PICARRO

SEMI V2.1.4
System Software User Manual

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This manual is the original instruction provided in English.

semi S-2 CERTIFIED

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1. Introduction

This manual provides SEMI system software operation instructions for SLiM or SAM systems.

1.1 SEMI Software Version 2.1.4

The information in this manual reflects the features and functionalities of SEMI software Version 2.1.4.

1.2 Products Supported by Version 2.1.4

The following products are supported by SEMI software version 2.1.4

- **SLiM 100:** This fixed-installation SLiM 100 Lithography Process Tool Monitoring System detects volatile organic compounds (VOCs) in the lithography process and supports up to 32 sampling ports. It can support up to four analyzers, one of which includes a broadband VOC analyzer that can detect up to 10 AMC species in the parts per billion range.
- **SLiM 100S:** This smaller, mobile version of SLiM 100S Lithography Process Tool Monitoring System detects volatile organic compounds (VOCs) in the lithography process and supports up to 16 ports and up to two analyzers, one of which includes a broadband VOC analyzer that can detect up to 10 AMC species in the parts per billion range.
- **SAM-C:** This fixed-installation version of SAM supports up to 32 sampling ports and up to four analyzers (VOC analyzer not included).
- **SAM-S:** This smaller, mobile version of SAM supports up to 16 ports and up to two analyzers (VOC analyzer not included).

1.3 A Note Regarding Example Illustrations

NOTE

IMPORTANT NOTE ABOUT ILLUSTRATIONS: Many of the illustrations in this manual are for example only and generally reflect the SLiM-100 32-Port system and therefore may not represent what the system that you purchased provides.

For example, if you have a SAM-S system, the ports shown on some UI pages may be 8 or 16 ports. Also, the number and type of species displayed will differ, depending on the analyzers that were ordered during purchase (and in this case, will not display VOC species).

1.4 SLiM and SAM Product Hardware Manuals

For installation, safety, and hardware startup and shutdown instructions, refer to one of the following manuals included with your applicable product:

- **SLiM 100:** Picarro PN 40-0097
- **SLiM 100S:** Picarro PN 40-0098
- **SAM-C:** Picarro PN 40-0099
- **SAM-S:** Picarro PN 40-0100

1.5 Intended Use

SLiM 100 and SAM systems are fully integrated **AMC (Airborne Molecular Contamination)** monitoring systems with hardware and software working seamlessly together, enabling efficient and effective monitoring of AMCs in your fab.

AMCs can affect your final product and equipment. With contaminants coming from inside and outside the fab, it is vital to monitor and understand changes to the ambient environment. SLiM 100 and SAM monitors your fab conditions, using integrated sensors to track AMC trends in key fabrication areas; the system actively and accurately visualizes, analyzes, and stores data continuously, so you can view conditions and evaluate them according to your unique needs.

The User Interface (UI) provides an easy to use layout to access monitoring of the most recent species concentration values, recipe creation, scheduling and management, system health, and numerous related settings. The navigation panel along the interface left side will advance you to each page. More information about the navigation panel will be in the sections that follow.

Once you are logged into the system software, the **Monitor** page is the first page of the UI that appears. It is the starting point for accessing all the other system features. It shows the analyzer readings, the most recent species concentration values, and the analyzer conditions.

1.6 Key Features

SLiM 100 and SAM offers the following elements as prime advantages in AMC detection:

- **FAST SYSTEM RESPONSE:** The gas-handling hardware of the SLiM 100/SAM system has been specifically designed to minimize the “time-to-detection” response function of the sampling system. Flow control hardware enables you to monitor up to 32 unique locations throughout your fab and can rapidly detect concentration changes within the various monitored environments.

- **A USER-FRIENDLY GUI:** While the SLiM 100/SAM hardware system is complex, its UI is simple, easy-to-use, and configurable. From the UI, you can evaluate the concentration of one species or multiple species, and you can assess conditions of specific ports, multiple ports, specific instruments, multiple instruments, a bank or the entire fab. In addition, these conditions can be reproduced in both graph and tabulated forms, so you can see patterns and changes and generate reports for offline analysis and archiving.
- **MOBILE MANAGEMENT:** For network connected installations, the software enables you to access all of its software features and have full system control from your desktop; you do not have to gown-up and enter the fab to modify measurement schedules and adjust measurement conditions. The software also dynamically detects hardware connections and configures itself; you can easily validate these connections via the System page on the GUI.
- **EASY-TO-USE DATA EVALUATION TOOLS:** The GUI enables you to track current conditions and to track the history of conditions. The software is always monitoring and collecting concentration data on multiple species from each port in your fab. You can view a history of changes and spot trends, by species, by location, and by specified time period. This enables you to respond to AMC conditions in the moment and make improvements based on your analysis of historical trends.
- **SIMPLE RECIPE CREATION and SCHEDULING:** The user interface provides **Schedule** and **Recipe Library** interfaces where you view currently running scheduled recipes and easily generate, store and schedule new recipes. You can also create and store new recipes and modify existing recipes from the Recipe Library.

1.7 Audience and Manual Scope

This manual is designed for technicians, production managers, fab managers, and those involved in the monitoring and management of semiconductor fabrication facilities.

1.8 Manual Organization

This manual describes the User Interface software, divided into the following sections:

- **Monitor:** Displays live data points and historical data where users can choose a relative time span or define a custom time span. It also provides selectable lists to view data by species, port number, and name. See page **20**.
- **Recipes:** The Recipes page has two tabs. The **Schedule** tab enables you to view recipes that are currently running and those that are scheduled to run. You can manage the schedule for each recipe listed or remove it from

the schedule. From this page you can also create a new recipe or select an existing one from the Recipe Library to add to the schedule, as well as run an individual port. From the **Recipe Library** tab, you can create new recipes or edit existing recipes in the library and add them to a schedule. See page **37**.

- **System:** Provides a view of the SLiM/SAM CPU usage, temperature, memory usage, and storage status. It also provides the analyzer's operational, hardware health, and connected hardware communication status. See page **58**.
- **Logs:** Provides access to all existing logs generated by the system for download to a designated location. See page **60**.
- **Settings:** This icon opens the Settings page, which provides the following tabs. See page **66**.
  - **Ports Tab:** Edit port names, optimize flow rates each time a sampling line is changed, and adjust the time needed to stabilize pressure fluctuation after port switching.
  - **Species Tab:** Set warning and alarm thresholds for each monitored species per port.
  - **General Tab:** Set date and time; Change units of measurement for species concentration; Select Download File Format; Assign Port Average value.
  - **Zero Port Tab:** Select Analyzer – SI5450 (SO2 analyzer) or VOC (if equipped); Select a specific port to designate as a Zero Port (SO2 analyzer only if no pressurized clean air source is available); Set MFC flow rate (SO2 analyzer only); Set species offset value(s) – (both VOC and SO2 analyzers).
  - **Backup Tab:** Set the backup frequency to Automatic or Manual backup; Backup frequency; Backup location – either local or remote (remote requires password); Encryption.
  - **My Account Tab:** Adjust your user account details and change your password.
  - **About Tab:** View the system serial number, software version, UPS details (if equipped), and view installed analyzers.
  - **User Management Tab:** (Appears only for system Admin when logged in.) Provides tools to: Create new user profiles; Edit user details; Change password; Deactivate a user; Remove a user.
- **Alerts:** Clicking on this icon opens a chronological list of alerts such as threshold breaches and FDC events as they occur during recipe runs.
- **Profile:** Clicking on this icon opens a menu with links to user profile for editing, or to log out of a SLiM or SAM system.

- **Shutdown:** Activating this will shut down the installed analyzers and the SLiM/SAM computer. See page **16**.

2. Accessing the User Interface

2.1 Login

NOTE

When a SLiM 100 or SAM system is delivered and set up, Picarro provides an admin login and password so an owner-designated admin can then set up user profiles. See section *9.8 User Management Tab* in instructions on adding users.

1. After system power up, the system login screen appears.
2. Enter your username, click **Next**, enter password, then click **Submit**.

   If a full system startup is not needed, you will be taken directly to the ***User Interface Landing Page – Monitor*** (shown in Figure 4). If full system startup is needed, the sequence explained below (**System Startup**) will take place *before* taking you to the Login page.

Figure 1: System Login Page

2.2 System Startup

When a system is first started or restarted, a **System Startup Status** pop-up screen will appear, showing the progression of the startup (Figure 2 and Figure 3).

Figure 2: System Startup Status Screen – Starting

Figure 3: System Startup Status Screen – Completed

3. If any one of the services or drivers fails during startup, the sequence will pause. If this occurs, contact Picarro Support for assistance.
4. If you wish to close the Startup Status pop-up while startup is still running, click the X in the upper right corner.
5. Once the startup sequence has completed, the **Monitor** page shown in Figure 4 is displayed. This is the default landing page upon startup. It shows the current graphs of concentration values for each species being monitored by the system.

Figure 4: User Interface Landing Page – Monitor

2.3 Shutdown Picarro SLiM or SAM

Clicking this icon opens a shutdown pop-up (Figure 5). Activating this will shut down all installed analyzers and the SLiM/SAM computer. All other components in the system remain energized.

WARNING

Shutting down the SLiM/SAM from the UI does NOT turn off the entire system. For a safe, full shut down of the entire system (e.g., for service), refer to the Hardware Installation and Startup Manual that was delivered with your system. See section *1.4, SLiM and SAM Product Hardware Manuals* to find the document part number applicable to your system.

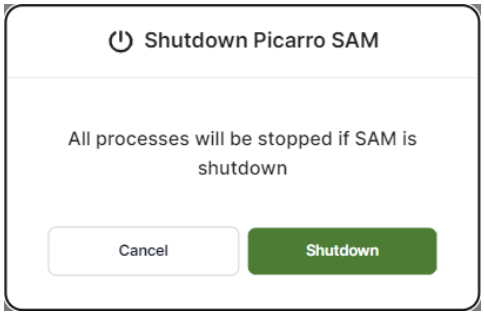


Figure 5: Shutdown Confirmation

3. General User Interface Terminology

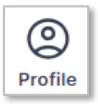
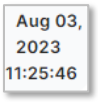
- **Bank:** A collection of ports, numbering 8 each that are routed to different areas of a fab for sensing AMC (airborne molecular contaminants). The number of banks depends on your system configuration.
- **Breach:** When a measured species concentration value exceeds the concentration assigned **Warning** or **Alarm** thresholds for that species.
- **Cleaning a Bank:** This runs a clean gas through the analyzer to return it to baseline.
- **FDC: Fault Detection and Control:** FDC alerts provide the user with system event information as FDC events occur and can inform the user when there is an issue with sensor readings within any of the installed analyzers that may affect the validity of the concentration readings for a relevant species.
- **Interference Flag:** When zeroing a VOC analyzer, an additional calculation is performed on the stored port-average data to determine its validity, e.g., whether or not an unknown molecular interferent is negatively affecting the measurement accuracy. The value of the Interference Flag is calculated at the end of each port measurement.
- **Loop Recipe:** This runs a recipe repeatedly as configured by a user.
- **Port:** The endpoint from which the species' concentrations are read.
- **Recipe:** Collection of steps where selected ports are sequentially connected via valves to the installed analyzers for concentration measurements.
- **Reference Gas:** The gas used to verify the calibration of the analyzer.
- **Run Port:** This is a manual operation that allows the selection and running of any port in order to immediately see what concentration values of supported species are being detected at that port location within the fab.
- **Run Recipe:** This runs the recipe you have established with your schedule.
- **Species:** The molecule being measured.
- **Standby:** System state whereby the system is running, but no concentration measurements are taking place.
- **SYNC X:** Synchronization of the graph X-axis to all species; plots.
- **Threshold:** Refers to species' concentration level warning and alarm thresholds that are set up by species and by port.

4. UI Navigation Panel

From the Landing page or any page, you can navigate to any place in the user interface by selecting the icons from the navigation panel located on the left side of the display. See the table below for general functionalities of each navigation icon.

Table 1: UI Navigation Panel General Functions

Icon	Functionality
	**Monitor:** This icon takes you to the Monitor page where you can view and download measured species live and historical data values. It also provides multiple ways of viewing the data and various tools for evaluating specific data points or areas of data.
	**Recipes:** This icon takes you to the **Recipes** page where you can monitor measurement schedules, create new recipes, or select and add existing recipes to a schedule. The **Schedule** tab provides a view of the ongoing sampling steps as they execute for each designated measurement port. You can also create and add new recipes from this page. The **Recipe Library** tab provides access to all previously created recipes which you can select to add to the schedule, view, edit, or delete. You can also create new recipes from this tab.
	**System:** This icon takes you to the **System** page. The page has two tabs: **System Status:** Provides a view of the SLiM/SAM CPU usage and temperature, memory usage, and storage status. It also provides Analyzer operational status, and communication status of connected hardware. **Sensors:** Displays analyzer and other system component fault status.
	**Logs:** This icon takes you to the **Logs** page. This page provides access to all existing logs generated by the system software for viewing and downloading to a designated location.
	**Settings:** This icon takes you to the **Settings** page, which provides the following tabs: • **Ports** tab: Here, you can: Edit port names, optimize flow rates each time a sampling line is changed, and adjust the time needed to stabilize pressure fluctuation after port switching; • **Species** tab: Here you can: Set warning and alarm thresholds for each monitored species for Ports 1-32 (not applicable to Clean, Reference, or VOC Zero port). • **General** tab: Here you can: Set date and time; Change Units of Measurement for species concentration; Select Download File Format; Assign Port Average value. • **Zero Port** tab: Here you can: Select Analyzer – SI5450 or VOC (if equipped); Select a port to which a Zero Port is assigned (SO2 analyzer

Icon	Functionality
	only); Set MFC flow rate (SO2 analyzer only); Set species offset value (both VOC and SO2 analyzers). • **Backup** tab: Here you can: Adjust Data Backup Settings including: Automatic or Manual backup; Backup frequency; Backup location – either local or remote (remote requires password); Encryption. • **My Account** tab: Here you can adjust your user account details and change your password. • **About** tab: Here you can view the SLiM/SAM system serial number, software version, UPS details (if equipped), and view installed analyzers. • **User Management** tab (appears only if admin is logged in): Provides tools to: Create new user profiles; Edit user details; Change password; Deactivate a user; Remove a user.
	**Alerts:** This icon opens a window that displays a list of all Alerts and Notifications, including Threshold, FDC, Interference, and System Issue events. This can be activated while Monitor, Recipes, System, and Logs pages are open. Clicking anywhere outside the list frame closes the alerts list.
	**Profile:** This icon opens a window from which users can access their account profile or logout from the system.
	Displays current date and time.
	**Shutdown:** Activating this icon provides a prompt to shut down the SLiM or SAM system.

5. Monitor Page

5.1 Introduction

The Monitor page (which is the default landing page after login) enables the user to monitor and analyze measured species' data values over time. The numbered callouts in Figure 6 identify the general feature groups. Each feature is described in greater detail in the next section.

1. **Species Column:** All available species that can be measured by the system are listed here. The species column can be collapsed to allow expanded viewing of data windows.
2. **Port Selection; Measurement Data Type; Refresh Rate**: Menus for customizing data graph views.
3. **Graph Slider:** Three-position slider allows viewing of 2, 4, or 6 data graphs for each species to display in Monitor view (default is two graphs).
4. **Sync X; Download; Line/Scatter:** Provides a sync x-axis button to view same live and analysis data time spans for all available species; Provides a data download menu; Provides choice of line graph or scatter graph data presentation.
5. **Data Graph Area:** This area displays data graphs over time that are selected by species for viewing. Allows full-page expand graph view, zoom, pan, reset axes, and image/data file download. Displays historical data for analysis when one of the time spans (located at the page bottom) is selected. For details, see ***5.2, Data Graph Details***.
6. **Live Data Feed and Historical Analysis buttons; Stop/Start Recipe button and Run Status:** Provides live data feed and historical data buttons. view status information of the currently running Recipe and Port; Stop /Start recipe schedule.

Figure 6: Monitor Page – Default View

5.2 Data Graph Details

The data graph for each species contains information available for live viewing and analysis, or historical analysis as described in this section. In graphical data representations, data can be viewed in either **Live** mode (which is represented in a rolling 1 hour time frame – (the default presentation), or for analysis can be selected to view in historical **6 Hour**, **1 Day**, **7 Day**, or user-selected **Custom** time frames.

Live Mode

The default **Monitor** page presentation is **Live** mode, designated by the "**Live**" indicator (shown at the left-lower bar at the bottom of the page). **Live** is the default view.

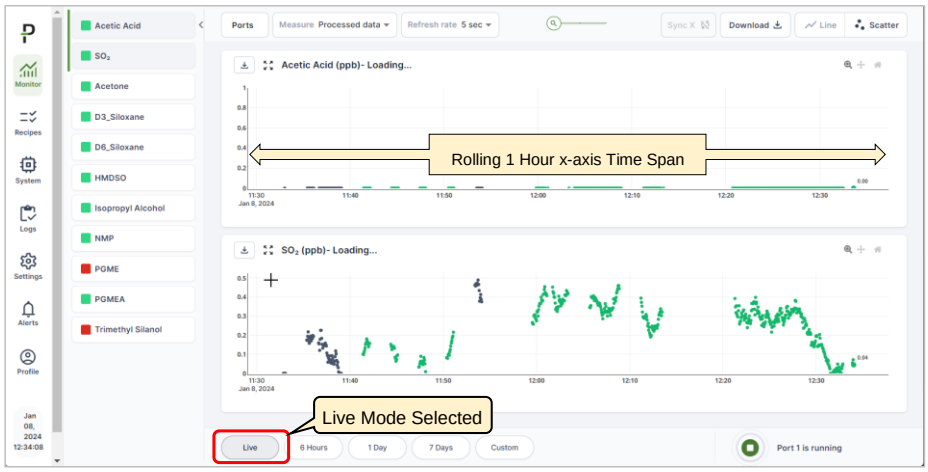


Figure 7: Live Mode – Rolling 1 Hour Data Display

Graph Data Point Details

When hovering the cursor over any of the data points, a pop-up appears (Figure 8) which displays that point's details: **Status** (Normal, Warning, or Alarm), the **Port Label**, the **Port Number** at which the reading was taken, the **Concentration** reading, and **Date/Time** of the data point. Shown are the various pop-ups a user may see on a species graph.

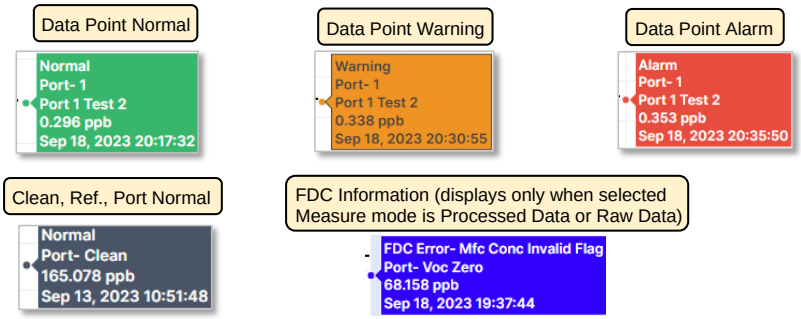
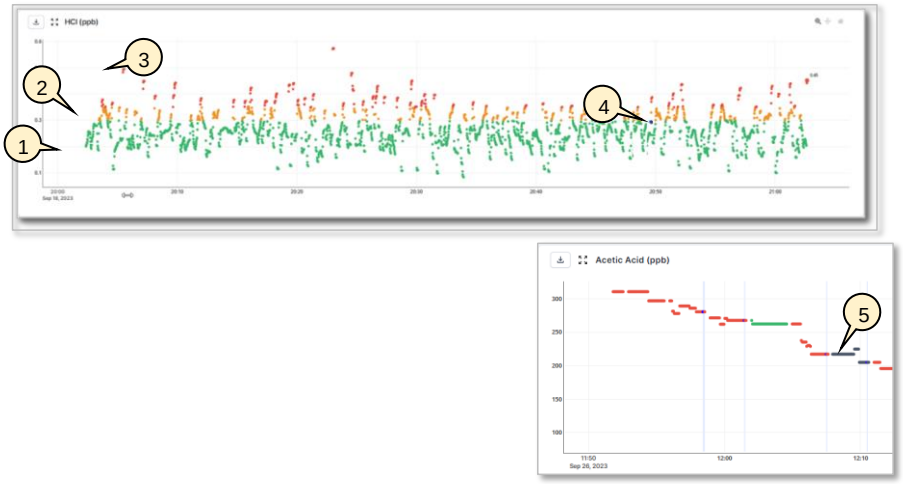


Figure 8: Individual Data Point Informational Graph Pop-ups

Graph Data Point Color Designations

Below the data point colors that may display during a sampling run are defined (Figure 9).



1. Data Points normal (**Green**) – below warning and alarm thresholds
2. Data Points – Warning threshold exceeded (**Amber**)
3. Data Points – Alarm threshold exceeded (**Red**)
4. FDC (Fault Detection and Control) indication points (**Dark Blue**) – *appears only when Processed or Raw Data is selected from the Measure menu*.
5. Reference or Clean Port active (**Dark Gray**)

Figure 9: Data Color Designations

5.3 FDC (Fault Detection and Control)

FDC alerts provides the user with system event information when FDC events occur and can inform the user when there is an issue with sensor readings within any of the installed analyzers that may affect the validity of the concentration readings for a relevant species.

