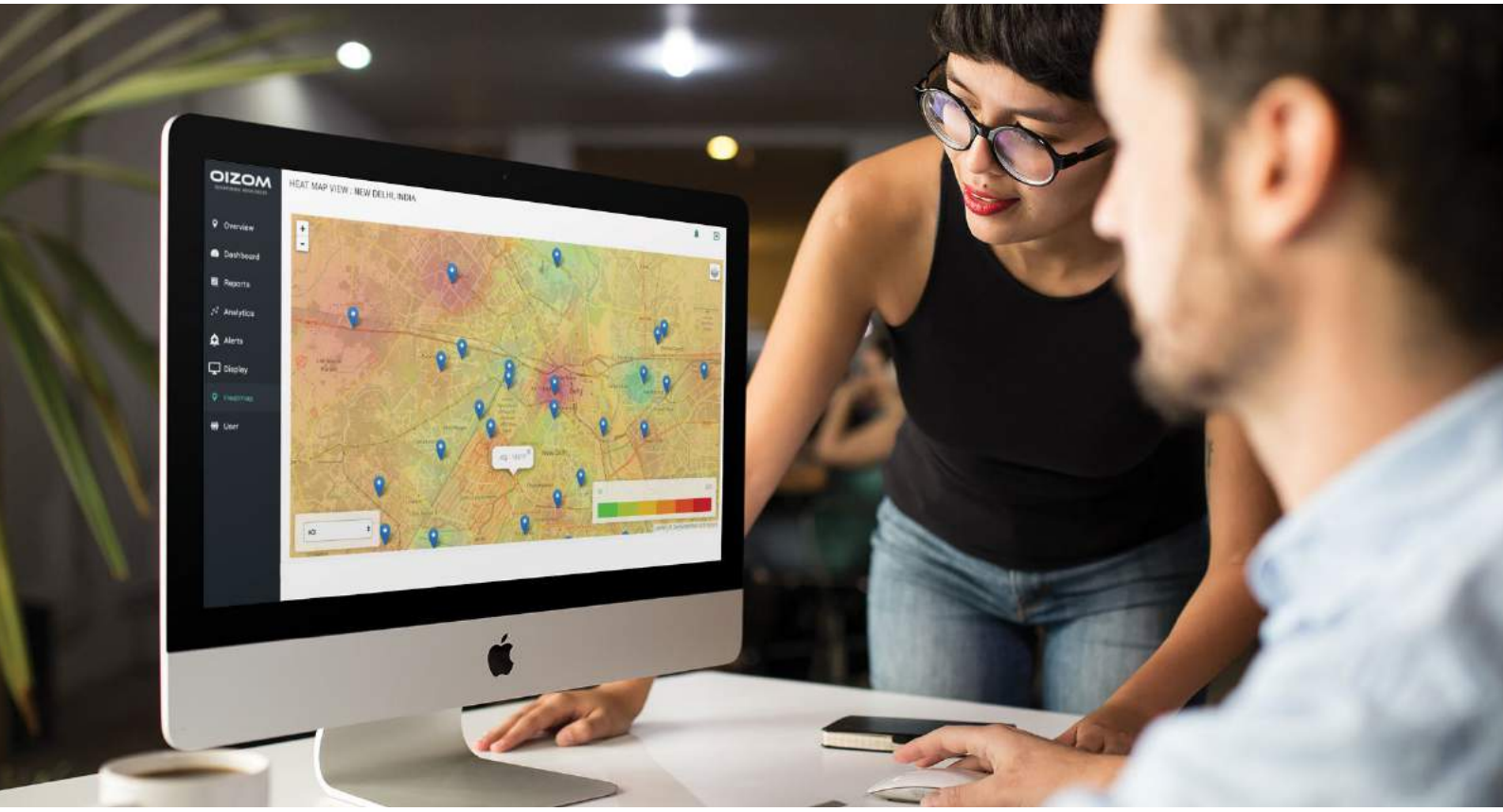
OIZOM®
REDEFINING RESOURCES

Smart **Air Quality** Monitoring for **Sustainable** Future

About Company



Oizom is an Environmental IoT company offering data-driven environmental solutions for better decision-making. Using our sensor-based hardware, we monitor various environmental parameters related to air quality, noise, odour, weather, radiation, etc. Our data analytics platform derives various actionable insights for authorities, communities, and industries. Through smart environmental solutions and data science, Oizom is striving to play an important role in future cities. Since its inception in 2015, Oizom is primarily focused on environmental monitoring technology and solutions. In a short span of 6 years, Oizom solutions are live at 1000+ locations monitoring the environmental health of more than 23 million people every day. Oizom solutions are actively monitoring the environmental conditions of 15 Smart Cities in India. The solutions are live in 25 global cities like Mumbai, Delhi, London, Tokyo, Istanbul, and a few more. Through an ecosystem of network-partners, Oizom has a strong presence in 47 countries.

VISION : Keeping Environment at the core, we envision to empower various industries with highly scalable data-driven solutions for better decision making.

MISSION : Implement our Environmental IoT and Environmental AI solutions in 50 Major cities of the world by 2022.

