ellona

TECHNICAL DATA SHEET


# INDOOR ENVIRONMENTAL MONITORING.

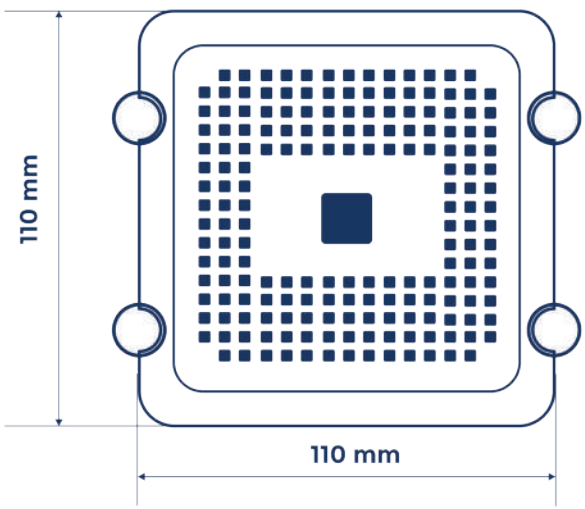
# GENERAL FEATURES

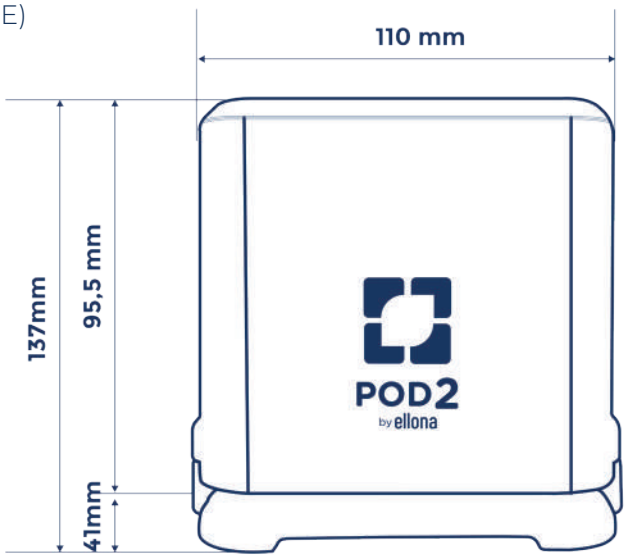
A versatile multisensory device dedicated to indoor environments, designed for comprehensive and continuous environmental data collection, encompassing physical, chemical, and perceptual metrics.

1. **Multisensors device**: it collects data on physical, chemical, and perception factors.
2. **Alarm mode:** it monitors all measurement channels with adjustable triggering thresholds.
3. **Visual alerts:** it provides information through LED color changes for quick visual feedback.
4. **Data security:** it safeguards your information with online data collection and 48-hour storage (in case of communication loss).
5. **Software updates:** it ensures your device is always up-to-date with software hosted on secured servers and online update functionality.
6. **Versatile connectivity:** it communicates seamlessly through various channels, including WIFI, LoRa (Long Range), LTE-M (3G-4G), and Ethernet.
7. **High data frequency:** it captures data at a frequency of one data set every 10 seconds for detailed monitoring.
8. **Odour data banks:** it detects and categorizes odours such as musty, solvents, cigarette smoke, sewer, and more.
9. **Real-time subjective reporting:** it allows users to report their real-time subjective perceptions of the environment through **QR Codes** attached to each module.

- **Operating temperature:** -20°C/ +40°C
- **Operating humidity:** <100% non condensing R.H
- **Storage temperature:** -5°C / +40°C

Power supply = 5V DC / Power Over Ethernet (POE)
Weight = 360 gr



# SENSORS COMBINATION

## NATIVE FUNCTIONALITIES

- **Temperature**
- **Humidity**
- **Atmospheric pressure**
- **Light** (Intensity & Color)
- **TVOC** (equivalent concentration)
- **Vibration**
- **Noise**

