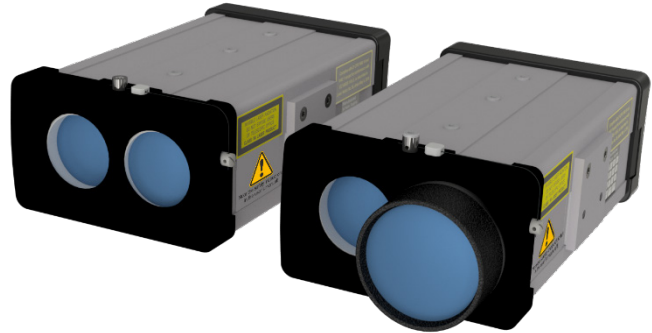


# DIGITAL LASER DISTANCE METERS **LD05-A20, LD05-A30** and **LD05-A40**

The *RIEGL* LD05 is a **multi-purpose laser distance meter** based on precise time-of-flight laser range measurement. It uses state-of-the-art **digital signal processing** enabling 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. Five target distances can be detected and provided for each laser shot.



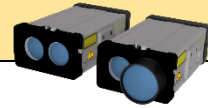
The LD05 can be configured for various application modes:

- **High Penetration and High Accuracy Mode** for complex target situations, based on a sequence of laser shots, self-adapting (rather low) data update rate  
Significant enhancement of the maximum range based on Pre-Detection-Averaging
- **Fast Mode** is between the High Speed and High Penetration Mode, very high data update rate
- **High Speed Mode** for simple target situations, extremely high data update rate


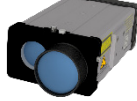
- Short infrared laser pulses providing **excellent interference immunity**
- Narrow measurement beam with low divergence for **excellent spatial resolution**
- **Measurement to almost any surface** regardless of the angle of incidence of the beam and the surface characteristics
- Lightweight, stable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



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





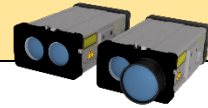
## Performance Examples



|  | LD05-A20   | LD05-A30                                   | LD05-A40  |
|--|--|--|---|
|  |  |  |  |
| <b>High Penetration and High Accuracy Mode</b>   |  |  |   |
| <b>Measurement range</b> <sup>1)</sup><br>for natural targets, $\rho \geq 80\%$<br>for natural targets, $\rho \geq 10\%$<br>reflector foil <sup>2)</sup> & plastic cat's-eye reflector | up to 500 m<br>up to 150 m<br>up to 2200 m   | up to 750 m<br>up to 250 m<br>up to 2300 m | up to 900 m<br>up to 300 m<br>up to 2400 m  |
| <b>Minimum range</b> <sup>3)</sup>   | 2 m  | 2 m  | 2 m   |
| <b>Measurement accuracy</b> <sup>4) 5)</sup>   | typ. $\pm 12$ mm   | typ. $\pm 12$ mm                           | typ. $\pm 12$ mm  |
| <b>Measurement rate</b> <sup>6)</sup>  | typ. 100 Hz  | typ. 100 Hz                                | typ. 100 Hz   |
| <b>Max. number of targets</b>  | 5  | 5  | 5   |

|  | LD05-A20   | LD05-A30                                   | LD05-A40  |
|--|--|--|---|
|  |  |  |  |
| <b>Fast Mode</b>   |  |  |   |
| <b>Measurement range</b> <sup>1)</sup><br>for natural targets, $\rho \geq 80\%$<br>for natural targets, $\rho \geq 10\%$<br>reflector foil <sup>2)</sup> & plastic cat's-eye reflector | up to 250 m<br>up to 80 m<br>up to 1200 m  | up to 380 m<br>up to 130 m<br>up to 1800 m | up to 470 m<br>up to 160 m<br>up to 2200 m  |
| <b>Minimum range</b> <sup>3)</sup>   | 2 m  | 2 m  | 2 m   |
| <b>Measurement accuracy</b> <sup>4) 5)</sup>   | typ. $\pm 15$ mm   | typ. $\pm 15$ mm                           | typ. $\pm 15$ mm  |
| <b>Measurement rate</b>  | 2500 Hz  | 2500 Hz                                    | 2500 Hz   |
| <b>Max. number of targets</b>  | 5  | 5  | 5   |

- 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 3 m for full accuracy with reflecting foil and minimum distance 30 m for full accuracy with plastic cat's-eye reflector.
- 4) One sigma standard deviation @ 50 m range under *RIEGL* test conditions.
- 5) Plus distance depending error  $\leq \pm 20$  ppm.
- 6) With self-adapting measurement time selected, the effective data update rate depends on the number of targets and their reflectivity and distance.

