

Tilt & Subsidence Monitoring

Typical applications include:

- Retaining Structure Monitoring
- Tunnel Wall Monitoring
- Dam Monitoring
- Party Wall Monitoring
- Excavation Monitoring
- Foundation Monitoring

Commonly used instrumentation detailed below:

- Electrolevel Beam
- Tilt Sensor
- MEMs Sensor
- Inclinometer
- Portable Tiltmeter
- Bassett Convergence
- Liquid Settlement System



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CCOLADE MEASUREMENT



Electrolevel Beam / Mounted Tilt Sensor

Variables measured Tilt (mm/m, degrees or radians)

±0°45′00" (13mm/m) Range ±0°0′21" (± 0.1mm/m) Accuracy

0.02% full scale (0°0'2" or 0.0052mm/m) Resolution ±0.05% full scale (±0°0'3" or ±0.013mm/m) Repeatability

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System operation Automated Remotely Data access **Reading frequency** >1min

- Best suited for use on short to medium duration projects.
- Cheap, simple & reliable, although prone to drift over long durations.
- Good for tight / restricted access locations (i.e. tunnels / façades adjacent to excavations).
- Contains a sealed precision glass chamber containing conductive fluid and a number of electrodes, mounted in an inert ceramic compound.



MEMS Sensor

Variables measured Tilt (mm/m, degrees or radians)

Range $\pm 3^{\circ}$ to $\pm 15^{\circ}$ (± 52 mm/m to ± 265 mm/m)

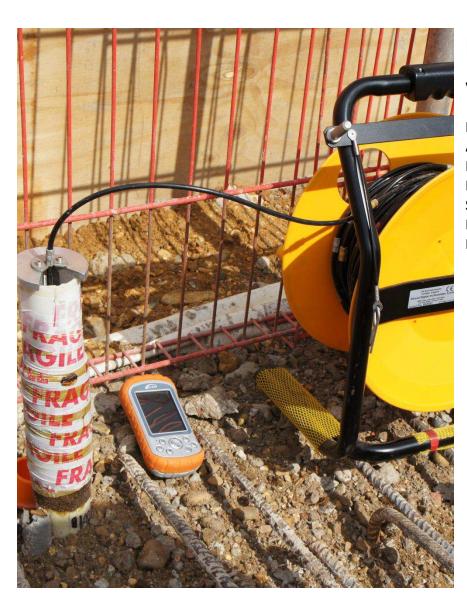
Accuracy $\pm 0.05\%$ full scale ($\pm 0^{\circ}0'11''$ or ± 0.05 mm/m)

Resolution 0.008% full scale ($0^{\circ}0'2''$ or 0.0052mm/m)

Repeatability $\pm 0.01\%$ full scale ($\pm 0^{\circ}0'3''$ or ± 0.013 mm/m)

System operation Automated
Data access Remotely
Reading frequency >1min

- Suited for use on short to long duration projects.
- Accurate & reliable; not prone to drift on long duration projects.
- Good for tight / restricted access locations (i.e. tunnels / facades / boreholes / piles).
- MEMS (micro electro-mechanical systems) are very small devices that convert mechanical movement into an electrical signal.



Inclinometer

Variables measured Tilt (mm/m, degrees or radians)

Displacement away from centre line (mm)
Range $\pm 30^{\circ}$ (± 577 mm/m), at 3m to 150m depth
Accuracy $\pm 0.02\%$ full scale ($\pm 0^{\circ}0'22''$ or ± 0.1 mm/m)
Resolution 0.001% full scale ($0^{\circ}0'2''$ or 0.01mm/m)
Repeatability $\pm 0.008\%$ full scale ($\pm 0^{\circ}0'9''$ or ± 0.042 mm/m)

System operation Automated or Manual Data access Remotely or on site

Reading frequency 5min intervals or as per visit

- Suited for use on short to long duration projects.
- Accurate & reliable; not prone to drift on long duration projects.
- Good for underground and restricted access locations (i.e. tunnels, slopes, banks, structures / boreholes / piles).
- MEMS (micro electro-mechanical systems) are very small devices that convert mechanical movement into an electrical signal.
- Can monitor horizontal, vertical & inclined displacements.





Portable Tiltmeter

Variables measured Tilt (mm/m, degrees or radians)

Range ±10° (±176mm/m)

Accuracy $\pm 0.02\%$ full scale $(\pm 0^{\circ}0'15'' \text{ or } \pm 0.07\text{mm/m})$ Resolution 0.006% full scale $(0^{\circ}0'4'' \text{ or } 0.017\text{mm/m})$ Repeatability $\pm 0.007\%$ full scale $(\pm 0^{\circ}0'5'' \text{ or } \pm 0.024\text{mm/m})$

System operation Manual
Data access On site
Reading frequency Per visit

- Suited for use on short to medium duration projects.
- Easy installation; install tilt plates to structure.
- MEMS (micro electro-mechanical systems) are very small devices that convert mechanical movement into an electrical signal.
- Tilt plates remain in position throughout monitoring; a portable tiltmeter is brought to site to measure tilt of the plates.



More detail available if required:

- Bassett Convergence
- Liquid Settlement System

Please get in touch if you would like more information.