ADI 9531-J

CONCOA®
PRECISION GAS CONTROLS
Certified ISO 9001

Advantium 16 System Monitor

INSTALLATION AND OPERATING INSTRUCTIONS

Carefully Read These Instructions Before Operating

Controls Corporation of America
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CE

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Revision J

SAFETY

⚠ CAUTION

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

- While the Advantium16 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 Advantium16 where the ambient temperature range is between 0° F (-18° C) and 140° F (60° C).
- 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

Index

Power Requirements 4
Alarm Output Relay Specifications 4
Understanding Alarm Operation 4
Mounting Requirements 5
Installation Instructions 6
Connecting External Input Devices to the Advantium 16 6
Alarm Inputs and Product Hookup Overview 7
Wiring Diagrams for Various CONCOA Products 8-12
Connecting Alarm Outputs 12
Table 1 – Cable Information 13
Setting Remote Alarm Outputs 14
Table 2 – Jumper Settings 15
Muting Audible Alarm 16
Real Time Clock 16
Configuration Using the Webserver 17
Status Page 17
View Settings Page 18
Change Settings Tab 19
- Configuration Page 19
- Inputs Page 20
- Input Groups Page 21
- Output Relays Page 22
- E-mail Alerts Page 23-24

Security Page 25
Networking Page 26
Warranty Information 27
CE Declaration of Conformity 28

POWER REQUIREMENTS

Input Voltage: External Power Supply

Universal input voltage 100-240 VAC, 50/60Hz.

Power Consumption: 8 watts

ALARM OUTPUT RELAY SPECIFICATIONS:

Contacts: Normally Open/ Normally Closed (selectable) Dry Contact

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

UNDERSTANDING ALARM OPERATION

Figure 1

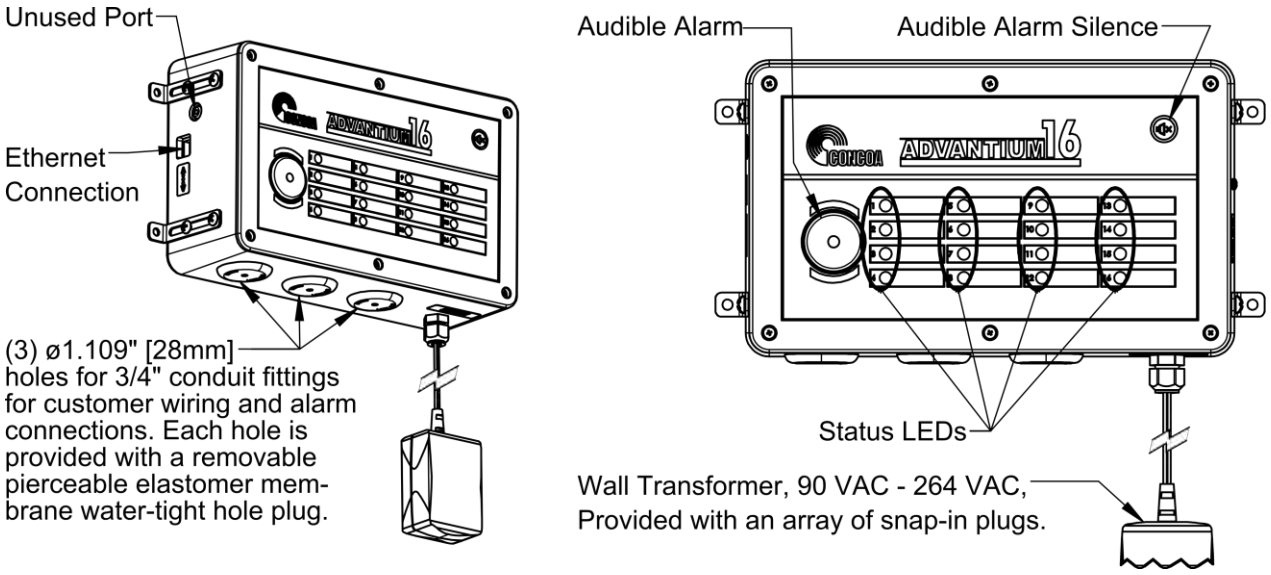


Figure 1 shows the location of the various inputs, outputs and indicators for the Advantium 16. The Advantium 16 has a universal power supply.

Input signals coming from external devices are connected to the Advantium 16 via individual wires through a ¾" conduit connection to a terminal strip.

The Advantium 16 provides output relay signals to indicate the state of 18 user defined alarms. These signals are brought out through the relay contacts terminal connector. The relay contacts terminal section consists of 9 terminal blocks. Each terminal block contains two relay output signals and a shared common voltage input. The Advantium 16 is factory set so that these output signals are brought out through Normally Closed (N.C.) contacts.

Output relay signals are routed from the Advantium 16's terminal strip via individual wires through ¾" conduit connections on the bottom/left side.

These contacts can be changed if needed to Normally Open. Refer to the section in this manual “Changing Output Relay Contacts”.

Figure 1 shows a view of the front panel. It is laid out with sixteen status lights representing 16 signal inputs. The indicator lights are bi-colored LEDs. This means that the same light can be turned ON as either a green indicator or a red indicator. A green LED indicates a normal condition while a red LED indicates an alarm condition. A blinking red LED indicates an alarm condition for all members of the group for which the input is configured.

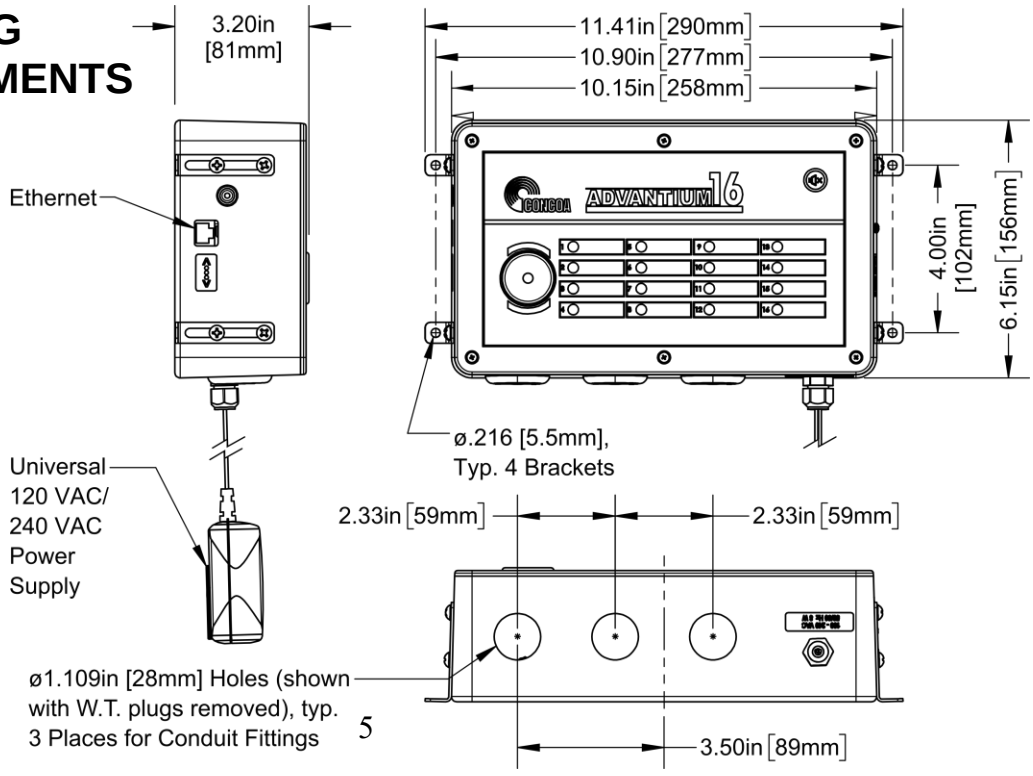
On the left side of the front panel is an audible speaker. This speaker is used to provide an audible indication of an alarm condition. In the upper right portion of the front panel is an alarm silence button. This button allows the operator to silence the audible alarm even though an alarm condition still exists. This button is also used to permanently enable or disable the audible alarm. The button must be pressed for 5 seconds to permanently enable or disable the audible alarm.

The Advantium16 supplies a +12V DC signal to the input terminal connectors. This serves as a common supply voltage for the external inputs. The Advantium16 uses Normally Closed (N.C.) contact signals by default from the external inputs to determine the state of the alarms. The normal-conditions of these alarms are customizable via the web interface.

If there are no alarm conditions, the Advantium16 will turn ON the green indicator next to the status being monitored. When an alarm condition occurs, the corresponding contact inside the Advantium 16 opens. This “open” condition is sensed by the Advantium16, changing the color of the indicator next to its status from Green to Red. If enabled, at the same time the audible buzzer in the Advantium 16 will begin to sound. The set of contacts representing this alarm condition will alarm in the relay output section of the Advantium 16. The corresponding status LED’s will turn RED. If the corresponding Input is a member of a group (see Input Groups Page for details) and all the other members of the group are also in alarm, the LED will blink RED.

MOUNTING REQUIREMENTS

Figure 2

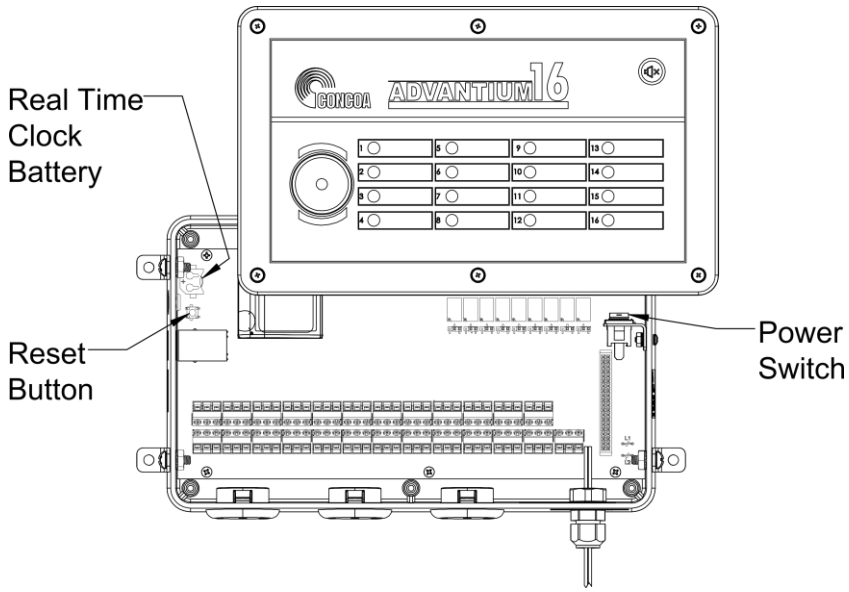


INSTALLATION INSTRUCTIONS

After mounting the Advantium16 to the wall, wire any monitored devices through a conduit connection and to the input terminal blocks (see Figures 3-12). If using the output of the Advantium16 to connect to another alarm or system, attach wires to the output terminal blocks (see Figure 13).

Turn Advantium16 ON by plugging the unit directly into a wall outlet and turning the power switch on the inside behind the front cover to the ON position. The system may be tested once it is connected to an external device by tripping the external alarm seeing the corresponding input LED turn red.

Figure 3



CONNECTING EXTERNAL INPUT DEVICES TO THE ADVANTIUM 16

The Advantium 16 is designed to interface with up to 16 external pressure switches or any dry contact inputs. The external device wires (+12V DC out, signal in) are brought in through a conduit connector on the bottom/left side of the box and connected to terminal blocks on the left hand side of the circuit board. Figures 4-12 outline how to connect various CONOCA products to the Advantium 16.

The recommended cable for this assembly is 18-26 AWG wire (Alpha # 1176C or equivalent). The length of each cable should be limited to 1500 feet.

Cut the cable to length. Remove the outer jacket of the cable 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.

