INTRODUCTION

Roboshop Pro is a professional software for mobile robotics applications developed purposes.

Roboshop Pro integrates common features for mobile robotics applications such as robot control, map building and editing, and robot modeling, and is designed to provide fast, accurate, and stable mobile robotics solutions.

Software Installation

Introduction to the installation of Roboshop Pro

System Requirement

The system requirements required to install this software are as follows.

- PC with a mouse or equivalent input device
- Operating system (64-bit).

  Windows ® 10

  Windows® 8.x

  Windows ® 7 (Service Pack SP1)
- PC Flash Memory:

4GB RAM (depending on the size of the map used for the scene, 8GB RAM and above is recommended for maps with an actual area of 200 m × 200 m or more)

- Hard Disk Space:

  8GB or more of available space monitor resolution

- 1366 x 768 or higher resolution (1920 x 1080 recommended)
- Network device

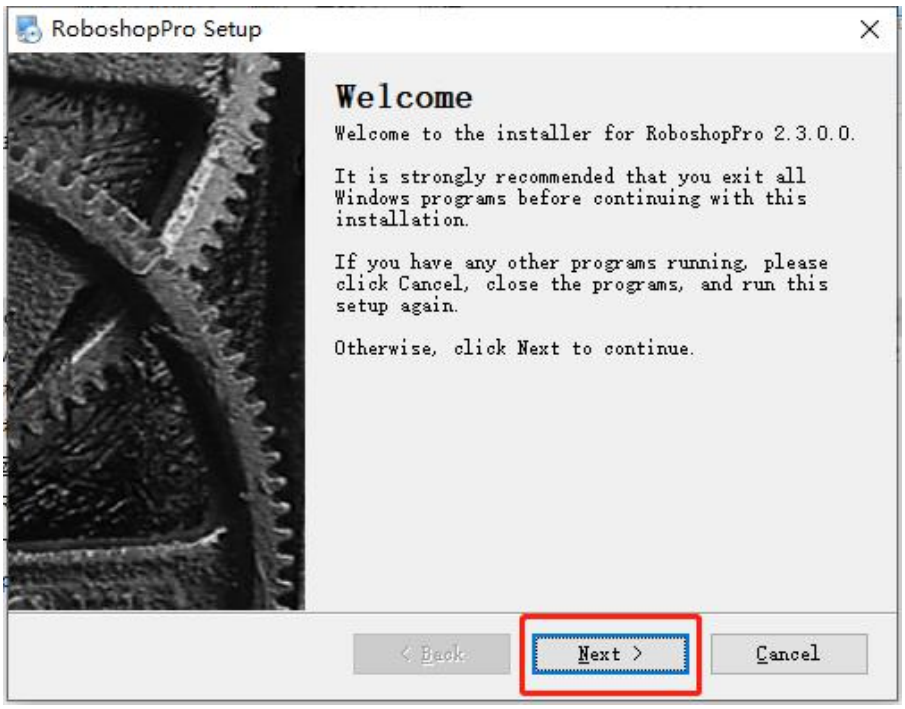
  Normal access to wired and wireless networks

Installation and Configuration

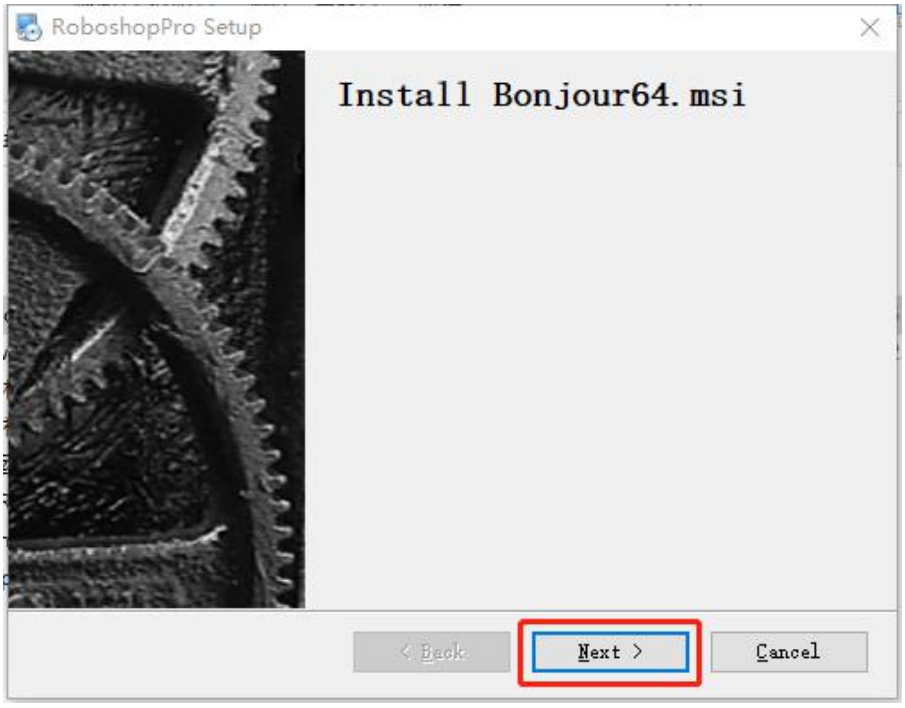
The Roboshop Installer is shown as bellow:

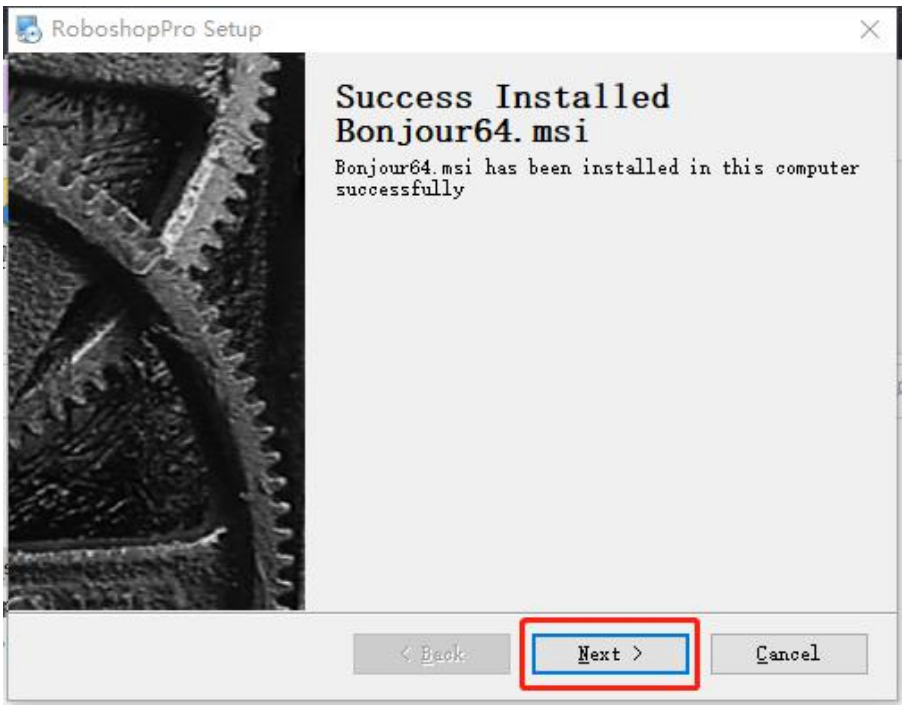
RoboshopPro_setup.exe

Double click (where x.x.x stands for the version number, e.g. 2.0.0) to start the installer and select the desired installation language (which will also apply to Roboshop Pro software languages).

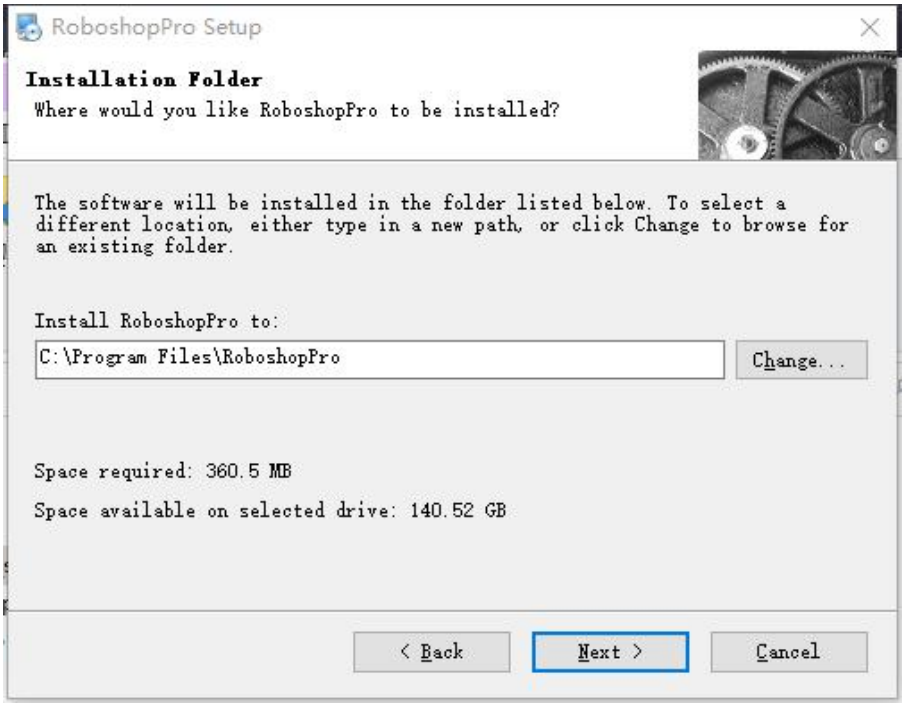


Click "Next >", and then click "Next >" to install Bonjour64.msi first.

