
 No Recipe
 Location 004
 Mode: Sample
 Cycles: 8 / 0
 Sample: 00:00:10
 Recs: 10000 / 10000
 IDLE

History View Settings Screen

Select Settings for up to 3 data columns.

Enable or Disable Column

Channel Size per column

Count or Alarm

Cumulative or Differential

Raw or Normalized

Normalized units, ft³, m³, L

Column	Column	Column
Enable Disable	Enable Disable	Enable Disable
0.3	0.5	5.0
Count Alarm	Count Alarm	Count Alarm
Σ Δ	Σ Δ	Σ Δ
Raw Norm	Raw Norm	Raw Norm

Graph View

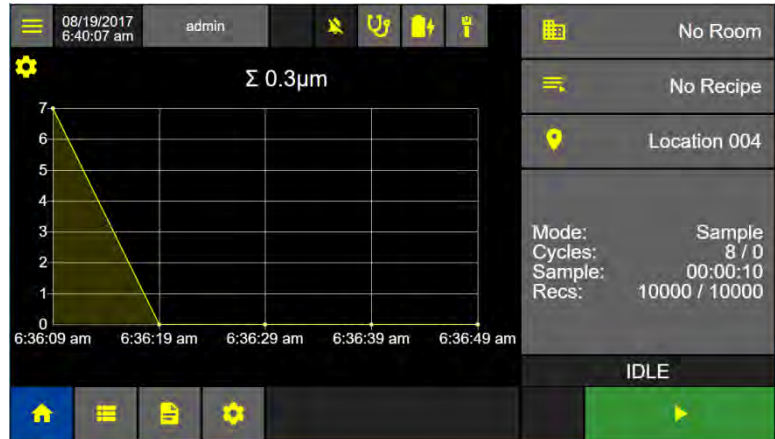
The Graph View displays the last 5 recorded samples on a line graph.

From Graph View

Graph View Screen

1

Press the gear icon to display the Graph Settings screen.



2

Select Linear or Logarithmic

3

Select Channel size

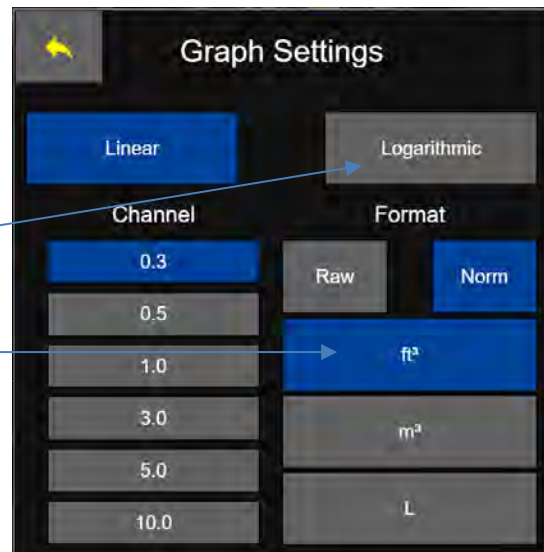
4

Select Format Raw or Normalized

5

Select Normalized Units

Graph Settings Screen

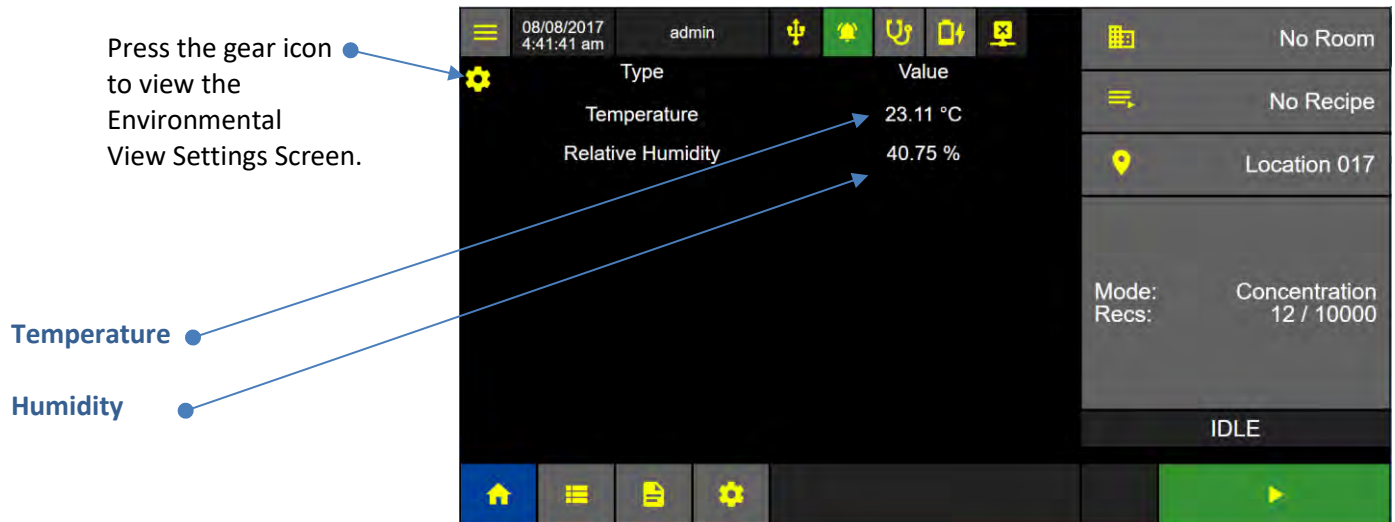


Note: For Graph View the ApexZ graphs the last 5 recorded samples, regardless of which location the data was recorded at.

Environmental View

If one or more environmental sensors are attached to the ApexZ, the ApexZ will record environmental data along with particle counts. Environmental data for the currently running sample can be viewed on the Environmental View. Connect a Temperature / Humidity probe to ApexZ and then enable the Temperature and Relative Humidity Settings.

Environmental View Screen



Enable Temperature and Humidity Sensors

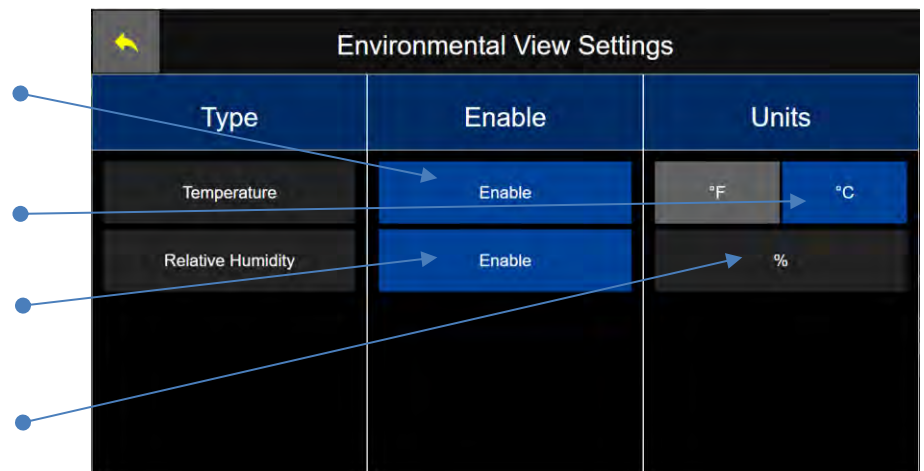
Environmental View Settings Screen

Press the enable button to enable the Temperature sensor.

Press Units for either degrees °F or degrees °C.

Press the enable button to enable Relative Humidity sensor.

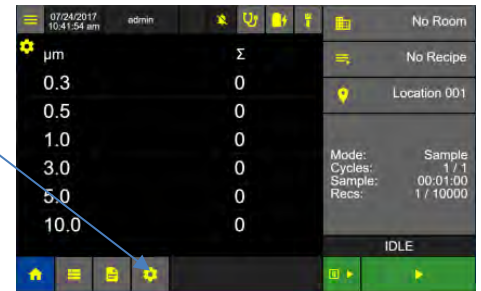
Relative Humidity will be displayed as %.



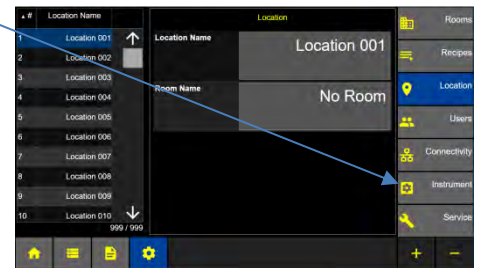
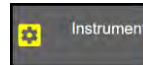
Instrument Settings

The Instrument Settings screen allows the user to view or edit settings for Time Zone, Daylight Savings Time, Date, Time, Date and Time Formats, Audio/Visual and Options. In addition a Maintenance tab is provided for importing and exporting configurations, updating firmware and resetting instrument and factory settings. The About tab displays the Instrument Name, Model #, Serial #, Sensor #, Calibration Due, and Firmware version #'s.

- 1 From the Home screen press the Configuration button to display the configuration screen.



- 2 From the Configuration screen press the Instrument button to display the Instrument Settings screen.



- 3 Press the Time tab to display or edit the time zone, daylight savings time, date, time, date and time formats.

Instrument Settings Time Screen

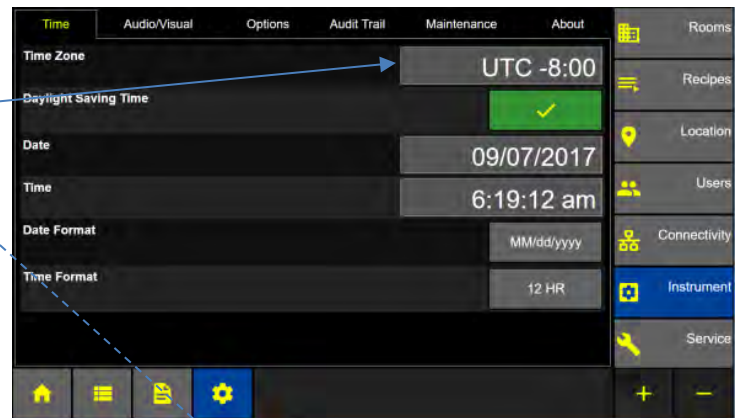


Time Zone & Daylight Savings

Set the Time Zone

- 1 Press the Time Zone button to display the Select Time Zone Screen.

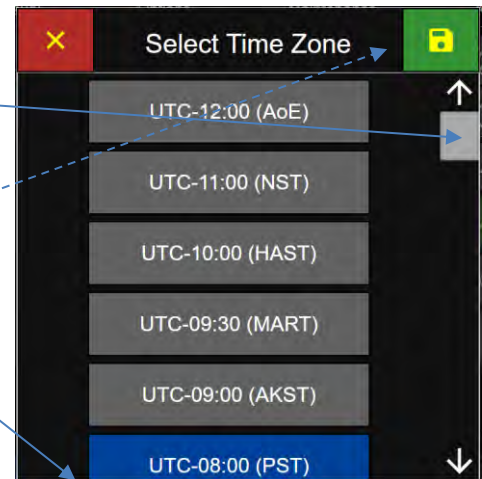
Instrument Settings: Time Screen



Select Time Zone Screen

To set the Time Zone

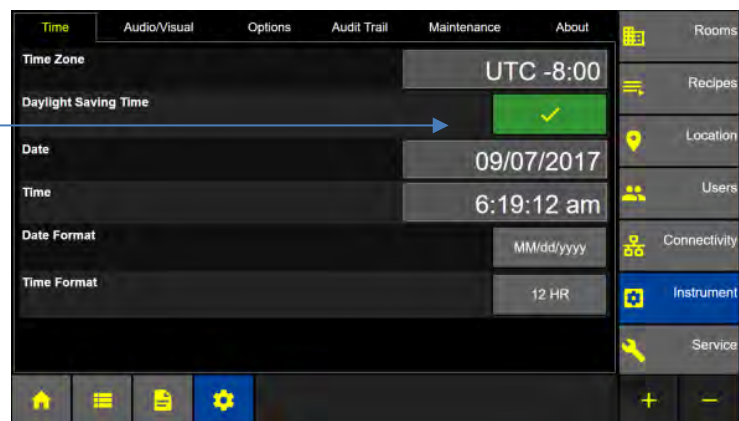
- 2 Use the scroll bar to scroll up or down the Time Zone list.
- 3 Press and select your UTC-Time Zone.
- 4 Press the green save button to save the UTC-Time Zone.



Set Daylight Saving Time

- 5 Press the Daylight Saving Time button to enable or disable Daylight Savings Time.
- 6 Press the Date button to display the Enter Date Screen.

Instrument: Time Screen



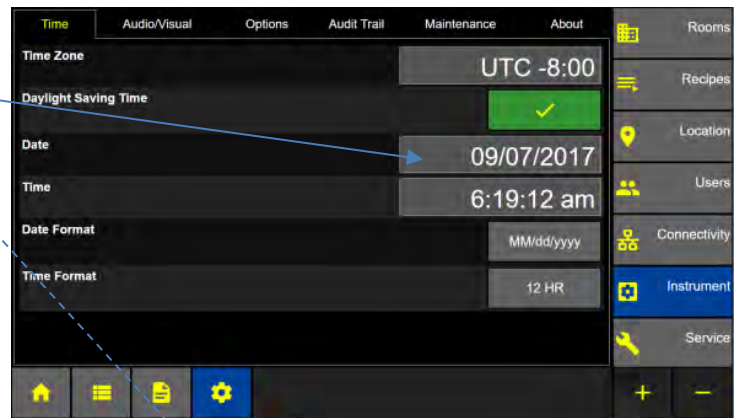
Date

HOME – CONFIG – Instrument – Time

Instrument Settings: Time Screen

Set Today's Date

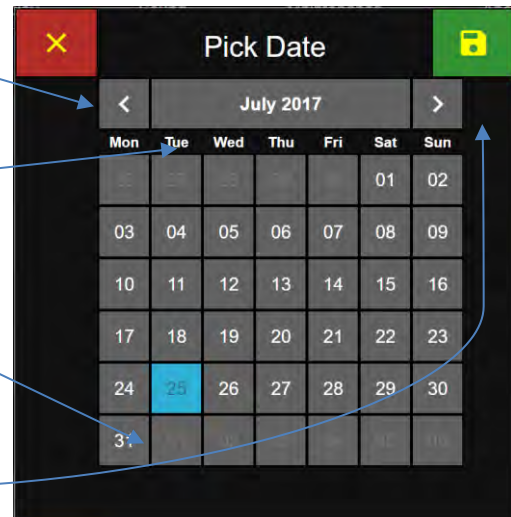
- 1 Press the Date Input button to display the Pick Date screen.



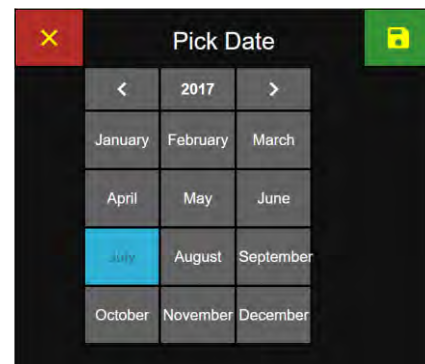
Select Day/Month/Year

- 2 Press right/left arrow buttons to Increase / decrease the month.
- 3 Press the month/year button to display the Pick Date - Month/Year Screen.
- 4 Select Today's Date
- 5 Press the green SAVE button to save the date settings.

Pick Date Screen



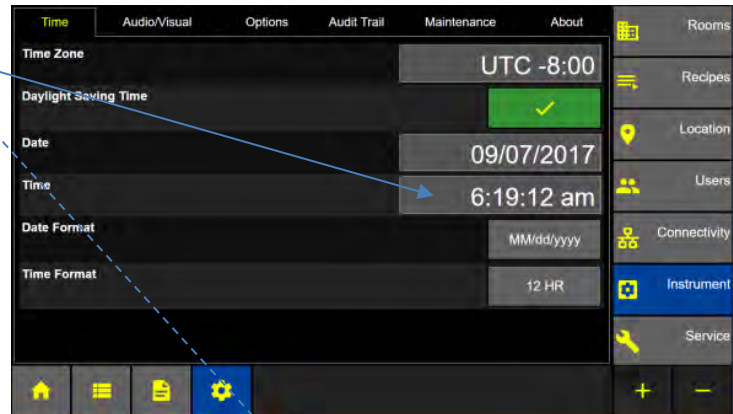
Pick Date - Month/Year Screen



Time

Instrument Settings: Time Screen

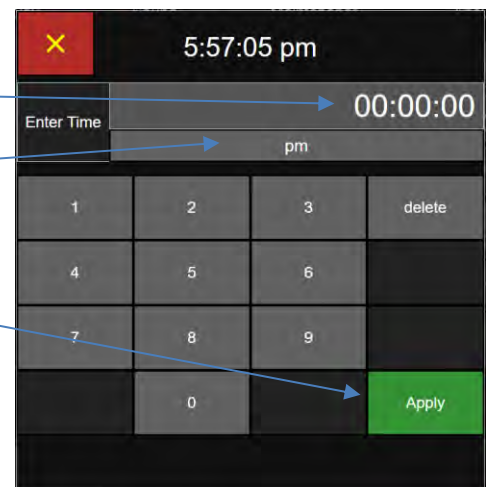
- 1 Press the Time input button to display the Enter Time keypad.



Enter Time Screen

Enter Time on the keypad

- 2 Enter the current time on the numeric keypad: HH:MM:SS.
- 3 Select am or pm.
- 4 Press the green Apply button to save the current time.

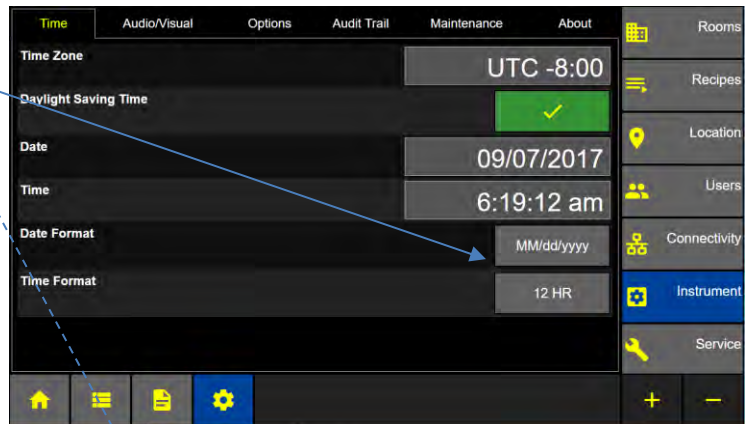


Date and Time Format

Set Date Format

- 1 Press the Date Format Input button to display the Select Date Format Screen.

Instrument: Time Screen

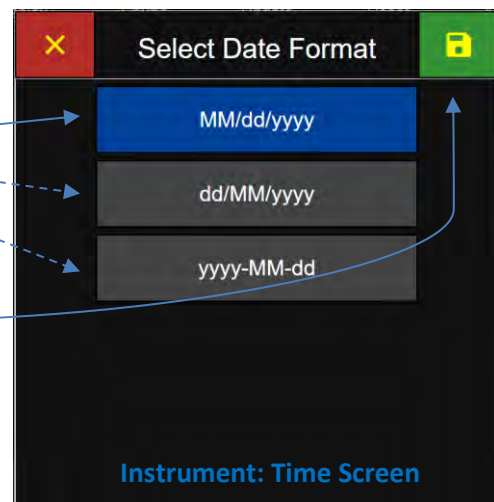


Select Date Format

- 2 Select one date format:
MM/dd/yyyy (Month/Day/Year)
dd/MM/yyyy (Day/Month/Year)
yyyy-MM-dd (Year/Month/Day)

- 3 Press the green Save button to save the date format.

Select Date Format Screen



Set Time Format

- 4 Press the Time Format button to Toggle between 12 or 24 hour time format.

Audio/Visual

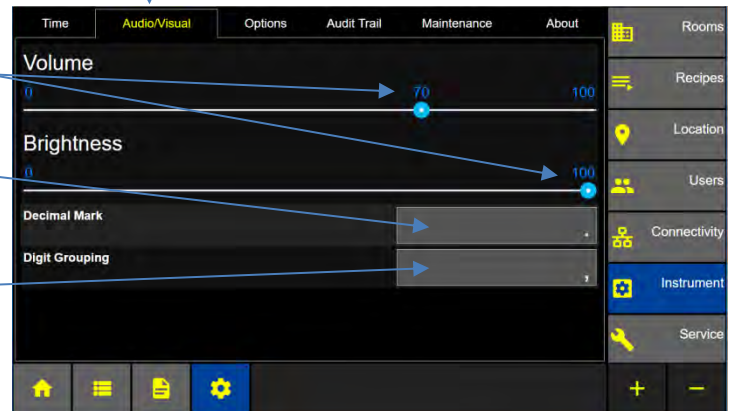
HOME – CONFIG – Instrument – Audio/Visual

Instrument: Audio/Visual Screen

Volume and Brightness

- 1 Touch and slide the volume or brightness button from 0 – 100%.
- 2 Press the Decimal Mark button to display the Select Decimal Mark screen.
- 3 Press the Digit Grouping button to display the Select Digit Separator screen.

