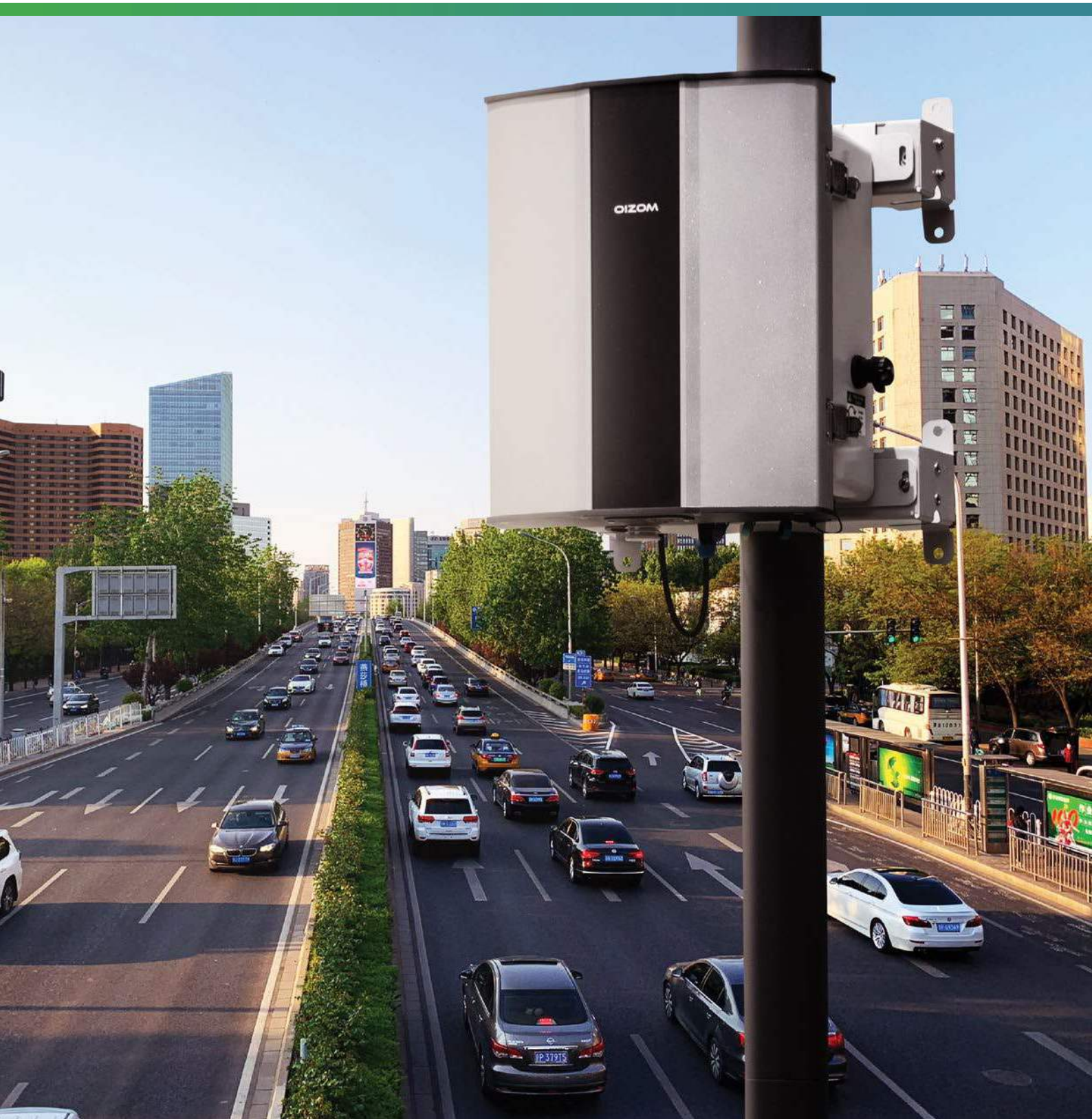
OIZOM®
REDEFINING RESOURCES

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, 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.

Polludrone® 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

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

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.

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

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.

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.

Network Agnostic
Supports a wide range of connectivity options like GSM / GPRS / WiFi / LoRa / NBIoT / Ethernet / Modbus.

Real-Time Data
Continuous monitoring and real-time data transfer at configurable intervals.

