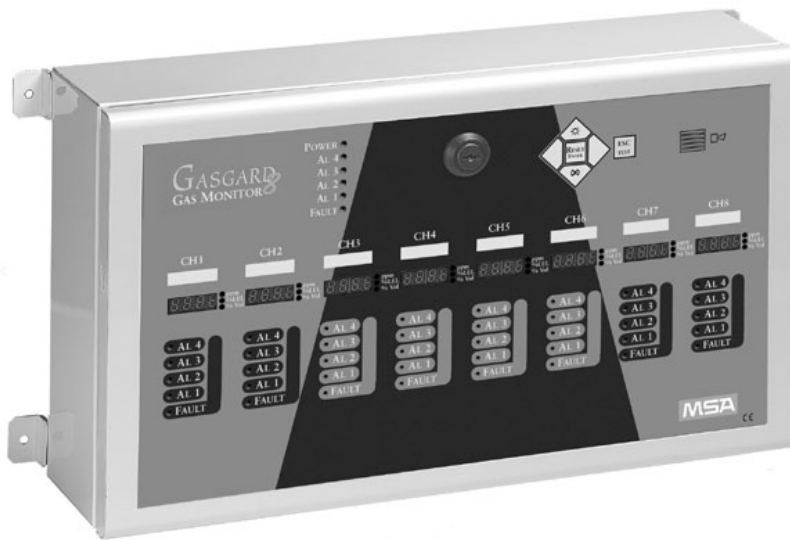




GASGARD[®] 8 Monitor

instruction manual



In the U.S., to contact your nearest stocking location, dial toll-free 1-800-MSA-INST.
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WARNING

THIS MANUAL MUST BE CAREFULLY READ BY ALL INDIVIDUALS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THE PRODUCT. Like any piece of complex equipment, the unit will perform as designed only if it is installed, used and serviced in accordance with the manufacturer's instructions. OTHERWISE IT COULD FAIL TO PERFORM AS DESIGNED AND PERSONS WHO RELY ON THIS PRODUCT FOR THEIR SAFETY COULD SUSTAIN SEVERE PERSONAL INJURY OR DEATH.

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Section 1

General Information

Introduction

The Gasgard 8 Gas Monitor is designed for remote monitoring of up to eight input sensors (two or three-wire 4-20 mA). Calibration of the sensor is performed at the sensor location and does not require calibration adjustments at the monitor, reducing the personnel required for calibration.

The Gasgard 8 Monitor offers many features and options, available through easy-to-program software. These features and options are accessed through the front panel control buttons.

Features

The Gasgard 8 Monitor is designed with easy-to-program software, allowing the user to set:

- Full-scale range for the connected 4-20 mA sensor
- Alarm level setpoints for each of the four alarm levels
- Alarm on an upscale or downscale gas reading
- Relays as energized or de-energized
- Alarms as latching or non-latching
- Buzzer output as enabled or disabled
- External alarm reset switch or flow failure fault status
- Time and Date.

These software settings are stored in memory and, due to an internal battery, remain preserved even with a loss of power. In addition, the alarm and fault relays are jumper configurable as normally-opened or normally-closed. The Gasgard 8 Gas Monitor control and indicator features are shown in FIGURE 1-1.

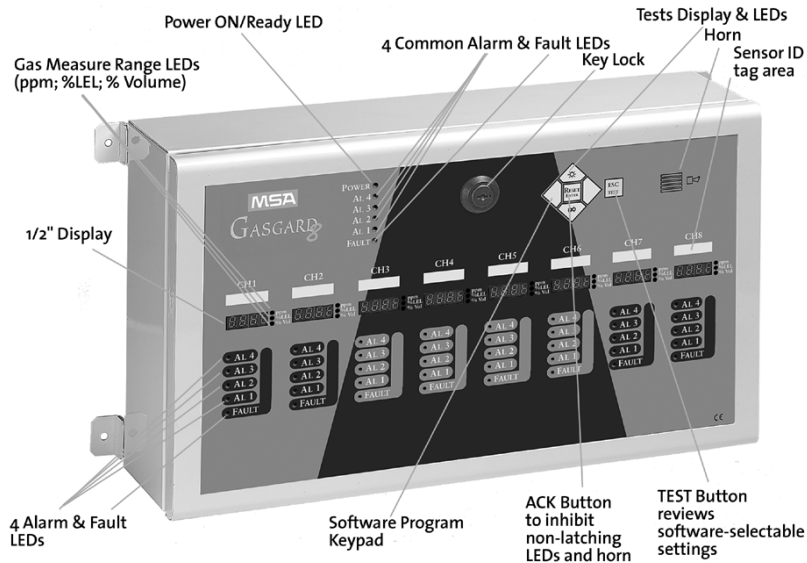


Figure 1-1. Front Panel

Front Panel Features

Display - Four digit, 1/2-inch readout indicates remote sensor gas concentration readings.

Power-On - Green LED indicates unit is powered ON.

Alarms (AL1 through AL4) - Four red LEDs indicate when gas concentrations exceed alarm level setpoints. Each of the four alarm levels has individual relay outputs.

Fault - Orange LED indicates all fault conditions within the monitor. The fault indicator has an individual relay output.

Gas Measure Range LEDs - Green LED indicates measuring range for each channel. Software-selectable as ppm, % LEL, and % volume.

