

ATEAGO S1 Cleaning Robot User Manual

Version: 1.5.4s



Note: This document provides machine-related deployment procedures and precautions. Follow the instructions in the document to avoid other abnormal situations when using the machine in the future.

Introduction to Robots

Use environment requirements

Please use this product in accordance with the instructions of the manual.

Any loss caused by improper use shall be borne by the user.

- ✓ Do not use in places with stairs or drops
- ✓ There should not be a lot of black marble and black reflective cabinets at the height of 27 cm
- ✓ Do not travel on the ground with high friction: thicker and softer carpets
- ✓ Do not use in a large amount of stagnant water and similar environments
- ✓ There should be no densely placed thin-legged chairs in the travel area
- ✓ Do not use in an environment above 50°C and below 0°C
- ✓ Do not use on uneven and sloped roads
- ✓ There are a lot of transparent glass and thin-legged tables and chairs, which can be used depending on the construction of the map and the test situation

Hardware parameters

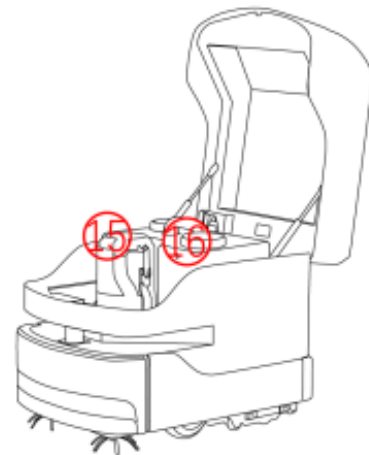
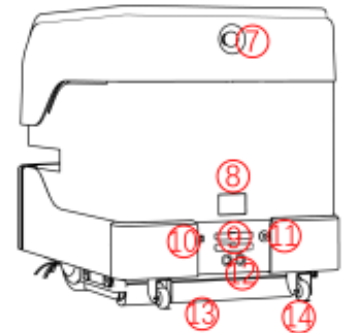
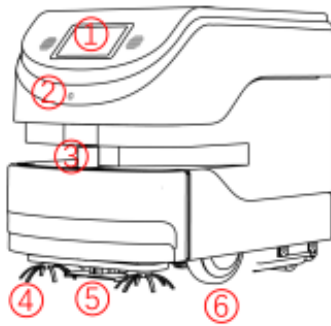
Hardware parameters	Index performance
Product specification	
Product Size	Length 684mm * Width 500mm * Height 600mm
product weight	80kg with packaging
Product color	white
product material	3D printed parts
Environmental requirements	Storage temperature: -15°C~55°C; Working temperature: 0°C ~ +50°C Humidity (RH): 10%~90%
Android specifications	
operating system	Android 5.1
language support	Chinese
Processor type	RK3128
RAMLPDDR3	1G
Built-inNAND FLASH	8GB
USB Debug port	Micro USBinterface
Display screen	7 inch, IPS screen (16:9) resolution 1024X600
External I/O port	1 USB 2.0 (MICROUSB), RJ45 network port
speaker	4Ω/3W Mono speaker

Wireless technology AP6255	Support dual frequency 2.4&5G WIFI 802.11b/g/n non-domain network cable office 11ac 5.15GHz-5.825GHz
ROS Navigation specifications	
operating system	LINUX
Lidar	Laser wavelength 905 nm, working area 270°
Single axis gyroscope sensor	Yaw angle measurement
hard disk	32G high-speed solid state drive
motor driven	6.5 inch hub motor
Infrared sensor	Communicate with charging piles within 1 meter
512AN_HMW module Intel WIFI	Support dual frequency 2.4&5G WIFI&BT4.1 802.11b/g/n wireless LAN 11ac 5.15GHz-5.825GHz
Moving speed	Min 0.1 m/s, max0.5 m/s
Navigation board	Intel Core I5 motherboard
Remote function	Support remote navigation status monitoring, remote online update navigation system
Light tube	
UV lamp	16W

Water tank	
Volume	15L
Power system	
24V Rectifier	LPS-425-40A24U DC24V output power 48W rectifier
Motor	Vacuum cleaner, solenoid water valve switch, suction pump motor, roller motor
charging method	Automatic recharge, DC direct charge
adapter	enter: AC110-240V.50-60HZ Output: DC43.2V-5A
Robot input power	42V--5A
battery	25AH lithium iron phosphate, 38.4V/960W
Charging pile parameters	Overcurrent protection, intelligent power off, output rated voltage: 43.2VDC, output rated current: 5A
Charging time	5.5-6 hour
Battery life	4-6 hour

Meet your robot

1. 7 inch display
- 2.3d camera
3. Lidar
4. Brush strip
5. Dust suction port
6. Driving wheel
7. Emergency stop switch
8. Infrared sensor
9. Automatic charging shrapnel
10. Absorbent sponge
11. Direct charging source hole
12. Ultrasound
13. Clean the sponge
14. Universal wheel
15. Trash box
16. Water tank



Cleaning precautions: ① Touch screen ③ Laser navigation. Do not wipe with a wet towel to avoid water ingress!

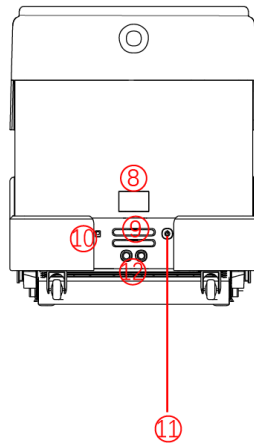
Precautions for use: ③ Laser: Do not block the laser with objects

⑦ **Emergency stop switch:** The emergency stop switch can only be rotated to the right, do not rotate to the left

Use your robot

1. Boot

The power button is located on the base 11 on the back of the robot. It is a button switch. Press it once to turn it on, and press and hold the power button for 3 seconds to turn it off.

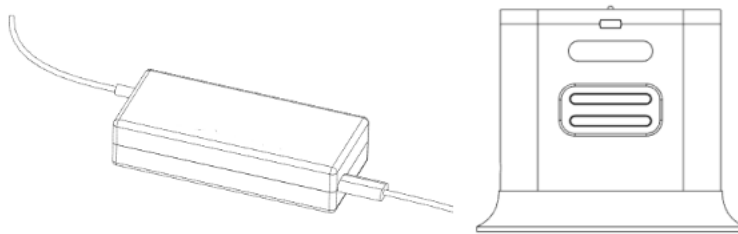


Note for shutdown: Press and hold the power button for 3 seconds, the display will turn off the screen first, and then the motor will be powered off, and finally the chassis light will go out!

