GeoWAN™

Product Data Sheet

GeoWAN 2.0 Optical Displacement Sensor with integrated Triaxial Tilt Sensor (High-G) Node

The GeoWAN 2.0 Optical Displacement Sensor with Triaxial Tilt Sensor (High-G) 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

Integrated software:

- WebMonitor (Data visualisation)
- Senceive.io (Data management)
- NFC (In-field hardware management tool)

Key features

- Fully integrated unit
- Extremely low noise performance
- Internal antenna
- 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 ±0.0025° (±0.0436 mm/m)
- Changeable batteries
- 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

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GeoWAN 2.0 Optical Displacement Sensor Node

Physical Specifications

Parameter	Value
Dimensions (L x W x H)	105 x 105 x 64 mm
Total Mass	440 g (approx.) including D-size battery
Housing Material	PC plastic body and lid cover with die cast aluminium base
Internal Protection Marking	IP66
Mounting Options (size and number of holes for mounting plate connection)	M4 holes in bottom, 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, D-cell
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*
Recommended options*	Senceive: SP-C03282-1 Saft: LS33600

*Batteries from other suppliers may work but we provide no guarantee on performance

Optical Sensor Specification

Parameter	Value
Resolution	0.1 mm
Repeatability	±0.15 mm
Range	0.05 - 50 m (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 2.0 Optical Displacement Sensor Node

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
Internal Antenna Maximum Gain	+0.17 dBi (internal)
Range (with internal antenna)	Up to 12 km depending on the environment Trackbed: 1 km Tunnel: 2 km Urban: 2.3 km Line of Sight: 12 km *Consult with Senceive for your application and/or external antenna options*

Tilt Sensor Specification

Parameter	Value
Resolution	0.0001° (0.00175 mm/m)
Repeatability (-IXH model)	±0.0025° (±0.0436 mm/m)
Range	±90°

Sampling and Reporting

Parameter	Value
Maximum Reporting Frequency	30 seconds
Sample Storage*	Stores up to 40,000 sampling cycles in a circular buffer

*Retrieval is only available locally via NFC. The unit is not intended to operate as an offline data logger and requires a network connection to maintain an accurate clock

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GeoWAN 2.0 Optical Displacement Sensor Node

Certifications - to be obtained

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

Ordering Information and Accessories

Model	Description
L3N1-LDS-IXH(868)	**GeoWAN 2.0 Optical Displacement Sensor with integrated Triaxial Tilt Sensor (High-g)** Europe
L3N1-LDS-IXH(902)	**GeoWAN 2.0 Optical Displacement Sensor with integrated Triaxial Tilt Sensor (High-g)** North America
L3N1-LDS-IXH(915)	**GeoWAN 2.0 Optical Displacement Sensor with integrated Triaxial Tilt Sensor (High-g)** Australia, New Zealand

Accessories	Description
FF-MP-PRLN-S	**G2.0 Precision Optical Bracket with swivel mount**
FF-MP-PRLN-M	**G2.0 Precision Optical Bracket with magnetic mount**
FF-MP-PRLN-RS	**G2.0 Precision Optical Bracket with right angle swivel mount**
FF-MP-PRLN-RM	**G2.0 Precision Optical Bracket with right angle magnetic mount**
FF-MP-S360N	**G2.0 Swivel mounting kit with 360-degree adjustment range** Screw directly to vertical walls
FF-MP-RSN	**G2.0 Right angle swivel mount** Screw to concrete tunnel linings and inclined walls
FF-MP-T2N	**G2.0 Trackbed two-part mounting plate kit**
FF-MP-V (Order with FF-MP-S360N)	**Vertical mounting plate** Use U-bolts to fix to poles or stakes Use glue to fix to walls where drilling is not permitted
FF-MP-M2N	**G2.0 two-part magnetic mounting kit** High degree of adjustability, perfect for cast iron lined tunnels
FF-MK-N	**G2.0 Magnetic mounting kit** Perfect for steel or cast iron structures
FF-BK-xxxx FF-BE	**Tilt beam kit** See separate datasheet for more information
SP-C03282-1	**G2.0 ER34615 3.6V 19Ah Battery** Senceive provided, suitable for GeoWAN 2.0 nodes
FA-G2-SMA	**Replacement G2.0 Lid for External Antenna (SMA)**

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