

DIGITAL LASER DISTANCE METER

LD05e-A30-PH67

The Digital Laser Distance Meter *RIEGL* LD05e-A30-PH67 is a successor of the LD90-31K-HiP with an IP67-specified housing.

State-of-the-art **digital signal processing** enables precise distance measurement for complex multi-target situations even under bad visibility conditions.

Digitizing the echo signal and subsequent analyzing allows multi-target distance measurements. Four target distances can be detected and provided for each laser shot.

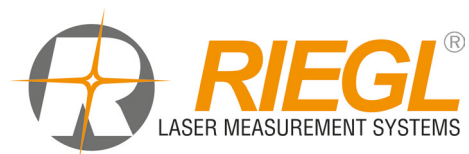


The LD05e-A30-PH67 is especially designed for the use without reflectors. It offers extremely “High Penetration”-capabilities under conditions of bad visibility and is therefore ideally suited for long-range applications in ship-docking systems and for laser altimetry, etc.

Its **High Penetration Mode** allows for acquisition of highly accurate and reliable data in complex target situations, based on a sequence of laser shots and a self-adapting (rather low) data update rate. Additionally, pre detection-averaging allows significant enhancement of the maximum range.

- Short infrared laser pulses providing **excellent interference immunity**
- Narrow measurement beam with low divergence for **excellent spatial resolution**
- **Measurement to almost any surface** regardless of the angle of incidence of the beam and the surface characteristics
- Stable aluminium housing, ready **to be used in harsh industrial environments**.
- Different pre-configured measurement modes, but also **individually programmable for customer specific applications**

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Performance Examples

The following **pre-configured High Penetration Modes** with different measuring times are available.

Measurement Program 0, measuring time 0.3 sec

Measurement range ¹⁾ for natural targets, $\rho \geq 80\%$ for natural targets, $\rho \geq 10\%$ reflector foil ²⁾ & plastic cat's-eye reflector	up to 1100 m up to 400 m up to 1850 m
Minimum range ³⁾	1 m
Measurement accuracy ^{4) 5)}	typ. ± 25 mm
Pre Averaging ⁶⁾ with PRR of 2000 Hz	600
Measurement rate ⁷⁾	3.33 Hz
Max. number of targets ⁸⁾	4

Measurement Program 1, measuring time 0.5 sec

Measurement range ¹⁾ for natural targets, $\rho \geq 80\%$ for natural targets, $\rho \geq 10\%$ reflector foil ²⁾ & plastic cat's-eye reflector	up to 1250 m up to 450 m up to 2100 m
Minimum range ³⁾	1 m
Measurement accuracy ^{4) 5)}	typ. ± 25 mm
Pre Averaging ⁶⁾ with PRR of 2000 Hz	1000
Measurement rate ⁷⁾	2 Hz
Max. number of targets ⁸⁾	4

- 1) The following conditions are assumed
 - target is larger than footprint of laser beam
 - perpendicular angle of incidence
 - visibility 10 km
 - typical values for average ambient brightness conditions. In bright sunlight, the operational range is considerably shorter than under an overcast sky. At dawn or at night the range is even higher.
- 2) Reflecting foil 3M DG4090 or equivalent, dimensions $\geq 0.45 \times 0.45$ m².
- 3) Minimum distance 5 m for full accuracy with retro-reflecting targets.
- 4) One sigma standard deviation @ 50 m range under *RIEGL* test conditions.
- 5) Plus distance depending error $\leq \pm 20$ ppm.
- 6) For each laser pulse emitted by the instrument, the echo signal is sampled and digitized. Digitized signals of single laser shots can be summed to a total signal, thereby increasing the sensitivity and the maximum range at which a target can be measured. Summing of single laser shot signals is called pre-detection averaging.
- 7) With self-adapting measurement time selected, the effective data update rate depends on the number of targets and their reflectivity and distance.
- 8) If the laser beam hits, in part, more than one target, the laser's pulse power is split accordingly. Thus, the achievable range is reduced.

