YO Pure Pro .

Datasheet

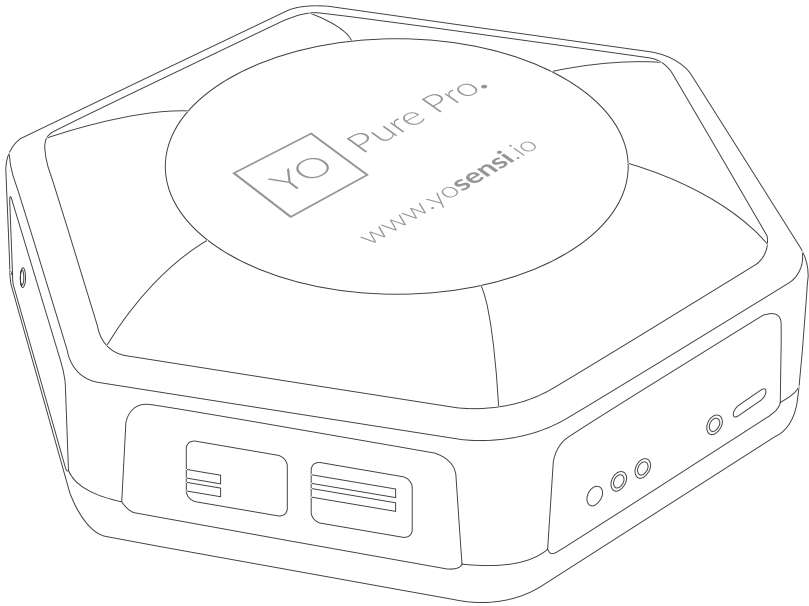# YO | Pure Pro.

Application

- YO Pure Pro is a device for measuring indoor environmental conditions.
  YO Pure Pro measures concentrations of:

  – particulate matter (PM2.5),

  – particulate matter (PM4),

  – particulate matter (PM10),

  – carbon monoxide (CO),

  – carbon dioxide (CO2),

  – total volatile organic compounds (TVOC),

  – atmospheric pressure,

  – illumination,

  – temperature,

  – humidity,

  – noise level.

- The device may be used wherever there is a need to diagnose quality and environmental conditions in a room that will consequently lead to their improvement.

Components

- The device consists of a microcontroller (with Bluetooth Low Energy), a communication module (LoRa), sensors and a charger for 2 x Li-Ion 18650.

- The enclosure of the device is made of ABS plastic (FR). It has a mounting bracket which allows the device to be easily mounted on the ceiling or wall. The enclosure is equipped with rubber feet for stable desktop use.

- The device is equipped with an RGBW LED to indicate the status of the device/radio and orange LED to indicate the charge status.

Operation of the device

- A LoRaWAN network is required for data transmission.

- The device can be powered via USB-C connector, external power supply, or in the absence of those, from Li-Ion 18650 batteries.

- YO Pure Pro should be placed in a room whose parameters are desired to be measured.

- It is possible to configure or reconfigure device parameters, at any time, via BLE.

- The device takes measurements at the interval specified in the configuration parameters.

- Yosensi provides access to a Command Line Interface application as a part of a comprehensive solution, allowing the device to be configured.

- It is recommended to add the device to the Yosensi Management Platform, which allows detailed and easy monitoring of the data transmitted by the devices.

Device configuration

LoRaWAN settings	Network type (private or public) Operating mode selection (OTAA or ABP)	
	OTAA	**ABP**
	• Device EUI • Application EUI • Application key • Number of trials	• Device address • Network session key • Application session key
Bluetooth Low Energy (BLE) settings	Transmission power Advertising frame interval	
Device settings	Measuring interval	

Advantages

- Production quality - made in the European Union by qualified engineers.

- The device measures as many as ten non-electrical environmental parameters.

- Sensors measuring CO, CO_2, and PM2.5 concentrations are pre-calibrated at the production stage.

- CO and CO_2 sensors do not react to other gases in the environment.