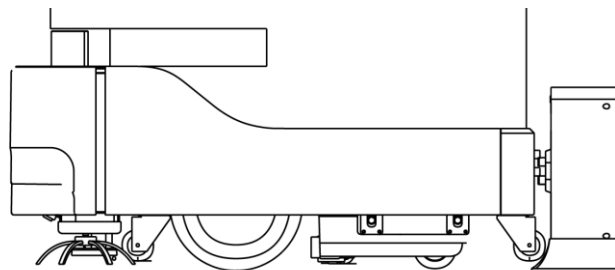
2. Charging

Get to know your charger

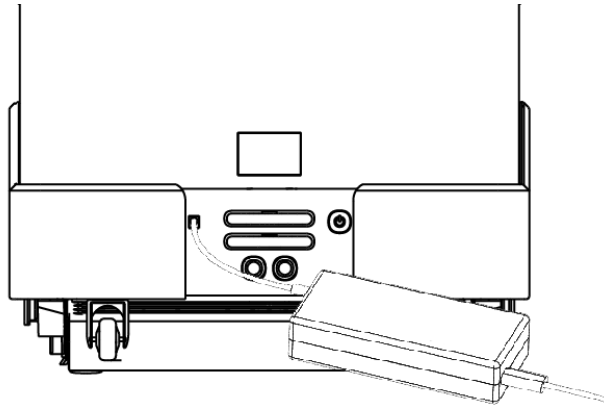
The adapter plug needs to be plugged into the 110-220 V voltage, and the DC head is plugged into the automatic charging pile. At this time, the green light of the charging pile will be on, indicating that it is ready to charge.



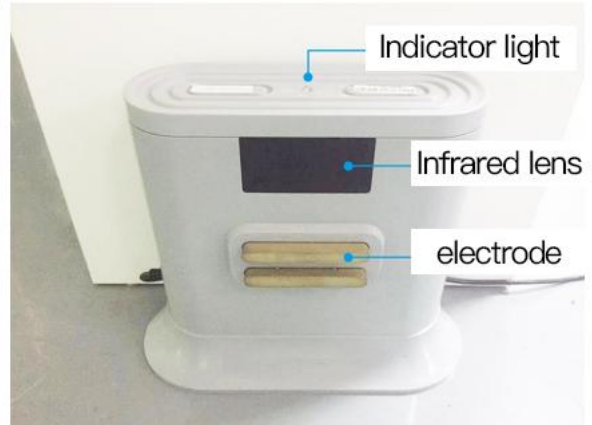
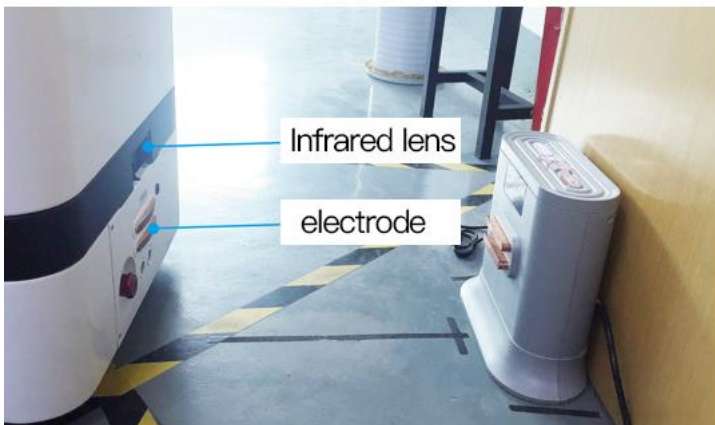
Automatic charging: the robot can automatically detect the power and charge automatically when the power is lower than the set threshold (prerequisite: it is necessary to build a good map to mark the point of the charging pile, the calibration method is as follows)



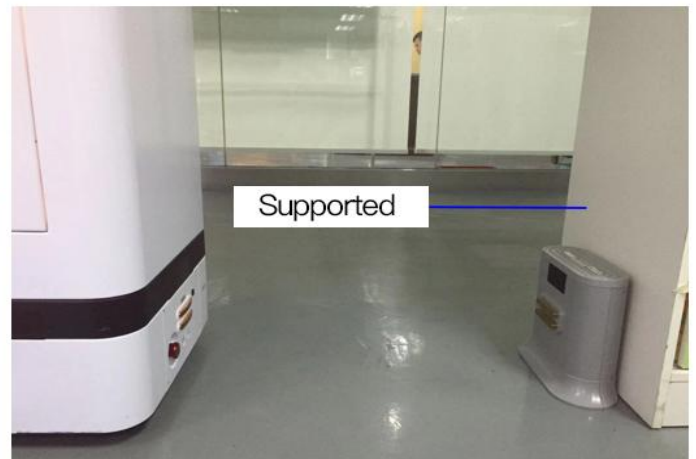
Direct charging: plug the power adapter cable into the power supply on the back of the robot



Automatic charging hardware description

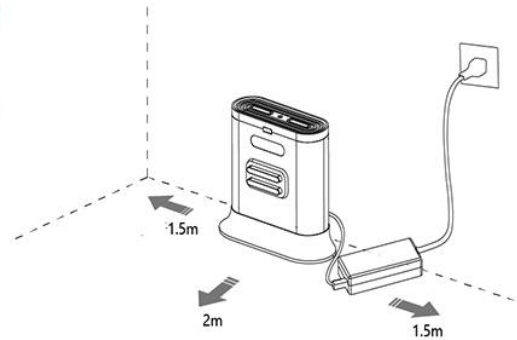


Placement of charging pile



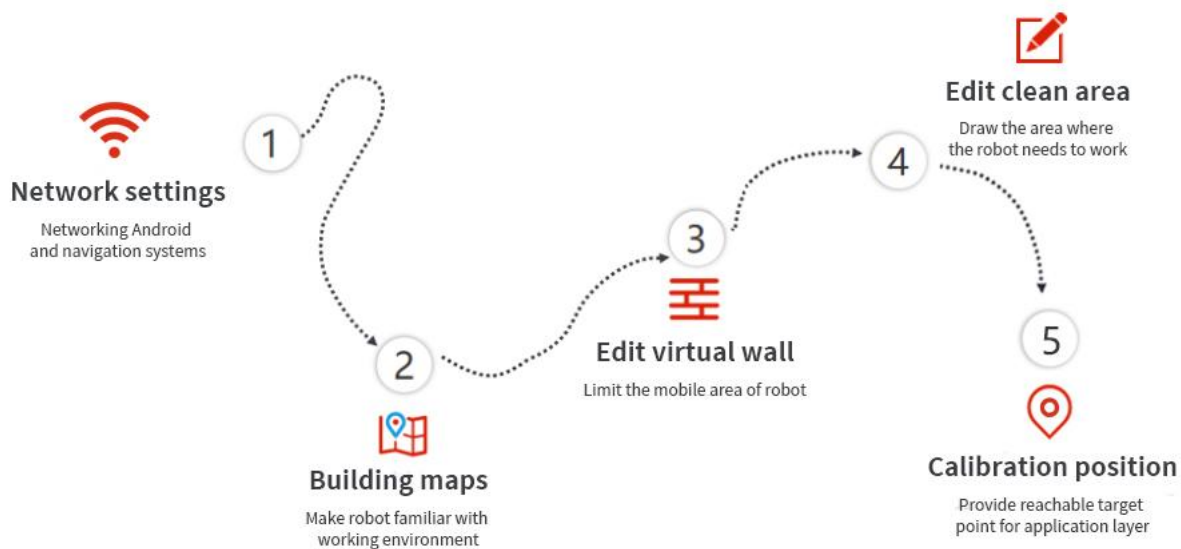
Notes on the selection of charging pile location

- The location of the charging pile must be selected within the map and placed against the wall;
- Obstacles within 2 meters in front of the charging pile and within 1.5 meters on both sides;
- Place the charging pile to avoid moisture, dripping, high temperature environment;
- When multiple charging piles are placed, the charging pile spacing is not less than 1.5 meters;



3. Navigation

Note:The following content is an introduction to all the functions of the robot deployment background. The functions that must be operated are as shown in the points 1, 2, 3, 4 and 5 in the following figure. Other functions depend on the specific scenarios and usage conditions.



