



**U3**

## User Manual of Spray Disinfection Robot

Produced by Dual-Engines Technology (Hangzhou) Co., Ltd.

## Table of Contents

1. Introduction.....	1
2. Safety rules.....	1
3. Product introduction.....	1
3.1. Product basic parameters.....	3
4. Robot installation and operation process.....	5
4.1. Initial operation flow.....	5
4.2. Robot disinfection workflow.....	5
5. Initial operation.....	6
5.1. Robot charging.....	6
5.2. Install charging pile.....	7
5.3. Install the robot.....	8
5.4. Robot power on and off (including other button instructions).....	10
5.5. Use tablet to connect robot hotspot.....	11
5.6. Log in to the tablet app.....	13
5.7. Create a map.....	13
5.7.1. Mapping skills (important).....	16
5.8. Edit map.....	18
5.8.1. Modify the map-remove obstacles.....	19
5.8.2. Modify map-virtual wall.....	21
5.8.3. Marking dot-charging point.....	23
5.8.4. Marking dot-navigation point.....	24
6. Start using the robot.....	25

6.1. New disinfection task.....	25
6.1.1. Immediate disinfection task.....	27
6.1.2. Timed disinfection mode.....	28
6.1.3. Low liquid level alarm.....	29
6.2. Disinfection record.....	30
6.3. Statistics.....	31
6.4. Settings.....	31
6.4.1. Robot settings.....	31
6.4.2. Disinfection record settings.....	35
6.4.3. Robot details.....	35
6.4.4. System settings.....	37
6.4.5. About.....	38
7. Automatic recharge.....	38
8. Accessories instructions.....	39
8.1. Joystick.....	39
9. Appendix.....	40
9.1. Troubleshooting instructions.....	40
9.2. Care instructions.....	41
9.3. FAQ.....	41
9.4. Contact details.....	43

# **1. Introduction**

This manual is a user manual for spray robot product instructions, quick use guides, safety information and correct maintenance concepts. This manual applies to the U3 model of Futural Robotics. In order to ensure your correct use, it is recommended that you detail read and understand the entire manual.

# **2. Safety rules**

Before using this product, please follow the following safety rules.

- \* Before using this product, please read and understand the entire manual.
- \* When installing the product, please follow the instructions strictly.
- \* When using the product, please strictly follow the instructions and do not use it with other products.
- \* Strictly follow the instructions during the disinfection process.
- \* When a fault occurs, please refer to the troubleshooting instructions in this manual.
- \* Please refer to the maintenance instructions in this manual, and perform maintenance work regularly.
- \* When operating this product, please ensure that the operator has the authority to operate the product.
- \* Do not let this product be used by other operators who are not familiar with this product.

# **3. Product introduction**

U3 uses an intelligent smart chassis as a carrier, an integrated spray disinfection system, combined with the characteristics of intelligent movement and autonomous work of mobile robots, to achieve full-automatic spraying and rapid antivirus in all areas without manual intervention, reducing manual work intensity and the risk of infection.

In order to achieve the product use effect, please read and understand this manual thoroughly. According to the instructions provided in the manual, perform disinfection settings for the area to be disinfected. If you encounter any problems, please consult with the technician you contacted for disinfection. Disinfect again.

In addition, the spray disinfection robot can only be used for disinfection, please do not use it in combination with other related products or accessories not provided in this manual, otherwise it will cause related unnecessary safety hazards or cause a certain degree of damage to the product. If you fail to abide by the operation of this manual during use, the relevant warranty rules will be invalidated, and the effective use of this spray disinfection robot will not be guaranteed..



### 3.1. Product basic parameters

Component	Specification	
CPU	RK3288,32-bit,quad-coreARM-A17,1.8GHz	
GPU	Mali-T764	
DDR	DDR 2GB	
Flash	EMMC 8G	
Android	Android 7.1.2	
Touch display	Display screen	LCD screen , TFT-LCD
	Dimension	7 inch
	Resolution	1024×600
	Brightness	≥250cd/m
	Contrast	≥ 800:1
	Viewing angle	178°
	Touch technology	Capacitive touch screen
	Response time	< 5ms
	Touch points	10-point touch
WiFi	Surface hardness	Tempered Morse Class 6 Explosion-proof Glass
Bluetooth	802.11b/g/n	
RTC real time clock	4.0	
Speaker	Support	
Interface	3W	
Lidar	USB、OTG	
	270° , 10m	

Accelerometer	Support
Ultrasound	7 groups
Drive way	2 front wheel drive + 2 rear guide wheels
Maximum clearance width	3cm
Maximum walking speed	1.2m/s
Navigation walking speed	0.12~0.72m/s
No-load braking distance	28cm
Positioning accuracy	±5cm
Maximum mechanical working time	15h
Maximum electronic working time	2h
Battery Type	lithium battery
Battery capacity	45Ah
Charging method	Automatic / Manual
Charging time	Adapter: 2.5h (10%-80%)
	Charging pile: 3h (10%-80%)
Power connector	29.4V
The amount of fog	3000ml/h
Water tank capacity	16L
Fog method	4-core ultrasound
Rehydration method	Add water
Safety measures	Water shortage and power failure
Filter method	Activated carbon air filtration

Fog outlet	45° single outlet or 4-port nozzle
Operating temperature	0°C~40°C
Relative humidity	≤80RH
Transportation storage temperature	-20°C~70°C
Transportation and storage humidity	≤90RH, No condensation

## 4. Robot installation and operation process

After receiving the robot for the first time, you need to complete the initialization operation. After the initialization operation is completed, you can start the robot disinfection work. In addition, please refer to 4.1 and 4.2 for the specific details of the initial operation process and the robot disinfection workflow.

[Initial operation process --> Robot disinfection workflow](#)

### 4.1. Initial operation flow

Install the charging pile --> install the robot --> turn on and off the robot --> log in to the tablet --> create a map --> modify the map --> mark and do a dot --> save the map

### 4.2. Robot disinfection workflow

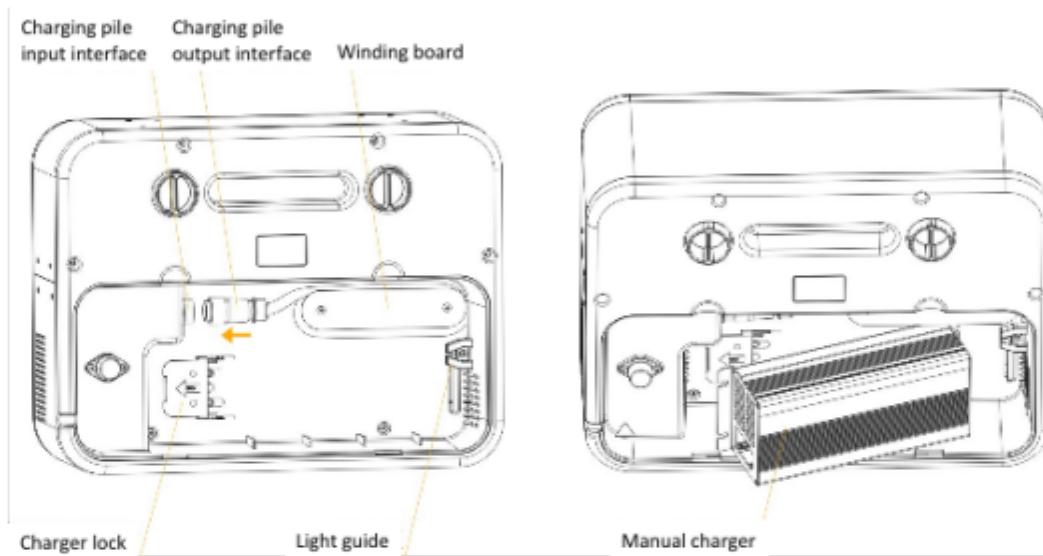
The robot disinfection workflow is as follows, please follow the procedure below:

Add disinfectant liquid and confirm the height of the liquid level --> Edit disinfection tasks (tasks are divided into timed tasks and immediate tasks) --> Execute the task --> View the task status when the task is completed

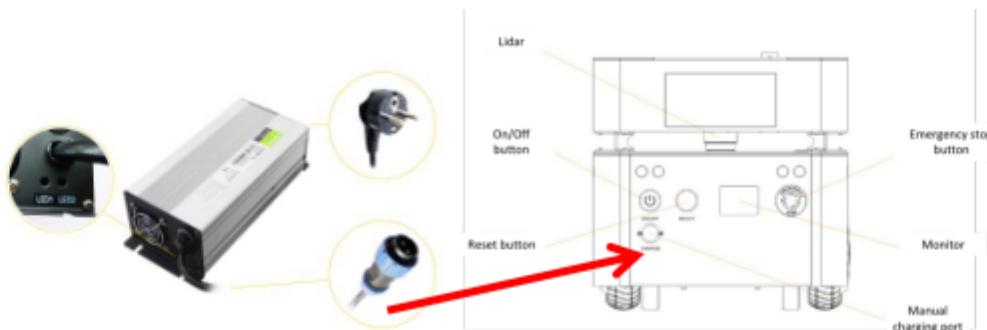
## 5. Initial operation

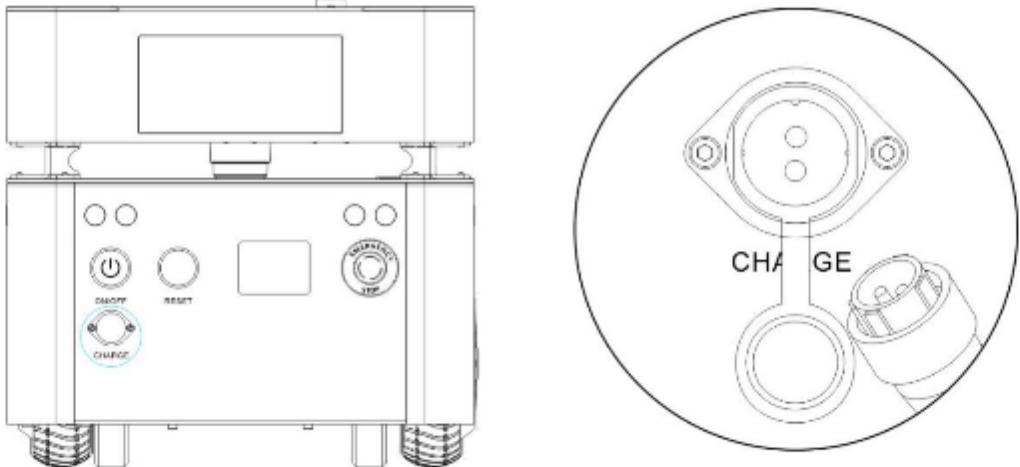
### 5.1. Robot charging

After the "smart chassis" and the "charging pile" are taken out of the package, it is recommended to remove the "manual charger" behind the charging pile and charge the smart chassis first.



Insert the "manual charging head" into the "manual charging port" of the smart chassis for charging. After the charging is completed, the subsequent initialization of the robot can ensure that the robot does not need to be recharged during the initialization process, thereby interrupting the initialization work.





## 5.2. Install charging pile

Place the charging pile in a suitable location, and plug it in after placement.

The placement requirements are as follows:

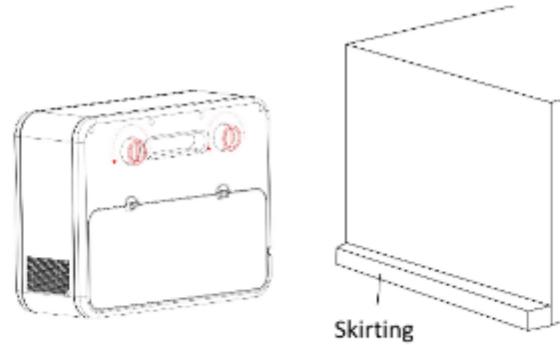
- (1) Please do not place any obstacles within a radius of 2.5 meters around the wall of the power supply. If there are obstacles in the selected wall area, please remove the obstacles to effectively ensure that the robot automatically recharges effectively.
- (2) Please ensure that the ground and wall are flat, and place the charging pile against the wall. Please do not place it on an uneven place, it may shake the charging pile after installation, causing the automatic recharging work to not work normally.



This side is placed against the wall, and ensure that there is no obstacle in the surrounding 2.5 meters.environment.

- (3) For walls with skirtings, please adjust the charging pile knob so that the

back of the charging pile is close to the wall to increase the stability of the charging pile.

