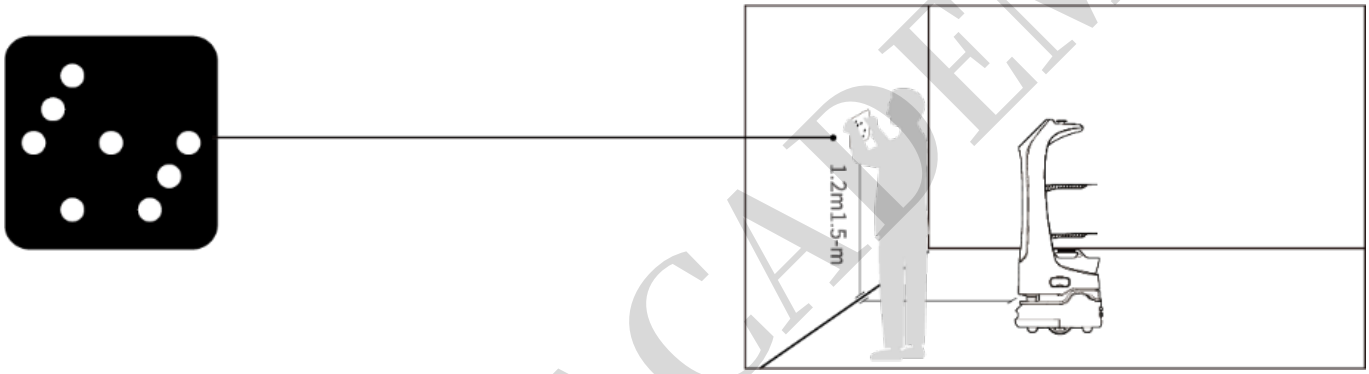
Operation guide

1 Mapping Instructions

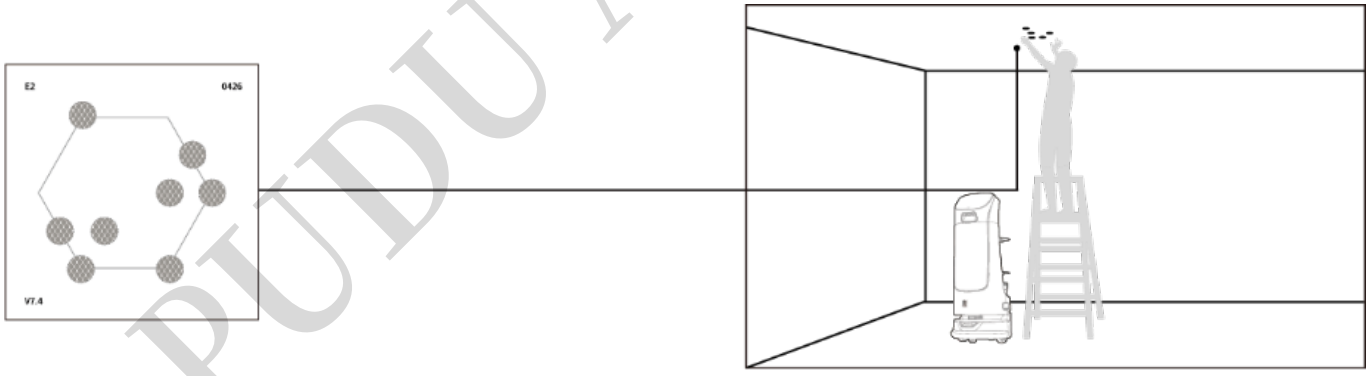
KettyBot supports creating new maps on the robot itself. When the robot is first started, you can create new maps directly on the robot without using any mapping tools.

Before creating a map, please contact our technical support for an activation code, and pick a location to apply a wall or ceiling marker and use it as the startup location. You can then create the map as instructed on the screen. For details, please refer to 3.4.1 Map Settings

- If you are using a wall marker, do not apply it to reflective surfaces such as glass or ceramic tiles.



- If you are using a ceiling marker, do not apply it to a highly reflective ceiling.



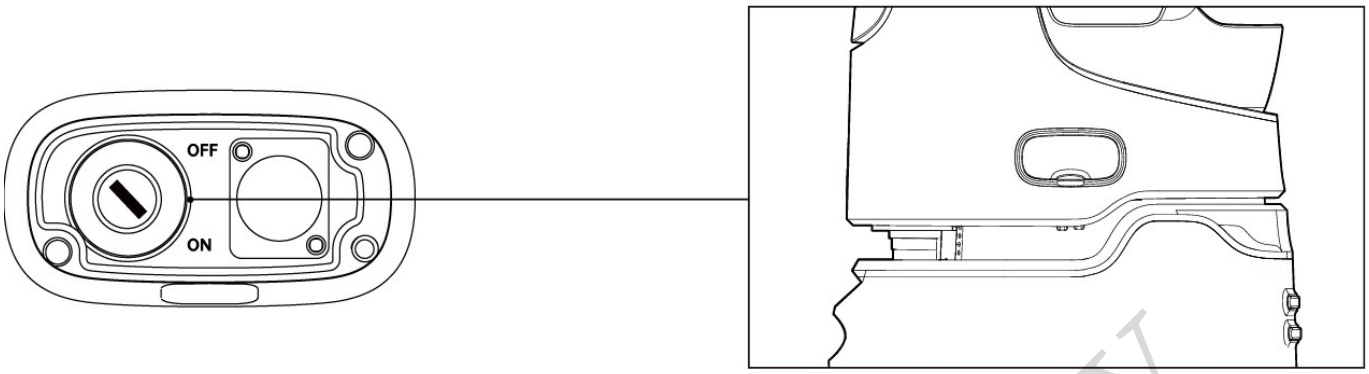
Note

A wall marker and a ceiling marker cannot be used at the same time. Please choose either one of them.

2 Quick Start Guide

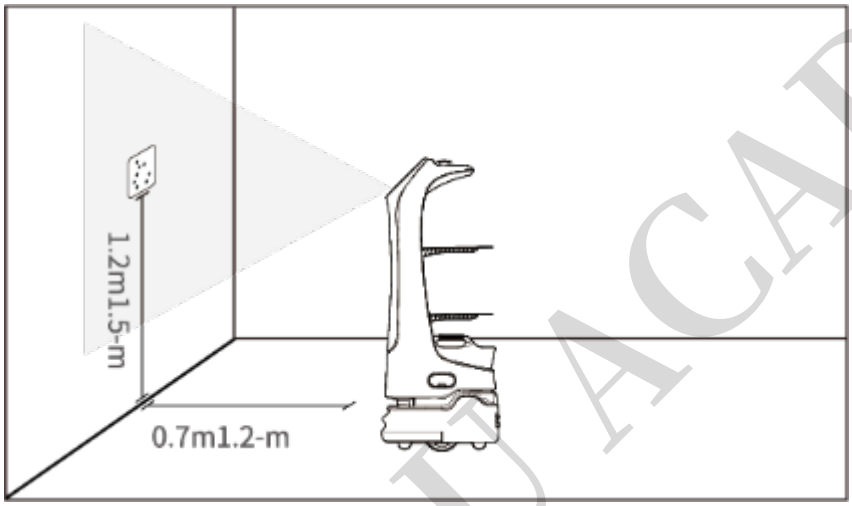
2.1 Power On

Step 1 Make sure the key switch is turned to ON.

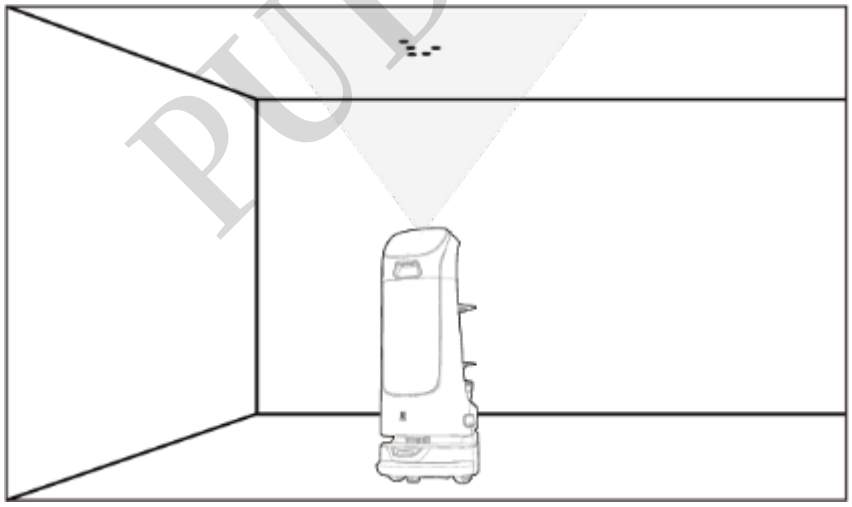


Step 2 Move the robot to the startup location.

- If you are using a wall marker, the startup location is shown as follows:

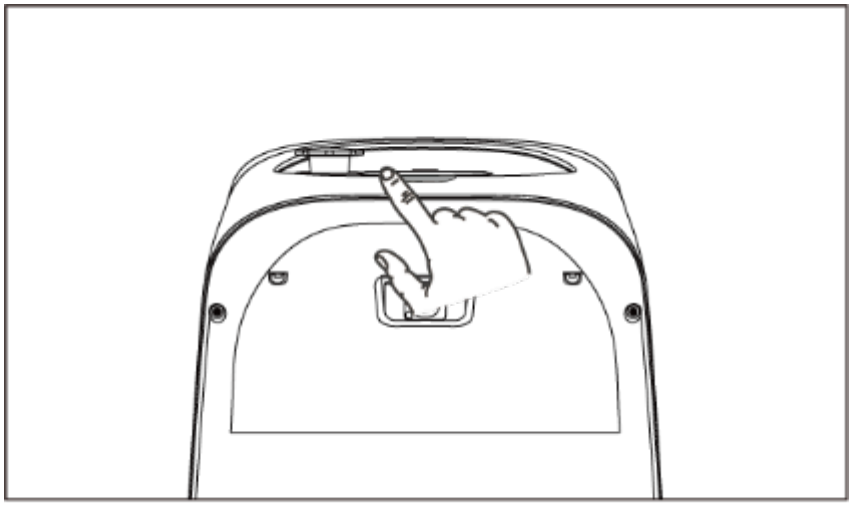


- If you are using a ceiling marker, the startup location is shown as follows:



Step 3 Press and hold the power switch for 1 second.

The bottom light strip flashes, and the screen displays boot logo, animation, and Android desktop in turn, indicating that the robot is powered on.



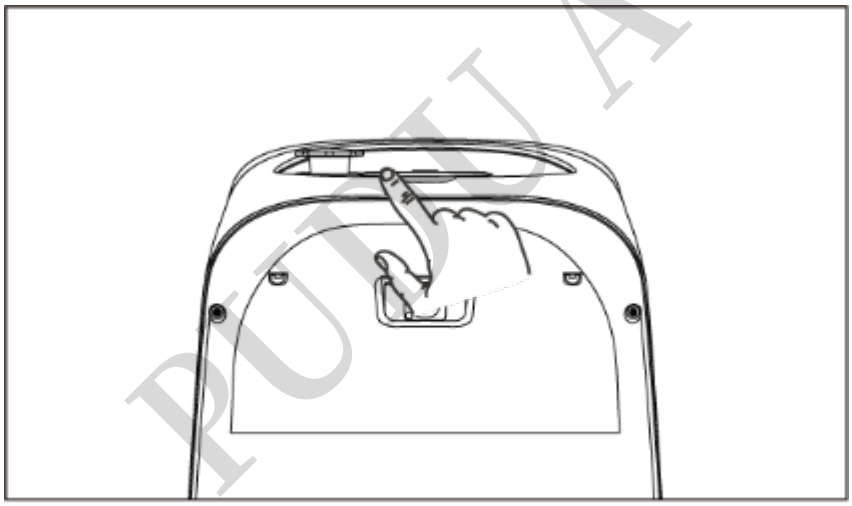
Note

The system will automatically start Pudu App by default after powering on. If not, tap the Pudu App icon on the system desktop to start it.

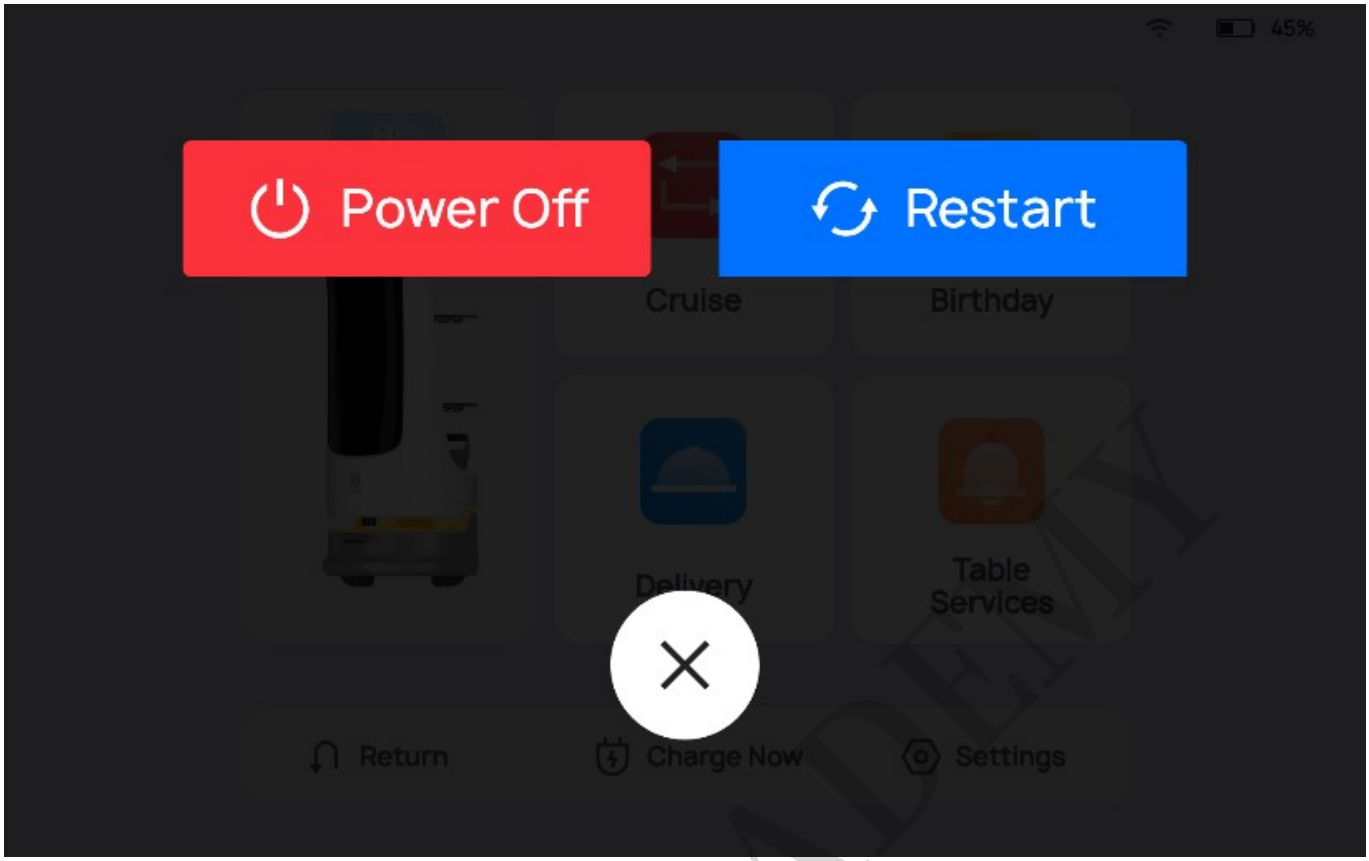
Step 4 The robot is powered on, let's try it out!

2.2 Power Off

Step 1 Press and hold the power switch for 3 seconds.

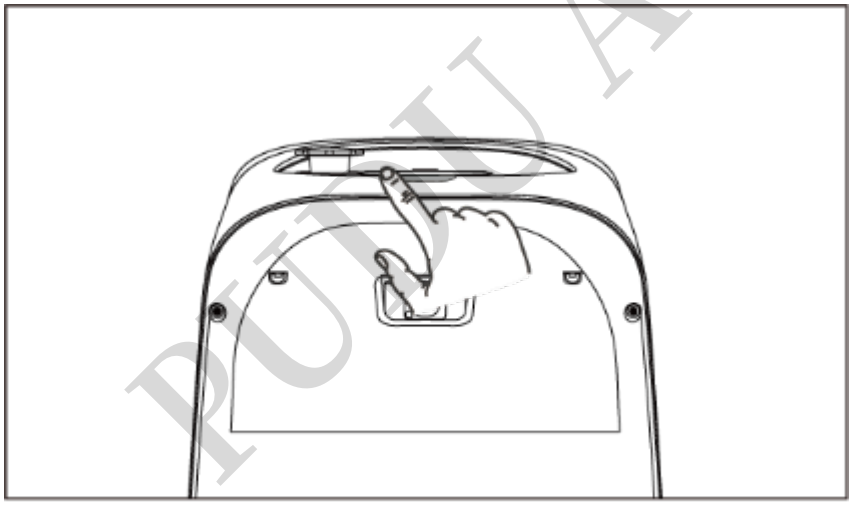


The screen will pop up the **Power Off** and **Restart** options.



Step 2 Tap **Power Off**.

