



# SALES GAS MONITOR (SGM) Instruction Guide



Sales Gas Monitor

Sample Conditioning Unit



# Introduction

The Net Safety Sales Gas Monitor is one of a kind, innovative product that continually monitors sampled gas for H<sub>2</sub>S content at a fraction of the expense of gas analyzers. Net Safety not only supplies specially designed equipment to satisfy customers' needs, but also provides the following services and expertise:

Over 20 years of Dedicated Service	24/7 Product Availability	On Call Technicians
Consulting & Customer Support	Customer Training	After Sales Support
Staging & Testing Facility	Field Commissioning	Quality Assurance
SGM Sales Gas Monitor Instructions		

The instructions herein supplement the NSM Millennium Product Manual. Refer to the Millennium manual for calibration details as required. The Sales Gas Monitor (SGM) is based on the Net-Safety Millennium controller technology. As such, persons familiar with the operation and maintenance of the Millennium will find it easy to install, calibrate, and service the SGM.

**Note:** The life of the H<sub>2</sub>S sensors will be determined by the application, environment and length of exposure.

## Installation

The SGM is to be installed outdoors. The gas sample vents to atmosphere at a rate of approximately 0.5 liters per minute. A Sample Conditioning Unit (SCU) should be with the SGM. It is used to filter out dirt and liquids from the gas before it enters the SGM. The SCU unit must be installed indoors.

Power supply can be either 12 VDC (Solar) for low power, or 24 VDC. This voltage must be specified at time of ordering, as it will determine the solenoid valve voltage rating. Normal operating power consumption is less than 8 watts.

## Wiring

Wire the SGM in accordance with standard wiring practices and codes. Use 18 (AWG) or 16 (AWG) wires. The SGM provides 2 separate analog signals (4-20mA) intended to be monitored by a PLC or other control systems. Fault contact and Alarm contact are also provided. See Figure 1. All other connections are pre-wired.

## SGM Components /Assembly


The SGM gas inlet requires a clean gas supply at a pressure of 1-3 psig. The SGM comes with a High Pressure Regulator (Inlet up to 3600 psi) and the SCU, which includes two stages of pressure reduction. Connection is via ¼" Stainless Steel tubing. Flow rate will be adjusted via the Rotameter to 0.5 liters per minute (30 liters per hour). Refer to Figure 4 and Figure 5.

## Steps in Starting -Up

1. Ensure the SGM is properly mounted.
2. The Millennium Controller power switch should be off.
3. Verify wiring and field terminations are correct according to illustration given.

4. Ensure gas supply line is properly connected.
5. The gas sample supply valve should be closed.
6. The High Pressure (HP) Regulator is fully backed off.
7. Check for leaks up to the HP Regulator.
8. Check that the power supply is within operation limits specified.
9. Turn power on to the Millennium controllers.

## Steps in Calibrating

**Warning:**  Always calibrate the Millennium controller with H<sub>2</sub>S gas that is 50% of the full scale (i.e. for a H<sub>2</sub>S unit with a full scale of 20 ppm the calibration gas must be 10 ppm).

1. Allow the SGM an initial warm up period of at least 4 hours prior to first calibration. 24 hours is preferable.
2. Prior to calibration, ensure that the gas supply valve to the SGM is closed.
3. Remove CCS-2 and Stainless Steel lines. Refer to Figure 4.
4. With the aid of the calibration cup (CCS-1), apply zero gas (clean air) from air canister to the sensor and allow it to stabilize.
5. Using the calibration cup (CCS-1), calibration tubing and the required H<sub>2</sub>S gas, commence calibration as outlined in H<sub>2</sub>S Millennium Controller manual(MAN-0043)
6. When calibration is completed remove the calibration cup (CCS-1) and refit the CCS-2 and Stainless Steel lines.

