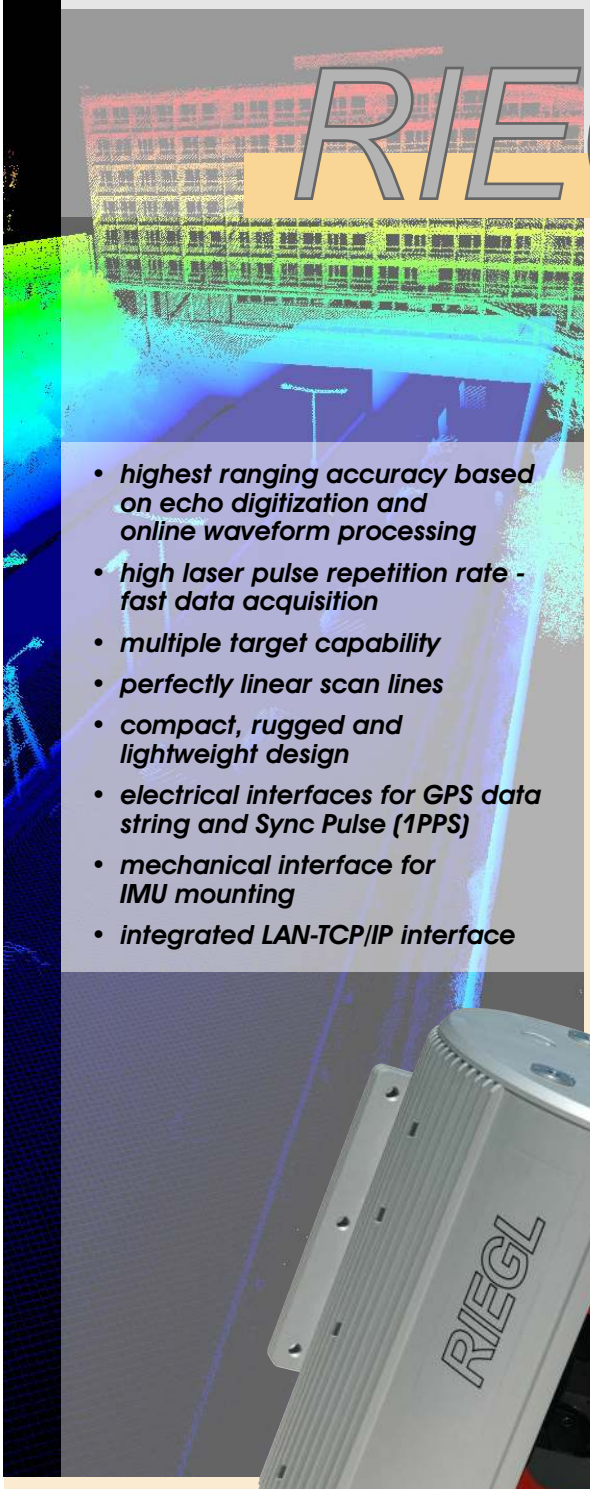
2D Laser Scanner with Online Waveform Processing

RIEGL VQ®-180



- *highest ranging accuracy based on echo digitization and online waveform processing*
- *high laser pulse repetition rate - fast data acquisition*
- *multiple target capability*
- *perfectly linear scan lines*
- *compact, rugged and lightweight design*
- *electrical interfaces for GPS data string and Sync Pulse (1PPS)*
- *mechanical interface for IMU mounting*
- *integrated LAN-TCP/IP interface*

The V-Line® 2D Laser Scanner *RIEGL* VQ-180 provides high speed, non-contact data acquisition using a narrow infrared laser beam and a fast line scanning mechanism.

High-accuracy laser ranging is based on *RIEGL´s* unique echo digitization and online waveform processing, which allows achieving superior measurement capability even under adverse atmospheric conditions and the evaluation of multiple target echoes. The scanning mechanism is based on a fast rotating multi-facet polygonal mirror, which provides fully linear, unidirectional and parallel scan lines.

