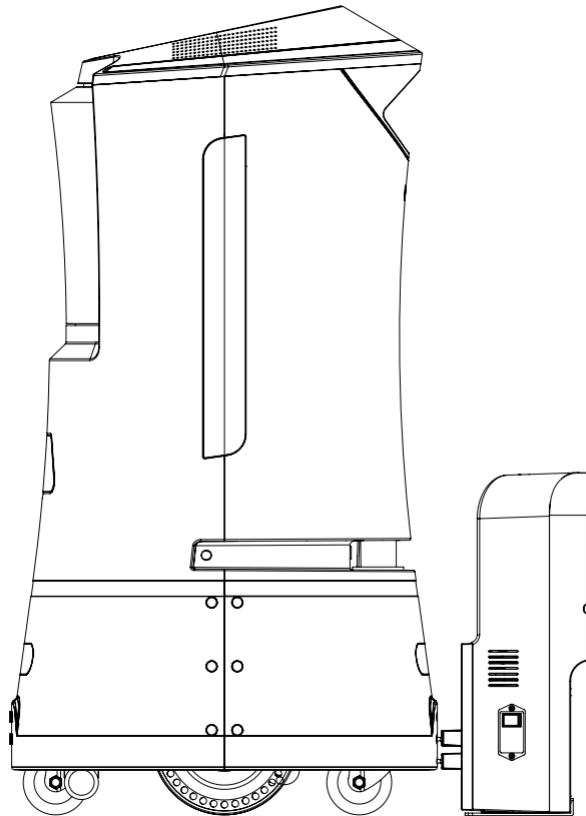


Exclland Service Robot

User Manual

Document No.: APN0000241V0.4.1



Product Model	UDM06XX
Subsystem name and model	
Module name	

Revision History

Revision	Initiator	Revision Description	Reviewed by	Approved by	Issue Date
V0.1.1	Fish Yu	Initial version	Eileen Zhou Johny Wu	John Gu	13 May 2022
V0.2.1	Alex Qin	Added FCC Warning Information.	Eileen Zhou Johny Wu	John Gu	15 Jul. 2022
V0.3.1	Alex Qin	Deleted Footer of "Exclland Confidential, Do Not Copy or Distribute without Permission".	Eileen Zhou Johny Wu	John Gu	28 Jul. 2022
V0.4.1	Alex Qin	Deleted Chinese interfaces information not used by users.	Lily Li Victor Rong	John Gu	06 Sept.2022

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Robot Parameters

Yomie M6	
Overall dimensions (L*H*W)	500mm*500mm*950mm
Cabinet dimensions (L*H*W)	292mm*272mm*331mm (26L)
Weight	52kg
Touch screen/ advertisement screen size	10.1"
Resolution	1280*800
Navigation mode	Laser Radar Navigation
Wireless Communications	WiFi
Maximum load/maximum climbing angle	10kg/10°
Maximum obstacle overcome ability	2.5cm
Battery Life	8h
System	Android&ROS
Platform	NVIDIAJETSON NANO+RK3399
Battery capacity	12Ah
Rated input voltage/Rated output voltage	48V
Rated power	60W (Non-charging state)
Sensor	Sonar, collision, laser radar, depth-sensing camera and so on
Speed	0-1.2m/s settable
Minimum pass-through width	65cm

Basic Purposes

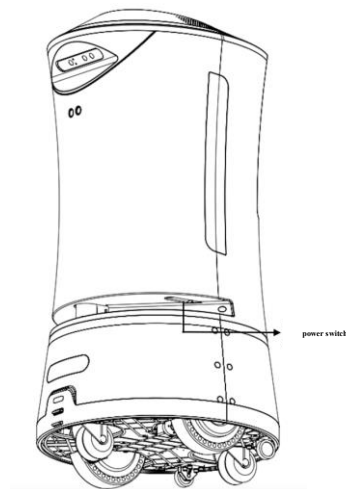
1. Startup &Shutdown

1.1 Main Power Switch

The main power switch at the bottom of the machine is located next to the universal wheel on the right side of the machine and is used to disconnect battery power. The switch is turned off by default when leaving the factory, and needs to be turned on when used for the first time.

