



Jingbao Disinfection Robot

USER MANUAL

VERSION: V4.2.3

Suzhou Pangolin Robot Corp., Ltd.

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Chapter 1 Overview

Thanks for purchasing the 9th Generation Dish Delivery Robot -Wenda of Suzhou Pangolin Robot Corp., Ltd.!

This manual briefly introduces various functions which will guide you well about the machine. At the same time, a series of high-quality and premium solutions will be provided to bring you a comprehensive service experience!

Please carefully review this manual before using the machine.

Chapter 2 Copyright Statement

Suzhou Pangolin Robot Corp., Ltd. (hereinafter referred to as “Pangolin Robot”) will reserve all rights to modify this manual and we insure the information offered is correct and reliable.

Please kindly be noted that:

1. This manual is compiled to fulfill company series of products and it is permissible that your purchased machine may not be equipped with all specified functions.
2. When it comes to patent, copyright, trademarks and some other intellectual properties, you shall not be allowed to use our products or related documents until or only if you get the approval or authorization from Pangolin Robot, however, which don't belong to Pangolin Robot's responsibility.
3. Pangolin Robot will reserve all rights to this manual and users shouldn't disseminate, copy or modify any contents of this manual.

Chapter 3 Product Function

1 Animated emoticons Display Screen

Robot can show diverse face expressions by distinct working condition to enhance the interface interaction effect.

HMI (Human Machine Interface)

Set the functionality like dish delivery and other basic operations by touching on the screen interface.

2 Playing Advertisement

The robot can support to play music and video during her work process.

3 Trackless Navigation and Obstacle Navigation:

Robot will achieve auto navigation by laser sensor, which is designated by point to point. When there is any obstacles

detected ahead, robot will stop until the obstacle is cleared.

4 Voice reminding during dish delivery

During the dish delivery process, there will be corresponding voice reminding at each stage, for example: 1. at the beginning of delivery, the robot will remind “ I am going to delivery dish” 2. if some obstacles on they way of delivery ,the robot will say “ excuse me, you are on my way” . 3. When the robot takes the dish arriving at the set table, the robot will remind “ dear customer, your order is here”. After waiting for a while, The robot will remind “If there is nothing else, please touch my hand and let me get back”. 4. When returning to the waiting point, the robot will remind “I am back”. All the voice content can be set according to the actual situation by users.

5 Auto-charging system

The robot equipped with an automatic charging pile can realize the automatic charging. When the power is lower than a certain value, the robot will automatically find the charging pile and complete the charging.

Chapter 4 Precautions for Use

- 1 The robot is internally installed with Industrial Personal Computer (hereinafter referred to as IPC), with which the screen is adopted with touch screen technology. Please DO NOT frequently cut the power voltage during the system starts up in case of any machine breakdown.
- 2 Only if or unless urgent situation, please DO NOT press the “Emergency Stop Switch” in protection of the machine life expectancy.
- 3 DO NOT assembly and disassembly the robot or any spare part of the robot by yourself due to its high precision.
- 4 When the robot is in the process of working, DO NOT open her outer shell lest any careless touching on the electronic moving parts will do unnecessary damage on human body.
- 5 Avoid any strong collision impact or man force on the robot.
- 6 When the robot is in the process of working, DO NOT force to change her moving way in case of any unnecessary damage on human body.
- 7 Please use the AC 100~240V, the original charger and make sure it’s under the guardianship of somebody. Remember to unplug the charger once the robot finished charging. DO NOT shaking the battery during the whole process above mentioned.
- 8 It is a must that you should use the originally equipped charger and put the battery into the originally installed battery pack, all of which must also be under custody of somebody. DO NOT forget to unplug the charger after it finishes charging.
- 9 Any chemical cleaning is forbidden and you can use a dry clean cloth to wipe the surface dust out.

- 10 Please kindly deal with waste products and accessories in accordance with the relevant local environmental protection regulations.
- 11 In case of any data loss, it is recommended that the user backup the important documents, especially when software and firmware is about to upgrade. Our company shall not be responsible for any data loss caused herein.
- 12 During the process of repairing defective products, the company will root all of the data and back to manufacturer default Settings.
- 13 There won't be prior notice on any product changes. We apologize for any inconvenience caused.
- 14 Any problems please directly contact with our customer service.