The *RIEGL* VQ-180 is a very compact and lightweight scanner, mountable in any orientation and even under limited space conditions on moving platforms, such as boats, trains, road and off-road vehicles. The instrument needs only one power supply and provides line scan data via the integrated LAN-TCP/IP interface. The binary data stream can easily be decoded by user-designed software making use of the available software library RiVLib.

Typical applications:
Mobile Mapping
Shipborne Surveying

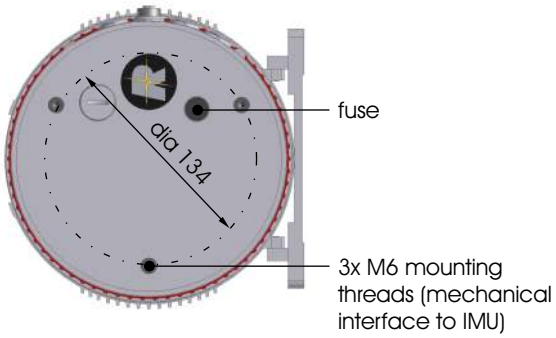
visit our website www.riegl.com

RIEGL®
LASER MEASUREMENT SYSTEMS

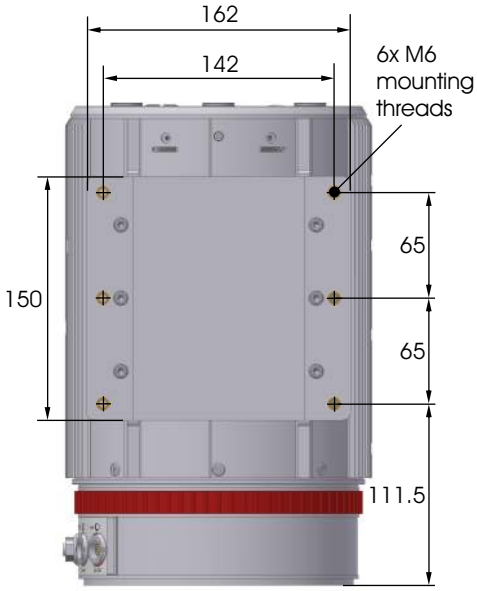
Mobile Laser Scanning

all dimensions in mm

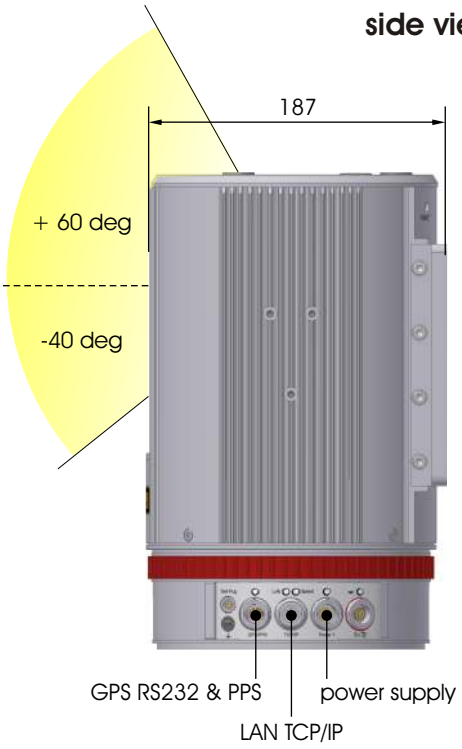
bottom view



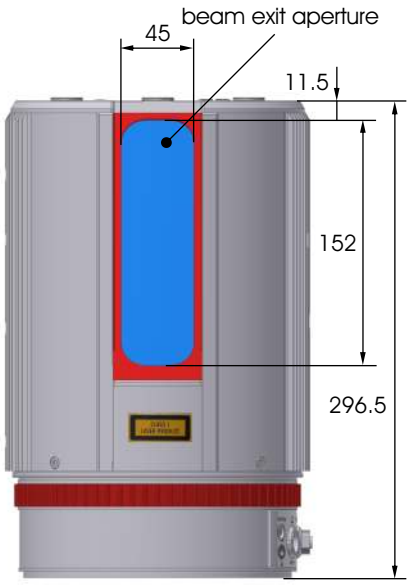
rear view



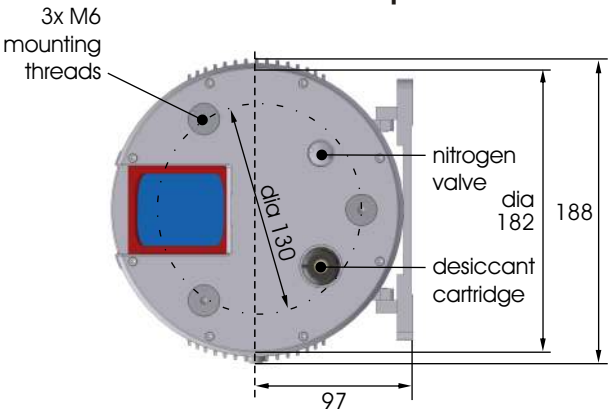
side view



front view



top view



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 June 24, 2007.

Range Measurement Performance

Measuring Principle

- time-of-flight measurement
- echo signal digitization
- online waveform processing

Laser Pulse Repetition Rate PRR (selectable)[1]	50 kHz	100 kHz	150 kHz	200 kHz
Resulting Measurement Rate (meas./sec)[1]	21 000	42 000	62 500	83 000
Max. Measuring Range [2] natural targets ρ ≥ 10% natural targets ρ ≥ 60%	150 m	135 m	100 m 150 m	90 m
Max. Number of Targets per Pulse	practically unlimited (details on request)			

Minimum Range	1.5 m
Accuracy [3) 5)]	15 mm
Precision [4) 5)]	10 mm
Laser Pulse Repetition Rate PRR [1)]	up to 200 kHz
Max. Effective Measurement Rate [1)]	up to 83 000 meas./sec (@ 200 kHz PRR & 100° FOV)
