

Intelligent Unmanned Surface Vehicle

iUSV-6 User Manual



Shanghai Ubiquitous Navigation Technology Co., Ltd.

Shanghai UbiNavi Tech Co., Ltd.

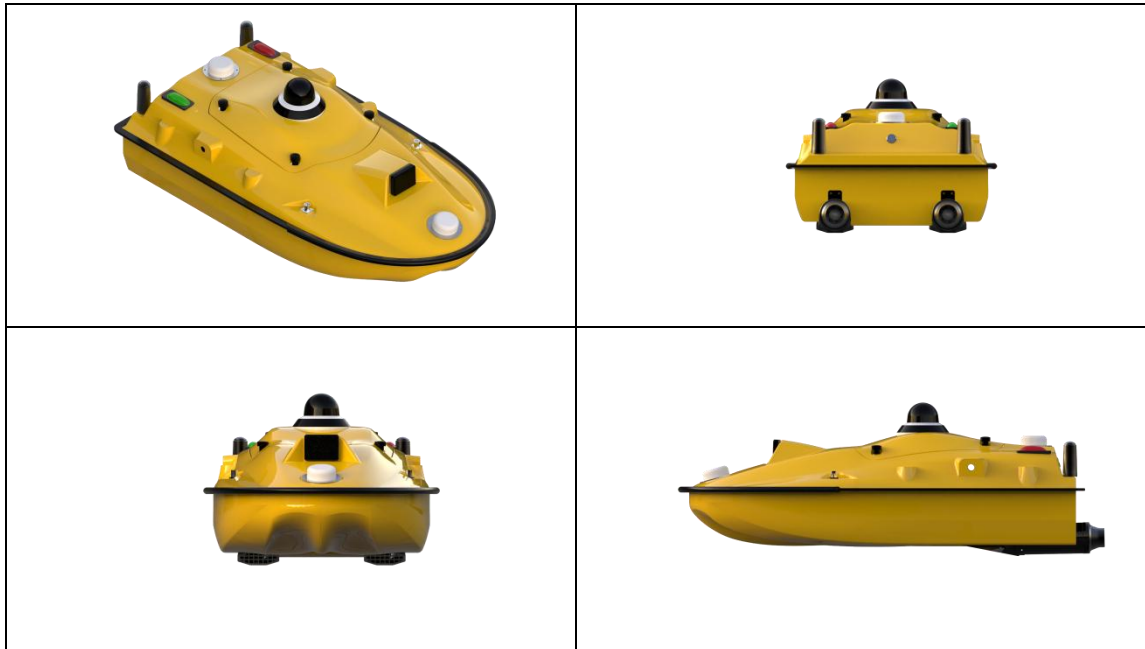
Version 1.0 2025.11.06

Contents

1.Introduction.	2
1.1.iUSV-6 Introduction	2
1.2.Hull Structure.	3
1.3.G20 Remote Controller	5
1.4.G20 Remote Controller Tutorial	7
2. Hardware Operation	11
2.1. Accessory Installation.	11
2.2. Pre-Launch Preparation	11
2.3. Battery Charging Instructions.	12
3. Software Operation	12
3.1. Software Introduction	12
Uninstallation: Long-press the iSail software icon and move it to uninstall, then click OK to confirm uninstalling iSail.	13
3.3.Project Creation	15
3.4. Device Self-Test	16
3.5. App Main Interface.	16
3.6.Route Planning.	19
3.7.Parameter Settings	24
3.8.Depth Sounding Control	30
3.9.Camera Control	31
3.10.Data Post-Processing	32
3.10.1.View Introduction.	32
3.10.2.Function Button Introduction	33
3.10.3.Gesture Operation Introduction	36
4.Quick Start Guide for Operations	36
Warning.	38

1.Introduction

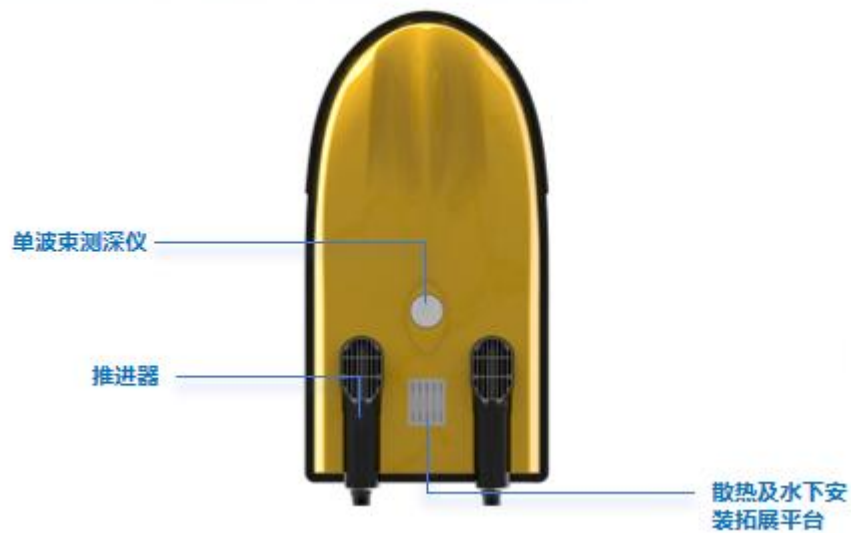
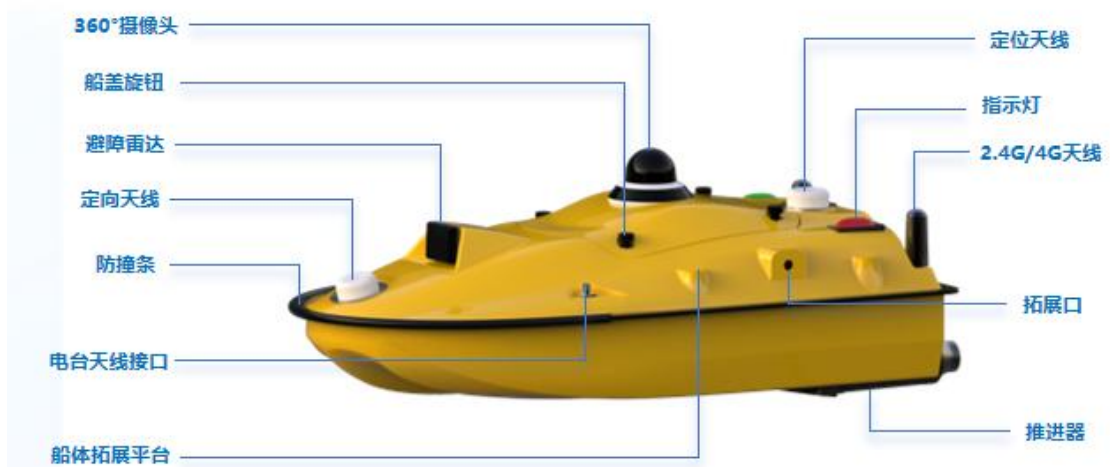
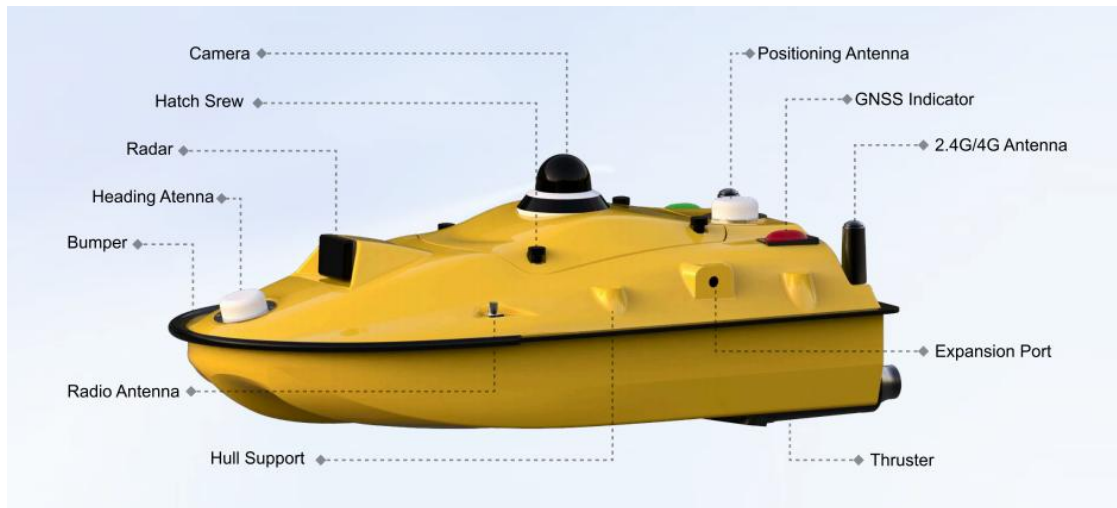
1.1.iUSV-6 Introduction



UbiNavi iUSV-6 USV(unmanned surface vehicle) is a highly integrated platform comprising a hull, main control system, millimeter-wave radar module, GNSS positioning module, remote control system, and power supply system. It is engineered for hydrographic surveying, environmental monitoring, and scientific research, with all subsystems connected through a wireless radio data link.

The remote control system includes an Android-based controller equipped with data transmission capabilities. Together with the iSail software, it enables task execution, data acquisition, and data post-processing.

1.2.Hull Structure



单波束测深仪:

Single-Beam Echo Sounder

推进器:

Thruster

散热及水下安装拓展平台：

Cooling and Expansion Platform



开机/遥控器连接状态指示灯：

Power on / Remote Controller Connection Status Indicator

4G天线：

4G Antenna

一键启动开关：

Power Button

差分状态指示灯：

Differential Status Indicator

2.4G天线：

2.4G Antenna

1.3.G20 Remote Controller

(1)The G20 remote controller is powered by a Qualcomm 6nm octa-core processor and runs on Android 13. It features a high-bandwidth 2.4/5.8 GHz dual-frequency wireless module, ensuring clear imaging, low latency, long-range transmission, and robust anti-interference performance.

