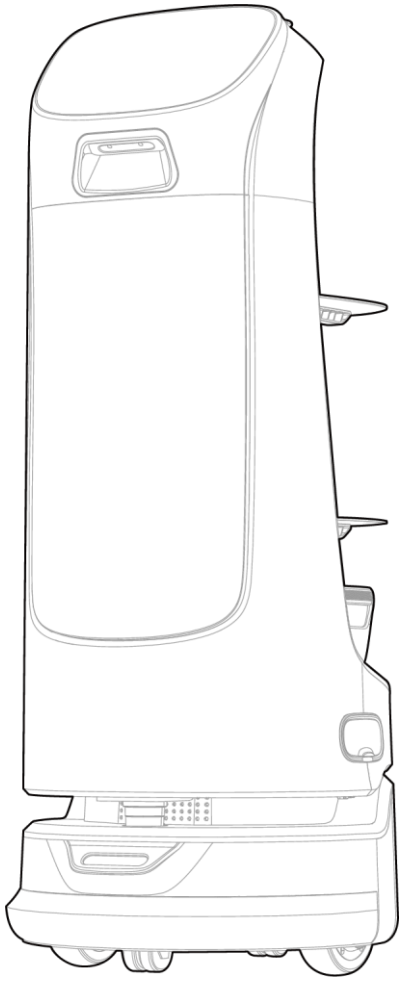

KettyBot PRO Operation Guide

Version: V1.1

Model: PNT

Shenzhen Pudu Technology Co., Ltd.

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Introduction

Purpose

This manual describes the functions, technical specifications, and detailed operations of KettyBot to help users better understand and work with the robot.

Audiences

This manual is intended for:

- Customers
- Sales engineers
- Installation and commissioning engineers
- Technical engineers

Revision History

Time	Revision History
2023/10/12	Initial release
2023/11/17	Revision of After-sales Policy

Signs

The signs listed below may appear in this manual with the following meanings.

Sign	Description
⚠Danger	Indicates high potential hazards, which could cause death or serious personal injury if not avoided.
⚠Warning	Indicates moderate or low potential hazards, which could cause minor personal injury or robot damage if not avoided.
⚠Caution	Indicates potential risks, which could cause robot damage, data loss, or unpredictable consequences if neglected.
🕮Note	Provides additional information as the emphasis and supplement to the main text.

Table of Contents

1. Safety Instructions 5
1.1 Power Usage 5
1.2 Robot Usage 5
1.3 Working Environment 6
2. Product Components 9
2.1 Overview 9
2.2 Appearance & Components 9
2.3 Specifications 10
3. How to Use 13
3.1 Mapping Instructions 13
3.2 Quick Start Guide 13
3.2.1 Power On 13
3.2.2 Power Off 14
3.3 Task Scenarios 15
3.3.1 Product Features 15
3.3.2 Delivery Mode 16
3.3.3 Cruise Mode 19
3.3.4 Guiding Mode 21
3.3.5 Customer Attraction Mode 24
3.3.6 Birthday Mode 27
3.3.7 Dish-Return Mode 29
3.4 Settings 32
3.4.1 Map Settings 33
3.4.2 Cellular Network 37
3.4.3 Turn on Cellular Network 38
3.5 Auto Charging 38
3.6 Docking Instructions 39
4. Troubleshooting 40
4.1 Troubles during Operation 40
4.2 Positioning Failure 40
4.3 Charging Failure 40

4.4 Power-on Failure....41
4.5 Robot Does Not Move Smoothly....41
5. Maintenance and Care....42
5.1 Component Maintenance....42
5.2 Cleaning Method....42
6. After-sales Service Policies....43
7. Compliance Information....45
7.1 Federal Communications Commission Compliance Statement....45
7.2 Industry Canada Compliance Statement....45
7.3 Disposal and Recycling Information....45

1. Safety Instructions

1.1 Power Usage

- Do not charge your robot using non-original chargers. If the charger is damaged, replace it immediately.
- When the battery drops to 20%, the robot should be charged timely. Running at a low battery for a long time may impair battery life.
- Make sure that the power voltage matches the voltage indicated on the charger, or it may cause damages to the charger.
- Unplug the charger timely after the charging cycle is complete. Do not leave the charger plugged in for a long time if the robot is fully charged.
- If the robot is not used for a long time, please turn the key switch in the battery box to OFF.
- Do not expose the charging pile to high temperatures or heating equipment, including sunshine, heaters, microwave ovens, and water heaters.
- Please dispose of the battery according to local regulations and do not dispose of it as household waste. Improper handling may cause the battery to explode.
- Please do not drop the battery, charging pile and charger or hit them with foreign objects to avoid damage.
- Do not use the battery or the charging pile if it is damaged.
- Designate a person to charge the robot. Do not charge the robot in an unattended manner.
- When using the charger, ensure that the fastener of the charging interface is fully engaged to avoid overheating during charging, which may cause burns or damage to the equipment.
- When using the charging pile, do not move the pile away from the designated place.
- Disconnect the robot from the charging pile when the indicator light on the pile turns red. Please use the charging pile after the indicator light turns blue. If the red light persists, contact Shenzhen Pudu Technology Co., Ltd. for technical support.
- In case of malfunction of the charging pile (e.g., smoke, burning smell), cut off the power supply of the pile immediately and contact Shenzhen Pudu Technology Co., Ltd. for technical support.

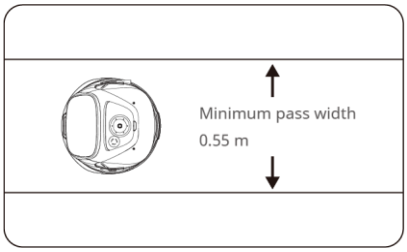
1.2 Robot Usage

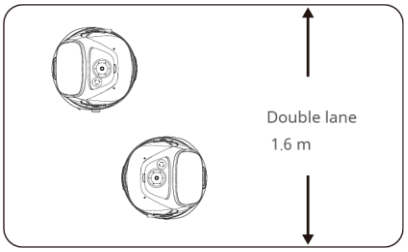
- Do not cover the robot's top camera while it is working to prevent it from moving abnormally. If the camera is covered, pause the current task and move the robot to the correct route before continuing the task.
- Do not clean or maintain the robot when it is powered on and working.
- Do not put open-flame stoves or any flammable and explosive articles on the robot.

- Do not pick or place dishes while the robot is moving to avoid any food loss or personal injury caused by accidental collision.
- To avoid damage to the robot, please ensure that no scattered power cords and sharp objects such as decoration wastes, glass, and nails are on the ground.
- When the robot is in motion, no playing is allowed in front of the robot to avoid unnecessary harm.
- Do not move or transport the robot while it is working to prevent it from moving abnormally.
- In case of emergency, stop the robot by pressing the emergency stop button on the top.
- The robot must not be disassembled or repaired by untrained personnel. In case of malfunction, contact Shenzhen Pudu Technology Co., Ltd. for technical support in time.
- Observe the maximum weight a person is allowed to lift as required by local laws and regulations when transporting the robot. Keep the robot upright during transportation. Never attempt to transport it by lifting the tray or the box.
- Do not spill any liquid into the robot to avoid any damage.
- Although the robot features automatic obstacle avoidance, never block the robot moving at a high speed to avoid any accidents.
- If the collision sensor is hit while the robot is moving, the robot will stop moving and pause the task. At this time, you can resume the task according to the interface guidelines.
- Please prevent the robot from violent impact or shock to avoid any damage.
- Do not clean the robot with caustic chemicals, cleansers, or detergents. Always clean the robot by wiping it with a clean and dry cloth.

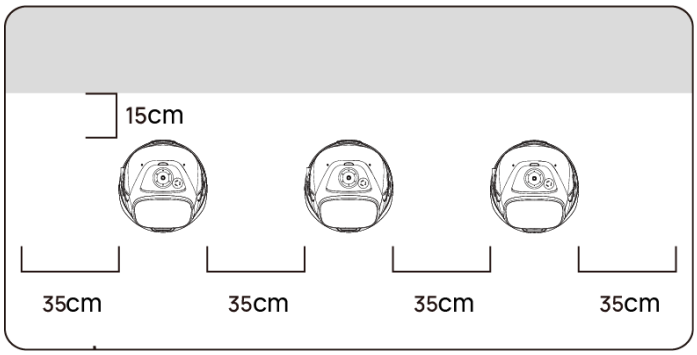
1.3 Working Environment

- Do not use or charge the robot in a high temperature/pressure environment, areas with fire or explosion hazard, or other dangerous scenarios to avoid personal injury or robot damage.
- The robot can only be used in an indoor environment on a flat and smooth surface with a slope less than 5 °and protrusions not more than 0.5cm (1.97in) high.
- Do not use the robot in a humid environment or on surfaces covered with fluid or gooey stuff to avoid damage to the robot.
- Do not use the robot in places where the use of wireless devices is explicitly prohibited, otherwise it may cause interference to other electronic devices or lead to other dangers.
- The minimum travel width for a single robot is 0.55m (1.80ft). The travel width is recommended to be greater than 1.6m (5.25ft) when two robots pass head-on.

