

APACHE 3 PRO USV AUTONOMOUS DRONE FOR BATHYMETRIC SURVEY

DEALERS INTRODUCTION

CONFIDENTIAL
FOR CHCNAV DEALER USE ONLY

Sep 2023



INTRODUCING APACHE 3 Pro

AUTONOMOUS DRONE FOR HYDROGRAPHIC SURVEY



INTRODUCTION



KEY FEATURES AND BENEFITS



COMPETITION



RELEASE SCHEDULE

APACHE 3 Pro USV

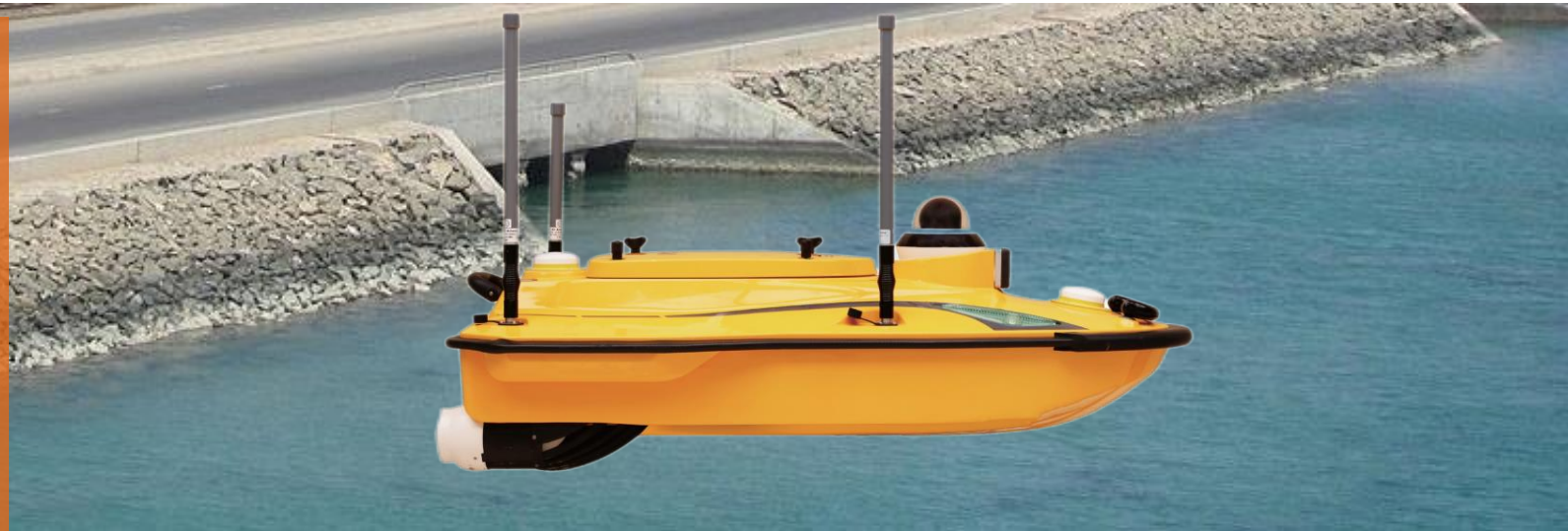
INTRODUCTION

CHCNAV 

INTRODUCING APACHE 3 Pro USV

COST-EFFECTIVE USV SOLUTION FOR HYDROGRAPHIC SURVEYING

COST EFFECTIVE
SINGLE BEAM
ECHO SOUNDER
USV SOLUTION



APACHE 3 Pro

APACHE 3 Pro is a compact USV for the bathymetric survey of Inland rivers and lakes. The APACHE 3 Pro fits easily in the trunk of a car and can be used by one person, saving labour costs. Projects can be carried out in manual and automatic cruise mode with maximum speeds of 6 m/s

MARKET POSITIONING

BATHYMETRIC SURVEY IN SHALLOW WATER

The APACHE 3 Pro USV addresses the growing market segment of customers searching for:

- USV Solution for channel, inland river or riffle hydrographic surveying projects especially in shallow water applications.
- High integrated and portable USV solution to ensure timely project completion.
- Full GNSS RTK integration as well as other sensors such as water quality probe.



