

INDUSTRIAL  
3D LASER SCANNER SYSTEM  
**LMS-Z210ii-S**

The 3D laser scanner system *RIEGL* LMS-Z210ii-S is a rugged sensor especially designed for the rapid acquisition of high-quality three dimensional images for industrial applications even under high demanding environmental conditions.

The *RIEGL* LMS-Z210ii-S provides a unique and unrivalled combination of a wide field-of-view, excellent range measurement performance even at low reflecting target surfaces, high accuracy, and fast data acquisition.

The optional hard- and software accessories, like shock absorbing mount, additional heater jacket, protective hood, industrial standard HARTING® connectors and a special software control library, allow seamless integration of the *RIEGL* LMS-Z210ii-S into automated industrial data acquisition and control systems.

In order to assure uninterrupted operation and availability, a special maintenance concept is offered to keep the probability of sudden failures resulting from wear-and-tear-caused defects as low as possible.



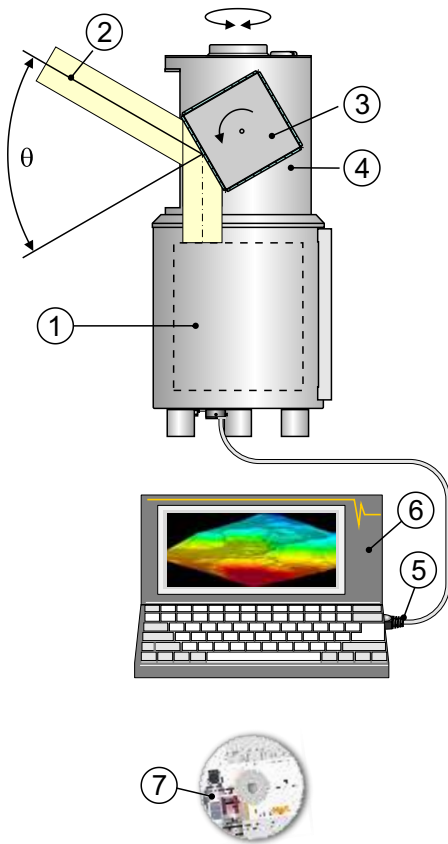
- **Range up to 100 m  
@ target reflectivity as low as 5 %**
- **Precision up to 10 mm**
- **Measurement rate up to 10 000 pts / sec**
- **Field of View up to 95° x 360°**
- **TCP/IP data interface**
- **Operated by any  
standard PC or Notebook**
- **Rugged and robust design for  
harsh industrial environment**
- **Industrial standard HARTING®  
connectors and supply cables**
- **Wide operating temperature range  
with additional heater jacket**

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**RIEGL**  
LASER MEASUREMENT SYSTEMS

## Principle of Scanner Operation



The **range finder electronics (1)** of the 3D scanner *RIEGL LMS-Z210ii-S* are optimized in order to meet the requirements of high speed scanning (high laser repetition rate, fast signal processing, and high speed data interface).

The vertical deflection ("line scan") of the **laser beam (2)** is realized by a **polygon (3)** with a number of reflective surfaces. For high scanning rates and/or a vertical scan angle up to  $95^\circ$ , the polygonal mirror continuously rotates at an adjustable speed. For slow scanning rates and/or small scanning angles, it linearly oscillates up and down. The horizontal scan ("frame scan") is realized by rotating the complete **optical head (4)** up to  $360^\circ$ .

Scandata: RANGE, ANGLE, SIGNAL AMPLITUDE, and optional **TIMESTAMP** are transmitted to a **laptop (6)** via **TCP/IP Ethernet Interface (5)**.

The **control software library RiSCANLib** allows seamless integration of the scanner into automated industrial data acquisition and control systems.

The **optionally available RiSCAN PRO software (7)** allows the operator to perform a large number of tasks including sensor configuration, data acquisition, data visualization, data manipulation, and data archiving. RiSCAN PRO runs on platforms WINDOWS 2000 SP2, WINDOWS XP or WINDOWS VISTA.

