AURA1 · INSTRUCTION MANUAL

Installation, use and maintenance

Safety, placement, connection, measurements with GasCatena or your own software, calibration, service and specifications of the Aura1 ambient sensor.

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This manual describes how to install, use and maintain the Aura1. Read chapter 1 (Safety) before first use and keep this manual with the device. The Aura1 is read by GasCatena or by the free Aura software on your computer; it has no settings, no clock and no log of its own, which is why this manual is short.

1. Safety

- **Indoor use only.** Do not expose the device to rain, condensation or dripping water.
- **Not for safety-critical or life-support applications.** The Aura1 is a measuring instrument for laboratory use; it is not an alarm, a gas detector or a protective device.
- **Operating conditions:** 0 – 50 °C, 0 – 95 %RH, non-condensing.
- Use a USB port or a USB power source that complies with the applicable safety standards (5 V DC).
- **Do not open the housing.** There are no user-serviceable parts inside, and the Aura1 contains no battery and no memory card that would need replacing.

CE marking. The Aura1 carries the CE marking. The EU declaration of conformity can be found through the QR code on the back label.

Disposal (WEEE). The crossed-out wheelie bin on the label means: do not dispose of the device with household waste. Hand it in at a collection point for electrical and electronic equipment, or return it to Qualimetric.

2. What the Aura1 is

The Aura1 measures the **ambient conditions** at a balance: air temperature, relative humidity and barometric pressure. It is designed for the gravimetric preparation of calibration gases, where these three quantities give the air density and the buoyancy on the cylinder, and feed the uncertainty budget. It is the recommended companion of **GasCatena**, which reads it at every weighing.

How a measurement works. The Aura1 has no processor of its own: the software on your computer takes a number of individual readings in quick succession (16 by default) and returns, for each quantity:

- the **mean** of those readings,
- the **standard deviation (SD)** of those readings, and
- the number of readings **n**.

The Aura1 reports the SD, **not** SD/√n; your software decides how to use it. A common approach is to use SD/√n (the type A uncertainty of the mean) as a floor under the calibration uncertainty, so that a measurement can only ever increase the uncertainty, never reduce it.

Timestamps. A measurement carries **no time of its own**: the computer that asks for it stamps it at that moment. This keeps a single clock in charge of every value that matters for a calibration record.

What the Aura1 does not do:

- It does not filter or smooth the data. Each reading is independent; averaging is the only noise reduction.
- It does not log and does not archive: your software keeps the record. For monitoring around the clock, also without a computer, the **Aura2** is the model to choose.
- It has no clock, no battery and no wireless connection.

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3. In the box

- Aura1 module
- USB-C cable
- Quick start sheet

The calibration certificate is included if calibration was ordered (chapter 7). This manual and the EU declaration of conformity are available through the QR code on the back label.

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4. Installation

4.1 Placement

The reading is only as good as the air around the sensors.

- Mount the module **where you want to know the conditions**: close to the balance, at the height of the weighing pan, and in the same air.
- Mount it with the **cable gland at the bottom**. Keep the ventilation slots on both sides free; do not cover the device or place it against a surface that blocks the slots.
- Keep it away from heat sources (lamps, computers, radiators, direct sunlight) and out of direct draughts from air-conditioning outlets.
- After moving the device, or after connecting it for the first time, allow **at least 30 minutes** for it to settle to the room before you rely on the readings.

4.2 Connecting

Connect the USB-C cable to the computer that runs GasCatena or the Aura software. The Aura1 is powered from USB; it has no on/off switch and no battery. It is a standard USB device (HID class): Windows 10/11 recognises it by itself and **no driver is needed**. The **ON** light shows that it is powered and the **CONN** light that the computer has recognised it (chapter 6).

Use a USB cable that carries data; some USB-C cables carry power only. **Only one program at a time** can use the Aura1. Close the other program first.

4.3 Ways to read the Aura1

Way	What you need
GasCatena	select the Aura1 once under *Settings* → *Sensors* (section 5.1)
Aura software	the free Python package from Qualimetric, Python 3.11 or later (section 5.2)
Your own software	the Aura software as a library in your own Python program (section 5.3)

5. Taking measurements

5.1 With GasCatena

Select the Aura1 under *Settings* → *Sensors*. From then on GasCatena reads it **at every weighing** and records the temperature, humidity and pressure with the preparation, for the air density and the buoyancy effect. Nothing else needs to be done; the ambient conditions appear with the weighings and on the preparation record.

