



Gas and Flame Detection

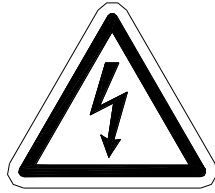
Operation and Maintenance Manual

GASMAX SSX Single Channel Gas Monitor

GDS Corp.

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409-927-2980 • 409-927-4180 (Fax) • www.gdscorp.com



CAUTION: FOR SAFETY REASONS THIS EQUIPMENT MUST BE OPERATED AND SERVICED BY QUALIFIED PERSONNEL ONLY. READ AND UNDERSTAND INSTRUCTION MANUAL COMPLETELY BEFORE OPERATING OR SERVICING.

ATTENTION: POUR DES RAISONS DE SÉCURITÉ, CET ÉQUIPEMENT DOIT ÊTRE UTILISÉ, ENTRETENU ET RÉPARÉ UNIQUEMENT PAR UN PERSONNEL QUALIFIÉ. ÉTUDIER LE MANUE D'INSTRUCTIONS EN ENTIER AVANT D'UTILISER, D'ENTREtenir OU DE RÉPARER L'ÉQUIPEMENT.

REVISION HISTORY

Revision 1.0 8//22/21 Initial Release

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1 SAFETY INFORMATION

Important – Read Before Installation

Users should have a detailed understanding of GASMAX SSX operating and maintenance instructions. Use the GASMAX SSX only as specified in this manual or detection of gases and the resulting protection provided may be impaired. Read the following WARNINGS prior to use.

WARNING

WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 1, OR EQUIVALENT AS STATED IN USER MANUAL

AVERTISSEMENT – RISQUE D'EXPLOSION-LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION

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ATTENTION: POUR DES RAISONS DE SECURITE, CET ÉQUIPEMENT DOIT ETRE UTILISE ENTRETENU ET REPARER UNIQUEMENT PAR UN PERSONNEL QUALIFIE. ETUDIER LE MANUEL D' INSTRUCTIONS EN ENTIER AVANT D' UTILISER, D' ENTERETENIR OU DE RÉPARER L' ÉQUIPEMENT.

CAUTION: THIS AREA MUST BE FREE OF FLAMMABLE GASES DURING CALIBRATION.

ATTENTION: CETTE ZONE DOIT ETRE EXEMPTÉ DE GAZ INFLAMMABLES PENDANT L'ÉTALONNAGE.

CAUTION: TO PREVENT IGNITION OF EXPLOSIVE ATMOSPHERES, REMOVE FROM EXPLOSIVE ATMOSPHERE BEFORE SERVICING

CAUTION

THE GASMAX SSX MUST BE INSTALLED, OPERATED, AND MAINTAINED IN ACCORDANCE WITH INFORMATION CONTAINED HEREIN. INSTALLATION IN ANY HAZARDOUS AREA MUST COMPLY WITH ALL APPLICABLE RESTRICTIONS, REQUIREMENTS, AND GUIDELINES FOR SAID HAZARDOUS AREAS. IT IS THE END USER CUSTOMER'S FINAL DECISION TO ENSURE THAT THE GASMAX SSX IS SUITABLE FOR THE INTENDED USE.

THE GASMAX SSX IS DESIGNED AND CONSTRUCTED TO MEASURE THE LEVEL OF CERTAIN GASES IN AMBIENT AIR. ACCURACY IN ATMOSPHERES CONTAINING STEAM OR INERT GASES CANNOT BE GUARANTEED.

DO NOT PAINT TRANSMITTER OR SENSOR ASSEMBLY.

DO NOT OPERATE THE GASMAX SSX IF ITS ENCLOSURE IS DAMAGED OR CRACKED OR HAS MISSING COMPONENTS. MAKE SURE THE COVER, INTERNAL PCB'S AND FIELD WIRING ARE SECURELY IN PLACE BEFORE APPLYING POWER.

DO NOT EXPOSE THE GASMAX SSX TO ELECTRICAL SHOCK OR CONTINUOUS SEVERE MECHANICAL SHOCK. PROTECT THE GASMAX SSX FROM DRIPPING LIQUIDS AND HIGH-POWER SPRAYS.

PERIODICALLY TEST FOR CORRECT END-TO-END OPERATION OF THE ENTIRE SYSTEM.

DANGER

GDS CORP GASMAX SSX IS AN AMBIENT AIR GAS SENSOR ASSEMBLY AND ONLY MONITORS IN THE IMMEDIATE VICINITY OF THE SENSOR HOUSING. A SITE SURVEY IS REQUIRED IN ORDER TO DETERMINE THE BEST PLACEMENT AND QUANTITY OF SENSOR ASSEMBLIES. IMPROPER INSTALLATION CAN LEAD TO AN UNDETECTABLE GAS LEAK WHICH COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

WARRANTY

GDS Corp products carry a 2-year limited repair or replacement warranty on electronics and workmanship and one year warranty on sensors. GDS Corp. reserves the right to void warranty claims based on evidence of misuse, abuse, or misapplication. Warranty period starts on date of shipment.

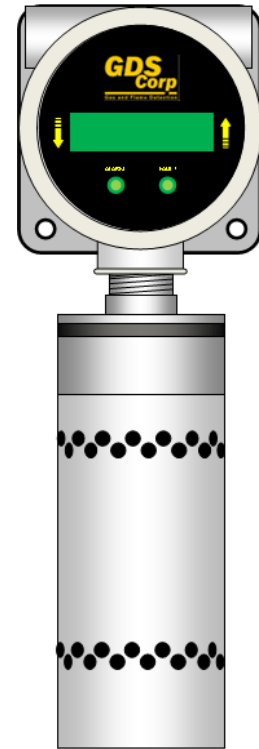
IF YOU HAVE QUESTIONS

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2 OVERVIEW

GASMAX SSX OVERVIEW

The GDS Corp GASMAX SSX Explosion-Proof Ambient Air Toxic Gas Detector is designed to detect a wide range of toxic and combustible gases in potentially hazardous environments. This product is CSA certified as Class I, Division 1, Groups B, C and D. The GASMAX SSX features non-intrusive magnetic switches that allow for complete system configuration, regular calibration, and product maintenance to be performed in the field, without opening the enclosure and breaking the seal of the enclosure, thereby compromising the explosion-proof rating of the device. Non-intrusive interface with the GASMAX SSX is made possible by use of the Magnetic Wand included in the purchase of the device.



This document is an operation manual containing diagrams and step-by-step instructions for the proper and safe installation, start-up, configuration and settings, normal operation, and product maintenance of the GASMAX SSX.

In this manual, the instructions reference the use of magnetic switches (“buttons”) located on the front panel of the device. In certain environments, the activation of the non-intrusive magnetic switches, using the Magnetic Wand, will replace the directive of the button-press actions. To apply the Magnetic Wand, hold the tool to the side of the device enclosure adjacent to the push-button that you wish to activate.

Should a question arise during the use of the product, this document will serve as a first reference for the end-user. For inquiries beyond the information and instructions provided within this manual, contact the sales representative of this product for assistance.

KEY FEATURES

- Explosion Proof Design & Certifications
- Back lighted LCD Display
- Non-intrusive magnetic interface allows setup & calibration in hazardous areas
- Plug and play toxic, oxygen, and combustible gas sensors
- Self-check diagnostic system
- Industry standard 4-20 mA output with fault error codes
- Isolated RS-485 serial MODBUS Interface

- Optional alarm and fault relays
- Non-intrusive programming
- Non-intrusive calibration
- Removable, non-volatile, time stamped data logging
- Digital communication link to GDS Corp sensors for optimum noise immunity
- Explosion-proof housing for easy installation

The GASMAX SSX has three (3) 3/4" NPT threaded connectors for mounting and wiring the sensor and transmitter into a permanent installation.