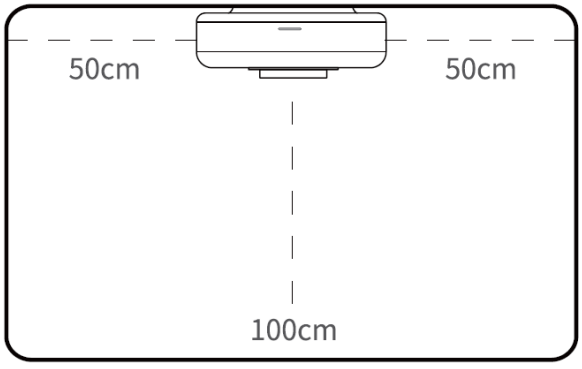




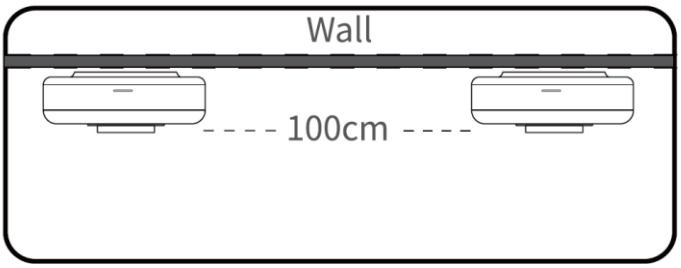
- There is a 35cm (13.78in) space between the two robots placed side by side at the standby point, and a clearance of 15cm (5.91in) from the rear wall and 35cm (13.78in) from the side wall.



- Things that are black (e.g., skirting line), polished, or transparent (e.g., French window) at the height of 14cm to 22cm (5.51-8.66in) may interfere with the radar reflection and cause abnormal movement of the robot. Such sites should be modified (e.g., posting stickers). Please contact Shenzhen Pudu Technology Co., Ltd. for technical support
- The maximum climbing angle of the robot is 5 °. Do not pause the robot on the slope to avoid any sliding of the robot that may cause loss of dishes.
- Do not dispose of the robot or its accessories as household waste. Always dispose of the robot and its accessories according to local laws and regulations, and recycle wherever possible.
- The charging pile should work in an open, unobstructed space (100cm (39.37in) clearance in front and 50cm (19.69in) clearance on both sides).



- When multiple charging piles are working at the same time, they should be placed at 100cm (39.37in) intervals.

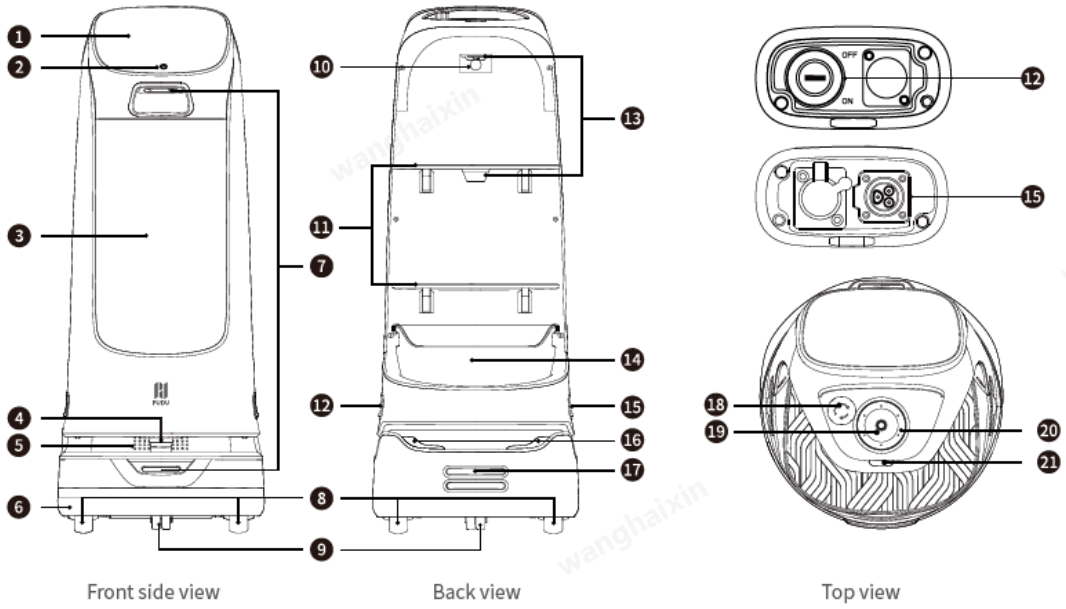


2. Product Components

2.1 Overview

KettyBot is a delivery and reception robot with a large advertising screen that supports SLAM positioning and navigation solutions integrating both visual and laser positioning. Its superior trafficability of only 55cm (21.65 in) allows it to move around effortlessly in complex and crowded environments. As a versatile all-rounder for marketing, customer attraction & acquisition, greeting & guiding, food delivery, voice interaction, and more, KettyBot is suitable for use in restaurants, hotels, supermarkets, and many other business scenarios.

2.2 Appearance & Components



No.	Description
1	LCD screen
2	Front positioning camera
3	Advertising screen
4	Lidar
5	Audio equipment
6	Collision sensor
7	Depth vision sensors
8	Drive wheels

9	Auxiliary wheels
10	SIM card slot cover
11	Trays
12	Key switch
13	Pallet detection sensor
14	Dish-return box
15	Charging electrode plate
16	Light strip
17	Charging electrode plate
18	Emergency stop switch
19	Vision sensor
20	Mic circular array kit
21	Power switch

Buttons:

Button	Description
Power switch	Press and hold the power switch for 1 second to power on. Press and hold the power switch for 3 seconds to power off as instructed on the screen.
Emergency stop switch	In case of emergency, press the emergency stop switch to stop the robot. Rotate the emergency stop switch clockwise, and resume the operation according to the screen tips.
Key switch	Control the power supply of the robot. Make sure the power supply is **ON** before charging or powering on the robot.
Collision sensor	In order to avoid accidental injury, if the collision sensor is hit while the robot is moving, the robot will stop moving and pause the task. In this case, you can resume the task according to the interface operating guidelines.

2.3 Specifications

Feature	Description
Model	PNT
Operating voltage	DC 25.6V

Power input	AC 100-240 V, 50/60 Hz
Power output	29 V/ 8 A
Battery capacity	20 Ah
Charging time	3.5 h
Charging mode	Manual and auto charging
Battery life	9 h (None load)
Cruise speed	0.2-1.2 m/s (1.64-3.93 ft/s)(adjustable)
Navigation	Laser and visual integrated SLAM positioning
Min. travel width	55 cm (21.65 in)
Max. surmountable height	5 mm (0.20 in)
Max. climbing angle	5 °
Tray dimensions	352 mm × 340 mm (13.86×13.39 in)
No. of trays	Two trays and one dish-return box
Height between trays	From top to bottom: 248 mm/253 mm/223 mm (9.76 in/9.96 in/8.78 in)
Tray load	10 kg/layer
Machine material	ABS/aviation grade aluminum alloy
Robot weight	38 kg (83.78 lbs)
Robot dimensions	435 mm × 450 mm × 1120 mm (17.13×17.72×44.09 in)
Screen size	10.1-inch LCD screen and 18.5-inch LCD screen (advertising screen)
Operation system	Android
Microphone	6-mic circular array kit
Speaker power	2 × 10 W stereo speakers
Service life	5 years
Working environment	Temperature: 0 ℃ to 40 ℃ (32 °to 104 °F) RH: ≤ 85%
Storage environment	Temperature: -40 ℃ to 65 ℃ (-40 °to 149 °F) RH: ≤ 85%
Working altitude	< 2000 m (6561.68 ft)

