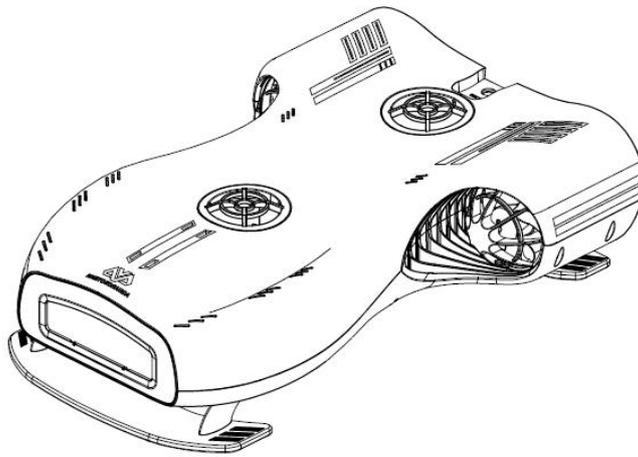




NEMO

User Manual





Reading Tips

Recommendation

Users are advised to watch the instructional videos and Disclaimer before reading this manual.

Video course

Users can watch the instructional videos through the following link, including how to use this product correctly and safely.

<https://www.youtube.com/watch?v=qo-piE7QJhY>

Download Aquarobotman APP

Key in Aquarobotman in Apple App Store or Google Play and download the Aquarobotman APP

Apple Mobile Terminal: <https://itunes.apple.com/cn/app/aquarobotman/id1247384464?mt=8>

Android Mobile Terminal: <https://play.google.com/store/apps/details?id=com.qsx.aquarobotma>



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Product Introduction

This chapter mainly introduces the features and functions of Nemo.

Brief Introduction

The underwater drone Nemo with 4K UHD shooting system and four-ducted stability system enable real-time, stable and high-definition shooting underwater. The maximum underway speed in water is 2m/s and duration of running underwater reaches 3 hours. At the same time, the modular design makes the product more convenient to carry and longer battery life.

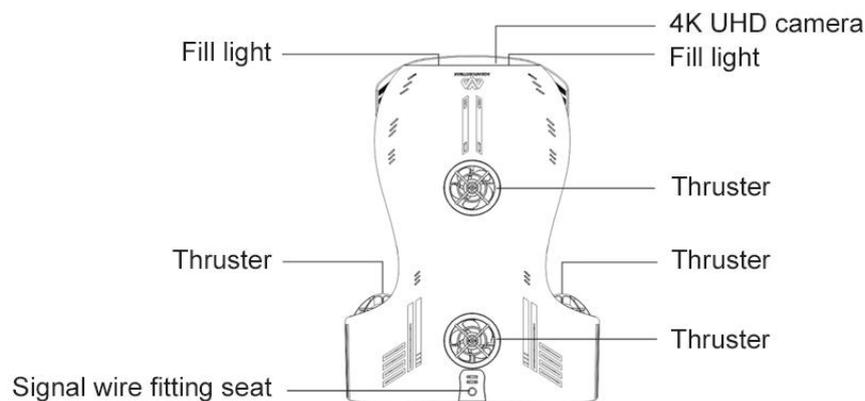
Function Features

1. High-definition 4K lens. Support 4K video capture and shooting with 16 million pixels. 120/fps video capture with the QAS-Balance system enables high-quality dynamic images to be snapshotted.
2. QAS-Balance system. The four-ducted structure design and the independently developed control system enable Nemo to run stably underwater and perform stable video and photo capture.
3. Detachable battery design. The hosting machine battery is detachable, which finishes loading and unloading steps through the rotary knob. If the battery is run out, another battery can be replaced. At the same time, the battery of wheel on wireless transmitter is also independently replaceable.
4. Dynamic experience. Provide various operating methods such as mobile APP, handle, and VR glasses. The APP control interface is simple and quick to get started. In VR mode, the handle works on control when it is operated with VR glasses at the same time. The somatosensory control mode is set, which makes the machine movement is synchronized with the head movement, bringing more real feeling to the user.

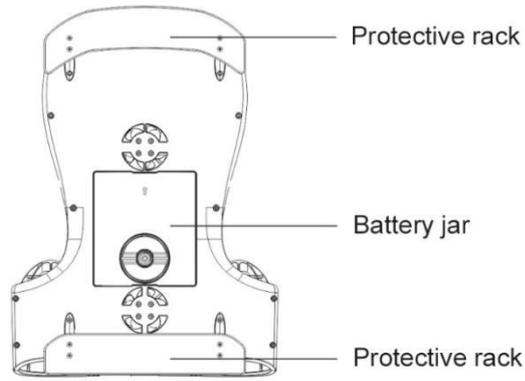
Module Composition

Mainly introduce the various modules of the whole machine, detailed parameters can be viewed in the appendix specification parameter table.

