

Polludrone[®]

Ambient Air Quality Monitoring System



About 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, weather and 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.

Polludrone® is an ideal choice for smart infrastructure applications such as Smart Cities, Industries, Airports, Neighborhoods, University Campuses, Schools, Highways, Tunnels, and roadside monitoring. It is the perfect ambient air pollution monitoring system to understand a premise's environmental health.



Product Features



Patented Technology

Works on innovative e-breathing technology for higher data accuracy.



Tamper Proof

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



Retrofit Design

Plug and play design for ease of implementation.



Over-The-Air Update

Automatically upgradeable from a central server without any onsite visit.



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 / Modbus.



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.



On-device Calibration

On-site device calibration capability using on-device calibration software.



Weather Resistant

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



Identity And Configuration

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



Solar Powered with Battery Backup

Compatible to charge internal battery using solar power.

Key Benefits



Robust And Rugged

Durable enclosure to sustain extreme climatic conditions.



Multi-parameter

Compatible with a wide range of parameters including PM, gases and meteorological parameters



Seamless Connectivity

A wide range of options of wired and wireless connectivity.



Cloud Platform

Visualize and analyze data in the cloud. Easy data integration via APIs.



Accurate Data

Gives accurate readings in real-time to detect concentrations in ambient air.



Easy to install

Effortless installation with versatile mounting arrangements.

Polludrone® Usecases



Smart City

Pollution monitoring at strategic locations in a smart-city empowers city authorities to obtain actionable insights for pollution control.



Roads And Highways

Pollution monitoring at roads and tunnels can help create pollution mitigation action plan to control vehicular emissions.



Smart Campus

Pollution monitoring at key locations on campus allows stakeholders to spread awareness about environmental conditions of the premises.



Airports

Pollution and noise monitoring at taxiways and terminal surroundings facilitates airport authorities to analyze its impact on travellers and surrounding neighbourhoods.

Polludrone® Variants

Variants	Applications	Parameters
Polludrone® Lite	General Purpose	PM _{2.5} , PM ₁₀ , CO ₂ , CO, Noise, Light, UV-Radiation, Temperature, Humidity, Pressure
Polludrone® Smart	Extensive	PM _{2.5} , PM ₁₀ , CO ₂ , CO, SO ₂ , NO, NO ₂ , O ₃ , Noise, Light, UV - Radiation, Temperature, Humidity, Pressure
Polludrone® Pro	Critical	PM ₁ , PM _{2.5} , PM ₁₀ , PM ₁₀₀ (TSP), CO ₂ , CO, SO ₂ , NO, NO ₂ , O ₃ , H ₂ S, Noise, Light, UV-Radiation, Temperature, Humidity, Pressure
Polludrone Custom	As per request	Choice of Particulate Matter, Noise and upto 9 gases with External Modules.

