SEC 3500 Operator Interface

Hardware Manual

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Part Number 75-3500 Version 032113

Commitment

Our quality and service are uncompromising. We back each of our products with a two-year warranty on all materials and workmanship. We offer technical support, user training and on-site service and maintenance of equipment to meet the needs of our customers.

Gas Detection Service

Individually designed maintenance packages are available for specific customer needs. Service begins with verification of the system installation that includes an initial system check and calibration. We then offer customer training programs (on-site and at factory) to insure that technical personnel fully understand operation and maintenance procedures. When on-the-spot assistance is required, service representatives are available to handle any questions or problems immediately.

Warranty

Sensor Electronics Corporation (SEC) warrants products manufactured by SEC to be free from defects in workmanship and materials for a period of two (2) years from date of shipment from the factory. Any parts returned freight pre-paid to the factory and found defective within the warranty would be repaired or replaced, at SEC's option. SEC will return repaired or replaced equipment pre-paid lowest cost freight. This warranty does not apply to items, which by their nature are subject to deterioration or consumption in normal service. Such items may include:
Fuses and Batteries.
Warranty is voided by abuse including rough handling, mechanical damage, alteration or repair. This warranty covers the full extent of SEC liability and SEC is not responsible for removal, replacement costs, local repair costs, transportation costs or contingent expenses incurred without prior written approval. Sensor Electronics Corporation's obligation under this warranty shall be limited to repair or replacement of any product that has been returned to Sensor Electronics Corporation for warranty consideration. This warranty is expressly in lieu of any and all other warranties expressed or implied, and all other obligations or liabilities on the part of Sensor Electronics Corporation including but not limited to, the fitness for a particular purpose. In no event shall Sensor Electronics Corporation be liable for direct, incidental, or consequential loss or damage of any kind connected with the use of it's products or failure to function or operate properly.

Table of Contents

I. SPECIFICATIONS

Model: SEC3500 Operator Interface

Interface
RS485 Port: Interactive “Modbus” (expandable to two)
RS232 Port: “Statcast” System parameter broadcast
Ethernet Port: Remote Screen Access
16 Programmable Relays (expandable to 40)

Construction: Powder Coated Steel

Dimensions: 16” X 16” X 10”

Weight: 45lbs

Operating Temperature Rating:
0° to +50°C at 0 to 99% RH (non-condensing)

Operating Voltage: 19 to 29 VDC ⎓

Power Consumption: 40 Watt Max. (Not including relay contact current or 24VDC power supplied to external devices)

Relay Contacts: 1 NO, 1 NC per Relay.
Contact Rating: 8A @ 30VDC, 8A @ 250VAC

System Components:
SEC3500 Operator Interface (Master)
SEC3100 Gas Transmitter
SEC 3500 - XX Relay Controller
SEC 3100 AIM Interface Module
SEC 3100 LIM Interface Module
SEC 3100 ISO Repeater

Approvals: CSA: C22.2 No 0, No 0.4-04, No 14-05, No 142
UL 508

Installation Category: Cat. I, Pollution Degree 2

II. GENERAL DESCRIPTION

CONVENTIONS

The following conventions are used in this manual.

⚠ Warning Statement

⎓ VDC (DC Voltage)

SEC 3500

The SEC3500 Operator Interface continuously interrogates up to 254 system devices over the 9600 baud RS485 Modbus Interface. The OI, operating as the Modbus Master, can communicate with any SEC3XXX Device and any 4-20 transmitter via the SEC3100AIM.
Network devices can be interrogated, configured, and calibrated using the password protected touchscreen user interface.
16 embedded programmable relays provide external device control/interface based on network events. Additional relays can be located anywhere on the network (groups of 8).
The Statcast RS232 interface continuously scrolls through system operating status. (Read only for the user)
An Ethernet port allows remote access to system screens.

⚠ WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR SAFETY

III. OPERATION

The SEC3500 Operator Interface is an intuitive operator interface. For the individual page operations please refer to the following individual instruction manuals on the SEC website:

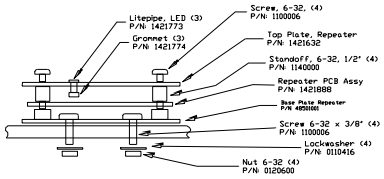
3500 OI Basic Operators Guide.pdf

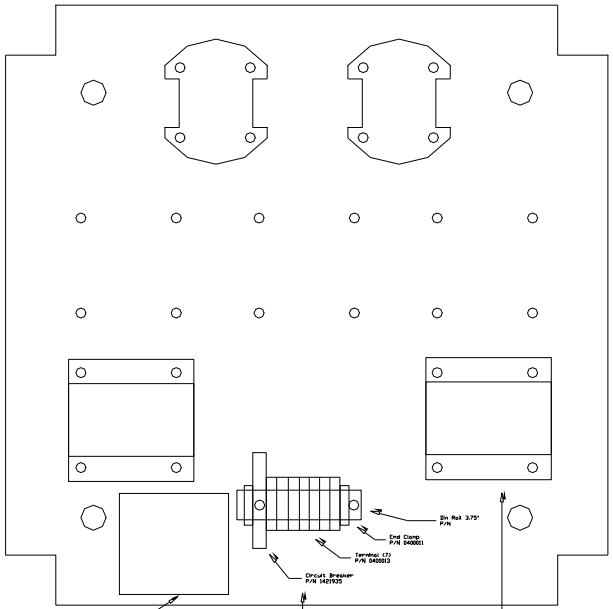
3500 OI Startup Basics Guide.pdf

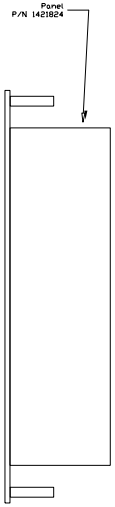
StatCast.pdf

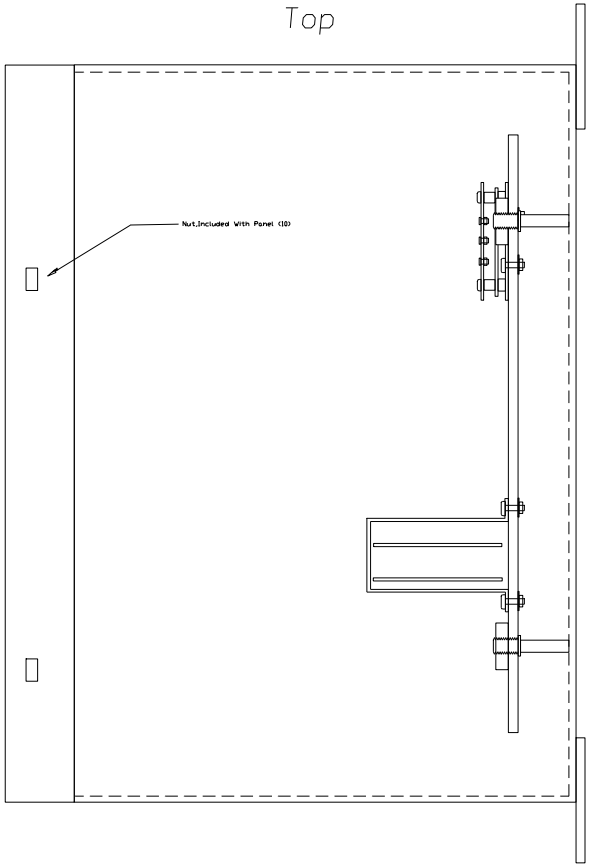
IV. DRAWINGS

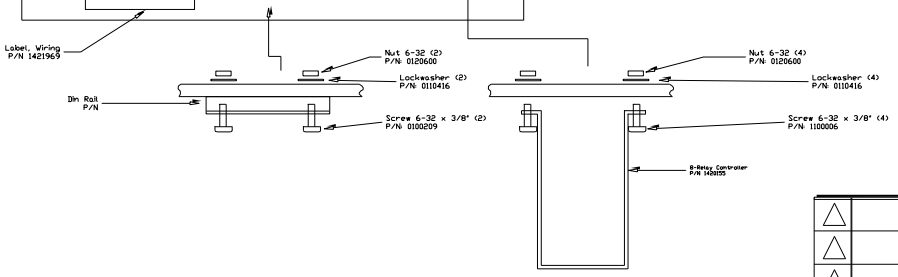
1421901	Mounting and dimensional drawing
350000016X16X10	Internal component layout
	Wiring Examples









