

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 etc. 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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Technical Data

Application	Distance-measurement for solid surfaces without reflector
Measuring range²	0.1 m up to 30 m with natural surfaces, more than 100 m achievable, depending on target reflectance
Measuring accuracy³	± 3 mm (+15 °C up to +30 °C), ± 5 mm (-10 °C up to +50 °C) ± 2 mm under defined measuring conditions ⁴ ,
Resolution	0.1 mm , user scalable
Reproducibility	± 0.5 mm
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 divergence⁵	0,6 mrad
Operating temperature	-10 °C up to +50 °C
Storage temperature	-40 °C up to +70 °C
Data interface⁶	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 distance tracking, single measurement, trigger mode
Operating modes	
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