## Operation

**Warning:**  Do not over pressurize the sensors or damage can result.

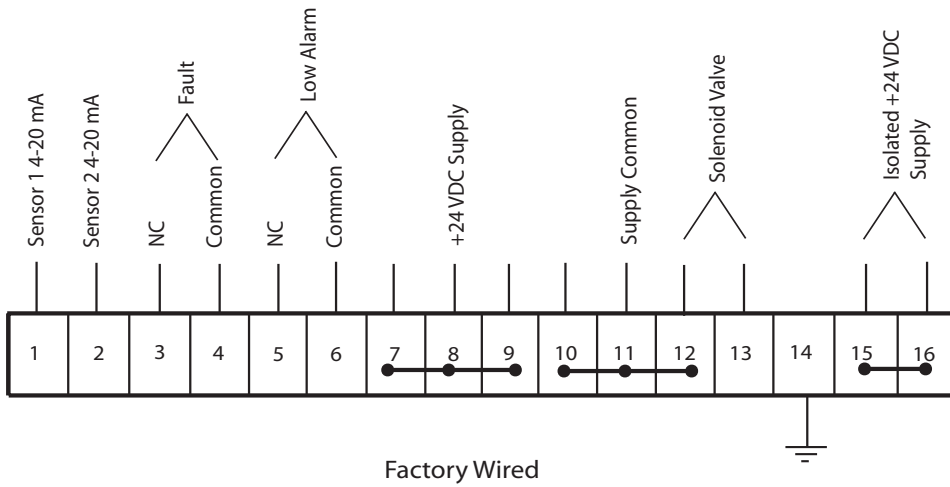
1. The HP Regulator connected to the SCU should be fully turned off.
2. Slowly open the gas sample supply valve that brings gas to the HP regulator and SCU.
3. Slowly open the HP Regulator to allow a gas flow rate while monitoring the SCU and Rotameter.
4. Slowly open the gas supply valve and/or increase the HP regulator outlet pressure to achieve a flow somewhat less than the maximum on the Rotameter.
5. Close the Rotameter slightly until a flow near midscale is achieved. This will be 0.5 liters per minute (30 liters per hour).

The solenoid switches on a 90 second cycle. After a complete cycle the solenoid valve will divert the gas through the second Rotameter to the second sensor. Adjust the second Rotameter also for a flow of 0.5 liters per minute. The SGM is now ready for use.

## Maintenance

It is recommended that the Millennium Controller be calibrated every 3 months (90 days), however this may vary depending on the application, gas sample and other conditions. Periodically check that the SCU filters are clean and the gas flow is correct. The SGM and its component parts are not designed to be repaired in the field. If a problem develops, first check wiring and confirm proper voltage. If the problem persists consult factory.

Figure 1: Sales Gas Monitor (SGM) Field Wiring



**Note:** For Isolated loop power, connect +24VDC to Terminal 15, and move Jumper located on the Millennium Terminal Board to position 1 & 2. Refer to Millennium manual(MAN-0043).