1.2 Startup

When you press and hold the power switch for about 3 to 5 seconds, the light band at the bottom of the robot will flash, indicating that the robot is starting.



1.3 Shutdown

When you press and hold the power switch for about 3 to 5 seconds, the light band at the bottom of the robot will flash, indicating that the robot is shutting down.

2. Charging

2.1 Placement of Charging Pile

The charging pile should be placed on the wall, and there should be no other objects on either side of the center of the charging pile.

The charging pile shall be placed on flat ground instead of slopes or carpets.

The height of the charging part of the charging pile should be consistent with the height of the charging contact on the machine. Otherwise, the bottom of the charging pile needs to be adjusted through appropriately increasing or decreasing the filler.

The position of the charging pile should be fixed relative to the site to avoid causing movement.

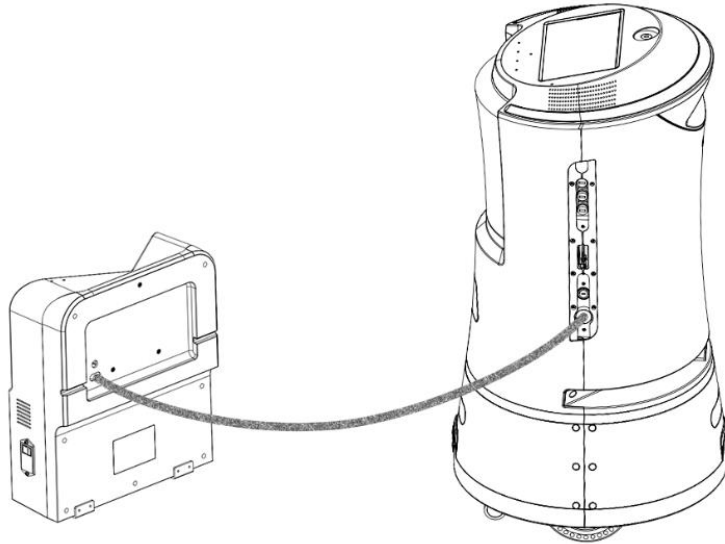
The distance between two machines shall not be less than 150cm when several machines are used in the same scenario at the same time.

After placing the charging pile properly, connect the charging pile to the power supply through the power line. At this point, the red indicator light on the charging pile is on.

2.2 Manual Charging

Behind the charging pile are a one-meter manual charging cable and a vertical cover connected to the right side of the machine. The cover is fixed by magnetic suction. You can suck it out with the sucker provided. After removing the cover, you can see the manual charging port. Manually insert the plug at one end of the cable into the manual charging port of the machine. After normal connection, the indicator light

of the charging pile turns red.

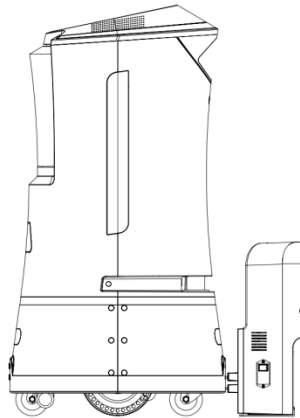


When the machine is manually charged through a charging cable, the case does not move. After a task is sent, it will fail directly. Before sending a task, remove the manual charging cable.

2.3 Contact Charging

After fixing the charging pile, manually push the machine to the charging pile so that the charging contact and the charging board of the machine contact the charging pile, then charging can start.

When the local map is normal and the charging pile point has been calibrated, the machine can automatically return to the position of the charging pile and automatically identify it and be charged according to the task sent to the charging pile point.



