

CHCNAV

# APACHE 3

COMPACT BATHYMETRIC  
SURVEY USV



MARINE  
SURVEYING

# COST-EFFECTIVE USV WITH SINGLE-BEAM ECHOSOUNDER

The APACHE 3 is a portable, shallow-draft unmanned surface vessel (USV) equipped with a single-beam echo sounder for bathymetric surveys of lakes, inland rivers, and coastal zones. With seamless 4G communications, dual GNSS positioning and heading, an IMU sensor, and high-efficiency motors, the APACHE 3 navigates pre-determined courses in autonomous mode under adverse current and flow conditions, ensuring accurate and efficient data collection.

## OPTIMIZED STRUCTURE AND DURABILITY

### High-impact-resistant hull

Built with carbon fiber and one-piece molding, the APACHE 3 USV hull delivers up to 10 MPa of strength and a 60% improvement in collision resistance. A reinforced aluminum cover adds structural integrity and reduces deformation upon impact. The design is 30% lighter than its previous version, making the Apache 3 even easier for one person to carry and deploy.

## MAINTAIN HIGH ACCURACY UNDER BRIDGES

### Integrated IMU to mitigate temporary GNSS outages

The integration of GNSS and IMU sensor provides accurate position and attitude data to compensate for hull sway on survey results. The APACHE 3 provides consistently high accuracy positions even during temporary GNSS outages while passing under bridges. Tight integration of GNSS and INS data eliminates outliers.

## SURVEYING IN CHALLENGING WATER CONDITIONS

### High-efficiency propulsion design

The APACHE 3 features a semi-recessed motor design that enhances protection and reduces the risk of damage in shallow water. Its next-generation bathymetric algorithms support adaptive parameter adjustment, ensuring reliable performance in dynamic riverbeds and diverse aquatic environments.

## SINGLE-BEAM ECHOSOUNDER FOR BATHYMETRIC SURVEY

The APACHE 3 comes equipped with D270 single-beam echo sounder as standard, making it highly portable. The D270 also integrates a built-in water temperature sensor, enabling real-time sound velocity corrections based on temperature variations. This feature enhances the accuracy of depth measurements, providing reliable bathymetric data even under dynamic environmental conditions.

## INTELLIGENT ANDROID REMOTE CONTROLLER

### An easy-to-use solution for bathymetric surveys.

The APACHE 3's remote control comes pre-installed with the Android-based EasySail software, eliminating the need for cumbersome computer systems. The software features real-time video transmission, parameter monitoring, and an integrated suite of path planning, data logging, and processing functions. These capabilities streamline field operations, providing a more user-friendly and efficient experience for the operator.



**COMPACT  
TURNKEY USV  
SYSTEM**



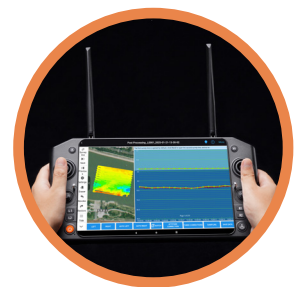
**Motor**



**Reinforced Aluminum  
Alloy Cover**



**360° Camera**



**Android Remote  
Controller**

# SPECIFICATIONS

Physical	
Hull Dimension(L x W x H)	1050 mm x 550 mm x 390 mm
Material	High strength, high modulus carbon fiber
Process	HPT one-piece molding
Weight (w/o instrument and battery)	7 kg
Maximum Payload	35 kg
Anti-Wave & Wind	3 <sup>rd</sup> wind level and 2 <sup>nd</sup> wave level
Hull Design	Triple-hull vessel
Waterproof	IP67
Protection	Equipped with anti-collision strips
Static Draft	10 cm
Indicator Light	Two-color (positioning and differential signal)
Camera	360° omnidirectional video
Obstacle Avoidance Distance & Range	0.2–40 m (H: 112°, V: 14°)

Propulsion	
Propeller Type	Brushless DC
Direction Control	Veering without steering engine
Rated Motor Power	800 W
Maximum Motor Speed	7200 ± 5% RPM
Motor Installation	Pluggable
Li-ion Battery Capacity	32.4 V, 23.1 Ah
Battery Endurance	7 h @1.5 m/s (1 battery set, expandable)
Power Supply	Single/dual balanced battery support
Battery Replacement	Hot swap supported
Charging Time	3 h
Maximum Speed	6 m/s

Remote control	
Dimension(L x W x H)	346 mm x 196.5 mm x 89.4mm
Display Screen	10-inch
Resolution Ratio	1920 x 1200
Internal Storage	RAM: 4 GB, Storage: 64 GB
Battery Endurance	5 h
Communication Frequency	2.4 GHz
Peripheral Interface	USB, Nano SIM, TF card (up to 128 GB), Type-C

Communications	
Data Communication	Standard 4G and Remote control
Remote Control Range	1 km (Remote); Unlimited (4G)
SIM Card Slot	Nano SIM
Reserved Interface	2 × RS232 serial ports
Navigation Mode	Manual or Auto-Pilot
Data Storage	Local (multi-channel) & Remote

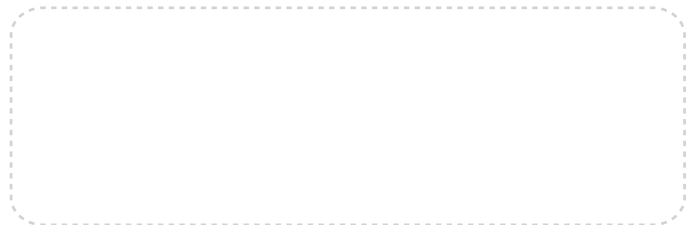
Software	
Easysail	Route planning and autonomous navigation. Total mileage statistics, remaining mileage reminder, multi-angle video and online map display. Hull parameter control, physical & virtual joysticks, system self-check at power-on. Data collection and post-processing. Waveform overlay and attitude correction. Coordinate conversion, trajectory, water depth, waveform and hull parameter real-time display. Online software/firmware updates. Export via USB/Type-C.

Positioning	
Satellite System	BDS B1/B2I /B3I、GPS L1C/A/L2P(Y)/L2C/L5、Galileo E1/E5a/E5b、GLONASS L1/L2、QZSS L1/L2/L5
Single Point Position (RMS)	Horizontal: 1.5 m Vertical: 2.5 m
DGNSS Positioning Accuracy	Horizontal: 0.4 m + 1 ppm Vertical: 0.8 m + 1 ppm
RTK Positioning Accuracy	Horizontal: ±8 mm + 1 ppm Vertical: ±15 mm + 1 ppm
Radio Protocols	Satel 3AS, CHC <sup>(1)</sup> , TT450, Transparent
Heading Accuracy	0.1 ° @ 1 m baseline
Inertial Navigation Stability	6 %/h (accuracy attenuation 1 m after 20 s)
IMU Update Rate	200 Hz

D270 Single beam Echo Sounder	
Data Type	CHCGD <sup>(1)</sup> , NMEA SDDPT/SDDBT, original waveform
Sounding Range	0.1 m to 200 m
Sounding Accuracy	±0.01 m + 0.1% x D (D is the depth of water)
Resolution	0.01 m
Maximum Sampling Rate	30 Hz
Frequency	200 kHz
Beam Angle	6.2° ± 1°
Sound Velocity Adjustment Range	1400–1700 m/s
Integrated Water Temperature Sensor	-55°C~+100°C, real-time correction of the sound speed



\*Specifications are subject to change without notice.  
(1) CHCGD & CHC protocol is CHCNAV format.



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