



SENSORTECH

An Amphenol Company



PS-SMART

PS-SMART Smart Gas Sensor Device

Datasheet

Easy Gas Detection Solution

The PS-SMART Smart Gas Sensor Device offers an intelligent approach to gas detection. Equipped with a 4-20mA two-wire and RS485 Modbus RTU output signal, it utilizes a reliable microprocessor, solid polymer electrochemical gas sensor technology, and advanced algorithm calculations. This makes the PS-SMART an ideal choice for industrial safety applications, combining temperature and humidity sensing in a single device.

The Smart Gas Sensor Device features a self-test function that evaluates sensor performance without the need for gas measurement, making it an excellent option for smart home and IoT applications. Data is transmitted through the output signal or RS485 transmission command, simplifying maintenance and replacement scheduling.

Each PS-SMART Sensor Device comes professionally calibrated and ready to use without any warm-up time. Calibration information is stored in the flash chip, and recalibration can be easily performed using the included software via the RS485 output or 4-20mA output signal.

The PS-SMART Gas Sensor Device's standard 4-20mA two-wire or RS485 Modbus RTU output signal allows for quick setup and connection to displays, DCS, PLC, and other systems.

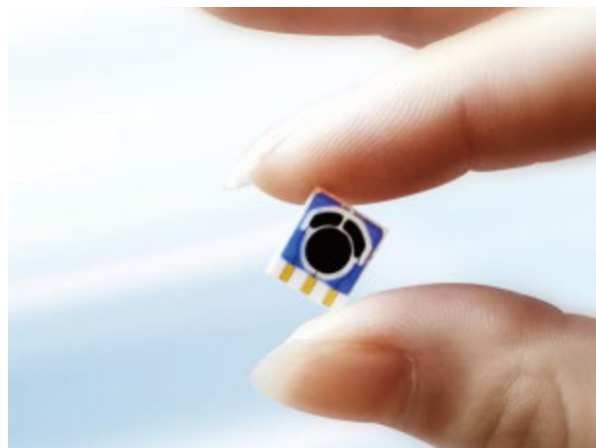


Quality, Safety, Responsibility

Working principle

The Sensor Device is a durable product. It converts the original small current signals of the gas sensors into a standard 4-20mA or RS485 Modbus-RTU output through a digital circuit.

The Sensor Device uses the Solid Polymer Electrochemical Sensing Technology. It employs a three-electrode arrangement- the working, the counter and the reference electrodes- in which concentration measurements can be performed continuously and the sensor operates at a fixed potential. The gas of interest (target gas) diffuses through a diffusion barrier, like a capillary, into the cell to the working electrode, where an electrochemical reaction takes place. Oxidation and reduction reactions are happening simultaneously. The current flowing through the cell is direct proportional to the concentration of the target gas. A reference electrode keeps the potential constant together with a potentiostat.



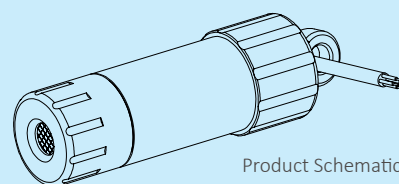
Features

- 4-20mA standard two-wire and RS485 Modbus-RTU output, 24V DC. power supply
- Detects single gas + temperature and humidity at the same time
- With calibration, sensor performance and life-testing output
- Fast signal stability time at power on
- Suitable for indoor and outdoor environments, sensor can work in -40°C to +55°C
- Response time is fast and has a stable zero point without drift, anti-electromagnetic interference ability
- Long lifetime, anti-poisoning
- Integrated safety protection enables use in potentially explosive environments
- Electronic circuit boards have a dust and corrosion resistant coating
- Small size
- RoHS approved

