



Pure Pro .

Datasheet





Application

- YO Pure Pro is a device for measuring environmental conditions indoors.
- YO Pure Pro measures concentrations of PM2.5, PM10, CO, CO₂, TVOC, atmospheric pressure, illumination, temperature, humidity, and 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, communication modules (LoRa, Bluetooth Low Energy) and sensors.
- The enclosure of the device is made of nylon and is suitable for easy installation on a ceiling or wall.
- The device is equipped with an RGBW diode, which indicates the operating status of the device.

Operation of the device

- A LoRaWAN network is necessary for data transmission.
- The device must be powered from the mains.
- 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 can provide access to a mobile application as a part of a comprehensive solution, allowing the device to be configured and connected to the LoRaWAN network. Additionally, it offers a preview of the operating parameters via BLE.
- It is recommended that the device be added to the Yosensi Suite system, which allows for easy management of the data transmitted by the devices.

Device configuration

Device settings

Measuring interval

Bluetooth Low Energy (BLE) settings

Transmission power
Advertising frame interval

LoRaWAN settings

Operating mode selection (OTAA or ABP)

OTAA

- Device EUI
- Application EUI
- Application key
- Number of trials

ABP

- Device address
- Network session key
- Application session key

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, CO₂, and PM2.5 concentrations are pre-calibrated at the production stage.
- CO and CO₂ sensors do not react to other gases in the environment.
- The PM2.5 measurement is MCERTS certified.
- 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. in EU868, US915, AU915, etc. adapted to different ISM frequency bands. Mobile application for convenient device configuration and network monitoring.
- If there is no LoRaWAN network, the data is sent via BLE.
- Using Bluetooth Low Energy (BLE) provides:
 - Configuration convenience
 - Possibility of firmware update via OTA
 - Very low energy consumption
- Supported LoRaWAN connection over ABP or OTAA.
- Mobile application for convenient device configuration and network monitoring.
- Access to the Yosensi Suite system for configuring devices and managing infrastructure.

Technical details



Figure 1. Top view of the device.

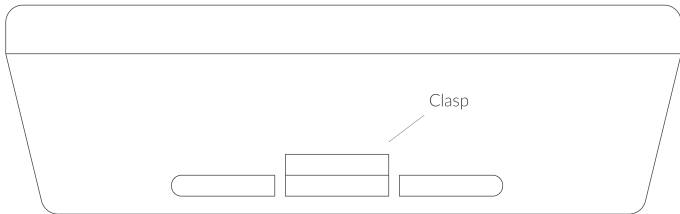


Figure 2. Side view of the device.

Enclosure of the device

Dimensions	Height: 40 mm Depth: 136 mm	Width: 136 mm
Colour	White	
Installation	Screw	
Enclosure material	Nylon	
Level of protection	IP20	

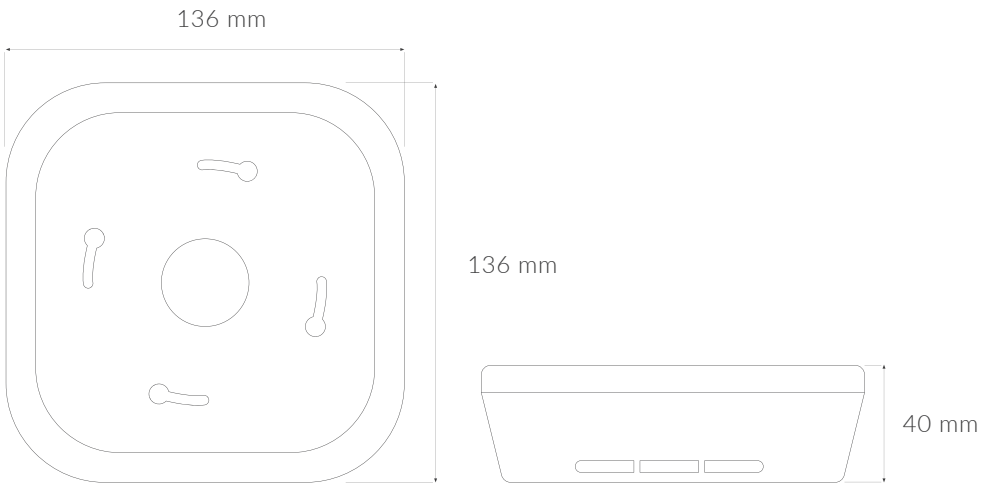


Figure 3. Dimensions of the device.

