



Tiltmeters can be mounted on stakes or poles and used to trigger alarms when sudden movement occurs.



Tiltmeters can be mounted on structures to monitor stability. Brackets are available for nearly every environment.



Tiltmeters can be installed on vertical or horizontal arrays of beams to monitor differential settlement and deformation.

Tiltmeter Applications

Triggering Alarms

- Landslides & Rockfalls
- Embankment Failure

Monitoring Stability

- Stability of piles & shoring
- Stability of structures potentially affected by excavations or tunneling
- Stability of piers during bridge renovations
- Stability of building facades during interior renovations

Monitoring Deformation

- Effects of pressure grouting
- Differential settlement and heave

Types of Tiltmeters

Wired Tiltmeters are electrolevel-based devices that are connected to a datalogger. The logger supplies powers and obtains readings. When used in arrays, electrolevel tiltmeters can be supplied with an RS-485 interface to simplify cabling and connections.

Wireless Tiltmeters are MEMS-based, self-powered digital devices that provide high-resolution measurements, wide measurement ranges, built-in logger capabilities, and wireless communications to an internet gateway.

Wireless tiltmeters are preferred for their simplicity of operation, ease of installation, and high performance.



Wireless Laser-Tiltmeters monitor stability of bridge piers as bumper system is replaced.



Wireless Tiltmeters monitor stability of MSE wall during major repair work.



Airport jetbridge monitored by wireless tiltmeter during adjacent foundation work.



Wireless tiltmeters monitor stability of 40-foot retaining wall above public parking lot.



Electrolevel Tiltmeter (Wired)

Sensor: Uniaxial electrolytic sensor.

Full Range: $\pm 3^\circ$.

Calibrated Range: $\pm 0.68^\circ$.

Resolution: 0.0003° .

Accuracy: $\leq 1\%$ FS calibrated range.

Temp Rating: -20 to $+50^\circ\text{C}$.

Power: Supplied by datalogger.

Compatibility: Both analog and RS-485 versions are compatible with Campbell Scientific dataloggers.



FlatMesh Wireless Tiltmeter

Sensor: 3-axis MEMS accelerometer integrated with wireless node. Reports two axes of rotation from horizontal.

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

Resolution: 0.0001° .

Repeatability: $\pm 0.0005^\circ$.

Environmental: IP68 at 1m for 24 hours, -40°C to $+85^\circ\text{C}$.

Power: Internal batteries, 12 year battery life, 25 min intervals.

Compatibility: 2.4Ghz FlatMesh wireless network with cellular gateway to internet.



LoRaWan Wireless Tiltmeter

Sensor: 3-axis MEMS accelerometer integrated with wireless logger. Reports two axes of rotation from horizontal.

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

Resolution: 0.00001° .

Repeatability: $\pm 0.0003^\circ$.

Accuracy: $\pm 0.005^\circ$ @ 4° of tilt,
 $\pm 0.013^\circ$ at 15° of tilt

Environmental: IP 68 at 2m, 2 hours, -40°C to $+85^\circ\text{C}$.

Data Memory: 140,000 readings

Power: Internal batteries, 3 year battery life, 5 minute intervals.

Compatibility: 900Mhz LoRaWan wireless network with cellular gateway to internet.