Chapter 5 Safety Precautions

Before installing, using, carrying, maintenance and repairing, please make sure read carefully and master the content of this manual and relevant appendix. Make sure operate after you are fully familiar with all equipment, safety precaution and matters need attention. The following precaution is involved with five main categories: “Danger”, “Attention”, “Force”, “Prohibited”, “Important”.



Compulsory: Rules must abide by.



Danger: Wrong operation might hurt or cause causality.



Attention: Wrong operation may cause irreversible or serious damage to the robot.



Prohibited: Matters excluded from use



Important



Compulsory

(1) This user manual belongs to technical materials concerned with robot body content. In order to ensure the normal application of this system and the proper maintenance and repair, including product profile, precautions for use, safety precautions, product instructions, installation and so on, please make sure read carefully and fully understand this manual before using.

(2) In addition, details regarding safety precautions are stated in chapter of "Safety", please read it carefully before using.



Danger

(1) The product is supplied with 24V battery but it is unguaranteed that individual spare parts are within 36V that is affordable safety voltage for human. In the process of working, any touching to electron moving parts is strictly prohibited in case of unnecessary damage to robot or human body.

The product is charged with 220V AC. Watch out the electricity shock when plug in. Please be carefully noted that lithium battery is vulnerable and explosive. For the sake of your health and property, it is suggested that charging is under the guardianship of somebody to avoid any potentiality of explosion and fire. Remember to unplug the charger once the robot finished charging. DONOT shake the battery during the whole process above mentioned.

Any individual part isn't so safe up to food grade that please DO NOT devour it and keep spare parts away from food material.

Please keep the minors and the elderly out of reach the product unless being under the custody.

(2) The product is charged with 220V AC. Watch out the electricity shock when plug in. Please be carefully noted that lithium battery is vulnerable and explosive. For the sake of your health and property, it is suggested that charging is under the guardianship of somebody to avoid any potentiality of explosion and fire. Remember to unplug the charger once the robot finished charging. DONOT shake the battery during the whole process above mentioned.

(3) Any individual part isn't so safe up to food grade that please DO NOT devour it and keep spare parts away from food material.

(4) Please keep the minors and the elderly out of reach the product unless being under the custody.



Attention

(1) Some of the illustrations in this manual are drafted upon uncovering the robot shell to more specify the robot, therefore when you are working with this kind of parts, ensure to recover the shell and operate it adhere to the specification.

(2) Graph and pics in this manual is only for your reference and there might be slightly different from the real purchased product on hand.

(3) Sometimes due to product improvement, spec change and utilizing, there should be times of modification which edition will be followed by hereafter.

(4) Perhaps due to loss or damage, please directly contact with the sales person if you need to book the manual and follow the material no to purchase.

(5) We won't be responsible for any alternation without authorization which as well shall not fall within the range of warranty.



Prohibited

(1)The product shell is made from ABS plastic. Please keep it from metal components or sharp object.

(2)When the robot is in the process of working, DO NOT strongly force her to change the moving way.

(3)The product is equipped with server and IPC so those non-professional people is prohibited from opening the back cover or plug and unplug the electric wire.

(4)Please keep customers away from touching ON/OFF switch and Emergency Stop switch.

(5)Please leave it in a dry, cool dark place. DO NOT put it lean or upside down.



Important

In spite of inconformity with content of “Attention “or” Danger” but these are indeed important matters marked exclusively to abide by.

Besides, even though it is recorded in “Important”, occasions changing will also result in serious consequences; accordingly any precautions should be paid extreme attention on and strictly obeyed herein.

Encountering emergent circumstances, quickly press the emergency stop button so that electricity is cut out from the movable parts and robot stops. Only after the emergency can you free emergency stop button (shown as Pic 1) :



Pic1. Emergency Stop

Chapter 6 On/Off button and Map building

6.1 On/off Button

6.1.1 Firstly confirm if it has freed the emergency stop, if not, Press down the red button to relieve the emergency stop state

6.1.2 Press the “On/Off Button” to turn on the robot.

The positions of emergency stop switch and on/off button shown as



6.2 Emergency Stop

6.2.1 When it occurs to an emergency, please press the Emergency Stop asap. To cut out partly electricity and shut down any movement.

