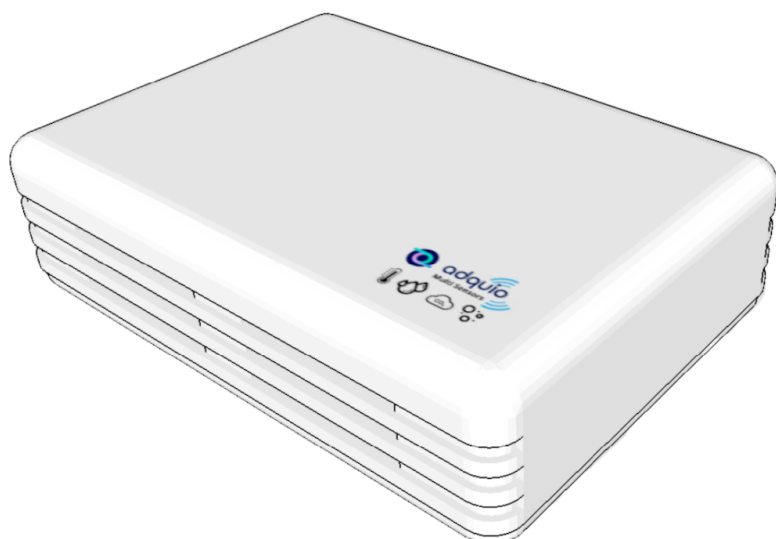


DATA SHEET — ADQUIO LORA MULTI SENSORS

LoRa temperature, humidity, CO2 and air quality probe.

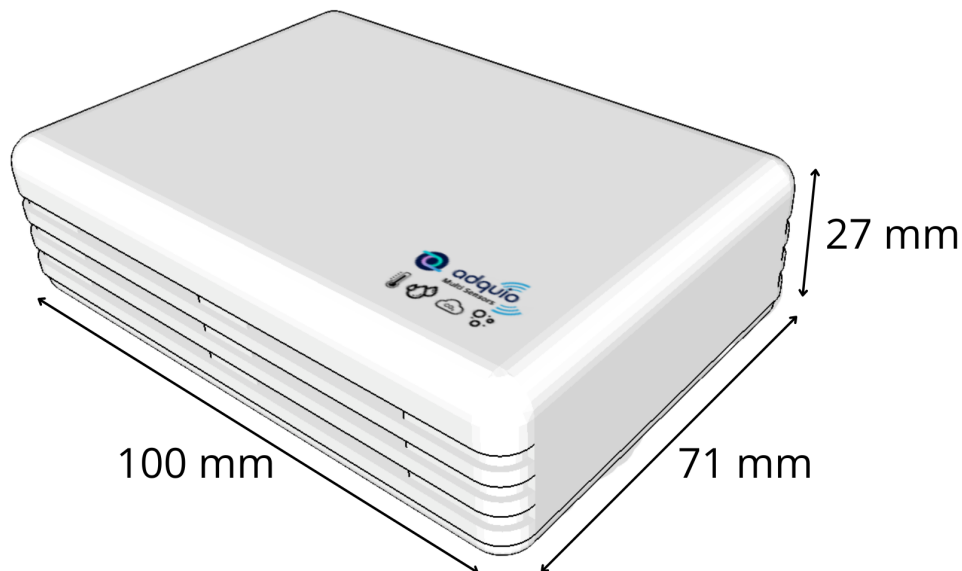


1 Ordering information

Reference	Description	Life cycle*
ADQ-STHCV-LORA	Adquio LoRa Multisensors: a probe with 4 sensors for temperature, humidity, CO2 and air quality, connected wirelessly via LoRa with low power consumption and long range.	Active

* For planning and commissioning new installations, use modules with Active status only.

2 Dimensions



3 Technical data

Parameter	Value
Power supply	
Connections	2-contact terminal block, 3.55 pitch
Connection method	Screws
Minimum and maximum voltage	100 VAC - 240 VAC
Power consumption — alternating current	200 mA maximum

CAUTION!

Exceeding the maximum power-supply voltage for process or supply voltages could cause irreparable damage to the system. The system could be destroyed.

CAUTION!

Unsuitable connecting cables cause overheating at the terminals. Adquio LoRa Multi Sensors may be destroyed if an incorrect cable type, wire size or cable temperature rating is used.

