AYRDYNE® 4.1

Installation, Operation, and Maintenance Manual

Last updated 02/21/2025

Edition notice

DenTech Industrial
1975 N. Reading Rd.
Denver, PA 17517

For customer support, please contact our service technicians.

Phone: (717) 335-4899
Email: service@dentechindustrial.com
Or visit dentechindustrial.com/customer-support

AD-IOM
Printed in the USA.
The PDF version of this manual is available on ayrdyne.com

Table of Contents

1. Overview

1.1 Introduction

The purpose of this document is to outline proper installation, maintenance, operation, and care of the AyrDyne® Monitoring System Human Machine Interface (HMI). This document is in no way intended to be used to determine the reliability of this product outside of its originally intended application. It is the duty of the end user or integrator to perform the appropriate risk analysis to determine the relevance of its use within any specific application.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

Failure to follow the guidelines outlined in this manual may result in injury, harm, or improper operating results. Failure to observe this information may also result in equipment damage, premature wear, or failure.

1.2 Safety notice

The installation, maintenance, operation, and care of the AyrDyne® Monitoring System Human Machine Interface (HMI) should only be performed by individuals who are qualified and trained to do so. A “qualified” person in this context is a person who has skills and knowledge related to the construction and operation of electrical equipment and its installation through both work experience and training. Additionally, a qualified person is one who has received and undergone safety training specific to electrical maintenance.

Anyone who has not undergone safety training specific to this system should not operate or perform maintenance on the system.

In terms of maintenance of this system, “lock out tag out” safety protocol applies. This means that any time maintenance on this system is performed, the machine must be shut down, unplugged, and tagged or labeled, explaining that maintenance is taking place.

DenTech is not liable for any consequences arising from misuse of this system.

If you are unsure of whether you are qualified to use or maintain this system, please contact an electrician or other qualified professional for assistance. Failure to follow safety protocol for this and any other system could result in serious bodily harm or other injury.

No responsibility is assumed by DenTech for any consequences arising out of the use of this material.

This symbol indicates that an electrical hazard exists, which could result in personal injury if the instructions are not followed.

This safety alert symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

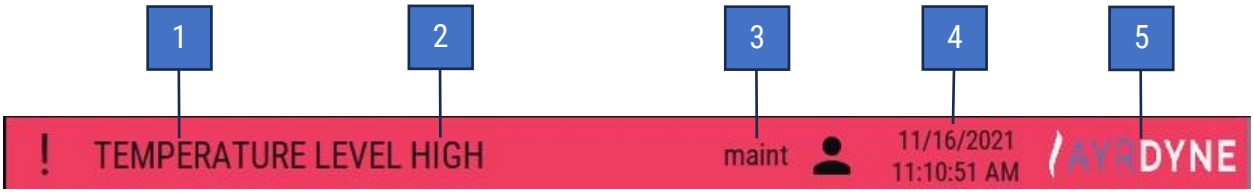
2. Operation

2.1 System

This section covers the navigation and operation of the standard AyrDyne Monitoring System. The operation and functionality of each screen is covered in detail in later sections. The outline below shows the layout of the screens. Available screens may vary, depending on system requirements and configuration.

- System – Contains system-wide monitoring, settings, and controls
    - Overview – The first screen to display when power is applied. This shows an overview of the system.
    - Metrics – System metrics
    - Alarms – Alarms monitoring and control
    - Settings – User settings, IO settings, and settings for analog and digital devices
- Filters – Contains all monitoring, settings, and controls related to filters
    - Primary Info – Primary filter differential pressure monitoring and cleaning
    - Primary Settings – Primary filter cleaning settings
    - Primary Solenoids – Primary filter cleaning system monitoring and manual control
    - Secondary Info – Secondary filter differential pressure monitoring
- Airflow – Contains all monitoring, settings, and controls related to airflow
    - Airflow Control – Airflow monitoring and control settings
    - VFD Settings – VFD monitoring and parameter entry
- Discharge – Contains all monitoring, settings, and controls related to the discharge system
- Safety – Contains all monitoring, settings, and controls related to safety

2.1.1 Status bar overview

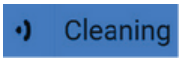


The status bar is visible on all screens. This bar displays system information, active alarm description, and corrective action.

1. System state indicator - This graphic display shows the current system state.

System is Stopped

System is Running



System is Cleaning

System is Faulted

2. System faults - This text display shows details of any active faults as well as corrective actions.

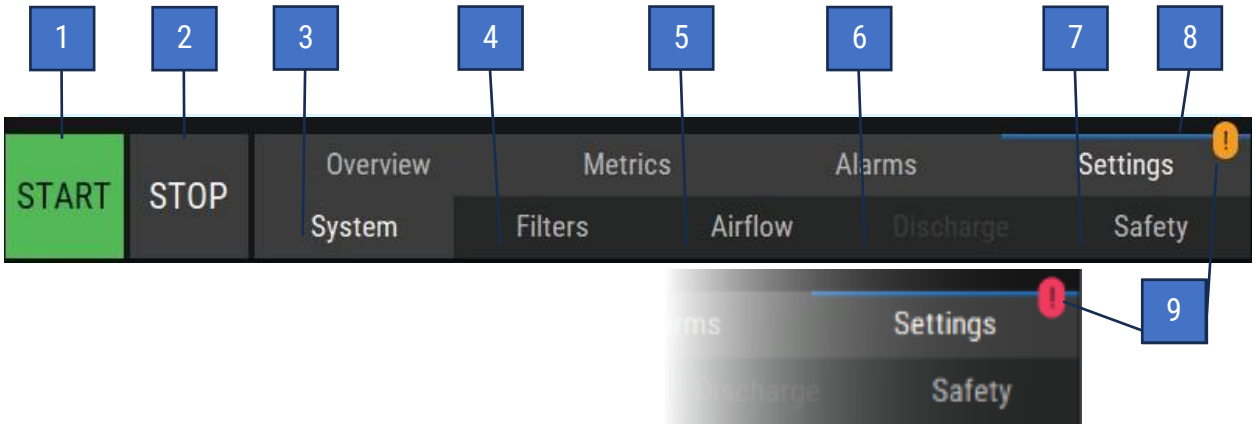
3. User - Shows the user who is currently logged in. Pressing the user icon will log out the current user.

4. Time and date - This graphic display shows the internal date and time. Pressing this will display a pop-up entry page where the time and date can be adjusted.

5. Logo - Pressing the logo will display information for support with the AyrDyne system, including customer support contacts, system information, and ordering spare or replacement parts.

Once on the information screen, you may press anywhere on the screen to return to the home screen.

2.1.2 Navigation bar overview



The navigation bar is located at the bottom of each screen.

1. START – This button starts the system.

2. STOP – On the first press, this button initiates shutdown of blower. On the second press, this button initiates shutdown of components pertaining to downtime cleaning sequence.

Note: When there is an active fault, the Clear Faults button displays instead of the Stop button. After the corresponding fault conditions have been eliminated, press the Clear Faults button to clear all faults.

3. System – This button displays the system screen.

4. Filters – This button displays the filters screen.

5. Airflow – This button displays the airflow screen.

6. Discharge – This button displays the discharge screen.

7. Safety – This button displays the safety screen.

8. Current screen indicator – The blue line and white font indicate the screen currently displayed.

9. Alarm and warning indicators – These bubbles with exclamation points denote warnings (when orange) and alarms (when red).

2.1.3 Main screen overview

1. Primary filter DP – This numeric display and dial display show the filtered differential pressure measured between the dirty and clean sides of filters.

2. Primary filter life - This numeric display and dial display show filter status and remaining life.

3. Data plot - This graphical display shows the filter differential pressure over time. The timeline view can be changed from one day to six months.

4. Airflow - This numeric display and bar graphic show the system static pressure, velocity, or volume measured.

5. VFD (Hz) - This numeric display shows VDF output frequency (measured in Hertz).

6. Uptime (Hrs) - This numeric display shows the total time that the collector has been powered on (including time running, time stopped, and time faulted).

7. Stopped time (%) - This numeric display shows what percentage of the uptime was spent stopped.

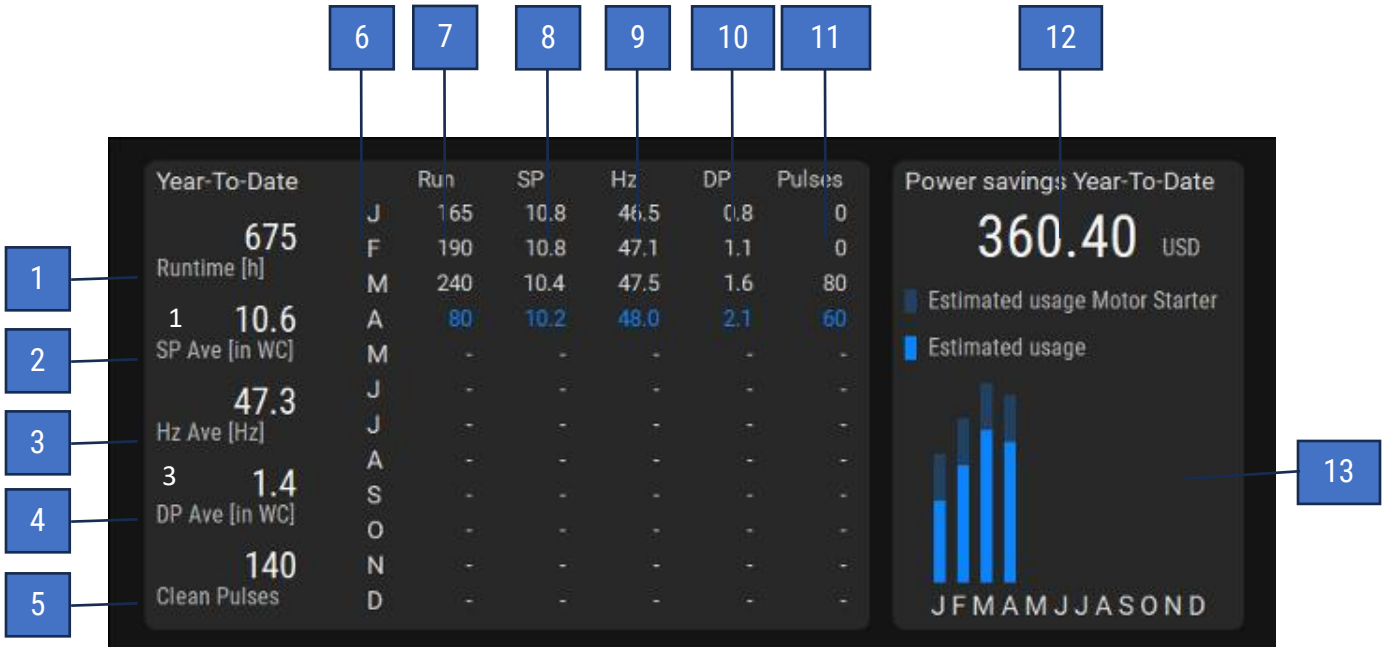
8. Running time (%) - This numeric display shows what percentage of the uptime was spent running.

9. Faulted time (%) - This numeric display shows what percentage of the uptime was spent in a fault condition.

10. Auto stop (Hrs) - This shows the status of the auto stop.

- Auto Stop Disabled by REM run
    - Auto Stop is not available when using the remote run signal.
- Schedule Auto Stop
    - Press and follow on-screen prompts to schedule an auto stop.
- Auto Stop in hhh:mm:ss
    - Shows the remaining hours, minutes, and seconds until the system automatically stops.

2.1.4 Metrics (static pressure)



1. Runtime (h) - This numeric display shows the total system runtime for the calendar year (measured in hours). This metric is not resettable.

2. SP Ave (in WC or FPM) - This numeric display shows the average static pressure for the calendar year. This metric is not resettable.

3. Hz Ave - This numerical display shows the average blower frequency for the calendar year (measured in Hertz). This metric is not resettable.

4. DP Ave - This numeric display shows the average differential pressure for the calendar year. This metric is not resettable.

5. Clean pulses - This numeric display shows total cleaning pulses executed by the filter cleaning system for the calendar year (if equipped).

6. Month - This column shows the month of the year for the saved metrics. Blue numbers in the corresponding rows represent the current month.

7. Run - This numeric display shows the total system runtime for the corresponding month (measured in hours). This metric is not resettable.

8. SP or FPM - This numeric display shows the average static pressure (SP) in WC or feet per minute (FPM), depending on the system configuration, for the corresponding month. This metric cannot be reset.

9. Hz - This numeric display shows the average blower frequency for the corresponding month (measured in Hertz). This metric is not resettable.

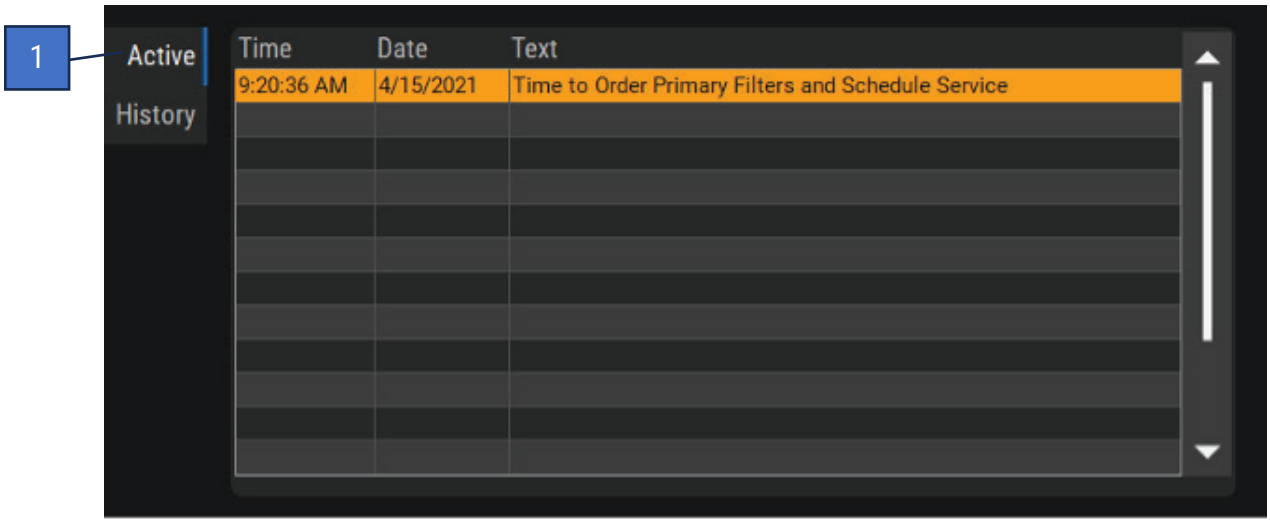
10. DP - This numeric display shows the average differential pressure for the corresponding month. This metric is not resettable.

11. Pulses - This numeric display shows the average differential pressure for the corresponding month. This metric is not resettable.

