



DATASHEET

kunak air

The most advanced and reliable solution for air quality monitoring



MULTI-POLLUTANT SENSOR
WITH THE BEST ACCURACY





Kunak AIR Pro

Air quality monitor



MULTI-POLLUTANT SENSOR WITH THE BEST ACCURACY

Measure air pollution with accurate and reliable data.

SENSOR BASED | BEST AVAILABLE ACCURACY

Monitor up to 5 pollutants and particles simultaneously and get real-time data on the quality of the air you breathe. With the Kunak AIR Pro you can measure the impact of your activities and see if your decisions to ensure good air quality are really effective.

All collected data can be visualised and analysed in one place thanks to the Kunak AIR Cloud web platform.

With the most versatile solution on the market, you can choose the pollutants to measure for each project and thanks to its patented smart cartridge technology, you can replace them whenever you need to.

Data quality is guaranteed. All our sensors are factory calibrated and tested and include their calibration certificate.



Patented cartridge system



Multiple pollutants



Proven accuracy



Additional probes



Remote calibration



Reduced maintenance

Simplify your daily operations. Make better decisions.

Our solution has been tested by the world's leading air quality experts.



The Kunak AIR Pro air quality station was awarded as **The Most Accurate Multi Pollutant Sensor** in the latest ARLAB Microsensors Challenge organised by Airparif.



Specifications

Dimensions	257 x 270 x 225 mm
Weight	< 3.5 kg
Enclosure	PMMA & Polycarbonate & Stainless steel
Operating temp	-20 °C to 60°C
Operating RH	0 to 99 %RH
IP rating	IP65
Battery	Lithium 2.9Ah or 26 Ah
External supply	7 - 12 Vdc. charger or solar panel
Autonomy	24/7 with charger or solar panel
Power consumption	0.08 - 1.2W (depending on configuration)
Communications	Multi-Band 2G/3G/4G, Ethernet and Modbus RTU Slave
GNSS	GPS and GLONASS

Gas sensors	CO, CO ₂ , NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, NH ₃ , CH ₄ , VOC, HCl
PM sensor	PM ₁ , PM _{2.5} , PM ₄ , PM ₁₀ TSP and TPC
Internal status	Temperature, battery, charging voltage and current, and signal
Built-in sensors	Temperature, humidity, atmospheric pressure and dew point
Connectors	#1: Power 7V to 12V or Ethernet #2: Modbus RTU Slave #3: Sound meter, UV #4: WBGT, Pyranometer, Modbus RTU Master #5: Anemometer & Rain Gauge
Sampling freq.	3Hz gases, 0.25Hz particles
Avg. periods	From 10 seconds to a maximum of 24 hours
Sending periods	From 5 minutes to a maximum of 24 hours
Remote management	Bidirectional communications Remote configuration and calibration
SIM	Embedded eSIM and SIM holder





Kunak AIR Lite

Air quality station

Take fast and effective actions based on accurate and reliable data.

INDUSTRY GRADE DESIGN | HIGHEST ACCURACY

Monitor pollution levels and make quick and effective decisions to protect human health and the environment. With the Kunak AIR Lite air quality monitoring station, you get accurate data on multiple pollutants easily, quickly and cost-effectively.

Designed for industrial applications and mass deployments in cities, the Kunak AIR Lite provides you with accurate, real-time air quality information.

Thanks to the patented smart cartridge technology, you can measure particulate matter (PM₁, PM_{2.5} and PM₁₀) and 2 gases simultaneously. If the characteristics of the project change, you can replace the cartridges and install new ones without having to send it back to the factory.

Designed for projects where no more than 2 gases and particles need to be measured.



Patented cartridge system



2 gases and particles



Robust and compact



Additional probes



Autonomous operation



Reduced maintenance

All data collected by the sensor network is wirelessly transmitted to the Kunak AIR Cloud software, where you can visualise and analyse it to make the best decisions to reduce the environmental impact of your operations.

Our solution has been tested by the world's leading air quality experts.