Figure 4

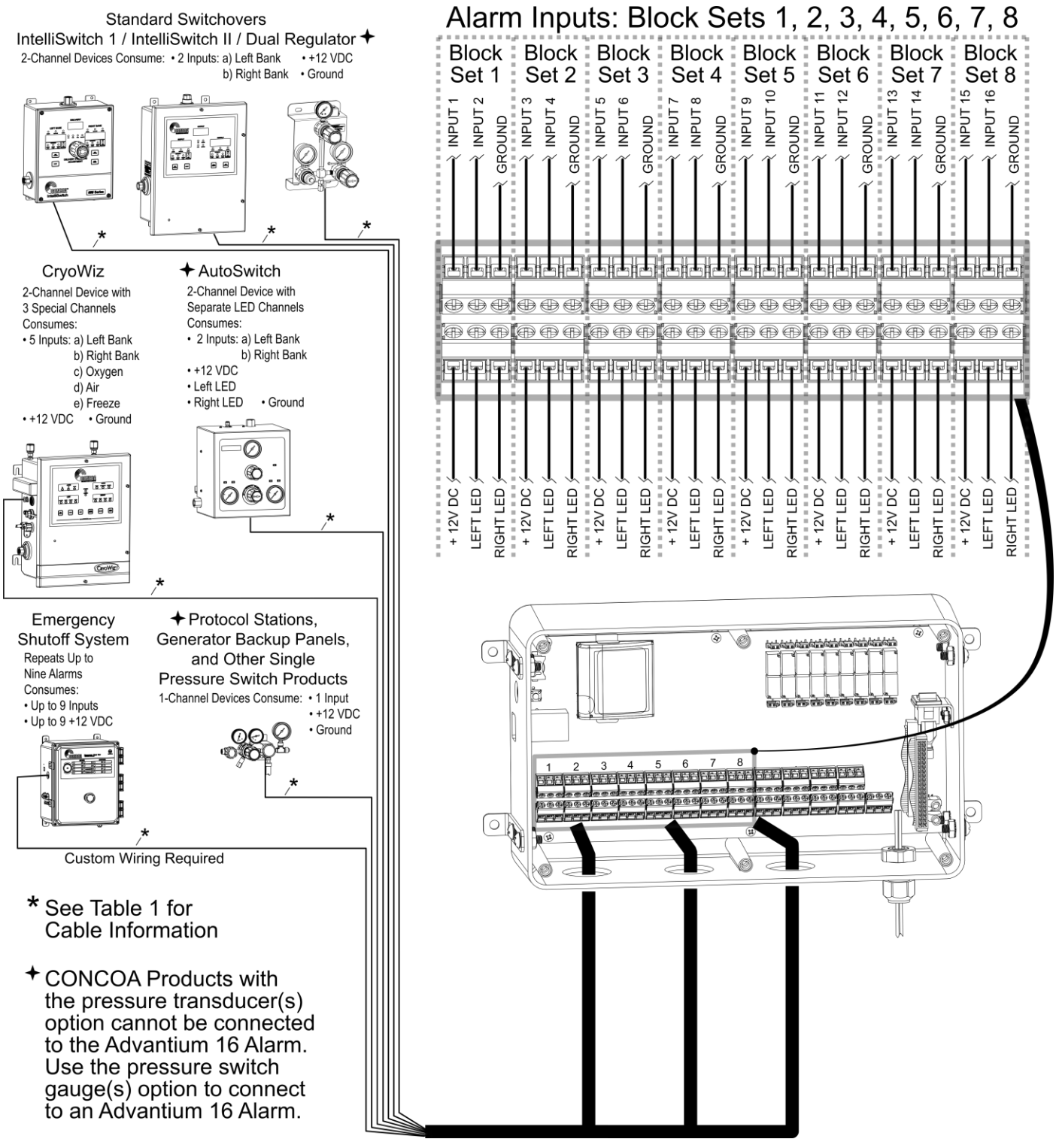

Standard Switchovers
IntelliSwitch 1 / IntelliSwitch II / Dual Regulator ✦
2-Channel Devices Consume: • 2 Inputs: a) Left Bank b) Right Bank • +12 VDC • Ground
CryoWiz
2-Channel Device with 3 Special Channels Consumes:
• 5 Inputs: a) Left Bank b) Right Bank c) Oxygen d) Air e) Freeze
• +12 VDC • Ground
✦ AutoSwitch
2-Channel Device with Separate LED Channels Consumes:
• 2 Inputs: a) Left Bank b) Right Bank
• +12 VDC
• Left LED
• Right LED • Ground
Emergency Shutoff System
Repeats Up to Nine Alarms Consumes:
• Up to 9 Inputs
• Up to 9 +12 VDC
✦ Protocol Stations, Generator Backup Panels, and Other Single Pressure Switch Products
1-Channel Devices Consume: • 1 Input • +12 VDC • Ground
Custom Wiring Required
* See Table 1 for Cable Information
✦ CONCOA Products with the pressure transducer(s) option cannot be connected to the Advantium 16 Alarm. Use the pressure switch gauge(s) option to connect to an Advantium 16 Alarm.
Alarm Inputs: Block Sets 1, 2, 3, 4, 5, 6, 7, 8
Block Set 1
Block Set 2
Block Set 3
Block Set 4
Block Set 5
Block Set 6
Block Set 7
Block Set 8
INPUT 1
INPUT 2
GROUND
INPUT 3
INPUT 4
INPUT 5
INPUT 6
INPUT 7
INPUT 8
INPUT 9
INPUT 10
INPUT 11
INPUT 12
INPUT 13
INPUT 14
INPUT 15
INPUT 16
+ 12V DC
LEFT LED
RIGHT LED
1 2 3 4 5 6 7 8

Figure 5

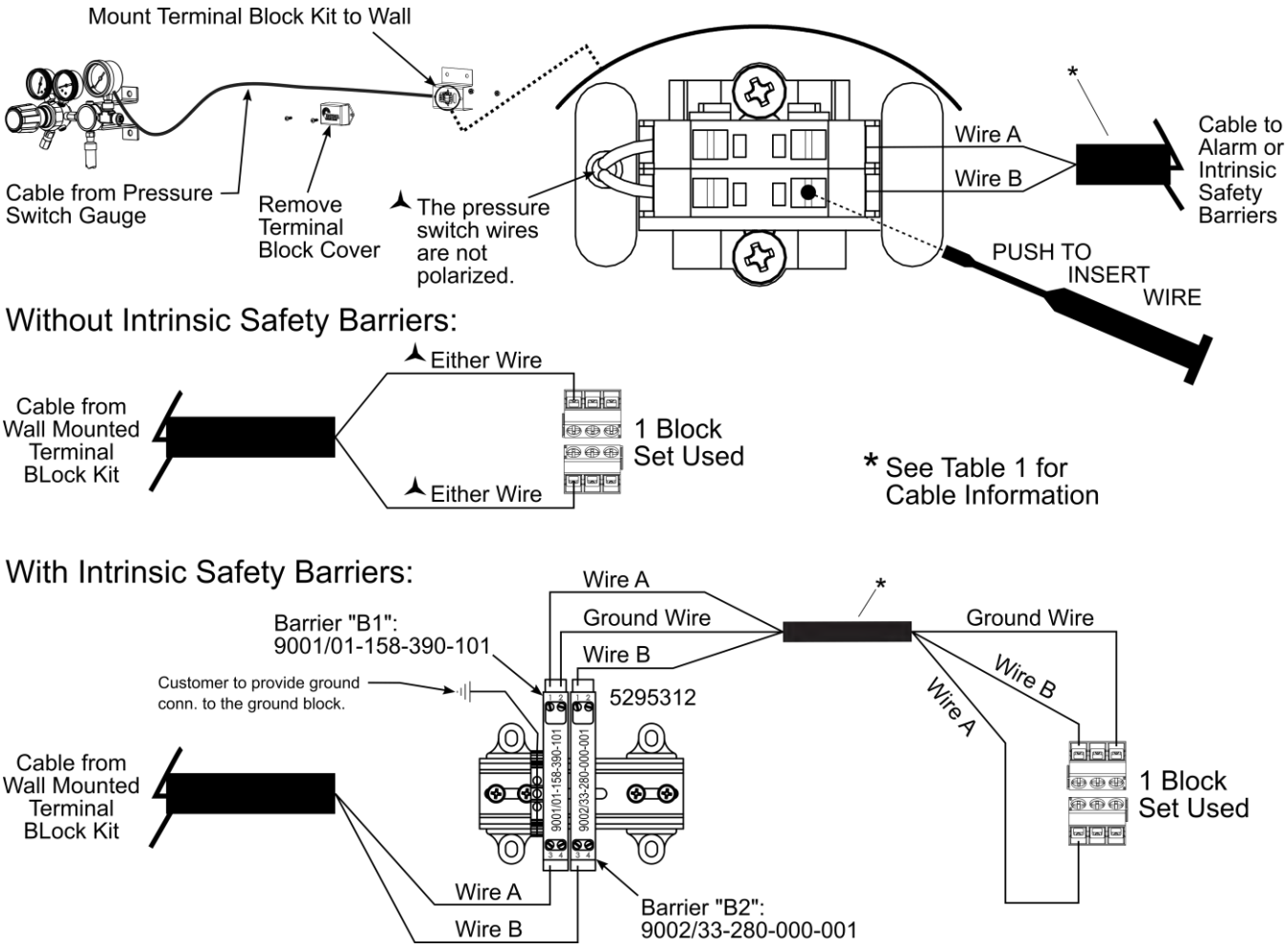
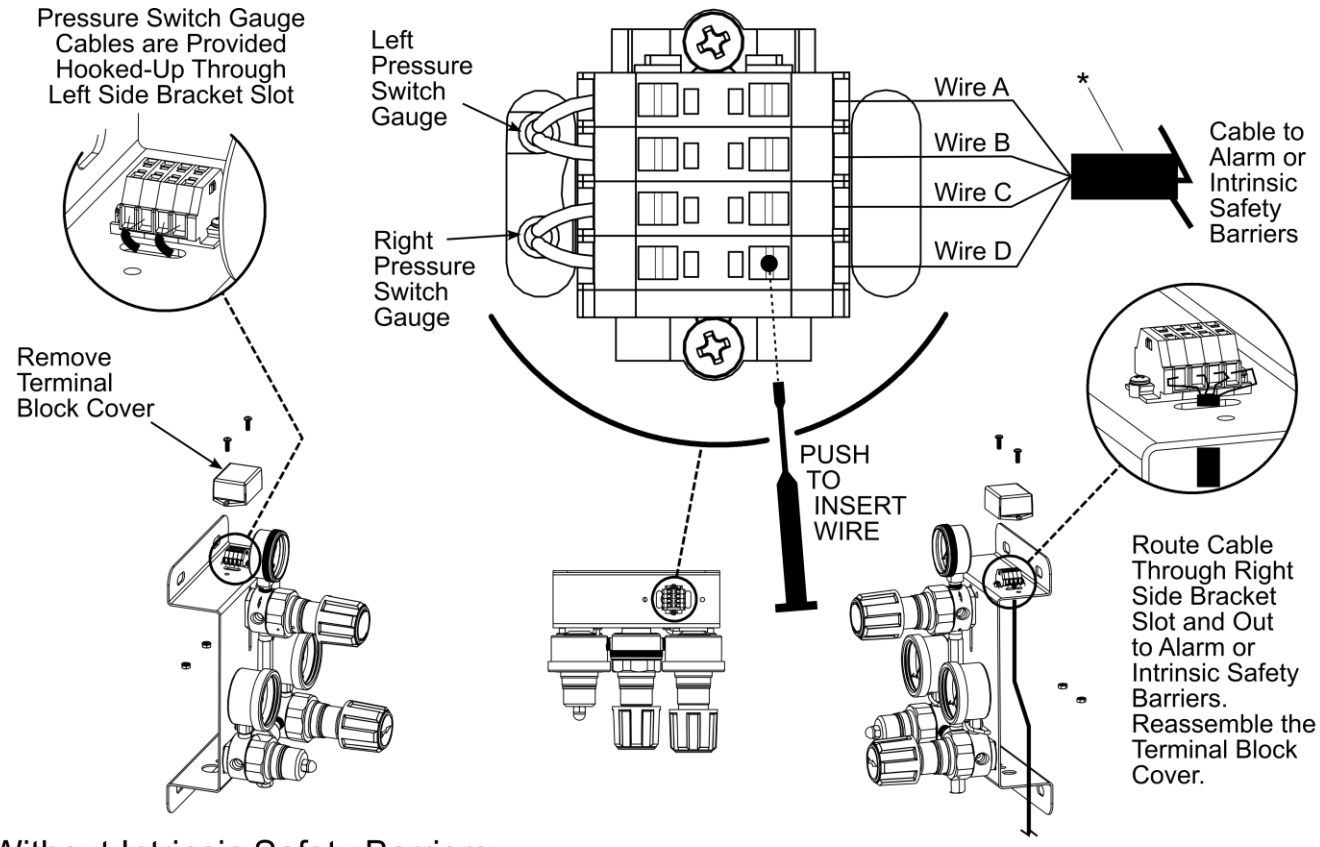
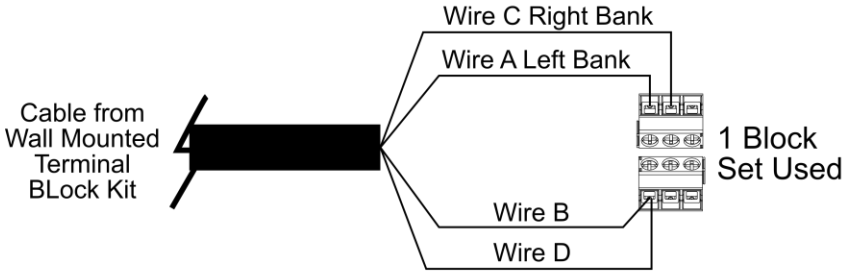