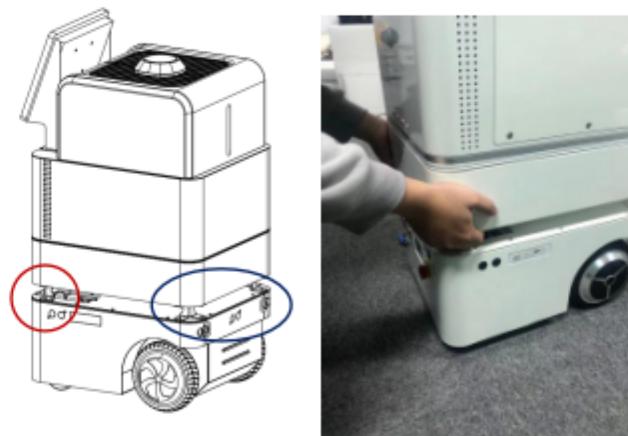


Note: If the robot is turned off and not in use for a period of time, please unplug the charging pile.

### 5.3. Install the robot

First of all, when transporting the robot, for your safety, please follow the following regulations and carry it.

1. When carrying the robot, please indicate the position as shown in the figure below, grasp and lift it with both hands, and carry it by one person at the front and back (1 person in the direction of the red circle and 1 person in the direction of the blue circle).



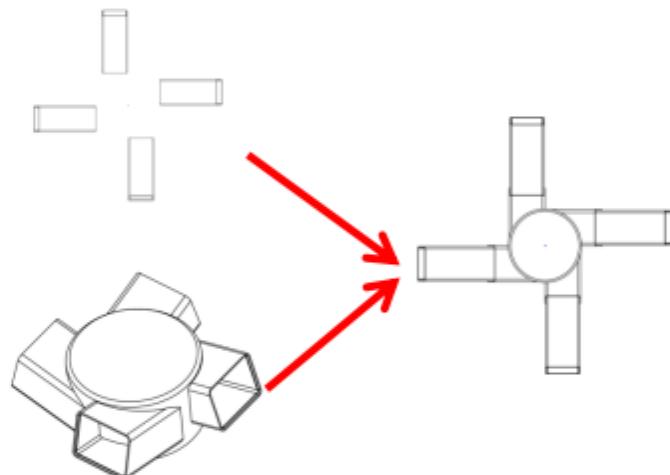
2. When carrying, please wear cotton gloves for carrying to prevent injury to

your hands.

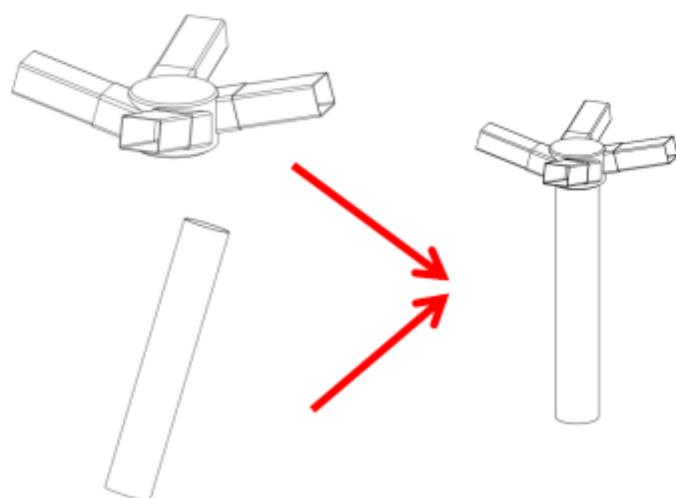
3. Please consider your physical condition when carrying the machine. It is recommended that people with cardiovascular disease, physical injury or underweight do not try to carry this machine, and do not try to carry it, so as not to harm personal health.

**After transportation, follow the steps below to install it.**

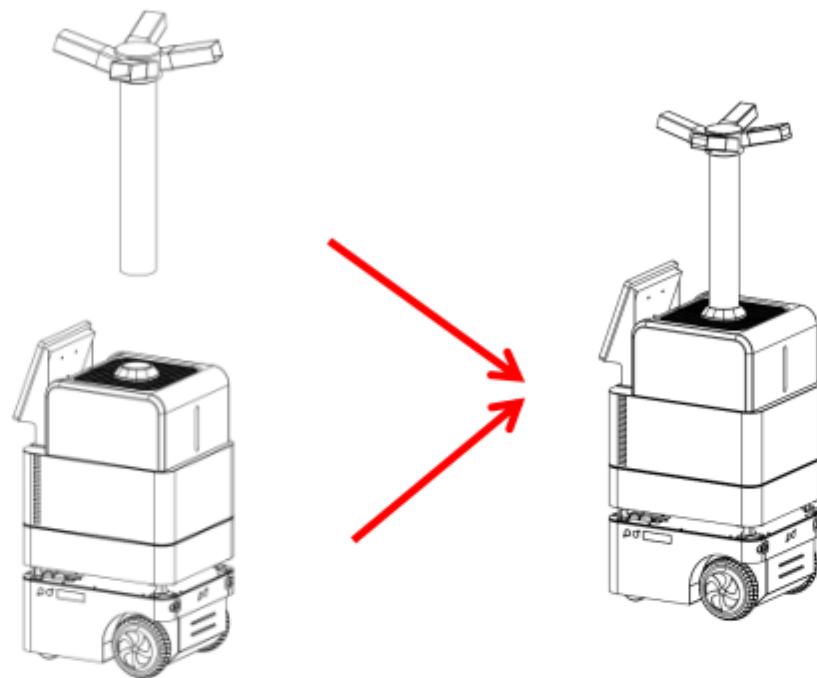
Step 1: Take out the four nozzle tubes and assemble them at the four nozzle positions as shown in the figure.



Step 2: Take out the nozzle column, and assemble the nozzle column as shown below.

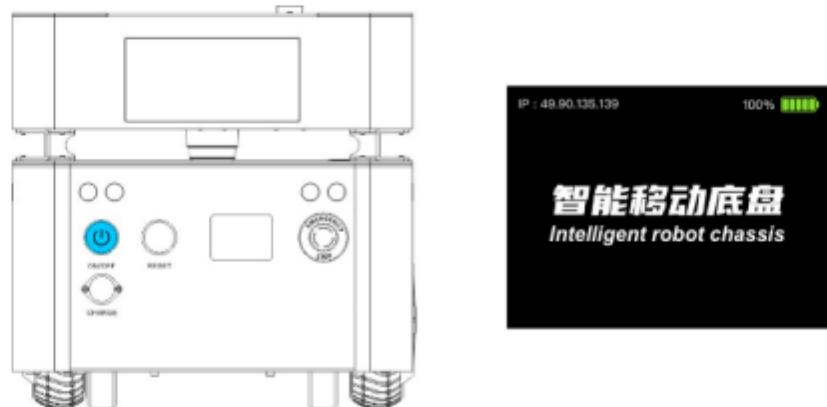


Step 3: Install the assembled nozzle column and nozzle on the main body of the robot as shown in the figure below.



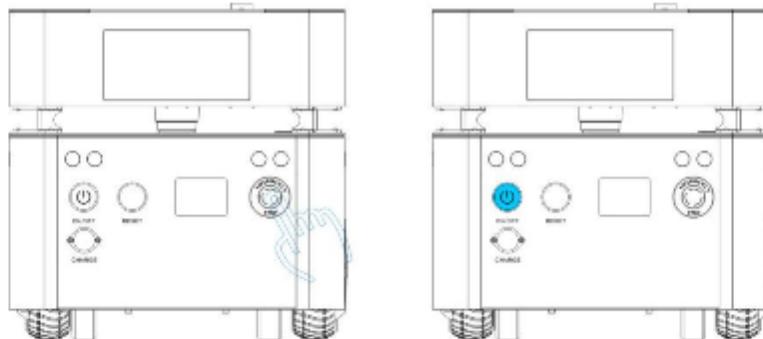
#### 5.4. Robot power on and off (including other button instructions)

(1) **Power on:** Press the ON/OFF button to indicate that the iris is illuminated, which means normal startup. After normal startup, the screen will display as shown below.

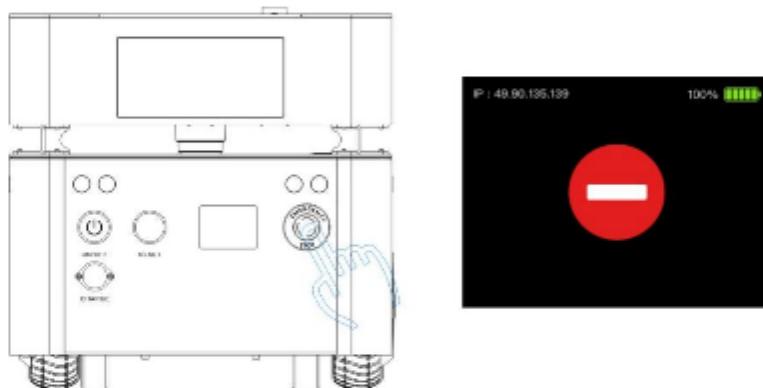


(2) **Power off:** Press the STOP button first to stop the robot, then press

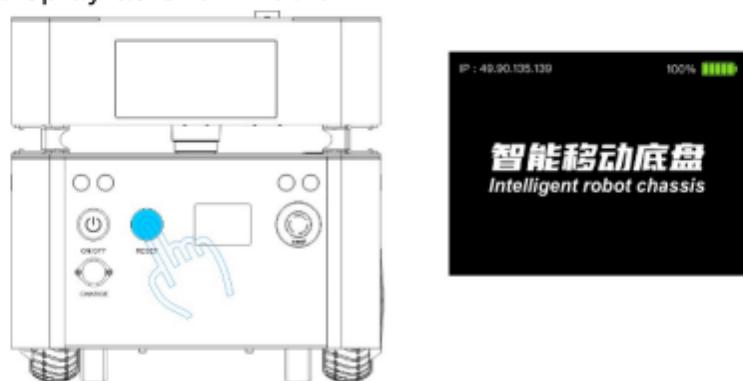
the ON/OFF button, release to complete shutdown.



(3) **Pause:** Press the STOP button, the machine stops moving, and the screen displays as follows.



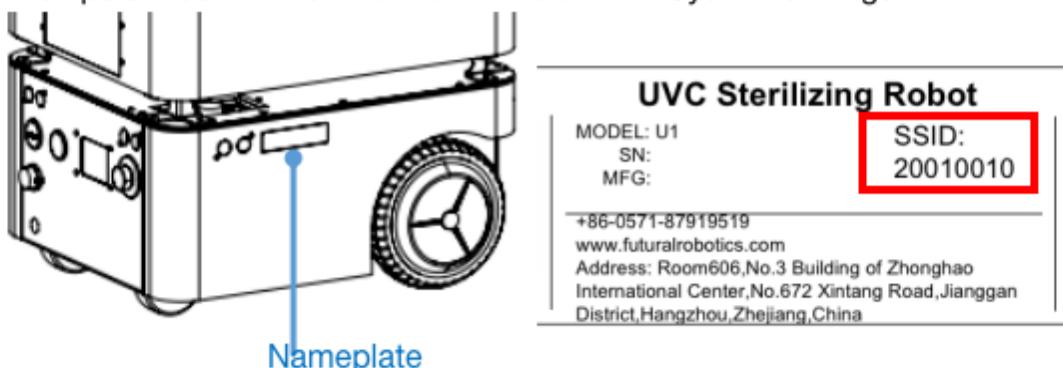
(4) **Unpause:** You need to press the STOP button first, and then press the RESET button to release the emergency stop. After resetting, the screen will display as shown below.



## 5.5. Use tablet to connect robot hotspot

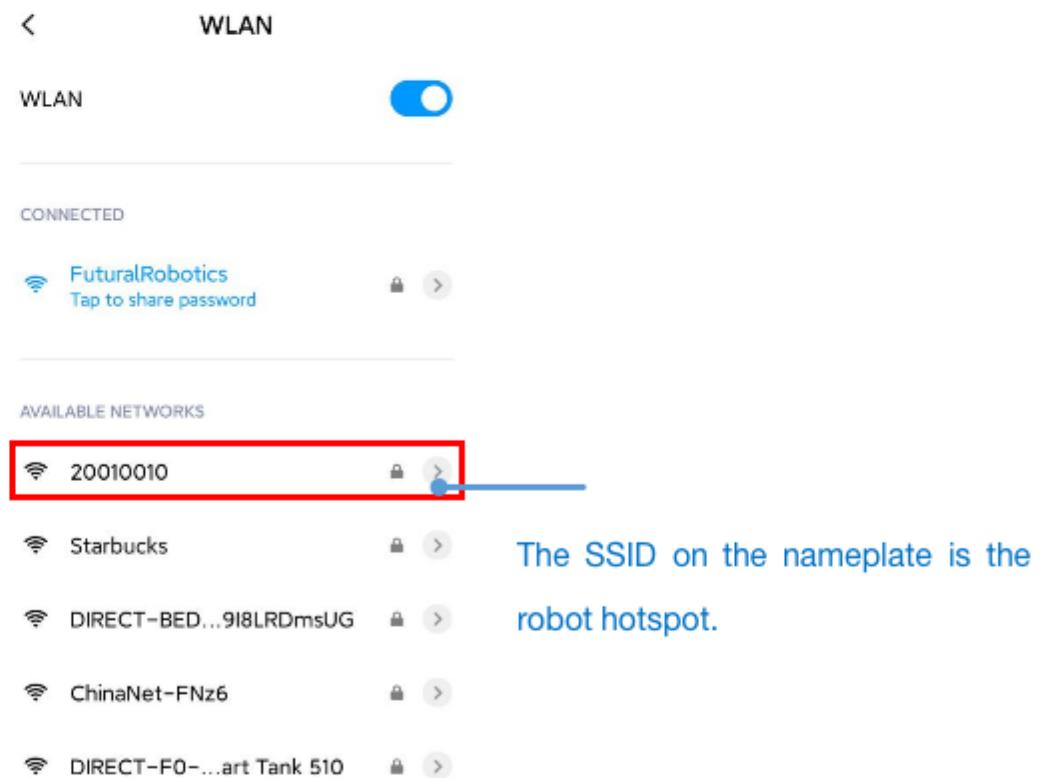
After the robot is turned on, please also turn on the attached tablet. After the tablet is turned on, please turn on the WiFi to connect to the robot hotspot.

