



ADI 0025-M


ALTOS 2TM System Monitor

INSTALLATION AND OPERATING INSTRUCTIONS

Carefully Read These Instructions Before Operating

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Revision M

SAFETY



BASIC SAFETY PRECAUTIONS MUST BE FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRICAL SHOCK OR INJURY.

- While the Altos 2™ is dust and moisture resistant, it is NOT water-proof or completely sealed. It should be installed where it will not be subjected to rain or high concentrations of dust. Never pour or spray liquids directly onto the product.
- Install the Altos 2™ where the ambient temperature range is between 0° F and 140° F.
- THIS PRODUCT IS NOT INTENDED FOR USE IN EXPLOSIVE ENVIRONMENTS.
- DO NOT INSTALL THIS PRODUCT IN ANY HAZARDOUS ENVIRONMENT.
- If product appears damaged in any way, do not use and request service from CONCOA.

USER RESPONSIBILITY

Service to this product should only be performed by CONCOA or an authorized CONCOA agent. Requests for service may be made through CONCOA CUSTOMER SERVICE at 1-800-225-0473. Written requests may be made using CONCOA's FAX number at 1-757-422-3125 or CONCOA's E-MAIL at info@concoa.com

CONCOA accepts no responsibility for damage or injury if this product is modified in any way.

CONCOA assumes/accepts no liability or responsibility for damage to individuals or equipment that may occur when using this product

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DESCRIPTION OF PRODUCT

The CONCOA Altos 2™ system monitor reports the status of up to 2 individual points of observation. Ideal for monitoring automatic switchovers and other fail-safe gas delivery installations with pressure switch or transducer pressure monitoring capability. The reading for 4-20mA input signals or contact closure status for pressure switches or dry contacts will be displayed locally on a 2.9" LCD screen for up to 2 channels. The statuses of all inputs are also displayed locally with high visibility multicolor LEDs that turn red when an input exits its normal condition. Additionally, status may be accessed through three dry contact relay outputs, one for each input channel and a master alarm.

POWER REQUIREMENTS

Input Voltage: External Power Supply

Universal input voltage 96-264 VAC, 50/60Hz.

Power Consumption: 5 watts

ALARM OUTPUT RELAY SPECIFICATIONS:

Contacts: Normally Open/ Normally Closed Dry Contact

Contact Rating: 24 volts DC @.5 amps Max.

UNDERSTANDING ALARM OPERATION

Figure 1

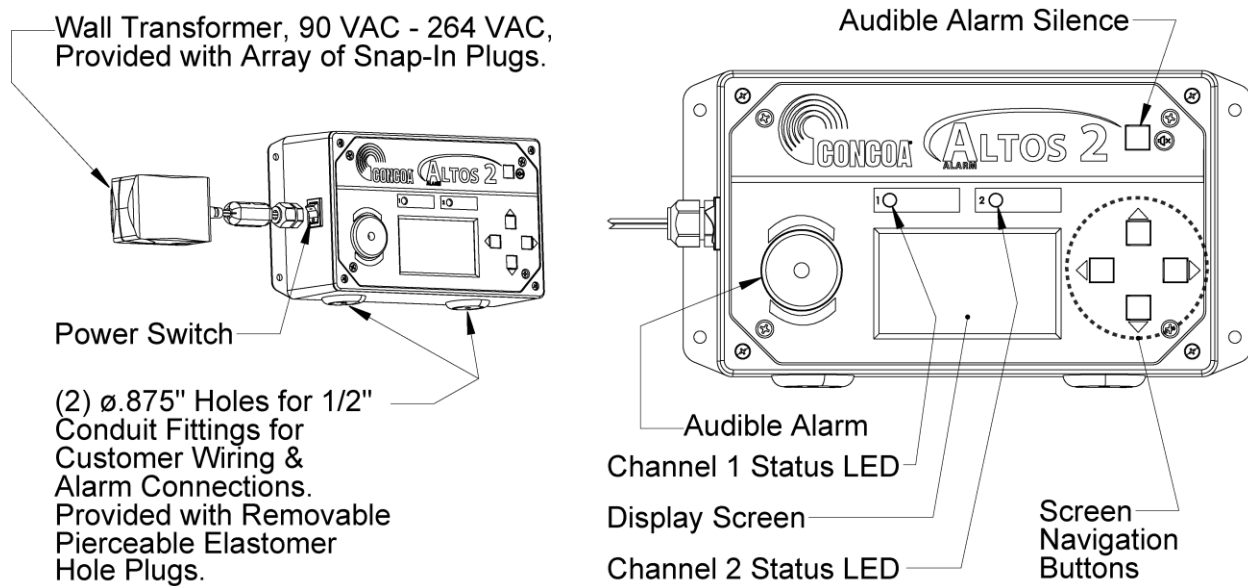


Figure 1 shows the location of the various inputs, outputs, and indicators for the Altos 2™. The Altos 2™ has a universal power supply.

Input signals coming from external devices are connected to the Altos 2™ via individual wires through a 1/2" conduit connection in the bottom of the enclosure to a terminal strip.

The Altos 2™ provides output relay signals to indicate the state of channel 1, 2, and the master alarm. The master alarm is engaged when either channel is in alarm with signals brought out through terminal connectors consisting of 3 terminal blocks. Each terminal block contains a common voltage input, a normally-closed contact, and a normally-open contact.

Output relay signals are routed from the Altos 2™ terminal strip via individual wires through a 1/2" conduit connection on the bottom of the enclosure.

Figure 1 shows a view of the front panel which is laid out with two status lights representing channels 1 and 2. The indicator lights are bi-colored LEDs so that the same light can be turned ON as either a green indicator or a red indicator. A green LED indicates a normal condition. A red LED indicates an alarm condition. If the option has been enabled, a blinking red LED indicates that both channels are in alarm.

On the left side of the front panel, a speaker is used to provide an audible indication of an alarm condition. The alarm silence button in the upper right portion of the front panel allows the operator to silence the audible alarm even while an alarm condition still exists.

In the center of the front panel is a 2.9" diagonal LCD screen used for displaying channel 1 and 2 status as well as system configuration menus. On the right side of the screen are four directional arrows used for navigating the configuration menu.

The Altos 2™ allows for a 4-20mA input signal from any device (e.g., transducer, scale, etc.) or a contact closure input (typical pressure switch) for channel monitoring. The channel configuration is selectable via the system menu.

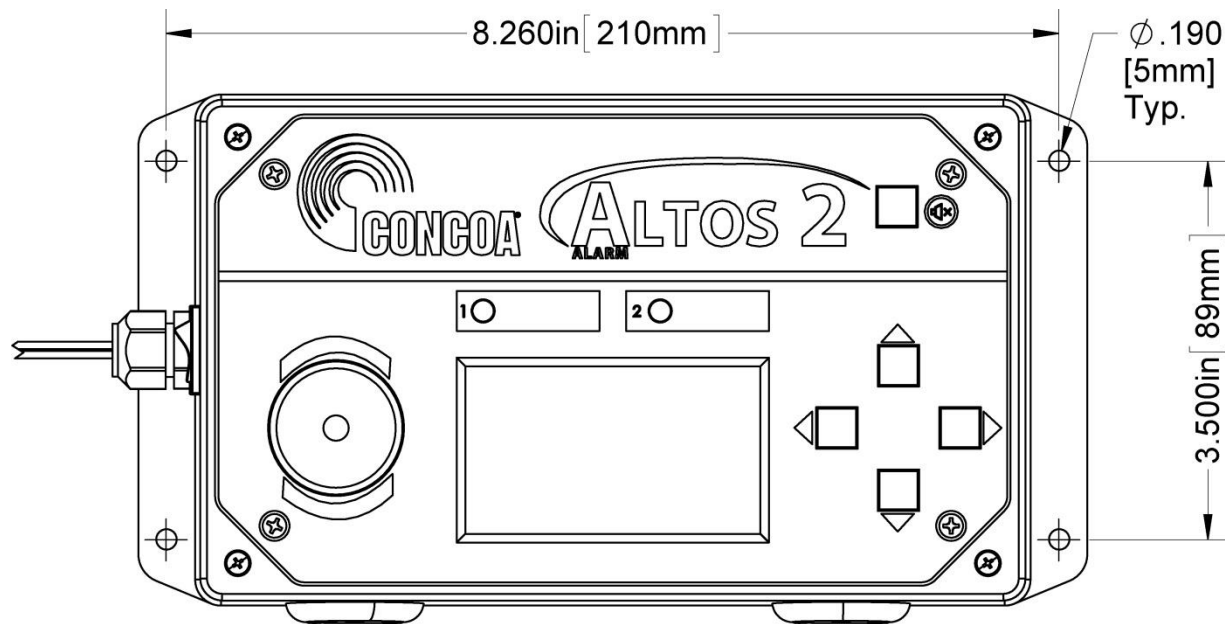
The 4-20mA inputs are accessed via a terminal block containing the +12vdc supply line and the signal return for each channel. The channel pressure is displayed on the LCD screen and, depending on the channel alarm configuration and set point, the channel LED with either be green (normal state) or red (alarm state).

The contact closure inputs are also accessed via a terminal block containing a +12vdc supply line and a signal return for each channel. The Altos 2™ can use normally closed (N.C.) or normally open (N.O.) contact signals from the external inputs to determine the state of the alarms. The normal conditions of these alarms are customizable via the configuration menu.

If there are no alarm conditions, the Altos 2™ will turn on the green indicator next to the status being monitored. When an alarm condition occurs, the color of the indicator next to its status changes from green to red. At the same time, the audible buzzer in the Altos 2™, if enabled, will begin to sound. The LCD screen will display the current channel pressure or whether the contact is open or closed depending on the channel's configuration. The set of contacts representing this alarm condition will alarm in the relay output section of the Altos 2™.

MOUNTING REQUIREMENTS

Figure 2



INSTALLATION INSTRUCTIONS

After mounting the Altos 2™ to the wall, wire any monitored devices through the conduit connections and to the input terminal blocks (see Figures 3-17, Table 1). If using the relay output of the Altos 2™ to connect to another alarm or system, attach wires to the relay output terminal blocks (see Figure 3, Table 1).

Turn Altos 2™ on by plugging the unit directly into a wall outlet and turning the power switch on the left side of the unit to the on position. The system may be tested once it is connected to an external device by tripping the external alarm, causing the corresponding input LED to turn red.

CONNECTING EXTERNAL INPUT DEVICES TO THE ALTOS 2™

The Altos 2™ is designed to interface with up to 2 external 4-20 mA input signals (transducers by default) or any dry contact inputs depending on the channel configuration. The external device wires (+12Vdc out, signal in) are brought in through a conduit connector on the left side of the box and connected to terminal blocks on the left hand side of the circuit board. Figures 3-17 and Table 1 outline how to connect various CONCOA products to the Altos 2™.

The recommended cable for this assembly is 14-26 AWG wire (Alpha # 1176C or equivalent). The length of each cable should be limited to 500 feet for pressure transducers and 1500 feet for dry contact inputs.

After cutting the cable to length, remove the outer jacket to expose approximately 3/4 inch of the internal conductors on both sides of the cable. Strip away 1/4-inch of the insulation on each of the conductors, unscrew the terminal block, insert wire, and tighten screw. Test to ensure the wire does not pull out of the connector.

Table 2 shows common wire part numbers that are available to connect to various CONCOA devices. Contact CONCOA for details.

Figure 3

Circuit Board Terminal Blocks and DIP Switches

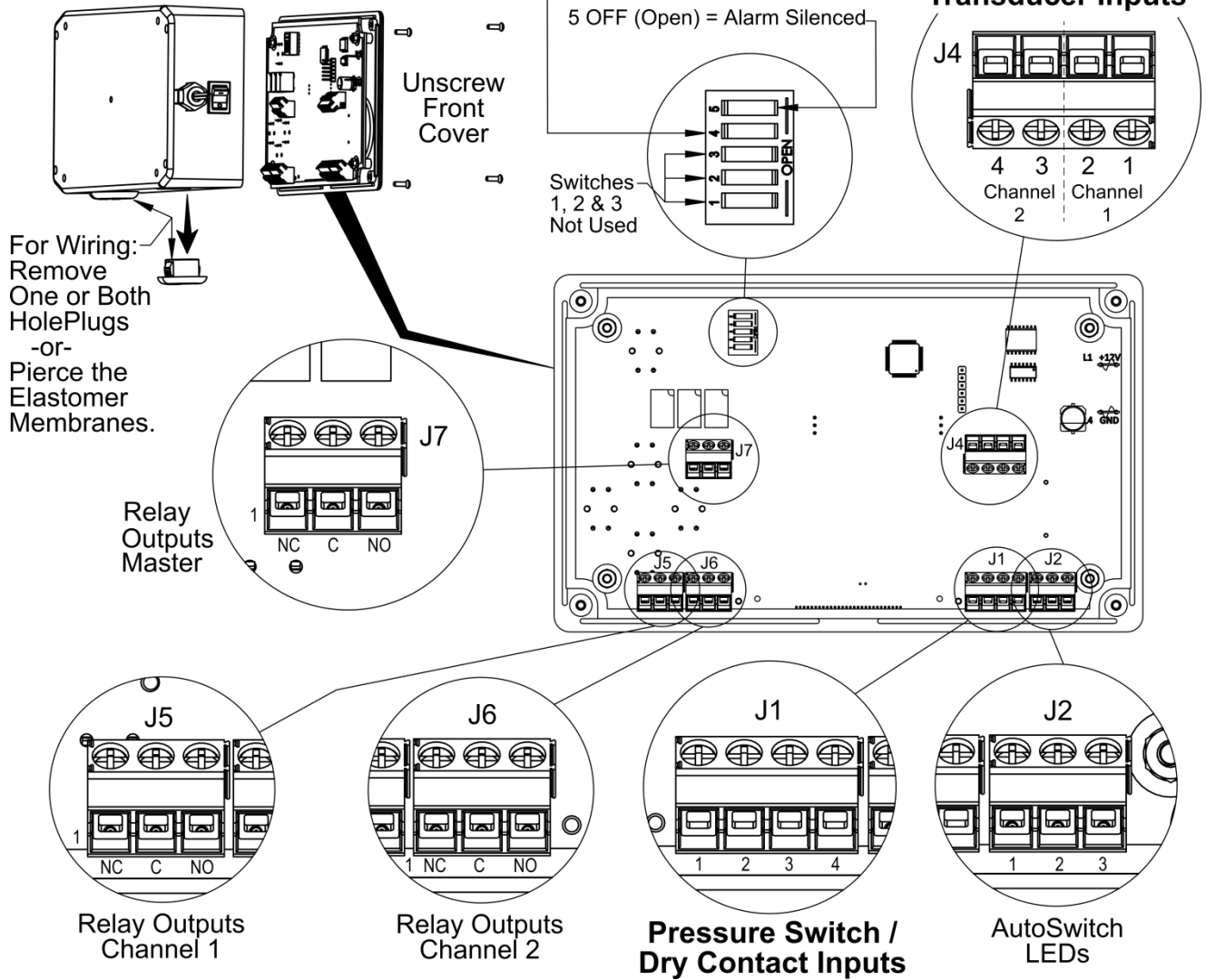


Table 1

Input	
Terminal	Function
J1-1	Channel 1 Pressure Switch Signal Return
J1-2	Channel 1 Pressure Switch +12V Supply
J1-3	Channel 2 Pressure Switch Signal Return
J1-4	Channel 2 Pressure Switch +12V Supply