Field wiring connections are made on the backside of the GASMAX SSX display printed circuit board (PCB). For wiring details refer to the chapter on Installation.

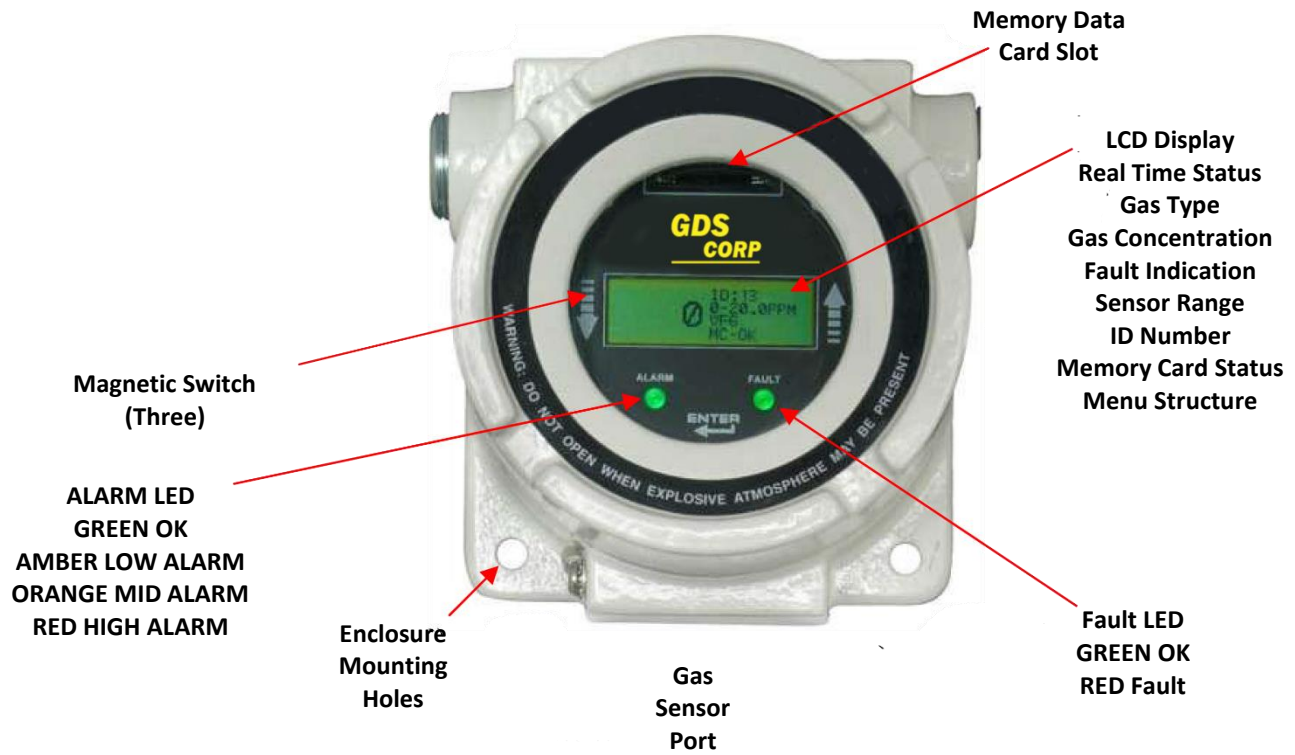


Figure 2-1: GASMAX SSX Display

3 INSTALLATION

SELECTING A LOCATION

These installation instructions, and any other information supplied by GDS Corp, provide only basic guidelines relating to the properties of combustible gas and the effects of environmental conditions on the GASMAX SSX device. Sensor placement should be determined in consultation with the site safety personnel, as well as those knowledgeable of: (1) the site/facility where the equipment is being installed and (2) the potentially present gas types and their dispersion. GDS Corp strongly recommends that the end-user consults with the appropriate third-party Health, Safety and Environmental (HSE) and Industrial Hygiene (IH) professionals to determine the final quantity and placement of your gas detection devices.

The primary purpose of the is to provide an early warning of the accumulation of toxic gas to minimize hazards to people and property. Proper placement of the device is paramount to achieving this goal.

The following general guidelines should be considered when determining the placement of the GASMAX SSX:

- ✓ The unit shall be placed such that the position of the sensor housing is pointing downward to the ground.
- ✓ Avoid installing the unit in a location where airborne particles could cover or coat the sensor head.
- ✓ The unit should be placed in an area that will produce the highest gas concentration. Enclosed corners and stopping points of moving devices are two areas susceptible to a buildup of combustible gas.
- ✓ To provide an accurate representative sample of a room, care should be taken to avoid locating the unit near a room entrance, fresh air intake vent, or vehicle/generator exhaust point.
- ✓ The unit should be placed as close as physically possible to the source of the potential toxic gas leak.
- ✓ In consideration of possible ignition points, the unit should be placed between the potential leak source and ignition point.
- ✓ Consider placing the unit in a seldom used area, such as a warehouse, storage area, or other unfrequented location.
- ✓ Consider accessibility for regular calibration and other required maintenance.
- ✓ When monitoring a ventilated gas cylinder storage area, the unit should be placed near the air return vent.
- ✓ When monitoring an outdoor or open-air area, the unit should be placed near the air intake of the HVAC system of the building.

- ✓ When monitoring for the potential presence of multiple toxic gas types, the unit should be calibrated for the least cross-sensitive toxic gas.

NOTE: These guidelines are **ONLY** intended as a general directive for the placement of the **GASMAX SSX**. This information should **NOT** serve as a complete list when considering all potential parameters for the proper location of the unit. It is **STRONGLY** advised that a third party **Certified Industrial Hygienist**, or other **Certified Safety Professional**, conduct a site survey and annotate the location and quantity of detection devices that should be installed for **EVERY** installation of **EVERY** site.

MOUNTING THE ENCLOSURE

It is recommended to mount the GASMAX SSX to a solid structure (such as a concrete wall, steel column, or angle iron) where a minimum of vibration will be transmitted to the unit. Alternately, a pole may be used along with a strap or a U-bolt, if it is rigid and of sufficient strength. Wooden structures are not recommended for mounting, as they trap moisture (which could affect sensor performance) and their mounting rigidity degrades over time (screws/bolts weaken and fall out or corrode).

POWER AND SIGNAL CONNECTIONS

The GASMAX SSX requires a source of DC power between +18VDC and +30VDC. Power and ground are connected to Pin 3 (+) and Pin 2 (-) on the back of the display board as shown.

The single 4-20mA output (source) is connected to Pin 1 on TB2,

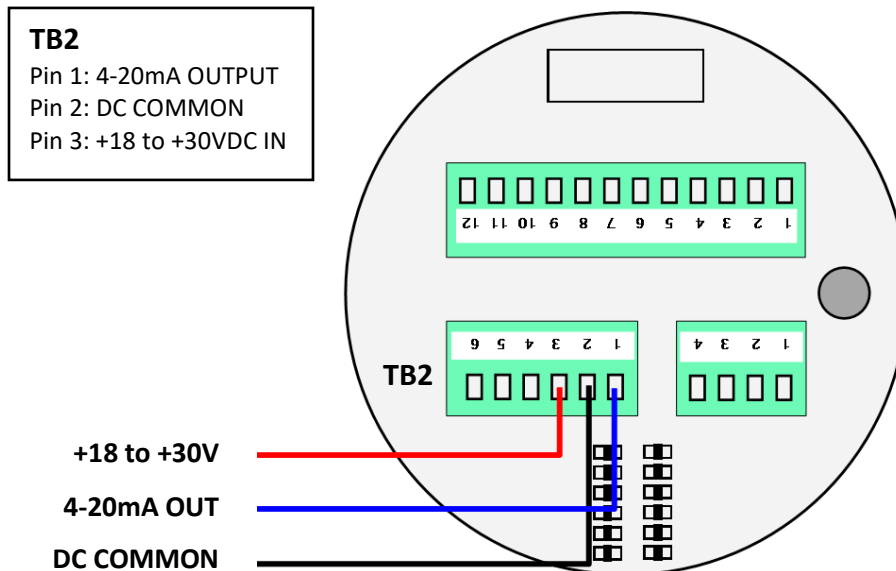


Figure 3-1: GASMAX SSX Power and Signal Wiring

MODBUS CONNECTIONS

The GASMAX SSX includes a single isolated RS-485 Serial MODBUS slave interface. MODBUS wiring is connected to Pin 6 ("A") and Pin 5 ("B") on the back of the display. The common ground for the MODBUS signals is connected to Pin 4 as shown.

