OIZOM®
REDEFINING RESOURCES

Dustroid®

Real Time Dust Monitor



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About 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.

Dustroid® can be used for dust monitoring in areas with dust-laden activities like Construction, Mining, Quarrying, Ports, Metallurgical Processes, and many more. The data gathered from Dustroid® can assist in dust suppression automation, for instance, to activate suppressants at the location once the threshold is breached.

Product Features

Heated Inlet
Dehumidifies the sample to nullify the effect of humidity for better accuracy.
(only available in Pro & Max variant)

Retrofit Design
Plug and play design for ease of implementation.

Compact
Lightweight and compact system that can be easily installed on a pole or wall.

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

Identity And Configuration (Geo-tagging)
Geo-tagging allows you to get the exact location of the device, consisting of latitude and longitude coordinates.

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

Over-The-Air Update
Automatically upgradeable from a central server without any onsite visit.

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

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

Supports High Dust concentration
Measures up to 30000 µg/m3 dust concentration to provide accurate dust data.

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Key Benefits

Robust And Rugged
Robustly built enclosure to sustain extreme climatic conditions.

Multi-parameter Capability
Provision to add gases, noise, meteoro-logical, and vibration sensors to existing Dustroid® Units.

Noise & Vibration Monitoring
Critical applications can utilise Dustroid with Noise Sensor to understand decibel trends.

Easy to install
Effortless installation with versatile mounting arrangements.

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

Relay-Based Automation
Dust Suppression systems such as Mist Cannons can be activated based on data thresholds configured.

Dustroid® Usecases



Mining
Dustroid® ensures that effective alerts are deliver-able to the authorities and the triggers automate the dust suppression systems on time.



Construction
Dustroid® monitors dust at construction sites and alerts authorities when dust concentrations breach the threshold limit.



Industrial Monitoring
Dustroid® provides real-time data on dust emis-sions from industrial processes. Tracking PM levels helps industries maintain clean air and comply with regulations.



Open Pit Mining
Dustroid® helps open-pit mines to comprehen-sively manage air quality, tackling dust at critical sites like drilling and blasting.

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Dustroid® Variants

Variants	Applications	Parameters
Dustroid® Smart	Construction and Mining	PM_1, $PM_{2.5}$, PM_{10}, PM_{100} (TSP), Temperature, Humidity, Pressure
Dustroid® Pro *(with heated inlet)*	Quarrying, Sea Ports (for High Humidity Regions)	PM_1, $PM_{2.5}$, PM_{10}, PM_{100} (TSP), Temperature, Humidity, Pressure
Dustroid® Custom	For Critical Applications	Industrial Dust Sensor, Light, UV Noise and Vibration

Parameters

Sensor		ID	Range	Resolution	Min. Detection	Working Principle	Expected Sensor Life
Suspended Particulate Matters with size less than 2.5µ ($PM_{2.5}$)		OZPM_1	Upto 5000 µg/m³	0.1 µg/m³	1 µg/m³	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/m³				
Ambient Noise		OZN_1	Upto 140 dB	1 dB	0.5 dB	Capacitive	2 years
Temperature		OZTEMP_1	-40 to 125°C	0.01°C	-40 °C	Solid State Semiconductor Sensing	
Humidity		OZHUM_1	100% Rh	0.10%	0.10%		
Barometric Pressure		OZPRES_1	300-1100 hPa	0.18 Pa	300 hPa		
Pyranometer Solar Radiation 300 - 1100 nm	Light Intensity	OZUV_1	Up to 1,00,000 Lux	1 Lux	1 Lux	Photoconductivity	3 years
	Visible Light		Upto 5000 Lux	0.1 Lux	0.1 Lux		
	UV Radiation		0.1-100,000 uW/cm²	0.1 uW/cm²	0.1 uW/cm²		
	UV Index		0-12	-	-		

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



Noise Sensor
OZN_1*
Working Principle: Capacitive
Range: Upto 140 dB



Vibration Sensors
PPV: +/- 2G
Range frequency: 0.5 - 250 Hz
Range velocity: ±50 mm/s (±2 in/s)
Working Principle: MEMS

**Indicates standard delivery timeline.*

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Specifications

Mechanical

Size	360mm (H) x 328mm (W) x 200mm (D)
Weight	6.5 Kg (instrument weight)
Material	Aluminum Magnesium Alloy, Mild-steel (With Powder Coating), FRP
Certifications	CE, NEMA 4X, IP66, RoHS