Input	
Terminal	Function
J4-1	Channel 1 Transducer Signal Return
J4-2	Channel 1 Transducer +12V Supply
J4-3	Channel 2 Transducer Signal Return
J4-4	Channel 2 Transducer +12V Supply

Output	
Terminal	Function
J2-1	Channel 1 LED Driver (for 522/523 Switchovers Only)
J2-2	Channel 2 LED Driver (for 522/523 Switchovers Only)
J2-3	Ground

Output	
Terminal	Function
J5-1	Channel 1 Normally Closed Relay Output
J5-2	Channel 1 Relay Common
J5-3	Channel 1 Normally Open Relay Output

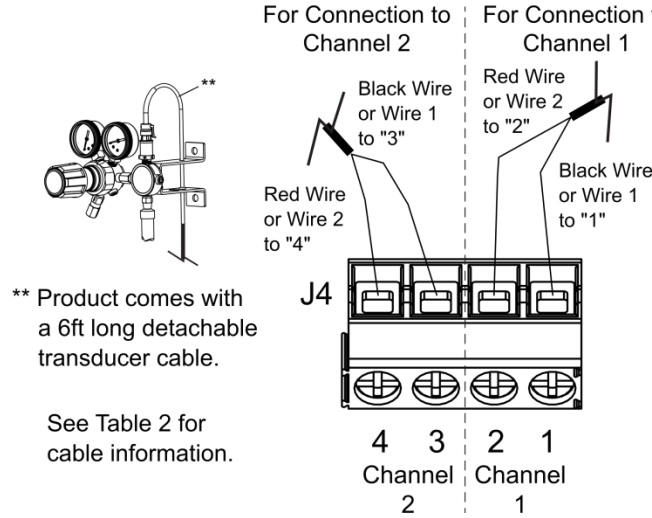
Output	
Terminal	Function
J6-1	Channel 2 Normally Closed Relay Output
J6-2	Channel 2 Relay Common
J6-3	Channel 2 Normally Open Relay Output

Output	
Terminal	Function
J7-1	Master Normally Closed Relay Output
J7-2	Master Relay Common
J7-3	Master Normally Open Relay Output

Dipswitch	
Switch	Function
SW1-5	Alarm Silence
SW1-4	Keypad Lockout
SW1-3	Reserved
SW1-2	Reserved
SW1-1	Reserved

Figures 4, 5 & 6

Protocol Stations with Standard Transducers



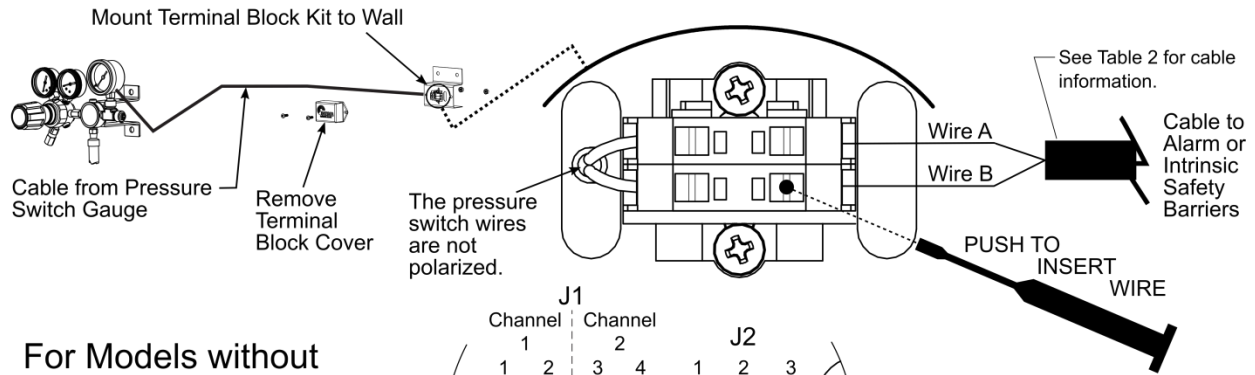
** Product comes with a 6ft long detachable transducer cable.

See Table 2 for cable information.

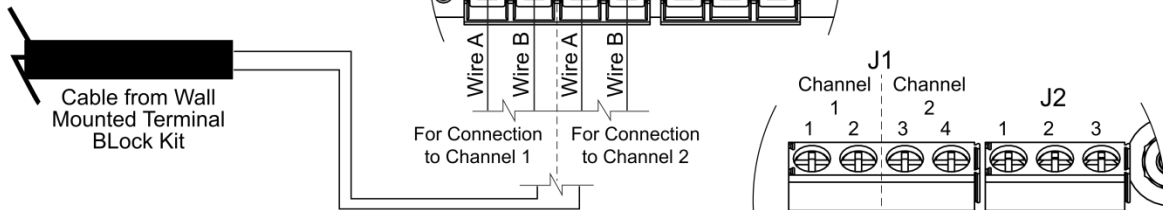
CONCOA Products with Intrinsically Safe Transducers Require the 24 Volt Altos 2 Alarm, CONCOA #5750025-01-24V.

Do Not Use the 12 Volt Altos 2 Alarm, CONCOA #5750025-01-000, with Intrinsically Safe Transducers.

Protocol Stations with Pressure Switch Gauge



For Models without Intrinsic Safety Barriers:



For Models with Intrinsic Safety Barriers:

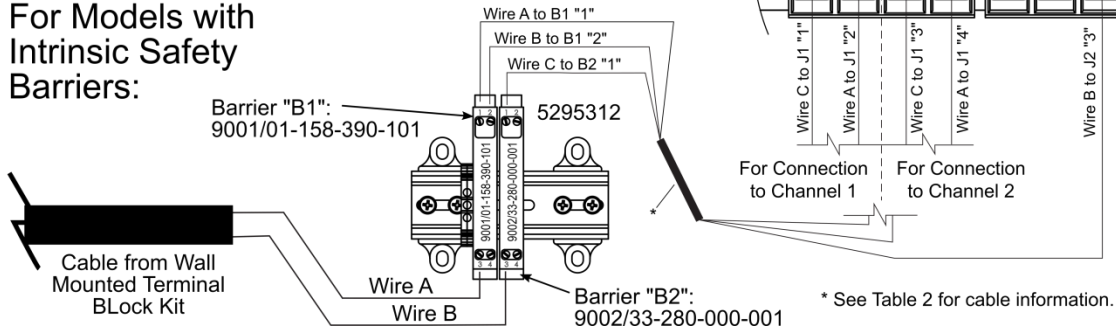
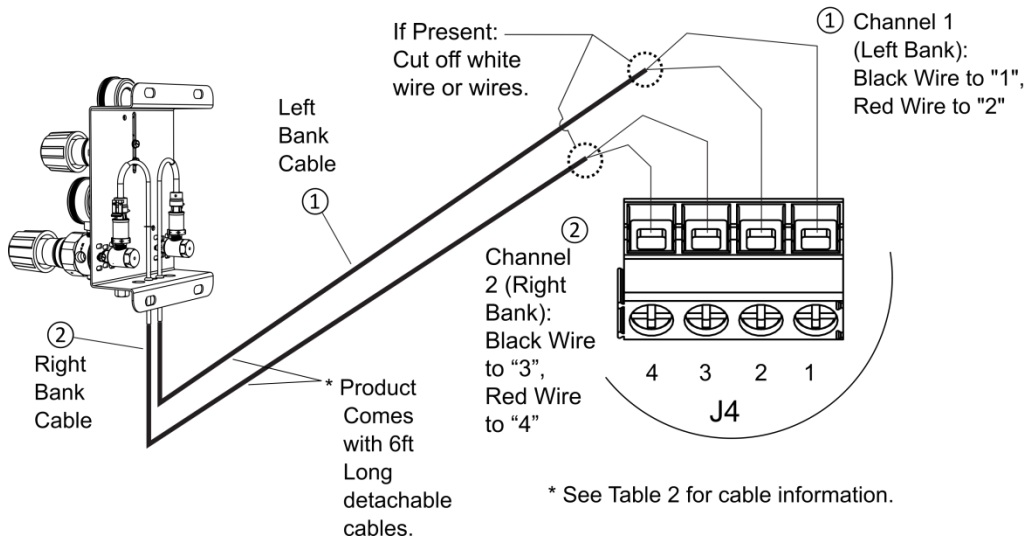


Figure 7

Dual Regulator Switchovers with Standard Transducers

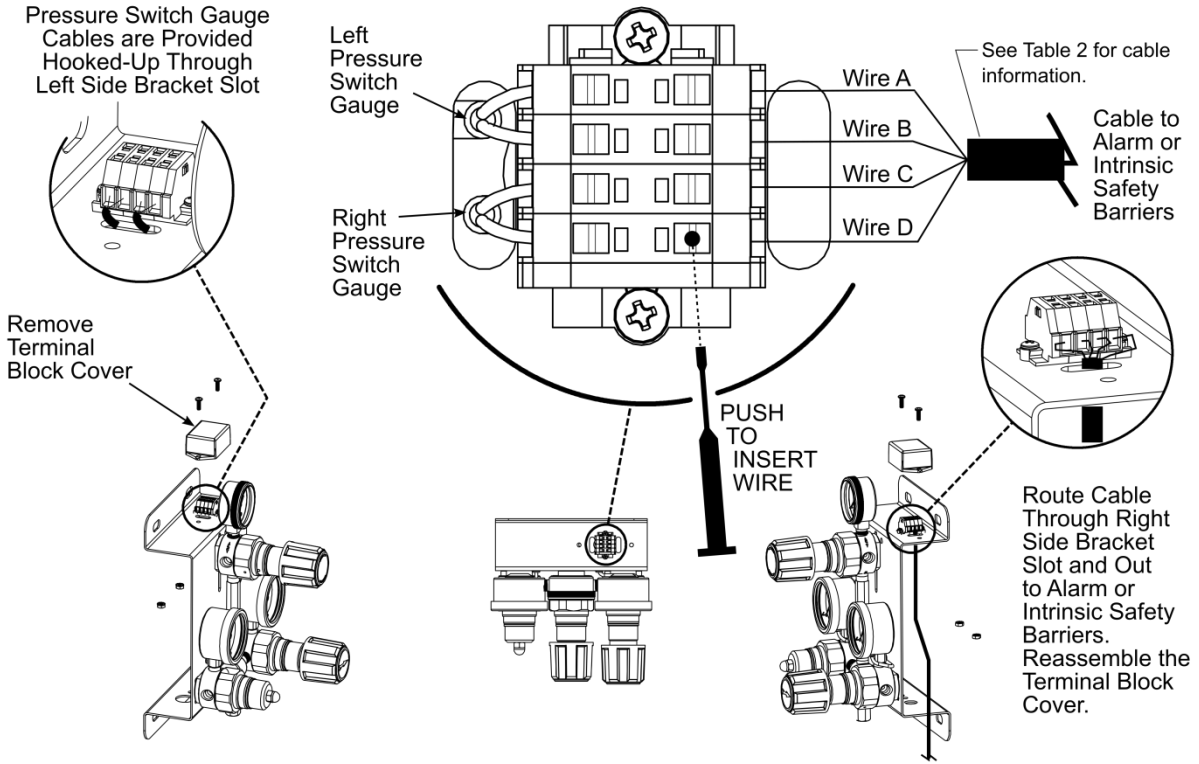


**CONCOA Products with
Intrinsically Safe
Transducers
Require the
24 Volt
Altos 2 Alarm,
CONCOA
#5750025-01-24V.**

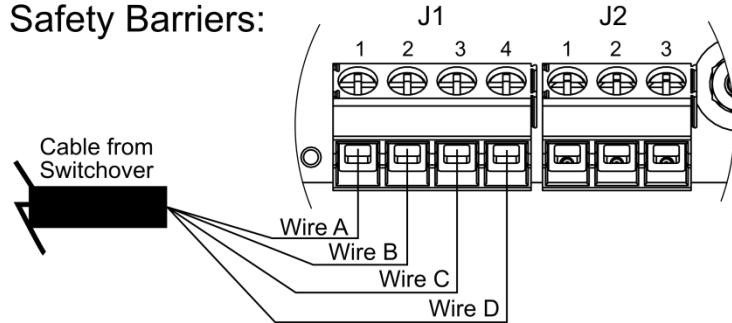
**Do Not Use the 12 Volt
Altos 2 Alarm,
CONCOA
#5750025-01-000,
with Intrinsically
Safe Transducers.**

Figures 8 & 9

Dual Regulator Switchovers with Pressure Switch Gauges



For Models without Intrinsic Safety Barriers:



For Models with Intrinsic Safety Barriers:

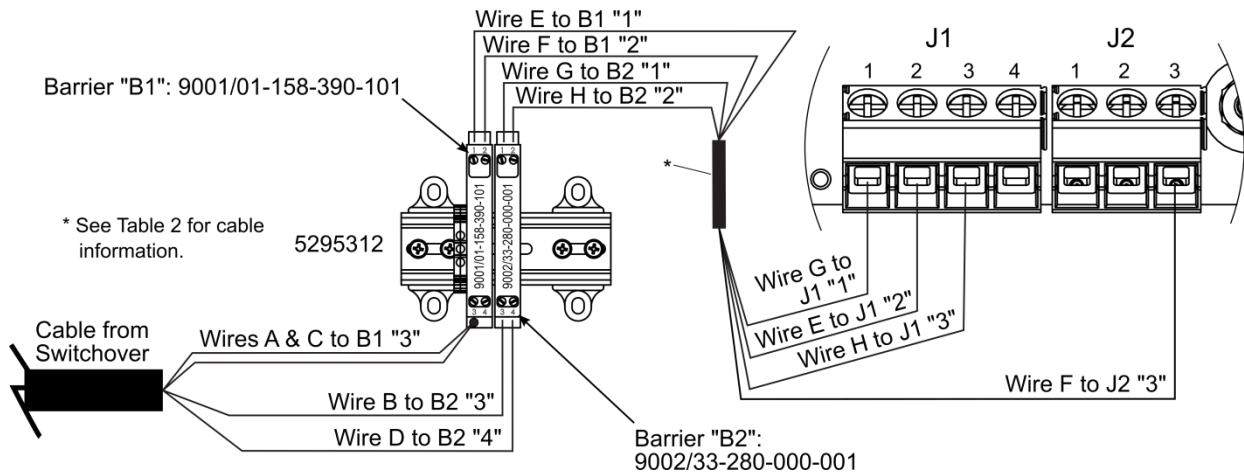
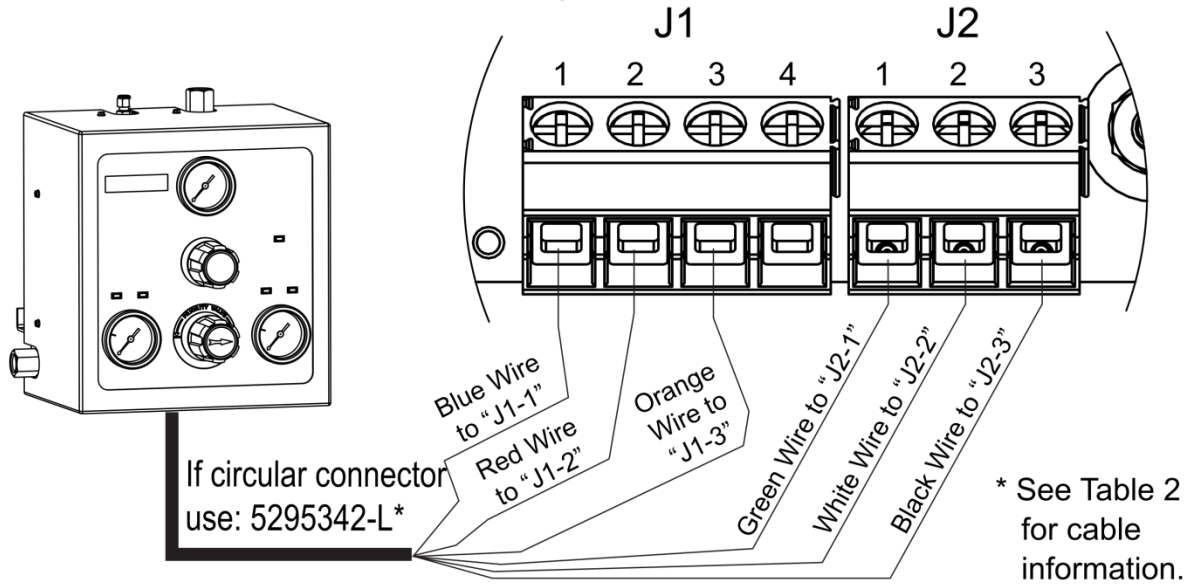


Figure 10

AutoSwitches with Pressure Switch Gauges, Without Intrinsic Safety Barriers



AutoSwitches with Transducers, Without Intrinsic Safety Barriers

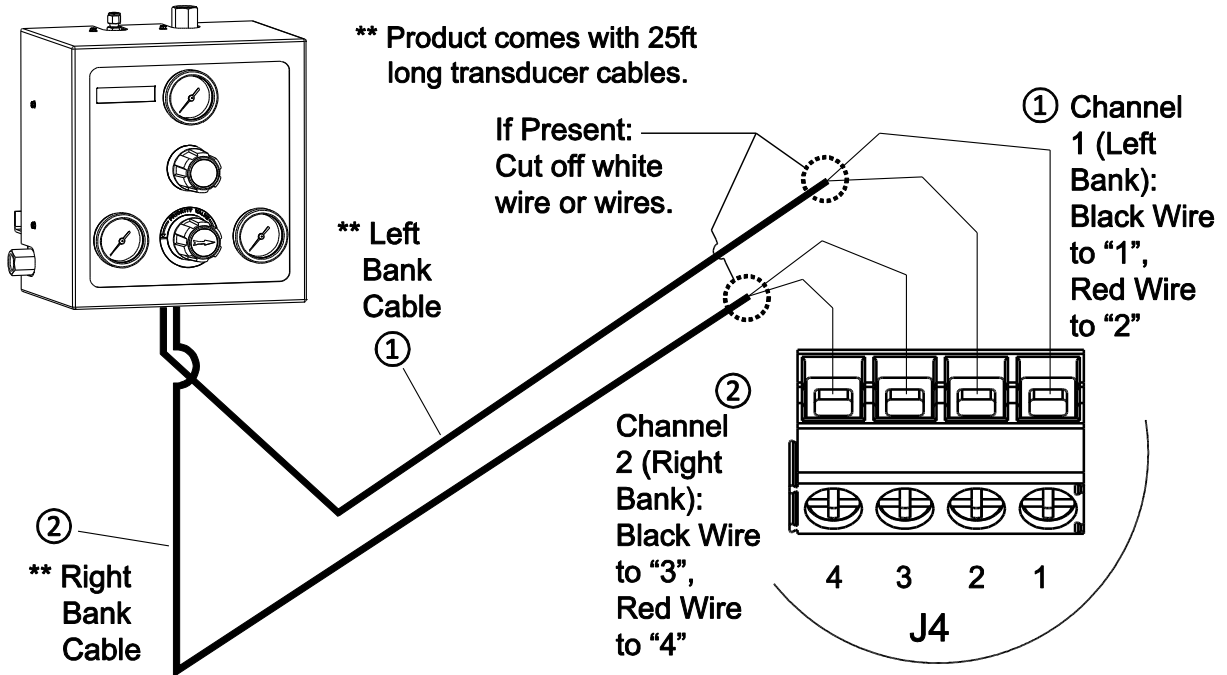
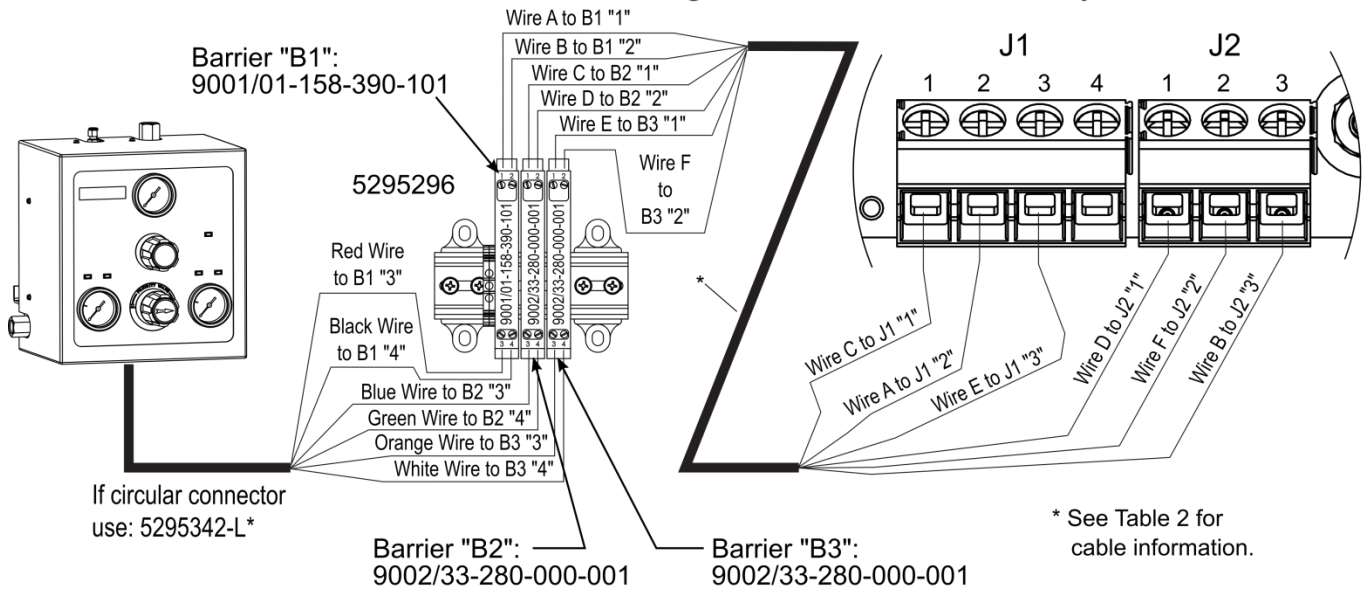