4 Sensors

Parameter	Value
Temperature	
Temperature measurement range	–40 °C to 70 °C
Accuracy	0–50 °C: $\pm (0.4\text{ °C} + 0.023 \times (T\text{ [°C]} - 25\text{ °C}))$ Deviation from a high-precision reference. Accuracy is met by > 90% of sensors after calibration.
Repeatability	$\pm 0.1\text{ °C}$ RMS error of consecutive measurements under constant conditions. Repeatability is met by > 90% of sensors.
Response time	$\tau_{63\%} > 10\text{ s}$ Time to reach 63% of a respective step function. Response time depends on the design, heat exchange and sensor environment in the final application.
Accuracy drift	$< 0.03\text{ °C / year}$
Humidity	
Humidity measurement range	0% RH – 100% RH
Accuracy	At 25 °C, 0–100% RH: $\pm 3\% \text{ RH}$ Deviation from a high-precision reference. Accuracy is achieved by > 90% of sensors after calibration.
Repeatability	$\pm 0.1\% \text{ RH}$ RMS error of consecutive measurements under constant conditions. Repeatability is met by > 90% of sensors.
Response time	$\tau_{63\%} 8\text{ s}$
Accuracy drift	$< 0.25\% \text{ RH / year}$
CO2	
Sensor type	Telaire T6713
Measurement method	Non-dispersive infrared (NDIR), gold-plated optics, diffusion sampling, with Telaire's patented ABC Logic self-calibration algorithm.

4 Sensors (continued)

Parameter	Value
CO2 measurement range	0 to 5000 ppm Exposing sensors to environments below 400 ppm for more than 15 minutes may affect accuracy due to the ABC Logic algorithm.
Accuracy	400-5000 ppm: $\pm 30 \text{ ppm} \pm 3\%$ of reading 400-2000 ppm: $\pm 25 \text{ ppm} \pm 3\%$ of reading The module may exhibit an additional tolerance of $\pm 60 \text{ ppm}$ when first installed. ABC Logic corrects this within the first few weeks of operation.
Temperature dependence	5 ppm per °C or 0.5% of reading per °C, whichever is greater
Stability	< 2% of FS over the sensor lifetime (typically 15 years)
Pressure dependence	0.13% of reading per mm Hg
Calibration interval	Not required
Response time	< 3 minutes for a typical 90% step change
Signal update	Every 5 seconds
Warm-up time	< 2 minutes (operational) 10 minutes for maximum accuracy
Operating conditions	-10 to 60 °C 0 to 95% relative humidity, non-condensing
Storage conditions	-30 to 70 °C 0 to 95% relative humidity, non-condensing
VOC (air quality)	
Sensor type	CCS811
Measurement range	0 ppb to 1187 ppb (parts per billion) TVOC (Total Volatile Organic Compound) concentration
Sampling rate	1 s
Detects	Alcohols, aldehydes, ketones, organic acids, amines, aliphatic and aromatic hydrocarbons.

5 System data

5.1 Communication

Parameter	Value
Radio system	LoRa 433/866/915 MHz, depending on the region
Communication chip	SX1276

The SX1276 incorporates the LoRa spread-spectrum modem, which can achieve significantly longer range than existing systems based on FSK or OOK modulation.

At maximum LoRa data rates, sensitivity is 8 dB better than FSK. Using a low-cost bill of materials with a 20 ppm crystal (XTAL), LoRa can improve receiver sensitivity by more than 20 dB compared with FSK. LoRa also provides significant improvements in selectivity and blocking performance, further improving communication reliability.

For maximum flexibility, the user can select the spread-spectrum modulation bandwidth (BW), spreading factor (SF) and error-correction coding rate (CR). Another benefit of spread-spectrum modulation is that each spreading factor is orthogonal, so multiple transmitted signals can occupy the same channel without interfering. This also allows simple coexistence with existing FSK-based systems.

Standard GFSK, FSK, OOK and GMSK modulation is also provided for compatibility with existing systems or standards, such as wireless MBUS and IEEE 802.15.4g.

The SX1276 offers bandwidth options from 7.8 kHz to 500 kHz with spreading factors from 6 to 12, covering all available frequency bands.

Further information and complete data sheet

SX1276/77/78/79 data sheet



5.2 Environmental conditions

Parameter	Value
Temperature — operation	−10 °C to +60 °C (wall mounting)
Temperature — storage	−40 °C to +70 °C
Temperature — transport	−40 °C to +70 °C
Humidity	Maximum 95%, non-condensing
Air pressure — operation	> 800 hPa / < 2000 m
Air pressure — storage	> 600 hPa / < 3500 m
Insulation	IP20

5.3 Mechanical data

Parameter	Value
Mounting	Wall mounting
Protection rating	IP20
Housing material	ABS, white
Mounting with double-sided tape	For flat surfaces only; adhesive included
Screw mounting	For all surface types; screws included

6 Certifications

Parameter	Value
Safety and Health	EN ISO 13849-1:2015 EN ISO 13849-2:2012 EN 62061:2005 + A1:2013 + A2:2015 EN 60950-1:2006 EN 62311:2008
EMC	EN 61000-6-4:2007 + A1:2011 EN 61000-6-2:2005
RoHS	EN 50581:2012

Fridama Instalaciones S.L.
 Rúa Ánade Real 11
 15172 Oleiros, La Coruña
 Spain
 Telephone: +34 881 24 62 55
 E-mail: soporte@adquio.com
<https://adquio.com>

© 2015–2022 Fridama Instalaciones S.L.
 We reserve all rights to this document and the information contained in it. Reproduction, use or disclosure to third parties without express authorisation is strictly prohibited.