

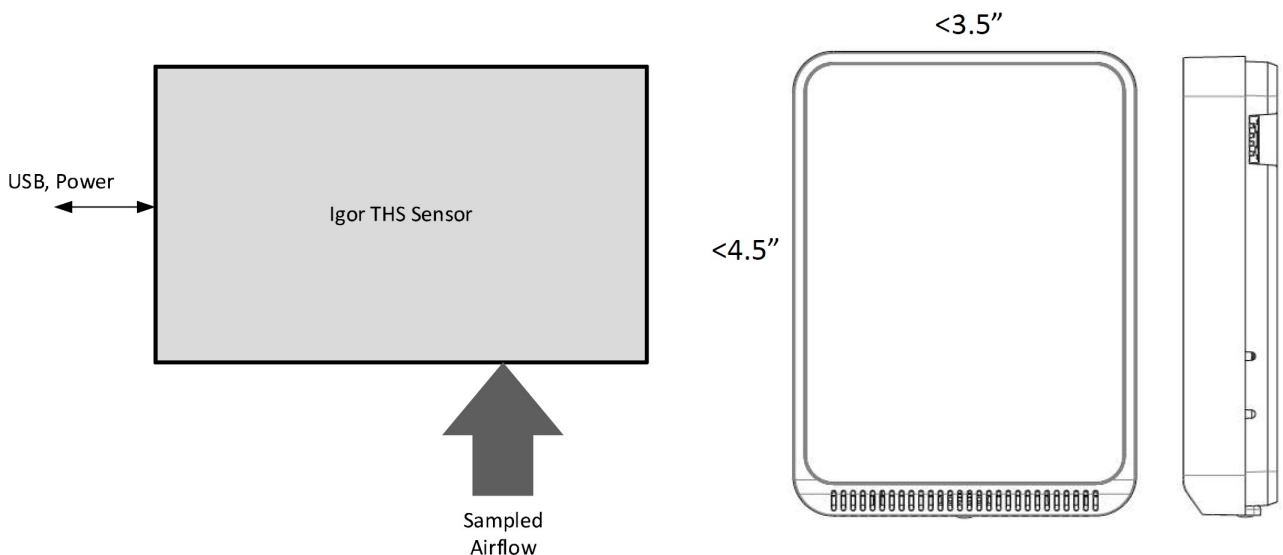
Igor[®] CO₂, TVOC, Temperature & Humidity IAQ Sensor

Model: ISIAQ-U-U

The Igor CO₂, Total VOC, Temperature-Humidity Sensor (Model ISIAQ-U-U) is mounted in its own standalone plastic case and is meant to connect to a nearby Igor Node via USB. The ISIAQ-U-U receives power and transmits data over the USB connection.

General

- USB power and communication, under 2.5W total power draw
- Embedded Sensor
- Temperature Range: -20C to +85C
- Relative Humidity Range: 0-100% non-condensing
- TVOC Range: 0-60,000 ppb (parts per billion)
- CO₂ Range: 0-60,000 ppm (parts per million)*
- Long-term reliability; 10-year operation expected
- Wall mounted



*1 ppm = 1000 ppb

Product Specifications¹

1. Unless otherwise stated, default conditions of T=25°C, humidity = 50% RH, p =1013 mbar, V_{DD} = 3.3V, continuous measurement mode with measurement rate of two (2) seconds apply to values listed in the following three specifications tables (CO₂, Humidity, and Temperature).

CO₂ Specifications

Parameter	Conditions	Value
CO ₂ measurement range	12C, UART	0 – 40'000 ppm
	PWM	0 – 5'000 ppm
Accuracy ²	400 ppm - 10'000 ppm	± (30 ppm ± 3%MV)
Repeatability ³	400 ppm - 10'000 ppm	± 10 ppm
Temperature stability ⁴	T = 0 ... 50°C	± 2.5 ppm / °C
Response time ⁵	τ _{63%}	20 seconds
Accuracy drift over lifetime ⁶	400 ppm - 10'000 ppm ASC field-calibration algorithm activated; and sensor in environment allowing for ASC or FRC field calibration algorithm applied	± 50 ppm

Humidity Specifications⁷

Parameter	Conditions	Value
Humidity measurement range	-	0%RH - 100% RH
Accuracy ⁸	25°C, 0 - 100%RH	± 3%RH
Repeatability ³	-	± 0.1%RH
Response time ⁵	τ _{63%}	8 s
Accuracy drift	-	< 0.25%RH /year