Achievements

accenture

CIIE.CO BUILT AT IIMA

SparkLabsIoT

2017 FRENCH TECH TICKET

IBM SmartCamp

Katapult Accelerator

Knowledge Partners

THE UNIVERSITY OF WARWICK

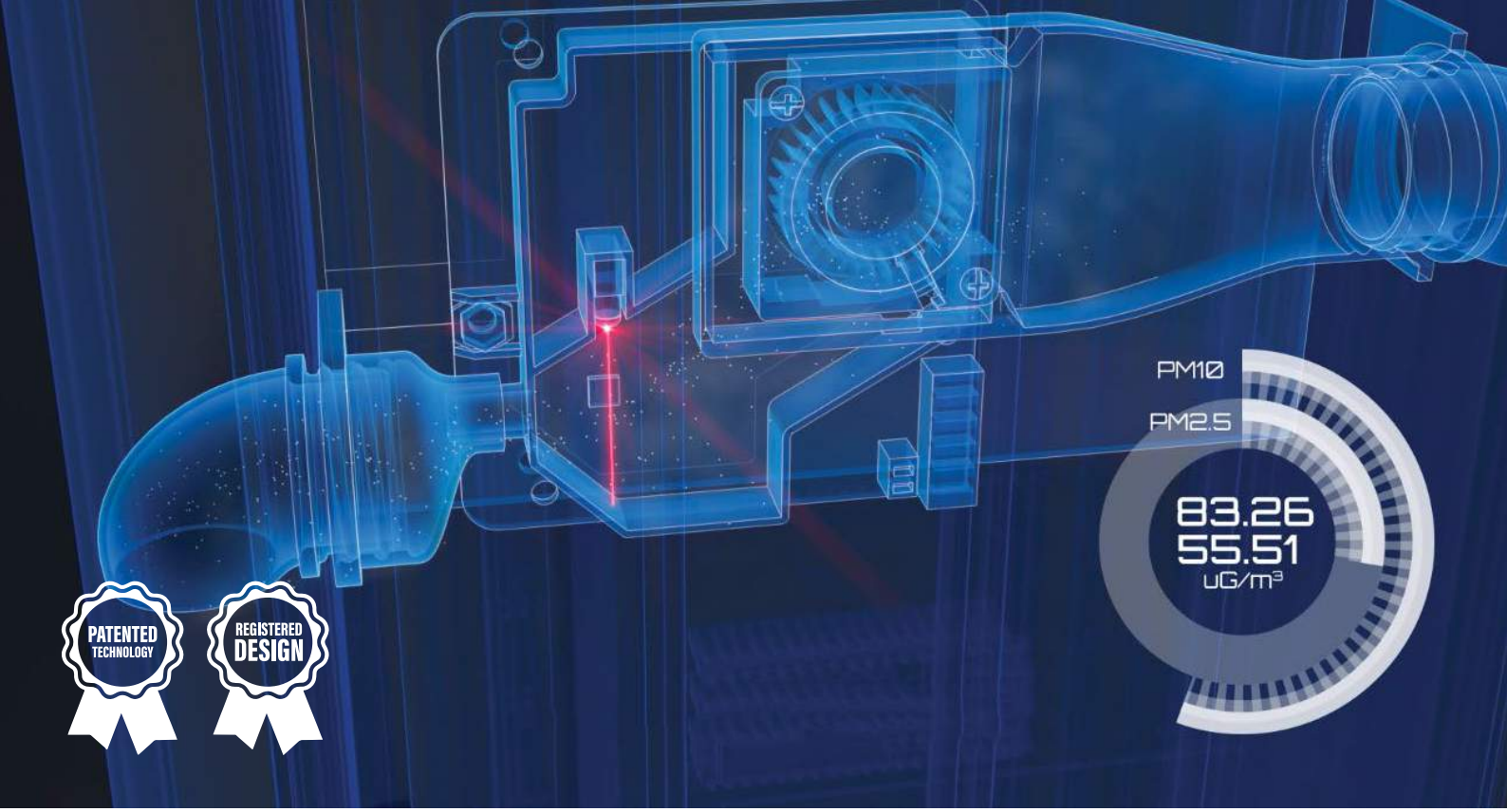
UNIVERSITY of York

ATIRA

UNIVERSIDAD DE GRANADA

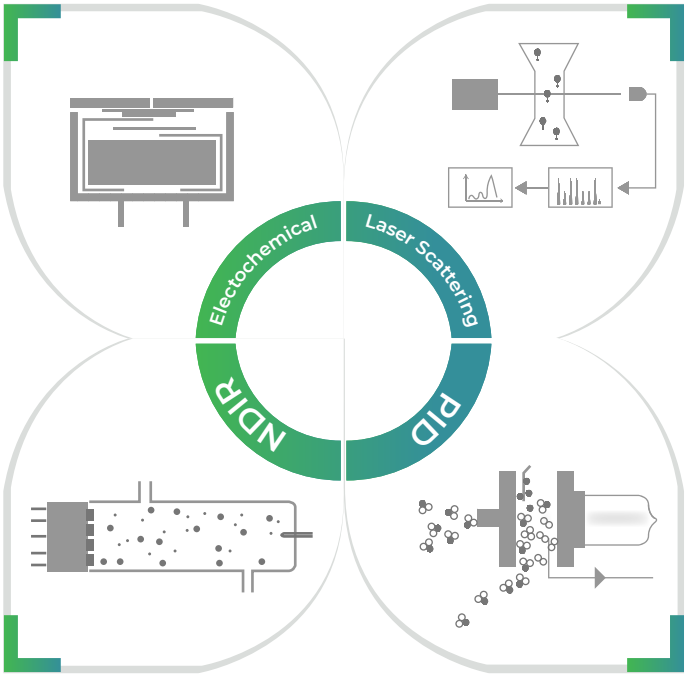
BERGISCHE UNIVERSITÄT WUPPERTAL

NWU



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 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.



Data Communication

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

Data Accuracy

The Oizom Gas Sensor (OGS) module can accurately measure low concentrations of various gases at ppb level in the ambient air. The design is capable to monitor the point source gases on real-time basis. The low noise support electronics makes it compact & reliable and allows accurate gas detection even at very low concentrations in the atmosphere.

- Proprietary gas sensing technology
- Independent calibration of each sensor
- Electronic noiseproof design

Hardware Solutions

Polludrone®

Polludrone is an Ambient Air Quality Monitoring System (AAQMS). It is capable to monitor all the required urban pollutants like Air-Pollution, Radiation, Noise, etc. Using external probes/ attachments, it can monitor other peripheral parameters like weather, traffic, disaster, etc. Polludrone is an ideal choice for urban monitoring applications such as smart-city infrastructure, roadside monitoring, campus monitoring, airport monitoring, etc.