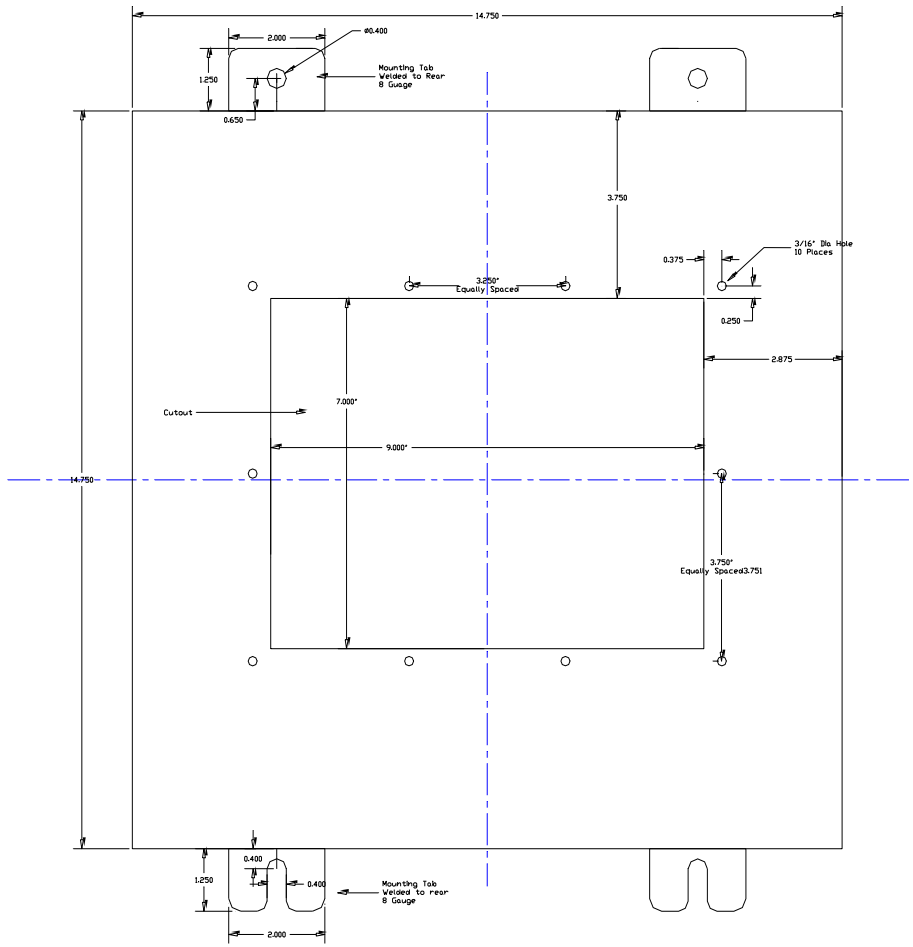


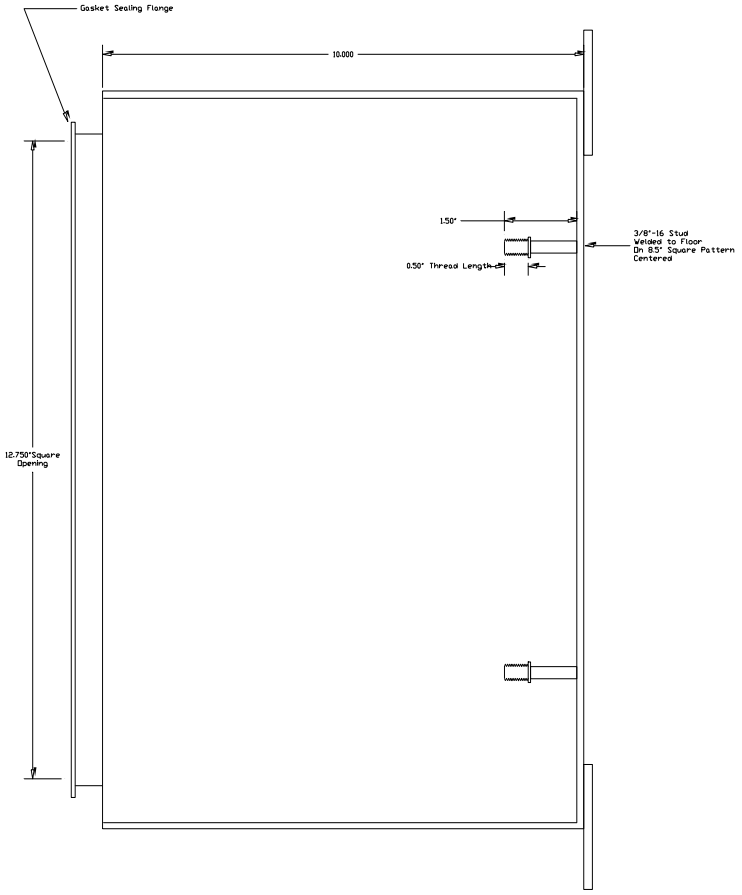
Notes

NO.	REVISION	BY CHKD.	DATE
A	RELEASED	PGS	10/3 06

SENSOR ELECTRONICS CORP.
5500 LINCOLN DRIVE
MINNEAPOLIS, MINNESOTA
55436

SCALE: 2:1	DESIGN BY: PGS	REVISED BY:
DATE: 10/2/06	DRAWN BY:	APPROVED BY:
Assembly, SEC3500		
SIZE: A	DRAWING NO. 350000D16X16X10	REVISION: A





Notes
1) Material: Steel, 14 Gauge, Unless Specified Otherwise
2) Finish: Powder Coated, White
3) Manufacturer: Delta
4) Gasket Sealed Door
5) Hidden Hinges
6) Tolerance +/- 0.025"

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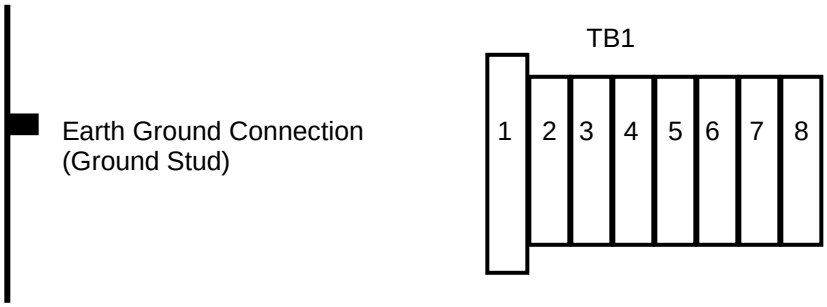
5500 LINCOLN DRIVE
MINNEAPOLIS, MINNESOTA
55436

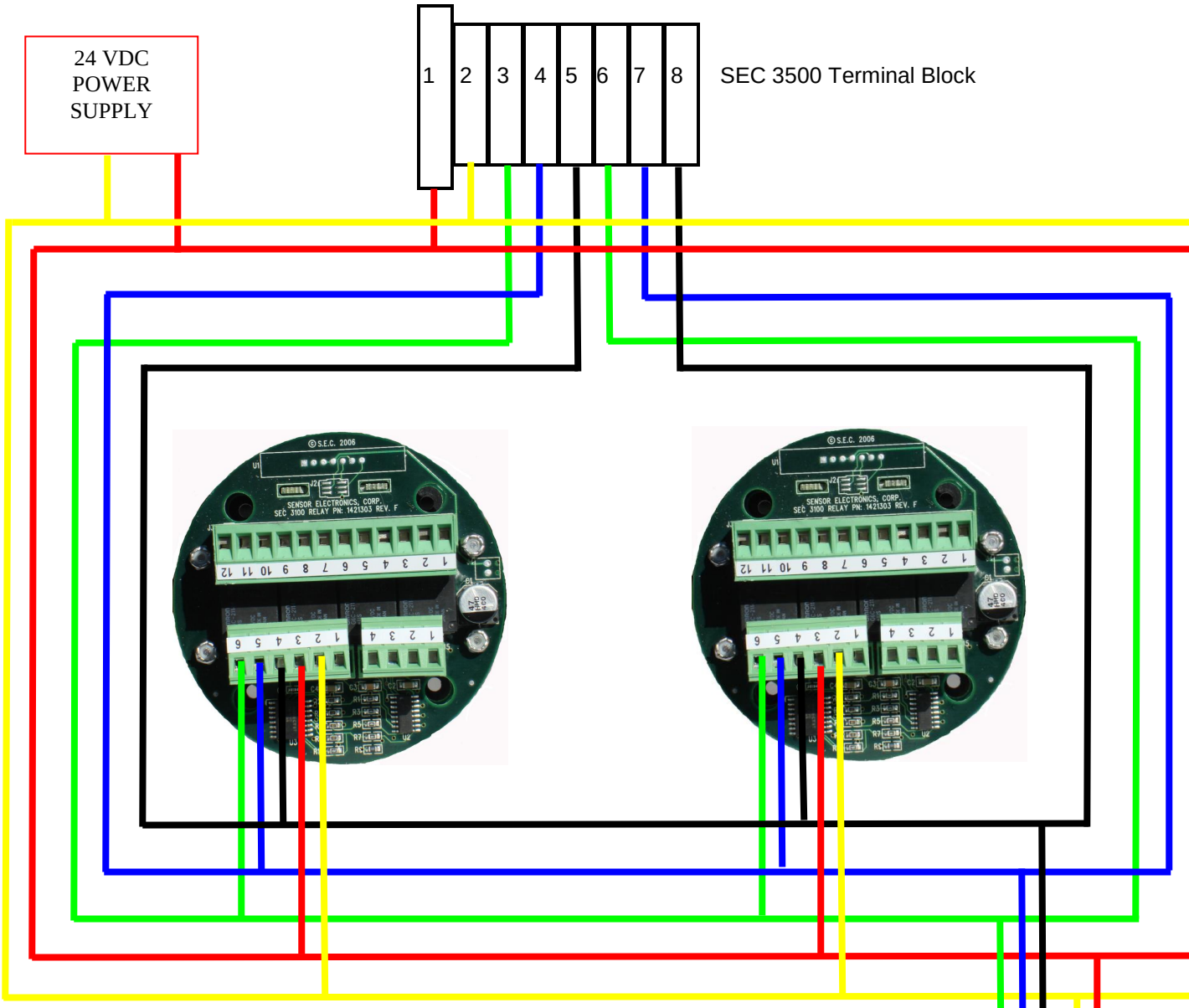
SCALE: 2:1	DESIGN BY: PGS	REVISED BY:
DATE: 9/29/06	DRAWN BY:	APPROVED BY:
Enclosure, SEC3500		
SIZE: A	DRAWING NO. 1421901	REVISION: A