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

100–240 V AC
50/60 Hz

Measuring range

PM2.5 - pre-calibrated:

Measuring range: 0 to 1000 $\mu\text{g}/\text{m}^3$
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: $\pm 10 \mu\text{g}/\text{m}^3$ (in temperature 25°C (77°F))

PM10:

Measuring range: 0 to 1000 $\mu\text{g}/\text{m}^3$
Size range: 0,3 to 10 μm
Recommended working conditions: 10°C to 40°C (50°F to 104°F) / from 20% RH to 80% RH
Accuracy: $\pm 25 \mu\text{g}/\text{m}^3$ (in temperature 25°C (77°F))

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: $< \pm 2\%$

CO₂ - pre-calibrated:

Measuring range: 300 ppm to 5000 ppm
Recommended working conditions: 0°C to 50°C (32°F to 122°F) / 5% to 85% RH
Accuracy of measurements: $\pm(50 \text{ ppm} + 3\%)$
(in the measuring range from 300 ppm to 5000 ppm)

Measuring range

Volatile organic compounds (TVOC) - pre-calibrated:

Measuring range: 0 ppb to 60000 ppb [parts per billion]; approx. 0-270 mg/m³ (the conversion assumes a molecular mass of the TVOC reference gas mixture equal to 111,86 g/mol, 25°C (77°F) temperature and 1,013 bar pressure).

Accuracy: ±15%

Atmospheric pressure:

Pressure range: 300 hPa to 1100 hPa

Absolute accuracy: ±1 hPa (in temperature 0°C to 40°C (32°F to 104°F) and atmospheric pressure 950 hPa to 1050 hPa)

Recommended working conditions: -40°C to 85°C (-40°F to 185°F)

Illuminance:

Measuring range: 0,01 lx to 83 klx

Recommended working conditions: -40°C to 85°C (-40°F to 185°F)

Accuracy: 10% (in temperature 25°C (77°F), ~2 klx)

Temperature:

Measuring range: -40°C to 125°C (-40°F to 257°F)

Accuracy: ±0,3°C (at temperatures between -40°C to 90°C (-40°F to 194°F))

Relative humidity:

Measuring range: 0% to 100%

Accuracy: ±2°C (35,6°F) (at a relative humidity from 0 to 100%)

Volume:

Measuring range: 30 to 120 dB SPL

Optimal operating temperature: 40°C to 100°C (104°F to 212°F)

