



Operating Manual
GasGard XL
Wall Mount Controller



Order No.: 10091922/02
CR: 800000023280



WARNING!

Read this manual carefully before using the device. The device will perform as designed only if it is used and maintained in accordance with the manufacturer's instructions. Otherwise, it could fail to perform as designed and persons who rely on this device for their safety could sustain serious personal injury or death.

The warranties made by MSA with respect to the product are voided if the product is not installed and used in accordance with the instructions in this manual. Please protect yourself and your employees by following the instructions.

Please read and observe the WARNINGS and CAUTIONS inside.



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1 Safety Regulations

The GasGard XL Wall Mount Controller is a compact control unit that:

- connects with up to eight active combustible, toxic and/or oxygen sensors
- is used to monitor indoor industrial locations for the presence of combustible, explosive, toxic gases or air/vapor mixtures and oxygen content
- provides power to the sensors, signal conditioning and display of measured gas concentrations, alarm thresholds, outputs for alarm devices and self monitoring diagnostics
- is suitable for many applications and industrial areas
- provides simple installation, easy editing and copying functions
- is ideal for smaller, independent gas warning systems.

The user must carefully read and observe:

- • this operating manual, particularly, the safety, use and operating instructions
- • the national regulations applicable in the user's country, including requirements specific to explosive risk approval.

Use or alterations outside these instructions is considered as non-compliance.

WARNING!

This product is supporting life and health. Incorrect use, maintenance or servicing can affect its function and seriously compromise the user's life. When turned ON for the first time, the controller performs a self-check. Do Not use the monitor if it fails the self-check, which is indicated by a failure light. Do Not use the monitor if it is damaged, improper servicing/maintenance has been performed, or if genuine MSA spare parts have not been used.

Before use the product operability must be verified. The product must not be used if the function test is unsuccessful, it is damaged, a competent servicing/maintenance has not been made, genuine MSA spare parts have not been used.

1.1 MSA Permanent Instrument Warranty

Warranty

MSA, the Safety Company warrants that this product will be free from mechanical defect or faulty workmanship for a period of two (2) years from the date of delivery, provided it is maintained and used in accordance with MSA's instructions and/or recommendations.

This warranty does not apply to expendable or consumable parts whose normal life expectancy is less than one (1) year, such as, but not limited to, nonrechargeable batteries, filament units, filter, lamps, fuses, etc. MSA shall be released from all obligations under this warranty in the event that repairs or modifications are made by persons other than its own or authorized service personnel or if the warranty claim results from physical abuse or misuse of the product. No agent, employee, or representative of MSA has any authority to bind MSA to any affirmation, representation, or warranty concerning the goods sold under this contract. MSA makes no warranty concerning components or accessories not manufactured by MSA, but will pass on to the Purchaser all warranties of manufacturers of such components.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF. SELLER SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

Exclusive Remedy

It is expressly agreed that the Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortious conduct of the Seller, or for any other cause of action, shall be the repair and/or replacement at the Seller's option of any equipment or parts thereof, which after examination by the Seller is proven to be defective. Replacement equipment and/or parts will be provided at no cost to the Purchaser, F.O.B. Seller's Plant. Failure of the Seller to successfully repair any nonconforming product shall not cause the remedy established hereby to fail of its essential purpose.

Exclusion of Consequential Damage

The Purchaser specifically understands and agrees that under no circumstances will the Seller be liable to the Purchaser for economic, special, incidental, or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of nonoperation of the goods. This exclusion is applicable to claims for breach of warranty, tortious conduct, or any other cause of action against the Seller.

2 Description

The general-purpose control system enables:

- Combustible gas monitoring
 - for protecting operational plants and workers by monitoring atmospheres for potentially explosive gases/vapors in air before they reach the lower explosion limit and by activating alarms and initiating risk aversion measures.
- Oxygen monitoring
 - for protecting individuals by monitoring the atmosphere for oxygen deficiency or oxygen enrichment.
- Toxic gas monitoring
 - for protecting individuals by continuously monitoring the atmosphere for toxic gas concentrations.

NOTE: An alarm activates if set limit values are reached (e.g. minimum/ maximum concentration in the atmosphere).

Typical applications are:

- Chemical and petrochemical industry
- Paint and solvent industry
- Gas-processing industry
- Municipal areas.

2.1 Control Unit

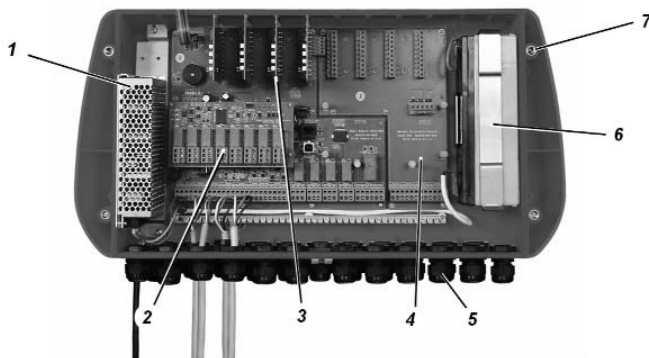


Fig. 1 Enclosure

1	Power Supply	5	Cable entries
2	Channel Relay Board	6	Backup Battery
3	Channel Board	7	Enclosure with mounting holes
4	Sensor Extension Board		

Wall Mount Enclosure

The Control Unit:

- is housed in an ABS enclosure in accordance with IP 56 and NEMA 4X
- dimensions are 515 mm x 277 mm x 129 mm (20 x 11 x 5 inches)
- cable entry points are not provided, but are predesigned on the bottom of the enclosure (0.75" or M20)
- front panel is molded with predesigned holes for fully equipped configuration (eight channels)
- is mounted by four screws (1/4 - 20 or M6).

Power Supply

- The 100 W power supply accepts main AC and DC power.
- In case of loss of main power, the power supply automatically switches to backup battery.
- Power source for detector is 24 VDC.

Backup Battery

Two batteries in series (12 VDC/2.2 Ah lead acid) can be used in the Control Unit as an option. The batteries supply 20 minutes of backup for eight catalytic combustible sensors.

To activate battery backup, the pc software must be configured. Go to Settings, Service Function, Device Settings. Check the Battery Backup box to activate, save and then download settings to the Control Unit.

Do not use primary non-rechargeable batteries.

Operation under back-up power is indicated by the Power LED blinking on the front panel.

Main Board

The Main board microcontroller includes:

- watchdog
- internal buzzer (85 dB) standard common outputs
- battery charger circuit.

All necessary information is stored on the Main board. The following communications are possible:

- 1 Ethernet configurable for ModBus TCP/IP (galvanically isolated)
- 1 RS485 configurable for ModBus RTU (galvanically isolated)
- 1 USB configurable for ModBus RTU.

NOTE: Communication doesn't interfere with operation of the Control Unit.

- For SCADA visualization software, all three interfaces can be used.
- For service access, as a safety precaution, only the two ModBus RTU communications can be used.

Standard common outputs are incorporated:

- two SPDT (Single Pole Double Throw) relays common alarm (ALARM 1 and ALARM 2)
- one DPDT (Double Pole Double Throw) relay common fault
- two addressable common horn relays.

Display Board

The Display board, located on the back side of the lid, includes:

- microcontroller
- watchdog
- push buttons
- graphic display (128x64).

Sensor Extension Board

The sensor extension board is used to:

- attach channel boards
- connect internal communication.

NOTE: See 3.4 "Sensor Connection".