APACHE 3 Pro USV

KEY FEATURES AND BENEFITS

CHCNAV 

APACHE 3 Pro USV

INTEGRATED TECHNOLOGIES FOR HIGH PRODUCTIVITY

KEY FEATURES

- 4G modem to expand field operations and improve transmission efficiency.
- Integrated D270 single beam echosounder to enhance bottom tracking accuracy.
- Integrated GNSS RTK + dual antennas to ensure accurate heading and navigation.
- Integrated data storage, low power return and return path planning.
- Obstacle avoidance radar and 360° PTZ camera to easily identify the distance to shore.
- Optimization of ship shape, anti-sinking and anti-collision.



SMART POSITIONING AND NAVIGATION

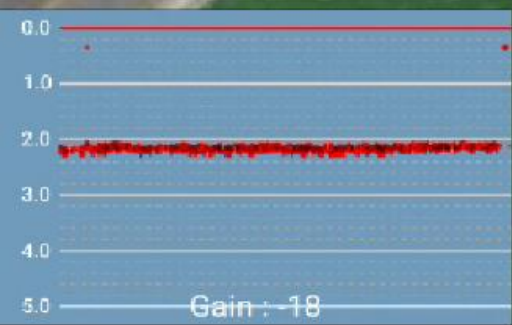
INTERRUPTED POSITIONING WITH GNSS+IMU IN OBSTRUCTED ENVIRONMENTS

MAINTAIN HIGH ACCURACY IN OBSTRUCTED ENVIRONMENTS

- APACHE 3 Pro provides stable position. Its IMU sensor ensures the availability of position data even in case of momentary GNSS signal loss.
- The obstacle avoidance radar system and live video ensure safe operations in case of loss of visibility or difficult environmental conditions. Because of the fully autonomous, the APACHE 3 Pro is operated safely from shore.
- The AutoPlanner and HydroSurvey software allow the operator to define the entire mission, from survey area to export results.



