

LONG RANGE  
3D TERRESTRIAL LASER SCANNER SYSTEM  
**LMS-Z210ii**

The terrestrial laser scanner system *RIEGL* LMS-Z210ii is a rugged and fully portable sensor especially designed for the rapid acquisition of high-quality three dimensional images even under high demanding environmental conditions.

The *RIEGL* LMS-Z210ii provides a unique and unrivalled combination of wide field-of-view, long range measurement performance, high accuracy, and fast data acquisition.

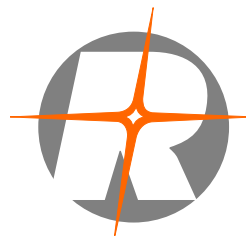
A standard Windows notebook and the bundled software package RiSCAN PRO enable the user to instantly acquire high-quality 3D data in the field. The optional hard- and software accessories also allow seamless integration of the *RIEGL* LMS-Z210ii into automated industrial data acquisition and control systems.

- **Range up to typ. 650 m @ Laser Class 1**
- **Precision up to 10 mm**
- **Measurement rate up to 12 000 pts / sec**
- **Field of View up to 80° x 360°**
- **Optional True Color Channel**
- **TCP/IP data interface**
- **Operated by any standard PC or Notebook**
- **Fully portable, rugged & robust**

- **Topography & Mining**
- **Process Automation**

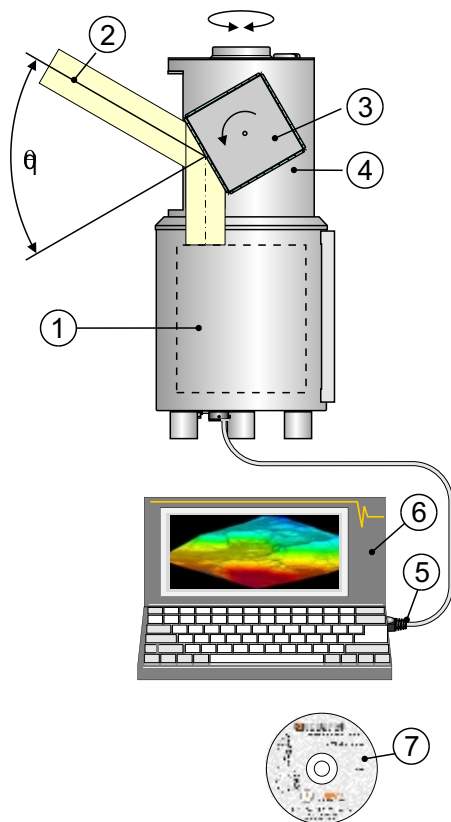


visit our webpage  
[www.riegl.com](http://www.riegl.com)



**RIEGL**  
LASER MEASUREMENT SYSTEMS

## Principle of Scanner Operation



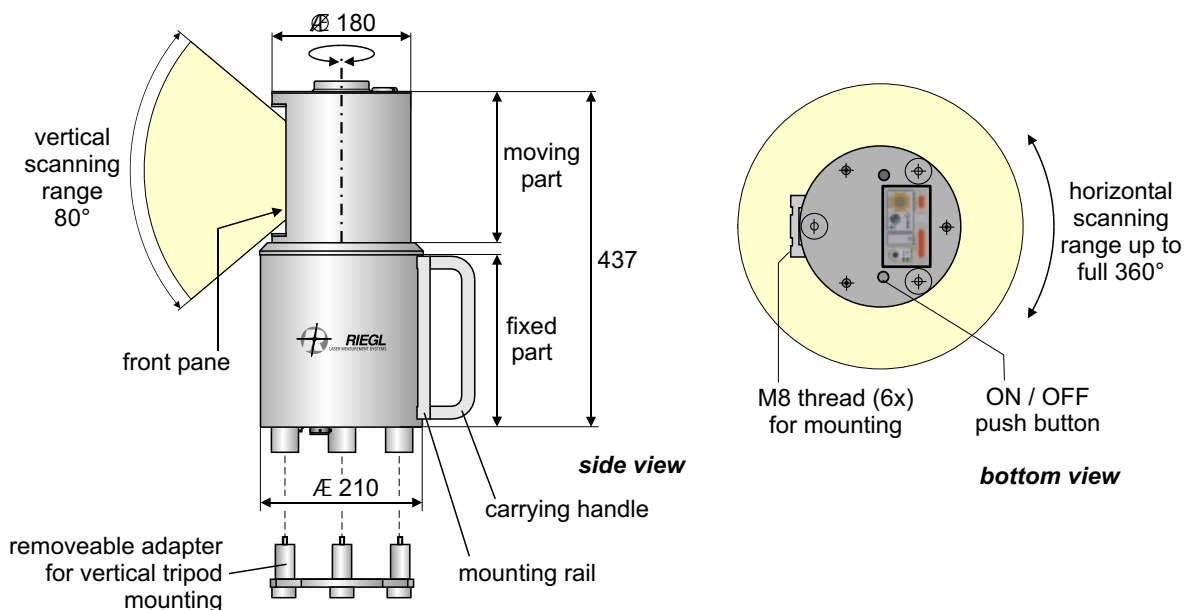
The **range finder electronics (1)** of the 3D scanner *RIEGL LMS-Z210ii* is optimized in order to meet the requirements of high speed and long range scanning (fast laser repetition rate, fast signal processing, and high speed data interface).