WIRING TERMINATION

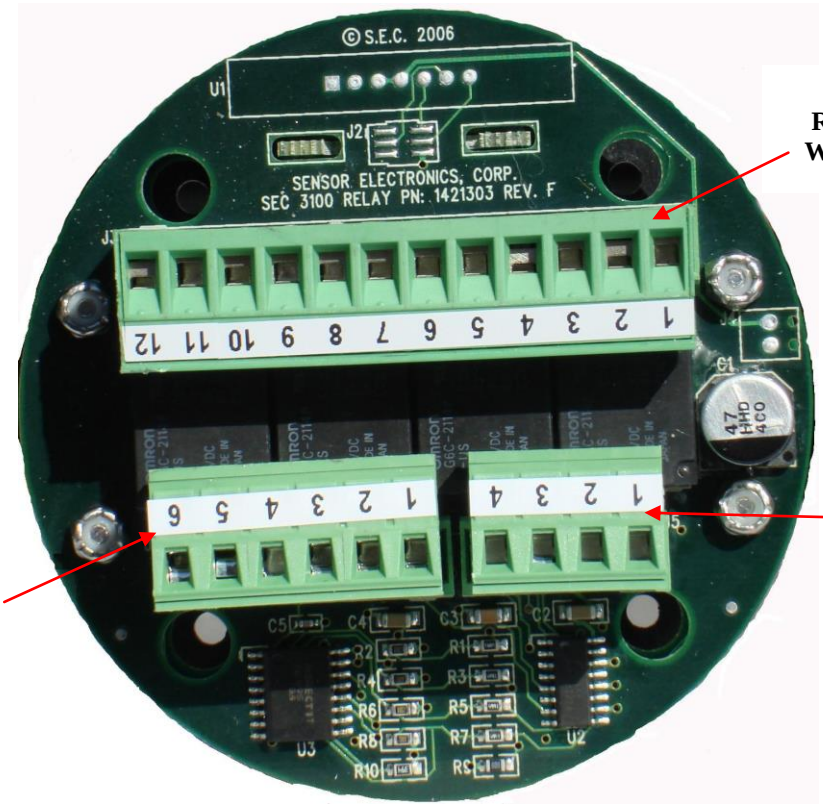
The wiring diagram is for the input power to the SEC 3500 and RS485 Data Highway Connection.



Terminal	Description:
1	2 AMP Circuit Breaker Power for SEC 3500 only
2	DC Common
3	LAN Y DATA A
4	LAN Y DATA B
5	LAN Y ISOLATED DC COMMON
6	LAN X DATA A
7	LAN X DATA B
8	LAN X ISOLATED DC COMMON



WIRING EXAMPLE:
SEC 3500 TO SEC 3100 TRANSMITTERS AND SEC 3500 – 8 RELAY CONTROLLER



TB 1
(12) LOW ALARM N.C.
(11) LOW ALARM COMMON
(10) LOW ALARM N.O.
(9) MID ALARM N.C.
(8) MID ALARM COMMON
(7) MID ALARM N.O.
(6) HIGH ALARM N.C.
(5) HIGH ALARM COMMON
(4) HIGH ALARM N.O.
(3) FAULT (N.E.) N.C.
(2) FAULT (N.E.) COMMON
(1) FAULT (N.E.) N.O.

TB 2
(1) 4-20 mA ANALOG OUTPUT
(2) DC COMMON
(3) +24 VDC
(4) DATA ISO COMMON
(5) RS485 DATA B
(6) RS485 DATA A

TB 3
(1) WHITE
(DATA/CAL)
(2) BLUE OR GREEN
(4-20 mA)
(3) RED
(+24 VDC)
(4) BLACK
(DC COMMON)