1. Hosting machine

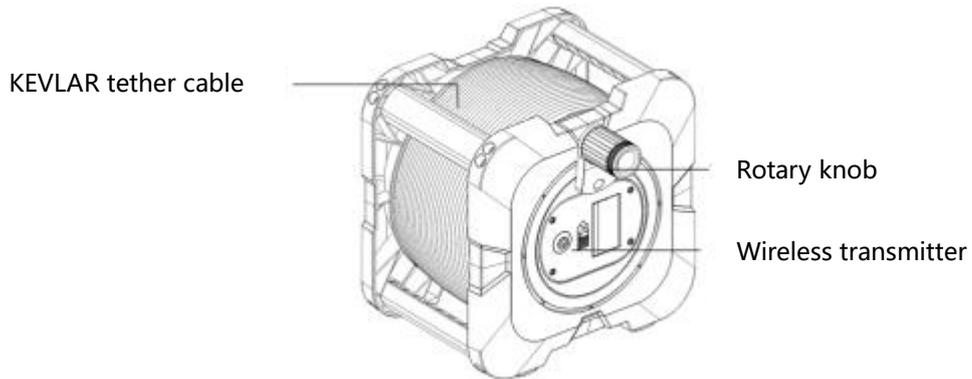
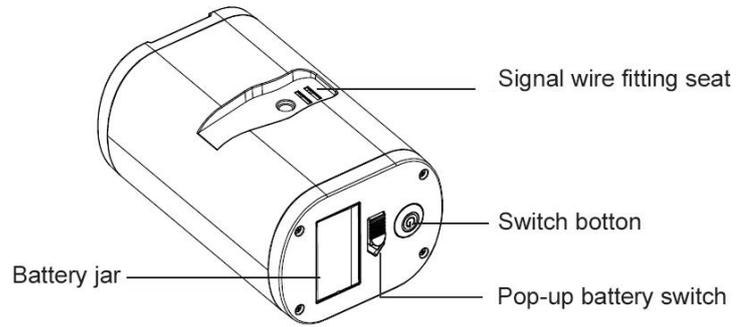


Front

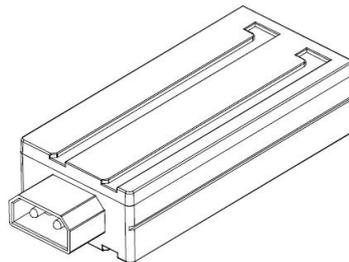


Reverse

2. Wireless transmitter

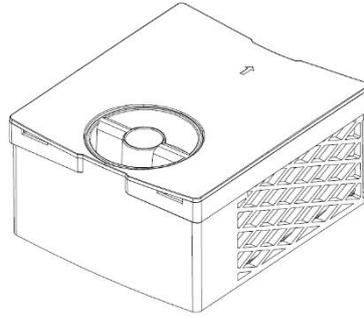


3. Wireless transmitter battery

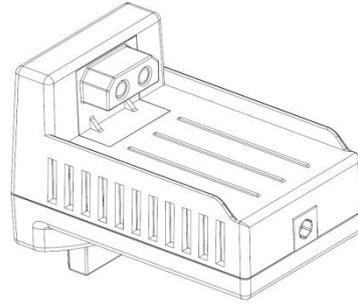




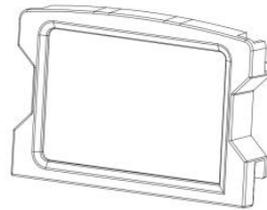
4. Hosting machine battery



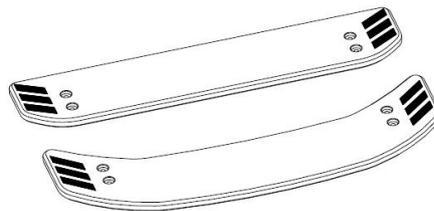
5. Charger



6. Filter



7. Protective rack





Power System

The power system is mainly composed of two horizontal + two vertical four-ducted thrusters. The thruster is composed of a customized waterproof and corrosion-resistant motor. With the self-designed propeller, the performance of the motor can be improved to the highest.

Lighting System

Adjustable matrix lower beam fill light with a maximum brightness of 1000lm.

Suggestions: It is recommended to turn off the fill light to save power in the day time. The fill light needs to be turned on in water holes with weak light at night.

Hosting Machine Function

1. Depth-oriented: When controlling the horizontal direction, the machine maintains the current depth and pitch angle unchanged. This mode relies on the internal sensors of the machine. If complicated situations happen, such as strong magnetic field interference, the machine will not operate normally. Please head to safe place.
2. Direction-oriented: The direction of the machine remains unchanged, and the snorkeling throttle controls the machine to float or dive.
3. Open-ended operation: This mode provides a fully open control mode to complete complex dive postures, such as the machine moving up or down at a large angle. In this mode, the machine's pitch angle is limited to $\pm 90^\circ$, and the pitch angle can be controlled according to different speed levels.
4. VR somatosensory operation: This operation needs to be used with VR glasses. In VR mode, it has a somatosensory start lock. The user needs to lift the head up more than 60° , then lower the head more than 60° , finally return the head back and thus the somatosensory function can be unlocked. After unlocking, the machine angle can be controlled by the head posture.