Mount Terminal Block Kit to Wall
Cable from Pressure Switch Gauge
Remove Terminal Block Cover
The pressure switch wires are not polarized.
Wire A
Wire B
*
Cable to Alarm or Intrinsic Safety Barriers
PUSH TO INSERT WIRE
Without Intrinsic Safety Barriers:
Either Wire
Cable from Wall Mounted Terminal BLock Kit
1 Block Set Used
Either Wire
* See Table 1 for Cable Information
With Intrinsic Safety Barriers:
Wire A
Ground Wire
Wire B
Barrier "B1": 9001/01-158-390-101
Customer to provide ground conn. to the ground block.
5295312
Ground Wire
Wire B
Wire A
Cable from Wall Mounted Terminal BLock Kit
9001/01-158-390-101
9002/33-280-000-001
1 Block Set Used
Wire A
Wire B
Barrier "B2": 9002/33-280-000-001

Figure 6



Without Intrinsic Safety Barriers:



* See Table 1 for Cable Information

With Intrinsic Safety Barriers:

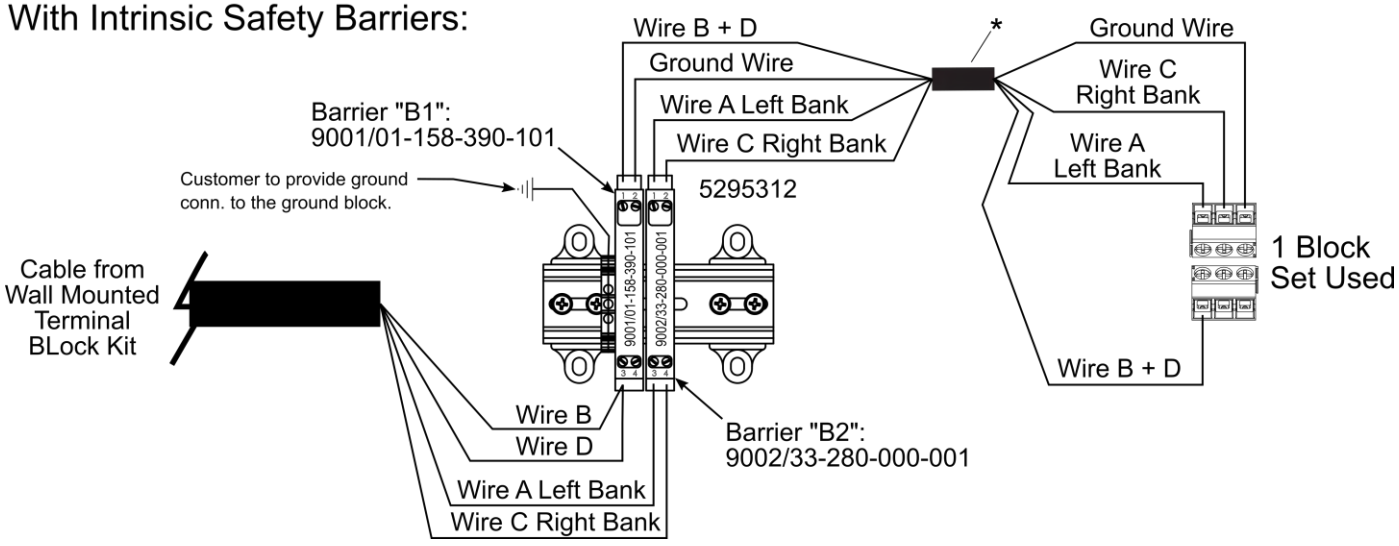


Figure 7

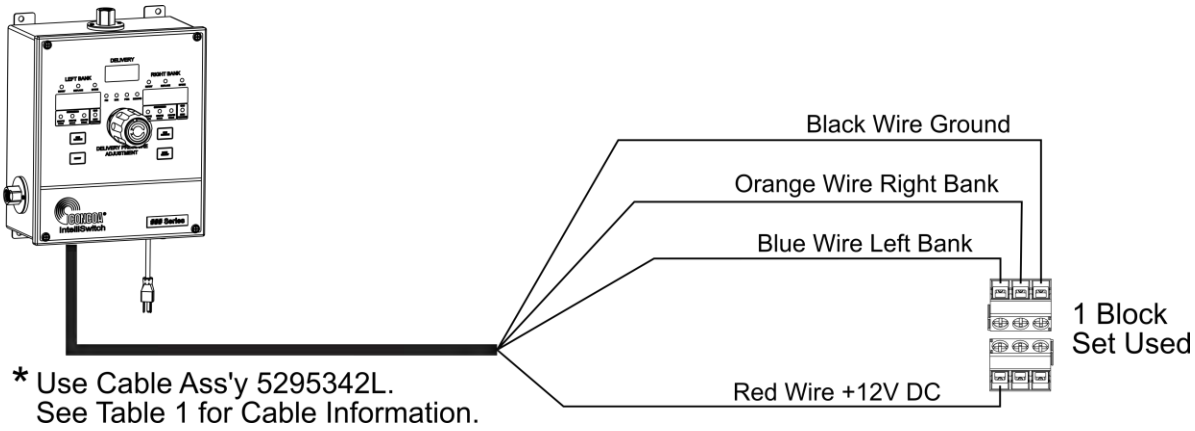


Figure 8

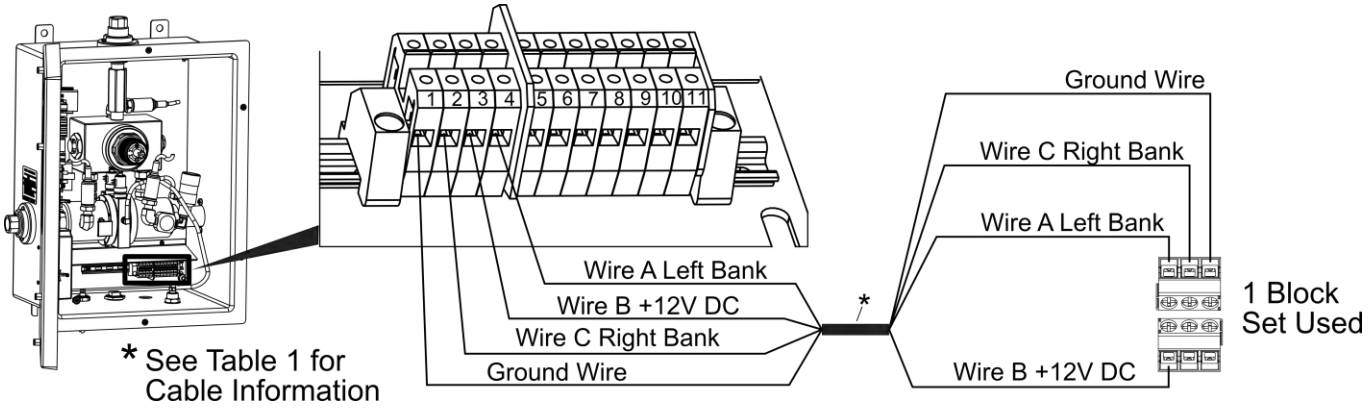


Figure 9

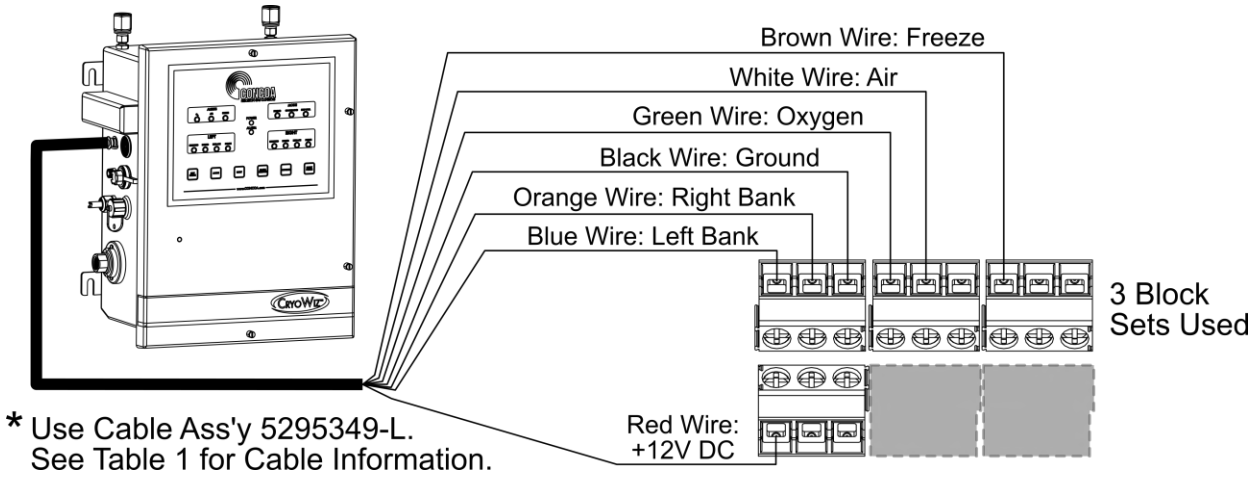
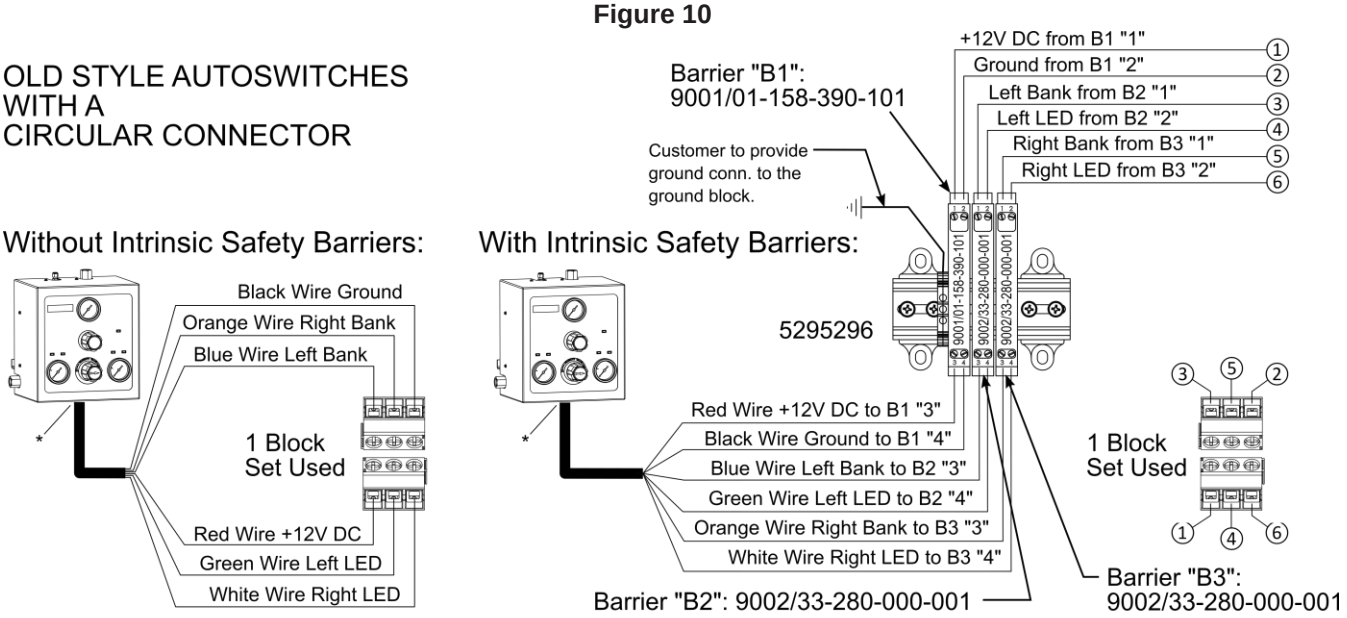


