



Product Data Sheet: GeoWAN Optical Displacement Sensor Node

The GeoWAN Optical Displacement Sensor Node is an instrument which uses optical means to take high precision displacement measurements and pass these through Senceive's GeoWAN wireless communications network to a GeoWAN Gateway.

It can also be combined with Senceive's world-leading triaxial tilt sensor to obtain high precision tilt measurements that are linked to an external reference.

Optical Displacement sensing is perfect for many applications, including those measuring:

- Convergence / divergence for Tunnel / Arch intrados or bridge abutments
- Vertical movements for structural settlement or heave
- Lateral movements such as rail track slew
- Earthworks and embankment movement



Key Features

- Fully integrated unit
- Extremely low noise performance
- Optical sensor resolution of 0.1mm and repeatability of ± 0.15 mm
- Tilt sensor resolution of 0.0001° (0.0018 mm/m) and repeatability of $\pm 0.0005^\circ$ (± 0.009 mm/m)
- Integrated long life battery
- Up to 10 year battery life
- Easy to align with target when using the magnet triggered aiming mode
- Integrated temperature sensor
- Versatile mounting options
- Waterproof to IP66 / IP67 / IP68



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Specifications

Physical Specifications

Dimensions	90 x 90 x 60 mm (excluding antenna and vent) 90 x 96 x 60 mm (excluding antenna)
Total Mass	0.6 kg (approx.)
Housing Material	Die cast aluminium body
International Protection Marking	IP66 / IP67 IP68 (1m for 24 hours)
Mounting Options	1/4" UNF holes in bottom, M4 blind holes in side Plates and brackets available for magnetic fixing, track bed, stake and pole mounting, and many other applications
Operating Temperature Range	-10°C to +40°C (full functionality) -25°C to +70°C (temperature and tilt only)

Internal Battery

Battery Type	Lithium Thionyl Chloride, non-rechargeable
Nominal Voltage	3.6V
Nominal Capacity	19000mAh
Typical Battery Life	10 years at 1 hour reporting interval when using radio preset 1 8 years at 30 minute reporting intervals when using radio preset 1 Consult with Senceive for your application

GeoWAN Radio Specifications

Communication Type	Star Topology
Frequency Band (868 variant)	863MHz - 870MHz ISM Band
Frequency Band (902 variant)	902MHz - 928MHz ISM Band
Frequency Band (915 variant)	915MHz - 928MHz ISM Band
Maximum Transmit Power (868 variant)	14dBm conducted
Maximum Transmit Power (902 variant)	18dBm conducted
Maximum Transmit Power (915 variant)	18dBm conducted
Maximum Antenna Gain	1.8dBi
Range	Up to 15km depending on the environment and fitted antenna Consult with Senceive for your application



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Optical Sensor Specifications

Resolution	0.1mm
Repeatability	±0.15mm
Range	50 metres (natural surface) 100 metres (white target) 150 metres (reflecting target)
Laser Type	Class 2, 655nm (visible red)

Tilt Sensor Specification

Resolution	0.0001° (0.00175mm/m)
Repeatability (-IX variant)	±0.0005°(±0.0087mm/m)
Repeatability (-IXH variant)	±0.0025°(±0.0436mm/m)
Range	±90°

Sampling and Reporting

Maximum Reporting Frequency	30 seconds
Sample Storage	Stores the last 36 days of samples at a reporting interval of 30 minutes (22 days including tilt)

Certifications

- Tested to conformity with all the essential requirements of the Radio Equipment Directive 2014/53/EU and RoHS Directive 2011/65/EU
- FCC Grant of Equipment Authorization: FCC ID 2AMFBLR3N
- ACB ISED Canada Certificate: 24373-LR3N
- RCM (Australia and New Zealand)
- Tested to conformity with IEC61010-1:2010/AMD1:2016 for CB Test Certificate GB EMT 1479



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Ordering Information and Accessories

LR3N-LDS(868)	GeoWAN Optical Displacement Sensor Europe
LR3N-LDS-IX(868)	GeoWAN Optical Displacement Sensor with integrated Triaxial Tilt Sensor Europe
LR3N-LDS-IXH(868)	GeoWAN Optical Displacement Sensor with integrated Triaxial Tilt Sensor (High-g) Europe
LR3N-LDS(902)	GeoWAN Optical Displacement Sensor North America, South America
LR3N-LDS-IX(902)	GeoWAN Optical Displacement Sensor with integrated Triaxial Tilt Sensor North America, South America
LR3N-LDS-IXH(902)	GeoWAN Optical Displacement Sensor with integrated Triaxial Tilt Sensor (High-g) North America, South America
LR3N-LDS(915)	GeoWAN Optical Displacement Sensor Australia, New Zealand, Chile, Brazil
LR3N-LDS-IX(915)	GeoWAN Optical Displacement Sensor with integrated Triaxial Tilt Sensor Australia, New Zealand, Chile, Brazil
LR3N-LDS-IXH(915)	GeoWAN Optical Displacement Sensor with integrated Triaxial Tilt Sensor (High-g) Australia, New Zealand, Chile, Brazil
FF-MP-PRL-S	Precision Laser Bracket with swivel mount
FF-MP-PRL-M	Precision Laser Bracket with magnetic mount
FF-MP-PRL-RS	Precision Laser Bracket with right angle swivel mount
FF-MP-PRL-RM	Precision Laser Bracket with right angle magnetic mount
FA-LR-WPS	Waterproof straight antenna Overall node height 168mm (approx) when antenna fitted Maximum gain +1.8dBi

CONTACT US

For information on our award-winning wireless asset condition monitoring solutions, call **+44 (0) 207 731 8269**, email **info@senceive.com**, visit **www.senceive.com**