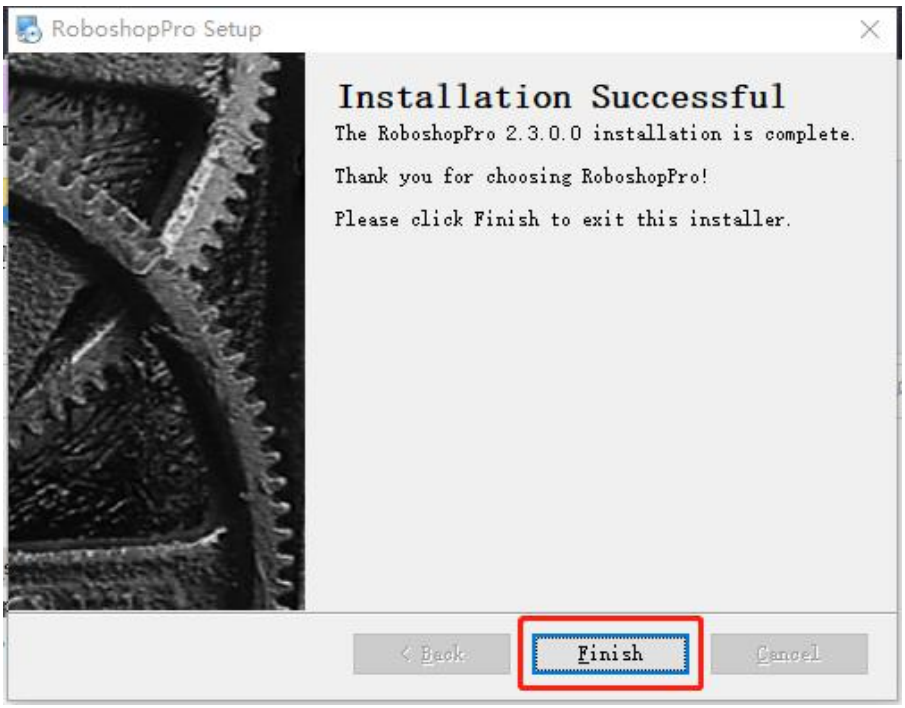




After installing Bonjour64.msi successfully, click "Next >" to select the destination folder for installation.

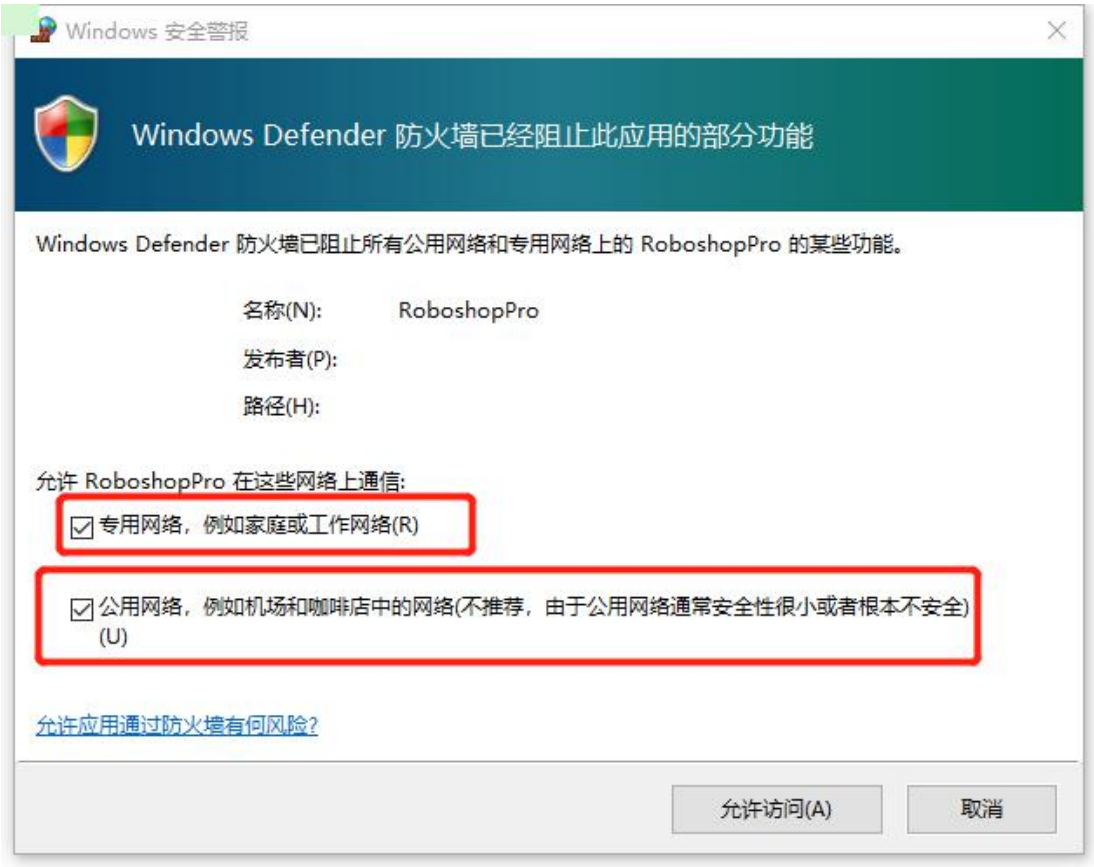


Chek the Install folder and shortcut folder, and click "Next >" to install RoboshopPro.



After installing Bonjour64.msi successfully, click "Finish" to exit the RoboshopPro Installation.

If a Windows firewall warning displays while using Roboshop Pro, please click both [Private Network] [Public Network] as shown below and Allow Access. If only one is chosen, some of Roboshop Pro's functions may not work properly when the computer is connected to another network. If other antivirus software or firewalls are popping up to block it, click Allow as well.



Note:

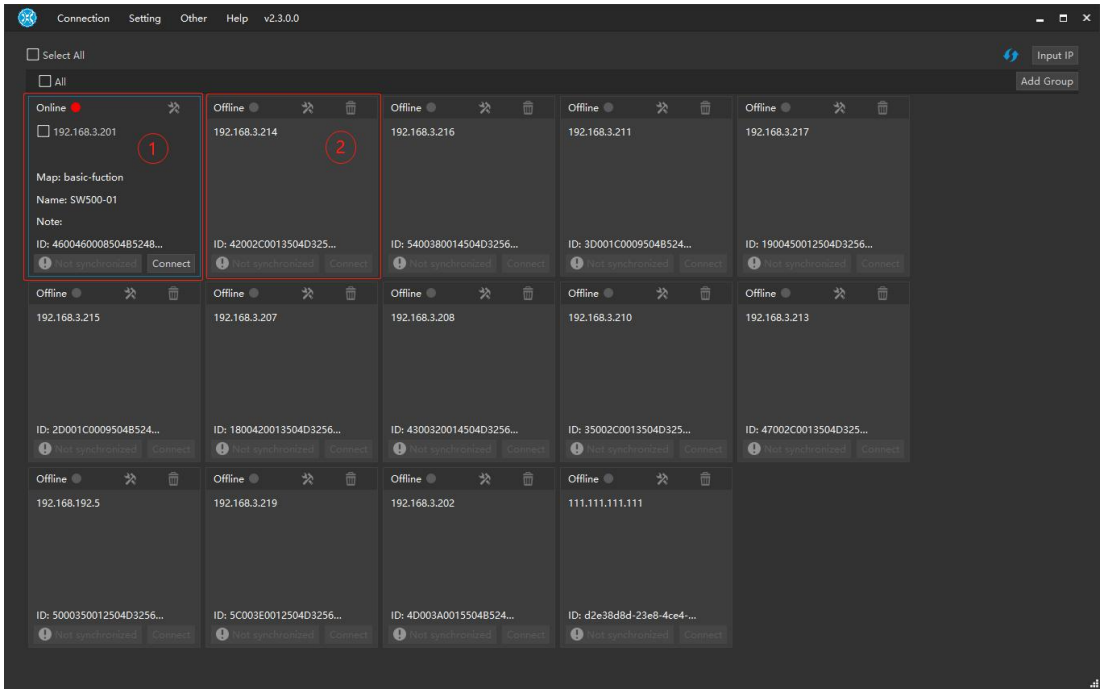
1. Please make sure to install the software on a non-system disk (usually D Disk). If the computer has only one hard disk, do not install the software in the Program Files and Program Files(x86) directories of that hard disk (recommended path: C\Robotics\RoboshopPro).

