The V-Line® “Full Circle” laser scanner RIEGL VQ-450 is a very high speed, non-contact profile measuring system using a narrow infrared laser beam and a fast line scanning mechanism, enabling full 360 degree beam deflection without any gaps.

High-performance pulsed laser ranging, based on RIEGL’s well-proven echo signal digitization technology with subsequent online waveform processing results in superior measurement capabilities even under adverse atmospheric conditions and in excellent multiple target echo discrimination.

The RIEGL VQ-450 is a compact and lightweight scanner, mountable in any orientation and even under limited space conditions on land based vehicles, tunnel measuring devices, watercrafts, etc. 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.

The RIEGL VQ-450 is optimally suited for

• Long Range, High Speed, 
  High Accuracy Mobile Mapping 
  Applications

visit our website www.riegl.com
## Technical Data RIEGL VQ®-450

### Laser Product Classification

**RIEGL**

**VQ®-450**

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

#### Effective Measurement Rate

<table>
<thead>
<tr>
<th>Max. Measurement Range</th>
<th>150 kHz</th>
<th>200 kHz</th>
<th>300 kHz</th>
<th>380 kHz</th>
<th>550 kHz</th>
<th>550 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>natural targets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 10 %</td>
<td>300 m</td>
<td>260 m</td>
<td>200 m</td>
<td>180 m</td>
<td>140 m</td>
<td>70 m</td>
</tr>
<tr>
<td>natural targets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 80 %</td>
<td>800 m</td>
<td>700 m</td>
<td>450 m</td>
<td>330 m</td>
<td>220 m</td>
<td>200 m</td>
</tr>
</tbody>
</table>

#### Max. Number of Targets per Pulse

- practically unlimited (details on request)

1) Rounded values.

2) Reduced laser power for avoiding of ambiguous echo range readings.

3) 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.

4) Limited by PRR.

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) One sigma @ 50 m range under RIEGL test conditions.

8) User selectable.

### Scanner Performance

**Scanning Mechanism**

- rotating mirror

**Field of View** (selectable)

- up to 360° "full circle", without gaps

**Scan Speed** (selectable)

- up to 200 scans/sec
- 0.001° ≤ Δφ ≤ 0.48°
- 0.001° for real-time synchronized time stamping of scan data

**Angular Step Width Δ ϕ (selectable)**

- between consecutive laser shots

**Angle Measurement Resolution**

- Internal Sync Timer

**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

### Mechanical Interfaces

**Mounting of Laser Scanner**

- 6x dia 11 mm mounting slots

**Mounting of IMU Sensor**

- 3x M6 thread inserts, depth 8 mm at bottom

### General Technical Data

**Power Supply Input Voltage**

- 18 - 32 V DC

**Current Consumption**

- typ. 55 W @ 10 scans/s, typ. 135 W @ 200 scans/s, max. 180 W

**Main Dimensions (L x W x H)**

- approx. 12.5 kg (without protective cap)

**Weight**

- max. 80 % non condensing @ +31°C

**Humidity**

- IP64, dust and splash-proof

**Protection Class**

- -10°C up to +40°C (operation) / -20°C up to +50°C (storage)

**Temperature Range**

9) At the maximum scanning rate of 200 scans/sec and ambient temperature < +10°C.

**Note:** In Germany and in the U.S.A. only, use of the VQ-450 for other applications than Mobile Mapping and Tunnel Profile Measurement is not permitted.
Dimensional Drawings RIEGL VQ®-450

Rear view

All dimensions in mm

dia. 8mm H7 slotted hole

6x dia. 11 mm mounting slots
dia. 5 mm H7 dowel hole

top view

gps RS232 & PPS
LAN TCP/IP

Power supply

desiccant cartridge

side view

scanner FOV 360 deg

3x M6 threads depth 8mm

bottom view

fuse

front view

beam aperture window

dia. 172

dia. 100

Protective Cap:

When not in operation, a protective cap is to be attached to shield the high precision optical front end from mechanical damage and soiling.