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

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
Visualise and analyse 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_2S, 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	5000 hours
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	
	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_2S)	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	OZN_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.		
Light Intensity	OZUV_1*	Up to 1,00,000 Lux	1 Lux	1 Lux	N.A.	Photoconductivity	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.		

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

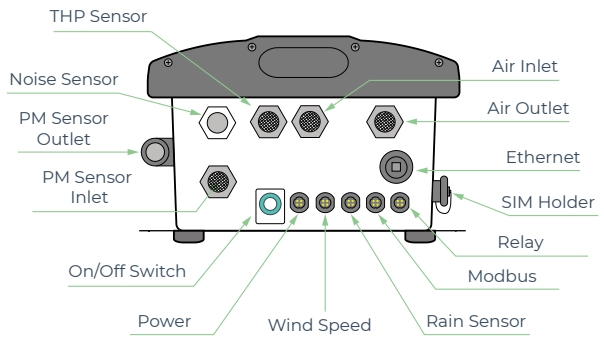
Operating Temperature	-20 °C to 60 °C
Operating Humidity	0-93% RH
Recommended Humidity	15-90% RH
Storage Conditions	10 - 40°C

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

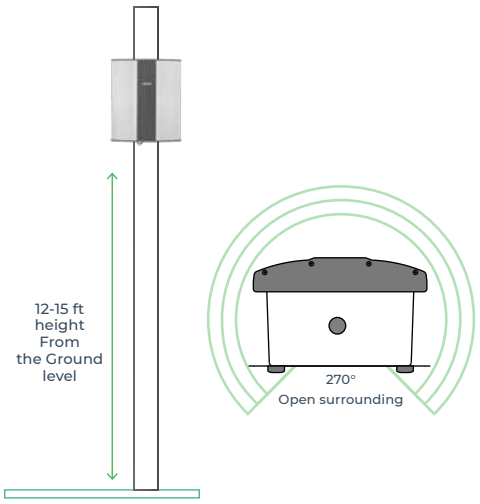


	Connectivity Options	Specification
Wireless	GSM	Global 2G / 3G / 4G
	LoRa	868 MHz / 915 MHz
	LTE	CAT-M1
	NB-IoT	CAT-NB1
	sigfox	868 to 869 MHz, 902 to 928 MHz
	Wi Fi	AP Mode and Station Mode
Wired	ETHERNET	Static / DHCP Configuration
	Modbus	RS485 RTU / TCP
	RELAY	2 Channel Relay

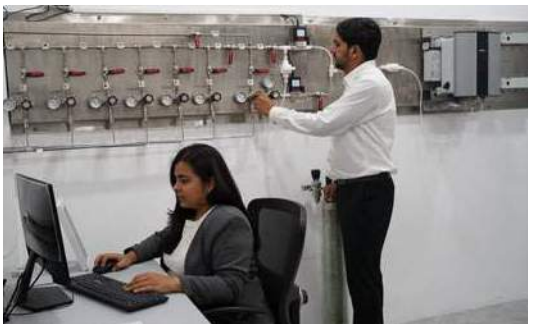
Functional Specifications

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.