- The PM2.5 measurement is MCERTS certified.

- It is possible to choose the most convenient way of power supply.

- With the additional mounting bracket, the YO Pure Pro can be easily mounted on the ceiling or wall.

- Trendy hexagon-shaped enclosure.

- Low energy consumption.

- Wireless communication - no need for additional wiring or conversion of existing installations.

- Depending on the version, the LoRa radio can operate in different regions (e.g., EU868, US915, AU915, AS923) adapted to different ISM frequency bands.

- If there is no LoRaWAN network, the data is sent via BLE.

- Using Bluetooth Low Energy (BLE) provides:
  – Configuration convenience (in a user-friendly way via a JSON data exchange format)
  – Possibility of firmware update via OTA
  – Very low energy consumption

- Supported LoRaWAN network type: private or public and connection over ABP or OTAA.

- Command Line Interface application for convenient device configuration.

- Access to the Yosensi Management Platform system for configuring devices and managing infrastructure.
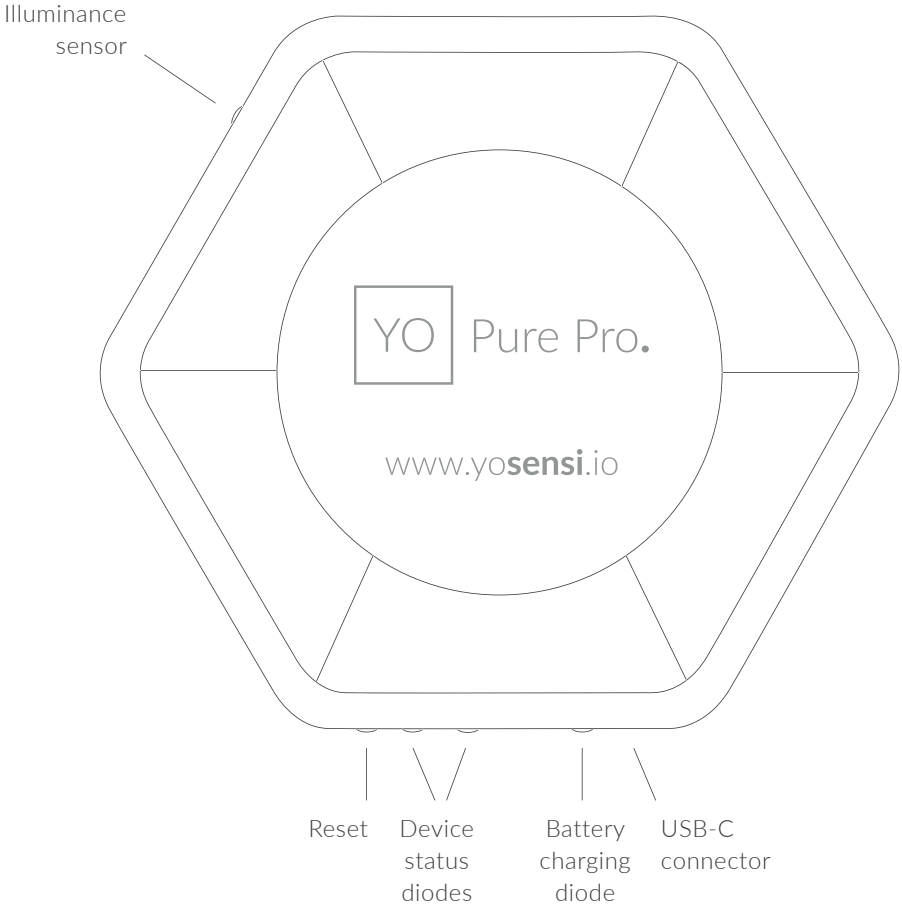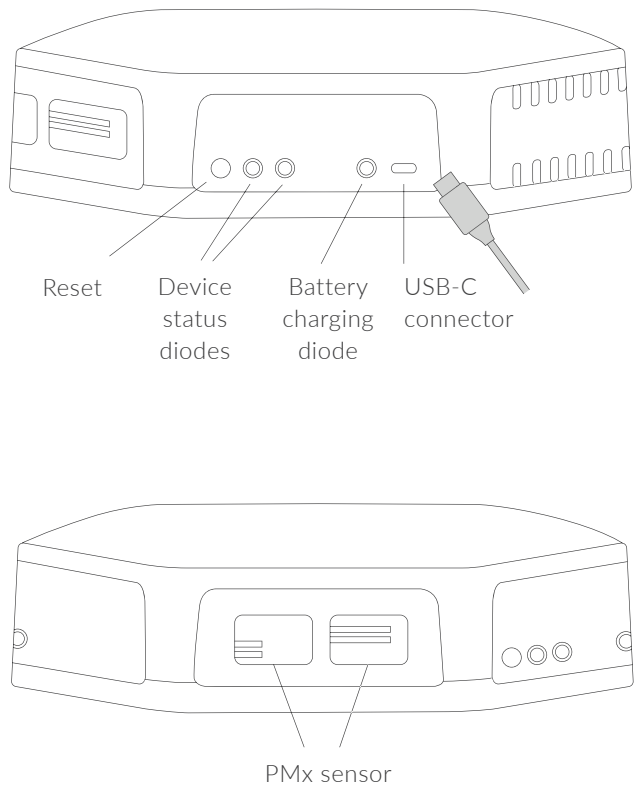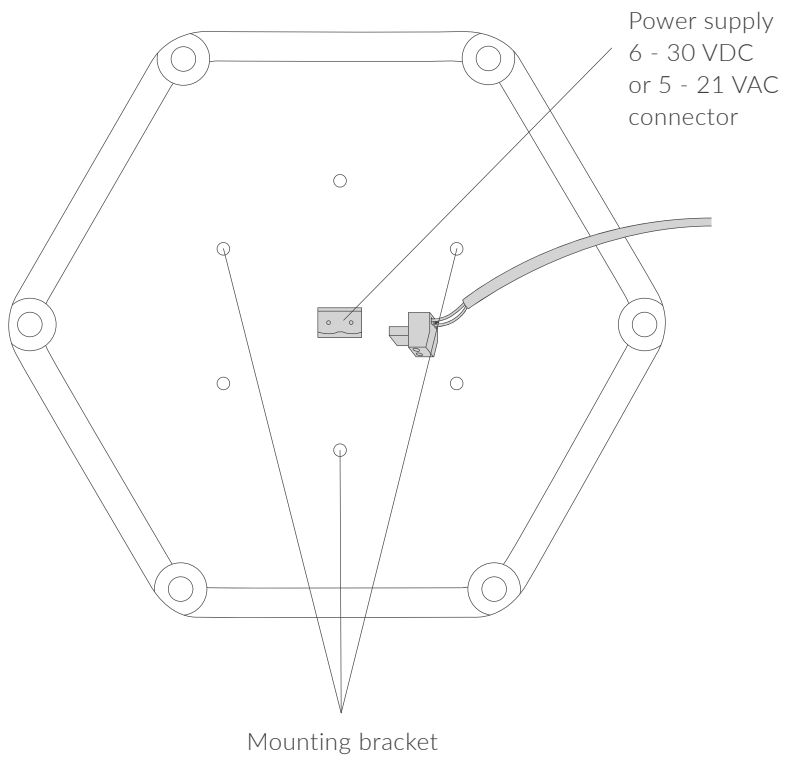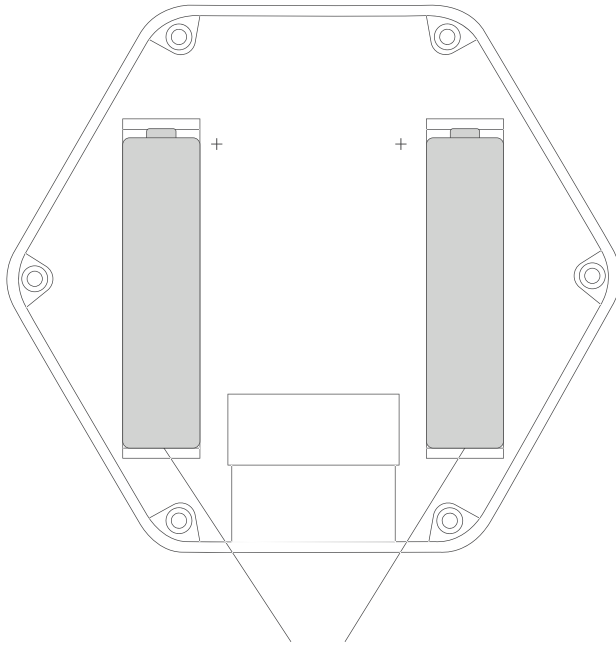
Technical details