FDC Graphical Alerts

FDC alerts are graphically displayed as dark blue data points in the graph, and light blue vertical shading which helps identify the length of time over which the error has occurred. Hovering over an FDC data point opens a pop-up (Figure 10) that provides details of the error and the port on which it occurred. ***Note:*** *FDC Error indications appear only when Processed Data or Raw Data is selected from the Measure menu*.

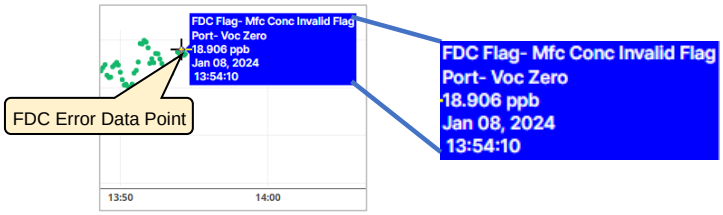


Figure 10: FDC Event Example (Processed or Raw Data Measure Mode Only)

FDC Alerts in Numerical Data Downloads

Below is an example of downloaded data output illustrating FDC events.

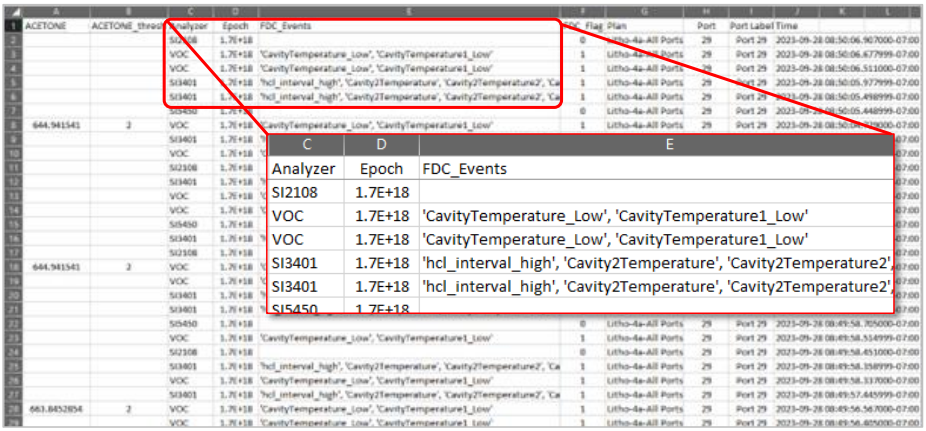


Figure 11: FDC Alerts in Downloaded Data

5.4 Interference Flags (VOC Analyzer Only)

When zeroing a VOC analyzer, an additional calculation is performed on the stored port-average data to determine its validity, e.g., whether or not an unknown molecular interferent is negatively affecting the measurement accuracy. The value of the Interference Flag is calculated at the end of each port measurement. The flag value cannot be seen in any visual display and is only available from the Port Average data export function. Flag definitions are given below:

- 0 = OK; no interference at this data point
- 1 = Interference is probable at this data point
- -1 = Insufficient information to flag whether this data point has interference or not.

Interference Flag Graphical Designations

Interference flags only appear with **Port Averaging** measurement mode selected. *Can be viewed only in Summarization mode*.

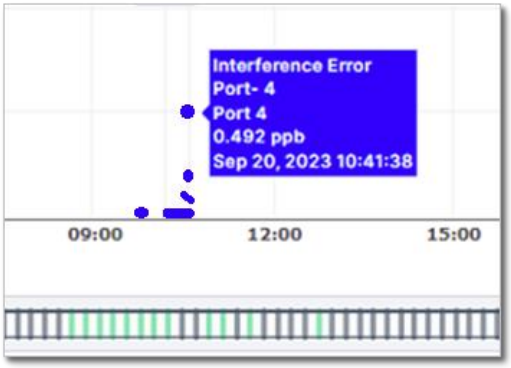


Figure 12: Interference Flag Graphical Example (Summarization Mode)

Interference Flag Downloaded Numerical Data

Below is an example of VOC downloaded data output illustrating the interference flag column (int_flag) and flag states for Trimethyl Silanol.

The interference flag applies to all species supported by the VOC Analyzer. If an unknown interference species is detected, the interference flag pertains to all species concentration values during that port run.

TRIMETHYL_SILANOL_avg_ppb	TRIMETHYL_SILANOL_thresh	Time	int_flag
2.804758105		40:14.5	0
-0.063990524	0	38:41.2	0
-7.759213035			0
-1.245935073	0	26:41.1	0
-20.46935861			1
0.583975281	0	14:40.7	-1
-11.42220384			-1
-1734.328602		02:35.4	-1
-2113.939055		01:12.0	-1
-1809.906362		00:05.9	-1
-16.32211144		56:12.2	0
-1732.345916	0	55:23.1	-1
-1734.719902		45:24.0	-1

No interference at this data point.

Interference at this data point.

Insufficient information at this data point to discern whether or not interference is present.

Figure 13: VOC Analyzer Exported Data Showing Interference Flag States

5.5 Monitor Page Settings and Tools

Shown below is the **Monitor** page with **Live Feed** active. In this section, each feature and function is described in detail. *With **Live Feed** active, the graph always displays a rolling 1-hour time span of data as it is collected.*

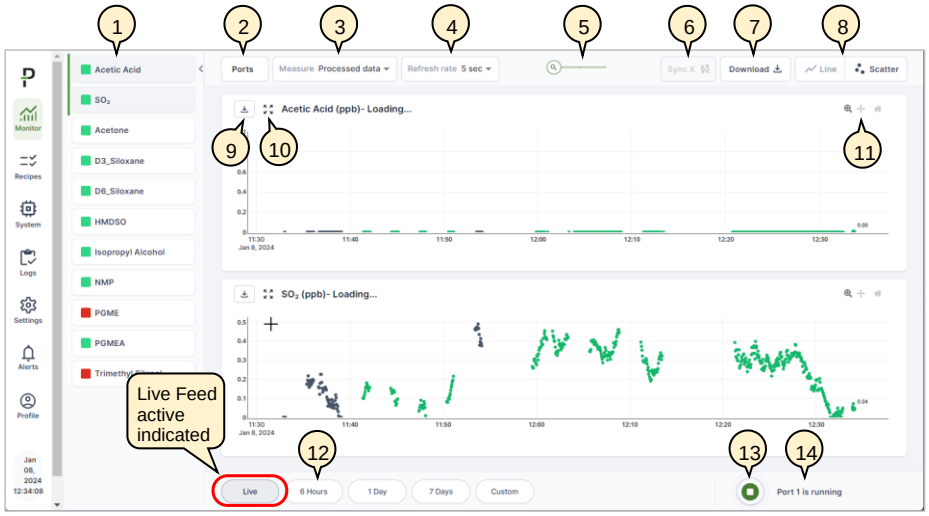
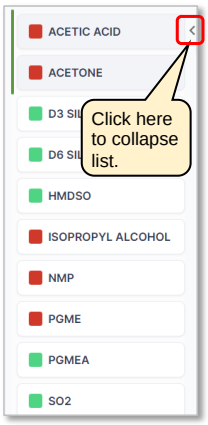
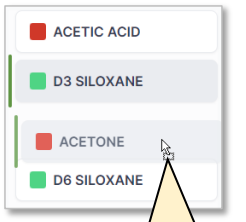


Figure 14: Monitor Page

Species List



1. **Species List:** This area lists all species being monitored.
   - The **number of species listed** depends on the analyzers installed and whether they are communicating and sending data to the SLiM/SAM computer. By default, the first 2 species are selected.
   - The **Species** list can be collapsed to allow for more area to view and analyze data graphs.
   - **Selecting a species** anywhere in the list will also select the next species down. These two species are then displayed in the two data graphs displayed on the UI. (**Note:** If the user clicks on the last species, then the species above it will be selected. For example, in the image at the left, SO2 is the last species, if the user clicks on SO2, then PGMEA and SO2 will be selected.)
   - **The default order** of the list is alphabetical. However, when a user rearranges the species, the new arrangement will be saved in the individual user preferences. The next time the user logs in, that same arrangement will be shown.
   - **Rearranging List:** Each species in the list can be rearranged by dragging and dropping to a different position on the list in any arrangement desired. (Default positions are alphabetical.)
   - The **icon color** next to each species in the list indicates the following as described in the table below. (**Note:** *These indicators are based on Processed Data only.*)

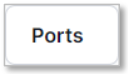


Example: Dragging Acetone to a new position in the list

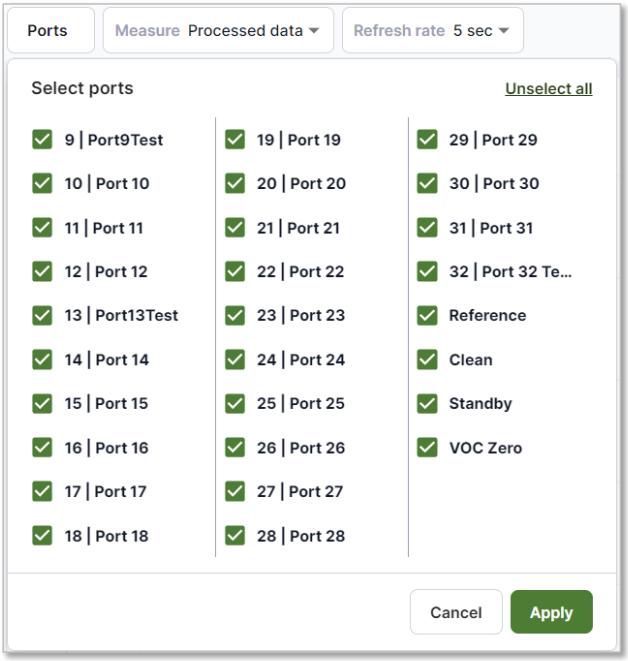
Icon Color (based only on Processed Data)	Indication Definition
GREEN	**Normal** (Processed data below warning and alarm thresholds)
AMBER	**Above Warning** (Processed data has breached warning threshold)
RED	**Above Alarm** (Processed data has breached alarm threshold)

Colors on Detailed Graphs (based on any data type)	Indication Definition
BLUE	**FDC Events** (appear only when *Processed Data* or *Raw Data* is selected from the **Measure** menu) **Interference Events** (appear only when *Port Average* is selected from the **Measure** menu)
GREY	**Standby**, **Clean**, **Reference**, **Stabilization**
GREEN	**Normal** (State is 0) (Always green when **Measure** mode is **Port average** or **100s average**, regardless of whether thresholds are exceeded.)
AMBER	**Warning (**State is 1)
RED	**Alarm (**State is 2)

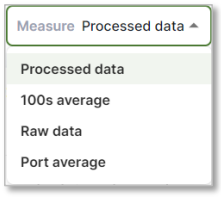
Ports Menu



2. **Ports Menu:** Clicking the **Ports** button opens the window shown below where you can select (or unselect) all or any number of individual ports for concentration data viewing and analysis.



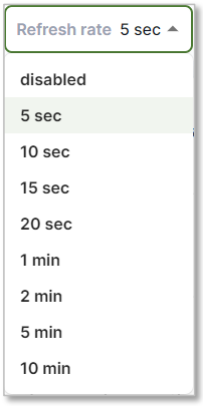
Measure Menu



3. **Measure Options:** Clicking button opens a menu from which the user can select the following data measurement/display options as defined below. **Processed data** is the default selection.
   - **Processed Data:** Removes data that is measured during stabilization time each time the system switches to the next port. In other words, processed data eliminates stabilization time but still tags FDC Data. Default **Stabilization Time** is 20 seconds (but can be altered in the ***Settings Page*** under the **Ports** tab).
   - **100s Average:** Selecting this displays the average of the last 100 seconds of data in a time frame. However, all samples will be displayed in green even when they are above a warning or alarm threshold.
   - **Raw Data:** Selecting this displays all unprocessed data collected

- **Port Average:** When selected, the software will take an average of the last ‘n’ seconds of data taken (the default setting for ‘n’ = 60 seconds). This time can be modified in **Settings | General | Port Average**. There, the user sets the number of seconds to average data from the end of the run).
    - For inorganic species then last n seconds as mentioned in settings.
    - For organic (VOC-measured) species, it averages the entire port average.
    - When Port Average is selected, all sample data is displayed in green, even if data are above warning or alarm thresholds.
    - Interference flag details are shown only with Port Average enabled.

Refresh Rate



4. **Refresh Rate:** Opens a menu from which the user can select the rate at which the displayed graphs refresh as data are collected.

   Shown here is the expanded menu with the available refresh rate selections. The selection **Disabled** is available when the user wishes to pause data refresh when needing to take time to view and scrutinize a particular area of data. The available refresh rate selections are:

   - 5 seconds
   - 10 seconds
   - 15 seconds
   - 20 seconds
   - 1 minute
   - 2 minutes
   - 5 minutes
   - 10 minutes

Multiple Graph Display Control

5. The Multiple Graph Display control allows the user to view more than two data graphs on the monitor. The functionalities of each graph are still the same.

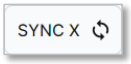
Two Graph Display (default)

Four Graph Display

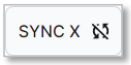
Six Graph Display

Sync X

Sync (On)

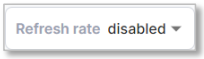


Sync (Off)



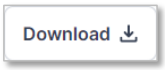
6. **Sync X:** Turning **Sync X On** synchronizes the **X-axis** span on all species' graphs when any graph is zoomed or panned, whether in **Live** view state or in **Analysis** view state.

   For **Live** Monitoring, this control is active only when **Refresh Rate** is disabled.



   When an **Analysis** time span has been selected (at bottom of Monitor page), Sync X is always active.

Download Data Button



7. **Download:** Selecting this icon (upper right corner of Monitor window) will open the **Download Data** dialog shown below in Figure 15. The user can select any or all species, any or all ports, graph type, and time range.

   Clicking **Download** button will activate a pop-up status indicating when download is ready, then the Windows **Downloads** list will appear, where the user can open the file for viewing, and save to a designated location. Figure 16 shows an example opened data file.

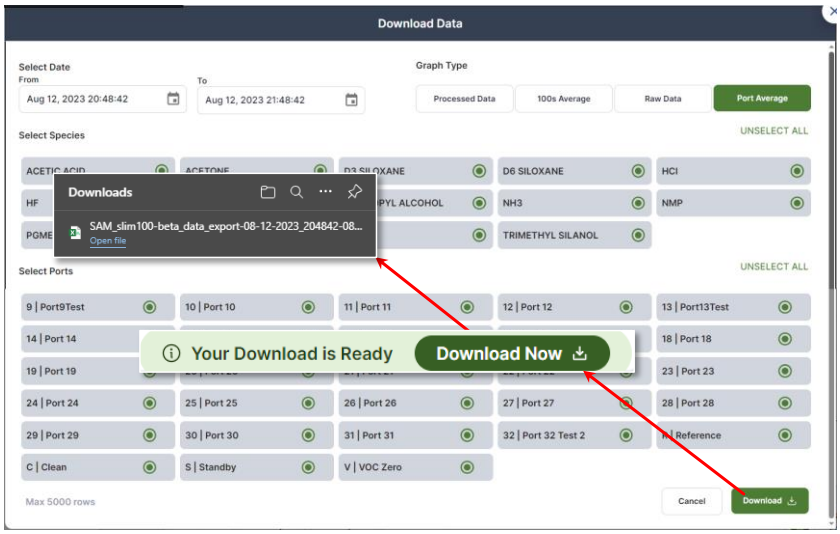


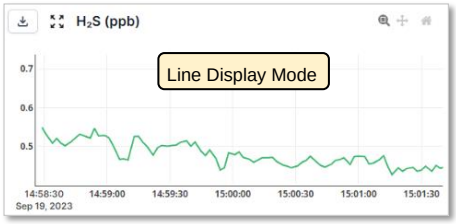
Figure 15: Data Download Dialog

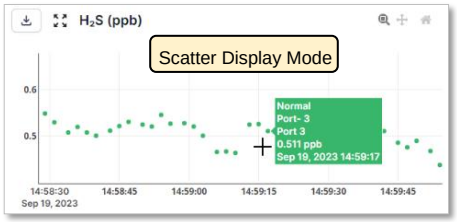
	A	B	C	D	E	F	G	H	I	J	AA	AB	AC	AD	AE	AF	AG
1	ACETIC_ACID_avg_ppb	ACETIC_ACID_int_flag	ACETONE_avg_ppb	ACETONE_int_flag	Analyzer	D3_SILOXANE_avg_ppb	D3_SILOXANE_int_flag	D6_SILOXANE_avg_ppb	D6_SILOXANE_int_flag	Epoch	Port	Port Label	SO2_avg_ppb	SO2_int_flag	TRIMETHYL_SILANOL_avg_p	TRIMETHYL_SILANOL_int_fl	Time
2	166.6054246	-1	532.2314		VOC	5.999923146	-1	0	-1	1.7E+18	27	Port 27			15.42784	-1	2023-09-28 08:48:19.080999-07:0
3					SI2108					1.7E+18	27	Port 27					2023-09-28 08:48:18.910000-07:0
4					SI5450					1.7E+18	27	Port 27	0.134344				2023-09-28 08:48:17.263000-07:0
5					SI2108					1.7E+18	26	Port 26					2023-09-28 08:45:18.871000-07:0
6					SI5450					1.7E+18	26	Port 26	0.11287				2023-09-28 08:45:18.282000-07:0
7	209.0931087	-1	532.3537		VOC	1.504263193	-1	0	-1	1.7E+18	26	Port 26			53.67811	-1	2023-09-28 08:45:18.255000-07:0
8	262.1565159	-1	568.42244		VOC	0	-1	0	-1	1.7E+18	25	Port 25			81.60509	-1	2023-09-28 08:42:17.754999-07:0
9					SI2108					1.7E+18	25	Port 25					2023-09-28 08:42:16.504000-07:0
10					SI5450					1.7E+18	25	Port 25	0.089652				2023-09-28 08:42:15.915000-07:0
11	290.3997076	-1	590.49681		VOC	0	-1	0	-1	1.7E+18	24	Port 24			94.20078	-1	2023-09-28 08:39:18.276000-07:0
12					SI5450					1.7E+18	24	Port 24	0.062812				2023-09-28 08:39:17.283000-07:0
13					SI2108					1.7E+18	24	Port 24					2023-09-28 08:39:16.953999-07:0
14	311.9317572	-1	610.10629		VOC	0	-1	0	-1	1.7E+18	23	Port 23			98.37209	-1	2023-09-28 08:36:18.975000-07:0
15					SI5450					1.7E+18	23	Port 23	0.042479				2023-09-28 08:36:18.353999-07:0
16					SI2108					1.7E+18	23	Port 23					2023-09-28 08:36:17.377000-07:0
17					SI2108					1.7E+18	22	Port 22					2023-09-28 08:33:18.185999-07:0
18	372.0930007	-1	629.05591		VOC	0	-1	0	-1	1.7E+18	22	Port 22			135.0458	-1	2023-09-28 08:33:17.570000-07:0
19					SI5450					1.7E+18	22	Port 22	0				2023-09-28 08:33:15.969000-07:0
20	431.4884574	-1	616.6287		VOC	0	-1	0	-1	1.7E+18	21	Port 21			142.7899	-1	2023-09-28 08:30:18.910999-07:0
21					SI2108					1.7E+18	21	Port 21					2023-09-28 08:30:18.679999-07:0
22					SI5450					1.7E+18	21	Port 21	0				2023-09-28 08:30:18.562000-07:0
23					SI2108					1.7E+18	20	Port 20					2023-09-28 08:27:18.733000-07:0
24					SI5450					1.7E+18	20	Port 20	0				2023-09-28 08:27:18.608999-07:0
25	445.8821859	-1	594.49662		VOC	0	-1	0	-1	1.7E+18	20	Port 20			125.0832	-1	2023-09-28 08:27:18.556999-07:0
26	461.8839981	-1	588.70592		VOC	0	-1	0	-1	1.7E+18	19	Port 19			106.6945	-1	2023-09-28 08:24:18.512000-07:0
27					SI2108					1.7E+18	19	Port 19					2023-09-28 08:24:18.093999-07:0
28					SI5450					1.7E+18	19	Port 19	0				2023-09-28 08:24:16.109000-07:0
29	497.1669647	-1	607.4094		VOC	0	-1	0	-1	1.7E+18	17	Port 17			34.74158	-1	2023-09-28 08:18:19.024999-07:0
30					SI2108					1.7E+18	17	Port 17					2023-09-28 08:18:18.997000-07:0
31					SI5450					1.7E+18	17	Port 17	0				2023-09-28 08:18:16.892000-07:0
32	544.2345156	-1	629.22371		VOC	1.702215931	-1	0	-1	1.7E+18	16	Port 16			3.936316	-1	2023-09-28 08:15:18.367999-07:0
33					SI2108					1.7E+18	16	Port 16					2023-09-28 08:15:17.747000-07:0
34					SI5450					1.7E+18	16	Port 16	0				2023-09-28 08:15:16.996999-07:0
35	579.3361675	-1	643.20557		VOC	4.376614328	-1	0	-1	1.7E+18	15	Port 15			0	-1	2023-09-28 08:12:18.924000-07:0
36					SI2108					1.7E+18	15	Port 15					2023-09-28 08:12:18.256999-07:0

Figure 16: Example Downloaded Data File Spreadsheet

Line/Scatter Display Modes

8. **Line or Scatter Data Display Option:**
   Selecting **Scatter** displays data as individual points.
   Selecting **Line** displays graph data as a continuous line.





