DATASHEET

STOCKED PRODUCT, READY FOR DELIVERY.

2 TWO YEAR WARRANTY

Portable MEMS Inclinometer Systems

Direct from site connection

send data live via FTP, email or API

- MEMS Digital probe & carry case
- Lightweight robust cable & reel
- Bluetooth communication
- Android Smart Device readout
- Intuitive android app
- Connectivity via FTP, API, email
- 360° EMC protection throughout

GEOSENSE

Portable MEMS Inclinometer

Overview

The Geosense Portable Inclinometer system utilises modern communication and Smart devices to enable the tilt data generated by the probe to be managed, stored and transferred directly from site via FTP, API, email or other communication platforms.

The system comprises a slimline detachable probe, a lightweight robust elongation-resistant cable, lightweight reel with Bluetooth communication to the smart android readout device, with a user-friendly app, plus storage and carry cases for all components.

The probe is fitted with industry standard MEMS biaxial sensors together with a signal conditioning board allowing the calibration factors to be stored within the probe. A digital output signal via the reel is sent to the Smart android device where it is converted to engineering units.

The multi-stranded high tensile fibre yarn reinforced cable with depth markers have been designed and tested with weight up to 40 kg to ensure their long-term stability.

To ensure data is not compromised by electro-magnetic interference and thus become inaccurate, even on noisy sites, the system has been designed and fitted with full 360 degree EMC protection within the probe, cable and reel and is fully tested in accordance with CE and FCC requirements.

APPLICATIONS

- Dams & embankments
- Retaining walls & deep excavations
- Slopes & embankments
- Tunnels & shafts
- Bridges
- Ground improvement

USED TO MONITOR

- Lateral displacement of soil or rock
- Lateral displacement of diaphragm walls
- Lateral displacement of retaining walls
- Lateral displacement of dam cores
- Downstream face of rock filled dams
- Settlement & heave under tanks

FEATURES

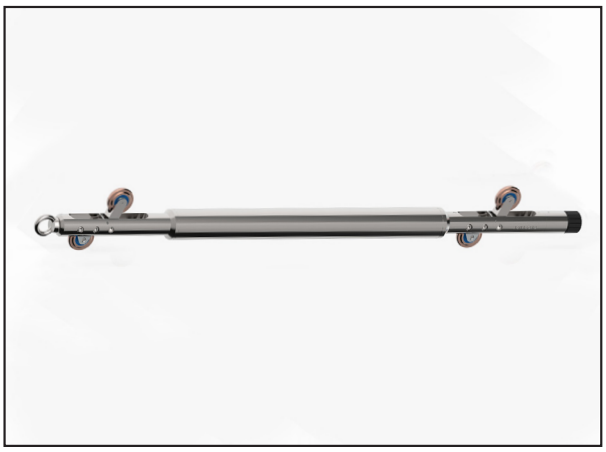
- Direct from-site live data transfer
- Fast stable readings
- Data export CSV and RPP formats
- Robust MEMS sensor
- High accuracy
- Auto & manual reading options
- Android-based operating system
- Probes and reels are interchangeable
- Bluetooth connection - auto mating of device & reel
- Strain resistant cable with swaged cable marks
- IP68 (20 bar) rated

Portable Vertical MEMS Inclinometer

Specifications

RANGE	
Full Scale Range	±30° from vertical
PROBE	
Sensor type	Biaxial MEMS
Sensor accuracy	±0.004° (±13.5 arc sec, ±0.07 mm/m) ±0.0125% FS
Sensor resolution	0.0005° (2 arc sec, 0.01 mm/m) 0.0017% FS
Sensor repeatability	±0.002° (±7.2 arc sec, ±0.037 mm/m) ±0.007% FS
Output signal	RS-485 Digital BUS
Output unit	Sine of angle
Probe gauge length	500mm
Probe diameter	25mm
Probe length	680mm
Probe length (including connector)	800mm
Probe weight	1.32kg
Enclosure rating	IP68 (24 bar)
Materials	316 stainless steel,
Probe carry case dimensions	725 x 200 x 105mm
Probe carry case weight	5.6kg
CABLE	
Diameter	7.5mm
Weight	5.8kg/100m
Minimum break load	400kgf
Restraining member	Vectran® Multi-strand high tensile yarn
Jacket	Polyurethane
Depth markers	Every 500mm
Lengths	30, 50, 75, 100, 150m (other available on request)
Connector	Piston & face seal with robust stainless steel alignment keyway (30 bar rated)