Electrical

Avg. Power Consumption	Up to 7 Watt (Actual consumption will vary 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	Up to 12 Hours (Not available in Pro variant)
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

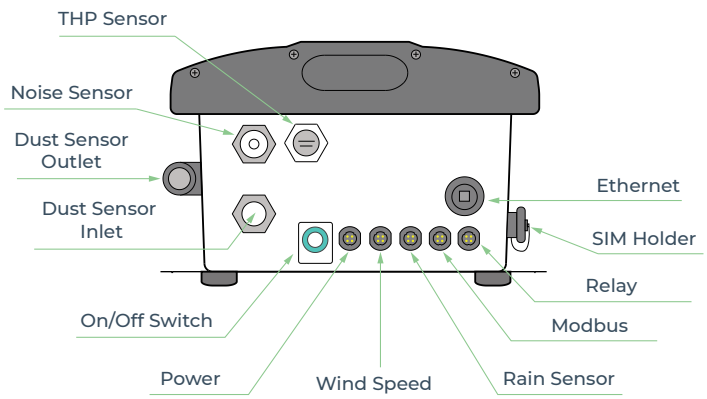
Operating Temperature	-20 °C to 60 °C
Operating Humidity	0-93% RH
Recommended Humidity	15-90% RH
Storage Conditions	10 - 40°C

Sensing

Dust Measurement Principle	Active Sampling with Sampling rate of 1 L / min
Warm up time	< 2 minutes for data stabilisation

Communication

Data Interval	2-30 minutes (configurable)
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



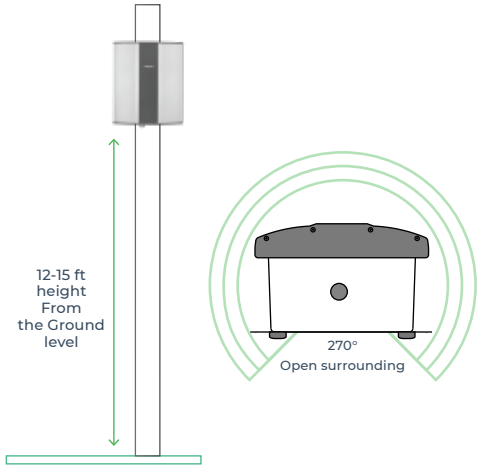
	Connectivity Options	Specification
Wireless	GSM	Global 2G / 3G / 4G
	LoRa	868 MHz / 915 MHz
	LTE	CAT-M1
	NB-IoT	CAT-NB1
	sigfox	868 to 869 MHz, 902 to 928 MHz
	Wi Fi	AP Mode and Station Mode
		Satellite
Wired	ETHERNET	Static / DHCP Configuration
	Modbus	RS485 RTU / TCP
	RELAY	2 Channel Relay

