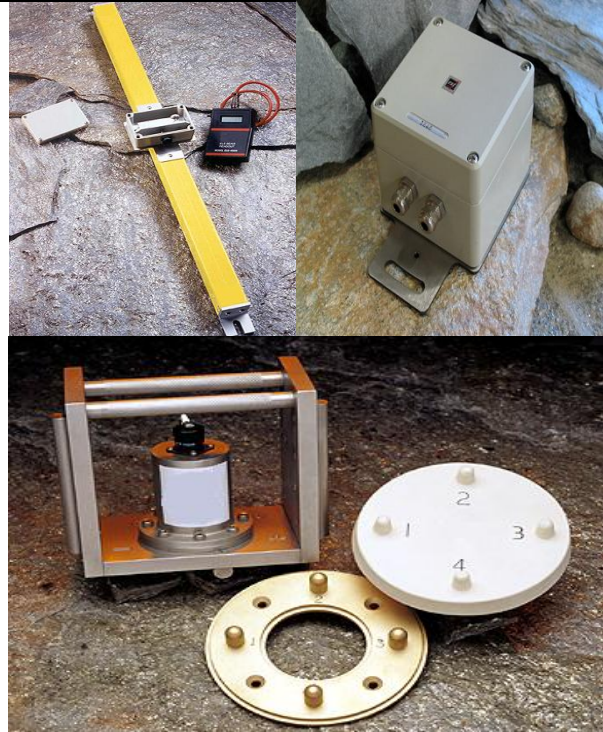


TILTMETER



SysTel Tiltmeter is a portable device designed to measure tilt in many types of structure. The portable Tiltmeter is used to monitor changes in the inclination of a structure. Tiltmeter data can provide an accurate history of movement of a structure and early warning of potential structural damage. Typical applications include:

Monitoring rotation of concrete dams and retaining walls

- Buildings over tunnelling works
- open pits excavation
- Retaining Wall
- soil compaction
- Bridges
- Pile caps

Tiltmeter are used to monitor the change in inclination from the norm of points on the ground or on structures. Typical highway applications include monitoring the tilt of MSE or conventional retaining walls and bridge columns. The complexity of Tiltmeter can range from relatively simple instruments based on a plumb line or bubble level, to more sophisticated devices equipped with accelerometers to measure inclination housed inside a protective cover.

Tiltmeter can either be permanently affixed to a structure or be portable. For the portable versions, a reference plate is attached to the structure and the portable instrument takes readings after it is attached to the plate in a repeatable position. The portable Tiltmeter can be used to measure tilt biaxially by rotating the instrument 180 degrees on the reference plate and taking another reading. Fixed Tiltmeter can also be used biaxially by installing two transducers on the same bracket at 90-degree angles to one another.



It is imperative that the Tiltmeter reference plate or mounting bracket is attached securely to the structure that is to be monitored. They are typically cemented or screwed into place. A limitation of tilt measurements is that they tend to be more localized than with other types of field instrumentation. Extrapolating tilt measurements across a structure involves assumptions about the rigidity of the structure and therefore can be very difficult. For this reason, Tiltmeter are generally used in conjunction with other deformation measurement methods such as inclinometers or surveying points.

To obtain tilt readings, the operator connects the Tiltmeter to the readout unit, positions the Tiltmeter on the tilt plate, and notes the displayed reading. The operator then rotates the Tiltmeter 180 degrees and obtains a second reading. Later, the two readings are averaged to cancel sensor offset. Changes in tilt are found by comparing the current reading to the initial reading.

PORTABLE TILTMETER

SPECIFICATION

Standard Range $\pm 30^\circ$
Resolution ± 0.05 mm/m (± 10 arc seconds)
Accuracy¹ $\pm 0.02\%$ F.S.
Output @ 30° ± 5.00 VDC
Shock Survival 1000 g
Temperature Range 0°C to $+50^\circ\text{C}$
L x W x H 159 x 89 x 143 mm

TILTMETER

SPECIFICATION

Standard Range¹ $\pm 15^\circ$
Resolution ± 0.01 mm/m (± 2 arc seconds)
Accuracy² $\pm 0.1\%$ F.S.
Shock Survival 2000 g
Temperature Range -20°C to $+80^\circ\text{C}$
Length x Diameter 139 x 32 mm (transducer only)