

# RiCOPTER

with *RIEGL VUX*<sup>®</sup>-SYS integrated



RIEGL VUX-TUAV features



550kHz



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-TUAV 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!



## RiCOPTER<sup>®</sup>

# 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

## RiCOPTER Main Features & Key Facts

- robust und 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
- RiCOPTERControl (RiCC):
  - redundant flight control system developed and produced by RIEGL
- optimized for operation of VUX-SYS Sensor System including camera(s)
- remote control Graupner MC32 (2.4 GHz; telemetry supported)
- 433, 868 or 915 MHz command and control link (details on request); 5.8 GHz live video downstream
- UN 38.3 certified batteries

## RiCOPTER Aircraft Technical Data

Specifications and Performance:

Main Dimensions ready to fly arms folded for transportation & storage	1,920 mm x 1,820 mm x 470 mm 624 mm x 986 mm x 470 mm
MTOM (Maximum Take-Off Mass)	25 kg
Max. Sensor Load	up to 6.5 kg
Empty Weight	11 kg
Max. tested and permitted Operating Altitude AMSL 1	up to 3000 m (10,000 ft) <sup>2) 3) 4)</sup> (under ISA <sup>5)</sup> conditions
Max. Flight Endurance	up to 30 min <sup>6)</sup>
Cruise Speed	typ. 6 - 8 m/sec
Take-off / Landing	VTOL (Vertical Take-off and Landing)
RiCOPTER Transportation Case dimensions empty weight	1,220 mm x 810 mm x 540 mm approx. 20 kg
RiCOPTER Ground Control Unit weight component	approx. 1.2 kg <ul style="list-style-type: none"> <li>• integrated datalink interface</li> <li>• integrated receiver of video signal for FPV camera</li> <li>• powered via USB connection</li> <li>• status display</li> </ul>

1) AMSL – Above Mean Sea Level

2) depending on rotor blade configuration

3) For flight altitude above ground level, operational limits for civil unmanned aircraft according to national regulations have to be observed. 4) higher altitude possible with reduced performance

5) ISA – International Standard Atmosphere

6) with 6.5 kg sensor load



easy to carry with integrated handle



Remote Control Groupner MC32



RiCopter ready for take-off



Transportation Case: foldable arms facilitate easy transportation and storage

**Limitations:**

Max. Ground Speed	14 m/sec <sup>1)</sup>
Max. Tolerable Wind Speed	8 m/sec
Max. Climb Rate	5 m/sec <sup>1)</sup>
Max. Descent Rate	2 m/sec <sup>1)</sup>

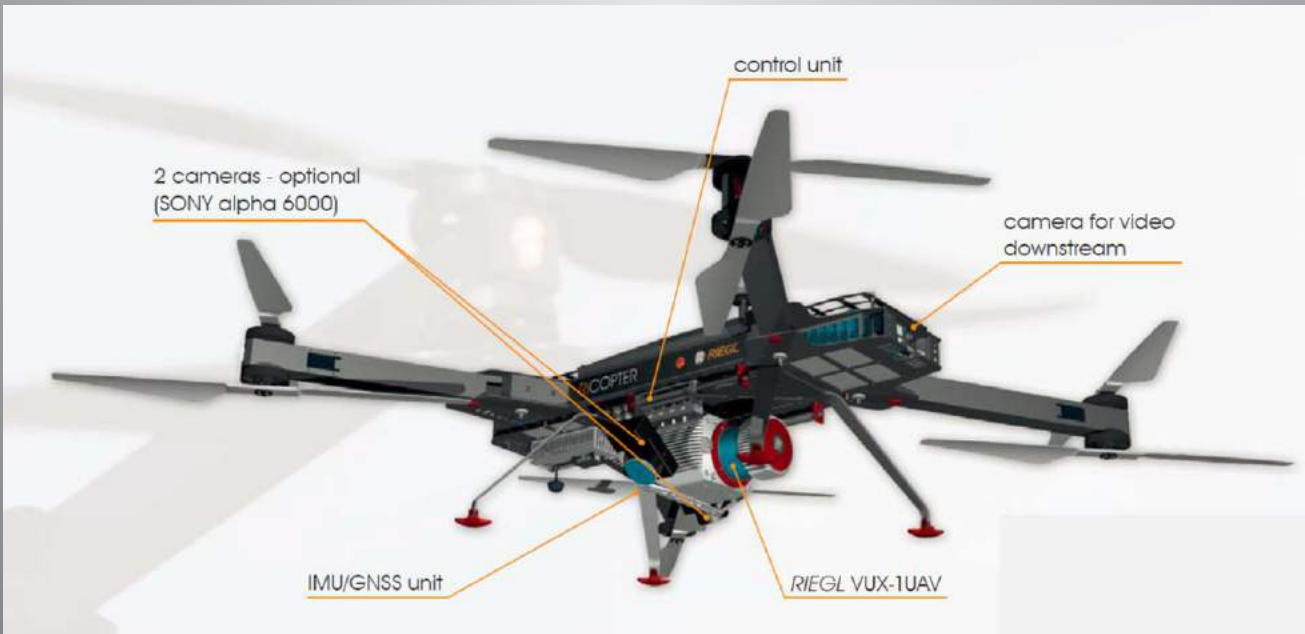
1) electronically limited

**Hot/Cold Weather Operation:**

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

**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.



Infrastructure Mapping



Powerline Mapping



Open-cast Mining

## RIEGL VUX-SYS Sensor System Technical Data

System Components	<ul style="list-style-type: none"> <li>• RIEGL VUX-1UAV</li> <li>• IMU/GNSS unit (APX-20 UAV) with antenna</li> <li>• up to 2 cameras (optional)</li> </ul>
RIEGL VUX-1UAV Scanner Performance when integrated in RiCOPTER	
Field of View (FOV)	230°
max. effective measurement rate	up to 350,000 meas./sec
max. range @ target reflectivity 20 % minimum range	550 m
range accuracy	3 m
Laser Safety Class according to IEC 60825-1:2014	10 mm
IMU/GNSS Unit (Applanix APX-20 UAV)	Laser Class 1 (eye safe)
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-1UAV Technical Data



max. measurement range



pulse repetition rate PRR (peak)



online waveform processing



optional digital camera



multiple target capability



eye safe operation at Laser Class 1

RIEGL VUX-1UAV  
LiDAR Sensor



RiCOPTER  
Ground Control Unit

## Optional RiCOPTER Components / Accessories

### RiCOPTER Ground Control Unit

The Ground Control Unit comes with accoring tripod mount.

- integrated datalink interface (433, 868 or 915 MHz)
- integrated receiver of video signal for FPV camera (5.8 GHz)
- powered via USB connection
- status display
- rugged PC 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)



RICOPTER  
Charging Control Unit

