

# Scrubber 50 Deployment Guide

售后运营中心-服务中台部【制作】

# Changelog:

Document version	Updated	Change type	Based on software version	Based on the machine version	Revisions	Revision Personnel
CN_V1.0	23.7.14	A	M8-00-1	V4.1	newly built	严玖
CN_V1.1	23.9.8	M	M8-00-1	V4.1		严玖

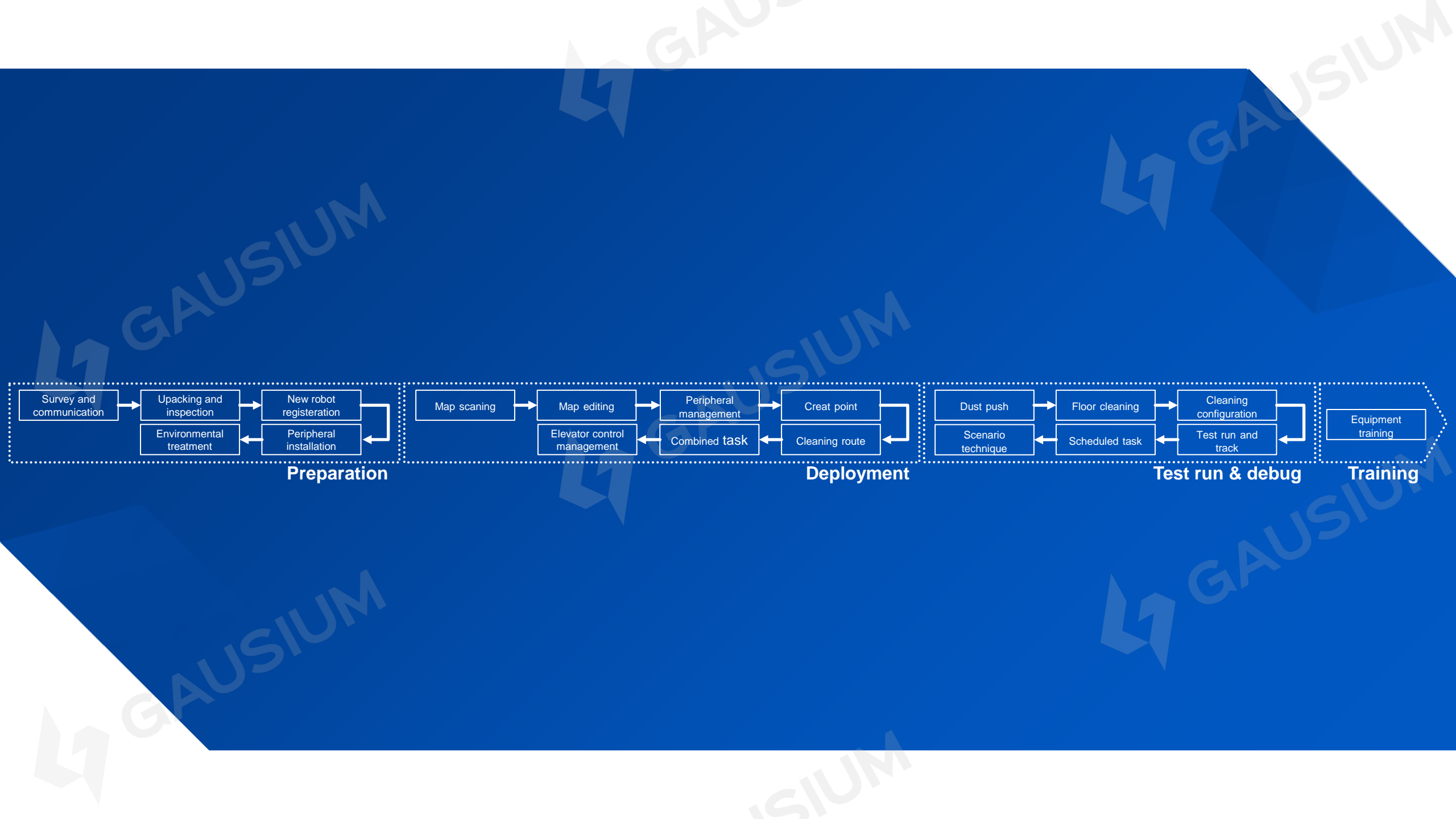
**Change Type:** A=Increase; M = Modified; D=Delete.

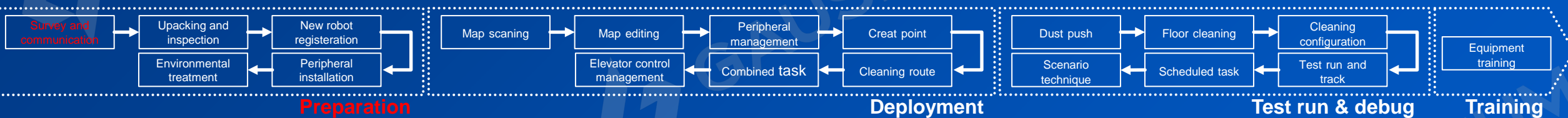
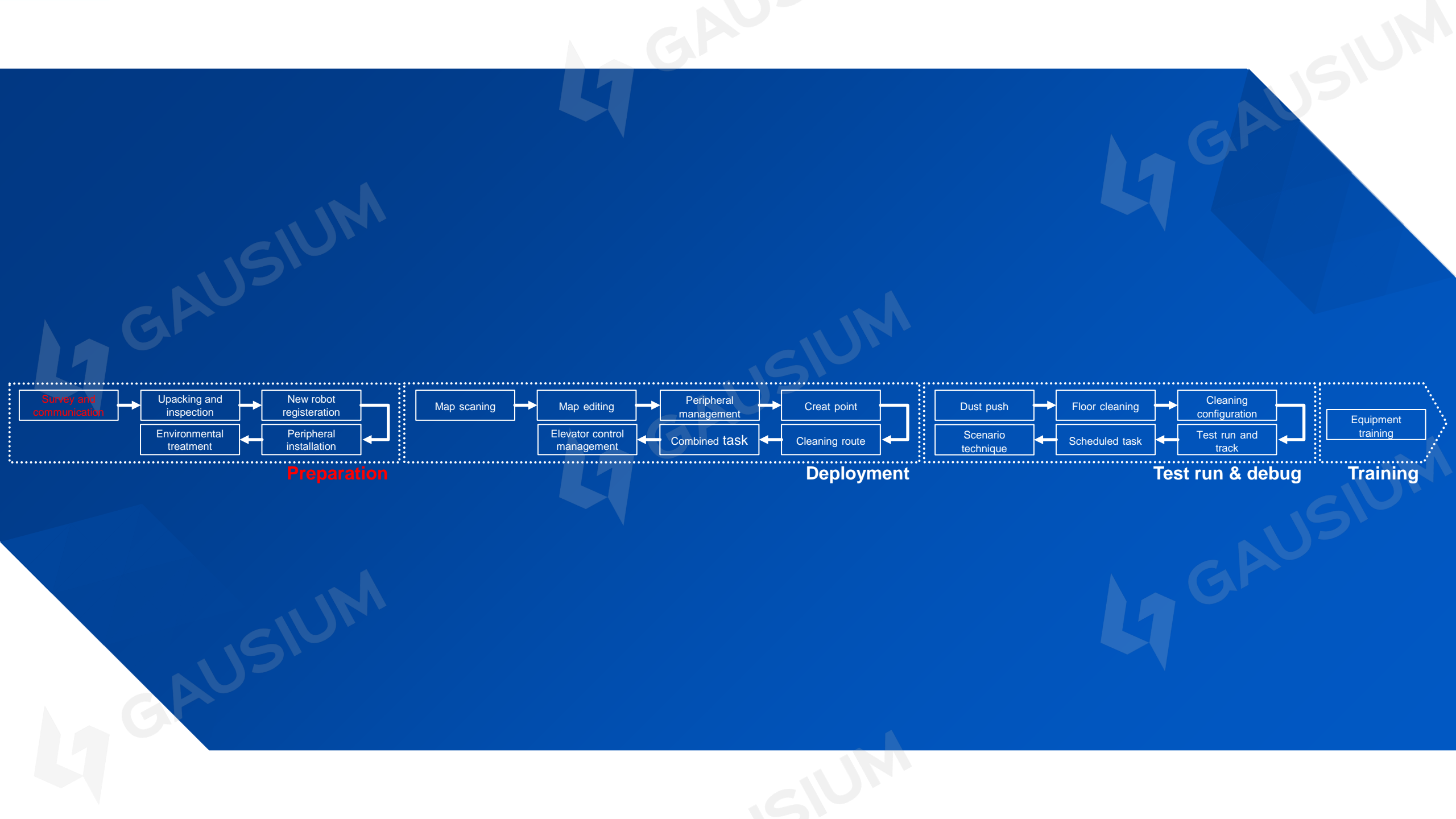
**Software version basic:** the software version used during document development, and different software versions will affect some of the operation methods of device deployment.

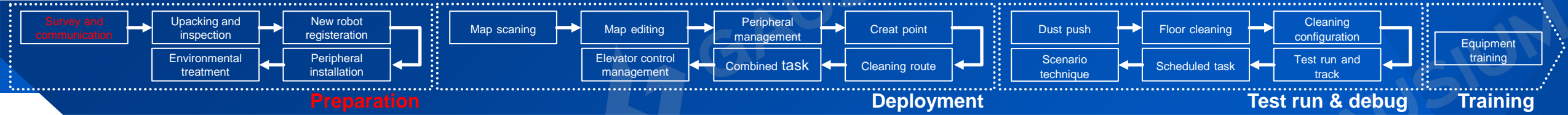
**Full-machine version:** The full-machine version used during document development, and different versions of the full-machine have little impact on device deployment.

**Disclaimer:** The document is for reference only, if the document is inconsistent with the actual situation, please consult the Gaussian docking engineer for the actual operation method.

\* Gausium continuously upgrades and optimizes the software version to make it more comfortable for users.







**Reconnaissance and communication:** communicate with the clients and conduct an entire reconnaissance for on-site to confirm information including cleaning area, cleaning mode, cleaning time and equipment storages.

### Key Action

1. Identify the cleaning area;
2. Survey to recognize risk;
3. Identify the charging dock/workstation setting position, machine manual charging position.
4. Clarify the cleaning mode;
5. Clarify the working time;
6. Clarify the storage location of consumables.
7. Clarify the location of drainage;
8. Identify the customer's assistance personnel and obtain contact information.

### Steps

1

Cleaning is required

No cleaning required

Communicate with the customer, initially confirm the floors and areas to be cleaned by the machine, and inform the customer that the entire site environment will be surveyed later.

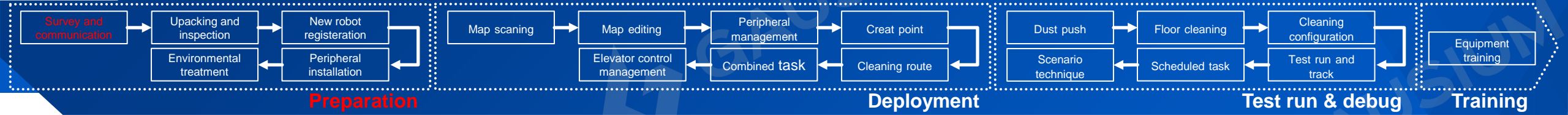
2

Mall	Supermarket	Office	Hotel
Transportation	Industry	Hospital	School
Width	Height	Ridge/Slope	Other Precautions

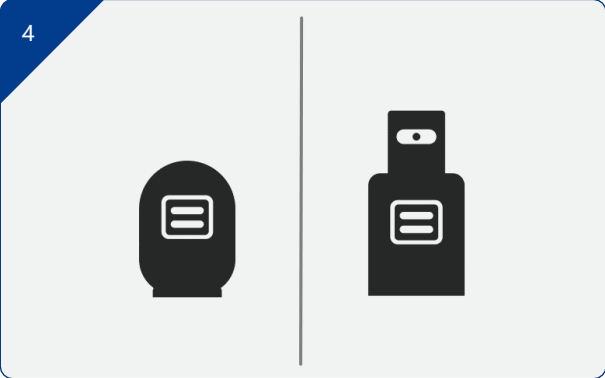
Survey the entire site environment and identify areas that are not suitable for machine operation. Please refer to: [50 Applicable Scenarios & Ground Materials](#), [50 Capability Boundaries](#).

3

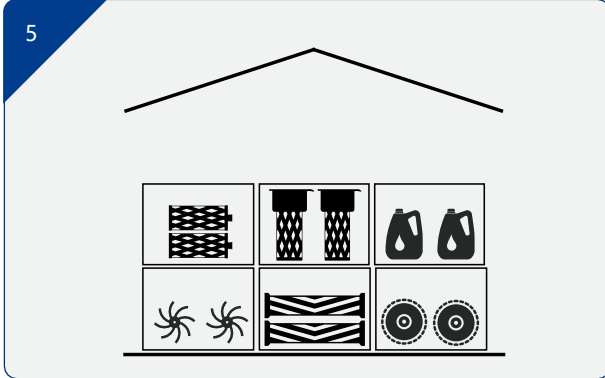
Survey the entire site environment and identify areas with risks in machine operation. Please refer to: [Common Operation Risks and Treatment Methods](#).



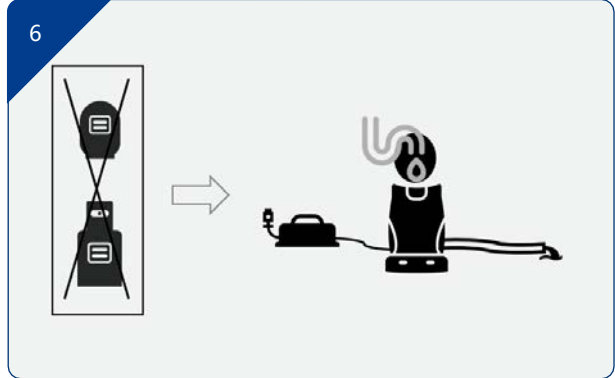
## Steps



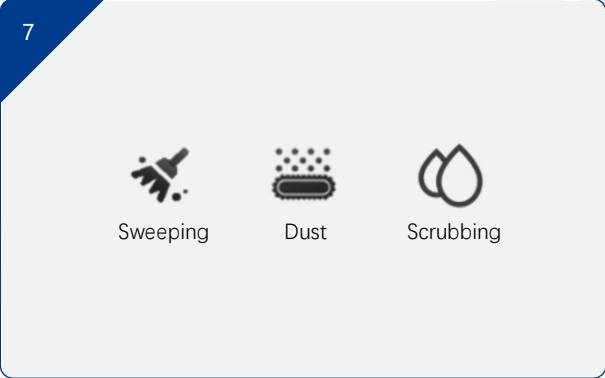
Survey the entire site environment and communicate with customers to determine the installation location of charging piles/workstations. Please refer to: [50 Charging Pile & Workstation Installation Environment Requirements](#).



Communicate with customers to confirm the storage location of machine consumables.



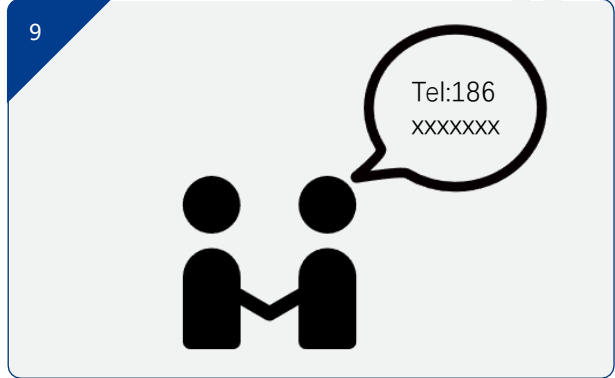
If there is no workstation or the workstation has not been installed, communicate with the customer to confirm the position of manual drainage, manual water addition, and manual charging of the machine.



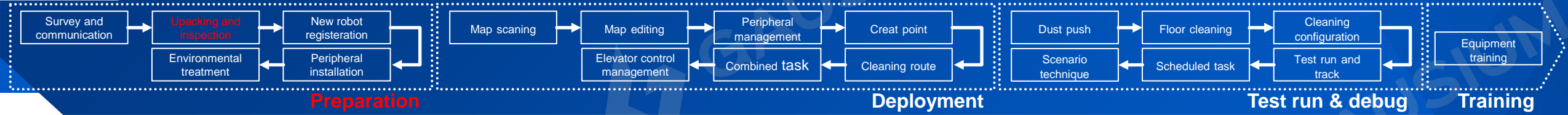
Communicate with customers to confirm cleaning mode requirements. Please refer to: [50 floor materials applicable to each cleaning mode](#).

Time period	Foot traffic
06—07	
07—08	
08—09	
09—10	
⋮	

Communicate with customers to understand the peak time period for on-site traffic and confirm the machine operation time period.



Communicate with customers, confirm follow-up customer assistance personnel, and obtain contact information.



**Unboxing and inspection:** Complete machine unpacking, machine appearance and function inspection, verify the delivery list with the customer, and ask the customer to sign for the sales delivery list.

### Key Action

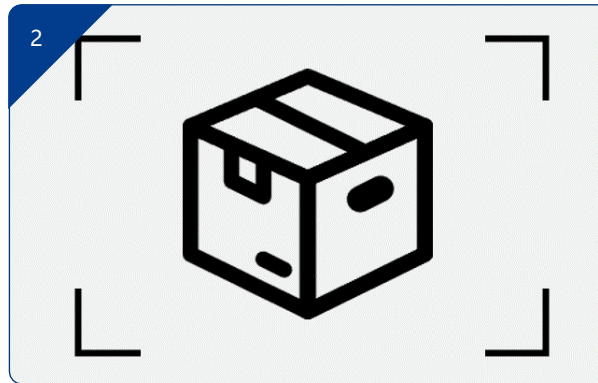
1. Take photos of the outer packaging and keep them;
2. Robot appearance inspection
3. Robot startup inspection;
4. Sign and receive the sales delivery list

5. Use Gausium Intelligence to fill in the unboxing information into the system.

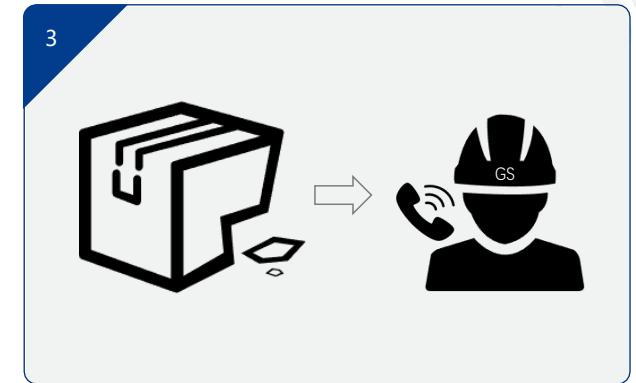
### Steps



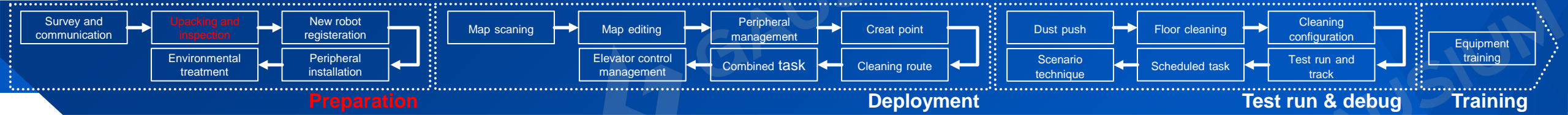
1 Before unpacking, check the outer packaging to make sure it is intact.



2 When taking photos of the external packaging, it is necessary to show the front, rear, left and right packaging conditions.



3 If the outer packaging is damaged, please contact Gausium docking engineer.



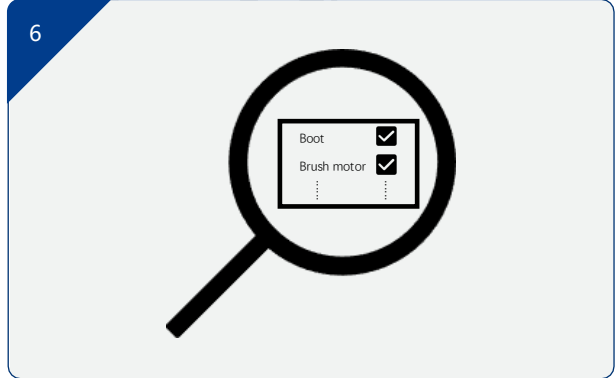
## Steps



Remove the outer packaging and take out the robot.  
For the unpacking process, please refer to: [50 Unpacking Guide](#).



Check the appearance of the machine to ensure that there is no damage to the appearance of the machine.  
Please refer to: [50 Appearance Inspection Methods](#).



Start-up inspection to ensure that all functions of the machine can be used normally. Please refer to: [50 Start-up Inspection Methods](#).



When there is an abnormality in the appearance or function of the machine, it is determined to be unboxing damage.

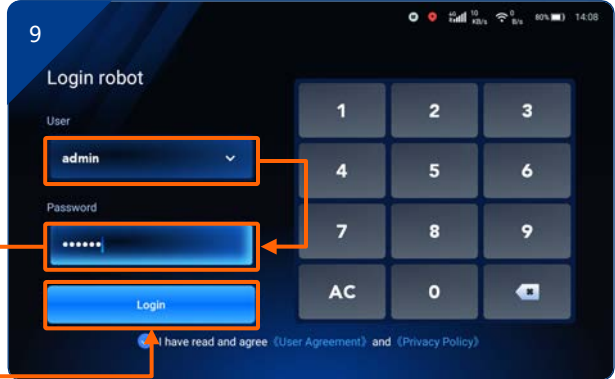
**Non-Gausium internal engineers please contact Gausium docking engineers for assistance in time.**

8

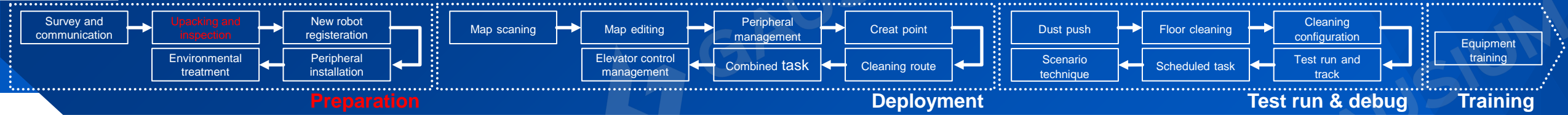
### Sales Shipping Lists

Ecobot Scrubber 50	1
Consumables box	1
⋮	⋮
Consignee and signatory:	

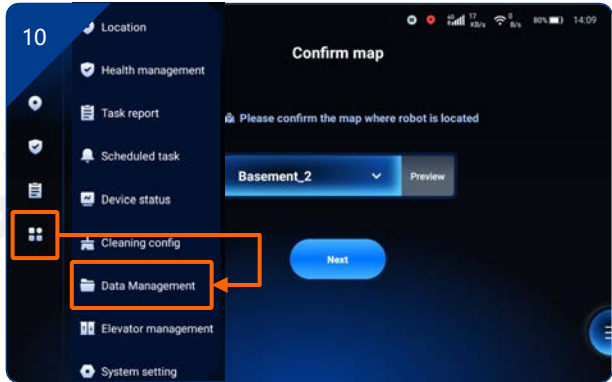
Verify the delivery list, and after confirming it with the customer, ask the customer to sign the sales delivery list; Attachment: [50 sales delivery list template](#).



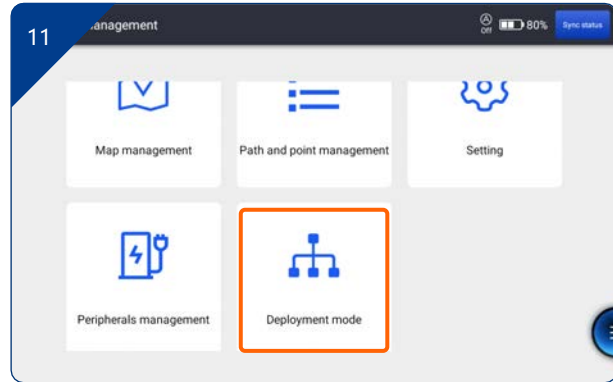
Operating machine screen:  
Select the "admin" account > enter the password "314159" > click "OK"



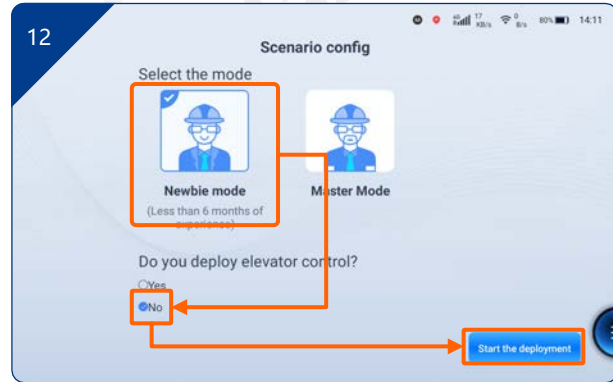
## Steps



Click the More icon > Click Data Management



Click "Deployment Mode"



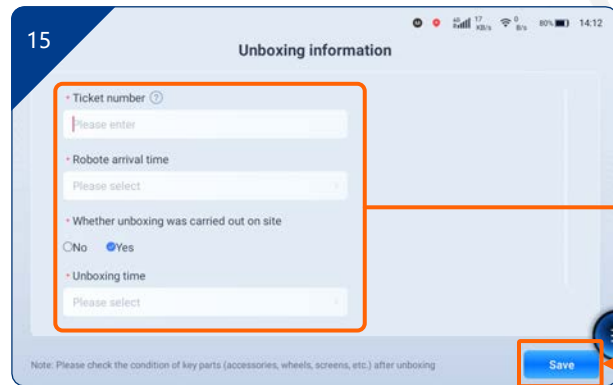
Select "Novice Mode" > Select "Whether to Deploy Elevator Control" according to the site conditions > Click "Start Deployment"



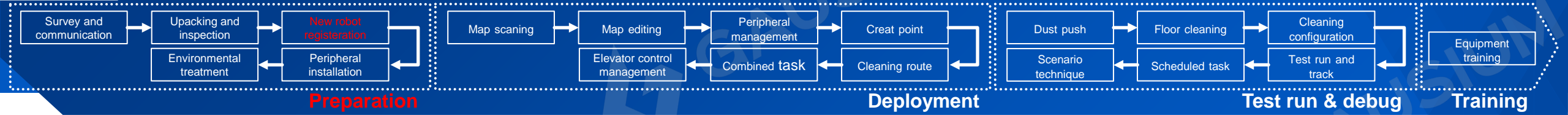
Click "Enter" in the [Unboxing and Deployment Preparation] card



Click "Enter" in the [Unboxing Information] card



Fill in the "work order number" > fill in the "machine arrival time" > fill in "whether unpacking was performed on site" > fill in the "unpacking time" > fill in the "unpacking time" > click "Save"



**New machine registration:** Complete the robot registration on the cloud platform and help customers register a Gausium account. Only after registering on the cloud platform can the machine undergo software OTA upgrade and run data query. If the robot registration is not completed, udesk (Gausium internal service work order system) will be unable to query the machine.

**Note:** Only Gausium engineers can complete new machine registration. Non-Gausium internal engineers please contact Gausium docking engineers for assistance.

**Key action**

1. New machine registration on the cloud platform.
2. Customer's Palm Gausium account application.

**Steps**



To obtain the SN number (serial number) of the machine, please refer to: [50 SN number to obtain the location](#).



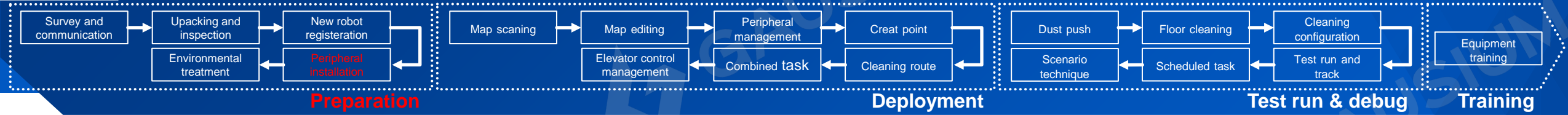
To complete robot registration on the cloud platform, please refer to: [Cloud platform new machine registration steps](#).

**Note:** This step can only be performed by Gausium engineers. Non-Gausium internal engineers please contact Gausium docking engineers for assistance.



To obtain customer information and help customers complete the registration of Zhangshang Gausium account, please refer to: [Zhangshang Gausium account registration process](#).

**Note:** This step can only be performed by Gausium engineers. Non-Gausium internal engineers please contact Gausium docking engineers for assistance.



**Peripheral equipment installation:** optional items, including charging pile/workstation installation and elevator control equipment installation, which can be selected according to the on-site conditions.

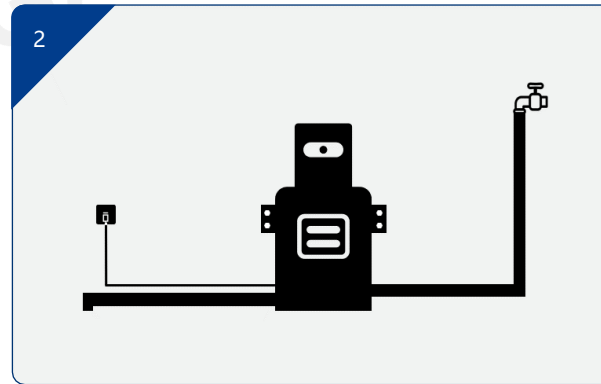
**Key action**

1. Install fixed charging piles/workstations;
2. Install and debug the elevator control equipment.

**Steps**

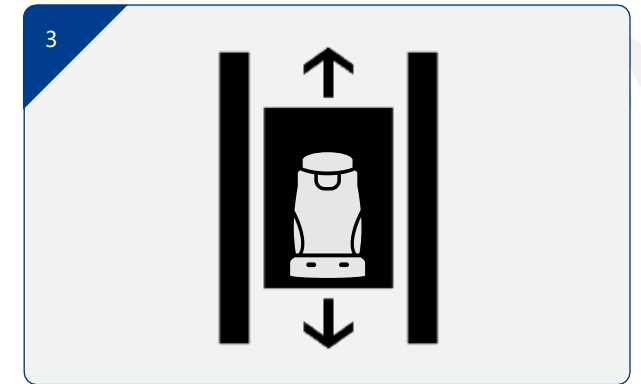


When purchasing a charging pile/workstation, clean the installation location before installing the charging pile/workstation.



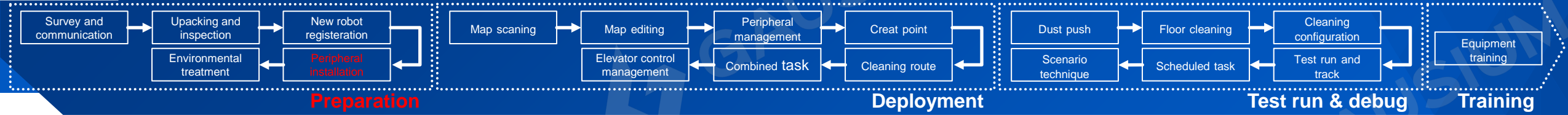
When purchasing a charging pile/workstation, when installing a fixed charging pile/workstation, please refer to: [50 Workstation Installation Specifications](#).

**Note:** The installation of the workstation is led by the customer, and Gao Xian is only responsible for assisting and guiding.

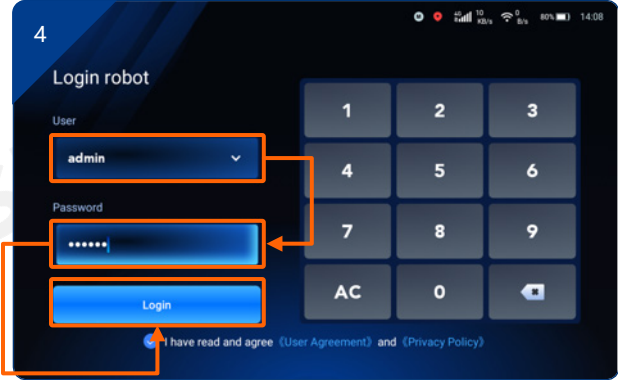


When customers purchase elevator control equipment, Gausium's internal engineers need to install and debug the elevator control equipment.

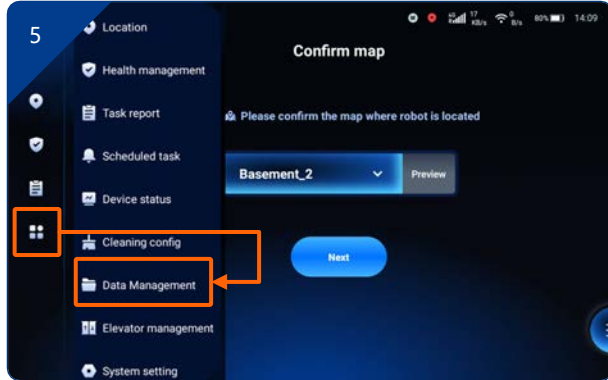
**Note:** This step can only be performed by Gausium engineers. Non-Gausium internal engineers please contact Gausium docking engineers for assistance.



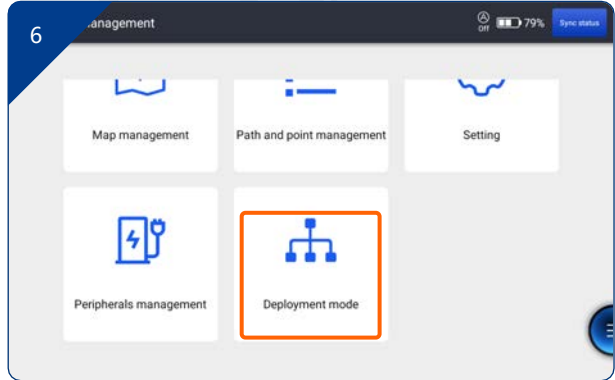
# Steps



Operating machine screen:  
 Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click Data Management



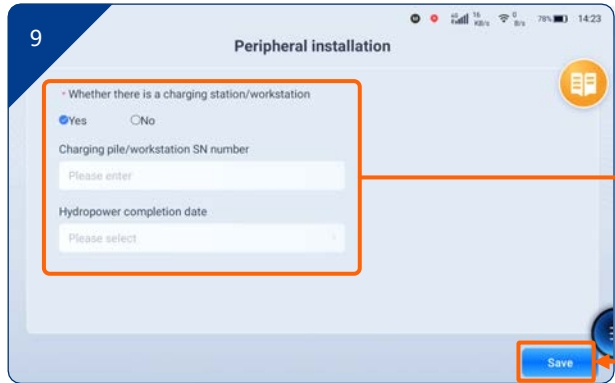
Click "Deployment Mode"



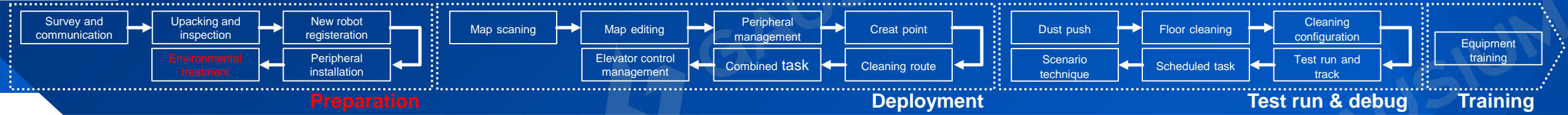
Click "Enter" in the [Unboxing and Deployment Preparation] card



Click "Enter" in the [Peripheral Device Installation] card.  
 If you do not want to install the peripheral device yet or do not need to install it, click "Skip".



Select "Whether a charging pile/workstation is equipped" according to the site conditions > Fill in the "Charging pile/workstation SN number", you can refer to the 50 charging pile/workstation SN number to check the location > Fill in the "Hydropower completion time" > Click "Save"



**Environmental treatment:** Post anti-fall infrared stickers on steps and escalators where there is a risk of falling;

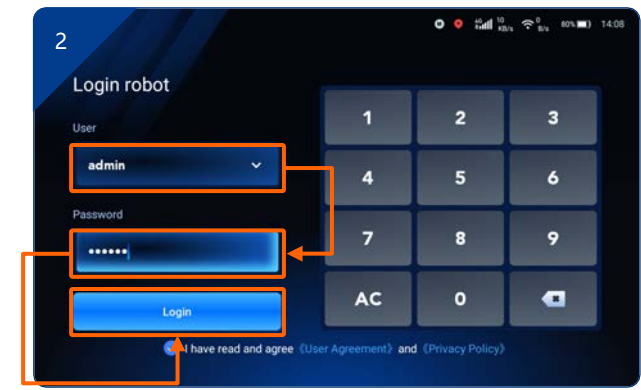
**Key action**

1. Post infrared stickers

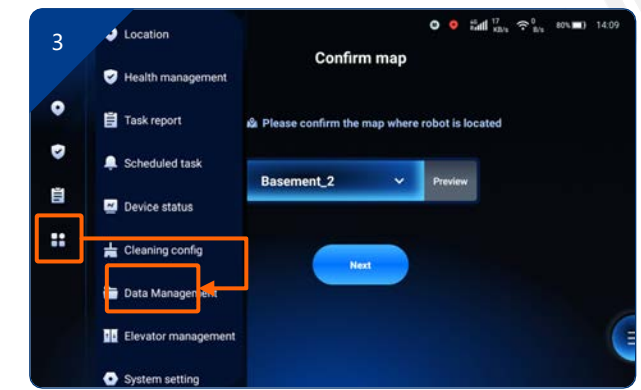
**Steps**



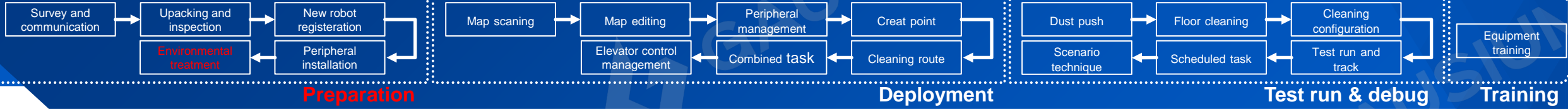
When posting infrared stickers in locations where there is a risk of falling, please refer to: [50 Infrared Sticker Pasting Specifications](#).



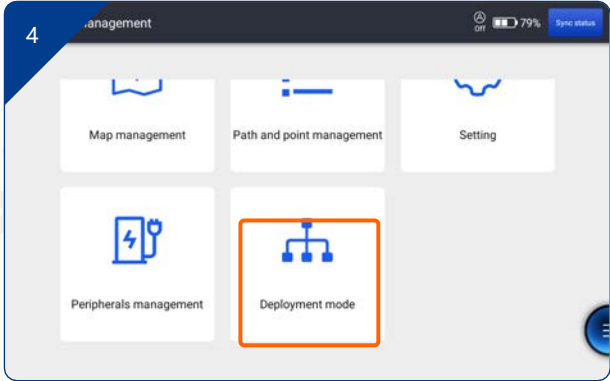
Operating machine screen:  
Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click Data Management



**Steps**



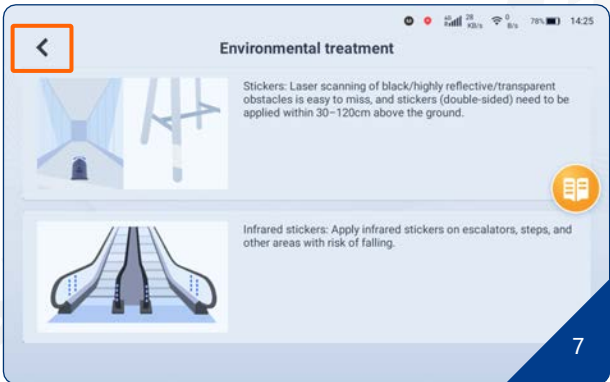
Click "Deployment Mode"



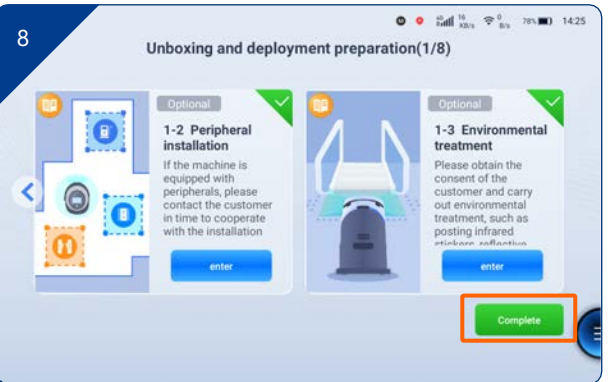
Click "Enter" in the [Unboxing and Deployment Preparation] card



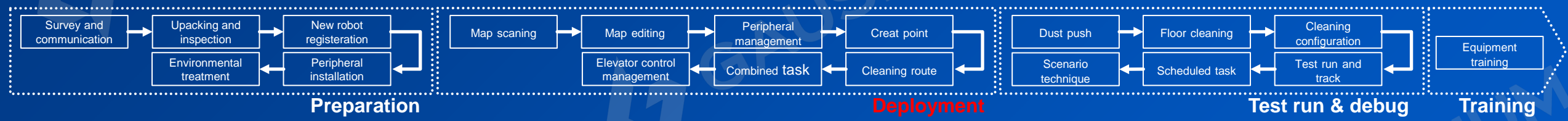
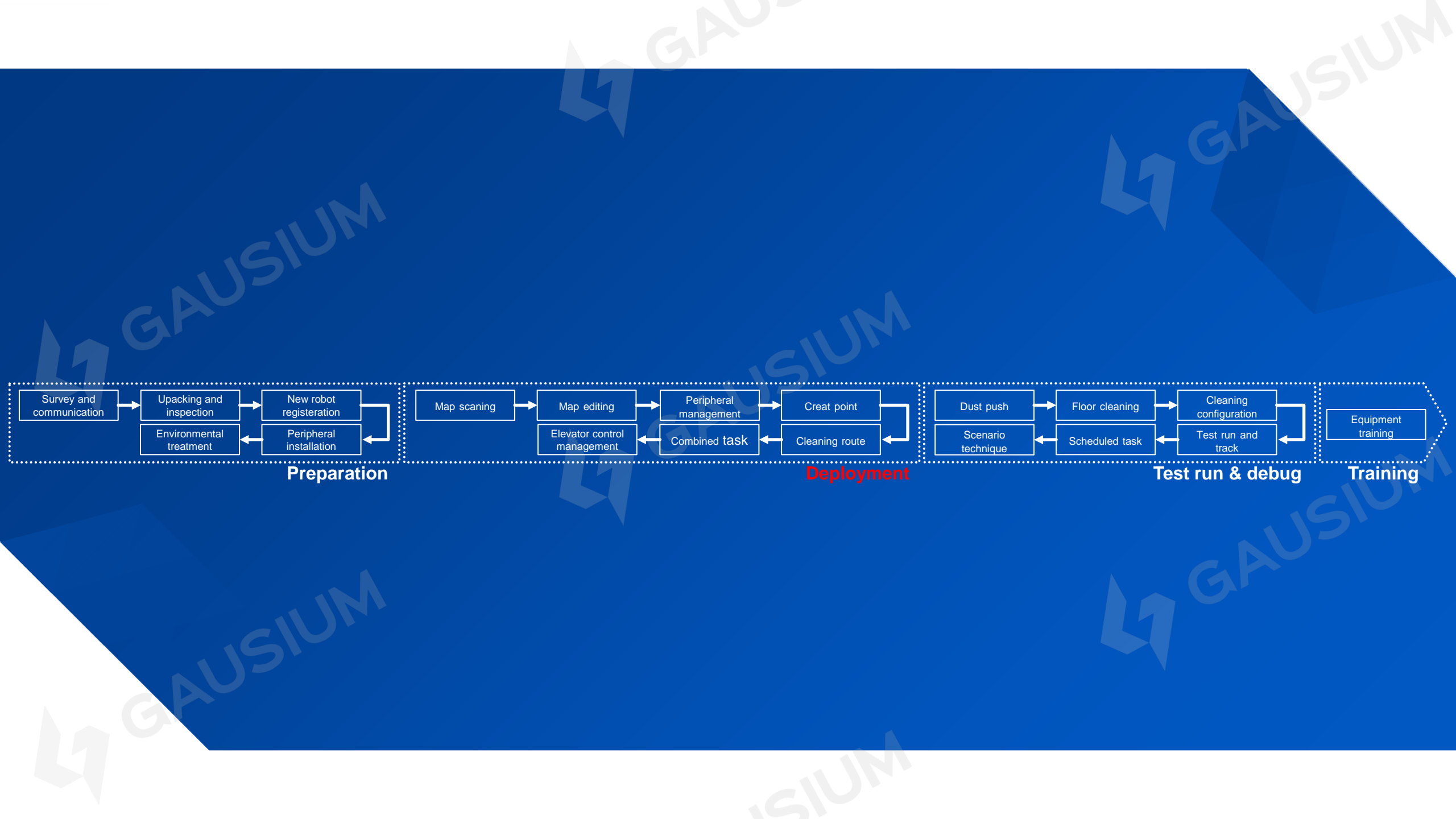
Click "Enter" in the [Environment Processing] card

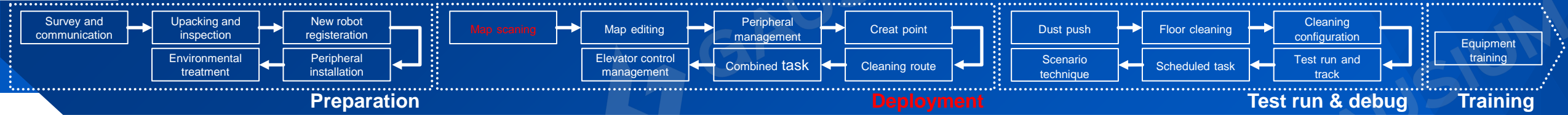


Click the "Back" icon in the upper left corner



Click "Done"





**Map scanning:** Operate Gaussian Robotics to put the machine into map scanning state and promote the machine to move within the environment. The machine generates a point cloud map for positioning and automatic navigation through environmental perception.

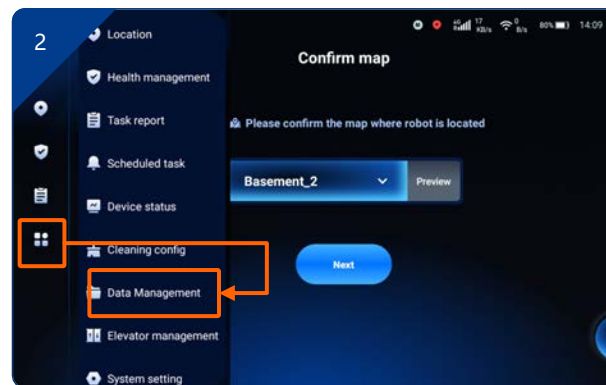
**Key action**

1. Scan the map;
2. Check the map quality;
3. Save the map.

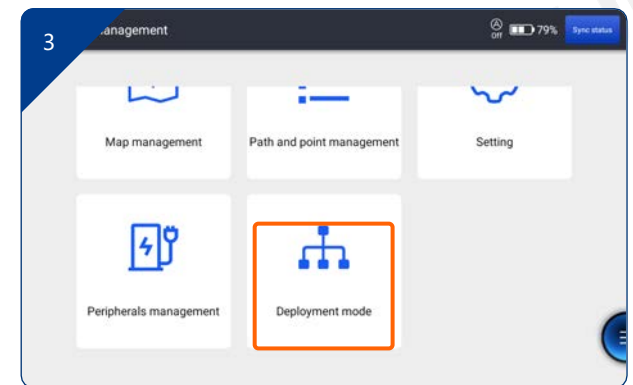
**Steps**



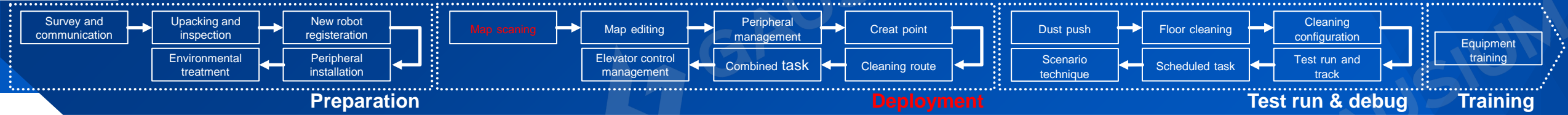
Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click Data Management



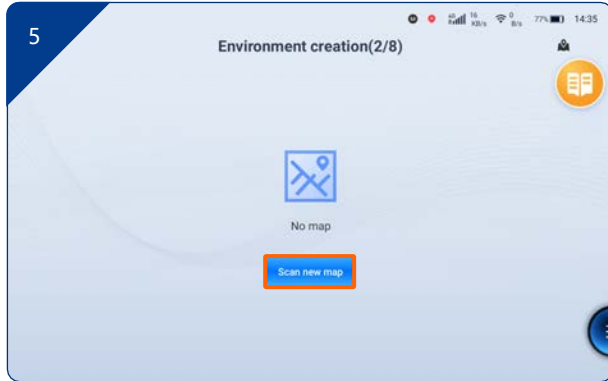
Click "Deployment Mode"



## Steps



Click "Enter" in the [Environment Creation] card



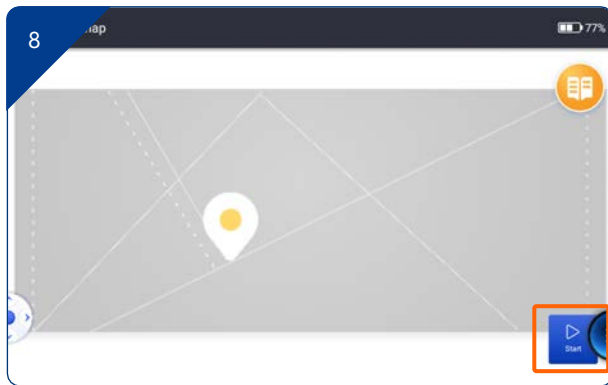
Click "Scan new map"



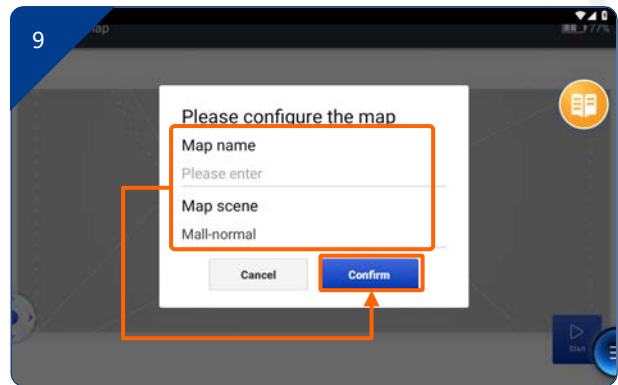
To push the machine to the appropriate scanning starting point, please refer to: [Scanning starting point selection specifications](#).



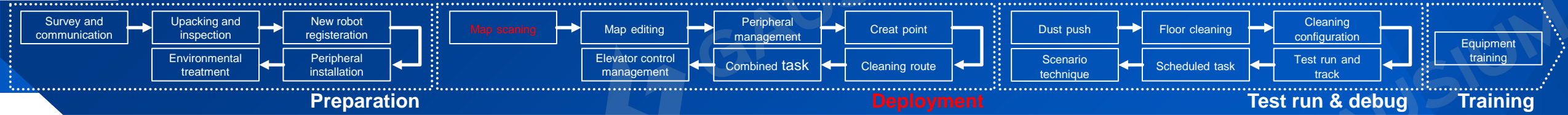
To determine whether it is necessary to physically mark the rear wheel position, please refer to: [Physically Marking the Rear Wheel Scenario](#).



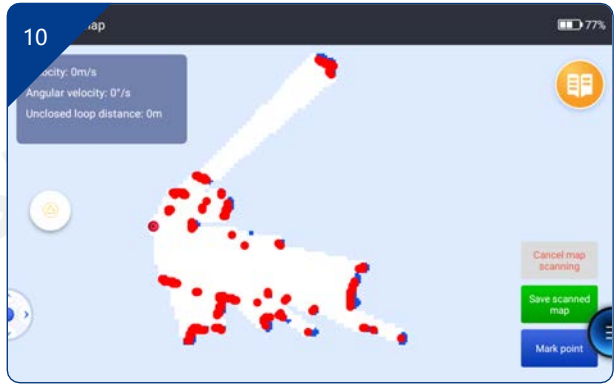
Click "Start"



Fill in the "Map Name", please refer to: [Map Naming Specification](#). > Select "Map Scene" according to the actual scene > Click "OK".