The steps are as follows: "Turn on the tablet --> System settings --> WLAN".

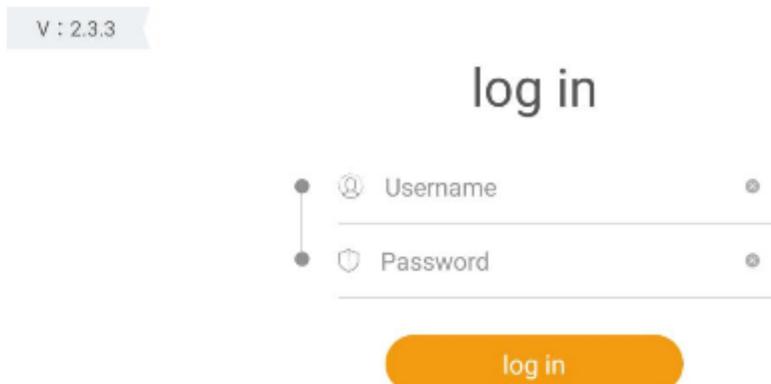


The robot hotspot needs to check the SSID on the nameplate (as shown in the picture above, each SSID is unique and different), and then find the corresponding SSID in the WIFI list of the system on the tablet, which is the hotspot (as shown in the picture below, the SSID on the nameplate will be displayed WIFI list), you need to enter a password when you click to connect, the password is as follows:

Password: @futural



## 5.6. Log in to the tablet app



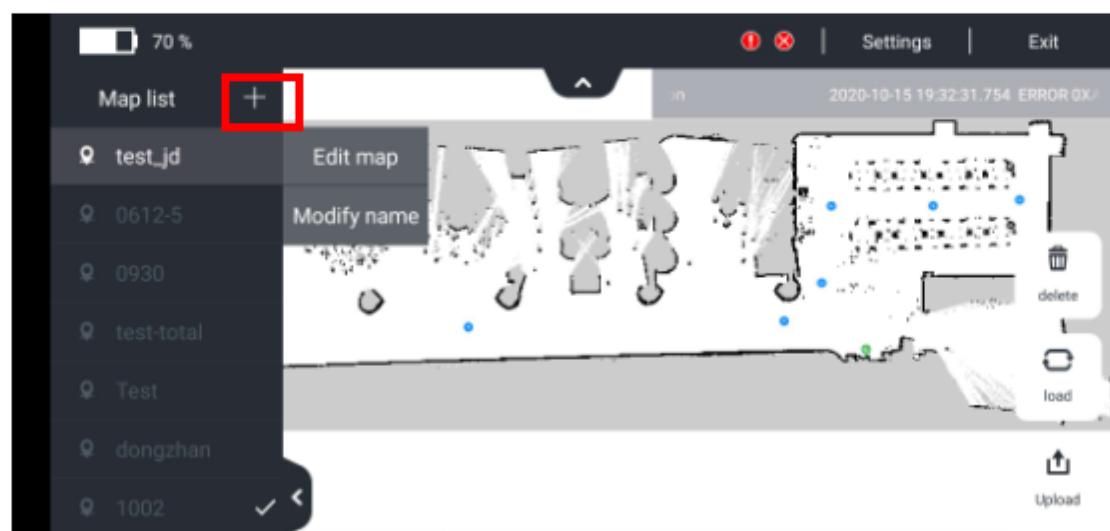
After turning on the tablet, click to open the "Futural Robotics" APP.

After you finish opening the APP, you will enter this login page, follow the prompts to enter your login name and password, and click login after entering.

Login name: admin

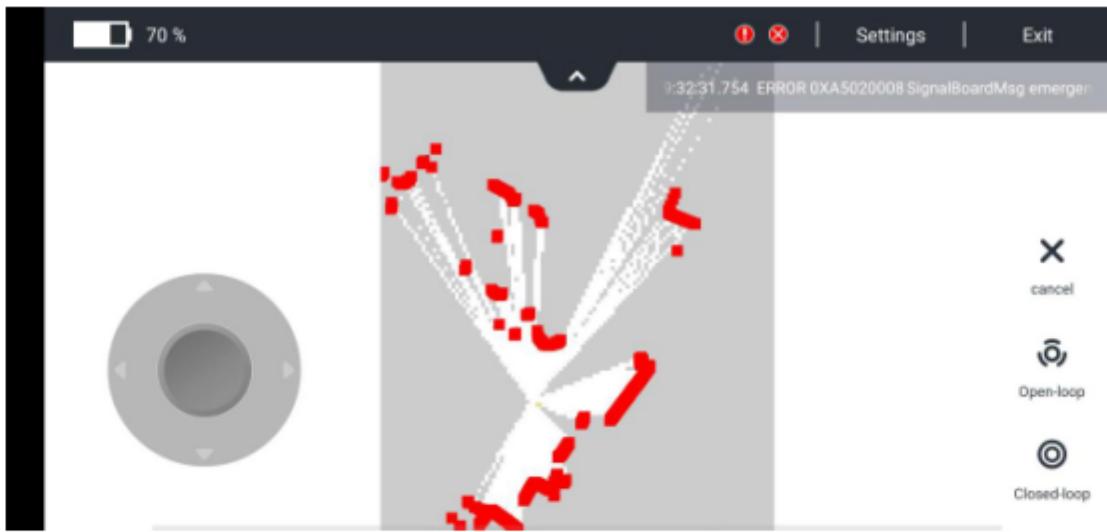
Password: Robot

## 5.7. Create a map



After logging in, you will enter the interface above, click on the "+" on the left

side of the map list to start building the map.



On the left is the joystick, which can control the walking of the robot, and the map will be scanned during the walking process.

The white area that appears during the scanning process is the completed scanning area, and it is walkable without obstacles.

During the scanning process, the black lines or areas that appear are obstacles or walls, which are areas that the robot will not walk and avoid later.

When the entire mapping is scanned, you can select "Open-loop mapping" and "Closed-loop mapping", and the map will be generated after selection.

The difference between open-loop mapping and closed-loop mapping is introduced as follows:

- **Open-loop mapping:** Different from closed-loop mapping, it belongs to the map type with lower similarity, and you can choose to use open-loop mapping.
- **Closed-loop mapping:** the built map has a high degree of similarity, such as a circular map, as long as the starting point to the end point of the robot mapping is the same, please select closed-loop mapping.

Abnormal closed loop is a condition of incomplete map construction.

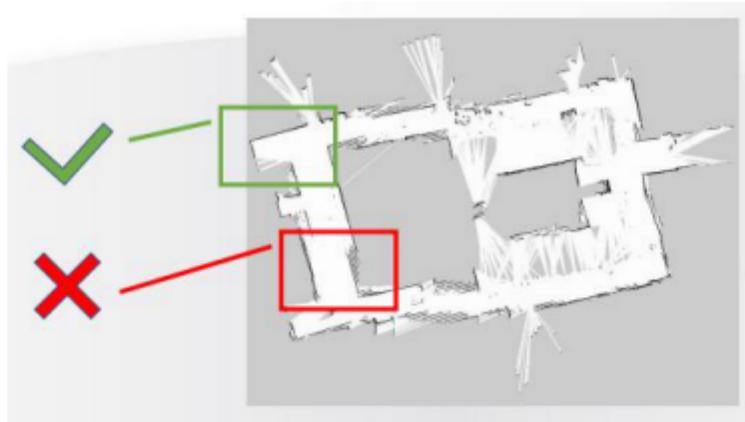
Closed-loop errors can cause map information errors, and human readability is greatly reduced. Inconsistent with the actual environment, a large

positioning offset will occur near the abnormal position of the closed loop during actual use, and even the positioning loss cannot be retrieved. The following figure shows that after the map is created, the starting point and current position in the closed-loop environment may be partially offset due to the different angles determined by the machine. Therefore, please select "closed-loop mapping" for this type of map to ensure that all closed-loops are normal .



When building a map, please avoid that the path of the map has been created. Please do not return to the original path to create the map again, which may cause duplication of the map, that is, ghosting.

Ghosting is a condition of inaccurate map results. The most common ghosting performance is that a wall in the actual environment becomes two parallel walls in the map. The ghosting will cause great interference to the navigation effect and cause positioning offset.



### 5.7.1. Mapping skills (important)

1. Choose places with obvious feature points and clean terrain as the starting and ending points. Examples of unobvious feature points include:
  - 1) A corridor with very flat walls on both sides, the length of the corridor > the maximum distance measured by the laser;
  - 2) In the middle of the office corridor with many workstations.
2. When starting to build a map, it is recommended to adjust the robot's linear speed and angular speed to below 60%, and then control the robot to rotate slowly in place to clean the surrounding feature points, and then control the robot to walk.
3. When you can walk in a straight line, try to walk in a straight line. If you need to walk in an arc, you can replace it by a straight line and in-situ rotation.

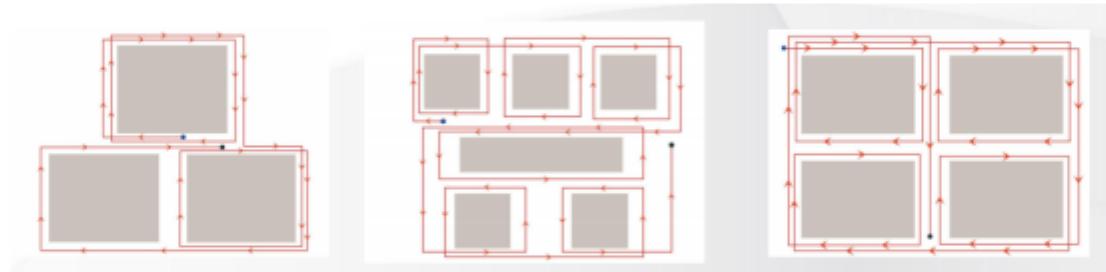


4. In a narrow area, you can walk in a straight line. Pay attention to the gap in the process of walking. You need to control the robot to slowly rotate 90° to

face the gap to clean the characteristic points, and then slowly turn back to continue scanning; the open area follows the U-shaped route ( Picture below) Walking.



5. Control the robot to walk slowly, always observe whether the laser matches the terrain, if it does not match, stop and wait for the laser data to match the actual terrain before continuing.
6. First a small closed loop and then a large closed loop.