Specifications

Dimensions	200 x 153 x 185 mm
Weight	< 2.3 kg
Enclosure	PMMA & Polycarbonate & Stainless steel
Operating temp	-20 °C to 60°C
Operating RH	0 to 99 %RH
IP rating	IP65
Battery	Lithium 2.9Ah or 20 Ah
External supply	7 - 12 Vdc. charger or 6 Vdc. solar panel
Autonomy	24/7 with charger or solar panel
Power consumption	0.08 - 0.55W (depending on configuration)
Communications	Multi-Band 2G/3G/4G, Ethernet and Modbus RTU Slave
GNSS	GPS and GLONASS

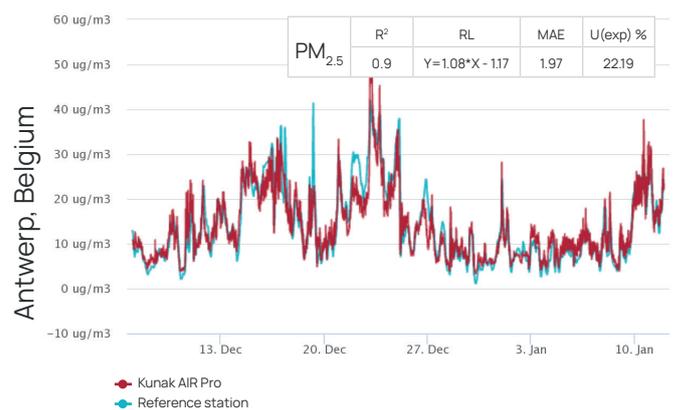
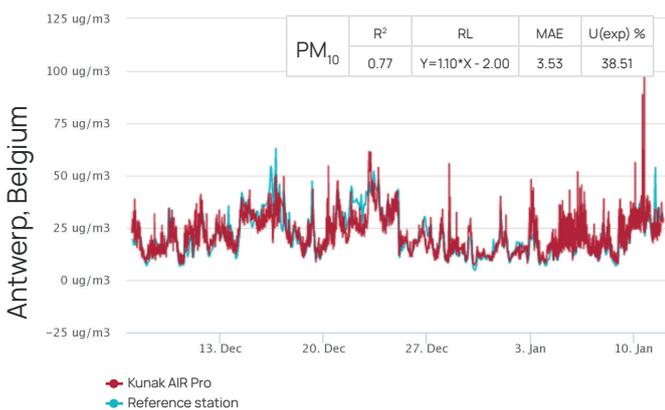
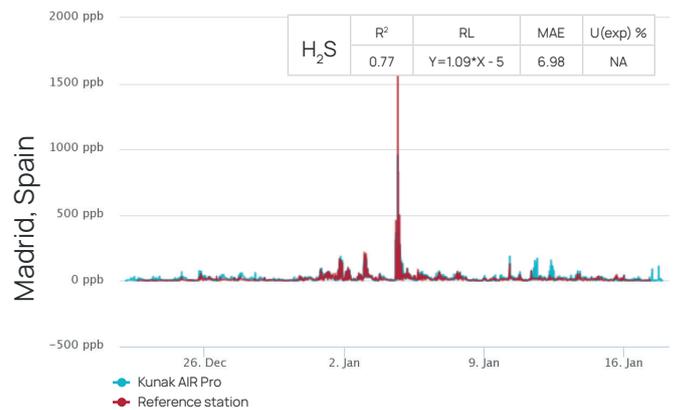
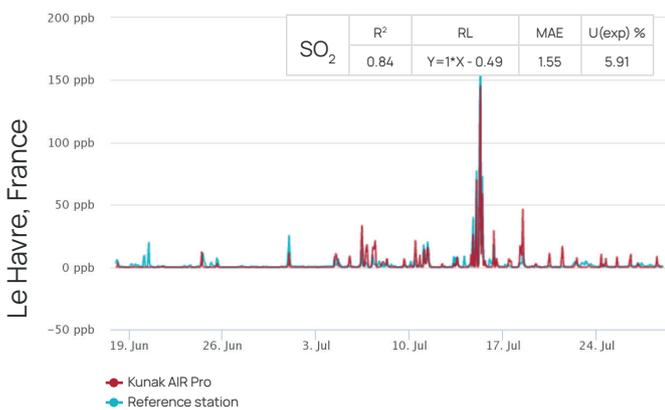
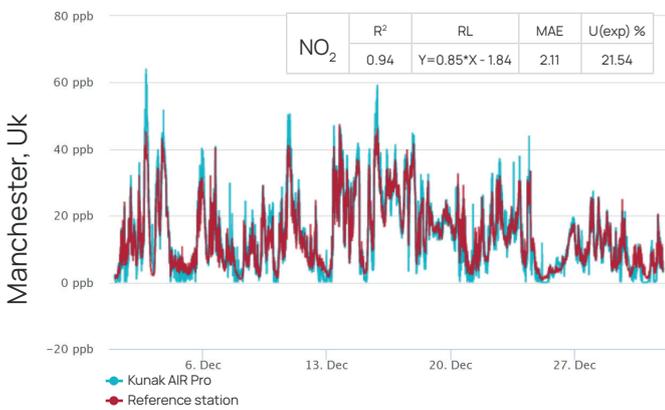
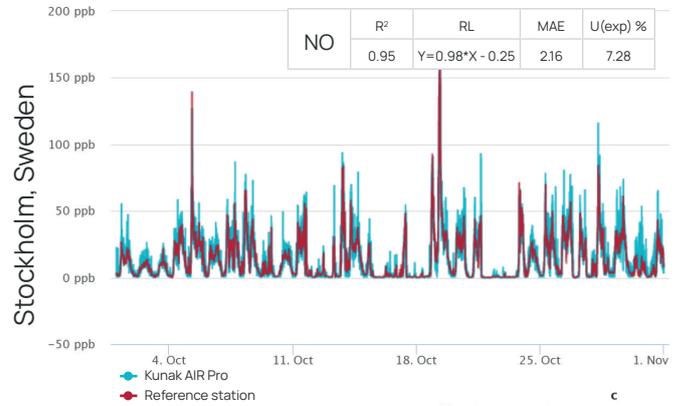
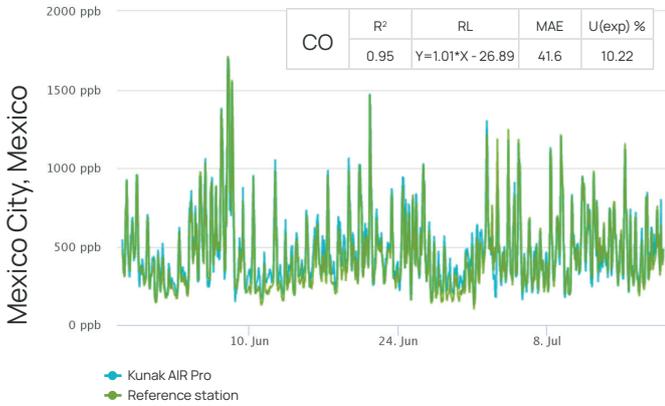
Gas sensors	CO, CO ₂ , NO, NO ₂ , O ₃ , SO ₂ , H ₂ S, NH ₃ , CH ₄ , VOC, HCl
PM sensor	PM ₁ , PM _{2.5} and PM ₁₀ *
Internal status	Temperature, battery, charging voltage and current, and signal
Built-in sensors	Temperature, humidity, atmospheric pressure and dew point
Connectors	#1: Power 7V to 12V #2: Several options to choose from: • Option 1: Anemometer & Rain Gauge • Option 2: Modbus RTU Master • Option 3: Sound meter • Option 4: Modbus RTU Slave • Option 5: Ethernet
Sampling freq.	3Hz gases, 1Hz particles
Avg. periods	From 10 seconds to a maximum of 24 hours
Sending periods	From 5 minutes to a maximum of 24 hours
Remote management	Bidirectional communications Remote configuration and calibration
SIM	Embedded eSIM and SIM holder