6.2.2 Press down the emergency stop button to relieve the emergency stop.

6.3 Map building

6.3.1 Preparations

1) Make sure it a vacant area or with limited people within the area;

- 2) Clear up all the frequently movable objects in the area;
- 3) Regarding to those objects may reflect, transmit and absorb lights, under some conditions permissible, stick several ordinary materials on the plane domain area where laser radar may reflect;

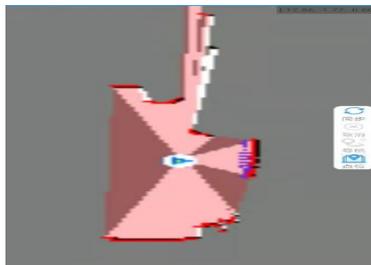
6.3.2 Frequently Disturbed Objects

Before starting mapping, you should figure out what kind of objects that may have an influence on the laser radar that requires us to do several precautions as the case may be. Generally speaking, 70% of light reflective rate will be up to the limit that radar data manual instructs. Attention should be focused that all the environment we are talking is inside the room /indoor environment. Below are several interfered objects:

- 3) Low reflective objects, e.g. light absorbing wall in black, furniture, etc.;
- 4) Glasses;
- 5) Mirror, stainless steel that reflects the objects;
- 6) Other reflective objects.

2 Mapping Steps:

(1) Push robots to the **Starting Point** where you turn on the robot. In order to generate a high-quality map, make sure the direction to which robot is facing towards a vertical straight wall (not a curve wall or closed loop area) among the area, no obstacles surround the robot within 1m in case of not interrupt robot to get more valid points, shown as below Pic



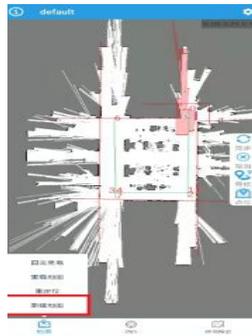
(2) On the mobile phone WIFI, select the network mapped by the disinfecting robot (set the network hotspot, see 7.2 network settings), and connect.:

(3) Open the software CsjRobotStudio.apk in your Android Phone, Click "Connect Robot", enter the IP address 192.168.99.2, then make it connected to enter the mapping page; shown as below Pic:

(When you scanned the map and map is tilted, please turn off the robot and push it to the charging pile to restart it. If you not restart it and continue to scan the map, the quality of the map is very poor and it is easy to lose the positioning.)



(4)After clicking the new map button, you can start to create a new map, as shown in the figure below:



(5) Built new map

After entering the [Map Scan] page, you can use the joystick to control the robot, slide the joystick to control the robot to walk, as shown in the figure below:

When encountering a turn, you need to wait for a while, after refreshing the map on RobotStudio then Control walking again. Try to ensure the integrity of the map. On the possible walking path of the machine, all the surrounding 360-degree areas need to be detected by radar. The purpose is to increase the integrity of the map and make more reference points for laser matching.



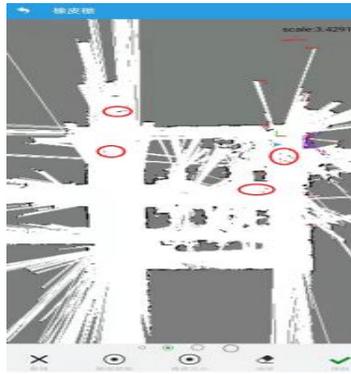
(6) Save map

After the map has been scanned, run the robot nearby the charging pile, and then press the emergency stop button to slowly push the robot to the charging pile. Click the [Save Map] button in the upper right corner, you can fill in the required map name in the input box. The default is default, If prompted [The map already exists, please check to overwrite], You need to check the [overlay map] button.

