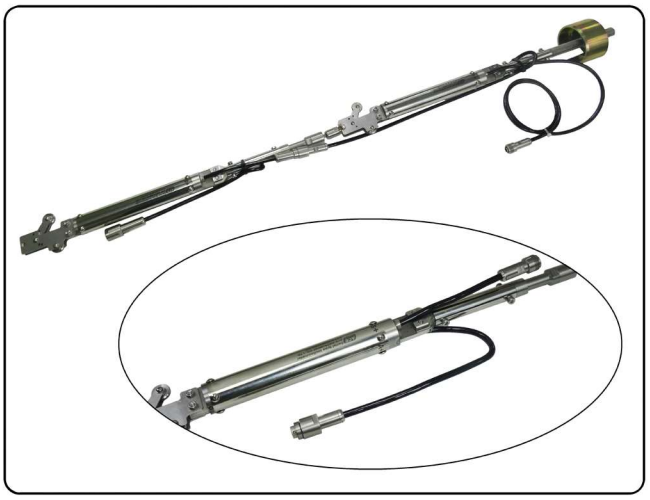
MEMS serial type multi-point inclinometers



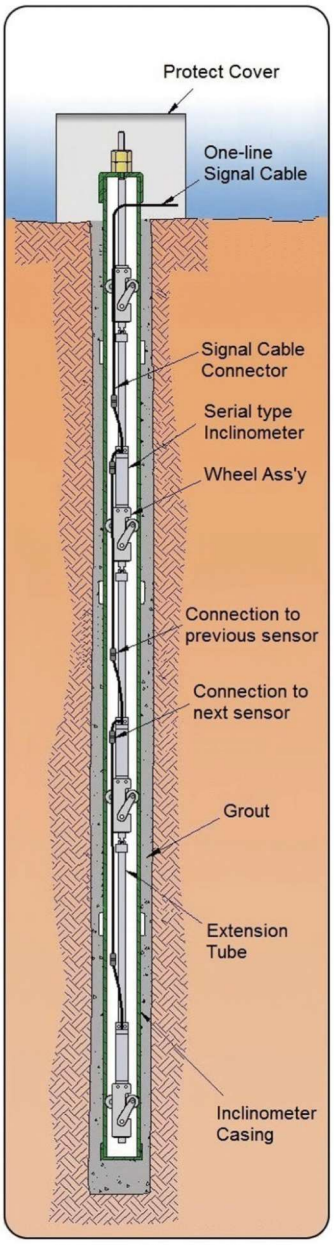
Description

The model 4490 serial type multi-point inclinometer can be configured by wiring several 4490 series inclinometers with one signal cable and connect to a data logger.
The sensors transmit the data to data logger sequentially with one signal cable, so installation and operation are simple and very accurate. The casing shall be attached to the structure or embedded in a direction in which horizontal or vertical displacement is expected, and the casing controls the position and direction of the inclinometer.
The MEMS inclinometer is located in the casing in series by guide wheels, extension tubes and fasteners.
A total of 50 sensors can be built within a maximum 3meters gage length between each sensor by considering the purpose of measurement and economic efficiency.
The measurement range of the sensor is up to ±10° and can be installed vertically or horizontally according to the calibration method using a MEMS sensor.
It is useful for real-time measurement when measuring slope displacement or horizontal displacement of underground ground or when dynamic measurement is required.
This product is waterproof, anti-rust treatment, semi-permanent precision measurement is possible.

Applications

The MEMS serial type multi-point inclinometer is useful for measuring vertical displacement such as settlement and uplift etc. at the bank, dam foundation and highway construction site.

- Measurement of ground displacement due to tunneling and excavation
- Measuring the displacement of the bank and retaining wall
- Horizontal displacement measurement of unstable underground ground such as sloping area on dam, highway and railroad
- Displacement measurement during pile load test



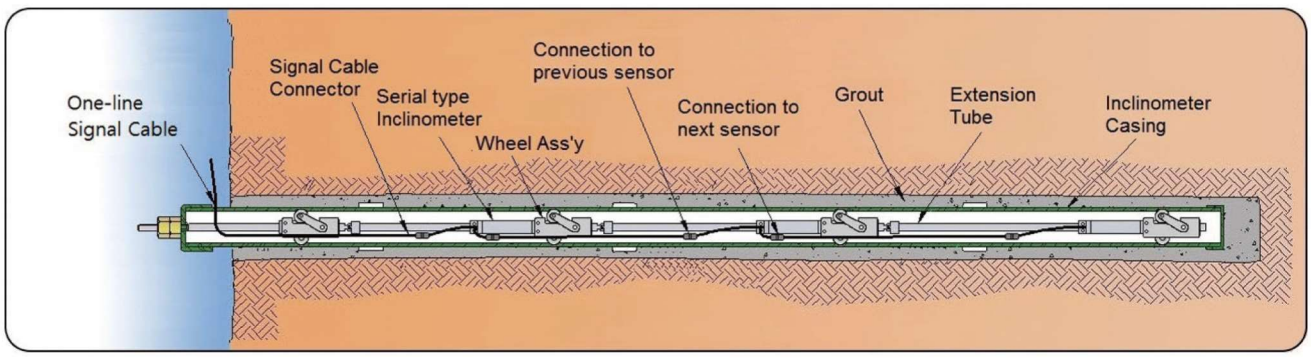
[Vertical installation]