Note: When Alarms are enabled Alarms will sound at 100% volume.

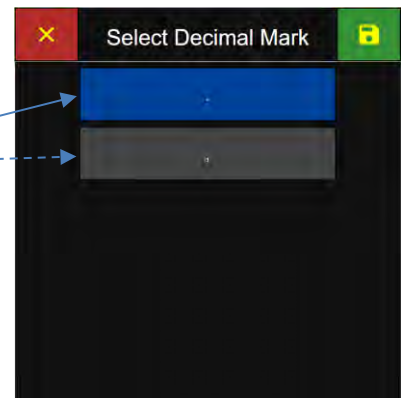


Select Decimal Mark Screen

Decimal Mark

- 4 Select the Period or Comma for the decimal mark.

Press the green save button to Save the Decimal Mark.



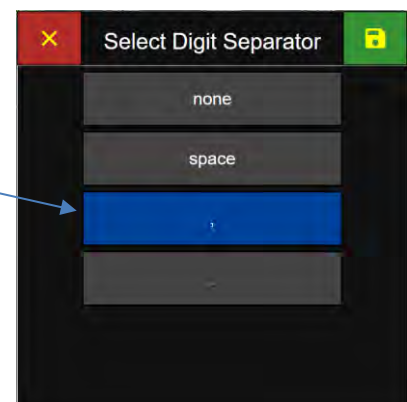
Digit Separator

- 6 Select the Digit Separator. The digit separator will be applied to normalized data counts.

- 7 Press the green save button to Save the Digit Separator.



Select Digital Separator Screen



Options

HOME – CONFIG – Instrument – Options

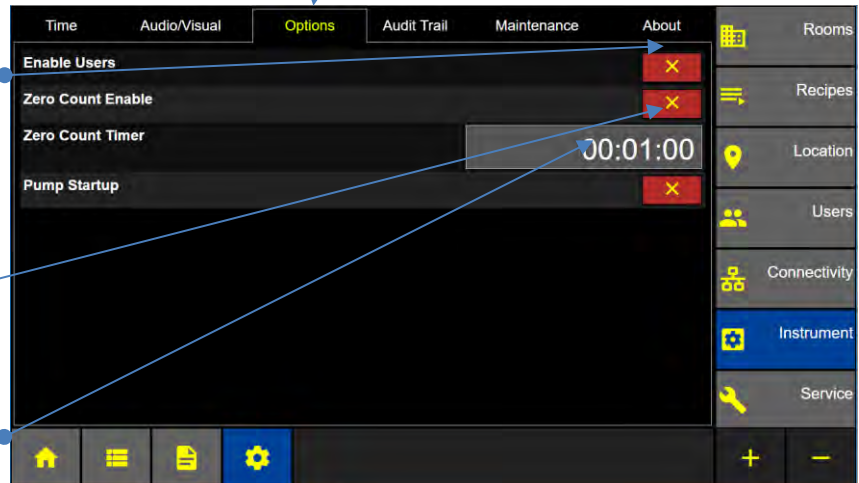
Enable Users

- 1 Press the Enable Users button to enable users and force users to logon to the ApexZ.

Zero Counting

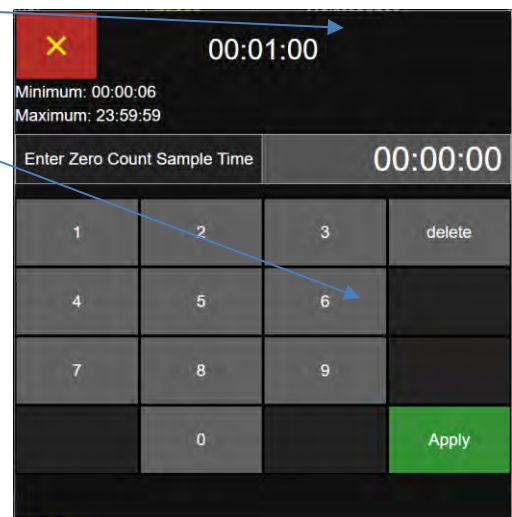
- 2 Press the Zero Count Enable button to enable the Zero Count Start button on the Home Screen.
- 3 Press the Zero Count Timer to display the Enter Zero Count Sample Time Screen.

Instrument Options Screen



- 4 Enter the zero count sample time on the keypad
- 5 Press the green Apply button to save the zero count time setting.

Enter Zero Count Sample Time Screen



Pump Startup

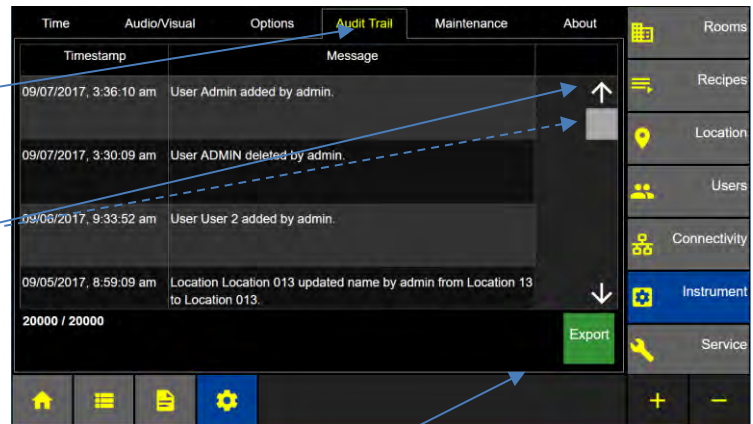
- 6 Enable Pump Startup to:
Start pump immediately after pressing START.
(Pump will run during delay time period).
- 7 Disable Pump Startup to:
Start pump after the sample Delay Time has completed.

Audit Trail

Audit Trail

- 1 Press the Audit Trail Tab to display the Audit Trail Screen.
- 2 Press the arrow button or slide the elevator bar to scroll up and down the audit trial history.
- 3 Insert a USB key prepare to export the audit trail.

Audit Trail Screen



Export Audit Trail

- 4 Insert a USB key into the instrument. If no USB key is inserted then the Export button will be inactive.
- 5 Press the Export button to export the audit trail to USB key.
- 6 A countdown message box will appear until 100% has been exported to USB key.
- 7 The USB file will be named:
Audit_YYMMDD_HHMMSS_ApexName.csv



Note: Export Audit Trail requires that a USB key is inserted into ApexZ. If no USB key is present then the Export button will have a dark background. When the USB key is present the Export button will have a green background.

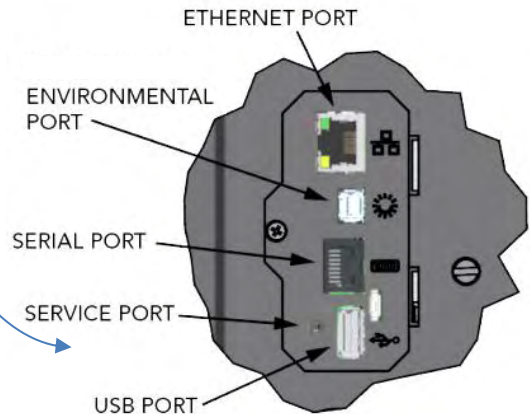
Maintenance

HOME – CONFIG – Instrument – Maintenance

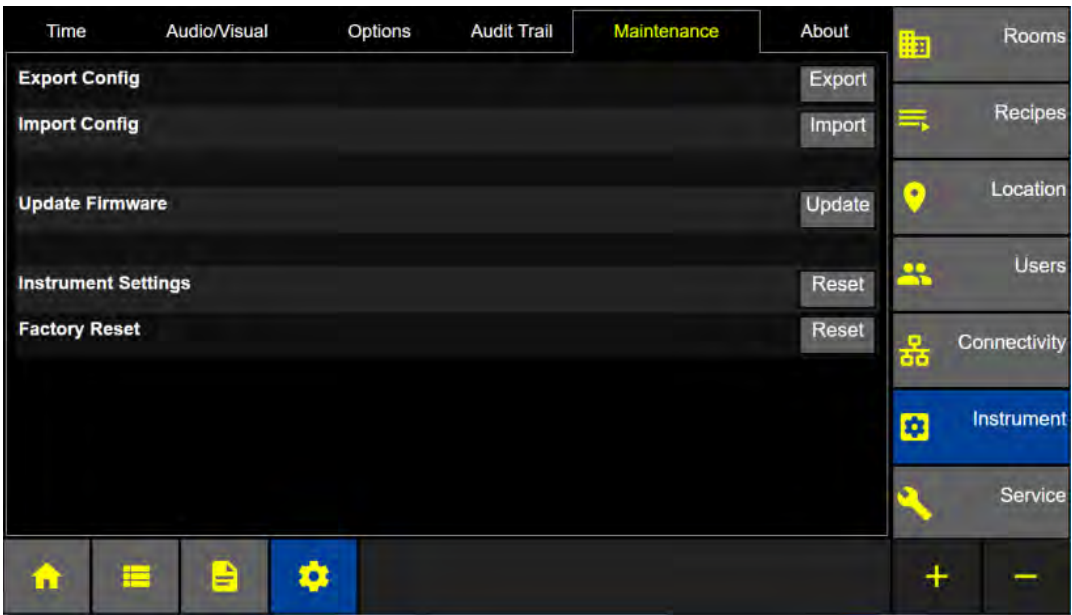
The Maintenance screen allows the user to import and export configurations, update firmware and reset instrument and factory settings. A USB key will be required to activate Export/Import/Update.

1 Insert USB key into USB port.

Note: If no USB is connected Export, Import and Update will be disabled.



Instrument: Maintenance Screen with USB inserted



Export Configuration

ApexZ can export its configuration to a file on a USB key. This configuration file can be saved as a backup or it can be Imported onto another ApexZ instrument (see Import Configuration).

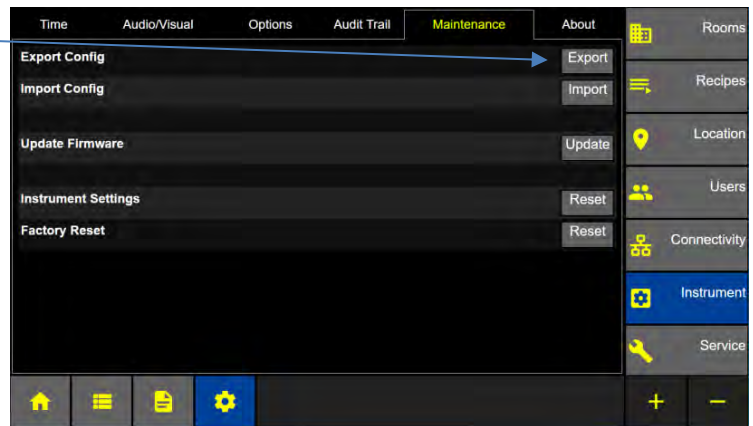
Export Configuration

- 1 Press the Export button to display the Export Configuration screen.

Note: If no USB is connected Export, Import and Update are disabled.

Note: All locations, rooms, recipes, user settings will be saved to the configuration file.

Instrument: Maintenance Screen



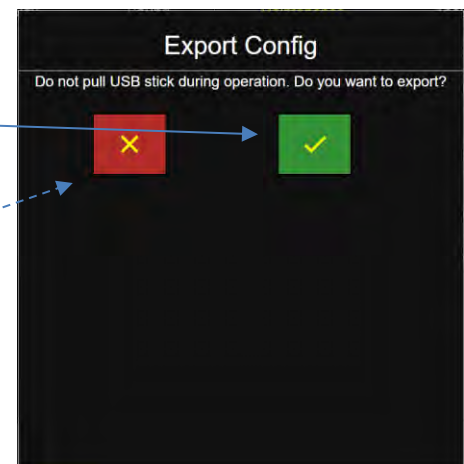
Export Configuration Screen

Confirm Export Configuration

- 2 Press the green check box to export the ApexZ's configuration to the USB stick.

Or press the red x box to cancel the Export.

Note: Exported configuration files will be named: config_YYMMDD_HHMMSS_SERIALNUMBER.json or Config_YYMMDD_HHMMSS_InstrumentName.json (if the unit has been assigned an Instrument Name) HHMMSS will be in UTC, not local time.



Import Configuration

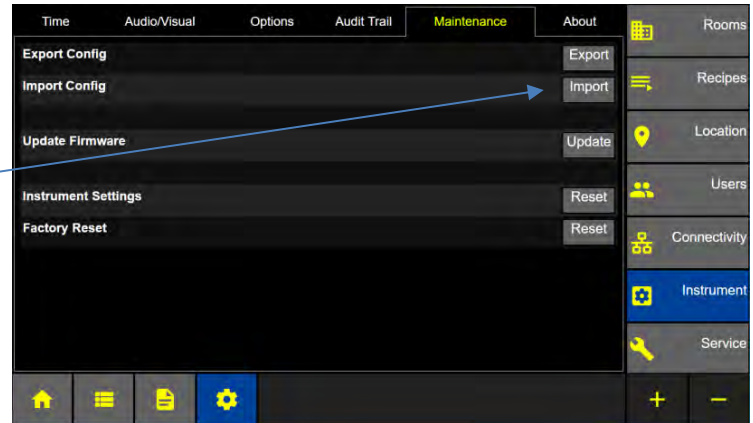
ApexZ can import its configuration from a file on a USB key. This configuration file can be imported from a backup copy or it can be Imported as a clone of another ApexZ instrument configuration (see Export Configuration).

Import Configuration

- 1 Insert a USB stick into the USB slot on ApexZ.
- 2 Press the Import button to display the Select File to Import screen.

Note: When no USB is connected Export, Import and Update will be disabled.

Instrument: Maintenance Screen



- 3 Select a saved configuration file to import from the USB stick.
- 4 Press the green Save button to display the Import Configuration pop up screen.

Note: Importing Configuration will remove all current configuration settings.

- 5 Press the green check box to Import the Configuration or press the red x box to cancel and the configuration will not be imported.

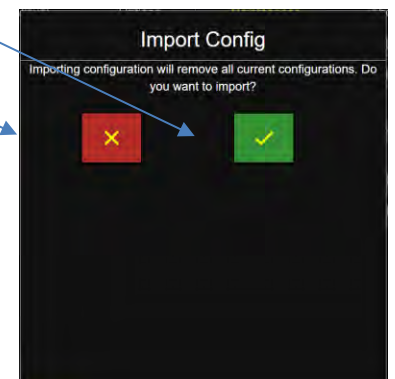
WARNING: Importing a configuration file will replace the ApexZ's current configuration entirely.

WARNING: Do not pull the USB stick out during operation.

Select File to Import Screen



Import Configuration Confirmation



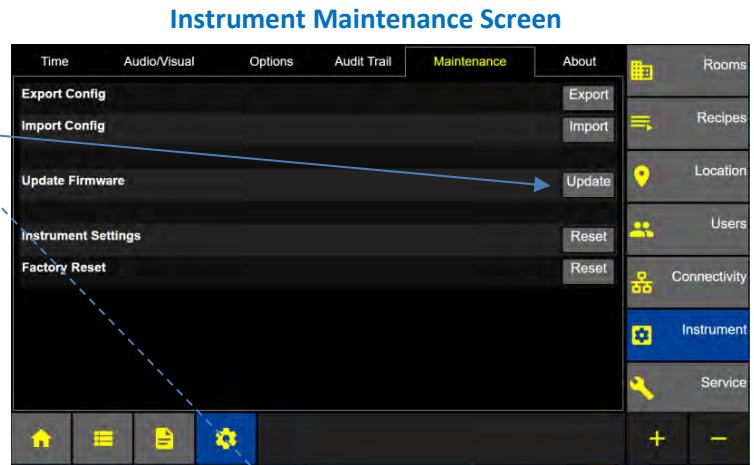
Update Firmware

To update the instruments firmware make sure the firmware upload file is copied on a USB key and then follow these steps.

- 1 Insert the USB key with FW Upload File

- 2 Press the Update button to display the Firmware Update Screen.

Note: If no USB is connected Export, Import and Update will be disabled.



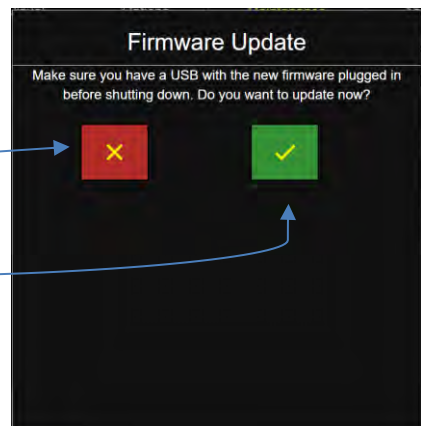
Firmware Update Screen



Update Firmware

- 3 Press the red x button for NO UPDATE and return to the Instrument Maintenance Screen. Or press the green check box to Update the Firmware from the USB stick.

Firmware Update Confirmation Screen



Update Firmware – Confirmation

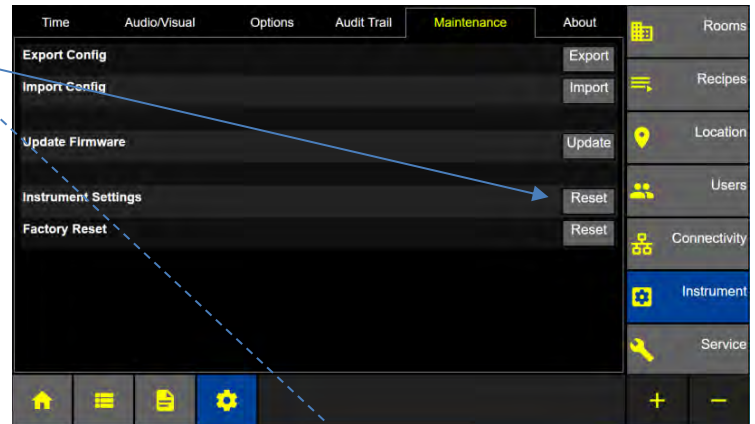
- 4 Press the red x button to ABORT the firmware update. and return to the Instrument Maintenance Screen.
- 5 Press the green check box to **UPDATE** the Firmware from the USB stick.
- 6 ApexZ will reboot. After reboot the USB key may be removed.

Instrument Settings Reset

Instrument Settings

Instrument: Maintenance Screen

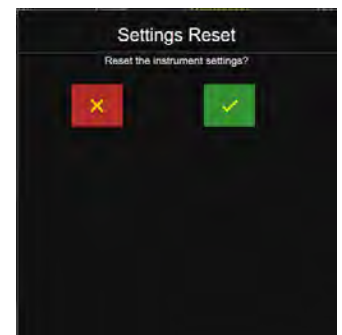
- 1 Press the Instrument Settings Reset button to display the Settings Reset Screen.



Reset Instrument Settings

- 2 Press the green check box to RESET the instrument settings.
- 3 Press the red x box to CANCEL and abort resetting the Instrument.

Settings Reset Screen



Settings Reset List (these settings will be reset from Instrument Settings Reset)

Instrument Settings:

Users enabled/disabled, volume, brightness, decimal mark, digit grouping, date, time, time zone, daylight savings time.

View Settings:

Data table, Histogram, History, Graph, and Environmental view settings.

Connectivity Settings:

Ethernet enabled/disabled, IP, Subnet, MAC address, DHCP enabled/disabled
Wi-Fi enabled/disabled, Bluetooth enabled/disabled, Print output settings, USB output settings.

Print Options:

Data Raw or Normal, Data Cumulative or Differential, Statistics (mean, minimum, maximum, standard deviation, standard error, 95% UCL), Formatting (model, serial #, calibration date, user name, tag, separator, company, address), Output (on sample, on alarm), font size.

Zero Count Settings:

Zero count enabled/disabled, Zero count sample time.