Portable Horizontal MEMS Inclinometer



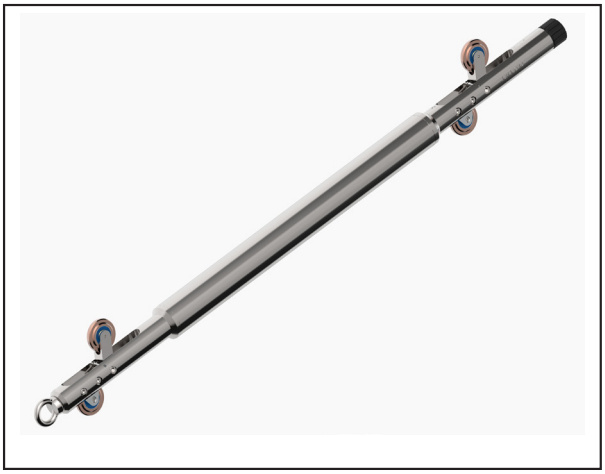
The Geosense Horizontal Portable Inclinometer system is used to measure settlement and/or heave within a horizontal borehole under structures such as embankments, dams, roadways, storage tanks and lanfills.

The system differs from the vertical model in that it has a fixed bottom wheel to eliminate the possibility of eronious readings due to the effect of gravity on the probe in the horizontal position.

Specifications

RANGE		
Full Scale Range	±30° from horizontal	
PROBE		
Sensor type	Uniaxial MEMS	
Sensor accuracy	±0.004° (±13.5 arc sec, ±0.07 mm/m) ±0.0125% FS	
Sensor resolution	0.0005° (2 arc sec, 0.01 mm/m) 0.0017% FS	
Sensor repeatability	±0.002° (±7.2 arc sec, ±0.037 mm/m) ±0.007% FS	
Output signal	RS-485 Digital BUS	
Output unit	Sine of angle	
Probe gauge length	500mm	1000mm
Probe diameter	35mm	35mm
Probe length	680mm	1254mm
Probe length (including connector)	800mm	1372mm
Probe weight	1.9kg	2.583kg
Enclosure rating	IP68 (24 bar)	
Materials	316 stainless steel	
Probe carry case dimensions	725 x 200 x 105mm	
Probe carry case weight	5.6kg	

Portable Inclined MEMS Inclinometer



The Geosense Inclined Portable Inclinometer system is used to measure lateral movements and deformations of soil, rock and reatining structures within or on an inclined borehole or surface. Typical applications include monitoring the downstream face of concrete faced rock-filled dams.

The system differs from the vertical model in that it has a fixed bottom wheel to eliminate the possibility of eronious readings due to the effect of gravity on the probe in the inclined position.

For deep installations, an additional weight may need to be added to the bottom of the probe to overcome the possible effects of friction and the weight of the cable.

Specifications

RANGE	
Full Scale Range	±30° from 35° from horizontal
PROBE	
Sensor type	Biaxial MEMS
Sensor accuracy	±0.004° (±13.5 arc sec, ±0.07 mm/m) ±0.0125% FS
Sensor resolution	0.0005° (2 arc sec, 0.01 mm/m) 0.0017% FS
Sensor repeatability	±0.002° (±7.2 arc sec, ±0.037 mm/m) ±0.007% FS
Output signal	RS-485 Digital BUS
Output unit	Sine of angle
Probe gauge length	500mm
Probe diameter	35mm
Probe length	680mm
Probe length (including connector)	800mm
Probe weight	1.9kg
Enclosure rating	IP68 (24 bar)
Materials	316 stainless steel,
Probe carry case dimensions	725 x 200 x 105mm
Probe carry case weight	5.6kg