2. If your computer is equipped with security software, the warning messages may appear when you install the software.

Quick Start

Robot status

Open Roboshop Pro and enter the Home page, we can see all the robots that exist in the current network environment. the robot status is divided into: [Online] [Offline], as shown below.



①. [Online], refers to the available robots that exist in the current area.

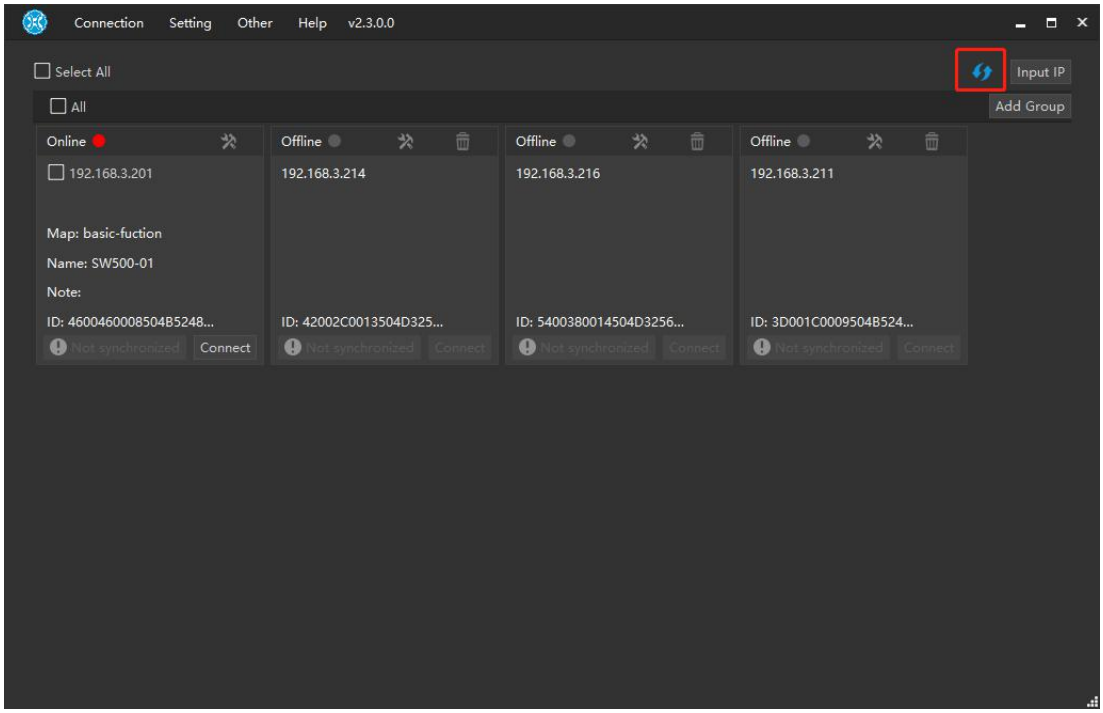
② . [Offline], refer to the robots that was previously scanned, or connected, but is now in an unavailable state.

Connect Robots

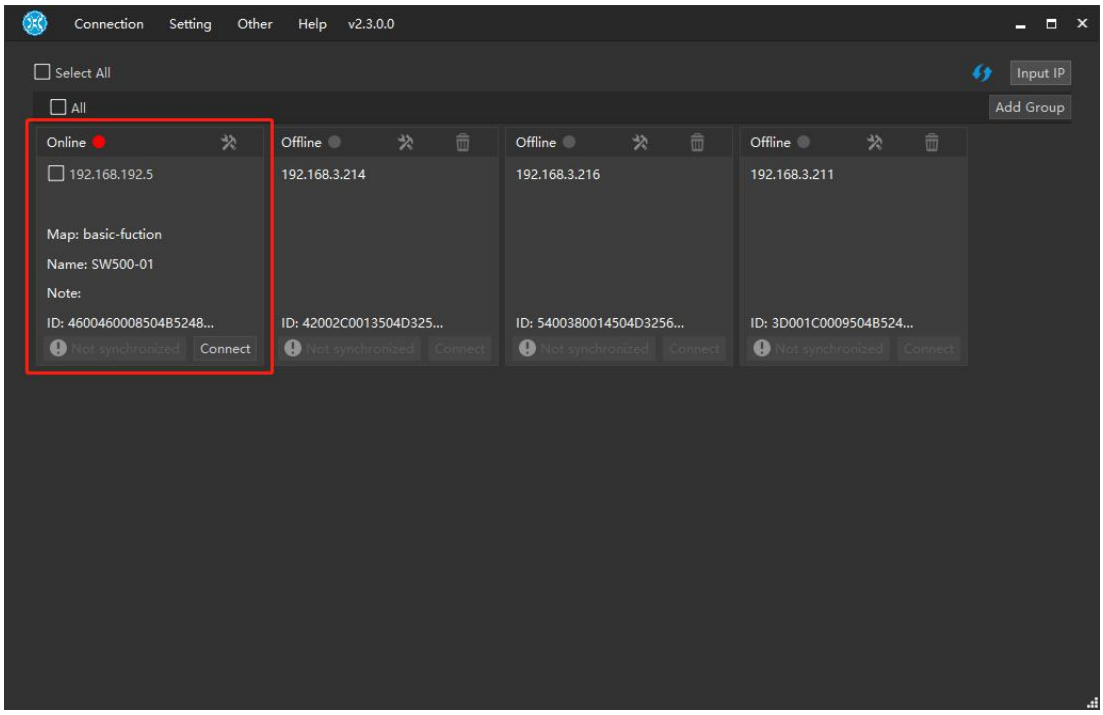
Use Roboshop Pro to connect the robot so as to use all the software function. There are two ways to connect to the robot.

1. Connection by network cable

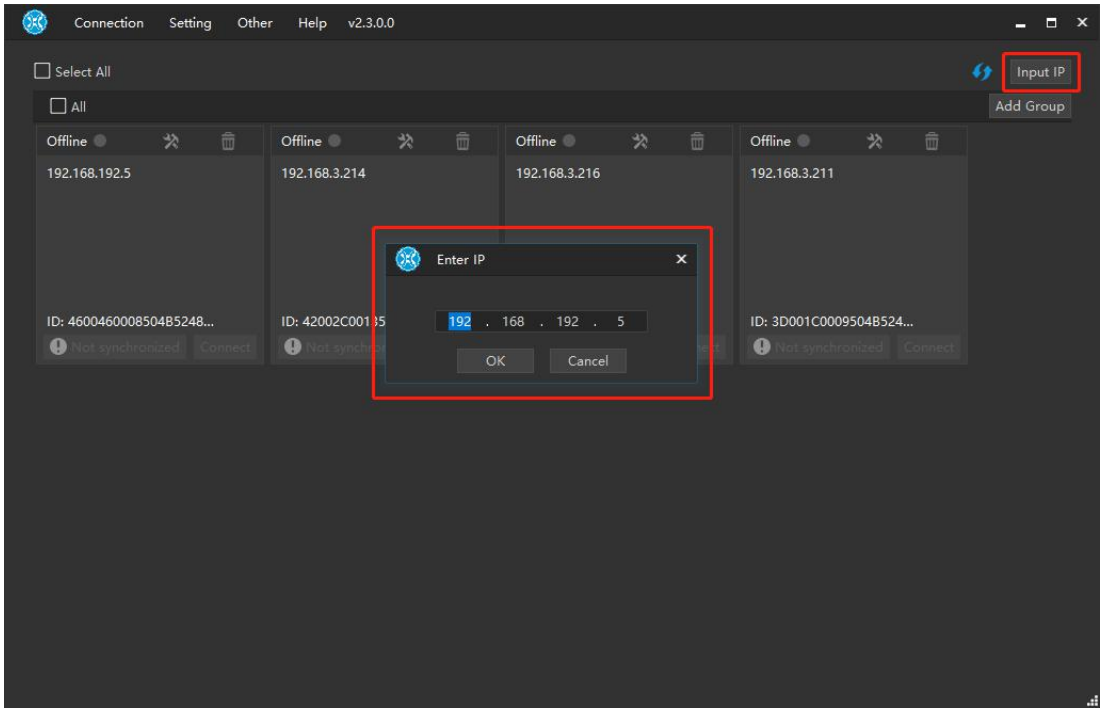
Connect the computer to the robot using a network cable. Open Roboshop Pro and enter the home page, then wait or click the [Refresh] button in the top right corner.



Find the robot with IP address 192.168.192.5 in the list and click [Start Connecting].