Four Common Alarm and Fault LEDs - Common LEDs energized when any channel alarm or system fault condition occurs.

Alarm Acknowledge Button (Ack) - Acknowledges alarm and fault conditions and silences buzzer.

Test Button - Inhibits monitor gas reading capability in order to indicate all software settings on the display, including:

- Alarm level setpoints
- Upscale/downscale setting
- Energized/de-energized status
- Latching/non-latching setting
- Buzzer status.

Sensor ID Tag Area - Use this area to identify the sensor type connected to the Gasgard 8 Monitor.

Table 1-1. Gasgard 8 Gas Monitor General Specifications			
ELECTRICAL CHARACTERISTICS			
POWER SUPPLY	AC Voltage	100 - 240 VAC, 47 - 63 Hz	
	DC Voltage	24 VDC	
SENSOR CAPACITY		Up to eight sensors	
SENSOR INPUT		4-20 mA; three-wire or two-wire loop powered	
READ-OUT		Four-digit LED display (1/2" digits)	
SETPOINTS	Alarm Level	Four alarm set points (AL1, AL2, AL3, AL4) with indicating LEDs	
	Full-scale Range	Variable .1 to 99.9 or 999	
RELAYS	Alarm	Four programmable	
	Fault	One common	
	External	One common	
	Status	All have one LED to indicate coil voltage	
	Terminals	#12 gauge maximum wire size	
	Contacts	Single-pole, double-throw, 2 amps, 250 VAC, 3 amps, 30 VDC	
AUDIBLE ALARM	Piezo Electric Horn	Approximately 75 decibels	
OPERATING RANGE	Relative Humidity	15 to 90% non-condensing	
	Temperature Range	Operating	0 °C to 50 °C
		Storage	-20 °C to +70 °C
PHYSICAL CHARACTERISTICS			
ENCLOSURE		NEMA 4 Wall Mount, not suitable for use in hazardous locations	
	Dimensions	10.5" (H) x 17.75" (W) x 5" (D) (265 x 445 x 140 mm)	
	Case Weight	15.5 lbs.	
APPROVALS		CE, European Standards EN 50081-2-1993 / EN 50082-2-1995, CEM 89/336/CEE, LVD 73/23 amended by 93/68/CEE	

Chapter 2 Installation

Mounting the Gasgard 8 Gas Monitor

1. Choose a mounting location that is in a clean and accessible area, and as free as possible from shock, vibration, physical damage and water. The housing is a general-purpose enclosure and is not suitable for hazardous locations.

⚠ CAUTION

Make sure the Gasgard 8 Monitor unit is not blocked; otherwise front panel lights and controls will be obscured from view.

2. Using four 1/4 or 20 mm mounting screws, mount the Gasgard 8 Monitor to a wall or suitable structure.

Wiring Connections

Perform all wiring connections and conduit runs in accordance to accepted commercial wiring practices. Install your monitor in compliance with the applicable requirements of the National Electric Code and/or any other local code requirements.

⚠ WARNING

When wiring the unit, disconnect the main power; failure to do so can result in serious personal injury or death.

AC Power Wiring Connection

The Gasgard 8 Monitor does not include a power ON/OFF switch; if local power OFF is required, a convenient disconnect should be installed.

1. Route the power, ground and signal wiring through the electrical entry hole in the enclosure.
 - Power and ground wiring should be separated from signal wiring.

2. To connect the Gasgard 8 Monitor to the power source, connect AC, ACN and GND terminals of the AC connector to the power source in accordance with FIGURE 2-1.

⚠ CAUTION

Improper application of the primary power to the system may cause damage to the unit. If unsure of the available power, contact your local power utility for clarification. Verify that the unit's power is rated for the proper AC supply line (See Table 1-1, "Gasgard 8 General Specifications").

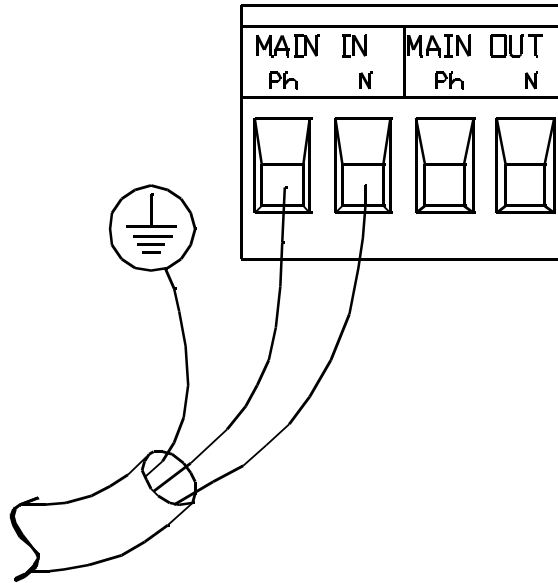


Figure 2-1.
AC Power Wiring Connection

Optional DC Power Wiring Connection

1. Prior to wiring the DC Power Supply, disconnect the two wires from the AC Power Supply from Terminal IN OV and +ALIM, located on the inside front panel.
2. Connect the two wires from the external 24 VDC Power Supply to the same terminal IN OV (negative) and +ALIM (+24 VDC). See FIGURE 2-2.