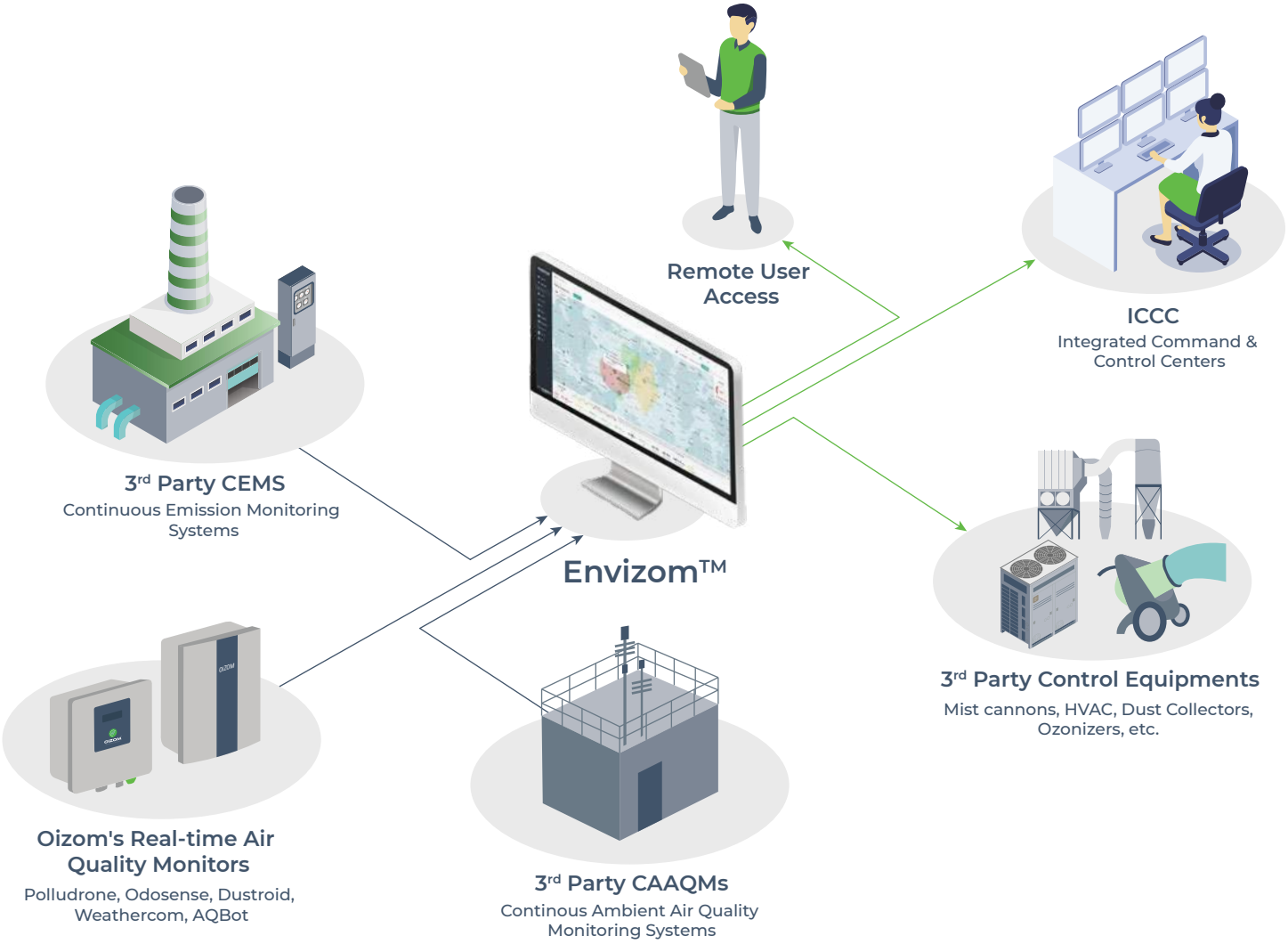
2 Collocation Calibration

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.

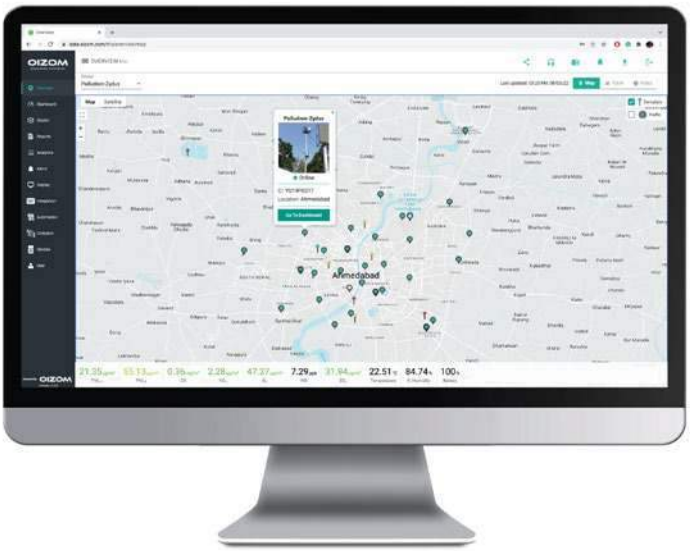
3 On-site Calibration

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.