# Technical Data LD05



|  | LD05-A20   | LD05-A30                                   | LD05-A40  |
|--|--|--|---|
|  |  |  |  |
| <b>High Speed Mode</b>   |  |  |   |
| <b>Measurement range</b> <sup>1)</sup><br>for natural targets, $\rho \geq 80\%$<br>for natural targets, $\rho \geq 10\%$<br>reflector foil <sup>2)</sup> & plastic cat's-eye reflector | up to 200 m<br>up to 60 m<br>up to 1000 m  | up to 310 m<br>up to 100 m<br>up to 1500 m | up to 390 m<br>up to 130 m<br>up to 1900 m  |
| <b>Minimum range</b> <sup>3)</sup>   | 2 m  | 2 m  | 2 m   |
| <b>Measurement accuracy</b> <sup>4) 5)</sup>   | typ. $\pm 20$ mm   | typ. $\pm 20$ mm                           | typ. $\pm 20$ mm  |
| <b>Measurement rate</b>  | 10000 Hz   | 10000 Hz                                   | 10000 Hz  |
| <b>Max. number of targets</b>  | 5  | 5  | 5   |

- 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 3 m for full accuracy with reflecting foil and minimum distance 30 m for full accuracy with plastic cat's-eye reflector.
- 4) One sigma standard deviation @ 50 m range under *RIEGL* test conditions.
- 5) Plus distance depending error  $\leq \pm 20$  ppm.

