



FlatMesh Triaxial Tiltmeter



FlatMesh Nano Tiltmeters

FlatMesh Wireless Tiltmeters

The FlatMesh data acquisition network consists of a number of wireless nodes and an internet gateway. Nodes transmit measurements to the gateway and the gateway forwards them to the internet.

GeoCloud Services on the internet server process the readings sent from the gateway, check for alarms, and update GeoCloud project websites to show current status, graphs, and reports

Tiltmeter Applications

- Monitoring the stability of structures adjacent to excavations.
- Monitoring landslides, rockfalls, and embankments.
- Monitoring movement of shoring walls.
- Monitoring the tilt of piers and piles.
- Monitoring differential settlement and heave.
- Monitoring deformation in tunnels.
- Monitoring compaction, and compensation grouting in real time.

Tiltmeter Specifications

Sensors: 3 orthogonally mounted MEMS sensors measure tilt in three axes.

Range: $\pm 90^\circ$ in each axis.

Resolution: 0.0001°.

Repeatability: $\pm 0.0005^\circ$.

Battery life: 12 to 15 years, with data transmissions at 25 minute intervals, even when acting as a relay node in the mesh network.

Environmental: IP68 at 1m for 24 hours, -40°C to +85°C.

Dimensions: 3.5 x 3.5 x 2.4 inch high.

Nano-Tiltmeter Specifications

Sensors: 3 MEMS sensors to measure tilt in three axes.

Range: $\pm 90^\circ$ in each axis.

Resolution: 0.0001°.

Repeatability: $\pm 0.0005^\circ$.

Battery life: 4 to 5 years with data transmissions at 25 minute intervals.

Environmental: IP68 at 2 m for 24 hours, -40°C to +85°C.

Dimensions: 2.3 inch diameter x 1.78 inch high (50 x 45 mm).

Advantages

- **High Performance:** FlatMesh tiltmeters provide high resolution, high precision, low noise measurements.
- **Cloud or Local Access:** The FlatMesh cellular gateway transmits measurements to the internet, where they can be accessed by an internet browser. The FlatMesh USB gateway provides on-site access for real-time control.
- **Versatile Mounting Options:** FlatMesh tiltmeters can be installed in any orientation. A wide variety of plates and brackets provide convenient mounting to walls, stakes and poles, and track ties.
- **Self-Configuring Communications:** FlatMesh tiltmeters automatically optimize communication paths to the gateway.
- **Cable-Free:** FlatMesh tiltmeters provide their own power and transmit measurements by radio, entirely eliminating the cost of cables, cable protection, and cable maintenance.

Communications

Protocol: Proprietary Senceive FlatMesh network protocol, IEEE802.15.4 compliant.

Frequency: 2400-2485 MHz ISM Band. FCC approved.

Max Transmit power: 6.5 dBm.

Max Antenna Gain: 2.2 dBi.

Range: 980 feet point to point. Can be extended when nodes act as repeaters.

Gateway to Internet: Cellular.

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