Parameters

Sensor	ID	Range	Resolution	Min. Detection	Drift	Working Principle	Expected Sensor Life	
Suspended Particulate Matters with size less than 2.5µ (PM _{2.5})	OZPM_1*	Upto 5000 µg/m ³	0.1 µg/m ³	1 µg/m ³	N.A.	Optical Particle Counter	18 Months	
Suspended Particulate Matters with size less than 10µ (PM ₁₀)								
Ultra Fine Particulate Matters with size less than 1µ (PM ₁)								
Total Suspended Particulates (TSP) (PM ₁₀₀)		Upto 30 mg/m ³						
Carbon Monoxide (CO)	OZCO_1*	0-5 ppm	0.01 ppm	0.01 ppm	< 1ppm / year	Electrochemical	2 years	
	OZCO_4	0-50 ppm	0.05 ppm	0.05 ppm	< 2% / Month			
	OZCO_2	0-100 ppm	0.1 ppm	0.1 ppm	< 2% / Month			
	OZCO_3	0-1000 ppm	0.75 ppm	0.75 ppm	< 2% / Month			
Carbon Dioxide (CO ₂)	OZCO2_1*	0-5000 ppm	1 ppm	400 ppm	±5 ppm / Year	Non Despersive Infrared		
Nitric Oxide (NO)	OZNO_1*	0-5 ppm	0.001 ppm	0.01 ppm	< 2% / Month	Electrochemical	2 years	
	OZNO_2	0-100 ppm	0.5 ppm	0.5 ppm	±50 ppb / Year			
Nitrogen Dioxide (NO ₂)	OZNO2_1*	0-10 ppm	0.001 ppm	0.01 ppm	±20 ppb / Year			
	OZNO2_2	0-100 ppm	0.2 ppm	0.2 ppm	< 2% / Month			
	OZNO2_3	0-500 ppm	0.5 ppm	0.5 ppm	< 2% / Month			
Ozone (O ₃)	OZO3_1*	0-10 ppm	0.001 ppm	0.01 ppm	±20 ppb / Year			
Oxygen (O ₂)	OZO2_1	(0-25) %VOL	0.1 %VOL	0.1 %VOL	< 2% / Month			
Hydrogen Sulfide (H ₂ S)	OZH2S_1*	0-1.5 ppm	0.001 ppm	0.01 ppm	±100 ppb / Year			
	OZH2S_2	0-50 ppm	0.05 ppm	0.05 ppm	< 2% / Month			
	OZH2S_3	0-200 ppm	0.2 ppm	0.2 ppm	< 2% / Month			
	OZH2S_4	0-2000 ppm	2 ppm	2 ppm	< 2% / Month			
Sulfur Dioxide (SO ₂)	OZSO2_1*	0-10 ppm	0.001 ppm	0.01 ppm	±20 ppb / Year			
	OZSO2_2	0-100 ppm	0.2 ppm	0.2 ppm	< 2% / Month			
	OZSO2_3	0-2000 ppm	5 ppm	5 ppm	< 2% / Month			
Ambient Noise	OZLN_1*	Upto 140 dB	1 dB	0.5 dB	N.A.	Capacitive		
Temperature	OZTEMP_1*	-40 to 125°C	0.01°C ppm	-40 °C	N.A.	Solid State Semiconductor Sensing		
Humidity	OZHUM_1*	100% Rh	0.10% ppm	0.10%	N.A.			
Barometric Pressure	OZPRES_1*	300-1100 hPa	0.18 Pa	300 hPa	N.A.			
Solar Radiation 300 - 1100 nm	OZUV_1	Light Intensity	Up to 1,00,000 Lux	1 Lux	1 Lux	N.A.	Photoconductivity	3 Years
		Visible Light	Upto 5000 Lux	0.1 Lux	0.1 Lux	N.A.		
		UV Radiation	0.1-100,000 uW/cm ²	0.1 uW/cm ²	0.1 uW/cm ²	N.A.		
		UV Index	0-12	-	-	N.A.		

Note: Expected Sensor Life can vary, subject to actual concentration on-site. In the interest of continued product improvement, we reserve the right to change design features and specifications without prior notification. The data contained in this document is for guidance only. Oizom™ accepts no liability for any consequential losses, injury or damage resulting from the use of this document or the information contained within.

External Modules



Anemometer
OZWSD_1*
Wind Speed: 0-40 m/s
Wind Direction: 0-359°
Working Principle: Ultrasonic



Rain Gauge
OZRAIN_1*
Resolution: 0.25 mm
Working Principle: Tipping Bucket

* Indicates standard delivery timeline

Specifications

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, NEMA 4X, 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

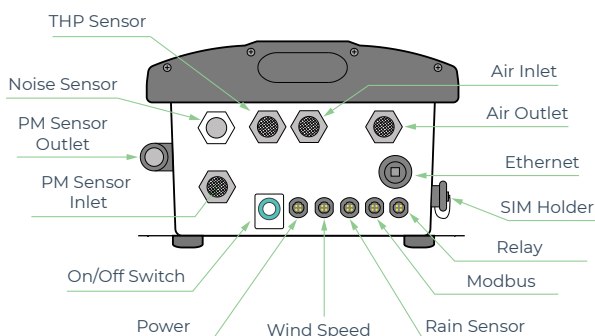
Operating Temperature	-20 °C to 60 °C
Operating Humidity	0-93% RH
Recommended Humidity	15-90% RH
Storage Conditions	10 - 40°C










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
Certification	PTCRB, CE, FCC, RoHS, ICASA, GCF

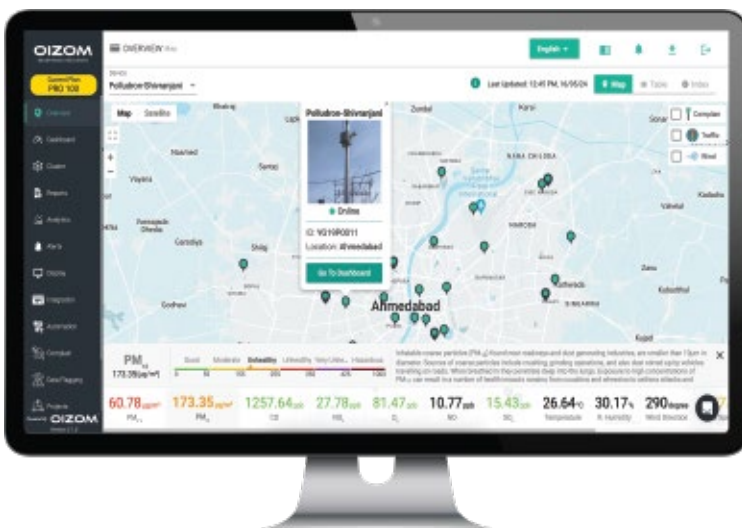


Connectivity Options		Specification
Wireless	 GSM	Global 2G / 3G / 4G
	 LoRa	868 MHz / 915 MHz
	 LTE	CAT-M1
	 NB-IoT	CAT-NB1
	 sigfox	868 to 869 MHz, 902 to 928 MHz
	 WiFi	AP Mode and Station Mode
Wired	 Ethernet	Static / DHCP Configuration
	 Modbus	RS485 RTU / TCP
	 RELAY	2 Channel Relay

