OptiPressure

Making Complex Applications Simple

Operation and Configuration Manual

Firmware Version 1.07

Revision 1.00

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! CAUTION !

Always verify that the power has been disconnected from both the panel and the Fuji MEGA variable frequency drive before making changes to the wiring.

Failure to do so may result in severe injury or death!

High DC voltages may still be present for a period of time after main power has been removed from the variable frequency drive. Take note of the red **Charge** LED, labeled CRG, located on the drive. Depending on the size of the drive, the LED may be visible through the front cover. The LED will go dark when the DC bus has been discharged. Until then, potentially dangerous voltages may still be present for several minutes after disconnecting power.

Always verify that terminals are no longer powered by using a properly working and tested multimeter.

Technical Specifications	
Display	5.7” 64K color touchscreen 320x240 TFT
Digital Inputs	18
Digital Outputs	17
Analog Inputs	5 Multiple Configurations Based on Sensor Required • 5: 4-20mA • 4: 4-20mA, 1: K-Type Thermocouple • 4: 4-20mA, 1: 100Ω RTD • 3: 4-20mA, 2: K-Type Thermocouples • 3: 4-20mA, 2: 100Ω RTDs
Analog Outputs	2 4-20 mA
Data Storage	SD card
Battery-Backed Memory	7 years typical at 25°C Replaceable without opening controller
Date, Time, and Supervisor	Battery-Backed Real-Time Clock and Watchdog
Power Supply Voltage	12 or 24 VDC 10.2 VDC to 28.8 VDC with less than 10% ripple
Power Supply Current	540 mA maximum at 12 VDC 270 mA maximum at 24 VDC
Power Consumption	6.5 Watts (excluding I/O module)
Temperature	Operation: 0 °C to +50 °C (32 °F to 122 °F) Storage:-20 °C to +60 °C (-4 °F to 140 °F)
Humidity	5 % to 95 % (non-condensing)
Physical	7.75” x5.77” x 2.7” (197 mm x 146.6 mm x 68.5 mm) 26.4 oz (750 g) (excluding I/O module)
Mounting	IP 66/IP65/NEMA 4X for front panel

Please note that all wiring to and from the controller should be shielded in order to reduce any potential for electrical interference. Using unshielded wiring may result in erratic and unpredictable behavior.

The OptiPressure controller follows a defined sequence of steps during startup, running, and stopping of the system. The steps help to ensure proper and safe operation of the system, and attempt to prevent damage in the event of equipment or device failure. Some steps may be optional depending on features included with the system. Use extreme caution when altering any configuration options that were set during the initial commissioning of the system, as an improperly configured system could result in equipment damage or injury to personnel. Always refer to the most recent revision of the Operation and Configuration Manual and consult qualified technical support or engineering staff if any question regarding physical modification or changes in configuration parameters arises.

Pre-Run Sequence

The Pre-Run sequence begins when the HOA switch is in the Hand or Auto position, and the configured start conditions have been met. If the Pre-Run sequence is aborted for any reason (including by the operator or an event), the Pre-Run sequence equipment states are set back to their waiting/idle positions. The Post-Run sequence will not run if the Pre-Run sequence is aborted prior to successful completion.

1. Start the compressor pre-run timer.
2. Move the bypass valve to the pre-run position, if enabled, and start the bypass valve pre-run timer.
3. Close the vessel bleed valve, if enabled.
4. Once the compressor pre-run timer elapses, start the compressor. The bypass valve pre-run timer may still be active at this time.
5. Pre-Run sequence complete.

Run Sequence

The Run sequence begins after the Pre-Run sequence successfully completes, and comprises the main control loop for the system. The controller will continually run this process until a stop condition has been met.

1. Command the variable frequency drive to run and control the speed based on configured parameter values.
2. Command the bypass valve to maintain a pressure based on configured parameter values.

3. Command the cooling fan to maintain a temperature based on configured parameter values.

4. Continue running the normal process control until a stop condition has been met.

Post-Run Sequence

The Post-Run sequence begins when a stop condition has been met while running. If a shutdown or fault event occurs while running, the Post-Run sequence will be followed. The Post-Run sequence will not run if the Pre-Run sequence is aborted prior to successful completion.

1. Move the bypass valve to the post-run position, if enabled, and start the bypass valve post-run timer.

2. Wait for the variable frequency drive to decelerate and come to a stop.

3. Start the Vessel Bleed Valve post-run timer, if enabled.

4. Wait for the Vessel Bleed Valve post-run timer to elapse, then open the vessel bleed valve.

5. Wait for the bypass valve post-run timer to elapse, if enabled.

6. Post-Run sequence complete.

The OptiPressure controller uses a color touchscreen interface to display information and interact with the local operator. The touchscreen uses a resistive touchscreen, which works well for operators with bare fingers, or when the operator is wearing gloves or using a stylus. To select an option on the screen, the operator need only lightly touch the button or area indicated.

Note:

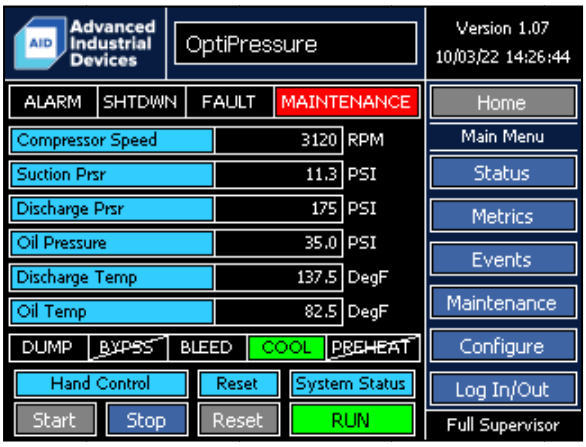
During periods of operator inactivity, the OptiPressure controller may turn off the display, very similar to a blank screensaver on a desktop or laptop computer. If power is available to the controller, simply touch anywhere on the screen to enable/wake the local display. The time for this feature can be adjusted, or disabled, in the System configuration settings.

Configuration and operation of the controller is performed primarily via the menu located on the right side of the screen. This menu is context-sensitive – that is, the content will change depending on which screen is currently displayed. The text located just below the Home button near the top of the menu indicates which menu is currently displayed. The Home button located at the top of the menu is present on all menus, regardless of context. This button will always return the operator immediately to the Home screen. The AID logo in the upper left corner of the screen functions as a Home button as well.

Generally, if an item on the screen is blue, the item is touch-sensitive, and will react when pressed. If an item is Gray, the item is touch-sensitive, but currently disabled for some reason. This reason could be that the function is not active or that the operator is not logged-in. An example of the Home and Main Menu is shown below.

Button Examples

	**Menu Button Disabled**
	**Menu Button Active**
	**Operation Button Disabled**
	**Operation Button Active**



The Home screen provides an overview of the operational values of the compressor system, and is used as the launching point for navigating to more advanced features of the controller, such as configuration and diagnostic information.

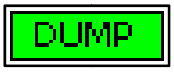
Operational controls are also available at the bottom of the Home screen. When the Hand-Off-Auto (HOA) switch is in the Hand position, the Hand Control Start and Stop buttons become active – as indicated by their transition from gray to blue. If a fault or shutdown is currently active, the Reset button will become active in order for the operator to manually reset the fault or shutdown.

System Status

OFF	**System is off.** Pre-Run, Run, and Post-Run are complete. No Alarm, Shutdown, or Fault is present. The system is not currently in Timed Restart.
READY	**System is ready and waiting for a start condition to be met.** The HOA switch is in the Hand position, but the system is currently stopped. The HOA switch is in the Auto position, but the system start condition has not been met.
PRE-RUN	**Pre-Run sequence for start-up of the compressor is currently active.** Start conditions have been met, and the system is delaying the start of the compressor (either in Hand or Auto) to allow time for Pre-Run activities, such as bypass valve positioning, to complete.
RUN	**System is running.** The compressor and supporting equipment is performing as expected.
POST-RUN	**Post-Run sequence for stopping the compressor is currently active.** Stop conditions have been met, and the system is performing steps needed to safely stop the compressor and supporting equipment, such as bypass valve positioning.
ALARM	**Alarm event is active.** One or more alarm conditions have been met. When an alarm is active, the system will continue to run as normal, but the operator should investigate the alarm and take the necessary action to address the condition, if the condition is unexpected.
SHUTDOWN	**Shutdown event is active, and is configured for manual restart.** A shutdown condition has been met. When a shutdown occurs, the system stops after completing the Post-Run sequence. A shutdown condition should generally not occur during normal operation. However, setpoints have been configured to handle the occurrence by stopping the system if the condition does occur.
FAULT	**Fault event is active, and is configured for manual restart.** A fault condition has been met. When a fault occurs, the system stops after completing the Post-Run sequence. A fault condition should never occur during normal operation, and indicates a failure of hardware. If a fault event is active or appears in the event history, the operator should thoroughly investigate the fault code and/or description and snapshot data, then take steps necessary to address and correct the source of the fault before resuming normal operation.

	**Shutdown or fault event is active, and a configured for timed restart.** A shutdown or fault condition has been met, and is configured to automatically reset the shutdown or fault and restart the system automatically after a period of time. Automatic/Timed restart of the system is intended to address intermittent nuisance trips of conditions like low voltage, etc. Ideally, these conditions should be addressed in order to prevent them from occurring without the need for automatic/timed restart.

Dump Valve

	**Disabled** The dump valve is disabled and will always remain in the inactive/closed position.
	**Closed** The dump valve is enabled and currently closed.
	**Open** The dump valve is enabled and currently open.

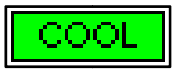
Bypass Valve

	**Disabled** The bypass valve is disabled and will always remain in the inactive/closed position.
	**Closed** The bypass valve is enabled and currently closed.
	**Open** The bypass valve is enabled and currently open.

Vessel Bleed Valve

	**Disabled** The vessel bleed valve is disabled and will always remain in the inactive/closed position.
	**Closed** The vessel bleed valve is enabled and currently closed.
	**Open** The vessel bleed valve is enabled and currently open.

Cooling Fan

	**Disabled** The cooling fan is disabled and will always remain off.
	**Stopped** The cooling fan is enabled and currently stopped.
	**Running** The cooling fan is enabled and currently running.

Oil Preheat

	**Disabled** The oil preheat function is disabled.
	**Inactive** The oil preheat function is enabled and inactive.
	**Open** The oil preheat function is enabled and currently active. The compressor will run at minimum speed while the oil preheat function is active.

Access to the configuration parameters of the system is restricted by a user/password system. Local operators must log-in with the password of the desired access level. When logged-out, the local operator can view all of the configuration parameter values, but cannot change the values. This feature can be useful when on-site personnel need to verify operational parameters without the need to provide the personnel with the ability to change the parameters.

The current access level is shown in the lower right corner of the screen, just below the Log In/Out button.

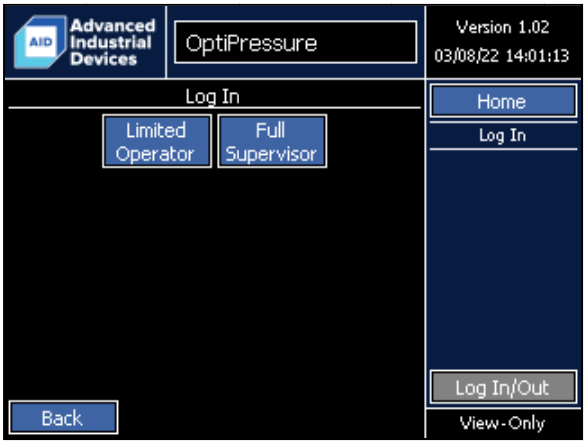
The OptiPressure controller supports several types of operator access levels:

Access Level

View-Only	**View-Only** All configuration parameters are viewable, but cannot be changed. This is the default, logged-out, access level.
Limited Operator	**Limited Operator** Access to operational setpoints needed for day-to-day operation of the system. Access to all other configuration parameters is restricted.
Full Supervisor	**Full Supervisor** Access to all configuration parameters is available. No restrictions.
Service	**Service** Special access for technical service personnel is available. This access level is only available by speaking with the technical or engineering support department.
Factory	**Factory** Special access for factory technical personnel is available. This access level is only available by speaking with the technical or engineering support department.

In order to modify configuration parameters, the local operator must first log-in by pressing the Log In/Out button. The Log In/Out button is located at the bottom of the menu located on the right side of the screen, and is available on all menus regardless of context. After the button is pressed, the Log In screen will be displayed, with the option to select between the Limited Operator and Full Supervisor access levels.

Log In

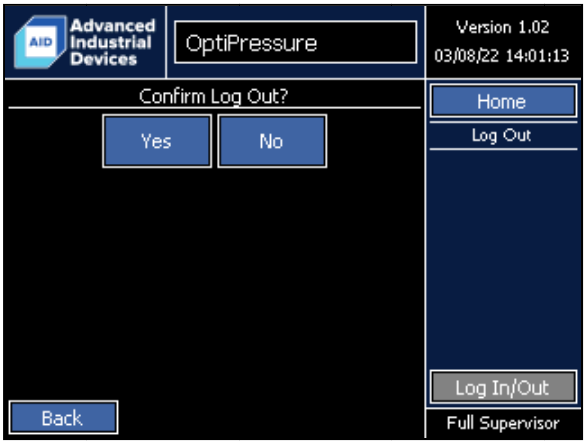


After pressing either of the access level buttons, the operator will be prompted for the password for the selected access level.

Password Entry

Entering the correct password will result in the display returning to the screen from which the Log In/Out button was pressed. Pressing the Esc button will return to the Log In screen, and pressing the Back button from the Log In screen will also result in the display returning to the screen from which the Log In/Out button was initially pressed.

Log Out

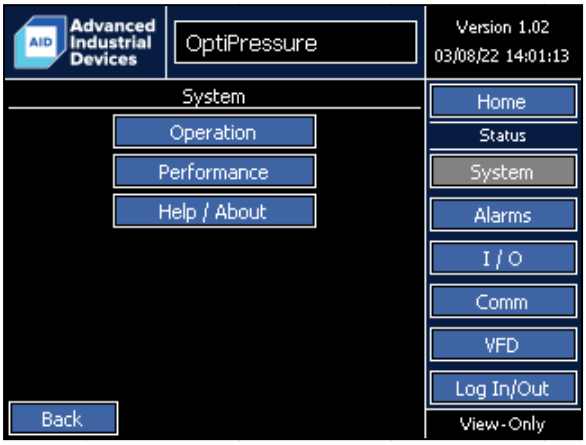


Once the local operator has completed making changes to the configuration parameters, the operator, as a good practice, should log-out before walking away from the controller. This prevents others from accidentally making changes to the configuration. After pressing the Log In/Out button, the Log Out screen will be displayed, with the option to Confirm Log Out – Yes or No. Pressing the Yes button will result in the operator access level being returned to View-Only and the display returning to the screen from which the Log In/Out button was pressed. Pressing the No button (or the Back button) will result in the display immediately returning to the screen from which the Log In/Out button was pressed, and the operator access level being unchanged.

The OptiPressure controller provides extensive operational status information that can be used as a powerful tool for commissioning, troubleshooting, and optimization of the compressor system. This information is available by pressing the Status button on the Main Menu. The status information is available using the View-Only access level, and does not require a password to view.

For convenience, the status information is presented in groups, which are selectable using the menu. If a status group contains subgroups, a selection menu will appear in the content area on the screen.

System



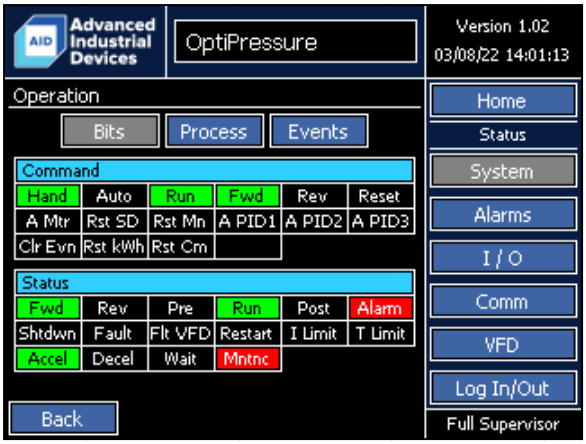
The System status information provides a quick overview of the current operating conditions of the controller, and is presented in two groups:

- Operation
  Status Bits, Process State, and Events

- Performance
  Status Bits, Variable Frequency Drive Performance, and Motor Performance

- Help/About
  Firmware Version, Serial Number, and Contact Information

Bits

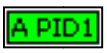
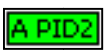
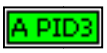


Command and Status bits are duplicated on both the System Operation and System Performance status groups in order to provide a quick reference for the local operator, without the need to flip back and forth between groups for the needed information.

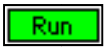
Command and Status bits are displayed in white text over a black background when in the reset/inactive (logic 0) state. During normal operation, Command and Status bits are displayed in black text over a green background when in the set/active (logic 1) state, or when in need of immediate attention, in white text over a red background.

Command Bits

Hand	**Hand** Active when the HOA is in the Hand position and the local operator has started the system using the Start button on the Home screen.
Auto	**Auto** Active when the HOA is in the Auto position and the start condition has been met (digital input, analog input, etc.).
Run	**Run** Active when the Hand and/or Auto Command Bit(s) is/are active.
Fwd	**Forward** Active when the Run Command Bit and the Run Status Bit are active.

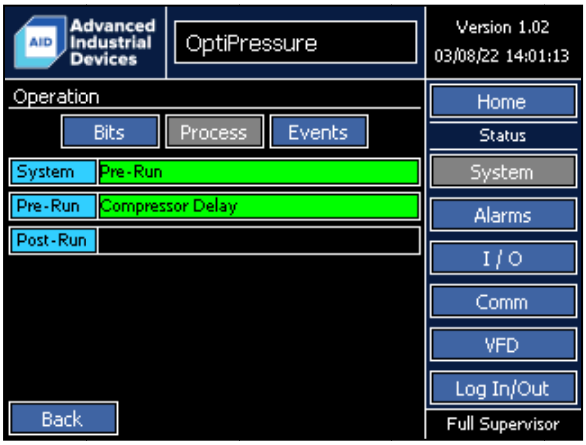
	**Reverse** Future firmware release. Currently not used. Always inactive.
	**Reset** Active when a reset of a shutdown or fault is requested, either manually by the operator (locally or via SCADA) or automatically by the controller if the shutdown or fault is configured for a timed reset.
	**Auto-Tune Motor** Future firmware release. Currently not used. Always inactive.
	**Reset SD Card Logging** Active when a reset of the SD card logging system is requested by the local operator (factory use only).
	**Reset Manual** Active when a manual reset of a shutdown or fault is requested locally by the operator.
	**Auto-Tune Bypass Valve Position** Active when the modulating bypass valve PID auto-tune process is requested by the local operator, and remains active until the PID auto-tune process completes.
	**Auto-Tune Compressor Speed** Active when the compressor PID auto-tune process is requested by the local operator, and remains active until the PID auto-tune process completes.
	**Auto-Tune Cooling Fan Speed** Active when the cooling fan PID auto-tune process is requested by the local operator, and remains active until the PID auto-tune process completes.
	**Clear Events** Active when a clearing of the event history is requested by the local operator (factory use only).
	**Reset kWh** Future firmware release. Currently not used. Always inactive.
	**Reset Communication/SCADA** Active when a reset of a shutdown or fault is requested remotely over the communication link.

Status Bits

	**Forward** Active when the variable frequency drive is confirmed running in the forward direction.
	**Reverse** Active when the variable frequency drive is confirmed running in the reverse direction.
	**Pre-Run** Active when the controller is processing the Pre-Run sequence.
	**Run** Active when the controller has completed the Pre-Run sequence, and the main pump is running.
	**Post-Run** Active when the controller is processing the Post-Run sequence.
	**Alarm** Active when any alarm event is currently present.
	**Shutdown** Active when any shutdown event is currently present.
	**Fault** Active when any fault event is currently present.
	**Fault Variable Frequency Drive** Active when a variable frequency drive fault is currently present.
	**Restart** Active when a shutdown or fault is currently present, and is configured for a timed/automatic restart.
	**I (Current) Limit** Active when the variable frequency drive is current limiting.
	**T (Torque) Limit** Active when the variable frequency drive is torque limiting.
	**Accelerating** Active when the variable frequency drive is accelerating.
	**Decelerating** Active when the variable frequency drive is decelerating.

Wait	**Waiting** Active when the controller is waiting for start conditions to be met.
Mntnc	**Maintenance Required** Active when any Maintenance Reminder is in need of attention.

Process



Process - Pre-Run

System Off	
Off	The HOA switch is in the Off position, and the system will not run.
Ready	The HOA switch is in the Hand or Auto position, and the system is waiting for run conditions to be met.
Pre-Run	The Pre-Run sequence is currently running.
Run	The main pump is running.
Post-Run	The Post-Run sequence is currently running.
Alarm	One or more alarm conditions is/are currently present.
Shutdown	A shutdown event is currently present.
Fault	A fault event is currently present (system or variable frequency drive).
Restart	A shutdown or fault event is currently present, and is configured for a

	timed/automatic restart.

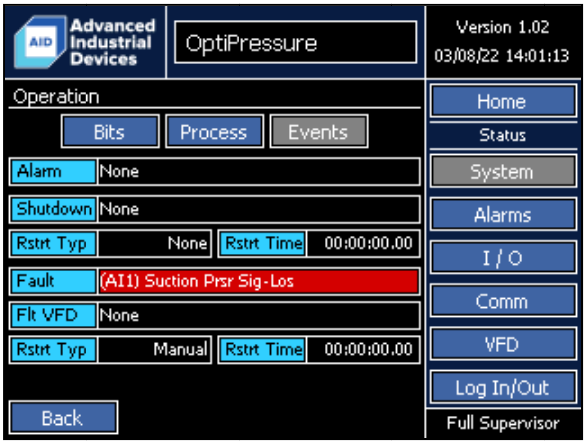
Process - Pre-Run

	
Idle	The system is waiting for start conditions to be met (the HOA could also be in the Off position).
Compressor Delay	The thrust chamber oil pump is currently running.
Done	The Pre-Run sequence has completed successfully.

Process - Post-Run

	
----------	Future firmware release. Currently not used. Always blank.

Events



Events - Alarm

Alarm None
Displays a text description of any alarm event (single or multiple) that is currently present. Refer to the Events chapter for a list of alarm events and descriptions.

Events - Shutdown

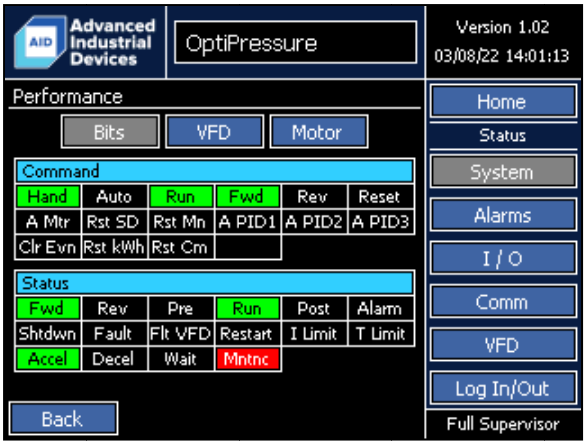
Shutdown None	
Displays a text description of a shutdown event that is currently present. Refer to the Events chapter for a list of shutdown events and descriptions.	
Rstrt Typ None	Rstrt Time 00:00:00.00
Displays the restart type of a shutdown event that is currently present. • None No shutdown event is currently present. • Manual The shutdown event requires a manual reset. • Timed	Displays the amount of time remaining before the shutdown event is automatically reset, if the Shutdown Restart Type is Timed.

The shutdown event will automatically reset when the Shutdown Restart Time elapses. The shutdown event can also be manually reset before the Shutdown Restart Time elapses.	

Events - Fault

	
Displays a text description of a fault event that is currently present. Refer to the Events chapter for a list of fault events and descriptions.	
	
Displays a text description of a variable frequency drive specific fault event. Refer to the Events chapter for a list of variable frequency drive fault events and descriptions.	
	
Displays the restart type of a fault event that is currently present. • None No fault event is currently present. • Manual The fault event requires a manual reset. • Timed The fault event will automatically reset when the Fault Restart Time elapses. The fault event can also be manually reset before the Fault Restart Time elapses.	Displays the amount of time remaining before the fault event is automatically reset, if the Fault Restart Type is Timed.

Bits

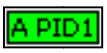


Command and Status bits are duplicated on both the System Operation and System Performance status screens in order to provide a quick reference for the local operator, without the need to flip back and forth between screens for the needed information.

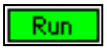
Command and Status bits are displayed in white text over a black background when in the reset/inactive (logic 0) state. During normal operation, Command and Status bits are displayed in black text over a green background when in the set/active (logic 1) state, or when in need of immediate attention, in white text over a red background.

Command Bits

Hand	**Hand** Active when the HOA is in the Hand position and the local operator has started the system using the Start button on the Home screen.
Auto	**Auto** Active when the HOA is in the Auto position and the start condition has been met (digital input, analog input, etc.).
Run	**Run** Active when the Hand and/or Auto Command Bit(s) is/are active.
Fwd	**Forward** Active when the Run Command Bit and the Run Status Bit are active.

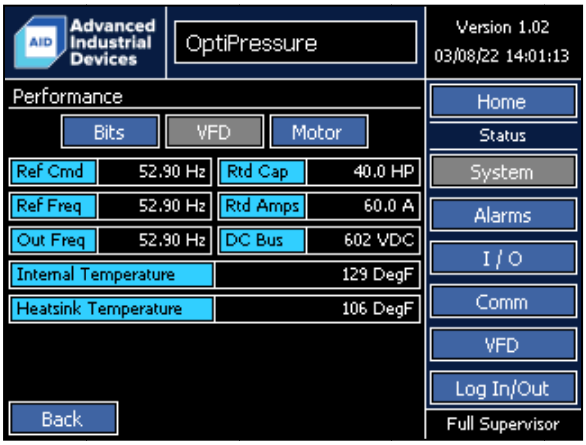
	**Reverse** Future firmware release. Currently not used. Always inactive.
	**Reset** Active when a reset of a shutdown or fault is requested, either manually by the operator (locally or via SCADA) or automatically by the controller if the shutdown or fault is configured for a timed reset.
	**Auto-Tune Motor** Future firmware release. Currently not used. Always inactive.
	**Reset SD Card Logging** Active when a reset of the SD card logging system is requested by the local operator (factory use only).
	**Reset Manual** Active when a manual reset of a shutdown or fault is requested locally by the operator.
	**Auto-Tune Bypass Valve Position** Active when the modulating bypass valve PID auto-tune process is requested by the local operator, and remains active until the PID auto-tune process completes.
	**Auto-Tune Compressor Speed** Active when the compressor PID auto-tune process is requested by the local operator, and remains active until the PID auto-tune process completes.
	**Auto-Tune Cooling Fan Speed** Active when the cooling fan PID auto-tune process is requested by the local operator, and remains active until the PID auto-tune process completes.
	**Clear Events** Active when a clearing of the event history is requested by the local operator (factory use only).
	**Reset kWh** Future firmware release. Currently not used. Always inactive.
	**Reset Communication/SCADA** Active when a reset of a shutdown or fault is requested remotely over the communication link.

Status Bits

	**Forward** Active when the variable frequency drive is confirmed running in the forward direction.
	**Reverse** Active when the variable frequency drive is confirmed running in the reverse direction.
	**Pre-Run** Active when the controller is processing the Pre-Run sequence.
	**Run** Active when the controller has completed the Pre-Run sequence, and the main pump is running.
	**Post-Run** Active when the controller is processing the Post-Run sequence.
	**Alarm** Active when any alarm event is currently present.
	**Shutdown** Active when any shutdown event is currently present.
	**Fault** Active when any fault event is currently present.
	**Fault Variable Frequency Drive** Active when a variable frequency drive fault is currently present.
	**Restart** Active when a shutdown or fault is currently present, and is configured for a timed/automatic restart.
	**I (Current) Limit** Active when the variable frequency drive is current limiting.
	**T (Torque) Limit** Active when the variable frequency drive is torque limiting.
	**Accelerating** Active when the variable frequency drive is accelerating.
	**Decelerating** Active when the variable frequency drive is decelerating.

Wait	**Waiting** Active when the controller is waiting for start conditions to be met.
Mntnc	**Maintenance Required** Active when any Maintenance Reminder is in need of attention.

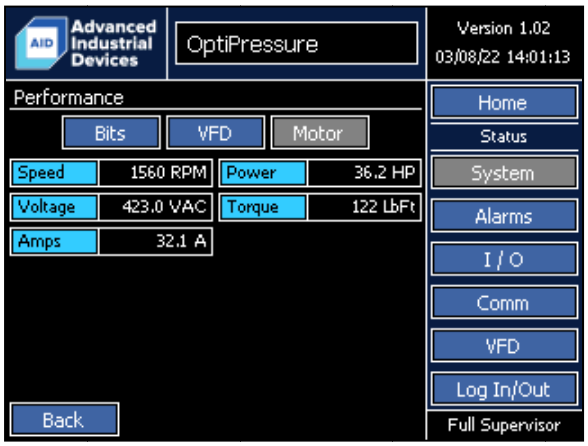
Variable Frequency Drive



Ref Cmd	The Reference Command is the reference frequency, in Hz, set by the controller and sent to the variable frequency drive.
Ref Freq	The Reference Frequency is the reference frequency, in Hz, read back as a monitor from the variable frequency drive. Under normal operating conditions, the Reference Command and Reference Frequency should match, or be very close in value.
Out Freq	The Output Frequency is the frequency output, in Hz, at the variable frequency drive motor terminals.
Rtd Cap	The Rated Capacity identifies the rated capacity, in horsepower, of the variable frequency drive. The rated capacity horsepower should match the label located on the outside of the variable frequency drive if correctly identified by the controller firmware.
Rtd Amps	The Rated Current identifies the rated current, in amps, of the variable frequency drive. The rated current amperage should match the label located on the outside of the variable frequency drive if correctly identified by the controller firmware.

DC Bus	The DC Bus is the value of the internal DC bus, in volts DC, of the variable frequency drive. The DC voltage has a relationship of 1.141 times the incoming AC RMS voltage. For example, 480 VAC incoming, results in 480 VAC * 1.414 = 678 VDC (approximately). This monitor can be helpful when troubleshooting internal issues with the variable frequency drive or incoming power.
Internal Temperature	The Internal Temperature is the temperature of the control card, in degrees F, of the control card located inside the variable frequency drive.
Heatsink Temperature	The Heatsink Temperature is the temperature of the large aluminum heatsink, in degrees F, of the variable frequency drive.

Motor

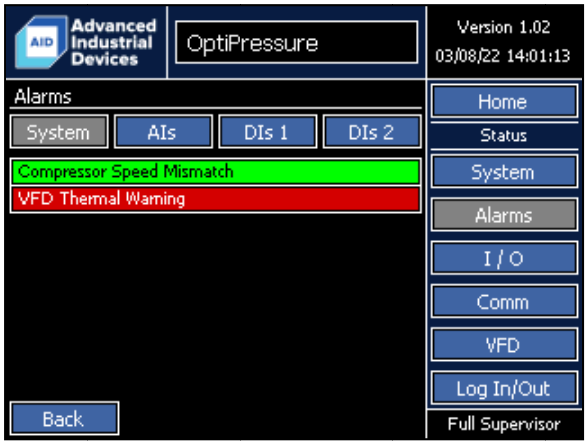


Speed	The speed of the motor in RPM.
Voltage	The output voltage at the motor terminals of the variable frequency drive in volts AC.
Amps	The output current of the variable frequency drive to the motor in amps AC.
Power	The electrical power input to the motor in horsepower.
Torque	The shaft torque of the compressor motor in Lb-Ft.

Alarms

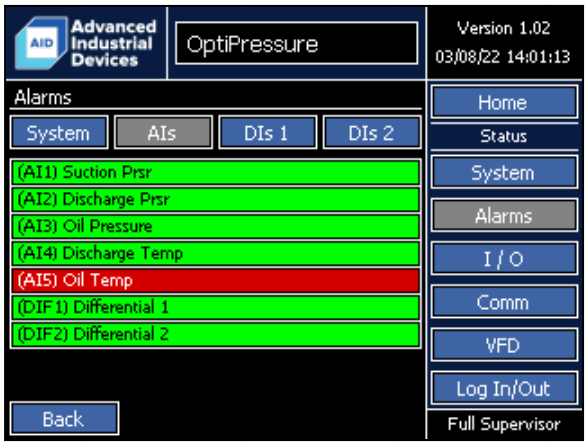
Alarm events serve to notify the operator or external equipment of a condition that warrants attention, but does not yet need to stop the process. Since the system continues to run when alarm events occur, multiple alarms can be present simultaneously.

System



Individual alarm events are listed on the Alarms screen. Alarm events that are not currently present (inactive/OK) are displayed in black text over a green background. When an alarm event is currently present (active), the individual alarm indicator will be displayed in white text over a red background.

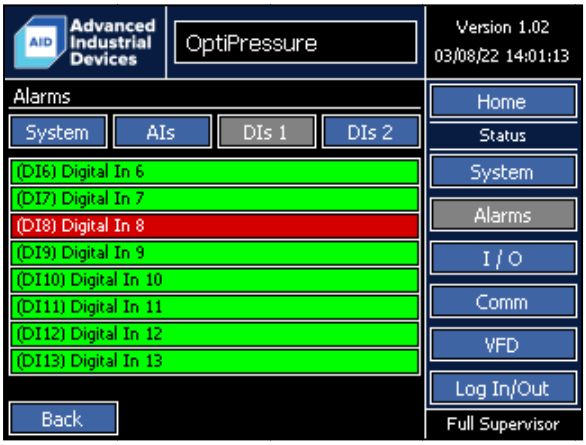
Analog Inputs

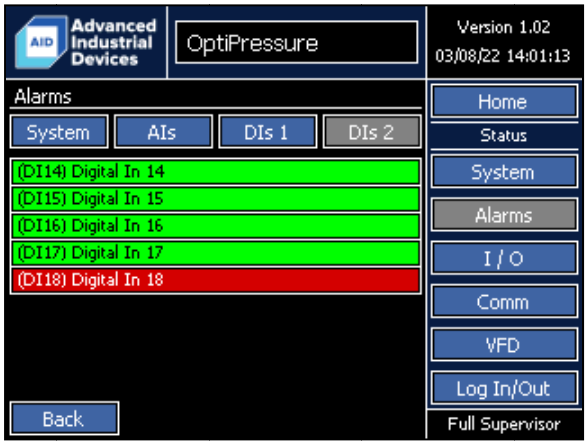


For analog input alarms, the text on the individual alarm indicators will automatically be updated with the names entered by the operator on the configuration screen for the associated input.

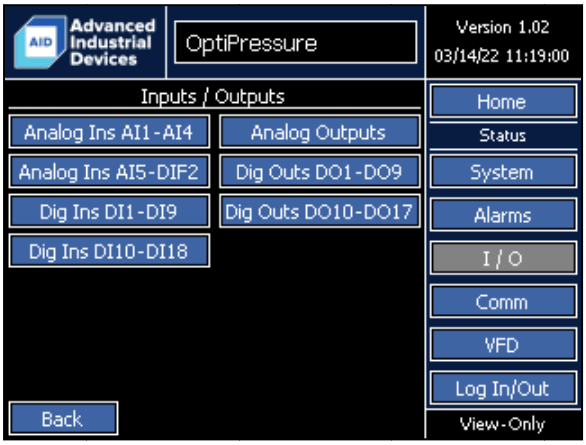
Each analog input can be configured for up to four independent alarm setpoints, but only one alarm indicator per analog input is shown on the Alarms screen. The alarm indicator for each of the analog inputs shown will indicate an alarm condition if ANY of the four alarm conditions associated with that analog input is present. For a detailed breakdown of the analog input alarm events, refer to **Status > I/O > Analog Ins AI1-AI4** and **Status > I/O > Analog Ins AI5-DIF2**.

Digital Inputs 1 and 2

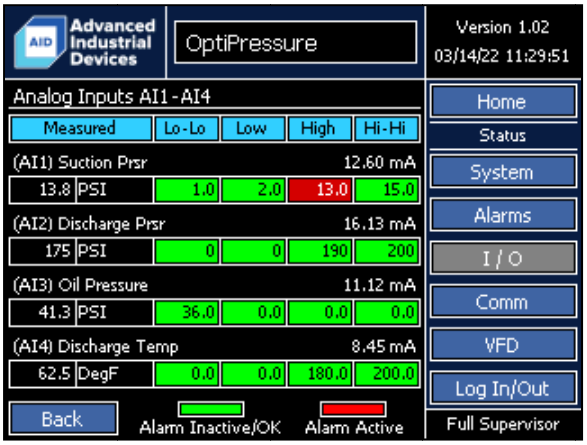


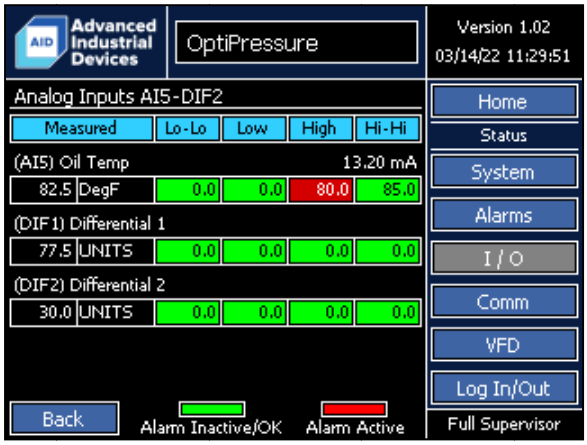


For digital input alarms, the text on the individual alarm indicators will automatically be updated with the names entered by the operator on the configuration screen for the associated input.



The OptiPressure controller provides a robust set of analog and digital I/O that allows for monitoring and control of a variety of external devices. For operator simplicity, the analog and digital I/O status information is grouped by I/O type.



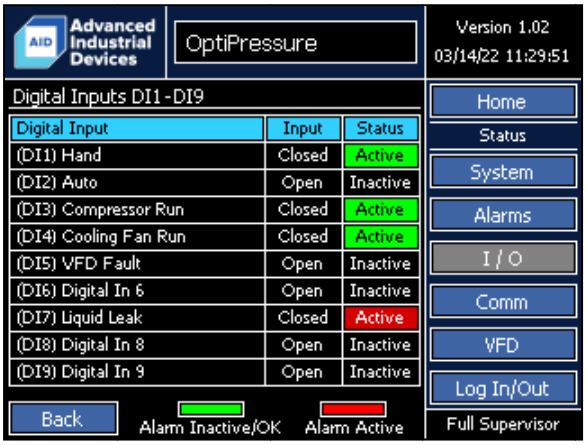


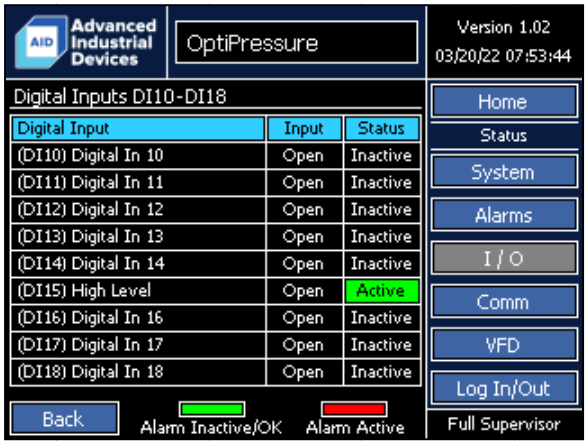
Analog inputs 1 through 4 are shown on the first Analog Inputs I/O status screen and analog inputs 5 through DIF2 are shown on the second Analog Inputs I/O status screen. Each row in the table represents a single analog input, and provides the following:

- Name (configurable, however some inputs have a dedicated function)
- Current Signal Level (mA)
- Current Measured Value (based on the minimum and maximum scaling configured)
- Units (configurable or fixed, depending on the function)
- Low-Low Alarm/Shutdown Setpoint Value (configurable)
- Low Alarm/Shutdown Setpoint Value (configurable)
- High Alarm/Shutdown Setpoint Value (configurable)
- High-High Alarm/Shutdown Setpoint Value (configurable)

While the **Status > Alarms** screen groups the four individual alarm/shutdown setpoints into a single indicator, the I/O status screen displays each of the setpoints individually, and color codes the setpoints in the same manner as the alarms screen. A setpoint with no alarm event present (inactive/OK) is displayed in black text over a green background. A setpoint with an alarm event present (active) is displayed in white text over a red background.

