



**Model GK-604D Digital Inclinometer System**

The Model GK-604D Digital Inclinometer System includes a Model 6100D Digital Inclinometer Probe, a reel-mounted cable and a Model FPC-2 Field PC. The Digital Inclinometer Probe contains electronics to convert the analog voltage into a digital signal, which is transmitted via the control cable to the cable reel containing the Interface. The Interface communicates via **Bluetooth®** with the Field PC, which is used to take the inclinometer survey and to store and view the survey data. A Digital Compass built into the Inclinometer Probe can be used to correct the inclinometer data sets for any twist (or spiraling) in the inclinometer casings.

**Specifications**

Range	±30°
Resolution (Probe)	0.0013°
Resolution (System) <sup>1</sup>	±0.025 mm/500 mm; ±0.0001 ft/2 ft
Total System Accuracy <sup>2</sup>	±3 mm/30 m; ±0.125 in/100 ft
Temperature Range	-30 °C to +85 °C; -22°F to +185°F
Wheel Base	0.5 m, 1 m; 2 ft
Casing Size ID	48 to 89 mm; 2 to 3.5 in
Dimensions (L × ø)	700 × 25 mm, 1200 × 25 mm; 32 × 1 in (probe)

<sup>1</sup>±10 arc seconds. The resolution shown is only true in the range of ±5° from vertical.  
<sup>2</sup>Within 3° of vertical.



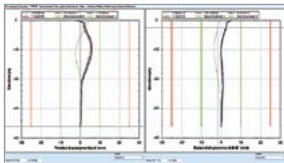
**Model 6015 Horizontal Inclinometer Probe**

The Model 6015 Horizontal Inclinometer Probe is a modification of the vertical probe, which allows it to be used in horizontal inclinometer casing. The probe, in effect, measures differential settlement along the length of the casing.

**Specifications**

Range	±53°
Resolution	±0.025 mm/500 mm (±10 arc seconds)
Total System Accuracy <sup>1</sup>	±6 mm/30 m
Temperature Range	0 °C to +50 °C
Casing Size ID	59 to 79 mm
Dimensions (L × ø)	671 × 45 mm (probe)

<sup>1</sup>Within 3° of horizontal.



**SiteMaster Inclinometer Data Reduction Software**

SiteMaster is a powerful inclinometer processing and presentation program that's used to process and present all inclinometers within a project. It can also include plan view displacement graphs related to any excavation history. SiteMaster works with any inclinometer system that produces a text data file. Data are stored systematically in an easy to modify folder, with corresponding displacement graphs organized in a simple and efficient manner. A reporting tool allows reports to be quickly generated and exported in PDF or **Microsoft® Word™** format.

**System Requirements**

Operating Systems	<b>Windows®</b> 8, 7, Vista, XP Professional
Memory Requirements	512 MB or more ( <i>minimum</i> ). More RAM will improve application performance.
Hard Disk Requirements	60 MB ( <i>minimum</i> )



**Model 6150F Series MEMS Addressable In-Place Inclinometer System**

The Model 6150F MEMS (Micro-Electro-Mechanical Systems) Digital In-Place Addressable Inclinometer System consists of a string of Biaxial MEMS Tilt Sensors mounted on lengths of stainless steel tubing, which are cut to customer-specified segment lengths, and interconnected with universal joints. Spring-loaded wheel assemblies located at each joint allow the sensor string to engage the grooves of conventional inclinometer casing. The tilt sensors are connected to each other by means of a four-wire bus cable and communicate via the industry standard **Modbus®** Remote Terminal Unit (RTU) protocol. (Quantities of discontinued Model 6150A/B/C/D/E Series versions are available on request. Please contact GEOKON for more information.)

**Specifications**

Range	±15° (±54000 arc seconds)
Resolution <sup>1</sup>	±0.0001° (±0.2 arcseconds)
Operating Temperature	-40 °C to +80 °C
Minimum Sensor Spacing	0.5 m
Sensor Dimensions (L × ø)	240 × 32 mm

<sup>1</sup>All but one in a hundred individual readings would fall within our published tolerance. (Most measuring devices are specified with only a 95% confidence interval, meaning one in twenty readings exceed the stated limit, on average.)



**Model 6155 MEMS Horizontal In-Place Inclinometer**

The Model 6155 MEMS Horizontal In-Place Inclinometer consists of a string of MEMS (Micro-Electro-Mechanical Systems) tilt sensors (uniaxial or biaxial) mounted on lengths of stainless steel tubing, which are cut to customer-specified segment lengths and linked together by universal joints. The string of sensors is installed inside casing with all the sensor cables passing to the surface where they are connected to Terminal Boxes or Dataloggers. Several models are available, including analog, digital and addressable versions, allowing for optimal configuration based on application and site specifics.