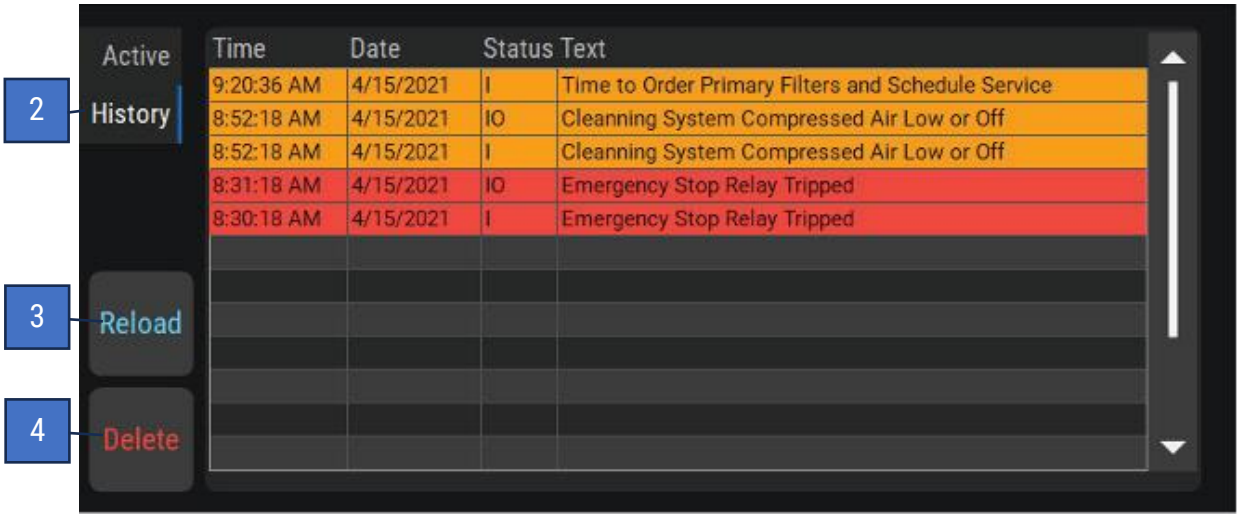
12. Power savings year-to-date (USD) - This numeric display, visible when equipped with a VFD, shows estimated power usage cost savings on a yearly basis, in comparison to the usage of a motor starter.

13. Estimated power usage month display - This bar graph shows estimated power usage each month if equipped with a VFD.

2.1.5 Alarms



1. Active - This tab shows active alarms with a time stamp of when the alarm occurred and a description of that alarm.

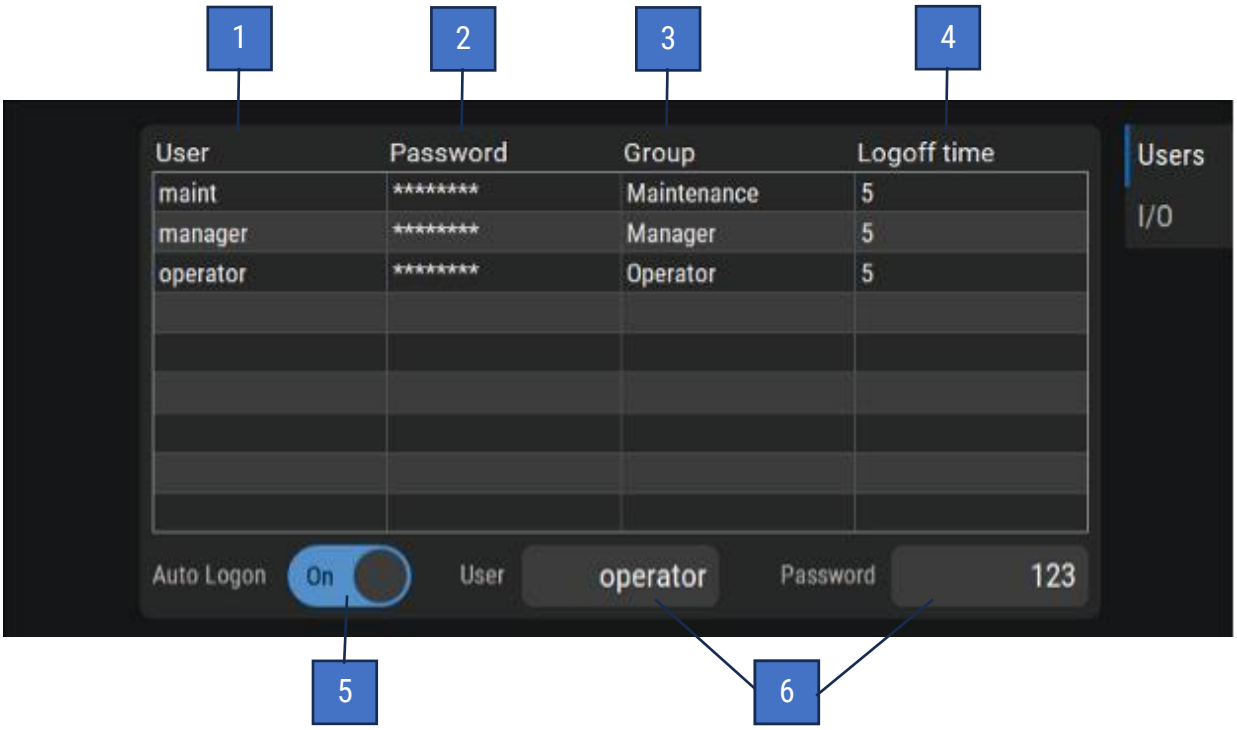


2. History - This tab shows previously active alarms with a time stamp and description of each alarm.

3. Reload – This button reloads the alarm history on the screen.

4. Delete – This button deletes the alarm history on the screen.

2.1.6 Settings: Users



1. User – Shows the users in the system.

2. Password – Shows the password for the respective user.

3. Group – Shows the group for the respective user:

- **Manager** - Can perform any operation on the system and add or remove users, change group assignments, and change passwords for any user
- **Maintenance** - Can perform any operation except for user administration. May change their own password or logoff time.
- **Operator** - Can change settings on the system that are not part of the airflow and balancing. May change their own password or logoff time.

4. Logoff time - Shows the inactivity time in minutes that the respective user has prior to being logged off automatically.

5. Auto logon - Allows the manager to set up Auto Logon. When enabled, the system will attempt to log on the user as specified in the user and password fields. **Note:** These fields ARE NOT linked to the user administration table.

Changing usernames and passwords in the table will break the auto logon feature until the user and password are updated in the auto logon fields.

6. Default users and passwords - The system ships with the default users and passwords. Be sure to make your passwords secure and document them.

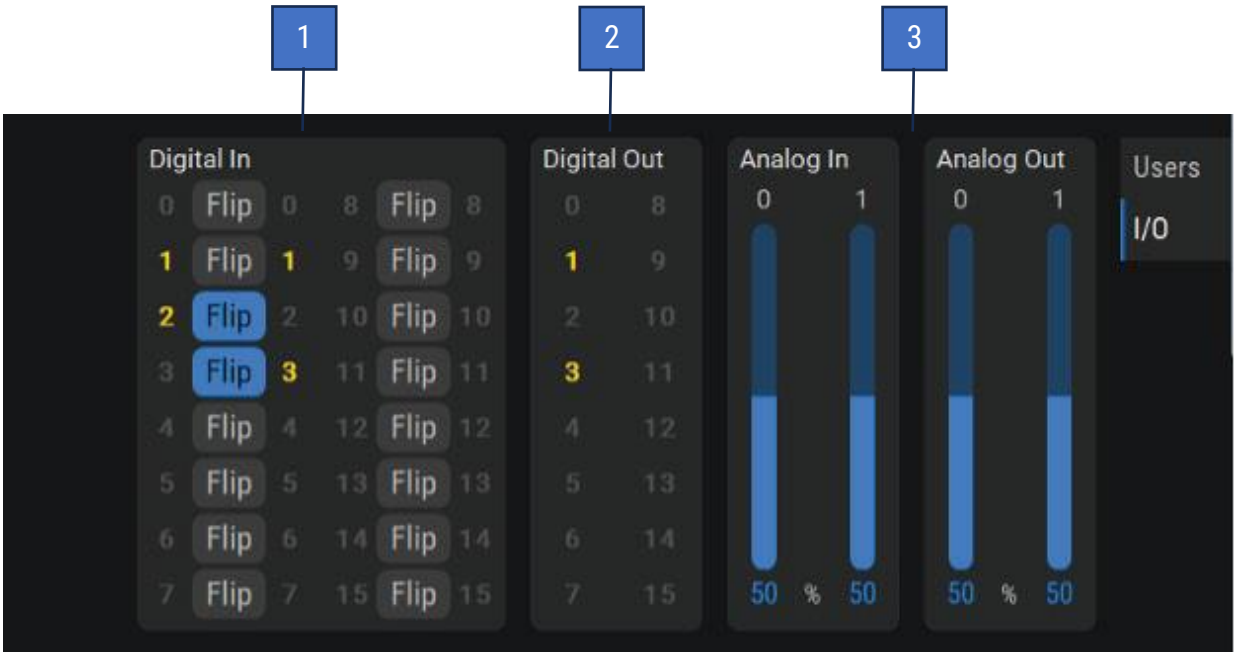
To create a new user:

1. Log in as a manager
2. Press on an empty row in the table
3. Assign a user, password, group, and logoff time

To change a user's password:

1. Press on **Password**
2. Follow on-screen prompts

2.1.7 Settings: I/O



1. Digital In

This graphic display shows the status of each input. A gray number indicates that the corresponding input is OFF. A yellow number indicates that the corresponding input is ON.

Each input may also be flipped by the "Flip" button immediately to the right. When the "Flip" button is gray, the input remains wired. When the "Flip" button is blue, the input state is flipped. The number immediately to the right of the "Flip" button shows the status of the input as evaluated in the program.

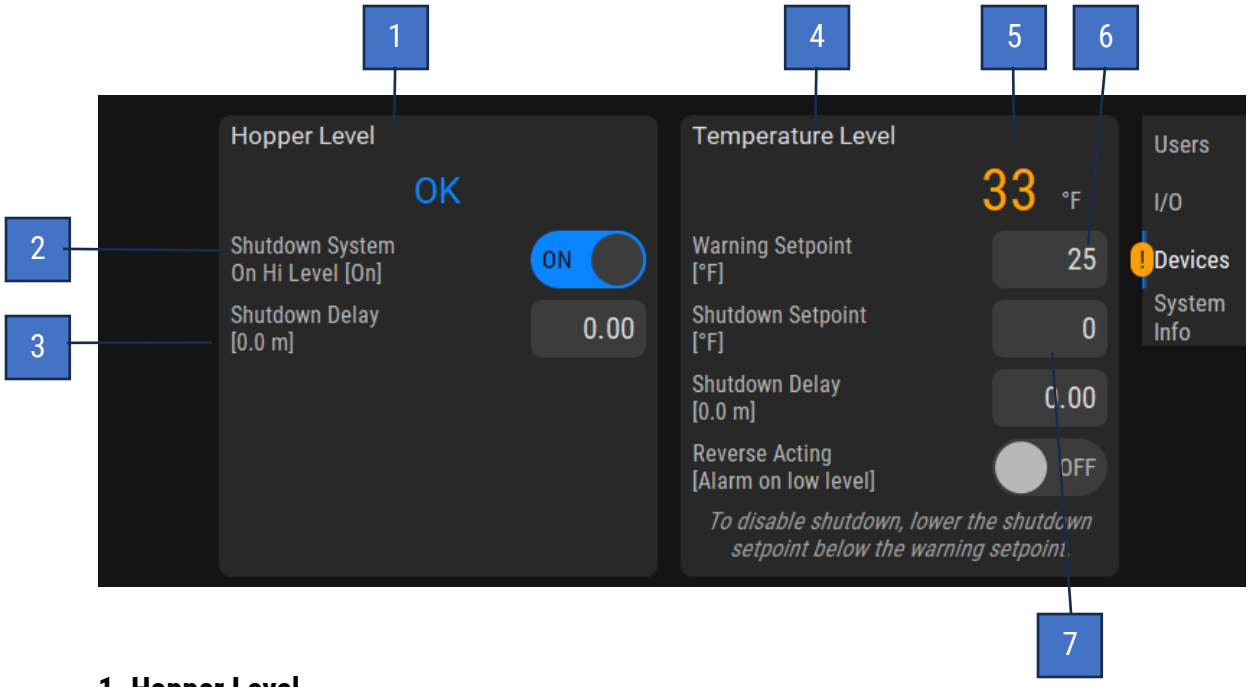
2. Digital Out

This graphic display shows the status of each output. A gray number indicates that the corresponding output is OFF. A yellow number indicates that the corresponding output is ON.

3. Analog In and Analog Out

This graphic display shows the signal of each analog input/output from 0 to 100%.

2.1.8 Settings: Devices



1. Hopper Level

The following settings will be consistent with any device that provides a digital fault/OK signal and is not limited to level sensors.

2. Shutdown System On Hi Level [On]

This toggle enables a shutdown fault of the collector when there is a high level. When switched off, the collector will continue to run, but a warning indicator will continue to display the active fault.

3. Shutdown Delay [0.0 m]

This numeric entry/display shows the amount of time a level fault must be active before the collector is shut down.

4. Analog Level 1

The following settings will be consistent with any device that provides an analog feedback signal and is not limited to temperature sensors.

5. Temperature

This numeric display shows the analog feedback signal of the device.

6. Warning Setpoint

This numeric entry/display shows the setpoint that the analog signal must rise above to initiate a warning.

