os5500
## Displacement Gage

The os5500 is an FBG based displacement gage designed for measuring changes of up to 450 mm in civil and geotechnical structures.

Based on fiber Bragg grating (FBG) technology, the os5500 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 FBG sensors that comprise the os5500 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 os5500 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.
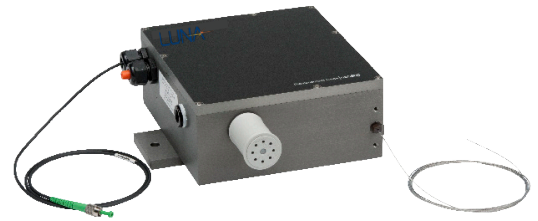
Key Features

Up to 450mm measurement range using a 1 mm stainless steel cable

Rugged aluminum enclosure suitable for outdoor installations, IP65 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 applicationsA

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	os5500
Displacement Measurement Range[1]	150 mm, 300 mm, or 450 mm
Resolution[2]	0.02% F.S.
Linearity[3]	< 0.4% F.S.
Repeatability[4]	± 0.05% F.S.
Operating Temperature Range	-40 to 80°C
Environmental Ingress	IP65
Fatigue Life (Tested to)	16x 10^6 cycles at 63 mm stroke
Temperature Dependence	0.006%/ °C F.S.
Physical Properties	
Dimensions (mm)	190 L x 175 W x 90 H
Weight	< 3.1 kg
Material	Hardcoat anodized aluminum
Wire Pull-Cable Length	2 m with 6 mm loop termination
Fiber Optic Connection	Internal to gage, accepts cables between 3 to 7 mm diameter
Fastening Method	Bolt-on, two 8.8 mm dia. holes
Optical Properties	
Peak Reflectivity (Rmax)	> 70%
FWHM (- 3 dB point)	0.25 nm (± .05 nm; apodized grating)
Isolation	> 15 dB (@ ± 0.4 nm around center wavelength)

Ordering Information

os5500-rrr-wwww/wwww-1xx

rrr — Range
150 150mm
300 300mm
450 450mm

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

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

Ordering Information Example

os5500-300-1521/1523-1FS

Notes

1. Does not include overtravel. For the 150 mm, 300 mm, and 450 mm options overtravel is 310 mm, 160 mm and 10 mm respectively

2. Full scale at room temperature, measured on a calibrated displacement stage using a Luna sm130

3. Based on nominal performance

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