

# Portable MEMS Inclinometer

- Proven MEMS technology
- Wireless communication to readout
- Lightweight
- Rugged construction
- On board calibration in probe
- Probes and reels are interchangeable



# Portable MEMS Inclinometer



## Overview



The MEMS Portable Inclinometer System utilises the very latest in Bluetooth and MEMS (Micro-Electro-Mechanical) technology to provide fast and highly accurate readings.

The system comprises a slimline probe (detachable), lightweight cable reel and a rugged PDA (Personal Digital Assistant) which is used to view and/or download data at the borehole.

The probe is fitted with guide wheels and contains MEMS accelerometers measuring tilt in two perpendicular planes: One in the plane of the inclinometer wheels is known as the A axis; the other, in a plane perpendicular to that of the wheels, is known as the B axis.

Kevlar® reinforced cable is mounted on a lightweight, tough plastic reel which houses the Bluetooth module for wireless communication to the PDA. The cable is attached to the probe via a waterproof (to 1500m) quick connection which allows the probe to be detached, significantly reducing transport costs when returned for re-calibration.

The probe contains 'on board' calibration making it completely interchangeable with any reel. A MEMS Spiral Sensor is also available and is also compatible with any reel.

System comprises:

- MEMS Digital probe & carrying case
- Reel and cable with case & spare battery
- PDA with data collection & transfer software
- Charger & accessories for reel & PDA
- 70 & 85mm inclinometer casing cable grips

## 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

- High accuracy
- Fast stability of readings
- MEMS technology
- Wireless communication to readout
- Lightweight
- Rugged construction
- On-board calibration in probe
- Probes and reels are interchangeable
- Only probe needs to be returned for calibration
- Kevlar® reinforced cable with swaged cable marks

# Portable MEMS Inclinometer

## Specifications

### MODELS

Orientation	Full Scale Range <sup>1</sup>
Vertical	±30° from vertical
Inclined	±15° from 45°
Horizontal	±30° from horizontal

### PERFORMANCE

Accuracy <sup>2</sup>	±2mm per 25m
Resolution	0.005mm per 500mm
Repeatability	±0.002°
Operating temperature range	-40 to +70°C

### PROBE

Wheelbase	0.5m
Probe diameter	25.4mm
Probe length (including connector)	719mm
Probe weight	1.06kg
Probe material	Stainless steel

### CABLE

Cable diameter	6.4mm (±0.1)
Cable weight	2.3kg / 50m
Cable tensile strength	5.90 kN
Cable jacket	Polyurethane
Cable stretch (in 50m dry borehole)	7.0mm
Cable lengths	30, 50, 75, 100 150m <sup>3</sup>

### CABLE CONNECTOR

Connector material made of 316 stainless steel

Rating for underwater use, with wet connection at 1524m in salt water

Includes a spring strain relief to enhance cable durability at the connector entrance

### CABLE REELS

Up to 75m cable reel diameter	310mm
100 to 200m cable reel diameter	380mm
+225m cable reel diameter	460mm
Reel weight with 50m cable	4.7kg

<sup>1</sup> Other ranges available on request

<sup>2</sup> Using 3rd order polynomial

<sup>3</sup> Longer available on request

# Ultra-Rugged Field PC<sup>2</sup> & Accessories



## Overview



The Ultra-Rugged Field PC<sup>2</sup> is a data collector which provides a high-level user interface, industry-leading memory, optional Flash data security, on-site data analysis and instant USB synchronisation with office computers. It also offers on-board wireless communication options for ease of use and reliability.

