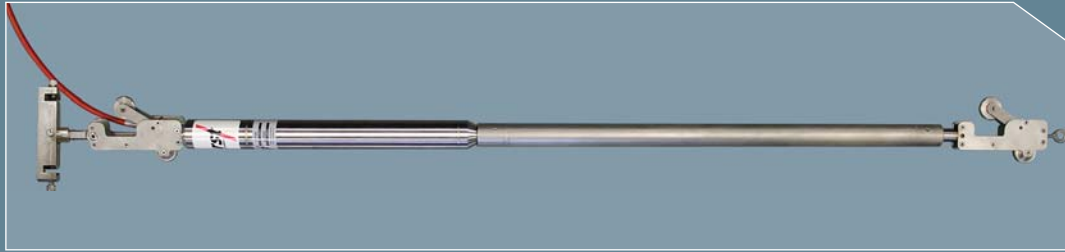




# Horizontal In-place MEMS Inclinometer



Horizontal In-place MEMS Inclinometer showing detailed structure of the wheel assembly.

The Horizontal In-place MEMS Inclinometer is designed to remotely monitor, and continuously measure, underground vertical movement as a result of construction and excavation and any settlement that may occur around tunnels, dams, embankments and landfills.

In-place inclinometers consist of one or more MEMS inclinometer sensors housed in a 31.75 mm (1.25 in.) diameter, water-tight, stainless steel enclosure. Each sensor is separated from the next by stainless steel rods and wheel assemblies. Rod lengths can be varied to alter the gauge length and sensors can be concentrated in areas of expected movement.

Wheel assemblies are sized to fit 70 mm (2.75 in.) or 85 mm (3.34 in.) O.D. inclinometer casing. As movement occurs and the inclinometer casing deforms, each sensor can be automatically monitored and can be read at a remote readout location. If necessary, an alarm can be triggered when movement reaches a preset critical rate or magnitude.

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## applications

Monitoring stability adjacent to excavations or underground workings.

Monitoring settlement and vertical movements around tunnels, dams, embankments, roadways, storage tanks and landfills.

Continuous, automated reading where early warning of movements is essential for protecting life and equipment.

## features

Optional single cable digital BUS system.

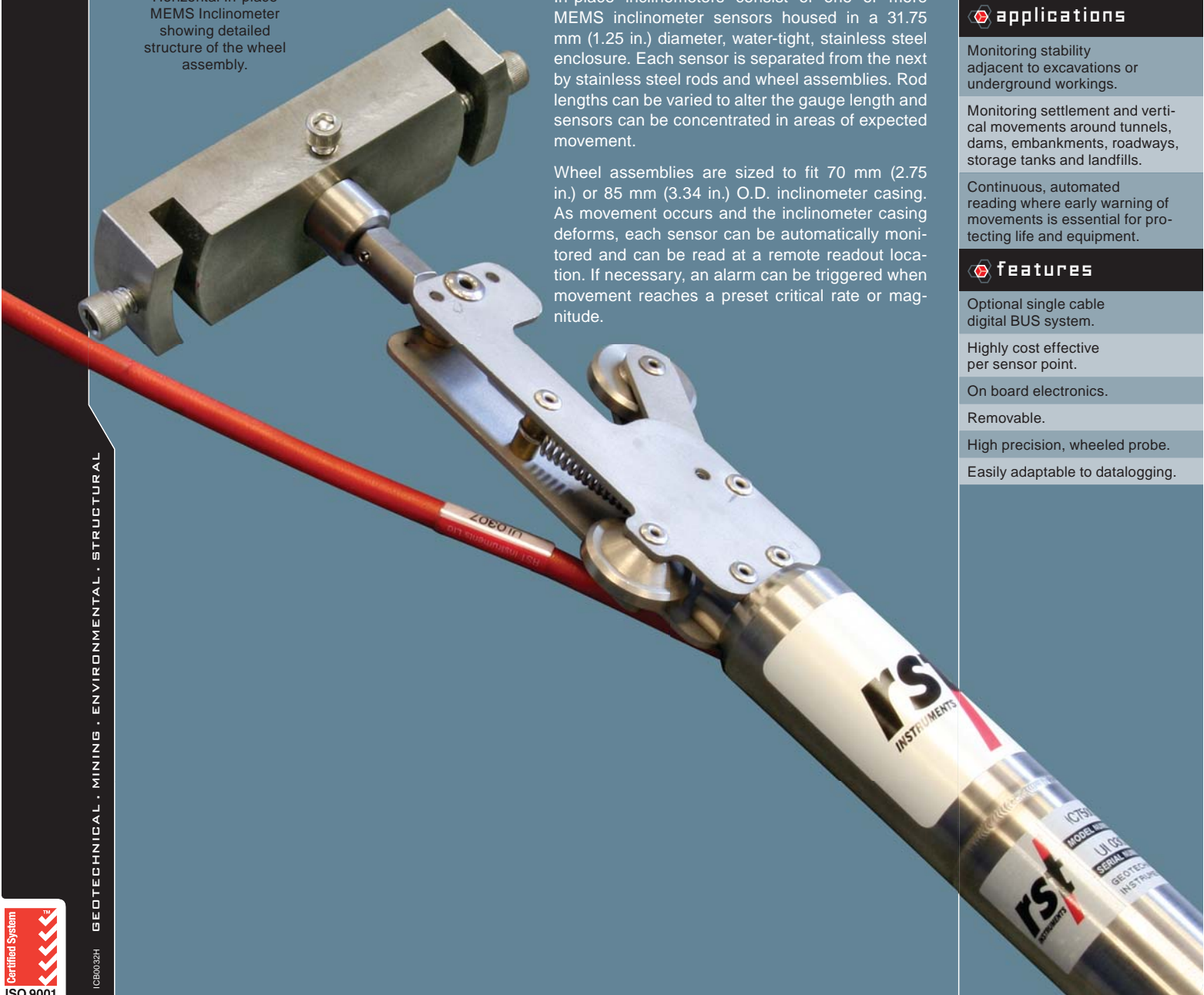
Highly cost effective per sensor point.