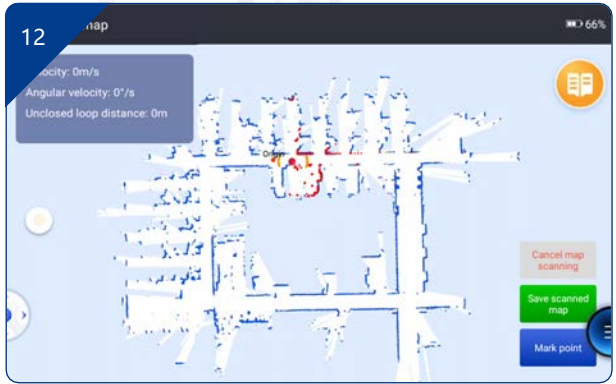
## Steps



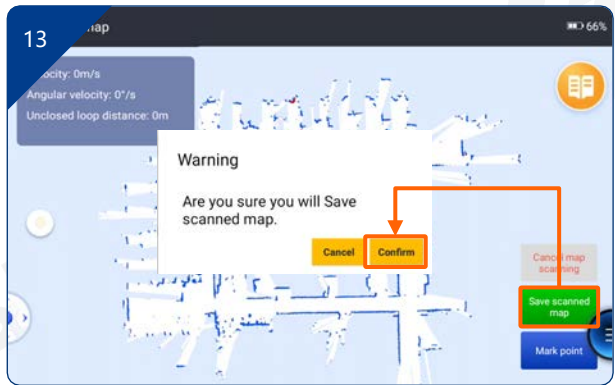
Leave the machine alone for 5 seconds and wait for the real-time laser point cloud (red) to stabilize.



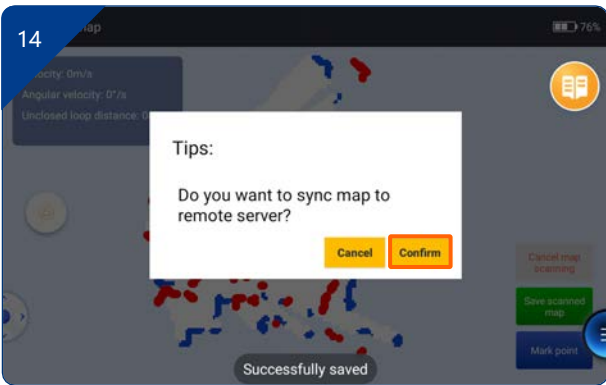
The promotion machine moves the entire site to scan the map. During the promotion process, always pay attention to the scanning status displayed on the screen. Please refer to: [Scanning tips and precautions](#).



After the entire site is scanned, check the quality of the scan. Please refer to: [Map quality inspection method](#).



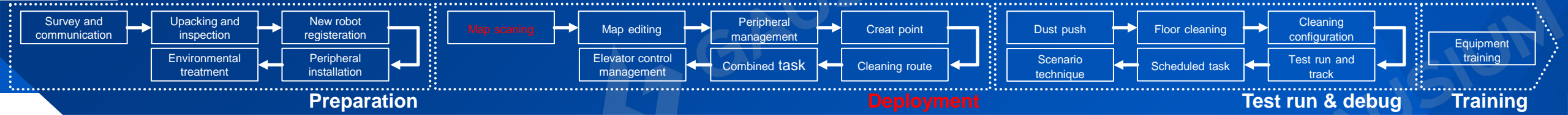
If the quality is good, click "Save Scanned Map" > click "OK" and leave the machine still during the saving process.



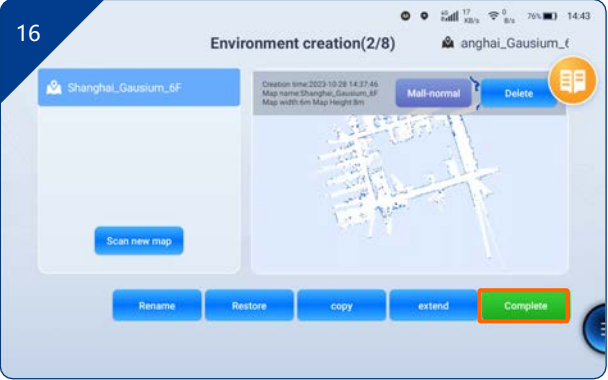
After saving, a prompt for uploading to the cloud server will pop up, click "OK". At this stage, except for the S line map, which will be uploaded to the cloud platform, clicking "OK" on other machines has no effect.



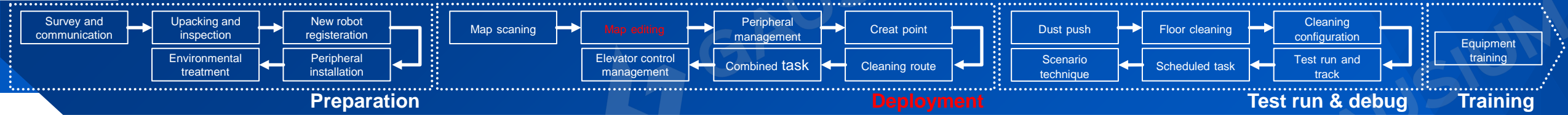
After the map is saved, if you want to update the map or continue to expand the scanned map, please refer to: [Extended Map Instructions](#).



**Steps**



After the map is scanned and saved, click "Done"

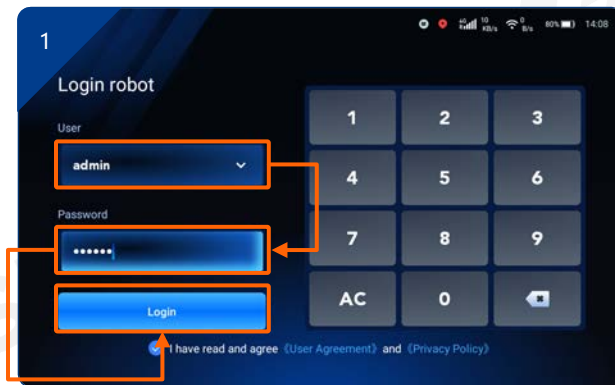


**Map editing:** Operate Gausium Smart Guide and use different editing modes to edit or mark the map, which can help the machine optimize cleaning routes and avoid risks.

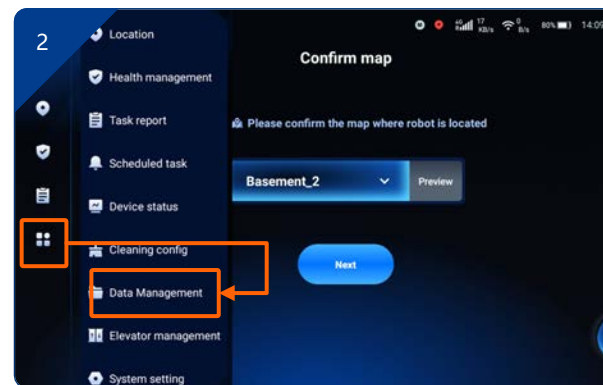
### Key action

1. Delete noise;
2. Draw virtual walls;
3. Draw the highlighted area;
4. Use other editing modes according to the scene.

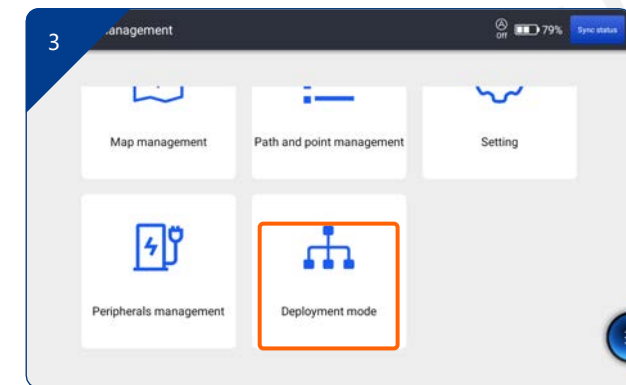
### Steps



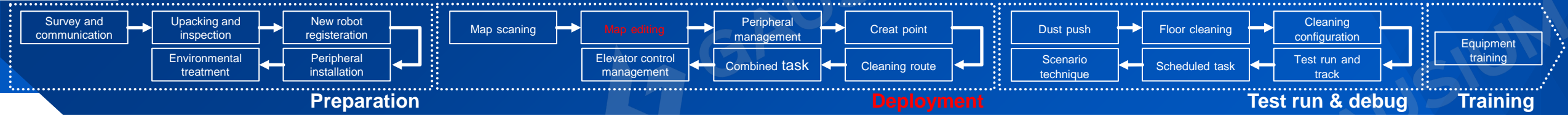
Select the "admin" account > enter the password "314159" > click "OK"



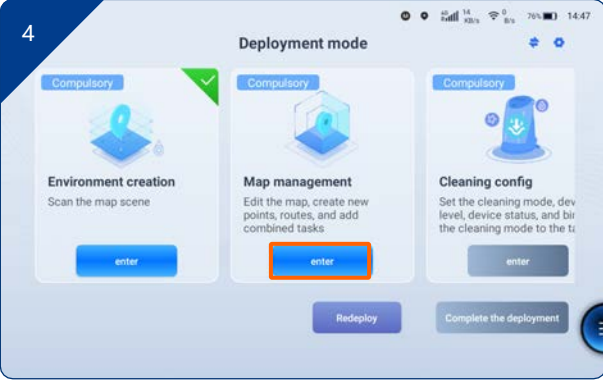
Click the More icon > Click Data Management



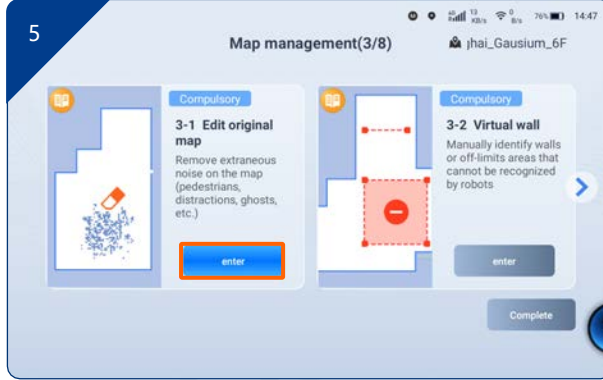
Click "Deployment Mode"



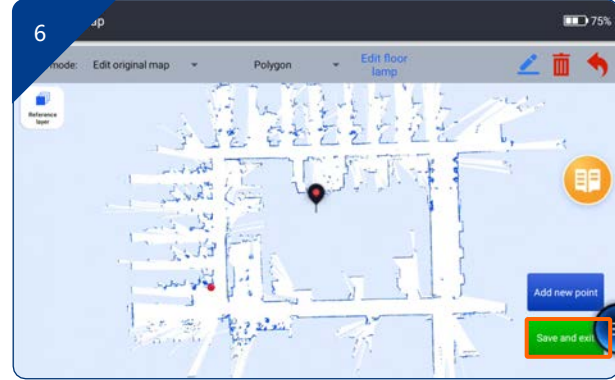
**Steps**



Click "Enter" in the [Map Management] card



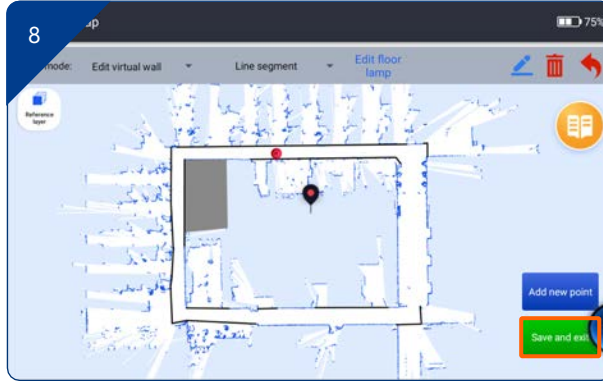
Click "Enter" in the [Original Image Editing] card to use original image editing to delete all noise points. Please refer to: [How to use noise points and original image editing.](#)



After removing all noise, click "Save and Exit"



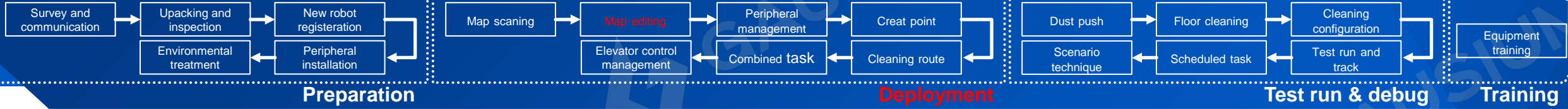
Click "Enter" in the [Virtual Wall] card to add virtual walls to all locations on the map where virtual walls need to be drawn. Please refer to: [How to use virtual wall editing.](#)



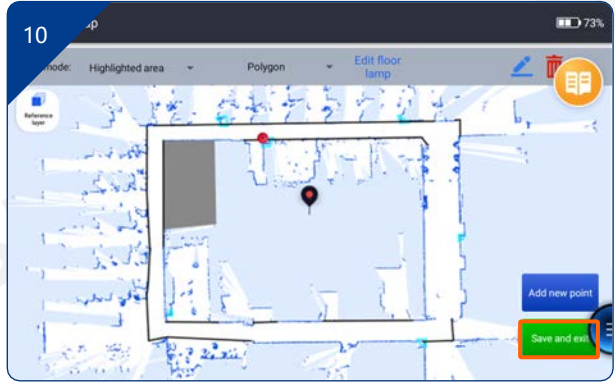
Therefore, after adding virtual walls wherever you need to draw virtual walls, click "Save and Exit"



Click "Enter" in the [Highlight Area] card to add highlight areas to all locations on the map where highlight areas need to be drawn. Please refer to: [How to use highlight areas.](#)



**Steps**



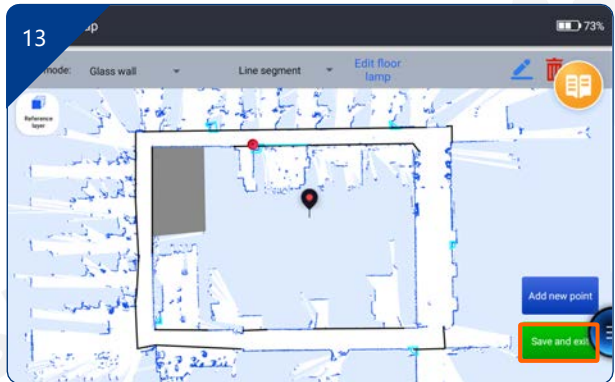
After drawing all highlighted areas, click "Save and Exit"



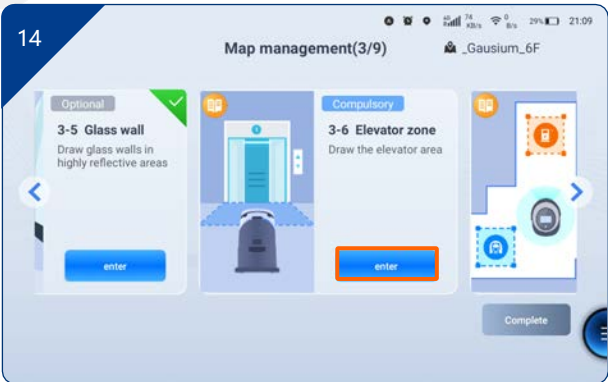
Click "Skip" in the [Temporary Booth] card to suspend the temporary booth function.



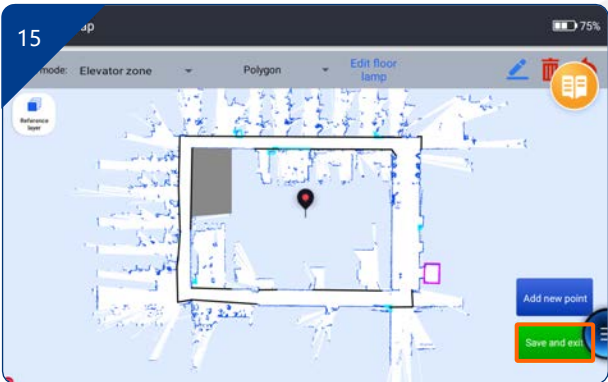
When there are glass walls or other highly reflective walls on site, click "Enter" in the [Glass Wall] card to draw a glass wall at the location of the wall. Please refer to: [How to use glass walls](#). When the target wall does not exist on site, click "Skip".



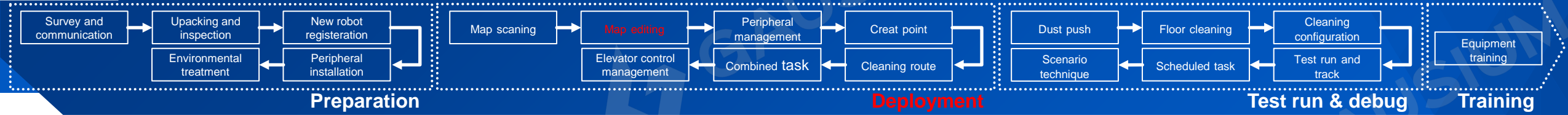
Once all glass walls are drawn, click "Save and Exit"



Click "Enter" to draw the elevator area on the map. Please refer to: [How to use the elevator area](#).  
When entering the deployment mode for the first time to configure the scene, you have selected that you need to deploy elevator control, so there will be an extra step here.



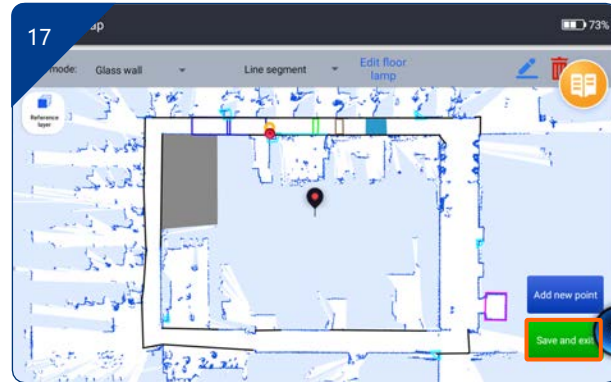
Once you've finished drawing the elevator area, click "Save and Exit."  
When entering the deployment mode for the first time to configure the scene, you have selected that you need to deploy elevator control, so there will be an extra step here.



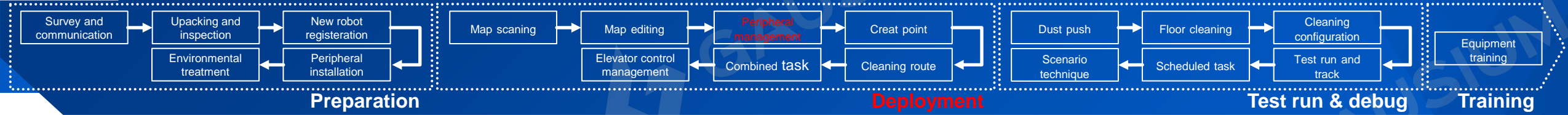
**Steps**



According to the on-site environment, determine whether you need to use other editing modes. If necessary, click "Enter" in the [Other Areas] card, otherwise click "Skip". Please refer to: [How to use other editing modes](#).



After using all the editing modes you need to use, click "Save and Exit"

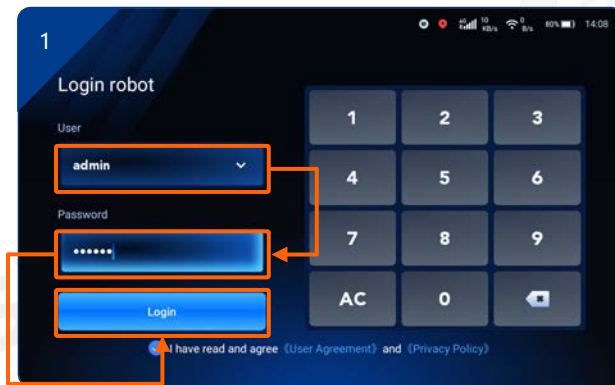


**Peripheral equipment management:** Based on the actual installation location of charging piles/workstations, create charging points/workstations on the map so that the machine can automatically return to the charging pile for charging or return to the workstation for charging and drainage when the machine is low on battery power/the clean water tank is empty/the sewage tank is full.

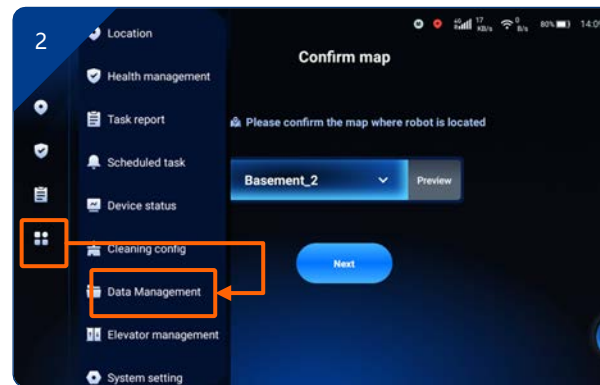
### Key action

1. The promotion machine should be facing the charging pile/workstation, and the distance should be controlled at about 1m.
2. Create charging points/work stations.
3. Test to ensure that the machine can charge/drain the pile normally.

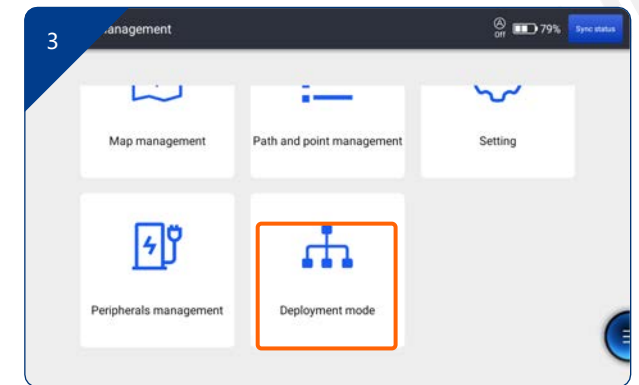
### Steps



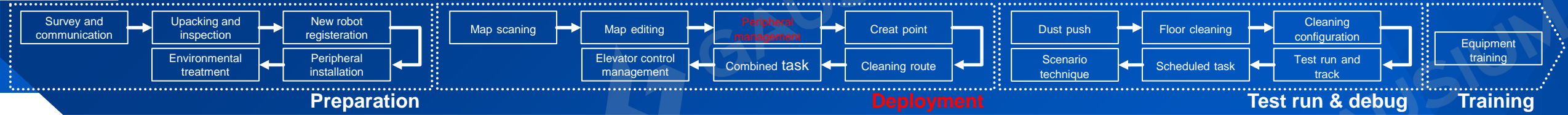
Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click Data Management



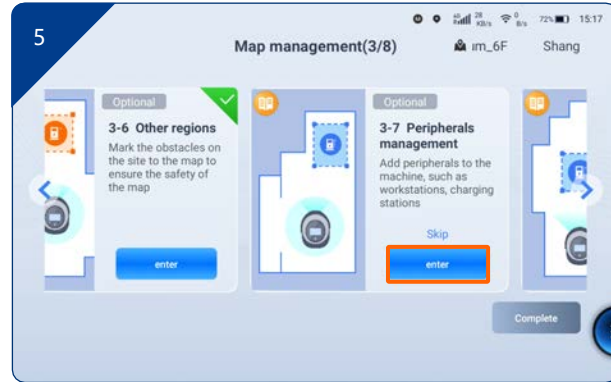
Click "Deployment Mode"



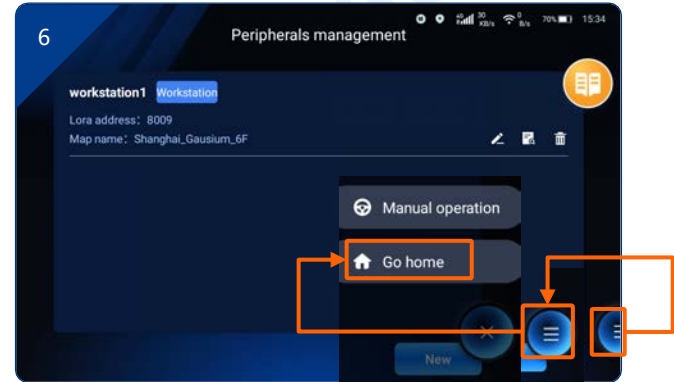
## Steps



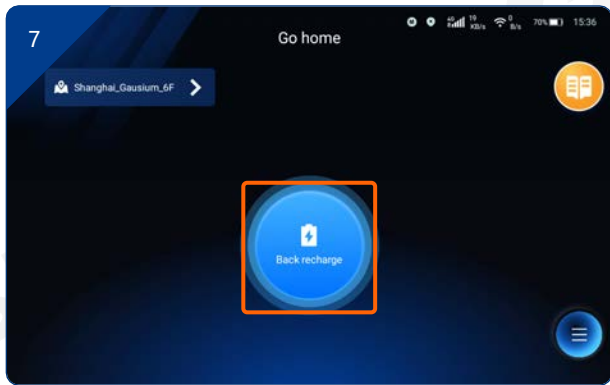
Click "Enter" in the [Map Management] card



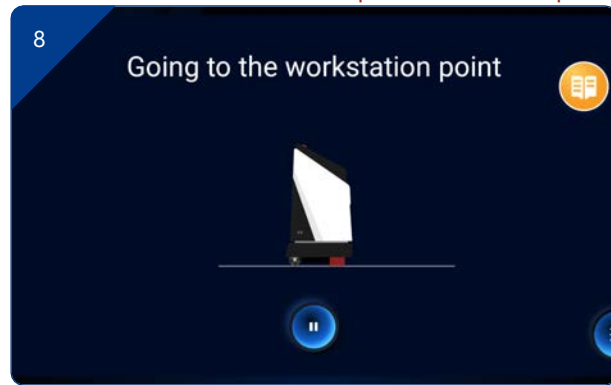
Make sure that the water and electricity installation of the workstation/charging pile has been completed and fixed. Click "Enter". You can refer to: [How to create a workstation/charging pile point](#). If the water and electricity installation has not been completed, has not been fixed, or there is no installation requirement, click "Skip"



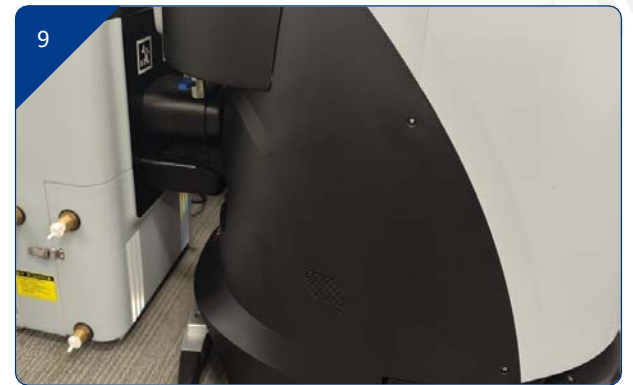
Click on the floating ball in the lower right > Expand and click on the floating ball again > Click "Go Home"



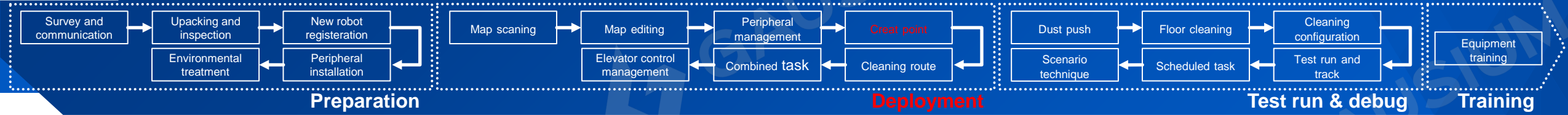
Click "Recharge"



Track the machine and observe the machine to ensure that it can align the piles normally.  
Charging pile: The charging electrodes are in good contact and the machine is charging normally;  
Workstation: The water inlet and drain outlet are in normal contact, and the machine is charging and draining normally.



Switch the machine to manual mode, manually remove the workstation/charging pile, and repeat the machine alignment 10 times to ensure that the pile can be aligned and charged (workstation/charging pile) or drained (workstation) normally each time.

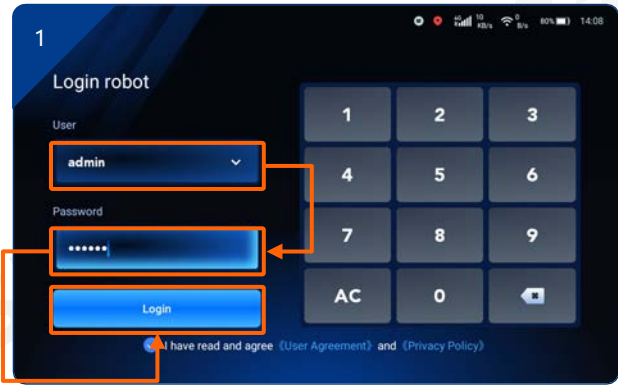


**Create points:** Flexibly create points on the map according to actual needs, including: navigation points, landmark points, QR code points, maintenance points, ladder entry points, dangerous points, and summoning points.

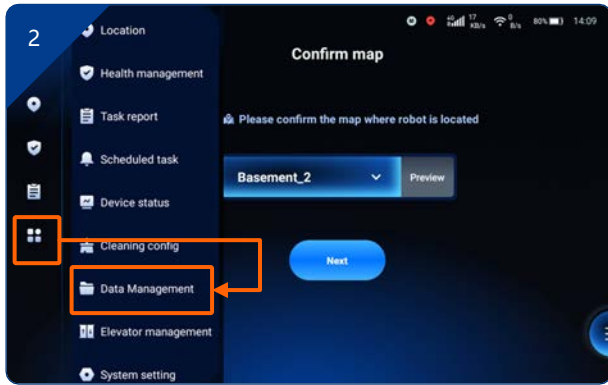
**Key action**

1. The promotion machine should be facing the charging pile/workstation, and the distance should be controlled at about 1m.
2. Create charging points/work stations.
3. Test to ensure that the machine can charge/drain the pile normally.

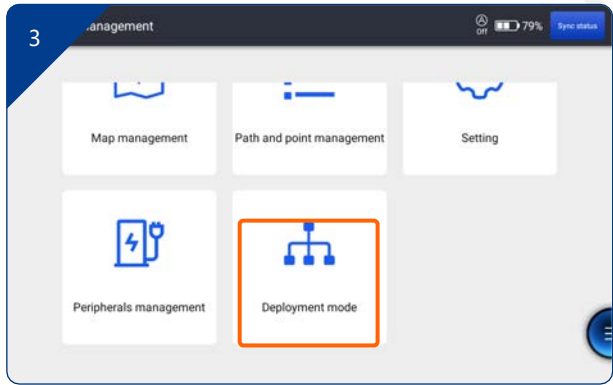
**Steps**



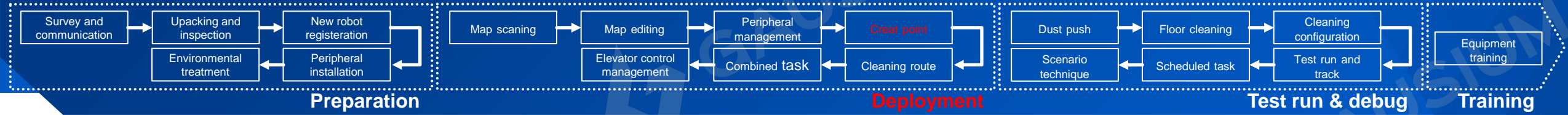
Select the "admin" account > enter the password "314159" > click "OK"



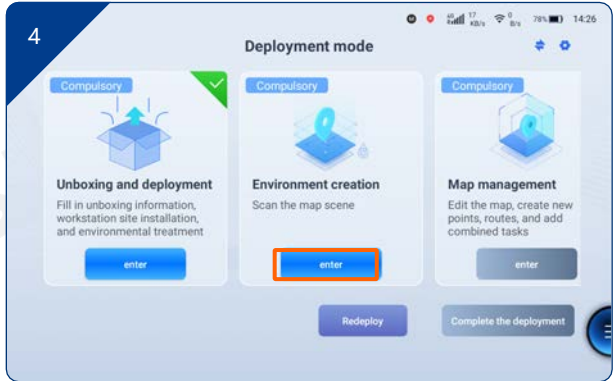
Click the More icon > Click Data Management



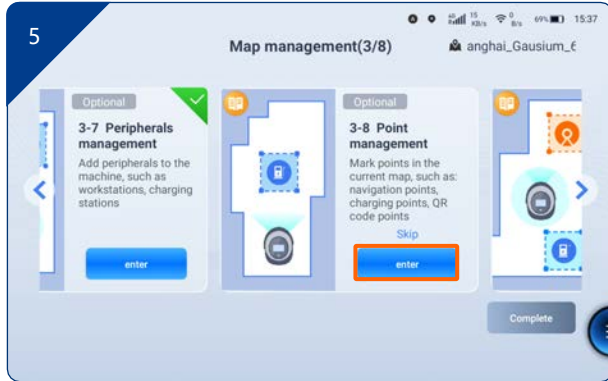
Click "Deployment Mode"



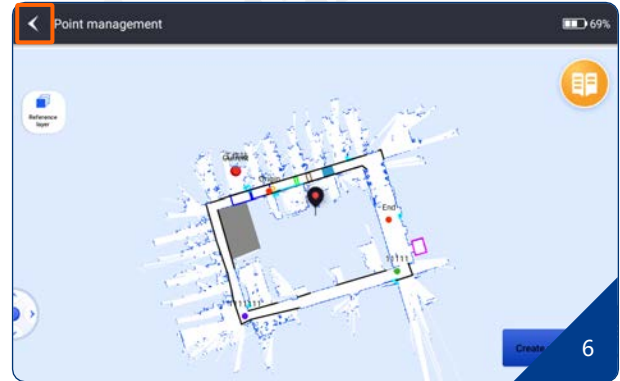
## Steps



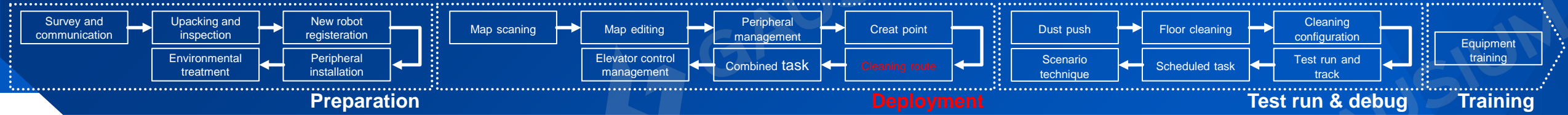
Click "Enter" in the [Map Management] card



According to the actual situation, you need to create a point and click "Enter". You can refer to: [How to use point management](#), There is no need to create a point and click "Skip".



After using the created points, click the "Return" icon to exit point management.



**Cleaning path:** Based on the size of the on-site pre-cleaning area and customer needs, select the correct path drawing method to help the machine draw the cleaning path on the map.

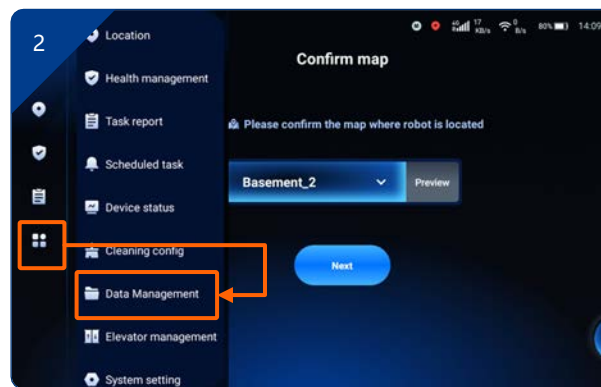
### Key action

1. Choose the correct path drawing method;
2. Draw a cleaning path on the map.

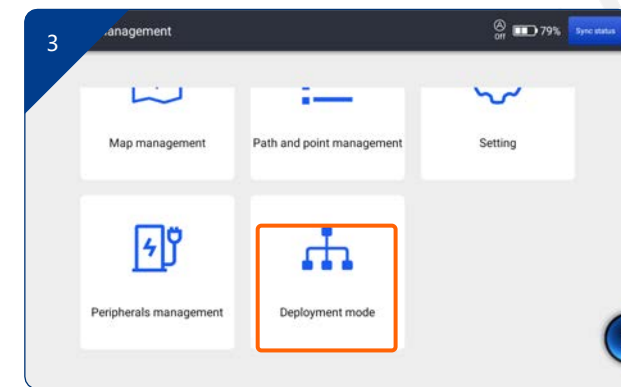
### Steps



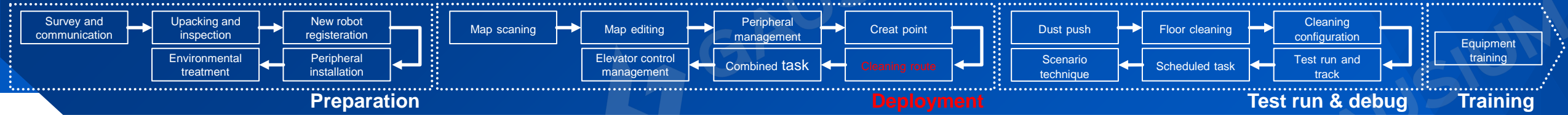
Select the "admin" account > enter the password "314159" > click "OK"



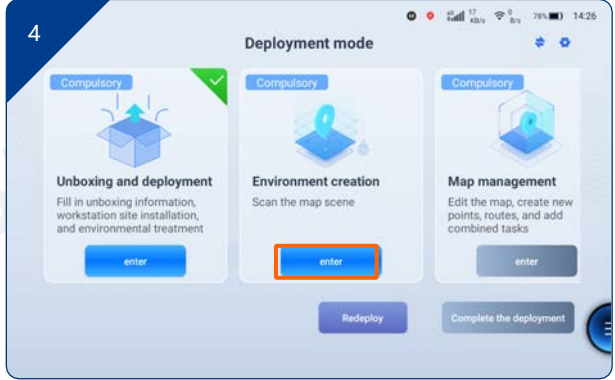
Click the More icon > Click Data Management



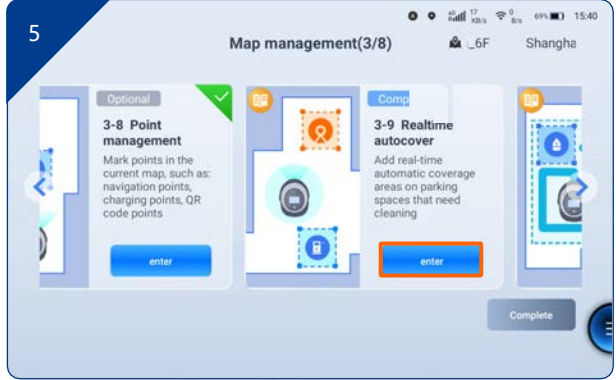
Click "Deployment Mode"



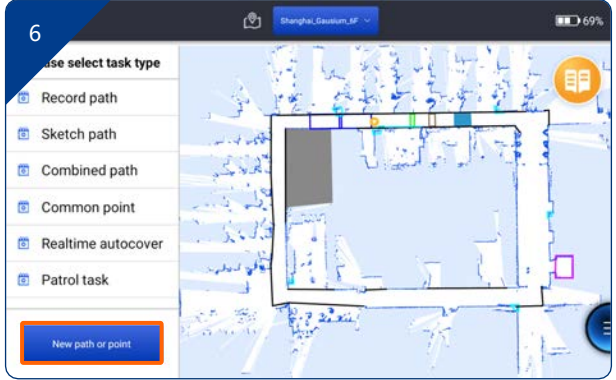
**Steps**



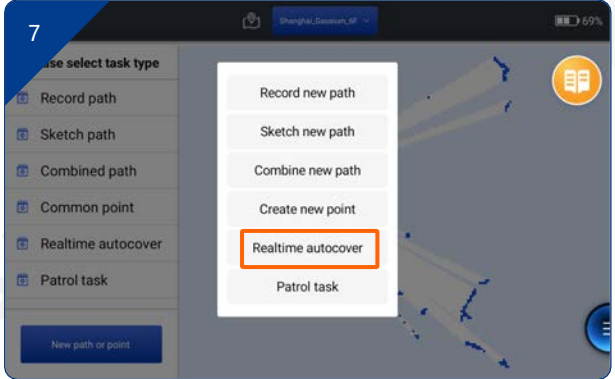
Click "Enter" in the [Map Management] card



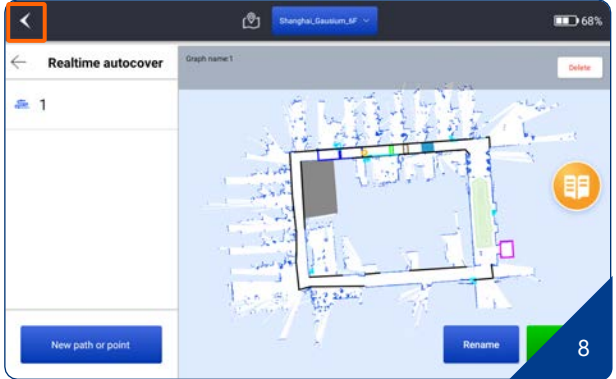
Click "Enter" in the [Real-time automatic coverage] card



According to the map thumbnail on the right, plan the order and method of drawing the cleaning path in advance. Please refer to: [Cleaning path planning suggestion](#). Path planning is very important and ultimately affects the combined mission.



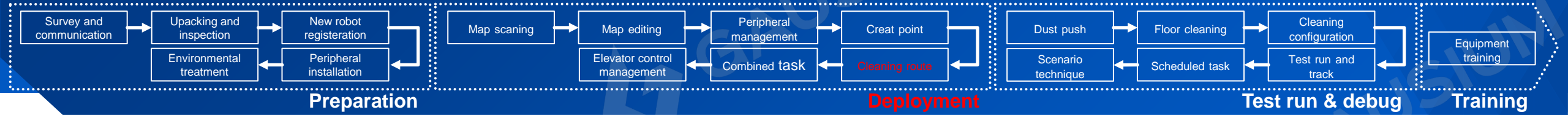
According to the planned cleaning path drawing sequence, use the real-time automatic coverage drawing method to draw the cleaning paths in sequence. Please refer to: [How to use real-time automatic coverage](#).



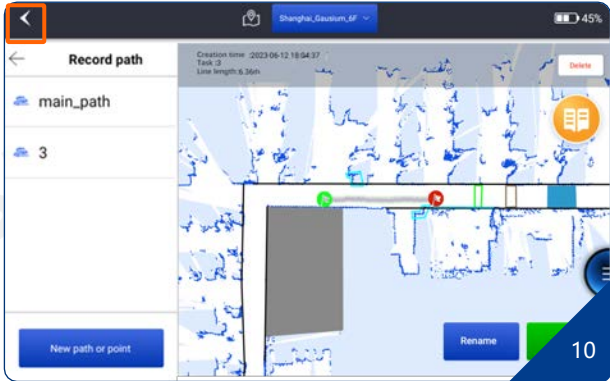
After adding paths to all areas that need to be added using real-time automatic coverage, click the "Return" icon.



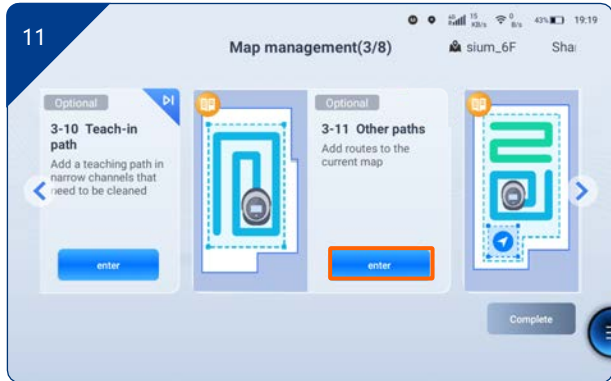
According to the actual environment on site, you need to click "Enter" to determine whether you need to use the teaching path. Otherwise, "click to skip"; Please refer to: [How to use the teaching path](#).



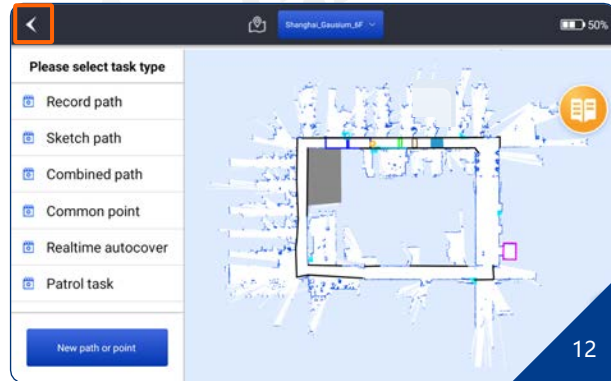
**Steps**



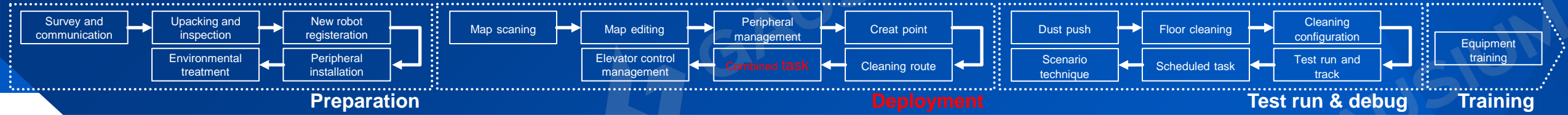
After adding all the locations that need to use the teaching path to create a cleaning path, click the "Return" icon.



There are also some 50 less commonly used path drawing methods. If you need to use them, click "Enter" in the [Other Paths] card, otherwise click "Skip". You can refer to: [How to use other paths.](#)



When you are done using other paths as needed, click the Back icon.

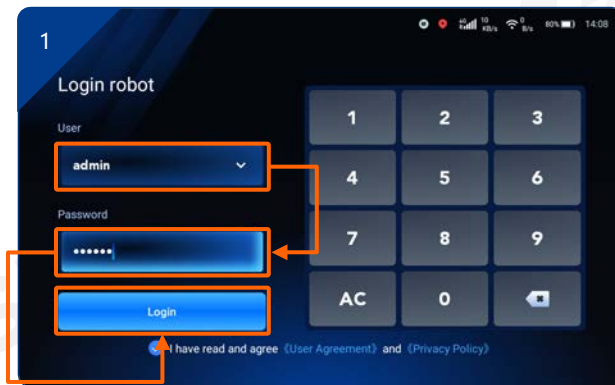


**Combined tasks:** Based on path planning, on-site zoning conditions, and cleaning path area size, existing cleaning paths are combined and sorted and corresponding tasks are generated for customers to select and deliver tasks to the machine when using automatic mode, and to set timings. Task configuration is performed during the task, which is used for task configuration when creating cross-floor tasks.

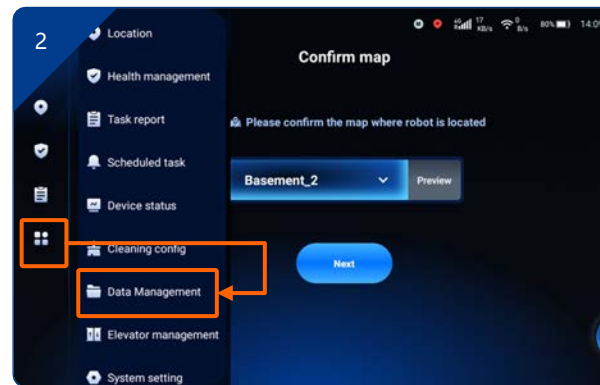
### Key action

1. Create portfolio tasks
2. The paths within the tasks are sorted reasonably

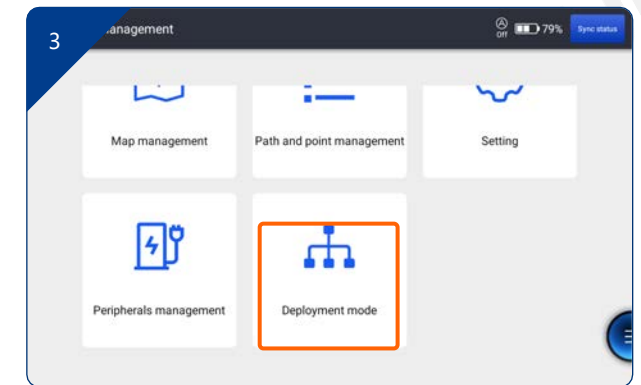
### Steps



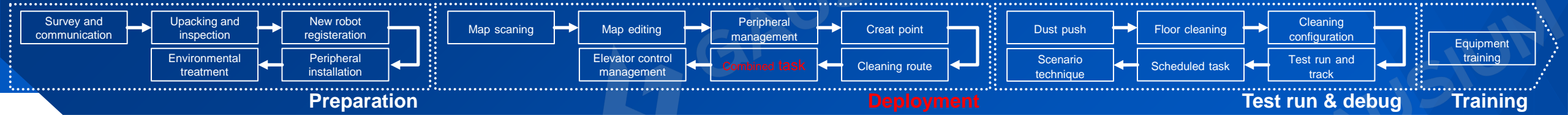
Select the "admin" account > enter the password "314159" > click "OK"



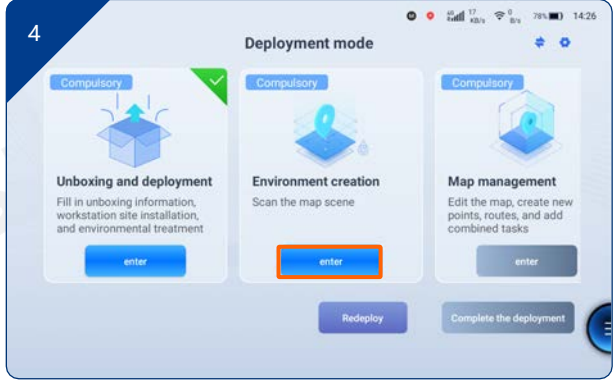
Click the More icon > Click Data Management



Click "Deployment Mode"



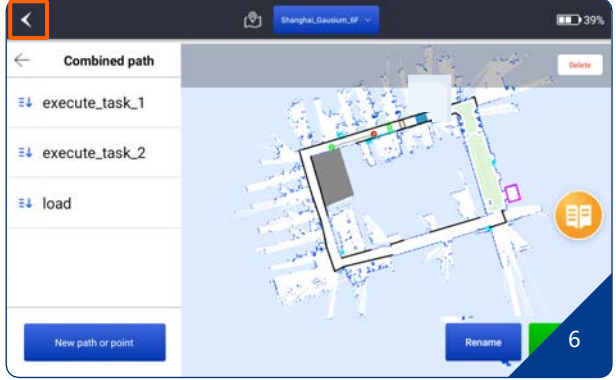
**Steps**



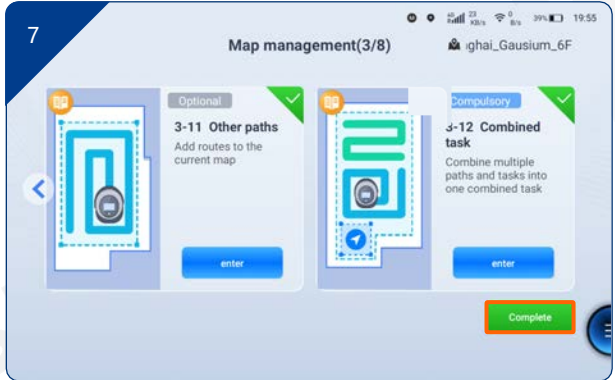
Click "Enter" in the [Map Management] card



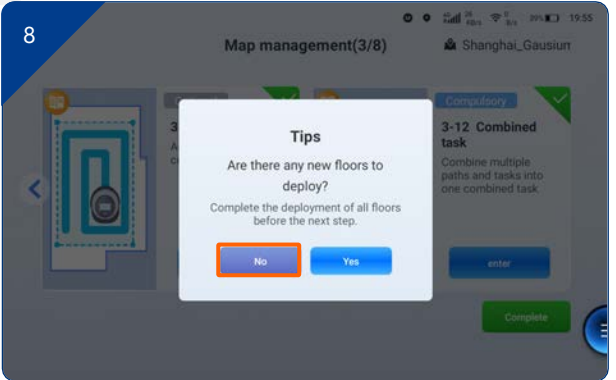
Click "Enter" in the [Combined Task] card to sort the drawn cleaning paths and create a cleaning task. Please refer to: [How to use combined tasks.](#)



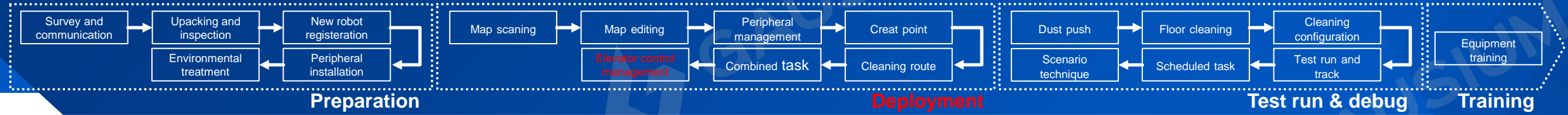
After combining all required tasks, click the "Back" icon.



Click "Done"



If there is only one map, the prompt "Are there any new floors that need to be deployed?" will appear. If there are other maps to be created, click "Yes", otherwise click "No"



**Elevator control management:** Configure elevator control interconnection-related configurations, including: elevator floor configuration, floor map binding, and cross-floor task creation.