1. It features a 7-inch 1920×1200 HD display for real-time camera video transmission. A dual-fan cooling system ensures continuous and stable operation.
2. Interfaces include a SIM card slot, USB port and Type-C port. The high-energy-density lithium battery provides 6–8 hours of runtime.

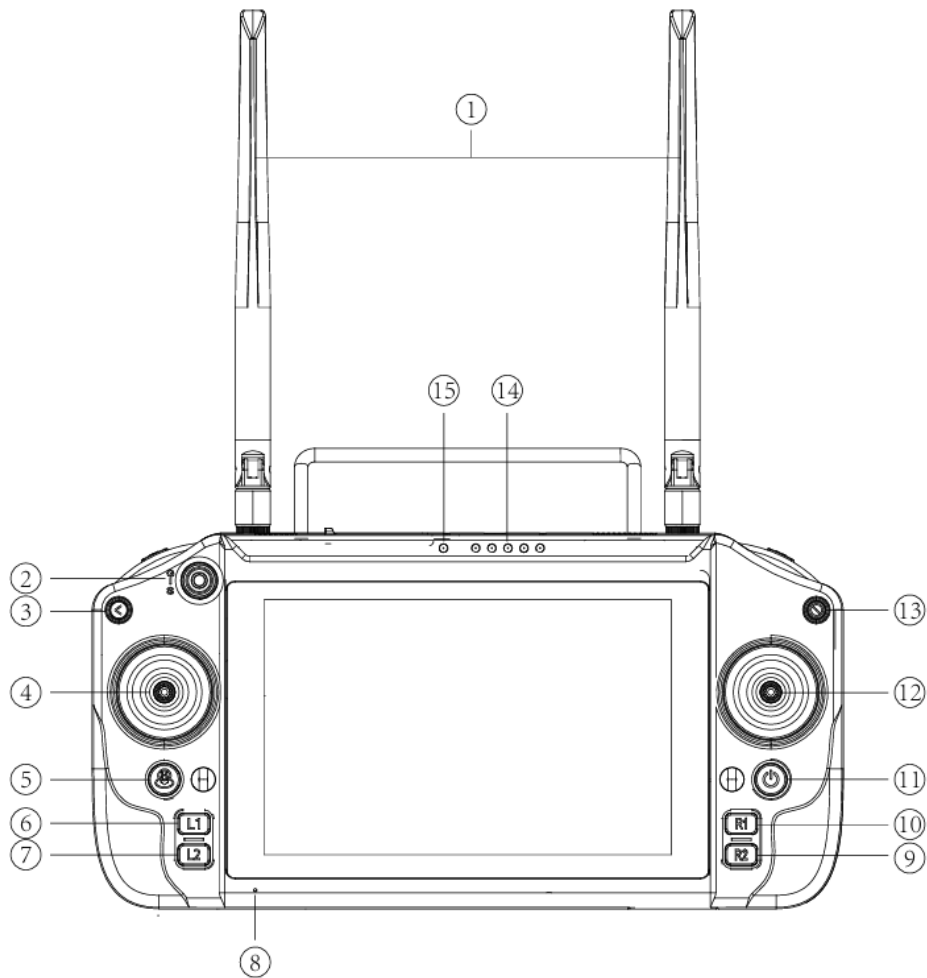
(4)The housing is constructed from weather-resistant silicone, matte rubber, and ABS (Acrylonitrile Butadiene Styrene) materials, with waterproof and dustproof protection for key interfaces and switches, making it suitable for operation in harsh environments.



G20 Remote Controller Specifications

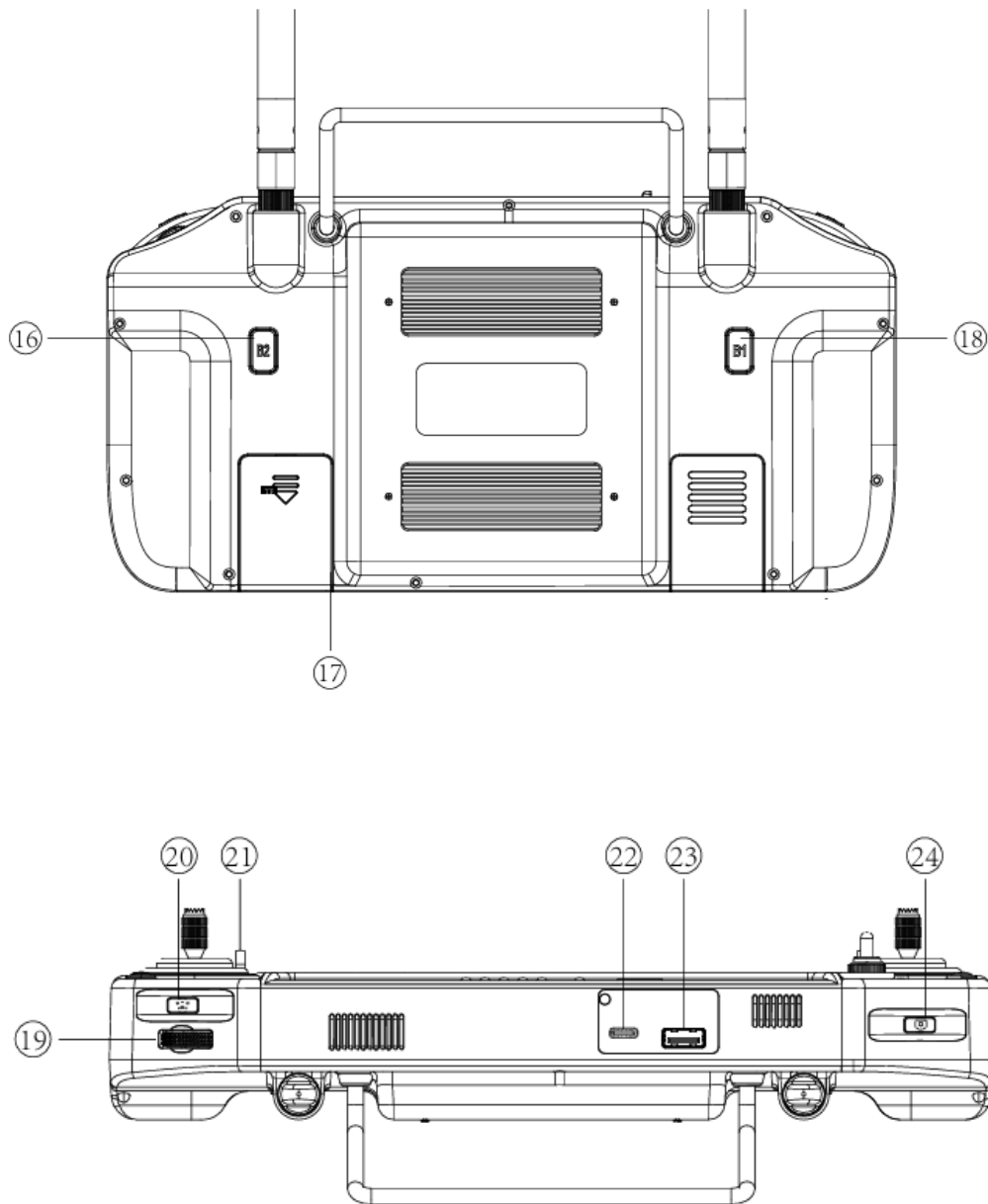
Product Model	G20	Channels	16
Operating Voltage	4.2V (Built-in Battery)	RF Power	23dBm@CE/FCC
Frequency Band	2.4G	Dynamic Frequency Hopping	Supported
Dimensions	277(L)×138(W)×96(H) mm	Weight	1.2kg
Operating Life	6-8 Hours	Battery Capacity	20000mAh
Upgrade Method	OTA Package/Online Update	Charging Port	Type-C
RAM	4GB	System Storage	64GB

1.4.G20 Remote Controller Tutorial



No.	Function	No.	Function
1	2.4G Antenna	9	USV Info Shortcut Key R2
2	Three-position switch (Forward: Auto / Middle: Hover / Backward: Manual)	10	USV Parameter Setting Shortcut Key R1
3	Backspace	11	Power Button
4	Left Joystick (Forward/Backward Control)	12	Right Joystick (Left/Right Control)

5	Return-to-Home Button	13	Data Recording Stop Button
6	Route Planning Shortcut Key L1	14	Battery Indicator Light
7	Safety Setting Shortcut Key L2	15	Pairing Indicator Light
8	Microphone		



NO.	Function	NO.	Function
16	B2 Button (Reserved)	21	Lanyard Interface
17	TF Card/SIM Card Slot	22	TYPE-C Port
18	B1 Button (Reserved)	23	USB Port
19	PTZ Camera Left/Right Rotation Control Auto-centering Wheel	24	Camera Photo Button
20	Camera Switch Button		

Operating Environment Conditions:

- a. Ambient Temperature: -10 °C ~ +45 °C.
- b. Storage Temperature: -20 °C ~ +50 °C.
- c. Relative Humidity: ≤85%
- d. Atmospheric Pressure: 86kPa~106kPa.
- e. The operating environment shall be free of explosive or hazardous substances. It must not contain gases or conductive media that could corrode metals or damage insulation, and should be free of excessive water vapor or severe mold.
- f. The location shall provide protection against rain, snow, wind, sand, and dust.