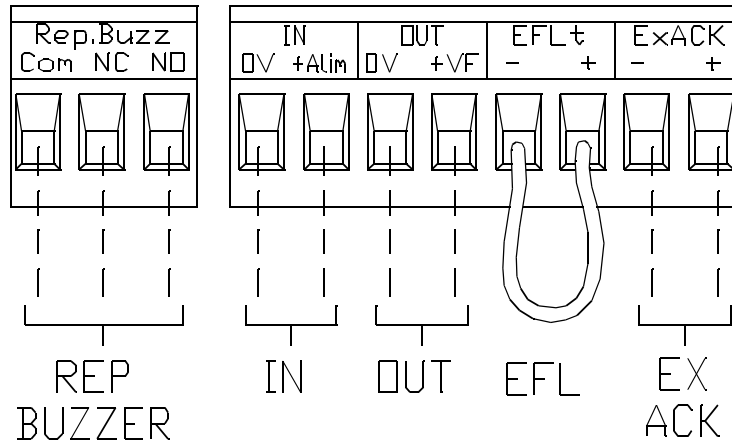


Figure 2-2.
Optional DC Power Wiring Connection

NOTE: REP BUZZER represents Report Buzzer and provides a common alarm relay output (250 VAC, 5 amps)

Sensor Wiring Connection

The Gasgard 8 Monitor is capable of taking a two-wire or three-wire loop 4-20 mA sensor. Refer to the sensor manual to determine:

- Optimal sensor placement
 - Required wire size
 - Number of conductors required for proper operation.
1. Connect the sensor to the Gasgard 8 Monitor in accordance with FIGURE 2-3.

⚠ CAUTION

Ensure all sensor connections are correct. Use correct wiring techniques and ensure that no wire strands are contacting other conductors. Failure to wire the sensor correctly may result in an inoperative or damaged sensor or Gasgard 8 Gas Monitor.

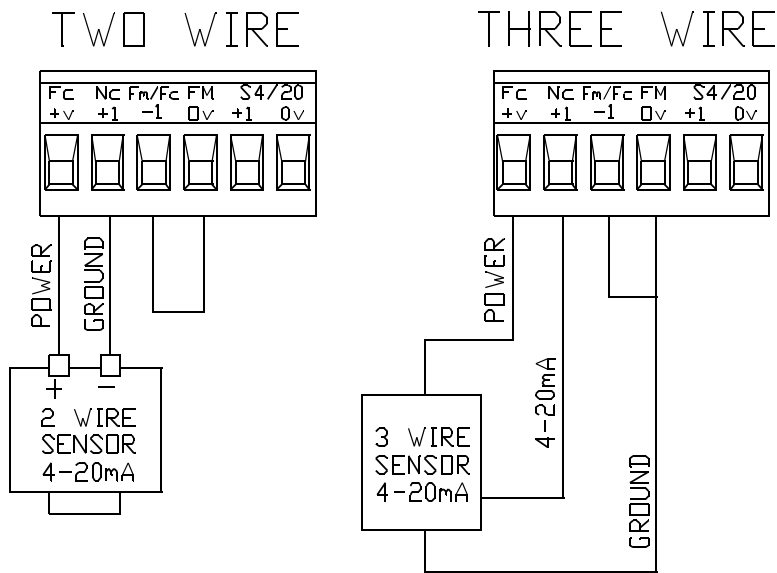
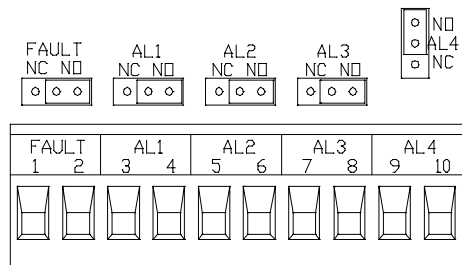


Figure 2-3.
Signal Input Wiring Connection

Relay Wiring Connection

The four alarm relays and the one fault relay are single-pole, double-throw and can be jumper-configured from within the unit. Figure 2-4 identifies jumper locations for normally-opened and normally-closed configurations on the universal relay module, each channel of which is normally energized (fail-safe). Relay modules connected to individual channels also have normally energized fault channels per FIGURE 2-4, but have selectable energizing for the alarm channels, which will reverse the NO/NC positions in the case of normally de-energized operation.



ALARM AND FAULT RELAY CONNECTIONS

NO = Normally Open, NC = Normally Closed
 JUMPER POSITIONS IN NORMALLY ENERGIZED (FAILSAFE) OPERATION

Figure 2-4.
Jumper Settings for Relay Configurations

4-20 mA Output Wiring Connection

Each channel card contains one 4-20 mA output. Wiring is shown in FIGURE 2-5.