Application 2 Continuous survey under bridge



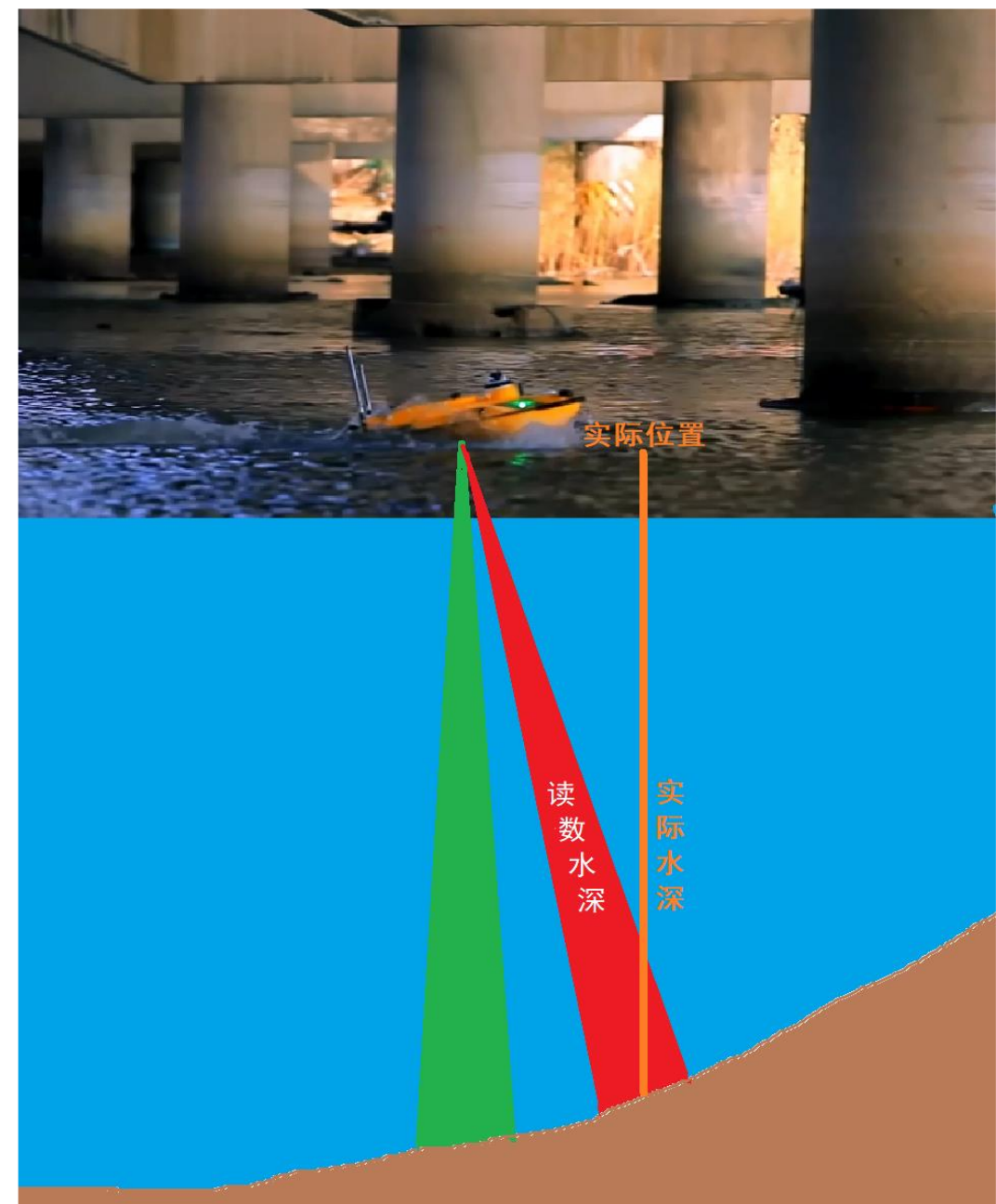
Northing 3368795.8229m
 Easting 251753.9468m
 Depth 2.10m
 Target dist 10m