Solution Architecture

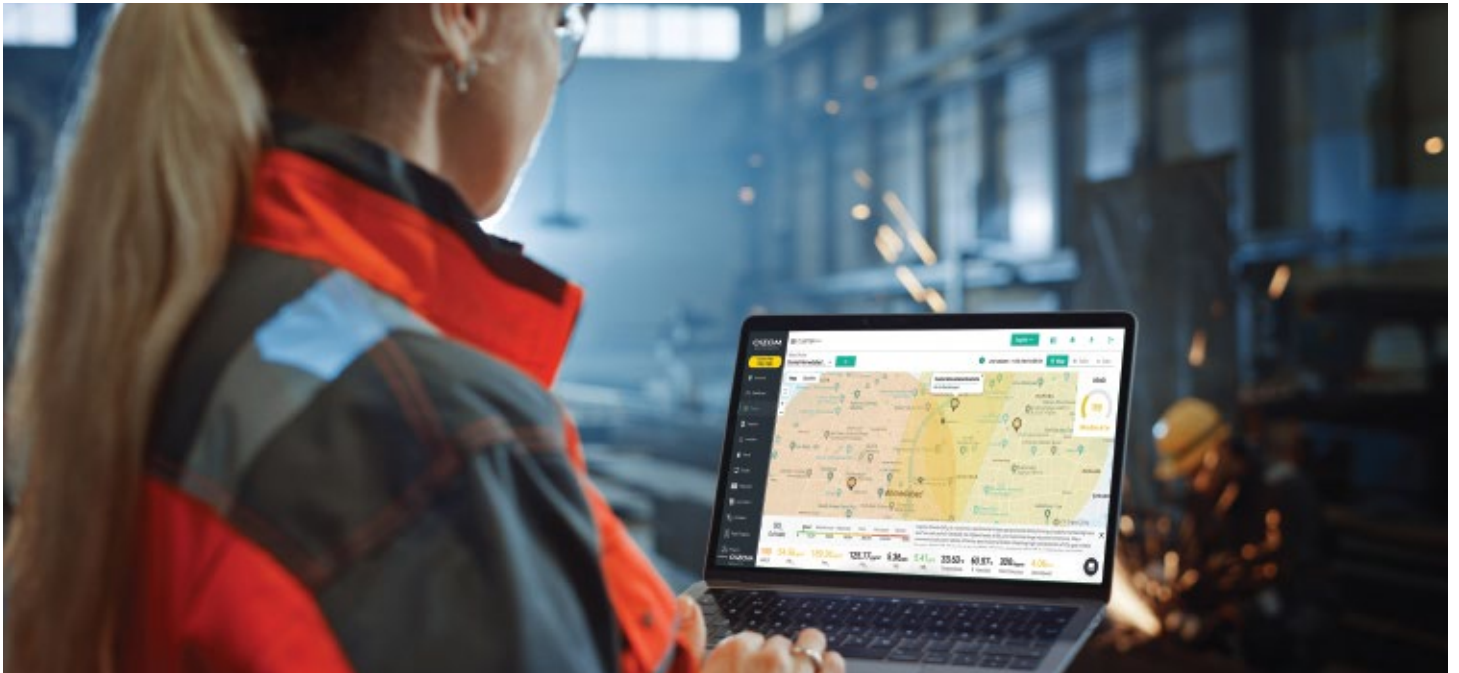


Envizom™ Data Visualization and Analytics Platform



Envizom™ is an Environmental monitoring software for real-time air quality data acquisition, visualization, and analytics. The Oizom® environmental data interpretation engine fetches the data from the Oizom® Environmental monitoring stations. On receiving the data, the engine runs necessary corrections and compensation algorithms. Envizom™ uses secured HTTPS servers for data storage. Alternatively, this data can also be stored on-premise local servers.

Envizom™ Capabilities



Real-time Data



Easy to Integrate



Smart alerts



Analytics



User friendly interface



Process Automation

Privacy First Platform



Data Privacy

The data shared with the client uses an encryption server through HTTPS Secure Socket layers. Envizom™ also uses AES encryption for connection that adds to data safety.



