

Odosense™

Odour Emissions Tracking Solution

Odosense™ is the real-time odour emission tracking solution. Odosense™ continuously detects, measures and monitors the odourful gaseous contaminants. Oizom Odour Monitoring Solution comprises of a network of e-noses (Odosense™) positioned on the periphery of the site. The solution incorporates Odour Atmospheric Dispersion Modelling for predicting odour impact on the surrounding area depending on meteorological conditions. With the help of meteorological data, Odosense™ can trace the odourant dispersion plume incited by conditions like wind speed and wind direction. Odosense™ is a fully solar-powered solution with wireless data transmission. This makes it an ideal choice for landfill sites, wastewater treatment facilities, fertilizers, paper-pulp industries and soil-treatment sites, etc.

Product Variants

Variant Name	Application	Parameter
Odosense Lite	STP	SO ₂ , H ₂ S, NH ₃ , Temperature, Humidity
Odosense Smart	Solid Waste	SO ₂ , H ₂ S, NH ₃ , CH ₃ SH, CH ₄ , TVOC Temperature, Humidity
Odosense Pro	Industrial, ETP	SO ₂ , H ₂ S, NH ₃ , CH ₃ SH, CH ₄ , TVOC, CH ₂ O, NO ₂ , Cl ₂ , Temperature, Humidity
External Modules	Optional	Wind-speed & direction (integrable with all the 3 variants)



STP / WWTP

Monitoring odour intensity in and around water treatment plants can help regulate odour emission by appropriate maintenance on time. It can avoid odour nuisance in the surrounding residential areas.



Landfill / Dumpyard

Diffusion of odorful gases from the landfills/dumpyard can create nuisance in the neighborhood. The odour level can be monitored to carry out precautionary steps for odour suppression.



ETP

Emissions of carcinogenic and other hazardous gases from the effluent treatment process can be monitored in real-time and preventive actions can be taken immediately.



Industries

Odourful gaseous emission from industries like agro-chemical, pharmaceutical, paper-pulp, sugar, etc. can be monitored to make data-driven measures for minimizing their fatal effect.


Product Features

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Patent Pending Technology: Works on innovative e-breathing technology for higher data accuracy
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Weatherproof: Weather proof with its IP65 grade enclosure
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Solar Powered: Capable of running independently on solar power
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Tamper Proof: Comes with an optional security system to avoid tampering
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Retrofit Design: Plug and play design for ease of implementation
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Over-The-Air Update: Automatically upgradeable from a central server without any onsite visit
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Compact: Light-weight and compact system installed at 12-15 feet (4-5 m) height
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Real-Time Data: Continuous real-time-data transfer possible through various connectivity options
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Ultimate Durability: Made of high-grade engineering-metal and composite polymers for long-lifecycle
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Network Agnostic: Supports a wide range of connectivity options like GSM / GPRS / WiFi / LoRa / NBIoT/ Ethernet
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Identity & Configuration: Each equipment carries its unique identity with geotagging through wireless configurable sensor
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3-level Calibration: Can be calibrated by a third party nodal agency, reference station and on the spot calibration for ultimate precision

Levels of Calibration



Factory Calibration

The sensors are bump tested at Oizom factory to check their proper functioning for each parameter.



Lab Calibration

Laboratory calibration is done in a controlled environment for all parameters to compensate for cross-sensitivity and ensure higher data accuracy.

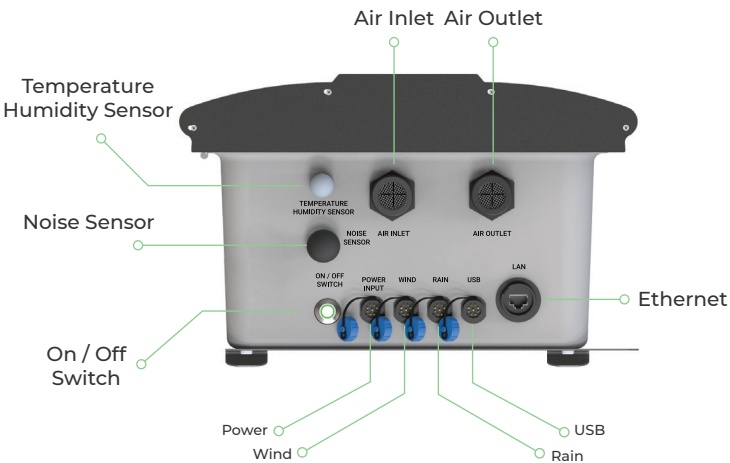


Co-location Calibration

The sensors are calibrated against a reference station before installation and their performance is tested in the ambient condition before final deployment.

General Specifications

Size	321 mm(L) x 199 mm(B) x 372 mm(H)
Weight	9.8 Kg
Material	Aluminum Magnesium Alloy, Mild-steel (With Powder Coating), FRP
Certifications	CE & FCC Certified, PTCRB Certified Communication Module



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) for remote diagnosis, FOTA updates, and cloud calibration

Connectivity Options		Specification
Wireless	GSM	Global 2G / 3G
	LORA	868 MHz, 915 MHz
	LTE	CAT-M1
	NB-Iot	CAT-NB1
	Sigfox	868 to 869 MHz, 902 to 928 MHz
Wired	Wifi	802.11 b/g/n
	Ethernet	10BaseT/100BaseTx
Modbus		RS485 RTU

Power

Avg. Power Consumption	Maximum 2.5 Watt
Power Input Options	External 110-230V AC 50-60Hz, 40Watt Monocrystal Solar Panel
SMPS Specs	24V, 2Amps output from either of the power inputs
Battery Backup Time	Up to 48 Hours
Battery Specs	Lithium iron phosphate (LiFePO4) battery cell with rated voltage 12.8V Capacity 6Ah

