

**CHCNAV**

# APACHE 3

**COMPACT HYDROGRAPHIC DRONE**



**MARINE SURVEY  
& CONSTRUCTION**

# COST-EFFECTIVE SINGLE BEAM ECHOSOUNDER

The APACHE 3 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 field work easier.

The APACHE 3 USV combines a dual GNSS positioning and heading sensor, a stable and reliable hull attitude and an IMU sensor, allowing uninterrupted survey while passing under bridges. The high efficiency 5 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 UNDER BRIDGES

**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 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.

## 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), its anti-collision design with a sealed straw cover with oblique titanium alloy mesh and its anti-corrosion design (resistant to one month's immersion in sea water) make it extremely durable.

## HIGH PERFORMANCE POCKET-HULLED VESSEL DESIGN

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

With less than 1 m length and pocket-hulled vessel design, the APACHE 3 supports operation in shoals, channels, and shallow rivers for the bathymetric survey without run aground.

## ABSOLUTE LINEAR TECHNOLOGY

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

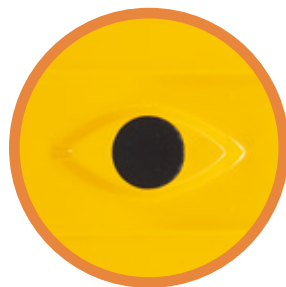
Integrate high precision GNSS positioning and heading technology to ensure high accuracy bathymetric survey in fully autonomous mode.



COMPACT  
TURNKEY USV  
SYSTEM



Motor



Transducer



360° Camera



CAS Radar

# SPECIFICATIONS

Physical	
Hull dimension (L x W x H)	1 m x 0.65 m x 0.3 m
Material	Macromolecule polyester carbon fiber
Weight (w/o instrument and battery)	7 kg
Maximum payload	25 kg
Anti-wave & Wind	3 <sup>rd</sup> wind level and 2 <sup>nd</sup> wave level
Hull design	Triple-hull vessel
Waterproof	IP65
Draft	13 cm
Indicator light	Two-color light (Display positioning signal)
Video	360° omnidirectional video
Auto-return	Auto-return while low battery or signal loss

Communication	
Data communication	Network bridge: 2 km and 4G: unlimited
R/C communication	2.4 GHz
Remote control Range	2 km
SIM Card slot	Nano SIM
Interface	2 x RJ45 port 2 x RS232 serial port 1 x RS485 serial port 1 x PPS
Navigation mode	Manual or Auto-Pilot
Waterproof of master control	IP67
Data storage	Local multi-sessions and FTP push
UHF radio	Standard Internal Rx: 410 - 470 MHz Transmit power: 0.5 W Protocol: CHC, Transparent, TT450, 3AS Satel Link rate: 9,600 bps to 19,200 bps
Data formats	RTCM2.x, RTCM3.x, CMR input HCN, HRC, RINEX2.11, 3.02 NMEA 0183 output NTRIP Client, NTRIP Caster
Integrated 4G modem	LTE FDD: B1/B3/B5/B8 LTE TDD: B38/B39/B40/B41 WCDMA: B1/B8 TD-SCDMA: B34/B39 CDMA: BC0 GSM: 900/1,800 MHz

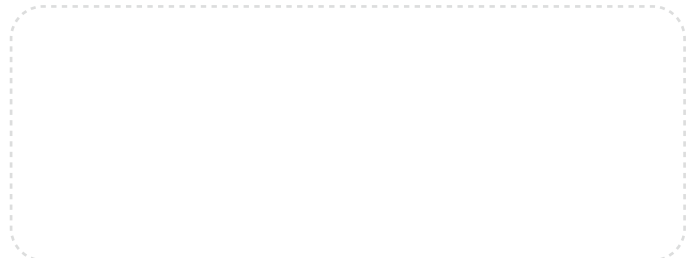
Power	
Type	Electric
Propeller type	Brushless DC
Direction control	Veering without steering engine
Maximum motor power	700 W
Maximum motor speed	7,000 rpm
Maximum speed	5 m/s
Li-ion battery capacity	4 x 40,000 mAh, 18 V 2 x 15,000 mAh, 18 V
Battery endurance	2 x 2 hours @ 2 m/s (running on 2 battery sets)

Positioning	
Satellite system	BDS B1/B2, GPS L1/L2, GLONASS L1/L2, Galileo E1/E5, SBAS, QZSS
Channel	432
Single point position (RMS)	Horizontal: 1.5 m Vertical: 2.5 m
SBAS Positioning accuracy	Horizontal: 0.5 m Vertical: 0.85 m
DGNSS positioning accuracy	Horizontal: 0.4 m + 1 ppm Vertical: 0.85 m + 1 ppm
RTK Positioning accuracy	Horizontal: ±8 mm + 1 ppm Vertical: ±15 mm + 1 ppm
Heading accuracy	0.2 ° @1 m baseline
Inertial navigation stability	6 °/h

D230 Single Beam Echo Sounder	
Data type	CHCGD <sup>(1)</sup> , NMEA SDDPT/SDDBT, original waveform
Weight	1.1 kg
Sounding range	0.15 m to 300 m
Sounding accuracy	±0.01 m + 0.1% x D (D is the depth of water)
Resolution	0.01 m
Frequency	200 kHz
Beam angle	6.5° ± 1°
Supply voltage	10-30 V DC/ 220 V AC



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



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