Portable MEMS Inclinometer Accessories

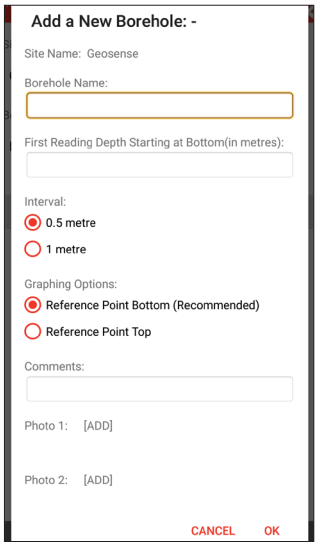
Specifications

CABLE REEL & CARRY BAG	
Communication	Bluetooth low energy
Enclosure rating	IP65
Power supply	Ni-MH 12V 2500mAh rechargeable batteries
Operating time	Minimum 15 hours continuous
Material	Polycarbonate
30 to 50m cable diameter	310mm
75 to 100m cable diameter	380mm
30m cable weight	6.30kg (including carry case)
50m cable weight	7.58kg (including carry case)
75m cable weight	9.88kg (including carry case)
100m cable weight	11.23kg (including carry case)
SYSTEM	
Total system accuracy	± 3mm/30m (within 3° from vertical)
Total system repeatability	± 1mm/30m
Display units	mm
Readout data export	CSV (Sine alpha & mm) & RPP
Operating temperature	-40 to +80°C
COMPLIANCE	
RED	
Article 3.1(a) : Electrical Safety	BS EN 61010 -1:2010+A1:2019
Article 3.1(a): EMF exposure	BS EN IEC 62479:2010
Article 3.1(b): EMC	EN 301 489 -1 V2.2.3 EN 301 489 -17: V3.2.4
Article 3.2: Radio Spectrum use	EN 300 328: V2.2.2
FCC	
FCC Part 15B	
FCC Part 15C	
RoHS	
BS EN IEC 63000:2018	

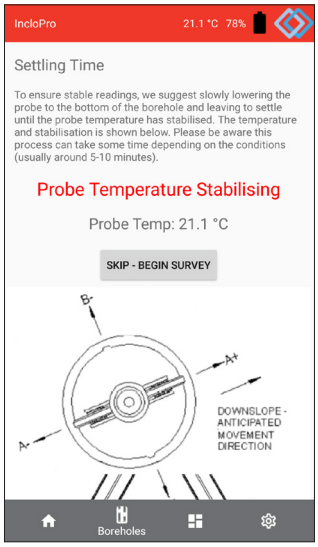
Portable MEMS Inclinometer Software

IncloPRO App

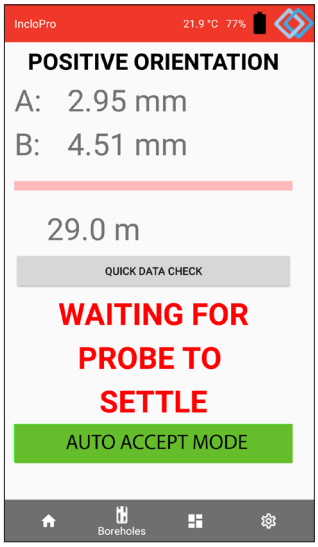
The IncloPRO app allows the user to take readings, visualise various plots and send data form site via FTP, API, email etc.



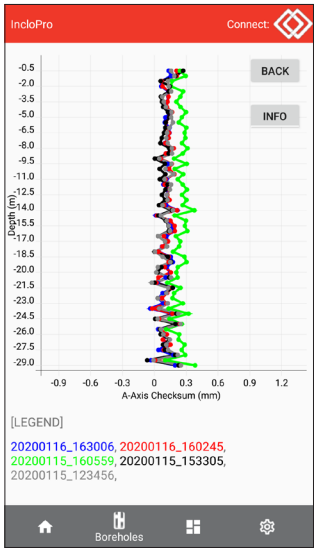
Wizard guides you through setting up sites & boreholes.



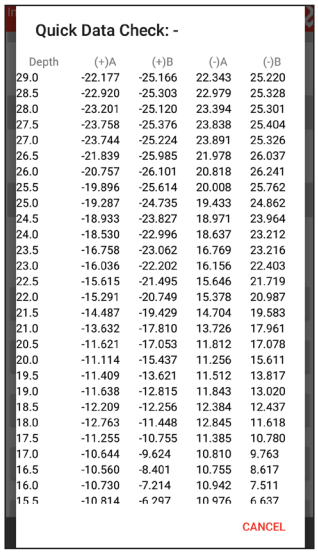
Step-by-step guide to ensure correct survey methodology is carried out.



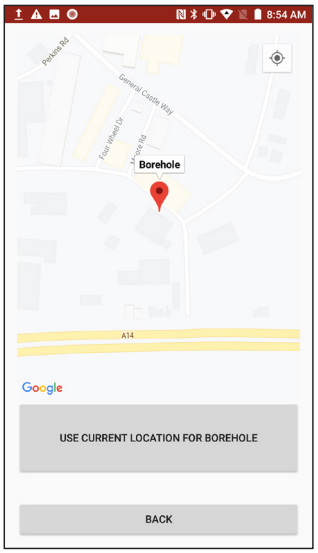
Auto mode provides handsfree automated data recording which ensures consistency & quality of surveys.