Digital Inputs DI1 – DI18



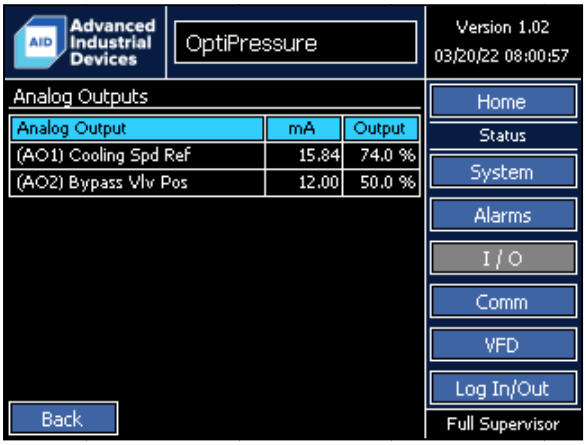


Digital inputs 1 through 9 are shown on the first Digital Inputs I/O status screen and digital inputs 10 through 18 are shown on the second Digital Inputs I/O status screen. Each row in the table represents a single digital input, and provides the following:

- Name (configurable, however some inputs have a dedicated function)
- Input Status (Open or Closed)
- Status (Active or Inactive - each digital input can be configured to be active when open or closed)

The status of inactive digital inputs is displayed with white text over a black background, while the status of active digital inputs is displayed with black text over a green background.

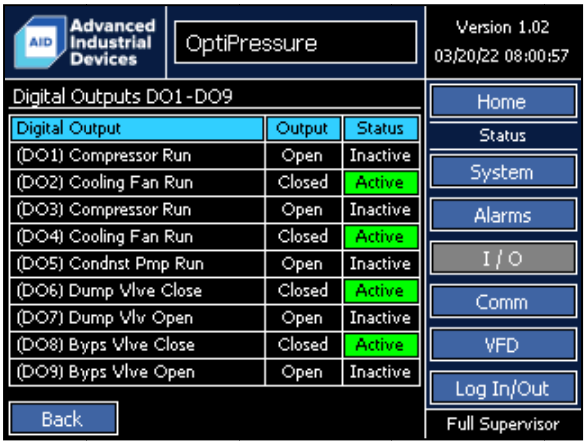
Some digital inputs can be configured for alarm and shutdown events. If the status of a digital input is active and an alarm event is present (active) the status will be displayed in white text over a red background.



Each row in the table represents a single analog output, and provides the following information:

- Name (determined by function selected)
- Current Signal Level (mA)
- Current Output Value in Scaled Units (units determined by function selected)

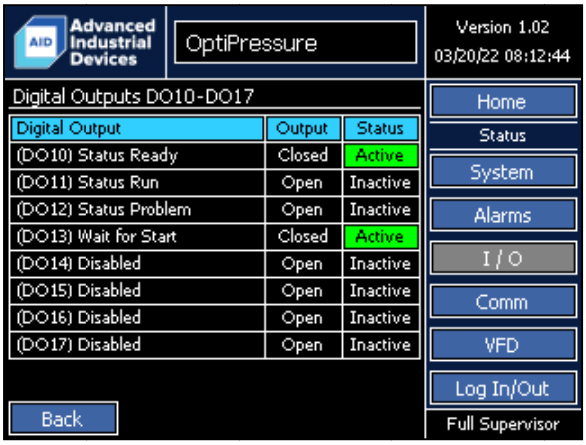
Both Analog Output 1 and Analog Output 2 are multipurpose, with the function configurable by the operator.



Digital outputs 1 through 9 are shown on the first Digital Outputs I/O status screen. The Digital Outputs status screen presents information in a similar layout to the Digital Inputs status screen. The key difference is the digital outputs do not have alarm indications, as the outputs cannot be configured for alarm or shutdown events. Each row in the table represents a single digital output, and provides the following information:

- Name (determined by function selected)
- Output Status (Open or Closed)
- Status (Active or Inactive - each digital output can be configured to be active when open or closed)

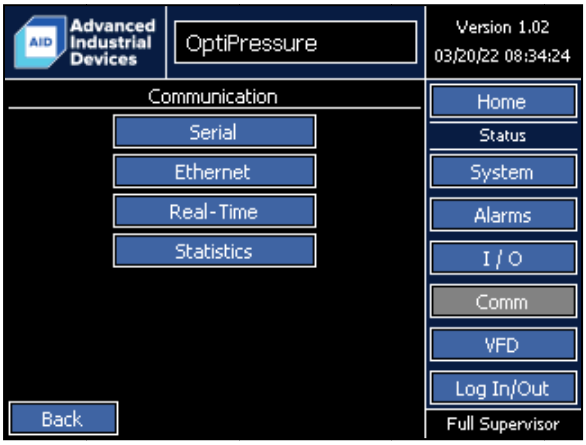
The status of inactive digital outputs is displayed with white text over a black background, while the status of the active digital outputs is displayed with black text over a green background.



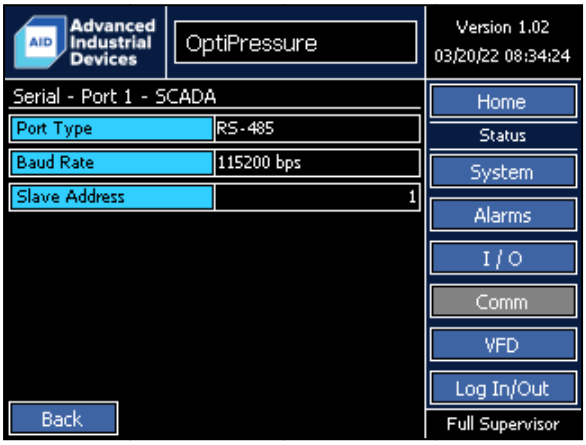
Digital outputs 10 through 17 are shown on the first Digital Outputs I/O status screen. The Digital Outputs status screen presents information in a similar layout to the Digital Inputs status screen. The key difference is the digital outputs do not have alarm indications, as the outputs cannot be configured for alarm or shutdown events. Each row in the table represents a single digital output, and provides the following information:

- Name (determined by function selected)
- Output Status (Open or Closed)
- Status (Active or Inactive - each digital output can be configured to be active when open or closed)

The status of inactive digital outputs is displayed with white text over a black background, while the status of the active digital outputs is displayed with black text over a green background.

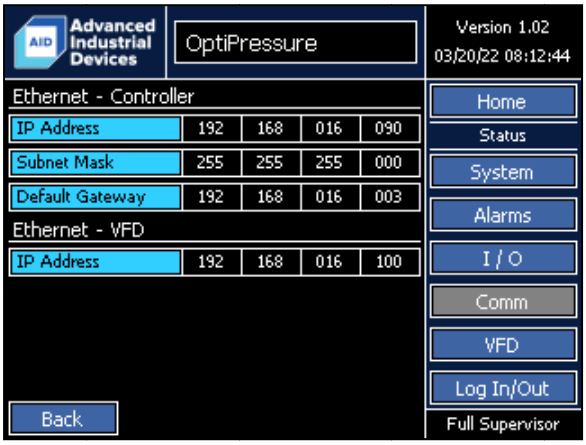


The OptiPressure controller supports several configurable data communication methods. The Communication Status screens summarize all of the communication configuration parameter values and key communication statistics. The availability of all the communication data in a single location provides the operator or technician with quick access to key parameter values needed for commissioning or troubleshooting.



Ethernet communication between the OptiPressure controller and the variable frequency drive is required. Serial communication between the two devices is NOT supported.

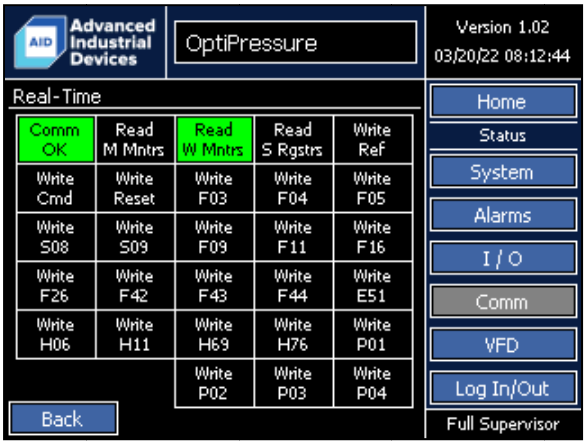
Serial communication is available for SCADA communication with the OptiPressure controller. However, Ethernet communication is highly recommended for both speed and reliability.



Ethernet communication between the OptiPressure controller and the variable frequency drive is required. Serial communication between the two devices is NOT supported.

The Ethernet status screen summarizes the IP addressing currently configured for both the controller and the variable frequency drive. For simplicity, the controller and the variable frequency drive should be configured for the same subnet.

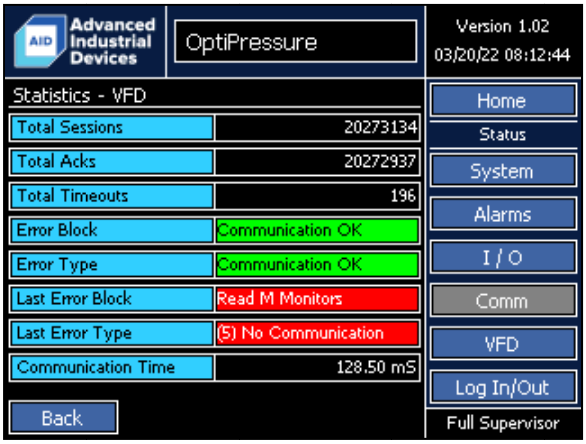
Both the controller and variable frequency drive should be power-cycled if any of these parameters are modified.



Stable, reliable Ethernet communication between the OptiPressure controller and the variable frequency drive is a critical component to the optimal performance of the system as a whole. Since unknown site conditions may affect the quality of the communications link at the time of installation or later when site conditions change, the Communication Status screens provide capture of communication error messages, if errors occur.

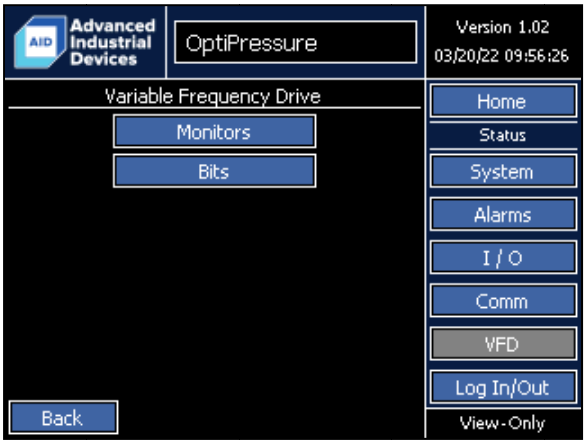
Each step in the communication process between the controller and the variable frequency drive can be noted by the operator using the rows of communication indicators. The Comm OK indicator will remain green when communication has been established with the variable frequency drive, and will turn red if a communication error occurs. All other communication indicators will appear to blink during normal and successful communication with the variable frequency drive. A green background indicates that the step is currently running. A black background indicates that the step is currently idle.

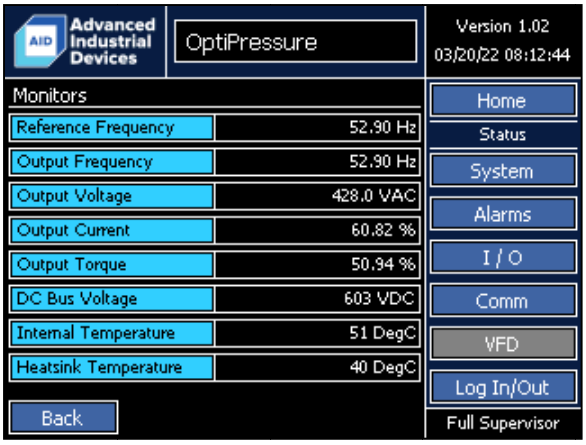
Please note that the Read indicators will blink much more often than the Write indicators, as the controller only writes values to the variable frequency drive when particular values require updating.

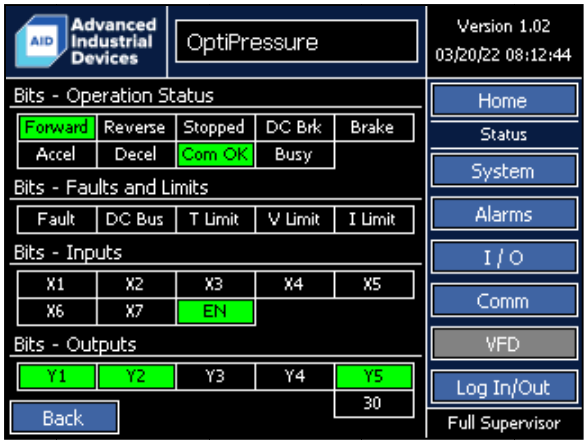


If a communication error does occur, the communication block that experiences the problem will be shown in the Error Block monitor and the type of communication error shown in the Error Type monitor. Once the communication error has been resolved, the values of Error Block and Error Type are moved to the Last Error Block and Last Error Type monitors, to provide some historical information if the communication error occurs only intermittently.

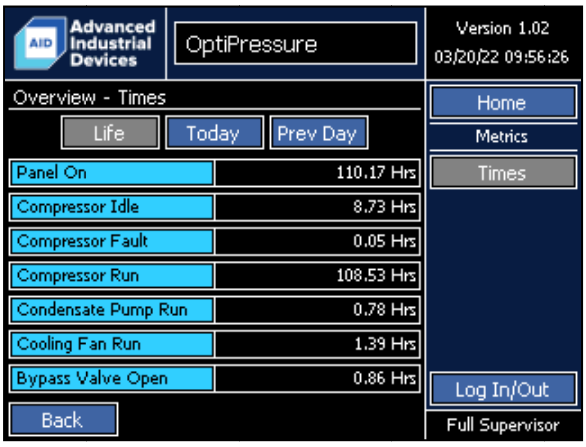
Finally, the Communication Time monitor displays the amount of time in mS for the entire communication loop to complete. Normally, the communication time required is approximately 100 mS. However, some communication loop passes require additional time to update several values within the variable frequency drive, so the time may vary. If, however, the operator notes that the Communication Time frequently spikes to over 1000 mS, the communication link should be investigated for possible errors in the configuration or damage to the physical communication wiring. Typically, when intermittent communication errors are present, the Total Timeouts monitor will be increasing fairly quickly, as the variable frequency drive is intermittently not responding to the requests or commands sent by the controller.

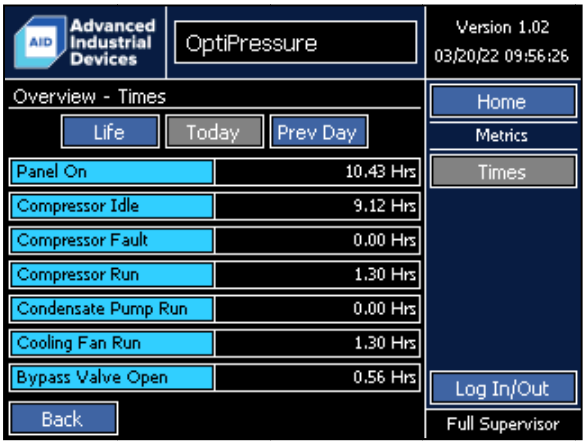


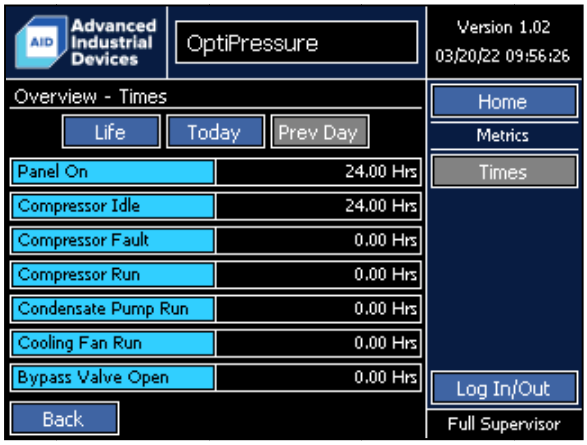




The status indicators and monitor values displayed on the Variable Frequency Drive Status screen are the values read directly from the variable frequency drive monitor registers. The values are unmodified or manipulated, and can be used for troubleshooting when checking to verify that the information being presented by the variable frequency drive to the controller for decision-making are expected and/or sensible values.







Function time and operational data are tracked on the Metrics Times screen. Metrics data can be used for determining when equipment maintenance should be performed and/or if daily operational performance has been affected by changes to the system.

Life, Today, and Previous Day monitors are available for the following devices:

- Panel (tracks the powered-on time, and increments even when the equipment is not running)
- Compressor Idle
- Compressor Fault
- Compressor Run
- Condensate Pump Run
- Cooling Fan Run
- Bypass Valve Open

The Today monitor values are automatically moved to the Previous Day monitors everyday at midnight.

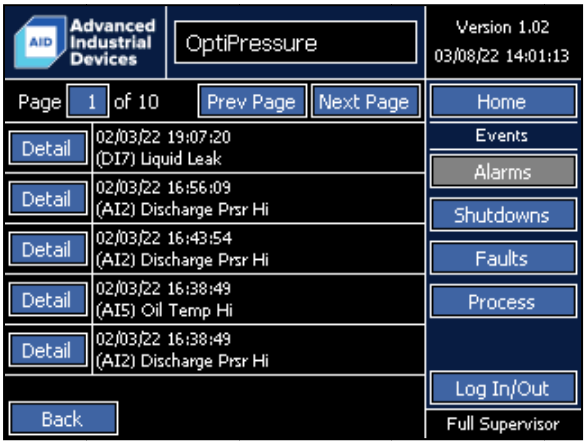
Process events create log entries of important actions that occur during operation. Process conditions that stray outside of normal operation bounds can trigger alarm, shutdown, and fault events. Some event conditions are configurable, and others have fixed limits that cannot be changed or disabled. The OptiPressure controller uses four classifications of events, based on severity (listed below from least to most severe):

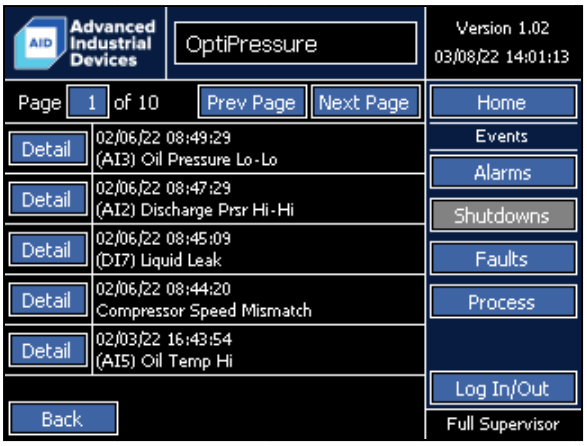
- Process
    - Occur during normal operation, so do not alert the operator.
    - Record that the action occurred, in case the operator needs to review the sequence to verify proper operation or investigate the actions that occurred during the lead-up to a problem.

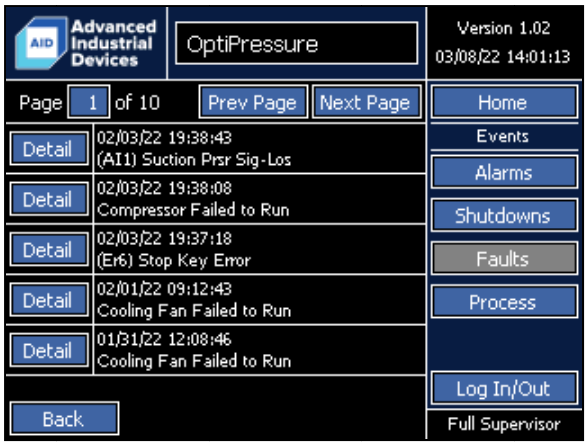
- Alarms
    - May occur during normal operation, so warn the operator, but continue the process.
    - When alarm event conditions are met, the controller indicates a warning message and records the event. The system continues to operate. If the alarm event conditions are no longer met while the system is running, the alarm event automatically resets/clears. Because alarm events do not stop the system, multiple alarm events may be active at the same time.

- Shutdowns
    - Should not occur during normal operation, so stop the process.
    - When shutdown event conditions are met, the controller immediately stops the process and records the event. If running, the compressor will come to a full stop, and the Post-Run sequence will run. A shutdown event may be configured to automatically restart after a set time has elapsed or may be configured to require the operator to manually reset/clear the shutdown event.

- Faults (Controller and Variable Frequency Drive)
    - Should never occur during normal operation and likely indicates a hardware failure, so stop the process.
    - When fault event conditions are met, the controller immediately stops the process and records the event. If running, the compressor will come to a full stop, and the Post-Run sequence will attempt to run. A fault event cannot be configured to automatically restart, and must be reset/cleared by the operator.
    - If a fault event occurs, the operator should thoroughly investigate the cause, and make any necessary repairs before restarting the system.

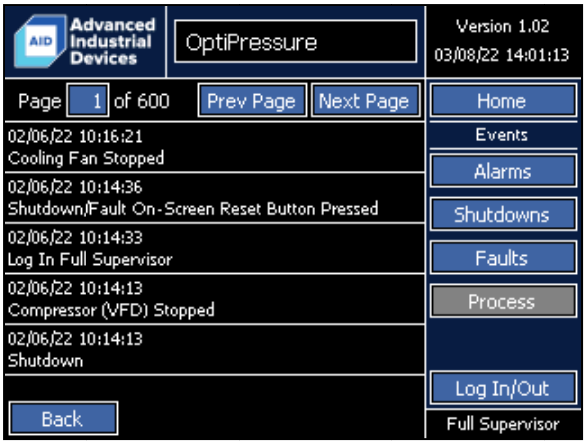




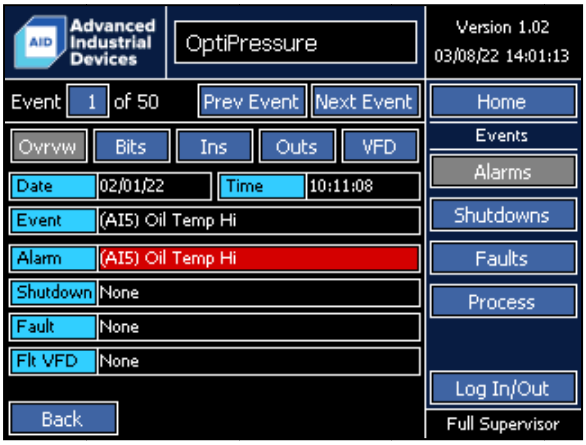


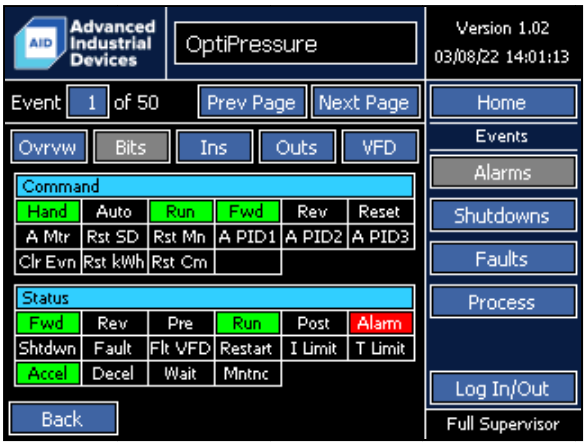
The OptiPressure controller can store up to 50 events per event type for alarm, shutdown and fault events, and up to 3000 process events. Events are grouped by classification. The classification can be selected from the menu located on the right side of the screen. When an event type is selected from the menu, a list of the events will be displayed, with the most recent event shown at the top. Each page within the event type displays 5 events. The Prev Page and Next Page buttons at the top of the screen move backward and forward in the list, displaying the previous or next 5 events. If known, the operator can jump to a specific page of events using the page number button in the upper left corner of the screen.

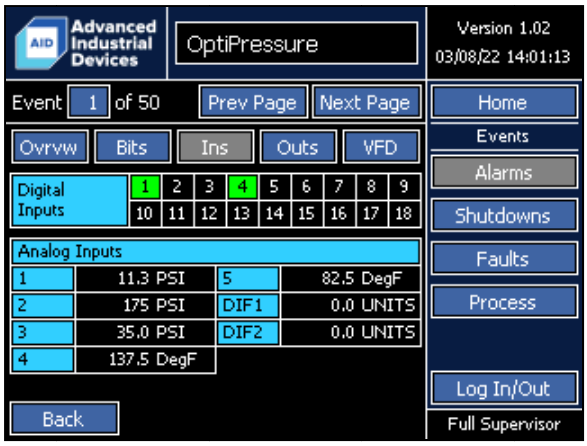
Each event shown in the list displays the date and time the event occurred, and a short text description. The Detail buttons located on the left side of the event list switch to the Event Detail screen, which displays a snapshot of the operating conditions at the time the event was set.

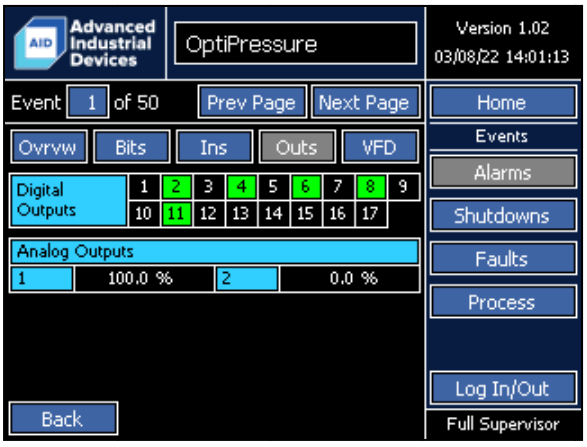


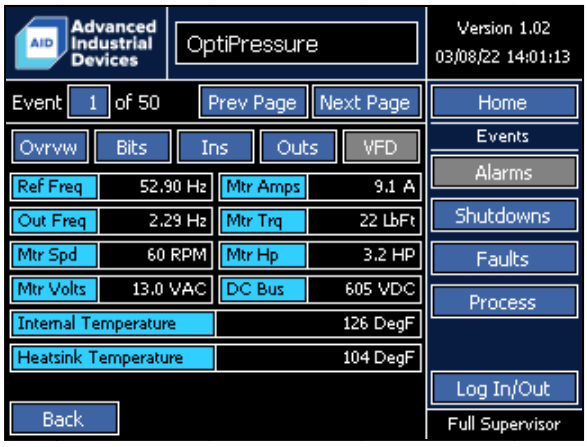
Process events do not record a snapshot at the time the entry is recorded. Since the system is operating normally, the SD card data logging is recommended for tracking performance in this case.











Navigation on the Event Details screen operates similarly to the Event List Screen. The Prev Page and Next Page buttons at the top of the screen move backward and forward one event at a time, displaying the snapshot data

at the time of the event. If known, the operator can jump to a specific page (event) using the Event number button in the upper left corner of the screen.

The snapshot data shown for the event are the same values available on the System Status and I/O Status screens. For more detail on the values, refer to the sections on the System Status and I/O Status screens.

Press the Back button located in the lower left corner of the screen to return back to the Event List screen.

Process Events	
None	Event Log Cleared
Controller Power-On	Firmware Changed
Controller Power-Off	Maintenance Reminder 01 Activated
Log Out	Maintenance Reminder 02 Activated
Log In Limited Operator	Maintenance Reminder 03 Activated
Log In Full Supervisor	Maintenance Reminder 04 Activated
Log In Special Service	Maintenance Reminder 01 Reset
Log In Special Factory	Maintenance Reminder 02 Reset
HOA Switch in Hand Position	Maintenance Reminder 03 Reset
HOA Switch in Off Position	Maintenance Reminder 04 Reset
HOA Switch in Auto Position	Persistent Data Cleared
Hand Control On-Screen Start Button Pressed	Panel Run-Time Cleared
Hand Control On-Screen Stop Button Pressed	Compressor Run-Time Cleared
Shutdown/Fault On-Screen Reset Button Pressed	Condensate Pump Run-Time Cleared
Shutdown/Fault Terminal (Digital Input) Reset	Cooling Fan Run-Time Cleared
Shutdown/Fault SCADA (Communication) Reset	Bypass Valve Open Time Reset
Dump Valve Commanded to Open	Alarm
Dump Valve Commanded to Close	Shutdown
Bypass Valve Commanded to Open	Fault
Bypass Valve Commanded to Close	Vessel Bleed Valve Commanded to Open
Cooling Fan Started	Vessel Bleed Valve Commanded to Close
Cooling Fan Stopped	
Compressor (VFD) Started	
Compressor (VFD) Stopped	

Alarms	
None	(AI11) Analog Input 11 High-High
Multiple	(AI11) Analog Input 11 High
(AI1) Analog Input 1 High-High	(AI11) Analog Input 11 Low
(AI1) Analog Input 1 High	(AI11) Analog Input 11 Low-Low
(AI1) Analog Input 1 Low	(AI12) Analog Input 12 High-High
(AI1) Analog Input 1 Low-Low	(AI12) Analog Input 12 High
(AI2) Analog Input 2 High-High	(AI12) Analog Input 12 Low
(AI2) Analog Input 2 High	(AI12) Analog Input 12 Low-Low
(AI2) Analog Input 2 Low	(AI13) Analog Input 13 High-High
(AI2) Analog Input 2 Low-Low	(AI13) Analog Input 13 High
(AI3) Analog Input 3 High-High	(AI13) Analog Input 13 Low
(AI3) Analog Input 3 High	(AI13) Analog Input 13 Low-Low
(AI3) Analog Input 3 Low	Differential Input 1 High-High
(AI3) Analog Input 3 Low-Low	Differential Input 1 High
(AI4) Analog Input 4 High-High	Differential Input 1 Low
(AI4) Analog Input 4 High	Differential Input 1 Low-Low
(AI4) Analog Input 4 Low	Differential Input 2 High-High
(AI4) Analog Input 4 Low-Low	Differential Input 2 High
(AI5) Analog Input 5 High-High	Differential Input 2 Low
(AI5) Analog Input 5 High	Differential Input 2 Low-Low
(AI5) Analog Input 5 Low	(DI1) Digital Input 1
(AI5) Analog Input 5 Low-Low	(DI2) Digital Input 2
(AI6) Analog Input 6 High-High	(DI3) Digital Input 3
(AI6) Analog Input 6 High	(DI4) Digital Input 4
(AI6) Analog Input 6 Low	(DI5) Digital Input 5
(AI6) Analog Input 6 Low-Low	(DI6) Digital Input 6
(AI7) Analog Input 7 High-High	(DI7) Digital Input 7
(AI7) Analog Input 7 High	(DI8) Digital Input 8
(AI7) Analog Input 7 Low	(DI9) Digital Input 9
(AI7) Analog Input 7 Low-Low	(DI10) Digital Input 10
(AI8) Analog Input 8 High-High	(DI11) Digital Input 11
(AI8) Analog Input 8 High	(DI12) Digital Input 12
(AI8) Analog Input 8 Low	(DI13) Digital Input 13
(AI8) Analog Input 8 Low-Low	(DI14) Digital Input 14
(AI9) Analog Input 9 High-High	(DI15) Digital Input 15
(AI9) Analog Input 9 High	(DI16) Digital Input 16
(AI9) Analog Input 9 Low	(DI17) Digital Input 17
(AI9) Analog Input 9 Low-Low	(DI18) Digital Input 18
(AI10) Analog Input 10 High-High	Compressor Speed Mismatch
(AI10) Analog Input 10 High	VFD Heatsink Thermal Warning
(AI10) Analog Input 10 Low	
(AI10) Analog Input 10 Low-Low	

Shutdowns

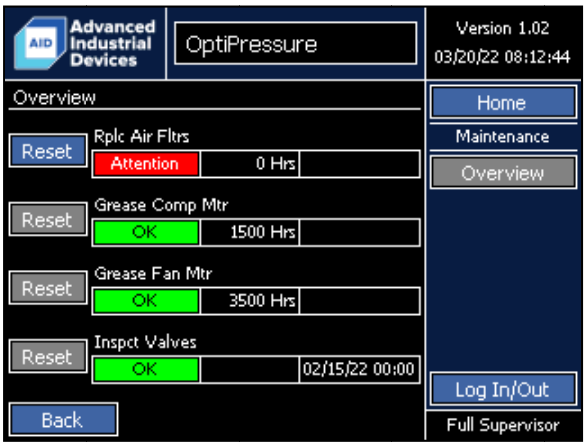
Shutdowns	
None	(AI11) Analog Input 11 High-High
RESERVED	(AI11) Analog Input 11 High
(AI1) Analog Input 1 High-High	(AI11) Analog Input 11 Low
(AI1) Analog Input 1 High	(AI11) Analog Input 11 Low-Low
(AI1) Analog Input 1 Low	(AI12) Analog Input 12 High-High
(AI1) Analog Input 1 Low-Low	(AI12) Analog Input 12 High
(AI2) Analog Input 2 High-High	(AI12) Analog Input 12 Low
(AI2) Analog Input 2 High	(AI12) Analog Input 12 Low-Low
(AI2) Analog Input 2 Low	(AI13) Analog Input 13 High-High
(AI2) Analog Input 2 Low-Low	(AI13) Analog Input 13 High
(AI3) Analog Input 3 High-High	(AI13) Analog Input 13 Low
(AI3) Analog Input 3 High	(AI13) Analog Input 13 Low-Low
(AI3) Analog Input 3 Low	Differential Input 1 High-High
(AI3) Analog Input 3 Low-Low	Differential Input 1 High
(AI4) Analog Input 4 High-High	Differential Input 1 Low
(AI4) Analog Input 4 High	Differential Input 1 Low-Low
(AI4) Analog Input 4 Low	Differential Input 2 High-High
(AI4) Analog Input 4 Low-Low	Differential Input 2 High
(AI5) Analog Input 5 High-High	Differential Input 2 Low
(AI5) Analog Input 5 High	Differential Input 2 Low-Low
(AI5) Analog Input 5 Low	(DI1) Digital Input 1
(AI5) Analog Input 5 Low-Low	(DI2) Digital Input 2
(AI6) Analog Input 6 High-High	(DI3) Digital Input 3
(AI6) Analog Input 6 High	(DI4) Digital Input 4
(AI6) Analog Input 6 Low	(DI5) Digital Input 5
(AI6) Analog Input 6 Low-Low	(DI6) Digital Input 6
(AI7) Analog Input 7 High-High	(DI7) Digital Input 7
(AI7) Analog Input 7 High	(DI8) Digital Input 8
(AI7) Analog Input 7 Low	(DI9) Digital Input 9
(AI7) Analog Input 7 Low-Low	(DI10) Digital Input 10
(AI8) Analog Input 8 High-High	(DI11) Digital Input 11
(AI8) Analog Input 8 High	(DI12) Digital Input 12
(AI8) Analog Input 8 Low	(DI13) Digital Input 13
(AI8) Analog Input 8 Low-Low	(DI14) Digital Input 14
(AI9) Analog Input 9 High-High	(DI15) Digital Input 15
(AI9) Analog Input 9 High	(DI16) Digital Input 16
(AI9) Analog Input 9 Low	(DI17) Digital Input 17
(AI9) Analog Input 9 Low-Low	(DI18) Digital Input 18
(AI10) Analog Input 10 High-High	Compressor Speed Mismatch
(AI10) Analog Input 10 High	VFD Heatsink Thermal Warning
(AI10) Analog Input 10 Low	
(AI10) Analog Input 10 Low-Low	

Faults

Faults	
None	(AI16) Thrst Chmbr Oil Temp Signal-Loss
VFD Fault	(AI17) Mtr Winding 1 Temp Signal-Loss
(AI1) Analog Input Signal-Loss	(AI18) Mtr Winding 2 Temp Signal-Loss
(AI2) Analog Input Signal-Loss	(AI19) Mtr Winding 3 Temp Signal-Loss
(AI3) Analog Input Signal-Loss	(AI20) Mtr Brng Frnt Temp Signal-Loss
(AI4) Analog Input Signal-Loss	(AI21) Mtr Brng Rear Temp Signal-Loss
(AI5) Analog Input Signal-Loss	(AI22) Pump Housing Temp Signal-Loss
(AI6) Analog Input Signal-Loss	(AI23) Ambient Temp Signal-Loss
(AI7) Analog Input Signal-Loss	Block Valve Failed to Open
(AI8) Analog Input Signal-Loss	Pressure Control Valve Failed to Position
(AI9) Analog Input Signal-Loss	Thrust Chamber Oil Pump Failed to Run
(AI10) Analog Input Signal-Loss	Charge Pump Failed to Run
(AI11) Analog Input Signal-Loss	Main Pump Failed to Run
(AI12) Analog Input Signal-Loss	VFD Communications Failed
(AI13) Mtr Brng Out Signal-Loss	VFD Failed to Stop at Start-up
(AI14) Auxiliary Tank 1 Lvl Signal-Loss	Battery Failure
(AI15) Auxiliary Tank 2 Signal-Loss	Hand and Auto Both Active

Faults - Variable Frequency Drive

Faults – Variable Frequency Drive	
None	(Er4) Option Card Comm Error
(OC1) Overcurrent During Accel	(Er5) Option Card Error
(OC2) Overcurrent During Decel	(Er6) Stop Key Error
(OC3) Overcurrent At Set Speed	(Er7) Auto-Tuning Error
EF Ground Fault	(Er8) RS485 Comm Port 1 Error
(OU1) Overvoltage During Accel	(OL3) Motor 3 Overload
(OU2) Overvoltage During Decel	(OL4) Motor 4 Overload
(OU3) Overvoltage At Set Speed	(OPL) Output Phase Loss
(LU) Undervoltage	(ErE) Excessive Speed Deviation
(Lin) Input Phase Loss	(ErF) Data Save Error
(FUS) DC Bus Fuse Blown	(ErP) RS485 Comm Port 2 Error
(PbF) Charging Circuit Fault	(ErH) Hardware Error
(OH1) Heatsink Overheat	(ECN) Enabled EN1/EN2 Lost
(OH2) External Shutdown	(CoF) PID Fdbck Disconnected
(OH3) Internal Overheat	(dbA) Dynamic Braking Transistor
(OH4) Motor PTC/NTC Overheat	(FAL) Internal DC Fan Failure
(dbH) Braking Resistor Overheat	(OL) Motor Overload Warn
(OL1) Motor Overload	(OH) Cooling Fin Overheat Warn
(OL2) Motor 2 Overload	(LiF) Component Life Warn
(OLU) VFD Overload	(rEF) Command Loss
(OS) Overspeed Protection	(Pid) PID Output Warn
(PG) PG Disconnected	(UTL) Low Torque Detected
(nrb) NTC Disconnected	(PTC) Thermistor Loss
(Er1) Memory Error	(rTE) Machine Life Accum Hours
(Er2) Keypad Comm Error	(CnT) Machine Life Start Count
(Er3) CPU Error	(Err) Simulated Fault



The OptiPressure controller includes a built-in Maintenance Reminder system that can automatically remind operators of the need to perform maintenance and other tasks at set intervals. When one or more of the Maintenance Reminders becomes active, a notification appears on the Home screen, a Modbus SCADA indication bit is set, and a Process event entry is recorded.

