REMOTE PANEL
(INDOOR)

OR

REMOTE PANEL
(OUTDOOR)

MAIN PANEL

CHILLER
Enabled Off

FAN
Auto High
Speed

REMOTE
SENSOR

MODEL 4200-IG-2 (Up to 2 Sensors)
MODEL 4200-IG-6 (Up to 6 Sensors)
MODEL 4200-IG-10 (Up to 10 Sensors)

Industrial Grade Gas Monitor
User Manual

Technical Support
Continental North America Toll Free 1-(800) 387-9487
Ph: +1 (905) 829-2418 Fx: +1 (905) 829-4701

ARJAY
ENGINEERING

A Product of Arjay Engineering Ltd.
Oakville, Ontario, Canada

www.ArjayEng.com

MODEL:	
HARDWARE NO.:	
SOFTWARE NO.:	
SERIAL NO.:	

TABLE OF CONTENTS

TABLE OF FIGURES

1.0   INSTRUMENT OVERVIEW

The Arjay Model 4200-IG monitors the inputs from various field sensors to provide a gas concentration display, alarms and interlocks.

The monitoring system is comprised of one main control panel and a minimum of one remote alarm sensor transmitter. The panel can support multiple sensor inputs and signal types as per the part number ordered.

Optional Remote alarm panels can also be added that will display and provide audio/visual alarms.

Local or site specific regulations may apply to your application. Be aware and to comply with all applicable regulations for your installation.
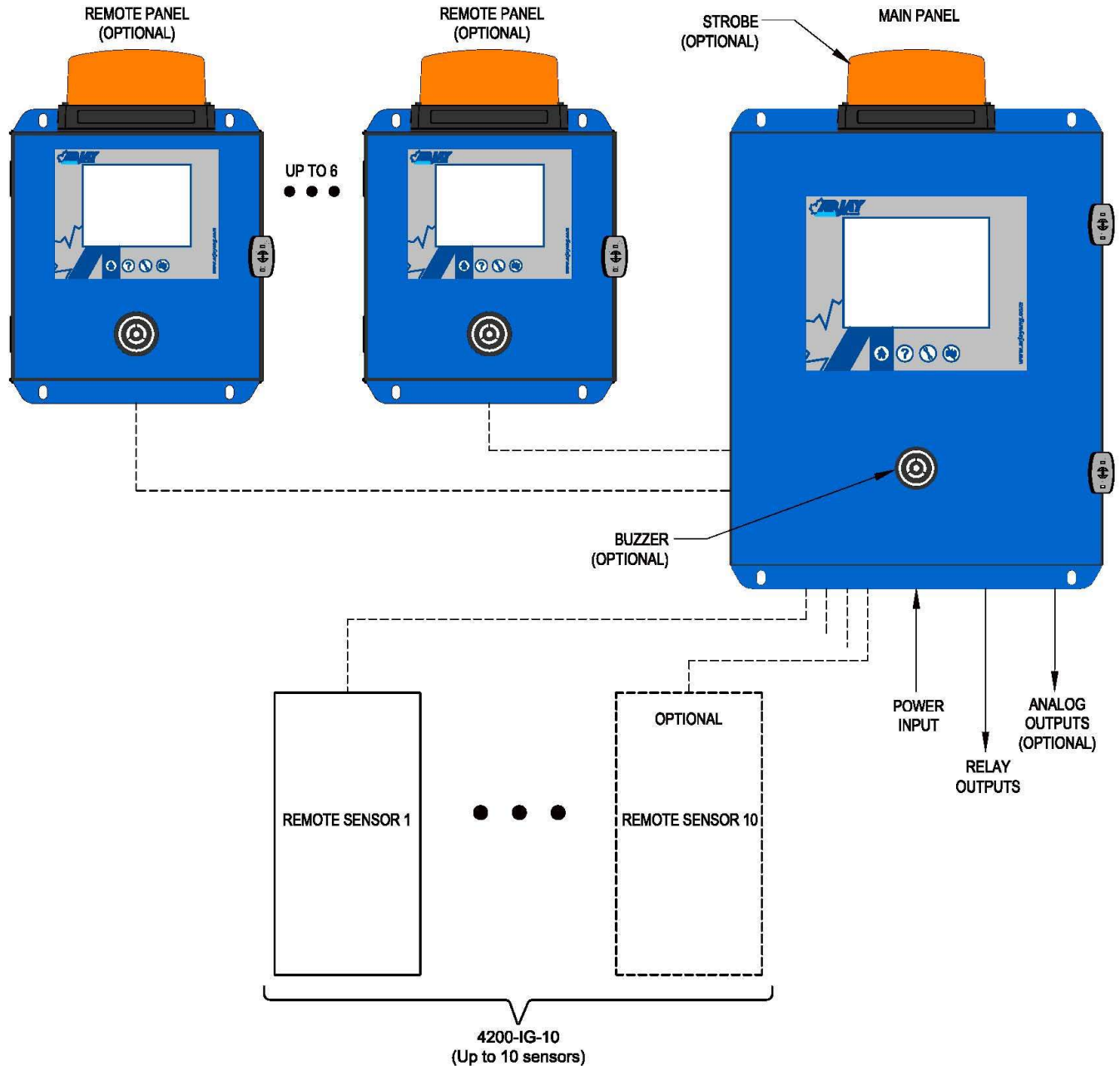

Figure 1 – System Overview

Main Panel

The main panel is a wall mounted touch screen monitor in a general purpose (non-hazardous) location that is accessible for set-up and observation of the display and alarms.

