

3D TERRESTRIAL LASER SCANNER SYSTEM

LMS-Z360i

The terrestrial laser scanner system *RIEGL* LMS-Z360i 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-Z360i provides a unique and unrivalled combination of wide field-of-view, 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-Z360i into automated industrial data acquisition and control systems.

- **Range up to 200 m @ Laser Class 1**
- **Measurement accuracy up to 6 mm**
- **Measurement rate up to 12 000 pts / sec**
- **Field of View up to 90° x 360°**
- **TCP/IP data interface**
- **Operated by any standard PC or Notebook**
- **Fully portable, rugged & robust**

- **Tunnel Surveying**
- **Archaeology & Cultural Heritage Documentation**
- **Topography & Mining**

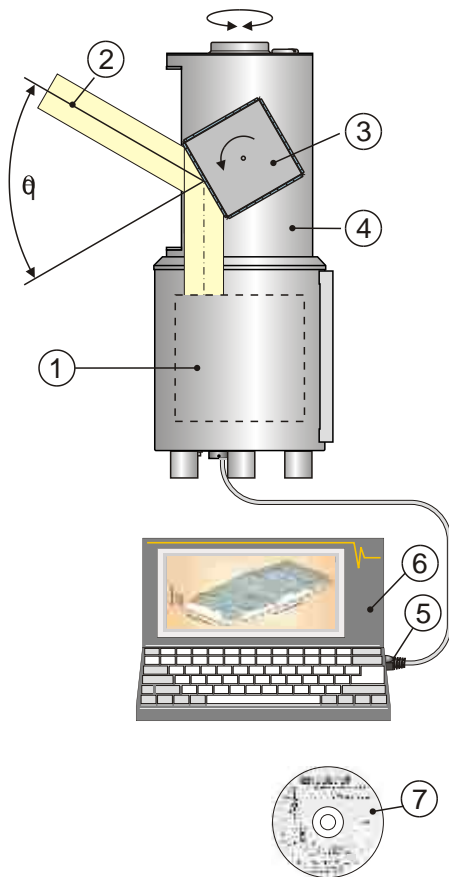


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LASER MEASUREMENT SYSTEMS

Principle of Scanner Operation



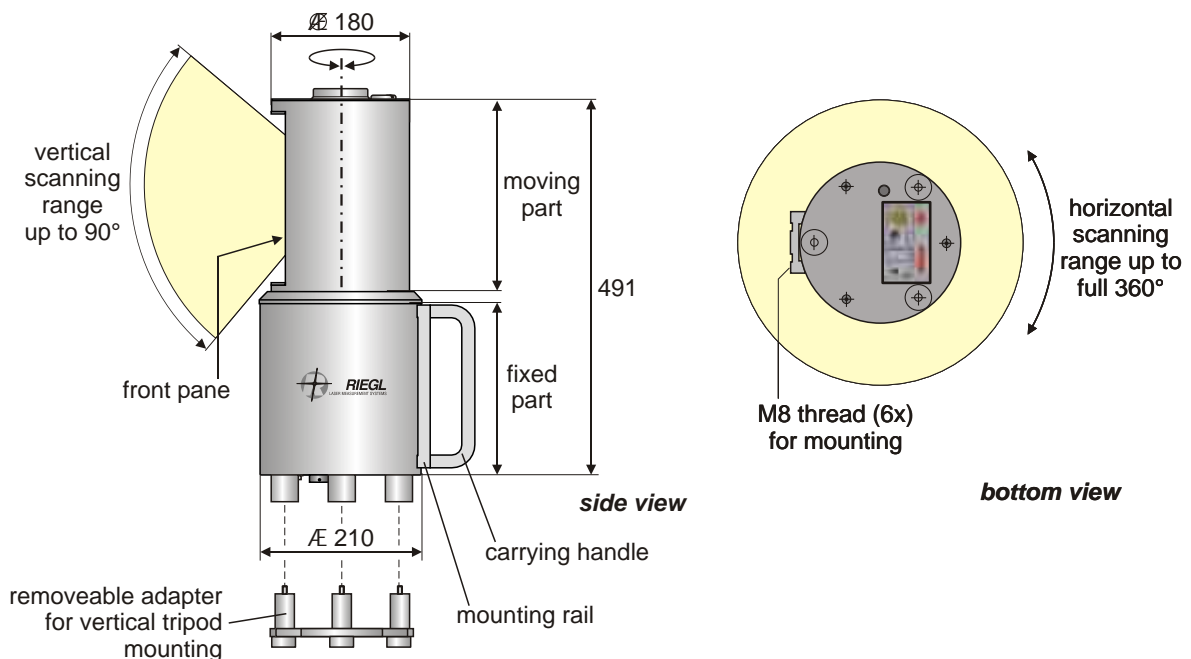
The **range finder electronics (1)** of the 3D scanner *RIEGL* LMS-Z360i is optimized in order to meet the requirements of high speed scanning (fast laser repetition rate, fast signal processing, and high speed data interface).

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 φ up to 90° , 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° .

Scandata: RANGE, ANGLE, and SIGNAL AMPLITUDE 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, 2000 SP2, or NTSP4.

Dimensional Drawings



Technical Data 3D Scanner Hardware *RIEGL LMS-Z360i*

Rangefinder Performance¹⁾

Eye safety class according to IEC60825-1:2001	Laser Class 1
Measurement range ²⁾	
for natural targets, $r \approx 80\%$	up to 200 m
for natural targets, $r \approx 10\%$	up to 60 m
Minimum range	1 m
Measurement accuracy ³⁾	typ. ± 6 mm (averaged), typ. ± 12 mm (single shot)
Measurement resolution	5 mm
Measurement rate	up to 12 000 pts/sec @ low scanning rate (oscillating mirror) up to 8 000 pts/sec @ high scanning rate (rotating mirror)
Laser wavelength	near infrared
Laser beam focus range ⁴⁾	adjustable in steps between 2 m and infinity

Scanner Performance

Vertical (line) scan	
Scanning range	0° to 90°
Scanning mechanism	rotating / oscillating mirror
Scanning rate ⁵⁾	1 scan/sec to 20 scans/sec @ 90° scanning range
Minimum angle stepwidth	0.01°
Angular resolution	0.002°
Horizontal (frame) scan	
Scanning range	0° to 360°
Scanning mechanism	rotating optical head
Scanning rate ^{5) 6)}	0.01 °/sec to 15 °/sec
Minimum angle stepwidth	0.01°
Angular resolution	0.0025°
Inclination Sensors	optional (specifications to be found in separate datasheet)
Internal Sync Timer	
for external GPS/INS synchronization	optional (specifications to be found in separate datasheet)

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
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
Main dimensions	491 mm x 210 mm (Length x Diameter)	
Weight	approx. 13 kg	
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.
- 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.
- 3) Standard deviation, plus distance depending error ± 20 ppm.
- 4) Beam focus adjustable via software.
- 5) Scanning rates selectable via Ethernet Interface or RS 232.
- 6) 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-Z360i, 27/09/05



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