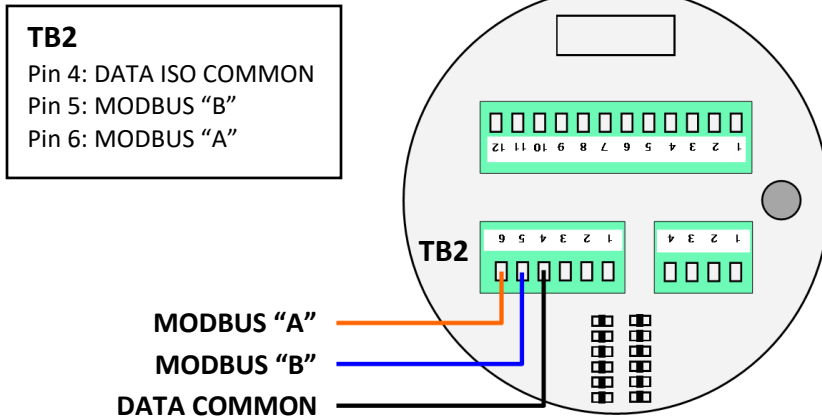


Figure 3-2: GASMAX SSX MODBUS Wiring

For MODBUS applications, GDS Corp recommends that the GASMAX SSX include the MODBUS Wiring Junction Box (MBJB) option. This extends the MODBUS serial wiring into an attached XP junction box that provides a convenient way for the daisy-chained power and signal wiring to be connected and allows each detector to be individually powered and tested during startup.

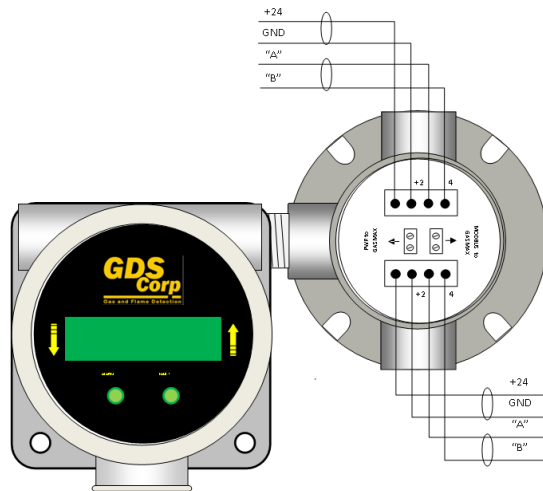


Figure 3-3: GASMAX SSX with MODBUS Wiring Junction Box

RELAY CONNECTIONS

The GASMAX SSX includes three alarm relays (LOW, MEDIUM, HIGH) and a separate Fault relay. Each SPDT relay has Normally Open (NO), Common (COM) and Normally Closed (NC) terminals and each relay is capable of handling up to 8A of non-reactive power.

Relay connections are located on the back of the display board as shown below.

GDS CORP RECOMMENDS AN APPROPRIATELY SIZED INTERPOSING RELAY BE USED TO DRIVE LARGE REACTIVE LOAD SUCH AS FAN MOTORS, VALVE SOLENOIDS OR SIMILAR DEVICES.

RELAYS CAN BE SET FOR ENERGIZE HIGH OR ENERGIZE LOW. RELAYS SET FOR ENERGIZE LOW WILL BE POWERED DURING NON-ALARM CONDITIONS AND WILL DROP OUT WHEN AN ALARM OCCURS. THIS IS OFTEN CALLED "NORMALLY OPEN HELD CLOSED". USING THE NORMALLY CLOSED PINS TO ACTIVATE THE ALARM ENSURES THAT AN ALARM WILL ALSO OCCUR IF THE RELAY FAILS OR IF POWER IS LOST.

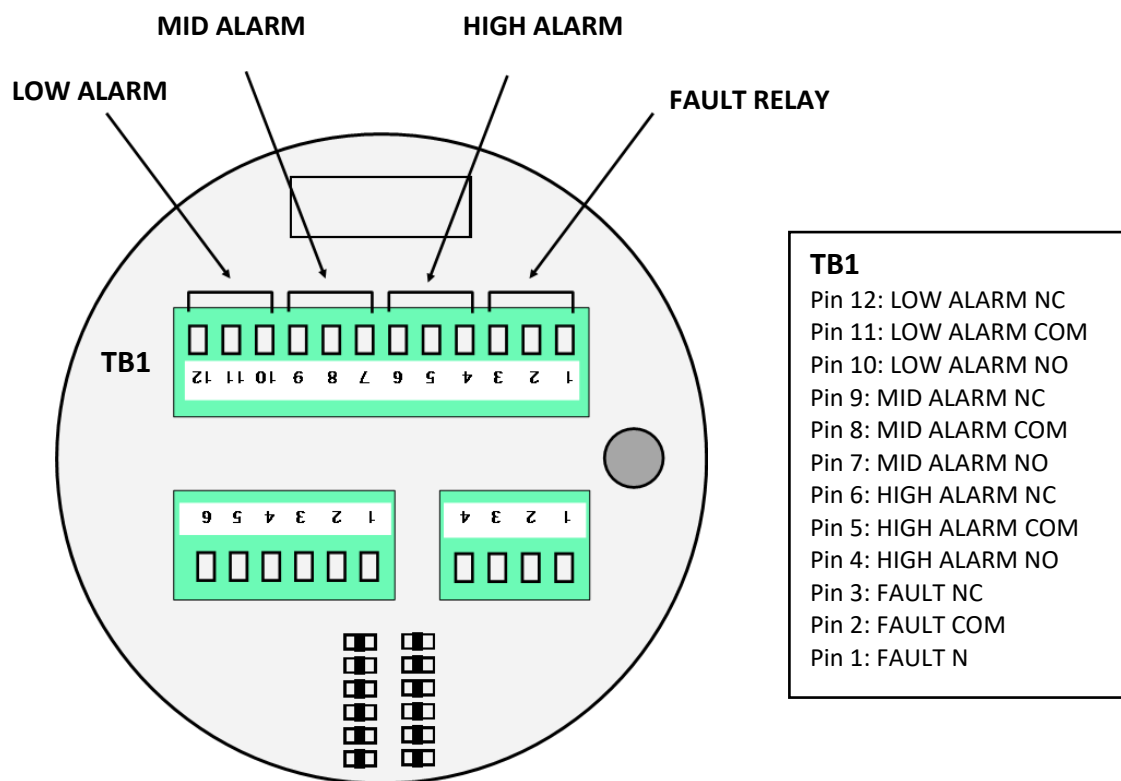


Figure 3-4 GASMAX SSX ALARM RELAY Wiring

CONNECTING REMOTE TOXIC SENSORS

If the GASMAX SSX is shipped with a remote GDS-49X Toxic Sensor, the wiring between the GASMAX SSX and GDS-49X should be connected as shown below. The GDS-49X red wire (+18-30VDC) should be connected to TB3 Pin 3 and the GDS-49X black wire (GND) should be connected to TB3 Pin 4. The GDS-49X white wire (Digital Com) should be connected to TB3 Pin 1. The GDS-49X blue wire (4-20mA) is not used.