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

Odosense®

Odosense is the Real-time Odour Emission Tracking Solution. Odosense detects, measures, and monitors the odourful gases and gaseous contaminants on a continuous basis. Odosense is engineered for accuracy to measure odourful gases such as Ammonia (NH_3), Hydrogen Sulfide (H_2S), Volatile Organic Compounds (TVOCs), and Methyl Mercaptan(CH_3SH), Meteorological Parameters, and many more.

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

Weathercom®

Weathercom is an automatic weather station which measures real-time Wind Speed, Wind Direction, Rainfall, Flood, Temperature, and Humidity. The data can be visualized on Envizom™ for real time data visualization and analytics.

Parameter	Lite	Smart	Pro
Wind Speed, Wind Direction	✓	✓	✓
Rainfall Monitoring	✓	✓	✓
Light, UV Radiation	✓	✓	✓
Temperature, Humidity, Pressure	✓	✓	✓
Soil Humidity	X	✓	X
Visibility, Road Surface Condition	X	X	✓
Equipment Size (HxWxD)	360mm (H) x 328mm (W) x 200mm (D)		
External Modules (optional)	Flood Monitor, Noise		

Dustroid®

Dustroid is an Online Particulate Monitoring system for Ambient applications. It is capable to monitor various particulate matter like Suspended Particulate Matters(SPM) and Respiratory Suspended Particulate Matters (RSPM). Dustroid is an ideal choice for applications like construction sites, mines, quarries, ports, research projects, etc.

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

AQBot™

AQBot™ is an industrial grade single parameter air quality monitor with automation capabilities. AQBot™ Series offers a wide range of air quality parameters to choose from. AQBot™ product range consists of critical parameters and toxic gases like Total Volatile Organic Compounds (TVOC), Ammonia (NH_3), Hydrogen Sulfide (H_2S), Methane (CH_4), Carbon Monoxide (CO), Formaldehyde (CH_2O), Particulate Matter (PM_1, $PM_{2.5}$, PM_{10}, PM_{100}), Ambient Noise. The AQBot™ series is designed for easy operation.

The range listed here is for AQBot only

ID	Parameter	Range	Resolution	Min. Det.	Working Principle	Sensor Life
OZNH3_1 OZNH3_2 OZNH3_3	Ammonia (NH_3)	0-20 ppm 0-100 ppm 0-1000 ppm	0.3 ppm 0.3 ppm 2 ppm	0.3 ppm 0.3 ppm 2 ppm	Electrochemical Sensing	2 Years
OZCH4_1	Methane (CH_4)	500-1500 ppm	1 ppm	500 ppm	Molecular Property Spectrometer (MPS)	2 Years
OZH2S_1 OZH2S_2 OZH2S_3 OZH2S_4	Hydrogen Sulfide (H_2S)	0-10 ppm 0-50 ppm 0-200 ppm 0-2000 ppm	0.001 ppm 0.05 ppm 0.2 ppm 2 ppm	0.01 ppm 0.05 ppm 0.2 ppm 2 ppm	Electrochemical Sensing	2 Years
OZTVOC_1 OZTVOC_2	Total Volatile Organic Compounds (VOC)	0-40 ppm 0-200 ppm	0.001 ppm 0.05 ppm	0.005 ppm 0.05 ppm	Photo Ionization Detection (PID)	5000 Hours
OZPM_1 OZPM_2 OZPM_3 OZPM_4	Particulate Matter ($PM_{2.5}$) Particulate Matter (PM_{10}) Particulate Matter (PM_1) Particulate Matter (PM_{100})	Upto 5000 µg/m³ Upto 5000 µg/m³ Upto 5000 µg/m³ Upto 30 mg/m³	0.1 µg/m³	1 µg/m³	Optical Particle Counter	5000 Hours
OZN_1	Noise	up to 140 dBA	1 dB	0.5 dB	Capacitive	2 Years
OZCL2_1 OZCL2_2	Chlorine (Cl_2)	0-20 ppm 0-50 ppm	0.05 ppm 0.1 ppm	0.05 ppm 0.1 ppm	Electrochemical Sensing	2 Years
OZHCl_1 OZHCl_2	Hydrogen Chloride (HCl)	0-50 ppm 0-100 ppm	0.5 ppm 1 ppm	0.5 ppm 1 ppm	Electrochemical Sensing	2 Years
OZCH2O_1 OZCH2O_2	Formaldehyde (CH_2O)	0-10 ppm 0-50 ppm	0.05 ppm 0.1 ppm	0.05 ppm 0.1 ppm	Electrochemical Sensing	2 Years
OZCH3SH_1	Methyl Mercaptan (CH_3SH)	0-10 ppm	0.1 ppm	0.1 ppm	Electrochemical Sensing	2 Years
OZSO2_1 OZSO2_2 OZSO2_3	Sulfur Dioxide (SO_2)	0-20 ppm 0-100 ppm 0-2000 ppm	0.001 ppm 0.2 ppm 5 ppm	0.01 ppm 0.2 ppm 5 ppm	Electrochemical Sensing	2 Years
OZNO2_1 OZNO2_2	Nitrogen Dioxide (NO_2)	0-20 ppm 0-100 ppm 0-500 ppm	0.001 ppm 0.2 ppm 0.5 ppm	0.01 ppm 0.2 ppm 0.5 ppm	Electrochemical Sensing	2 Years
OZCO_1 OZCO_2 OZCO_3	Carbon Monoxide (CO)	0-50 ppm 0-100 ppm 0-1000 ppm	0.1 ppm 0.1 ppm 0.75 ppm	0.1 ppm 0.1 ppm 0.75 ppm	Electrochemical Sensing	2 Years
OZNO_1 OZNO_2	Nitric Oxide (NO)	0-20 ppm 0-100 ppm	0.001 ppm 0.5 ppm	0.01 ppm 0.5 ppm	Electrochemical Sensing	2 Years
OZCO2_1	Carbon Dioxide (CO_2)	0-5000 ppm	1 ppm	400 ppm	NDIR	2 Years