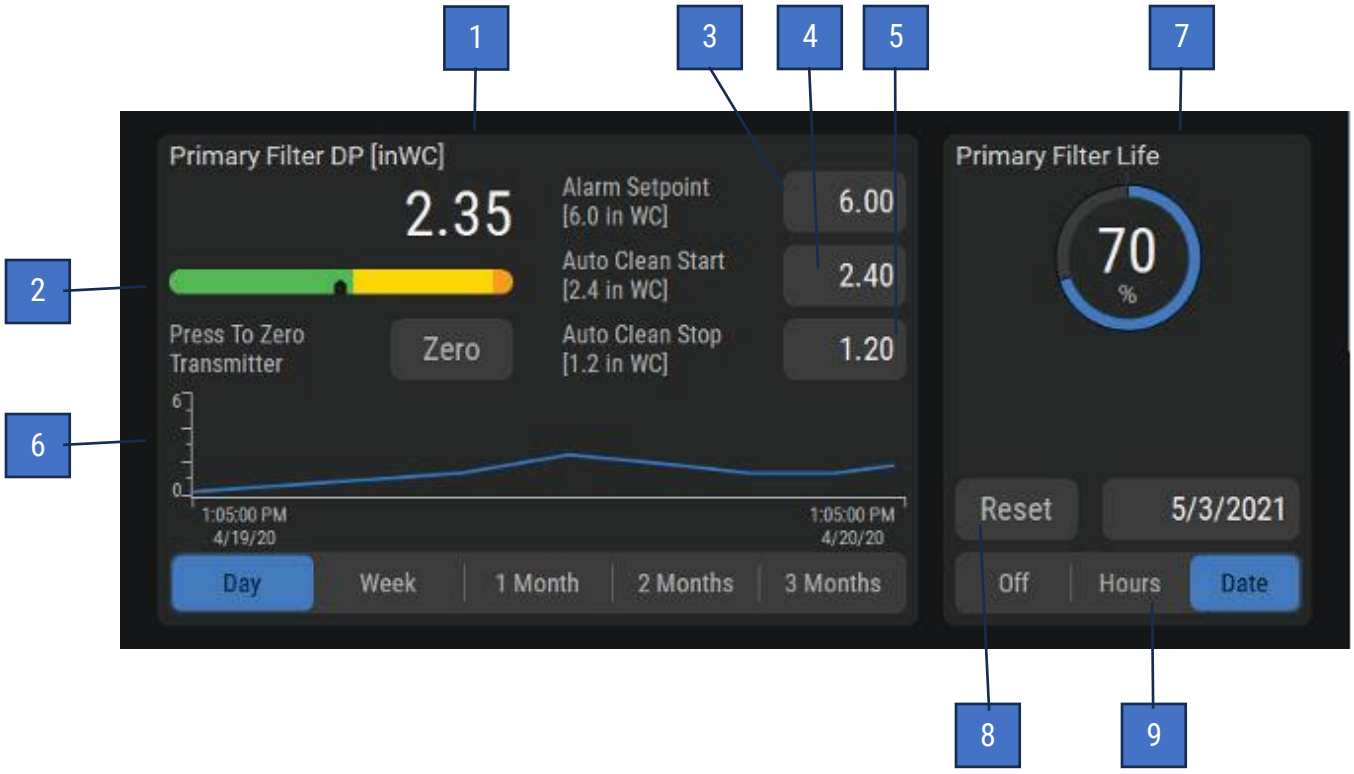
7. Shutdown Setpoint

This numeric entry/display shows the setpoint that the analog signal must rise above to initiate a fault. This will shut down the collector. Shutdown can be disabled by setting the shutdown setpoint lower than the warning setpoint.

2.2 Filters

This section covers filter settings and information.

2.2.1 Primary info



1. Primary Filter DP

This numeric display and segmented bar graph show the filter differential pressure measured between the dirty and clean sides of the filters.

2. Zero

The Zero button will zero the differential pressure reading, should it wander from zero over the lifespan of the differential pressure sensor. This can be done only when the system is not running.

Disconnect the pneumatic tubing from the control panel before pressing the Zero button.

3. Alarm Setpoint

This numeric entry/display shows the setpoint that the differential pressure must rise above to initiate an alarm. This value is adjustable between the Clean Start Setpoint and max. transmitter output. The factory default setting is 6 inWC.

4. Auto Clean Start

This numeric entry/display shows the setpoint that the differential pressure must rise above to start On Demand cleaning.

This value is adjustable between the Clean Stop Setpoint and Alarm Setpoint. The factory default setting is 2.4 inWC.

Note: Auto Clean Start is not available on RF units.

5. Auto Clean Stop

This numeric entry/display shows the setpoint that the differential pressure must fall below to stop On Demand cleaning. This value is adjustable between min. transmitter output and the Clean Start Setpoint. The factory default setting is 1.2 inWC.

Note: Auto Clean Stop is not available on RF units.

6. Data Plot

This graphic display shows the filter differential pressure over time. The timeline view can be changed from one day to three months.

7. Primary Filter Life

This numeric display and dial display show the estimated remaining life of the filter, based on user-set parameters. When the filter is nearing the end of life, it will remind you to order or schedule the filter change. Once the filter has reached end of life, it will prompt you to change the filter.

8. Reset

The Reset button resets the hour meter or date. It should be pressed after filters are replaced.

9. Filter Life Settings

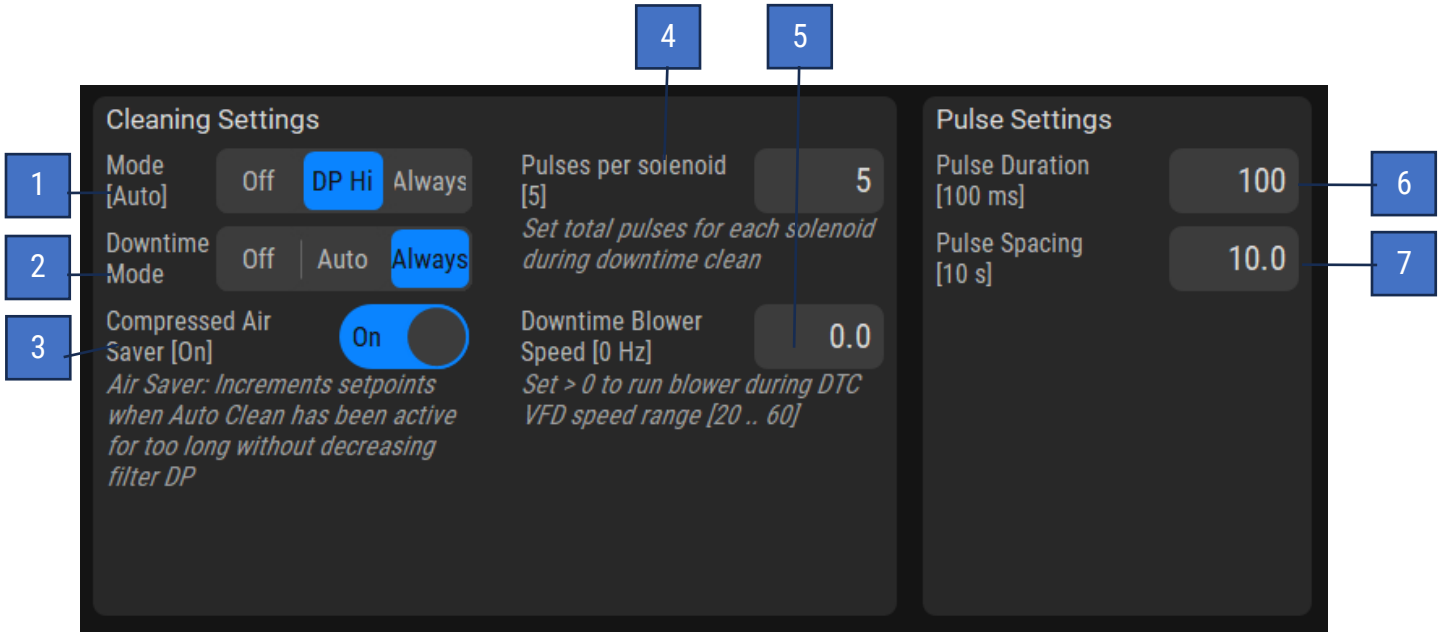
This selection sets when the system will remind the user to change filters.

When Hours is set, there will be a reminder after a certain number of hours, which can be set by the user.

When Date is set, there will be a reminder on the day that is set.

2.2.2 Primary settings for filters

For non-RF/RP units



1. Mode

These toggles select the cleaning mode.

- **Off** – This switch turns the cleaning system off.
- **DP Hi** – This toggle switch turns the cleaning system to automatic mode. In this mode, the cleaning sequence is activated any time the differential pressures reaches the Auto Clean Start setpoint and stops when it reaches the Auto Clean Stop setpoint.
- **Always** – This toggle turns the cleaning system on to clean constantly while the blower is running.

2. Downtime Mode

These toggles select the downtime mode.

- **Off** – System will never perform downtime clean.
- **Auto** – System will perform downtime clean if it was cleaning at the time of stopping.
- **Always** – System will perform downtime clean every time it is stopped.

3. Compressed Air Saver

This toggle turns the Compressed Air Saver on and off. When enabled, the Auto Clean Start and Auto Clean Stop setpoints will be increased if the Auto Clean is active for 8 consecutive hours.

4. Pulses per solenoid

This numeric entry/display shows how many times each solenoid will be pulsed during downtime cleaning.

5. Downtime Blower Speed (Hz)

This numeric entry/display shows the speed the blower will run at during downtime cleaning.

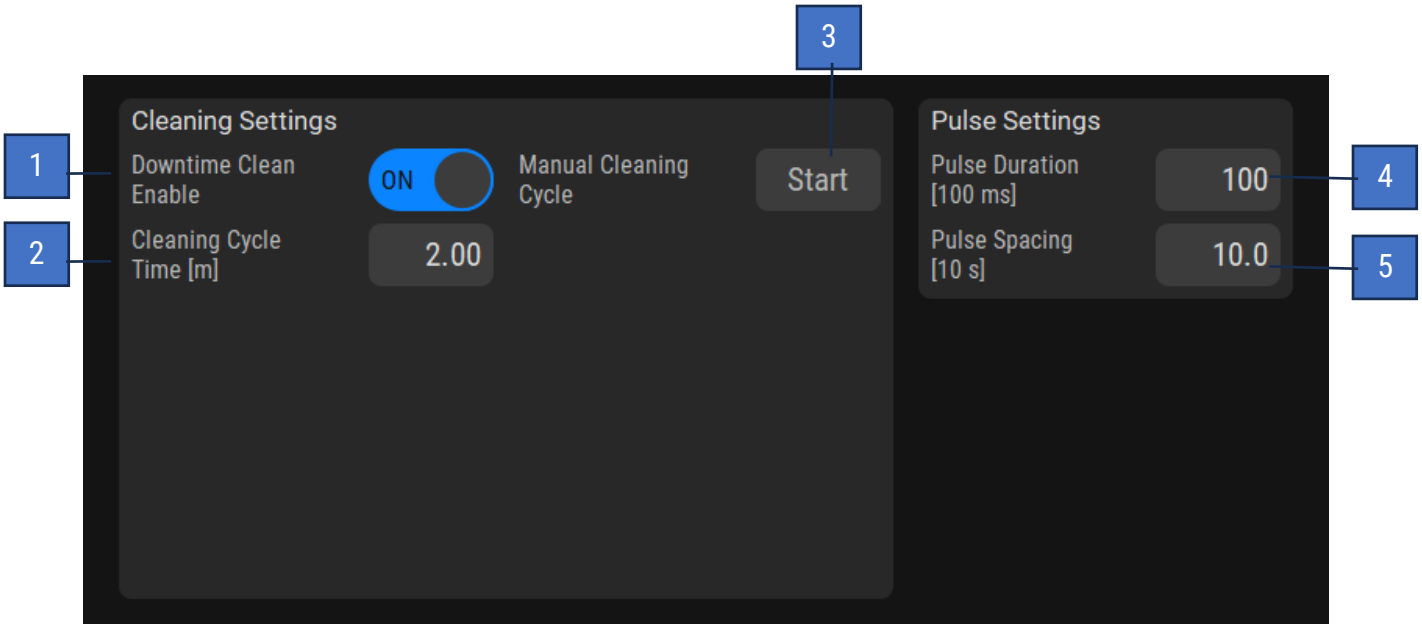
6. Pulse Duration (ms)

This numeric entry/display shows the duration of each cleaning pulse. This value is adjustable between 50 and 500 milliseconds. The factory default setting is 100 ms.

7. Pulse Spacing (s)

This numeric entry/display shows the delay between each cleaning pulse. This value is adjustable between 1 and 20 seconds. The factory default setting is 10s.

Primary settings for filters on RF units



1. Downtime Clean Enable

When this is enabled, the system will perform a cleaning cycle upon stopping the system.

Note: Cleaning cycle will only be initiated if it is stopped when the system status is “Running.” It will not start if the system is stopped when the system status is “Starting.”

2. Cleaning Cycle Time [m]

This numeric entry/display shows the amount of time (in minutes) that the system will perform a cleaning cycle.

3. Manual Cleaning Cycle

When this button is pressed a cleaning cycle will be performed. Note: A cleaning cycle will only be initiated if the system status is “Stopped.”

Note: A manual cleaning cycle can be stopped by pressing the stop button twice.

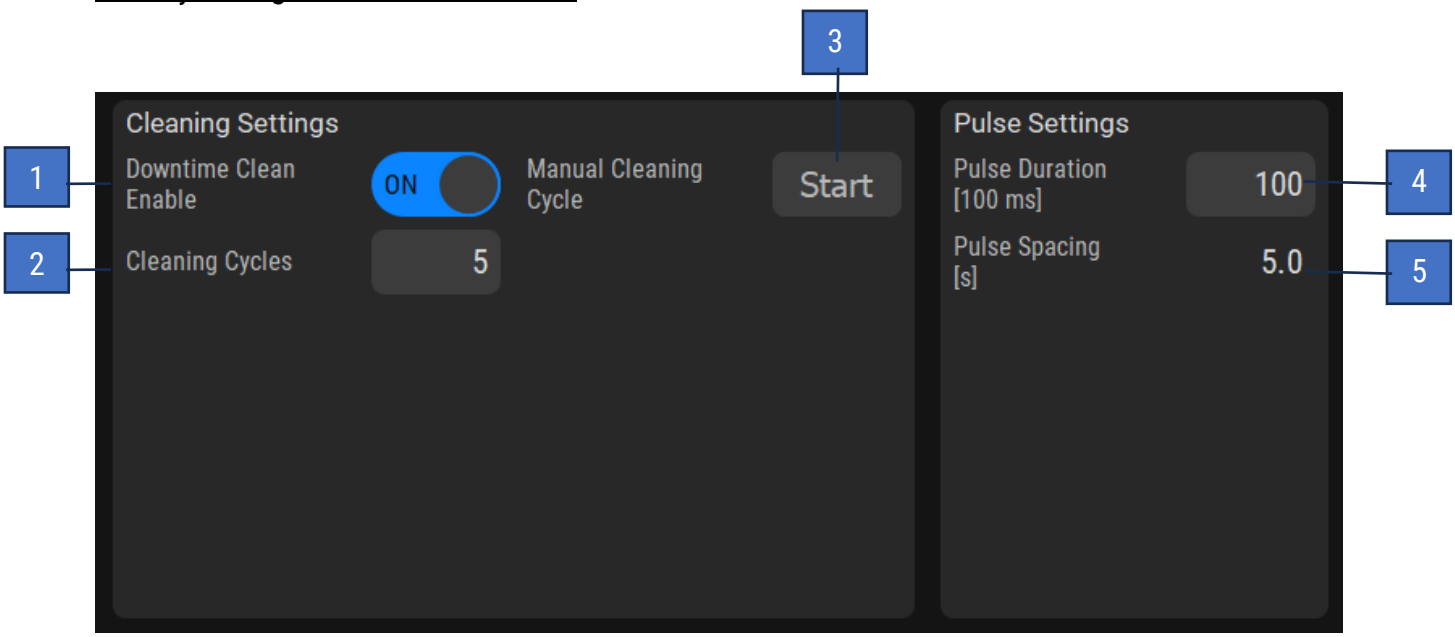
4. Pulse Duration [100 ms]

This numeric entry/display shows the duration of each cleaning pulse. This value is adjustable between 50 and 500 milliseconds. The factory default setting is 100 ms.

