

Geobotica GeoLidar

GeoLidar is a smart LiDAR system developed for monitoring ground deformation and subsidence. Using a combination of rapid scanning and artificial intelligence GeoLidar automatically removes people, vegetation, moving vehicles, and other noise from its high-precision scans, allowing deformation and subsidence to be monitored with millimeter precision.

GeoLidar Features

Rapid Scanning Technology: Rapid scanning allows moving objects to be identified and eliminated from the point cloud. GeoLidar takes just three seconds to capture 600,000 data points from a 70° x 70° field of view.

Progressive Mapping: With the smearing effects of motion removed, the system can map the point cloud to the surface. Successive scans fill in areas that were blocked by traffic, pedestrians, and parked cars.

Settlement Calculations: With the surface map completed, the system can track the thousands of points making up the map, calculating settlement or deformation for each point with sub-millimeter resolution at shorter ranges and millimeter-scale resolution at longer ranges. All processing is done on-board the GeoLidar in real time.

Time Lapse Photos: GeoLidar captures a photo each time it scans. Photos are uploaded to the cloud for easy viewing. The time-lapse photos are exportable as JPG and are automatically merged with the LiDAR data to give a rich 3D experience.

On-Site Configuration: A built-in WiFi hotspot allows smartphones or tablets to configure, start/stop, or reset the scanner.

Benefit Short List: Rapid deployment, no traffic control needed, no reflectors or prisms needed on the road surface, safer and more reliable monitoring, results presented as easily understood heat maps and tabulated data.



Traffic obstructs monitoring points on the road surface, presenting challenges to successful monitoring.



GeoLidar leverages the power of Geobotica's super computer chip that processes 21 trillion operations per second.



Geobotica's rapid scanning and road surface mapping technology works in real time to eliminate moving traffic from the scan.

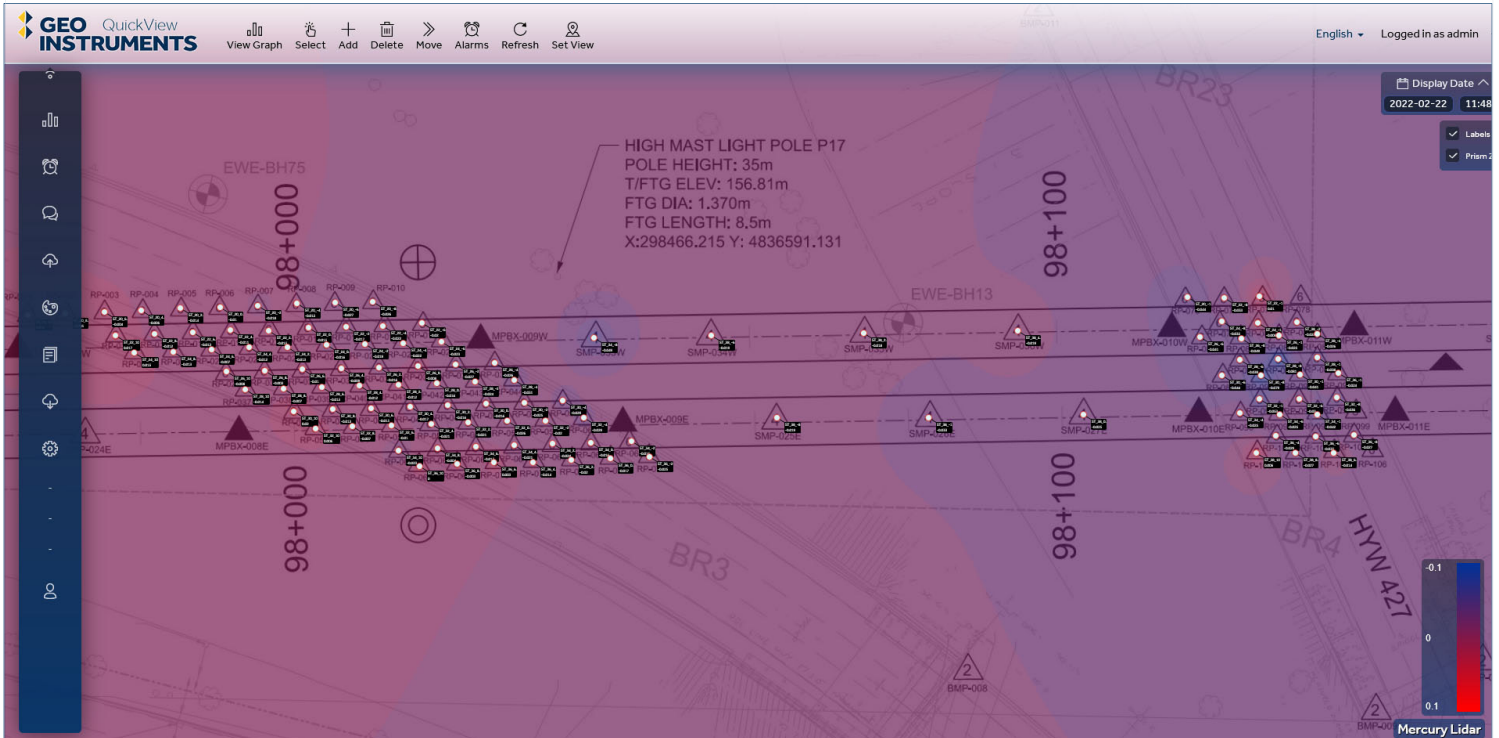
TECHNOLOGY	
Field of view	70° x 70°
Range	1m to 150m typical surfaces 1m to 250m (White 90%)
Point cloud acquisition rate	200,000 points per second
Point cloud scan time	3 seconds
Deformation & subsidence pixels	0.5m x 0.5m cartesian grid
Deformation & subsidence precision	0.5mm at 10m, <1mm at 50m
Rotational platform	System can be rotated to a new fixed field of view using inbuilt system rotation in azimuth. Precision 0.05 degrees.
Wavelength	905nm
Laser safety	Class 1
Input voltage	12v DC
Power consumption	~ 10 Watts
Camera	12mp, 110° FoV, full color
IMU + GPS details	Tilt meter (0.005° precision), temperature sensor, pressure sensor, accelerometer, 6 axis gyroscope, GNSS 6 channel receiver

ENVIRONMENTAL	
Operating temperature	-20°C to 45°C
IP rating	IP65
Humidity	0% to 99%
Rain rate for data	50mm/hr 80% field of view coverage
COMMUNICATIONS	
WiFi hotspot	Secure WLAN hotspot at 2.4Ghz for configuration and set up from any tablet or phone
Cloud data transfer	3G/4G inbuilt modem (frequency is country specific)
DATA	
Deformation/subsidence format	CSV, Raster image
Point cloud format	LAS, PLY, CSV

Geobotica specializes in sensing solutions that use Radar, LiDAR, Computer Vision, Photogrammetry, AI and Machine Learning.

QuickView Presentation of Settlement Data

After each scan, GeoLidar outputs a compressed CSV file containing calculated settlements for every point in the point cloud. File size is only 128kB and easily transmitted by cell connection. GeoCloud servers receive the file and present the data in QuickView.



QuickView Heat Map

Quickview heat maps show color coded settlement. The screen shot above shows how baseline data might appear. Variations are only +/- 0.1 mm.

QuickView Point Data

The white dots represent the points selected from the point cloud. There are thousands of other points available as well. The black boxes contain numeric settlement values.

QuickView Plots

Trend plots can be generated on the fly for individual points or for a set of points. Below, six points have been selected for the plot.