Calibration Capabilities

1. Factory Calibration

All the sensors are calibrated by our sensor manufacturing partner before leaving the factory. They are kept under lab condition and calibrated with Pure (Zero) Air and with calibration gas (between 1-100 PPM depending on the sensor range).

2. Lab Calibration (PM)

Particulate matter sensors are collocated against a reference i.e. Metone BAM 1020 for 24 hours. Any drift observed from the correlation is corrected prior to the dispatch of the monitors.

3. Lab Calibration (Gas)

Monitors are calibrated with pure air and calibration gases with high range concentration in a clean and controlled lab accredited by ISO/IEC 17025. Multi-point span calibration is performed using international grade MFCs for all the gaseous sensors.

4. Collocation Calibration

Wherever the customer has access to a reference-grade air quality monitoring system, we deploy our sensor-based system side-by-side and compare 1000+ data points to establish a correlation.

5. Spot Calibration

Using our on-device data visualisation software, customers can perform on-field calibration using a portable zero air cylinder or a generator. Real-time data plots will assist users to set drift if required.

Operation and Maintenance

Cleaning: Periodic cleaning is important to ensure optimum device performance. Monthly or quarterly regular maintenance activity has to be carried out depending upon the surrounding. The activity includes cleaning the dome for the light sensor, air inlet, and outlet mesh & general cleaning of the exterior.

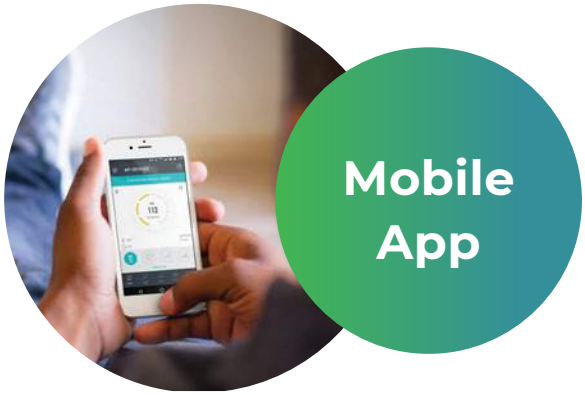
Sensor Replacement: Every sensor has a limited life span. The sensor life depends on the average pollutant concentration in the area. The sensors need to be replaced once their performance starts to deteriorate and the system starts giving unstable data.

