

Aura CO<sub>2</sub> is a battery-operated CO<sub>2</sub> monitor that continuously measures the CO<sub>2</sub> concentration, temperature and relative humidity. It allows aeration and ventilation recommendations to be observed in classrooms, residences and offices to ensure satisfactory air renewal.

Aura CO<sub>2</sub> integrates eLichens' high performances and low power CO<sub>2</sub> double-beam channel patented NDIR sensor.

- ZERO measurement drifts thanks to its patented self-calibration algorithm
- High accuracy, no recalibration, no recharging & no maintenance required

Aura CO<sub>2</sub> integrates Bluetooth Low Energy (data communication & device configuration). Data is displayed on a low power e-Paper screen and on the online dashboard when Aura CO<sub>2</sub> is connected to the network or a smartphone.

End users can customize network on/off, alarm thresholds, sound & visual alarms and more through the eLichens Aura CO<sub>2</sub> smartphone application.

Lithium Batteries (2xAA) lifetime of 6+ years, no need for any power cable

No hidden costs nor subscription fees :

- free smartphone Application (iOS & Android)
- unlimited & free access to eLichens Cloud Dashboards, Graphs and API for remote management



## **Table of contents**

<b>1. Product summary.....</b>	<b>2</b>
<b>2. Technical specifications .....</b>	<b>3</b>
<b>3. Interfaces.....</b>	<b>6</b>
<b>5. Power Saving Mode .....</b>	<b>8</b>
<b>6. Cloud communication .....</b>	<b>9</b>
<b>7. eLichens Cloud &amp; Dashboards.....</b>	<b>10</b>
<b>8. Mobile Application .....</b>	<b>11</b>
<b>9. ICONE / Air Stiffness Index.....</b>	<b>12</b>
<b>10. Station Fixation.....</b>	<b>13</b>
<b>11. Ordering information .....</b>	<b>14</b>



## 1. Product summary

### Product:

- CO<sub>2</sub>, ambient temperature, relative humidity sensors.
- ePaper screen for a clear display of relevant information.
- Configurable visual and audible CO<sub>2</sub> level alarms.
- Bluetooth Low Energy (BLE) connectivities.
- Compact size, wall mounted and battery powered for an easy installation.
- Maintenance free.
- More than 5 years run time without changing batteries.
- Aura CO<sub>2</sub> can be installed on the wall and can be secured with the anti-theft mounting base or freestanding on a table/desk.

### Ecosystem:

- Easy configuration with our iOS and Android mobile application and BLE.
- Unlimited cloud storage, accessible through API and dashboards.
- Web and mobile data visualization applications.

### Applications

- Indoor air quality monitoring for schools, offices, homes, stores, ...
- Air purification control
- Demand control ventilation
- HVAC management



When the CO<sub>2</sub> concentration alert level is exceeded, colors on the e-paper screen are reversed to warn you.



## 2. Technical specifications

Operating conditions	
Environment	Indoor
Temperature range	0-50°C
Humidity range <sup>(1)</sup>	0-85%RH
Lifetime	>10 years

<sup>(1)</sup> Non-condensing

Power supply	
Battery type	2 x 3.6V AA Lithium Batteries
Battery Lifetime <sup>(2)</sup>	>6 years

<sup>(2)</sup> Contact eLichens for replacement batteries.

Mechanical	
Dimensions	92 x 60 x 30 mm
Mounting options	Wall-mounted (anti-theft system option) Stands on a flat surface table
Screen dimensions	73mm (2.9")

CO <sub>2</sub> Sensor	
Technology	eLichens patented dual-channel low-power NDIR
Measurement Range	400-5000ppm
Absolute Accuracy	±30ppm ±3% of reading
Output Resolution	10 ppm

Aura CO<sub>2</sub> is equipped with eLichens low power NDIR (Non Dispersive Infra-Red) CO<sub>2</sub> sensor. eLichens sensors are designed to accurately monitor Indoor Air Quality over time with ZERO drift through its innovative self-calibration system.