Ground surface standard	Indoor environment, flat and smooth ground	
IP rating	IP20	
Frequency band range	Wi-Fi	2.4G Wi-Fi: 2412–2472 MHz, 2422–2462 MHz 5.2–5.6G Wi-Fi: 5180–5320 MHz, 5500–5700 MHz, 5190–5310 MHz, 5510–5670 MHz, 5210–5290 MHz, 5530–5610 MHz 5.8G Wi-Fi: 5745–5825 MHz, 5755–5795 MHz, 5775 MHz
	Bluetooth	2402–2480 MHz
	3G	B1/B8
	4G	B1/B3/B7/B8/B20/B28/B34/B38/B40
Max. transmit power	Wi-Fi	2.4G Wi-Fi: 17.48 dBm 5.2–5.6G Wi-Fi: 13.35 dBm 5.8G Wi-Fi: 13.85 dBm
	Bluetooth	LE: 5.96 dBm BDR/EDR: 8.49 dBm
	3G	B1: 23.56 dBm B8: 23.43 dBm
	4G	B1: 23.49 dBm B3: 23.96 dBm B7: 24.33 dBm B8: 23.45 dBm B20: 23.36 dBm B28: 23.81 dBm B34: 23.32 dBm B38: 24.76 dBm B40: 23.25 dBm

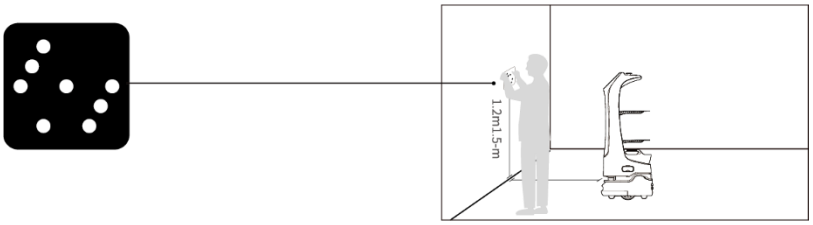
3. How to Use

3.1 Mapping Instructions

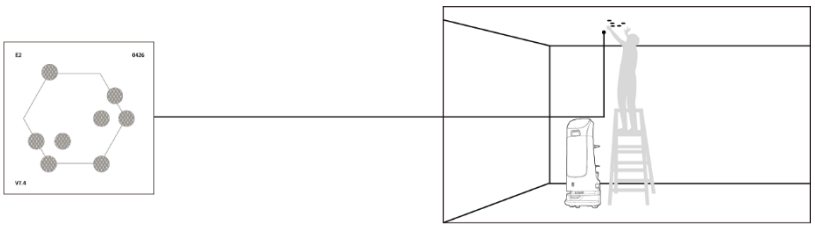
KettyBot supports creating new maps on the robot itself. When the robot is first started, you can create new maps directly on the robot without using any mapping tools.

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.



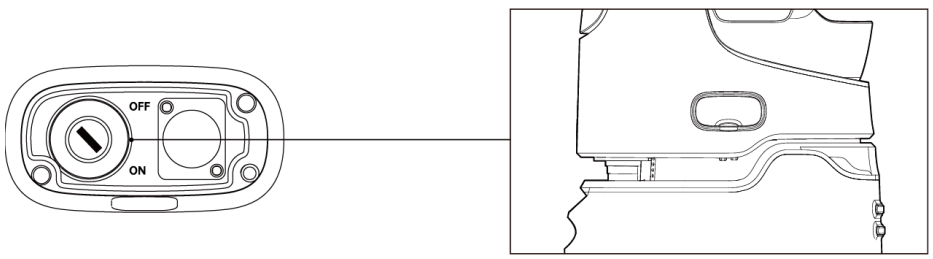
📖Note

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

3.2 Quick Start Guide

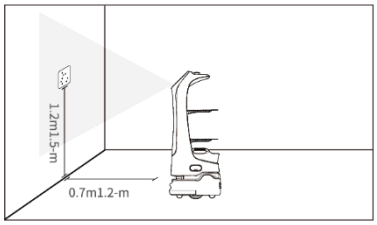
3.2.1 Power On

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

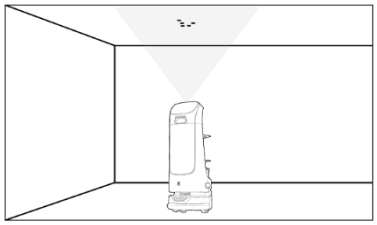


Step 2 Move the robot to the startup location.

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

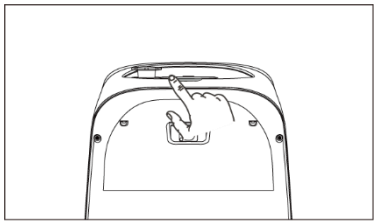


- If you are using a ceiling marker, the startup location is shown as follows:



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.



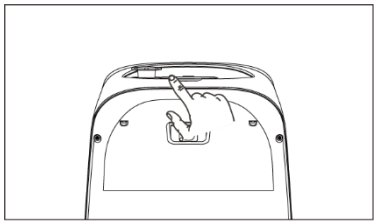
Note

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.

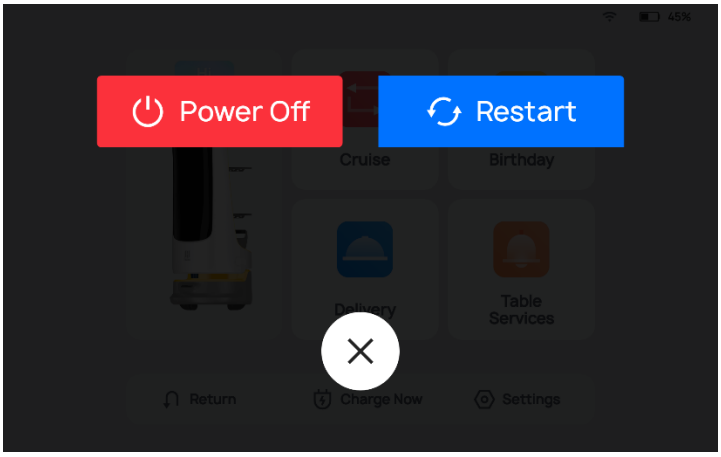
Step 4 The robot is powered on, let's try it out!

3.2.2 Power Off

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

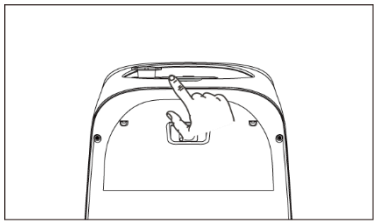


The screen will pop up the **Power Off** and **Restart** options.



Step 2 Tap **Power Off**.

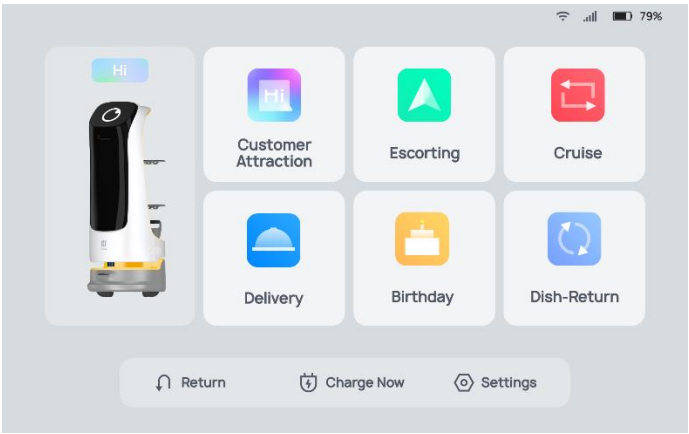
The bottom light strip and screen will go off, indicating that the robot is powered off.



3.3 Task Scenarios

3.3.1 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.

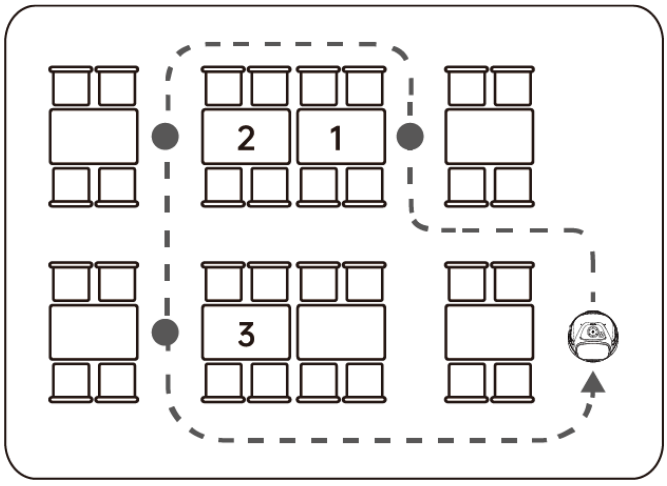
Mode	Description
Cruise mode	The robot circulates along a predetermined path with self-service drinks, desserts or napkins, and recommends them to customers by voice.
Customer attraction mode	The robot can play speech to attract customers when it detects passers-by in the attraction area. Customers can 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 (0.66 ft/s) or 0.6m/s (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.