Figure 10

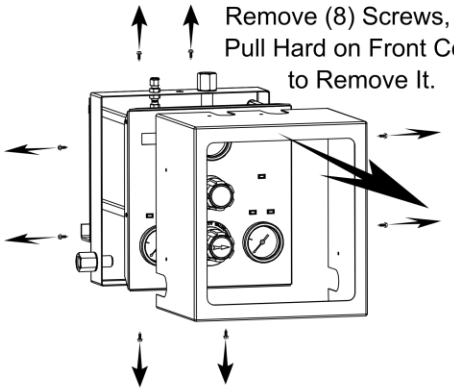
OLD STYLE AUTOSWITCHES
WITH A
CIRCULAR CONNECTOR

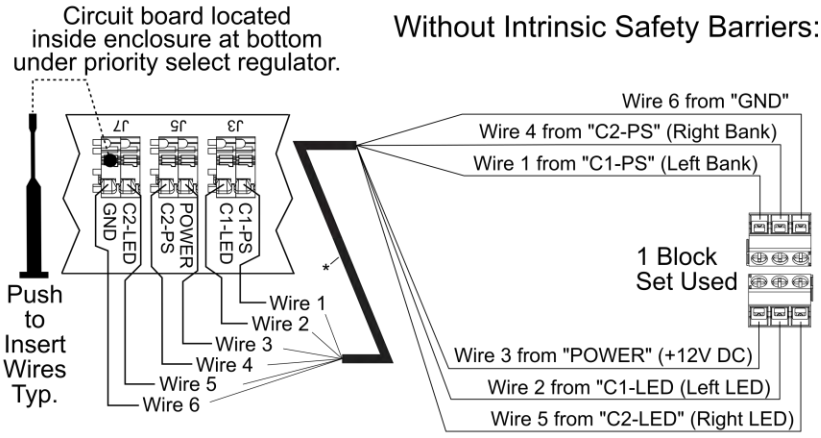


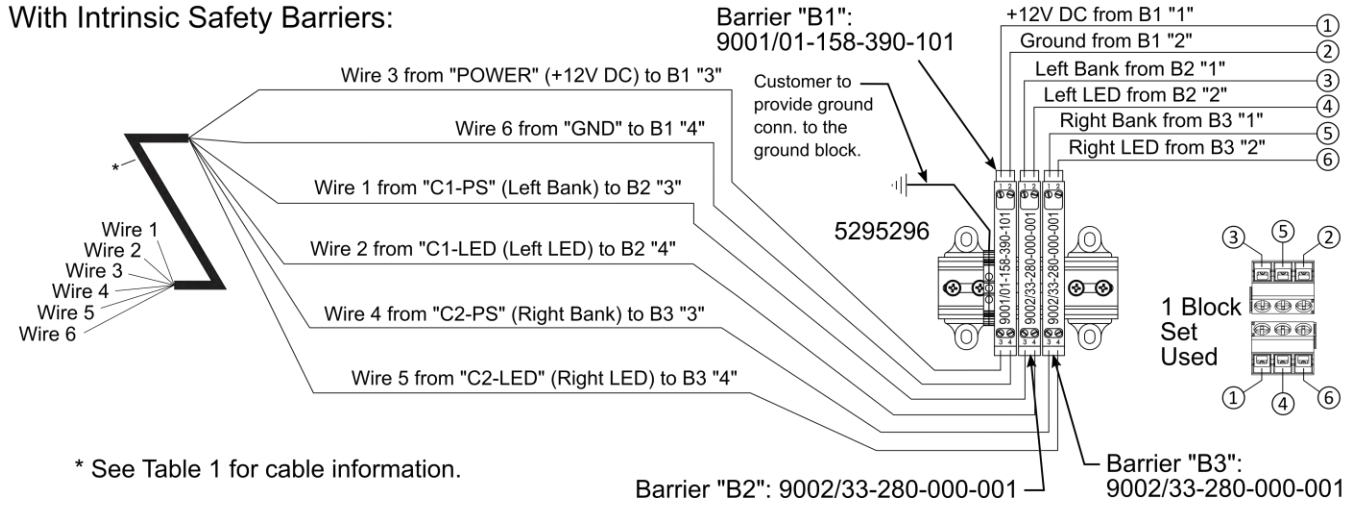
* Circular connector on AutoSwitch requires use of cable 5295342-L. See Table 1 for cable information.

Figure 11

NEW STYLE AUTOSWITCHES WITH
INTERNAL CIRCUIT BOARD INSTEAD
OF CIRCULAR CONNECTOR



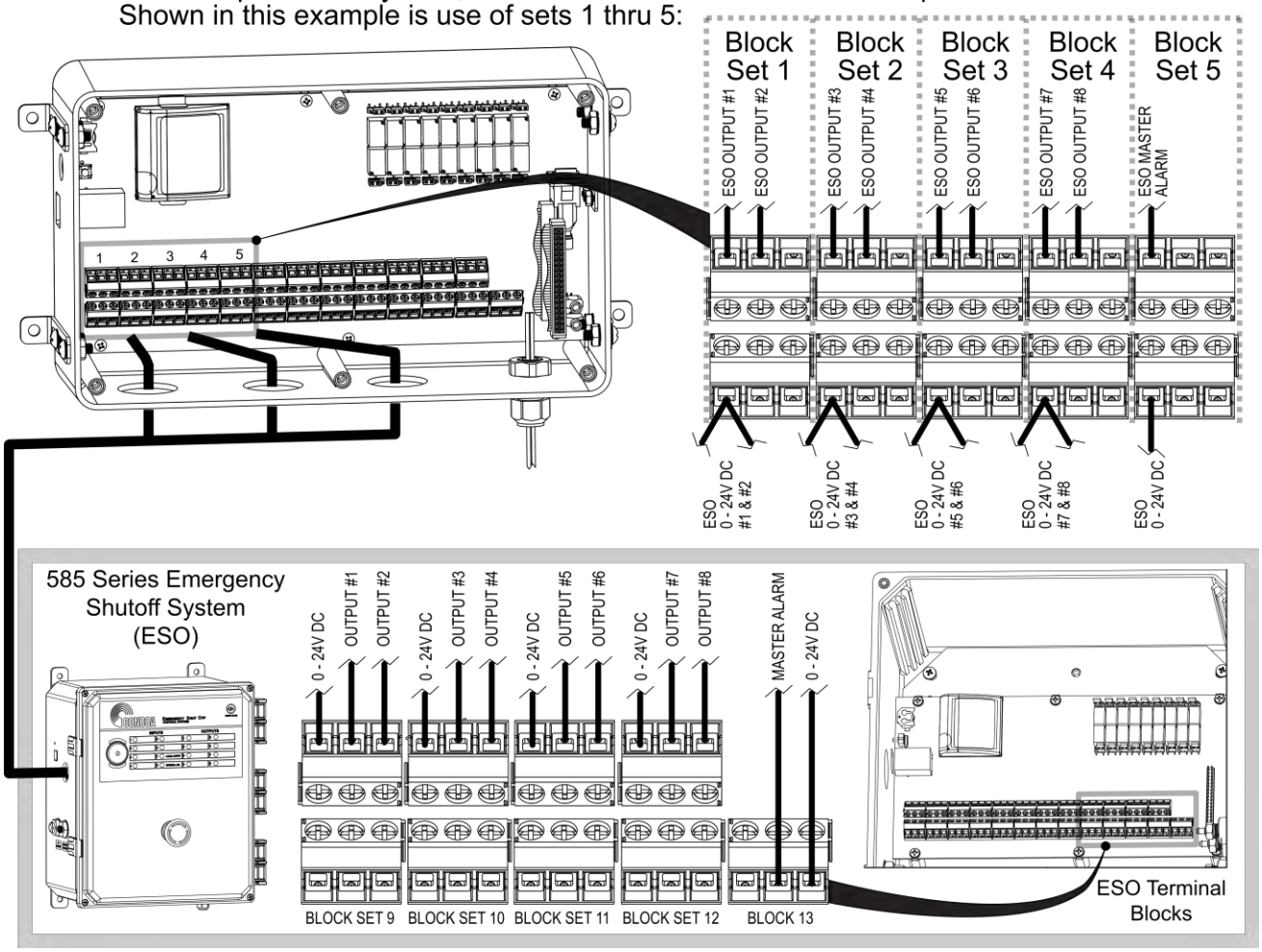




* See Table 1 for cable information.

Figure 12

Note: To hook up an ESO system, 5 of the 8 terminal block sets are required.
Shown in this example is use of sets 1 thru 5:



CONNECTING ALARM OUTPUTS

The Advantium 16 provides output signals corresponding to the alarm conditions that it senses. These signals are presented through relay contacts and are brought out to terminal connectors on the right hand side of the circuit board connector at the bottom of the alarm. They are then routed through a conduit connector on the bottom/left side of the box (See Figure 13). The relay contacts are configurable. They are factory set as Normally Closed (N.C.) but may be changed to Normally Open (N.O.) if needed. Refer to the Section "Setting Remote Alarm Outputs" in the manual for the procedure.

The recommended cable for making an output cable assembly is 18-26 AWG. The length of each cable should be limited to 1500 feet.

Cut the cable to length. Remove the outer jacket of the cable 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.

