CHCNAV

APACHE 3 PRO

COMPACT HYDROGRAPHIC DRONE

MARINE SURVEY
& CONSTRUCTION

CHCNAV

ADVANCED USV FOR BATHYMETRIC SURVEY

The APACHE 3 Pro is a compact, professional unmanned surface vehicle (USV) designed for autonomous bathymetric surveys in shallow waters. Its double-layered carbon fibre hull provides exceptional impact resistance and unsinkability. The IP67 rating guarantees dust and water tightness, protecting on-board components under all circumstances. The semi-recessed motor reduces water resistance, improves endurance, and allows speeds up to 6 m/s.

The Apache 3 Pro GNSS RTK + inertial navigation system ensures highly accurate measurements even when the GNSS signal is temporarily interrupted, such as when navigating under a bridge. The built-in CHCNAV D270 echo sounder provides the most reliable and accurate depth measurements at all times.

LIGHTWEIGHT DESIGN

The APACHE 3 Pro is constructed from macromolecular polyester carbon fibre and Kevlar glass fibre, resulting in a remarkably light weight of only 10 kg (excluding sensors). This design allows a single operator to effortlessly manage a variety of remote deployment scenarios, ensuring versatility and ease of use in a wide range of operating conditions.

ENABLING SURVEYS IN DIVERSE WATER CONDITIONS

The semi-recessed motor and innovative internal rotor motor design provide the APACHE 3 Pro with a shallower draft, improving the USV's ability to navigate in different water depths. The motor design provides enhanced protection, reducing the risk of damage and ultimately extending the motor's service life.

REAL-TIME DATA FOR GREATER SECURITY AND PRODUCTIVITY

A combination of SIM, and network bridge with automatic switching capabilities ensures reliable communications. In addition, cloud-based remote monitoring is seamlessly integrated to provide real-time information on the status of the Apache 3 Pro, enhancing its control and security. The use of 4G and 2.4G networks eliminates distance limitations and enables efficient data exchange in a variety of operating environments.

MILLIMETER WAVE AUTOMATIC OBSTACLE AVOIDANCE

The APACHE 3 Pro comes standard with a millimetre-wave obstacle avoidance system to detect obstacles within a wide 110° angle ahead. When it encounters an obstacle, the USV autonomously charts a detour course to navigate around the obstacle, effectively minimising the potential risk of collision damage during operation.

MAINTAIN HIGH ACCURACY UNDER BRIDGE

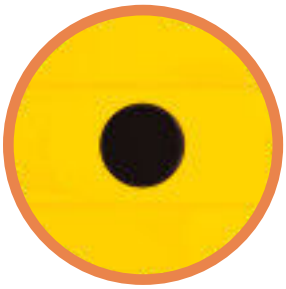
APACHE 3 Pro ensures consistent accuracy even when navigating under bridges. If the GNSS signal is lost, the USV maintains its course by automatically navigating under bridges and continuously providing high-precision position data. Accurate position and attitude data also compensates for the effects of hull sway on survey results. Tight integration of GNSS and INS data eliminates outliers and improves the reliability of the information collected.

SINGLE-BEAM ECHOSOUNDER FOR BATHYMETRIC SURVEY

APACHE 3 Pro comes standard with D270 single beam echo sounder. It is portable and integrates a built-in water temperature sensor to enable real-time correction of sound velocity in response to temperature changes, resulting in superior depth measurement accuracy.

COMPACT TURNKEY USV SYSTEM

Motor



Transducer

360° Camera

Millimetre Wave Radar

SPECIFICATIONS

Physical	
Hull dimension (L × W × H)	1.05 m x 0.55 m x 0.39 m
Material	Macromolecule polyester carbon fibre
Weight (w/o instrument and battery)	10 kg
Maximum payload	30 kg
Anti-wave & Wind	3rd wind level and 2nd wave level
Hull design	Triple-hull vessel
Waterproof	IP67
Draft	9 cm
Indicator light	Two-color light (Display positioning signal)
Video	360° omnidirectional video
Auto-return	Auto-return while low battery or signal loss
Obstacle avoidance	Millimetre wave automatic obstacle avoidance
Obstacle avoidance range	0.2 ~ 40 m Horizontally & vertical angle: 112° x 14°

Power	
Type	Electric
Propeller type	Brushless DC
Direction control	Veering without steering engine
Maximum motor power	800 W
Maximum motor speed	7,200 rpm/min
Motor installation	Pluggable
Li-ion battery capacity	24,500 mAh, 36 V x 5
Power supply	Support single battery independent power supply or dual battery balanced power supply
Battery replacement	Support hot swap
Battery endurance	2 x 3 h@2 m/s (running on 2 battery sets)
Maximum speed	6 m/s

Communication	
Data communication	Network bridge: 1 km and 4G: unlimited
R/C communication	2.4 GHz
Remote control range	1 km
SIM card slot	Nano SIM
Interface	2 x RJ45 network 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 storage (multi-channel storage) & Remote storage

Positioning	
Satellite system	BDS B1/B2, GPS L1/L2, GLONASS L1/L2, Galileo E1/E5, QZSS
Channel	432
Single point position (RMS)	Horizontal: 1.5 m Vertical: 2.5 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 (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
Operating system	Linux
OLED display	1.46 inch
Wi-Fi	802.11n 2.4 GHz
Bluetooth	BT5.0, downward compatible to BT2.x
Weight	0.84 kg
Sounding range	0.15 m to 200 m
Supply voltage	±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°
Waterproof	IP67
Water temperature sensor	-55°C~+100°C, real-time correction of the sound speed
Maximum transmit power	300 W
Power consumption	10 W

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