



LT2004-20k

# LASER TRIANGULATION DISTANCE SENSOR

- **APPLICATION TO NON-CONTACT MEASUREMENT OF DISPLACEMENT/VIBRATIONS/DISTANCE**

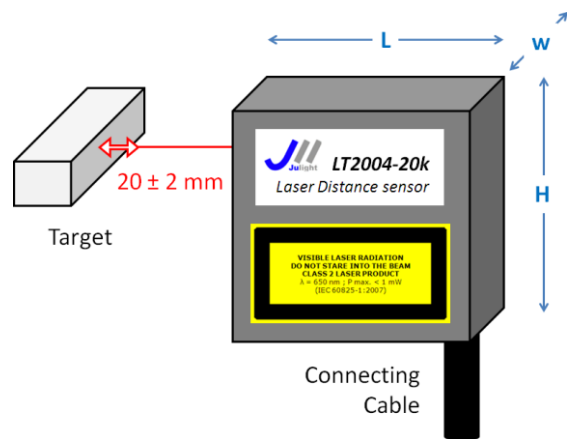
- **DISPLACEMENT ANALOG OUTPUT**
- **2 MICRON RESOLUTION**
- **CLASS 2 LASER**

- **FREQUENCY RANGE: FROM DC UP TO 20 KHz**
- **SELECTABLE LP FILTER: 0.3/1/3/10 KHz, FULL BW**

## PRINCIPLE OF OPERATION

Julight LT2004-20k is a laser distance sensor, based on the reliable triangulation principle: a collimated laser beam forms a spot on the surface of the target and the diffusely reflected light is projected back onto a Position Sensitive Detector (PSD) via a precision receiving optical system. If the distance between the target and the laser sensor changes, the angle at which the light spot is observed also changes, resulting in a different position of the laser spot image onto the PSD

A properly designed electronic circuit elaborates the information about the position and provides a continuous analog output signal that is the replica of the target surface position/displacement.



## APPLICATION

Julight LT2004-20k laser triangulator sensor is intended for precise measurements of position, displacements and vibrations of almost any kind of surface.

Furthermore, the laser triangulation technique is ideal for any high speed measurement task which requires extremely high accuracy and resolution.

Several advantages can be obtained by using the laser triangulation technique and optical solutions:

- non-contact principle allows to perform measurements without affecting the motion of the object under test;
- static and dynamic measurements can be performed;
- High speed and accuracy can be achieved;

*Customized solutions can be developed according to customer needs. Some of the parameters that can be changed are: output interface; optical configuration and geometry; stand-off distance, dynamic range and bandwidth...*

(\*) <http://www.julight.it/triangulation.html>

### Technical and Physical Characteristics

Stand-off distance	20 mm
Maximum measurable vibration (peak-to-peak)	4 mm
Resolution and Accuracy (time-domain)	2 µm
Bandwidth	Selectable low-pass filter: 300Hz, 1kHz, 3kHz, 10kHz, 20 kHz
Output signal	displacement (analog 0 – 10 V)
Output signal responsivity	1 V/mm
Noise Equivalent Displacement	0.01 µm/√Hz
Spatial transversal resolution	1 mm
Target surface	unpolished metal, non-reflective, diffusive
Laser power	< 1 mW
Laser wavelength	650 ± 10 nm
Laser classification (according to IEC 60825-1:2007)	Class 2
Power supply	-12, 0, +12 VDC
Dimensions (L x H x W)	40 mm x 40 mm x 30 mm
Weight	0.3 kg



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