In further development of the RIEGL VQ-580 Airborne Laser Scanner Series – the RIEGL VQ-580 II presents itself in a completely new design that successfully takes up the already proven qualities and leads them to a new standard of performance and user-friendliness.

Its new sophisticated design allows to further reduce the overall weight and enables the seamless integration into stabilized platforms, e.g. standard gyromounts, and also into even small hatches. The scanner is well suited for the use in manned aircrafts like helicopters, small fixed-wing aircrafts, or ultra-light planes.

Based on RIEGL’s proven Waveform-LiDAR technology, the VQ-580 II provides highly accurate point clouds, excellent vertical target resolution, calibrated reflectance readings, and pulse shape deviation for unsurpassed information content on each single measurement. With a measurement rate of up to 1,250,000 measurements/second and an extremely wide field of view of 75°, the scanner offers itself as the first choice for airborne surveying applications like corridor mapping, city modelling, and agriculture & forestry. The laser wavelength makes it especially suited for measurements on ice and snow.

An easy to remove CFast® storage card and an integrated Solid State Disk and/or the option for streaming the scan data via LAN TCP/IP interface are provided for data transfer and storage.
RIEGL VQ®-580 II Installed on GSM-4000 Stabilized Platform to be Used in a Helicopter or Fixed-Wing Aircraft

**RIEGL VQ®-580 II Installation Example**

RIEGL VQ-580 II installed on GSM-4000 stabilized platform to be used in a helicopter or fixed-wing aircraft
The following conditions are assumed for the Operating Flight Altitude AGL:

- ambiguity resolved by multiple-time-around (MTA) processing
- roll angle ±5°
- target size ≥ laser footprint
- average ambient brightness
- operating flight altitude given at a FOV of ±5.75°
### Maximum Measurement Range & Point Density RIEGL VQ®-580 II

**PRR = 1200kHz**

**Example:** VQ-580 II at 1,200,000 pulses/sec, laser power level 100%  
Altitude = 2,300 ft AGL, Speed 60 kn  
**Results:** Point Density ~ 22.58 pts/m²

**PRR = 2000kHz**

**Example:** VQ-580 II at 2,000,000 pulses/sec, laser power level 100%  
Altitude = 1,300 ft AGL, Speed 60 kn  
**Results:** Point Density ~ 66.60 pts/m²

The following conditions are assumed for the Operating Flight Altitude AGL:

- ambiguity resolved by multiple-time-around (MTA) processing
- roll angle ±5°
- target size ≥ laser footprint
- average ambient brightness
- operating flight altitude given at a FOV of +/- 37.5°
Laser Product Classification

Technical Data RIEGL VQ®-580 II

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.

The instrument must be used only in combination with the appropriate laser safety box.

Range Measurement Performance

Measuring Principle

echo signal digitization, online waveform processing, time-of-flight measurement, multiple target capability

<table>
<thead>
<tr>
<th>Laser Pulse Repetition Rate PRR</th>
<th>150 kHz</th>
<th>300 kHz</th>
<th>600 kHz</th>
<th>1200 kHz</th>
<th>2000 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Measuring Range (2</td>
<td>1)</td>
<td>1850 m</td>
<td>2150 m</td>
<td>1000 m</td>
<td>1200 m</td>
</tr>
<tr>
<td>natural targets p ≥ 20 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>natural targets p ≥ 60 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Operating Flight Altitude (2</td>
<td>4)</td>
<td>1350 m</td>
<td>1600 m</td>
<td>750 m</td>
<td>900 m</td>
</tr>
<tr>
<td>natural targets p ≥ 20 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>natural targets p ≥ 60 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOHD (5)</td>
<td>160 m</td>
<td>110 m</td>
<td>70 m</td>
<td>30 m</td>
<td>300 m</td>
</tr>
<tr>
<td>ENOHD (6)</td>
<td>1020 m</td>
<td>710 m</td>
<td>480 m</td>
<td>310 m</td>
<td>200 m</td>
</tr>
<tr>
<td>Max. Number of Target per Pulse (6)</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>

1) Rounded average PRR
2) Typical values for average conditions and average ambient brightness. In bright sunlight, the max. range is shorter than under an overcast sky.
3) The 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. Range ambiguities have to be resolved by multiple-time-around processing.
4) Typical values for max. effective FOV 75°, additional roll angle ± 5°
5) Nominal Ocular Hazard Distance (NOHD) and Extended Nominal Ocular Hazard Distance (ENOHD), based upon MPE according to IEC 60825-1:2014, for non-persisting beam viewing (less than 600 laser pulses within a time period of 10 s) and non-overlapping beam footprints. NOHD and ENOHD increase when number of laser pulses exceeds this limit (persistent viewing).
6) If more than one target is hit, the total laser transmitter power is split and, accordingly, the achievable range is reduced.