Note: The indicator of the charging pile is only in one state:

Blue

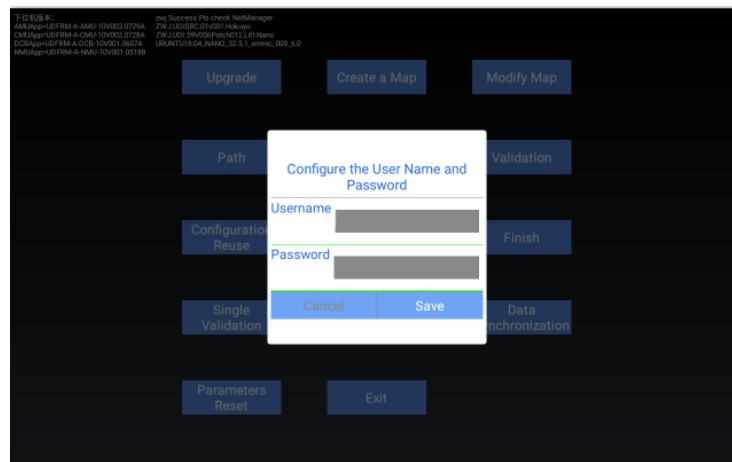
- Charging pile power-on
- The robot is being charged

Tool Operation

2.3.1 Robot Deployment APK (Mapping, Point Selection and Testing)

2.3.1.1 Opening Tool

Before opening the Robot Deployment APK of the machine the first time, you need to log in the APK. After logging in, you do not need to log in again within 24 hours, and you need to log in again after 24 hours.



2.3.1.2 Hotel Information Configuration

Area code: hotel.sit.0766.001 (“hotel” refers to the hotel mode; “sit” refers to the abbreviation of the hotel; “0766” represents the area code; “001” represents the first hotel in the current area); the area code is directly delivered by the NMS and cannot be modified.

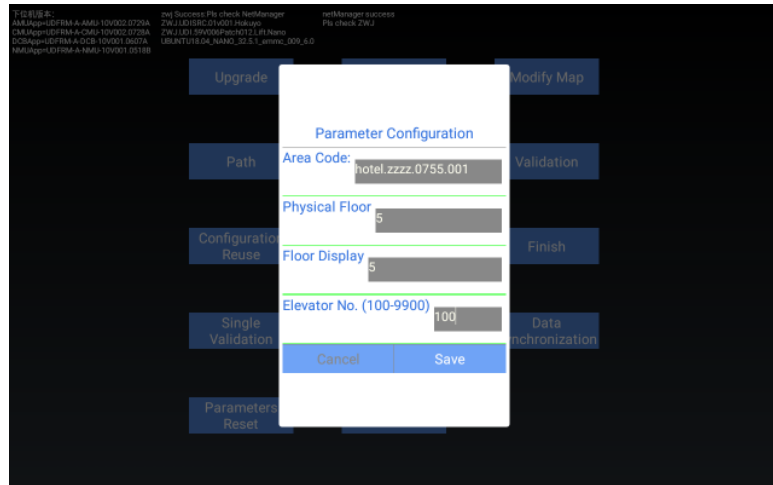
Physical floor: Count according to the number of on-site elevator buttons. Assuming that the hotel has negative three layers, fill “1” in this column for the third negative floor, “2” for the second negative floor, “3” for the first negative floor, “4” for the first floor;

Floor display: Positive floor display, for example, fill “-3” for the third negative floor;

Elevator number: the best for 100, 200, 300(do not fill it with “203/ 207”, the configuration can only be increased at a rate of 100);

