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AOCEMS Sensor Specifications

INTEGRATED IOT HARDWARE FROM OUR TECHNOLOGY PARTNERS

SENSOR TECHNOLOGY PARTNERS

seelive | kunak SENSING ANYWHERE | NEXSENS technology | OIZOM REDEFINING RESOURCES | Engineering & Environmental Solutions Pvt. Ltd.


seelive

Seelive Air Pro

Continuous Ambient Air Quality Monitor

Seelive Air Pro is a Continuous Ambient Air Quality Monitoring System (CAAQMS) by Seelive Pvt Ltd. It is capable of monitoring various environmental parameters related to air quality, noise, odour, weather, radiation. It measures the particulate matter and gaseous concentrations in the ambient air in real-time. Using external probes, it can also monitor other auxiliary parameters like traffic, disaster and weather monitoring.

Seelive Air Pro is an ideal choice for smart cities as well as urban infrastructure applications like roads and highways, tunnels, smart campus and airport monitoring. It is easily integrable with a Smart Pole / Intelligent Pole.

Product Features

TECHNOLOGY
Works on innovative laser technology for higher data accuracy

TAMPER PROOF
Comes with a security system to avoid tampering / malfunction / sabotage.

OVER-THE-AIR UPDATE
Automatically upgradeable from a central server without any onsite visit.

INTERNAL STORAGE
Internal data storage capacity of upto 8 GB or 90 days.

REAL-TIME DATA
Continuous monitoring and real-time data transfer at configurable intervals.

Solar Powered with Battery Backup
Compatible to charge internal battery using solar power.

RETROFIT DESIGN
Plug and play design for ease of implementation.

COMPACT
Light-weight and compact system that can be installed at 12-15 feet (4-5 m) height.

NETWORK AGNOSTIC
Supports a wide range of connectivity options like GSM / GPRS / WiFi / LoRa / NBIoT / Ethernet / Satellite / Modbus.

Weather Resistant
IP66 Grade (certified) enclosure for endurance against harsh weather.

ON-DEVICE CALIBRATION
On-site device calibration capability using on-device calibration software.

IDENTITY AND CONFIGURATION
Each equipment carries its unique identity with geo-tagging through wireless configuration.

CERTIFICATIONS

Approved by Ghana Standards Authority (GSA)

Tested by National Accreditation Board for Testing and Calibration Laboratories (NABTCL)

Certified by ISO & UK CERT

Compliance CE FC

Models

Variants	Applications	Parameters
Seelive Air Lite	General Purpose	PM2.5, PM10, CO2, CO, Noise, Light, UV-Radiation, Temperature, Humidity, Pressure
Seelive Air Smart	Extensive	PM2.5, PM10, CO2, CO, SO2, NO, NO2, O , Noise, Light, UV -Radiation, Temperature, Humidity, Pressure
Seelive Air Pro	Critical	PM , PM2.5, PM10, PM100 (TSP), CO2, CO, SO2, NO, NO2, O , H2S, Noise, Light, UV-Radiation, Temperature, Humidity, Pressure
Seelive Air Custom	As per request	Noise, Light, UV-Radiation, Temperature, Humidity, Pressure

SEELIVE AIR MONITOR

Parameter Specifications

Sensor	ID	Range	Resolution	Min Detection	Drift	Working Principle	Expected Sensor Life
Suspended Particulate Matters with size less than 2.5µ ($PM_{2.5}$)	KAPM_1*	Upto 5000 µg/m^3	0.1 µg/m^3	1 µg/m^3	N.A.	Optical Particle Counter	5000 hours
Suspended Particulate Matters with size less than 10µ (PM_{10})							
Ultra Fine Particulate Matters with size less than 1µ (PM)							
Total Suspended Particulates (TSP) (PM_{100})		Upto 30 mg/m^3					
Carbon Monoxide (CO)	KACO_1*	0-5 ppm	0.01 ppm	0.01 ppm	< 1ppm / year		2 years
	KACO_4	0-50 ppm	0.05 ppm	0.05 ppm	< 2% / Month		
	KACO_2	0-100 ppm	0.1 ppm	0.1 ppm	< 2% / Month		
	KACO_3	0-1000 ppm	0.75 ppm	0.75 ppm	< 2% / Month		
Carbon Dioxide (CO_2)	KACO2_1*	0-5000 ppm	1 ppm	400 ppm	±5 ppm / Year	Non Despersive Infrared	
Nitric Oxide (NO)	KANO_1*	0-5 ppm	0.001 ppm	0.01 ppm	< 2% / Month		
	KANO_2	0-100 ppm	0.5 ppm	0.5 ppm	±50 ppb / Year		
Nitrogen Dioxide (NO_2)	KANO2_1*	0-10 ppm	0.001 ppm	0.01 ppm	±20 ppb / Year		
	KANO2_2	0-100 ppm	0.2 ppm	0.2 ppm	< 2% / Month		
	KANO2_3	0-500 ppm	0.5 ppm	0.5 ppm	< 2% / Month		
Ozone (O)	KAO3_1*	0-10 ppm	0.001 ppm	0.01 ppm	±20 ppb / Year		
Oxygen (O_2)	KAO2_1	(0-25) %VOL	0.1 %VOL	0.1 %VOL	< 2% / Month		
Hydrogen Sulfide (H_2S)	KAH2S_1*	0-1.5 ppm	0.001 ppm	0.01 ppm	±100 ppb / Year		
	KAH2S_2	0-50 ppm	0.05 ppm	0.05 ppm	< 2% / Month		
	KAH2S_3	0-200 ppm	0.2 ppm	0.2 ppm	< 2% / Month		
	KAH2S_4	0-2000 ppm	2 ppm	2 ppm	< 2% / Month		
Sulfur Dioxide (SO_2)	KASO2_1*	0-10 ppm	0.001 ppm	0.01 ppm	±20 ppb / Year		
	KASO2_2	0-100 ppm	0.2 ppm	0.2 ppm	< 2% / Month		
	KASO2_3	0-2000 ppm	5 ppm	5 ppm	< 2% / Month		
Ambient Noise	KAN_1*	Upto 140 dB	1 dB	0.5 dB	N.A.	Capacitive	
Temperature	KATEMP_1*	-40 to 125°C	0.01°C ppm	-40 °C	N.A.	Solid State miconductor Sensing	
Humidity	KAHUM_1*	100% Rh	0.10% ppm	0.10%	N.A.		
Barometric Pressure	KAPRES_1*	300-1100 hPa	0.18 Pa	300 hPa	N.A.		
Light Intensity	KAUV_1*	Up to 1,00,000 Lux	1 Lux	1 Lux	N.A.		3 Years
UV Radiation		0.1-100,000 uW/cm2	0.1 uW/cm2	0.1 uW/cm2	N.A.		
Visible Light Intensity		Up to 5000 Lux	0.1 Lux	0.1 Lux	N.A.		

SEELIVE AIR PRODUCT

Specification

Mechanical

Size	360mm (H) x 328mm (W) x 200mm (D)
Weight	7.2 Kg (instrument weight)
Material	Aluminum Magnesium Alloy, Mild-steel (With Powder Coating), FRP
Certifications	CE, FCC, IP66, RoHS

Electrical

Avg. Power Consumption	5 Watt (Actual consumption depends upon the number of parameters)
Power Input Options	AC : External 110-240V AC, 50-60Hz DC : Uninterrupted 24V DC, 2 Ampere 60 Watt 24V Solar Panel
SMPS Specs	24V, 2Amps output UL-62368 & CAN/CSA C22.2 Certified
Battery Backup Time	Upto 12 Hours
Battery Specs	Lithium iron phosphate (LiFePO4) battery cell with rated voltage 12.8V Capacity 6Ah

Technical

Processor	Quad Core ARM Cortex
Memory	2GB RAM / 8GB eMMC ROM
Device Interface	On-device Software / API / Cloud Platform
Internal Data Storage	Upto 8 GB or 90 days

Environmental

Operating Temperature	-20 °C to 60 °C
Operating Humidity	0-93% RH
Recommended Humidity	15-90% RH
Storage Conditions	10 - 40°C

