Datasheet

GSS
Gas Sensing Solutions

SprintIR®-W CO2 Sensor

- Measurement range: 0-5%; 0-20%; 0-100%
- Battery applications
- Low power
- Fast response
- Long lifetime

Tel: +44 (0) 1236 781 900 | info@gassensing.co.uk | www.gassensing.co.uk

Overview

SprintIR®-W is a high speed CO2 sensor. It measures up to 100% CO2 concentration, and comes with an optional flow through adapter.

The sensor takes 20 readings per second, which makes it ideal for high speed sensing requirements, and for measuring rapidly changing CO2 levels.

Its low power requirement also makes it ideal for battery powered systems, including portable, wearable and self-powered applications.

SprintIR®-W is built on our unique patented LED technology platform and optical designs. It's this solid-state technology that enables best-in-class speed, power consumption, and durability.

Applications

SprintIR®-W is available in measurement ranges from 0-5%, 0-20%, and 0-100% concentration. The sensor caters for high speed sensing, and capture of rapidly changing CO2 levels. This includes breath analysis, analytical instrumentation, and other real-time CO2 monitoring applications.

It can be used for battery applications, where low power consumption is required. This includes IoT applications, such as wearables.

Examples of markets where SprintIR®-W CO2 sensors are being successfully used:

- **Healthcare**
- **Transportation**
- **Food packaging**
- **Academia**

Benefits

- Rapid measurements - 20 measurements/second
- Fast response (see graph below)
- Ideal for low power and battery applications
- Suitable for wireless, portable, wearable and self-powered systems
- Integrates with wireless IoT networks such as ZigBee, Wifi, LoRa, Bluetooth, SigFox and EnOcean

Features

- High speed sensing - 20 Hz
- Low power/energy consumption - 35mW
- Measures up to 100% CO2 concentration
- Solid-state - no moving parts, no heated filaments
- Vibration and shock resistant
- Non-heating
- Digital (UART) output
- RoHS compliant
- Manufactured in the UK

General performance

Start-up time	<30 seconds
Operating conditions-Temperature	0°C to 50°C (standard) -25°C to 55°C (extended range)
Operating conditions-Humidity	0 to 95% RH, non-condensing
Recommended storage	-30°C to +70°C

CO2 measurement

Sensing method	Solid-state Non-Dispersive InfraRed (NDIR) absorption Patented solid-state LED and detector Patented gold-plated optics
Sample method	Diffusion
Measurement range	0-5% 0-20% 0-100%
Accuracy[1]	± (70ppm+5% of reading) (100% range ± (300ppm+5% of reading)
Measurement Noise	< 10% of reading with no digital filtering
Pressure dependence[2]	0.15% of reading per mbar in normal atmospheric conditions
Operating pressure range[3]	500mbar to 10 bar 500mbar to 2 bar with flow through adaptor
Response time (to a step change in gas level)[4]	Flow rate dependent
Update rate	20 Hz

Electrical

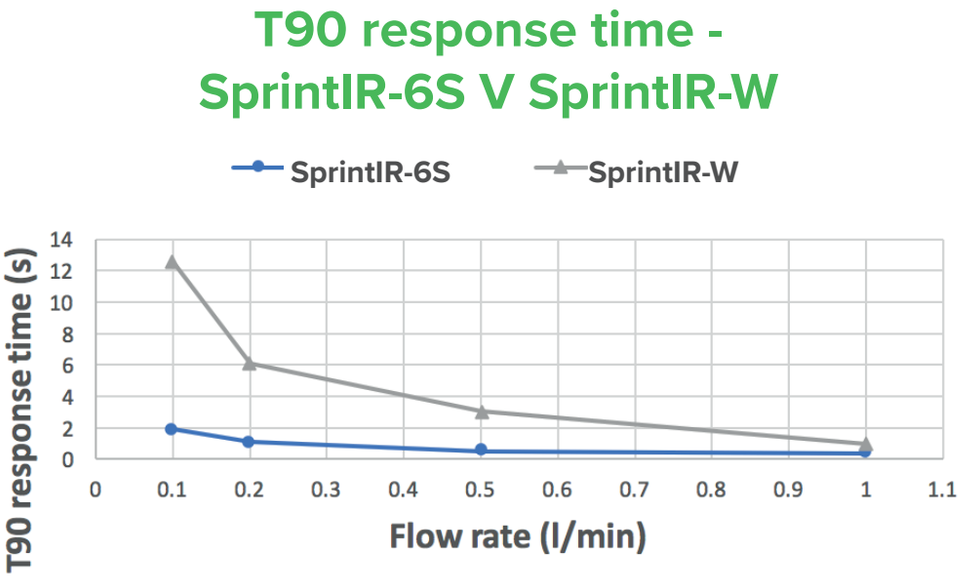
Power input	3.25 to 5.5V. (3.3V recommended) Peak Current 100mA Average Current <15mA
Power consumption[5]	35 mW
Connector	2x5 2.54mm header[6]
Communication	UART