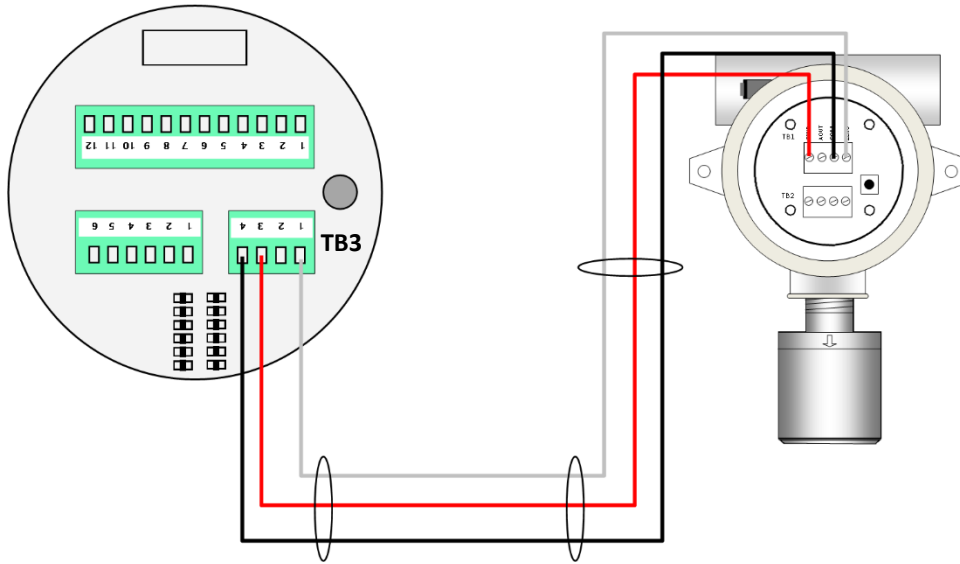


Figure 3-5: Remote GDS-49X Toxic Sensor

CONNECTING REMOTE GDS-IR SENSORS

If the GASMAX SSX is shipped with a remote GDS-IR Infrared Sensor, the wiring between the GASMAX SSX and GDS-IR should be connected as shown below. The GDS-IR red wire (+18-30VDC) should be connected to TB3 Pin 3 and the GDS-IR black wire (GND) should be connected to TB3 Pin 4. The GDS-IR white wire (Digital Com) should be connected to TB3 Pin 1. The GDS-IR blue wire (4-20mA) is not used.

THE POWER AND GROUND WIRE SIZE SHOULD BE CHOSEN TO ENSURE THAT A MINIMUM OF +18VDC IS PRESENT AT THE GDS-IR SENSOR. FOR CALCULATION PURPOSES, THE AVERAGE POWER IS 5 WATTS (210 mA at 24VDC)

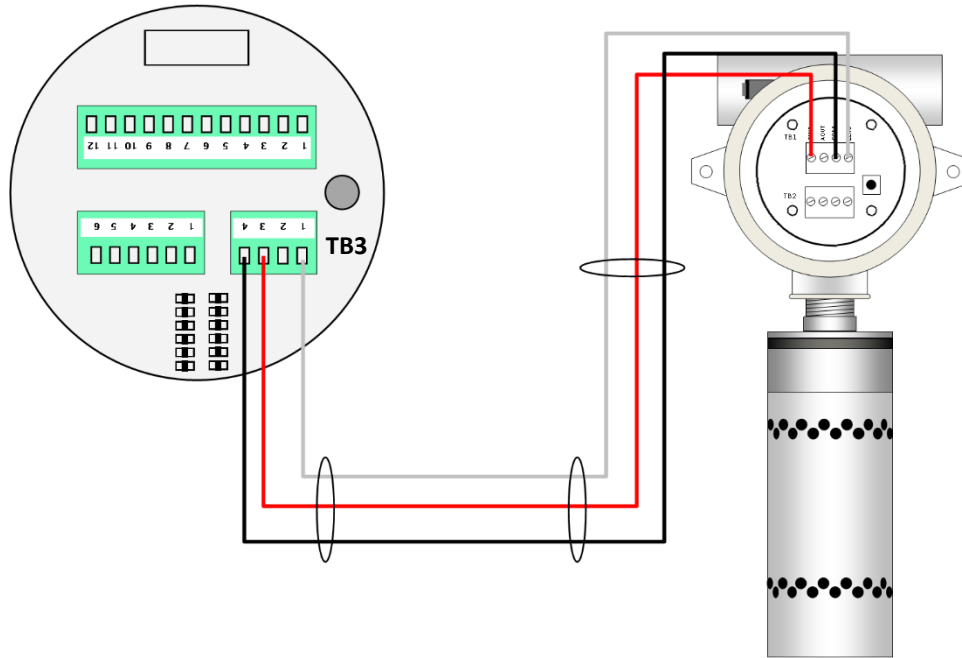


Figure 3-6: Remote GDS-IR Infrared Sensor

4 PROGRAMMING & SETUP

USER INTERFACE

The GASMAX SSX display uses three magnetic switches to enable user interaction. Pressing a magnetic wand to the left side of the enclosure activates the DOWN key. Pressing a magnetic wand to the right side activates the UP key and bringing the magnet close to the bottom of the enclosure activates the ENTER key.

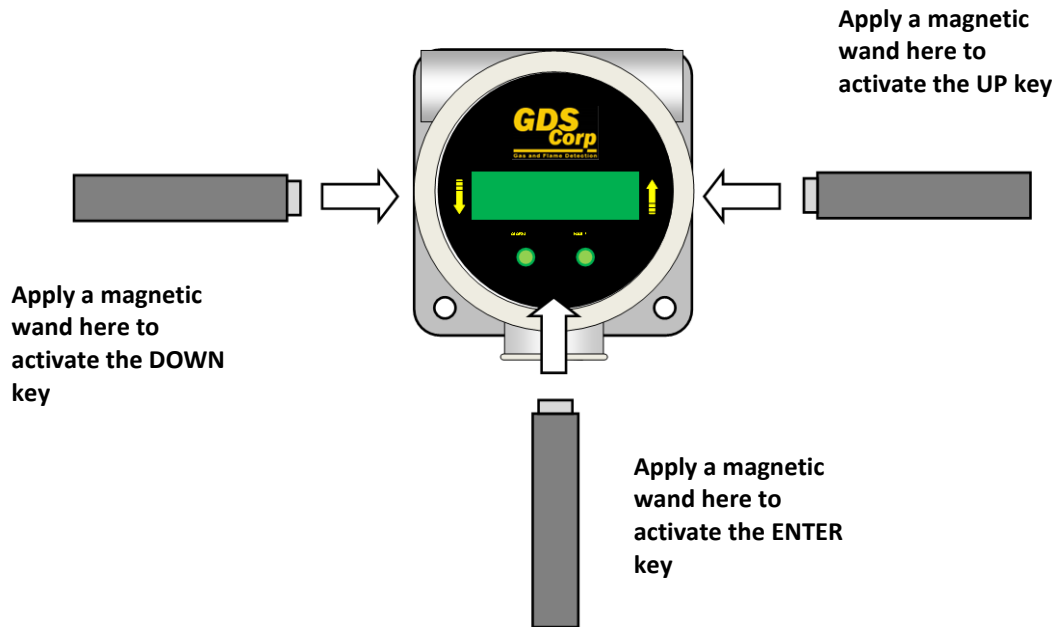


Figure 4-1: GASMAX SSX User Interface

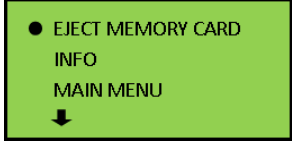


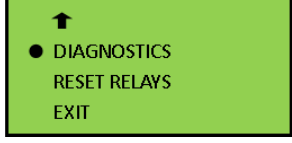
NORMAL OPERATION

During normal operation, the display shows the current measured and calibrated gas value, the gas engineering units ("ppm" or "%LEL") and the type of sensor attached.