Illuminance sensor

YO Pure Pro.

www.yosensi.io

Reset   Device status diodes   Battery charging diode   USB-C connector

Figure 1. Top view of the device.

Reset   Device   Battery   USB-C
status   charging   connector
diodes   diode

PMx sensor

Figure 2. Side views of the devices.

Power supply
6 - 30 VDC
or 5 - 21 VAC
connector

Mounting bracket

Figure 3. Bottom view of the device.

2 x battery Li-Ion 18650

Figure 4. Inside view of the device.

Enclosure of the device

Dimensions	Height: 45 mm Width: 130 mm Length: 146 mm
Colour	White
Installation	Screw and external mounting bracket
Enclosure material	ABS (FR)
Level of protection	IP40

146 mm

130 mm

45 mm
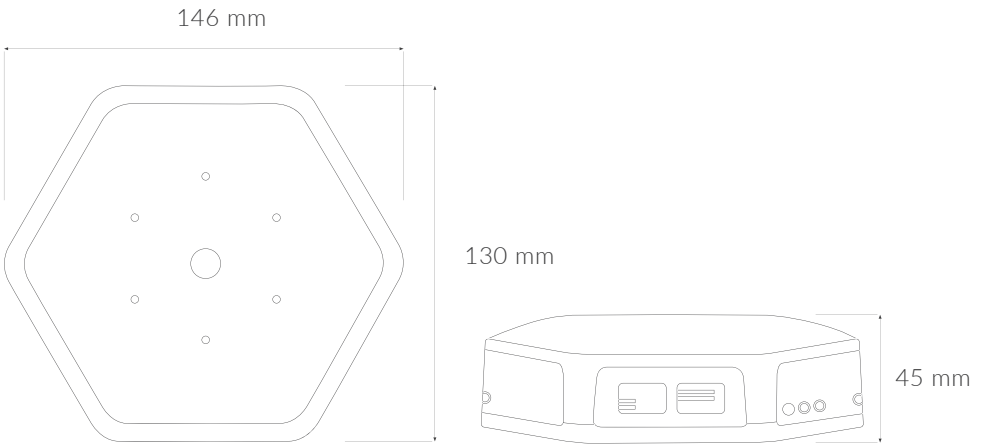
Figure 5. Dimensions of the device.

Parameters

Tx Power	LoRa EU868: to +14 [dBm] LoRa US915, AU915, AS923: to +22 [dBm] Bluetooth Low Energy (BLE): -20 to +6 [dBm]
Power supply	USB-C 5 V DC 6 - 30 V DC 5 - 21 V AC 2 x backup battery Li-Ion 18650 (2x 3,6 V DC)
Power consumption	Maximum: 1,1 A (12 VDC)
Measuring range	**PM2.5 - pre-calibrated:** Measuring range: 0 to 1000 µg/m3 Size range: 0,3 to 2,5 µm Recommended working conditions: 10°C to 40°C (50°F to 104°F)/ from 20% RH to 80% RH Accuracy: ±10 µg/m3 (in temperature 25°C (77°F)) **PM4:** Measuring range: 0 to 1000 µg/m3 Size range: 0,3 to 4,0 µm Recommended working conditions: 10°C to 40°C (50°F to 104°F)/ from 20% RH to 80% RH Accuracy: ±25 µg/m3 (in temperature 25°C (77°F)) **PM10:** Measuring range: 0 to 1000 µg/m3 Size range: 0,3 to 10,0 µm Recommended working conditions: 10°C to 40°C (50°F to 104°F)/ from 20% RH to 80% RH Accuracy: ±25 µg/m3 (in temperature 25°C (77°F))