Figure 2: SGM Shroud

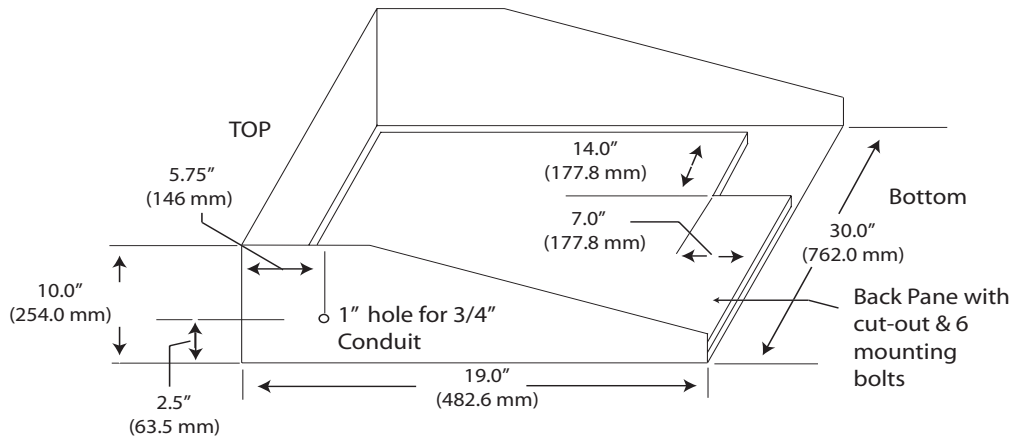


Figure 3: SGM Shroud & Cover

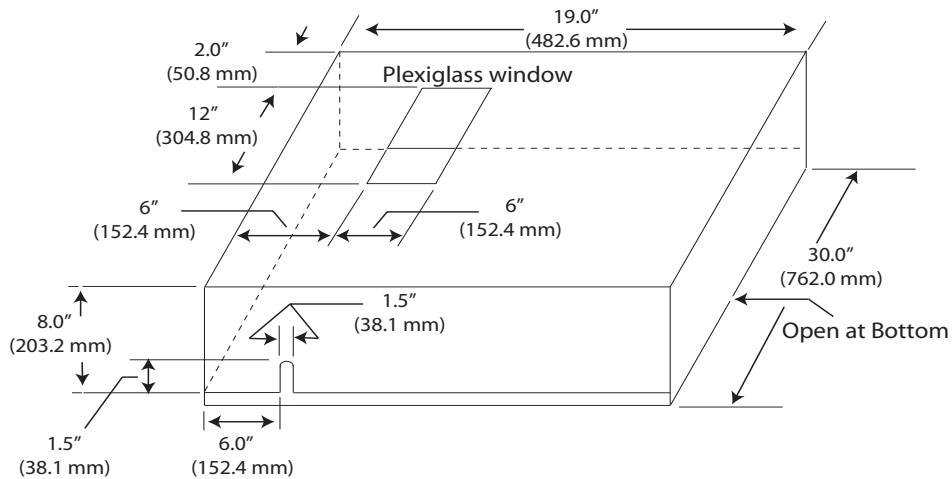