Smart Protection System

The machine will react to unexpected situations:

1. Temperature protection: The normal working water temperature of the machine is -2°C - 35°C . If the internal temperature of the machine is abnormal, it will start protection mode.

There are two situations:

- a) Work in water with high temperature.
 - b) The machine is kept in the air after power on, and the internal temperature of the machine is too high.
2. Humidity protection: The protective measures are activated when the machine is too humid. This problem does not occur in normal use and needs to be returned to the factory for repair when problems occur.
 3. Overcurrent protection: The main causes are as follows:
 - a) The propeller is entangled and cannot be rotated.
 - b) Internal performance failure results in short circuit.



4. Low voltage protection: This protection will be triggered when the battery voltage is too low. When the voltage is lower than 10%, the APP will occur page reminder; when the voltage drops to 0%, the battery will automatically power off. At this point, the machine can only be manually pulled out of the water through the KAVLAR signal cable.

5. Motor protection: When the machine's pitch angle or roll angle is greater than 60° under unlocking and without any control, the motor stops rotating and enters protection mode until the pitch angle and roll angle are less than 60° at the same time.

Smart Battery

The hosting machine battery acts as a separate part with a built-in intelligent control panel to ensure the safety of the battery as a connection to various states. The specific features are as follows:

1. Load detection: When it is not loaded, the battery is in sleep state and will not discharge. It only works when the battery is connected to the machine.

2. Battery self-test: After the battery is installed on the hosting machine, it will first perform a self-test to check whether the power meets the requirements to power on.

3. Battery short-circuit protection: When the battery detects a short circuit, it will cut off the output and protect the battery.

4. Discharge overcurrent protection: During the discharge process, if the current is too large, the output will be cut off to protect the battery and external circuits.

5. Battery storage: The battery can be placed in any state for a short period of time. If it needs long-term placement, the battery will remain at 80%.



Wireless Transmitter

As a link of communication between the underwater drone and user terminals

Brief Introduction

The wireless transmitter has a built-in WIFI signal, and the battery of which is independently detachable. The mobile terminal can be connected to WIFI by the Aquarobotman's APP to view the status of the machine in real time. Please refer to the operation guide for specific operations. Users can choose a wheel to achieve convenient cable recycling.

KEVLAR Tether Cable

The main function of the KEVLAR signal cable aims to transmit signals. The cable built-in reinforced KEVLAR fiber can withstand a maximum tensile force of 100kg. It exhibits neutral buoyancy in fresh water, and slight buoyancy in seawater.

WIFI Signal

The WIFI signal uses the 802.11a standard, and the communication distance in a spacious place reaches 50m.

Protection System

When the battery voltage is too low, the system will automatically power off to protect the wireless transmitter battery.



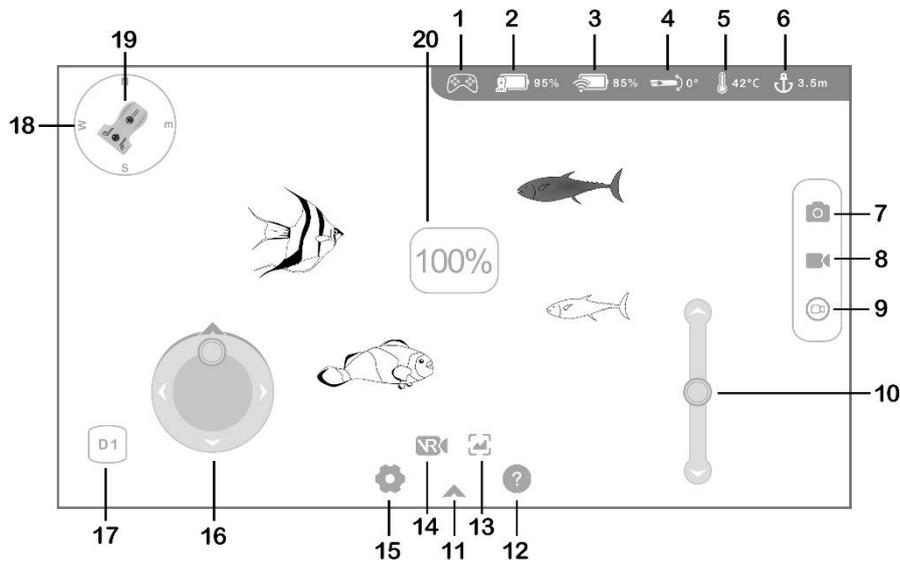
Aquarobotman APP

About the APP interface and instructions

Brief Introduction

The Aquarobotman APP is applied with Nemo to manipulate Nemo's movements and set basic camera parameters, as well as share photos and videos directly to social networks.

Main Interface



1. Handle connection status

: Display the handle connection status. Red and “x” are displayed, the connection fails; white and blue “v” are displayed, the connection succeeds; white icon is displayed, the connection is normal.

2. Hosting machine power

: The battery level is displayed as a percentage. When the battery is too low, the icon will turn red and a pop-up prompt will appear.

