

LONG RANGE & HIGH ACCURACY
3D TERRESTRIAL LASER SCANNER SYSTEM

LMS-Z420i

The terrestrial laser scanner system *RIEGL* LMS-Z420i consists of a high performance long-range 3D scanner, associated operating and processing software RiSCAN PRO, and a calibrated and definitely orientated high-resolution digital camera.

The system provides data which lend itself to automatic or semi-automatic processing of scan data and image data to generate products such as textured triangulated surfaces or orthophotos with depth information.

The *RIEGL* LMS-Z420i 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, providing a unique and unrivalled combination of 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**
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RIEGL
LASER MEASUREMENT SYSTEMS

System Key Performance Data



Scanner Hardware LMS-Z420i

allows high-speed, high resolution and accurate 3D measurements

- Range up to 1000 m @ Laser Class 1
- Measurement accuracy up to 5 mm
- Measurement rate up to 12000 pts / sec
- Field of View up to 80° x 360°
- TCP/IP data interface, easily allowing wireless data transmission
- Operated by 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 XML file format
- Object VIEW / INSPECTOR for intelligent data viewing and feature extraction
- Straightforward Global Registration
- Interfacing to Post Processing Software



Camera

provides high resolution calibrated color images

NIKON D70 / NIKON D100 / NIKON D200:

- D200: 10.2 Megapixel (3.872 x 2.592 pixel)
D70 / D100: 6.1 Megapixel (3.008 x 2.000 pixel)
- Lens focal length: 14/20/28/35/50/85/180 mm
- USB interface, easily allowing wireless data transmission

or

CANON EOS 1Ds MARK II / CANON EOS 20D:

- EOS 1Ds MARK II:
16.7 Megapixel (4.992 x 3.328 pixel)
EOS 20 D: 8.2 Megapixel (3.504 x 2.336 pixel)
- Lens focal length: 20/28/35/50/85/200 mm
- EOS 1Ds MARK II: IEEE 1394 firewire interface
EOS 20 D: USB interface, easily allowing wireless data transmission

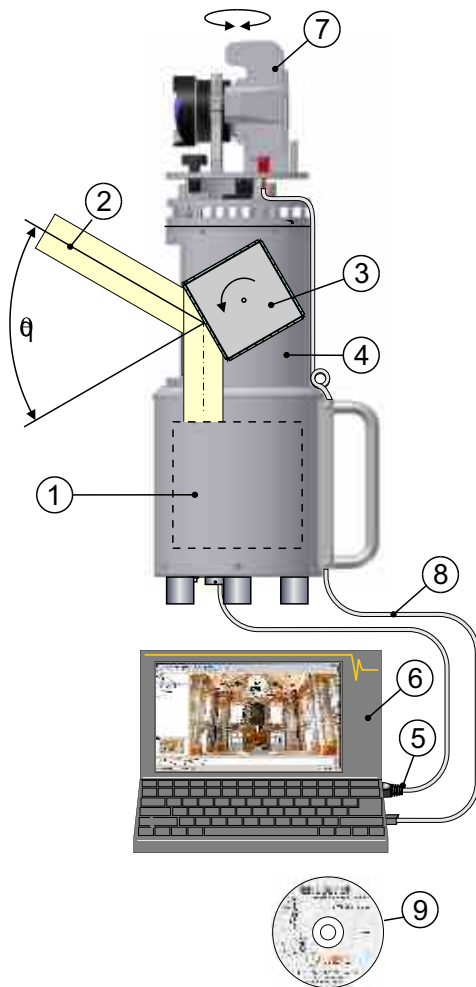


The combination of the key components

Scanner, Software and Camera results in

- Automatic generation of high resolution textured meshes
- Photorealistic 3D reconstruction
- Exact identification of details
- Automatic generation of 3D orthophotos
- Online position and distance measurements
- Online setting of any virtual point of view

Principle of Scanner Operation



The **range finder electronics (1)** of the 3D scanner *RIEGL LMS-Z420i* 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 q up to 80° , 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)**. **Camera (7)** data are 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 platforms WINDOWS XP, 2000 SP2, or NT SP4.

Dimensional Drawings