You can also add the robot to the list by clicking the [Input IP] button in the upper right corner and entering the IP address (192.168.192.5) and connecting.



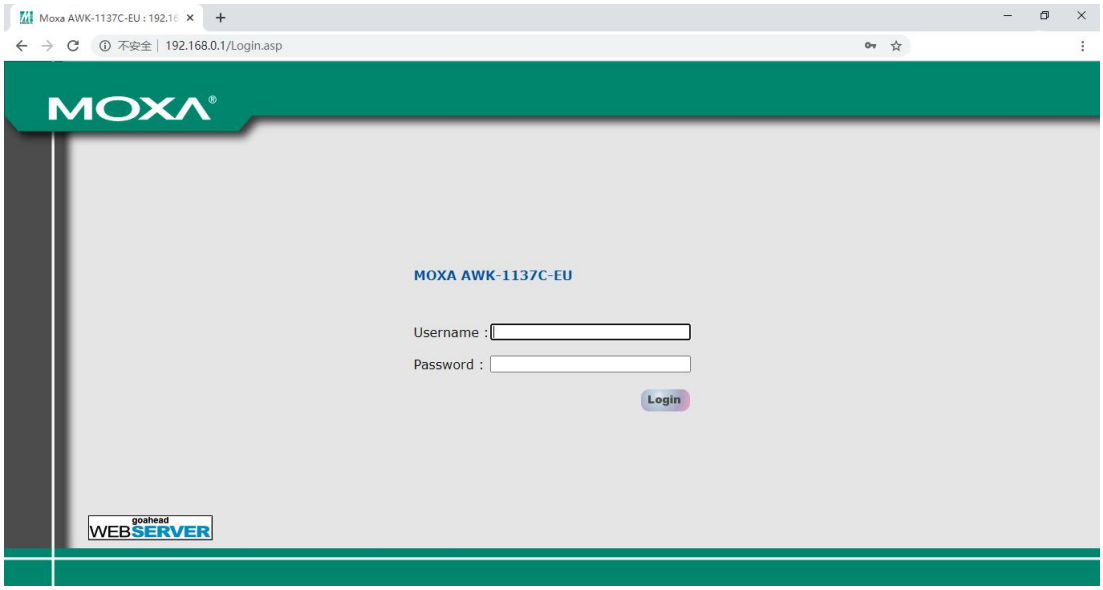
2. Using local area wireless network for connection

Connect to MOXA by network cable

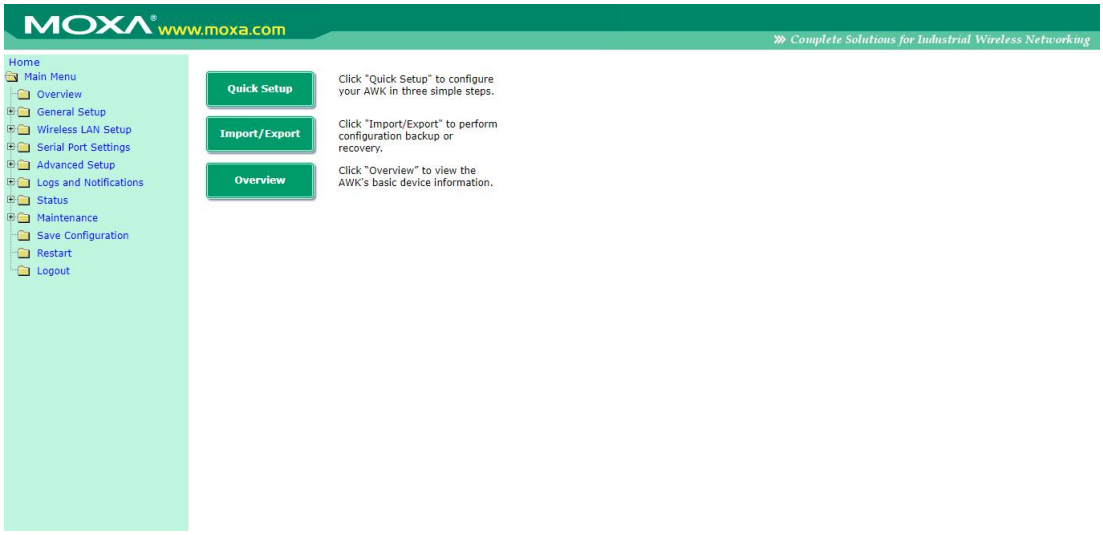
Connect the computer and MOXA client by network cable. The network port of MOXA is in the left side of the robot.

MOXA Setting

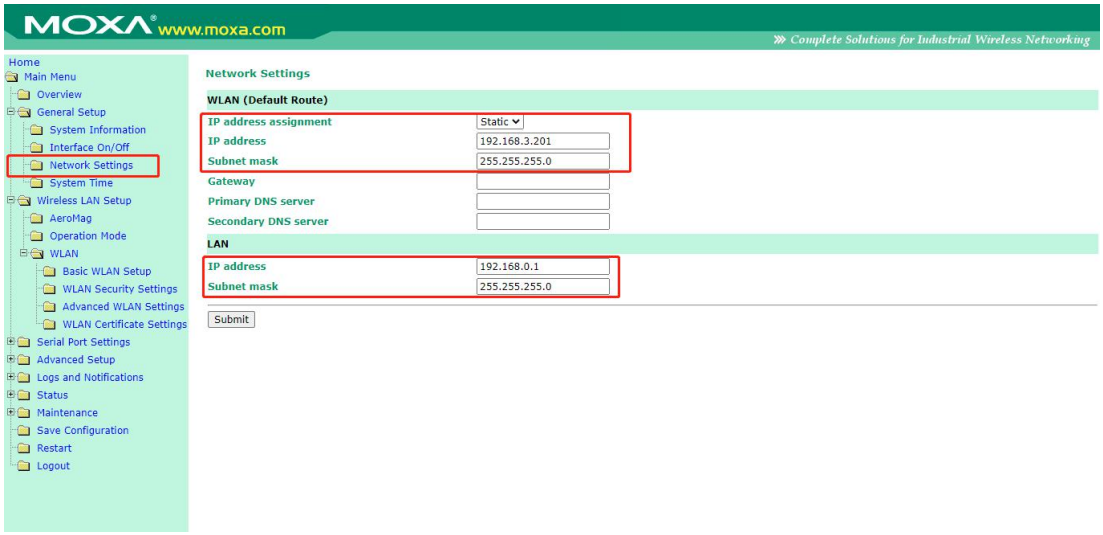
After connecting the computer with MOXA, input 192.168.0.1 in the web browser (recommend Chrome browser). The MOXA interface will display as shown below:



The default Usename\Password is "admin" and "moxa". Input the default Username and Password and click [Login] button to enter MOXA setting interface.

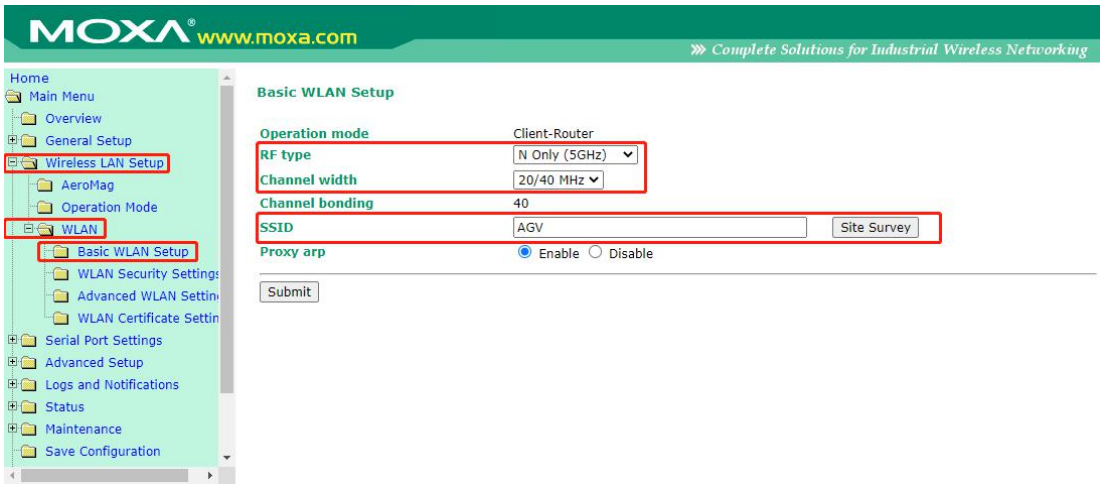


Click [General Setup] -> [Network Settings].



Input IP address and Subnet mask of WLAN. The WLAN IP address should be fixed to the WLAN which MOXA would access to. After finishing setting, click [Submit] button to save setting.

Click [Wireless Lan Setup] -> [WLAN] ->[Basic WLAN Setup].