3. WIFI connector battery power

: Wheel battery power. When the battery is too low, the icon will turn red and pop up on the interface

4. Machine pitch angle

: Display the machine's pitch angle data in real time.

5. Machine working temperature

: Display the value of the internal working temperature of the machine, not the temperature in water.

6. Current water depth

: Show the current water depth of the machine and measured in meters.

7. Photo shooting button



 : start up single photo shooting

8. Long video capture button

 : Start long video capture and the button turns red, then the time shows on the left side of the button. Press the button again to end the video capture, and the button returns to white.

9. Short video capture button

 : Click the button to start short video capture and it takes 20 seconds. Click the button again before ending record, the record can be canceled. The video will be automatically stored to local album for sharing at any time.

10. Snorkeling throttle push rod

 : Click on the middle dot, slide up and down to make the machine float or dive in the water.

11. Expand/Hide Menu Bar

 : Expand the secondary menu bar, including help interface, playback, VR mode, settings. Click the button again to hide the menu bar.

12. Help interface

 : Click help icon to display the function definition of each button.

13. Album preview

 : Preview all videos and photos taken by the machine, you can choose to download the file to the local file or delete the selected file.

14. VR mode

 : Choose VR mode, the interface will be divided into two screens, which are put directly into the VR glasses for use.

15. Setting

 : Provides related auxiliary settings, including depth calibration, video definition selection, version number, etc.

16. Directional control panel

 : The directional control panel provides 360° omnidirectional control and the machine can move in any horizontal direction.

17. Speed switch button

 : By sliding up and down on this button, you can change the basic speed level and this can be reflected through the direction control panel.

18. Handheld compass direction

 : Real-time display of the current specific direction of the phone/tablet

19. The direction of the machine in the water

 : You can see the direction of the machine under water in real time.



Setting Interface

1. Sensor calibration

Horizontal calibration. Place the underwater drone in the air or on the water surface, click the depth calibration button, and it takes about 2S.

Compass calibration. After clicking on the compass calibration button, rotate the machine 360° until the calibration is completed, and it takes about 30S.

2. Shooting setting

Video resolution information and properties of captured photos can be set. More professional shooting settings and functions can be provided including video resolution, picture pixels, picture quality, video quality, continuous shooting mode, time-lapse shooting, video watermarking.



Calibration interface

Shooting parameter

3. Status information

View the firmware version information of the current underwater drone in real time. It also shows the internal humidity of the machine, which is used to detect the risk of water in the machine.

4. About us

Visit the Aquarobotman website for more information.



Status information

About us

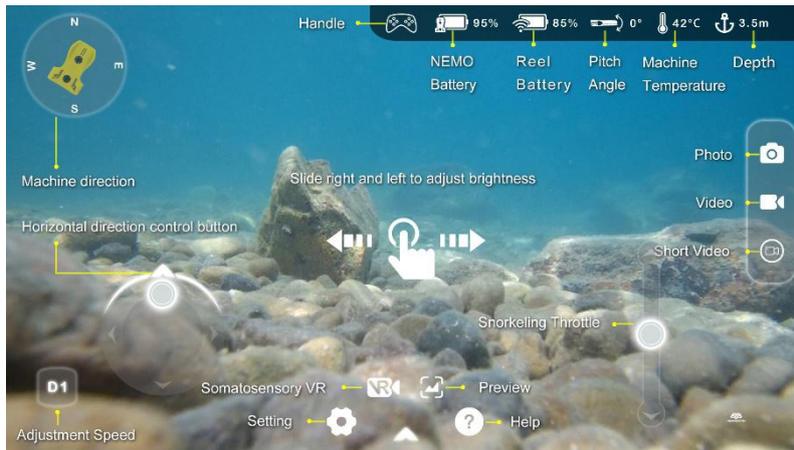
VR Interface

Split screen display video interface applied with VR box. In this mode, somatosensory operation function enables user to watch the underwater scene wearing VR glasses. The head posture is converted into a real-time view of the machine, bringing stronger immersive experience.



Help Interface

Main interface button illustration.



Preview Interface

Show all taken photos and videos, download or delete files, which enables users to view taken photos and videos.



Handle Introduction

The handle connects to the APP via Bluetooth, and the APP receives the connection of the Bluetooth handle. After connecting, direct control and shoot can be operated on the handle.



