

C19-1 HORIZONTAL DIGITAL INCLINOMETER SYSTEM

Datasheet C19-1



**Description**

The Horizontal Digital Inclinerometer System is used to measure settlement and/or heave within a horizontal borehole. The system comprises a uniaxial probe, cable reel and a rugged Field PC supplied with 'In-Port' data presentation software.

The probe incorporates MEMS technology allowing highly accurate and repeatable readings, transferred via a digital signal. Bluetooth communication enables a cable free data transmitting system with no connectors to corrode or break.

The Kevlar cable consists of a cable marker system which, when used in conjunction with the cable gate, provides highly accurate and repeatable depth control.

With all these combined features, the Horizontal Digital Inclinerometer System is a robust and highly accurate system that is light, compact and easy to operate in any site environment.

**Features**

- No connectors between probe, cable reel and Field PC
- Probe is manufactured from 316 Stainless Steel
- Precision sprung wheel assemblies
- Bluetooth connection between cable reel and Field PC
- Accurate and precise measurements using MEMS sensors
- Repeatable depth control using metal markers and cable gate system
- Field PC allows easy interface with most office systems and applications
- Enhanced 'In-Port' software to use with Field PC for easy data capture

**Benefits**

- Eliminates water ingress and connection problems
- Digital signal allows interference-free data transmission
- Advanced electronics ensure long, trouble free use in a site environment
- Can take a days' worth of readings on a single battery charge
- Lightweight and easily portable



Comprehensive information about this product and our full range is available at [www.soil.co.uk](http://www.soil.co.uk)  
If you would like to speak with someone directly please call +44 (0)1825 765044 or email [sales@soil.co.uk](mailto:sales@soil.co.uk)



Microelectromechanical Systems, or MEMS, is a technology that uses miniaturised mechanical and electromechanical elements that are made using the techniques of microfabrication. The physical dimensions of MEMS devices can vary from well below one micron all the way to several millimetres.

Our MEMS microsensors is a small discrete device that converts a measured mechanical signal, gravity (g) into a voltage signal.

### Operation

The inclinometer probe is inserted into the inclinometer casing and lowered to depth, ensuring the probe wheels are correctly aligned and slotted within the keyways of the casing. The probe is connected by a graduated cable to the cable reel.

Displacement readings are taken at regular intervals of 0.5m within the casing (the gauge length between the probe wheels). This is measured and controlled by metal markers crimped around the cable that pass through a notch in the cable gate, giving an exact position for each reading.

A key fob activates the saving of readings from the MEMS sensors, which are transmitted to the Field PC from the cable reel via Bluetooth transmission and saved.

When you take all subsequent readings at identical depths the comparison of successive casing profiles indicates the depth, direction, magnitude and the rate of change of movement.

You can see the clearest indication of movement by plotting the change in displacement of the casing against depth using 'In-Site' Inclinometer Data Management Package.

### Applications

Horizontal Inclinometer Systems can be used to provide settlement profiles and monitoring of heave.

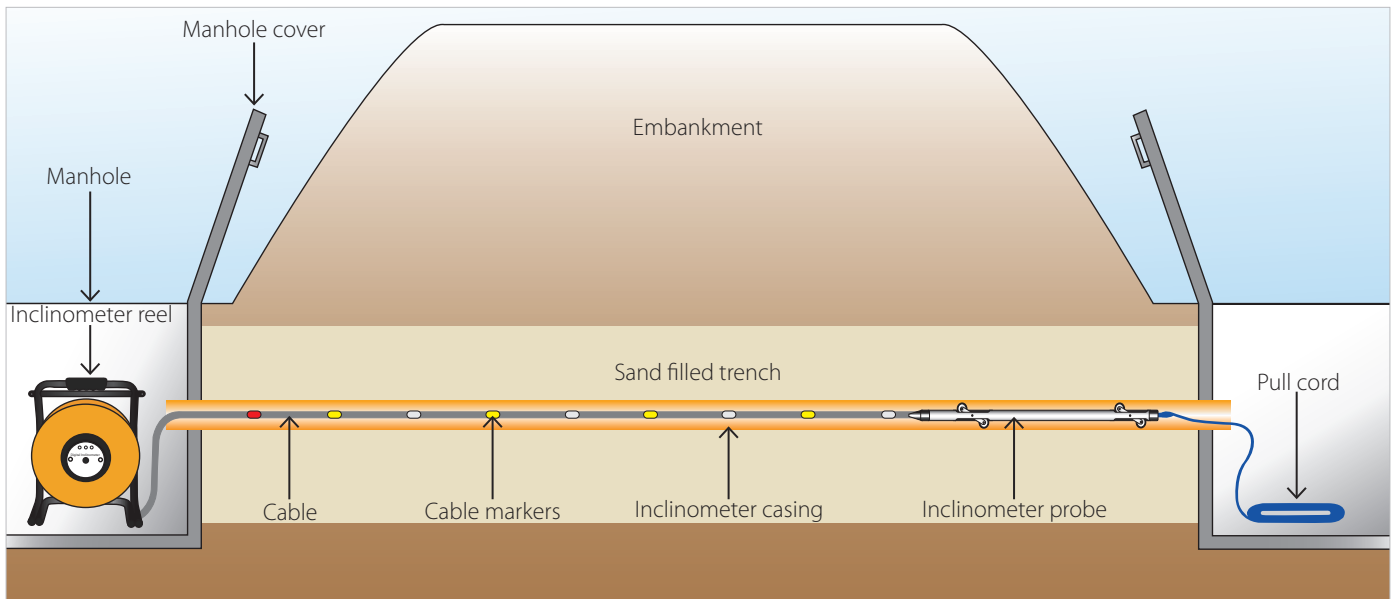
Typical applications include:

- Embankments
- Dams
- Structures
- Landfill
- Storage Tanks

### Associated products

For details on:	Catalogue code:
EC Casing	C9
Standard Casing	C18
'In-Site' Software	C13
Inclinometer Test Probe	C10

View our full product range on [www.soil.co.uk](http://www.soil.co.uk)



#### THE TECHNICAL RATING FOR THIS PRODUCT:

**INTERMEDIATE** 

As the correct installation of any monitoring sensor or system is vital to maximise performance and accuracy, Soil Instruments makes the following recommendations, for the skill level of the installation contractor.