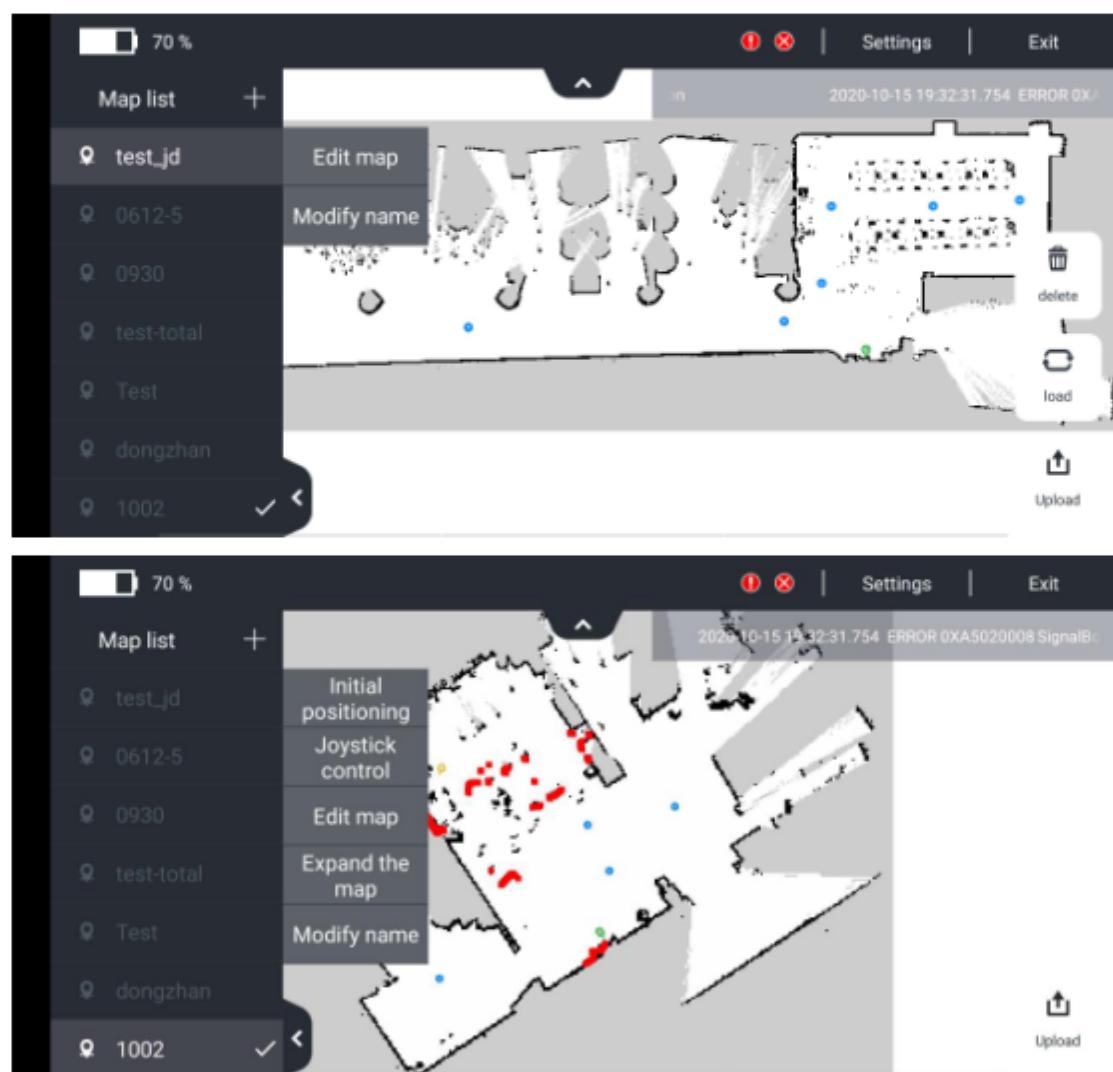


7. The robot should not be too close to the wall (>0.5m).
8. The operator should try not to be too close or too far away from the robot, too close will cause black spots on the map, and too far will cause unstable WIFI connection. A distance of 3 to 8 meters is suitable.
9. Don't close the loop in difficult to identify (such as walls, corridors without features).
10. If there are many closed-loop scenes in the scene, the consumption of computing resources will increase, and the real-time map status may not be displayed on the app. It is recommended to wait for the map information displayed on the app to be updated before finally saving the map. If the map

is all updated after 3 minutes No more changes, you can finally save the map.

11. Do not move the robot after the robot reaches the end point. Just observe whether the map is clean and free of ghosting and matches the actual terrain. If there is no obvious misalignment, the map can be completed. If there is a misalignment, please wait for a while. Algorithm Will be corrected. If the correction is not successful within 5 minutes, consider rebuilding the map.

## 5.8. Edit map



After the map is created, you can see the map list on the homepage. The map that has been created is displayed on the left side of the map list, but there will be missing scans during the map creation process, or in the case of

special obstacles, manual operation is required to correct the pattern.

The above two pictures show two types of maps, ticked and not ticked. The ticked one is the default map of the system, and there are more options for editing and control, while the unticked one is the general map library.

After the map is created, you can edit the navigation points, charging points and map errors. You only need to select "Edit Map". The available editing tools include "**Remove Obstacles**", "**Virtual Wall**", and "**Charging point**" and "**Navigation point**".



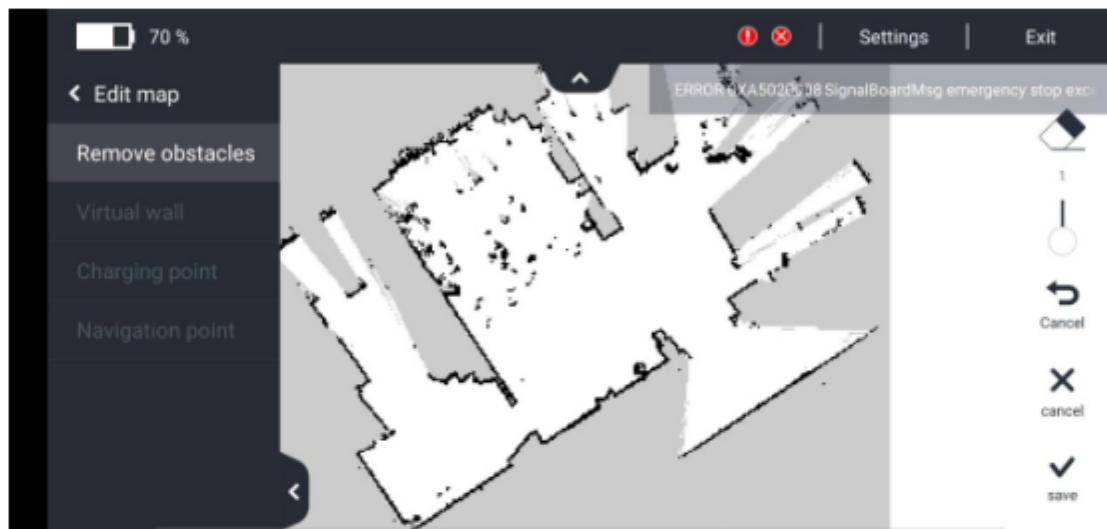
Please use "**Remove obstacles**" and "**Virtual wall**" to modify the map.

"**Remove obstacles**" is to erase unnecessary areas, while "**Virtual wall**" can create a virtual wall. After the establishment, the robot will default to the virtual wall being built as a wall, so the robot will not pass through the wall area during the mission.

Marking points are divided into "**charging point**" and "**navigation point**". The "**charging point**" is the location of the charging pile. If automatic charging is required, this point is necessary. The "**navigation point**" means that the robot will pass or stay at points, if you want to select disinfection points, these navigation points are the points that can be selected for disinfection.

### 5.8.1. Modify the map-remove obstacles

Generally, in the process of mapping, because there are moving objects on the route of the scan, which are regarded as obstacles, you need to use "remove obstacles" to remove them. Certain force majeure in the environment (for example, there are many pedestrians) and the performance limitations of laser sensors can cause abnormal gray areas and black spots. This part of the area needs to be manually restored to a passable state to stabilize the navigation function.



The size of the noise removed can be removed by dragging the size with the tool. If you decide that the black spots on the image after removal are not obstacles, you can use Remove Noise to remove them. If you find an error in the cleaning process, you can click to go back, and you can return to the state before cleaning. After clearing, click to save the revised map.



### 5.8.2 Modify map-virtual wall



The situation in the above picture is a complicated situation. The results of the scan during the mapping process will not be consistent with the actual situation, and the result is not identified as an obstacle, or when some areas do not want the robot to walk, you need to use the "virtual wall" function. The addition of obstacles and virtual walls. After adding, the robot will treat the virtual wall as a non-walkable obstacle.



The virtual wall needs to be drawn by touching the screen with your finger. After drawing, you can compare the actual scene and plan to confirm that it is correct, and then save the settings of the virtual wall. If you need to change, you can add a new virtual wall, and delete unnecessary virtual walls.

When the robot is building a map, if it encounters glass doors, reflective objects, or parts that easily absorb light sources, the judgment will be incorrect and no black areas or lines are generated. If there is no area judged to be unwalkable, please create a virtual wall to modify the map. In addition, some walls will be mistaken as being in a passable state when scanning the picture. This part of the area needs to be painted with a virtual wall (the red circle area in the picture below is recommended to be painted with a virtual wall).

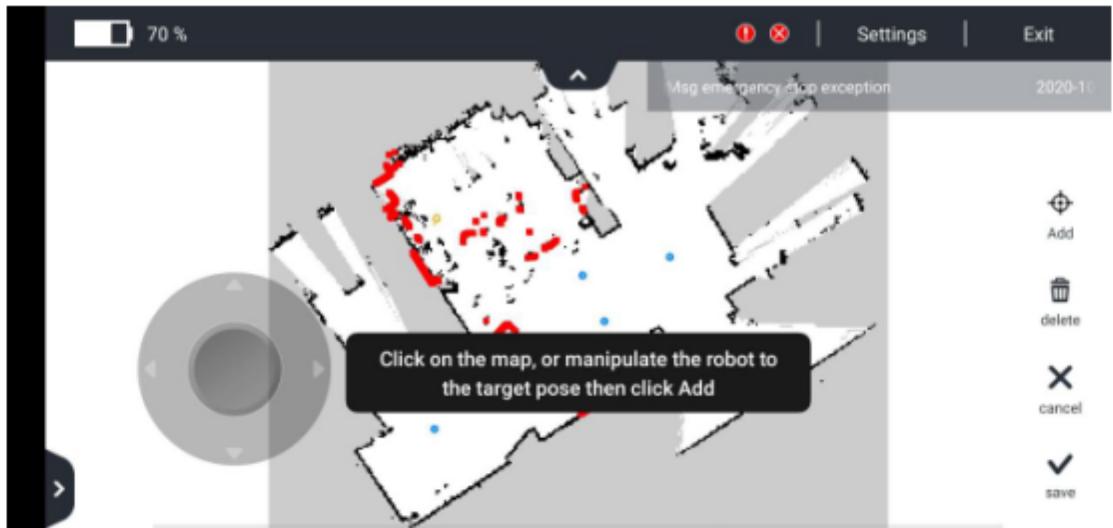


### **5.8.3. Marking dot-charging point**

Click the "charging point" process, please follow the steps below.

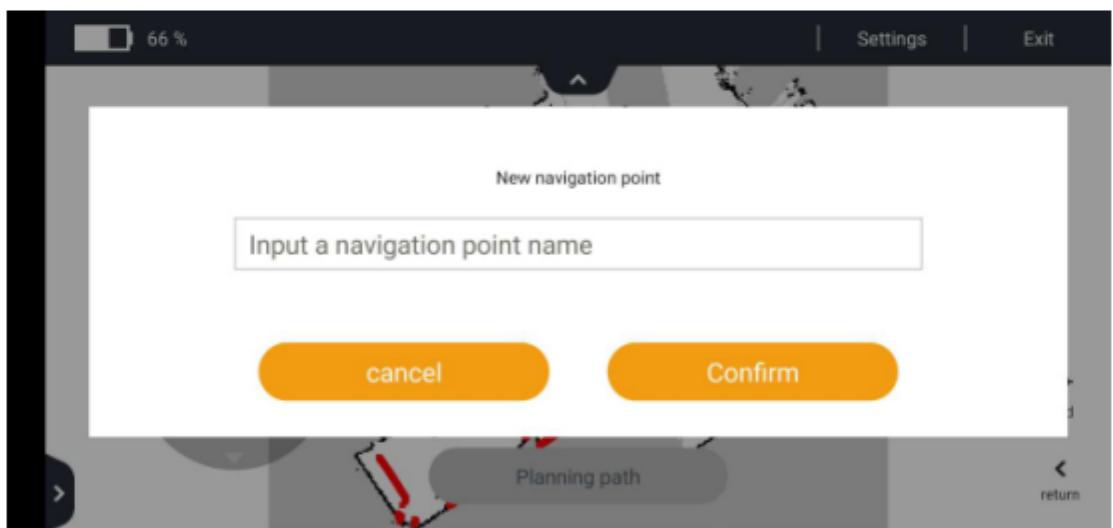
1. There are two ways to move the robot near the charging pile.
  - \*Use the attached handle to operate the robot to move.
  - \*Press the emergency stop switch to push the robot to move.
2. After reaching the charging station, please press the emergency stop switch (if you have already pressed it, please ignore it), then align the charging pole piece on the robot with the charging pole piece of the charging station, and push the robot to make the charging pole pieces at both ends touch.
3. After contact, release the emergency stop switch.
4. Press the RESET button.
5. Connect the attached PAD to the robot hotspot.
6. Open the Futural Robotics APP on the attached PAD.
7. Log in.
8. Select the corresponding map and click "Edit Map".
9. Click "Charging Point".
10. Click "Add" and click "Save" to complete the charging point management.