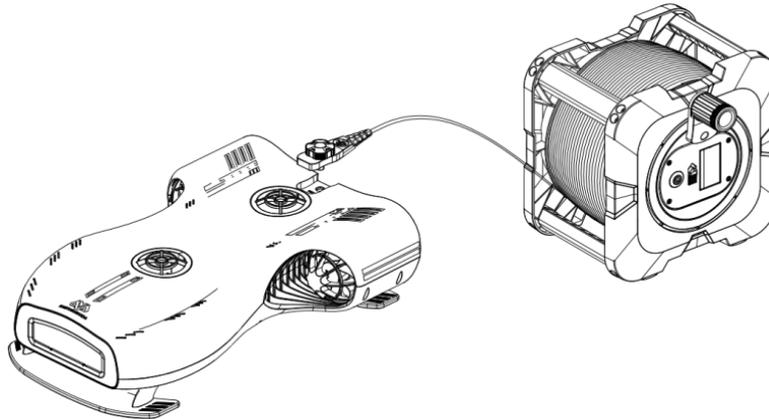
Operation Guide

Detailed instructions for installation and use

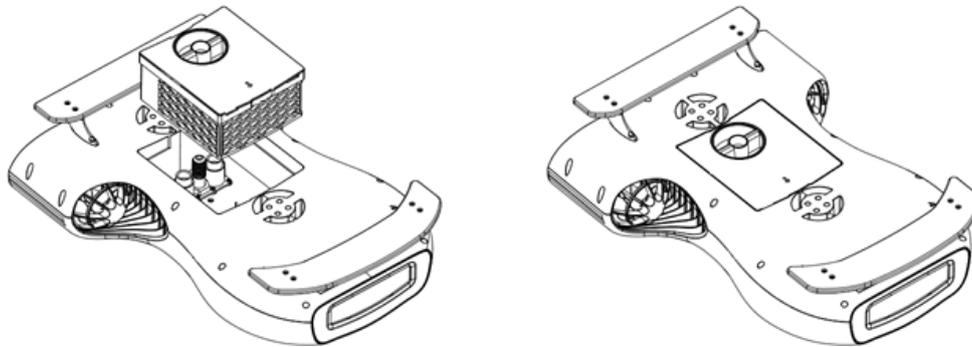
Installation

1. Connect the hosting machine

- a) Connect the wheel signal cable connector to the rear of the machine



- b) Install the battery into the battery jar of the hosting machine, gently press the battery and turn the butterfly knob clockwise to tighten the battery

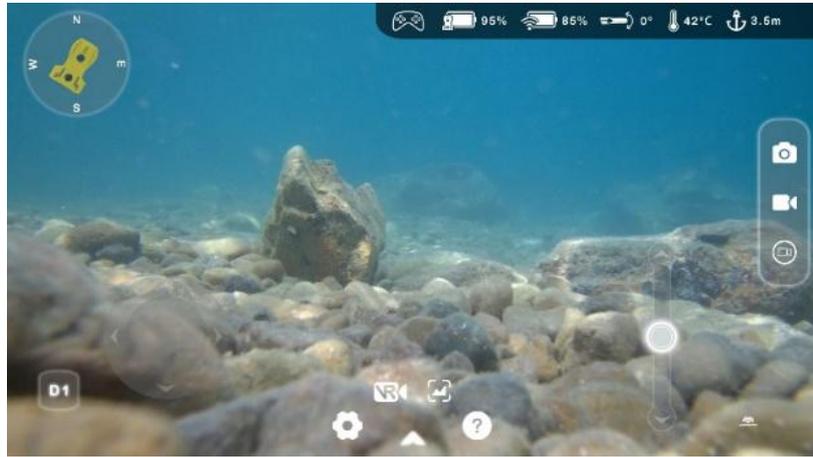


APP Application

1. Connect APP

- a) Connect the WIFI Aquarobotman

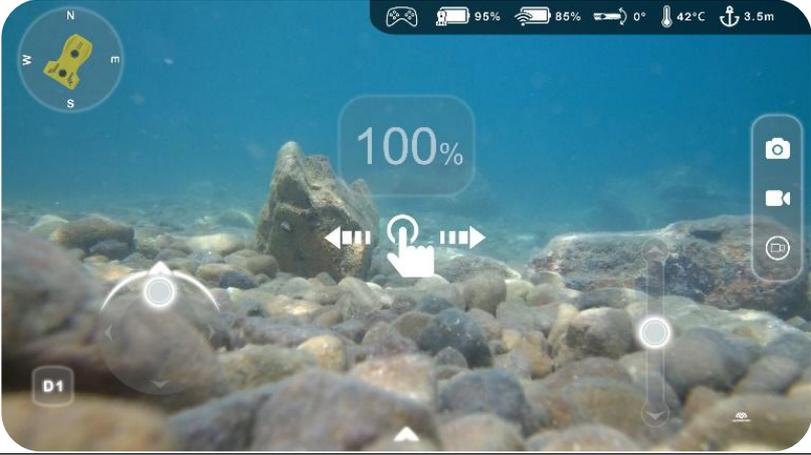
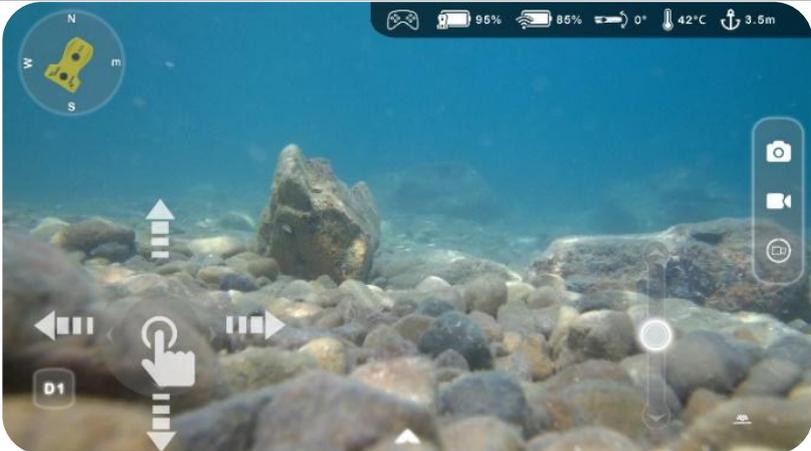
- b) The interface of the APP successful connection is as shown below