The Maintenance Overview screen displays the status of all 4 Maintenance Reminders:

- Status (OK, Attention, or Disabled)
- Time Remaining (hours remaining until the reminder becomes active if configured for run-time)
- Next Reminder (date and time the reminder will become active if configured for monthly)
- Reminder Name (the operator-defined name for the reminder)

When a Maintenance Reminder becomes active, the associated Reset button will also become active when the operator is logged-in as the Full Supervisor. Only the Full Supervisor can reset an active Maintenance Reminder. As a good practice, the reminder should not be reset until after the maintenance task has been performed.

When reset, a Maintenance Reminder configured for run-time based notification will reload the Time Remaining monitor with the value set in the associated Run-Time Hours parameter. For a Maintenance Reminder configured for Monthly notification, resetting the reminder will update the Next Reminder monitor with the next available date configured in the associated Day of Month parameter.

The OptiPressure controller is highly versatile and configurable to meet a wide range of site requirements. The flexibility built into the controller allows the equipment to be tailored to meet the specific needs of the site without the need for custom program changes.

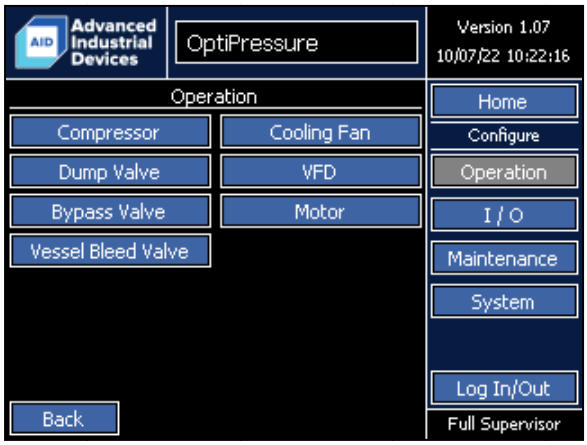
All configurable parameters are accessible via the Configure button on the Main Menu of the Home screen. Parameters are protected from modification by a password, which requires the operator to log-in prior to making changes. All parameters are viewable, but cannot be modified, without logging-in. This can be helpful when troubleshooting with personnel on site that may not be authorized to make changes, but can assist in verifying an improperly configured option before sending qualified personnel to the site.

For safety of both the equipment and personnel, only qualified operators should make changes to the configuration parameters.

Operation

Configuration parameters related to the operation of the controller and connected equipment are available in:

Configure > Operation

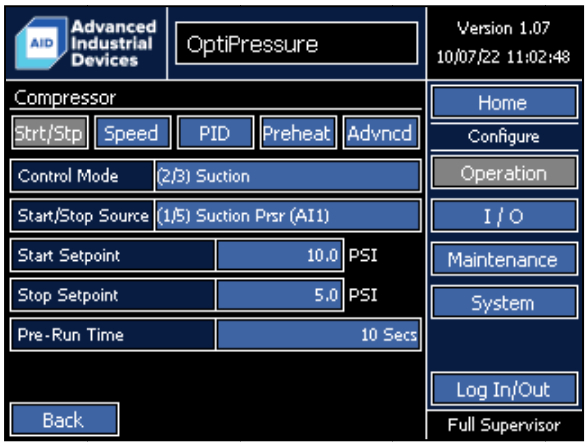


Compressor

Configuration parameters related to the Compressor are available in:

Configure > Operation > Compressor

Configure > Operation > Compressor – Start/Stop



Compressor – Start/Stop > Control Mode

- (1/3) Disabled
  When the Control Mode is set to Disabled, the system will not run. For safety, if the controller battery, which maintains the current configuration parameter values, fails, the Start/Stop Source will default to Disabled to indicate to the operator that other equipment settings have been lost and corrective action will need to be taken before restarting the system.

- (2/3) Suction
  The primary operation of the compressor will be to control the suction pressure.

- (3/3) Discharge
  The primary operation of the compressor will be to control the discharge pressure.

Compressor – Start/Stop > Start/Stop Source

Start/Stop Source sets the control signal responsible for starting and stopping the compressor. The default names for the analog inputs are shown below. However, the names are configurable by the operator, so may differ. The analog input number/designation shown will be the same.

- (1/5) Suction Prsr (AI1)
  The analog signal connected to Analog Input 1 (AI1) will control the starting and stopping of the compressor.

- (2/5) Discharge Prsr (AI2)
  The analog signal connected to Analog Input 2 (AI2) will control the starting and stopping of the compressor.

- (3/5) Oil Pressure (AI3)
  The analog signal connected to Analog Input 3 (AI3) will control the starting and stopping of the compressor.

- (4/5) Discharge Temp (AI4)
  The analog signal connected to Analog Input 4 (AI4) will control the starting and stopping of the compressor.

- (5/5) Oil Temp (AI5)
  The analog signal connected to Analog Input 5 (AI5) will control the starting and stopping of the compressor.

Compressor – Start/Stop > Start Setpoint

The value of the analog input configured as the Start/Stop Source must meet the Start Setpoint value in order to start the compressor.

- If the Start Setpoint is greater than the Stop Setpoint, the system will not start until the analog input value is greater than or equal to the Start Setpoint.

- If the Start Setpoint is less than the Stop Setpoint, the system will not start until the analog input value is less than or equal to the Start Setpoint.

The Start Setpoint units will automatically change based on the analog input selected in Start/Stop Source.

Compressor – Start/Stop > Stop Setpoint

The value of the analog input must meet the Stop Setpoint value in order to stop the compressor.

- If the Start Setpoint is greater than the Stop Setpoint, the system will not stop until the analog input value is less than or equal to the Stop Setpoint.

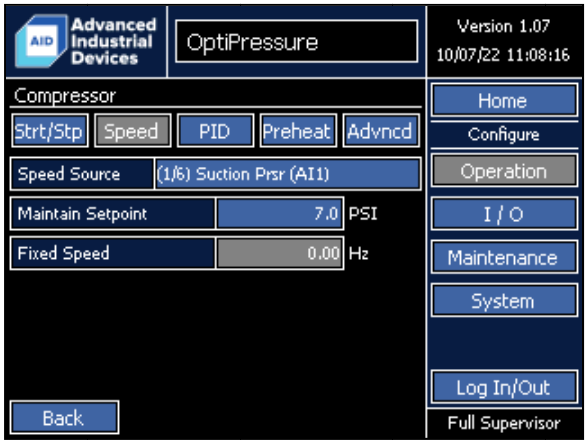
- If the Start Setpoint is less than the Stop Setpoint, the system will not stop until the analog input value is greater than or equal to the Stop Setpoint.

The Stop Setpoint units will automatically change based on the analog input selected in Start/Stop Source.

Compressor – Start/Stop > Pre-Run Time

During start-up, connected support equipment, such as the bypass valve, may require time to move to the start-up position. When the Start Setpoint has been reached, the system will start the Pre-Run process and the Pre-Run Timer will begin. Once the Pre-Run timer elapses, the system will enter the Run process and the compressor will start.

Configure > Operation > Compressor – Speed



Compressor – Speed > Speed Source

Speed Source sets the control signal responsible for controlling the speed of the compressor. The default names for the analog inputs are shown below. However, the names are configurable by the operator, so may differ. The analog input number/designation shown will be the same.

- (1/6) Suction Prsr (AI1)
  The analog signal connected to Analog Input 1 (AI1) will control the speed of the compressor. The speed of the compressor will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (2/6) Discharge Prsr (AI2)
  The analog signal connected to Analog Input 2 (AI2) will control the speed of the compressor. The speed of the compressor will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (3/6) Oil Pressure (AI3)
  The analog signal connected to Analog Input 3 (AI3) will control the speed of the compressor. The speed of the compressor will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (4/6) Discharge Temp (AI4)
  The analog signal connected to Analog Input 4 (AI4) will control the speed of the compressor. The speed of the compressor will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (5/6) Oil Temp (AI5)
  The analog signal connected to Analog Input 5 (AI5) will control the speed of the compressor. The speed of the compressor will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (6/6) Fixed Speed
  The speed of the compressor will remain fixed at the value entered. Maintain Setpoint will be disabled. This option can also be used when setting the speed via SCADA is desired.

Compressor – Speed > Maintain Setpoint

When the Speed Source is configured to use one of the analog input selections, the Maintain Setpoint value will be the value that the system attempts to maintain.

The Maintain Setpoint units will automatically change based on the analog input selected in Speed Source.

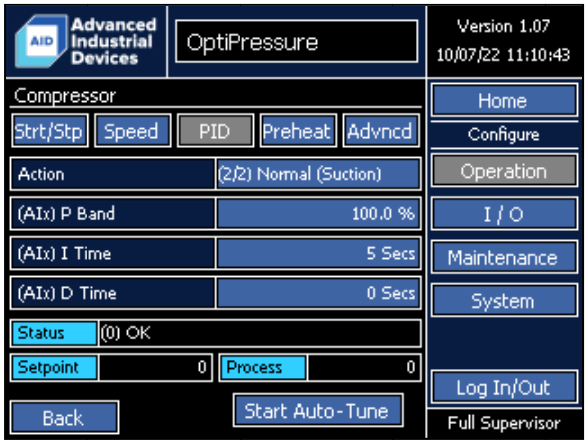
If the Speed Source is not configured to use a maintain analog input, Maintain Setpoint will be disabled.

Compressor – Speed > Fixed Speed

When the Speed Source is set to Fixed Speed, the compressor will run at a speed set by Fixed Speed in Hz. The speed of the compressor will not change automatically.

If the Speed Source is not set to Fixed Speed, Fixed Speed will be disabled.

Configure > Operation > Compressor – PID



Compressor – PID – PID Monitors

Displays the status PID loop controlling speed of the compressor when Speed Source is configured to use one of the analog input selections.

- (0) OK
  The PID loop is in standby.

- (1) Auto-Tune in Progress, (2) Auto-Tune in Progress, (3) Auto-Tune in Progress
  The PID auto-tune procedure is currently active.

- (4) PID Running
  The PID loop is actively controlling the speed of the main pump.

- (5) Setpoint Change in Progress, (6) Setpoint Change in Progress
  A change in the PID setpoint is currently in progress.

- (7) Integral Wind-Up, (8) Integral Wind-Down
  The PID loop output has reached limits due to accumulation of the integral component.

- (9) Paused
  Control of the PID loop is currently paused. Integral and derivative values are not being calculated.

- (10) Process Value Exceeds P Band, (11) Process Value Exceeds P Band
  The process value exceeds the proportional band, so no PID calculations are being performed.

- (12) Auto-Tune Parameter Mismatch, (13) Auto-Tune Parameter Mismatch
  An error is present with the PID auto-tune values. The PID loop will operate without the auto-tune values.

- (-1) P Band Zero
  The P Band value is set to 0. Correct by entering a non-zero, positive value.

- (-2) Input Range Invalid
  The process value is out of range.

- (-3) Output Range Invalid
  The control value is out of range.

- (-4) Integral Overflow
  The integral value has reached the maximum value of 100,000.

- (-5) Error in Auto-Tune Vector Address
  A programming error in the PID loop auto-tuning feature is present.

- (-6) Setpoint Value Out of Input Range
  The setpoint value is out of range.

- (-7) Auto-Tune Error, (-8) Auto-Tune Error, (-9) Auto-Tune Error, (-10) Auto-Tune Error
  The auto-tuning procedure failed.

- (-11) Noise Exceeds 5% Input Range
  The auto-tune procedure cannot be completed successfully due to excessive process value oscillations.

- (-13) Auto-Tune Aborted
  The auto-tune procedure was aborted prior to completion.

	
The setpoint value of the speed control PID loop. No units. Scaled from -10,000 to +10,000. Used for diagnostics and troubleshooting.	The process value of the speed control PID loop. No units. Scaled from -10,000 to +10,000. Used for diagnostics and troubleshooting.

Compressor – PID > Action

When the Speed Source is configured to use an analog input to maintain a process value (PV), the Action determine if the compressor decreases or increases speed as the process value (PV) decreases or increases.

- (1/2) Reverse (Discharge)
  When the discharge pressure is less than the **Compressor – Speed > Maintain Setpoint**, the compressor will increase speed to increase the discharge pressure. As the discharge pressure begins to reach **Compressor – Speed > Maintain Setpoint**, the compressor speed will begin to slow. If the discharge pressure exceeds the **Compressor – Speed > Maintain Setpoint**, the compressor speed will eventually slow to the minimum speed.

- (2/2) Normal (Suction)
  When the suction pressure is greater than the **Compressor – Speed > Maintain Setpoint**, the compressor will increase speed to decrease the suction pressure. As the suction pressure begins to reach the **Compressor – Speed > Maintain Setpoint**, the compressor speed will begin to slow. If the suction pressure drops below the **Compressor – Speed > Maintain Setpoint**, the compressor speed will eventually slow to the minimum speed.

Compressor – PID > (AIx) P Band

When **Compressor – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the (AIx) P Band will set the proportional band around the setpoint in which the PID loop is active. If (AIx) P Band is set to more than 100.0%, the PID function is applied over the entire range.

Running the PID Auto-Tune function is recommended to automatically set this value.

Compressor – PID > (AIx) I Time

When **Compressor – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the (AIx) I Time will set the amount of time, as calculated by the PID loop, required to bring the process value to the Maintain Setpoint. If the (AIx) I Time is set too low, the PID loop will react too quickly, resulting in an overshoot of the Maintain Setpoint. If the (AIx) I Time is set too high, the PID loop will react too slowly.

Running the PID Auto-Tune function is recommended to automatically set this value.

Compressor – PID > (AIx) D Time

When the **Compressor – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the (AIx) D Time will change the response of the PID loop to the rate of change in the error between the process value and **Compressor – Speed > Maintain Setpoint**. (AIx) D Time can be difficult to adjust by hand in order to provide satisfactory results.

Running the PID Auto-Tune function is recommended to automatically set this value.

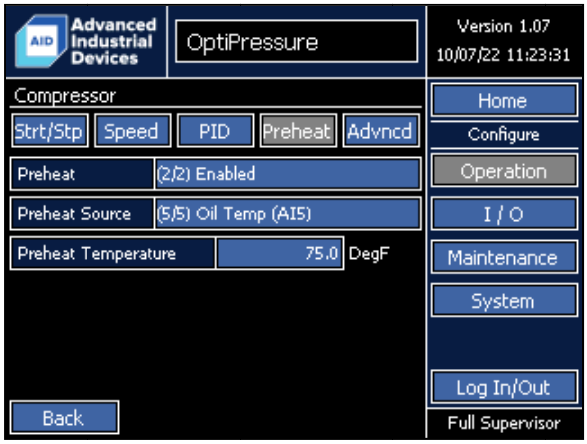
Compressor – PID > Start Auto-Tune

When the **Compressor – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the Start Auto-Tune function will automatically control the speed of the compressor, causing the process value to cycle above and below the Maintain Setpoint. The cycling process allows the controller to calculate the required P Band, I Time, and D Time needed for optimal control of the application. The time required to complete the auto-tune may take several minutes.

Auto-Tune Steps (*must be logged-in as the Full Supervisor to complete these steps):

1. With the desired **Compressor – Speed > Speed Source** selected and **Compressor – Speed > Maintain Setpoint** set, start the system in the Auto mode.
2. Wait for the Pre-Run process to complete, and for the compressor to start.
3. Press the Start Auto-Tune button.
4. Wait for the PID loop to gather data on the process. The compressor will automatically speed up and slow down several times, going above and below the **Compressor – Speed > Maintain Setpoint**. The Start Auto-Tune button will be disabled during this process.
5. When the auto-tune process has completed, the values for P Band, I Time, and D Time will be automatically updated on the screen, and the Start Auto-Tune button will be enabled again.
6. No further adjustments are typically needed. However, the auto-tune process values can be adjusted by hand to fine-tune the response if the operator believes that the response can be further improved.

Configure > Operation > Compressor – Preheat



Compressor oil viscosity increase as temperature decreases. Since a seal is created by the oil in rotary screw compressors, the increased oil viscosity at lower temperatures increases wear and reduces the efficiency of the system. Compressor oil preheat runs the compressor at minimum speed during startup until the oil temperature reaches an operator-defined setpoint. Once the oil temperature reaches the setpoint, the controller releases the compressor to run at a speed based on normal operation.

Compressor – Preheat > Preheat

- (1/2) Disabled
  When Preheat is set to Disabled, the compressor will immediately begin running at normal operation speed after the Pre-Run sequence has completed.

- (2/2) Enabled
  The compressor will run at minimum speed after the Pre-Run sequence has completed, and will continue to run at minimum speed until the compressor oil temperature has reached the desired preheat temperature.

Compressor – Preheat > Preheat Source

Preheat Source sets the control signal responsible for measuring the oil temperature of the compressor. The default names for the analog inputs are shown below. However, the names are configurable by the operator, so may differ. The analog input number/designation shown will be the same.

- (1/5) Suction Prsr (AI1)
  The analog signal connected to Analog Input 1 (AI1) will be used to measure the compressor oil temperature.

- (2/5) Discharge Prsr (AI2)
  The analog signal connected to Analog Input 2 (AI2) will be used to measure the compressor oil temperature.

- (3/5) Oil Pressure (AI3)
  The analog signal connected to Analog Input 3 (AI3) will be used to measure the compressor oil temperature.

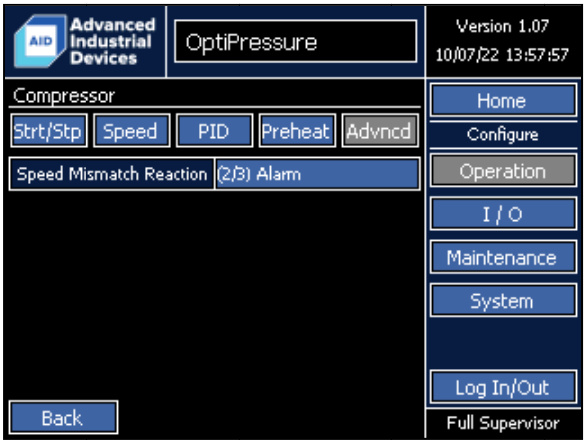
- (4/5) Discharge Temp (AI4)
  The analog signal connected to Analog Input 4 (AI4) will be used to measure the compressor oil temperature.

- (5/5) Oil Temp (AI5)
  The analog signal connected to Analog Input 5 (AI5) will be used to measure the compressor oil temperature.

Compressor – Preheat > Preheat Temperature

The value of the analog input configured as the Preheat Source must be equal to or greater than the Preheat Temperature value in order to release the compressor from minimum speed.

Configure > Operation > Compressor – Advanced



Compressor – Advanced > Speed Mismatch Reaction

Reaction to the condition when the Output Frequency exceeds the Command Reference Frequency by ±0.65 Hz for a period equal to the Acceleration Time plus 5 seconds.

During normal operation, the Output Frequency should match the Command Reference Frequency. However, several conditions may cause the two frequencies to mismatch. For example:

1. Current limit is active.
2. Torque limit is active.
3. Overvoltage suppression is active due to an overhauling load.

The controller can be configured to ignore these conditions or alert the operator if these conditions occur.

- Disabled (1/3)
  A speed mismatch will be ignored.

- Alarm (2/3)
  An alarm event will be indicated, but the system will continue to run.

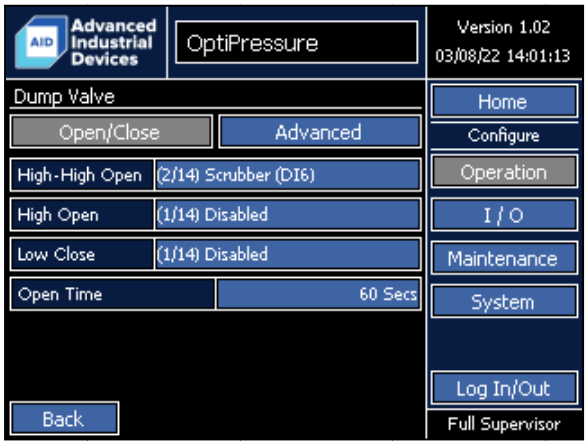
- Shutdown (3/3)
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Dump Valve

Configuration parameters related to the Dump Valve are available in:

Configure > Operation > Dump Valve

Configure > Operation > Dump Valve – Open/Close



The OptiPressure controller supports several dump valve configurations depending on the number of liquid sensors installed. In all configurations, the high-high shutdown sensor is required, while the high open and low close are sensors are optional.

Configuration	High-High Shutdown/Open	High Open	Low Close	Open Timer
1	**Installed**	Not Available	Not Available	Yes
2	**Installed**	Not Available	**Installed**	No
3	**Installed**	**Installed**	Not Available	Yes
4	**Installed**	**Installed**	**Installed**	No

For Configurations 1 and 2, when the high-high shutdown sensor is installed but the high open sensor is **NOT** installed, the single sensor performs two functions:

1. Open the dump valve when the liquid level reaches this level.
2. Shutdown the system if the liquid level remains at or above this level for the shutdown detection time.

The detection time for the shutdown should be set long enough to allow the liquid level to drop below the high-high level after the dump valve opens, but short enough to provide sufficient protection to the system. The detection time can be set for the selected digital input in **Configure > I/O > Digital Inputs > Digital Input X**.

For Configurations 3 and 4, the high-high shutdown sensor does not open the dump valve and only serves to shutdown the system when the liquid levels remains at or above this level for the shutdown detection time. The high open sensor is responsible for opening the dump valve when the liquid level reaches this level.

The low close sensor is optional for either of the configurations using the high-high shutdown and high open sensors. After the dump valve is opened, when a low close sensor is installed, the dump valve will close when the liquid level drops to this level. When a low close sensor is not installed, the dump valve will remain open for the time set in Open Timer, then close after the timer elapses.

Dump Valve – Open/Close > High-High Open

The digital input connected to the high-high liquid level shutdown sensor to also be used to open the dump valve. This parameter is for use when a high open liquid level sensor is **NOT** installed. The default names for the digital inputs are shown below. However, the names are configurable by the operator, so may differ. The digital input number/designation shown will be the same.

- (1/14) Disabled
  When disabled, do not use the high-high shutdown liquid level sensor to open the dump valve. This option should be selected when a separate high open liquid level sensor is installed.

- (2/14) Digital In 6 (DI6)
  The dry contact connected to Digital Input 6 (DI6) will open the dump valve, if High Open is set to Disabled.

- (3/14) Digital In 7 (DI7)
  The dry contact connected to Digital Input 7 (DI7) will open the dump valve, if High Open is set to Disabled.

- (4/14) Digital In 8 (DI8)
  The dry contact connected to Digital Input 8 (DI8) will open the dump valve, if High Open is set to Disabled.

- (5/14) Digital In 9 (DI9)
  The dry contact connected to Digital Input 9 (DI9) will open the dump valve, if High Open is set to Disabled.

- (6/14) Digital In 10 (DI10)
  The dry contact connected to Digital Input 10 (DI10) will open the dump valve, if High Open is set to Disabled.

- (7/14) Digital In 11 (DI11)
  The dry contact connected to Digital Input 11 (DI11) will open the dump valve, if High Open is set to Disabled.

- (8/14) Digital In 12 (DI12)
  The dry contact connected to Digital Input 12 (DI12) will open the dump valve, if High Open is set to Disabled.

- (9/14) Digital In 13 (DI13)
  The dry contact connected to Digital Input 13 (DI13) will open the dump valve, if High Open is set to Disabled.

- (10/14) Digital In 14 (DI14)
  The dry contact connected to Digital Input 14 (DI14) will open the dump valve, if High Open is set to Disabled.

- (11/14) Digital In 15 (DI15)
  The dry contact connected to Digital Input 15 (DI15) will open the dump valve, if High Open is set to Disabled.

- (12/14) Digital In 16 (DI16)
  The dry contact connected to Digital Input 16 (DI16) will open the dump valve, if High Open is set to Disabled.

- (13/14) Digital In 17 (DI17)
  The dry contact connected to Digital Input 17 (DI17) will open the dump valve, if High Open is set to Disabled.

- (14/14) Digital In 18 (DI18)
  The dry contact connected to Digital Input 18 (DI18) will open the dump valve, if High Open is set to Disabled.

Dump Valve – Open/Close > High Open

The digital input connected to the high open liquid level sensor used solely open the dump valve. This parameter is for use when a dedicated high open liquid level sensor is installed. The default names for the digital inputs are shown below. However, the names are configurable by the operator, so may differ. The digital input number/designation shown will be the same.

- (1/14) Disabled
  When disabled, do not use the high open liquid level sensor to open the dump valve. This option should be selected when a single high-high shutdown liquid level sensor is installed.

- (2/14) Digital In 6 (DI6)
  The dry contact connected to Digital Input 6 (DI6) will open the dump valve.

- (3/14) Digital In 7 (DI7)
  The dry contact connected to Digital Input 7 (DI7) will open the dump valve.

- (4/14) Digital In 8 (DI8)
  The dry contact connected to Digital Input 8 (DI8) will open the dump valve.

- (5/14) Digital In 9 (DI9)
  The dry contact connected to Digital Input 9 (DI9) will open the dump valve.

- (6/14) Digital In 10 (DI10)
  The dry contact connected to Digital Input 10 (DI10) will open the dump valve.

- (7/14) Digital In 11 (DI11)
  The dry contact connected to Digital Input 11 (DI11) will open the dump valve.

- (8/14) Digital In 12 (DI12)
  The dry contact connected to Digital Input 12 (DI12) will open the dump valve.

- (9/14) Digital In 13 (DI13)
  The dry contact connected to Digital Input 13 (DI13) will open the dump valve.

- (10/14) Digital In 14 (DI14)
  The dry contact connected to Digital Input 14 (DI14) will open the dump valve.

- (11/14) Digital In 15 (DI15)
  The dry contact connected to Digital Input 15 (DI15) will open the dump valve.

- (12/14) Digital In 16 (DI16)
  The dry contact connected to Digital Input 16 (DI16) will open the dump valve.

- (13/14) Digital In 17 (DI17)
  The dry contact connected to Digital Input 17 (DI17) will open the dump valve.

- (14/14) Digital In 18 (DI18)
  The dry contact connected to Digital Input 18 (DI18) will open the dump valve.

Dump Valve – Open/Close > Low Close

The digital input connected to the low close liquid level sensor used solely close the dump valve. This parameter is for use when an optional low close liquid level sensor is installed. The default names for the digital inputs are shown below. However, the names are configurable by the operator, so may differ. The digital input number/designation shown will be the same.

- (1/14) Disabled
  When disabled, do not use the low open liquid level sensor to close the dump valve. This option should be selected when a low liquid level sensor is installed. Open Time will be enabled.

- (2/14) Digital In 6 (DI6)
  The dry contact connected to Digital Input 6 (DI6) will open the dump valve. Open Time will be disabled.

- (3/14) Digital In 7 (DI7)
  The dry contact connected to Digital Input 7 (DI7) will open the dump valve. Open Time will be disabled.

- (4/14) Digital In 8 (DI8)
  The dry contact connected to Digital Input 8 (DI8) will open the dump valve. Open Time will be disabled.

- (5/14) Digital In 9 (DI9)
  The dry contact connected to Digital Input 9 (DI9) will open the dump valve. Open Time will be disabled.

- (6/14) Digital In 10 (DI10)
  The dry contact connected to Digital Input 10 (DI10) will open the dump valve. Open Time will be disabled.

- (7/14) Digital In 11 (DI11)
  The dry contact connected to Digital Input 11 (DI11) will open the dump valve. Open Time will be disabled.

- (8/14) Digital In 12 (DI12)
  The dry contact connected to Digital Input 12 (DI12) will open the dump valve. Open Time will be disabled.

- (9/14) Digital In 13 (DI13)
  The dry contact connected to Digital Input 13 (DI13) will open the dump valve. Open Time will be disabled.

- (10/14) Digital In 14 (DI14)
  The dry contact connected to Digital Input 14 (DI14) will open the dump valve. Open Time will be disabled.

- (11/14) Digital In 15 (DI15)
  The dry contact connected to Digital Input 15 (DI15) will open the dump valve. Open Time will be disabled.

- (12/14) Digital In 16 (DI16)
  The dry contact connected to Digital Input 16 (DI16) will open the dump valve. Open Time will be disabled.

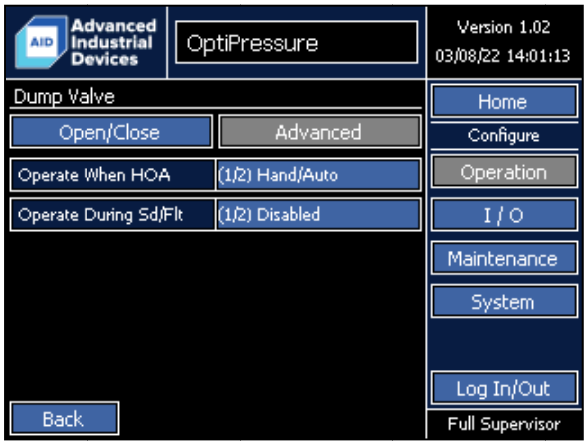
- (13/14) Digital In 17 (DI17)
  The dry contact connected to Digital Input 17 (DI17) will open the dump valve. Open Time will be disabled.

- (14/14) Digital In 18 (DI18)
  The dry contact connected to Digital Input 18 (DI18) will open the dump valve. Open Time will be disabled.

Dump Valve – Open/Close > Open Time

When a low close sensor is **NOT** installed and Low Close is set to Disabled, after the dump valve is opened, the dump valve will remain open for the time set in Open Time, then close after the timer elapses. The Open Time should be set to a duration long enough to sufficiently drain the liquid, but not so long as to run the condensate pump dry.

Configure > Operation > Dump Valve – Advanced



Dump Valve – Advanced > Operate When HOA

- (1/2) Hand/Auto
  The dump valve will operate if the open and close conditions are met when the HOA switch is in the Hand or Auto position. If the HOA is in the Off position, the dump valve will be commanded to the closed position, and will not open.

- (2/2) Hand/Off/Auto
  The dump valve will operate if the open and close conditions are met for any position of the HOA switch.

Dump Valve – Advanced > Operate During Shutdown/Fault

- (1/2) Disabled
  The dump valve will move to the closed position if any shutdown or fault occurs.

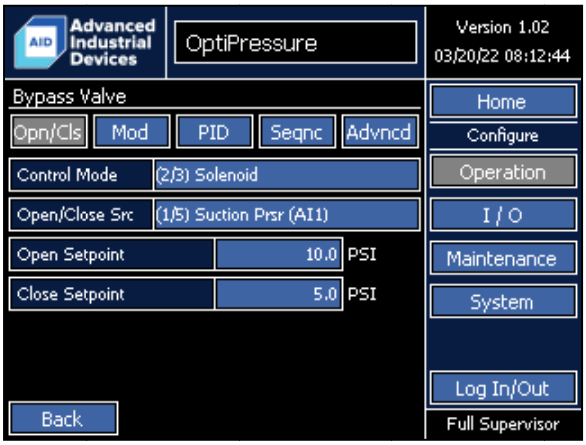
- (2/2) Enabled
  The dump valve will attempt to continue to operate based on the open and close conditions, even when a shutdown or fault is currently active.

Bypass Valve

Configuration parameters related to the Bypass Valve are available in:

Configure > Operation > Bypass Valve

Configure > Operation > Bypass Valve – Open/Close



An optional bypass valve can be installed connecting the suction side to the discharge side of the compressor. The function of the bypass valve can vary depending on the type of compressor and site requirements, but is commonly used to unload the compressor during startup or allow the compressor to run at a more optimal speed.

When using a modulating bypass valve, the valve may be fully closed even though the open conditions have been met depending on the measured analog input process and setpoint values. The Open Setpoint and Close Setpoint operate more as activate PID control setpoints in this case. When the Open Setpoint condition is met, the PID control will be active and automatically move the bypass valve to any position, which includes the fully closed and fully open positions. When the Close Setpoint condition is met, the bypass valve will move to the fully closed position, and PID control will be inactive.

Bypass Valve – Open/Close > Control Mode

- (1/3) Disabled
  A bypass valve is not installed and will not operate as part of the system.

- (2/3) Solenoid
  A bypass valve is installed and controlled by a digital output. The bypass valve is either fully open or fully closed, with no positions in between.

- (3/3) Modulating
  A bypass valve is installed and controlled by an analog output. The bypass valve can be fully open, fully closed, or any position in between. When using a modulating bypass valve, the parameters in **Bypass Valve – Mod** and **Bypass Valve – PID** will be available and can be used to maintain a pressure.

Bypass Valve – Open/Close > Open/Close Source

When Control Mode is set to Solenoid or Modulating, the bypass valve will automatically open or close based on the feedback provided by the analog input selected by Open/Close Source.

Bypass Valve – Open/Close > Open Setpoint

When Control Mode is set to Solenoid or Modulating, the value of the analog input configured as the Open/Close Source must meet the Open Setpoint value in order to open the bypass valve.

- If the Open Setpoint is greater than the Close Setpoint, the bypass valve will not open until the analog input value is greater than or equal to the Open Setpoint.

- If the Open Setpoint is less than the Close Setpoint, the bypass valve will not open until the analog input value is less than or equal to the Open Setpoint.

The Open Setpoint units will automatically change based on the analog input selected in Open/Close Source.

The Open Setpoint may be overridden during Pre-Run or Post-Run if **Bypass Valve – Sequence > Operation** is not set to Disabled.

Bypass Valve – Open/Close > Close Setpoint

When Control Mode is set to Solenoid or Modulating, the value of the analog input configured as the Open/Close Source must meet the Close Setpoint value in order to close the bypass valve.

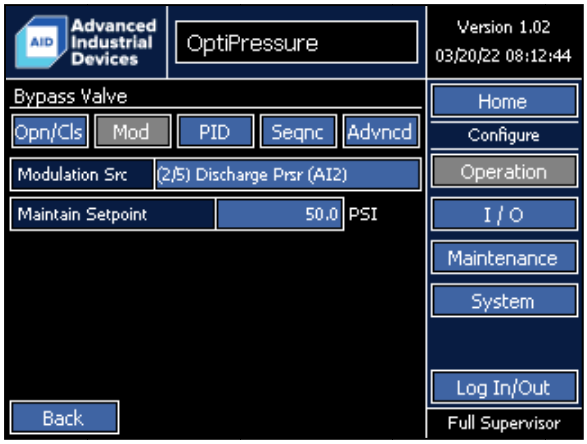
- If the Open Setpoint is greater than the Close Setpoint, the bypass valve will not close until the analog input value is less than or equal to the Open Setpoint.

- If the Open Setpoint is less than the Close Setpoint, the bypass valve will not open until the analog input value is greater than or equal to the Open Setpoint.

The Close Setpoint units will automatically change based on the analog input selected in Open/Close Source.

The Close Setpoint may be overridden during Pre-Run or Post-Run if **Bypass Valve – Sequence > Operation** is not set to Disabled.

Configure > Operation > Bypass Valve – Modulating



Bypass Valve – Modulating > Modulation Source

When **Bypass Valve – Open/Close > Control Mode** is set to Modulating, the bypass valve position will automatically change based on the feedback provided by the analog input selected by Modulation Source when the bypass valve has met the conditions required to open.

Modulation Source is only enabled when **Bypass Valve – Open/Close > Control Mode** is set to Modulating.

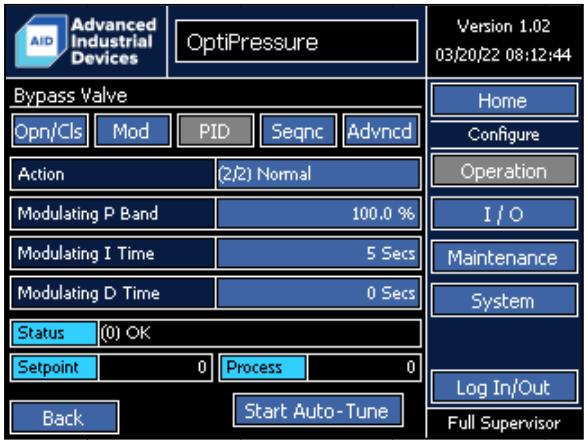
Bypass Valve – Modulating > Maintain Setpoint

When **Bypass Valve – Open/Close > Control Mode** is set to Modulating, the Maintain Setpoint value will be the value that the system attempts to maintain by automatically changing the position of the bypass valve.

The Maintain Setpoint units will automatically change based on the analog input selected in Modulation Source.

Maintain Setpoint is only enabled when **Bypass Valve – Open/Close > Control Mode** is set to Modulating.

Configure > Operation > Bypass Valve – PID



Bypass Valve – PID – PID Monitors

Displays the status PID loop controlling the position of the bypass valve when **Bypass Valve – Open/Close > Control Mode** is configured for Modulating.

- (0) OK
  The PID loop is in standby.

- (1) Auto-Tune in Progress, (2) Auto-Tune in Progress, (3) Auto-Tune in Progress
  The PID auto-tune procedure is currently active.

- (4) PID Running
  The PID loop is actively controlling the speed of the main pump.

- (5) Setpoint Change in Progress, (6) Setpoint Change in Progress
  A change in the PID setpoint is currently in progress.

- (7) Integral Wind-Up, (8) Integral Wind-Down
  The PID loop output has reached limits due to accumulation of the integral component.

- (9) Paused
  Control of the PID loop is currently paused. Integral and derivative values are not being calculated.

- (10) Process Value Exceeds P Band, (11) Process Value Exceeds P Band
  The process value exceeds the proportional band, so no PID calculations are being performed.

- (12) Auto-Tune Parameter Mismatch, (13) Auto-Tune Parameter Mismatch
  An error is present with the PID auto-tune values. The PID loop will operate without the auto-tune values.

- (-1) P Band Zero
  The P Band value is set to 0. Correct by entering a non-zero, positive value.

- (-2) Input Range Invalid
  The process value is out of range.

- (-3) Output Range Invalid
  The control value is out of range.

- (-4) Integral Overflow
  The integral value has reached the maximum value of 100,000.

- (-5) Error in Auto-Tune Vector Address
  A programming error in the PID loop auto-tuning feature is present.

- (-6) Setpoint Value Out of Input Range
  The setpoint value is out of range.

- (-7) Auto-Tune Error, (-8) Auto-Tune Error, (-9) Auto-Tune Error, (-10) Auto-Tune Error
  The auto-tuning procedure failed.

- (-11) Noise Exceeds 5% Input Range
  The auto-tune procedure cannot be completed successfully due to excessive process value oscillations.

- (-13) Auto-Tune Aborted
  The auto-tune procedure was aborted prior to completion.

	
The setpoint value of the bypass valve PID loop. No units. Scaled from -10,000 to +10,000. Used for diagnostics and troubleshooting.	The process value of the bypass valve PID loop. No units. Scaled from -10,000 to +10,000. Used for diagnostics and troubleshooting.

Bypass Valve – PID > Action

When the **Bypass Valve – Open/Close > Control Mode** is set to Modulating, the OptiPressure controller will use the analog input selected by **Bypass Valve – Modulating > Modulation Source** to maintain the value set by **Bypass Valve – Modulating > Maintain Setpoint**. The Action determines if the controller increases or decreases the bypass valve position as the measured analog input process value (PV) exceeds the setpoint value (SV).