Checksum, cumulative displacement, incremental displacement, mean deviation & absolute position graphs can all be viewed.



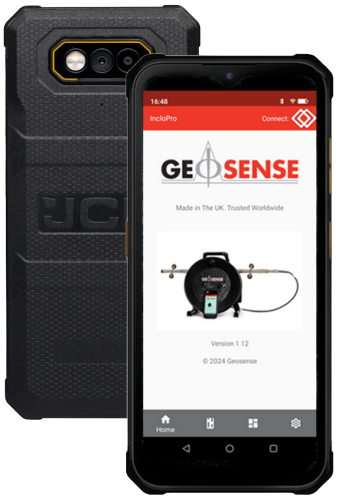
Quick data check available during the survey to highlight any problems.



Borehole location can be set using GPS coordinates.

JCB Toughphone

Overview



The JCB Toughphone is used as a handheld readout to configure and collect Portable Inclinometer data using the IncloPRO purpose-designed app.

Designed for use in challenging environments, the Toughphone has a long-lasting battery and provides a high-level user interface and industry-leading memory plus wireless communication options for ease of use and reliability.

JCB Toughphones are built to Military Defence Specification MIL SPEC 810H and are IP69 water and dust resistant. The scratch-resistant screen has been drop-proof tested from 1.8 metres.

APPLICATIONS

On-site data collection for Portable Inclinometer

FEATURES

- Rugged design for use in extreme environments
- 6500 mAh battery
- In-built E-compass
- Large data memory
- IP68 certified
- Dust-proof and drop proof

JCB Toughphone

Specifications

DISPLAY

Display Type: 6.6" HD Display - Wet finger/glove-on working technology*

Display Cover: Corning® Gorilla® Glass 5

CAMERA

Main/Rear: Main Camera 50MP + 8MP Night Vision, Rear facing flash

CONNECTIVITY

Bluetooth: 5

USB: Type C, USB-OTG

SIM Type: Dual Nano SIM

DATA STORAGE

RAM: 8 GB

PROCESSOR

Processor Type: MT6765X

Platform/OS: Google Android™ 15

RUGGED

IP Rating: IP68 Certified

Drop Test: From 1.8m onto steel

Military Standard: MIL-SPEC 810H, Operating Temp: -20°C to +55°C

BATTERY

Capacity: 6500 mAh

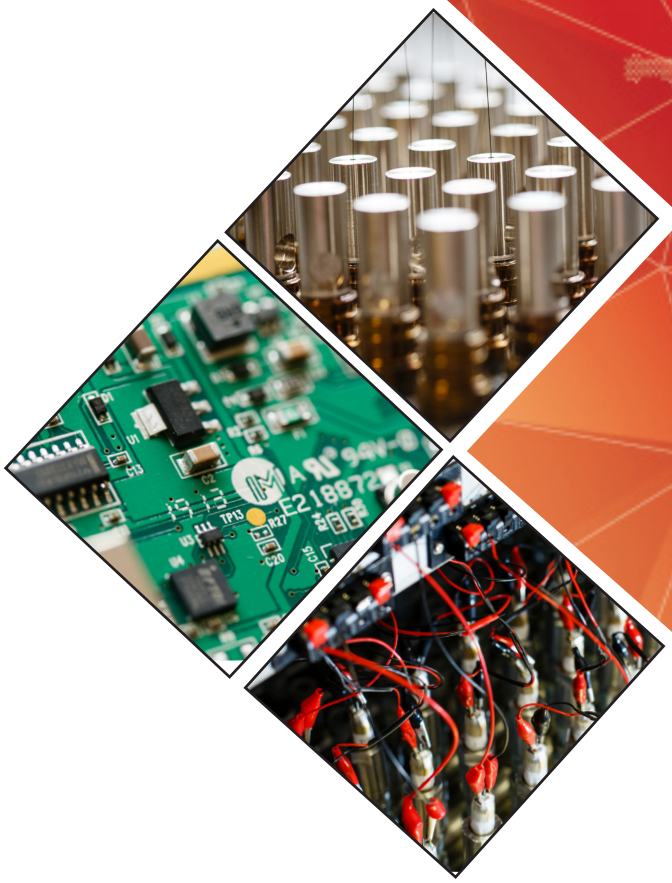
Type: Non-removable Lithium Polymer

SIZE

Size: 170 x 80 x 12mm

Weight: 276g

* We cannot guarantee that all gloves will work with this feature.



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