Water surface 5.460m
 Target point 1
 Speed 1.79m/s
 Number 0

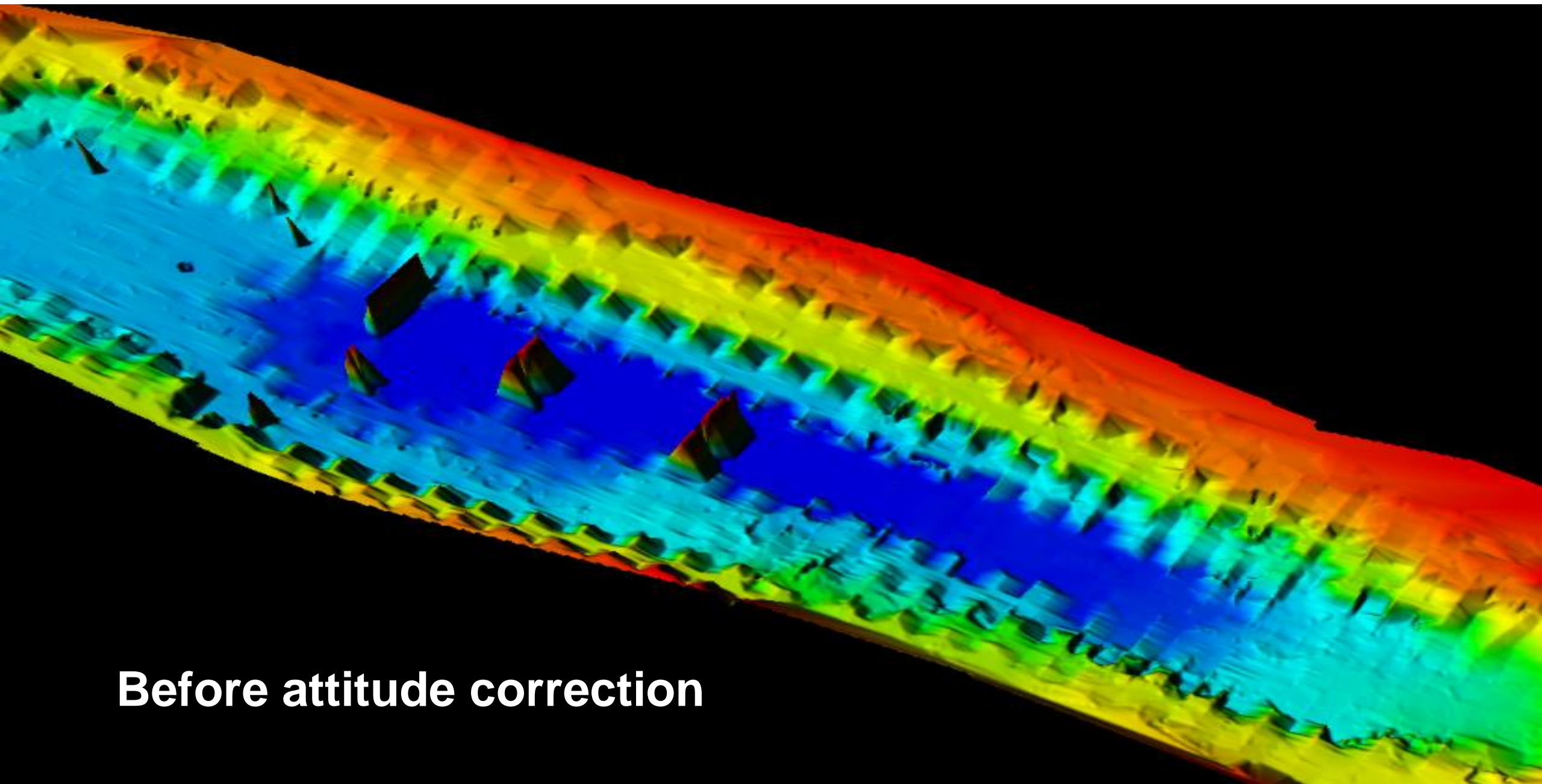


COMBINED NAVIGATION AND ATTITUDE COMPENSATION

- Integrated positioning + orientation, no need to connect external RTK
- GNSS+IMU combined navigation, anti-hopping point, under the bridge measurement
- One-click correction of attitude