- (1/2) Reverse
  When the measured analog input process valve (PV) is less than the **Bypass Valve – Modulating > Maintain Setpoint**, the controller will open the bypass valve. As the measured analog input begins to reach the **Bypass Valve – Modulating > Maintain Setpoint**, the controller will begin to decrease the bypass valve position. If the measured analog input exceeds the **Bypass Valve – Modulating > Maintain Setpoint**, the bypass valve position will eventually be fully closed.

- (2/2) Normal
  When the measured analog input process valve (PV) is greater than the **Bypass Valve – Modulating > Maintain Setpoint**, the controller will open the bypass valve. As the measured analog input begins to reach the **Bypass Valve – Modulating > Maintain Setpoint**, the controller will begin to decrease the bypass valve position. If the measured analog input drops below the **Bypass Valve – Modulating > Maintain Setpoint**, the bypass valve position will eventually be fully closed.

Bypass Valve – PID > Modulating P Band

When the **Bypass Valve – Open/Close > Control Mode** is set to Modulating, the Modulating P Band will set the proportional band around the setpoint in which the PID loop is active. If Modulating P Band is set to more than 100.0%, the PID function is applied over the entire range.

Running the PID Auto-Tune function is recommended to automatically set this value.

Bypass Valve – PID > Modulating I Time

When the **Bypass Valve – Open/Close > Control Mode** is set to Modulating, the Modulating I Time will set the amount of time, as calculated by the PID loop, required to bring the process value to the value set in **Bypass Valve – Modulating > Maintain Setpoint**. If the Modulating I Time is set too low, the PID loop will react too quickly, resulting in an overshoot of the target. If the Modulating I Time is set too high, the PID loop will react too slowly.

Running the PID Auto-Tune function is recommended to automatically set this value.

Bypass Valve – PID > Modulating D Time

When the **Bypass Valve – Open/Close > Control Mode** is set to Modulating, the Modulating D Time will change the response of the PID loop to the rate of change in the error between the process value and value set in **Bypass Valve – Modulating > Maintain Setpoint**. Modulating D Time can be difficult to adjust by hand in order to provide satisfactory results.

Running the PID Auto-Tune function is recommended to automatically set this value.

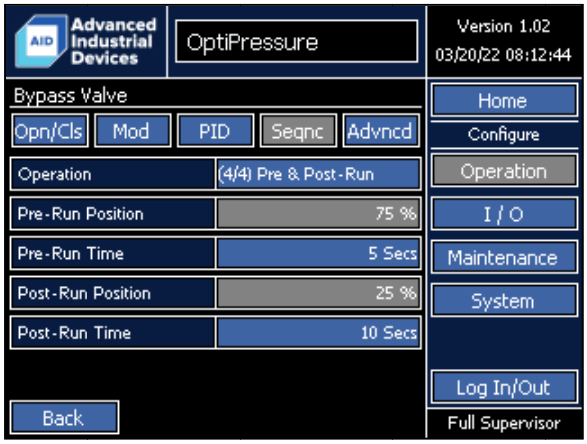
Bypass Valve – PID > Start Auto-Tune

When the **Bypass Valve – Open/Close > Control Mode** is set to Modulating, the Start Auto-Tune function will automatically control the position of the bypass valve, causing the process value to cycle above and value set in **Bypass Valve – Modulating > Maintain Setpoint**. The cycling process allows the controller to calculate the required P Band, I Time, and D Time needed for optimal control of the application. The time required to complete the auto-tune may take several minutes.

Auto-Tune Steps (*must be logged-in as the Full Supervisor to complete these steps):

1. With the desired Speed Source selected and Maintain Setpoint set, start the system in the Auto mode.
2. Wait for the Pre-Run process to complete, and for the compressor to start.
3. Press the Start Auto-Tune button.
4. Wait for the PID loop to gather data on the process. The compressor will automatically speed up and slow down several times, going above and below the Maintain Setpoint value. The Start Auto-Tune button will be disabled during this process.
5. When the auto-tune process has completed, the values for P Band, I Time, and D Time will be automatically updated on the screen, and the Start Auto-Tune button will be enabled again.
6. No further adjustments are typically needed. However, the auto-tune process values can be adjusted by hand to fine-tune the response if the operator believes that the response can be further improved.

Configure > Operation > Bypass Valve – Sequence



The bypass valve can be configured to open for a set duration as part of the Pre-Run and/or Post-Run sequence of the compressor. This overrides the **Bypass Valve – Open/Close > Open Setpoint**, and immediately commands the bypass valve to open. The bypass valve will close again only when the **Bypass Valve – Open/Close > Close Setpoint** condition is met.

When configured for use with a modulating bypass valve, the Pre-Run and Post-Run Position parameters will be enabled. When configured for a solenoid bypass valve, the position values will be disabled, as the bypass valve is either in the fully closed or fully open positions.

Bypass Valve – Sequence > Operation

Operation will be disabled if **Bypass Valve – Open/Close > Control Mode** is set to Disabled.

- (1/4) No Pre or Post-Run
  The bypass valve will not operate as part of the Pre-Run or Post-Run operation of the compressor. If enabled, the bypass valve will continue to function independently of the operation sequence.

- (2/4) Pre-Run
  The bypass valve will open fully, in the case of a solenoid bypass valve, or move to the Pre-Run Position, in the case of a modulating bypass valve, when the start conditions for the compressor have been met. The bypass valve will be held in the Pre-Run position for the duration set in Pre-Run Time.

- (3/4) Post-Run
  The bypass valve will open fully, in the case of a solenoid bypass valve, or move to the Post-Run Position, in the case of a modulating bypass valve, when the stop conditions for the compressor have been met. The bypass valve will be held in the Post-Run position for the duration set in Post-Run Time.

- (4/4) Pre & Post-Run
  The bypass valve will open fully, in the case of a solenoid bypass valve, or move to the Pre-Run Position, in the case of a modulating bypass valve, when the start conditions for the compressor have been met. The bypass valve will be held in the Pre-Run position for the duration set in Pre-Run Time.

  The bypass valve will open fully, in the case of a solenoid bypass valve, or move to the Post-Run Position, in the case of a modulating bypass valve, when the stop conditions for the compressor have been met. The bypass valve will be held in the Post-Run position for the duration set in Post-Run Time.

Bypass Valve – Sequence > Pre-Run Position

The position of the bypass valve to hold during the Pre-Run sequence.

Pre-Run Position will be disabled if **Bypass Valve – Open/Close > Control Mode** is set to Disabled or Solenoid.

Bypass Valve – Sequence > Pre-Run Time

The period of time to hold the bypass valve in the Pre-Run position during the Pre-Run sequence.

Pre-Run Time will be disabled if **Bypass Valve – Open/Close > Control Mode** is set to Disabled.

Bypass Valve – Sequence > Post-Run Position

The position of the bypass valve to hold during the Post-Run sequence.

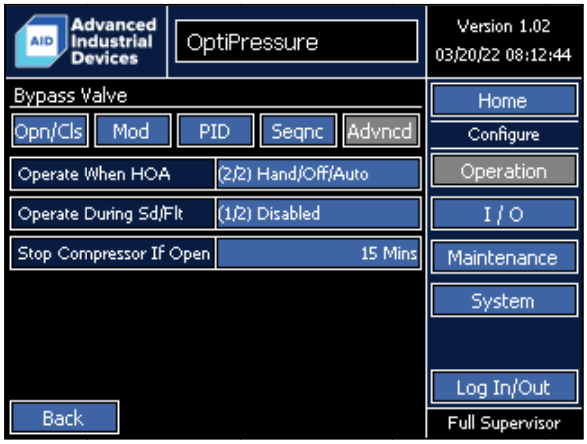
Post-Run Position will be disabled if **Bypass Valve – Open/Close > Control Mode** is set to Disabled or Solenoid.

Bypass Valve – Sequence > Post-Run Position

The period of time to hold the bypass valve in the Post-Run position during the Post-Run sequence.

Post-Run Time will be disabled if **Bypass Valve – Open/Close > Control Mode** is set to Disabled.

Configure > Operation > Bypass Valve – Advanced



Bypass Valve – Advanced > Operate When HOA

- (1/2) Hand/Auto
  The bypass valve will operate if the open and close conditions are met when the HOA switch is in the Hand or Auto position. If the HOA is in the Off position, the bypass valve will be commanded to the closed position, and will not open.

- (2/2) Hand/Off/Auto
  The bypass valve will operate if the open and close conditions are met for any position of the HOA switch.

Bypass Valve – Advanced > Operate During Shutdown/Fault

- (1/2) Disabled
  The bypass valve will move to the closed position if any shutdown or fault occurs.

- (2/2) Enabled
  The bypass valve will attempt to continue to operate based on the open and close conditions, even when a shutdown or fault is currently active.

Bypass Valve – Advanced > Stop Compressor If Open

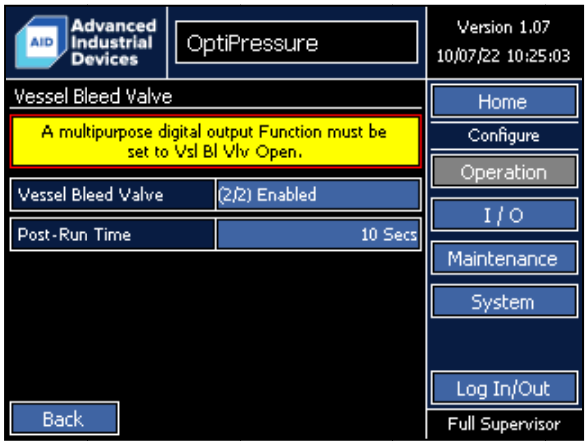
If the bypass valve remains open for too long, indicating a problem a with the equipment, process, and/or a misconfiguration, the OptiPressure controller can stop the compressor. When the bypass valve is commanded to open, a timer will start. If the bypass valve remains open for the time set in Stop Compressor If Open, the controller will stop the compressor. A shutdown or fault event is not set in this case. The compressor will resume normal operation once the start condition has been met.

Vessel Bleed Valve

Configuration parameters related to the Vessel Bleed Valve are available in:

Configure > Operation > Vessel Bleed Valve

Configure > Operation > Cooling Fan – Start/Stop



An optional vessel bleed valve can be installed to open a valve while the compressor is stopped to relieve vessel pressure. The valve is closed during normal operation while the compressor is running.

Note:
The **Configure > I/O > Digital Inputs > Digital Input X > Function** of a multipurpose digital output must be set to Vsl Bl Vlv Open in order to operate a valve.

Vessel Bleed Valve > Vessel Bleed Valve

- (1/2) Disabled
  When Vessel Bleed Valve is set to Disabled, the vessel bleed valve will not operate and will remain inactive.

- (2/2) Enabled
  The vessel bleed valve will close immediately when start conditions have been met and the system enters the Pre-Run sequence. The valve will remain closed while the compressor is running and for a period of time after the compressor stops, set by Post-Run Time. After the post-run timer elapses, the vessel bleed valve will reopen.

Vessel Bleed Valve > Post-Run Time

The period of time to delay reopening the vessel bleed valve after the compressor has stopped and entered the Post-Run sequence.

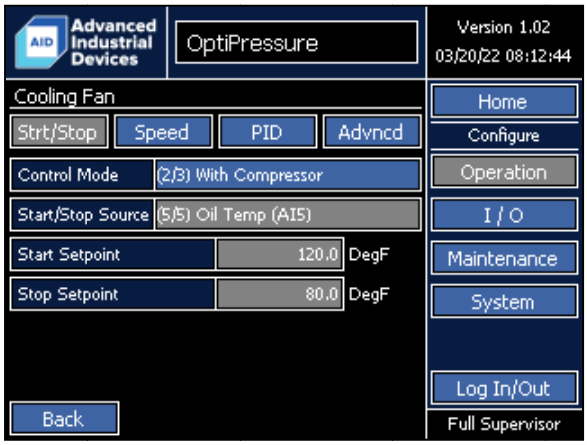
Post-Run Time will be disabled if Vessel Bleed Valve is set to Disabled.

Cooling Fan

Configuration parameters related to the Cooling Fan are available in:

Configure > Operation > Cooling Fan

Configure > Operation > Cooling Fan – Start/Stop



Cooling Fan – Start/Stop > Control Mode

- (1/3) Disabled
  When the Control Mode is set to Disabled, the cooling fan will not run.

- (2/3) With Compressor
  The cooling fan will run anytime the compressor is running, regardless of temperature.

- (3/3) By Temperature
  The cooling fan will be independently controlled by the analog input selected in Start/Stop Source. The cooling fan may run even if the compressor is stopped.

Cooling Fan – Start/Stop > Start/Stop Source

Start/Stop Source sets the control signal responsible for starting and stopping the cooling fan when Control Mode is set to By Temperature. The default names for the analog inputs are shown below. However, the names are configurable by the operator, so may differ. The analog input number/designation shown will be the same.

Start/Stop Source will be disabled when the Control Mode is set to Disabled or With Compressor.

- (1/5) Suction Prsr (AI1)
  The analog signal connected to Analog Input 1 (AI1) will control the starting and stopping of the cooling fan.

- (2/5) Discharge Prsr (AI2)
  The analog signal connected to Analog Input 2 (AI2) will control the starting and stopping of the cooling fan.

- (3/5) Oil Pressure (AI3)
  The analog signal connected to Analog Input 3 (AI3) will control the starting and stopping of the cooling fan.

- (4/5) Discharge Temp (AI4)
  The analog signal connected to Analog Input 4 (AI4) will control the starting and stopping of the cooling fan.

- (5/5) Oil Temp (AI5)
  The analog signal connected to Analog Input 5 (AI5) will control the starting and stopping of the cooling fan.

Cooling Fan – Start/Stop > Start Setpoint

The value of the analog input configured as the Start/Stop Source must meet the Start Setpoint value in order to start the cooling fan.

- If the Start Setpoint is greater than the Stop Setpoint, the cooling fan will not start until the analog input value is greater than or equal to the Start Setpoint.

- If the Start Setpoint is less than the Stop Setpoint, the cooling fan will not start until the analog input value is less than or equal to the Start Setpoint.

The Start Setpoint units will automatically change based on the analog input selected in Start/Stop Source.

Cooling Fan – Start/Stop > Stop Setpoint

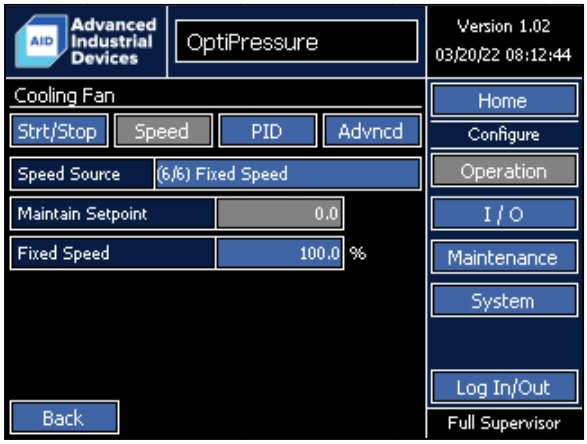
The value of the analog input must meet the Stop Setpoint value in order to stop the cooling fan.

- If the Start Setpoint is greater than the Stop Setpoint, the cooling fan will not stop until the analog input value is less than or equal to the Stop Setpoint.

- If the Start Setpoint is less than the Stop Setpoint, the cooling fan will not stop until the analog input value is greater than or equal to the Stop Setpoint.

The Stop Setpoint units will automatically change based on the analog input selected in Start/Stop Source.

Configure > Operation > Cooling Fan – Speed



Cooling Fan – Speed > Speed Source

Speed Source sets the control signal responsible for controlling the speed of the cooling fan. The default names for the analog inputs are shown below. However, the names are configurable by the operator, so may differ. The analog input number/designation shown will be the same.

- (1/6) Suction Prsr (AI1)
  The analog signal connected to Analog Input 1 (AI1) will control the speed of the cooling fan. The speed of the cooling fan will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (2/6) Discharge Prsr (AI2)
  The analog signal connected to Analog Input 2 (AI2) will control the speed of the cooling fan. The speed of the cooling fan will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (3/6) Oil Pressure (AI3)
  The analog signal connected to Analog Input 3 (AI3) will control the speed of the cooling fan. The speed of the cooling fan will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (4/6) Discharge Temp (AI4)
  The analog signal connected to Analog Input 4 (AI4) will control the speed of the cooling fan. The speed of the cooling fan will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (5/6) Oil Temp (AI5)
  The analog signal connected to Analog Input 5 (AI5) will control the speed of the cooling fan. The speed of the cooling fan will automatically change based on the feedback provided using a PID loop to maintain the value set in Maintain Setpoint. Fixed Speed will be disabled.

- (6/6) Fixed Speed
  The speed of the cooling fan will remain fixed at the value entered. Maintain Setpoint will be disabled. This option can also be used when setting the speed via SCADA is desired or when the cooling fan is controlled by a motor starter.

Cooling Fan – Speed > Maintain Setpoint

When the Speed Source is configured to use one of the analog input selections, the Maintain Setpoint value will be the value that the cooling fan attempts to maintain.

The Maintain Setpoint units will automatically change based on the analog input selected in Speed Source.

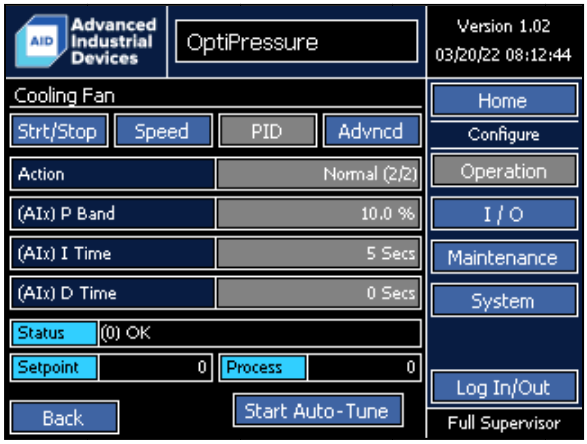
If the Speed Source is set to Fixed Speed, Maintain Setpoint will be disabled.

Cooling Fan – Speed > Fixed Speed

When the Speed Source is set to Fixed Speed, the cooling fan will run at a speed set by Fixed Speed in %. The speed of the cooling fan will not change automatically.

If the Speed Source is set to Fixed Speed, Maintain Setpoint will be disabled.

Configure > Operation > Cooling Fan – PID



Cooling Fan – PID – PID Monitors

Displays the status PID loop controlling the speed of the cooling fan when **Cooling Fan – Speed > Speed Source** is configured for an analog input.

- (0) OK
  The PID loop is in standby.

- (1) Auto-Tune in Progress, (2) Auto-Tune in Progress, (3) Auto-Tune in Progress
  The PID auto-tune procedure is currently active.

- (4) PID Running
  The PID loop is actively controlling the speed of the main pump.

- (5) Setpoint Change in Progress, (6) Setpoint Change in Progress
  A change in the PID setpoint is currently in progress.

- (7) Integral Wind-Up, (8) Integral Wind-Down
  The PID loop output has reached limits due to accumulation of the integral component.

- (9) Paused
  Control of the PID loop is currently paused. Integral and derivative values are not being calculated.

- (10) Process Value Exceeds P Band, (11) Process Value Exceeds P Band
  The process value exceeds the proportional band, so no PID calculations are being performed.

- (12) Auto-Tune Parameter Mismatch, (13) Auto-Tune Parameter Mismatch
  An error is present with the PID auto-tune values. The PID loop will operate without the auto-tune values.

- (-1) P Band Zero
  The P Band value is set to 0. Correct by entering a non-zero, positive value.

- (-2) Input Range Invalid
  The process value is out of range.

- (-3) Output Range Invalid
  The control value is out of range.

- (-4) Integral Overflow
  The integral value has reached the maximum value of 100,000.

- (-5) Error in Auto-Tune Vector Address
  A programming error in the PID loop auto-tuning feature is present.

- (-6) Setpoint Value Out of Input Range
  The setpoint value is out of range.

- (-7) Auto-Tune Error, (-8) Auto-Tune Error, (-9) Auto-Tune Error, (-10) Auto-Tune Error
  The auto-tuning procedure failed.

- (-11) Noise Exceeds 5% Input Range
  The auto-tune procedure cannot be completed successfully due to excessive process value oscillations.

- (-13) Auto-Tune Aborted
  The auto-tune procedure was aborted prior to completion.

	
The setpoint value of the bypass valve PID loop. No units. Scaled from -10,000 to +10,000. Used for diagnostics and troubleshooting.	The process value of the bypass valve PID loop. No units. Scaled from -10,000 to +10,000. Used for diagnostics and troubleshooting.

Cooling Fan – PID > Action

When the **Cooling Fan – Speed > Speed Source** is set to an analog input, the OptiPressure controller will use the analog input to maintain the value set by **Cooling Fan – Speed > Maintain Setpoint**. The Action determines if the controller increases or decreases the cooling fan speed as the measured analog input process value (PV) exceeds the setpoint value (SV). For nearly all cases, the Action should be set to Normal, which increases the cooling fan speed as the analog input/temperature rises.

- (1/2) Reverse
  When the measured analog input process valve (PV) is less than the **Cooling Fan – Speed > Maintain Setpoint**, the controller will run the cooling fan. As the measured analog input begins to reach the **Cooling Fan – Speed > Maintain Setpoint**, the controller will begin to decrease the cooling fan speed. If the measured analog input exceeds the **Cooling Fan – Speed > Maintain Setpoint**, the cooling fan will eventually stop.

- (2/2) Normal
  When the measured analog input process valve (PV) is greater than the **Cooling Fan – Speed > Maintain Setpoint**, the controller will run the cooling fan. As the measured analog input begins to reach the **Cooling Fan – Speed > Maintain Setpoint**, the controller will begin to decrease the cooling fan speed. If the measured analog input drops below the **Cooling Fan – Speed > Maintain Setpoint**, the cooling fan will eventually stop.

  The Normal setting is recommended for most applications.

Cooling Fan – PID > (AIx) P Band

When the **Cooling Fan – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the (AIx) P Band will set the proportional band around the setpoint in which the PID loop is active. If (AIx) P Band is set to more than 100.0%, the PID function is applied over the entire range.

Running the PID Auto-Tune function is recommended to automatically set this value.

Cooling Fan – PID > (AIx) I Time

When the **Cooling Fan – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the (AIx) I Time will set the amount of time, as calculated by the PID loop, required to bring the process value to the Maintain Setpoint. If the (AIx) I Time is set too low, the PID loop will react too quickly, resulting in an overshoot of the Maintain Setpoint. If the (AIx) I Time is set too high, the PID loop will react too slowly.

Running the PID Auto-Tune function is recommended to automatically set this value.

Compressor – PID > (AIx) D Time

When the **Cooling Fan – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the (AIx) D Time will change the response of the PID loop to the rate of change in the error between the process value and Maintain Setpoint. (AIx) D Time can be difficult to adjust by hand in order to provide satisfactory results.

Running the PID Auto-Tune function is recommended to automatically set this value.

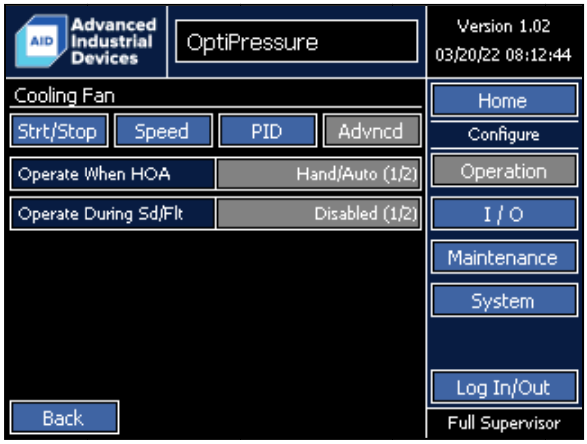
Cooling Fan – PID > Start Auto-Tune

When the **Cooling Fan – Speed > Speed Source** is configured to use an analog input to maintain a process value (PV), the Start Auto-Tune function will automatically control the speed of the compressor, causing the process value to cycle above and below the Maintain Setpoint. The cycling process allows the controller to calculate the required P Band, I Time, and D Time needed for optimal control of the application. The time required to complete the auto-tune may take several minutes.

Auto-Tune Steps (*must be logged-in as the Full Supervisor to complete these steps):

1. With the desired **Cooling Fan – Speed > Speed Source** selected and **Cooling Fan – Speed > Maintain Setpoint** set, start the system in the Auto mode.
2. Wait for the Pre-Run process to complete, and for the compressor to start.
3. Press the Start Auto-Tune button.
4. Wait for the PID loop to gather data on the process. The cooling fan will automatically speed up and slow down several times, going above and below the **Cooling Fan – Speed > Maintain Setpoint** value. The Start Auto-Tune button will be disabled during this process.
5. When the auto-tune process has completed, the values for (AIx) P Band, (AIx) I Time, and (AIx) D Time will be automatically updated on the screen, and the Start Auto-Tune button will be enabled again.
6. No further adjustments are typically needed. However, the auto-tune process values can be adjusted by hand to fine-tune the response if the operator believes that the response can be further improved.

Configure > Operation > Cooling Fan – Advanced



Cooling Fan – Advanced parameters are available when **Cooling Fan – Start/Stop > Control Mode** is set to By Temperature. **Cooling Fan – Advanced** parameters are disabled when **Cooling Fan – Start/Stop > Control Mode** is set to Disabled or With Compressor.

Cooling Fan – Advanced > Operate When HOA

- (1/2) Hand/Auto
  The cooling fan will operate independently if the start/stop conditions are met when the HOA switch is in the Hand or Auto position. If the HOA is in the Off position, the cooling fan will not run.

- (2/2) Hand/Off/Auto
  The cooling fan will operate if independently if the start/stop conditions are met for any position of the HOA switch.

Cooling Fan – Advanced > Operate During Shutdown/Fault

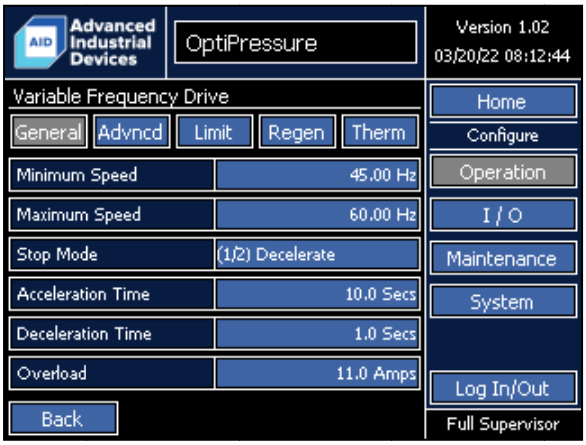
- (1/2) Disabled
  The cooling fan will stop if any shutdown or fault occurs.

- (2/2) Enabled
  The cooling fan will attempt to continue to operate based on the start and stop conditions, even when a shutdown or fault is currently active.

Configuration parameters related to the Variable Frequency Drive are available in:

Configure > Operation > Variable Frequency Drive

Configure > Operation > Variable Frequency Drive – General



Variable Frequency Drive – General > Minimum Speed

The Minimum Speed is the slowest speed that the compressor will operate while running. The only time that the system would not run at least at this minimum speed is because there is a current limit or torque limit being activated on the main motor of the system. In this case it is common to see the speed of the motor not go above 2-3Hz and occurs automatically to prevent the damage of the motor or the variable frequency drive.

Variable Frequency Drive – General > Maximum Speed

The Maximum Speed is the maximum speed the system will run. The only time the system can run faster than this value is if automatic regeneration protection mode is turned on and the system is experiencing an event that is causing a regenerative condition. The speed increase is very temporary and will go away automatically when the regenerative condition goes away. **This setting can only be changed when the compressor is not running.**

Variable Frequency Drive – General > Stop Mode

This setting is only effective when there is a stop command present to the VFD inside the OptiPressure system. The setting of this value to Coast to Stop is the common setting and a stop command to the system will simply cut off voltage to the motor, allowing the motor to coast to a stop. If a controlled stop is desirable then set to Decelerate. Deceleration will be controlled by what the operator sets for Deceleration Time. Setting the

deceleration time too aggressively may frequently result in an overvoltage fault on the variable frequency drive every time the system stops. If deceleration is needed, do not set a short deceleration time. Sometimes the system will be unable to reliably stop the motor with just deceleration and a special setting for DC injection braking is required. Contact the factory if this is the case for your system for specialty settings.

Variable Frequency Drive – General > Acceleration Time

The amount of time that the variable frequency drive will take to bring the compressor motor from fully stopped to 100% speed. For example, if the compressor is currently at 50% speed then half of the acceleration time will be required to increase the speed from 50% to 100% speed.

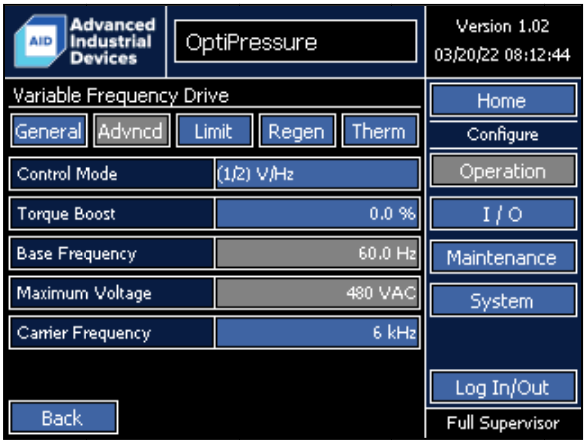
Variable Frequency Drive – General > Deceleration Time

The amount of time the variable frequency drive will take to bring the compressor motor from 100% speed to fully stopped.

Variable Frequency Drive – General > Overload

The Overload setting is just what it sounds like. This is the overload current for the compressor motor. This setting can be set to a maximum of either the motor FLA + the service factor or the maximum running amperage the variable frequency drive the panel is capable of (which ever value is lower). A recommended starting point of the overload can be at least 4 or 5 amps over the motor nameplate FLA to avoid nuisance overload shutdown events.

Configure > Operation > Variable Frequency Drive – Advanced



Variable Frequency Drive – Advanced > Control Mode

The Control Mode has two possible settings of V/Hz (volts to hertz mode) and Torque Vector mode. V/Hz mode is generally recommended for a majority of applications and sites. If torque vector mode is required then a special motor to variable frequency drive tuning process must be done. If torque vector mode is desired contact the factory on how to perform the auto-tuning procedure to allow torque vector mode to work correctly.

Variable Frequency Drive – Advanced > Torque Boost

Torque boost can be beneficial on a hard starting system. Torque boost will overexcite the motor by sending a higher level of voltage at a low speed when starting (starting only) to create extra low speed torque in the motor to get past the hard start. If torque boost is desired the starting point should not be too aggressive and 2.0 is a reasonable number to begin with.

Variable Frequency Drive – Advanced > Base Frequency

Base Frequency is the motor driving speed that maximum available motor voltage will be applied to the motor. Since the base speed of a 60Hz motor is at 60 Hz it is typical to leave this value at the default of 60Hz. **This setting can only be changed by qualified service personnel and when the compressor is stopped.**

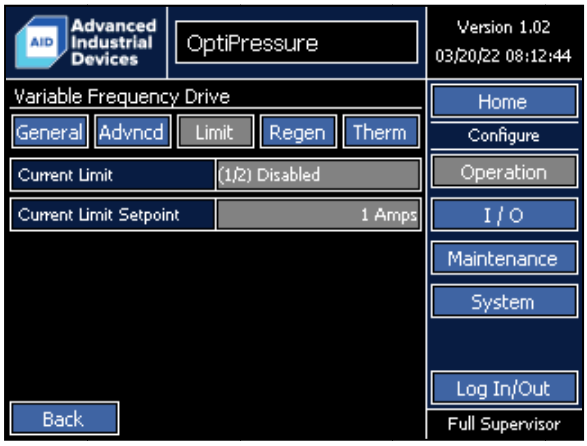
Variable Frequency Drive – Advanced > Maximum Voltage

Maximum Voltage is the voltage that the variable frequency drive will output to the motor when running at or above the Base Frequency. It is typical to leave this value at the default setting. **This setting can only be changed by qualified service personnel and when the compressor is stopped.**

Variable Frequency Drive – Advanced > Carrier Frequency

The carrier frequency affects how smooth electrically the sine wave output from the variable frequency drive is to the motor. The higher the number, the smoother the sine wave is to the motor. This should not be confused with motor harmonics or common mode current and does not relate to these issues. The lower the carrier frequency, the lower the heat generation of the drive will be. The cooling system on the OptiPressure panel has been tuned to allow a maximum carrier frequency of 6.0 kHz. If the system experiences overheating, lowering the carrier frequency from 6.0 kHz to 4.0 kHz (possibly even 2.0 kHz) will make the system operate cooler. The motor will accept all carrier frequencies, but the audible noise coming from the motor gets louder at lower carrier frequencies. The higher level of audible noise does not hurt the motor, but may become an environmental issue if the installation is near a populated structure and noise is undesirable.

Configure > Operation > Variable Frequency Drive – Limit



Variable Frequency Drive – Limit parameters can only be changed by qualified service personnel and are disabled by default.

Variable Frequency Drive – Limit > Current Limit

- (1/2) Disabled
  When disabled, the variable frequency drive will provide as much current to the compressor motor as required by the load of the compressor (below the maximum internal protection limit of the drive).

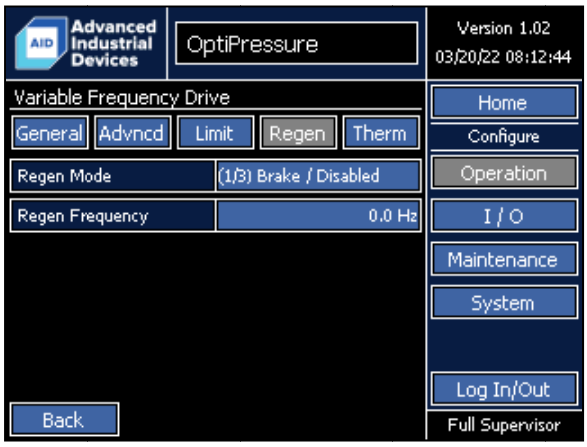
- (2/2) Enabled
  When enabled, the variable frequency drive will enforce a maximum limit on the current, as set by Current Limit Setpoint, supplied to the compressor motor. The motor current is limited by automatically lowering the output frequency of the drive.

Variable Frequency Drive – Limit > Current Limit Setpoint

The Current Limit Setpoint sets the maximum amount of current allowable to the compressor motor, when Current Limit is set to Enabled. The variable frequency drive will automatically lower the output frequency to the compressor motor in order to limit the motor current.

This current limit is an adjustable limit that is separate from the internal drive hardware protection limit.

Configure > Operation > Variable Frequency Drive – Regeneration



Variable Frequency Drive – Regeneration > Regeneration Mode

- (1/3) Brake/Disabled
  The variable frequency drive will not monitor for conditions of an overhauling load and will not attempt to prevent regeneration back onto the DC bus.

- (2/3) Control by Torque
  The variable frequency drive will monitor for conditions of an overhauling load by using the calculated compressor motor output torque. A negative torque value indicates that regeneration is occurring. The output frequency will automatically be increased, up to the maximum frequency set by Regeneration Frequency, in order to bring the torque value from negative to back to 0% during the overhauling duration.

- (3/3) Control by DC Bus
  The variable frequency drive will monitor the internal DC bus for indications of an overhauling load that results in regeneration. The output frequency will automatically be increased, up to the maximum frequency set by Regeneration Frequency, in order to lower the DC bus.

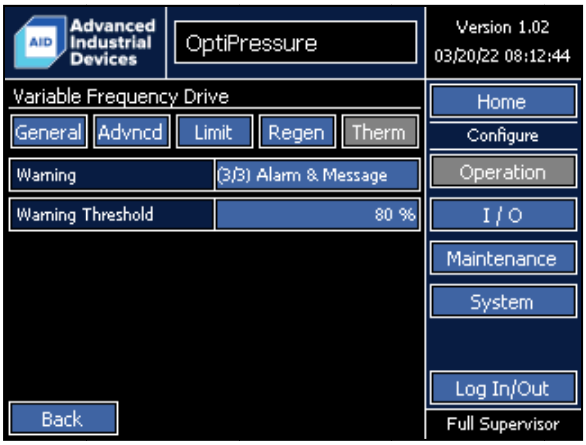
Variable Frequency Drive – Regeneration > Regeneration Frequency

Regeneration Frequency sets the maximum frequency the variable frequency drive is permitted to automatically increase in order to prevent regeneration. The maximum automatic frequency value is determined by using the value set in Regeneration Frequency added to the current reference frequency. For example, if Regeneration Frequency is set to 10 Hz and the current reference frequency is 45 Hz, the drive will be permitted to increase the output frequency automatically, up to 10 Hz + 45 Hz = 55 Hz, in order to attempt to prevent regeneration from occurring.

If, after the drive automatically increases the output frequency up to the maximum, the regeneration continues to occur, the drive will trip on an overvoltage fault.

If Regeneration Mode is set to Disabled, Regeneration Frequency will be disabled.

Configure > Operation > Variable Frequency Drive – Thermal



The VFD Thermal Warning feature is customizable by the operator. The warning should be configured to occur before the variable frequency drive faults on VFD Heatsink Overtemp (OH1). The system will continue to operate normally while this warning is active, and is designed to provide the operator with enough warning to schedule maintenance on the fans, filters, and heatsink. When used in combination with the Maintenance Reminder feature, unscheduled downtime should be significantly reduced.

The VFD Thermal Warning feature is active only while the compressor variable frequency drive is running, since the heatsink temperature while stopped should not result in overheat faults.

Variable Frequency Drive – Thermal > Warning

- (1/3) Disabled
  The variable frequency drive thermal warning is disabled.

- (2/3) Alarm
  The variable frequency drive thermal warning will trigger an alarm in the same way that an analog or digital input can trigger an alarm. An alarm bit specific to the variable frequency drive thermal warning feature is available to monitor via SCADA.

- (3/3) Alarm & Message
  The variable frequency drive thermal warning will trigger an alarm in the same way that an analog or digital input can trigger an alarm. An alarm bit specific to the VFD thermal warning feature is available to monitor via SCADA. Additionally, a warning notification screen will replace the Home screen to alert the operator that the warning threshold has been reached, with recommended actions that should be performed. This warning message must be acknowledged by the local operator. While the warning message is displayed, the screensaver will be disabled. Once acknowledged, the warning message will not be displayed again for the current run session – meaning that the compressor will need to stop and start again for the message to reappear.

Variable Frequency Drive – Thermal > Warning Threshold

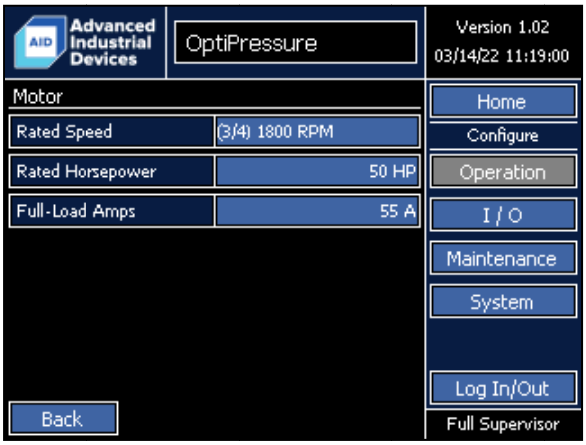
The percent of the rated heatsink temperature that the variable frequency drive will fault on Heatsink Overtemp (OH1) to trigger the warning message. The default value is 80%. For example, if the drive will set a Heatsink Overtemp (OH1) fault at 100 degC and the Warning Threshold is set at 80%, the VFD Thermal Warning will be triggered when the heatsink temperature reaches 80 degC for 10 seconds (the detection delay for this feature is a fixed 10 seconds).

