CO2S-A Ambient Range
Ultra Low Power Carbon Dioxide Sensor

CO2S-A is an ultra low power (3.5mW[4]), high performance CO_2 sensor, ideally suited for battery operation and portable instruments. Based on patented IR LED and Detector technology and innovative optical designs, CO2S-A is the lowest power NDIR sensor available. Optional temperature and humidity sensing are available.

With measurement ranges of 0-2000ppm, 0-5000ppm and 0-1% the **CO2S-A Ambient** Sensor is suitable for applications such as Building Management and Horticulture.

Unlike Electrochemical Sensors the CO_2 sensors connect to customers systems using the TTL-Level RS232 protocol. This removes the need for A to D conversion.

- Ultra-low Power 3.5mW

- Measurement ranges from 0 to 1%

- Low noise measurement (<10ppm)

- 3.3V supply.

- Peak current only 33mA.

- Optional Temperature and Humidity Outputs

- All sensors come pre-calibrated and temperature compensated

**CO2S-A Ambient Sensor**

Specifications

General Performance	
Warm-up Time	< 10s. 1.2 secs to first reading.
Operating Conditions	0°C to 50°C (Standard) -25°C to 55°C (Extended range) 0 to 95% RH, non-condensing
Recommended Storage	-30°C to +70°C
CO2 Measurement	
Sensing Method	Non-dispersive infrared (NDIR) absorption Patented Gold-plated optics Patented Solid-state source and detector
Sample Method	Diffusion
Measurement Range	0-2000ppm, 0-5000ppm, 0-1%
Accuracy	±50 ppm +/- 3% of reading[1]
Calibration	Autocalibration[6]
Non Linearity	< 1% of FS
Pressure Dependence	0.13% of reading per mm Hg in normal atmospheric conditions.
Operating Pressure Range	950 mbar to 1050 mbar[2]
Response Time	30 secs to 3 mins (Configurable via filter type and application)[3] Reading refreshed twice per second.[3]

Electrical/ Mechanical	
Power Input	3.25 to 5.5V. (3.3V recommended). Peak Current 33mA[4]. Average Current <1.5mA[4].
Power Consumption	3.5 mW[4](@3.3V)

Dimensions and Wiring Connections
2x5 0.1" header. view from underside (connector side)
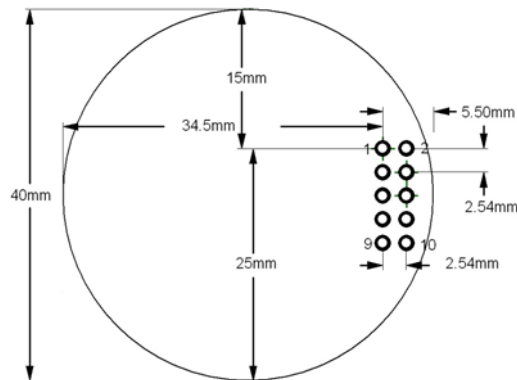
Note that the drawing shows details of the PCB inside the sensor casing. The outside dimension of the sensor casing is 43mm.

Function	Pin #	Pin #	Function
0V/GND	**1**	**2**	N/C
+3.3V	**3**	**4**	N/C
Sensor Rx (in)	**5**	**6**	N/C
Sensor Tx (out)	**7**	**8**	Nitrogen Zero
Analogue O/P	**9**	**10**	Fresh Air Zero

Pin 2 should not be connected. Pins 4 and 6 do not require connection and are internally connected to GND.

The zeroing options are for hardware zeroing (both active low). These functions can also be implemented by sending a serial command (recommended).

Typical connections for digital interface are GND, 3.3V, Rx and Tx. Note that the Vh for the serial Tx line will be 3V regardless of the supply voltage.

The analog (voltage) output is available only when specified. Otherwise, N/C.