5. Pulse Spacing [10 s]

This numeric entry/display shows the delay between each cleaning pulse. This value is adjustable between 1 and 20 seconds. The factory default setting is 10 s.

Primary settings for filters on RP units



1. Downtime Clean Enable

When this is enabled the system will perform a cleaning cycle upon stopping the system.

Note: Cleaning cycle will only be initiated if it is stopped when the system status is “Running.” It will not start if the system is stopped when the system status is “Starting.”

2. Cleaning Cycles

This numeric entry/display shows the number of cleaning cycles.

One cleaning cycle on an RP unit represents 4 full rotations of the cleaning arm. Four rotations are required to clean every single filter.

3. Manual Cleaning Cycle

When this button is pressed a cleaning cycle will be performed. Note: A cleaning cycle will only be initiated if the system status is “Stopped.”

Note: A manual cleaning cycle can be stopped by pressing the stop button twice.

4. Pulse Duration [100 ms]

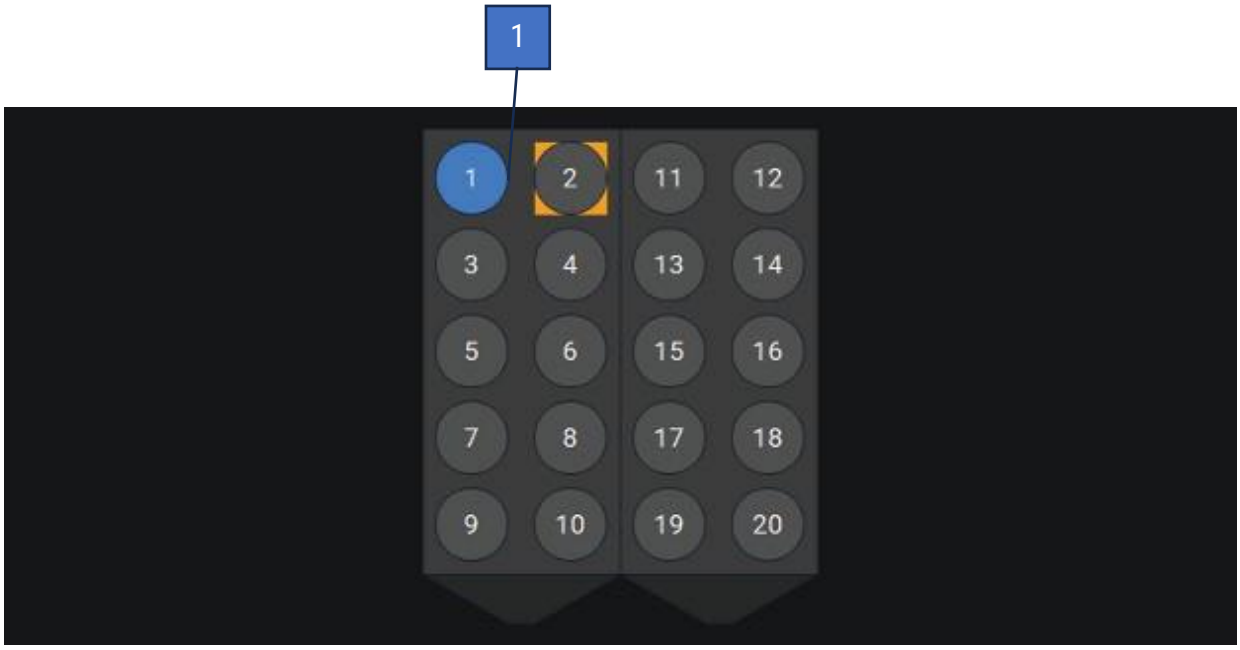
This numeric entry/display shows the duration of each cleaning pulse. This value is adjustable between 50 and 500 milliseconds. The factory default setting is 100 ms.

5. Pulse Spacing [s]

This numeric entry/display shows the delay between each cleaning pulse. This value is not editable on RP units.

2.2.3 Primary solenoids

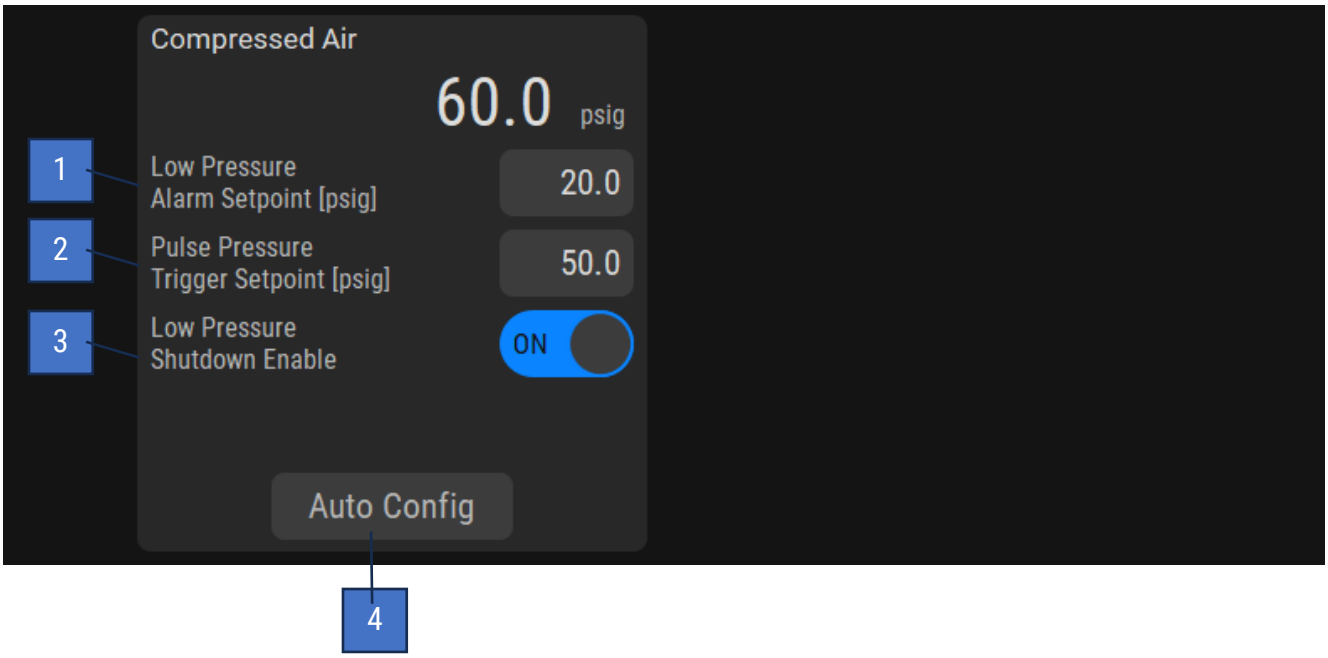
This screen enables the user to manually pulse each solenoid valve on the selected Module. Each solenoid is numbered and may be pressed to fire the solenoid valve manually.



The Compressed Air Monitoring Device detects failures and leaks, if equipped with the compressed air monitoring device. When the same solenoid fails to pulse two times, it is highlighted orange, and an alarm is produced. In addition, the monitoring system will detect air leaks on the solenoid manifold, at which time it will alarm. The leak can also be pointed to a solenoid if it started after a specific solenoid was pulsed.

1. Compressed Air Monitoring

When equipped with a Compressed Air Monitoring Device, the solenoids will appear with an orange highlight if a fault is detected. The number of modules and valves per module depends on the user's system. Modules not displayed on the screen may be selected from the navigation buttons on the left of the screen.



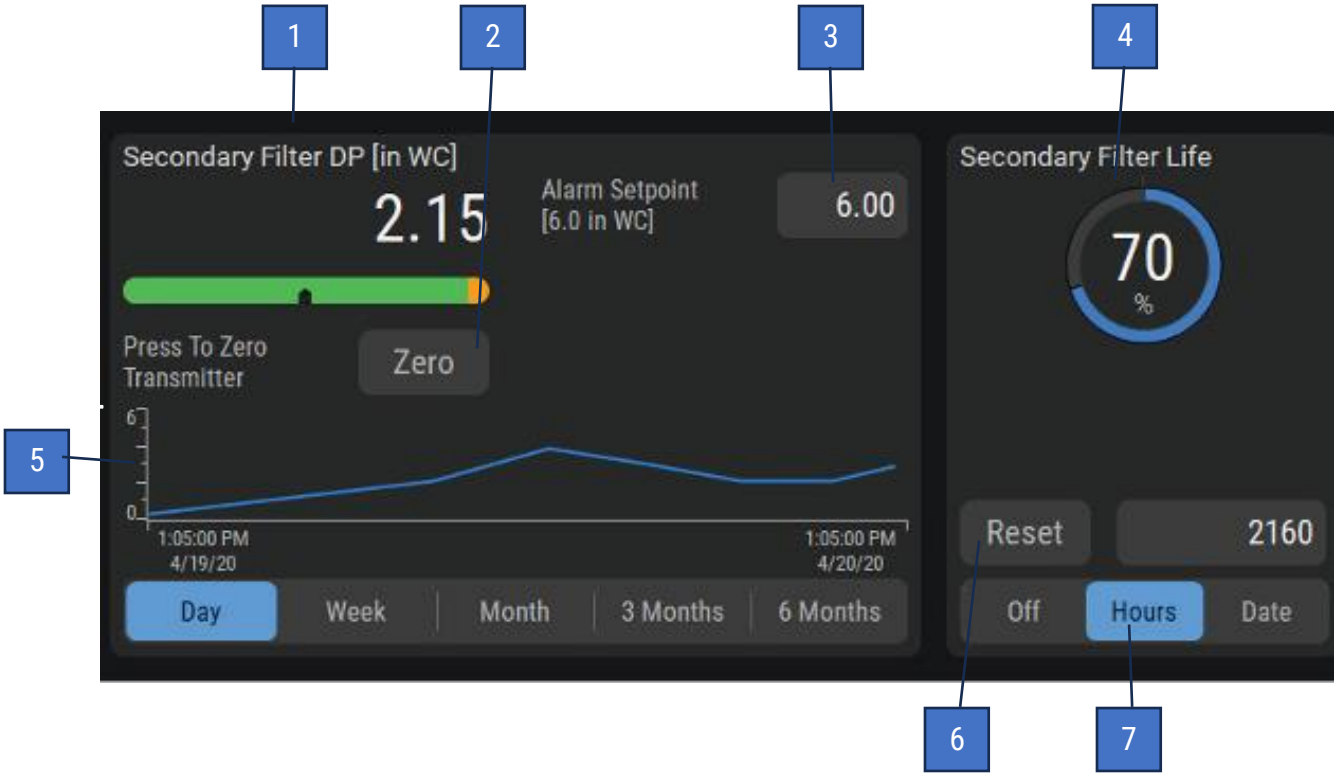
1. Low Pressure Alarm Setpoint
System will alarm if the pressure falls below this setpoint.

2. Pulse Pressure Trigger Setpoint
This is the setpoint the system expects the pressure to fall below when successfully pulsing a solenoid.

3. Low Pressure Shutdown Enable
System will shut down on a low-pressure alarm if this is turned on.

4. Auto Config
System will perform an auto configuration sequence to determine the pulse pressure trigger setpoint. Note: System must be running to start auto configuration and will pulse all cleaning solenoids multiple times. Auto configuration can take 12-20 minutes depending on the number of solenoids. Lower pulse spacing time will decrease the time it takes to perform an auto configuration sequence.

2.2.4 Secondary information



1. Secondary Filter DP

This numeric display and segmented bar graph show the filter differential pressure measured between the dirty and clean sides of the filters.

2. Zero Meter

The Zero button will zero any differential pressure reading, should it wander from zero over the lifespan of the differential pressure sensor. This can be done only when the system is not running. Additionally, the pneumatic tubing should be disconnected from the control panel.

3. Alarm Setpoint

This numeric entry/display shows the setpoint that the differential pressure must rise above to initiate an alarm. This value is adjustable between the min. and max. transmitter outputs. The factory default setting is 6 inWC.

4. Secondary Filter Life

This dial display shows the estimated remaining life of the secondary filter. When the filter is nearing end of life, it will remind you to order or schedule the filter change. Once the filter has reached end of life, it will prompt you to change the filter.

5. Data Plot

This line graph display shows the filter differential pressure over time. The timeline view can be changed from one day to six months.

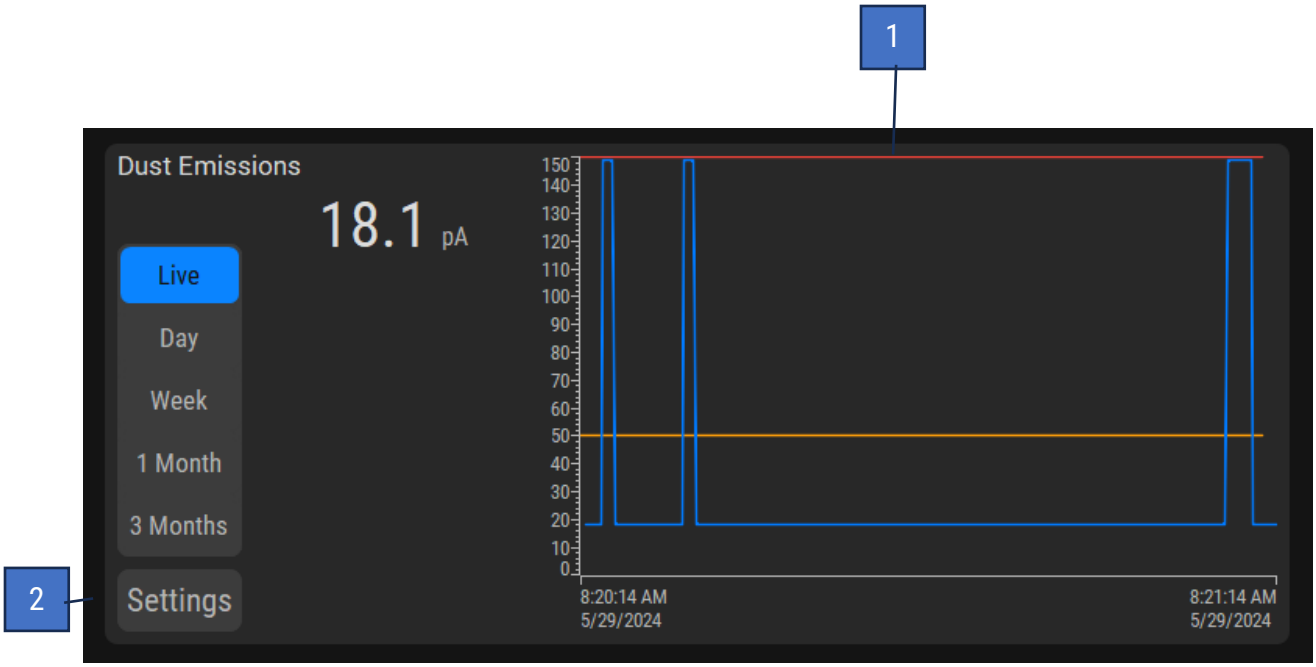
6. Reset

This button resets the hour meter or date, after the filters have been replaced.