There are 3 models available to order:

1. 4200-IG-2: This system has up to 2 zones to configure.

2. 4200-IG-6: This system has up to 4 zones to configure. If more then 4 sensors are ordered then several sensors can be grouped into one zone.

3. 4200-IG-10: This system has up to 4 zones to configure. If more then 4 sensors are ordered then several sensors can be grouped into one zone

For example: Zone 1 can be set for Sensors 1-4 while Zone 2 can be set for Sensors 5-6.

A low alarm relay for each zone is activated at a low setpoint and is indicated by the touch screen flashing yellow by pressing the zone icon. The screen text also shows the sensor number, gas concentration and "LO" indication. The relay resets automatically when the concentration clears below the determined differential setpoint.

A high alarm relay for each zone is activated at a high setpoint and is indicated by the touch screen flashing red by pressing the zone icon. The screen text also shows the sensor number, gas concentration and "Hi" indication. The relay resets automatically when the concentration clears below the determined differential setpoint.

A high/high alarm relay common to all zones is activated at a high/high setpoint and is indicated by the screen text "Hi/Hi". An optional beacon and/or buzzer is also available to activate at this setpoint. The high/high alarm maybe latched to be acknowledged and reset after the gas concentration clears. If user is not using zone 4 Hi alarm then this relay can be selected as a common Fault alarm.

If latched, the buzzer can be silenced during an alarm condition but the beacon will only turn off when a gas alarm has cleared and has been acknowledged.

Pressing each zone icon (e.g. Zone 1) will allow user to view which sensor was in alarm in that particular zone as well as type of sensor (e.g. CO) and concentration.

The main panel screen provides additional user interface menus for diagnostics, set-up and general Help information. Menus can be accessed for viewing but a password entry is required to make any changes.

Remote Panel

Remote panels are available to mimic the screen and audio/visual alarms of the main panel. Access to the touch screen menus are password protected on the remote panels. The main panel will accept up to 6 remote panels depending on the model ordered.
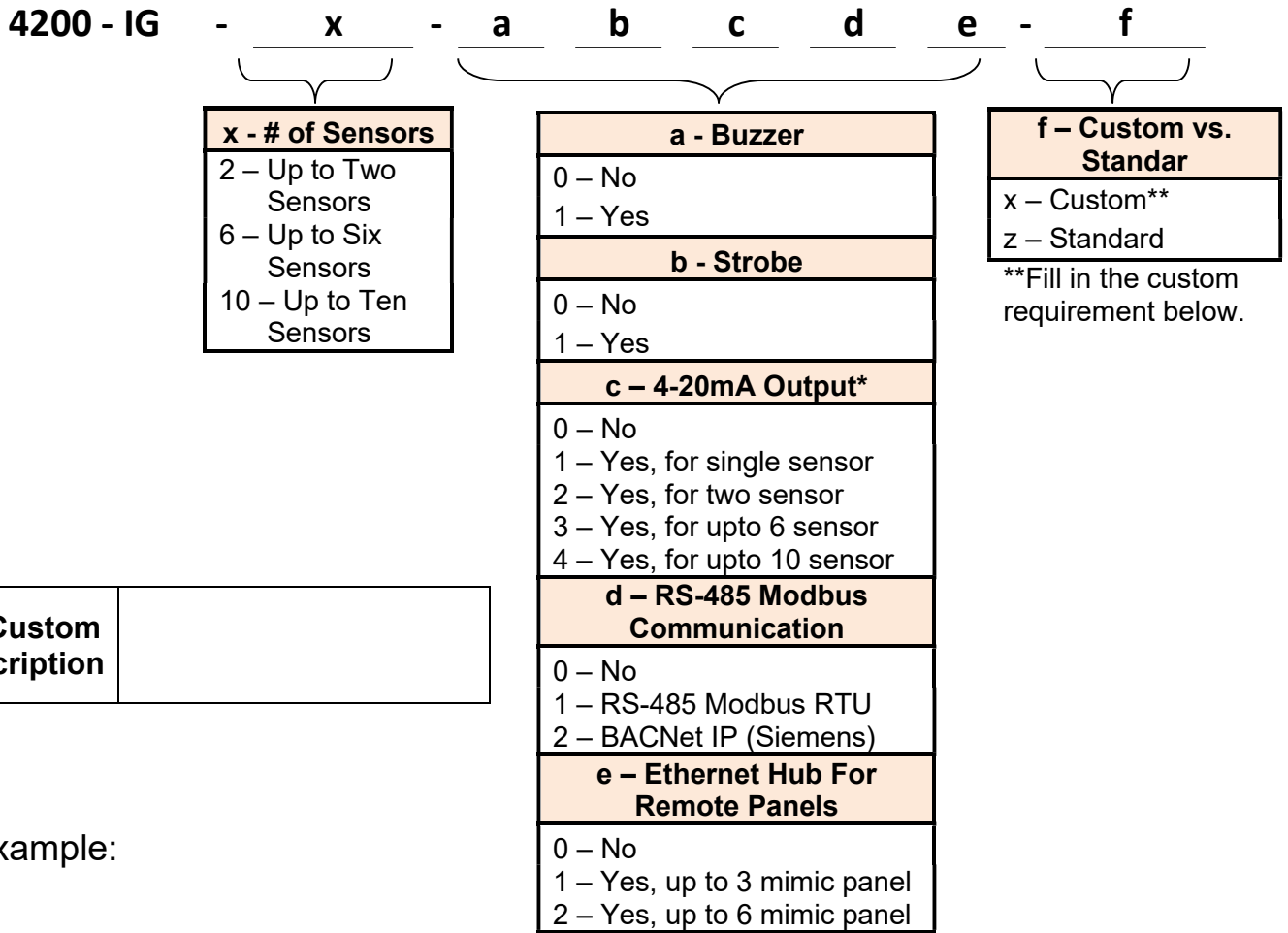
Remote Sensor

The panel will accept one or more sensor inputs depending on the model ordered. Typical inputs are 4-20 mA signals proportional to the gas concentration.