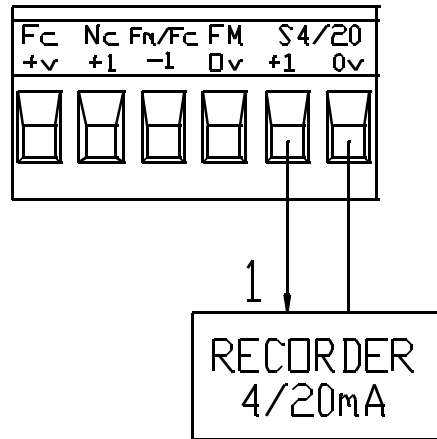


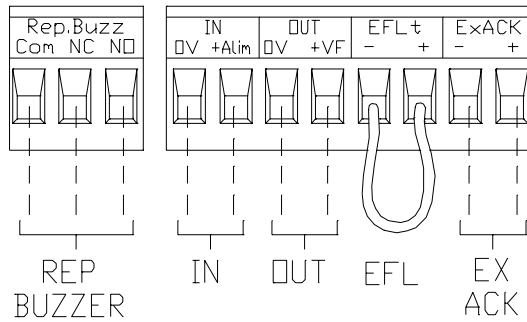
Figure 2-5.
4-20 mA Output Wiring Connection

Remote Device Wiring Connection

The Gasgard 8 Monitor can be configured:

- With an external reset switch for silencing alarm conditions from a remote location (EX ACK)
- For external fault input (EFL)

Wiring must be in accordance with FIGURE 2-6.



REMOVE BLACK WIRE JUMPER ONLY IF EXTERNAL FAULT INPUT (EFL) IS USED

Figure 2-6.
Remote Device Wiring Connection

Serial Link Module Wiring Connection

The Gasgard 8 Monitor has the capability of interfacing with either an RS-232 connection (printer) or an RS485 connection (superior/JBus). Wiring is shown in FIGURE 2-7 and FIGURE 2-8.

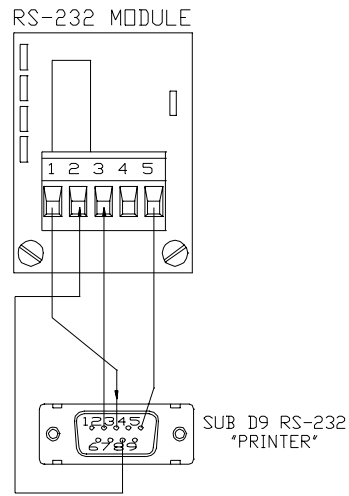


Figure 2-7.
RS-232 Wiring Connection

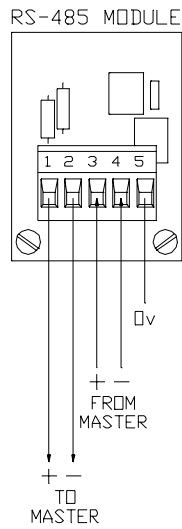


Figure 2-8.
RS-485 Wiring Connection

Chapter 3

Start-up and Operation

RS-485 Output

The Gasgard 8 Controller uses an RS-485 serial interface with Modbus protocol. To communicate to the RS-485 output via a computer interface, an isolated RS-485 converter should be used. The baud rate is 1200 or 9600 baud with RTU format sent. Each byte has eight bits with no parity and two stop bits.

Table 3-1. Channel Card Register Addresses			
TITLE	REGISTER ADDRESS	CHANNEL NUMBER	FORMAT
Gas Concentration	40001	1	0 to 1000 (full-scale)
	40002	2	
	40003	3	
	40004	4	
	40005	5	
	40006	6	
	40007	7	
	40008	8	
Alarm State	40009	1	See TABLE 3-2
	40010	2	
	40011	3	
	40012	4	
	40013	5	
	40014	6	
	40015	7	
	40016	8	

Table 3-2. Alarm State Format					
BIT 5 TO BIT 15	BIT 4	BIT 3	BIT 2	BIT 1	BIT 1
Free	Fault	Alarm 4	Alarm 3	Alarm 2	Alarm 1

Internal Buttons and Features

The Gasgard 8 Controller is customer configured by push buttons located on the front panel of the enclosure. These settings are user-modified and protected during power OFF.

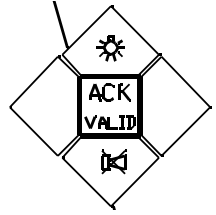


Figure 3-1.
Front Panel Buttons
and Features

Configuration Mode

1. Power unit ON.
 - Ready light turns ON.
 - Unit will perform a 30-second self-check, indicated by dash lines in channel 1.
2. There are two menus accessible through password input.
 - Factory Mode **<FACT>** which allows the operator to configure the unit
 - User Mode **<USER>** which allows the operator to perform operations and access limited features.
3. Each channel of the Gasgard 8 Monitor must be configured for:
 - Sensor range
 - Alarm level
 - Alarm upscale or downscale
 - Alarm status
 - Relay state.

To Access Factory **<FACT>** Mode:

1. Press the **<SCROLL RIGHT>** button (FIGURE 3-1) for five seconds.
 - The password must now be entered.
 - A 30-second timeout occurs, placing the instrument back into the monitor mode.
 - The default password is 0000 and is entered by using the **<SCROLL UP>** and **<SCROLL DOWN>** buttons for each digit of the password.

- Each digit must be validated by pressing the **<VALID>** key.
 - On the final digit, the unit will indicate **<GOOD>** for successful entry and **<BAD>** for an incorrect entry.
 - The password can be modified by using the **<CODE>** feature.
2. Configuration of the Gasgard 8 Monitor is performed by selecting through the programming flowchart (FIGURE 3-2).
 3. Use the **<SCROLL DOWN>** and **<SCROLL UP>** buttons on the keypad to access the software options.
 4. Press the **<ACK/VALID>** button to modify the selected software option.