Measuring range

CO - pre-calibrated:
Measuring range: 0 ppm to 1000 ppm
Recommended working conditions: -20°C to 40°C
(-4°F to 104°F) / from 15% RH to 95% RH
Measurement repeatability: < ±2%

CO_2 - pre-calibrated:
Measuring range: 0 ppm to 40 000 ppm
Recommended working conditions: -10 - 60 °C (14°F to
140°F) / from 0% RH to 95% RH
Accuracy of measurements: ±(40 ppm+5%)
(in the measuring range from 400 ppm to 5000 ppm)

Total volatile organic compounds (TVOC) - pre-calibrated:
Measuring range: 0 to 20 mg/m3
Accuracy: ±15 %

Atmospheric pressure:
Pressure range: 10 hPa to 1200 hPa
Absolute accuracy: ±1.5 hPa (in temperature from
25°C (77°F))
Recommended working conditions: -40°C to 85°C
(-40°F to 185°F)

Illuminance:
Measuring range: 0 lx to 120 klx
Recommended working conditions: -25°C to 85°C
(-13°F to 185°F)
Accuracy: 10% (in temperature 25°C (77°F)

Temperature:
Measuring range: -40°C to 125°C (-40°F to 257°F)
Accuracy: ±0,2°C (32.36°F) (at temperatures from
10°C to 60°C (50°F to 140°F))

Relative Humidity:
Measuring range: 0% to 100%
Accuracy: ±2°C (35.6°F) (at a relative humidity
from 20 to 80%)

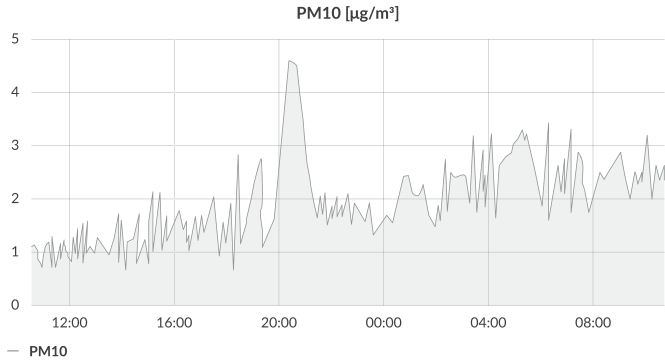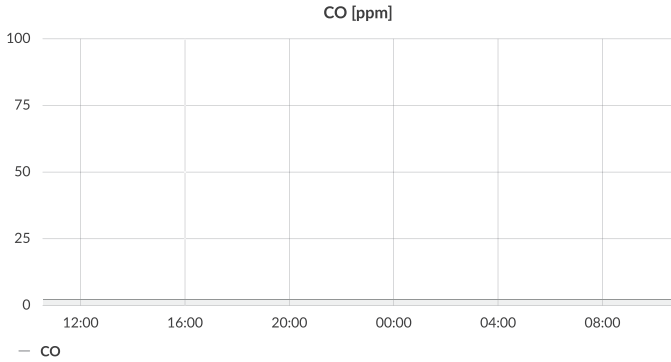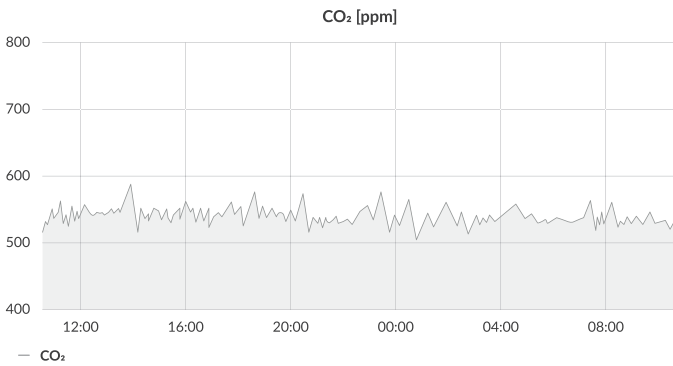| Measuring range	**Sound Pressure Level:** Measuring range: 45 dB to 110 dB SPL Operating temperature: -40°C to 100°C (40°F to 212°F) The frequency range: 100 Hz to 10 kHz Sensitivity: -42 dBV/Pa SNR: 59 dB(A)
Weight	200 g
Certificates	C E

