

Applications

Wireless Tiltmeter networks are an easy to implement structural monitoring solution that provide high accuracy measurements of inclination across multiple axes. Tiltmeters allow for detailed observation of movement across a structure. Their versatility makes them useful in monitoring a wide variety of assets.

Typical applications include:

- Understanding structural movement of excavation faces or building façades
- Track monitoring, including Twist and Cant.
- Tunnel deformation monitoring
- Remote monitoring of structures that are difficult to access or monitor by other means

Specifications

Range:	+/- 90° across 3 axes
Resolution:	0.0001°
Accuracy:	0.002° to 0.01°
Temp Rating:	-40 to +85 °C
Dimensions:	80 x 75 x 57 mm
Weight:	0.5kg
Battery Life:	Up to several years depending on data frequency.

Installation

Wireless tiltmeters generally simple to install. They are most often attached to the monitored structure or asset using purpose-made brackets that position the sensors parallel or perpendicular to the surface they are fixed to.

In most cases tilt brackets are fixed directly into brickwork or concrete by drilling into the exterior but, in many situations, other methods such as powerful magnets, clamps or adhesives are more appropriate.

Tiltmeters can also be attached mounted onto fibreglass Tilt Beams. This allows for accurate measurement of inclination over specific lengths. The below image shows a Tiltmeter on a 1 metre beam.



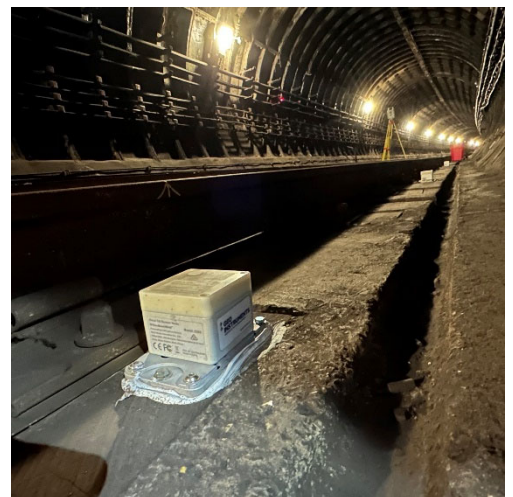
Operation

Tiltmeter networks gather and transmit data automatically through the use of one or more on-site Gateways. Networks are made more robust through the use of sophisticated mesh networks where data can "hop" between sensors and optional additional nodes. This can dramatically extend the range of networks where sensors may not be able to communicate with the gateway directly.

There are a variety of gateways and communication methods to best suit the needs of the project. Short and Long-range options are available, with potential to transmit data over several kilometres.

For applications where battery life is a concern, wired tiltmeter options are also available.

When used with GEO-Instruments' visualisation software QuickView, Tiltmeter data can be used to accurately calculate and understand factors like tunnel deformation and track twist and cant.



Key Advantages

High Resolution and Frequency: Sensors provide high frequency, 24-hour data at accuracies up to 0.002°

Certified Instrumentation: Approved for use on Network Rail and London Underground assets.

Automated and Low Maintenance: Systems have the potential to run for several years with minimal need for maintenance.