7. Filter Life Settings

This selection sets when the system will remind the user to change filters. When Hours is set by the user, there will be a reminder after a certain number of hours. When Date is set by the user, there will be a reminder on the day that is set.

2.2.5 Dust emissions



This screen shows the particulate detected by the dust emissions sensor.

1. Trend lines:

- Blue - Shows the particulate level
- Orange - Shows the warning setpoint
- Red - Shows the alarm setpoint.

The buttons on the left can be used to change the time frame of the trend.

2. Settings

Tap on this button to access dust emission settings.

Auto Calibration Start
Press the Start button to begin an auto calibration sequence to determine the warning setpoint and alarm setpoint. Note: System must be running to perform an auto calibration and will pulse solenoids multiple times. Auto calibration will take approximately 6 minutes.

Warning Setpoint [pA]

This numeric entry/display shows the setpoint at which the system will indicate a warning.

Alarm Setpoint [pA]

This numeric entry/display shows the setpoint at which the collector will shut down.

Shutdown System On Fault

This toggle enables a shutdown fault of the collector when the alarm setpoint is reached. When switched off, the collector will continue to run, but a warning indicator will continue to display the active fault.

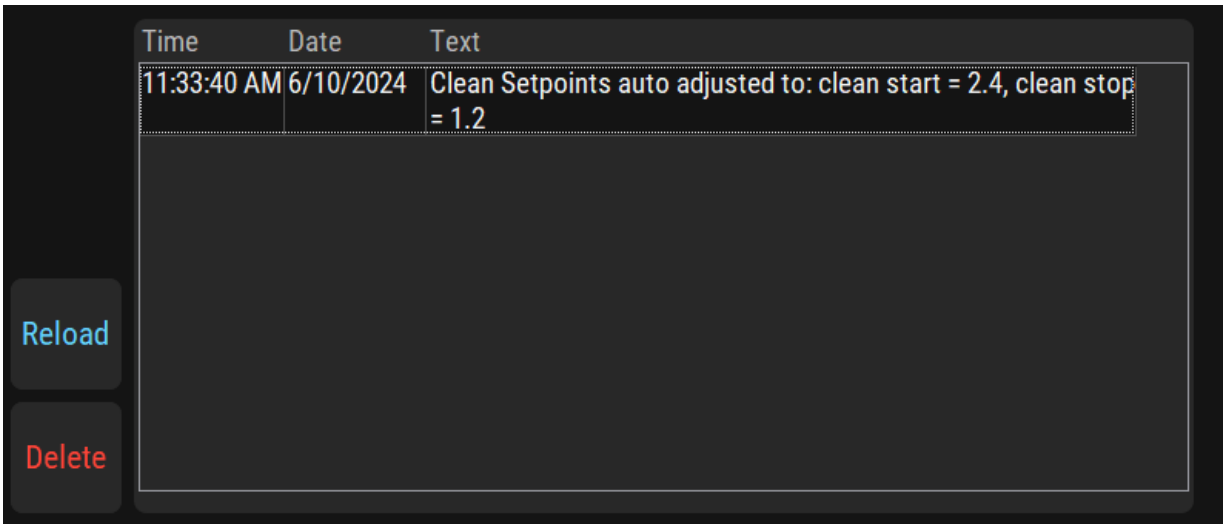
Shutdown Delay [s]

This numeric entry/display shows the amount of time after reaching the alarm setpoint that the collector will shut down.

Scale Max Range [pA]

This numeric entry/displays shows the max range to scale the particulate reading. Note: This setting must be set to the same range as the particulate sensor or else this feature will not function properly.

2.2.6 Clean setpoint log

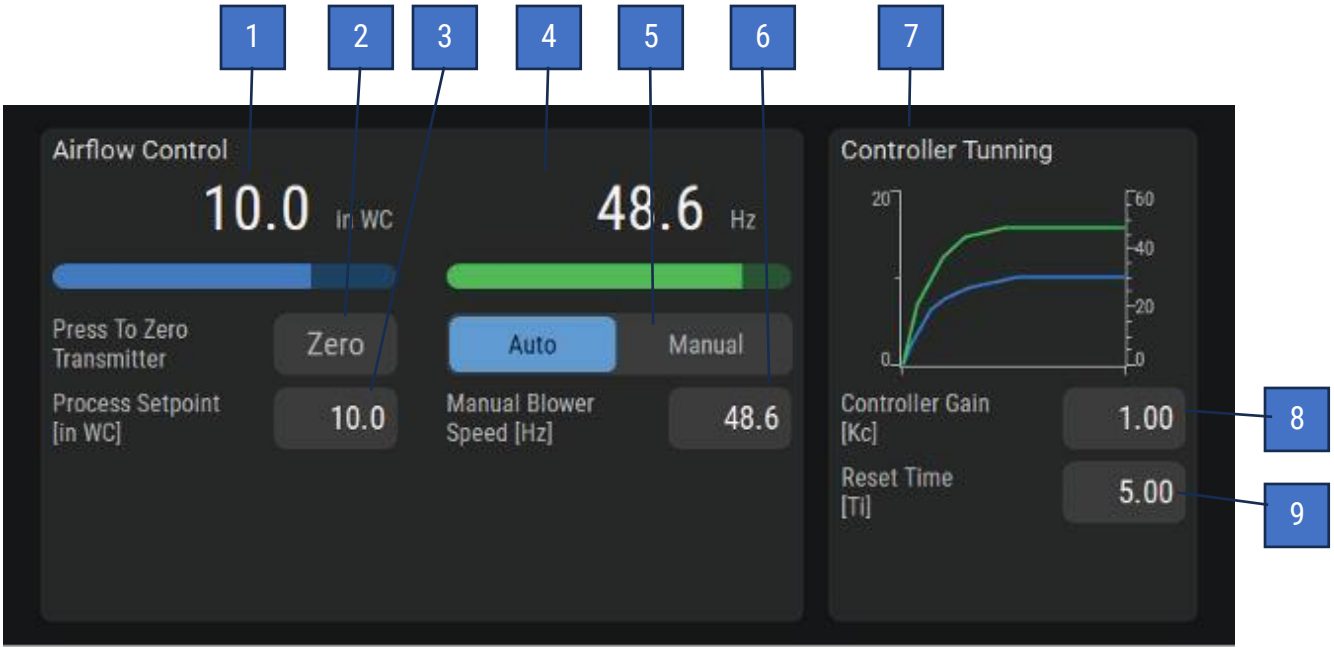


Each time the system automatically changes the clean start/stop setpoints, the setpoints will be logged with a date, time, and what the setpoints were changed to.

2.3 Airflow

This section covers airflow settings and information.

2.3.1 Static pressure (if equipped) (3.5)



1. Airflow Display

This numeric display and bar graph show the system static pressure between the clean side of the filter and atmosphere.

2. Zero Meter

The Zero button will zero any reading, should it wander from zero over the lifespan of the sensor. This can be done only when the system is not running. Additionally, the pneumatic tubing should be disconnected from the control panel.

3. Process Setpoint

This numeric entry/display is visible in Auto mode and shows the desired setpoint for the static pressure. The Airflow Controller will automatically adjust the blower speed to best meet this setpoint. Factory default setting is 4 inWC.

4. Blower Speed (Hz)

This numeric display and bar graph show blower speed in Hertz.

5. Mode Selection

The mode selection allows the user to choose between Auto or Hand control of the Airflow Controller system.

- Auto - Default recommended mode of operation. The controller adjusts the blower speed to maintain a constant airflow.
- Manual - Blower speed set according to Blower Speed numeric entry/display.

6. Manual Blower Speed (Hz)

This numeric entry/display is visible in Manual mode and shows the desired setpoint for the Blower Speed.

7. Controller Tuning Display

This graphical display shows the relationship between the blower frequency (in green) and the static pressure (in blue).

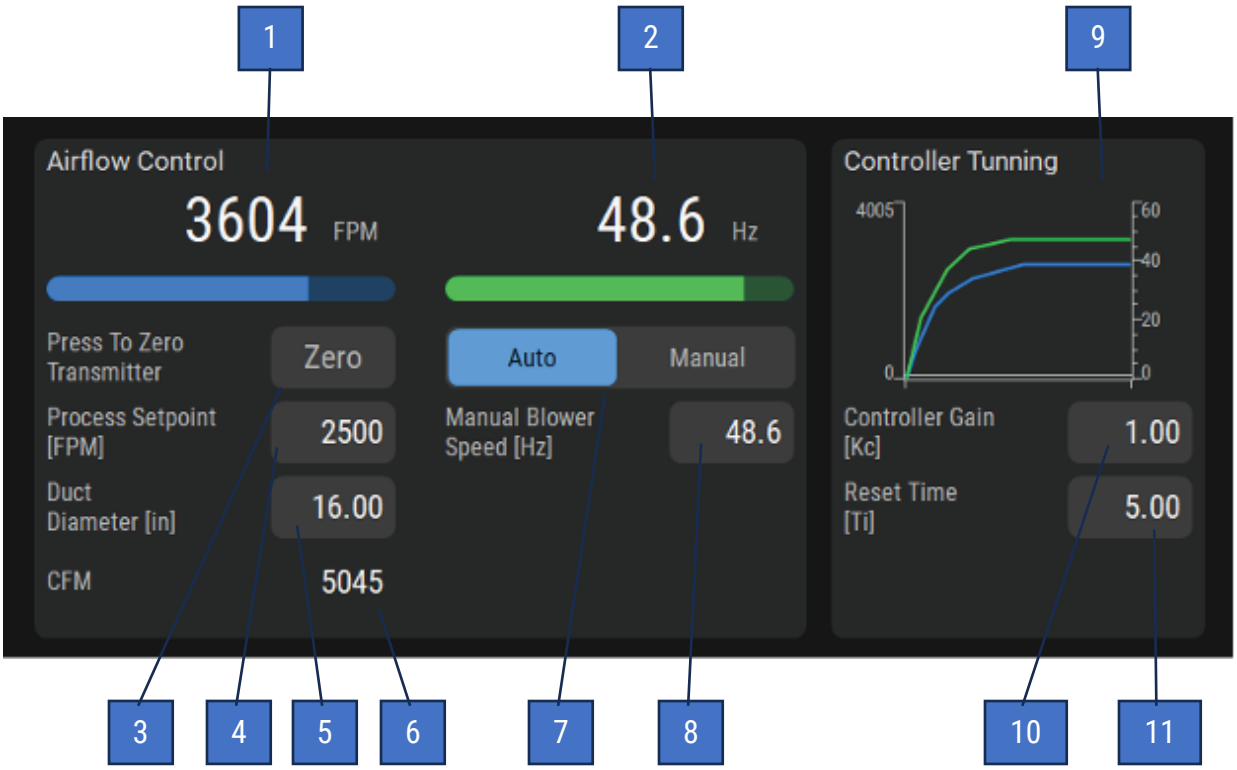
8. Controller Gain (Kc)

This numeric entry/display allows for advance tuning of the airflow controller's PID loop.

9. Reset Time (Ti)

This numeric entry/display allows for advance tuning of the airflow controller's PID loop.

2.3.2 Velocity (if equipped) (3.5)



1. Airflow Display

This numeric display and bar graph show the system air velocity (measured in FPM) inside the duct.

2. Blower Speed (Hz)

This numeric display and bar graph show blower speed in Hertz.

3. Zero Meter

The Zero button will zero any reading, should it wander from zero over the lifespan of the sensor. This can be done only when the system is not running. Additionally, the pneumatic tubing should be disconnected from the control panel.

4. Process Setpoint

This numeric entry/display is visible in Auto mode and shows the desired setpoint for air velocity. The Airflow Controller will automatically adjust the blower speed to best meet this setpoint. Factory default setting is 2500 FPM.

5. Duct Diameter (In)

This numeric entry/display is used to enter the duct size at the point where the airflow measuring device is installed for the purpose of calculating CFM.

6. CFM

This numeric text display shows the calculated Cubic Feet per Minute (CFM) based on air velocity and duct size.

7. Mode Selection

The mode selection allows the user to choose between Auto or Hand control of the Airflow Controller system.

- Auto - Default recommended mode of operation. The controller adjusts the blower speed to maintain a constant airflow.
- Manual - Blower speed set according to Blower Speed numeric entry/display.

8. Manual Blower Speed (Hz)

This numeric entry/display is visible in Manual mode and shows the desired setpoint for the Blower Speed.

9. Tuning Display

This graphical display shows the relationship between the blower frequency (in green) and the process setpoint (in blue).

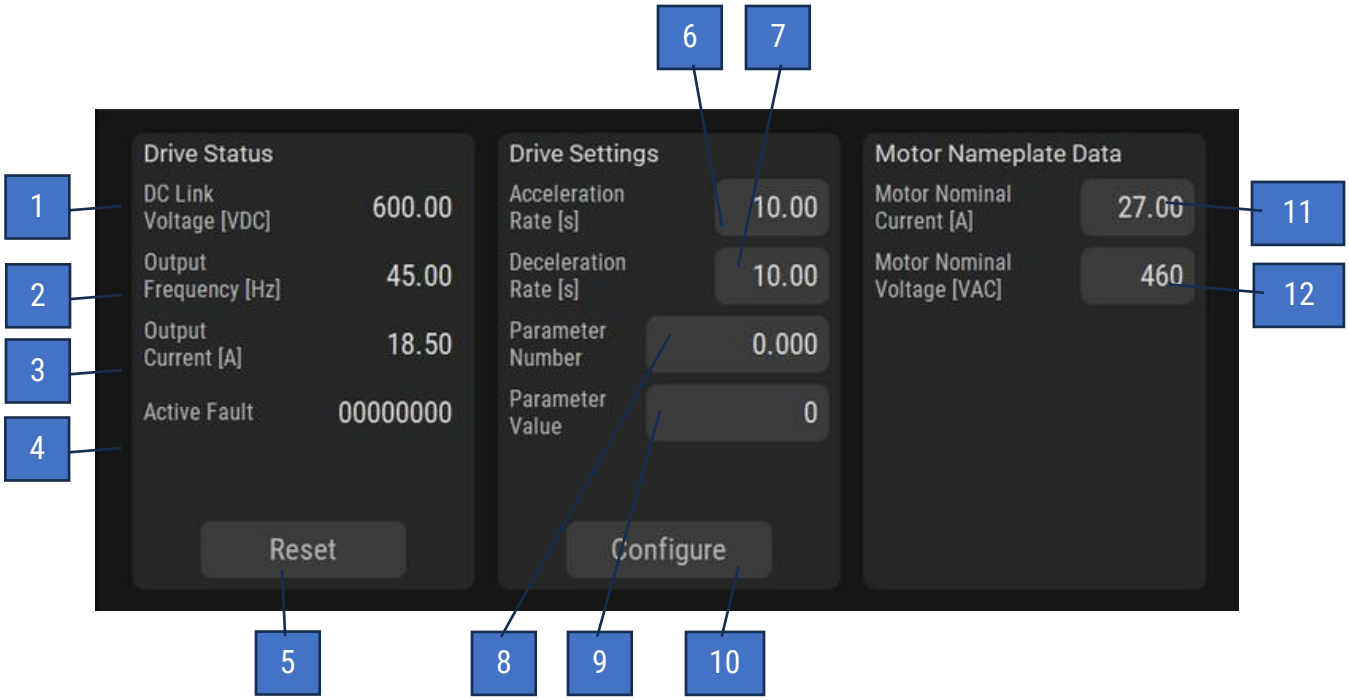
10. Controller Gain (Kc)

This numeric entry/display allows for advance tuning of the airflow controller's PID loop.