Sensing

Gas Measurement Principle	Active Sampling with Sampling rate of 325 mL/Sample
Dust Measurement Principle	Active Sampling with Sampling rate of 1 L / min
Warm up time	< 48 hours for data stabilisation

Communication

Data Interval	5-30 (configurable) minutes
Data-push Protocol	HTTP post request to host server
Data-pull	HTTP request on device IP
Firmware Updates	Over-The-Air Firmware Update
Standby Connectivity	GSM (2G/3G/4G) for remote diagnosis, FOTA updates, and cloud calibration / Satellite
Certification	PTCRB, CE, FCC, RoHS, ISO, GSA

	Connectivity Options	Specification
Wireless	GSM	Global 2G / 3G / 4G
	LoRa	868 MHz / 915MHz
	LTE	CAT-M1
	NB-IoT	CAT-NB1
	sigfox	868 to 869 MHz, 902 to 928 MHz
	Wi-Fi	AP Mode and Station Mode
Wired	Ethernet	Static / DHCP Configuration
	Modbus	RS485 RTU / TCP
	RELAY	2 Channel Relay

SEELIVE AIR PRODUCT

Functional Specifications

Proper location selection is critical for optimized data collection. It varies as per the purpose of the project. According to USEPA QA handbook (Vol II, Section 6.0 Rev.1), the selection of locations should be based on monitoring purposes.

Preferred Mounting	Pole / Wall (preferably 270° open surrounding)
Installation Height	12-15 feet (4-5 meters)
Direction	As per maximum direct sunlight exposure
Power Availability	Constant AC / DC supply within a 2-meter range from the unit or solar panel
Network Availability	Uninterrupted network connection

Data and Calibration

Collocation Calibration

The monitors are operated adjacent to a custom built reference station housing U.S. EPA designated Federal Equivalent Method (FEM) for collocation calibration to ensure optimum data quality.

Laboratory Calibration

All air quality monitoring systems are calibrated at the ISO/IEC 17025:2017 certified calibration laboratory using standard NIST traceable calibration gas standards as per the international guidelines by USEPA.

On-site Calibration

On-site calibration of seelive devices can be performed using standard calibration gas cylinders of known concentration or by co-locating with a reference standard.

Seelive Water Quality Monitor

The SEELIVE WATER QUALITY MONITOR is a smart water monitoring solution developed by Seelive Technologies, powered by trusted s::can technology. It provides real-time, accurate monitoring of critical water quality parameters using submersible spectrometer probes and integrated sensor systems.

This solution is ideal for drinking water, environmental water, wastewater, and industrial water applications. It seamlessly integrates with both Seelive and third-party platforms, allowing flexible deployment in various settings.

The system monitors key parameters such as:
pH, turbidity, conductivity, dissolved oxygen, nitrate, ammonium, organic carbon (TOC/DOC), chemical oxygen demand (COD), and temperature.

By combining Seelive's implementation expertise with the precision of s::can technology, the SEELIVE WATER QUALITY MONITOR delivers reliable, low-maintenance, and scalable monitoring for smart infrastructure and environmental management.

CERTIFICATIONS

Approved by Ghana Standards Authority (GSA)

Tested by National Accreditation Board for Testing and Calibration Laboratories (NABTCL)

Certified by ISO & UK CERT

Compliance CE FC


0.05
36.25
2.56
16.93
2.53
0.89
0.91
0.54
seelive
seelive

Usecases

Mining Site

Deforestation, water pollution, and habitat destruction at mining sites influence environmental authorities to monitor, analyze and control their significant impact on the environment, by the use of environmental pollution monitoring control technologies.

Food Processing

Food processing activities contribute to climate change through greenhouse gas emissions. Adopting eco-friendly technologies and smart practices can help reduce the industry's carbon footprint and environmental impact.

Industries

Improper chemical handling in industries poses risks to health and the environment. Implementing regulations, technology advancements, and sustainable practices reduces these risks, promotes a cleaner environment, and minimizes waste.

Airports

Smart technologies revolutionize airports, making them more sustainable and passenger-friendly. By optimizing operations, reducing emissions and noise, and improving safety and efficiency, airports create a convenient and eco-friendly travel experience.

Smart City

Environmental pollution monitoring systems such as IOT sensors, and other smart technologies in cities provide city authorities with actionable insights and efficient data for environmental pollution control plans and research.

Landfill

Landfills release pollutants that harm the environment. Employing waste reduction, recycling, composting, and treatment technologies minimizes pollution and aids in pollution control strategies. These practices mitigate the negative impact of landfills on the environment.

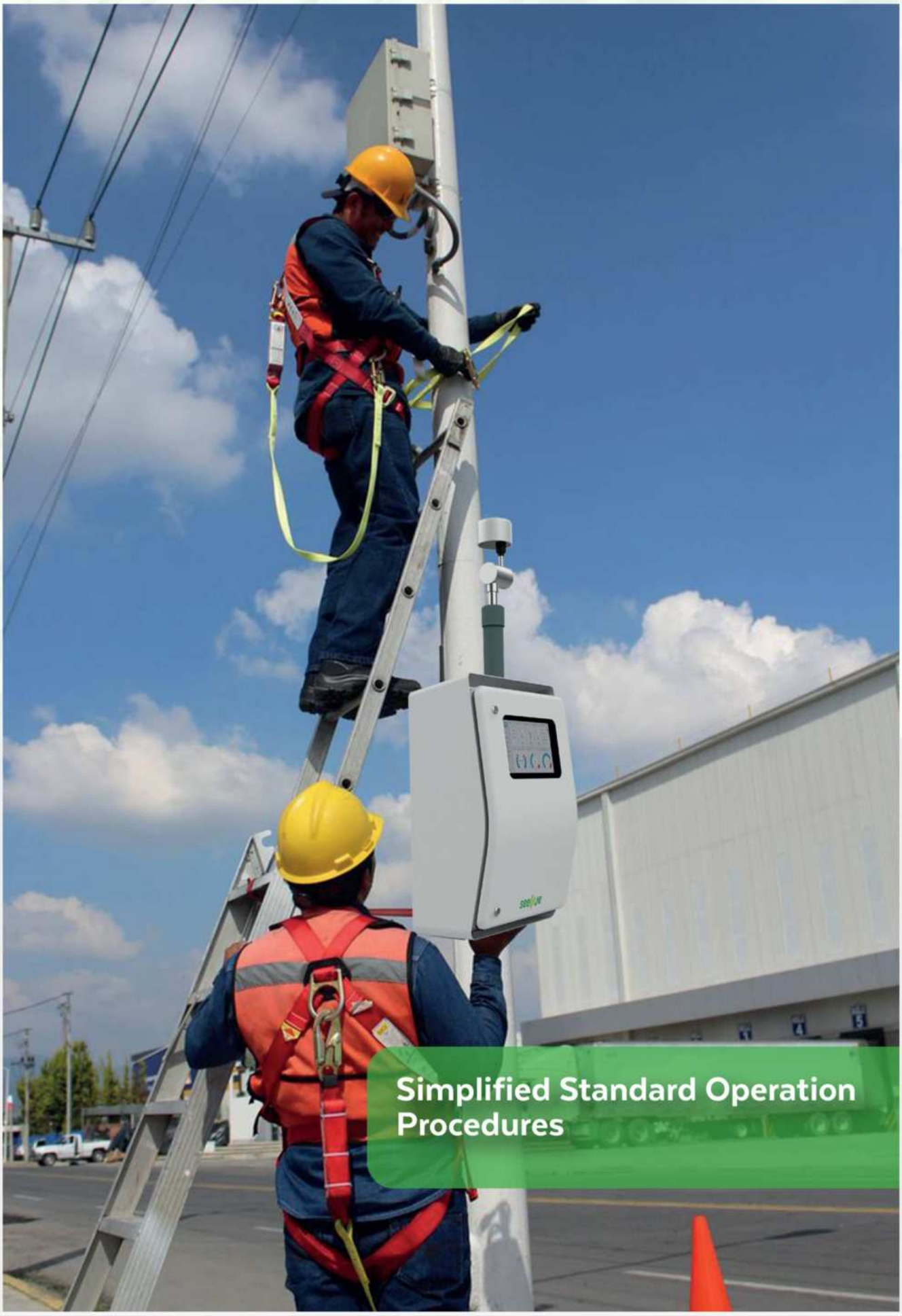
SEELIVE PRODUCT

Installation Process

Easy & Fast

The installation of the Klima Air is quick and easy, and the device can start to operate in less than 20 min.