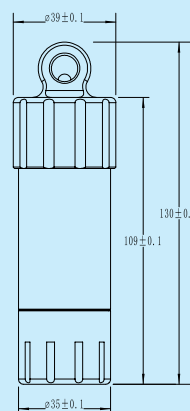
Key applications

- Industrial Gas Safety Monitoring
- Industrial Process Gas Monitoring
- Air Exchange System and Air Purifier
- Food Storage Insecticides Monitoring
- Wastewater Treatment, Garbage Disposal, Biogas Safety Monitoring
- Medical & Health Care
- Semiconductor Gas Purification Monitoring
- Transformer Failure and Power Chamber Environment Monitoring
- Warehouse Logistics Environment Monitoring

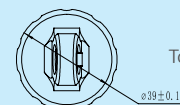
PS-SMART Gas Sensor Device Mechanical Drawing



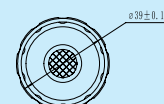
Product Schematic



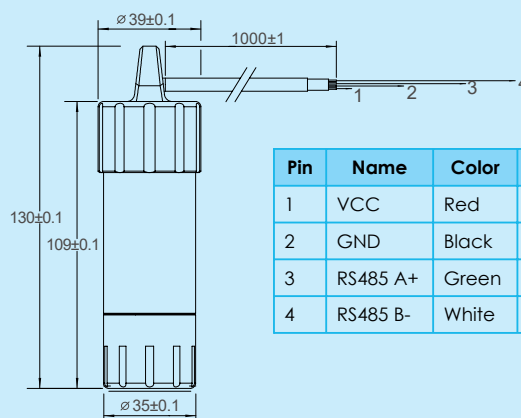
Front View



Top view



Bottom View



Side View

Pin	Name	Color	Description
1	VCC	Red	Power Supply
2	GND	Black	Power Supply
3	RS485 A+	Green	RS485 A+
4	RS485 B-	White	RS485 B-

Technical Specifications

Temperature & Relative Humidity Sensor Specification

Parameter	Range	Resolution	Accuracy	Repeatability	Response Time	Long-Term Drift
Temperature	-40°C to 85°C	0.01°C	± 0.2°C	0.1°C	< 5s to 30s @ t63%	< 0.02°C /year
Humidity	0-100% RH	0.01% RH	± 2% RH	0.1% RH	8s @ t63%	< 0.25% RH/year

Gas Sensor Specifications

Detection Gas	Please choose from "Order Information" (Page 4)
Range	Please choose from "Order Information" (Page 4)
Resolution	Please see the "Order Information" (Page 4)
Response Time	Please see the "Order Information" (Page 4)
Principle	Solid Polymer Electrochemical Sensing Technology
Accuracy	± 5% (Measurement value)
Repeatability	< 2%
Linearity	Linear
Long-Term Drift	< 5% / year
Expected Lifetime	> 3 years

Electrical Specifications

Optional Output Signal	4-20mA two-wires (Only gas sensor output, without temperature and humidity) Or RS485 Modbus-RTU (Gas with temperature and humidity sensor signal output)
Fault Output	3.5mA Fault Signal: Sensor signal weak 3mA Fault Signal: Sensor failure or sensor disconnected RS485 Modbus-RTU output with sensor life and performance detection and early sensor failure warning
Supply Voltage	12 to 24V DC
Supply Current	3 to 22 mA
Power Consumption	< 0.6W
Maximum Loop Resistance	< 500R @ 24V DC

Environment Specifications

Operating Temperature	Sensor can work from -40°C to +55°C
Operating Humidity	15-95% RH. Non-condensing
Operating Pressure	Atmospheric pressure ± 10%
Storage Temperature	0 to 20°C

Mechanical Specifications

Size	39 x 130 mm
Weight	135 g
Power Cable length	1 m
Warranty	12 months
Package Size	185 x 150 x 108 mm

DISCLAIMER:

SGX Europe Sp. z o.o. reserves the right to change design features and specifications without prior notification. We do not accept any legal responsibility for customer applications of our sensors. SGX Europe Sp. z o.o. accepts no liability for any consequential losses, injury or damage resulting from the use of this document, the information contained within or from any omissions or errors herein. This document does not constitute an offer for sale and the data contained is for guidance only and may not be taken as warranty. Any use of the given data must be assessed and determined by the user thereof to be in accordance with federal, state and local laws and regulations. All specifications outlined are subject to change without notice.