(7) Edit map: eraser operation

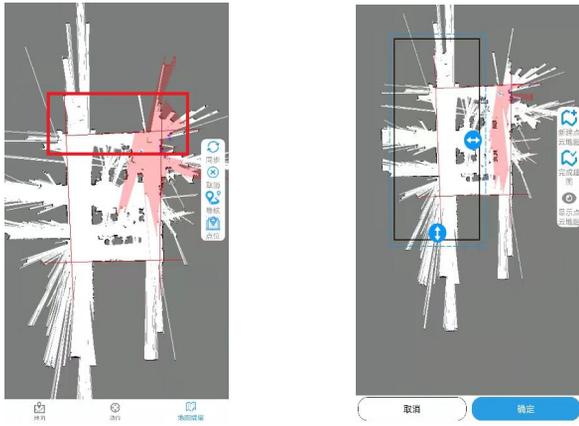
On the homepage (navigation mode), click the [Map Edit] button, click [Eraser], white eraser in order to erase moving objects (such as people, moving objects), as shown in picture

(Drag and drop on the screen to set certain grid areas as black, white or gray areas. At the same time, you can also choose the size and color of the eraser sassafras)



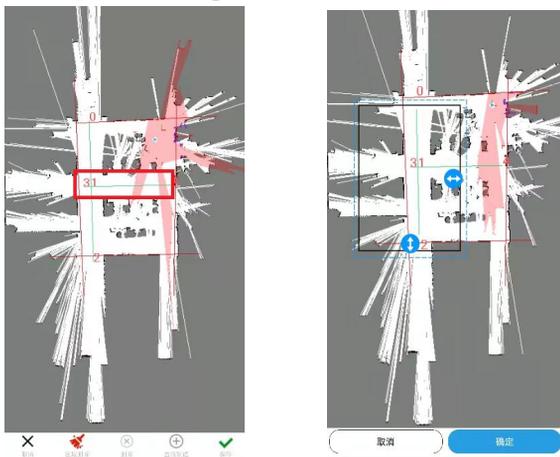
(8) Edit map: virtual wall operation

Click the [Virtual Wall] button to operate the virtual wall, add or delete the virtual wall, as shown in the picture:



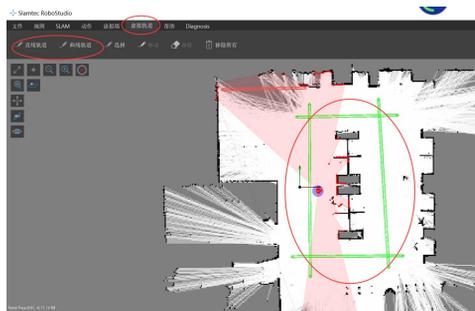
(9) Edit map: virtual track

Click the [virtual track] button to operate the virtual track, add or delete a linear virtual track, as shown in the picture:



(10) After completing the above, please return to the navigation page and start navigation.

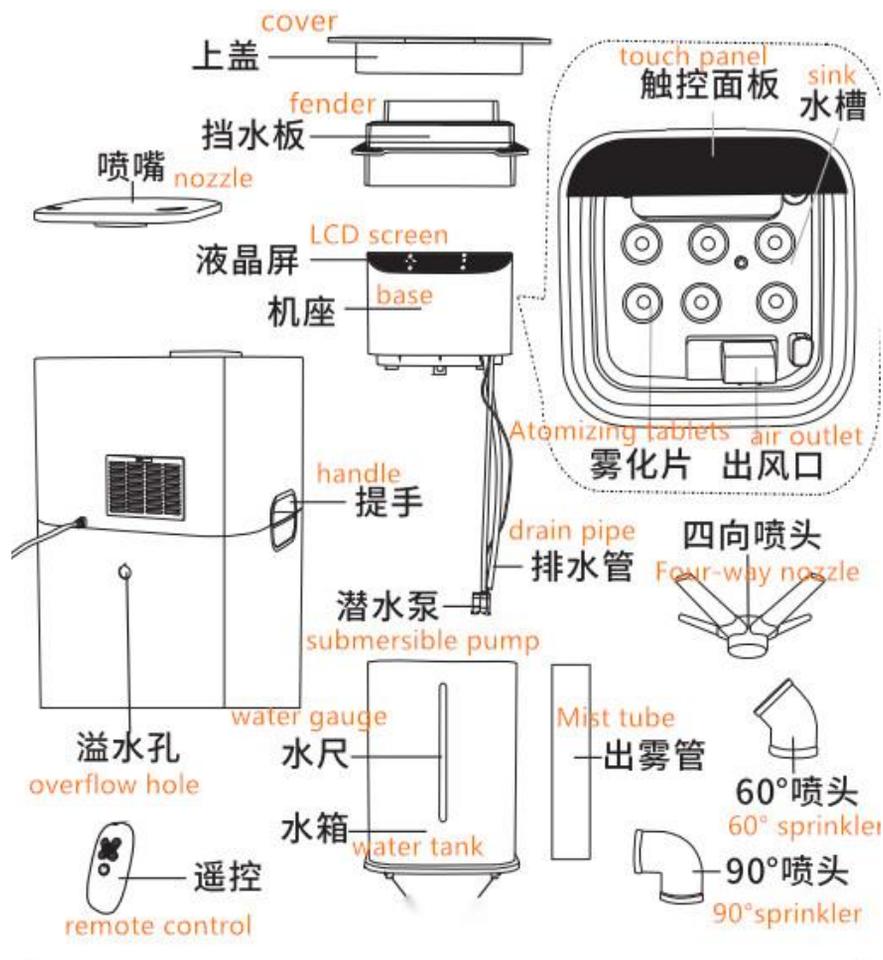
Click the [Return] button in the upper left corner, or the system's [Return] to switch the mode to [Navigation Mode].