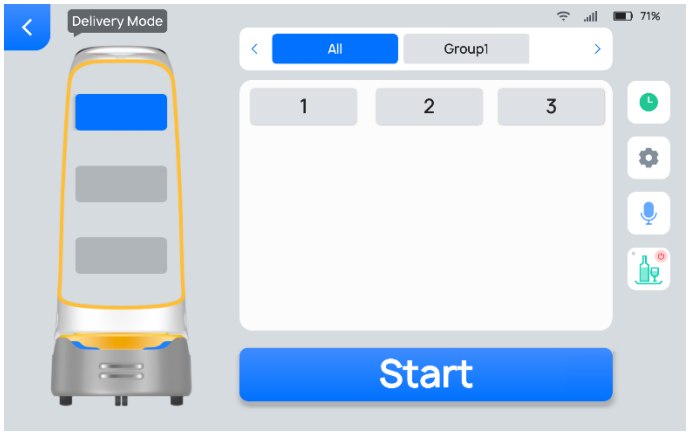
3.3.2 Delivery Mode

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



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

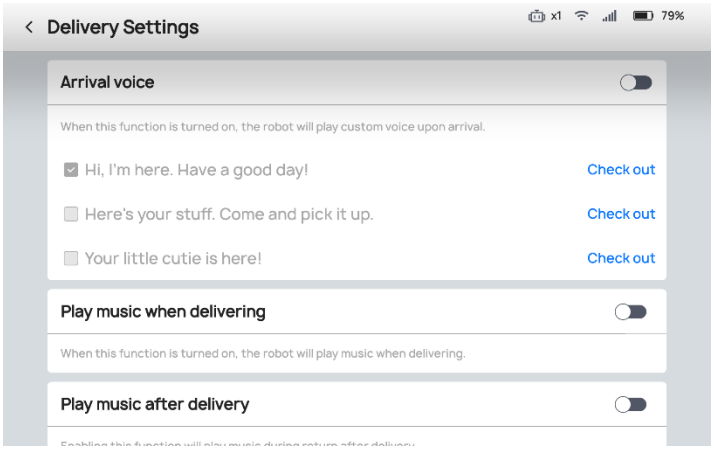
The Delivery Mode interface is shown below.



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.
	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.

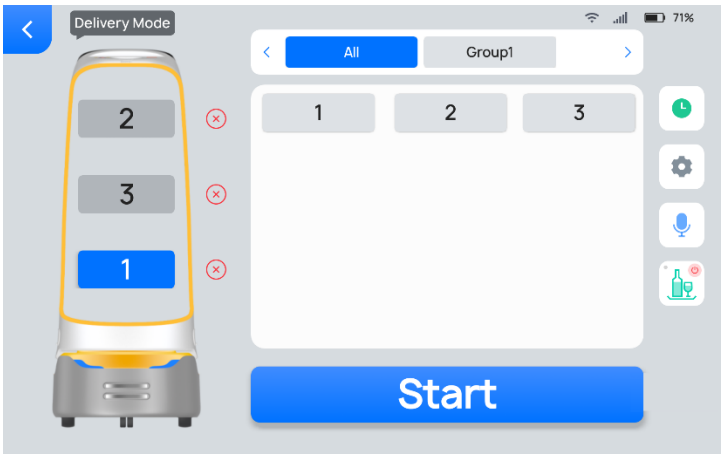


Delivery Settings	Description
Arrival voice	Choose whether to enable **Arrival voice**. If enabled, the selected custom voice will be played upon delivery arrival. Custom voices can be configured via the Business Management Platform.
Play music when delivering	Choose whether to enable **Play music when 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**.

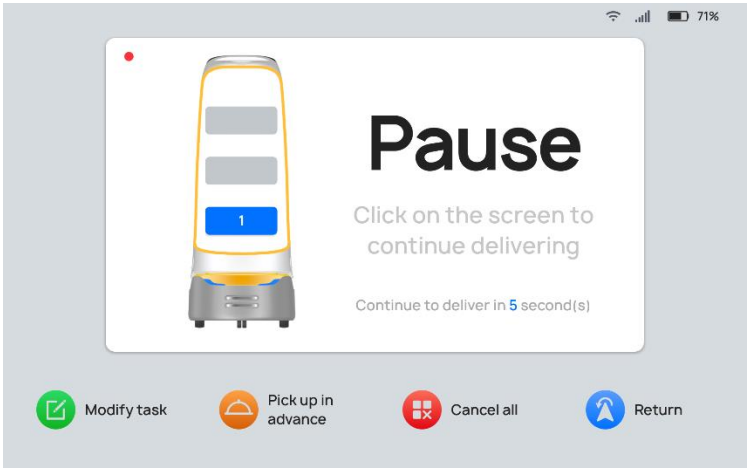
The robot arrives at the specified table along the predetermined path.

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.

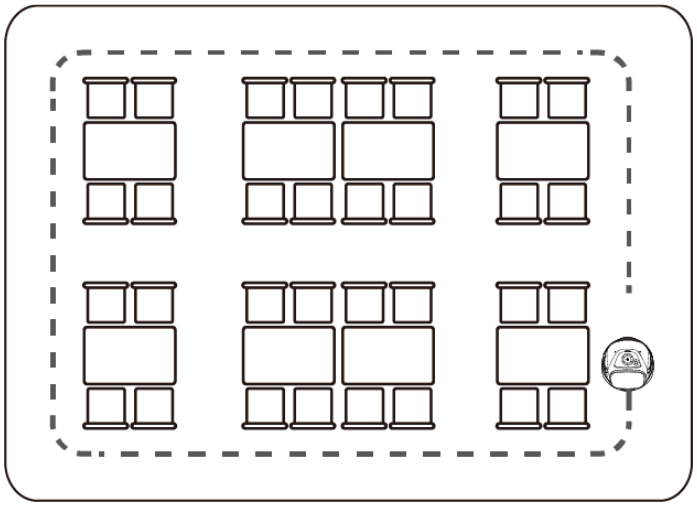
To make any modifications during delivery (e.g., modify task, pick up in advance, cancel all, or return), tap the screen on the robot's head to pause the robot before any operation. If no operation is performed within 10 seconds, the robot will proceed with its current task.



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.

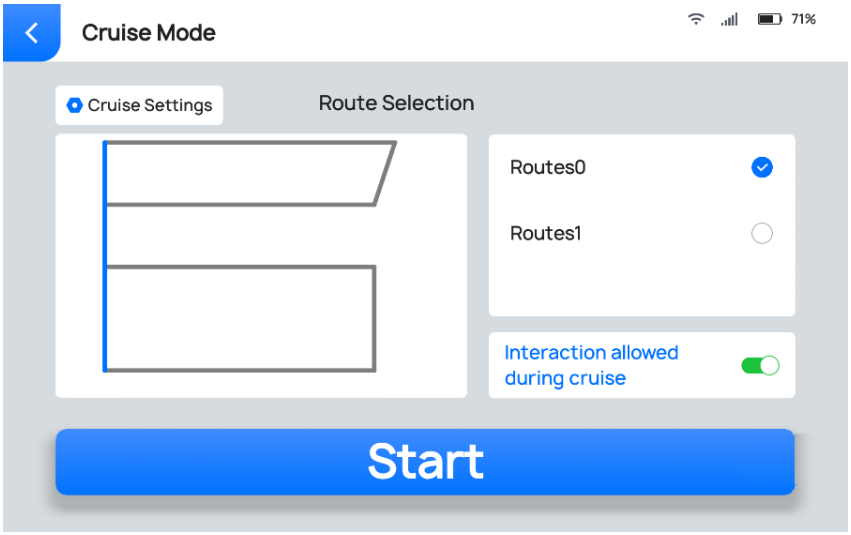
3.3.3 Cruise Mode

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



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

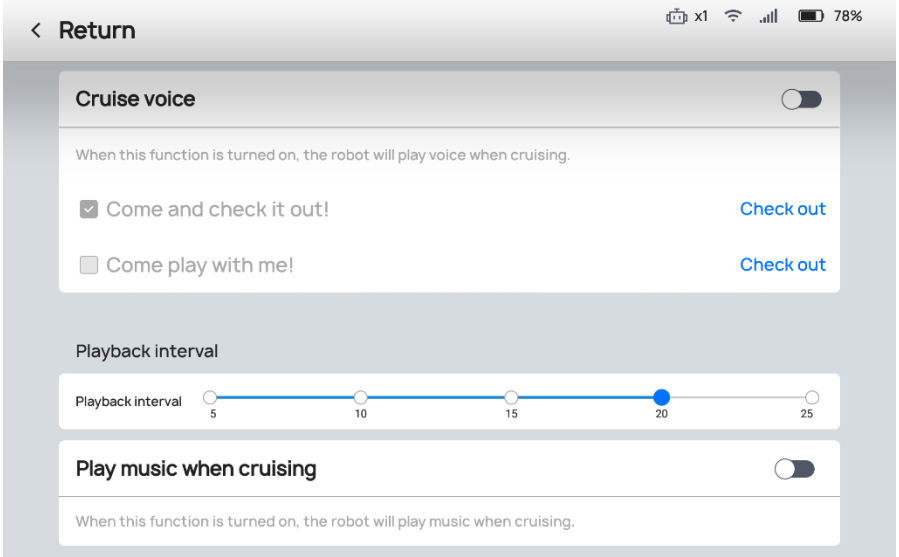
The **Cruise Mode** interface is shown below. The cruise route is shown in blue on the map.



