



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.

Successfully applied in 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 0.1 mm 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





GeoWAN Optical Displacement Sensor Node

Parameter	Value
Dimensions (excluding antenna and vent)	90 x 90 x 60 mm
Dimensions (excluding antenna)	90 x 96 x 60 mm
Total Mass	0.6 kg (approx.)
Housing Material	Die cast aluminium body
Internal Protection Marking	IP66 / IP67 IP68 (1 m for 24 hours)
Mounting Options	1/4" UNF holes in bottom, M4 blind holes in side Plates and brackets available for magnetic fixing, trackbed, 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

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

Optical Sensor Specification

Parameter	Value
Resolution	0.1 mm
Repeatability	±0.15 mm
Range	0.05 - 50 metres (natural surface) 0.05 - 100 m (white target) 40 - 150 m (reflecting target)
Laser Type	Class 2, 655nm (visible red)





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GeoWAN Radio Specifications

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

Tilt Sensor Specification

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

Sampling and Reporting

Parameter	Value
Maximum Reporting Frequency	30 seconds
Sample Storage	Stores the last 29 days of samples at a reporting interval of 30 minutes (18 days including tilt)



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GeoWAN Optical Displacement Sensor Node

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
- ACB ISSED Canada Certificate: 24373-LR3N
- RCM (Australia and New Zealand)

Ordering Information and Accessories

Model	Description
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

