

# Displacement Gage | os5100



## Description

The os5100 is an FBG based displacement gage designed for measuring changes of less 50 mm in civil and geotechnical structures.

Based on fiber Bragg grating (FBG) technology, the os5100 is specifically designed to measure displacement between two gage points on a specimen surface. The gage design is flexible enough to allow for easy attachment to various substrates, making measurements on metal, concrete and other surfaces straightforward. The two FBG sensors that comprise the os5100 gage are located within the rugged hard-coat anodized aluminum enclosure which shields them from the elements and allows for installations in harsh environments.

This gage can be used alone or in series as a part of an FBG sensor array (which may include strain and temperature gages, accelerometers and other displacement gages). Cabling for such arrays is much less expensive and cumbersome than comparable electronic gage networks. Cables can be joined directly inside the enclosure, eliminating the need for separate junction boxes. The os5100 delivers the many advantages inherent to all FBG based sensors, including EMI immunity - something vibrating wire gages cannot offer.

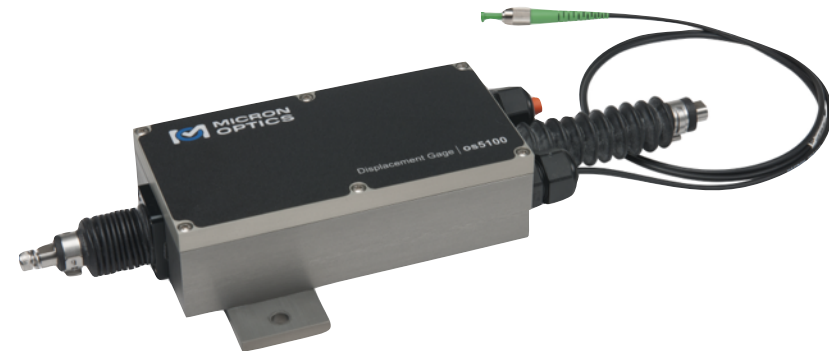
With each gage, Micron Optics provides a Sensor Information Sheet listing the gage factor and calibration coefficients needed to convert wavelength information into engineering units. Micron Optics' ENLIGHT Sensing Software provides a utility to calculate and then record, display and transmit data for large networks of sensors. Installation, qualification, mechanical drawings and other sensor information is available at:

[http://www.micronoptics.com/support\\_downloads/Sensors/](http://www.micronoptics.com/support_downloads/Sensors/)



## Key Features

- Up to 50 mm measurement range** using a 9.5 mm stainless steel rod
- Rugged aluminum enclosure** suitable for outdoor installations, IP67 rating
- Qualified** to same rigorous standards used for comparable electronic gages
- Internal protection** of connectors/splices
- Supports multiplexing** of multiple gages on one fiber
- Fully temperature compensated** over entire operating range
- Fast response time**, stable measurements, high resolution
- Designed for simple installation** in a variety of applications



## Deployments

- Structures** (bridges, dams, tunnels, mines, buildings, oil platforms)
- Energy** (wind turbines, oil wells, pipelines, nuclear reactors, generators)
- Transportation** (railways, trains, roadways, specialty vehicles, cranes)
- Marine vessels** (hull, deck, cargo containers)
- Aerospace** (airframes, composite structures, wind tunnels, static and dynamic tests).

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## Performance Properties

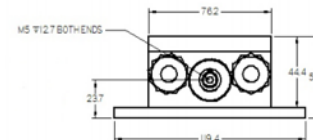
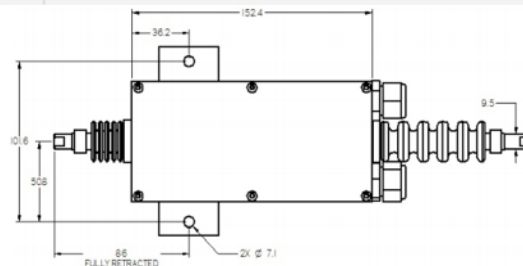
	os5100
Displacement Measurement Range	0 to 50 mm
Accuracy <sup>1</sup>	0.03 mm in steady-state environment
Operating Temperature Range	-40 to 80° C
Water Resistance	IP67 rating
Fatigue Life	>10x10 <sup>6</sup> cycles @ 40 mm stroke
Maximum Speed	1050 mm/sec
Probe Actuation Force	~ 10 N

## Physical Properties

Dimensions	152.4 x 76.2 x 44.5 mm
Weight	1.0 kg
Material	Anodized Aluminum and Stainless Steel
Cable Length	Customer specified
Cable Type	Terminate inside gage. Gage accepts two cables between 3 to 7 mm diameter
Fastening Method <sup>2</sup>	Bolt-on bracket for sensor body

## Optical Properties

Peak Reflectivity (R <sub>max</sub> )	> 70%
FWHM (- 3 dB point)	0.25 nm (± .05 nm; Apodized Grating)
Isolation	> 15 dB (@ ± 0.4 nm around center wavelength)



## Ordering Information

os5100-**www**/www-1xx

**www** Wavelengths (+/- 1.5 nm)  
Standard -  
1476/1478, 1491/1493, 1506/1508,  
1521/1523, 1536/1538, 1551/1553,  
1566/1568, 1581/1583, 1596/1598,  
1611/1613  
Bandwidth allocation requires an  
additional -6 and +7 nm

**1xx** Length and Termination  
1 Standard length is 1 m  
FC FC/APC Connector  
FS Fusion Splice

## Ordering Information Example

os5100-1536/1538-1FC

## Notes

- Long term accuracy - 0.5mm based on 300 temperature cycles from -40 to +80°C and 1000 hours of humidity soak at 75°C - 75% relative humidity.
- See [http://www.micronoptics.com/support\\_downloads/Sensors/](http://www.micronoptics.com/support_downloads/Sensors/) for mechanical drawings and installation details for the os5100 and accessories.
- Add wavelength tolerance of ±1.5 nm. See the Sensor Information Sheet for more detailed requirements