RIEGL VZ®600i
Exceeding your expectations

Typical Applications

• Architecture & Facade Measurements • As-Built Surveying • Archeology & Cultural Heritage Documentation • City Modeling • Civil Engineering • Building Information Modeling (BIM) • Forensics & Crash Scene Investigation • Emergency Management • Tunnel Surveying • Forestry • Research • Monitoring
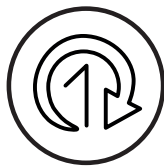
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RIEGL®

RIEGL VZ®-600i

RIEGL's latest generation of professional Terrestrial Laser Scanners stands for extreme versatility, high productivity, ultimate performance, and additional mobility – providing an excellent return on investment.

High Productivity

- 60 scan positions per hour (with image acquisition)
- One-Touch button operation
- *RIEGL* VZ-i Project Map App for scan project monitoring
- simultaneous scan and image data acquisition
- Real-Time On-Board automatic registration
- One-Touch Processing Wizard in RiSCAN PRO for automatic production of detailed PDF-report
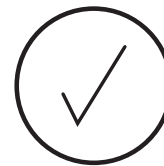
Ultimate Performance

- broad range capability (0.5 m up to 1000 m)
- 5 sec scan time for low resolution overview scans
- 30 sec scan time for 6mm resolution @ 10m distance
- pulse repetition rate up to 2.2 MHz
- 3D position accuracy up to 3 mm @ 50 m
- scan speed up to 420 lines/sec
- high speed data download of up to 500 MB/sec

Extreme Versatility

- for various applications
- indoor and outdoor 3D mapping
- internal cameras and GNSS receiver
- lightweight (approx. 6 kg / 13 lbs)
- prepared for user-specific Python apps
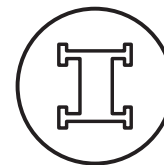
Additional Mobility

- prepared for robotic operation (ROS driver available)
- option for mobile mapping
- can be used with the *RIEGL* VMR Robotic Rail Scanning System
- flexible mounting platforms

High Productivity –
Key Components

Front View

Rear View

1	beam exit window
2	3 internal cameras
3	1 rechargeable battery at each side

4	7 inch touch screen
5	single button for convenient handling
6	quick mounting adapter

Extreme Versatility –
Optional Equipment

### RTK GNSS antenna and/or external camera

With an attached RTK-GNSS antenna, the absolute positioning accuracy can be improved to 1-2 cm. The correction data is then received via WLAN.

Charger for 2 or 6 batteries

The chargers are designed for 2 or 6 batteries. They can be supplied from the 12V DC voltage of a vehicle as well as from the 110/230V AC voltage. The advantage of the 2-fold charger lies in the size and weight, that of the 6-fold charger in the possibility of continuous scanning over 24 hours (with simultaneous charging of the empty batteries).

Optional Equipment

🌐 RIEGL

Accessory List
RIEGL VZ-i Series

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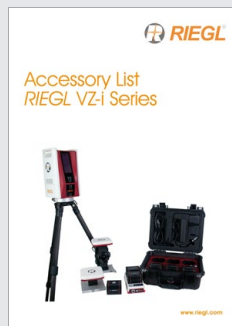
Ultimate Performance –
Technical Data

Laser Product Classification

Class 1 Laser Product according to IEC 60825-1:2014	The following clause applies for instruments delivered into the United States: Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed.3., as described in Laser Notice No. 56, dated May 8, 2019.	CLASS 1 LASER PRODUCT

Range Measurement Performance

Measuring Principle / Mode of Operation	time of flight measurement, echo signal digitization, online waveform processing			
Laser Pulse Repetition Rate (PRR) – (peak) [1]	**2200 kHz**	1200 kHz	600 kHz	150 kHz
Max. Measuring Range [2] natural targets $\rho \geq 90\%$ natural targets $\rho \geq 20\%$	**220 m** **100 m**	320 m 150 m	420 m 200 m	1000 m 450 m
Minimum Range [3]	**0.5 m**	0.5 m	0.5 m	1 m
Max. Number of Targets per Pulse [4]	**5**	10	10	10
Ranging Accuracy [5] [7]	**5 mm**			
3D Position Accuracy [8]	**3 mm @ 50 m, 5 mm @ 100 m**			
Precision [6] [7]	**3 mm (1 mm with extended scan time)**			
Laser Wavelength	near infrared, invisible			
Laser Beam Divergence	0.35 mrad [9] / 0.25 mrad [10]			

1) Rounded values.
2) Typical values for average conditions. Maximum range is specified for flat targets with size in excess of the laser beam diameter, perpendicular angle of incidence, and for atmospheric visibility of 23 km. In bright sunlight, the max. range is shorter than under overcast sky.
3) Minimum range specified for vertical zenith angles from 30 deg to 120 deg, resp. 90° vertical field of view.