The frequency range: 100 Hz to 10 kHz

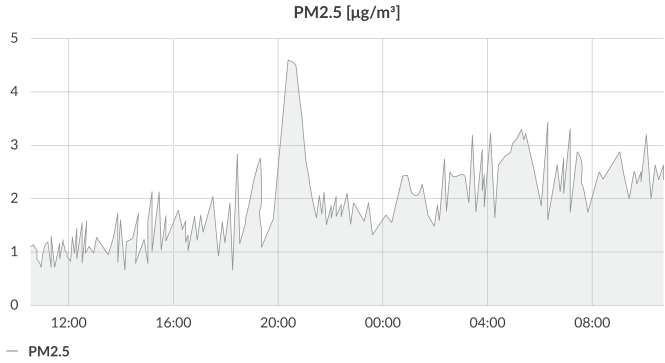
Sensitivity: 22 dB

SNR: 59 dB

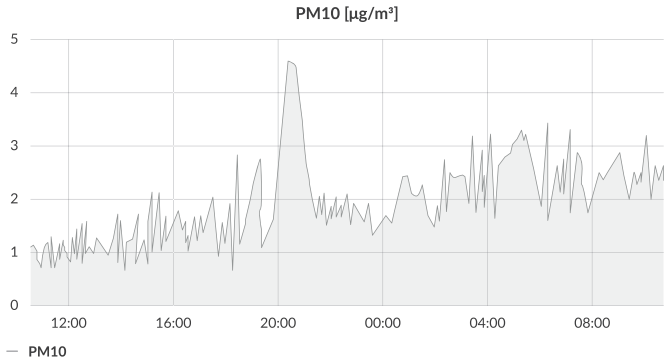
Weight

200g

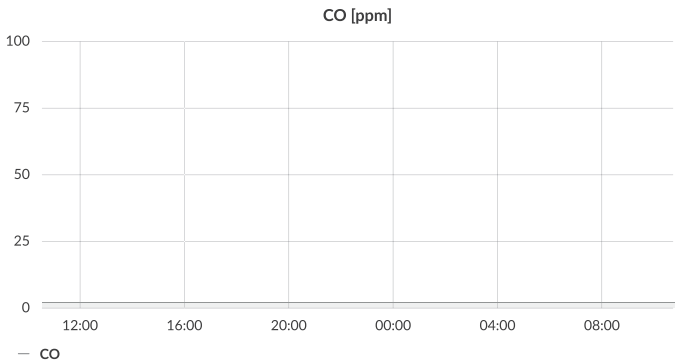
Sample charts



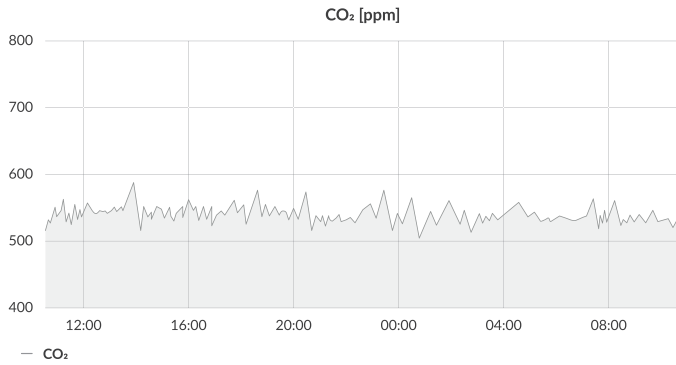
Example of a **PM2.5** monitoring chart.



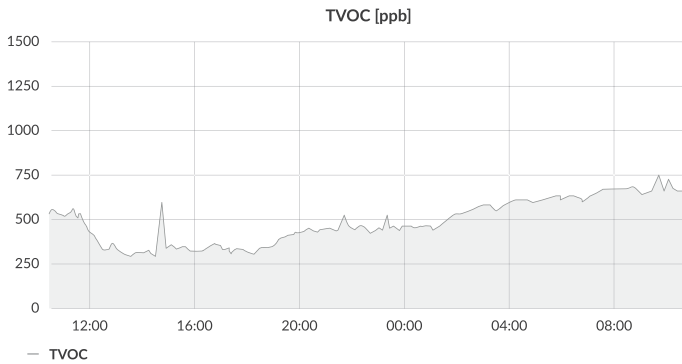
Example of a **PM10** monitoring chart.



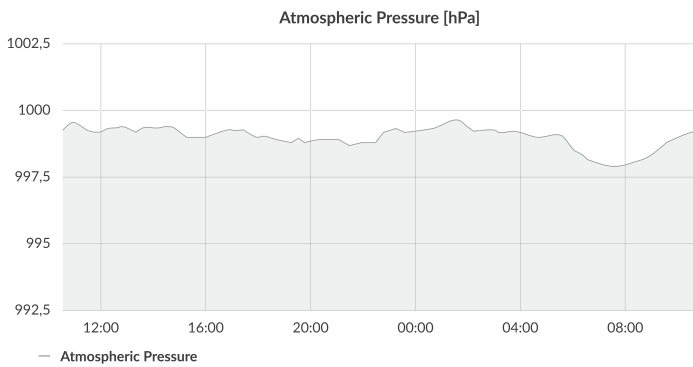
Example of a **CO** monitoring chart.