Echo Signal Intensity	for each echo signal, high-resolution 16 bit intensity information is provided
Laser Wavelength	near infrared
Beam Divergence	0.3 mrad
Laser Beam Footprint (Gaussian Beam Definition)	31 mm @ 100 m 50 mm @ 150 m

1) Rounded values.
2) The following conditions are assumed: target larger than the footprint of the laser beam, perpendicular angle of incidence, visibility 23 km, average ambient brightness.
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.

Scanner Performance

Scanning Mechanism	rotating multi-facet mirror
Field of View (max.)	100° (+60° / -40°)
Scan Speed (selectable)	10 - 120 scans/sec
Angular Step Width $\Delta\vartheta$ (selectable) between consecutive laser shots	$0.012° \leq \Delta\vartheta \leq 0.57°$
Angle Measurement Resolution	0.001°
Internal Sync Timer	for real-time synchronized time stamping of scan data
Scan Sync (optional)	scanner rotation synchronization

Data Interfaces

Configuration	LAN 10/100/1000 Mbit/sec
Scan Data Output	LAN 10/100/1000 Mbit/sec
GPS-System	Serial RS232 Interface for data string with GPS-time information, TTL input for 1 PPS synchronization pulse

General Technical Data

Power Supply Input Voltage	18 - 32 V DC
Power Consumption	typ. 50 W
Main Dimensions	188 x 296.5 mm (diameter x length)
Weight	approx. 9 kg
Humidity	max. 80% non condensing @ +31°C
Protection Class	IP64, dust and splash-proof
Temperature Range	-10 °C to +40 °C (operation) / -20 °C to +50 °C (storage)

RIEGL®
LASER MEASUREMENT SYSTEMS

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