The RIEGL miniVUX-1UAV is an extremely lightweight airborne laser scanner, designed specifically for integration with UAS/UAV/RPAS.

The small and sophisticated design of the stable aluminum housing offers various integration possibilities with platforms that offer restricted space or payload capabilities. The 360° field of view allows complete acquisition of the environment.

An easy-to-remove SD card for data storage, and/or the option for streaming the scan data via LAN-TCP/IP interface, in combination with the modest power consumption of the scanner, enable straight-forward integration with most UAS/UAV/RPAS types.

The RIEGL miniVUX-1UAV makes use of RIEGL’s unique Waveform-LiDAR technology, allowing echo digitization and online waveform processing. Multi-target resolution is the basis for penetrating even dense foliage. As a further special feature, the wavelength is optimized for the measurement of snowy and icy terrain.

In addition to the stand-alone version of the miniVUX-1UAV, RIEGL also offers fully-integrated system solutions.

Typical applications include:
- Agriculture & Forestry
- Glacier and Snowfield Mapping
- Archeology and Cultural Heritage Documentation
- Construction-Site Monitoring
- Landslide Monitoring

- very compact & lightweight (1.55 kg / 3.4 lbs)
- 360° field-of-view
- robust aluminum housing, ready to be mounted on multi-rotor, rotary-wing, and fixed-wing UAVs
- makes use of RIEGL’s unique echo signal digitization and online waveform processing
- multiple target capability – up to 5 target echoes per laser shot
- scan speed up to 100 scans/sec
- measurement rate up to 100,000 measurements/sec
- mechanical and electrical interface for IMU mounting
- exceptionally well suited to measure in snowy and icy terrains
- user-friendly, application- and installation-oriented solutions for integration
**RIEGL miniVUX-SYS System Integration Options**

Besides of the stand-alone miniVUX-1UAV LiDAR engine, **RIEGL** offers also system solutions, combining the miniVUX-1UAV with IMU/GNSS systems of different performance and of different form factors as well as optional RGB camera systems. Additionally, a special add-on to the miniVUX-SYS allows for straightforward integration with your multi-rotor UAV, e.g. a DJI Matrice M600 / M300 RTK.

Please contact sales@riegl.com to get more detailed information.

**RIEGL miniVUX-1UAV with APX-15 UAV**

- IMU/GNSS unit integrated with LiDAR engine
- total weight approx. 2 kg
- interfaces for up to 2 cameras
- suited for integration into fixed-wing UAVs

**RIEGL miniVUX-1UAV with APX-20 UAV (IMU82/IMU90)**

- higher-grade IMU/GNSS unit partly integrated (IMU82) respectively fully integrated (IMU90) with LiDAR engine
- total weight approx. 2.5 kg / 2.3 kg
- interfaces for up to 2 cameras
- suited for integration into all types of UAVs

**RIEGL Integration Kit 600 / 300**

- add-on to the miniVUX-SYS coming with shock-absorbing mounting-kit, power supply module and cabling
- total weight approx. 0.7 kg / 0.35 kg (without sensor and camera)
- suited for integration into multi-rotor UAVs

---

1) See technical details in the corresponding Applanix datasheet
**RIEGL miniVUX®-1UAV LiDAR Sensor equipped with APX-15 UAV**

- with two Sony Alpha 6000 cameras (oblique mount)

**RIEGL miniVUX®-1UAV LiDAR Sensor equipped with APX-20 UAV (e.g. IMU82)**

- with nadir-looking camera e.g. Alpha 6000 camera or Sony A7R III or Sony A7R IV
- Integration of other 3rd party cameras possible

---

1. See technical details in the corresponding Applanix data sheet.
2. Multispectral camera, hyperspectral camera, thermal imaging sensor – more information on request.
Technical Data RIEGL miniVUX-1UAV

### 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.

### Range Measurement Performance

**Measuring Principle**

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

<table>
<thead>
<tr>
<th>Laser Pulse Repetition Rate PRR</th>
<th>100 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>natural targets ρ ≥ 20 %</td>
<td>100 m (330 ft)</td>
</tr>
<tr>
<td>natural targets ρ ≥ 60 %</td>
<td>160 m (525 ft)</td>
</tr>
<tr>
<td>natural targets ρ ≥ 80 %</td>
<td>330 m</td>
</tr>
</tbody>
</table>

| Min. Measuring Range [3]       | 3 m     |
| Max. Measuring Range [2]       | 15 mm   |
| natural targets ρ ≥ 20 %       | 10 mm   |
| natural targets ρ ≥ 60 %       | 100 kHz |
| natural targets ρ ≥ 80 %       | 100 000 meas./sec. (@ 100 kHz PRR & 360° FOV) |
| Typ. Operating Flight Altitude | 100 m (330 ft) |
| Scan Angle ±45° FOV            | 160 m x 50 mm @ 100 m |

### General Technical Data

- **Power Supply Input Voltage / Consumption**
  - 11 - 34 V DC / typ. 18 W @ 100 scans/sec

- **Main Dimensions (L x W x H) / Weight**
  - with Cooling Fan: 243 x 111 x 85 mm / approx. 1.6 kg
  - without Cooling Fan: 243 x 99 x 85 mm / approx. 1.55 kg

- **Environmental Conditions**
  - Humidity: max. 80 % non condensing @ 31°C
  - Protection Class: IP64, dust and splash-proof
  - Temperature Range: -10°C up to +40°C (operation) / -20°C up to +50°C (storage)

---

*RIEGL Laser Measurement Systems GmbH*  
Horn, Austria  
Phone: +43 2982 4211 | www.riegl.com

*RIEGL USA Inc.*  
Winter Garden, Florida, USA  
Phone: +1 407 248 9927 | www.rieglusa.com

*RIEGL Laser Measurement Systems GmbH*  
Horn, Austria  
Phone: +43 2982 4211 | www.riegl.com

*RIEGL Japan Ltd.*  
www.riegl-japan.co.jp

*RIEGL Australia Pty Ltd.*  
www.riegl.com

*RIEGL Canada Inc.*  
www.rieglcanada.com

*RIEGL UK Ltd.*  
www.riegl.co.uk

---

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. Flat terrain assumed, scan angle ±45° FOV
4. If more than one target is hit, the total laser transmitter power is split and, accordingly, the achievable 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. One sigma @ 50 m range under RIEGL test conditions.
8. Measured at 50% peak intensity, 1.6 mrad corresponds to an increase of 160 mm of beam diameter per 100 m distance.
9. Internally available (not available with standard interface box)
10. 1x externally available with standard interface box

---

Copyright RIEGL Laser Measurement Systems GmbH © 2022 – All rights reserved. Use of this data sheet other than for personal purposes requires RIEGL's written consent. This data sheet is compiled with care. However, errors cannot be fully excluded and alterations might be necessary.