2. Operation

Function	Diagram
<p>Locked</p> <p>The icon in the upper left corner is gray, which shows it is locked and the main thruster does not rotate</p>	
<p>Unlocked</p> <p>The icon in the upper left corner is yellow, which shows it is unlocked and the hosting machine enters normal running state</p>	



Function	Diagram
Lighting Adjustment Slide the middle to adjust the brightness of the fill light	
Speed Adjustment Adjust the speed of horizontal movement while using direction control	
Horizontal Control Control the horizontal movement of the machine	
Snorkeling Control	



Function	Diagram
Control the machine to float and dive	 A screenshot of the app interface showing an underwater scene with rocks. The top status bar displays battery (95%), Wi-Fi (86%), signal strength, 0° temperature, 42°C temperature, and 3.5m depth. A compass in the top left shows directions N, W, E, S. A yellow submarine icon is in the top left. A vertical slider control is on the right side of the screen, with a hand icon pointing to it. A 'D1' button is in the bottom left.
Snorkeling Control	
Simultaneous operation of the horizontal direction and snorkeling throttle, while changing the pitch angle. The maximum angle of the pitch angle can reach 90°.	 A screenshot of the app interface showing an underwater scene with rocks. The top status bar displays battery (95%), Wi-Fi (86%), signal strength, 0° temperature, 42°C temperature, and 3.5m depth. A compass in the top left shows directions N, W, E, S. A yellow submarine icon is in the top left. A vertical slider control is on the right side of the screen, with a hand icon pointing to it. A 'D1' button is in the bottom left.
Shooting	
The button will flash red and the interface will flash once, when taking a photo,	 A screenshot of the app interface showing an underwater scene with rocks. The top status bar displays battery (95%), Wi-Fi (86%), signal strength, 0° temperature, 42°C temperature, and 3.5m depth. A compass in the top left shows directions N, W, E, S. A yellow submarine icon is in the top left. A red camera icon is on the right side of the screen. A 'D1' button is in the bottom left.
Long video capture	



Function	Diagram
Start shooting long videos and the hosting machine will record video	

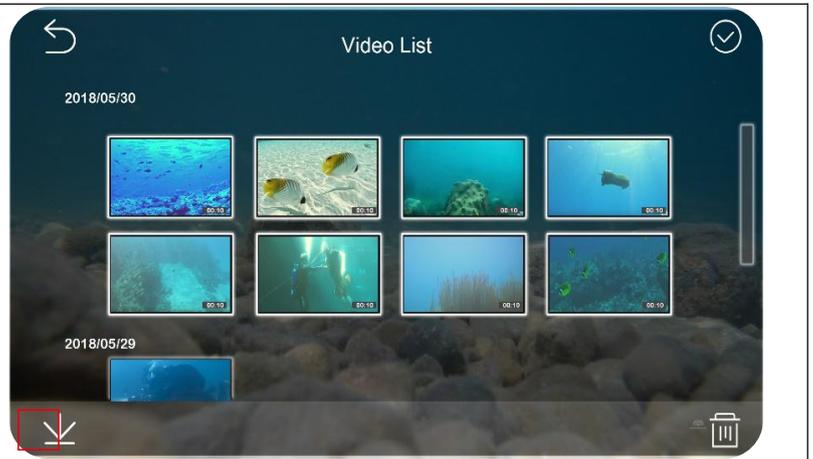
Short video capture	
20 seconds video capture	

3. Photo album management

Function	Diagram
Photo album preview	
Check and manage taken photos and videos	
Download	



Select a video or image to download and share on the internet



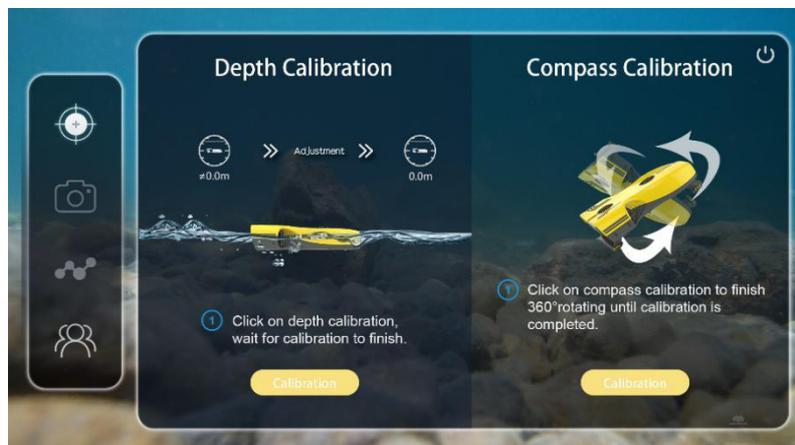
PC Software

- PC software can download the video or photo file taken by the hosting machine, open the Aquatobotman.exe file on the PC side, and the interface is successfully connected.
- Open the file list and view the basic information of the video.
- A pop-up reminder will appear when the download is completed
- When the video is deleted, the user will be prompted to confirm again

Sensor Calibration

Machine sensor calibration must be performed when it is first used. It can be calibrated later depending on the needs of the user. The sensors that the machine needs to calibrate include the compass and depth.