The step 1 [Network Settings]

Note: The router network segment cannot be the 192.168.10.x network segment

1. Open the [Settings]-[WLAN] on the Android screen of the robot to connect to Wi-Fi
2. Open the Ftp application and enter the following interface. Follow the steps shown in the figure. If the Wi-Fi password already exists, click "Send Wi-Fi Information to Connect to ROS".

Please enter WIFI SSID ①

JJCC_5G_Wi-Fi5

Please enter WIFI password ②

jcan123456

Send WiFi information to connect to ROS ③

ROS IP:JJCC_5G_Wi-Fi5:192.168.3.157 ④

Nav system version:RMB101-ROS-I5-B1.4.8

ROS hostname:wbot11u-210304-001-001

Laser data:laser[0.28]

ROS log

- ① Check the Wi-Fi name you want to connect to
- ② Enter Wi-Fi password
- ③ Send Wi-Fi information to the navigation system (just click once, don't click repeatedly)
- ④ Show IP for connection success (show 127.0.0.1 for connection failure)

3. The scanning device should be connected to the same LAN as the machine. Open the browser and input the IP address of the machine (Chrome browser is recommended)

If the Wi-Fi connection fails, you can click ③ again to reconnect. If it still fails, you can connect to another network.

The step 2 [Build mode]

The purpose of building the map is to let the robot know the working environment

- The robot needs to scan the actual environment and construct an "original map". During the navigation process, the robot can compare with the original map based on the real-time scanning situation and find its own position.



Actual environment

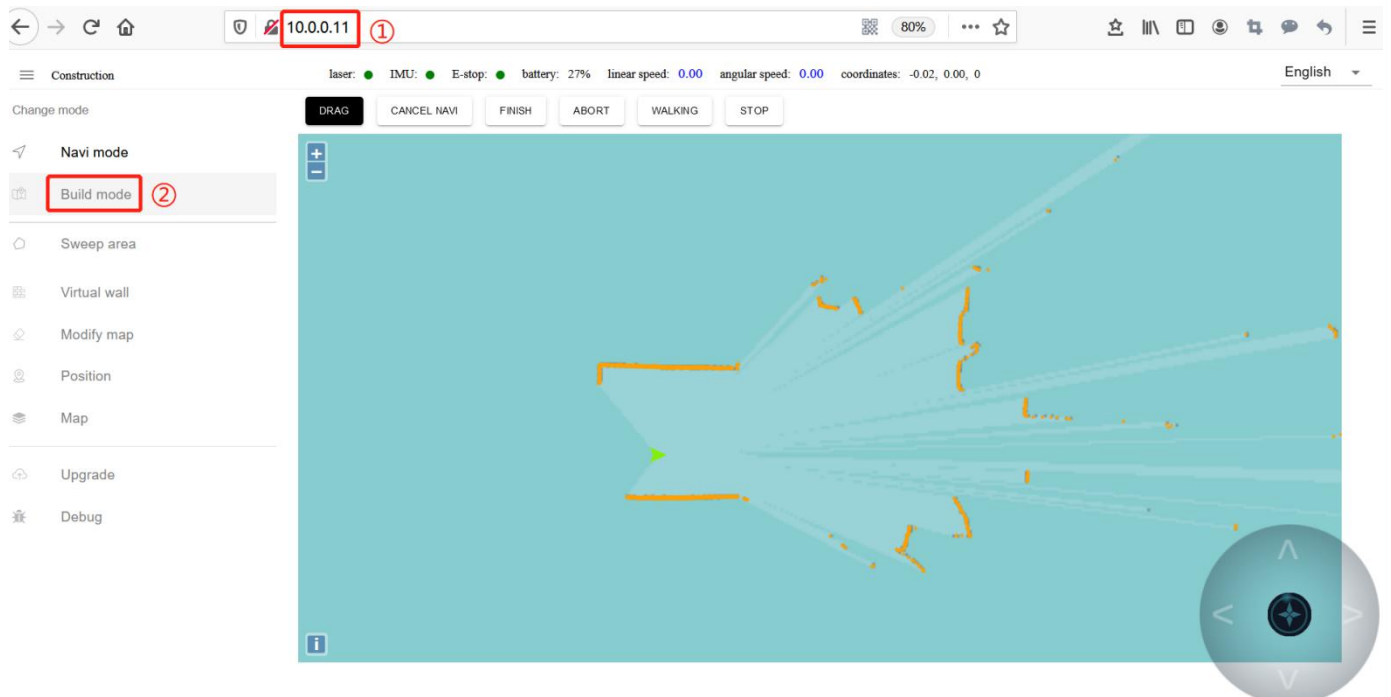


The map scanned by
the robot's laser

- The viewing angle of the Lidar is 270° , and the scanning range is the horizontal plane of the radar height; the scanning distance is 20 meters
- Ask people to stand behind to push the robot, or use the keyboard arrow keys to control the mapping



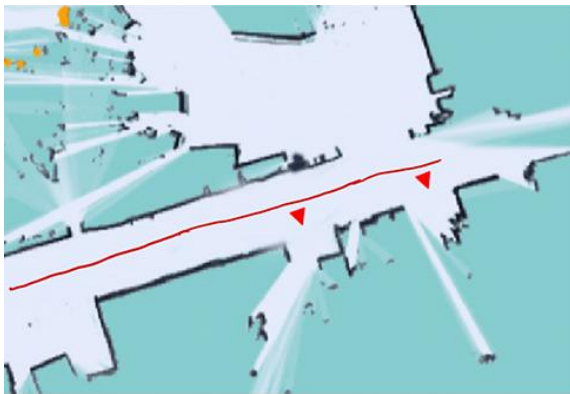
1, After entering the webpage, the default state is "Navigation Mode", click to switch to "Mapping Mode" and select "Laser Mapping" to enter the state as shown below to start scanning.