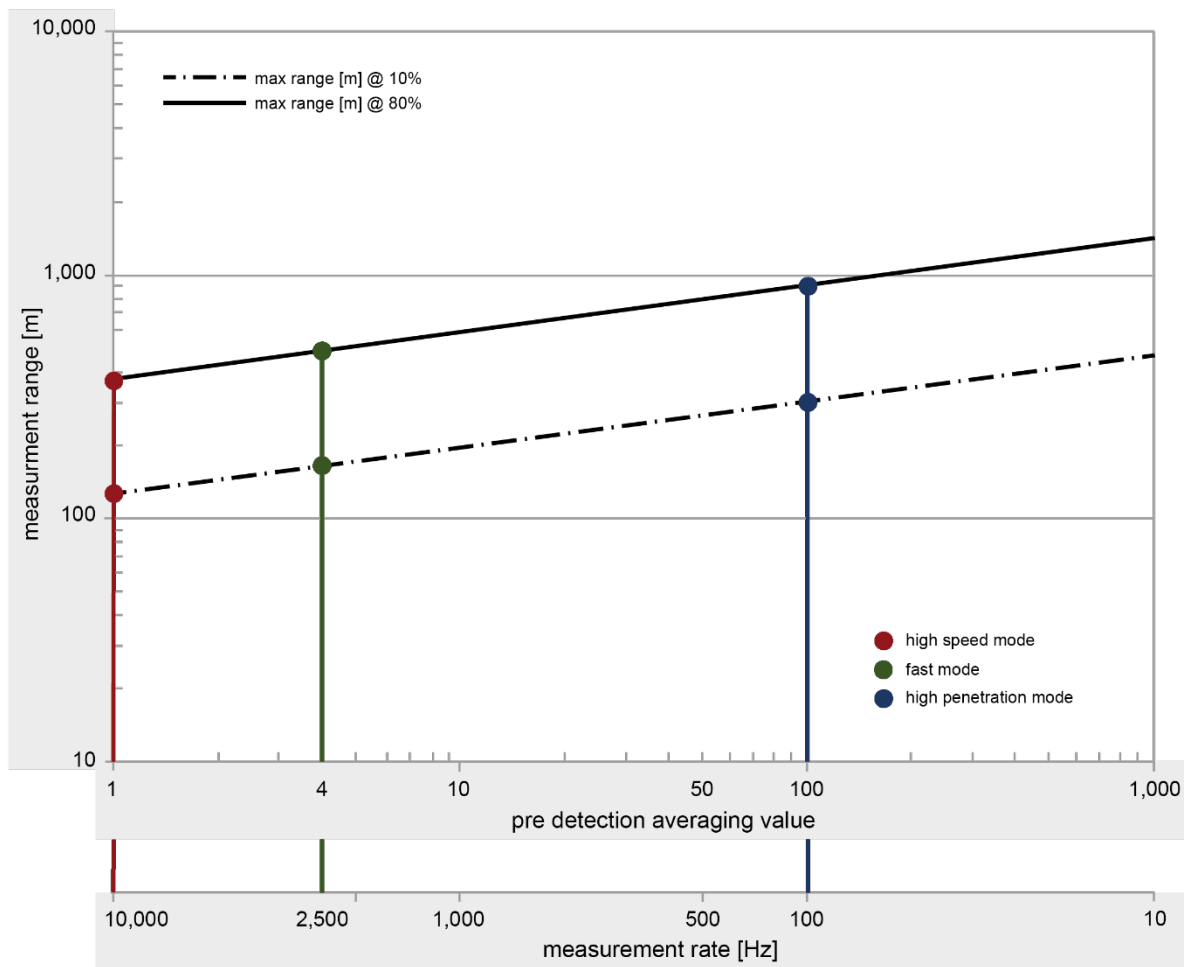


## Increasing Measurement Range

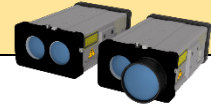
The measurement range can be increased by summing echo signals of multiple laser shots (pre-detection averaging) <sup>1)</sup>. The position of the target must be stable while a measurement is executed.

The following diagram shows the maximum measurement range versus pre-detection averaging value without any atmospheric attenuation. Depending on atmospheric visibility, the resulting maximum range can be further reduced.

The following diagram shows the measurement range values for the LD05-A40:




- 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.



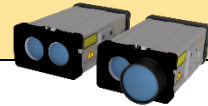
## Optional Full Waveform Mode

The digitized waveform data can be logged to either an internal memory card or to a TCP/IP data port. Subsequent offline full waveform analysis allows detailed investigation of the target situation, especially with complex target situations.

## Laser Specifications

|  | LD05-A20  | LD05-A30       | LD05-A40       |
|--|---|----------------|----------------|
| <b>Wavelength</b>  | near infrared   |                |                |
| <b>Beam divergence</b> <sup>1)</sup>   | 0.9 x 0.2 mrad  | 1.4 x 1.6 mrad | 1.1 x 1.2 mrad |
| <b>Laser product classification</b><br>according to<br>IEC 60825-1:2014 /<br>EN 60825-1:2014/A11:2021<br><br>The following clause applies for instruments delivered into the United States:<br>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<br><br>Viewing the laser output with certain optical instruments designed for use at a distance<br>(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

