



SGX

SENORTECH

An Amphenol Company



Digital Gas Sensor

Datasheet

PSD4-XX

Introduction

The PSD4 Sensor is a Digital Gas Sensor, using our printed solid polymer electrochemical sensing technology. With an on-board powerful microprocessor, high-precision ADC and intelligent algorithm incorporated in the compact design, it offers a UART digital output signal, so can be easily integrated into Gas Detection Equipment, IoT applications and other sensing systems.

We also offer an Evaluation Kit for individual PSD4 sensors, this for easy sensor testing. The Sensor data is acquired through the test software with UART to USB data transmission.

Features

- Digital UART communication
- Factory calibrated – ready to use
- Low power use, 3.3–12V DC (5V recommended)
- Operating temp: -40°C to +55°C
- Long-term zero stability
- Fast response to gas changes
- Excellent linearity
- RoHS compliant
- Anti-poisoning, long lifespan
- Solid polymer tech – no leakage risk

Key Applications

- Leakage
- Fire Safety
- Industrial Safety
- Process Monitoring
- Emission Monitoring
- Water Treatment Plants
- Agriculture
- Biogas

Technology Specifications

Gas Sensors Specifications	
Principle	Solid Polymer Electrochemical Sensing Technology
Accuracy	± 5% F.S
Repeatability	< 2%
Linearity	Linear
Warm-Up Time	< 60 s

Electrical Specifications	
Output Signal	UART 3.3V half-duplex Baud rate: 9600, Data bit: 8 bits ,Stop bit: 1 bit
Supply Voltage	3.3 to 12V DC, Recommended 5V DC
Supply Current	0.65 mA @ 5V DC
Peak Current	1 mA @ 5V DC
Sleep Mode Current	0.35 mA @ 5V DC
Power Consumption	≤ 5 mW @ 5V DC

Note: The above current reference data may have slight differences due to the varying stabilization times of different sensors upon initial power-up. Please refer to actual measurement data.

Lifetime	
Long-Term Drift	< 1 %/month
Expected Lifetime	> 3 years
Warranty	12 months from the date of shipment

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

Housing Specifications	
Housing Material	ABS
Weight	4.56g



Packaging: Individual or in trays.