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.

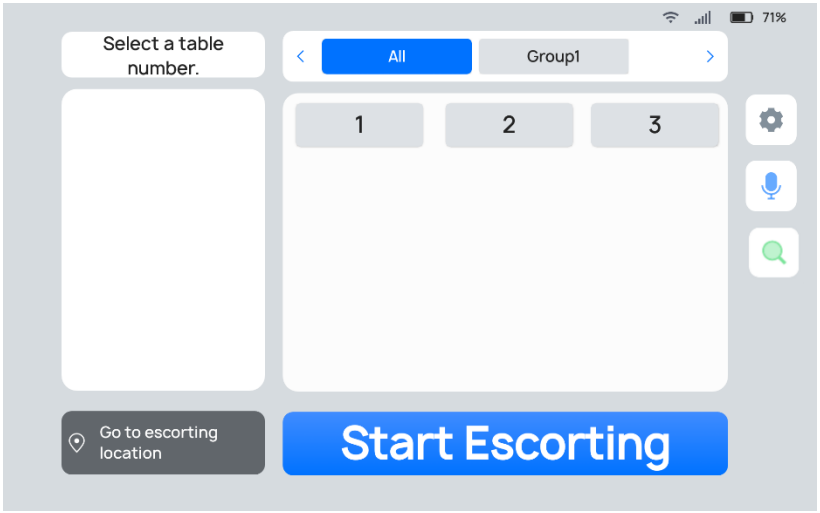
To stop a cruise, tap the screen and swipe down with two fingers, then click **Exit this mode** to exit Cruise mode.

3.3.4 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.

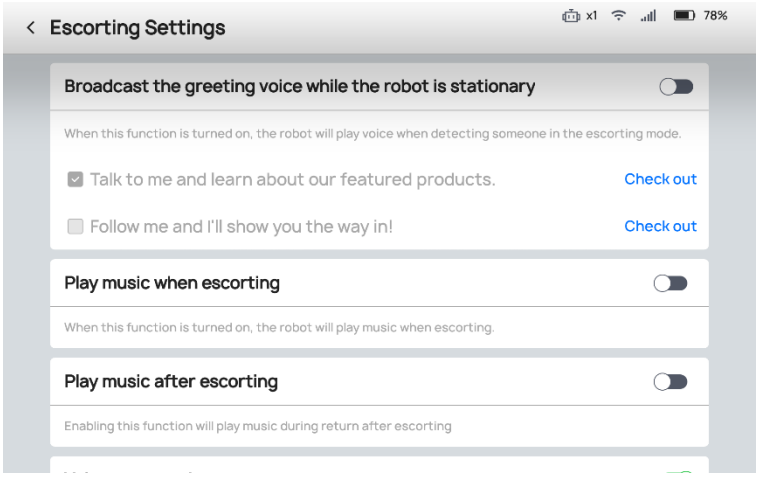
The **Escorting Mode** interface is shown below.



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.

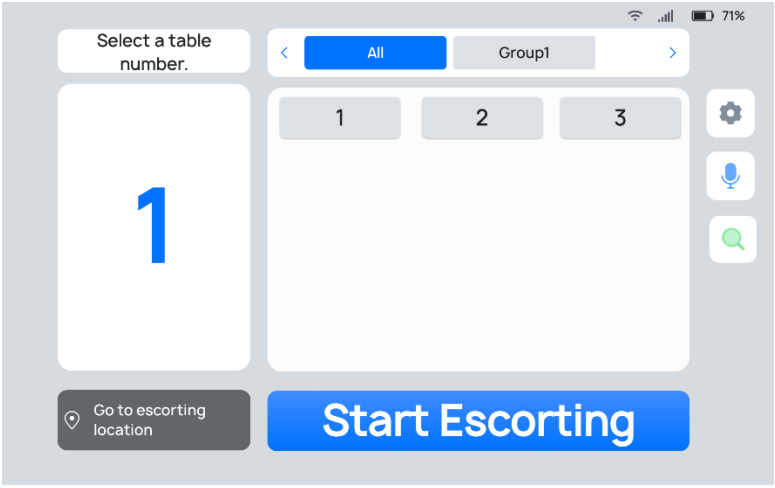


Escorting Settings	Description
Broadcast the greeting voice while the robot is stationary	Choose whether to enable **Broadcast the greeting voice while the robot is stationary.** If it is enabled and the robot is idle in Guiding mode, the selected custom voice will be played when a person is detected 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.

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.



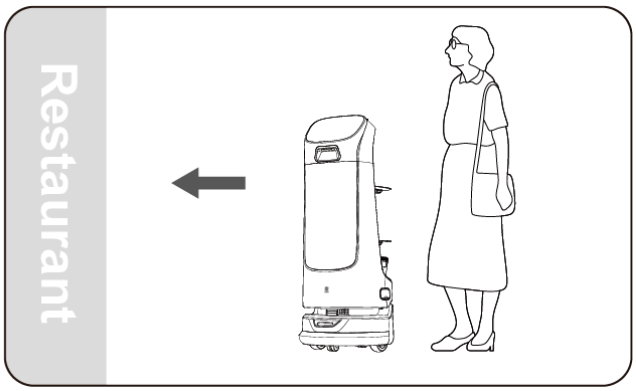
Step 3 Tap **Done** after the robot reaches the desired table.

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**.

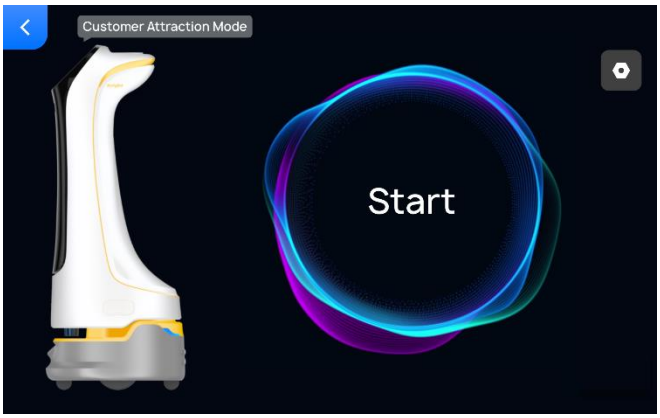
3.3.5 Customer Attraction Mode

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.

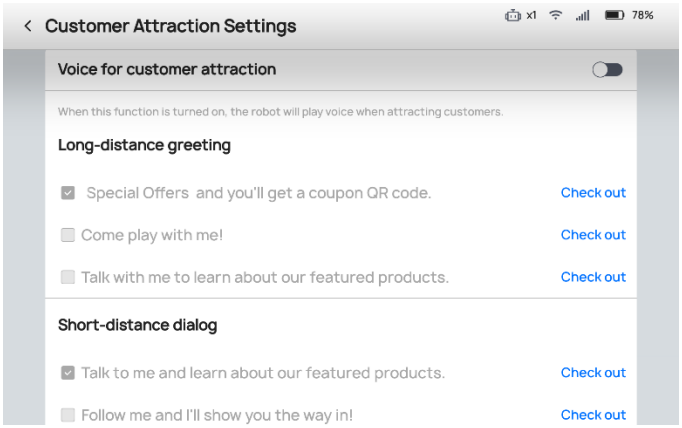
The Customer Attraction Mode interface is shown below.



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.



