

# Odosense®

## Odour Monitoring & Analysis 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, WWTP	SO <sub>2</sub> , H <sub>2</sub> S, NH <sub>3</sub> , Temperature, Humidity
Odosense Smart	Solid Waste	SO <sub>2</sub> , H <sub>2</sub> S, NH <sub>3</sub> , CH <sub>3</sub> SH, TVOC Temperature, Humidity
Odosense Pro	Industrial, ETP	SO <sub>2</sub> , H <sub>2</sub> S, NH <sub>3</sub> , CH <sub>3</sub> SH, TVOC, CH <sub>2</sub> O, NO <sub>2</sub> , Cl <sub>2</sub> , Temperature, Humidity
External Modules	Optional	Ambient Noise, 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.



Powered By

## Product Features

-  **Patented Technology:** Works on innovative e-breathing technology for higher data accuracy
-  **Weather Resistant:** IP66 Grade (certified) enclosure for endurance against harsh weather conditions
-  **Solar Powered with Battery Backup:** Compatible to charge internal battery using solar power
-  **Tamper Proof:** Comes with an optional security system to avoid tampering
-  **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
-  **Real-Time Data:** Continuous real-time-data transfer possible through various connectivity options
-  **Ultimate Durability:** Made of high-grade engineering-metal and composite polymers for long-lifecycle
-  **Network Agnostic:** Supports a wide range of connectivity options like GSM / GPRS / WiFi / LoRa / NBIoT/ Ethernet / Modbus
-  **Identity & Configuration:** Each equipment carries its unique identity with geotagging through wireless configurable sensor
-  **On-device Calibration:** On-site device calibration capability using on-device calibration software

## 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 performed for Baseline Correction & Span-Calibration for all the parameters to compensate for cross-sensitivity and ensure higher data accuracy.

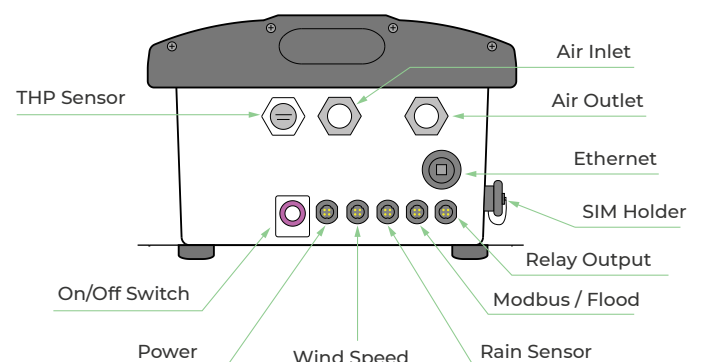


### Collocation Calibration

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	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 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

## Power

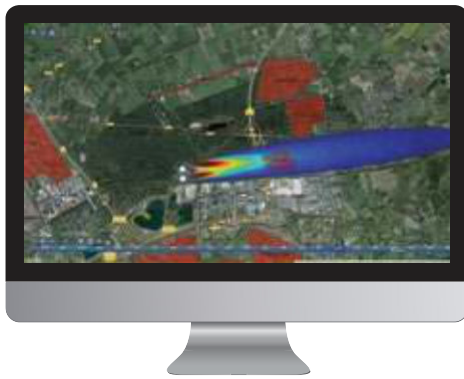
Avg. Power Consumption	5 Watt (Actual consumption depends upon the number of parameters)
Power Input Options	External 110-230V AC 50-60Hz, 40Watt Monocrystal Solar Panel
SMPS Specs	24V, 2Amps output UL-62368 & CAN/CSA C22.2 Certified
Battery Backup Time	12 Hours
Battery Specs	Lithium iron phosphate (LiFePO4) battery cell with rated voltage 12.8V Capacity 6Ah

## Technical Specification

Processor	Quad Core ARM Cortex
Memory	2GB RAM / 8GB eMMC ROM
Device Interface	On-device Software / API
Operating Temperature	-20 °C to 60 °C
Operating Humidity	0-95% RH