Power Supply Method and Precautions:

- a. The G20 series ground station is equipped with a built-in rechargeable lithium battery and supports charging via standard Type-C interfaces (e.g., USB chargers for phones, cameras, etc.).
- b. If smoke, unusual odor, or liquid leakage occurs during charging, immediately stop charging and send the device to our company for repair.
- c. Do not charge this product within the reach of infants to avoid the risk of electric shock.
- d. Do not charge the product in environments where the temperature exceeds 60 °C.
- e. Always use a certified professional charger to charge the battery.
- f. The antenna is a delicate component; avoid applying excessive force to prevent damage.

Pre-work Preparation and Inspection:

- a. Before use, ensure the remote controller battery is sufficiently charged.
- b. Verify that the antenna is positioned correctly to achieve optimal performance.
- c. Users must not operate the device under the influence of alcohol or drugs.

2. Hardware Operation

2.1. Accessory Installation

1. Insert the battery and connect the power aviation connector.
2. Connect the main camera's network and power cables.
3. Close the cabin cover and secure it by tightening the knob.

2.2. Pre-Launch Preparation

(1) USV and Remote Controller Power On

Press and hold the switch button at the tail of the USV for three seconds until the switch indicator flashes rapidly, then release. Wait for more than ten seconds until the switch indicator remains steadily on, indicating that the USV control system has fully started. Power on the remote controller, launch the UbiNavi control software iSail, and connect to the USV via image transmission. Once the connection is successful, the red indicator light on the left side of the hull will remain on.

(2) Propeller Airflow Test

Use the left and right joysticks on the remote controller to verify normal airflow in all directions:

4. Forward (Push left joystick forward): Both left and right propellers blow air backward.
5. Backward (Pull left joystick backward): Both left and right propellers blow air forward.
6. Turn Left (Push right joystick left): Left propeller blows air forward, right propeller blows air backward.
7. Turn Right (Push right joystick right): Left propeller blows air backward, right propeller blows air forward.

(3) Power-on Self-test

After the control software is connected, perform the power-on self-test. All items in the self-test must show normal status before proceeding.

2.3. Battery Charging Instructions

(1) Charging

Use the dedicated charger to charge both the lithium battery and the remote controller.

1. Connection and Charging Procedure

Connect the charger connector to the battery interface, ensuring proper alignment. Then plug the charger into a 220 V AC power source. Note: Always connect the interface to the battery first, then to the power source.

1. When the battery is not connected, only the POWER light on the charger will be on.
2. Once the battery is connected, the CHARGE light will turn red.
3. When fully charged, the CHARGE light turns green, indicating the battery is ready for use.

4. Battery Maintenance Instructions

5. Newly received batteries typically have a charge level of $\geq 30\%$. Fully charge them within two months.
6. Recharge batteries promptly when only one power bar remains.
7. Fully charged batteries can be stored for up to six months. After six months, recharge them before use.

3. Software Operation

3.1. Software Introduction

Developed by UbiNavi, iSail is an advanced Android software for controlling USV and performing data post-processing. The system processes operational commands and sensor inputs, executes control algorithms, and drives the USV to perform corresponding actions. It supports multiple surveying modes, enabling autonomous

navigation and task execution across diverse operational scenarios. Key features include hull control, route planning, real-time status monitoring, safety alerts, and over-the-air update.

Isail supports 4G-enabled remote control and simultaneous live display of three camera views on one screen. It integrates data from external sensors like multibeam echosounders, ADCP, and side-scan sonars directly in the app—no extra PC display needed. The platform also provides post-processing waveform stacking for noise analysis and multiple data-correction modes to ensure accurate, reliable results. It is designed for precise, efficient, and user-friendly USV operation.

(1) Technical Parameters

Operating Environment: G20 Remote Controller (Android 13).

(2) Software Installation and Uninstallation

Installation:

Copy the iSail program (the .apk file) to the Download folder on the G20 remote controller. Navigate to the Download folder from the desktop, tap the iSail installation package to initiate installation. Once completion, the iSail application icon will appear on the desktop for direct access.



Figure0-iSail Control App

Uninstallation: Long-press the iSail software icon and move it to uninstall, then click OK to confirm uninstalling iSail.

(3) iSail Software Version and O-T-A Update

Open the app while connected to the Internet. When a new software version is detected on the server, the system will display a pop-up window according to the server's

configuration. If not connected to Wi-Fi, the system will prompt whether to download the update. The iSail app is pre-installed by default on the G20 remote controller. If the app is not present, please contact UbiNavi technical support for assistance.

(Note: Many functions of the current software require a mobile network. The USV also requires network connectivity to access RTK signal. Ensure that you are in an environment with available network coverage when using this product.)

3.2. Establishing Connection

(1) Click the iSail app icon to open the software and enter the home page. Then, click the iUSV button in the lower right corner. A USV connection pop-up window will appear. Select "Image Transmission" or "4G" to establish the connection;

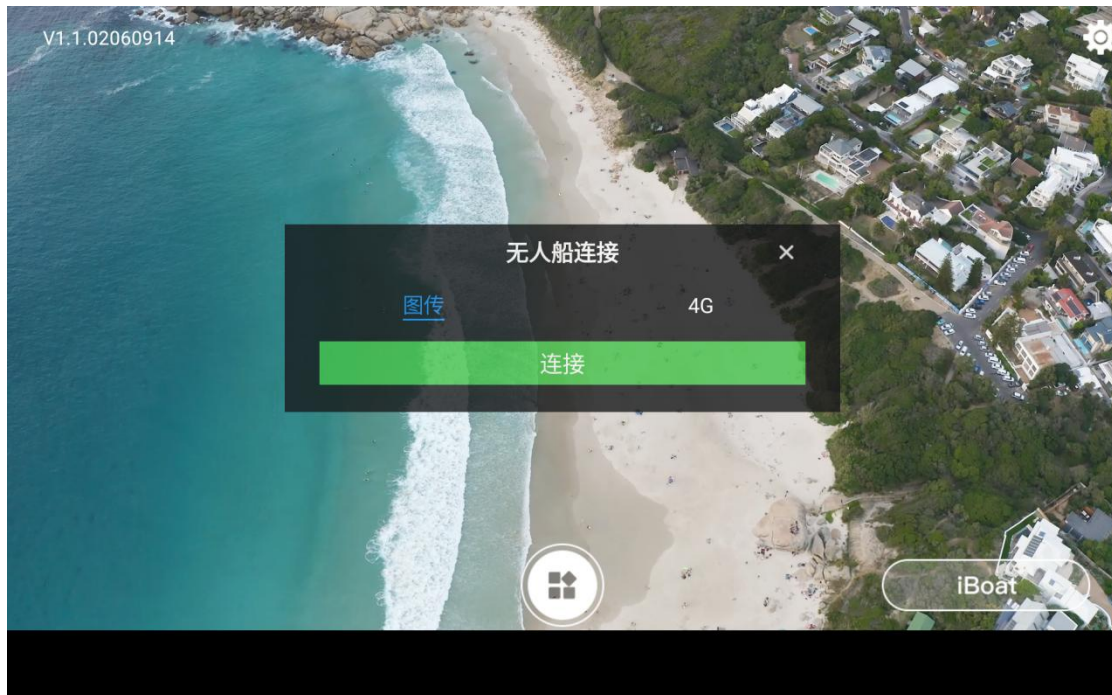


Figure 3-1: Home Page Connection

(2) The USV supports two connection methods: 4G and Video Transmission, with Video Transmission used by default. In 4G connection mode, the User Name corresponds to the USV's SN number, and the default password is admin123. Once the connection is successful, the button will change to "Disconnect".



Figure 3-2 Home Page Connection

3.3.Project Creation

- (1) Tap the function button at the bottom of the screen to enter the project directory, then select "New Project";

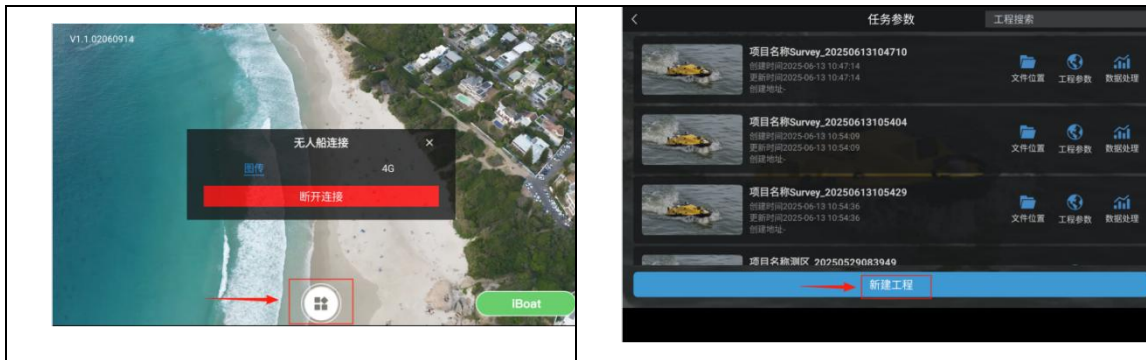


Figure0-3-1 New Project

1. Select the coordinate system, set project parameters such as the central meridian, then click [Confirm] to complete project creation and enter the App main interface;

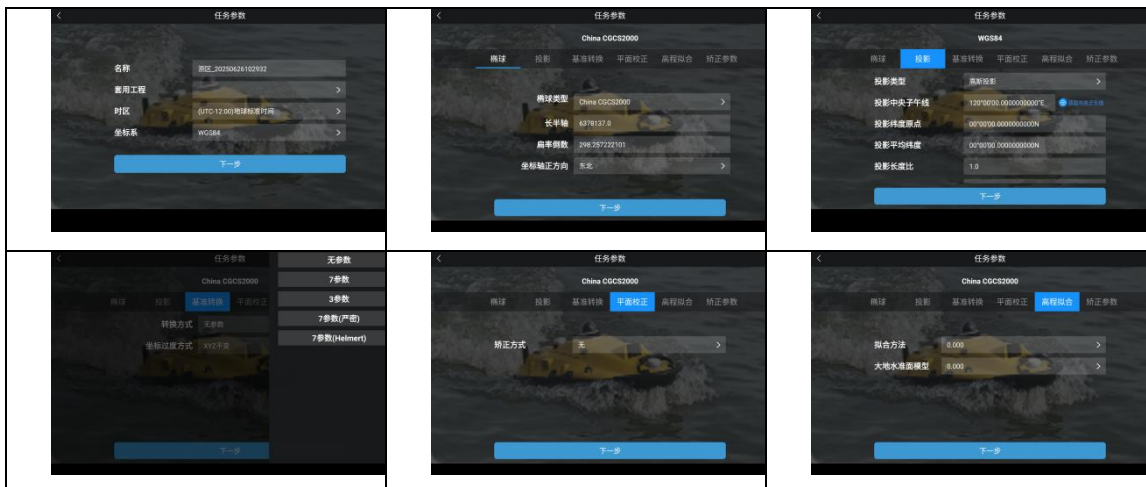


Figure0-1-2Project Parameter Settings

3.4. Device Self-Test

When the USV is connected, the system will prompt for a self-test action upon entering the control interface for the first time. Click“Confirm” to



Figure0-4Device Power-on Self-Test

USV 4G Network Signal:Displays the USV’s network quality in real time.