Temperature Sensor	
Absolute Accuracy	$\pm 0.5^{\circ}\text{C}$ at $25^{\circ}\text{C}$ and $\pm 1.0^{\circ}\text{C}$ in the full range
Output Resolution	$0.1^{\circ}\text{C}$

Humidity sensor	
Absolute Accuracy	$\pm 3\%$ RH
Output Resolution	$1\%$ RH

Available services over Bluetooth Low Energy (BLE)	
Protocol version	BLE V4.2
Services	<ul style="list-style-type: none"><li>• Get device information</li><li>• Get measures</li><li>• Set CO<sub>2</sub> alarm threshold</li><li>• Enable / Disable audible alarm</li><li>• Synchronize date and time</li><li>• Set date format</li><li>• Set Temperature unit</li><li>• Launch a manual calibration procedure</li><li>• Upload 21 days of data to eLichens Cloud</li><li>• Upgrade Firmware</li><li>• Activate / Deactivate Power Saving Mode</li><li>• Restore sensor factory calibration</li><li>• Modify LED duration</li><li>• Modify LED blinking frequency</li></ul>

With BLE connectivity, Aura CO<sub>2</sub> communicates directly with any Bluetooth connected device and allows users to access settings.

Data Storage	
On device	3 weeks, one measure every 15 minutes

e-Paper screen data refreshment	
Above alarm threshold	1 minute
Below alarm threshold	5 minutes

LED On Time
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<b>By default</b>	200 ms
<b>Custom<sup>(5)</sup></b>	0 .. 2000 ms

<sup>(5)</sup> Change LED On time may impact Aura CO2 battery autonomy

<b>LED Blinking Frequency</b>	
<b>By default</b>	1 minute above alarm threshold 5 minutes below alarm threshold
<b>Custom<sup>(5)</sup></b>	1 .. 120 min

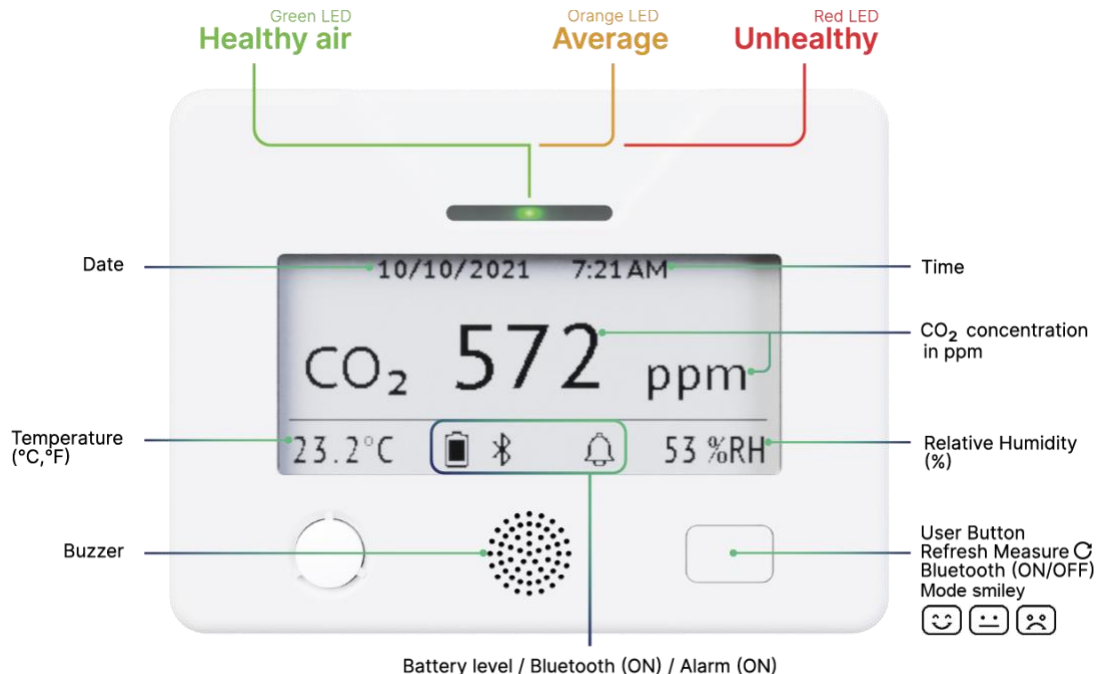
<sup>(3)</sup> Change LED On time may impact Aura CO2 battery autonomy