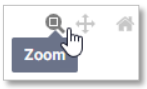
Download Graph Image/Data and Expand Graph View

9. **Download Graph Data:** This feature icon (*located at the left-upper corner of each data graph, next to the species name*) is available on each species' graph. Clicking this button provides selections to download an image file of the selected data graph (**JPG, PNG, PDF**), or a **CSV** file containing the numerical data displayed in the graph.

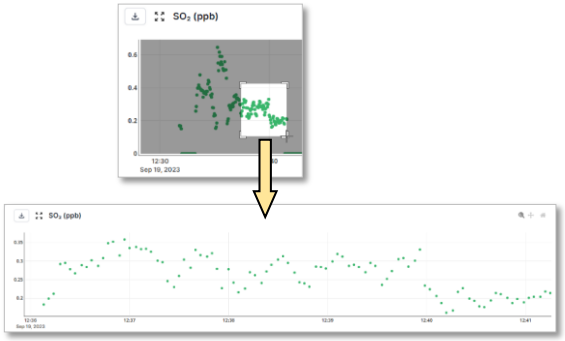
10. **Expand Graph:** When clicked, graph expands to full page for more detailed viewing. This works even when multiple graphs are showing. Clicking again shrinks graph to default size.

Graph – Zoom/Pan/Reset Tools

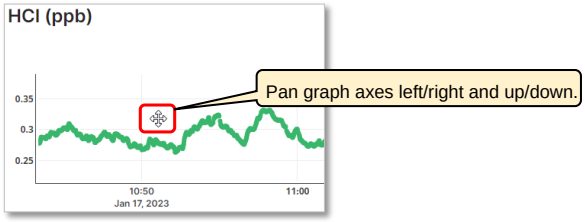
11. **Graph Zoom/Pan/Reset Tools:**



Zoom: Clicking this icon allows the user to select a particular region of a displayed graph for a closer view of the data as shown below. To zoom in, left-click and hold near the area of interest then drag to the desired capture area.

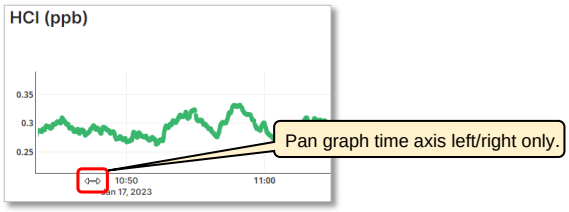


Pan: To Pan, select this icon to activate. Left-click/hold over the graph area to move the graph around the X and Y axes to move to an area of data that is of interest.



Pan Time Only: Also, by hovering over the X axis, the cursor becomes a left/right arrow time so the time axis can be panned

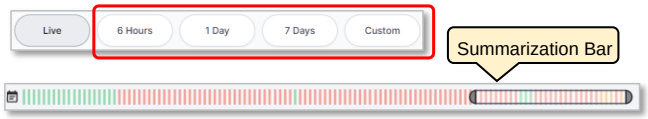
left/right (only) to view previous data during live data view. This function is always active and does not require clicking on the Pan icon.



Reset Axes: Clicking the **Reset axes** icon returns the graph to its default time span and concentration magnitude, covering the most recent 60 minute time span of data collected.

Summarization Modes for Data Analysis

12. **Data Analysis Time Spans:** To view and analyze a summarization of previous data, the user can switch from **Live** measurement and select one of four historical time ranges; **6 Hours**, **1 Day**, **7 Days**, or **Custom** for a user-designated time span. Once a range is selected, each species graph shows a **Summarization Bar** below it so the user can identify problem areas along the selected time span. The vertical marks within the bar are colored to indicate the data status (defined below). **Note: The colors in the** summarization bar **are determined from Processed Data only.** The selection of the graph area for the summarization is 24 hours processed, 100s Avg and RAW. While it is 30 days for Port average.



The colored vertical bars within the summarization bar are a fixed number of 120 that represents the data summarization within the selected time span.

Summarization Bar Color Definitions:

Red = Concentration Data has breached the defined Alarm threshold

Amber = Concentration Data has breached the defined Warning threshold

Green = Concentration Data is below Warning and Alarm thresholds

Gray = Measurement in Standby

Following are examples of time selections along with ways the user can manipulate the displayed graph to view the desired area for scrutiny.

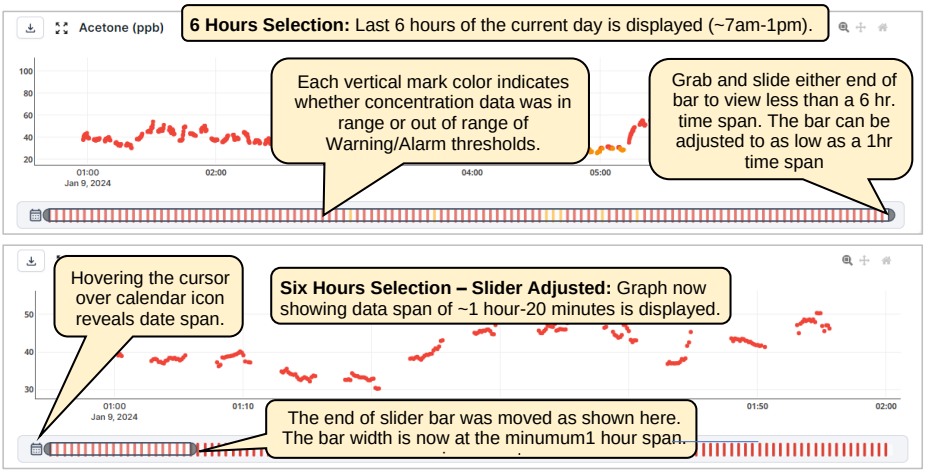


Figure 17: Six Hour Historical Time Span

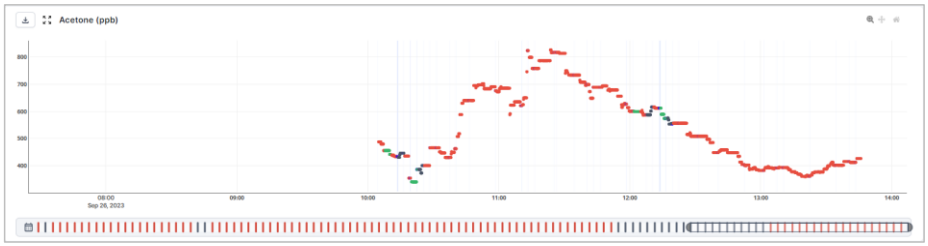


Figure 18: One Day Historical Time Span

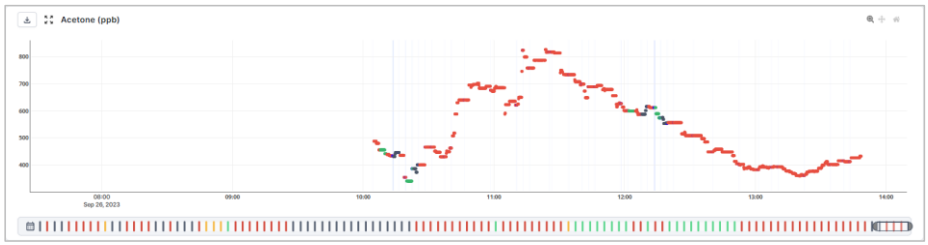


Figure 19: Seven Days Historical Time Span

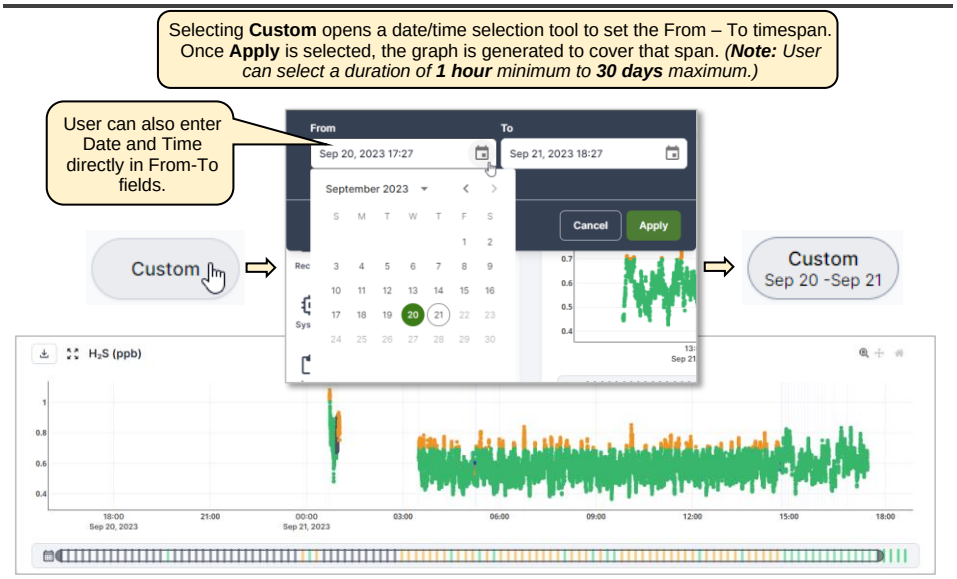
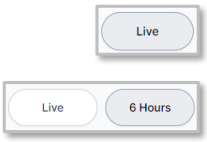
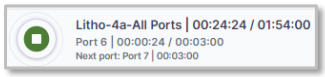


Figure 20: Custom Historical Time Span

Live Feed Indicator / Recipe Status / Stop Start Control



13. **Live Indicator:** When highlighted on **Monitor** page, indicates that live data is being displayed on the graph in a rolling 1 hour time span.
When an **Analysis** time span is selected, the **Live** indicator is not highlighted. Clicking on **Live** will return the displayed graphs to current recipe **Live** display.



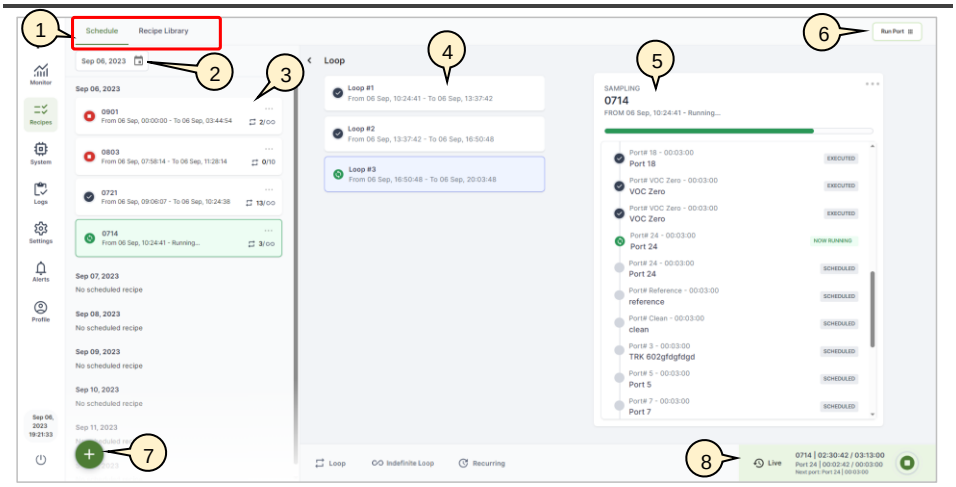
14. **Recipe Run Status:** On right lower corner of the **Monitor** page, indicates currently running recipe name, port name, time remaining for that port, and next port to be measured and its duration.

15. **Stop/Start Control:** Clicking the **Stop** button stops the currently running recipe. If the recipe running was executed as “Start Now”, that recipe cannot be restarted. If the recipe was scheduled for a designated start date/time, the recipe can be restarted by clicking the Start button.

6. Recipes Page

6.1 Introduction

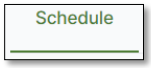
The **Recipes** page provides tools to create, modify, schedule, and run recipes. From the **Schedule** tab (the default view), users can view the schedule and the currently running recipe. It also provides a button to create and schedule a new recipe or add one from the library to the schedule. Also provided is a button to manually run an individual port at any time if needed. From the **Recipe Library** tab, any existing recipes can be added to the current schedule, sorted, filtered, viewed, and edited. New recipes can also be created from the library tab.



1. **Schedule** and **Recipe Library** tabs
2. **Go to Recipe Date:** Opens calendar to view 7-day recipe schedule dates in future or past.
3. **Recipe Schedule List:** Shows currently running recipe (shaded green) and recipes scheduled by date/ time. Recipe status is indicated as currently running, completed, stopped/inclomplete, or scheduled but not run.
4. **Currently running Recipe Loop Schedule and Status:** In default view, loop is closed.
5. **Current Recipe step list**: Includes run time for each step and a progress status bar.
6. **Run Port** button: Clicking this allows for immediately running an individual port to check its status at will.
7. **Add/Create New Recipe** button: Opens dialog to create new recipes and add to the schedule. See section ***6.4, Recipe Creation and Scheduling from Schedule Tab***.
8. **Live; Recipe Info; Stop/Start Control**: "**Live**" (when clicked) returns schedule to current day; **Recipe Info** Indicates the currently running recipe's status, and provides recipe stop/start control.

Figure 21: Recipes Page – Schedule Tab Selected

6.2 Schedule Tab Overview



Shown below is the **Schedule** tab. This tab displays the currently running recipe, recipes that have already run, and recipes scheduled to run in the future. In this section, each feature and function within the tab is described in detail. The numbered callouts in Figure 22 correspond to each feature's detailed description listed below.

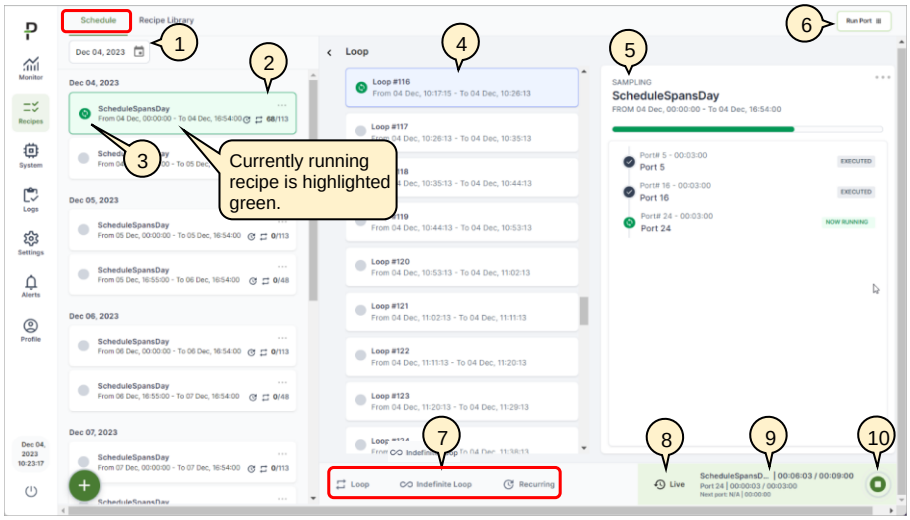
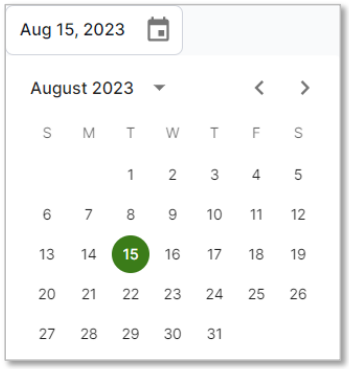
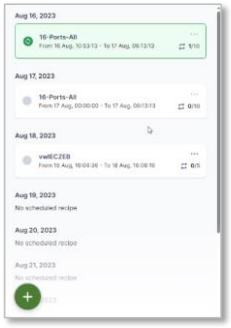


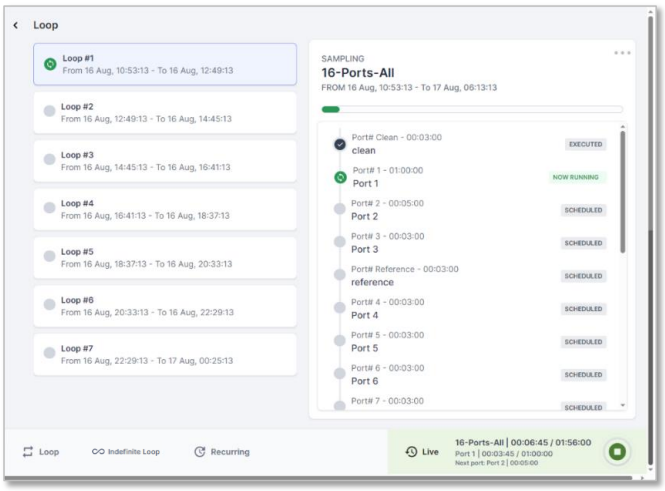
Figure 22: Recipes Page – Schedule Tab

1. **Schedule Calendar** Clicking the calendar icon provides a way to jump to and view future or past recipe schedulesWhen a day is selected on the calendar, the schedule list will display the selected day and the next 6 days. Note the date can also be directly edited in the date window rather the clicking the calendar icon.

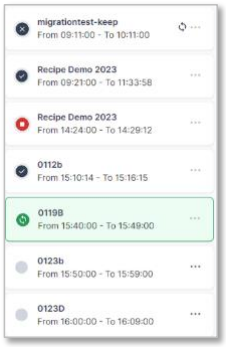




2. **Recipe Schedule List**: User can scroll up and down list to view recipes scheduled for each day. Clicking on any of the recipes listed opens the sequence details of that recipe and the number of times it will loop. The recipe details panel for the selected recipe shows **Recipe Name**, **Time Span, Port Numbers**, and individual **Step Durations**.



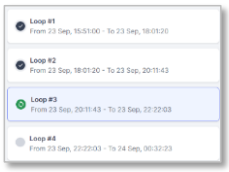
In scenarios where the recipe name is longer than thirty characters, the name will display truncated by default. However, the complete recipe name will display when hovered with a mouse pointer.



3. **Recipe Schedule Run Status – Icon Definitions:**

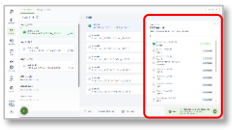
- = Currently running
- = Scheduled
- = Completed successfully
- = Stopped by manual intervention
- = Recipe not run due to system issue or software malfunction
- Also = Step(s) in a recipe were not run due to recipe loop stopped via manual intervention.

Note that when a recipe is stopped by manual intervention and deleted, a strikethrough displays when hovered with a mouse pointer.

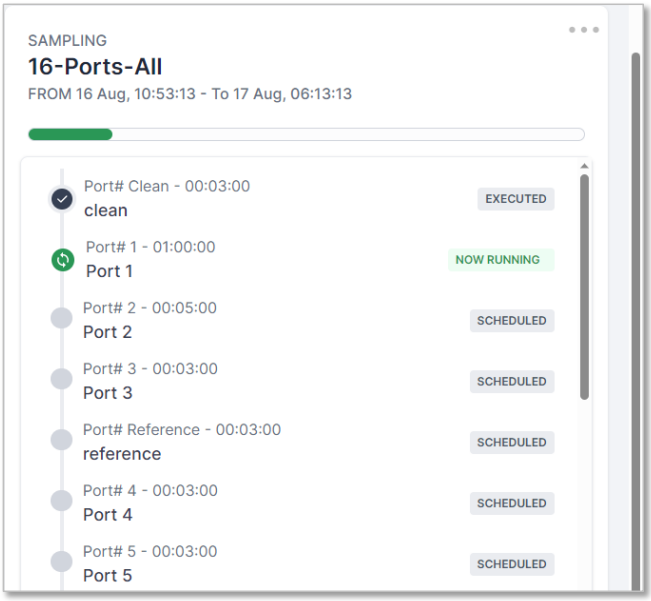


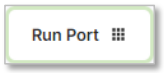
4. Loop **Recipe Panel:** This panel lists the number of times the current recipe will run and the time span each loop will run. The loop run status icon changes state as each loop is run.

   The default display of loop panel is *closed*. Click the right-pointing arrow (›) to open the panel; left-pointing arrow (‹) to close the panel.



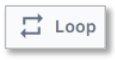
5. **Recipe Sampling Status Panel:** The recipe sampling status panel shows a green horizontal bar that indicates progress of the current sample loop. It also indicates the run status of each step in the recipe as **EXECUTED**, **NOW RUNNING**, OR **SCHEDULED**.

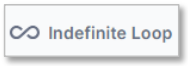


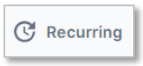


6. **Run Port:** Clicking this button provides a quick way to manually run a single port to see what the current concentration readings are for the area of a fab to which the port of interest is routed.