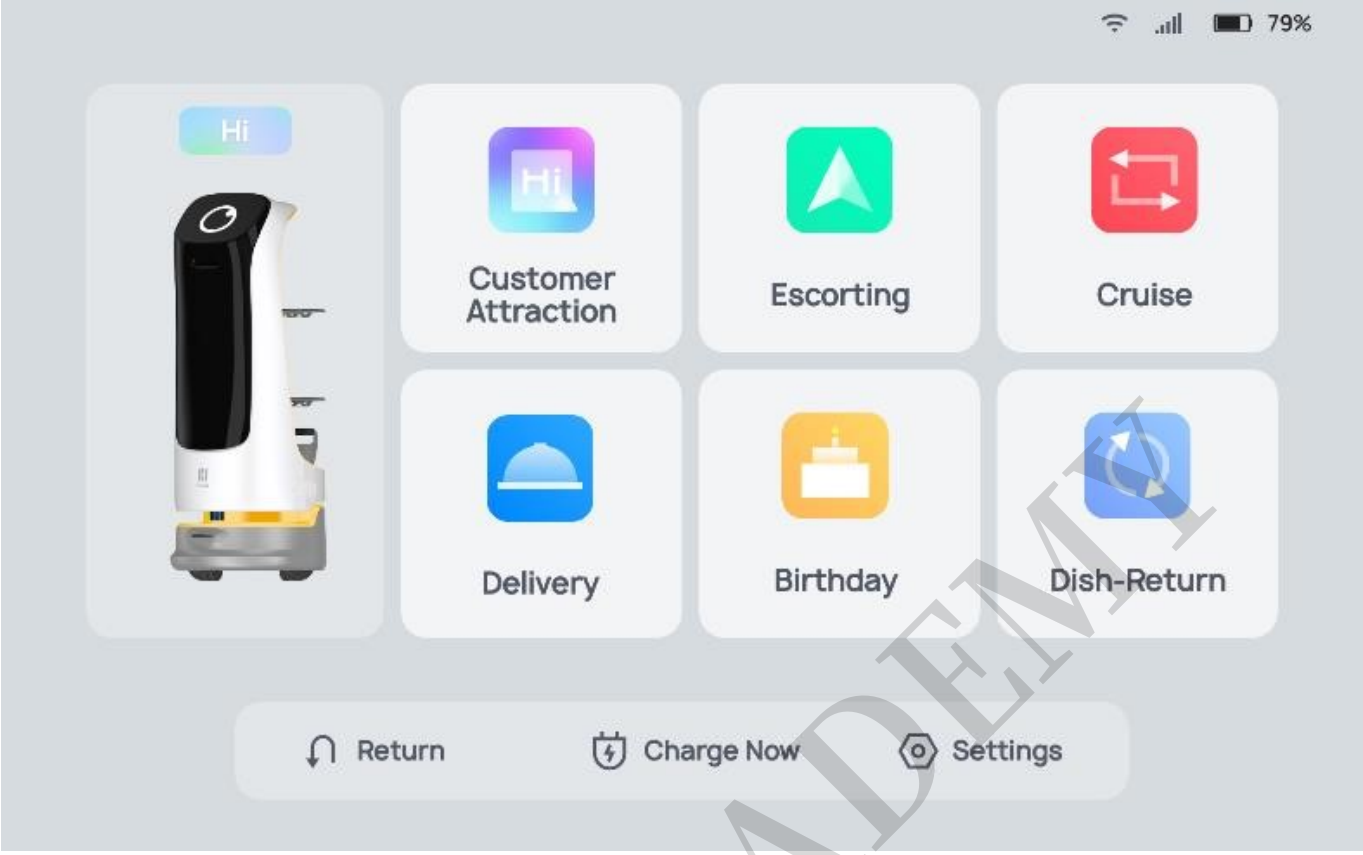
The bottom light strip and screen will go off, indicating that the robot is powered off.



3 Task Scenarios

3.1 Product Features

The robot comes with various modes, including Delivery mode, Cruise mode, Birthday mode, Dish-return mode, Customer Attraction mode and Guiding mode, to cater to the needs of different scenarios. After powering on the robot, you can select the mode as needed in the screen.



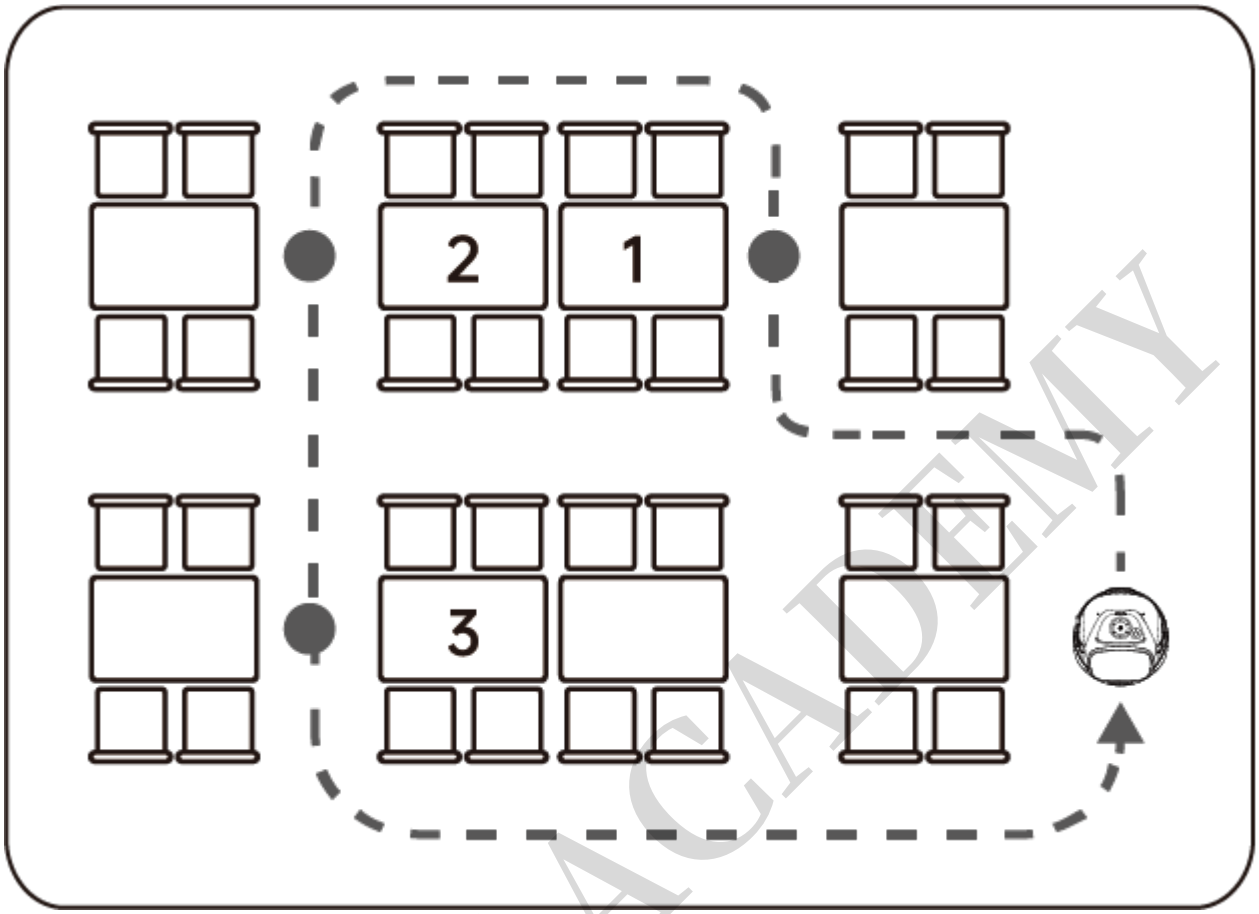
Mode	Description
Delivery mode	The robot delivers food to multiple tables at the same time. After the dishes ordered by different customers are placed on the trays and the table numbers are entered, the robot automatically plans the best routes for delivery. After that, the robot automatically returns to the pick-up position.
Mode	Description
Cruise mode	The robot circulates along a predetermined path with self-service drinks, desserts or napkins, and recommends them to customers by voice.
Customer attraction mode	The robot can play speech to attract customers when it detects passers-by in the attraction area. Customers can talk to the robot, view special offers, featured products, and other information and choose to follow the robot to the store.
Birthday mode	The robot delivers birthday cakes or gifts to customers, accompanied by customized background music.
Guiding mode	The robot says hello to customers coming into the store and leads them to their tables. Then, it automatically returns to the greeting location.
Dish-return mode	In Dish-return mode, the robot collects the dishes to be cleaned and delivers them to the collecting point.

Note

- To ensure a stable and safe operation of the robot, it is recommended that the delivery speed be lower than 0.9m/s (2.95 ft/s), and the cruise speed at 0.2m/s or 0.6m/s (0.66 ft/s or 1.97 ft/s).
- Do not place drinks and bottles that spill or fall easily to avoid damage to the robot caused by drink spillage.

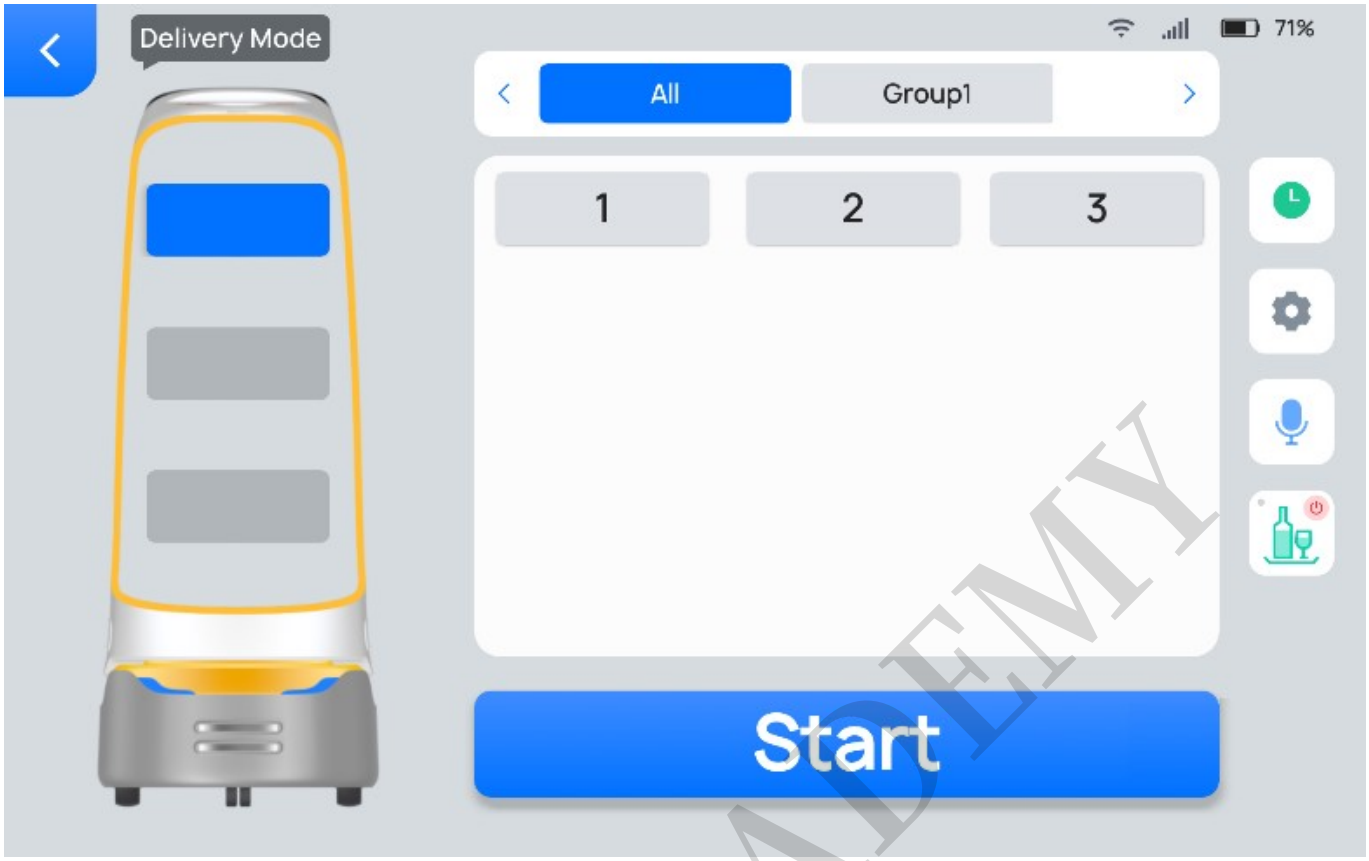
3.2 Delivery Mode

In Delivery Mode, the robot delivers meals to the designated locations.

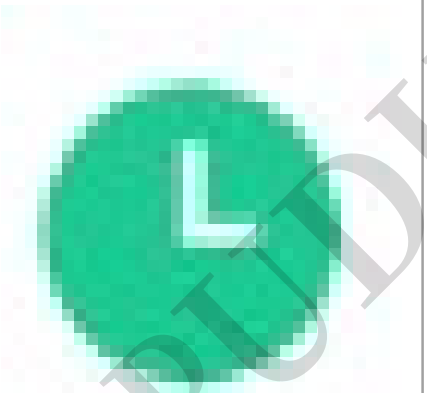
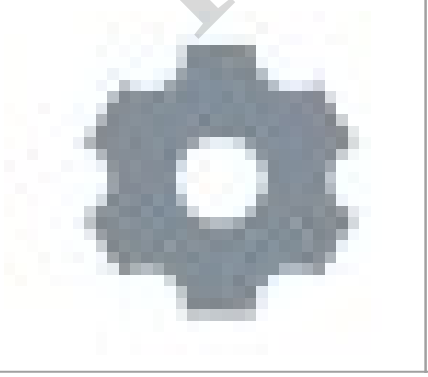


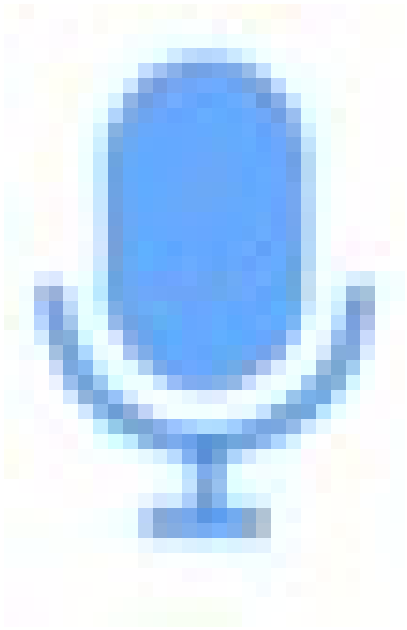
Step 1 Select **Delivery** at the pickup location.

The Delivery Mode interface is shown below.

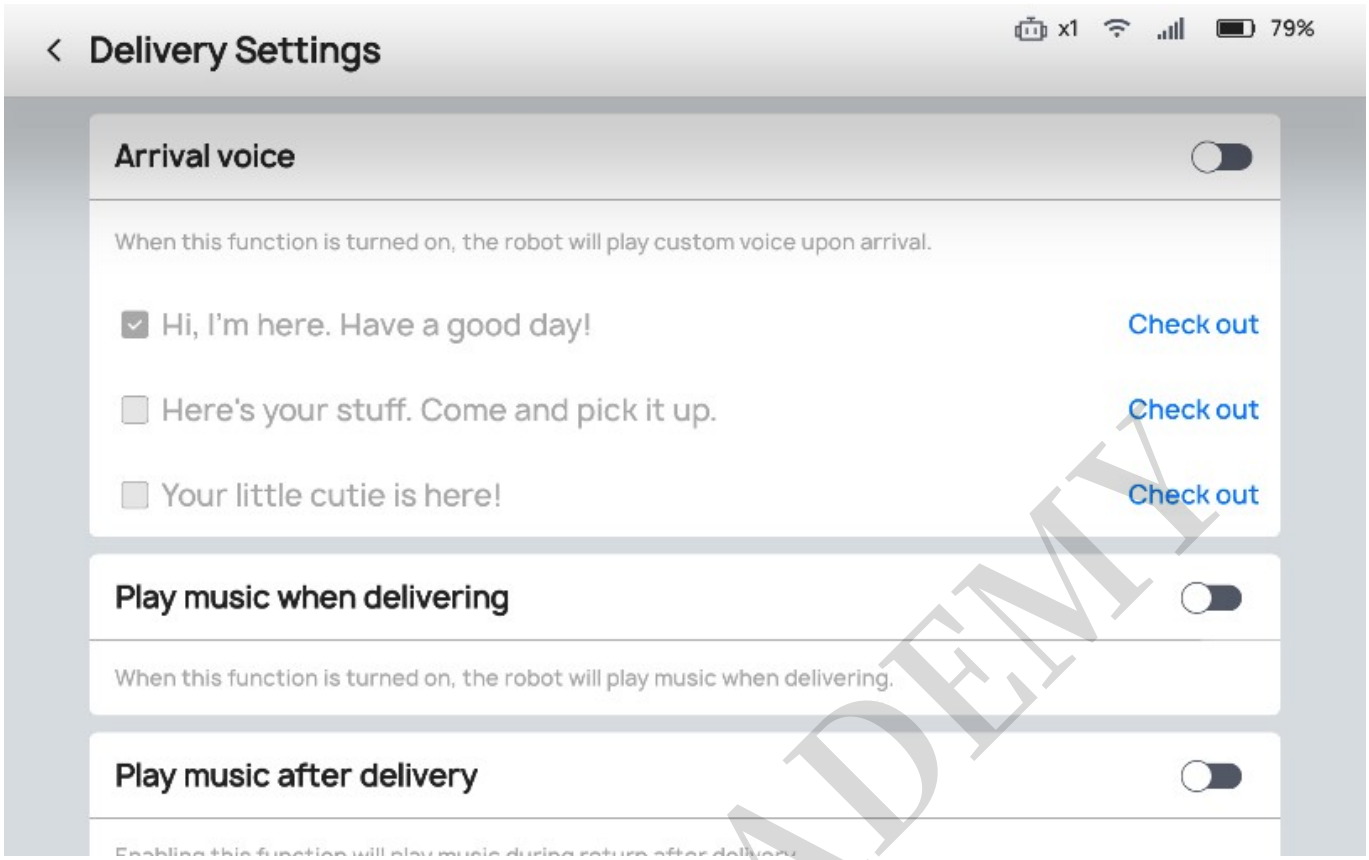


Shortcut buttons on the **Delivery Mode** interface are explained below.

Button	Description
	View the previous task.
	Set the delivery arrival voice, delivery arrival music, etc. See the table below for details.

Button	Description
	Initiate a voice command. For example, if you say "go to XXX" to the robot, "XXX" will be displayed on the selected tray and the robot will automatically go there. This button will not be displayed on the **Delivery Mode** interface if **Voice Command** is turned off in the **Delivery Settings** interface. The voice command supports Chinese only.
	Turn on Smooth Mode. Smooth Mode is mainly used to deliver dishes with a small amount of soup.

