

TB200B-EC4-F2-5

TB200B-EC4-F2-5 Fluorine Detection Module

EC Sense • Fluorine • Solid-Polymer Electrochemical (smart digital module)

The EC Sense TB200B-EC4-F2-5 is an industrial-safety-grade smart digital gas sensor module for Fluorine detection, with a 0 – 5 ppm range and 0.001 ppm resolution. The module uses an EC4 electrochemical sensor (40 × 30 × 22.45 mm including sensor, under 25 g). Built on German solid-polymer electrochemical sensing technology with intelligent algorithm calculation, it outputs gas concentration directly while also measuring ambient temperature and humidity. It communicates over a UART (TTL 3.3 V) or I²C digital interface with both active-upload and question-answer protocols. Every module is professionally calibrated with standard gas before shipment, with the calibration data stored in its flash chip — plug-and-play with no secondary gas calibration. Low power and a sleep mode make it ideal for battery-powered and IoT applications. It operates from -40 °C to +55 °C with an expected lifetime beyond 5 years, well suited to industrial safety, leakage detection, emission monitoring and process gas monitoring.

Specifications

Target Gas	Fluorine
Detection Range	0 – 5 ppm
Resolution	0.001 ppm
Sensor Packaging	EC4
Order No. (UART)	04-TB200B-EC4-F2-5-01
Order No. (I ² C)	04-TB200B-EC4-F2-5-I2C-01
Operating Principle	Solid Polymer Electrochemical Sensing Technology
Accuracy	± 5% (measurement value)
Repeatability	1%
Linearity	Linear
Long-Term Drift	< 5% / year
Expected Lifetime	> 5 years
Output Signal	UART (TTL 3.3 V) or I ² C digital signal
UART Parameters	Baud rate 9600, 8 data bits, 1 stop bit; VCC red / GND black / RX yellow / TX green
I ² C Parameters	Frequency ≤ 20 kHz, signal voltage 3.3 V; VCC red / GND black / SDA yellow / SCL green
Communication Mode	Active-upload and question-answer modes; Q&A is the default on power-up
Built-in Temperature Sensor	-20 °C to +70 °C, ± 0.2 °C (typical)
Built-in Humidity Sensor	0 – 100% RH, ± 2% (typical)
Working Temperature	-40 °C to +55 °C
Working Humidity	15 – 95% RH (non-condensing)

Working Pressure	Atmospheric pressure $\pm 10\%$
Size (Including Sensor)	40 × 30 × 22.45 mm
Size (Without Sensor)	40 × 30 × 5.6 mm
Weight	< 25 g (including sensor)
Cable Length	100 mm, special length by request
Warranty	12 months from the date of shipment

Key Features

- Detects gas, temperature and humidity simultaneously
- Detects with high selectivity a wide variety of gases
- Digital output: UART (TTL 3.3 V) or I²C
- Low power with sleep mode — suits battery & IoT applications
- Typical warm-up time in seconds
- Wide temperature range -40 °C to +55 °C
- Excellent accuracy
- Long lifetime > 5 years, no poisoning
- Fast response time, linear output, no zero-line drift
- No leakage, RoHS approved

Typical Applications

- Industrial Safety
- Leakage Detection
- Gas Manufacturing Process Monitoring
- Emission Monitoring
- Warehouse Logistics Monitoring
- Tobacco Storage Environmental Monitoring
- Data Center Protection
- Power Transformer
- Hydrogen Energy
- Fire Safety
- Garage
- Indoor Air Quality
- Outdoor Air Quality
- Battery

Calibration & Cross-Sensitivity

Every module is professionally calibrated with standard gas before shipment, with the calibration data stored in its flash chip — plug-and-play, no secondary gas calibration required. Refer to the datasheet for the calibration gas and cross-sensitivity data.