

ElastiSense Sensors

ElastiSense DS sensors use electroactive polymer technology to provide high resolution and accurate measurements of displacement.

Typical applications include monitoring joints and cracks in bridges, tunnels, buildings, dams, and other structures. They can also be used to monitor faults in rock faces.

Operating Principle

DS sensors are designed to change their capacitance in direct proportion to the strain applied to the sensor.

The two ends of the sensor are anchored across a joint or crack. Opening of the crack or joint causes the sensor to extend and increases its capacitance. Closing of the crack or joint causes the sensor to contract, decreasing its capacitance. Internal circuitry outputs capacitance measurements to a datalogger.

Advantages

ElastiSense sensors are engineered to endure extreme conditions, with a fully encapsulated rubber core that withstands misalignments, heavy rain, UV light, gale force winds, extreme temperatures, chemicals, dirt, and dust. They are more compact and have a lower profile than most other crackmeters and require no special mounting, no protection, and no maintenance.

Specifications

Sensor type: ElastiSense DS Series.

Measurement range: 5, 20, 50, 100, 250 mm. (0.2, 0.8, 2, 4, 10 inch)

Resolution: 0.01% FS.

Accuracy: 0.5% FS.

Temp coefficient: <math><0.01\%FS \text{ per } ^\circ C.</math>

Output signal: 4-20mA, 0-5V, 0-10V, RS-232, RS-485.

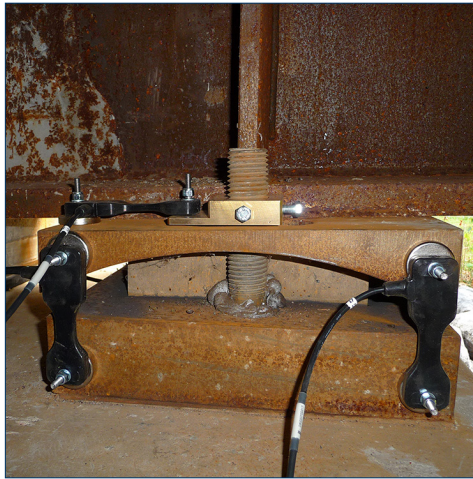
Update rate: 1000 updates/second.

Power Supply: 2.5-5.25V or 12-24V.

Force at max displacement: 120N.

Operating Temperature: -40 to 85 or -40 to 105C

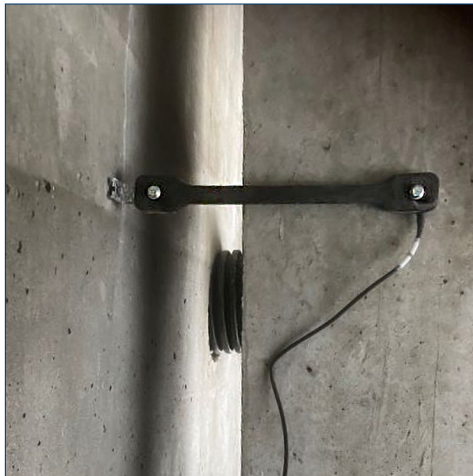
Protection: IP68 equivalent.



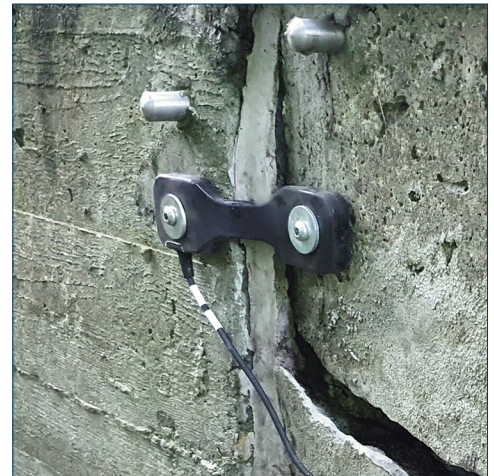
Structural Health: Monitoring bridge bearings to estimate remaining life of the structure.



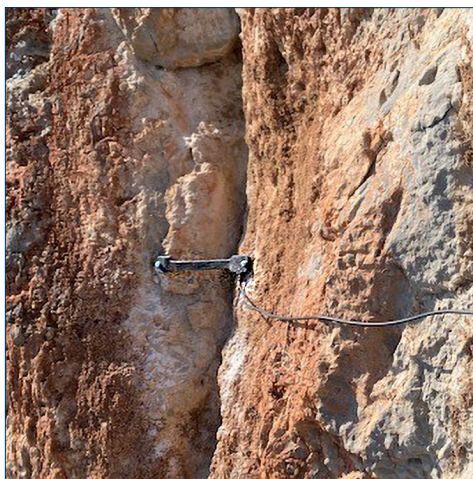
Structural Deformation: Monitoring rate of deformation caused by foundation settlement.



Predictive Maintenance: Monitoring structural movement that could lead to fatigue and cracks.



Structural Safety: Monitoring condition of bridge to inform decisions on timing of repair or replacement.



Early Warning: Monitoring hazardous rock face.



ElastiSense DS Series with ranges from 0.2 to 10 in.

Images and specifications courtesy of ElastiSense Sensor Technology