Pump Startup:

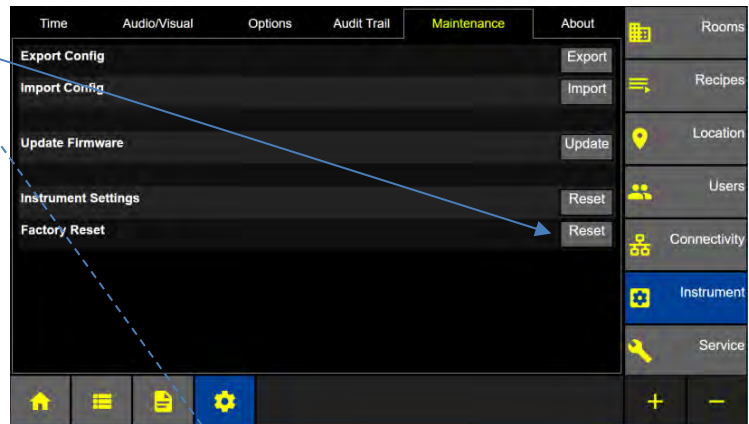
Pump start up enable/disabled.

Factory Reset

Pressing Factory Reset will DELETE all data on the ApexZ and return the instrument's configuration to it's original factory default configuration. There is no data recovery after a Factory Reset. .

Instrument: Maintenance Screen

- 1 Press the Factory Reset button to display the Database Reset Screen.

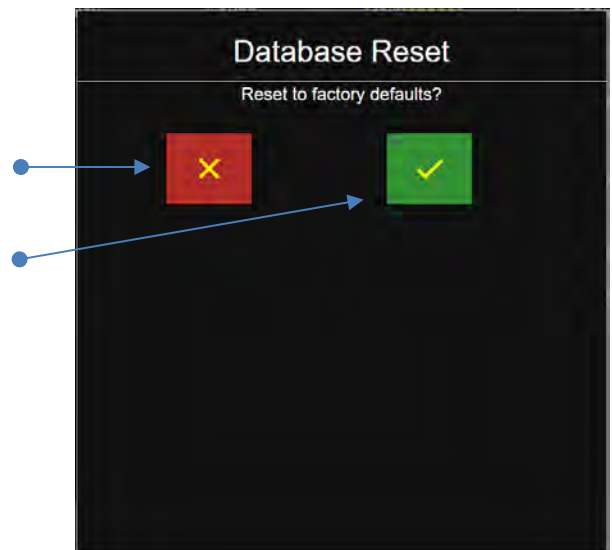


WARNING: Factory Reset will delete all data and configuration from ApexZ.

Database Reset Screen

Reset to Factory Defaults

- 2 Press the red x box to cancel and abort resetting the instrument to factory defaults.
- 3 Press the green check box to RESET the instrument to factory defaults.
- 4 All Data will be deleted and the instrument will be restored to factory defaults.

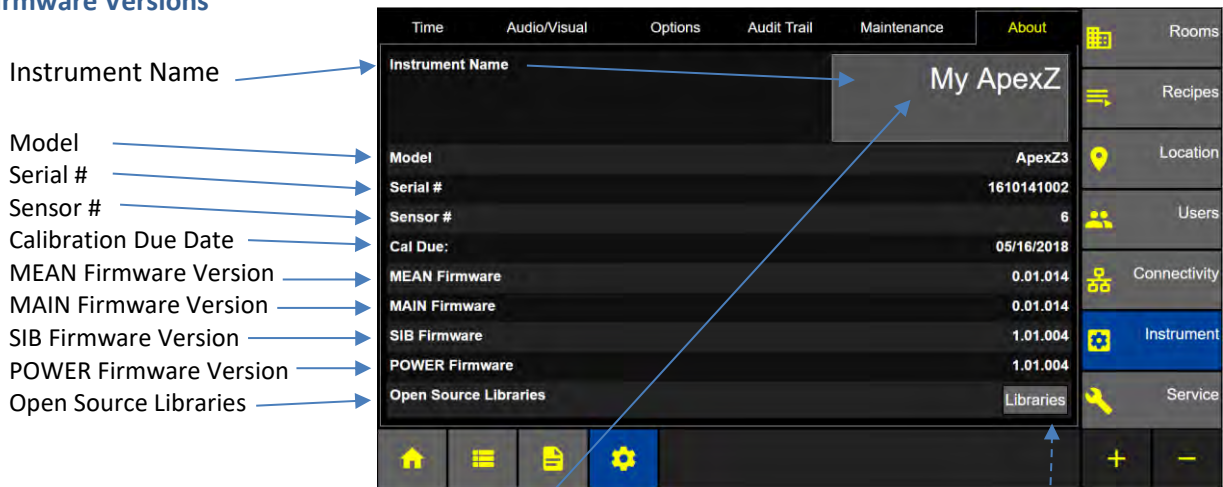


About Screen

HOME – CONFIG – Instrument – About

View Firmware Versions

Settings: About Screen



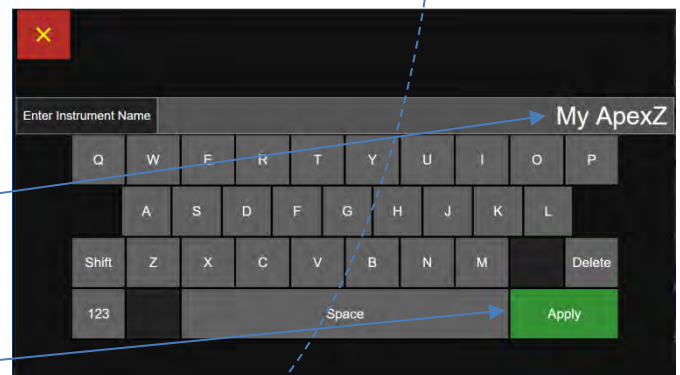
- 1 Press the Instrument Name button to display the Enter Instrument Name Screen.

Enter Instrument Name Screen

The ApexZ name will be used exporting configuration to USB and by the mobile app Basecamp.

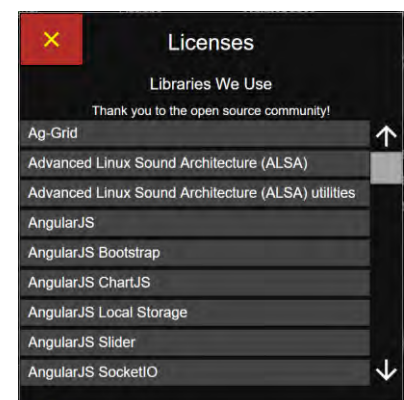
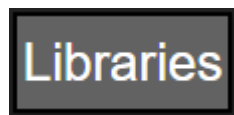
- 2 Enter the new instrument name on the keyboard.

- 3 After entering the Instrument Name Press the green Apply button.



- 4 Press the “Libraries We Use” button to pop up a list of Open Source Libraries used by ApexZ.

Licenses/Libraries Screen



Users

User Levels

The ApexZ has 3 different User Groups, Operators, Power Users and Administrators.

Users in the Operator Group:

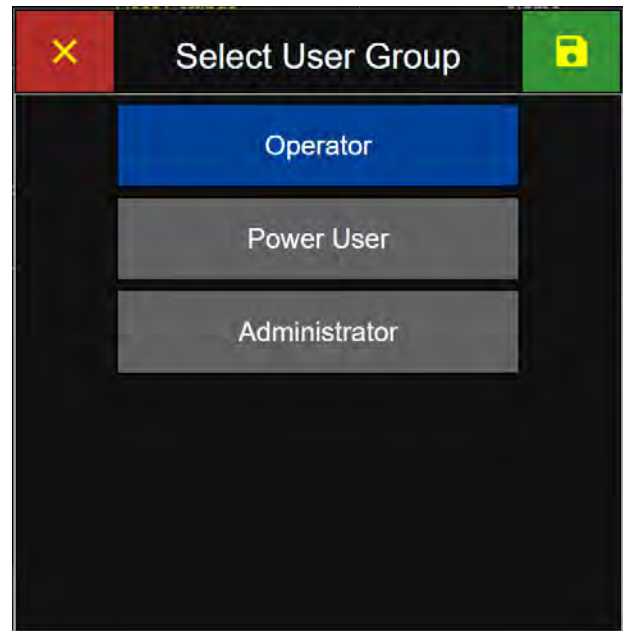
- Operators can start and stop samples.
- Operators can change locations.
- Operators can start and stop recipes.
- Operators cannot make new users.
- Operators cannot access configuration.

Users in the Power User Group

- Power Users can do all that Operators can do.
- Power Users can view and edit configuration.
- A Power User cannot make new users.

User in the Administrator Group

- Administrators can do what Power Users can do.
- Administrators can create new users.



Note: Changing the admin account password, first and last name is recommended.

Add a New User

Home – CONFIG – Users - +

Add New Users

Note: In order to add new users Login as an Administrator level user.

- 1 Press the **+** sign to Add a new User and Display the New User and Password Screen.

User Settings Screen

Enter User Name

- 2 Touch the Username input box.
- 3 Enter user name on keyboard.
- 4 Press Apply and the new username will display in the username box.

New User and Password Screen

Enter Password

- 5 Touch the Password input box.
- 6 Enter Password on keyboard.
- 7 Press Apply and the new password will be displayed in the Password box as "*****".

Enter First and Last Name

- 1 Press the Name button below the Username button to advance from the Username Tab to the Name Tab.

Enter First Name

- 2 Touch the First Name input box.
- 3 Enter First Name from the keyboard.
- 4 Press Apply and the first name will be displayed above.

First and Last Name Screen

The screenshot shows the 'New User' screen with a red 'X' button in the top left corner. The screen is divided into two main sections: 'First Name' and 'Last Name'. The 'First Name' field contains the text 'John' and the 'Last Name' field contains the text 'Smith'. Below these fields is a keyboard with a green 'Apply' button. Blue arrows point from the numbered steps to the corresponding UI elements: step 2 points to the 'First Name' input box, step 3 points to the keyboard, and step 4 points to the 'Apply' button. On the right side of the screen, there are three buttons: 'Username' (with a yellow checkmark icon), 'Name' (with a yellow dot icon), and 'Group' (with a yellow camera icon).

Enter Last Name

- 5 Touch the Last Name input box.
- 6 Enter the Last Name from the keyboard.
- 7 Press Apply and the last name will be displayed in the last name box.
- 8 Press the Group button to move to the Select User Group screen.

Select User Group

9

Press to select either Administrator, Power User or Operator.

Administrator

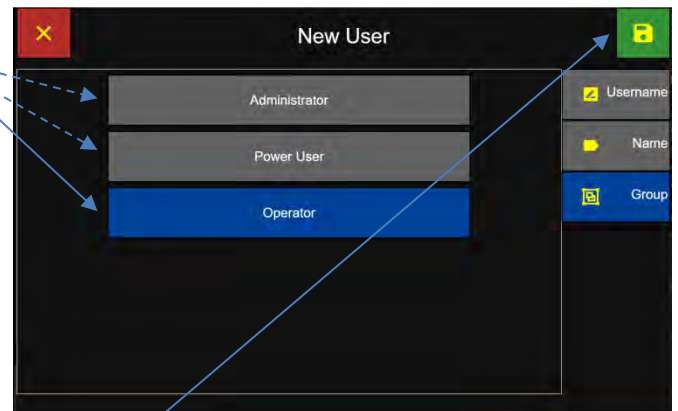
has full instrument configuration access and can create new users on ApexZ.

Power User

has full instrument configuration access, but CANNOT create new users on ApexZ.

Operator

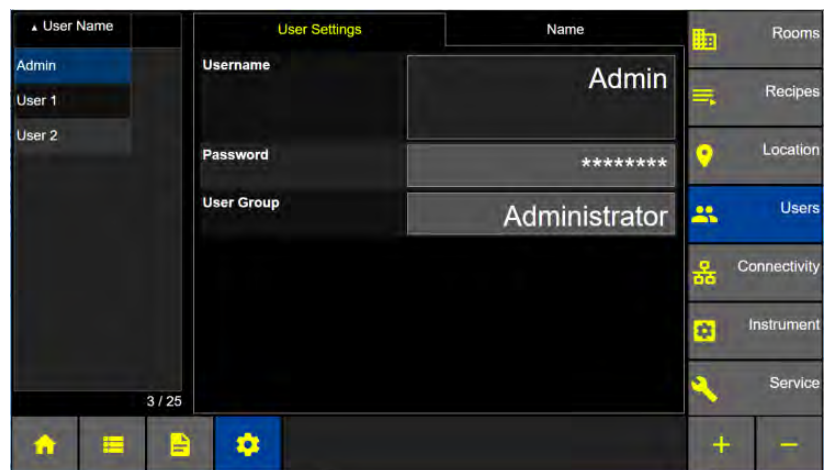
has full instrument access to preset configurations but no access to edit configuration.



10

Press the green Save button to save the User Group and display the User Name List Screen

User Name List Screen



User Login

Logging in to the ApexZ requires both a Username and a Password.

Enter Username

1

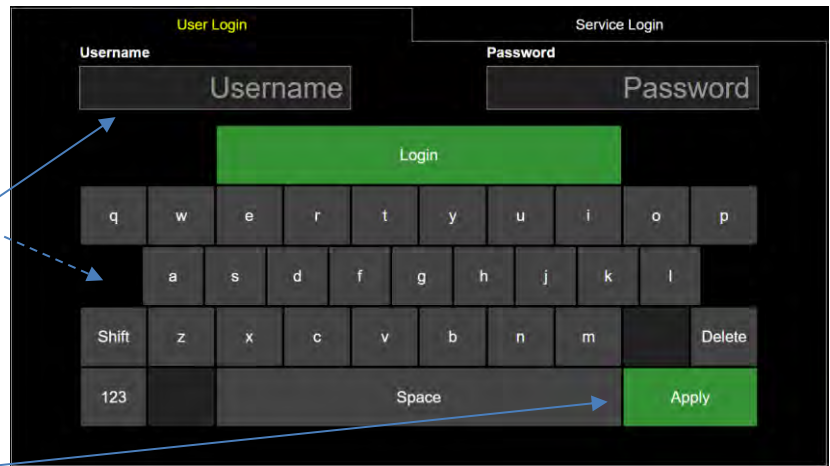
Touch the Username box then enter "admin" (lower case) from the login keypad.

The username "admin" will display in the username box.

2

Press the green Apply button

Login Screen User Name



Enter Password

3

Touch the Password box

4

Then enter "password" (lower case) from the login keypad and "*****" will appear in the password box.

5

Press the green Apply button.

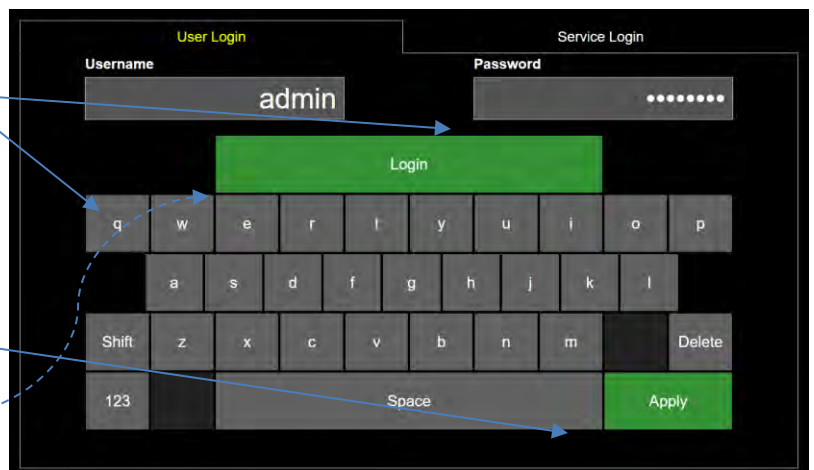
6

Press the Login button.

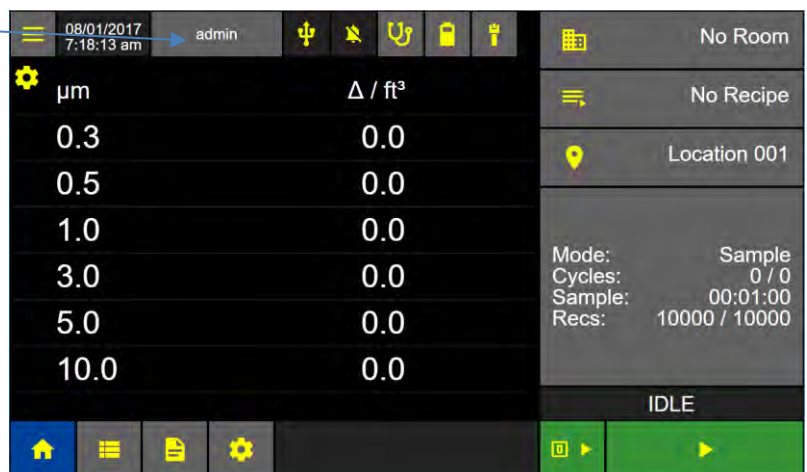
7

You are now logged in As "admin"

Login Screen Password



Home Screen "admin" logged in



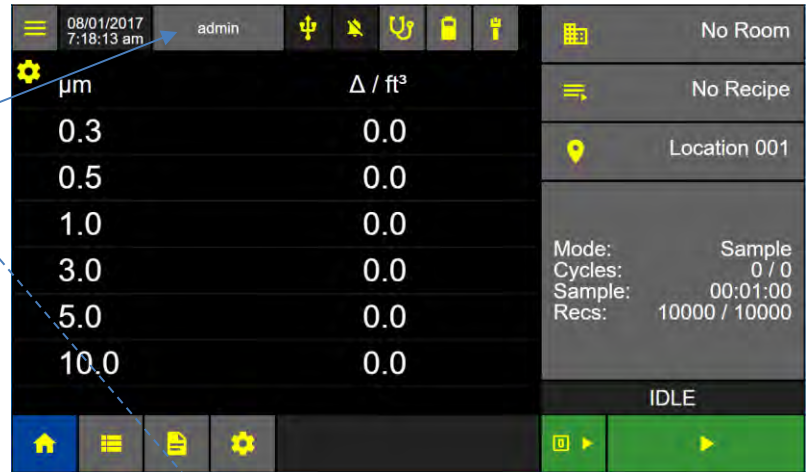
Note: To display the login screen when the ApexZ is powered on, Enable Users on the Configuration Instrument Options Screen.

User Logout

Note: If you press the Username button and it does not display the Logout screen: Check that Users are “enabled”.

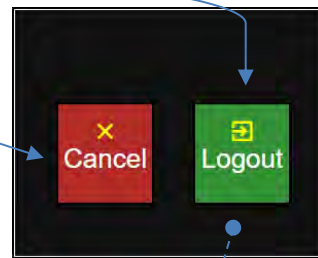
- 1 Press the User button
to display the Logout screen

Home Screen: User Enabled



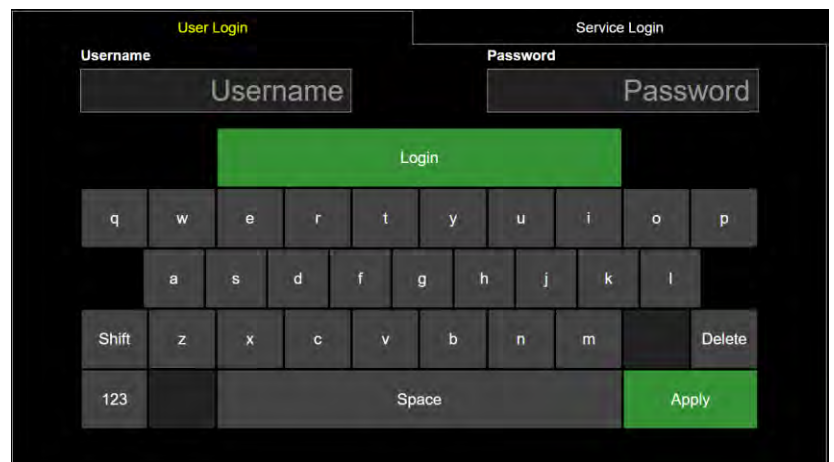
- 2 Press Logout to logout
Or press Cancel to remain
logged in.

Logout Screen



- 3 If you press Logout then ApexZ
will return to the Login Screen.

