

Extra Long Range & High Accuracy 3D Terrestrial Laser Scanner System

LMS-Z620

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



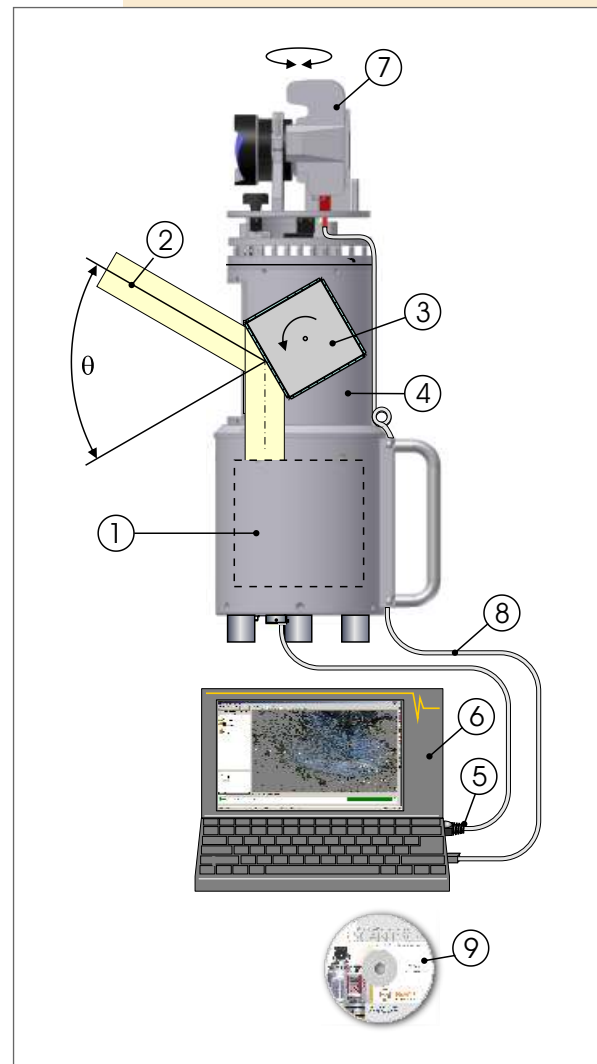
Principle of Scanner Operation

The **range finder electronics (1)** of the 3D 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).

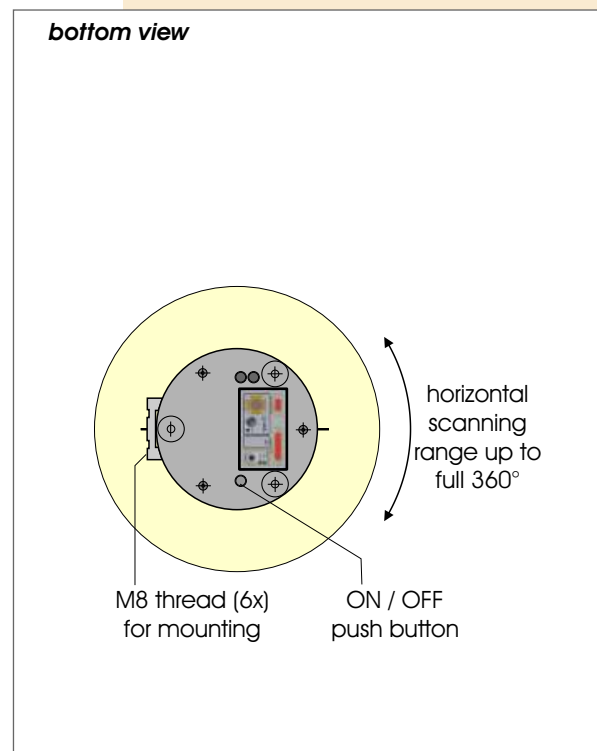
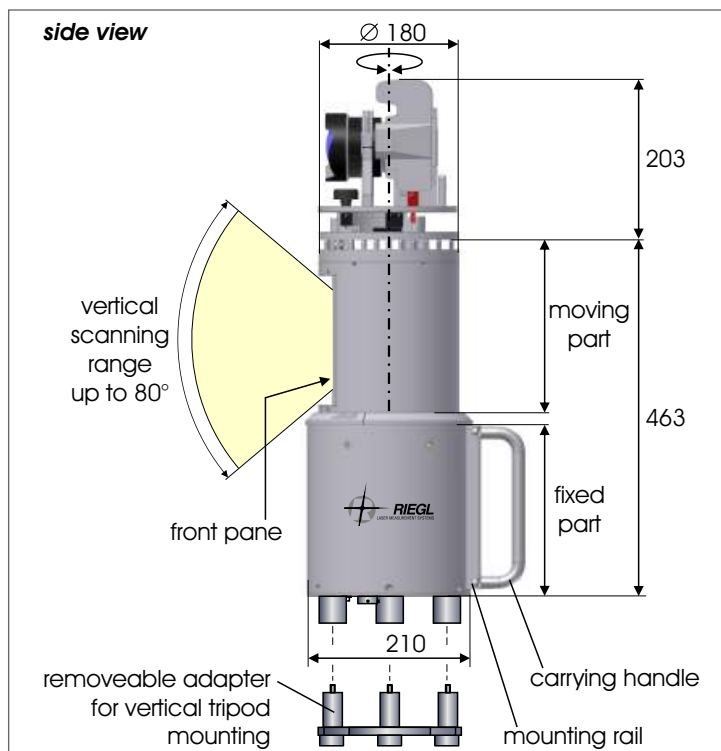
The *vertical deflection* ("line scan") of the **laser beam (2)** is realized by a **polygon (3)** with a number of reflective surfaces. For high scanning rates and/or a vertical scan angle of up to 80°, the polygonal mirror continuously rotates at an adjustable speed. For slow scanning rates and/or 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°.