Warranty

Sensor warranty[7]	1 year

1 All measurements are at NTP unless stated otherwise.
2 Calibrated for 1013mbar. External pressure calibration required.
3 GSS can supply advanced pressure correction advice when operating outside normal atmospheric conditions.
4 Response time to a step change in gas level is dependent on application/filter/flow rate/diffusion.
5 Power measurements for standard CO2 sensor with 20 readings per second.
6 Part no: BF041-10-C-0685-0295-N-G
7 Gas Sensing Solutions Ltd (GSS Ltd) offers a limited one (1) year manufacturer's warranty on its products commencing from the date of original purchase. The warranty is limited to defects in materials and workmanship and does not cover damage or abnormal wear and tear resulting from abuse, misuse, or accidental damage. The warranty excludes operational damage due to exposure to blasts or other threats such as excessive abrasion or flames. Unauthorized repairs or alterations void the product warranty. GSS Ltd cannot and does not assume liability for defective products not manufactured or supplied by it even though such be used in conjunction with products manufactured by GSS Ltd.

Comparison of sensor response times



(T90 time measured from 0 to 10% CO_2 - digital filter switched off)

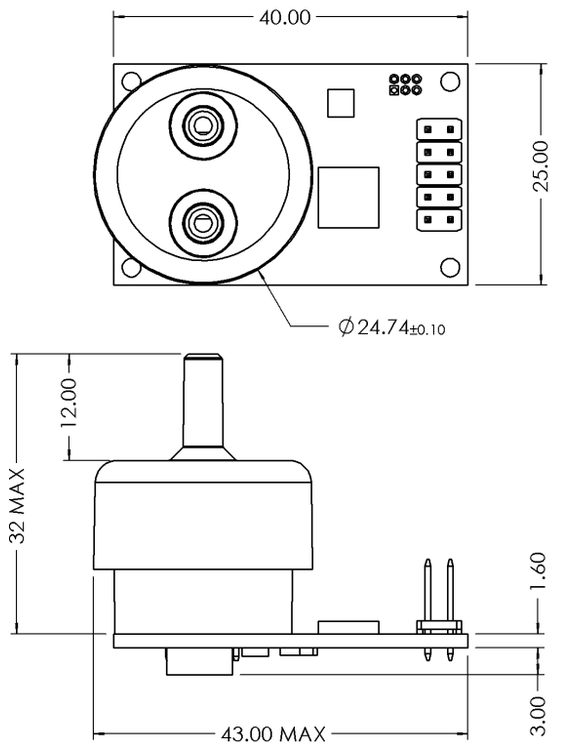
Dimensions and wiring connections.

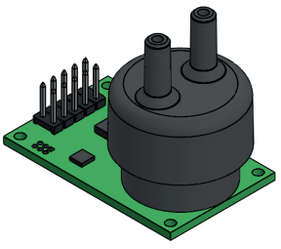
2x5 0.1inch header.

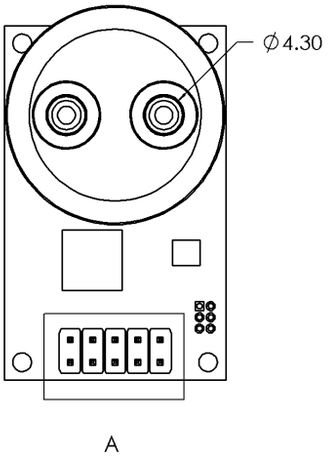
Pin 1 is identified on the dimensional drawing.
Pin 2 should not be connected.
Pins 4 and 6 do not require connection and are internally connected to GND.
The zeroing options are for hardware zeroing (both active low). These functions can also be implemented by sending a serial command (recommended).
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.

