

Track Monitoring

Track monitoring systems help maintain the safety of railroad tracks by monitoring track alignment for lateral movement, longitudinal profile for settlement or heave, and cant for changes in the relative elevation of the two rails.

Instrumentation

GEO-Instruments supplies two different track monitoring solutions. Both solutions are fully wireless and provide automated processing, data visualization, and distribution of data and alerts to stakeholders. The systems operate 24/7 and always display current conditions.

Wireless Mesh Tiltmeters: Tiltmeters provide 2D measurements for calculating changes in longitudinal profile and cant.

Tiltmeters are particularly robust, with reliable performance unaffected by water, snow, brake dust, cold temperatures, and electrically noisy environments. The advanced flatmesh networking algorithms, powered by Senceive, ensure that measurements are never lost, even if neighboring sensors are damaged.

AMTS Systems provide 3D measurements for calculating changes in alignment, longitudinal profile, and cant.

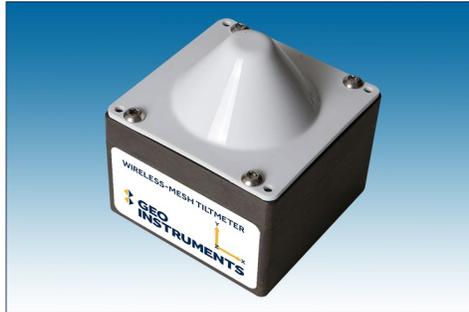
AMTS can be used to monitor changes in alignment. They can also provide absolute positioning over long distances with AMTS arrays.

Advantages of Automation

Safety: Readings are obtained remotely, and after installation, very little access is required.

Reliability: Measurements are recorded electronically. Additional tiltmeters or prisms can be added easily, if required.

Quick Access: Data and alerts are available on smartphones and PCs just minutes after the reading is taken.



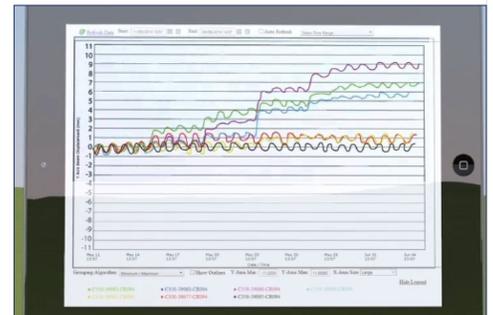
Wireless mesh tiltmeters are reliable, high resolution, self-powered sensors. They can be installed quickly and require no maintenance. Battery life is 15 years with readings every 25 minutes. 1-minute reading rates are possible.



Wireless mesh tiltmeters are fixed to the ties with screwed in brackets or with glue. Each tiltmeter relays its readings to a neighboring tiltmeter. This allows transmission around curves and obstructions.



A cellular gateway collects the readings and transmits them to the internet. Gateways can be powered by a solar panel or AC mains. Costs for deploying this system are much lower than with cabled sensors.



Readings are processed on a secure internet server. Graphs and data are made available to smart phone and desktop PCs web browsers only minutes later. Alerts are sent by email or text messages.



This AMTS was one of an array of fifteen used to monitor potential deformation of the track over a 2.5 mile span.



Prisms are mounted on rail clips or embedded in the ballast. They are relatively inexpensive and need no power or wiring.