Product Selection Table

Product	Gas	Partnumber	Range	Resolution	Response Time
Arsine Digital Sensor	AsH ₃	PSD4-AsH3-1	0 - 1 ppm	0.001 ppm	< 3 s (T90 < 80s)
Diborane Digital Sensor	B ₂ H ₆	PSD4-B2H6-1	0 - 1 ppm	0.001 ppm	< 3 s (T90 < 80s)
Methyl Mercaptan Digital Sensor	CH ₄ S	PSD4-CH4S-10	0 - 10 ppm	0.001 ppm	< 3 s (T90 < 80s)
		PSD4-CH4S-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 80s)
		PSD4-CH4S-5000	0 - 5000 ppm	0.1 ppm	< 3 s (T90 < 80s)
Chlorine Digital Sensor	CL ₂	PSD4-CL2-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 30s)
Monoxide Digital Sensor	CO	PSD4-CO-10	0 - 10 ppm	0.001 ppm	< 3 s (T90 < 80s)
		PSD4-CO-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 30s)
		PSD4-CO-1000	0 - 1000 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-CO-20k	0 - 2% vol.	0.001 % vol.	< 3 s (T90 < 30s)
Ethylene Oxide Digital Sensor	ETO (C ₂ H ₄ O)	PSD4-ETO-10	0 - 10 ppm	0.001 ppm	< 3 s (T90 < 30s)
		PSD4-ETO-200	0 - 200 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-ETO-1000	0 - 1000 ppm	0.1 ppm	< 3 s (T90 < 30s)
Germane Digital Sensor	GeH ₄	PSD4-GEH4-5	0 - 5 ppm	0.001 ppm	< 3 s (T90 < 80s)
Hydrogen Digital Sensor	H ₂	PSD4-H2-1000	0 - 1000 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-H2-5000	0 - 5000 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-H2-5%	0 - 5% vol.	0.001% vol.	< 35 s (T90 < 90s)
Hydrogen Sulfide Digital Sensor	H ₂ S	PSD4-H ₂ S-10	0 - 10 ppm	0.001 ppm	< 3s (T90 < 30s)
		PSD4-H ₂ S-100	0 - 100 ppm	0.01 ppm	< 3s (T90 < 30s)
		PSD4-H ₂ S-1000	0 - 1000 ppm	0.1 ppm	< 3s (T90 < 30s)
		PSD4-H ₂ S-5000	0 - 5000 ppm	0.1 ppm	< 3s (T90 < 30s)
Formaldehyde Digital Sensor	HCHO	PSD4-HCHO-5	0 - 5 ppm	0.001 ppm	< 3 s (T90 < 80s)
		PSD4-HCHO-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 60s)
Hydrogen Cyanide Digital Sensor	HCN	PSD4-HCN-50	0 - 50 ppm	0.01 ppm	< 3 s (T90 < 30s)
Ammonia Digital Sensor	NH ₃	PSD4-NH3-10	0 - 10 ppm	0.001 ppm	< 3 s
		PSD4-NH3-100	0 - 100 ppm	0.01 ppm	< 3 s
Nitrogen Dioxide Digital Sensor	NO ₂	PSD4-NO2-50	0 - 50 ppm	0.01 ppm	< 3 s (T90 < 30s)
		PSD4-NO2-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 30s)
		PSD4-NO2-1000	0 - 1000 ppm	0.01 ppm	< 3 s (T90 < 30s)
		PSD4-NO2-2000	0 - 2000 ppm	0.01 ppm	< 3 s (T90 < 30s)
Oxygen Digital Sensor	O ₂	PSD4-O2	0 - 25% vol.	0.01% vol.	< 3 s (T90 < 30s)
Ozone Digital Sensor	O ₃	PSD4-O3-5	0 - 5 ppm	0.001 ppm	< 3 s (T90 < 80s)
		PSD4-O3-50	0 - 50 ppm	0.01 ppm	< 3 s (T90 < 30s)
		PSD4-O3-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 30s)
Phosphine Digital Sensor	PH ₃	PSD4-PH3-5	0 - 5 ppm	0.001 ppm	< 3 s (T90 < 80s)
		PSD4-PH3-20	0 - 20 ppm	0.01 ppm	< 3 s (T90 < 80s)
		PSD4-PH3-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 80s)
		PSD4-PH3-2000	0 - 2000 ppm	0.1 ppm	< 3 s (T90 < 80s)
Silane Digital Sensor	SiH ₄	PSD4-SiH4-10	0 - 10 ppm	0.001 ppm	< 3 s (T90 < 80s)
Odor Digital Sensor	SMELL	PSD4-SMELL-5	0 - 5 ppm	0.001 ppm	< 3 s (T90 < 30s)
		PSD4-SMELL-10	0 - 10 ppm	0.001 ppm	< 3 s (T90 < 30s)
		PSD4-SMELL-200	0 - 200 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-SMELL-500	0 - 500 ppm	0.1 ppm	< 3 s (T90 < 30s)
Sulfur Dioxide Digital Sensor	SO ₂	PSD4-SO2-50	0 - 50 ppm	0.01 ppm	< 3 s (T90 < 30s)
		PSD4-SO2-100	0 - 100 ppm	0.01 ppm	< 3 s (T90 < 30s)
		PSD4-SO2-1000	0 - 1000 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-SO2-2000	0 - 2000 ppm	0.1 ppm	< 3 s (T90 < 30s)
Volatile Organic Compounds Digital Sensor	VOC	PSD4-VOC-10	0 - 10 ppm	0.001 ppm	< 3 s (T90 < 30s)
		PSD4-VOC-200	0 - 200 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-VOC-1000	0 - 1000 ppm	0.1 ppm	< 3 s (T90 < 30s)
		PSD4-VOC-2000	0 - 2000 ppm	0.1 ppm	< 3 s (T90 < 30s)
Evaluation kit	---	PSD4_Eval	---	---	---

PSD4

Digital Gas Sensor



Standard 4-series housing

Standard industrial 4-series dimensions, with a 20 * 16.6 mm cylindrical housing, allowing easy integration into new product designs. Standard three-electrode pin dimensions (VCC_power positive, GND_power negative, IO_data transmission/reception.)