Refer to your sensor transmitter manual for details. Routine testing and calibration is recommended to ensure the sensor is responsive and accurate.

1.1   Features

- Microprocessor based Controller
- Up to 10 sensor inputs based on the model ordered
- Concentration Display
- Relay alarms on low and high for each zone and common high/high
- Available analog outputs and RS-485 communication
- Touch Screen interface with password protection
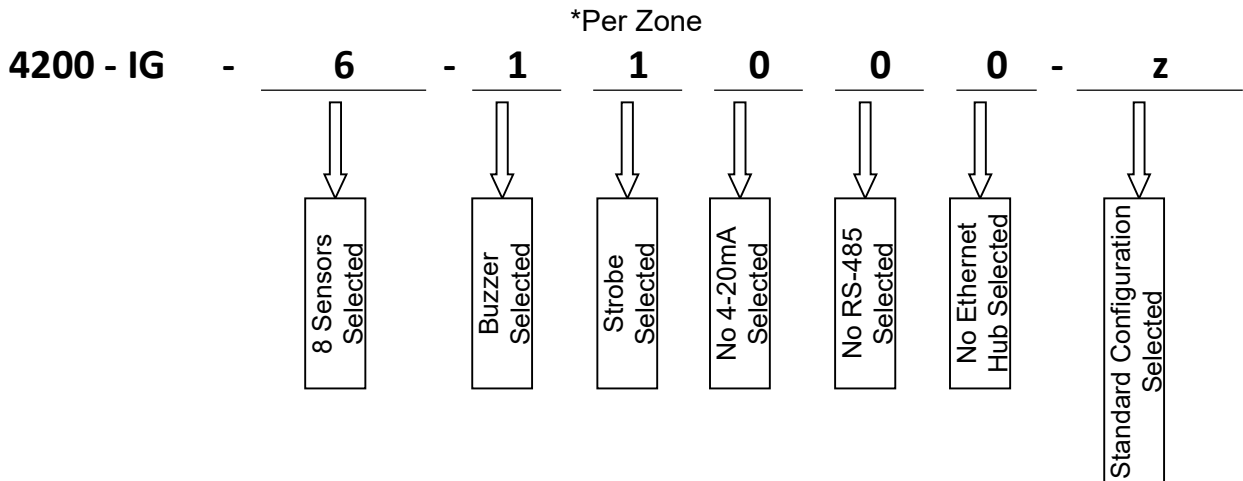- Diagnostic, set-up and Help menus on all screens

1.2   Model Numbers

4200 - IG - __x__ - __a__ __b__ __c__ __d__ __e__ - __f__

x - # of Sensors
2 – Up to Two Sensors
6 – Up to Six Sensors
10 – Up to Ten Sensors

a - Buzzer
0 – No
1 – Yes

b - Strobe
0 – No
1 – Yes

c – 4-20mA Output*
0 – No
1 – Yes, for single sensor
2 – Yes, for two sensor
3 – Yes, for upto 6 sensor
4 – Yes, for upto 10 sensor

d – RS-485 Modbus Communication
0 – No
1 – RS-485 Modbus RTU
2 – BACNet IP (Siemens)

e – Ethernet Hub For Remote Panels
0 – No
1 – Yes, up to 3 mimic panel
2 – Yes, up to 6 mimic panel

*Per Zone

f – Custom vs. Standar
x – Custom**
z – Standard

**Fill in the custom requirement below.

**

x – Custom Description	

Example:

4200 - IG - __6__ - __1__ __1__ __0__ __0__ __0__ - __z__

- 8 Sensors Selected
- Buzzer Selected
- Strobe Selected
- No 4-20mA Selected
- No RS-485 Selected
- No Ethernet Hub Selected
- Standard Configuration Selected

1.3   Specifications

Power Input: 100-240 vac, 50/60 Hz,
                                         1.22A maximum for 4200-IG-2 Model
                                         1.95A maximum for 4200-IG-6 Model
                                         4.00A maximum for 4200-IG-10 Model

User Interface:

Touch Screen   Full Colour 6 " display on Main Panel
                                         Monochrome 4" on Remote Panel

Outputs:

Relay Output   DPDT relay, 8 A @ 250 vac dry contacts
                                           - 5x Relays for Mdoel 4200IG-2
                                           - 10x Relays for Model 4200IG-6 and 4200IG-10
                                          Selectable failsafe or non-failsafe
                                         Programmable time delay: 0 – 1 hour; ON and/or OFF
                                         One relay each for:

- Low Setpoint per zone *
- High Septoint per zone *
- High/High common

  Max. 4 zones with 4200IG-6 & 4200IG-10

Sensor   Accepts various sensor types
                                         Refer to your sensor manual for specifications

Environmental:

Ambient Temperature   0 to +55 °C

Relative humidity   0 to 95% (non-condensing)

Installation Category   II

Pollution Degree   2

Mechanical Specification: Refer to dimensional drawing

2.0   INSTALLATION

NOTE: If any damage to the instrument is found, please notify an Arjay Engineering representative as soon as possible prior to installation.

