

# APACHE 6

## Marine Construction



# Introduction

## APACHE 6

Turnkey USV Solution With  
Multibeam For High  
Resolution Bathymetry

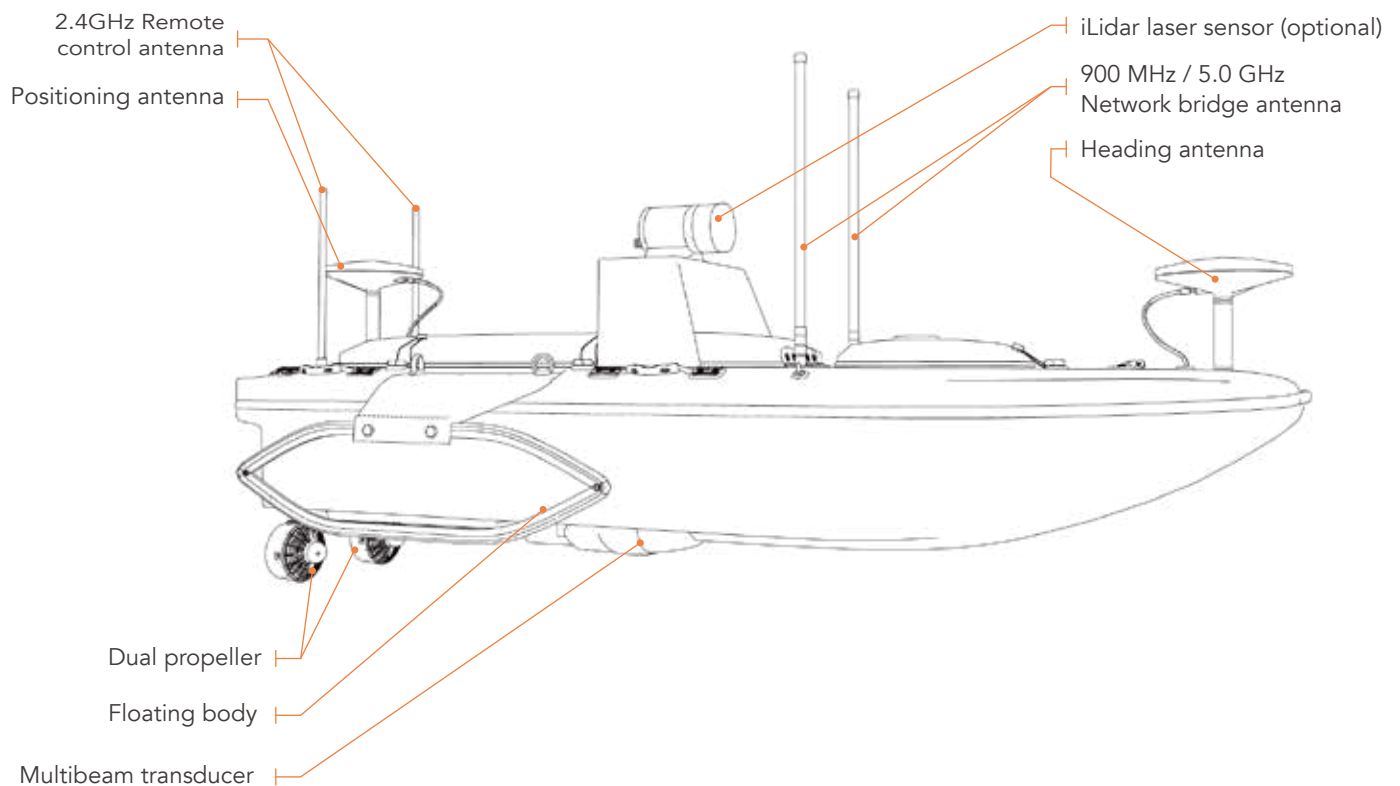
The APACHE 6 USV is a full-integrated innovative solution for 3D bathymetric survey, underwater object positioning, offshore construction, underwater archaeology and wrecked rescue.