The **Delivery Settings** interface and descriptions of the settings are shown below.

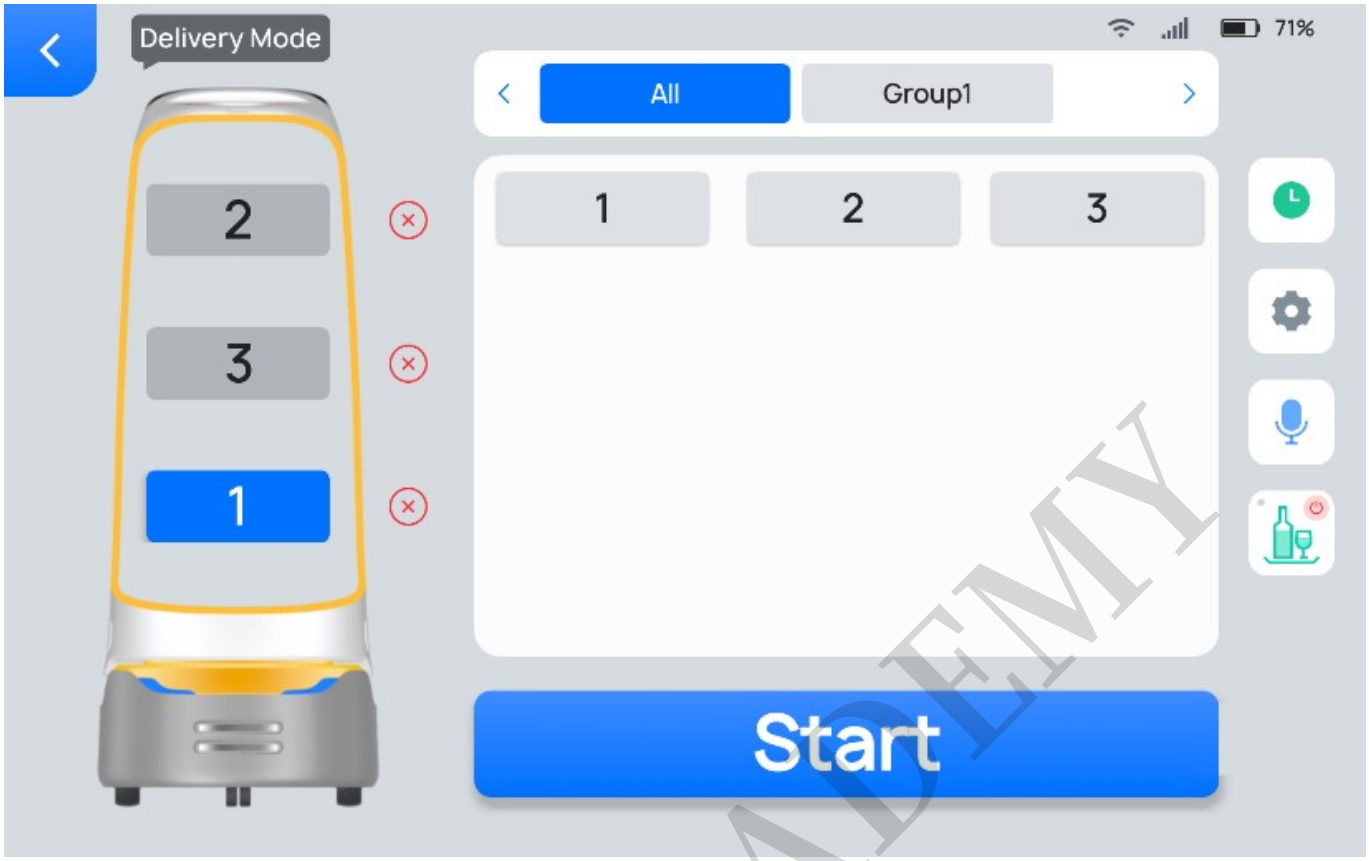


Delivery Settings	Description
Arrival voice	Choose whether to enable **Arrival voice**. If enabled, the selected custom voice will be played upon delivery arrival. Custom voices can be configured via the Business Management Platform.
Play music when delivering	Choose whether to enable **Play music when delivering**. If enabled, the selected music will be played during delivery. If no music is available, you may scan the QR code in the **Settings > Music** interface to import music.
Play music after delivery	Choose whether to enable **Play music after delivery**. If enabled, the selected music will be played after delivery. If no music is available, you may scan the QR code in the **Settings > Music** interface to import music.
Voice command	Choose whether to enable **Voice command**. If enabled, the Voice Interaction icon will be displayed on the **Delivery Mode** interface. Tap the icon to go to the **Voice Interaction** interface, where you can initiate voice commands.
Food delivery animation	Choose whether to enable **Food delivery animation**. If enabled, the robot will show emoticons rather than the table number during delivery.
Time before auto-return	Choose whether to enable Auto pick up function and set the Time before auto-return.

Step 2 Put the dishes on the corresponding tray.

Step 3 Tap the tray on the screen and select the desired table number.

The corresponding tray then displays its table number.



Step 4 After entering the table number, tap **Start**.

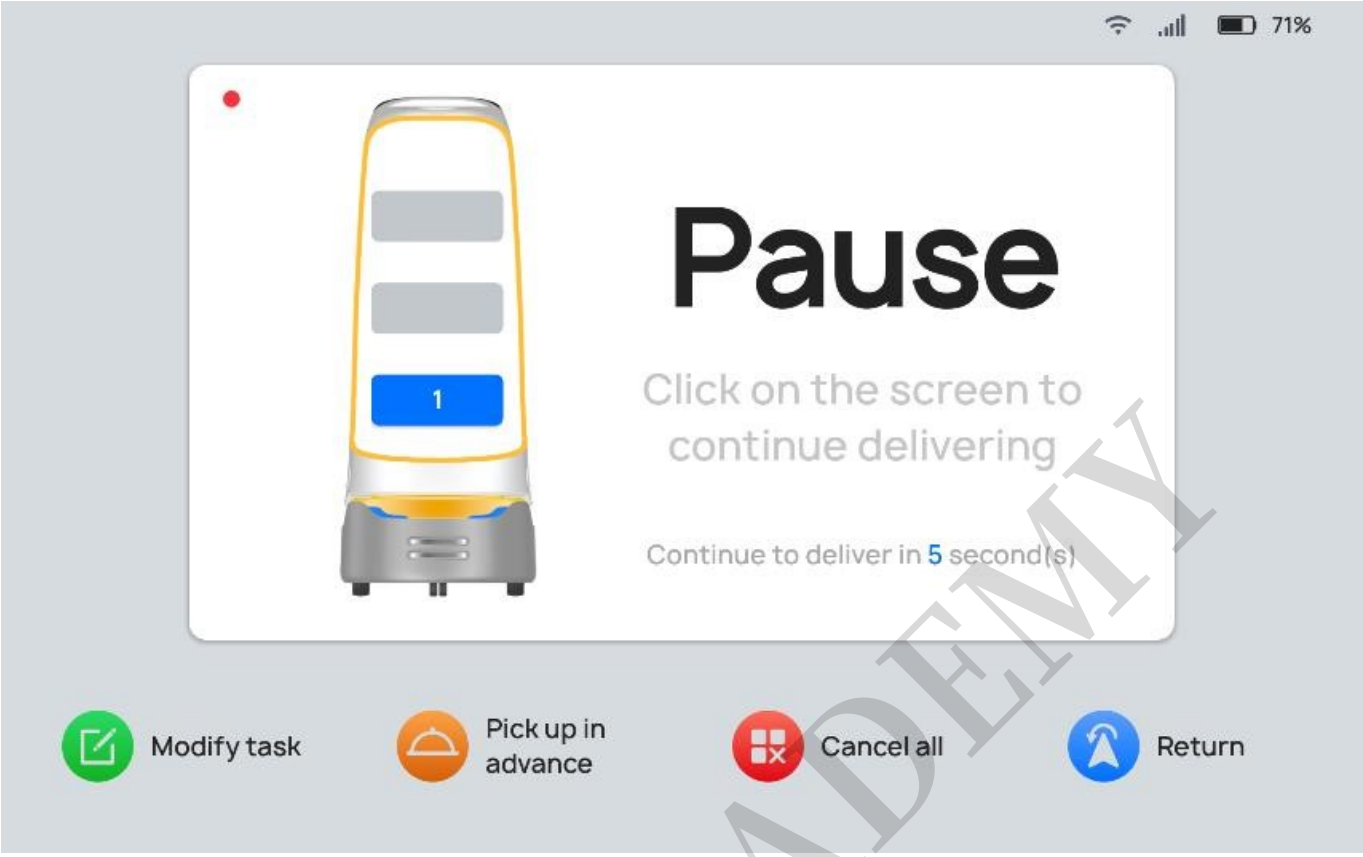
The robot arrives at the specified table along the predetermined path.

Step 5 After arriving at the table, the robot provides a voice prompt. The waiter then takes the dishes following screen display and voice prompts.

Step 6 After taking the dishes, tap **Done** and the robot performs its next task.

After taking the dishes, you can press the power switch to make the robot start the next task; you can also wave your hand 2 to 12 cm (0.79 to 4.72 in) above the vision sensor (at the top of the robot) more than twice to make the robot start the next task when it detects the hand gesture.

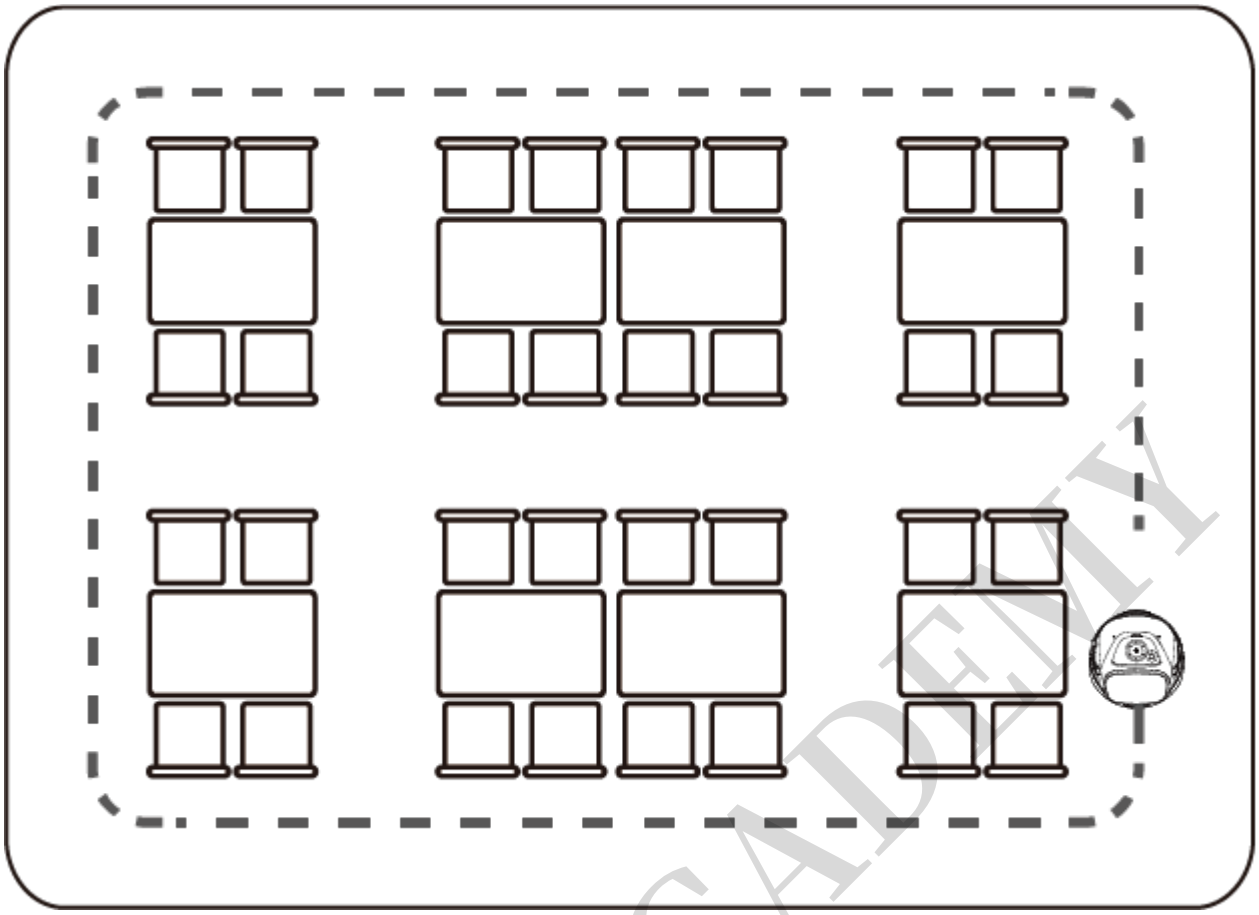
To make any modifications during delivery (e.g., modify task, pick up in advance, cancel all, or return), tap the screen on the robot's head to pause the robot before any operation. If no operation is performed within 10 seconds, the robot will proceed with its current task.



Button	Description
Modify task	Tap to modify the table number of delivery.
Pick up in advance	Tap to pick up the dishes in advance and proceed with the next task.
Cancel all	Tap to cancel all delivery tasks without returning to the pickup location.
Return	Tap to return to the pickup location.

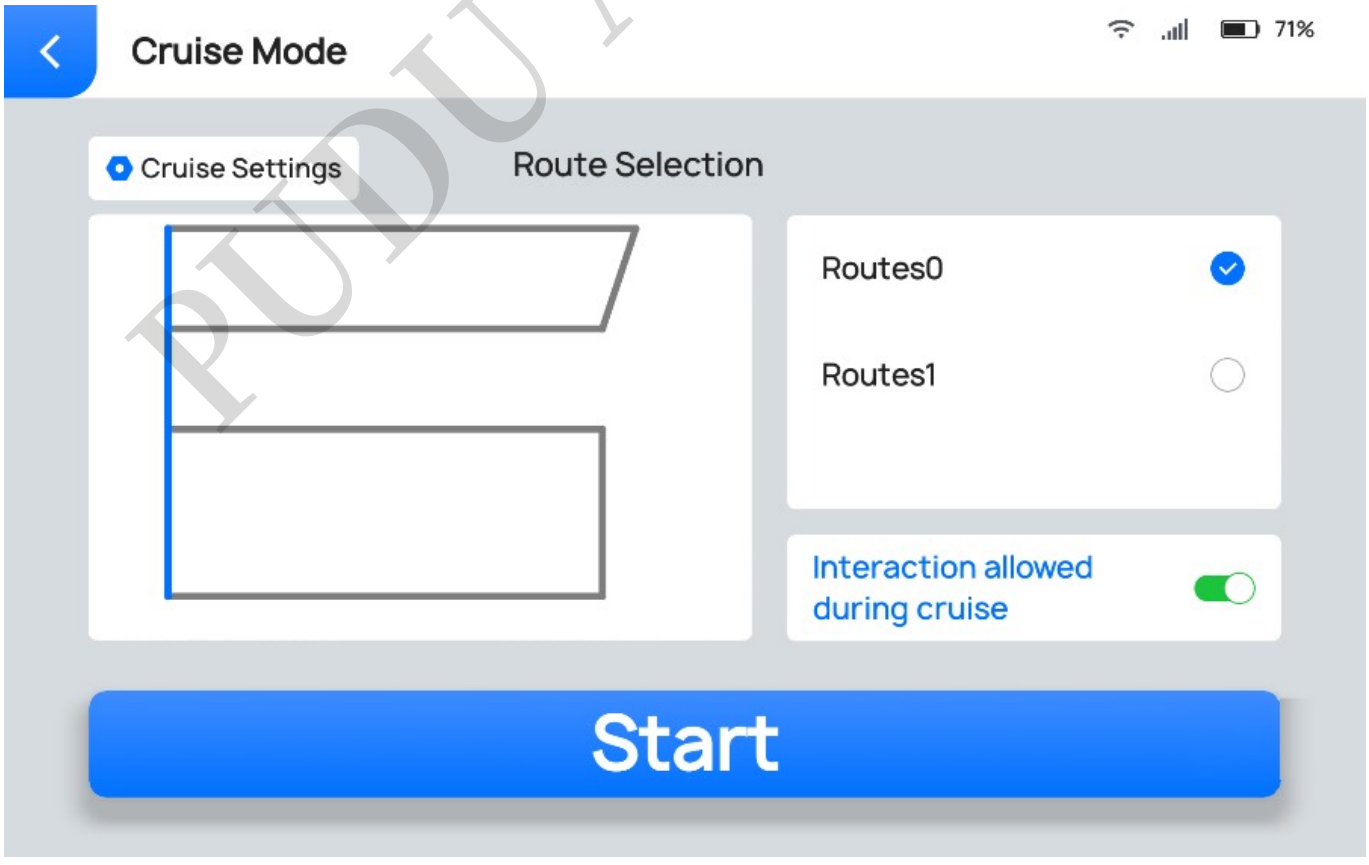
3.3 Cruise Mode

In Cruise Mode, the robot cruises around a specific large area.



Step 1 Tap **Cruise** on the main interface.