   This is explained in detail in the section ***Manual Operation (Run Individual*** Port) under section ***6.4 Recipe Creation and Scheduling from Schedule Tab***.





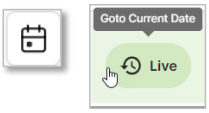


7. **Recipe Run Type Icon Definitions:**

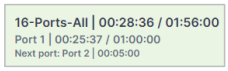
   Loop: This indicates that the scheduled recipe will run in a loop for a user-defined number of times. The number of loops can vary from 1 to 1000.

   Indefinite Loop: This indicates that the scheduled recipe will repeat its full run indefinitely until a user stops the run.

   Recurring: This indicates that the scheduled recipe will repeat on a user-defined recurring schedule, which can be daily, weekly, or on specified days/times, and be specifed as to what time and date it will end.



8. **Live Indicator**: If a date in future or past in the schedule has been selected (via the calendar icon shown at the left – to view recipes in the list), or you have scrolled down the list, click “**Live**” to return to the current day and current recipe on the schedule.



9. **Recipe Run Status:** Displays the currently running recipe name, the port that is currently being measured, the step elapsed time of its total duration time, and next port to be measured. When a recipe isn’t actively running, the display only indicates “No Recipe Running”.

10. **Stop/Start Button:** Clicking the **Stop** button stops the currently running recipe. If the recipe running was executed as “Start Now”, that recipe cannot be restarted. If the recipe was scheduled for a designated start date/time, the recipe can be restarted by clicking the Start button.

6.3 Recipe Library Tab Overview

Shown below is the **Recipe Library** tab. All columns can be sorted and filtered to narrow searches for a particular recipe. Columns can also be resized and rearranged. In this section, each feature and function within the tab is described in detail. The numbered callouts in Figure 23 correspond to each feature’s detailed description below.

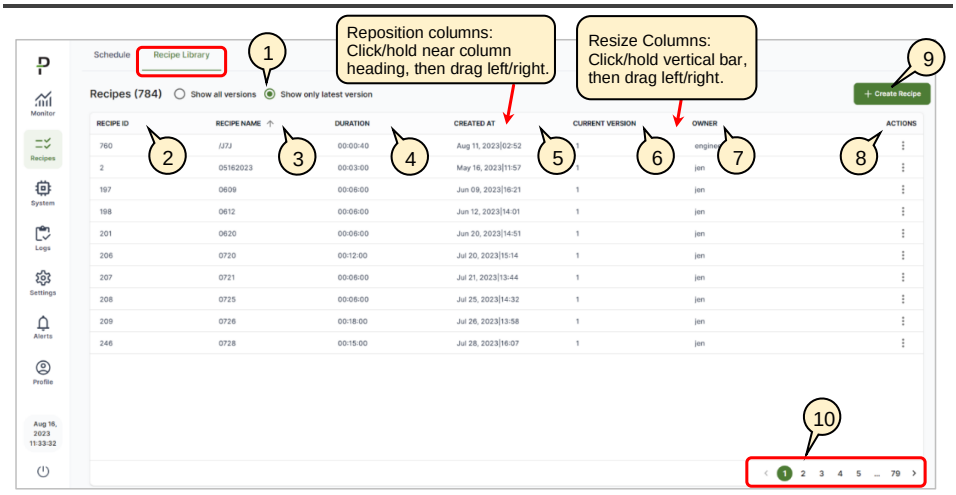


Figure 23: Recipes Page – Recipe Library Tab

Show only latest version

1. **Show only latest version (default):** When selected, Show only latest version filters out earlier versions of the recipe contained in the library. *For efficiency, this selection tends to be the most used radio button*.

Show all versions

Show all versions: There can be any number of versions of a recipe with the same recipe name. When selected, Show all versions will display all available versions of the recipes in the library.

RECIPE ID

2. **Recipe ID** column**:** Each recipe that is created is assigned an ID number in the order created. If you know the ID of a particular recipe, you can either sort the column or enter the ID using the provided filter tool.

RECIPE NAME

3. **Recipe Name:** A name is assigned by the user whenever a new recipe is created. This column can be sorted and filtered.

DURATION

4. **Duration:** Lists the total recipe time duration of all steps combined.

CREATED AT

5. **Created At:** Lists the date and time the recipe was created/modified.

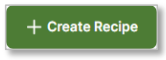
CURRENT VERSION

6. **Current Version:** When there are multiple versions of a recipe with the same name, this column displays the most current version number of that recipe.

OWNER

7. **Owner:** Lists the username of the person who created the recipe.

8. **Actions:** The vertical ellipsis at the end of each row provides three action choices for the selected recipe; **Add to Schedule**, **View/Edit Recipe**, and **Delete Recipe**.

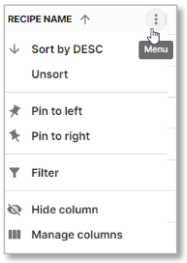


9. **Create Recipe** button: Click this to open the Create New Recipe dialog.

10. **Library Pages:** Library pages on the UI are viewable in groups of 10. Select a number to view more pages of logged events.

Sorting and Filtering the Library

By default, the recipes list/library is sorted by the ascending order of the recipe name. The **Sort/Filter/Hide/Show Columns** menu accessible in each column enables the user to organize the recipe library listing by column and to narrow searches for a particular recipe. **Quick Sort** is described in Figure 24.



- **Unsort:** Clicking this in a column that has been sorted reverts the listing back to its default order.
- **Sort by ASC:** Clicking this in any column arranges the list in **ascending** order, either numerically or alphabetically, for that column. Figure 24 shows the **Recipe Name** column has been sorted in ascending order.
- **Sort by DESC:** Clicking this in any column arranges the list in **descending** order, either numerically or alphabetically.

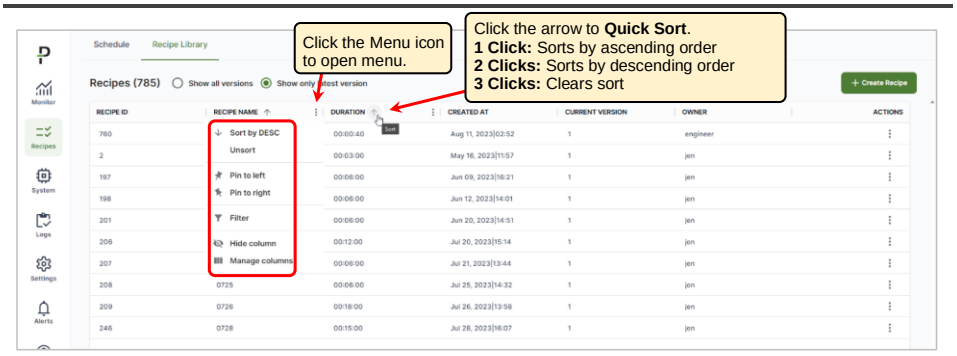


Figure 24: Recipe Library Name Column Sorted in Ascending Order

- **Filter Tool:** Selecting the menu choice **Filter** in any column brings up the tool shown below in Figure 25. It provides setup choices shown to help narrow your search results.
    1. Click the **Columns** list to select a column to which you want the filter applied.
    2. Select **Operator** to further narrow the search.

3. The filter **Value** entered can be any known number or letters for the particular recipe you want to find. In the example, the value "VOC" narrows down to events listed that only contain the word "VOC".
4. Once a **Value** is entered, the list will filter out all events except those to which the parameters entered for the selected column apply.
5. Multiple filter parameters can be applied by clicking **+ADD FILTER**. The and/or operator choice appears when an additional filter appears.
6. Note that when a filter is applied, a filter icon appears next to the relevant column heading.

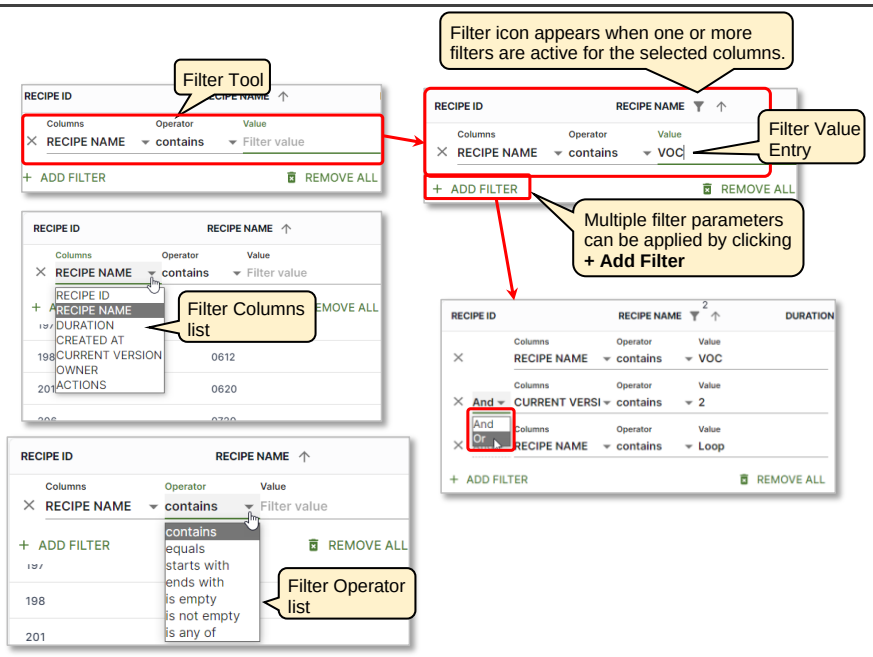
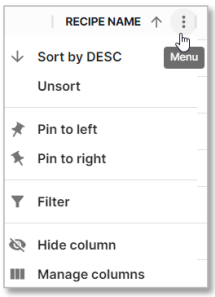


Figure 25: Recipe Library Filter Tool Options



- **Hide Column:** Clicking this hides the selected column.
- **Manage Columns:** Clicking this opens a panel for showing or hiding any or all columns.

- **Pin to Left:** Clicking pins the column to the left side of the table.
- **Pin to Right:** Clicking pins the column to the right side of the table.
- **Unpin:** This appears in the menu to return a pinned column to its default position.

6.4 Recipe Creation and Scheduling from Schedule Tab

Add/Create New Recipe (Button)

On the Schedule tab, click **Add/Create New Recipe** button: Clicking this button opens a pop-up for selecting one of two choices:

- **Create New Recipe**
- **Add Recipe from Library**

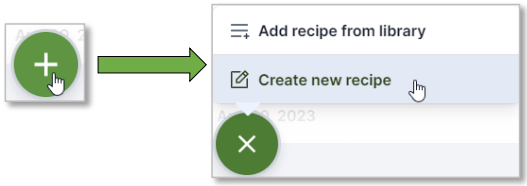
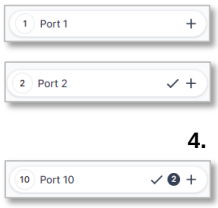


Figure 26: Add/Create New Recipe Button

Creating a New Recipe

1. Click the **Add/Create New Recipe** button then click the **Create New Recipe** option as shown above to open the **Create a Recipe** dialog window (Figure 27).
2. Enter a relevant name in the **Recipe Name** field.



3. Add ports to the recipe by clicking the desired port's plus (+) symbol. This adds the port to the **Create a Recipe** side of the window as shown in **Error! Reference source not found.**.

A checkmark appears next to the plus symbol for each port added to the recipe.

4. A port can be added multiple times to the schedule at any point in the sequence. When this is done, a number appears next to the checkmark indicating that the port will be run more than once during the recipe run.

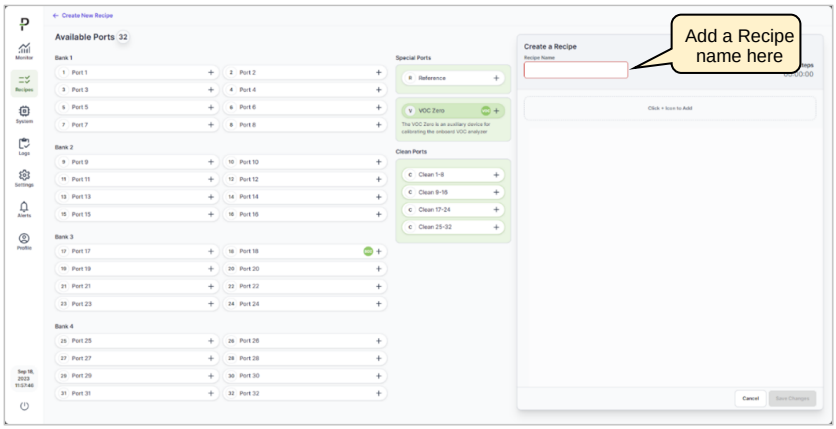


Figure 27: Create New Recipe Window – Default View

Figure 28: Ports Added to Recipe Sequence

Any port in the recipe sequence may be dragged and dropped to a different position within the sequence as you build the recipe. It can also be moved to a different step position by clicking on the **Edit** link under the step number.

Note: Checking the "**RUN VOC Zero alongside**" (available only if SLiM 100 or SLiM 100S is installed) causes the VOC analyzer to run a zeroing calibration sequence while the designated port is being sampled by the other installed analyzers. In the example, Port 10 below has the Run VOC zero enabled, so when that port runs, the VOC analyzer is flowing air through a PAIC filter to zero the VOC analyzer. Consequently, the VOC is not sampling from Port 2 during this step, but all other installed analyzers are sampling from port 2.

5. Add any other ports desired to the sequence as shown in Figure 30 below. As ports are added, the **Step Count** total and **Total Recipe Time** at the top of the sequence list advances. To change each **Step Duration** click in the time field. A scroll bar appears when the number of steps exceeds the window space.
6. Add any available **Clean-Port** for any of the Banks into the sequence as desired.
7. Add the **Reference** port (and/or VOC Zero, if installed) from **Special Ports** into the sequence as desired.
8. For any port that has been designated as a **Zero Port**, add that port into the sequence to the position desired. Note that Zero Port is assigned under the Zero Port tab on the **Settings** page. Refer to the sub-section ***Zero Port*** Tab under section ***9*** for more information.
9. Drag and drop any steps already in the sequence to a different loacation within the sequence if desired.
10. Any port can be removed from the sequence by clicking the **X** on that port.

Adding Special Ports to Recipe

Special Ports available can be added as steps to the sequence (Figure 30).

11. Reference: Add this port to the recipe sequence when you want to run the reference gas through applicable analyzers.

12. VOC Zero (SLiM 100, SLiM 100S only): Add this port to the recipe sequence when you want to run VOC zeroing through the VOC. Analyzer.

Previewing a Recipe

13. The recipe sequence may be preivewed at any time by clicking the icon shown to the left. A condensed window pops up showing the entire recipe sequence (Figure 29). Click away from the window to close it.

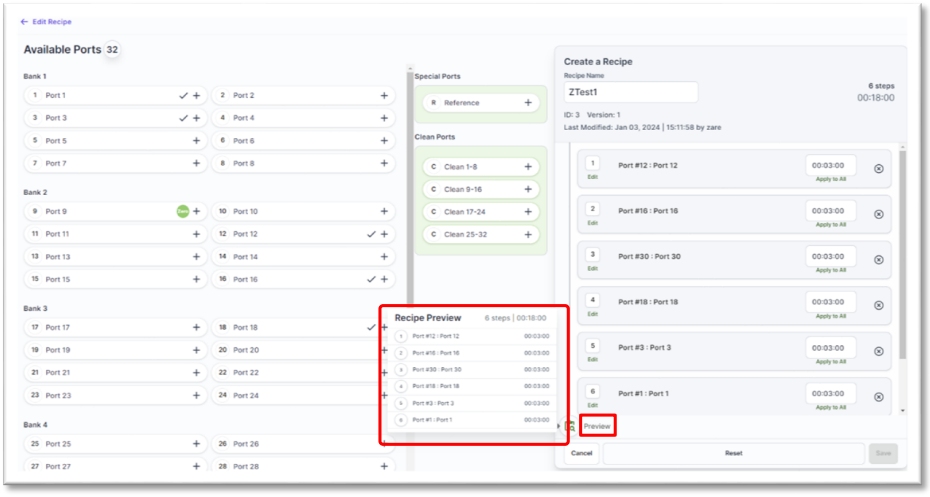


Figure 29: Recipe Preview Selected

Recipe Completion

14. Once building the recipe is completed, click the **Save Changes** button (Figure 30).

An action choice window will pop up (Figure 31). At this point, the newly created recipe is automatically assigned a **Recipe ID** number, a **Version** number, and then stored in the **Recipe Library** for future use.

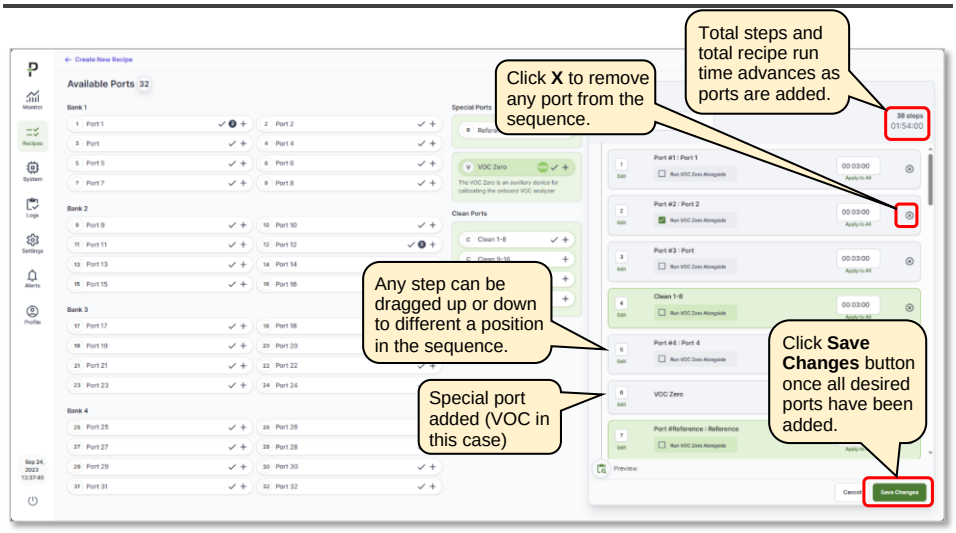


Figure 30: Recipe Completion

15. Click the **Schedule This Recipe** button if you want to add this recipe to the schedule now. Otherwise click **Close,** which closes the Create Recipe window and takes you to the **Recipe Library** tab.

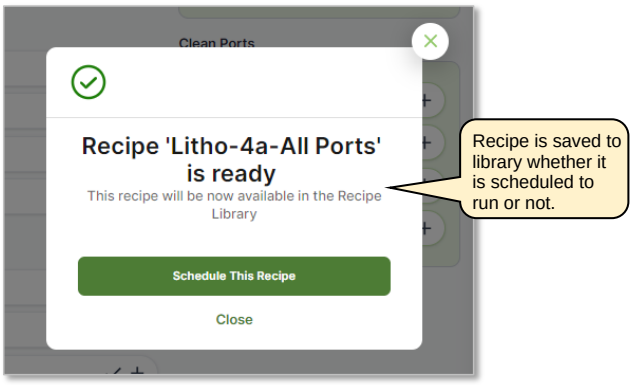


Figure 31: Recipe Ready Notice with Option to Schedule or Close

Scheduling the New Recipe (Run Now)

When the **Schedule This Recipe** button is selected, the following window opens with various options for adding it to the schedule. (Note that the newly created recipe now has an ID number and Version assigned.)

1. To add to the schedule now, the radio button **Run now** (the default option) is selected as shown in Figure 32.
2. In the **Run __ time(s) and stop** field, enter the desired number of times you would like to repeat the recipe, then click **Create**. This places the recipe into the schedule and starts running it immediately.
3. Click **Run Indefinitely** (until manually stopped) which will run the recipe now and continue to run indefinitely until it is stopped.

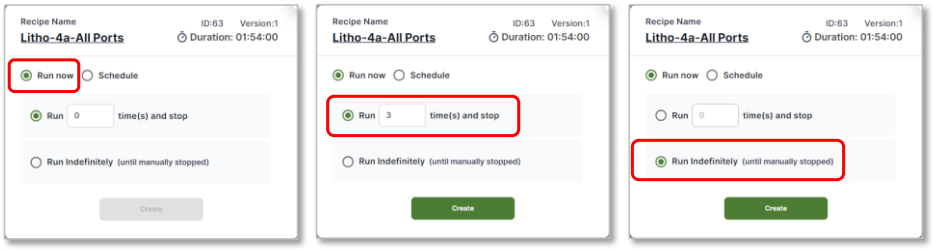


Figure 32: Scheduling New Recipe – Run Now

Scheduling the New Recipe (Run Later)

1. Select the **Schedule** radio button to run the recipe at a later specified date and time.
2. Click on the calendar icon next to the **Start schedule on** field to open and select a date from the displayed calendar. The date and time can also be entered directly into the **Start schedule on** field.