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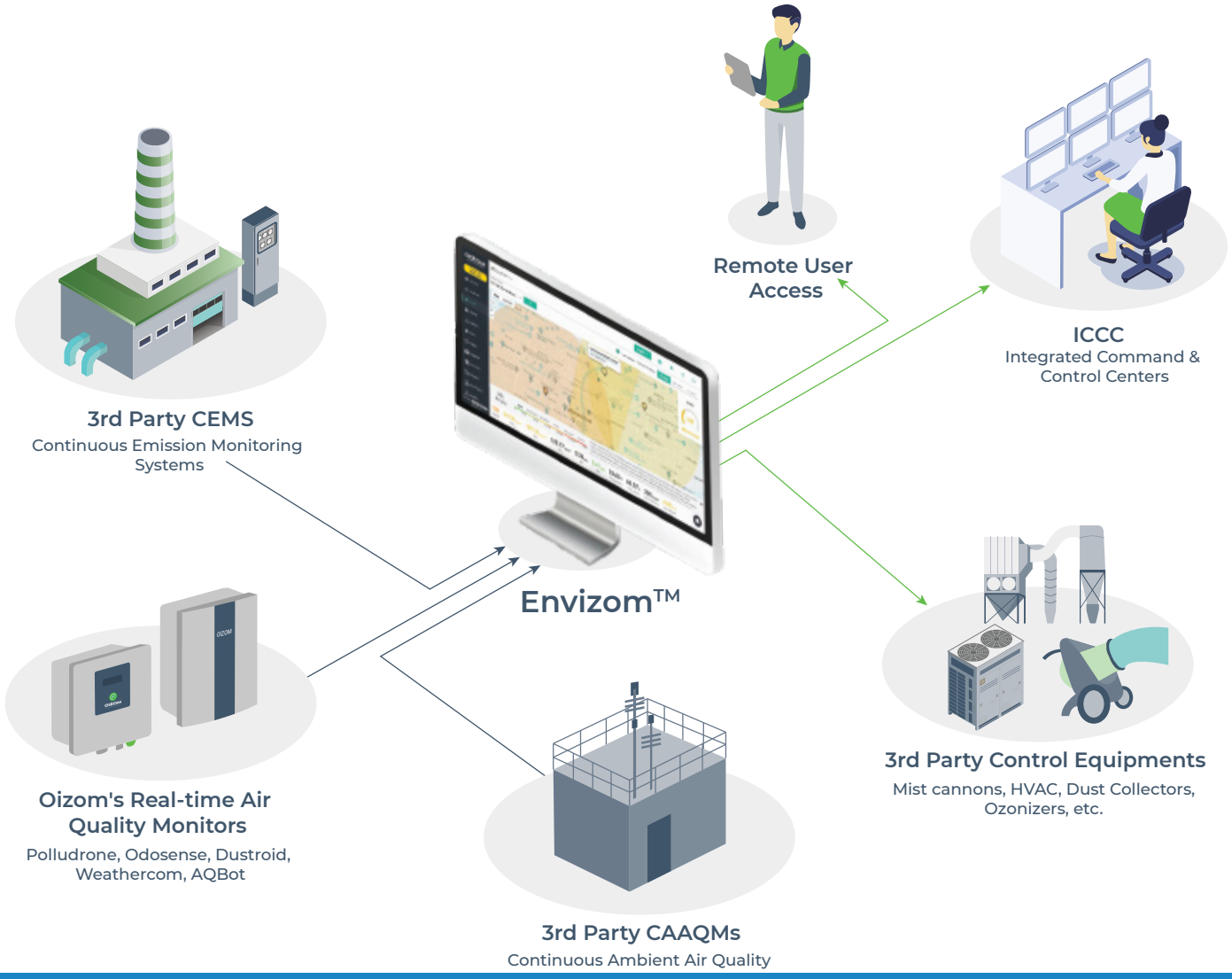
Functional Specifications

Proper location selection is critical for optimised data collection. It varies as per the purpose of the project. According to U.S. EPA 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



Solution Architecture



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Envizom™

Data Visualisation and Analytics Platform



Envizom™ is an Environmental visualisation and analytics platform for real-time air quality data acquisition. Our Environmental Data Interpretation Engine, powered by Artificial Intelligence & Machine Learning algorithms, provides highly accurate data and actionable insights, empowering users to make well-informed decisions. Envizom™ uses secured HTTPS servers for data storage. Alternatively, this data can also be stored on-premise local servers.

Envizom's modules empower users to make informed decisions and implement effective strategies to mitigate air quality issues on time. Envizom offers an automation feature based on user-defined thresholds to trigger mist cannons for dust control to nullify the dust impacts based on real-time environmental data.

Envizom™ Capabilities

- Real-time Data
- Easy to Integrate API
- Smart alerts
- Advanced Analytics
- Automated Reports
- 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.

SANS | OWASP | IEC IEC 62443-4-1 | API Security Tested | 100w Cybersecurity Practices | TCM SECURITY

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Case Studies



Ensuring Workers' safety by dust monitoring at the Red Sea Airport

Oizom® installed Dustroid® to monitor the dust levels and warn the authorities in case of sandstorms in Saudi Arabia's Red Sea Development luxury project

Saudi Arabia | Dustroid Smart | Airports

Analysing challenges and monitoring a wide range of pollutants in Umnu Gobi province

Oizom® installed Dustroid® in Umnu Gobi province to monitor harmful dust and pollutants to protect the environment and miners from harsh conditions.

Mongolia | Dustroid Smart | Mining





Monitoring dust for one of the largest coal mines in the world

Oizom® is monitoring the Dust and other air pollutant emissions from one of the largest Coal mines in the world, in Singrauli, India

India | Dustroid Smart | Mining & Quarrying

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Case Studies



Monitoring dust to ensure a healthy environment at Birla Estate's projects in Mumbai

Aditya Birla Group's real estate company installed Dustroid® at their construction sites to regularly monitor the dust levels at its Kalyan Birla Vanya and Walkeshwar Malabar Hill projects.

