# ABATH-6

## Autonomous Unmanned Survey Vessel




Dual-GNSS + IMU

Automatic Route + Track

Bathymetric & Hydrographic Surveying

Advanced Water Data Collection

Unmanned Surface Vessel for Advanced Hydrographic Surveying

# ABATH-6

## Autonomous Unmanned Survey Vessel

The APEKS ABATH-6 is a professional unmanned surface vessel designed for advanced hydrographic surveying, bathymetric mapping, and aquatic data collection.

It supports multiple payloads, including:

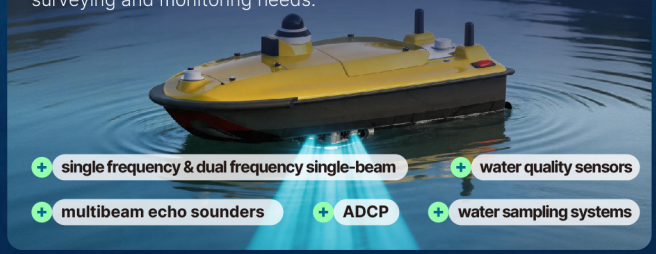
- single-beam and multibeam echo sounders
- ADCP
- water quality sensors
- water sampling systems

It offers a versatile platform for complex surveying and environmental monitoring tasks.




### Multi-Sensor Integration for Versatile Applications

Supports single frequency & dual frequency single-beam and multibeam echo sounders, ADCP, water quality sensors, and water sampling systems. Flexible payload configurations meet diverse surveying and monitoring needs.




### GNSS+IMU Positioning for Reliable Navigation

Dual GNSS and a 200 Hz IMU deliver ±8/±15 mm RTK positioning and ±0.1° heading accuracy. Integrated inertial navigation helps maintain continuous positioning during temporary GNSS signal interruptions.



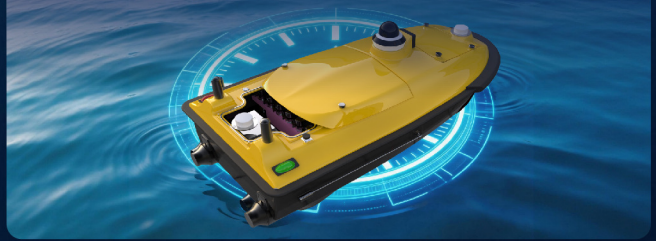
### mmWave Radar for All-Round Safety Monitoring

mmWave radar detects obstacles within 0.1–20 m across a ±120° field of view, complemented by a 360° night-vision camera. Auto-return, a full bumper, and redundant systems enhance operational safety.



### Long Endurance and Flexible Payload

Hot-swappable 33.6 V batteries provide up to 7 hours of operation at 1.5 m/s or 3 hours at 2 m/s, with a maximum speed of 6 m/s. The modular platform supports echo sounders, probes, samplers, and SDK-based development.



# AquaSurvey

## Intelligent USV Control & Survey Software

AquaSurvey is an integrated survey software suite for ABATH-6'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

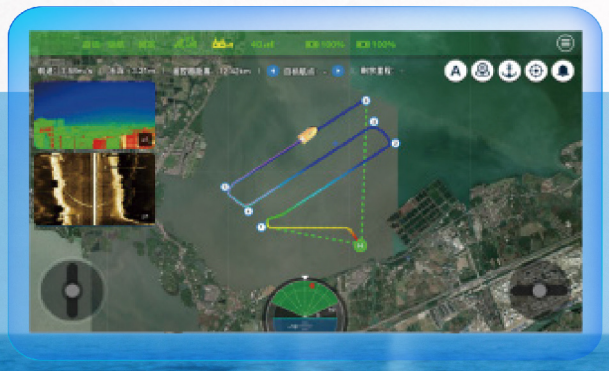
Obstacle Avoidance
Signal Alerts
Auto Return

### 04 Payload Management

Echo Sounder
Sonar
Water Quality Sensors

### 05 Data Processing

Echo Stacking
Attitude Correction
Data Export



## Physical

| | |
|---|---|
| **Hull Dimension (L*W*H)** | 1.28 × 0.58 × 0.43 m |
| **Material** | Macromolecular Polyester Carbon Fiber & Kevlar |
| **Shape** | M-Shape Monohull |
| **Draft** | 10 cm |
| **Weight** | 30.1 kg (W/O Battery) / 37.5 kg (W/ 2 Batteries) |
| **Maximum Payload** | 50 kg |
| **Anti-Wind & Wave** | 4th-Level Wind, 3rd-Level Wave |
| **Waterproof & Dustproof** | IP67 |

## Power & Propulsion

| | |
|---|---|
| **Motor Type** | Brushless Motor |
| **Steering Type** | Differential Steering, Support Reversing |
| **Maximum Motor Power** | 1100 W |
| **Motor Speed** | 4000 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** | 6 m/s |
| **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, Operation Settings, 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 & AI Camera |
| **Obstacle Avoidance Angle & Range** | Horizontal & Vertical Angle: 120° × 120°; Distance: 0.1 ~ 20 m (Can Be Upgraded to 40 m Maximum) |

## Echo Sounder

| | |
|---|---|
| **Frequency** | 200 KHz |
| **Beam Angle** | 8° |
| **Sounding Range** | 0.15–200 m |
| **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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