Channel Board

The channel boards are set to communicate with 4-20 mA transmitters.

Every board:

- includes four LEDs (A1, A2, Status, Power)
- attaches to the Channel connectors (four on the Main board, four on the Sensor Extension board).

Sensor power and connection is designed as "fail-safe"

(wrong connection/configuration does not damage the remote sensor).

Channel Relay Board

Every Channel Relay board:

- provides eight output relays
- is connected to the Main board or Sensor Extension board (one by one) via connectors.

Relays are fully user-configurable from the front panel or connected PC via configuration software.

Two optional SPDT (Single Pole Double Throw) relays per channel (eight relays per four channels) are configurable for individual alarms:

- Normally open/closed
- Normally energized/de-energized
- Latching/non latching
- Increasing/decreasing
- N out of m voting
- Grouping

NOTE: Contacts are resistive load.

Front Panel

The Front Panel enables communication with the Control Unit and is used to:

- monitor the status of all connected field sensors
- determine system settings
- configure all settings.



Fig. 2 Front Panel

- | | | | |
|---|----------------------|---|--------------------------|
| 1 | Common LEDs | 4 | Alarm Acknowledgement |
| 2 | Alarm Reset | 5 | Graphic Display |
| 3 | Control Push Buttons | 6 | Channel Status Info LEDs |

Graphic Display

The Control Unit has a large, 128 x 64 pixel graphic display which shows information for all channels. See Chapter 4 for symbol explanation.

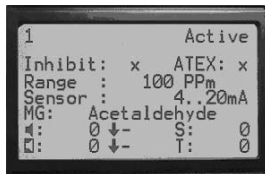







Fig. 3 Graphic Display

Control Push Buttons

Using the control push buttons, the user can operate the menu prompt as shown below. For more information, see section 4.3 "Controls".

-  Right button [←]
-  Up Button [↑]
-  Left button [ESC]
-  Down button [↓]
-  Alarm Acknowledgement
-  Alarm Reset

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Channel Status Info LEDs

Each of the eight Control Channels has four LEDs for monitoring unit operating status.

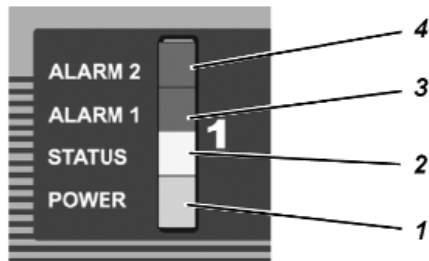


Fig. 4 Channel Status Info LEDs

1	The green Power LED:	<ul style="list-style-type: none"> • Channel is powered and enabled by the system.
2	The yellow Status LED:	<ul style="list-style-type: none"> • Channel is in a fault condition. • Blinking LED (0.5 Hz): Channel is disabled.
3	The red Alarm 1 LED:	<ul style="list-style-type: none"> • First alarm level is reached. It further indicates the specific status: <ul style="list-style-type: none"> • Hz blinking: First alarm level is reached, but not yet acknowledged • Steady: First alarm level is acknowledged, but still inside alarm range • 0.5 Hz blinking: First alarm is configured as latching. Measured value is out of alarm level and not yet reset.
4	The red Alarm 2 LED:	<ul style="list-style-type: none"> • Second alarm level is reached. It further indicates specific status: <ul style="list-style-type: none"> • 4 Hz blinking: Second alarm level is reached, but not yet acknowledged • Steady: Second alarm is acknowledged, but still inside alarm range • 0.5 Hz blinking: Second alarm is configured as latching. Measured value is out of alarm level and not yet reset.

Unit Status Info LEDs

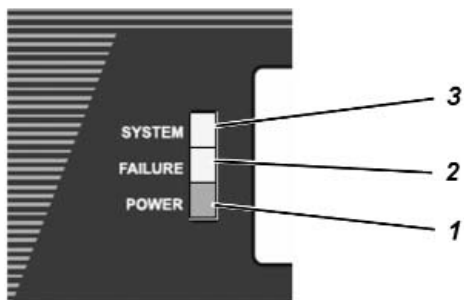


Fig. 5 Unit Status Info LEDs

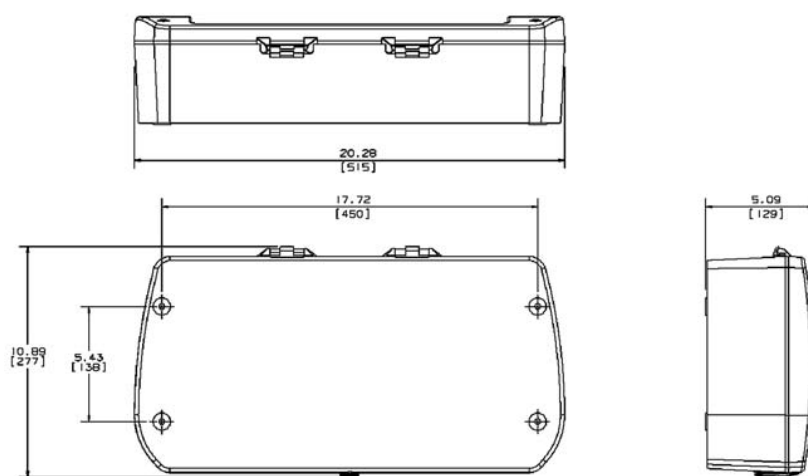
1 Green Power LED:	<ul style="list-style-type: none"> Control Unit is powered. Blinking LED: battery power supply.
2 Yellow Failure LED:	<ul style="list-style-type: none"> Sensor is in fault condition.
3 Yellow System LED:	<ul style="list-style-type: none"> Control Unit has a system fault.

3 Installation

NOTE: Reference shipping documents and carton label to check that delivered components are correct before installation.

- The installation location for the Control Unit must be outside the potentially explosive area and free of corrosive gases.
- Sensors for use in the potentially explosive area must have the appropriate approval and be installed in accordance with all relevant local and national regulations.
- The gas warning system must be installed by qualified personnel after reading the supplied documentation.
- All relevant local and national regulations and instructions must be observed.

3.1 Mechanical Installation



NOTE: DIMENSIONS SHOWN IN INCHES [MILLIMETERS].

Fig. 6 Mounting Drawing [dimensions in inches (mm)]

Mount the Control Unit as follows:

- (1) Mark holes for the four fixing screws as shown in Fig. 6.
- (2) Drill four holes of appropriate diameter for the wall plugs.
- (3) Lift the front panel from the enclosure.
- (4) Attach the unit to the wall with the appropriate screws.
- (5) Return the lid to the resting position.

3.2 Electrical Installation

⚠ CAUTION!

The control system must be installed in compliance with applicable regulations; otherwise, an unsafe condition may exist.

During installation, use the internal earth connection to ground the instruments.

If an external earth connection is permitted or demanded by the local authorities, it serves merely as additional earthing.

- Select an installation location that complies with the environmental conditions indicated in the technical data.
- When installing the Control Unit, the following conditions must be met to comply with the European EMC Directive.
 - A fault-free ground or fault-free potential bonding conductor must be provided when connecting devices to the main power supply.
 - Ensure an appropriate supply voltage in accordance with EMC directives.
 - If the devices are supplied from a direct voltage (DC) source, the supply cable must be shielded.
 - All sensor and control cables must be shielded. Shielded cables must have at least 80% coverage.
 - Control and sensor cables must be installed physically separate from power supply cables.
 - Shielded cables must be laid in a group. If cable lengths are to be extended using terminal boxes, the boxes must be shielded and internal connections must be kept as short as possible.
 - The control system can be simultaneously connected to AC voltage and 24 VDC (to enable an automatic power switch to 24 VDC voltage if the AC main supply fails).

