

Dust from demolition, construction, and cleanup activities can significantly impact local air quality, posing a health hazard and a nuisance. For that reason, dust mitigation measures are required at most construction sites, and real-time dust monitoring may be required to verify that mitigation measures are effective.



This solar-powered dust monitor is available with wind and noise modules. Measurements are displayed on website and smart phones.



Deploying automated dust monitors assures regulatory agencies and neighbors that active measures are being taken to control dust.

Air Quality Standards

The EPA's National Ambient Air Quality Standard sets limits for concentrations of airborne pollutants that can harm health and cause environmental damage.

Construction dust falls under the standards for particulate matter: PM₁₀ for particles with diameters 10 microns and smaller – typically soil, and PM_{2.5} for particles with diameters 2.5 microns and smaller – typically exhaust from heavy machinery.

The PM₁₀ limit is 150 µg/m³ averaged over 24 hours. The PM_{2.5} limit is 35 µg/m³ averaged over 24 hours.

Monitoring Practices

Local codes, agencies, and communities set specific regulations, but in general, dust monitoring should follow these practices:

- Dust monitors should be placed in path of the migrating dust, typically at the project fenceline and at critical locations outside the fenceline, such as hospitals and schools.
- Monitoring should be continuous during construction hours at minimum in order to document a 24-hour average. Ideally, windspeed and direction should be monitored as well.
- Monitoring should provide alerts so that prompt action can be taken if limits are exceeded.
- Monitoring should be used to evaluate dust mitigation measures to improve practices or reduce costs. Avoid including fugitive dust from other sites in the evaluation by placing a monitor upwind of the fenceline.
- Monitoring reports should be stored for easy retrieval in case of complaints.

Advantages of Automation

Continuous Sampling: Automated monitoring provides continuous sampling of air quality, typically at multiple locations around the construction site.

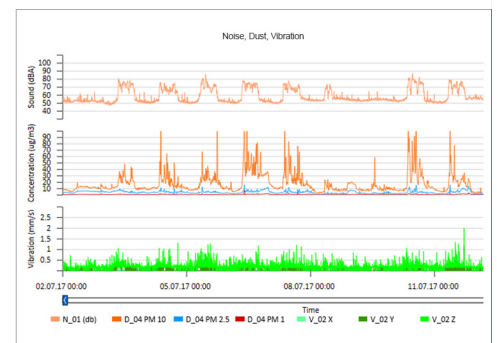
Minimal Maintenance: Each monitor operates autonomously, protected by a weatherproof enclosure and powered by AC mains or solar-charged batteries.

Timely Alerts: Automated systems can send alerts to on-site project managers for prompt action.

Web Access: Air quality status is displayed on a project website and reports are generated at required intervals. Reports and data are archived automatically for easy retrieval.

Cost-Effective Rentals: Multiple dust monitoring systems cost less and provide better coverage than a roving technician with a hand-held dust monitor.

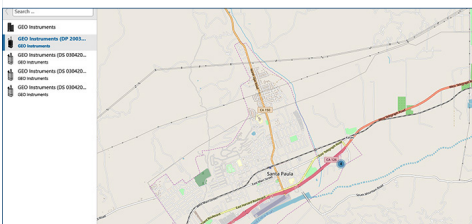
Combination Monitoring: GEO's automated monitoring platform can present data from dust, noise, vibration, and geotechnical measurements all on the same project website.



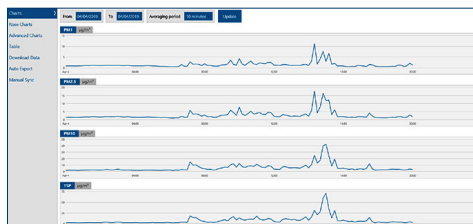
Time plot showing noise, dust, and vibration.



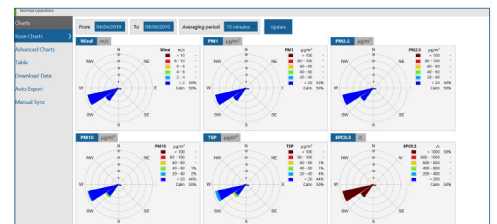
Aeroqual Dust Monitors	Dust Sentry	Dust Sentry Pro	AQS1
Measurement technology	Near forward angle laser scattering nephelometer	Right angle laser scattering particle counter	The AQS 1 air quality station can be ordered with either a near-forward angle laser scattering nephelometer or a right-angle laser scattering particle counter.
Particle counts	N/A	0-1,000,000 particles/L 0.3, 0.5, 0.7, 1.0, 2.0, 3.0, 5.0,10.0 µm	
Range			
Size channels			
Particle Mass Measurement	Range µg/m³	Range µg/m³	Particulate measurement specifications will reflect the measurement technology chosen.
PM ₁	0 - 60,000	0 - 200	
PM _{2.5}	0 - 60,000	0 - 2000	
PM ₁₀	0 - 60,000	0 - 5000	
TSP	0 - 60,000	0 - 5000	
Simultaneous	No. Each size fraction requires a dedicated cyclone	Yes	
Accuracy	<±(2 µg/m³ + 5% of reading)	<±(5 µg/m³ + 15% of reading)	
Resolution	0.1 µg/m³	0.1 µg/m³	
MCERTS certified	Yes	No	
SCAQMD Rule 1466	Pre-approved	No	
Auto zero check	Yes	No	
Sample flow	2 LPM	1 LPM	
Factory calibration interval	24 months	12 months; sooner if above 40°C	
Operating temperature	14 °F to 122 °F (-10°C to +50°C)	14 °F to 113 °F (-10°C to +45°C)	
Power consumption	24 W Max, depends on configuration	24 W Max, depends on configuration	24 W Max, depends on configuration
Additional Sensors	Wind speed and direction / Weather station / Noise / Solar incidence		
Dimensions (H x W x D)	19 x 13 x 7.4 inch (483 x 330 x 187 mm)	19 x 13 x 7.4 inch (483 x 330 x 187 mm)	19 x 13 x 7.4 “ (483 x 330 x 187 mm)
Weight	28.6 lb (13 kg)	28.6 lb (13 kg)	33 lb (15 kg)
Gas Measurement			0 -500 ppb (0.1 ppb) 0 -500 ppb (0.1 ppb) 0 -500 ppb (0.1 ppb) Low range 0-25 ppm High range (preferred in US)
Ozone (GSS)	-	-	
Nitrogen Dioxide (GSE)	-	-	
Volatile Organic Compound (PID)	-	-	



Map view showing Dust Sentry locations



Particle-size chart with running averages



Rose chart showing wind and pollution