## Mounting

**RIEGL LMS-Z210ii-S**  
for vertical (upright) mounting



**RIEGL LMS-Z210ii-SH**  
for horizontal hanging or tilted mounting



Technical Data 3D Scanner Hardware *RIEGL* LMS-Z210ii-S

**Rangefinder performance** <sup>1)</sup>

**Laser Product Classification**

according to IEC60825-1:2007  
The following clause applies for instruments delivered into the United States: Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.



Class 1 for the scanned laser beam

**Measurement range** <sup>2)</sup>

for natural targets,	80 %	up to 400 m
for natural targets,	10 %	up to 150 m
for natural targets,	5 %	up to 100 m

**Minimum range**

4 m

**Accuracy** <sup>3) 5)</sup>

15 mm

**Precision** <sup>4) 5)</sup>

15 mm (single shot) / 10 mm (averaged)

**Measurement rate**

up to 10 000 pts/sec @ low scanning rate (oscillating mirror)  
up to 8 000 pts/sec @ high scanning rate (rotating mirror)

**Laser wavelength**

near infrared

**Beam divergence** <sup>6)</sup>

4 mrad

1) First, Last, or Alternating Target Mode selectable from scan line to scan line.

3) Accuracy is the degree of conformity of a measured quantity to its actual (true) value.

2) Typical values under average conditions. Maximum range is specified for flat targets with size in excess of the laser beam diameter and near to perpendicular angle of incidence of the laser beam. In bright sunlight, the operational range is considerably shorter than under an overcast sky.

4) Precision, also called reproducibility or repeatability, is the degree to which further measurements show the same result.

5) One sigma @ 50 m range under *RIEGL* test conditions.

6) 4 mrad correspond to 40 cm increase of beamwidth per 100 m of range.

**Scanner performance**

**Vertical (line) scan**

Scan angle range	0° to 95° (-55° to +40°)
Scanning mechanism	rotating / oscillating mirror
Scan speed	1 scan/sec to 20 scans/sec @ 80° scanning range
Angular stepwidth <sup>7)</sup>	0.01°      0.2°
between consecutive laser shots	
Angle measurement resolution	0.005°

**Horizontal (frame) scan**

Scan angle range	0° to 360°
Scanning mechanism	rotating optical head
Scan speed <sup>8)</sup>	0.01 °/sec to 15 °/sec
Angular stepwidth <sup>7)</sup>	0.01°      0.75°
between consecutive scan lines	
Angle measurement resolution	0.005°

**Inclination Sensors**

optional, for vertical scanner setup position  
(specifications to be found in separate datasheet)

**Internal Sync Timer**

optional, for real-time synchronized time stamping of scan data  
(e.g. GPS time, specifications to be found in separate datasheet)

7) Selectable via Ethernet Interface or RS232.

8) Horizontal scan can be disabled, providing 2D-scanner operation.

**General technical data**

Interface:	for configuration & data output	Ethernet TCP/IP, 10/100 MBit/sec
	for configuration and debug purposes	RS 232, 19.2 kBd

