

ABATH-3

Autonomous Unmanned Survey Vessel



Dual-GNSS + IMU



Automatic Route + Track



Depth Measurement



Cross-section/Depth Profile

Unmanned Surface Vessel for Bathymetric Surveying

ABATH-3

Autonomous Unmanned Survey Vessel

The APEKS ABATH-3 is a highly-integrated, lightweight and portable autonomous single-beam survey vessel. It integrates high-precision dual-antenna GNSS, IMU and depth sounder onboard.



RAPID DEPLOYMENT

Boasting a streamlined, ready-to-use design, it can be deployed by one operator within minutes.



AUTONOMOUS SURVEYING

Suitable for lakes, inland rivers and coastal waters, the ABATH-3 runs along pre-programmed routes autonomously. It automatically collects, processes and analyzes underwater terrain and water-quality data.



ALL-WEATHER PRECISION

With centimeter-level positioning and all-weather performance, it elevates the efficiency and coverage of shallow-water survey operations.

Lightweight Hull, Easy Deployment

The 7 kg carbon-Kevlar hull is under 1 m and fits a car trunk. No assembly needed — one person handles transport, launch and recovery.



GNSS+IMU Positioning, Reliable Navigation

Dual GNSS + 200 Hz IMU deliver $\pm 8/\pm 15$ mm RTK and $\pm 0.1^\circ$ heading. If signals drop, the IMU keeps position streaming so data stays continuous.



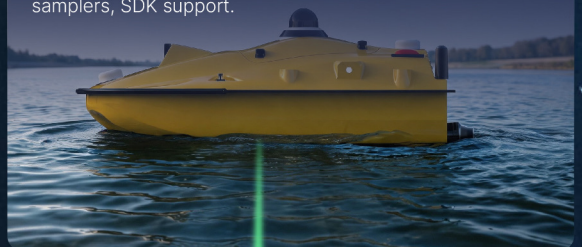
mmWave Radar, 360° Safety Monitoring

mmWave radar scans 0.1–20 m ($\pm 120^\circ$) with live alerts, plus a 360° night camera. Auto-return, full bumper and dual-redundant design add layered safety.



Single-Beam Echo Sounder, Modular Payload

Hot-swap 33.6 V packs give 7 h@1.5 m/s or 3 h@2 m/s (top 7 m/s). The bay carries a single-beam echo sounder for depth and cross-sections, plus sonar, probes, samplers, SDK support.



AquaSurvey

Intelligent USV Control & Survey Software

AquaSurvey is an integrated survey software suite for ABATH-3's controller, combining project planning, navigation, real-time monitoring, data synchronization, and secure data processing, with one-touch operation and automatic navigation.



01 Mission Control ▾

- Route Planning
- Auto Navigation
- Real-Time Tracking

02 Data Collection ▾

- Real-Time Depth
- Sonar Data
- Water Quality

03 Safety Monitoring ▾

- Obstacle Avoidance
- Signal Alerts
- Auto Return

04 Payload Management ▾

- Echo Sounder
- Sonar
- Water Quality Sensors

05 Data Processing ▾

- Echo Stacking
- Attitude Correction
- Data Export



Physical

Hull Dimension (L*W*H)	0.98 × 0.52 × 0.255 m
Material	Macromolecular Polyester Carbon Fiber & Kevlar
Shape	M-Shape Monohull
Draft	8.5 cm
Weight	7 kg (W/O Payload & Battery) / 30 kg (W/ Payload & Battery)
Maximum Payload	35 kg
Anti-Wind & Wave	3rd-Level Wind, 2nd-Level Wave
Waterproof & Dustproof	IP67

Power & Propulsion

Motor Type	Brushless Motor
Steering Type	Differential Steering, Support Reversing
Maximum Motor Power	900 W
Motor Speed	5300 RPM
Motor Installation	Pluggable
Anti-Clogging Design	Semi-Embedded Ducted Thruster: Weed-Resistant & Easy-Clean
Battery Specification	Hot-Swap 2× 33.6 V 25 Ah Rechargeable Lithium
Battery Endurance	3 h @ 2 m/s ; 7 h @ 1.5 m/s
Maximum Speed	Maximum Speed
Interface	2 × RJ45 Port; 2 × RS232 Serial Port; 2 × RS485 Serial Port
Storage	64 GB
Operating Mode	Manual & Auto
Operating System	Linux

Remote Controller

Dimensions	277 × 138 × 96 mm
Display	Touch-Sensitive & Sunlight-Visible Display 1920 × 1200 Resolution, 1200 nit
Storage	4GB RAM + 64GB
System	Android
Battery Capacity	20000 mAh
Runtime	8 h
Charger	18W Type-C Fast Charging in 2 h
External Interface	USB, Type-C, SIM Card Slot, TF Card Slot
Function	·One-Click Switch: Manual, Auto, Hover, Return; ·Quick Buttons: Route Planning, Safety Settings, Parameters Managing, Status Checking; ·360° Coverage: Full-Control Camera Dial

GNSS & Positioning

GNSS	Dual GNSS Antennas (Positioning & Heading)
Satellite System	BDS: B1I, B2I, B3I; GPS: L1C/A, L2P(Y), L2C; Galileo: E1, E5b; GLONASS: L1, L2; QZSS: L1C/A, L2C; SBAS: L1C/A
RTK Positioning (RMS)	Horizontal: ±8 mm + 1 ppm; Vertical: ±15 mm + 1 ppm
DGNSS Positioning (RMS)	Horizontal: 0.4 m + 1 ppm; Vertical: 0.8 m + 1 ppm
Single-Point Positioning (RMS)	Horizontal: 1.5 m; Vertical: 2.5 m
Cold Start	<30 s
Initialization	<5 s (D<10 km)
Heading Accuracy	0.1° @ 1 m Baseline
Inertial Navigation Accuracy	6°/h, <1 m/20 s
IMU Update Rate	200 Hz
NTRIP Protocol	Support CORS, NTRIP Client, Expansibility
Radio Protocol	TT450, Transparent

Camera & Obstacle Avoidance

Camera	360° Night-Visible Omnidirectional Camera
Obstacle Avoidance Angle & Range	Horizontal & Vertical Angle: 120° × 120°; Distance: 0.1 ~ 20 m

Echo Sounder

Frequency	200 KHz
Beam Angle	8°
Sounding Range	0.15~200 m (Optional Longer)
Resolution Ratio	8 mm
Sounding Accuracy	±1 cm + 0.1% D (D = Depth Value of Water)
Sound Velocity	0 m/s ~ 1700 m/s

Communication

Communication	2.4 GHz
Communication Range	Data Transmission in 3 km via 2.4G; Unlimited Distance via 4G
Base Station	UHF & Ntrip
Data Transmission	4G & 2.4G & UHF
Controller Communication	4G & 2.4G
SIM Card Slot	Nano Card Slot



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