Spot-Calibration: The frequency of calibration is decided based on atmospheric conditions and individual sensor drift to ensure data accuracy. Spot calibration can be performed using reference equipment which can also be a recently calibrated Oizom device.

Diagnosis/Debugging: Power and network availability are the prime check in case of equipment failure. If the issue is still unresolved after remote diagnosis, on-site troubleshooting can be planned by an engineer.

Envizom™ Software

Envizom™ is a cloud-based data visualization and analytics platform. It offers an overview as well as a detailed analysis of environmental data from all the locations. It has essential features like smart notifications, print-ready reports, historical data analytics, and many more.



The mobile app allows users to analyze the air quality of their city, compare the AQI of hundreds of cities around the world on the go. This user-friendly app also generates alerts every time there is a pollution threshold breach. Increased public awareness through this app simulates the precautionary actions by the citizens for their day-to-day activities and to achieve better health.

Using sensor data as a primary source and secondary sources like Satellite Data, Traffic Condition, Meteorological Condition, Heat Island Effect, and Source Inventory; Oizom creates a high-resolution environmental model in the form of a hyperlocal pollution map at a city scale. Using this map, multiple geospatial applications can be addressed.

Envizom™ can provide automated/on-demand print-ready reports as per industry standards. These reports can be activated on a daily, weekly, and monthly basis for multiple email recipients. This offers a better overview of the environmental condition and documentation capability.

Using custom thresholds for every parameter, Envizom's smart alert module can trigger actionable alerts in the form of push notifications, email notifications, and SMS notifications for the action team. This feature drastically reduces the problem-to-solution time using data-driven actions.

Outdoor Display

For better environmental awareness, Oizom environmental data can be published on a Visual Messaging Display (VMD). Along with data, the display can also showcase actionable insights for the citizens. This allows citizens to take precautionary actions for better environmental health safety.

Secured APIs

Secured and encrypted (OAuth 2.0) APIs enables the data transfer to a third party application. The MQTT/HTTPS API empowers developers and solution providers to build custom applications using Oizom Environmental Data.

TV Interface

Using smart TV box, any TV Display can be used for Environmental Awareness by showcasing Environmental Data and actionable insights. This Intuitive Environmental data interface can be used in any indoor key location (hot spots) for public engagement.

Web Widget

An easily integrateable i-frame based widget can be embedded in any third party web platform (website/apps) to showcase real-time environmental data and analytics. Such widget based approach can be a powerful medium for environmental awareness digitally.

Voice Activation

By enabling environmental data access through voice activation, people can interact with Oizom platform using their Digital Assistants (Google Home, Alexa). This enables hands-free requests, alerts and other environmental insights.

Solution Applications

Smart City

Oizom provides comprehensive solutions for complete environmental monitoring for smart city. The solution is designed to be compatible with the available network and communication infrastructure of the city. Through this, real-time data can be provided to the city's Command and Control Center (CCC). The solution is designed to be integrated with a smart/ intelligent pole. Hence, data-driven decisions for better citizen health and a sustainable environment are possible using our real-time air quality monitoring sensor.

Real Estate / Campus

Oizom sensors along with Outdoor LED Display is a Smart Solution to empower the residents of the society. The Oizom sensors can monitor the dust and noise levels in the residence periphery. The data is then transmitted to the cloud which reflects it on the Outdoor LED and the respective building's mobile app. The Oizom intelligent algorithms disperse the data in the form of suggestive actions for the citizens to take data-driven actions. The Maintenance and the Real Estate Management can also have a holistic view of the environmental health of the buildings.

Road Safety

By monitoring critical weather parameters from strategic locations, the problem can be well addressed by dynamically changing the top-speed-limit. Weather monitoring solution comprising Road Visibility, Road Surface Temperature, Ice/Snow on Road, Tyre grip level, Rainfall; can be installed at specific intervals to gather data in the command and control centre. Using this data, vehicle top-speed-limit can be dynamically derived by applying parametric algorithms. The same can be enforced using a speed-control system.