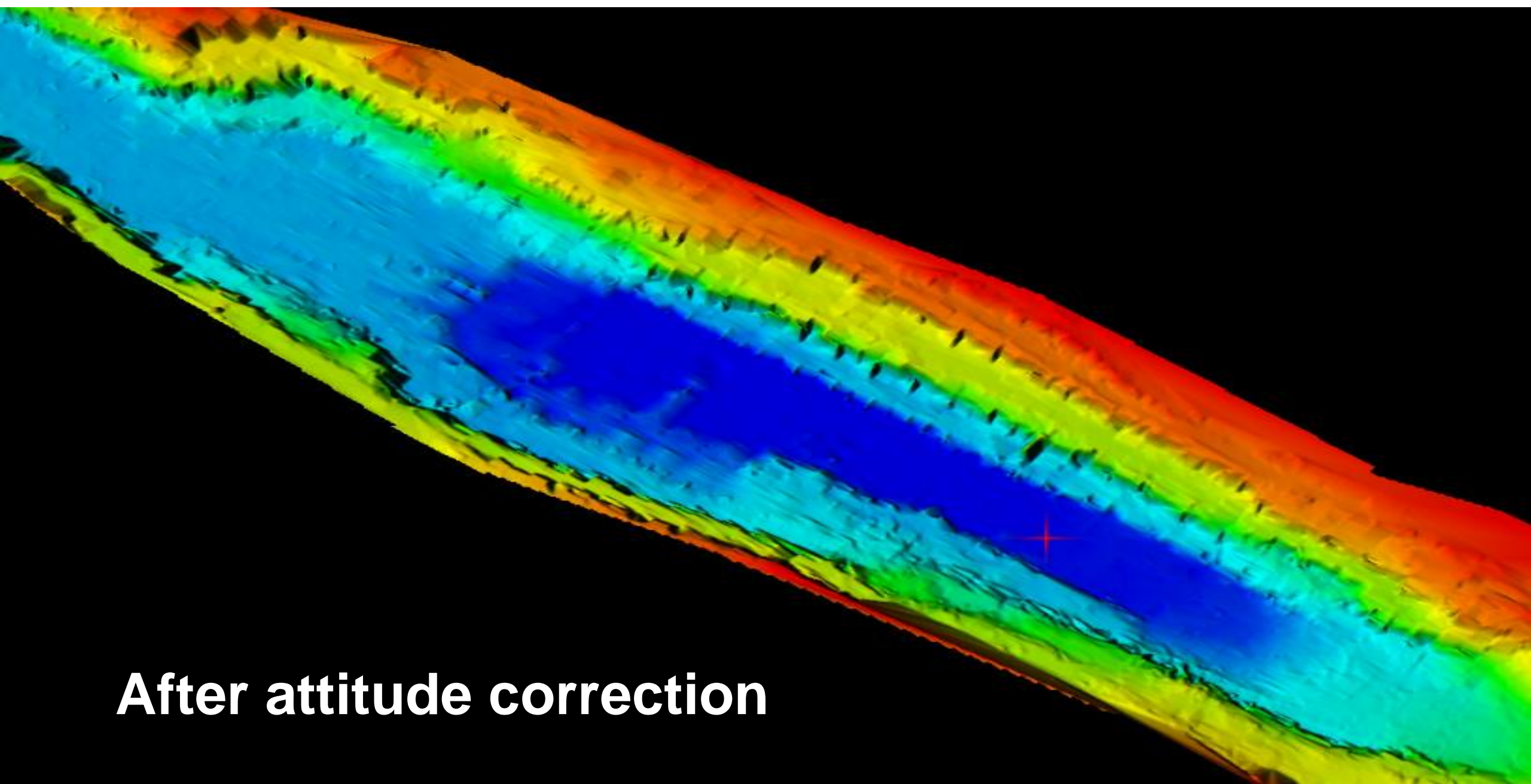


Application 1 One-click correction of attitude



Before attitude correction

Application 1 One-click correction of attitude



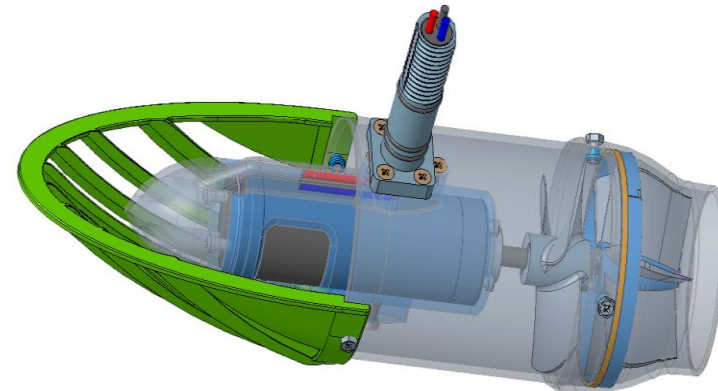
After attitude correction

NEW OVERSPEED MOTORS

POWERFUL, RUGGED AND DURABLE

MAKE SURVEY POSSIBLE IN ALL WATER CONDITIONS

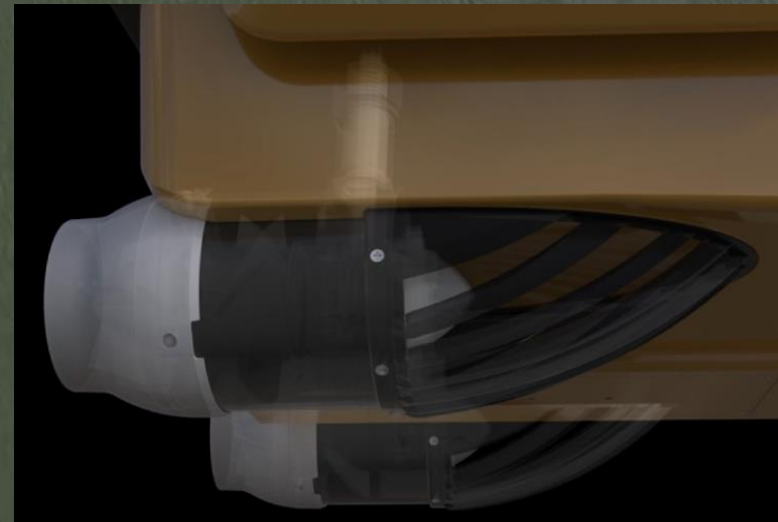
- Semi-embedded motor, no fear of water grass
- High speed: 7200 rpm/min
- Speed increase: A3Pro at 6 m/s
- Adopt the latest motor technology: internal waterproof motor
- More stable: motor life increased 10 times



Overspeed motor

1. Full fluid dynamics are optimized, with less resistance and a cruising range of up to 2*3h.

2. Semi-embedded motor, motor life increased 10 times.



Overspeed motor - Life test



Overspeed motor - Prevention of aquatic plants



NEW BALANCED POWER SUPPLY SYSTEM

BALANCED DISCHARGE TO IMPROVE OPERATION TIME

ENSURE THAT THE LEFT AND RIGHT BATTERIES DISCHARGE THE SAME

- Intelligent power control: with balanced power supply function, support startup hot swap battery replacement, power off continued test, all-weather operation
- Equilibrium discharge
- Add battery slots to prevent battery pulsation
- Power reading is more accurate



NEW SOUNDING SYSTEM

SENSING WATER TEMPERATURE ADM CORRECTING SOUND SPEED

D270 ECHOSOUNDER MORE ACCURATE AND EFFICIENT

- Temperature sensor measures water temperature, correct sound speed and improves accuracy
- Bluetooth connection to RTK, WiFi connection to mobile phone/computer, built-in storage
- Smaller size, more integrated