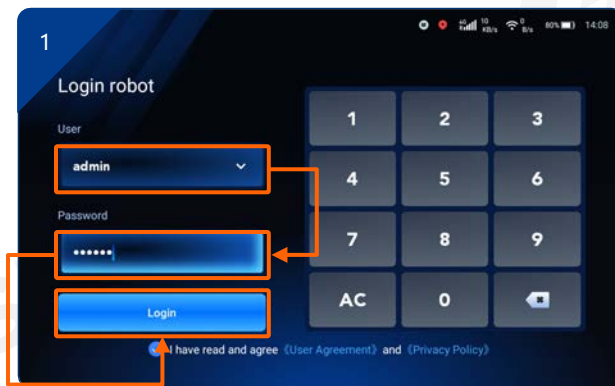
**This must be done at sites equipped with elevator control equipment, otherwise it will be skipped.**

### Key action

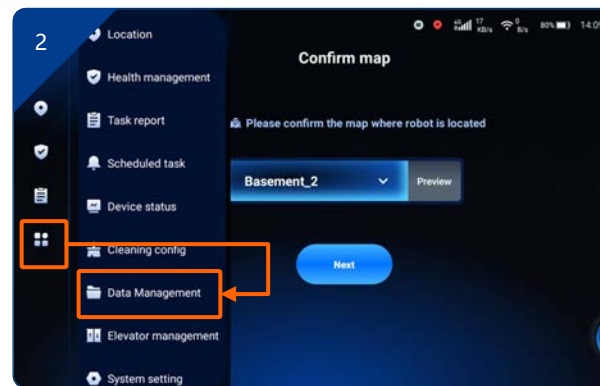
1. Complete map scanning and editing of all floors, map cleaning path creation, and task combination.
2. Make sure the elevator area is drawn on each map;
3. Configure elevator floor information;

4. Bind a map to each floor;
5. Create cross-floor tasks.

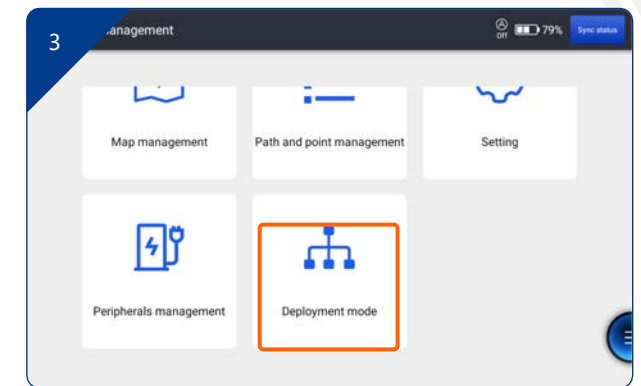
### Steps



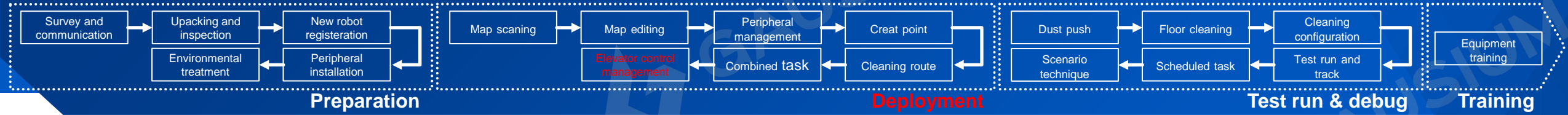
Select the "admin" account > enter the password "314159" > click "OK"



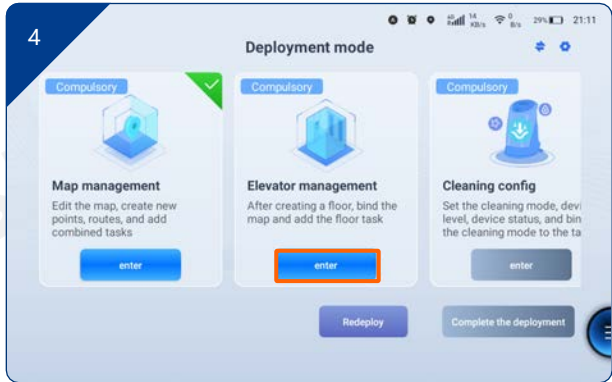
Click the More icon > Click Data Management



Click "Deployment Mode"



## Steps



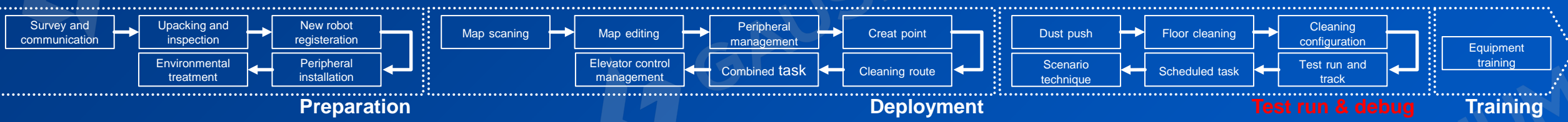
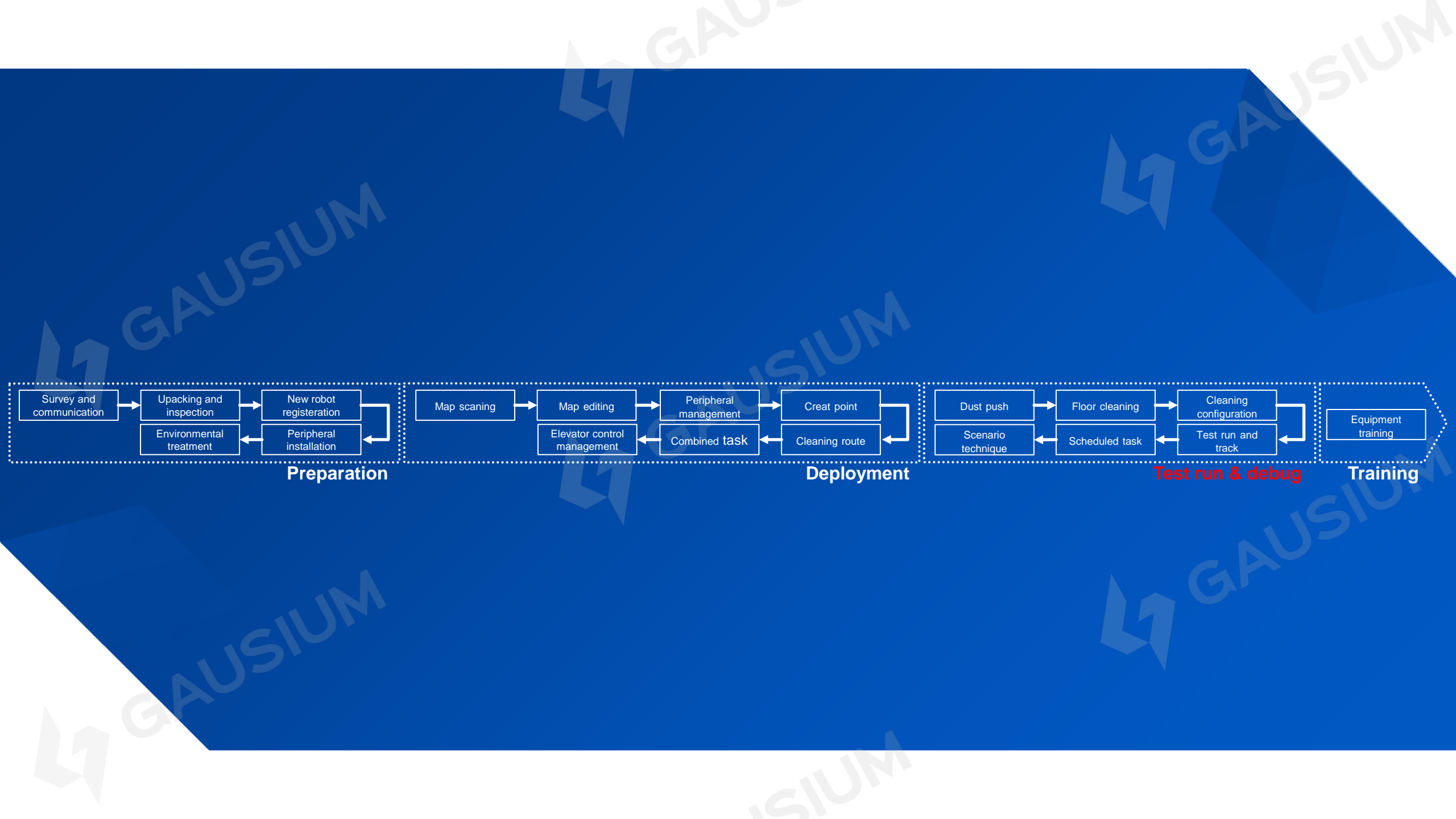
Click "Enter" in the [Elevator Control Management] card .

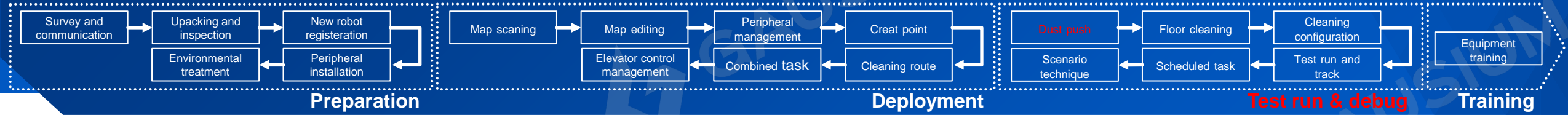
It is shown as a required item here because when entering the deployment mode for the first time to configure the scene, it was selected that the elevator control needs to be deployed.

If you make an incorrect selection, you can only enter and follow the steps to complete the configuration, and then delete the configuration later.



The subsequent elevator control configuration steps will not be explained in this document. If you need to know more, please obtain the elevator control documentation from the relevant person in charge of Gausium.



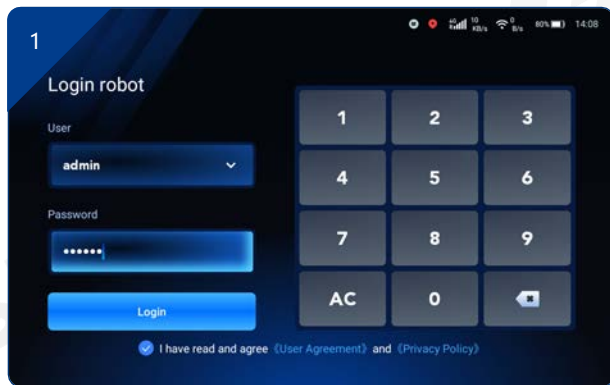


**Dust pusher:** It is an optional project and must be done when the customer has demand for dust pusher on site; debug the dust pusher effect of the machine to meet the customer's needs.

### Key action

1. Install the cleaning parts required for dust push mode;
2. Trial run of dust push mode;
3. Dust push effect evaluation;
4. Debug the cleaning configuration as needed.

### Steps



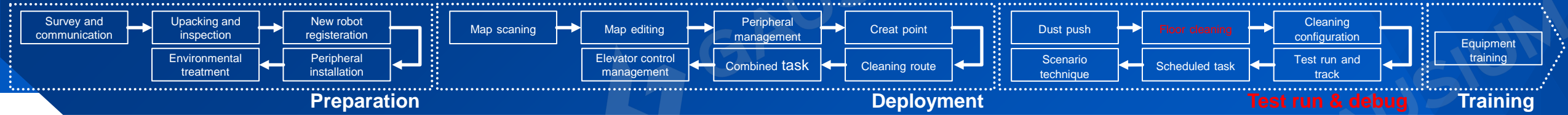
To install the cleaning parts required for dust push mode, please refer to: [50 Cleaning Mode Cleaning Parts Assembly Table](#).



Operate the machine, return to the main interface, select a task, select dust push mode, and click "Start Task".



Observe the dust pushing condition of the machine to ensure that the dust pushing effect is good and there is no abnormal noise from the dust pushing.

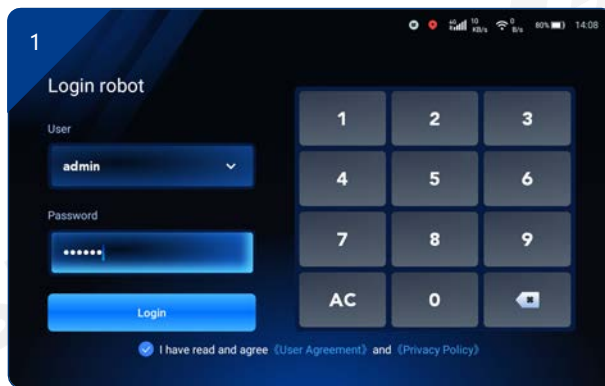


**Floor washing:** For the selected project, it must be done when the customer needs to wash the floor on site; debug the washing effect of the machine to meet the customer's needs. There will be no washing water, flowery floor, or incomplete washing.

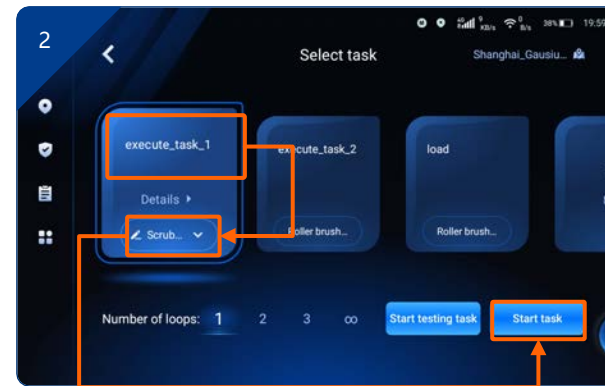
### Key action

1. Install the cleaning parts required for floor scrubbing mode;
2. Trial operation of floor washing mode;
3. Evaluation of floor washing effect.

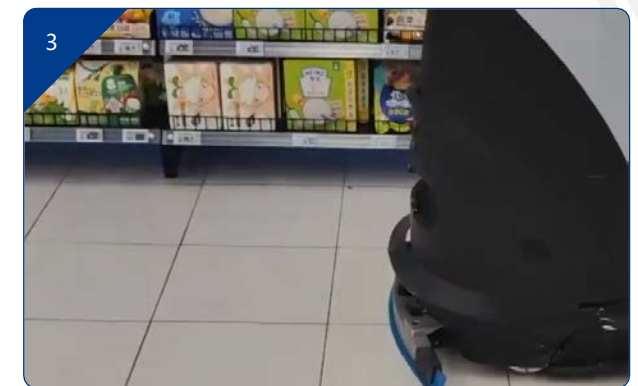
### Steps



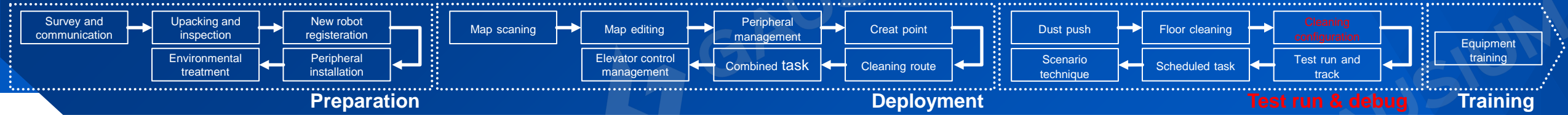
To install the cleaning parts required for floor scrubbing mode, please refer to: [50 Cleaning Mode Cleaning Parts Assembly Table](#).



Check that the height of the squeegee is normal, the rubber is installed normally, add clean water to the clean water tank, operate the machine, select a task, select the floor scrubbing mode, and start the automatic task.



Observe the washing condition of the machine to ensure that the washing effect is good and that there is no running water or flowers on the floor.

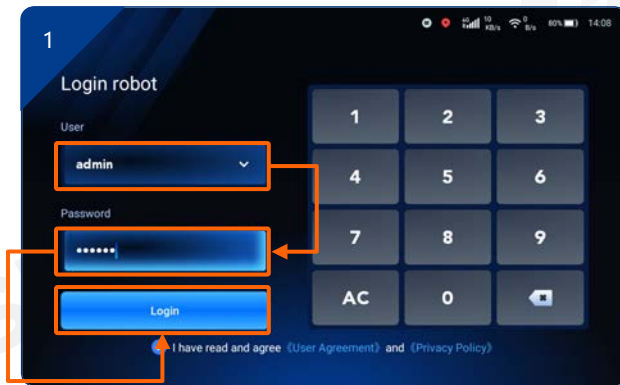


**Cleaning configuration:** When the cleaning effect is not good, the cleaning configuration needs to be adjusted appropriately, and the water volume, air suction size and other cleaning equipment levels need to be adjusted appropriately to achieve the ideal cleaning effect.

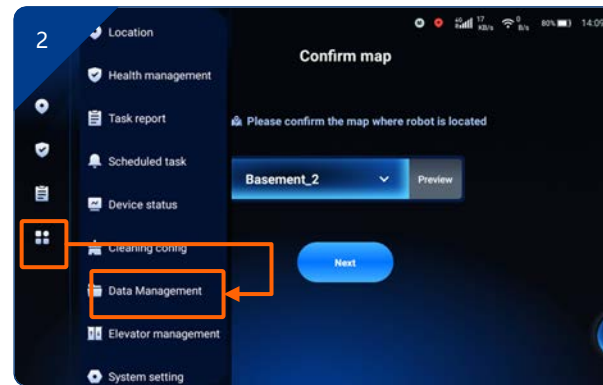
### Key action

1. Adjust cleaning configuration
2. Test the cleaning effect
3. Confirm the cleaning effect

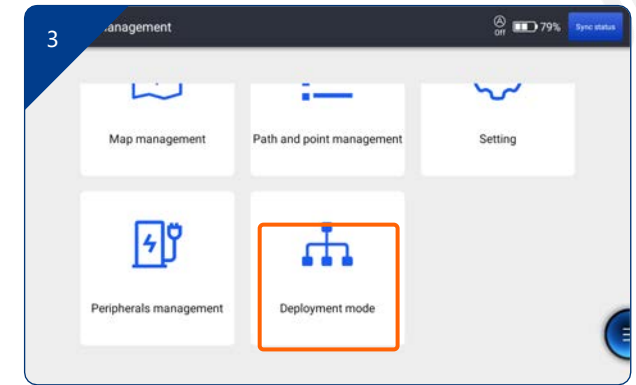
### Steps



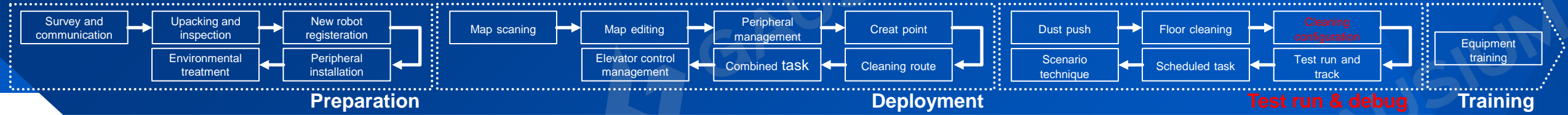
Select the "admin" account > enter the password "314159" > click "OK"



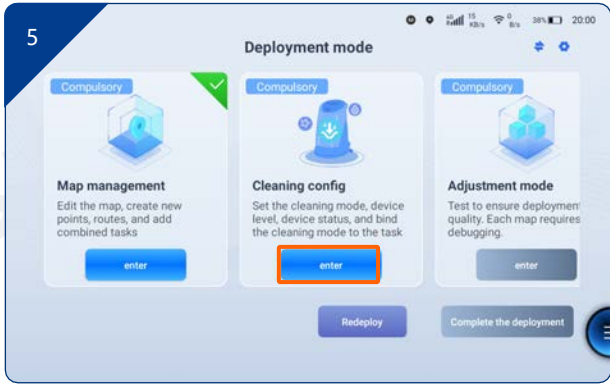
Click the More icon > Click Data Management



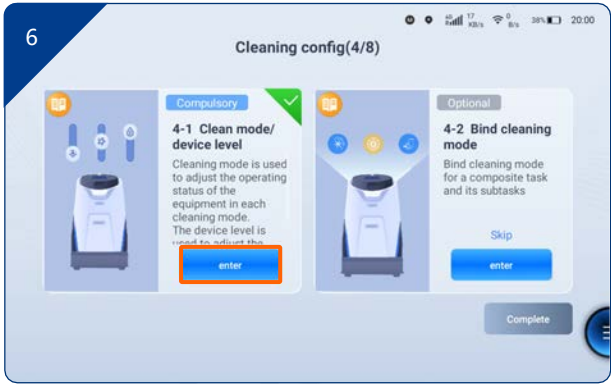
Click "Deployment Mode"



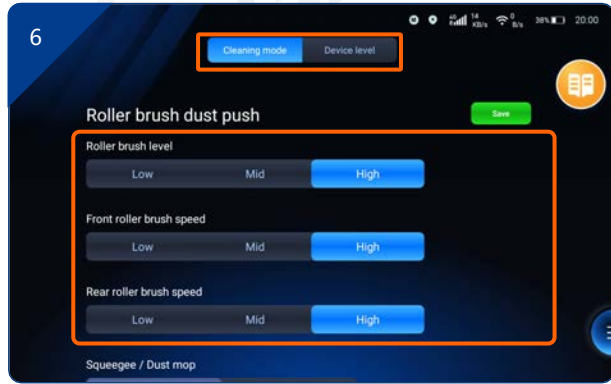
**Steps**



Click "Enter" in the [Clean Configuration] card



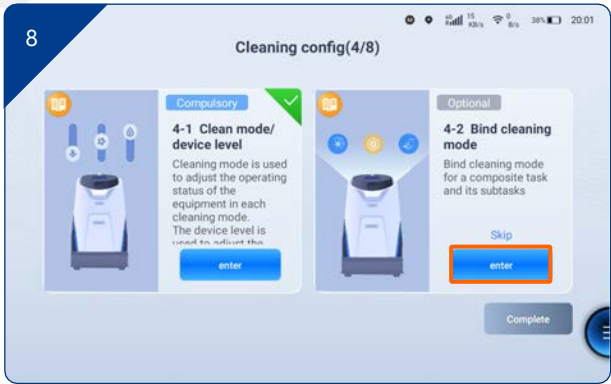
Click "Enter" in the [Cleaning Mode/Equipment Level] card



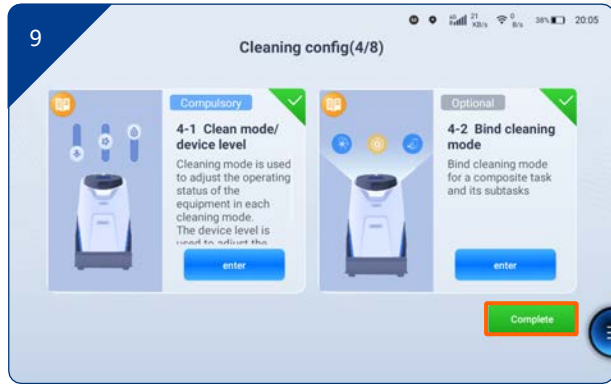
To set "Cleaning Mode" and "Equipment Level", please refer to: [50 Cleaning Configuration Suggestions for Each Mode and Different Scenarios.](#)



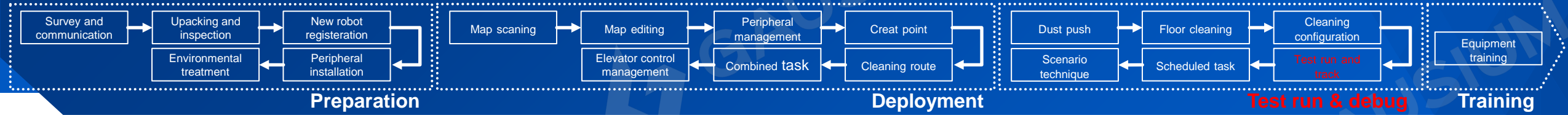
After debugging, click the "Return" icon



If you want to separately bind the cleaning mode to the sub-path in the combined task, you can click "Enter" in the [Bind Cleaning Mode] card, otherwise click "Skip". Please refer to: [Subtask binding cleaning mode method.](#)



After skipping/adjusting the subtask cleaning mode, click "Finish"

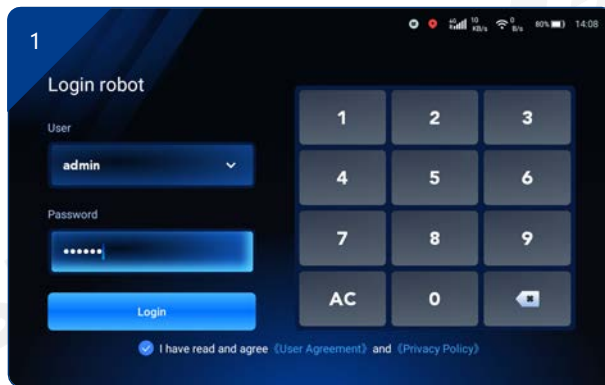


**Test run tracking:** Carry out a test run in the entire outer circle to ensure that there are no scratches, no abnormal pauses, and no operational risks during the operation of the machine.

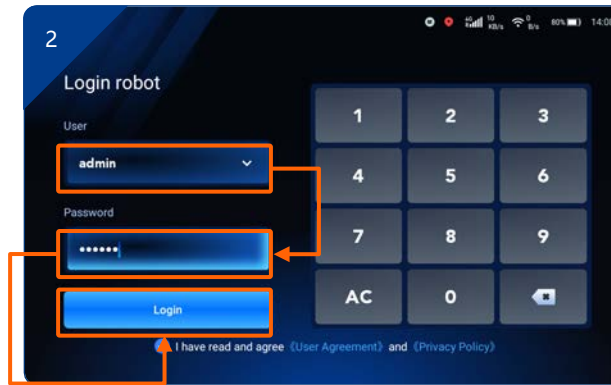
**Key action**

1. Install the consumables required for cleaning mode
2. Select the cleaning mode and conduct a full test run
3. Track the operation of the machine and observe the operation route to ensure that the machine has no scratches, no abnormal pauses, and no risk in operation.

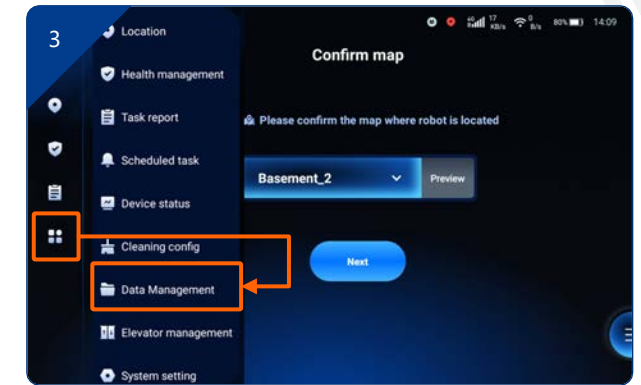
**Steps**



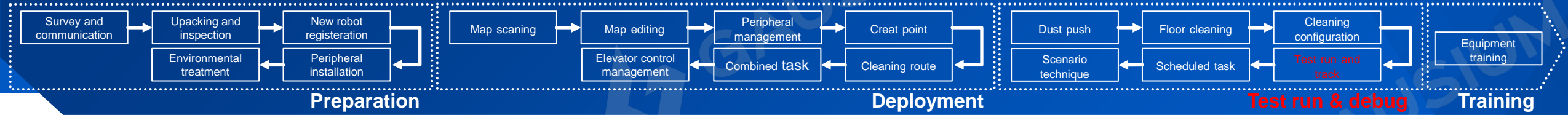
To install the cleaning parts required for dust push mode, please refer to: [50 Cleaning Mode Cleaning Parts Assembly Table](#).



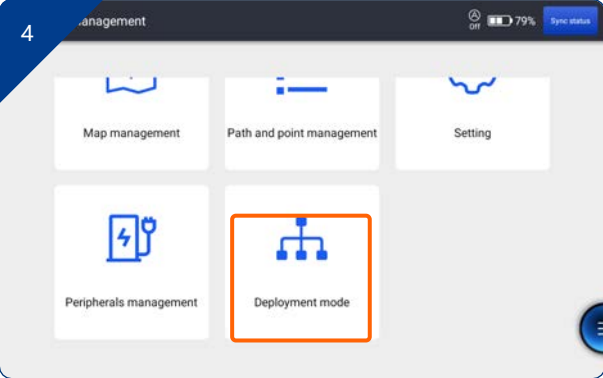
Select the "admin" account > enter the password "314 159" > click "OK"



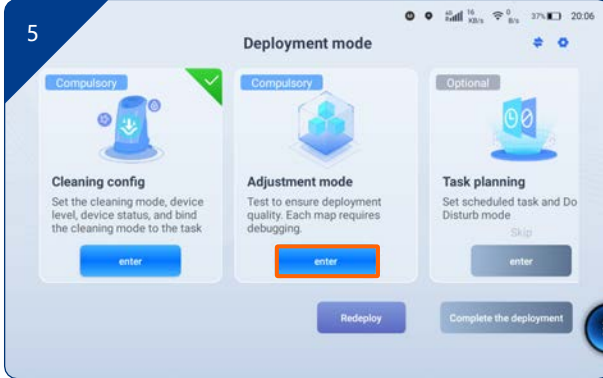
Click the More icon > Click Data Management



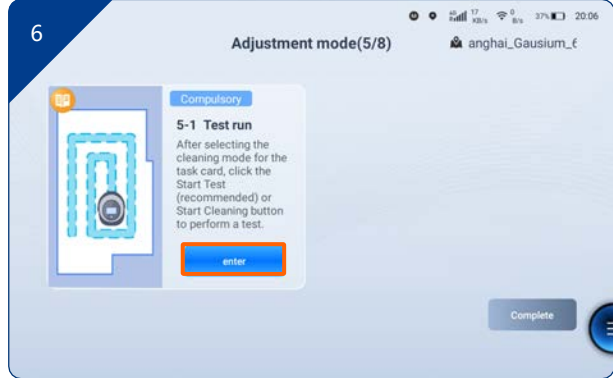
**Steps**



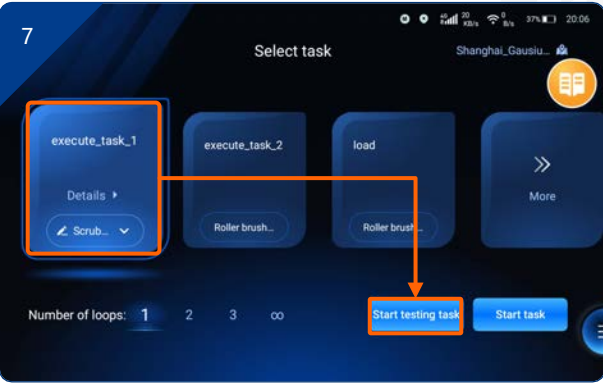
Click "Deployment Mode"



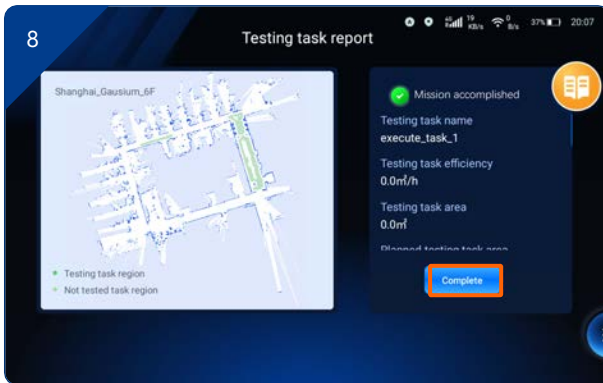
Click "Enter" in the [Debug Mode] card



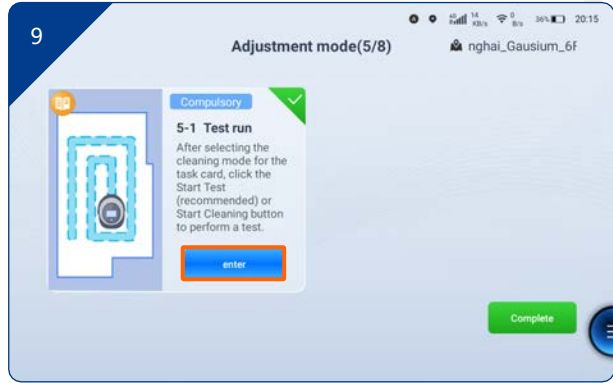
Click "Enter" in the [Test Run] card



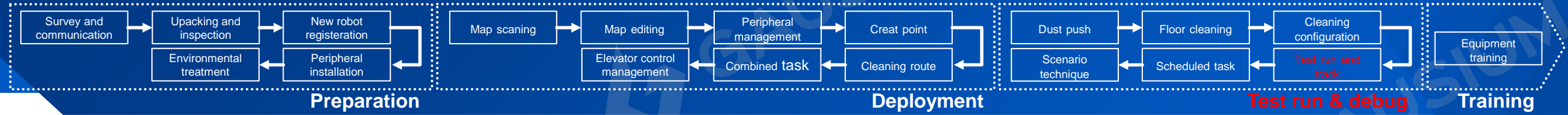
Select a task, select dust push mode, and start executing the automatic task.



Observe the operation of the machine to ensure that there are no scratches, no abnormal pauses, and no operational risks during the operation. After the task trial run is completed, click "Finish".



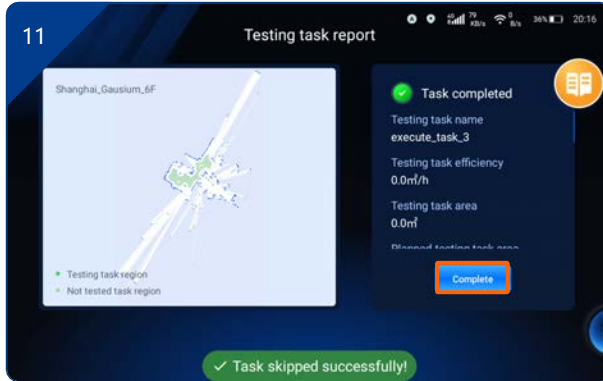
If there are other tasks that need to be tested, click "Enter" in the [Test Run] card again.



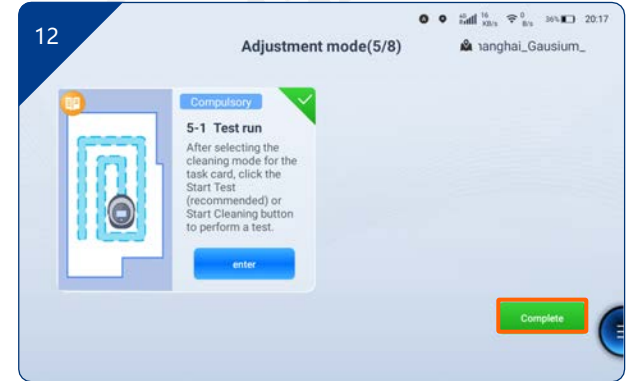
## Steps



Select another task, select dust push mode, and start the test run again.



Observe the operation of the machine to ensure that there are no scratches, no abnormal pauses, and no operational risks during the operation. After the test run is completed, click "Finish ".

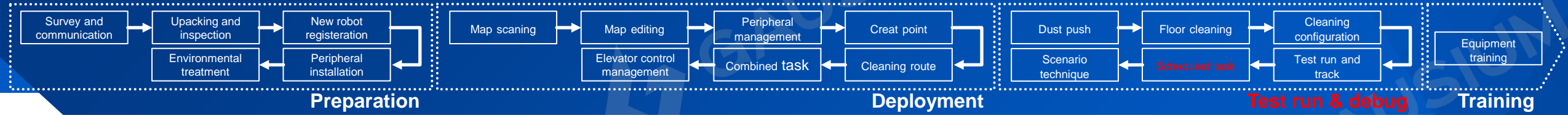


After all test runs are completed, click "Finish ".



### Exception handling:

- If there are any scratches or operational risks, edit the map and adjust the virtual wall. If there is an abnormal pause, check whether the map noise has not been deleted.
- If it is not affected by noise, copy the map and submit the bag to Jira for second-line support for analysis.

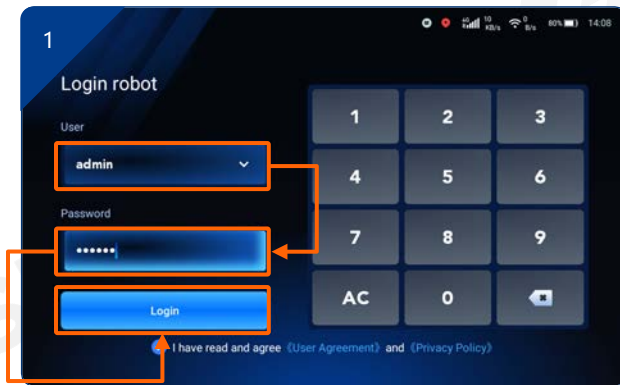


**Scheduled tasks:** According to the on-site cleaning schedule, avoid peak traffic periods, and reasonably set scheduled cleaning tasks after full communication with customers.

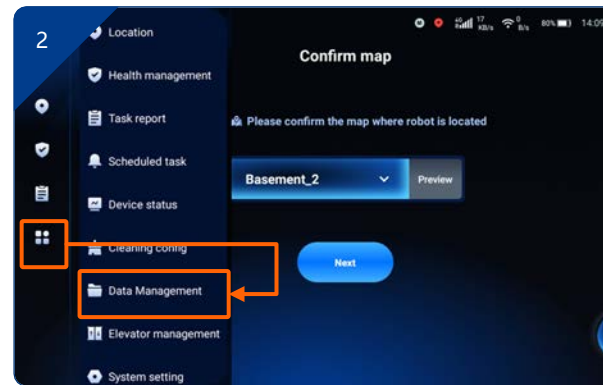
**Key action**

1. Understand the on-site cleaning schedule;
2. Understand the peak traffic hours at the site;
3. Communicate with customers to understand their needs for scheduled tasks;
4. Set up scheduled tasks reasonably.
5. Verify that the scheduled task can be executed normally.

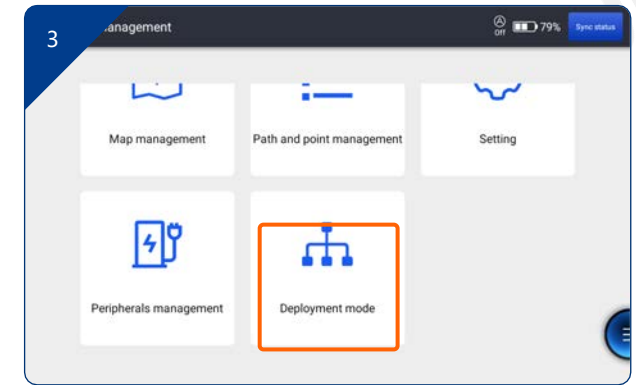
**Steps**



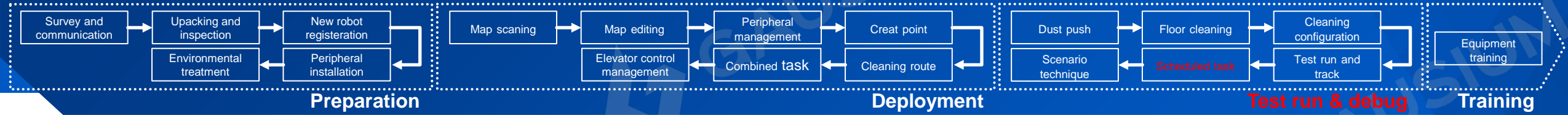
Select the "admin" account > enter the password "314159" > click "OK"



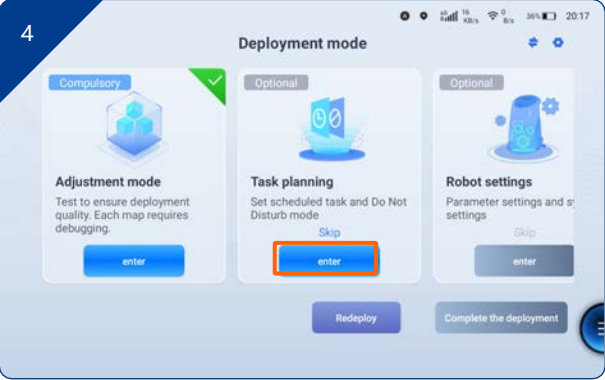
Click the More icon > Click Data Management



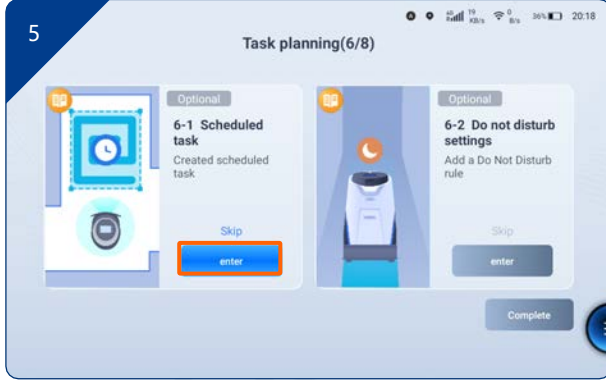
Click "Deployment Mode"



## Steps

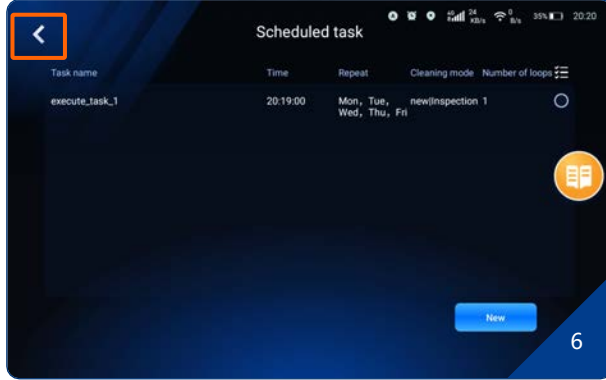


Click "Enter" in the [Task Planning] card to configure scheduled tasks and Do Not Disturb mode. If no configuration is required, click "Skip".

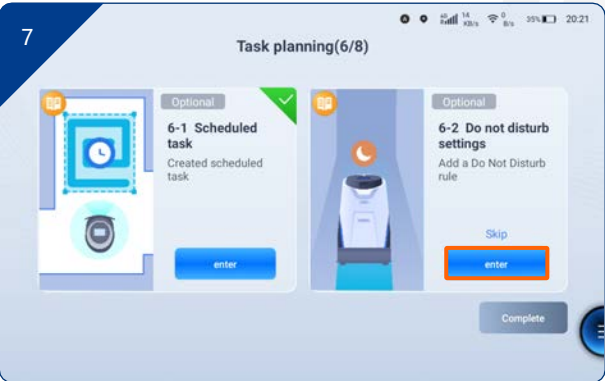


Click "Enter" in the [Scheduled Task] card to configure the scheduled task. If no configuration is required, click "Skip". Please refer to:

[Scheduled Task Configuration Method..](#)



After setting the scheduled task, click the "Return" icon to return.

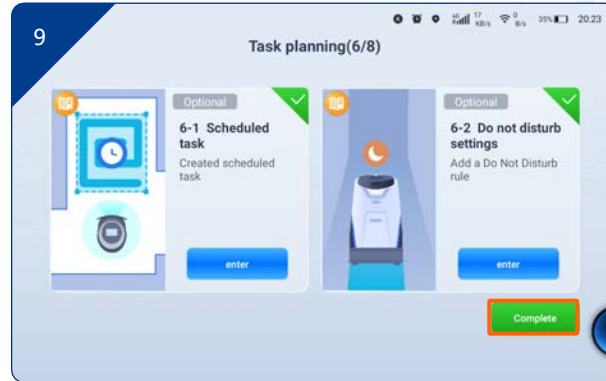


Click "Enter" in the [Do Not Disturb Settings] card to configure Do Not Disturb mode. If no configuration is required, click "Skip". Please refer to:

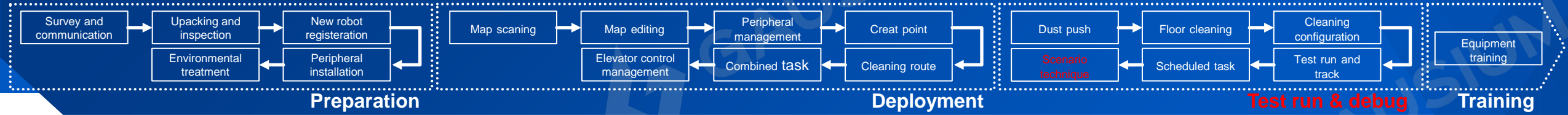
[How to configure Do Not Disturb mode.](#)



After setting the Do Not Disturb mode, click the "Return" icon to return.

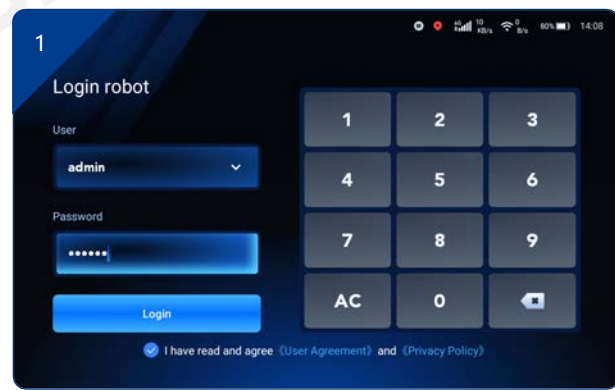


After skipping/setting the timer & do not disturb, click "Done".



**Scenario skills:** Different scenarios have different customer concerns and different on-site environments. Based on the deployment experience of senior FAE, we have summarized the deployment skills for individual scenarios.

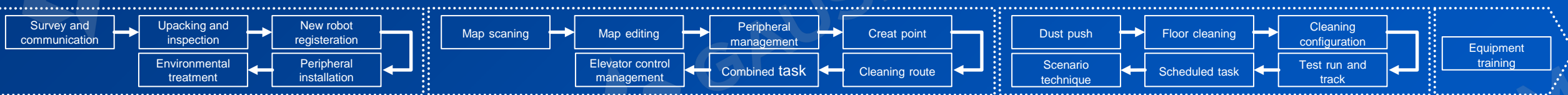
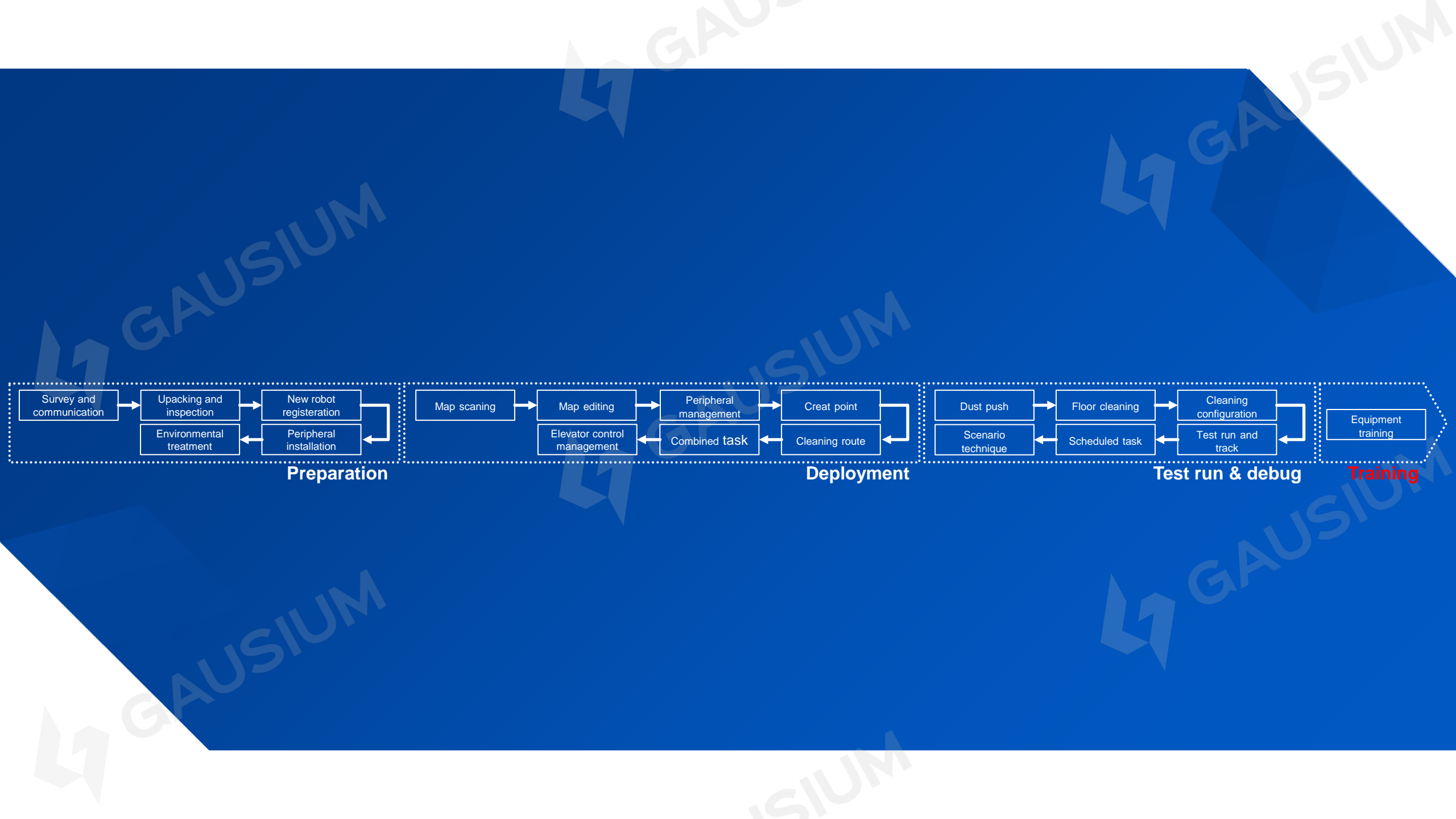
**Scenario tricks**



After the task is completed and the squeegee is raised, there is too much water remaining on the ground. The water stopping distance and delayed air suction can be adjusted. Please refer to: [Water stop distance & delayed air suction setting.](#)



When the welt effect of real-time automatic coverage is not good, you can adjust the welt distance of the real-time automatic coverage path. Please refer to: [Artificial wall lines & real-time automatic coverage welt settings.](#)

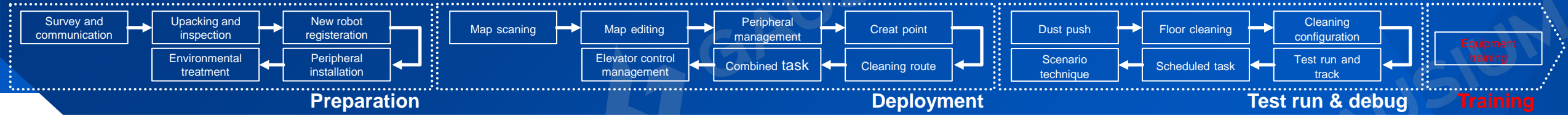


**Preparation**

**Deployment**

**Test run & debug**

**Training**

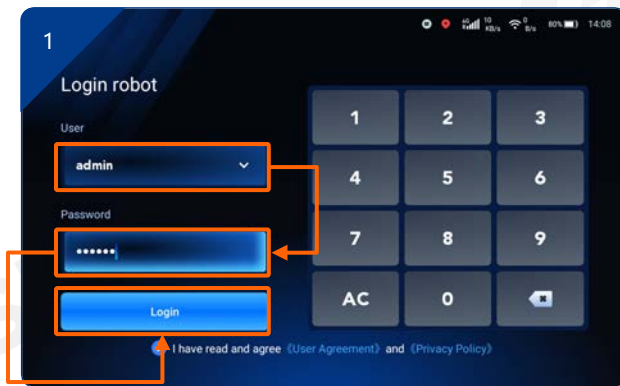


**Equipment training:** Provide training to customers. The training includes: machine use, machine daily cleaning and ICS, troubleshooting of common problems, fault repair, etc.