Chapter 7 Disinfect setting

7.1 Illustration of disinfecting part

Exploded view of disinfecting part



7.2 Features:

Exquisite design, stylish appearance

Microcomputer control, timing constant temperature

Simple inside and outside, easy to clean, water shortage and power failure protection, safe and reliable

7.3 How to use:

1. Place the machine horizontally in a suitable place.
2. Remove the nozzle or mist outlet pipe, open the top cover, and add water directly.
3. Fill with purified water or clean tap water. After filling with water, install the cap, nozzle or mist outlet pipe and wipe the surrounding water droplets.
4. Connect to the AC power supply and hear a "beep" (the smart version screen lights up at this time), indicating that it is powered on and enters the standby state (the smart version screen also displays the humidity and temperature of the space)
5. There are 6 touch keys on the base, which are "Mist", "Timer", "Constant Humidity", "Power", "Sleep" and "Interval Spray". (detailed below)

 : After turning on the power, touch the power button, the display will light up, the machine will work, the default level 1 will be turned on, and the display will display the current temperature and humidity. Touch the power button again to turn off the display and stop spraying.

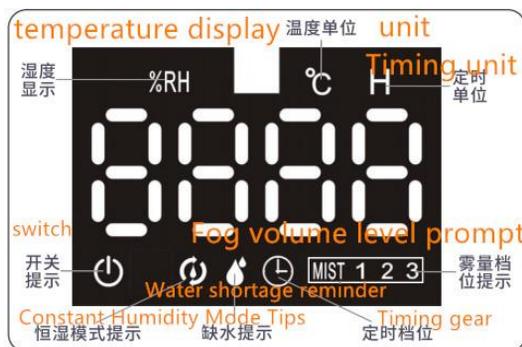
 : Press the fog volume key to display the corresponding level, each time you press the "fog volume" to select a different level between the "1-3" levels, and the default minimum level is turned on.

 : Press the "Sleep" key to turn off the display while the power is on, and press any key to light up the display.

 : When the machine is turned on, press the timer button to set the time for the timer to switch on and off, and the time range is 1-12 hours. After the timing is set, the temperature and timing numbers on the display screen are alternately displayed.

 : Touch "Constant Humidity" and the humidity will increase to the maximum humidity by 5%RH, and then release the constant humidity setting, the humidity adjustment range is "60%-90%", and the constant humidity icon will light up after the humidity function is turned on. Adjust in this cycle.

-  : MIS and gear flicker during intermittent work
 - 1st gear: open for one minute, stop for one minute
 - 2nd gear: open for one minute, stop for three minutes
 - 3rd gear: open for one minute, stop for five minutes



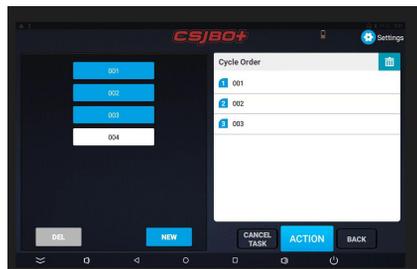
6. Water shortage function: When the machine is working, it will detect water shortage, the atomizer will stop working, the buzzer will sound three times, and the atomizer will continue to work if enough water is added within 5 minutes; off to return to standby.