2.1   Main and Remote Panel Installation

Choose a mounting location in accordance with good instrument practice. Extremes of ambient temperature and vibration should be avoided (see specifications and installation drawing).

Remote panels can be mounted up to 300 meters away from the main panel. Sensors can be mounted up to 4500 feet (using 14AWG wire) away from the main panel.

Important Note: The controller is set in Failsafe mode (Factory Default). This means that the relays are in an energized state during normal operation. The N.O. relay contact will be held closed and the N.C. relay contact will be held open during a normal condition. This will allow the relay to return to it's non-energized (shelf) state during an alarm, fault or power failure condition. **Wire accordingly.**

2.2   Sensor Installation

Refer to sensor manual for more specification on location and wire type.

The sensor is to be mounted near the targeted gas source and protected from extremes of temperature and damage. Keep the sensor accessible for routine calibration. Do not block with equipment or store materials or containers in front of the sensor.

Gases may have densities greater than or less than air. Sensors should be mounted accordingly.

Sensors targeting heavier than air gases should be mounted so the bottom of the sensor housing is approximately 250mm to 450mm (10" to18") above floor grade to protect it from damage from cleaning equipment and minor washdown. The sensor should be mounted above any risk of flooding.

Sensors targeting lighter than air gases should be mounted near the ceiling in a location that will be accessible for routine testing.

Sensor location is application specific and may need to be in accordance with local regulations or engineered recommendations.

2.3   Electrical Installation

Refer to the drawings provided by the contractual engineer for your project and the drawings included with this manual.
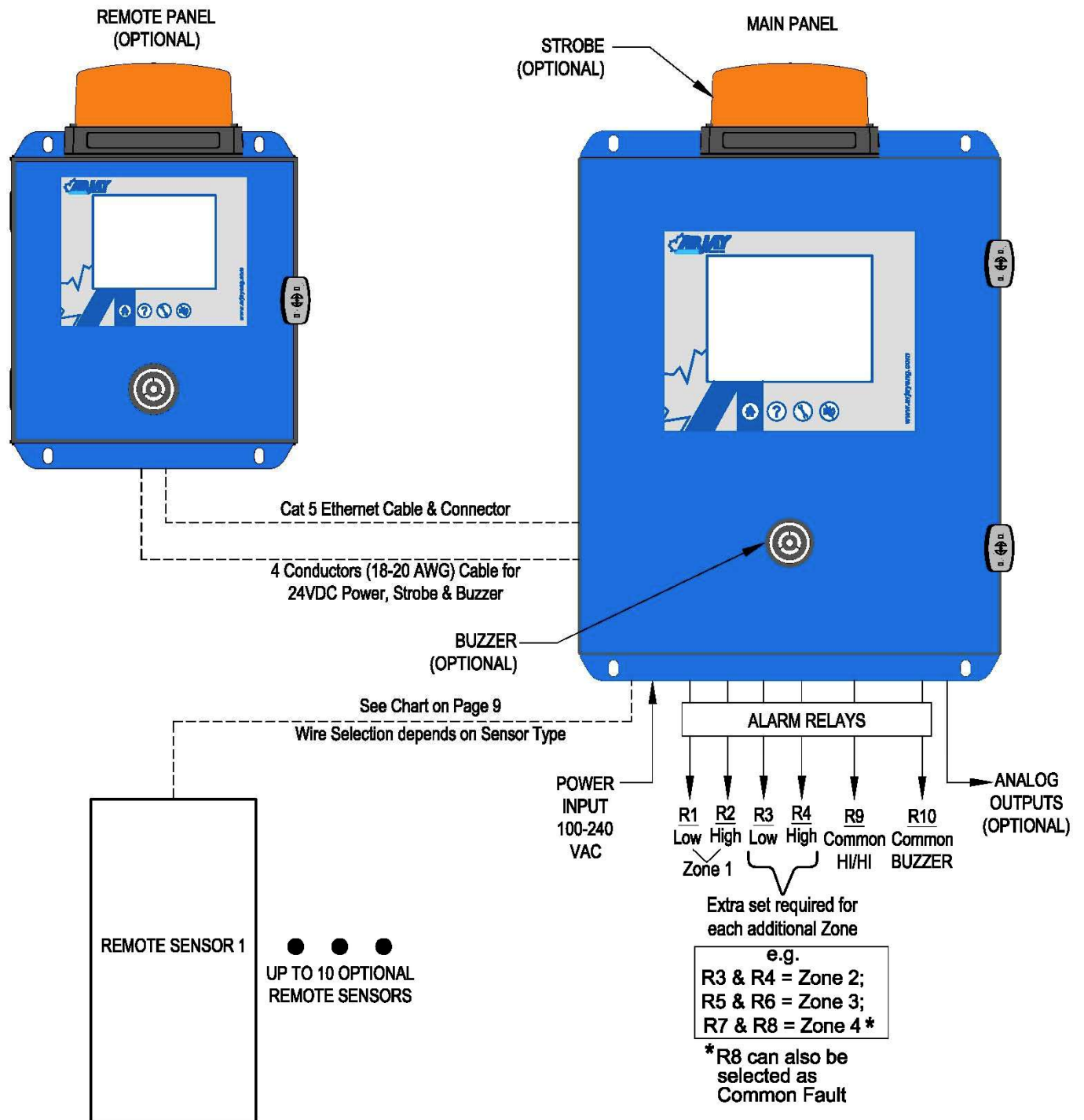

Figure 2 – Electrical Installation Overview

Wiring Chart (Depends on Sensor Selection)