11. Reset Time (Ti)

This numeric entry/display allows for advance tuning of the airflow controller's PID loop.

2.3.3 VFD settings



1. DC Link Volts (VDC)

This numeric display shows the VFD DC Bus voltage.

2. Output Frequency (Hz)

This numeric display shows VFD output frequency.

3. Output Current (A)

This numeric display shows VFD output current in amps.

4. Active Fault

This text displays shows the current status of the VFD. If faulted, a fault code will be shown.

5. Reset

This button will reset VFD faults.

6. Acceleration Rate (s)

This numeric entry/display shows the acceleration time in seconds. This value is adjustable between 1s and 500 s. Factory default setting will vary with size of motor.

7. Deceleration Rate (s)

This numeric entry/display shows the deceleration time in seconds. This value is adjustable between 1s and 500 s. Factory default setting will vary with size of motor.

8. Parameter Number

This numeric entry/display shows which parameter to view or edit.

9. Parameter Value

This numeric entry/display shows the value of the parameter selected to view or edit. Use caution when modifying parameters as modifications may render the drive unusable.

10. Configure

This button will re-download configuration. This does not reset all parameters to factory default. Consult the VFD manual for instruction on how to reset all parameters to factory default.

After resetting to factory default, make sure to press the Configure button to download parameters needed for operation of the drive. Button must be held for 3 seconds. Indicators on the button will turn blue after operation is complete.

11. Motor Nominal Current (A)

This numeric entry/display shows the motor full load amperage. Set to the motor nameplate rated full load amps.

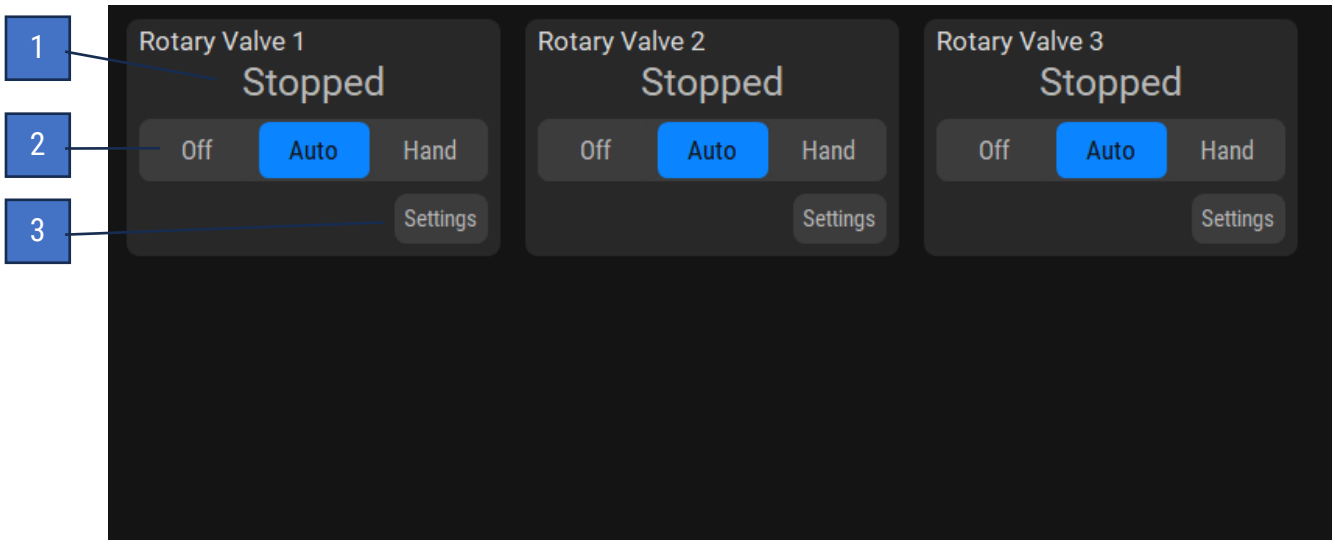
12. Motor Nominal Volts (VAC)

This numeric entry/display shows the motor voltage. Set to the motor nameplate rated volts.

2.4 Discharge

This section covers discharge settings and information.

2.4.1 Discharge for non-RF/RP units



1. Status

This text display shows the following conditions:

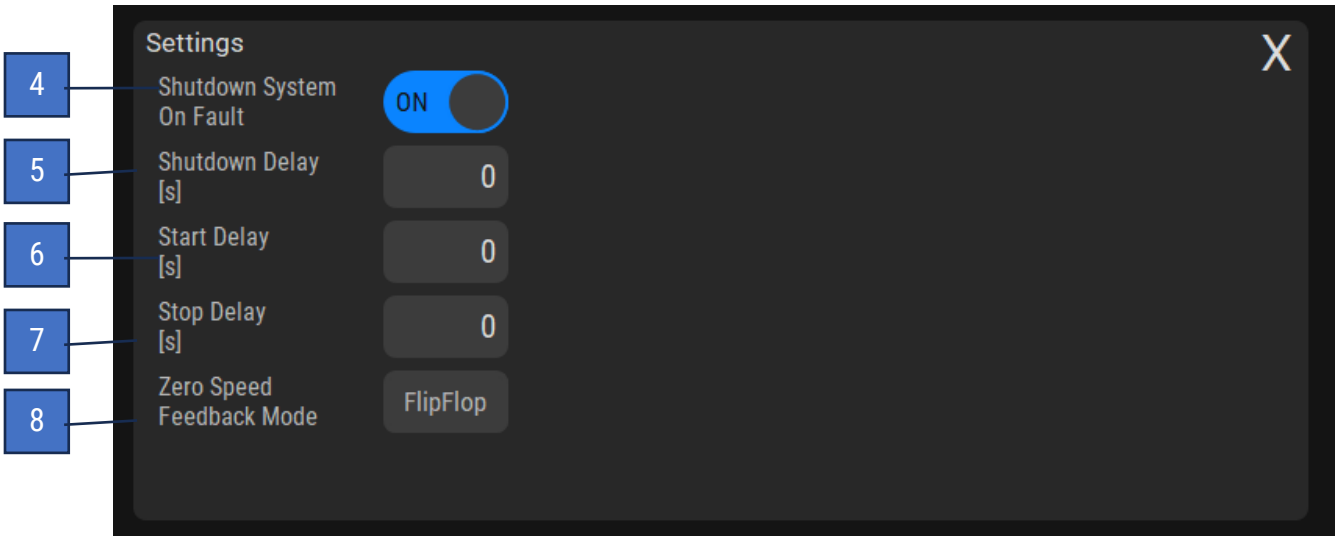
- Stopped: Motor is stopped
- Running: Motor is running
- Overload Tripped: Motor is faulted on overload condition
- Feedback Lost: Motor is told to run but the zero speed switch does not detect motion (if equipped)

2. Mode selection

- **Off**
  This button places the motor in Off mode and prevents the motor from running. This is not intended for servicing the rotary valve. Follow LOTO rules when servicing the rotary valve.
- **Auto**
  This button places the motor in Auto mode. When engaged, the motor will run based on the start and stop sequence.
- **Hand**
  This button places the motor in Hand mode. When engaged and all interlocks are met, the motor will run continuously.

3. Settings

Tap the Settings button to access the pop-up menu with settings for each rotary valve.



4. Shutdown System On Fault

This toggle enables a shutdown fault of the collector when the motor has a fault condition. When switched off, the collector will continue to run, but a warning indicator will continue to display the active fault.

5. Shutdown Delay (s)

This numeric entry/display shows the amount of time (in seconds) a motor fault must be active before generating a fault.

6. Start Delay (s)

This numeric entry/display shows the delay (in seconds) before the corresponding motor starts.

7. Stop Delay (s)

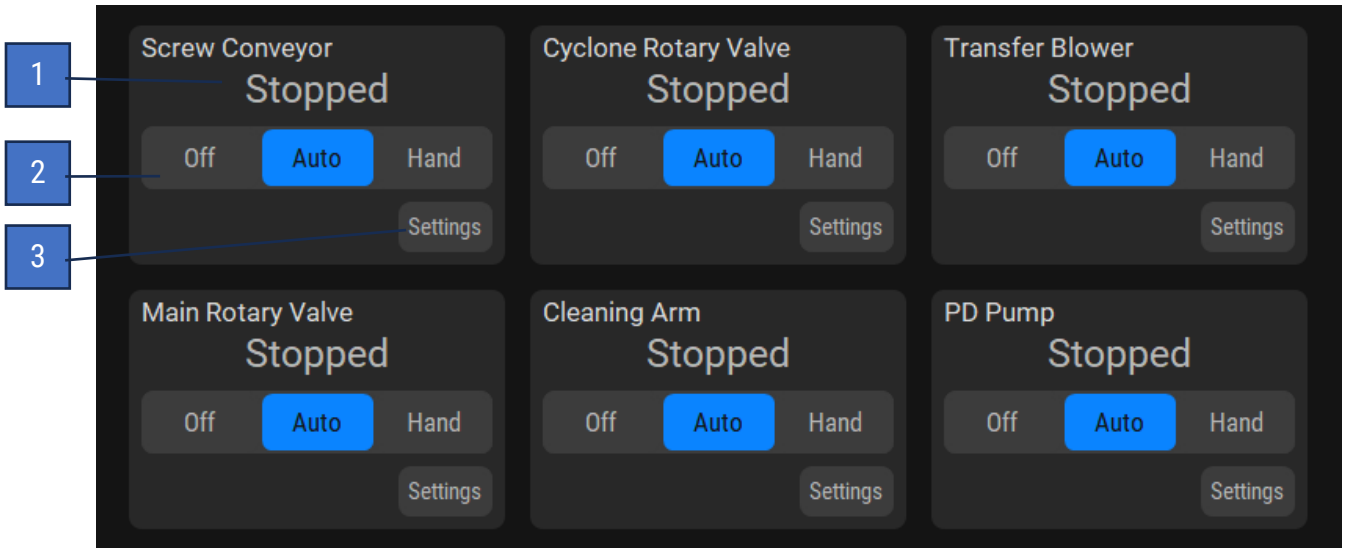
This numeric entry/display shows the delay (in seconds) before the corresponding motor stops.

8. Zero Speed Feedback Mode

This button will change the zero speed feedback mode. It is set to “FlipFlop” when the button is blue and “Constant Signal” when the button is gray.

- Constant Signal - This type of zero speed switch will provide a constant signal to the control panel while the motor is turning.
- FlipFlop - This type of zero speed switch will provide an intermittent signal while the motor is turning.

2.4.2 Discharge for RF units



1. Status

This text display shows the following conditions:

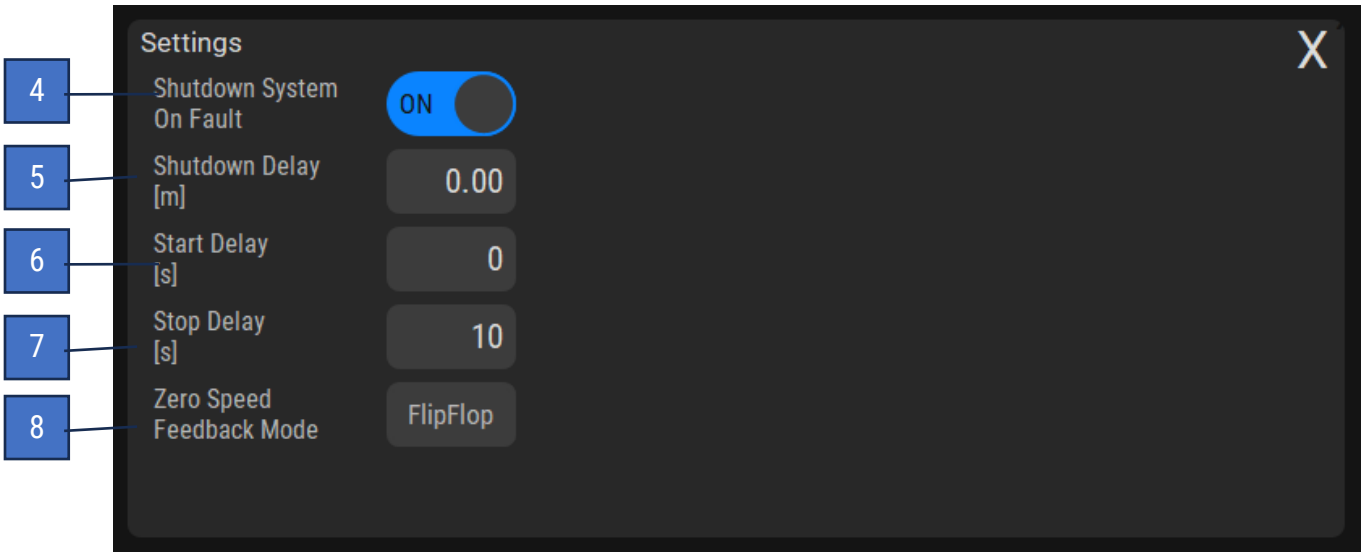
- Stopped: Motor is stopped
- Running: Motor is running
- Overload Tripped: Motor is faulted on overload condition
- Feedback Lost: Motor is told to run but the zero speed switch does not detect motion (if equipped)

2. Mode selection

- **Off**
  This button places the motor in Off mode and prevents the motor from running. This is not intended for servicing the rotary valve. Follow LOTO rules when servicing the rotary valve.
- **Auto**
  This button places the motor in Auto mode. When engaged, the motor will run based on the start and stop sequence.
- **Hand**
  This button places the motor in Hand mode. When engaged and all interlocks are met, the motor will run continuously.

