The terrestrial laser scanner system RIEGL LMS-Z620 consists of a high performance long-range 3D scanner, the accompanying operating and processing software RiSCAN PRO, and a calibrated and accurately orientated and mounted high-resolution digital camera.

The system provides data which lends itself to automatic or semi-automatic processing of scan- and image data to generate products such as textured triangulated surfaces and high resolution panorama images as a basis for e.g., geotechnical analysis and mining assessment.

The RIEGL LMS-Z620 is a rugged and fully portable sensor especially designed for the rapid acquisition of high-quality three dimensional images even under highly demanding environmental conditions, providing a unique and unrivalled combination of a wide field-of-view, high maximum range, 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 and provide a variety of registration, post processing and export functions.

- Topography & Mining
- Monitoring & Civil Engineering
- Archaeology & Cultural Heritage Documentation
- Architecture & Facade Measurement

visit our webpage www.riegl.com
Scanner Hardware LMS-Z620
allows high-speed, high resolution and accurate 3D measurements
- Ranges up to 2000 m @ Laser Class 1
- Repeatability up to 5 mm
- Measurement rates up to 11000 pts/sec
- Field of View up to 80° x 360°
- TCP/IP data interface, allowing easy wireless data transmission
- Operable with any standard PC or Notebook
- Fully portable, rugged & robust

Software RiSCAN PRO
RIEGL software package for scanner operation and data processing
- Data archiving using a well-documented tree structure in the XML file format
- Object VIEW / INSPECTOR for intelligent data viewing and feature extraction
- Straightforward Global Registration
- Interfacing to Post Processing Software

Camera (optional)
provides high resolution calibrated color images
NIKON D700 / NIKON D300(s) / NIKON D200:
- D300(s): 12.3 Megapixel
- D700: 12.1 Megapixel, Nikon FX format
- D200: 10.2 Megapixel
- USB interface

The combination of the key components Scanner, Software and Camera results in
- Automatic generation of high resolution textured meshes
- Online position and distance measurements
- Photorealistic 3D reconstruction
- Online setting of any virtual point of view
- Exact identification of details
The range finder electronics of the 3D laser scanner RIEGL LMS-Z620 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 is realized by a polygon with a number of reflective surfaces. For high scanning rates and/or a vertical scan angle of $\theta$ up to $80^\circ$, 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 up to $360^\circ$.

Scandata: RANGE, ANGLE, SIGNAL AMPLITUDE, and optional TIMESTAMP are transmitted to a laptop via TCP/IP Ethernet Interface. Camera data is fed into the same laptop via USB/firewire interface.

The RiSCAN PRO software 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 the platforms Windows XP Professional, Windows VISTA Professional, and Windows 7 Professional.

The following conditions are assumed:
- Flat target larger than footprint of laser beam, perpendicular angle of incidence, average brightness
## Technical Data 3D Scanner Hardware RIEGL LMS-Z620

### Laser Product Classification

CLASS 1 Laser Product 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.

### Rangefinder Performance

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Measurement Range</td>
<td>up to 2000 m up to 750 m 2 m</td>
</tr>
<tr>
<td>Minimum Range</td>
<td>10 mm 10 mm (single shot), 5 mm (averaged)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>up to 11000 pts/sec @ low scanning rate (oscillating mirror) up to 8000 pts/sec @ high scanning rate (rotating mirror)</td>
</tr>
<tr>
<td>Measurement Rate</td>
<td>near infrared</td>
</tr>
<tr>
<td>Beam Divergence</td>
<td>0.15 mrad</td>
</tr>
</tbody>
</table>

1) First, Last, or Alternating Target Mode selectable.
2) Typical values under average conditions. Maximum range is specified for flat targets with size in excess of the laser beam diameter and near perpendicular incidence of the laser beam and atmospheric visibility in excess of 23 km. In bright sunlight the operational range is considerably shorter than under an overcast sky.

### Scanner Performance

#### Vertical (Line) Scan
- Scan Angle Range: 0° to 80°
- Scanning Mechanism: rotating / oscillating mirror
- Scan Speed: 1 scan/sec to 20 scans/sec @ 80° scanning range
- Angular Stepwidth: 0.004° ≤ Δ θ ≤ 0.2°
- Angle Measurement Resolution: 0.002°

#### Horizontal (Frame) Scan
- Scan Angle Range: 0° to 360°
- Scanning Mechanism: rotating optical head
- Scan Speed: 0.01°/sec to 15°/sec
- Angular Stepwidth: 0.004° ≤ Δ ϕ ≤ 0.75°
- Angle Measurement Resolution: 0.0025°

#### Inclination Sensors
- Integrated, for vertical scanner setup position (specifications to be found in separate datasheet)
- Option for real-time synchronized time stamping of scan data (specifications to be found in separate datasheet)

### General Technical Data

- **Interfaces:**
  - for configuration & data output: TCP/IP Ethernet, 10/100 MBit/sec
  - for configuration: RS 232, 19.2 kBit/s
  - for data output: ECP standard (enhanced capability port) parallel
- **Power Supply Input Voltage:** 12 - 28 V DC
- **Power Consumption:**
  - typ. 75 W, max. 85 W
  - typ. 6.25 A, max. 7.1 A
  - typ. 3.13 A, max. 3.54 A
- **Current Consumption:**@ 12 V DC: 6.25 A, max. 7.1 A @ 24 V DC: 3.13 A, max. 3.54 A
- **Main Dimensions:** 463 mm x 210 mm (length x diameter)
- **Weight:** 16 kg
- **Temperature Range:** 0°C to +40°C (operation), -10°C to +50°C (storage)
- **Protection Class:** IP64, dust and splash-proof

RIEGL Laser Measurement Systems GmbH, A-3580 Horn, Austria
Tel.: +43-2982-4211, Fax: +43-2982-4210, E-mail: 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

RIEGL Japan Ltd., Tokyo 1640013, Japan
Tel.: +81-3-3382-7340, Fax: +81-3-3382-5843, E-mail: info@riegl-japan.co.jp

www.riegl.com

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