High quality (3 Bars) shows green

GNSS Solution Mode: Indicates the positioning solution status, with three modes: Single (white), Float (yellow), and Fixed (green).

Depth Sounder: Displays Normal in green when operating properly; otherwise, Abnormal is shown in red.

Power: Displays Normal in green when operating properly; otherwise, Abnormal is shown in red.

Camera: Displays Normal in green when operating properly; otherwise, Abnormal is shown in red.

Obstacle Avoidance Module: Displays Normal in green when operating properly; otherwise, Abnormal is shown in red.

Remote Controller: Displays Normal in green when operating properly; otherwise, Abnormal is shown in red.

USV Battery Level: Displays the USV battery level in real time. In the status bar: 61–100% shows green, 21–60% shows yellow, and 0–20% shows red.

3.5. App Main Interface

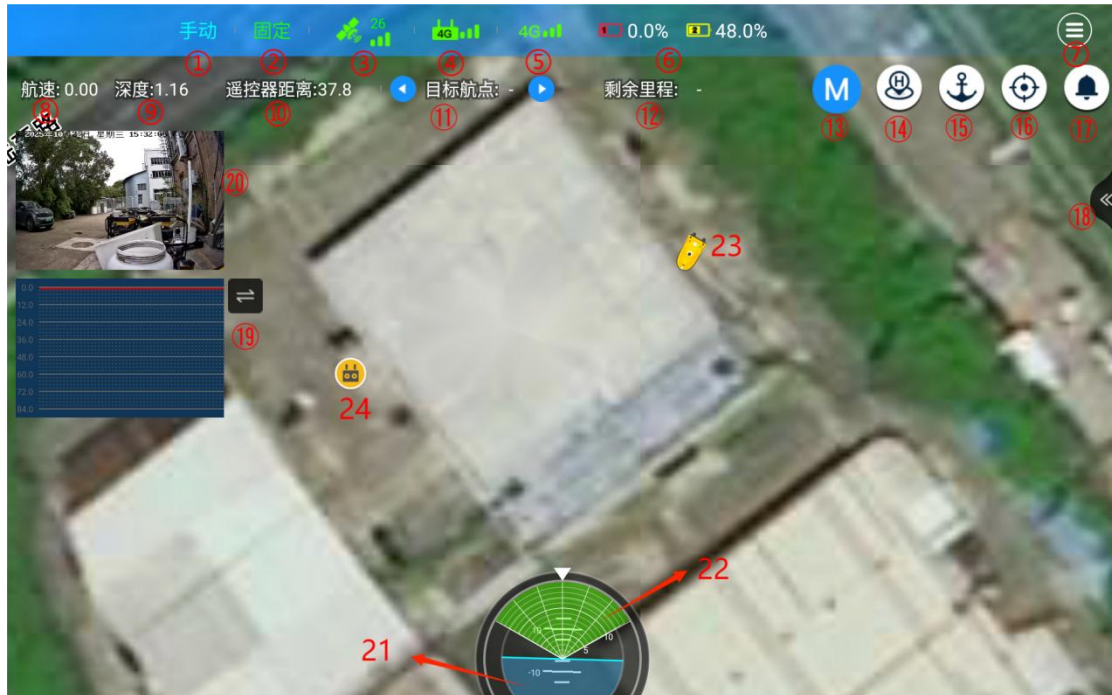


Figure0-5 Control App Main Interface

Overview of Control Interface Functions:

1. **Navigation Mode**

Provides real-time display of the USV's active navigation mode.

2. **Positioning Solution Status**

Indicates the USV's GNSS solution type in real time (Single, Float, Fixed)

3. **Satellite Status**

Shows satellite acquisition status and the current number of tracked satellites.

4. **Remote Controller Status**

Displays the connection status and signal strength of the remote controller.

5. **USV Network Status**

Indicates USV network connectivity and signal strength in real time.

6. **Battery Status**

Presents the real-time power levels of Battery 1 and Battery 2.

7. **Function Settings Module**

Opens the system configuration panel, including route planning, USV parameter settings, depth-sounding controls, data recording, differential configuration, vehicle information, layer management, safety settings, and additional system options.

8. **Speed**

Displays the current navigation speed of the USV.

9. **Water Depth**

Shows the real-time depth measurement at the USV's current location.

10. **Remote Controller Distance**

Indicates the operating distance between the USV and the remote controller.

11. **Target Waypoint**

Displays the current waypoint being navigated. Operators may switch between waypoints using the left/right toggle buttons.

12. **Remaining Distance**

Shows the remaining distance for the active mission route.

13. **Auto/Manual Mode Switch**

Allows toggling between automatic and manual navigation modes.

14. **Return / Cancel Return Switch**

Enables or disables the return-to-home function.

15. **Hover / Disable Hover Switch**

Activates or deactivates the USV hover (station-keeping) function.

16. **Auto-Center Function**

Toggles automatic map centering on the USV's location.

17. **Real-Time Message Center**

System alerts and operational messages appear automatically. Temporary alerts disappear after 5 seconds (e.g., “Caution: Shoal”). Archived messages can be viewed via the bell icon.

18. **Depth-Sounding Control Panel Toggle**

Expands the depth-sounding function controls.

19. **Depth Sounder Waveform View**

Provides real-time visualization of the depth-sounding waveform.

20. **Camera Feed**

Displays real-time video transmission from the onboard camera.

21. **Hull Attitude Information**

Shows the vehicle’s heading, roll, and pitch in real time.

22. **Obstacle Detection Display**

Provides real-time visualization of detected obstacle points.

23. **USV Position**

Displays the USV’s real-time location on satellite imagery.

24. **Remote Controller Position**

Shows the remote controller’s position on satellite imagery in real time.

3.6.Route Planning

1. **Manual Route Planning**

The current procedure for creating a new route is as follows:

Click the three horizontal lines in the upper-right corner of the vehicle control interface to open the function menu, then select **Route Planning**.

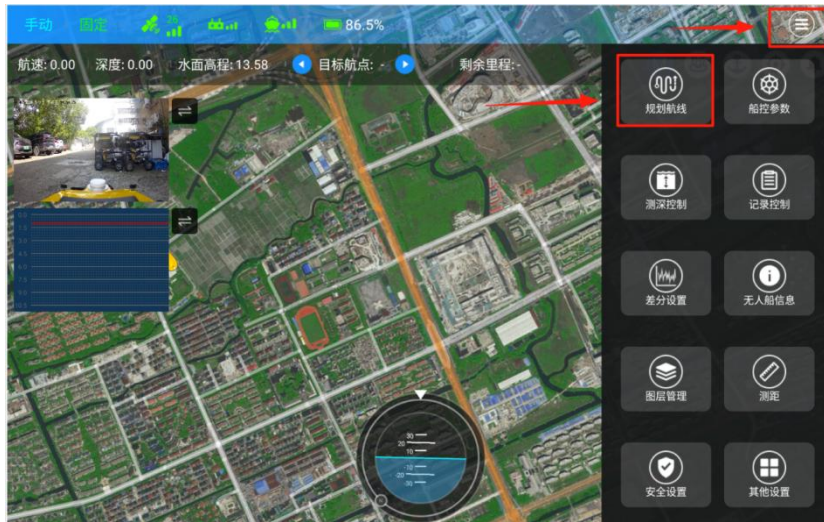


Figure0-6-1 Route planning function operation

Click the first function icon in the upper-left corner. When the icon is active, selecting multiple points on the satellite map will generate sequential task waypoints. Each click adds a waypoint, and the navigation path and heading follow the order in which the points are created. The double-headed arrow allows you to reorder waypoints (red marker 1). Current waypoint operations include deleting an individual waypoint (red marker 3) and deleting all waypoints (red marker 2). Click the flag icon on the right (as indicated by the red arrow) to view the latitude and longitude of the selected waypoint.



Figure0-6-2 Manual route planning function operation

2. Polygonal Route Planning

The second icon in the upper-left corner enables polygon-based route planning. The logic for defining a polygon is as follows: a single click on the map creates a polygon vertex; three clicks define a triangular area; additional clicks continue adding boundary vertices. Once the polygon is defined, you may generate a default route by selecting the **Generate Route** button on the right. Alternatively, you may customize the route by adjusting parameters such as route spacing, route orientation angle, and polygon expansion.

When the **Edit Polygon** button on the left is active, you can adjust the polygon by dragging any vertex to a new position or deleting a selected vertex as needed.