Two wire Loop Powered Transmitters (Sensor)*

Transmitter Model	Transmitter Wire Terminal	Panel Wire Terminal
HLM-2000-TX	+ 24VDC Power Input - Signal Output	24VDC Power Output (-) Common (Not Used) (S) + 4-20mA Input

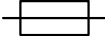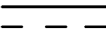## Three wire Loop Powered Transmitters (Sensor)*

Transmitter Model	Transmitter Wire Terminal	Panel Wire Terminal
HLM-2000-EX EC-Gold EC-Gold Dual IR-200	+ 24VDC Power Input -Negative + 4-20mA Output	+ 24VDC Power Output (-) Common (S) + 4-20mA Input

Four wire Loop Powered Transmitters (Sensor)*

Transmitter Model	Transmitter Wire Terminal	Panel Wire Terminal
IR-350	+ 24VDC Power Input -Negative + 4-20mA Output -Negative	+ 24VDC Power Output (-) Common (S) + 4-20mA Input

*Shielded wire is recommended on all installation.
  Maximum wire length 4,500 feet (Using 14AWG wire).

2.4   Glossary of Symbols

Attention, consult accompanying documents
Attention, veuillez consulter les documents ci-joints.

Protective Earth
Terre de protection

Fuse
Coupe-circuit; fusible

Direct Current (DC)
Courant continu

Normally open relay contacts
Contacts travail

Normally closed relay contacts
Contacts Repos

Power off
ArróÕ (mise hors tension)

Power on
Marche (mise sous tension)

L Live
Sous tension

N Neutral
Neutre

G Ground
Terre

3.0   STARTUP AND CALIBRATION
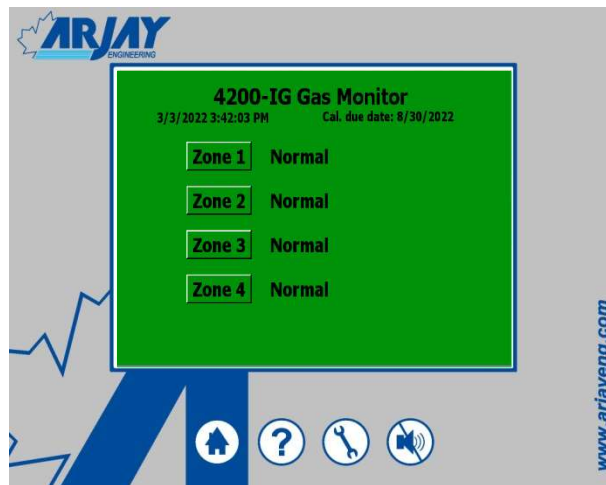
3.1   Startup

Check that the power wiring, sensor and remote panel connections, and interfaced equipment are wired in accordance with the electrical installation drawings.

Power On the unit.

The main screen will light up and run through initialization. After any operator power start up or power interruption, the display will indicate it was non-gas power-up condition and that it must be acknowledged by an operator to proceed.

The main and remote panels are set to factory defaults or customer specifications. The sensor is factory tested prior to shipment. As such, the system will be operational upon start-up.

After the power-up is acknowledged, confirm the screen reads similar to the following.

Figure 3 – Startup Main Screen View With Keypad

Pressing each zone icon (e.g. Zone 1) will allow user to view which sensor was in alarm in that particular zone as well as type of sensor (e.g. CO) and concentration as shown below in Figure 4.

	Gas name	Level	Unit	mA	Volt
#1:	Methane	0.0	%LEL	3.90	0.976
#2:	CO	0.0	ppm	3.98	0.996
#3:	NO2	0.2	ppm	4.03	1.009

◀

Figure 4 – Secondary Main Screen View

3.2   Screen Menu Background Information

3.2.1 Keypad Main Menu Entry

Below the touch screen are 4 touch keys. See **Figure 3** on previous page.

Home

At any time, you can press the Home Key to return directly to the Home Screen

Help

This provides an overview of the system operation and components. Contact details for technical help are included at the end of the text.

Tools

Access this section to view or configure the screen and control settings, view diagnostics or to do a system alarm test.

Silence

During an alarm condition the audio can be silenced. Silencing at any panel will silence all panels. The audio alarm will automically re-set when the alarm clears.

4.0   SYSTEM CONFIGURATION

This section describes the screen, alarm and interface features accessed through the Tools on the Main Panel. The following screens shots are based on a 4200-IG-6 with all options ordered. Screen shots may be different on other models.
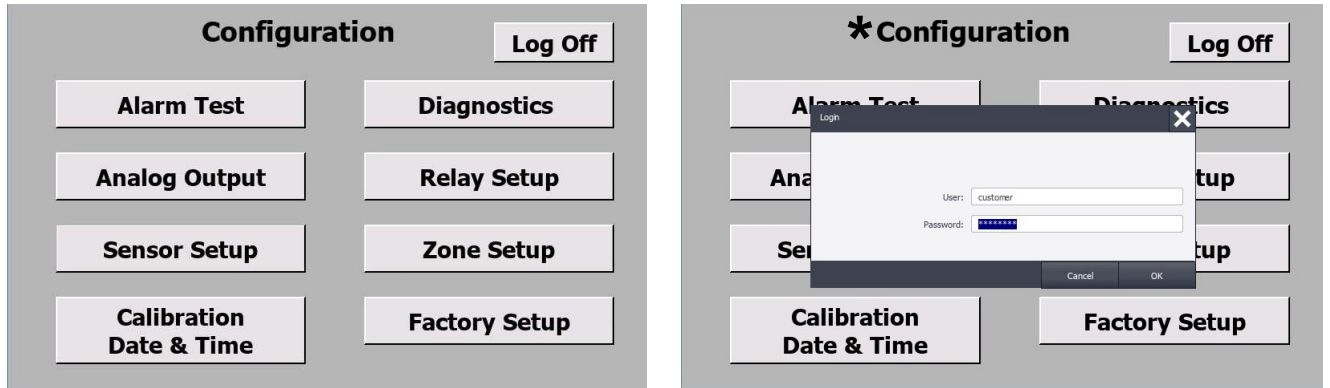
Press