Built around a triple hulled vessel design and optimized for the Norbit™ multibeam echosounder series, the APACHE 6 provides a fully-autonomous survey mode powered by the field proven CHCNAV absolute straight-line technology to follow pre-determined course even in adverse current conditions.

The APACHE 6 is powered with high-performance dual propeller system ensuring a stable constant automatic cruise speed of up to 2.5m/s (7.6 fps). The survey projects can also be completed in manual mode using the APACHE 6 remote control panel over 2 km distance.

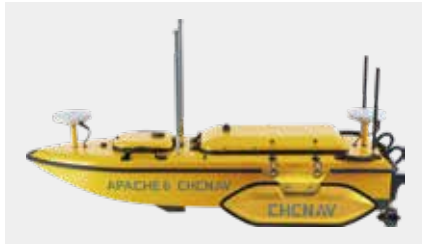
The CHCNAV Auto Planner® software is used to set up optimal navigation route planning and monitor the survey operation parameters in real time. The echosounder parameters are set via an intuitive web interface and the final multibeam data acquired during the survey processed by QINSy® software to generate high resolution accurate 3D maps.

The APACHE 6 multibeam USV reduces survey time, improves work efficiency and outputs high resolution data to always match the most demanding marine survey project requirements.



# Unmanned Surface Vessel

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## Lightweight design

APACHE 6 is made of macromolecule polyester carbon fiber and Kevlar fiber-glass (weighting 15 kg without sensors). It allows two operators to cope with most of remote deployment conditions.



## Triple-hulled vessel design

With a detachable triple-hulled vessel design, the APACHE 6 is a versatile USV solution allowing safe deployment in various mission environment. Its dual floating bodies keep the hull balanced even in the rapid current situation. Meanwhile, removing the floating bodies allows operation in shoals, channels and shallow rivers without run aground.



## Absolute linear technology

APACHE 6 integrates high precision positioning and heading technology to maintain a perfect straight sailing course even in complex current conditions.

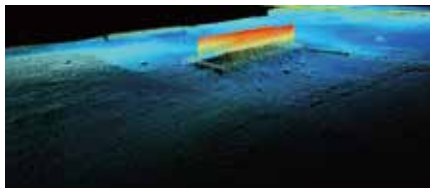


## iLiDAR Laser Sensor (optional)

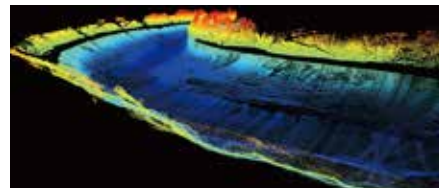
In addition to its multibeam echosounder, the APACHE 6 can be fitted with the Lidar sensor to collect terrestrial 3D point cloud. With 300 000 points per second at a 30x360 degree coverage, the iLiDAR provides an accurate combined marine and terrestrial 3D survey in a single pass saving significant processing time when performing harbor and river surveys with height clearance evaluation (transmission lines, bridges, ...).

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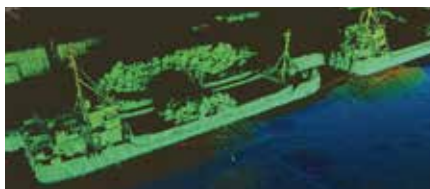
## Applications