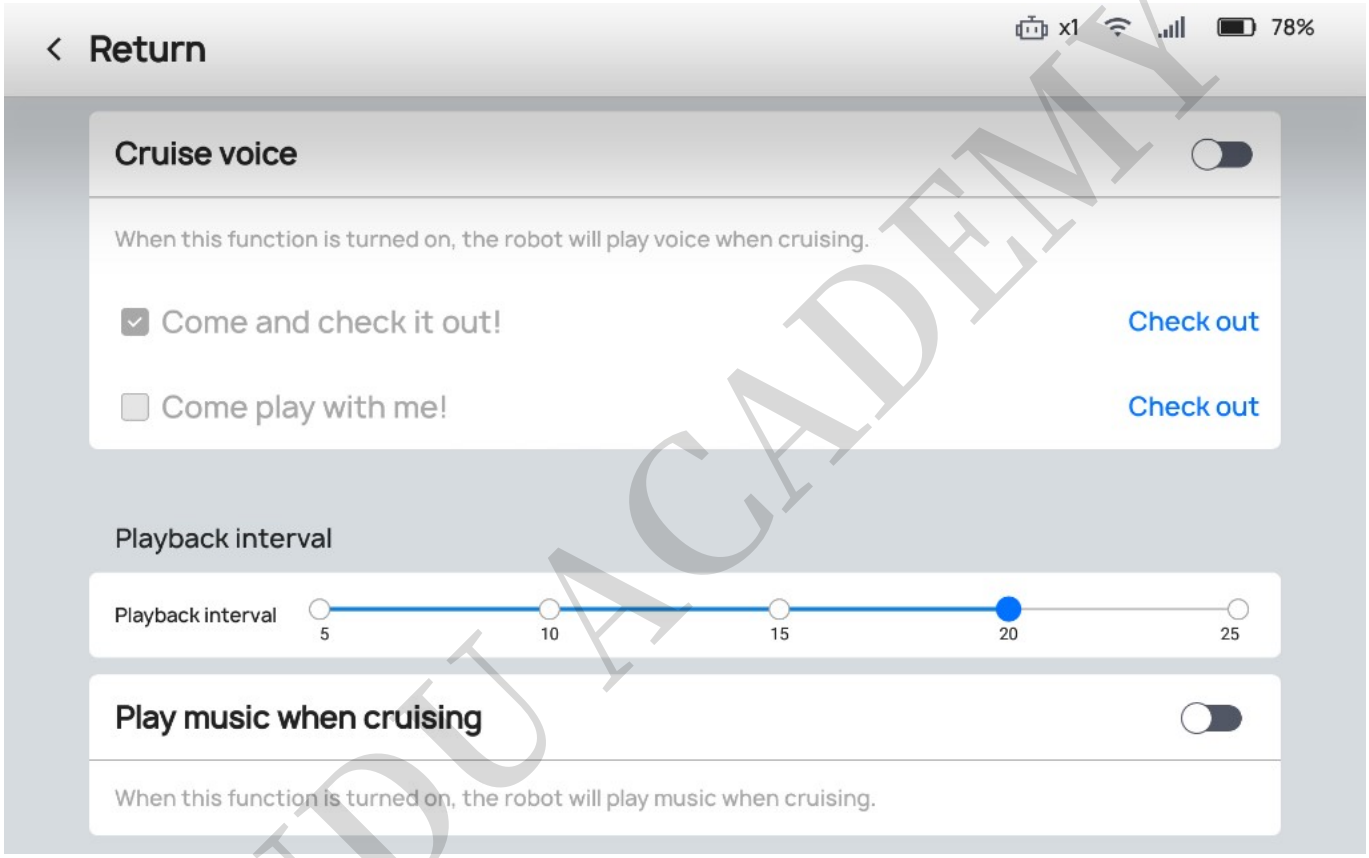
The **Cruise Mode** interface is shown below. The cruise route is shown in blue on the map.



Shortcut buttons on the Cruise Mode interface are explained below.

Button	Description
Cruise Settings	Set the cruise voice, cruise music, cruise speed, etc. See the table below for details.
Interaction allowed during cruise	When enabled, if a customer is detected by the robot's front positioning camera or the customer taps on the robot's screen during a cruise, the customer attraction interface will show up. The customer can then ask the robot via voice commands to lead them to the store or view featured products, special offers, and other information.

The **Cruise Settings** interface and descriptions of the settings are shown below.



Cruise Settings	Description
Cruise voice	Choose whether to enable **Cruise voice**. If enabled, the selected custom voice will be played during cruises. Custom voices can be configured via the Business Management Platform.
Playback interval	Set the playback interval for voices during cruises.
Play music when cruising	Choose whether to enable **Play music when cruising**. If enabled, the selected music will be played during cruises. If no music is available, you may scan the QR code in the **Settings > Music** interface to import music.
Cruise speed	Set the cruise speed. It is recommended to set the cruise speed at 0.2 m/s or 0.6 m/s (0.66 ft/s or 1.97 ft/s).

Step 2 Put desserts or snacks on the trays .

Step 3 Select the desired cruise route and tap **Start!**

During a cruise, the robot can invite customers to take free samples or try out the food on the tray via voice announcements. Tap the robot's screen to stop the robot if you need to pick up dishes from it.

To stop a cruise, tap the screen and swipe down with two fingers, then click **Exit this mode** to exit Cruise mode.

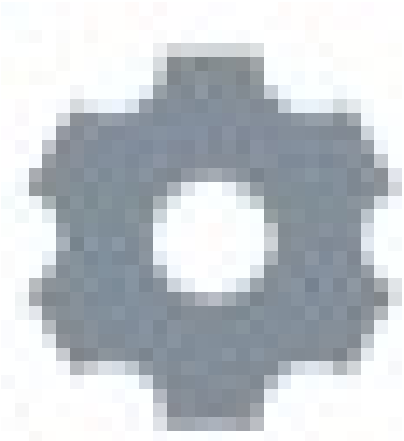
3.4 Guiding Mode

In Guiding Mode, the robot acts as a receptionist, greeting customers at the door and guiding them to their tables.

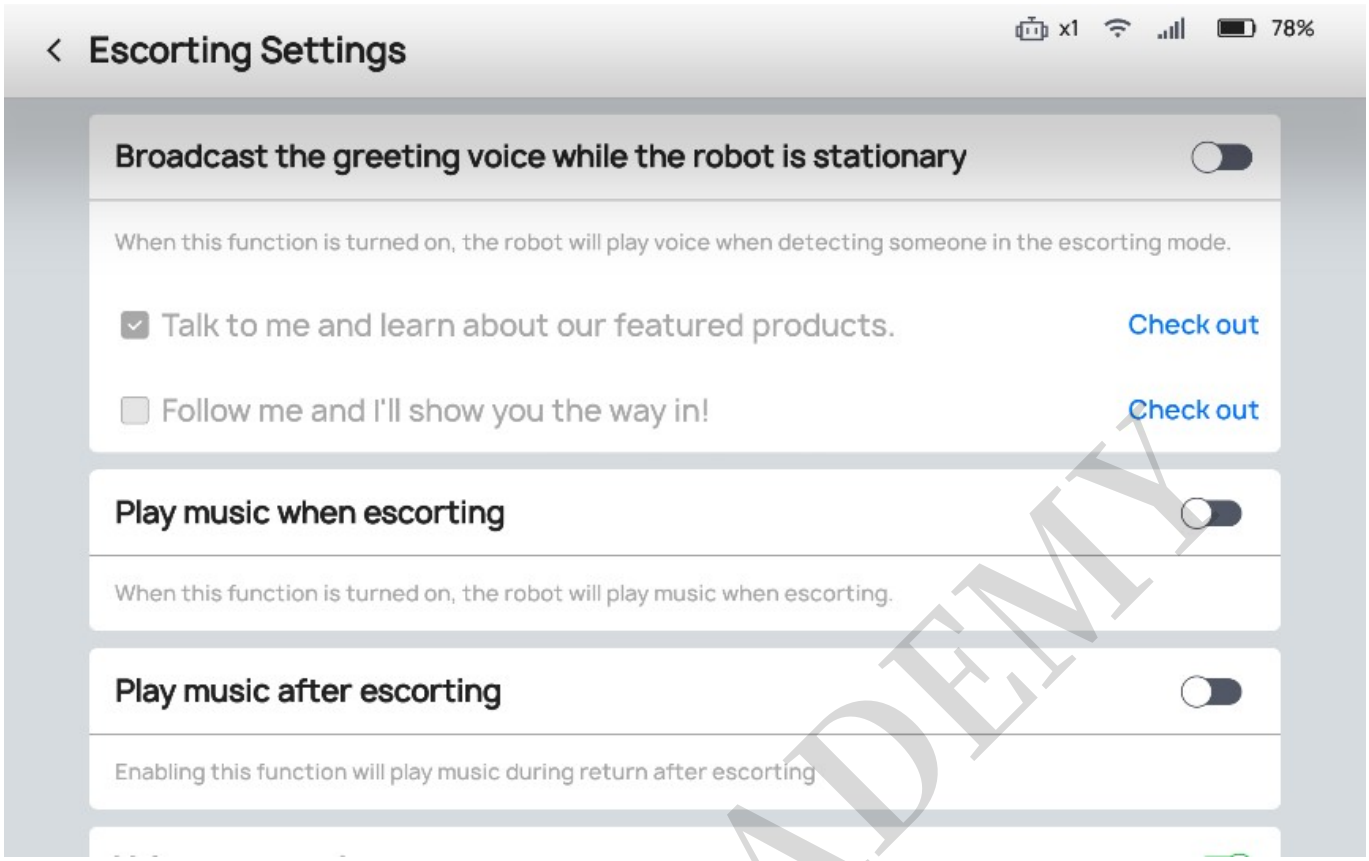
Step 1 Tap **Escorting** on the main interface.

The **Escorting Mode** interface is shown below.

Shortcut buttons on the Escorting Mode interface are explained below.

Button	Description
	Set guiding voice, guiding music, etc.
	Initiate a voice command. For example, if you say "go to XXX", the robot will automatically go there. This button will not be displayed on the Escorting Mode interface if **Voice Command** is turned off in the **Escorting Settings** interface. The voice command supports Chinese only.
	The user can enter the product name in search of its location. Once it is determined, the robot will guide the customer to it. The product-related information needs to be configured via Business Management Platform in advance. Otherwise, the customer cannot search for the location of products. Note: In a multi-floor store, if the product inquired is not on the floor where the robot is, a window will pop up on the robot's screen to prompt the customer to go to the corresponding floor.

The Escorting Settings interface and descriptions of the settings are shown below.



Escorting Settings	Description
Broadcast the greeting voice while the robot is stationary	Choose whether to enable **Broadcast the greeting voice while the robot is stationary.** If it is enabled and the robot is idle in Guiding mode, the selected custom voice will be played when a person is detected in front of the robot by the Lidar. Custom voices can be configured via the Business Management Platform.
Play music when escorting	Choose whether to enable **Play music when escorting**. If enabled, the selected music will be played during guiding. If no music is available, you may scan the QR code in the **Settings > Music** interface to import music.
Play music after escorting	Choose whether to enable **Play music after escorting**. If enabled, the selected music will be played when guiding completes. If no music is available, you may scan the QR code in the **Settings > Music** interface to import music.
Voice command	Choose whether to enable **Voice command**. If enabled, the Voice Interaction icon will be displayed on the **Escorting Mode** interface. Tap the icon to go to the **Voice Interaction** interface, where you can initiate voice commands.
Escorting speed	Set the guiding speed.
Show emoticon during escorting	Choose whether to enable **Show emoticon during escorting**. If enabled, the robot only shows emoticons rather than the table number during the guiding process.
Stay Put After Ushering	Choose whether to enable **Stay Put After Ushering**. If enabled, the robot stays put rather than returning to the greeting location after the guiding is completed.

Escorting Settings	Description
Playback duration after escort arrival	Set the stay time after ushered arrival. If **Done** is not tapped within the stay time after ushered arrival at the destination, the robot will automatically complete the task and return to the greeting location.

Step 2 Select the desired table number and tap **Start Escorting**.

The robot will then lead the customers to the desired table.

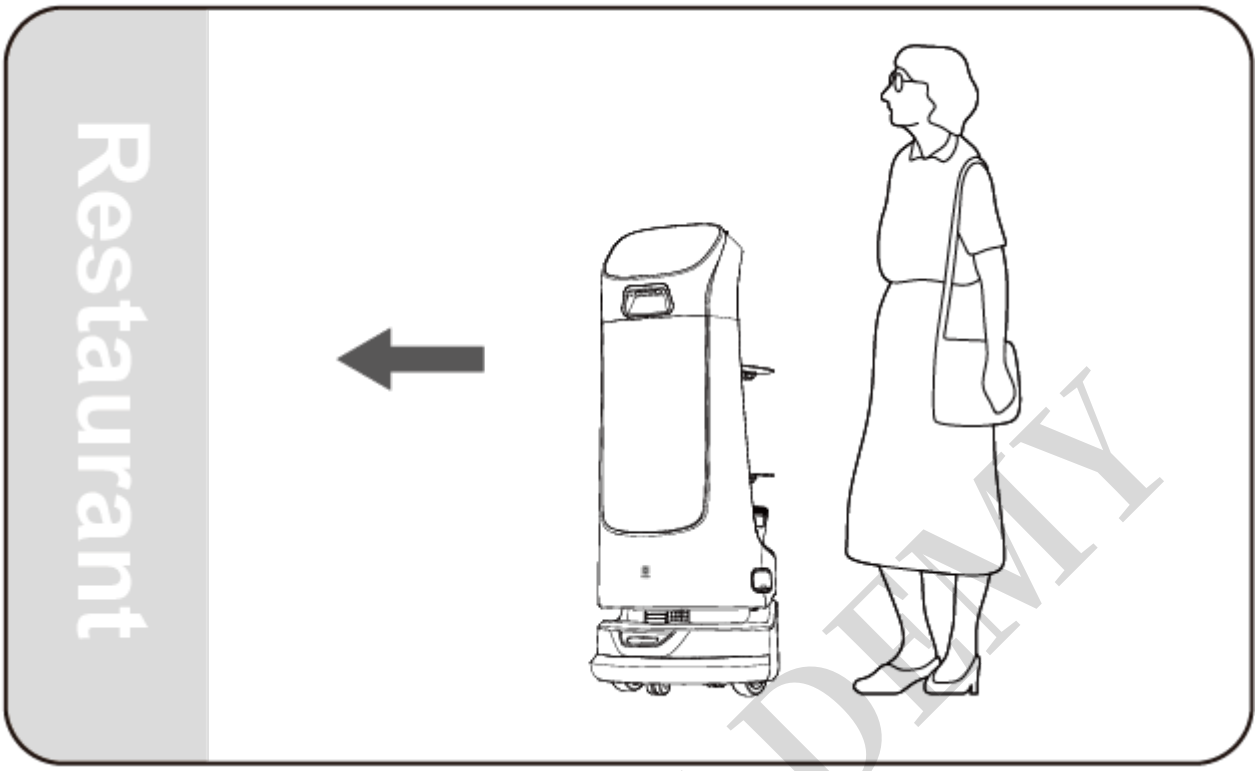
Step 3 Tap **Done** after the robot reaches the desired table.

The robot returns to the greeting location.

To cancel the task or return to the greeting location during guiding, tap the screen to pause the robot before any operation If no operation is performed within 10 seconds, the robot will proceed with its current task. To exit the Guiding mode, swipe down with two fingers on the screen and tap **Exit this mode**.

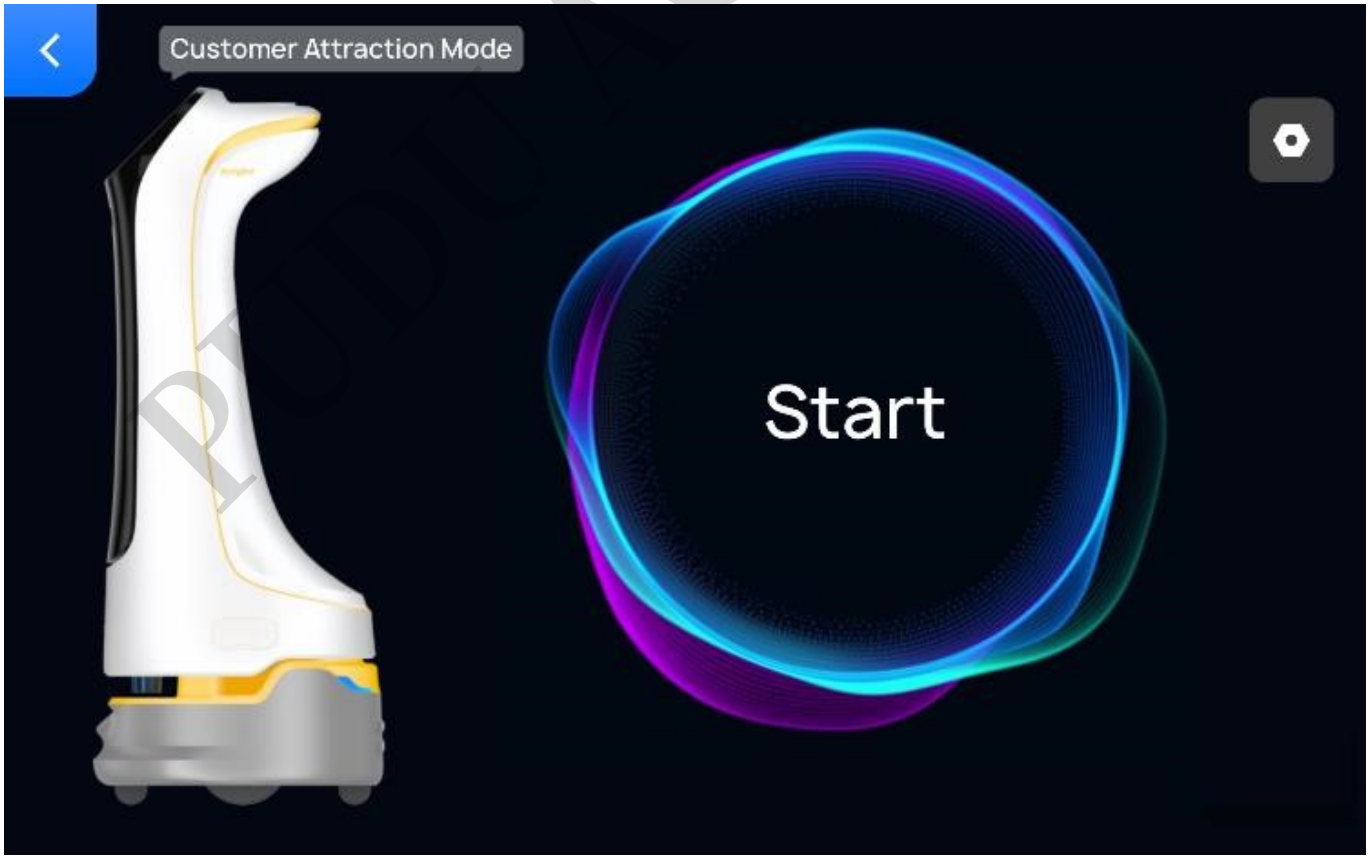
3.5 Customer Attraction Mode

In the Customer Attraction mode, the robot will attract customers at the attraction location by playing speeches. Customers can talk to the robot, view special offers, featured products, and other information and choose to follow the robot to the store.