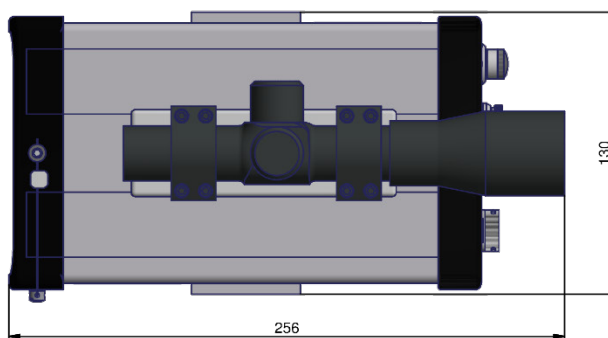
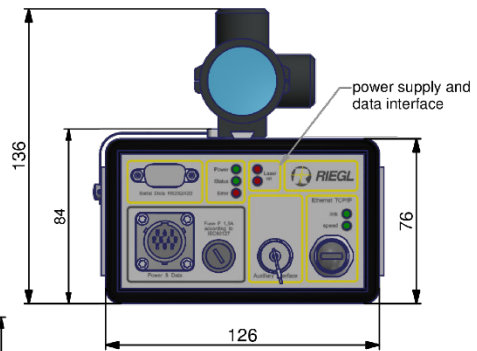
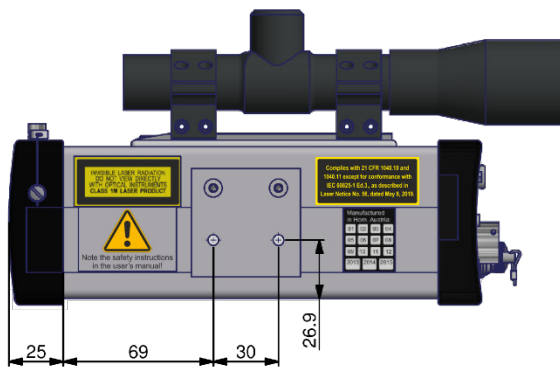
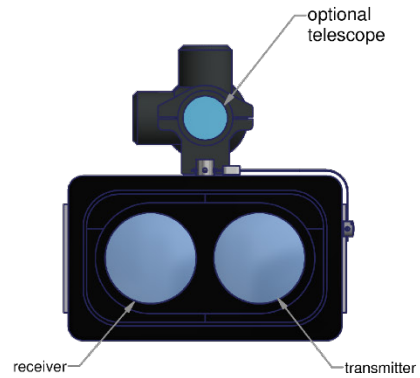
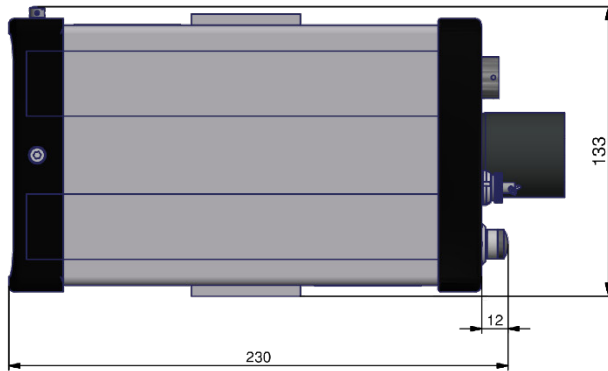
|  | LD05-A20  | LD05-A30 | LD05-A40       |
|--|---|----------|----------------|
| <b>Data interfaces</b>                               | TCP/IP, 10/100/1000 MBit port or RS-232/RS-422<br>TCP/IP, 10/100/1000 MBit port or RS-232/RS-422<br><br>TCP/IP  |          |                |
| Data port<br>Configuration port<br><br>WEB interface |   |          |                |
| <b>Power supply</b>                                  | 11 – 28 V DC, 24 VDC nominal  |          |                |
| <b>Power consumption</b>                             | 18 W  |          |                |
| <b>Main dimensions (L x W x H) mm</b>                | 230 x 133 x 84  |          | 259 x 133 x 84 |
| <b>Weight</b>  | approx. 2.1 kg  |          | approx. 2.9 kg |
| <b>Protection class</b>                              | IP64  |          |                |
| <b>Temperature range</b>                             | Operation -10°C up to +50°C <sup>1)</sup><br>Storage -20°C up to +60°C <sup>1)</sup>  |          |                |
| <b>Mounting</b>                                      | Flanges on both sides   |          |                |
| <b>Analog Output</b>                                 | 4 – 20 mA <sup>2)</sup> , not galvanically isolated, resolution 16 Bit, linearity 1 ‰ of full scale   |          |                |
| <b>Switching Output</b>                              | 2 x PNP transistor driver <sup>3)</sup> ,<br>built-in thermal and short-circuit protection,<br>switching current 200 mA max.,<br>switching voltage = supply voltage |          |                |

- 1) The life expectancy (MTBF) of the instrument is reduced in case of operation and/or storage at high temperatures.  
 2) Operating range selectable via TCP/IP port or serial interface.  
 3) Switching points adjustable via TCP/IP port or serial interface.