7. Remote control function: The remote control corresponds to each button function.

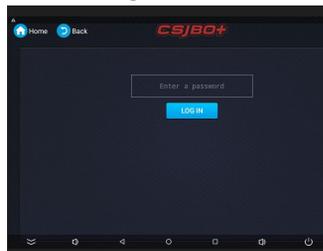
Chapter 8 System setting

8.1 Enter Setting Interface

Enter the home page, click the New button, add disinfecting points, select ≥ 3 disinfecting points, go to the task window on the right, and click the Start disinfecting button to perform cyclic disinfecting. See the figure below for details.



Click the Settings button to enter the password verification interface. The default factory password of the robot is csjbot, and the user can modify it in the setting interface, as shown in the figure below.

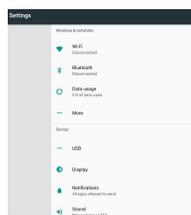


In the setting interface, you can set network settings, speed settings, charging management, language settings, restore maps, etc., see the figure below for details.



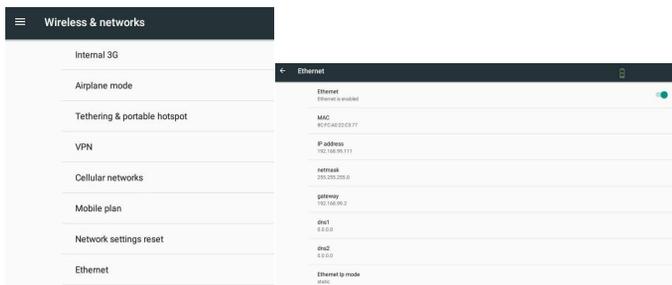
8.2 Network Setting

Click the Network Settings icon to go to the page shown as below .



- tap to get more/Network sharing with portable hot button , The hotspot page is displayed, and the portable hotspot is enabled , You can change the hotspot name and password as required , The default factory Settings have been set, do not change the hotspot name and password at will , The Ethernet IP address factory Settings have been set. Do not change the IP address Settings at will ,as shown below :

The default hotspot password is dnk131212



8.3 Speed Setting

Click the speed setting button to enter the speed setting interface. At present, the speed range is 0.4~1.2m/s, and the default speed is 0.7m/s. If the safety speed is exceeded, there will be a risk warning. Please set it carefully.



8.4 Charging management

Click the button of Charging Management to enter the charging management interface.

Charging immediately: Click the button of charging immediately, regardless of whether the battery reaches the threshold, the robot will go for charging immediately. If there is a charging pile, the robot will go to charging pile to charge immediately. If no charging pile, the robot will return to the boot point for charging immediately.

Charging coordinates: Control the robot to 1 meter in front of the charging pile, click Get, and then click Save. This coordinate assists the robot to go back to charging along the track.



8.5 Language Setting

Click the button of language setting to enter the language setting interface.

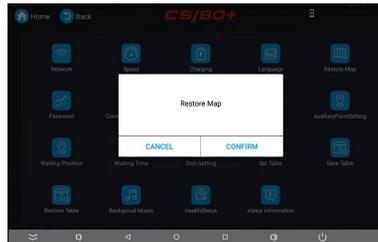
Language options: Simplified Chinese, Traditional Chinese, English, Japanese.

Note: The robot's interface and the broadcast contents of each scene will be displayed in selected language



8.6 Restore the map

After the machine is turned on, it can be turned on near the starting point, try to choose a place with obvious reference, otherwise map restore may not be successful. Click the Restore map option in the Settings screen, You can also restore the map operation.



8.7 Password Management

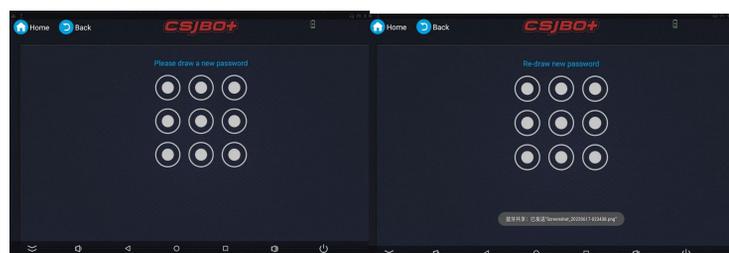
Enter the page of password setting to set the login password and the gesture password.