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Measurement Program 2, measuring time 1 sec

Measurement range ¹⁾ for natural targets, $\rho \geq 80\%$ for natural targets, $\rho \geq 10\%$ reflector foil ²⁾ & plastic cat's-eye reflector	up to 1500 m up to 550 m up to 2500 m
Minimum range ³⁾	1 m
Measurement accuracy ^{4) 5)}	typ. ± 25 mm
Pre Averaging ⁶⁾ with PRR of 2000 Hz	2000
Measurement rate ⁷⁾	1 Hz
Max. number of targets ⁸⁾	4


Measurement Program 3, measuring time 2 sec

Measurement range ¹⁾ for natural targets, $\rho \geq 80\%$ for natural targets, $\rho \geq 10\%$ reflector foil ²⁾ & plastic cat's-eye reflector	up to 1650 m up to 600 m up to 2750 m
Minimum range ³⁾	1 m
Measurement accuracy ^{4) 5)}	typ. ± 25 mm
Pre Averaging ⁶⁾ with PRR of 2000 Hz	4000
Measurement rate ⁷⁾	0.5 Hz
Max. number of targets ⁸⁾	4

- 1) The following conditions are assumed
 - target is larger than footprint of laser beam
 - perpendicular angle of incidence
 - visibility 10 km
 - typical values for average ambient brightness conditions. In bright sunlight, the operational range is considerably shorter than under an overcast sky. At dawn or at night the range is even higher.
- 2) Reflecting foil 3M DG4090 or equivalent, dimensions $\geq 0.45 \times 0.45$ m².
- 3) Minimum distance 5 m for full accuracy with retro-reflecting targets.
- 4) One sigma standard deviation @ 50 m range under *RIEGL* test conditions.
- 5) Plus distance depending error $\leq \pm 20$ ppm.
- 6) For each laser pulse emitted by the instrument, the echo signal is sampled and digitized. Digitized signals of single laser shots can be summed to a total signal, thereby increasing the sensitivity and the maximum range at which a target can be measured. Summing of single laser shot signals is called pre-detection averaging.
- 7) With self-adapting measurement time selected, the effective data update rate depends on the number of targets and their reflectivity and distance.
- 8) If the laser beam hits, in part, more than one target, the laser's pulse power is split accordingly. Thus, the achievable range is reduced.



Laser Specifications

Wavelength	near infrared
Beam divergence ¹⁾	1.6 x 1.7 mrad
Pulse repetition rate (PRR)	2000 Hz
Laser product classification according to IEC 60825-1:2014 / EN 60825-1:2014/A11:2021 The following clause applies for instruments delivered into the United States: Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed.3., as described in Laser Notice No. 56, dated May 8, 2019.	Laser Class 1M  Viewing the laser output with certain optical instruments (for example telescopes and binoculars) may pose an eye hazard.

1) Measured at the 1/e² points. 1mrad corresponds to 10 cm beam width per 100 m distance.