3.3 Power Supply

- Standard power supply 110-230 VAC/24 VDC (100 W) is used to power internal circuits and attached sensors.
- A switch or circuit-breaker shall be included in the building installation in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.
- Main voltage is connected to terminal L (Line), N (Neutral), and ground.



Fig. 7 Connecting the Main Supply

3.4 Sensor Connection

- The sensor must be connected to the terminals on the Main board or Sensor Extension board (See Appendices C and D for details).

CAUTION!

Follow the instructions for components subject to damage from static electricity!

- Incorrect connection of the sensors will not damage the Control Unit or the sensor.
- The wiring diagrams for different sensors are shown in Appendix B. The sensors must be connected to the terminals using shielded cables.
- For the number of wires and the maximum cable length for each sensor type, refer to the specific sensor operating manual.

4 Operation

The integrated operation/display unit:

- is the control system user interface
- displays alarms, warnings, and system parameters.
 - Connecting the operating unit to a PC enables a user-friendly operator interface.
 - Input fields are set up as selection fields as much as possible, with all known inputs displayed. Selection is cursor-controlled for easy display unit use.

4.1 Basic Screen

The basic screen displays information about active channel status (active, inhibit, and in service) including information about the system (system date and time).

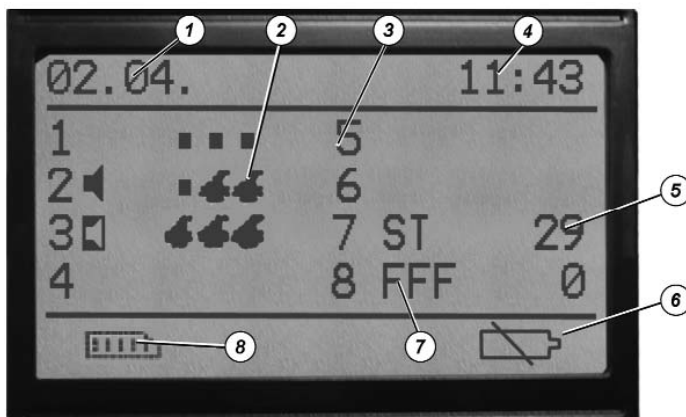





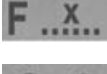








Fig. 8 Basic Screen




1	System Date	5	Actual Value
2	FlameGard Status	6	Battery Status
3	Channel Number	7	Status Information
4	System Time	8	Events Archive

- **System Date and Time:**
Actual preset values for events archive (default is DD/MM)
- **Channel Number:**
Position of the channel board [counted from left to the right on the Main board (1 ... 4) and the Sensor Extension board (5 ... 8)].
- **Status Information:**
Information about channel status (alarm, fault, in service, etc.; see symbols)
- **Actual Value:**
Measured value of gas concentration.
- **Events Archive:**
Last 700 events (alarms, alarm acknowledgement and reset, faults, calibrations, etc.) are stored in memory and can be user-restored.

4.2 Status Info Symbols

	Alarm 1: Displays if alarm level is reached
	Alarm 2: Displays if alarm level is reached
	Overrange: Displays if channel signal is above the range (more than 105 % of full scale).
	Underrange: Displays if channel signal is below the range (less than -5 % of full scale)
	Sensor Fault: Displays if a sensor connection is broken or shorted or if signal falls below -10% of full scale
	Internal Channel Fault: Displays if Channel board has a system fault
	In Service: Displays if channel is in service mode (calibration)
	Inhibit: Displays if channel is inhibited
	STEL Alarm: Displays if STEL alarm is reached
	TWA Alarm: Displays if TWA alarm is reached
	Battery included and fully charged
	Battery not included







If FlameGard is connected to the mA Channel board, the basic screen contains additional symbols for FlameGard status:

	FlameGard Detector is connected – No Flame
	Warning - FlameGard Detector is in the first alarm condition
	Alarm - FlameGard Detector is in second alarm condition

- The channel where an alarm condition is reached first is identified by blinking value.



4.3 Controls

Located on the front panel are four control push buttons for Control Unit operation and configuration.

SYMBOL	PRESS BUTTON TO CAUSE UNIT TO:	
	ENTER:	enter a lower menu or accept the change
	UP:	change values/options
	DOWN:	advance the cursor to the next position
	ESCAPE:	exit the upper menu or cancel the change
	ACKNOWLEDGEMENT:	disable the audible signal when alarm occurs
	RESET:	reset alarm relays to normal operating conditions when a measured value drops below the latching alarm level

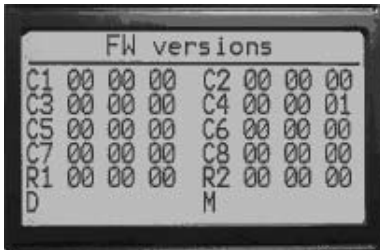
4.4 Using the Hotkeys

Pressing some of the front panel control push buttons for a longer period accesses some additional basic screen features.

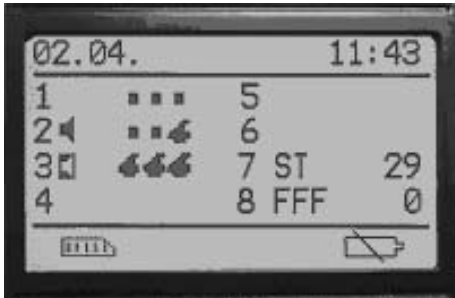
	UP:	Pressing button for five seconds changes the language from English to one of 10 local languages and back
	ESCAPE:	Pressing button for five seconds starts the GasGard XL Selftest Process, testing the: <ul style="list-style-type: none"> • LCD display • LEDs • internal buzzer.

After the selftest, the firmware version of all assigned boards displays:

- C1 ...C8 - Channel boards
- R1 ... R2 - Relay boards
- D- Display board
- M – Main board.



4.5 Viewing Channel Information



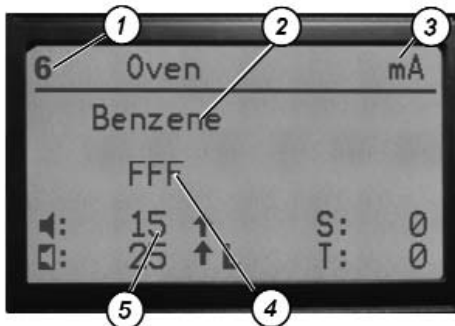
(1) Viewing the Basic Screen, press [ENTER].



(2) Select the channel by pressing [DOWN].



(3) Press [ENTER] to confirm.



The next screen (above) shows channel information as:

- | | |
|-------------------------|--|
| 1 Channel number | 4 Measured gas value and unit or channel state |
| 2 Measured gas | 5 Preset alarm levels |
| 3 Active Channel Symbol | |

NOTE: To change gas type, unit of measure or alarm levels, see the Quick Startup Guide (P/N 10095757) or Chapter 5 "Configuration".

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4.6 Viewing Events Archive



(1) Viewing the Basic Screen, press [ENTER].