Figure 11

AutoSwitches with Pressure Switch Gauges, With Intrinsic Safety Barriers



AutoSwitches with Transducers, With Intrinsic Safety Barriers

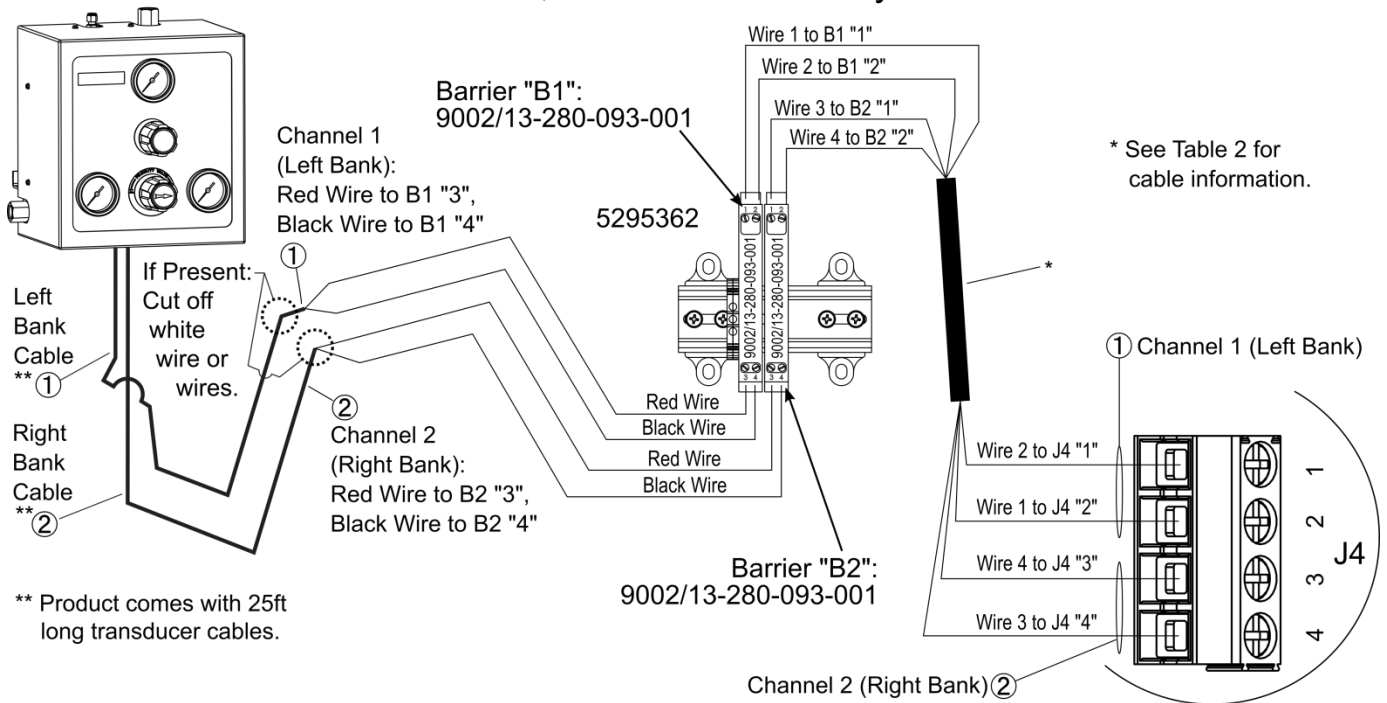


Figure 12

539 / 640 / 641 Series IntelliSwitches

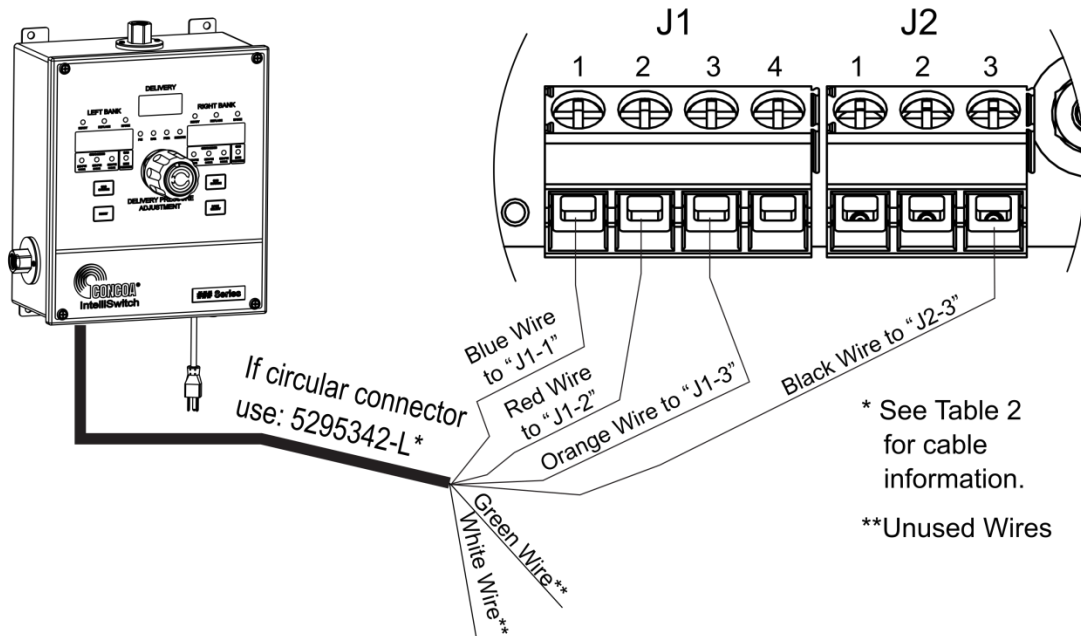


Figure 13

538 / 544 / 642 / 643 Series IntelliSwitch IIs

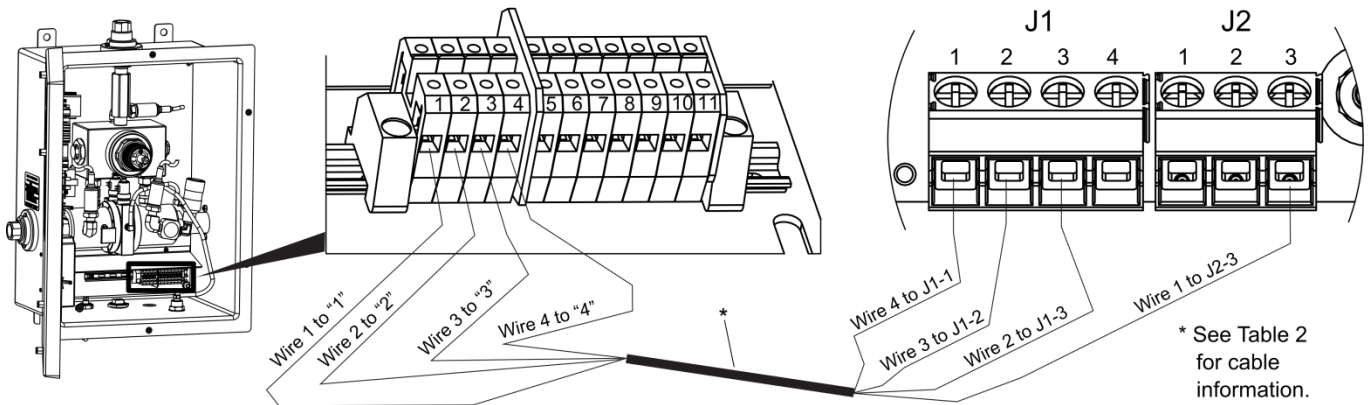


Figure 14

542 Series High Flow Backup System

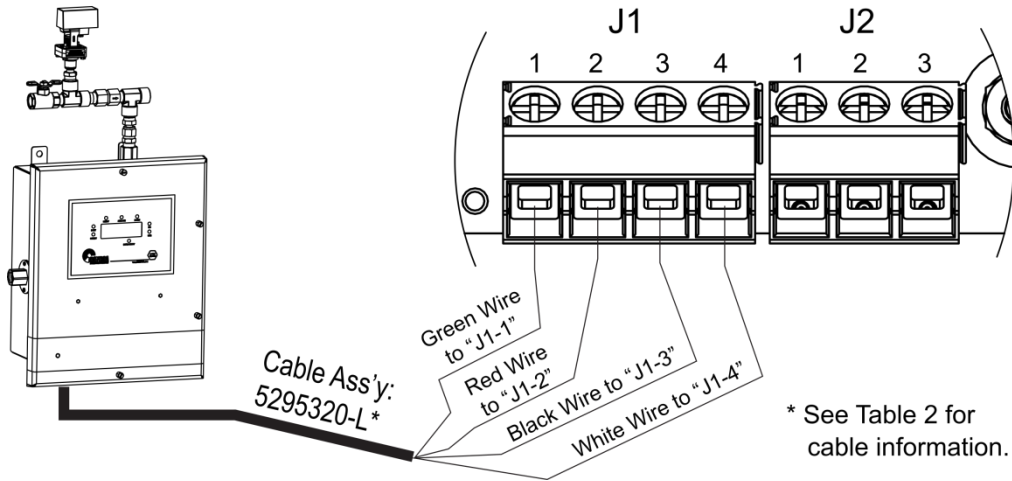
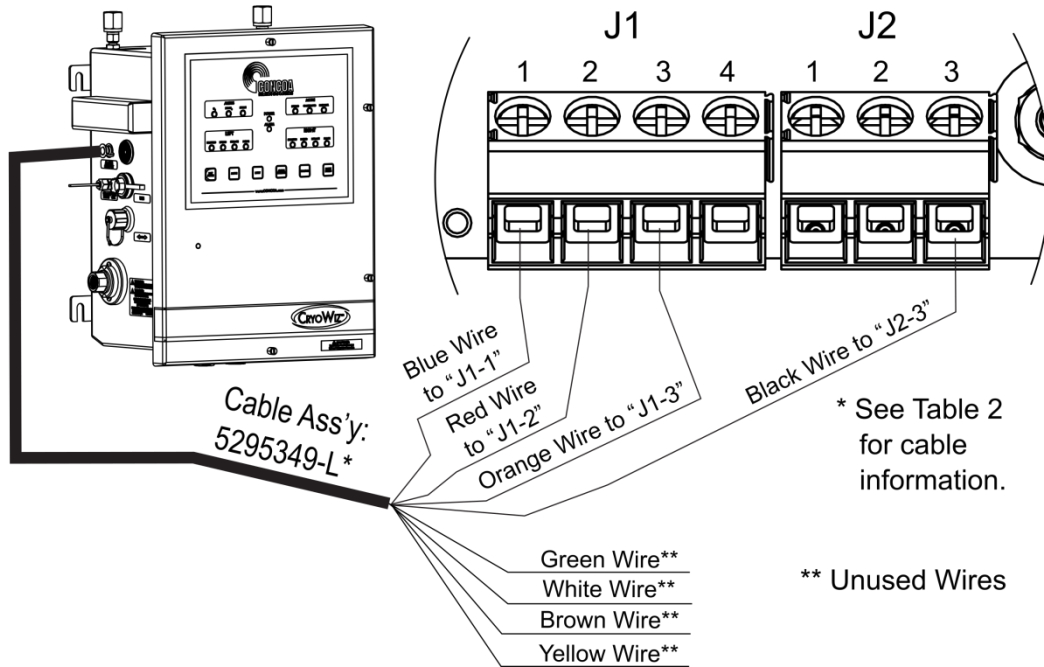


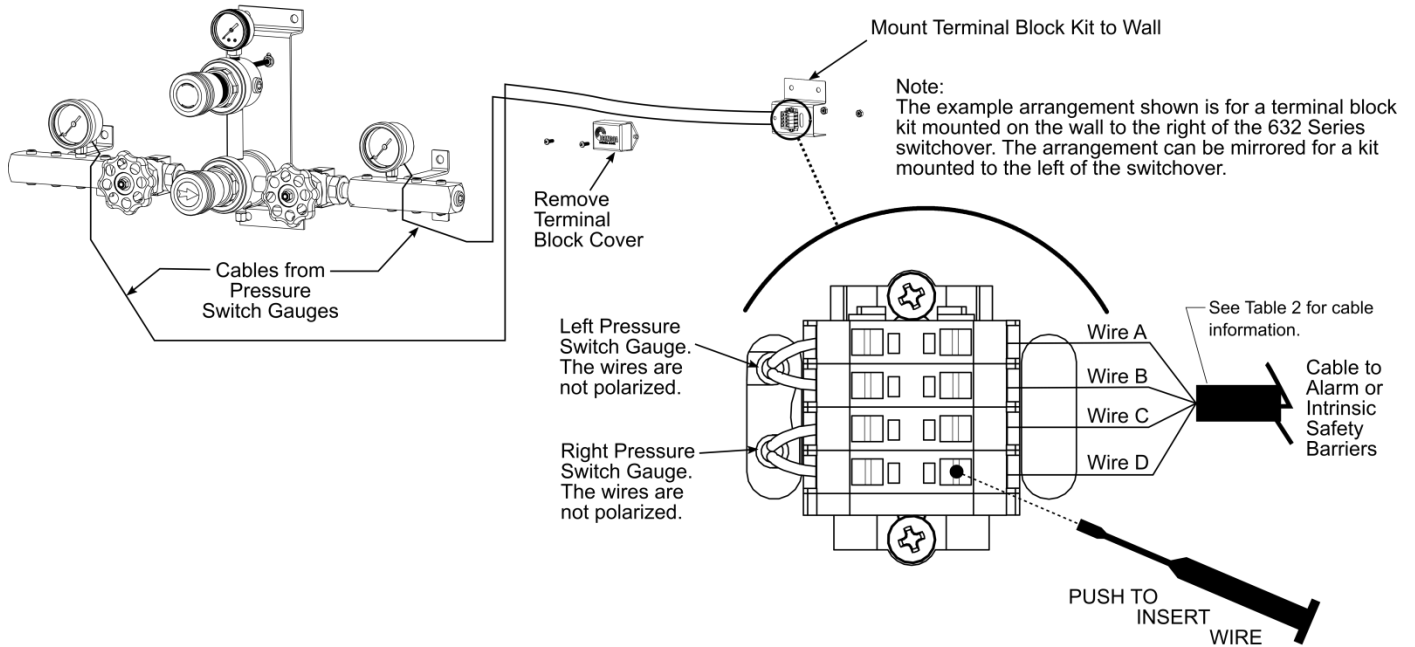
Figure 15

577 Series CryoWiz™

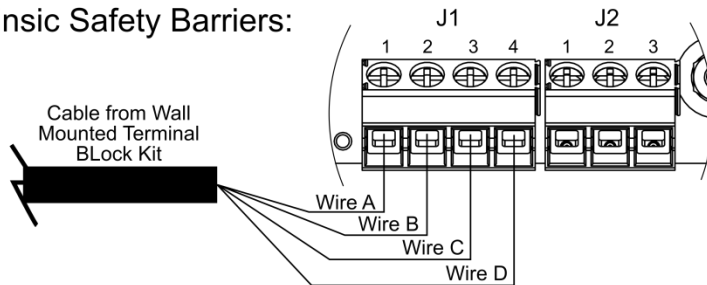


Figures 16 & 17

632 Series Switchovers with Pressure Switch Gauges



For Models without Intrinsic Safety Barriers:



For Models with Intrinsic Safety Barriers:

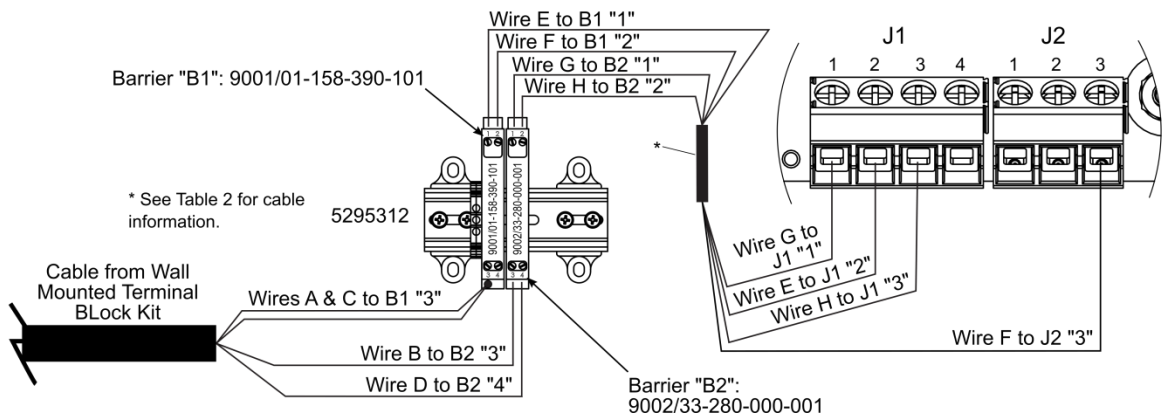


Table 2

CABLES	
CONCOA Cable Ass'y Part No.	Usage
5295320-L ("L"= length - contact CONCOA for options) 4-Pin Circular Connector x 4 Bare Wires (Red, Green, White, Black)	542 Series High Flow Backup System
5295342-L ("L"= length - contact CONCOA for options) 6-Pin Circular Connector x 6 Bare Wires (Blue, Green, Red, Orange, White, Black)	IntelliSwitch 1 and AutoSwitches with Pressure Switch Gauges
5295349-L ("L"= length - contact CONCOA for options) 8-Pin Circular Connector x 7 Bare Wires (Blue, Red, Orange, Black, White, Green, Brown)	577 Series CryoWiz™
5295360-01-L ("L"= length - contact CONCOA for options) Packard Connector x 2 Bare Wires (Black, Red)	All CONCOA Products with Standard Transducer(s) (Not Applicable for Products with Intrinsically Safe Transducer(s))

The following products will be provided with a 25ft long cable appropriate for your application (customer to cut and strip wires and select usage for wire colors):

- Products with a pressure switch gauge/gauges and a terminal block wiring arrangement.
- Products with intrinsic safety barriers - cable to hook up barriers to remote alarm.
- Products such as the IntelliSwitch II that have only a terminal block for alarm hookup.

Available Cables:

5296002-25-001 = 25ft Long 2 wire cable (wire colors: black, red)

5296002-100-001 = 100ft Long 2 wire cable (wire colors: black, red)

5296003-25-001 = 25ft Long 3 wire cable (wire colors: black, red, white)

5296003-100-001 = 100ft Long 3 wire cable (wire colors: black, red, white)

5296004-25-001 = 25ft Long 4 wire cable (wire colors: black, red, white, green)

5296004-100-001 = 100ft Long 4 wire cable (wire colors: black, red, white, green)

5296006-25-001 = 25ft Long 6 wire cable (wire colors: black, red, white, green, brown, blue)

5296006-100-001 = 100ft Long 6 wire cable (wire colors: black, red, white, green, brown, blue)

5296008-25-001 = 25ft Long 8 wire cable (wire colors: black, red, white, green, brown, blue, orange, yellow)

5296008-100-001 = 100ft Long 8 wire cable (wire colors: black, red, white, green, brown, blue, orange, yellow)

CONNECTING ALARM OUTPUTS

The Altos 2™ provides output signals corresponding to the alarm conditions that it senses, presented through relay contacts, and brought out to terminal connectors on the right hand side of the circuit board connector at the bottom of the alarm. Signals are then routed through the conduit connector on the right side of the box. A total of three relay output terminal strips are on the circuit board; one for each channel and a master alarm signal. Each terminal strip contains the independent common input signal, a normally closed output, and a normally open output. (See Figure 3 for terminal strip locations.)

