VULCAN

User Guide

Heavy-duty Cleaning Robot

FTR - VUL - VER - 06/25/2025

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PRODUCT INTRODUCTION

Product Introduction

1.1 Robot Description

The cleaning robot uses technologies such as perception and navigation to create maps and task paths by scanning the surrounding environment, and then performs automatic cleaning tasks. It can sense changes in the environment in real time to avoid collisions, and can automatically return to the charging station to recharge after completing its work, realizing fully autonomous and intelligent cleaning.

CUSTOMER DEMAND, ROBOT CAPACITY, & CAPABILITY STATEMENTS	
Effective Cleaning	Less Manual Intervention
Cleaning Capacity	Algorithmic Intelligence
Slave Device: Execution (Switch cleaning mode)	Hoster Computer: Computing (Positioning + Perception + Planning)
Excellent capability includes diverse cleaning effects and thoroughness of cleaning. Versatility indicates that the cleaning robot is capable of performing a variety of cleaning tasks in different scenarios. Thoroughness indicates that the robot can handle a variety of mixed waste, thus saving the user's time and effort and improving cleaning efficiency.	Localization algorithms accurately determine the position of the cleaning robot in the environment. Perception algorithm helps the robot to identify its surroundings and obstacles. And planning algorithms combine localization and information perception to accurately plan cleaning paths and ensure that the robot can efficiently and safely navigate environment.

Product Introduction

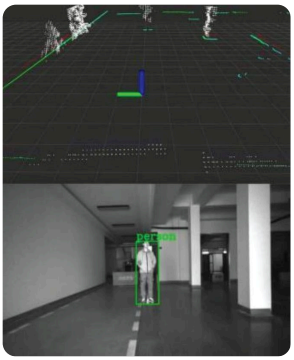
1.2 Product Appearance Introduction

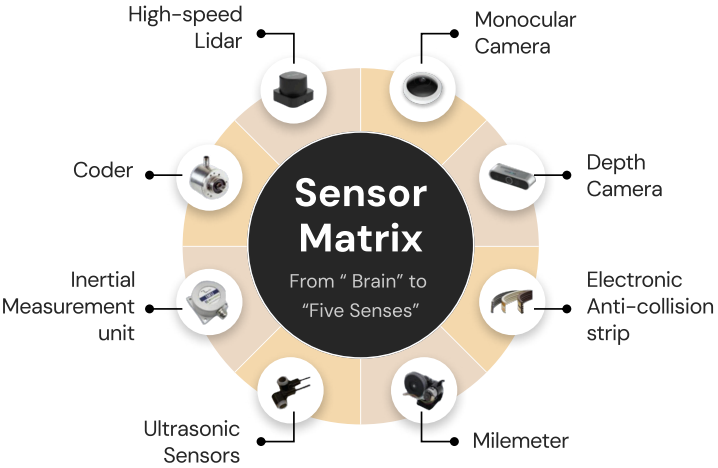
1.3 Self-developed Sensing System

1.3.1 Self-developed Advantage

Self-developed sensor matrix enables microsecond time synchronization.

- Self-developed LiDAR and vision fusion localization algorithm.
- Self-developed robot control platform.
- Self-developed wide-angle 3D TOF module.
- Self-developed SPAD dof LiDAR.





Product Introduction

1.3.2 Sensor Matrix

Wide-Angle Depth Camera

(TOF with largest horizontal viewing angle in market)

High Frame Rate: 45FPS

Ultra-sensitive: 20ms response time

High Accuracy: 2cm recognition accuracy

Wide Viewing Angle: 110° extra large view

Altitude Lidar: (Echo is used for better detection of reflective media such as glass)

High Speed: 900rpm

High Accuracy: 0.125 angle

Long Range: 50m Ultra long range

VULCAN Control Platform

AI Computing Power: 3 trillion operations per second

ARM Architecture: Small size, Low temperature, Power consumption reduction of more than 50%

Front Monocular Camera

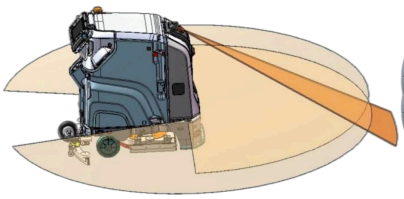
Multi-target: 1000-magnitude landmarks tracked simultaneously

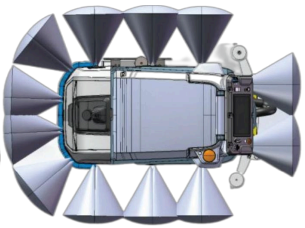
Full view: 210° large field of view, zero-dead-angle route planning

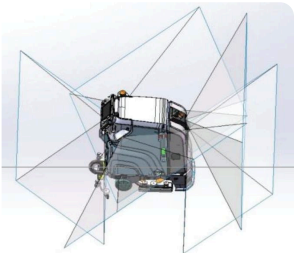
High precision: mm-level positioning accuracy

Ultrasonic Radar:

Calculates the distance to an obstacle by transmitting and receiving ultrasound, complementing other electromagnetic sensors to improve accuracy.







1.4 Specifications

TN70 SPECIFICATIONS				
Basic Parameters	Size L*W*H	1160*580*1210mm	Manual Operation	Support
	Weight	199kg (excluding water)	Cleaning Mode	Cleaning | Scrub Only | Vacuum Only | Dust Wiping | Disinfection
Performance Parameters	Scrubbing Width	510mm	Cleaning Speed	1.2m/s
	Vacuuming Width	810mm	Work Efficiency	2040㎡/h
	Climbing ability	6%		
	Ground Pressure of The Disc Brush	17.8g/cm²	Body-to-side Distance	15cm
	Ground Pressure	27kg	Noise	<65dB
	Clean Water Tank Volume	70L	Sewage tank volume	50L
Electronic System	Battery Voltage	25.6V	Full battery life	Scrub 3.5h; Sweep 10h
	Battery Capacity	100Ah	Charging method	Charging pile/Workstations
Intelligent system	Navigation Solution	Vision + Laser	Sensor Solutions	Panoramic Monocular Camera/ Laser Radar / 3D TOF Camera/ Single Line Laser / IMU/ Electronic Anti-collision Strip / Material Sensor / Edge Sensor / Liquid Level Sensor / Speaker / Microphone
	Car recorder	Standard Configuration	Elevator control	optional
	Remote Upgrade	Standard Configuration	Disinfection	optional

1.5 Core Highlights

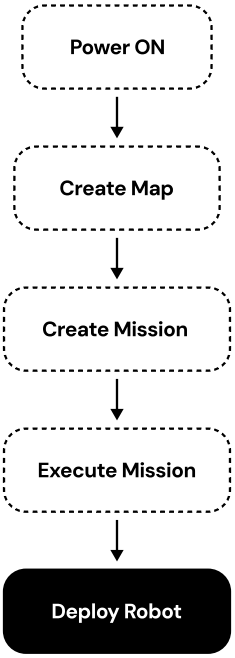
- **Easy to operate:** Rapid deployment, one-click task execution.
- **Long battery life:** Large amount of power and water to meet long time work.
- **Easy to pass:** Narrow enough to easily pass through the aisle scene.
- **Edge-to-edge cleaning:** Proximity to the wall for a larger cleaning area.
- **Dual cleaning modes:** Localized manual cleaning, panoramic auto-cleaning.
- **Intelligent Algorithm:** Multi-matrix intelligent sensors, omni-directional environment recognition.
- **Data-based management:** Remote intelligent management, data visualization.

1.6 Cleaning Mode

- **Cleaning:** Scrubbing + Draining, has ECO and MAX mode.
- **Vacuuming only:** Only water/dust vacuuming, suitable for wet floor scenarios.
- **Scrubbing only:** Only scrubbing the floor, at this time the robot will drain the water to brush the floor, will not draw in water.
- **Dust Wiping:** Install the dusting sheet on the squeegee and drop the squeegee assembly for dust wiping.
- **Disinfection:** Install a disinfection unit on the top of the robot to clean.

1.7 Steps of Use

Before cleaning, the robot needs to know how big the cleaning area is, the information about the environmental barriers around it and which local areas are off-limits for cleaning? All these questions need to be operated through deployment.



2
FUNCTION INTRODUCTION

Function Introduction

2.1 Power On

Insert the key.

Twist the key from vertical to horizontal.

2.2 Selecting Roles and Accounts

- Generally there are two roles that use the machine, **the cleaner and the administrator.**
- The functions available to the cleaner are relatively simple; The Manager has more operating rights.
- Cleaners please select **[Cleaner];** administrators please select **[Manager]** (Figure 1 below)
- The notification at the bottom shows the scheduled missions that have not yet been executed for the day, which makes it convenient for users to change the corresponding cleaning parts according to the mission mode without logging in. (Figure 1).

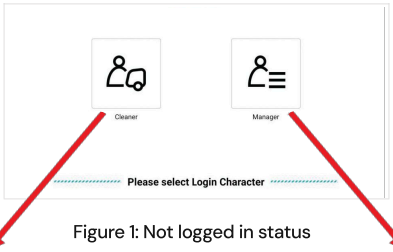


Figure 1: Not logged in status

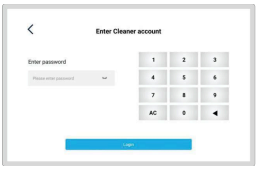


Figure 2: Select [Cleaner Mode], login password is “123456”.