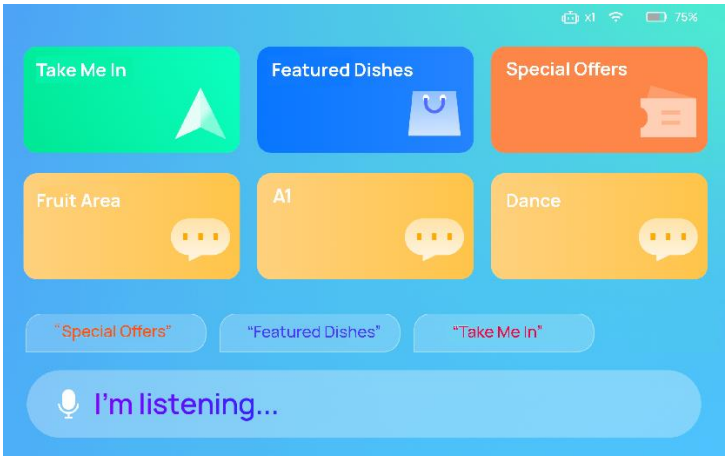
Customer Attraction Settings	Description
Voice for customer attraction	Choose whether to enable **Voice for customer attraction**. If enabled, when the robot is attracting customers, different voice announcements will be played according to the distance between the robot and the detected customer. The 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.
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

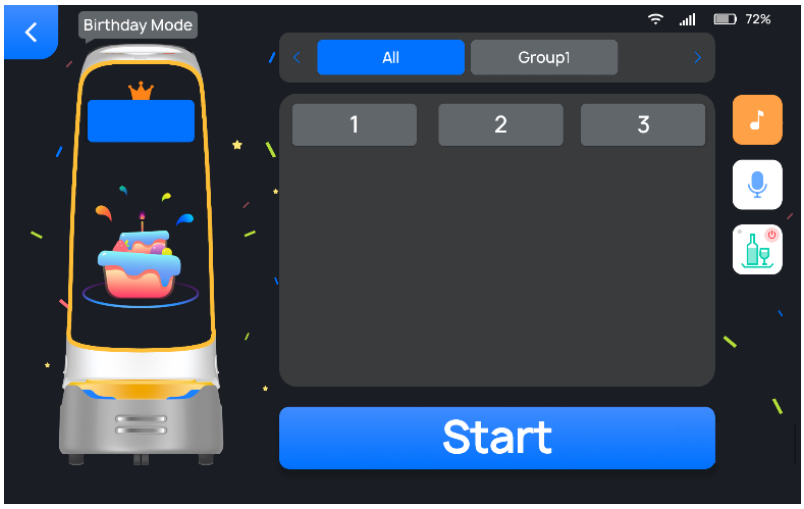
The front positioning camera is only used for face detection and will not collect any face information.

3.3.6 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.

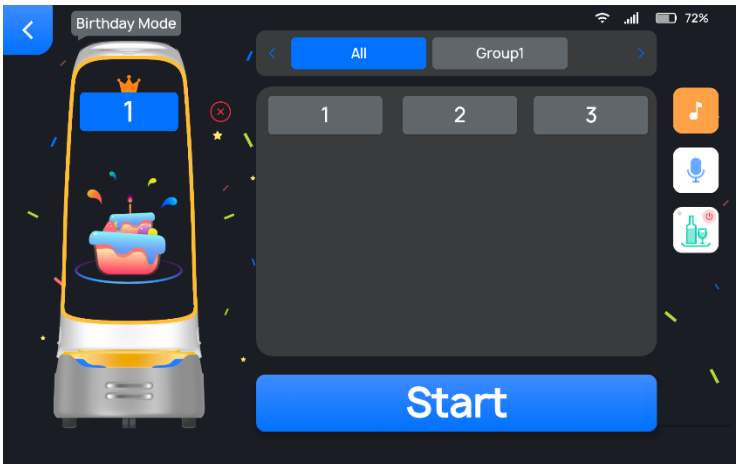


Shortcut buttons on the **Birthday Mode** interface are explained below.

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.
	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**.

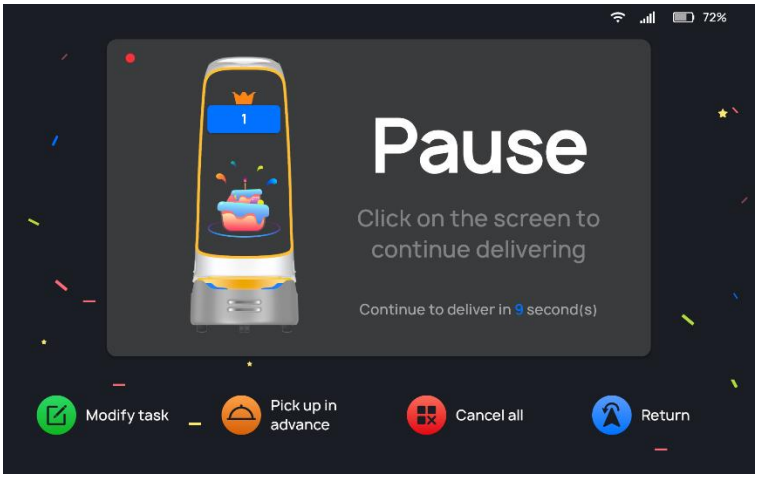
The robot arrives at the desired table along the predetermined path, and plays songs in the set playlist for Birthday Mode.

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.

3.3.7 Dish-Return Mode

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

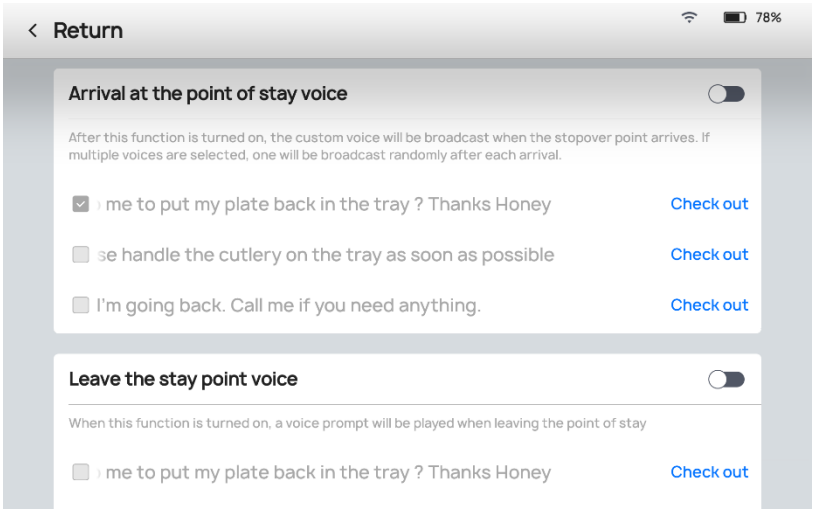
Step 1 Tap **Dish-Return** on the main interface.

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.

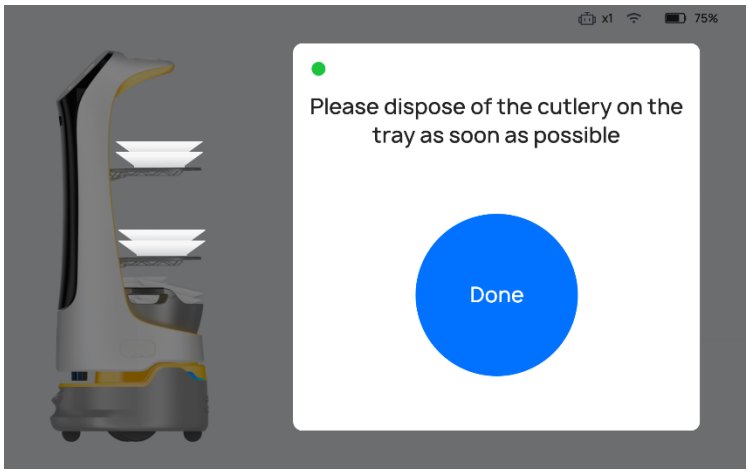
Dish-Return Settings	Description
Number of Stays	Choose whether to enable **Number of Stays**. If enabled, you can set the number of tables that the robot will collect dishes from at a time. You may turn on this function when the robot serves a larger number of tables. The robot will return to the dish-return 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.
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.



3.4 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
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.