The recommended cable for making an output cable assembly is 14-26 AWG. The length of each cable should be limited to 1500 feet.

After cutting the cable to length, remove the outer jacket to expose approximately 3/4 inch of the internal conductors on both sides of the cable. Strip away 1/4-inch of the insulation on each of the conductors, unscrew the terminal block, insert wire, and tighten screw. Test to ensure the wire does not pull out of the connector.

MUTING AUDIBLE ALARM

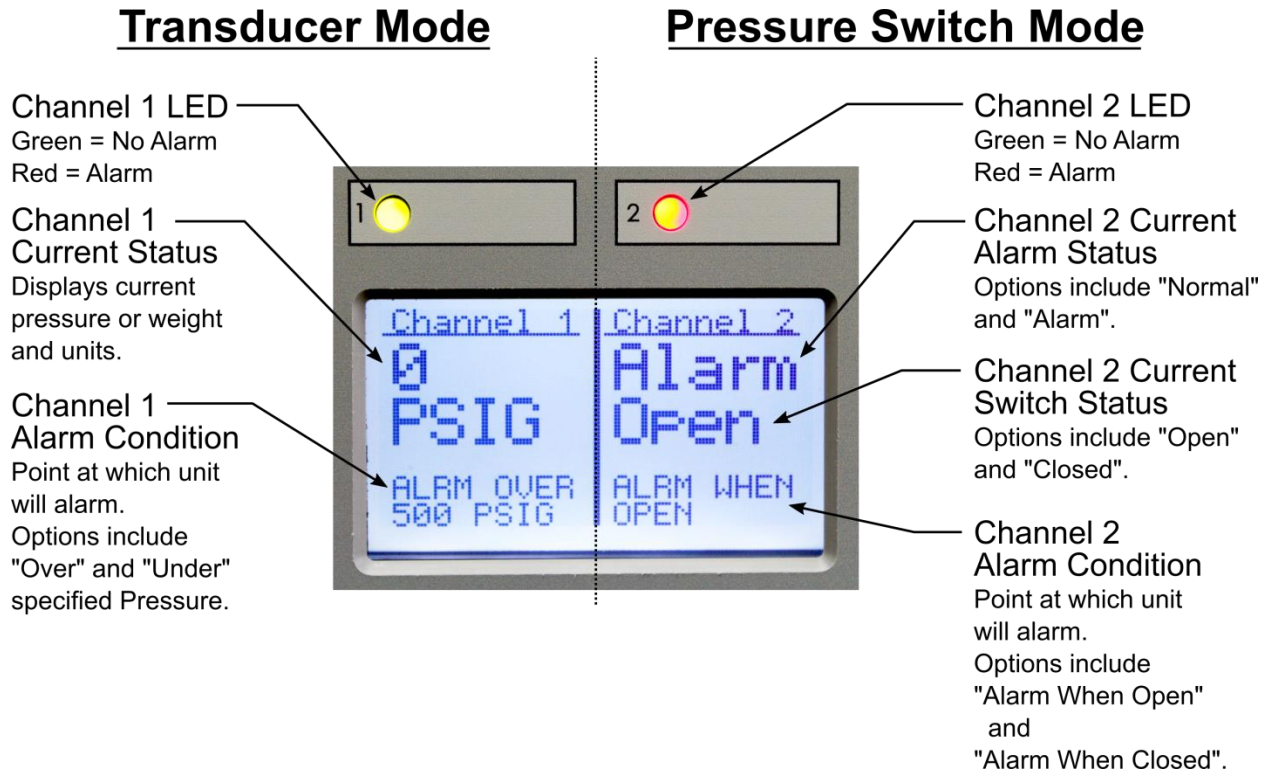
It is sometimes desirable to silence the audible alarm on the Altos 2™. This can be accomplished in one of two ways.

- 1) Pressing the alarm silence button on the top right hand side of the front panel will temporarily silence the alarm. In this mode, the audible alarm will automatically sound on the next asserted alarm
- 2) To permanently silence the alarm, power down the unit, open the front cover, and flip SW1-5 off (open) (See Figure 3.).

CONFIGURATION USING THE LCD SCREEN

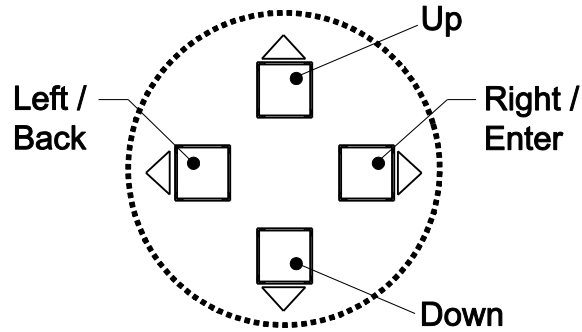
The Altos 2™ is equipped with an LCD screen for displaying system status and configuration of the system. The Altos 2™ LCD screen displays system status by default.

Figure 18



The Altos 2™ Settings Menu is also displayed via the LCD screen. Pressing any navigation button on the front right of the enclosure (Figures 1 + 18) when the status screen is displayed will enter the Settings Menu.

Figure 19

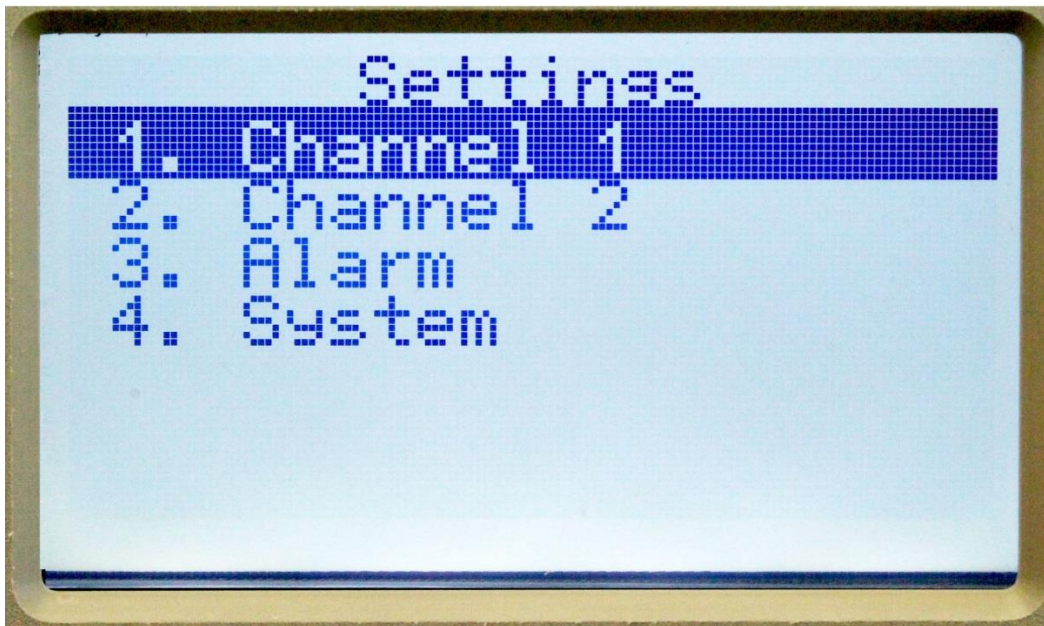


The up and down keys allow the user to navigate the menu selections. To enter a menu selection, press right/enter when the selection is highlighted. To go back a level, press the left/back key. To disable the navigation buttons, power down the unit, open the front cover and flip SW1-4 on (closed) (See Figure 3.). Pressing the navigation buttons when the keypad is locked will cause the Altos 2™ to display a keypad lock out warning for a couple of seconds before returning to the display screen.

SETTINGS MENU

The Altos 2™ Settings Menu is divided into four sections: Channel1, Channel2, Alarm, and System. Pressing right/enter when the selection is highlighted enters the submenu.

Figure 20



- “Channel 1” and “Channel 2” = Input configuration settings for channels 1 and 2 respectively.
- “Alarm” = Global alarm configuration settings.
- “System” = System configuration settings.

CHANNEL SETTINGS

The Channel Settings Menus “Channel 1 “ and “Channel 2” contain three settings for each channel: Input/Alarm Mode, Alarm Set Point, and Units of Measure

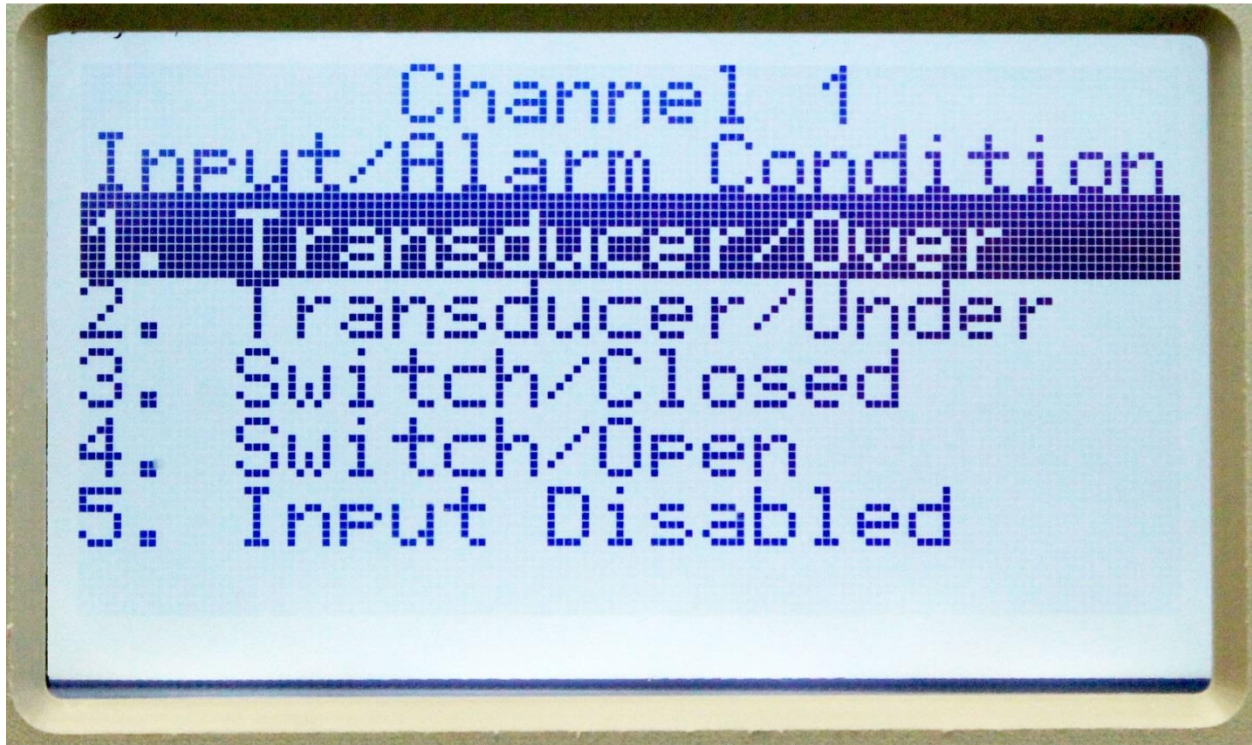
Figure 21



Input/Alarm Mode

Input/Alarm mode configures the specified channel input for the transducer (or other 4-20mA signal) or contact closure, or disables the input.

Figure 22

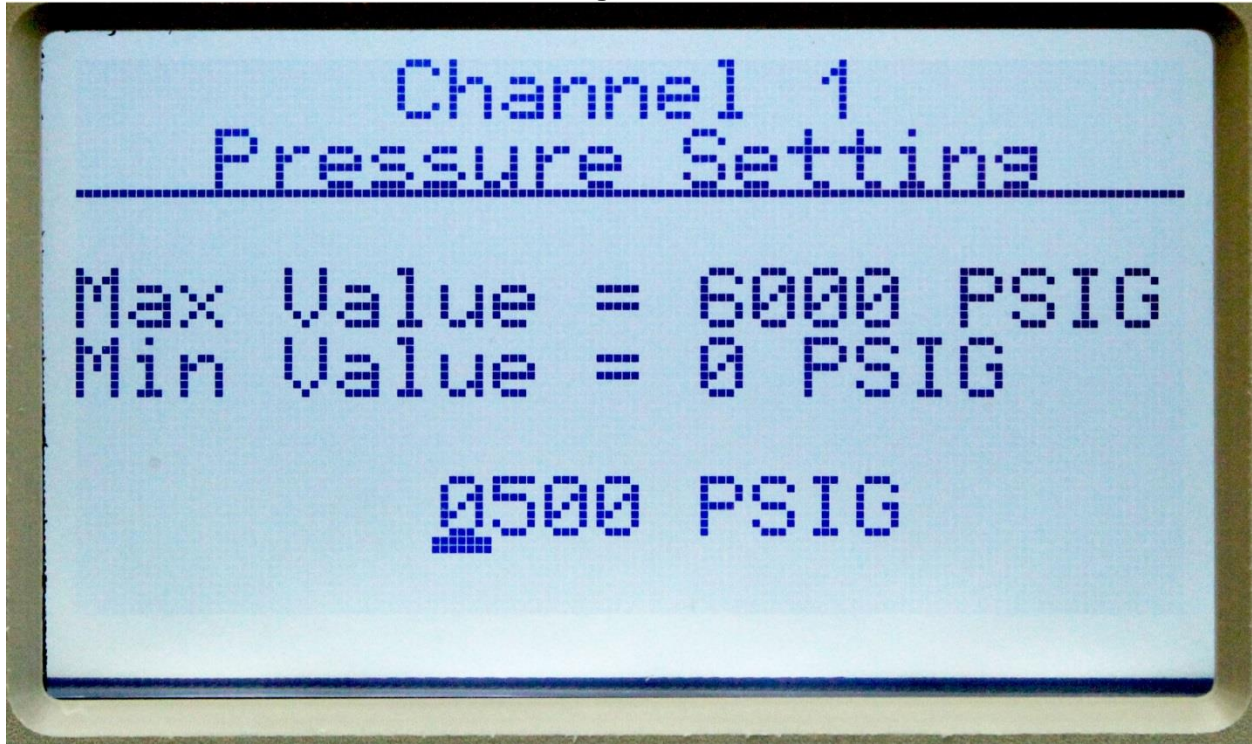


- Transducer/Over - Configures the specified channel to use the transducer or other 4-20mA signal input and causes the channel to alarm when the measured pressure rises above the alarm set point (see Alarm Set Point Section).
- Transducer/Under (DEFAULT) - Configures the specified channel to use the transducer or other 4-20mA signal input and causes the channel to alarm when the measured pressure falls below the alarm set point (see Alarm Set Point section).
- Switch/Closed - Configures the specified channel to use the contact closure input and causes the channel to alarm when the contact closes.
- Switch/Open - Configures the specified channel to use the contact closure input and causes the channel to alarm when the contact opens.
- Input Disabled - Disables the input so that the specified channel will not alarm, the corresponding LED turns off, and the LCD screen displays five dashes.