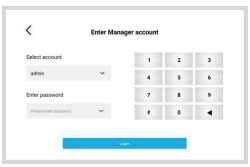
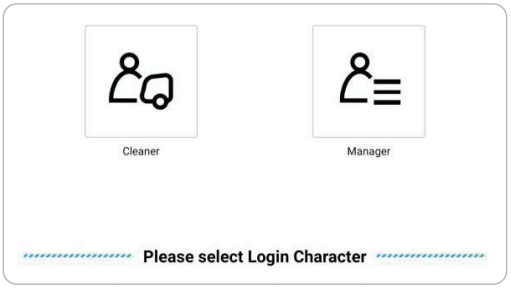
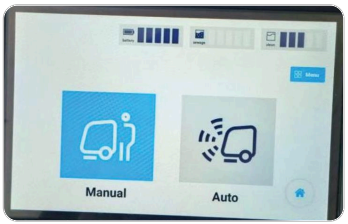


Figure 3: Select [Manager Mode], select the "admin" account, the login password is “321321”.

Function Introduction

Home Page		
Character	[Cleaner Mode]- Cleaned	[Manager Mode]-Manager
Menu Page		
Menu Page		

Function Introduction

2.3 Interface Structure

01) Top bar

- Fault codes will be displayed in the upper left corner, when the robot malfunctions. If the robot can not continue to perform the task, please contact after-sales personnel.
- The upper right corner display Sewage, Clean water, and Battery level.

02) Menu

- Click to set more parameters

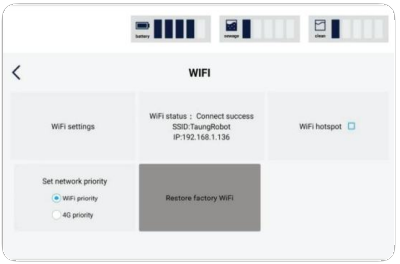
03) Key Features

- **Manual:** Push the machine for spot cleaning
- **Automatic:** you can scan the QR code of a certain location or choose a certain task to execute, which way can be set up
- **Maps:** View a list of maps on this device
- **Missions:** view all missions on the selected map

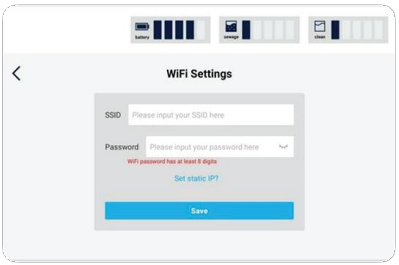
Function Introduction

2.4 Machine networking

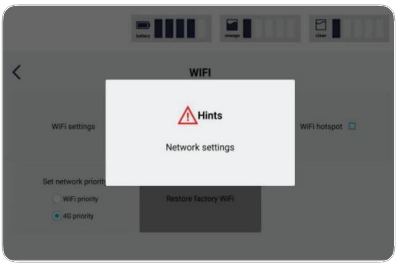
01. Log in to the manager mode and click [WIFI].



02. The machine is not connected to WIFI. when you use it for the first time, you need to configure it by yourself.



03. When connecting to WIFI, make sure the SSID and password are completely correct.



04. In order to ensure the stability of the machine networking, you need to set the network priority according to the scenario in which the machine is located. After switching priorities, it needs to sit for a few moments.

3
USE ROBOT

3.1 Manual cleaning

Manual driving instructions:

01) Make sure the start button is green to move the robot.

02) Hold both handles with both hands and press with four fingers to control the movement of the machine.

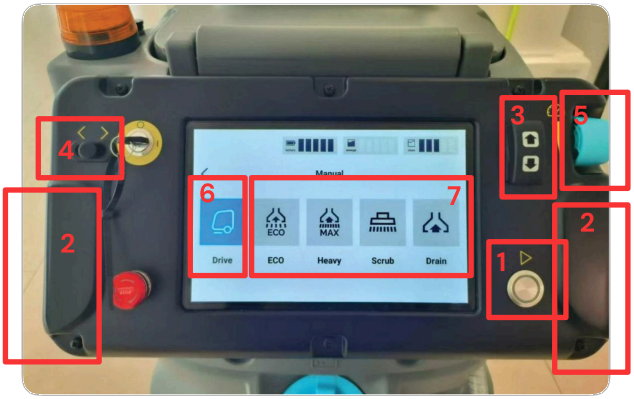
03) Press the forward and backward arrows to control the direction of movement.

04) Left hand toggles the joystick to control the left and right direction of movement.

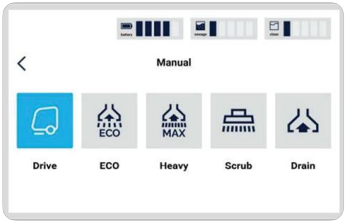
05) Slide the speed control knob to control the speed of movement.

06) When "Drive" is selected, the robot can only be moved by the above operations.

07) When the other four cleaning modes are selected, the robot switches to the corresponding cleaning parts, in which case localized cleaning is performed by moving the machine.



Both modes can be operated for manual cleaning.



Here are 5 states in Manual Cleaning: Drive, ECO, eavy, Scrub, Drain

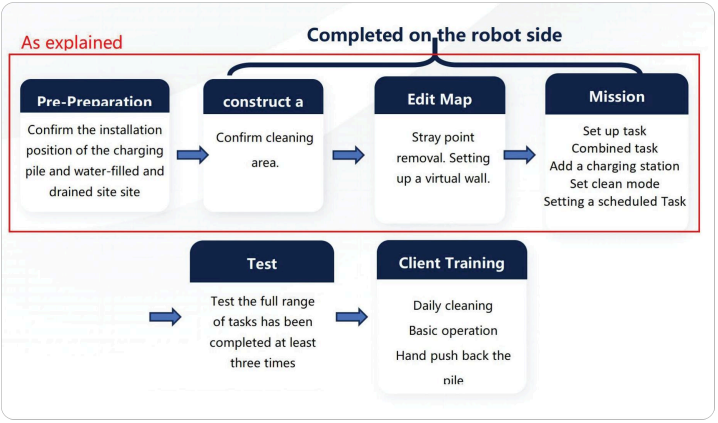
3.2 Deployment instructions

3.2.1 Deployment value

In order to ensure the stability of the robot to perform the mission, we need to inform the robot in advance of the area that needs to be cleaned to ensure its smooth completion, the process that is **[Deploy the robot].**

- **Map Creation:** Robots are required to create maps or recognize the environment so that it can accurately navigate, avoid obstacles and plan cleaning paths.
- **Create charging points:** In order to achieve full autonomy the robot needs to be cleaned and recharged automatically, so charging points need to be set up.
- **Setting a task plan:** The deployment phase usually also includes setting a task plan for the robot, including working hours, working frequency, etc., so that the robot can automatically perform tasks according to the predetermined plan
- **Setting parameters:** During the deployment phase, you need to set the relevant parameters of the robot, such as cleaning mode, cleaning time, cleaning area, etc., and plan the cleaning path to ensure that the robot can work according to the preset requirements.
- **Software updates and configuration:** The deployment phase may require updates and configuration of the robot's software to ensure that the robot has the latest features and performance.

3.2.1 Deployment process



3.3 Deployment - Preparedness

The deployment processes described below all need to be operated in [Manager Mode]:

01) **Cleaning Areas:** Observe areas that need to be cleaned, use photos and notes for memos, and need to know the following:

- Identify the location of the feature as the starting point for creating the map. It is recommended that the environment within 10 meters does not change, and the wall is used as a reference (as shown below).
- Think about planning a reasonable cleaning route.
- Depending on the complexity of the area to be cleaned, determine whether the parameters need to be changed to add virtual walls, etc.

2) **Marking points:** Observe several suitable locations for parking the robot, charging positions, etc., and make sure that there are few changes in these locations.

3) Think about the cleaning mode needed for different areas according to customer needs, and also think about the order of the cleaning route.

4) Remember the areas that are off-limits to machines or require special handling. These areas need to be labeled after the build, such as inaccessible warehouses or areas with a lot of glass.

5) Remember the narrow channel location, and use the **[Route Following]** mode when creating a mission.

6) Communicate with customers about cleaning time and frequency requirements, and set up timed tasks at a later stage.

Good

Bad

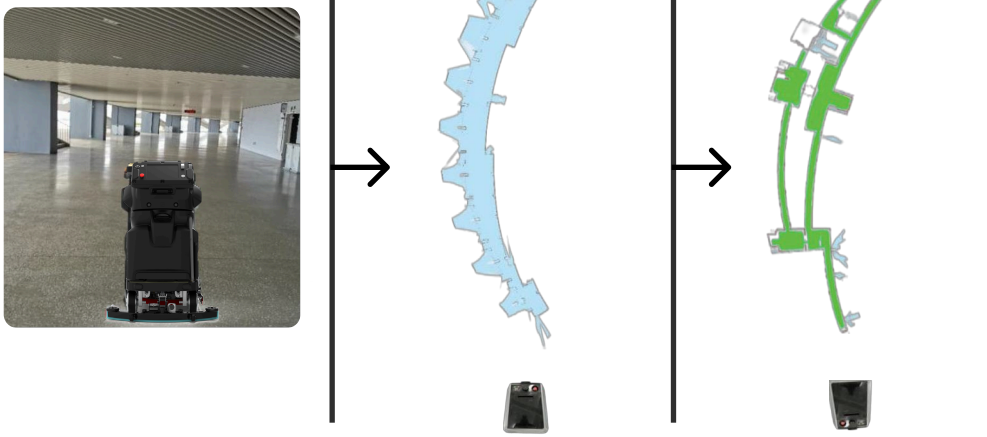
3.4 Deployment - mapping

3.4.1 Map values

The value of creating maps:

- **Precise navigation:** By creating maps, the cleaning robots is able to accurately understand the layout of the environment, allowing for precise navigation and avoiding duplicate cleaning or missing areas.
- **Optimize cleaning paths:** Based on map data, cleaning robots can plan the best cleaning paths to improve cleaning efficiency, save time, and energy.
- **Obstacle avoidance:** After building the map, marking the obstacle areas on the map can help the cleaning robot avoid collision, protect the robot and the surrounding objects.

PS: The quality of building maps will affect the subsequent planning control, it is recommended that the map area does not exceed **15,000 square** meters. If the map quality is poor, it will lead to **random risks.** Even if there is no problem in the trial operation, the positioning may be lost in the daily operation.