To Access the Configuration **<Conf>** Mode:

1. Select **<Conf>** and press the **<ACK/VALID>** button.
 - Channel 1 displays **<n1>**, indicating channel 1 is ready for configuration.
2. Use the **<SCROLL RIGHT>** and the **<SCROLL LEFT>** buttons to initiate configuration of the remaining channels (**n2** through **n8**).
3. Press the **<ACK/VALID>** button to configure a specific channel.

To Access the Channel **<CHan>** Mode:

1. Select **<CHan>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to turn the channel ON or OFF.
 - Selecting **ON** inhibits the channel.
 - Selecting **OFF** turns OFF channel outputs.
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Copy **<COpy>** Mode:

1. Select **<COpy>** and press the **<ACK/VALID>** button.

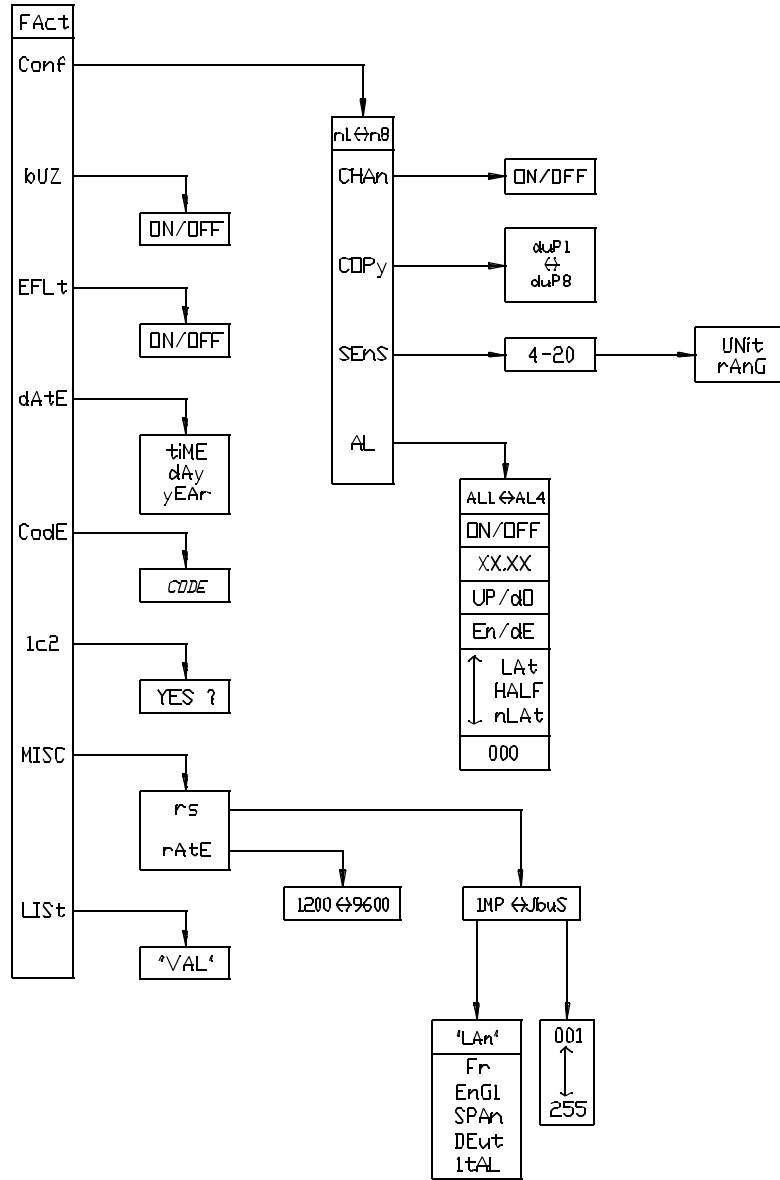


Figure 3-2.
Factory Mode Programming Flowchart

2. Use the **<SCROLL LEFT>** and the **<SCROLL RIGHT>** buttons to copy one channel's configuration onto the current channel being configured.
 - All configurations are copied (sensor range, alarm level, latching/non-latching, de-energized/energized, etc.).
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Sensor **<SEnS>** Mode:

1. Select **<SEnS>** and press the **<ACK/VALID>** button.
 - The display reads 4-20.
2. Press the **<ACK/VALID>** button again.

To Access the Unit **<UNit>** Mode:

1. Select **<UNit>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to select the unit of measure (ppm, % LEL, or % vol).
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

NOTE: The green LED displays the unit of measure and will not change until the channel is taken out of the configuration mode.

To Access the Range **<rAnG>** Mode:

1. Select **<rAnG>** and press the **<ACK/VALID>** button.
2. Select the full scale range of the sensor being monitored.
3. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to select the full range.
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

NOTE: The full scale range for ppm and % vol can be set between 0.5 and 6000. Full scale range for % LEL can be set at 10% or 100% only.

To Access the Alarm **<AL>** Mode:

1. Select **<AL>** and press the **<ACK/VALID>** button.

2. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to configure each of the four alarm levels (**A1** through **A4**).
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.
 - Once confirmed, the alarm level selected can be set **ON** or **OFF** by using the **<SCROLL UP>** or **<SCROLL DOWN>** buttons.