Motor

Configuration parameters related to the Motor are available in:

Configure > Operation > Motor

Configure > Operation > Motor



Motor > Rated Speed

Select the motor speed that closest matches the motor nameplate rated speed.

Motor > Rated Horsepower

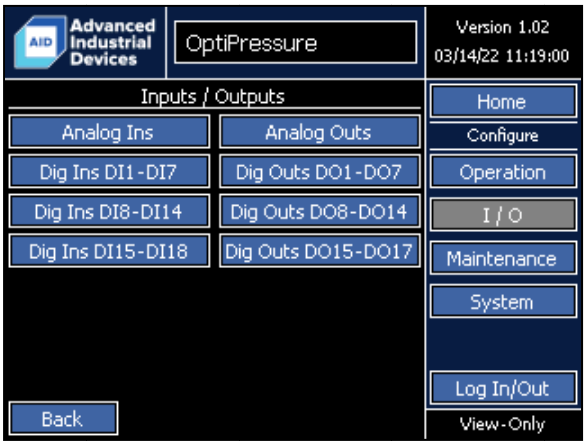
Enter the motor nameplate horsepower.

Motor > Full-Load Amps

Enter the motor nameplate full-load amps (FLA). Do not include the service factor or overload value.

Configuration parameters related to the analog inputs are available in:

Configure > I/O

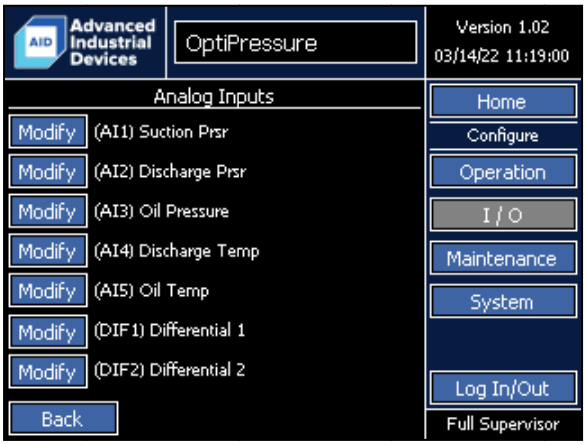


Analog Inputs

Configuration parameters related to the analog inputs are available in:

Configure > I/O > Analog Inputs

Configure > I/O > Analog Inputs Selection



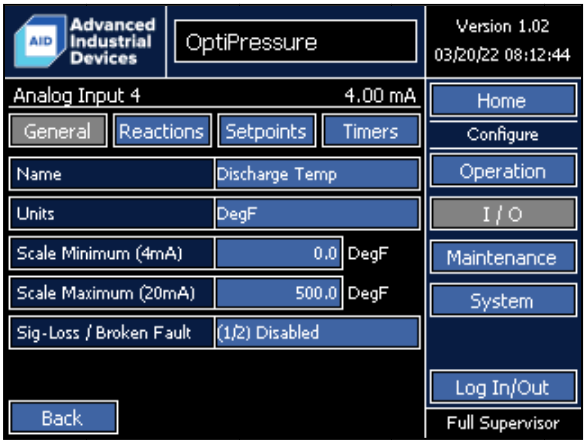
Analog inputs available to the operator vary based on the controller ordered, and include configurations for:

Configuration	Analog Inputs		
	4-20 mA	K-Type Thermocouple	100-Ohm Platinum RTD
1	5	0	0
2	4	1	0
3	4	0	1
4	3	2	0
5	3	0	2

Note:
When installed in a panel provided by Advanced Industrial Devices, the analog and digital inputs and outputs may be prewired to terminals mounted inside the panel or in a field device wiring hip-box. In this case, please refer to the wiring diagram included with the panel for field device connection locations.

The analog inputs for the OptiPressure controller are designed to be highly flexible and customizable by the operator to meet the needs of a site without requiring custom firmware. Several analog inputs have a dedicated function, as well as fixed units, depending on the ordered configuration. However, in general, the names and units of most of the analog inputs are customizable by the operator.

Configure > I/O > Analog Inputs > Analog Input X – General



Math conversions for the engineering units are not automatically performed by the controller. Any conversions required to change the units specified on the sensor to a different engineering units scale must be performed by the operator by setting the Units, Scale Minimum (4mA), and Scale Maximum (20mA) parameters.

Example: 1 PSI = 2.31 Feet. If a 0 – 10 PSI transducer/sensor is used for a tank level measurement, the Units would be set to Feet, Scale Minimum (4mA) would be set to 0 Feet, and the Scale Maximum (20mA) would be set to 10 PSI x 2.31 Feet/PSI = 23.1 Feet.

Analog Input X – General > Name

Analog input names can be modified by the operator in order to customize the controller to the individual site and sensors available.

Analog Input X – General > Units

Analog input units can be modified by the operator to display the preferred engineering units for the site.

For K-type thermocouple and 100-ohm platinum RTD analog inputs, the units are fixed in degrees Fahrenheit and cannot be modified by the operator.

Analog Input X – General > Scale Minimum (4mA)

For 4-20 mA analog inputs, the Scale Minimum sets the engineering units value to display when the input signal is 4 mA.

For K-type thermocouple and 100-ohm platinum RTD analog inputs, the units are fixed in degrees Fahrenheit and cannot be modified by the operator.

Analog Input X – General > Scale Maximum (20mA)

For 4-20 mA analog inputs, the Scale Maximum sets the engineering units value to display when the input signal is 20 mA.

For K-type thermocouple and 100-ohm platinum RTD analog inputs, the units are fixed in degrees Fahrenheit and cannot be modified by the operator.

Analog Input X – General > Signal-Loss/Broken Fault

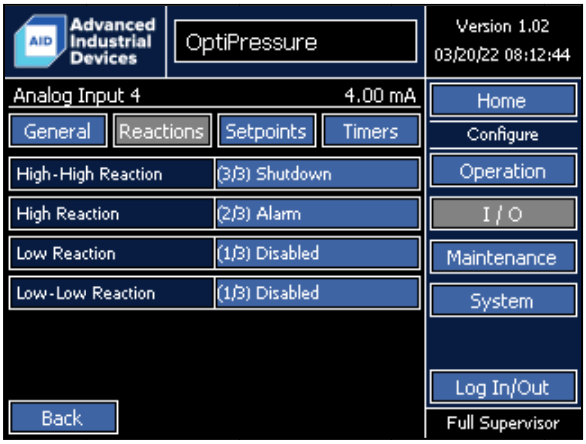
The OptiPressure controller can detect when a sensor signal has been lost or if the sensor fails.

Electrical noise can occasionally cause nuisance trips. In this case, Signal-Loss/Broken Fault detection can be temporarily disabled. However, for safety, enabling this feature is recommended and corrective action should be taken to reduce or eliminate the source of the electrical noise.

- (1/2) Disabled
  The system will continue to run, without setting a fault event. If a sensor is unused or not connected to the analog input, Signal-Loss/Broken Fault should be set to Disabled.

- (2/2) Enabled
  The system will set a fault event if the sensor reads out of range or indicates a broken condition.

Configure > I/O > Analog Inputs > Analog Input X – Reactions



Each analog input supports independent reactions to the four setpoints. The multiple setpoints and reactions provide a flexible method to create warnings/notifications that alert the operator a sensor indicates a high or low condition and if the measured value continues to increase or decrease to the high-high or low-low setpoint, trigger a shutdown event.

Example: The controller can set an high alarm event at 50 PSI to notify the operator but continue operation, and trigger a high-high shutdown event if the pressure continued to rise to 55 PSI.

- Disabled (1/3)
  The setpoint value will be ignored.

- Alarm (2/3)
  An alarm event will be indicated, but the system will continue to run.

- Shutdown (3/3)
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Analog Input X – Reactions > High-High Reaction

High-High Reaction determines the reaction when the scaled analog input value is greater than or equal to the **Analog Input X – Setpoints > High-High Setpoint**.

Analog Input X – Reactions > High Reaction

High Reaction determines the reaction when the scaled analog input value is greater than or equal to the **Analog Input X – Setpoints > High Setpoint**.

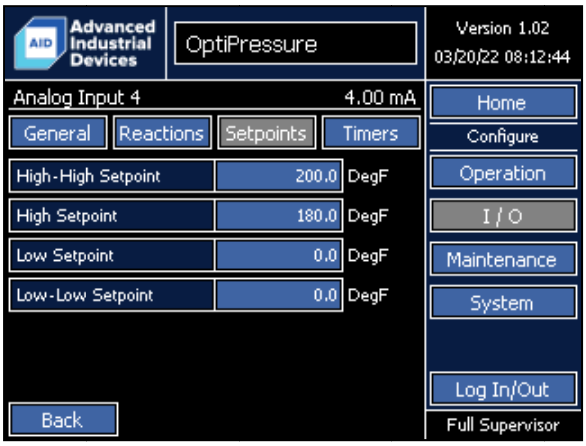
Analog Input X – Reactions > Low Reaction

Low Reaction determines the reaction when the scaled analog input value is less than or equal to the **Analog Input X – Setpoints > Low Setpoint**.

Analog Input X – Reactions > Low-Low Reaction

Low-Low Reaction determines the reaction when the scaled analog input value is less than or equal to the **Analog Input X – Setpoints > Low-Low Setpoint**.

Configure > I/O > Analog Inputs > Analog Input X – Setpoints



Each analog inputs supports four independent setpoints with configurable reactions when the measured, scaled values meets or exceeds the value of the setpoint.

Analog Input X – Setpoints > High-High Setpoint

High-High Setpoint sets the value the scaled analog input must be greater than or equal to in order to trigger the high-high reaction.

Analog Input X – Setpoints > High Setpoint

High Setpoint sets the value the scaled analog input must be greater than or equal to in order to trigger the high reaction.

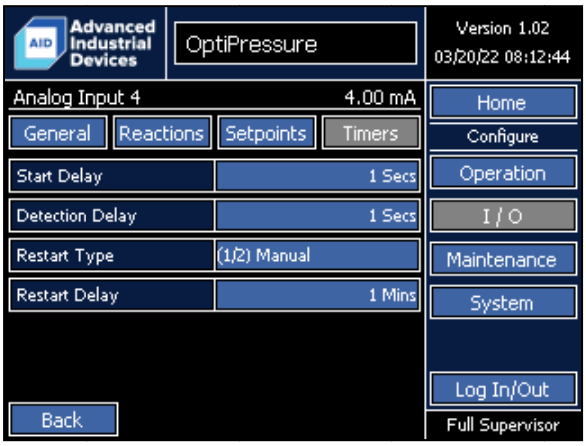
Analog Input X – Setpoints > Low Setpoint

Low Setpoint sets the value the scaled analog input must be less than or equal to in order to trigger the low reaction.

Analog Input X – Setpoints > Low-Low Setpoint

Low-Low Setpoint sets the value the scaled analog input must be less than or equal to in order to trigger the low-low reaction.

Configure > I/O > Analog Inputs > Analog Input X – Timers



Analog Input X – Timers > Start Delay

Start Delay provides a time delay for the compressor to start and stabilize before determining if one of the setpoint reactions should occur. The Start Delay timer starts as soon as the compressor motor starts. The analog input reactions and setpoints will be ignored for the duration of the Start Delay time. Once the Start Delay timer elapses, the normal detection delay timer, setpoints, and reactions will take over. The Start Delay timer will not be used again during this run cycle.

Analog Input X – Timers > Detection Delay

After the Start Delay timer has elapsed, the Detection Delay time will be used. When the measured, scaled value of the analog input has met a setpoint value condition, the Detection Delay timer will start. If the measured, scaled value of the analog input continues to meet a setpoint value condition when the Detection Delay timer has elapsed, the associated setpoint reaction will occur. If the measured, scaled value of the analog input no longer meets a setpoint value condition before the Detection Delay time has elapsed, the Detection Delay timer will reset, and no action will occur.

Analog Input X – Timers > Restart Type

- (1/2) Manual
  When a shutdown event is set, the controller will require an operator to manually reset the shutdown event before normal operation can resume.

- (2/2) Timed
  When a shutdown event is set, the controller will automatically reset the shutdown event when the Restart Delay timer has elapsed and resume normal operation without interaction from the operator.

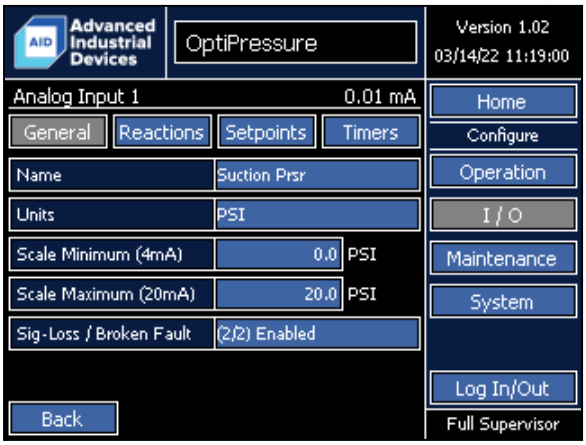
Analog Input X – Timers > Restart Delay

When a shutdown event occurs, and is configured for a Timed restart, the shutdown event will automatically reset after this delay has expired.

Analog Input 1

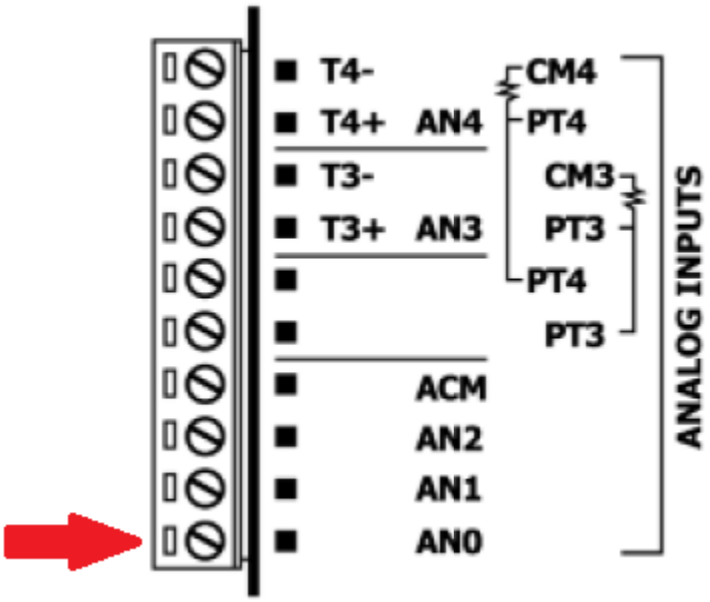
Configuration parameters related to Analog Input 1 are available in:

Configure > I/O > Analog Inputs > Analog Input 1



Suction pressure is the recommended function for Analog Input 1. Both the name and units can be modified by the operator.

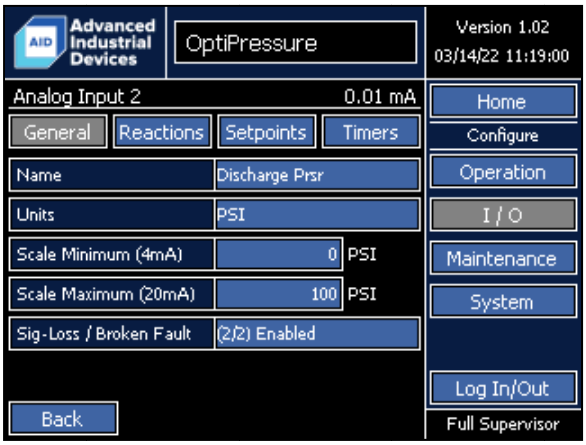
The 4-20 mA signal is connected to terminal AN0 on the V200-18-E6B I/O module located on the back of the controller.



Analog Input 2

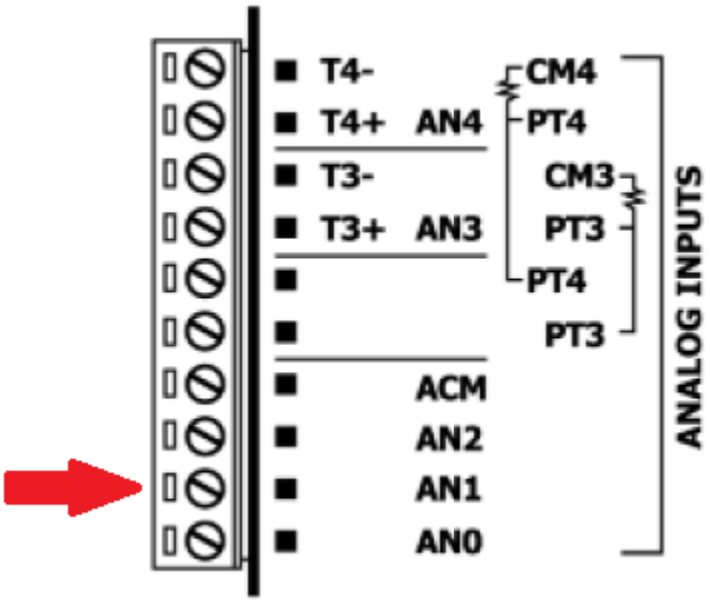
Configuration parameters related to Analog Input 2 are available in:

Configure > I/O > Analog Inputs > Analog Input 2



Discharge pressure is the recommended function for Analog Input 2. Both the name and units can be modified by the operator.

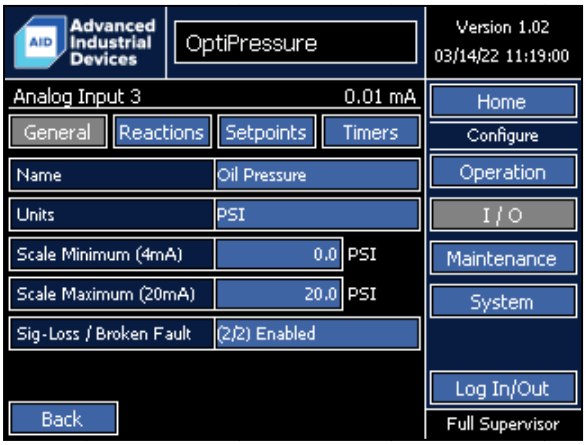
The 4-20 mA signal is connected to terminal AN1 on the V200-18-E6B I/O module located on the back of the controller.



Analog Input 3

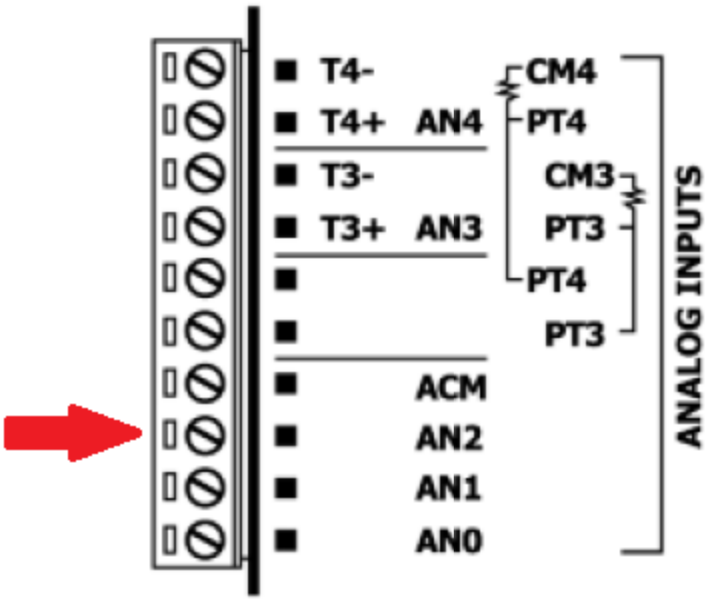
Configuration parameters related to Analog Input 3 are available in:

Configure > I/O > Analog Inputs > Analog Input 3



Both the name and units can be modified by the operator.

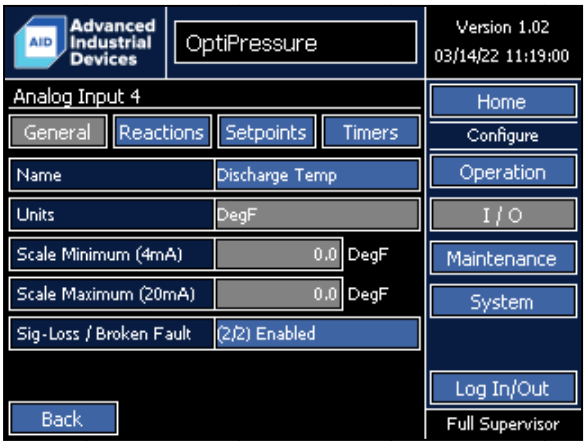
The 4-20 mA signal is connected to terminal AN2 on the V200-18-E6B I/O module located on the back of the controller.



Analog Input 4

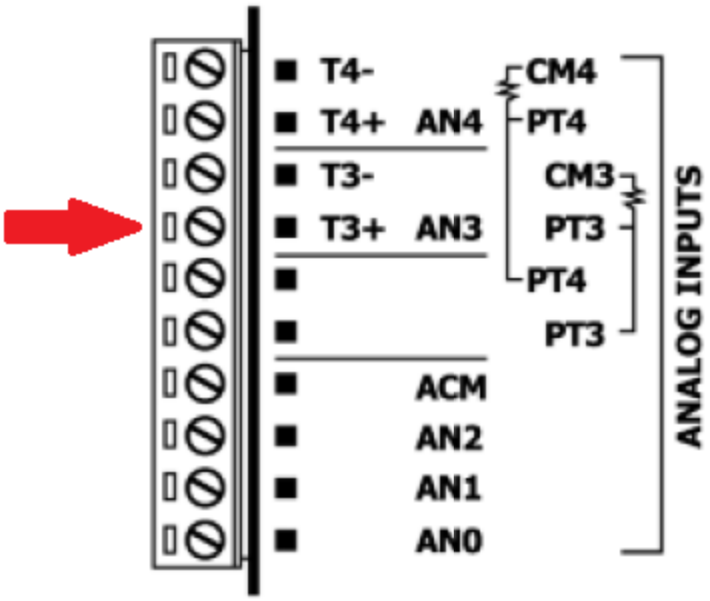
Configuration parameters related to Analog Input 4 are available in:

Configure > I/O > Analog Inputs > Analog Input 4



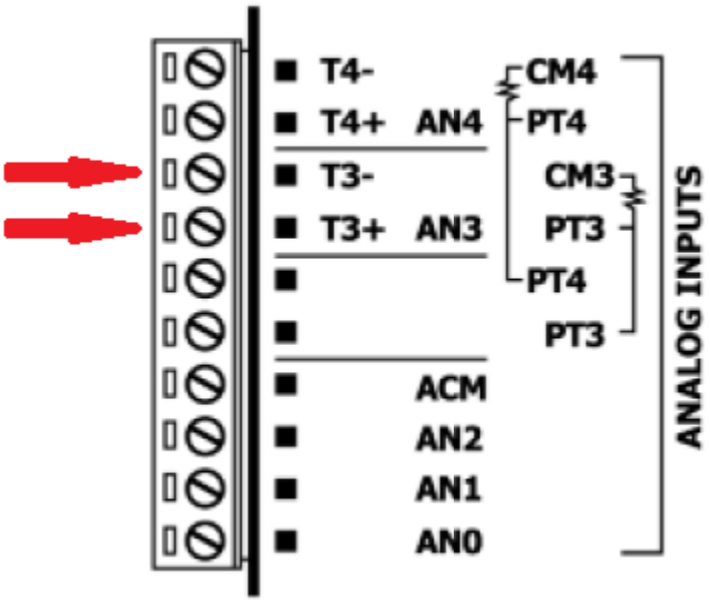
Discharge temperature is the recommended function for Analog Input 4. Both the name and units can be modified by the operator, when configured for a 4-20 mA input. When configured for a K-type thermocouple or 100-ohm platinum RTD, the Units, Scale Minimum, and Scale Maximum cannot be modified.

- 4-20 mA
  The 4-20 mA signal is connected to terminal AN3 on the V200-18-E6B I/O module located on the back of the controller.



- K-Type Thermocouple

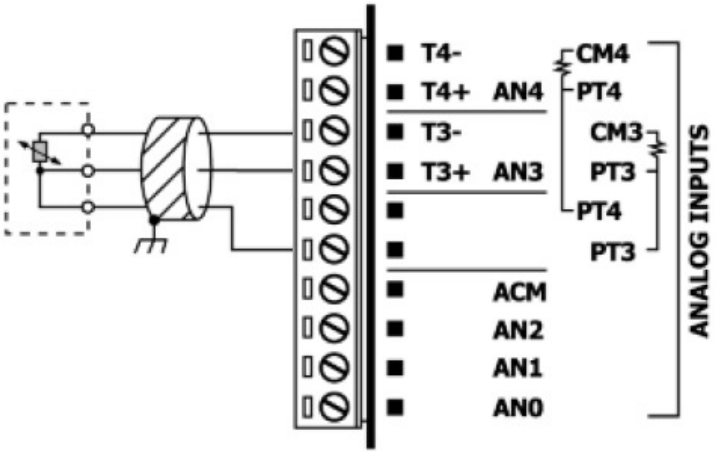
  The K-type thermocouple is connected to terminals T3- and T3+ on the V200-18-E6B I/O module located on the back of the controller. The red, insulated thermocouple wire is connected to terminal T3-. The white thermocouple wire is connected to terminal T3+.



- 100 Ohm Platinum RTD

  A 100 ohm RTD will have either 3 or 4 wires to connect depending on the make and model. If the RTD does not have 3 or 4 wires, the sensor is likely NOT a 100 ohm RTD or a RTD to 4-20ma converter is installed in the temperature sensor and cannot be connected to the location shown here.

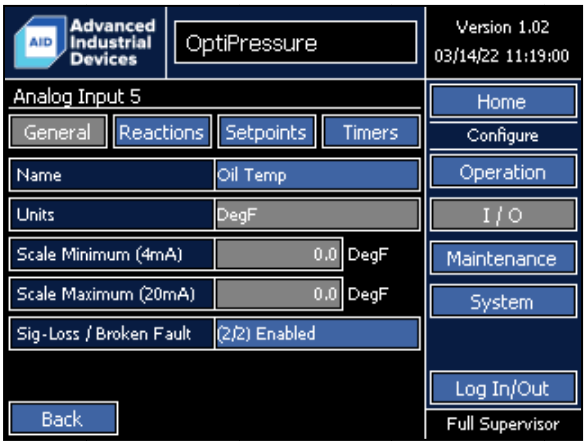
  For a 3-wire, 100 ohm RTD connection, the two white wires connect to terminal PT3 and PT3 and the red wire connects to terminal CM3. For a 4-wire, 100 ohm RTD connection, leave one of the sensor leads unconnected.



Analog Input 5

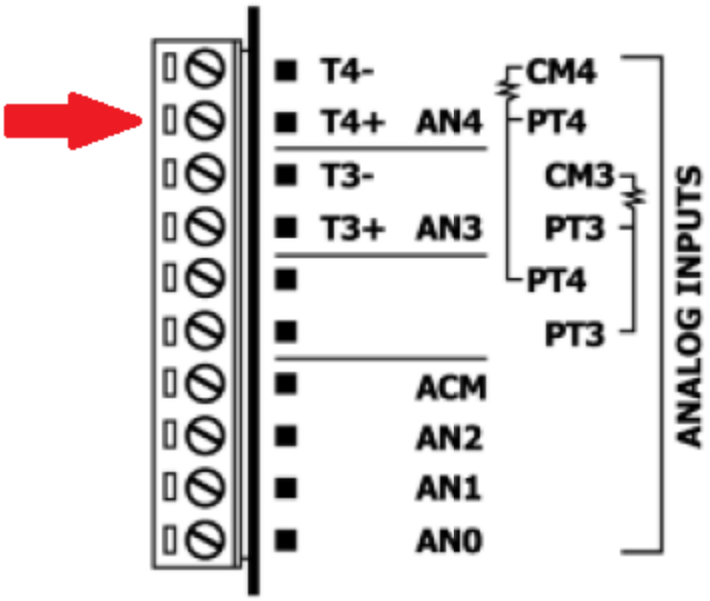
Configuration parameters related to Analog Input 5 are available in:

Configure > I/O > Analog Inputs > Analog Input 5



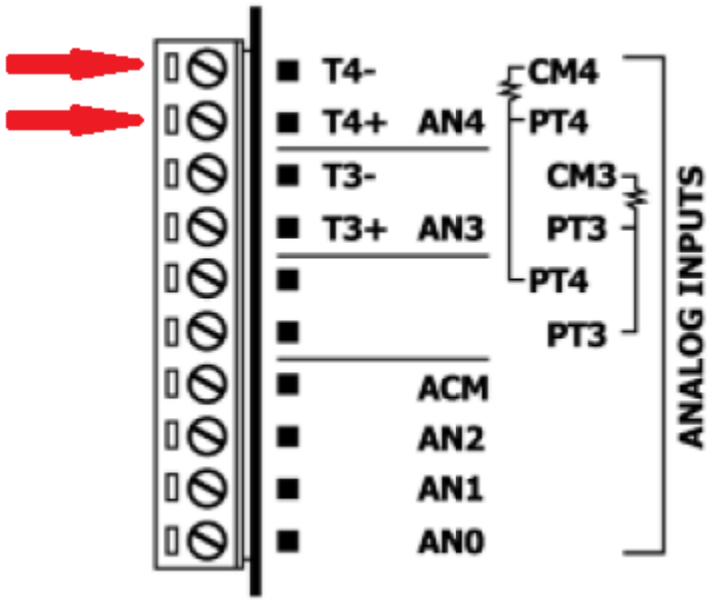
Discharge temperature is the recommended function for Analog Input 5. Both the name and units can be modified by the operator, when configured for a 4-20 mA input. When configured for a K-type thermocouple or 100-ohm platinum RTD, the Units, Scale Minimum, and Scale Maximum cannot be modified.

- 4-20 mA
  The 4-20 mA signal is connected to terminal AN4 on the V200-18-E6B I/O module located on the back of the controller.



- K-Type Thermocouple

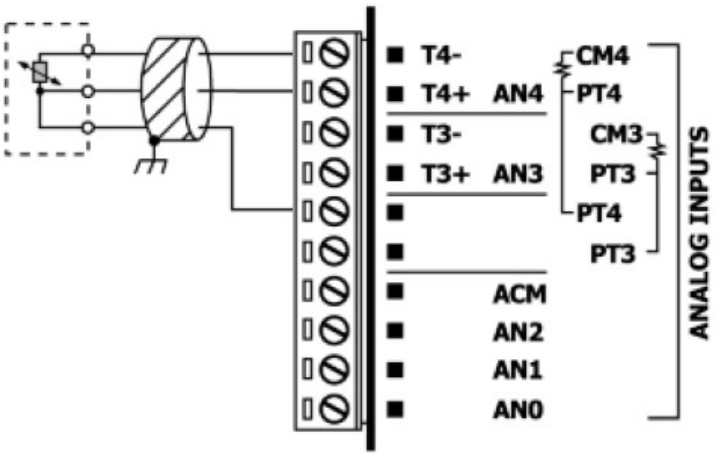
  The K-type thermocouple is connected to terminals T4- and T4+ on the V200-18-E6B I/O module located on the back of the controller. The red, insulated thermocouple wire is connected to terminal T4-. The white thermocouple wire is connected to terminal T4+.



- 100 Ohm Platinum RTD

  A 100 ohm RTD will have either 3 or 4 wires to connect depending on the make and model. If the RTD does not have 3 or 4 wires, the sensor is likely NOT a 100 ohm RTD or a RTD to 4-20ma converter is installed in the temperature sensor and cannot be connected to the location shown here.

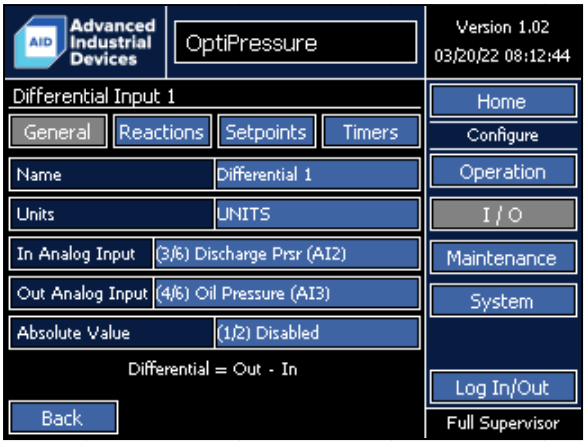
  For a 3-wire, 100 ohm RTD connection, the two white wires connect to terminal PT4 and PT4 and the red wire connects to terminal CM4. For a 4-wire, 100 ohm RTD connection, leave one of the sensor leads unconnected.



Analog Differential Input 1

Configuration parameters related to the Analog Differential Input 1 are available in:

Configure > I/O > Analog Inputs > Differential Input 1



The analog differential input is based on two sensors. The operator must select a combination of two sensors to enable this feature. The analog differential input is calculated by subtracting the Outlet Analog Input from the Inlet Analog Input.

Both of the selected analog inputs must be scaled in the same units.

Differential Input 1 – General > Inlet Analog Input

The analog input used at the inlet.

- (1/6) Disabled
- (2/6) Suction Prsr (AI1)
- (3/6) Discharge Prsr (AI2)
- (4/6) Oil Pressure (AI3)
- (5/6) Discharge Temp (AI4)
- (6/6) Oil Temp (AI5)

Differential Input 1 – General > Outlet Analog Input

The analog input used at the outlet.

- (1/6) Disabled
- (2/6) Suction Prsr (AI1)
- (3/6) Discharge Prsr (AI2)
- (4/6) Oil Pressure (AI3)

- (5/6) Discharge Temp (AI4)
- (6/6) Oil Temp (AI5)

Differential Input 1 – General > Absolute Value

- (1/2) Disabled
  When Absolute Value is set to Disabled, the value of the resulting differential calculation will be allowed be negative.

  Example:
  Inlet Analog Input is AI3 and Outlet Analog Input is AI4.
  Analog Input 3 measures 55 PSI. Analog Input 4 measures 45 PSI.
  Differential Input 1 = Outlet – Inlet = 45 PSI – 55 PSI = –10 PSI

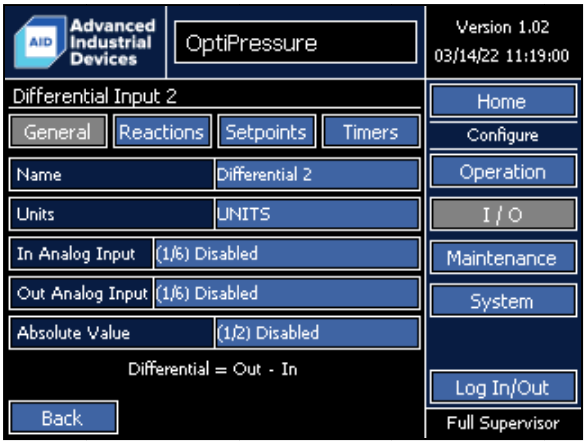
- (2/2) Enabled
  When Absolute Value is set to Enabled, the value of the resulting differential calculation will always be positive.

  Example:
  Inlet Analog Input is AI3 and Outlet Analog Input is AI4.
  Analog Input 3 measures 55 PSI. Analog Input 4 measures 45 PSI.
  Differential Input 1 = Outlet – Inlet = 45 PSI – 55 PSI = –10 PSI
  Absolute Value (–10 PSI) = +10 PSI
  Differential Input 1 = 10 PSI

Analog Differential Input 2

Configuration parameters related to the Analog Differential Input 2 are available in:

Configure > I/O > Analog Inputs > Differential Input 2



The analog differential input is based on two sensors. The operator must select a combination of two sensors to enable this feature. The analog differential input is calculated by subtracting the Outlet Analog Input from the Inlet Analog Input.

Both of the selected analog inputs must be scaled in the same units.

Differential Input 2 – General > Inlet Analog Input

The analog input used at the inlet.

- (1/6) Disabled
- (2/6) Suction Prsr (AI1)
- (3/6) Discharge Prsr (AI2)
- (4/6) Oil Pressure (AI3)
- (5/6) Discharge Temp (AI4)
- (6/6) Oil Temp (AI5)

Differential Input 2 – General > Outlet Analog Input

The analog input used at the outlet.

- (1/6) Disabled
- (2/6) Suction Prsr (AI1)
- (3/6) Discharge Prsr (AI2)
- (4/6) Oil Pressure (AI3)

- (5/6) Discharge Temp (AI4)
- (6/6) Oil Temp (AI5)

Differential Input 2 – General > Absolute Value

- (1/2) Disabled
  When Absolute Value is set to Disabled, the value of the resulting differential calculation will be allowed be negative.

  Example:
  Inlet Analog Input is AI3 and Outlet Analog Input is AI4.
  Analog Input 3 measures 55 PSI. Analog Input 4 measures 45 PSI.
  Differential Input 2 = Outlet – Inlet = 45 PSI – 55 PSI = –10 PSI

- (2/2) Enabled
  When Absolute Value is set to Enabled, the value of the resulting differential calculation will always be positive.

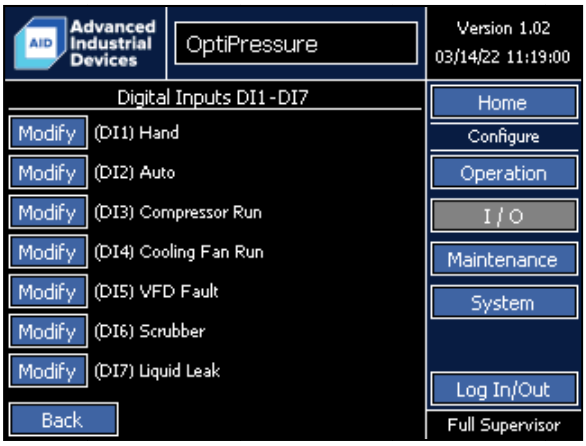
  Example:
  Inlet Analog Input is AI3 and Outlet Analog Input is AI4.
  Analog Input 3 measures 55 PSI. Analog Input 4 measures 45 PSI.
  Differential Input 2 = Outlet – Inlet = 45 PSI – 55 PSI = –10 PSI
  Absolute Value (–10 PSI) = +10 PSI
  Differential Input 2 = 10 PSI

Digital Inputs

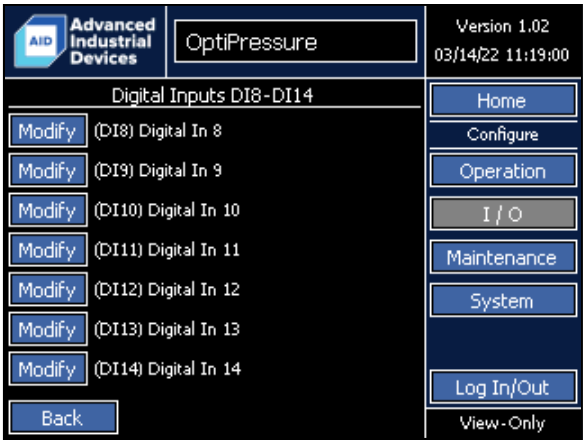
Configuration parameters related to the digital inputs are available in:

Configure > I/O > Digital Inputs

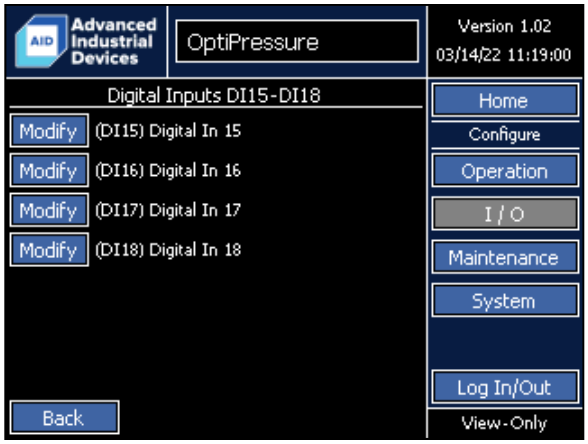
Configure > I/O > Digital Inputs DI1 – DI7 Selection



Configure > I/O > Digital Inputs DI8 – D14 Selection



Configure > I/O > Digital Inputs DI15 – D18 Selection



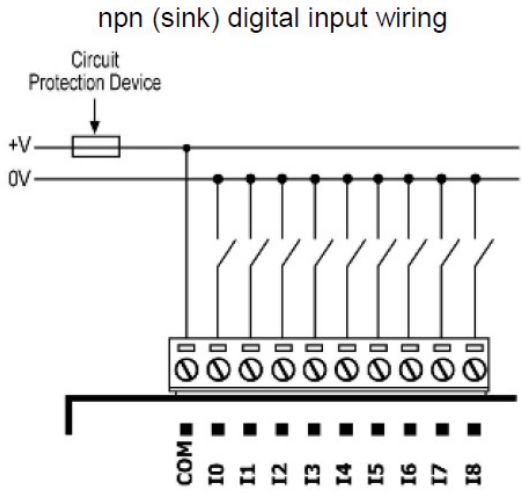
Note:

When installed in a panel provided by Advanced Industrial Devices, the analog and digital inputs and outputs may be prewired to terminals mounted inside the panel or in a field device wiring hip-box. In this case, please refer to the wiring diagram included with the panel for field device connection locations.