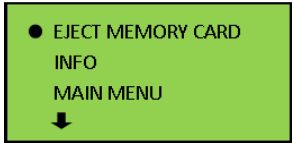
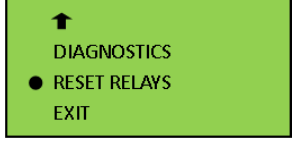
<p>During normal operating mode, the GASMAX SSX continuously samples the air and updates the measured concentration of the target gas on the display screen. The display, when in normal operation, displays the measured gas concentration ("0"), the gas range and unit of measure ("ppm") and type of sensor ("H2S")</p>	<p>The screenshot shows a green display with a large '0' on the left and the following text on the right: "ID: 1", "0-20 ppm", "H2S", and "MC - REMOVED".</p>
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TOP LEVEL MENU

The PRODUCT SETTINGS AND CONFIGURATION MENU allows the end-user to tailor the device settings to meet their required specifications and/or site conditions.

<p>To Enter the TOP LEVEL MENU, press (activate) the ENTER key. Once in the menu, using the UP or DOWN keys to move between selections. Pressing ENTER when the cursor is to the left of a choice will display the associated menu</p>	
<ul style="list-style-type: none"> • The EJECT MEMORY CARD command allows the user to safely remove the memory card without risk of data corruption. • The INFO menu allows the user to access information about the gas detector • The MAIN MENU allows the user to access the Calibration, Alarm and Relay Menus 	
<ul style="list-style-type: none"> • The NETWORK menu allows the user to setup the MODBUS communications variables • The HIDE command allows the user to access the menu that controls how the displayed value is shown on the LCD screen 	
<ul style="list-style-type: none"> • The SELF TEST menu allows the user to command the GASMAX SSX to perform certain system tests • The DATE TIME menu allows the user to set the internal Real Time Clock 	
<ul style="list-style-type: none"> • The DIAGNOSTICS menu allows the user to enter Locator Mode and toggle the relays on and off to verify proper operation of the complete system. • The RESET RELAYS command resets any LATCHED relays 	

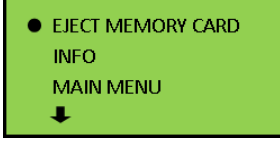
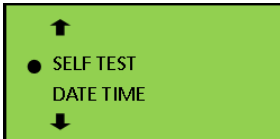
ACKNOWLEDGING LATCHED ALARMS

<p>To unlatch a latched relay, perform the following procedure:</p>	
<p>1. Press ENTER to enter the TOP LEVEL MENU. Press the DOWN key multiple times to select RESET RELAYS.</p>	
<p>2. Once the cursor is next to RESET RELAYS, press ENTER to acknowledge the alarm and unlatch the latched relay</p>	

RUNNING SELF TEST

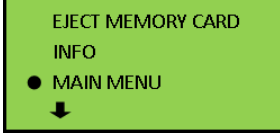
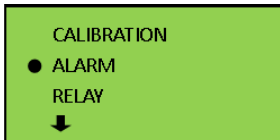
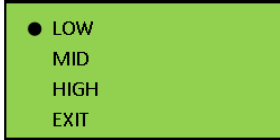
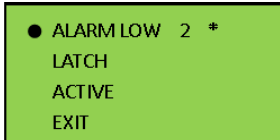
To have the GASMAX SSX perform a unit self-test, perform the following procedure

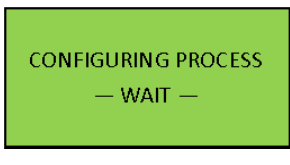
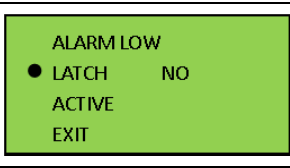

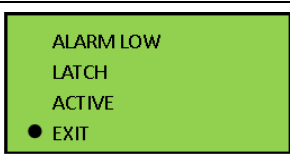
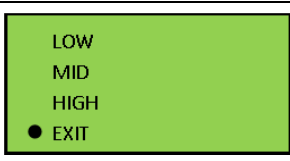
NOTE: OUTPUTS AND RELAY CONTACTS ARE ACTIVE DURING SELF TEST AND WILL TRIGGER EXTERNAL ALARMS. USE CAUTION WHEN RUNNING SELF TEST

<p>1. Press ENTER to enter the TOP LEVEL MENU. Press the DOWN key multiple times to select SELF TEST</p>	
<p>2. Once the cursor is next to SELF TEST, press ENTER to run self-test. During self-test, the reading will increase from zero, the output will slowly rise from 4mA to 20mA and the relays will trigger when the alarm thresholds are exceeded. Once self-test is complete, the GASMAX SSX will return to normal operation.</p>	

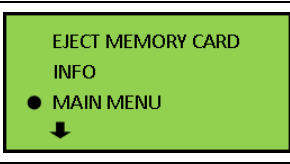

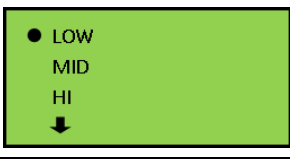
SETTING ALARM LEVELS

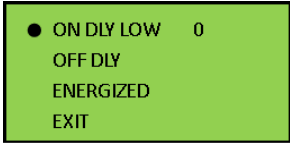
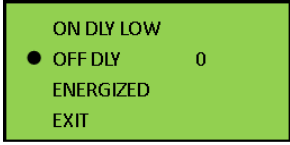
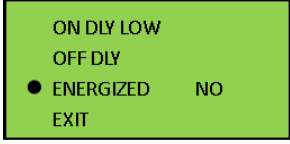
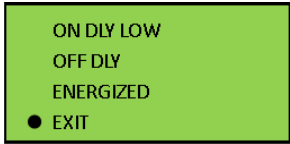
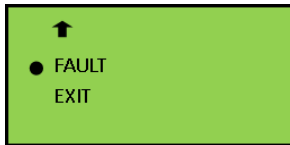
The ALARMS menu allows the user to set the alarm level (threshold), latching or non-latching status and whether the alarm is triggered when the measured value goes above or below the threshold.

<p>1. Press ENTER to enter the TOP LEVEL USER MENU. Press the DOWN key twice to select MAIN MENU. Press ENTER to enter the MAIN MENU</p>	
<p>2. Once in the MAIN MENU, press the DOWN key to select ALARM. Press ENTER to enter the ALARM MENU</p>	
<p>3. Once in the ALARM MENU, use the UP and DOWN keys to select the LOW, MID or HIGH alarm settings. When finished, select EXIT to return to the MAIN MENU</p>	
<p>Repeat the following steps for LOW, MID and HIGH alarm settings</p>	
<p>4. Press the ENTER key to adjust the alarm trigger value. Use the UP or DOWN keys to set the value to the desired level and press ENTER again.</p>	