Usage without preheating

The intelligent hardware design enables gas sensors to remain operational even without power supply, ensuring immediate gas detection upon powering up- anytime and anywhere. In IoT or battery application fields, energy-saving and low-power designs allow users to avoid lengthy preheating and slow data acquisition.



Certification

IntrinsicsafetyCertificatedEX ia IIC T6 Ga -40°C to +55°C,
Power Ui: DC 6V, Ii: 100 mA, Ci: 0.1 µF, Li: 0 mH, Pi: 0.6 W
Communication Ui: DC 6V, Ii: 100 mA, Ci: 0 µF, Li: 0 mH, Pi: 0.6 W
RoHs Compliant



Simple and easy-to-use UART digital output

The DS4 sensor utilizes UART 3.3V half-duplex single bus mode for output signals. The gas concentration values can be output without complex communication protocols, making secondary development application design simple, flexible and fast.



High accuracy pre-calibration

Each PSD4 digital gas sensor undergoes gas calibration at the factory, with calibration information stored in the microprocessor. Users can directly utilize the sensors without additional calibration. The factory calibration employs a diffusion gas calibration which simulates ambient conditions to closely resemble real application environments, thereby enhancing data accuracy. (For gas detection instruments utilizing pump-suction measurement methods, secondary calibration is needed based on the design parameters of the instrument.)



Easy service

Plug-and-play and hot-swappable design. Open calibration protocols allow for secondary offline calibration for customer service as well as factory reset calibration at the touch of a button. The plug-and-play function enables offline calibration, eliminating the need to introduce hazardous gases into the detection environment for instrument calibration. These features avoid safety risks and environmental contamination, providing a safer, simpler and more convenient maintenance.



Low-power sleep mode functionality

The sensor has a sleep function. Users can customize sleep and wake-up modes, suitable for low-power battery or IoT applications.



Self-recognition functionality

The PSD4 sensor outputs identity information such as gas type and detection range, which facilitates the design of self-recognition functionality, providing a more flexible usage.



User-customized encryption code functionality

Users can customize their own user codes to individually identify the device. When other types of sensors are inserted, the instrument can automatically verify whether the user code is correct. If an incorrect user code is detected, the instrument can display an error prompt, reminding the user to insert the correct sensor.

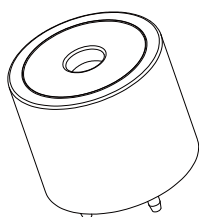
Solid Polymer Electrochemical Sensing Technology

The PSD4 Digital Gas Sensor uses our Solid Polymer Electrochemical Sensing Technology. It works with a three-electrode arrangement- the Working, the Counter and the Reference electrode- in which concentration measurements can be performed continuously and the sensor operates at a fixed potential. The target gas diffuses through a diffusion barrier, 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. The Reference electrode keeps, with a potentiostat, a constant potential.

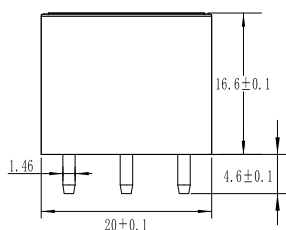
Dimensions

Unit: mm

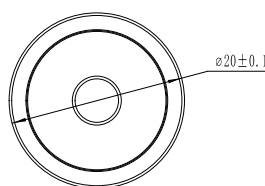
Product Schematic



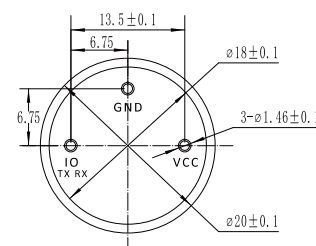
Side View



Top



Bottom



Pin Description

Pin	Description	Min Value	Typical Value	Max Value
VCC	Positive Power Supply	3.3 V	5 V	12 V
IO	Data Transceiver	-0.3 V	3.3 V	3.3 V
GND	Ground	-0.3 V	0	-

DISCLAIMER:

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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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