Most digital inputs have a dedicated purpose, but can be renamed by the operator in order to tailor the controller configuration to the site requirements.

Digital inputs are on/off, dry-contact, switch inputs that are either open or closed. Do NOT apply 120 VAC directly to the digital inputs, as this will damage the controller.

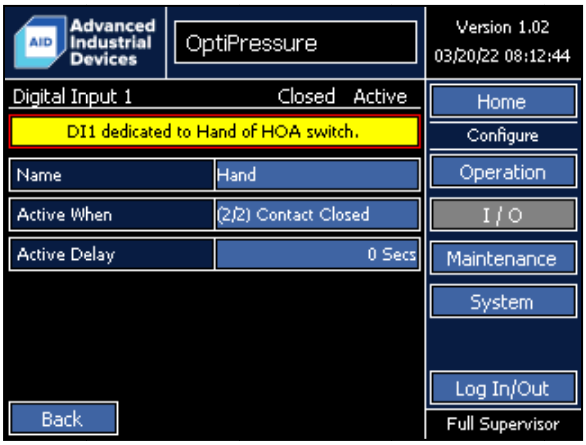
Each of the two groups of 9 digital inputs has a common connection and should be wired for npn (sinking) operation as shown below. V+ refers to the +24 VDC used to power the controller.



Digital Input 1 (Hand)

Configuration parameters related to Digital Input 1 are available in:

Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 1



The function of Digital Input 1 is dedicated to the Hand operation of the HOA switch. The name can be modified by the operator.

Digital Input 1 > Active When

Determines when the digital input is considered to be active and to perform the assigned function.

- (1/2) Contact Open
  The digital input will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input will be active when the contact to the input is closed.

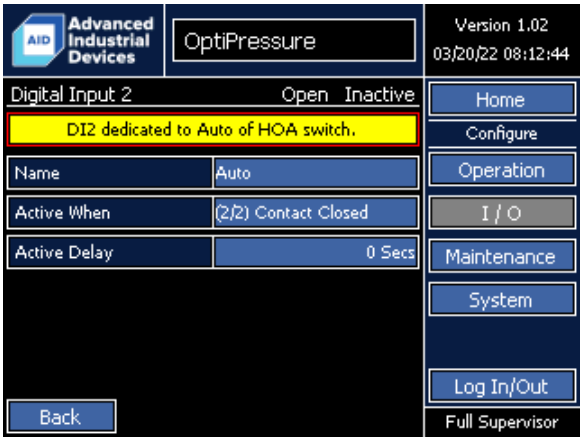
Digital Input 1 > Active Delay

The amount of time required for the input to be open or closed before activating the function. This feature can be used to debounce the input.

Digital Input 2 (Auto)

Configuration parameters related to Digital Input 2 are available in:

Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 2



The function of Digital Input 2 is dedicated to the Auto operation of the HOA switch. The name can be modified by the operator.

Digital Input 2 > Active When

Determines when the digital input is considered to be active and to perform the assigned function.

- (1/2) Contact Open
  The digital input will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input will be active when the contact to the input is closed.

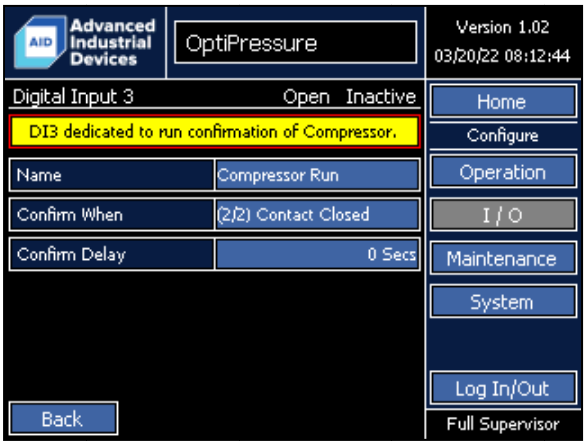
Digital Input 2 > Active Delay

The amount of time required for the input to be open or closed before activating the function. This feature can be used to debounce the input.

Digital Input 3 (Compressor Run Confirmation)

Configuration parameters related to Digital Input 3 are available in:

Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 3



The function of Digital Input 3 is dedicated to the run confirmation of the compressor. When the OptiPressure controller is used with a Fuji MEGA variable frequency drive, the compressor run confirmation is obtained over the Ethernet communication link and Digital Input 3 is not required.

Digital Input 3 > Active When

Determines when the digital input is considered to be active and to perform the assigned function.

- (1/2) Contact Open
  The digital input will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input will be active when the contact to the input is closed.

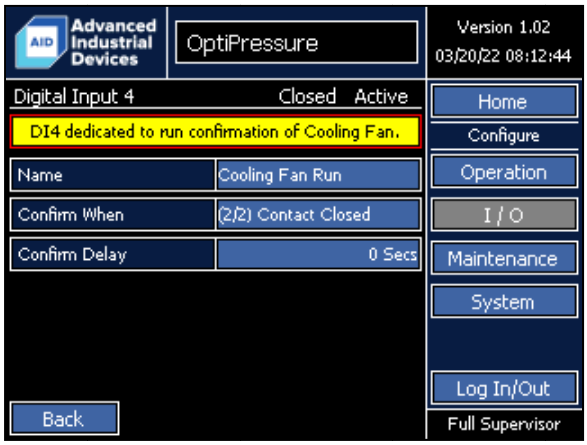
Digital Input 3 > Active Delay

The amount of time required for the input to be open or closed before activating the function. This feature can be used to debounce the input.

Digital Input 4 (Cooling Fan Run Confirmation)

Configuration parameters related to Digital Input 4 are available in:

Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 4



The function of Digital Input 4 is dedicated to the run confirmation of the cooling fan. If a cooling fan is used, either with a motor starter or a variable frequency drive, Digital Input 4 should be connected to a set of dry/unpowered contacts on the motor starter (auxiliary contacts) or drive (relay or transistor output programmed to close when the drive is running).

Digital Input 4 > Active When

Determines when the digital input is considered to be active and to perform the assigned function.

- (1/2) Contact Open
  The digital input will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input will be active when the contact to the input is closed.

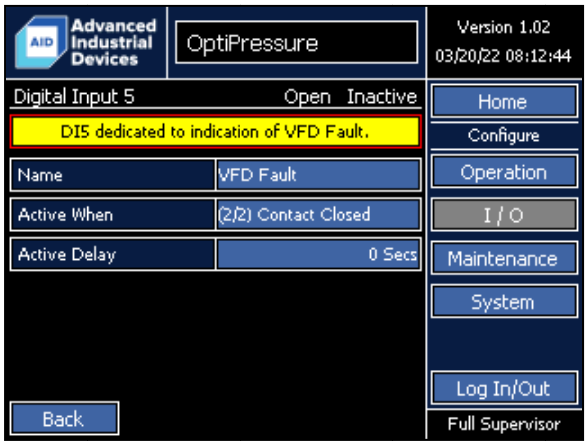
Digital Input 4 > Active Delay

The amount of time required for the input to be open or closed before activating the function. This feature can be used to debounce the input.

Digital Input 5 (VFD Fault)

Configuration parameters related to Digital Input 5 are available in:

Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 5



The function of Digital Input 5 is dedicated indication of a fault condition of the variable frequency drive. When the OptiPressure controller is used with a Fuji MEGA variable frequency drive, the drive fault status is obtained over the Ethernet communication link and Digital Input 5 is not required.

Digital Input 5 > Active When

Determines when the digital input is considered to be active and to perform the assigned function.

- (1/2) Contact Open
  The digital input will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input will be active when the contact to the input is closed.

Digital Input 5 > Active Delay

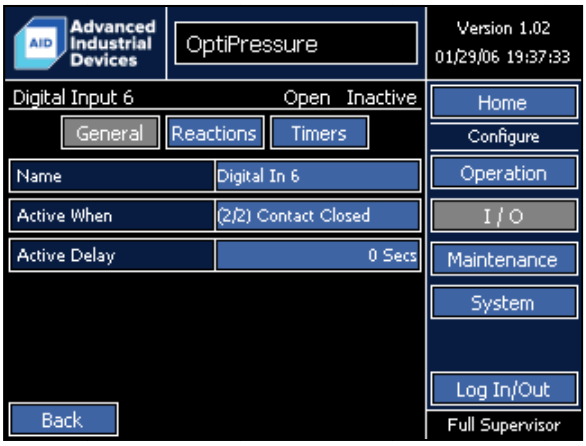
The amount of time required for the input to be open or closed before activating the function. This feature can be used to debounce the input.

Digital Input 6

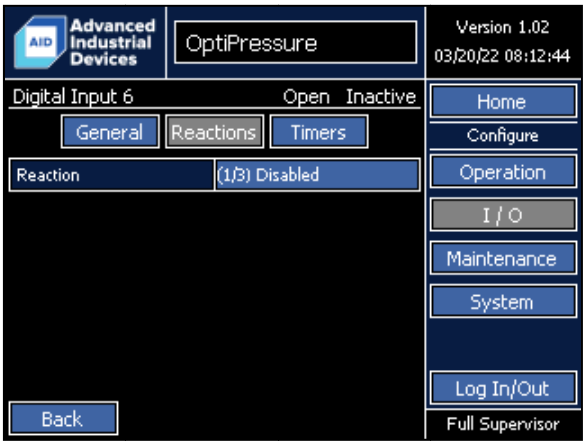
Configuration parameters related to Digital Input 6 are available in:

Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 6

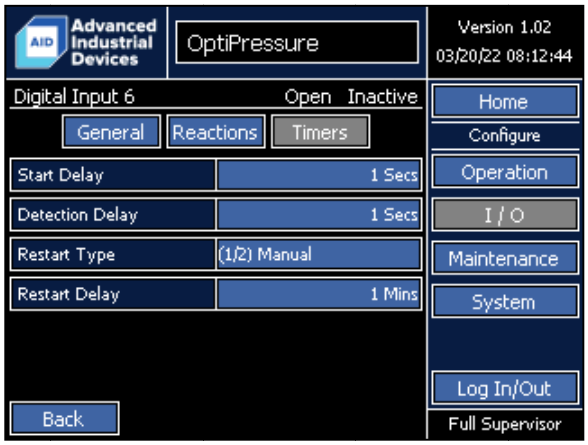
Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 6 – General



Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 6 – Reactions



Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 6 – Timers



Digital Input 6 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 6 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 6 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 6 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 6 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 6 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 6 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 6 – Timers > Restart Delay

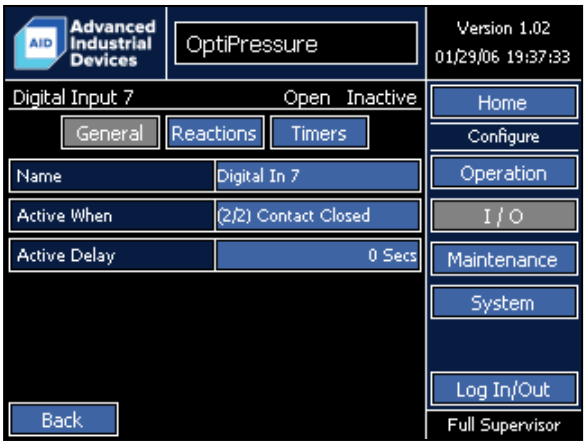
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 7

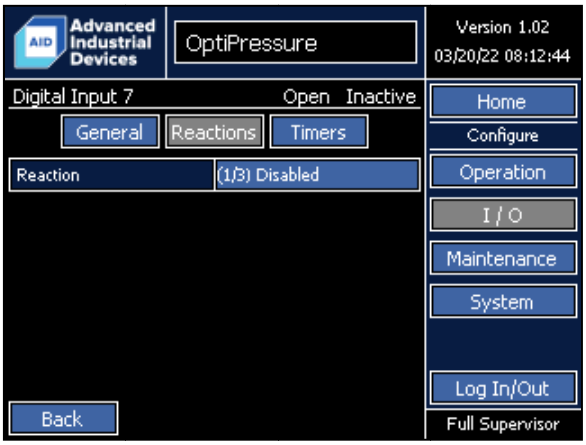
Configuration parameters related to Digital Input 7 are available in:

Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 7

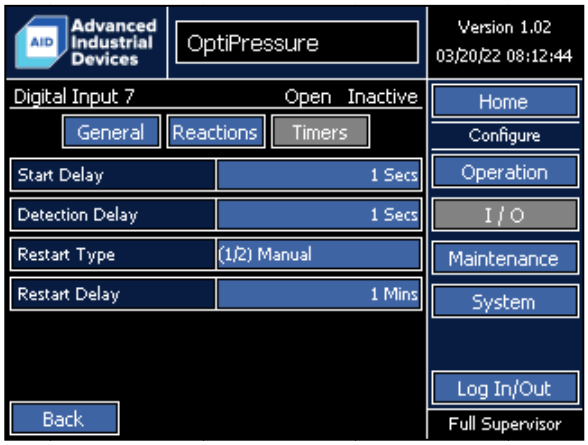
Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 7 – General



Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 7 – Reactions



Configure > I/O > Digital Inputs DI1 – DI7 > Digital Input 7 – Timers



Digital Input 7 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 7 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 7 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 7 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 7 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 7 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 7 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 7 – Timers > Restart Delay

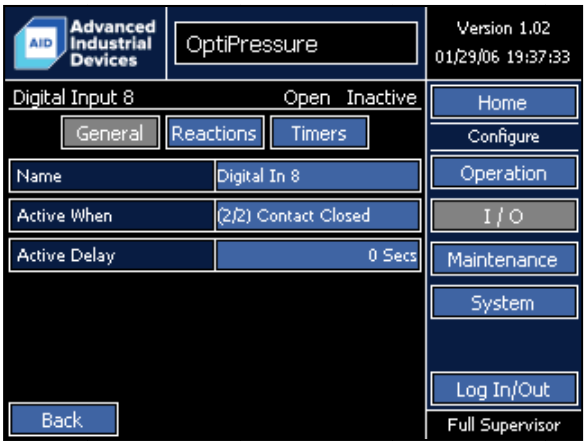
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 8

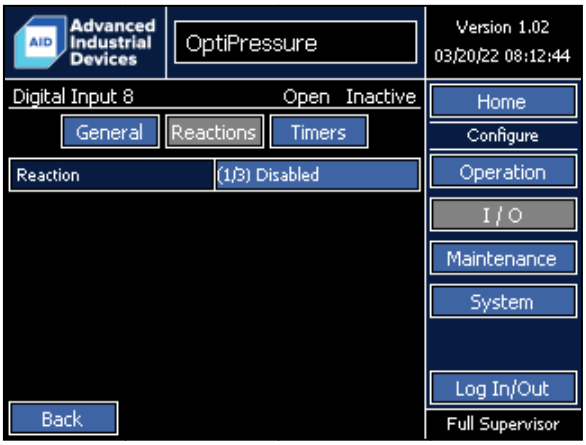
Configuration parameters related to Digital Input 8 are available in:

Configure > I/O > Digital Inputs DI8 – DI14 > Digital Input 8

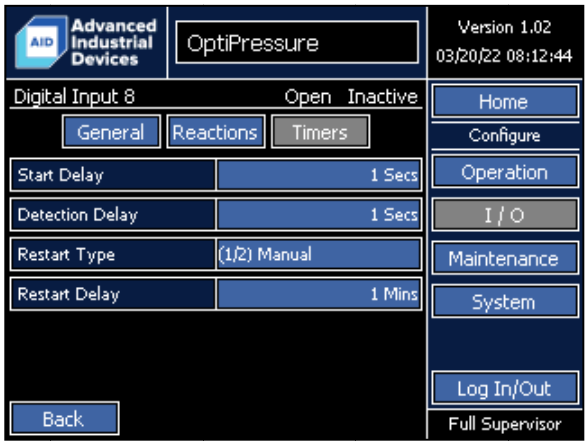
Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 8 – General



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 8 – Reactions



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 8 – Timers



Digital Input 8 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 8 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 8 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 8 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 8 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 8 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 8 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 8 – Timers > Restart Delay

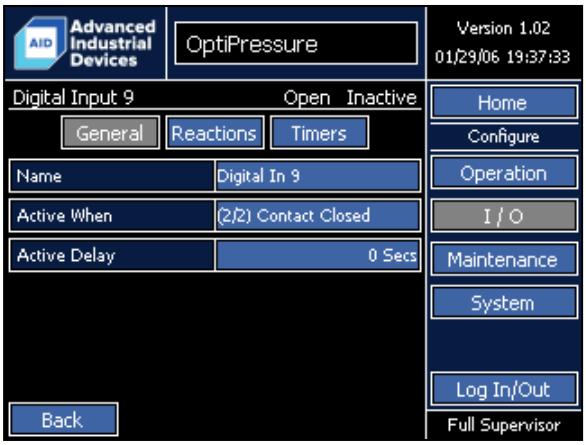
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 9

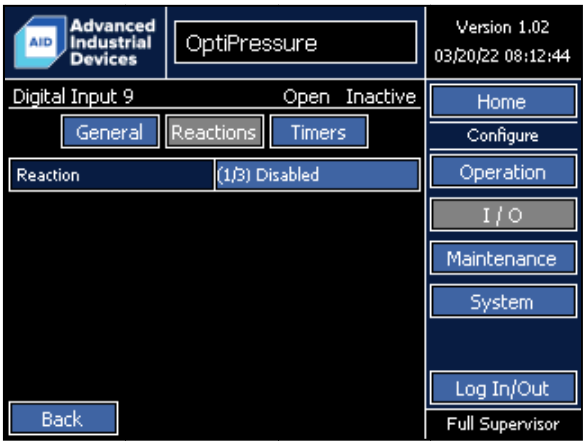
Configuration parameters related to Digital Input 9 are available in:

Configure > I/O > Digital Inputs DI8 – DI14 > Digital Input 9

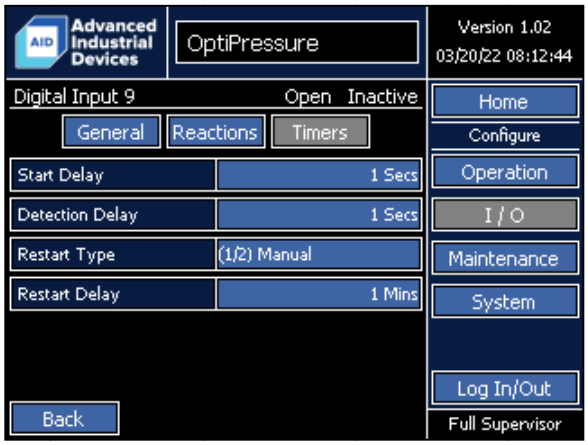
Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 9 – General



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 9 – Reactions



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 9 – Timers



Digital Input 9 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 9 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 9 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 9 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 9 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 9 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 9 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 9 – Timers > Restart Delay

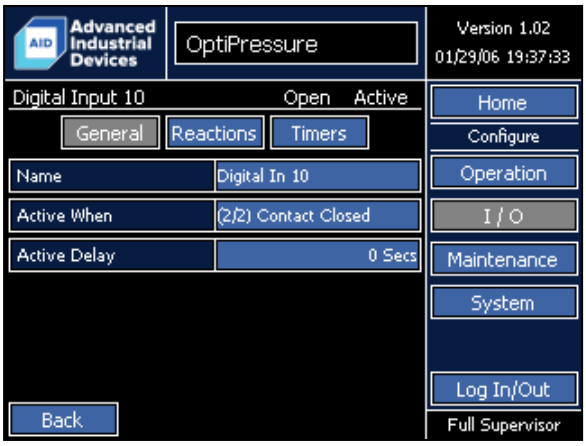
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 10

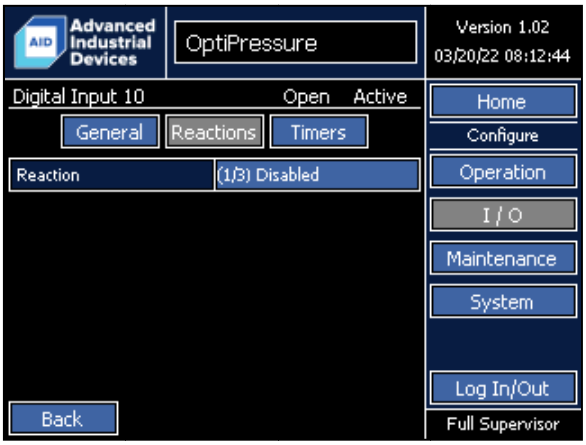
Configuration parameters related to Digital Input 10 are available in:

Configure > I/O > Digital Inputs DI8 – DI14 > Digital Input 10

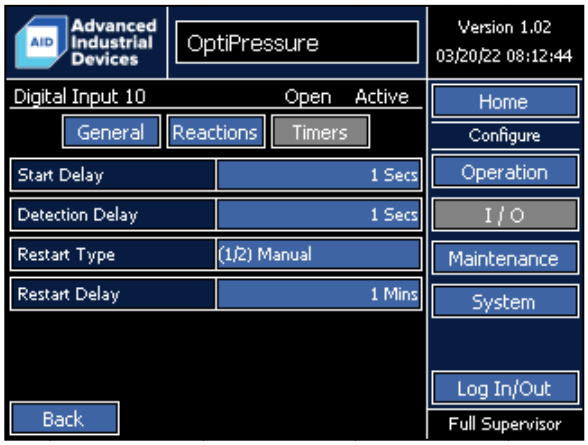
Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 10 – General



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 10 – Reactions



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 10 – Timers



Digital Input 10 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 10 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 10 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 10 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 10 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 10 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 10 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 10 – Timers > Restart Delay

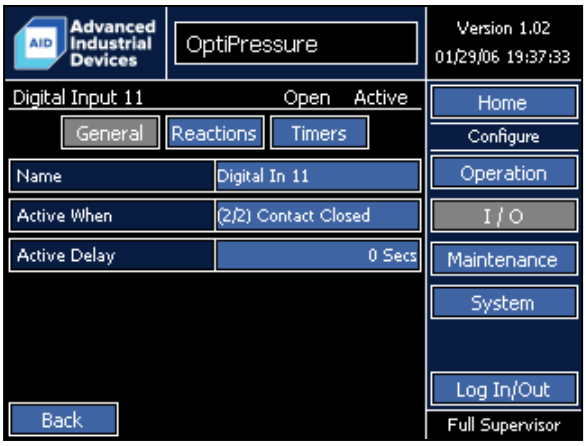
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 11

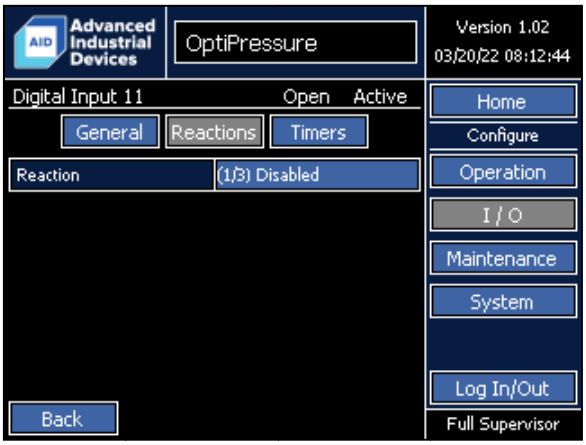
Configuration parameters related to Digital Input 11 are available in:

Configure > I/O > Digital Inputs DI8 – DI14 > Digital Input 11

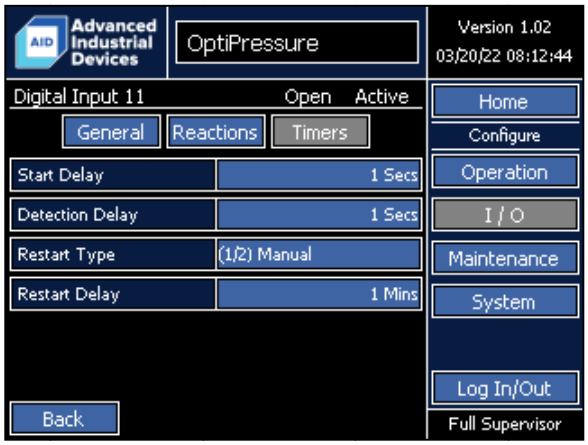
Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 11 – General



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 11 – Reactions



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 11 – Timers



Digital Input 11 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 11 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 11 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 11 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 11 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 11 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 11 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 11 – Timers > Restart Delay

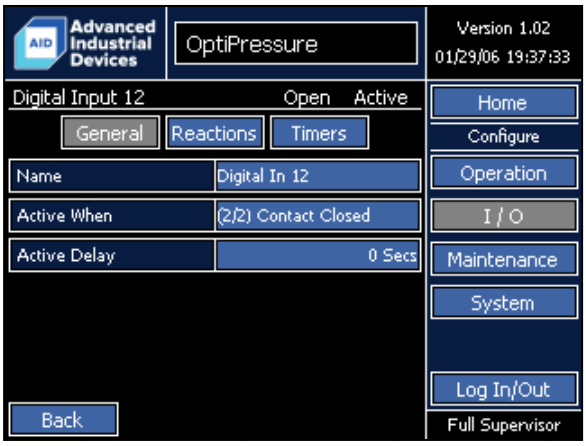
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 12

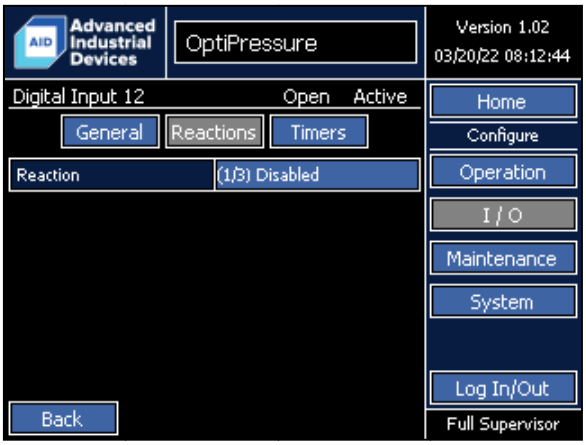
Configuration parameters related to Digital Input 12 are available in:

Configure > I/O > Digital Inputs DI8 – DI14 > Digital Input 12

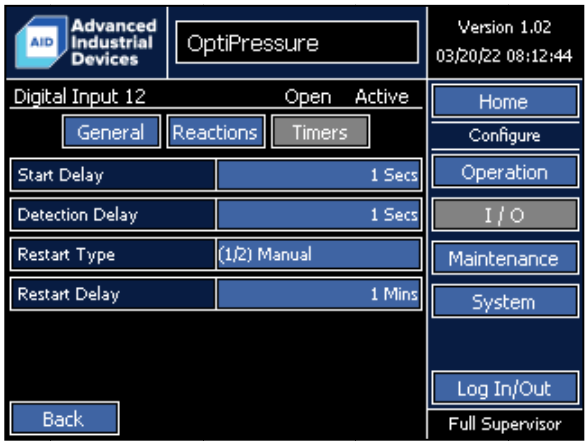
Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 12 – General



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 12 – Reactions



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 12 – Timers



Digital Input 12 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 12 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 12 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 12 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 12 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 12 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 12 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 12 – Timers > Restart Delay

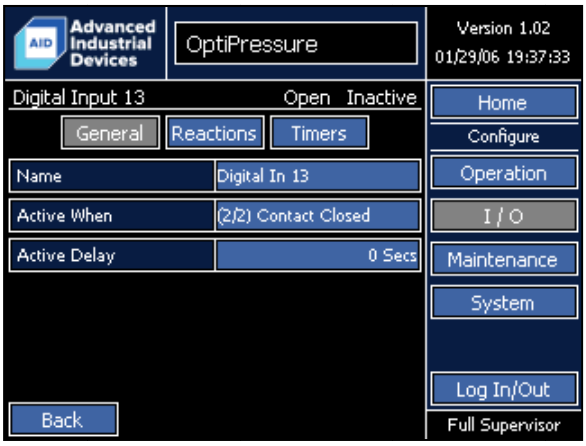
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 13

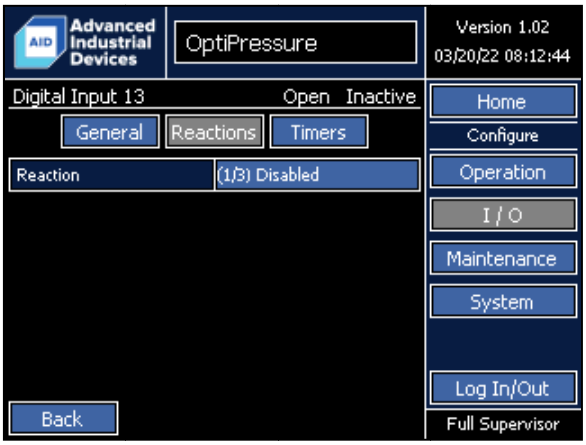
Configuration parameters related to Digital Input 13 are available in:

Configure > I/O > Digital Inputs DI8 – DI14 > Digital Input 13

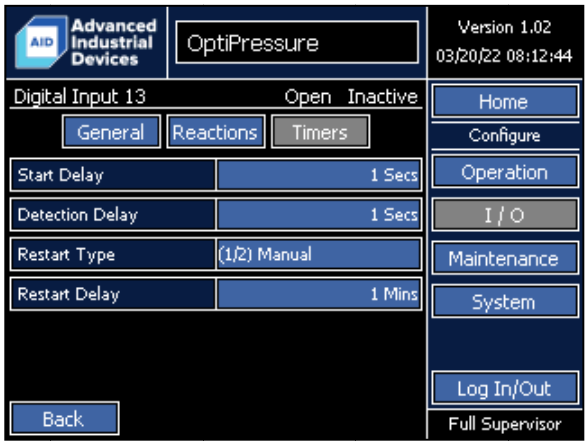
Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 13 – General



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 13 – Reactions



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 13 – Timers



Digital Input 13 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 13 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 13 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 13 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 13 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 13 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 13 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 13 – Timers > Restart Delay

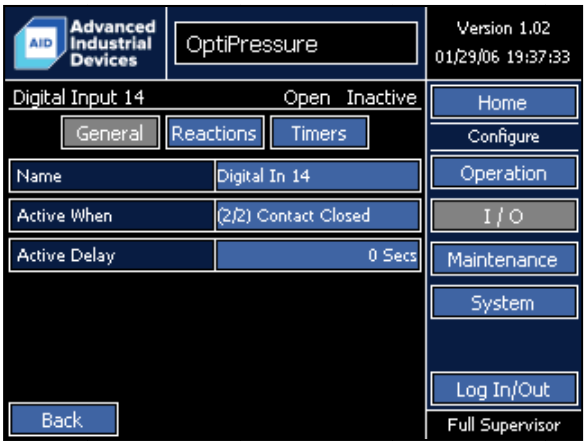
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 14

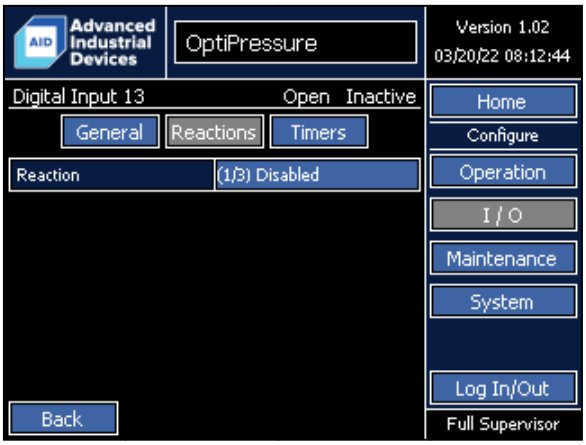
Configuration parameters related to Digital Input 14 are available in:

Configure > I/O > Digital Inputs DI8 – DI14 > Digital Input 14

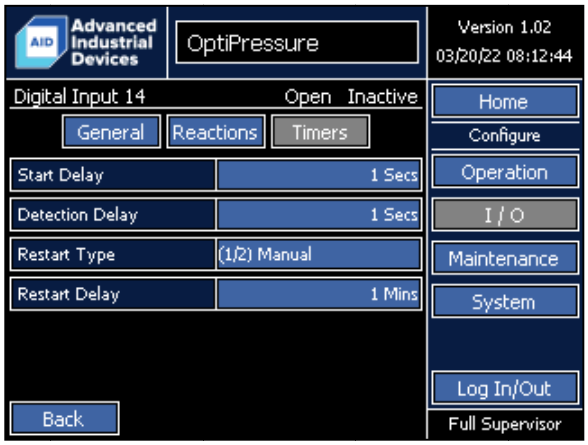
Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 14 – General



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 14 – Reactions



Configure > I/O > Digital Inputs DI1 – DI8 > Digital Input 14 – Timers



Digital Input 14 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 14 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 14 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 14 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 14 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 14 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 14 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 14 – Timers > Restart Delay

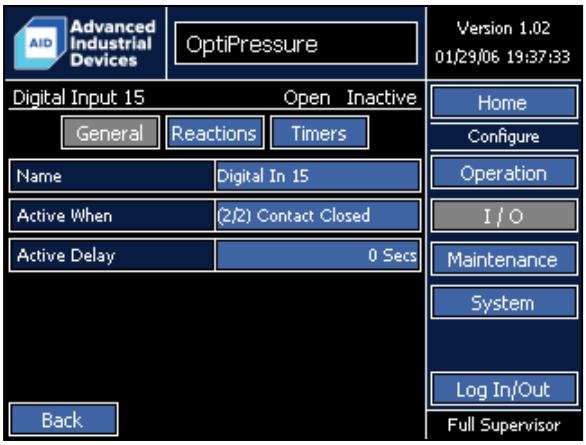
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 15

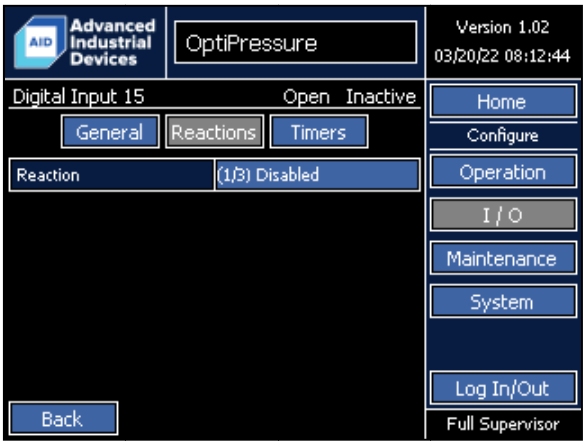
Configuration parameters related to Digital Input 15 are available in:

Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 15

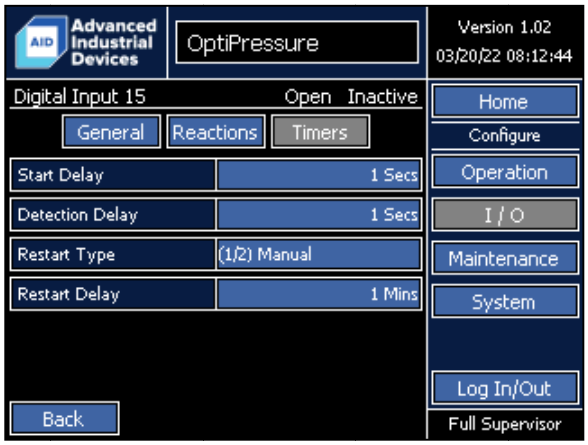
Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 15 – General



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 15 – Reactions



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 15 – Timers



Digital Input 15 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 15 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 15 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 15 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 15 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 15 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 15 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 15 – Timers > Restart Delay

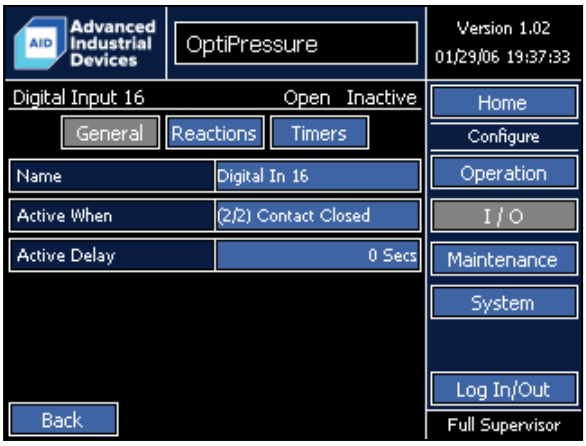
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 16

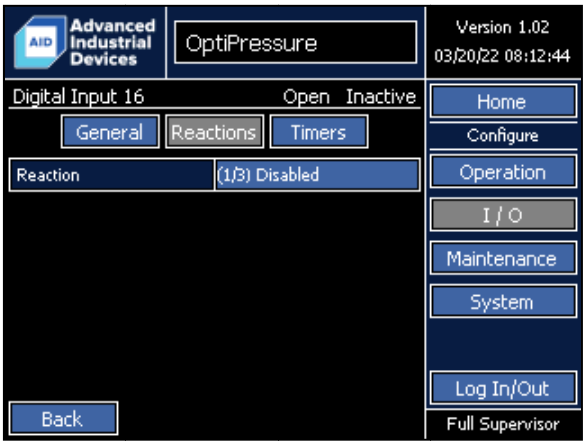
Configuration parameters related to Digital Input 16 are available in:

Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 16

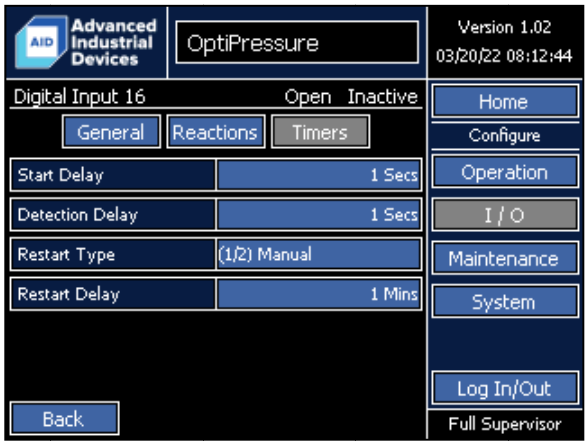
Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 16 – General



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 16 – Reactions



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 16 – Timers



Digital Input 16 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 16 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 16 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 16 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 16 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 16 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 16 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 16 – Timers > Restart Delay

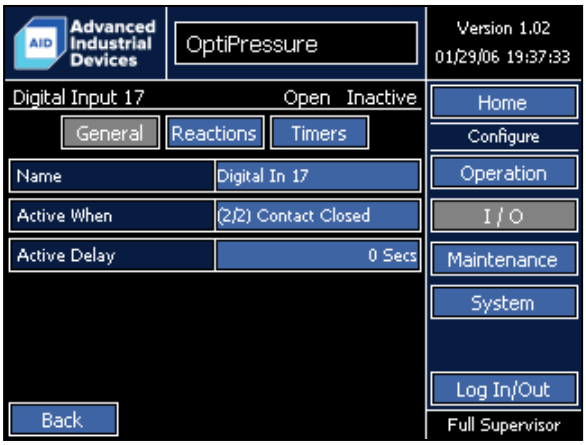
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 17

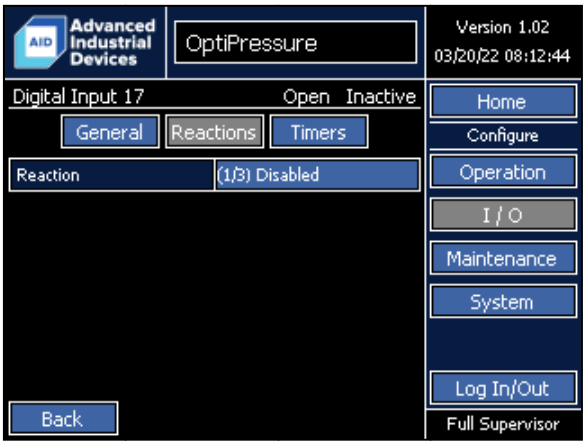
Configuration parameters related to Digital Input 17 are available in:

Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 17

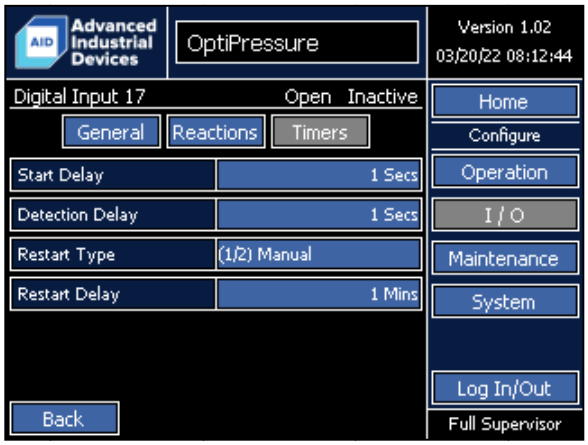
Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 17 – General



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 17 – Reactions



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 17 – Timers



Digital Input 17 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 17 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 17 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 17 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 17 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 17 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 17 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 17 – Timers > Restart Delay

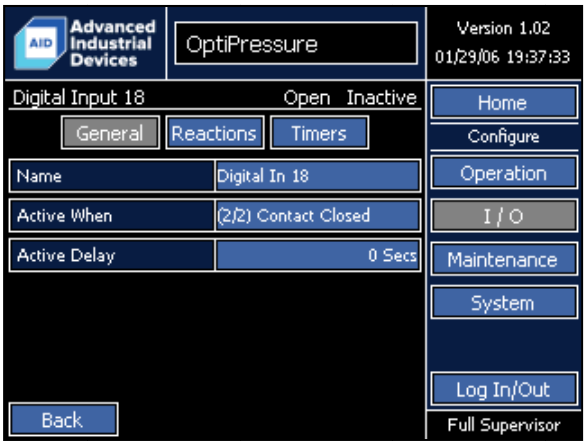
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Digital Input 18

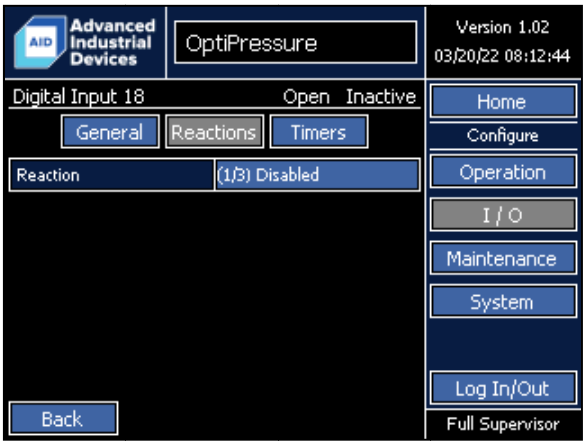
Configuration parameters related to Digital Input 18 are available in:

Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 18

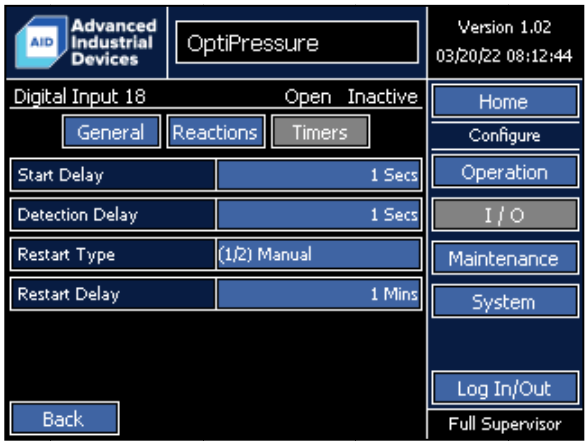
Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 18 – General



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 18 – Reactions



Configure > I/O > Digital Inputs DI15 – DI18 > Digital Input 18 – Timers



Digital Input 18 does not have a dedicated function and can be used for as a general purpose indicator, an alarm, a shutdown, or any of the functions that allow selection of a digital input for operation – such as the dump valve. The name can be modified by the operator.