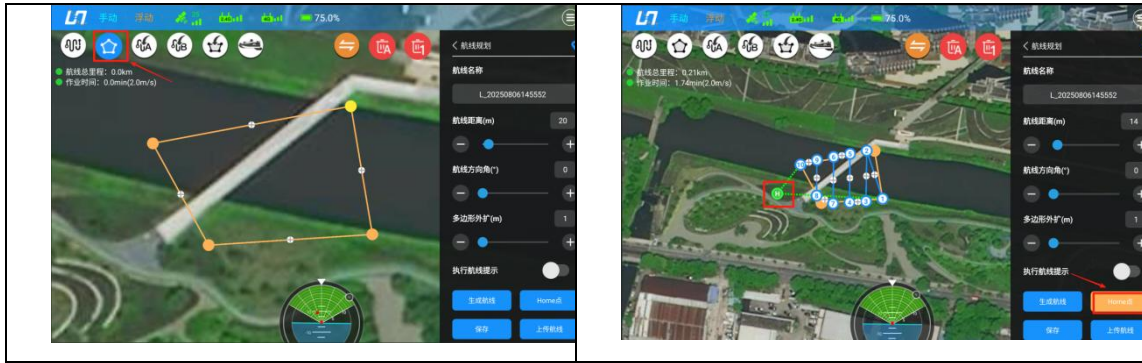


Figure0-6-3 Polygonal route planning

1. Download Route from Boat Controller to Local Device

Icon 5 in the route planning interface is used to download the route from the USV controller to the local device (remote controller).



Figure0-6-4 Download route from boat controller to local

2. Load Route from Local Device

Icon 6 in the route planning interface is used to load a route stored on the local device (remote controller).

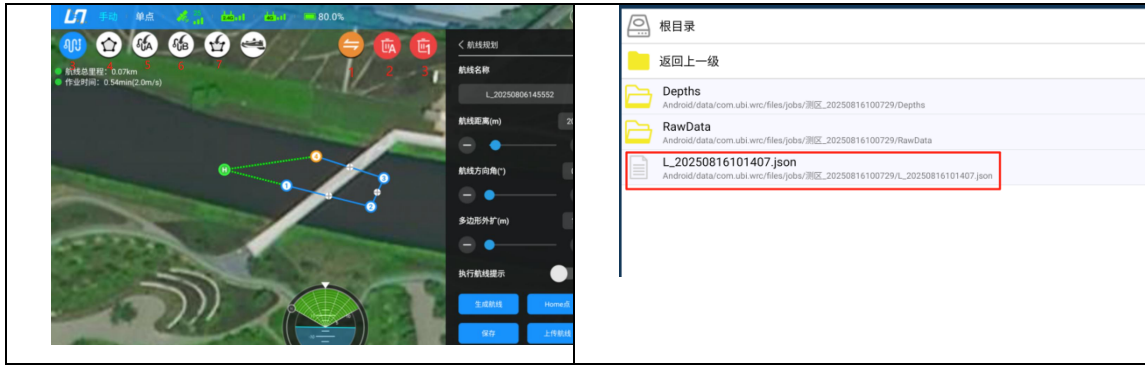


Figure0-2-5Load route from local

3. Import Boundary Line

Icon 7 in the route planning interface is used to import KML or DXF boundary files from the local device.

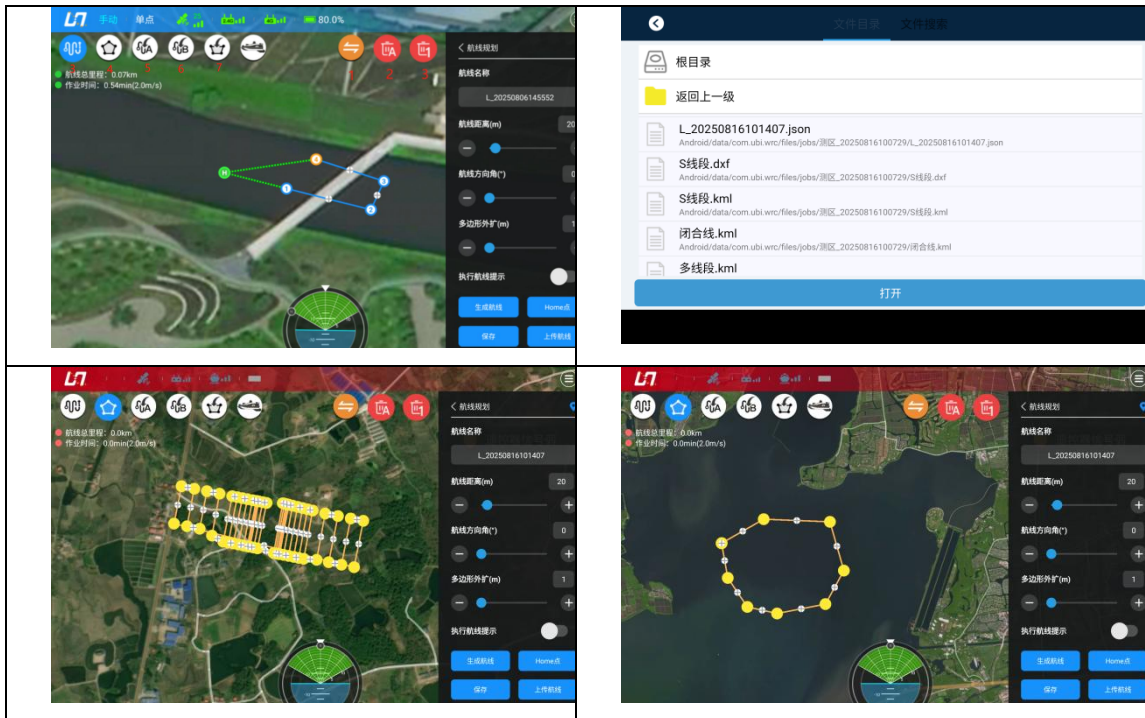


Figure0-6-6 Import boundary line

4. Set Home Point

After entering the route planning interface, tap the **Home Point** button to activate it, then click on the map to set the **Home point**. Tap the **Home Point** button again to confirm and complete the Home point setting.

=



Figure0-6-7 Home point setting

Note: The Home point must be set before uploading the route to the USV.

5. Target Waypoint Setting

The **Target waypoint** can be switched between the previous and the next waypoint on the main USV control interface, or you can click the **Target Waypoint** to access and modify waypoint settings.



Figure 3-8 Target Waypoint Settings

3.7.Parameter Settings

Set Cruising Speed: Adjust the cruising speed by tapping the + or – buttons in 0.5 m/s increments. Manual entry is also supported, and changes take effect immediately.

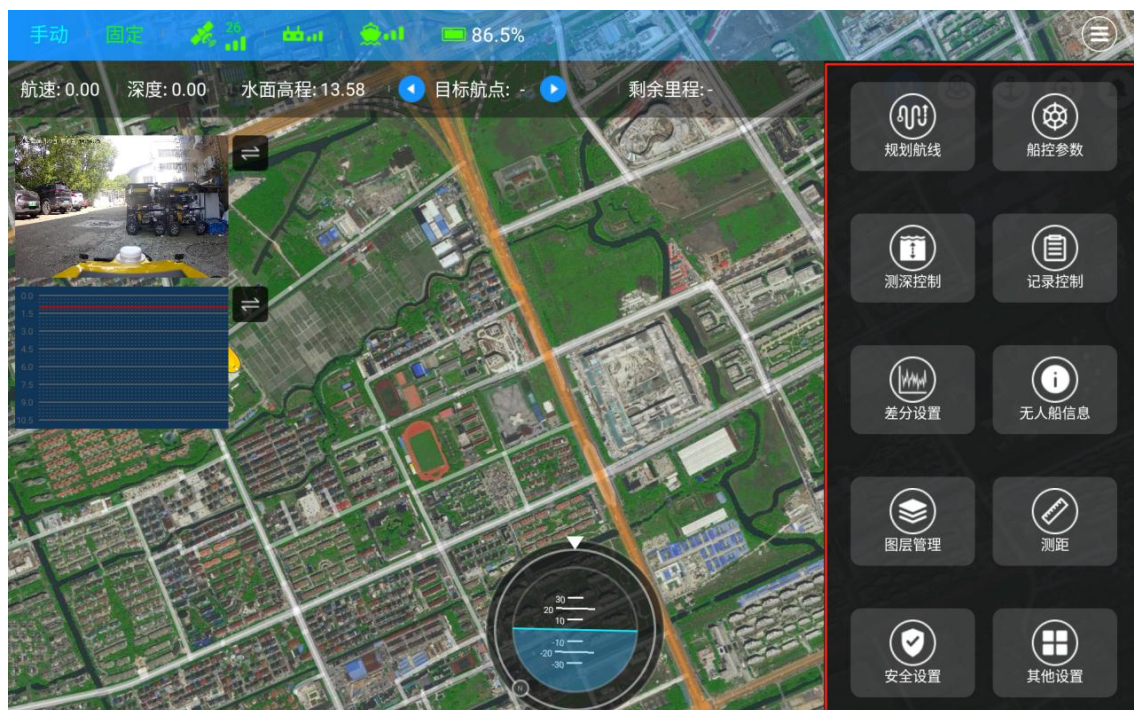


Figure0-9 Unmanned vehicle parameter settings



Figure0-10 Boat control parameter settings

1. Depth Sounding Control:

Set the depth sounder parameters, including manual settings for temperature, sound speed, gain, and depth filtering.

Draft: This value is tied to the hull type and is fixed; manual modification is not allowed.

Temperature: Can be entered manually, and can also be used to calculate the sound speed.

Sound Speed: Can be entered manually, or calculated automatically based on temperature and salinity.