Scandata: RANGE, ANGLE, SIGNAL AMPLITUDE, and optional **TIMESTAMP** are transmitted to a **laptop (6)** via **TCP/IP Ethernet Interface (5)**. **Camera (7)** data is fed into the same laptop via **USB/firewire interface (8)**.

The **RiSCAN PRO software (9)** 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 VISTA, XP or 2000 SP2.



Dimensional Drawings



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 Performance¹⁾

Max. Measurement Range²⁾

for natural targets, 80 %

for natural targets, 10 %

Minimum Range

Accuracy^{3) 5)}

Repeatability^{4) 5)}

Measurement Rate

Laser Wavelength

Beam Divergence⁶⁾

up to 2000 m

up to 650 m

2 m

10 mm

10 mm (single shot), 5 mm (averaged)

up to 11000 pts/sec @ low scanning rate (oscillating mirror)

up to 8000 pts/sec @ high scanning rate (rotating mirror)

near infrared

0.15 mrad

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.

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

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

5) One sigma @ 100 m range under *RIEGL* test conditions.

6) 0.15 mrad correspond to 15 mm increase of beamwidth per 100 m of range.

Scanner Performance

Vertical (Line) Scan

Scan Angle Range

Scanning Mechanism

Scan Speed

Angular Stepwidth⁷⁾

between consecutive laser shots

Angle Measurement Resolution

0° to 80°

rotating / oscillating mirror

1 scan/sec to 20 scans/sec @ 80° scanning range

0.004° 0.2°

0.002°

Horizontal (Frame) Scan

Scan Angle Range

Scanning Mechanism

Scan Speed⁸⁾

Angular Stepwidth⁷⁾

between consecutive scan lines

Angle Measurement Resolution

0° to 360°

rotating optical head

0.01°/sec to 15°/sec

0.004° 0.75°

0.0025°

Inclination Sensors

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

Internal Sync Timer

option for real-time synchronized time stamping of scan data (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

Interfaces: for configuration & data output

for configuration

for data output

Power Supply Input Voltage

Power Consumption

Current Consumption @ 12 V DC

@ 24 V DC

Main Dimensions

Weight

Temperature Range

Protection Class

TCP/IP Ethernet, 10/100 MBit/sec

RS 232, 19.2 kBd

ECP standard (enhanced capability port) parallel

12 - 28 V DC

typ. 75 W max. 85 W

typ. 6.25 A max. 7.1 A

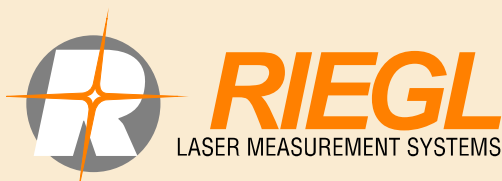
typ. 3.13 A max. 3.54 A

463 mm x 210 mm (length x diameter)

16 kg

0°C to +40°C (operation), -10°C to +50°C (storage)

IP64, dust and splash-proof



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