Figure 13

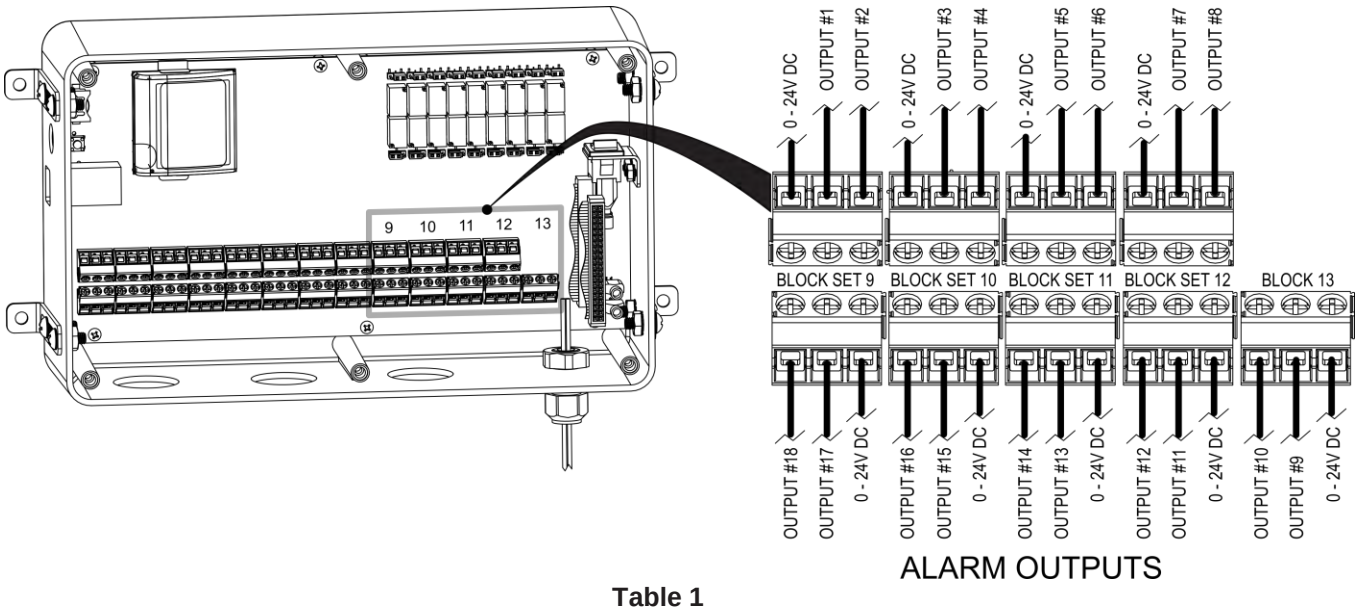


Table 1

CABLES	
CONCOA Cable Ass'y Part No.	Usage
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 Old AutoSwitches with Pressure Switch Gauges and Circular Connector on the AutoSwitch
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™

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 wirecable (wire colors: black, red, white, green, brown, blue, orange, yellow)

SETTING REMOTE ALARM OUTPUTS

The output signals from the Advantium 16 are brought out of the alarm through relay contacts. These contacts are set as Normally Closed (N.C.) FACTORY DEFAULT. The relay contacts can be reconfigured as Normally Open (N.O.). To change the relay configuration perform the following steps:

1. Unplug the alarm from AC power.
2. Open the unit by loosening the 6 screws located on the front of the enclosure.
3. Figure 14 shows the location of the jumpers on the circuit board for setting the contacts.
4. Using Table 2 and Figure 14, set the jumpers to the desired contact arrangement.
5. Reattach the two sections of the enclosure with the screws previously removed.
6. Make the necessary connections to the alarm and plug the alarm cable into the alarm connector on the bottom of the cabinet.
7. Plug the alarm back into the AC power.

Figure 14

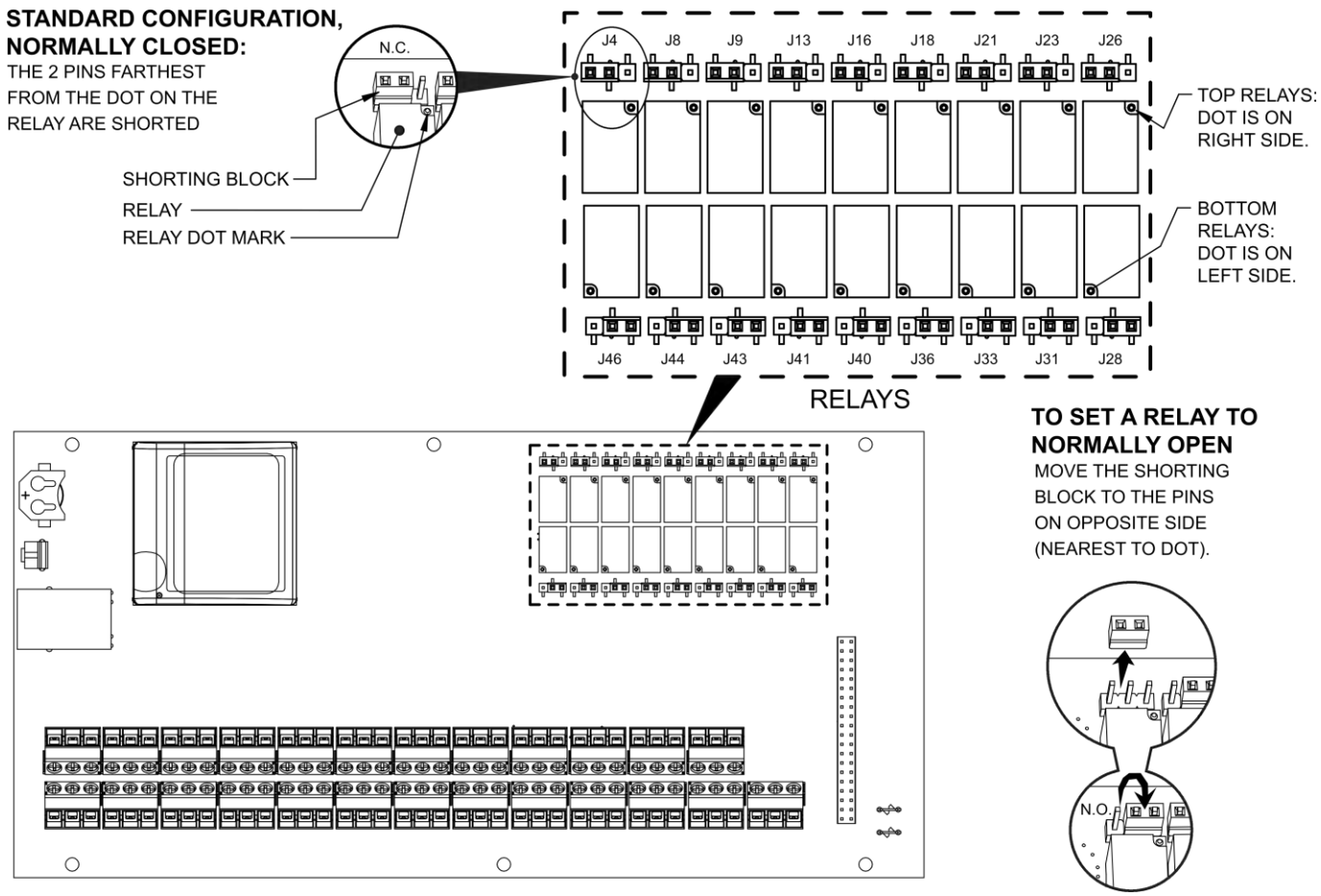


Table 2

Jumper	Function
J4	Relay Output 1
J8	Relay Output 2
J9	Relay Output 3
J13	Relay Output 4
J16	Relay Output 5
J18	Relay Output 6
J21	Relay Output 7
J23	Relay Output 8
J26	Relay Output 9
J28	Relay Output 10
J31	Relay Output 11
J33	Relay Output 12
J36	Relay Output 13
J40	Relay Output 14
J41	Relay Output 15
J43	Relay Output 16
J44	Relay Output 17
J46	Relay Output 18

MUTING AUDIBLE ALARM

It is sometimes desirable to silence the audible alarm on the Advantium 16. This can be accomplished in one of two ways.

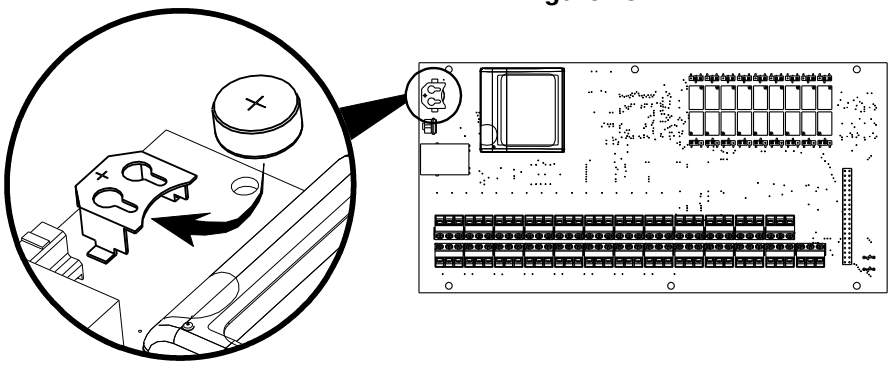
1) Temporarily silence the alarm simply pressing the alarm silence button on the top right hand side of the front panel. In this mode the audible alarm will automatically sound on the next asserted alarm

2) Permanently silence the alarm by pressing and holding the alarm silence for five seconds. The speaker will sound twice indicating alarm disable state. In this mode the audible alarm will never sound. In order to re-enable the audio alarm, press and hold the alarm for five seconds again. The speaker will sound once indicating the audio alarm is enabled.

REAL TIME CLOCK

The Advantium 16 has a battery backed real-time clock (RTC). The Advantium 16 uses a 357 coin battery with a nominal voltage of 1.55 V. Using typical current capacity, the RTC is expected to have 120,000 backup hours. The battery is mounted inside a holder attached to the board to allow battery replacement or remova1. To set the date and time, click the Change Settings tab in the Advantium 16's webserver. On the Configuration page, enter the date in the format YYYY/MM/DD. The time should be entered as HH:MM, with a leading zero for the first nine hours. Click "SET" to submit.

Figure 15



CONFIGURATION USING THE WEBSERVER

The Advantium 16 is equipped with an integral web server as a means for remote monitoring and configuration of the system. Connection to the webserver is achieved through an RJ45 connector located on the left hand side of the unit. Refer to the Advantium 16 Webserver Configuration Instructions for connection instructions, including factory default network and security settings. The internal reset button is used to restore factory network settings if necessary.

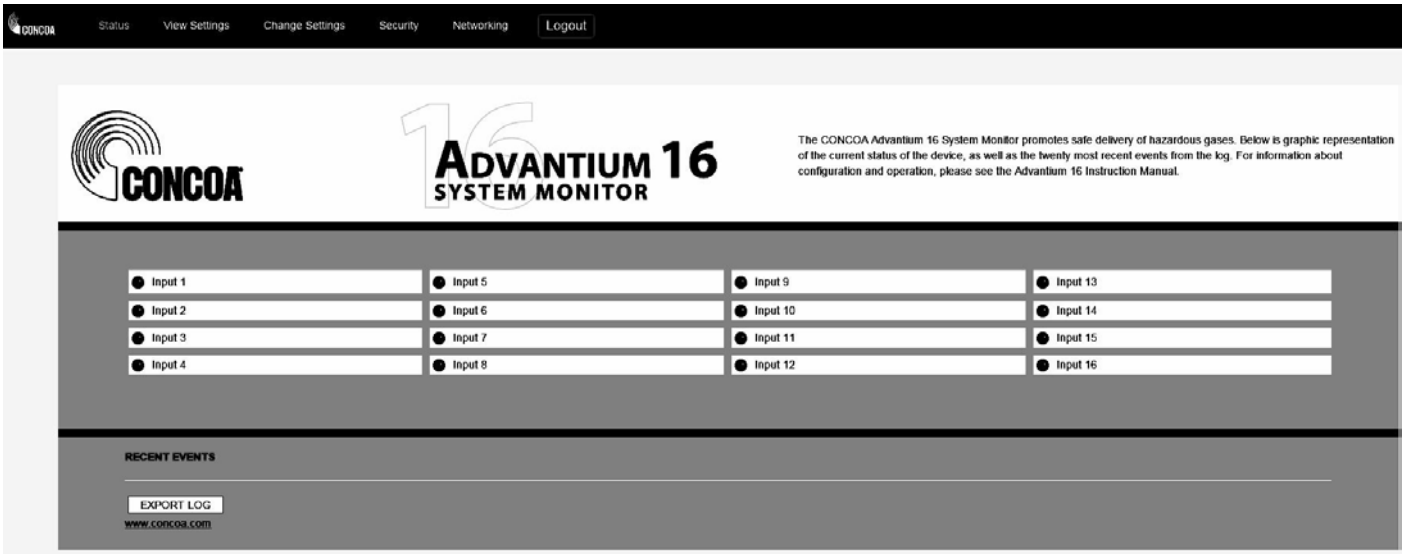
The Advantium 16 webserver has a number of useful status and configuration pages that will be explained in greater detail in the subsequent tabs/pages.

STATUS PAGE

The Advantium 16 webserver Status screen is essentially a copy of the front panel of the Advantium 16 unit. Each of the front panel LED's and labels are represented and colored RED or GREEN based on alarm status. Also a copy of the last 20 events in the on board event log are displayed at the bottom of the screen. An Export Log button at the bottom also allows for exporting of the entire event log in csv format.

The system event log has a maximum size of 500 Kb. When the event log reaches 90% of the maximum size, a warning email will be sent to all enabled email recipients. When the event log reaches capacity, no new items will be added to the log. New events will continue to be displayed in the "Recent Events" portion of the Status page and every subsequent email sent from the Advantium 16 will have "(Event Log full)" appended to the subject line.