India | Dustroid Smart | Construction

Construction company in Florida maintaining their environmental responsibility with Dustroid®

A renowned construction company in South Florida installed Oizom's Dustroid® to ensure effective dust management at their construction sites and maintain its environmental commitments.

South Florida | Dustroid Smart | Construction





World's largest gold undermine chose Oizom's Dustroid® for dust monitoring

The Guinness World Record holder for the deepest and richest mine chose Oizom's Dustroid® as the optimal solution for maintaining health and safety while protecting the environment.

South Africa | Dustroid Smart | Mining

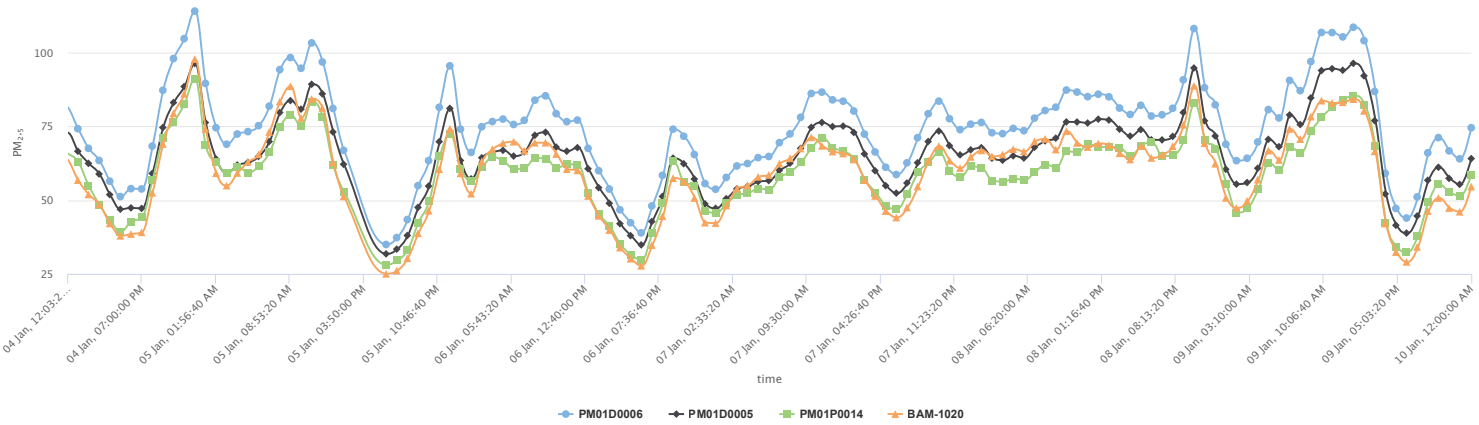
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Data and Calibration

Collocation Calibration

The monitors are operated adjacent to a custom-built reference station, beta attenuation monitor (BAM), housing U.S. EPA-designated Federal Equivalent Method (FEM) for 72 hrs for collocation calibration to ensure accurate data quality. Dustroid demonstrates data accuracy even in the lowest dust concentrations, with an $R^2 > 0.85$ when collocatedwith Horiba's FRM.





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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 monitoring company that offers accurate air quality monitoring solutions for better decision-making. Using our patented monitoring technology, Oizom's system monitors 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. With smart environmental solutions, Oizom® aims to empower future cities with reliable and accurate environmental monitoring.

Over the past decade, Oizom® has focused on environmental monitoring technology and solutions, and till now, we've deployed 3000+ devices. We are monitoring the environmental health of more than 200 million people worldwide. The solutions we provide are in 65+ major cities worldwide. With a network of partners, Oizom® has expanded its reach and made a strong presence in over 70 countries worldwide.

Other Oizom® Products



Polludrone®

Ambient Air Quality Monitoring

Polludrone® is ideal for real-time ambient air quality monitoring for urban and industrial applications.



Odosense®

Odor Monitoring System

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



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.

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OIZOM®
REDEFINING RESOURCES

Trusted by
70+ Countries

Solutions Installed in
65+ Cities

Total Devices Installed
3000+

Total Population Covered
200 million+

Oizom Customers

AECON · CODELCO · SWECO · ENGIE · Richards Bay Minerals · DANGOTE · Red Sea Global · TATA STEEL · JCB · WSP · Seco · IMERYS · MAHAMAYA · LECHLER

Changing the way Industries monitor air quality

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