



**GENERAL MONITORS**  
Protection for life.

# MODEL S4000CH

## Intelligent Sensor for Combustible Gas Detection



### Features

- Compatible with Automatic Remote Gas Calibrator
- Event logging
- HART and Modbus communication
- 4-20 mA output
- Warning, Alarm & Fault Relays
- Calibration, Calibration Check, Setup Modes
- Remaining sensor life indication

### Benefits

- Fully automatic calibration
- Stores fault, gas check, calibration, and alarm event history
- Provides complete status and control capability in the control room
- Industry standard output for remote alarm and fault indication
- Provides local alarm capability
- Simplifies operation and maintenance
- Reduces downtime by providing an estimate of remaining sensor life

### Description

The Model S4000CH Intelligent Sensor is a microprocessor-based transmitter designed for use with General Monitors' catalytic bead sensors. The unit features one person calibration and can virtually self-calibrate by simply activating a magnetic switch and applying gas. It is designed to monitor combustible gases and vapors within the lower explosive limit (LEL) and provide status indication and alarm outputs.

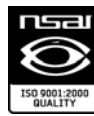
All of the Model S4000CH electronics are contained within an explosion-proof housing so that sensor information can be processed at the sensor site. The detector uses a 4-20 mA analog output signal that is proportional to 0 to 100% LEL gas concentration at the sensor. In addition, the Model S4000CH includes warning, alarm, and fault relay contacts that can be used to indicate an alarm or fault condition and dual redundant Modbus or HART communication. Configurations with relays, Modbus, and HART are available to meet many needs.

The Model S4000CH also includes a three-digit LED display. This local display continuously indicates gas concentrations during normal operation or in the Gas Check Mode, calibration prompts during Calibration Mode, display codes during the Setup Mode, and eight fault codes.

The Model S4000CH has four different operating modes. First, a normal operating mode in which alarms are active and the display and 4-20 mA readings are proportional to the gas concentration at the sensor. Second, a gas check mode that allows the user to apply a gas and check the sensor response while alarm outputs are inhibited. Third, a calibration mode in which gas is applied to the sensor to calibrate the unit. Finally, a setup mode which allows the user to review or change setup options such as relay settings, calibration level, and Modbus parameters.

Selecting Setup Mode on the Model S4000CH is accomplished by using the magnetic switch or HART or Modbus command. Options include:

- Calibration level
- Energized/de-energized relays
- Latching/non-latching relays
- Alarm set points for relays
- Baud rate, data format, and address for each Modbus channel



# MODEL S4000CH

## System Specifications

<b>Sensor Type:</b>	Continuous diffusion, low temperature catalytic bead
<b>Sensor Life:</b>	3 to 5 years
<b>Accuracy:</b>	±3% LEL up to 50% LEL ±5% LEL ≥ 51% LEL
<b>Zero Drift:</b>	Less than 5% of full scale per year
<b>Response Time:</b>	T <sub>50</sub> <10 s T <sub>90</sub> <30 s with 100% LEL methane applied
<b>Measuring Ranges:</b>	0-100% LEL
<b>Modes:</b>	Calibration, gas check, setup
<b>Electrical Classification:</b>	
CSA/FM	Class I, Division 1, Groups B, C & D; Class I, Zone 1, IIB+H <sub>2</sub> , T6, Type 4X (T <sub>amb</sub> = -40°C to +75°C)
ATEX	II 2 G EEx d IIB+H <sub>2</sub> T5, IP66 (T <sub>amb</sub> = -40°C to +70°C)
<b>Warranty:</b>	Two years
<b>Approvals:</b>	CSA, FM, ATEX, MED, DNV, CE, IECEx approved. Complies with ANSI/ISA 12.13.01-2000 and EN61779-1,-4, HART registered, SIL 2 / 3 suitable

## Environmental Specifications

<b>Operating Temperature Range:</b>	
Electronics	-40°F to 167°F (-40°C to 75°C)
Standard Sensor	-65°F to 200°F (-55°C to 93°C)
High Temp Sensor	-65°F to 400°F (-55°C to 200°C)
<b>Storage Temperature Range:</b>	-58°F to 185°F (-50°C to 85°C)
<b>Operating Humidity Range:</b>	5% to 100% RH, non-condensing

