

EC Odor Finder

Detection of Organic and Inorganic Odors
Electro-chemical Gas Sensing Device on Modbus

EC Odor Finder is an industrial-grade, PPB level gas sensing device. It houses an electro-chemical gas sensor made of solid polymer with technology from EC Sense, Germany.

The **SMELL** sensor adopted inside EC Odor Finder is designed to represent olfactory sensation of human nose. It responds to multiple city odors such as hydrogen sulfide (H₂S), ammonia (NH₃), and various hydrocarbons (VOCs), alkanes and ketones.



Tested response levels of SMELL sensor to various gases:

» Cross Sensitivity

Gas	Formula	Concentration (ppm)	Response(ppm)
Ammonia	NH ₃	100	0.4
Hydrogen sulfide	H ₂ S	5	5
Trimethylamine	C ₃ H ₉ N	Liquid solvent	Responded well
Dimethylamine	C ₂ H ₇ N	Liquid solvent	Responded well
Methyl mercaptan	CH ₃ SH	Liquid solvent	Responded well
Methyl sulfide	C ₂ H ₆ S	Liquid solvent	Responded well
Dimethyl disulfide	C ₂ H ₆ S ₂	Liquid solvent	Responded well
Styrene	C ₈ H ₈	Liquid solvent	Responded well
Carbon disulfide	CS ₂	Liquid solvent	Responded well
Ozone	O ₃	10	0
Sulfur dioxide	SO ₂	10	1.35
Nitrogen oxides	NO _x	/	No Respond

Note: 1) The above interference factors may vary due to different sensors and service life. Please refer to the actual test results.
2) This table is not complete for all gases, and the sensor may be sensitive to other gases.