Choose the "RF type" and "Channel Width" according to the actual local area WLAN. Then click [Site Survey] button and wait for a little time, a "Site Survey" web page will pop-up as shown below:

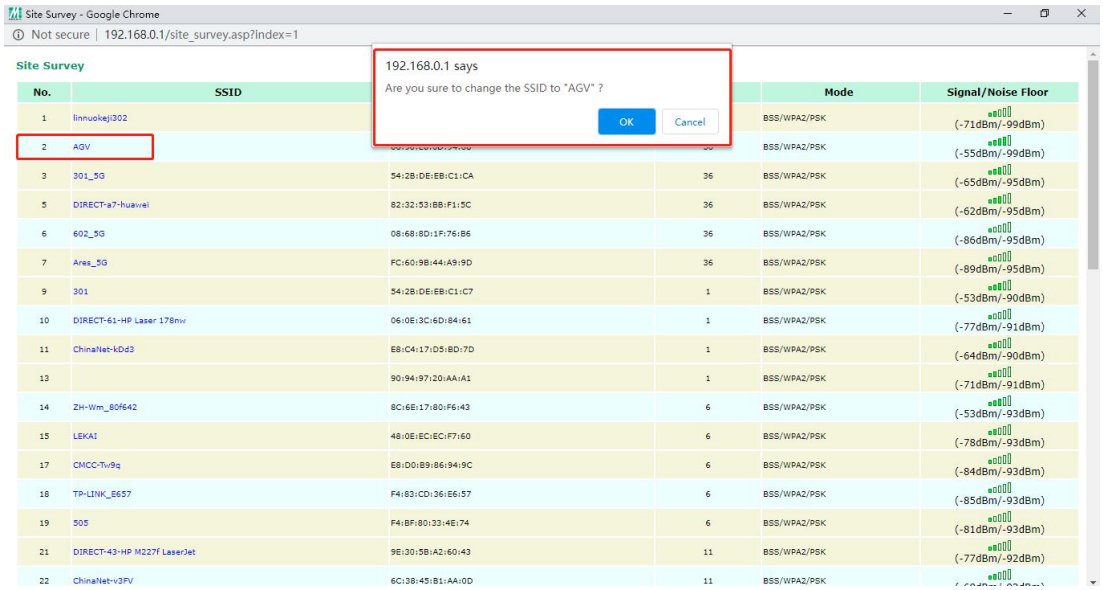
Site Survey - Google Chrome

不安全 | 192.168.0.1/site_survey.asp?index=1

Site Survey

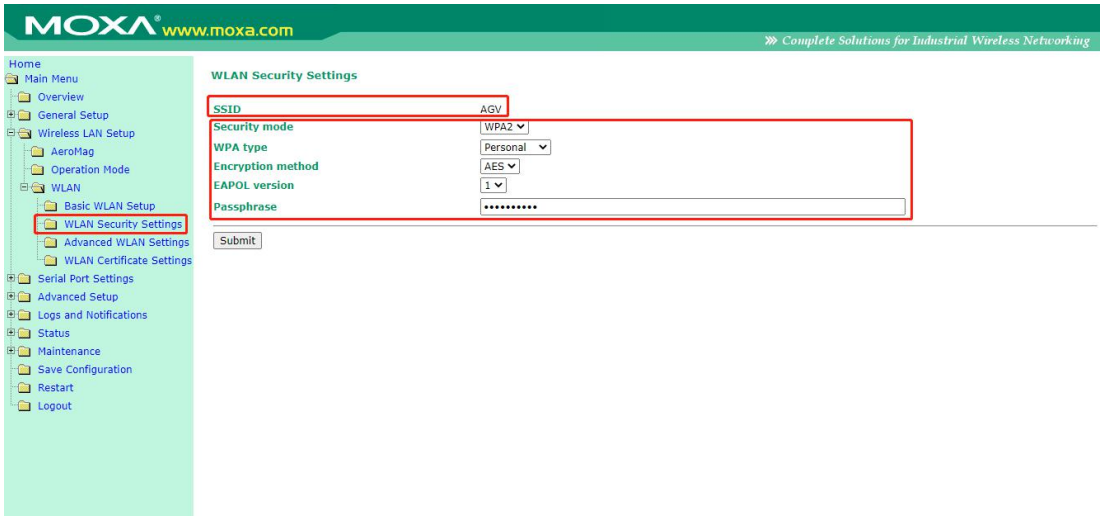
No.	SSID	MAC Address	Channel	Mode	Signal/Noise Floor
1	DIRECT-a7-huawei	82:32:53:BB:F1:5C	36	BSS/WPA2/PSK	(-67dBm/-100dBm)
2	AGV	06:90:E8:6D:94:68	36	BSS/WPA2/PSK	(-54dBm/-100dBm)
3	301_5G	54:2B:DE:EB:C1:CA	36	BSS/WPA2/PSK	(-71dBm/-100dBm)
5	linnuokeji302	50:98:B8:91:60:CE	36	BSS/WPA2/PSK	(-67dBm/-96dBm)
6	602_5G	08:68:8D:1F:76:B6	36	BSS/WPA2/PSK	(-88dBm/-96dBm)
7	HP-Print-61-LaserJet Pro MFP	34:68:95:82:D0:61	1	BSS/WPA2/PSK	(-82dBm/-91dBm)
9		B0:E5:ED:FC:75:49	1	BSS/WPA2/PSK	(-69dBm/-91dBm)
10	ChinaNet-3014	20:6B:E7:38:7A:74	1	BSS/WPA2/PSK	(-76dBm/-91dBm)
11	Wellwit_Finance	FC:D7:33:BB:70:6A	1	BSS/WPA2/PSK	(-69dBm/-91dBm)
13	301	54:2B:DE:EB:C1:C7	1	BSS/WPA2/PSK	(-54dBm/-90dBm)
14	Redmi_9AFC	54:48:E6:A1:9A:FE	1	BSS/WPA2/PSK	(-68dBm/-90dBm)
15	ChinaNet-kDd3	E8:C4:17:D5:BD:7D	1	BSS/WPA2/PSK	(-66dBm/-91dBm)
17	ZH-Wm_80f642	8C:6E:17:80:F6:43	6	BSS/WPA2/PSK	(-56dBm/-93dBm)
18	BX	D8:32:14:76:60:79	6	BSS/WPA2/PSK	(-74dBm/-92dBm)
19	CMCC-Tw9q	E8:D0:B9:86:94:9C	6	BSS/WPA2/PSK	(-86dBm/-93dBm)
21	GM	F0:B4:29:E1:48:23	11	BSS/WPA2/PSK	(-74dBm/-92dBm)

This web page shows all the WLAN that MOXA found. Then click the targeted WLAN SSID and click [OK] to continue.



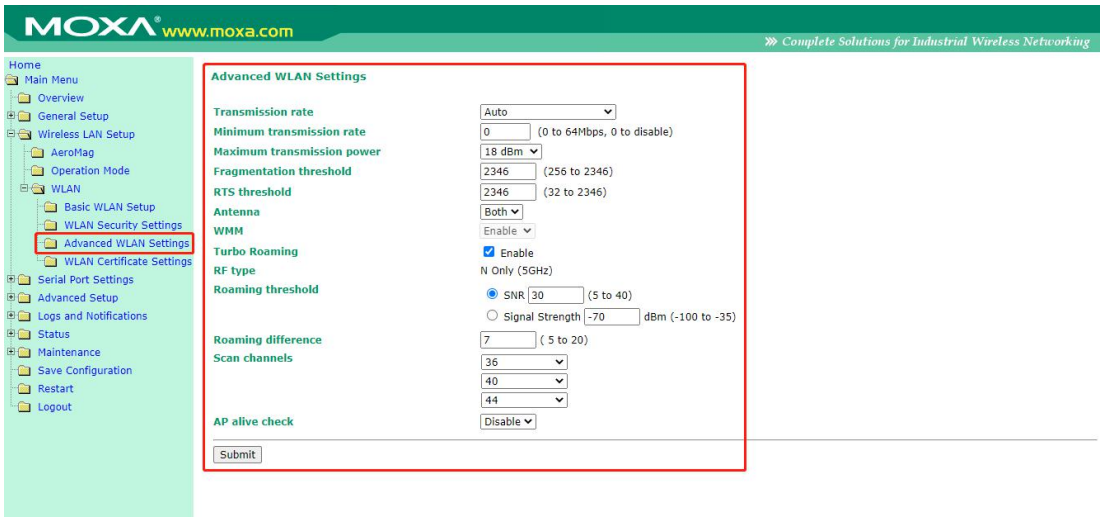
Confirm your setting and click [Submit] to save all [Basic WLAN Network] settings.

Click [WLAN Security Settings].

