

# MicroStrain Sensors For Displacement Measuring

## Sub/microminiature LVDTs and Gauging LVDTs for precise results

### Why measure displacement?

- Detects strain & deflection in materials/structures
- Adds process control for production-line monitoring
- Ensures linear & angular motion control
- Provides dimensional gauging for quality control
- Serves as reliable indicator of system degradation



### MicroStrain LVDTs:

- Offer excellent length-to-sensing stroke ratio
- Have frictionless design for use over millions of cycles
- Are designed for use in harsh fluids and environments
- Offer simple integration with plug-and-play usability
- Are easily customized to your specific requirements

#### Microminiature LVDTs

##### M-LVDT® Linear Displacement Sensor



**Outside Diameter:**  
1.5 mm (standard version)  
1.8 mm (high resolution)

**Linear Stroke Length**  
3, 6, 9 mm (standard)  
1.5 mm (high resolution)

**Approx. Body Length**  
4mm + 2.5x stroke length

#### Microminiature LVDTs

##### M-LVDT® Linear Displacement Sensor



**Outside Diameter:**  
4.76 mm (3/16 inch)

**Linear Stroke Length:**  
4, 8, 24, 38 mm (standard)  
6 mm (high resolution)  
500 µm or less (nano)

**Approx. Body Length:**  
10mm + 3x stroke length

##### MG-LVDT Linear Displacement Gauge Sensor



**Outside Diameter:**  
1.8 mm (smooth body)

**Linear Stroke Length:**  
3, 6, 9 mm (standard)  
1.5 mm (high resolution)

**Approx. Body Length:**  
4mm + 6x stroke length

##### SG-LVDT Linear Displacement Gauge Sensor



**Outside Diameter:**  
6.0 mm (smooth body)  
8.0 mm for 38 mm stroke

**Linear Stroke Length:**  
4, 8, 24, 38 mm (standard)  
6 mm (high resolution)  
500 µm or less (nano)

**Approx. Body Length:**  
10mm + 5x stroke length



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# MicroStrain Application note: Displacement Sensors

- Microminiature LVDT resolution: 300nm to 4.5  $\mu$ m
- Subminiature LVDT resolution: 125nm to 9.5  $\mu$ m
- Stainless steel housing for long-lasting performance
- Low Signal to Noise ratio (M/MG-LVDT - 2000:1, S/SG-LVDT - 4200:1)
- Engineered for operation in temperatures from -55° to 170° C
- Keyed 4-pin Lemo connector compatible with LORD MicroStrain DEMOD signal conditioners

## REAL-WORLD APPLICATIONS:



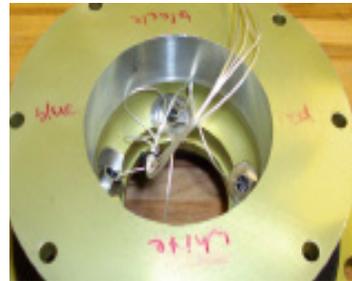
**Assembly Verification:** Employing an LVDT provides verification of proper assembly dimensions, especially when it is used in differential mode (when one sensor finds a reference surface, the other locates the part in question).

### Precise Feedback For Motion Control:

MicroStrain LVDTs are ideal for motion control applications, particularly ones requiring secondary confirmation of motion, or for other applications that cannot use standard encoders. Examples: robotics, semi-conductor material handling, aperture control, valve position on vehicles, electronic cam motion loop

**Aerospace Fuel Tank Monitoring:** Using an SG-LVDT with a custom-designed hermetic housing and an integrated connector allowed customers to monitor the deflection of a rocket fuel tank, which in turn enabled researchers to monitor the amount of fuel expended.

**Condition Monitoring:** A multiple-MG-LVDT setup allowed aircraft OEM customers to determine motion in 6DoF, which successfully monitored degradation in elastomeric bearing stiffness.



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