

Model GEO-AQAN-4000

Air Quality & Ambient Noise Monitoring System

As part of **GEOcityQUAL solutions**, **GEO-AQAN-4000** is a Continuous Ambient Air Quality Monitoring System (CAAQMS). It is capable of monitoring various environmental parameters related to air quality, noise, weather, radiation etc. 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 etc. **GEO-AQAN-4000** is an ideal choice for smart cities as well as urban infrastructure applications like roadside, campus, and airport monitoring. It is easily integrable with a Smart Pole/Intelligent Pole.

Applications

Smart City

Pollution monitoring at strategic locations in a smart-city empowers city authorities to obtain actionable insights for pollution control.

Campus Monitoring

Pollution monitoring at key locations on campus allows stakeholders to spread awareness about environmental conditions of the premises.

Road-side & Tunnels

Pollution monitoring at roads and tunnels can enable authorities to layout a pollution mitigation action plan.

Airports

Pollution and noise monitoring at taxiways and terminal surroundings facilitates airport authorities to analyze its impact on travellers and surrounding neighbourhoods.

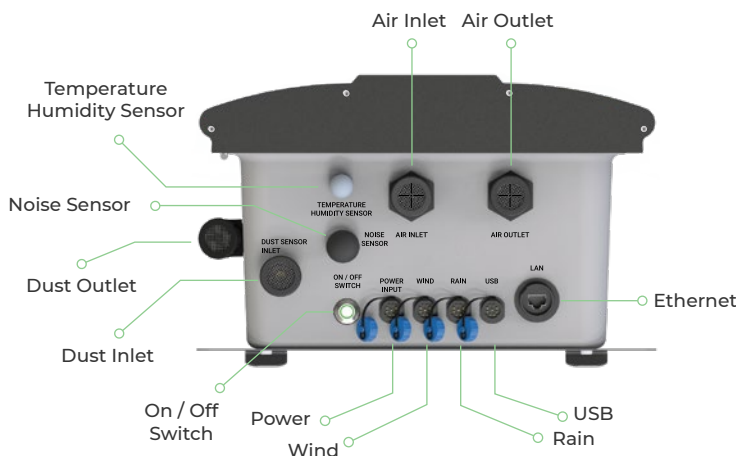


Product Variants

Model	Application	Parameter
GEO-AQAN-4000L	General Purpose	PM2.5, PM10, CO ₂ , CO, Noise, Light, UV-Radiation, Temperature, Humidity
GEO-AQAN-4000S	Extensive	PM2.5, PM10, CO ₂ , CO, SO ₂ , NO, NO ₂ , O ₃ , Noise, Light, UV-Radiation, Temperature, Humidity
GEO-AQAN-4000P	Critical	PM1, PM2.5, PM10, TSP, CO ₂ , CO, SO ₂ , NO, NO ₂ , O ₃ , H ₂ S, Noise, Light, UV-Radiation, Temperature, Humidity
Other Sensors	Optional	Wind Speed & Direction, Rainfall, Flood (integrable with all the 3 variants)

General Specifications

Size	360mm (H) x 328mm (W) x 200mm (D)
Weight	9.8 Kg
Material	Aluminum Magnesium Alloy, Mild-steel (With Powder Coating), FRP
Certifications	CE & FCC Certified, PTCRB Certified Communication Module



Power

Avg. Power Consumption	2.5 W (Actual consumption depends upon the number of parameters)
Power Input Options	External 110-230V AC 50-60Hz, 40Watt Monocrystal Solar Panel
SMPS Specs	24V, 2A 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
Optimum Temperature	25 °C to 35 °C
Optimum Humidity	0-95%
Weather Protection	IP63