First of all, it's needed to fix the metal support on a mast or a wall. After it, the device can be held on its support. Once the device is mounted in its final position, turn it on and check the confirmation on the display. If you need to replace a cartridge, just release the metal grid, unplug the cartridge and plug the new one.



Simplified Standard Operation Procedures

Kunak AIR Pro

Air quality monitor

WINNER AIRLAB 2021 & 2023 — MOST ACCURATE MULTI-POLLUTANT SENSOR

WINNER AIRLAB 2023 — BEST ACCURACY FOR OZONE

Measure air pollution with accurate and reliable data.

SENSOR BASED | NEAR REFERENCE DATA

Monitor up to 5 gas pollutants and particles simultaneously and get continuous and real-time data on the ambient air. Kunak AIR Pro allows you to measure various air pollutants in different environments, obtaining near-reference data.

All collected data can be visualised and analysed anywhere and anytime via Kunak AIR Cloud web platform.

Get the most versatile solution. The patented smart gas cartridge technology allows you to choose different pollutants depending on the project needs. Switch them whenever you need to.

Data quality is guaranteed. All of our sensors are factory calibrated and tested according to Class 1 of the European CEN/TS 17660 and EPA/600/R protocols, metrics and target values.

Data traceability to reference standards: European Directive 2024/2881 and USEPA 40 CFR Part 53.

- Patented cartridge system
- Multiple pollutants
- MCERTS certified (CSA MC230418/00)
- Traceable back to reference standards
- Remote calibration
- Additional probes

Simplify your daily operations. Make better decisions.

Kunak AIR Pro air quality station was awarded The Most Accurate Multi Pollutant Sensor in 2021 and 2023 AIRLAB Microsensors Challenge editions organised by Airparif.

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

EPA United States Environmental Protection Agency · AQMD AQ-SPEC · University of York · Atmo France · RICARDO · Flanders State of the Art — Flanders Environment Agency · Secretaría del Medio Ambiente · AIRPARIF

Kunak AIR stations offer performance levels close to reference standards, providing reliable, accurate data according to Class 1 of the European CEN/TS 17660; protocols, metrics and target values of EPA/600/R-20/279 for O_3, EPA/600/R-23/14 for NO_2, CO and SO_2 and EPA/600/R-20/280 for PM_{10} and $PM_{2.5}$.

Also, data is traceable to international recognised standards (European Directive 2024/2881 and USEPA 40 CFR Part 53).

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 26 Ah
External supply	7 - 12 Vdc. charger or solar panel
Autonomy	24/7 with charger or solar panel 9-30 days operation on battery (depending on configuration)
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_2S, 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 extra holder

Kunak AIR Lite

Air quality station

WINNER AIRLAB 2023 — MOST ACCURATE MULTI-POLLUTANT SENSOR

WINNER AIRLAB 2023 — BEST ACCURACY FOR PM2.5

WINNER AIRLAB 2023 — BEST ACCURACY FOR OZONE

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

INDUSTRY GRADE DESIGN | NEAR REFERENCE DATA

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 different pollutants easily, quickly, and cost-effectively.

Designed for industrial applications and massive deployments in cities.

Thanks to the patented smart cartridge technology, you can measure particulate matter (PM_1, $PM_{2.5}$ and PM_{10}) and 2 gases simultaneously. Replace the cartridges as your project changes without the need of sending the device back to the factory.

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

Data quality is guaranteed. All of our sensors are factory calibrated and tested according to Class 1 of the European CEN/TS 17660 and EPA/600/R protocols, metrics and target values.

Data traceability to reference standards: European Directive 2024/2881 and USEPA 40 CFR Part 53.

- Patented cartridge system
- 2 gases and particles
- Proven accuracy
- Traceable to reference standards
- Autonomous operation
- Additional probes

All collected data can be visualised and analysed anywhere and anytime via the Kunak AIR Cloud web platform.

Kunak AIR Lite air quality station was awarded The Most Accurate Multi Pollutant Sensor in the latest AIRLAB Microsensors Challenge edition organised by Airparif.

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

EPA United States Environmental Protection Agency · AQMD AQ-SPEC · University of York · Atmo France · RICARDO · Flanders State of the Art, Flanders Environment Agency · Secretaría del Medio Ambiente · AIRPARIF

Kunak AIR stations offer performance levels close to reference standards, providing reliable, accurate data according to Class 1 of the European CEN/TS 17660; protocols, metrics and target values of EPA/600/R-20/279 for O_3, EPA/600/R-23/14 for NO_2, CO and SO_2 and EPA/600/R-20/280 for PM_{10} and $PM_{2.5}$.

Also, data is traceable to international recognised standards (European Directive 2024/2881 and USEPA 40 CFR Part 53).

Specifications

Dimensions	200 x 153 x 185 mm
Weight	< 2.3 kg
Enclosure	PMMA & Polycarbonate & Stainless steel
Operating temp.	-20 ºC to 60ºC
Operating RH	0 to 99 %RH
IP rating	IP65
Battery	Lithium 20 Ah
External supply	7 - 12 Vdc. charger or solar panel
Autonomy	24/7 with charger or solar panel 9-20 days operation on battery (depending on configuration)
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_2S, 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 extra holder

Technical specifications

CSA MC230418/00

Type A (only for Kunak AIR Pro)

Type	Optical particle counter
Unit of measurement	µg/m³
Measurement range[1]	0 - 1,000 µg/m³ (PM1) 0 - 2,000 µg/m³ (PM2.5) 0 - 2,000 µg/m³ (PM4) 0 - 10,000 µg/m³ (PM10) 0 - 15,000 µg/m³ (TSP) 0 - 8,000 counts/cm³ (TPC)
Resolution[2]	1 µg/m³ 1 count/cm³ (TPC)
Operating temperature range[3]	-10 to 50 °C
Operating RH range[4]	0 to 99 %RH
Recommended RH range[4]	0 to 95 %RH
Operating life[5]	> 24 months
Repeatability[8]	2 µg/m³ (PM1) 3 µg/m³ (PM2.5) 3 µg/m³ (PM4) 5 µg/m³ (PM10) 6 µg/m³ (TSP)
Response time[9]	< 10 sec

Limit of Detection (LOD)[7]	0.5 µg/m³ (PM1) 0.5 µg/m³ (PM2.5) 0.5 µg/m³ (PM4) 1 µg/m³ (PM10) 1 µg/m³ (TSP)
Typical accuracy (MAE)[10]	± 2 µg/m³ (PM1) ± 3 µg/m³ (PM2.5) ± 3 µg/m³ (PM4) ± 4 µg/m³ (PM10) ± 6 µg/m³ (TSP)
Typical precision R²[10]	> 0.9 (PM1) > 0.8 (PM2.5) > 0.8 (PM4) > 0.7 (PM10) > 0.7 (TSP) > 0.8 (TPC)
Typical slope[10]	0.85 - 1.18
Typical intercept (a)[10]	-1.8 µg/m³ ≤ a ≤ +1.8 µg/m³ (PM1) -2 µg/m³ ≤ a ≤ +2 µg/m³ (PM2.5) -2 µg/m³ ≤ a ≤ +2 µg/m³ (PM4) -3 µg/m³ ≤ a ≤ +3 µg/m³ (PM10) -4 µg/m³ ≤ a ≤ +4 µg/m³ (TSP)
DQO - Typical U(exp)[11]	< 50% (PM1 - PM10) < 35% (PM2.5)
Typical intra-model variability[12]	< 2 µg/m³

Type B (only for Kunak AIR Lite)

Type	Optical particle counter
Unit of measurement	µg/m³
Measurement range[1]	0 - 1,000 µg/m³
Resolution[2]	1 µg/m³
Operating temperature range[3]	-10 to 60 °C
Operating RH range[4]	0 to 99 %RH
Operating life[5]	> 24 months
Repeatability[8]	3 µg/m³ (PM1) 3 µg/m³ (PM2.5) 6 µg/m³ (PM10)
Response time[9]	< 10 sec

