



SpritIR[®]-R CO2 Sensor

📈 Measurement range: 0-5%; 0-20%; 0-100%

🔋 Battery applications ⚡ Low power

📏 Miniature ⌚ Very fast response



Overview

SprintIR®-R is a very fast response CO2 sensor. With a 2.5X faster sampling rate than the SprintIR®-6S, R is the fastest sampling NDIR CO2 sensor available today*.

The sensor takes 50 readings per second, which makes it ideal for high speed sensing requirements, and for measuring rapidly changing CO2 levels.

The SprintIR®-R measures up to 100% CO2 concentration, and comes fitted with a flow-through adapter.

With a compact design, the R can be easily integrated into measurement and detection systems. Its low power requirement also makes it ideal for battery powered systems, including portable, wearable and self-powered applications.

SprintIR®-R 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.

* Based on 0.1 litres per minute flow rate and 0-10% step change in CO2 concentration.

Applications

SprintIR®-R 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, capnography, metabolic assessment, 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®-R CO2 sensors are being successfully used:

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

Benefits

- Rapid measurements - 50 measurements/second
- Very fast response (see graph page 4)
- Ideal for low power and battery applications
- Fits neatly inside compact instruments
- 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 - 50 Hz
- 2ml sample volume
- 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 secs
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	Patented solid-state Non-Dispersive InfraRed (NDIR) absorption Solid-state LED and detector Gold-plated optics
Sample method	Flow through adaptor
Measurement range	0-5% 0-20% 0-100%
Accuracy¹	± (70ppm+5% of reading) (100% range ± (300ppm+5% of reading))
Measurement Noise	< 10% of reading with no digital filtering
Pressure dependence²	0.15% of reading per mbar in normal atmospheric conditions
Operating pressure range³	500mbar to 2 bar with flow through adaptor
Response time (to a step change in gas level)⁴	Flow rate dependent.
Update rate	50 Hz

Electrical

Power input	3.25 to 5.5V. (3.3V recommended) Peak Current 100mA Average Current <15mA
Power consumption⁵	35 mW
Connector	4 x 0.5mm sq pins (see drawing)
Communication	UART

Warranty

Sensor warranty⁶	1 year
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1 All measurements are at NTP unless stated otherwise.

2 Calibrated for 1013mbar. External pressure calibration required.

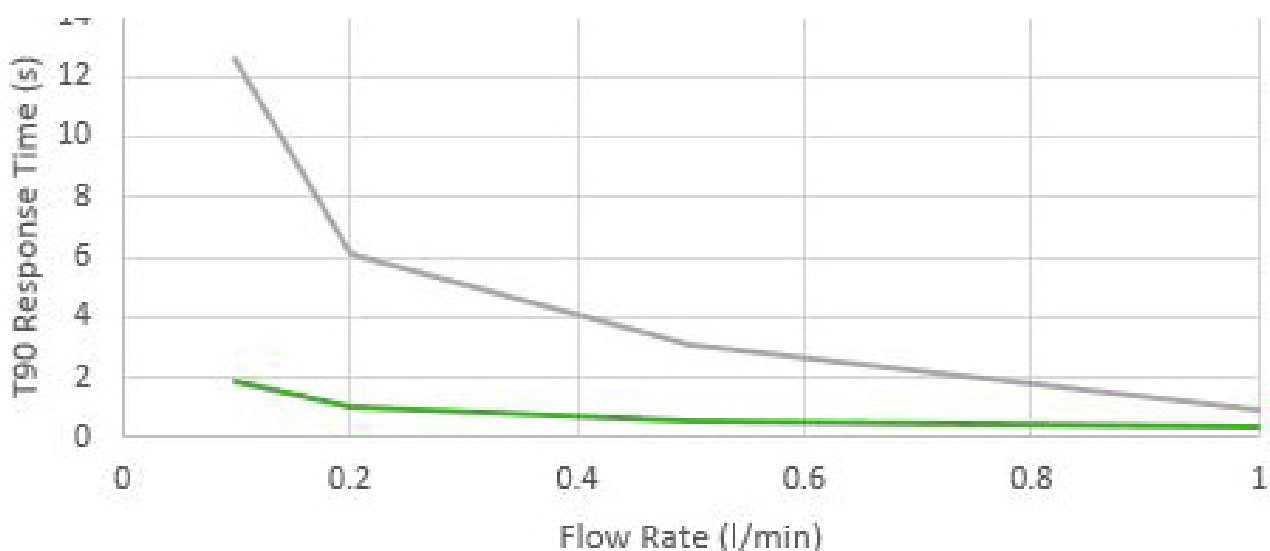
3 GSS can supply advanced pressure correction advice when operating outside normal atmospheric conditions.

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 50 readings per second.

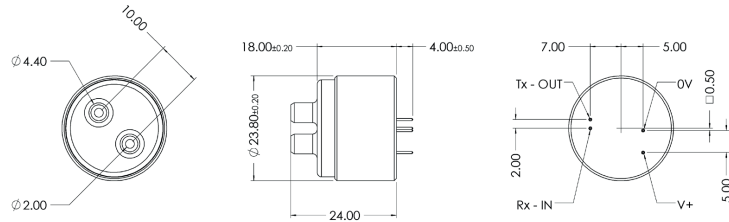
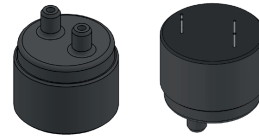
6 Gas Sensing Solutions Ltd (GSS Ltd) offers a limited one (1) year manufacturer's warranty on its products commencing from the date of original purchase. The warranty is limited to defects in materials and workmanship and does not cover damage or abnormal wear and tear resulting from abuse, misuse, 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.

T90 response time - SprintIR-R V SprintIR-W



Technical drawings

CONNECTION	DESCRIPTION	COMMENTS
0V	GND CONNECTION	0V
V+	POSITIVE POWER SUPPLY	3V3 TO 5V
Tx-OUT	UART Tx FROM SENSOR	V _{oh} WILL BE 3V. SENSOR OUTPUT.
Rx-IN	UART Rx TO SENSOR	USED FOR CONFIGURATION



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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 V_h for the serial Tx line will be 3V regardless of the supply voltage.

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®-R 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.

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