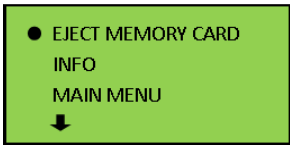

<p>5. The screen shown will indicate that the value is being stored in nonvolatile memory. When complete, press the DOWN key to select the latch setting.</p>	
<p>6. Press the ENTER key to select LATCH NO or LATCH YES. If YES, once the alarm is triggered, it will remain active until the alarm is reset from the TOP LEVEL MENU.</p>	
<p>7. Press the ENTER key to select ACTIVE HIGH or ACTIVE LOW. If HIGH, the alarm will trigger when the measured value rises above the setpoint value. If LOW, the alarm will trigger if the value falls below the setpoint.</p>	
<p>8. Once the value, latch and level values are set, select EXIT and proceed to set values for the MID and HIGH alarms.</p>	
<p>Proceed to next alarm setting</p>	
<p>Once all three alarm levels are programmed, select EXIT to return to the MAIN MENU</p>	

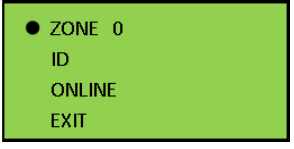
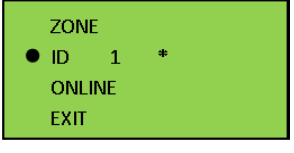
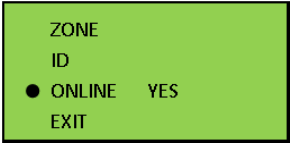
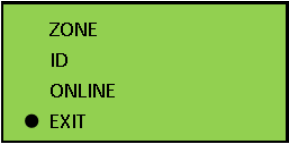
PROGRAMMING RELAY SETTINGS

<p>The RELAYS menu allows the user to program the ON Delay, OFF Delay and ENERGIZED (failsafe) status for each of the three alarm relays.</p>	
<p>1. Press ENTER to enter the TOP LEVEL USER MENU. Press the DOWN key twice to select MAIN MENU. Press ENTER to enter the MAIN MENU</p>	
<p>2. Once in the MAIN MENU, press the DOWN key twice to select RELAY. Press ENTER to enter the ALARM MENU</p>	
<p>3. Once in the RELAY MENU, use the UP and DOWN keys to select the LOW, MID or HI relay settings. When finished, select EXIT to return to the MAIN MENU</p>	
<p>Repeat the following process for LOW, MID and HI alarm relays</p>	

<p>4. Select the ON-DELAY setting. This is the value in seconds measured from the time the alarm threshold is exceeded until the relay is activated. The minimum time is 0 seconds, and the maximum time is 255 seconds.</p>	
<p>5. Select the OFF-DELAY setting. This is the value in seconds measured from the time the alarm ends until the relay is deactivated. The minimum time is 0 seconds, and the maximum time is 255 seconds.</p>	
<p>6. This setting allows the relay to be programmed for Normal (ENERGIZED NO) or Failsafe (ENERGIZED YES). If YES is selected, the alarm coil is energized when there is no alarm and becomes deenergized when an alarm occurs.</p>	
<p>7. Once the on delay, off delay and failsafe status are programmed, select EXIT and proceed to the next relay.</p>	
<p>Proceed to next relay setting</p>	
<p>Once all three relays are programmed, select EXIT to return to the MAIN MENU</p>	

PROGRAMMING NETWORK (MODBUS) SETTINGS

<p>The NETWORK menu allows the user to program values associated with the RS-485 serial MODBUS interface.</p>	
<p>1. Press ENTER to enter the TOP LEVEL USER MENU. Press the DOWN key multiple times to select NETWORK MENU.</p>	
<p>2. Press ENTER to enter the NETWORK MENU</p>	

<p>3. Press ENTER to edit the ZONE number. The ZONE number is currently unused and can be left at the default value.</p>	
<p>4. Press ENTER to edit the MODBUS ID. This value identifies the GASMAX SSX on a serial MODBUS link and must be unique on that link. Acceptable values are 002 through 240. Using an ID value of "1" is not recommended.</p>	
<p>5. The ONLINE setting allows the serial MODBUS interface to be completely disabled. If YES, the interface operates correctly. If NO, the interface is disabled and the GASMAX SSX will not respond to MODBUS data requests.</p>	
<p>6. Once all three NETWORK settings are programmed, select EXIT to return to the TOP LEVEL MENU</p>	

5 CALIBRATION

CALIBRATION

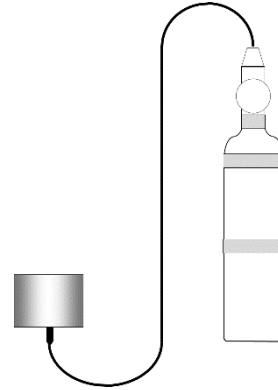
Calibration is the process of evaluating and adjusting the precision and accuracy of measurement equipment. Although GDS Corp tests and calibrates every device at the factory, **GDS Corp strongly recommends that the GASMAX SSX be calibrated in the environment where it is installed before being used to ensure personnel or equipment safety.**

It is imperative that calibration occur as part of the installation process, and then every thirty (30) to sixty (60) days thereafter. Days since last calibration should NEVER exceed ninety (90) days. GDS Corp recommends that you calibrate your device regularly to ensure proper functionality and a safe work environment.

CALIBRATION EQUIPMENT REQUIRED

To properly calibrate a GASMAX SSX gas detector, assemble the following equipment:

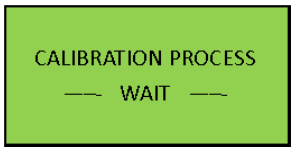

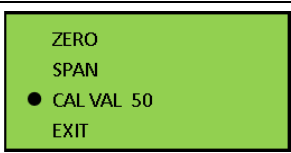
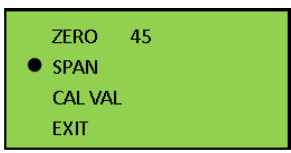
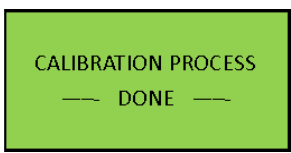
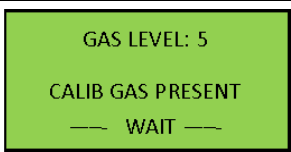
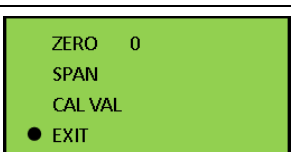
- ✓ Cylinder of Zero Air (Nitrogen / Oxygen mixture)
- ✓ Cylinder of Calibration gas (Best if 50% of scale)
- ✓ Fixed flow regulator
- ✓ Calibration Adapter for Toxic Sensors



CALIBRATION SEQUENCE

The CALIBRATION SEQUENCE allows the end-user to zero and span the GASMAX SSX.

<p>1. Press ENTER to enter the TOP LEVEL USER MENU. Press the DOWN key twice to select MAIN MENU.</p>	<p>EJECT MEMORY CARD INFO ● MAIN MENU ↓</p>
<p>2. Select CALIBRATION and press ENTER to proceed</p>	<p>● CALIBRATION ALARM RELAY ↓</p>
<p>3. Connect the cylinder of Zero Air to the fixed flow regulator. Attach the tubing to the regulator. If a toxic sensor is being calibrated, connect the Calibration adapter. If the sensor is an Infrared sensor, connect the tubing to the cal fitting on the bottom of the sensor.</p>	<p>● ZERO SPAN CAL VAL 50 EXIT</p>

<p>4. Place the calibration adapter on the sensor head and start the flow of gas. Press the ENTER key to proceed. A "Calibration Process" message will appear.</p>	
<p>5. When the zero-measurement process is complete a "Done" message will appear.</p>	
<p>6. Press the DOWN key to view the Cal (Span) Value. Make sure the Cal (Span) Value setting matches the value shown on the cylinder of gas.</p>	
<p>7. Disconnect the cylinder of Zero Air and connect the cylinder of Calibration Gas. Start the flow of gas, then press ENTER to start the calibration gas measurement process.</p>	
<p>8. When the span-measurement process is complete a "Done" message will appear.</p>	
<p>9. If calibration gas is still present, the GAS PRESENT screen will appear until the gas value falls below the LOW alarm setting. This will ensure that residual calibration gas will not trigger a false alarm.</p>	
<p>10. Calibration is now complete. Disconnect the calibration adapter (if used) and fixed flow regulator. Select EXIT to return to top level menu.</p>	

6 MAINTENANCE

SCHEDULED MAINTENANCE

GDS Corp recommends that our equipment be calibrated a MINIMUM of every 90 days, and STRONGLY advise that calibration be performed every 30 days. Without knowing the specific application, sensor assembly location, gas exposure, and other factors, GDS Corp recommends monthly calibrations – assuming no damage or potential damage has occurred to the sensor and that there has not been a power outage to the sensor assembly. If damage has occurred or the power supplied to the sensor has changed, a calibration should be completed immediately.