<b>Alarm Threshold</b>	
<b>By default</b>	1000 ppm
<b>Custom</b>	600 .. 2000 ppm



## 3. Interfaces

### Screen & User button



### User button

- A short press on the user button will refresh measures on screen
- If alarm buzzer rings, a short press on the user button will snooze it.
- A long press on the user button (around 3 sec) will enable the BLE for configuration. A beep will ring in addition with a Bluetooth icon appears on screen, confirming Bluetooth activation.
- 3 short presses allow to swap between standard display and smiley display.
- 2 short presses display on screen Aura Serial Number with a dedicated QR code.



## Visual Information & Alarms

If the CO<sub>2</sub> level is below 1000ppm (default factory setting, configurable by user),

- Flashing green LED
- Flashing orange LED when getting closer from alarm threshold (200 ppm below)

Whenever the CO<sub>2</sub> level is above 1000ppm (or user threshold) the device will alarm:

- A visible alarm:
  - o flashing red LED.
- An audible alarm: periodic “beep”.
  - o Can be disabled.
  - o When alarm sounds, it can be snoozed via the front panel button.
- Please note there is a hysteresis on the alarm level. For 1000 ppm concentration measured, AURA alarm will be effective at 1050 ppm, and will be shuttled down at 950 ppm.

## Smartphone App Features

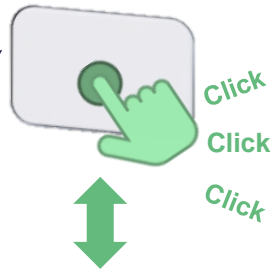
The device is configurable with a smartphone. eLichens provides a mobile application on iOS and Android:

- Set the CO<sub>2</sub> alarm threshold.
- Enable / Disable the audible alarm.
- Synchronize the date and time.
- Force a reset of device.
- Get device information
- Get measures
- Set date format
- Set Temperature unit
- Launch a manual calibration procedure
- Upload 21 days of data to eLichens Cloud
- Upgrade Firmware
- Activate / Deactivate Power Saving Mode
- Restore sensor factory calibration
- Modify LED duration
- Modify LED blinking frequency



## 4. Smiley Mode

ADVANCED MODE 



### Changing mode

User must press 3 times the button shortly (<1 second) to swap from one mode to another