Data Ownership

Envizom™ creates a secured and encrypted password combination for the user login. Oizom® ensures 100% privacy of the data and doesn't share without relevant permissions.



Data Transparency

Data collected from Oizom® equipment runs through the Environment Data Interpretation Engine. It processes various algorithms and eliminates environmental impact interferences on the sensors.

Case Studies



Ensuring environmental safety at Dangote Cement Plant

The communities living near Dangote Cement Plant were starting to raise concerns about the bad air quality due to excessive dust-laden activities. Oizom deployed Polludrones® in the area to ensure environmental safety.



Ethiopia



August 2021



Fenceline

Air Quality monitoring in smart cities for Arunachal Pollution Control Board

APSPCB monitors the various parameter levels of air pollution in Namsai and Kharsang of Arunachal Pradesh in real-time with Polludrone. Air quality data is displayed on an LED display to assure citizens' safety.



India



November 2021



Smart City



Smart city air quality monitoring at Agra, India

High levels of PM_{10} and $PM_{2.5}$ were rapidly degrading the air quality of Agra city. Oizom® helped in monitoring the air quality by installing Polludrones® all across the city.



India



August 2019



Smart City

Case Studies



Waste management company monitoring pollution levels with Polludrone in Alberta.

In Alberta, a waste management company installed Polludrone to collect real-time environmental parameters, and it provides accurate data even when temperatures reach below -40°C .



Alberta



November 2022



Waste Management

Ensuring safety during Skanska's Tunnel Construction in Norway

Skanska improved safety and efficiency using the Oizom instrument to monitor the air quality minutely, enabling better explosive use decisions and new industry standards.



Norway



May 2023



Construction



Monitoring harmful gases for Reliance Chemical Products Ltd.

By monitoring the SO_2 and CH_4 concentrations in its chemical plant in Lagos state with Oizom, Reliance Chemical Products Ltd. significantly improved its air quality management methods.



Nigeria



December 2023



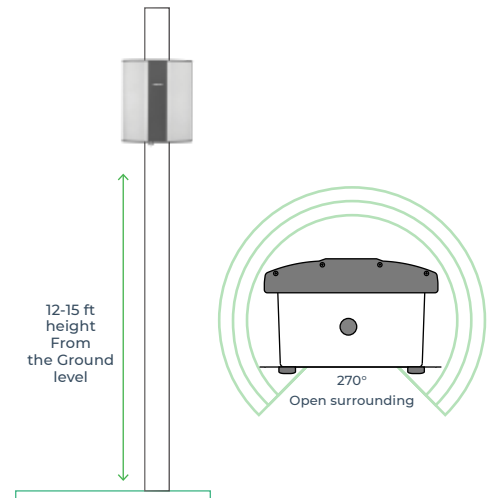
Industrial



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

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 USEPA.



2 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.



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.



About Oizom®



Leaders in sensor based
air quality monitoring



Plug and play monitors
for hassle free setup



Low powered solutions
for multiple applications

Oizom® is an environmental IoT company offering data-driven environmental solutions for better decision-making. With our sensor-based hardware, we monitor various environmental parameters like air quality, noise, odor, radiation, weather conditions, etc. Our data analytics platform derives many actionable insights for authorities, communities, and industries. Oizom® strives to play an essential role in a sustainable future through smart environmental solutions and data science.

Oizom® has years of experience in stimulating innovation by creating groundbreaking technology for environmental monitoring. With an IoT-based development approach, Oizom® has been able to successfully unlock multiple solutions, catering to various industries.

Other Oizom® Products



Odosense®

Odor Monitoring System

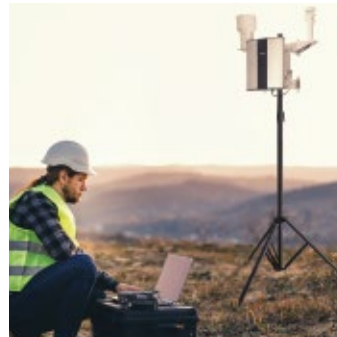
Odosense® monitors various odourful and toxic gases in the environment and provides insight into odor dispersion.



Dustroid®

Real-time Dust Monitor

Dustroid® is an online particulate monitoring system to measure a wide spectrum of particulate matter sizes.



Weathercom®

Automatic Weather Station

Weathercom® is an automatic weather station designed to measure various meteorological parameters.



AQBot™

Single Parameter Air Quality Monitor

AQBot™ is an industrial grade single parameter air quality monitor with automation capabilities.





Trusted by

70+ Countries



Solutions Installed in

65+ Cities



Total Devices Installed

3000+



Total Population Covered

200 million+

Global Presence



Changing the way Industries monitor air quality



Get in touch



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