

# 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.

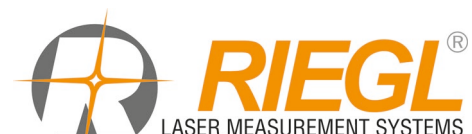


The LD05e-A30-PH67 is especially designed for the use without reflectors. It offers extremely "High Penetration"-capabilities under conditions of bad visibility and is therefore ideally suited for long-range applications in ship-docking systems and for laser altimetry, etc.

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**

visit our webpage  
[www.riegl.com](http://www.riegl.com)



# Technical Data LD05e-A30-PH67



## Performance Examples

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

### Measurement Program 0, measuring time 0.3 sec

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

### Measurement Program 1, measuring time 0.5 sec

<b>Measurement range</b> <sup>1)</sup> for natural targets, $\rho \geq 80\%$ for natural targets, $\rho \geq 10\%$ reflector foil <sup>2)</sup> & plastic cat's-eye reflector	up to 1250 m up to 450 m up to 2100 m
<b>Minimum range</b> <sup>3)</sup>	1 m
<b>Measurement accuracy</b> <sup>4) 5)</sup>	typ. $\pm 25$ mm
<b>Pre Averaging</b> <sup>6)</sup> with PRR of 2000 Hz	1000
<b>Measurement rate</b> <sup>7)</sup>	2 Hz
<b>Max. number of targets</b> <sup>8)</sup>	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  $\geq 0.45 \times 0.45$  m<sup>2</sup>.
- 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.

# Technical Data LD05e-A30-PH67



## Measurement Program 2, measuring time 1 sec

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

## Measurement Program 3, measuring time 2 sec


<b>Measurement range</b> <sup>1)</sup> for natural targets, $\rho \geq 80\%$ for natural targets, $\rho \geq 10\%$ reflector foil <sup>2)</sup> & plastic cat's-eye reflector	up to 1650 m up to 600 m up to 2750 m
<b>Minimum range</b> <sup>3)</sup>	1 m
<b>Measurement accuracy</b> <sup>4) 5)</sup>	typ. $\pm 25$ mm
<b>Pre Averaging</b> <sup>6)</sup> with PRR of 2000 Hz	4000
<b>Measurement rate</b> <sup>7)</sup>	0.5 Hz
<b>Max. number of targets</b> <sup>8)</sup>	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  $\geq 0.45 \times 0.45$  m<sup>2</sup>.
- 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.

# Technical Data LD05e-A30-PH67



## Laser Specifications

<b>Wavelength</b>	near infrared
<b>Beam divergence</b> <sup>1)</sup>	1.6 x 1.7 mrad
<b>Pulse repetition rate (PRR)</b>	2000 Hz
<b>Laser product classification</b> according to IEC 60825-1:2014  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.

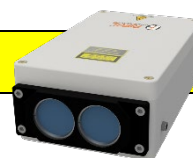
1) Measured at the 1/e<sup>2</sup> points. 1mrad corresponds to 10 cm beam width per 100 m distance.

## General Technical Data

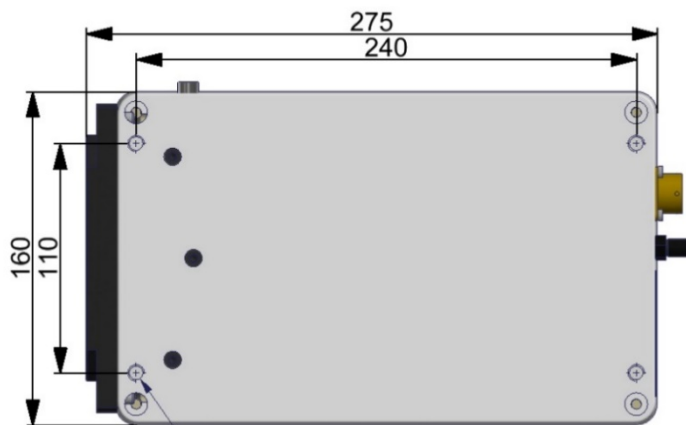
<b>Data interfaces</b>  Data port Configuration port	RS-422 RS-422
<b>Power supply</b>	20 – 28 VDC, 24 VDC nominal
<b>Power consumption</b>	typ. 15 W
<b>Main dimensions (L x W x H) mm</b>	275x160x90
<b>Weight</b>	approx. 3.6 kg
<b>Protection class</b>	IP 67
<b>Temperature range</b> Operation Storage	-10°C up to +50°C <sup>1)</sup> -20°C up to +60°C <sup>1)</sup>
<b>Mounting</b>	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.

