

LDM 40 A

Laser Distance Measurement Sensor



Theory of Operation

The LDM 40 A Laser Distance Measurement Sensor is designed for mobile and stationary distance measurement in a industrial environment. The LDM 40 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 40 A distinguishes itself through a high precision as well as a big independence of the surface of the measured object. 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
- Position control
- Diameter measurement of coils

Characteristics

- long range reflector-less distance measurement, with additional reflectors on the object over 100 m 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
- low and constant power consumption < 1,5 W (without I_{Alarm})
- simple alignment with a visible laser beam
- 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
- Laser Class 2 under DIN EN 60825-1:2001-11
- stable and simple to installing housing with protection IP 65
- Profibus DP via UNIGATE Gateway

¹ 3M, Type 3270, 3290, 5290

ASTECH Angewandte Sensortechnik GmbH

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 range²	0.2 m up to 30 m with natural surfaces, more than 100 m achievable, depending on target reflectance
Measuring accuracy³	± 2 mm under defined measuring conditions ⁴ , else ± 3 mm (+15 °C up to +30 °C), ± 5 mm (-10 °C up to +50 °C)
Resolution	0.1 mm, user scalable
Reproducibility ⁵	± 0.5 mm
Measuring time	0.16 up to 6 s or 0.1 s (10 Hz) on white surface
Laser Class	Laser Class 2
Laser divergence ⁶	under DIN EN 60825-1:2001-11, 650 nm (visible) 0,6 mrad
Operating temperature	-10 °C up to +50 °C
Storage temperature	-20 °C up to +70 °C
Data interface⁷	RS232/RS422 <ul style="list-style-type: none">• 2400, 4800, 9600, 19200, 38400 Baud, ASCII, 8N1• Programming with Windows terminal program (for example HyperTerminal)• programmable automatic start of measurement after switching on
Analog output	4 mA 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 DC, < 1.5 W
Power consumption	depending on operating mode < 0.4 W for standby, < 1,5 W for distance tracking
Enclosure	Aluminium, IP 65
Dimensions	approx. 187 x 96 x 50 (L x W x H) in mm
Weight	approx. 850 g
Mounting	100 x 85 in mm, 4 x M6 holes
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 1.5 m cable one-sidedly open, User Manual
Options	Connecting box, Profibus Gateway

Version 2.5 last changes 2004-08-01 File LDM40A_DATA_E.doc

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 continuous movement or still standing, approx. 20 °C

⁵ dependent on target reflectance, stray light influences and atmospheric conditions

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

⁷ convertible, conversion to be carried out by certified personnel

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