Limit of Detection (LOD)[7]	0.5 µg/m³ (PM1) 0.5 µg/m³ (PM2.5) 0.5 µg/m³ (PM10)
Typical accuracy (MAE)[10]	± 3 µg/m³ (PM1) ± 3 µg/m³ (PM2.5) ± 6 µg/m³ (PM10) *
Typical precision R²[10]	> 0.85 (PM1) > 0.8 (PM2.5) > 0.5 (PM10) *
Typical slope[10]	0.80-1.25 (PM1) 0.83-1.20 (PM2.5) 0.75-1.35 (PM10) *
Typical intercept (a)[10]	-2 µg/m³ ≤ a ≤ +2 µg/m³ (PM1) -3 µg/m³ ≤ a ≤ +3 µg/m³ (PM2.5) -9 µg/m³ ≤ a ≤ +9 µg/m³ (PM10) *
DQO - Typical U(exp)[11]	< 50% (PM1) < 35% (PM2.5) < 75% (PM10) *
Typical intra-model variability[12]	< 2 µg/m³

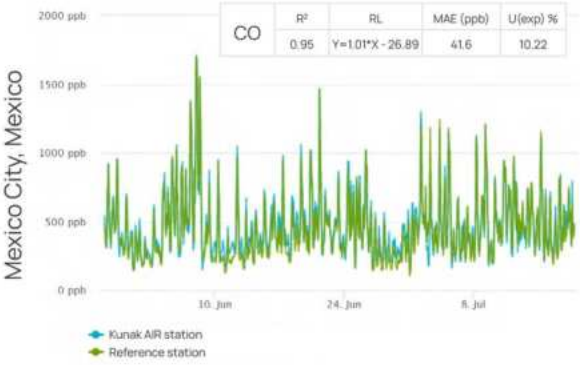
* See notes on page 25

Evidence of accuracy

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

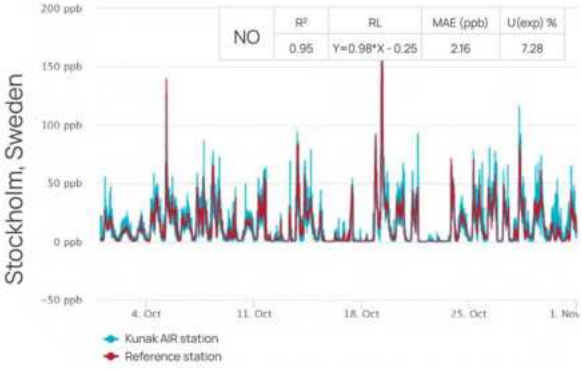
Mexico City, Mexico

	R^2	RL	MAE (ppb)	U(exp) %
CO	0.95	Y=1.01*X - 26.89	41.6	10.22



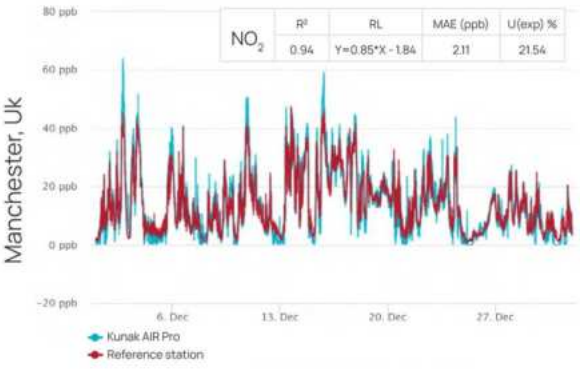
Stockholm, Sweden

	R^2	RL	MAE (ppb)	U(exp) %
NO	0.95	Y=0.98*X - 0.25	2.16	7.28



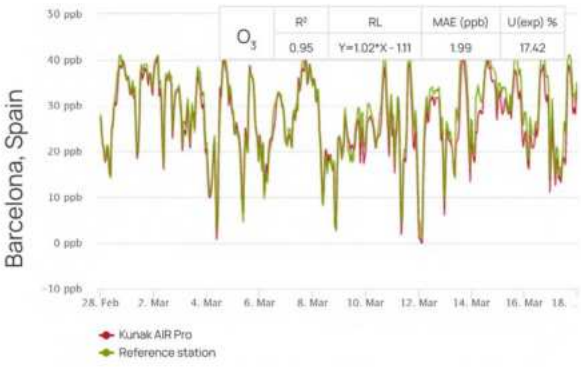
Manchester, Uk

	R^2	RL	MAE (ppb)	U(exp) %
NO_2	0.94	Y=0.85*X - 1.84	2.11	21.54



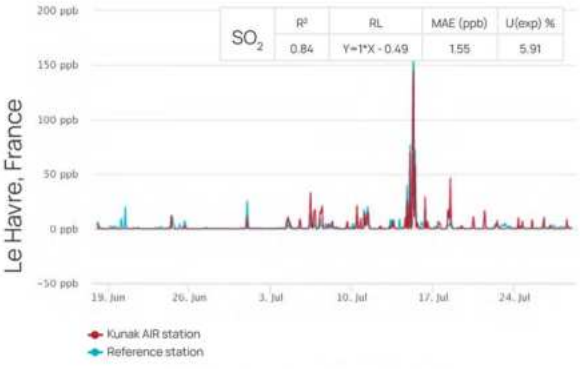
Barcelona, Spain

	R^2	RL	MAE (ppb)	U(exp) %
O_3	0.95	Y=1.02*X - 1.11	1.99	17.42



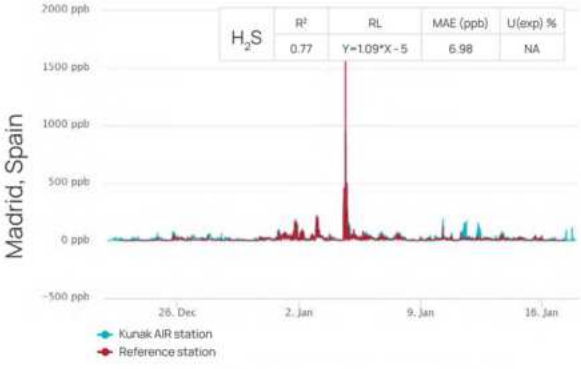
Le Havre, France

	R^2	RL	MAE (ppb)	U(exp) %
SO_2	0.84	Y=1*X - 0.49	1.55	5.91



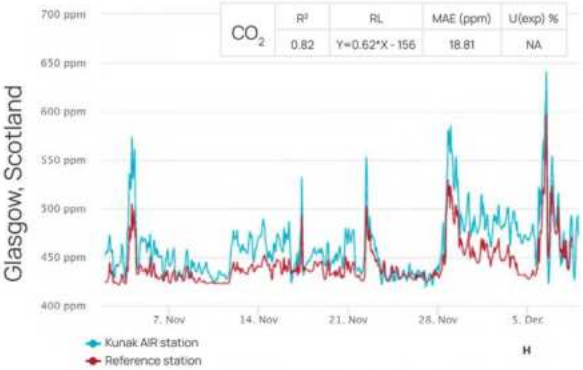
Madrid, Spain

	R^2	RL	MAE (ppb)	U(exp) %
H_2S	0.77	Y=1.09*X - 5	6.98	NA

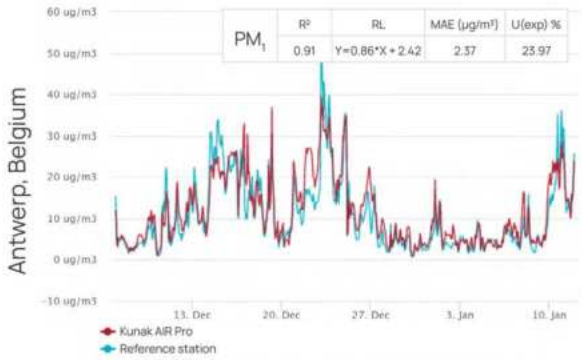


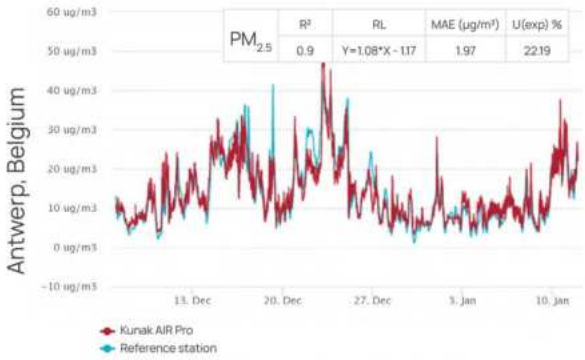
Glasgow, Scotland

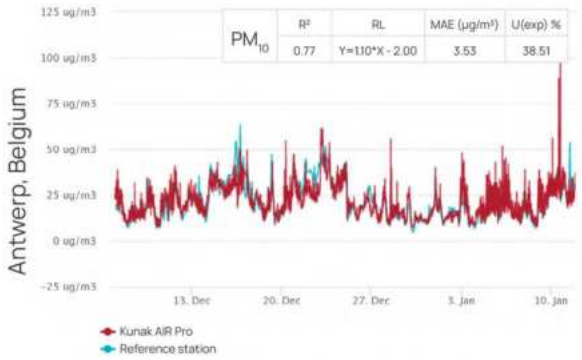
	R^2	RL	MAE (ppm)	U(exp) %
CO_2	0.82	Y=0.62*X - 156	18.81	NA

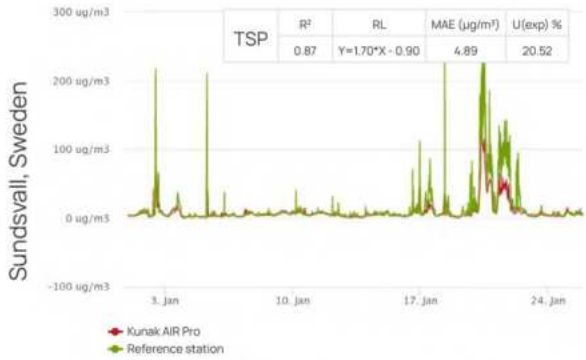


Kunak AIR Pro

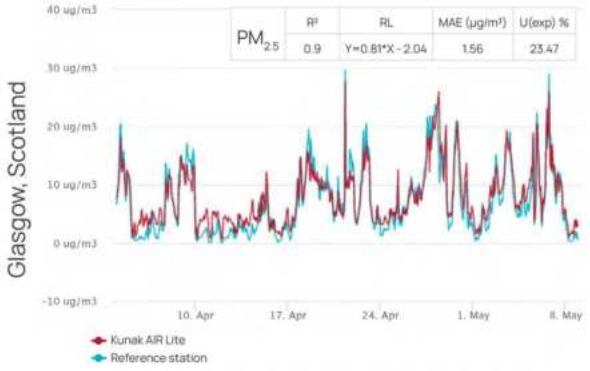


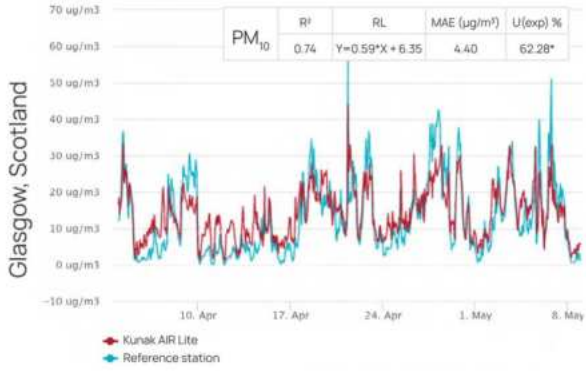






Kunak AIR Lite





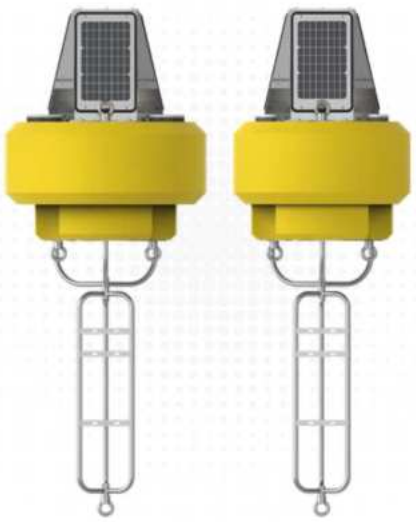
*The expected error for PM_{10} is higher in presence of coarse particles (see notes in p. 21)


Manage air quality with
reliable and accurate data.

NexSens Water Quality Monitors

General-Purpose Data Buoys

The CB-450 and CB-250 are designed for deployment in larger water bodies, striking a balance between their compact design and powerful capabilities. The versatile and lightweight design of the buoys allows both to be easily deployed from a boat. Three integrated solar panels provide adequate power and charging for sensor operation and data transmission. A data well provides watertight housing for batteries, data loggers, sensors, and other hardware that users wish to integrate with the buoys. The durable buoys are built to last with a heavy polymer coating protecting the closed-cell foam and providing adequate flotation with the strength of an indestructible stainless steel frame.



CB-450 CB-250

CB-450

Featuring 4-inch pass-through ports, the CB-450 allows for larger instruments (water quality sondes, etc.) to be deployed and retrieved without lifting the buoy out of the water.

