GENERAL MONITORS
Protection for life.

MODEL S4000TH

Intelligent Sensor for H_2S 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

MODEL S4000TH

System Specifications

Sensor Type: Continuous diffusion, adsorption type Metal Oxide Semiconductor (MOS)

Sensor Life: 3 to 5 years typical

Repeatability: ±2 ppm or 10% of the applied gas, whichever is greater

Response Time: T_{50} < 14 seconds (screen)
T_{50} < 30 seconds (sintered)
with full scale gas applied according to ISA 92.0.01

Measuring Ranges: 0-20 ppm, 0-50 ppm, 0-100 ppm

Modes: Calibration, calibration check, setup

Classification:

CSA/FM Class I, Division 1, Groups B, C & D; Class I, Zone 1 IIB+H_2, T6, Type 4X
(Tamb = -40°C to +75°C)-CSA
(Tamb = -40°C to +60°C)-FM

ATEX/IECEx Ex d IIB+H_2, T5 Gb IP66
(Tamb = -40°C to +70°C)

Warranty: Two years

Approvals: ATEX, CSA, FM, IECEx, CE Mark, HART registered, SIL 2 and 3 suitable*, FM certified to IEC 61508

Environmental Specifications

Operating Temperature Range:
Electronics -40°F to 167°F (-40°C to 75°C)

Storage Temperature Range: -58°F to 185°F (-50°C to 85°C)

Operating Humidity Range: 10% to 95% RH, non-condensing

Mechanical Specifications

Length: 6.4 inches (161mm)

Height: 3.4 inches (86mm)

Width: 4.1 inches (104mm)

Weight: 5.5 lbs. (2.5 kg)-AL
14.0 lbs. (6.4 kg)-SS

Mounting Holes: 5.0 inches (127mm) (center to center)

Housing: Aluminum 6061-T6 alloy (cover), A356-T6 alloy (base) or 316 Stainless Steel

Electrical Specifications

Input Power: 24 VDC nominal, 20 to 36 VDC
350 mA max.

Relay Ratings: (optional) 8A @ 250 VAC / 8A @ 30 VDC res. max.
(3x) SPDT - Warning, Alarm & Fault

Analog Signal: 0-20 mA (650 Ohms max. load)

Malfunction	0 mA**
Gas Check / Cal	1.5 mA***
Setup mode	1.5 mA***
Zero reading	4 mA+0.2 mA
0-100% scale	4-20 mA
Over-range	20-22 mA

EMC Protection: Complies with EN50270, EN61000-6-4

Status Indicators: Three-digit LED display with gas concentration, Warn and Alarm LED's, calibration prompts, fault codes, and setup options

RS-485 Output: *(optional)* Modbus RTU, suitable for linking up to 128 units or up to 247 units with repeaters

Baud Rate: 2400, 4800, 9600, or 19200 BPS

HART: *(optional)* HART 6, HART Device Description Language available. AMSAware

Wireless Communication: Available with ELPRO Technologies wireless devices

Faults Monitored: Calibration error, sensor heater error, low DC supply, EEPROM, EPROM, setup error, gas check time exceeded, switch input error, internal errors

Cable Requirements: 3 wire shielded cable. Max. distance between S4000TH and power source or remote sensor @ 24 VDC nominal (20 Ohm loop):
14 AWG - 2240 ft. (824 m)

Max. distance for analog output (600 Ohms max):
14 AWG - 8000 ft. (2400 m)

Standard Configuration: **S4000TH-1-0-01-1**
(4-20 mA, P/N 50445-1, 0-100 ppm aluminum sensor, aluminum housing, push terminals)

Specifications subject to change without notice.

Represented by:

* *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*
*** *Under HART, current value can be either 3.5 mA or 1.5 mA, depending on user selection*

General Monitors Worldwide

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

Houston, TX
9776 Whithorn Drive
Houston, Texas 77095
Tel: +1-281-855-6000
Fax: +1-281-855-3290
Email: gmhou@generalmonitors.com

Ireland
Ballybrit Business Park
Galway
Republic of Ireland
Tel: +353-91-751175
Fax: +353-91-751317
Email: 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

United Arab Emirates
P.O. Box 61209
Jebel Ali
Dubai
United Arab Emirates
Tel: +971-4-8143814
Fax: +971-4-8857587
email: gmme@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

Publication #: DS-S4000TH-E1212e