3.4.1 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

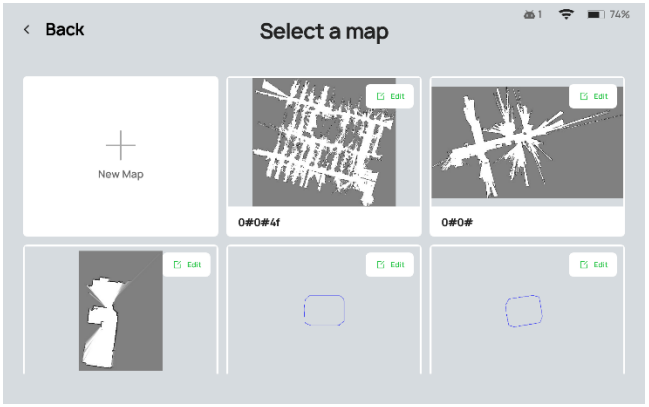
When modifying a map, in addition to expanding the map, you can also change the functions supported by the robot, the pick-up locations, the greeting locations, etc. Move the robot to the start point (startup location) before you start expanding the map. After the expansion is completed, return the robot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

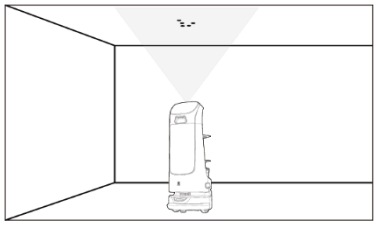
Operational steps

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

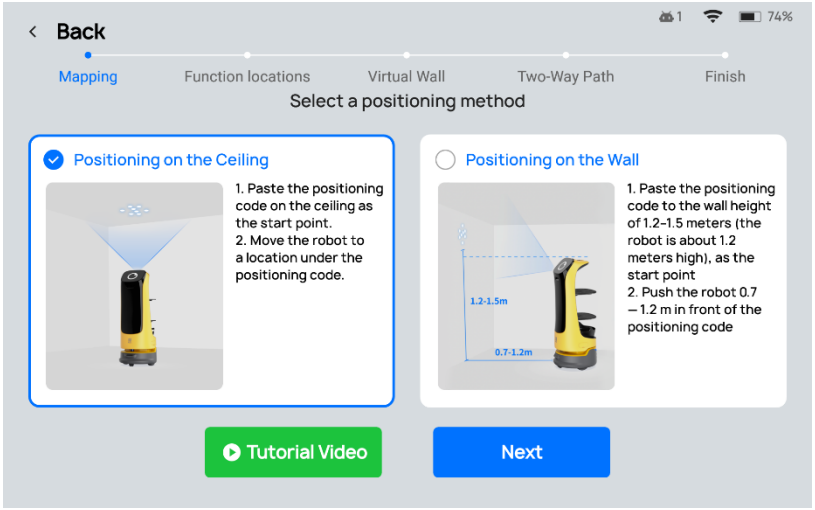
The Edit Map interface is shown below.



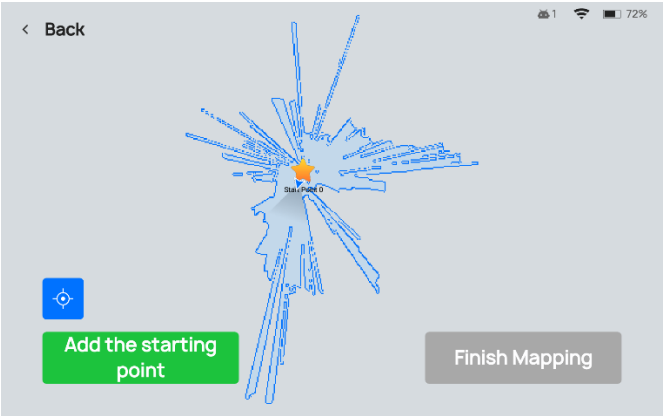
Step 2 Move the robot to a position right under the ceiling marker.



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.



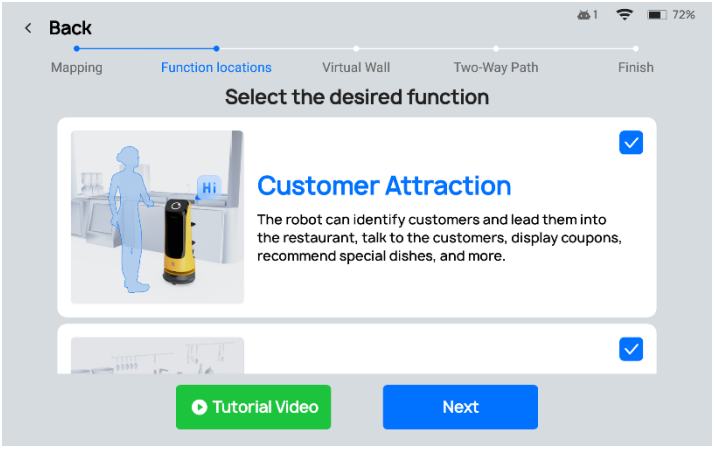
If you need to set more than one start point, you may place the robot under a different ceiling marker and tap **Add the start point**.

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**.

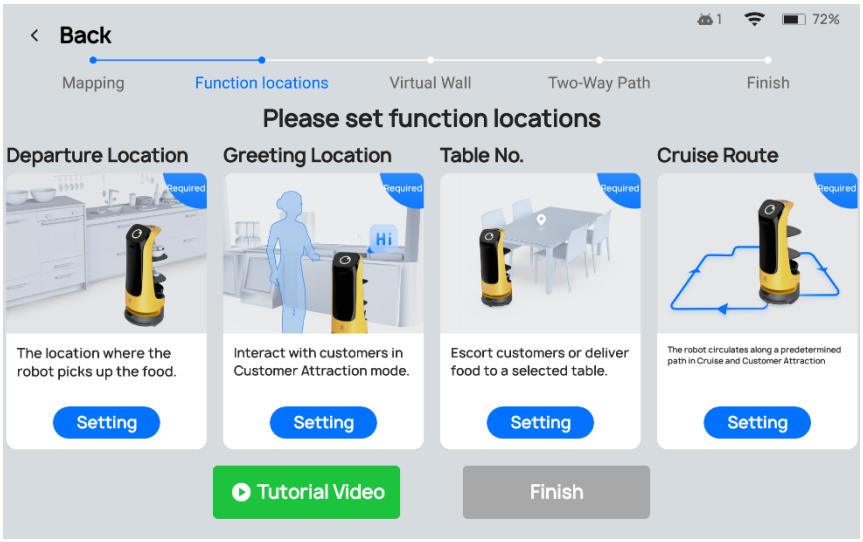
⚠Caution

- 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.

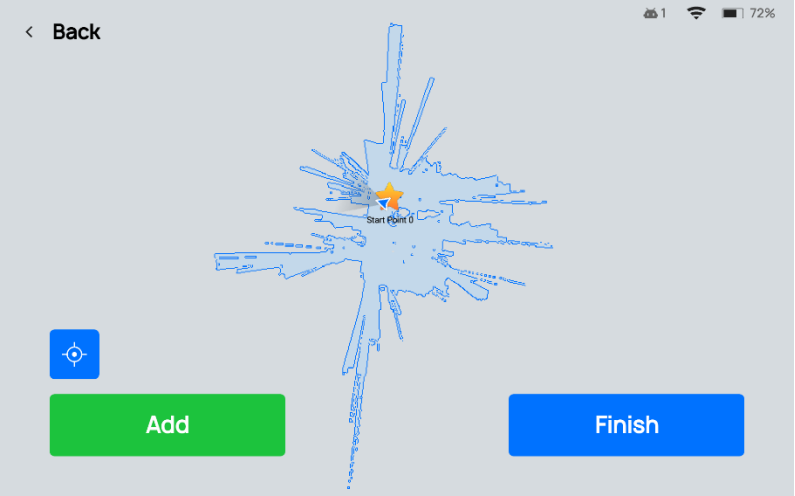


Function Location	Description
Pick-up Location	This location has to be set up for delivery. This is where the robot picks up food. You may set up multiple pick-up locations according to your actual needs.
Greeting Location	This location has to be set up for customer attraction or greeting. You may set 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.

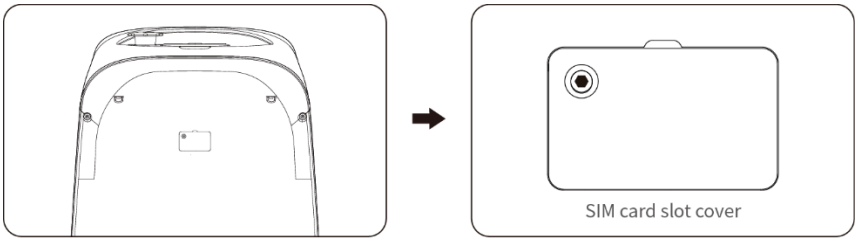
The robot can then use this map for delivery, customer attraction, etc.