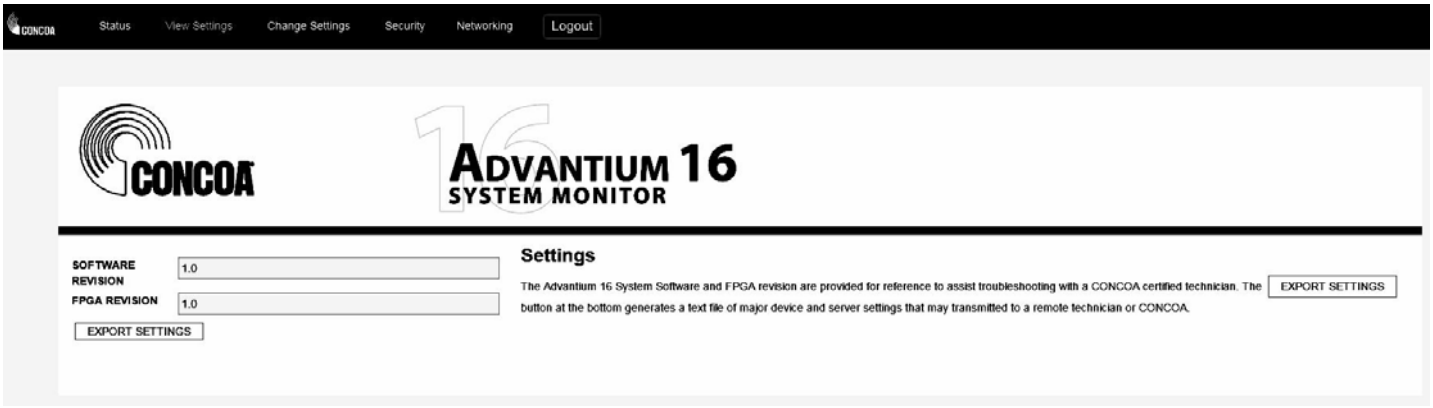
Figure 16



VIEW SETTINGS PAGE

The Advantium 16 webserver view settings screen displays two system parameters: Webserver Software version and FPGA version. An export settings button on the page allows for exporting data into a text file. This includes all of the Advantium 16 system parameters in addition to the text boxes displayed on this page.

Figure 17



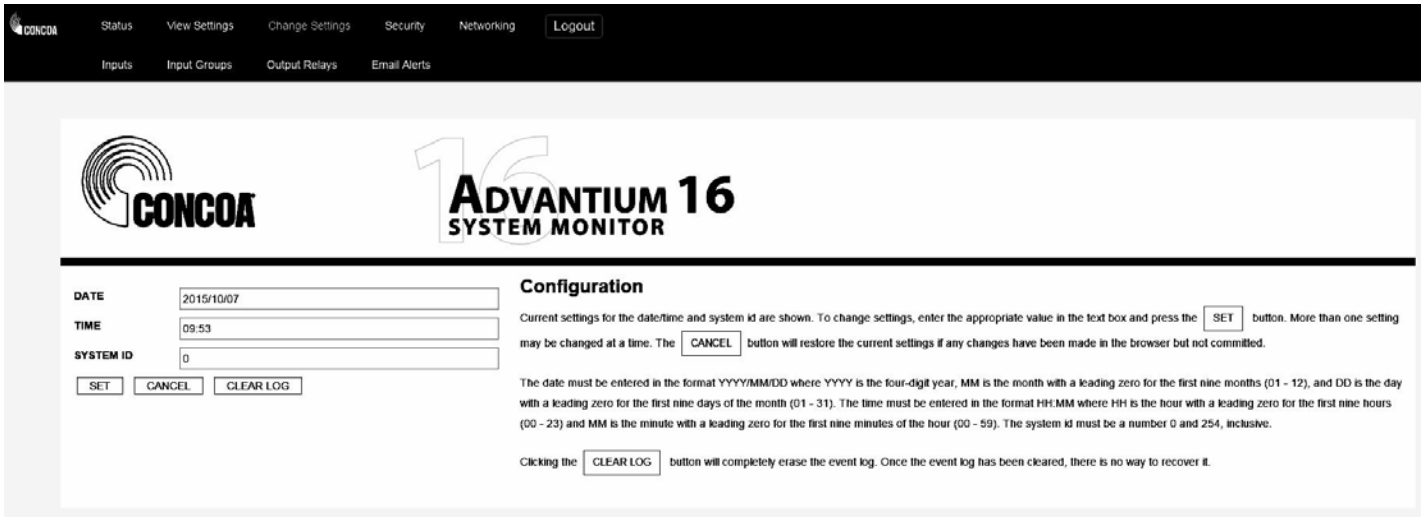
CHANGE SETTINGS TAB

The Advantium 16 “Change Settings” tab contains five pages comprising of all the system I/O configuration information. These five pages are: Configuration, Inputs, Input Groups, Output Relays and Email Alerts.

CONFIGURATION PAGE

The Advantium 16 Configuration page shows the current settings for the date, time and system ID. When utilizing more than one Advantium 16 control system, the System ID can be used to differentiate the units in the email subject line. The settings are changed by entering the appropriate values in the text box and clicking the set button. The cancel button will restore the current settings if any have been made in the browser but not committed. The Clear Log button will permanently erase the event log.

Figure 18



INPUTS PAGE

The Advantium 16 Inputs page shows the current settings for each of the sixteen system inputs. The settings may be changed by entering the appropriate value in the text box, selecting the appropriate value from the drop-down box, or by clicking the appropriate check box and clicking the set button. The cancel button will restore the current settings if any have been made in the browser but not committed.

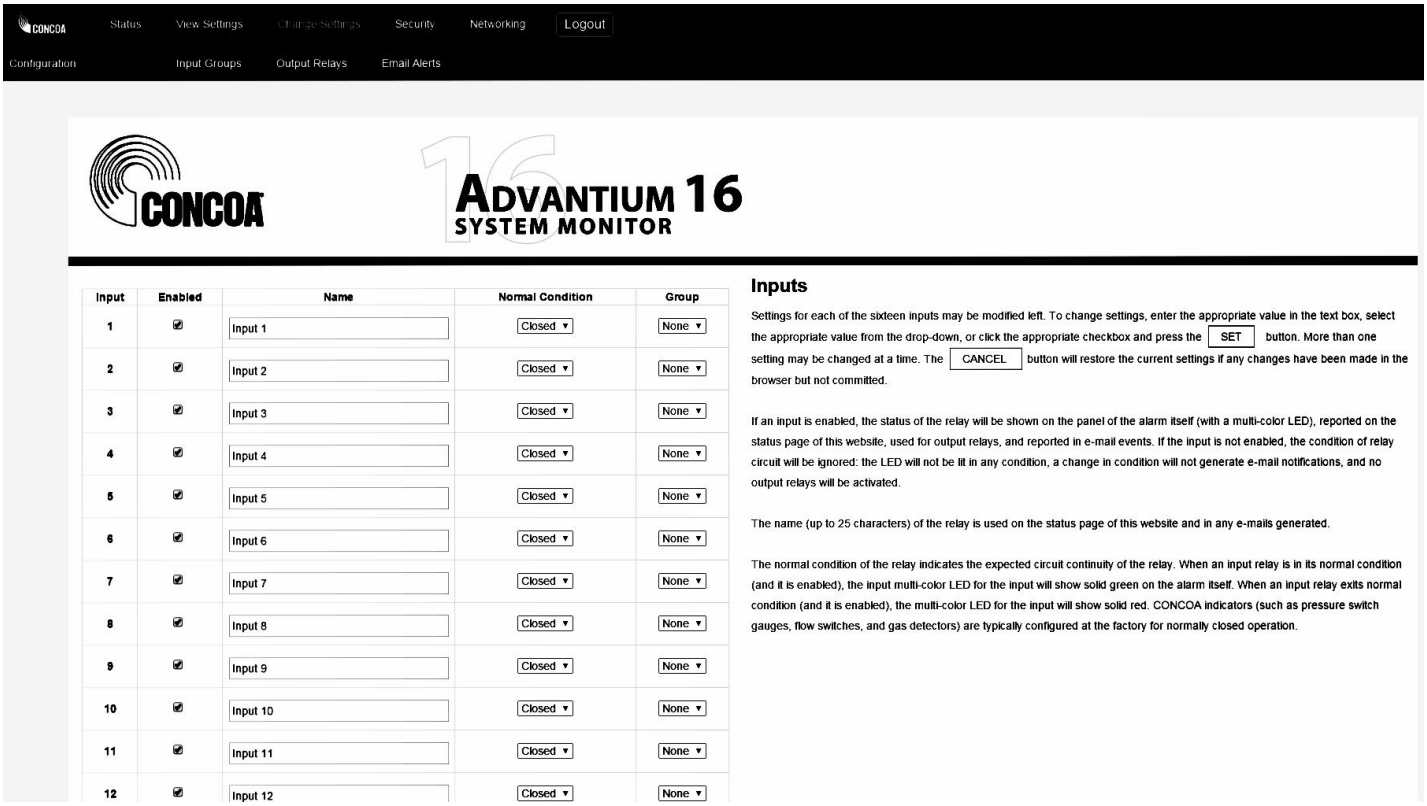
If an input is enabled, the status of that input will be shown on the alarm panel, reported on the status page, used for output relays and reported in email events. If an input is disabled, it will be ignored and the LED will be turned off.

The name of the input is used on the status page and in any generated emails.

The normal condition of the input indicates the expected circuit continuity of the input. When an input is in normal condition, its associated LED (on the front panel and status page) will show green. When the input exits its normal condition the indicator will show red. All inputs are configured at the factory for normally closed operation.

If all the inputs in an enabled group exit normal condition, the multi-color LED on the alarm panel will blink red. Each inputs may be a member of only one group and may be a member of no group, in which case its multi-color LED will never blink red. (See the *Input Groups* settings page for more information.)

Figure 19



INPUT GROUPS PAGE

The Advantium 16 Input Groups page shows the current configuration for Input groups. Each row represents the configuration for the Input Group of that number. The settings may be changed by clicking the appropriate check box and clicking the set button. The cancel button will restore the current settings if any have been made in the browser but not committed.