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BACK VIEW OF SEC 3100

SEC 3100 WIRING

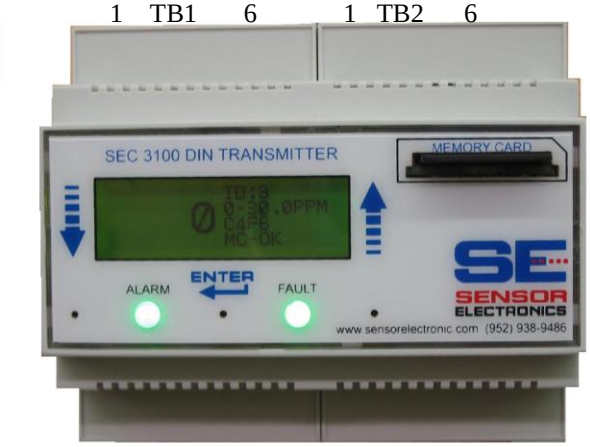
TB 1 Relay Wiring

1 High Alarm N.C.
2 High Alarm Common
3 High Alarm N.O.
4 Fault N.O.
5 Fault Common
6 Fault N.C.

TB 2 Relay Wiring

1 Low Alarm N.C.
2 Low Alarm Common
3 Low Alarm N.O.
4 Mid Alarm N.C.
5 Mid Alarm Common
6 Mid Alarm N.O.

1 TB1 6 1 TB2 6



1 TB5 4 1 TB6 6

TB 5 Sensor Wiring

1 DC Common (Black)
2 + 24 VDC (Red)
3 4-20 mA (Blue or Green)
4 Communication (White)

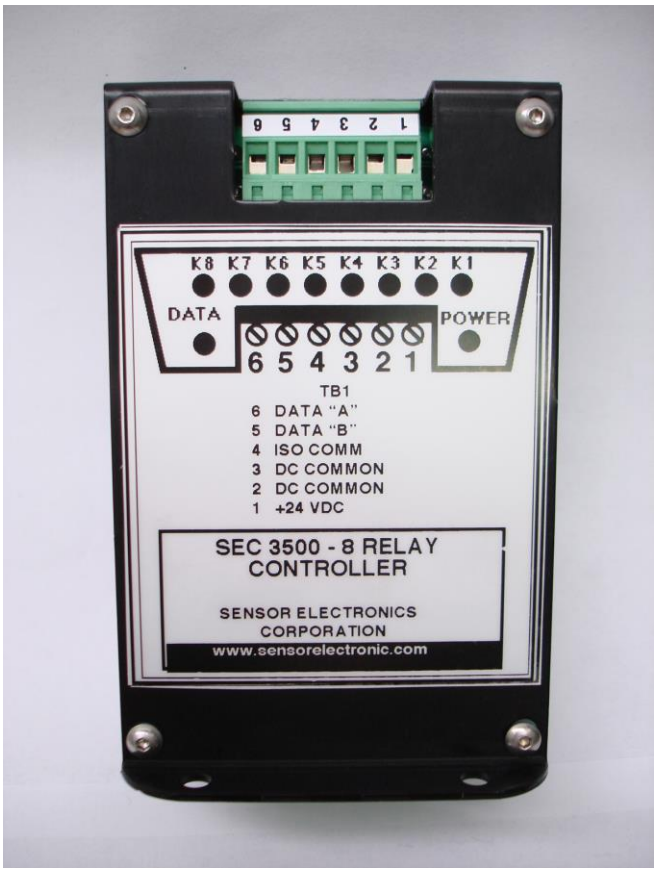
TB 6 Power / Data Wiring

1 Data A
2 Data B
3 Iso-Common
4 + 24 VDC Input Power
5 DC Common
6 4-20 mA Output

Housing Dimensions

3.54 (W) x 4.17 (L) x 2.28 (H) inches
{90 (W) x 106 (L) x 58 (H) mm}

SEC 3500-8 RELAY CONTROLLER



TB 1 (WIRING CONNECTION FOR POWER AND RS485)

TB 2 AND TB 3 (RELAY CONTACT WIRING)

SPECIFICATIONS

INPUT POWER: 10-30 VDC

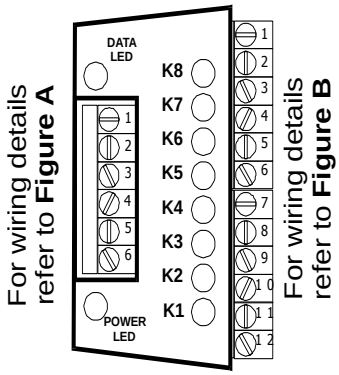
RELAY CONTACT RATING: 8 AMPS @ 250 VAC OR 8 AMPS @ 30 VDC

COMMUNICATION: ISOLATED RS485 (MODBUS)

WEIGHT: SEC 3500 – 8 RELAY CONTROLLER (PN 1421999) 2 LBS
SEC 3500 – 16 RELAY CONTROLLER (PN 1422182) 3 LBS

POWER: SEC 3500 – 8 RELAY CONTROLLER 4 WATTS @ 24 VDC
SEC 3500 – 16 RELAY CONTROLLER 6 WATTS @ 24 VDC

TOP VIEW OF SEC 3500 - 8 RELAY CONTROLLER



TOP VIEW OF SEC 3500 -16 RELAY CONTROLLER

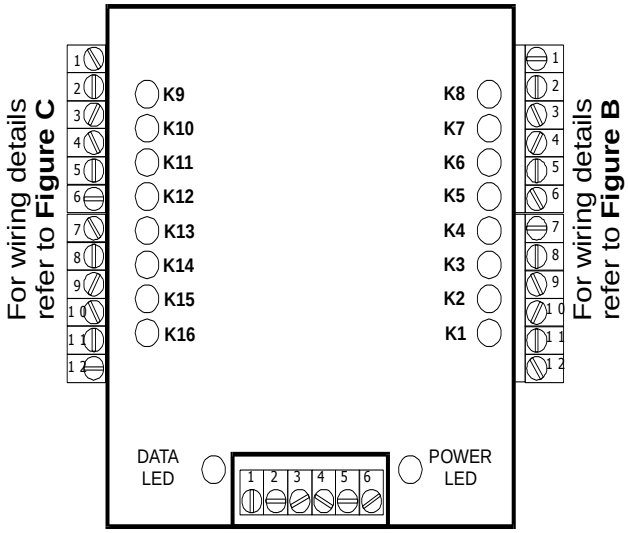


Figure A
(TB 1)

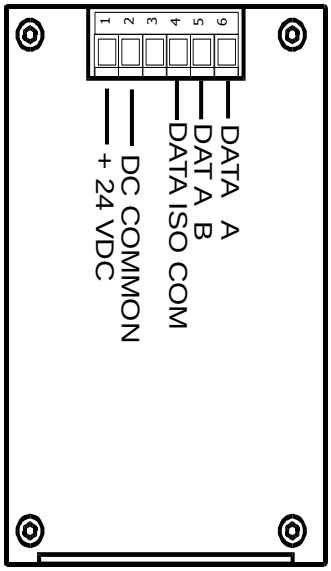


Figure B
TB 2 (K1-K4)
TB 3 (K5-K8)