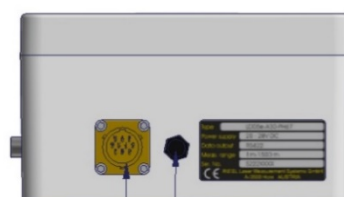
# Technical Data LD05e-A30-PH67



## Dimensional Drawings

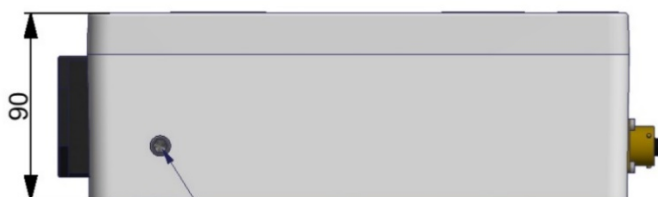


4x M8x1.25 - 6H threads,  
depth 8mm for mounting



10pole for power supply  
and data interface

Nitrogen purge valve



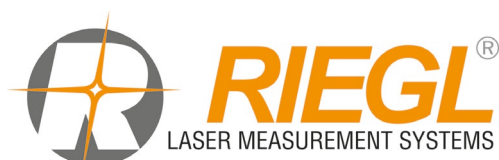
Screw for nitrogen flushing



Receiver

Transmitter

Copyright RIEGL Laser Measurement Systems GmbH © 2021 – All rights reserved. Use of this data sheet other than for personal purposes requires RIEGL's written consent. This data sheet is compiled with care. However, errors cannot be fully excluded and alternations might be necessary. Data Sheet RIEGL LD05e-A30-PH67, 2021-06-15, page 5 of 5



**RIEGL Laser Measurement Systems GmbH**, 3580 Horn, Austria  
Tel.: +43-2982-4211, E-mail: [office@riegl.co.at](mailto:office@riegl.co.at), [www.riegl.com](http://www.riegl.com)  
**RIEGL USA Inc.**, E-mail: [info@rieglusa.com](mailto:info@rieglusa.com), [www.rieglusa.com](http://www.rieglusa.com)  
**RIEGL Japan Ltd.**, E-mail: [info@riegl-japan.co.jp](mailto:info@riegl-japan.co.jp), [www.riegl-japan.co.jp](http://www.riegl-japan.co.jp)  
**RIEGL China Ltd.**, E-mail: [info@riegl.cn](mailto:info@riegl.cn), [www.riegl.cn](http://www.riegl.cn)  
**RIEGL Australia Pty Ltd.**, E-mail: [info@riegl.com.au](mailto:info@riegl.com.au), [www.riegl.com.au](http://www.riegl.com.au)  
**RIEGL Canada Inc.**, E-mail: [info@rieglcanada.com](mailto:info@rieglcanada.com), [www.rieglcanada.com](http://www.rieglcanada.com)

ES France - Département Bio-Tests & Industries - 127 rue de Buzenval BP 26 - 92380 Garches  
Tél. 01 47 95 99 90 - Fax. 01 47 01 16 22 - e-mail: [bio@es-france.com](mailto:bio@es-france.com) - Site Web: [www.es-france.com](http://www.es-france.com)