Alarm Set Point

Alarm Set Point determines the value at which the Altos 2™ will alarm when it is configured for Transducer (or other 4-20mA signal)/Over or Transducer (or other 4-20mA signal)/Under mode.

Figure 23

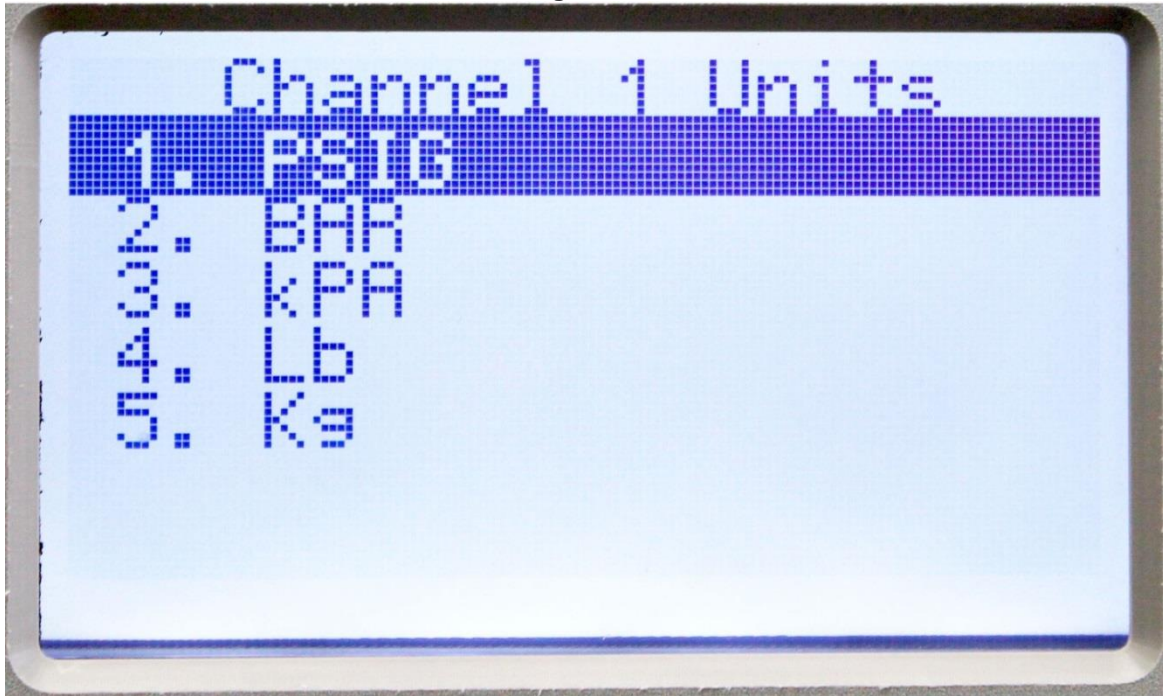


Pressing up or down on a particular digit will modify only the selected digit. To navigate between digits, press left or right. To save the selected setting, navigate to the far right digit and press right again. The Altos 2™ will not allow the user to select a value outside the maximum and minimum values displayed. The default value for this setting is 500 PSI.

Units of Measure

Units of Measure determines BAR, PSI, kPa, Lb, or Kg. Altos 2™ will display the selection for the specified channel. The default setting is PSI.

Figure 24



ALARM SETTINGS

The Alarm Configuration menu contains two global alarm choices: Alarm Delay and Blink.

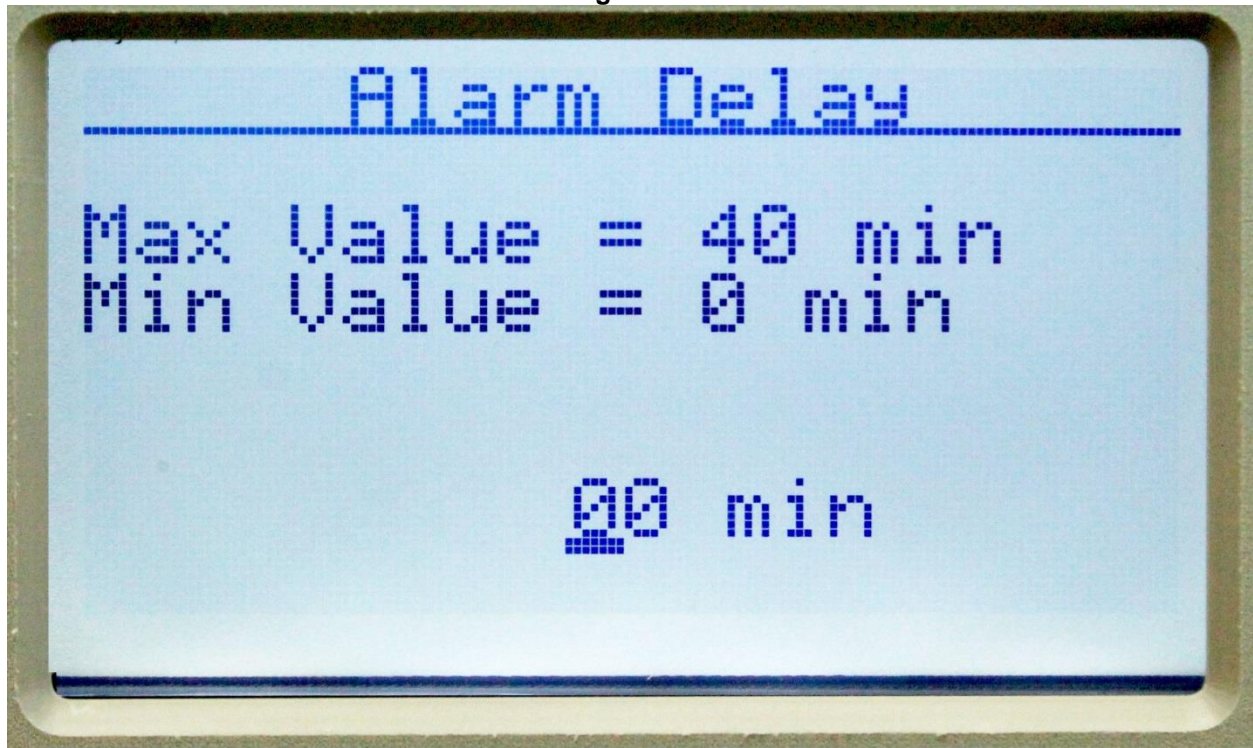
Figure 25



Alarm Delay

Alarm Delay specifies the number of minutes after an alarm condition is detected for the Altos 2™ to display an alarm condition.

Figure 26

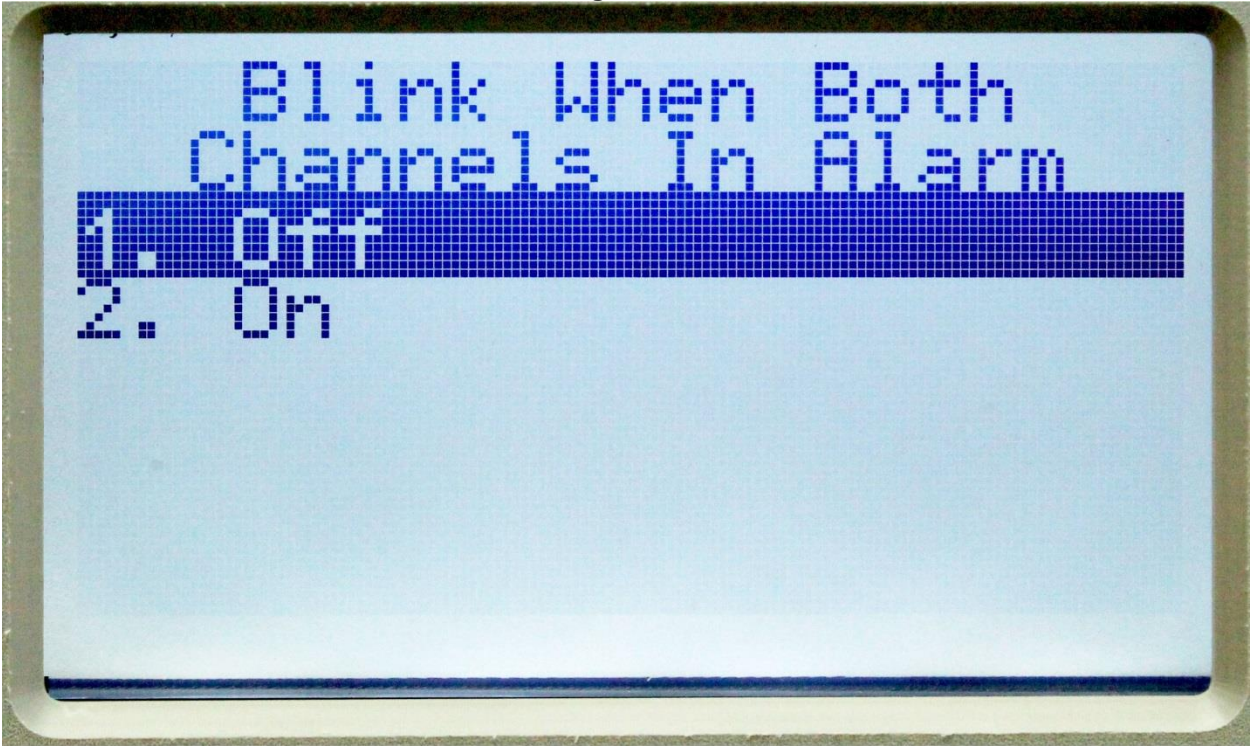


Pressing up or down on a particular digit will modify only the selected digit. To navigate between digits press left or right. To save the selected setting, navigate to the far right digit and press right again. The Altos 2™ will not allow the user to select a value outside the maximum and minimum values displayed. The default value for this setting is 0 minutes.

Blink When Both In Alarm

Blink When Both in Alarm causes the red alarm LEDs to blink when both channels are in alarm. The default setting is OFF.

Figure 27



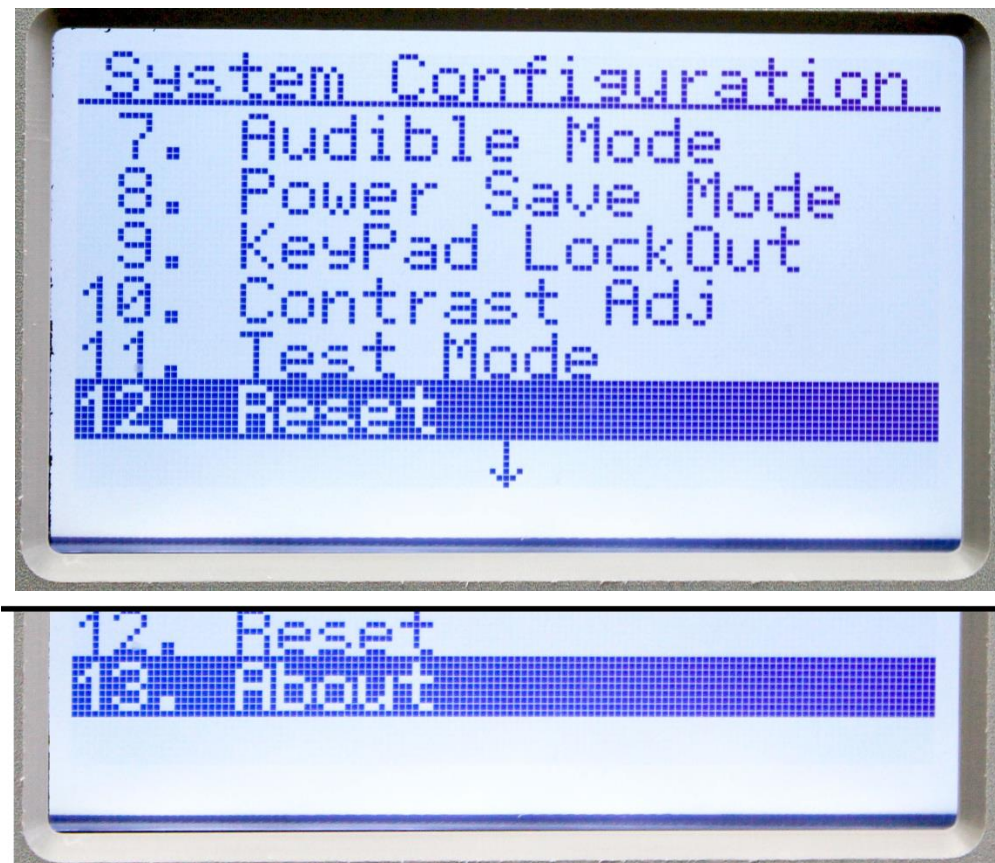
SYSTEM SETTINGS

The System Configuration menus contain twelve settings: Set Ch1 Offset, Set Ch2 Offset, Set Ch1 Max, Set Ch2 Max, Deadband Ch1, Deadband Ch2, Audible Mode, Power Save Mode, Keypad Lockout, Test Mode, Reset, and About.