AutomaticData Recording: When enabled, depth data is automatically collected during route execution.

Automatic Range Acquisition: Automatically adjusts the measurement range based on the current water depth.

Automatic/Manual Gain: Supports both manual and automatic modes to set the sonar signal strength of the depth sounder.

Depth Filtering: Filters out spurious and noisy data outside the specified depth range.



Figure0-11 Depth sounding parameter settings

2. Recording Control

Configure the recording control parameters. Data is recorded in real time according to the current settings. For example:

1. **Distance-based recording:** If the route distance interval is set to 1 m, the depth file records one point per meter.
2. **Time-based recording:** If the route time interval is set to 1 s, the depth file records one point per second.

Positioning Solution Modes:

3. **Fixed Solution:** Record only fixed solution data.
4. **Float Solution:** Record both fixed and float solution data.
5. **Single-Point Solution:** Record all solution data (fixed, float, INS, and single-point solutions)

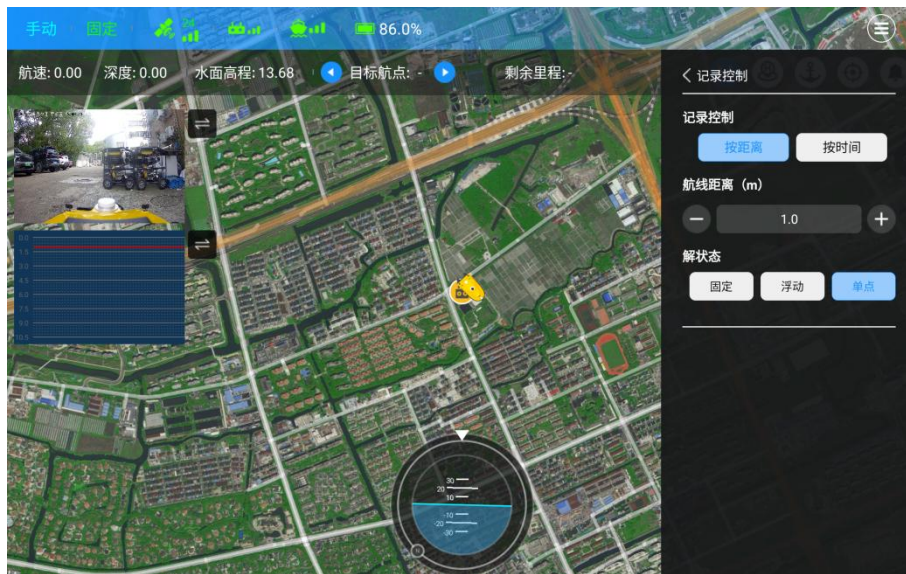


Figure0-12 Recording control parameter settings

6. Differential Settings

This interface allows setting the boat controller CORS and handheld network CORS login parameters, as well as radio login parameters.

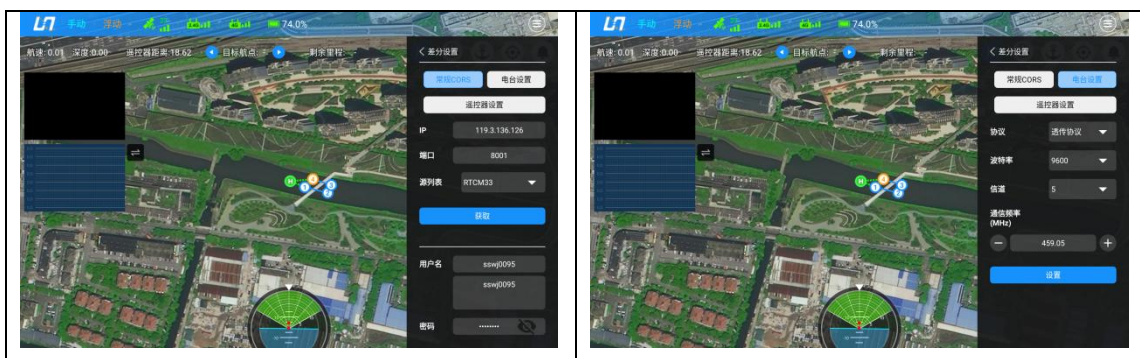




Figure0-3Differential information parameter settings

7. Unmanned Vehicle Information

Displays comprehensive information about the USV, including GNSS positioning, navigation attitude, hull type, battery status, navigation status, depth sounder status, thruster status, 4G connectivity, and more.

参数			
GNSS信息		电池信息	
经度(dd)	31.1795198	电池1电压(V)	0.0
纬度(dd)	121.2627169	电池2电压(V)	29.0
大地高(m)	14.33	电池1电流(Amps)	0.0
东坐标(m)	334381.832	电池2电流(Amps)	0.8
北坐标(m)	3452178.049	电池1电量(%)	0.0
水面高程	14.189	电池2电量(%)	42.0
GPS状态	固定	电池温度(°C)	22.0
卫星数量	30/60	天线偏差	
航行姿态		相位中心(m)	0.001
航向(°)	214.00	天线偏差 X(m)	-0.24
俯仰(°)	-4.30	天线偏差 Y(m)	0.0
横滚(°)	1.60	底座离水面高(m)	0.17
船型信息		航行信息	
型号	06	航点距离(m)	0.00
		测深信息	
		水深(m)	1.16
		水温(°C)	25.0
		声速(m/s)	1483.0
		吃水(m)	0.1
		马达转速	
		方向输入	0
		油门输入	0
		左马达输出	0.0
		右马达输出	0
		4G信息	
		网络注册状态	已注册,home
		SIM卡状态	OK
		运营商	CHN-UNICOM
		网络模式	FDD LTE

Figure0-13 Unmanned vehicle information parameters

8. Layer Management

Includes measurement point layers and boundary line layers. Click the corresponding layer to show or hide it.

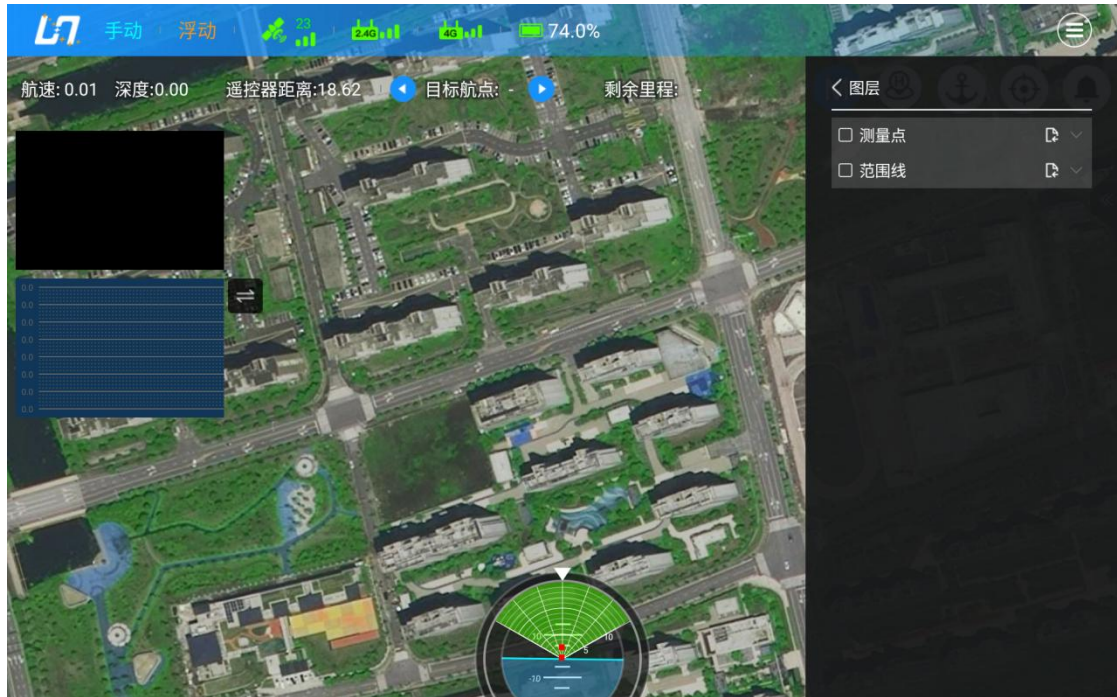


Figure0-14Unmanned vehicle layer management

9. Distance Measurement Function

Click any two points on the satellite map to display the distance and angle between them.



Figure0-15 Distance measurement function

10. Safety Settings

1. **Automatic Obstacle Avoidance:**

1. Function switch.
2. When turned on, the unmanned vehicle will automatically detour and continue the original route if an obstacle is detected during route execution.

1. **Return Settings:**

1. Straight Line Return: When the return button is pressed during route execution, the USV returns to the Home point along a straight line.
2. Track Return: When the return button is pressed, the USV returns to the Home point following the previously traveled path.

3. **Shallow Water Reversal:**

1. Function switch.
2. When turned on, if the unmanned vehicle enters shallow water below the set depth value, it will automatically brake and reverse for 6 seconds.

3. **Lost Connection Return:**

1. Function switch.
2. When enabled, if the connection with the remote controller is lost (e.g., the controller moves out of range) during route execution, the USV will automatically return after the preset lost connection time.

3. **Low Battery Return:**

1. Function switch.
2. When enabled, if the battery level drops below 15% during route execution, the USV will automatically return to the Home point.



Figure0-16Safety settings

3. Other Settings

Includes virtual joystick, map selection, APN settings, self-test, and other functions.