CB-250

The CB-250 strikes a balance between compact and easy to deploy, yet buoyant and powerful enough to be deployed in larger water bodies.

Specifications	CB-250	CB-450
Hull Outer Diameter in (cm)	30.0 (76.2)	34.0 (86.4cm)
Hull Height in (cm)	20.0 (50.8)	20.0 (50.8)
Tower Height in (cm)	20.0 (50.80)	20.0 (50.80)
Data Well Inner Diameter in (cm)	10.3 (26.2)	10.3 (26.2)
Data Well Height in (cm)	19.5 (49.5)	19.5 (49.5)
Instrument Pipe Diameter in (cm)	2.0 (5.1)	4.0 (10.2)
Weight lbs (kg)	115 (52)	130 (59)
Buoyancy lbs (kg)	250 (114)	450 (204)
Solar Power Watts	3x 15-watts	3x 15-watts
Mooring Attachments ¾" eyenut	1, 2, or 3 point	1, 2, or 3 point

Key Features

Versatile

Light enough to deploy from most smaller boats while still offering adequate power and charging for rigorous instrument sampling and data transmission.

Connections

The data well lid provides pass-through connections for sensors, power, venting, and more.

Efficient Charging

Three integrated 15-watt solar panels are angled and evenly spaced around the buoy to capture sunlight from any direction and provide adequate battery charging.

Pass-Through Ports

Three 4-inch pass-through ports on the CB-450 and 2-inch pass-through ports on the 250 allow sensors to be mounted underwater while securely routing the cable.

Durable Design

Cross-linked polyethylene foam coated with a heavy polymer skin over a stainless steel frame makes the CB-250 and CB-450 durable against rough environmental conditions.

Data Well

A 10-inch diameter by 19.5 tall data well provides watertight housing for batteries, data loggers, sensors, and other hardware.

Power Options

For remote applications where line power is not available, solar power packs may be installed to continuously operate the data logger and attached sensors. Alternatively, an AC power adapter may be used to power the logger and sensors.

Solar Power Pack

The SP-Series Solar Power Packs feature a solar panel, regulator, and battery housed in a weather tight enclosure. Solar Power Packs are used to provide continuous power for X-Series systems. All components are weather tight and designed to withstand harsh conditions. A UW-6 plug provides an easy-to-use, waterproof, thread-in connection to compatible devices. A built-in mounting bracket allows the packs to be mounted to a 1.5" to 2" pipe. Options include 10, 15, and 32 watt packs.

Features:

- Designed for use with the NexSens X-Series data loggers
- All components are weather tight and designed to withstand harsh conditions
- Adjustable angle to 0, 30, 45 degrees

AC Power Adapter

The UW6-PW AC adapter is used to supply power to X-Series instruments through NexSens' standard UW6 underwater connector for continuous operation. The instrument connection end is waterproof and vented, allowing for a wide range of deployment options.