Evidence of accuracy

We continuously conduct intercomparative studies with reference stations in different locations and laboratories to guarantee the highest quality results.





Smart gas cartridges

Air pollution sensor

Measure the pollutants you need in your project.

MULTIPLE COMBINATIONS | REUSABLE

Our Kunak AIR stations revolutionise the way air pollution levels are measured.

No need to send your equipment back to the factory every time your environmental project changes.

1. Order the new cartridges you need.
2. Take out the old ones and put in the new ones.
3. Start measuring almost instantly.

Main advantages of the cartridge technology:



Accurate data

Accurate real-time pollutant value without the need for calibration or data processing.



Low intra-variability

Consistent readings across all equipment and locations, correcting for implicit sensor variability.



Efficiency

Highest measurement accuracy thanks to factory calibration ensuring reliable data.



Easy maintenance

Eases the tasks of air quality network managers thanks to its easy maintenance.

Patented GasPlug™ technology

You no longer need to send your instruments back to the factory for calibration.

The revolutionary cartridge system, designed by Kunak engineers, allows the replacement of the pollutants at the customer's convenience. Because all cartridges are the same size, they fit into any available slot in the Kunak AIR stations.

Inside each cartridge, the sensor is installed in the electronics, where data such as type, age and factory calibration are stored. When you insert a new cartridge, the system reads the information, automatically configures itself and starts sending data almost immediately.

Select the pollutants you need to measure. If project characteristics change, order new cartridges you need. When you receive them, simply pull out the old cartridge and insert the new one.

Select the pollutants you need to measure.
Replace them when needed.

Technical specs

	CO	CO ₂	NO	NO ₂	O ₃	H ₂ S	SO ₂	NH ₃	VOCs	CH ₄	HCl
Type	Electrochemical	Non-dispersive infrared (NDIR)	Electrochemical	Electrochemical	Electrochemical	Electrochemical	Electrochemical	Electrochemical	Photo-ionization detector	NDIR ^(A) Non-dispersive Infrared MEMS ^(B) Micro-Electro-Mechanical Systems	Electrochemical
Unit of measurement	µg/m ³ , ppb ^(A) mg/m ³ , ppm ^(B)	mg/m ³ , ppm	µg/m ³ , ppb ^(A) mg/m ³ , ppm ^(B)	µg/m ³ , ppb	mg/m ³ , ppm	µg/m ³ , ppb ^(A) mg/m ³ , ppm ^(B)	mg/m ³ , ppm	mg/m ³ , ppm			