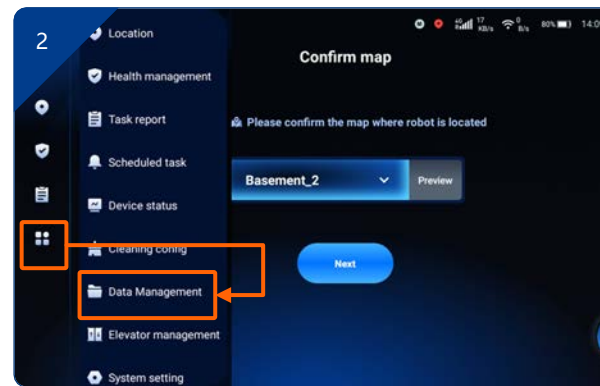
### Key action

1. Communication and organization training;
2. Introduction to training products;
3. Training on product use;
4. Troubleshooting simple problems with training products;
5. Training on fault reporting;
6. The use of Palm Immortal;
7. Use of ICS Nissin;
8. Sign the delivery and training order;

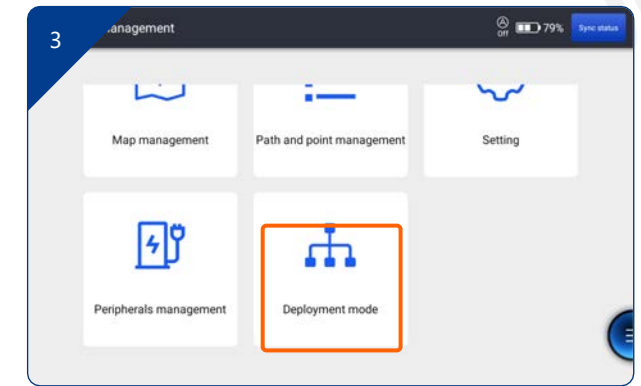
### Steps



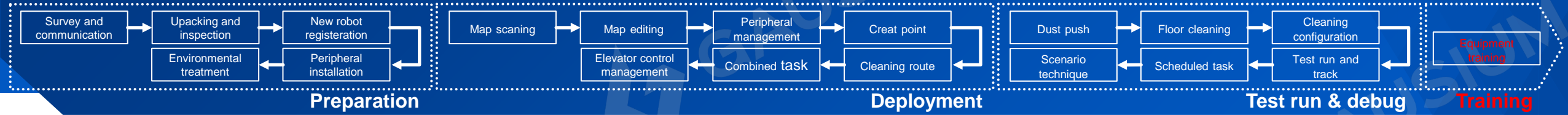
Select the "admin" account > enter the password "314159" > click "OK"



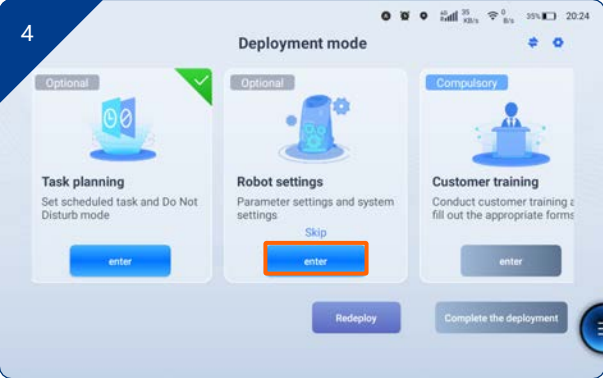
Click the More icon > Click Data Management



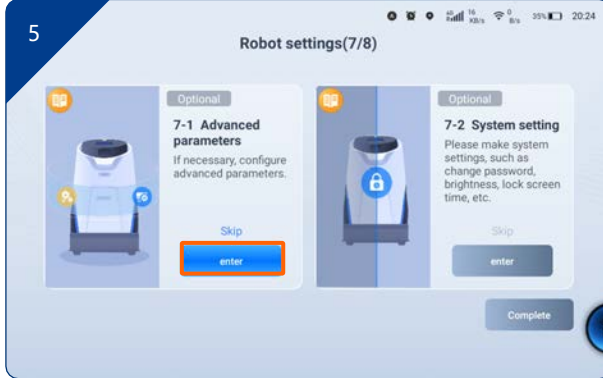
Click "Deployment Mode"



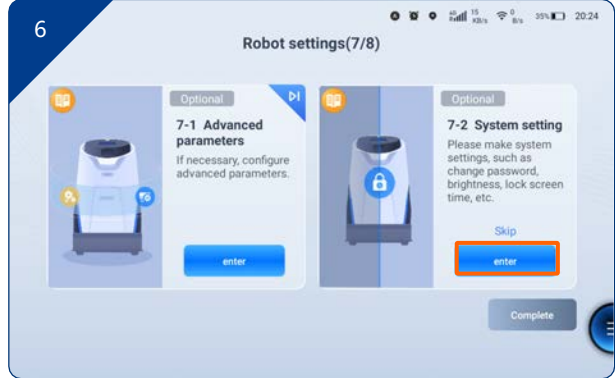
**Steps**



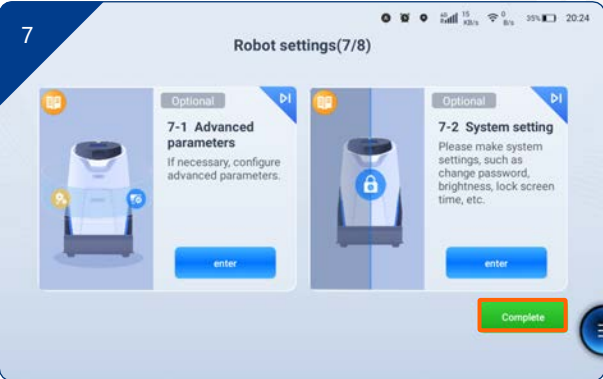
Click "Enter" in the [Robot Settings] card. If the settings do not need to be modified, click "Skip"



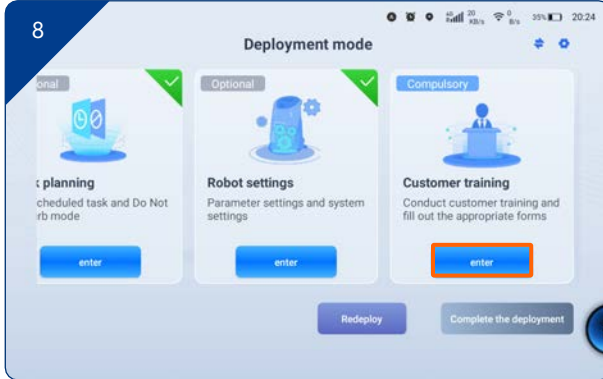
Click "Enter" in the [Advanced Parameters] card. If the settings do not need to be modified, click "Skip"



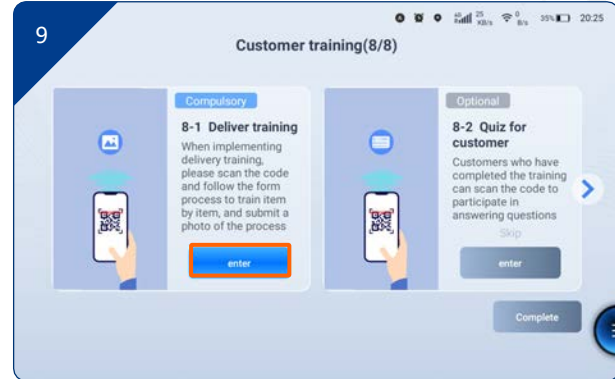
Click "Enter" in the [System Settings] card. If the settings do not need to be modified, click "Skip"



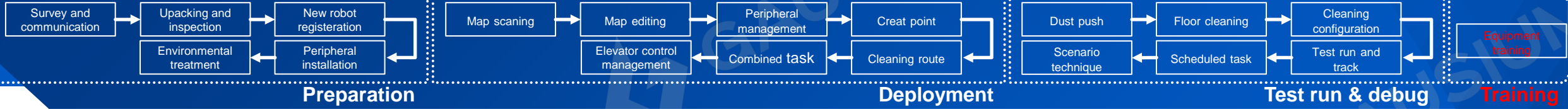
After setting is complete, click "Finish"



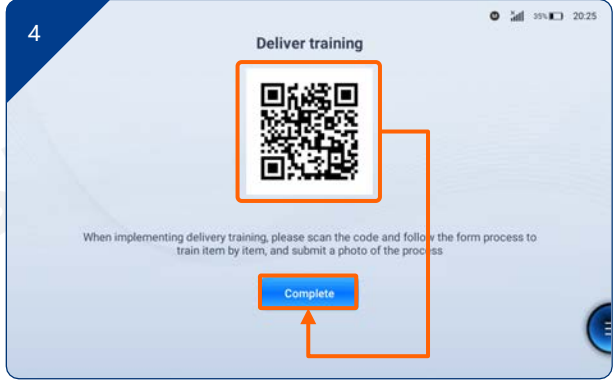
Click "Enter" in the [Customer Training] card



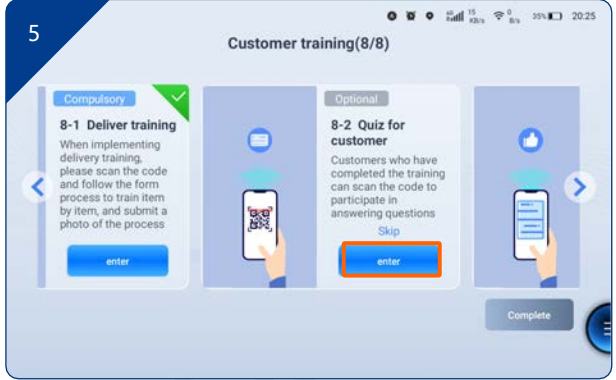
Click "Enter" in the [Delivery Training] card



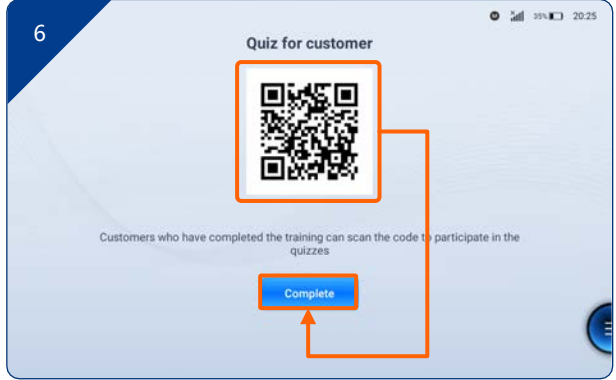
**Steps**



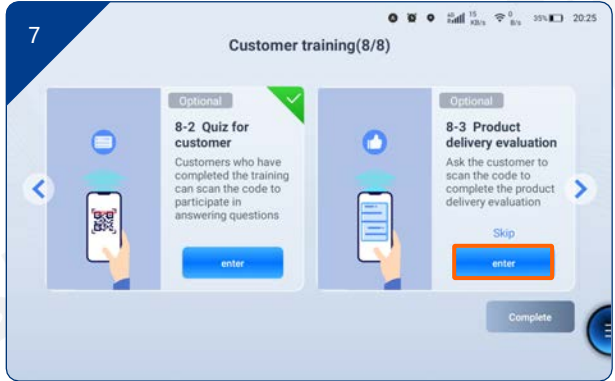
Scan the QR code with your mobile phone, follow the QR code prompts to complete the equipment training, and click "Finish" after completion.



Click "Enter" in the [Customer Answer] card.



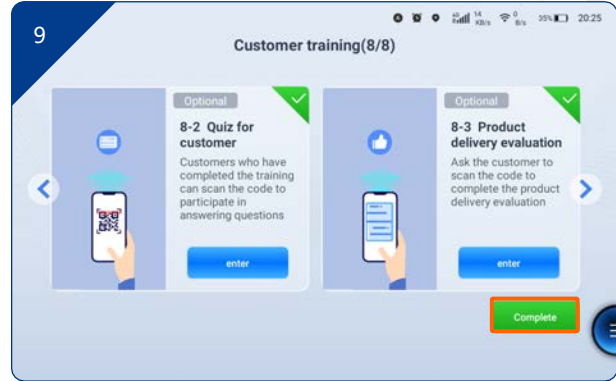
Ask customers to use WeChat to scan the QR code and complete the answer. When finished, click "Finish ".



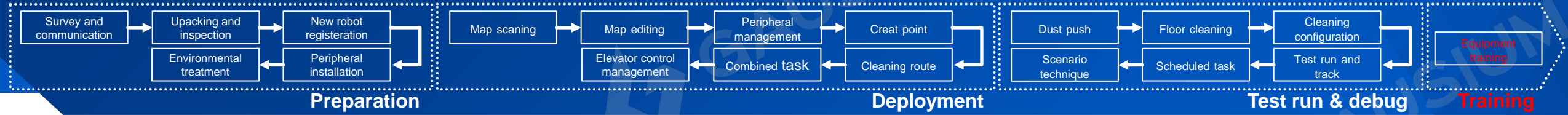
Click "Enter" in the [Product Delivery Review] card.



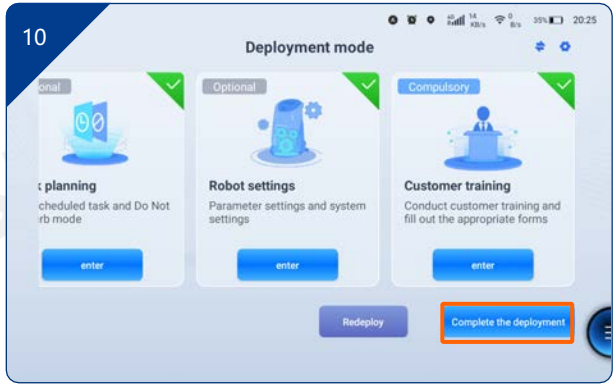
Let customers use WeChat to scan the QR code and make comments. After completing, click "Finish ".



Click "Done ".



## Steps



Click "Complete Deployment ".

# Making service robots available across the world

Action without boundaries and wisdom without limits

Keep Exploring Keep Innovating

# Knowledge expansion: 50 applicable scenes and ground materials (P1/2)

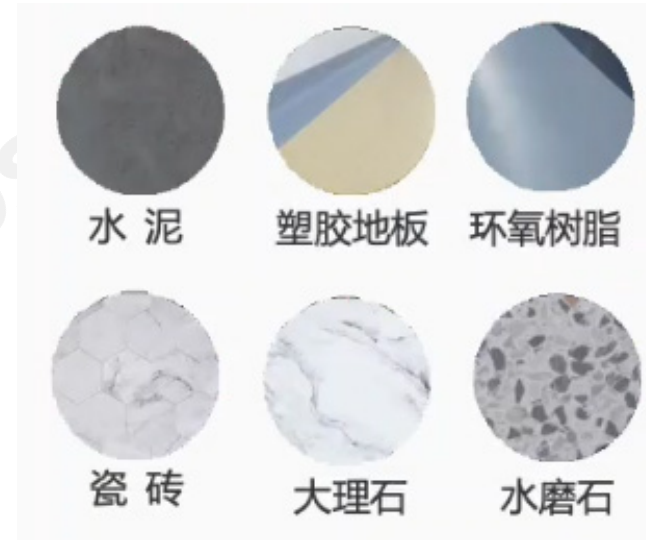


## Applicable scenes and ground materials:

**Scene:** small indoors in office buildings, banks, hotels, residences, etc;



**Ground material:** hard flat ground;



# Knowledge expansion: 50 applicable scenes and ground materials (P2/2)

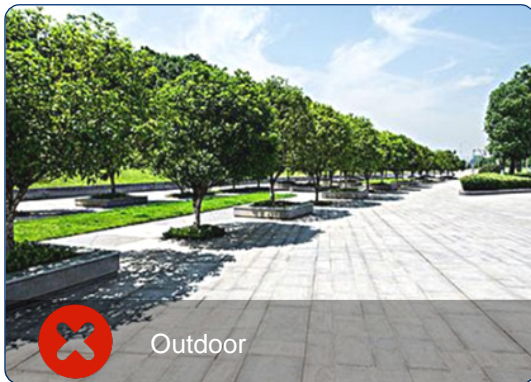
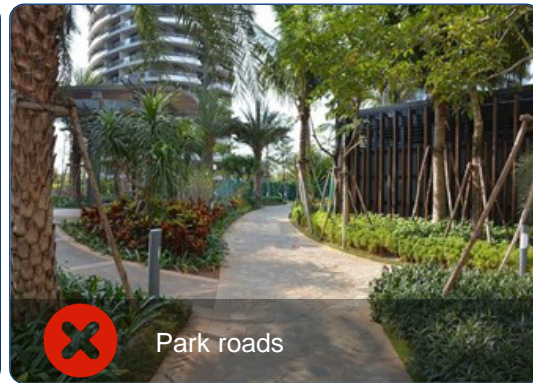
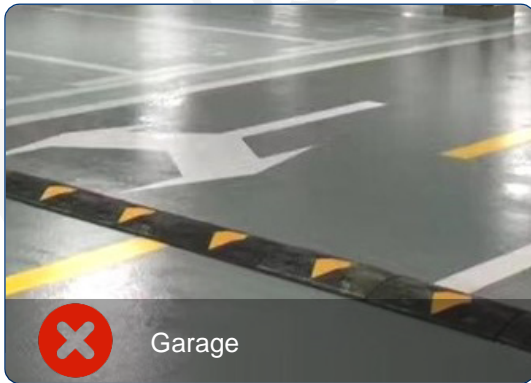
This page is the last page of knowledge  
Please click to return



## Not applicable to scenes and ground materials:

**Scenes:** large indoor and outdoor scenes such as basements, outdoors, and park roads;

**Floor material:** carpet, glass floor, uneven floor;



# Knowledge expansion: 50 ability boundaries (P1/1)

This page is the last page of knowledge  
Please click to return



	Brush version	Roller brush type
<b>Working temperature and humidity</b>	Ambient temperature: 0~45°C, relative humidity: 0-80%RH (45°C)	
<b>Automatic running speed</b>	Minimum 0.1m/S - Maximum 1.0m/s (non-cleaning mode) Minimum 0.3m/S - Maximum 0.9m/s (cleaning mode)	
<b>Plane obstacle avoidance braking distance</b>	14cm~90cm	
<b>Minimum pass width in non-cleaning mode</b>	900mm	
<b>Minimum U-turn width in non-cleaning mode</b>	12Roller brush style0mm	
<b>Maximum full load climbing angle</b>	8%	
<b>Overcoming obstacles</b>	Continuous sill height (front and rear universal wheels and driving wheels pass the sill at the same time) ≤10mm Width requirements: 30mm	
<b>Raised ground</b>	≤10mm	
<b>Low obstacle recognition</b>	The minimum height obstacle that can be recognized is 1.5cm. The parameters can be configured on the app. The default is 3cm.	
<b>Elevator control</b>	Allow	
<b>positioning accuracy</b>	±5cm	
<b>Maximum map area</b>	60,000m <sup>2</sup>	
<b>Washing floor welt distance</b>	Shell to wall: 4cm Brush body to wall: 16cm (distance from floor scrubber to edge))	Shell to wall: 4cm Brush body to wall: 16cm (distance from floor scrubbing edge) Side brush to wall: 0 (distance from floor sweeping edge)
<b>Dust push welt distance</b>	Shell to wall: ≤14cm Dust pusher to wall: ≤10cm (dust pusher edge distance)	Brush body to wall: 12~15cm (dust pusher edge distance) side brush up to 0cm (sweeping edge edge distance)

\*The data comes from Gausium Laboratory. The specific data may be slightly biased due to different test environments.

# Knowledge expansion: common operational risks and treatment methods (P1/3)



**Risk of crushing:** The object or obstacle is less than 2cm, and the machine does not recognize it, resulting in the potential risk of crushing or roller brush entanglement;



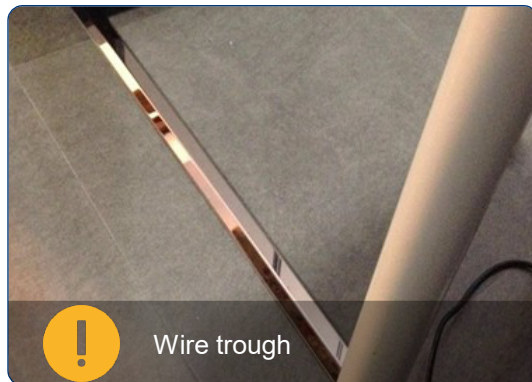
Electric wire

### Characteristics of things:

If it is less than 2cm, it cannot be recognized by the machine and is easily rolled up by the roller brush or motor wheel.

### Approach:

1. Communicate with the customer and try to remove it. If it cannot be removed, use a virtual wall to avoid it when editing the map.
2. If the virtual wall is circumvented and the machine has no other way to pass, it must be resolved through communication.



Wire trough



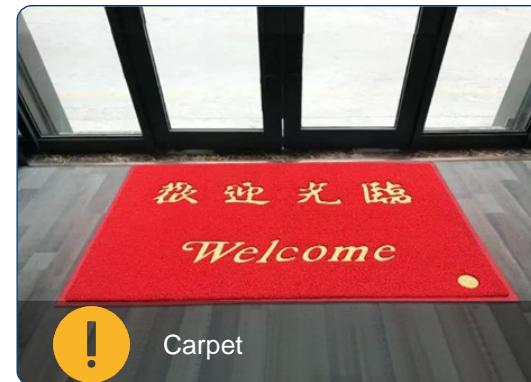
Short pile carpet ( $\leq 10\text{mm}$ )

### Characteristics of things:

If the height is less than 2cm, the machine cannot recognize it. The machine can pass but cannot carry out dust pushing and floor washing operations.

### Approach:

1. The machine needs to pass through the tunnel to draw the carpet area;
2. The machine does not need to use the road to pass by. Edit the map and use virtual walls to avoid it.

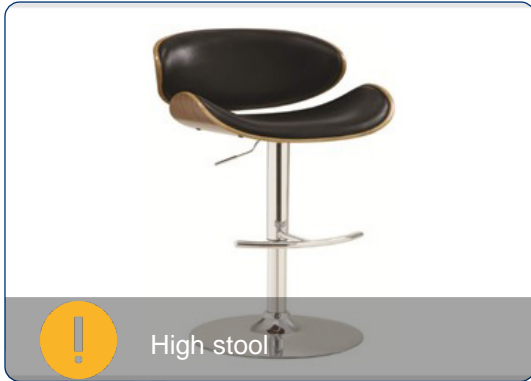
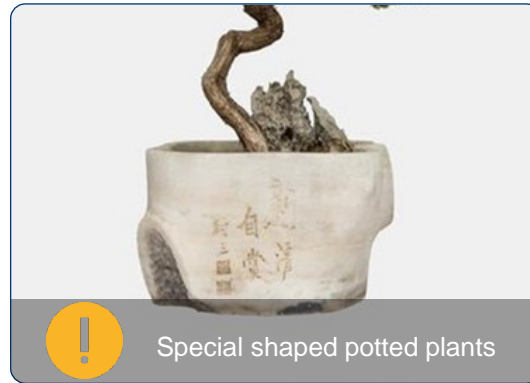
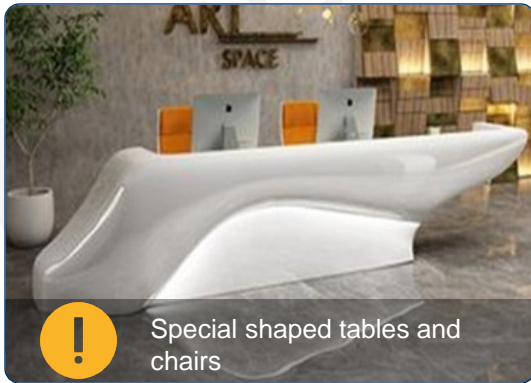


Carpet

# Knowledge expansion: common operational risks and treatment methods (P2/3)



**Risk of scratching:** Due to the structure, shape, color, etc. of the object, the robot cannot fully identify it, and there is a risk of scratching.



### Characteristics of things:

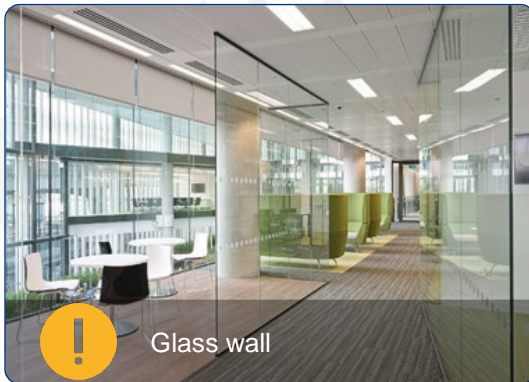
suspended obstacle

### Approach:

1. It is best to communicate with the customer to remove it. If it cannot be removed, use a virtual wall to avoid it when editing the map.
2. If it is a movable object, you need to communicate with the customer to agree on the area where the object will be placed. When editing the map, use a virtual wall to avoid it.



**Risk of scratching:** Due to the structure, shape, color, etc. of the object, the robot cannot fully identify it, and there is a risk of scratching.



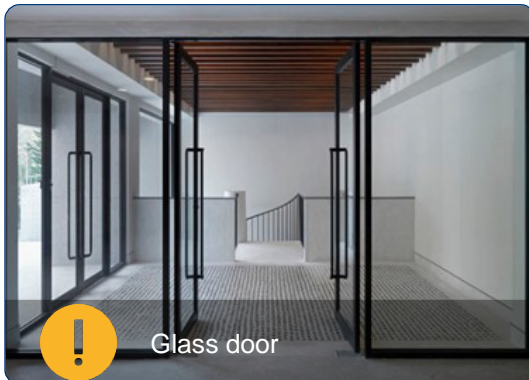
Glass wall

### Characteristics of things:

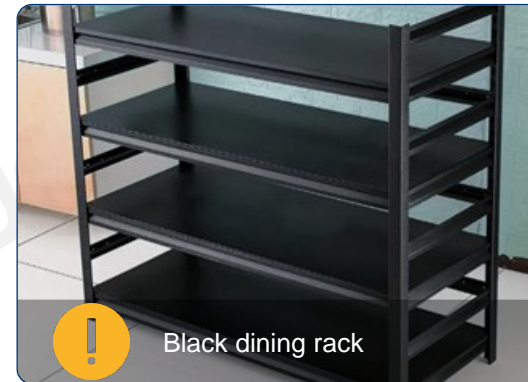
Transparent objects cannot be identified by the laser at long distances, and the laser is easily interfered at short distances.

### Approach:

1. (Not mandatory) Communicate with the customer and paste a frosted sticker at the height of the main laser for laser identification.
2. (Mandatory) When editing the map, use virtual wall avoidance and use glass wall markers.



Glass door



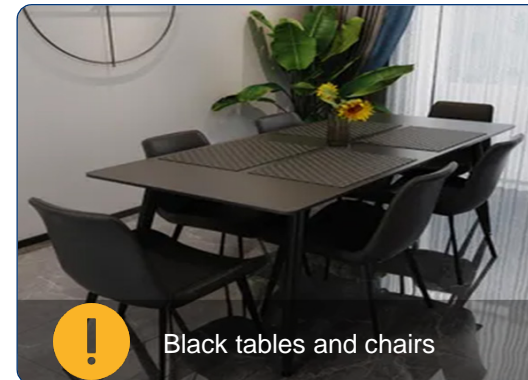
Black dining rack

### Characteristics of things:

The color is darker and the machine recognition ability is weak.

### Approach:

1. (Not mandatory) Communicate with the customer and paste a frosted sticker at the height of the main laser for laser identification.
2. (Mandatory) Use virtual wall circumvention when editing the map.
3. If the object can move, communicate with the customer to agree on the moving range of the object.



Black tables and chairs

# Knowledge expansion: 50 charging piles & workstation installation environment requirements (P1/1)

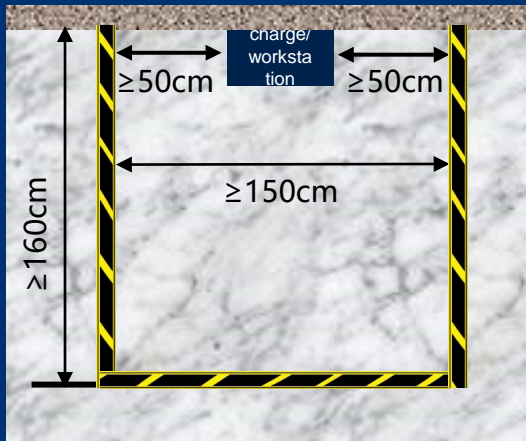
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## Three necessary conditions for the installation of charging piles/workstations

### Space size & floor material

**No other debris shall be piled within the space.**



Lateral width:  $\geq 150\text{cm}$

Width from wall:  $\geq 160\text{cm}$

There should be at least 50cm of space left and right of the workstation/charging pile

Floor: hard level

Back: There is wall support and expansion screws can be driven

There is a power outlet nearby to supply power to the charging pile. There is water supply and drainage nearby.



three-hole socket;

Current: 10A;

Voltage: 110V-220V;

There are drain and water inlets;

The machine can automatically navigate to arrive



Safety doors that cannot be closed on the road

No ground maintenance will be done at night

If you encounter the above situation, you need to communicate and resolve it



# Knowledge expansion: 50 unboxing guide (P1/3)



## Carton unboxing steps



1 Place the box so that the "head direction" arrow faces the wall.



2 Remove the "Sales Shipping List" and store it properly. Location: In the box packaging bag of the upper cover.



3 Cut off all ties from the packaging box.



4 Remove the top cover of the carton.



5 Remove the carton.



6 Cut off the ties holding the machine in place.

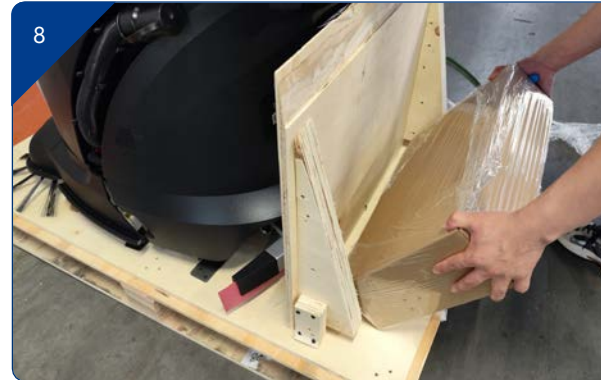
# Knowledge expansion: 50 unboxing guide (P2/3)



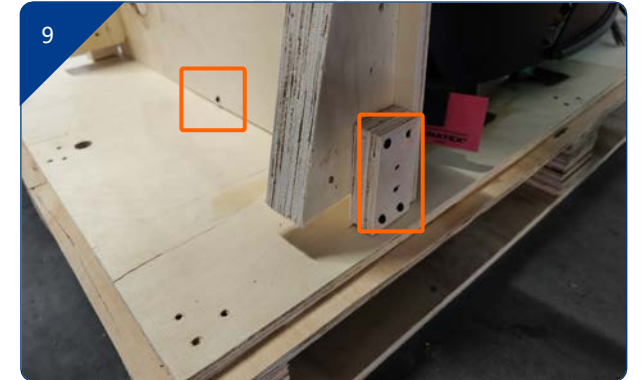
## Carton unboxing steps



Remove the protective bag wrapping the machine.



Remove the protective film securing the supplied supplies box and take out the supplied supplies box.



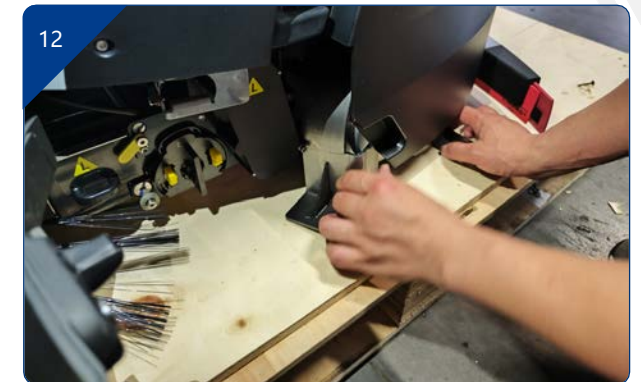
Remove the 9 screws fixing the ramp plate (4 on each side and 1 in the middle), and remove the ramp plate.



Open the left and right side doors



Remove the limiting sheet metal parts that secure the left and right wheel hub motors. There are 6 screws on the left and right wheels.



Remove all hub motor limit sheet metal parts.



## Carton unboxing steps



On the squeegee side of the machine, place a ramp plate.



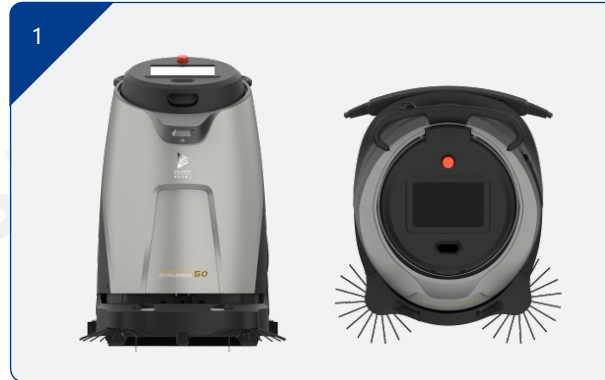
Drag the machine slowly and transfer the machine from the platform to level ground via the ramp.

# Knowledge expansion: 50 appearance inspection methods (P1/1)

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## Check steps



1 Appearance of the whole machine: The front, rear, left, and right casings and display are not damaged or scratched.



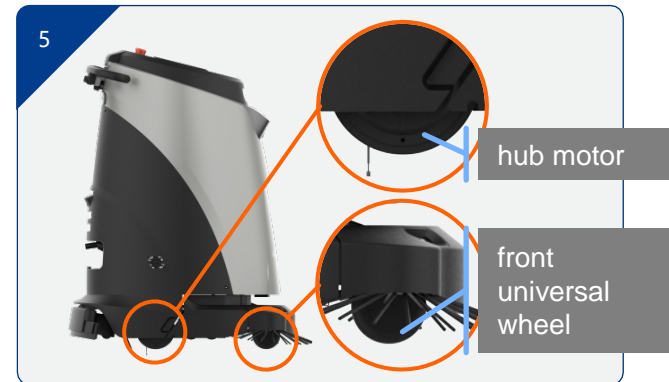
2 Main lidar: no scratches on the surface



3 Front camera, left and right cameras, front lottery camera: no scratches on the appearance



4 Rear lottery camera, rear lidar: no scratches on the surface



5 Hub motor and front and rear universal wheels: no damage to the rubber coating When the machine is turned off and pushed manually, there is no abnormal sound from the wheel hub and the damping is even.

# Knowledge expansion: 50 power-on inspection methods (P1/2)



## Check steps

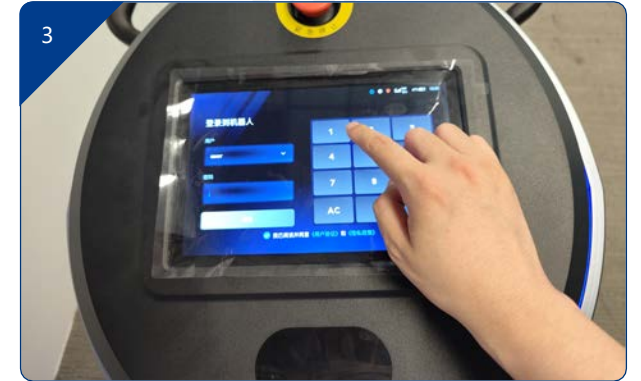


1 Turn on the air switch. If you feel obvious resistance, it is on. If there is no obvious resistance, it is off.

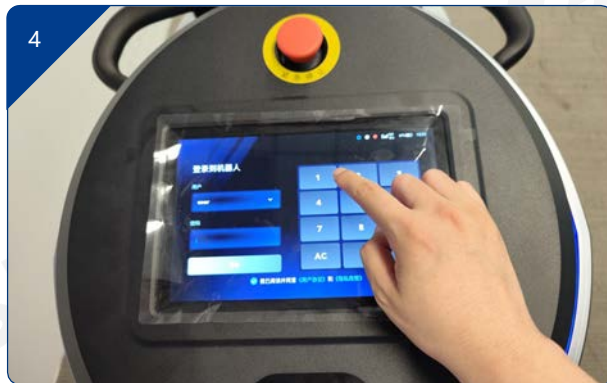


2 When the key is turned on, "on" is not turned on, and "off" is turned off.

If it cannot be turned on, please use the charger to charge manually first.



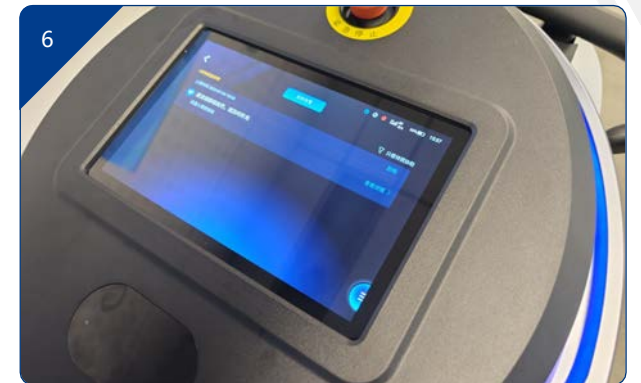
3 The display shows: it lights up normally, without blurry screen, black screen, flickering screen, etc.



4 Display touch: Touch sensitive.



5 Initial password: Select the user user, enter the password 123456, and you can log in normally.



6 Self-check: After logging in, health alarms are not fault alarms (alarms such as water volume and electricity are not fault alarms).

# Knowledge expansion: 50 power-on inspection methods (P2/2)

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## Check steps



7  
Light strip: normally lit, blue in normal state, red in emergency stop state.

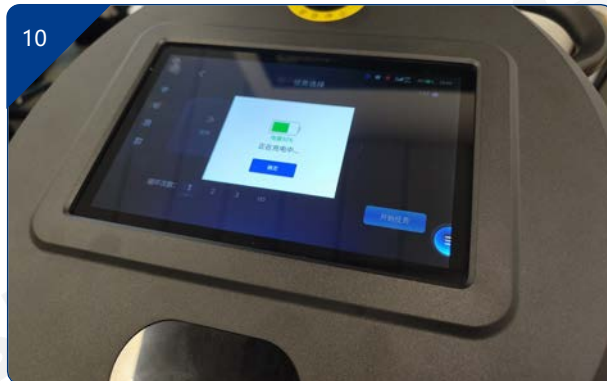


8  
Emergency stop button and voice: Press the emergency stop button, and there will be corresponding prompts on the display. The hand-pushed machine cannot be pushed, and there will be corresponding voice prompts.

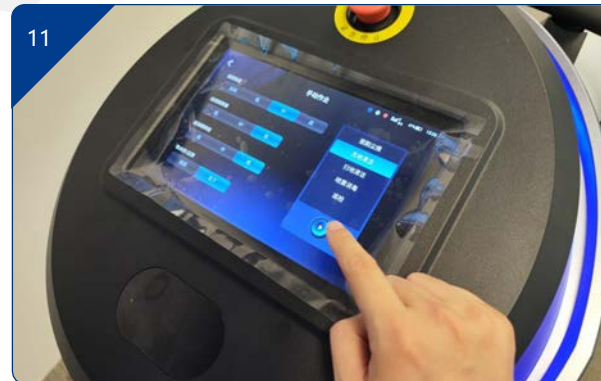


9  
Networking: The 4G signal icon in the upper right corner of the display shows data sending and receiving normally.

Note: Overseas users need to insert the SIM card first and configure the APN. Please refer to: [50SIM card installation method](#), [50 APN configuration](#).



10  
Charging: Push the machine onto the charging pile/workstation, or charge manually, and the machine will show normal charging.



11  
Cleaning equipment: Install side brushes and front and rear roller brushes, use brushes, use manual floor scrubbing, push the machine, put down the squeegee normally, rotate the side brush and roller brush normally, there are traces of cleaning on the floor, and the suction motor is running sound.

# Knowledge expansion: 50SIM card installation method (P1/2)



## V3 Installation steps



1 Open the head cover.



2 Press the button to pop out the sim card slot.



3 Place the sim card in the sim card slot.



4 Insert the sim card slot into the 4G module.



5 Close the head cover.



# Knowledge expansion: 50SIM card installation method (P2/2)

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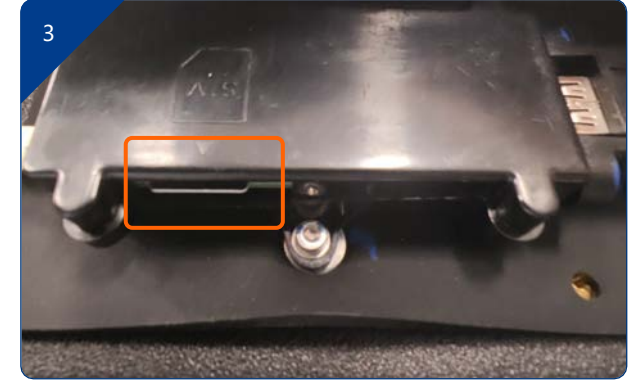
## V4 Installation steps



1 Open the small front door of the machine, hold the middle position of the small front door, and pull it outward (magnetic attraction);



2 Find the location of the 4G module of the machine, which is covered by a waterproof rubber pad above the machine.



3 Find the location of the sim card slot and insert the sim card.



4 If you need to remove the sim card, press the sim card to pop it out.



5 After installing the sim card, reinstall the small front door.

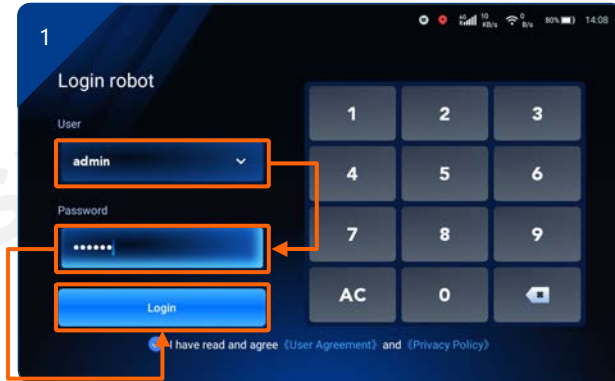


# Knowledge expansion: 50APN configuration (P1/1)

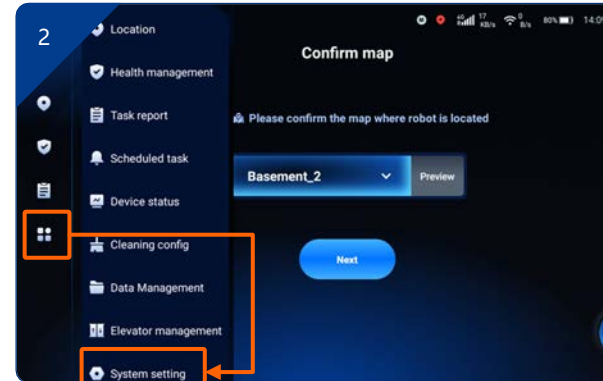
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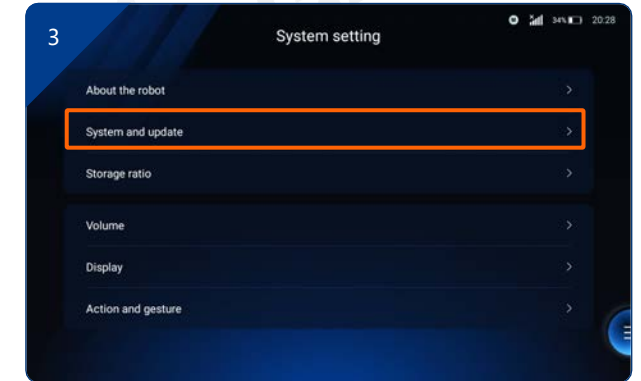
## Configuration steps



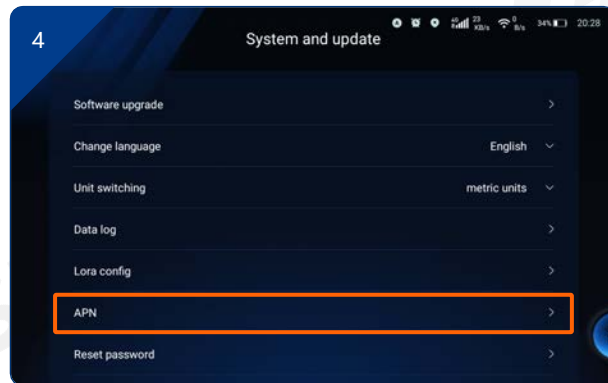
Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click System Settings



Click "System and Updates"



Click "APN"



After filling in the relevant information, click "OK"



# Knowledge expansion: 50SN number acquisition location (P1/1)

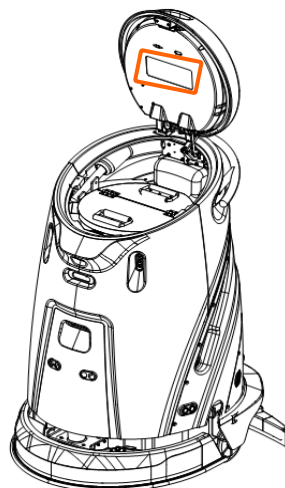
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## 位置一 机身铭牌



V3 series



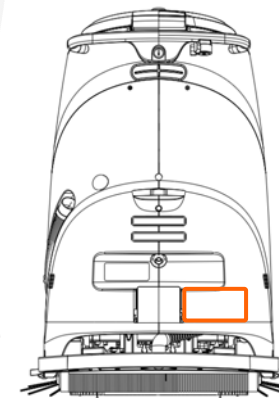
Nameplate location  
(Open the head cover and see the back  
of the head cover)



V4 series white  
(discontinued)

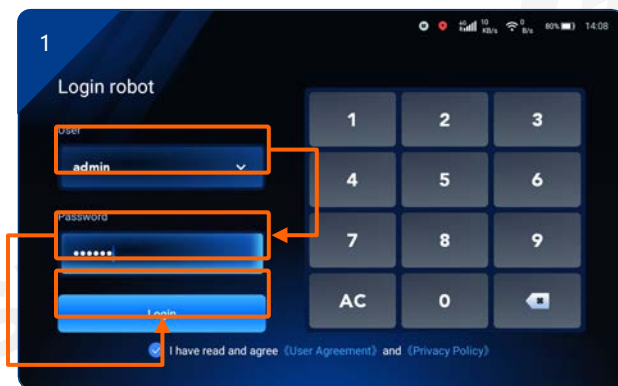


V4 series starry  
sky gray

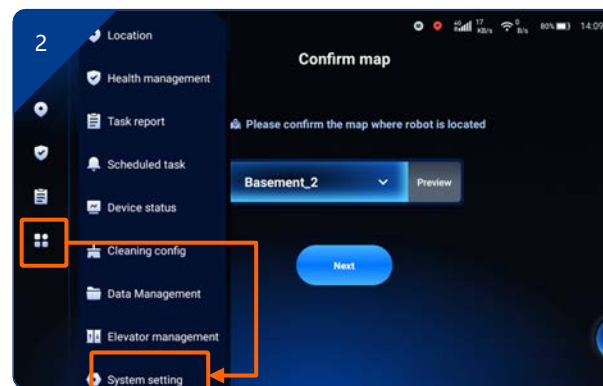


Nameplate location  
(Bottom of the back of the  
fuselage)

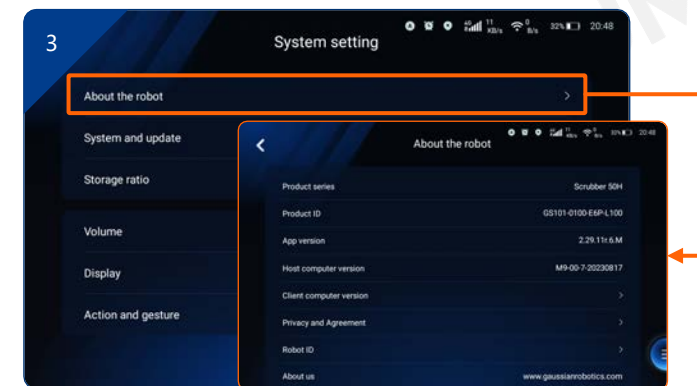
## 位置二 高仙智导



Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click System Settings



Click "About Robot", where the product number is the SN number

# Knowledge expansion: Cloud platform new machine registration steps (P1/1)

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Please click to return



This step can only be performed by Gausium engineers. If you are not a Gausium internal engineer, please contact Gausium docking engineers for assistance.

高仙云平台 Cloud platform URL: <https://cloud.gs-robot.com/#/analysis/overview> 应用中心

机器人 > 机器人注册

机器人注册 机器人注册历史记录 延保申请

机器人S/N: 请输入 录入时间: 开始日期 结束日期 状态: FAE补充信息中

生产车间: 请输入 流水号: 请输入 运维大区: 请选择

国家/地区: 国家 合同客户: 请选择 机器类型: 请选择

FAE补充信息中 S/N: GS101-0100-U5M-5000

机器人S/N	合同客户	机器类型	生产车间	流水号	录入时间	状态	国家	操作
GS101-0100-U5M-5000	gs-robot	50	zhangjiagang	1153	2021-05-28 21:26:30	FAE补充信息中	中国	
GS101-0100-T5M-3000	上海旷为智能科技有限公司(代理商)	50	zhangjiagang	1100	2021-05-27 10:19:02	FAE补充信息中	中国	
GS101-0100-G5M-0000	gaussian-fae	50	zhangjiagang	1087	2021-05-16 09:55:06	FAE补充信息中	中国	

Account login >>> Robot >>> Robot registration >>> Enter SN >>> Search >>> Edit >>> Fill in information >>> Update >>> After the update is completed, the status is "To be approved by supervisor". Gausium engineers should contact their direct supervisor for approval. Non-Gausium engineers should contact Gausium's docking engineer.

When the status is not "FAE supplementary information in progress".  
Engineer Gao Xian please contact your immediate supervisor;  
Non-Gausium engineers please contact Gausium docking engineers.

# Knowledge expansion: Palm Gausium account registration process (P1/1)

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Please click to return



This step can only be performed by Gausium engineers. If you are not a Gausium internal engineer, please contact Gausium docking engineers for assistance.

The image shows two screenshots of the DingTalk Workbench interface. The left screenshot shows the '工作台' (Workbench) page with a grid of application icons. The '钉钉审批' (DingTalk Approval) icon is highlighted with an orange box. The right screenshot shows the '发起审批' (Initiate Approval) page for the '掌上高仙账户开通申请' (Palm Gausium Account Opening Application). The form fields are highlighted with orange boxes: '申请人' (Applicant) with the value '张三', '申请日期' (Application Date) with a date picker, '申请部门' (Application Department) with a '+添加' button, '运维大区' (Operation Area) with a dropdown menu, and '新老客户' (New/Old Customer) with a radio button. The '提交' (Submit) button is also highlighted with an orange box. A flowchart at the bottom left explains the process: DingTalk Workbench >>> DingTalk Approval >>> Palm Gausium Account Opening Application >>> Fill in the information >>> Submit >>> In an emergency, you can contact "Chen Ju'ao" on DingTalk to urge approval. A text box below the flowchart lists the required customer information: name, phone number, email address, and position.

DingTalk Workbench >>> DingTalk Approval >>> Palm Gausium Account Opening Application >>> Fill in the information >>> Submit >>> In an emergency, you can contact "Chen Ju'ao" on DingTalk to urge approval.

Customer information required to apply for an account: name, phone number, email address, position

# Knowledge expansion: 50 workstation installation specifications (P1/3)



## Installation steps

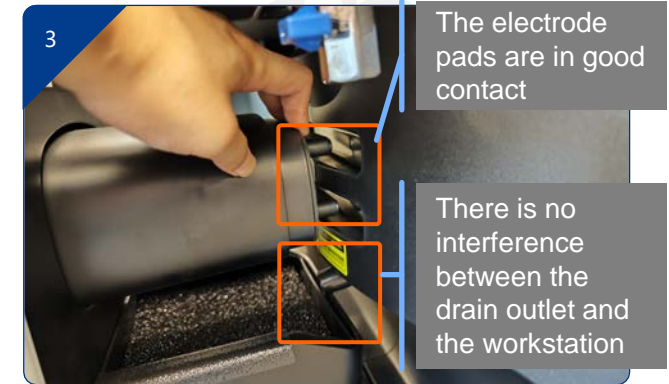


1 Install the 4 support bolts on the back of the workstation. Do not adjust the length of the bolts yet, just keep them at the longest length.

**NOTE:** Anchor bolts require two nuts to be installed.



2 Place the workstation in the pre-installation position so that the 4 support bolts on the back are against the wall.



3 Align the machine manually to the pile. After aligning the pile, ensure that the charging electrode pads are in good contact and there is no interference with the position of the drain outlet.



4 The water-adding rod is properly positioned and in the center of the water-adding port.



5 If the contact between the charging point electrodes is abnormal and there is interference with the water filling rod or drain outlet, the four anchor bolts of the workstation can be adjusted appropriately at the same time to raise or lower the height of the workstation as a whole.

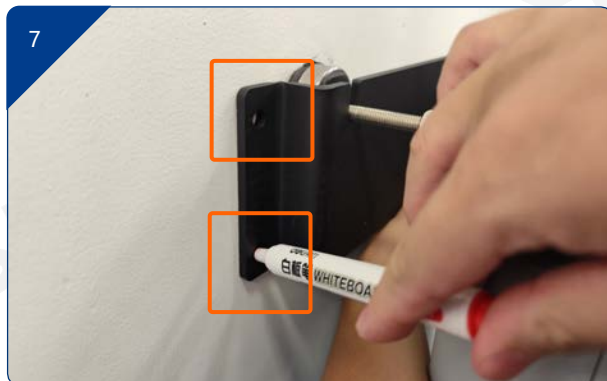


6 After adjusting the height, place the four support bolts on the back of the workstation against the wall, and then move the two slots of the workstation hanger from the bottom to the two support bolts on the top of the workstation. The hanger must be close to the support bolts and the wall. Use your hands to maintain support.