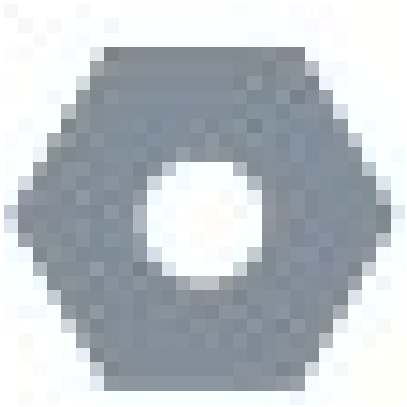


Step 1 Tap **Customer attraction** on the main interface.

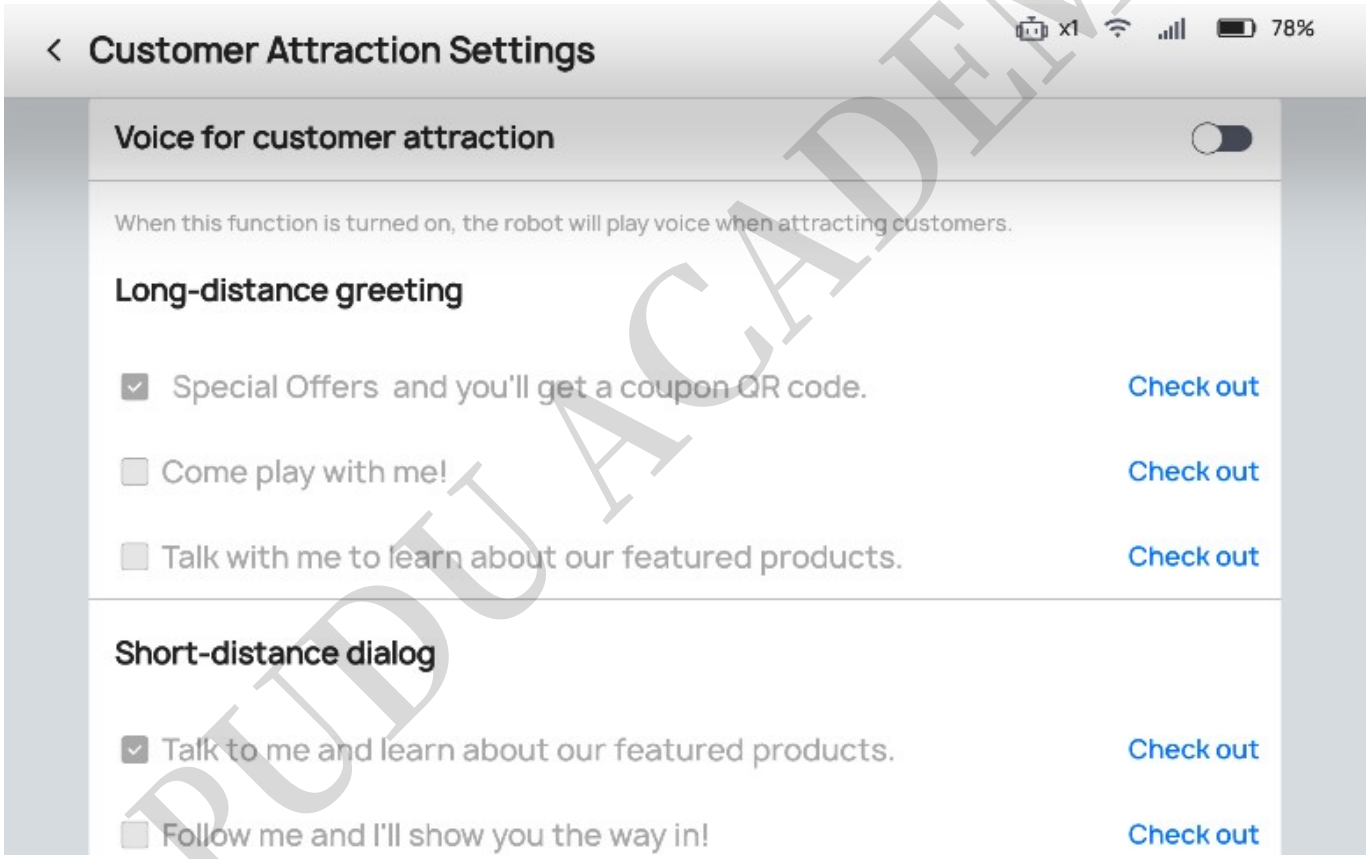
The Customer Attraction Mode interface is shown below.



Shortcut buttons on the **Customer Attraction Mode** interface are explained below.

Button	Description
	Set the voice for customer attraction, customer attraction music, customer attraction area, and voice interaction. See the table below for details.

The **Customer Attraction Settings** interface and descriptions of the settings are shown below.



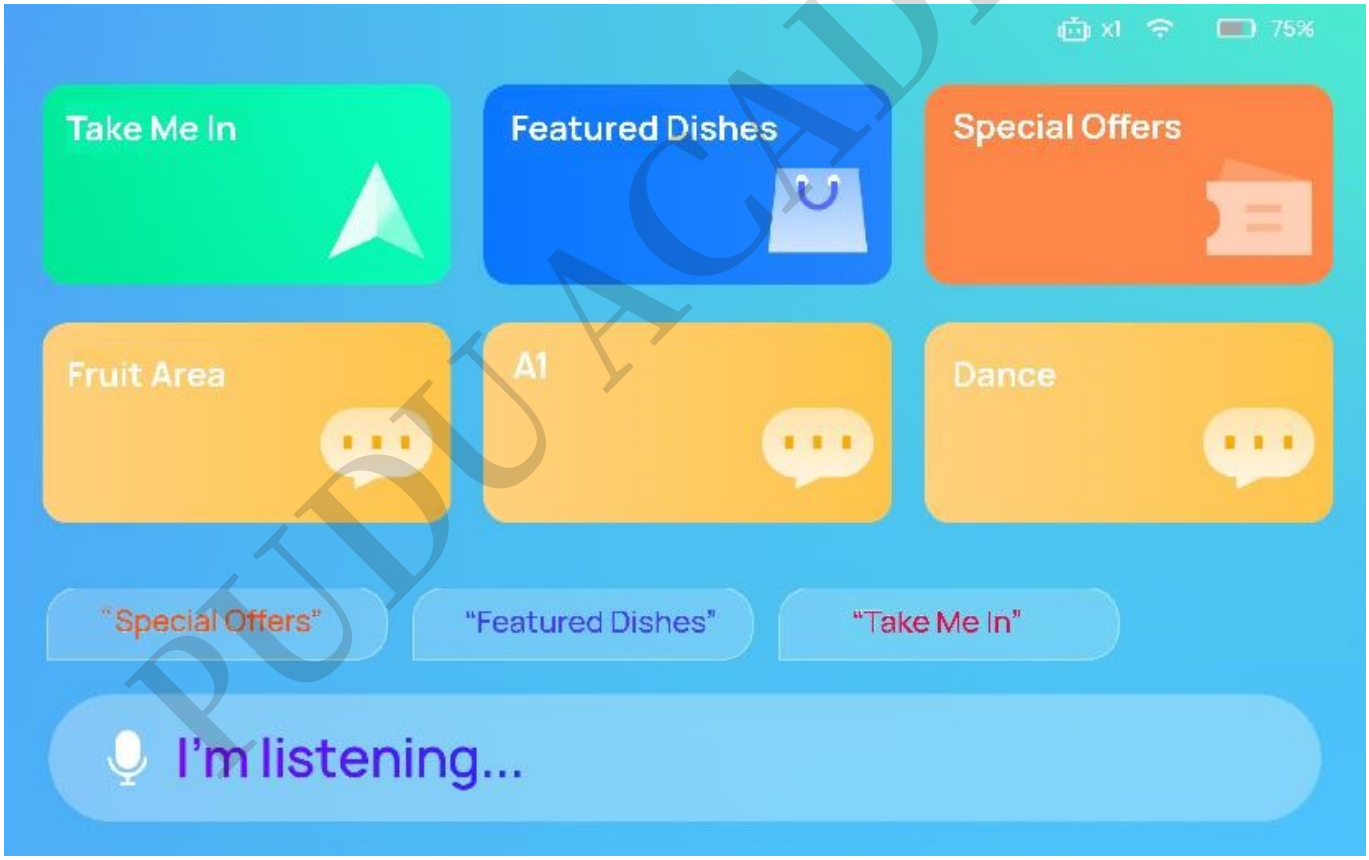
Customer Attraction Settings	Description
Voice for customer attraction	Choose whether to enable **Voice for customer attraction**. If enabled, when the robot is attracting customers, different voice announcements will be played according to the distance between the robot and the detected customer. The voices can be configured via the Business Management Platform.
Play music when heading for the attraction area	Choose whether to enable **Play music when heading for the attraction area**. If enabled, the selected music will be played when the robot heads for the attraction area. If no music is available, you may scan the QR code in the **Settings > Music** interface to import music.

Customer Attraction Settings	Description
Voice Interaction	Choose whether to enable Voice Interaction. If enabled, customers can talk to the robot during customer attraction.
Select Customer Attraction Location	Select an appropriate greeting location as the customer attraction location. The greeting locations (customer attraction locations) should be set when creating the map.

Step 2 Tap **Start**.

The robot will go to the attraction location and start attracting customers proactively.

When the robot arrives at the attraction area, it will switch to the **Customer Attraction** interface and play the speech for customer attraction. The **Customer Attraction** interface is as shown below. The robot will change its speech when an approaching person is detected by its front positioning camera or Lidar. In this case, customers can talk to the robot, view the featured dishes, and choose to follow the robot to the restaurant (greeting location).



Note

If the robot is displaying the customer attraction interface, its motor is locked, and the user cannot move the robot at this time.

When the robot has led the customers to the store, it can either go back to the attraction area to attract more customers or switch to Escorting Mode to usher the customers to their table.

Note

The front positioning camera is only used for face detection and will not collect any face information.

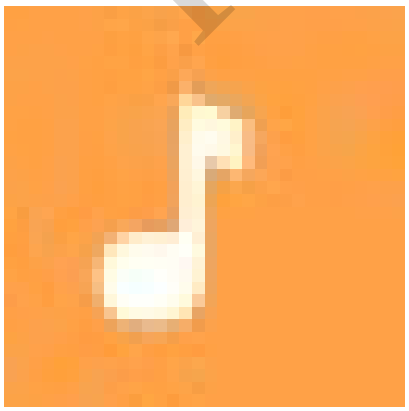
3.6 Birthday Mode

In Birthday Mode, the robot delivers gifts and plays birthday songs for customers who celebrate their birthdays.

Step 1 Tap **Birthday** on the main interface.

The **Birthday Mode** interface is shown below.

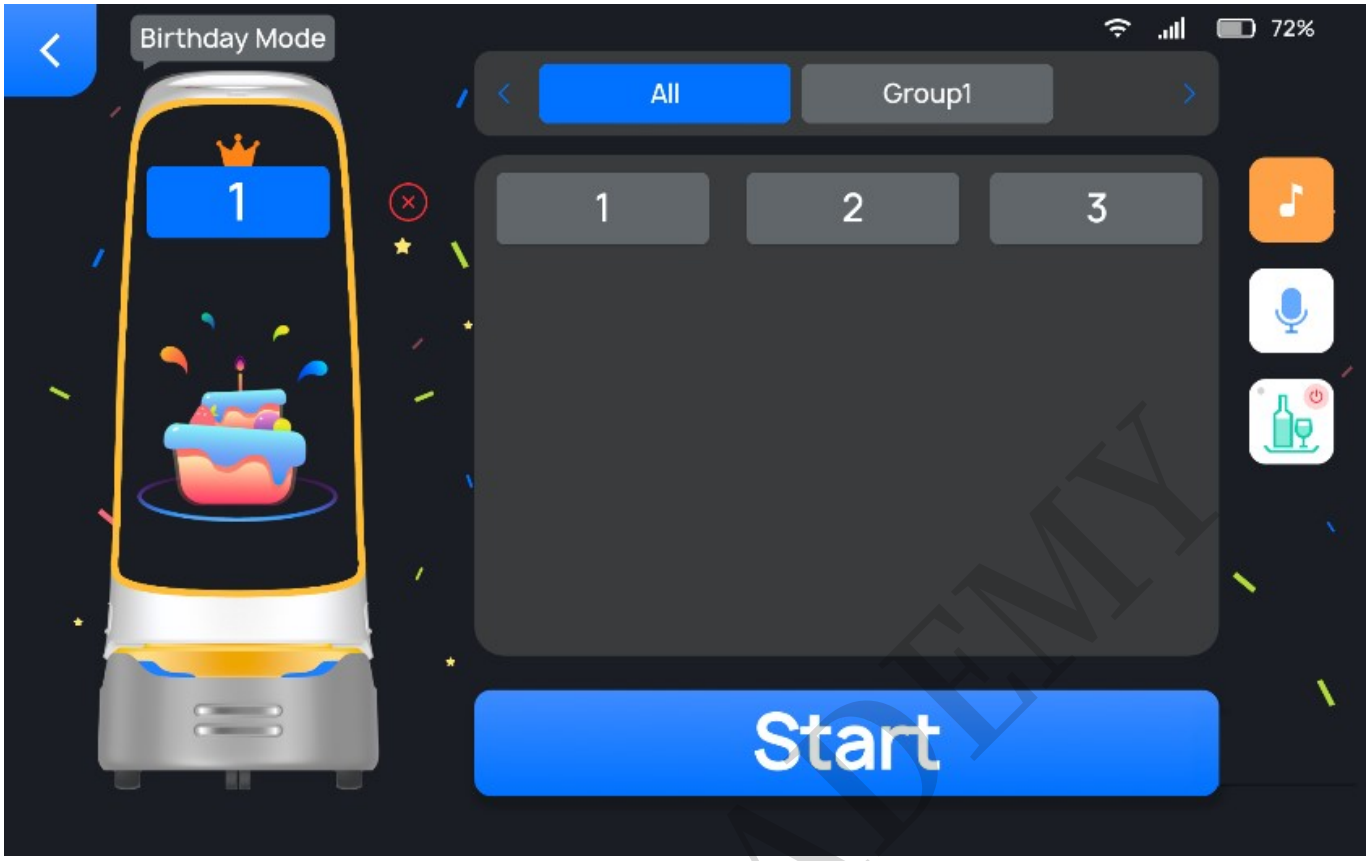
Shortcut buttons on the **Birthday Mode** interface are explained below.

Button	Description
	Set the music played during and after delivery in Birthday mode. If no music is available, you may scan the QR code in the **Settings > Music** interface to import music.

Button	Description
	Initiate a voice command. For example, if you say "XXX" to the robot, "XXX" will be displayed on the first tray and the robot will automatically go there. This button will not be displayed on the **Birthday Mode** interface if **Voice Command** is turned off in the **Delivery Settings** interface. The voice command supports Chinese only.
	Turn on **Smooth Mode**. Smooth mode is mainly used to deliver dishes with a small amount of soup.

Step 2 Place the gifts on the first tray and select the desired table number.

The tray then displays its table number.



Note

Only a single table number can be selected in Birthday mode.

Step 3 Tap **Start**.

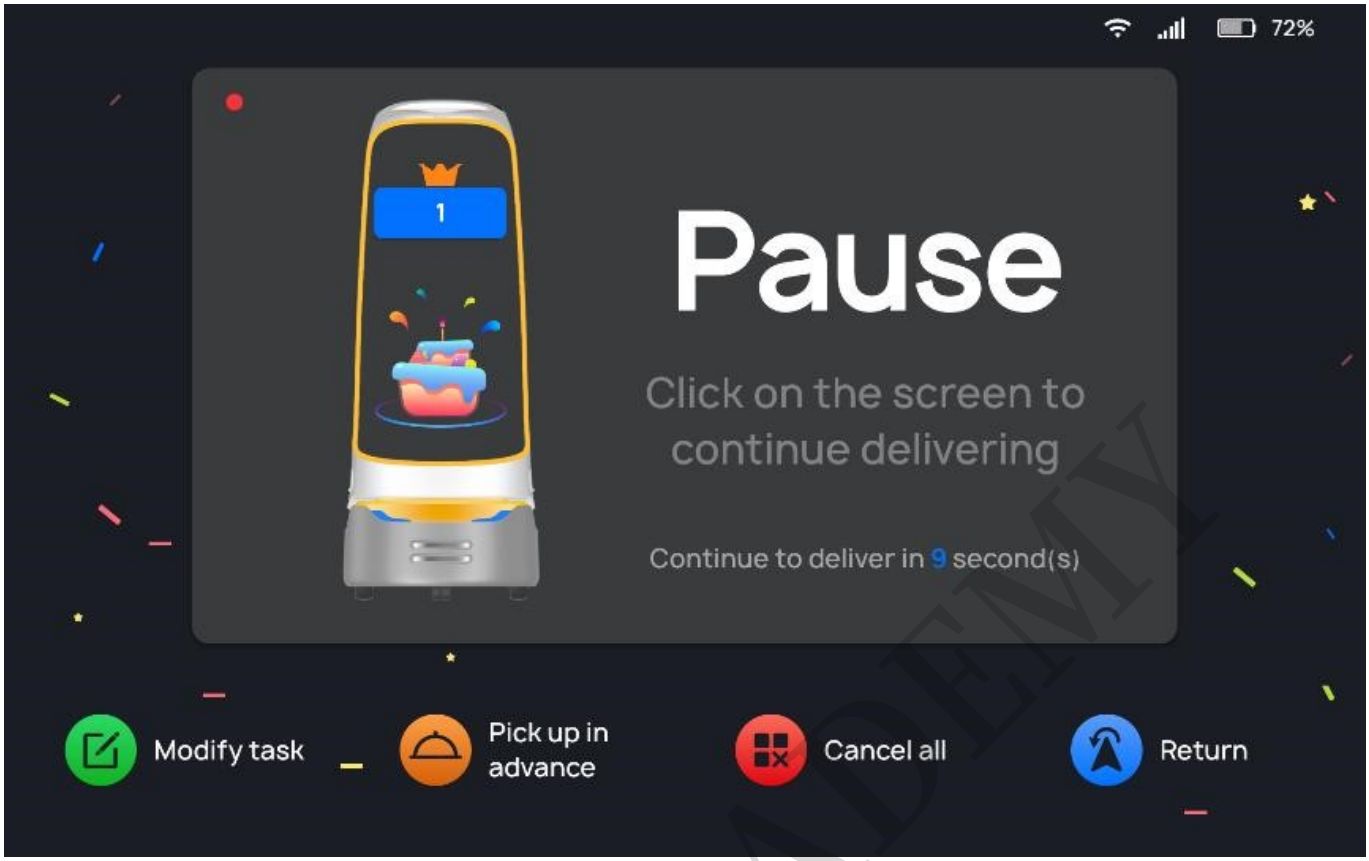
The robot arrives at the desired table along the predetermined path, and plays songs in the set playlist for Birthday Mode.