Login Screen



Change User Password

HOME – CONFIG – Users – User Settings

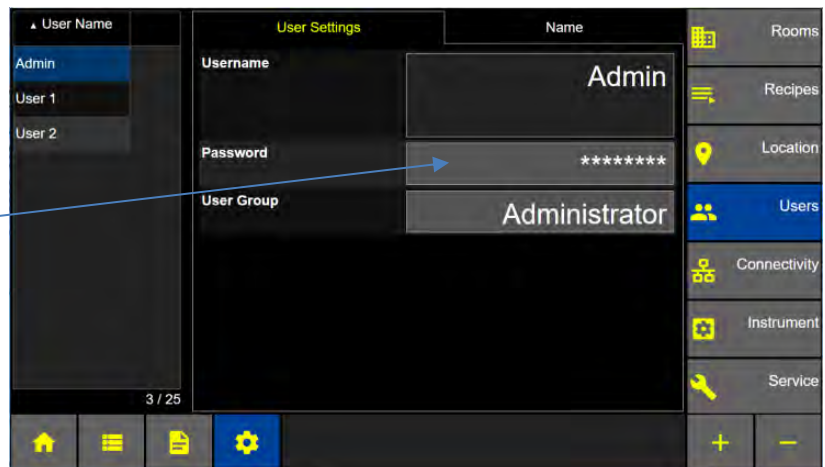
Change the “admin” user password.

ApexZ is shipped with one user name: “admin” and the password is preset to “password” (case sensitive).

1

Press the Password button to Change the user password.

Configuration: Users Screen - User Settings Tab



Change User First and Last Name

Change the “admin” First Name

2

Press the Name Tab to display the User First and Last Name Screen.

3

Press First Name to display the input keyboard.

4

Enter the users First Name and press apply to save.

Change the “admin” Last Name

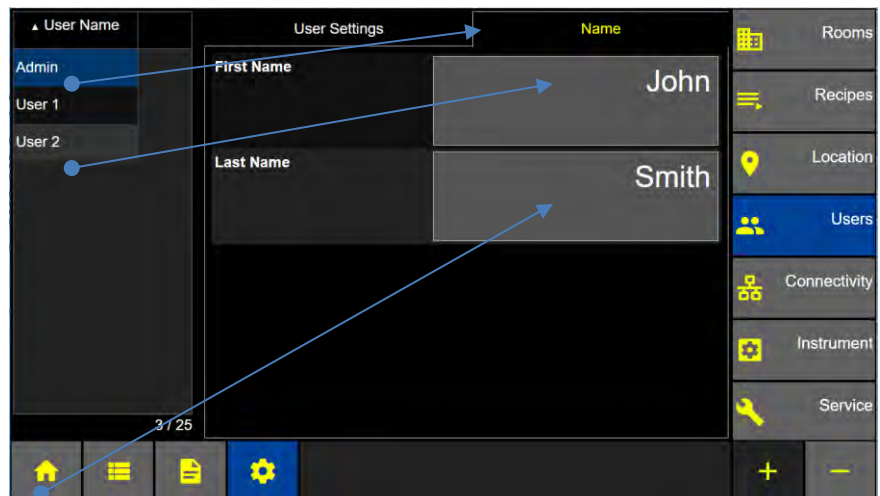
5

Press Last name to display the input keyboard.

6

Enter the users Last Name and press apply to save.

Configuration: Users Screen - Name Tab



Rooms

Add a Room

HOME – CONFIG – Rooms

- 1 Press the + button to add a Room.

Note: ApexZ can store up to 50 room names. At least 1 Location must be assigned to a Room and each location may only be assigned to 1 Room.

Rooms Screen



Assign Locations to a Room

Select Locations to Include in Room

Include Locations Screen

- 1 Press the red x button to include each location for the new room. The button will change to a green checkmark.
- 2 Press a location name button to rename a location.
- 3 Press the Name button to display the Enter New Room Screen.



Enter Room Name

Room Name Screen

Enter Room Name

- 1 Use the keyboard to enter the New Room's Name.

Press Apply

- 2 Then press the green Apply button to save the Room name.

Note: A Room may contain multiple locations but a location may only be assigned to one room. Duplicate room names are permitted.

Save Room Screen

Press Save

- 3 Press the green Save button to Save the new room name.

Locations

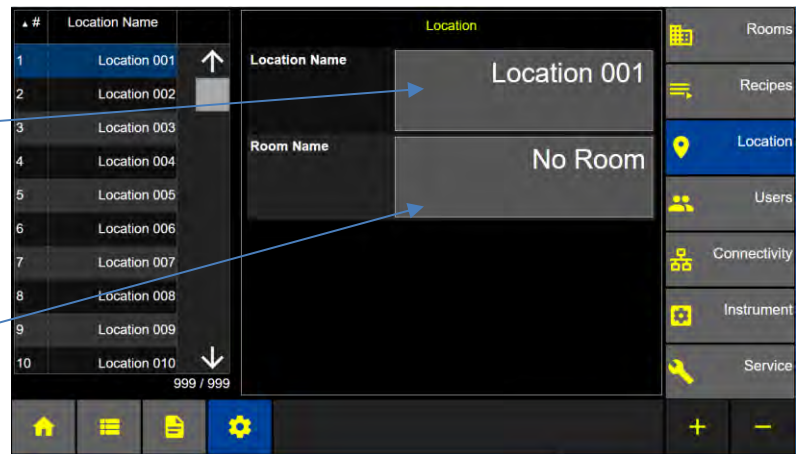
HOME – CONFIG – Location

Edit Location Name

- 1 Press the Location Name button to display the Enter Location Name screen.
- 2 Press the Room Name button to assign or reassign the location to a room.

Note: The Room Locations list will display locations assigned to that Room Name. If room "No Room" is selected then all locations will display.

Location Screen



Enter Location Name Screen

- 1 Enter the Location Name with the keyboard.
- 2 Press the green Apply button to save the location name.

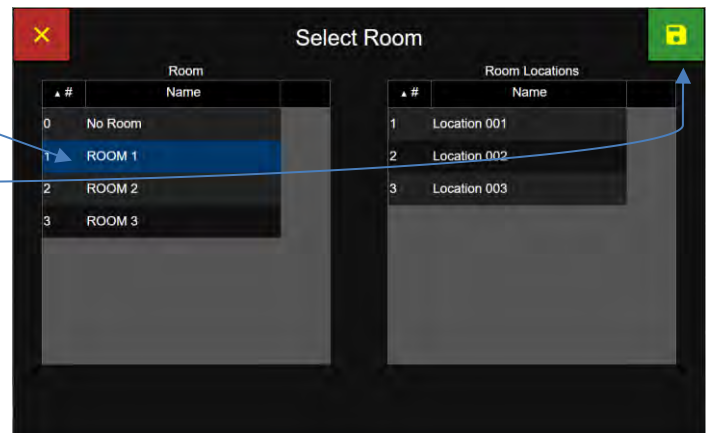


Assign Location to a Room

- 1 Select the room for the new location from the Room list on the left.
- 2 Press the green Save button to save the Room selected.

Note: If a room has only one location selected, the user cannot reassign that location to a different room. Instead enable the new location then disable the undesired location.

Select Room Screen



Recipes

Custom and Certification Standard Recipes

The ApexZ supports multiple Sample Recipes and Cleanroom Standards including: Custom, EU GMP, Federal Standard 209E, ISO 14644-1: 1999 and ISO 14644-1: 2015. To add, edit, or delete recipes, if users are enabled, login as an Administrator or Power User account. If users are not enabled on the instrument, anyone can add, edit, or delete the instruments' recipes.

Certification Standard Recipes conform to the certified standard specifications for room size, room class, and room operation.

To view the Certification Recipe Types:

From the Home screen press the Configuration button to display the Configuration Screen.

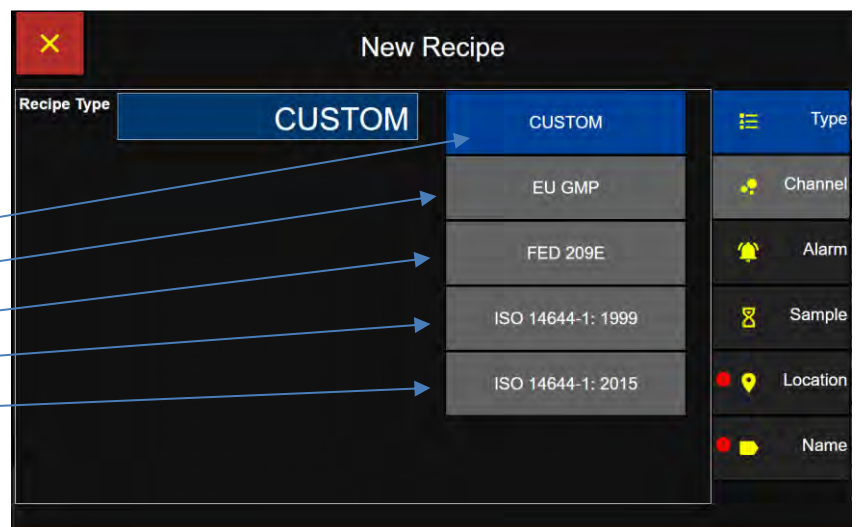
From the Configuration Screen press the Recipe button.

Press the + button to Add a New Recipe.

Recipe Type Screen

Select a Recipe Type

Custom
EU GMP
FED 209E
ISO 14644-1: 1999
ISO 14644-1: 2015



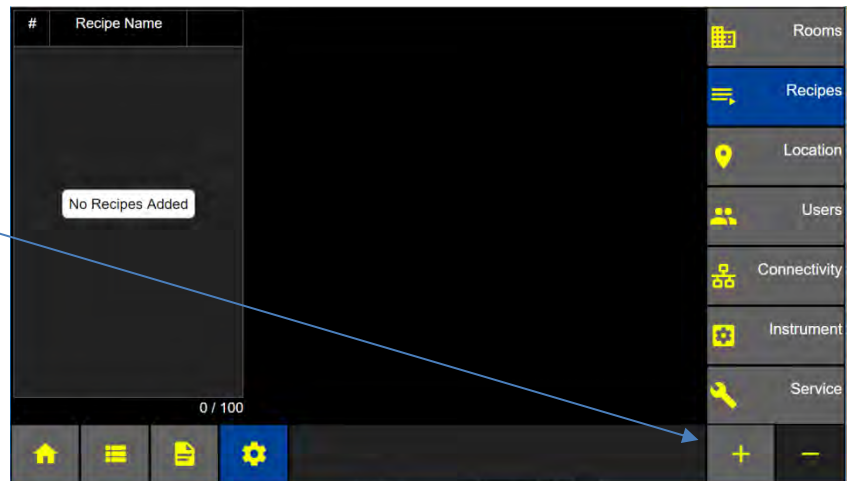
Custom Recipes

ApexZ Custom Recipes allow the operator to select customized sampling parameters for channel, alarm, sample times, and location.

Add a new Recipe

Configuration: Recipe Screen

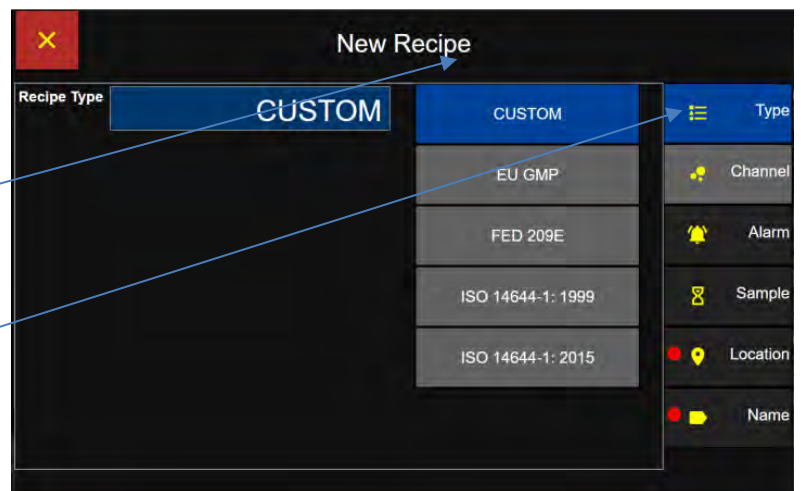
- 1 Press the **+** button to add a new recipe and display the New Recipe Screen.



Select a Recipe Type

Custom Recipe: Recipe Type Screen

- 2 Press the **CUSTOM** button to select the Recipe Type **CUSTOM**.
- 3 Press the **Channel** tab to advance to the Channel Screen.



Custom Recipe - Channel Sizes

Custom Recipe: Channels Screen

Enable or Disable Particle Size Channels

- 1 Press the Enable/Disable button to Enable or disable any channel for the New Recipe.

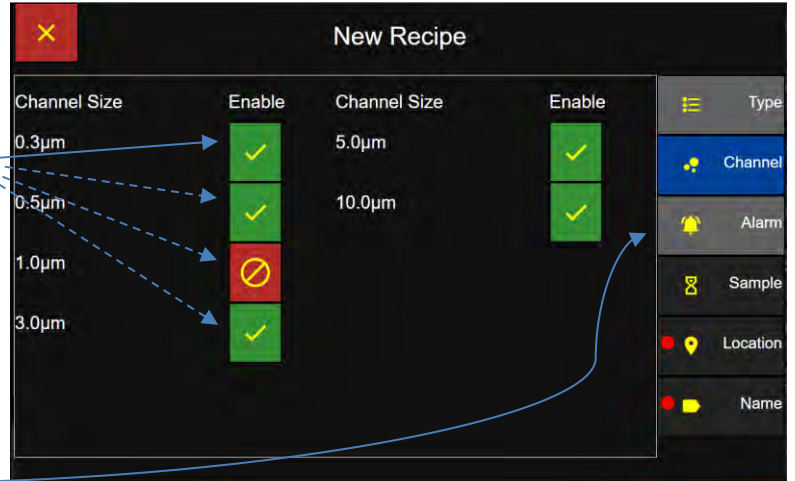


Disabled



Enabled

- 2 Press the Alarm tab to display the Alarm Screen.



Note: The user may not disable all channels. At least 1 channel must be enabled to create a new recipe.

Custom Recipe - Warning and Alarm Thresholds

Custom Recipe: Warnings Screen

Enable/Disable Warnings

ApexZ allows the user to set specific warning and alarm values for each particle size channel for a Custom Recipe.

The user can enable or disable warnings or alarms for each channel size.



Disabled



Enabled

Enable Warning Channels

Custom Recipe: Alarms Screen

1 Select the "Warning" tab.

2 Press the toggle button to Enable or disable warnings for the channel.

Set Warning Values

3 Touch the Warning input button and it will highlight in blue to show that it is selected.

4 Enter Warning value on the keypad.

5 Press Apply to save and the warning value will be displayed in the channel's warning value box.

Set Alarm Values

- 1 Select the Alarm Tab.
- 2 Press the toggle button to enable or disable alarms for the desired channel.
- 3 Touch the Alarm value button and it will highlight in blue to show it is selected.
- 4 Enter the Alarm value with the numeric keypad.
- 5 Press the Apply button to save the Alarm value.
- 6 Press the Sample button to advance to the Sample screen.

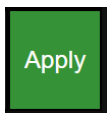
The screenshot shows the 'New Recipe' interface. The 'Alarm' tab is selected. The channel list on the left shows the 0.5 channel is active and selected. The numeric keypad on the right is used to enter the alarm value. The 'Apply' button is used to save the value. The 'Sample' button is used to proceed to the next screen.

Custom Recipe - Sample Settings

Custom Recipe: Sample Settings Screen

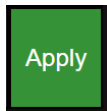
Delay

- 1 Press the Delay button and the button will turn blue to indicate that it is selected.
- 2 Enter the delay time with the numeric key pad.
- 3 Press Apply to store the value.



Sample

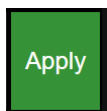
- 1 Press the Sample button and change the sample time with the numeric keypad.
- 2 Press Apply to store the value.



Hold

- 1 Press the Hold button and change the hold time between cycles using the numeric key pad.

- 2 Then press Apply.



The screenshot shows the 'New Recipe' screen with the following settings:

Mode	Sample
Delay	00:00:00
Sample Time	00:01:00
Hold	00:00:00
Cycles	1
Volume	0.028
Units	m ³

On the right side, there is a numeric keypad with buttons 0-9, a 'delete' button, and an 'Apply' button. The 'Max Delay' is set to 23:59:59. The 'Type' dropdown is set to 'Sample'.

Location

Press the Location Tab to advance to the Location screen.

Units

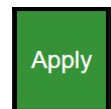
Press the Units button to change the units:

ft³ - cubic feet
m³ - cubic meters
L - liters

Cycles

1 Press the Cycles button and change the # of cycles with the numeric keypad.

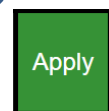
- 2 Then press Apply.



Volume

1 Press the Volume button and change the sample volume with the numeric keypad.

- 2 Then press Apply.



Note:

The sample time will change accordingly to the Volume; and vis versa.

Custom Recipe – Locations

Select Room

- 1 Select a room.

Select Locations

- 2 Press the enable/disable toggle button to enable the desired locations to be sampled.
- 3 Press the Name tab to display the Enter Recipe Name Screen.

Custom Recipe Location Screen

#	Room Name	Include
0	No Room	

#	Location Name	Include
1	Location 001	✓
2	Location 002	✓
3	Location 003	✓
4	Location 004	✗
5	Location 005	✗
6	Location 006	✗
7	Location 007	✗
8	Location 008	✗
9	Location 009	✗

Enter Custom Recipe Name

- 4 Enter the Custom Recipe Name Using the keypad
- 5 Press the Apply button to save the Name and display the Save Recipe Screen.

Enter Recipe Screen

Enter Recipe Name: Recipe 1

Enter Valid Name

Apply

Save Custom Recipe

- 6 Press the Save button to save the recipe and return to the Recipe Configuration Screen.

Configuration: Save Recipe Screen

The screenshot shows the 'Save Recipe Screen' titled 'Recipe 1'. It features a red close button (X) in the top left and a green save button (floppy disk) in the top right. Below the title is a text input field labeled 'Enter Recipe Name'. A virtual keyboard is displayed below the input field, including numeric keys (1-0), punctuation/symbols, and an 'Apply' button. To the right of the keyboard is a vertical list of configuration options: Type, Channel, Alarm, Sample, Location, and Name, each with a corresponding icon.

Edit - Custom Recipes

Edit Recipe Name/Type

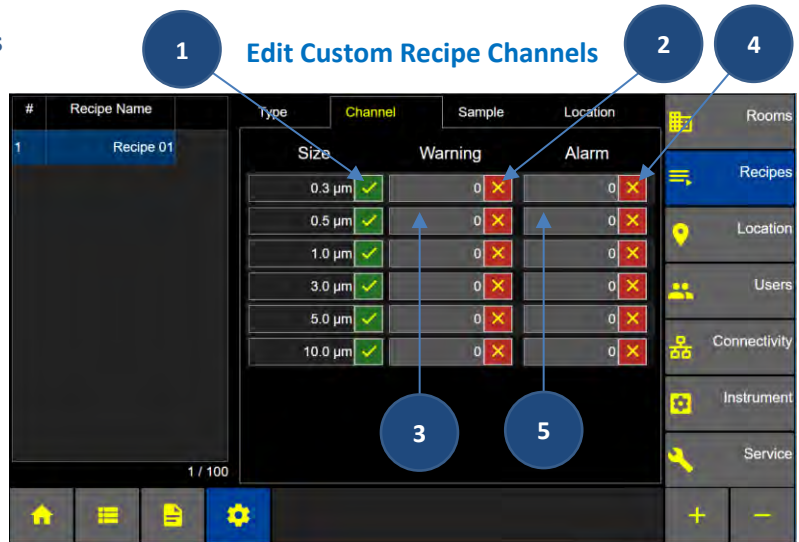
- 1 Select a Recipe Name to edit.
- 2 Press the Type Tab.
- 3 Press the Name button to edit the Recipe Name.
- 4 Press the Recipe Type button to edit the Recipe Type.
- 5 Press the Channel Tab to display the Channel, Warning and Alarm settings.

Configuration: Recipes Screen

The screenshot shows the 'Recipes Screen' with a table listing recipes. The first row is highlighted in blue and contains the following data: # 1, Recipe Name Recipe 01, Type Name, Channel, Sample, and Location. Below the table, there are tabs for 'Type', 'Channel', 'Sample', and 'Location'. The 'Type' tab is currently selected, showing 'Recipe Type' and 'CUSTOM'. On the right side of the screen is a vertical menu with icons and labels for 'Rooms', 'Recipes', 'Location', 'Users', 'Connectivity', 'Instrument', and 'Service'. At the bottom, there is a navigation bar with icons for home, list, document, and settings, along with a '1/100' indicator.