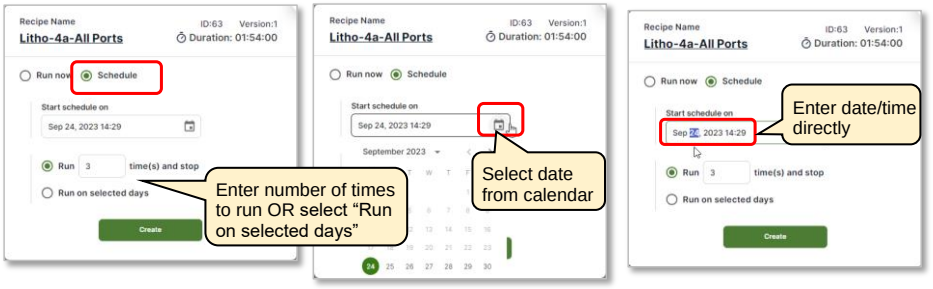


Figure 33: Scheduling New Recipe – Scheduled to Run Later

3. Once the start date/time is selelcted, you can either enter the number of times you want to run the recipe (in **Run __time(s) and stop** field - or select the **Run on selected days** radio button.

4. If **Run on selected days** button is selected, the scheduling options shown in Figure 34 appear.
5. Tick the **Run Daily** box to run every day of the week, or leave it un-ticked to select specific days as shown in the third image.
6. In the **Run until** field, enter the time of day for the recipe to stop (on each day that was selected).

   The recipe will resume (on each subsequent day selected) at the same time that was entered in the **Start schedule on** field.
7. In the **End schedule at** field, click the calendar icon and select a month and day for the recipe to end its sampling run.
8. Click **Create** to finish the process and add the recipe to the schedule.

   The new recipe will execute and end on the dates/times that were specified.

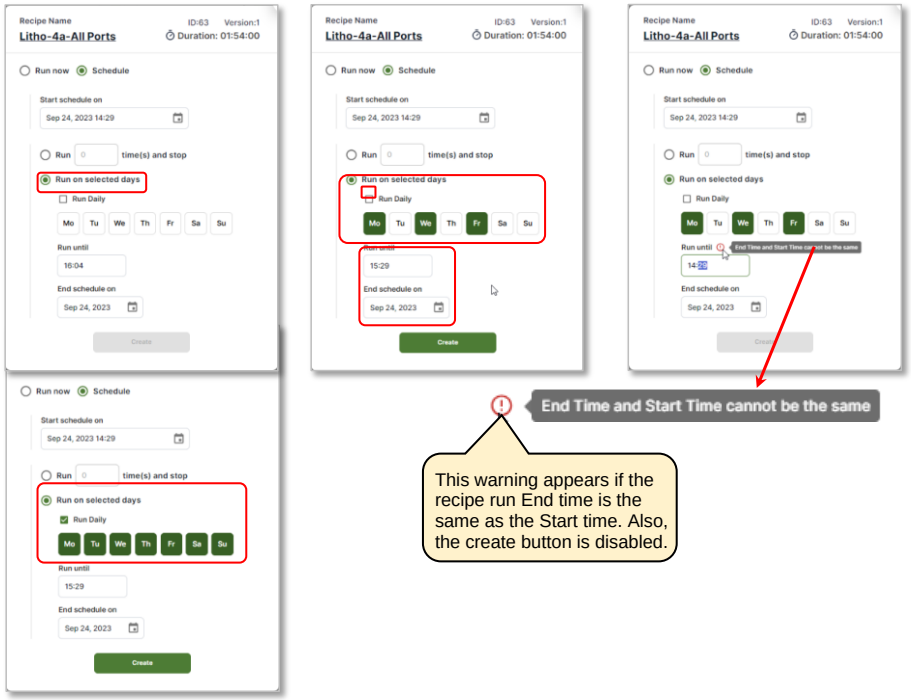
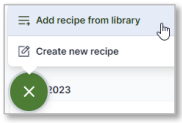


Figure 34: Scheduling New Recipe – Run on Selected Days

Adding a Recipe from Library to Schedule



1. Selecting the choice **Add Recipe from Library** from the Schedule tab opens the dialog shown in Figure 35 from which you can select a recipe to add to the schedule.
2. In this example, a recipe named "**Litho-4a-All Ports**" is selected in the library. The right side of the window shows a preview of the details of each step that will take place when this recipe is added to the schedule and executes. You can move the slider bar on the right of the window to review all the steps that will occur before adding it. *Note that the recipe cannot be edited from this view; only from the edit selection in the Recipe Library tab.*

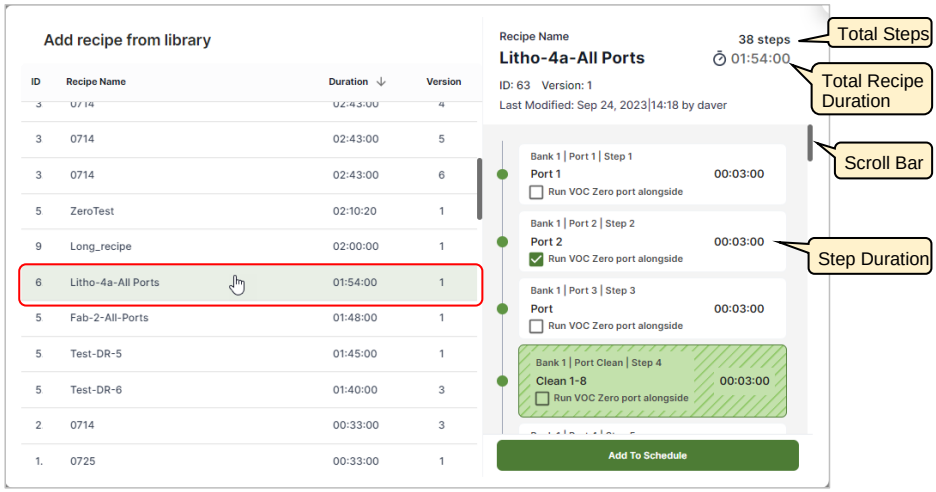


Figure 35: Adding Recipe from Library via Schedule Tab

3. Click **Add to Schedule** to open the dialog shown below, from which you can select either **Run Now**, or **Schedule** to run it later at a specific date and time. In this illustration, **Run Now** is selected.
4. In the **Run ___ time(s) and stop** field, enter the number of times to repeat the recipe.
5. Alternatively, you can select **Run Indefinitely** which repeats the recipe run until a user stops it.
6. Click the **Create** button to execute the **Run Now** choice. This places the recipe into the schedule and starts running it immediately and gives a confirmation message that the recipe was successfully started.

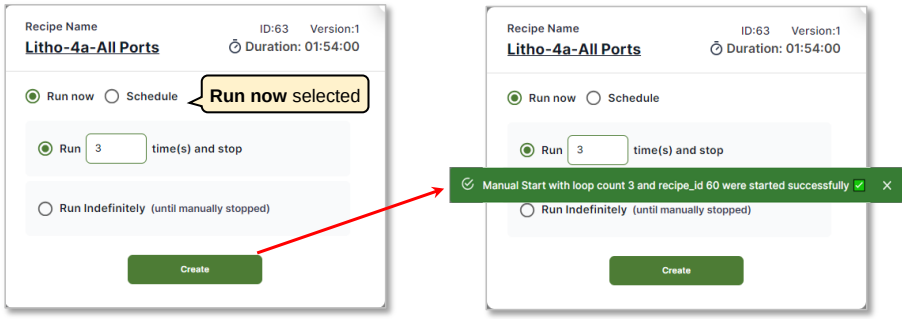


Figure 36: Recipe Selected from Library – Run Now Selected

7. If there is another recipe scheduled that conflicts with the recipe that occupies the same or part of the selected time (**Run Now** in this example), the following **Job Conflict** alert (Figure 37) will pop up giving the choice to either click **No** to schedule it later or **Yes** to stop the currently running recipe and to start the new recipe. Click the **Yes** button to override and start the new recipe. To run later, see the section: **Scheduling the New Recipe (Run Later)**.

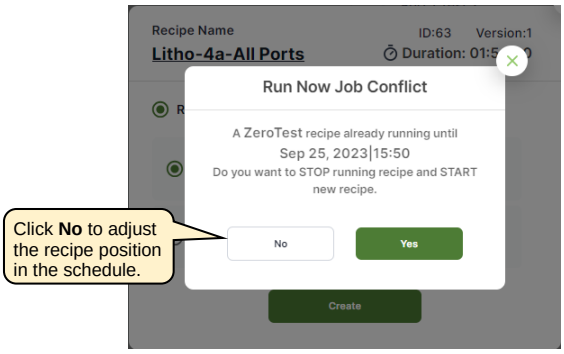
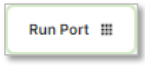


Figure 37: Run Recipe Now – Conflict Alert and Response Choices



Manual Operation (Run Individual Port)

A user can run an individual port manually to quickly see what is going on in the part of the fab to which that port is routed.

1. From the **Recipes | Schedule** tab, click the **Run Port** button (located at the top right of the window).

   The **Manual Operation** dialog opens (Figure 38). Note that a green notice bar appears stating that a scheduled recipe is already running shown in the example below).

2. Click on any port to run manually (in this example, **Port 7**).

   A **Manual Operation** action notice pops up. If a VOC is installed in the SLiM 100 or SLiM 100S, the user can select the “Run VOC port alongside”.

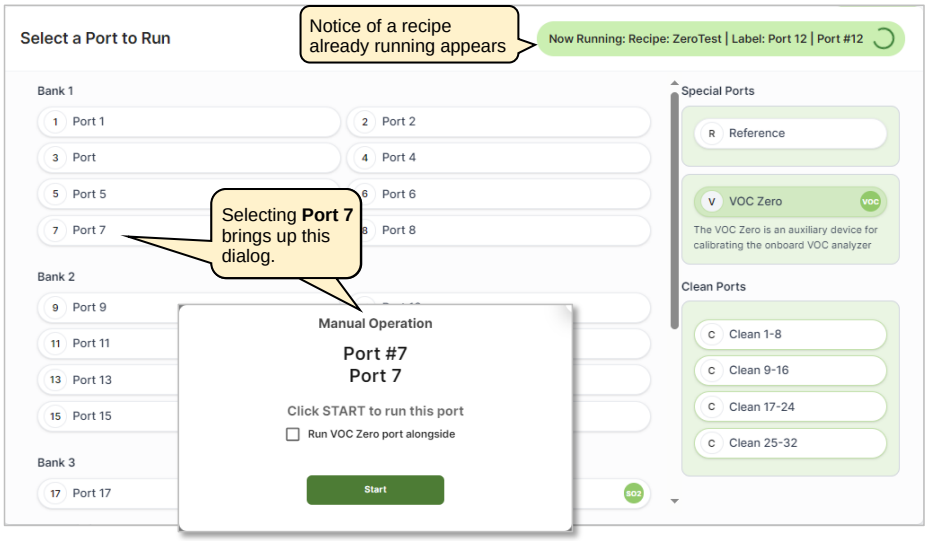


Figure 38: Run Port Dialog (Manual Operation – Port 7 Example)

3. Since a recipe is already running, clicking the **Start** button causes a popup **Schedule Job Conflict** action notice to open (Figure 39). It states which recipe is currently running and asks if you want to stop the current schedule and start the manual run.

4. Click **Start Manual Run** if you wish to start running **Port 7** or click **Cancel** to abort the Manual Run and allow the current recipe to continue. Figure 40 shows the manual run in progress.

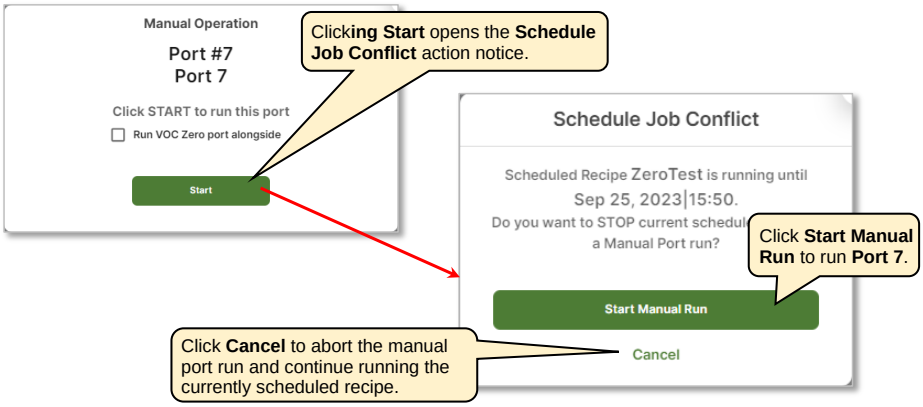


Figure 39: Run Port (Manual Operation – Schedule Conflict Warning)

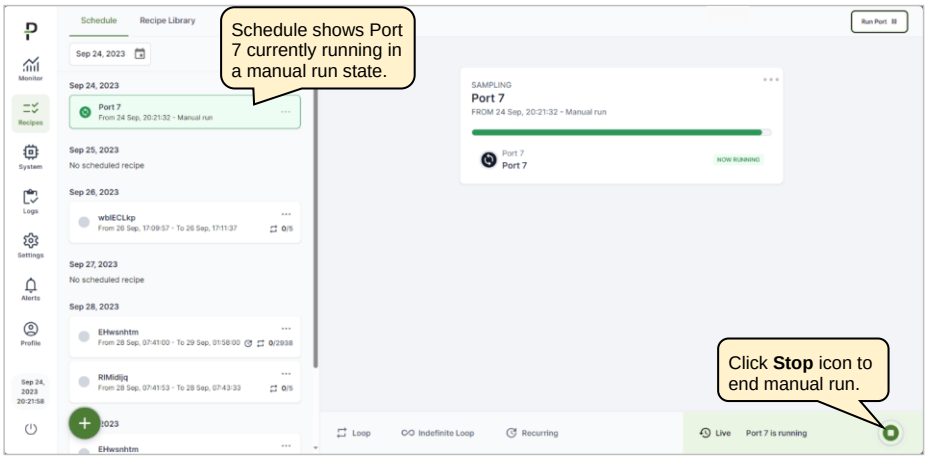


Figure 40: Run Port (Manual Operation – Running)

5. The recipe Schedule will remain paused until the manual run is stopped (by clicking the **Stop** button). Figure 40 above shows the schedule page with **Port 7** running manually.

6.  Once the manual run has gathered the amount of data desired, click the **Stop** button at the bottom-right of the Schedule screen to end the Manual port run. A pop-up (Figure 41) will appear with a choice to Restart Scheduler Engine or Skip. Clicking **Restart Scheduler** will start the next scheduled recipe at its designated Date and Time.

7. Click the **Restart Scheduler** button on the pop-up to restart the current schedule. Clicking **Later** will leave the scheduler paused.

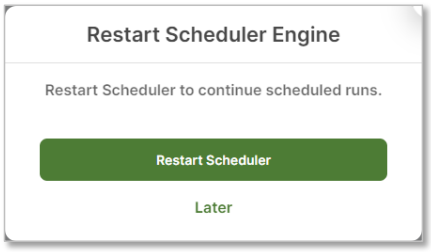
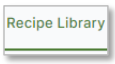


Figure 41: Restarting Scheduler after Run Port (Manual Run) Stopped

6.5 Recipe Creation and Scheduling from Library Tab



From the **Recipe Library** window (Figure 42), you can create new recipes using the **+ Create Recipe** button (which are then automatically stored in the library). You can also add an existing recipe from the library into the schedule.

You can also sort and filter the recipe list, view/edit, or delete existing recipes from the library. (See section ***6.3*** for details on these subjects.)

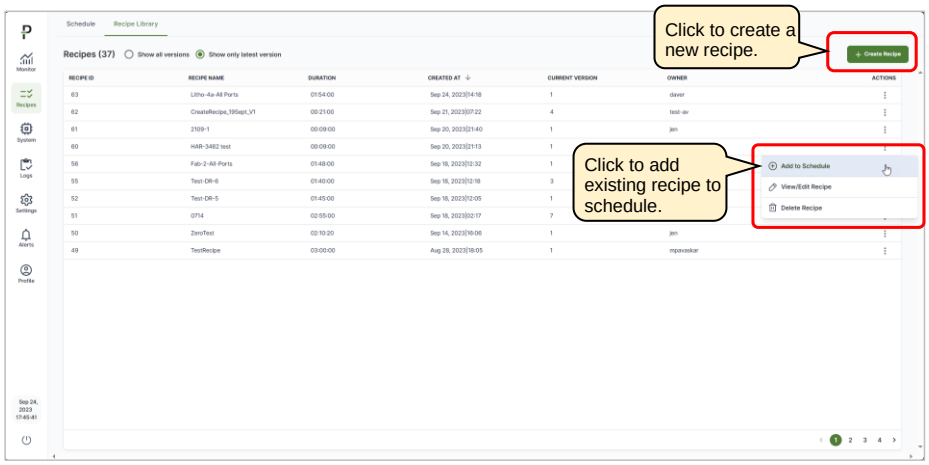
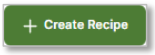


Figure 42: Recipe Library Window



Creating a New Recipe (Library Tab)

Creating a new recipe from the **Recipe Library** follows the same steps as when creating a new recipe from the **Schedule** tab.

1. From the Recipe Library page (Figure 42), click the **+ Create Recipe** button to open the **Create New Recipe** dialog window.
2. Go to the section: ***6.4, Recipe Creation and Scheduling from Schedule Tab*** and follow the instructions for generating a new recipe.

Scheduling the New Recipe (Run Now)

3. Follow the section ***Scheduling the New Recipe (Run Now)*** located under section ***6.4***.

Scheduling the New Recipe (Run Later)

4. Follow the section ***Scheduling the New Recipe (Run Later)*** located under section ***6.4***.

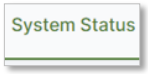
Adding a Recipe from Library to Schedule

1. From the **Recipe Library** page, choose the recipe you want to run and click the menu icon (vertical elipsis) under the **Actions** column.
2. Select **Add to Schedule**.
3. Go to the section: ***Adding a Recipe from Library to*** Schedule located under section ***6.4*** and follow the instructions.

7. System Page

The **System** page has two tabs, **System Status** and **Sensors.**

7.1 System Status Tab



The System Status tab provides a view of the SLiM/SAM CPU usage, memory, storage, and CPU temperature. It also shows each analyzer installed in the system and each one's current status, as well as connected hardware driver status. The system dynamically detects the hardware that is connected to its system and configures itself. Use this section to validate your connections. It shows the status of network devices and serial drivers, and their associated hardware.

Analyzer Status: The status column next to each analyzer's name will show one of the following states: **Warming** or **Measuring**. If monitoring this page when the system is shut down from the user interface, as each analyzer is shut down, their respective status will show **Parking**, then **Disconnected**.

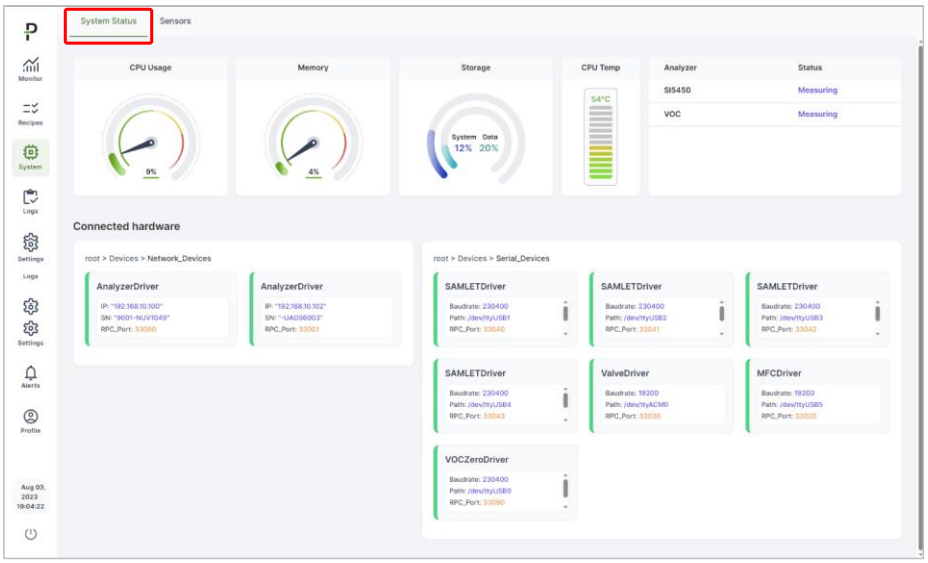


Figure 43: System Page – System Status Tab

7.2 Sensors Tab

Sensors

The Sensors tab provides sensor data that indicates certain status metrics of each installed analyzer and other system components. Sensor data gathered from Fault Detection and Control (FDC) includes device temperatures, pressure, flow rates, and other data relevant to each device. If a fault is detected from the sensor data for a device, the status states indicated on this tab will change to red and indicate “High” or “Low.