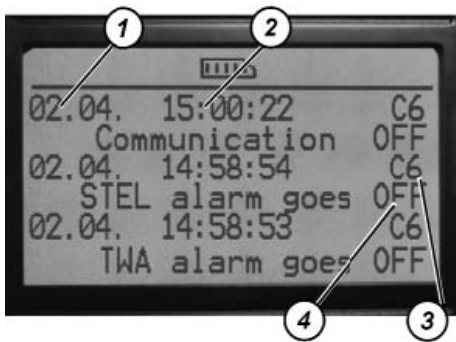


(2) Select the Event Archive button by pressing [DOWN].



(3) Press [ENTER] to confirm.

The next screen shows channel information as:



1 Event Date

3 Channel Identification

2 Event Time

4 Event Description



(4) Scroll the Events Archive by pressing [DOWN] or [UP].

List of Assigned Events

0	Device Turned On	27	Master Calibration Saved
1	Communication OFF	28	New Calibration Saved
2	Communication ON	29	Coil Relay 1 FAULT
3	Board Reset	30	Coil Relay 2 FAULT
4	Alarm1 ON	31	Coil Relay 3 FAULT
5	Alarm1 OFF	32	Coil Relay 4 FAULT
6	Alarm1 Acknowledgement	33	Coil Relay 5 FAULT
7	Alarm1 Reset	34	Coil Relay 6 FAULT
8	Alarm2 ON	35	Coil Relay 7 FAULT
9	Alarm2 OFF	36	Coil Relay 8 FAULT
10	Alarm2 Acknowledgement	37	Main Power Supply OFF
11	Alarm2 Reset	38	Main Power Supply ON
12	UnderRange	39	Low Battery
13	OverRange	40	Battery FAULT
14	STEL alarm ON	41	Common Coil Relay Horn2 FAULT
15	STEL alarm OFF	42	Common Coil Relay Horn1 FAULT
16	STEL alarm Acknowledgement	43	Common Coil Relay Alarm2 FAULT
17	TWA alarm ON	44	Common Coil Relay Alarm1 FAULT
18	TWA alarm OFF	45	Common Coil Relay Fault FAULT
19	TWA alarm Acknowledgement	46	RAM Check FAULT
20	Sensor FAULT	47	ROM Check FAULT
21	System FAULT	48	System Password entered
22	Start of Calibration	49	Calibration Password entered
23	ZG accepted	50	Read FAULT
24	SG accepted	51	Write FAULT
25	FAULT of ZG result		
26	FAULT of SG result		

5 Configuration

All GasGard XL Control Unit parameters can be configured by using:

- front panel control push buttons
- configuration software tool (see Chapter 6 "Configuration Software").

Two menus allow the user to change unit parameters:

(1) System Menu

The System menu:

- enables the user to change any parameter needed for application requirements
- is accessible only by an access password.

From the System menu, the user can enter additional Control Unit set-up menus:

- Relay Setting menu (to set up individual relay parameters)
- Calibration menu (to calibrate all channels)
- General Setting menu (to set up general unit parameters).

(2) Calibration Menu

The channel boards are configured to accept 4-20 mA input signals from two-wire or three-wire remote transmitters. The controller does not require any calibration.

NOTE: There are different passwords for the System menu and Calibration menu. Passwords can be set in the General Setting menu.

5.1 System Menu

The System menu allows full unit configuration:

- Modifying channel parameters
- Setting output relays (Relays Setting menu)
- Calibration (Calibration menu)
- General settings (General setting menu).



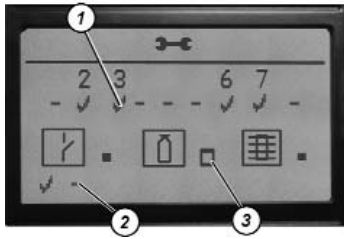
(1) Simultaneously Press [ENTER] and [ESCAPE] and hold for one second.

- User is prompted to enter the password.



- Access Password is any number from 1 to 9999.
 - The factory password preset value is 123.
- (2) Use [UP]; [DOWN] and [ENTER] to enter the password.
 (3) Press [ENTER] to confirm the password.
- If password is valid, the System menu screen appears.

The System menu screen displays:



- 1 Channel Board Identification Mark
- 2 Relay Board Identification Mark
- 3 Setting Icons

Channel Number

If selected, the Channel Number allows user to set channel parameters.

NOTE: The Channel board Identification Mark must be selected by user to confirm that a channel board is inserted in the slot.

Relay Board Identification Mark

The Relay board Identification Mark must be selected by the user to confirm that a channel relay board is inserted in the slot:

- Left mark is for the first board (connected to the Main board), counting from the left
- Right mark is for the second board (connected to the Sensor Extension board), counting from the left).

Setting Icons

Marking icons enable the user to enter an additional submenu:



Relays setting menu (individual relays modification menu; see Chapter "Modifying Channel Parameters").



Calibration menu (channel calibration; see Chapter 5.4 "Calibration")



General setting menu (general parameters setting; see Chapter 5.3 "General Setting Menu")



Right button [←]



Up Button [↑]



Left button [ESC]






Down button [↓]

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- (1) Use control push buttons to select an item to set.
 - (2) Press [ENTER] to confirm the selected item.
- NOTE:** A selected setting item is inverse and non-blinking.
- NOTE:** Pressing [ESCAPE] exits the System menu.

(3) Use control push buttons to:

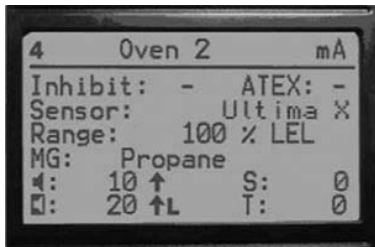
-  Accept changes and leave menu
-  Do not accept changes and leave menu
-  Return to the System menu.







Description of Channel Parameters

- (1) Enter the System menu (see Chapter 5.1 "System Menu").
- (2) Use the control push buttons to select a channel number to modify.
- (3) Press [ENTER] to confirm.

The first of two configuration screens appears:

NOTE: Use [DOWN] to toggle between the two screens.



Inhibit:	Marking inhibits the channel
ATEX:	Marking presets alarm and relay conditions according to ATEX 94/9 requirements
Range:	Defines measuring range and units
Sensor:	Specifies sensor head to be connected
MG:	Defines measuring gas
 	Alarm 1 value threshold and Alarm 2 value threshold (Default value in ATEX version)
	Displays if alarm level is reached
	Falling value will activate alarm
	Alarm is automatically deactivated
	Alarm is latched until acknowledgement by [RESET]

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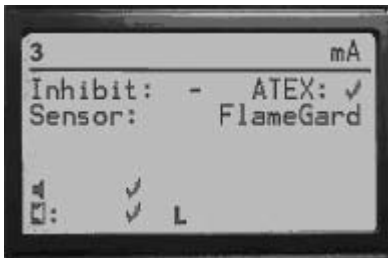
The second screen displays:



- Delay:** Time delay for alarm activating (0 - 180 seconds);
In ATEX version default value is "0".
- Hysteresis:** Defines Alarm 1 and Alarm 2 hysteresis (from 0 to ±2.0 % full scale).
- Dead Band:** Defines zero baseline (from 0 to ±5.0 % full scale). Default is ±2.0 %.

The second screen contains only the "Delay" parameter.

If FlameGard is selected from the sensor list, the setting menu changes to the following screen.



(4) Use control push buttons to:

- Accept changes and leave menu
- Do not accept changes and leave menu
- Return to the System menu.

Modifying Channel Parameters

- (1) Enter into System menu (see Chapter 5.1 "System Menu").
- (2) Use control push buttons to select a channel number to modify and press [ENTER] to confirm. The first of two configuration screens displays.