NOTE: Setting alarm level **OFF** disables alarm and relay outputs.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.
- Once confirmed, the alarm level setpoint can be configured.
- Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to set the alarm level.
- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.
- Once confirmed, the alarm level can be set for release on upscale (**UP**) or downscale (**dO**).

NOTE: The downscale setting is normally reserved for oxygen deficiency.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.
- Once confirmed, the alarm can be set as energized (**En**) or de-energized (**dE**) by using the **<SCROLL UP>** or **<SCROLL DOWN>** buttons.
 - An alarm in the **Energized Mode** (failsafe) energizes the relay in a non-alarm state and de-energizes the relay in an alarm state.
 - The opposite is true for an alarm in the **De-energized Mode**.
- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.
- Once confirmed, the alarm can be set as Latching (**LA**t), Half-Latching (**HALF**), or Non-latching (**nLA**T) by using the **<SCROLL UP>** or **<SCROLL DOWN>** buttons.

- **Latching Mode** requires the **<ACK/VALID>** button be pressed after an alarm condition has passed to de-activate relays, LEDs and the horn.
 - **Half-Latching Mode** allows the relays and horn to de-activate after an alarm condition has passed; however, alarm LEDs must be de-activated by pressing the **<ACK/VALID>** button.
 - **Non-Latching Mode** allows for automatic de-activation of relays, LEDs and the horn after an alarm condition has passed.
- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.
 - Once confirmed, a time delay can be set to allow for a delay in alarm indication after an alarm setting has been exceeded.
 - The **<SCROLL UP>** or **<SCROLL DOWN>** buttons are used to set this relay between 0 and 995 seconds.
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Buzzer **<bUZ>** Mode:

1. Select **<bUZ>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to turn the Buzzer **ON** or **OFF**.

NOTE: This software select is for the entire monitor and not for each individual channel.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the External Fault **<EFLt>** Mode:

1. Select **<EFLt>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to turn the External Fault **ON** or **OFF**.
 - When set to **ON**, an external device (e.g., a pump or reset switch) can be connected to the appropriate terminal (see Chapter 2, "Remote Device Wiring Connection") and will change the common fault status on a state of change.

- The choice is confirmed by pressing the <ACK/VALID> button or rejected by pressing the <ESC/TEST> button.

To Access the Date <dAtE> Mode:

1. Select <dAtE> and press the <ACK/VALID> button.
2. Use the <SCROLL UP> and <SCROLL DOWN> buttons to access the time, date, and year.

To Access the Time <tiME> Mode:

1. Select <tiME> and press the <ACK/VALID> button.
2. If the time listed is incorrect, press the <ACK/VALID> button to correct.
3. Use the <SCROLL UP> and <SCROLL DOWN> buttons to set the correct time.

NOTE: Enter the time in the military format and in the same manner as the password.

- The choice is confirmed by pressing the <ACK/VALID> button or rejected by pressing the <ESC/TEST> button.

To Access the Day <dAy> Mode:

1. Select <dAy> and press the <ACK/VALID> button.
2. If the day listed is incorrect, press the <ACK/VALID> button to correct.
3. Use the <SCROLL UP> and <SCROLL DOWN> buttons to set the correct day.

NOTE: Enter the day as the day and month and in the same manner as the password.

- The choice is confirmed by pressing the <ACK/VALID> button or rejected by pressing the <ESC/TEST> button.

To Access the Year <yEAR> Mode:

1. Select <yEAR> and press the <ACK/VALID> button.
2. If the year listed is incorrect, press the <ACK/VALID> button to correct.
3. Use the <SCROLL UP> and <SCROLL DOWN> buttons to set the correct four-digit year.

NOTE: Enter the four-digit year in the same manner as the password was input to access the factory mode.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Code **<CodE>** Mode:

1. Select **<CodE>** and press the **<ACK/VALID>** button.
 - The password code is listed.
2. Press the **<ACK/VALID>** button to change the code.
3. Use the **<SCROLL UP>** and **<SCROLL DOWN>** buttons to set the new Factory Mode Password.

NOTE: Enter the new Factory Mode Password in the same manner as the initial password entry.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Password Reset **<1 c2>** Mode:

1. Select **<1 c2>** and press the **<ACK/VALID>** button.
 - **YES** appears on the display.
2. Press the **<ACK/VALID>** button to reset the Password to 0000.
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Connection Series **<nisc>** Mode:

1. Select **<nisc>** and press the **<ACK/VALID>** button.
 - This allows the user to set a Printer output (**RS232**) or to set the channel for JBUS Slave output (**RS485**).

To Access the RS Output **<rs>** Mode:

1. Select **<rs>** and press the the **<SCROLL UP>** and **<SCROLL DOWN>** buttons to choose between Printer Mode (**INp**) or jbuS Slave Mode (**JbuS**)
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Printer <INp> Mode:

1. Select <INp> and press the <ACK/VALID> button.
 2. Select the choice of printer language by using the <SCROLL UP> and <SCROLL DOWN> buttons.
 - Choices include French (**Fr**), English (**EnGl**), Spanish (**SPAn**), German (**DEut**), and Italian (**ItAL**).
 - The choice is confirmed by pressing the <ACK/VALID> button or rejected by pressing the <ESC/TEST> button.
- NOTE:** To use the Printer Mode, it is necessary to install the RS232 interface card (P/N 10029957) on the motherboard.

