BathyCopter®

The BathyCopter is a UAV-based LiDAR surveying system for bathymetric applications, ideally suited for generating profiles of shorelines and inland waterbodies.

The robust and reliable platform design of *RIEGL's* remotely piloted RiCOPTER now integrates the new ***RIEGL* BDF-1**, a compact and lightweight bathymetric depth finder comprising a tilt compensator, an IMU/GNSS unit with antenna, a control unit, and up to two external digital cameras. The ***RIEGL* BDF-1** can optionally be supplemented with a miniVUX-1UAV LiDAR sensor.

BathyCopter®

UAV-Based Surveying System

for Hydrographic Applications

Typical Applications

• Generation of profiles of shorelines and inland water bodies (rivers, lakes, channels) • Repeated survey of water reservoirs • Canal surveying • Landscaping • Surveys for planning and hydraulic engineering work

Scan this QR code to watch the BathyCopter video.

www.riegl.com
www.ricopter.com

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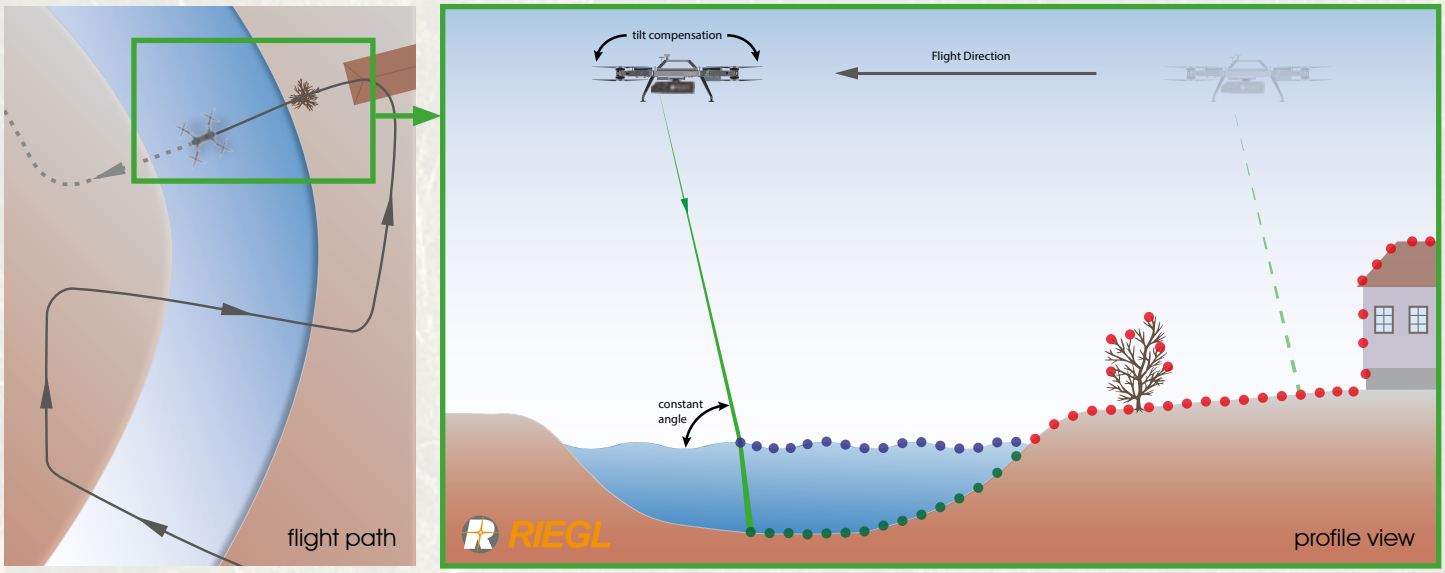
BathyCopter Measuring Principle



The drawings above illustrate the measurement principle of the BDF-1 when operated from a UAV: The UAV performs a meander-like flight path over an inland water body (river, channel, or lake) while the BDF-1 is measuring downward. In case the optional tilt compensator is used, the measuring angle is user-defined and stabilized. Profiles of the water surface (blue dots), ground (green dots) as well as the surrounding landscape (red dots) are generated this way. The multi-target capability of the rangefinder is not only employed for separating the water surface from the ground but also for vegetation penetration.

RIEGL VUX-SYS Scan Data and *RIEGL* BDF-1 Profiles

Riverine zone surveying is a typical application of the BathyCopter:
The image above shows a colorized 3D point cloud acquired with a VUX-1UAV combined with profiles acquired by the BDF-1. Both devices were mounted on the RiCOPTER. The combined dataset provides comprehensive information about the topography of the river and its surroundings. The locations of the detailed river profiles are selected according to hydrographic viewpoints. They can be used to assess water transportation, roughness, and clarity.

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BathyCopter General Setup

RiCOPTER

miniVUX-1UAV
with Applanix AP20 IMU/GNSS unit

BDF-1 bathymetric depth finder
with Sony alpha 6000 camera

floating support

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BathyCopter Key Features

- UAV-based surveying system for hydrographic applications
- ideally suited for generating profiles of shorelines and inland waterbodies
- fully integrated solution, comprising *RIEGL* Bathymetric Depth Finder BDF-1 providing up to 1.5 Secchi depth measuring range
- floating support for safe water landing and take-off from water bodies
- excellent performance even at adverse conditions based on predetection averaging
- highly accurate, reliable and informative bathymetric data resulting from *RIEGL*'s proprietary hydrographic waveform processing
- **modular setup**[1]**:**
  The RiCOPTER can be equipped with any combination of:
  BDF-1, floating support, camera(s), and/or miniVUX-1UAV LiDAR sensor.

1) Note: Operation is subject to legal conditions, especially for configurations with MTOM >25 kg

BathyCopter Specifications

Laser Class according to IEC 60825-1:2014	Class 2M
Operating Flight Altitude	10 - 40 m AWSL (Above Water Surface Level)
MTOM (Maximum Take-Off Mass)	25 kg [2]
Flight Endurance	up to 30 min
Measurement Direction	downward-looking, 15° off nadir
Active Pitch Compensation	24° range
Achievable Secchi Depth vs. Measurement Rate [3]	1.0 @ 4,000 meas./sec (single pulse) 1.2 @ 400 meas./sec (10 pulses averaged) 1.5 @ 40 meas./sec (100 pulses averaged)
Integrated Camera	Sony Alpha 6000
IMU/GNSS unit	Applanix APX-15 UAV
Operation Temperature	+10°C up to +40°C
Main Dimensions arms folded (for transportation & storage) arms unfolded (ready to fly)	 624 mm x 986 mm x 470 mm 1,920 mm x 1,820 mm x 470 mm
Transportation Case (dimensions)	1,220 mm x 810 mm x 540 mm

2) applies for basic setup RiCOPTER with BDF-1
3) @ flight altitude 15 m above water surface

BathyCopter Highlights

BathyCopter in action

BathyCopter ready for take-off

Transportation Case: foldable arms facilitate easy transportation and storage

BathyCopter Ground Station (optional)

YouTube

Watch our videos!
youtube.com/rieglms

The RiCOPTER/BathyCopter is a high performance unmanned multi-rotor aircraft, designed & manufactured by *RIEGL* Laser Measurement Systems GmbH.
It is distributed, supported and serviced by RiCOPTER UAV GmbH, also a *RIEGL* company.

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