

SSL2200 MEMS In-Place Inclinator

Features

- Measurement range: $\pm 5^\circ$, $\pm 15^\circ$, $\pm 30^\circ$
- Resolution : $\pm 0.002^\circ$
- Accuracy : max $\pm 0.005^\circ @ 25^\circ\text{C}$
- Direct watertight cable outgoing
- Flexible pitch configuration
- SUS304 stainless steel housing, wire rope connection
- Max pressure resistance 1MPa, long-term work underwater 100m
- MEMS, low cost, shock resistance

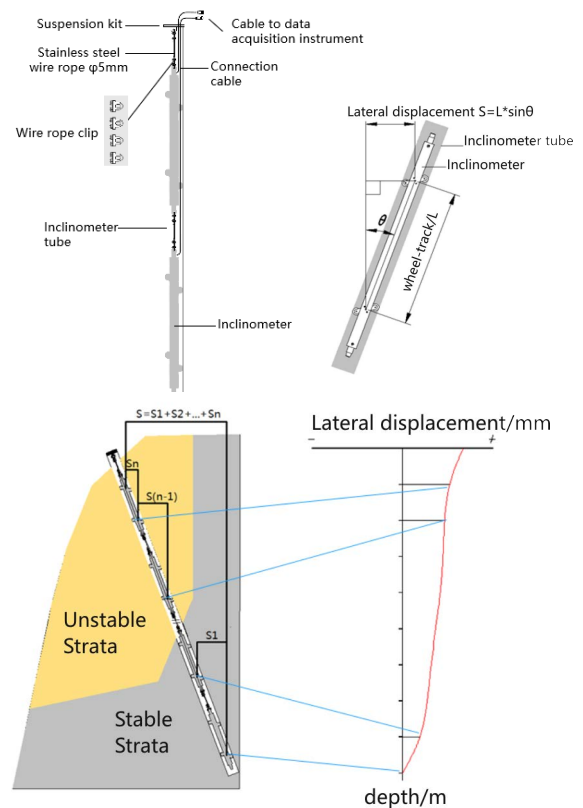


Descriptions

SSL2200 in-place MEMS inclinometer, independently developed by LT, is a dual-axis transducer with RS485 signal output, housed inside a rugged tube, SSL2200 is used for continuous and unattended measurements of lateral displacement of soil, rock and structures. The system mainly includes inclinometer group, data acquisition instrument, wireless/wired transmission system, data processing system, solar power supply system, etc. The inclinometer group is vertically installed in inclinometer tube of $\phi 70$ -90 mm, which senses stratum changes synchronously, transmits the measured inclinometer data to data acquisition system, and then transmits the measured inclination data to data acquisition instrument by wireless or wired transmission for calculation and analysis, at last a depth-displacement curve is obtained.

Measuring principle

SSL2200 consists of several MEMS inclinometers in series which are installed in the inclinometer tube, when the stratum is deformed and displaced, the inclinometer tube will deform synchronously, and the attitude of each inclinometer will change correspondingly, which is reflected in the change of inclination angle. As shown in the right figure, an inclinometer is installed at the specified depth of the inclinometer tube. The wheel-track of the inclinometer (the center of the upper and lower guide wheels) is L , the measured inclination angle changes to θ , According to the trigonometric function, the horizontal displacement variation of the two nodes is $S = L \cdot \sin\theta$. When several inclinometers are connected in series, the total horizontal displacement variation can be obtained by taking the bottom node of the fixed inclinometers as the starting point and accumulating upward in turn: $S = S_1 + S_2 + \dots + S_n$



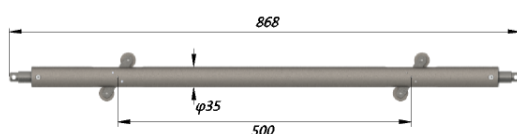
Applications

- Slope stability monitoring
- Soil displacement monitoring
- Monitoring of diaphragm wall
- Dam deformation monitoring
- Deflection monitoring of lateral loaded piles
- Foundation pit monitoring, etc.

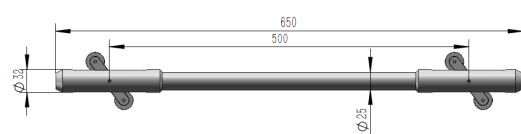
Performances

Measurement range	±5°	±15°	±30°
Accuracy	±0.005°@25°C		
	±0.01°@-20~65°C		
Resolution	0.002°		
Cross-axis sensitivity	±0.1%FS		
Repeatability	±0.002°		
Long-term stability	±0.01°@12 months		
Measurement axis	Dual-axis		
Output	RS485 ModBus		
Cold start warming time	60s		
Operation temperature	-40 ~ 85°C		
Storage temperature	-40 ~ 85°C		
Power supply	9-36VDC , current consumption≤50mA@24VDC(single inclinometer)		
MTBF	≥25000 h/times		
Shock	100g@11ms, three-axis, half-sine		
Vibration	8grms , 20 ~ 2000Hz		
Pressure resistance	1MPa(Max 100m underwater)		
Max connected sensors	25 @φ70mm tube		
Connection cable	Each inclinometer is connected to the data acquisition instrument independently by a 7-core 5mm tension-resistant 30Kg watertight cable		
Guide wheels	Stainless steel material, NSK high precision bearing, long service life		
Sealing performance	Double high hardness high pressure resistant seal ring @Shore hardness 90 degrees+Inside all-silicone seals		
Balance treatment	Make gravity center in geometric center, prolong the life of guide wheels and springs		
Safety factor of housing	≥5.65@25 inclinometers in series		
Interconnection between inclinometers	Stainless steel wire rope with customizable length		
Diameter of adapted inclinometer tube	φ70-90mm		
Housing	SUS304 stainless steel		
Packing	Aluminum alloy packing box : 1000X450X75 mm		
Weight	2Kg@single inclinometer(without cable and wire rope)		

Dimensions (mm)



Size of single inclinometer
(without cable and wire rope)

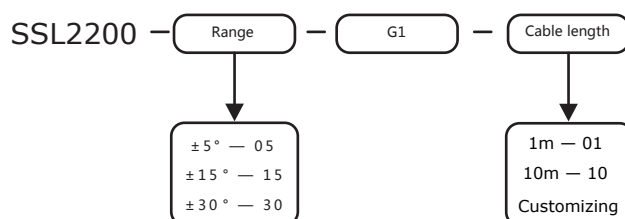


Size of preconditioner
(without cable and wire rope)

Wiring

Pin	Wire colour	RS485 output
1	Red	Power+
2	Black	Power-
3	Blue	RS485-A
4	Brown	RS485-B
5	Green	Signal GND

Ordering



Optional list

Items	Quantity
Preconditioner	1 pcs
Connected cable	Depends on request
Solar Power Supply System	1 set
Data acquisition instrument	1 set
Cloud-based software	1 set
Installation accessories	1 set