CO$_2$ Sensors
Fast Response Range—SprintIR^{6S}

📝 FEATURES

- Low power / energy consumption—35mW
- Measures up to 100% CO$_2$ concentration
- Ultra-fast response rate; 6X faster than the SprintIR[a]
- High speed sensing; 20 measurements per second (20Hz)
- Sample volume of only 2ml
- Solid-state; no moving parts, no heated filaments
- Digital (UART) output

Supply Voltage	Power Consumption	Operating Temp	Output Digital	Response Time
3.3 V **VOLTAGE**	Max 35mW **POWER**	0°C to +50°C TEMPERATURE / -25°C to +55°C TEMPERATURE	**TTL**	SEE GRAPH

📂 BENEFITS

- Very fast response (see graph page 2)
- Ideal for very low power and battery applications
- Suitable for wireless, portable, wearable and self-powered systems
- Fits neatly inside compact instruments

🛠 TECHNICAL SPECIFICATIONS

|	
Supply voltage	3.25—5.5V$_{DC}$ (3.3V recommended)
Current	<15mA (average) 100mA Peak
Power consumption[b]	35mW
Output type	3.3V TTL level UART
Temperature	
Operating:	0°C to +50°C (standard)
	-25°C to +55°C (extended)
Storage:	-30°C to +70°C
Humidity	0—95% Rh, non-condensing
Start-up time	< 30 seconds

📈 CO$_2$ MEASUREMENT SPECIFICATIONS

Sensing method	Non-dispersive infrared (NDIR) absorption
Sample method	Flow through adaptor
Measurement range	0—5%, 0—20%, 0—100%
Accuracy[c]	±70ppm / ±5% of reading (100% range ±300ppm ±5% of reading)
Measurement noise	<10% of reading (no digital filtering)
Pressure dependence[d]	0.15% of reading per mbar in normal atmospheric conditions
Operating pressure range[e]	500mbar to 2 bar with flow through adaptor
Response time (a step to change in gas level)[f]	Flow rate dependant; refer to graph overleaf
Update rate	20Hz

✔ NOTES

a) Based on 0.1 litres per minute flow rate and 0—10% step change in CO$_2$ concentration.
b) Power measurements for standard CO$_2$ sensor with 20 readings per second.
c) All measurements are at NTP unless otherwise stated.
d) Calibrated for 1013mbar. External pressure calibration required.
e) ISweek can supply advanced pressure correction advice when operating outside normal atmospheric conditions.
f) Response time to a step change in gas level is dependent on application/filter/flow rate/diffusion.
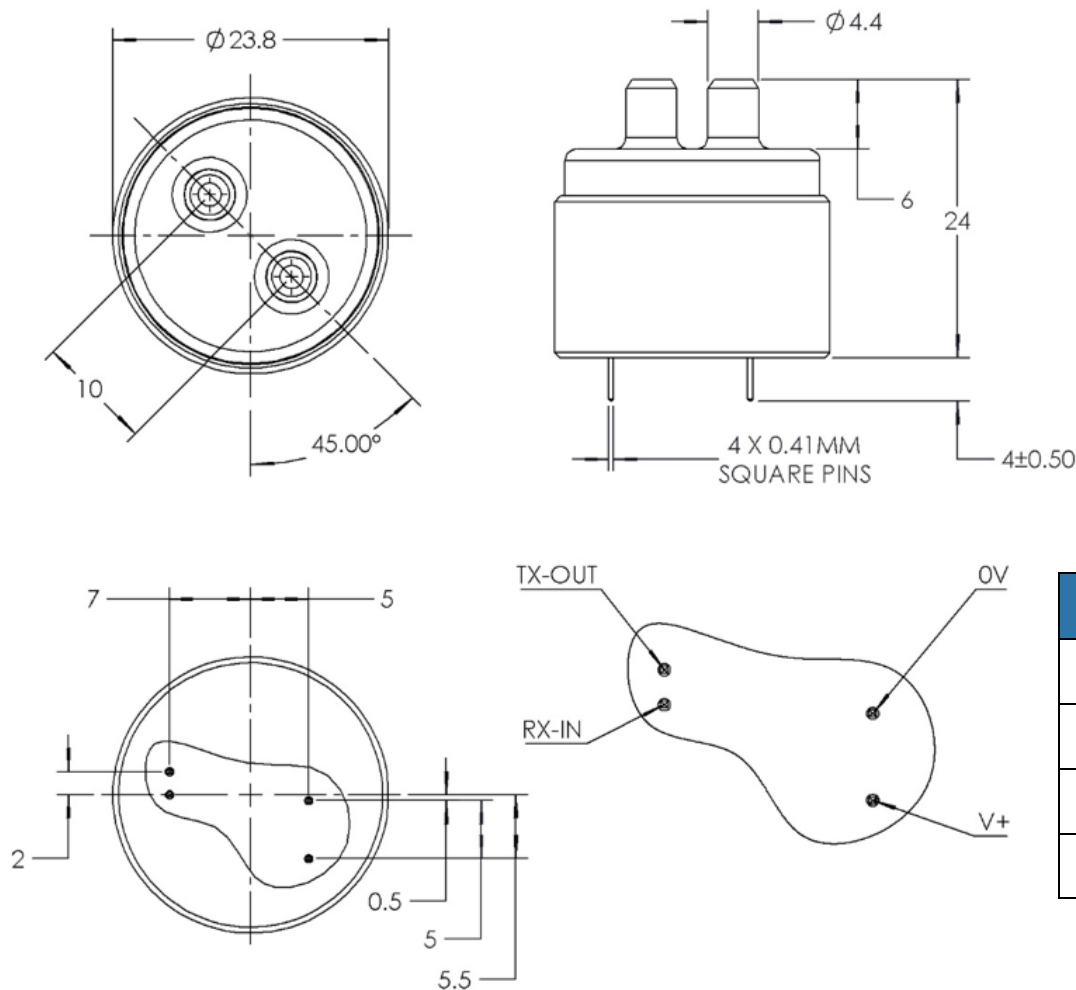
📈 RESPONSE TIME GRAPH

