CHCNAV

Geospatial

APACHE 4 PRO

MULTI-PURPOSE SURVEY USV



Highlights

The APACHE 4 Pro is a versatile Unmanned Surface Vessel (USV) designed to meet a wide range of hydrological survey needs. It is compatible with a variety of mainstream Acoustic Doppler Current Profilers (ADCPs) and integrates seamlessly with the CHCNAV HQ-400 Multibeam Echo Sounder (MBES) for detailed underwater bathymetric surveys.



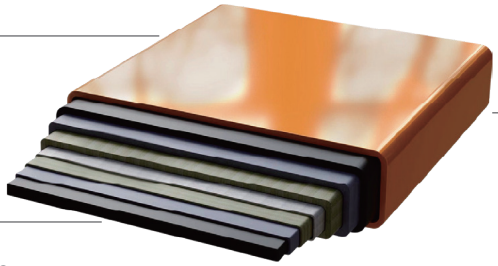
Protection for Every Mission

- Lighter and Stronger Materials
- Smart Tangle Prevention
- Precision Depth Measurement
- Multi-Function Capability: Depth and Flow

Strong and collision-resistant hull

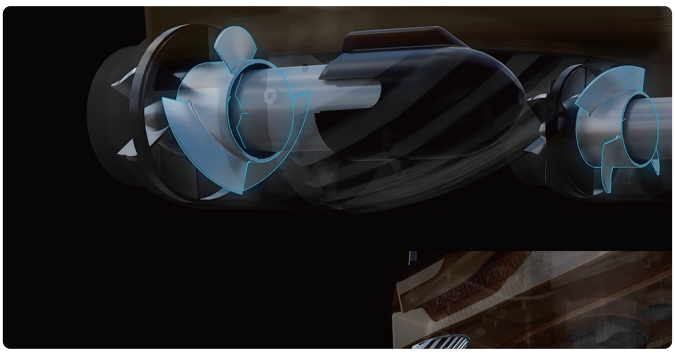
30% ↓
Hull weight reduced by 30%

60% ↑
10 MPa Strength:
60% better impact resistance



High-strength
High-modulus materials
One-piece molded hull construction High-density
Small-aperture mesh cover

Hybrid Water Pressure Conversion Technology & Real-time Tangle Self-Check Technology



Engineered dynamics for 70% lower entanglement in challenging environments



Proactive tangle alarm for long-lasting motor

Multiple Uses and Compatibility with Various Equipment







Optional multibeam echo sounder and automatic SVP launching kits.

Adaptive water flow straight-line technology,
compatible with mainstream ADCP for a wide range of measurement scenarios.

Adaptive measurement ensures precise data capture in complex environments.

- Highly sensitive, anti-interference transducers with adaptive parameter tuning for complex survey scenarios.
- 3 mm ranging resolution
- 10 cm blind zone
- +6 dB SNR improvement

EasySail: All-in-one Android software for bathymetric and hydrological surveys







No additional computer required for efficient operation

Integrated multibeam display, control, and acquisition system, with scan data overlaid on satellite imagery. Automatic parameters adjustement for ensuring optimal coverage.

Enhanced hydrology functions

Supports satellite map overlay with flow velocity vector diagrams, data playback and post-processing, and one-click data synchronization.

Use Cases



Water Resource Survey



Hydrological Survey



Channel Dredging



Emergency Rescue

SPECIFICATIONS

Physical

Hull Dimension (L x W x H)	1200 mm x 750 mm x 400 mm
Material	High strength, high modulus carbon fiber
Process	HPT one-piece molding
Weight (with instrument and batteries)	36 kg
Maximum Payload	50 kg
Anti-Wave & Wind	3rd wind level and 2nd wave level
Hull Design	Triple-hull vessel
GNSS	Internal GNSS dual antenna
Waterproof	IP67
Draft	8.6 cm (unladen)
Indicator Light	Two-color (positioning and differential signal)
Camera	360° omnidirectional video
ADCP Mounting Hole	240 mm
ADCP Compatibility	Compatible with RiverStar, M9, RiverPro, RiverRay, RioGrande and other ADCP
Available Instrumentation	ADCP, integrated compact multibeam echosounder, side scan sonar, water quality monitor, sampling bucket
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	9.8 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	6.5 m/s

Remote Control

Dimension (L x W x H)	346 mm x 196.5 mm x 89.4 mm
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	2x RJ45 ports, 2x 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. 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. Single beam mode: Data collection and post-processing. Hydrological mode: Flow test results output. Multibeam mode: Real-time parameter adjustment.

Positioning

Satellite System	BDS B1I/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(1) , 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 (1), 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	3 mm
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.

©2025 Shanghai Huace Navigation Technology Ltd. All rights reserved. The CHCNAV and CHCNAV logo are trademarks of Shanghai Huace Navigation Technology Limited. All other trademarks are the property of their respective owners. Revision December 2025.

CHC Navigation Headquarter

577 Songying Road, Qingpu, 201703, Shanghai, China
MARKETING@CHCNAV.COM
+86 21 54260273

CHC Navigation Europe

Office Campus, Building A, Gubacsi út 6, 1097 Budapest, HUNGARY
+36 20 421 6430
Europe_office@chcnav.com