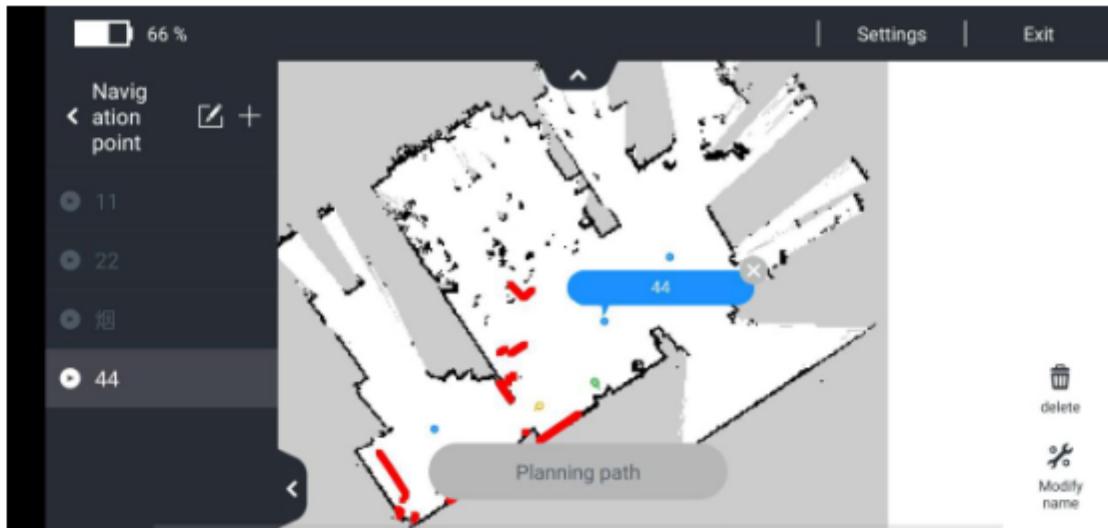
Note: Only one charging point can be established per map, and multiple charging points are not supported.



#### 5.8.4. Marking dot-navigation point

The navigation point construction logic is the same as the charging point. You can still use the virtual handle to control the robot to the location that needs to be disinfected, click Add, enter the corresponding navigation point name, and click OK to complete the navigation point creation.



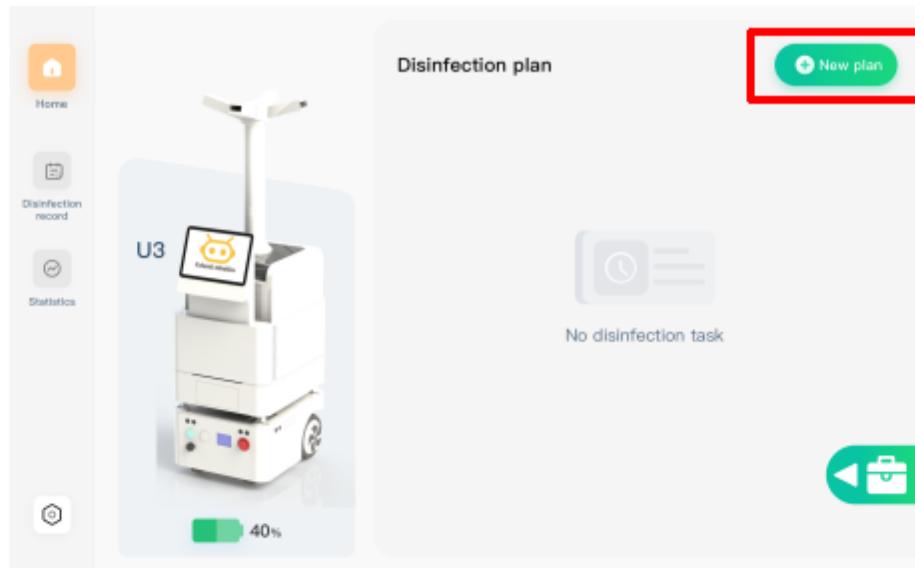


## 6. Start using the robot

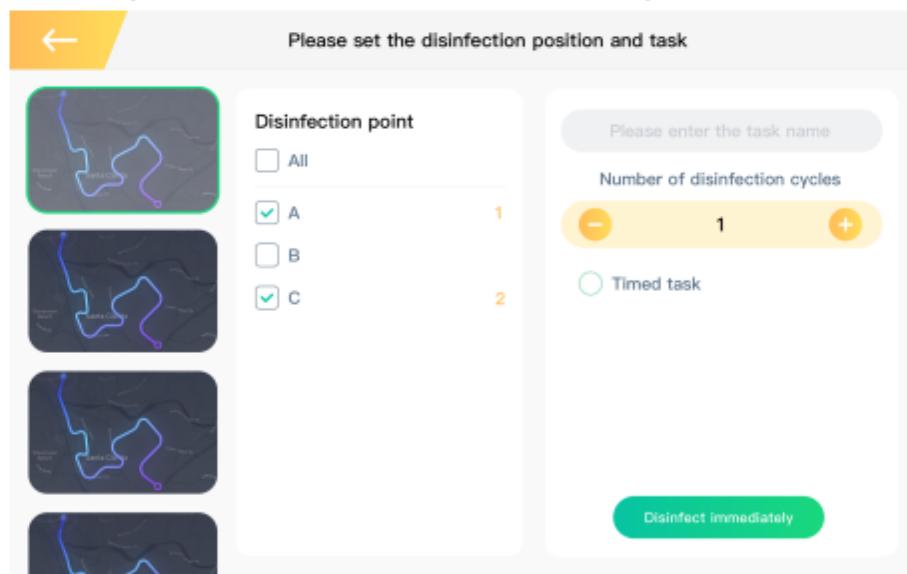
The scope of work on the PAD side is to plan disinfection maps and establish navigation points, while the software control on the robot side covers all disinfection-related tasks, including "**New disinfection tasks**", "**Disinfection records**", "**Statistics**" and "**Settings**".

### 6.1. New disinfection task

To create a disinfection task, please click "New Plan" in the upper right corner of the homepage. The disinfection plan is divided into two types: "**Immediate Disinfection Task**" (refer to 6.1.1) and "**Timed Disinfection Task**" (refer to 6.1.2)..

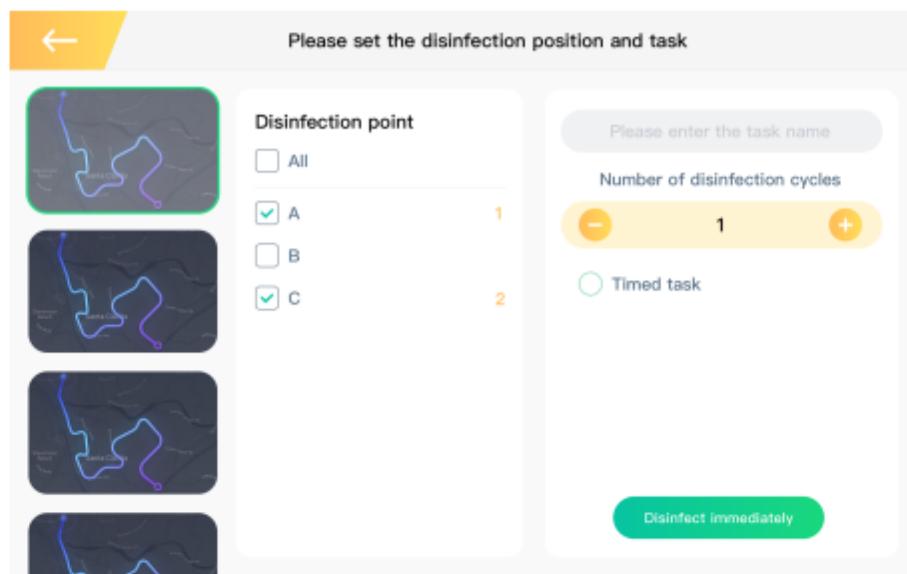


After clicking "New plan", enter the page for selecting the disinfection location and task, you need to select the corresponding sterilization position against the use of scenarios and situations, the far left is the default map selected preset map. You can also choose to disinfect on other maps, but please remember to select the map corresponding to the disinfection work, otherwise it may cause the robot to work abnormally.

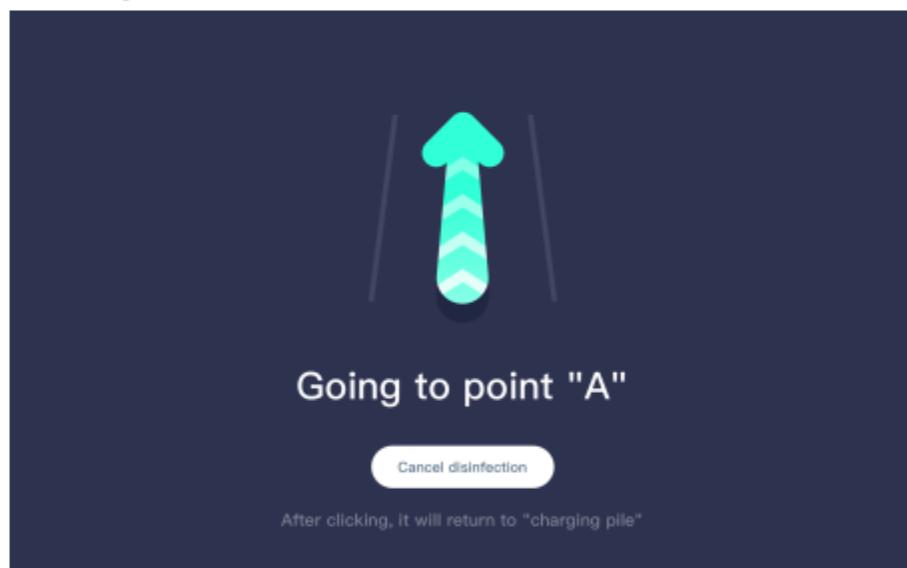


Next, you need to select the corresponding disinfection mode according to the use situation. The disinfection mode is divided into two types: "Immediate disinfection task" and "Timed disinfection task". The two disinfection modes are introduced below.

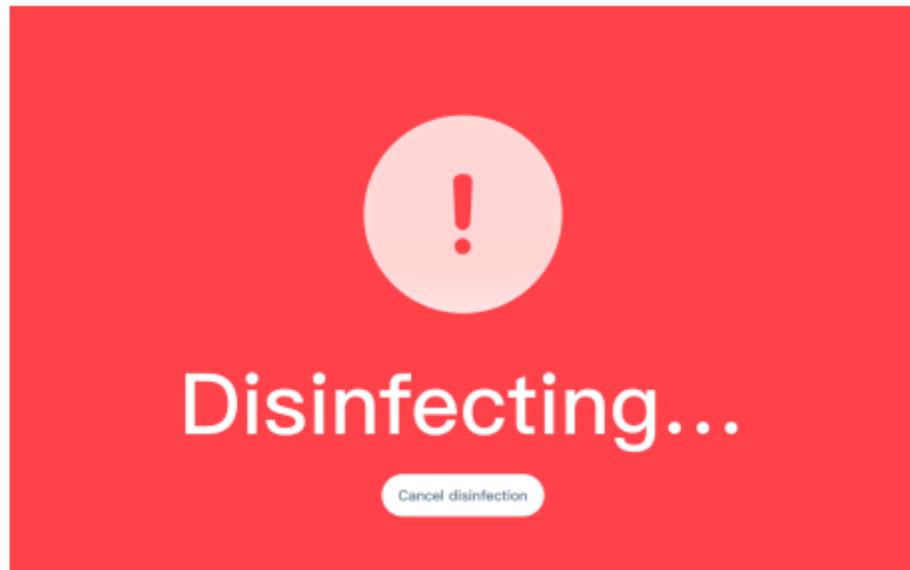
### 6.1.1. Immediate disinfection task



As shown in the figure above, after executing the immediate disinfection mode, it will start to go to the first point in the disinfection sequence, as shown in the figure below.

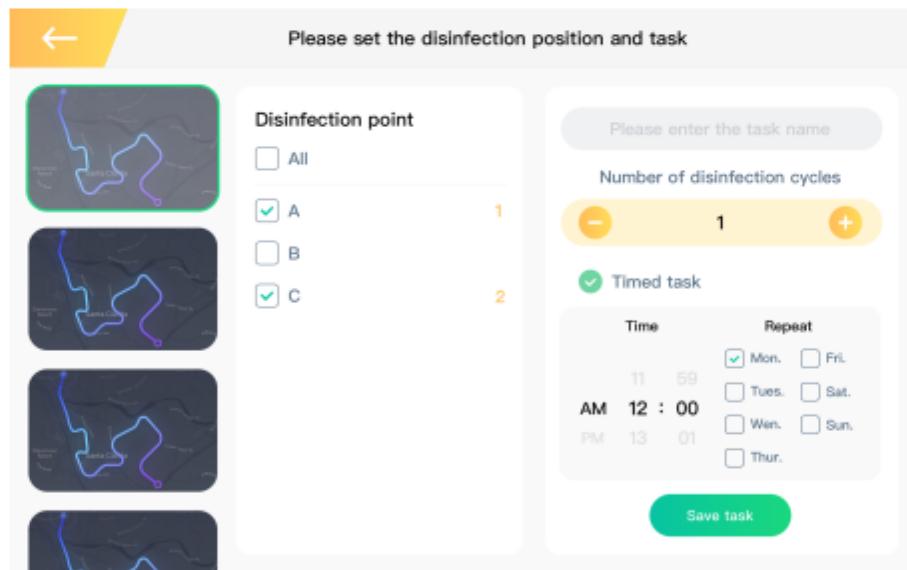


After reaching the first point, the following picture will appear, and the spray disinfection will start at the same time.