SMILEY MODE 



*CO<sub>2</sub> alarm threshold is set to 1000 ppm- changeable by user*

## 5. Power Saving Mode

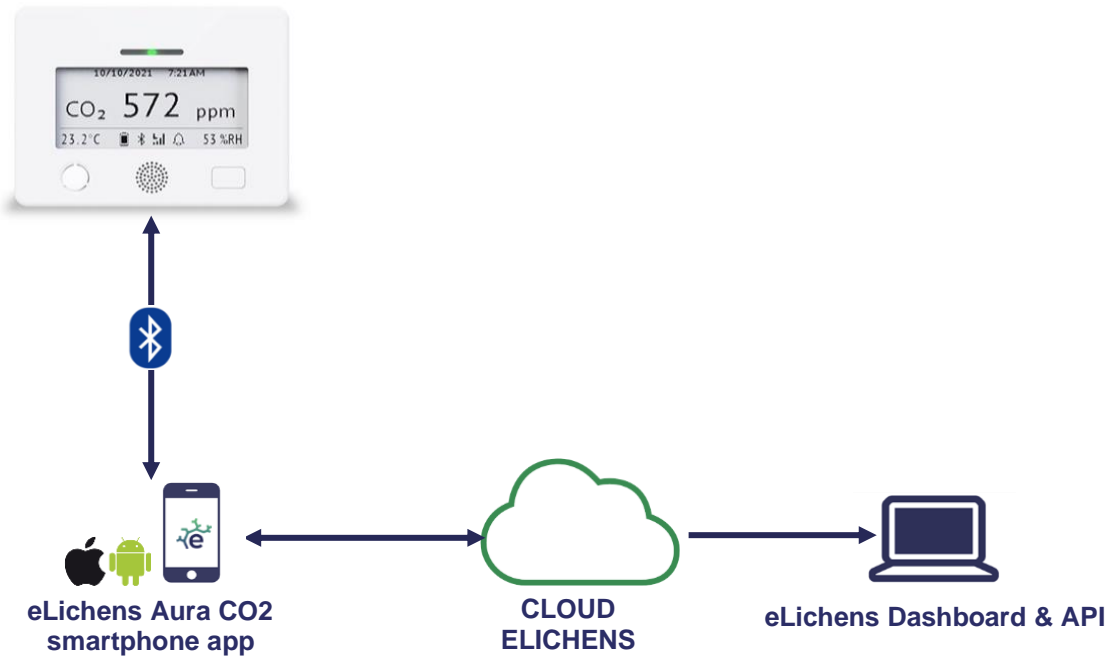
Power saving mode allow Aura CO<sub>2</sub> to increase battery lifetime. The user can activate/deactivate it within the mobile app. When activated, a “moon” and sleeping icons “ZZ” appear on screen, display is not refreshed anymore, and LED doesn’t blink from 8PM to 6AM and the whole Sunday (customizable). Data are still being recorded.





## 6. Cloud communication

The Aura CO2 recorded data is downloaded to the smartphone with the eLichens Aura CO2 app and then send to the cloud. User can access to the Aura CO2 data on the smartphone app and on online dashboards.





## 7. eLichens Cloud & Dashboards

eLichens Cloud gives to the user the unlimited access to:

- eLichens backend with plots and dashboards.
- eLichens Aura CO2 Mobile application with plots and dashboards.
- eLichens API: <https://lab.elichens.com/doc/api#tag/Air-Quality-Station>

AURA CO2 data can be display on multiple  
Dashboards



eLichens dashboards allow to:

- Get the access to all Aura CO2 recorded data with the preferred display (Dashboard, TV Mode, Advanced View)
- Access to all historical data, by time range and without limit date
- Export all data to CSV files
- Access to eLichens API documentation
- Locate AURA CO2 to get the latest eLichens outdoor Air Quality Index, based on proprietary eLichens Air Pollution Map
- Associate new stations



## 8. Mobile Application

The eLichens smartphone application allows to complete Aura-CO2 experience:

- Show data and its historic
- Configure Aura CO2 wherever you are
- Modify your alarm threshold, assess in real-time your data for one or several stations
- Download Aura CO2 data to your Dashboard



Aura CO2  
on Android/iOS

Download the eLichens smartphone application from iOS & Android:



<https://apps.apple.com/us/app/aura-co2/id1565190899>



<https://play.google.com/store/apps/details?id=com.elichens.auraco2&gl=US>





## 9. ICONE / Air Stuffiness Index

The ICONE (Indice de CONfinement d'air dans les Ecoles) is the air stuffiness index for classrooms, based on the measurement of the carbon dioxide concentration, developed by the CSTB, the French scientific and technical center for building. It takes into account both the occurrence and the intensity of CO<sub>2</sub> concentrations.