SMELL Sensor (0-10 ppm) Specifications

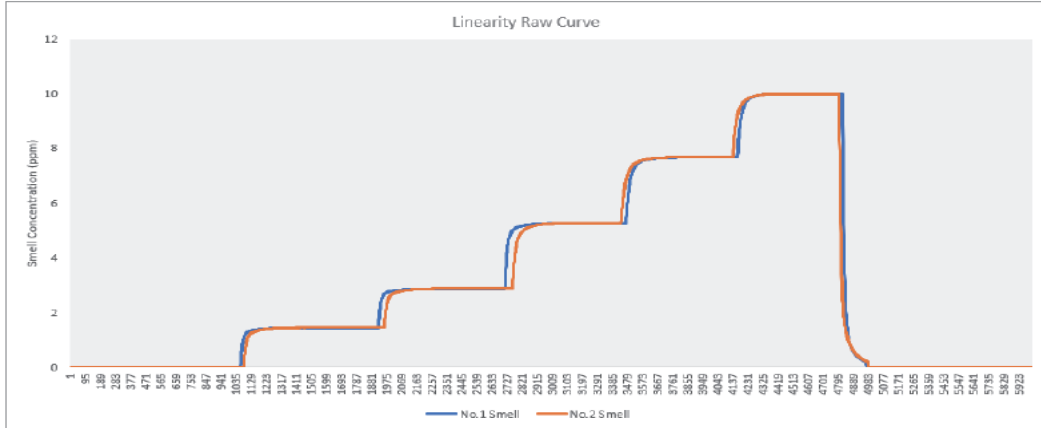
» Specification

Principle	Solid Polymer Electrochemical Sensing Technology	
Detection of gas	SMELL Odor, sulfide gas, volatile organic gas, some toxic gases	
Detection Range	0-10 ppm; Resolution: 0.001 ppm	
Lowest Detection Limit	0.1 ppm	
Full-scale accuracy error	± 5% F.S	
Repeatability	<2%	
Settling time	The first power-on under storage in clean air <120 seconds	
	The first power-up under storage in non-clean air <240 seconds (except in the presence of high concentrations of polluted gas)	
Response time	T90: <20 seconds	
Zero return time	<80 seconds	
	Note: The module is separated from the measured gas environment, in clean air, the displayed value returns to 0.03ppm or less	
Calibration Gas	10ppm measurement range: 5ppm hydrogen sulfide gas calibration;	
	Note: The smaller the measuring range, the higher the detection accuracy. It is not recommended for users to use it over the measuring range.	
Sensor expected life time	>3 years	
	Note: Temperature (0-25) °C, Humidity (30-70)% RH, the measured gas concentration is within the range, and there is no gas environment that affects the warm-up time mentioned above	
Output	The standard output is: 3.3V UART digital signal (see below for communication protocol) ; Optional custom Modbus protocol	
	Interface definition: VCC- Red, GND- Black, RX- Yellow, TX- Green; Baud rate: 9600 Data bits: 8 bits Stop bits: 1 bit	
Get data command	The communication is divided into active uploading and Q & A. The default is Q & A mode after power-on. You can use instructions to switch between the two modes.	
	Return to Q & A mode after power off or switch power mode See next page for details	
Working Voltage	3.3-5.5V DC	
Working Current	< 5mA	
Power Consumption	25mW @ 5V DC	
Working temperature	(-40 - 55) °C	
Optimal working temperature	(20 - 35) °C	
Working humidity	(15-95) % RH. (Non-condensing)	
Optimum working humidity	50% RH.	
Working pressure	Atm ± 10%	
Circuit board size	40X30X5.6 (mm)	
Module size	With ES1 sensor: 40X30X12 (mm); With ES4 sensor: 40X30X22.45 (mm)	
Weight	TB200B-ES1-SMELL-10-01 < 15g; TB200B-ES4-SMELL-10-01 < 25g	
Temperature and humidity sensor Data	Temperature Range: (-40 - 85) °C Relative error: ± 0.2 °C	
	Humidity measurement range: (10 - 95)% RH. non-condensing	Relative error: ± 2%

SMELL Sensor Tests

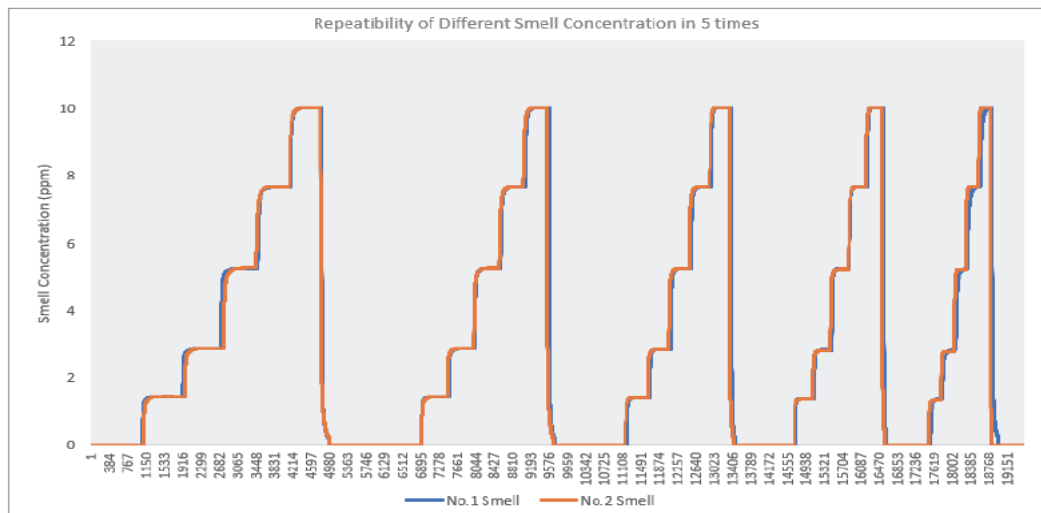
» Linearity

Temperature environment: 26 °C; Humidity environment: 55%; Air chamber space: 0.03m³; Ventilation flow of air distribution system: 3000sccm