Main dimensions	690 mm x 251 mm (length x diameter) with shock proof mount and protective hood
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Weight	approx. 24.5 kg
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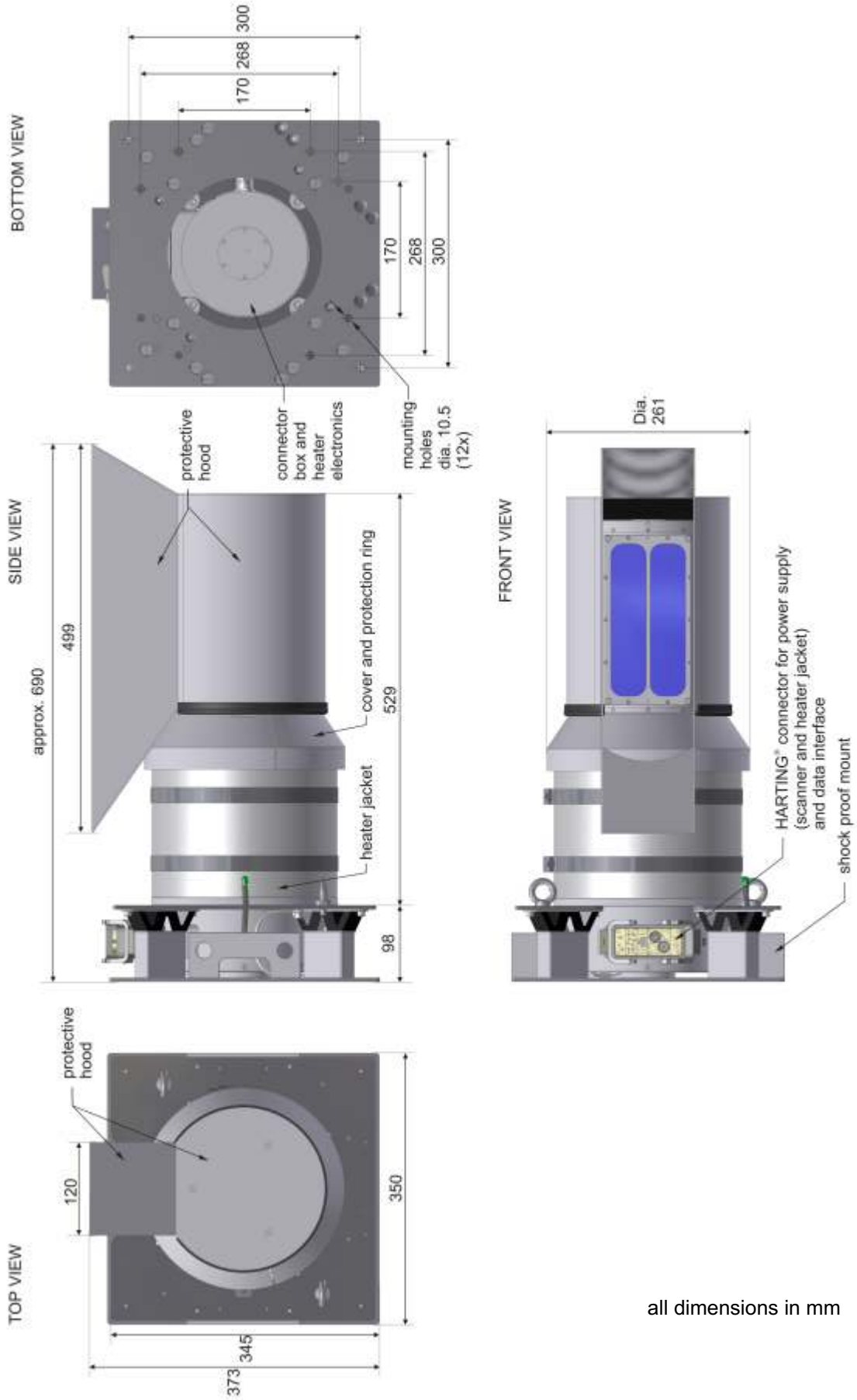
	scanner	heater jacket
Voltage supply range	12 - 28 V DC	24 V DC
Power consumption	typ. 78 W, max 96 W	typ. 200 W
Current consumption @ 24 V DC	typ. 3.25 A, max. 4 A	typ. 8.5 A