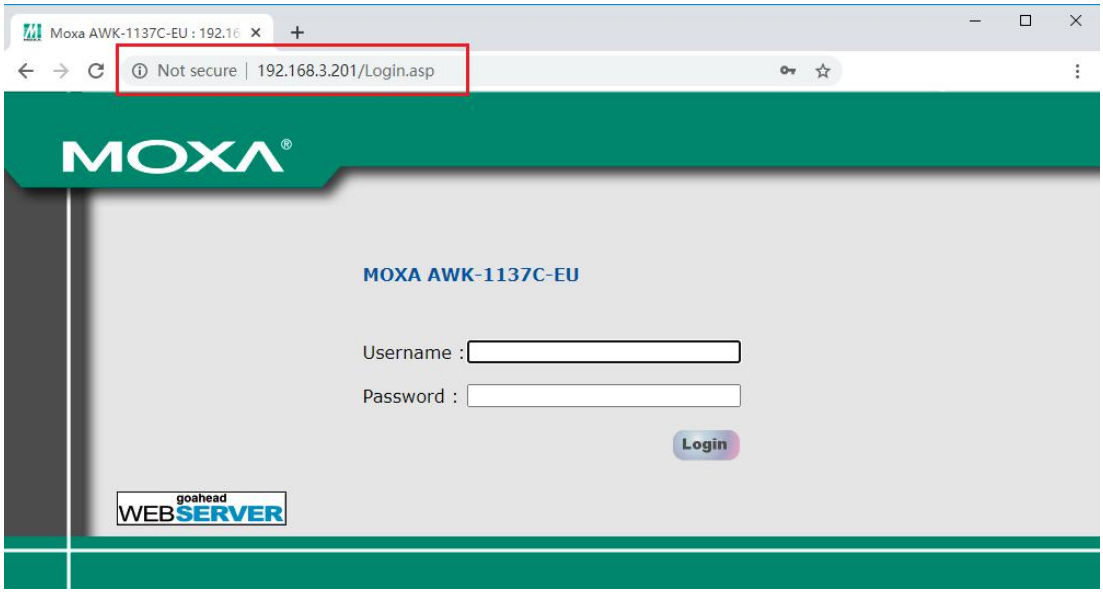


The SSID has changed to the WLAN SSID just selected. Choose the "Security mode", "WPA type", "Encryption method", "EAPOL version" accoding to the actual WLAN. Finally input the WLAN password in "Passphrase" box. Confirm the your setting and click [Submit] to save all [WLAN Security Setup] settings.

Click [Advanced WLAN Settings]. Then choose the proprty as actual local area WLAN and click [Submit] to save all [Advanced WLAN Setup] settings after confirming.

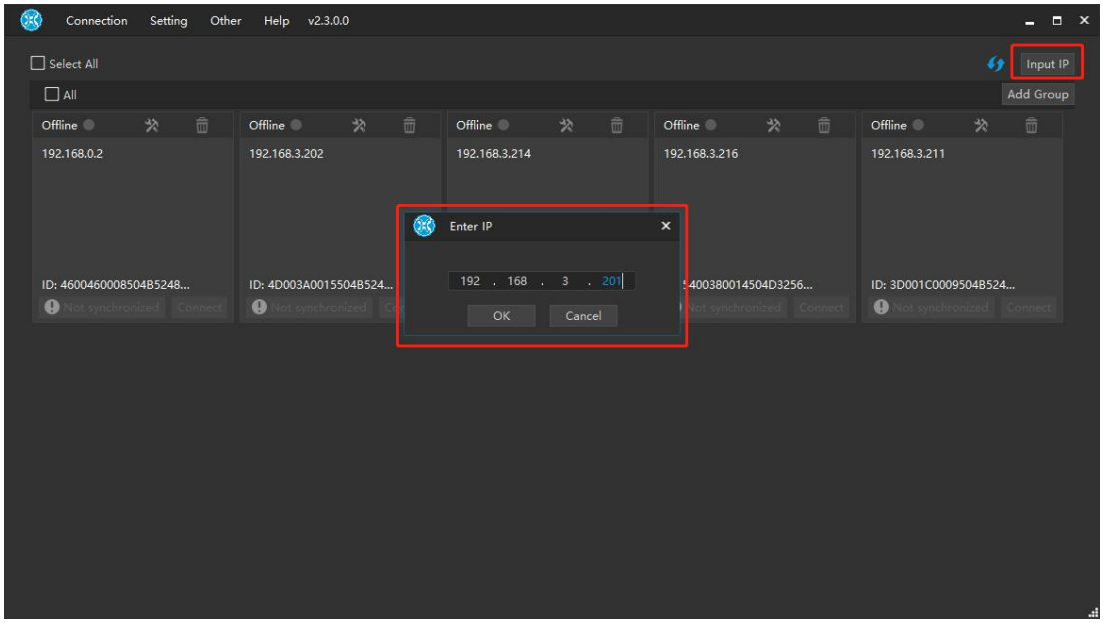


Unplug the network cable, then connect the computer to WLAN. Input the MOXA WLAN IP address in the web browser to check whether the WLAN setting is OK or not. If WLAN setting is OK, the MOXA interface will show.

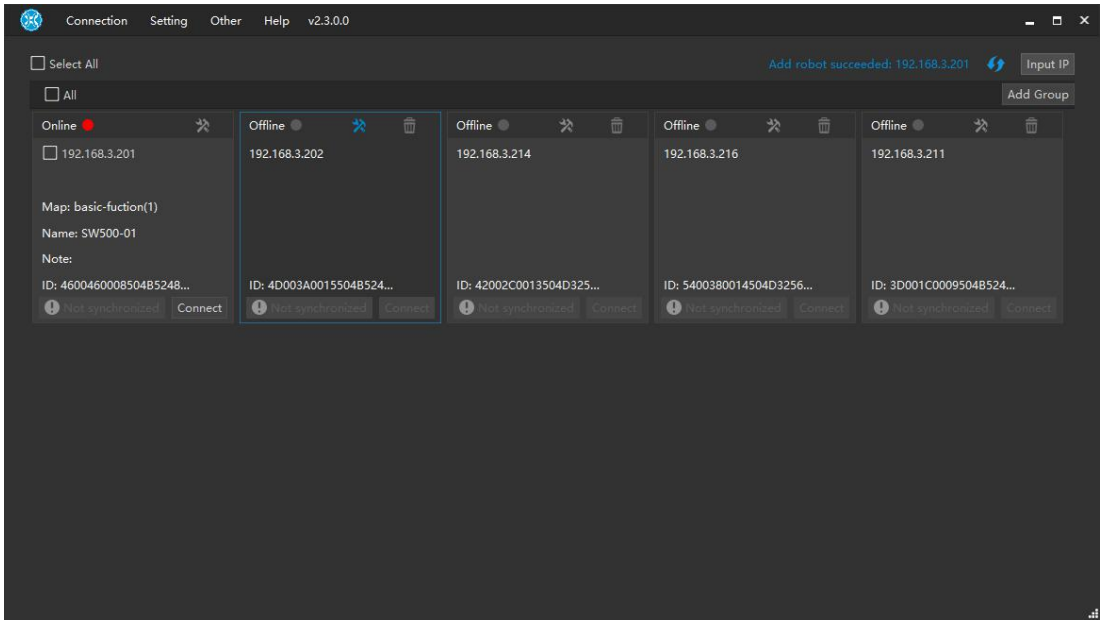


Connect the robot in Roboshop by WLAN

After the computer has connected to the WLAN. Input the MOXA WLAN IP and click [OK] button.

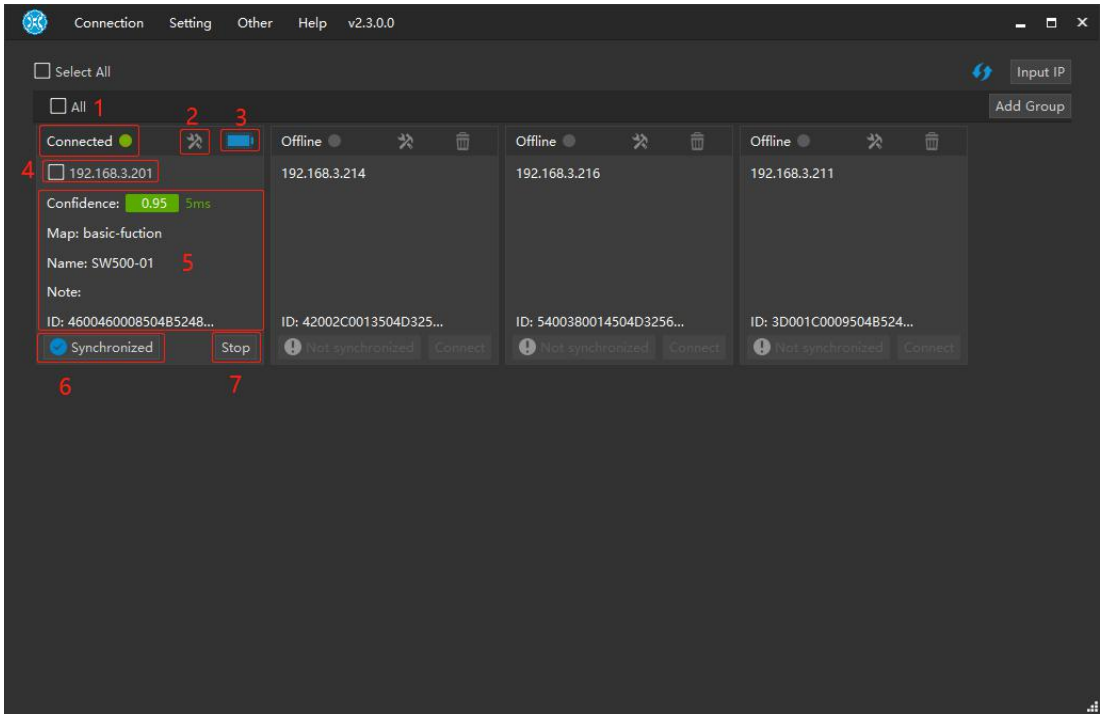


The robot has been add in Roboshop, and you can control this robot through wireless network.