1. Into the environment

2. Complete map building

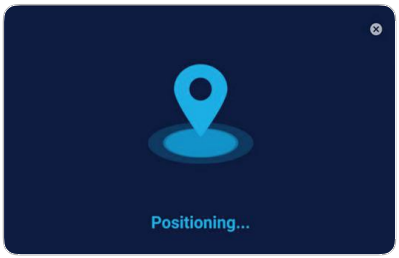
3. Complete cleaning tasks

3.4.2 Mapping Steps

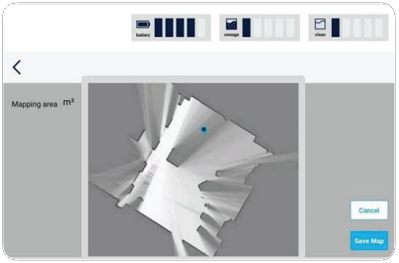
3.4.2.1 Map building process

Select the starting point of the map → Start mapping → During mapping → Check and Save

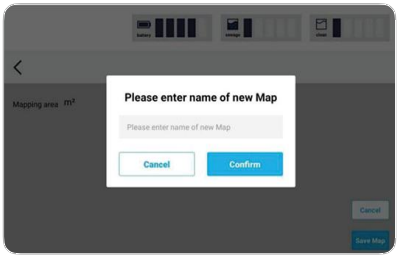
1. Place the device in the environment to be cleaned and start creating the map.



2. The device will memorize the starting point of the map, after which a mission can be bound.



3. During mapping, remotely control or push the device until the map is all white

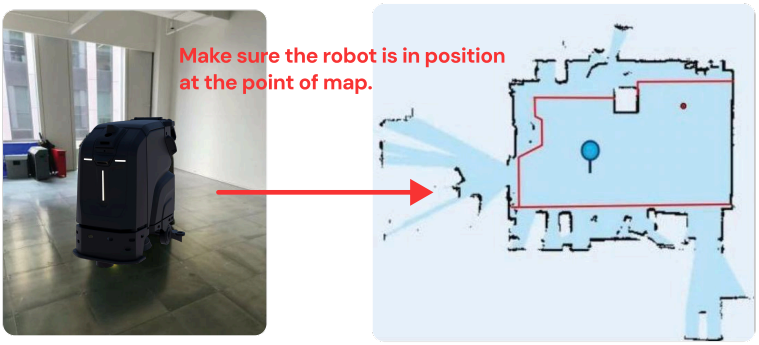


4. Click "Save Map" and enter the map name.

3.4.2.2 Positioning methods for mapping

The robot does not know where it is in an unfamiliar environment, we need to give it an initial positioning point and then start mapping. There are generally two kinds of positioning methods:

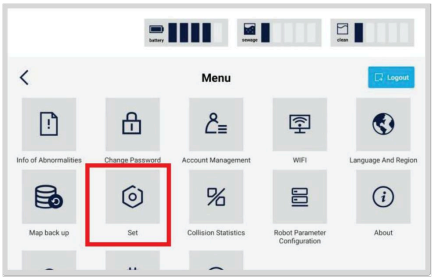
Point selection and **Scan code:**



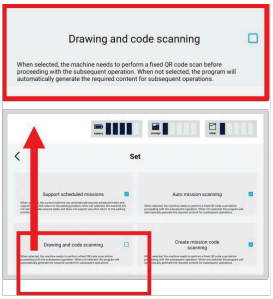
- **Point Selection:** Requires the user to accurately move the robot to the location displayed on the map.
- **Advantage:** Easy to use
- **Disadvantage:** In larger scenarios, it is difficult for humans to move the robot to the correct position.
- **Suitable for:** Smaller, empty scenes

- **Scancode:** Need to stick the QR code on the wall in advance, the robot can be aligned with the QR code
- **Advantage:** High accuracy
- **Disadvantage:** A lot of QR codes need to be posted
- **Suitable for:** Larger, complex scenes

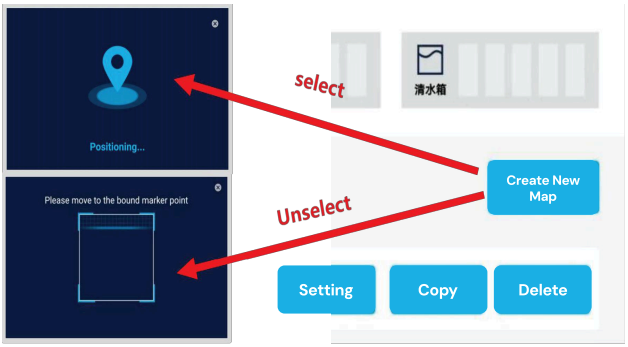
How do I set the positioning method?



01. Click “Settings”.



02. Select “ Drawing and code scanning”.



3.4.2.3 Instructions for posting QR codes

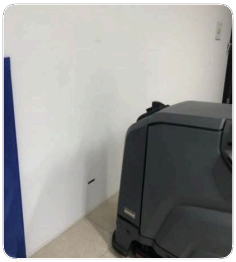
Please post the standard QR code provided by us at a few fixed points where the task will be frequently started.

Currently we have two versions of the robot:

- One has only the front monocular, and at this time only the front monocular is used to scan the code, as shown in the left picture below
- One has both a front and a top monocular, at this time the top monocular is used to scan the code, as shown in the right figure below

Use Robot

Front monocular scanning
(Robot needs to be facing the QR code)



Top monocular scanning
(machine can scan sideways)

Front Scan Requirements:

- The QR code is on the axis directly in front of the robot.
- QR code height between 30~ 150 cm
- QR code between 100~200 cm from the front of the car.

Front Scan Requirements:

- The height of the QR code should not be less than 180 cm
- QR code between 10~30 cm from the front of the car

Side Scan Requirements:

- QR code height not less than 130 cm
- QR code between 20~40 cm away from the car body

3.4.3 Mapping Tips

Notice before mapping

- All clean areas need to be scanned.
- Loop closure route is adopted in the drawing, the first small closed loop, the second large closed loop (Figure 1).

During mapping

- During the map building, the robot will be steadily pushed forward, preferably in a smooth straight line, avoiding curved routes as much as possible (Figure 2), and the forward speed should be less than 1 m/s.
- When rotating or turning, you need to rotate slowly, with an angular speed of less than 20°/s, and then move forward in a straight line again.

Use Robot

Confirmation

- **Map loop:** A successful closure means that the same area scanned by the robot at different times can overlap. If the map is not closed correctly, this may result in a loss of position (Figure 4).
- **Map distortion:** Distortion means that an actual wall becomes two or more parallel walls, that is, distortion or ghosting, distortion or ghosting will cause huge interference to navigation, such as positioning jumps, loss. These will cause significant disruption to navigation, with a common example being one wall becoming 2 or more parallel walls (Figure 3).
- If the map is not saved and some areas are not scanned, continue to perform supplementary scanning.

Figure1

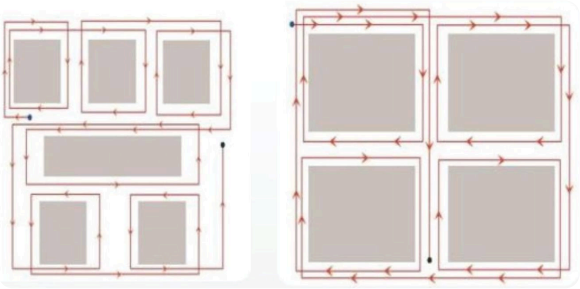
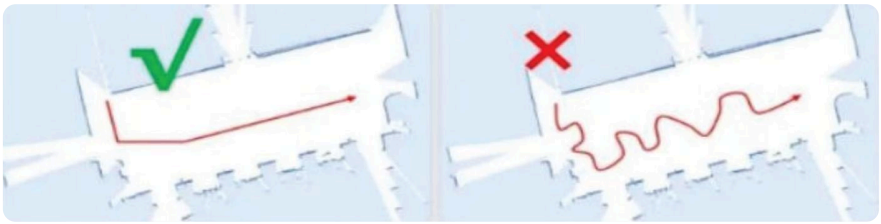


Figure2



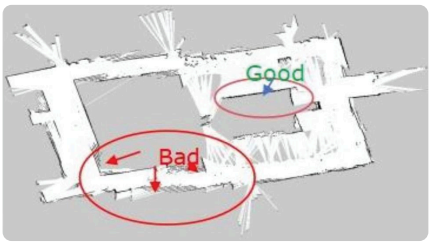


Figure3

Figure4

3.5 Deployment - Map Editing

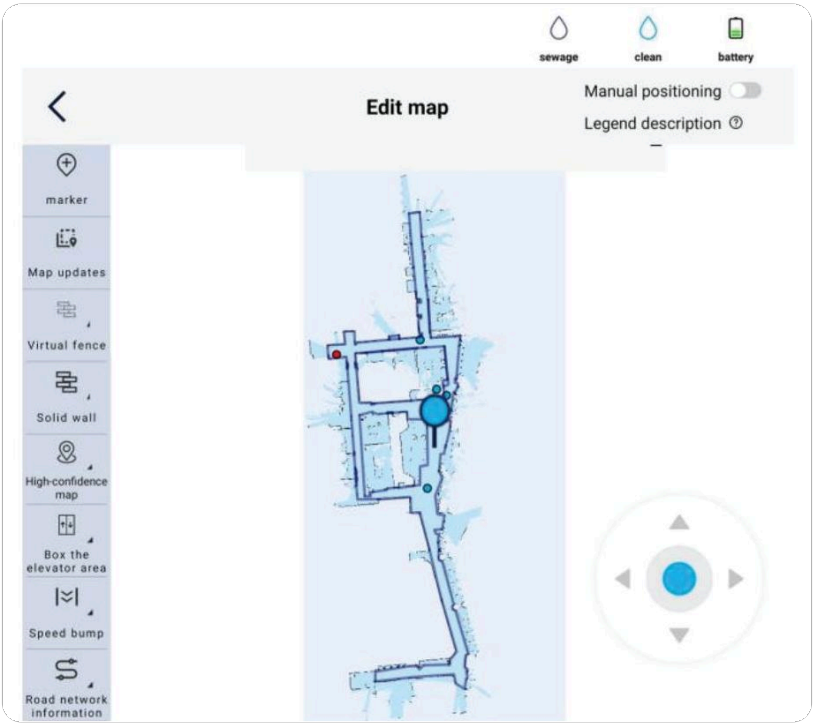
3.5.1 Map Editing Value

A new map is created only to scan out the cleaning area, but to ensure efficient and safe cleaning, it is necessary to mark out specific areas on the map, for example:

01) Multiple **[marker points]** can be created on the map, such as charging piles/ workstations, special points, etc., and then set as the starting point of the mission.

