LDM 41/42 A

Laser Distance Measurement Sensor

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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 and rolls

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 reflectors[1] mounted onto target
- high availability under in the high temperature area with high precision
- big supply voltage range 10 V until 30 V DC
- optional heating (24 W at 24 V operating voltage, option /h)
- low risk 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
- various accessories; device versions with field bus connection

[1] e.g. 3M, self adhesive foil matte white, or with greater distance with reflective foil type 3290

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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 or with additional reflectors
Measuring accuracy [3]	**± 2 mm** under defined measuring conditions [4] **± 3 mm** (+15 °C up to +30 °C), ± 5 mm (-10 °C up to +50 °C)
Resolution	**0.1 mm**, user scalable, standard 1mm
Reproducibility	**± 0.5 mm**
Measuring time	**0.24 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 EN60825-1:2007, ≤1 mW, **650 nm (visible red)**
Laser divergence [5]	0,6 mrad
Data interface [6]	**RS232 or RS422** • 2400, 4800, 9600, 19200, 38400 Baud, ASCII, 8N1 • Programming with Windows program (LDMTool or HyperTerminal) • programmable automatic start of measurement after switching on
Analog output	**4 mA up to 20 mA current output** • programmable distance range limits • programmable on error event, 3 mA or 21 mA • load resistance ≤ 500 Ω • accuracy: ± 0.15%, temperature drift: < 50 PPM/°C
Digital switching output	**"high-side switch", rated for max. load of 0.5 A**, programmable switching threshold and hysteresis
Trigger input	programmable trigger slope and delay, trigger pulse 3 up to 24 V
Supply voltage	**10 up to 30 V direct** (protected against polarity reversal) [7]
Power consumption	< 1,5 W for distance tracking, < 0.4 W for standby < 24 W with heating active (LDM 41/42 A /h only)
Operating temperature	**- 10 °C up to + 50 °C** **- 40 °C up to + 50 °C (only LDM 41/42 A /h)**
Storage temperature	- 40 °C up to + 70 °C
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	approx. **760 g / IP 65**
EMV	EN 61326-1
Shock resistance	10 g / 6 ms persistence shock DIN ISO 9022-3-31-01-1
Options	Cable with varied length, connecting box, software LDMTool, protection tube and cases, 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, +15 up to +30 °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] please specify when ordering
[7] Please use only 24V DC For devices with heating (LDM 41/42 A / h). The heater is connected directly to the power supply.

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