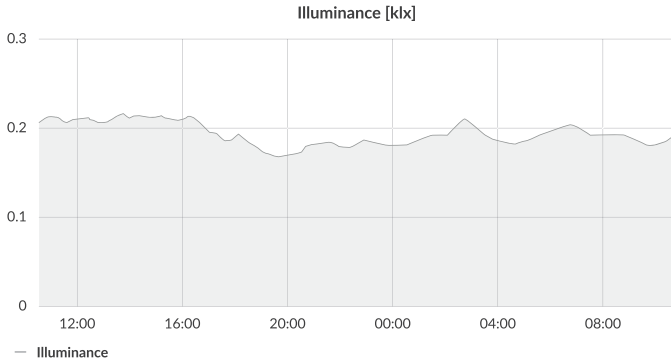
Example of a **CO₂** monitoring chart.



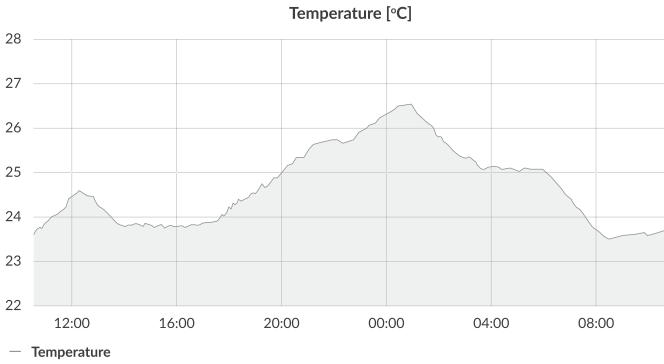
Example of a **TVOC** monitoring chart.



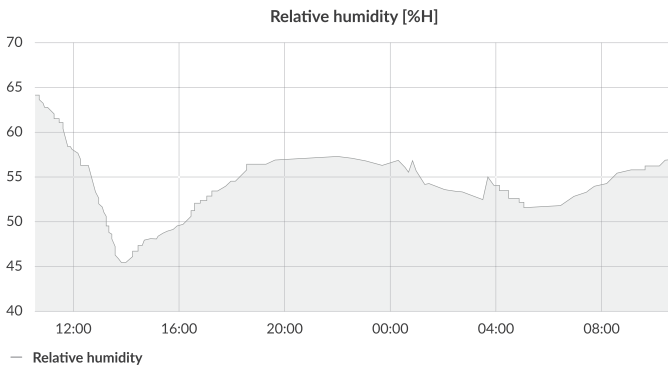
Example of an **atmospheric pressure** monitoring chart.



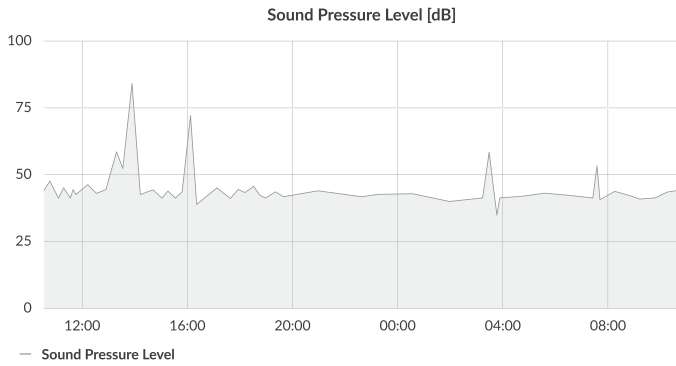
Example of an **illuminance** monitoring chart.



Example of a **temperature** monitoring chart.



Example of an **relative humidity** monitoring chart.



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.





The logo for YOSSENSI.IO is displayed in a white rectangular box with a thin black border. The text 'YOSENSI' is in a bold, sans-serif font, and '.IO' is in a smaller, regular font. A small green dot is positioned above the 'I' in '.IO'.

YOSENSI.IO

The LoRa Alliance Member logo features the LoRa logo (three curved lines above the text 'LoRa') followed by the text 'Alliance Member' in a sans-serif font.

LoRa Alliance Member

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