02) **[Virtual wall]** is mainly used to mark the area that the laser can not scan or the area that the machine is not allowed to enter, in order to prevent the robot from colliding, falling, etc., in the above area, causing danger. For example: glass fences, floor-to-ceiling Windows, irregular shapes, large and small barriers, escalators, etc.

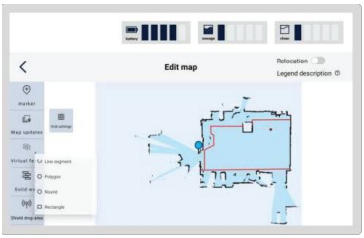
03) If a region does not exist fall risk, and does not trigger the fall prevention function, can be labeled **[shielded fall area]**. Common environment: glass signboard, glass floor, etc.

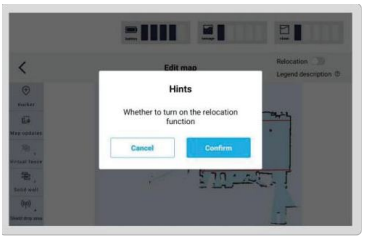


3.5.2 Map Editing Content List

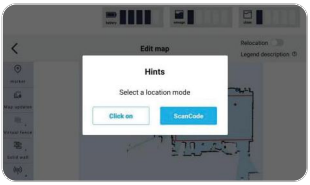
3.5.2.1 Add Markers

Positioning Equipment → Move to new point location → Locate the new marker → Selection of the type of point



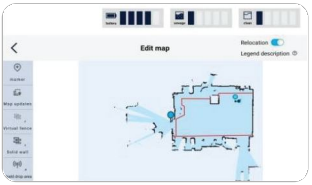


1. Before adding marked points, the device needs to know its location first. First, turn on the "Manual Positioning" switch in the upper right corner, and select the marked points on the map to reposition the device

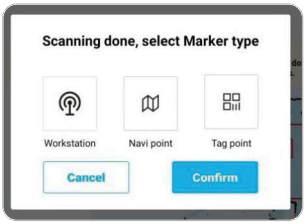


2. Select the way to locate the robot

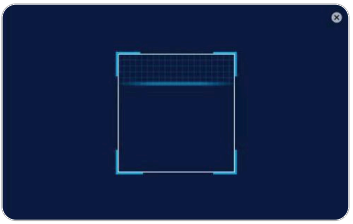
3. Wait for positioning



4. After successful positioning, move the machine to the new position



5. Select the new position as the type of Marker



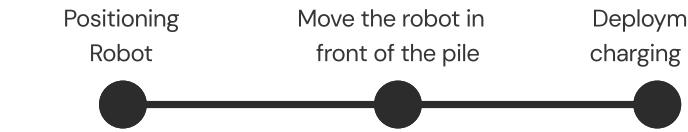
6. New marker points need to be saved by sweeping the code

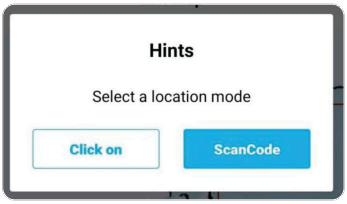
Tips: When locating the position of the robot, it can be done by selecting a point or by scanning the QR code. **The new position can only be located by scanning.**

3.5.2.2 Deployment of charging posts/workstations

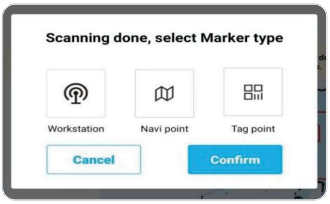
Preparation:

- Ensure that there are no obstacles or objects of reflective material within 2 meters of the charging post.
- If the position of the charging post is changed, the distance between left and right should be less than 20cm, otherwise the charging post needs to be redeployed.
- Release the emergency stop button on the pile when charging is required.

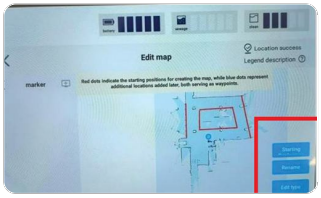




1. Select an existing marker to locate the device (two ways)



2. Select Add "Workstation" after successful location

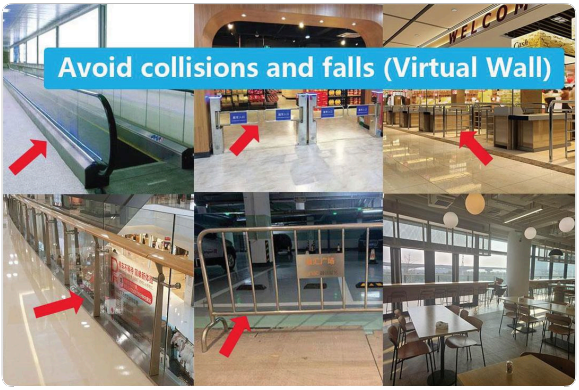


2. Prepared charging pile will be placed in front of the machine pile about 0.5m, ensure that the front monocular can see the charging pile, and then click on the screen "start deployment"

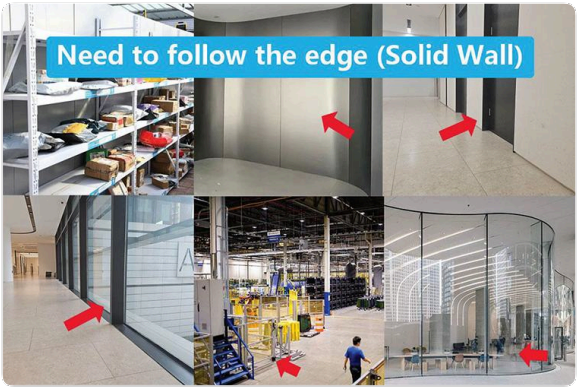
3. Wait for the machine to deploy the charging post location, if it fails then you need to redeploy it, if it succeeds then enter the workstation name

3.5.2.3 Mark Virtual Wall/Solid Wall

- **Virtual Wall:** This refers to areas marked as hazardous to prevent the robot from colliding with or falling from these zones. Examples include glass railings, floor-to-ceiling windows, top-heavy obstacles, suspended obstacle(including fine suspended objects), and staircases.



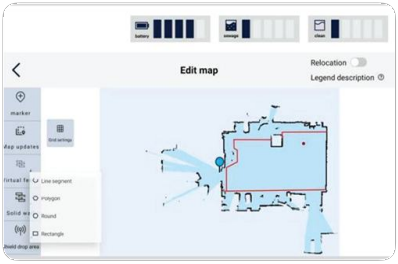
- **Solid Wall:** This refers to areas marked to achieve the effect of a flat, physical wall, facilitating edge cleaning. Examples include glass walls, uneven walls, and shelves.



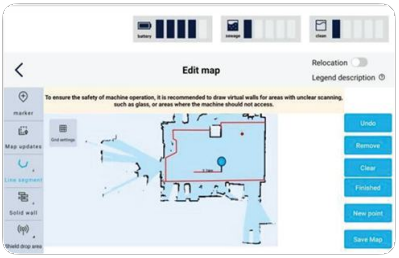
- For scanned walls and marked solid walls, the robot will maintain a minimum distance of 7.5 cm from the wall.

For marked air walls, the robot will maintain a minimum distance of 20 cm from the air wall.

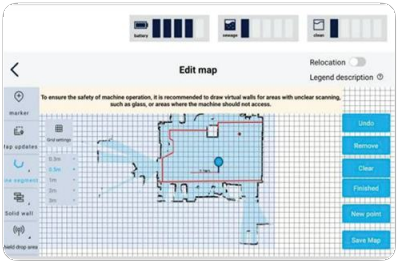
Use Robot



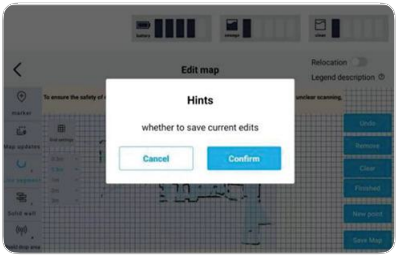
1. Click to edit Air Wall/Solid Wall



2. Choose any drawing method, ,click the “new point” to draw the line, then click the “ Finished” and ”Save map”



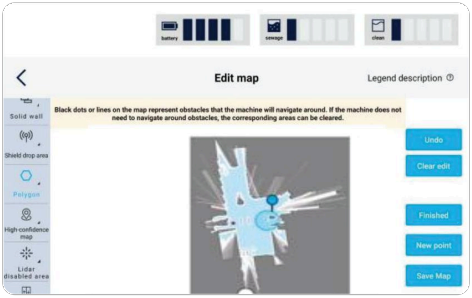
3. The drawing process can also be assisted by "Grid Settings"



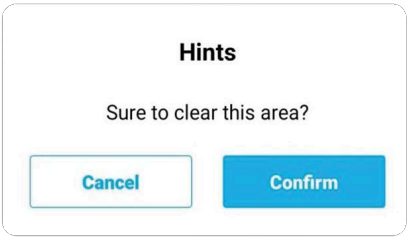
4. Click "Confirm", the map is saved successfully

3.5.2.4 Remove Obstacles

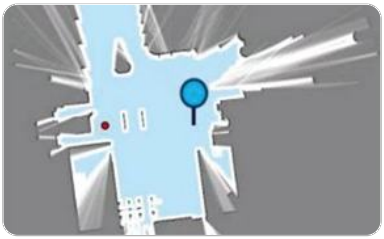
- Black dots or lines on the map represent obstacles that the machine will go around, or the corresponding area can be cleared if the machine is not needed to go around the obstacle.