Figure 28



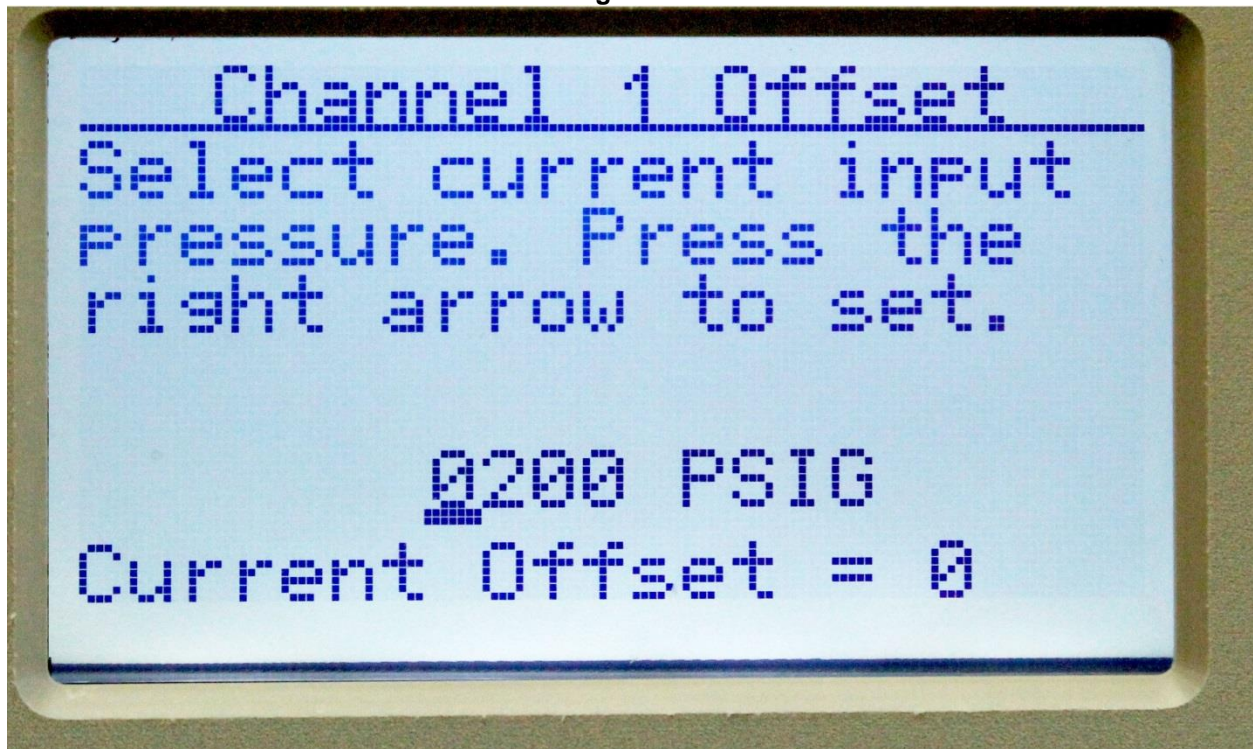
Figure 29



Set Channel Offset

The Offset specified for a channel calibrates the 4-20mA signal for the specified input.

Figure 30

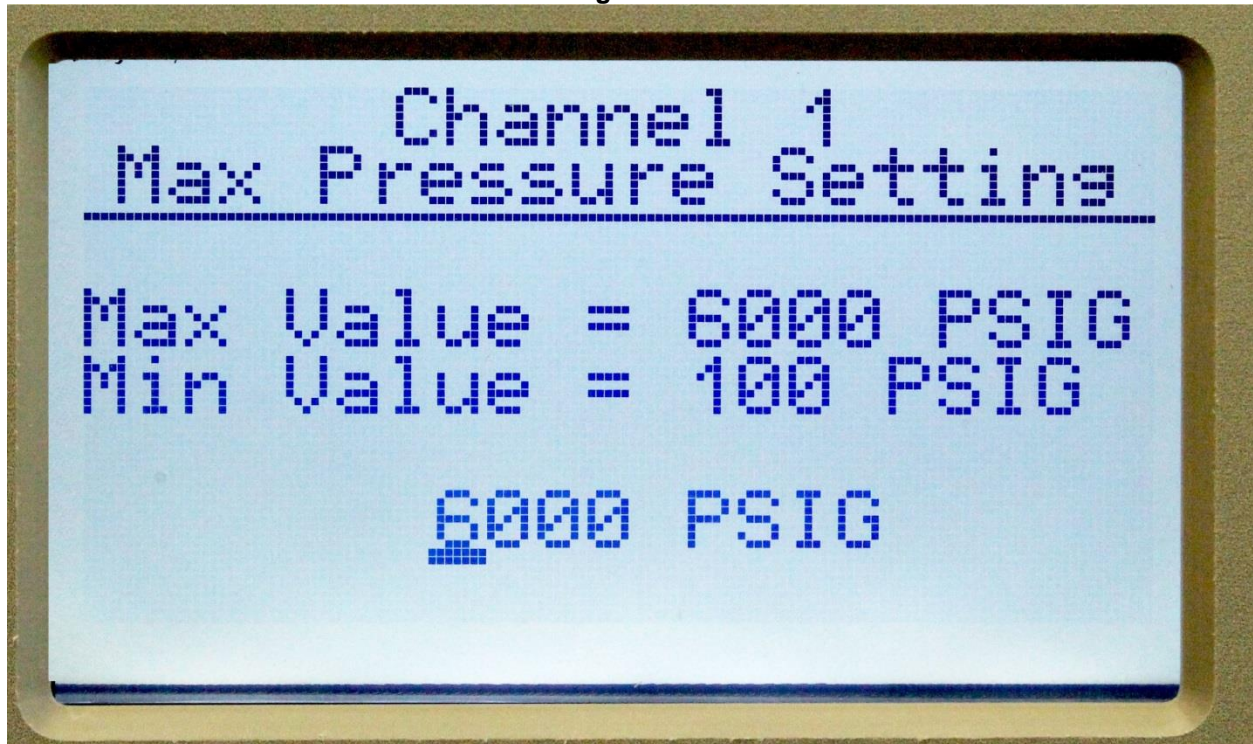


To calibrate the transducer or other 4-20mA signal, apply a pressure or weight greater than zero but less than the maximum sensor rating. Pressing up or down on a particular digit will modify only the selected digit. To navigate between digits, press left or right. To save the selected setting, navigate to the far right digit and press right again. The Altos 2™ will not allow the user to select a value outside the maximum and minimum values displayed. The default value for this setting is 0.

Set Channel Max

The Max Pressure Setting specified for a channel configures the maximum pressure rating for the specified pressure transducer or other 4-20mA signal.

Figure 31



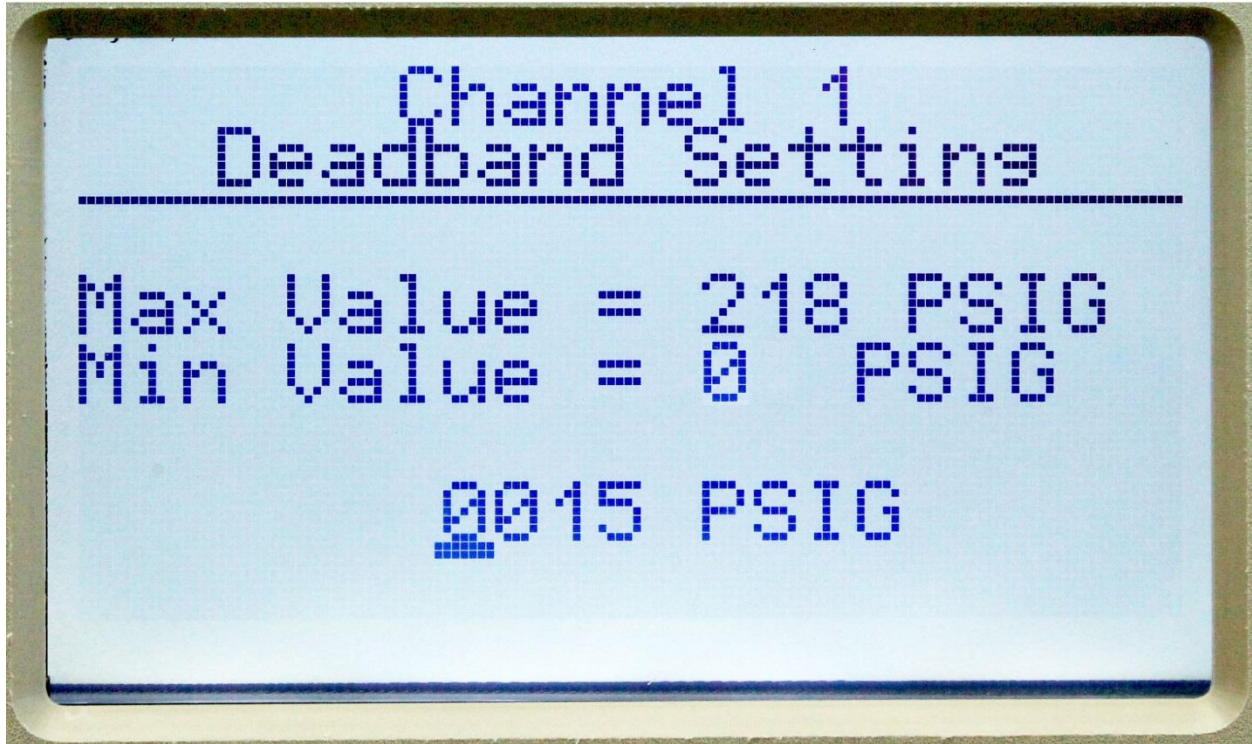
Pressing up or down on a particular digit will modify only the selected digit. To navigate between digits, press left or right. To save the selected setting, navigate to the far right digit and press right again. The default value for this setting is 6000 PSI.

WARNING: Changing this value to a value that does not match the actual range of the transducer used will result in invalid pressure readings.

Deadband

The Deadband specified for a channel configures the value that the specified channel units must rise above or fall below the alarm set point to clear the channel alarm (depending on the Input/Alarm Condition).

Figure 32

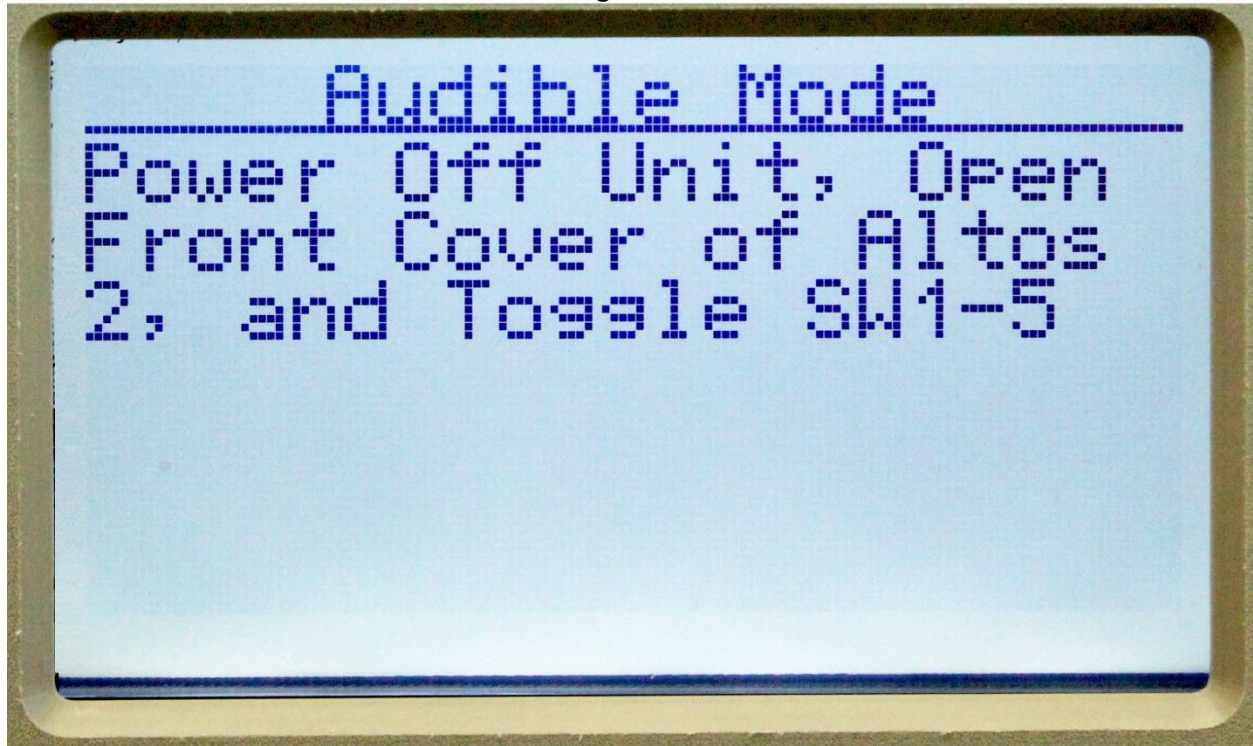


Pressing up or down on a particular digit will modify only the selected digit. To navigate between digits, press left or right. To save the selected setting, navigate to the far right digit and press right again. The Altos 2™ will not allow the user to select a value outside the maximum and minimum values displayed. The default value for this setting is 15 PSI.

Audible Mode

Audible Mode provides instructions on how to change the audible mode. Default is ON.