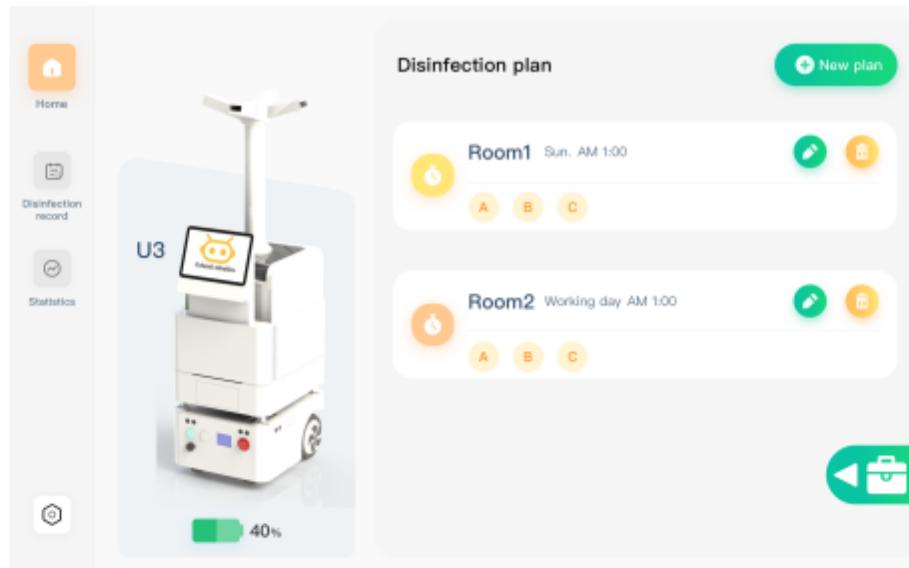


The robot will start the disinfection work along the disinfection point, until the disinfection reaches the last point, it will complete the task and turn off the spray. After completing the disinfection task, it will return to the charging pile.

### 6.1.2. Timed disinfection mode



When editing a task, check the time task, and the executed task will be in the scheduled disinfection mode. You only need to enter the time and repetition frequency of the task, and then click to save the task. The task list will be displayed on the homepage of the robot (disinfection plan). ), please refer to the figure below.

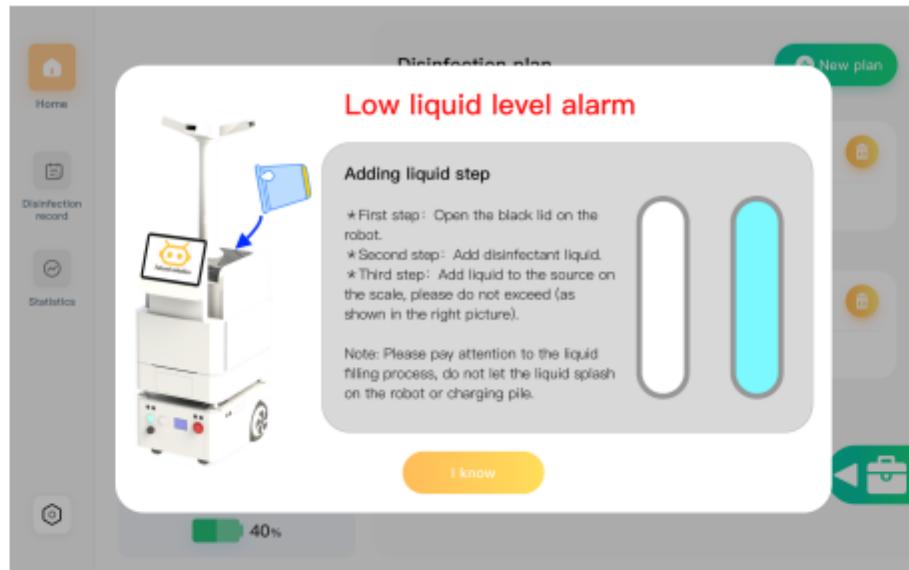


When the task in the task list (disinfection plan) reaches the specified time, the task will be executed.

### 6.1.3. Low liquid level alarm

When the robot is performing a task, if the disinfection liquid level is lower than the liquid level warning line, a low liquid level alarm will appear (shown in the figure below), and the task can not be continued until the liquid is added.

Please open the black cover (left and right ends) on the robot before adding liquid. After opening the liquid can be added, but please do not pull out the nozzle column and add liquid to the middle opening, otherwise the robot will be damaged.



## 6.2. Disinfection record

The disinfection record will record each disinfection situation for you, and you can judge from the disinfection record whether the task performed each time is normal.

A screenshot of the "Disinfection record" section of the app. It shows two entries under "Walking disinfection mode".

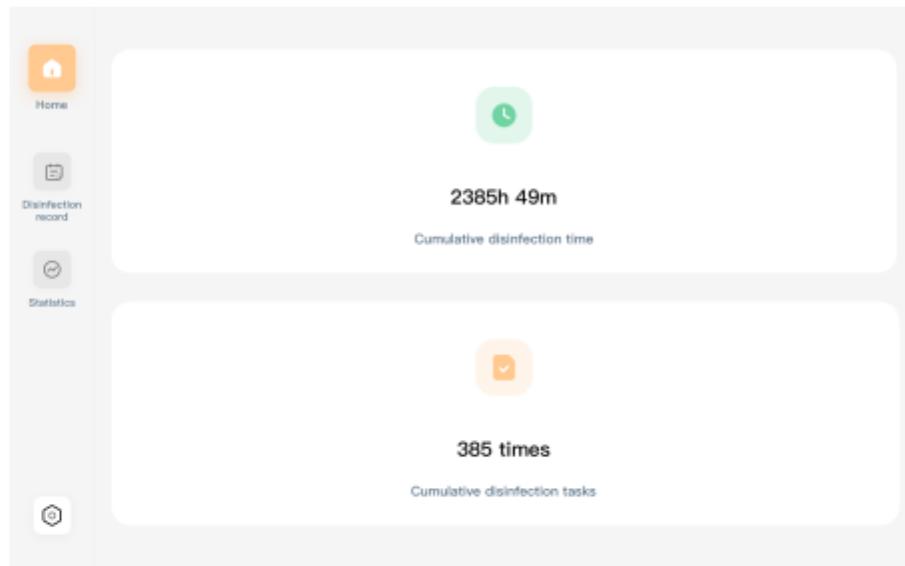
Room	Time consuming	Power consumption	Cycles	Number of points	Status
AM 1:00~PMT:13	00:12:12	2%	1	2	Abnormal
AM 3:00~PM4:24	00:12:12	12%	1	7	Normal

A "Task record" button is located between the two entries.

Each disinfection record will record the task record in detail, and display the results of the execution. You can also check the task record and troubleshoot the abnormality that occurred.

## 6.3. Statistics

Statistics mainly show cumulative disinfection time and cumulative disinfection tasks..

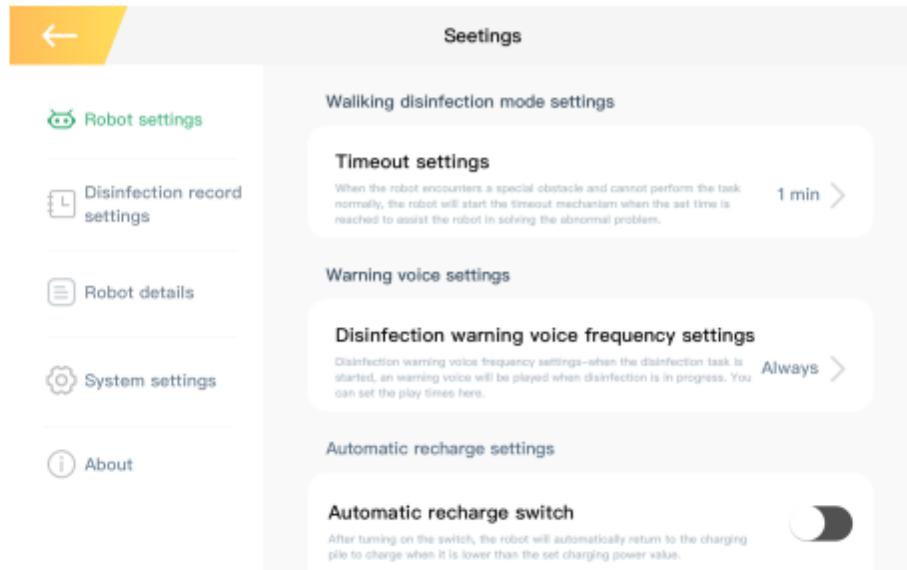


## 6.4. Seetings

The settings are divided into "**Robot Settings**", "**Disinfection Record Settings**", "**Robot Details**", "**System Settings**" and "**About**".

### 6.4.1. Robot settings

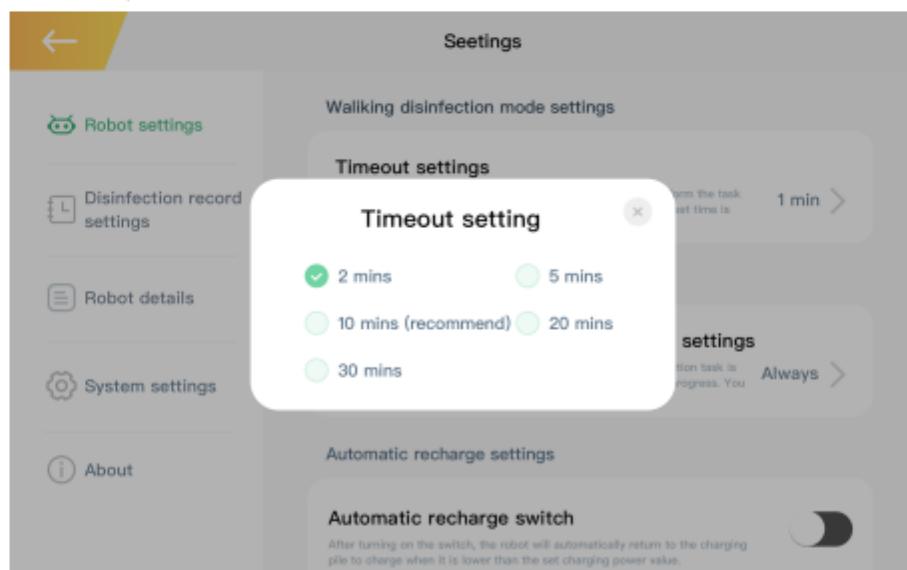
The robot settings are divided into "Walking disinfection mode settings", "Warning voice settings" and "Automatic recharge settings".



"Walking disinfection mode settings" can be "**Timeout setting**" for timeout.

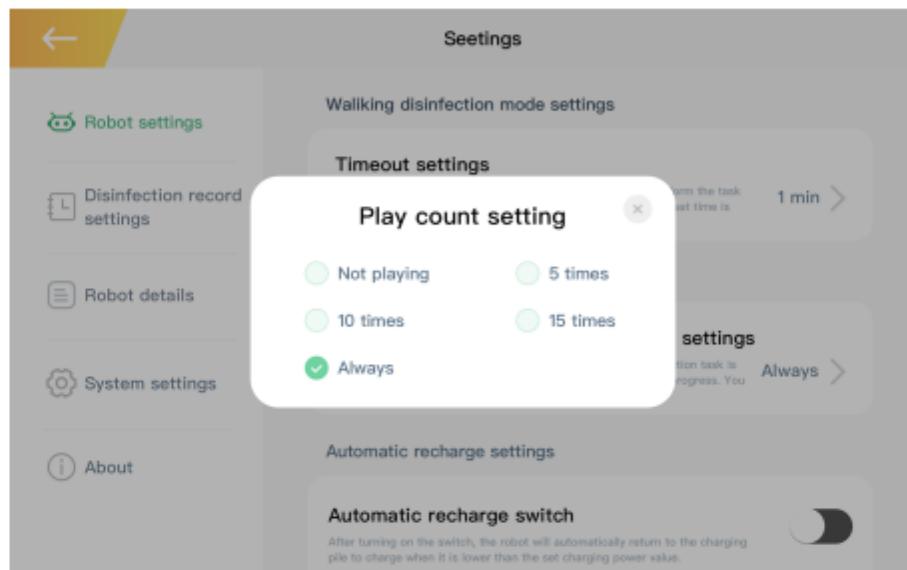
The detailed setting function description is as follows:

\*Timeout setting: When the robot is unable to perform the task normally due to a special obstacle, the robot will start the timeout mechanism when the set time is reached to assist the robot in solving the abnormal problem. The timeout settings are divided into 2 minutes, 5 minutes, 10 minutes (recommended), 20 minutes and 30 minutes.



