

**CHCN**AV

# APACHE3

**HYDROGRAPHIC  
SURVEY DRONE**



**MARINE SURVEY  
& CONSTRUCTION**

# COST-EFFECTIVE SINGLE BEAM MARINE DRONE

The APACHE3 is a portable shallow-draft hull with a single beam echo sounder for bathymetric surveys of lakes, inland rivers, and coastal areas. The master control unit provides seamless 4G communication, removing the limitations of traditional network bridge base stations and transmission distances, making hydrographic survey easier.

The APACHE3 USV combines a dual GNSS positioning and heading sensor, a stable and reliable hull attitude and an IMU sensor, allowing uninterrupted survey while passing below bridges. The high efficiency 8 m/s motors and absolute straight-line technology allow a fully automatic pre-determined course in autonomous mode under adverse current and flow conditions.

## ONE-MAN OPERATION

**Allow one operator to cope with most of remote deployment conditions**

Made of macromolecule polyester carbon fiber and Kevlar fiber-glass weighting 7 kg without sensors. It can be carried by a single person during the entire project from on-site transport, installation, calibration, and mission processing.

## MAINTAIN HIGH ACCURACY

**Integrated IMU to overcome temporary GNSS outage**

The integration of GNSS and IMU sensor provides accurate position and attitude data to compensate for hull sway on survey results. The Apache3 provides consistently high accuracy positions even during temporary GNSS outages while passing under bridges. Tight integration of GNSS and INS data eliminates outliers.

## ABSOLUTE LINEAR TECHNOLOGY

**Maintain a perfect straight sailing course even in complex current conditions**

Integrate high precision GNSS positioning and heading technology to ensure high accuracy bathymetric survey in fully autonomous mode.

## MAKE SURVEY POSSIBLE IN MOST WATER CONDITIONS

**High-efficiency maritime design propulsion**

DC-injection rotary motor technology provides a 40% increase in energy conversion efficiency. The motor's high speed (7,000 rpm), anti-collision design with a sealed straw cover with oblique titanium alloy mesh and anti-corrosion design (resistant to one month's immersion in sea water) make it extremely durable.

## HIGH PERFORMANCE POCKET-HULLED VESSEL

**Keeps the hull balanced even in the rapid current situation**

With less than 1 m length and pocket-hulled vessel design, the APACHE3 supports operation in shoals, channels, and shallow rivers for the bathymetric survey without run aground.



 **COMPACT  
TURNKEY  
USV SYSTEM**



Motor



Transducer



360° Camera



CAS Radar

# SPECIFICATIONS

Physical	
<b>Hull Dimension (L x W x H)</b>	100 x 65 x 30 cm
<b>Material</b>	Macromolecule polyester carbon fiber
<b>Weight (w/o instrument and battery)</b>	7 kg
<b>Maximum payload</b>	25 kg
<b>Anti-Wave &amp; Wind</b>	3 <sup>rd</sup> wind level and 2 <sup>nd</sup> wave level
<b>Hull Design</b>	Triple-hull vessel
<b>Waterproof</b>	IP65
<b>Draft</b>	10 cm
<b>Indicator Light</b>	Two-color light (display positioning signal)
<b>Video</b>	360° omnidirectional video
<b>Auto-return</b>	Automatic return in case of low battery or signal loss

Power	
<b>Type</b>	Electric
<b>Propeller Type</b>	Brushless DC
<b>Direction Control</b>	Veering without steering engine
<b>Maximum Motor Power</b>	700 W
<b>Maximum Motor Speed</b>	7000 rpm/min
<b>Maximum speed</b>	8 m/s
<b>Li-ion Battery Capacity</b>	30 000 mAh, 18.5 V 15 000 mAh, 18.5V
<b>Battery Endurance</b>	6 hours @ 2 m/s (operating time can be extended by adding batteries)

Communications	
<b>Data Communication</b>	Network bridge and 4G for data, video and RTCM corrections
<b>Remote Control Communication</b>	2.4 GHz radio, network bridge and 4G
<b>Remote Control Range</b>	Radio: 3 km, network bridge: 2 km and 4G: unlimited
<b>SIM Card Slot</b>	eSIM and nano SIM
<b>Interface</b>	2x RJ45 port 2x RS232 serial port 1x RS485 serial port 1x PPS
<b>Navigation Mode</b>	Manual or Auto-Pilot
<b>Waterproof (master control)</b>	IP67
<b>Data Storage</b>	Local multi-thread and and remote

Positioning	
<b>Satellite System</b>	BDS B1/B2, GPS L1/L2, GLONASS L1/L2, Galileo E1/E5, SBAS, QZSS
<b>Channel</b>	432 channels
<b>Single Point Position (RMS)</b>	Horizontal: 1.5 m Vertical: 2.5 m
<b>SBAS Positioning Accuracy</b>	Horizontal: 0.5 m Vertical: 0.85 m
<b>DGNSS Positioning Accuracy</b>	Horizontal: 0.4 m + 1ppm Vertical: 0.85 m + 1ppm
<b>RTK Positioning Accuracy</b>	Horizontal: ±8 mm + 1ppm Vertical: ±15 mm + 1ppm
<b>Heading Accuracy</b>	0.2° @1 m baseline
<b>Inertial Navigation stability</b>	6°/h

D230 Singlebeam Echo Sounder	
<b>Data Type</b>	CHCNAV, NMEA SDDPT/SDDBT, original waveform
<b>Weight</b>	1.1 kg
<b>Sounding Range</b>	0.15 m to 200 m
<b>Sounding Accuracy</b>	±0.01 m + 0.1% x D (D = depth of water)
<b>Resolution</b>	0.01 m
<b>Frequency</b>	200 kHz
<b>Beam Angle</b>	6.5° ± 1°



\*Specifications are subject to change without notice.

© 2020 Shanghai Huace Navigation Technology Ltd. All rights reserved.  
The CHC and CHC logo are trademarks of Shanghai Huace Navigation Technology Limited.  
All other trademarks are the property of their respective owners.

WWW.CHCNAV.COM | SALES@CHCNAV.COM

CHC Navigation Headquarter  
Shanghai Huace Navigation Technology Ltd.  
599 Gaojing Road, Building D,  
Shanghai, 201702, China ,  
+86 21 54260273

CHC Navigation Europe  
Infopark Building , Sétány 1, 1117  
Budapest, Hungary  
+36 20 235 8248 +36 20 5999 369  
info@chcnav.eu

CHC Navigation USA LLC  
16412 N 92nd Street, Suite 115,  
85 260 Scottsdale, Arizona, USA,  
+1 480 676 4306

CHC Navigation India  
409 Trade Center, Khokhra Circle,  
Maninagar East, Ahmedabad,  
Gujarat, India  
+91 90 99 98 08 02