NOTE: Use [DOWN] to toggle between the two screens:



US



(3) Use control push buttons to select required parameter.



Right button [→]



Up Button [↑]



Left button [ESC]



Down button [↓]

(4) Press [ENTER] to confirm the selected parameter.

(5) Use the control push buttons to change parameter value.

(6) Press [ENTER] to accept the changes.

NOTE: Pressing [ESCAPE] toggles to the upper menu.

If FlameGuard is selected from the sensor list, the Setting menu changes to the following single screen:



(7) Use control push buttons to:



Accept changes and leave menu



Do not accept changes and leave menu



Return to the System menu.



5.2 Relay Setting Menu

The Relay Setting menu enables the user to configure each relay in relation to each channel.

Description of Relay Parameters

- (1) Enter into System menu.
- (2) In the System menu, select the item for "Relay Setting Menu" and press [ENTER] to confirm (see chapter 5.1 "System Menu").



Right button [←]



Up Button [↑]



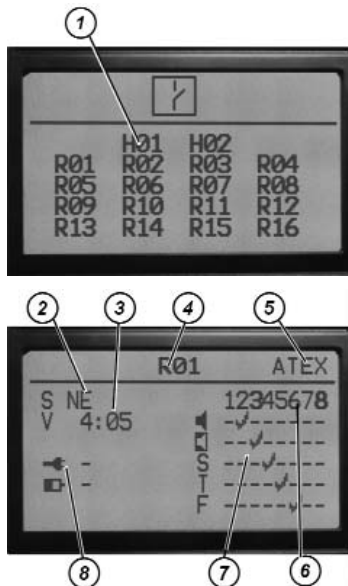
Left button [ESC]












Down button [↓]

The first of two configuration screens displays.

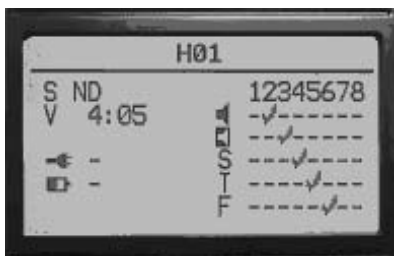
NOTE: Use [DOWN] to toggle between the two screens:



1	Horn Relay Number (H01-H02)	Position of the horn relay on the Main Board.
2	Relay Status (S)	Defines contacts position in de-energized status. <ul style="list-style-type: none"> • NE - Normally energized • ND - Normally de-energized
3	Relays voting (V)	Allows user to set the voting of the selected relays.
4	Relay Number (R01-R16)	<ul style="list-style-type: none"> • 1 - 8 (Channel Relay Board No.1) • 9 - 16 (Channel Relay Board No.2)

5	ATEX status	Defines the selected relay is related to the channel being configured according to ATEX regulation. ATEX channels are displayed in bold numbers on the screen. Some relay parameters are limited (for example normally energized status (S: NE) is only allowed to be set.
6	Channel Number	Relates the relay to the selected channel (bold number indicates channel is configured according ATEX regulation).
7	Configuration Grid	Setting following items to the grid will define the status on the selected channel that activates the selected relay:
		• Alarm 1 is set.
		• Alarm 2 is set.
		• STEL alarm is set.
		• TWA alarm is set.
		• Fault is set
8	Battery/Power Relay Control	Sets the relay that will be energized in case if:
		• The main power is off and the Control Unit is powered from battery.
		• The battery voltage is low.
		Relay is set using these symbols:
		• Not selected
		• Selected

Example of Relay Configuration



US

Relay HORN no. 1:

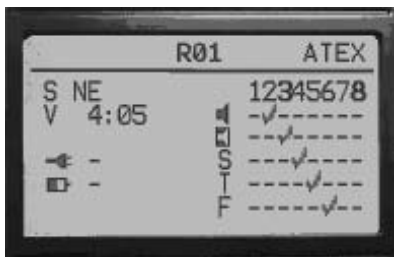
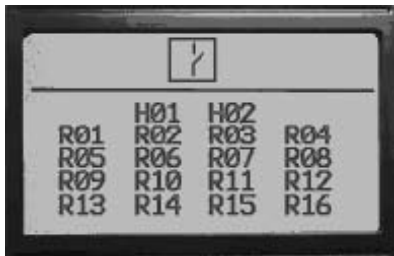
- is configured as normally de-energized (ND).
- is not activated if power is OFF or battery is depleted
- is voted if four out of five conditions are met and
- is energized if at least four of these conditions are met:
 - Channel 2 goes into alarm 1
 - Channel 3 goes into alarm 2
 - Channel 4 goes into STEL alarm
 - Channel 5 goes into TWA alarm
 - Channel 6 goes into FAULT.

Modifying Output Relays

- (1) Enter into System menu.
- (2) In the System menu, select the item for "Relay Setting Menu" and press [ENTER] to confirm (see 5.1 "System Menu").

The first of two configuration screens displays.

NOTE: Use [DOWN] to toggle between the two screens:



US

(3) Use control push buttons to select and change the required parameter.



Right button [←]



Up Button [↑]



Left button [ESC]



Down button [↓]

(4) Press [ENTER] to accept the parameter changes.

NOTE: Pressing [ESCAPE] returns unit to the upper menu.

(5) Use control push buttons to:



Accept changes and leave menu



Do not accept changes and leave menu



Return to the System menu.

NOTE: Common relays are not configurable. Their condition is set to the following fixed settings:

Fixed Setting for Common Relays

- Alarm 1 on any channel de-energizes common Alarm 1 relay on the Main board.
- Alarm 2 on any channel de-energizes common Alarm 2 relay on the Main board.
- Fault on any channel de-energizes Fault relay on the Main board.
- System fault de-energizes Fault relay on the Main board.



5.3 General Setting Menu

The General Setting menu allows the user to:

- configure access passwords for the system and Calibration menu
- set parameters.

- (1) Enter the System menu.
- (2) In the System menu, select the item for "General Setting Menu" and press [ENTER] to confirm (see chapter 5.1 "System Menu").



Right button [←]



Up Button [↑]



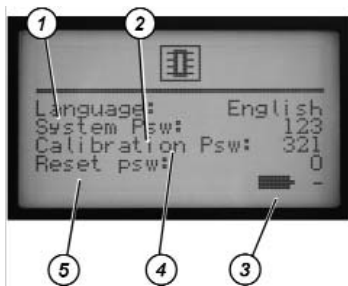
Left button [ESC]



Down button [↓]

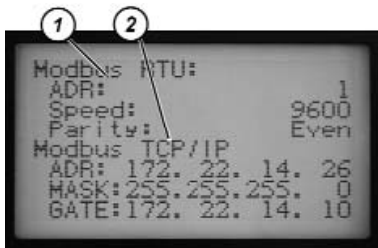
The first of three configuration screens displays.

NOTE: Use [UP/DOWN] to toggle between the three screens:



1	Language:	Setting required language
2	System Psw:	Setting system password (factory preset password is: 123)
3	Battery Back Up:	Select if battery backup is used
4	Calibration Psw:	Setting calibration password (factory preset password is: 321)
5	RESET Psw:	Setting alarm reset password (factory preset password is: 0)

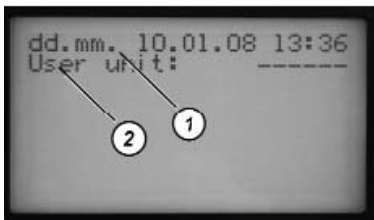
NOTE: Setting any above password to 0 disables this password.