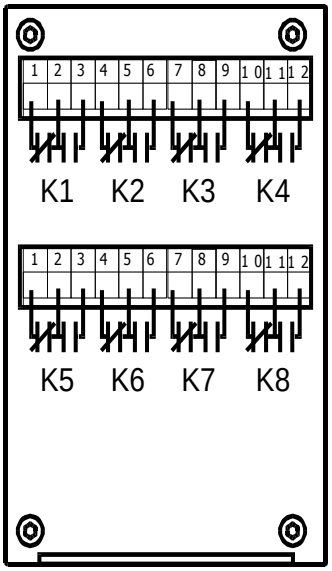
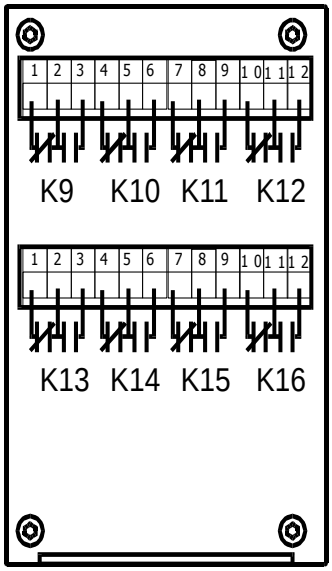
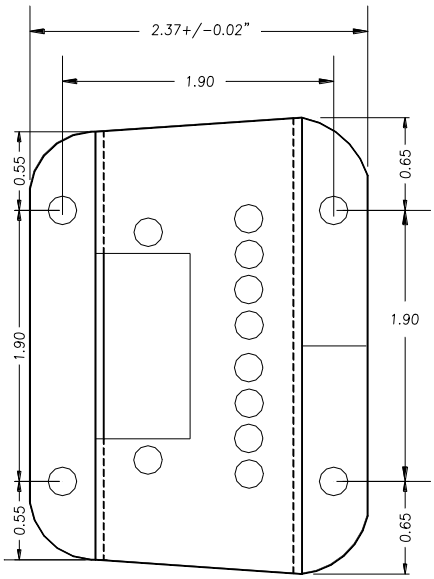


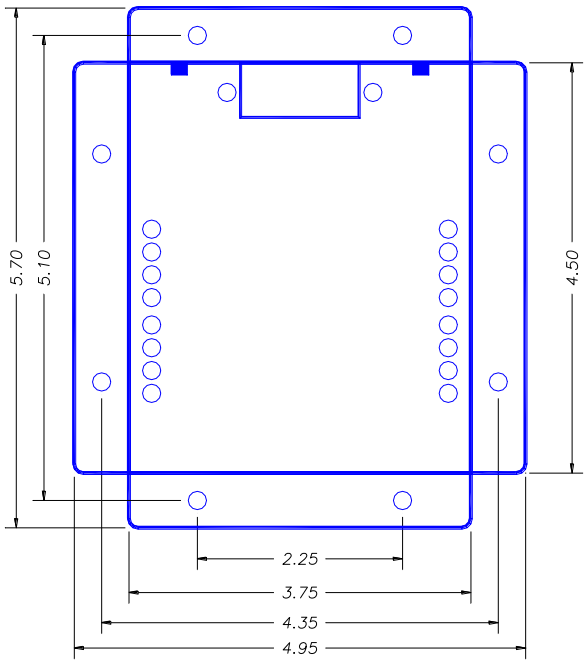
Figure C
TB 4 (K9-K12)
TB 5 (K13-K16)



SEC 3500-8 RELAY CONTROLLER DIMENSIONS



SEC 3500 – 16 RELAY CONTROLLER DIMENSIONS

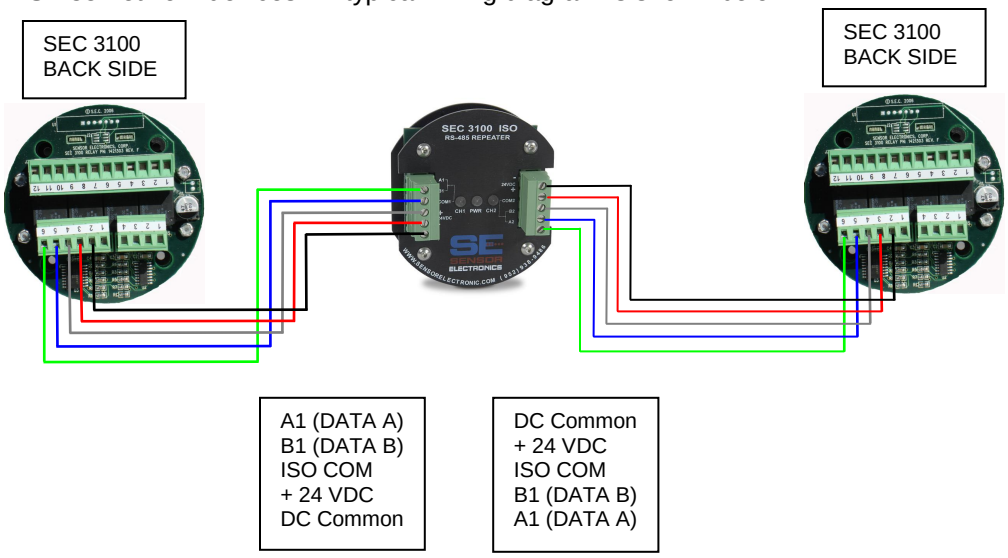


SENSOR ELECTRONICS

SEC 3100 ISO
RS-485 Repeater Module

Operation

The SEC 3100 ISO RS-485 Repeater Module is used in conjunction with the SEC 3100 transmitters and the SEC 3500 HMI Operator Interface or other MODBUS RS-485 data highway systems. The SEC 3100 ISO RS-485 Repeater Module is used to extend the distance of the RS-485 network and increase the number of devices on the RS-485 network. The SEC 3100 ISO RS-485 Repeater Module provides 1500 volt isolation bidirectional data flow and transient suppression on the RS-485 data lines. An SEC 3100 ISO RS-485 Repeater Module should be installed for every 1000 feet of data highway cable or 32 network devices. The SEC 3100 ISO RS-485 Repeater Module is powered by 24 VDC and wired in line with the SEC RS-485 network devices. A typical wiring diagram is shown below:



Specifications

Operating Voltage
18-32 VDC

Operating Current
50mA @ 24VDC

Temperature Rating
-40° to + 70°C

Input / Output (digital)
MODBUS RTU

Humidity
0-99% RH (non-condensing)

Part Number
3100-000-REPEAT

SEC 3100 AIM
Analog Input Module

Operation

The SEC 3100 AIM is used in conjunction with the SEC 3100 explosion proof transmitter or SEC 3100 DIN transmitter. A non-SEC device with a conventional analog 4 - 20 mA output is wired to the SEC 3100 AIM. The SEC 3100 AIM receives a sourced 4 - 20 mA signal from the device, converts the analog signal into a digital signal compatible with the SEC 3100 transmitter. The SEC 3100 AIM is factory programmed with the following customer supplied variables:

Device Name
Range
Unit of Measure
Calibration Value

The SEC 3100 visually displays the variables on the LCD the same as if the SEC 3100 had an SEC gas detector connected. The SEC 3100 transmitter reports the foreign device status bidirectional to the SEC 3500 HMI Operator Interface via the MODBUS RS485 communication network. The SEC 3100 AIM can be installed in the SEC 3100 explosion proof transmitter housing using a taller window dome.

The SEC 3100 AIM accepts one device input. Examples of 4 - 20 mA devices that can be used with the SEC 3100 AIM are:

Open Path Gas Detectors
Fire Detectors
Temperature Transmitter
Pressure Transmitter
Pyrolyzers

SPECIFICATIONS

Operating Voltage
18-32 VDC

Operating Current (No Sensor)
50mA @ 24VDC

Output (digital)
SEC SSP (Smart Sensor Protocol)

Temperature Rating
-40° to + 70°C

Humidity
0-99% RH (non-condensing)

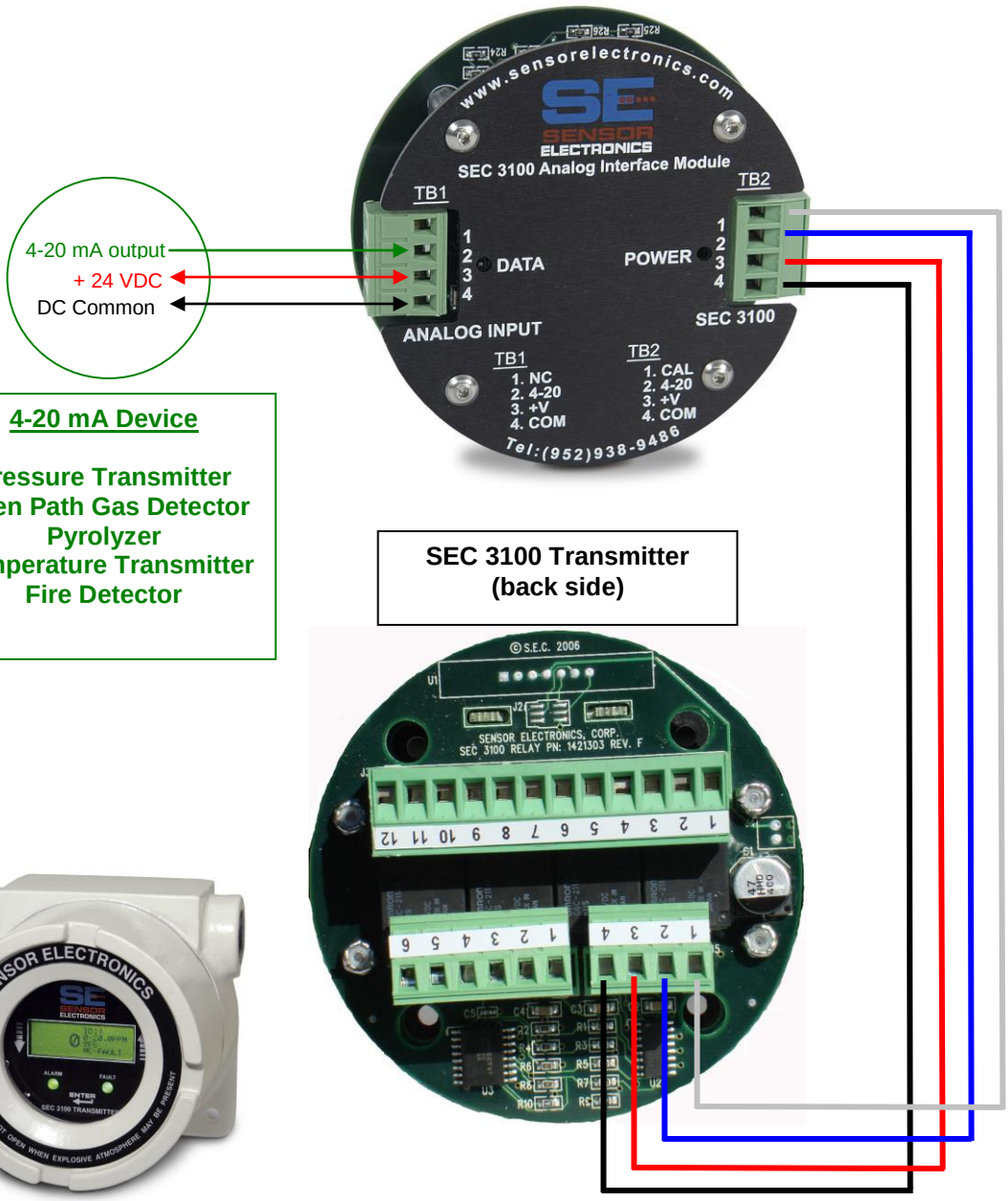
Input (analog)
Impedance: 200 Ω
Max applied voltage: 32 VDC

Device Variable Characters
Device Name: 8
Range: 4
Unit of Measure: 4
Calibration Value: 4

(Standard ASCII Characters

Part Number
3100-000-000-AIM

SEC 3100 AIM



4-20 mA Device

Pressure Transmitter
Open Path Gas Detector
Pyrolyzer
Temperature Transmitter
Fire Detector

SEC 3100 Transmitter (back side)

SEC 3100 Explosion Proof Transmitter

NOTE: Refer to the SEC 3100 Transmitter Instruction Manual for additional wiring connections.