General Technical Data

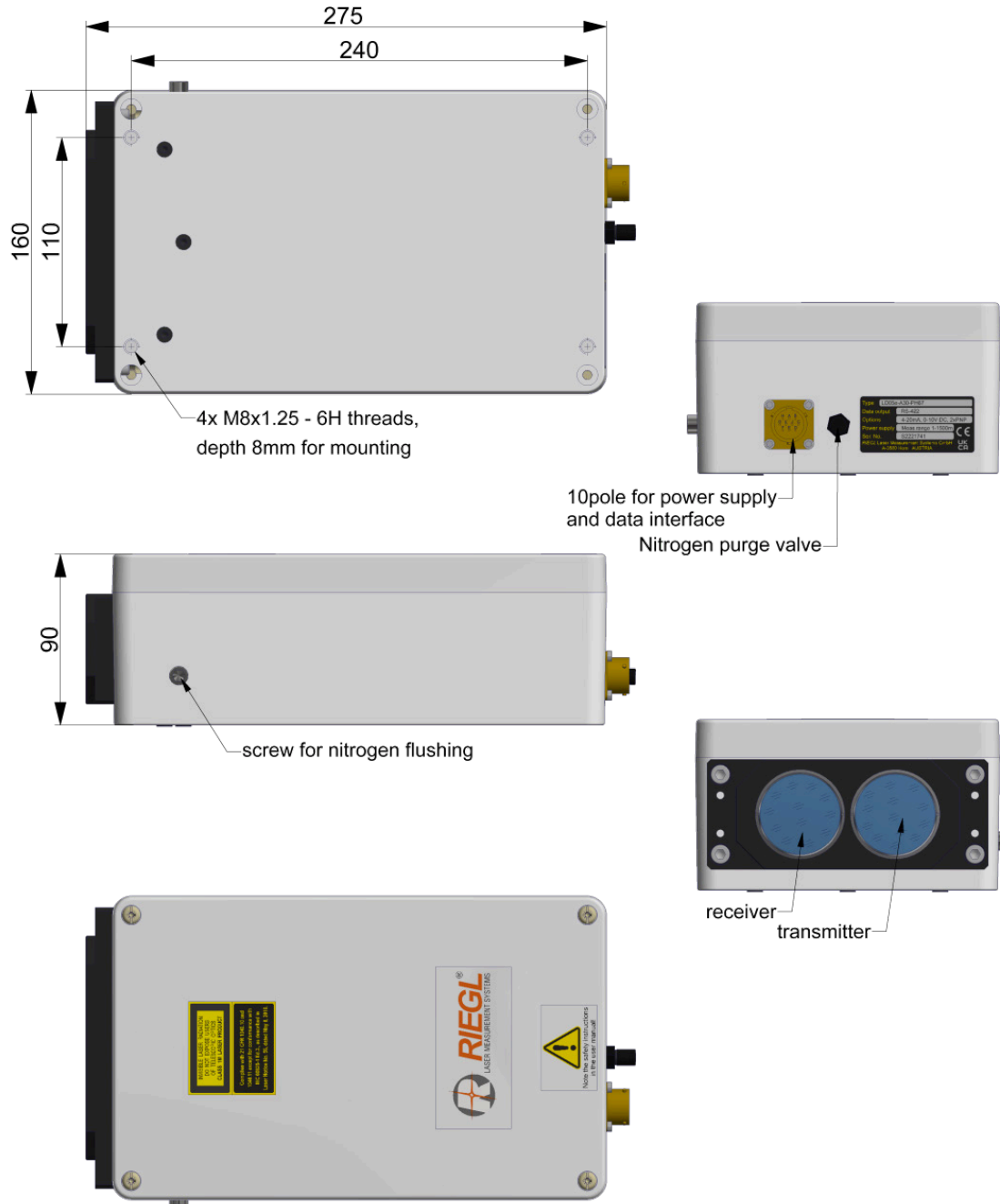
Data interfaces	
Data port	RS-422
Configuration port	RS-422
Power supply	20 – 28 VDC, 24 VDC nominal
Power consumption	typ. 15 W
Main dimensions (L x W x H) mm	275 x 160 x 90
Weight	approx. 3.6 kg
Protection class	IP 67
Temperature range	
Operation	-10°C up to +50°C ¹⁾
Storage	-20°C up to +60°C ¹⁾
Mounting	4x M8x1.25 - 6H threads, depth 8mm, at the bottom of the housing.

1) The life expectancy (MTBF) of the instrument is reduced in case of operation and/or storage at high temperatures.

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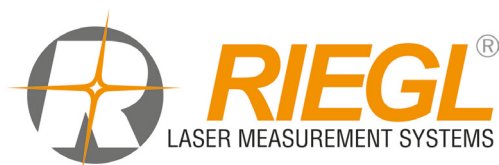


Dimensional Drawings



all dimensions in mm

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RIEGL Laser Measurement Systems GmbH, 3580 Horn, Austria
Tel.: +43-2982-4211, E-mail: office@riegl.co.at, www.riegl.com
RIEGL USA Inc., E-mail: info@rieglusa.com, www.rieglusa.com
RIEGL Japan Ltd., E-mail: info@riegl-japan.co.jp, www.riegl-japan.co.jp
RIEGL China Ltd., E-mail: info@riegl.cn, www.riegl.cn
RIEGL Australia Pty Ltd., E-mail: info@riegl.com.au, www.riegl.com.au
RIEGL Canada Inc., E-mail: info@rieglcanada.com, www.rieglcanada.com
RIEGL UK Ltd, E-Mail: info@riegl.co.uk, www.riegl.co.uk