3.4.2 Cellular Network

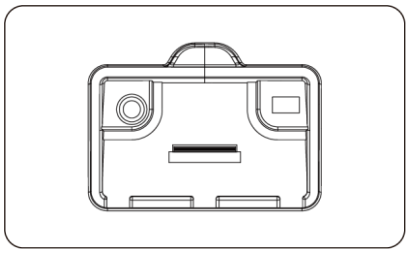
Voice interaction, data upload, remote maintenance, and other functions of the robot require a network connection. The robot now supports Wi-Fi and cellular networks for you to choose from according to your actual needs. To use the cellular network, you have to install a 4G SIM card and turn on the cellular 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.

3.4.2.1 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.



3.4.3 Turn on Cellular Network

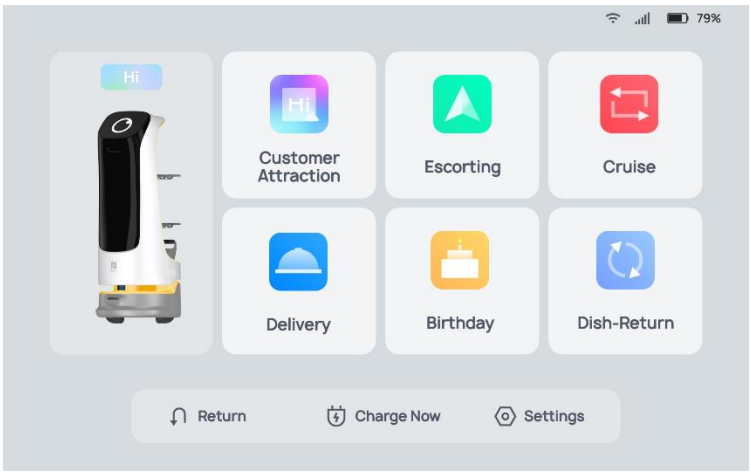
Turn on **Cellular Network** in the **Settings > Network Settings** interface. A 4G signal symbol will appear on the top bar.

⚠Caution

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

3.5 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.

3.6 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.

4. Troubleshooting

4.1 Troubles during Operation

Troubles

The following errors may be reported during the robot operation:

- Motor parameters error
- Sensor parameters error
- Sensor connection error
- Motor rotation anomaly

Solution

Step 1 Following the prompts on the screen, tap **OK** or **Continue operation** to see if the robot can continue operation.

Step 2 If not, reboot the robot and re-enter the task.

Step 3 If the problem persists after the reboot, please contact our technical engineers.

4.2 Positioning Failure

Troubles

The robot screen prompts **I'm lost. Please push me under the positioning mark** or **Location failed, please click retry button**.

Possible Causes

- The robot is not powered on at the startup location.
- The map selected on the robot does not match the actual site.

Solution

Step 1 Select the correct map in the Map settings interface if the current map of the robot does not match the actual site.

Step 2 Check if the robot is right below the ceiling marker or right in front of the wall marker. If the robot deviates too far from the marker, move the robot right below the ceiling marker or right in front of the wall marker. If the problem persists, please reboot the robot and try again.

Step 3 Check if the vision sensor or the front positioning camera is blocked by obstacles such as oil stains. If so, clean it with a lens cleaning kit.

Step 4 Check if the fill light of the vision sensor is red. If not, please contact technical engineers in time.

4.3 Charging Failure

Troubles

Charging failure

Solution

- Check if the key switch is turned to ON.

- Check if the charger indicator is on. If not, the charging failure may be caused by a damaged charger. Please contact our technical engineers in time.

4.4 Power-on Failure

Troubles

Power-on failure

Solution

- If the battery is low, please charge the robot.
- If the battery level is normal, check if the key switch is turned to ON.
- If the problem persists, please contact our technical engineers.

4.5 Robot Does Not Move Smoothly

Troubles

The robot does not move smoothly or stops moving.

Solution

- Check if there are obstacles in front of the robot.
- Check if there are stains like oil or soup on the depth vision sensors.
- Check if the passageway is wider than the minimum travel width.
- Check if there are mirrored and reflective metal surfaces on either side of the passageway that may affect the robot's operation. If so, attach matte stickers 14-22 cm (5.51-8.66 in) above the ground.

5. Maintenance and Care

5.1 Component Maintenance

Components	Robot Status	Inspection Interval	Method
Trays, drive wheels, and auxiliary wheels	Powered off	Weekly	Wipe the surface with a clean cloth.
Vision sensor, front positioning camera, depth vision sensors, and Lidar	Powered off	Weekly	Use a clean cloth or lens cleanser for the cleaning.
Robot	Powered off	Monthly	Wipe the surface with a clean cloth.

5.2 Cleaning Method

⚠Warning

Do not use water or any other liquid to clean the robot. Always make sure that the robot is kept dry.

Step 1 Press and hold the power switch for 3 seconds to ensure that the robot is powered off.

Step 2 Turn the key switch to OFF, and make sure that the robot is powered off.

Step 3 Wipe the robot surface with a clean cloth.

Step 4 Wipe the trays, drive wheels, and auxiliary wheels with a clean cloth.

🕮Note

- If the drive wheels or auxiliary wheels are entangled or stuck with debris, please place the robot down on its side for cleaning. Keep the ground clean and tidy (a mat can be used) to avoid scratches on the robot surface when placing the robot down on its side.
- If there are oil stains on the tray pad, take it out and wash it separately. Put back the tray pad after it dries off completely.

Step 5 Clean the vision sensor, front positioning camera, depth vision sensors, and Lidar with a clean cloth or specialized lens cleanser.

🕮Note

In case of unexpected contamination, address it immediately to avoid blocking the sensor and preventing the robot from working improperly.

6. After-sales Service Policies

Shenzhen Pudu Technology Co., Ltd. promises to meet the following conditions, within the effective warranty period of the product (the warranty period of different parts of the product may be different). We will provide the spares parts for free, Customers do not need to pay it again, Circumstances beyond the warranty period or not covered by the free product warranty service. We will charge a normal price.

In Warranty

Distributors are responsible for the maintenance for end-users, Pudu Robotics provides free maintenance spare parts and technical support;

- Pudu Robotics provides warranty within following conditions:

a. The products are within the specified warranty period;

b. The products are normally used, without man-made quality problems;

c. No unauthorized disassembly, maintenance, no water, foreign matters, no collision, fall situation happened etc.;

d. Product serial number, factory label and other marks are not torn or altered.

e. Valid proof of purchase, receipt and tracking number should be provided.

f. Damaged spare parts replaced in the warranty shall be owned by Pudu Robotics.

Out of Warranty

The distributors shall pay for the maintenance spare parts and are responsible for the maintenance of end-user, PUDU provides free technical support;

- Pudu Robotics will not provide warranty in any of the following conditions:

a. The product has exceeded the warranty period;

b. Product serial number, factory label and other marks are torn or altered and cannot be identified;

c. Collision, burning and quality problems caused by foreign matter (water, oil, sand, etc.) and not the quality problems of the product itself;

d. Damage caused by unauthorized modification, dismantling, shell opening and maintenance under unofficial guidance;

e. Damage caused by improper installation, use, charging or storage without following the instructions;

f. Delivery robot：Damage caused by use in excess of safe weight；

g. Faults of accessories or parts other than major warranty parts

h. Faults and damages caused by force majeure (such as earthquake, fire, war, etc.).

Contact information

- Please contact the local regional technical support first to solve your after-sales problems, or contact Pudu Robotics headquarters.
- PUDU Service Email: techservice@pudutech.com.
- PUDU Hotline: +86 755-86952935.

7. Compliance Information

7.1 Federal Communications Commission Compliance Statement

The following information applies to Pudu technology.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

7.2 Industry Canada Compliance Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.

7.3 Disposal and Recycling Information

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to minimize the impact of electrical and electronic goods on the environment, by increasing re-use and recycling and by reducing the amount of WEEE going to landfill. The symbol on this product or its packaging signifies that this product must be disposed separately from ordinary household wastes at its end of life. Be aware that this is your responsibility to dispose of electronic equipment at recycling

centers in order to conserve natural resources. Each country should have its collection centers for electrical and electronic equipment recycling. For information about your recycling drop off area, please contact your related electrical and electronic equipment waste management authority, your local city office, or your house hold waste disposal service.

Before placing electrical and electronic equipment (EEE) in the waste collection stream or in waste collection facilities, the end user of equipment containing batteries and/or accumulators must remove those batteries and accumulators for separate collection.