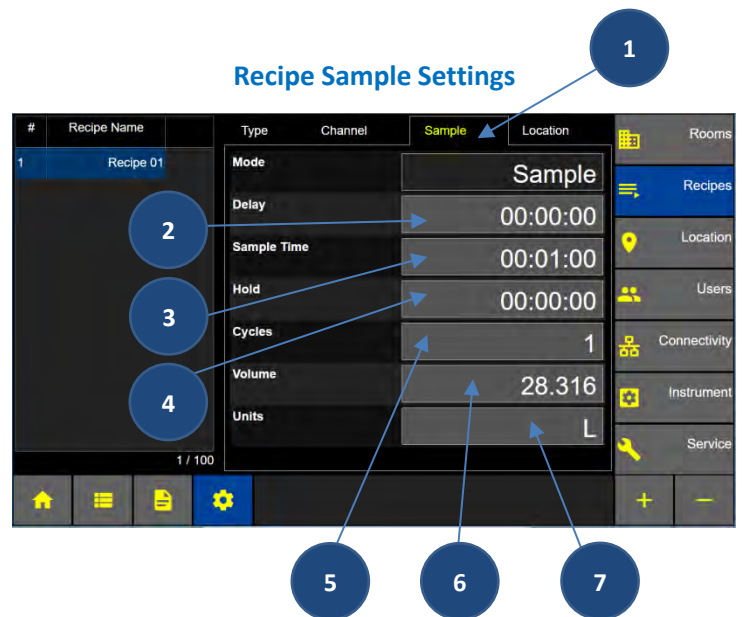
Edit Custom Recipe Channel, Warning and Alarms

- 1 Enable or disable the particle channels by pressing the enable/disable toggle button.
- 2 Enable or disable the particle warning limit by pressing the enable/disable toggle button.
- 3 Enter Warning limits by pressing the warning limit value buttons and use the pop up key pad to enter the value.
- 4 Enable or disable the particle Alarm limits by pressing the enable/disable button for the desired channels.
- 5 Enter Alarm limits by pressing the alarm limit button and using the pop up key pad to enter the value.



Edit Custom Recipe Sample Settings

- 1 Press the Sample Tab to Edit Sample Settings.
- 2 Press the Delay value button to enter a value using the keypad.
- 3 Press the Sample Time button to enter the sample time using the pop up keypad.
- 4 Press the Hold button to enter the hold time using the pop up keypad.
- 5 Press the Cycles button to enter the number of cycles using the pop up keypad.
- 6 Press the Volume button to enter the sample volume using the pop up keypad.
- 7 Press the Units button to edit the Volume Units: ft³ (cubic feet), m³ (cubic meters) or L (liters).



Edit Custom Recipe Room/Locations

Edit Custom Recipe Locations

- 1 Press the Room button to edit the Room associated with this Custom Recipe.
- 2 Press the enable/disable toggle button to include or not include specific locations for the Custom Recipe.

#	Recipe Name	Type	Channel	Sample	Location
1	Recipe 01				

Room: No Room

Min Locations: 1 Locations: 1 / 999

2 ▼ Incl...	1 #	Location Name
☒	1	Location 001
☐	2	Location 002
☐	3	Location 003
☐	4	Location 004
☐	5	Location 005
☐	6	Location 006

1 / 100

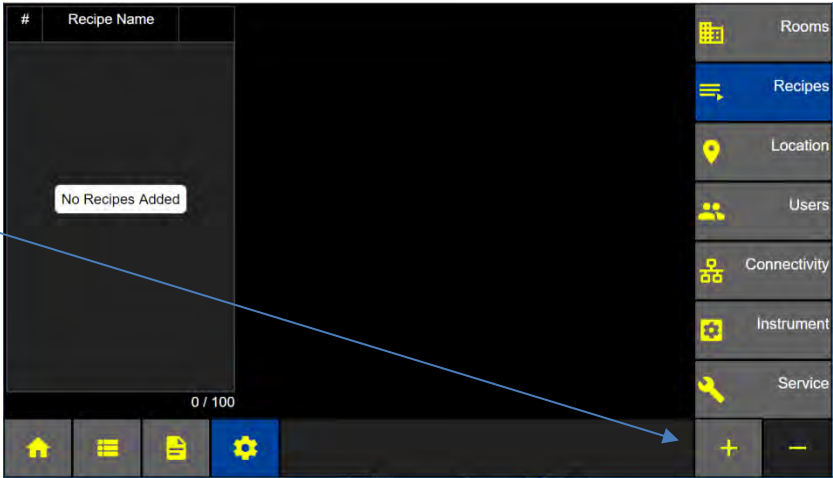
Certification Recipes

HOME – CONFIG – Recipes

Add a Recipe

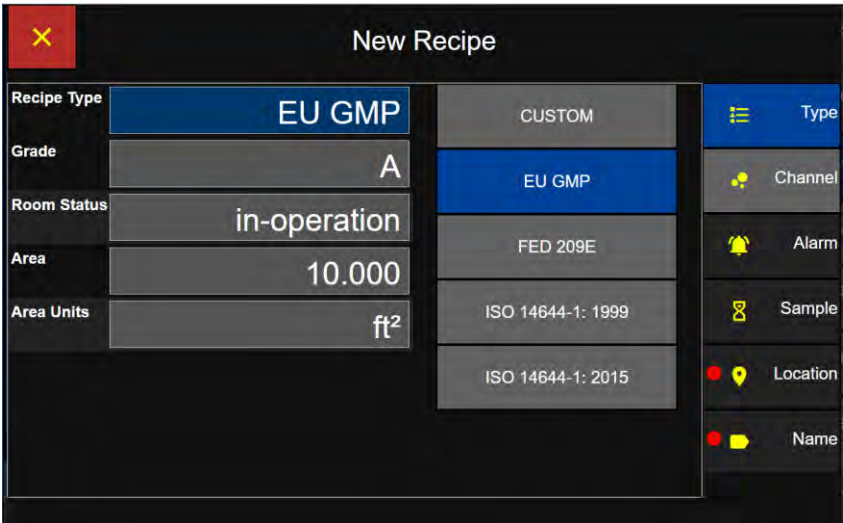
Press the + button to add a new recipe and display the New Recipe screen.

Configuration: Recipes Screen



Certification Recipe Types

- EU GMP
European Union Good
Manufacturing Processes
- FED 209E
Federal Standard 209E
- ISO 14644-1: 1999
- ISO 14633-1:2015



Certification Recipe - Type Settings

Certification Recipe Type Screen

1 Select your desired certification recipe type standard.

2 Select Class or Grade

3 Select Airflow

4 Select Room Status

5 Select Area

6 Select Area Units

Recipe Type

1
10
100
1000
10000
100000

ISO

1
2
3
4
5
6

Grade EU GMP

A
B
C
D

Airflow FED 209E only

bi-directional
uni-directional

Room Status

as-built
at-rest
in-operation

Room Area

Max Area: 398,264.856			
Enter Value			
1	2	3	delete
4	5	6	
7	8	9	
	0	.	Apply

Area Units

ft²
m²

Certification Recipe - Channels and Target Limits

ApexZ certification recipes will automatically enable the required channels and assign target limits according to the selected standard type for each particle size channel. Channels not required for the standard will be disabled and no values will be shown. The user cannot edit any of the enabled or disabled channels, nor may any target limits be modified.

Enable/Disable Channels

Example: EU GMP Recipe Channels Screen

1

Target limits may not be added, modified or deleted.

Shown here are the target limits calculated for:

EU GMP Recipe

Grade: A

Room Status: In Operation

Area: 10.000

Area units: Square feet (ft²)

Size	Enable	Target Limit / m ³
0.3 µm	⊘	
0.5 µm	✓	3520
1.0 µm	⊘	
3.0 µm	⊘	
5.0 µm	✓	20
10.0 µm	⊘	

Type

Channel

Alarm

Sample

Location

Name

2

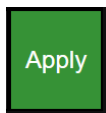
Press the Sample button to display the Sample Screen.

Certification Recipe - Sample Settings

Certification Recipe Sample Screen

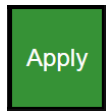
Delay

- 1 Press the Delay button and the button will turn blue to indicate that it is selected.
- 2 Enter the delay time with the numeric key pad.
- 3 Press Apply to store the value.



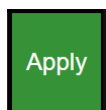
Sample

- 1 Press the Sample button and change the sample time with the numeric keypad.
- 2 Press Apply to store the value.



Hold

- 1 Press the Hold button and change the hold time between cycles using the numeric key pad.
- 2 Press Apply to store the value.



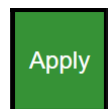
The screenshot shows the 'New Recipe' screen with the following settings:

- Mode: Sample
- Delay: 00:00:00
- Sample Time: 00:35:19
- Hold: 00:00:00
- Cycles: 1
- Volume: 1,000.027
- Units: L

On the right side, there is a numeric keypad with buttons 0-9, a 'delete' button, and an 'Apply' button. Above the keypad, it says 'Enter Value' and 'Max Delay: 23:59:59'. On the far right, there are tabs for 'Type', 'Channel', 'Alarm', 'Sample', 'Location', and 'Name'. The 'Sample' tab is currently selected.

Cycles

- 1 Press the Cycles button and change the # of cycles with the numeric keypad.
- 2 Press Apply to Store the value.



Location

- 1 Press the Location Tab to advance to the Location screen.

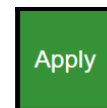
Units

- 1 View the volume units pre-assigned per the standard.

ft³ - cubic feet
m³ - cubic meters
L - liters

Volume

- 1 Press the Volume button and change the sample volume with the numeric keypad.
- 2 Press Apply to Store the value.



Certification Recipe - Locations

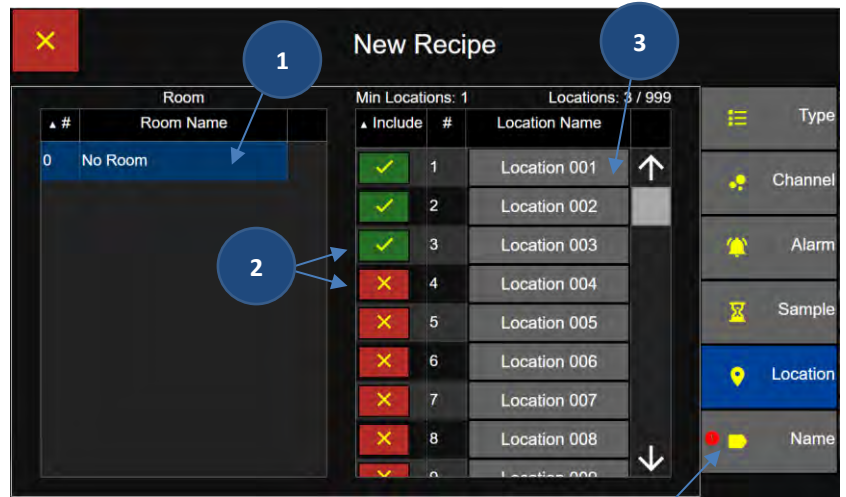
EU GMP Recipe Location Screen

Select Room

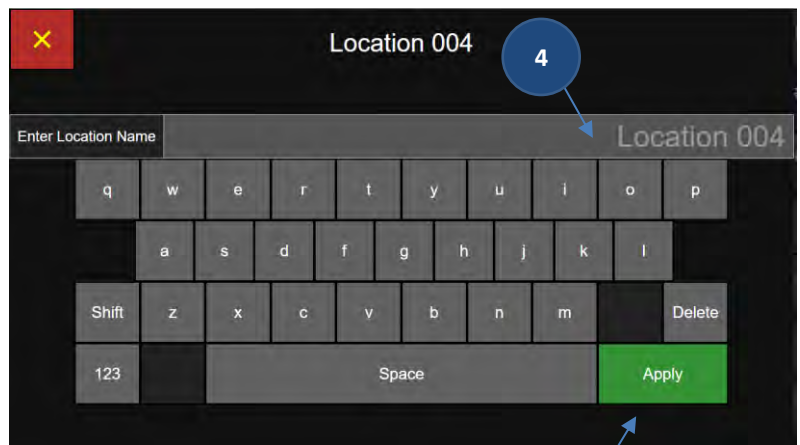
- 1 Select a Room Name button.

Select Locations

- 2 Press the enable/disable toggle button to enable the desired locations to be sampled.
- 3 Press a Location Name button to edit the location name.
- 4 Using the keypad enter a new location name for the selected location number.
- 5 Press the Apply button to save the new location name for that location number.
- 6 Press the Name Tab to display the Enter Location Name Screen.



Enter Location Name Screen



Certification Recipe - Name

Enter Certification Recipe Name

- 1 Enter the Certification Recipe Name using the keypad.
- 2 Press the Apply button to save the new Recipe Name and display the Save Recipe button.

Enter Recipe Name Screen

The screenshot shows the 'New Recipe' screen. At the top, there is a red close button and the title 'New Recipe'. Below the title is a text input field labeled 'Enter Recipe Name' which contains the text 'Recipe 1'. A red error message 'Enter Valid Name' is displayed below the input field. Below the input field is a numeric keypad (0-9) and a QWERTY keyboard. A green 'Apply' button is located at the bottom right of the keyboard. A red dot on the 'Apply' button has a dashed arrow pointing to the 'Save Recipe Screen'.

Save Certification Recipe Name

- 3 Press the Save button to save the recipe and return to the Recipe Configuration Screen.

Save Recipe Screen

The screenshot shows the 'Recipe 1' screen. At the top, there is a red close button and the title 'Recipe 1'. Below the title is a text input field labeled 'Enter Recipe Name'. Below the input field is a numeric keypad (0-9) and a QWERTY keyboard. A green 'Apply' button is located at the bottom right of the keyboard. A green 'Save' button is located at the top right of the screen. A red dot on the 'Save' button has a dashed arrow pointing to the 'Save Recipe Screen'.

Edit - Certification Recipes

Edit Recipe Type Settings

- 1 Select the Recipe Name to Edit.
- 2 Press the Type Tab
- 3 Press each button to edit:
 Recipe Name
 Recipe Type
 Grade
 Room Status
 Area
 Area Units

Edit Recipe Type Settings Screen

#	Recipe Name	Type	Channel	Sample	Location
1	Recipe 01	Name			
		Recipe Type			
		Grade			
		Room Status			
		Area			
		Area Units			

1 / 100

Bottom navigation bar: Home, List, Document, Settings (selected), Plus, Minus.

Right sidebar: Rooms, Recipes (selected), Location, Users, Connectivity, Instrument, Service.

View Recipe Channels and Target Limits

For certification recipes, enabled channels and target limits are fixed and may not be modified.

Shown here are the target limits for the following EU GMP certification report for Room, Grade, Status and Area.

Grade A
Room Status: In Operation
Area: 10,000
Area Units: ft³

Edit Recipe Channel and Target Limits Screen

#	Recipe Name	Type	Channel	Sample	Location
1	Recipe 01	Size	Target Limit / m ³		
		0.3 µm			
		0.5 µm			
		1.0 µm			
		3.0 µm			
		5.0 µm			
		10.0 µm			

1 / 100

Bottom navigation bar: Home, List, Document, Settings (selected), Plus, Minus.

Right sidebar: Rooms, Recipes (selected), Location, Users, Connectivity, Instrument, Service.

Note: Particle size channels enabled and target limits are fixed for each specified certification standard.

Edit Certification Recipe Sample Settings

- 1 Press the Sample Tab

Edit Recipe Sample Settings Screen

- 2 Press the button to edit:
Delay Time
Sample Time
Hold Time
of Cycles
Volume

Units (Liters, view only)

#	Recipe Name	Type	Channel	Sample	Location
1	Recipe 01	Mode		Sample	
		Delay		00:00:00	
		Sample Time		00:35:19	
		Hold		00:00:00	
		Cycles		1	
		Volume		1,000.027	
		Units		L	

Edit Certification Recipe Locations

- 1 Press the Locations Tab

Edit Recipe Locations Screen

- 2 Press the Room button to edit the selected Room.
- 3 Press the enable button to include locations in the Recipe.

#	Recipe Name	Type	Channel	Sample	Location
1	Recipe 1	Room:		No Room	
		Min Locations: 1		Locations: 1 / 999	
		2 v Incl...	1 a #		Location Name
		☒	1		Location 001
		☐	2		Location 002
		☐	3		Location 003
		☐	4		Location 004
		☐	5		Location 005
		☐	6		Location 006

Communications

Communication to the ApexZ can be set up via a wired Ethernet connection or a wireless Wi-Fi connection. With the Ethernet connection enabled, data from the ApexZ can be transferred manually or real time to the LMS Express 8 Software. The ApexZ can also be remotely controlled and configured via Lighthouse's mobile device application Basecamp.

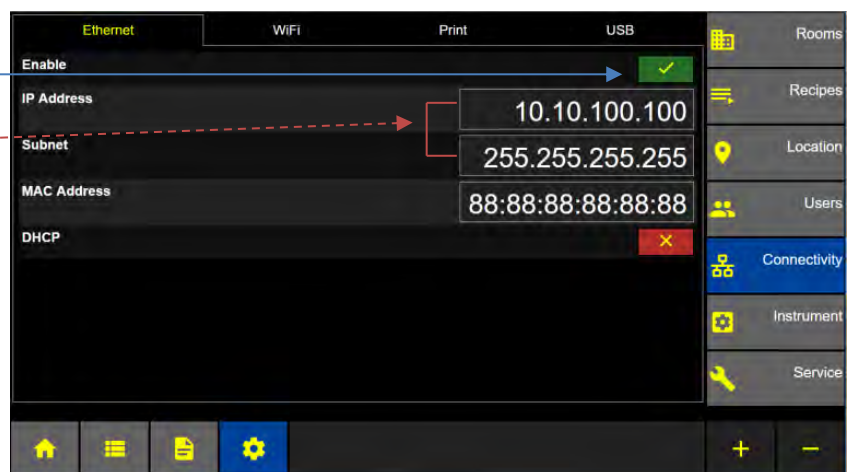
Ethernet

HOME – CONFIG – Connectivity – Ethernet tab

Ethernet Address Enabled

When Ethernet is enabled the IP Address and Subnet buttons will be locked.

Ethernet Enabled Screen



Ethernet Address Disabled

To set or change the instruments IP or Subnet addresses you must disable Ethernet first.

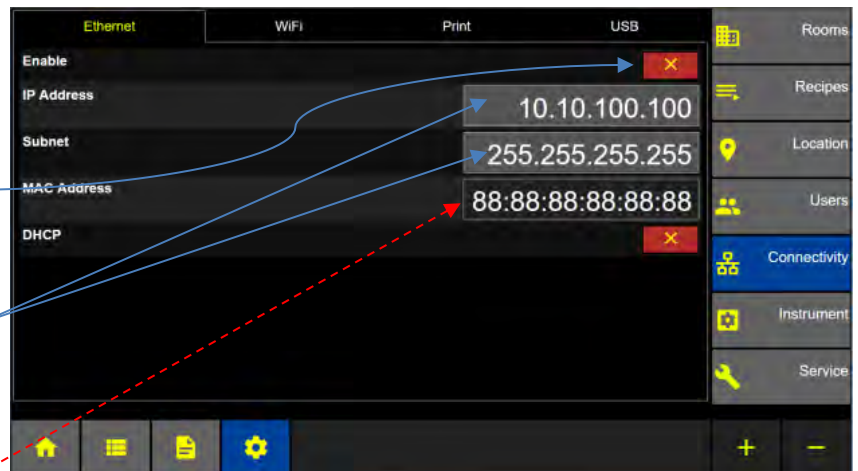
1

Press the enable/disable toggle button to disable Ethernet and allow input of a new setting.

The IP and Subnet buttons will change to light grey indicating the button is available to edit.

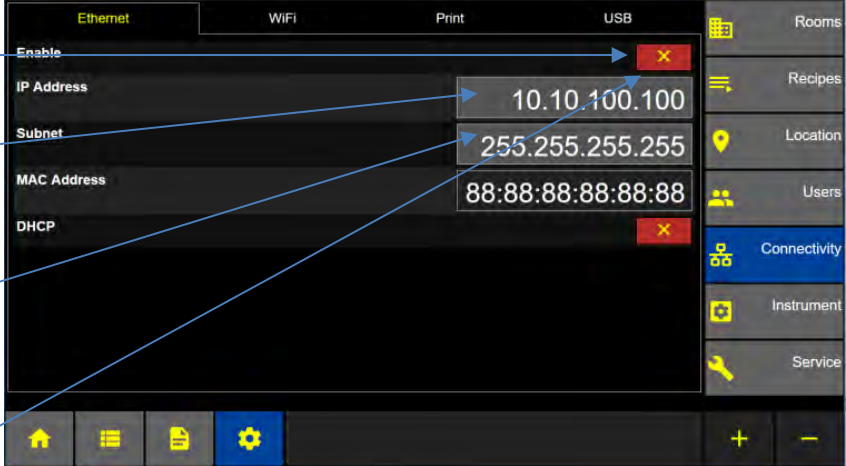
MAC Address is fixed and cannot be changed.