## OPTIONS

**Gas sensors**
Select up to 4 electrochemical gas sensors and 1 optical gas sensor

**Particulate Matter Sensors**
Several options are available

**Odour function**
Quality
1 board with 4 MOX sensors

# NATIVE SENSORS

| | Sensor Type | Measuring Range | Accuracy* | Resolution* | Lifespan** |
|---|---|---|---|---|---|
| 1 | **Temperature** | -40 to +85° C | ±1° C | 0.1° C | 3-5 years |
| 2 | **Atmospheric pressure** | 300 to 1,100 hPa | ±0.6 hPa | 0.1 hPa | 3-5 years |
| 3 | **Humidity** | 0 to 100 % RH | ±3 % RH | 0.1 % RH | 3-5 years |
| 4 | **Total VOC** equivalent concentration | 0 to 1,000 ppm | 1 ppm | 0.1 ppm | 3-5 years |
| 5 | **Light** intensity | 0 to 10,000 Lux | 5 Lux | 1 Lux | 3-5 years |
| 6 | **Light** color (t°) | 0 to 12,000 K | 50 K | 1 K | 3-5 years |
| 7 | **Noise** equivalent level | 30 to 120 dBA | 1 dBA | 0.1 dBA | 3-5 years |
| 8 | **Vibration** level | 0 to 40 $m/s^2$ | 0.01 $m/s^2$ | 0.005 $m/s^2$ | 3-5 years |

** Precision Measurements in Controlled Laboratory Conditions: 50% RH, 20°C*
*** 12-month warranty included*

# OPTIONAL SENSORS (1/2)

## GASES

**LIFESPAN: 3-5 years**
(contingent on the surrounding conditions)

**Select up to:**
**4** Electrochemical sensors
**1** Optical sensor

● = The most frequently utilized gases

| | | Sensor Type | Measuring Range | LOD* | Resolution* | Interferences |
|---|---|---|---|---|---|---|
| ● | 1 | **Alcohols** | 0 to 200 ppm | 0.009 ppm | 0.001 ppm | +1% CO, hydrocarbons |
| ● | 2 | **$CH_2O$** Formaldehyde | 0 to 10 ppm | 0.002 ppm | 0.001 ppm | +3% $H_2$; +15% CO; +50% Ethanol, organic solvents |
| | 3 | **$Cl_2$** | 0 to 20 ppm | 0.018 ppm | 0.006 ppm | 100% $NO_2$; -80% $H_2S$ |
| ● | 4 | **CO** | 0 to 1,000 ppm | 0.063 ppm | 0.001 ppm | +10% $H_2$; -2% $NO_2$ |
| | 5 | **$CO_2$** NDIR** | 0 to 5,000 ppm | ± 30 ppm | 1 ppm | |
| ● | 6 | **EtO** Ethylene Oxyde | 0 to 10 ppm | 0.005 ppm | 0.001 ppm | +30% $H_2$; +50% CO; +60% EtOH |
| | 7 | **$H_2$** | 0 to 2,000 ppm | 6 ppm | 2 ppm | NO<40%; $C_2H_4$<25% |
| | 8 | **$H_2$** | 0 to 4,000 ppm | 6 ppm | 2 ppm | +70% CO |
| | 9 | **$H_2$** | 0 to 40,000 ppm | 15 ppm | 5 ppm | +60% CO |
| | 10 | **HCL** (HBr) | 0 to 100 ppm | 0.09 ppm | 0.03 ppm | +250% $H_2S$; -150% $NO_2$; -20% $Cl_2$ |
| | 11 | **HCN** | 0 to 100 ppm | 0.129 ppm | 0.043 ppm | +300% $H_2$; -180% $NO_2$; -12% $Cl_2$; +10% $SO_2$ |
| | 12 | **$H_2O_2$** Peroxyde | 0 to 100 ppm | 0.1 ppm | 0.001 ppm | + 100% $SO_2$ |
| ● | 13 | **$H_2S$** | 0 to 50 ppm | 0.003 ppm | 0.001 ppm | -30% $NO_2$; -25% $Cl_2$; +10% $SO_2$ |
| ● | 14 | **$NH_3$** | 0 to 100 ppm | 0.09 ppm | 0.001 ppm | -20% $SO_2$ |
| ● | 15 | **NO** | 0 to 250 ppm | 0.011 ppm | 0.001 ppm | +10% $H_2S$; +2% $NO_2$; + 3% $SO_2$ |
| ● | 16 | **$NO_2$** | 0 to 5 ppm | 0.003 ppm | 0.001 ppm | +10% $H_2S$; +2% $NO_2$; + 3% $SO_2$ |
| ● | 17 | **$NO_2$ + $O_3$** | 0 to 10 ppm | 0.003 ppm | 0.001 ppm | +100% $Cl_2$ |
| | 18 | **$O_2$** | 0 to 30% | 0.1% | 0.1% | |
| | 19 | **$PH_3$** | 0 to 20 ppm | 0.009 ppm | 0.003 ppm | +20% $H_2S$; -30% $NO_2$; +25% $SO_2$; +50% $SiH_4$ |
| | 20 | **RSH** Tertiobutyl Mercaptan | 0 to 14 ppm | 0.1 ppm | 0.03 ppm | |
| ● | 21 | **$SO_2$** | 0 to 50 ppm | 0.008 ppm | 0.001 ppm | -130% $NO_2$: -60% $Cl_2$; + 40% $C_2H_4$ |