Figure 5 – System Configuration Main Screen View

*Some configuration required password. The password is "2000"

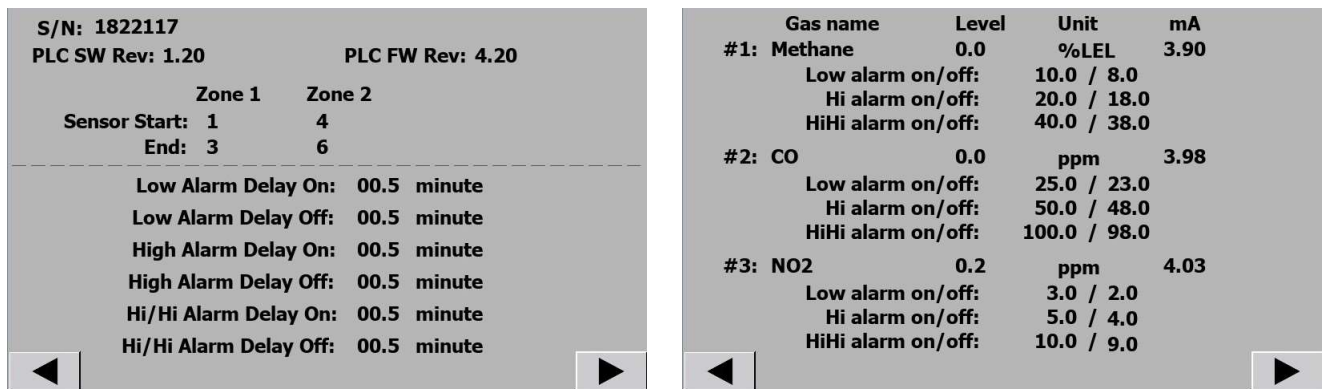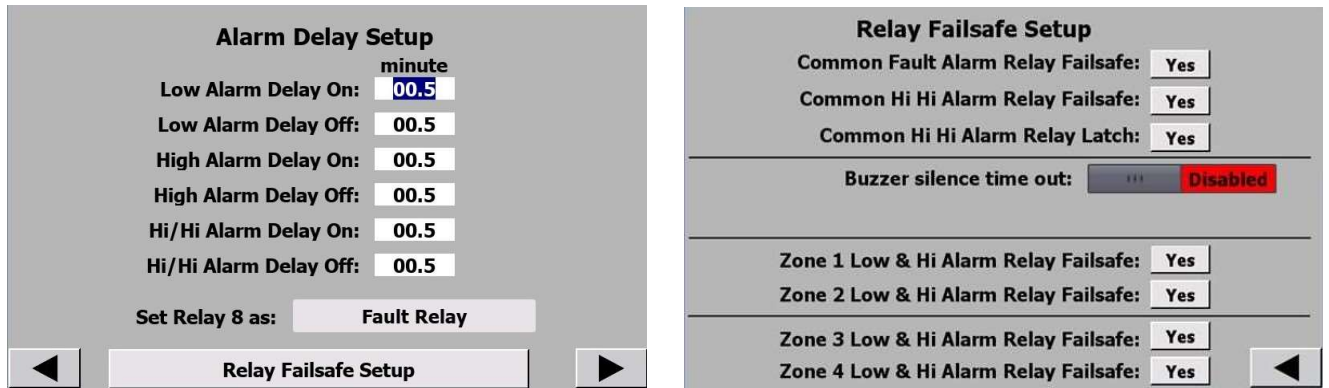## 4.1   Diagnostic Information

Figure 6 – Diagnostic Information Screen View

This is a View Only screen. It provides the alarm and sensor setup details that have been entered for this unit. It also shows real time voltage and mA reading. Setup and sensor changes can be made through the password protected Zone and Sensor Setup menu.

4.2   Relay Setup

Figure 7 – Alarm Setup Screen View

The Password "*2000"* will be required to make changes in this section.

There are three alarm settings: Low alarm, High Alarm and Common High/High alarm

The low alarm is typically used as a warning level that gas is present but at a safe level. It is not unusual to have trace levels of gas present during maintenance or process operations. A relay is provided for each zone. Determine your application requirement such as fan ventilation.

The high alarm is typically used as an alarm condition for action. A relay is provided for each zone.

The high/high alarm is common to all sensors and will activate the buzzer and strobe if ordered. There are 2 common relays for strobe and buzzer options.

FAULT ALARM SETUP

User has the option to use relay 8 as a Common Fault alarm instead of zone 4 High Alarm.

ALARM DELAY SETUP

The low, high and high/high alarm delay for all zones are as follows:

Delay ON. This is the time, in minutes and seconds, that the relays will delay before activating when the ppm setpoint has been reached. Delay ON is used to suppress a nuisance alarm that may be caused by a spurious or momentary alarm of gas.