Digital Input 18 – General > Active When

Determines when the digital input is considered to be active.

- (1/2) Contact Open
  The digital input indication will be active when the contact to the input is open.

- (2/2) Contact Closed
  The digital input indication will be active when the contact to the input is closed.

Digital Input 18 – General > Active Delay

The amount of time required for the input to be open or closed before indicating that the digital input is active. This feature can be used to debounce the input.

Digital Input 18 – Reactions > Reaction

- (1/3) Disabled
  The input will be ignored. Use this option if the input will not be used.

- (2/3) Alarm
  An alarm event will be indicated, but the system will continue to run.

- (3/3) Shutdown
  A shutdown event will be triggered, and the system will stop after following the Post-Run sequence.

Digital Input 18 – Timers > Start Delay

The amount of time the controller will wait for the main pump to be running before ever looking for an alarm/shutdown condition on the digital input. Once the start delay time is complete it will not be used again until the next system start.

Digital Input 18 – Timers > Detection Delay

After the start delay is complete, the controller will then use the detection delay. If an alarm/shutdown condition is present for the amount of time in this setting, the controller will set an alarm or shutdown event depending on the setting of Reaction.

Digital Input 18 – Timers > Restart Type

- (1/2) Manual
  If a shutdown event occurs, a manual restart will require an operator to either locally or remotely, via SCADA, reset the shutdown event before the system will restart.

- (2/2) Timed
  If a shutdown event occurs, a timed restart will automatically reset the shutdown event after the time set in Restart Delay.

Digital Input 18 – Timers > Restart Delay

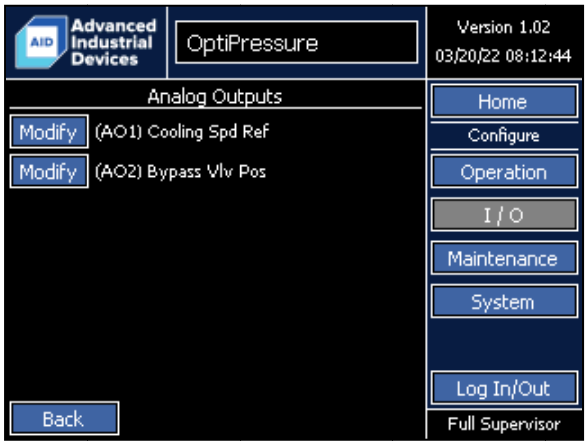
When a shutdown event occurs, and is configured for a timed restart, the shutdown event will automatically reset after this delay has expired.

Analog Outputs

Configuration parameters related to the analog outputs are available in:

Configure > I/O > Analog Outputs

Configure > I/O > Analog Outputs Selection

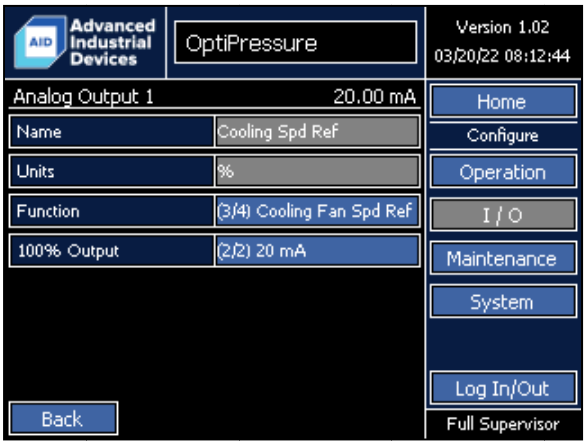


Note:
When installed in a panel provided by Advanced Industrial Devices, the analog and digital inputs and outputs may be prewired to terminals mounted inside the panel or in a field device wiring hip-box. In this case, please refer to the wiring diagram included with the panel for field device connection locations.

Analog Output 1

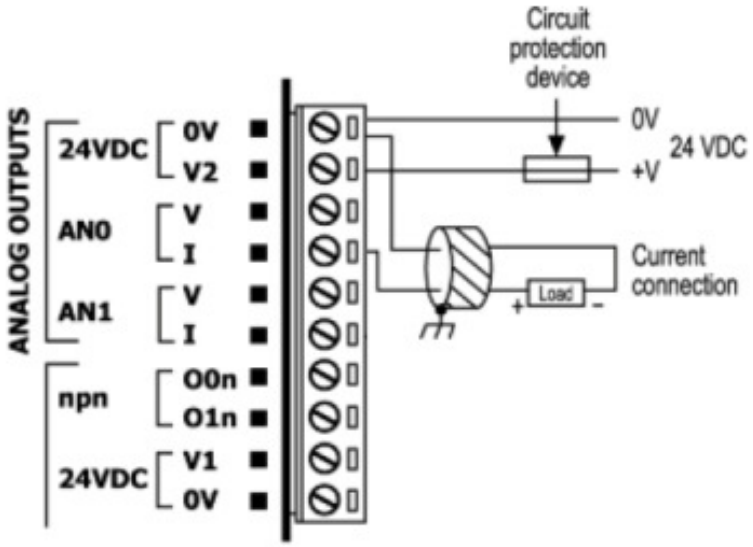
Configuration parameters related to Analog Output 1 are available in:

Configure > I/O > Analog Outputs > Analog Output 1



Analog Output 1 is a multipurpose analog output with a function selectable by the operator. The Name and Units automatically change based on the function selected and cannot be modified by the operator.

The 4-20ma signal is connected to terminals AN0-I and 0V on the V200-18-E6B I/O module located on the back of the controller.



Analog Output 1 > Function

The function for the analog output.

- (1/4) Disabled
  The analog output is not used and will always output the 0% level.

- (2/4) Compressor Speed Reference
  The analog output will be used to command the speed of the compressor variable frequency drive. When used with a Fuji MEGA drive, the compressor speed reference is sent over the Ethernet communication link.

- (3/4) Cooling Fan Speed Reference
  The analog output will be used to command the speed of the cooling fan variable frequency drive.

- (4/4) Bypass Valve Position
  The analog output will be used to command the bypass valve position when used with a modulating bypass valve.

Analog Output 1 > 100% Output

Depending on the brand and model of field device connected to the analog output, the signal value used to 100% may vary from installation to installation. Select the value that matches the signal value required by the field device to reach 100%.

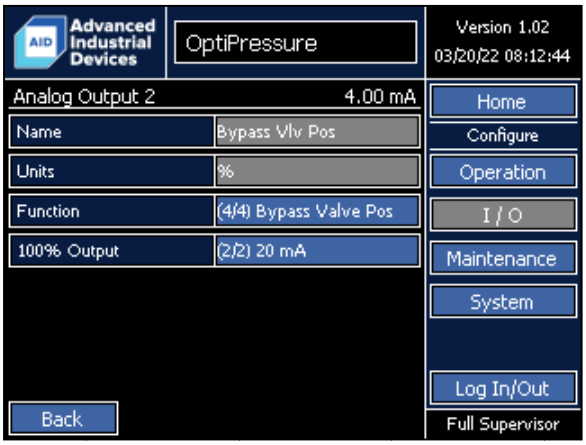
- (1/2) 4 mA
  The field device is at the 100% level when sending a 4 mA command signal.

- (2/2) 20 mA
  The field device is at the 100% level when sending a 20 mA command signal.

Analog Output 2

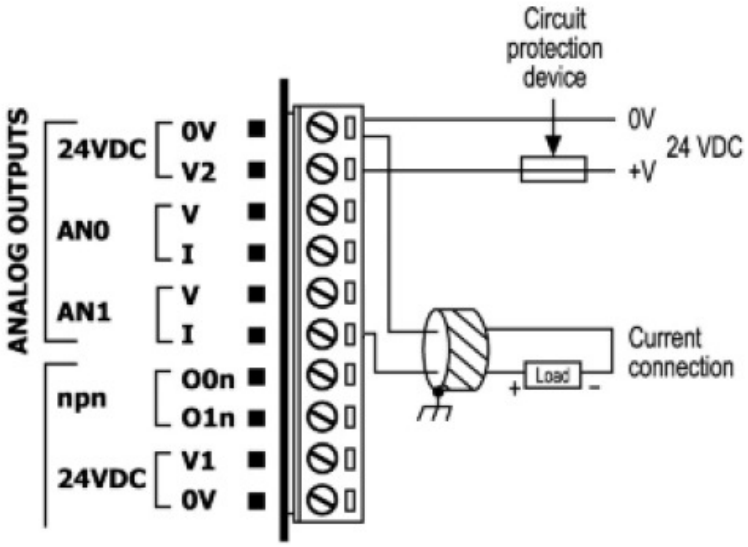
Configuration parameters related to Analog Output 2 are available in:

Configure > I/O > Analog Outputs > Analog Output 2



Analog Output 2 is a multipurpose analog output with a function selectable by the operator. The Name and Units automatically change based on the function selected and cannot be modified by the operator.

The 4-20ma signal is connected to terminals AN1-I and 0V on the V200-18-E6B I/O module located on the back of the controller.



Analog Output 2 > Function

The function for the analog output.

- (1/4) Disabled
  The analog output is not used and will always output the 0% level.

- (2/4) Compressor Speed Reference
  The analog output will be used to command the speed of the compressor variable frequency drive. When used with a Fuji MEGA drive, the compressor speed reference is sent over the Ethernet communication link.

- (3/4) Cooling Fan Speed Reference
  The analog output will be used to command the speed of the cooling fan variable frequency drive.

- (4/4) Bypass Valve Position
  The analog output will be used to command the bypass valve position when used with a modulating bypass valve.

Analog Output 2 > 100% Output

Depending on the brand and model of field device connected to the analog output, the signal value used to 100% may vary from installation to installation. Select the value that matches the signal value required by the field device to reach 100%.

- (1/2) 4 mA
  The field device is at the 100% level when sending a 4 mA command signal.

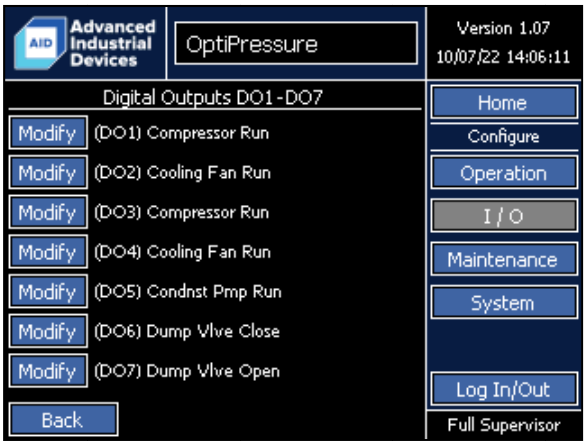
- (2/2) 20 mA
  The field device is at the 100% level when sending a 20 mA command signal.

Digital Outputs

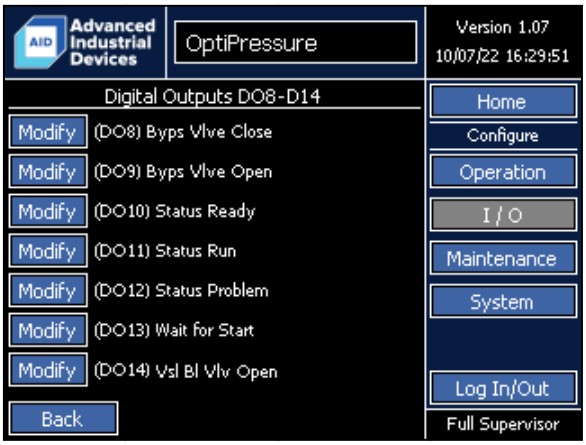
Configuration parameters related to the digital outputs are available in:

Configure > I/O > Digital Outputs

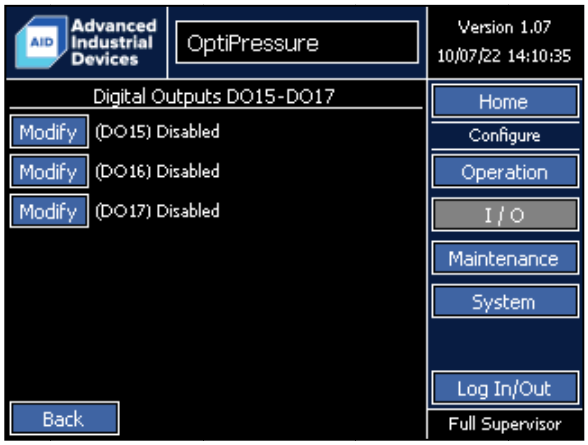
Configure > I/O > Digital Outputs DO1 – DO7 Selection



Configure > I/O > Digital Outputs DO8 – DO14 Selection



Configure > I/O > Digital Outputs DO15 – DO17 Selection

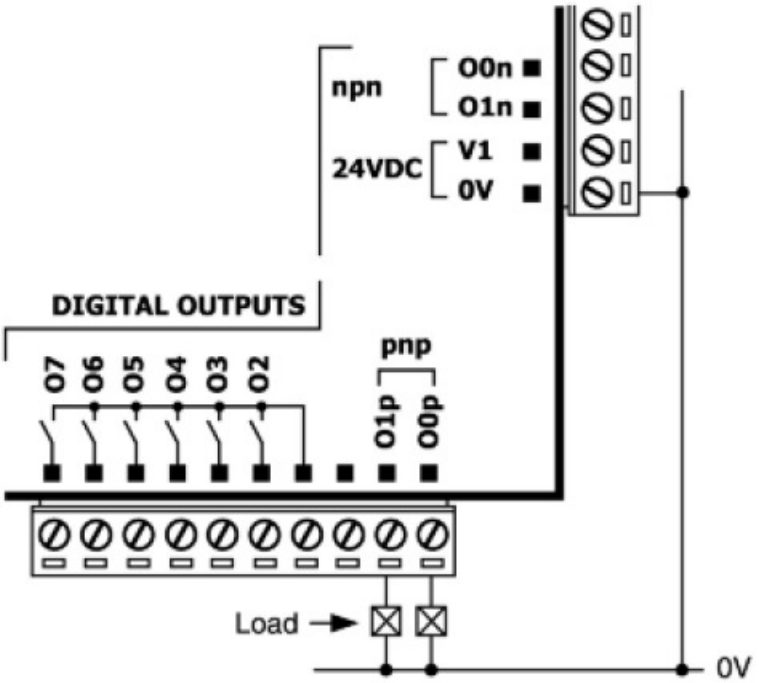


Note:

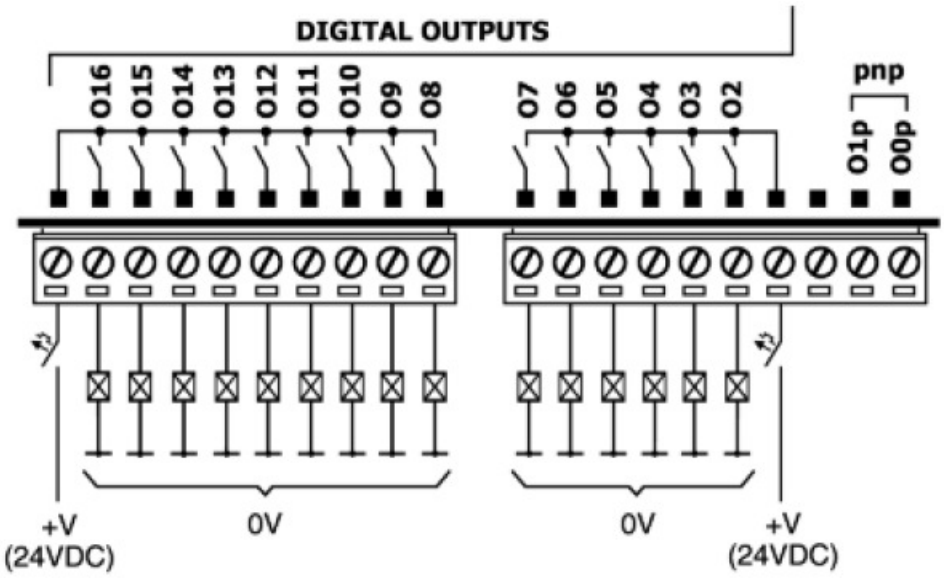
When installed in a panel provided by Advanced Industrial Devices, the analog and digital inputs and outputs may be prewired to terminals mounted inside the panel or in a field device wiring hip-box. In this case, please refer to the wiring diagram included with the panel for field device connection locations.

Most digital outputs have a dedicated purpose. The Name of a dedicated digital output will automatically change based on the function selected and cannot be modified by the operator.

Digital outputs DO1 and DO2 (O0 and O1 in the pnp group on the diagram below) are TRANSISTOR outputs. These outputs are low current outputs and CANNOT be used with 120 VAC. Use one of the RELAY outputs when higher voltages or current are required.



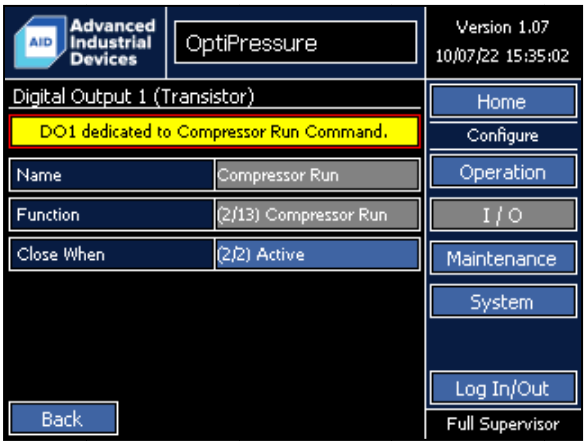
Each of the two groups of **RELAY** digital outputs (O2 through O16 on the diagram below) has a common connection to the relay bank.



Digital Output 1 (Transistor – Compressor Run Command)

Configuration parameters related to Digital Output 1 are available in:

Configure > I/O > Digital Outputs DO1 – DO7 > Digital Output 1



The function of Digital Output 1 is dedicated to the run command of the compressor variable frequency drive. When the OptiPressure controller is used with a Fuji MEGA variable frequency drive, the run command is sent over the Ethernet communication link and Digital Output 1 is not required.

The digital output is connected to terminals 00p and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 1 > Close When

Determines when the digital output is closed and to perform the assigned function.

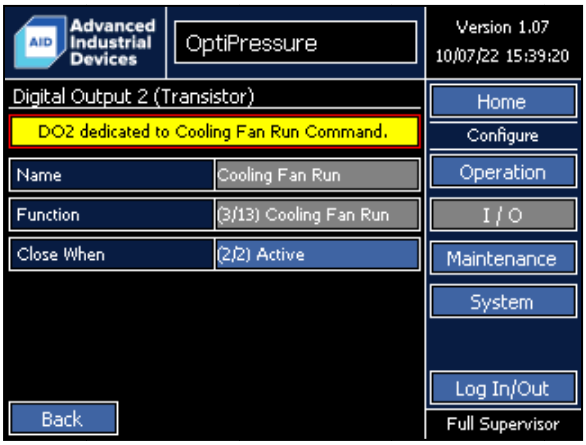
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 2 (Transistor – Cooling Fan Run Command)

Configuration parameters related to Digital Output 2 are available in:

Configure > I/O > Digital Outputs DO1 – DO7 > Digital Output 2



The function of Digital Output 2 is dedicated to the run command of the cooling fan motor starter or variable frequency drive.

The digital output is connected to terminals 01p and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 2 > Close When

Determines when the digital output is closed and to perform the assigned function.

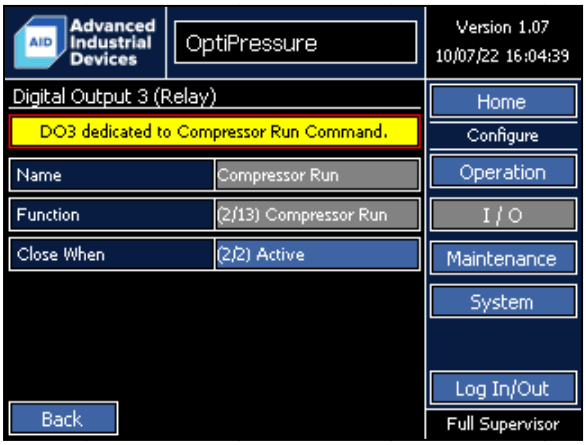
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 3 (Relay – Compressor Run Command)

Configuration parameters related to Digital Output 3 are available in:

Configure > I/O > Digital Outputs DO1 – DO7 > Digital Output 3



The function of Digital Output 3 is dedicated to the run command of the compressor variable frequency drive. When the OptiPressure controller is used with a Fuji MEGA variable frequency drive, the run command is sent over the Ethernet communication link and Digital Output 1 is not required.

The digital output is connected to terminals 02 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 3 > Close When

Determines when the digital output is closed and to perform the assigned function.

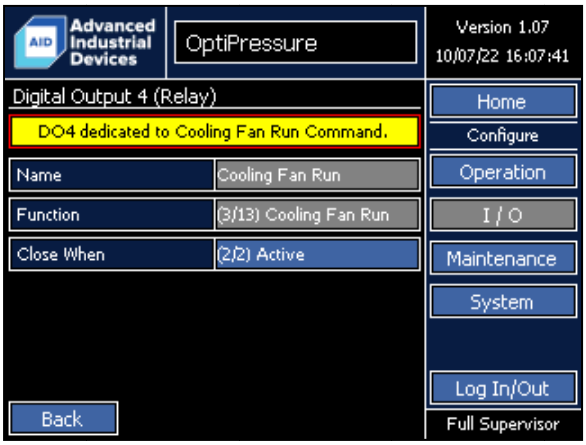
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 4 (Relay – Cooling Fan Run Command)

Configuration parameters related to Digital Output 4 are available in:

Configure > I/O > Digital Outputs DO1 – DO7 > Digital Output 4



The function of Digital Output 4 is dedicated to the run command of the cooling fan motor starter or variable frequency drive.

The digital output is connected to terminals O3 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 4 > Close When

Determines when the digital output is closed and to perform the assigned function.

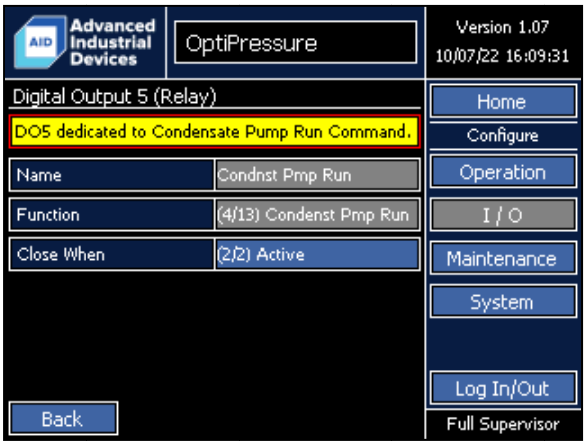
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 5 (Relay – Condensate Pump Run Command)

Configuration parameters related to Digital Output 5 are available in:

Configure > I/O > Digital Outputs DO1 – DO7 > Digital Output 5



The function of Digital Output 5 is dedicated to the run command of the condensate pump.

The digital output is connected to terminals 04 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 5 > Close When

Determines when the digital output is closed and to perform the assigned function.

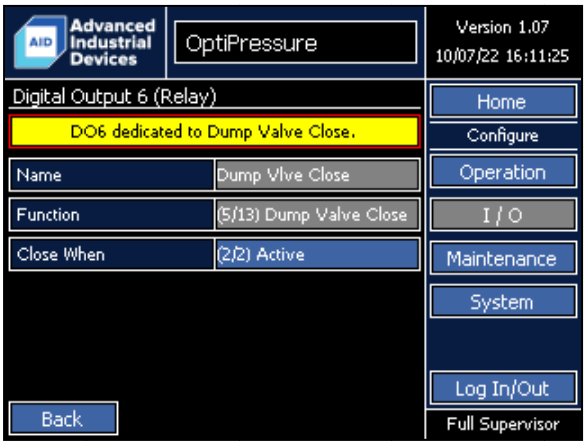
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 6 (Relay – Dump Valve Close Command)

Configuration parameters related to Digital Output 6 are available in:

Configure > I/O > Digital Outputs DO1 – DO7 > Digital Output 6



The function of Digital Output 6 is dedicated to the close command of the dump valve.

The digital output is connected to terminals O5 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 6 > Close When

Determines when the digital output is closed and to perform the assigned function.

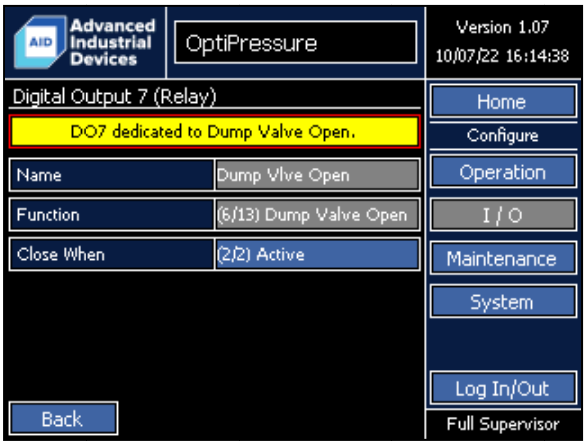
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 7 (Relay – Dump Valve Open Command)

Configuration parameters related to Digital Output 7 are available in:

Configure > I/O > Digital Outputs DO1 – DO7 > Digital Output 7



The function of Digital Output 7 is dedicated to the open command of the dump valve.

The digital output is connected to terminals O6 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 7 > Close When

Determines when the digital output is closed and to perform the assigned function.

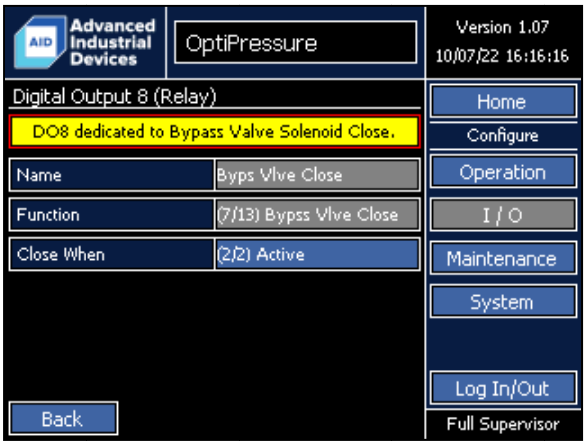
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 8 (Relay – Bypass Valve Close Command)

Configuration parameters related to Digital Output 8 are available in:

Configure > I/O > Digital Outputs DO8 – DO14 > Digital Output 8



The function of Digital Output 8 is dedicated to the close command of the bypass valve.

The digital output is connected to terminals 07 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 8 > Close When

Determines when the digital output is closed and to perform the assigned function.

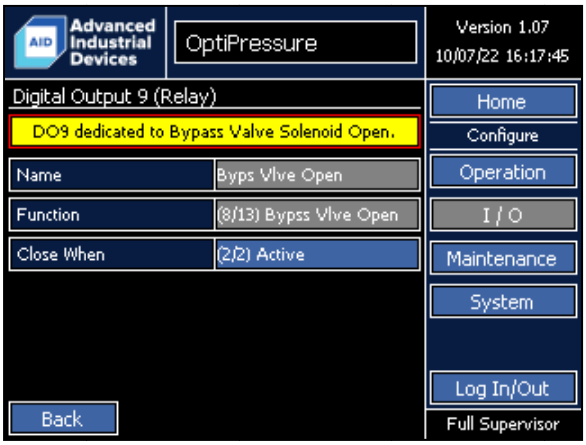
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 9 (Relay – Bypass Valve Open Command)

Configuration parameters related to Digital Output 9 are available in:

Configure > I/O > Digital Outputs DO8 – DO14 > Digital Output 9



The function of Digital Output 9 is dedicated to the open command of the bypass valve.

The digital output is connected to terminals 08 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 9 > Close When

Determines when the digital output is closed and to perform the assigned function.

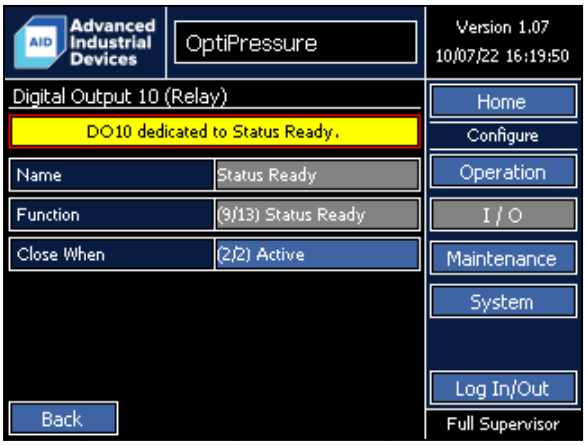
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 10 (Relay – Status Ready)

Configuration parameters related to Digital Output 10 are available in:

Configure > I/O > Digital Outputs DO8 – DO14 > Digital Output 10



The function of Digital Output 10 is dedicated to the ready status indication of the system. Ready status indication is active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event.

The digital output is connected to terminals 09 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 10 > Close When

Determines when the digital output is closed and to perform the assigned function.

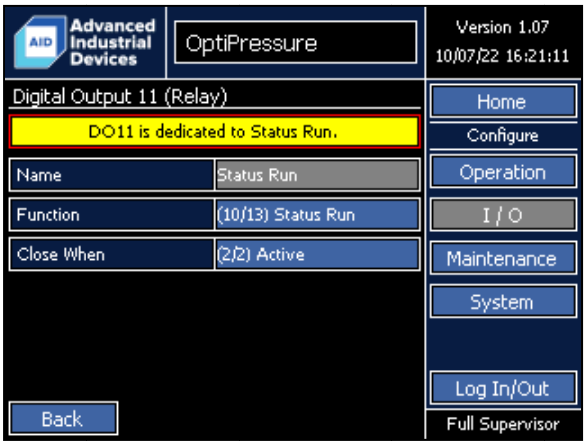
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 11 (Relay – Status Run)

Configuration parameters related to Digital Output 11 are available in:

Configure > I/O > Digital Outputs DO8 – DO14 > Digital Output 11



The function of Digital Output 11 is dedicated to the run status indication of the system. Run status indication is active when the system is in the Pre-Run, Run, or Post-Run sequence. The output toggles (blinks) when in the Pre-Run and Post-Run sequences. The output is solid (steady) when in the Run sequence.

The digital output is connected to terminals O10 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 11 > Close When

Determines when the digital output is closed and to perform the assigned function.

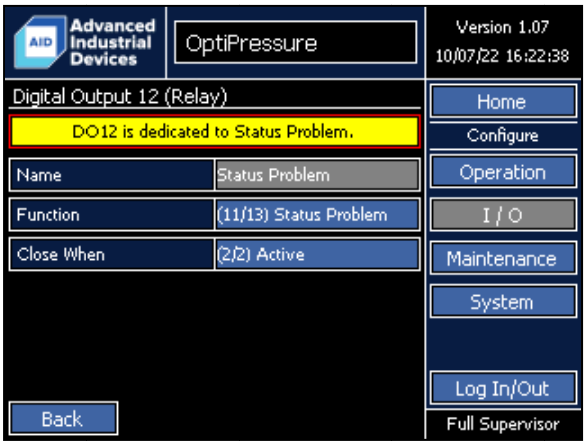
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 12 (Relay – Status Problem)

Configuration parameters related to Digital Output 12 are available in:

Configure > I/O > Digital Outputs DO8 – DO14 > Digital Output 12



The function of Digital Output 12 is dedicated to the problem status indication of the system. Problem status indication is active when a shutdown or fault event is currently active.

The digital output is connected to terminals O11 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 12 > Close When

Determines when the digital output is closed and to perform the assigned function.

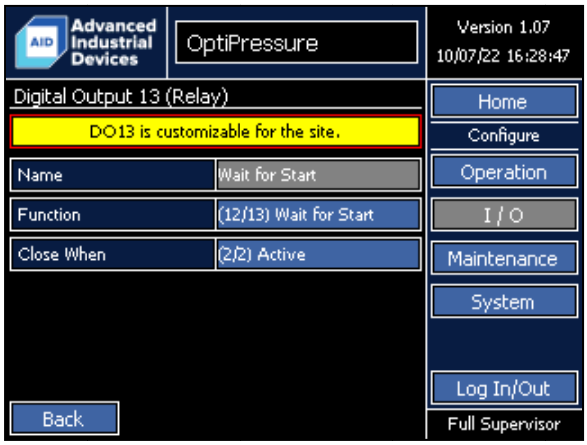
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 13 (Relay – Multipurpose)

Configuration parameters related to Digital Output 13 are available in:

Configure > I/O > Digital Outputs DO8 – DO14 > Digital Output 13



Digital Output 13 is a multipurpose digital output with a function selectable by the operator. The Name automatically changes based on the function selected and cannot be modified by the operator.

The digital output is connected to terminals O12 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 13 > Function

The function for the digital output.

- (1/13) Disabled
  The digital output will always be inactive.

- (2/13) Compressor Run
  Active when the compressor variable frequency drive is commanded to run.

- (3/13) Cooling Fan Run
  Active when the cooling fan motor starter or variable frequency drive is commanded to run.

- (4/13) Condensate Pump Run
  Active when the condensate pump is commanded to run.

- (5/13) Dump Valve Close
  Active when the dump valve is commanded to close.

- (6/13) Dump Valve Open
  Active when the dump valve is commanded to open.

- (7/13) Bypass Valve Close
  Active when the bypass valve is commanded to close.

- (8/13) Bypass Valve Open
  Active when the bypass valve is commanded to open.

- (9/13) Status Ready
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event.

- (10/13) Status Run
  Active when the system is in the Pre-Run, Run, or Post-Run sequence. The output toggles (blinks) when in the Pre-Run and Post-Run sequences. The output is solid (steady) when in the Run sequence.

- (11/13) Status Problem
  Active when a shutdown or fault event is currently active.

