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!

Typical Applications
- Agriculture and Forestry
- Topography in Open-Cast Mining
- Terrain and Canyon Mapping
- Surveying of Urban Environments
- Archaeology and Cultural Heritage Documentation
- Construction-Site Monitoring
- Corridor Mapping: Power Line, Railway Track, and Pipeline Inspection
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 camera(s)
- Remote control Graupner MC32 (2.4 GHz; telemetry supported)

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 (624mm x 986mm x 470mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTOM (Maximum Take-Off Mass)</td>
<td>25 kg</td>
<td></td>
</tr>
<tr>
<td>Max. Sensor Load</td>
<td>up to 6.5 kg</td>
<td></td>
</tr>
<tr>
<td>Empty Weight</td>
<td>11 kg</td>
<td></td>
</tr>
<tr>
<td>Max. Operating Altitude AMSL</td>
<td>up to 3000 m (10,000 ft) (under ISA\textsuperscript{4}) conditions</td>
<td></td>
</tr>
<tr>
<td>Max. Flight Endurance</td>
<td>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>RiCOPTER Transportation Case dimensions empty weight</td>
<td>1,220mm x 810mm x 540mm approx. 20 kg</td>
<td></td>
</tr>
<tr>
<td>RiCOPTER Ground Station (optional) dimensions weight components</td>
<td>525mm x 437mm x 217mm approx. 18.5 kg</td>
<td></td>
</tr>
</tbody>
</table>
  - Monitor for video downstream
  - Video receiver with two antennas
  - Ground station PC (flight planning, mission guidance)
  - Internal batteries for power supply

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) |

\textsuperscript{1} AMSL – Above Mean Sea Level
\textsuperscript{2} depending on rotor blade configuration
\textsuperscript{3} For flight altitude above ground level, operational limits for civil unmanned aircraft according to national regulations have to be observed.
\textsuperscript{4} ISA – International Standard Atmosphere

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**RiCOPTER Setup with Integrated RIEGL 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 25 kg.

**System Components**
- RIEGL VUX-1UAV
- 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>230°</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. effective measurement rate</td>
<td>up to 350,000 meas./sec</td>
</tr>
<tr>
<td>max. range @ target reflectivity 20 %</td>
<td>550 m</td>
</tr>
<tr>
<td>minimum range</td>
<td>3 m</td>
</tr>
<tr>
<td>range accuracy</td>
<td>10 mm</td>
</tr>
<tr>
<td>Laser Safety Class according to IEC 60825-1:2014</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

**RIEGL VUX-SYS Sensor System Technical Data**

![RIEGL VUX-1UAV](image1)

**RIEGL VUX-1UAV Data Sheet**

![RIEGL VUX-1LR](image2)

**RIEGL VUX-1LR Data Sheet**

![RIEGL VUX-SYS](image3)

**RIEGL VUX-SYS Data Sheet**

The VUX-SYS Sensor System can also be equipped with the RIEGL VUX-1LR (details on request). Details to be found in the latest RIEGL VUX-1UAV, VUX-1LR & VUX-SYS data sheets.

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**Executive Summary**

**Power Line Project**

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

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**Optional RiCOPTER Components / Accessories**

**RiCOPTER Ground Station**

The Ground Station comes in a PELI-Carrying-Case for easy and safe transportation and includes:

- monitor for receiving the video stream
- video receiver with 2 antennas
- mounting possibility for data link
- internal batteries for power supply
- Panasonic Toughbook for flight planning and configuration of the mission (optional)

**RiCOPTER Charging Control Unit**

- professional PELI-Carrying-Case for easy and safe transportation
- equipped with all required connectors and cables
- Power Supply: 100 – 240 VAC / max. 1.200 Watt
- 2 charging slots for max. 10 A each (2 Charging Control Units are recommended)
- charging time: approx. 1 hour for 1 set (4 batteries; 2 Charging Control Units)

Further accessories available (more information on request).

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**Further Information & Scan Data Projects**

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

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**RIEGL VUX-1UAV Technical Data**

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

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**RIEGL® COMPANY**

www.ricopter.com

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