## Mechanical Specifications

<b>Length:</b>	6.4 inches (161 mm)
<b>Height:</b>	3.4 inches (86 mm)
<b>Width:</b>	4.1 inches (104 mm)
<b>Weight:</b>	5.5 lbs. (2.5 kg) - AL 14.0 lbs. (6.4kg) - SS
<b>Mounting Holes:</b>	5.0 inches (127 mm) (center to center)
<b>Housing:</b>	Marine aluminum or stainless steel

## Electrical Specifications

<b>Input Power:</b>	24 VDC nominal, 20 to 36 VDC 250 mA max.
<b>Relay Ratings:</b> <i>(Optional)</i>	8A @ 250 VAC / 8A @ 30 VDC res. max. (3x) SPDT - Warning, Alarm & Fault
<b>Analog Signal:</b>	0-20 mA (650 Ohms max. load) Malfunction 0 mA† Gas Check/Calibrate 1.5 mA‡ Setup mode 1.5 mA‡ Zero reading 4 mA ± .05 mA 0-100% LEL 4-20 mA Over-range 20-22 mA
<b>RFI/EMI Protection:</b>	Complies with EN50270, EN61000-6-4
<b>Status Indicators:</b>	Three-digit LED display with gas concentration, Warn and Alarm LED's, calibration prompts, fault codes, and setup options
<b>RS-485 Output:</b> <i>(Optional)</i>	Dual redundant Modbus RTU, suitable for linking up to 128 units or up to 247 units with repeaters
<b>Baud Rate:</b>	2400, 4800, 9600, or 19200 BPS
<b>HART:</b> <i>(Optional)</i>	HART 6, HART Device Description Language available. AMSAware
<b>Faults Monitored:</b>	Calibration error, sensor error, low DC supply, EEPROM, EPROM, setup error, gas check time exceeded, switch error, ARGC, internal error
<b>Cable Requirements:</b>	Three-wire shielded cable. Max. distance between S4000CH and power source @ 24 VDC nominal (20-Ohm loop): 14 AWG - 2303 ft (702 m)  Max. distance for analog output (650 Ohms max): 14 AWG - 9000 ft (2740 m)
<b>Wireless Communication:</b>	Available with ELPRO Technologies wireless transmitters
<b>Standard Configuration:</b>	<b>S4000CH-1-0-01-1</b> 4-20 mA, standard aluminum sensor, aluminum housing

*Specifications subject to change without notice.*

Represented by:

Publication #: DS-S4000CH-C0215e

## General Monitors Worldwide



[www.generalmonitors.com](http://www.generalmonitors.com)

### Lake Forest, CA

26776 Simpatica Circle  
Lake Forest, California 92630  
Tel: +1-949-581-4464  
Fax: +1-949-581-1151  
Email: [info@generalmonitors.com](mailto:info@generalmonitors.com)

### Houston, TX

9776 Whithorn Drive  
Houston, Texas 77095  
Tel: +1-281-855-6000  
Fax: +1-281-855-3290  
Email: [gmmhou@generalmonitors.com](mailto:gmmhou@generalmonitors.com)

### Ireland

Ballybrit Business Park  
Galway  
Republic of Ireland  
Tel: +353-91-751175  
Fax: +353-91-751317  
Email: [info@gmil.ie](mailto:info@gmil.ie)

### Singapore

No. 2 Kallang Pudding Road  
#09-16 Mactech Building  
Singapore 349307  
Tel: +65-6748-3488  
Fax: +65-6748-1911  
Email: [genmon@gmpacifica.com.sg](mailto:genmon@gmpacifica.com.sg)

### United Arab Emirates

P.O. Box 61209  
Jebel Ali  
Dubai  
United Arab Emirates  
Tel: +971-4-8143814  
Fax: +971-4-8857587  
Email: [gmmme@generalmonitors.ae](mailto:gmmme@generalmonitors.ae)

### United Kingdom

Heather Close  
Lyme Green Business Park  
Macclesfield, Cheshire  
United Kingdom, SK11 0LR  
Tel: +44-1625-619583  
Fax: +44-1625-619098  
Email: [info@generalmonitors.co.uk](mailto:info@generalmonitors.co.uk)

† Under HART, current values can be either 3.5 mA or 1.25 mA, depending on user selection.

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