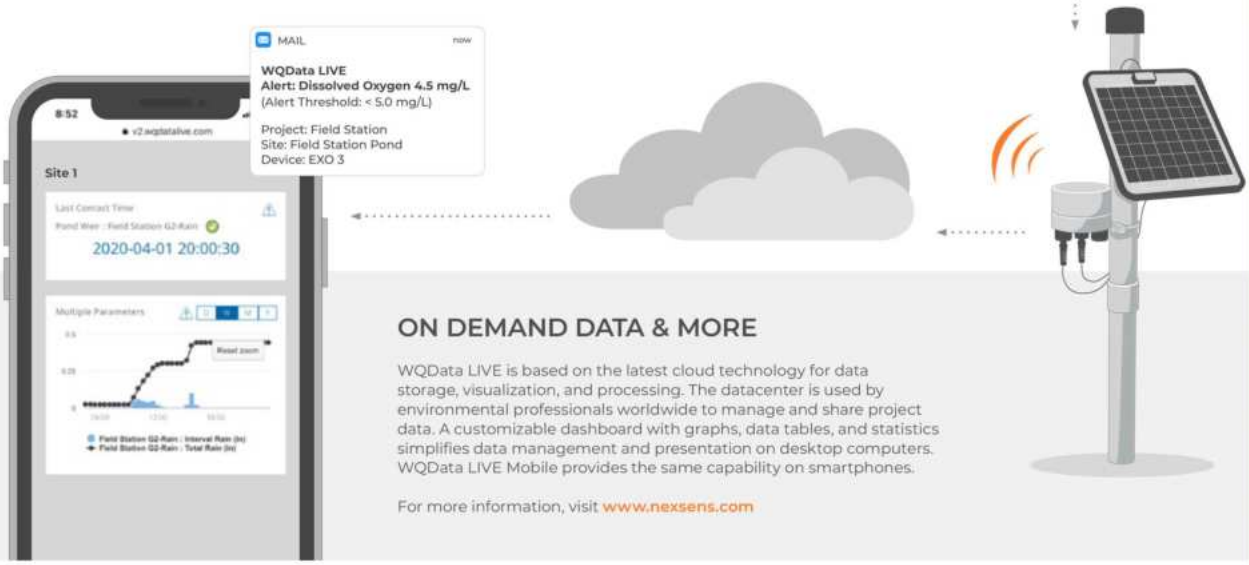
Features:

- Vented and waterproof UW-6 provides robust connection to instrument
- Specifically designed to work seamlessly with NexSens X-Series instruments
- 2A supply runs even high power draw systems

EASY-TO-CONNECT LOGGERS & SENSORS

PLUG-AND-PLAY DESIGN

The NexSens NX-Series sensors and other popular sensors easily connect to and are auto-recognized by X-Series data loggers. When powered and scanned, the data logger begins streaming data to the cloud, where it is available to view or download at the WQData LIVE datacenter.



ON DEMAND DATA & MORE

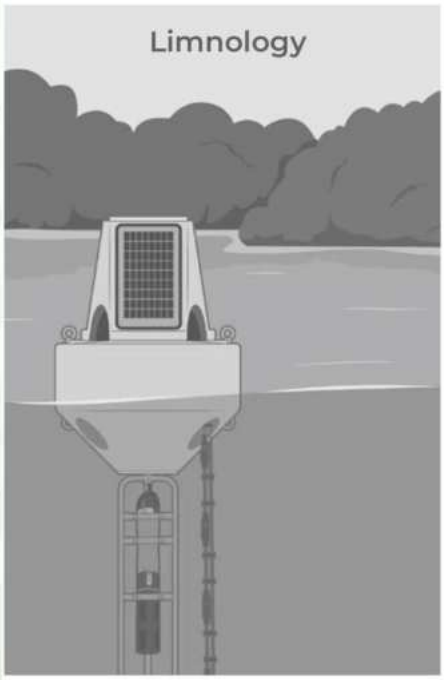
WQData LIVE is based on the latest cloud technology for data storage, visualization, and processing. The datacenter is used by environmental professionals worldwide to manage and share project data. A customizable dashboard with graphs, data tables, and statistics simplifies data management and presentation on desktop computers. WQData LIVE Mobile provides the same capability on smartphones.

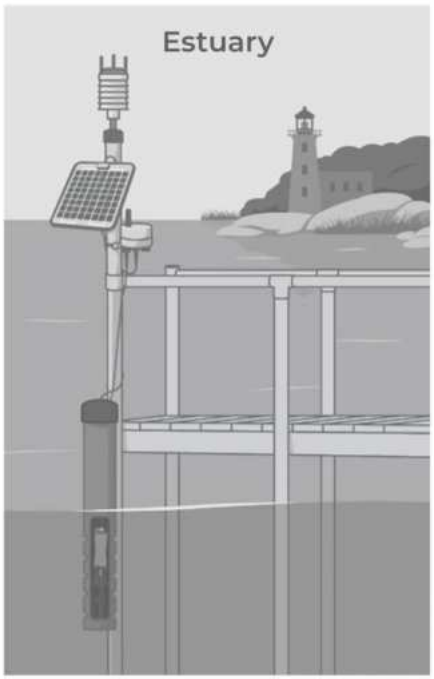
For more information, visit www.nexsens.com

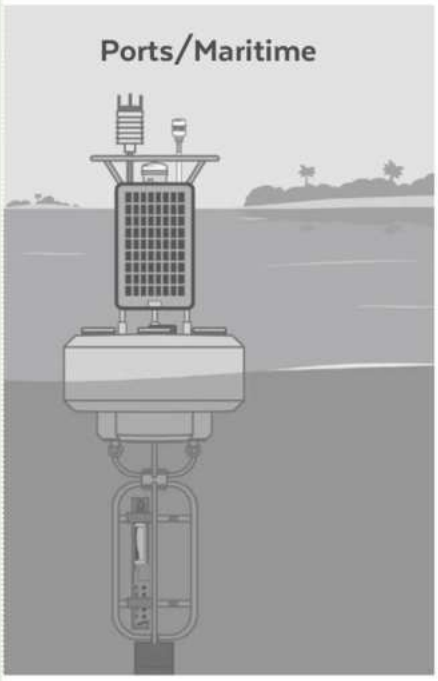
Product Use Cases

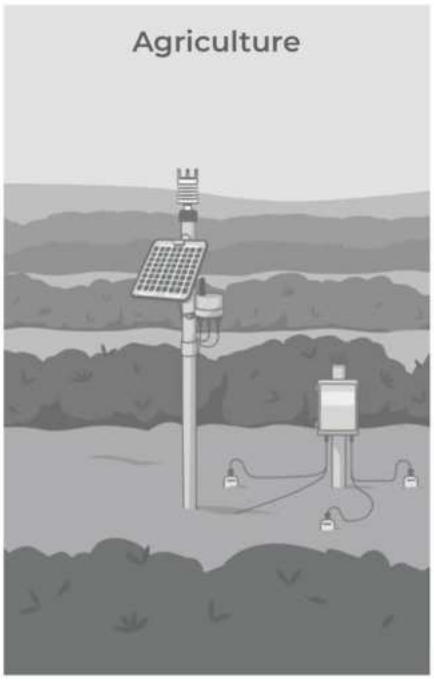
Monitoring Applications

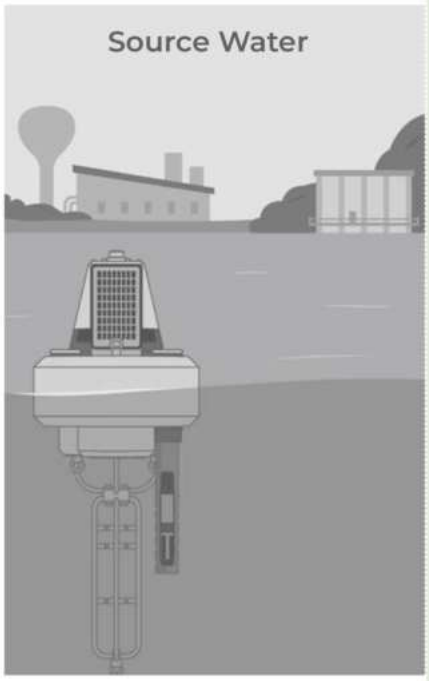
NexSens data loggers offer industry-leading versatility. With a large integrated sensor library, other manufacturers' sensors and instruments, including water quality sondes, current meters, weather stations and specialized measurement systems, are easy to connect and configure. Users can quickly set up a standard or customize a real-time system for any application.







