

LDM 41/42 A

Laser Distance Measurement Sensor



Theory of Operation

The LDM 41/42 A Laser Distance Measurement Sensor is designed for mobile and stationary distance measurement in a industrial environment. The LDM 41/42 A works based on comparative phase measurement. To achieve this, it emits visible laser beams in different frequencies. The target being measured returns diffusely reflected light that is subsequently compared with a reference signal. Finally, a microprocessor uses the recorded phase shift to calculate a required distance with mm accuracy.

The sensor LDM 41 A distinguishes itself through a high precision as well as a big independence of the surface of the measured object. The LDM 42 A is design for fast measurement on a white target. The red, well visible laser beam allows a simple alignment.

Applications

- Supervision of crane and conveyors
- Distance and position measurement
- Expletive-stand-measurement
- Supervision of security-relevant parts
- Supervision of walking beam systems / stroke length measurement / position of lifts
- Position control
- Diameter measurement of coils

Characteristics

- millimetre precise measurement at various surfaces (LDM 42 A only for white surface)
- long range reflector-less distance measurement, with additional reflectors on the object over 100m with additional reflectors¹ mounted onto target
- high availability under in the high temperature area with high precision
big supply voltage range 10 V until 30 V DC
- risk less use because of laser class 2
- simple alignment with a visible laser class
- bi-directional data-interface, switching and analogue output
- simple setup for parameter with a PC or laptop
- measured values are displayed in meters, decimetre, centimetre, feet, inch... and different resolutions due to free scaling
- stable and simple to installing housing with protection IP 65
- Profibus DP via UNIGATE Gateway

¹ e.g. 3M, self adhesive foil white non glossy

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No-contact measurement techniques for length, width, distance, position, velocity; laser; CCD-cameras
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Technical Data

Application	Distance-measurement for solid surfaces without reflector
Measuring range ²	0.1 m up to 30 m with natural surfaces, more than 100 m achievable, depending on target reflectance
Measuring accuracy ³	± 3 mm (+15 °C up to +30 °C), ± 5 mm (-10 °C up to +50 °C) ± 2 mm under defined measuring conditions ⁴ ,
Resolution	max. 0.1 mm , user scalable
Reproducibility	± 0.5 mm
Operating modes	distance tracking DT, DW, DX only LDM 42 A, single measurement DM, trigger mode DF
Measuring time	0.16 up to 6 s setup or auto mode DT 0.1 s mode DW at white surface 20 ms mode DX at white surface (only LDM 42 A)
Laser Class	Laser Class 2 under DIN EN 60825-1:2001-11, ≤1 mW, 650 nm (visible red)
Laser divergence ⁵	0,6 mrad
Operating temperature	-10 °C up to +50 °C
Storage temperature	-40 °C up to +70 °C
Data interface ⁶	RS232 or RS422 <ul style="list-style-type: none"> • 2400, 4800, 9600, 19200, 38400 Baud, ASCII, 8N1 • Programming with Windows terminal program (for example LDMTool or HyperTerminal) • programmable automatic start of measurement after switching on
Analog output	4 mA up to 20 mA current output <ul style="list-style-type: none"> • programmable distance range limits, load resistance ≤ 500 Ω • accuracy: ± 0.15%, temperature drift: < 50 PPM/°C
Digital switching output	"high-side switch" , programmable switching threshold and hysteresis, rated for max. load of 0.5 A
Supply voltage	10 up to 30 V direct voltage
Power consumption	depending on operating mode < 0.4 W for standby, < 1,5 W for distance tracking
Dimensions	approx. 212 x 96 x 50 (L x W x H) in mm
Mounting	100 x 85 in mm, 4 x M6 holes
Weight / protection class	Aluminum approx. 850 g / IP 65
EMV	EN 61000-6-2 and EN 55011
Shock resistance	10 g / 6 ms persistence shock DIN ISO 9022-3-31-01-1
Scope of delivery	Sensor with male plug, female cable connector with prefabricated cable 2 m, customers side open, user manual
Options	Cable with varied length, connecting Box, Profibus Gateway, software, filter and protection glass

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² dependent on target reflectance, stray light influences and atmospheric conditions

³ statistic spread 95 %

⁴ for measurement at a planar white target surface in continues movement or still standing, approx. 20 °C

⁵ at 10 m distance the beam diameter is 6 mm, at a distance of 50 m it is 3 cm and at a distance of 100 m it is 6 cm

⁶ convertible, conversion to be carried out by certified personnel

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