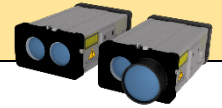


## Dimensional Drawings LD05-A20 / LD05-A30

All dimensions in mm

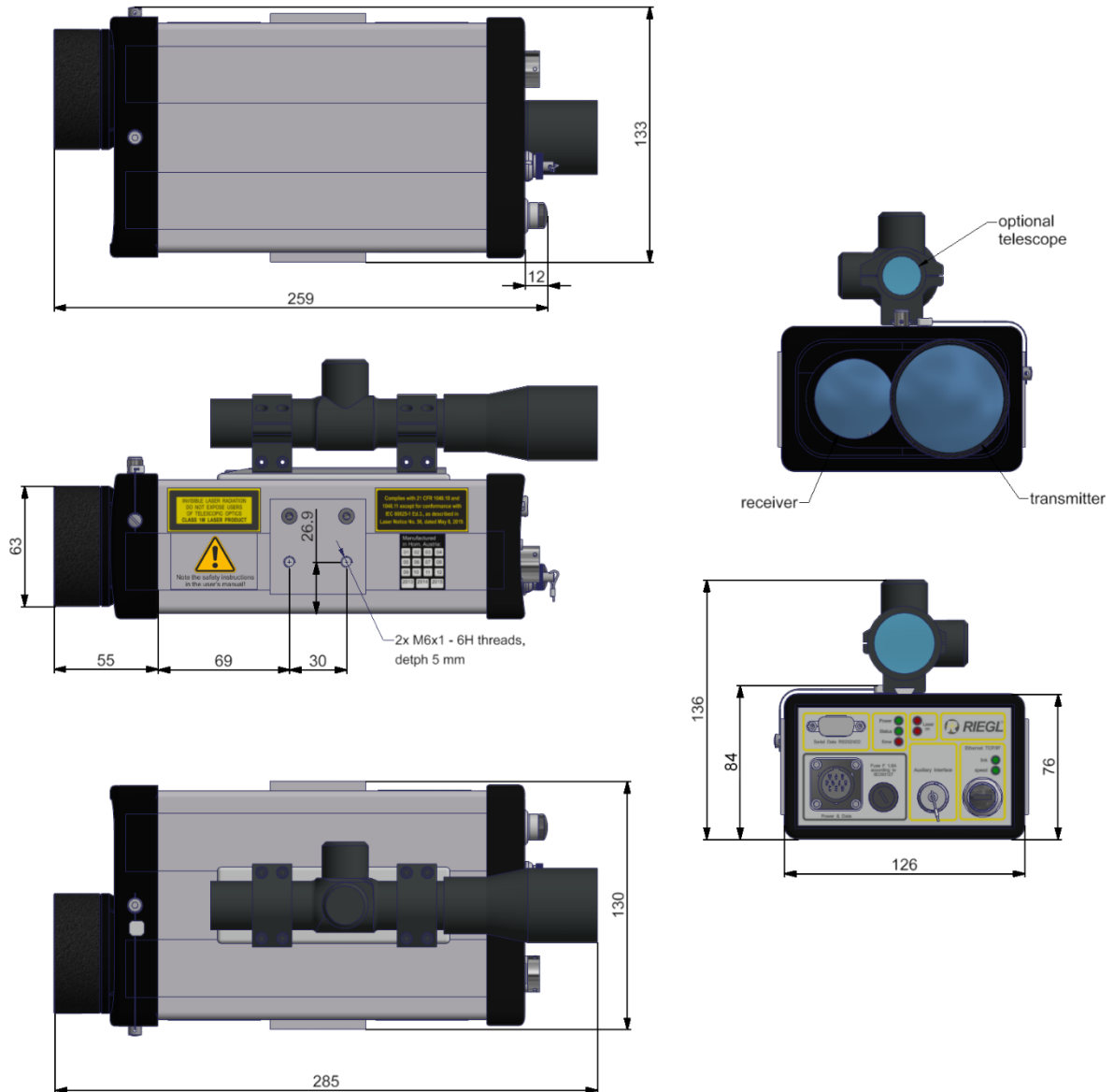


# Technical Data LD05

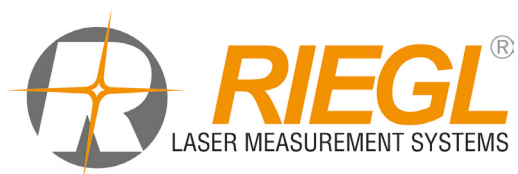


## Dimensional Drawings LD05-A40

All dimensions in mm



Copyright RIEGL Laser Measurement Systems GmbH © 2024 – 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 LD05-A20/A30/A40, 2024-02-13, page 8 of 8



**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](http://www.riegl.com)  
**RIEGL Canada Inc.**, E-mail: [www.rieglcanada.com](http://www.rieglcanada.com)  
**RIEGL UK Ltd.**, E-mail: [www.riegl.co.uk](http://www.riegl.co.uk)