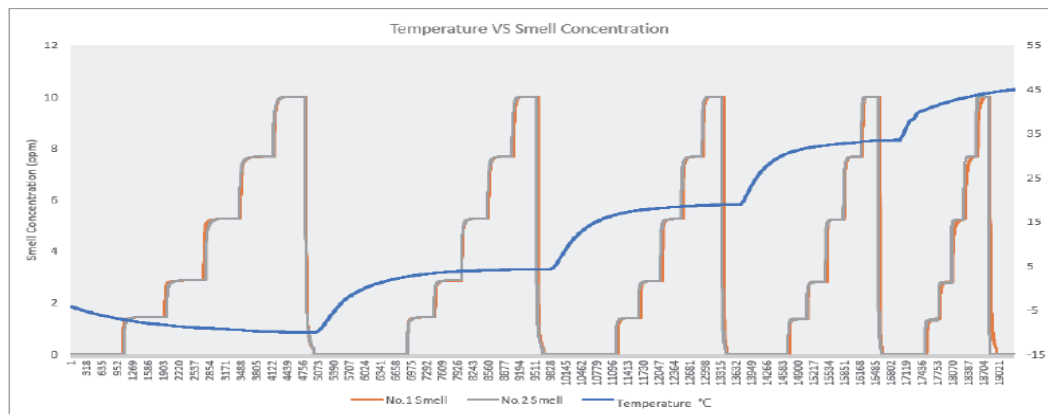
» Repeatability

Temperature environment: 26 °C; Humidity environment: 55%; Air chamber space: 0.03m³; Ventilation flow of air distribution system: 3000sccm



» Temperature

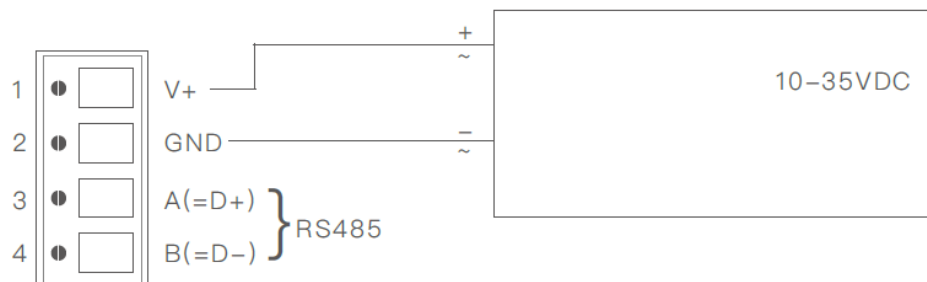
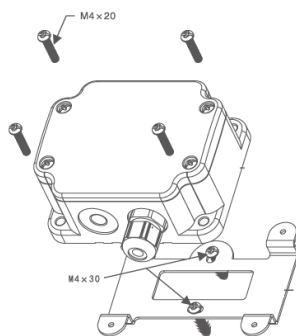
Temperature environment: -15, -5, 5, 15, 25, 35, 45, 55°C; air chamber space: 0.03m³; ventilation flow of gas distribution system: 3000sccm



EC Odor Finder Specifications

Temperature Sensor
Range: -40°C ~ +80°C / Resolution @20°C: ±0.2°C
Humidity Sensor
Range: 0~100% RH non-condensing / Resolution @20°C: ±2%RH
Power Supply: 10V~35V DC, < 30mA
Data Communication: RS485 (terminal wiring size 1.5 mm ²)
Casing: Polycarbonate, UL94 Flame-Retardant / IP65; size 100 x 45 x 80 mm, sensor probe length 120 mm M16x1.5 cable flange
Working temperature range: -30°C ~ +60°C
Storage temperature range: -40°C ~ +80°C
Electromagnetic compatibility (EMC): EN61326-1 / EN61326-2-3

Mounting & Wiring Details



Other Gas Options

EC Sense has other gas type modules to fit in the **EC Odor Finder**, easily to become **EC Gas Finder**. Dual-gas Finder version is also available on request.

