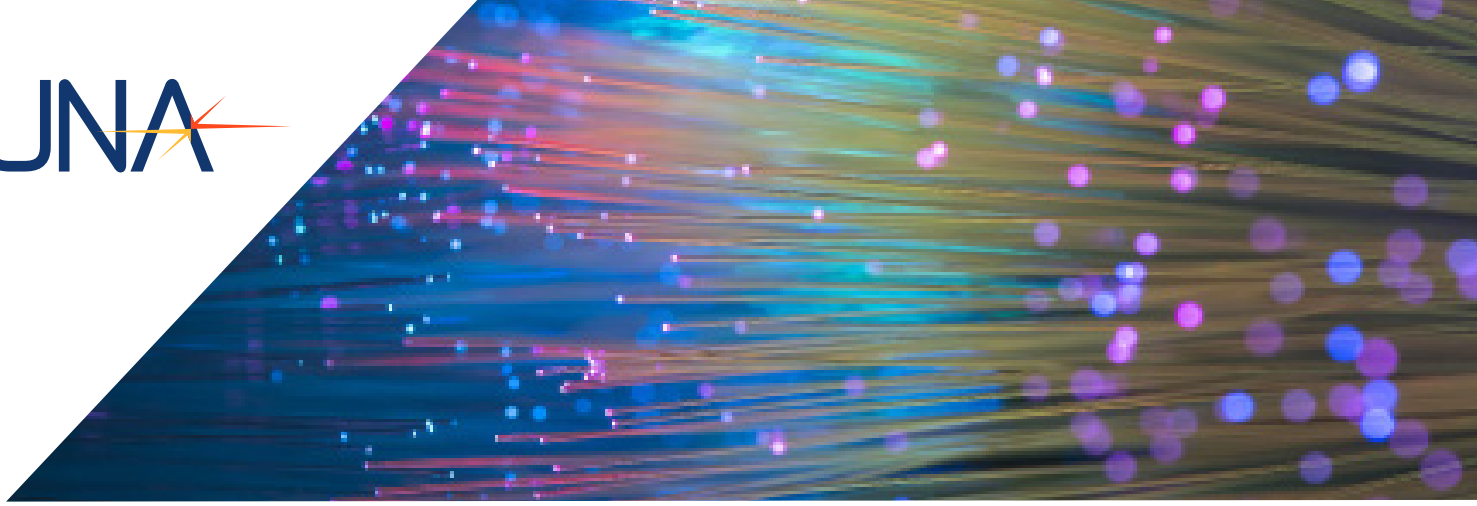
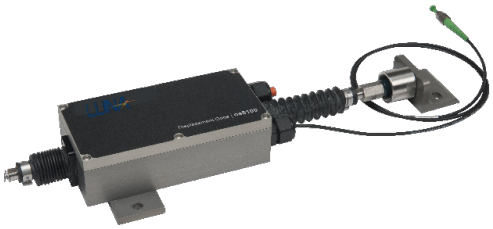


os5100

Displacement Gage



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.

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

Applications

Structures (bridges, dams, tunnels, mines, buildings, oil platforms)

Energy (wind turbines, oil wells, pipelines, nuclear reactors, generators)

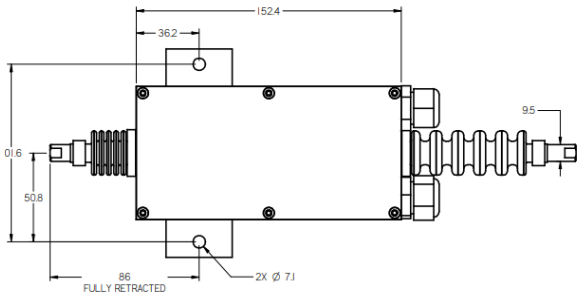
Transportation (railways, trains, roadways, specialty vehicles, cranes)

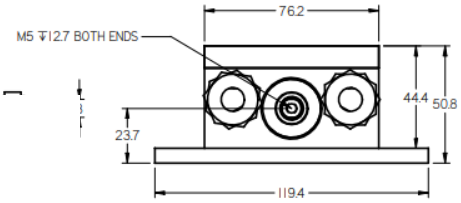
Marine vessels (hull, deck, cargo containers)

Aerospace (airframes, composite structures, wind tunnels, static and dynamic tests)

Properties

Performance Properties	os5100
Displacement Measurement Range	0 to 50 mm
Accuracy[1]	0.03 mm in steady-state environment
Operating Temperature Range	-40 to 80° C
Water Resistance	IP67 rating
Fatigue Life	>10x10^6 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	Bolt-on bracket for sensor body
Optical Properties	
Peak Reflectivity (Rmax)	> 70%
FWHM (- 3 dB point)	0.25 nm (± .05 nm)
Isolation	> 15 dB (@ ± 0.4 nm around center wavelength)





Ordering Information

os5100-wwww/wwww-1xx

wwww 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

1 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.

2 Add wavelength tolerance of +/- 1.5 nm. See the Sensor Information Sheet for more detailed requirements

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