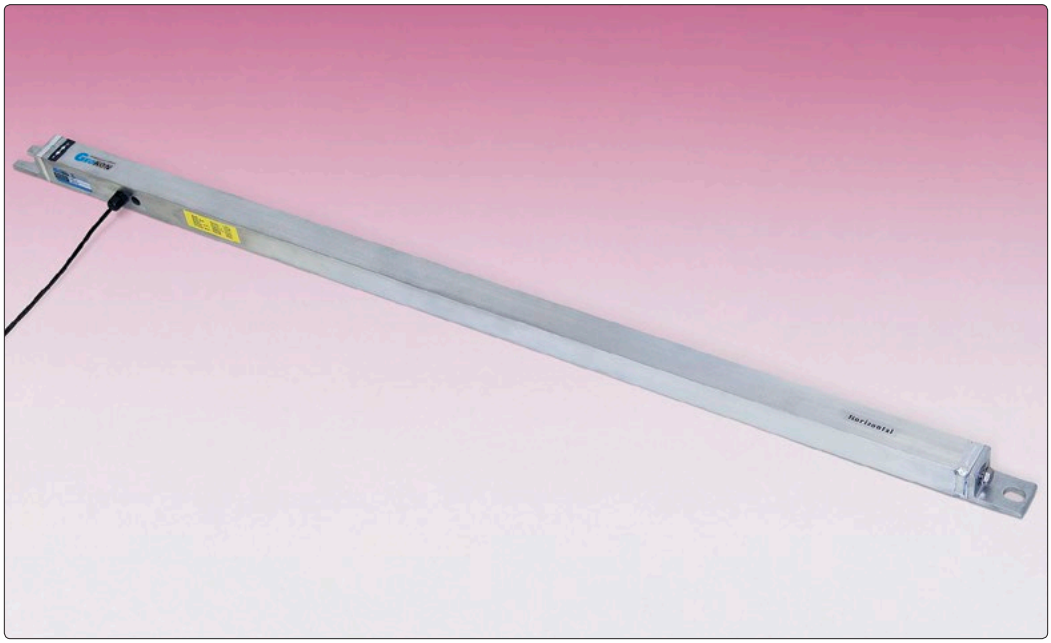
MEMS Tilt Beams

Applications

The Model 6165 MEMS Tilt Beams are designed to measure tilt or differential settlements in structures including…

- **Buildings**
- **Dams**
- **Embankments**
- **Tunnels**
- **Retaining walls**
- **Railroad tracks**



Model 6165 MEMS Tilt Beam.

Operating Principle

The Model 6165 MEMS Tilt Beam is designed for attachment to structures, on either a vertical or horizontal surface, for the measurement of any tilting or differential settlements that may occur.

The Tilt Beams can be coupled together in long horizontal strings to measure differential settlement along embankments, railroad tracks, pipelines, tunnels, etc. In addition, they can be used in vertical strings to measure the horizontal deformation of retaining walls, sheet piling, etc.

Advantages and Limitations

The MEMS tilt sensors have very good long-term stability, are virtually immune to shock loading and have very low thermal coefficients. They are low-cost and robust. They are readily adaptable to automation and remote monitoring for profiling in real-time.

System Components

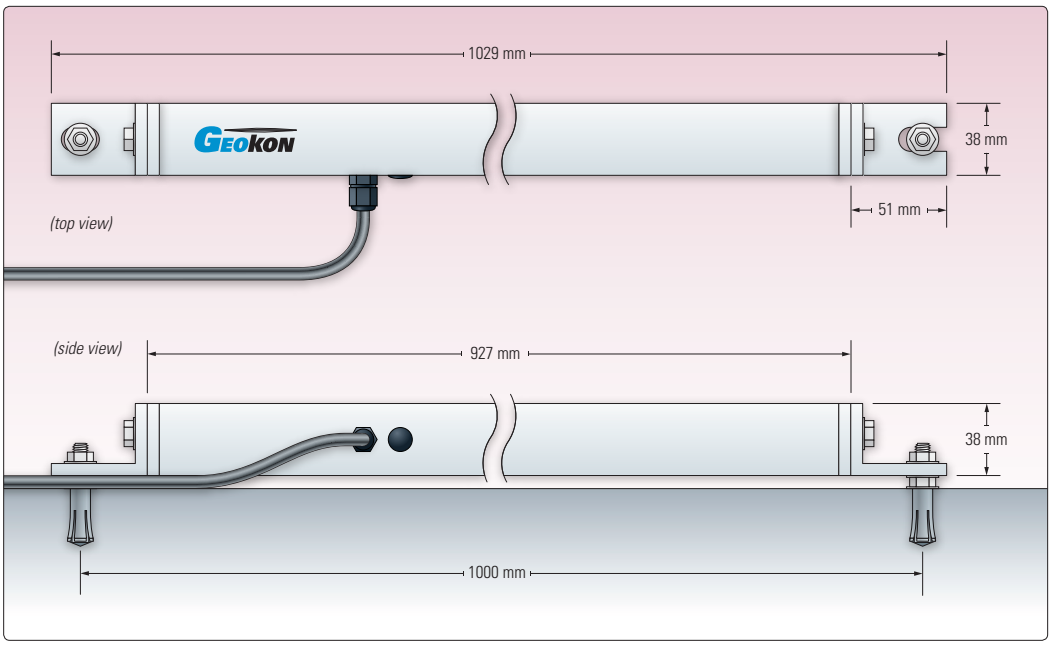
The basic transducer for the Model 6165 MEMS Tilt Beam is mounted inside a fiberglass, aluminum or anodized aluminum channel equipped with lugs for mounting to the structure under study. The beams are bolted to the structure using the supplied hardware, which includes two ⅜" drop-in anchors.

The Tilt Beam contains a Micro-Electro-Mechanical-System (MEMS) sensor which offers a range of ±15°, with high sensitivity and accuracy. The included signal conditioning yields a sensor output of ±3 V at ±10° and is designed to drive long cables without output signal degradation.

A thermistor mounted inside the sensor housing permits the measurement of temperatures.

A cable extends from the Tilt Beam to facilitate read-out, which is accomplished by using a Model RB-500 Readout, or the Model 8021 Micro-1000 Datalogger or Model 8025 Micro-800 Datalogger.

MEMS Tilt Beam (fiberglass version) installation alongside railroad tracks.



Model 6165 MEMS Tilt Beam dimensions.

MEMS Tilt Beam mounting attachment (with optional survey target).

Technical Specifications

Standard Range[1]	±15°
Resolution	±4 arc seconds (±0.02 mm/m)
Sensor Accuracy[2]	±10 arc seconds (±0.05 mm/m)
Input	8-15 VDC
Sensor Output	±4 V @ ±15°
Output Impedance	55 Ω
Temperature Range[1]	–20°C to +80°C
Shock Survival	2000 g
Material	Aluminum (standard) Fiberglass (on request)
Dimensions (L×W×H)[3]	*(Aluminum)* 1029 × 38 × 38 mm *(Fiberglass)* varies by application

[1]*Other ranges available on request.*
[2]*Established under laboratory conditions.*
[3]*Other lengths available on request.*

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