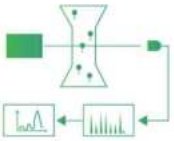




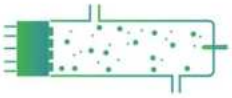
About Technology

Oizom® has years of experience in stimulating innovation by creating groundbreaking technology for environmental monitoring. With the platform-based development approach, Oizom® has been able to successfully unlock multiple solutions catering to various industries. Our sensing technology is built on proven working principles like NDIR, Electrochemical, Semiconductor, Optical, Laser-Scattering, etc. As a part of our patented 'Micro Active Sampling' (e-breathing technology), we have a sophisticated suction and exhaust system to take a sample of air and monitor it inside a controlled environment. This leads to zero effect of the external environment on measurement, responsible for up to 13% higher accuracy than the industry standards.

Electrochemical



Laser Scattering



Non Dispersive Infrared

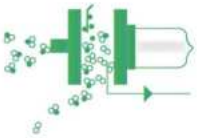


Photo-ionization Detection

Data Communication

GSM · LTE · NB-IoT · LoRa · Wi Fi · ETHERNET · sigfox · RELAY · Modbus

Oizom® devices support a variety of device communication protocols. Depending on the user's needs and the deployment type, these modes can be wired or wireless. Oizom® products can support GSM, LTE, Wi-Fi, LoRa, Sigfox, Satellite, NB-IoT, Ethernet, and Modbus communication protocols. This wide range of options allows users to choose the most appropriate communication method for their location, ensuring seamless data transmission.

Hardware Solutions

Polludrone®

Polludrone® is a Continuous Ambient Air Quality Monitoring System (CAAQMS). It is capable of monitoring various environmental parameters related to Air Quality, Noise, Odour, Meteorology, and Radiation. Polludrone® measures the particulate matter and gaseous concentrations in the ambient air in real-time. Using external probes, it can also monitor other auxiliary parameters like traffic, disaster, and weather.

Parameter	
Particulate Matter - $PM_{2.5}$ & PM_{10}	
Ultra Fine Particulate Matter (PM_1), Total Suspended Particulate Matter (PM_{100})	
Carbon Monoxide (CO) and Carbon Dioxide (CO_2)	
Noise, Solar Radiation, Temperature, Humidity, Pressure	
Gaseous Pollutants (SO_2, NO, NO_2, O_3)	
Hydrogen Sulfide (H_2S)	
Equipment Size	360mm (H) x 328mm (W) x 200mm (D)
External Modules (optional)	Wind Speed, Wind Direction, Rain (Customizable)

CE FC RoHS PTCRB TÜV

Odosense®

Odosense® is an E-nose-based Odour Monitoring system designed to monitor various odourful and toxic gases. It offers real-time monitoring of odourful parameters such as Sulphur Dioxide (SO_2), Hydrogen Sulfide (H_2S), Ammonia (NH_3), Methyl Mercaptan (CH_3SH), Total Volatile Organic Compound (TVOC), Formaldehyde (CH_2O), Nitrogen Dioxide (NO_2), Chlorine (CL_2), Temperature, Humidity and Pressure. The data collected can be visualised in the Envizom environmental monitoring platform in different values like ppm, ppb, µg/m³ and Ou (odour unit) in the real-time dashboard. The odour data is useful for different applications, such as wastewater treatment plants, landfills, oil and gas industries, etc.

Parameter	
Hydrogen Sulfide (H_2S), Sulfur Dioxide (SO_2), Ammonia (NH_3)	
Methyl Mercaptan (CH_3SH), Total Volatile Organic Compounds (TVOCs)	
Chlorine (Cl_2), Nitrogen Dioxide (NO_2), Formaldehyde (CH_2O)	
Temperature, Humidity, Pressure	
Equipment Size	360mm (H) x 328mm (W) x 200mm (D)
External Modules (optional)	Wind Speed, Wind Direction, Rain (Customizable)

CE FC RoHS PTCRB

Dustroid®

Dustroid® is an MCERTs-certified Real-time Particulate Monitoring System that measures the concentration of dust particles in ambient air. It is capable of monitoring various particulate sizes ranging from 1 micron to 100 microns, such as Ultrafine Suspended Particulate Matter (UFPM), Suspended Particulate Matter (SPM), Respiratory Suspended Particulate Matter (RSPM), and Total Suspended Particulates (TSP). The system works on the Active Sampling method to count particulate matter using a highly accurate laser beam.

Parameter	
Ultra Fine Particulate Matters (PM_1)	
Suspended Particulate Matters - $PM_{2.5}$, PM_{10}	
Total Suspended Particulate Matter (TSP-PM_{100})	
Temperature, Humidity, Pressure, Noise	
Heated Inlet for Air-sample Dehumidification	
Equipment Size (HxWxD)	360mm (H) x 328mm (W) x 200mm (D)
External Modules (optional)	Wind Speed, Wind Direction, Rain (Customizable)

Weathercom®

Weathercom® is an Automatic Weather Station (AWS) that provides a holistic view by continuously monitoring Wind Speed & Direction, Rainfall, Visibility, Light Intensity, Solar Radiation, Temperature, Humidity, and Pressure. It goes beyond basic data collection. It analyses historical trends to provide accurate forecasts and timely alerts, empowering proactive decision-making. This makes it ideal for diverse applications such as roads and highways, smart cities, mining sites, agriculture, climate research, disaster prevention, and airport and seaport monitoring.

Parameter	
Wind Speed, Wind Direction	
Rainfall Monitoring	
Solar Radiation, UV Radiation, UV Index, Light Intensity	
Temperature, Humidity, Pressure, Noise	
Equipment Size (HxWxD)	360mm (H) x 328mm (W) x 200mm (D)

Class 1 Noise and Vibration sensors are available as optional features upon specific customer request.

AQBot™

AQBot™ is an Industrial-Grade Single-Parameter air quality monitor with automation capabilities. It is compatible to monitor various critical environmental parameters like Toxic Gases, Particulate Matter, and Noise. This real-time air quality monitor allows industries to monitor what's crucial for them. It also has a display, siren, and strobe light system to get immediate alerts in critical situations. This system activates in real-time upon exceeding user-defined thresholds, providing a multi-sensory alert alongside software notifications.

Parameter	
Ammonia (NH_3)	
Methane (CH_4)	
Total Volatile Organic Compounds (VOC)	
Particulate Matter (PM_1, $PM_{2.5}$, PM_{10}, PM_{100})	
Gaseous Pollutants (SO_2, NO, NO_2, O_3)	
Noise	
Equipment Size (HxWxD)	210MM(W) x 258mm(H) X 105mm(D)

CE FC RoHS PTCRB

Pollusense™

Pollusense is a Portable Air Quality Monitoring System that measures multiple Toxic Gases and Particulate Matter. It offers a range of customizable parameters, making it ideal for various applications such as Industries, environmental audits, mining, leak detection, construction, landfills, and research. Pollusense is a compact and briefcase-sized device that can be carried anywhere to get accurate air quality data.

Parameter	
Particulate Matter - $PM_{2.5}$ & PM_{10}	
Ultra Fine Particulate Matter (PM_1), Total Suspended Particulate Matter (PM_{100})	
Carbon Monoxide (CO) and Carbon Dioxide (CO_2)	
Gaseous Pollutants (SO_2, NO, NO_2, O_3)	
Hydrogen Sulfide (H_2S)	
Equipment Size	503mm (L) x 406mm (W) x 193mm (H)

CE

Data Accuracy and Calibration

The Oizom® Gas Sensor (OGS) module is designed to accurately measure low concentrations of various gases at ppb, and ppm levels in the ambient air. The sensor is capable to monitor the point source gases on real-time basis. Each sensor is integrated into a metal casing along with the ultra-low-noise support electronics, which makes it compact and reliable. This allows accurate gas detection even at very low concentrations in the atmosphere.

