

DATA SHEET

## ADQUIO LORA SENSORS

Temperature and humidity probe, LoRa.



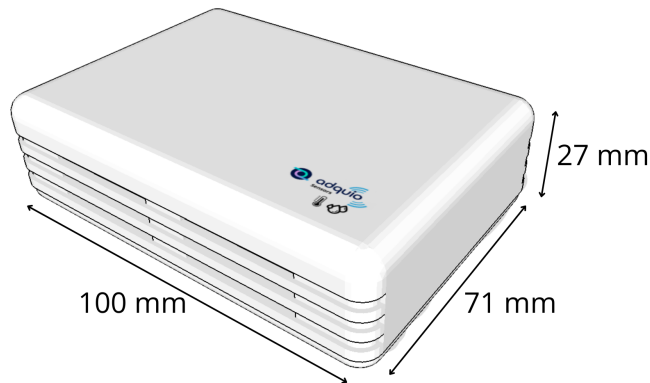
### 1 Ordering information

Reference	Description	Life cycle *
ADQ-STH-LORA	Adquio LoRa Sensors, Probe with 2 sensors, temperature and humidity, wirelessly connectable through LoRa with low consumption and long range.	Active



\* For the planning and commissioning of new installations, use modules in Active state only

## 2 Dimensions



## 3 Technical data

Parameter	Value
Supply	
Batteries	One or two 18650 Batteries
Connection method	Pressure
Minimum and maximum value	From 3V to 4.2V
Consumption	
From batteries	10 mA maximum when radio transmission



**CAUTION!**

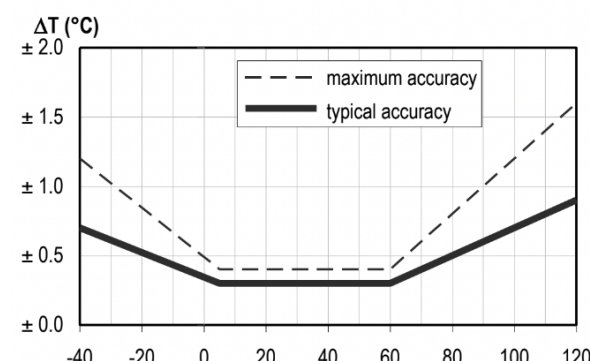
Exceeding the maximum power supply voltage for supply or process voltages could cause irrecoverable damage to the system. The system could be destroyed.

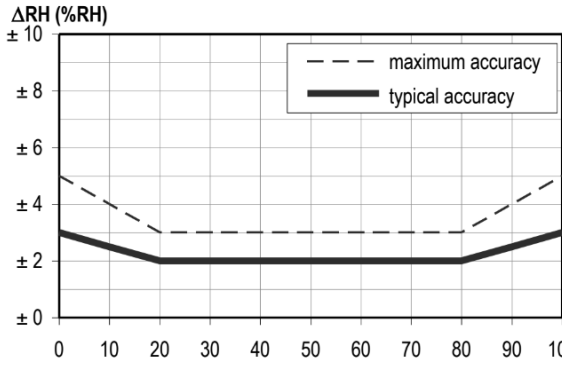


**CAUTION!**

Inadequate connection cables cause over temperature at the terminals. Adquio LoRa Sensors can be destroyed if the wrong wire type, wire size, or wire temperature rating is used.

## 4 Probes


Parameter	Value
<b>Temperature</b>	
Sensor type	SHT21
Resolution	14 bit 0.01 °C
Accuracy tolerance	Typical $\pm 0.3$ Maximum $\pm 1.2$ 
Repeatability	$\pm 0.1$ °C
Operating range	-40 to 125 °C (Normal operating range: 0-80% RH , beyond this limit, the sensor can read a reversible drift with slow kinetics (+3%RH after 60h with humidity >80%RH).)
Response time	$\tau$ 63%, 5 to 30s
Drift to long term	Typical < 0.02 °C per year
<b>Humidity</b>	
Sensor type	SHT21
Resolution	12 Bits, 0.04 % RH (Relative Humidity)