Delay OFF. The time, in minutes and seconds, that the relays will stay on after the ppm has dropped below the setpoint. Delay OFF is used to keep ventilation fans running after the sensor has cleared to assist ventilating any areas that may not be clear due to poor ventilation.

RELAY FAILSAFE SETUP (Press ▶ to move to next page)

Failsafe will determine if the relays are energized or de-energized during a normal operating state (no alarm condition).

If Failsafe is YES, the relay will be energized during a normal operating condition. An alarm or power failure will de-energize the relay to the alarm state.

When in Failsafe mode and during a normal condition, the N.O. contact is closed and the N.C. contacts is open. WIRE ACCORDINGLY.

COMMON Hi/Hi ALARM RELAY LATCH

Select YES to latch the Hi/Hi relay when it alarms. In this mode, the alarm will need to be manually acknowledged by the Reset button on the Main screen after the gas condition has cleared.

Note: Buzzer silence time out option is only available on 4200-IG-6 model. When enabled the buzzer will come back on after set time

4.3   Sensor Setup

Figure 8 – Sensor Setup Screen View

The Password "*2000*" will be required to make changes in this section.

Gas Name
You can enter the gas name for each sensor. This will show on the secondary screen adjacent to the sensor #. This has been factory set according to the sensor shipped with this panel. Press zone # on main screen to get to sensor status within the zone.

Gas Unit
This is the unit used for each sensor e.g. % * or PPM you can enter the gas name for each sensor.
* Use shift key to get to other keyboard which display %.

Span
This will determine the full concentration level of sensor. This is determined by the sensor type and is factory set according to the sensor shipped with this panel.

Low Alarm ON
This will determine the concentration at which the low alarm relay activates. At this setpoint, the screen will flash yellow.

Low Alarm OFF
This will determine the concentration at which the low alarm will turn off. This differential is used to suppress chattering of alarms if the gas concentration is hovering at the setpoint.

The low alarm will clear automatically if the concentration levels drop below the alarm levels.

High Alarm ON
This will determine the concentration at which the high alarm relays activate. At this setpoint, the screen will flash red.

High Alarm OFF

This will determine the concentration at which the screen will indicate the gas condition has cleared. The high alarm will clear automatically if the concentration levels drop below the alarm levels.
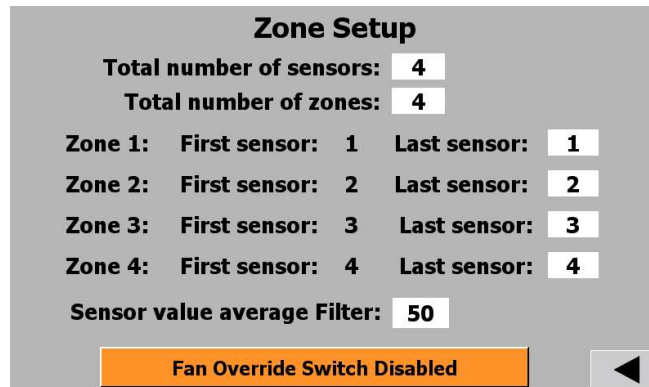
High/High Alarm
This will determine the concentration at which the high/high alarm relay and alarms activate. This relay can be latched to be acknowledged after the gas clears.

4.4   Zone Setup (only for 4200-IG-6 & 4200-IG-10 models)

Sensor Start
This sets up how many sensors required per zone (up to 10 sensors) e.g. 3 sensors in zone is set as sensor start: 1 , end: 3. Set up each zone sequentially starting with Zone 1.

Figure 9 – Zone Setup Screen View

4.4.1 Sensor Value Average Filter

Sensor filtering is used to smooth data from a sudden change and minimize fluctuating reading. Minimum is 1 and maximum value is 100. Higher the filter value, slower the response.

4.4.2 Fan Overide Switch

This button will enable or disable the fan override function. If selected the switch will show on main screen. When fans are hooked up thru the low alarm relay, the operator would be able to manually operate the fans for all zones.

4.5   Calibration Date and Time

The 4200-IG has a real time clock to remind users of impending calibration duties.

The calibration reminder frequency can be entered here. When a calibration is performed, Press the Record calibration icon to initiate reminder countdown timer.
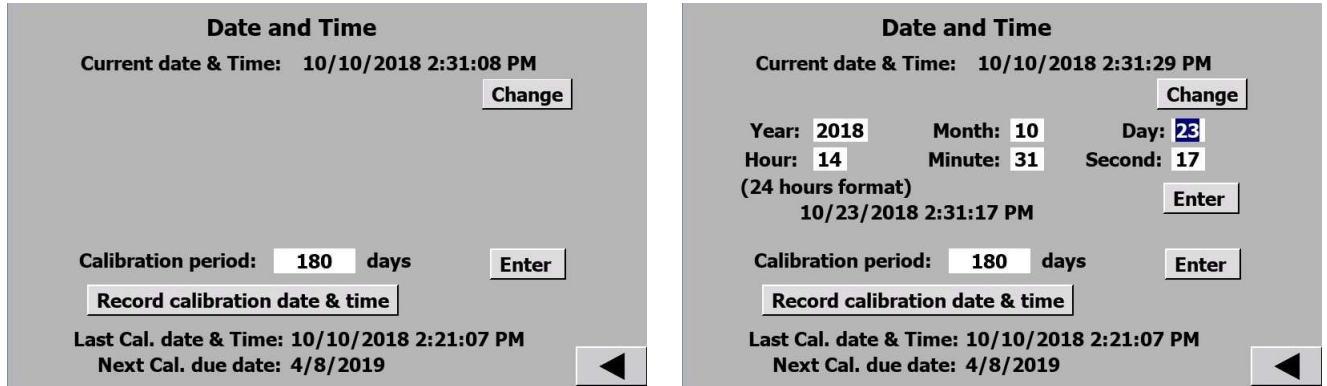