Scheduled maintenance **should include a zero and span calibration of the sensor** and a **relay test**. Consult the Sensor Calibration and Relay Test sections of this manual for further information and instructions on how to perform these procedures.

The sensor head **should be kept free of airborne particles, dirt, mud, spider webs, bugs and insects, and/or any other debris that could potentially cover or coat the sensor**. Keeping the sensor head clear of foreign articles will allow for proper operation of the device. A brief inspection during scheduled maintenance should suffice, but dependent upon the location and the environment in which the unit is installed, more frequent inspections may be warranted.

The sensor assembly may be adversely affected by the exposure to certain airborne substances. Loss of sensitivity or corrosion may be gradual if such materials are present in sufficient concentrations.

Other inhibiting substances include those that can coat the internal walls of the optical chamber (when using an infrared sensor) and reduce reflectivity. These include, but are not limited to, heavy oil deposits, dust/powder, water condensation, and salt formation.

Continuous and high concentrations of corrosive gases may also have a detrimental long-term effect on the product's service life. The presence of such substances in an area does not preclude the use of this device, but the likelihood of the shortened lifetime of the sensor element should be noted. Use of the sensor assembly in these environments may require more frequently scheduled maintenance to ensure safe and reliable system performance.

SENSOR REPLACEMENT

The toxic sensor elements used in the GASMAX SSX detect gas in either % by volume or PPM concentrations; this element must be fully functional for the system to operate correctly. GDS Corp recommends replacing the sensing element whenever a slow response to gas is observed during the normal calibration process. After replacing the sensor element, the device **MUST** then be nulled and calibrated for proper operation of the device.

Perform the following steps to replace a toxic sensor on the GASMAX SSX

1	Remove power from the GASMAX SSX
2	Unscrew the sensor head cover
3	Remove the old sensor element by pulling straight down
4	Install a new element by aligning the three pins and pushing straight up
5	Replace the sensor head cover
6	Apply power and allow the sensor to warm up for at least 30 minutes before performing a full calibration. NOTE: Some sensors may require an extended warm-up time. If possible, allow 24 hours warmup for best calibration accuracy.

7 TROUBLESHOOTING GUIDE

DEVICE APPEARS INOPERATIVE

- No DC power applied. Check voltage.
- Low DC power applied. Check voltage to make sure the value is between +18VDC and +30VDC
- Lightning strike or power spike. Replace electronics

SENSOR INDICATES FAULT

- Sensor is unplugged or missing
- Sensor is faulty. Replace sensor
- Sensor has excessive drift. Replace sensor
- Failure of analog input board. Contact GDS Corp

SENSOR INDICATES OVERRANGE

- Some sensors go into a temporary overrange condition during warmup. Allow time for the sensor to stabilize.
- Applied gas concentration exceeds sensor's linear range. Wait for gas to dissipate and check sensor for normal operation (exposure to extreme gas levels can damage sensor)

CALIBRATION FAILURE

- Sensor output does not stabilize around zero, causing a zero-calibration failure. Check for the presence of background gas that may be detected by sensor. Replace sensor.
- Sensor output does not rise sufficiently during span measurement, resulting in a span-calibration failure. Check sensor for end of life. Check calibration gas for proper concentration.

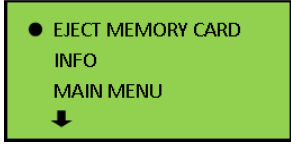
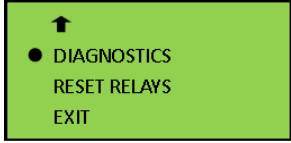
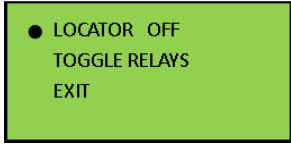
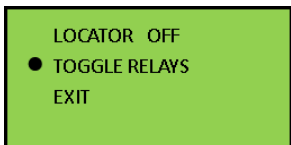
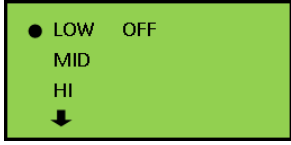
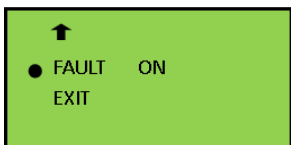
COMMUNICATION FAILURE

- Incorrect MODBUS ID
- MODBUS "A" and "B" wiring swapped
- Incorrect MODBUS register specified in MODBUS read command
- Incorrect MODBUS serial link parameters (Baud rate, number of data bits, etc)


mA OUTPUT STATES & MEANING

The output from the GASMAX SSX can assume any value between 0mA and 23mA. Indications below 4.0mA are a result of errors detected by the GASMAX SSX.	
0-20 mA	Normal range
0.0 mA	Unit Fault
0.2 mA	Reference channel fault (IR Sensor)
0.4 mA	Analytical channel fault (IR Sensor)
0.8 mA	Unit warm-up
1.0 mA	Optics fault (IR Sensor)
1.2 mA	Zero drift fault
1.6 mA	Calibration fault
2.0 mA	Unit spanning (IR Sensor)
2.2 mA	Unit zeroing (IR Sensor)
4.0 mA	Zero gas level
5.6 mA	10% of full scale
8.0 mA	25% of full scale
12.0 mA	50% of full scale
16.0 mA	75% of full scale
20.0 mA	100% of full scale
20.0+ mA	Overrange indication

SYSTEM DIAGNOSTICS

<p>To Enter the TOP LEVEL MENU, press (activate) the ENTER key. Once in the menu, using the UP or DOWN keys to move between s</p>	
<p>Press ENTER to enter the TOP LEVEL MENU. Press the DOWN key multiple times to select DIAGNOSTICS</p>	
<p>Select DIAGNOSTICS and press ENTER to proceed</p>	
<p>The LOCATOR function is used to test the alarm LED indicators. When ON, the Alarm and Fault LEDs will alternately flash red and green. Press ENTER to turn off LOCATOR mode.</p>	
<p>Select TOGGLE RELAYS to individually switch each relay ON or OFF to test or verify system wiring.</p>	
<p>Select the Alarm Relay (LOW, MID, HI, FAULT) that is to be configured using the down arrow. Once the cursor is on the correct alarm relay, hold the magnet over Enter. Selecting ENTER will turn on the relay. Selecting ENTER again will turn off the relay.</p>	
<p>Select EXIT to return to the TOP LEVEL MENU</p>	

8 SPECIFICATIONS

Power	18 to 30VDC as measured at the detector head Max current draw 250 mA (Average) 500 mA (Peak)
Temperature	-20°C to +70°C (operating)
Humidity	0-98% noncondensing
Measurement	Gas concentration depends on sensor selected
Response Time	Gas response depends on sensor selected
Display	LCD Screen LED Back-Light
Interface	3 Magnetic Switches for Non-Intrusive Calibration
Output (analog)	4-20mA current loop
Output (digital)	RS485 serial MODBUS RTU
Output (relays)	Three (3) alarm relays, Low, Mid, High plus Fault. Rated for 8A 30VDC or 220VAC non-reactive load
Dimensions	Aluminum Enclosure 5.0" W x 4.75" D x 8.5" H (Toxic Sensor) 5.0" W x 4.75" D x 12.5" H (Infrared Sensor) 5.75 lbs
Approvals	 Class I Division 1, Groups B, C and D
Warranty	Two years from date of purchase (electronics), one year from date of purchase (sensors) NOTE: Sensors that remain unpowered for more than 3 months after purchase may fail to operate properly and will not be covered under warranty.