Basic Information

When a robot is successfully connected, basic information about the connected robot is displayed in the home page.



As shown in the figure above, where.

①. Display of the robot's connection status.

②. Advanced configuration button is clicked to use the advanced configuration.

③. The current power level of the robot is displayed.

④. Robot's IP.

⑤. Some basic information display of the robot, the confidence level of this robot's location, network delay, loaded map name, notes and ID.

⑥. Synchronization status of this robot.

⑦. Connect robot and disconnect robot buttons.

Synchronization

[Unsynchronized] : the map or model file in the current robot that does not match the map or model file in Roboshop Pro.

[Synchronized]: the map or model file in the current robot is the same as the map or model file in Roboshop Pro.

Map file

Map files can be obtained in two ways.

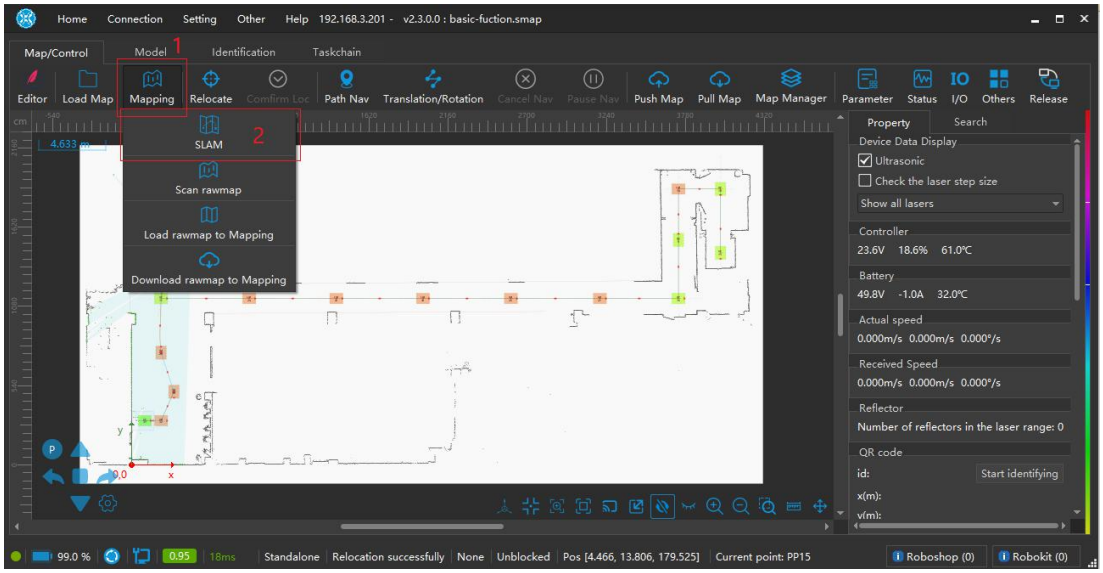
①. Obtained through [Build Map] in [Map and Control] (refer to Build Map for details)

②. Obtained by opening an existing map file (file with a .smap or .map extension)

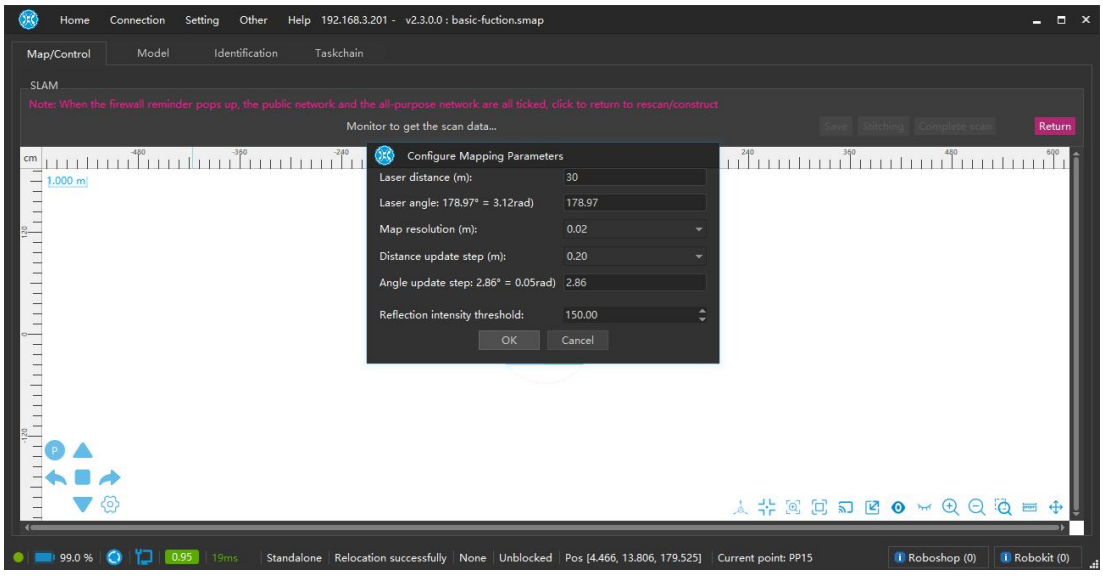
Build Map

Open Roboshop Pro and connect the robot. Double click the robot to enter the robot control interface.

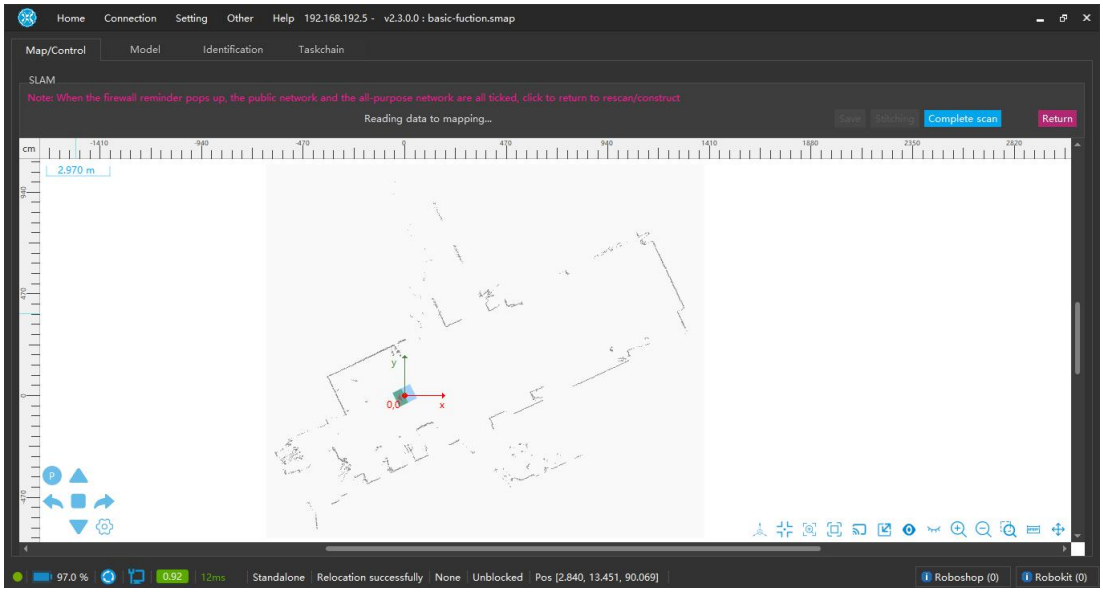
1.Click [Mapping] in the toolbar and choose the SLAM method to build map.