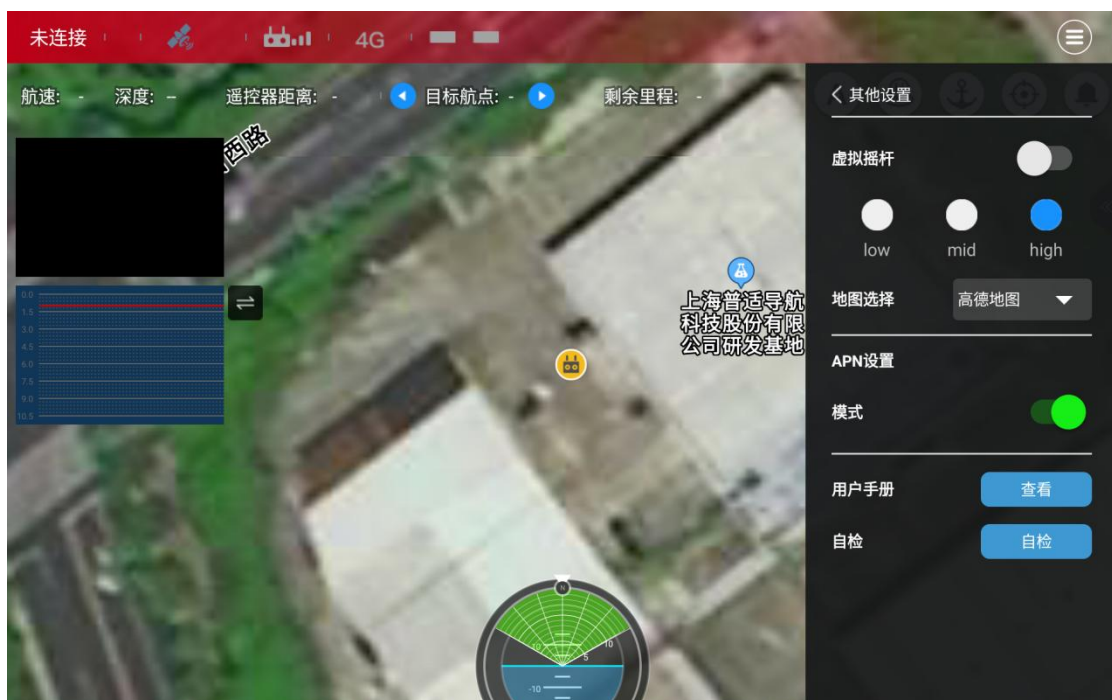


Figure 3-17 Other Settings

3.8.Depth Sounding Control

1. Click the depth sounder slide button on the right, then click **Emit Sonar** to start the depth sounder.

2. Click **Depth Collection** to start recording depth point data.
3. Click **Pause Recording** to stop recording depth point data.
4. Click **Stop Recording** to save the recorded point data to a file.



Figure0-4Depth sounding control

3.9.Camera Control

Click the camera icon in the upper-left corner to enter the camera view. Split-screen display is supported. In the lower-right corner: 1 indicates video recording, 2 indicates photo capture, and 3 controls the gimbal's up, down, left, and right movements.

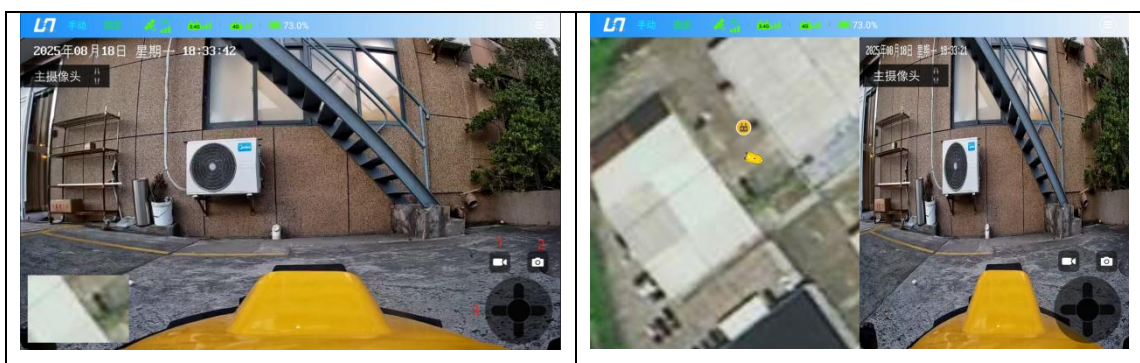


Figure0-5Camera control

3.10.Data Post-Processing

In **Project Management**, select the desired project and click [Data Processing] to enter the data processing interface.



Figure0-6Data post-processing interface

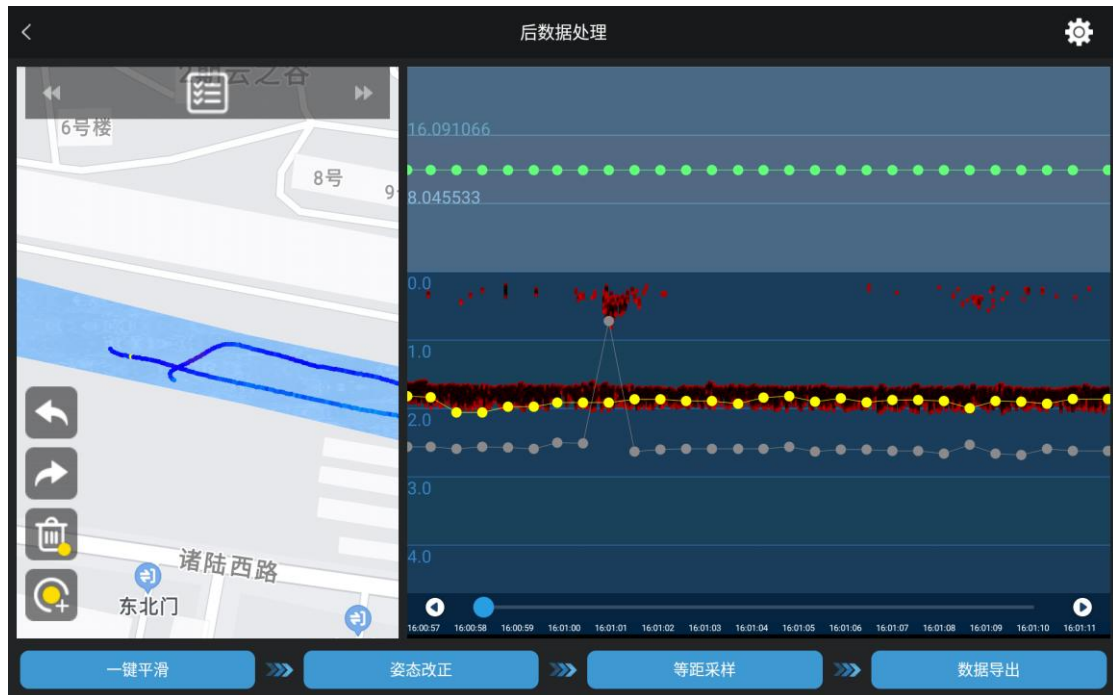
3.10.1.View Introduction

(1) Right-side Depth View:

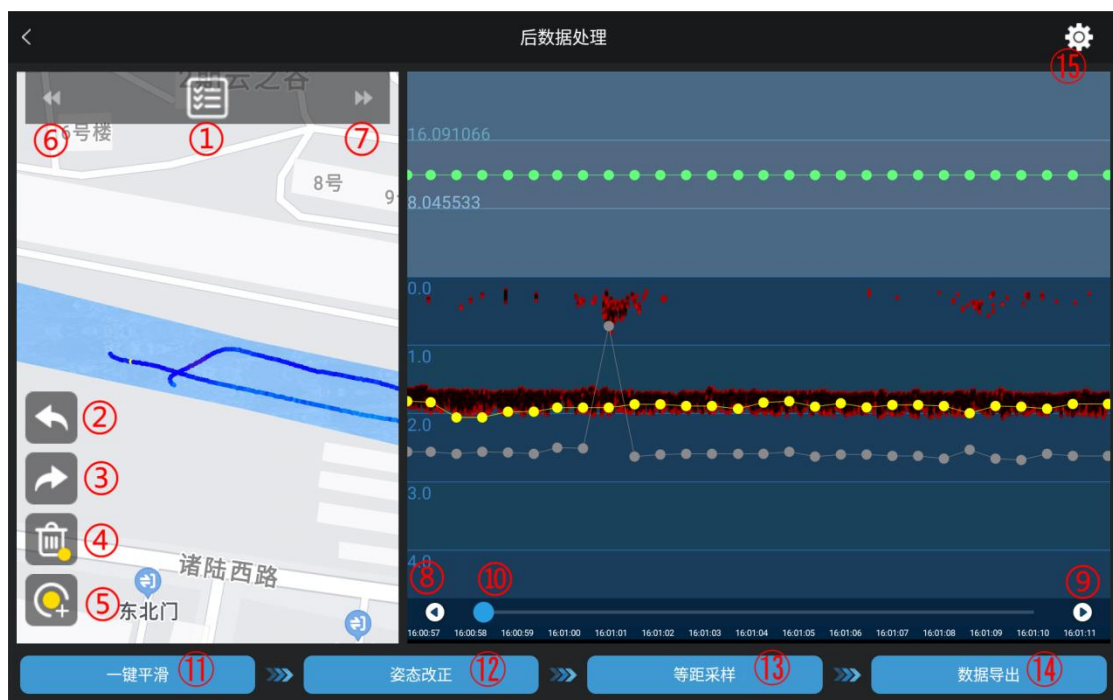
5. Green points at the top represent water surface elevation points, indicating the elevation of each water surface point;
6. Yellow points at the bottom represent measured depth points, and red points indicate sonar echoes.

(2) Left-side Map View:

7. The map can be moved, zoomed in, or zoomed out by dragging.
8. Map record points are color-coded based on water depth, with the gradient from shallow to deep as follows: red, orange, yellow, green, cyan, blue, and purple.