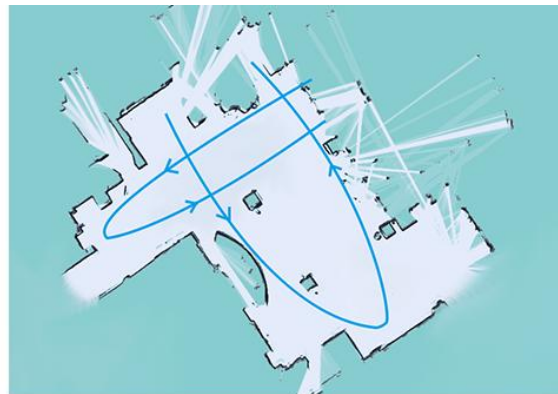
①Get IP from FTP software

②Switch to mapping mode and select "Laser Mapping"

2, After entering the "map mode", the machine first rotates in place to clean the surrounding feature points, and the speed should not be too fast when rotating, and the machine can be controlled to go after one rotation. In narrow areas, you can walk straight. Pay attention to the gaps during walking. Slowly rotate the machine 90° facing the gap to clean the feature points, and then slowly turn back to continue scanning; open areas can follow the U-shaped route, as follows:



straight line



u-shaped route

3, When controlling the machine to go, pay attention to whether the laser matches the actual terrain. If it does not match, stop and wait for a while, wait until the laser matches the actual terrain before continuing. As shown below:

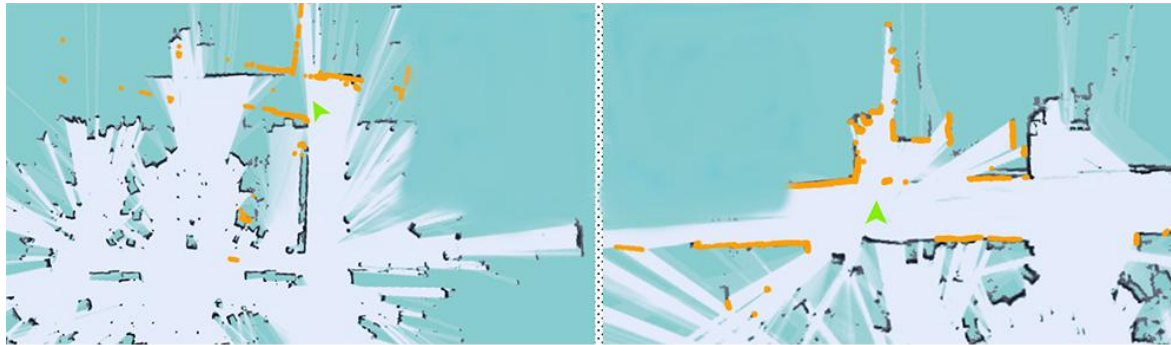


figure 1

figure 2

Figure 1: mismatch between laser and terrain (when the laser does not match the terrain, stop and wait for the laser to match the terrain before pushing the robot to build the map)

Figure 2: matching of laser and terrain (some areas need robot to turn to be able to scan clearly, such as wide terrain and room)

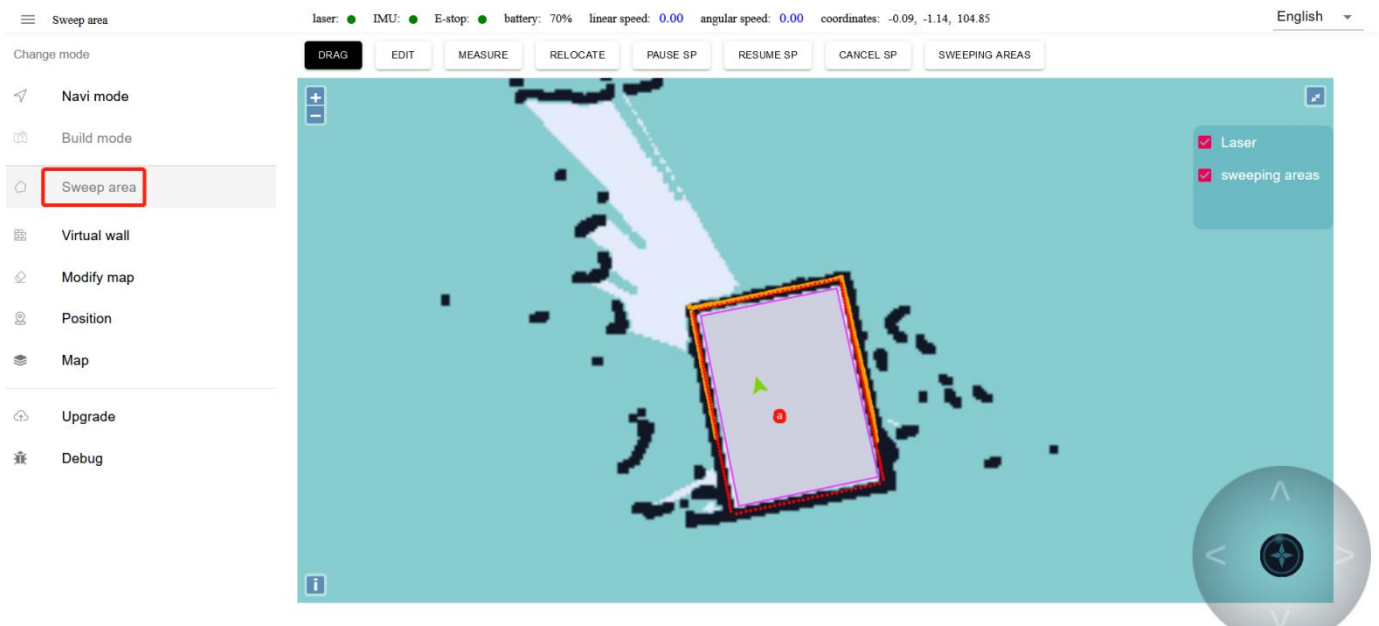
4, Do not move the machine after the machine reaches the end point. Just observe whether the map is clean, without ghosting and matches the actual terrain. If there is no obvious dislocation, click "composition completed". If there is any dislocation, please wait for a period of time, and the algorithm will correct it. If the correction is not successful in 10 minutes, consider rebuilding the map.

matters needing attention:

1. When pushing or controlling the robot, walk slowly and observe whether the laser matches the terrain. If there is a mismatch, stop and wait for the laser to match the current terrain.

2. After the robot reaches the destination, observe whether the map is clean without ghosting and matches the actual terrain. If there is no obvious dislocation, click "composition complete". If there is any dislocation, please wait for a period of time, and the algorithm will correct it. If the correction is not successful in 10 minutes, consider rebuilding the map.

Step 3 [Edit clean area]