Note: The floor and elevator numbers must be filled with

the same as those on the NMS

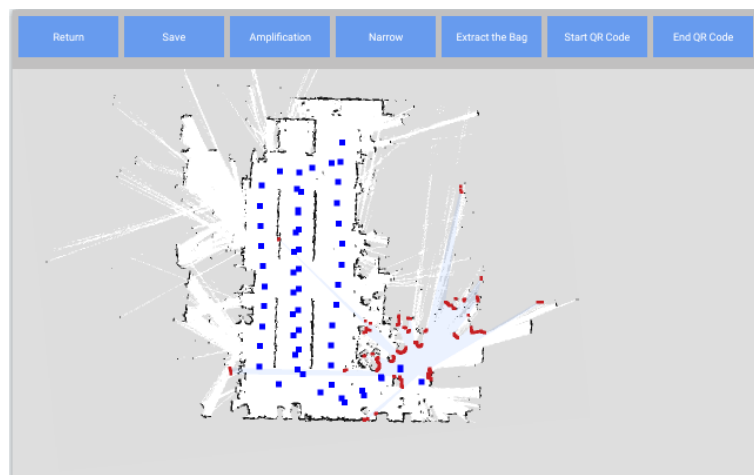


2.3.1.3 Starting to Mapping

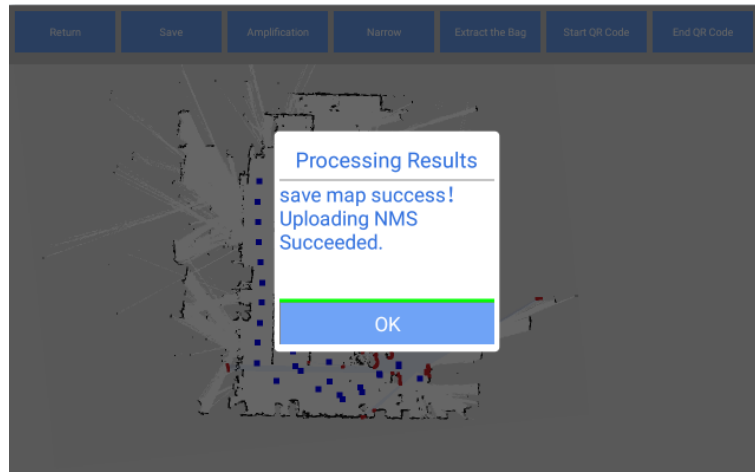
Click “Mapping” button to jump to the interface



After normal map scanning;



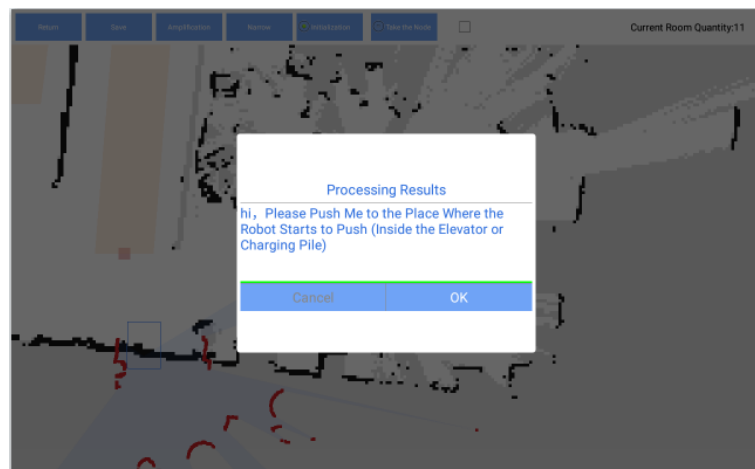
These blue points are the paths you pass



Click “Save” button to save the map and upload it to the background

2.3.1.4 Point Selection

After entering the page, the map will be displayed automatically and the paths will be read. The interface is as follows and needs to be initialized;



Click “Cancel” button on the pop-up window

In the initialization mode, press and hold the screen and then release in the direction corresponding to the machine radar for the initialization positioning; after positioning, manually push the machine for a distance to judge whether the machine positioning is accurate.

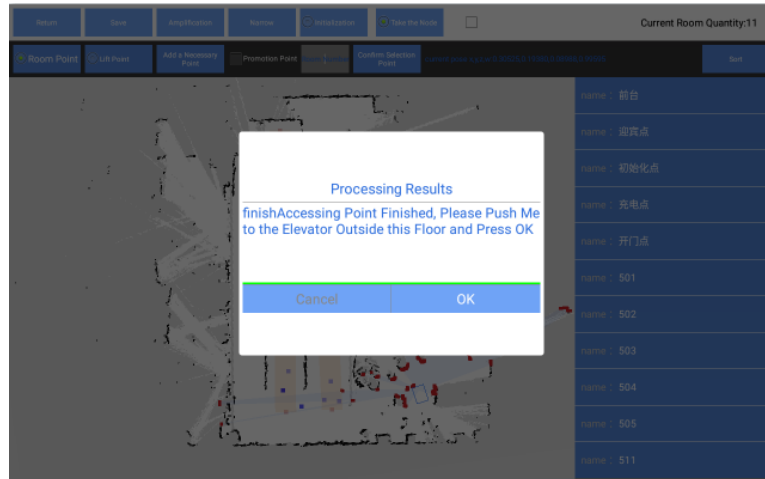


Push the machine to the corresponding elevator position, select the corresponding point name on the right, and then confirm the selected point