US

1 Modbus RTU:	<p>Defines the RS 485 / USB communication parameters</p> <ul style="list-style-type: none"> • ADR –unit address • Speed – communication speed • Parity – setting the parity (Even/Odd)
2 Modbus TCP/IP	<p>Defines the Ethernet communications parameters</p> <ul style="list-style-type: none"> • ADR – unit IP address • MASK - subnetwork mask • GATE -gateway

NOTE: Use [UP/DOWN] to toggle between the screens.



1 Time/Date	Define time or date format (dd.mm. or mm.dd) can be selected.
2 User Unit:	Define measuring units.

- (3) Use control push buttons to select and change required parameter.
- (4) Press [ENTER] to accept the parameter changes.
NOTE: Pressing [ESCAPE] toggles to the upper menu.



Right button [→]



Up Button [↑]



Left button [ESC]



Down button [↓]

- (5) Use control push buttons to:



Accept changes and leave menu



Do not accept changes and leave menu



Return to the System menu.



5.4 Calibration

Calibration (4 - 20 mA)

Channel boards are configured to accept 4 - 20 mA input signals from two-wire or three-wire remote transmitters. The controller does not require any calibration.

During calibration of MSA's Ultima X Gas Monitors, the GasGard XL unit shows the following:

- For combustibles and toxics, if cal enable is ON, the 3.75 mA signal does not show a fault or under-range state on the GasGard XL unit. The display may show 0 or some negative value, depending on the Dead Band Around Zero setting.
- For oxygen, if cal enable is ON, the 21 mA signal causes the GasGard XL to go into an overrange status. As soon as the signal drops below 20.4 mA, the user must clear this state by pressing the RESET button.

6 Configuration Software

6.1 Installation and Start up

For software installation, copy the [GASGARD XL] folder from the installation disc into the user's own directory.

NOTE: To run this software, Java module must be installed on the user's computer.

To launch the application, run the file "run.bat" from the user's directory.

NOTE: For easy access, create a shortcut on the computer desktop.

Hardware Requirements:	PC, 512 MB RAM, CPU 1.5 GHz or higher
System Requirements:	Windows 2000, Windows XP
Software Requirements:	Java 6 SE or higher

6.2 Application

The main Application screen contains four basic parts:

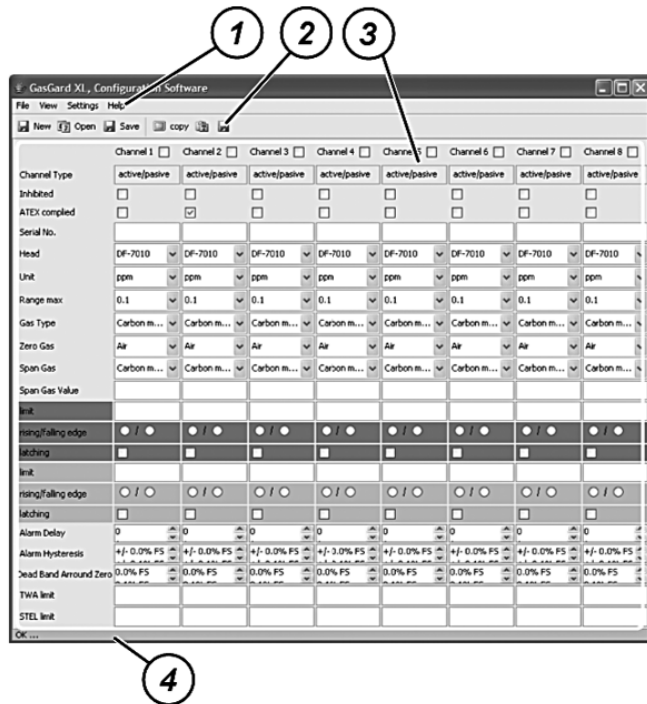


Fig. 9 Main Applications Screen

- | | | | |
|---|----------|---|-------------|
| 1 | Menu Bar | 3 | Main Screen |
| 2 | Toolbar | 4 | Status Bar |

US

Menu Bar

The menu bar has four pull down menus for application functions:

- File
- View
- Settings
- Help.

File	<p>From the File menu, the user can:</p> <ul style="list-style-type: none"> • send or receive a configuration to the device • load or save a configuration to or from a file • print • exit the application
View	<p>From the View menu, the user can switch between four basic screens and show or hide the toolbar and status bar.</p> <p>NOTE: For easy access click on the toolbar icon to show a particular screen.</p> <p>The user can select from the following options:</p> <ul style="list-style-type: none"> • Channels • Outputs • Calibration • Logs
Settings	<p>From the Settings menu, the user can select from:</p> <ul style="list-style-type: none"> • Connection Type option • Service Function option. <p>This application allows communication with devices via serial or USB port. The user must select one port to use for communication.</p> <p>The Service Function option enables the user to set:</p> <ul style="list-style-type: none"> • language • device address • IP address • mask <p>The window also shows firmware version information</p>
Help	<p>The Help menu assists the operator in using the application.</p>

6.3 Multilingual System

The Configuration software is multilingual; for individual languages, use the "lang.properties" configuration file.

For additional local language configuration software, contact MSA or an MSA representative.



6.4 Setting Up Channels

The window displays the status of all eight channels and allows configuration.

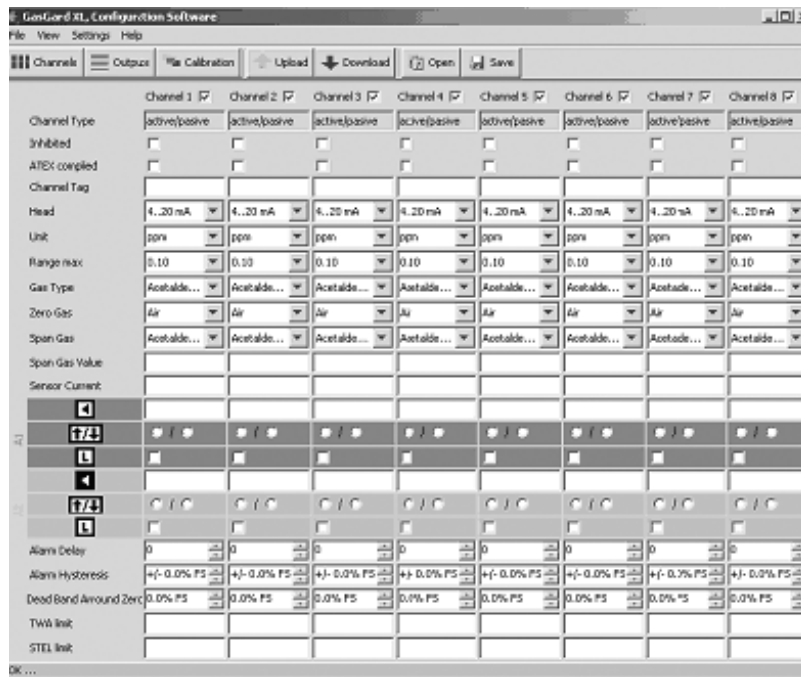


Fig. 10 Setting up Channels

UPLOAD button:	Allows user to upload configuration from the GasGard XL unit
DOWNLOAD button:	Allows user to download configuration to the GasGard XL unit
OPEN Button:	Opens the GasGard XL configuration saved on the hard drive
SAVE button:	Saves the GasGard XL configuration to the hard drive

US

6.5 Setting Up Output Relays

The window shows the outputs for the connected devices.