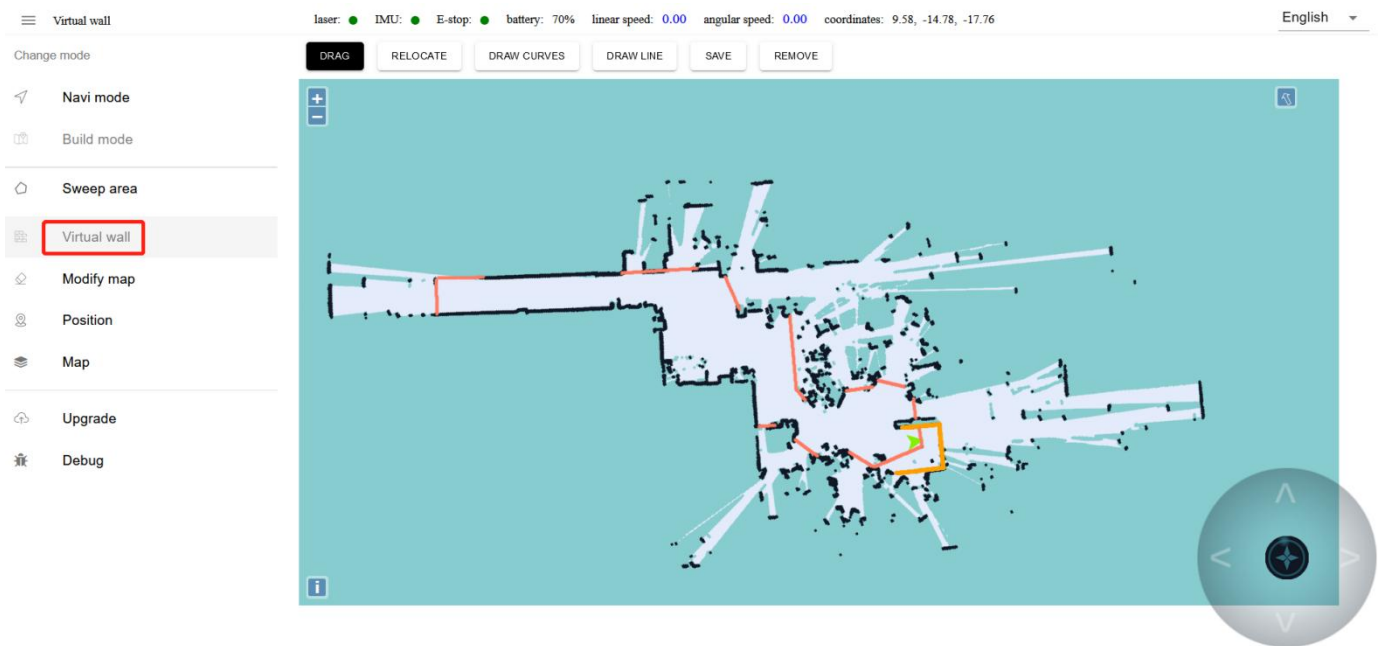
Edit: Use polygons to draw the area that needs to be cleaned

Ranging: measuring distance

Clean area: Click to pop up all clean areas for editing

The step 4 [Virtual wall]

Edit the function of virtual wall: restrict the active area of robot



Drag: This mode can zoom, pan and rotate the map. In this mode, press "ctrl+left mouse button" to select a rectangular area, and the virtual wall in this area will be cleared

Draw a curve: often used to draw irregular terrain

Draw a straight line: connect two points to form a straight line, which is often used for regular terrain or rough drawing of an area

Save: Only click save to save the drawn virtual wall

Clear: Clear all virtual walls (need to click save to take effect)

Example: glass wall

Note: the laser can penetrate the glass, so when drawing the virtual wall, pay attention to the virtual wall outside the glass



figure 1



figure 2



figure 3

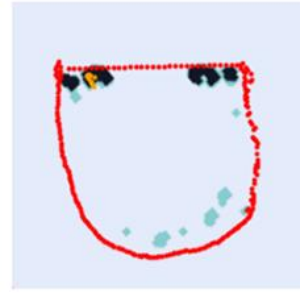


figure 4

figure 1 Actual environment figure 2 Map scanned by laser

figure 3 error figure 4 correct

Example: table

Note: the laser can only scan one horizontal plane, so when drawing the virtual wall, consider the desktop projection

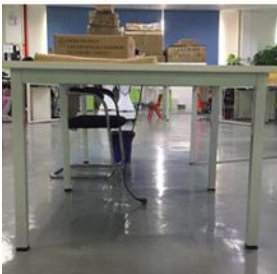


figure 1

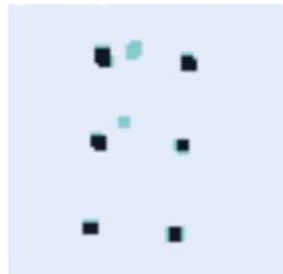


figure 2

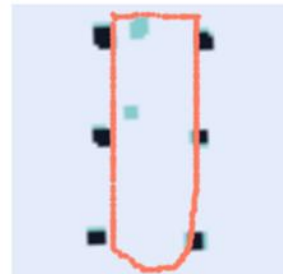


figure 3

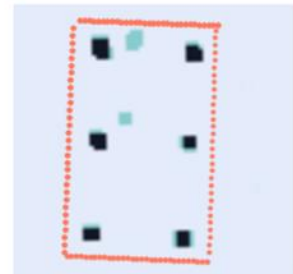


figure 4

figure 1 Actual environment

figure 2 Map scanned by laser

figure 3 error

figure 4 correct

matters needing attention:

1. The minimum passing distance of the machine is 1.5m, so attention should be paid when drawing the virtual wall

2. The main function of the virtual wall is to draw the robot's moving space and separate the areas where the robot does not want to travel with the virtual wall.

3. Some areas that do not need to be driven or cannot be scanned by laser (glass walls, tables and chairs, steps, transparent and fragile objects, etc.) please make sure to build virtual walls.

The step 5 [Modify map]

The function of editing map: correcting the errors in scanning map

Editing premise: The map has changed after the scan is completed, and the map editing function can be used to edit the map appropriately if the change

is not significant. If the map is too different from the actual environment, it is recommended to scan the map again.



- ① Click Save to apply the map modification
- ② Clear drawn polygons
- ③ Here is the drop-down menu. You can select different amount map area types

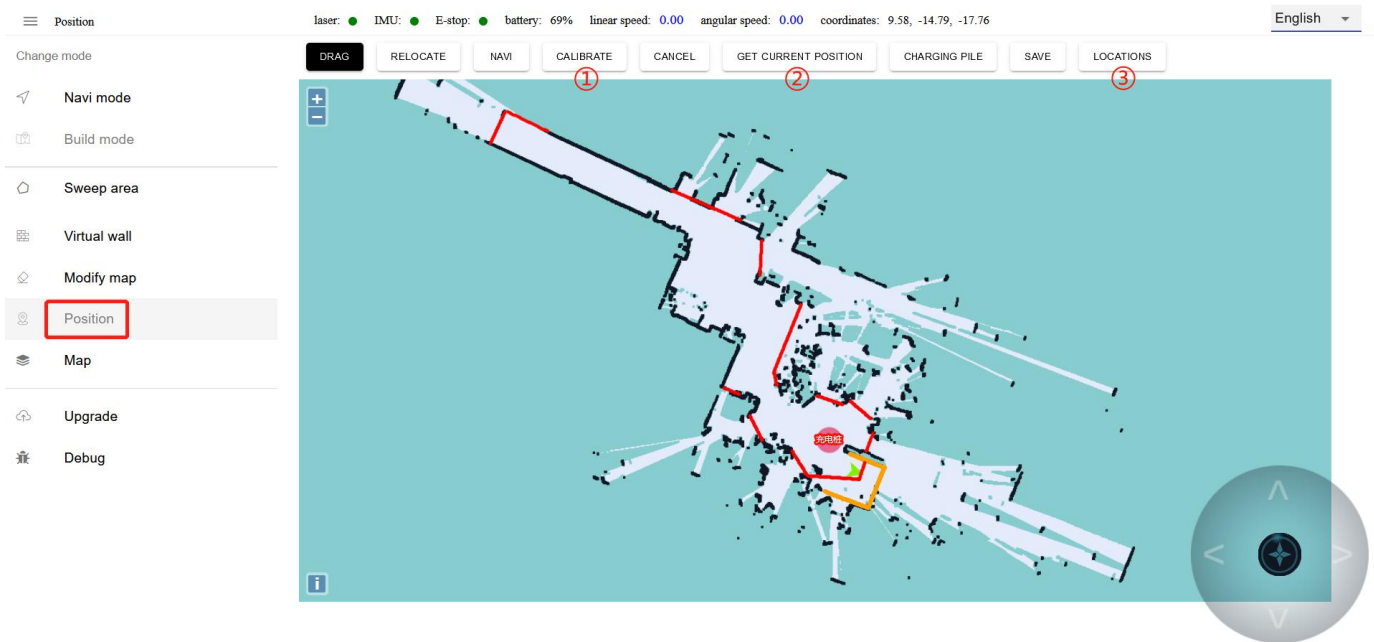
- **Blank area:** remove the noise (such as the noise left by pedestrians walking on the map and temporary obstacles, etc.) during the process of scanning the map. Do not remove the real obstacles as noise.
- **Obstacle area:** some real fixed obstacles may not be scanned very clearly