4) If more than one target is hit, the total laser transmitter power is split and, accordingly, the achieveable range is reduced.
5) Accuracy is the degree of conformity of a measured quantity to its actual (true) value.
6) Precision, also called reproducibility or repeatability, is the degree to which further measurements show the same result.
7) 1 sigma @ 100 m range under *RIEGL* test conditions.

8) 1-sigma value, based on target modelling, under *RIEGL* test conditions.
9) Measured at the 1/e2 points. 0.35 mrad corresponds to an increase of 35 mm of beam diameter per 100 m distance.
10) Measured at the 1/e points. 0.25 mrad corresponds to an increase of 25 mm of beam diameter per 100 m distance.

Scanner Performance

	Vertical (Line) Scan	Horizontal (Frame) Scan
Scan Angle Range	total 105° (+65° / -40°)	max. 360°
Scanning Mechanism	rotating multi-facet mirror	rotating head
Scan Speed	4 lines/sec to 420 lines/sec	0°/sec to 360°/sec [11]
Performance	scan time less than 30 seconds for "Panorama_6mm" (approx. 30 Mio measurements) 6 mm resolution @ 10 m distance, **up to 60 scan positions per hour** (including scan and image acquisition with real-time onboard registration)	
Angular Step Width [12] $\Delta\vartheta$ (vertical), $\Delta\varphi$ (horizontal) User defineable Resolution	$0.0007° \leq \Delta\vartheta \leq 0.5°$ between consecutive lase r shots	$0.0015° \leq \Delta\varphi \leq 0.86°$ between consecutive scan lines
Angular Accuracy [13]	0.0028° (10 arcsec)	0.0028° (10 arcsec)
Angle Measurement Resolution	better 0.0007° (2.5 arcsec)	better 0.0005° (1.8 arcsec)

11) Frame scan can be disabled, providing 2D scanner operation.
12) Selectable.

13) 1-sigma value, based on target modeling, under *RIEGL* test conditions

Scanner Performance (continued)

Orientation Sensors	integrated 3-axis accelerometer, 3-axis gyroscope, 3-axis magnetometer (compass), barometer
GNSS Receiver	integrated L1 GNSS receiver, optional external *RIEGL* GNSS RTK receiver
Waveform Data Output (optional)	providing digitized echo signal information for specific target echoes
Data Storage	integrated SSD 1 TByte, removable CF-Express card 480 GByte, automatic sync while scanning
Cloud Storage	Amazon S3, FTP-Server, Microsoft Azure
On-board Registration	automatic scan data registration as background process while scanning

Scanner Control

via Laser Scanner	7 inch touch screen, 1280 pixel x 800 pixel
via Mobile Device(WiFi)	„*RIEGL* VZi-Series"-App, available for iOS and Android
via ROS	ROS (Robot Operation System) driver available

Camera

Internal Camera	3 x 12 MPix CMOS color cameras, FOV 115° x 40° (v x h)
External Camera (optional)	e.g. detachable SONY α7R IV

General Technical Data

Internal Power Supply	**2 x Li-Ion hot-swap rechargeable batteries** 99 Wh, up to 90 minutes operating time, each <0.5 kg / 1.1 lbs each
External Power Supply	input voltage 11 - 34 V DC
Power Consumption	typ. 50 W, max. 65 W (without external devices)
Main Dimensions (width x height x depth)	173 mm x 305 mm x 184 mm
Weight	**Scanner without battery <6 kg / 13 lbs**
Humidity	max. 80 % non condensing @ +31°C
Protection Class	**IP64, dust- and splash-proof**
Temperature Range Storage / Operation Low Temperature Operation [1]	-10°C up to +50°C / 0°C up to +40°C: standard operation -20°C: continuous scanning operation if instrument is powered on while internal temperature is at or above 0°C and still air -40°C: scanning operation for about 20 minutes if instrument is powered on while internal temperature is at or above 15°C and still air

[1]   Insulating the scanner with appropriate material will enable operation at even lower temperatures.

RIEGL VZ-600i Online-Datasheet
for further details

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