Step 4 Tap **Done** after the task is completed.

The robot returns to the pickup location.

After picking up the dishes, you can press the power switch to make the robot return to the pick-up location; you can also wave your hand 2 to 12 cm (0.79 to 4.72 inches) above the vision sensor (at the top of the robot) more than twice to make the robot return to the pick-up location when it detects the hand gesture.

To make any modifications during the delivery of birthday gifts (e.g., modify task, pick up in advance, cancel all, or return), tap the screen to pause the robot before any operation. If no operation is performed within 10 seconds, the robot will proceed with its current task.



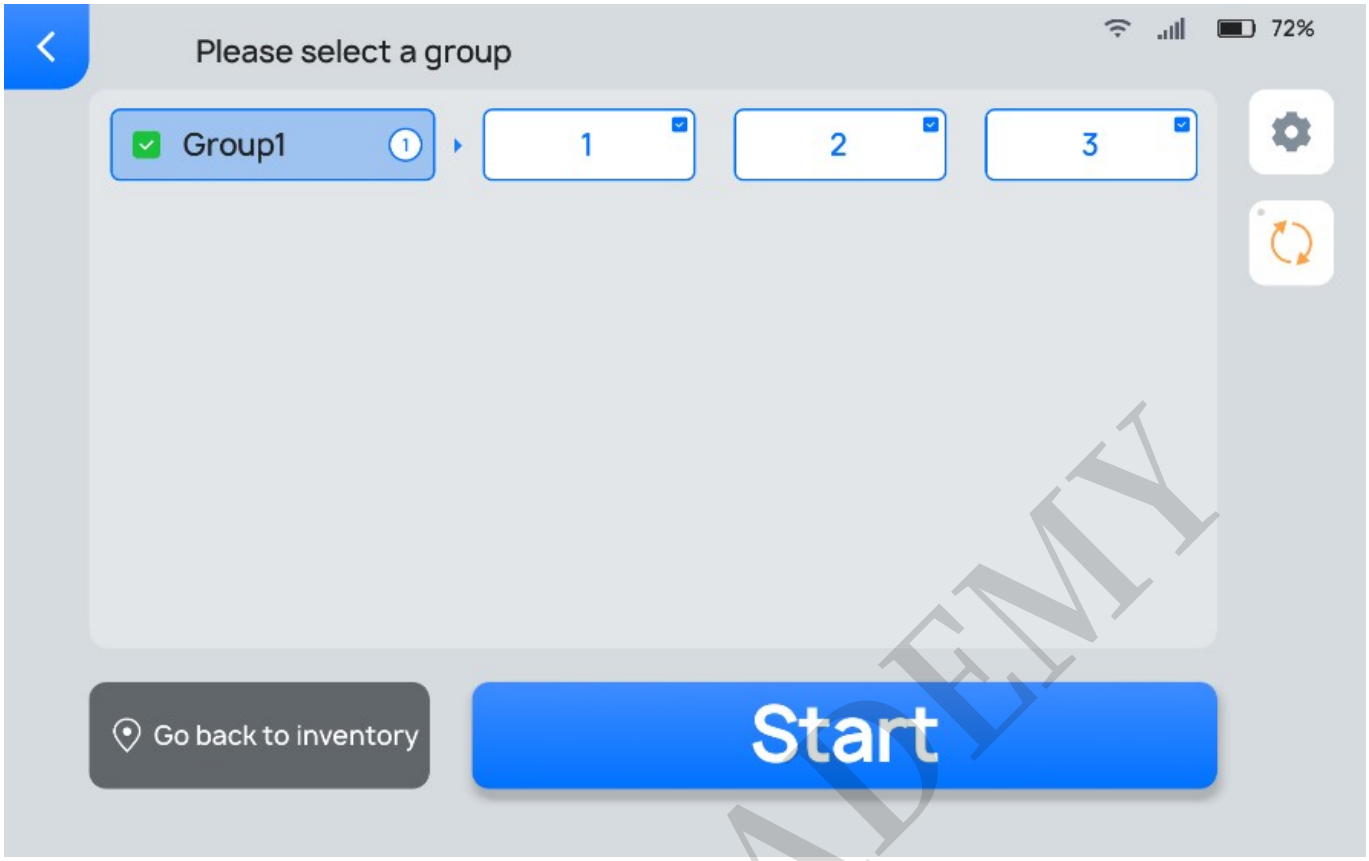
Button	Description
Modify task	Tap to modify the table number of delivery.
Pick up in advance	Tap to pick up the dishes in advance and return to the pickup location.
Cancel all	Tap to cancel the delivery task without returning to the pickup location.
Return	Tap to return to the pickup location.

3.7 Dish-Return Mode

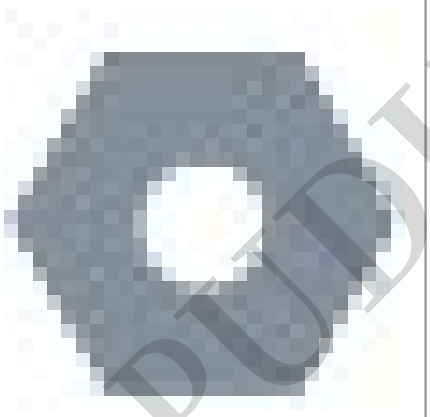
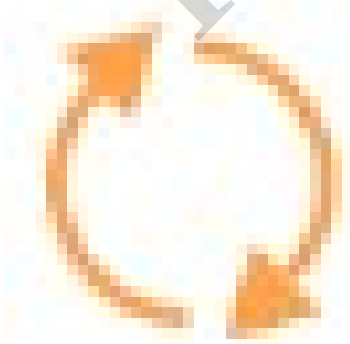
In Dish-Return mode, the robot collects dishes to be cleaned and delivers them to the dish-return location.

Step 1 Tap **Dish-Return** on the main interface.

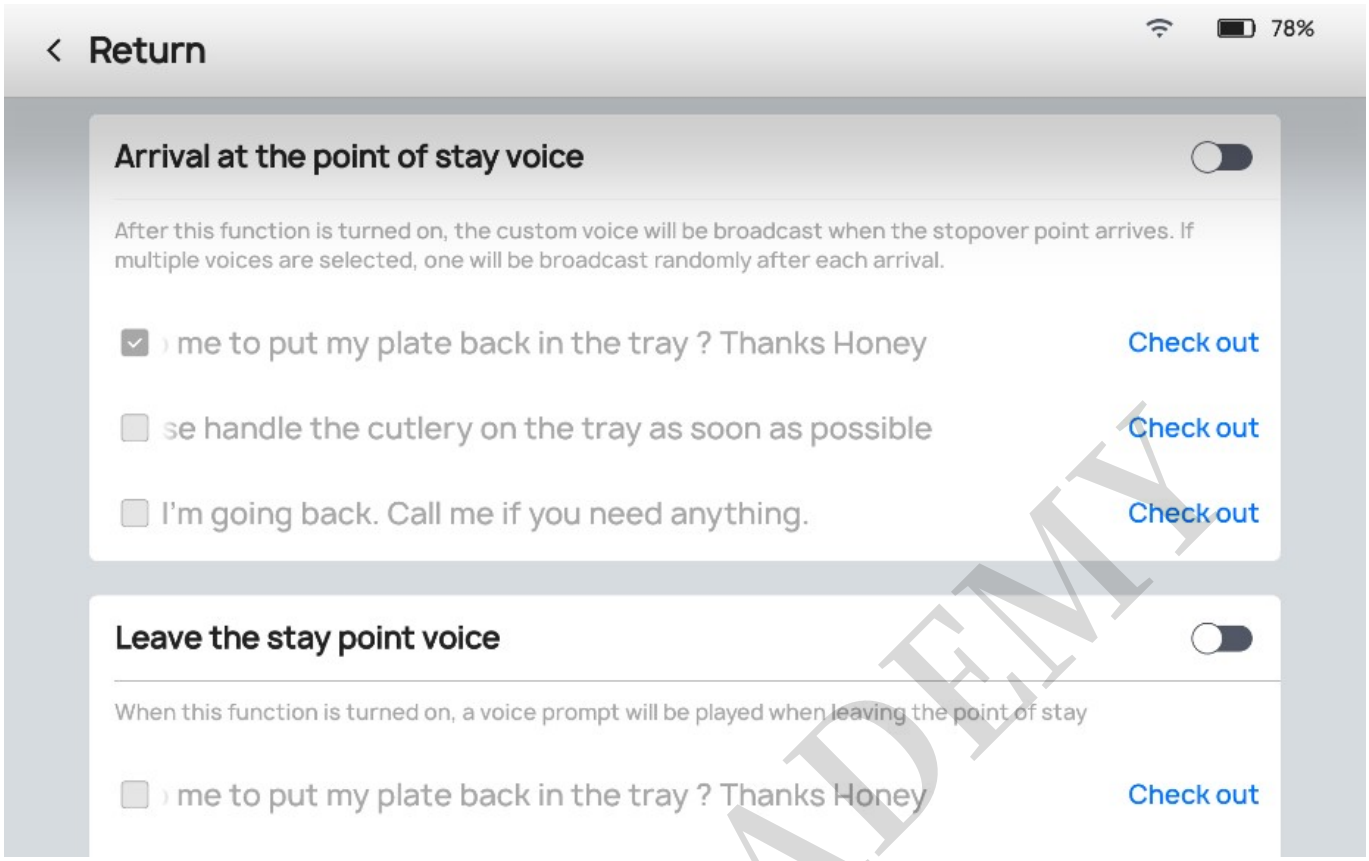
The Dish-Return Mode interface is shown below.



Shortcut buttons on the **Dish-Return Mode** interface are explained below.

Button	Description
	Set the voice for arrival at stay location, stay time at the stay location (desired table) in Dish-Return mode, etc. See the table below for details.
	Choose to enable cyclic Dish-Return. If enabled, after a dish-return task is performed, the robot will perform the task again without having to reselect.

The **Dish-Return Settings** interface and descriptions of the settings are shown below.



Dish-Return Settings	Description
Voice for arrival at stay location	Choose whether to enable **Voice for arrival at stay location**. If enabled, the selected custom voice will be played when the robot arrives at the stay location (desired table). You can select multiple voice announcements for the robot to play randomly every time the robot arrives at a stay location. Custom voices can be configured via the Business Management Platform.
Voice for leaving stay location	Choose whether to enable **Voice for leaving stay location**. If enabled, the selected custom voice will be played when the robot leaves the stay location (desired table). You can select multiple voice announcements for the robot to play randomly every time the robot leaves a stay location. Custom voices can be configured via the Business Management Platform.
Voice for arrival at dish-return location	Choose whether to enable **Voice for arrival at dish-return location**. If enabled, the selected custom voice will be played when the robot arrives at the dish-return location. You can select multiple voice announcements for the robot to play randomly every time the robot arrives at the dish-return location. Custom voices can be changed via the Business Management Platform.
Dish-Return Settings	Description
Number of Stays	Choose whether to enable **Number of Stays**. If enabled, you can set the number of tables that the robot will collect dishes from at a time. You may turn on this function when the robot serves a larger number of tables. The robot will return to the dish-return location after it has collected dishes from the preset number of tables, and then continue to collect the dishes from the remaining tables according to the preset **Number of Stays** after the collected dishes are picked up by the waiter. If disabled, the robot will return to the dish-return location only after it has collected plates from all tables.

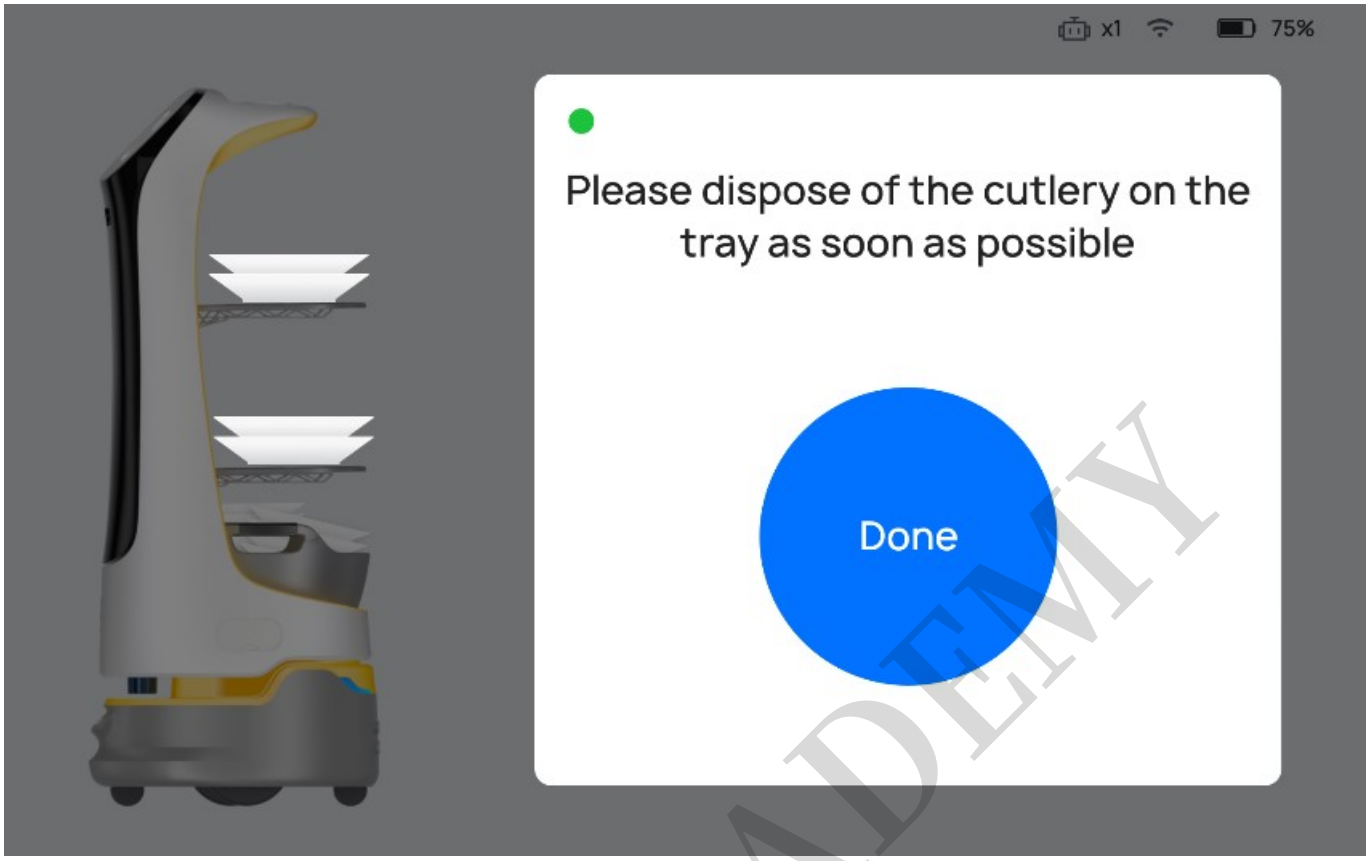
Dish-Return Settings	Description
Playback duration at stay location	Set the stay time at the stay location (desired table).
Select dish-return location	Select a dish-return location. The dish-return locations are obtained from the data of the selected map.

Step 2 Select the table number for the robot to collect dishes and tap **Start**.

The robot arrives at the specified table along the predetermined path.

Step 3 After arriving at the desired table, the robot will count down according to the set duration and issue a voice prompt. The waiter can then collect dishes following the screen display and voice prompt.

If the robot’s trays are full during a dish-return task, tap the screen and select **Go to dish-return location** to return the robot to the dish-return location. The waiter can then pick up the dishes following the voice prompts and the instructions on the interface when the robot arrives at the dish-return location. Tap **Done** and the robot will continue to complete the current unfinished dish-return task.



4 Settings

Settings	Description
Basic settings	Set screen brightness and language.
Network Settings	Set up the network connection. You can choose the cellular network or Wi-Fi network. The robot will connect to the Wi-Fi network first if both cellular and Wi-Fi networks are available. If the Wi-Fi signal is weak, the robot will automatically switch to the cellular network instead. The robot cannot upgrade or perform voice interaction without a network connection.
Bluetooth	Choose whether to enable **Bluetooth**. If enabled, the robot can connect to a Bluetooth speaker.
Map Settings	Create or modify existing maps, switch maps, and select pick-up locations, greeting locations, and customer attraction locations, etc.
Volume Settings	Adjust the music volume, voice volume, and key tone volume.
Voice Settings	Update the voice packet or select the tone.
Work plan	The user can develop work plans for the robot via the Business Management Platform. For example, the user may create tasks in advance for the robot to perform at a certain period according to the store’ s peak and off-peak traffic count. KettyBot will automatically go to the specified area to carry out the tasks set for the predetermined period without setting it up on the spot.
Music	Scan the QR code to import music for the robot to play during tasks. Only Android phones are supported.
Settings	Description

Settings	Description
Speed Settings	Set the speed of the robot in different modes. Speed range: 0.2m/s-1.2m/s (0.66 ft/s-3.94 ft/s).
Calling	Choose whether to enable Calling and set the call response time. If enabled, the robot can work with PuduBeeper and support third-party systems.
Home Functions	Choose whether to display robot functions on the main interface according to the actual scenario. All functions are displayed on the main interface by default..
Software Update	Check if the current version of the software is the latest. If not, you can download the latest version and upgrade the software. Please keep the battery level above 20% to ensure a successful upgrade.
Ad Screen Settings	Set the volume and brightness of the advertising screen. You can upload the advertising copywriting via the Business Management Platform.
About Us	Displays company service information, such as official website, robot operation guide, etc.
Debug	Debugging robot parameters (for technical engineers only). Pudu shall not be held responsible for any accident caused by unauthorized operation.