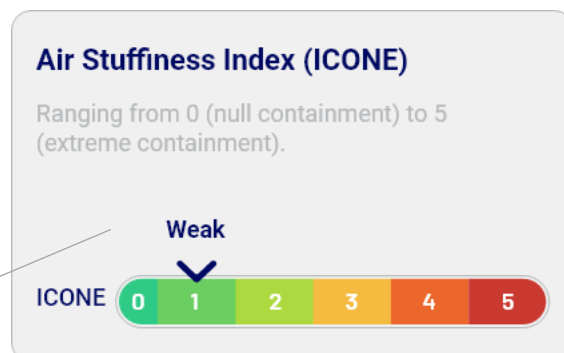
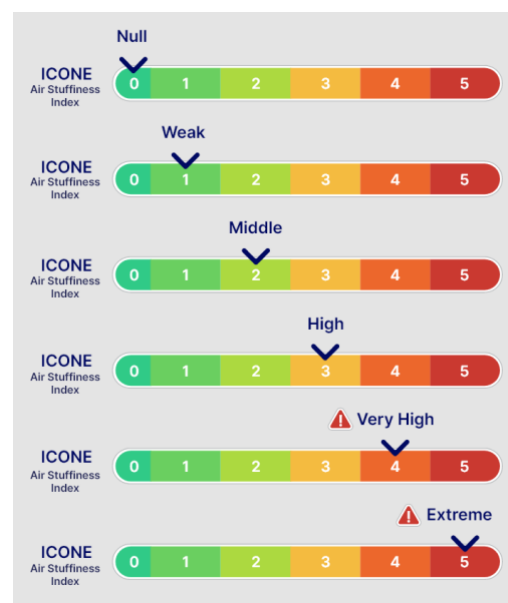
ICONE is based on the frequency and intensity of CO<sub>2</sub> levels around defined threshold values of 1000 and 1700 ppm, and taking exclusively into account children occupancy periods. The air stuffiness level of the room is then expressed by a score from 0 to 5. A score of 0 corresponds to non-stuffy air (CO<sub>2</sub> level always below 1000ppm) and is the most favorable situation. A score of 5 corresponds to extremely stuffy air (CO<sub>2</sub> level always above 1700 ppm during children occupancy) and is the worst situation. Middle scores correspond to a gradient of variable exceeding situations.

The ICONE number is the average of a weekly score rounded to the nearest integer and corresponding to one of the six categories of air stuffiness (0 to 5). The air stuffiness index reflects the quality of the air change during occupancy.

The air stuffiness index is part of the French national decree related to the mandatory monitoring of indoor air quality in public buildings (Décret n° 2012-14 du 5 janvier 2012). ICONE is now used in the mandatory control of indoor air quality in schools and nurseries.

It is a relevant and useful tool for building managers to improve ventilation conditions.

*CSTB white paper can be provided upon request.*





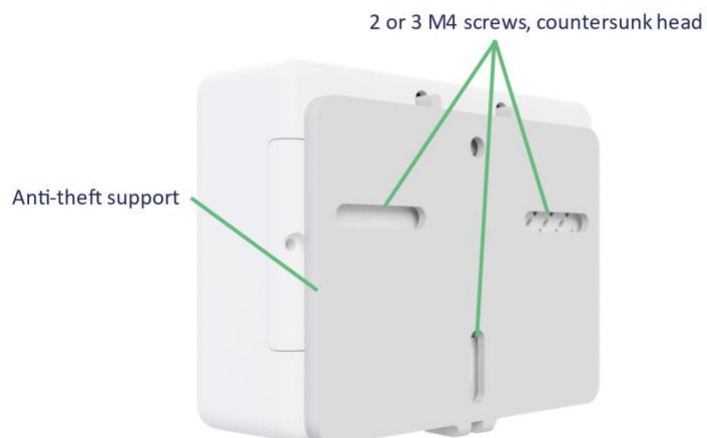
## 10. Station Fixation

The station is fixed either with 2 screws or with an optional anti-theft adapter.

### Standard Fixation



### Anti-theft Fixation





## 11. Ordering information

Below are listed the different versions with their corresponding part number:

Part Number	Specific configuration
AURA20LF221-BLE	BLE



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