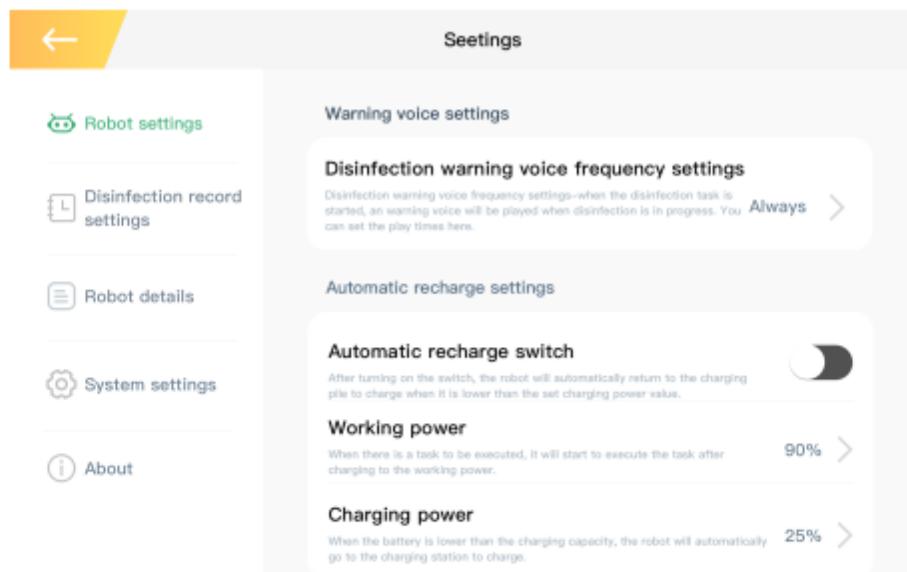
"Warning voice settings" can be directed to the "**Disinfection warning voice sound frequency setting**", the detailed setting function description is as follows:

\*Disinfection warning voice frequency setting: Disinfection warning voice frequency setting-when a disinfection task is started, an warning voice will be played when disinfection is in progress. You can set the number of times to play here. The setting of the number of disinfection warning voice is divided into not playing, 5 times, 10 times, 15 times and always report.

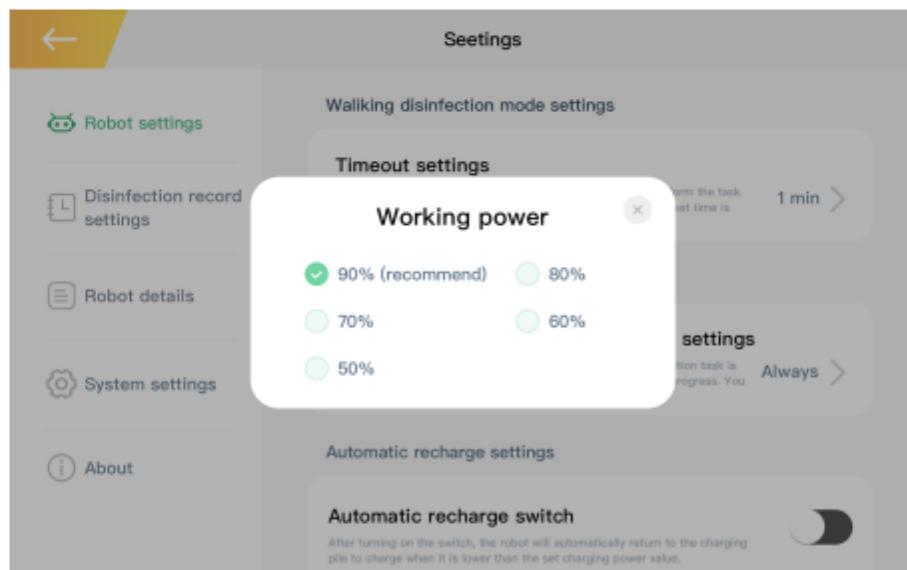


The automatic recharging setting is divided into "Automatic recharging switch", "**Working power**" and "**Charging power**". The detailed setting function description is as follows:

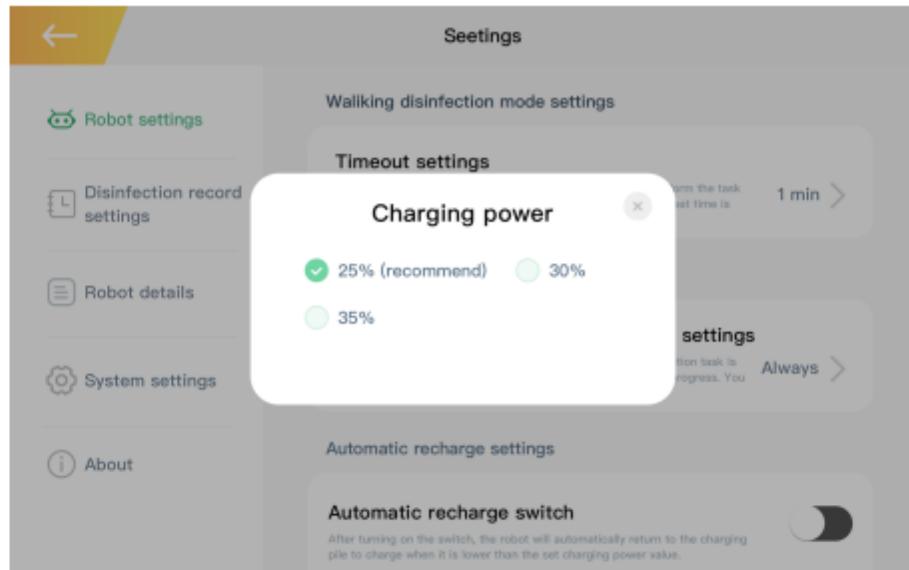
\* Automatic recharging switch: The automatic recharging switch is divided into two states: "on" and "off". When the automatic recharging switch is turned on, the robot will automatically return to the charging pile when the amount of charging power is lower than the set value.



\* Working power: The purpose of setting the working power is that when there is a task that needs to be executed, the work will start after being charged to the working power. The power percentage setting of the working power is divided into five values: 90%, 80%, 70%, 60%, and 50%. The recommended working power percentage is 90%.

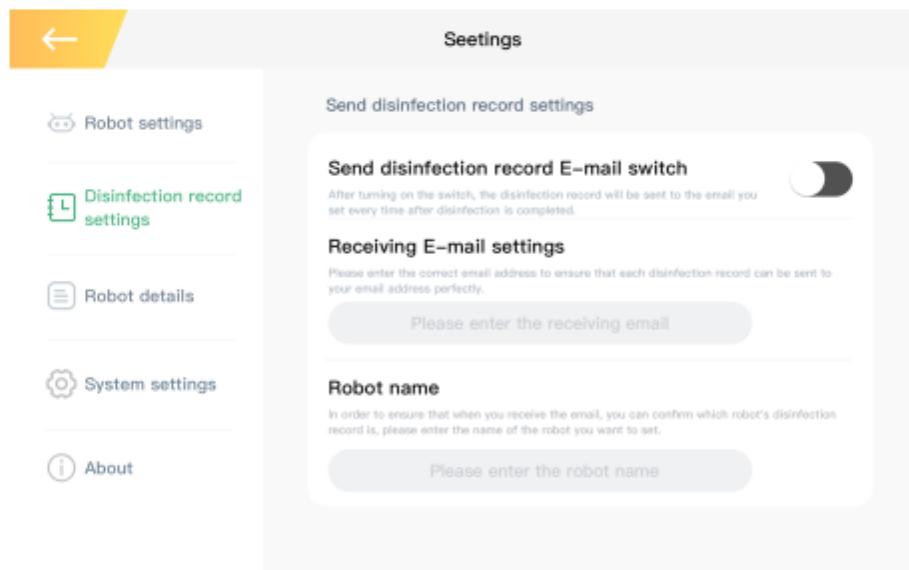


\* Charging power: The purpose of charging power setting is that when the battery power is lower than the charging power, the robot will automatically charge to the charging station. The charging power percentage settings are divided into 25%, 30%, and 35%, and the recommended charging power percentage setting is 25%.



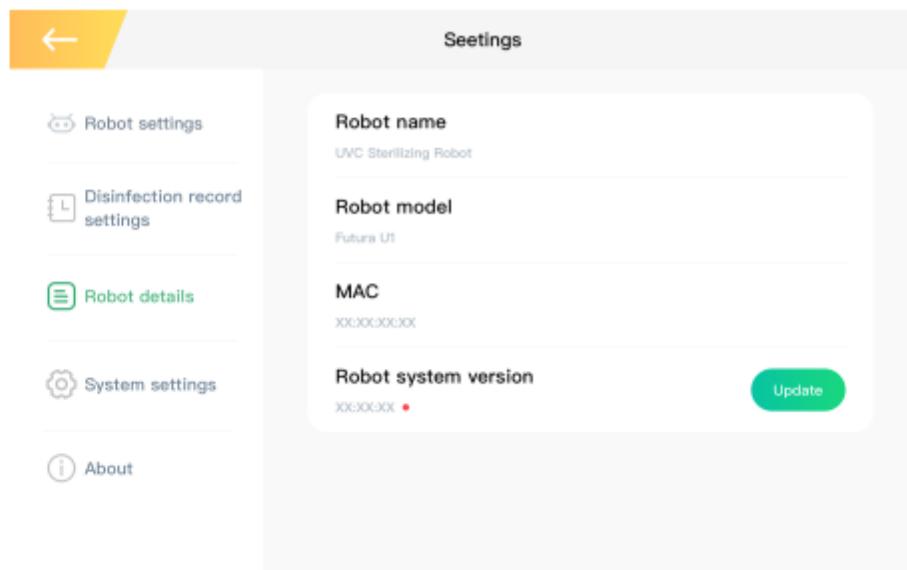
## 6.4.2. Disinfection record settings

The main function of the "**Disinfection record settings**" is to send the disinfection record of the robot to the designated email via email. This function must ensure that the robot network is connected, otherwise the disinfection record cannot be sent effectively.

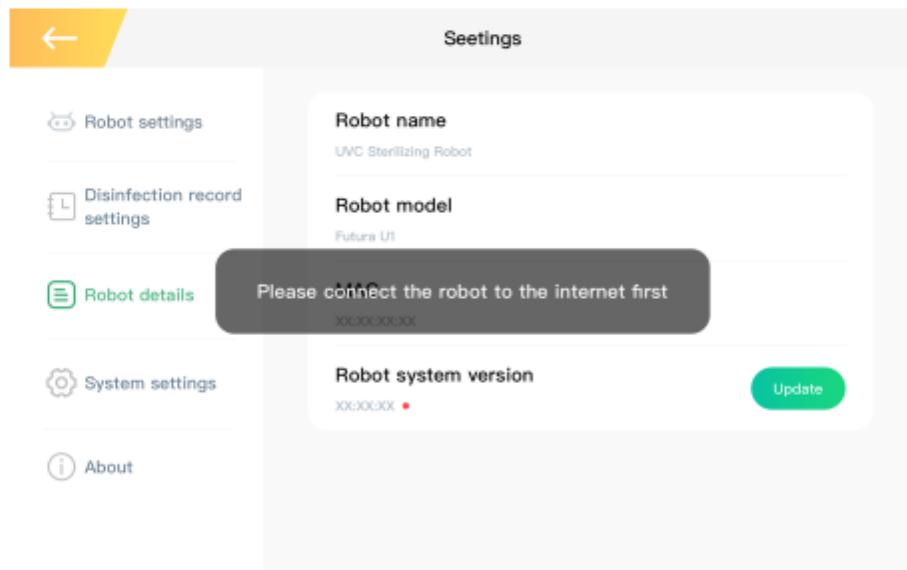


## 6.4.3. Robot details

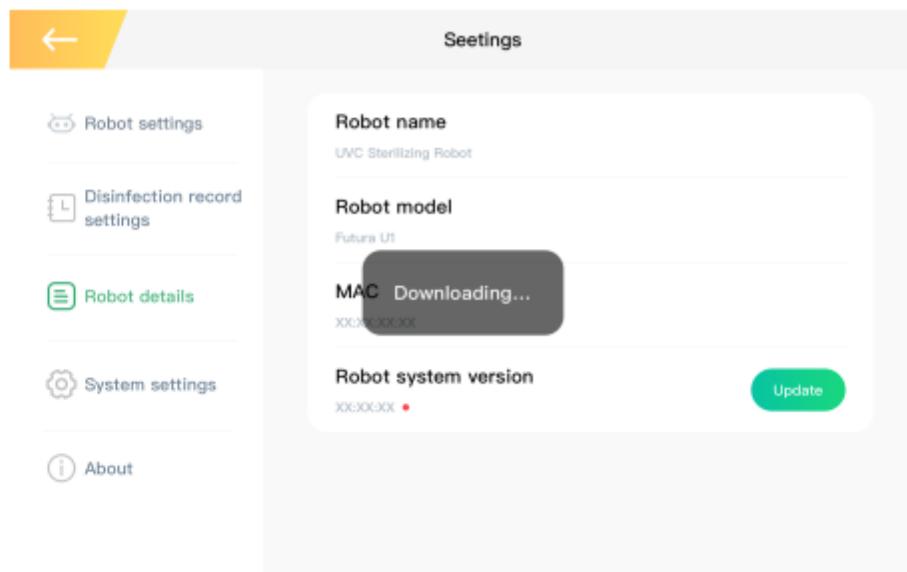
The robot details include "**Robot name**", "**Robot model**", "**MAC**" and "**Robot system version**".