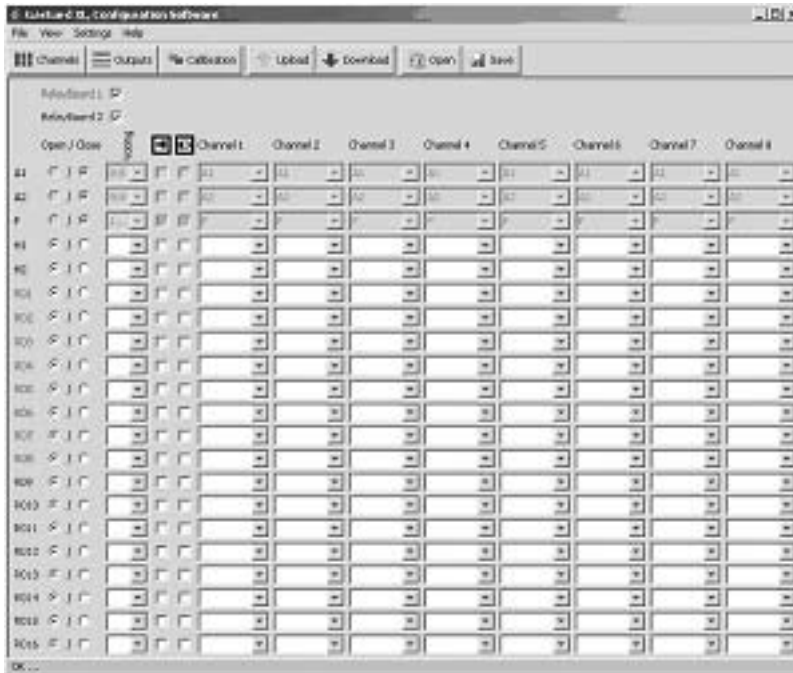


Fig. 11 Setting up Output Relays

The window shows the outputs for the connected devices.

For each channel and each output relay, the user can select:

- Alarm 1
- Alarm 2
- STEL
- TWA or
- Fault.

For each selected channel, the drop-down menu enables voting selection. Voting can be set from 1:1 up to 42:42.

US

7 Maintenance

- The Control Unit requires no special maintenance or cleaning, apart from verifying that it responds appropriately when performing sensor calibration checks.
- For SIL 2 (Safety Integrity Level) sensor applications, the calibration intervals must be reduced appropriately.
- Check the calibration of sensor(s) connected to the Control Unit according to your company's safety manager.

DESCRIPTION	PART NO.
Sensor Extension Board (for channels 5 - 8)	10081676
Channel Relay Board	10081677
Channel Board 4 - 20 mA	10081674
GasGard XL, manual	10091922
EMC Filter (to be used with external. 24 VDC supply)	10081680
Back-up battery (2.2 Ah Kit)	10089924
Back-up battery	10093414
Display Board	10081679
Lid for housing with touch pad and gasket (w/o screws)	10081774
Flat ribbon cable (Main Board to Display Board)	10081775
Set of Lid fixing screws	10081909
Spare battery for Main Board	10031402
Main Board (channel 1 – 4)	10085436
Fuse 250 V	10089808
Spacers for relay channel board [set of 6]	10089913
Screw for Sensor Extension Board (need qty. 13)	10095004

Tab. 12 Accessories and Spare Parts

WARNING!

Electrical Hazards

- ▶ Disconnect the power before access.

8 Technical Specifications/Certifications

8.1 Technical Specifications

	100 VAC - 240 VAC 50/60 Hz 2.5 A 100 W 24 VDC 4 A
Power Supply	Main supply voltage fluctuations are not to exceed 10% of the nominal supply voltage
Sensor Power Supply	24 VDC
Connection Modes	2, 3 wires
Terminal Board	for copper wires up to 2.5 mm ²
Input Signals	4 – 20 mA
Output: Relay Contacts	5 A at 240 VAC RESISTIVE or 5 A at 30 VDC RESISTIVE
Alarm Thresholds	ALARM 1 (Warning) adjustable from 5 to 100% full scale (80% LEL for ATEX version) ALARM 2 (Alarm) adjustable from 5 to 100% full scale (80% LEL for ATEX version)
Electronic Speed of Response	< 1 sec to reach 100 % full scale
Span/Zero Drift	< ±0.5 % full scale ±1 digit/month
Accuracy/Repeatability	< ±1 % full scale ±1 digit
Operating Temperature	-10 to +50°C (14 to 122°F)
Storage Temperature	-20 to +75 °C (-4 to 167°F)
Ambient Humidity	0 to 90%, non condensing
Ingress Protection	IP 56, NEMA 4X
Dimensions (W x H x D)	515 x 277 x 129 mm (20 x 11 x 5 inches)
Weight	5 kg (7 kg with battery) [11 lbs. (15 lbs. with battery)]
Pollution Degree	2
Altitude	2000 m (6561 ft)
Installation Category	II

The GasGard XL Controller is for indoor use only.

The GasGard XL Controller's ethernet connection works at 10 MBit/s half-duplex only.

8.2 Approvals

cCSAus Certification Mark

Ordinary Location to UL/CSA 61010-1

with performance to the controller portions of

CSA 22.2 No. 152 and ISA 12.13 standards.

9 Appendix A, Sensor List

9.1 GasGard XL-compatible Sensors

4 – 20 mA TRANSMITTERS

- FlameGard
- SafEye
- Standard 4-20 mA transmitter
- ULTIMA X (2-wire)
- ULTIMA X (3-wire)
- ULTIMA X IR

10 Appendix B, Wiring Diagrams

GasGard XL
Mainboard Terminal

Sensor Type
FlameGard
Detector

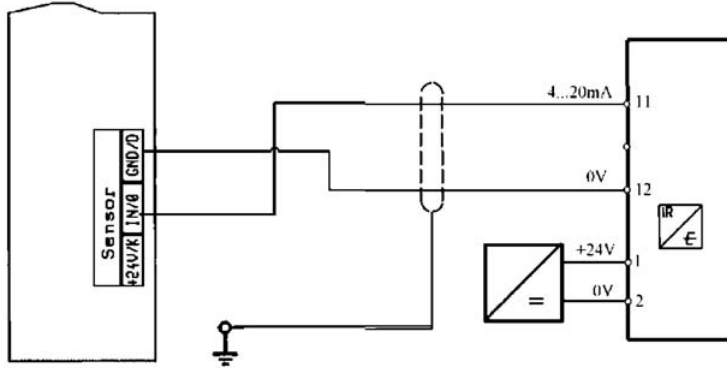


Fig. 13 Flamegard® Flame Detector

GasGard XL
Mainboard Terminal

Sensor Type
SafEye
Detector

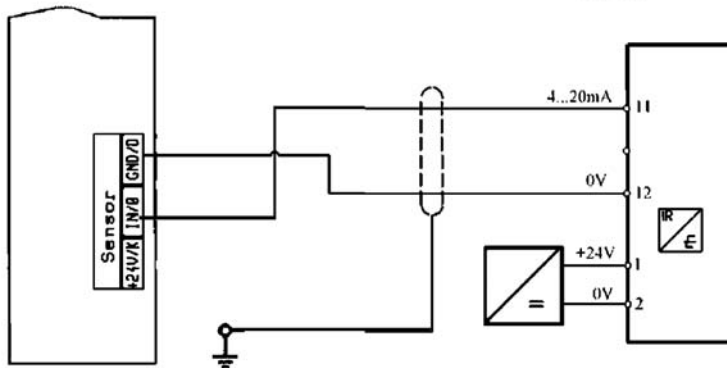


Fig. 14 SafEye® Open Path Gas Detector

GasGard XL
Mainboard Terminal

ULTIMA X
Detector
(2-wire)

