

Overview

Locator One is a compact, self-powered GNSS-based sensor that obtains high-precision 3D measurements of its location and transmits the measurements to the Cloud.

The receiving cloud server processes the data, applying adjustments and calculates changes from baseline measurements. Then it makes the data available on a website, such as a GeoCloud project website.

Applications

- Monitoring settlement of foundation soil during ground improvement operations.
- Automating settlement plate readings.
- Monitoring potential displacement and settlement of buildings and utilities near excavation and tunneling projects.
- Monitoring horizontal displacement of earth retention structures such as mse walls and sheet pile walls.
- Monitoring slope stability at open pit mines, tailings dams, and highway cuts.

Installation

Measured Points: Locator One sensors are mounted directly on the asset to be monitored, such as a settlement plate riser, a structure, or a building.

Reference Point: For highest precision, a Locator One sensor is also installed at a stable location outside the zone of influence to serve as a reference point.

Orientation: Sensors should be oriented with its solar panel facing the equator. The solar panel charges a supercapacitor rather than a battery.

Measurement Intervals: Locate One sensors report 24 measurements per day by default, but can be programmed to report at shorter intervals.



Locator One sensor mounted on settlement plate riser pipe and protected by bird spikes

Cloud Connectivity

The Locator One sensor sends its raw geodetic measurements and meta data to the cloud using LTE-M connectivity. LTE-M is provided by AT&T, T-Mobile, or global SIMs.

Cloud Processing

Cloud processing uses the reference point to calculate and adjust precise and reliable baselines and finally obtain absolute 3D coordinates of the monitored assets. The current coordinates are compared with baseline coordinates to present displacements, including the direction of displacement.

Data delivery

Results are displayed in graphic form on a project website.

Advantages of Locator One

Easy to deploy: Locator One is compact, self-powered, and easily installed directly on the riser pipes or structure.

Direct to Cloud: Locator One transmits directly to the Cloud using LTE-M. No gateway is necessary.

High Precision: Locator One provides a horizontal precision of $\pm 2\text{mm}$ and a vertical precision of $\pm 4\text{mm}$ with a clear horizon and no obstacles above an elevation of 10° .

Ground-Facing Radar Sensor: A radar sensor is built into the bottom of the Locator One. It measures the distance to ground level. Thus for settlement plate applications, the Locator One can report both the elevation of the settlement plate and the elevation of the fill above the plate.