**Specifications**

Range <sup>1</sup>	±15°
Resolution	±0.02 mm/m (±4 arc seconds)
Accuracy <sup>2</sup>	±0.05 mm/m (±10 arc seconds)
Sensor Output	Analog (±4 V @ ±15°); Digital
Shock Survival	2000 g
Temperature Range <sup>1</sup>	-20 °C to +80 °C
Dimensions (L × ø)	219 × 32 mm (sensor); 362 × 32 mm (sensor <sup>3</sup> )

<sup>1</sup>Other ranges available on request. | <sup>2</sup>Transducer accuracy established under laboratory conditions. <sup>3</sup>Addressable versions.



**Model 6300 VW In-Place Inclinometer**

The Model 6300 Vibrating Wire In-Place Inclinometer consists of a string of Vibrating Wire Tilt Sensors mounted on lengths of stainless steel tubing, which are cut to customer-specified segment lengths, and linked together by universal joints. The string of sensors is installed inside grooved inclinometer casing with all the sensor cables passing to the surface. The system is designed to be left in place to permit automatic or continuous reading of borehole inclination and lateral deflection.

**Specifications**

Range <sup>1</sup>	±10°
Resolution <sup>2</sup>	±0.05 mm/m (±10 arc seconds)
Accuracy <sup>3</sup>	±0.1% F.S.
Temperature Range <sup>1</sup>	-20 °C to +80 °C
Dimensions (L × ø)	187 × 32 mm (sensor)

<sup>1</sup>Other ranges available on request. | <sup>2</sup>Transducer accuracy established under laboratory conditions. <sup>3</sup>Depends on readout equipment.



**Model 6400 Inclinometer Casing**

Model 6400 Glue-Snap ABS Inclinometer Casing is used in conjunction with an inclinometer probe or in-place inclinometer system to monitor the stability of embankments, slopes, foundation and excavation walls, piles, etc. The Model 6400 is flush-coupled for quick and easy assembly.

**Specifications**

Maximum OD	70 mm, 85 mm
Wall Thickness	5.5 mm
Dimensions (L)	1.5 or 3 m
Telescoping Coupling	609 mm (extended length) 457 mm (compressed length)
Telescoping Coupling OD	77 mm, 91 mm



**Model 6500 Inclinometer Casing**

The Model 6500 Inclinometer Casing is manufactured from pultruded fiberglass to produce a lightweight, strong, environmentally resistant casing with grooves free from spiraling. The casings and couplings are pop-riveted together and the joints are waterproofed using caulk and tape.

**Specifications**

Maximum OD	70 mm (casing) 76.5 mm (coupling)
Wall Thickness	3 mm (casing) 2 mm (coupling)
Dimensions (L)	3 m (casing) 300 mm (coupling)
Telescoping Coupling	available up to 3 m (specify)



**Model 6101D MEMS Digital Tiltmeter**

The Model 6101D MEMS Digital Tiltmeter is a low-cost, portable device designed to measure tilt in structures such as buildings, dams, retaining walls and embankments, as well as measurements related to the stability of slopes, open pits and the walls of excavations (e.g. slurry walls). The sensing element is a highly accurate MEMS (Micro-Electro-Mechanical Systems) tilt sensor, which communicates with the Model FPC-2 Field PC Readout via **Bluetooth®**.

**Specifications**

Range	±15°
Resolution	±0.02 mm/m ( $\pm 4$ arc seconds)
Accuracy <sup>1</sup>	±0.05 mm/m ( $\pm 10$ arc seconds)
Sensor Output	Digital
Shock Survival	2000 g
Temperature Range	-40 °C to +70 °C
Dimensions (L x W x H)	172 x 102 x 166 mm

<sup>1</sup>Transducer accuracy established under laboratory conditions.



**Model 6160 MEMS Tilt Sensors**

The Model 6160 MEMS Tilt Sensor is designed for attachment to structures, on either a vertical or horizontal surface, and for the subsequent measurement of any tilting that may occur. The sensor comprises one (uniaxial) or two (biaxial) MEMS (Micro-Electro-Mechanical Systems) sensors, with associated signal conditioning, packaged inside a water-proof, stainless steel housing. Four versions are available: analog, analog addressable, digital addressable and RS-485.

**Specifications**

Range <sup>1</sup>	±15°
Resolution	±0.02 mm/m ( $\pm 4$ arc seconds)
Accuracy <sup>2</sup>	±0.05 mm/m ( $\pm 10$ arc seconds)
Sensor Output	Analog ( $\pm 4$ V @ $\pm 15^\circ$ ); Digital
Shock Survival	2000 g
Temperature Range <sup>1</sup>	-20 °C to +80 °C
Dimensions (L x ø)	219 x 32 mm (sensor); 362 x 32 mm (sensor <sup>3</sup> )

<sup>1</sup>Other ranges available on request. | <sup>2</sup>Transducer accuracy established under laboratory conditions. <sup>3</sup>Addressable versions.