** Precision Measurements in Controlled Laboratory Conditions: 50% RH, 20°C*

***Non dispersive infrared sensor*

# OPTIONAL SENSORS (2/2)

## PARTICLES

**LIFESPAN: 3-5 years**

| | Sensor | Measuring Range | Resolution* | LOD (Limit of detection) | Typical Accuracy |
|---|---|---|---|---|---|
| 1 | **Particles Mass Concentration** | | | | |
| | $PM_1$ | 0 to 1,000 µg/m³ | 1 µg/m³ | 0.5 µg/m³ | ±2 µg/m³ |
| | $PM_{2.5}$ | 0 to 2,000 µg/m³ | 1 µg/m³ | 0.5 µg/m³ | ±3 µg/m³ |
| | $PM_4$ | 0 to 2,000 µg/m³ | 1 µg/m³ | 0.5 µg/m³ | ±3 µg/m³ |
| | $PM_{10}$ | 0 to 10,000 µg/m³ | 1 µg/m³ | 0.5 µg/m³ | ±4 µg/m³ |
| 2 | **PM count** | PM0.5, PM1, PM2.5, PM4, PM10 particles/m³ | 1 particle | - | Linearity error <5%, Repeatability error <3% |

** Precision Measurements in Controlled Laboratory Conditions: 50% RH, 20°C*

## ODOURS

**MOX SENSOR LIFESPAN: 3-5 years**

1 board with **4 MOX Sensors**

| | Principle | ELLONA virtual sensor | Training |
|---|---|---|---|
| **Odour Detection** | Relative odour event in Indoor environment (baseline monitoring) | "ELLONA distance" Anomaly detection OIIL: Odour Intensity Index Level in real time | Sampling? No Inputs? Ambiant exposition to event or QR code surveys |
| **Odour Intensity** | Odour Quantification Event detection | "IOU: Instrumental Odour Unit in real time" | Sampling? No Inputs? Ambiant exposition to event or QR code surveys |
| **Source Identification** | Event Fingerprinting | "Identification" Classifier & Trigger value | Sampling? No Inputs? Ambiant exposition to event or QR code surveys |

# CONFIGURATIONS
## Examples

### HEALTH - HOSPITALS

Temperature / Humidity / Odours / Pressure
Noise / $CO_2$ / PM / EtO / $CH_2O$ / $NH_3$ / $H_2S$

### OFFICE - OPEN SPACES

Temperature / Humidity / Odours / Pressure
Noise / $CO_2$ / PM

### SHOPPING CENTERS

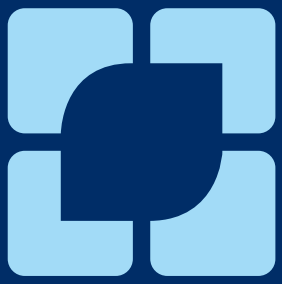
Temperature / Humidity / Odours / Pressure
Noise / $CO_2$ / PM / $NO_2$

### INDUSTRIAL WORKSHOP

Temperature / Humidity / Odours / Pressure
Noise / $CO_2$ / PM / $NO_2$ / CO / NO / $H_2S$

### AIRPORTS - HALLS

Temperature / Humidity / Odours / Pressure
Noise / $CO_2$ / PM / $NO_2$ / $O_3$ / $H_2S$ / $NH_3$



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