SGX Europe Sp. z o.o. sensors are designed to operate in a wide range of harsh environments and conditions. However, it is important that exposure to high concentrations of solvent vapours is to be avoided, both during storage, fitting into instruments and operation. When using sensors on printed circuit boards (PCBs), degreasing agents should be used prior to the sensor being fitted. SGX Europe Sp. z o.o. makes every effort to ensure the reliability of its products. Where life safety is a performance requirement of the product, we recommend that all sensors and instruments using these sensors are checked for response to gas before use.

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Order Information

Product	Gas Formula	Partnumber	Range	Resolution	Response Time
Carbon Monoxide Sensor Device	CO	PS-SMART-CO-10	0 - 10 ppm	0.001 ppm	< 3s (T90 < 80s)
		PS-SMART-CO-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-CO-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-CO-2%	0 - 2% vol	0.001% vol	< 3s (T90 < 30s)
Organic Volatiles Sensor Device	VOC	PS-SMART-VOC-10	0 - 10 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-VOC-200	0 - 200 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-VOC-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-VOC-2000	0 - 2000 ppm	0.1 ppm	< 3s (T90 < 30s)
Hydrogen Fluoride Sensor Device	HF	PS-SMART-HF-10	0 - 10 ppm	0.001 ppm	T90 < 60s
Sulfur Hydrogen Sensor Device	H2S	PS-SMART-H2S-5	0 - 5 ppm	0.001 ppm	< 3s (T90 < 30s)
		PS-SMART-H2S-10	0 - 10 ppm	0.001 ppm	< 3s (T90 < 30s)
		PS-SMART-H2S-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-H2S-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-H2S-5000	0 - 5000 ppm	0.1 ppm	< 3s (T90 < 30s)
SMELL Sensor Device	SMELL	PS-SMART-SMELL-5	0 - 5 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-SMELL-200	0 - 200 ppm	1 ppm	< 3s (T90 < 30s)
Nitrogen Dioxide Sensor Device	NO2	PS-SMART-NO2-5	0 - 5 ppm	0.001 ppm	< 3s (T90 < 80s)
		PS-SMART-NO2-50	0 - 50 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-NO2-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-NO2-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-NO2-2000	0 - 2000 ppm	0.1 ppm	< 3s (T90 < 30s)
Sulfur Dioxide Sensor Device	SO2	PS-SMART-SO2-5	0 - 5 ppm	0.001 ppm	< 3s (T90 < 30s)
		PS-SMART-SO2-50	0 - 50 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-SO2-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-SO2-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-SO2-2000	0 - 2000 ppm	0.1 ppm	< 3s (T90 < 30s)
Chlorine Sensor Device	CL2	PS-SMART-CL2-5	0 - 5 ppm	0.001 ppm	T90 < 60s
		PS-SMART-CL2-50	0 - 50 ppm	0.01 ppm	T90 < 60s
		PS-SMART-CL2-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 30s)
Ethylene Oxide Sensor Device	ETO (C2H4O)	PS-SMART-ETO-10	0 - 10 ppm	0.001 ppm	< 3s (T90 < 30s)
		PS-SMART-ETO-200	0 - 200 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-ETO-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
Phosphine Sensor Device	PH3	PS-SMART-PH3-5	0 - 5 ppm	0.001 ppm	< 3s (T90 < 80s)
		PS-SMART-PH3-20	0 - 20 ppm	0.01 ppm	< 3s (T90 < 80s)
		PS-SMART-PH3-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 80s)
		PS-SMART-PH3-2000	0 - 2000 ppm	0.1 ppm	< 3s (T90 < 80s)
Formaldehyde Sensor Device	HCHO	PS-SMART-HCHO-5	0 - 5 ppm	0.001 ppm	< 3s (T90 < 80s)
		PS-SMART-HCHO-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 60s)