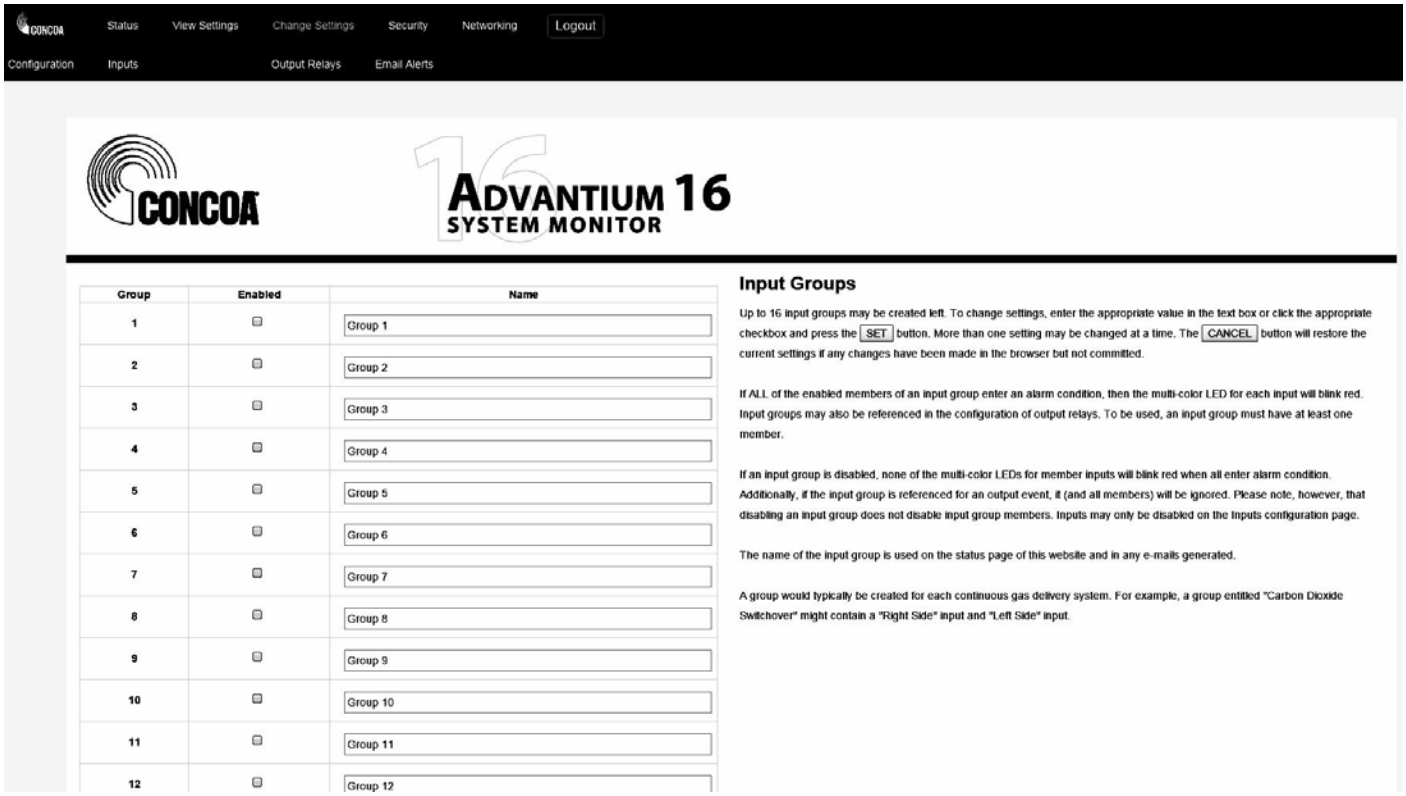
If ALL of the enabled members of an input group enter an alarm condition, then the multi-color LED for each input will blink red. Input groups may also be referenced in the configuration of output relays. To be used, an input group must have at least one member.

If an input group is disabled, none of the multi-color LEDs for member inputs will blink red when all enter alarm condition. Additionally, if the input group is referenced for an output event, it (and all members) will be ignored. Please note, however, that disabling an input group does not disable input group members. Inputs may only be disabled on the Inputs configuration page.

The name of the input group is used on the status page of this website and in any e-mails generated.

A group would typically be created for each continuous gas delivery system. For example, a group entitled "Carbon Dioxide Switchover" might contain a "Right Side" input and "Left Side" input.

Figure 20



OUTPUT RELAYS PAGE

The Advantium16 output relays page shows the current configuration for each of the systems output relays. Each row represents the configuration for the dry contact output relay of that number. The settings may be changed by selecting the appropriate value from the drop-down box, or clicking the appropriate check box and clicking the set button. The cancel button will restore the current settings if any have been made in the browser but not committed.

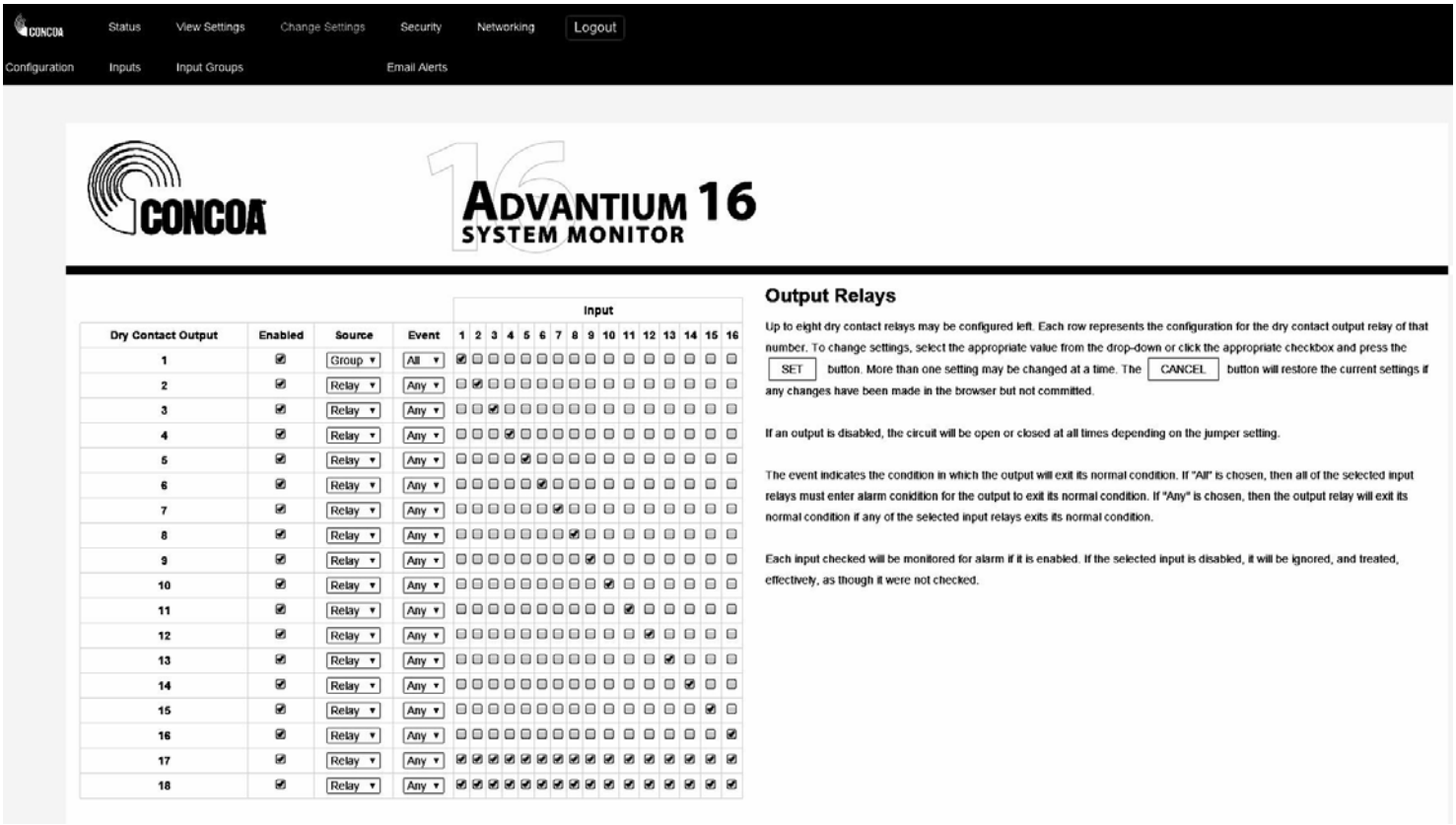
If an output is disabled, the circuit will be open or closed at all times depending on the jumper setting.

The source indicates whether individual input relays or input groups should be used to determine whether the output relay exits normal condition. If "Relay" is chosen, the numbers at the right of the row (1-16) correspond to the number of the input relay (see the *Inputs* settings page for configuration information). If "Group" is chosen, the numbers at the right of the row (1-16) correspond to the number of the input group (see the *Inputs* settings page for configuration information).

The event indicates the condition in which the output will alarm. If “All” is selected, then all of the selected inputs must enter an alarm condition for the output to exit its normal condition. If “Any” is chosen, then any of the selected relays entering alarm condition will cause the output relay to exit its normal condition.

Each input checked will be monitored for alarm if enabled. If the selected input is disabled, it will be ignored.

Figure 21



E-MAIL ALERTS PAGE

The Advantium 16 e-mail alerts page shows the current configuration for the system email alerts. Each row represents the configuration for the email alert of that input number. The settings may be changed by entering the appropriate value in the text box, selecting the appropriate value from the drop-down box, or clicking the appropriate check box and clicking the set button. The cancel button will restore the current settings if any have been made in the browser but not committed. Options common to all e-mail alerts (such as network settings, relay information, sender, and reply-to) may be configured in the Networking page.

If an alert is disabled, an email will not be sent regardless of the input conditions associated with the alert.

“Condition” indicates whether an email alert will be triggered when the described alarm condition occurs, when it is cleared, or both. Note that emails are sent only on the change of the entire state, not individual inputs.

The source indicates whether individual input relays or input groups should be used to determine whether the e-mail alert will be triggered. If "Relay" is chosen, the numbers at the right of the row (1-16) correspond to the number of the input relay (see the *Inputs* settings page for configuration information). If "Group" is chosen, the numbers at the right of the row (1-16) correspond to the number of the input group (see the *Inputs* settings page for configuration information).

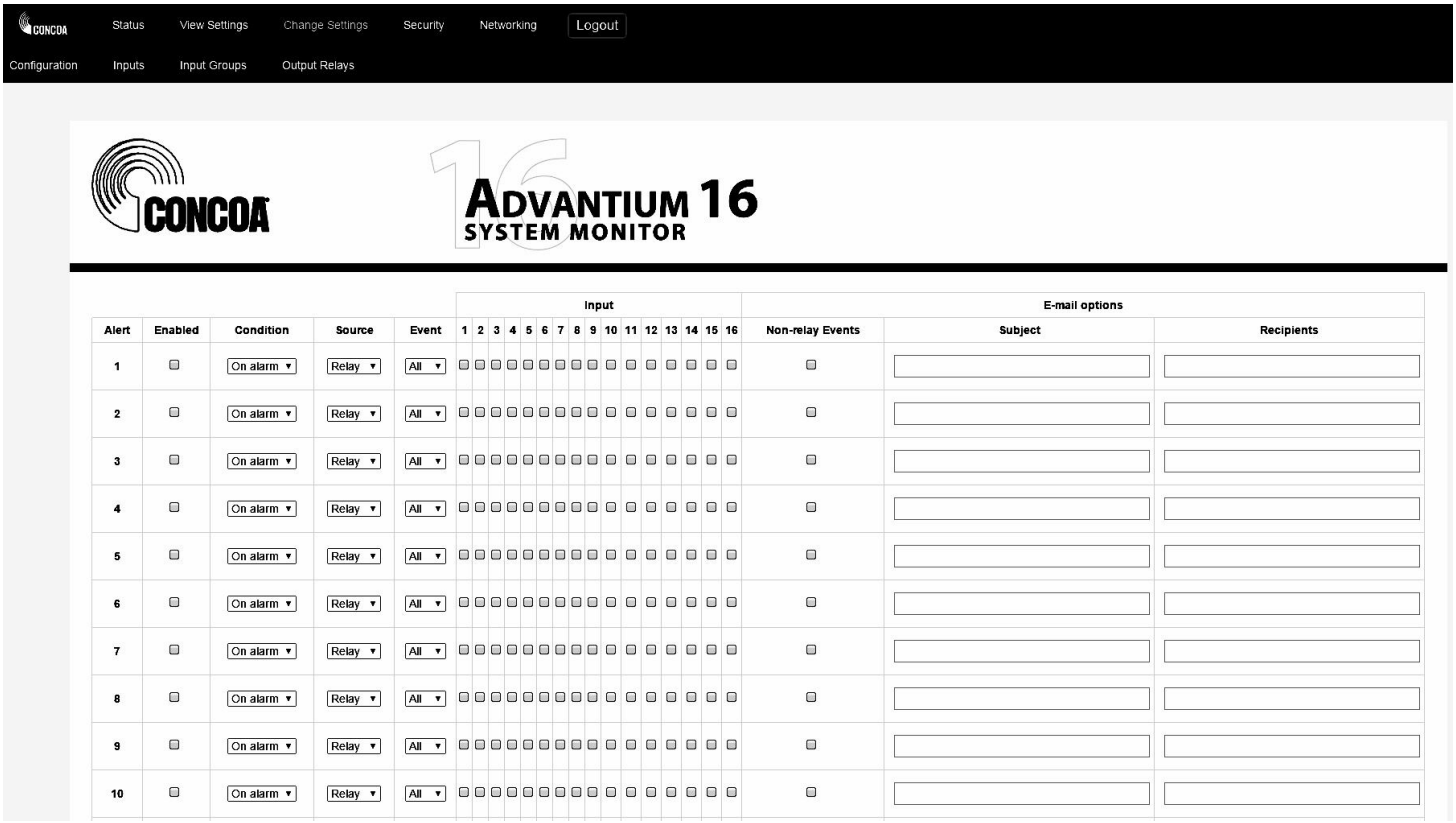
The event indicates the condition in which the email alert will be triggered. If “All” is selected, then all of the selected inputs must enter alarm condition for the alert to be triggered. If “Any” is chosen, then any of the selected relays entering alarm condition will cause the alert to trigger.