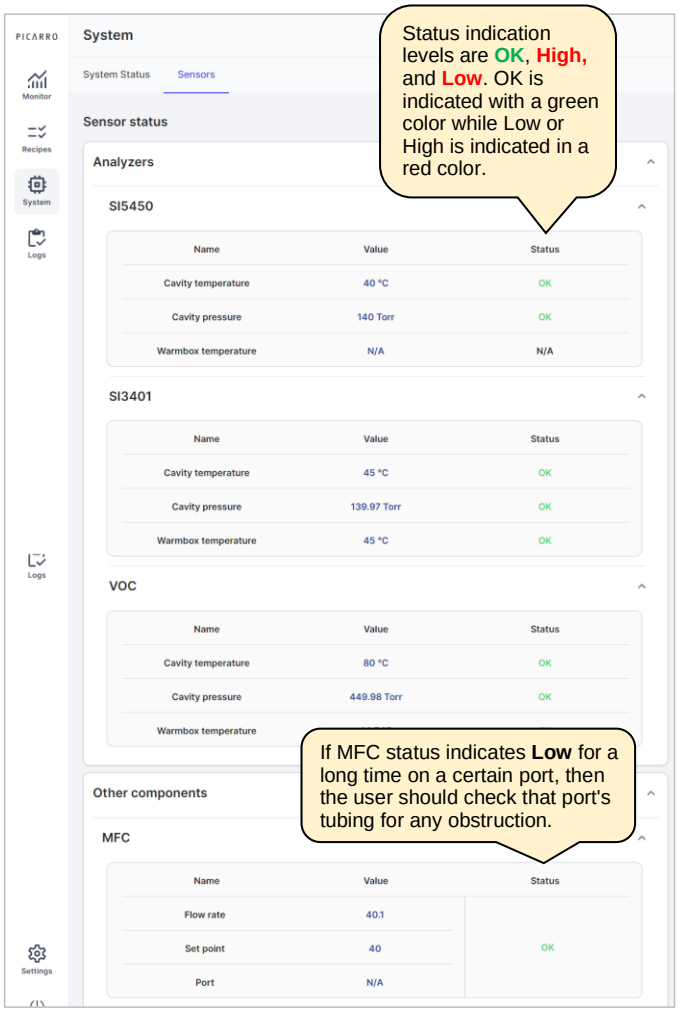


Figure 44: System Page – Sensors Tab (expanded view)

8. Logs Page

When the **Logs** icon is clicked, the default **Live Feed** view of this page appears as shown in Figure 45. The data on this page is constantly updated. It provides a way to search, sort, filter, and select data logs for download and viewing. The listing shows each event with an **SN** number (serial number), the **Log Course Name**, the **Event** description, the current event **Severity**, and a **Time Stamp**.

1. **Live Feed:** With Live Feed enabled as shown, the log table updates as each event is logged. With it disabled, the log shows only events from the most recent entry.
2. **Custom Date:** Opens a window to set a Date/Time span to view only events that have logged within that time span. The maximum duration is three days of logs available to download.
3. **Max Rows:** This menu provides selections to view 500, 1000, 2000, or 5000 events. (This does not affect the quantity of events that are stored for download – all events are stored).
4. **Severity:** This menu provides selections to view events with severity levels of 10, 20, 30, 40, 50, or all. Severity levels are defined below.
5. **Search All Logs:** Provides a field in which to enter specific search terms to narrow the event entries to only those containing those terms. Entering values here will search only in **Log Course Name** and **Events** columns.
6. **Download:** Clicking this button downloads event data in CSV or SSV data formats for viewing and analysis in a spreadsheet.
7. **Event Rows:** Each event row in the log provides the event ID (SN), Log Course Name, the Event data, Severity, and Time Stamp.
8. **Log Pages:** The number of pages available for viewing depends on specified time span (**Custom Date**) of the data and the **Max Rows** selection.

Figure 45: Logs Page – Default View

8.1 Log Column Definitions

- **SN:** denotes an assigned event ID number.
- **Log Course Name:** Specifies what part of the application emitted the log message.
- **Event:** The Event title provides information on any action the system has taken.
- **Severity:** Log data severity shown in Table 2 defines the severity level for each event in the log.
- **Time Stamp:** The time stamp denotes System time the event was logged.

Table 2: Log Data Severity Column – Level Number and Color Meanings

Severity Number	Color	Meaning
Level 10	Green 10	**Debug:** This level is not usually relevant to most users. It can be useful in rare circumstances if the user wants to see a larger level of detail to gain an in-depth understanding of a specific event.
Level 20	Green 20	**Information:** Any normal expected activity or event.
Level 30	Amber 30	**Warning:** Handled exceptions; statuses approaching thresholds; non-fatal conditions that you can continue operating in or recover from via software control; improper user inputs.
Level 40	Red 40	**Error:** Handled exceptions; you cannot recover to the normal operating state via software control; missing files; missing configuration; unintended web-socket disconnection.
Level 50	Red 50	**Critical:** Unhandled exception, traceback info, crash.

8.2 Setting Custom Date Search Parameters

1. Click on **Custom Date** button to open a calendar date selection window (Figure 46 below). You can either type in the date/time directly, or click on the calendar icon to use the calendar and time tools. The default span is the last 24 hours. The maximum time span is limited to 3 days. Select the desired **From** date and time. Repeat the same for the **To** field.

Note: The **LIVE FEED** switch is disabled when Custom Date is enabled.

2. In the **Max Rows** field, select the number of rows you would like to display on the UI. When the search results are displayed, each page contains 100 rows each (scroll to see all events on the page).
3. Click **Apply**. This will generate a list of all events that occurred during the designated time span (Figure 47). Note that the Live button on the upper left of the window is not available in this mode.

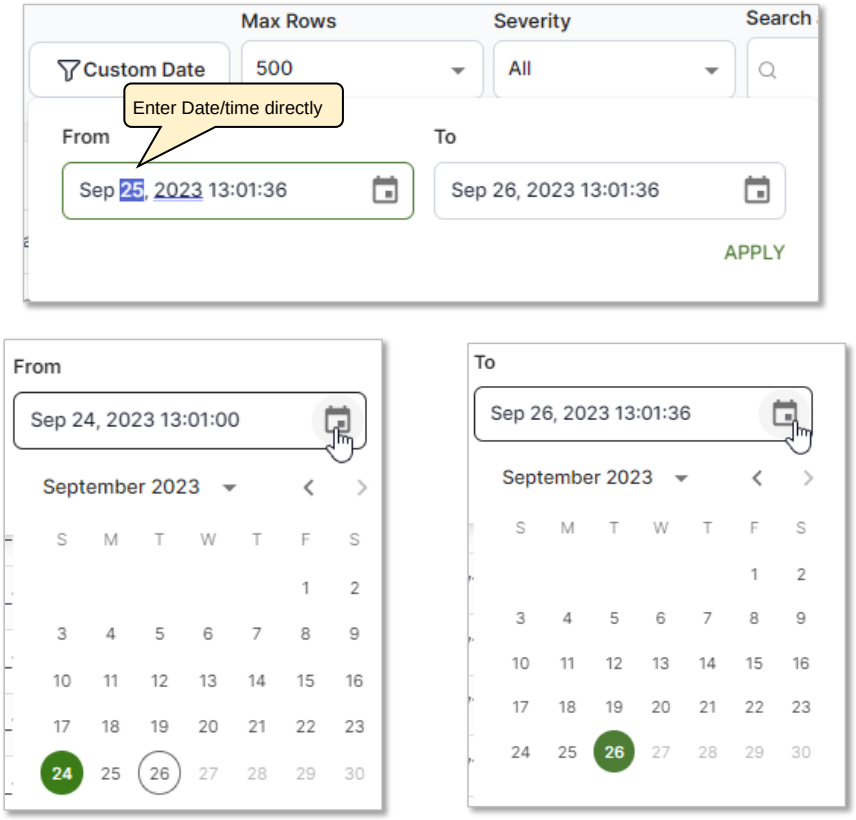


Figure 46: Logs Page – Setting the From/To Date and Time Search Parameters

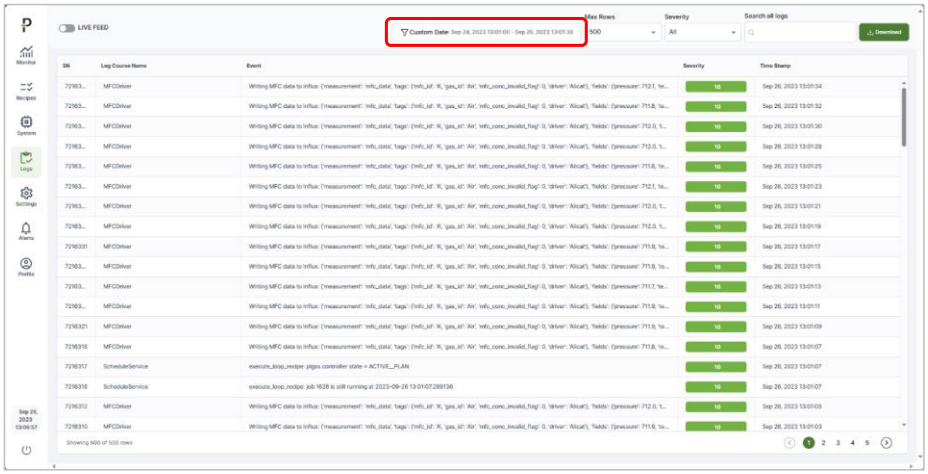


Figure** 47**: Logs Page – Example Search Results – Custom Date/Time Span

4. The event list displayed can be sorted and filtered for viewing particular events. It can be downloaded to your computer in a CSV (Comma Separated Values) or SSV (Semicolon Separated Values) file format. See the section **Downloading Log Data** below for instructions.

8.3 Sorting Log Events For Viewing

Each log column can be sorted alphabetically or numerically by clicking on the column vertical arrow which enables the user to organize the current log listing by column. Column order can also be rearranged by click/holding the column header and dragging to another location.

8.4 Downloading Log Data

When the **Download** button is clicked, all data in the user-selected time frame is downloaded into either a **.csv** or **.ssv** format. A “Download in progress” pop-up appears (Figure 48). Once data download is ready, the green colored pop-up appears on the Logs page with a button from which you can execute the download. Clicking the **Download Now** button opens the Windows **Downloads** window from which you can open the file for immediate viewing in a spreadsheet or save the file for later use.

Commented [AP1]: Sec: 8.4: Downloading Log Data:

After download csv file, formatting issue on "ClientTimeStamp" column in MS Excel, can be fix by using "Format Cell" -> "Custom Format" -> set with "mm/dd/yyyy hh:mm:ss"

cc @Mangala Pavaskar

Commented [MD2R1]: Note added on page 64

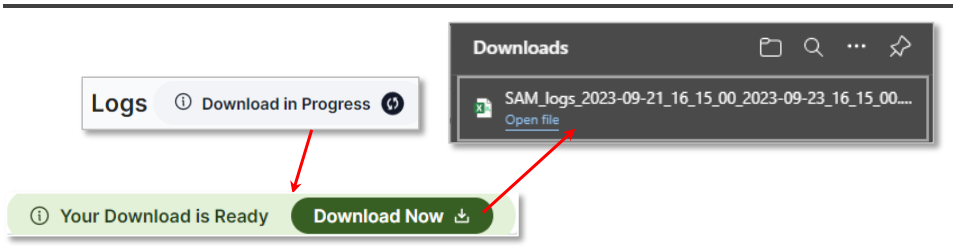


Figure 48: Logs Download Sequence

Upon opening the file after download, the user can view and sort the event data as needed in a spreadsheet for analysis (see example file in Figure 49). The Filename of the downloaded file is named for the time span selected. In the example filename below, the user-entered time span was Sep 21, 2023, at 16:15:00 to Sep 23 2023, at 16:15:00 .

```
SAM_logs_2023-09-21_16_15_00_2023-09-23_16_15_00.csv
```

NOTE

The desired data format (CSV or SSV) can be specified by clicking *Settings* on the Navigation bar and then clicking on the *General* tab. Select Download File Format to choose the desired format.

NOTE

If CSV format is selected, after downloading, you can correct the formatting issue in the "ClientTimeStamp" column by updating the cell format. From MS Excel select: "Format Cell", "Custom Format", set with "mm/dd/yyyy hh:mm:ss"

8.5 Log Data Column Definitions

ClientTimestamp: Same as **Time Stamp** column shown in the UI Log listing.

ClientName: Same as **Log Course** column shown in the UI Log listing.

EpochTime: Conversion of **ClientTimestamp** to epoch time (Unix time is the number of seconds that have elapsed since 00:00:00 UTC on 1 January 1970

LogMessage: Same as **Event** column content shown in the UI Log listing.

Level: Same as **Severity** column shown in the UI Log listing.

	A	B	C	D	E	F	G
1	ClientName	ClientTimestamp	EpochTime	IP	Level	LogMessage	rowid
56	Picarro_-AMSADS0003_subthread	13:57.1	1.6758E+12		40	Error occured sending FDC alert in analyzer_driver =	642505
57	MFCDriver	13:57.0	1.6758E+12		10	Writing MFC data to Influx: {'measurement': 'mfc_data', 'tags': {'mfc	642504
58	MFCDriver	13:54.9	1.6758E+12		10	Writing MFC data to Influx: {'measurement': 'mfc_data', 'tags': {'mfc	642503
59	MFCDriver	13:52.9	1.6758E+12		10	Writing MFC data to Influx: {'measurement': 'mfc_data', 'tags': {'mfc	642502
60	InletService	13:52.1	1.6758E+12		20	No Zero Port configured	642501
61	InletService	13:52.1	1.6758E+12		30	No ZeroPort configured: list index out of range	642500
62	ScheduleService	13:52.1	1.6758E+12		10	ManualJobModel: list job start/finish 2023-02-07 00:00:00/2023-02-1	642499
63	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at 2023-02-14 00:00:0(	642498
64	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance started_at 2023-02-13 00:00:00	642497
65	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at epoch 1676361600	642496
66	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance started_at epoch 1676275200	642495
67	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: current end view = 2023-02-14 00:00:00	642494
68	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: current start view = 2023-02-13 00:00:00	642493
69	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: UI request display weekday = 0	642492
70	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at 2023-02-13 00:00:0(	642491
71	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance started_at 2023-02-12 00:00:00	642490
72	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at epoch 1676275200	642489
73	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance started_at epoch 1676188800	642488
74	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: current end view = 2023-02-13 00:00:00	642487
75	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: current start view = 2023-02-12 00:00:00	642486
76	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: UI request display weekday = 6	642485
77	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at 2023-02-12 00:00:0(	642484
78	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance started_at 2023-02-11 00:00:00	642483
79	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at epoch 1676188800	642482
80	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance started_at epoch 1676102400	642481
81	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: current end view = 2023-02-12 00:00:00	642480
82	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: current start view = 2023-02-11 00:00:00	642479
83	ScheduleService	13:52.1	1.6758E+12		10	ScheduleModel.list: UI request display weekday = 5	642478
84	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at 2023-02-11 00:00:0(	642477
85	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance started_at 2023-02-10 00:00:00	642476
86	ScheduleService	13:52.1	1.6758E+12		10	RunInstanceModel: list run instance finished_at epoch 1676102400	642475

Figure 49: Log Downloaded for Viewing in Spreadsheet

9. Settings Page

The **Settings** page provides the tabs as shown in Figure 54 below and described in detail later. The following tabs can be accessed from this page:

Ports: Assign port names, establish flow rates, and adjust stabilization time. Port quantity varies with the system purchased.

Species: Sets alarm thresholds for each relevant species.

General: Set date and time, units of measure, port average value, and file download format.

Zero Port: Select Zero Port for VOC (SLiM 100 or SLiM 100S only) and SI5450 analyzers (if either or both are installed in the system).

Backup: Set data backup parameters and frequency.

My Account: Enables individual users to modify some of their account details.

About: View system details.

User Management: Manage all user accounts (This tab appears only when the designated system administrator (admin) is logged in).

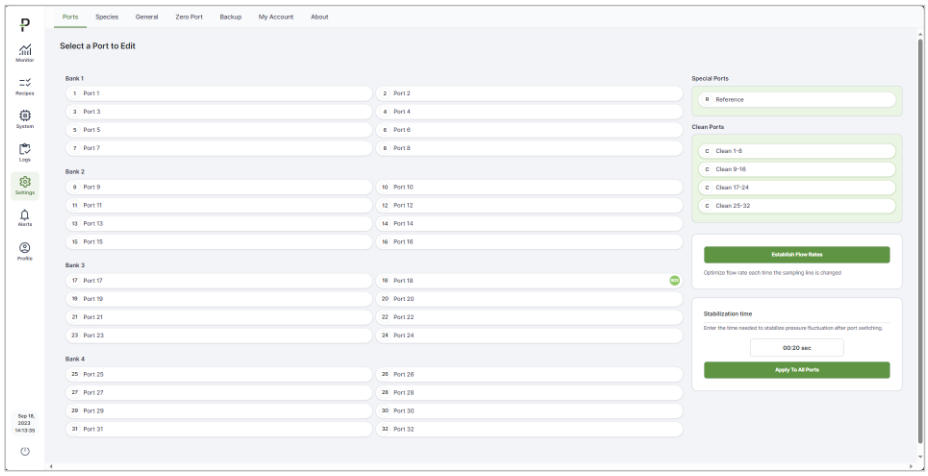


Figure** 50**: Settings Page (My Account tab is default view)

9.1 Ports Tab

Ports Tab Features

The **Ports** tab enables the user to:

- Edit **Port Name**, **Flow Rate,** and **Stabilization Time** for each port in each bank, in accordance with the fab locations to which the sample lines from The system are routed. For each port:
- **Establish Flow Rates:** Optimizes the flow rate each time a sampling line is changed, including length, size, and location. When Establish Flow Rates is selected, the following warning pop-up appears.

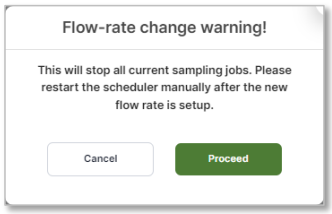


Figure 51: Flow Rate Change Warning Pop-up

- Selecting **Proceed** starts a sequence in which the flow rate of each port within each bank is optimized depending on its line length. See Figure 52 for an example of this process underway. Each bank turns green as the process in it proceeds. Each port turns yellow to indicate the flow rate is being set for that port. The sequence stops when all banks are completed.

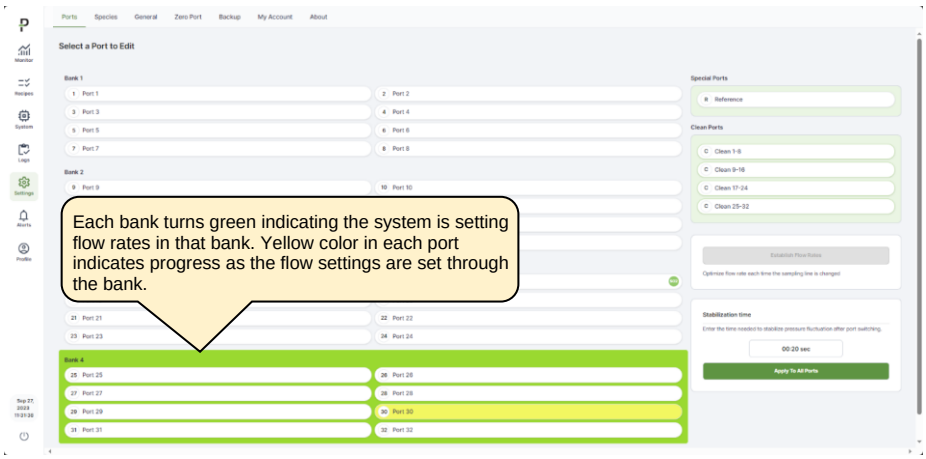


Figure 52: Establish Flow Rates Routine Running

- Adjust **Stabilization Time:** Here the user can enter the time needed to stabilize pressure fluctuation after port switching so data collected during that stabilization period will be ignored. Clicking **Apply To All Ports** sets entered time in all ports.

Editing a Port

1. Click on the port you wish to change. A pop-up dialog (Figure 53) appears for making changes.
2. Change **Port Name** as needed.
3. Change **Stabilization Time** (the amount of time required for the measurement to stabilize after port switching) and **Flow Rate** as needed.
4. The **Clean Port** for any bank may be edited for stabilization time and flow rate only. The name cannot be changed.
5. The **Special Ports** selection (the default name is "**Reference**") may be edited for port name, stabilization time, and flow rate.
6. Click **Save** to complete and close the dialog.