1. Click "Edit Map", in order to make it easier to see the obstacles, a white border has been expanded around the black material, and the blue color is barrier-free area. Just circle the black area that you want to erase.



2. Click "Save Map".



3. The selected area has been cleared

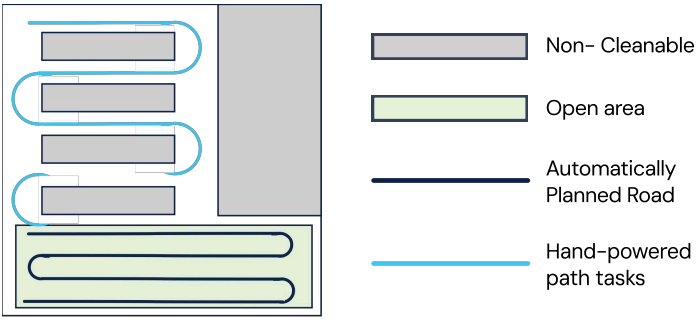
3.6 Deployment - Route Planning

3.6.1 Route Planning Value

Route Planning Valus:

- **Improve efficiency:** Through intelligent path planning, the cleaning robot can choose the shortest and optimal cleaning path to improve cleaning efficiency.
- **Avoid repeated cleaning:** Route planning ensures that the cleaning robot does not clean the same area repeatedly, avoiding wasted resources and time.

- **Safety:** Reasonable path planning can help the cleaning robot avoid obstacles, avoid collision and damage, to ensure the safety of the cleaning process.
- **Data collection:** The data collected during the cleaning process following the planned path can be used to optimize the cleaning strategy, improve robot performance and enhance cleaning effect.



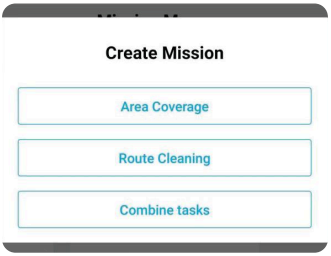
3.6.2 Route Planning Types

There are three types in total:

01) Area Coverage: Suitable for relatively empty areas. Select the area to be cleaned on the Pad, and the route to be cleaned is automatically planned, for example, the dark-colored path on the right.

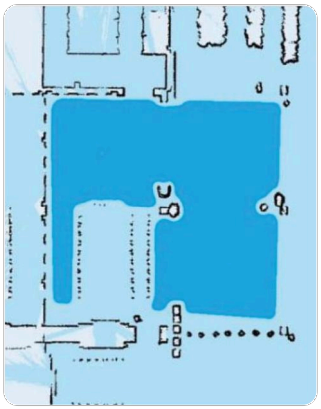
02) Route Cleaning: Suitable for relatively narrow areas. Push the device in the area to be cleaned, then the device will remember the path to be pushed, usually only forward and not backward when pushed, for example, the light-colored path on the right.

03) Combine Tasks: Suitable for **larger and more complex** environments. That is, combining existing box-checking overlays or path-following into one large task, such as combining the two paths on the right.

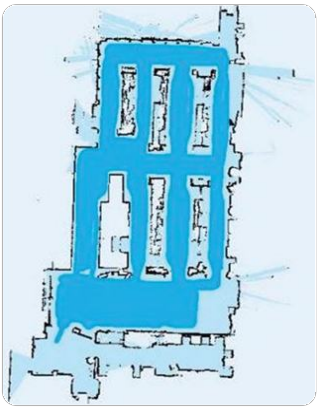


Use Robot

Auto Override and Path Following Instructions



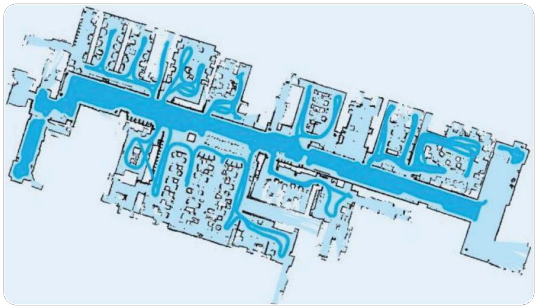
Area Coverage

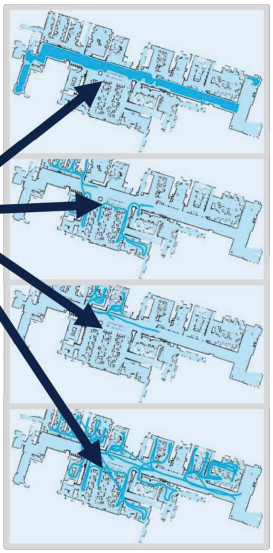


Route Cleaning

Tips:
Only the wide and regular shaped areas are covered automatically, and the rest use Route Cleaning as much as possible.

Combine Task Instructions



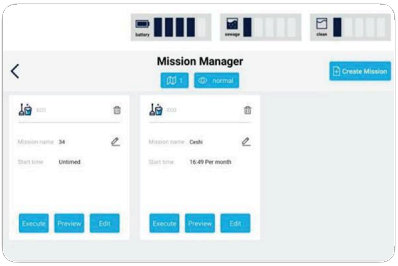


- The shape is regular and the planned route is more reasonable.
- Different areas can be cleaned at different times and at different frequencies.
- Ensures that the robot passes through the center when crossing narrow areas.
- Optional Route Cleaning or Auto Area Coverage depending on the area.
- Finish one small area and then move to another, avoiding frequent.

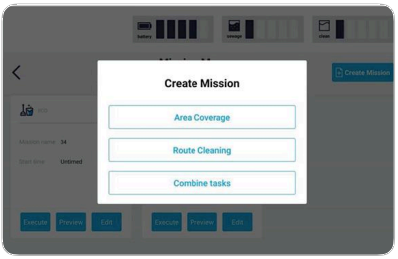
Tips:
Multiple sub-tasks can be sliced and then combined, and narrow areas can be connected together with single sub-tasks.

3.6.3.1 Area Coverage

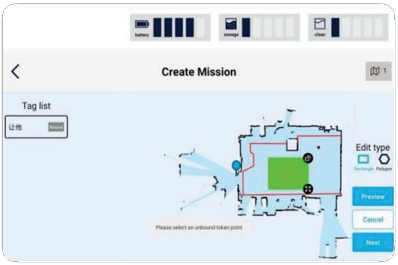
Select Task → Choose the task area → Bound mission starting point → Set the cleaning mode



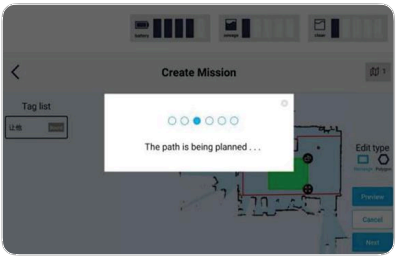
1. Click "Create Mission" in the upper right corner of the Mission Management Page.



2. Select "Area Coverage".



3. Selects the task area and bound the tag (task starting point), and then select the area to automatically plan the task path



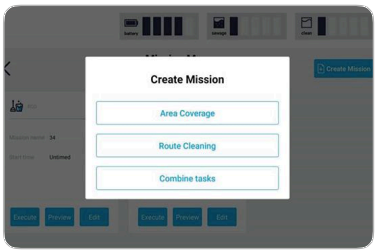
4. Click on "Preview" to view the planned route, and you can preview several ways of planning the route

5. Choose the clean mode after confirming the route

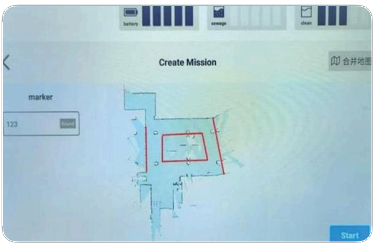
6. Select the cleaning intensity

3.6.3.2 Route cleaning

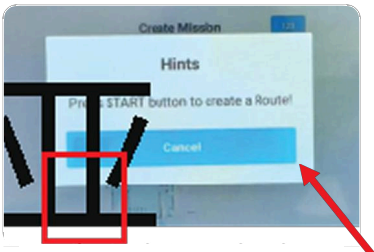
Select Task Type → Positioning the robot → Mobile device learning Path → Bound the start point → Set cleaning mode



1. Select "Route Cleaning"

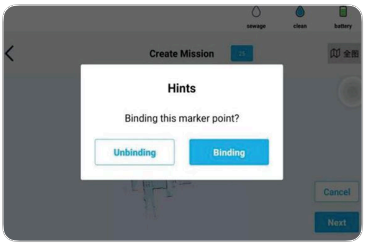


2. Select an existing marker on the map to locate the device

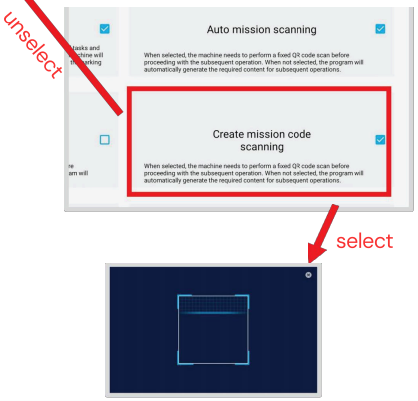


3. Press the start button on the robot to start moving the machine

4. Positioning success to start moving the machine, the machine will remember the path of movement. Unchecked: for point positioning; Checked: for code positioning