when building the map, so it is necessary to draw obstacles artificially on the map (note that the obstacles drawn must match the obstacles that can be swept by the real laser).

- **Unknown area:** some frequently changing feature points need to be drawn into unknown areas (for example, the area where robots will not walk outside the glass wall).

The Step 7 [Position]

The function of calibration location: provide reachable target points for business layer applications

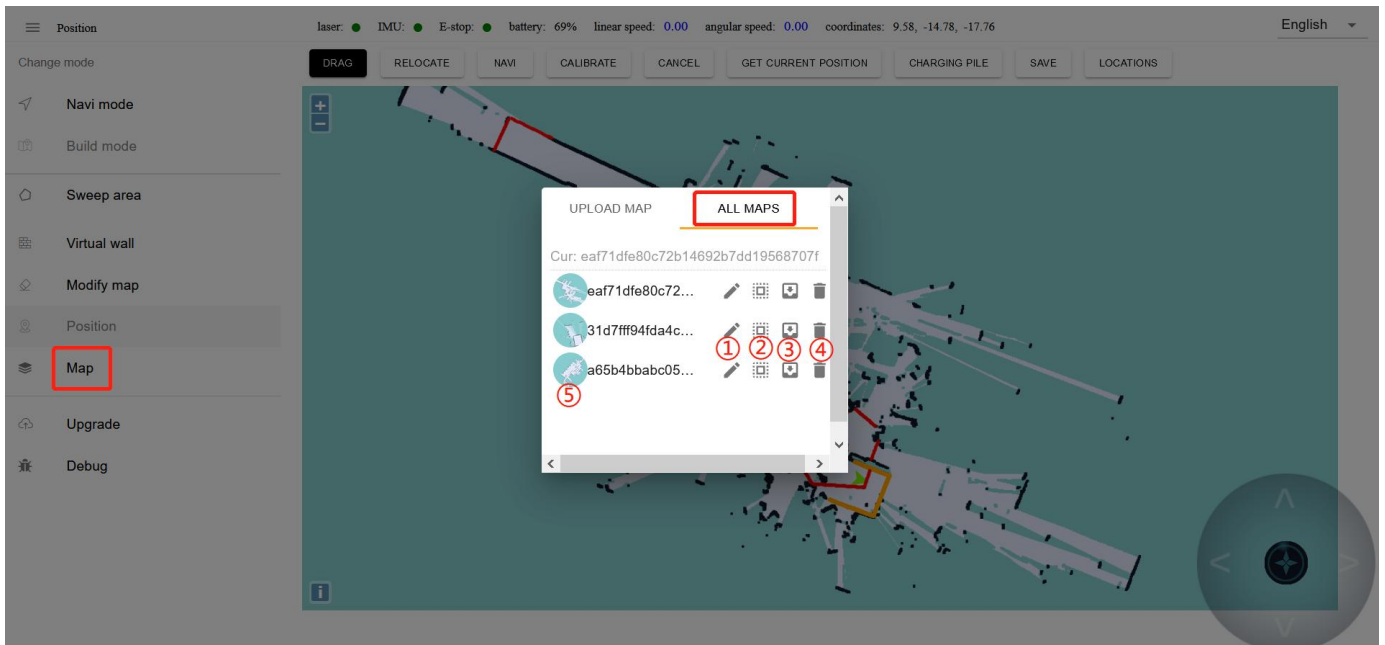


① You can drag on the map to get the coordinates of the specified location for calibration

② You can also get the current position of the robot for calibration

③ Click on the right side to pop up the toolbar

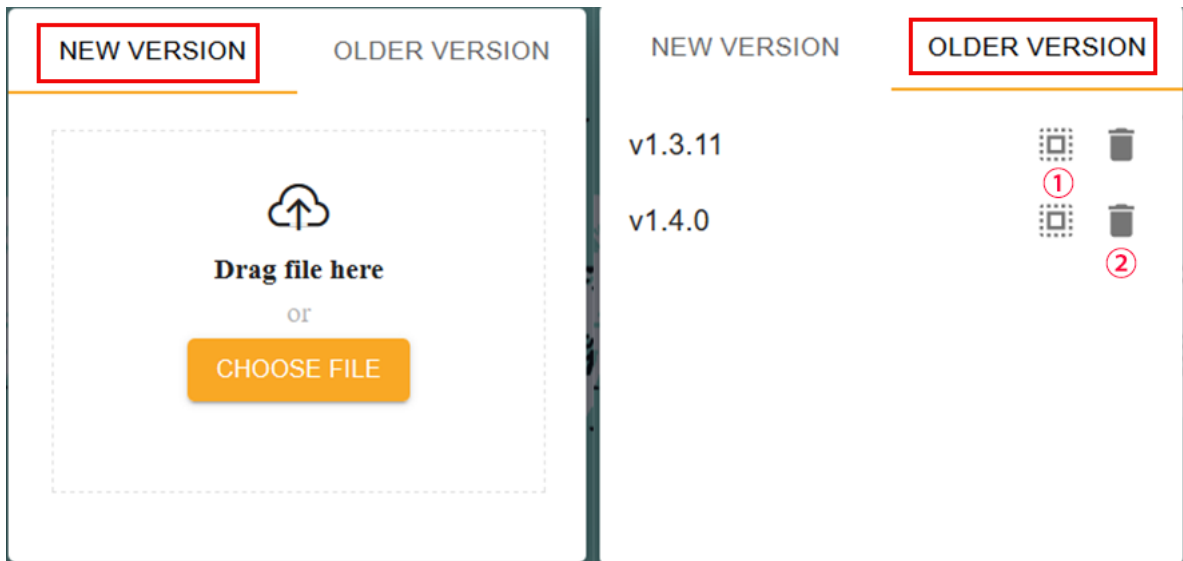
The Step 8 [Map]



- ① Edit map name
- ② Apply this map
- ③ Export the map to the computer
- ④ Delete this map
- ⑤ Mouse over to show preview map, click to show original image