Dust Supression

Oizom offers a smart, cost-effective, and low-powered real-time Suspended Particle Monitoring Solution. It is capable of monitoring the Total Suspended Particulate Matters i.e. PM_{1}, $PM_{2.5}$, PM_{10}, PM_{100}. Peripheral monitoring at strategic locations in the vicinity of the Construction site / Earthworks (Mines & Quarries) / Civil Works is beneficial to ensure the activities are not violating the Air-Quality Regulations. Alerts feature can trigger notifications to the concerned person automatically whenever the Dust accumulation is rising than the threshold and helps in effective mitigation planning.

Industrial Emissions

Industrial fenceline monitoring solutions use Oizom's air monitors like Polludrone, Odosense, Dustroid and AQBot. They can be a cost-effective alternative to the expensive CAAQMS. Apart from the industry's environmental impact assessment, such a solution is also useful for air quality monitoring, fugitive emissions, and gas leaks. By deploying the air monitors at strategic locations on the periphery of an industrial area, fugitive emissions and gas leaks can be detected effectively. A wide range of parameters like Particulates (PM_{1}, $PM_{2.5}$, PM_{10}, PM_{100}), Gases (CO, SOx, NOx, H_2S, NH_3, VOCs, CH_4, etc), Noise can be monitored and real-time data can be accessed using Air Quality Software.

Waste Water Treatment

By installing Oizom Odosense near key process tanks of a Sewage Treatment Plant (STP) or an Effluent Treatment Plant (ETP), odourful gases emission can be monitored on a real-time basis. Using this solution, the source of odour can be identified and corrective measures can be taken. This solution leads to data-driven odour control for waste-water treatment. In addition, by installing Odosense on the periphery of the WWTP, its impact on the surrounding neighbourhood can be measured.

Airports

Oizom has designed a solution to measure pollutants of concern for the aviation industry. Polludrone Pro is capable to measure PM_1, $PM_{2.5}$, PM_{10}, Noise, gases like SOx, NOx, CO, O_3, CO_2, H_2S, Light, and meteorological parameters. A network of Polludrone Smart at strategic locations of airports enables complex environmental data handling and an accurate environmental impact report. The Oizom air quality data analytics platform can generate intelligent reports. It prepares the report by integrating various data sources like Air Quality data and weather conditions to identify the impact of Air Pollution on the Airport's environmental health.

Schools

Oizom Polludrone Smart is an ideal choice for school and university campus monitoring. The compact real-time air quality monitor enables authorities to have an eagle-eye view of the environmental health of their campus. By deploying our air quality monitoring devices across the campus for air quality assessment, the authorities can understand the impact of key air pollutants across the campus. The collected air quality data can be accessed in real-time on the Oizom IoT platform. The data is useful to generate reports and understand the impact of ambient pollutants on the students. By setting thresholds and generating alerts, the authorities can take immediate steps in case of very poor air quality levels.

Industrial Hygiene

Oizom offers comprehensive solutions for environmental health safety EHS air quality monitoring for industries. Oizom's AQBot series provides single parameter gas monitors that provide data on a real-time basis. AQBot is a robust device that can withstand harsh industrial conditions. Oizom's AQBot provides real-time data which enables EHS managers to generate reports for annual legal compliances. The solution enables threshold-based triggers that alert the concerned managers with visual and sonic alarms. Accurate data monitoring helps timely actions for a known concentration of air pollution.

Case Studies

Fenceline Monitoring

The area near Dangote Cement Plant in Ethiopia had been appearing to decline in its air quality for a while due to excessive dust-laden activities. The communities living nearby were starting to raise concerns about the air quality affecting their health. Consequently, Oizom deployed its real-time air quality monitoring systems. As a result, it ensured environmental safety to the people living in the area and the employees working there.