# Knowledge expansion: 50 workstation installation specifications (P2/3)

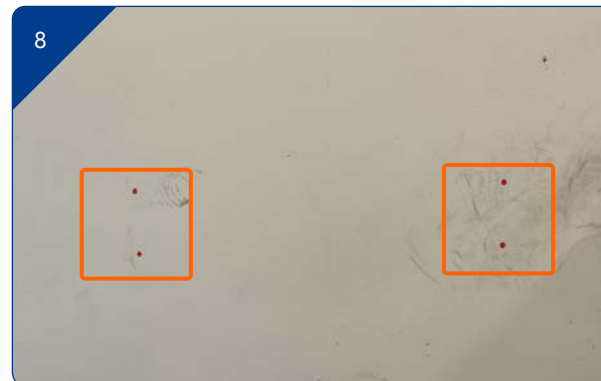


## 安装步骤

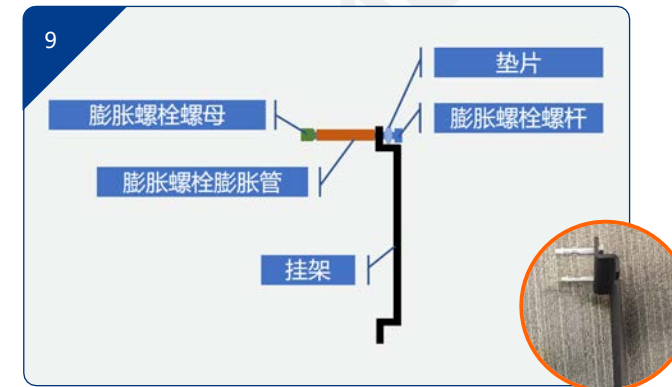


To support the hanger, use a marker to mark the positions of the fixing holes (4) on the wall.

Line marks can be drawn on the four corners of the hanger, which can be used as a reference when drilling holes.



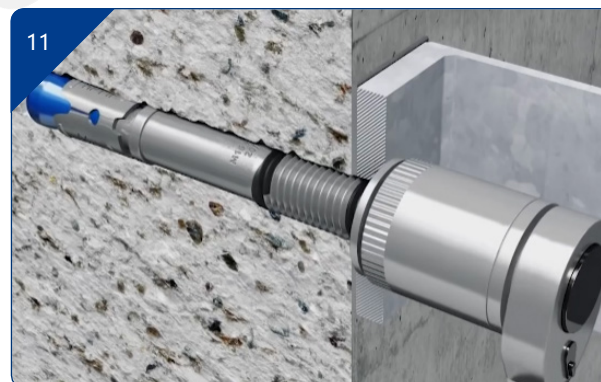
Remove the hanger, move the workstation, and drill holes on the wall according to the markings of the marker. Select the M10 impact drill bit as the drill bit.



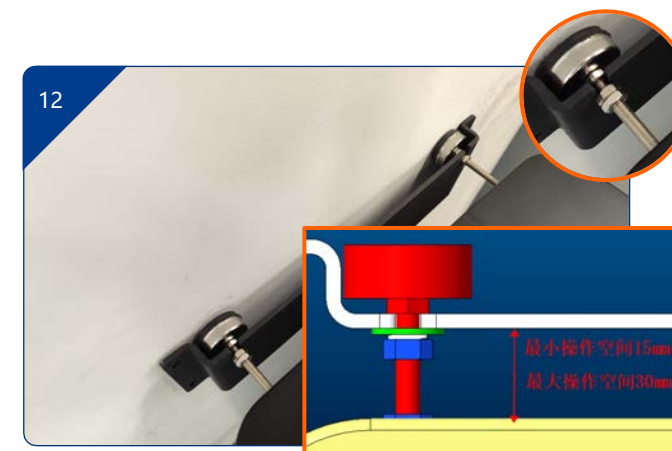
Assemble the hanger and expansion bolts, and pass the four expansion bolts through the hanger fixing holes.



Align the 4 expansion bolts with the drilled wall holes. After alignment, tap the 4 expansion bolts into the wall holes.



Use an M13 socket to properly tighten the expansion bolt.



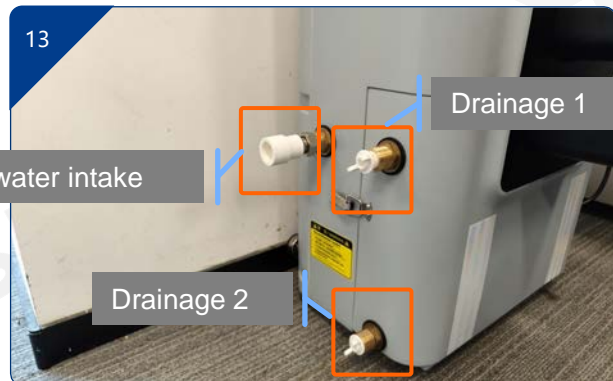
Lift the workstation, insert the two support bolts on the upper back of the workstation into the hanger slot, adjust the support bolts on the back of the workstation so that the distance between the hanger and the back plate of the workstation is between 15 and 30mm, and tighten the support bolts and nuts.

# Knowledge expansion: 50 workstation installation specifications (P3/3)

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## 安装步骤



After the workstation is firmly installed, install the water inlet pipe and drainage pipe. Be sure to use acetate tape during installation. Select one of the two drain outlets. Drain outlet 2 is ground drain (straight drain).

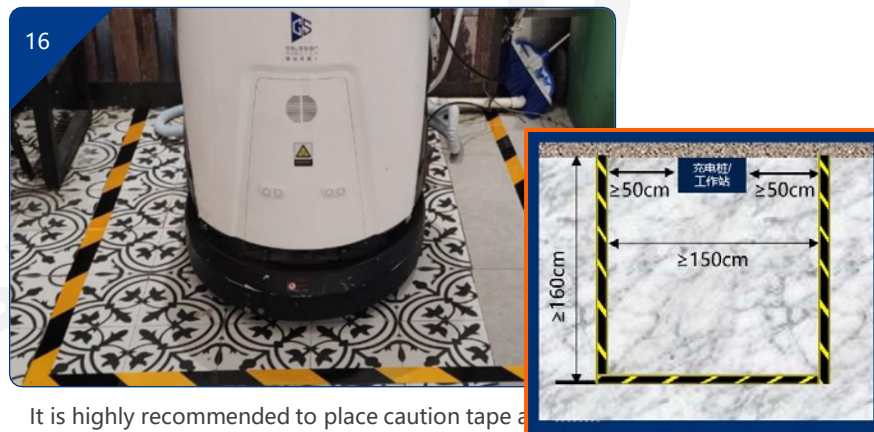
When ground drainage is available, it is strongly recommended to use drain outlet 2 for drainage.



It is strongly recommended to install a water valve where the water inlet is connected to the workstation.



Provide power to the workstation and use the key to power on the workstation.



It is highly recommended to place caution tape around workstations

Paste range:

50cm on the left and right sides of the workstation;  
160cm in front of workstation.

# Knowledge expansion: 50 infrared sticker application specifications (P1/5)



**Infrared sticker:** a physical sticker made of highly reflective material, the depth camera of 50 can identify the sticker, once identified, the machine will determine that there is a risk of falling in front of it, and stop to avoid it, which is a fall-proof measure.

## Sticker style



Infrared sticker (old version is no longer available)

1. Paste position: paste on the wall or ground near the potential danger of falling, such as up and down escalators, down stairs, steps, steep slopes, etc.;
2. Protruding paste, easy to identify by the machine;
3. Keep it away from the hidden danger of falling as much as possible, so that the machine can identify it in advance and reduce the risk;
4. The width of the falling area >1.2m, sticking to the ground, and the width of the falling area ≤1.2m, sticking to the wall;
5. After pasting the sticker, the virtual wall must be drawn at the outermost 1-1.5m distance from the sticker, and the virtual wall drawn too close (less than 1m) may cause the machine to get stuck in normal operation.
6. It does not support pasting in outdoor environments.

## Paste the specification



IR Sticker (New Version)

1. Paste position: on the left and right walls near the potential danger of falling, such as up and down escalators, down stairs, steps, steep slopes, etc.;
2. Protruding paste, easy to identify by the machine;
3. The pattern can not be crooked, as horizontal as possible;
4. Keep it away from the hidden danger of falling as much as possible, so that the machine can identify it in advance and reduce the risk;
5. After pasting the sticker, the virtual wall must be drawn at the outermost 1-1.5m distance from the sticker, and the virtual wall drawn too close (less than 1m) may cause the machine to get stuck in normal operation.
6. It does not support pasting in outdoor environments.
7. The width of the drop area >1.2m, and the new version of the infrared sticker is not applicable.



There is a software version requirement for the use of the new version of IR stickers.

The 50 model must use the software version of M8-00 and above, otherwise the machine will not be able to recognize the new version of the IR sticker.

When the old and new stickers exist at the same time, if the separation between the two is less than 20cm, it will affect the recognition algorithm, so the old sticker must be removed.

# Knowledge expansion: 50 infrared sticker application specifications (P2/5)



## Paste diagram for up and down escalators ( old version ) :

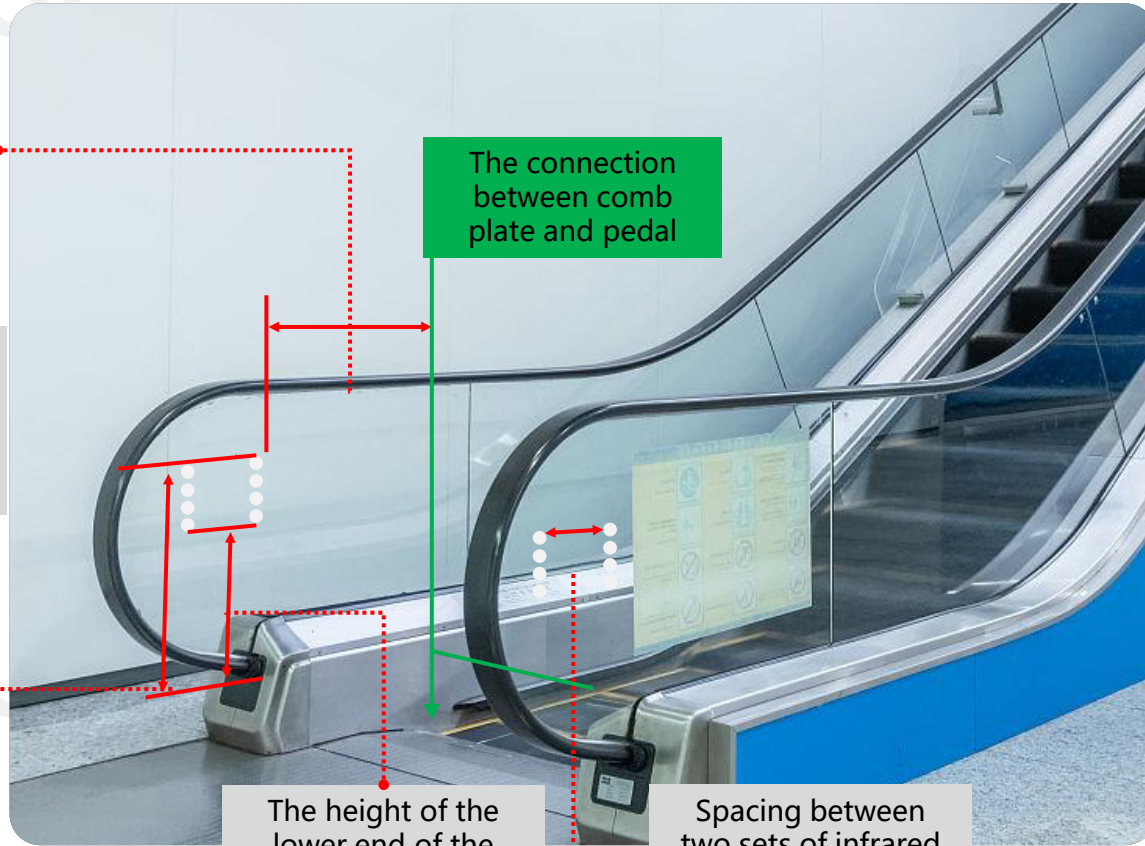
The horizontal distance between the sticker and the connection:  $\geq 20\text{cm}$

The height of the upper end of the sticker from the ground:  $\leq 80\text{cm}$

The connection between comb plate and pedal

The height of the lower end of the sticker from the ground:  $\geq 50\text{cm}$

Spacing between two sets of infrared stickers:  $20\text{cm} < \text{Gap} < 50\text{cm}$



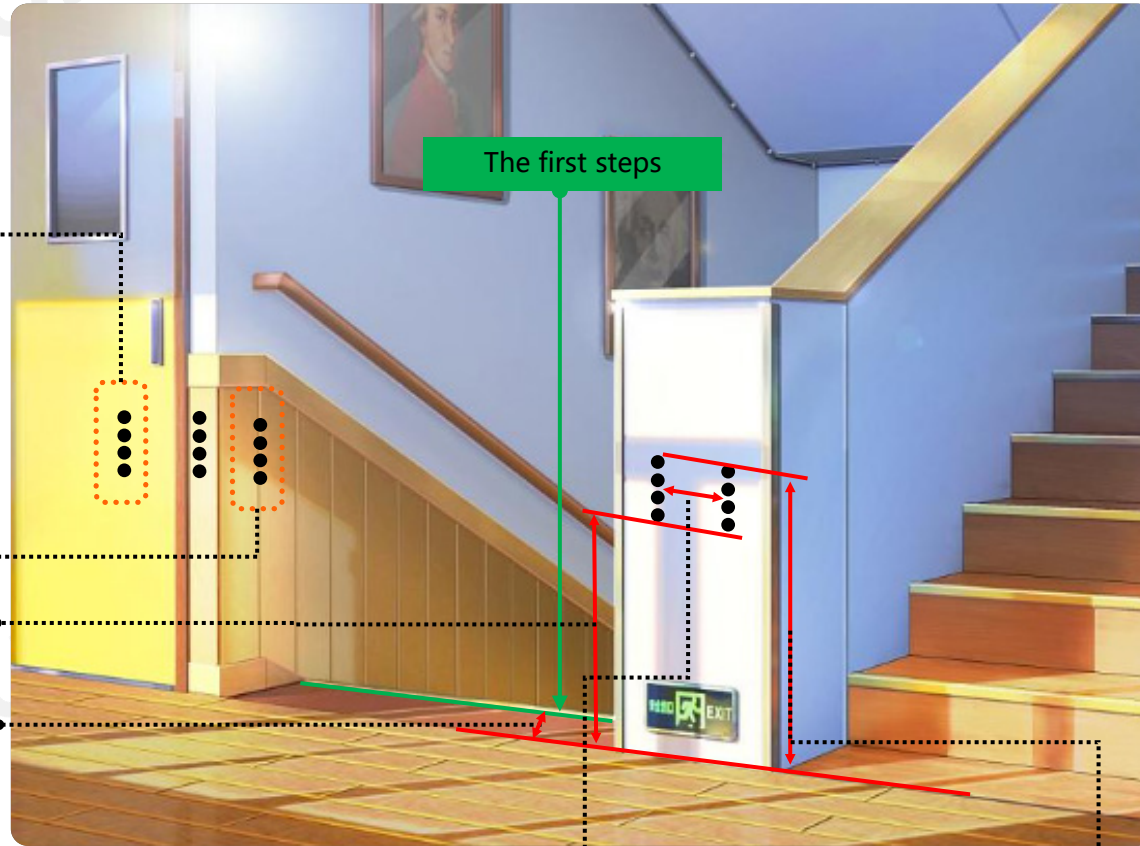
### Precautions:

1. If the width of the escalator is  $> 1.2\text{m}$ , the sticker should be affixed to the ground. Please refer to stairs larger than  $1.2\text{m}$ .
2. Do not stick infrared stickers directly on transparent objects (such as glass). If the scene has a transparent background, you need to use a sticker backing board.
3. The virtual wall needs to be drawn using a polygonal virtual wall. The virtual wall needs to frame the position of the infrared sticker and the distance from the sticker should be  $> 0.8\text{m}$ .

# Knowledge expansion: 50 infrared sticker application specifications (P3/5)



## Paste diagram for descending stairs (width $\leq 1.2m$ ) (old version) :



Ideal location for pasting, but cannot be pasted due to force majeure, can be pasted on another wall

The height of the lower end of the sticker from the ground:  $\geq 50cm$

The horizontal distance between the sticker and the first step:  $\geq 20cm$

The first steps

Spacing between two sets of infrared stickers:  $20cm < Gap < 50cm$

The height of the upper end of the sticker from the ground:  $\leq 80cm$



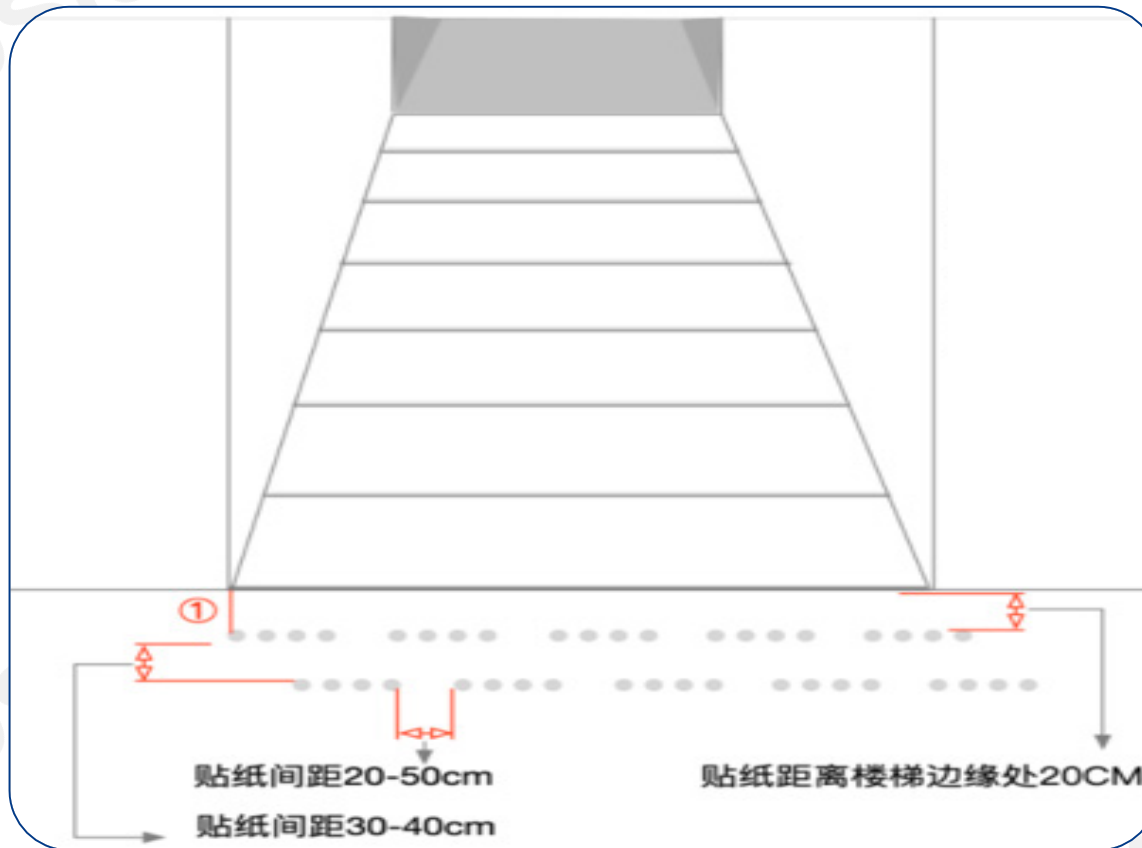
**Precautions:**

1. If there is a fire door or other area between the stairs and the robot's operating area, it is recommended to paste the sticker on the fire door or other passage closest to the robot's operating area to try to increase the distance between the robot and risk areas such as stairs.
2. The virtual wall needs to be drawn using a polygonal virtual wall. The virtual wall needs to frame the position of the infrared sticker and the distance from the sticker should be  $>0.8m$ .

# Knowledge expansion: 50 infrared sticker application specifications (P4/5)



**Paste diagram for descending stairs (width >1.2m) ( old version ) :**



### Precautions:

1. Make sure that the first origin of the sticker on the far left side of the sticker is perpendicular to the entrance of the stairs. The last dot of the last group of stickers should be outside the entrance of the stairs. Make sure that all the stickers cover the entrance of the stairs.
2. The stickers can be pasted as far away from the stairs as possible.
3. The stickers in the first and second rows need to be pasted crosswise.
4. The virtual wall needs to be drawn using a polygonal virtual wall. The virtual wall needs to frame the position of the infrared sticker and the distance from the sticker should be >0.8m.

# Knowledge expansion: 50 infrared sticker application specifications (P5/5)

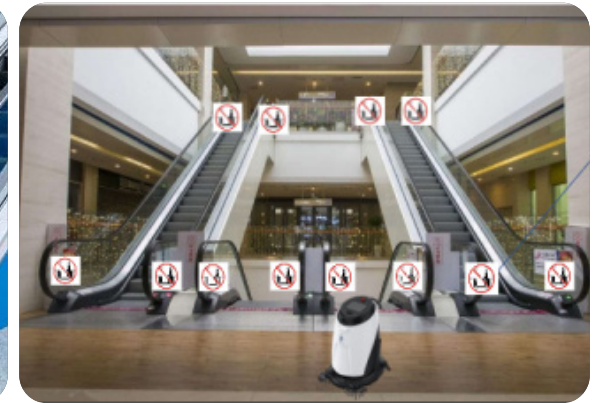
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## Sticker diagram of up and down escalator (new version):

No more than 15cm, the closer the better

45-70cm



### Notes:

1. The nearest infrared point on the inner edge of the escalator handrail is no more than 15cm away from the inner edge of the escalator handrail, and the closer the distance, the better (that is, the infrared sticker is as far away as possible from the escalator paste)
2. The two infrared dots at the bottom of the infrared sticker are 45~70cm away from the ground, not too low and not too high, otherwise the machine will not be able to identify.
3. The sticker should be pasted on the inner glass on the left and right sides of the escalator, and the film should be torn off after pasting.

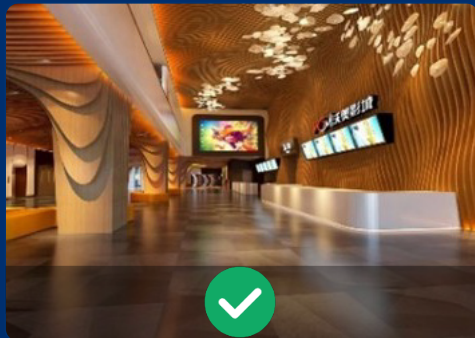
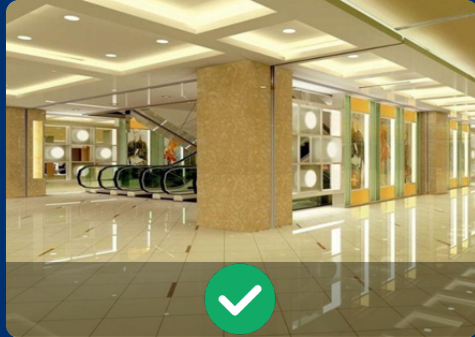
4. Paste an infrared sticker on the left and right is defined as a group, the new version of the infrared sticker can be pasted as a group, and the upward and downward escalators can be pasted with two sets of infrared stickers.
5. The distance of a group of infrared stickers is greater than 1.2m, and the machine has the probability to cross this group of infrared stickers, and the new version of the infrared stickers is only suitable for escalators, stairs, and steps with a width of less than 1.2m.
6. The surface of the sticker is worn, or mutilated and cannot be recognized.
7. The pattern can not be crooked, try to be horizontal.

\* Applicable to the new version of the infrared sticker software version requirements: M8-00 and above.



**Characteristics that a suitable starting point for scanning should possess:** obvious structural features

## Recommended choice



Where there is a right angle wall  
Where there are right-angled columns/circular columns

## Disable selection



In a long corridor >>> Features are not obvious  
Glass wall/mirror >>> Diffuse reflection  
interference laser

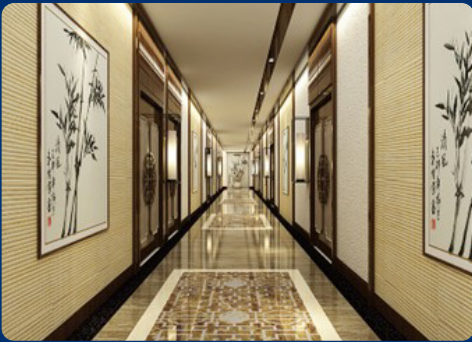
# Knowledge Expansion: Physically marking rear wheel scenario (P1/1)

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**Characteristics of the physically marked rear wheel scene:** the structure is similar or the scanned image can only go around in a large circle

Most structures on site  
Both are long corridor environments



The map is very big  
And scanning pictures can only go in large circles



Most structures on site  
All are symmetrically similar structures




Physical marking of rear wheels



Marker: tape or marker

Marking location: The ground on both sides of the machine's left and right hub motor wheels



 **Map naming convention:** national city + project name + floor information

**Demonstration:** Shenyang National Games Wanda F1



## Scanning skills and precautions

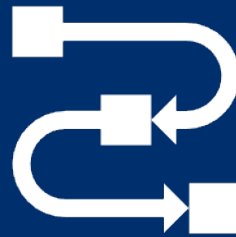
### Before starting to scan

- Scan starting point selection
- Do you need to mark the rear wheel position?



### In the process of scanning

- Scanning movement speed
- Scanning image turning angle speed
- Scan the moving track
- Scanning moving path closed loop
- Is it necessary to use forced closed loop?



### After scanning is completed

- Map quality





## Scanning skills and precautions - during the scanning process

Scanning movement speed



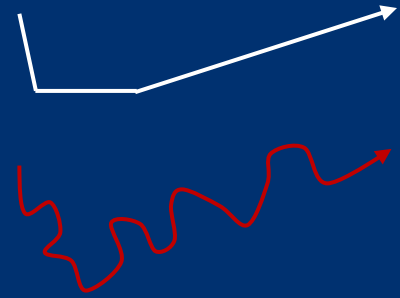
Should be less than 1m/s

Scanning image turning angle  
speed



Should be less than 20°/s

Scan the moving track



Should be straight and have smooth turns

Scan back and forth as little as possible

S-shaped trajectories prohibited



## Scanning skills and precautions - during the scanning process

Scanning moving path closed loop

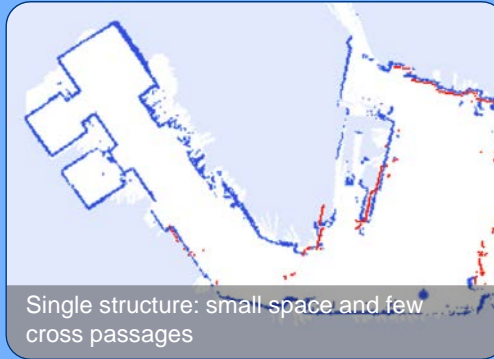


Is the site structure complex?  
The complex structure requires small closed loops first and then large closed loops.  
Just scan the entire structure

Determine whether the site structure is complex or not

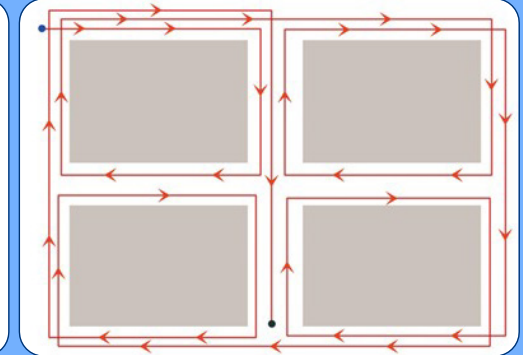
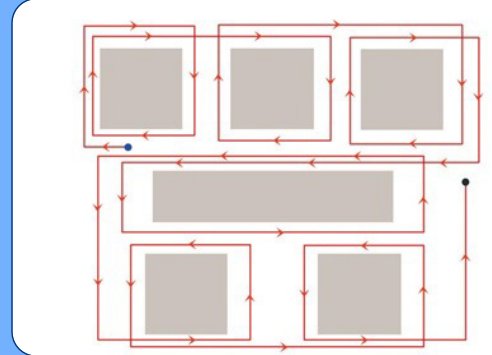


Complex structure: large space and many cross passages

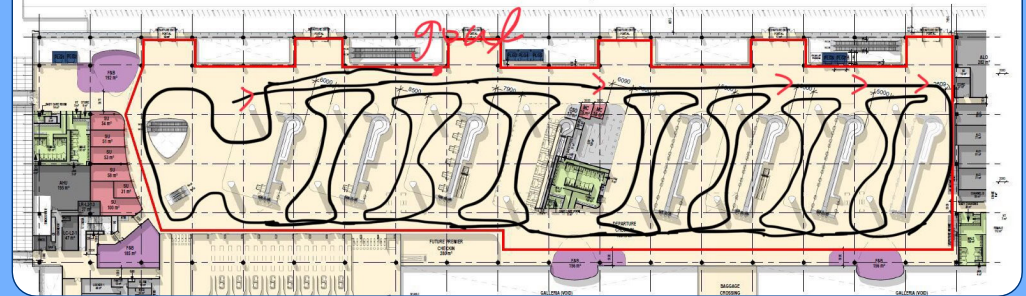


Single structure: small space and few cross passages

Illustration of small closed loop first and then large closed loop



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**i** After the paths intersect and close the loop, the software will automatically optimize the coordinate position of the point cloud in the map, improve the map accuracy, and reduce the probability of positioning loss during automatic operation. We generally call this process automatic loop closure.



### Scanning skills and precautions - during the scanning process

Is it necessary to use forced closed loop?



Need to be used with marking the rear wheels before scanning  
Measures to solve poor map quality



1 Move the machine to the physical starting point of the scan, with the rear wheels aligned with the physical marks before scanning.



2 At this point, you can find that the starting point of the scan recorded by the software does not coincide with the current location of the robot. This is another manifestation of poor map quality.



3 Click the "Force Closed Loop" icon

The starting point of the scan recorded by the software

The current position of the robot (accurate positioning is required)



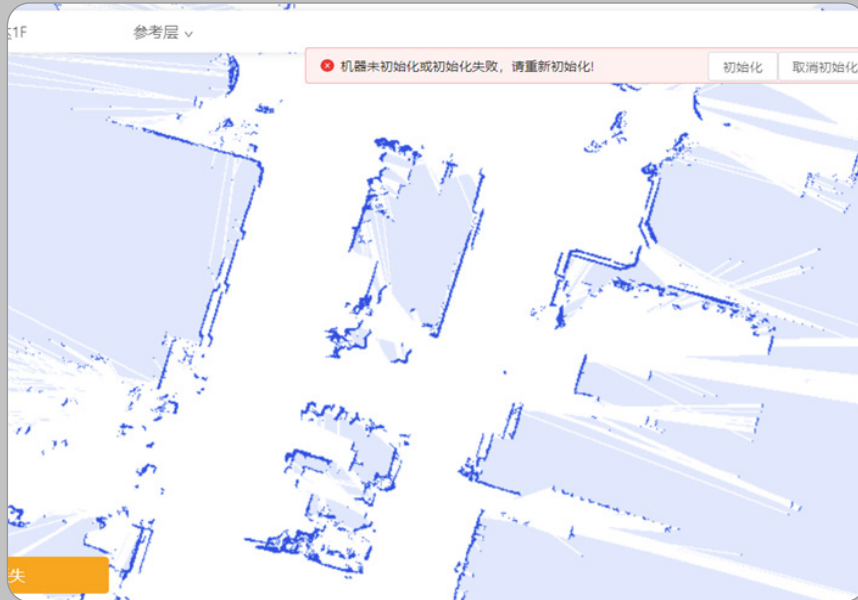
If after clicking Forced Loop Closure, the map still has ghosting and loop closing problems, the map can only be rescanned.



**Low map quality:** The map has ghosting issues or closed-loop issues.

## Ghosting problem:

A common ghosting phenomenon is that a wall in the real environment becomes two parallel walls in the map. It causes great interference to navigation, causing problems such as positioning jitters and stuck.



## Closed loop problem:

Inadvertently closed loops or missing loops will lead to incorrect map information, resulting in large positioning offsets and jumps when the machine is running, resulting in machine jamming or positioning loss;



## Quality Check Instructions:

1. Check the entire map. If there are no closed-loop or ghosting problems, the quality is excellent.
2. If there are local problems, you can use the original image editing function to delete the area and then expand the scan. If the global frame is distorted, it can only be rescanned.
3. Map quality problems will lead to random operation risks. The machine may have no problem during the test run, but the positioning may be lost or stuck during subsequent runs.

# Knowledge expansion: Expanded map usage instructions (P1/3)



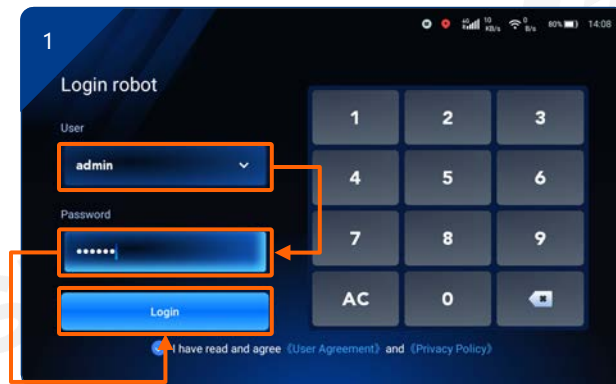
**Expanded map:** Based on the existing map, expand the map or partially rescan the map.

## Using scenarios

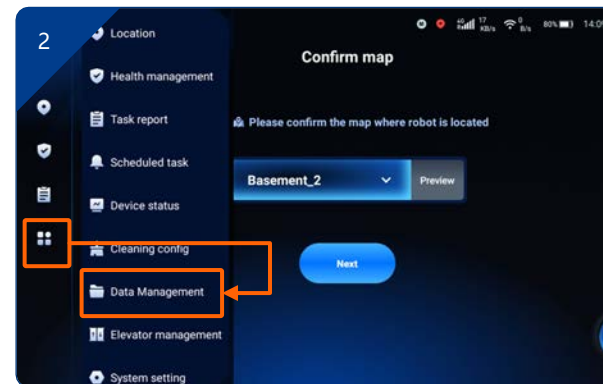
1. A new mission area needs to be added to the scene. The initially scanned map does not cover this area.
2. The on-site map area is very large (>?), and the map can be scanned multiple times using the extended map to increase the success rate of scanning.

3. When checking the map quality, it is found that there are some parts of the map with poor map quality (ghosting, closed-loop problems). You can edit and delete the area using the original image, and then rescan using the expanded map.

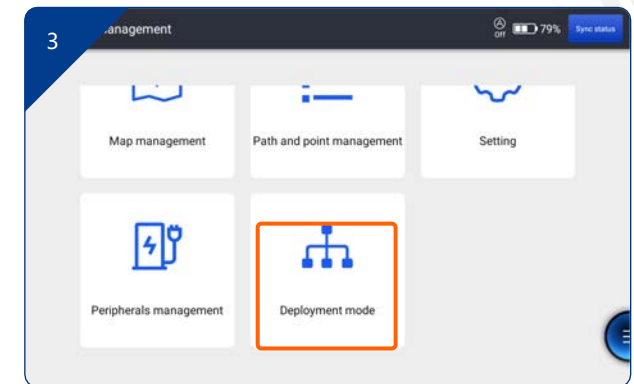
## Expand map steps for usage



Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click Data Management



Click "Deployment Mode"

# Knowledge expansion: Expanded map usage instructions (P2/3)



Expand map steps for usage



Click "Enter" in the [Environment Creation] card



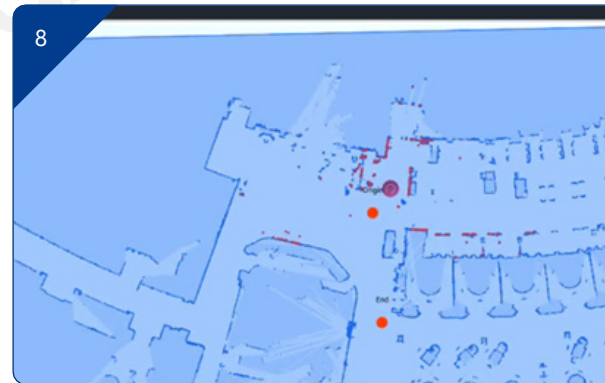
Click "extend"



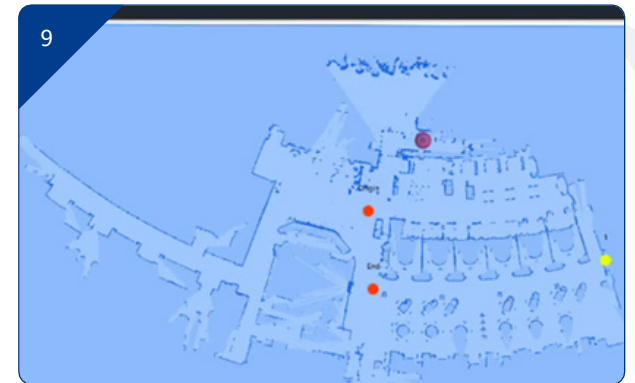
According to the prompts, push the machine to the main scanning path of the original map (distance from the main path  $\leq$  ? m), click "OK"



Click "Start"



Control the movement of the machine and let the machine travel more than 2m in the original map. When the machine moves, observe the overlap between the real-time laser data and the original map to ensure a high degree of overlap.



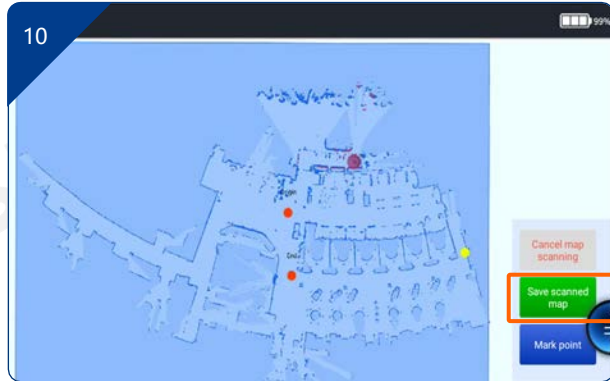
After there is no height mismatch, control the machine to move to the area that needs to be expanded and start map expansion.

# Knowledge expansion: Expanded map usage instructions (P3/3)

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Please click to return



Expand map  
steps for usage



After the expansion is completed, wait about 10 seconds, check that the map quality is correct, and click "Save Map"



When expanding the map, you must fully follow the scanning techniques and precautions.

# Knowledge expansion: How to use noise and original image editing (P1/2)

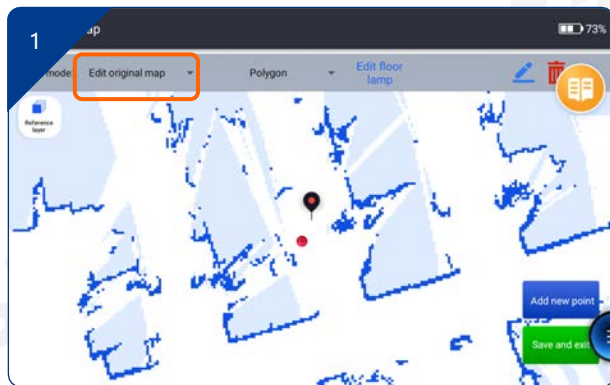


**Noise:** When the machine scans the map, some dynamically moving people and things, and temporarily placed objects will also generate point cloud data. If these point cloud data are retained on the map, it will subsequently affect the operation and positioning of the machine, Gao Xian This kind of point cloud data is called noise.

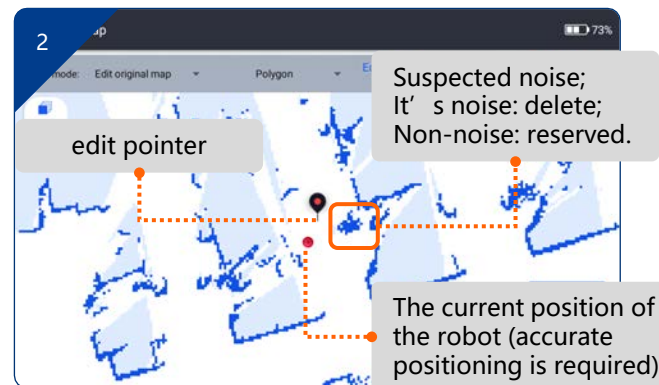
## Noise processing

When editing the map, use the original image editing mode to delete the noise. The most difficult thing to delete is to correctly identify the noise. The operation is not difficult.

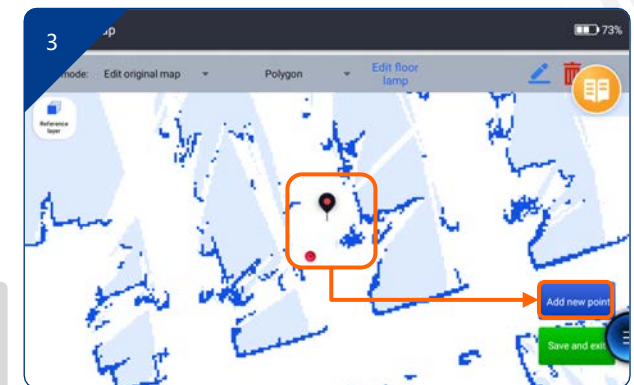
## Original image editing instructions



Confirm that the editing mode is "original image editing"



Identify noise points in the map. If you are not sure whether they are noise points, you can ensure that the machine is positioned accurately and then push the machine nearby to compare the map with the actual environment.



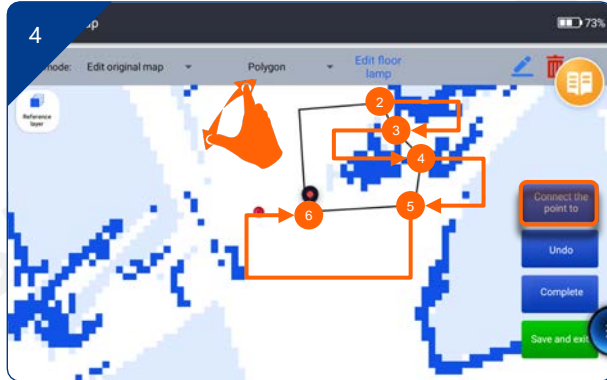
Move the pointer near the pre-deleted point cloud data (appropriate white area) > click "Add New Point".

# Knowledge expansion: How to use noise and original image editing (P2/2)

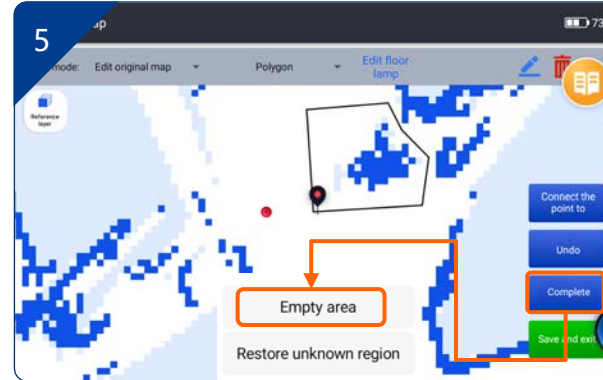
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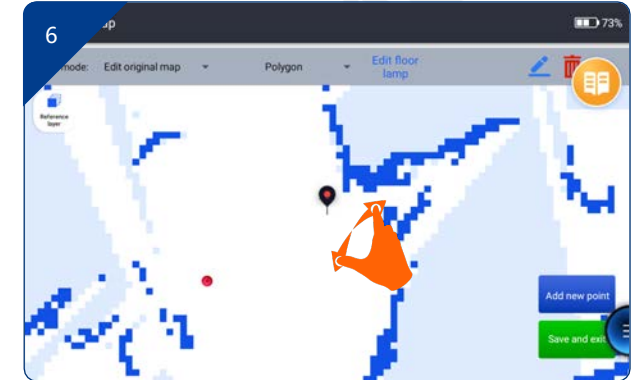
## Original image editing instructions



Move the editing pointer several times and click "Connect the point to" in the appropriate white area. Finally, the pre-deleted noise will be completely selected. You can appropriately enlarge the screen during the operation to avoid selecting non-noise areas during the selection.



After the box selection is completed, click "Finish" and click "Clear Area";  
The unknown area that is currently prohibited from using.

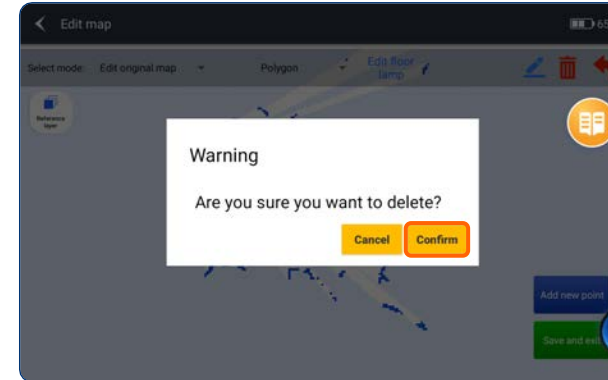


Pull out with two fingers to zoom in, pull in with two fingers to zoom out, and check to make sure the noise is removed.

Accidental deletion recovery method (before "Save All and Exit", please refer to the following figure. After saving, you can only recover by expanding the map and rescanning):



Click on the previously deleted point cloud location on the map. After the click is successful, the area will be displayed in red. Click "Delete"



Just click "OK".

# Knowledge expansion: How to use virtual wall editing (P1/6)



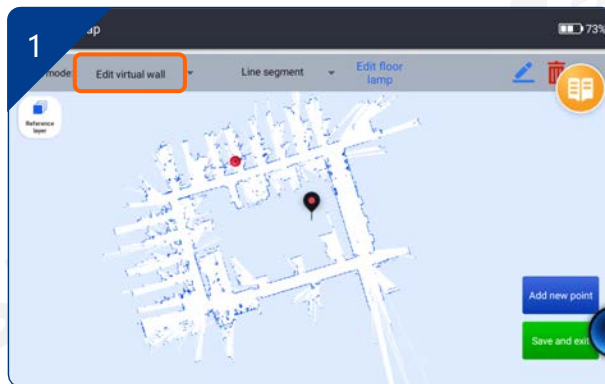
**Virtual wall:** A virtual wall at the software level that cannot be traversed when the machine is running automatically. It limits the machine's operating space, helps the machine avoid unrecognized risks, and limits the machine's operating route. The machine will always calculate the coordinate relationship between itself and the virtual wall, so the premise for the virtual wall to work is that the machine is positioned accurately.

## Virtual wall draw scene

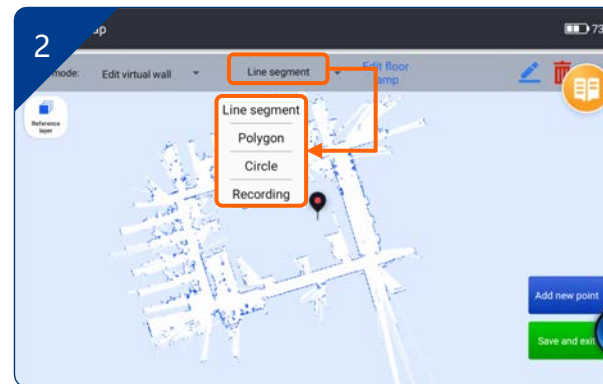
1. Virtual walls need to be drawn in all places where there are risks, including risks of falling, scratching, and crushing.

2. The machine should be restricted to a closed space composed of virtual walls and scanned point clouds to prevent the machine from running to unexpected locations.

## Switch virtual wall drawing mode



Confirm that the editing mode is "Virtual Wall Editing"



Click the current category name and select the category with the corresponding name in the expanded list to switch the virtual wall editing category.

Virtual wall drawing method category description:

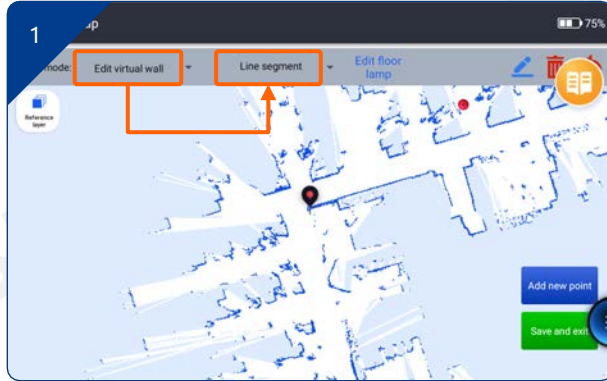
1. Line segment virtual wall: you can draw straight lines or discount virtual walls;
2. Polygonal virtual wall: You can select an area and fill it with virtual wall blocks, also known as the "forbidden zone".
3. Circular virtual wall: A circular virtual wall can be drawn, which is convenient for drawing virtual walls on circular objects.
4. Record virtual wall: Based on the current position (positioning) of the machine, a certain point on the robot body is used as a reference point. After recording and running the machine, a virtual wall will be generated at the corresponding position.

The virtual wall generated by recording a virtual wall is not beautiful. Generally, you first use recording to find the position where the virtual wall should be drawn, then use other virtual walls to re-draw it by hand and then delete the recorded virtual wall.

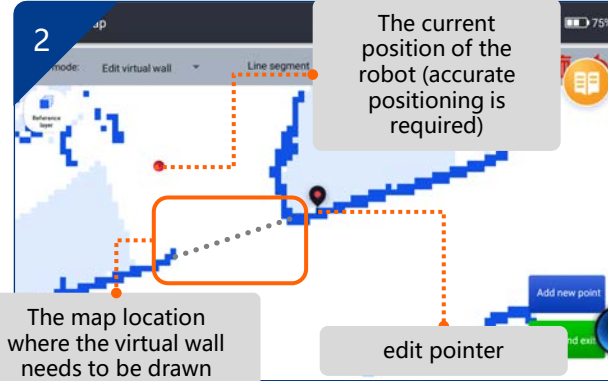
# Knowledge expansion: How to use virtual wall editing (P2/6)



## Line segment virtual wall drawing method



Switch the virtual wall category to "Line Segment".

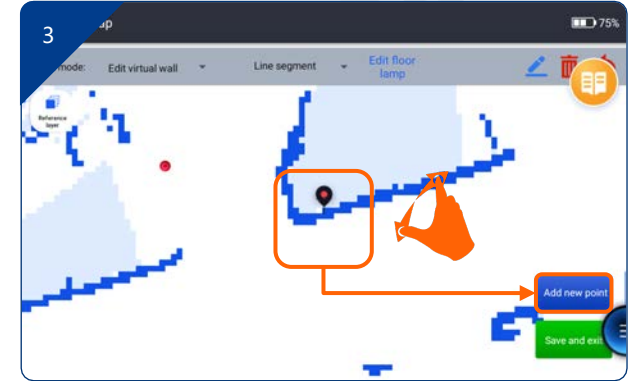


The map location where the virtual wall needs to be drawn

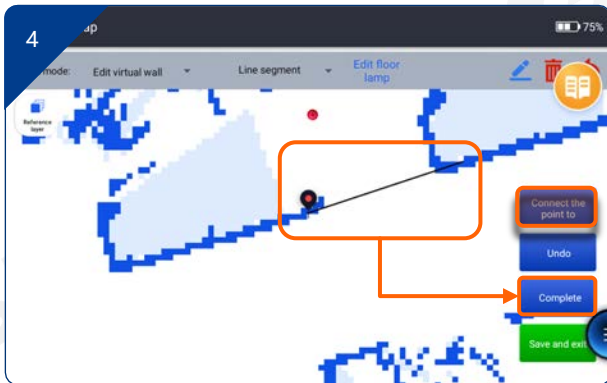
The current position of the robot (accurate positioning is required)

edit pointer

Drag the screen to identify where the virtual wall needs to be drawn on the map. When you are not sure whether it needs to be drawn, you can ensure that the machine is positioned accurately and push the machine nearby to compare the map with the actual environment.



After appropriately enlarging the picture, move the editing pointer to the starting point of the pre-drawn virtual wall and click "Add New Point".



Move the pointer and click "Connect Point To" to change the drawing direction of the line segment to draw a polyline. You can click "Undo" midway to undo the most recently added inflection point. After drawing the expected result, click "Finish".

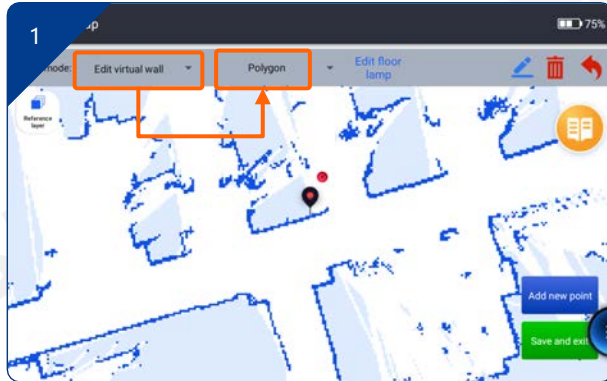


In order to ensure the edge effect of the clean area, when drawing a line segment virtual wall, if there is no risk of falling or scratching, it must be drawn along the outer edge of the clean area as much as possible. If there is a risk, safety first.

