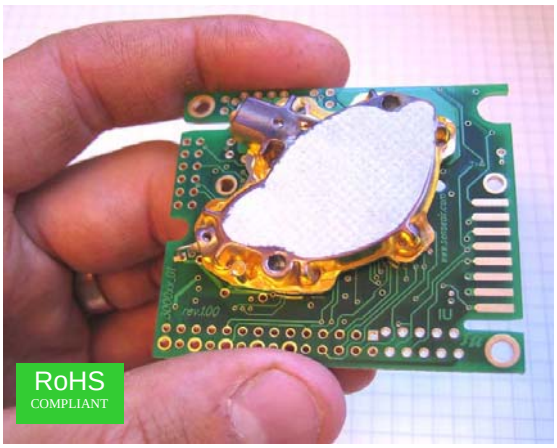
Model CO_2 Engine™ (K30)
Carbon Dioxide sensor module

PRODUCT DESCRIPTION

CO_2Engine™(K30) is a low cost, infrared and maintenance-free transmitter module intended to be built into different host devices that require CO_2 monitoring data.

CO_2Engine™ is aimed at *high volume production.* For a moderate start cost ***SenseAir™*** will tailor-make the product to meet the customer's unique requests.

Suitable applications for ***CO_2Engine™*** are; fresh air ventilators, air conditioning and air cleaners in car cabins and buildings; appliances such as kitchen fans, automatic window openers, combustion controls etc.



The CO_2 Engine (K30) module is compact (5,1 x 5,7 x 1,4 cm)

FEATURES

SenseAir™ patented state-of-the-art, gold-plated, infrared (NDIR) wave-guide technology comprising a unique folded-path optical sensor. That provides an un-beatable path length ensuring excellent accuracy and long-term stability.

- simple to install
  Pre-calibrated and ready-to-use
- compact.
  PCB dimensions: 5,1 x 5,7 x 1,4 cm
- low cost
- maintenance free in normal IAQ applications
- flexible through advanced digital technology
- MODBUS serial communication

Additional measurements options are for example: *temperature, pressure, humidity, other gases and measurement ranges.*

APPLICATIONS

CO_2Engine™ from ***SenseAir™*** is an accurate, yet low cost gas sensing solution for OEMs who wish to integrate CO_2 gas sensing into their product without investing in their own gas sensor development. The compact sized and low powered module is intended to be an add-on component to compliment other microprocessor-based controls and equipment.

CO_2Engine™ may be software customized in different ways in order to optimize the total system with respect to the OEM application.

CO_2Engine™ is offered for installation in OEM IAQ sensor housings, OEM air handling units, OEM alarm sensor housings, among other applications. The only restriction for what this product can be used for is the creativity and inventiveness of the customer.

This new product version is a RoHS compliant upgrade replacing the former ***CO_2Engine™*** product, has the same key product performance, but now has an improved speed of response and a reduced spatial build-in height.

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CO_2*Engine*^{TM} *(K30) –gas sensor transmitter OEM module*

Technical specifications[*]

General Performance:

Operating Temperature Range	0 to 50 °C
Operating Humidity Range	0 to 95% RH (non-condensing)
Operating Environment	Residential, commercial, industrial spaces and potentially dusty air ducts used in HVAC (Heating Ventilation and Air-Conditioning) systems.[2,4]
Storage Temperature Range	-30 to +70 °C
Sensor Life Expectancy	> 15 years
Maintenance Interval	no maintenance required [1]
Self-Diagnostics	complete function check of the sensor module
Warm-up Time	≤ 1 min. (@ full specs ≤ 15 min)
Conformance with the standards	Emission: EN61000-6-3:2001 Immunity: EN61000-6-2:2001 RoHS directive 2002/95/EG

Electrical / Mechanical:

Power Input	4,5-14 VDC, stabilized to within 10% (external protection circuits required) [3]
Current Consumption	40 mA average < 150 mA peak current (averaged during IR lamp ON, 110 msec) < 300 mA peak current (during IR lamp start-up, the first 35 msec)
Electrical Connections [4]	terminals not mounted (G+, G0, OUT1, OUT2, ErrStat, TxD, RxD)
Dimensions	5,1 x 5,7 x 1,4 cm (Length x Width x approximate Height)

CO_2 Measurement: [4]

Sensing Method	non-dispersive infrared (NDIR) waveguide technology with ABC automatic background calibration algorithm
Sampling Method	diffusion (optional sampling method: tube-in / tube-out)
Response Time ($T_{1/e}$)	20 seconds diffusion time
Measurement Range	0 - 2 000 $ppm_{vol.}$
Repeatability	± 20 ppm ± 1 % of measured value
Accuracy [1]	± 30 ppm ± 5 % of measured value
Pressure Dependence	+ 1.6 % reading per kPa deviation from normal pressure, 100 kPa
On-board Calibration Support	Din1 switch input to trigger Background Calibration @ 400 ppm CO_2 Din2 switch input to trigger Zero Calibration @ 0 ppm CO_2

Linear Signal Outputs: [4,5,6]

Linear Conversion Range	1 - 4 VDC for 0 - 2 000 $ppm_{vol.}$, with 0,5 VDC used as FAULT status signal
Electrical Characteristics	R_{OUT} < 100 Ω, R_{LOAD} > 5 kΩ
D/A Conversion Accuracy	± 2 % of reading ± 20 mV
OUT1 D/A Resolution	10 mV
OUT2 D/A Resolution	5 mV

UART Serial com port [4]

Protocol	MODBUS open protocol
Hardware interface	CMOS UART with RxD, TxD (R/T to support RS485 standard drivers on request)
Baud Rate	9600 (maximum TBD)

Note 1: In normal IAQ applications. Accuracy is defined after minimum 3 weeks of continuous operation. However, some industrial applications do require maintenance. Please, contact SenseAir for further information!
Note 2: SO_2 enriched environments are excluded.
Note 3: Notice that absolute maximum rating is 14V, allowing for a 12V+-10% power supply
Note 4: Different options exist and can be customized depending on the application. Please, contact SenseAir for further information!
Note 5: During power up, OUT1 and OUT2 are defined to be low. Exact value depends on many factors including temperature.
Note 6: For the buffered outputs OUT1 and OUT2 the maximum output voltage range equals power voltage input minus 0,5 V

[*] Protected by the following patents: WO 97/18460, WO 98/09152, WO 2005/015175.
More patents pending.

For more information please contact SenseAir AB

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