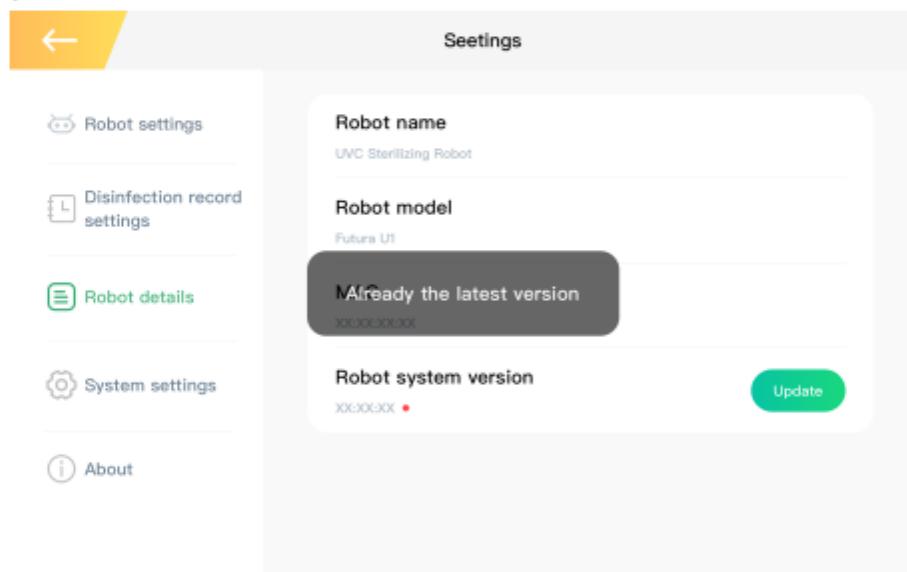
\*Robot system version: The version of the robot system will be monitored. When there is a new version, a red dot reminder will be displayed, and you can click the "Update" button to update the system version. When the robot is not connected to the Internet, when you click "Update", you will be prompted to connect to the Internet, please refer to 6.4.4 for the Internet connection operation).



When the robot is connected to the Internet and the version needs to be updated, it will download when you click Update.

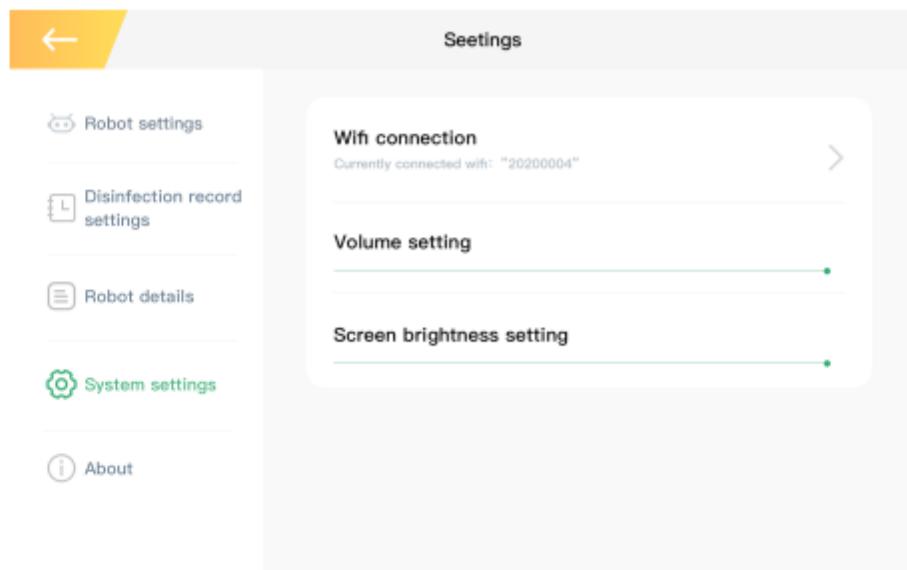


When the robot is already the latest version, clicking update will display to inform you that it is the latest version.



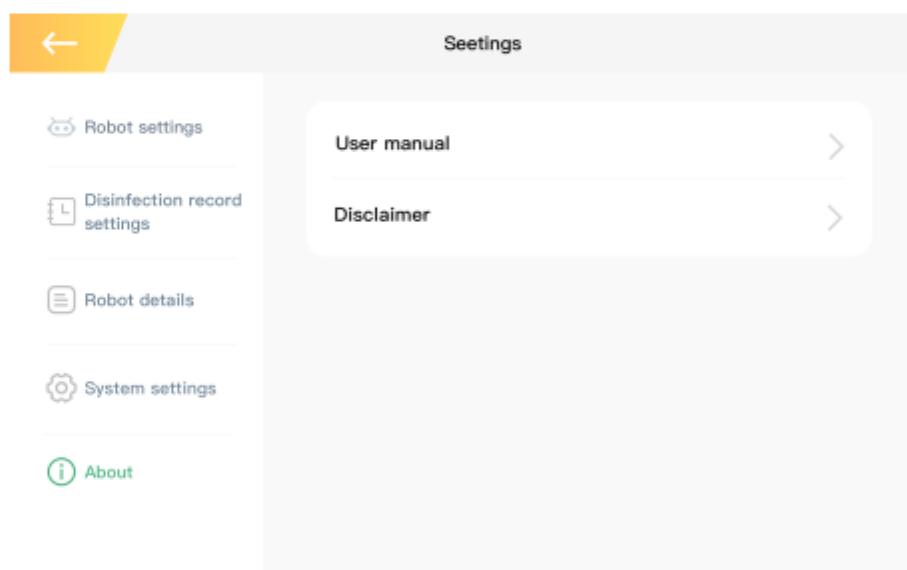
#### 6.4.4. System settings

The system settings are divided into "**WiFi connection**", "**Volume setting**" and "**Screen brightness setting**".



### 6.4.5. About

About is divided into "**User Manual**" and "**Disclaimer**".



## 7. Automatic recharge

First of all, the automatic recharge switch can be set in the settings (see 6.4.1). When the automatic recharge switch is turned on, the robot will automatically recharge according to the following logic.

\*Automatic recharge logic for scheduled disinfection tasks –

	Power is lower than charging power	The power is between the charging power and the working power	Power is higher than working power
No task	Automatic recharge	Stay at the charging point	Stay at the charging point
Task in progress	Recharge after the task is suspended, and perform the task after charging to the working power	Continue the task	Continue the task
Scheduled tasks are ready to be executed	After charging to the working power, perform the task	Start execution task	Start execution task

\*Automatic recharge logic for immediate disinfection tasks –

	Power is lower than charging power	The power is between the charging power and the working power	Power is higher than working power
No task	Automatic recharge	Stay at the charging point	Stay at the charging point
Task in progress	Recharge after the task is suspended, and perform the task after charging to the working power	Continue the task	Continue the task
Start an immediate disinfection task	It cannot be started, and the immediate disinfection task can be started until the charge exceeds the charge capacity.	Start execution task	Start execution task

## 8. Accessories instructions

### 8.1. Joystick



The joystick is used to control the robot, and the robot can be controlled without the cumbersome PAD login.

When the joystick is in the normal power-on state of the robot, insert the joystick receiver into the "Navigation" hole of the robot. After connecting, just press the A button and press the front, back, left and right keys to operate the robot control.

## 9. Appendix

### 9.1. Troubleshooting instructions

#### 1.What should I do if the robot fails halfway?

First confirm whether the robot is turned on. If it is not turned on, please try to turn it on and press the RESET button. If it cannot be turned on, please confirm whether it is dead, if it is dead, try using a hand charger to charge it. After successfully booting, you can use the handle to control the robot to the charging pile and re-plan the disinfection task.

If the fault is halfway for many times, and it has not been effectively solved, please try to contact after-sales personnel.

#### 2.The robot cannot walk and the wheels will not move?

Please confirm whether the emergency stop switch is pressed, if it is pressed, release it to unlock it.

#### 3.The robot cannot be turned on?

Please check if charging is required. Check whether the machine process is correct.

## 9.2. Care instructions

This chapter needs to be read quite carefully. It is recommended that after using U3, you need to perform simple routine maintenance work once a week.

The work content is as follows:

1. Please use the handle to connect the robot, and listen to whether there is any abnormal sound when walking. If any abnormality is found, please contact after-sales personnel.
2. Please check whether there is any damage on the appearance of the robot. If there is related damage, please contact after-sales personnel.
3. Please check the disinfection record, check the detailed record of the robot task this week, check whether there is any abnormality in the task, if the record shows that the abnormality is serious, please contact the after-sales personnel.
4. Please check the spray column and nozzle for foreign matter, damage, etc. If the damage is serious, please contact after-sales personnel.
5. Please wipe the provided tablet.
6. Please wipe the handle provided.
7. If the robot is shut down and not in use for a period of time, please unplug the charging pile as well.

Note: Do not use alcohol or any highly corrosive chemical products for wiping.

It is recommended that you use cleaning fluid.

## 9.3. FAQ

1. How to charge the tablet?

A: Please use the provided MicroUSB cable for charging.

2. Why won't U3 automatically charge?

A: First, please confirm whether a charging point has been established. When you have not established a charging point, you cannot perform any tasks, and U3 cannot perform charging. Second, please confirm whether you turn off the automatic charging switch in the robot software. You can check and change it in the robot software. Third, please confirm whether your charging point and the position of the charging pile are the same. If they are inconsistent, U3 cannot perform automatic charging. Fourth, if you have checked the above conditions correctly and U3 still does not perform automatic charging, please contact after-sales personnel.

3. Is there a time limit for U3's automatic charging?

If you turn on the automatic charging function, you can 7\*24 hours without managing the charging time. As long as the U3 is lower than the charging power set by you (the system default is 25%), it will automatically charge.

4. Can the scheduled disinfection task be cancelled?

Yes, you can delete tasks in the task list on the homepage.

5. After the task is started, I find that this is not the task I want and can be terminated immediately?

When U3 is going to the disinfection point or is disinfecting, there is a button in the interface that can be clicked to stop the robot disinfection.

6. How do I know whether the robot disinfection is successful?

You can click on the disinfection record on the robot side, there will be a detailed disinfection record in the record, and you can check whether the disinfection is normal.

7. How to add disinfectant liquid?

Please open the black cover on the robot (left and right ends). After opening, you can add liquid, but please do not pull out the nozzle column and add liquid to the middle opening, otherwise the robot will be damaged.



#### 8. What can the emergency stop switch do?

After pressing the emergency stop switch, U3 can be prevented from walking.

#### 9. Where can U3 be used for disinfection?

U3 is suitable for biosafety laboratories, infectious wards, ICU wards, inspection departments, scientific research institutes, dust-free workshops, schools, food companies and other spaces that require regular disinfection.

#### 10. How to prepare disinfectant liquid?

Please follow the instructions of the disinfectant tablet you purchased for dosage allocation, and must abide by the rules for the use of the disinfectant tablet, and there should be no safety problems caused by non-compliance with the rules.

### 9.4. Contact details

Address: Room606-1,No.3 Building of Zhonghao International Center,No.672 Xintang Road,Jiangan District,Hangzhou,Zhejiang,China

Phone: 0571-87919519

URL: [www.futuralrobotics.com](http://www.futuralrobotics.com)

E-mail: [sales@futuralrobotics.com](mailto:sales@futuralrobotics.com)