Temperature & Humidity Measurement[5]

Optional Temperature and Humidity sensor (only available as digital output)

Sensing Method	Humidity: Capacitive Temperature: Bandgap
Measurement Range	-25 to +55 °C 0 to 95% RH
Resolution	0.08 °C 0.08% RH
Absolute Accuracy[5]	+/- 1 °C 0°C to 55°C. +/- 3% RH 20°C to 55°C. +/- 2 °C over the full temperature range. +/- 5% RH over the full temperature range.
Repeatability	+/- 0.1 °C +/- 0.1 % RH

Note 1: All measurements are at STP unless otherwise stated.
Note 2: External Pressure calibration required.
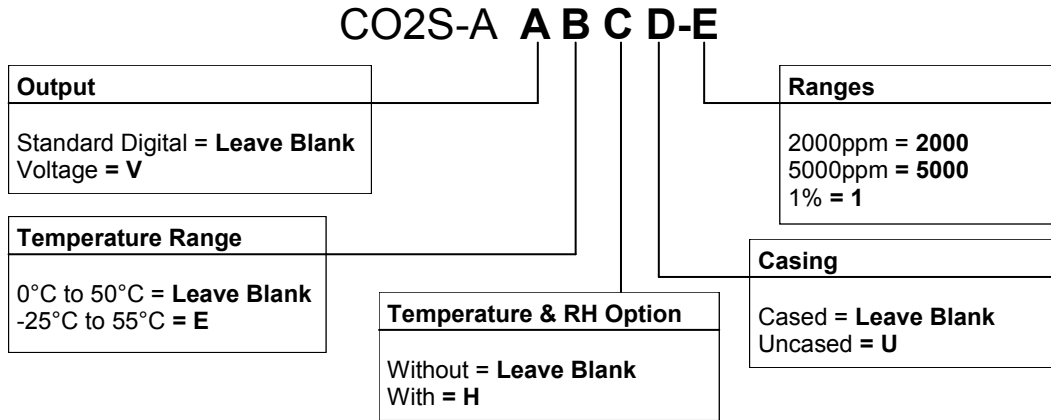**Note 3**: User Configurable Filter Response.
Note 4: Power measurements for standard CO_2 sensor with 2 readings per second. Temperature and humidity measurements increase the power consumption.
Note 5: Temperature and Humidity derived from Sensirion SHT21 chip. Please request data sheet for full   details.
Note 6: Autocalibration is enabled by default on CO2S-A (after Nov 2012). For correct operation, the sensor must experience fresh air once every week. For details request the application note "CO2 Sensor Autocalibration".

Ordering Guide

Replace **A, B, C, D** and **E** with the following values to create the part number you require.

CO2S-A **A B C D-E**

Output

Standard Digital = **Leave Blank**
Voltage **= V**

Temperature Range

0°C to 50°C = **Leave Blank**
-25°C to 55°C **= E**

Temperature & RH Option

Without = **Leave Blank**
With **= H**

Ranges

2000ppm = **2000**
5000ppm **= 5000**
1% **= 1**

Casing

Cased = **Leave Blank**
Uncased **= U**

Examples:

CO2S-A-VH-2000 = Voltage output, 0°C to 50°C, with Temperature & RH Option, Cased, 2000ppm
CO2S-A-EHU-1 = Digital output, -25°C to 55°C, with Temperature & RH Option, uncased, 1%

WARNING	CAUTION
Personal Injury **DO NOT USE these products as safety or Emergency Stop devices or in any other application where failure of the product could result in personal injury.** **Failure to comply with these instructions could result in death or serious injury.**	**Do not exceed maximum ratings.** **Please read this data sheet thoroughly to ensure the product is suitable for your application.** **Failure to comply with these instructions may result in product damage.**

It is the customer's responsibility to ensure that this product is suitable for use in their application. For technical assistance or advice, please email us: technical@sstsensing.com

General Note: SST Sensing Ltd reserves the right to make changes in product specifications without notice or liability. All information is subject to SST's own data and is considered accurate at time of going to print.