# Knowledge expansion: How to use virtual wall editing (P3/6)



## Polygon virtual wall drawing method



Switch the virtual wall category to "Polygon".



Drag the screen to identify where the virtual wall needs to be drawn on the map. When you are not sure whether it needs to be drawn, you can ensure that the machine is positioned accurately and push the machine nearby to compare the map with the actual environment.



After appropriately enlarging the picture, move the editing pointer to the starting point of the pre-drawn virtual wall and click "Add New Point".



Move the pointer several times and click "Connect to Point" at the appropriate place. Finally, the map location where the polygon area needs to be drawn will be completely covered and click "Finish"



Check the polygonal virtual wall drawing effect.

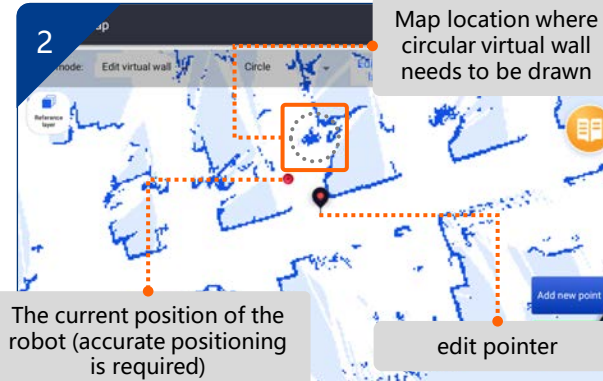
# Knowledge expansion: How to use virtual wall editing (P4/6)



## Circular virtual wall drawing method



Switch the virtual wall category to "Circular".



The current position of the robot (accurate positioning is required)

edit pointer

Drag the screen to identify where the virtual wall needs to be drawn on the map. When you are not sure whether it needs to be drawn, you can ensure that the machine is positioned accurately and push the machine nearby to compare the map with the actual environment.



After appropriately enlarging the screen, move the editing pointer to the starting point of the pre-drawn virtual wall and click "Select starting point".



Drag the screen left and right to adjust the size of the circular virtual wall. Control the editing pointer away from the starting point to zoom in, and the editing pointer close to the starting point to zoom out. Adjust the appropriate size and click "Finish".



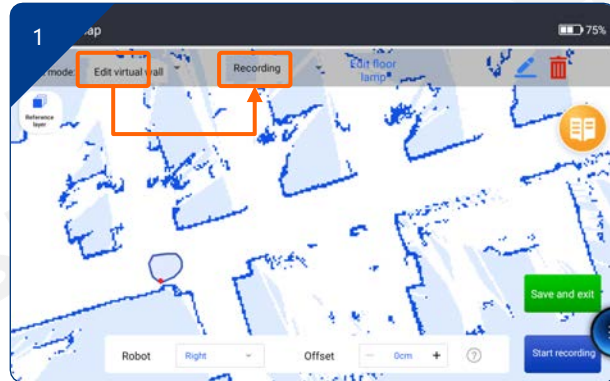
Check the circular virtual wall drawing effect.

# Knowledge expansion: How to use virtual wall editing (P5/6)

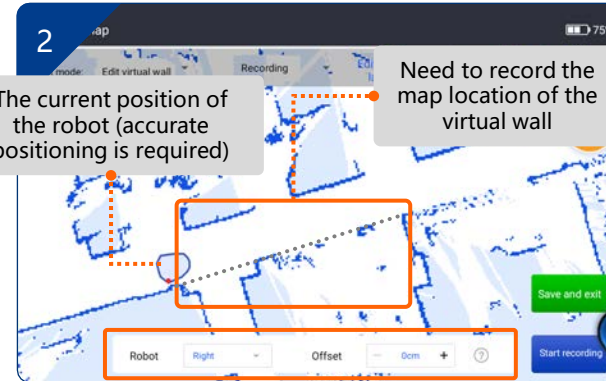
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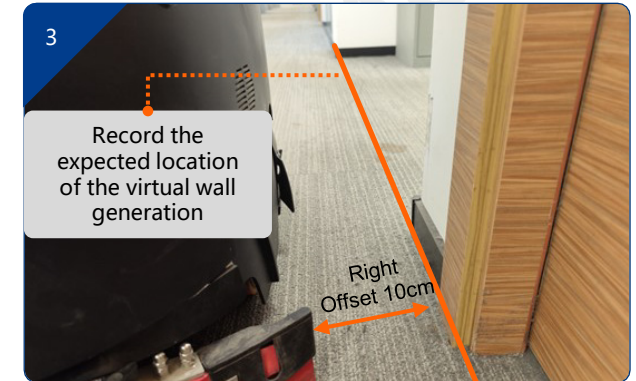
## Record virtual wall drawing method



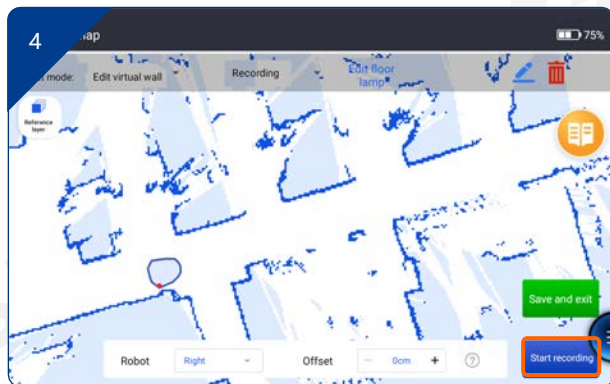
Switch the virtual wall category to "Recording".



Select the reference point "right/left", adjust the offset distance, and offset to the outside of the machine based on the reference point. 50If you select the right side, the reference point is the rightmost end of the squeegee strip. 50If you select the left side, the reference point is the leftmost end of the squeegee strip.



After ensuring that the machine positioning is accurate, push the machine to the position where the virtual wall needs to be drawn. Refer to the reference point and offset distance configured in the software to adjust the actual reference point position.



After adjusting the actual position of the reference point, click "Start Recording" and run the machine to ensure that the distance between the reference point and the expected drawn virtual wall is always the offset distance.



Check the virtual wall generated by the recording. When it meets the expectations, click "End Recording"

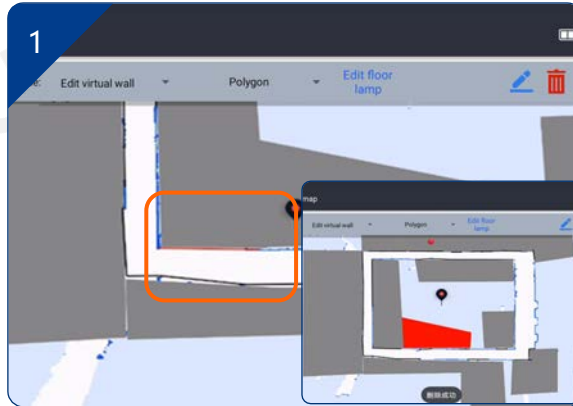


Check the virtual wall generated by the recording. If it does not look good, you can switch to another category of virtual wall and redraw it. Recording the virtual wall is mainly used to determine the approximate map location of the virtual wall that needs to be drawn.

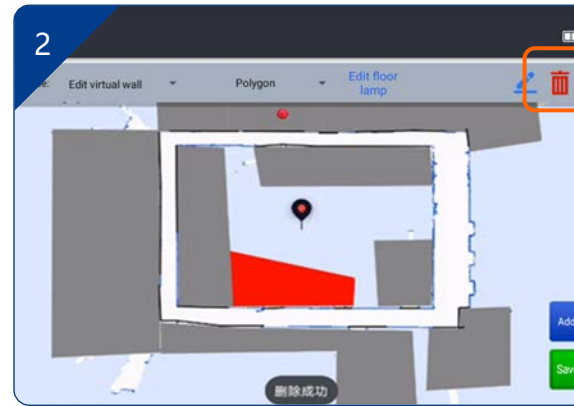


## Virtual wall considerations

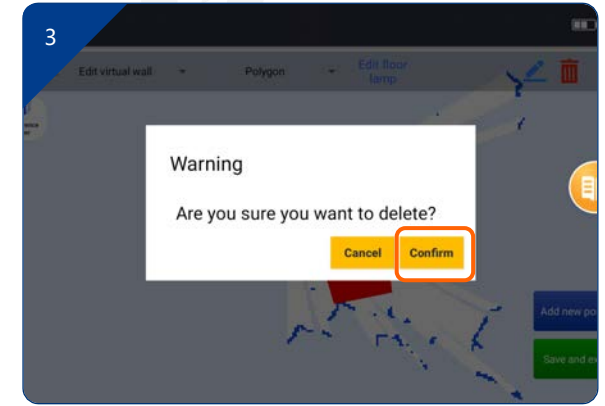
How to delete virtual wall:



Click to select the line segment virtual wall or polygonal virtual wall. After the selection is successful, it will turn red.



Click the "Delete" icon



Click "Confirm" to delete

# Knowledge expansion: How to use highlighted areas (P1/2)



**Highlighted area:** Select the point cloud generated by the scan to enhance the weight of the selected point cloud in the positioning calculation. The selected point cloud functions similarly to a "lighthouse" and plays a role in assisting positioning.

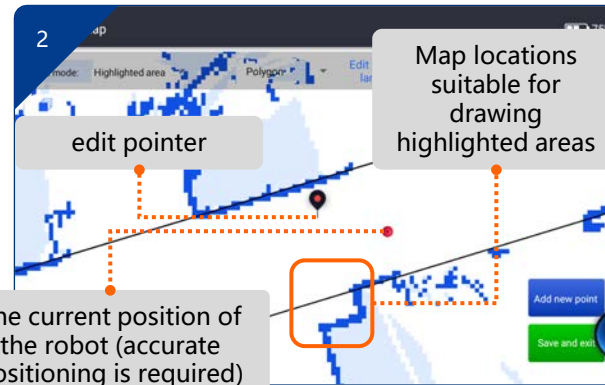
## Highlighted area mark location

1. Only point clouds generated by fixed walls can be marked, and the structural features must be obvious, such as right-angled walls, square columns, round columns, etc.
2. It is prohibited to mark objects that may move.

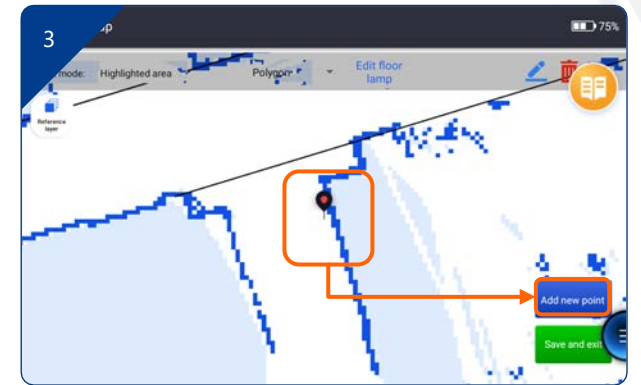
## Highlighted area drawing steps



Confirm that the editing mode is "Highlight Area"



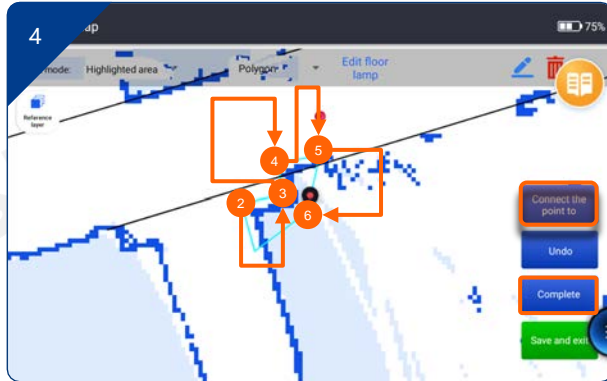
Identify the location on the map that is suitable for drawing highlights. If you are not sure whether it is suitable for drawing highlights, ensure that the machine is positioned accurately and then push the machine nearby to confirm the actual environment.



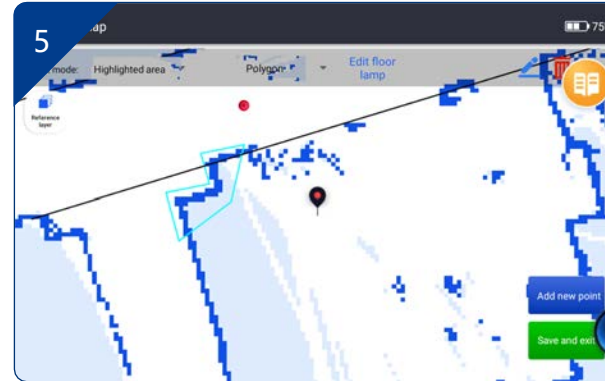
Move the pointer near the pre-selected point cloud data (appropriate white area) > click "Add New Point".



## Highlighted area drawing steps



Move the pointer multiple times, click "Connect to point" at the appropriate location, frame the point cloud data suitable for drawing the highlighted area, and click "Finish"



Check the highlight area drawing effect.

## Highlighted area precautions

1. The highlighted area is generally drawn every 15-20m.
- 2.50 In a shopping mall or subway station scene, all pillars and corners need to be highlighted.
3. Symmetry is prohibited when drawing highlighted areas.
4. The highlighted area should not be drawn too large, and try to just wrap the point cloud data you want to frame.
5. For point cloud data with movable obstacles and unclear structures, it is prohibited to draw highlighted areas.

# Knowledge expansion: How to use glass walls (P1/2)



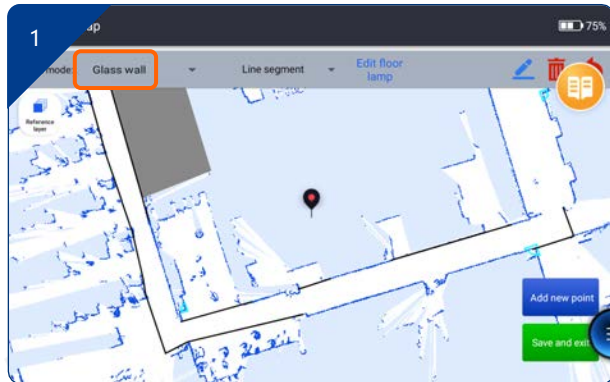
**Glass walls:** When the robot runs near glass walls or walls made of highly reflective materials, it will be affected by the noise refracted back by these walls, causing the machine to run lag. Drawing glass walls at the map locations of these walls can effectively reduce This kind of lag.

**Reminder:** Glass walls do not have the virtual wall function. Glass objects need to draw both glass walls and virtual walls.

Glass wall  
mark location

1. Glass position
2. Highly reflective material wall location

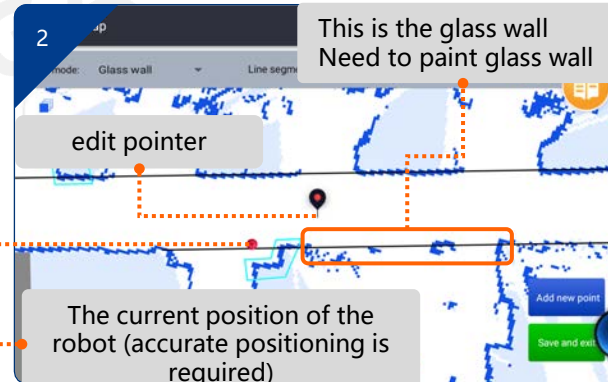
Polygon  
glass wall



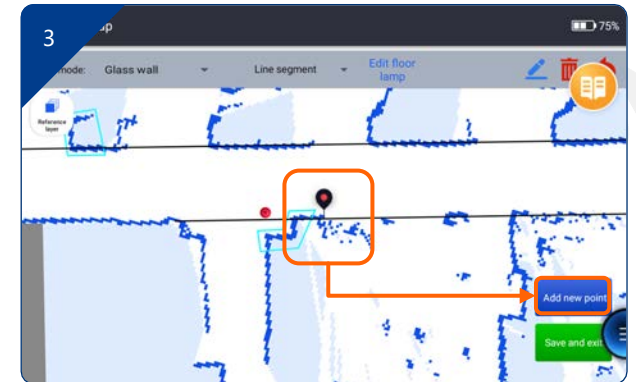
Confirm that the editing mode is "Glass Wall"

Glass wall  
drawing method

1. Polygon
2. Record



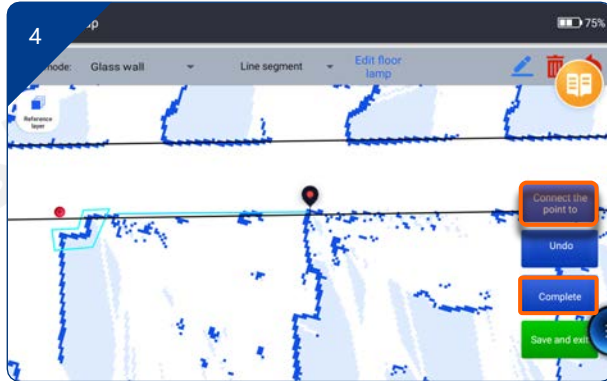
Identify the location where the glass wall needs to be drawn on the map. If you cannot confirm the drawing location, you can first use the recorded glass wall to mark the location of the glass wall, then switch to polygon optimization drawing, and finally delete the recorded glass wall.



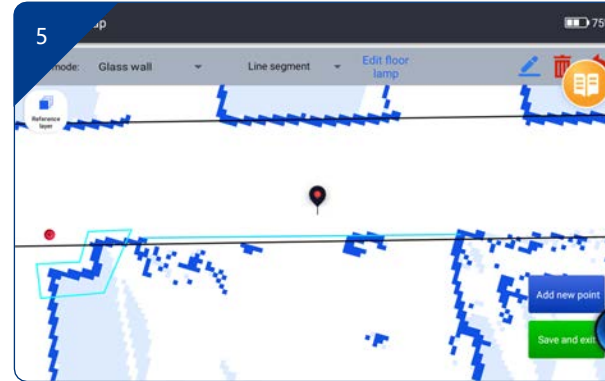
After appropriately enlarging the picture, move the editing pointer to the starting point of the pre-drawn glass wall and click "Add New Point".  
The drawing position of the glass wall should coincide with the actual position of the glass as much as possible, and the deviation distance should not exceed 10cm.



## Polygon glass wall



Move the editing pointer and click "Finish" after drawing the desired effect. For special-shaped glass, you can click "Connect point to" to change the drawing direction of the glass wall, thereby changing the shape of the glass wall drawing.



Check the glass wall painting effect.

## Record glass wall

The operation method is the same as recording a virtual wall and will not be introduced. Please give priority to mastering the use of recording virtual walls and draw inferences from one example.

## glass wall Precautions

1. The drawing position of the glass wall should coincide with the actual position of the glass as much as possible, and the deviation distance should not exceed 10cm.
2. Glass walls do not have the virtual wall function. Glass objects must draw both glass walls and virtual walls.
3. The glass wall and the highlighted area display similar colors on the all-in-one machine, so pay attention to distinguish them.

# Knowledge expansion: How to use the elevator area (P1/3)



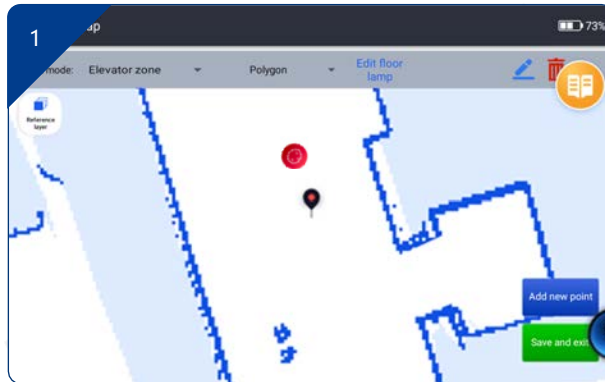
**Elevator area:** Mark the location and size of the elevator car, and automatically generate waiting points outside the elevator and stopping points inside the elevator after marking.

Elevator areas must be added only on sites where elevator control equipment is installed, and maps of all floors must be added.

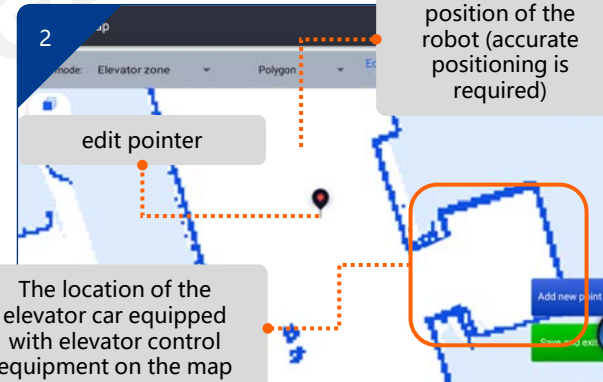
## Elevator area mark location

1. The location of the elevator equipped with elevator control equipment in the machine map.

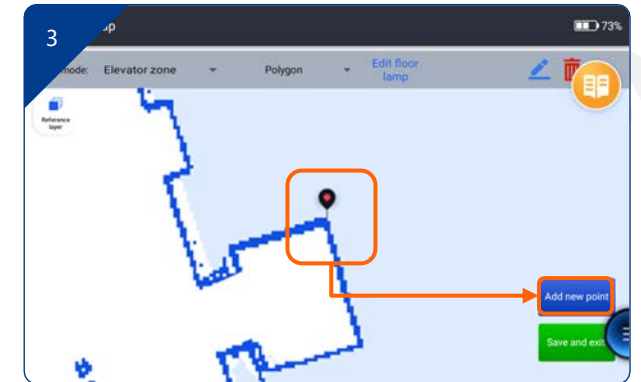
## Elevator area drawing steps



Confirm that the editing mode is "Elevator Area"



Identify the location of the elevator car on the map. If the location cannot be confirmed, ensure that the machine is positioned accurately and then push the machine to the vicinity of the elevator.

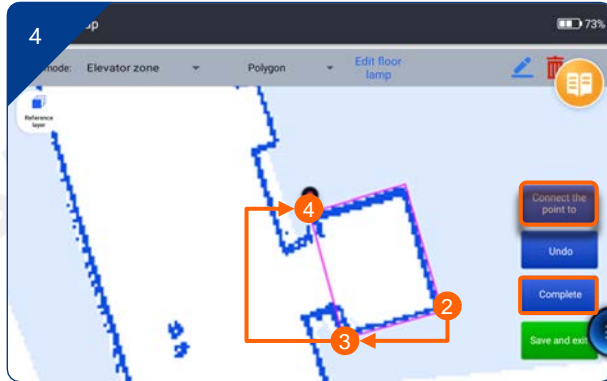


The elevator area needs to be cut out of the elevator outline as much as possible and wrap the elevator outline.

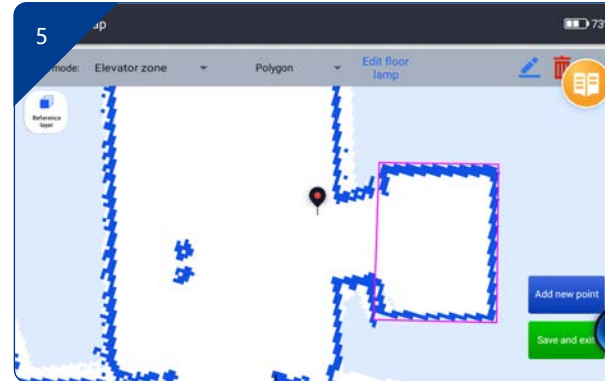
# Knowledge expansion: How to use the elevator area (P2/3)



## Elevator area drawing steps

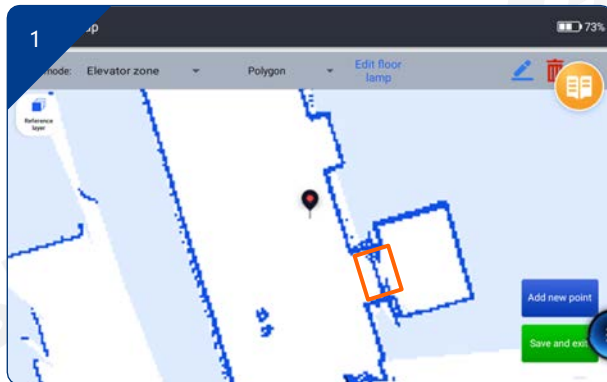


Move the editing pointer several times, click "Connect Point to" at other vertices of the elevator car outline slightly outside (not coincident with the vertices), and finally wrap the elevator outline and click "Finish".



Check the rendering effect of the elevator area.

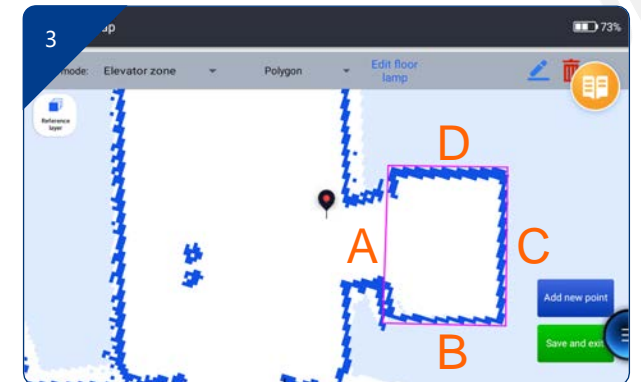
## Elevator area precautions



The noise in the elevator door and inside the elevator needs to be edited and deleted using the original image.



Special attention should be paid to the C side of each map at the same site. Try to keep the distance between the C side of each map and the outline of the elevator consistent. Do not be too far or too close.



The elevator area circumscribes the elevator outline as much as possible, just to completely wrap the elevator outline. Surfaces B and D also have an impact on the generated inner and outer points of the elevator.

# Knowledge expansion: How to use the elevator area (P3/3)

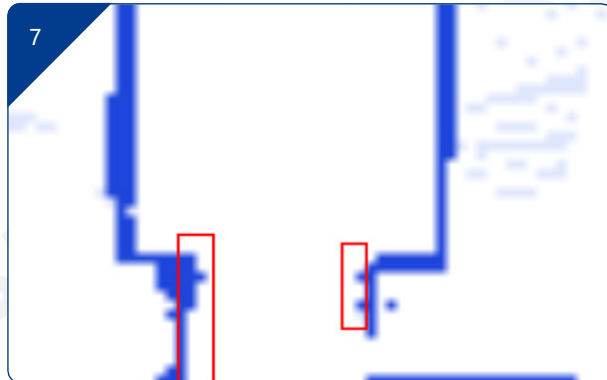
This page is the last page of knowledge  
Please click to return



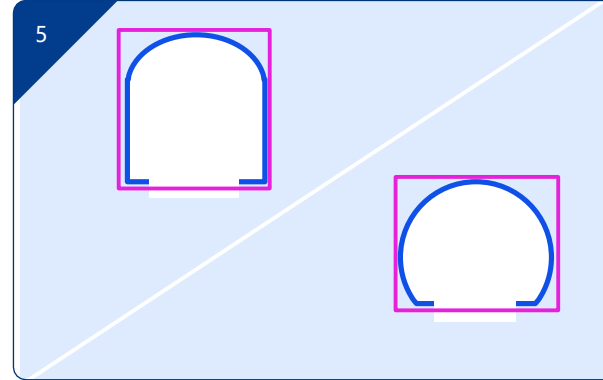
## Elevator area precautions



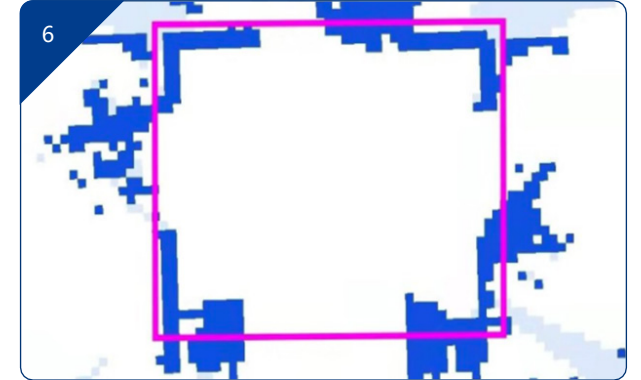
The elevator area must include the entrance and floor seams of the actual elevator, so side A can be slightly farther away from the elevator door, but not too far out, otherwise it will also affect the positions of the generated inner and outer points of the elevator.



Protruding noise spots are prone to appear on the walls of elevator doorways, which must be removed to ensure that the width of the elevator door in the map is consistent with the actual width.



The elevator area can only be drawn as a rectangle. If the actual elevator outline is not rectangular, that is, a special-shaped elevator, the elevator outline needs to be wrapped with a rectangular elevator area.



If the actual elevator outline is rectangular and regular, but the elevator outline scanned in the map is irregular, the elevator area needs to be drawn according to the actual elevator outline.

# Knowledge expansion: How to use other editing modes (P1/12)

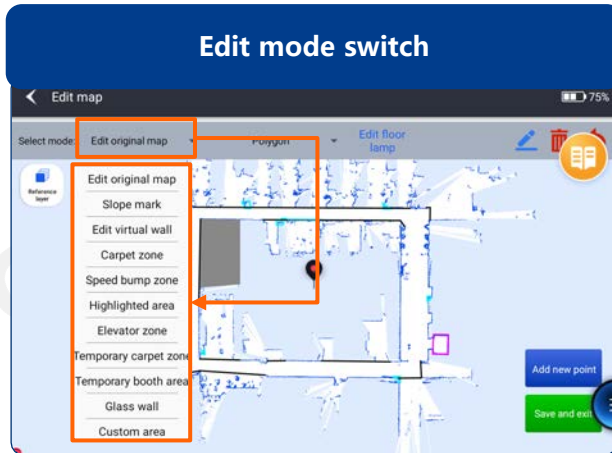


**Editing mode:** A tool for marking or modifying scanned maps. The previously used original image editing, virtual wall editing, highlighted areas, and elevator areas all belong to the editing mode. Different editing modes have different effects on the machine.

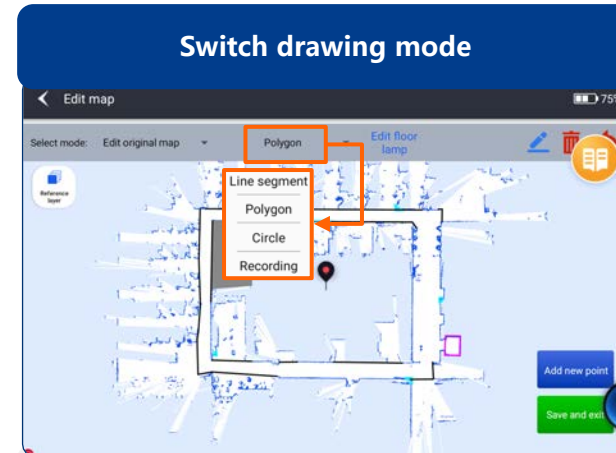
Edit mode category summary

Edit mode name	Impact and function on machines	Drawing method category	usage frequency	Usage Has the explanation been given	Usage Will there be a briefing?
Original image editing	Delete the map noise to prevent the noise from affecting the machine's abnormal avoidance and prevent the noise from affecting the machine's positioning.	Polygon	Must use if there is noise	Yes	—
Virtual wall editing	Help the machine avoid risks that cannot be recognized or are easily misjudged, and limit the operating range of the machine to avoid running into unknown areas.	Line segment/polygon/circle/recording	Must use	Yes	—
Highlighted area	It can be regarded as a road sign on the road, a lighthouse for maritime navigation, a mark with obvious structural features, a fixed object, and an auxiliary positioning.	Polygon/Circle/Record	Must use	Yes	—
glass wall	Mark glass or highly reflective walls to reduce the impact of glass or highly reflective walls on machine sensors and reduce abnormal machine shutdowns.	Line segment/Recording	Must use if there is glass	Yes	—
Elevator area	Mark the location of the elevator car equipped with elevator control equipment to inform the machine of the exact location of the elevator.	Polygon	Must use if there is elevator control equipment	Yes	—
carpet area	Mark carpets or other carpet-like objects. When the machine passes through this area, it will stop the water in advance, turn off the cleaning equipment, lift the cleaning equipment, and slow down to cross.	Polygon/Circle/Record	Choose to use according to the situation	No	Yes
speed bump area	Mark speed bumps or other speed bumps. Machines do not give priority to crossing this area when passing through. They must cross only when passing through. The water will be stopped in advance, the cleaning equipment will be turned off, the cleaning equipment will be raised, and the speed will be slowed down. At the same time, the anti-fall detection will be weakened.	Polygon/Circle/Record	Choose to use according to the situation	No	Yes
mark slope	Mark slopes or slope-like objects. When the machine passes through this area, it will continue to maintain its original state, continue cleaning, and continue navigation. It will slow down in the area and weaken anti-fall detection.	polygon/recording	Choose to use according to the situation	No	Yes
Self-defined area	Mark a custom-sized area and you can individually turn off the machine's anti-fall/one-meter bar detection/thin rod detection functions in this area.	polygon/recording	Use as appropriate	No	Yes
Floor lamp editor	Accurately mark the location of floor lamps on the map. The attributes are the same as those of virtual walls. This function only speeds up the efficiency of floor lamp marking.	recording	Choose to use	NO	Yes
Temporary carpet area	临时地毯识别, 存在风险暂不使用。	多边形/圆形/录制	不使用	No	No
temporary exhibition stand	临时展台识别, 存在风险暂不使用。	多边形/录制	不使用	No	No

# Knowledge expansion: How to use other editing modes (P2/12)



Click the name of the currently selected editing mode, and select the editing mode you want to use in the pop-up mode list.



Click the name of the currently selected drawing method, and select the drawing method you want to use in the pop-up drawing method list.

# Knowledge expansion: How to use other editing modes

(P3/12)



**Carpet area:** When the machine encounters a carpet area, the current task is waterless mode (cleaning, dust pushing, and disinfection). The speed is limited to 0.8m away from the carpet area. The cleaning equipment is turned off and lifted to cross the carpet area. After crossing, cleaning is restarted. Equipment; the current task is water mode (washing the floor). Stop the water in advance and increase the suction 5m away from the carpet area. Lift the roller brush 3m, speed limit 0.8m, lift the squeegee 0.3m to turn off the suction, and restart cleaning after crossing. equipment. (The specific values are subject to fine-tuning depending on the software version, and the values are brought here only for ease of understanding)

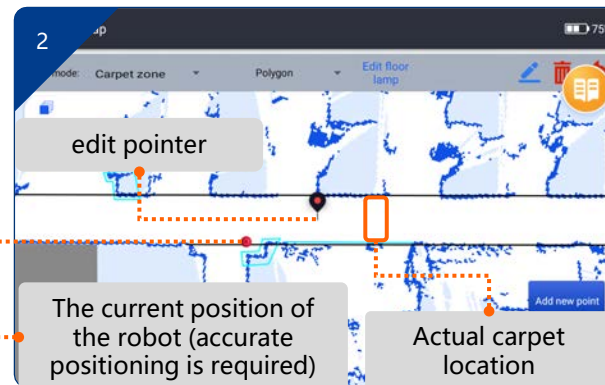
Carpet area  
mark location

Carpet (hair length  $\leq 10\text{mm}$ )  
Carpets with hair length  $> 10\text{mm}$  cannot be passed by the machine and virtual walls need to be drawn to avoid them.

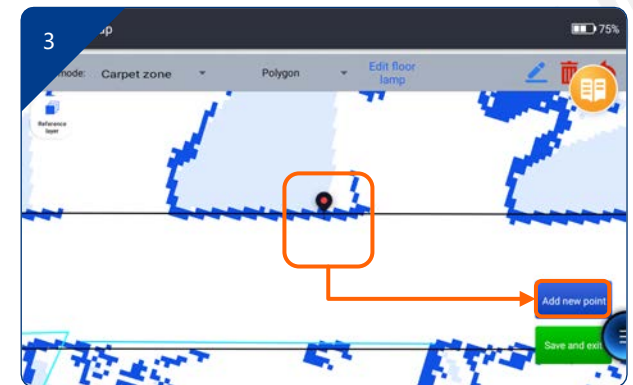
Polygon  
carpet area



Confirm that the editing mode is "Elevator Area" and the drawing method is "Polygon"



Identify the location on the map where the carpet area needs to be drawn. If the location cannot be confirmed, you can first use the recorded carpet area to mark the carpet range, then switch to polygon optimization drawing, and finally delete the recorded carpet area.



After appropriately enlarging the screen, move the editing pointer to the map location where the carpet area needs to be drawn, and click "Add New Point".

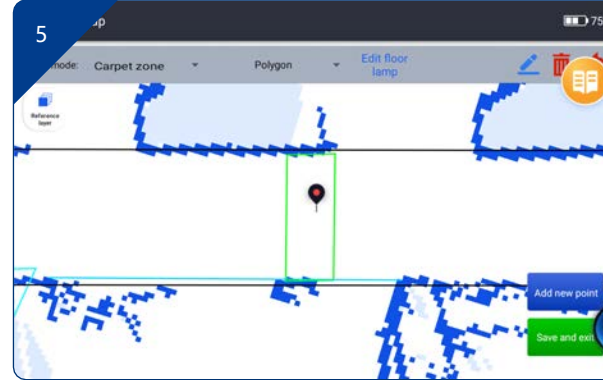
# Knowledge expansion: How to use other editing modes (P4/12)



## Polygon carpet area



Move the pointer several times, click "Connect to Point" at the appropriate location, select the location where the carpet area needs to be drawn, and click "Finish".



Check the polygonal carpet area drawing effect.

## Record carpet area

The operation method is the same as recording a virtual wall and will not be introduced. Please give priority to mastering the use of recording virtual walls and draw inferences from one example.

Suggestion: first use recording to find the approximate location of the carpet on the map, then use line segments to draw, and finally delete the recorded carpet area.

## Carpet area Precautions

1. Around carpet areas? mThe machine will not clean by default (safe distance).
2. The carpet area should not be drawn too large, and the carpet area should be selected as precisely as possible, otherwise the area that is not cleaned by the machine may have an impact on customer sentiment.

# Knowledge expansion: How to use other editing modes

(P5/12)

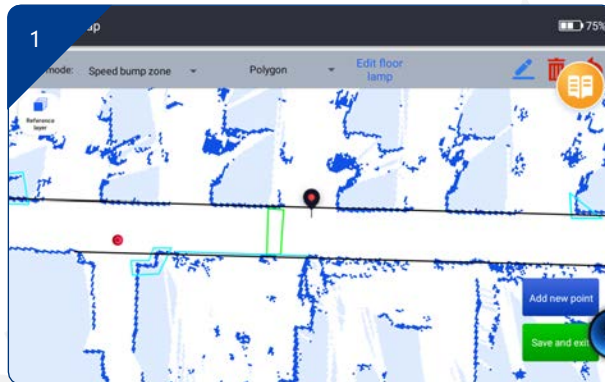


**Speed bump area:** When the machine encounters the speed bump area, it will give priority to avoid this area (left and right probes). If there is no way to go, it will cross over. The current task is in waterless mode (cleaning, dust pushing, and disinfection). The speed limit is 0.8m away from the speed bump area. Turn off and lift the cleaning equipment to cross the speed bump area. Restart the cleaning equipment after crossing; the current task is in water mode (Washing the floor), stop the water in advance 5m away from the speed bump area, increase the suction, lift the roller brush 3m, limit the speed to 0.8m, lift the squeegee 0.3m to turn off the suction, then cross the speed bump area, and restart the cleaning equipment after crossing. (The specific values are subject to fine-tuning depending on the software version, and the values are brought here only for ease of understanding)

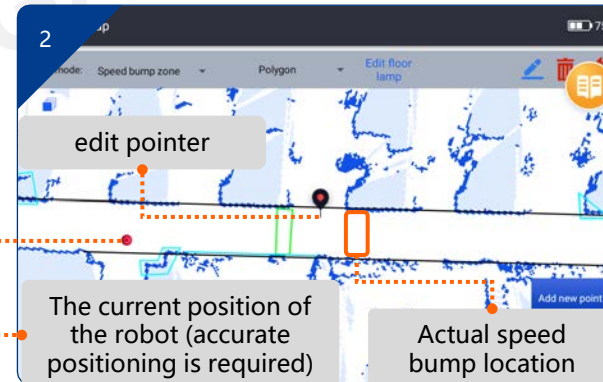
Speed bump area marking location

Speed bump (height  $\leq 10\text{mm}$ )  
Sill (height  $\leq 10\text{mm}$ )

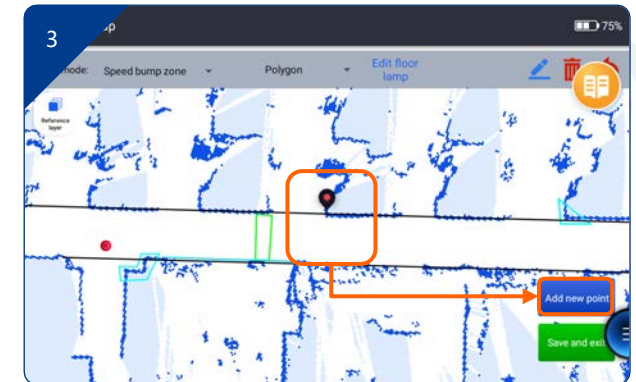
Polygon speed bump area



Confirm that the editing mode is "speed bump area" and the drawing method is "polygon"



Identify the location where the speed bump area needs to be drawn on the map. If you cannot confirm the location, you can first use the recorded speed bump area to mark the speed bump area, then switch to polygon optimization for drawing, and finally delete the recorded speed bump area.



After appropriately enlarging the screen, move the editing pointer to the map location where the speed bump area needs to be drawn, and click "Add New Point".

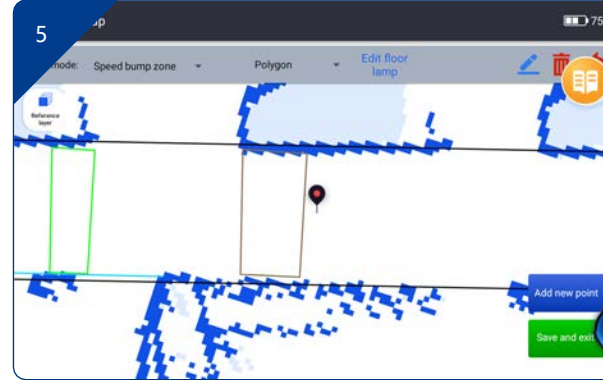
# Knowledge expansion: How to use other editing modes (P6/12)



## Polygon speed bump area



Move the pointer several times, click "Connect to point" at the appropriate location, select the location where the speed bump area needs to be drawn, and click "Finish".



Check the polygonal speed bump area drawing effect.

## Polygon speed bump area

The operation method is the same as recording a virtual wall and will not be introduced. Please give priority to mastering the use of recording virtual walls and draw inferences from one example.

Suggestion: first use recording to find the approximate location of the speed bump on the map, then use line segments to draw, and finally delete the recorded speed bump area.

## Speed bump area Precautions

1. Around the speed bump area? mThe machine will not clean by default (safe distance).
2. The speed bump area should not be drawn too large, and the speed bump area should be selected as precisely as possible, otherwise the unclean area of the machine may have an impact on customer sentiment.

# Knowledge expansion: How to use other editing modes (P7/12)



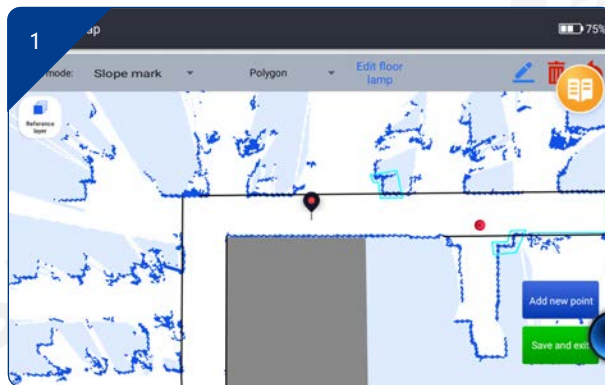
**Mark the slope:** When the machine encounters a slope area, it will slow down, weaken the anti-fall detection, maintain the original working state, and will not close or lift the cleaning equipment.

The prohibition of automatic cleaning operations on slopes is achieved by not drawing a cleaning path on the slope.

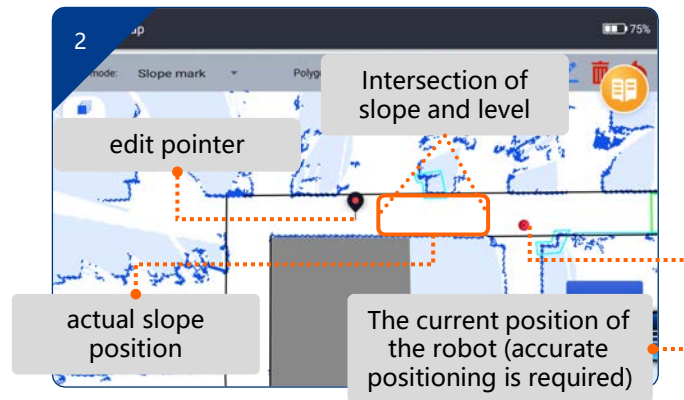
Slope area mark location

Slopes on which machines can travel automatically;  
Bumpy surfaces where the machine can travel automatically;

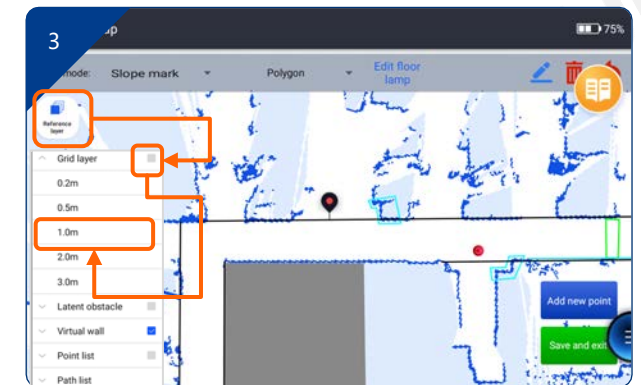
Polygon slope area



Confirm that the editing mode is "Mark Slope" and the drawing method is "Polygon"



Identify the location where the slope area needs to be drawn on the map. If you cannot confirm the location, you can first use the recorded slope area to mark the slope range, then switch to polygon optimization drawing, and finally delete the recorded slope area.

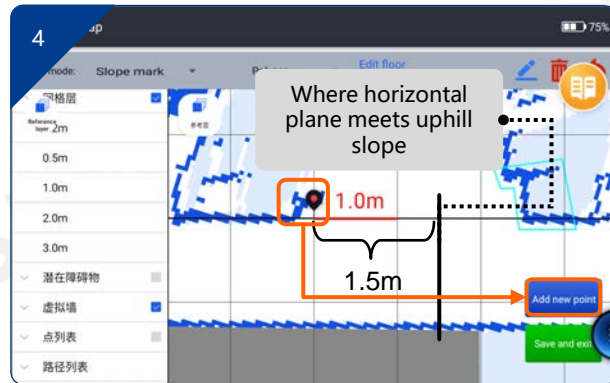


Click "Reference Layer", check "Grid Layer", click "Grid Layer", click on the grid scale, it is recommended to adjust it to 1 grid and 1m.

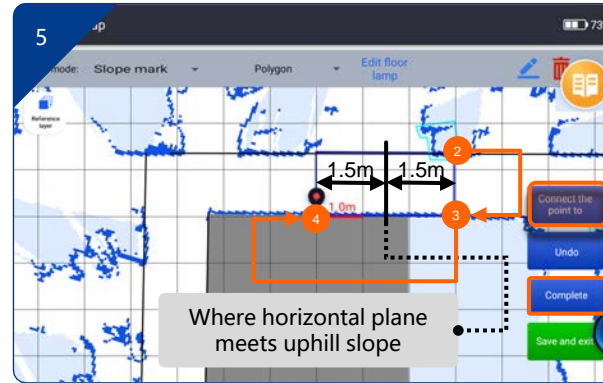
# Knowledge expansion: How to use other editing modes (P8/12)



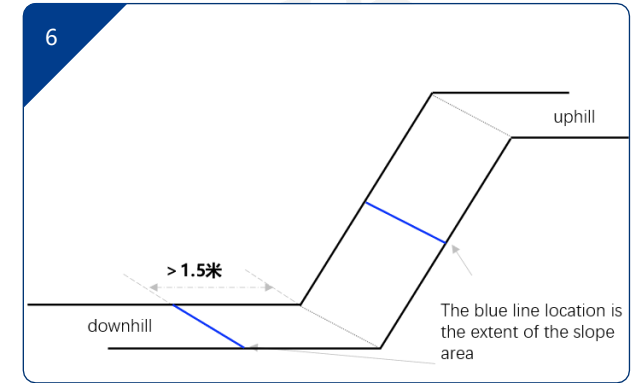
## Polygon slope area



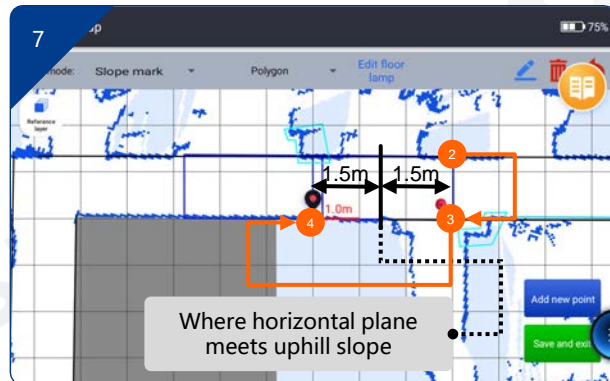
Move the editing pointer, adjust the pointer to be 1.5m away from the intersection of the horizontal plane and the slope, and click "Add New Point". Reminder: During operation, you can click "Reference Layer" again to temporarily hide the reference layer sidebar.



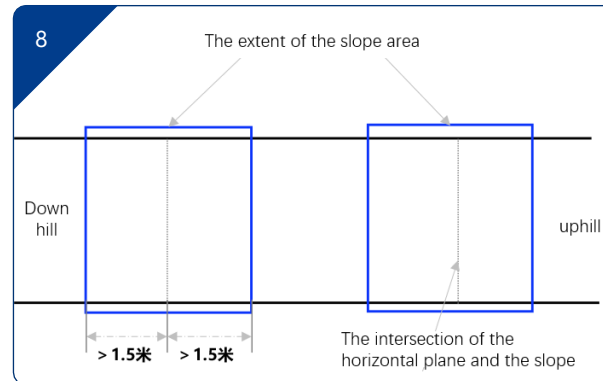
Move the editing pointer multiple times, click "Connect point to" at the appropriate location, and finally ensure that the drawn slope area covers the 1.5m range before and after the intersection, click "Finish". This completes the drawing of the slope area at the entrance.



Draw an axonometric view of the results.



Draw the slope area at the slope location in the same way as the slope area at the approach location. Reminder: Ramp areas can overlap.



Draw a top view of the slope area according to the standard and check whether the drawn slope area meets the standards.

## Notes on marking slopes

1. When the total length of the slope is  $\leq 4\text{m}$ , you can draw only one slope area, ensuring that the slope area covers 1.5m before and after the intersection of the outgoing slope and the incoming slope.
2. When the total length of the slope is  $> 4\text{m}$ , separate slope areas must be drawn for the incoming and outgoing slopes.
3. Real slope. For the safety of machine operation, it is recommended to draw a virtual wall and leave a road on the slope that the machine can pass to prevent the machine from ducking left and right on the slope.

It also supports recording slope areas. The operation method is the same as recording a virtual wall. No introduction will be given. Please give priority to mastering the use of recording a virtual wall and draw inferences from one example.

# Knowledge expansion: How to use other editing modes (P9/12)



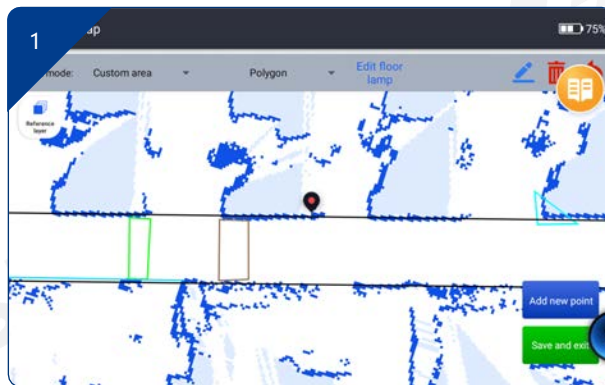
**Customized area:** Use a polygonal frame to select an area of any size. You can flexibly turn on or off the anti-fall detection, one-meter column detection, and thin pole detection functions in this area according to the actual situation.