Click Reset verification password to enter the interface of reset verification password. The default password of the robot is csjbot. The administrator can verify the password according to the actual situation. The password length is between 8~16 digits. When the password are consistent in 2 times: the robot will remind that the password change is successful.



Click Reset Graphic Password to enter the interface of the reset graphic password. The default graphic password of the robot is L. The administrator can modify it according to the actual situation. For resetting the graphic password, you need to draw the same graphic twice.



8.8 About BOT

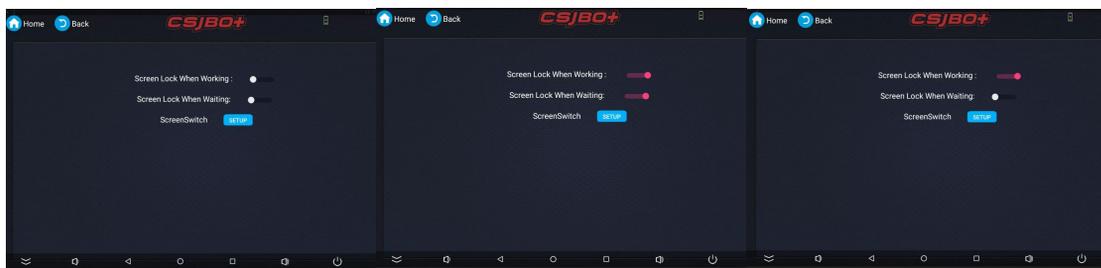
Click on the About BOT to enter the About BOT interface, where you can see basic information about the robot. Robot Model, Android Versions,SN, Navigation Algorithm Versions.



8.9 Function switch

Click the function switch option to enter the function switch interface. The functions can be turned on or off, the screen doesn't work.

When the food delivery lock screen is on, Lock screen operation will be carried out in the delivery process, The wait lock screen cannot be opened separately, So there are only three cases.



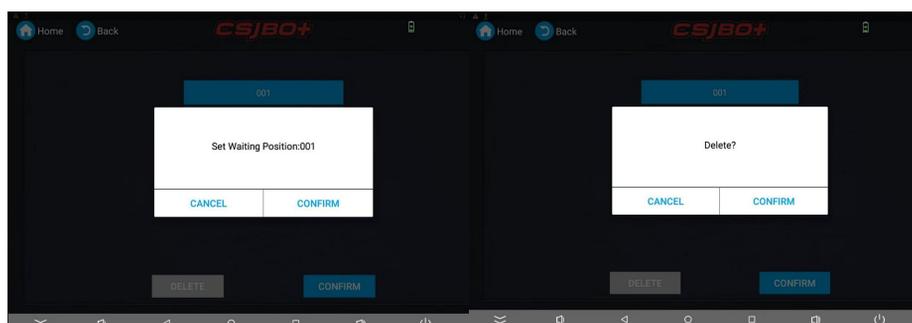
8.10 Waiting Point Setting

Click Set Waiting Point to enter the Setting Waiting Point page. By setting the waiting point, set the starting point of the robot's disinfecting task.

When you use the robot for the first time, you will be prompted to set a waiting point; the disinfecting function can only be used after the waiting point is set.

Up to three waiting points can be set, and there is only one waiting point used at the same time.

Add a new waiting point to the system or change the current waiting point to a different waiting point. Waiting points that already exist in the system can be deleted.



8.11 Background audio settings

Click the background audio setting button to enter the background audio setting interface. Administrators can select multimedia playback files during the disinfecting process.

Multimedia files can be copied to tablet desktop/explorer/internal memory/robot/audio via USB, and the files must be in MP3 format.

The background audio is played when disinfecting, stop playing and record the audio playback time node when touching or blocking, and continue to play audio from the playback node when the disinfecting is continued. If the disinfect mission is canceled, the background audio will no longer be played.



8.12 Health status

Click the Health status button to enter the health status query page, you can view radars, depth cameras、odom、imu、infrared health.

A screenshot of the CSJBO+ mobile application interface showing a table of health status data. The table has three columns: TYPE, LEVEL, and VALUE. The data rows are as follows:

TYPE	LEVEL	VALUE
lidar_health	1	0.7549999952316284
depth_health	1	1.0
odom_health	1	1.0
imu_health	1	1.0
ir_health	1	0.0

The screenshot also shows the 'Home', 'Back', and 'CSJBO+' navigation elements at the top and the Android navigation bar at the bottom.