#### ADDITIONAL SUPPORT

We offer installation and monitoring services to support this system. For more information please email : [sales@soil.co.uk](mailto:sales@soil.co.uk) or call : **+44 (0) 1825 765044**

**ADVANCED** 

The installer is trained and experienced in the installation of this type of instrument or systems, and is ideally a specialist Instrumentation and Monitoring contractor.

**INTERMEDIATE** 

The installer already has previous experience and/or training in the installation of this instrument or system.

**BASIC** 

As a minimum the installer has read and fully comprehends the manual, and if possible has observed these instruments or systems being installed by others.

## Specifications

### Probe

Gauge length	500mm
Diameter	44mm
Calibrated range	±86.8mm/500mm (±10° arc)
Resolution	0.01mm
Sensor accuracy	±0.028% full scale (±0.05mm)
Operating temperature	-20 to +60°C
Repeatability	±0.006% full scale
System accuracy <sup>1</sup>	±2mm over 25m
Cable lengths	50m   100m   150m
Minimum casing internal diameter	57mm
Maximum casing internal diameter	85mm

### Cable

	Standard Cable	Heavy Duty Cable
Type	Kevlar re-enforced Polyurethane coated 4 core cable	Steel / Kevlar re-enforced Polyurethane Coated 4 core cable
Weight	42g per metre (approx)	126g per metre (approx)
Cable marker	Hard anodised colour coded	Stainless Steel numbered

### Cable Reel

	Standard	Heavy Duty
Cable		
Dimensions	483mm x 385mm x 315mm	485mm x 385mm x 365mm
Battery life	12 hrs' continuous use	

### Weight (complete with probe)

50m	9.5kg	14.3kg
100m	11.5kg	21.6kg
150m	14.5kg	30kg

### Field PC

Program footprint	128KB
Initial database size	200KB
Dimensions	165mm x 95mm x 45mm
Weight	520g
Ingress protection	IP67
Operating temperature	-30 to +60°C
Battery life	Up to 20 hours

### Key Fob (remote handheld activator)

Dimensions	65mm x 35mm x 15mm
Weight	26g
Battery	1 x GP23A

<sup>1</sup> Derived empirically from surveys that include systematic and random errors introduced by casing, probe and operator. Achieved using Soil Instruments Easy Connect (EC) Casing installed within 3° of horizontal and operated in accordance with the user manual

## Ordering information

### Horizontal Digital Inclinometer

Range:  $\pm 86.8\text{mm}/500\text{mm}$  ( $\pm 10$  arc degree). Includes uniaxial probe, cable, cable reel & charger, cable gate, key fob, robust Field PC & charger, calibration certificate and manual. For use with up to 85mm OD casing

C19-1.3	50m cable length
C19-1.1	100m cable length
C19-1.2	150m cable length

### In-Site Inclinometer Data Management Package

Priced per dongle licence, includes installation CD, manual & dongle per licence. Multiple licences available at reduced rates

C13-1	In-Site package with 1 dongle licence key
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### Replacement Battery Charger and Cables

C17-4.1	Universal inclinometer battery charger kit; includes UK mains cable – alternatives below
C17-4.2	Mains cable Australasia region plug; 1.9m long
C17-4.3	Mains cable, EU region plug; 1.9m long
C17-4.4	Mains cable, USA region plug; 1.9m long

### Inclinometer Spares

C17-5.1	Spare cable gate; for digital inclinometer system with standard cable & post-DI1199
C17-5.2	Spare heavy duty cable gate; for digital inclinometer system with heavy duty cable & pre-DI1198
C17-3.11	Spare key fob; for inclinometers DI1355 and DI1357 onwards
C17-3.25	Spare battery for key fob

### Inclinometer Accessories

C11-2.2	Horizontal test probe complete with 100m steel cable & reel
C10-3.8	Probe reference frame

### Installation Accessories

S17-4.5	Reference survey pin
E2-2.13	Protective cover; 2inch BSP threaded cap, 50mm ID, 500mm length
E2-2.14	Security cover; with bar and padlock, 50mm ID, 500mm length

### Single Ended Installation Accessories

C11-2.3	Pulley box; used with draw cord E2-3.6 and profile tubing S17-4.1
S17-4.1	Profile tubing; supplied in 25m, 50m and 100m lengths
S17-4.2	End cap; to fit profile tube S17-4.1
S17-4.3	Profile tube repair coupling; for joining profile tubing S17-4.1 with a 50mm OD
E2-3.6	Pull cord; priced per 100m, 4mm OD

### Manuals

MAN-155	Inclinometer Reference Frame
MAN-202	Digital Horizontal Inclinometer

**soil**  
INSTRUMENTS



FM 611948

Bell Lane, Uckfield, East Sussex  
TN22 1QL United Kingdom

t: +44 (0) 1825 765044  
f: +44 (0) 1825 744398

e: info@soil.co.uk  
w: www.soil.co.uk

Soil Instruments Ltd. Registered in England. Number: 07960087. Registered Office: 34 Bell Lane, Uckfield, East Sussex, TN22 1QL