Note: The inner point of the elevator must be inside the elevator and not too close to the door; the outer point of the elevator should be outside the door and not too close to the elevator door; the waiting point of the call should be far away from the elevator door than the outer point of the elevator. Click “Save” button after all inputs are completed.

The files saved by the hotel are in Excel format and an elevator is configured with one file (the elevator point file is save as liftpoint.xls; room point file is saved as mealspoint.xlsl, liftPoint.json); the storage path is: /sdcard/UTRobot/EXPLORE/ area code /

In hotel mode, only the elevator points and room points are saved; after “Save” button is clicked, the following window will pop up.



2.3.1.5 Robot Deployment Completion Tests

Push the machine to the outer point of the elevator of the Human-Computer Interface and enter the corresponding area number and floor.



Including full room test, partial room test and elevator test.

3. Maintenance

3.1 Safety Instructions

Notices for us

- 1) Do not put items exceeding its bearing capacity. See the product manual for specific parameters.
- 2) Do not take or place items during operation.
- 3) Do not press or tap the screen hard.
- 4) Do not pull the robot during operation.
- 5) Do not reversely push the robot when the robot is on.
- 6) If the robot enters the wrong position due to occlusion or other factors, please suspend the task in time and push it to the correct path before continuing the task.
- 7) Please do not artificially block the robot.
- 8) It is not recommended to deliver soup in principle. When using, it is necessary to prevent soup splashing and high temperature burns.
- 9) Note that the status of the robot changes during movement. When carrying high temperature tableware or soup pot, please avoid colliding with the robot and causing high temperature burns.
- 10) Do not flap the robot, otherwise it may be damaged.
- 11) It is forbidden to store the robot outdoors to avoid appearance aging due to exposure to sunlight.

③3.2 Notice for Environment

- 1) The robot is only used for indoor delivery and is forbidden to be used outdoors (e.g. between buildings) or in industrial environment. It is suitable for the flat ground, such as floor tiles and thin carpet, other than the environment with steps, too large slope and too close environment.
- 2) It is not recommended to use the robot on the wet ground or the ground with water.
- 3) The robot may be tripped or entangled by power cables and other sundries scattered on the ground, please remove them before use of the robot.
- 4) The use of this product under the condition of protruding objects on the ground, such as thresholds may lead to food spilling. Please make sure that the height of protruding objects on site is less than 1cm.
- 5) The minimum passing width of the robot should be more than 65cm, and the width greater than 1.5m will have the best smoothness. In the passage with the width greater than 1.8m, two robots can be driven in opposite directions and meet (the specific width will be evaluated by technicians according to the real scene), otherwise the robot will give way to the other.
- 6) If there are pure black (such as skirting lines), mirror (such as wall) and transparent objects (such as landing window) at a height of 40-43cm relative to the ground, they may interfere with the radar reflection of the robot and cause abnormal walking of the robot, therefore, it is necessary to modify the site to make the radar reflect (such as sticking stickers and frothing film).

- 7) The maximum permissible gradient of the robot is designed to be 10° , but the recommended slope for carrying items should be less than 5° , and the slope width should not be less than the minimum passing width of 0.9m, and the rollover angle should not exceed 5° to prevent items from spilling.
- 8) There should be a space of 70cm between two robots at the standby point, a gap of 15cm from the back wall and a distance of 35cm from the side wall.
- 9) Fences or other barriers should be installed at the edge of the stairs, the entrance of the downhill and other places where there is a risk of robot falling. If there is no protection measure, customized laser stickers of our company should be pasted to form a virtual wall to avoid robot falling.

① 3.3 Power Supply and Notice for Electric Power Utilization

- 1) Please charge it in time when the remaining battery of the robot is less than 10%, for the long-term low-battery operation will reduce the service life of the battery
- 2) If the robot is not used for a long time, please power off the product in time to protect the batter
- 3) Be sure to use the charging equipment specially equipped by the original factory (charging pile or adapter) and do not use non-original equipment to charge the robot
- 4) Ensure that the power voltage is the voltage marked on the charging pile; otherwise, the charging pile may be damaged
- 5) Take care to protect power cables from pulling or twisting
- 6) Do not charge the machine near inflammable and explosive objects
- 7) Please keep the storage and charging positions of the robot dry and in normal temperature. It is strictly prohibited to place the machine and charging pile in high temperature area ($>40^{\circ}\text{C}$), get the machine and charging pile exposed to water
- 8) Collision between charging pile and external objects is strictly prohibited, which may cause damage to charging pile
- 9) If the charging pile is damaged or the charging current is abnormal, please replace the charging pile in time or contact our technical personnel.

Product Maintenance

③ 3.4 Tray, drive wheel and auxiliary wheel

Keep the tray clean and tidy, check and clean it at least once a week. Wipe it with a clean cotton cloth. When the bottom wheel is tangled or bonded by sundries, please lift the robot to clean it.

③ 3.5 Sensor Maintenance

Please check and clean the laser radar sensor at least once a month. In case of sudden contamination, be sure to deal with it immediately to avoid abnormal operation of the machine. Clean it with soft paper towels or a clean cotton cloth.

③ 3.6 Body Maintenance

Keep the body neat and clean by wiping it with a clean cotton cloth. It is forbidden to lift, climb, bump, push or break off the robot, nor to stack sundries on the body. If the machine breaks down, it is forbidden to remove the screws or open the cover for repair without our permission or guidance. It is forbidden to wash the robot directly with water or to clean the robot with corrosive or volatile chemical solvents. Otherwise, the appearance or internal structure of the robot may be damaged and irreparable faults may occur.

③ 3.7 Maintenance of electrode slabs for charging pile and robot

Keep the electrode slabs for charging pile and robot dry and clean, check and clean them at least once a week, wipe them with soft paper towel or clean cotton cloth; in case of poor charging contact, please clean them immediately.

③ 3.8 The machine transportation should meet the requirements of the Packaging- Basic Tests for Transport Packages-Part 23:

Random Vibration Test Method (GB/T 4857.23-2012) and the handling shall be implemented with forklifts and other handling tools

4. Troubleshooting

When the robot runs abnormally, please solve the fault according to the following methods:

- 1) Keep stopping under the condition of no obstacle in the way:
Please press the Emergency Stop switch on the back of the robot and give a push to the robot, and then turn the Emergency Stop switch clockwise to release the switch. If the robot still does not move, please push it back to the starting point and then shut it down and restart it.
- 2) Automatic pile loading failure or pile unloading failure.
- 3) Due to the change of obstacles around the charging pile, automatic loading or unloading of the robot may fail. Please press the ON/OFF button to restart the robot.
- 4) There is Error 107- The robot failed to identify the charging pile during unloading.
- 5) In case of Error 107 and that the robot stopped after unloading from the charging pile, please press the Emergency Stop switch, push it to the starting point, shut it down and restart it.
- 6) There is Error 108- There is a fault during the charging of the robot on charging pile.
- 7) Check whether the power supply of the charging pile is normal. If the normal power indicator is on, shut it down and restart it so that it can be automatically recharged. If the fault occurs repeatedly, please call the hotline.
- 8) There is Error 113 during the moving of the robot.

- 9) Take photos, contact the technical support personnel, push the robot back to the charging pile (starting point) and then restart it.
- 10) When the robot's path is blocked, if it can go around, the path will be adjusted; if it can't go around, it will give a voice broadcast of "Make way".

FCC Radiation Exposure Statement

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 & your body.

FCC Warning

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.

NOTE 1: 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.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.