Ethiopia | August 2021 | 1.89 km²

Polludrone, Dustroid | Monitoring | Fenceline Monitoring

City Monitoring

Sydney, the most populous city of Australia faces harsh conditions which affect the air quality. Extreme weather creates obstacles for air quality monitoring. Accurate monitoring of polluting parameters becomes a necessity. Oizom, with its partner Ektimo installed dust monitoring solutions– Dustroid. The real-time urban air quality data monitoring helps citizens to take precautions to decrease exposure to pollution.

Sydney, Australia | May 2021 | 12,368 km²

Dustroid | Monitoring and Visualization | City Monitoring

Smart City Monitoring

High levels of PM_{10} and $PM_{2.5}$ were rapidly degrading the air quality of Agra city and one of the wonders of the world - Taj Mahal. The increasing pollutant level is mainly due to increased industrial activities and open crop burning. Oizom helped in monitoring the air quality by installing Polludrones all across the city. The authorities can now observe the environmental health of the city in real-time to take actions to solve the issue.

Agra, India | August 2019 | 121 km²

Polludrone | Visualization and Analytics | Smart City Monitoring

Odour Monitoring

Odour pollution was a major problem at the Sanford Waste Water Treatment Plant. The city administrators did not have data to correlate with the complaints raised by the citizens. Oizom's odour monitoring solution was deployed with real-time data visualization at the WWTP. Oizom's partner Metersys was empowered to understand the concentration trends of H_2S at different stages of the WWTP.

Sanford, USA
October 2018
1 km²
Odosense
Monitoring and Automation
Odour Monitoring

Airport Monitoring

King Khalid International Airport, Riyadh faces heavy pollution due to frequent dust storms and airplane emissions. Oizom helped in monitoring the air quality of the airport by installing Polludrone. Polludrone acquired the pollution data and analyzed the historical data and trends. With this solution, the airport authorities were able to identify the source and generate alerts. When in cases of high pollution levels in the airport vicinity.

Riyadh, Saudi Arabia
March 2019
36 km²
Polludrone
Visualisation and Analytics
Smart Airports

Industrial Monitoring

Devic Earth's client, one of the largest cement factories in India was facing a problem regarding fugitive emisions from the factory which was putting the employees' health at risk. After monitoring the air with Oizom Dustroids and clearing the pollutants with Devic Earth's Pure Skies technology, there was a rapid increase in the air quality levels, making the air safer for the employees and people living in the area.

Pune, India
November 2020
1.5 km²
Dustroid
Monitoring and Mitigation
Industrial Emissions

Construction Site

Chan and Chan Engineering was the main contractor for a renovation project of an existing primary school in Singapore. The hazardous dust that covers the air during the process is harmful to the people living close to the site. Oizom carried out dust monitoring throughout the process. With the accurate, real-time monitoring, the client and the authority were able to assess the condition of the construction site smoothly.

Singapore | August 2021 | 0.5 km²

Dustroid | Monitoring & Visualization | Dust supression

Port Monitoring

Oizom partnered with Pollucon to provide Weathercom – an Automatic Weather Station at Mormugao Port Terminal Pvt. Ltd. (AMPTPL) to monitor real-time temperature, humidity, wind speed, wind direction, rainfall, and ambient pressure. The real-time data of wind speed and wind direction helped the authorities take timely decisions to operate coal handling facilities.

Goa, India | May 2021 | 1 km²

Weathercom | Data Visualization | Weather Monitoring

Smart Campus

With over 61000 students and staff in residence, the University of Granada aimed to provide a healthier environment to its students. Oizom helped CISCO to convert it into a smart campus by offering an online air pollution monitoring instrument. Polludrone monitored ambient parameters in real-time within the campus and displayed the data to the students. It provided better healthcare suggestive actions.

Granada, Spain | April 2019 | 1 km²

Polludrone | Visualization and Analytics | Campus Monitoring

Oizom Customers

Oizom Ecosystem

Global Presence

ISO 9001:2015 | ISO 14001 | MAKE IN INDIA

Accurate Air Quality Monitoring And Advanced Data Analytics

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