4.1 Map Settings

KettyBot allows you to create and modify maps on the robot itself. You can create or modify maps directly on the robot without using any mapping tools. Before creating or modifying a map, please contact our technical support for an authorization code.

Note

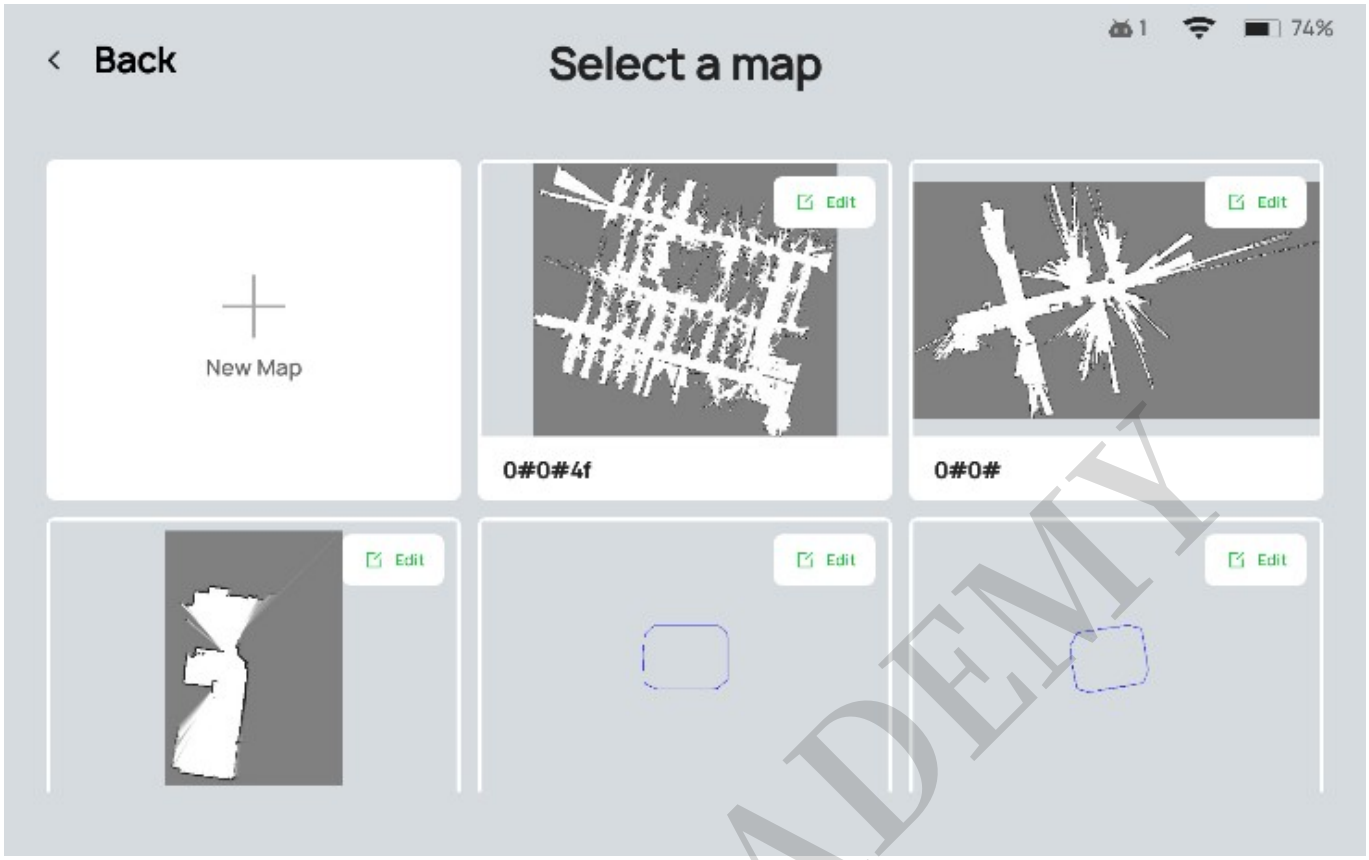
When modifying a map, in addition to expanding the map, you can also change the functions supported by the robot, the pick-up locations, the greeting locations, etc. Move the robot to the start point (startup location) before you start expanding the map. After the expansion is completed, return the robot to its start point. Otherwise, the map expansion will fail.

This section takes creating new maps as an example and assumes that ceiling markers are used for positioning. Please refer to 3.1 Mapping Instructions for the application requirements of ceiling markers.

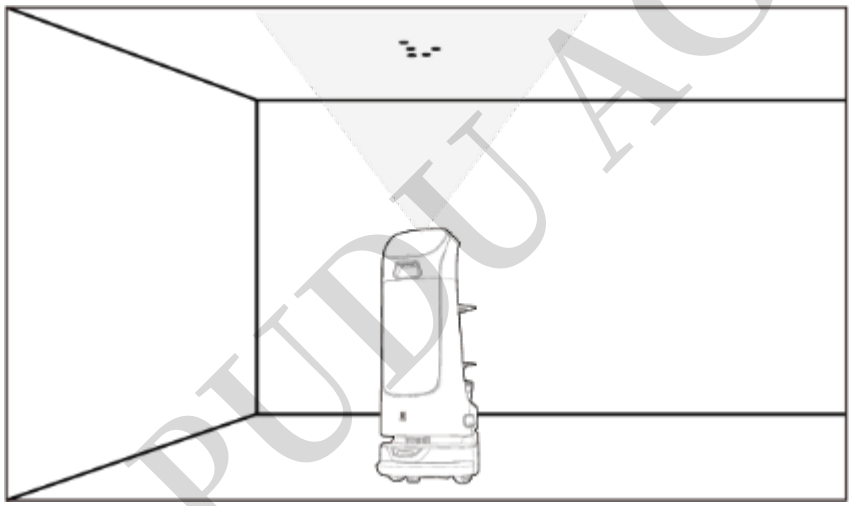
Operational steps

Step 1 Select **Edit Map** in the **Settings > Map Settings** interface and enter the authorization code.

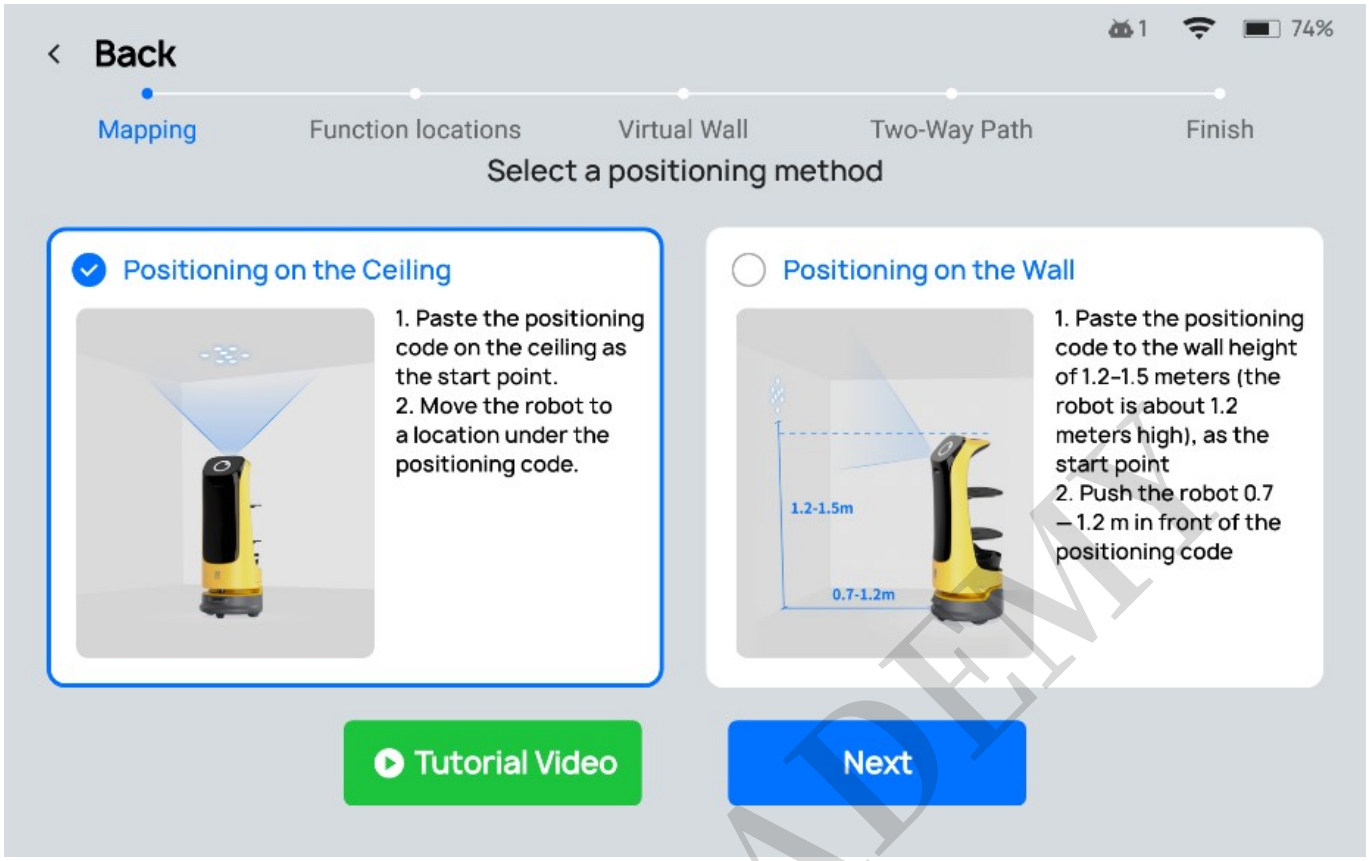
The Edit Map interface is shown below.



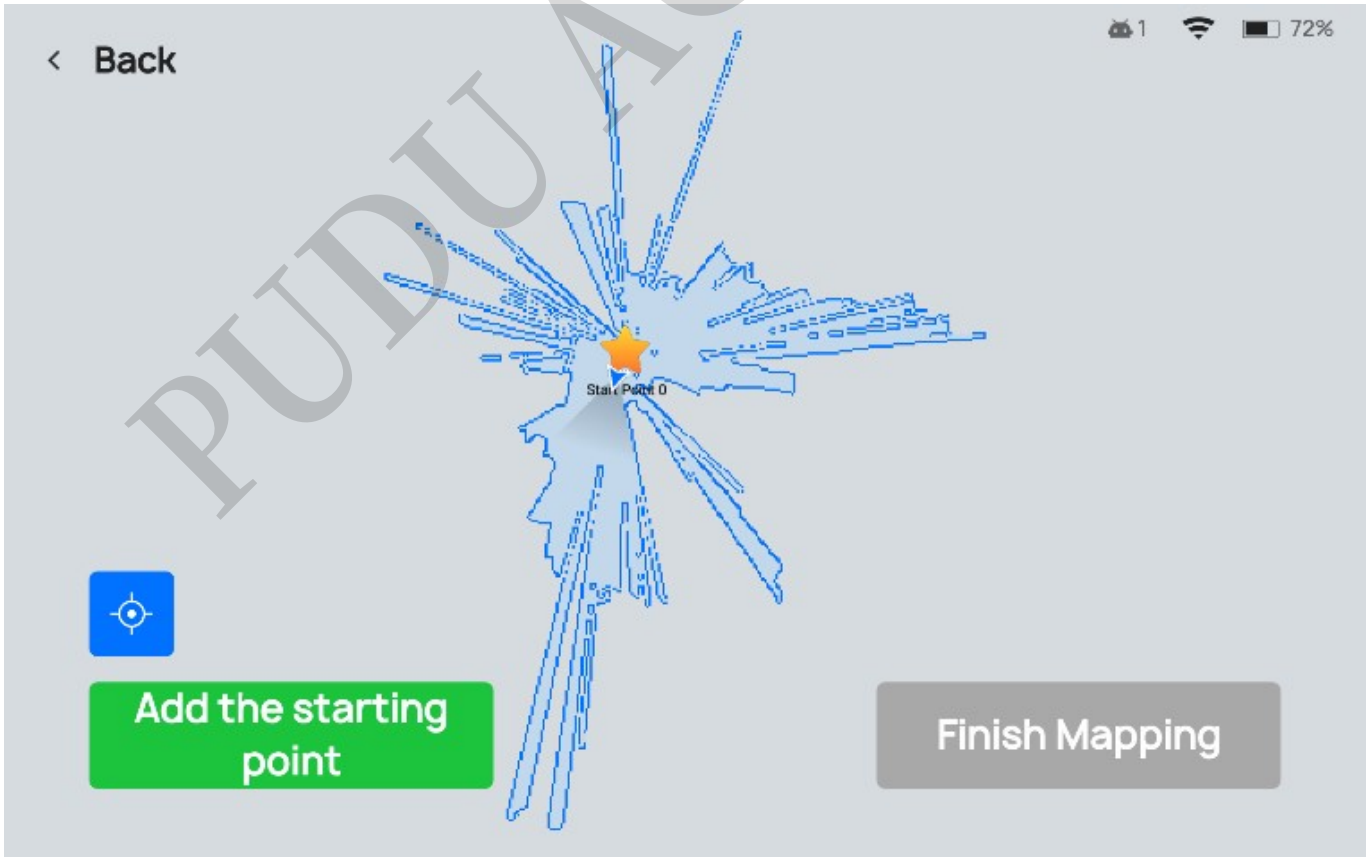
Step 2 Move the robot to a position right under the ceiling marker.



Step 3 Tap **New Map**, select **Positioning on the Ceiling** and then tap **Next**.



The Mapping interface is shown below, where you can set a start point as the startup location for the robot.



If you need to set more than one start point, you may place the robot under a different ceiling marker and tap **Add the start point**.

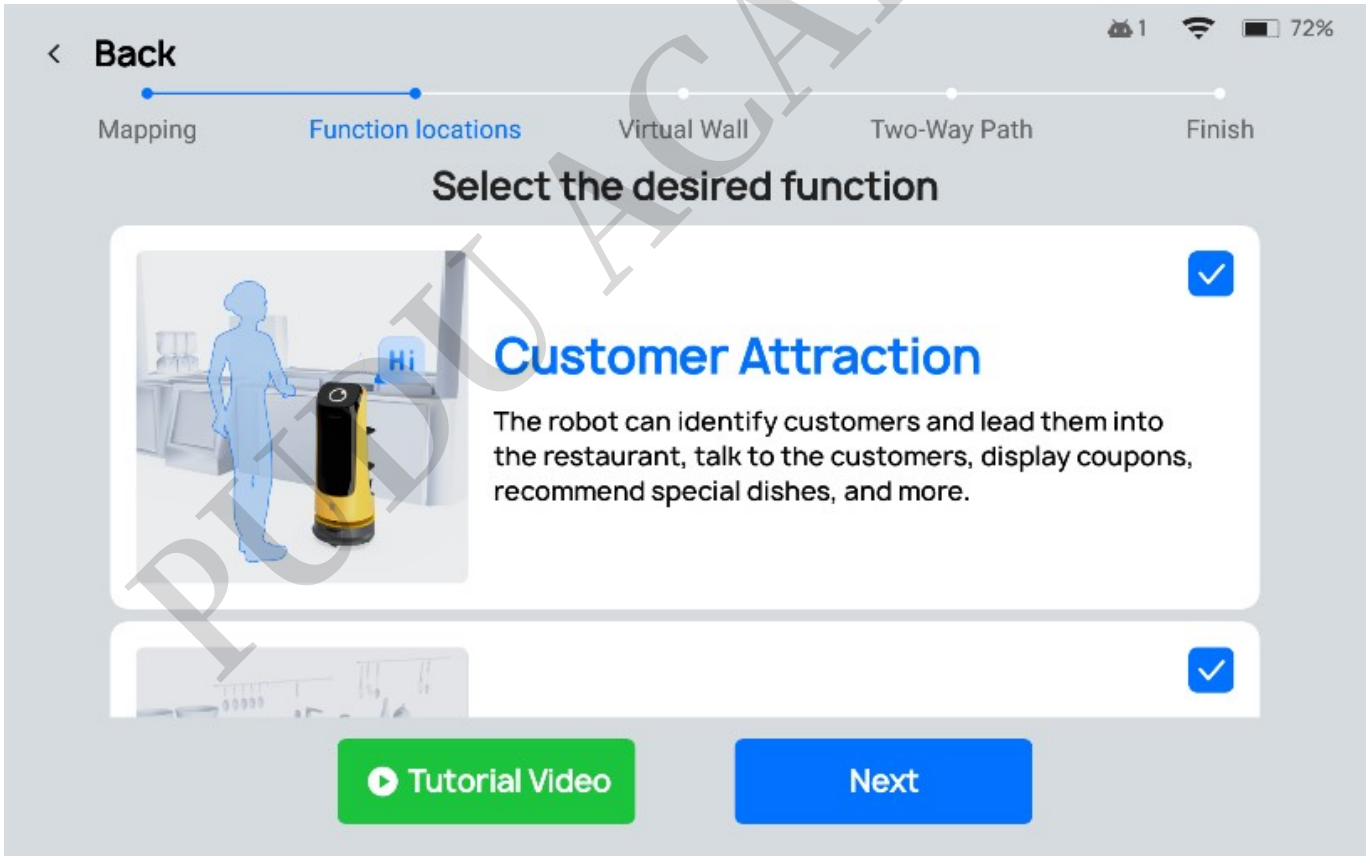
Step 4 Move the robot along the desired route, which will be recorded by the robot.

When the route recording completes, return the robot to the start point before tapping **Finish Mapping**.

 Caution

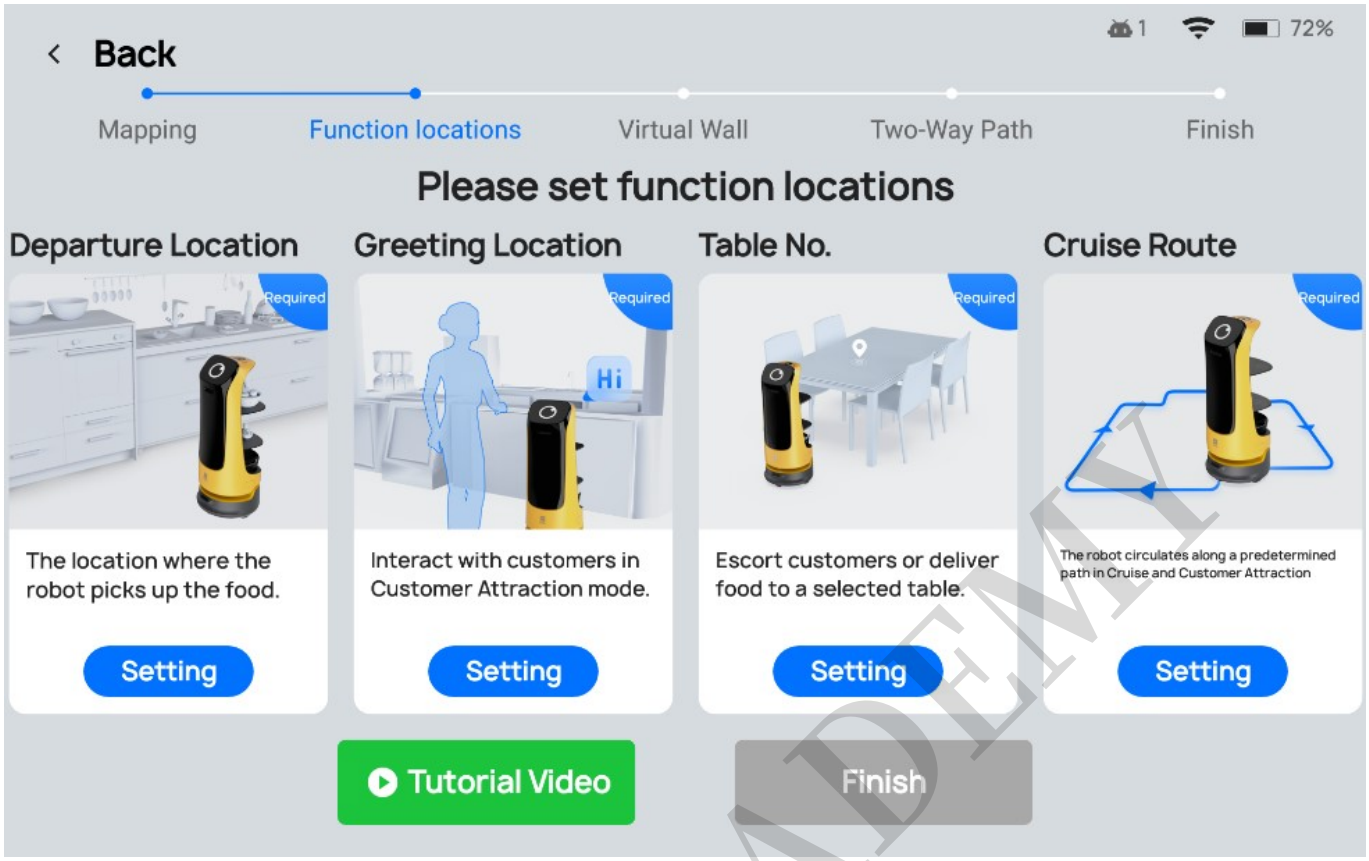
- During mapping, the operator must always stay behind the robot to ensure that the Lidar will not be blocked to avoid error when traveling for a task.
- To ensure mapping accuracy, make sure that the robot travels in the middle of its path and moves along the mapping route at least twice.

Step 5 Tap **Next** and scroll to select the functions that you need the robot to support, such as customer attraction and guiding. Please select the functions according to your actual needs.



Step 6 Tap **Next** to set up function locations, such as the pick-up locations, greeting locations, table number, cruise route, charging pile locations, and docking locations.

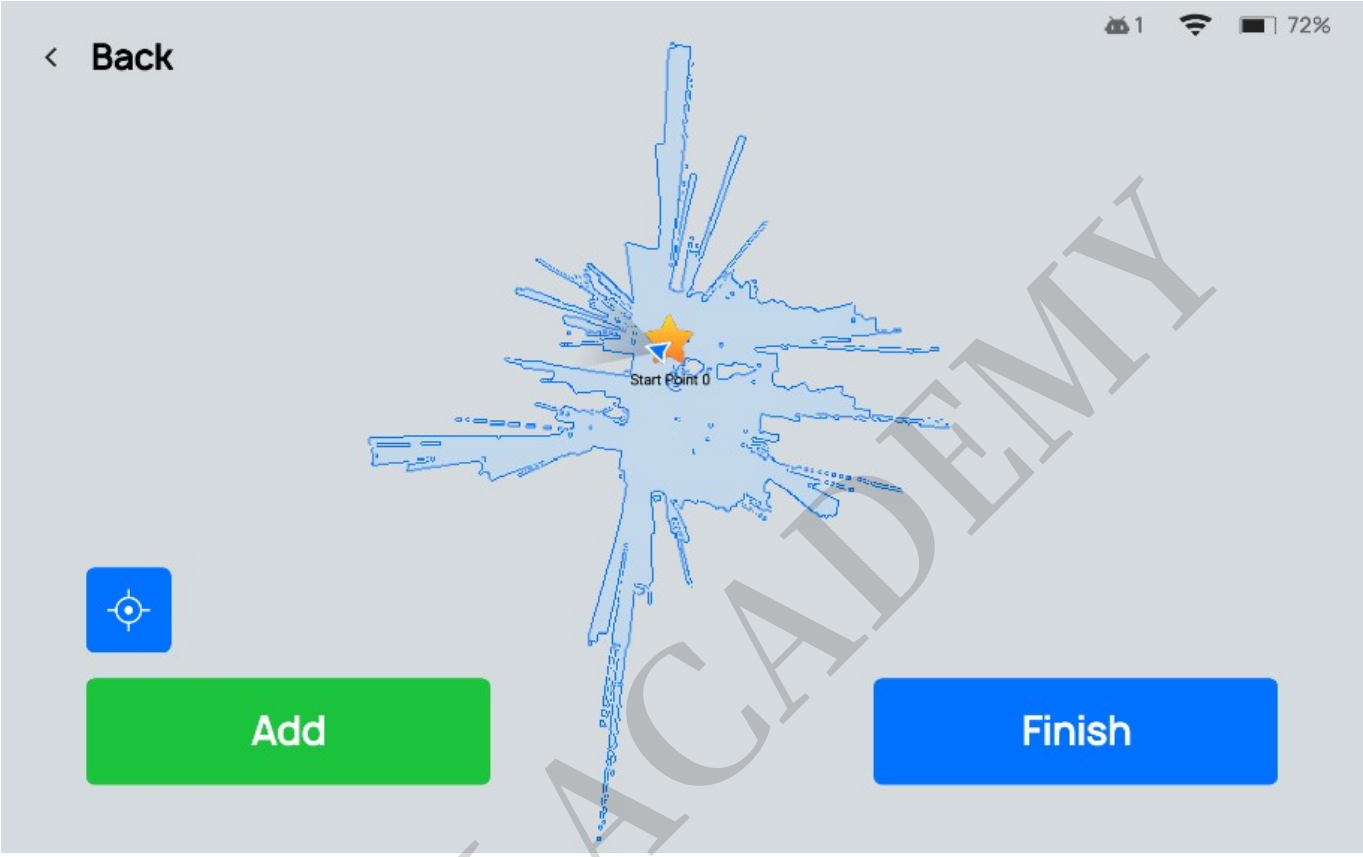
Please set up the locations according to your actual needs.



Function Location	Description
Pick-up Location	This location has to be set up for delivery. This is where the robot picks up food. You may set up multiple pick-up locations according to your actual needs.
Greeting Location	This location has to be set up for customer attraction or greeting. You may set up multiple greeting locations according to your actual needs. Ensure no obstacles exist within 1.2 m (3.94 ft) in front of the robot before setting up a greeting location.
Table No.	Table numbers have to be set up for delivery or guiding. You may group the table numbers according to your actual needs.
Cruise Route	The cruise route has to be set up for Cruise mode. You may set up multiple cruise routes according to your actual needs.
Dish-return location	This location has to be set up for dish-return. This is where the robot returns dishes. You may set up multiple dish-return locations according to your actual needs.
Temporary stop point	A temporary docking location has to be set up for an actual scenario where more than one robot works together. The robot may go to the temporary stop point when the pick-up location is occupied, and it will go to the pick-up location when the location is available. Ensure that the temporary stop point is more than 1 m away from the pick-up location.
Function Location	Description
Charging pile	Users who have purchased a charging pile can set up the charging pile location. Move the robot to a position 0.4 -1.2 m (1.3-3.94 ft) in front of the charging pile and face it to the pile. Otherwise, the charging pile location may fail to be set up.

Take the pick-up location as an example of how to set up a function location.

1. Move the robot to the position that you wish to set as the pick-up location and tap Setting in the Departure Location interface.
2. Tap Add, name the pick-up location and tap OK.



3. Tap Finish to finish setting up the pick-up location.

Step 7 Tap **Next**.

Step 8 (Optional) Set up a virtual wall. Move the robot right in front of the virtual wall and tap **Add** to outline the virtual wall on the map.

Restricted areas for the robot, such as stairs and glass doors, have to be set as virtual walls. You may skip this step if there are no restricted areas.

Step 9 (Optional) Set up a two-way path.

If the path the robot is traveling on is wider than 1.6 m (5.25ft), it will be identified by the robot as a two-way path and you need to set it up.

Step 10 Tap **Finish** to upload the map to the Pudu Cloud Platform.

The robot can then use this map for delivery, customer attraction, etc.

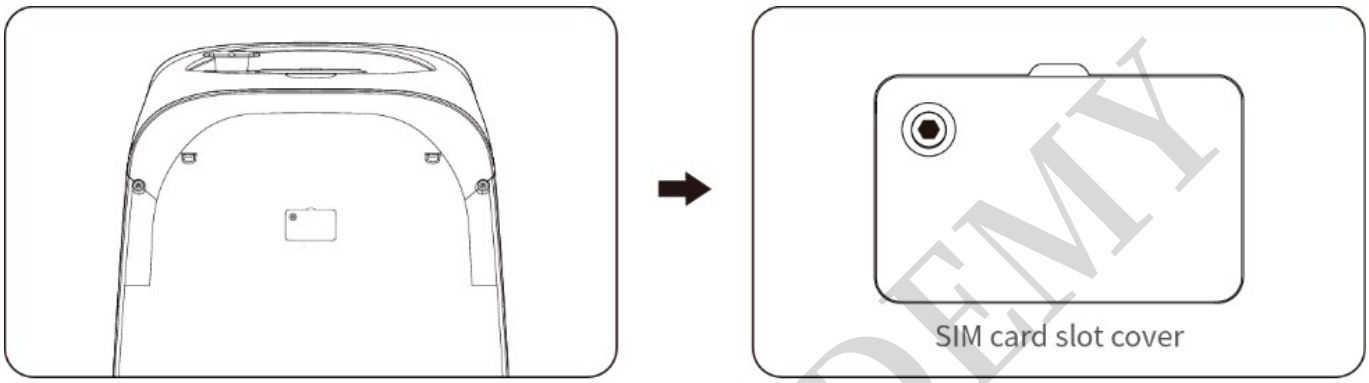
4.2 Cellular Network

Voice interaction, data upload, remote maintenance, and other functions of the robot require a network connection. The robot now supports Wi-Fi and cellular networks for you to choose from

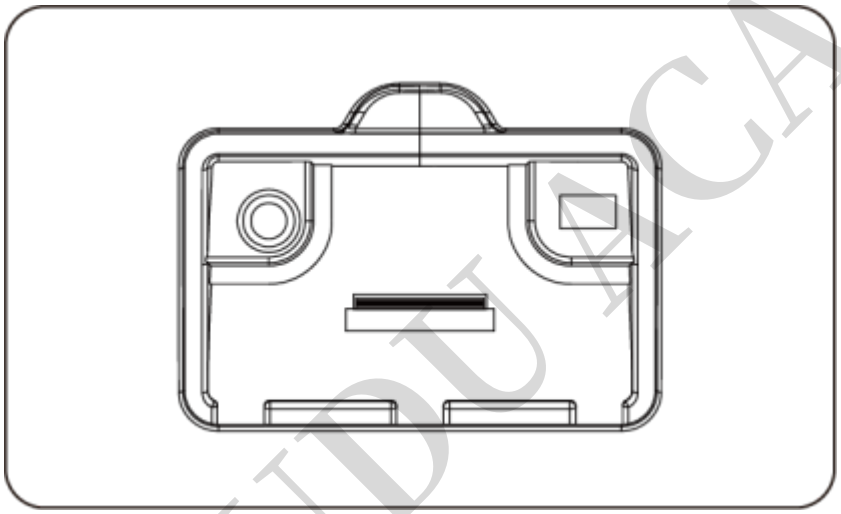
according to your actual needs. To use the cellular network, you have to install a 4G SIM card and turn on the cellular network first. The robot will connect to the Wi-Fi network first if both cellular and Wi-Fi networks are available. If the Wi-Fi signal is weak, the robot will automatically switch to the cellular network instead.

4.2.1 Install a SIM Card

Step 1 Remove the cover of the SIM card slot with a hex key.



Step 2 Insert a SIM card and reinstall the cover.



4.3 Turn on Cellular Network

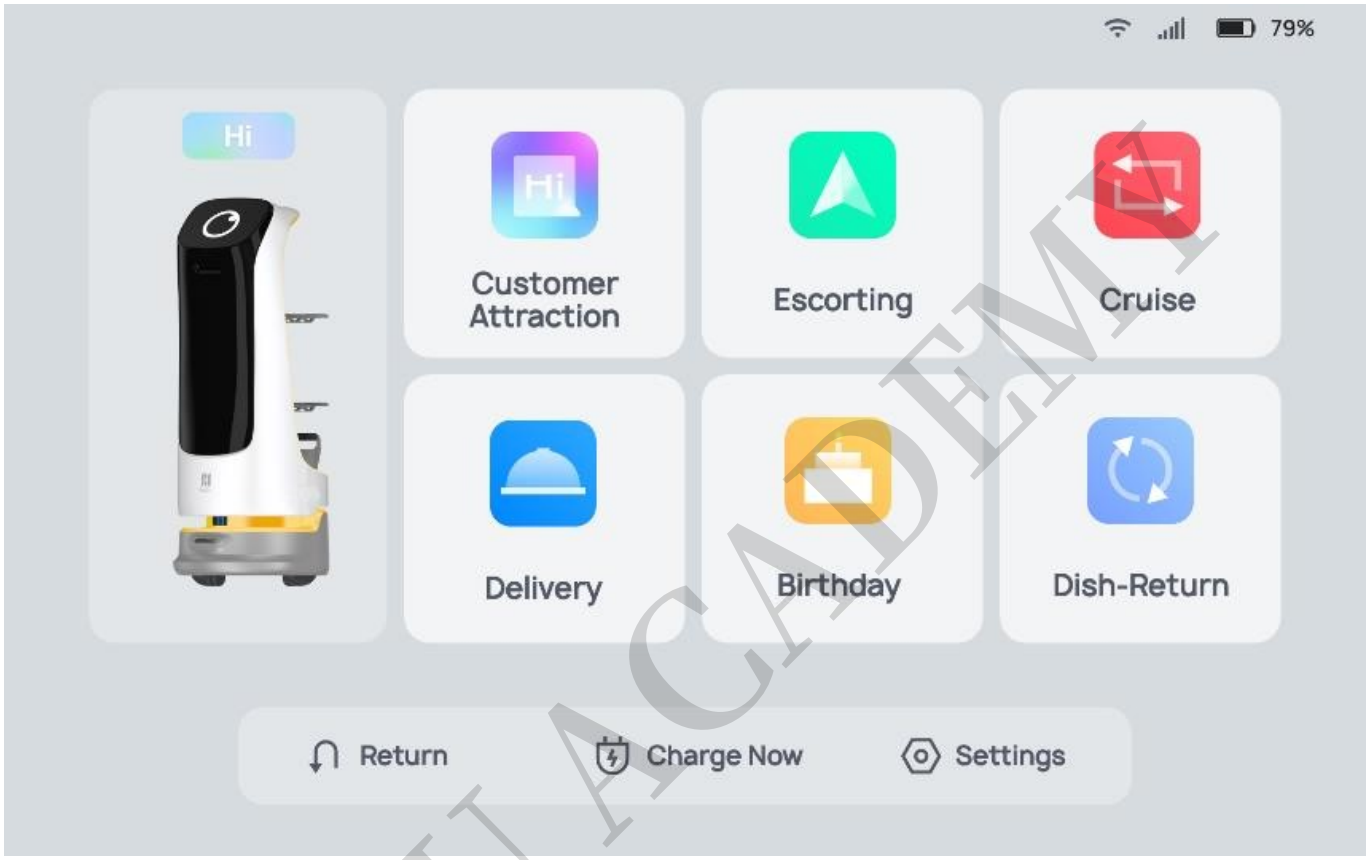
Turn on **Cellular Network** in the **Settings > Network Settings** interface. A 4G signal symbol will appear on the top bar.


Caution

Operations such as switching languages, importing music from mobile phones, and downloading pushed advertisements must be performed under a Wi-Fi network.

5 Auto Charging

KettyBot supports self-charging. If you have purchased a charging pile and have set up the pile's location during mapping, when the battery level of the robot falls below 10%, it will automatically return to the charging pile after the current task is completed. You may also tap **Charge Now** on the screen to return the robot to the charging pile for charging.



Note

The charging pile is an optional accessory and can be purchased separately.

6 Docking Instructions

KettyBot supports three docking modes. In actual scenarios where multiple robots cooperate, users can select any docking mode during mapping. This section only covers the description of the three docking modes. For details about mapping, please contact our technical engineers.

Three docking modes:

- One-to-one Docking mode: Each robot has its fixed pickup location (docking location).
- Free Docking mode: Set multiple pickup locations (docking locations) for the robot to dock by priority, i.e., the robot chooses the nearest pickup location for docking.
- Waiting mode: Set temporary docking location. When the robot has no task and there's no vacancy at the pickup locations (docking locations), the robot docks at the temporary docking location. Once a vacancy appears at a pickup location (docking location), the robot automatically goes there for docking.