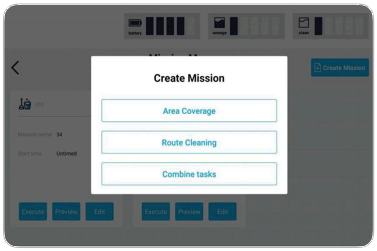


5. Bind the task starting point after learning the route, if not, the task will be started from the starting point of the map or the charging pile by default

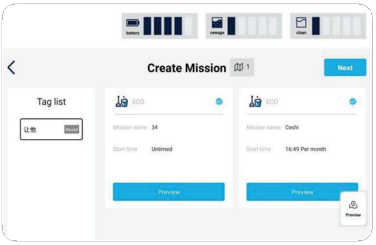


3.6.3.3 Combined tasks

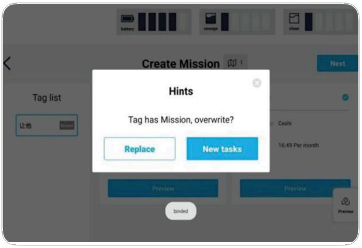
Select Task Type → Select subtasks → Bound the starting point → Set task order → Name



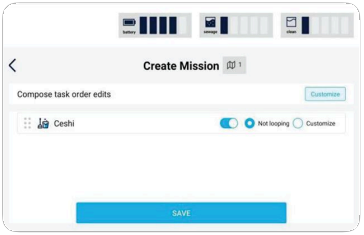
1. Select "Combine Task"



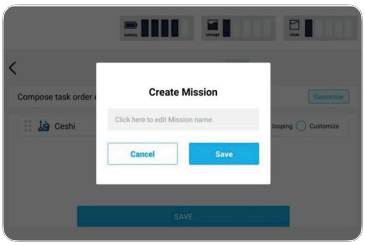
2. Select existing tasks as sub-tasks



3. Bind the starting point of the mission



4. Drag to modify the order of subtasks



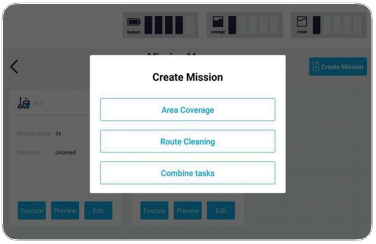
5. Create the mission name

Tips:

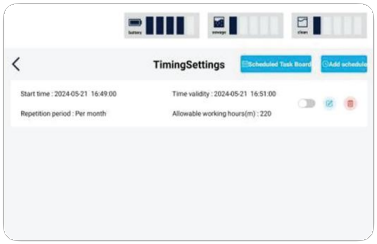
- The combined task does not need to set the cleaning information of the task again.
- When combining multiple small tasks into one large task, try to make the next task start point as close as possible to the last end point (For follow-the-path mode)

3.7 Schedule the Mission

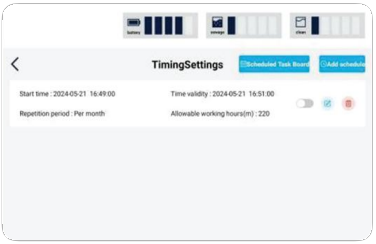
1. Select "Combine Task"



2. Click "Timing"

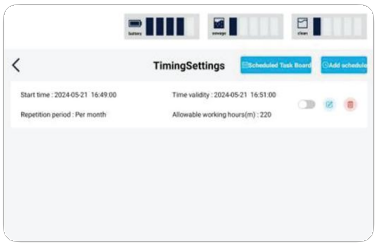


3. View or add information



4. Meaning of the "Add Timing" screen

- Start time: the date and point in time when the timer is activated.
- Repeat period: i.e. the repeat period of the timer.
- Timing expiration date: means this timing expires after the selected date.
- Allowed working hours: refers to how long the current timed task will automatically end the task (at this time, the task may not be completed). Suitable for the scenario: when a supermarket closes at 21:00 but the machine starts a task at 20:40, then you can choose to let the machine only work for 20min.



5. Click "Scheduled task board" in Figure 3 to display all the timed tasks of the current robot

Scheduling Strategy

01) Dispatch strategy: Consider the battery (10h dust pusher, 3.5h scrubber, 2h charging time), the water tank and the average work efficiency to determine how to combine tasks together.

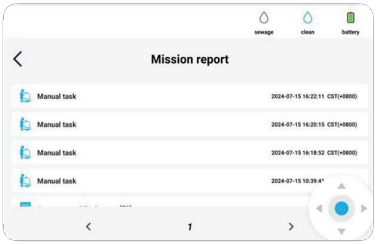
02) Scheduling Strategies: Know the operating or peak hours of the area to avoid conflicts with busy times. For example, the loading time of supermarket.

03) Example of a timing strategy for a supermarket scenario:

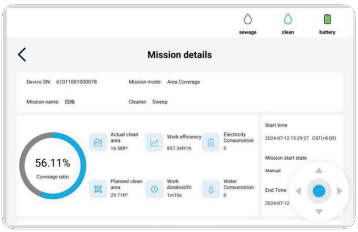
- Before the opening of the shop, execute store-wide floor scrubbing tasks.
- Execute sweeping tasks at the gate area at 10:00, 14:00, and 20:00, which are less crowded hours.
- Sweep the fruit and vegetable area once an hour.
- Scrub seafood area every two hours.
- A deep cleaning is recommended for deployment

3.8 View Mission Reports

1. Click "Mission report" on the settings page



2. Select manual/automatic report in mission report lists

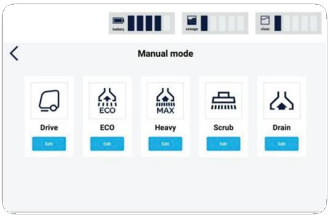


3. View detailed data

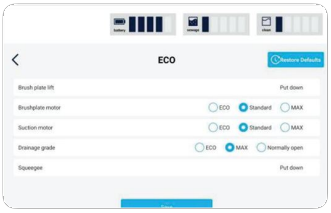
3.9 Changing the cleaning strength

1. Select "Clean Mode Manager"

2. Select the mode in which you want to set the cleaning intensity



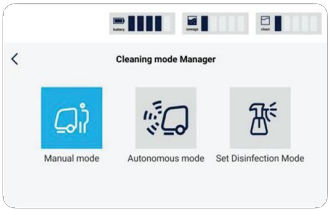
3. Select a mode and then select the specific cleaning method



4. Adjust motor strength

3.10 Changing the time zone

1. Select "Language and Region"



2. Select "Time Zone"

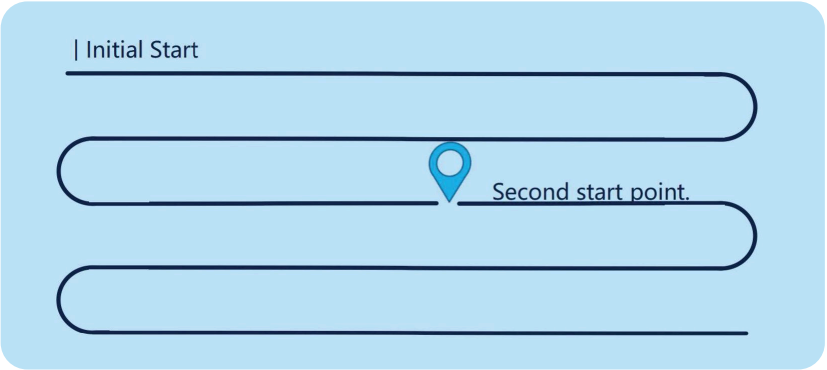
3. Select the time zone in which the robot is located. After updating the time zone, the time when the robot executes a timed task will start according to the new time zone

Synchronization between the cloud platform and the robot: After changing the time zone on the robot, it will be synchronized to the Web cloud platform. Similarly, if a robot with the status of **[Standby]** or **[Charging]** on the Web cloud platform has its time zone changed, the update will be automatically synchronized to the robot.

3.11 Breakpoint Continuation

3.11.1 Breakpoint Continuation Process

Definition: the machine will memorize the progress of the cleaning, after which the task can be continued from the saved position, avoiding repetitive cleaning



3.11.2 Manual staging tasks

When "Scheduled tasks allow recovery" is selected on the settings page: if an automated task is manually paused (manually press the Pause button, then cancel the task and select Save (Figure 3), the task will continue from the pause point the next time it is started.