Solution Architecture

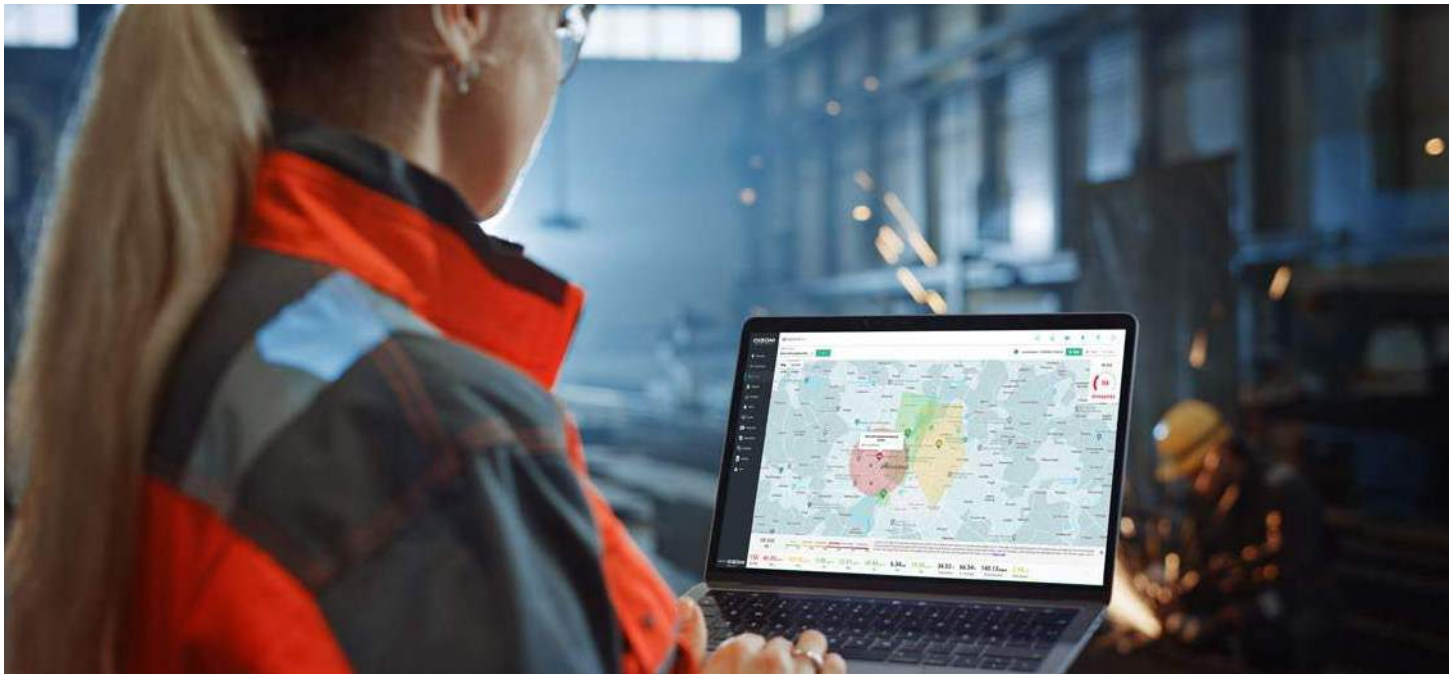


Envizom™ Air Quality Software



An on-device data software enables users to access the data, configure networks and sensors without any dependency on the internet. Users can also connect their smart devices to Polludrone and view real-time data, perform on-site calibration, change network configuration, and change sensor configuration.

Envizom™ Features



- Real-time data
- Smart alerts
- User friendly interface
- Easy to Set Up
- One click share
- Data accessibility

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 at Imphal Smart City, India

Imphal Smart City deployed air quality monitoring devices in the city to understand the spatial variations and ascertain the reasons for degrees of pollution.

India | July 2020 | 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

Air Quality Monitoring at Granada University

With over 61,000 students and staff in residence, the University of Granada aimed to provide a healthier environment to its students. Polludrone® monitored ambient parameters within the campus and displayed the data to the students.

Spain | April 2019 | Smart Campus

Monitoring Ambient Air quality at J.P. Medanta Hospital

Oizom® is monitoring the Ambient Air Quality around the JP Medanta Hospital by installing Polludrone® and empowering the hospital admisinstrators.

India | July 2021 | Hospitals

Detecting forest fires by monitoring Air Quality in Portland

Oizom® is detecting forest fires in Portland by monitoring air quality with its real-time air quality monitoring system, Polludrone®.

USA | April 2021 | Flora And Fauna

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, odour, 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®

Odour Monitoring System

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

OIZOM®
REDEFINING RESOURCES

Trusted by
60+ Countries

Solutions Installed in
65+ Cities

Total Devices Installed
1000+

Total Population Covered
200 million+

Global Presence

ISO 9001:2015 ISO 14001 MAKE IN INDIA

Accurate Air Quality Monitoring And Advanced Data Analytics

Get in touch

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