The RiCOPTER is a high-performance unmanned multi-rotor aircraft equipped with RIEGL’s VUX-SYS sensor system to offer a fully integrated turnkey solution for professional UAS surveying missions.

The excellent measurement performance of the VUX-1UAV in combination with IMU/GNSS unit, antenna, control unit, and optional digital cameras results in survey grade measurement accuracy.

The RiCOPTER is a complete UAS LiDAR solution from one single manufacturer!

RIEGL RiCOPTER®
Remotely Piloted Aircraft System for Unmanned Laser Scanning (ULS)

Typical Applications
• Agriculture and Forestry • Topography in Open-Cast Mining • Terrain and Canyon Mapping • Surveying of Urban Environments • Archeology and Cultural Heritage Documentation • Construction-Site Monitoring • Corridor Mapping: Power Line, Railway Track, and Pipeline Inspection

Scan this QR code with your smartphone to get further information about the RIEGL RiCOPTER.
**RIEGL RiCOPTER Main Features & Key Facts**

- robust and reliable airborne scanner carrying platform
- full mechanical and electrical integration of sensor system components with aircraft fuselage
- carbon fibre main frame, foldable propeller carrier arms, and shock-absorbing undercarriage for stable flight, landings and comfortable transportation
- redundant flight controllers, live video & telemetry downstream
- optimized for operation of VUX-SYS Sensor System including cameras
- remote control Graupner MC32 (2.4 GHz; telemetry supported)

**RIEGL RiCOPTER Aircraft Technical Data**

### Specifications and Performance:

<table>
<thead>
<tr>
<th>Main Dimensions</th>
<th>ready to fly: arms folded for transportation &amp; storage</th>
<th>1,920mm x 1,820mm x 470mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTOM (Maximum Take-Off Mass)</td>
<td>&lt; 25 kg</td>
<td>624mm x 986mm x 470mm</td>
</tr>
<tr>
<td>Max. Payload (batteries &amp; sensor load)</td>
<td>up to 16 kg</td>
<td></td>
</tr>
<tr>
<td>Empty Weight</td>
<td>8 kg</td>
<td></td>
</tr>
<tr>
<td>Max. Operating Altitude AMSL</td>
<td>up to 4000 m (12,000 ft)</td>
<td>(under ISA(^1) conditions)</td>
</tr>
<tr>
<td>Max. Flight Endurance</td>
<td>with 8 kg sensor load: up to 30 min</td>
<td></td>
</tr>
<tr>
<td>Cruise Speed</td>
<td>typ. 20 - 30 km/h</td>
<td></td>
</tr>
<tr>
<td>Take-off / Landing</td>
<td>VTOL (Vertical Take-off and Landing)</td>
<td></td>
</tr>
<tr>
<td>RiOPTER Transportation Case dimensions empty weight</td>
<td>1,220mm x 810mm x 540mm</td>
<td>approx. 20 kg</td>
</tr>
<tr>
<td>RiCOPTER Ground Station (optional) dimensions weight components</td>
<td>600mm x 400mm x 400mm</td>
<td>approx. 19 kg</td>
</tr>
<tr>
<td>• monitor for video downstream</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• video receiver with two antennas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ground station PC (flight planning, mission guidance)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• internal batteries for power supply</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Limitations:

| Max. Horizontal Air Speed | 60 km/h |
| Max. Tolerable Wind Speed | 30 km/h |
| Max. Climb Rate | 6 m/sec |
| Max. Descent Rate | 1.3 m/sec |
| Max. Descent Speed for smooth landings | 0.2 m/sec |

### Hot / Cold Weather Operation:

| Min. Operating Temperature | -5°C OAT (Outside Air Temperature) |
| Max. Operating Temperature | +40°C OAT (Outside Air Temperature) |

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1) 8 kg batteries + up to 8 kg sensor load
2) AMSL – Above Mean Sea Level
3) depending on rotor blade configuration
4) For flight altitude above ground level, operational limits for civil unmanned aircraft according to national regulations have to be observed.
5) ISA – International Standard Atmosphere
**RIEGL RiCOPTER Setup with Integrated VUX-SYS Sensor System**

The VUX-SYS fits the dedicated mounting bay of the RiCOPTER directly without any adaptations. The system is supplemented by two digital cameras, covering a field of view of approximately 160 degrees. The low weight of the VUX-SYS enables the RiCOPTER to operate up to half an hour at a gross weight of 25kg.

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### System Components

- RIEGL VUX-1UAV LIDAR sensor
- IMU/GNSS unit with antenna
- control unit
- up to 2 cameras (optional)

### RIEGL VUX-1UAV Scanner Performance when integrated in RiCOPTER

<table>
<thead>
<tr>
<th>Field of View (FOV)</th>
<th>max. effective measurement rate</th>
<th>max. range @ target reflectivity 20 %</th>
<th>minimum range</th>
<th>range accuracy</th>
<th>Laser Safety Class according to IEC60825-1:2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>230°</td>
<td>up to 350,000 meas./sec</td>
<td>550 m</td>
<td>3 m</td>
<td>10 mm</td>
<td>Laser Class 1 (eye safe)</td>
</tr>
</tbody>
</table>

### IMU/GNSS Unit

- accuracy Roll, Pitch / Heading: 0.015° / 0.035°
- IMU sampling rate: 200 Hz
- position accuracy (typ.): 0.05 m - 0.3 m

### Camera Interfaces

- 2x trigger and event marker

Details to be found in the latest RIEGL VUX-1UAV & VUX-SYS data sheets.

The VUX-SYS Sensor System can also be equipped with the RIEGL VUX-1LR (details on request).
Executive Summary

Power Line Project

Environmental & Flood Analysis

For receiving more information about the scope of delivery, pricing, and availability of sample data, please get in contact with sales@riegl.com.

Reference projects have already been carried out successfully in applications like power line & infrastructure mapping, forestry & agriculture, environmental monitoring, flood analysis, and many more.

Optional RIEGL RiCOPTER Components / Accessories

RIEGL RiCOPTER Ground Station

The Ground Station comes in an aluminum carrying case for easy and safe transportation and includes:

- monitor for receiving the video stream
- video receiver with 2 antennas
- Panasonic Toughbook for flight planning and configuration of the mission
- internal batteries for power supply
- storage for remote control unit

RIEGL RiCOPTER Integrated Charging Station

- professional charging station for RiCOPTER battery set
- 200 – 240 V / max. 2,600 Watt
- 4 loading slots for max. 13A each
- loading time: approx. 1 hour for 1 set (4 batteries)

Further accessories available (more information on request).

Further Information & Scan Data Projects

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RIEGL VUX-1UAV Technical Data

- max. measurement range: 350m
- optional digital camera
- pulse repetition rate PRR (peak): 500 kHz
- multiple target capability
- online waveform processing
- eye safe operation at Laser Class 1
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