Temperature range	-25°C <sup>9)</sup> to +50°C (operation), -25°C to +60°C (storage)
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Protection class	IP64, dust and splash-proof
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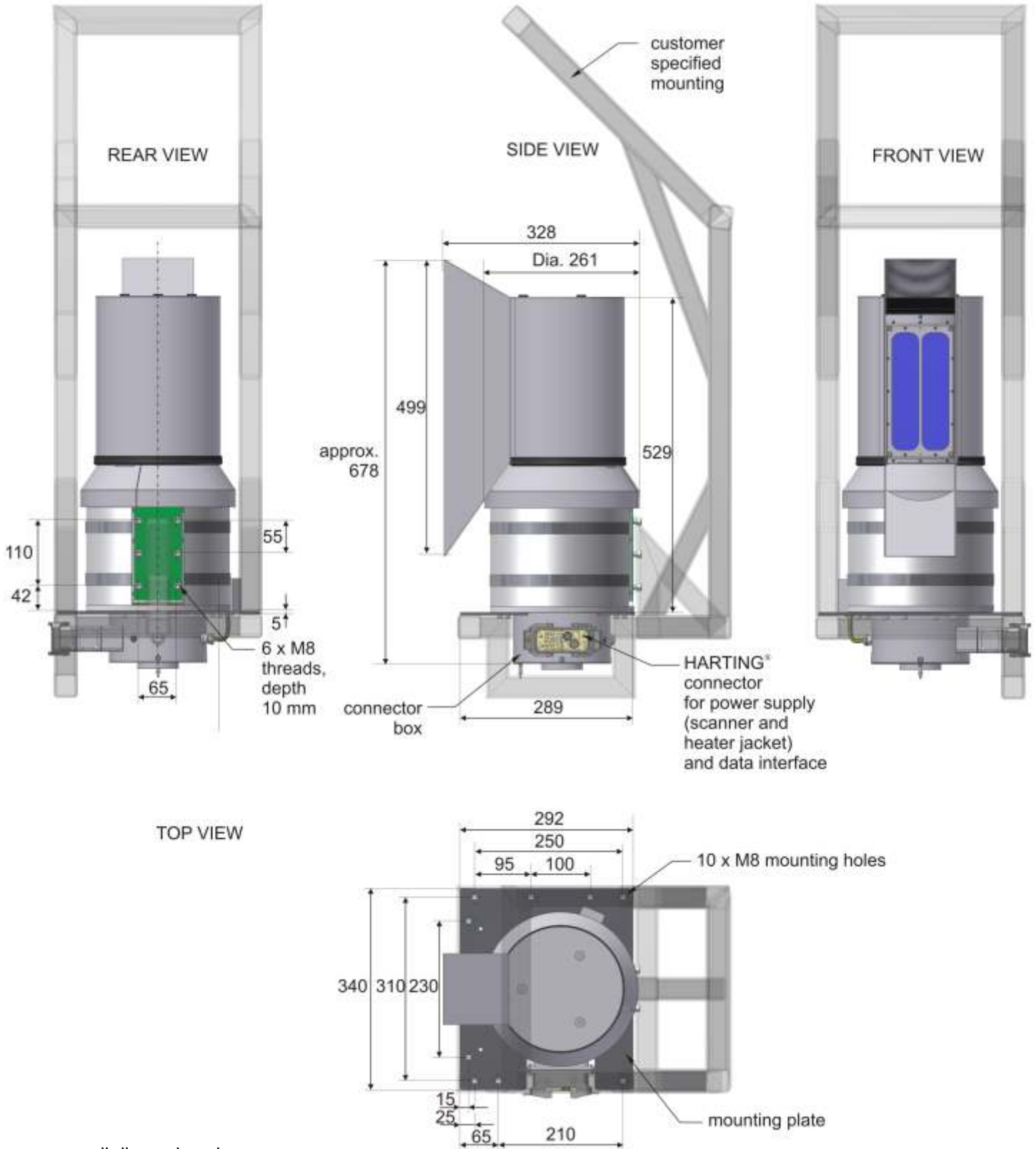
9) With heater jacket and warm-up time of 45 minutes.

Dimensional Drawings of RIEGL LMS-Z210ii-S



all dimensions in mm

Dimensional Drawings of *RIEGL* LMS-Z210ii-SH



all dimensions in mm

Information contained herein is believed to be accurate and reliable. However, no responsibility is assumed by *RIEGL* for its use. Technical data are subject to change without notice.

Preliminary Data sheet, LMS-Z210ii-S, 11/11/2009



**RIEGL**  
LASER MEASUREMENT SYSTEMS  
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