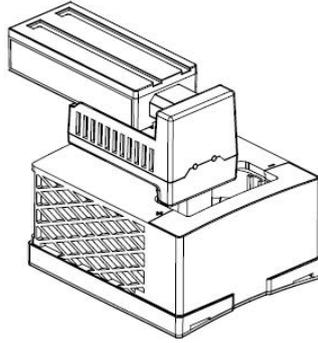
- Depth calibration: Place the machine in the air, click on the depth calibration and wait for completion.
- Compass calibration: Click the compass calibration, rotate the machine space 360° until the calibration is completed. The APP operation is as shown below.





Battery Charge

Nemo's dedicated charger must be used when battery charging



1. The battery light is red when charging,
2. The battery will turn green when it is fully charged.
3. Two batteries can be charged at the same time or independently.
4. Attention:
 - a) The adapter provided by the Aquarobotman must be used.
 - b) The charger provided by the Aquarobotman must be used.

Attention

Problems to be aware of when using this product

Environmental requirement

Water quality: sea water or fresh water.

Temperature: The water temperature is between -2 ° C and 35 ° C.

Water depth: 0 ~ 100 meters

Check before use

Things to confirm before use:

1. No attachment on the lens in case of affecting the video.
2. Make sure the knob at the signal cable connection is tight enough.
3. Check that the wheel power switch is activated.
4. Make sure the current battery level is sufficient.

Maintenance after use

The user needs to perform the following maintenance after use.

1. Clean the machine with fresh water. The machine and the WIFI connector are waterproof.
2. Unload the battery of the machine and wheel to prevent it from being over-discharged.



Export of the hosting machine memory data

To prevent the hosting machine from overheating when exporting raw data from the memory data, the front half of the hosting machine needs to be immersed in cold water.

Possible problems are as follows :

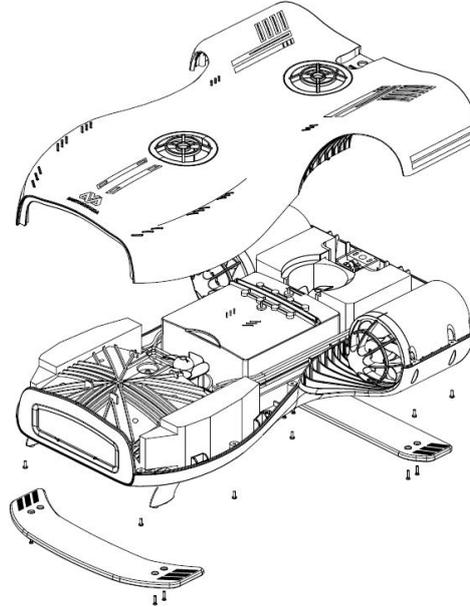
Possible problems	Resolutions
1 After the machine was taken out from the sea water, a layer of crystal salt on the surface of the machine without cleaning in fresh water	Soak the machine into fresh water for a while and wait the crystal salt attached to the surface dissolving.
2 When the machine runs on the bottom of the sea with wrapped water plants or other strips, which causes the machine to enter protection state	Take the machine out of the water, clean up the water wrapped around the blade, then power it back on. Users are advised to avoid using the machine in places with lots of grass.
3 The machine is close to the bottom of the sea, and some small sand or stones enter the machine interior	Shake the machine in the water to make the sand rush out. If it doesn't work very well, the upper shell can be disassembled, then clean it to install again. Specific disassembly course can be referred to the appendix.



Appendix

Take off upper shell

As is shown below, remove the stand of the machine and then all screws of the bottom shell.



Upper shell disassembly diagram



Specification and Parameter

Nemo	
	Parameters
Architecture	4 thrusters (2 vertical 2 horizontal)
Size (with racks)	40.4*29.0*11.4cm
Size	39.4*29.0*9.5cm
Weight (with racks)	3.6KG
Weight	3.3KG
Power System	Waterproof and corrosion resistant motor, high efficient 5 blade propeller
Max forward speed	2m/s
Max Depth	100m
Memory	32G/64G
Wireless transmitter	
	Parameters
Size	105mm*75mm*159mm
Weight	170g
Signal frequency	2.4G
Max communication distance	50m
Battery	Wireless transmitter battery
Wheel	
	Parameters
Length	30m/100m
Size	30*35*16cm
weight	400g
Wireless transmitter battery	
	Parameters
Size	47mm*120mm*27mm
Weight	170g
Battery voltage	8V
Charging voltage	8.4V
Nemo battery	
	Parameters
Size	112mm*125mm*65mm
Weight	650g
Battery voltage	11.1V
Charging voltage	12.6V
Charging current	2A
Charger	
	Parameters
Size	68.5mm*53mm*85mm