Each input checked will be monitored for alarm if enabled. If the selected input is disabled, it will be ignored.

If “Non-relay Events” is checked, then the alert will also be triggered by any change in alarm condition unrelated to the selected inputs. These events include alarm silence and web based configuration changes.

The Subject text box adds a customizable subject to the email alert and the “To:” allows the user to assign recipients. Multiple email addresses are permissible in the “To” field and should be separated by a semicolon. There is a 256 character limit to the “To” string.

Figure 22


CONCOA
Status
View Settings
Change Settings
Security
Networking
Logout
Configuration
Inputs
Input Groups
Output Relays
CONCOA
ADVANTIUM 16
SYSTEM MONITOR
Input
E-mail options
Alert
Enabled
Condition
Source
Event
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Non-relay Events
Subject
Recipients
1
2
3
4
5
6
7
8
9
10
On alarm
Relay
All

SECURITY PAGE

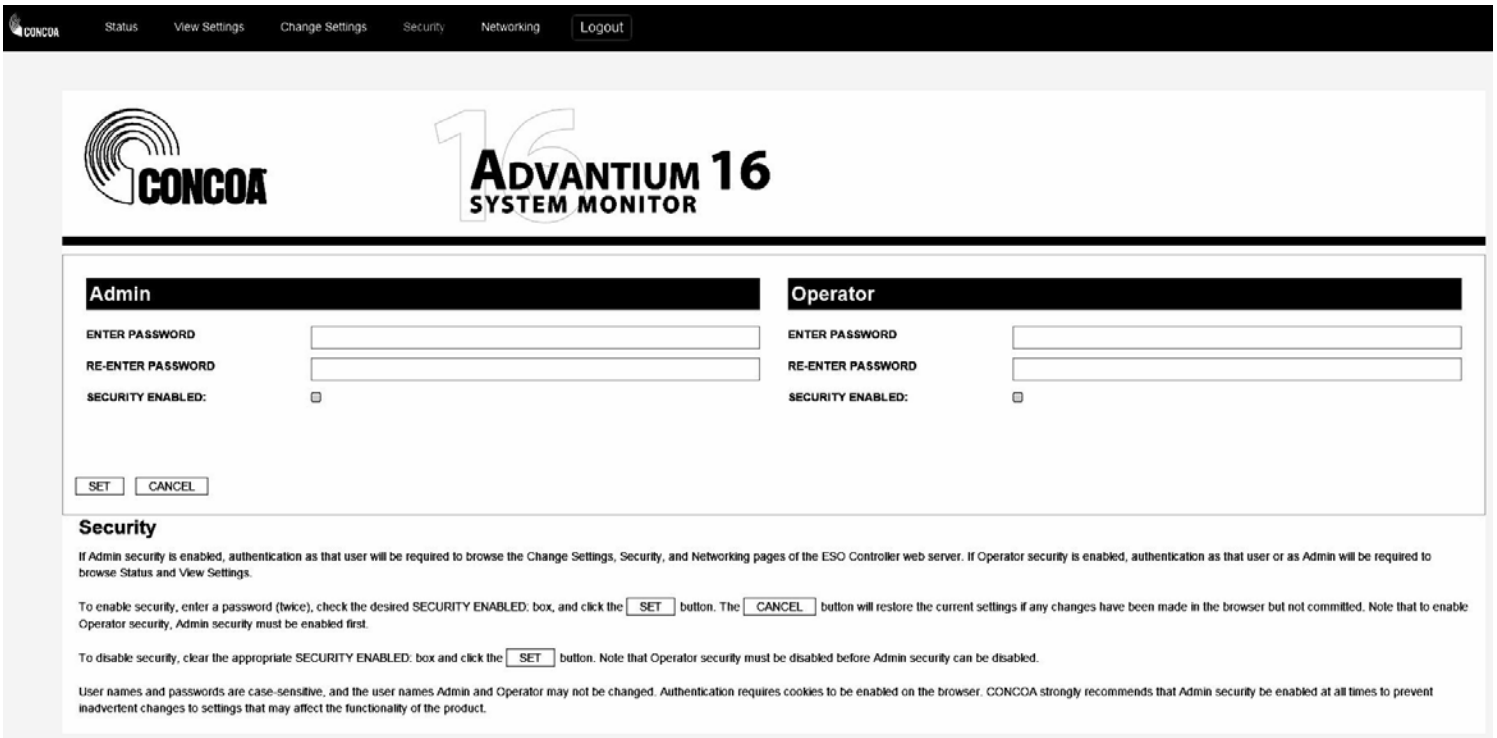
The Advantium 16 Security page shows the security settings for the system. If the Admin security is enabled, authentication as that user will be required to browse the Change Settings, Security, and Networking Pages of the Advantium 16 server. If Operator security is enabled, authentication as that user or as Admin will be required to browse Status and View Settings. Refer to the Advantium 16 Webserver Configuration Instructions for factory default security settings.

To enable security, enter a password (twice), click the desired Security Enabled box and click the set button. The cancel button will restore the current settings if any have been made in the browser but not committed. Note that to enable Operator security, Admin security must also be enabled.

To disable security, clear the appropriate Security Enabled box and click the set button. Note that Operator security must be disabled before Admin security can be disabled.

User names and passwords are case-sensitive and the user names Admin and Operator may not be changed. Authentication requires cookies to be enabled on the browser. CONCOA strongly recommends that Admin security be enabled at all times to prevent inadvertent changes to settings that may affect the functionality of the product. For security purposes, be sure to click the “Logout” button or close browser. If you have been locked out of the Advantium 16, contact manufacturer.

Figure 23



NETWORKING PAGE

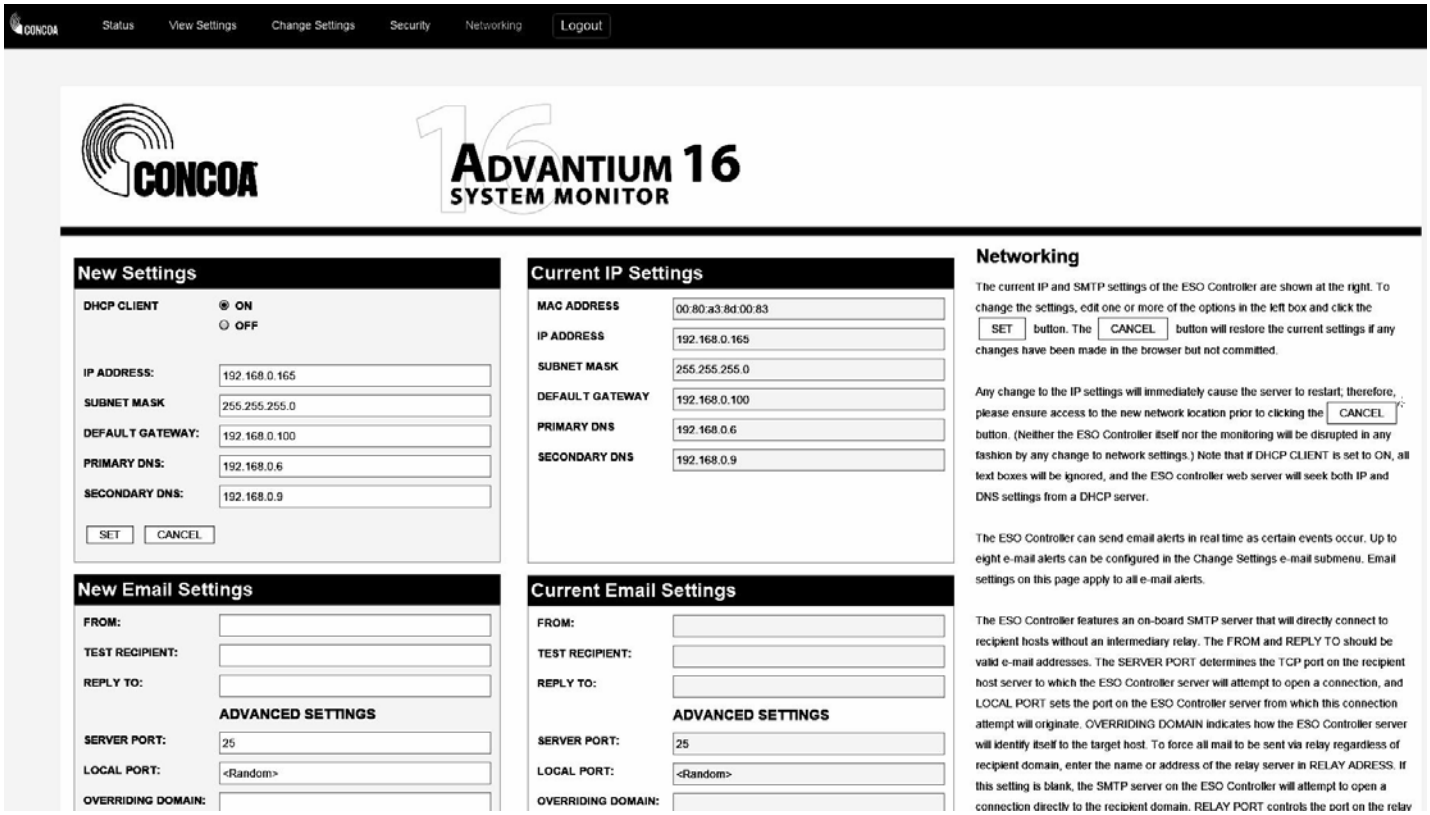
The Advantium 16 networking page shows the IP and SMTP settings for the system. The current IP and SMTP settings are displayed on the right. The settings may be changed editing one or more of the options in the left box and clicking the set button. The cancel button will restore the current settings if any have been made in the browser but not committed.

Any change to the IP settings will immediately cause the server to restart; therefore, please ensure access to the new network location prior to clicking the set button. Note that if DHCP CLIENT is set to ON then all IP text boxes will be ignored and the Advantium 16 will seek IP settings from a DHCP server.

The Advantium 16 can send email alerts in real time as certain events occur. Up to eight email alerts can be configured on the e-mail alerts page described in the previous section. Email settings on this page apply to all email alerts.

The Advantium 16 features an on-board SMTP server that will directly connect to recipient hosts without an intermediary relay. The FROM and REPLY TO should be valid email addresses. The SERVER PORT determines the TCP port on the recipient host to which the Advantium 16 server will connect to open a connection. LOCAL PORT sets the port on the Advantium 16 server from which this connection will attempt to originate. OVERRIDING DOMAIN indicates how the Advantium 16 server will identify to the target host. To force all mail to be sent via relay regardless of the recipient domain, enter the name or address of the relay server in RELAY ADRESS. If this setting is blank, the SMTP server on the Advantium 16 will attempt to open a connection directly to the recipient domain. RELAY PORT controls the port on the relay server to which the Advantium 16 will connect. The scroll box below these settings shows the SMTP log for troubleshooting purposes.

Figure 24



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This equipment is sold by CONTROLS CORPORATION OF AMERICA under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to the purchase of this equipment directly from CONTROLS CORPORATION OF AMERICA or its Authorized Distributors as new merchandise and are extended to the first Buyer thereof other than for the purpose of resale.

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Controls Corporation of America
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Virginia Beach, Va. 23454

CE DECLARATION OF CONFORMITY

In accordance with ISO/IEC 17050

The ***Advantium 16 System Monitor*** **is compliant with the CE directives and standards listed below:**

Directives:

- **Electromagnetic Compatibility (2004/108/EC)**
- **Low-Voltage (2006/95/EC)**
- **RoIIS (2002/95/EC)**

Standards:

- **EMC: EN61326-1**
- **EMC: EN61000-4, EN61000-6**
- **EMC: CIPSR-11**
- **Safety: EN 61010-1**

QUALITY MANAGER

Form: QA-170 Rev: 0

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