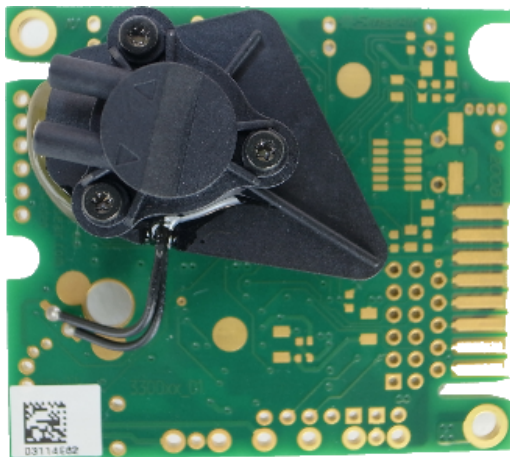


# CO<sub>2</sub> Engine<sup>®</sup> ICB

## Sensor Module for bio applications



CO<sub>2</sub> Engine<sup>®</sup> ICB is targeted on bio applications with required measurement range 0 to up to 30%<sub>vol</sub> CO<sub>2</sub>.

CO<sub>2</sub> Engine<sup>®</sup> ICB can be supplied in diffusion modification with (CO<sub>2</sub> Engine<sup>®</sup> ICB F) or without tube IN/OUT. The module is as all other sensors from Senseair<sup>®</sup> designed for high volume production with full traceability by sensor serial number on all manufacturing processes and key components. Every sensor is individually calibrated and is provided with UART digital interface.

### STANDARD SPECIFICATION

Measured gas	Carbon dioxide (CO <sub>2</sub> )
Operating Principle	Non-dispersive infrared (NDIR)
Measurement range CO <sub>2</sub>	0–30% <sub>vol</sub> (CO <sub>2</sub> )
Accuracy	±0.5% <sub>vol</sub> (CO <sub>2</sub> ) ±3% of measured value
Dimensions	51 x 57 x 14mm (L x W x H)
Life Expectancy	>15 years
Operation temperature range	0–50°C
Operation humidity range	0–95%RH (non-condensing)
Power supply	5–14VDC max rating, stabilised to within 10% (on board protection circuits)
Power consumption	40mA average <200mA average during IR lamp ON (120 msec) <250mA peak power during IR lamp start-up (the first 50 msec)
Communication	I <sup>2</sup> C, UART (Modbus protocol)

### APPLICATIONS

This platform is designed to be a low power OEM module for integration into host apparatus, such as battery operated products and sensors with radio transmitters. Any application where power consumption is important to keep at a minimum without sacrificing the performance.

### KEY BENEFITS

- Low-power consumption
- Individually calibrated
- Maintenance-free
- High quality
- Long term stability



**General Performance:**

Storage Temperature Range.....	-40–70°C, (no condensation)
Storage Environment .....	Non-condensing, non-corrosive <sup>1</sup>
Sensor Life Expectancy .....	>15 years
Maintenance Interval.....	Maintenance free <sup>2</sup>
Self-Diagnostics .....	Complete function-check of the sensor module
Operating Temperature Range .....	0–50°C
Operating Humidity Range.....	0–95%RH, (non condensing) <sup>3</sup>
Operating Environment .....	Residential, commercial, industrial spaces used in HVAC (Heating Ventilation and Air-Conditioning) systems <sup>1</sup>

**Electrical / Mechanical:**

Power Input .....	5–14VDC max rating, stabilized to within 10% (on board protection circuits) <sup>4</sup>
Average Current Consumption.....	40mA average, <200mA averaged during IR lamp ON, (120 msec)
Peak Current Consumption.....	<250 mA peak power (during IR lamp start-up, the first 50 msec)
Electrical Connections <sup>5</sup> .....	Terminals not mounted (G+, G0, OUT1,OUT2, Din1, Din2, TxD and RxD)
Dimensions .....	51 x 57 x 14mm (Length x Width x Height)

**CO<sub>2</sub> Measurement:**

Operating principle.....	Non-dispersive infrared (NDIR) waveguide technology with ABC (Automatic Baseline Correction)
Sampling Method.....	Diffusion
Response Time (T <sub>1/e</sub> ).....	<20s, diffusion or tube IN/OUT (0.2l/minute gas flow)
Measurement Period.....	>5min
Measurement Range .....	0–30%vol(CO <sub>2</sub> )
Accuracy <sup>6</sup> .....	±0.5%volCO <sub>2</sub> ±3% of measured value
Pressure Dependence .....	+1.6% reading per kPa deviation from normal pressure, 101.3kPa

**Linear Signal Output:**

**OUT2**

D/A Resolution.....	5mV
Linear Conversion Range .....	0–5VDC for 0–20%vol
Electrical Characteristics.....	R <sub>OUT</sub> <100Ω, R <sub>LOAD</sub> >5kΩ, Power input >5,5V <sup>7</sup>

Note 1: SO<sub>2</sub> enriched environments excluded

Note 2: When using SenseAir’s ABC (Automatic Baseline Correction) algorithm. ABC is enabled in default configuration

Note 3: Sensors are 100% tested in production at 45°C / 85%RH / 1000ppm CO<sub>2</sub> for one hour.

For applications operating continuously in high humidity, contact SenseAir for further information.

Note 4: Notice that absolute maximum rating is 14V, so sensor can be used with 12V±10% supply.

Note 5: Different options exist and can be customized depending on the application. Please contact SenseAir for further information!

Note 6: Accuracy is specified over operating temperature range at normal pressure 101.3kPa. Specification is referenced to certified calibration mixtures.

Uncertainty of calibration gas mixtures (±1% currently) is to be added to the specified accuracy for absolute measurements.

Note 7: For the buffered output OUT2 the maximum output voltage range equals power voltage input minus 0.5V