SEC 3100 LIM
Logic Input Module

Operation

The SEC 3100 LIM is used in conjunction with the SEC 3100 explosion proof transmitter or SEC 3100 DIN transmitter. A non-SEC device with normally open contacts is wired to the SEC 3100 LIM. The SEC 3100 LIM receives a Low and High contact closure from the device, converts the input signal into a digital signal compatible with the SEC 3100 transmitter. The SEC 3100 LIM is factory programmed with the following customer supplied variables:

Device Name
Range
Unit of Measure
Calibration Value

The SEC 3100 visually displays the variables on the LCD the same as if the SEC 3100 had an SEC gas detector connected. The SEC 3100 transmitter reports the foreign device status bidirectional to the SEC 3500 HMI Operator Interface via the MODBUS RS485 communication network. The SEC 3100 LIM can be installed in the SEC 3100 explosion proof transmitter housing using a taller window dome.

The SEC 3100 LIM accepts one device input for Low Alarm and High Alarm. Examples of switch contact devices that can be used with the SEC 3100 LIM are:

Open Path Gas Detectors
Fire Detectors
Temperature Switch
Pressure Switch

SPECIFICATIONS

Operating Voltage
18-32 VDC

Operating Current (No Sensor)
50mA @ 24VDC

Output (digital)
SEC SSP (Smart Sensor Protocol)

Temperature Rating
-40° to + 70°C

Humidity
0-99% RH (non-condensing)

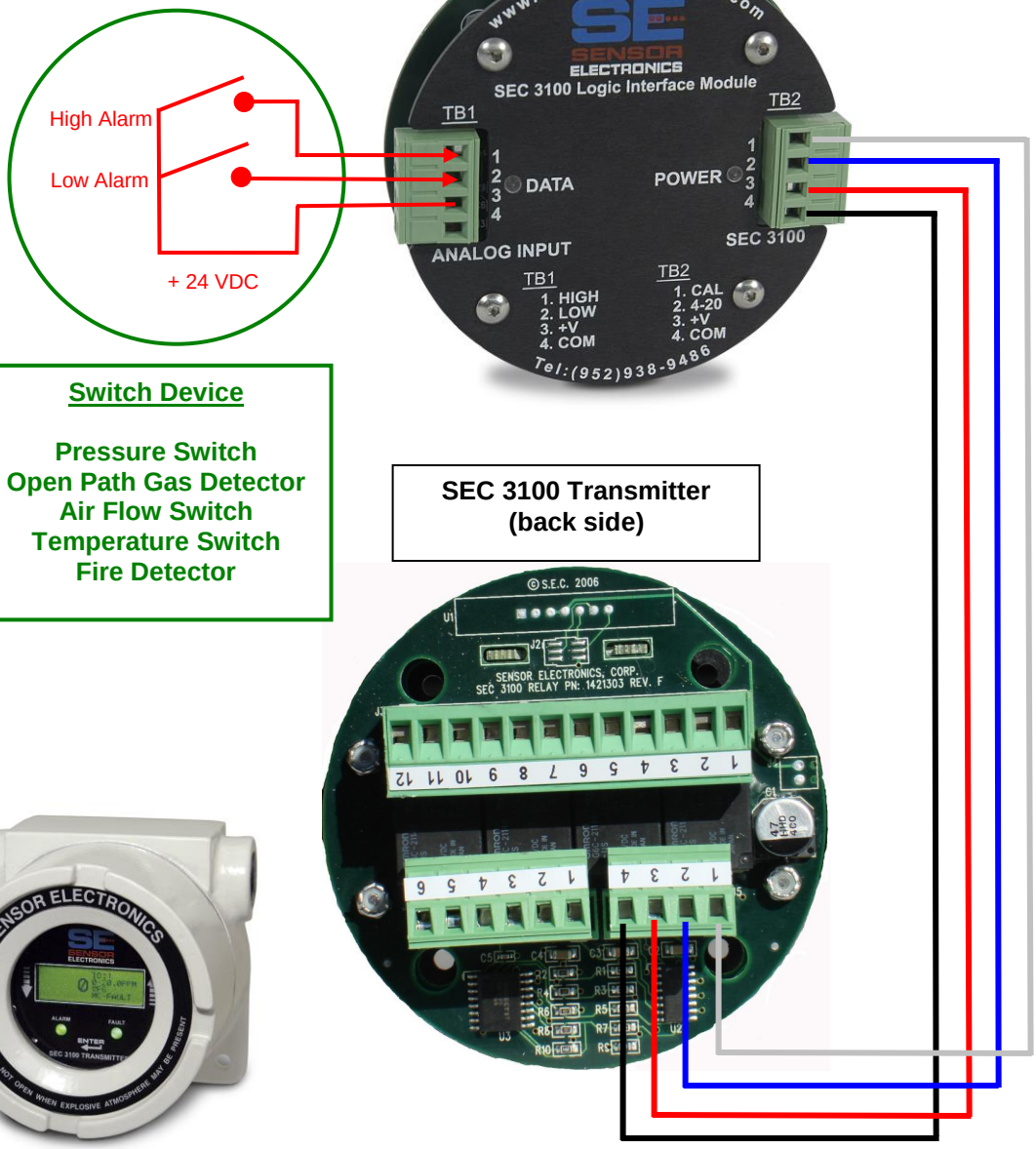
Input
Low Alarm
High Alarm

Device Variable Characters
Device Name: 8
Range: 4
Unit of Measure: 4
Calibration Value: 4

(Standard ASCII Characters

Part Number
3100-000-000-LIM

SEC 3100 LIM



Switch Device

Pressure Switch
Open Path Gas Detector
Air Flow Switch
Temperature Switch
Fire Detector

SEC 3100 Transmitter (back side)

SEC 3100 Explosion Proof Transmitter

NOTE: Refer to the SEC 3100 Transmitter Instruction Manual for additional wiring connections.