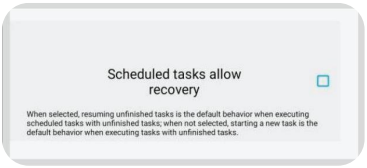


Figure 1

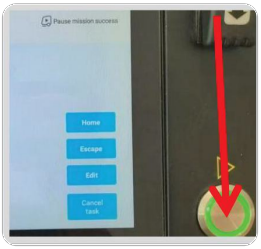


Figure 2

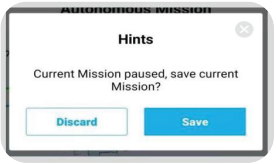
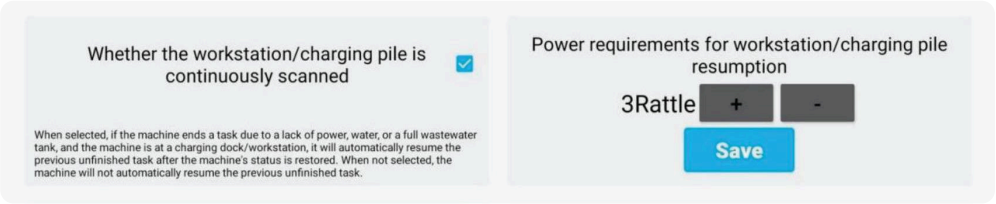


Figure 3

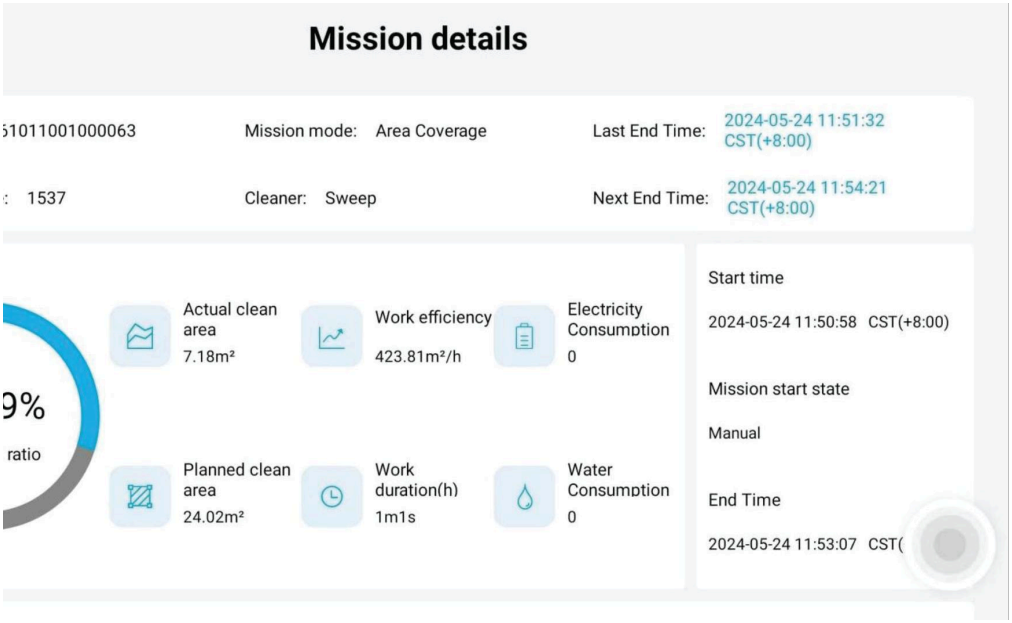
3.11.3 Automatic staging tasks

When "Whether the workstation/charging pile is continuously scanned" is selected on the settings page: if an automatic task is out of power, the current task will be temporarily stored and charged at the charging pile; when the charging amount reaches the setting (power requirement), the task will be continued from the pause point.



3.11.4 Breakpoint Continuation Reports

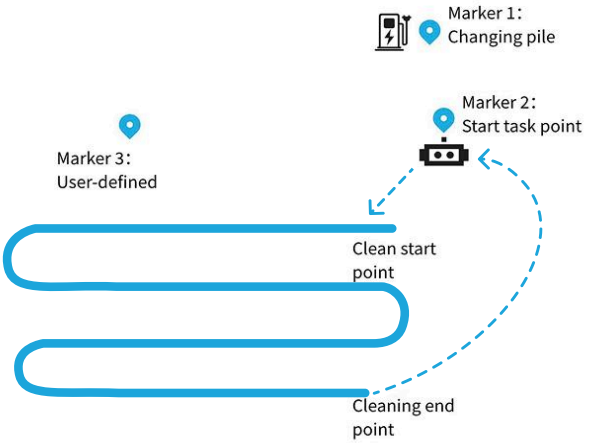
If the task is a Breakpoint Continuation task, "Last/Next End Time" will appear in the upper right corner of the task report, **click it to jump** to the mission report before and after the current mission.

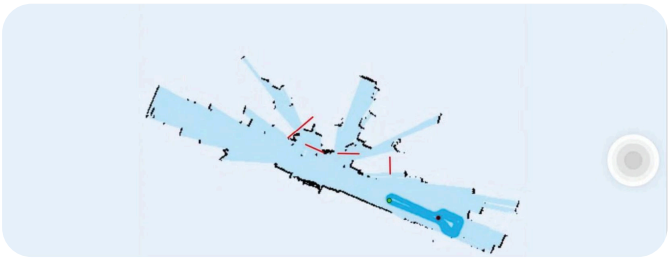


3.12 Execute Automated Task

3.12.1 Automated Task Realization Process

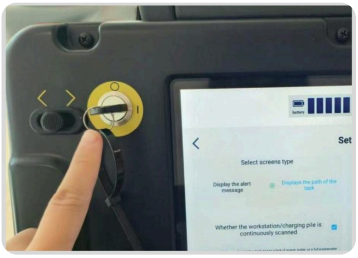
- A map will have multiple marker points, if you need the machine to perform automatic tasks, make sure that the machine is at the **"start task point"** (i.e., the binding point of the task), in order to successfully start the task.
- After the machine has successfully started the task, it will first reach the start of the planned route (**"clean start point",** the green dot on the Task Preview page) and then drop the cleaning parts to start the cleaning task.
- When the task is finished, the machine automatically returns to the starting point. So it is recommended to set the starting point as a charging pile/workstation to ensure that it automatically goes back to charging/drainage after the task is finished.



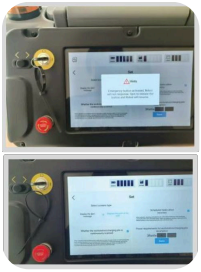


3.12.2 Confirmation Before Automated Mission

- Confirm that the battery power, water volume, sewage volume, and trash container are sufficient for the complete execution of the task.
- Ensure that cleaning parts such as brushes, suction squeegee and waterproof adhesive strips are clean.
- If the cleaning mode of dust wiping and disinfection, you need to change the corresponding cleaning parts.
- Ensure that deployed main cleaning route are free of obstacles.

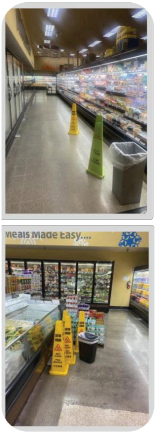


Turn on the robot, turn the key in the horizontal direction



Ensure that the emergency stop button is released

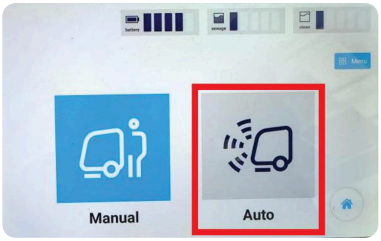
Replacement of parts corresponding to the cleaning method of the task, such as dust mop and disinfecting components



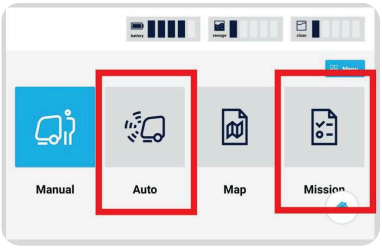
Remove the obstacles in the route of the mission

3.12.3 Execute Mission

3.12.3.1 Start Task Location



The cleaner can click [Auto] to start the task

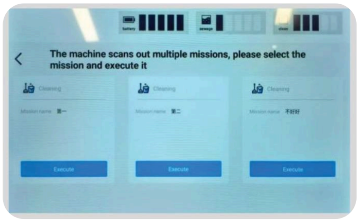


The manager can click [Auto] and [Mission] to start the task

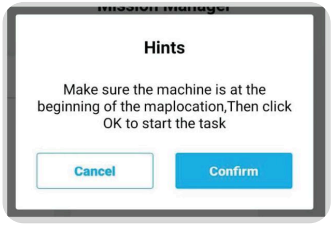
3.12.3.2 Start Task Mode

There are two ways to start a task: Click on and Scancode

3.12.3.3 Initiation point description



If starting with “Scancode”, after scanning the code successfully, select the task bound to the QR code to execute



If starting with “Click on”, you need to ensure that the machine starts successfully at the starting point of the task (the task bound point)

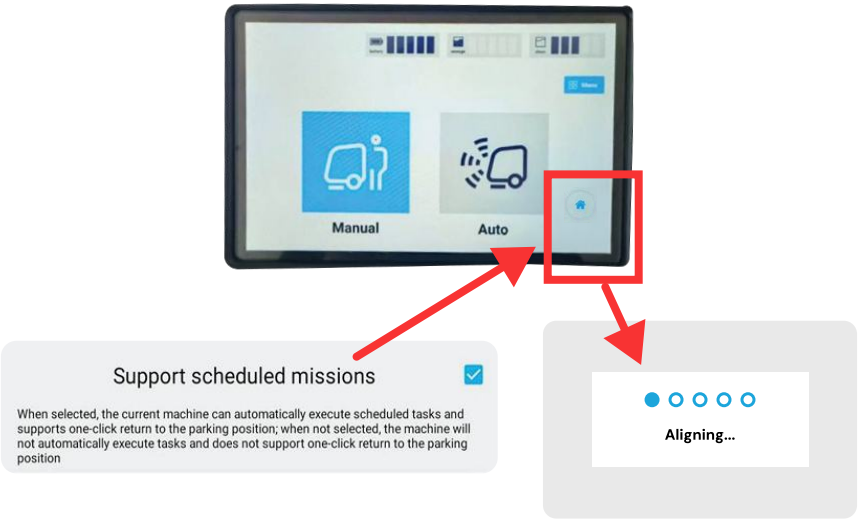
3.13 Execute Automatic Charging Pile Return

3.13.1 Charging Pile Return Process

- Generally the robot automatically returns to the pile after the automatic task, while this function refers to the robot in the non-automatic task state, the need to return to the pile.
- Make sure robot in front of charging pile about 1.5m when you click the “Home”.

