

APACHE 3 PRO

User Guide



Marine Survey | Oct 2023

Make your work more efficient



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CE Interference Statement	未定义书签。
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Preface

Copyright

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Trademarks

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Safety Warnings

The Global Positioning System (GPS) is operated by the U.S. Government, which is solely responsible for the accuracy and maintenance of the GPS network. Accuracy can also be affected by poor satellite geometry and obstructions, like buildings and heavy canopy.

Introduction

The APACHE 3 PRO USV User Guide describes how to set up and use the CHC[®] APACHE 3 PRO USV. In this manual, "the USV" refers to the APACHE 3 PRO USV unless otherwise stated.

Even if you have used other Unmanned Surface Vessels before, CHC recommends that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with USV, go to <u>www.chcnav.com</u> for an interactive look at CHC and USV safety information

Warnings and Cautions

An absence of specific alerts does not mean that there are no safety risks involved.

A Warning or Caution information is intended to minimize the risk of personal injury and/or damage to the equipment.

WARNING – batteries for USV should be fully charged if the LED light on the battery has one light.

CAUTION –it is necessary to check the motors if work normally via the remote controller before putting it on the water.

Regulations and Safety

The receivers contain a built-in wireless modem for signal communication through wireless technology. Regulations regarding the use of wireless modems vary greatly from country to country. In some countries, the unit can be used without obtaining an end-user license. However, in some countries, administrative permissions are required. For license information, consult your local dealer.

Before operating an APACHE 3 PRO USV, determine if authorization or a license to operate the unit is required in your country.

Use and Care

This APACHE 3 PRO is designed to withstand the rough environment that typically occurs in the field. However, the USV is high-precision electronic equipment and should be treated with reasonable care.

CAUTION - Operating or storing the USV outside the specified temperature range will cause irreversible damage.

Technical Support

If you have a problem and cannot find the information you need in this manual or CHC website (www.chcnav.com), contact your local CHC dealer from which you purchased the receiver(s).

If you need to contact CHC technical support, please contact us by email (<u>support@chcnav.com</u>) or Skype (chc_support).

Disclaimer

Before using the receiver, please make sure that you have read and understood this User Guide, as well as the safety information. CHC holds no responsibility for the wrong operation by users and for the losses incurred by the wrong understanding about this User Guide. However, CHC reserves the right to update and optimize the contents of this guide regularly. Please contact your local CHC dealer for new information.

Your Comments

Your feedback of this user guide will help us to improve it in future revisions. Please email your comments to support@chcnav.com.

1 Getting Started with APACHE 3 PRO

1.1 APACHE 3 PRO brief introduction

Featuring a triple-hulled and shallow draught design, the APACHE 3 PRO USV offers a portable remotely controlled platform in small lakes, inland rivers, and coastal water for bathymetric surveys. Its overall 1-meter length and 7 kg weight (without instrument) allow one person to operate the system easily.

Multiple data transfer options are available with RS232 connection and TCP protocols along with multi-channel and high bandwidth transmission. It can also carry single beam echo sounder, AP-2000 water quality and other instruments to meet diverse application requirements.

Item	Quantity	Picture
APACHE 3 PRO Hull (integrated with RTK and echo sounder)	1	
M12 Pro Remote Controller	1	
Battery (24500mAh 32.6V)	4	
Battery (15000mAh 18.5V)	1	

1.2 Product Basic Supply Accessories



Lithium Battery Charger	3	R
Hand Toolbox	1	13
2.4G Network Bridge Host	1	
CAT6E Cable (5m)	1	
POE Cable 1.2m	1	
UHF Whip Antenna (450 MHz - 470 MHz)	1	
GPRS Antenna	1	
RC&WIFI Antenna	4	C
Tripod For Network bridge Antenna	1	and the second sec



Backpack	1	Dicate and
Shipping Case	1	

2 Hardware Installation

2.1 Preparing for conducting the survey

It is necessary to have an accumulator to supply power for external radio if you use external radio mode. Full charge the remote controller and batteries with a standard charger. Figure 2-1 is about how to charge the batteries.



Figure 2-1 and 2-2 Battery connection during charging

Firstly we connect the charger to the battery interface, pay attention to tighten the nut, and then connect it to the 220v AC power supply. When the battery is not connected, only the POWER LED of the charger lights up, the CHARGE LED lights up red when connected to the battery, and turns green when fully charged.

Maintenance instructions for batteries:

- 1. For the new arrival battery, please fully charge it as soon as possible.
- 2. Please charge the battery in time if the remaining power is less than 25%.

3. A Fully charged battery can be placed for 6 months. Please charge it in time if not being used.

2.2 Setup RTK Base Station and Onshore Data Receiving System

Set RTK base station:

1.External radio mode

Prepare GNSS Base receiver, external radio and transmitting antenna, tripod, etc. Configure base receiver to send RTCM3.2 via external radio.

2.Ntrip mode

For detailed operation, please check 3.3.4 Rover Configuration



Figure 2-3 Set RTK Base Station

Check the accuracy of the rover station: Under the fixed solution state, compare the accuracy of the RTK rover station with the coordinates of the known points to ensure that the accuracy meets the measurement requirements before proceeding to the next operation.

2.3 Install Accessories for the USV System

2.3.1 Install the accessories of the boat



Figure 2-4 Install the accessories on the boat



Figure 2-5 Insert a Nano card

2.3.2 Debug before launching the boat

1). Boot the boat

Long press three seconds the switch on the tail of the boat. Pay attention to the lights on both sides, when the red satellite lights and green differential signal lights are always on, they are in normal working condition.

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2). Turn on the remote control

The switch button is in the lower left corner. Press the key first, then long press quickly, and wait until the indicator lights up gradually, showing that it has been successfully booted. The indicator light represents the power of the remote control. The operation of powering off the remote control shutdown is the same.



Figure 2-6 Remote control

3). Debug the motors

Use the remote control to check whether the motors are working properly.

Figure 2-7 Debug the motors

3 Software Operation for the USV System

3.1 Install the software

There are two software for the USV system, AutoPlanner and HydroSurvey.

1) When installing the AutoPlanner software, double-click the installation package, click Next until the installation driver and plug-in interface appear, tick 'Install Tap



Driver' and 'Install Ezopen Plugin', and then click Next until the installation is OK. Figure 3-1 Install the software

2) When installing the HydroSurvey software, double-click the installation package and click Next until the installation is complete.

- 3.2 AP Software Configurations
- 3.2.1 Change the Server IP via webpage
- 1. connect to the boat via WIFI
- 2. go to the webpage
- a. open a Google browser
- b. enter IP address:192.168.0.254
- c. input the user name and password user name is admin password is Admin1234
- go to [system settings], and choose [N2N Setting].
 Change International Server in the server type selection. Then click [Confirm].

CNA	V	/	
	N2N Setting ×		
es	N2N Setting		
er Configuration	Server type selection:	International Server	
ecording	username'	China Server	
tings	password:	International Server	
settings	Client IP: Server IP:	159.138.1.94	
k Setting	Server Port:	7777	
Setting		Confirm	

Figure 3-2 Change International Server

3.2.2 INTER Connection for AP Software

a. A computer connected to the Internet by a hotspot shared by the phone in the field working.

b. Double-click the AP software icon to open it, select [INTER], and click [Connect].

c. Select the server by your location, and the **User Name** is SN of main control, the **Password** is "Admin1234"

AutoPlanner							
	plan parameter help					INTER ~	CONNEC
Spread/Shrink	Had and Video 0 45 20 NE 8 9 10 20 00		in a control and region.		iorente instruger.	and the regime.	
DISARI	VIED		Exception 操作超时	Exception 操作超时	Exception 操作超时	Exception 操作把时	Ð
		don't soom 1.	We are sorry, but 🦉 Remote Inf have imagory at the level for this re Server	o X	We are sorry, but we don't have imagery at this zoom level for this region.	We are sorry, but we don't have imagery all this zoom level for this region.	
O (Home)	/Shrink /Shrink Set VP Restart Mission sar Track Keep Loiter		Client IP H Client Fort 3 User Nume 3 Fastverd & Excoption 操作提明	92 168.0.254 0000 2281013 definin1234	* Exception:操作提时	Exception 操作超时	Đ
Latitude (dd)	Longitude (dd)	dan't toom	We are sorry, but we don't have imagery at this zoom	OK Centrel We are sorry, but we don't have imagery all this zoom	We are sorry, but we don't have imagery at this zoom	We are sorry, but we don't have imagery at this zoom	-
AltitudeGeo (m)	Gps Status 0.00	B.	level for this region.	level for this region.	level for this region.	level for this region.	
0.00	0.00		Exception 操作超时	Exception 操作超时	Exception 操作超时	Exception:操作超时	Ð
Bat Remaining (%)	Bat Remaining2 (%)	Lat (RTK) Lag(RTK) GEO + 0	0.0000000 Direct to current VF GPS	S Track (Black) Mo see opens but up don't	We are corpulative dest	We me nor bit we don't	

Figure 3-3 INTER connection

- 3.2.3 Plan Route for AP Software
 - (1) Connect the computer to the network, and load the surrounding satellite image

maps through the positioning of the boat. Select [NAVIGATION PLAN] on the main interface, and select the appropriate satellite image map. Commonly used are Bing satellite maps and Google satellite maps.

(2) Plan work area

Right-click on the interface and select [Polygon] \rightarrow [Add Polygon Point].

Note:

1) The satellite image is not updated in real time, so pay attention to the actual area when planning the polygon.

2) The role of the home point: a. The home point is the return point. b. The logic for generating the automatic route is to generate the waypoint 1 near the home point, and the other waypoints are generated in sequence.





Figure 3-4 Plan work area



Figure 3-5 Plan work area

(3) Edit auto waypoints



Right click the interface and select [Polygon] \rightarrow [Navigation Path].



Figure 3-6 Set Navigation Path



Figure 3-7 Set Navigation Path

[Path angle]: Adjust the angle of the route.

[Distance between lines]: The distance between routes.

[Waypoints spacing]: The distance between points on the route, the value set should be greater than the true distance of the route, to ensure that there are only two points on a route. The automatic waypoint spacing here is not the same as the data collection spacing.

(4) Write waypoints to the boat

[Load WP File]: Load the WP file from the computer.

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[Save WP File]: Save the currently planned route to the computer. [Read WPs]: Read the current mission waypoint from the boat. [Write WPs]: Write the planned waypoint data to the central control.



Figure 3-8 Write WP into the boat

3.2.4 Semi-automatic measurement mode

A. Launch the unmanned ship, control the successful initialization of the unmanned ship (the red light is always on), the navigation plan interface, and the right side of the middle operation mode select semi-automatic mode.

B. Create a polygonal working area (which can be larger than the actual survey area and can include non-water areas), Right click on the satellite image map,

select [Polygon] \rightarrow [Navigation Path] in the pop-up interface for route editing,

by adjusting the angle to change the direction of the route, trajectory spacing, then click the Write WPs.

C. Switch to automatic mode and wait for the measurement to end. Note:

1. This mode is used with millimeter wave obstacle avoidance radar, and the actual use is judged according to the field environment if the shore slope is low or the shoal area is not recommended.

2.Waypoint 1 shall be set in water.

3. Try to sail from outside the survey area to waypoint 1, do not cross the route to point 1.





Figure 3-9 Semi-automatic mode



Figure 3-10 Semi-automatic mode

3.2.5 Full-automatic measurement mode

3.2.5.1 Full-automatic measurement mode (Software)

A.USV launched, control ship initialization success(the red light is always on).

B. Select the full-automatic measurement mode in the AutoPlanner software.

C. Setting the distance between routes, the direction of routes and the measuring area; then click the Write WPs.

- D. Switching to auto mode.
- E. Wait for the measurement to end.

3.2.5.2 Full-automatic measurement mode (Remote Control)

A. USV launched, control ship initialization success (the red light is always on).

B. Select full-automatic measurement mode in the navigation plan in AutoPlanner software, select remote control mode of operation, and set the course distance, then click the Write WPs.

C. Push forward the ship (above 3s) in a straight line, determine the direction of the route, and switch to auto mode.

D. Push the left or right rocker (more than 3s) to determine the measurement area;

E. Wait for the measurement to end.



Figure 3-11 Full-automatic mode





Figure 3-12 Full-automatic mode



Figure 3-13 Full-automatic mode

3.2.6 Login HD Camera for AP Software

- a. Click [Navigation Data] \rightarrow [Spread/Shrink Hud and Video] \rightarrow [Intranet]
- b. Enter camera serial number (Posted beside GD100)
- c. Click [Login] first, click [Play] while you have login successfully



Figure 3-14 Login HD camera



Figure 3-15Login HD camera



3.2.5 Other common functions for AP Software

1. Control USV via AP software



Click **[Shrink Remote-Control]**, and remotely control the USV by dragging the blue dot.

Figure 3-16 Control USV via AP software

2. Useful functions

[Set WP]: Set a new waypoint quickly without clicking the navigation plan interface. **[Restart mission]**:back to the first point and start a new mission.

[Clear track]:clear the track line of the interface you have run.

[Keep loiter]: change the state of the boat.



Figure 3-17 Other functions

3. Convenient switch

Now we can turn on the switch when you need it in software instead of Web page.

[Shoal]: set a shoal depth to ensure your boat's safety.

[Avoid Obstacles]: set a distance to ensure your boat will not crash into some objects in the water.

[Low Power And Return]: makes your boat return to its home point automatically.

[Lost Connection And Return]: make you boat return to home point automatically when your boat has lost connection for few times.



Figure 3-18 Convenient switch

3.3 Webpage Setting for GD100

3.3.1 Login webpage

Input 192.168.0.254 on the browser. Username: admin Password: Admin1234



Figure 3-19 Login webpage of the GD100

3.3.2. Register the receiver

Click **[Firmware][GNSS Registration]**. Send the receiver SN to the dealer or sales branch to obtain the registration code. Enter and apply the correct registration code.

CNA		1						SN:3271498	English 💛	l
5	GNSS Registration ×									
stellites	Serial Number:	3271498	1							
teceiver Configuration	Registration Limit:	2021-2-20								
Data Recording	Registration Code:	WkfyC2pZwUP								
I/O Settings										
System settings		P Registration								
Firmware										
Firmware Info.										
Hardware Version										
Config File										
System Log										
User Log										
Firmware Update										
Radio Upgrade										
GNSS Registration										
Cloud Service Setting										

Figure 3-20 Register the receiver

3.2.4 3.3.3.Configure the I/O of the rover station

There are two kinds of working modes for the rover station:

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1) CORS mode. 2) Internal radio mode

1. Set CORS mode. Click **[I/O Setting][RTK Client][Connect]**. Select **[Connection Protocol]** as NTRIP protocol, and input the CORS parameters. Then click **[Confirm]**.

🕽 Status	I/O Set	tings ×							
Satellites		Туре	Description		Dutput		Connection Status		Modify
Receiver Configuration	1	RTK Client	60 205 8 49 8003				Unconnected	Connect	Disconnected Detai
] Data Recording	2	TGP/UDP_Client1/NTRIP Server1	192 165 53 66 9900	GP	GGA SH2,		Logged In	Connect	Disconnected Detai
I/O Settings	3	TCP/UDP_Client2/NTRIP Server2	192.168.53.66.9901	GP	HDT5Hz,		Logged In		Disconnected Detai
I/O Settings	4	TCP/UDP_Client3/NTRIP Server3	192.168.3.18.9902	RTK Client		8	Unconnected	Connect	Disconnected Detai
	5	TCP/UDP_Client4/NTRIP Server4	192.168.3.18.9903	Connection Protocol: NTR	RIP 😼		Unconnected	Connect	Disconnected Detai
	6	TCP/UDP_Client5/NTRIP Server5	192.168.3.18.9904	Server IP: 60	205.8.49		Unconnected	Connect	Disconnected Detai
	7	TCP/UDP_Client6/NTRIP Server6	192 168 3 18 9905	Port: 80	03		Unconnected	Connect	Disconnected Detai
	8	TCP Server/NTRIP Caster1	9901	Mount Point: RT	CM32_GGE 🗸 💅 Get		OFF	Connect	Disconnected Detai
	9	TCP Server/NTRIP Caster2	9902	User Name:			ON	Connect	Disconnected Detai
	10	TCP Server/NTRIP Caster3	9903	Password:			OFF	Connect	Disconnected Detai
	11	TCP Server/NTRIP Caster4	9904	⊘ Confirm	n 🛞 Back		OFF	Connect	Disconnected Detai
	12	Serial Port	115200						Settings
	13	Radio	456 0500MHz						Settings
	14	Sounder	normal	SC	OPTMax				Settings
Sustam settings	15	External Equipment	Water Quality Meter						Settings

Figure 3-21 Set CORS mode

2. Set internal radio mode. [System Setup][Radio Settings]

CHCNA		SN:3271498	English 💛	Quit
👩 Status	Radio Setting ×			
✤ Satellites	Radio Setting			
X Receiver Configuration				
Data Recording	Radio Status: OFF			
I/O Settings	Auto Start: Ves No			
System settings				
Network Setting	Radio Protocol: CHC			
Radio Setting	Channel Bandwidth : 25 (KHz)			
 Bridge Setting 	OTA Baud Rate: 9800			
 Return To Launch Setting 	Radio Power: 1W			
 N2N Setting 	Radio Frequency: 1 456.0500 (410MHz470MHz)			
 ZTW mode setting 	Save .			
Remote Control Setting				
 Ship Type Setting 				
Firmware				
Cloud Service Setting				

Figure 3-22 Set internal radio mode

3.2.5 System State

Click [Unmanned Ship Status][System State]

The status of USV, positioning status, battery status, sounder status, etc. can be viewed in this Interface.

CHCNA		SN:3271498 English 🗸
🗊 Status	System ×	
▶ System	NetWorkState	Location State
 Position State 	Power Statuer ON	Colution State: Elv
position record	Connection Protocol: CHINA MOBILE	Solution State: Pix
	Signal Strength: -57(dBm) 100%	DOP: HDOP-0.983563 VDOP-1.756819
 Water Quality Data Recording 	SIM Status: SIM Card Ok	RTK Mode: Mobile Station CORS
Settings	Dialing Status: Connected	Differential Delay: 01
	IMEI: 864513040078054	
	Battery Status	Activity Status
	Battery: 0%	Current Time: 2021-01-25 05:11:48 (UTC)
	Battery Voltage: 0 (v)	Operation Duration; 00-00-00 01:45:33
	Use Mileage: 181.066(km)	Internal Storage: 0.59% 1919MB/29110MB
	Range: 0.000(km)	External Storage: 0% Disconnected
Satellites		
- outcomes		Sounder
X Receiver Configuration	Control State	
Receiver Configuration Data Recording	EKF: Abnormal	Range: 0.000
Receiver Configuration Data Recording I/O Settings	Control State EKF: Abnormal Mode: Manual	Range: 0.000 The Depth of The Water: 0.000
Receiver Configuration Data Recording I/O Settings System settings	Control State EKF: Abnormal Mode: Manual Ship Type: APACHE-3 Automatic Detection	Range: 0.000 The Depth of The Water: 0.000
	Control State EKF: Abnormal Mode: Manual Ship Type: APACHE-3 Automatic Detection	Range: 0.000 The Depth of The Water: 0.000

Figure 3-23 System state

3.2.6 Firmware upgrade

We have updated the firmware frequently, you can upgrade the control firmware, host firmware and Echo Sounder control firmware when you need to.

CHCNA		SN:3268070 English	Quit
😨 Status	Firmware Update ×		
✤ Satellites	Manual Upgrade		
🔆 Receiver Configuration			
Data Recording	Tip:It is not supported to upgrade three firmwares at the same time		
I/O Settings	GD100 Host I lovrade		
System settings	File(.bin):		
🌒 Firmware	Confirm		
 Firmware Info. 	CD100 Control Lingrado		
 Hardware Version 	File(.px4):		
Config File	E Confirm		
 System Log 			
 User Log 			
Firmware Update	Online Upgrade		
 Radio Upgrade 			
GNSS Registration	Tip:Both GD100 host firmware and control firmware will be upgraded at the same time.		
	🖂 Online Upgrade		
Cloud Service Setting			

Figure 3-24 Firmware upgrade

3.4 Set Hydrosurvey

3.4.1 New project and connection to the boat

1)Open HydroSurvey 7 , click on [Project] - [New Project].

"Project name"is default and can be renamed if you need. It also can be saved as a



template by clicking [Save coord template]. It is important to input the deviation if you perform the base shift.

Figure 3-20 and 3-22 Create a new project and set coordinate system

2) click connect the GPS and the sounder after you have connected the boat via AutoPlanner.

3) When you set it up, click in the menu bar and then all the data are displayed to the left of the interface.



Figure 3-25 Main interface

3.4.2 Record control

As shown in the following figure 3-27, click on [Setting] – [Record control]. If [By Distance] is set to 1 M, a point will be recorded for every meter; if [By Time] is set to 1 S, a point will be recorded for every second; if [By Space] is ticked, a point will be recorded once you click the space bar.

In terms of Limitation selection, [Fixed] is recommended when RTK is used and [Float] is recommended when the beacon is used.



Figure 3-26 Record control

3.4.3 start work

When the new projects, parameters, data, settings and other preparations are done well, data can be recorded.

①Choose [measure mode]

(2) Toolbar indicates the start, pause, and stop of the record.

Meantime, a line name could be entered at the beginning of measuring.

③In order to facilitate post processing and prevent massive loss of data in unexpected cases, it is suggested to change a line every 300 or 500 points.

(4) When the data in the test area is measured, click on [stop] and then save the APACHE 3 PRO User Guide | 2023-10 Page | 29



project by clicking [Project] – [Save Project] before closing the software.



Figure 3-27 Import background map

When the unmanned boat travels to the designated route to be measured, click **[Measure]** \rightarrow **[Start]** then pop up the setting line information interface. The line name and line number are set by default. The auto switch selects 2000 points for automatic line change.

Click [Measure] \rightarrow [End] after the measurement area task is completed Stop here, you can start your measuring work.

3.4.4 Download the depth file from the boat (skip this step if you need

not)

1. connect the wifi of boat(serial number of the boat)



B A	
	APACHE-3256732 Open Connecting
	HC-office Secured HC-Guest Secured
	ChinaNet-bCyP Secured ChinaNet-MuOR Secured
	Network & Internet settings Charge setting: such a making a connection metered. Activate Windcows Got 475 ettings to althouse Windcows. Witi Fight mode Wataget

Figure 3-28 Connect Wifi

Open a file maybe 'This PC' on your computer, and input IP: ftp://192.168.53.254

nikule woeka keyaleka bakey	Location 中世//19 和時史/2000年 和時代	Network 12.168.53.254 T 92.168.53.254/ 3D Objects	System		✓ → D Search T
	TT 70.000		Cestop	Documents	
	Inis PC Jo Objects Desktop Documents Downloads	Downloads Videos	Music	Pictures	
Naresofi Egg: B Cope Caminterer	♪ Music ■ Pictures ■ Videos ▲ Windows (C:) ■ New Volume (D: ■ 新加楼 (E:)	Windows (C:) 290 GB free of 383 GB	New Volume (Dc)	新加聯 (E) 45.8 GB free of 195	G8
	10 items			1	Activate Windows So to Settings to activate Windows.

Figure 3-29 Input IP address

 Username: admin Password: Admin1234



6 👬	Log on as X				- 1	I X
360	Either the server does not allow anonymous log-ins or the email address was not accepted.	New item -	Open -	Select all		
🤉 <u>🐢</u>	FTP server: 192.168.53.254	Easy access •	Properties Edit	iii Select none		
alle Wollan	Bassword:	New	Open	Select		
de Bin Deskiep	After you're logged on, you can add file server to you Favourites and return to it eatly. Let FTP does not encrypt or encode passwords or data before sending them to the server. To protect the security of your passwords and data, use WebDAV instead.				¥ X P	Search 1
	Log on gnonymously Save password					
9)	Documents					- 1
e 📕 🗎	Downloads Music					- 1
stall NewMales NewText	Pictures					
ge (g) Guirdinian.	Videos 					
	New Volume (D:					
lene:	■ 新加田郡 (E:) 10 items					100 000
lante J						
		6 -				15:43

Figure 3-30 Input username and password

 Copy the files from the record 2 file Dep files record the original data. SD files record the waveform.

	2 Cut	C I New ten -	Open • Elect all		
Quick Copy Paste ess Clipboar/	Add Copy parts Move Copy Delet to * Copy Delet to * to * *	te Rename New folder Prop	• Open Select		
⇒ ~ ↑ <mark></mark> > T	he Internet > 192.168.53.254 > record_2				v ð P Search
Quick access	V Earlier this week (4)				
Desktop #	L0006_2020-06-23-14-13-34.d	ep 🔊 L0005_2020-06-23-12-09-24	4.dep	11-42-36.dep 🔊 L0003_2020-06-23-10-31-30./	dep
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Figure 3-31 Copy files from record2

5. process the dep files via Hydrosurvey



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Figure 3-32 Copy dep files to the project of Hydrosurvey

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Figure 3-33 Copy .sd files to project of Hydrosurvey

4 Data Processing

4.1 Water depth sampling

Water depth sampling is a process that corrects the depth data and handles the wrong depth data. We will get an **Htt** file including all data that can be select in the data export section after sampling. This process will be divided into four steps.

1.Correct the depth by sound velocity correction

tick [All], selected [Three Corrections] to get the edit interface.



Figure 4-1 Main interface



Figure 4-2 Sound velocity correction



As the figure 4-2 shows, there are three ways to correct the sound velocity: Single Sound velocity, Depth + Sound velocity, and Depth+ Correction. Take the second method as an example

(1) Import the sound velocity file via clicking [Import] button, the format should be as follows:

Sound v	elocity fi	le.txt -	Notepad	1		X	
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Figure 4-3 Sound velocity file

The first column is depth, and the second one is the sound velocity. (2) the imported sound velocity will be shown in the list.

🔣 Data Correct		- • ×						
Sound Velocity Cor	rect Delay Correct Attitud	de Correct						
Correct Paramete	ers Input							
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Depth(m)	Sound Velocity(m/s)	Correction(m)						
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1	1480	0						
1.5	1475	0						
2	1470	0						
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Ship 1_S	Ship 1_Sounder1_L0002_2022-03-30-15-00-54EU							
All 🗖 Re	verse	Correct Skip						
Tip: Items that do	n't need to be corrected cl	ick [Skip] button.						

Figure 4-3 Imported sound velocity file

(3) Calculate the correction and apply it to all raw data.



Click the [Correct] button, then it will pop up successfully applying information

Figure 4-4 Apply sound velocity file

(4) Skip Delay correct and attitude correct

The delay correct is the correction for GPS and depth transmission delay. The impact of time delay on bathymetric data can be reduced. The time delay value for the whole system is fixed. Enter a known time delay value or calculate it via a special method if necessary. Hydrosurvey also supports adjust the beam angle to recalculate depth. For more details, please directly contact with technical support engineer of CHC.



Figure 4-5 Skip delay correct and attitude correct

2. Handle the depth data

Double click a depth file in the depth file list.





Figure 4-6 Depth sampling interface

As Figure 4-6 shows, the green line on the top of the main interface shows the elevation of the surface of the water and fixed state (yellow represents floating and red represent a single point), the main interface can be changed by adjusting the [Depth H]and [Width]. the green line displayed on the bottom interface shows depth, the red line is a simulative echo signal. If these two match well, the depth can be trusted and accurate. If not, just select the wrong depth points, then click[Eraser] to delete the points. It is suggested that the dep files should be handled in turn.

3. Select a proper[Interval]

Choose an interval for exporting the data. Select a value in the [interval] setting, then click [2.Interval]



Figure 4-7 Interval setting

4. You also can change the interval by clicking [Manual] button.





Figure 4-8 Manually change interval

5. Click [4.Export htt]

When the interval setting is complete, click [4.Export htt] to save htt files



Figure 4-9 Export htt files

4.2 Data export

Click on [Data processing] – [Data Export], Select the Htt files and choose a file type, APACHE 3 PRO User Guide| 2023-10 Page | 38



there are some default formats for option, and the format also can be modified via [Customer]. At last export data to the desktop by clicking [Export].



Figure 4-10 Customer the format



Figure 4-11 Data export

Select the [Save Path] and click on [Export], the final result will be acquired.



CHC Navigation

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