3.10.2.Function Button Introduction



- 1. Survey Line:** Displays all recorded survey line files within the current project.
- 2. Undo:** Reverts the previous operation, such as dragging, deleting points, or adding/deleting feature point sampling lines.
- 3. Redo:** Restores the last undone operation, including dragging, deleting points, or adding/deleting feature point sampling lines.

4. Delete: Click this button, then select multiple depth points to delete them. Deleted points are grayed out and cannot be clicked again. Click the button again to cancel deletion.

5. Insert Point: Manually interpolate data. Click this button, then click anywhere within the depth view to insert a new record point at the corresponding time and depth. Newly inserted points appear in yellow. Click the button again to cancel insertion.

6. Previous: Switch to the previous survey line.

7. Next: Switch to the next survey line.

8. Left Page: Turn to the previous page.

9. Right Page: Turn to the next page.

10. Progress Bar: Drag to any position to jump to that location in the data.

11. One-Click Smoothing: Automatically corrects depth points to align with the echo.

12. Attitude Correction: Corrects roll and pitch values of the depth data.

13. Equal Distance Sampling: Samples depth points according to the selected sampling method.

14. Data Export:

9. 14.1 File Merge: Merge multiple selected survey line files into a single file.

10. 14.2 Save Header: Display file header information.

11. 14.3 File Type: Select the export file format, supporting txt, dat, csv, and dxf.

12. 14.4 File Format: Manually select the header information to include in the exported file.

15. Data Settings:

13. 15.1 Project Parameters: Modify and configure project parameters.

14. 15.2 Depth Sounding Settings: Set and adjust the depth sounder draft and sound speed.

15. 15.3 Sampling Settings: Limit sampling data, choose sampling method (feature point sampling), and set the sampling interval.

16. 15.3.1 Sample by Distance: At equal intervals of X meters, select the depth point at the interval line as the sampling point.

17. 15.3.2 Deepest (Equal Interval): At equal intervals of X meters, select the deepest depth point within the interval.

18. 15.3.3 Shallowest (Equal Interval): At equal intervals of X meters, select the shallowest depth point within the interval.

19. 15.3.4 Average (Equal Interval): At equal intervals of X meters, calculate the average of all depth points within the interval as the sampling point.
20. 15.4 Tide Correction: Import a tide file (*.tid). The file's date and time must cover the project's survey time. After import, water surface elevation is processed using the tide data.

15.5 Interface Settings:

21. 15.5.1 Depth Interval: Set the vertical axis depth interval.
22. 15.5.2 Time Interval: Set the horizontal axis time interval.
23. 15.5.3 Time Width: Keep the time interval unchanged while expanding the horizontal axis view width to prevent data points from appearing too dense to select.

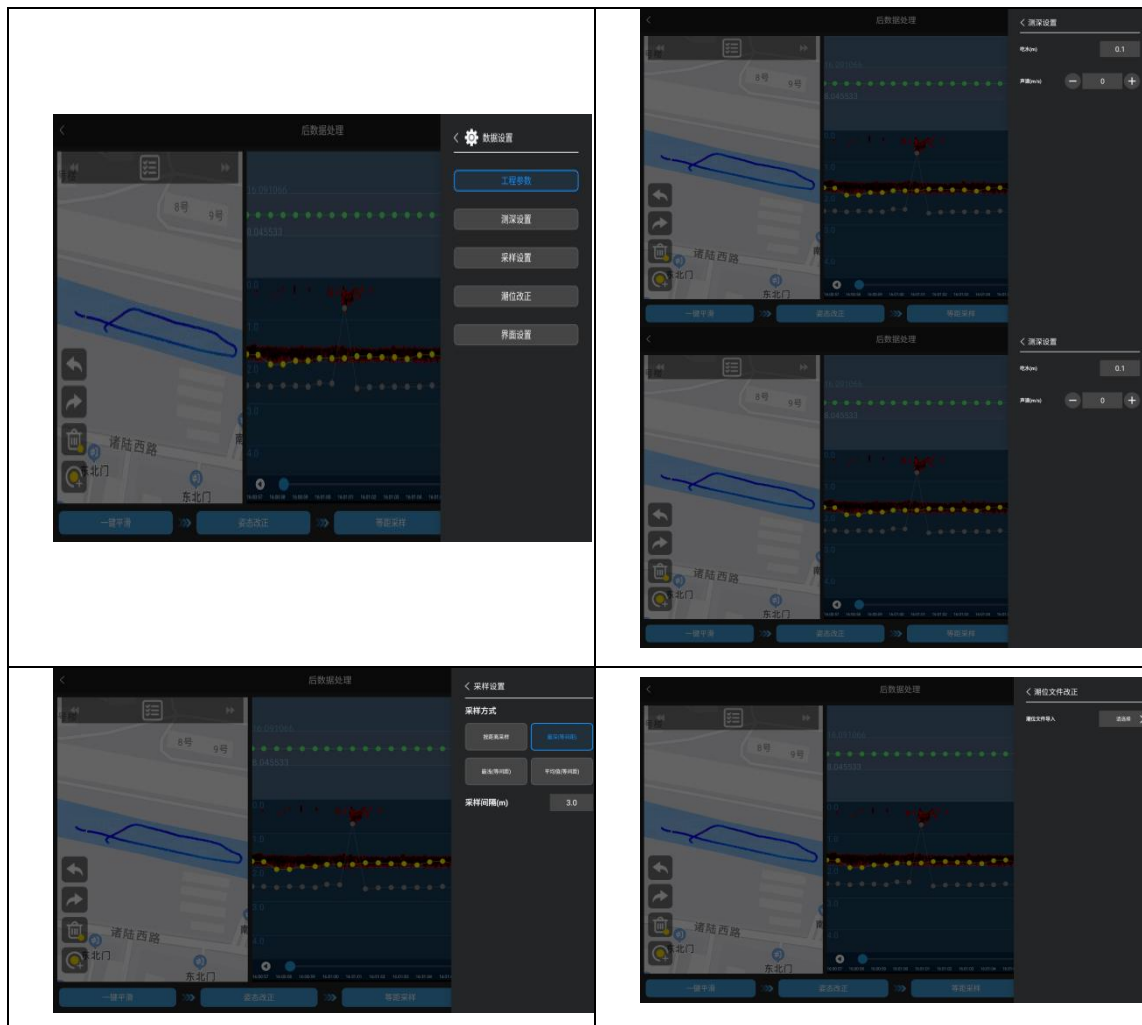




Figure0-7Data post-processing function interface

3.10.3. Gesture Operation Introduction

1. Depth points in the depth view can be dragged vertically to adjust their values. For example, select a single point and move it up or down to modify its depth. After selecting a point, you can continue sliding without releasing to adjust multiple points simultaneously.
2. Pinch vertically (outward or inward) to zoom the depth scale on the vertical axis.
3. Pinch horizontally (outward or inward) to adjust the time scale on the horizontal axis.

4. Quick Start Guide for Operations

1. Power on the unmanned vehicle and remote controller

Press and hold the switch button on the stern of the unmanned vehicle for three seconds until the indicator light flashes rapidly, then release. Wait approximately ten seconds until the indicator light remains steady, indicating that the boat controller is fully powered on. Power on the remote controller, launch the UbiNavi boat control software iSail, and connect to the unmanned vehicle via video transmission. Once connected, the red indicator light on the left side of the hull will remain on.

2. Create a new project task

Click the function button at the bottom to enter the **[Project Task]** interface, then click **[New Project]**. Set the project name and coordinate system, then enter the main interface of the app. Return to the project interface, select **[Project Parameters]** for the corresponding project, and click **[Projection]** to obtain the local central meridian. Other parameters, such as the seven transformation parameters, can also be entered for the project as needed.

3. Plan and execute a route

Click the **[Function Bar]** in the upper-right corner and select **[Depth Sounding Control]**, then enable **[Automatic Recording]**. Return to the main interface and click **[Route Planning]**. Enable the route execution prompt, plan the route, and click **[Upload Route]**. Swipe to start route execution. Depth data will be recorded automatically during the route.

Warning

This device was tested for typical body-worn operations. To comply with RF exposure requirements, a minimum separation distance of 20cm must be maintained between the user's body and the handset, including the antenna.

This product can be used across EU member states.

2.4G frequency range: 2411-2477MHz, Maximum E.I.R.P: -7.23dBm

5.8G frequency range: 5730-5840MHz, Maximum E.I.R.P: -7.07dBm

GNSS: 1559~1610MHz

LoRa (RX): 433.5~434.5MHz

WCDMA:

Band I: 1920~1980MHz, Maximum power: 23.17dBm

Band VIII: 880~915MHz, Maximum power: 23.17dBm

LTE:

Band 1: 1920MHz ~ 1980MHz, Maximum power:23.53 dBm

Band 3: 1710MHz~1785MHz, Maximum power:24.20 dBm

Band 7: 2500MHz ~ 2570MHz, Maximum power:23.39 dBm

Band 8: 880MHz ~ 915MHz, Maximum power:23.90 dBm

Band 20: 832MHz ~ 862MHz, Maximum power:23.74 dBm

Band 28: 703MHz ~ 748MHz, Maximum power:24.04 dBm

Band 34: 703MHz ~ 748MHz, Maximum power:23.21 dBm

Band 38: 2570MHz ~ 2620MHz, Maximum power:23.54 dBm

Band 40: 2300MHz ~ 2400MHz, Maximum power:23.57 dBm

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

RED 2014/53/EU

Declaration Of Conformity

This product can be used across EU member states .

Hereby, **Shanghai Ubiquitous Navigation Technology Co., Ltd.** declares that this **Unmanned Surface Vehicle** is in compliance with the essential requirements and other relevant provisions of directive 2014/53/EU.

FCC Warning

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.