Obstacle avoidance - millimeter wave radar

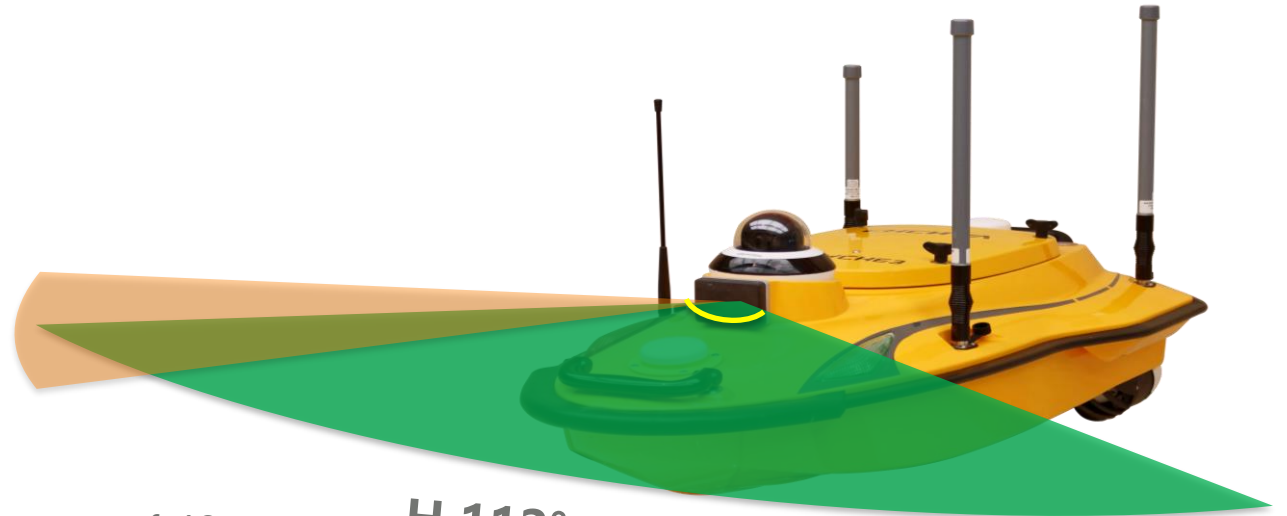
A COMBINATION OF NEW FEATURES AND MAJOR IMPROVEMENTS

ENHANCED FEATURES

- Double hull, IP67 waterproof, more secure, more stable posture
- Millimeter wave radar automatic obstacle avoidance
- Automatic surveying and mapping: obstacle avoidance + shoal alarm + power detection

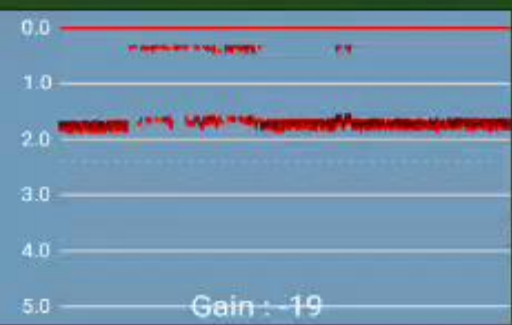
V 14°

Detection range of 40 meters H 112°





Automatic obstacle avoidance



Northing 3373278.7906m
 Easting 251515.6474m

Depth 1.66m Target dist 43m
 Water surface 5.125m
 Target point 2

Speed 1.81m/s
 Number 8



APACHE 3 PRO HIGH INTEGRATION

ADVANCED NAVIGATION SYSTEM

GNSS + INS COMBINATION

Feature	Benefit
Integrated position and heading GNSS RTK module	Save the cost of rover and compass.
Integrated IMU	Keep working under conditions such as under a bridge or under a tree without or poor GNSS signal.



APACHE 3 PORTABLE DESIGN

SINGLE PERSON OPERATION

1 M LENGTH AND LESS THAN 25 KG

Feature	Benefit
One-man operate.	Improve efficiency in measurement tasks and save labor costs.
Easy to carry by vehicle	Allowing one operator to cope with most remote deployment conditions.