Gas Type	Measure Range (Resolution)
O ₂	0 - 30% (0.01%) vol.
CO	0-10 ppm (0.001 ppm), 0-100 ppm (0.01 ppm), 0-1000 ppm (0.1 ppm), 0-2% (0.01%) vol., 0-10% (0.1%) vol.
TVOC	0-10 ppm (0.001 ppm), 0-200 ppm (0.01 ppm), 0-1000 ppm (0.1 ppm), 0-2000 ppm (0.1 ppm), 0-10000 ppm (1 ppm)
NH ₃	0-10 ppm (0.001 ppm), 0-50 ppm (0.01 ppm), 0-100 ppm (0.01 ppm), 0-1000 ppm (0.1 ppm)
H ₂ S	0-50 ppm (0.01 ppm), 0-100 ppm (0.01 ppm), 0-500 ppm (0.01 ppm), 0-5000 ppm (1 ppm)
SMELL (EC Odor Finder)	0-10 ppm (0.001 ppm), 0-500 ppm (0.01 ppm)
HCHO	0-5 ppm (0.001 ppm), 0-100 ppm (0.01 ppm)
O ₃	0-5 ppm (0.001 ppm), 0-50 ppm (0.01 ppm), 0-100 ppm (0.01 ppm)
NO ₂	0-5 ppm (0.001 ppm), 0-50 ppm (0.01 ppm), 0-100 ppm (0.01 ppm), 0-1000 ppm (0.1 ppm)
SO ₂	0-5 ppm (0.001 ppm), 0-50 ppm (0.01 ppm), 0-100 ppm (0.01 ppm), 0-1000 ppm (0.1 ppm)
Cl ₂	0-5 ppm (0.001 ppm), 0-50 ppm (0.01 ppm), 0-100 ppm (0.01 ppm)
ClO ₂	0-5 ppm (0.001 ppm)
H ₂	0-1000 ppm (0.1 ppm), 0-4% (0.1%) vol.
HCN	0-50 ppm (0.01 ppm)
HCl	0-500 ppm (0.01 ppm)
F ₂	0-5 ppm (0.001 ppm)
HF	0-10 ppm (0.001 ppm)
Br ₂	0-5 ppm (0.001 ppm)
PH ₃	0-20 ppm (0.001 ppm), 0-2000 ppm (0.1 ppm)
C ₂ H ₄ O	0-100 ppm (0.01 ppm)
CH ₄ S	0-100 ppm (0.01 ppm)

About Solid Polymer Electrochemical Technology

Solid polymer electrochemical technology is a revolutionary innovation in the field of electrochemical detection. This technology is based on the principle of electrochemical catalytic reaction caused by the target gas leading to a electrical signal that is direct proportional to the gas concentration.



The sensor is composed of three catalytic electrodes, a solid electrolyte, and gas diffusion holes. The gas reaches the working electrode of the sensor through the diffusion holes, an electrochemical redox reaction occurs on the porous micro-surface of the electrode, the solid electrolyte conducts electron transfer, and generate a current signal as an output. The current signal can characterize the gas concentration.

Further information: EC Sense < <http://www.ecsense.de> >

Key Features

- ✓ Embedded with smart algorithms, making the sensor to have higher adaptability to the environment, more accurate detection, and stable zero point.
- ✓ Anti-toxicity, which is a major performance problem in many other semi-conductive and fluid-type electrochemical sensors working in industrial environment.
- ✓ No volatilization of chemical materials (which limits product life of fluid-type electrochemical sensor less than 2-year), yielding a product lift over 5 years (when operating in non-corrosive environment).
- ✓ Fast response, fast return to zero, plug and play.
- ✓ Independent temperature and humidity digital sensor output.
- ✓ New micro circuit design, strong anti-electromagnetic interference ability.
- ✓ The smallest size and lowest power consumption in the electrochemical field
- ✓ RoHS Eco-friendly materials
- ✓ Sleeping-mode is available low-power IoT applications

About WOOFAA

WOOFAA is a solution developer of network-based indoor air quality management system for sustainable green building and smart manufacturing. In short, we do IoT+IAQ.

We created WOOFAA as a sound of clean air.

Our team is well-versed in latest technologies on air purification, smart building, and Internet-of-Things, giving you effective and energy efficient solutions to any of your odor and air quality problem. Our technical competence is world class and has enabled us to fill nearly a dozen invention and utility patents on method, system, and apparatus design.



Corporations who treasure data quality and have practices to make evident-based judgements on air quality measures, would find our service adding much value to their corporate sustainability. Join them so you get to know what you are inhaling everyday:

