

UVC Robot Operation&Maintenance Manual



V1.0 Issue: 20200501

IMPORTANT SAFETY INSTRUCTIONS

BEFORE USING THIS MACHINE READ ALL INSTRUCTIONS AND

CAUTIONARY MARKINGS IN THIS MANUAL AND ON THE MACHINE

When using an electrical appliance, basic precautions should always be followed, including the following:

⚠ WARNING

These warnings apply to the machine, and also where applicable, to all tools, accessories, chargers or mains adaptors.

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR INJURY

1. This machine is not intended for use by persons (including children) with reduced physical, sensory or reasoning capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the machine by a person responsible for their safety.
2. Do not allow to be used as a toy. Close attention is necessary when used by or near children and other non related person.
3. Use only as noted in this manual. Don't carry out any maintenance other than that shown in this manual or advised by DLS
4. Suitable for indoor locations ONLY. Do not use outdoors or on wet surfaces.
5. Do not handle any part of the charger or machine with wet hands
6. Do not use with a damaged charger
7. Contact the Helpline when a service or repair is required. Do not disassemble the machine as incorrect reassembly may result in an electric shock or fire
8. If the machine is not working as it should, if it has received Wireless information, if it has been dropped damaged, left outdoors, or dropped into water, do not use and contact us
9. Don't use it before you insure battery,sensor and WIFI.. are well
10. Use only recommended accessories and replacement parts
11. Unplug the charger when not in use for extended periods.
12. Use only the charger provide by DLS for charging this machine. Use only batteries: other types of batteries may explode, causing injury to persons and damage
13. The battery is a sealed unit ond under normal circumstances poses no safety concerns. In the unlikely event that liquid leaks from the battery, do not touch the liquid as it may cause irritation or burns, and observe the following precautions
Skin contact -can cause irritation. Wash with soap and water
Inhalation-can couse respiratory irritation. Expose to fresh air and seek medical advice
Eye contact-can cause irritation. Immediately flush eyes thoroughly with water for at least 15 minutes, Seek medical attention
Disposal-wear gloves to handle the battery and dispose of immediately, following local ordinances or regulations
14. Follow all charging instructions and do not charge the battery improperly or may damage the battery and increase the risk of fire.

READ AND SAVE THESE INSTRUCTIONS

1、Introduction

UVC disinfection robot is mainly used for automatic disinfection in public places. Such as Medical,Hospital, Shopping malls,Airports,Subways, Enterprise Meeting Room, etc. The robot adopts the most advanced laser navigation system to realize the robot's automatic driving in the environment.

Note: When It is working, pls keep it away person which will be harmful to eyes and skin



Upper Body



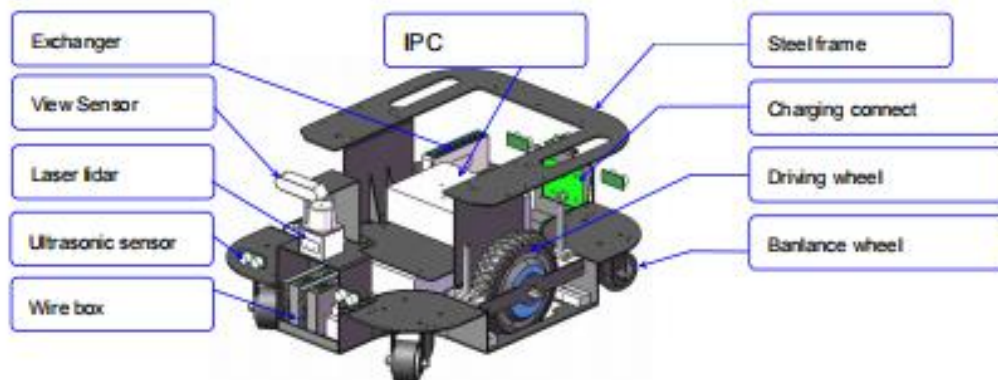
Robot Base



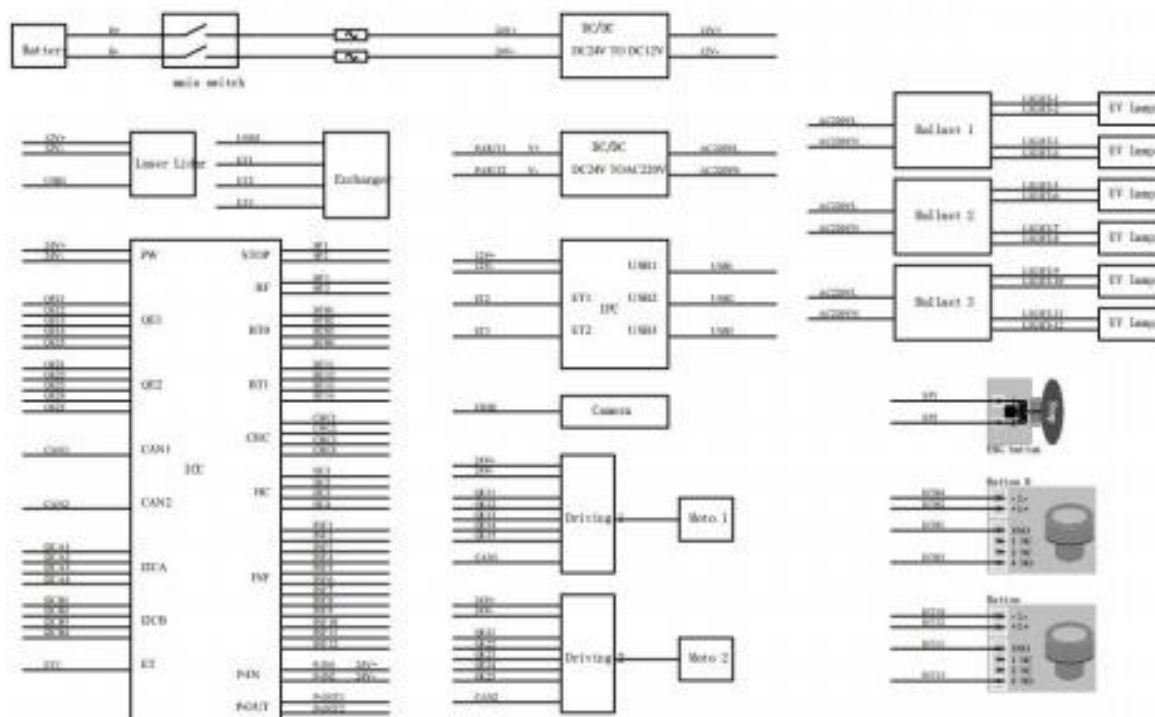
2、Technology Specification

1	Battery model	Ternary lithium battery	19	Safety protection	emergency stop button
2	Battery capacity:	24V / 30ah		located at the front and back of the casing, two for each	Ultrasonic sensor
3	Charging time	≤ 2H	20	Indicator light and Speaker	
4	Maximum charging voltage:	29.4V	22	Navigation mode	slam navigation
5	Continual working (no load)	6H	23	WIFI	2.4g
6	Charging mode:	manual / automatic	24	Debugging port	Ethernet RJ45
7	Driving wheel (diameter * width mm)	200 * 42	25	Route planning: automatic planning / manual route planning	automatic / manual
8	Tire Material	polyurethane	26	Laser lidar	30m
9	Power	200W	27	Wireless transmission /USB2.0	433M
10	Maximum speed:	250r / min	28	Ambient temperature:	0 ℃ ~ 45 ℃
11	Maximum torque:	30nm	29	Ambient humidity:	5-95%
12	Driven wheel	nylon	30	Operation environment:	indoor (no dust and corrosive gas)
13	Driven wheel Dimension (diameter * width mm)	63 * 50	31	Ground anti slip coefficient	≥ 0.5
14	Turning radius (mm)	53	32	Floor requirements:	concrete smooth
15	Performance: maximum load:	50kg	33	vertical obstacle crossing capacity:	10 mm
16	Maximum operating speed:	1.5m/s	34	Capacity of crossing gullies:	20mm
17	Navigation accuracy	± 30mm	35	Maximum climbing angle	5 °
18	Turning Angle	360 °	36	UV-C	36W x 4

3、Base Main Drive Unit



4、Block Diagram



5、Charger

Model: S-C-01
Input: 14.4V , 0.1A;
Inside Battery: 11.1V , 4mAh, 44.4Wh;

6、Maintenance Schedule

Maintenance interval				
Standard=●	W	A	B	C
Lamp				
1.1	Check the function of the Lamp		●	
1.2	Inspection of Cable Connections and Connections		●	

1.3	Check the brake pads			•	
Electrical system					
2.1	Check alarm system and safety device according to operation instructions			•	
2.2	Inspection of cable and motor fixations			•	
2.3	check the functions of operation switch and components			•	
2.4	Check the function of the emergency stop button			•	
2.5	Inspection of Frame Connections			•	
2.6	Check whether damage to the electrical line (insulation material,cable,terminal etc.)			•	
2.7	Read the control system, check the settings and correct them if necessary.			•	
Battery					
3.1	surface of battery and components			•	
3.2	Check that the connection of battery cable is tight			•	
3.4	Check whether the battery plug is damaged, fixed			•	
3.5	Check battery voltage			•	
Runing status					
4.1	Check the functionality of the test run			•	
4.2	Check for abnormal sound or leakage of driving wheel			•	
4.7	Check wheels for wear and tear			•	
Body Structure					
5.1	Check the front cover and battery case cover			•	
5.2	Check whether the sign is missing or not and whether the mark is clear and readable			•	
5.3	Test run with rated load			•	
5.4	Test run after maintenance			•	
5.7	Check whether the frame and bolt connections are damaged			•	

7、Automated Guide Technology Specification

navigation system adopts slam natural navigation, laser sensor scans the surrounding environment, creates a map in the system, and in the process of robot driving, the laser sensor constantly obtains the information of the environment, matches the map data for positioning, and cooperates with the motion controller and the control algorithm to realize the robot's automatic driving.

1) Robot scan the disinfection site firstly and then the system automatically generates the environment map.

2) Set up the disinfection work area for the disinfection robot.

3) Set up disinfection free area, red line area and forbidden area.

4) Start the disinfection program on the computer client or the touch screen of the disinfection robot.

5) After disinfection, return to standby area for charging (manual or automatic charging).

6) In the process of disinfection, if someone intrudes within 5 meters from the robot, the UV light will go out, and it will be released automatically when people leave.



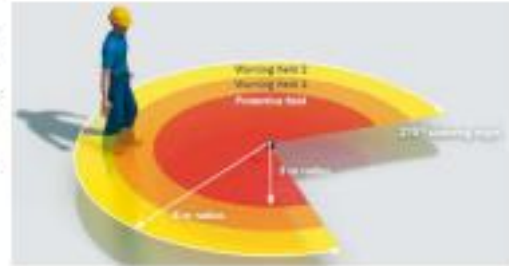
8、Safety control

Safety protection is particularly important. Robot can drive and disinfect automatically, . Multiple safety protection is adopted. Robot will immediately automatically avoid or slow down to stop, so as to ensure the safe and stable operation of the operation.

4.1 Laser Lidar is installed in the forward direction of the robot, and a certain laser anti-collision area and anti-collision distance are set. When there are people or obstacles in the safety protection area, the robot slows down and stops or automatically avoids.

4.2 Ultrasonic anti-collision

Four ultrasonic sensors are installed at the front and back of the robot. When obstacles trigger the ultrasonic collision avoidance, the robot slows down and stops or automatically avoids.



4.3 Emergency stop button

Emergency stop button is equipped. In case of emergency, press the emergency stop button and the robot will stop immediately at the front and back of the robot. When obstacles trigger the ultrasonic collision avoidance, the robot slows down and stops or automatically avoids

5. Operation process

5.1 inspection before use

In order to ensure the safe operation of the robot and the normal start-up of the disinfection robot, careful inspection must be carried out before using the robot.

1) Check of emergency stop button

Make sure the emergency stop button on the robot is released

2) Laser Lidar , Ultrasonic sensor

Check whether the laser sensor and ultrasonic are damaged in appearance. If so, stop using.

3) Check whether the ultraviolet lamp of the disinfection robot is damaged

Make sure that the UV light of the robot is normal. If not, stop using the robot, check the problem manually and then use the robot again.

5.2, operation

1) Turn on the switch button, the disinfection robot will automatically start and enter the standby state.

1) Turn off the switch button, and the disinfection robot is shut down.

6. Operating software

6.1, introduction

The operation software is android app, which is used to display the robot's data information (driving map, running route and other status), build environment map, set navigation map and

parameters, and set driving target in the software app.

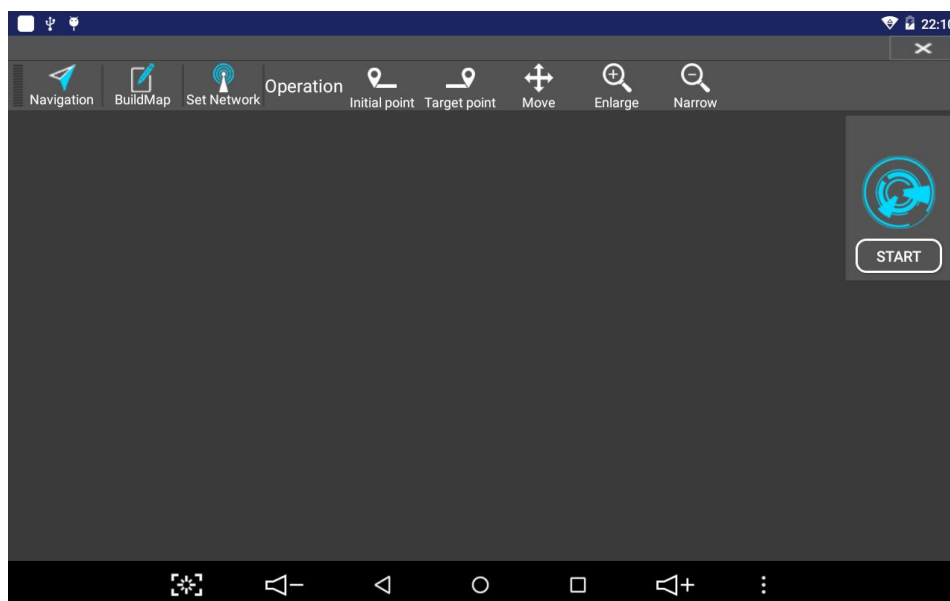
6.2 main interface

The software and robot are connected to the same network, start the disinfection robot and open the operation software app, and enter the main interface directly after starting the software. The following **diagram**.

Navigation: Choose the map

BuildMAP: START to build the map

Set Network: Connect the Wifi



Initial Point: Set the initialization point, click the button, select the location in the map, set the position as the initialization point of the robot, and set up the initialization point when the robot starts.

Target Point: Set the target point, click the button, select the location in the map, and set the location as the target point of the robot. When the robot performs the disinfection task, it will automatically go to the location for disinfection.

Move: Move up,down,left and right in the map

Enlarge: Zoom out

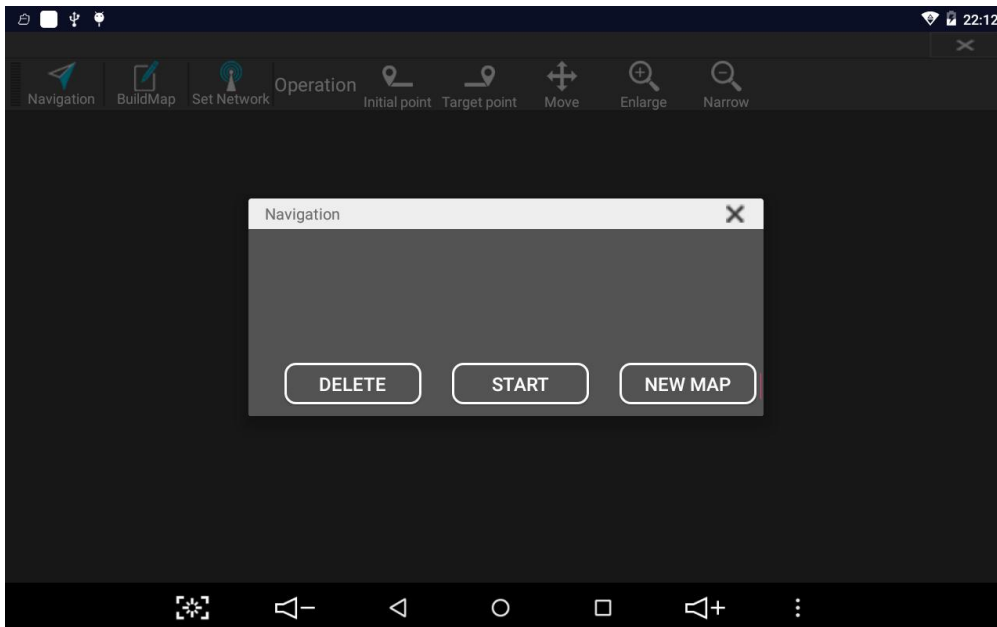
Narrow: Zoom in

6.3 Map selection

Press the navigation button to open the navigation map setting window, where you can select the map for navigation driving.

The middle of the window shows the map that the robot has stored.

- delete: after selecting the map to be deleted, press the delete button to delete the map inside the robot.
- start: select the map, press the start button, and use the map for navigation and driving.
- New Map: create a new environment map.



FCC Warning:

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.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

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

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.