Figure 4: Sales Gas Monitor (SGM) Assembly

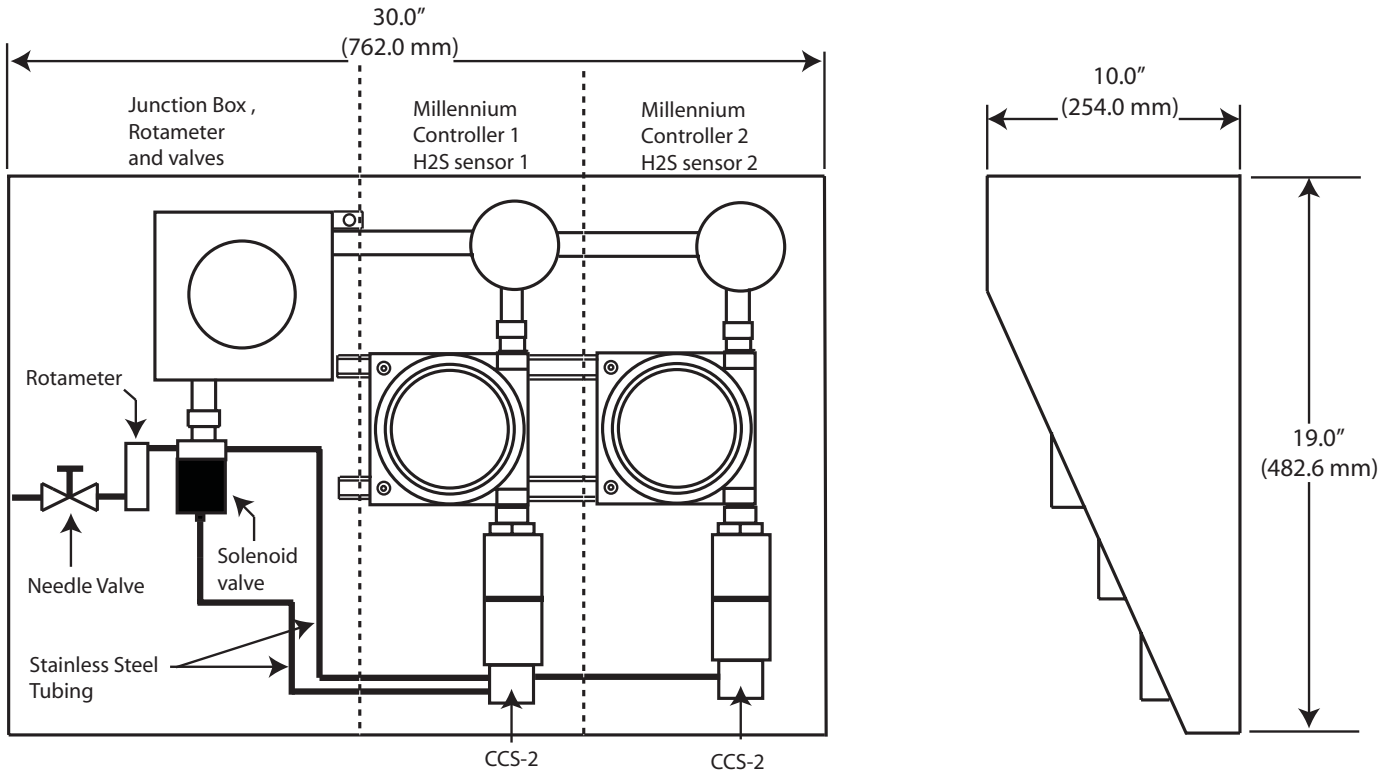
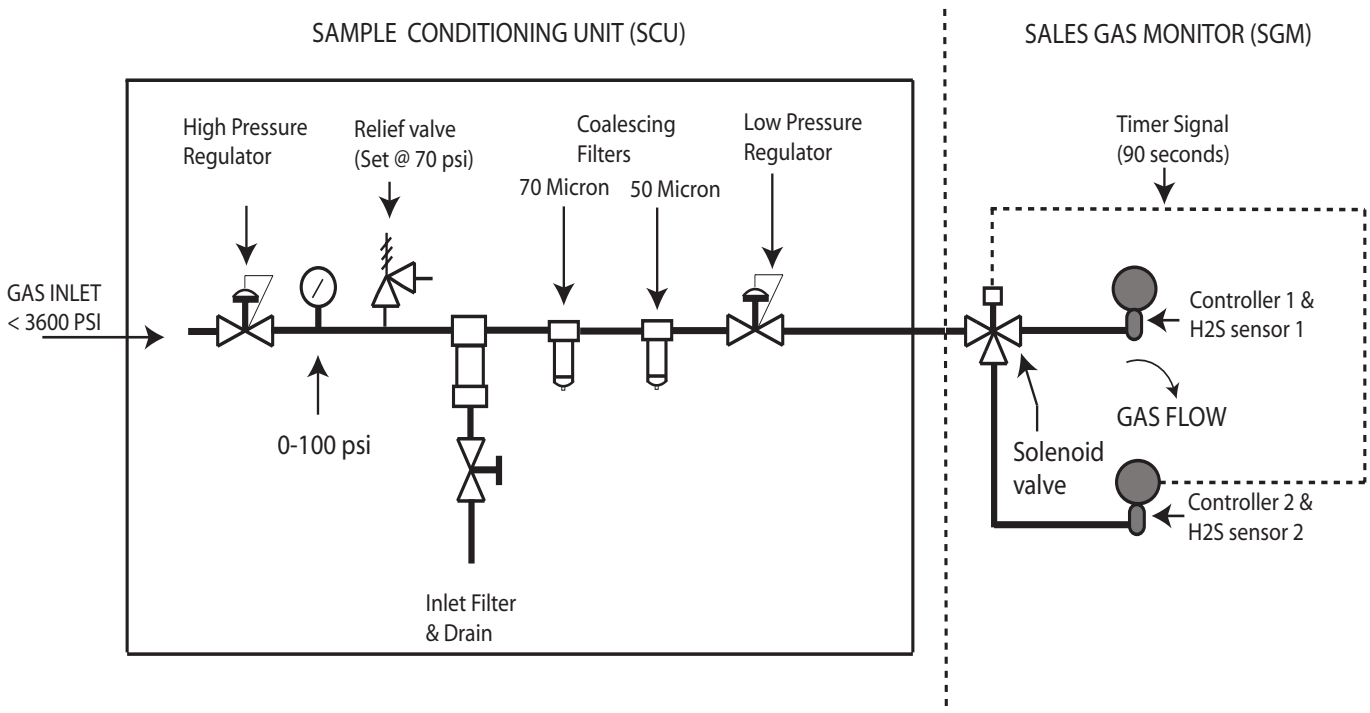