Figure 10 – Date & Time Screen View

4.6   Alarm Test

The Low, High and Common HI/HI & Fault relays can be tested for each zone by pressing appropriate Icon which will turn green if selected. Push the appropriate alarm level for test. "Test in Progress Push to finish" Icon will start flashing, press again to finish the test.
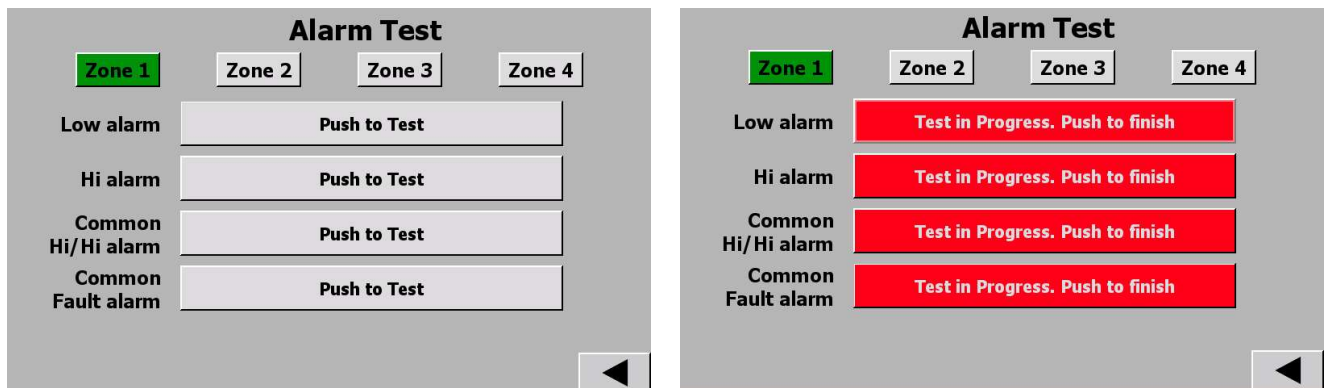

Figure 11 – System Test Screen View

4.7   Log Off

Once logged in with the password, the system will allow user to make changes. If no activity for more than 20 minutes the password will be expired. Log off feature will terminate the password right away with the push of the log off button.

4.8   Analog Output (Optional)

If ordered this feature will show up in configuration menu. Each sensor can be setup for 20mA equals the sensor span.

The force 20mA output feature will allow user to test the equipment.

ANALOG OUTPUTS

	4 mA	20 mA		Force 20mA output:
Sensor 1: Methane	0	100	%LEL	
Sensor 2: CO	0	100	ppm	OFF
Sensor 3: NO2	0	30	ppm	
Sensor 4: Methane	0	100	%LEL	
Sensor 5: CO	0	100	ppm	
Sensor 6: NO2	0	30	ppm	

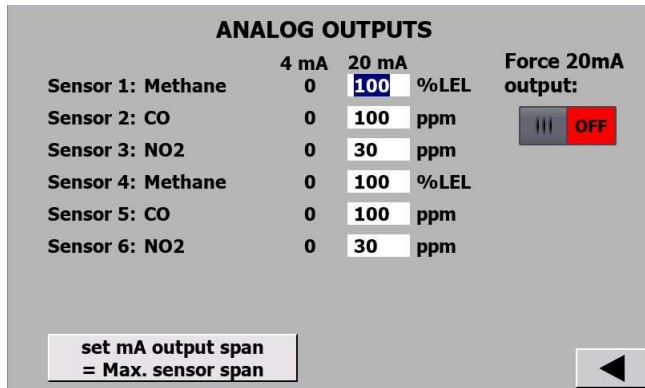set mA output span = Max. sensor span

Figure 12 – Analog Output Screen View
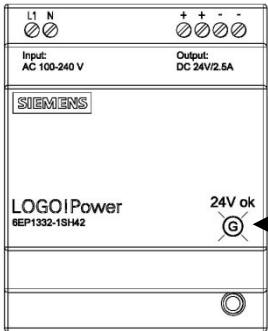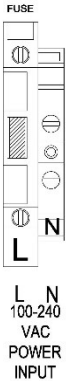
5.0   SENSOR CALIBRATION

Refer to the specific sensor Instruction Manual attached to this manual for the sensor calibration details.

The sensor is factory calibrated and will operate upon installation, however, the sensor response should be verified after installation with a calibration or test gas. Re-calibrate if necessary.

Routine verification of the sensor response and confirmation of the panel alarms and interlocks is recommended. A minimum verification every 4 to 6 months is recommended. Re-calibrate as necessary.

6.0   TROUBLESHOOTING

Main Panel

Green LED	• Confirm the power supply LED is active (Green).
	• Confirm the Power Input is 100-240VAC using a meter. • Confirm if input fuse has blown.
	• Confirm that sensor is wired according to electrical wiring drawing for each sensor.

7.0   DETAILED ELECTRICAL AND DIMENSIONAL DRAWINGS

Drawings are included in this section that are specifc to your model ordered.

If drawings are not included here, record the serial number on the left outside wall of the main panel and contact:

ARJAY ENGINEERING TECHNICAL SUPPORT

(800) 387-9487

+1 (905) 829-2418

www.arjayeng.com