NOTE: T90 time measured from 0 to 10% CO_2. Digital filter switched off.

T90 response time - SprintIR V SprintIR[6S]
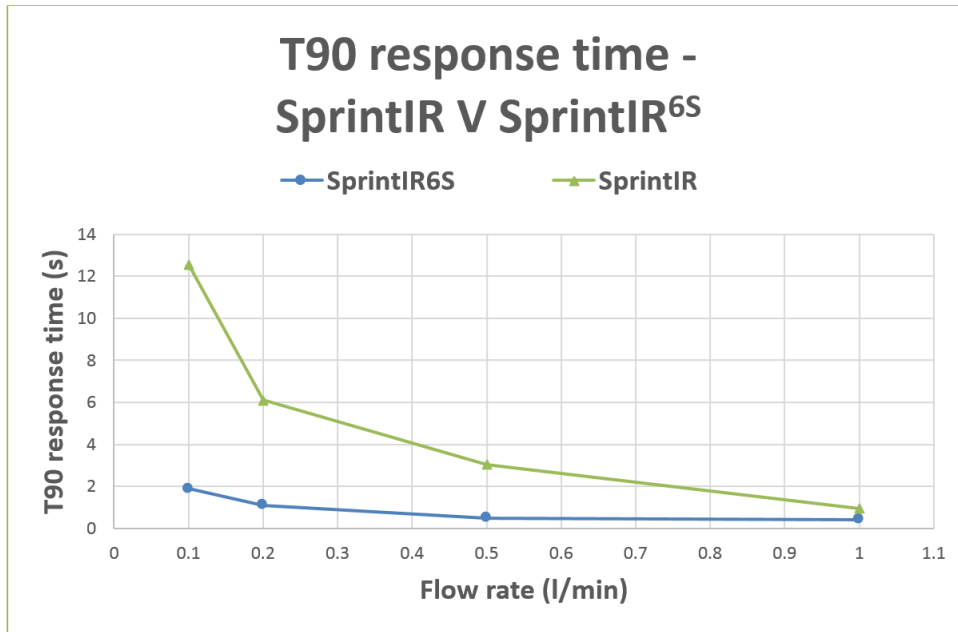
OUTLINE DRAWING & ELECTRICAL CONNECTIONS

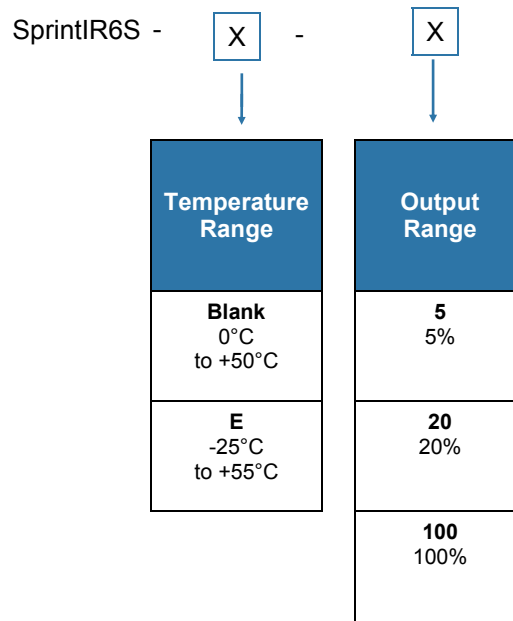2x5 0.1" header. PIN 1 is identified on the dimensional drawing. All dimensions shown in mm.

Pin	Designation
0V	GND
V+	3.3V to 5V
TX-OUT	UART Tx from sensor V_{oh} = 3V
RX-IN	UART Rx to sensor used for configuration

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.

ORDER INFORMATION

Generate your specific part number using the convention shown below. Use only the numbers that correspond to the sensor option you require — omit those you do not.

SprintIR6S - X - X

Temperature Range	Output Range
Blank 0°C to +50°C	**5** 5%
E -25°C to +55°C	**20** 20%
	100 100%

* NOTE: Temperature & humidity option not available on voltage output variant.

EXAMPLES:

- SprintIR6S -5 = Standard temperature range, 5% range.

⚠ CAUTION

Do not exceed maximum ratings and ensure sensor(s) are operated in accordance with their requirements.
Carefully follow all wiring instructions. Incorrect wiring can cause permanent damage to the device.
Do NOT use chemical cleaning agents.

Failure to comply with these instructions may result in product damage.

ℹ INFORMATION

As customer applications are outside of Week Technology Ltd.'s control, the information provided is given without legal responsibility. Customers should test under their own conditions to ensure that the equipment is suitable for their intended application.

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

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