Figure 5: SGM Gas Conditioning & Flow Drawing



## Sales Gas Monitor (SGM) Components Specifications

SGM Assembly weight: 45 kg

SGM shroud and cover material: Steel

SCU Assembly weight: 10 kg

SCU mounting panel material: Steel

<b>Controller Specification</b>					
<b>MILLENNIUM</b>	<b>4-20 mA Analog Output</b>	<b>Low Power board 4-20 mA Analog and Relay Output(Solid State) display dimmed</b>	<b>4-20 mA with Relay Output module</b>	<b>Low Power Board 4-20 mA Analog Output(disabled) and Relay Output(Solid State) display dimmed</b>	<b>RS-485 MODBUS RTU Digital Communications</b>
<b>Operating temp range</b>	Operational -50°C to +85°C (-58F to + 185F) / Certified -40°C to +85°C (-40F to + 185F)				
<b>Power Consumption 12V dc @ 50% Span(half full scale)</b>		Max 90mA /1.08W		Max 48 mA /0.58W	
<b>Power Consumption 24V dc @ 50 % Span(half full scale)</b>	Nom. 100 mA/ 2.40W Max 110 mA /2.64W	Max 48mA / 1.15W	Nom. 115mA / 2.76W Max. 145mA / 3.48W	Max 32mA / 0.77W	Nom. 125mA / 3.01W Max. 155mA / 3.73W
<b>Humidity Range</b>	0 to 100% Relative humidity, non- condensing				
<b>Operating voltage range</b>	10.5 to 32V dc				
<b>Enclosure material</b>	Powder coated Copper Free Cast Aluminium				
<b>Certifications</b>	CSA and NRTL/C certified for hazardous locations. Class 1, Division 1, Groups B,C and D. Temperature Code T5. IEC Rating Ex dIIB +H2 T5(Class 1, Zone 2, Group IIB +H2T5). Maximum operating ambient of 85°C. Enclosure Type 4X. Note: Electronics only- CSA and NRTL/C certified for hazardous locations Class 1, Division 2 , Groups A,B,C and D.				
<b>Weight</b>	3.2 kg (7.0 lb)				
<b>Output</b>	4 to 20 mA - Into a maximum loop impedance of 800 Ohms at 32 V dc or 150 Ohms at 10.5 V dc. Isolated or non-isolated loop supply. - <b>Premium version</b> Form C contacts rated 5 Amps at 30 V dc / 250 V ac. Selectable energized / de-energized, latching/non-latching configurable low and high alarms. Fault relay is factory set as energized, non-latching and cannot be modified. - <b>Low Power Version</b> Form A contacts rated 2.5 Amps at 60 V ac/dc. Selectable energized / de-energized, latching/non-latching configurable low and high alarms. Fault relay is factory set as energized, non-latching and cannot be modified. - Digital RS 485 Modbus RTU Protocol				

### H2S Sensor Specifications

<b>H2S Sensor (ST1200)</b>	
<b>Operating Temperature Range</b>	-40°C to +50°C (-40F to +122F)
<b>Range of Detection</b>	0-10ppm/20 ppm/ 50 ppm/100 ppm
<b>Response Time</b>	<30 secs to T90
<b>Span Drift</b>	<2% of full scale/ month
<b>Linearity/ Repeatability</b>	3% of full scale/ 1% of full scale
<b>Enclosure Material</b>	Anodized / powder coated Aluminum (optional Stainless Steel)
<b>Weight : 0.5 Kg (1.0 lb)</b>	

**Note:** Sensor temperatures of -40°C or less may have slower response times and readings may show higher than expected.

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