

SenseAir[®] LP8

Sensor module for
battery-powered applications



Driesen + Kern GmbH

SenseAir[®] LP8 is a miniature sensor module which targets battery-powered applications. It gives customer a full control on sensor integration into a host system, flexibility in changing of the CO₂ measurement, period and consequently power consumption. One measurement requires only 3.6mC of charge (or energy 11.9mJ at 3.3V battery supply). The sensor is supposed to be switched off between measurements to minimize average current consumption.

STANDARD SPECIFICATION

Article number	005-0-0001
Operating principle	Non-dispersive infrared (NDIR)
Measurement range [CO ₂]	0 – 2000ppm
Accuracy [CO ₂]	±50ppm ±3% of reading ^{1,4}
RMS noise [CO ₂]	14ppm @ 400ppm @ 25°C 25ppm @ 1000ppm @ 25°C
Accuracy temperature	±0.7°C
Power supply	2.9 – 5.5V
Peak current	125mA
Shutdown current	1µA ^{2,3}
Charge per measurement	3.6mC
Energy per measurement	11.9mJ @ 3.3V
Average current	
16s measured period	225µA ^{2,3}
60s measured period	61µA ^{2,3}
120s measured period	31µA ^{2,3}
Measurement period	≥16s
Dimensions [mm]	8 x 33 x 20mm (L x W x H)
Sensor lifetime expectancy	>15 years
Operation range	0 – 50°C, 0 – 95%RH
Communication	UART (host – slave protocol)

Note 1: 15 – 35°C, 20 – 60%RH, after three eight days periods, each period followed by ABC command set in the Calculation Control byte
Note 2: Resistor network for measuring VCAP voltage adds 14µA @ 5.5V
Note 3: External super-capacitor leakage is not considered
Note 4: Spec is ref. to uncertainty of calibration gas mixtures ±1%

APPLICATION

A wide 2.9-5.5V supply voltage range enables long duty, if sensor is powered from three alkaline 1.5V batteries. A compact alternative is to power sensor from a single 3.6V Li-SOCl₂ battery.

SenseAir[®] LP8 provides a communication protocol which allows customer changing measurement period on the fly and control ABC (Automatic Baseline Correction) period. Background- and zero- calibrations are implemented.

KEY BENEFITS

- 3.6mC per measurement (11.9mJ @ 3.3V)
- Miniature size (*SenseAir[®] S8* format)
- A wide supply voltage range enables a variety of battery options
- Adjustable measurement period by host
- Adjustable ABC period by host

SenseAir® LP8 Technical Specification

General Sensor Performance:

Required storage/operation environment	Non-corrosive ¹ and non-condensing ²
Sensor lifetime expectancy	>15 years
Service interval and maintenance	Adjustable ABC period by host
Self-diagnostics	Complete function-check of the sensor module every power on.
Complies with standard	EMC directive 2014/30/EC, Emission EN 55011:2016,
.....	Immunity EN 61000-4-3:2006/A1:2008/A2:2010, EN61000-4-6:2014,
.....	EN 61000-4-8:2010, RoHS directive 2011/65/EU

Operative environment required for keeping calibrated and specified accuracy in gas measurement:

Operative temperature range	0 – 50°C
Operative relative humidity range.....	0 – 95%RH, non-condensing ²

Electrical Properties:

Power supply	2.9 – 5.5V
Peak current	125mA
Shutdown current.....	1µA

Mechanical Properties:

Electrical Connections	VCAP, VBB and GND
Dimensions.....	8 x 33 x 20mm (Length x Width x Height)

CO₂ Measurement:

Operating principle.....	Non-dispersive infrared (NDIR)
Measurement Range	0 – 2000ppm CO ₂
Accuracy ³	±50ppm ±3% of reading
Measurement period.....	≥16s, adjustable by host

Temperature Measurement:

Operating principle.....	NTC (Negative Temperature Coefficient) Resistor
Measurement range.....	0 – 50°C
Accuracy.....	±0.7°C
Measurement interval	Adjustable by host

Note 1: SO₂ enriched environments excluded

Note 2: When using ABC (Automatic Baseline Correction) algorithm of SenseAir.

Note 3: Specification is referenced to uncertainty of calibration gas mixtures ±1%.
15 – 35°C, 20 – 60%RH, after three eight days periods,
each period followed by ABC command set in the Calculation Control byte

Document Edition Page
PSH1233 1 2 (2)