Mark position on self-defined area

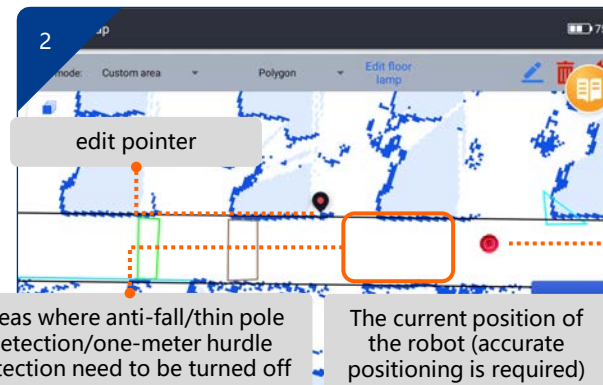
1. Turn off fall detection: There is actually no risk of falling, but it is easy to falsely report fall prevention scenarios, such as mirrored floors, etc.;

2. Turn off one-meter hurdle detection: There is actually no one-meter hurdle, but it is easy to misidentify the scene that causes the machine to stop abnormally.  
3. Turn off thin rod detection: There is actually no thin rod, but it is easy to misidentify the scene that causes the machine to stop abnormally.

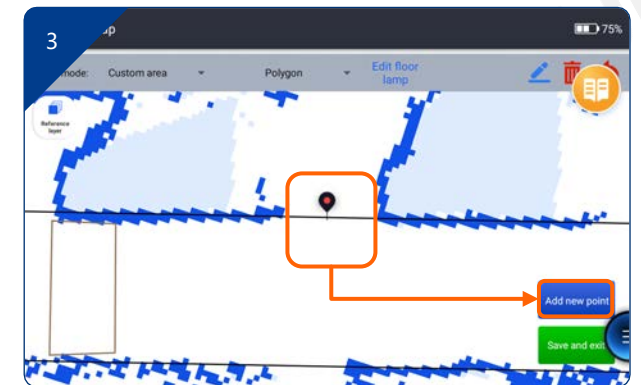
Polygon custom area



Confirm that the editing mode is "Custom Area" and the drawing method is "Polygon"



Identify the location on the map where a custom area needs to be drawn. If you cannot confirm the location, you can first use the recording custom area to mark the range, then switch to polygon optimization drawing, and finally delete the recording custom area.

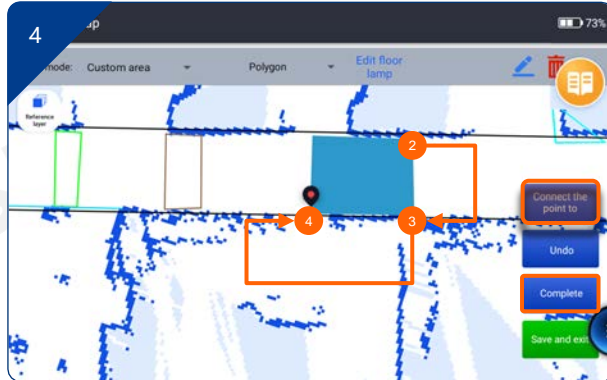


After appropriately enlarging the screen, move the editing pointer to the map location where the custom area needs to be drawn, and click "Add New Point".

# Knowledge expansion: How to use other editing modes (P10/12)



## Polygon custom area



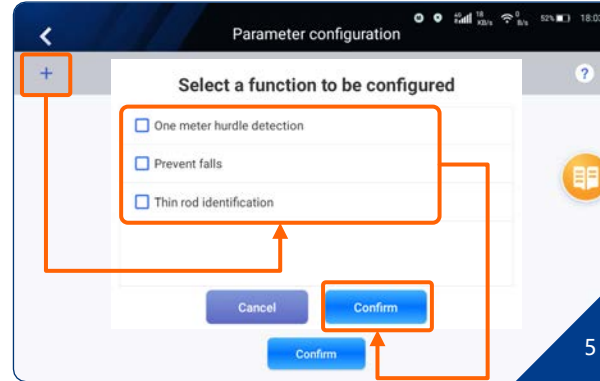
Move the pointer several times, click "Connect to point" at the appropriate location, select the location of the area that needs to be customized, and click "Finish".

## Record custom area

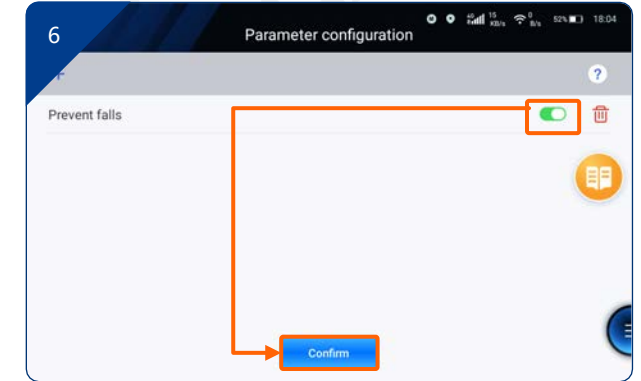
The operation method is the same as recording a virtual wall and will not be introduced.

Please give priority to mastering the use of recording virtual walls and draw inferences from one example.

Suggestion: first use recording to find the approximate location of the custom area on the map, then use line segments to draw, and finally delete the recorded custom area.



After completion, it will automatically jump to the "Parameter Configuration" page, click "+" > Check the functions to be turned off according to the situation > Click "Finish"

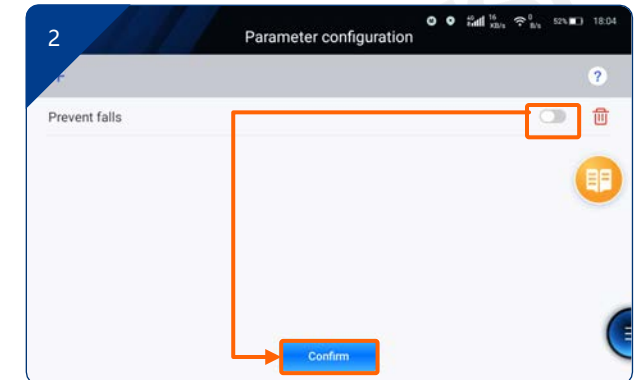


Click the Close icon > Click OK  
In this way, the corresponding functions of the machine in the custom area can be turned off.  
Green means on, gray means off.

## Custom area parameter modification



Click on the custom area (selected in red) > click on the "Edit" icon



Modify parameter configuration > Click "OK".

# Knowledge expansion: How to use other editing modes (P11/12)

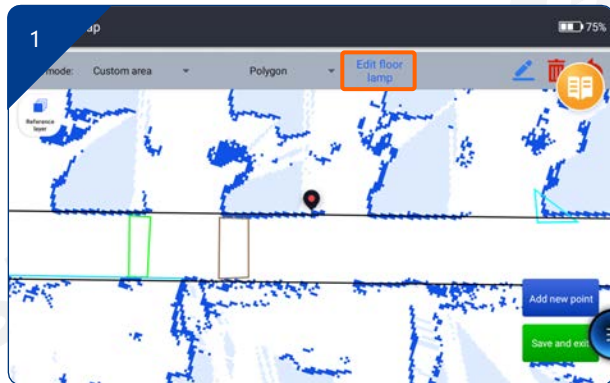


**Floor lamp editing:** Accurately mark the position of the floor lamp on the map. The attributes are the same as the virtual wall. This function is only to speed up the efficiency of floor lamp marking.

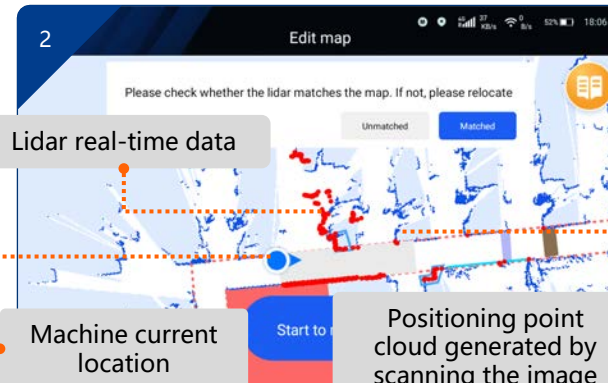
## Floor lamp editor mark location

1. Floor lamps that cannot bear the weight of the machine;
2. Floor lamp with height >2mm;
3. Avoid ground lamp-like objects crushed by machines.

## Floor lamp editor instructions



In any editing mode, click "Floor Light Edit".



Check the overlap between the real-time lidar data and the positioning point cloud. If most of the overlap occurs, the positioning is accurate. Click "Match". Otherwise, click "Doesn't Match" and reposition.



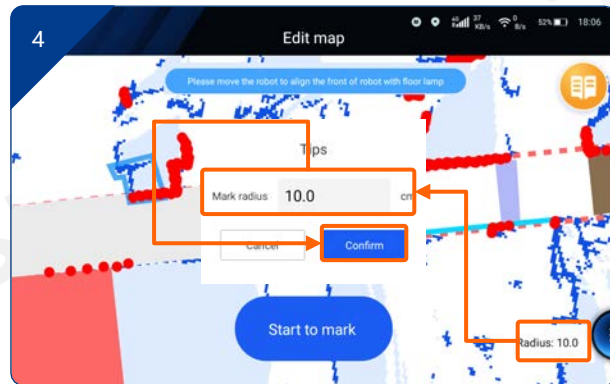
After ensuring the positioning is accurate, push the machine so that the center of the machine's front housing is suspended in the center of the floor lamp.

# Knowledge expansion: How to use other editing modes (P12/12)

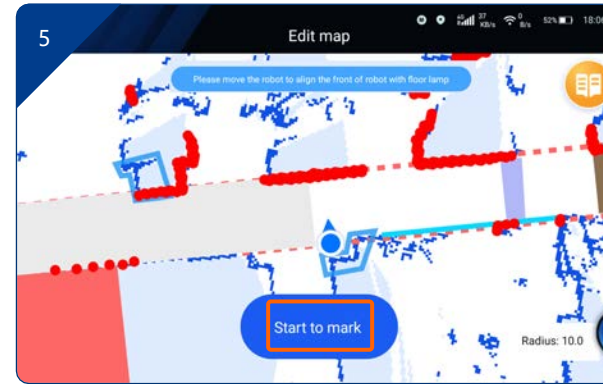
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Please click to return



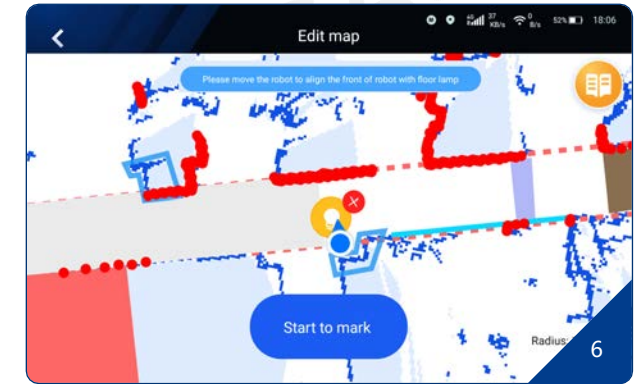
## Floor lamp editor instructions



Click "Radius" and adjust the mark radius according to the actual radius of the floor lamp > Click "OK" after adjustment is completed

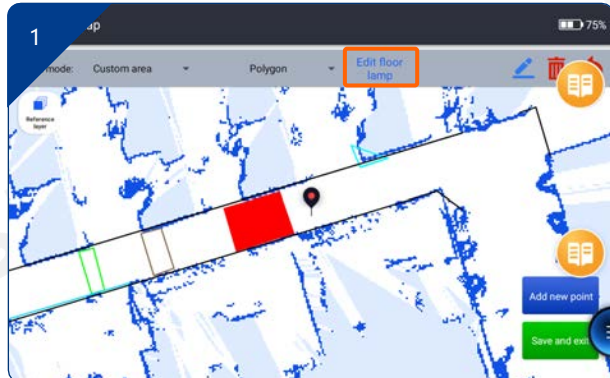


Click "Start Tagging"

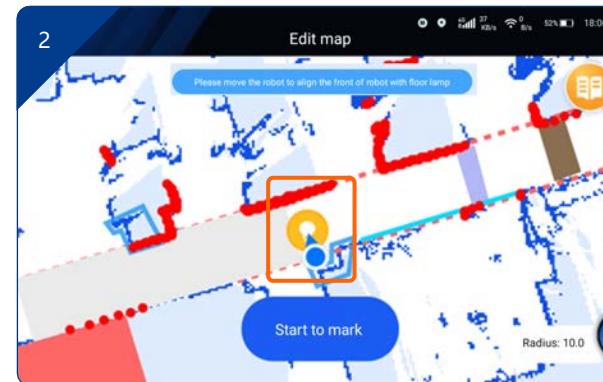


Check the effect of marking floor lamps. After marking is completed, you can continue to push the machine to other floor lamps. Click "Start Marking" to mark other floor lamps. After all marking is completed, click "Return Icon" to exit floor lamp editing.

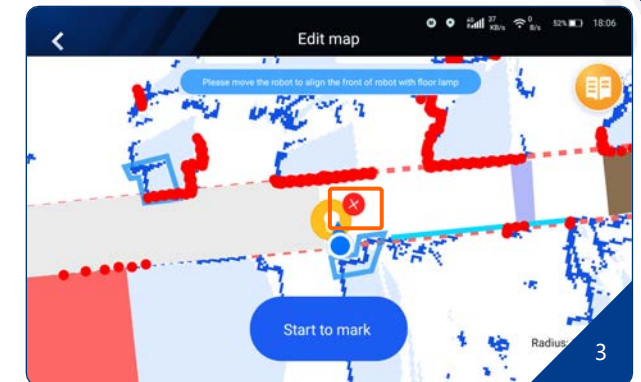
## How to delete floor lamp marks



In any editing mode, click "Floor Light Edit".



If you find a pre-deleted floor lamp and cannot confirm it, you can make sure that the machine is positioned accurately and then push the machine to the vicinity of the actual floor lamp.



Click the "Floor Lamp" icon > Click "X" to delete the floor lamp > Click the "Return" icon to exit floor lamp editing

# Knowledge Expansion: Workstation/Charging Point Creation Method (P1/2)



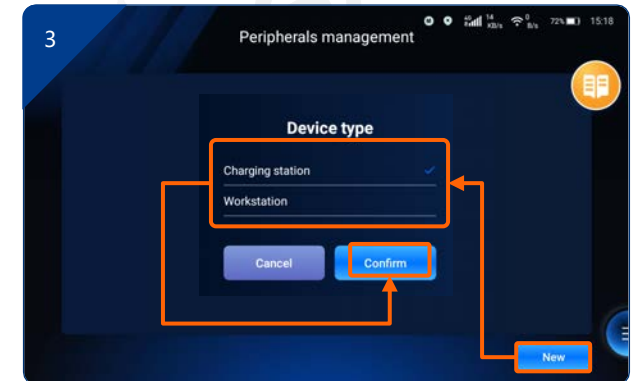
Create steps



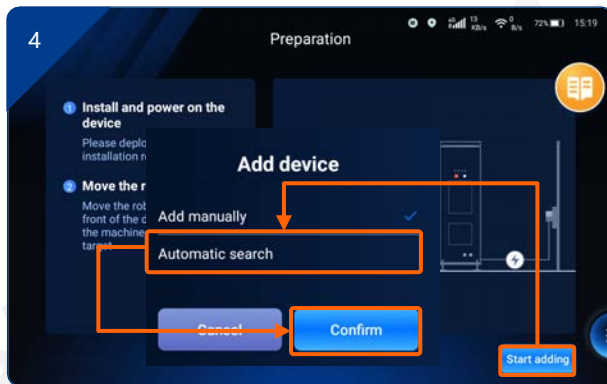
1 Make sure the workstation/charging pile is properly powered and turned on.



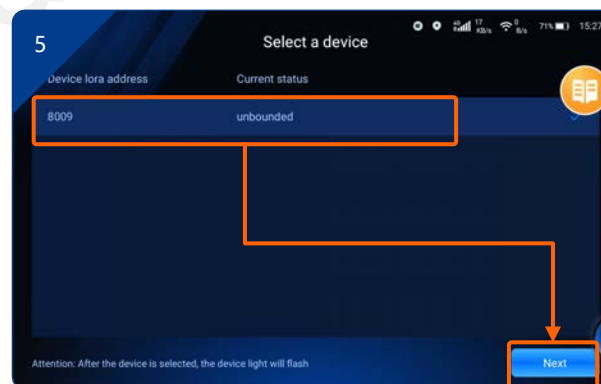
2 Push the machine forward so that the machine is facing the charging pile/workstation, keeping a distance of about 1m.



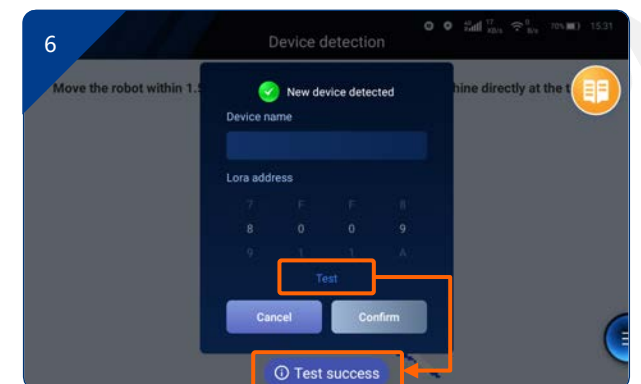
3 Click "New" > Select the device type based on the actual device type > Click "OK"



4 Click "Start Adding" >>> Click "Automatic search" >>> Click "Confirm"



5 确保工作站/充电桩处于开启状态且机器正对工作站/充电桩，在搜索到的设备列表选择对应的lora address，点击next.



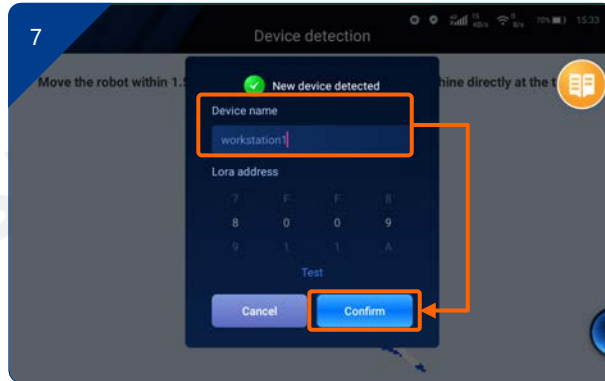
6 Click "Test" > Display test success

# Knowledge Expansion: Workstation/Charging Point Creation Method (P2/2)

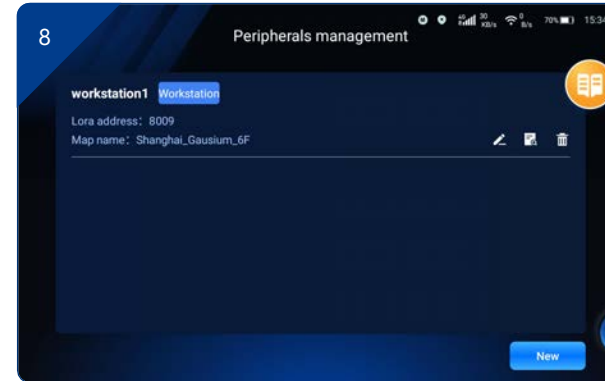
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## Create steps



After entering the device name > click "Confirm"



After the work site is created, you can click the "Edit" icon to modify it, you can click the "Preview" icon to preview the location of the point on the map, and you can click the "Delete" icon to delete the point.

## Create precautions

1. Use automatic search to create charging pile/workstation locations. Manual addition is not recommended.
2. When there are multiple machines and multiple charging piles or workstations on the same site, you need to modify the lora hardware dialing code of each device (the machine, charging pile, and workstation all become devices), and then log in to the host computer to modify the machine's software lora configuration.
  - \* Point 1: Software and hardware lora correspond;
  - \*Point 2: The lora addresses of all devices are different.

# Knowledge expansion: How to use point management (P1/2)



**Point:** Different points have different functions. The conditions for the machine to trigger going to the point are different, and the subsequent actions of the machine after arriving at the point are different.

## Point category summary 1

Point name	Trigger the way to the point	Machine action after arrival	Fuctions	Creation methods	usage frequency	Note	Usage Has the explanation been given?	Usage Will there be a briefing?
Chargin g point	<ol style="list-style-type: none"> <li>1. The machine automatically triggers when the battery power is lower than the normal working power.</li> <li>2. Home &gt; Manual trigger.</li> </ol>	Automatic charging	<ol style="list-style-type: none"> <li>1. The machine charges automatically;</li> <li>2. Manual positioning (check to support initialization when creating)</li> </ol>	Peripheral management Auto Search	Charging piles must be created	<ol style="list-style-type: none"> <li>1. The machine only has one picture and can only create one charging point.</li> <li>2. The machine has multiple maps, but is not equipped with elevator control. Each map has and can only create one charging point, which can be used to meet special needs and is not recommended.</li> <li>3. The machine has multiple maps and is equipped with a ladder control. It can only create one charging point and cannot have multiple charging points.</li> <li>4. After the charging point is created, maintenance points can be mixed and a maintenance point for manual watering and drainage can be created, but no workstation can be created.</li> </ol>	Yes	—
Work site	<ol style="list-style-type: none"> <li>1. The machine automatically triggers when the battery power is lower than the normal working power.</li> <li>2. Automatically triggered when the clean water tank is empty.</li> <li>3. Automatically trigger when the sewage tank is full.</li> <li>4. Home &gt; Manual trigger.</li> </ol>	Automatic charging, automatic water addition, automatic drainage	<ol style="list-style-type: none"> <li>1. The machine automatically charges, automatically adds and drains water;</li> <li>2. Manual positioning (check to support initialization when creating)</li> </ol>	Peripheral management Auto Search	A workstation must be created	<ol style="list-style-type: none"> <li>1. The machine only has one picture and can only create one work site.</li> <li>2. The machine has multiple maps, but is not equipped with elevator control. Each map has and can only create one work station, which can be used to meet special needs and is not recommended.</li> <li>3. The machine has multiple maps and is equipped with an elevator control. Only one work station can be created, and multiple work stations cannot be created.</li> <li>4. Charging points and maintenance points cannot be created after the work station is created.</li> </ol>	Yes	—



## Point category summary 2

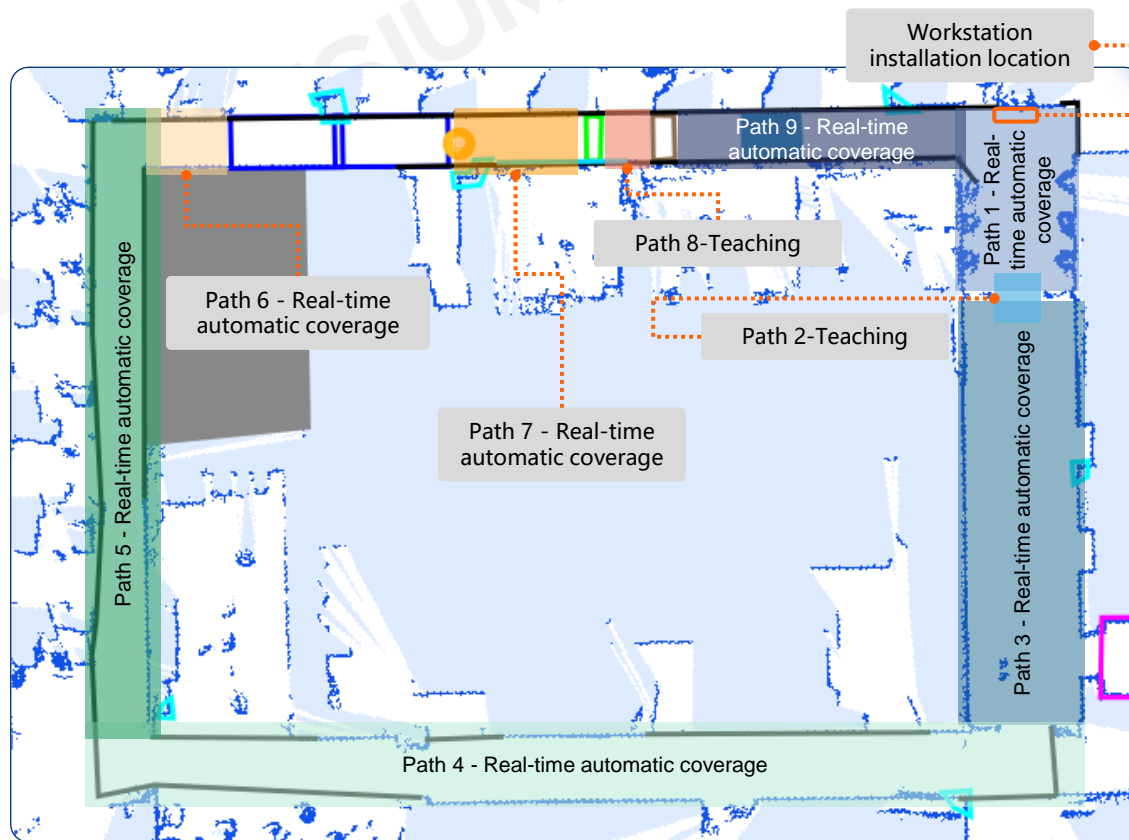
Point name	Trigger the way to the point	Machine action after arrival	Fuctions	Creation methods	usage frequency	Note	Usage Has the explanation been given?	Usage Will there be a briefing?
QR code point	Arrival by hand push > Scan	Scan the QR code and read the QR code task	1. Scan the QR code to locate 2. Scan the QR code to execute the task	point management Scan code to create	Created according to customer needs	A QR code needs to be created.	No	Yes
Maintenance point	1. The machine automatically triggers when the battery power is lower than the normal working power. 2. Automatically triggered when the clean water tank is empty. 3. Automatically trigger when the sewage tank is full. 4. Home > Manual trigger.	Static setting	1. Specific conditions automatically trigger navigation to a specific location; 2. Manually trigger navigation to a specific location; 3. Manual positioning (check support initialization when creating)	point management Create manually	1. It cannot be charged automatically and needs to be created when charging manually; 2. It can be charged automatically, but it needs to be manually put in and out of the water.	1. After creating a work site, a maintenance point cannot be created; 2. After creating a charging point, only two maintenance points, water filling and drainage, can be created.	No	Yes
Ladder entry point	Automatically triggers the destination during cross-floor tasks	Waiting for the elevator to enter the elevator	1. Enter elevator	point management Create manually	Use it when there is a problem with the automatically generated entry point.	1. After drawing the elevator area, the entry point is automatically generated. If there is a problem with the automatically generated point, it can be deleted and re-created;	No	Yes
Navigati on point	Home > Manual trigger	Static setting	1. Manually trigger navigation to a specific location; 2. Manual positioning (check to support initialization when creating)	point management Create manually	Created according to customer needs	None	No	Yes
Landma rk point	Home > Manual trigger	Static setting	1. Manually trigger navigation to a specific location; 2. Manual positioning (check to support initialization when creating)	point management Create manually	Created according to customer needs	The probability of landmark points is blurred. Basically, all points that support initialization are checked when they are created can be regarded as landmark points for manual positioning. When creating, you need to pay attention to the obvious structural characteristics of the creation location.	No	Yes

# Knowledge Expansion: Cleaning Path Planning Suggestions (P1/1)

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**Cleaning path planning:** Before drawing the cleaning path, plan the sequence of the machine's cleaning areas in advance, and draw according to the planning results during subsequent path drawing, so that the most efficient and reasonable cleaning tasks can be quickly combined during subsequent task combinations.



## Route planning suggestions:

1. First determine the location of the workstation/charging pile;
2. Plan the cleaning path from near to far based on the distance between the cleaning area and the workstation/charging pile.
3. If there are obvious regional divisions at the site, keep the actual divisions during planning. Assume that the site is divided into three areas: A/B/C. Area A is closest to the workstation/charging pile. Then, priority is given to planning the path in area A, and the path in area A. Also plan in order from closest to farthest from the workstation/charging pile.

# Knowledge expansion: How to use real-time automatic coverage (P1/5)



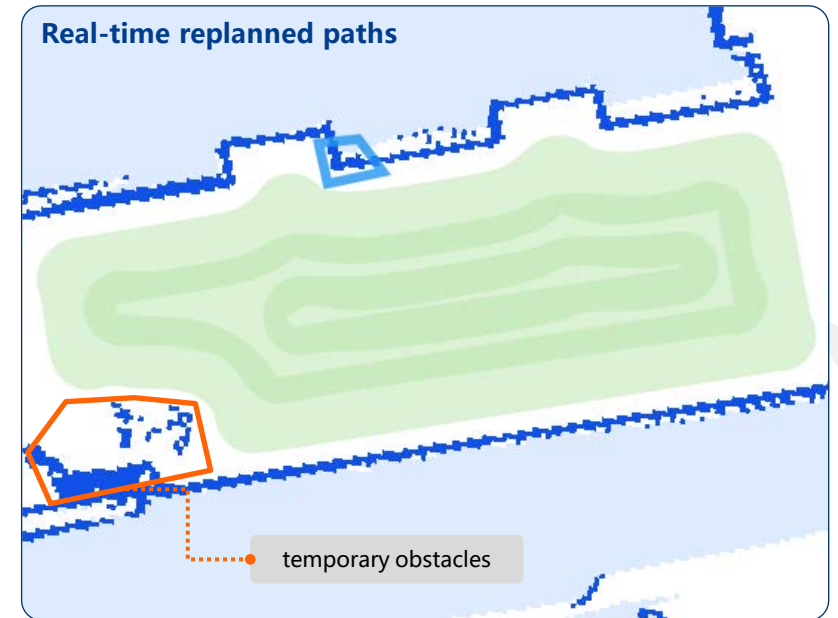
**Real-time automatic coverage:** Select an area that needs to be cleaned, and the machine will automatically generate a "return" cleaning path in the area. When the machine automatically operates on this path, after triggering avoidance, it will re-plan in real time based on obstacle information and operation progress. "Return" the glyph path, and before executing the next cleaning path, clean the uncleaned area of the current path.

Real-time automatic coverage of running logic



When the machine performs the cleaning path of the real-time automatic coverage area, it will first follow the default "return" self-propelled path generated when creating real-time automatic coverage, and circle counterclockwise from the outside to the inside.

The operation encountered an obstacle



If a temporary obstacle appears in the real-time automatic coverage area, the machine will identify it and avoid it, while re-planning the "return" path. If the obstacle moves away midway, the planned "return" glyph path will not be updated immediately, and the operation will be based on the existing "return" glyph path.

# Knowledge expansion: How to use real-time automatic coverage (P2/5)



Real-time automatic coverage of applicable scope

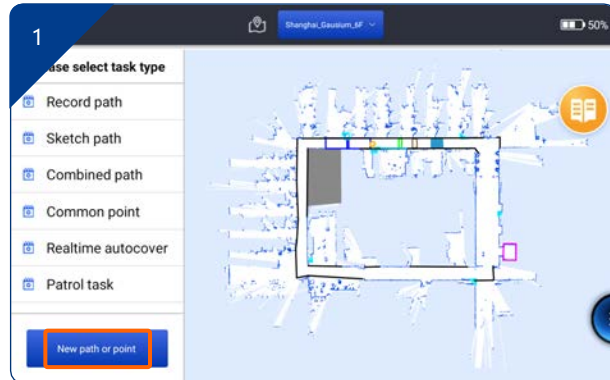
Applicable scene:

Scenes with high mobility that require flexible cleaning, such as aisles in shopping malls and parking spaces in parking garages (50 is not applicable to garage scenes, this is just an example.)

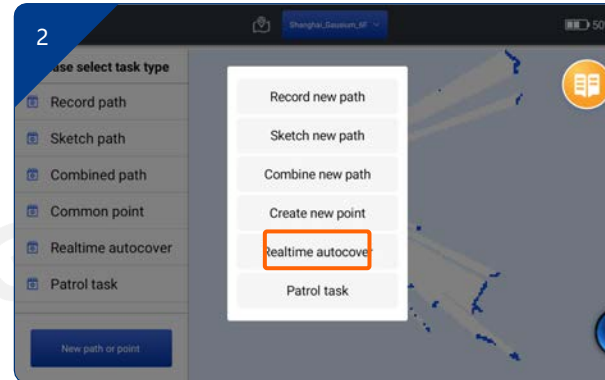
Drawing area requirements:

1. The area of the pre-drawn area must be  $\leq 2000\text{m}^2$ .
2. When the area of the pre-drawn area is  $>2000\text{m}^2$ , the area will be divided into multiple small areas for drawing.
3. When the length and width of the pre-drawn area are lower than the minimum U-turn width of the machine, real-time automatic coverage paths cannot be generated.

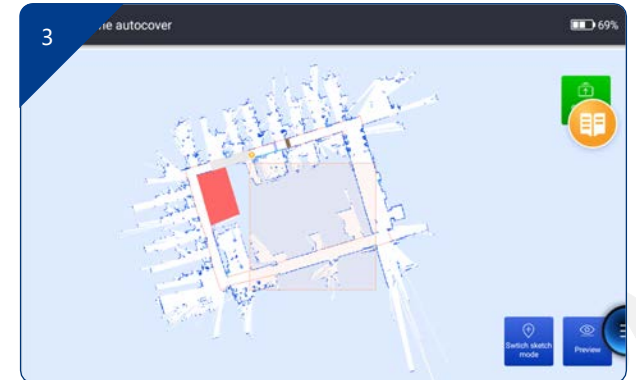
Automatic polygon overlay in real time



Click "New Path or Point"

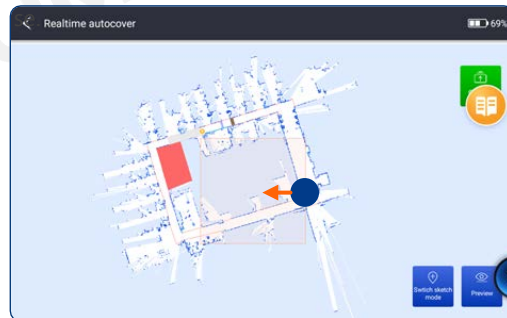


Click "Real-time automatic coverage"

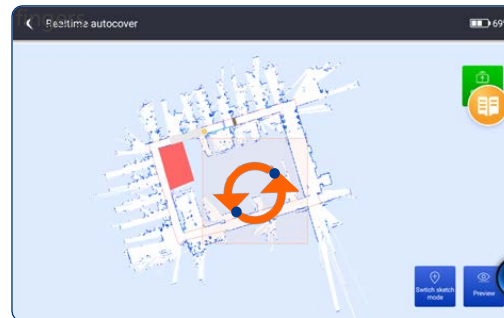


Adjust the size, angle, and position of the polygonal rectangular frame.

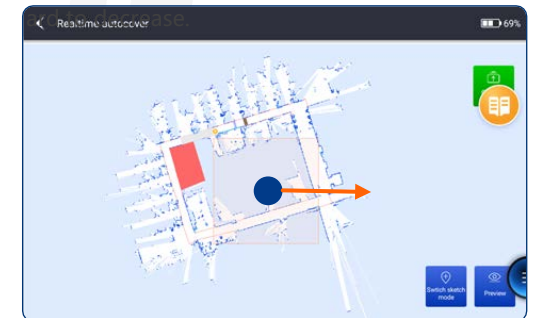
Resize: Click on the edge of the polygon, drag outward to expand, and drag inward to decrease.



Adjust the angle: touch the inside of the polygonal frame with two fingers and rotate the two.



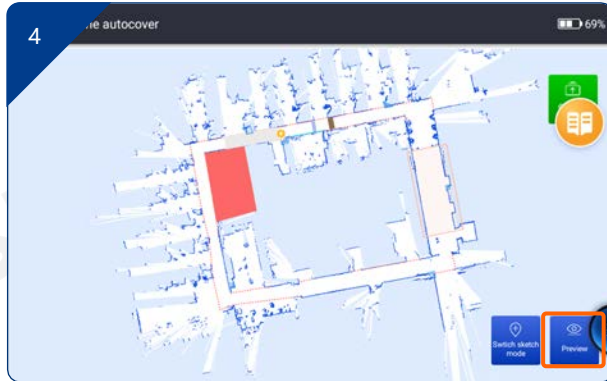
Adjust the position: Click on the edge of the polygon, drag outward to expand, and drag inward to decrease.



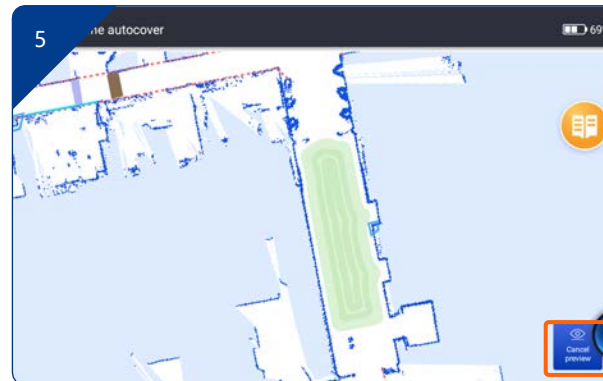
# Knowledge expansion: How to use real-time automatic coverage (P3/5)



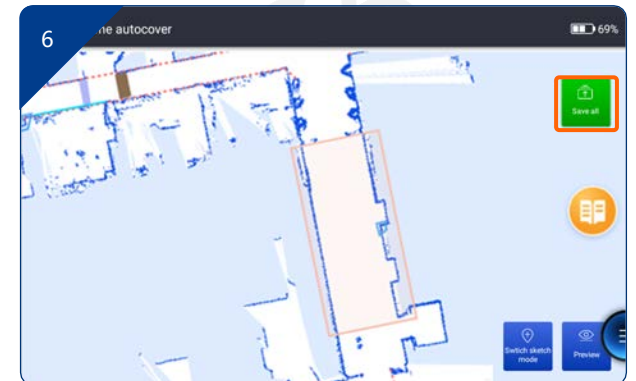
Automatic polygon overlay in real time



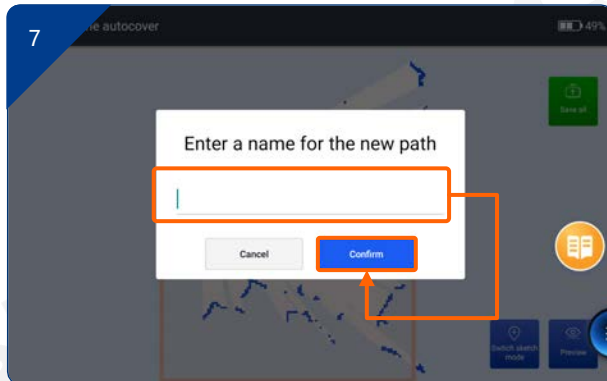
Place the adjusted polygonal frame to cover the area to be drawn and automatically covered in real time (the size of the frame can be larger than the actual area), and click "Preview".



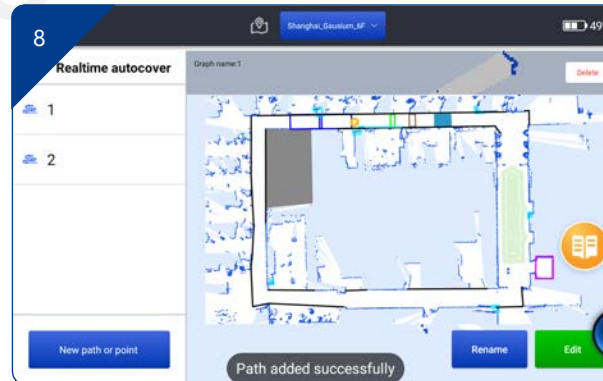
View the pre-generated path, confirm that the path meets expectations, and click "Cancel Preview".



Click "Save All"



Enter the new path name and click "OK".  
The names are named according to which path the current path is actually drawn. The first path is named 1, the second path is named 2..., if there are obvious partitions, the first path in area A is named A1, and the area B is named The first one is named B2...

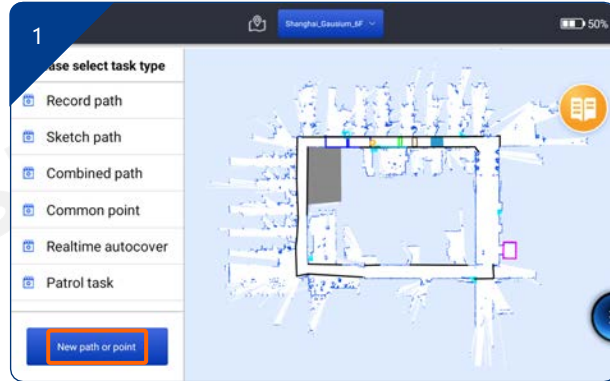


Check the path generated by the draw to make sure it is as expected.

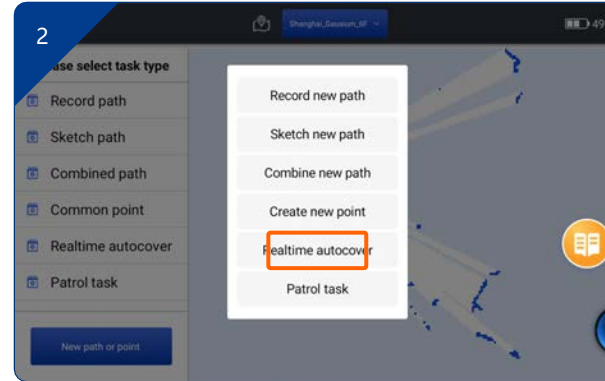
# Knowledge expansion: How to use real-time automatic coverage (P4/5)



Hand-painted real-time automatic overlay



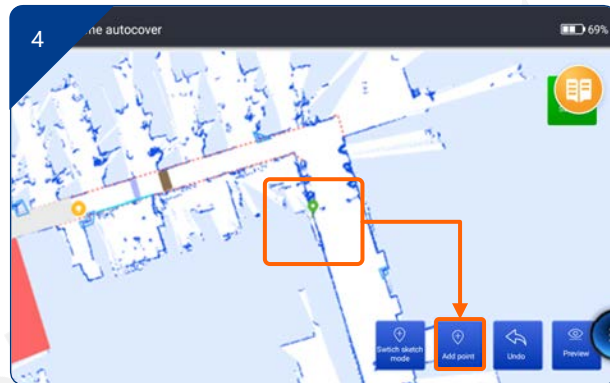
Click "New Path or Point"



Click "Real-time automatic coverage"

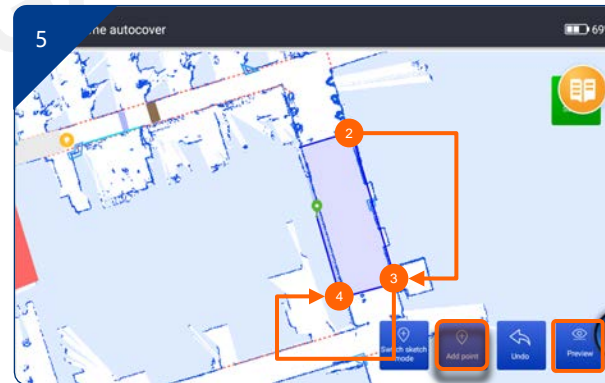


Click "Switch drawing mode"

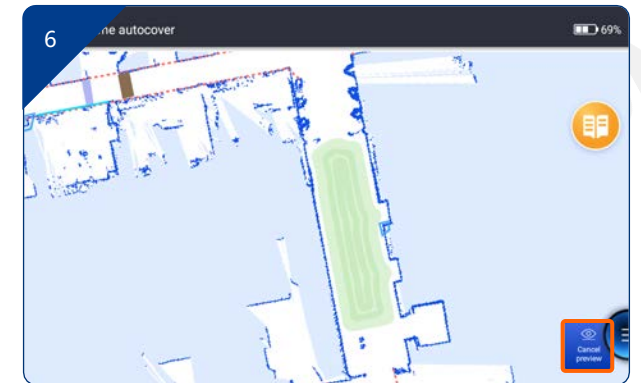


Enlarge the screen appropriately, move the editing pointer near the area that needs to be drawn and automatically covered in real time, select a suitable starting point, and click "Add Point".

Subsequent area selection is required, and the starting point needs to be appropriately selected.



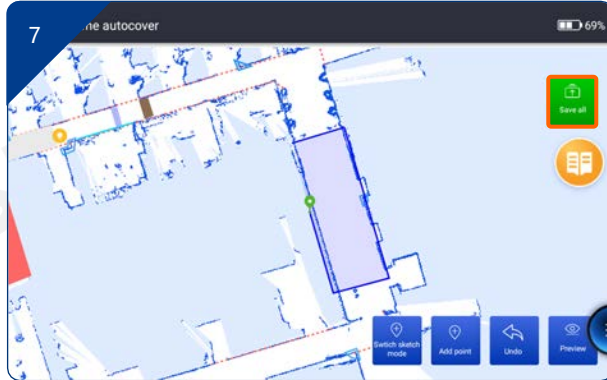
Move the editing pointer multiple times and click "Add Point" at the appropriate location. Finally, select the location that needs to be drawn and automatically covered in real time, and click "Preview".



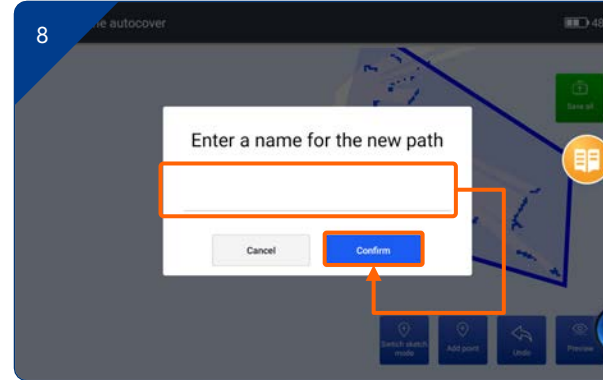
The preview path is as expected, click "Cancel Preview".



Hand-painted real-time automatic overlay

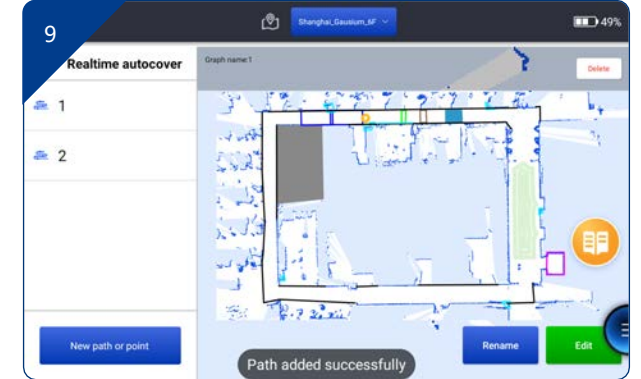


Click "Save All"



Enter the new path name and click "OK".

The names are named according to which path the current path is actually drawn. The first path is named 1, the second path is named 2..., if there are obvious partitions, the first path in area A is named A1, and the area B is named The first one is named B2...



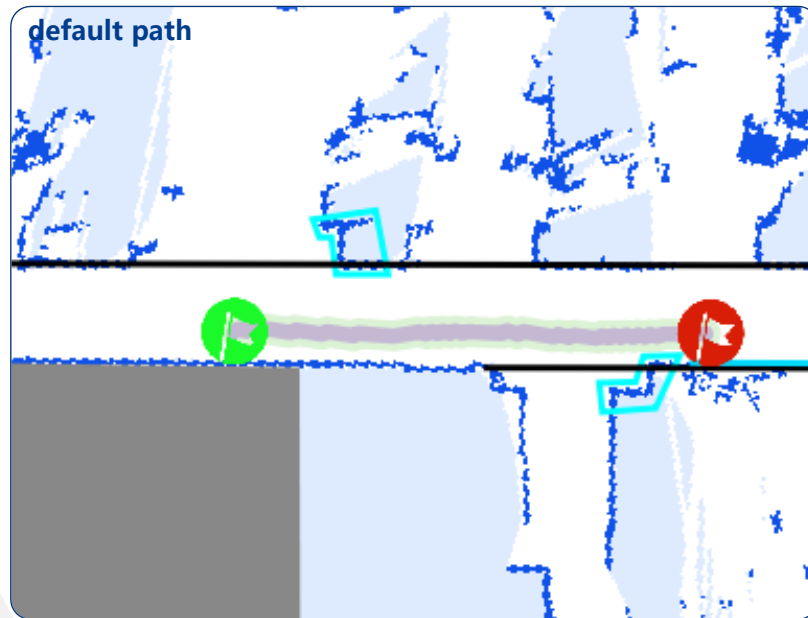
Check the path generated by the draw to make sure it is as expected.

# Knowledge expansion: How to use teaching paths (P1/4)



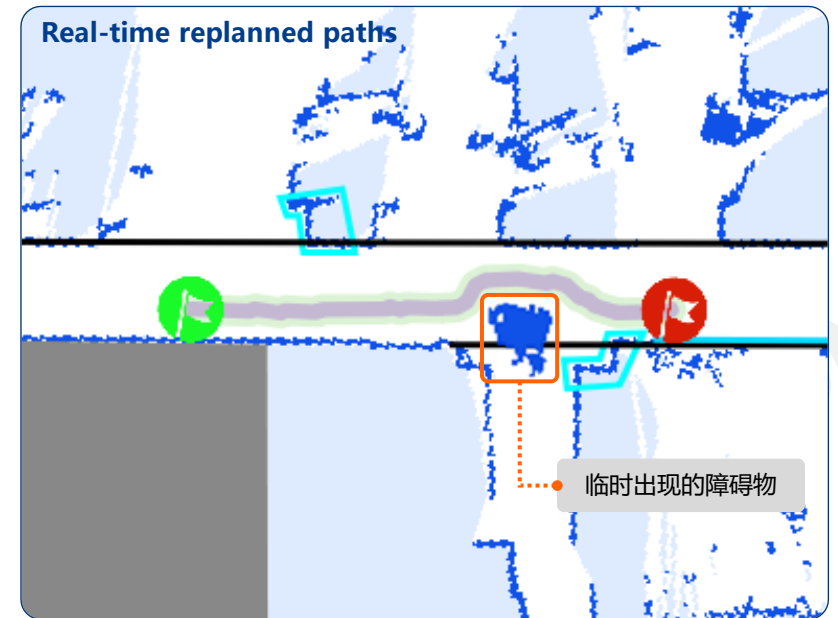
- Teaching path:** Ensure that the machine is positioned accurately. When creating a path, the actual pushing of the subsequent machine will not exceed the safe distance of machine operation.

## Teaching path run logic



When the machine executes the taught cleaning path, it runs according to the path implemented when creating the taught path, running from the starting point (green) to the end point (red), maintaining a certain safe distance from obstacles.

Running into obstacles



If there is a temporary obstacle when running the teaching path, the machine will avoid it after identifying it, and go around the obstacle to the original cleaning path to continue cleaning. Subsequent cleaning will not be performed, and it will be stuck if it cannot go around.