Ethernet Disabled Screen



Enter a new Ethernet Address

- 1 Press the toggle button to disable Ethernet.
- 2 Press the IP Address button to display the Enter IP keypad.
- 3 Press the Subnet button to display the Enter Subnet keypad.
- 4 To enable the new Ethernet settings press the Ethernet enable toggle button.



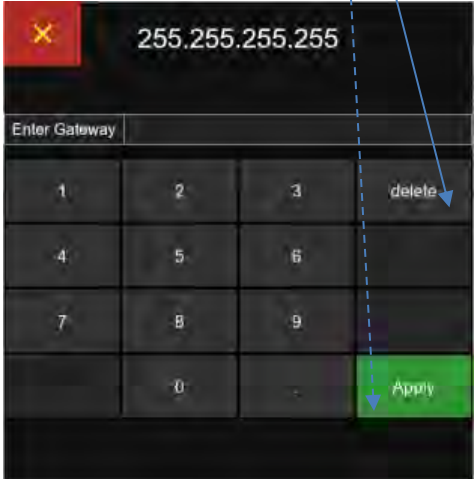
The MAC Address is fixed.

- 5 Enter the IP address using the keypad and press the green Apply button.
- 6 Enter the Subnet Address using the keypad and press the green Apply button.

Enter IP keypad



Enter Subnet Keypad



Note: Once Ethernet is enabled the IP and Subnet addresses will be locked and greyed out. They cannot be changed while Ethernet is enabled.

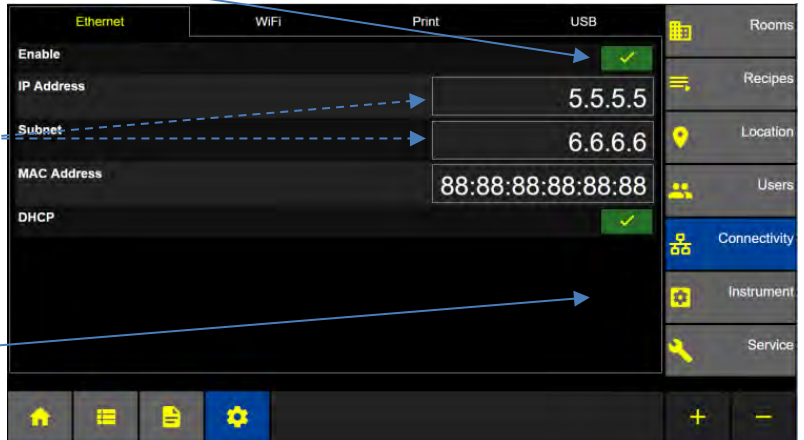
DHCP (Dynamic Host Configuration Protocol)

- 1 Press the Enable Ethernet button

Ethernet DHCP Enabled Screen

Note: When DHCP is enabled: The IP and Subnet addresses will be dynamically assigned by your network.

- 2 Press the Enable DHCP button



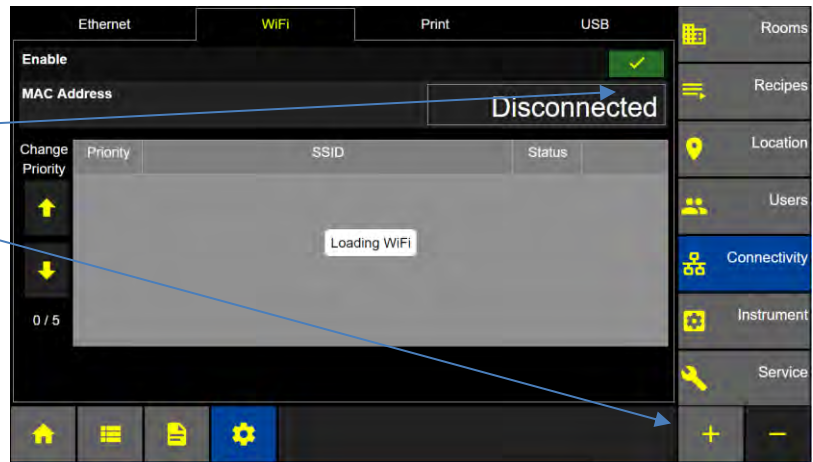
Wi-Fi

HOME – CONFIG – Connectivity – Wifi tab

Enable Wi-Fi

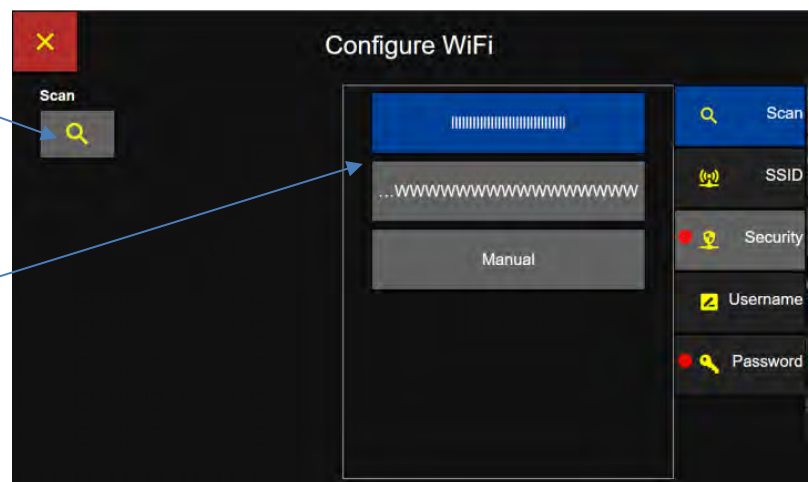
- 1 Press the Wi-Fi Enable button to enable Wi-Fi.
- 2 Press the + button to Configure one to five Wi-Fi connections.

Configuration: Wi-Fi Screen



- 3 Press Scan to search for available Wi-Fi networks or routers in the area.

ApexZ will scan for available Wi-Fi networks
- 4 Select a Wi-Fi network for your ApexZ communications.
- 5 Press the Connect Button.



Connecting Message...

Connection Successful Message...

Press the check mark.

Wi-Fi is status active.

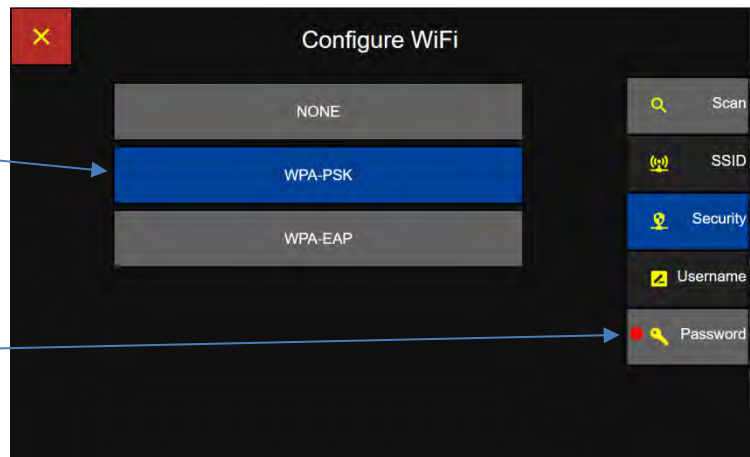
1

Press Security and select one of:

None
WPA-PSK
WPA-EAP

2

Press the Password Button.



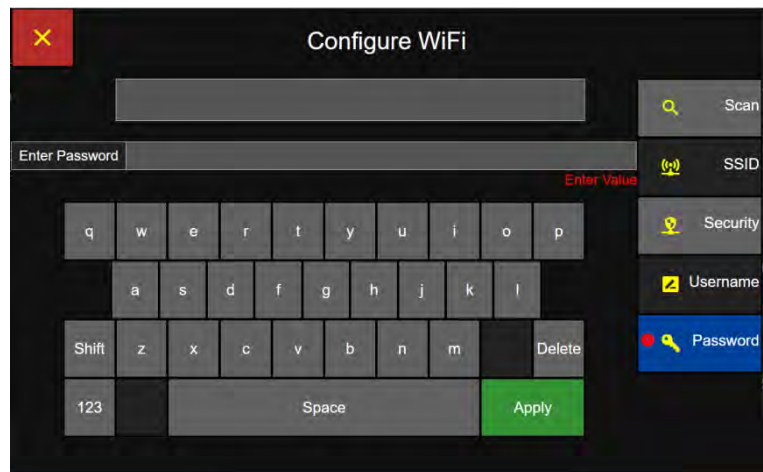
3

Enter password on
the keyboard screen
and press Apply.

4

Press Save to Connect.

When the ApexZ successfully
connects to the Wi-Fi network, a
“Connection Successful” message
will appear.



Print

HOME – CONFIG – Connectivity – Print tab

Print Options

The Print Options screen allows the user to setup how printouts will be formatted. Users can set data formats to Raw or Normalized, Cumulative or Differential and choose the normalized unit of measure (cubic feet, cubic meters or Liters). Certain statistics can also be enabled to print on reports. These include: Mean, Minimum, Maximum, Standard Deviation, Standard Error and 95% UCL.

Configuration: Print Settings Screen

Data Format

Enable or Disable data formats:
Select Raw or Normalized
Select Cumulative and/or Differential
Select Normalize Units ft³, m³, L

Statistics

Enable/Disable printing statistics for:
Mean
Minimum
Maximum
Std. Dev.
Std. Error
95% UCL

Formatting

Enable/Disable printing the following:
Model
Serial #
Calibration Date
Username
Tag
Separator

Output On Sample, On Alarm

If Output on Sample is enabled each record will be printed when the sample is complete.

If Output on Alarm is enabled the alarm data will be printed every time an alarm is recorded.

Font Size

Enable either Reg (regular font size) or Small (reduced font size).

Category	Option	Status
Data	Raw/Norm	Raw (Red), Norm (Green)
	Cumulative/Diff	Cumu (Green), Diff (Red)
	Normalize Units	ft ³ (Green), m ³ (Red), L (Red)
Statistics	Mean	Green
	Minimum	Green
	Maximum	Green
	Std.Dev.	Green
	Std.Error	Green
	95%UCL	Green
Formatting	Model	Green
	Serial #	Green
	CalDate	Green
	Username	Green
	Tag	Green
	Separator	Green
Output	On Sample	Red (X)
	On Alarm	Red (X)
	Font Size	Reg (Green), Small (Red)

Note:
Green buttons indicate active options.
Red buttons indicate inactive options.

Raw Norm

Disabled Enabled

Note: The User may enable both output "On Sample" and "On Alarm" (this will output to the printer on every sample and on every alarm record).

USB

HOME – CONFIG – Connectivity – USB tab

USB Options

The USB Options screen allows the user to select how to format data exported to USB. Data can be exported to USB as .csv (comma separated value) or .lsd (Lighthouse Secure Data) files. The format for particle data can be set to Raw or Normalized; cubic feet, cubic meters or liters. The user may also select to output data records to USB on every sample, every alarm, or both.

Configuration: USB Screen

Output File Format, On Sample, On Alarm

- 1 Select .csv or .lsd file format

Note: Green buttons indicate active options. Red buttons indicates inactive options.

.CSV

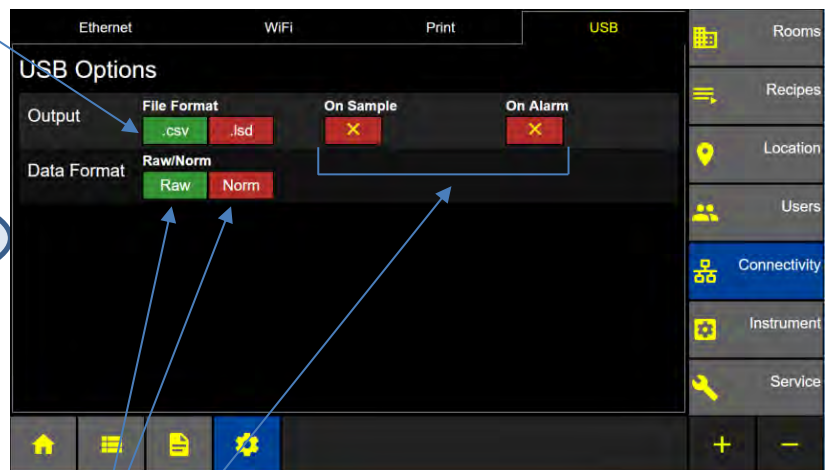
Enabled

.lsd

Disabled

- 2 Select Data Format: Raw or Normalized.

- 3 Select Output on Sample and/or On Alarm.



Note: The User may enable both output “On Sample” and output “On Alarm. (This will output to USB every sample and every alarm record).

Data Screen

Scroll data records

The ApexZ can store up to 10,000 sample data records and display them via the Data Screen. By default data for the first channel, first environmental sensor, first alert, and first fault will be displayed. Additional columns can be displayed by clicking on the column headings with arrow buttons to the right. Press the right arrow button to expand and the left arrow button to collapse that column grouping.

There are three ways to scroll through the data records on the ApexZ.

Slide Elevator Bars

1

Slide the vertical elevator bar up and down to scroll through data records saved on the ApexZ.

2

Slide the horizontal elevator bar right and left to view additional data columns.

Press the Arrow Keys

3

The user can also press the arrow buttons to scroll data records up/down or right/left.

Swipe the Data display region to scroll

4

Using your finger and swipe the data screen region up or down, right or left. The data displayed will scroll accordingly up or down, right or left.

Data Screen

Timestamp	Channels	Analog	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/21/2017, 10:08:31 am	0	25.10	False	False	00:00:10	Cleanrc	Time
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanrc	Room
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanrc	Recipe
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanrc	Location
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No F	Tag
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No F	Alert/Fault
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No F	
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No F	
filtered: 9 / 9 selected: 0 total: 9 / 10000							

Data Screen

Timestamp	Channels	Analog	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/21/2017, 10:08:31 am	0	25.10	False	False	00:00:10	Cleanrc	Time
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanrc	Room
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanrc	Recipe
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanrc	Location
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No F	Tag
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No F	Alert/Fault
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No F	
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No F	
filtered: 9 / 9 selected: 0 total: 9 / 10000							

Total Data Records View

View the Data Record Totals for

Data Records Filtered
Data Records Saved
Data Records Capacity

Total Records Filtered

Total Records Saved

Total Record Capacity

Data Columns

By default channels, analogs, alerts, and fault columns are compressed. To expand a columns press the arrow button on each of the corresponding column headings.

Data Record Columns 1-6

1. Timestamp
2. Channels
3. Analogs
4. Alerts
5. Faults
6. Sample Time
7. Room

Swipe the screen or slide the Elevator Bar to view additional columns to the right left, above or below.

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
08/21/2017, 10:08:31 am	0.3	TEMP	All	All	00:00:10	Cleanr	Time
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanr	Room
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanr	Recipe
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanr	Location
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No F	Tag
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No F	Alert/Fault
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No F	
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No F	

Data Record Columns 8-11

8. Location
9. Recipe
10. User
11. Tag

Swipe the screen or slide the Elevator Bar to view additional columns to the right or left.

Timestamp	Room	Location	Recipe	User	Tag	Filter
08/21/2017, 10:08:31 am	Cleanroom 3	Location 007	Recipe 3	admin	Tag 3	Time
08/21/2017, 10:07:54 am	Cleanroom 3	Location 007	Recipe 3	admin	Tag Name	Room
08/21/2017, 10:06:25 am	Cleanroom 2	Location 004	Recipe 2	admin	Tag Name	Recipe
08/21/2017, 10:02:34 am	Cleanroom 1	Location 001	Recipe 1	admin	Tag Name	Location
08/21/2017, 10:01:58 am	No Room	Location 001	No Recipe	admin	Tag Name	Tag
08/21/2017, 10:01:52 am	No Room	Location 001	No Recipe	admin	No Tag	Alert/Fault
08/21/2017, 10:01:14 am	No Room	Location 001	No Recipe	admin		
08/21/2017, 10:01:08 am	No Room	Location 001	No Recipe	admin		

Data Columns - Expanded

Expand channel size columns

- 1 Press the right arrow button to expand the channel columns.

Data Screen: Channels View Expanded

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/17/2017, 6:03:29 am	146342		False	False	00:00:10	No F	Time
08/17/2017, 6:03:19 am	146446		False	False	00:00:10	No F	Room
08/17/2017, 6:03:09 am	146417		False	False	00:00:10	No F	Recipe
08/17/2017, 6:02:59 am	147649		False	False	00:00:10	No F	Location
08/17/2017, 6:02:49 am	146958		False	False	00:00:10	No F	Tag
08/17/2017, 6:02:39 am	146872		False	False	00:00:10	No F	Alert/Fault
08/17/2017, 6:02:29 am	144662		False	False	00:00:10	No F	
08/17/2017, 6:02:19 am	146421		False	False	00:00:10	No F	

Expanded Channel Sizes columns:

- 2 Press the left arrow button to collapse the Channels columns

Data Screen: Channels View Expanded

Timestamp	Channels						Filter
	0.3	0.5	1.0	3.0	5.0	10.0	
08/17/2017, 6:03:29 am	146342	15931	2711	70	19		Time
08/17/2017, 6:03:19 am	146446	15639	2695	72	25		Room
08/17/2017, 6:03:09 am	146417	15647	2722	81	21		Recipe
08/17/2017, 6:02:59 am	147649	15739	2518	68	23		Location
08/17/2017, 6:02:49 am	146958	15821	2658	71	17		Tag
08/17/2017, 6:02:39 am	146872	15728	2721	78	14		Alert/Fault
08/17/2017, 6:02:29 am	144662	15710	2655	80	17		
08/17/2017, 6:02:19 am	146421	15693	2662	76	16		

Expanded Analog status column view

3

Press the right arrow button to expand the analog data columns:

TEMP – temperature
RH– relative humidity

Data Screen: Analog View Expanded

Timestamp	Channels	0.3	TEMP	RH	Alerts	Faults	SampleTime	Filter
08/17/2017, 6:03:29 am	146342				False	False	00:00:1	Time
08/17/2017, 6:03:19 am	146446				False	False	00:00:1	Room
08/17/2017, 6:03:09 am	146417				False	False	00:00:1	Recipe
08/17/2017, 6:02:59 am	147649				False	False	00:00:1	Location
08/17/2017, 6:02:49 am	146958				False	False	00:00:1	Tag
08/17/2017, 6:02:39 am	146872				False	False	00:00:1	Alert/Fault
08/17/2017, 6:02:29 am	144662				False	False	00:00:1	
08/17/2017, 6:02:19 am	146421				False	False	00:00:1	

filtered: 10000 / 10000 selected: 0 total: 10000 / 10000

Collapse Analog status column view

4

Press the left arrow button to collapse display of the additional Analog columns.

Expanded Alerts status column view

Data Screen: Alert View Expanded

5

Press the Alerts right arrow button to expand the Alert columns:

Warning
Alarm

Timestamp	Channels	0.3	TEMP	RH	Warning	Alarm	Faults	SampleTime	Filter
08/17/2017, 6:03:29 am	146342				None	None	False	00:00:10	Time
08/17/2017, 6:03:19 am	146446				None	None	False	00:00:10	Room
08/17/2017, 6:03:09 am	146417				None	None	False	00:00:10	Recipe
08/17/2017, 6:02:59 am	147649				None	None	False	00:00:10	Location
08/17/2017, 6:02:49 am	146958				None	None	False	00:00:10	Tag
08/17/2017, 6:02:39 am	146872				None	None	False	00:00:10	Alert/Fault
08/17/2017, 6:02:29 am	144662				None	None	False	00:00:10	
08/17/2017, 6:02:19 am	146421				None	None	False	00:00:10	

filtered: 10000 / 10000 selected: 0 total: 10000 / 10000

Collapse Alert status column view

6

Press the left arrow button to collapse the alert data columns.