Measurement range ⁽¹⁾	0 - 12,000 ppb ^(A) 0 - 500 ppm ^(B)	0-5,000 ppm	0-5,000 ppb	0-5,000 ppb	0-2,000 ppb	0 - 2,000 ppb ^(A) 0 - 20 ppm ^(B)	0-10,000 ppb	0-50 ppm ^(A) 0 - 1,500 ppm ^(B)	0 - 3,000 ppb ^(A) 0 - 40 ppm ^(B)	0-50,000 ppm ^(5%vol) ^(A) 0-300,000 ppm ^(30% vol) ^(B)	0-20 ppm
Resolution ⁽²⁾	1 ppb ^(A) 0.01 ppm ^(B)	1 ppm	1 ppb	1 ppb	1 ppb	1 ppb ^(A) 0.01 ppm ^(B)	1 ppb	0.01 ppm	1 ppb ^(A) 0.01 ppm ^(B)	100 ppm ^(A) 1 ppm ^(B)	0.01 ppm
Operating temp. range ⁽³⁾	-30 to 50 °C	-20 to 50 °C	-30 to 45 °C	-30 to 45 °C	-30 to 45 °C	-30 to 50 °C	-30 to 40 °C	-10 to 50 °C ^(A) -20 to 43 °C ^(B)	-40 to 60 °C	-20 to 50 °C ^(A) -35 to 70 °C ^(B)	-20 to 50 °C
Operating RH range ⁽⁴⁾	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH	0 to 99% RH	0 to 99 %RH	0 to 99 %RH
Recommended RH range ⁽⁴⁾	15 to 90 %RH	15 to 95 %RH	15 to 85 %RH	15 to 85 %RH	15 to 85 %RH	15 to 90 %RH	15 to 90 %RH	15 to 90 %RH	0 to 99% RH	15 to 90 %RH ^(A) 0 to 99 %RH ^(B)	15 to 90 %RH
Operating life ⁽⁵⁾	> 24 months	> 5 years	> 24 months	> 24 months	> 24 months	> 24 months	> 24 months	> 24 months	10,000 hours	> 5 years ^(A) > 4 years ^(B)	> 24 months
Guarantee range ⁽⁶⁾	1,000 ppm	-	20 ppm	20 ppm	20 ppm	100 ppm	100 ppm	100 ppm ^(A) 5,000 ppm ^(B)	50 ppm ^(A) 60 ppm ^(B)	100% vol	200 ppm
LOD - Limit of detection ⁽⁷⁾	10 ppb ^(A) 0.02 ppm ^(B)	-	2 ppb	2 ppb	3 ppb	2 ppb ^(A) 0.01 ppm ^(B)	3 ppb	0.02 ppm ^(A) 0.15 ppm ^(B)	1 ppb ^(A) 0.01 ppm ^(B)	1,000 ppm ^(A) 60 ppm ^(B)	0.01 ppm
Repeatability ⁽⁸⁾	20 ppb ^(A) 0.05 ppm ^(B)	-	4 ppb	4 ppb	4 ppb	4 ppb ^(A) 0.01 ppm ^(B)	5 ppb	0.03 ppm ^(A) 0.5 ppm ^(B)	5 ppb ^(A) 0.02 ppm ^(B)	500 ppm ^(A)	0.02 ppm
Response time ⁽⁹⁾	< 30 sec ^(A) < 180 sec ^(B)	< 30 sec	< 30 sec	< 60 sec	< 70 sec	< 60 sec	< 60 sec	< 45 sec ^(A) < 90 sec ^(B)	< 12 sec ^(A) < 10 sec ^(B)	< 90 sec ^(A)	< 45 sec
Typical accuracy ^{(11) (12)}	± 80 ppb ^(A) ± 0.1 ppm ^(B)	±20 ppm	±4 ppb	±5 ppb	±8 ppb	± 10 ppb ^(A) ± 0.05 ppm ^(B)	±15 ppb	±0.3 ppm ^(A) ±1.5 ppm ^(B)	-	±3% of F.S. ^(A) ±30 ppm + 10% of reading ^(B)	±0.1 ppm
Typical precision - R ² ⁽¹⁰⁾	> 0.85	> 0.8	> 0.9	> 0.85	> 0.9	> 0.75	> 0.75	-	-	-	-
Typical slope ⁽¹⁰⁾	0.78 - 1.29	0.6 - 1.66	0.9 - 1.12	0.78 - 1.29	0.85 - 1.18	0.78 - 1.29	0.78 - 1.29	-	-	-	-
Typical intercept (a) ⁽¹⁰⁾	-50 ppb ≤ a ≤ +50 ppb ^(A) -0.1 ppm ≤ a ≤ +0.1 ppm ^(B)	-170 ppm ≤ a ≤ 170 ppm	-2 ppb ≤ a ≤ +2 ppb	-4 ppb ≤ a ≤ +4 ppb	-3 ppb ≤ a ≤ +3 ppb	-5 ppb ≤ a ≤ +5 ppb ^(A) -0.05 ppm ≤ a ≤ +0.05 ppm ^(B)	-5 ppb ≤ a ≤ +5 ppb	-	-	-	-
DQO - Typical U(exp) ⁽¹³⁾	< 20%	-	< 20%	< 25%	< 20%	-	< 25%	-	-	-	-
Typical intra-model variability ⁽¹⁴⁾	< 3 ppb ^(A) < 0.05 ppm ^(B)	< 0.5 ppm	< 1 ppb	< 1 ppb	< 1 ppb	< 2 ppb ^(A) < 0.02 ppm ^(B)	< 3 ppb	< 0.1 ppm ^(A) < 0.2 ppm ^(B)	< 3 ppb ^(A) < 0.1 ppm ^(B)	< 500 ppm ^(A)	< 0.1 ppm

