GEOSYSTEMS

Geotechnical Instrumentation — Design, Manufacture, Installation, Data Acquisition, On-Line Monitoring

Tilt-Beam Sensor

Model 2600-GS-TB1

FEATURES

- ***Easy to install***
- ***Rugged / robust construction suitable for extreme outdoor conditions***
- ***Accurate and reliable readings***
- ***Manual readings or automatic monitoring using datalogger***

APPLICATIONS

- *Monitoring movement of structures under the effects of nearby tunnelling or excavations*
- *Monitoring performance of bridges, beams, struts and other structures under load*
- *Monitoring deflection movement of retaining structures*
- *Slope stability monitoring with early warning alarm system*

General

The Geosystems Tilt-Beam Sensor is designed to measure differential displacement and angular rotation in structures such as bridges, dams, tunnels, buildings, retaining walls etc.

It is a low cost alternative to accelerometer based tilt sensors, settlement systems or surveying.

The Tilt-Beam Sensor is available in two versions—Horizontal Tilt-beam for monitoring vertical displacement and tilt, and Vertical Tilt-beam for lateral displacement and tilt.

Description

The Tilt-Beam system consists of a rigid beam (of fixed length) with a uniaxial electrolytic tilt sensor mounted at the centre of the beam.

In the field, the beam is mounted horizontally on two anchor bolts that are set securely on the structure. The sensor unit is zero adjusted using a portable readout and adjustment unit in the sensor assembly.

Operating Principle

The tilt sensor consists of a precision bubble with electrolytic fluid and electrodes which contact the fluid. When the tilt-beam is tilted (due to differential displacement), the resistance between contacts changes, thus producing an output voltage proportional to the angle of tilt.

The sensor wires are connected to a PCB with a temperature sensor (thermistor) and COM connector for portable readout.

Structural movements will result in rotational tilt of the tilt-beam supported between two anchor points. Differential displacement is calculated as follows:

Displacement $\Delta L = L.\sin(\alpha_1 - \alpha_0)$

Where:

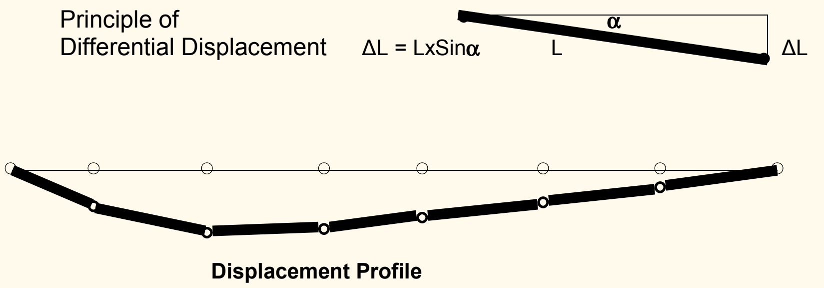
L - Distance between anchors (mm)

α_0 - Initial tilt reading (degrees)

α_1 - Current tilt reading (degrees)

ΔL - Displacement to be measured

Cumulative Differential Displacement



Tilt-Beam Sensor *Model 2600-GS-TB1*

FOR FURTHER INFORMATION

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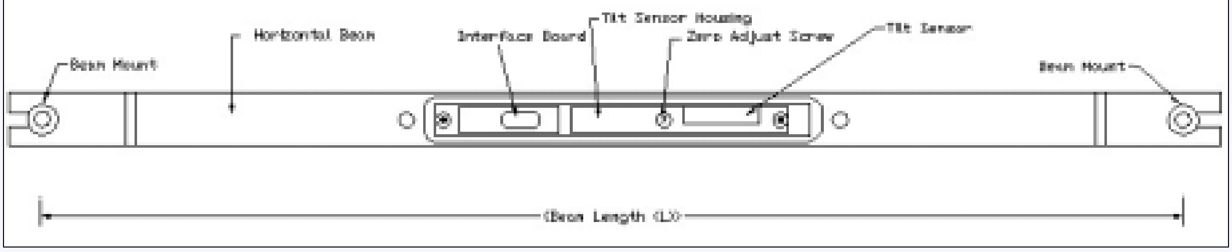

Accessories

- *Portable Readout*
- *Datalogger*

Ordering Information

- *Specify Horizontal or Vertical*
- *Specify beam length (1m, 2m or 3m)*
- *Cable length required*
- *Anchor type*

Specifications

Available Range:	± 0.5°C
Resolution:	1 arc second
Repeatability:	± 3 arc seconds
Temperature Range:	-20 to +50°C
Max Thermal Error:	0.3% F.S.

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