To Access the JBUS <JbuS> Mode:

1. Select <JbuS> and press the <ACK/VALID> button.
 2. Use the <SCROLL UP> and <SCROLL DOWN> buttons to select the JbuS address number, 1 through 255.
 - The choice is confirmed by pressing the <ACK/VALID> button or rejected by pressing the <ESC/TEST> button.
- NOTE:** To use the JbuS Mode, it is necessary to install the RS485 interface card (P/N 10029958) on the motherboard.

To Access the Rate <rAtE> Mode:

1. Select <rAtE> and press the <ACK/VALID> button.
2. Use the <SCROLL UP> and <SCROLL DOWN> buttons to set the Baud Rate (**1200, 2400, 4800** or **9600** Bps.) according to the printer requirements.
 - The choice is confirmed by pressing the <ACK/VALID> button or rejected by pressing the <ESC/TEST> button.

To Access the List <LISt> Mode:

1. Select <LISt> and press the <ACK/VALID> button.
 - This command sends all of the channel settings and the current state of the monitor to the printer for printing in the selected language.
 - **run** appears on the display during printing.

To Exit the Factory <FACT> Mode:

1. Press the <ESC/TEST> button until the software tree is exited and the unit returns to the measure mode.

To Access User <USER> Mode:

1. Press the <ACK/VALID> button (FIGURE 3-1) for five seconds.
 - The password must now be entered.
 - A 30-second timeout occurs, placing the instrument back into the Monitor Mode.
 - The default password is 0000 and is entered by using the <SCROLL UP> and <SCROLL DOWN> buttons for each digit of the password.
 - Each digit must be validated by pressing the <VALID> key.
 - On the final digit, the unit will indicate <GOOD> for successful entry and <BAD> for an incorrect entry.
 - The password can be modified by using the <CODE> feature.
2. Configuration of the Gasgard 8 Monitor is performed by selecting through the programming flowchart (FIGURE 3-3).

To Access % LEL OVERRANGE <WArn> Reset:

1. Select <WArn> and press the <ACK/VALID> button.

NOTE: The overrange latch engages when a % LEL input reaches 100%. The display will show "EEE" and alarms will be latched until reset with the <WArn> command.

 - The display will read <VALID> and clear on its own.

To Access the Configuration <ConF> Mode:

1. Select <ConF> and press the <ACK/VALID> button.
 - Channel 1 displays <n1>, indicating channel 1 is ready for configuration.

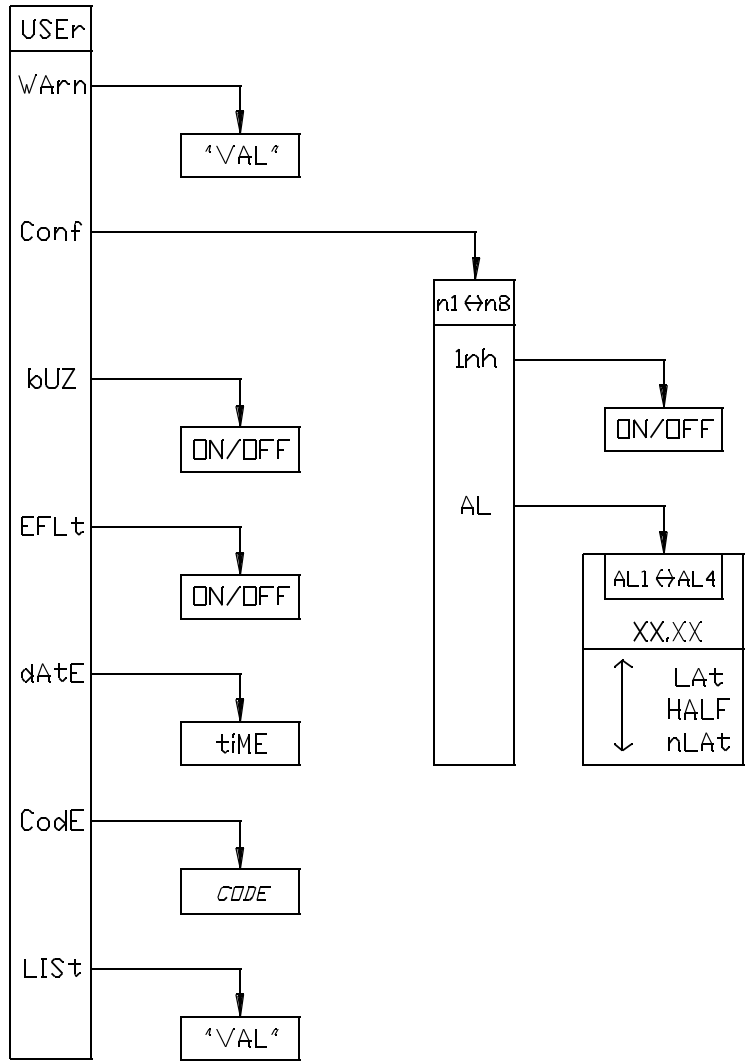


Figure 3-3.
User Mode Programming Flowchart

2. Use the **<SCROLL RIGHT>** and the **<SCROLL LEFT>** buttons to initiate configuration of the remaining channels (**n2** through **n8**).
3. Press the **<ACK/VALID>** button to configure a specific channel.