Temperature Specifications⁷

Parameter	Conditions	Value
Temperature measurement range ⁹	-	-40°C - 70°C
Accuracy ⁸	0 – 50°C	± (0.4°C+ 0.023 x (T[°C]-25°C))
Repeatability ³	-	± 0.1°C
Response time ⁵	τ _{63%}	> 10 seconds
Accuracy drift	-	< 0.03°C / year

Footnotes 2—9:

2. Deviation to a high-precision reference in the calibrated range (400-10'000 ppm) of the sensor. Accuracy is fulfilled by >90% of the sensors after calibration. Rough handling, shipping, and soldering reduces the

accuracy of the sensor. Full accuracy is restored with FRC or ASC recalibration features. Accuracy is based on tests with gas mixtures having a tolerance of $\pm 1.5\%$.

3. RMS error of consecutive measurements at constant conditions. Repeatability is fulfilled by > 90% of the sensors.
4. Average slope of CO₂ accuracy when changing temperature, valid at 400 ppm. Fulfilled by 90% of the sensors after calibration.
5. Time for achieving 63% of a respective step function. Response time depends on design-in, heat exchange, and environment of the sensor in the final application.
6. CO₂ concentrations <400 ppm may result in sensor drifts when ASC is activated. For proper function of the ASC field-calibration algorithm, the sensor must be exposed to air with CO₂ concentration 400 ppm regularly.
7. Design-in of the sensor in the final application and environment affects the accuracy of the RH/T sensor component. For optimal performance, heat sources must be considered. Use an integrated on-board RH/T compensation algorithm to account for the actual design-in.
8. Deviation to a high precision reference. Accuracy is fulfilled by >90% of the sensors after calibration.
9. The RH/T sensor component is capable of measuring up to T=120°C. Measuring at T >70°C might result in permanent damage to the sensor.

Gas Sensing Performance Signals Specifications

The values listed below are valid at 25°C, 50% RH, and typical (typ) VDD.

Parameter	Signal	Value
Measurement Range ¹	Ethanol	0 ppm to 1000 ppm
	H ₂	0 ppm to 1000 ppm
Specified measurement range ²	Ethanol	0.3 ppm to 30 ppm
	H ₂	0.5 ppm to 3 ppm
Accuracy ^{3, 4}	Ethanol	typ.: 15% of measured value
	H ₂	typ.: 10% of measured value
Sensitivity	Ethanol	-1.0
	H ₂	-1.0
Sensitivity tolerance ³	Ethanol	typ. tolerance $\pm 7\%$ rel. error max. tolerance $\pm 14\%$ rel. error
	H ₂	typ. tolerance $\pm 7\%$ rel. error max. tolerance $\pm 14\%$ rel. error
Long-term drift ^{3, 5, t}	Ethanol	typ.: 1.3% of measured value
	H ₂	typ.: 1.3% of measured. Value
Resolution	Ethanol	0.2% of measured value
	H ₂ s	
Sampling frequency	Ethanol	Max. 40 Hz
	H ₂	

1. Exposure to ethanol and H₂ concentrations up to 1000 ppm have been tested. For applications requiring the measurement of higher gas concentrations, please contact Igor Technical Services.
2. 2ppm (parts per million): 1 ppm = 1000 ppb (parts per billion).
3. 90% of the sensors will be within the typical accuracy tolerance; >99% are within the maximum tolerance.
4. Valid at an air flow of >1m/s.
5. Long-term drift is stated as change of accuracy per year of operation.
6. Test conditions: operation in 250 ppm Decamethylcyclopentasiloxane (D5) for 200h simulating 10 years of operation in an indoor environment.

Air Quality Signals Specifications

Parameter	Signal	Value
Output range	TVOC	0 ppb to 60000 ppb
	CO ₂ eq	400 ppm to 60000 ppm
Resolution	TVOC	0 ppb – 2008 ppb
		2008 ppb – 11110 ppb
		11110 ppb – 60000 ppb
	CO ₂ eq	400 ppm – 1479 pp0m
		1479 ppm – 5144 ppm
		5144 ppm – 17597 ppm
		17597 ppm – 60000 ppm
	Sampling Rate	TVOC
CO ₂ eq		

Who to Contact

Igor Technical Services

For technical assistance, please contact Igor Technical Services. Our Technical Services phone line is staffed from 7:00 A.M. to 5:00 P.M. Central time, Monday through Friday, except for U.S. holidays. If arranged in advance, we can have an engineer available during local business hours.

Phone: 515-661-4412 | 1-877-588-2650

Email: support@igor-tech.com

Inquiries

For other inquiries, please contact us here:

Email: info@igor-tech.com

Phone: 1-877-588-2650

END.