Expanded Fault status column view

Data Screen: Faults View Expanded

7 Press the arrow button to expand or collapse the Faults status columns.

Flow fault

Laser fault

Service fault

Timestamp	Channels	Analogs	Alerts	Faults	SampleT
08/17/2017, 6:03:29 am	0.3	TEMP	All	Flow Laser Service	
08/17/2017, 6:03:19 am	146342		False	Good Good None	
08/17/2017, 6:03:09 am	146446		False	Good Good None	
08/17/2017, 6:03:09 am	146417		False	Good Good None	
08/17/2017, 6:02:59 am	147649		False	Good Good None	
08/17/2017, 6:02:49 am	146958		False	Good Good None	
08/17/2017, 6:02:39 am	146872		False	Good Good None	
08/17/2017, 6:02:29 am	144662		False	Good Good None	
08/17/2017, 6:02:19 am	146421		False	Good Good None	

filtered: 10000 / 10000 selected: 0 total: 10000 / 10000

Feed

Data Records - Select

Select a single record

- 1 To select a single data record on the Data Screen, press the data record and it will highlight blue to indicate it has been selected.
- 2 Press the same record again and the blue highlight will be removed, indicating that the record is no longer selected.

Data Screen

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/21/2017, 10:08:31 am	0	25.10	False	False	00:00:10	Cleanr	Time
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanr	Room
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanr	Recipe
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanr	Location
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No f	Tag
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No f	Alert/Fault
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No f	

filtered: 9 / 9 selected: 1 total: 9 / 10000

Select multiple records

To select a continuous range or set of data, do the following.

- 1 While a selected data record is highlighted blue.
- 2 Touch another record above or below that record.
- 3 The records between the first highlighted record and the second selected record will also be highlighted blue and included in the data selection.

Data Screen

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/21/2017, 10:08:31 am	0	25.10	False	False	00:00:10	Cleanr	Time
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanr	Room
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanr	Recipe
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanr	Location
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No f	Tag
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No f	Alert/Fault
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No f	

filtered: 9 / 9 selected: 5 total: 9 / 10000

Data Records - Tag

Tags can be used to add batch names or numbers, short notes, or notations to a single data record or a group of selected data records.

Select Data Records to Tag

- 1 Select a single data record or a group of data records .
- 2 Press the Tag button to display the Enter Tag Name Screen.

Data Screen

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/21/2017, 10:08:31 am	0	25.10	False	False	00:00:10	Cleanrc	↑
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanrc	
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanrc	
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanrc	
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:00:54 am	0	25.10	False	False	00:00:06	No f	

filtered: 9 / 9 selected: 5 total: 9 / 10000

Bottom bar icons: Home, List, Document, Gear, Feed, Trash, Tag (highlighted), Add, Share

Tag Name

The Tag Name can be up to 16 characters long.

- 3 Enter the Tag Name
- 4 Press Apply to save the Tag Name to the data records.

Enter Tag Name Screen

Enter Tag Name Screen

Top bar: No Tag

Input field: Enter Tag Name

Keyboard layout:

- Row 1: q, w, e, r, t, y, u, i, o, p
- Row 2: a, s, d, f, g, h, j, k, l
- Row 3: Shift, z, x, c, v, b, n, m, Delete
- Row 4: 123, Space, Apply (highlighted)

Data Records - Export to Print or USB.

Data on the ApexZ can be output to the ApexZ printer or exported to a file on a USB key.

Data Screen

Select Data Records to Export or Print.

- 1 Select a single data record or a group of data records.
- 2 Press the Export button to display the Export Screen.

Timestamp	Channels	Analog	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/21/2017, 10:08:31 am	0	25.10	False	False	00:00:10	Cleanr	Time
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanr	Room
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanr	Recipe
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanr	Location
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No f	Tag
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No f	Alert/Fault
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No f	
08/21/2017, 10:00:54 am	0	25.10	False	False	00:00:06	No f	

filtered: 9 / 9 selected: 5 total: 9 / 10000

Select Export to Printer or USB

- 3 Select the Export Output Type by pressing either the printer or USB buttons.
The selected output type button will turn green.

Note: At any time the user may press the green and yellow Export button to export with the given settings.

Export Type Screen



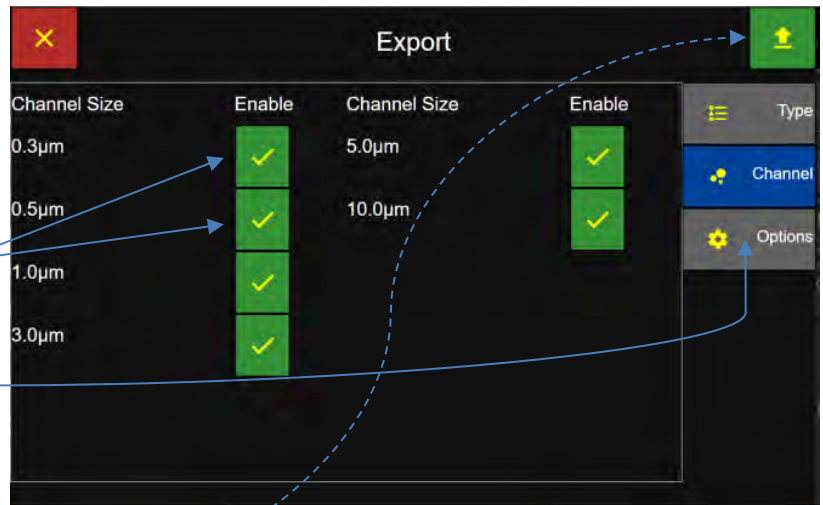
- 4 Press the Channel button to display the Export Channels.

Note: If the USB button is grey or disabled, attach a USB key to the ApexZ USB port.

Export Channel Screen

Select Export Channels

- 5 Press the Channel button to display the channels enabled or disabled for the Export.
- 6 The user may press any channel to disable or enable for the Export.
- 7 Press the Options button to display the Export Options Screen.



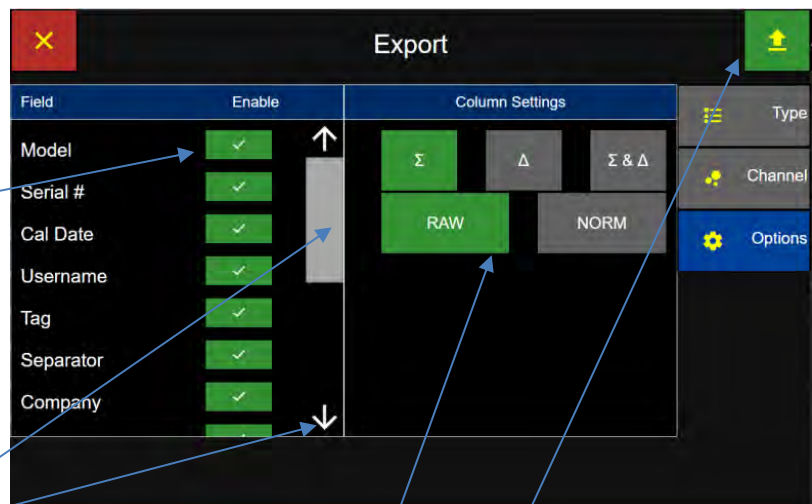
Note: At any time the user may press the green and yellow Export button to export with the given settings.

Select Export Options

Export Options List 1 Screen

- 8 Press the Enable/Disable toggle buttons to enable/disable the following fields from the export.

Model
Serial #
Calibration Due
Username
Tag
Separator
Company
- 9 Slide the elevator bar or press the up/down arrows to scroll up/down of the field list.
- 10 Set the column settings to Cumulative, Differential or Both; Raw or Normalized with units of measure.
- 11 Press the green Export button to Export the selected data records using the current settings.



Export Options List 2 Screen

Select Export Options continued

1

Press any Field button to enable or disable that field in the Export.

Address
Mean
Minimum
Maximum
Standard Deviation
Standard Error
95% UCL

2

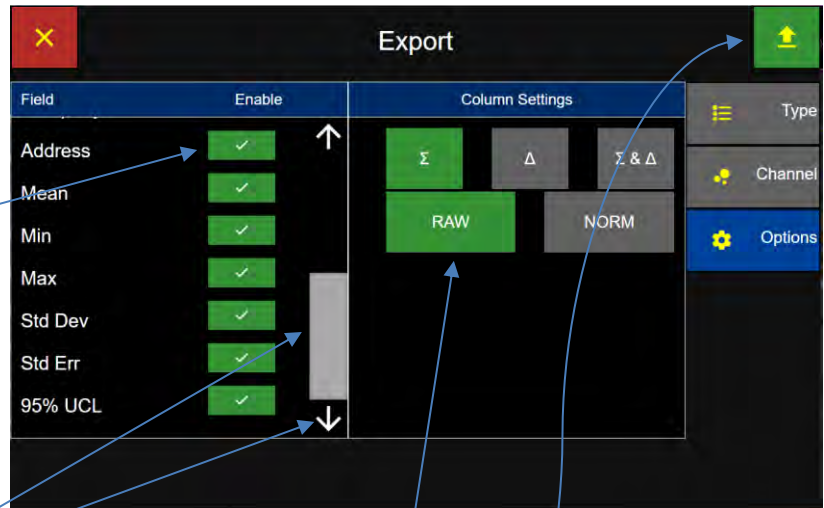
Slide the elevator bar or press the up/down arrows to scroll up/down the field list.

Set the Column Settings for the data to be exported to Cumulative, Differential or Both; Raw or Normalized with units of measure.

3

Press the green Export button to Export with the current settings.

Note: At any time the user may press the green and yellow Export button to export with the given settings.



Data Records - Select Data Records for Report

While a single data record or a group of data records are selected, the user can press the “+ Report” button to use the selected data records to create a new report.

Follow these steps to select the data records, report type, channels; enter a new report name and save the report.

Select Data Records to Make Report

1 Press and highlight the desired data records.

2 Press the + Report button. ApexZ will use the highlighted records to create a new report.

Data Screen

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter	
	0.3	TEMP	All	All				Time
08/21/2017, 10:08:31 am	0	25.10	False	False	00:00:10	Cleanrc	↑	
08/21/2017, 10:07:54 am	0	25.10	False	False	00:00:10	Cleanrc		
08/21/2017, 10:06:25 am	0	25.10	False	False	00:00:10	Cleanrc		
08/21/2017, 10:02:34 am	0	25.10	False	False	00:00:10	Cleanrc		
08/21/2017, 10:01:58 am	0	25.10	False	False	00:00:06	No f		
08/21/2017, 10:01:52 am	0	25.10	False	False	00:00:06	No f		
08/21/2017, 10:01:14 am	0	25.10	False	False	00:00:06	No f		
08/21/2017, 10:01:08 am	0	25.10	False	False	00:00:06	No f		
08/21/2017, 10:00:51 am	0	25.10	False	False	00:00:06	No f		

filtered: 9 / 9 selected: 5 total: 9 / 10000

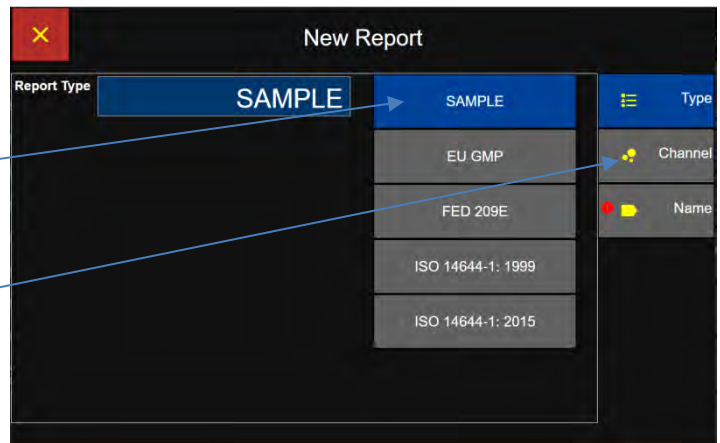
Bottom navigation bar: Home, Menu, Reports, Settings, Feed, Trash, Tag, + Report, Share

Report Type: Sample

Sample Report Type Screen

Sample Report Type Screen

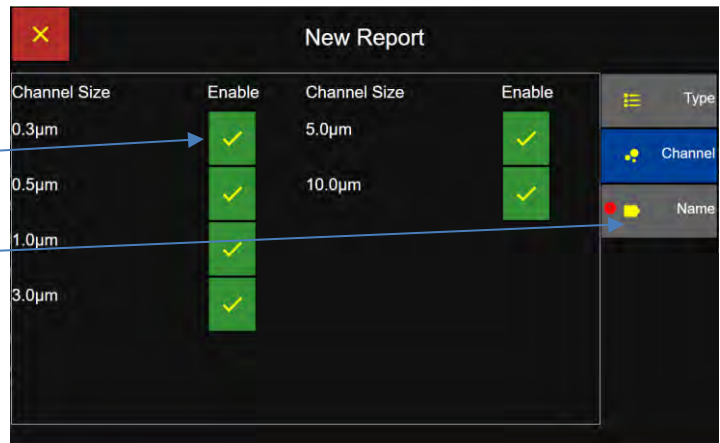
- 3 Press the Sample button to select Report type Sample.
- 4 Press the Channel button to display the Report Channels Screen.



Sample Report Channels Screen

Sample Report Channels Screen

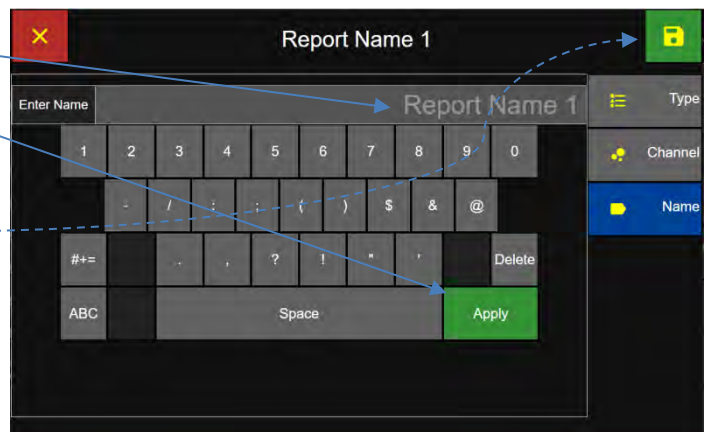
- 5 To disable a channel press the green check box and it will change to a red x box indicating that that channel is disabled for the Report.
- 6 Press the Name button to display the Report Name Screen.



Report Name Screen

- 7 Enter the Report Name from the keyboard.
- 8 Press the green Apply button to apply the report name.
- 9 Press the green Save button to save the report and return to the Data Screen.

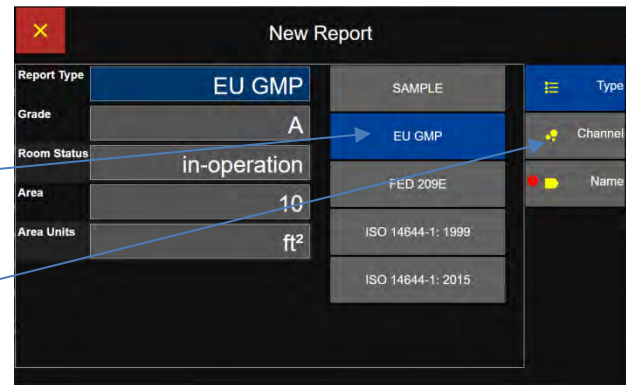
Report Name Screen



Report Type: Certification Standard

EU GMP Report Type Screen

- 1 Press the EU GMP button to select Report type EU GMP.
- 2 Press the Channel button to display the Report Channels Screen.



The screenshot shows the 'New Report' screen. The 'Report Type' is set to 'EU GMP'. The 'Grade' is 'A'. The 'Room Status' is 'in-operation'. The 'Area' is '10' and the 'Area Units' are 'ft²'. The 'SAMPLE' section shows 'EU GMP', 'FED 209E', and two ISO 14644-1 standards (1999 and 2015). On the right, there are buttons for 'Type', 'Channel', and 'Name'.

EU GMP Report Channels Screen

- 3 To disable a channel press the green check box and it will change to a red x box indicating that that channel is disabled for the Report.
- 4 Press the Name button to display the Report Name Screen.

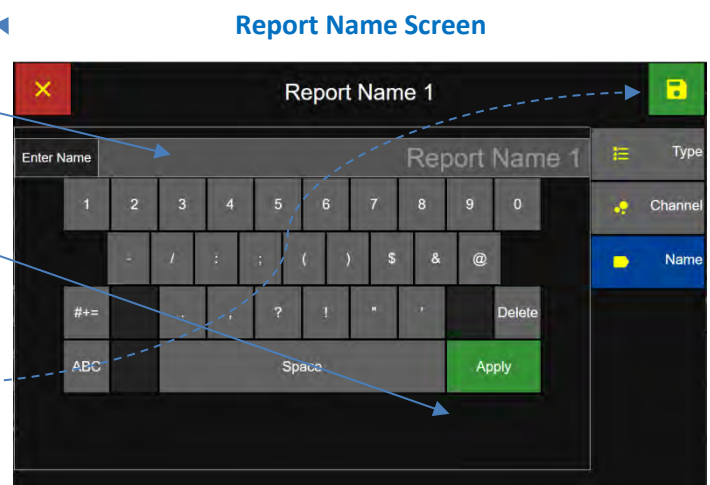


The screenshot shows the 'New Report' screen with a table of channels. The 'Size' column lists various particle sizes, and the 'Target Limit / L' column shows the corresponding limits. The 'Channel' column has checkboxes to enable or disable each channel.

Size	Target Limit / L	Channel
0.3 µm		☒
0.5 µm	3520	☒
1.0 µm		☒
3.0 µm		☒
5.0 µm	20	☒
10.0 µm		☒

Report Name Screen

- 5 Enter the Report Name from the keyboard.
- 6 Press the green Apply button to apply the report name.
- 7 Press the green Save button to save the report and return to the Data Screen.



The screenshot shows the 'Report Name 1' screen. It features a keyboard interface for entering the report name. The 'Enter Name' field is at the top. The keyboard includes a numeric keypad, a QWERTY layout, and a 'Delete' key. There are 'Apply' and 'Save' buttons at the bottom right.

Filter Data Records - Date and Time

Select Filter Time

- 1 Press the Time button to display the Filter Time Screen.

Data Screen

Timestamp	Channels	Analog	Alerts	Faults	SampleTime	Room	Filter
	0.3	TEMP	All	All			
08/21/2017, 2:53:57 am	91369		False	False	00:00:06	No f	Time
08/21/2017, 2:53:51 am	90189		False	False	00:00:06	No f	Room
08/21/2017, 2:53:12 am	91042		False	False	00:00:06	No f	Recipe
08/21/2017, 2:53:06 am	47418		False	False	00:00:06	No f	Location
08/21/2017, 2:53:00 am	1		False	False	00:00:06	No f	Tag
08/21/2017, 2:51:05 am	0		False	False	00:00:06	No f	Alert/Fault
08/21/2017, 2:50:40 am	0		False	False	00:00:06	No f	
08/21/2017, 2:49:39 am	0		False	False	00:00:10	No f	
08/21/2017, 2:49:29 am							

filtered: 10000 / 10000 selected: 1 total: 10000 / 10000

Enter the start and end dates to filter data records.

The ApexZ3 will display only the data from the Start date/time to the End date/time.

Filter Data - Time Screen

- 2 Press the Start Date button and Enter Start Date on keypad
- 3 Press the Start Time button and Enter the Start Time on keypad
- 4 Press the End Date button and Enter the End Date on keypad
- 5 Press the End Time button and Enter the End Time
- 6 Press the green Save button to activate the filter settings and return to the Data Screen.

×

Filter Time

Save

Start

12/31/2016 3:00:00 pm

End

12/31/2037 3:00:00 pm

<

December 2016

>

Mon	Tue	Wed	Thu	Fri	Sat	Sun
28	29	30	01	02	03	04
05	06	07	08	09	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	01
02	03	04	05	06	07	08

Filter Data Records - Rooms

Select the Filter Room Tab

1

Press the Room button to display the Filter Room Screen.

Data Screen

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
08/21/2017, 2:53:57 am	91369		False	False	00:00:06	No f	Time
08/21/2017, 2:53:51 am	90189		False	False	00:00:06	No f	Room
08/21/2017, 2:53:12 am	91042		False	False	00:00:06	No f	Recipe
08/21/2017, 2:53:06 am	47418		False	False	00:00:06	No f	Location
08/21/2017, 2:53:00 am	1		False	False	00:00:06	No f	Tag
08/21/2017, 2:51:05 am	0		False	False	00:00:06	No f	Alert/Fault
08/21/2017, 2:50:40 am	0		False	False	00:00:06	No f	
08/21/2017, 2:49:39 am	0		False	False	00:00:10	No f	
08/21/2017, 2:49:29 am							

filtered: 10000 / 10000 selected: 1 total: 10000 / 10000

Include Rooms in the Data Filter

2

Press the red x button to change to a green check mark button to include the Room Name in the Data Table Filter.