On board electronics.

Removable.

High precision, wheeled probe.

Easily adaptable to datalogging.





specifications + ordering info

# Horizontal In-place MEMS Inclinometer



## specs: vertical in-place inclinometer

DESCRIPTION	SPECIFICATION
<b>ELECTRICAL</b>	
Range	±15° (other ranges upon request)
Resolution (analog)	±5 arc sec. (±0.025 mm/m) (10Hz BW)
Resolution (digital)	±2 arc sec. (±0.0006°) (0.01 mm/m)
Non-linearity (analog)	±0.05% F.S. (±0.0075°) (0.13 mm/m)
Non-linearity (digital)	±0.0125% F.S. (±0.002°) (0.03 mm/m)
Repeatability (analog)	±0.025% F.S. (±0.004°) (0.06 mm/m)
Repeatability (digital)	±0.0125% F.S. (±0.002°) (0.03 mm/m)
Sensor	MEMS (Micro-Electro-Mechanical Systems) Accelerometer
Sensor Offset	+/- 0.002 arc deg./deg. C
Sensor Sensitivity	+/- 0.013 % of reading/deg. C
Excitation (analog)	8 - 15V DC
Operating Temp.	-40 to 85°C (-40 to 185°F)
Ingress Protection	IP68 to 200m H <sub>2</sub> O (2000 kPa)
<b>MECHANICAL</b>	
Gauge Length	0.5 - 3 meters
Housing Diameter	31.75mm (1.25 in.) (sensor)
Wheel Assembly	70 mm (2.75 in.) 85 mm (3.34 in.)
Extension Rod Diameter	25 mm (1.0 in.)

## general ordering info

Part number
Number of boreholes
Number of sensors per borehole
Location of sensors in borehole
Gauge length
Wheel assembly size
Length of signal cable

## options

Submersible cable connector for bus options.

## ordering info: sensors

ANALOG CABLE SYSTEM	PART #
MEMS IPI sensor assembly: Uniaxial for 70 mm casing	IC7600
MEMS IPI sensor assembly: Uniaxial for 85 mm casing	IC7605
DIGITAL BUS CABLE SYSTEM	PART #
MEMS IPI bus sensor assembly: Uniaxial for 70 mm casing	IC7650
MEMS IPI bus sensor assembly: Uniaxial for 85 mm casing	IC7655

## ordering info: collar hangers

ANALOG OR DIGITAL BUS SYSTEM	PART #
Hanger & Wheel Assembly 70 mm casing	IC7070H
Hanger & Wheel Assembly 85 mm casing	IC7085H

## ordering info: extension rods

ANALOG AND DIGITAL BUS SYSTEMS	PART #
Extension rod for 0.5 m gauge length	IC7700
Extension rod for 1 m gauge length	IC7701
Extension rod for 1.5 m gauge length	IC7702
Extension rod for 2 m gauge length	IC7703
Extension rod for 2.5 m gauge length	IC7704
Extension rod for 3 m gauge length	IC7705

## ordering info: cables

ANALOG AND DIGITAL BUS SYSTEM	PART #
6 conductor, 22 gauge polyurethane jacketed cable (analog)	EL380006
4 conductor, 22 gauge polyurethane jacketed cable (digital bus)	EL380004

## ordering info: readouts

READOUTS & DATALOGGERS	PART #
MEMS Analog Readout (analog systems)	IC6800-V
Ultra Rugged Field PC (digital bus systems)	IC32000-14803
Digital Interface for Ultra Rugged Field PC with software	ELGL4010
flexDAQ Dataloggers (analog and digital systems)	

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