EDGE DEVICES – WIRELESS SENSORS

Laser Distance Meter

LS-G6-LASER

The Loadsensing laser distance meter wireless sensor measures the relative distance between pairs of reference points. One of the two points can be a natural surface or target foils while the node can be placed at the other end point. It can be used to measure changes in the distance between walls, tunnel convergence, bearing and joint movements in bridges, lifting and placement of structures and movements of historical buildings. It can also be used to monitor slope movements and for fracture and faults surveillance.

Network Management Software
The Loadsensing laser distance wireless sensor is capable of transmitting data via long-range radio to a gateway connected to the Internet. One gateway can support hundreds of Loadsensing edge devices in the same network that are also measuring other sensors installed in the monitoring sections (borehole extensometers, pressure cells, load cells, strain gauges etc.). It can be easily configured and connected with a USB cable and an Android phone.

Work without disruptions
Measurement of tunnel convergence is one of the most important controls of the NATM (New Austrian Tunneling Method) construction. Portable devices like tape extensometers, levels and temporarily installed total stations allow sporadic measurements. On the other hand, one of the most commonly used methods, the measuring tape, disrupts construction activities due to the use of aerial work platforms.

Laser distance meter wireless sensors may be easily relocated along the convergence cross sections up to the excavation front or until the measured relative displacements are stabilized when the required frequency of measurements is reduced. It can also be used when permanent monitoring is required. The wireless sensor can also measure deformations in underground excavations and mining without causing work disruptions and delays.

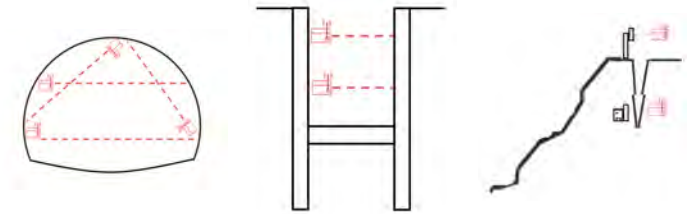| FEATURES |
| --- |
| Wireless sensor. |
| Accurate distance measurement. |
| Long battery life (>6 years @1h sampling rate). |
| Reduced size (150 x 100 x 61 mm). |
| Visible Laser Class II laser with 655 nm. |
| High repeatability. |
| **SOFTWARE** |
| User-friendly Android configuration app included. |
| Pointing mode for an easy installation. |
| Web browser software (CMT Edge and CMT Cloud). |
| Standard CSV download, FTP push, Modbus TCP, MQTT* and API access. |

APPLICATIONS
Tunnel and mining convergence monitoring.
Deformations in underground excavations.
Remote monitoring of slope movements.
Fracture and faults surveillance.
Bearing and expansion joint movements.
Monitoring displacement in structures and buildings.
ADVANTAGES
High reliability and robustness.
Integrated unit (2-in-1 sensor + data node).
Long-range communications (up to 15 km / 9 miles).
Low-power, long battery life (over 5 years).
Robust, small and weather-proof box.
Easy configuration.

Note: Specifications are subject to review and change without notice.

www.worldsensing.com
connect@worldsensing.com

Barcelona
Viriat 47, Edificio Numancia 1, 10th floor,
08014 Barcelona, Spain
(+34) 93 418 05 85

London   Los Angeles   Singapore

Main specifications

GENERAL

Battery life		Life time estimates are based on distance measurements between 10 and 20 m and a model considering Barcelona temperature profile.
sampling rate 5 min	1.5 years	
sampling rate 1 h	6.4 years	
sampling rate 6 h	8.5 years	

Battery type	2 x 3.6V C-Size user-replaceable batteries (recommended Saft LSH 14).
Sampling rate	30 seconds to 1 day.

Internal temperature collected and transmitted at each reading (Accuracy: ±1 °C).

Configuration software   Android App.

App features: Pointing mode and radio signal coverage tests for easy installation.

LASER DISTANCE METER

Measuring range at favorable conditions	0.05 to 150 m
Typical measuring accuracy	±1 mm
Resolution	0.1 mm
Repeatability (1 sigma)	0.15 mm
Laser type (light source)	Visible Laser Class II laser with 655 nm

Accuracy	in favorable conditions**	in unfavorable conditions***
@ 1 m	±1 mm	±2 mm
@ 10 m	±1 mm	±2 mm
@ 20 m	±1.5 mm	±3 mm
@ 50 m	±4 mm	±7 mm
@ 100 m	±9 mm	±15 mm
@ 150 m	±16 mm	not applicable

** on natural objects (white wall, low target illumination <3K lx, moderate temperatures).

MEMORY

Reading capacity	200 000 readings.

MECHANICAL

Box dimensions (WxLxH)	100x100x61 mm.
Overall dimensions	150x100x61 mm (excluding antenna).
Operating temperature	-10ºC to +50ºC
Storage temperature	-25ºC to + 70ºC
Weather protection	IP67
External antenna	100 mm length (including connector).
External Port	mini USB port for configuration and data access; can also be used to power the node.
Box material	Aluminium alloy.

RADIO – ISM sub 1 GHz operating frequency bands adjustable

Range open field	15 km
Range city street	4 km
Range manhole in a city street	2 km
Tunnel	4 km
Bidirectional communications	Remote sampling rate change / Clock synchronization.
Maximum link budget	151 dB / 157 dB
Configuration	

Accessories
Other mounting brackets and accessories available on request.

Adjustable mounting plate for vertical or horizontal surfaces.

Swivel mounting bracket. It can be mounted on a wall or on a convergence bolt with 3/8" male thread.

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