5.2 With the Aura software

The Aura software is a free Python package that reads the module from the command line:

```
python -m aura meet --route aura1          one averaged measurement (n = 16)
python -m aura meet --route aura1 --n 32   the same, averaged over 32 readings
```

The answer gives, per quantity, the mean, the SD and n. Temperature is in °C, relative humidity in %RH and pressure in **pascal**: 101 325 Pa = 101.325 kPa.

5.3 From your own software

Your own Python program calls the Aura software as a library and receives the same mean, SD and n. Timestamp each measurement in your software when you request it, and record the identity of the unit with it (section 5.4).

5.4 Identification

Every Aura1 carries a **serial number** on the back label (for example `2026-00012846`). Record it in your equipment register and with every measurement you store: it links each value to the unit and to its calibration certificate. After any repair, check the serial number on the certificate against the unit.

6. Indicator lights

The front of the Aura1 has three indicator lights:

Light	State	Meaning
ON (red)	on	powered from USB
CONN (green)	on	the module is recognised by the computer
COMM (yellow)	flashing	the sensors are being read

All three off: no power. ON without CONN: the computer does not see the module (chapter 9).

7. Calibration

The Aura1 is supplied **uncalibrated** as standard. Its accuracy and repeatability are therefore **not specified until the unit has been calibrated**: they are stated on the calibration certificate, per quantity and over the calibrated range. Calibration is optional, at additional cost:

- **Calibration by Qualimetric**, in accordance with ISO/IEC 17025: by comparison against reference standards calibrated by ISO/IEC 17025 accredited laboratories; results are metrologically traceable to the SI.
- **Calibration by a laboratory of your choice.** You can also have the Aura1 calibrated by a calibration laboratory of your own choice, for example one accredited to ISO/IEC 17025 for this calibration.

Temperature, humidity and pressure are calibrated together, so that the air density and the buoyancy calculated from them rest on calibrated values. The calibration range is available on request.

Recalibration. The interval is set by your quality system; once a year is common. You can recalibrate on site against your own references, with our assistance if needed, have Qualimetric calibrate it in accordance with ISO/IEC 17025, or use a calibration laboratory of your choice. When Qualimetric calibrates a unit that is returned after use, it is calibrated **as found** (as it arrived) and, if an adjustment is made, again **as left** (as it is returned), so that your measurement history stays continuous.

8. Maintenance and service

- **Cleaning:** wipe the housing with a dry or slightly damp cloth. Do not spray cleaning agents into the ventilation slots.
- **No scheduled service.** The Aura1 has no battery, no clock cell and no firmware of its own, so there is nothing to replace or update. Recalibration (chapter 7) is the only recurring task.
- **Support and repair:** contact info@qualimetric.nl with the serial number from the back label and a short description. Support is given by e-mail in English or Dutch. Units for repair or calibration are returned to Qualimetric after agreement on a return number.

Warranty. Qualimetric warrants the Aura1 against defects in materials and workmanship for **24 months** from delivery. Within the warranty period a defective unit is repaired or replaced free of charge. The warranty does not cover damage from misuse, liquids or condensation, operation outside the specified conditions, opening the housing, or modifications. Calibration drift and recalibration are not covered by the warranty.

9. Troubleshooting

Symptom	Likely cause and remedy
No light on the front	No power: check the USB cable and the USB port. Some USB-C cables carry power only.
ON on, **CONN** off	The computer does not see the module: try another USB port or cable, and avoid unpowered USB hubs.
GasCatena or the Aura software cannot open the module	Another program has the Aura1 open. Only one program at a time.
Readings drift after connecting or moving	The module is still settling to the room: allow 30 minutes (section 4.1).
A measurement fails with a read error	A sensor does not respond. Disconnect and reconnect the USB cable; if it happens again, contact Qualimetric.

10. Technical specifications

	Aura1
Temperature	0 – 50 °C
Relative humidity	0 – 95 %RH, non-condensing
Barometric pressure	30 – 125 kPa
Accuracy and repeatability	stated on the calibration certificate; not specified for an uncalibrated unit
Output	mean, SD and n per quantity; pressure in Pa
Averaging	set by your software; 16 readings by default
Interface	USB-C; standard USB device (HID class), no driver needed
Status lights	ON (red) · CONN (green) · COMM (yellow)
Environmental log	none; your software keeps the record
Clock	none; your computer stamps each value
Power	5 V DC via USB-C; no battery
Enclosure	86 × 85 × 25.5 mm, cable gland at the bottom
Operating conditions	indoor, 0 – 50 °C, 0 – 95 %RH non-condensing
Software	GasCatena; the free Aura software for Windows (Python 3.11 or later)
Conformity	CE; WEEE

11. Contact

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