Environmental Performance

Operating Temperature	-20 °C to 60 °C (According to SASO test report)
Optimum Temperature	25 °C to 35 °C (According to SASO test report)
Operating Humidity	0-90% (According to SASO test report)
Weather Protection	IP65 (According to lab test)

Parameters

ID	Parameter	Range	Resolution	Min. Detection	Drift	Working Principle	Measurement Principle	Sample Rate	Expected Sensor Life
H ₂ S	Hydrogen Sulfide	0-100 ppm	0.01 ppm	0.01 ppm	Z: <±100 ppb S: < 20%	Electro - chemical	Active Sampling	325 ml per sample	2 year
NH ₃	Ammonia	0-100 ppm	0.1 ppm	0.1 ppm	2% Signal/ Month				1 year
CH ₂ O	Formaldehyde	0-10 ppm	0.05 ppm	-	2% Signal/ Month				2 year
CH ₃ SH	Methyl Mercaptan	0-10 ppm	0.5 ppm	-	2% Signal/ Month				3 years
CO	Carbon Monoxide	0-1000 ppm	0.1 ppm	0.1 ppm	Long Term Sensitivity Drift: <5% (Yearly)				5 years
NO	Nitric Oxide	0-20 ppm	20 ppb	20 ppb	Z: 0-50 ppb S: 0 to -20 %				2 years
NO ₂	Nitrogen Dioxide	0-20 ppm	20 ppb	20 ppb	Z: 0-20 ppb S: -20 to -40 %				2 years
SO ₂	Sulfur Dioxide	0-20 ppm	20 ppb	20 ppb	Zero Drift: <± 20 ppb Sensitivity Drift: <±15%	NDIR			2 years
CH ₄	Methane	0-5000 ppm	50 ppm	50 ppm	±3%				2 years
TVOC	Total Volatile Organic Compounds	0-20 ppm	5 ppb	5 ppb	-	PID	Passive Monitoring	N.A.	3 years
Cl ₂	Chlorine	0-20 ppm	0.1 ppm	-	2% Signal/ Month	Electro - chemical	Active Sampling	N.A.	2 years
Li	Light Intensity	Up to 65,000 Lux	1 Lux	1 Lux	-	Photo-Conductivity	Passive Monitoring	N.A.	3 years
UV	UV Radiation	0.1-100,000 uW/ cm ²	0.1 uW/cm ²	0.1 uW/cm ²	-			N.A.	3 years
Lv	Visible Light Intensity	Up to 5000 Lux	0.1 Lux	0.1 Lux	-			N.A.	3 years
Temp	Temperature	-20 °C to +60 °C	0.01 °C	-20 °C	-	Solid State Semi-Conductor Sensing		N.A.	3 years
Hum	Humidity	100% Rh	0.10%	0.10%	± 1.0 hPa/ year			N.A.	3 years
Bmp	Barometric Pressure	300-1100 hPa	0.18 Pa	0.18 Pa	N/A			N.A.	3 years

External Modules (optional)

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Wind Sensor:



Ultrasonic sensor



360°, 0-60 m/s

Functional Specification

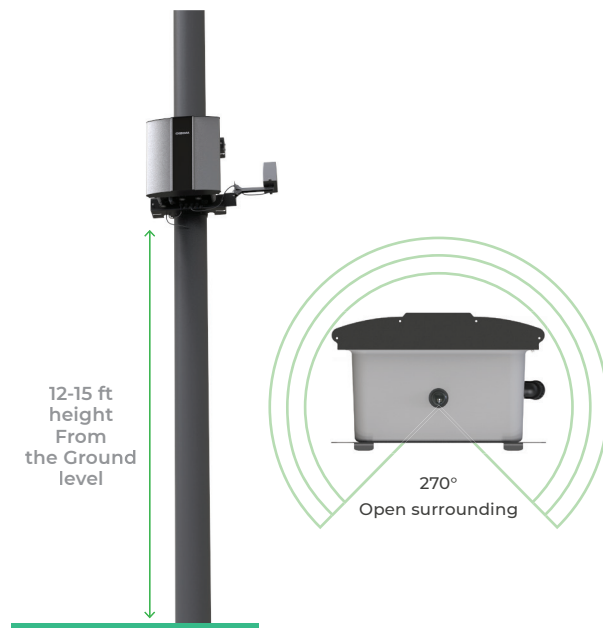
Strategic Location Selection:

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 such as:

- Real-time air quality public reporting
- Research monitoring
- Trends monitoring
- Compliance monitoring
- Emergency episode monitoring

Installation:


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





Operation:


When the device is powered on, the device intakes air samples at a predefined frequency through the air sampling system. Once the air sample is stabilized, the sensory system takes multiple readings during the sampling time and performs relevant data-processing. During this cycle time, the device flushes out old air sample and pulls in a fresh one. After each sampling, the data processing system sends the processed data to the central server using a built-in communication module

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 the atmospheric conditions and individual sensor drift (mentioned in the parameter table) to ensure data accuracy. Spot calibration can be performed using reference equipment which can be a recently calibrated Oizom device.

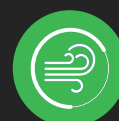
 **Diagnosis/Debugging:** Power and network availability are the prime check in case of equipment failure. If the issue is still unresolved after remote diagnosis, on-site troubleshooting can be planned by an engineer.



306, Indraprasth Corporate, Prahladnagar,
Ahmedabad - India
✉ contact@oizom.com / connect@oizom.com
☎ +91-8866660025 / 82



HB9, Savoie Technolac,
Le Bourget du Lac - France
✉ hello@oizom.com
☎ +33 783426695



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