Minimum Range

Accuracy (7, 9) 7) | 20 m | 20 mm | 20 mm |
| Precision (8, 9) | up to 2000 kHz | up to 1 250 000 meas./sec. (@ 2000 kHz PRR & 75° scan angle) |

Laser Pulse Repetition Rate (10) | User selectable. |

Max. Effective Measurement Rate | up to 1 250 000 meas./sec. (@ 2000 kHz PRR & 75° scan angle) |

Echo Signal Intensity | provided for each echo signal |

Laser Wavelength | near infrared |

Scanner Performance

Laser Beam Divergence | 0.25 mrad (11) |

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

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

7) Accuracy is the degree of conformity of a measured quantity to its actual (true) value.
8) Precision, also called reproducibility or repeatability, is the degree to which further measurements show the same result.
9) One sigma @ 150 m range under RIEGL test conditions.
10) User selectable.
11) Measured at 1/e2 points, 0.25 mrad corresponds to an increase of 25 mm of beam diameter per 100 m distance.
12) The minimum scan rate depends on the selected laser PRR.
13) The angular step width depends on the selected laser PRR.

Total Scan Rate | 30 lines/sec, 300 lines/sec, 3000 lines/sec |

Angular Step Width Δ | 0.002° ≤ Δ ≤ 0.24° |

Angle Measurement Resolution | 0.001° |

14) The maximum angular step width is limited by the maximum scan rate.

Data Interfaces

Configuration | LAN 10/100/1000 MBit/sec |

Scan Data Output | LAN 10/100/1000 MBit/sec |

Synchronization | Serial RS-232 interface, TTL input for 1 pps synchronization pulse, accepts different data formats for GNSS-time information |

Camera Interface | 1 connector with power, RS-232, pps, trigger, exposure |

2 connectors with power, 2x trigger, 2x exposure |

Data Storage

Permanently Installed Data Storage | Solid State Disc SSD, 1 TByte |

Removable Data Storage | Cardholder for CFAS(Tm) storage cards (up to 256 GByte) |

15) CFast is a registered trademark of CompactFlash Association.
## Technical Data RIEGL VQ®-580 II

### General Technical Data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply Input Voltage</td>
<td>18 - 34 V DC</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>typ. 110 W, max. 220 W ¹)</td>
</tr>
<tr>
<td>Main Dimensions (L x W x H)</td>
<td>378 mm x 193 mm x 252 mm (without mounted carrying handles)</td>
</tr>
<tr>
<td>Weight without integrated IMU/GNSS</td>
<td>9.9 kg</td>
</tr>
<tr>
<td>Weight with integrated IMU/GNSS</td>
<td>10.3 kg</td>
</tr>
<tr>
<td>Humidity</td>
<td>non condensing</td>
</tr>
<tr>
<td>Protection Class</td>
<td>IP54, dust-proof and splash-proof</td>
</tr>
<tr>
<td>Max. Flight Altitude</td>
<td>18'500 ft (5600 m) above MSL (Mean Sea Level)</td>
</tr>
</tbody>
</table>
| Max. Flight Altitude operating     | -5°C up to +40°C (operation) /
| Max. Flight Altitude not operating | -10°C up to +50°C (storage)               |

### Integrated IMU & GNSS (optional) ²)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMU Accuracy</td>
<td></td>
</tr>
<tr>
<td>Roll, Pitch</td>
<td>0.015°</td>
</tr>
<tr>
<td>Heading</td>
<td>0.035°</td>
</tr>
<tr>
<td>IMU Sampling Rate</td>
<td>200 Hz</td>
</tr>
<tr>
<td>Position Accuracy (typ.)</td>
<td></td>
</tr>
<tr>
<td>horizontal</td>
<td>≤ 0.05 m</td>
</tr>
<tr>
<td>vertical</td>
<td>≤ 0.1 m</td>
</tr>
</tbody>
</table>

¹) Max. scan rate, all heaters in operation.
²) Accuracy specifications for post-processed data.