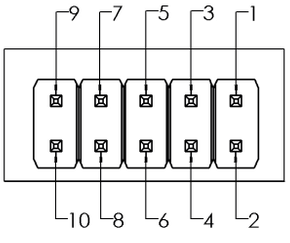
Technical drawings

THIS INFORMATION SUPPLIED BY GSS IS BELIEVED TO BE ACCURATE AND RELIABLE.
HOWEVER NO RESPONSIBILITY IS ASSUMED BY GSS LTD FOR ITS USE.









DETAIL A
SCALE 3 : 1

FUNCTION	PIN #	PIN #	FUNCTION
FRESH AIR ZERO	10	9	N/C
NITROGEN ZERO	8	7	SENSOR Tx (OUT)
GND	6	5	SENSOR Rx (IN)
GND	4	3	+3.3V
N/C	2	1	GND

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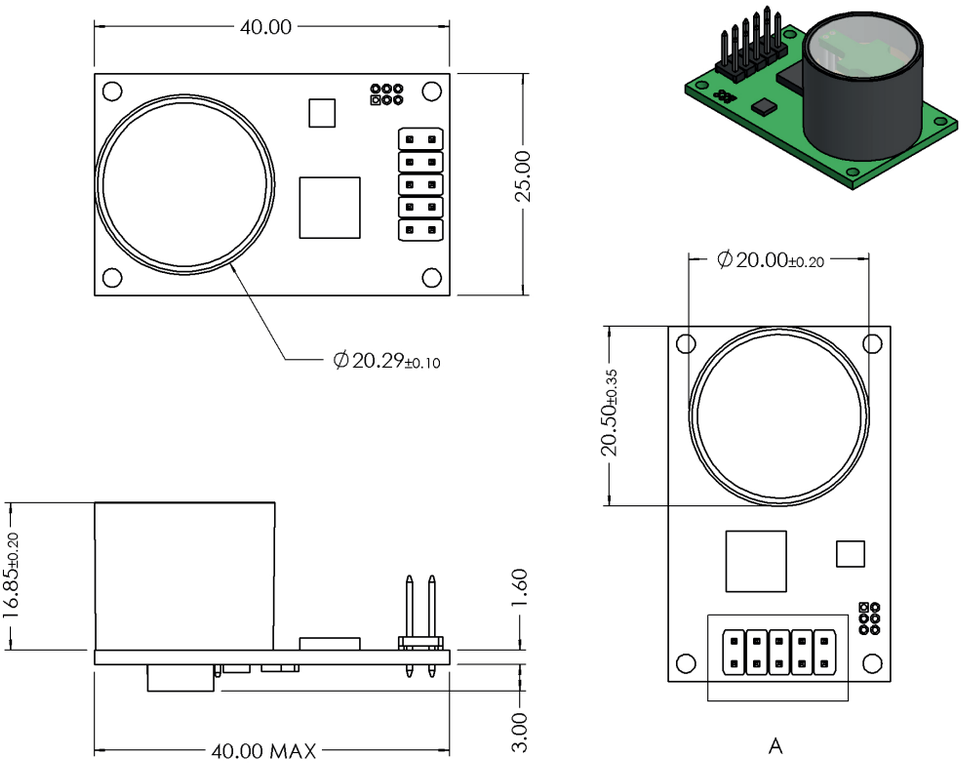

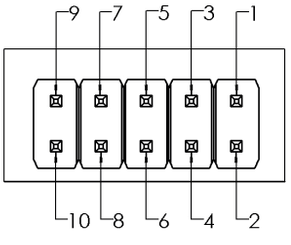

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N/C	2	1	GND

Put it to the test

Our evaluation kit contains everything you need to test the sensor for your project requirements. The USB cable allows you to easily connect the SprintIR®-W sensor to your PC, for real-time CO2 readings.

- CO2 sensor (including adapter if specified)
- USB connecting cable
- Evaluation guide on USB stick

Please visit our website to request a quote for an evaluation kit.

Technical support

The GSS team are specialists in CO2 sensor design, manufacture and customisation. We can advise how best to integrate our award-winning sensors into your product or process. Whether it's a fixed unit, portable instrument, wearable device, or energy harvester, our engineering team have the experience to help bring your project to life.

For more information about GSS and our technology, please visit our About page.

Custom sensors

If you need the sensor to be altered to your specific requirements, our engineering team can develop a custom solution for you. Please contact us to discuss your project requirements with our engineering department.

60-62 Grayshill Road
Westfield North Courtyard
Cumbernauld G68 9HQ

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