Filter Room Screen

Room Name List

Filter Room

Reset Filter

Include

Room Name

No Room

Cleanroom 3

Cleanroom 2

Cleanroom 1

3

Press the green Save button to activate the filter settings and return to the Data Screen.

Filter Data Records - Recipe

Select the Filter Recipe Tab

- 1 Press the Recipe button to display the Filter Recipe Screen.

Data Screen

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
08/21/2017, 2:53:57 am	91369	TEMP	All	All	00:00:06	No f	Time
08/21/2017, 2:53:51 am	90189		False	False	00:00:06	No f	Room
08/21/2017, 2:53:12 am	91042		False	False	00:00:06	No f	Recipe
08/21/2017, 2:53:06 am	47418		False	False	00:00:06	No f	Location
08/21/2017, 2:53:00 am	1		False	False	00:00:06	No f	Tag
08/21/2017, 2:51:05 am	0		False	False	00:00:06	No f	Alert/Fault
08/21/2017, 2:50:40 am	0		False	False	00:00:06	No f	
08/21/2017, 2:49:39 am	0		False	False	00:00:10	No f	
08/21/2017, 2:49:29 am							

filtered: 10000 / 10000 selected: 1 total: 10000 / 10000

Include Recipes in the Data Filter

- 2 Press the red x button to change to a green check mark button to include the Recipe Name in the Data Table Filter.

Recipe Name List

Filter Recipe Screen

✕
Filter Recipe
📁

Reset Filter

Include	Recipe Name
✕	No Recipe
✕	Recipe 1
✕	Recipe 2
✕	Recipe 3

- 3 Press the green Save button to activate the filter settings and return to the Data Screen.

Filter Data Records - Locations

Select the Filter Location Tab

- 1 Press the Location button to display the Filter Location Screen.

Data Screen

The Data Screen displays a table of sensor data with columns: Timestamp, Channels, Analogs, Alerts, Faults, SampleTime, and Room. A filter sidebar on the right allows selecting various filter criteria. The 'Location' filter is highlighted with a blue arrow from the instruction text.

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room
08/21/2017, 2:53:57 am	0.3	TEMP	All	All	00:00:06	No f
08/21/2017, 2:53:51 am	91369		False	False	00:00:06	No f
08/21/2017, 2:53:12 am	90189		False	False	00:00:06	No f
08/21/2017, 2:53:06 am	91042		False	False	00:00:06	No f
08/21/2017, 2:53:00 am	47418		False	False	00:00:06	No f
08/21/2017, 2:51:05 am	1		False	False	00:00:06	No f
08/21/2017, 2:50:40 am	0		False	False	00:00:06	No f
08/21/2017, 2:49:39 am	0		False	False	00:00:10	No f
08/21/2017, 2:49:29 am						

filtered: 10000 / 10000 selected: 1 total: 10000 / 10000

Filter sidebar options: Time, Room, Recipe, Location, Tag, Alert/Fault.

Include Locations in the Data Filter

- 2 To filter data records by the location they were recorded at, press the red x button to change to a green check mark button to include the Location Name in the Data Table Filter.

Filter Location Screen

The Filter Location screen has a title bar with a red 'X' button and a green 'Save' button. Below the title bar is a 'Reset Filter' button. The main area is a table with columns 'Include' and 'Location Name'. Three locations are listed: Location 001, Location 004, and Location 007. Each has a red 'X' button next to it. A blue arrow points from the instruction text to the red 'X' button for Location 001.

Include	Location Name
☐	Location 001
☐	Location 004
☐	Location 007

Location Name List

- 3 Press the green Save button to activate the filter settings and return to the Data Screen.

Filter Data Records - Tag

Select the Filter Tag Tab

- 1 Press the Tag button to display the Filter Tag Screen.

Data Screen

Timestamp	Channels	Analog	Alerts	Faults	SampleTime	Room	Filter
08/21/2017, 2:53:57 am	0.3	TEMP	All	All	00:00:06	No f	Time
08/21/2017, 2:53:51 am	91369		False	False	00:00:06	No f	Room
08/21/2017, 2:53:12 am	90189		False	False	00:00:06	No f	Recipe
08/21/2017, 2:53:06 am	91042		False	False	00:00:06	No f	Location
08/21/2017, 2:53:00 am	47418		False	False	00:00:06	No f	Tag
08/21/2017, 2:51:05 am	1		False	False	00:00:06	No f	Alert/Fault
08/21/2017, 2:50:40 am	0		False	False	00:00:06	No f	
08/21/2017, 2:49:39 am	0		False	False	00:00:10	No f	
08/21/2017, 2:49:29 am	0		False	False	00:00:10	No f	

filtered: 10000 / 10000 selected: 1 total: 10000 / 10000

Include Tags in the Data Filter

Filter Tag Screen

- 2 Press the red x button to change to a green check mark button to include the Tag Name in the Data Table Filter.

Tag Name List

✕
Filter Tag
💾

Reset Filter

Include

✕ No Tag

✕ Tag 1

✕ Tag 2

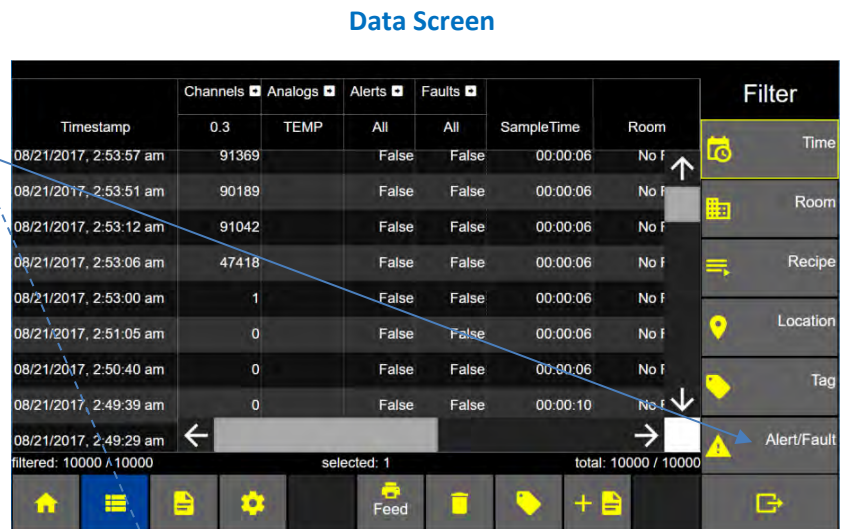
✕ Tag 3

- 3 Press the green Save button to activate the filter settings and return to the Data Screen.

Filter Data Records - Alert/Fault

Select the Filter Alert/Fault Tab

- 1 Press the Alert/Fault button to display the Filter Alert/Fault Screen.

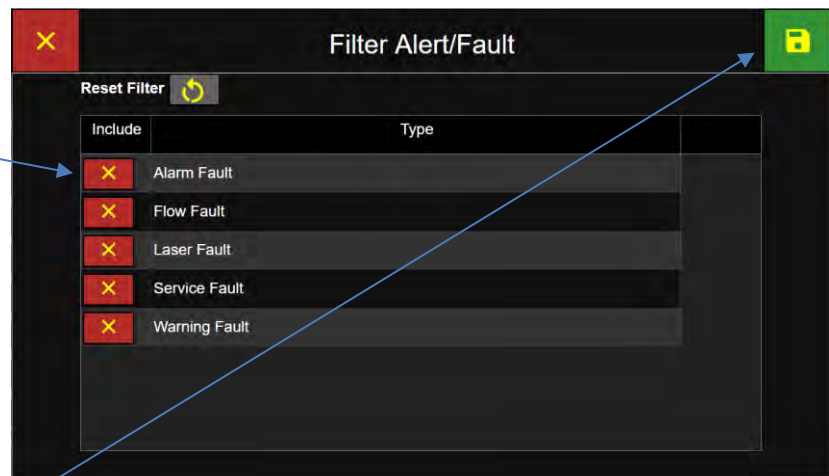


- 2 Include Alert/Faults in the Data Filter.

Filter Data - Alert/Fault Screen

- 2 Press the red x button to change to a green check mark button to include the Alert/Fault name in the Data Table Filter.

Alarm Fault
Flow Fault
Laser Fault
Service Fault
Warning Fault

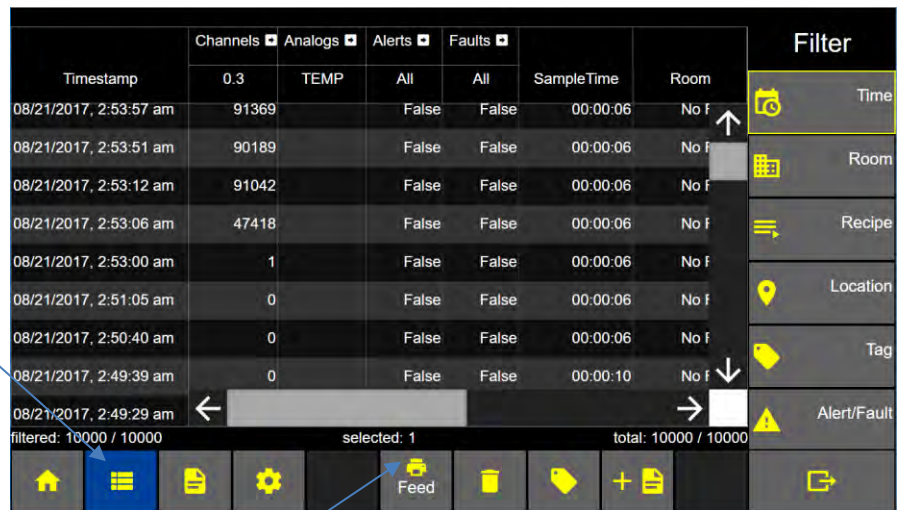


- 3 Press the green Save button to activate the filter settings and return to the Data Screen.

Paper Feed

The printer paper feed button is located on the ApexZ Data Screen. Press the printer paper feed button to advance the printer paper. When the report is finished printing, pull the paper gently upward and to the side to tear the printer paper along the serrated edge of the printer enclosure.

Data Screen



Timestamp	Channels ☐	Analogs ☐	Alerts ☐	Faults ☐	SampleTime	Room	Filter
08/21/2017, 2:53:57 am	91369		False	False	00:00:06	No f	Time
08/21/2017, 2:53:51 am	90189		False	False	00:00:06	No f	Room
08/21/2017, 2:53:12 am	91042		False	False	00:00:06	No f	Recipe
08/21/2017, 2:53:00 am	47418		False	False	00:00:06	No f	Location
08/21/2017, 2:51:05 am	0		False	False	00:00:06	No f	Tag
08/21/2017, 2:50:40 am	0		False	False	00:00:06	No f	Alert/Fault
08/21/2017, 2:49:39 am	0		False	False	00:00:10	No f	
08/21/2017, 2:49:29 am							

filtered: 10000 / 10000 selected: 1 total: 10000 / 10000

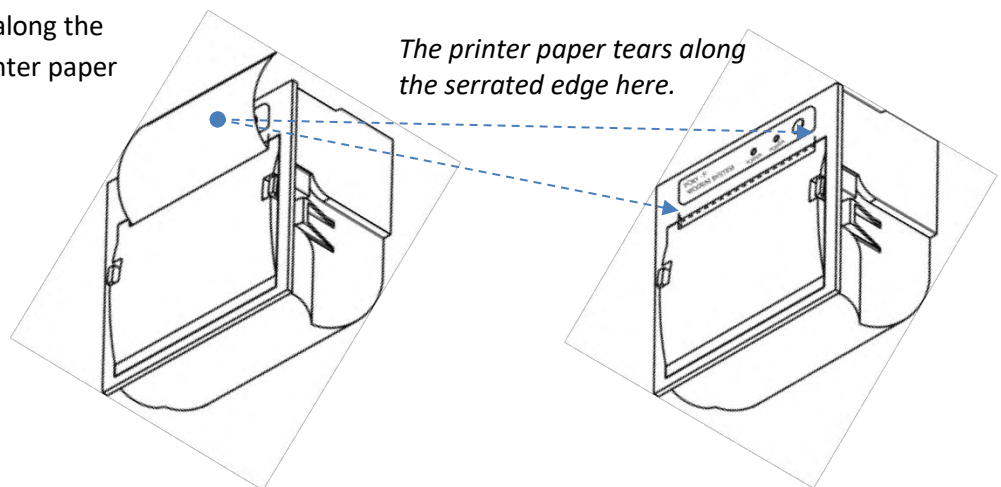
- 1 From the Home screen press the Data button for the Data screen.

Advance the printer paper

- 2 Press the Paper Feed button to advance the paper from the ApexZ embedded printer.

Tear off the printed report

- 3 Tear the printed report along the serrated edge of the printer paper opening.



Data Records - Delete All

10,000 data records can be saved in the ApexZ database.

After the 10,000th data record has been saved the database will wrap and the next sample data record will overwrite the oldest data record.

Data records may not be deleted individually or in a selected group.

Deleting data records will delete ALL data records.

Data Screen

Timestamp	Channels	Analogs	Alerts	Faults	SampleTime	Room	Filter
08/21/2017, 2:53:57 am	0.3	TEMP	All	All	00:00:06	No f	Time
08/21/2017, 2:53:51 am	91369		False	False	00:00:06	No f	Room
08/21/2017, 2:53:12 am	90189		False	False	00:00:06	No f	Recipe
08/21/2017, 2:53:06 am	91042		False	False	00:00:06	No f	Location
08/21/2017, 2:53:06 am	47418		False	False	00:00:06	No f	Tag
08/21/2017, 2:53:00 am	1		False	False	00:00:06	No f	Alert/Fault
08/21/2017, 2:51:05 am	0		False	False	00:00:06	No f	
08/21/2017, 2:50:40 am	0		False	False	00:00:06	No f	
08/21/2017, 2:49:39 am	0		False	False	00:00:10	No f	
08/21/2017, 2:49:29 am							

filtered: 10000 / 10000 selected: 1 total: 10000 / 10000

Confirm Delete Data Records Screen

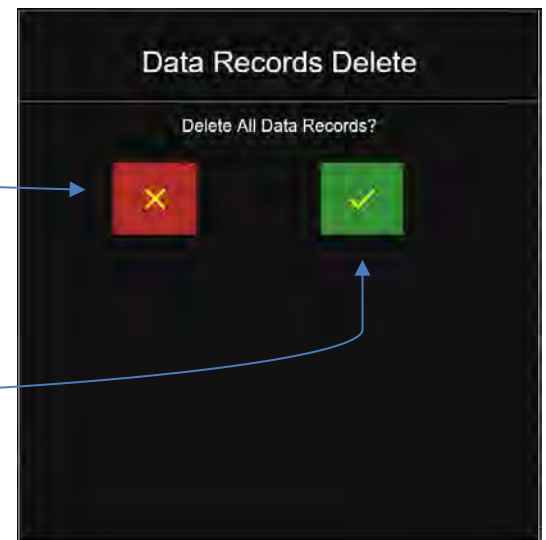
1 Press the trash can button to display the Data Records Delete Screen.

2 Press the red x button to cancel; Data records will NOT be deleted.

3 Press green check mark button to

DELETE ALL DATA RECORDS

Note: ApexZ can only delete all records. There is no option to delete individual records.



Reports

Report Screen

Selecting a Report

- 1 Select a report

Expand Result Columns

- 2 Press the arrow button to expand or collapse the Result columns including:
 - Over Limit Fault
 - Minimum Volume Fault
 - Minimum Locations Fault
 - Minimum Sample Time Fault
 - Instrument Fault



Created	Result ▾					
	Overlimit Fault	Min Volume Fault	Min Loc Fault	Min Samples Fault	Min Sample Time F...	Instrument Fault
09/08/2017, 3:15:33 am						

Report Screen Filters

Filter by Created Date

- 1 Select a Data Record Start Date Range
- 2 Select a Data Record End Date Range

Filter by Report Type

- 3 To filter by Report Type press the red x button in the include column. This will change to a green check button and enable the filter for that report type. The user may enable any number of report type filters.
- 4 Press the Save button to save and initiate the filter(s).
- 5 To reset the filter list press the RESET FILTER button.

Filter by Pass/Fail

- 6 To filter by report status Pass/Fail/Cannot Classify, press the red x button in the include column. This will change to a green check mark button and enable the filter for that report status.
 - 7 Press the green Save button to save the filter settings and initiate the report list filter.
- Press the Reset Filter button to disable all filters on the screen.

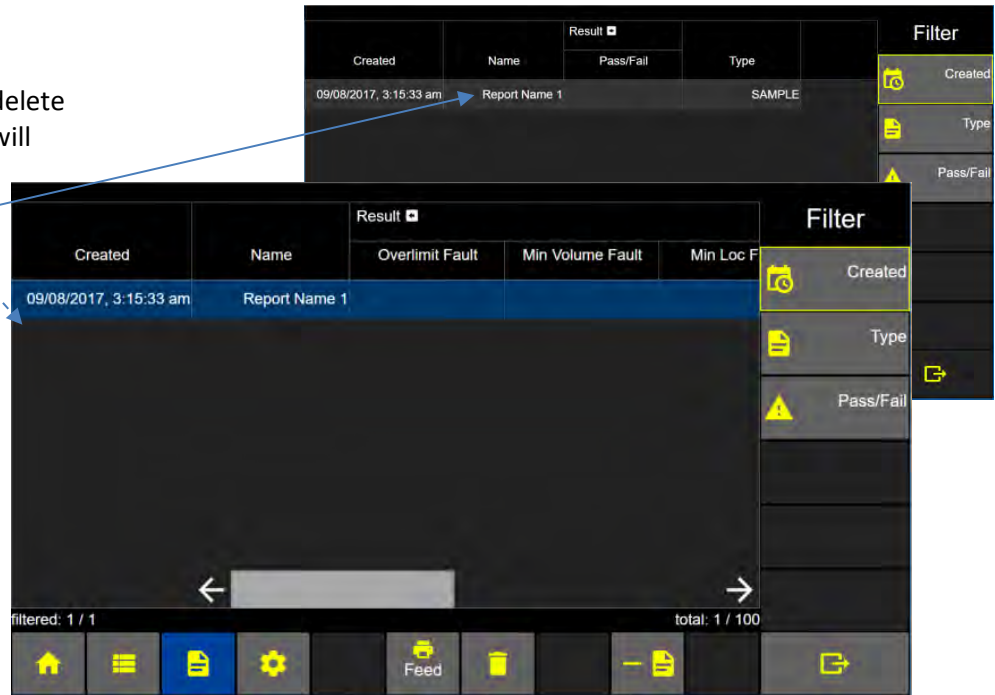
Deleting a Report

To delete a report from the Report Screen list simply select the report line and press the Export Report button.

Deleting a Report

1

Select the report to delete and that report line will highlight in blue indicating it has been selected.

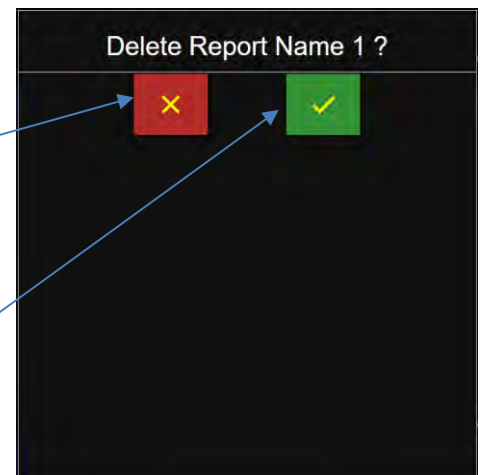


2

Press the red x button to CANCEL DELETE and the report will not be deleted.

3

Press the green check mark to DELETE the selected report.



Terminology:

Select: Touch the screen with your finger.

Press: Touch the screen with your finger.

Enter with the keypad: Touch the screen keypad with your finger and type the required input.

Button: area on screen user can touch to input data

Toggle button: this is a button that displays only 2 options, touch or slide to change between options.

Enable/Disable:

Red x box: this is a button that indicates disabled.

Green check mark box: this is a button that indicates enabled.