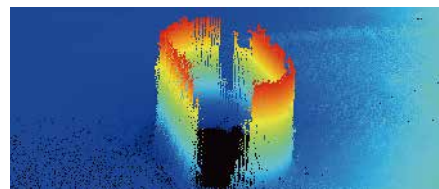
Underwater object recognition



River-route above and underwater 3D scanning



Harbour and Offshore Construction



Bridge Pier Deformation Monitoring

# Specifications

| Physical                    |                                    |
|-----------------------------|------------------------------------|
| Size (L x W x H)            | 1.8m*0.55m*0.25m                   |
| Weight (no instrument)      | 15Kg                               |
| Weight (Typical instrument) | 40Kg                               |
| Hull Material               | Carbon Fiber                       |
| Hardware                    | Anodized Aluminum, Stainless Steel |
| Typical Survey Speed        | 2-2.5m/s                           |
| Maximum Speed               | 3.5 m/s                            |
| Draft                       | 0.18 m                             |
| Payload (typical)           | 60 kg                              |




| Communications           |                             |
|--------------------------|-----------------------------|
| Communication Way        | UHF, network bridge         |
| Network bridge Frequency | 900MHz/ 5.0 GHz             |
| Communication Distance   | 1.5 km/ 0.8 km              |
| Communication Port       | RS232/Internet access       |
| R/C Control              | Hitec with Vessel Telemetry |
| R/C Antenna              | Omini Directional           |
| R/C Range                | Up to 1km                   |
| R/C Frequency            | 2.4GHz                      |

| Electrical                       |  |
|----------------------------------|--|
| Power                            | 4 x 18.5v 40Ah battery Lipo /<br>2 x 18.5v 15Ah battery Lipo |
| Motor                            | 2 x Brushless Thruster                                       |
| Navigation Mode                  | Auto/Manual  |
| Battery Endurance <sup>(1)</sup> | 2-3 h (operating time can be lengthened by adding batteries) |

| iLiDAR Laser Sensor (Integration Option) |                              |
|--|------------------------------|
| Frame Rate                               | 5-20Hz (10Hz Default)        |
| Wave Length Peak                         | 905nm                        |
| Output                                   | Up To 300.000 Points Per Sec |
| Accuracy                                 | 2cm                          |
| Field Of View                            | 30° VER., 360° HOR           |
| Range                                    | 100m                         |
| Power                                    | 8W                           |

**Auto Planner Software**

CHC Auto Planner software is designed for set up navigate course, USV calibration, real-time USV tracking and checking the status of USV operation.

| NORBIT MBES specifications |   |   |   |
|----------------------------|---|---|---|
|                            | NORBIT IWBMSe   | NORBIT IWBMS (Standard)   | NORBIT IWBMSh-STX   |
| Type                       |                |  |  |
| Swath Coverage             | 5-210°  | 7-210°  | 5-210°  |
| Range Resolution           |   | <10mm   |   |
| Number Of Beams            |   | 256-512   |   |
| Operating Frequency        |   | 400KHz  |   |
| Depth Range                |   | 0.2 - 275m  |   |
| Ping Rate                  |   | Up to 60Hz, Adaptive  |   |
| Resolution:                | 0.9° x 1.9°@400kHz And 0.5° x 1.0°@700kHz.  |   | 0.9° X 0.9°@400kHz or   |
| Standard                   | Narrow Option 0.9° x 0.9°@400kHz And 0.5° x 0.5°@700kHz.  |   | 0.5°X 0.5°@700kHz   |
| Position                   | HOR: ±(8mm +1ppm X DISTANCE FROM RTK STATION)<br>VER: ±(15mm +1ppm X DISTANCE FROM RTK STATION) |   |   |
| Heading Accuracy           | 0.08°   | 0.03°   | 0.02°   |
| Pitch/Roll Accuracy        | 0.03°   | 0.02°   | 0.01°   |
| Heave Accuracy             | 5cm   |   |   |
| Weight                     | 6.5kg (AIR)<br>2.4kg (WATER)  | APPROX. 9.5kg (AIR)<br>LESS THAN 6kg (WATER)                                      | APPROX. 11kg (AIR)<br>LESS THAN 6.5kg (WATER)                                       |
| Interface                  | ETHERNET  |   |   |
| Power Consumption          | 60W   |   | 70W   |
| Operating Temp             | -20°C to +60°C  |   |   |

\*Specifications are subject to change without notice.

(1) Operating time varies based on temperature. Specifications are subject to change without notice.

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