Support and interface software is available which enables the Ultra-Rugged Field PC<sup>2</sup> to be used with the following systems and data loggers:

- Digital MEMS Inclinometer System
- Digital MEMS Tilt Meters
- In-place Inclinometers
- Digital ThermArray Systems
- Single Channel Data logger
- 5/10 Channel Data logger

### APPLICATIONS

On-site data collection

Compatible with several systems and dataloggers

### FEATURES

Rugged design for use in extreme environments

Wireless options

Battery easily changed in the field

8GB flash storage, user-accessible micro SD/SDHC slot

Secure Digital (SD or SDIO) can be used with memory cards and other peripherals

Secure Hand Strap

On-board stylus for quick access

Compatible accessories

# Ultra-Rugged Field PC<sup>2</sup> & Accessories

## Specifications

### OPERATING SYSTEM AND MEMORY

1.0GHz ARM Cortex A8 i.MX53 processor

Windows® Embedded Handheld 6.5.3

Microsoft® Office Mobile 2010

Bluetooth® Wireless Communication

Wi-Fi® 802.11b/g/n with extended range

Internal solid state 512 MB Flash memory

8GB flash storage, user-accessible micro SD/SDHC slot

Both USB Host and Client plus 9-pin RS-232

Real-time clock keeps correct date & time even without battery

### DISPLAY

Active viewing area of 109mm diagonal

High visibility backlit LCD - brilliant contrast in direct sunlight

VGA LCD TFT (800 x 480 pixels). Portrait or landscape orientation

Scratch resistant screen

On-board stylus with tether

Projected capacitive touch interface 'optically bonded' to display for increased visibility

### POWER

Intelligent Li-Ion battery pack, 3.7VDC @ 10600mAh, 38.7Whr

20 hour battery life on single charge (2 to 4 hours charge time)

Battery easily changed in the field

### ENVIRONMENTAL

Operating temperature -30 to 60°C

Size 91mm(w) x 184mm(l) x 38mm(d)

Weight 590g

Port: Both USB Host & Client plus 9-pin RS 232

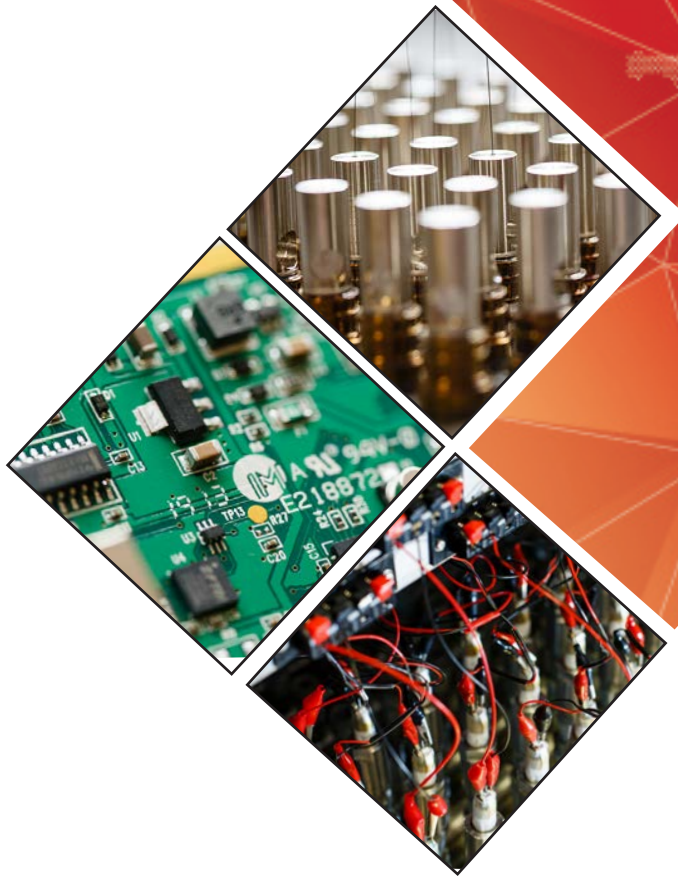
Bluetooth® rated to -20°C

Waterproof and dustproof, IP68

Shockproof: multiple drops from 1.5 m on to concrete

MIL-STD-810G: high/low temp, temp shock, rain, humidity, sand & dust, immersion, vibrations, altitude, shock





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