3. Settings

Tap the Settings button to access the pop-up menu with settings for each motor.



4. Shutdown System On Fault

This toggle enables a shutdown fault of the collector when the motor has a fault condition. When switched off, the collector will continue to run, but a warning indicator will continue to display the active fault.

5. Shutdown Delay (m)

This numeric entry/display shows the amount of time (in minutes) a motor fault must be active before generating a fault.

6. Start Delay (s)

This numeric entry/display shows the delay (in seconds) before the corresponding motor starts.

7. Stop Delay (s)

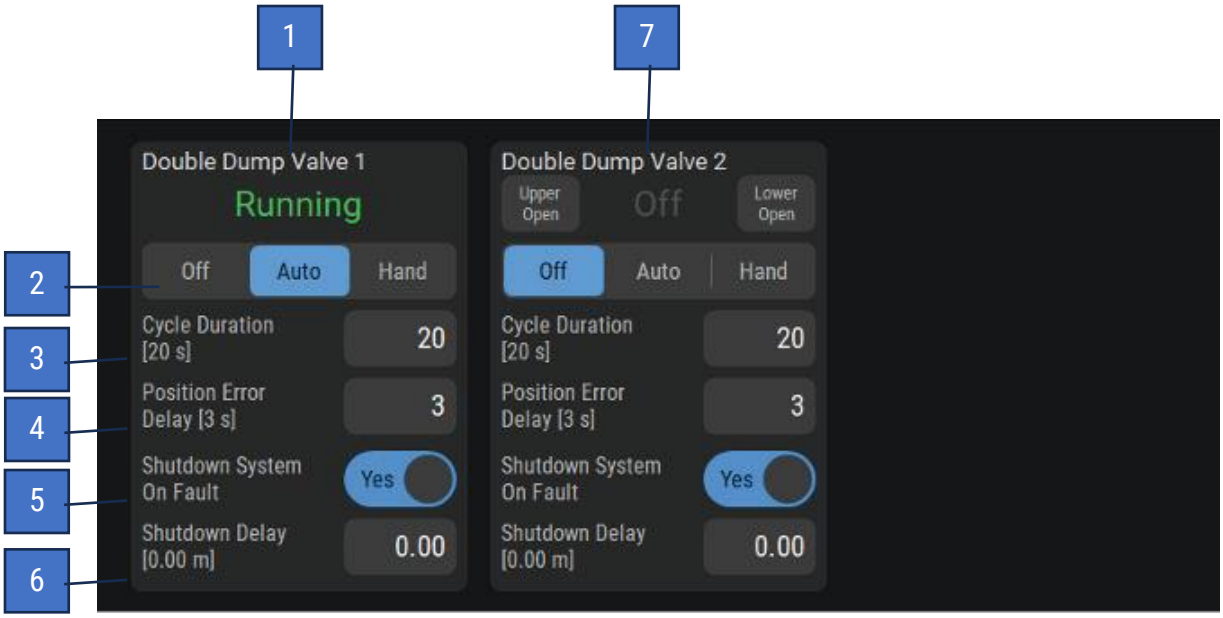
This numeric entry/display shows the delay (in seconds) before the corresponding motor stops.

8. Zero Speed Feedback Mode

This button will change the zero speed feedback mode. It is set to “FlipFlop” when the button is blue and “Constant Signal” when the button is gray.

- Constant Signal - This type of zero speed switch will provide a constant signal to the control panel while the motor is turning.
- FlipFlop - This type of zero speed switch will provide an intermittent signal while the motor is turning.

2.4.3 Double dump valve (if equipped)



1. Valve Status

This text display shows the status of the valve. Some of the following conditions rely on the position sensor.

- Open - Valve is in the open position (if equipped with position sensor).
- Closed - Valve is in the closed position (if equipped with position sensor).
- Opening - Valve is being told to open but has not reached the open position.
- Closing - Vave is being told to close but has not reached the closed position.
- Position Error - Valve has not reached position in time. Note: Clear Faults -- Turning the valve off and back to auto will clear any faults if the condition is not present.

2. Mode selection

- **Off**
  This button places the double dump valve in Off mode and prevents the rotary valve from running. This is not intended for servicing the rotary valve. Follow LOTO rules when servicing the rotary valve.
- **Auto**
  This button places the double dump valve in Auto mode. When engaged, the valve will run if the blower is running or during downtime cleaning.
- **Hand**
  This button places the double dump valve in Hand mode. When engaged and all interlocks are met, the valve will run continuously.

3. Cycle Duration (s)

This numeric entry/display shows how long the valves will take to complete a full cycle. This value is adjustable between 0 and 60 seconds. Factory default setting is 20 seconds.

4. Position Error Delay (s)

This numeric entry/display shows how long the valves have to open or close before a position fault is produced. This value is adjustable between 0 and 10 seconds. Factory default setting is 3 seconds. If set to 0, position fault is disabled.

5. Shutdown System On Fault

This toggle enables a shutdown fault of the collector when the double dump valve has a fault condition. When switched off, the collector will continue to run, but a warning indicator will continue to display the active fault.

6. Shutdown Delay (m)

This numeric entry/display shows the amount of time (in minutes) a double dump valve fault must be active before generating a fault.

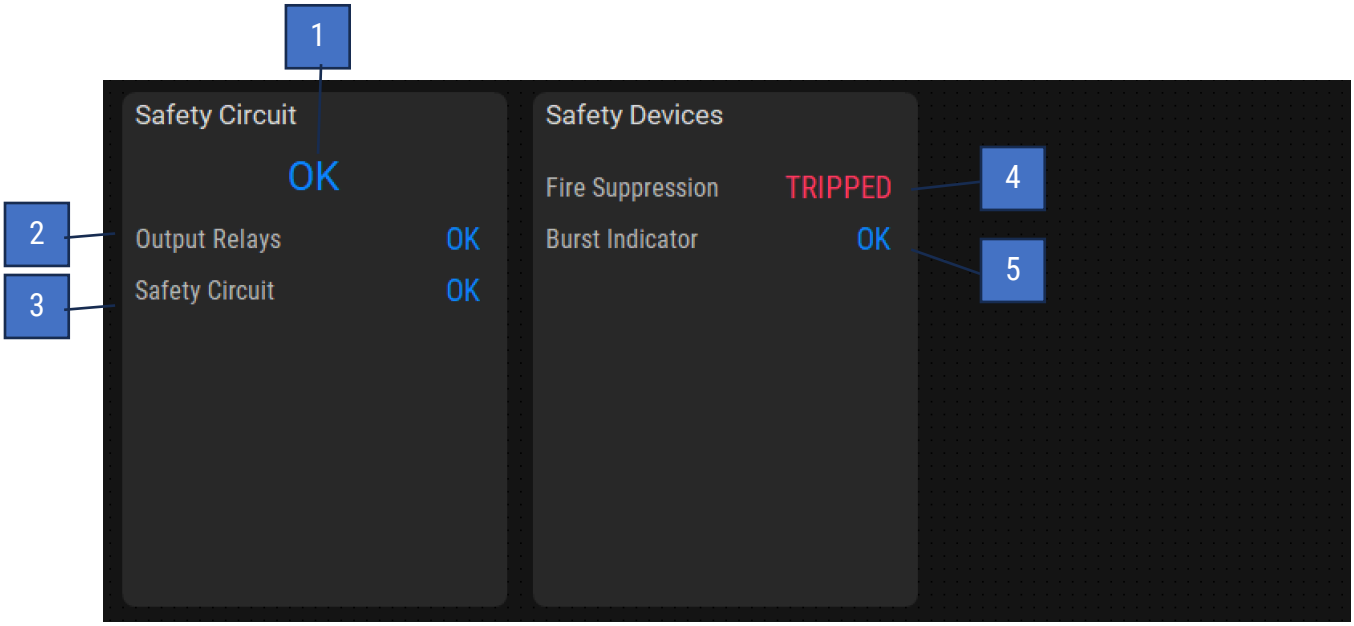
7. Force Open/Force Close

These buttons are intended for service and are visible only when the Double Dump Valve is set to OFF. The buttons will force the valve open or close. The upper and lower dump are interlocked so that they can never both be open at the same time.

2.5 Safety devices

This section covers safety settings and information.

Safety circuit and isolation valve



1. Safety Circuit Status

This text display shows the status of the safety relay.

2. Output Relays

Safety relay condition:

- OK - Safety Relay is set
- TRIPPED - Safety Relay is tripped

3. Safety Circuit

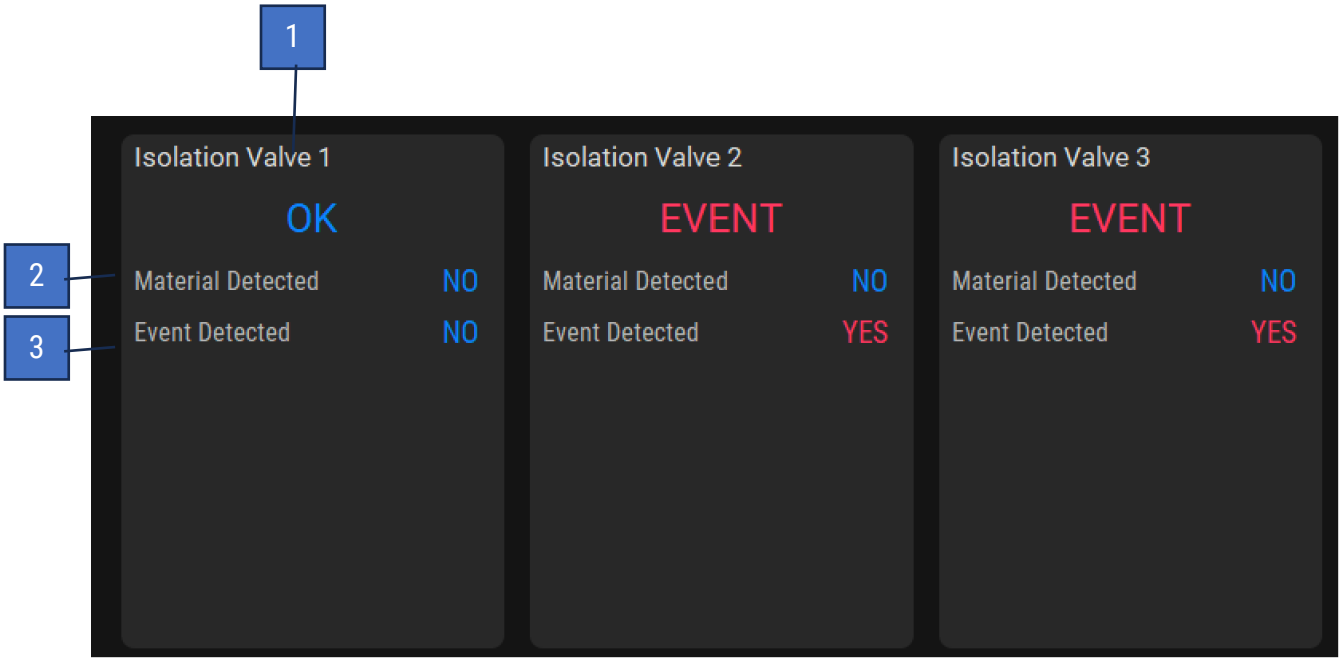
- OK - All devices in safety circuit are set
- OPEN - At least one device in the safety circuit is not set

4. Fire Suppression

- OK - All devices in safety circuit are set
- TRIPPED - At least one device in the safety circuit is not set

5. Burst Indicator

- OK - All devices in safety circuit are set
- TRIPPED - At least one device in the safety circuit is not set



1. Isolation Valve Status

This text display shows the status of the isolation valve.

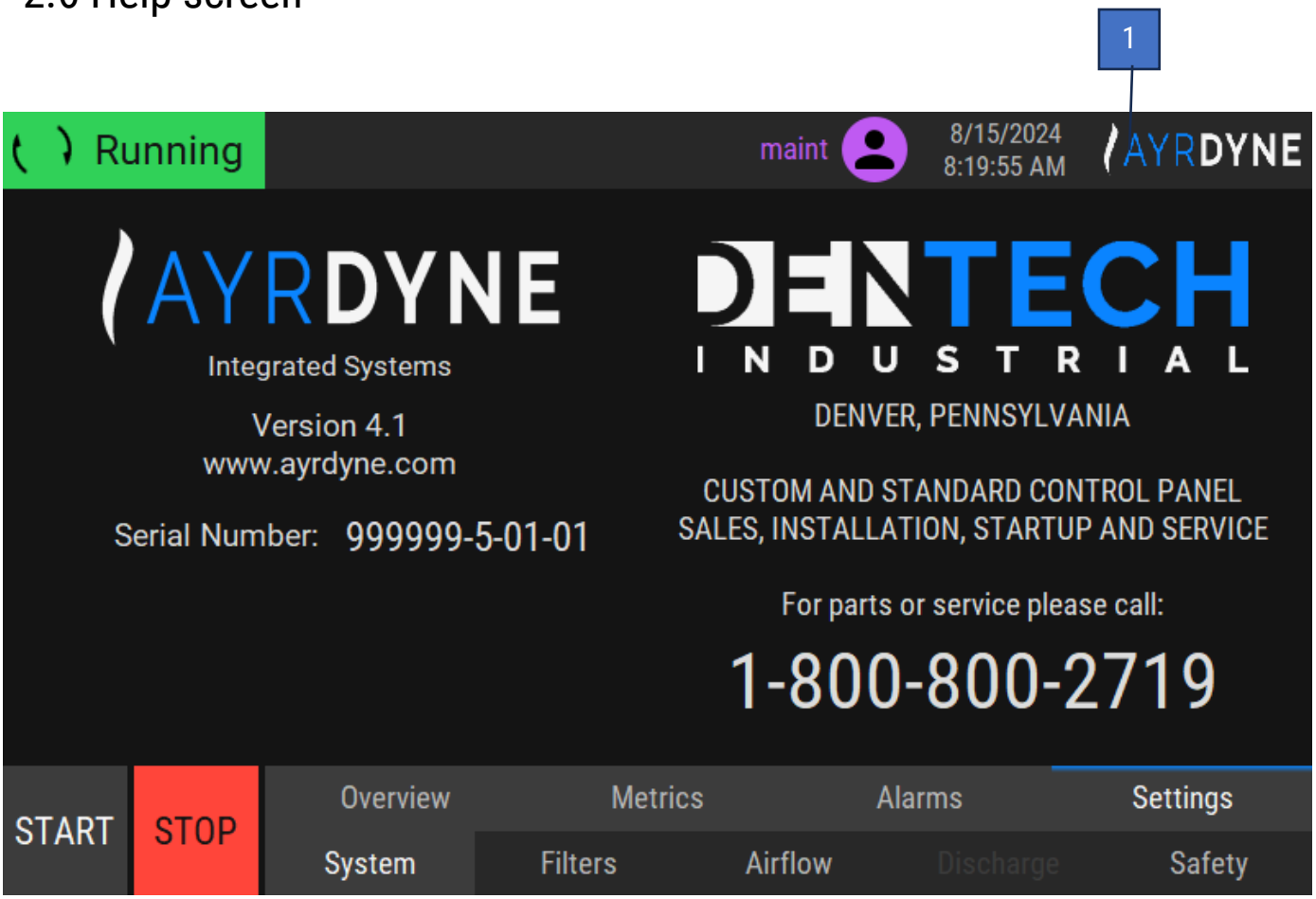
2. Material Detected

This text displays shows if excessive material accumulation has been detected: YES or NO

3. Event Detected

YES or NO

2.6 Help screen



1. AyrDyne logo

Access the Help screen by tapping on the AyrDyne logo in the top-right corner of the screen.