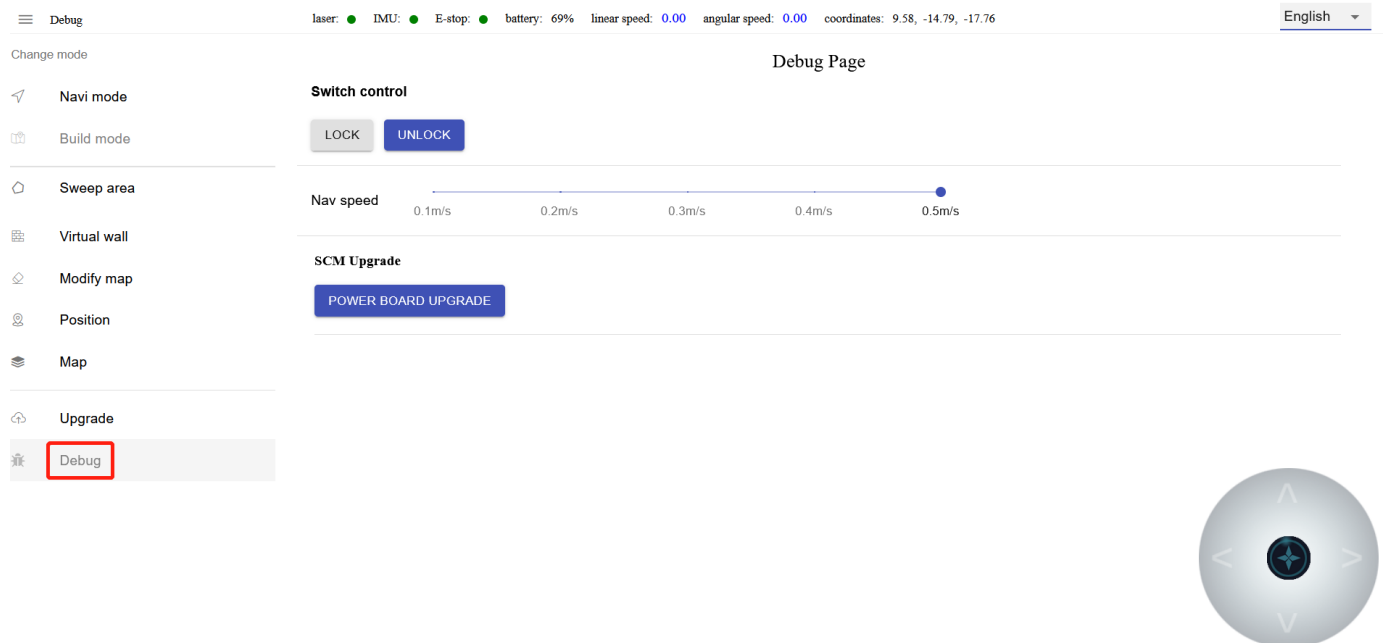
Note: The map will not be applied immediately after uploading, you need to find the row of the map in "All Maps" and click the "Apply" icon

The Step 9 [Upgrade]



- ① Apply this version ② Delete this version

The Step 10 [Debug]

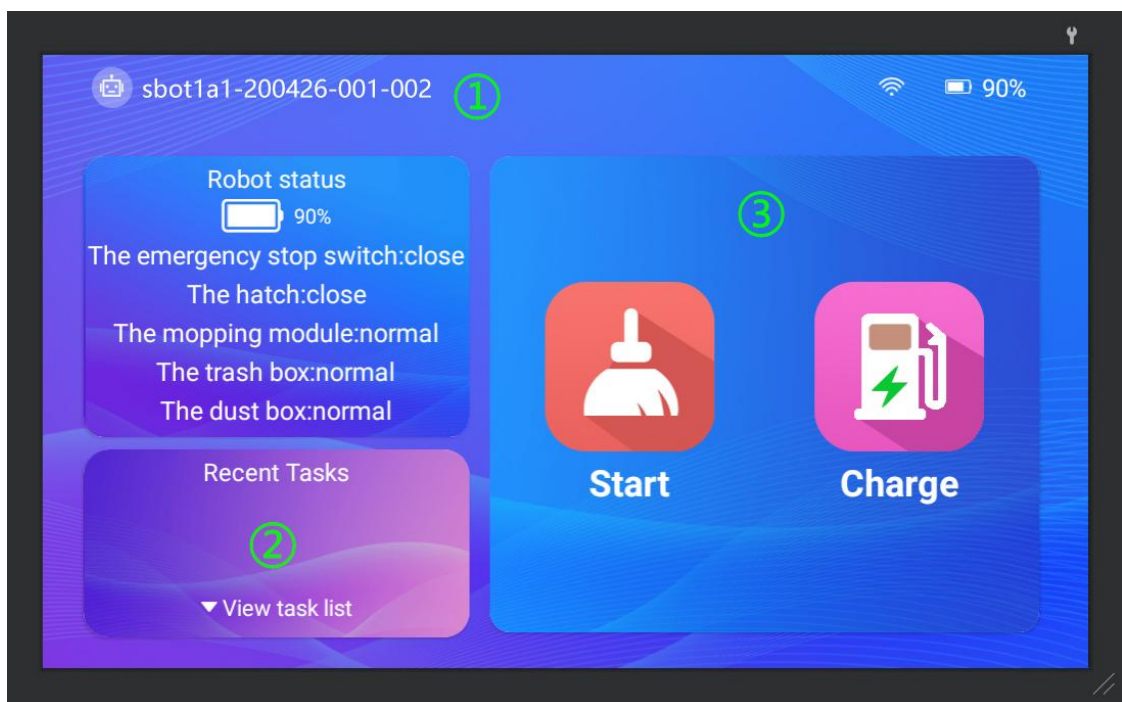


Navigation speed: adjust the travel speed of the machine (unit: m/s)

Perform cleaning tasks

Note: Before using this function, you need to deploy the map according to the previous steps

Open the "Clean Robot" APP on the Android screen and you will enter the following interface. The following figure shows the interface description:



① Click the machine number to enter the "System Settings" interface

②Click to enter the "disinfection plan setting" interface

③Click to start manual cleaning mode

1. System Settings



Starting up: Whether to start the application automatically when booting up

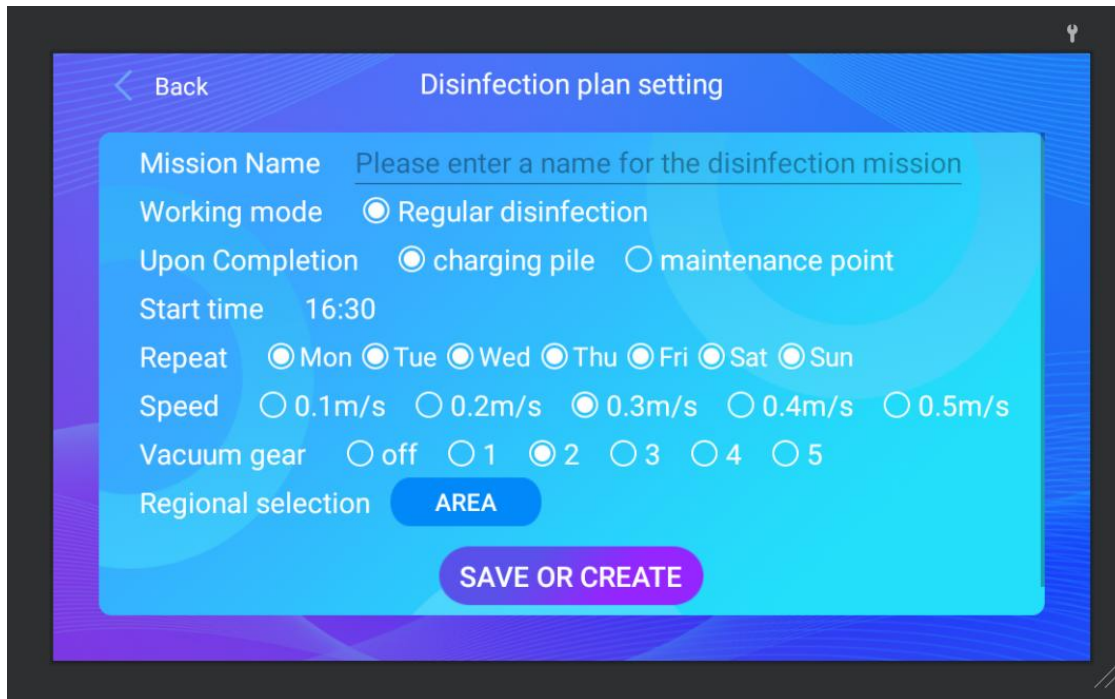
Minimum autocharge: when the power is lower than the set value, trigger the machine to automatically recharge

Task power: When the machine triggers "automatic charging" during the execution of a task, the machine will return to charging. When the set "task power" is reached, the machine will continue to perform unfinished tasks

Maintenance mileage: a prompt box will pop up when the machine reaches the set maintenance mileage

Application version: the APP version currently in use

2. Disinfection plan setting



The screenshot shows a mobile application interface for setting a disinfection plan. The title is 'Disinfection plan setting'. The form includes the following fields and options:

- Mission Name:** A text input field with the placeholder text 'Please enter a name for the disinfection mission'.
- Working mode:** Radio buttons for 'Regular disinfection' (selected) and another unselected option.
- Upon Completion:** Radio buttons for 'charging pile' (selected) and 'maintenance point'.
- Start time:** A time selection field showing '16:30'.
- Repeat:** Radio buttons for each day of the week: Mon, Tue, Wed, Thu, Fri, Sat, Sun.
- Speed:** Radio buttons for speeds: 0.1m/s, 0.2m/s, 0.3m/s (selected), 0.4m/s, and 0.5m/s.
- Vacuum gear:** Radio buttons for gear settings: off, 1, 2 (selected), 3, 4, and 5.
- Regional selection:** A button labeled 'AREA'.
- SAVE OR CREATE:** A large purple button at the bottom of the form.

Plan name: Give the plan a name

Work completed: After the work is completed, go back to the charging station or the maintenance station (the maintenance station refers to the cleaning point of the machine trash can)

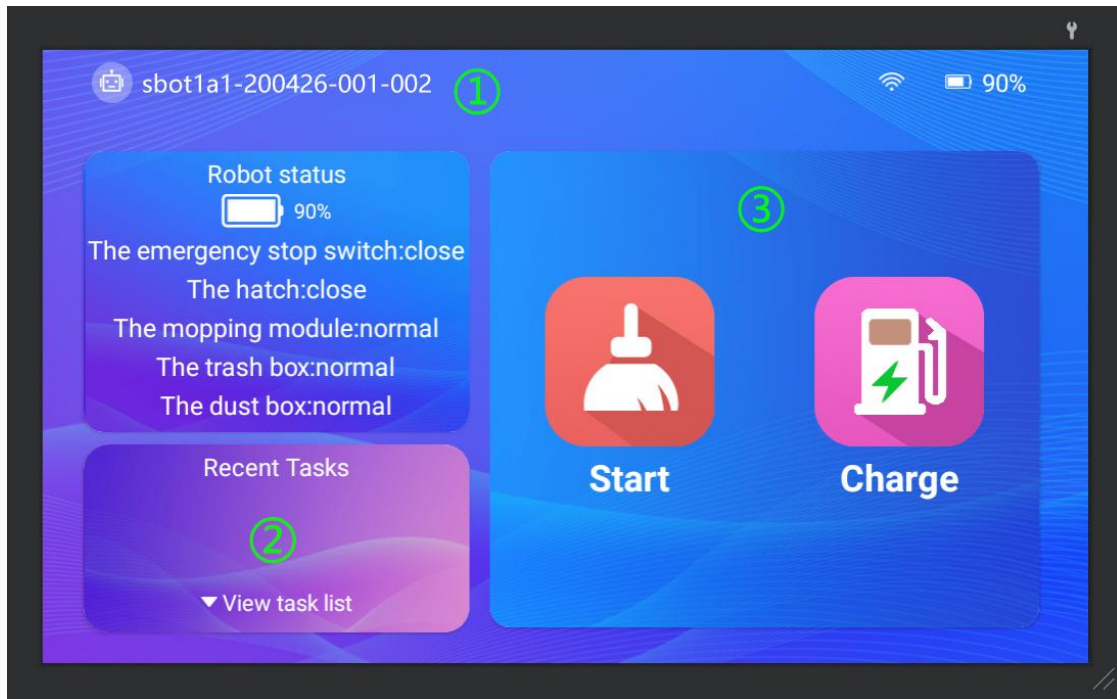
Start time: The start time of the plan

Speed : Driving speed

Vacuum gear : Vacuum cleaner gear adjustment

Area selection: click to select the area to be cleaned

3. Hand clean



Start cleaning: Click "Start cleaning" to pop up a cleaning area selection box, select the area to be cleaned and click OK to start cleaning

Return to charging: Click on 'Return to Charge' and the machine will immediately return to the charging station for charging

4. Clean the water tank and dust box

- **Open the upper cover of the cleaning robot**

Opening method: standing in front of the machine on the right hand side as shown in the figure below, there is a handle to pull the upper cover of the machine and it will open automatically.



➤ **How to take out the water tank and dust box**

Note: The vacuum box and water tank should be cleaned regularly. When the machine reaches the set mileage, the status will be reported. At this time, the vacuum box and water tank need to be cleaned.



As shown in Figure 2 above, the 'water tank' and the 'dust suction box' can be taken out and cleaned

Water tank: Twist the lid with the straw to lift the water tank

Vacuum box: Open the buckle on the lid, then take out the cloth bag in the vacuum box and clean it.

➤ **How to take out the mopping module**

Note: When removing the mopping module, be sure to press the emergency stop switch, and then take out the mopping module



As shown in the figure above, first open the cover of the mopping module, then pull the buckle, and pull out the mopping module box, then take out the sponge inside the box and clean it, and then move the mopping module box. Clean it with a brush, finally wring the sponge dry and put it back.