Vertical In-place MEMS Inclinometer Systems are designed to measure lateral movement of soil and rock or deflection of man made structures such as piles or retaining walls, when remote and continuous monitoring is required.

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.

Vertical In-place MEMS Inclinometers

**Applications**
- Monitoring stability adjacent to excavations or underground workings.
- Monitoring deflection of piles, piers, abutments or retaining walls.
- Continuous, automated reading where early warning of movements is essential for protecting life and equipment.
- Monitoring dams and embankments.

**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.
### 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: Collar Hangers

#### Analog or Digital Bus System

- **Collar hanger w/1 bottom wheel assembly for 70 mm casing**: IC7070
- **Collar hanger w/1 bottom wheel assembly for 85 mm casing**: IC7085

#### Wire Rope System

- **Collar hanger for 70 mm casing**: IC7070R
- **Collar hanger for 85 mm casing**: IC7085R

### Ordering Info: Extension Rods

#### Analog, Digital Bus, or Wire Rope Systems

- **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: Sensors

#### Analog Cable System

- **MEMS IPI sensor assembly: Biaxial for 70 mm casing**: IC7505
- **MEMS IPI sensor assembly: Biaxial for 85 mm casing**: IC7515
- **MEMS IPI sensor assembly: Uniaxial for 70 mm casing**: IC7500
- **MEMS IPI sensor assembly: Uniaxial for 85 mm casing**: IC7510

#### Digital Bus Cable System

- **MEMS IPI bus sensor assembly: Biaxial for 70 mm casing**: IC7565
- **MEMS IPI bus sensor assembly: Biaxial for 85 mm casing**: IC7575
- **MEMS IPI bus sensor assembly: Uniaxial for 70 mm casing**: IC7560
- **MEMS IPI bus sensor assembly: Uniaxial for 85 mm casing**: IC7570

#### Wire Rope System

- **MEMS IPI wire rope sensor assembly: Biaxial 70 mm casing with bottom wheel assembly**: IC7535
- **MEMS IPI wire rope sensor assembly: Biaxial 85 mm casing with bottom wheel assembly**: IC7545
- **MEMS IPI wire rope sensor assembly: Uniaxial 70 mm casing with bottom wheel assembly**: IC7530
- **MEMS IPI wire rope sensor assembly: Uniaxial 85 mm casing with bottom wheel assembly**: IC7540

### Ordering Info: Cables

#### Analog, Digital Bus, and Wire Rope System

- **6 conductor, 22 gauge polyurethane jacketed cable (analog)**: EL380006
- **4 conductor, 22 gauge polyurethane jacketed cable (digital bus)**: EL380004

#### Suspension Cable - For Wire Rope System Only

- **Stainless steel suspension cable 3/32”**: IC7300

### Ordering Info: Readouts

#### Readouts & Dataloggers

- **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**
  - **FlexDAQ Dataloggers (analog and digital systems)**: ELGL4010

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**Specifications + Ordering Info**

**Vertical In-place MEMS Inclinometer**

### Electrical

**Range**
- ±15° (other ranges upon request)

**Resolution**
- **(analog)** ±5 arc sec. (±0.025 mm/m) (10Hz BW)
- **(digital)** ±2 arc sec. (±0.004°) (0.001 mm/m)

**Non-linearity**
- **(analog)** ±0.05% F.S. (±0.0075°) (0.13 mm/m)
- **(digital)** ±0.0125% F.S. (±0.0006°) (0.03 mm/m)

**Repeatability**
- **(analog)** ±0.025% F.S. (±0.004°) (0.06 mm/m)
- **(digital)** ±0.0125% F.S. (±0.0006°) (0.03 mm/m)

**Sensor**
- MEMS (Micro-Electro-Mechanical Systems) Accelerometer

**Excitation (analog)**
- 8 - 15V DC

**Operating Temp.**
- -40 to 85°C (-40 to 185°F)

### Mechanical

**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.)