Order Information

Product	Gas Formula	Partnumber	Range	Resolution	Response Time
Bromine Sensor Device	Br2	PS-SMART-Br2-1	0 - 1 ppm	0.001 ppm	T90 < 60s
Chlorine Dioxide Sensor Device	CLO2	PS-SMART-CLO2-5	0 - 5 ppm	0.001 ppm	T90 < 60s
Fluorine Sensor Device	F2	PS-SMART-F2-5	0 - 5 ppm	0.001 ppm	T90 < 60s
Hydrogen Sensor Device	H2	PS-SMART-H2-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-H2-5000	0 - 5000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-H2-5%	0 - 5%	0.001 %	< 35 s (T90 < 90s)
Hydrogen Chloride Sensor Device	HCL	PS-SMART-HCL-30	0 - 30 ppm	0.001 ppm	T90 < 60s
Ammonia (Long lifetime) Sensor Device	NH3	PS-SMART-NH3-10-EL	0 - 10 ppm	0.001 ppm	< 3s, no T90
		PS-SMART-NH3-100-EL	0 - 100ppm	0.01 ppm	< 3s, no T90
Ammonia (Fast response) Sensor Device	NH3	PS-SMART-NH3-100	0 - 100ppm	0.01 ppm	T90 < 60s
		PS-SMART-NH3-500	0 - 500ppm	0.1 ppm	T90 < 60s
		PS-SMART-NH3-1000	0 - 1000ppm	0.1 ppm	T90 < 60s
Oxygen Sensor Device	O2	PS-SMART-O2-25%	0 - 25% vol.	0.01% vol.	< 3s (T90 < 30s)
Ozone Sensor Device	O3	PS-SMART-O3-5	0 - 5 ppm	0.001 ppm	< 3s (T90 < 80s)
		PS-SMART-O3-50	0 - 50 ppm	0.01 ppm	< 3s (T90 < 30s)
		PS-SMART-O3-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 30s)
Odor Sensor Device	SMELL	PS-SMART-SMELL-5	0 - 5 ppm	0.001 ppm	< 3s (T90 < 30s)
		PS-SMART-SMELL-10	0 - 10 ppm	0.001 ppm	< 3s (T90 < 30s)
		PS-SMART-SMELL-200	0 - 200 ppm	0.1 ppm	< 3s (T90 < 30s)
		PS-SMART-SMELL-500	0 - 500 ppm	0.1 ppm	< 3s (T90 < 30s)
Methyl Mercaptan Sensor Device	CH4S	PS-SMART-CH4S-10	0 - 10 ppm	0.001 ppm	< 3s (T90 < 80s)
		PS-SMART-CH4S-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 80s)
		PS-SMART-CH4S-5000	0 - 5000 ppm	0.1 ppm	< 3s (T90 < 80s)
Ethylene Sensor Device	C2H4	PS-SMART-C2H4-10	0 - 10 ppm	0.01 ppm	< 3s (T90 < 80s)
		PS-SMART-C2H4-200	0 - 200 ppm	0.1 ppm	< 3s (T90 < 80s)
Hydrogen Cyanide Sensor Device	HCN	PS-SMART-HCN-50	0 - 50 ppm	0.01 ppm	< 3s (T90 < 30s)
Arsenide Sensor Device	AsH3	PS-SMART-AsH3-1	0 - 1 ppm	0.001 ppm	< 3s (T90 < 80s)
Silane Sensor Device	SiH4	PS-SMART-SiH4-10	0 - 10 ppm	0.001 ppm	< 3s (T90 < 80s)
Borane Sensor Device	B2H6	PS-SMART-B2H6-1	0 - 1 ppm	0.001 ppm	< 3s (T90 < 80s)
Germane Sensor Device	GeH4	PS-SMART-GeH4-5	0 - 5 ppm	0.01 ppm	< 3s (T90 < 80s)