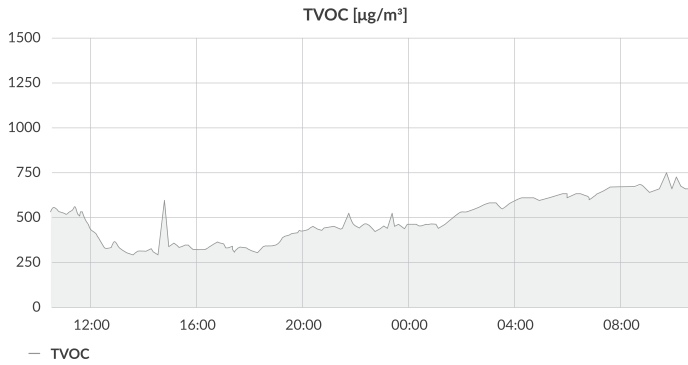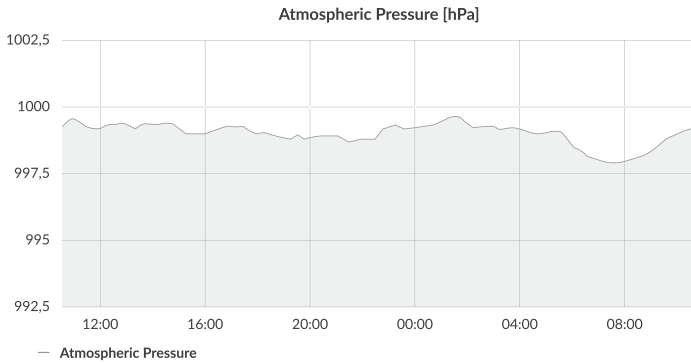# Sample charts
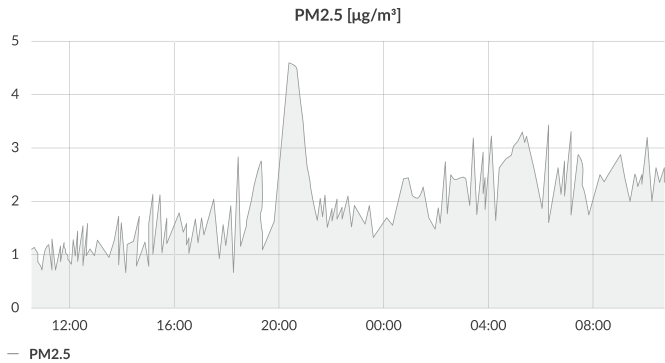
Example of a **PM2.5** monitoring chart.