3.13.2 Charging Pile Return Execution

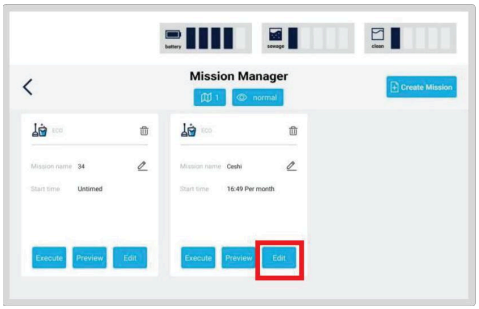
If the option in the picture is selected, the "Home" button will appear on the home page, you need to place the machine 1.5m in front of the pile, click on the button to start the pile back.



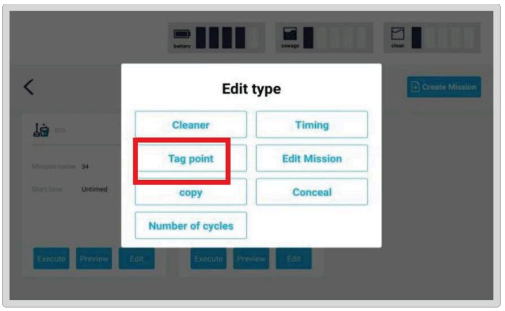
4
Q&A

4 Q&A

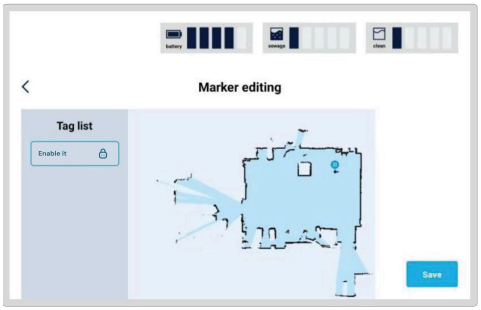
4.1 How to view the starting point (binding point) of a task?



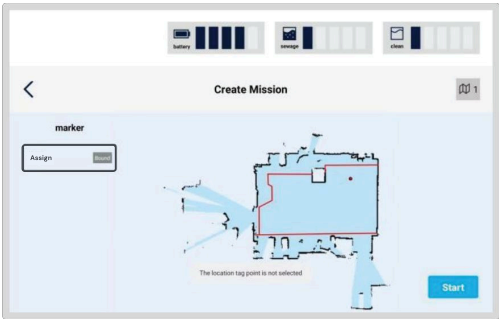
1. Click "Edit"



2. Click“Tag point”



Bound Starting Point



Unbound starting point

4.2 What needs to be noticed when the robot is on mission?

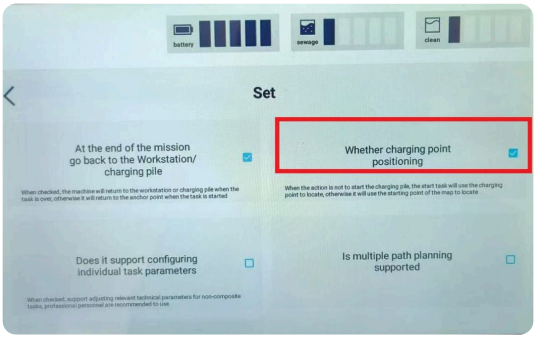
When the robot is on mission, do not press the emergency stop button unless it is an emergency. This is because the robot can be moved at will after pressing the emergency stop, and the robot will not be able to continue the task after being moved; if the emergency stop is pressed and the robot is not moved, the task can be continued after the emergency stop is released.

4.3 Can a task be started if no tag is bound?

Yes. The task will start by default from the starting point where the map was created, so push the machine to that location.

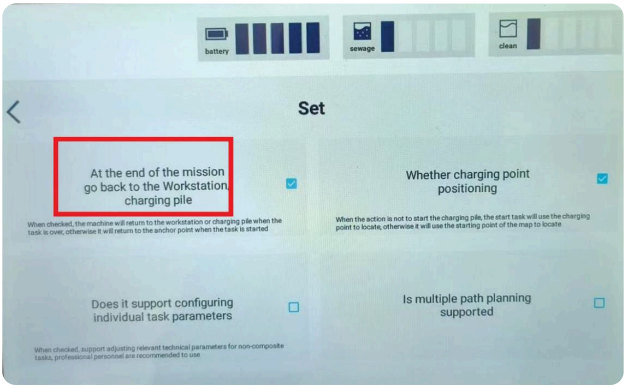
4.4 Is it possible to change the default starting point?

Yes. Check"Menu--Set--Whether charging point positioning". If the robot has a charging pile, the task will be started from the charging pile, if the tag point is not bound.



4.5 Will the robot return to the charging pile after cleaning?

If the task is a scheduled task, it will return to the origin after task finished. So in order to protect the autonomy of the machine, it is recommended to set the task starting point as the charging pile. If it is not a scheduled task, you need to check the following option to go back to the charging pile. You can go back to the charging pile even if the starting point is not in the charging pile.



4.6 What if the robot hasn't been used for too long and won't turn on?

This situation belongs to too long without using the robot has been fed, please follow the steps below:

1. Open the rear cover of the charging pile/ workstation and take out the spare charging port

2. Pull up the small cover on the right side of the robot and insert the charging port (Hear "click")

3. Wait for a moment to turn on the robot

5
DAILY MAINTENANCE

5 Daily Maintenance

5.1 Cleaning components

19" Magnetic

19" Magnetic Scrubber Holder

Cleaning pad

Side squeegees

Squeegee assembly

Dust Mop

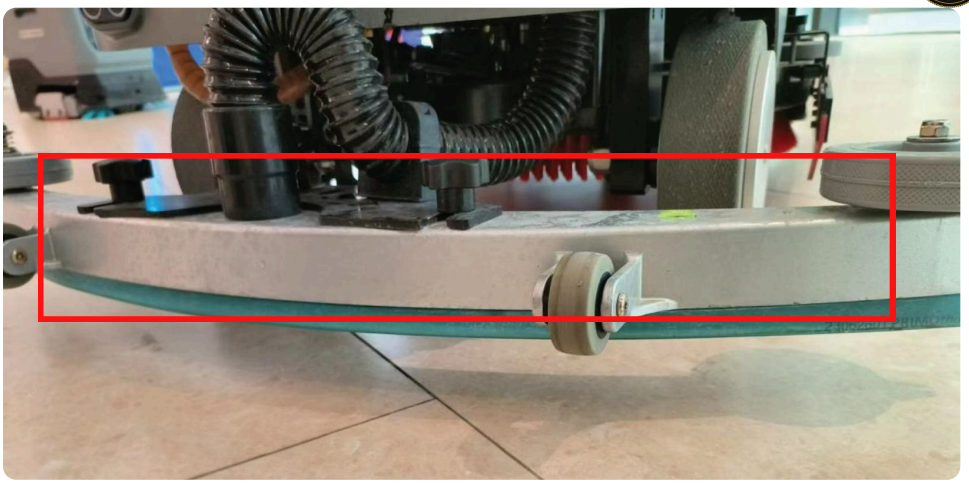
5.2 Daily maintenance

- Clean the squeegee, brush, side rubber, front hairbrush and wheels. Advice to clean squeegee daily and other parts weekly.
- Dump the sewage water and add clean water. Please fill the water a little lower than the level 1 marker.
- Charging the battery. Keep the robot on the charging station daily. If auto charging failed, please push the robot to charging.

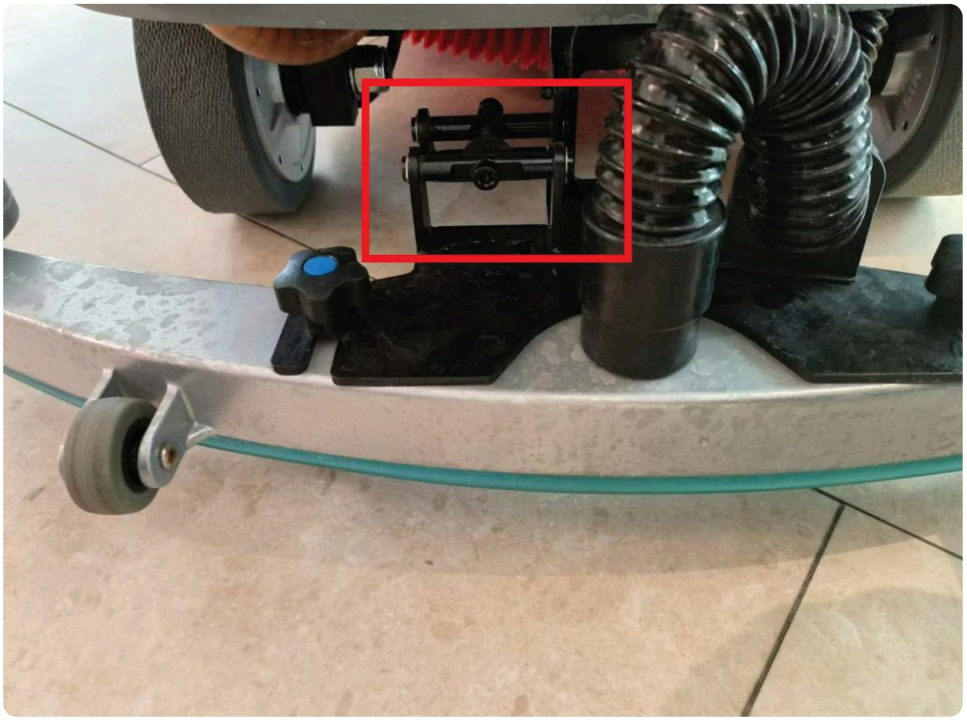
Drain the sewage and clear the filters of trash to ensure that the sewage tanks do not get blocked.

Add the clean water and make the water level a little lower than the level 1 marker. Showing in picture

5 Daily Maintenance



Regularly check that the squeegee strip on the suction rake is not broken



Regularly check whether the rear squeegee is level, if not, please adjust the framed components

+971 52 595 7037

sales@falcontechrobotics.com

www.falcontechrobotics.com

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