- (12/13) Wait for Start
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event. The controller is waiting for start conditions, such as a pressure setpoint, to be met.

- (13/13) Vsl Bl Vlv Open
  Active when the vessel bleed valve is commanded to open.

Digital Output 13 > Close When

Determines when the digital output is closed and to perform the assigned function.

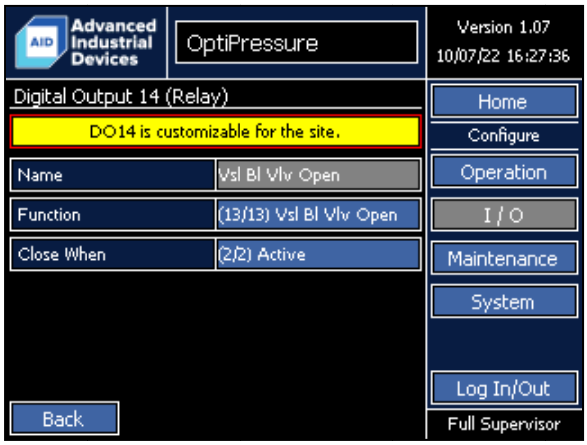
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 14 (Relay – Multipurpose)

Configuration parameters related to Digital Output 14 are available in:

Configure > I/O > Digital Outputs DO8 – DO14 > Digital Output 14



Digital Output 14 is a multipurpose digital output with a function selectable by the operator. The Name automatically changes based on the function selected and cannot be modified by the operator.

The digital output is connected to terminals O13 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 14 > Function

The function for the digital output.

- (1/13) Disabled
  The digital output will always be inactive.

- (2/13) Compressor Run
  Active when the compressor variable frequency drive is commanded to run.

- (3/13) Cooling Fan Run
  Active when the cooling fan motor starter or variable frequency drive is commanded to run.

- (4/13) Condensate Pump Run
  Active when the condensate pump is commanded to run.

- (5/13) Dump Valve Close
  Active when the dump valve is commanded to close.

- (6/13) Dump Valve Open
  Active when the dump valve is commanded to open.

- (7/13) Bypass Valve Close
  Active when the bypass valve is commanded to close.

- (8/13) Bypass Valve Open
  Active when the bypass valve is commanded to open.

- (9/13) Status Ready
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event.

- (10/13) Status Run
  Active when the system is in the Pre-Run, Run, or Post-Run sequence. The output toggles (blinks) when in the Pre-Run and Post-Run sequences. The output is solid (steady) when in the Run sequence.

- (11/13) Status Problem
  Active when a shutdown or fault event is currently active.

- (12/13) Wait for Start
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event. The controller is waiting for start conditions, such as a pressure setpoint, to be met.

- (13/13) Vsl Bl Vlv Open
  Active when the vessel bleed valve is commanded to open.

Digital Output 14 > Close When

Determines when the digital output is closed and to perform the assigned function.

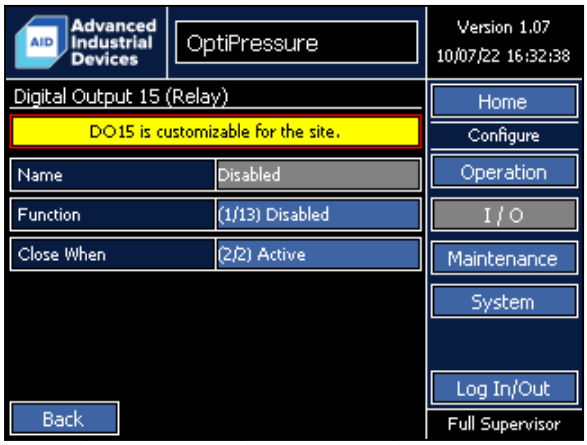
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 15 (Relay – Multipurpose)

Configuration parameters related to Digital Output 15 are available in:

Configure > I/O > Digital Outputs DO15 – DO17 > Digital Output 15



Digital Output 15 is a multipurpose digital output with a function selectable by the operator. The Name automatically changes based on the function selected and cannot be modified by the operator.

The digital output is connected to terminals O14 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 15 > Function

The function for the digital output.

- (1/13) Disabled
  The digital output will always be inactive.

- (2/13) Compressor Run
  Active when the compressor variable frequency drive is commanded to run.

- (3/13) Cooling Fan Run
  Active when the cooling fan motor starter or variable frequency drive is commanded to run.

- (4/13) Condensate Pump Run
  Active when the condensate pump is commanded to run.

- (5/13) Dump Valve Close
  Active when the dump valve is commanded to close.

- (6/13) Dump Valve Open
  Active when the dump valve is commanded to open.

- (7/13) Bypass Valve Close
  Active when the bypass valve is commanded to close.

- (8/13) Bypass Valve Open
  Active when the bypass valve is commanded to open.

- (9/13) Status Ready
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event.

- (10/13) Status Run
  Active when the system is in the Pre-Run, Run, or Post-Run sequence. The output toggles (blinks) when in the Pre-Run and Post-Run sequences. The output is solid (steady) when in the Run sequence.

- (11/13) Status Problem
  Active when a shutdown or fault event is currently active.

- (12/13) Wait for Start
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event. The controller is waiting for start conditions, such as a pressure setpoint, to be met.

- (13/13) Vsl Bl Vlv Open
  Active when the vessel bleed valve is commanded to open.

Digital Output 15 > Close When

Determines when the digital output is closed and to perform the assigned function.

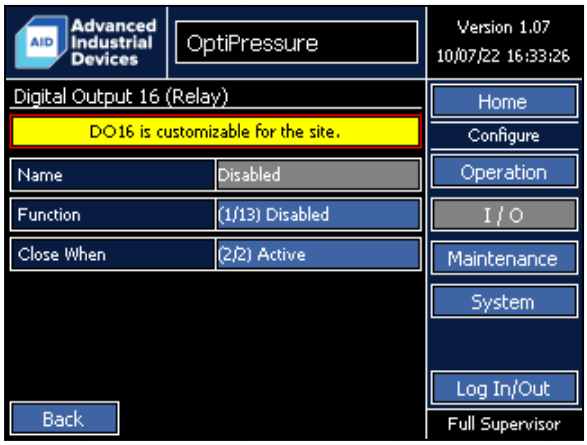
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 16 (Relay – Multipurpose)

Configuration parameters related to Digital Output 16 are available in:

Configure > I/O > Digital Outputs DO15 – DO17 > Digital Output 16



Digital Output 16 is a multipurpose digital output with a function selectable by the operator. The Name automatically changes based on the function selected and cannot be modified by the operator.

The digital output is connected to terminals O15 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 16 > Function

The function for the digital output.

- (1/13) Disabled
  The digital output will always be inactive.

- (2/13) Compressor Run
  Active when the compressor variable frequency drive is commanded to run.

- (3/13) Cooling Fan Run
  Active when the cooling fan motor starter or variable frequency drive is commanded to run.

- (4/13) Condensate Pump Run
  Active when the condensate pump is commanded to run.

- (5/13) Dump Valve Close
  Active when the dump valve is commanded to close.

- (6/13) Dump Valve Open
  Active when the dump valve is commanded to open.

- (7/13) Bypass Valve Close
  Active when the bypass valve is commanded to close.

- (8/13) Bypass Valve Open
  Active when the bypass valve is commanded to open.

- (9/13) Status Ready
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event.

- (10/13) Status Run
  Active when the system is in the Pre-Run, Run, or Post-Run sequence. The output toggles (blinks) when in the Pre-Run and Post-Run sequences. The output is solid (steady) when in the Run sequence.

- (11/13) Status Problem
  Active when a shutdown or fault event is currently active.

- (12/13) Wait for Start
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event. The controller is waiting for start conditions, such as a pressure setpoint, to be met.

- (13/13) Vsl Bl Vlv Open
  Active when the vessel bleed valve is commanded to open.

Digital Output 16 > Close When

Determines when the digital output is closed and to perform the assigned function.

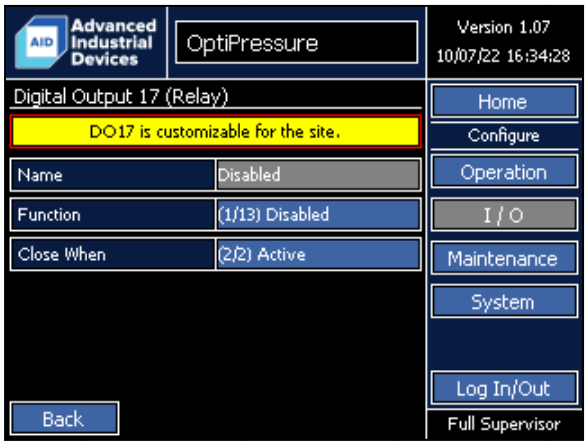
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

Digital Output 17 (Relay – Multipurpose)

Configuration parameters related to Digital Output 17 are available in:

Configure > I/O > Digital Outputs DO15 – DO17 > Digital Output 17



Digital Output 17 is a multipurpose digital output with a function selectable by the operator. The Name automatically changes based on the function selected and cannot be modified by the operator.

The digital output is connected to terminals O16 and 0V on the V200-18-E6B I/O module located on the back of the controller.

Digital Output 17 > Function

The function for the digital output.

- (1/13) Disabled
  The digital output will always be inactive.

- (2/13) Compressor Run
  Active when the compressor variable frequency drive is commanded to run.

- (3/13) Cooling Fan Run
  Active when the cooling fan motor starter or variable frequency drive is commanded to run.

- (4/13) Condensate Pump Run
  Active when the condensate pump is commanded to run.

- (5/13) Dump Valve Close
  Active when the dump valve is commanded to close.

- (6/13) Dump Valve Open
  Active when the dump valve is commanded to open.

- (7/13) Bypass Valve Close
  Active when the bypass valve is commanded to close.

- (8/13) Bypass Valve Open
  Active when the bypass valve is commanded to open.

- (9/13) Status Ready
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event.

- (10/13) Status Run
  Active when the system is in the Pre-Run, Run, or Post-Run sequence. The output toggles (blinks) when in the Pre-Run and Post-Run sequences. The output is solid (steady) when in the Run sequence.

- (11/13) Status Problem
  Active when a shutdown or fault event is currently active.

- (12/13) Wait for Start
  Active when the HOA is in the Hand or Auto position, the system is stopped, and does not have an active shutdown or fault event. The controller is waiting for start conditions, such as a pressure setpoint, to be met.

- (13/13) Vsl Bl Vlv Open
  Active when the vessel bleed valve is commanded to open.

Digital Output 17 > Close When

Determines when the digital output is closed and to perform the assigned function.

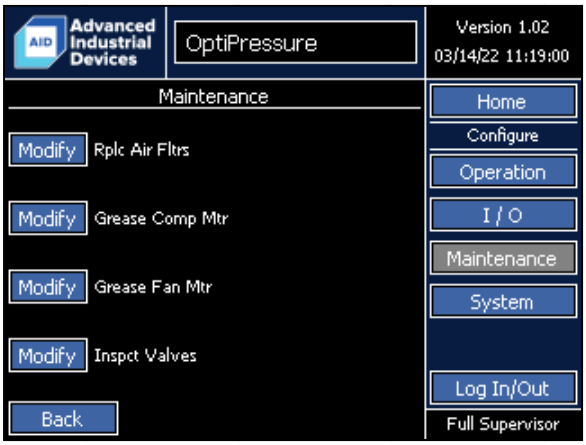
- (1/2) Inactive
  The digital output will be closed when the output is inactive.

- (2/2) Active
  The digital output will be closed when the output is active.

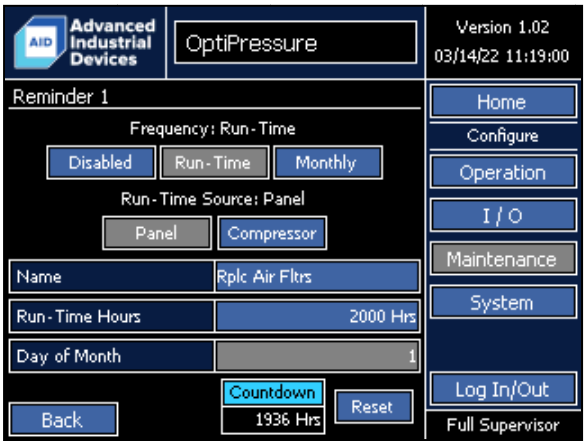
Maintenance Reminders

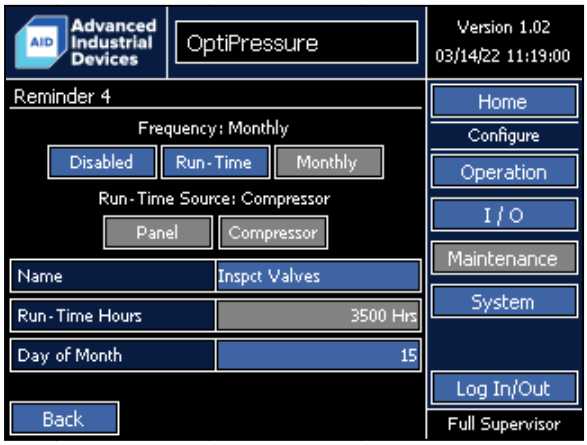
Configuration parameters related to the Maintenance Reminder system are available in:

Configure > Maintenance



The OptiPressure controller includes a built-in Maintenance Reminder system that can automatically remind operators of the need to perform maintenance and other tasks at set intervals. Four customizable Maintenance Reminders are available, each with independent reminder conditions.





Maintenance > Reminder X > Monitors

Countdown 1936 Hrs	The Reminder Countdown monitor is shown as a reference to the amount of run-time remaining until the reminder activates. Reminder Countdown is visible only when Frequency is set to Run-Time.

Maintenance > Reminder X > Frequency

Frequency defines how often the reminder to should be activated.

- Disabled
  The reminder will not be used.

- Run-Time
  The reminder will activate based on the run-time hours of the device selected by Run-Time Source.

- Monthly
  The reminder will activate monthly, based on the day of the month entered in the Day of Month parameter.

Maintenance > Reminder X > Run-Time Source

When Frequency is configured for Run-Time, the reminder will be activated based on the run-time hours of one of the following devices:

- Panel
  The panel run-time hours track any time the panel is powered on, regardless of whether or not the compressor is running.

- Compressor
  The compressor run-time hours track the time the compressor is running.

Maintenance > Reminder X > Name

A 20 character alphanumeric reminder name can be set by the operator for each of the four Maintenance Reminders. Since proper equipment maintenance is critical to the warranty and longevity of the equipment, the name should be chosen to provide facility personnel with a clear understanding of the maintenance task that needs to be performed.

Maintenance > Reminder X > Run-Time Hours

The Run-Time Hours are the number of hours of the selected Run-Time Source device at which the reminder should activate.

Run-Time Hours is disabled when Frequency is set to Disabled or Monthly.

Note:
If the maintenance task has been performed prior to the reminder activating, the Reminder Countdown hours can be reset immediately by holding down the Reset Countdown button for 5 seconds.

Maintenance > Reminder X > Day of Month

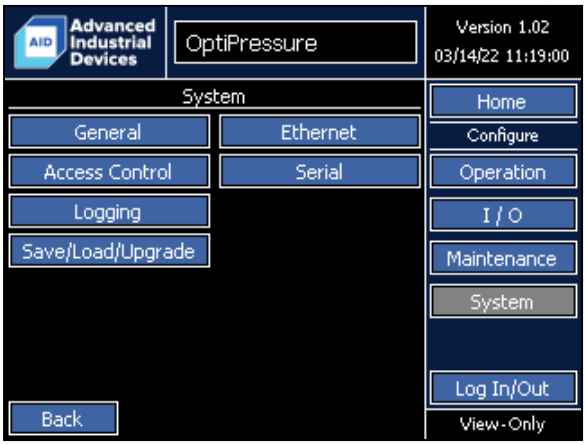
When Frequency is configured for Monthly reminders, the reminder will activate every month on the Day of Month entered by the operator.

Day of Month is disabled when Frequency is set to Disabled or Run-Time**.**

System

Configuration parameters related to the System are available in:

Configure > System

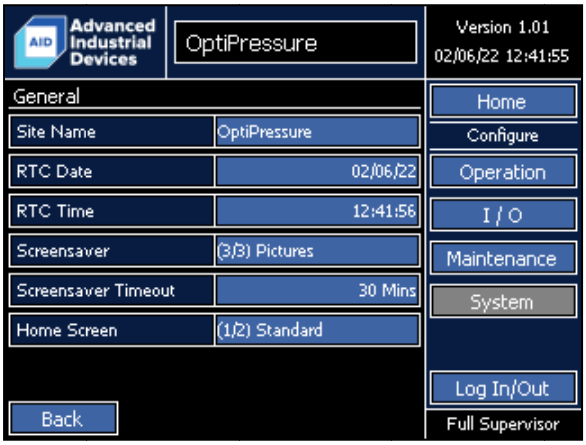


System configuration parameters contain settings related to the overall performance of the controller, which includes items such as the date and time, SD card data logging, and device communication.

General

General system configuration parameters are available in:

Configure > System > General



General > Site Name

A 20 character alphanumeric site name can be set by the operator to uniquely identify an installation. The site name will be displayed at the top of all screens, as well as in the SD card data log.

General > RTC Date

The real-time clock (RTC) date. The RTC date is used to timestamp events and data samples in the log.

General > RTC Time

The real-time clock (RTC) time in 24-hour format. The RTC time is used to timestamp events and data samples in the log.

General > Screensaver

- Disabled (1/3)
  The screen will always remain on. The display will return to the Home screen after 30 minutes of operator inactivity (touchscreen is not pressed).

- Blank (2/3)
  After the period of operator inactivity (touchscreen is not pressed) specified in Screensaver Timeout, the display will return to the Home screen and turn off the screen backlight. Pressing anywhere on the touchscreen will "wake" the display.

- Pictures (3/3)
  After the period of operator inactivity (touchscreen is not pressed) specified in Screensaver Timeout, the display will begin cycling through a series of product and application pictures. Pressing anywhere on the touchscreen will return the display to the Home screen.

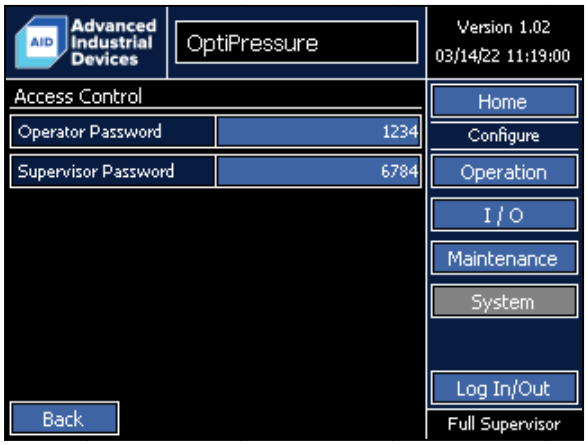
General > Screensaver Timeout

The period of operator inactivity (touchscreen is not pressed) required before the screensaver activates. This value only applies when Screensaver is enabled.

Access Control

Access Control system configuration parameters are available in:

Configure > System > Access Control



Access Control > Operator Password

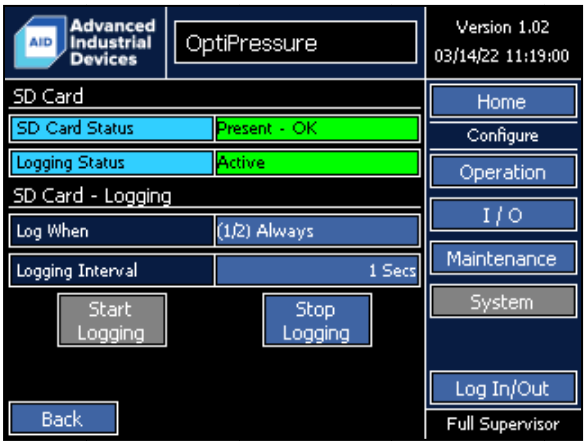
The 4-digit numeric password required to log-in as the Limited Operator access level. Refer to the **Operator Access Level – Log In/Out** section for more information.

Access Control > Supervisor Password

The 4-digit numeric password required to log-in as the Full Supervisor access level. Refer to the **Operator Access Level – Log In/Out** section for more information.

SD Card system configuration parameters are available in:

Configure > System > Logging



The OptiPressure controller supports a standard SD card, which can be used for periodic data logging, saving/loading configuration parameter values, and upgrading the controller firmware. The SD card MUST be specially formatted in order for the controller to properly recognize and use the SD card. Refer to the **SD Card Formatting** section for more detailed information on this process.

Note:
The HOA switch should be in the Off position before saving or loading configuration parameters to/from the SD card or upgrading the controller firmware.

The data logging system records numerous samples in multiple comma-separated value (CSV) files on the SD card. Each data sample within the log is a snapshot of the operational conditions present at that time. The CSV files are located on the SD card in the following folders:

- EXCEL\EXCEL1
- EXCEL\EXCEL2
- EXCEL\EXCEL3
- EXCEL\EXCEL4

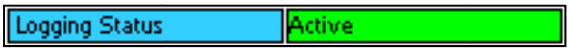
Each EXCEL folder can contain up to 64 CSV files, and each CSV file can contain up to 30,000 data samples. The CSV files are numerically named 1 through 64, in the order the files are created. When an EXCEL folder has reached the 64 file limit, the next EXCEL folder in the rotation is used, and the filename starts back at 1. This scheme allows for continuous data logging by overwriting the oldest log when no unused log files exist.

In order reduce the chances of data corruption, the data logging system should be stopped prior to removing the SD card from the controller. If the logging status is currently active, simply press the Stop Logging button to suspend data logging, or power down the controller, before removing the SD card.

Monitors – SD Card Status

	
No SD Card	The SD card is not installed in the controller.
Present – Read-Only	The SD card is correctly installed in the controller, but is marked as read-only. The controller will be unable to save parameter values or write logging data.
Present – OK	The SD card is installed correctly and writable. All features that depend on the SD card will be available.

Monitors – Logging Status

	
Stopped	Data logging to the SD card is currently stopped. Periodic operational conditions will NOT be saved.
Active	Data logging to the SD card is currently active and recording operational condition samples to the log.

SD Card – Logging > Log When

In order to provide flexibility for how data samples are recorded to the log, the data logging system can be configured to continuously record data samples, even when the system is not running, or only when the system is actively running.

- (1/2) Always
  The data logging system records data samples continuously, even when the pump system is stopped. This option can be helpful when sensor data needs to be recorded prior to the pump system entering the run state. Because data samples are logged even when stopped, this option can fill the log with long periods of little data if the pump system is off for long periods.

- (2/2) Running Only
  The data logging system records data samples ONLY when the system is actively running. This option can be helpful when the pump system is stopped or off for long periods of time, and can extend the total time recorded in the data log before overwrites occur.

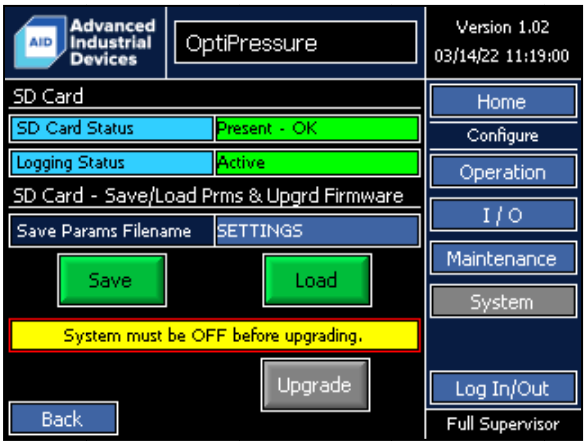
SD Card – Logging > Logging Interval

The logging interval specifies the time between data samples in the log. Data samples can be recorded as fast a once every 1 second, or as slowly as once every 1 hour. Because the size of the log is limited by the number of data samples, the overall length of time the log will record can be extended by increasing the logging interval time. Short logging intervals can be used when troubleshooting quickly changing operational conditions.

Save/Load/Upgrade

SD Card system configuration parameters are available in:

Configure > System > Save/Load/Upgrade



Monitors – SD Card Status

SD Card Status: Present - OK	
No SD Card	The SD card is not installed in the controller.
Present – Read-Only	The SD card is correctly installed in the controller, but is marked as read-only. The controller will be unable to save parameter values or write logging data.
Present – OK	The SD card is installed correctly and writable. All features that depend on the SD card will be available.

Monitors – Logging Status

Logging Status: Active	
Stopped	Data logging to the SD card is currently stopped. Periodic operational conditions will NOT be saved.
Active	Data logging to the SD card is currently active and recording operational condition samples to the log.

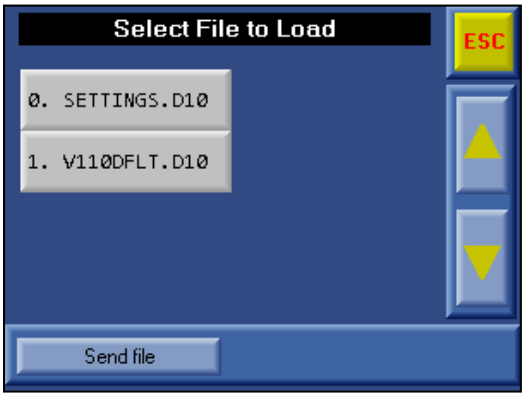
SD Card – Save/Load Parameters & Upgrade Firmware > Save, Load, and Save Parameters Filename

The current configuration parameter values can be saved in a file on the SD card for safe keeping (as a backup) or for reuse at other installation sites of similar configuration. The file format is a binary data file, and can only be read by the controller. The file is saved in the USER_APP folder on the SD card, with a .D10 file extension.

Save Parameters Filename sets the filename of the configuration parameters that will be saved to the SD card. This field applies ONLY when SAVING configuration parameters to the SD card, and does NOT apply when LOADING configuration parameters.

To save the current configuration parameters to the SD card, set the desired filename, without the .D10 file extension, in the Save Parameters Filename parameter, then press the green Save button immediately below the filename parameter. The controller will pause momentarily while the values are saved to the SD card.

To load configuration parameter values from a .D10 file on the SD card, press the green Load button. The file browser will open and display a list of .D10 files present in the USER_APP folder on the SD card. Select the desired saved settings file by pressing on the filename in the list, then press the Send File button.



The controller will pause momentarily while the values are loaded from the SD card.

SD Card – Save/Load Parameters & Upgrade Firmware > Upgrade

The OptiPressure controller supports field upgrades of the controller firmware. Controller firmware upgrades provide bug fixes and new features. However, technical support and/or engineering should be consulted prior to installing a firmware upgrade, in order to fully understand the changes between the firmware versions and the impact the changes may have on the operation of the equipment at the installation site.

The firmware upgrade file must be located in the SYSTEM folder on the SD card, and end in the .C10 file extension.

Firmware upgrades may be installed using two methods:

- Method 1 - **Configure > System > Save/Load/Upgrade**

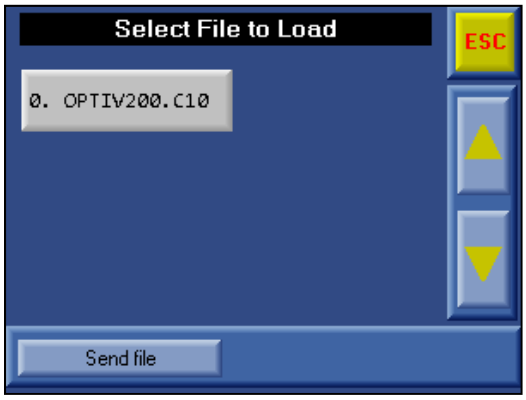
  Method 1, the recommended method, uses the standard configuration interface to install firmware upgrades, and is the most operator-friendly method of performing this function.

  The upgrade file must exist in the SYSTEM folder on the SD card. The upgrade file is often provided via email. The SD card should be removed from the controller, and the supplied .C10 firmware upgrade file should be copied to the SYSTEM folder on the SD card. Once the .C10 firmware upgrade file has been copied, the SD card must be reinstalled in the controller.

  The SD card status should indicate that the SD card is present and OK.

  Press the green Upgrade button to start the process.

  A list of the firmware upgrade files in the SYSTEM folder will be displayed. Press the desired firmware upgrade file to be installed, then press the Send File button.



  The controller will switch to the firmware upgrade mode while the process is ongoing, and will automatically reboot after the process completes.

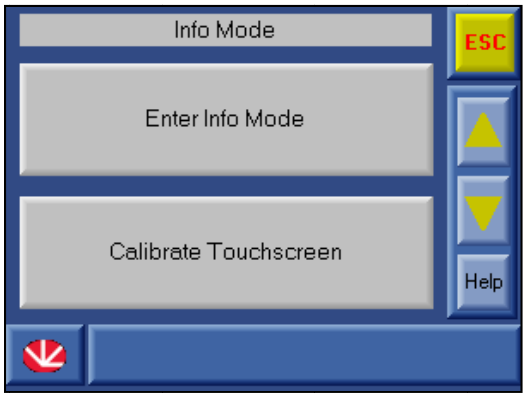
  The success or failure of the controller firmware upgrade process can be verified by checking the version of the firmware shown in the upper right corner of the Home screen with version displayed prior to the start of the firmware upgrade process.

- Method 2 - **Info Mode**

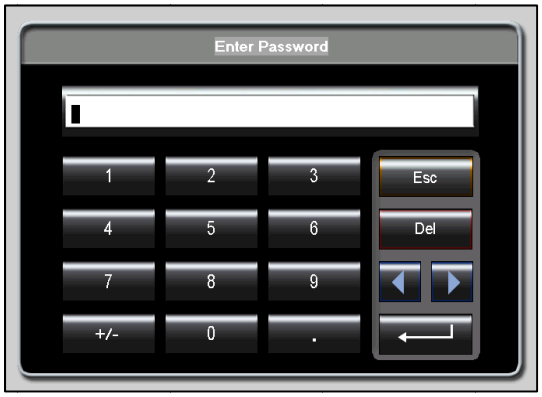
  In the event that the controller firmware upgrade process does not correctly load using the standard configuration interface, a special mode, called Info Mode, may be used to upgrade the controller firmware outside of the standard configuration interface.

The upgrade file must exist in the SYSTEM folder on the SD card. The upgrade file is often provided via email. The SD card should be removed from the controller, and the supplied .C10 firmware upgrade file should be copied to the SYSTEM folder on the SD card. Once the .C10 firmware upgrade file has been copied, the SD card must be reinstalled in the controller.

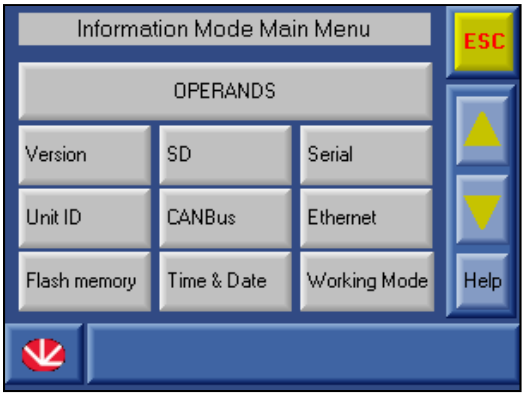
While on the **Configure > System > Save/Load/Upgrade** screen, press and hold the anywhere in the black background area below the **SD Card – Save/Load Parameters & Upgrade Firmware** section. After a few seconds, the Info Mode screen will appear. Press the Enter Info Mode button.

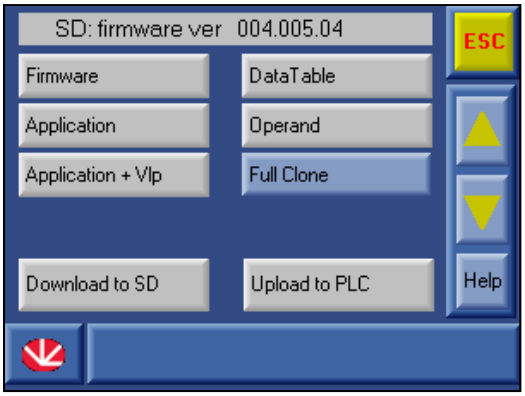


Enter the password "1111", and press Enter.

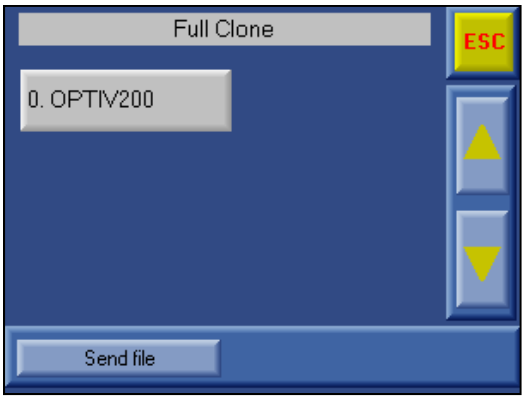


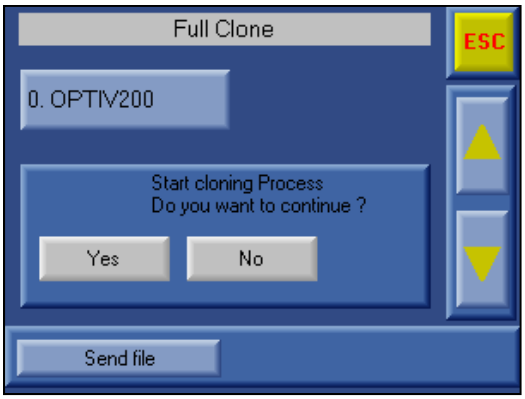
Press the SD button, then press the Full Clone button. When the Full Close button is pressed, the Upload to PLC button at the bottom of the screen will become active. Press the Upload to PLC button.





A list of the firmware upgrade files in the SYSTEM folder will be displayed. Press the desired firmware upgrade file to be installed, then press the Send File button. The controller will request confirmation of the firmware upgrade process. Press the Yes button to initiate the transfer process.





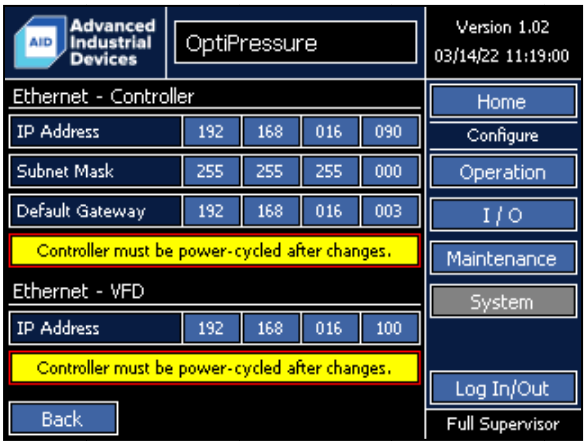
The controller will switch to the firmware upgrade mode while the process is ongoing, and will automatically reboot after the process completes.

The success or failure of the controller firmware upgrade process can be verified by checking the version of the firmware shown in the upper right corner of the Home screen with version displayed prior to the start of the firmware upgrade process.

Ethernet Communication

Ethernet communication configuration parameters are available in:

Configure > System > Ethernet



The OptiPressure controller supports two external device communication ports. The Ethernet port provides communication with both the variable frequency drive and with SCADA devices. One serial port is dedicated to communication with SCADA devices.

Note:
The controller must be rebooted or power-cycled in order for the changes made to the communication configuration parameters to take effect.

Communication ports available:

- Port 1
  Configurable serial communication with the controller as a Modbus RTU slave device.

- Port 2
  Disabled.

- Port 3
  Configurable Ethernet communication with the variable frequency drive and SCADA devices as a Modbus TCP/IP slave device. For SCADA communication, the Modbus TCP/IP port is set to 502, and cannot be changed.

Ethernet – Controller > IP Address

The IP address assigned to the controller. This address must be set by the operator. DHCP is NOT supported.

Ethernet – Controller > Subnet Mask

The subnet mask used by the controller. The subnet mask must be set by the operator. DHCP is NOT supported.

Ethernet – Controller > Default Gateway

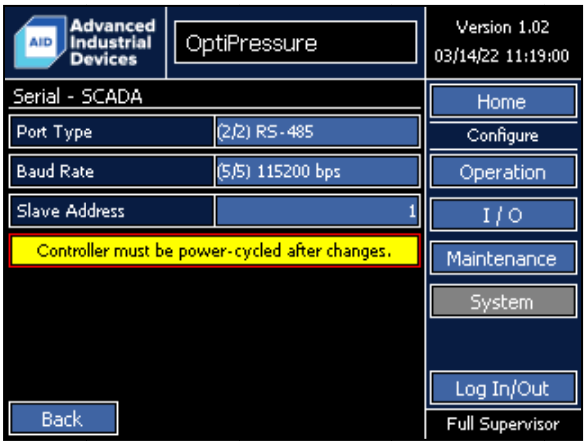
The default gateway used by the controller. Setting the default gateway is optional, depending on the network. DHCP is not supported.

Ethernet – VFD > IP Address

The IP address assigned to the variable frequency drive. This address must be set by the operator. The Fuji MEGA Ethernet card installed inside the drive on the control card must also be configured with this address and the same Subnet Mask.

Ethernet communication configuration parameters are available in:

Configure > System > Serial



The OptiPressure controller supports two external device communication ports. The Ethernet port provides communication with both the variable frequency drive and with SCADA devices. One serial port is dedicated to communication with SCADA devices.

Note:
The controller must be rebooted or power-cycled in order for the changes made to the communication configuration parameters to take effect.

Communication ports available:

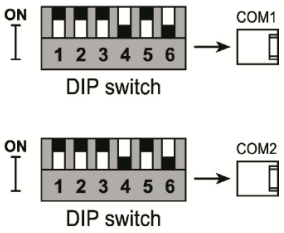
- Port 1
  Configurable serial communication with the controller as a Modbus RTU slave device.

- Port 2
  Disabled.

- Port 3
  Configurable Ethernet communication with the variable frequency drive and SCADA devices as a Modbus TCP/IP slave device. For SCADA communication, the Modbus TCP/IP port is set to 502, and cannot be changed.

For serial communication ports, the hardware must be physically configured using DIP switches that must also match the associated configuration parameter. The hardware DIP switches are located on the back of the controller, and are configured using the table below.

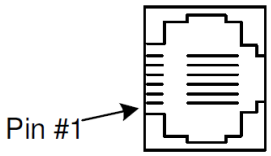
	Switch Settings					
	1	**2**	**3**	**4**	**5**	**6**
RS232*	**ON**	**ON**	**ON**	OFF	**ON**	OFF
RS485	OFF	OFF	OFF	**ON**	OFF	**ON**
RS485 with termination**	**ON**	**ON**	OFF	**ON**	OFF	**ON**



The serial communication ports use a standard RJ-11 socket. The pinout for the sockets is shown below. Note that the pinout is different depending on the port type configured.

RS232	
Pin #	**Description**
1*	DTR signal
2	0V reference
3	TXD signal
4	RXD signal
5	0V reference
6*	DSR signal

RS485**		**Controller Port**
Pin #	**Description**	
1	A signal (+)	
2	(RS232 signal)	
3	(RS232 signal)	
4	(RS232 signal)	
5	(RS232 signal)	
6	B signal (-)	



Serial – SCADA > Port Type

The serial port for SCADA communication can be configured for either RS-232 or RS-485 communication. The serial port type must match the port type used by the SCADA monitoring device.

Serial – SCADA > Baud Rate

The baud rate for the serial SCADA communication port should be configured to match the baud rate of the SCADA monitoring device.

Serial – SCADA > Slave Address

Slave Address sets the slave address of the controller for the serial SCADA communication port.

OptiPressure

Making Complex Applications Simple

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