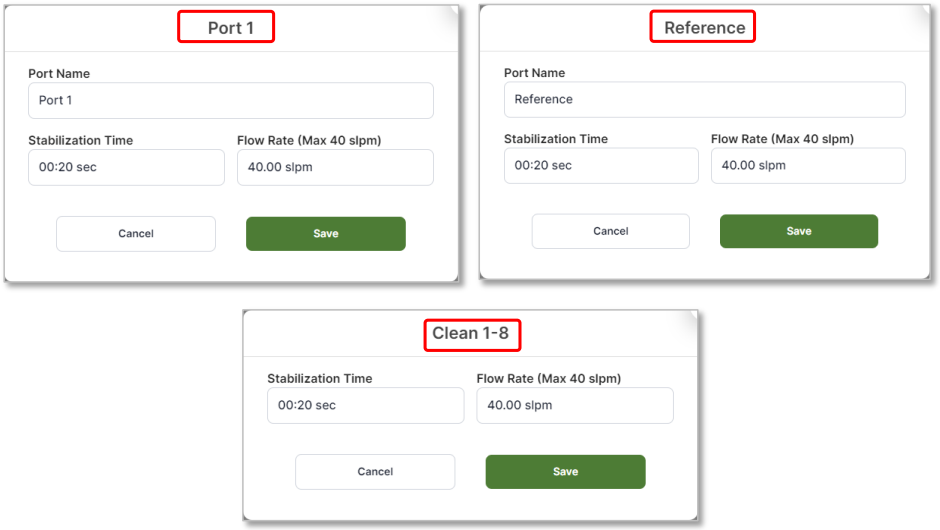


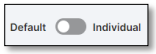
Figure 53: Port Edit Pop-up Dialogs

9.2 Species Tab

The **Species** tab enables the user to set **Warning** and **Alarm** threshold values for each species at each available port. The species and ports shown will vary depending on the analyzers and ports installed and operating in the system.

Default vs Individual Thresholds Toggle

1. Select **Individual** on the toggle to apply custom threshold values for each individual species at each port. Each individual species can have a different value assigned at each port (Figure 54).



2. Select **Default** on the toggle to apply the same assigned threshold values for each individual species to all ports (Figure 55).

To scroll left to right within the table:

Press and hold the keyboard **Shift** button to scroll right and left.

Set or Edit Threshold Values

1. Click on the cell of the species and port. The cell will change to green color.
2. Enter the desired number for the **Warning** and **Alarm** thresholds at each applicable port for each species.
3. Note that if a species value in the **Default** row is changed, it assigns that value for all ports under that species. See Figure 55.
4. Click **Save** button to implement changes.
5. Click **Reset** if you want to return the threshold to the previous values.

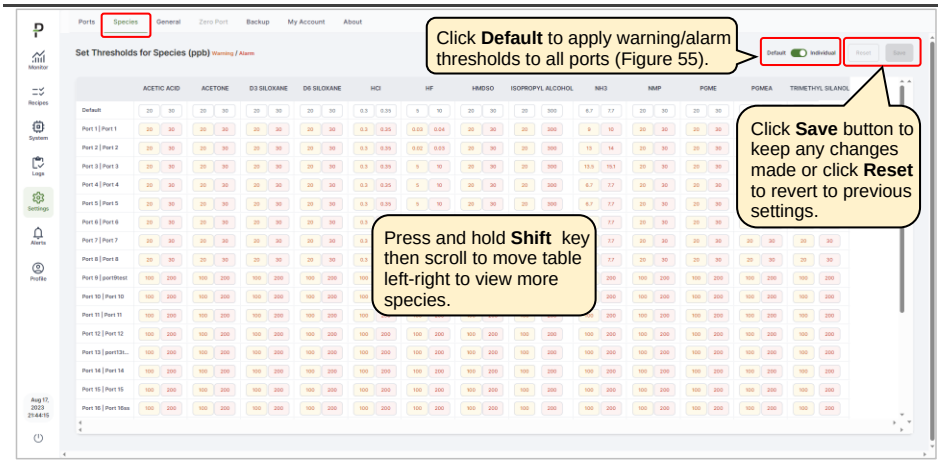


Figure 54: Species Tab – Set Concentration Warning and Alarm Thresholds

Figure 55: Species Tab – Set Default Thresholds (values applied to all ports)

9.3 General Tab

The General tab enables the user to adjust system Date and Time, Units of Measure, File Download format, and Port Average value. Further details are below. Any changes made here are saved by clicking the **Save** button.

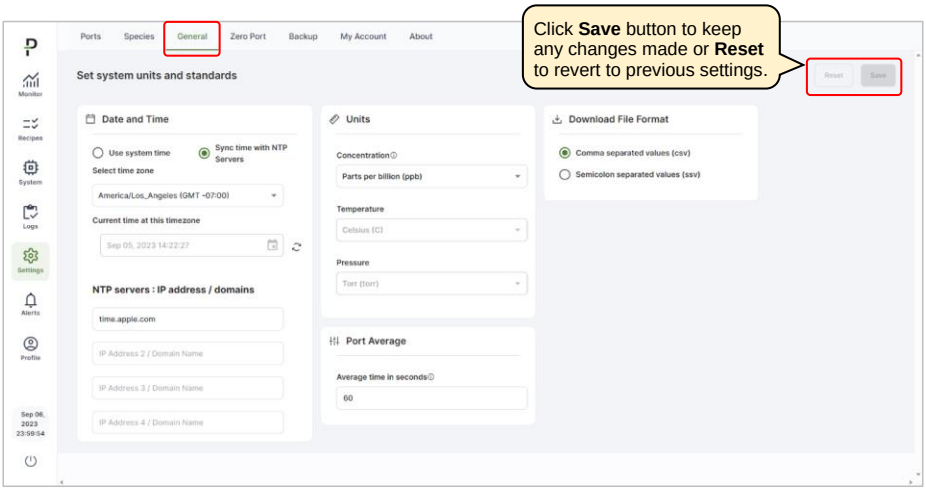


Figure 56: Settings Page – General Tab – Default View

Date and Time Dialog

Shown below is the Date/Time settings dialog where the user can select either **Use System Time** (Figure 57), or **Sync Time with NTP Servers** (Figure 61).

1. From the **Select Time Zone dropdown** menu, select any zone from the world-wide list.

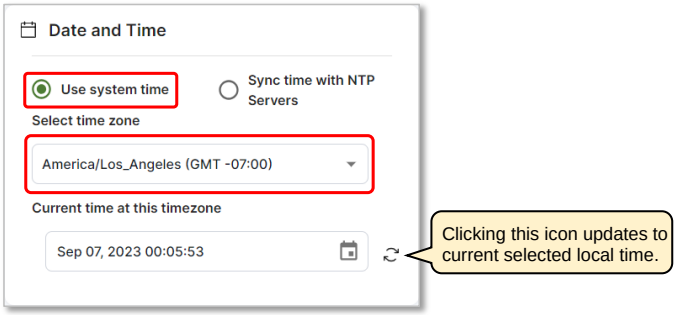


Figure 57: Date and Time – Use System Time is Selected

2. Click in the **Current Time at this Timezone** field. A calendar/time selection window opens for adjusting month and day at the selected timezone. The Date and Time can be entered directly into the the field.

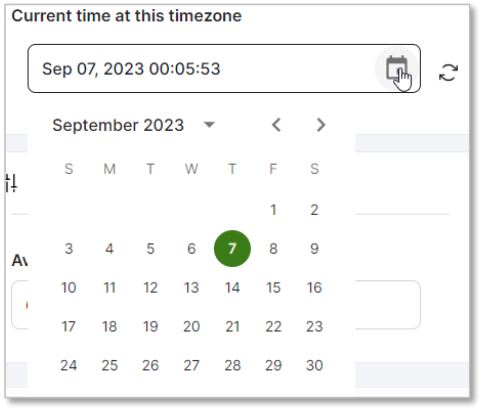


Figure 58: Window for Adjusting Current Time at Selected Time Zone

3. To use **Sync Time with NTP Servers**, select that radio button (Figure 59). This selection provides four additional fields for specifying different IP addresses / domains to which you can sync the system time.

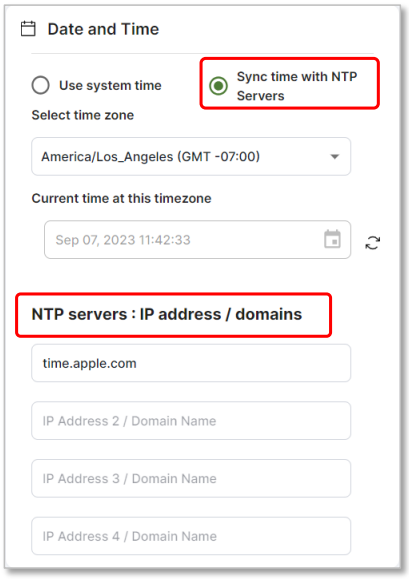


Figure 59: Date and Time – Sync Time with NTP Servers Selected

WARNING

Do NOT enable the *Automatic Date & Time* on the Ubuntu OS Home Page settings panel (see Figure 60 below). If the Ubuntu OS Automatic Date & Time in this panel is enabled, the SLiM/SAM system will no longer synchronize its time with external servers, nor will it serve its time to the Analyzers.

To avoid this issue, make SLIM/SAM time settings using "Sync Time with NTP Servers" feature on the Settings page (see Figure 59 above).

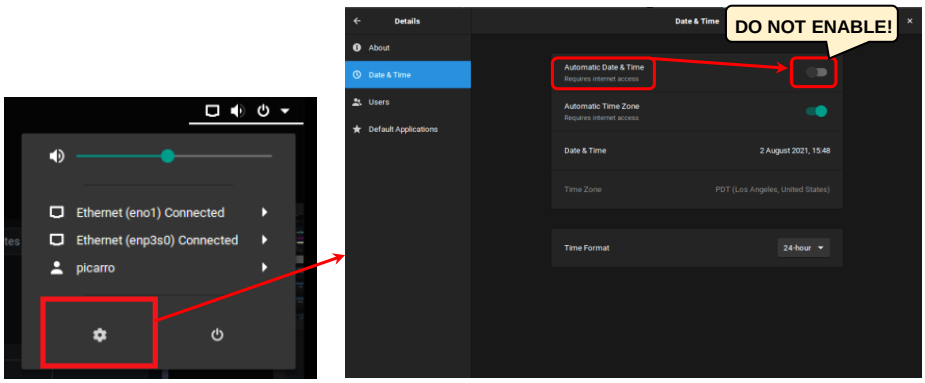


Figure 60: Ubuntu OS Date/Time – Leave Automatic Date & Time OFF

Units Dialog

Shown below is the **Units** dialog. Units of measure for Concentration, Temperature and Pressure can be adjusted.

- **Concentration:** The concentration menu provides choices between parts per billion (ppb) and micrograms per cubic meter (µg/m³). Note that ppb to ug/m³ conversion is done using room temp = 295K and 1 atm pressure.
- **Temperature:** Displays default degrees Celsius (°C) or degrees Fahrenheit (°F).
- **Pressure:** Displays default Torr (torr).

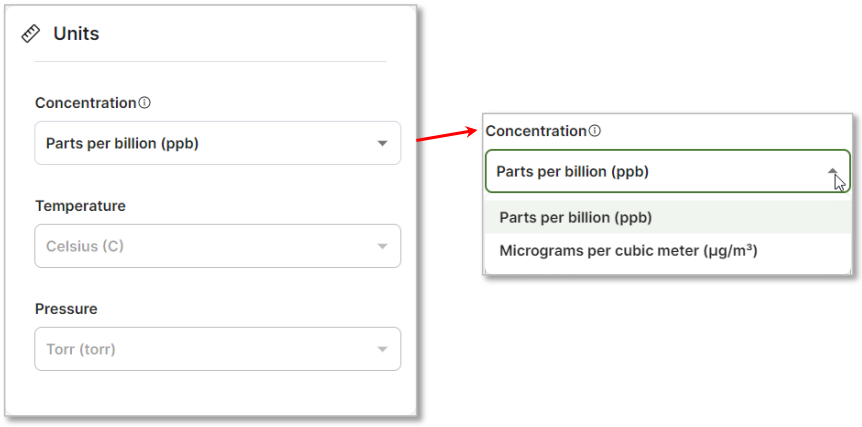


Figure 61: General Tab – Units Dialog

Download File Format

Shown below is the **Download File Format** dialog. The available formats are comma separated values (csv) or semicolon separated values (ssv). Note that the file format selected here is applied to downloads performed in **Monitoring** and **Logs** pages.

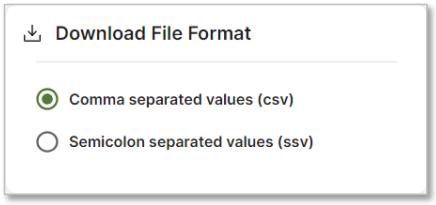


Figure 62: General Tab – Download File Format

Port Average

Shown below is the **Port Average** dialog. Here, the user can enter a time in seconds that will be used in the calculation of the port average value. The example in Figure 63 shows a value of 60 seconds entered. *Note that this applies to inorganic gas species only.* Here, input the number of seconds to average from the end of the run.

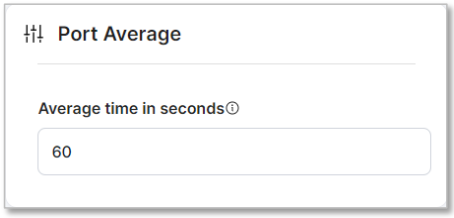


Figure 63: Port Average Value Setting

9.4 Zero Port Tab

Zero Port

Data collected from the **Zero Port** corrects data from all other ports for possible analyzer drift for relevant measured species measured by VOC and SO2 analyzers. The Zero Port tab provides a utility for applying Current zero offset values, Historic offset values, or to set all values to zero. For the SO2 analyzer, the user can assign any individual port as the Zero Port as well as its flow rate.

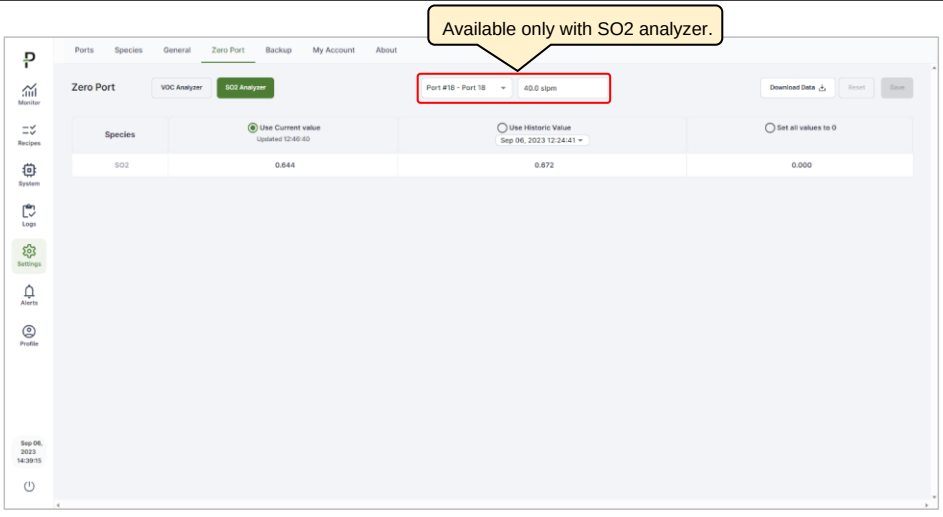
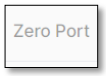


Figure 64: Zero Port Tab – SO2 Analyzer Selected

NOTE

If analyzer models relevant to the Zero Port tab are not installed in your system, the tab will be inactive and greyed out:



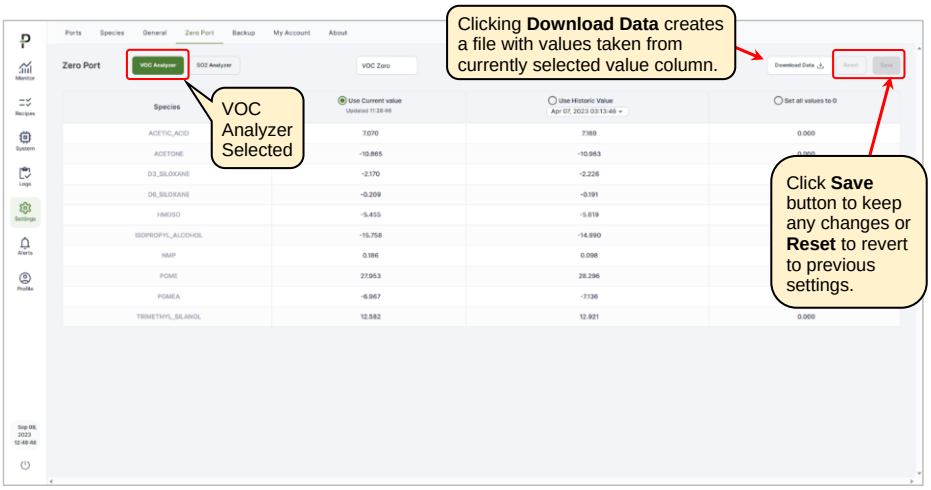


Figure 65: Zero Port Tab – VOC Analyzer Selected

Zero Port Setup Steps

1. Select the **Analyzer** to which you want to apply the Zero Offset parameters.
2. **SO2 Analyzer Selected:** From the Ports menu, select the port number you would like to associate as the Zero port. Then set flow rate if desired (default is 40 slpm).
3. **VOC Analyzer Selected:** Ports menu and flow rate selections are not available for VOC. If VOC Zero is present then it is Auto-assigned to the VOC Analyzer installed in your system.
4. Zero offset values are set @jeIn the panel associated with the selected analyzer, **Current Value** will be used if no changes are made. To make changes, user can select either **Use Historic Value**, or **Set all Values to 0**.
5. **Current Value:** Shows the current values which, if no changes are made (such as selecting Use Historic Value, or Set all Values to 0), zeroing will be applied to the selected Zero Port from this data (Figure 66).

6. Clicking on **Use historic value** copies the historical zero offset values selected from the date/time drop-down list (Figure 66) to the selected Zero Port. Click the dropdown menu, select a date, then click **Save**.

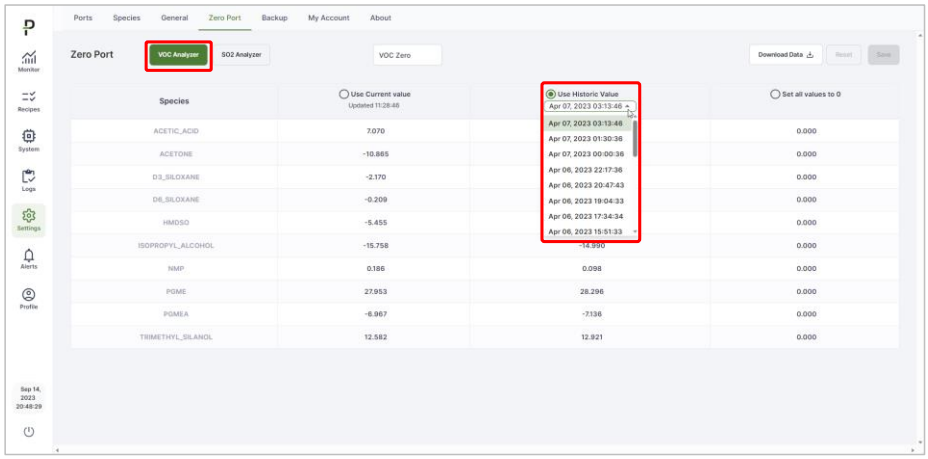
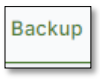


Figure 66: Zero Port Tab – Use Historic Value Menu

7. If the **Set all values to 0** radio button is selected, all species offset values are set to 0 and applied to the selected Zero Port when the **Save** button is clicked.
8. **For VOC** analyzer, click **Save** to apply the new offset values to the analyzer
9. **For SO2** analyzer, click on the **Save** button apply the new offset values to the analyzer and to save any port and flow rate changes. A notification appears on the **Settings** page indicating a successful save. **Cancel** will revert the port selection to “None”.

9.5 Backup Tab



The **Backup** tab provides various data backup features and options. Figure 67 shows the tab default view. A log of previous backups is provided here.

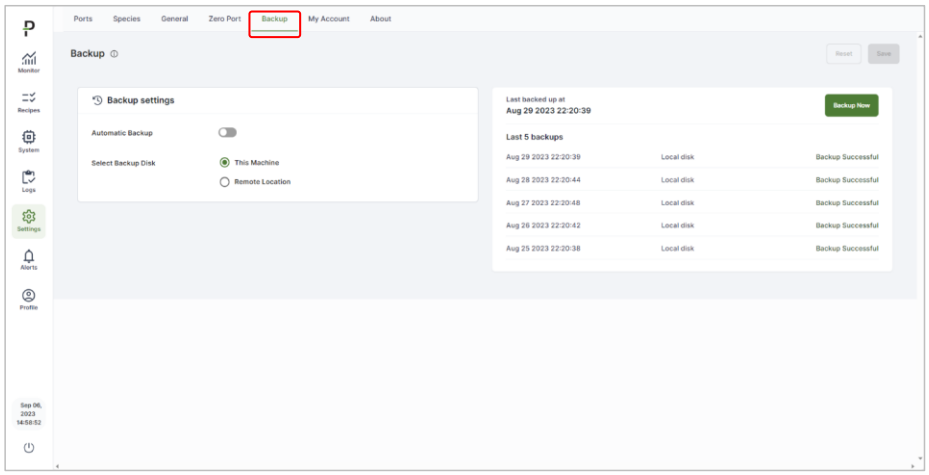


Figure 67: Settings Page – Backup Tab – Default View

Automatic Backup

When Automatic Backup is selected, the options in Figure 68 appear. Backup **Frequency** can be set to **Daily** or **Weekly**. Backup disk selection can be local (the SLiM/SAM computer) or remote. If using **Remote Location** selection, fields are provided for entering Username, Password (if required), and an IP Address.