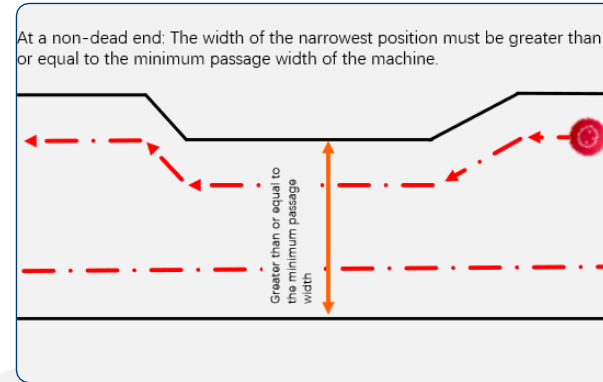
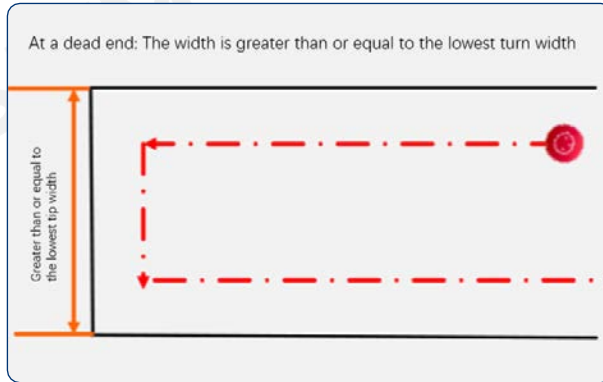
# Knowledge expansion: How to use teaching paths (P2/4)



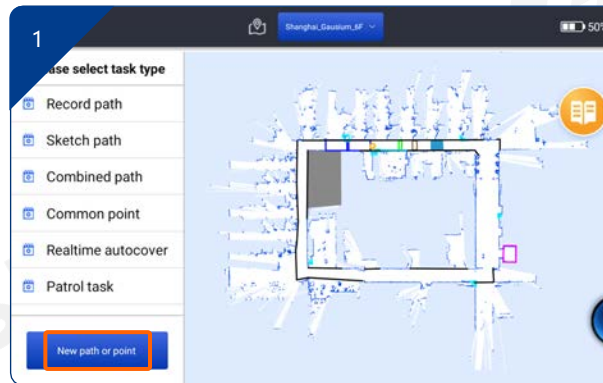
## Teaching path scope of application

Applicable scene:

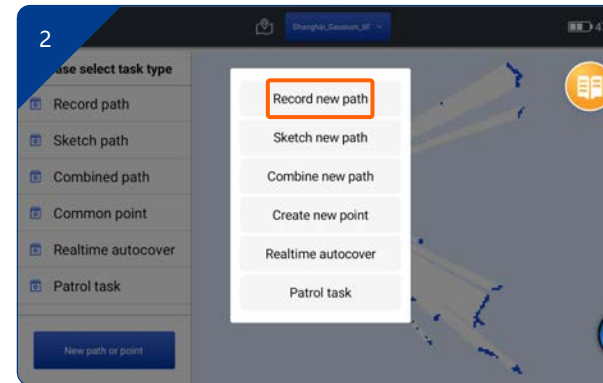
Machine-passable narrow aisles



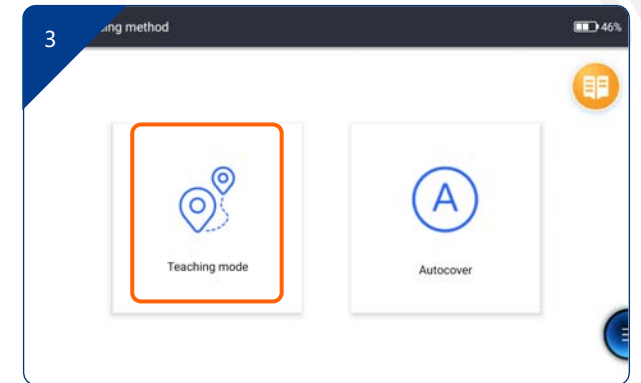
## Teaching path drawing method



Click "New Path or Point"



Click "Record New Path"



Click "Teaching Path"

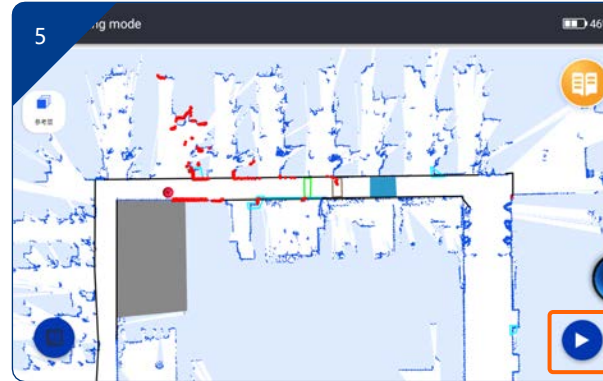
# Knowledge expansion: How to use teaching paths (P3/4)



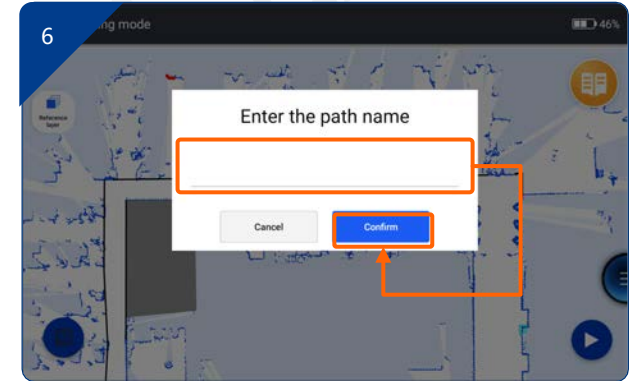
## Teaching path drawing method



Through the overlap between the real-time lidar data (red point cloud) and the map's blue point cloud, determine whether the machine positioning is accurate. Click "match" if it is accurate. If it is not accurate, click "mismatch" and the machine needs to be repositioned.



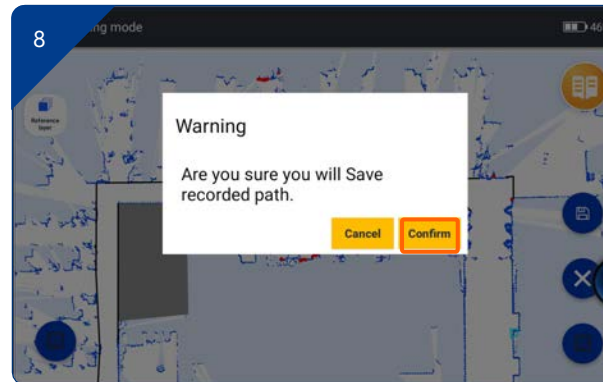
Push the machine to the starting point of the teaching path. The starting point is selected according to the actual site conditions and click the "Start" icon.



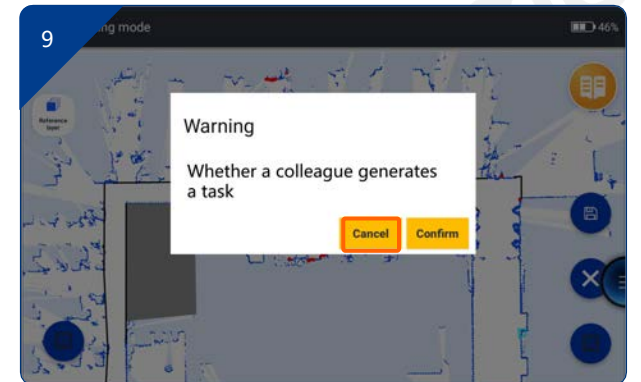
Enter the path name, and name it according to which path the current path is actually drawn. The first path is named 1, the second path is named 2..., if there is an obvious partition, the first path in area A is named A1, the first section of area B is named B2



Push the machine according to the expected cleaning route, and click the "Save" icon after pushing to the end.



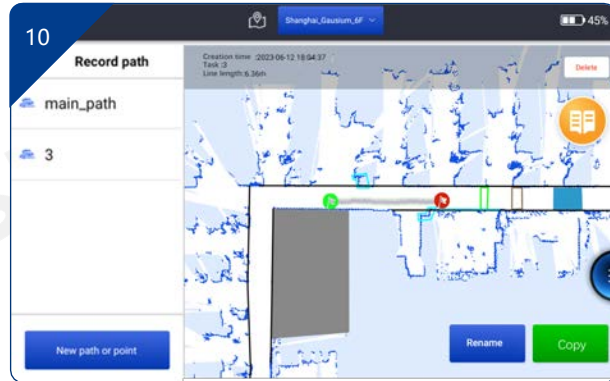
Click "Confirm"



A single path generally does not generate tasks. Click "Cancel" here.



## Teaching path drawing method



Check the generated teaching path to make sure it meets expectations.



**Path:** Paths generated by different path drawing methods have different operating logic when the machine is running. All areas that require cleaning operations must draw paths, otherwise the machine will not clean.

Route category summary					
Path classification name	path name	Path operation logic characteristics	usage frequency	Usage Has the explanation been given?	Usage Will there be a briefing?
Recording path	Teaching path	How it was pushed when it was created is how it will run automatically. It can be close to the edge but will not break the safe distance.	Commonly used	Yes	—
	Automatic coverage	The promotion machine draws a closed-loop area and automatically generates a "bow"-shaped path within the circle. When running, it first goes around the outer circle, and then runs the inner "bow"-shaped path. When encountering obstacles, it goes around to avoid them, and then returns to the path line after detouring. Continue to run on the machine without cleaning. It can fit the edges but will not break the safe distance.	Rarely used	No	No
hand drawn path	Hand drawn new path	Manually draw the teaching path, and the machine will run according to the drawn path. It can follow the edge but will not break the safe distance (the operating route is not as accurate as the teaching path).	Don't need to use	No	No
	Draw automatic overlay	Manually draw automatic coverage, select an area, and automatically generate an automatic coverage path in this area. (The running route is not as accurate as the recorded automatic coverage)	Don't need to use	No	No
Real-time automatic coverage	Real-time automatic coverage	Select an area and generate a "return"-shaped route in this area. During operation, the machine will run in a circle from outside to inside. When encountering obstacles, it will regenerate a "return"-shaped route. The edge distance is adjustable and the path will be supplemented at the end. clean.	Must use	Yes	—
Inspection tasks	Inspection tasks	Select an area and generate an inspection route in this area. During operation, the machine does not turn on the cleaning equipment and moves according to the inspection route. It uses the RGB camera to identify dirt, and after identification, the cleaning equipment is turned on for active cleaning.	Don't need to use	No	No

# Knowledge expansion: How to use combined tasks (P1/3)



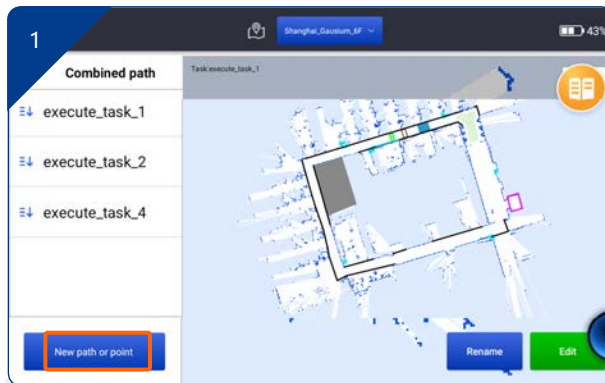
## Combined tasks precautions

1. The total cleaning area of the combined tasks must not be too large, otherwise the machine's low completion rate may cause customer complaints.
2. The order of the combined tasks must not be confused, and the principle of cleaning at the nearest location must be maintained.

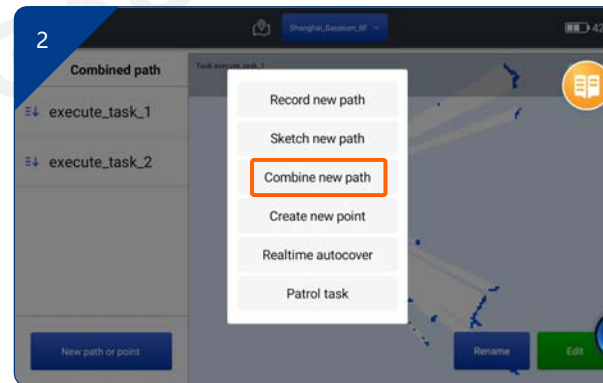
3. When combining tasks, the work station/maintenance point/charging point must be added to the last path, otherwise the machine may stay at the end point after completing the task.
4. The name of the combined task must be considered for customer use, so that customers can understand the name.

5. The tasks of a single path accidentally generated when creating a path need to be deleted. The tasks left in the machine are generally generated by combining tasks.

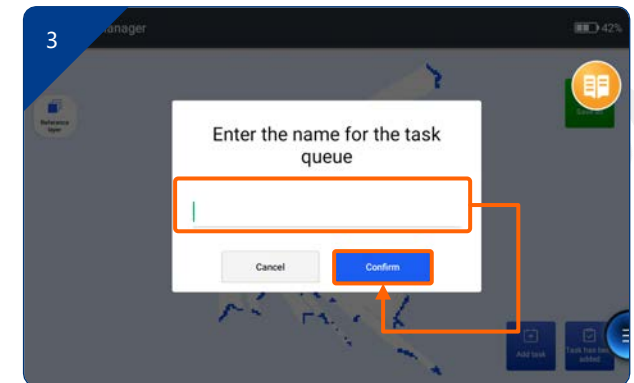
## Combined tasks instructions



Click "New Path or Point"



Click "Combine New Path"



Enter the task name and click "OK ".

**Naming requirements:** Users can understand the meaning by seeing the name.

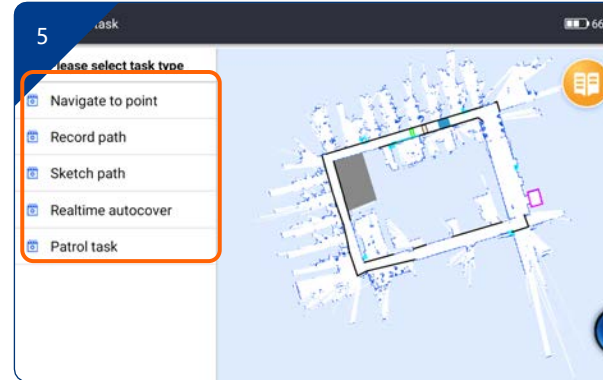
# Knowledge expansion: How to use combined tasks (P2/3)



## Combined tasks instructions



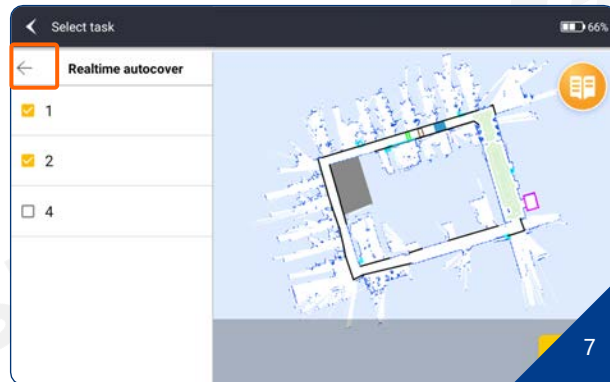
Click "Add Task"



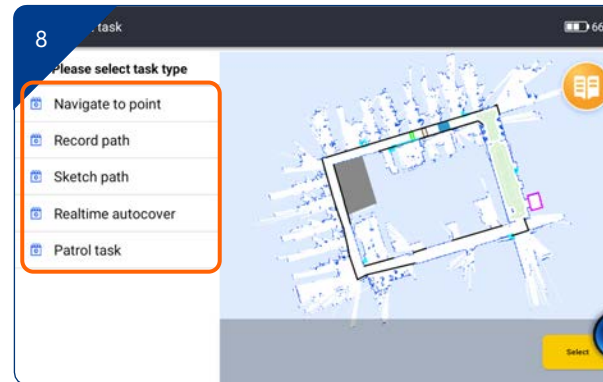
According to the type of path created on the left, query the path that needs to be added. If you need to add a real-time automatic coverage path to the task, click "Real-time Automatic Coverage"



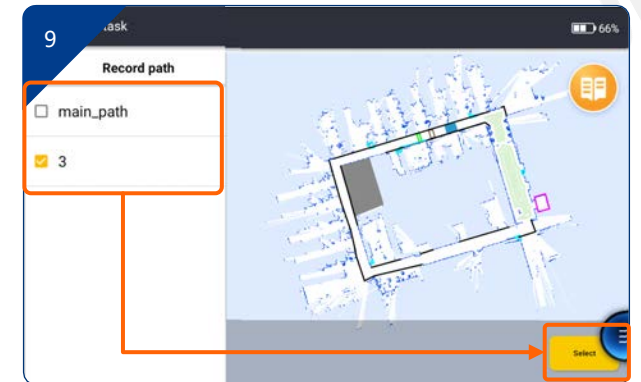
According to the expected path sequence, click the paths one by one. The order of clicking is the cleaning sequence when the machine is executed.



If there are other types of paths that need to be added, click the "Return" icon



Select the path type again. If you need to add a teaching path, click "Record Path"



Click the paths one by one. After checking all the required paths, click "Select"

# Knowledge expansion: How to use combined tasks (P3/3)

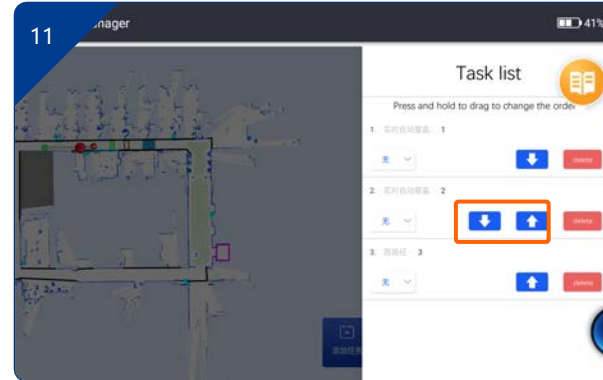
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Please click to return



## Combined tasks instructions



Click "Added Tasks" to view the added paths or reorder them.



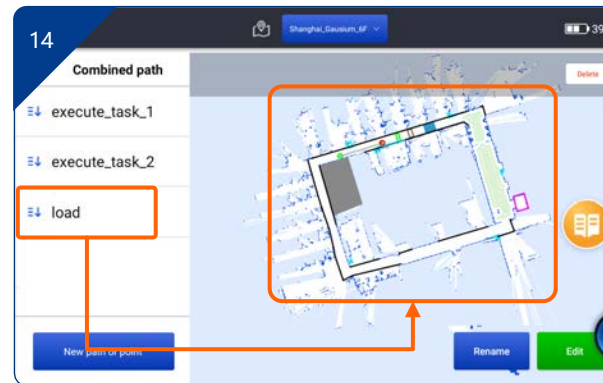
Click the up or down arrow to modify the path sorting, click "Delete" to remove the path, and click the blank area on the left without modification.



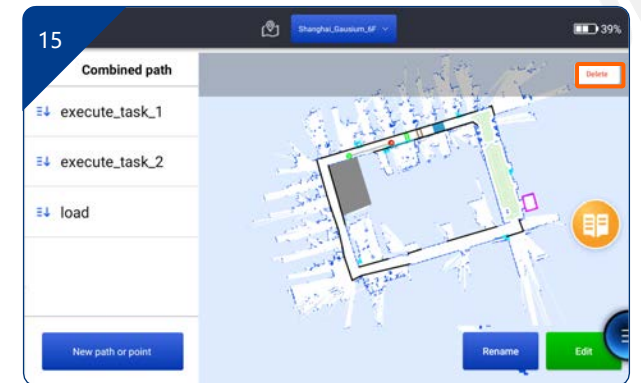
At the end of the task, you need to add a work station/charging point/maintenance point



After sorting the combinations of paths, click Save All.



Check the task coverage area to ensure that there are no blank areas as expected.



To delete other tasks in the task list of the combined path, click on the task name and click "Delete"

# Knowledge expansion: 50 cleaning mode cleaning parts assembly list (P1/2)

↻ Scrubbing mode

↻ Dust push mode

## V3 series roller brush machine

Clean parts cleaning mode	Filter fur	Dust box	Front roller brush (V type)	Clean water tank wire filter	Clean water tank wire filter	Sewage tank filter bag	Back roller brush		Watersuction / dust pusher	
							----- Full bristle brush / cloth brush			
Cleaning mode	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	—	<b>Must use</b>	—
Rolling brush dust pusher	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	Not required	Not required	Not required	—	<b>Must use</b>	Not required	Not required
dust pusher dust pusher	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	Not required	Not required	Not required	<b>Must use</b>	<b>Choose to use</b>	—	<b>Must use</b>

## V3 series disk flash machine

Clean parts cleaning mode	Brush the disk	Clean water tank wire filter	Sewage tank wire filter	Sewage tank filter bag	filter fur	Watersuction / dust pusher	
Cleaning mode	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	—
dust pusher dust pusher	Not required	Not required	Not required	Not required	<b>Must use</b>	—	<b>Must use</b>



# Knowledge expansion: 50 cleaning mode cleaning parts assembly list (P2/2)

↻ Scrubbing mode

↻ Dust push mode

## V4 series roller brush machine

Clean parts cleaning mode	Side brush	Front roller brush: V-shaped	Air filter (HEPA)	filter fur	Dust box (x2)	Clean water tank wire filter	Sewage tank wire filter	Sewage tank filter basket	Watersuction / dust pusher		Back roller brush ----- Full bristle brush / cloth brush	
	Cleaning mode	Not required	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	—	<b>Must use</b>
Rolling dust push	Not required	<b>Must use</b>	Not required	<b>Must use</b>	<b>Must use</b>	Not required	Not required	Not required	Not required	Not required	—	<b>Must use</b>
dust pusher dust pusher	Not required	<b>Must use</b>	Not required	<b>Must use</b>	<b>Must use</b>	Not required	Not required	Not required	—	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>

## V4 series disk flash machine

Clean parts cleaning mode	Brush disk (x2)	Clean water tank wire filter	Sewage tank wire filter	Sewage tank filter basket	Air filter (HEPA)	filter fur	Watersuction / dust pusher	
	Cleaning mode	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>	<b>Must use</b>
dust push mode	Not required	Not required	Not required	Not required	Not required	<b>Must use</b>	—	<b>Must use</b>



# Knowledge expansion: 50 cleaning configuration suggestions for each mode and different scenarios (P1/4)

 Scrubbing mode


 Dust push mode

Roller scrubber	Floor cleaning on the common floor of commercial complex [Other similar scenes]			Washing the floor in the front yard of the commercial and restaurant floor [Other similar scenes]			Washing the floor at the back of the commercial and restaurant floor [Other similar scenes]					
	version	V3	V4	version	V3	V4	version	V3	V4			
The machine version	Picture				Picture				Picture			

Configuration items	Cleaning mode	Equipment level	Equipment level	Cleaning mode	Equipment level	Equipment level	Cleaning mode	Equipment level	Equipment level
Roller brush height	Low	height adaptive	height adaptive	Low	height adaptive	height adaptive	Low	height adaptive	height adaptive
Front roller brush speed	High	30%	30%	High	30%	30%	High	30%	30%
Rear roller brush speed	High	30%	30%	High	30%	30%	High	30%	30%
Side brush speed	-	40%	40%	-	40%	40%	-	40%	40%
Water suction	Lower down	-	-	Lower down	-	-	Lower down	-	-
Water spray level	Low	13%	28%	Medium	18%	38%	Medium	18%	38%
Suction level	Medium	85%	85%	Medium	85%	85%	High	85%	85%
Cleaning speed	Low	0.6m/s	0.6m/s	Low	0.6m/s	0.6m/s	Low	0.6m/s	0.6m/s
Automatic liquid filling (V4 only)	Close	-	-	Detergent	-	-	Detergent	-	-
Cleaning fluid ratio (V4 only)	-	-	-	1%	-	-	1%	-	-
Cleaning fluid selection	-	Fangfeilite foam-free cleaning liquid			Fangfeilite bio-based detergent & Kangxing defoamer				
Adding liquid & mixing method	-	V3: The clean water tank is filled with water, then add 24ml of cleaning solution. V4: Measure 120ml of cleaning solution into the auxiliary water tank, and add water to fill the auxiliary water tank.			V3: The clean water tank is automatically filled with water, and 240ml of cleaning solution is measured and added to the clean water tank. V4: Measure 1.2L of cleaning fluid into the auxiliary water tank, and add water to fill the auxiliary water tank. V3 & V4: Add 100ml Kangxing defoaming agent to the sewage tank				

\* Software version requirements: M5-00-3 and above. If the software version is lower, please upgrade the version and then refer to the values in this table.

# Knowledge expansion: 50 cleaning configuration suggestions for each mode and different scenarios (P2/4)

 Scrubbing mode

 Dust push mode

Disk brush for cleaning	Floor cleaning on the common floor of commercial complex [Other similar scenes]		Washing the floor in the front yard of the commercial and restaurant floor [Other similar scenes]		Washing the floor at the back of the commercial and restaurant floor [Other similar scenes]	
	Version	V3      V4	Version	V3      V4	Version	V3      V4
The machine version	Picture	 	Picture	 	Picture	 

Configuration items	Cleaning mode	Equipment level	Equipment level	Cleaning mode	Equipment level	Equipment level	Cleaning mode	Equipment level	Equipment level
Disk brush height	Low	Adjust according to the actual brush bristle adhesion to the ground		Low	Adjust according to the actual brush bristle adhesion to the ground		Low	Adjust according to the actual brush bristle adhesion to the ground	
Disk brush speed	High	100%	100%	High	100%	100%	High	100%	100%
Water suction	Lower down	-	-	Lower down	-	-	Lower down	-	-
Water spray level	Low	13%	28%	Medium	18%	38%	Medium	18%	38%
Suction level	Medium	85%	85%	Medium	85%	85%	High	85%	85%
Cleaning speed	Low	0.6m/s	0.6m/s	Low	0.6m/s	0.6m/s	Low	0.6m/s	0.6m/s
Automatic liquid filling (V4 only)	Close	-	-	Detergent	-	-	Detergent	-	-
Cleaning fluid ratio (V4 only)	-	-	-	1%	-	-	1%	-	-
Cleaning fluid selection	-	Fangfeillite foam-free detergent			Fangfeillite bio-based detergent & Kangxing defoamer				
Concentration preparation method	-	V3: The clean water tank is automatically filled with water, and 24ml of cleaning solution is measured and added to the clean water tank. V4: Measure 120ml of cleaning solution into the auxiliary water tank, and add water to fill the auxiliary water tank.			V3: The clean water tank is automatically filled with water, and 240ml of cleaning solution is measured and added to the clean water tank. V4: Measure 1.2L of cleaning fluid into the auxiliary water tank, and add water to fill the auxiliary water tank. V3 & V4: Add 100ml Kangxing defoaming agent to the sewage tank,				

\* Software version requirements: M5-00-3 and above. If the software version is lower, please upgrade the version and then refer to the values in this table.

# Knowledge expansion: 50 cleaning configuration suggestions for each mode and different scenarios (P3/4)

Scrubbing mode


Dust push mode


roller brush  
Rolling dust push

**All venues that require dust rolling**

Version	V3	V4
---------	----	----

The machine version





Configuration items	Cleaning mode	Equipment level	Equipment level
Roller brush height	Low	height adaptive	height adaptive
Front roller brush speed	Low	15%	15%
Rear roller brush speed	Low	7%	7%
Side brush speed	-	40%	40%
Water suction	lift up	-	-
Water spray level	close	-	-
Suction level	close	-	-
Cleaning speed	Medium	0.8m/s	0.8m/s
Automatic liquid filling (V4 only)	close	-	-
Cleaning fluid ratio (V4 only)	-	-	-
Cleaning fluid selection	-	-	-


\*Software version requirements: M5-00-3 and above. If the software version is lower, please upgrade the version and then refer to the values in this table.


roller brush  
dust pusher dust pusher

**All venues that require dust pushers**

Version	V3	V4
---------	----	----

The machine version





Configuration items	Cleaning mode	Equipment level	Equipment level
Roller brush height	Low	height adaptive	height adaptive
Front roller brush speed	Low	15%	15%
Rear roller brush speed	Low	7%	7%
Side brush speed	-	40%	40%
Water suction	Lower down	-	-
Water spray level	close	-	-
Suction level	close	-	-
Cleaning speed	Medium	0.8m/s	0.8m/s
Automatic liquid filling (V4 only)	close	-	-
Cleaning fluid ratio (V4 only)	-	-	-
Cleaning fluid selection	-	-	-

\*Software version requirements: M5-00-3 and above. If the software version is lower, please upgrade the version and then refer to the values in this table.

# Knowledge expansion: 50 cleaning configuration suggestions for each mode and different scenarios (P4/4)

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Please click to return

 Scrubbing mode

 Dust push mode

Disk brush dust pusher

**All venues that require dust pushers**

Version	V3	V4
The machine version		

Configuration items	Cleaning mode	Equipment level	Equipment level
Disk brush height	Close	-	-
Disk brush speed	Close	-	-
Water suction	Lower down	-	-
Water spray level	Close	-	-
Suction level	Close	-	-
Cleaning speed	Medium	0.8m/s	0.8m/s
Automatic liquid filling (V4 only)	Close	-	-
Cleaning fluid ratio (V4 only)	Close	-	-
Cleaning fluid selection		-	
Concentration preparation method		-	

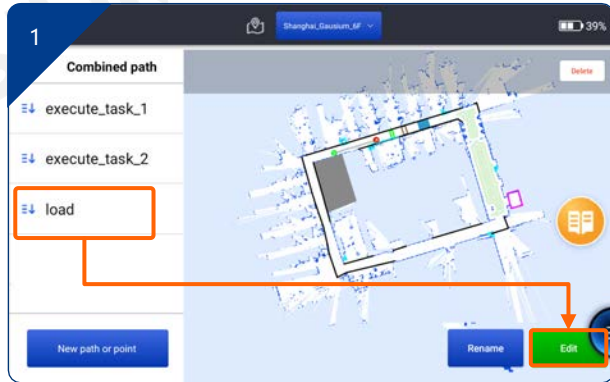
\*Software version requirements: M5-00-3 and above. If the software version is lower, please upgrade the version and then refer to the values in this table.

# Knowledge expansion: subtask binding cleaning mode method (P1/2)



**Purpose of sub-path binding cleaning mode:** Within the same task, use different cleaning modes and cleaning levels for different areas.

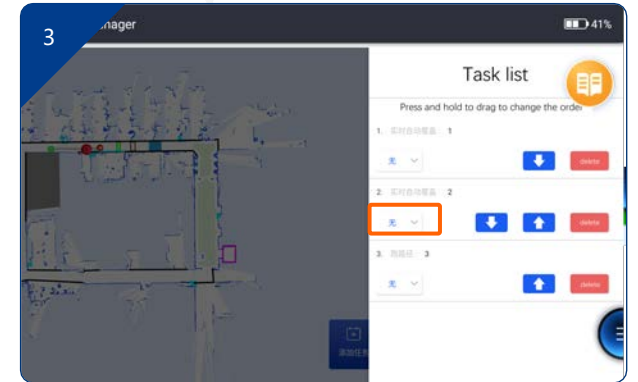
## Steps



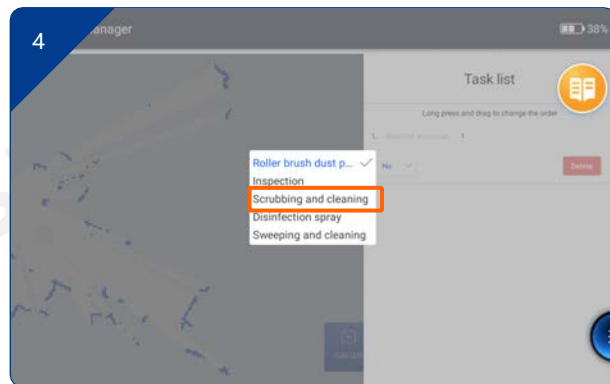
Select the corresponding task name in the task list of the combined path and click "Edit"



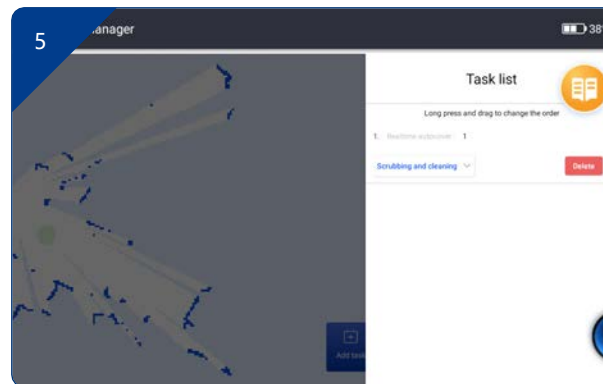
Click "Task Added"



Find the corresponding subtask and click "None" in the lower left corner of the task



Choose a cleaning mode



After selecting the cleaning mode, click on the blank space on the left



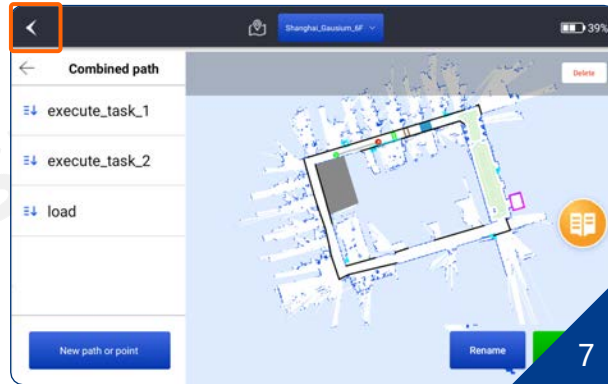
Click "Save All"

# Knowledge expansion: subtask binding cleaning mode method (P2/2)

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Please click to return



Steps



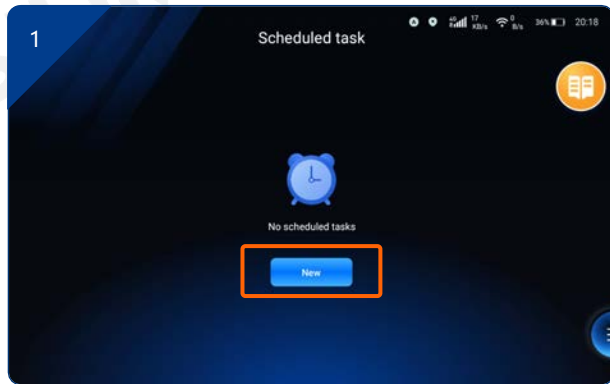
Just click the "Back" icon

# Knowledge expansion: scheduled task configuration method (P1/2)

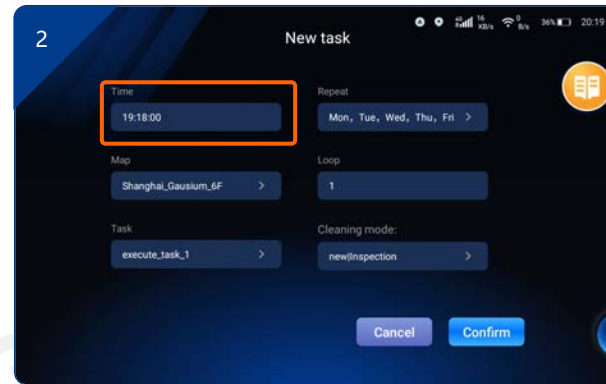


**Scheduled tasks:** Set the time of the working day (Monday to Sunday), what mode to use, which task to perform, how many times to perform it, and cooperate with the workstation to realize unattended automatic operation at night.

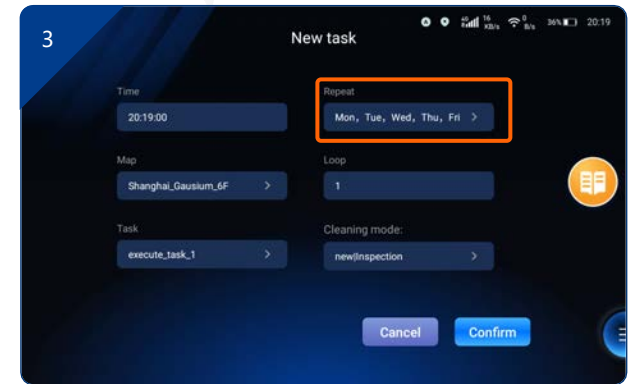
## Setup steps



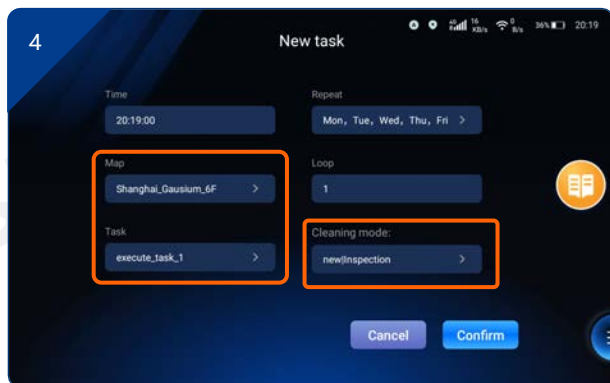
Click "New"



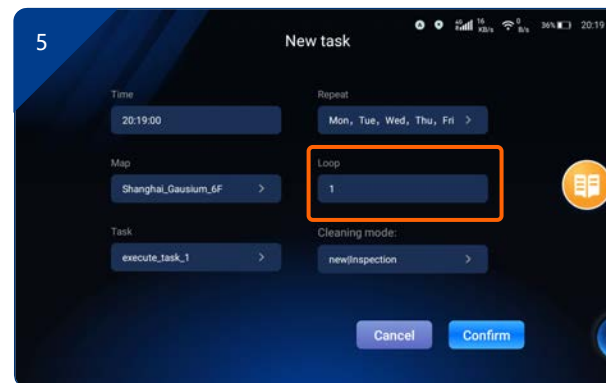
Set working days



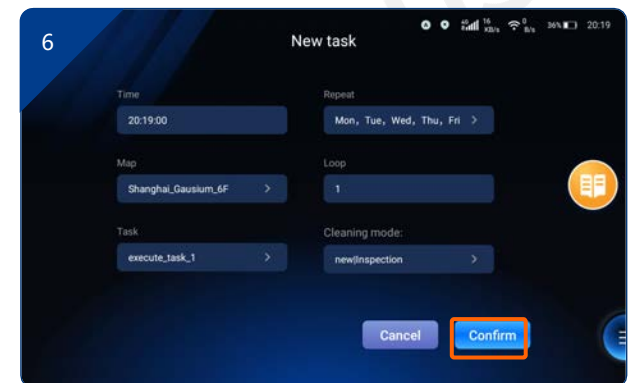
Set task start time



Set the map to be executed and the cleaning mode during execution



Set execution times



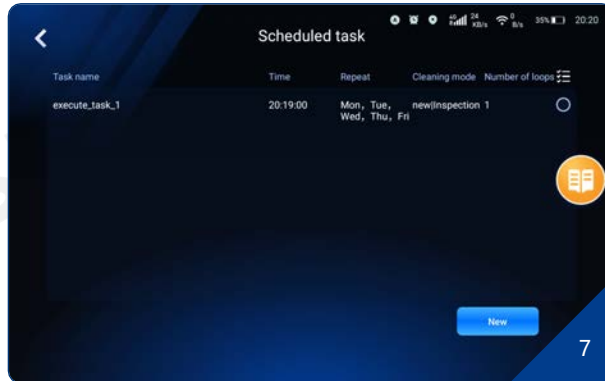
Click "OK"

# Knowledge expansion: scheduled task configuration method (P2/2)

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Please click to return



## Setup steps



If you need to continue creating a scheduled task, click "New" again, otherwise click the "Return" icon to return.

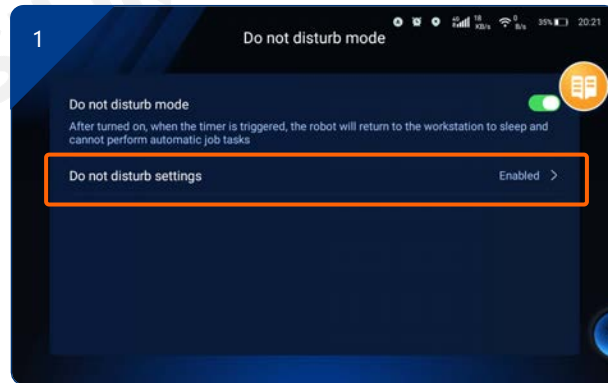
# Knowledge Expansion: Do Not Disturb Mode Configuration Method (P1/1)

This page is the last page of knowledge  
Please click to return

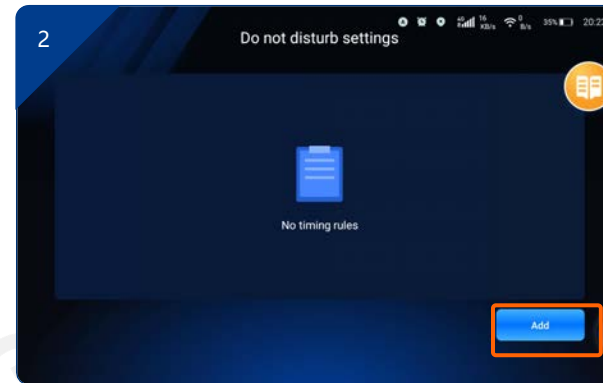


**Do Not Disturb mode:** Let the machine return to the workstation to sleep and enter low-power consumption mode during a certain period of time during the specified working day. During this period, automatic tasks cannot be performed.

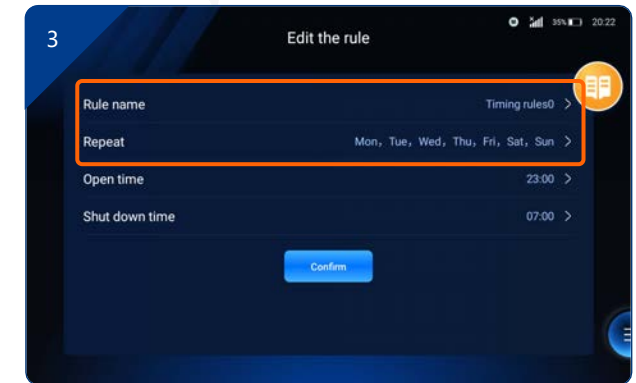
## Setup steps



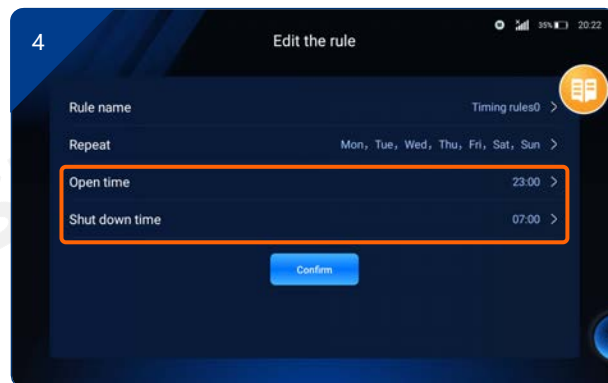
Turn on Do Not Disturb mode, green means on, click "Do Not Disturb Settings"



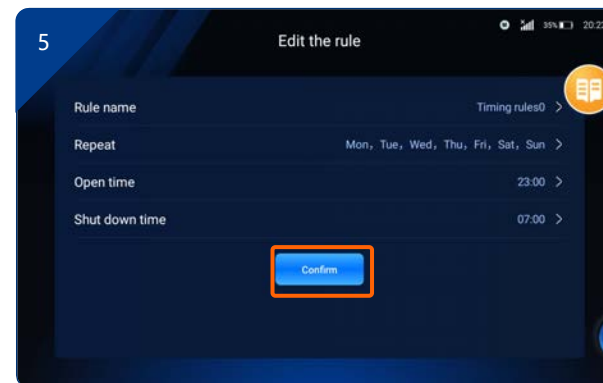
Click "Add" to add a do not disturb period.



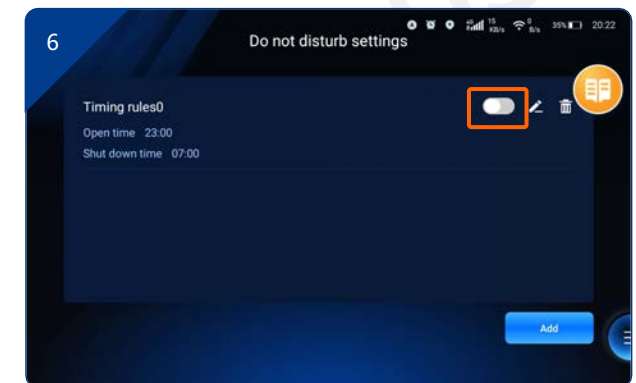
Define the rule name and set the effective working day



Set the start time and off time for Do Not Disturb mode to take effect.



After setting is complete, click "OK"



Click the open icon, green means open.

# Knowledge expansion: water stop distance & delayed air suction setting (P1/4)



**Water stopping distance:** Stop spraying water a certain distance in advance before the end of the water operation task. If the subtask squeegee lifting strategy is enabled, the water will be stopped in advance before the end of the subtask. If a speed bump or carpet area is encountered during cleaning with water, the water will also be stopped in advance.

## Water stop distance set location



Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click System Settings



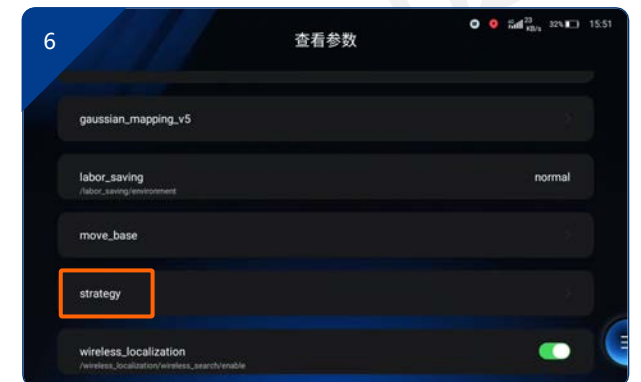
Click "Settings"



Click "Advanced Settings"



Click "Check Parameters" under Others

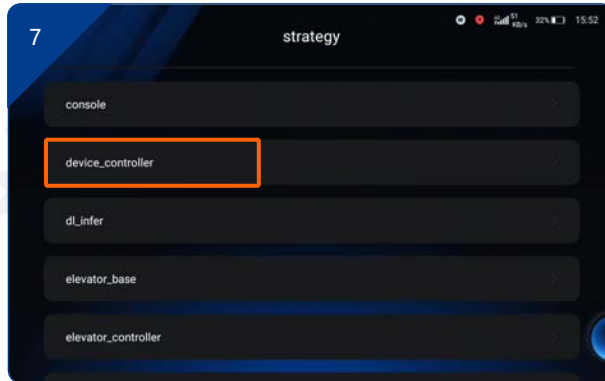


Click "strategy"

# Knowledge expansion: water stop distance & delayed air suction setting (P2/4)



## Water stop distance set location



Click "device\_controller"



Adjust relevant parameters on this interface.

## Water stop distance parameter description



### Parameter Description:

- ① is\_fixed\_water\_distance: Whether to enable fixed water stop distance, green is true, gray is false;
- ② max\_stop\_water\_distance: the maximum water stop distance, effective when the fixed water stop distance is false;
- ③ min\_stop\_water\_distance: the minimum water stop distance, effective when the fixed water stop distance is false;
- ④ stop\_water\_distance: water stop distance, effective when the fixed water stop distance is true.

### Adjustment method:

If you need to use dynamic water stop distance: ①Set to false, adjust ②③.

If you need to use a fixed water stop distance: ①Set to true, adjust ④.

If the ground is relatively smooth such as marble, PVC, epoxy floor, etc., the water stop distance is recommended to be set to: 25~30 meters.

If the ground is relatively rough, it is recommended to set the water stop distance to: 10~15 meters.

# Knowledge expansion: water stop distance & delayed air suction setting (P3/4)



**Delayed air suction shutdown:** After the water-carrying task is completed or after the water-carrying task is photographed and the emergency stop is made, the air suction will continue to be turned on for a period of time;

## Delayed air suction shutdown set location



Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click System Settings



Click "Settings"



Click "Advanced Settings"



Click "Check Parameters" under Others



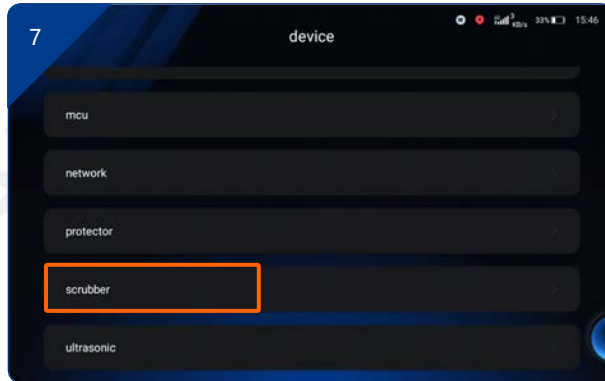
Click "device"

# Knowledge expansion: water stop distance & delayed air suction setting (P4/4)

This page is the last page of knowledge  
Please click to return



Delayed air suction  
shutdown  
Set location



Click "scrubber"



Adjust relevant parameters on this interface.

Delayed air suction  
shutdown  
Parameter  
Description



## Parameter Description:

- ① keep\_squeegee\_suction: Delay to lift the squeegee, unit s, default value 60;
- ② keep\_suction: Delay to turn off air suction, unit s, default value 30;

## Actual situation description:

After the machine completes its task or is photographed and stops suddenly, delay ② to turn off the air suction, and then delay ① to raise the squeegee.

# Knowledge expansion: artificial wall lines & real-time automatic coverage welt settings (P1/3)

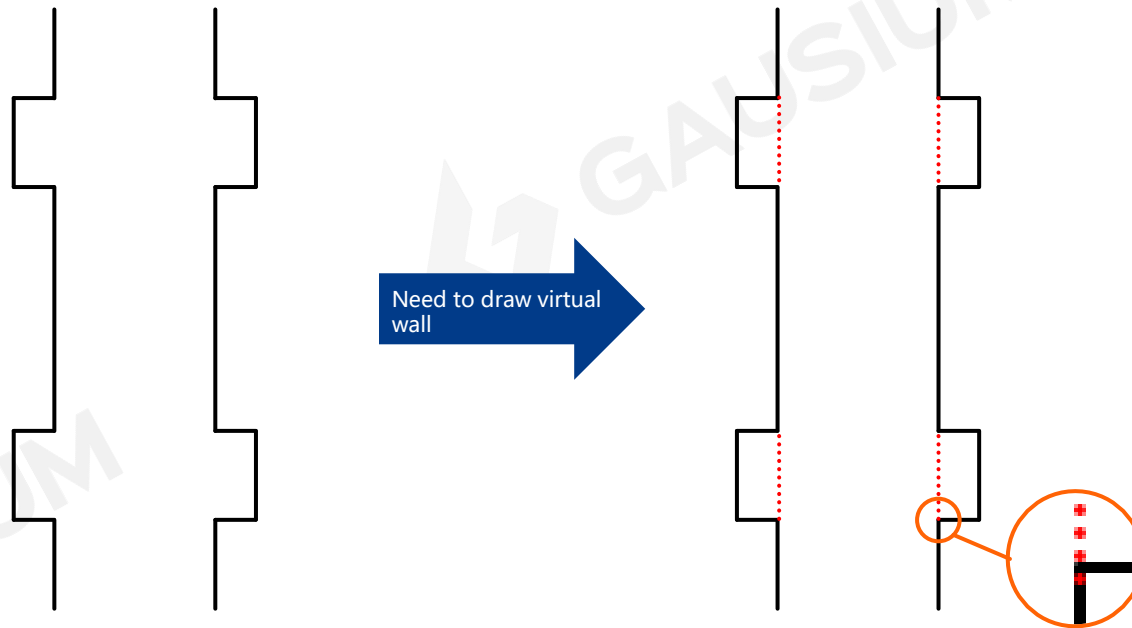


**Artificial wall line:** It is actually a virtual wall. After turning on the artificial wall line switch in the software, the software will add an edge semantic to the virtual wall, allowing the machine to clean the virtual wall.

## Using Scenarios

There are bumps and convexities on the surface of the obstacle that you want to fit (the height of the lidar).

For example, on the walls of hotel corridors, due to the existence of guest room doors, the walls recognized by the laser are not a straight line, but have bumps and convexities.



When drawing the virtual wall, try to coincide with the point clouds scanned left and right as much as possible

### Notice:

At the corner of a solid wall, do not draw a virtual wall with artificial wall line function to avoid entering the wall sticking mode, which may cause the machine to turn and collide with the wall.

# Knowledge expansion: artificial wall lines & real-time automatic coverage welt settings (P2/3)



Artificial wall line switch position



Select the "admin" account > enter the password "314159" > click "OK"



Click the More icon > Click System Settings



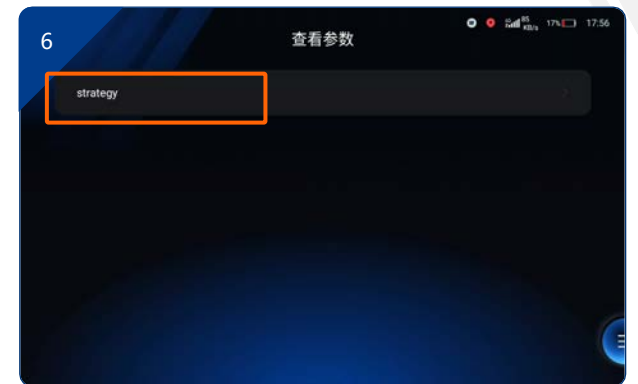
Click "Settings"



Click "Advanced Settings"



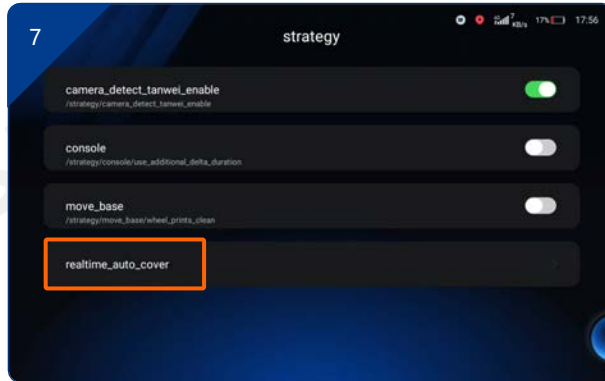
Click "View Parameters" below the configuration with a blue box (the blue box changes with the scene configuration of the map)



Click "strategy"



## Artificial wall line switch position



Click "realtime\_auto\_cover"



"use\_virtual\_wall\_tracking" on the current interface is the artificial wall line switch, green means on, gray means off.

## Automatically cover the welt distance in real time



The setting position is consistent with the artificial wall line switch position.

### Parameter Description:

- ① enable\_wall\_tracking: Wall line detection, enabled by default (green), uses laser point cloud to generate edge wall lines;
- ② safe\_distance: the safe distance of the wall line, unit m, default value 0.04, not less than 0.04;
- ③ use\_virtual\_wall\_tracking: Artificial wall line, turned off by default (gray), when turned on, adds welt semantics to the virtual wall.

### How to use:

- ① After turning on, when the artificial wall line is closed, stick the laser wall line according to the value of ②.
- ② After turning on, when the artificial wall line is turned on, stick the laser wall line and artificial wall line according to the value of ②.

### other instructions:

1. Artificial wall lines are different from wall lines. Artificial wall lines are virtual walls and wall lines are generated based on laser data.
2. Artificial wall lines and wall lines can be enabled at the same time, or one of them can be enabled independently.