	Accuracy tolerance	<p>Typical <math>\pm 2</math>, Maximum <math>\pm 5</math></p>  <table border="1"> <caption>Accuracy Tolerance Data</caption> <thead> <tr> <th>Humidity (%RH)</th> <th>Typical Accuracy (ΔRH (%RH))</th> <th>Maximum Accuracy (ΔRH (%RH))</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>±3</td> <td>±5</td> </tr> <tr> <td>10</td> <td>±2.5</td> <td>±4.5</td> </tr> <tr> <td>20</td> <td>±2</td> <td>±3</td> </tr> <tr> <td>30</td> <td>±2</td> <td>±3</td> </tr> <tr> <td>40</td> <td>±2</td> <td>±3</td> </tr> <tr> <td>50</td> <td>±2</td> <td>±3</td> </tr> <tr> <td>60</td> <td>±2</td> <td>±3</td> </tr> <tr> <td>70</td> <td>±2</td> <td>±3</td> </tr> <tr> <td>80</td> <td>±2</td> <td>±3</td> </tr> <tr> <td>90</td> <td>±2.5</td> <td>±4.5</td> </tr> <tr> <td>100</td> <td>±3</td> <td>±5</td> </tr> </tbody> </table>	Humidity (%RH)	Typical Accuracy (ΔRH (%RH))	Maximum Accuracy (ΔRH (%RH))	0	±3	±5	10	±2.5	±4.5	20	±2	±3	30	±2	±3	40	±2	±3	50	±2	±3	60	±2	±3	70	±2	±3	80	±2	±3	90	±2.5	±4.5	100	±3	±5
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	Repeatability	$\pm 0.1$ RH																																				
	Hysteresis	$\pm 1$ RH																																				
	Non-linearity	$< 0.1$ RH																																				
	Response time	<p>8s (Time to reach 63% of a step function, valid at 25°C and 1m/s airflow.)</p>																																				
	Operating range	<p>0 to 100%RH (Normal operating range: 0-80 %RH, beyond this limit, the sensor can read a reversible offset with slow kinetics (+3%RH after 60 hours with humidity &gt;80%RH).</p>																																				
	Long Term Drift	Typical $< 0.25$ %RH per year																																				

## 5 System data

### 5.1 Communication

Parameter	Value
Radio system	LoRa 433/866/915 Mhz depending on the region
Communication based on chip	SX1276
Description	<p>The SX1276 incorporates the spread spectrum modem LoRa which is capable of achieving significantly greater range duration than existing systems based on FSK or OOK modulation.</p> <p>At maximum LoRa data rates, sensitivity is 8dB better than FSK, but using a low cost BOM with a 20ppm XTAL LoRa can improve receiver sensitivity by more than 20dB compared to FSK. LoRa also provides significant advances in selectivity and blocking performance, as well as improving communication reliability.</p> <p>For maximum flexibility, the user can decide on the modulation of spread spectrum bandwidth (BW), spreading factor (SF) and error correction rate (CR). Another benefit of propagation modulation is that each spread factor is orthogonal, so multiple transmitted signals can occupy the same channel without interfering.</p> <p>This also allows for simple coexistence with existing FSK-based systems. Standard GFSK, FSK, OOK, and GMSK modulation is also provided to allow compatibility with existing systems or standards, such as wireless MBUS and IEEE 802.15.4g.</p> <p>The SX1276 offers bandwidth options ranging from 7.8 kHz to 500 kHz with spread factors ranging from 6 to 12, covering all available frequency bands.</p>

	More information and complete datasheet	 <p><a href="#">Link</a></p>
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## 5.2 Ambient conditions

Parameter		Value
Temperature		
	Operation	-10 °C...+60 °C (Wall mounting)
	Storage	-40 °C...+70 °C
	Transport	-40 °C...+70 °C
Humidity		Max. 95% non-condensing
Air pressure		
	Operation	> 800 hPa / < 2000 m
	Storage	> 600 hPa / < 3500 m
Insulation		IP20

## 5.3 Mechanical data

Parameter		Value
	mounting	Wall
	Protection level	IP20
	Casing material	ABS White
<b>Mounting alternatives</b>		
	Wall with double-sided tape	Only for flat surfaces, adhesives included
	Mounting with screws	For all types of surfaces, 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

Neuronal Innovation Control SL  
Rúa Ánade Real 11  
15172 Oleiros, La Coruña  
Spain  
Telephone: +34 881 24 62 55  
E-mail: [support@adquio.com](mailto:support@adquio.com)  
<https://adquio.com/?lang=en>

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