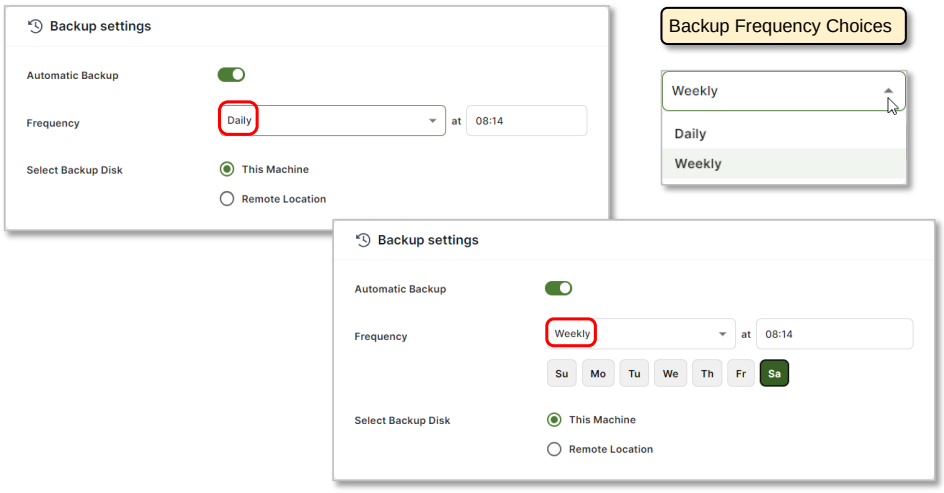


Figure 68: Backup – Automatic Backup – (Daily or Weekly)

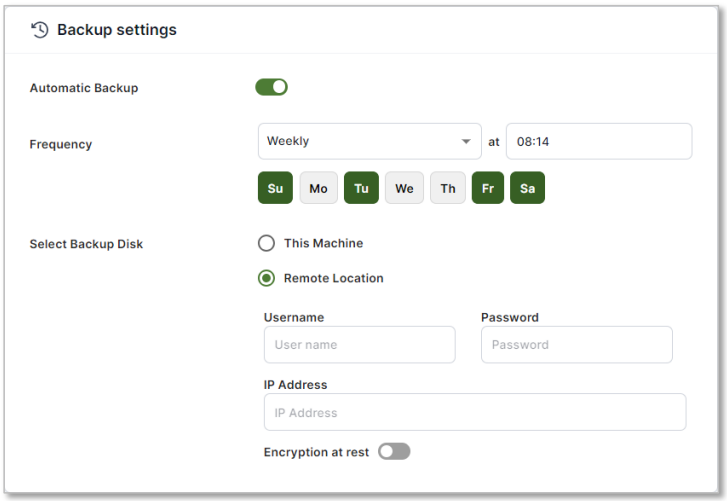


Figure 69: Backup – Automatic Backup – Remote Location Selected

Backup Now

Clicking the **Backup Now** button immediately executes a backup per the parameters set in the Backup Settings panel of this tab.

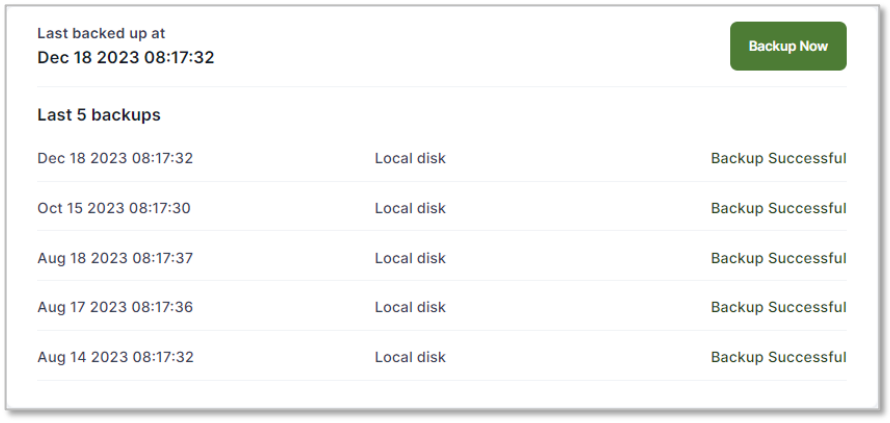
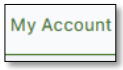


Figure 70: Backup Now Button and History

9.6 My Account Tab



The **My Account** tab provides for limited account changes by each individual user. Here, the user can change their first name, last name, and password. The email can only be changed by the admin. The username cannot be changed, even by the admin. The user is first required to login to the password reset portal using their current credentials.

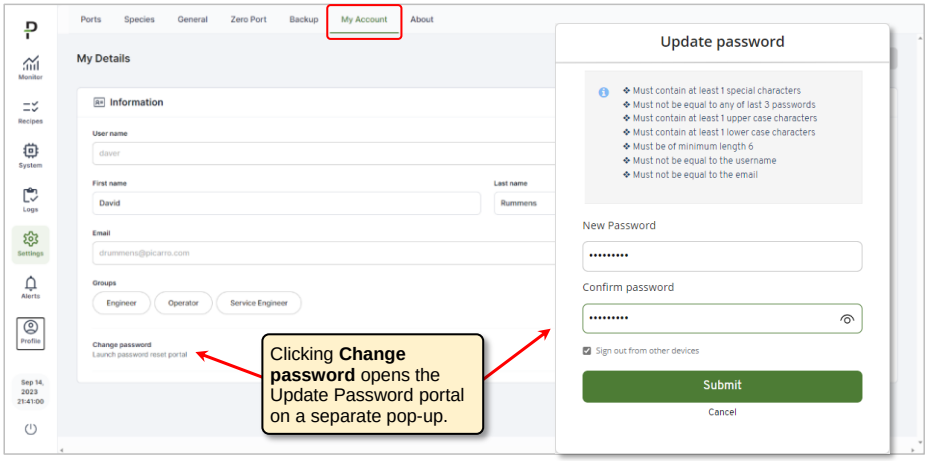


Figure** 71**: Settings Page – My Account Tab

9.7 About Tab

The **About** tab provides system hardware and software information including:

- Hardware: SLiM 100, SLiM 100S, SAM-C, or SAM-S
- Serial number of the system (Serial No)
- Software version of system (SW Version)
- UPS information (if installed)
- Number of ports
- Installed analyzers
- Serial number and software version of each installed analyzer

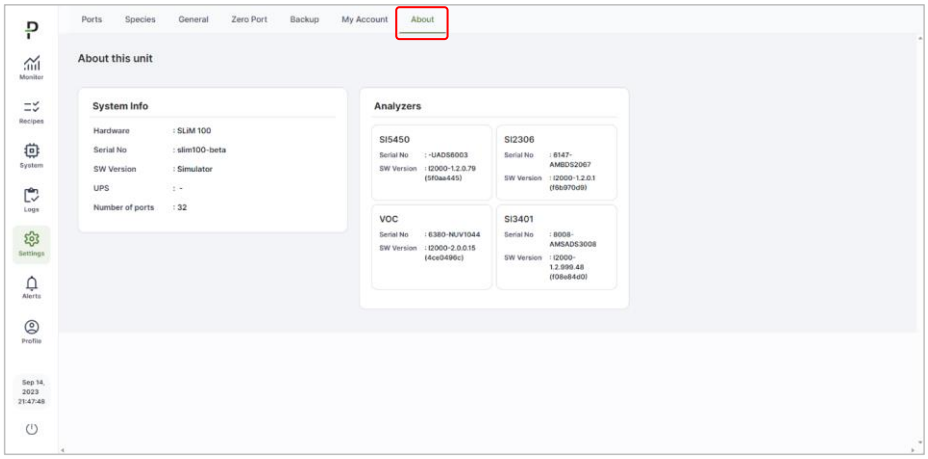
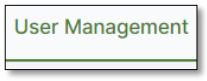


Figure 72: Settings Page – About Tab

9.8 User Management Tab



NOTE

The *User Management* tab only appears on the *Settings* page when the owner-designated Administrator (admin) is logged in.

The **User Management** tab provides the means for the administrator to add new users and manage each user's access and their respective roles. By clicking the **Create New** button the administrator can create a new user profile.

By clicking the ellipsis (**…**) in any user row (Figure 73), the administrator can:

- Edit existing user details including:
  - Email address
  - Groups
  - Alert Preferences
  - *Note that the Username field cannot be edited*
- Change user password
- Deactivate a user
- Remove a user

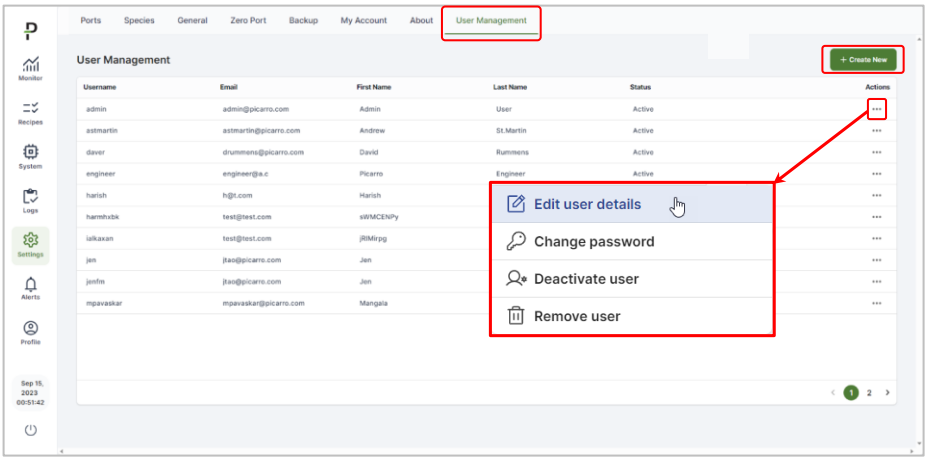


Figure 73: Settings Page – User Management Tab – Default View

Create New User

Clicking the **Create New** button opens the **Create New User** dialog (see Figure 74 and Figure 75). Here the admin can fill out all fields, set an initial password for the new user, assign groups, and set alert preferences.

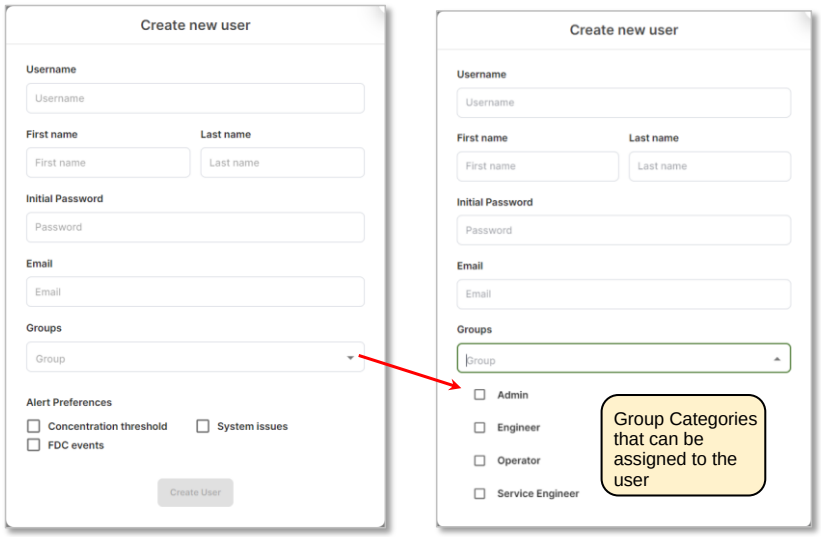


Figure 74: Create New User Dialog – Example

When any Alert Preferences are selected, any event notifications relevant to that selection will be sent to the user via email.

NOTE

When a new user is created, the Admin provides the user with the login credentials. At this point, the user would log in with the admin-provided password and then change the password to one of their choice that meets password security requirements.

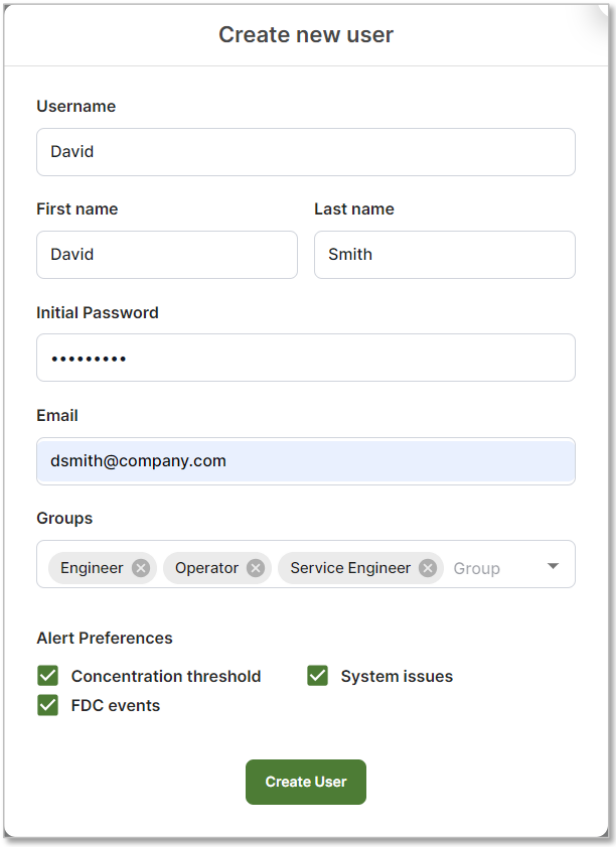


Figure 75: Completed New User Dialog

Edit a Current User

Shown in Figure 76 is an example Edit User Details dialog. The user's first and last name, email, groups, and alert preferences can be changed. *Note that the Username cannot be changed.*

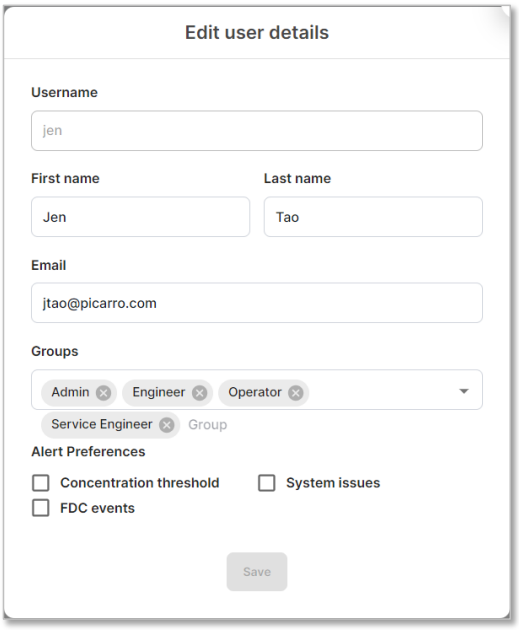


Figure 76: Edit User Details (Only by Admin)

Group Roles

The following User Roles (or permissions) shown in the **Groups** panel in Figure 74 are defined here:

- **Admin Access:**
  - **User Management** tab under **Settings** page. Only the User Administrator can access and edit items on the User Management tab which includes creating new users, editing, or removing existing users.
  - **Log, Backup,** and **Zero Port** downloads.
  - **Admin Restrictions:** Admin cannot download data, create, edit, run, or delete recipes.
- **Engineer Access**: Engineer role has the following access and restrictions.
  - **Monitor Page:** View and manipulate all features of Live Feed and Analysis tabs.

- **Recipes Page:** View and manipulate all features of Schedule and Recipe Library tabs including creation, edit, running and deletion of recipes, search, and modification of Recipe Library.
- **System Page:** View only.
- **Logs Page:** View and manipulate all features of Logs including search, filtering, and data download.
- **Settings Page:** View and manipulate available features in all tabs.
- **Engineer Restrictions: User Management** tab is not available or visible to Engineers.

- **Operator Access:**
  - **Monitor Page:** View and manipulate all features of Live Feed and Analysis tabs.
  - **Recipes Page:** View Schedule and Recipe Library tabs (search and view only on Library tab).
    - **Restrictions:** Cannot create, edit, run, or delete recipes.
  - **System Page:** View only.
  - **Logs Page:** View and manipulate all features of Logs including search, filtering, and download.
  - **Settings Page:** View permission only on all tabs
    - **Restrictions: User Management** tab is not available or visible to Operator.
- **Service Engineer Access:**
  - **Full access** as **Engineer.**
  - **Service Engineer Restrictions:** Cannot access **User Management** tab.

Alert Preference Categories

Any user can have alert preferences set so they can be notified via email when a concentration threshold has been breached, FDC (Fault Detection and Control) or other system issues have occurred. ***A user cannot set alert preferences. Contact the Administrator to request alert preference changes.***

When any of the categories shown in Figure 77 are checked, the user for which they are assigned will receive an alert email each time an event occurs, describing which parameter has issued an event message and the details of the that event. An example concentration threshold email alert is shown in Figure 78.

Figure 77: Alert Preference Categories

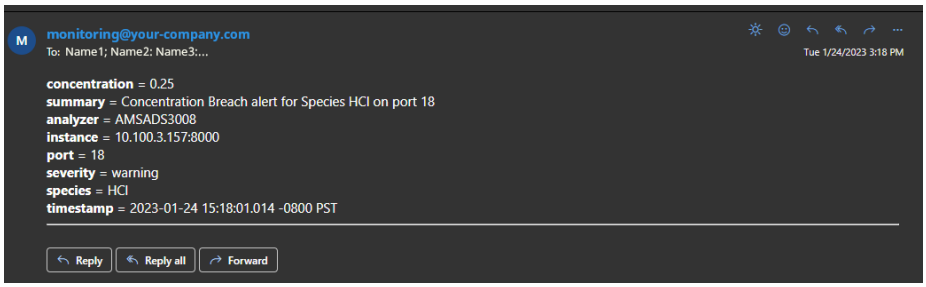


Figure 78: Concentration Threshold Alert Email Message – Example

Alert Category Definitions

- **Concentration Threshold:** Whenever a concentration warning or alarm threshold is breached, an email is issued describing the details of the breach, including species concentration, a summary of the event, which analyzer logged it, the port number, breach severity, molecule species, and timestamp (Figure 78).
- **System Issues:** This alerts the recipient when something malfunctions, such as hardware, communication, UPS status (if installed), or software within the system.
- **FDC Events:** This alerts the recipient when FDC (Fault Detection and Control) events occur.

10. Alerts Panel

Clicking this icon opens a list of any alerts that accumulate during the operation of the system and can be used to identify what actions may need to be taken.

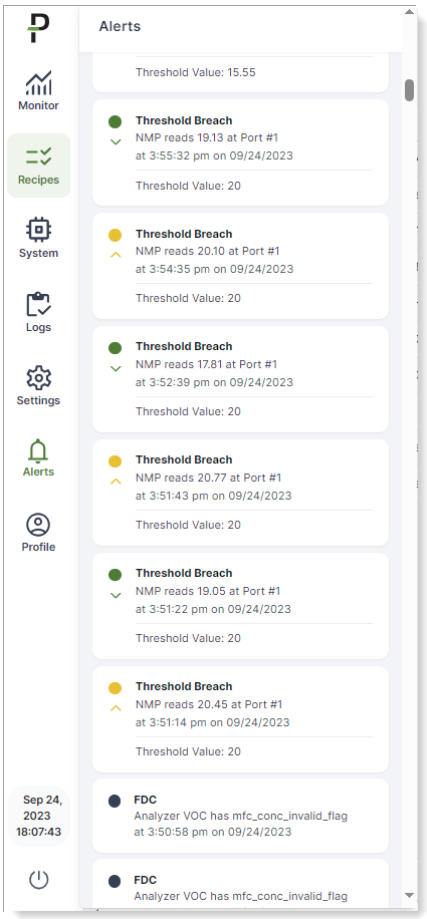


Figure 79: Alerts Window

11. Profile Menu

Clicking this icon on the navigation panel opens a selection screen of the current user from which they can view and edit their current account or log out of the current SLiM or SAM system.

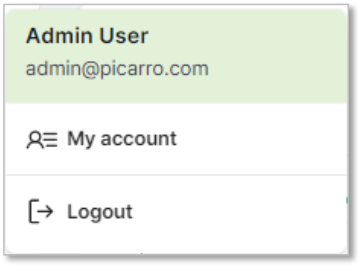


Figure 80: Example Profile Menu

About Picarro

Picarro is a leading provider of solutions to measure greenhouse gas (GHG) concentrations, trace gases, and stable isotopes across many scientific applications, along with the energy and utilities markets. Our patented Cavity Ring-Down Spectroscopy (CRDS) is at the heart of all Picarro instruments and solutions, enabling the detection of target molecules at part per billion or better resolution.

Product Support

Utilize Picarro support resources for product support. Join the Picarro community to ask questions and get answers, search the document library for datasheets and user manuals, download software, and purchase products and replacement parts.

Access to online User Manuals is available to all registered Picarro customers with login credentials. If you do not yet have an account, please email us at support@picarro.com to request access. Note must be a registered user and logged in to access the following resources:

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Phone:	+ 1 408 962 3991	Phone:	+31 85 888 1650	Phone:	+ 1 408 962 3992