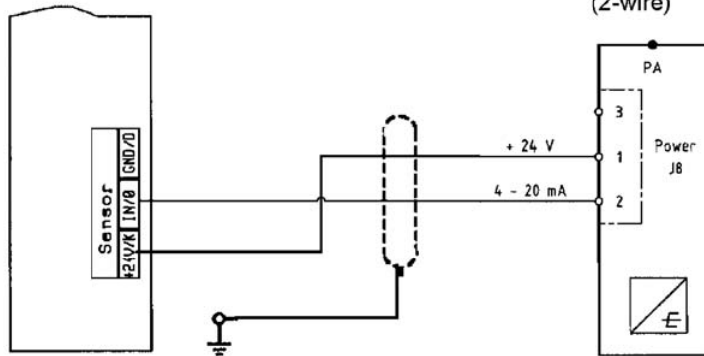


Fig. 15 Ultima® X (Two-wire)

US

GasGard XL
Mainboard Terminal

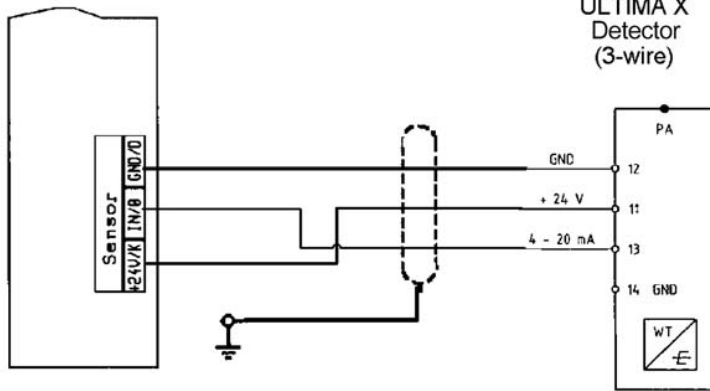


Fig. 16 Ultima[®] X (Three-wire)

GasGard XL
Mainboard Terminal

ULTIMA X IR

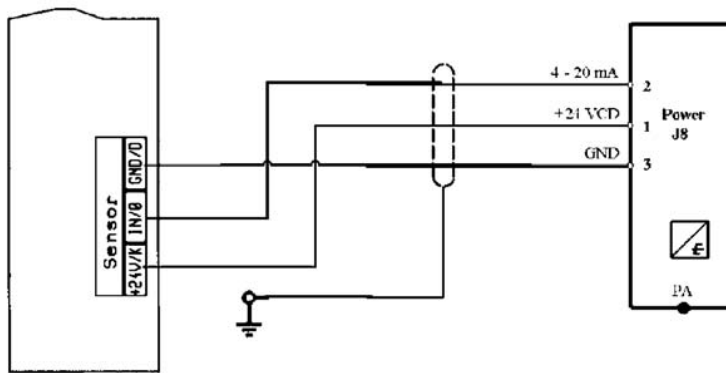


Fig. 17 Ultima[®] X IR Sensor

US

11 Appendix C, Individual Relay Connections

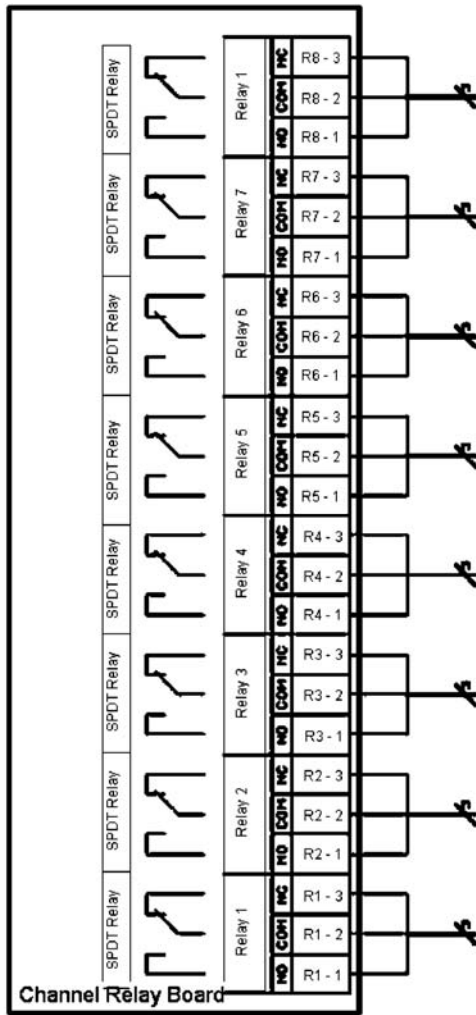


Fig. 18 Individual Relay Connections

12 Appendix D, Terminal Connectors

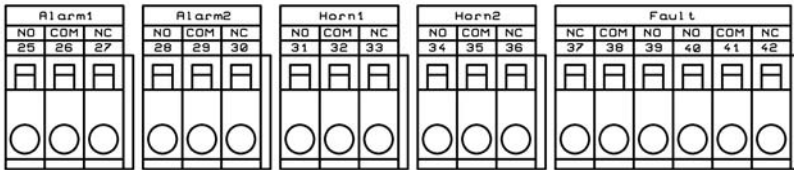
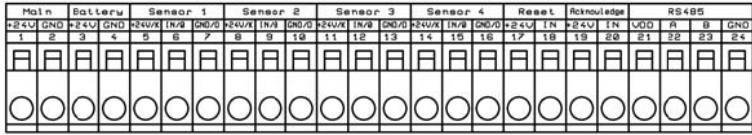


Fig. 19 Main Board

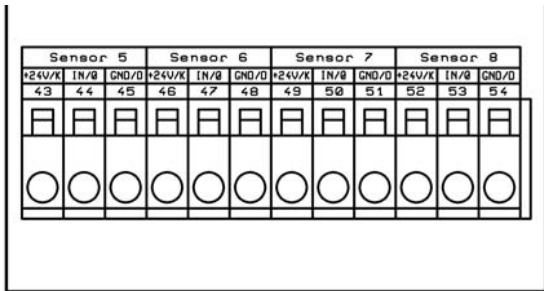


Fig. 20 Sensor Extension Board

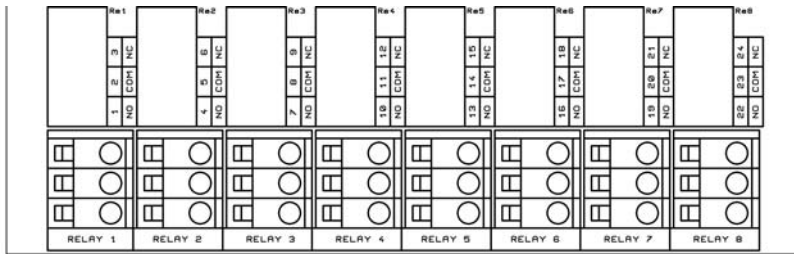


Fig. 21 Channel Relay Board



For local MSA contacts, please visit us at **[MSAsafety.com](https://www.MSA.com)**

*Because every life has a **purpose...***