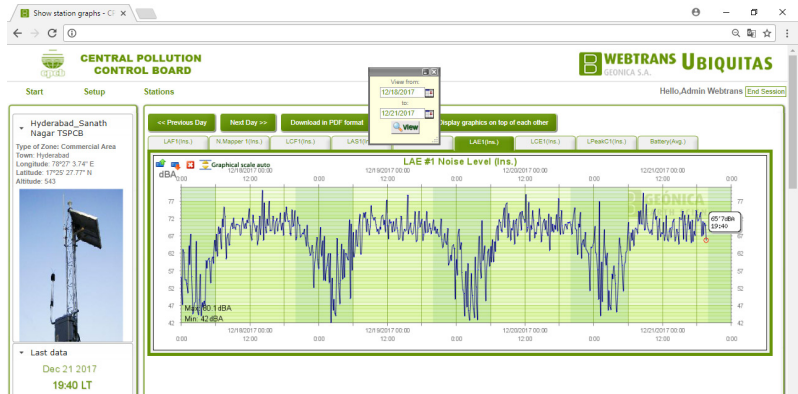
Parameters

ID	Parameter	Range	Resolution	Min. Detection	Error / Drift	Working Principle	Principle	Sample Rate	Expected Sensor Life
PM _{2.5}	Suspended Particulate Matters with size less than 2.5µ	Upto 1000 µg/m ³ & Upto 5000 µg/m ³ for GEO-AQAN-4000P	0.1 µg/m ³	1 µg/m ³	Upto ±10 %	Light Scattering & Optical Particle Counter for GEO-AQAN-4000P	Active Sampling	1 L /min	1 year & 1.5 year for GEO-AQAN-4000P
PM ₁₀	Suspended Particulate Matters with size less than 10µ								
PM ₁	Ultra Fine Particulate Matters with size less than 1µ								
PM ₁₀₀	Total Suspended Particulates (TSP)								
CO ₂	Carbon Dioxide	Up to 5000 ppm	1 ppm	20 ppm	< ±5 ppm / Year	NDIR	Electrochemical	325 mL per sample	3 years
CO	Carbon Monoxide	0-1000 ppm	10 ppb	100 ppb	< ±100 ppb / Year				
SO ₂	Sulfur Dioxide	0-20 ppm	1 ppb	10 ppb	< ±20 ppb / Year				
NO	Nitric Oxide	0-20 ppm	1 ppb	10 ppb	< ±50 ppb / Year				
NO ₂	Nitrogen Dioxide	0-20 ppm	1 ppb	10 ppb	< ±20 ppb / Year				
O ₃	Ozone	0-20 ppm	1 ppb	10 ppb	< ±20 ppb / Year				
H ₂ S	Hydrogen Sulfide	0-100 ppm	1 ppb	10 ppb	< ±100 ppb / Year				
Noise	Ambient Noise	Upto 140 dB	1 dB	30 dB	2% / Year	Capacitance	Passive Monitoring	N.A.	3 years
Li	Light Intensity	Up to 1,00,000 Lux	1 Lux	1 Lux	N.A.	Photo-conductivity			
UV	UV Radiation (0-12 UVI)	0.1-100,000 uW/cm ²	0.1 uW/cm ²	0.1 uW/cm ²	N.A.				
Lv	Visible Light Intensity	Up to 5000 Lux	0.1 Lux	0.1 Lux	N.A.				
Temp	Temperature	-20 to +85 °C	0.01°C	-20 °C	N.A.	Solid state semi conductor sensing			
Hum	Humidity	Up to 100% Rh	0.1%	0.1%	N.A.				
Bmp	Barometric Pressure	300-1100 hPa	0.18 Pa	300 hPa	±1.0 hPa / Year				

Communication & Datalogging



WEBTRANS Internet Platform



Direct connection to **METEO DATA** Datalogger with Integrated Communications (4G / 3G / GPRS, Line, Radio or Satellite)

Installation

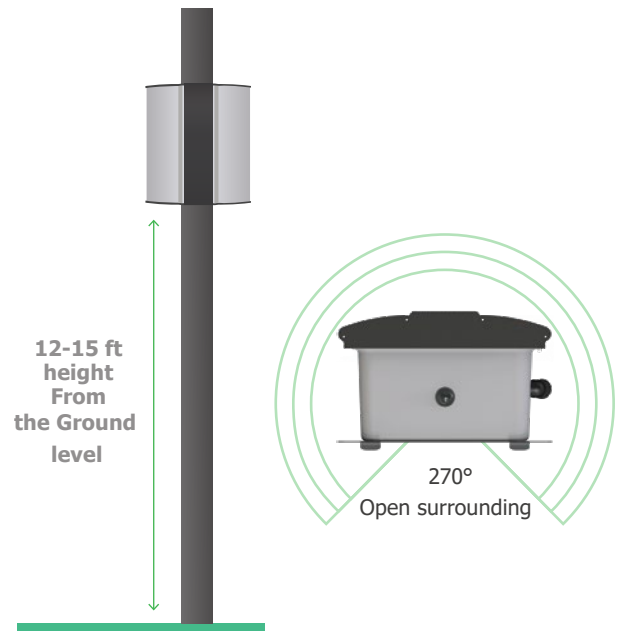
Strategic Location Selection:

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 or solar panel
Network Availability	Uninterrupted network connection

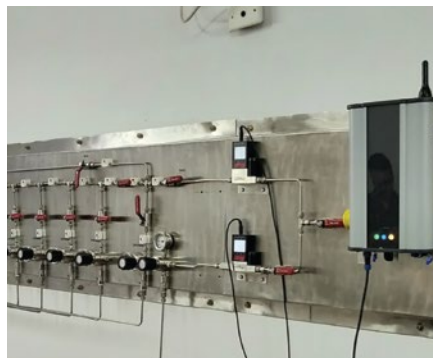


Levels of Calibration



Factory Calibration

The sensors are bump tested at 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.



Collocation Calibration

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