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  $q$  up to  $80^\circ$ , the polygonal mirror rotates continuously at adjustable speed. For slow scanning rates and/or small scanning angles, it is oscillating linearly up and down. The horizontal scan ("frame scan") is provided 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 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 XP or 2000 SP2.

## Dimensional Drawings



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

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

### Eye safety class

according to IEC60825-1:1993+A1:1997+A2:2001  
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,  $r \approx 80\%$  up to 650 m  
for natural targets,  $r \approx 10\%$  up to 200 m

Minimum range 4 m

Accuracy <sup>3)</sup> 15 mm

Repeatability <sup>3)</sup> 15 mm (single shot) / 10 mm (averaged)

Measurement rate up to 12 000 pts/sec @ low scanning rate (oscillating mirror)<sup>4)</sup>  
up to 8 000 pts/sec @ high scanning rate (rotating mirror)

Laser wavelength near infrared

Beam divergence <sup>5)</sup> 2.7 mrad

## Scanner performance

### Vertical (line) scan

Scanning range 0° to 80°  
Scanning mechanism rotating / oscillating mirror  
Scanning rate 1 scan/sec to 20 scans/sec @ 80° scanning range  
Angle stepwidth  $D_j$  <sup>6)</sup> 0.01°  $\Delta D_j$   $\Delta 0.2^\circ$   
between consecutive laser shots  
Angular resolution 0.005°

### Horizontal (frame) scan

Scanning range 0° to 360°  
Scanning mechanism rotating optical head  
Scanning rate <sup>7)</sup> 0.01 °/sec to 15 °/sec  
Angle stepwidth  $D_j$  <sup>6)</sup> 0.01°  $\Delta D_j$   $\Delta 0.75^\circ$   
between consecutive scan lines  
Angular resolution 0.005°

Inclination Sensors integrated, for vertical scanner setup position (specifications to be found in separate datasheet)

Internal Sync Timer Option for GPS-synchronized time stamping of scan data (specifications to be found in separate datasheet)

## True color channel

The optional True Color Channel, integrated in the LMS-Z210ii, provides the color of the target's surface as an additional information to each laser measurement. Color data are included in the binary data stream of the LMS-Z210ii. The color channel allows straightforward texturing of 3D models by unequivocal correspondence of color pixels and range measurement.

## General technical data

Interface:	for configuration & data output	Ethernet TCP/IP, 10/100 MBit/sec
	for configuration	RS 232, 19.2 kBd
	for data output	ECP standard (enhanced capability port) parallel
Main dimensions	437 mm x 210 mm (Length x Diameter)	
Weight	approx. 13 kg	
Power supply input voltage	12 - 28 V DC	
Power consumption	typ. 78 W	max 96 W
Current consumption @ 12 V DC	typ. 6.5 A	max 8 A
	@ 24 V DC	typ. 3.25 A max 4 A
Temperature range	-10°C to +50°C (operation), -20°C to +60°C (storage)	
Protection class	IP64, dust and splash-water proof	

- |  |   |
|--|---|
| 1) First, Last, or Alternating target mode selectable from scan line to scan line.   | 4) Without true color channel.  |
| 2) Typical values for average conditions. Maximum range is specified for flat targets with size in excess of the laser beam diameter and near to normal incidence of the laser beam. In bright sunlight, the operational range is considerably shorter than under an overcast sky. | 5) 2.7 mrad correspond to 27 cm increase of beamwidth per 100 m of range. |
| 3) One sigma @ 50 m range under <i>RIEGL</i> test conditions.  | 6) Selectable via Ethernet Interface or RS232.                            |
|  | 7) Horizontal scan can be disabled, providing 2D-scanner operation.       |

---

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.

Data sheet, LMS-Z210ii, 31/08/2006



**RIEGL**  
LASER MEASUREMENT SYSTEMS  
[www.riegl.com](http://www.riegl.com)

*RIEGL Laser Measurement Systems GmbH*, A-3580 Horn, Austria  
Tel.: +43-2982-4211, Fax: +43-2982-4210, E-mail: [office@riegl.co.at](mailto:office@riegl.co.at)  
*RIEGL USA Inc.*, Orlando, Florida 32819, USA  
Tel.: +1-407-248-9927, Fax: +1-407-248-2636, E-mail: [info@rieglusa.com](mailto:info@rieglusa.com)  
*RIEGL Japan Ltd.*, Tokyo 1640013, Japan  
Tel.: +81-3-3382-7340, Fax: +81-3-3382-5843, E-mail: [info@riegl-japan.co.jp](mailto:info@riegl-japan.co.jp)