Example of a **PM10** monitoring chart.
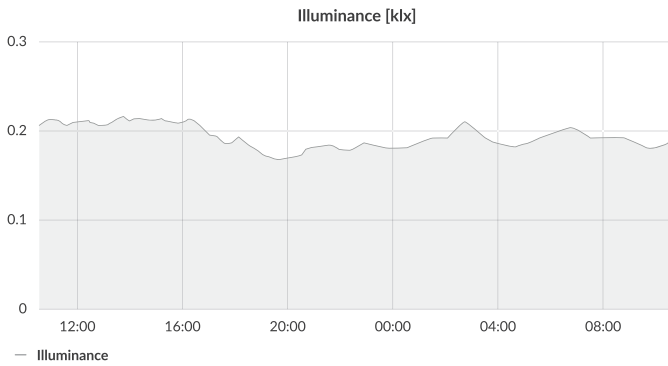

Example of a **CO** monitoring chart.
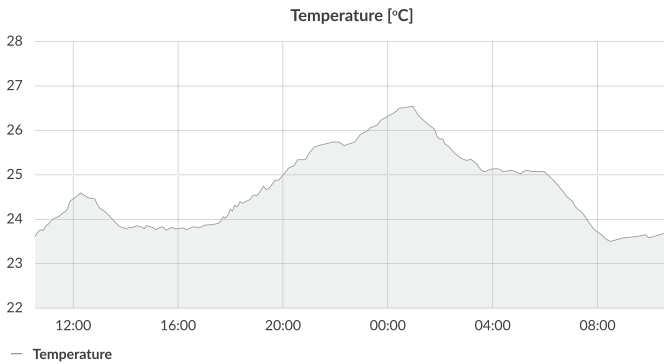

Example of a **CO₂** monitoring chart.

Example of a **TVOC** monitoring chart.

Example of an **atmospheric pressure** monitoring chart.

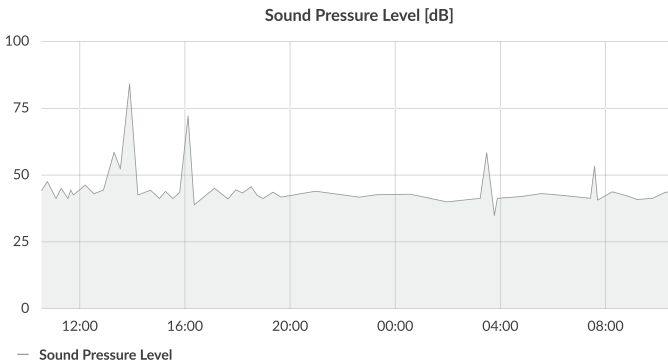Example of an **illuminance** monitoring chart.

Temperature [°C]

Example of a **temperature** monitoring chart.

Relative humidity [%H]
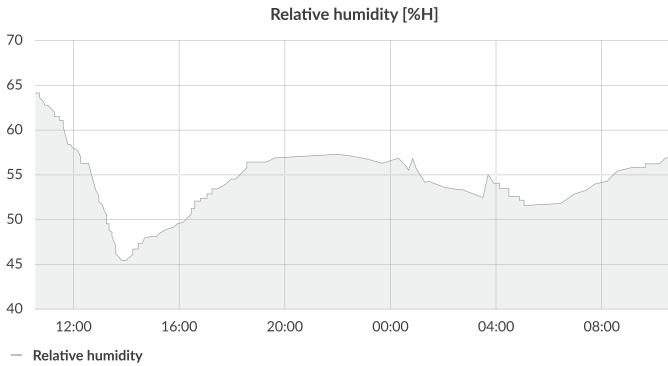
Example of an **relative humidity** monitoring chart.

Sound Pressure Level [dB]

Example of an **sound pressure level** monitoring chart.

Revision history

Date	Version	Page(s)	Changes
August 2020	1	All	Initial version
December 2020	1.1	8	Added information about the atmospheric pressure sensor in the "Parameters" table.
September 2021	1.2	2, 4, 7, 9	Added information about the PM2.5 and PM10 sensor.
December 2021	2	2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Added information about new enclosure, replaced sensors (atmospheric pressure, temperature, relative humidity, TVOC, CO2, and sound pressure level), the new option of power supply (USB-C, 6-30 V DC, 5-21 V AC, battery Li-Ion 18650).
January 2022	2.1	1, 5, 6, 9	Changing the position of diodes.
February 2022	2.2	3, 4	Changes are related to the firmware and apply to devices working with firmware version 2.0.0 and above.

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