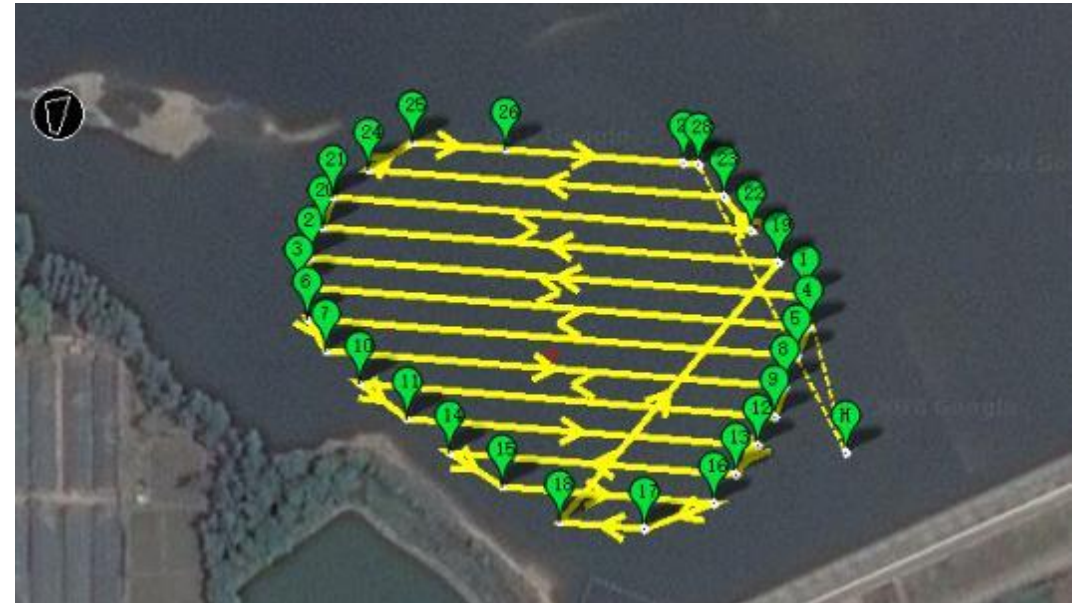


APACHE 3 pro MULTI-PURPOSE SOFTWARE

SET UP COURSE, RECORD AND POST PROCESS DATA

EASY-TO-USE SOFTWARE

Feature	Benefit
Automatic navigation control system in complex current condition.	Improve data accuracy and ease of operation.
Real time recording of RTK and echosounder data.	Monitor in real-time the survey status to ensure survey quality on the spot.



APACHE 3 Pro USV

COMPETITION OVERVIEW

CHCNAV 

APACHE 3 Pro VS. HI-TARGET BS2

OUR PROS

- Fewer operators, light transportation, convenient launching, saving manpower and material resources
- Fast speed, adapt to different water environments: 6 m/s vs. 4.5 m/s
- Extended operation time: 6h vs. 4h
- Independent research and development, timely support.

OUR CONS

- No obvious disadvantages



APACHE 3 Pro VS. Seafloor HyDrone-G2

OUR PROS

- Lighter and smaller. Fewer operators, easy to carry, convenient launching, saving manpower and material resources
- Larger payload capacity, many types of equipment can be carried: 30 kg vs. 18 kg
- Integrated position + heading GNSS RTK module
- Integrated IMU
- 4G modem transmission
- 355° camera
- Internal storage and FTP Push
- Fast speed, adapt to different water environments: 6 m/s vs. 1.5 m/s



OUR CONS

- Shorter battery life endurance (depending on the number of batteries)

APACHE 3 Pro VS. Oceanalpha SL20

OUR PROS

- Lighter and smaller. Fewer operators, easy to carry, convenient launching, saving manpower and material resources
- Integrated position + heading GNSS RTK module w/ IMU
- Max. payload: 30kg V.S. 8kg
- 4G modem transmission
- 355° camera
- Internal storage and FTP Push
- Shallow draft: 0.1 m vs. 0.15 m

CONS

- No obvious disadvantages



APACHE 3 Pro VS. DISCOVERY

OUR PROS

- Lighter and smaller. Fewer operators, easy to carry, convenient launching, saving manpower and material resources
- Integrated position + heading GNSS RTK module
- Integrated IMU
- Max. payload: 30kg V.S. 15kg
- 4G modem transmission
- 355° camera
- Internal storage and FTP Push
- Fast speed, adapt to different water environments: 6 m/s vs. 3 m/s
- Self-developed echo sounder, non-third-party integration.

CONS

- Shorter battery life endurance (depending on the number of batteries)



APACHE 3pro USV

RELEASE SCHEDULE

CHCN  AV

APACHE 3 PRO RELEASE SCHEDULE



THANK YOU

CHCNAV

Make your work more efficient

www.amw.gps.com



STAY IN TOUCH WITH US



Headquarter

577 Songying Road
Building C
201706 Shanghai
China

+86 21 5426 0273
sales@chcnav.com | ww.chcnav.com



Our subsidiaries and offices

APAC

CHC Navigation Limited | Hong-Kong
CHC Navigation PTE LTD | Singapore
CHC Navigation PVT LTD | India

EMEA

CHC Navigation Kft. | Hungary
CHC Representative Office | Kazakhstan
HUACE Navigation (Africa) Ltd | Kenya

NCSA

CHC Navigation LLC | USA
CHC Navigation Holding Company LTD. | USA
AMW Machine Control, INC. | USA
CHC Navigation SpA | Chile