To Access the Channel Inhibit **<Inh>** Mode:

1. Select **<Inh>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to turn the channel inhibit ON or OFF.
 - Selecting **ON** turns ON the channel outputs.
 - Selecting **OFF** turns OFF channel outputs.

NOTE: Setting inhibit to OFF inactivates alarm and relay outputs while activating the channel fault LED and displaying **<Inh>** on the channel display.

 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Alarm **<AL>** Mode:

1. Select **<AL>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to configure each of the four alarm levels (**A1** through **A4**).

NOTE: Access will be limited to alarm levels set to ON in the **<FACT>** configuration.

 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.
 - Once confirmed, the alarm level selected can be set **ON** or **OFF** by using the **<SCROLL UP>** or **<SCROLL DOWN>** buttons.
 - Once confirmed, the alarm can be set as Latching (**Lat**), Half-Latching (**HALF**), or Non-latching (**nLAT**) by using the **<SCROLL UP>** or **<SCROLL DOWN>** buttons.
 - **Latching Mode** requires the **<ACK/VALID>** button be pressed after an alarm condition has passed to de-activate relays, LEDs and the horn.
 - **Half-Latching Mode** allows the relays and horn to de-activate after an alarm condition has passed;

however, alarm LEDs must be de-activated by pressing the **<ACK/VALID>** button.

- **Non-Latching Mode** allows for automatic de-activation of relays, LEDs and the horn after an alarm condition has passed.
- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Buzzer **<bUZ>** Mode:

1. Select **<bUZ>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** and **<SCROLL DOWN>** buttons to turn the Buzzer ON or OFF.

NOTE: This software select is for the entire monitor and not for each individual channel.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the External Fault **<EFLt>** Mode:

1. Select **<EFLt>** and press the **<ACK/VALID>** button.
2. Use the **<SCROLL UP>** and **<SCROLL DOWN>** buttons to turn the External Fault ON or OFF.
 - When set to ON, an external device (e.g., a pump or reset switch) can be connected to the appropriate terminal and changes the common fault status on a state of change.
 - The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Date **<dAtE>** Mode:

1. Select **<dAtE>** and press the **<ACK/VALID>** button.
2. In user mode, only the time can be changed.
3. If the time listed is incorrect, press the **<ACK/VALID>** button to correct.
4. Use the **<SCROLL UP>** or **<SCROLL DOWN>** buttons to set the correct time.

NOTE: Enter the time in the military format and in the same manner as the password.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the Code **<CodE>** Mode:

1. Select **<CodE>** and press the **<ACK/VALID>** button.
 - The Password Code is listed.
2. Press the **<ACK/VALID>** button to change the code.
3. Use the **<SCROLL UP>** and **<SCROLL DOWN>** buttons to set the new Factory Mode Password.

NOTE: Enter the new user mode password in the same manner as the password was input to access the user mode.

- The choice is confirmed by pressing the **<ACK/VALID>** button or rejected by pressing the **<ESC/TEST>** button.

To Access the List **<LISt>** Mode:

1. Select **<LISt>** and press the **<ACK/VALID>** button.
 - This command sends all of the channel settings and the current state of the monitor to the printer for printing in the language selected.
 - **run** appears on the display during printing.

To Exit User **<USEr>** Mode:

1. Press the **<ESC/TEST>** button until the software tree is exited and the unit returns to measure mode.

System Checks

There are two system checks available through the front panel keypad (FIGURE 3-1). The two checks are:

- Lamp test
- Configuration review.

Performing a Lamp Test:

1. Press the **<SCROLL UP>** button (also indicated with a lamp diagram) while in the measure mode.

- The software version and serial number of the unit is displayed.
- All display LED characters and all fault and alarm LEDs are activated.

NOTE: During this test, all alarms and channel displays are still operating in measure mode.

Performing a Configuration Review:

1. Press the **<ESC/TEST>** button for five seconds while in measure mode.
2. The user password must now be entered.
 - The horn will alarm and the common alarm and fault LEDs will energize.
 - The default password is 0000 and is entered by using the **<SCROLL UP>** and **<SCROLL DOWN>** buttons for each digit of the password.
 - Each digit must be validated by pressing the **<VALID>** key.
 - On the final digit, the unit will indicate **<GOOD>** and **<TEST>** for successful entry and **<BAD>** for an incorrect entry.
 - Channel 1 displays **<n1>**, indicating channel 1 is ready for configuration review.
3. Use the **<SCROLL RIGHT>** and the **<SCROLL LEFT>** buttons to initiate configuration review of the remaining channels (**n2** through **n8**).
4. Press the **<ACK/VALID>** button to review a specific channel's configuration.
 - The display will scroll through the selected channel's settings.

NOTE: During this review, all alarms and channel displays are operating in measure mode.

- Pressing the **<ESC/TEST>** button at any time during the configuration review will return the unit back to the standard measure mode.

Table 3-3. Parts List	
PART	PART NO.
RS 232 Interface Card	10029957
RS485 Modbus RTU Interface Card	10029958
Channel Upgrade Kit includes one Channel PCB with Display and Relay Module	10035784
Channel PCB	10029955
Relay Module	10029956
Blank Panel	10029959