Chapter 9 Best Practices

9.1 The robot powers up on a charging pile

The charging pile is placed against the wall. The robot is placed on the charging pile to start the machine, The charging pile is recommended to be fixed and not moved, In order to avoid affecting the recharge or navigation or drawing functions, Start from the android APP , setup about the BOT option, Verify robot information is correct, reference to 7.9

9.2 Set new map

Open scan software on mobile phone ,set new map,save the map, edit map.Detailed process Reference to 6.3

9.3 Disinfection task

1. Set the disinfecting point and the circular disinfecting point in the Android APP, and set the rest of the settings

according to your needs.

2. On the Android APP homepage, select the task disinfecting point, up to 10 disinfecting points can be selected, click the start disinfecting button, and during the disinfecting process, click the cancel task button to cancel the disinfecting task at any time. During the disinfecting process, click to return to the waiting point, and it will immediately return to the waiting point.

3. On the cycle disinfecting page, click the New button to create a new disinfecting point. At least 3 cycle points need to be selected before the cycle disinfecting can be performed. Click the cycle start disinfecting button to start the cycle disinfecting task. During the cycle disinfecting process, click Cancel the task button, you can cancel the cycle disinfecting task at any time. During the cycle of disinfecting, click to return to the waiting point, and it will immediately return to the waiting point.

9.4 Robot default password

1. The default password of the robot hotspot is dnk131212
2. The default password set is csjbot

Chapter 10 Maintenance

10.1 Charge

The original charger or matching charging pile must be used to charge the robot, If the robot is not used for a long time, please charge the robot once a month.

When using the charger to charge the robot directly, please first plug the charger into the network power supply, wait 2-3 seconds for the charger to stabilize, and then plug the charger outlet into the charging hole below the back of the robot to start charging.

When charging the robot directly with charging pile, please place the charging pile against the wall first, plug the charger into the network power supply, wait 2-3 seconds for the charger to stabilize, and then plug the charger outlet into the charging hole on the side of the charging pile, when the robot detects a low battery, it automatically returns to the charging pile to charge.

10.2 Motor Clean

In the robot's normal walking process, it is inevitable to stick debris on robot's wheels which shall kill the service life of motor. Please clear it in time

10.3 Clean

Before cleaning, be sure to turn off the power and unplug it.

If there is scale on the surface of the sink or atomizer, you can pour the dissolved descaling agent, citric acid or white vinegar, then try to wipe it with a cotton swab or a brush, and rinse it with water.

After rinsing the soft cloth in warm water below 40 degrees Celsius, wipe off the surface stains. Do not use a wire ball or a nylon rag to wipe the body to avoid scratches and damage to the surface.

Do not use thinners, toluene, acidic detergents, lamp oil, alcohol or chemical wipes;

To clean the entire part of the base including the power cord, please wipe with a clean cloth.

Chapter 11 Packaging and Handling

11.1 Short Distance Handling (including the City Chartered Vehicle)

1. In the level of the cement floor or floor on the ground, can manually push the robot to walk, walking speed of not more than 15 m / min.

Note: It is strictly forbidden to manually drive the machine while the robot is powered or working.

2. In the loading and unloading truck, up and down the stairs or more (more than 2mm), slope (more than 10 °), when the outdoor asphalt road, are to use the company's special packaging, pay attention to the following operating practices and procedures will be fixed in the robot Tools, and then the corresponding handling and loading and unloading work

(1) Two adult men (height 1.6 meters above) from the sides of the robot, one hand at the bottom of the box, the other hand holding the middle of the box at the same time raised 15 ~ 25cm high, moved to the top of the special handling tools, In the middle of the tool plane.

(2) Two adult men (height 1.6 meters above) from the robot on both sides, one hand at the bottom of the box, the other hand holding the middle of the box at the same time lift, get off, steps.

(3) When loading, the internal height of the vehicle must be greater than 1800mm, and the robot and the truck interior box through the rope fixed, the machine and the car wall, between the machine and the machine need to use 2cm thick foam cotton filled to prevent bruises.

11.2 Long-Distance Transport (including Logistics Transport, Chartered Vehicle)

Transport needs to use the dedicated packaging and external packing box (company provided) filling method