1. Proprietary gas sensing technology
2. Independent calibration of each sensor
3. Low-noise electronic design

Three Step Calibration

1 Laboratory Calibration

All air quality monitoring systems are calibrated at the ISO/IEC 17025:2017 certified calibration laboratory using standard NIST traceable calibration gas standards as per the international guidelines by U.S. EPA. (Vol II, Section 6.0 Rev.1)

2 Collocation Calibration

Post lab calibration, the monitors are operated adjacent to a custom-built reference station housing U.S. EPA-designated Federal Equivalent Method (FEM) for collocation calibration to ensure optimum data quality.

3 On-site Calibration

On-site calibration of Oizom® devices can be performed using standard calibration gas cylinders of known concentration or by co-locating with a reference standard.

Sensor Technology From EandE

Engineering & Environmental Solutions Pvt. Ltd.

Ultrasonic Flowmeter
Pravaah
EE-UWFM-DNX

Pravaah, E&E Solutions' innovative inline ultrasonic flowmeter, designed for real-time water management. Pravaah goes beyond traditional meters by offering a complete water management solution with cutting-edge technology.

- Measures Water Flow
- Ultrasonic Transit Time Principle
- 4G/ LTE based remote monitoring
- Emergency Alerts & Dashboard Support

Electromanetic Flowmeter
MagnaFlo
EE-EFM-50DNX

MagnaFlo range of electromagnetic flowmeters offer a low cost high accuracy solution. With an obstruction-free design and high-precision sensors, you can trust our meters to deliver reliable data every time. Available in wide line range (15NB to 600NB)

- Measures Water Flow
- Electromagnetic Induction
- RS-485 Modbus RTU based communication
- Emergency Alerts & Dashboard Support

Rain Gauge
Raintip4G
EE-RNG-200S

RainTip4G is the industry's first to combine the accuracy and reliability of the tipping bucket design with the convenience of self-contained power, 4G SIM based connectivity, and secure cloud-based data storage.

- Tipping Bucket measurement
- Measures rainfall, duration, intensity
- 4G/ LTE Based Remote Monitoring
- Long term battery life

Piezometer

EE-PZO-1000NTX

E&E's Piezometer, crafted to deliver precise and reliable ground water level measurements in various environments. Equipped with our heavy-duty CE-approved pressure sensor & barometric pressure compensation we guarantee accuracy and stability for your long-term monitoring requirements.

- Absolute Piezoelectric Pressure Sensor
- Measures ground water level
- 4G/LTE based Remote Monitoring
- Emergency Alerts & Dashboard Support

Online Continuous Effluent Monitoring System

EE-OWQA-5000

Designed to provide precise and reliable water quality monitoring, built to withstand harsh conditions OQWA 5000 series is the ideal choice for effluent monitoring, STP, ETP, plants covering all required parameters.

- UV-Visible Spectroscopy & Amperometry
- Measures COD, BOD pH, TSS, Chlorine
- RS-485 Analog Output
- TUV Certified

Ambient Air Quality Monitoring System (Mini)

EE-AAQMS-100X-WS

Our Ambient Air Quality Monitoring Stations (AAQMS) offer precise and reliable data for a variety of applications. These advanced devices measure essential environmental parameters customizable to meet specific needs.

- Wide range detection PM10, PM2.5, SO_2, NO_2 O_2, CO, H_2S
- Measures Air Pollutants
- GSM/WIFI/LAN
- Fully Customizable as per requirements

Fine Particulate Sampler

EE-FPS-001X

Designed to meet the highest industry standards, our sampler accurately measures ambient PM-2.5, PM-10, and PM-coarse particulate matter, providing essential data for air quality monitoring and regulatory compliance.

Suspended Particulate Matter (SPM) Analyzer

EE-SPM-100-OP

Based on the principle of opacity of smoke, SPM-100-OP is designed to measure the concentration of dust or particulate matter suspended in the exhaust gas passing through a duct, stack, or flue.

Suspended Particulate Matter (SPM) Analyzer

EE-SPM-100-TBE

Our Tribo SPM analyzer leverages the proven Tribo-electric principle to provide precise and reliable measurements of suspended particulate matter (SPM) in emissions.

Automatic Weather Monitoring Station

EE-AWMS-01X

The EE-WMS-01 is a durable, battery-powered weather station, ideal for environmental compliance. It provides precise wind, solar, temperature, humidity, and pressure data, with wireless connectivity and a web based interface.

- Comprehensive Sensor Suite
- Low power usage
- Durable Stainless Steel Mounting Stand
- Full featured Data logger with LCD

Continuous Ambient Air Quality Monitoring Station

EE-CAAQMS- 9000

Our ambient air quality monitoring station adheres to CPCB guidelines for Continuous Air Quality Monitoring, utilizing USEPA-approved air analyzers. ENE Solutions provides a comprehensive suite of parameters to meet the compliance requirements of various industries throughout India

- Gases: O_3, NO_2, CO, CO_2, SO_2, VOCs, H_2S, CH_4, BTEX and NOx
- Particulate Matter: TSP, PM10, PM2.5
- Meteorological: Temperature, humidity, noise, barometric pressure, precipitation, solar radiation, wind speed and direction

Continuous Emission Monitoring System

EE-CEMS-ND-6000X

Designed to accurately measure a wide range of pollutants, including PM, HCl, HF, NH3, SOx, NOx, CO, O2, CO2, VOCs, with inbuilt remote calibration setup. Our CEMS ensures compliance with environmental regulations and helps you maintain a clean and sustainable operation.

- CPCB Approved Technology
- Measures Air particulate emissions
- High Accuracy, remote calibration
- Dashboard setup, control, & data logging

Data Logger

EE-RTU-485DL

Our all-in-one data logger is a compact and durable device that simplifies remote monitoring. It integrates a data logger, 4G/Wi-Fi modem, and battery into a single unit, eliminating the need for complex setup. Simply connect your sensors, insert a SIM card, and start collecting data.

- Modbus Available /4-20mA
- Wi-Fi Connectivity
- In-built battery
- LCD Option Available

Indoor Air Quality Monitor

AirSense

EE-IAQ-WS200

Protect your health and improve your indoor environment with our IAQ monitor. Our device accurately measures PM2.5, PM10, CO2, VOCs, and more, providing real-time insights into your air quality, it's the perfect solution for homes, offices, and public spaces.

- Wi-Fi Connectivity
- Detects air pollutants
- Rugged Construction
- Real time response with AQI

Ultrasonic Level Monitor

EE-ULM-100-R

Contact less level monitoring System is a revolutionary Device designed to transform urban drainage management. Our intelligent sensor network detects blockages, monitors fill levels, and measures flow rates in real-time using ultrasonic technology.

- All in One (Sensor, Battery, Communication)
- Real-time monitoring
- 4G/ LTE communication & Cloud-based data management
- 5+ Years Battery Life

Radar Water Velocity meter

EE-RA-WLM-01

E&E's Doppler Radar Flowmeter, operating at 24GHz, is built for accurate, real-time water flow velocity measurements. Its non-contact design ensures reliable performance, even in challenging environments. Featuring a robust bracket fixing method, it's a dependable choice for seamless and precise water flow monitoring.

- Non-contact radar technology for velocity measurement
- High precision across diverse flow conditions
- Compact RTU with integrated data logger and GSM modem
- Solar-powered with low-maintenance operation

Radar Water Flowmeter

RWLEES01

Engineered for precision and reliability, E&E's Radar Flowmeter offers real-time, round-the-clock water flow and level measurements using advanced radar technology. Designed for non-contact operation, it ensures stable performance in diverse and challenging environments. With an integrated flow model and flexible bracket fixing, it's the ideal solution for accurate and hassle-free water flow monitoring.

- Non-contact radar technology for flow measurement
- Wide velocity range of 0.05–30 m/s
- Solar-powered with compact rechargeable battery
- Integrated RTU with plug-and-play setup


Piezometer
GWLR-AT-01
Ground Water Level Recorder
4G
Engineering &
Environmental
Solutions Pvt. Ltd.
Piezometer
4G
Engineering &
Environmental
Solutions Pvt. Ltd.


seelive

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United Platform Solutions

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UPS™
United Platform Solutions

aocems
Ensuring ecofriendly communities