Features

- **Application of single line connection system**
  Connect multiple inclinometer to the signal cable and data is sent and received sequentially with data logger
  The structure is very simple and it is a digital type, highly accurate and reliable.

- **Real-time measurement possible**
  Real-time and dynamic measurement is possible by connecting our ADL-200 automated data logger or other data logger.

- Included the high precision tilt sensor
- 400m H_2O waterproof
- Included the electric noise protecting circuit
- Easy to analyze operation and measurement data
- It can be installed either horizontally or vertically



[Horizontal installation]

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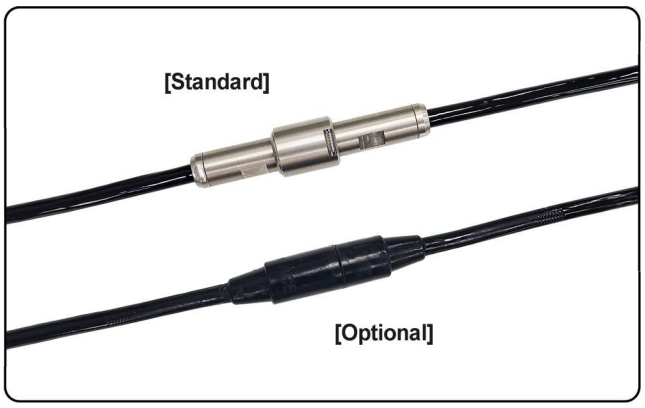
ACE INSTRUMENT CO., LTD.
The first value in the Geotechnical & Structural Instrumentation

MEMS Serial type multi-point inclinometers

Specification

Model	4490HS(Horizontal 1axis)	4490MS(Vertical 1axis)	4490BS(Vertical 2axis)
Sensor element	1-MEMS and serial communication circuit		2-MEMS and serial communication circuit
Range	±10°		
Resolution	10 arc seconds		
Accuracy	±0.1% FSR		
Nonlinearity	±0.5% FSR		
Supply voltage	12V DC		
Output voltage	-5V~5V DC		
Insulation resistance	More than 100 MΩ / 500 V		
Operating temperature	-30~80℃		
Communication method	Serial communication		
Gage length	Selection of standard length 1, 2, 3m		
Communication connector	700 bar waterproof (Standard : Stainless steel processing and waterproof structure / Optional : Rubber molded product)		
Waterproof	400m H_2O		
Built-in quantity	Depend on installation depth (maximum 50 to minimum 10 inclinometers)		
Materials	Special stainless steel, fluorinate series O-ring, high grade epoxy potting		
Weight	① Sensor 1.0kg ② Wheel Ass'y 0.4kg ③ Extension tube 0.7kg/m ④ Union 0.15kg		
Signal cable	Ø7.0㎜, 0.3㎟×7C shielded PU sheath cable		
Accessores	① Wheel Ass'y ② Extension tube ③ Union part ④ Top cover ⑤ Connection part		

[Waterproof communication connector]



Waterproof connectors for sensor connection are available in standard stainless steel processing product and optional rubber product.
The rubber waterproof connector is very simple to connect the sensor, but the price is a little expensive.

Ordering information

- Place to install
- Component of system
- Specification of system / controlled standard
- Depth of installation
- Keeping readout unit
- Length of signal cable

The readout

The 4490 series serial communication type multipoint inclinometer can connect to our model ADL-200A Smart logger and can be remotely controlled and measured by wireless modem.
It is also compatible with third-party devices such as the CR-1000.

Installation of quantity of sensor

Quantity of sensor	Length of signal cable
10	380m
13	340m
16	300m
19	260m
23	220m
27	190m
32	150m
37	110m
43	70m
50	40m

Recommendation

- In setting of standard inclinometer casing, if the horizontal / vertical displacement is expected, please us telescopic section for extension so that is make displacement to be absorbed in extension and prevent from damage of casing and sensor.

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