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
Wired	Wifi	AP Mode and Station Mode
	Ethernet	Static / DHCP Configuration
	Modbus	RS485 RTU / TCP
	Relay Output	2 Channel

Odour  
Atmospheric  
Dispersion  
Modelling



Odour Source  
Tracking  
&  
Complaint  
Management

## Parameters

ID	Parameter	Range	Resolution	Min. Detection	Drift	Working Principle	Measurement Principle	Sample Rate	Expected Sensor Life
H <sub>2</sub> S	Hydrogen Sulfide	0-100 ppm	1 ppb	10 ppb	< ±100 ppb / Year	Electrochemical	Active Sampling	325 mL per sample	2 years
NH <sub>3</sub>	Ammonia	0-100 ppm	10 ppb	100 ppb	±2% / Month				
CH <sub>2</sub> O	Formaldehyde	0-10 ppm	1 ppb	50 ppb	±2% / Month				
CH <sub>3</sub> SH	Methyl Mercaptan	0-10 ppm	10 ppb	100 ppb	±2% / Month				
NO <sub>2</sub>	Nitrogen Dioxide	0-20 ppm	1 ppb	10 ppb	< ±20 ppb / Year				
SO <sub>2</sub>	Sulfur Dioxide	0-20 ppm	1 ppb	10 ppb	< ±20 ppb / Year				
Cl <sub>2</sub>	Chlorine	0-20 ppm	10 ppb	100 ppb	±2% / Month	PID	1 LPM	6 Months Filament Life	
TVOC	Total Volatile Organic Compounds	0-20 ppm	1 ppb	5 ppb	N.A.				
CH <sub>4</sub>	Methane	0-5000 ppm	20 ppm	20 ppm	±3% of F.S.	NDIR	Passive Monitoring	N.A.	3 years
Noise	Ambient Noise	Upto 140 dB	1 dB	30 dB	±2% / Year	Capacitance			
Temp	Temperature	-40 °C to +125 °C	0.01 °C	-40 °C	N.A.	Solid State Semiconductor Sensing			
Hum	Humidity	100% Rh	0.1%	0.1%	N.A.				
Bmp	Barometric Pressure	300-1100 hPa	0.18 Pa	300 hPa	±1.0 hPa / Year				

## External Modules (optional)



## Functional Specification

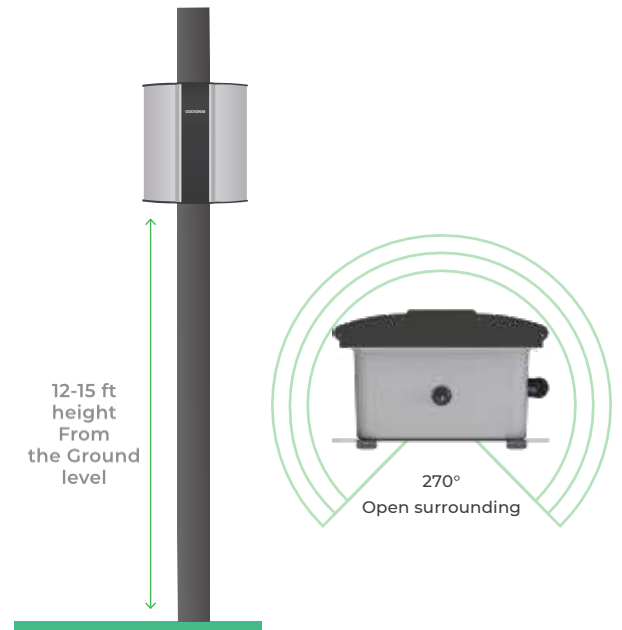
### Strategic Location Selection:

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 2-meter range from the unit or solar panel
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.



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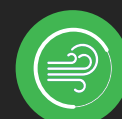
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