Technical specs

	PM ₁	PM _{2.5}	PM ₄	PM ₁₀	TSP	TPC
Type	Optical particle counter	Optical particle counter	Optical particle counter	Optical particle counter	Optical particle counter	Optical particle counter
Unit of measurement	µg/m ³	µg/m ³	µg/m ³ (A)	µg/m ³ (A)	µg/m ³ (A)	counts/cm ³ (A)
Measurement range (1)	0 - 1,000 µg/m ³	0 - 2,000 µg/m ³ (A) 0 - 1,000 µg/m ³ (B)	0 - 2,000 µg/m ³ (A)	0 - 10,000 µg/m ³ (A) 0 - 1,000 µg/m ³ (B)	0 - 15,000 µg/m ³ (A)	0 - 8,000 counts/cm ³ (A)
Resolution (2)	1 µg/m ³	1 µg/m ³	1 µg/m ³ (A)	1 µg/m ³	1 µg/m ³ (A)	1 counts /cm ³ (A)
Operating temp. range (3)	-10 to 50 °C (A) -10 to 60 °C (B)	-10 to 50 °C (A) -10 to 60 °C (B)	-10 to 50 °C (A)	-10 to 50 °C (A) -10 to 60 °C (B)	-10 to 50 °C (A)	-10 to 50 °C (A)
Operating RH range (4)	0 to 99 %RH	0 to 99 %RH	0 to 99 %RH (A)	0 to 99 %RH	0 to 99 %RH (A)	0 to 99 %RH (A)
Recommended RH range (4)	0 to 95 %RH (A)	0 to 95 %RH (A)	0 to 95 %RH (A)	0 to 95 %RH	0 to 95 %RH (A)	0 to 95 %RH (A)
Operating life (5)	> 24 months	> 24 months	> 24 months (A)	> 24 months	> 24 months (A)	> 24 months (A)
LOD - Limit of Detection (7)	0.5 µg/m ³ (A) 0.5 µg/m ³ (B)	0.5 µg/m ³ (A) 0.5 µg/m ³ (B)	0.5 µg/m ³ (A)	0.5 µg/m ³ (A) 0.5 µg/m ³ (B)	1 µg/m ³ (A)	-
Repeatability (8)	2 µg/m ³ (A) 3 µg/m ³ (B)	3 µg/m ³	3 µg/m ³ (A)	5 µg/m ³ (A) 6 µg/m ³ (B)	6 µg/m ³ (A)	-
Response Time (9)	< 10 sec	< 10 sec	< 10 sec (A)	< 10 sec	< 10 sec (A)	< 10 sec (A)
Typical Accuracy - MAE (10)	±2 µg/m ³ (A) ±3 µg/m ³ (B)	±3 µg/m ³	±3 µg/m ³ (A)	±4 µg/m ³ (A) ±6 µg/m ³ (B)*	±6 µg/m ³ (A)	-
Typical precision - R ² (10)	> 0.9 (A) > 0.7 (B)	> 0.8 (A) > 0.75 (B)	> 0.8 (A)	> 0.7 (A) > 0.5 (B)*	> 0.7 (A)	> 0.8 (A)
Typical Slope (10)	0.85 - 1.18 (A) 0.80 - 1.25 (B)	0.85 - 1.18 (A) 0.83 - 1.20 (B)	0.85 - 1.18 (A)	0.85 - 1.18 (A) 0.75 - 1.35 (B)*	0.85 - 1.18 (A)	-
Typical Intercept (a) (10)	-1.8 µg/m ³ ≤ a ≤ +1.8 µg/m ³ (A) -2 µg/m ³ ≤ a ≤ +2 µg/m ³ (B)	-2 µg/m ³ ≤ a ≤ +2 µg/m ³ (A) -3 µg/m ³ ≤ a ≤ +3 µg/m ³ (B)	-2 µg/m ³ ≤ a ≤ +2 µg/m ³ (A)	-3 µg/m ³ ≤ a ≤ +3 µg/m ³ (A) -9 µg/m ³ ≤ a ≤ +9 µg/m ³ (B)*	-4 µg/m ³ ≤ a ≤ +4 µg/m ³ (A)	-
DQO - Typical U(exp) (11)	< 50%	< 50%	< 50% (A)	< 50% (A) < 75% (B)*	< 50% (A)	-
Typical intra-model variability (12)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	< 2 µg/m ³ (A)	-