9 DRAWINGS AND DIMENSIONS

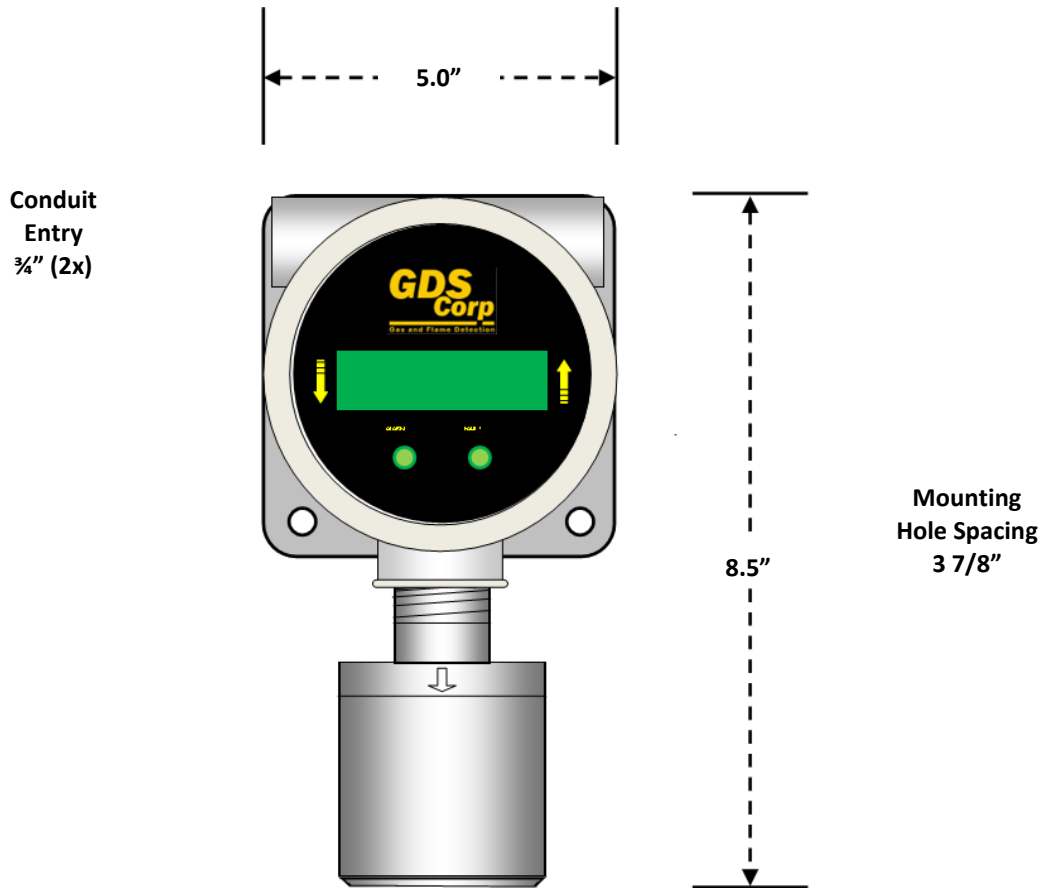


Figure 9-1: GASMAX SSX Dimensions (Toxic Sensor)

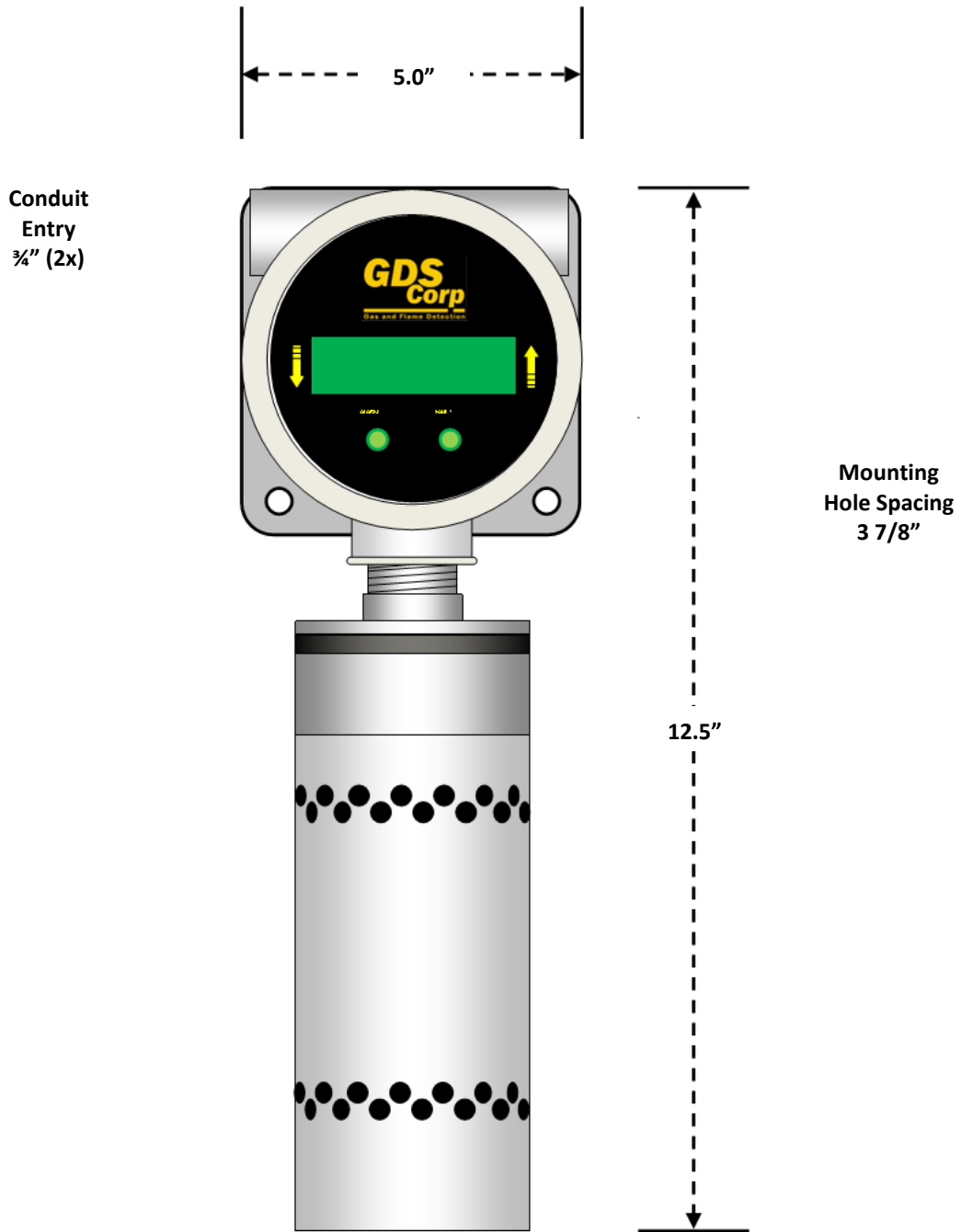


Figure 9-2: GASMAX SSX Dimensions (Infrared Sensor)

