



**GENERAL MONITORS**  
Protection for life.

# MODEL S4000TH

## Intelligent Sensor for H<sub>2</sub>S Gas Detection



### Features

- Event logging
- 4-20mA output
- HART and Modbus communication
- Detection Ranges (0-20 ppm, 0-50 ppm, 0-100 ppm)
- Warning, Alarm & Fault Relays
- Calibration, Calibration Check, Set-up Mode
- Remaining Sensor Life Indication
- Wireless capability

### Benefits

- Stores fault, gas check, calibration, and alarm event history
- Industry standard output for remote alarm and fault indication
- Provides complete status and control capability in the control room
- Wider range of applications
- Provides local alarm capability
- Simplifies operation and maintenance
- Reduces downtime by providing an estimate of remaining sensor life
- Compatible with ELPRO Technologies wireless devices

### Description

The Model S4000TH Intelligent Sensor is a microprocessor-based transmitter designed for use with General Monitors' Metal Oxide Semiconductor (MOS) sensor. This unit features one person calibration and can virtually self-calibrate by simply activating a magnetic switch and applying gas. It is designed to detect hydrogen sulfide in parts per million (ppm) levels and provide status indication and alarm outputs.

All of the S4000TH electronics are contained within an explosion-proof housing so that sensor information can be processed at the sensor site. It provides a 4-20 mA signal which is proportional to 0 to 100% of the detection range at the sensor. In addition, the S4000TH includes warning, alarm and fault relay contacts that can be used to indicate an alarm or fault condition, and dual redundant Modbus or HART communications. Configurations with relays, Modbus and HART are available to meet many needs.

The S4000TH includes a three (3) digit LED display. This local digital display continuously indicates gas concentrations during normal operation and in the calibration check mode, calibration prompts during calibration mode, display codes during the setup mode and eight fault codes.

The S4000TH has four different operating modes. First, the 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, the 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 set-up mode which allows the user to review or change setup options such as relay settings, sensor range, and Modbus parameters.

Selecting Setup Mode on the S4000TH is accomplished by using the magnetic switch, HART or Modbus command.

### Options

- Sensor Range (0-20 ppm, 0-50 ppm, 0-100 ppm)
- Energized/de-energized relays
- Latching/non-latching relays
- Alarm setpoints for relays
- Baud rate, data format, and address for each Modbus channel



Quality  
ISO 9001  
SAI GLOBAL

H<sub>2</sub>S

# MODEL S4000TH

## System Specifications

|                          |   |
|--------------------------|---|
| <b>Sensor Type:</b>      | Continuous diffusion, adsorption type Metal Oxide Semiconductor (MOS)   |
| <b>Sensor Life:</b>      | 3 to 5 years typical  |
| <b>Repeatability:</b>    | ±2 ppm or 10% of the applied gas, whichever is greater  |
| <b>Response Time:</b>    | T <sub>50</sub> < 14 seconds (screen)<br>T <sub>50</sub> < 30 seconds (sintered)<br>with full scale gas applied according to ISA 92.0.01      |
| <b>Measuring Ranges:</b> | 0-20 ppm, 0-50 ppm, 0-100 ppm   |
| <b>Modes:</b>            | Calibration, calibration check, setup   |
| <b>Classification:</b>   |   |
| <b>CSA/FM</b>            | Class I, Division 1, Groups B, C & D; Class I, Zone 1 IIB+H <sub>2</sub> , T6, Type 4X (Tamb = -40°C to +75°C)-CSA (Tamb = -40°C to +60°C)-FM |
| <b>ATEX/IECEX</b>        | Ex d IIB+H <sub>2</sub> , T5 Gb IP66 (Tamb = -40°C to +70°C)  |
| <b>Warranty:</b>         | Two years   |
| <b>Approvals:</b>        | ATEX, CSA, FM, IECEX, CE Mark, HART registered, SIL 2 and 3 suitable*, FM certified to IEC 61508  |

## Environmental Specifications

|                                     |                                |
|-------------------------------------|--------------------------------|
| <b>Operating Temperature Range:</b> |                                |
| <b>Electronics</b>                  | -40°F to 167°F (-40°C to 75°C) |
| <b>Storage Temperature Range:</b>   | -58°F to 185°F (-50°C to 85°C) |
| <b>Operating Humidity Range:</b>    | 10% to 95% RH, non-condensing  |

## Mechanical Specifications

|                        |   |
|------------------------|---|
| <b>Length:</b>         | 6.4 inches (161mm)  |
| <b>Height:</b>         | 3.4 inches (86mm)   |
| <b>Width:</b>          | 4.1 inches (104mm)  |
| <b>Weight:</b>         | 5.5 lbs. (2.5 kg)-AL<br>14.0 lbs. (6.4 kg)-SS                               |
| <b>Mounting Holes:</b> | 5.0 inches (127mm)<br>(center to center)                                    |
| <b>Housing:</b>        | Aluminum 6061-T6 alloy (cover), A356-T6 alloy (base) or 316 Stainless Steel |

## Electrical Specifications

|                                     |  |
|-------------------------------------|--|
| <b>Input Power:</b>                 | 24 VDC nominal, 20 to 36 VDC<br>350 mA max.  |
| <b>Relay Ratings:</b><br>(optional) | 8A @ 250 VAC / 8A @ 30 VDC<br>res. max.<br>(3x) SPDT - Warning, Alarm & Fault  |
| <b>Analog Signal:</b>               | 0-20 mA (650 Ohms max. load)<br>Malfunction 0 mA**<br>Gas Check / Cal 1.5 mA***<br>Setup mode 1.5 mA***<br>Zero reading 4 mA+0.2 mA<br>0-100% scale 4-20 mA<br>Over-range 20-22 mA   |
| <b>EMC Protection:</b>              | Complies with EN50270,<br>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><br>(optional) | 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><br>(optional)          | HART 6, HART Device<br>Description Language available.<br>AMSAware   |
| <b>Wireless Communication:</b>      | Available with ELPRO Technologies wireless devices   |
| <b>Faults Monitored:</b>            | Calibration error, sensor heater error, low DC supply, EEPROM, EPROM, setup error, gas check time exceeded, switch input error, internal errors  |
| <b>Cable Requirements:</b>          | 3 wire shielded cable. Max. distance between S4000TH and power source or remote sensor @ 24 VDC nominal (20 Ohm loop):<br>14 AWG - 2240 ft. (824 m)<br><br>Max. distance for analog output (600 Ohms max):<br>14 AWG - 8000 ft. (2400 m) |
| <b>Standard Configuration:</b>      | <b>S4000TH-1-0-01-1</b><br>(4-20 mA, P/N 50445-1, 0-100 ppm aluminum sensor, aluminum housing, push terminals)   |

Specifications subject to change without notice.

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\* Use in typical environments has a lower safety rating than in clean environments  
\*\* Under HART, current values can be either 3.5 mA or 1.25 mA, depending on user selection  
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