This screen shows who to call for service support and filter replacement.

3. Alarms

This section contains basic troubleshooting guidelines. Only a qualified individual should troubleshoot the system. **For maintenance of the system, "lock out, tag out" (LOTO) safety protocol applies.** This means that any time maintenance on this system is performed, the machine must be shut down, unplugged, and tagged or labeled, explaining that maintenance is taking place.

The alarms list below is to be used as a method of troubleshooting. Alarms may differ based on system configuration and features.

Alarm text	Potential Cause	Corrective Action
Remote Stop Button missing or pressed	Remote Stop Button missing or pressed	• Install Remote Stop • Release Remote
Schedule system maintenance	System is nearing maintenance due setpoint	Schedule system maintenance
Perform system maintenance	System has reached maintenance due setpoint	Perform system maintenance
Primary filters clogged	• Filters are dirty or clogged • Clogged or damaged tubing	• Inspect filters and replace as needed • Unclog or repair tubing
Time to order primary filters and schedule service	Filters are nearing end of life	Order and schedule primary filters service
Time to replace primary filters	Filters have reached end of life	Replace primary filters
Cleaning system pulse solenoid failure	• Cleaning solenoid failed • Compressed air low or off	• Inspect solenoid and replace as needed • Adjust or turn on compressed air
Cleaning system compressed air leak detected	• Compressed air leak detected • Compressed air flow switch stuck ON	• Inspect cleaning system for compressed air leaks • Inspect compressed air flow switch for proper operation
Cleaning system compressed air low or off	• Compressed air low or off • All cleaning solenoids failed • Compressed air flow switch stuck OFF	• Adjust or turn on compressed air • Inspect solenoids and replace as needed • Inspect compressed air flow switch for proper operation

3. Alarms (cont.)

Alarm text	Potential Cause	Corrective Action
Secondary filter clogged	• Filter dirty or clogged • Clogged and/or damaged tubing	• Inspect filters and replace as needed • Unclog or repair tubing
Blower running at limit	System not balanced	Schedule system balancing
Blower VFD faulted. Check VFD screen for fault code.	VFD fault	• Obtain fault codes from the VFD Settings screen • Reference VFD manual for detailed corrective actions
Blower motor overload tripped	Overload tripped	• Inspect motor for proper operation • Reset the overload • Verify motor current draw is within nameplate parameters
Rotary valve motor overload tripped	Overload tripped	• Lock out, tag out • Clear any material from valve • Verify proper chain tension • Reset the overload • Verify motor current draw is within nameplate parameters
Rotary valve bypassed	Rotary valve is OFF while the system is running	• Place the rotary valve in either AUTO or HAND mode
Rotary valve not turning	• Valve not turning • Sensor needs adjustment	• Lock out, tag out • Clear any material from valve • Verify proper chain tension

3. Alarms (cont.)

Alarm text	Potential Cause	Corrective Action
Double dump valve bypassed	Double dump valve OFF while the system is running	Place the double dump valve in either AUTO or HAND mode
Double dump valve upper dump valve position fault	• Compressed air low or off • Error delay time low • Solenoid malfunction • Sensor malfunction	• Adjust or turn on compressed air • Adjust error delay time • Inspect solenoid for proper operation and replace if needed • Inspect sensor for proper operation and replace if needed
Double dump valve lower dump valve position fault	• Compressed air low or off • Error delay time low • Solenoid malfunction • Sensor malfunction	• Adjust or turn on compressed air • Adjust error delay time • Inspect solenoid for proper operation and replace if needed • Inspect sensor for proper operation and replace if needed
Emergency stop circuit tripped	• Lock out, tag out • Power outage • Emergency stop	• Verify that all devices in the E-Stop circuit are ready • Verify that all E-Stop buttons are twisted out • Press the E-Stop Reset button
Fire suppression system activated	Fire suppression system activated or malfunctioned	Reset fire suppression system as per manufacturer's guidelines

3. Alarms (cont.)

Alarm text	Potential Cause	Corrective Action
Isolation valve excessive material accumulation detected	• Material accumulation detected • Sensor needs adjustment	• Clear water or debris from sensor • Adjust sensor as per manufacturer's guidelines
Isolation valve flap failed to open	• Material build up • Start delay time too low • Sensor needs adjustment	• Clear debris • Increase start delay time • Adjust sensor as per manufacturer's guidelines
Isolation valve failed to close	• Material build up • Stop time delay too low • Sensor needs adjustment	• Clear debris • Increase stop delay time • Adjust sensor as per manufacturer's guidelines
Isolation valve event detected	Potential explosion	Inspect pertinent explosion protection components
Isolation valve excessive wear detected	Isolation valve has excessive wear	• Inspect the isolation valve per manufacturer's guidelines • Repair or replace worn-out components
Isolation valve wiring or sensor problem	• Wiring problem • Sensor problem	• Inspect and correct position sensor wiring • Inspect position sensor and replace if needed

The installation, maintenance, operation, and care of the AyrDyne Monitoring System Human Machine Interface (HMI) should be performed only by individuals who are qualified and trained to do so.

A "qualified" person in this context is a person who has skills and knowledge related to the construction and operation of electrical equipment and its installation through both work experience and training. Additionally, a qualified person is one who has received and undergone safety training specific to electrical maintenance. Anyone who has not undergone safety training specific to this system should not operate or perform maintenance on the system.

"Lock out, tag out" safety protocol applies for maintenance of this system. This means that any time maintenance on this system is performed, the machine must be shut down, unplugged, and tagged or labeled, explaining that maintenance is taking place.

DenTech Industrial is not liable for any consequences arising from misuse of this system. If you are unsure of whether you are qualified to use or maintain this system, please contact an electrician or other qualified professional for assistance. Failure to follow safety protocol for this and any other system could result in serious bodily harm or other injury. **No responsibility is assumed by DenTech Industrial for any consequences arising out of the use of this material.**

4. Removal and installation

4.1 Installation and removal of HMI

CAUTION!

Mechanically unstable terminal

Always keep HMI stable in panel cut-out while you are installing or removing installation fasteners.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN INJURY OR EQUIPMENT DAMAGE.

WARNING!

ELECTRICAL SHOCK HAZARD EXISTS

- Ensure that the control enclosure within which you are working is powered down and locked out.
- Verify that all power sources are in a zero-energy state.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN INJURY, DEATH, OR EQUIPMENT DAMAGE.

Front view of HMI

Rear view of HMI

Figure 1
Power connection removed from HMI

1. Pull green connector downward to remove power connection from HMI (figure 1).

2. Use a T-20 Torx screwdriver to remove the ground wire (figure 2).

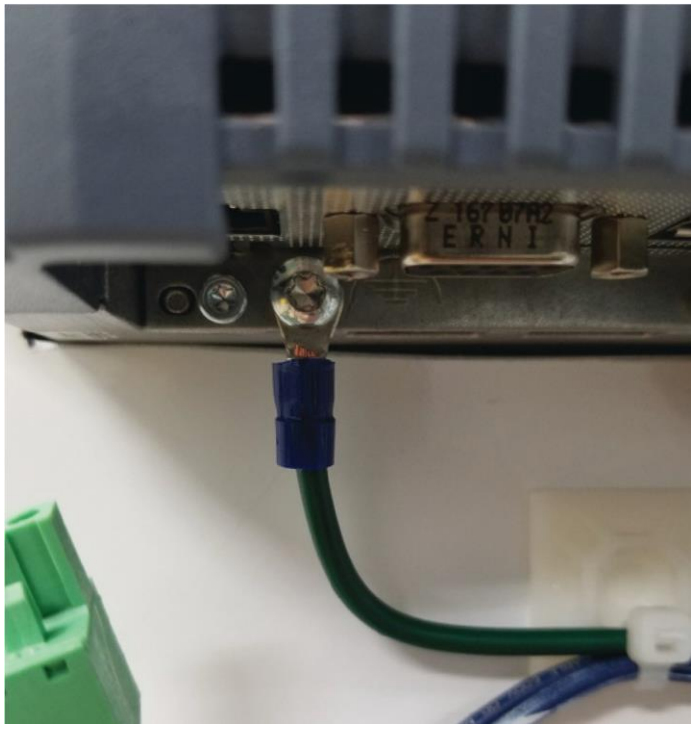


Figure 2
Ground wire with T-20 Torx screw

Figure 3
Loosening HMI fasteners

Figure 4
Installation fasteners removed

3. With the HMI free from all electrical wiring, use a small flat head screwdriver to begin loosening the 10 installation fasteners that secure the HMI to the control enclosure door. Make sure to support the HMI with the other hand.

4. Continue to loosen fasteners until they can be removed from the HMI.

Figure 5
Removal of the HMI from the front of the enclosure

5. After the installation fasteners have been removed, gently remove the AyrDyne HMI from the front of the enclosure door, taking care not to damage or displace the installation gasket.

Installation of the HMI

To install the HMI, follow the steps in section 4.1 in reverse order.

Figure 6
HMI completely removed

4.2 Installation and removal of PLC

For the removal of the PLC portion of the AyrDyne Monitoring System, please refer to the Siemens installation manual: Siemens S7-1200 Manual, 04/2012, A5E02486680-06. Pages 50-55.

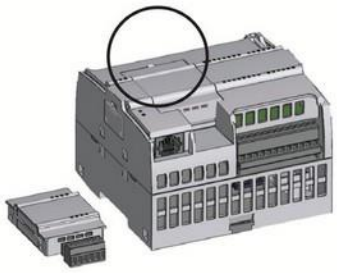
Installing or replacing the battery in BB 1297 Battery Board

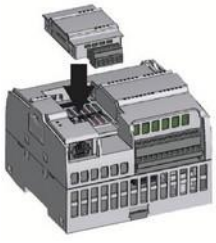
The BB 1297 requires battery type CR1025. The battery is not included with the BB 1297 and must be purchased by the user.

To install a new battery, follow these steps:

1. In the BB 1297, install a new battery with the positive side of the battery on top and the negative side next to the printed wiring board.

2. The BB 1297 is ready to be installed in the CPU. Follow the installation directions below to install the BB 1297.





Procedure:

1. Ensure that the CPU and all S7-1200 equipment are disconnected from electrical power.

2. Remove the top and bottom terminal block covers from the CPU.

3. Place a screwdriver into the slot on top of the CPU at the rear of the cover.

4. Gently pry the cover up and remove it from the CPU.

5. Place the module straight down into its mounting position in the top of the CPU.

6. Firmly press the module into position until it snaps into place.

7. Replace the terminal block covers.

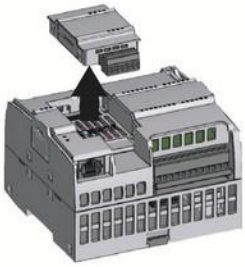
To replace the battery in the BB 1297, follow these steps:

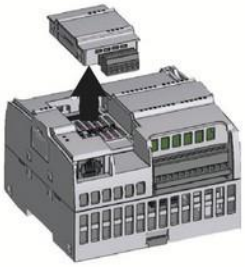
1. Remove the BB 1297 from the CPU following the removal directions below.

2. Carefully remove the old battery using a small screwdriver. Push the battery out from under the clip.

3. Install the new CR1025 replacement battery with the positive side of the battery on top and the negative side next to the printed wiring board.

4. Re-install the BB 1297 battery board following the installation directions below.





Procedure:

1. Ensure that the CPU and all S7-1200 equipment are disconnected from electrical power.

2. Remove the top and bottom terminal block covers from the CPU.

3. Place a screwdriver into the slot on top of the CPU at the rear of the cover.

4. Gently pry the cover up and remove it from the CPU.

5. Remove the module straight up from its mounting position in the top of the CPU.

6. Replace the terminal block covers.

5. Glossary

AMP (A)

The base unit of electric current in the International System of Units.

DIFFERENTIAL PRESSURE (DP)

The difference in pressure measured between two points. In AyrDyne systems, DP is measured between the clean and dirty sides of the filter. The higher the number, the more restriction across the filter.

FEET PER MINUTE (FPM)

A unit of speed that represents the number of feet traveled in one minute.

HERTZ (HZ)

The unit of frequency in the International System of Units. One hertz is equal to one cycle per second.

HORSEPOWER (HP)

A unit of power or the rate at which work is done (in reference to the output of engines or motors).

HUMAN MACHINE INTERFACE (HMI)

A mechanism, often a visual display with graphs, used for monitoring and controlling a machine or process.

INCHES OF WATER COLUMN (INWC)

A non-SI unit for pressure conventionally used for measurement of certain pressure differentials such as small pressure differences across an orifice, in a pipeline, or in a shaft.

LOCK OUT, TAG OUT (LOTO)

A safety protocol that applies when maintenance or repairs are performed on a system. Prior to working on the system, machines must be shut down, unplugged, and tagged or labeled to explain that maintenance is taking place.

PROGRAMMABLE LOGIC CONTROLLER (PLC)

A modular computer which performs various tasks based on customized instructions.

QUALIFIED INDIVIDUAL

A person who meets the skill level and experience to perform the essential functions of the activity.

REVOLUTIONS PER MINUTE (RPM)

A unit of rotational speed or the frequency of rotation around a fixed axis.

STATIC PRESSURE (SP)

The pressure exerted by a still liquid or gas. In AyrDyne systems, SP is measured between the dirty side of the filter and the atmosphere. The higher the number, the more suction capacity.

VARIABLE FREQUENCY DRIVE (VFD)

A motor control system that manipulates output frequency to run an electrical motor at any desired speed.

VAC

Voltage measured in AC.

VDC

Voltage measured in DC.

WATER COLUMN (WC)

A measurement of pressure defined by the pressure produced by a 1-inch by 1-inch column of water with a specified height.

TIME ABBREVIATIONS

Hours: h or hrs
Millisecond: ms
Minutes: min
Seconds: s

Notes

Installation, Operation, and Maintenance Manual

For customer support, please contact DenTech Industrial's service technicians.

Phone: (717) 335-4899

Email: service@dentechindustrial.com

Or visit dentechindustrial.com/customer-support

1975 N. Reading Rd., Denver, PA 17517

717-335-4820 | www.dentechindustrial.com

Manual ID: AD-IOM