**Model 6161 MEMS Tilt Sensors**

The Model 6161 MEMS Tilt Sensors are designed for attachment to structures, on either a vertical or horizontal surface, and for the subsequent measurement of any tilting that may occur. The sensor itself is a MEMS (Micro-Electro-Mechanical Systems) sensor, which offers a high range, with high sensitivity and accuracy. The included associated signal conditioning yields an output of  $\pm 4$  V at  $\pm 15^\circ$  and is designed to drive long cables without degradation. (Also see the Model 8003 (LC-3) Series MEMS Dataloggers, page 17.)

**Specifications**

Range <sup>1</sup>	±15°
Resolution	±0.02 mm/m ( $\pm 4$ arc seconds)
Accuracy <sup>2</sup>	±0.05 mm/m ( $\pm 10$ arc seconds)
Sensor Output	Analog ( $\pm 4$ V @ $\pm 15^\circ$ ); Digital
Shock Survival	2000 g
Temperature Range <sup>1</sup>	-20 °C to +80 °C
Dimensions (L x W x H)	140 x 140 x 91 mm (6161A enclosure) 220 x 120 x 91 mm (6161B/C enclosure) to be determined (6161E enclosure)

<sup>1</sup>Other ranges available on request. | <sup>2</sup>Transducer accuracy established under laboratory conditions.



**Model 6350 VW Tiltmeter**

The Model 6350 VW Tiltmeter is designed to measure tilt in structures such as buildings, dams and embankments and also for measurements related to the stability of slopes, open pits and the walls of excavations (e.g. slurry walls). The tiltmeter is permanently attached to the structure to be monitored and can make measurements on horizontal or vertical surfaces. Readings are taken with the Model GK-404/GK-405 Readout or continuously and remotely with the 8600 Series or 8002 dataloggers.

**Specifications**

Range	±10°
Resolution	±0.05 mm/m ( $\pm 8$ arc seconds)
Accuracy <sup>1</sup>	±0.1% F.S.
Temperature Range <sup>2</sup>	-20 °C to +80 °C
Dimensions (L x ø)	194 x 32 mm (transducer)

<sup>1</sup>Transducer accuracy established under laboratory conditions. | <sup>2</sup>Other ranges available on request.



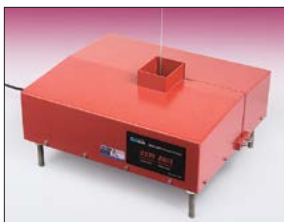
**Model 6165 MEMS Tilt Beam**

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. They can also be used in vertical strings to measure the horizontal deformation of retaining walls, sheet piling, etc.

**Specifications**

Range <sup>1</sup>	±15°
Resolution	±0.02 mm/m ( $\pm 4$ arc seconds)
Accuracy <sup>2</sup>	±0.05 mm/m ( $\pm 10$ arc seconds)
Sensor Output	$\pm 4$ V @ $\pm 15^\circ$
Shock Survival	2000 g
Temperature Range <sup>1</sup>	-20 °C to +80 °C
Dimensions (L) <sup>1</sup>	1029 mm (Beam: standard, aluminum version)

<sup>1</sup>Other ranges/lengths available on request. | <sup>2</sup>Transducer accuracy established under laboratory conditions.



**Model 6850 Pendulum Readout**

The Model 6850 is designed to make accurate measurements of the relative movements of normal and inverted pendulums, such as those found in dams, and can be installed as a new system or as an electronic upgrade for an existing system. The electronics package provides both 4-20 mA and EIA RS-485 data outputs. The data can be stored locally, or remotely, with the 8600 Series Dataloggers, or others, and thence by hard-wire or modem to a computer. Manual sighting/reading tables with optical (LED) readout are available where automated systems are not necessary, or where a manual reading back-up is required.

**Specifications**

Range	X: 0-50 mm, Y: 0-50 mm (2-D) X: 0-50 mm, Y: 0-100 mm (2-D) X: 0-50 mm, Y: 0-100 mm, Z: 0-50 mm (3-D) X: 0-50 mm, Y: 0-50 mm or 0-100 mm (2-D, Manual)
Resolution	0.01 mm
Accuracy	better than 0.1 mm; 0.2 mm (2-D, Manual)
Operating Temperature	-15 °C to +60 °C; n/a (2-D, Manual)
Dimensions (L x W x H)	380 x 330 x 145 mm, 425 x 375 x 190 mm (2-D) 425 x 375 x 190 mm (3-D) 356 x 356 x 100 mm (2-D, Manual)