- Measurement range: concentration range measured by the sensor.
- Resolution: smallest unit of measurement that can be indicated by the sensor.
- Operating temperature range: temperature interval at which the sensor is rated to operate safely and provide measurements.
- Operating RH range (Recommended RH range): humidity interval at which the sensor is rated to operate safely and provide measurements.
- Operating life: lifetime of the sensor at normal conditions.
- Guarantee range: limit covered by the guarantee.
- LOD (Limit Of Detection): measured at laboratory conditions at 20°C and 50% RH. The limit of detection is the minimum concentration that can be detected as significantly different at zero gas concentration, based on the metric from the Technical Specification CEN/TS 17660-1:2022.
- Repeatability (measured at laboratory conditions at 20°C and 50% RH): closeness of the agreement between the results of successive measurements of the same measure carried out under the same conditions of measurement, based on the metric from the Technical Specification CEN/TS 17660-1:2022.
- Response time: time needed by the sensor to reach 90% of the final stable value.
- Statistical metric: statistics obtained between the device hourly measurements and reference instruments for 1 to 8 months field test between -10 to +30°C in different countries. (*) The expected error for PM₁₀ is higher in presence of coarse particles.
- Mean Absolute Error: it is the average mean absolute error (MAE) obtained between the device hourly measurements and reference instruments for 1 to 8 months field test between -10 to +30°C in different countries.
- Error: it is the error of the sensor at reading measurement or full scale.
- DQO-Typical U(exp): Data Quality Objective expressed as the Expanded Uncertainty in the Limit Value obtained between hourly measurements of the device and the reference instruments for 1 to 8 months field test between -10 to +30°C in different countries, based on the metric from the European Air Quality Directive 2008/50/EC and from the Technical Specification CEN/TS 17660-1:2022. (*) The expected error for PM₁₀ is higher in presence of coarse particles.
- Typical intra-model variability: calculated as the standard deviation of the three sensor means in 1 to 8 months field test between -10 to +30°C in different countries.



Kunak AIR Cloud

Air quality software

Visualise and analyse the data collected by your sensor network.

COMPLETE SUITE OF TOOLS | FULL NETWORK MANAGEMENT

Kunak AIR Cloud is an easy-to-use data analysis software for decision-making. Access real-time data collected by the sensor network to make decisions that help improve air quality in the environment and protect people's health.

The Kunak AIR Cloud web platform offers professionals a complete suite for air quality data analysis, as well as a new way to remotely operate the network, manage devices, set alarms, calibrate and perform field operations.

Kunak AIR Cloud is a modular and flexible software designed to facilitate user account management, easy network operation, intuitive data analysis and validation, and fast and intuitive reporting.



Cloud based



Reliable data guaranteed



Flexible & Scalable



Multiple users



Data integration



Advanced tools



Analyse and understand pollution behaviour.



Complete suite of tools

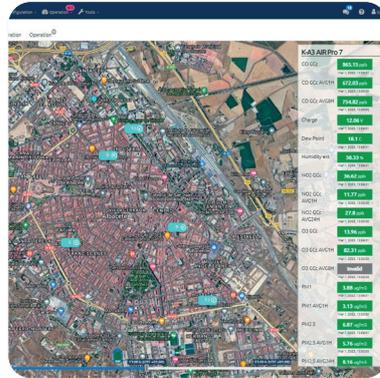
Our air quality monitoring software is the perfect complement to unleash the full potential of Kunak AIR stations and air pollution monitoring networks.

These are some of the main tools included:



Control panel

Check the status of your devices and easily view reliable data in real-time thanks to automatic data tagging.



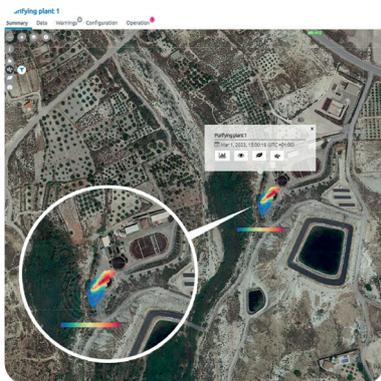
Dashboard

View your devices on a map, their status and the latest measurements.



Advanced analytics

Advanced analytics from the OpenAir suite: calculation of basic statistics, pollutant time plots, temporal variation, wind plots and many more.



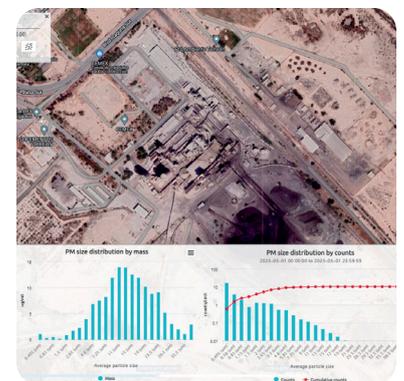
Contamination sources

Detection of pollution sources through pollution roses and polar graphs directly on the map.



Heat mapping

Identify hotspots in an area and variable heat maps to see how they evolve over time.



Particle counting

Particle size analysis tool including size distribution graphs by mass and by counts.

□ □ + Now you can choose the tools you need for your project.



**Protect your health.
Protect the environment.**

kunak[®]
SENSING ANYWHERE

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