Figure 33

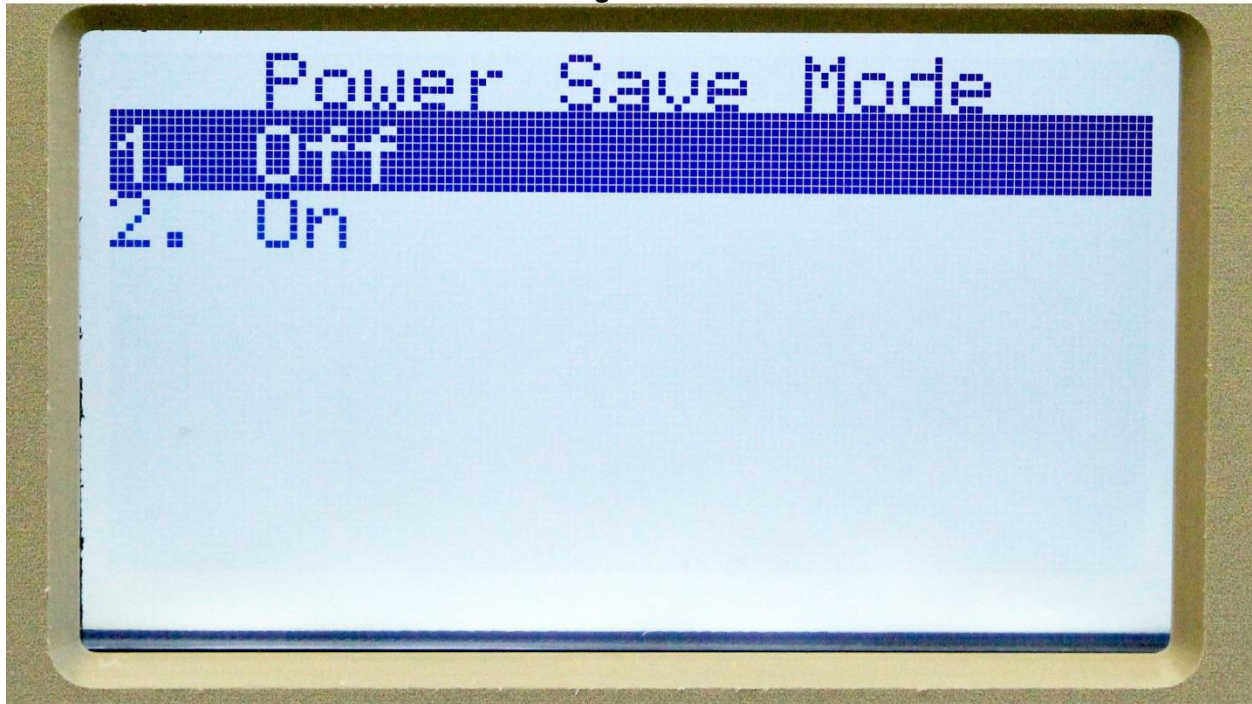


WARNING: *If audible mode is enabled, each navigational button press results in a chirping sound. If audible mode is disabled the speaker is completely silent.*

Power Save Mode

Power Save Mode, when enabled, turns off the LCD screen after fifteen minutes of inactivity. (When the screen is off the unit will still alarm as normal.) Pressing any button on the front cover will wake the unit up when in power save. Default Mode is OFF.

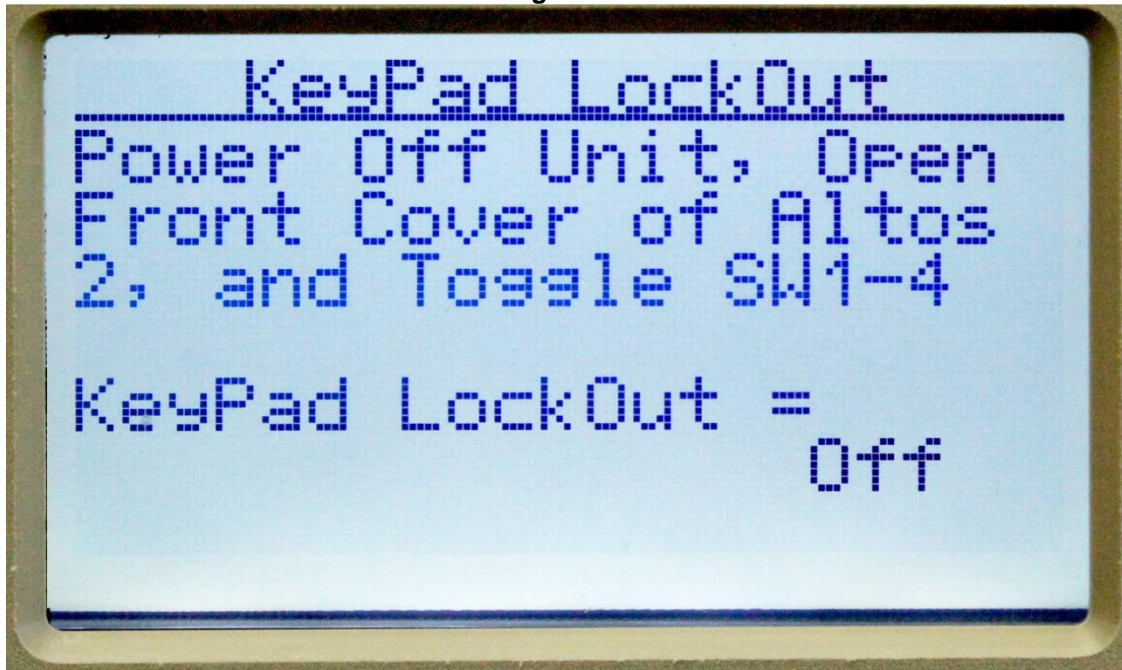
Figure 34



Keypad Lockout

Keypad Lockout provides instructions for changing the Keypad Lockout mode. Default Mode is OFF.

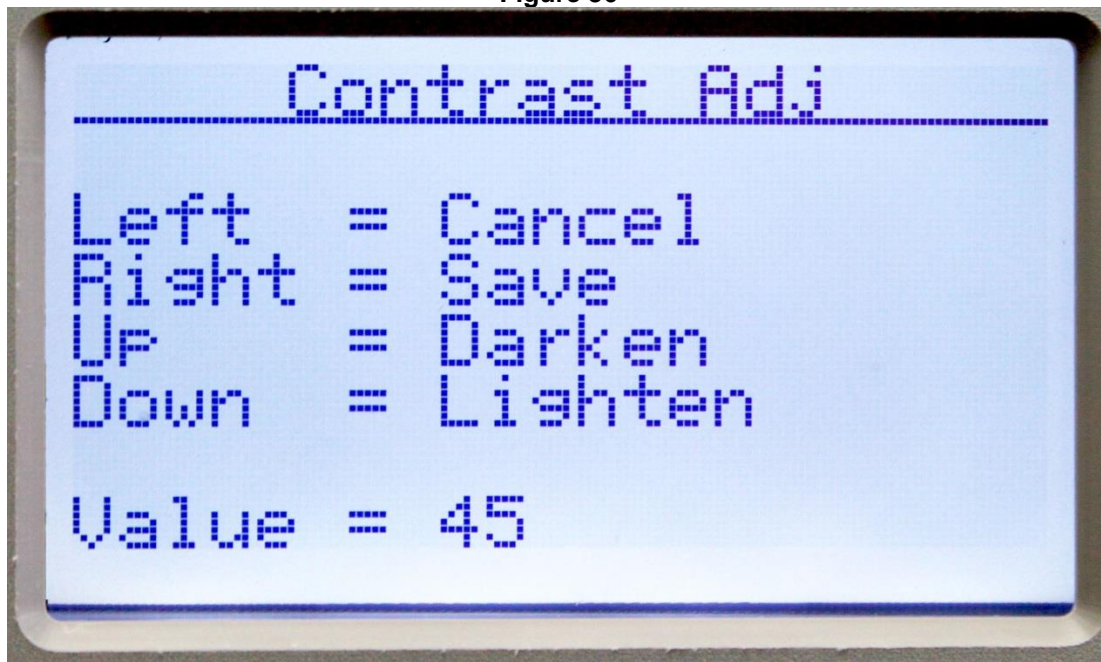
Figure 35



Contrast

Contrast adjustment allows the screen contrast to be adjusted on the Altos 2™ alarm display. Pressing the up or down buttons will increase or decrease the contrast ratio of the screen. The default factory value is 45. The value can be adjusted between 30 (the lightest) and 58 (the darkest). To save the selected ratio, press the right button.

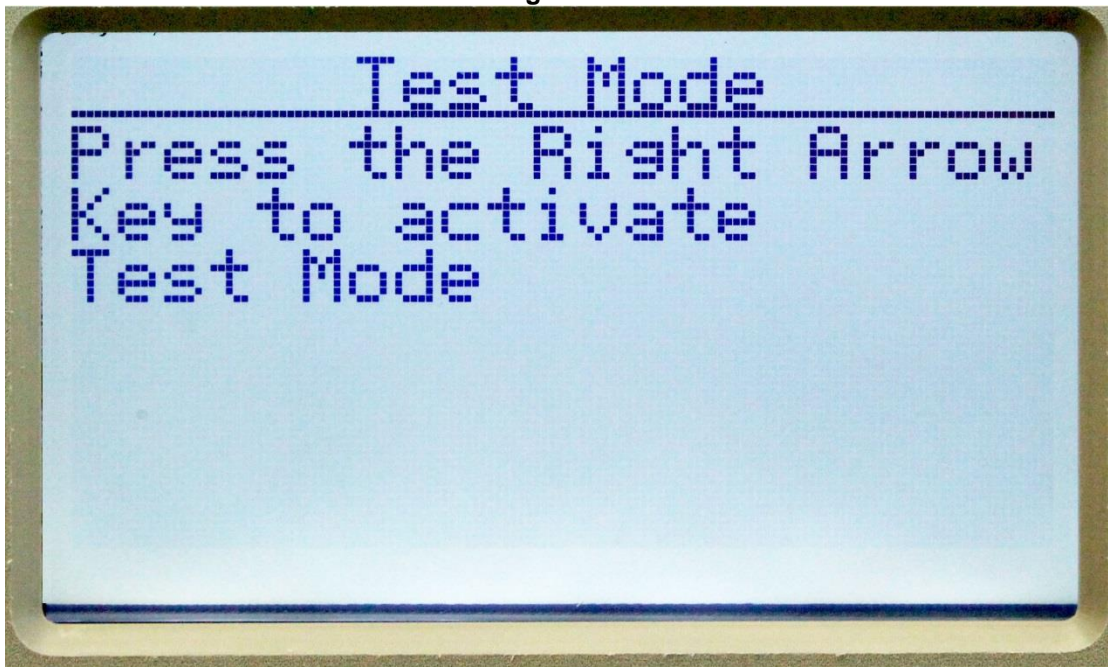
Figure 36



Test Mode

Test Mode provides instructions for enabling Test Mode. Test Mode toggles all LED's, speakers and relays as well as displays the Altos logo to test proper operation of the unit. When Test Mode completes ten iterations, the unit returns to the status screen.

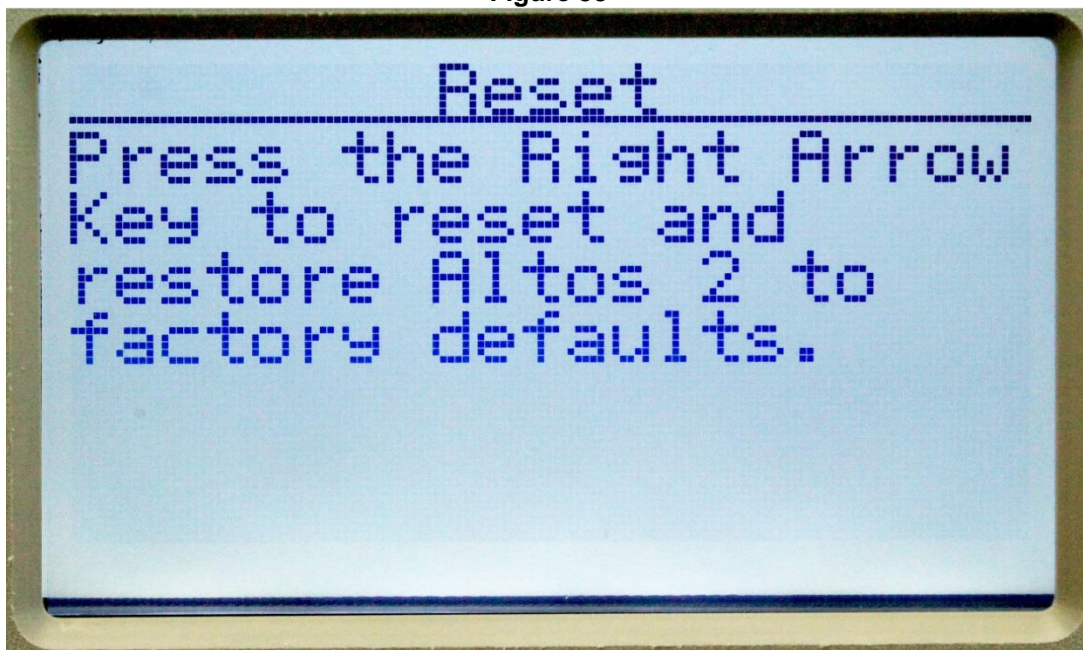
Figure 37



Reset

Activating Reset restores all parameters to the factory default state and resets the device.

Figure 38



About

The about screen displays the system part number as well as the installed software version.

Figure 39



TROUBLESHOOTING

Symptom	Possible Cause	Possible Solution
No display or status lights.	<ul style="list-style-type: none"> • No power to the system. • Check that the power source is live. • Power connections came loose from electronic control board. 	<ul style="list-style-type: none"> • Restore power. • Restore power connections to electronic control board • Replace electronic control board.
The pressure readings are incorrect on the system display.	<ul style="list-style-type: none"> • Transducer is not properly calibrated • Transducer connection came loose from the electronic control board • Transducer cable is damaged • Transducer is not working properly 	<ul style="list-style-type: none"> • Recalibrate the transducer using the Ch Offset option under the System menu • Restore transducer connections to electronic control board • Replace transducer cable • Replace transducer • Replace electronic control board
There pressure switch status is not displaying properly	<ul style="list-style-type: none"> • Pressure switch connection came loose • Pressure switch is damaged 	<ul style="list-style-type: none"> • Restore pressure switch connections • Replace pressure switch • Replace electronic control board
Output relays not functioning	<ul style="list-style-type: none"> • Remote monitoring system is not powered. • Wiring between the Altos 2™ output relays and the remote monitoring system is not correct. 	<ul style="list-style-type: none"> • Check that the remote system is powered on • Check wiring between Altos 2™ output relays and remote monitoring system.

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CE DECLARATION OF CONFORMITY
In accordance with ISO/IEC 17050

The *Altos 2 System Monitor* is compliant with the CE directives and standards listed below:

Directives:

- **Electromagnetic Compatibility (89/336/EC)**
- **Low-Voltage (2006/95/EC)**
- **RoHS (2002/95/EC)**

Standards:

- **EMC: EN61000-6-2:2001**
- **EMC: EN61000-6-4:2001**
- **Safety: EN 61010-1**



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