Weight	92g
Input voltage	15V
Output voltage	12.6V / 8.4V
Filter	Parameters
Size	70mm*45mm*10.5mm
Weight	10g
Protective rack	Parameters
Size (head of Nemo)	75mm*220mm
Size (rear of Nemo)	45mm*220mm
weight	313g
Camera	Parameters
Video resolution	4K:3840X2160 30P 16:9 2.7K:2704X1520 30P 16:9 1080P:1920X1080 30P 16:9 1080P: 1920*1080 120P 16:9 720P:1280x720 30P 16:9
Photo pixel	16M (4608x3456 4:3) 14M:4252x3264 4:3 12M:4000x3000 4:3 8.3M:3840X2160 16:9
Images quality	normal/good/very good
Continuous shooting mode	off/ 3pcs/s 5pcs/s
Time-lapse shooting	Turn off/1s/2s/5s/10s/30s
Video quality	normal/good/very good
Video watermark	off/on



After-sales support information

Detailed after-sales return and warranty policy

Return and replacement policy

1. Products return can be applied for in the following cases:
 - a) Within 7 natural days after the user receives the product; free from damage and defects; complete outer packaging, accessories, gifts, instructions; no human damage and secondary sales affection;
 - b) Within 7 natural days after the customer receives the product, it is found damaged or performance faults caused by non-human factors;
2. The company has the right to refuse the customer's return request in the following cases:
 - a) Return request after more than 7 natural days from the date of receipt;
 - b) Incomplete returned product; incomplete outer packaging, accessories, gifts, instructions, damaged appearance of the product due to human factors;
 - c) Unable to provide legal proof of purchase or receipt at the time of return, or to forge or alter the document;
 - d) Collision and burning, caused by non-product quality problems; the product quality problems caused by improper installations and failure to follow the instructions and use;
 - e) Products damage caused by irresistible forces such as fire, flood, lightning, traffic accidents;
 - f) The items are not sent within 7 natural days after customer service contact confirm;
 - g) Other circumstances as stated in the policy.
3. Replacement can be applied for in the following cases:
 - a) Within 15 natural days after the customer receives the product, it is found damaged during transportation and damage certificate can be provided by the transportation company;
 - b) Within 15 natural days after the customer receives the product, it is found damaged during transportation and damage certificate can be provided by the transportation company;
 - c) Within 15 natural days after the customer receives the product, it is found performance failure that was not caused by human damage;
3. The company has the right to refuse the customer's replacement request in the following cases:
 - a) Request for replacement after more than 15 natural days from the date of receipt;
 - b) Unable to provide legal proof of purchase or receipt at the time of replacement, or to forge or alter the document;
 - c) The replacement product is incomplete, or the appearance is damaged by human factors;
 - d) The returned product is tested by the Aqurabotman Tech Support Department and no quality problem appear in the product itself;



- e) Collision and burning, caused by non-product quality problems; the product quality problems caused by improper installations and failure to follow the instructions and use;
- f) Products damage caused by irresistible forces such as fire, flood, lightning, traffic accidents;
- g) The items are not sent within 7 natural days after customer service contact confirm;
- g) Damage certificate issued by the transportation company can't be provided when return request is applied for;
- i) Other circumstances as stated in the policy.

Warranty policy

Product warranty service can be applied for if the product has performance failure during the effective warranty period.

1. Free warranty service can be provided in the following cases:

- a) The purchased product is used normally within the specified product warranty period, no human performance failure occurs;
- b) No disassembling the machine (except the detachable part of the manual), no modification or retrofitting guided by non-official instructions, and other non-human-induced failures;
- c) Valid proof of purchase, bill and order number can be provided.

1. The following conditions are not part of the free product warranty:

- a) Collision or burning accidents caused by artificial non-product quality problems;
- b) Damage caused by unauthorized modification, dismantling, shell opening, etc., guided by unofficial instructions;
- c) Damage caused by improper installation, use and operation without instructions;
- d) Damage caused by the customer's own repair of the assembly without official instructions;
- e) Damage caused by improper circuit modification guided by unofficial instructions or improper matching of battery packs and chargers;
- f) Damage caused by use and shooting without correct product manual guide;
- g) Damage caused by handling in harsh environments, such as large waves, complex underwater terrain, poor visibility, etc.;
- h) Damage caused by manipulation in the case of interference with other wireless devices, such as WiFi signal;
- i) Mounting damage beyond the safe weight;
- j) Damage caused by forced start-up in the event of aging or damage to components;
- k) Use with third-party components that are not certified by Aquarobotman, causing damage due to reliability and compatibility issues;
- l) Damage caused by insufficient discharge when low battery or battery with quality problems occur;
- m) The items are not sent within 7 natural days after customer service contact confirm.