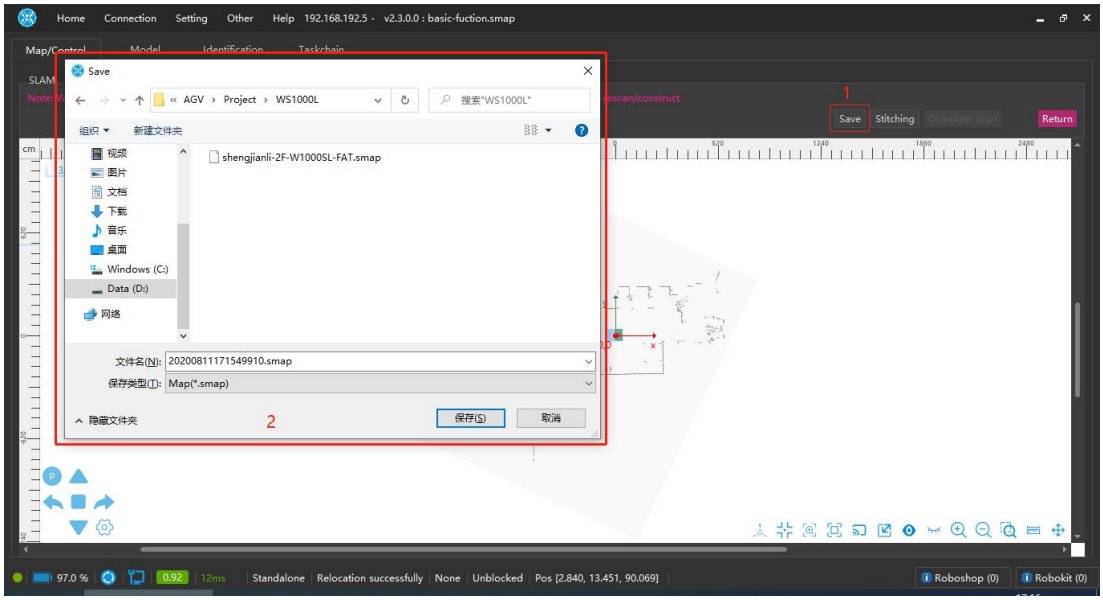
Don`t make any parameter changes in the pop-up window (there is usually no need to change the parameters in this window), click the [OK] button.



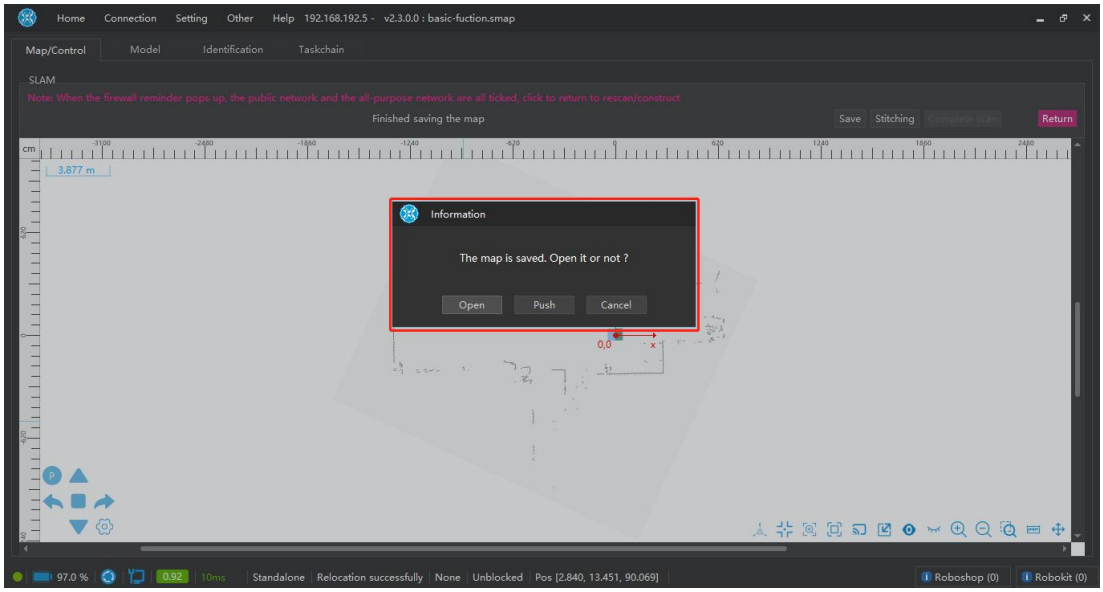
2. Use keyboard keys W (front), A (left), S (back), D (right) to control the robot, make the robot move around to scan all barriers. Then click the [Complete scan] button in the upper right corner after finished scanning the picture.



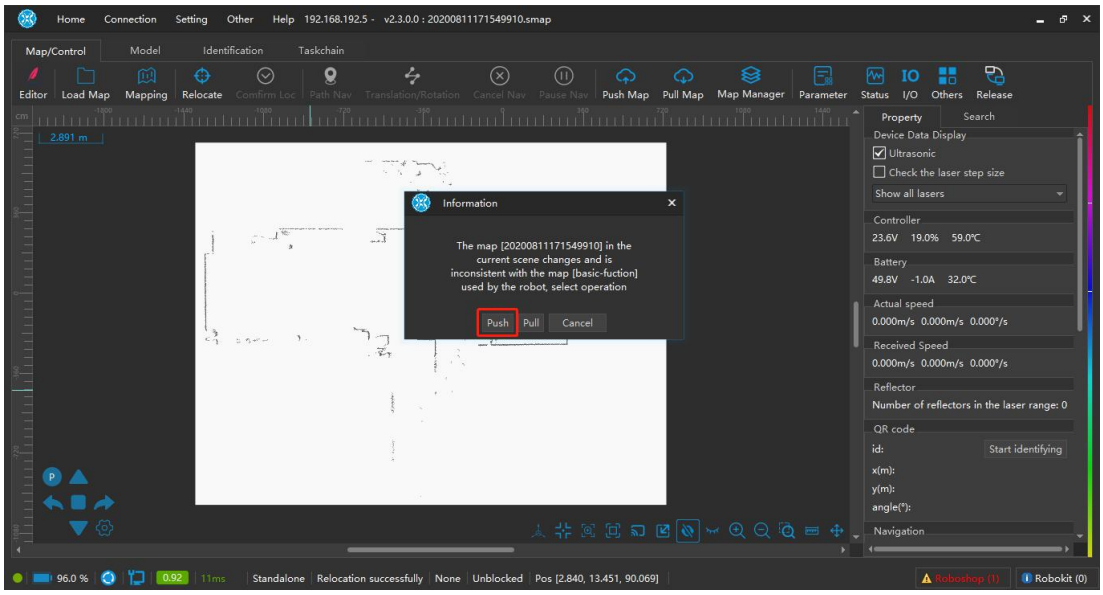
After finishing building map, then click the [Save] button in the upper right corner. Select the target path in the pop-up screen and enter the file name to save the map.



After saving map successfully, a dialog box will pop up asking if you want to open it, select [Open] to open the map you just built and synchronize the map, you can use it directly.

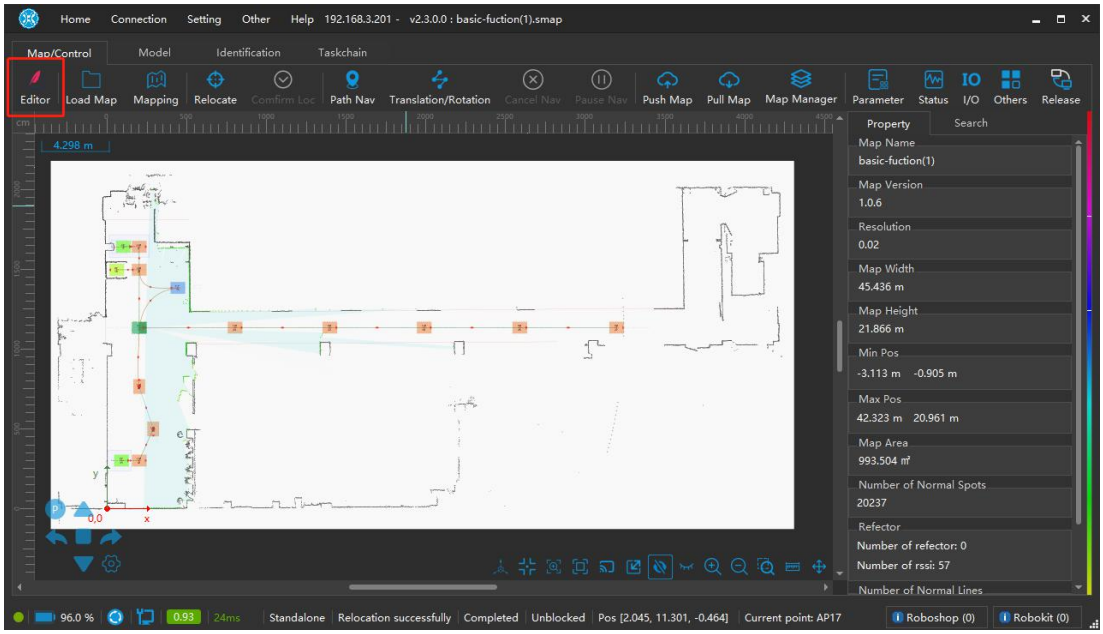


The map in the Roboshop Pro is different with that in the robot and a warning dialog box will pop up. Click [Push] button to synchronize the map.

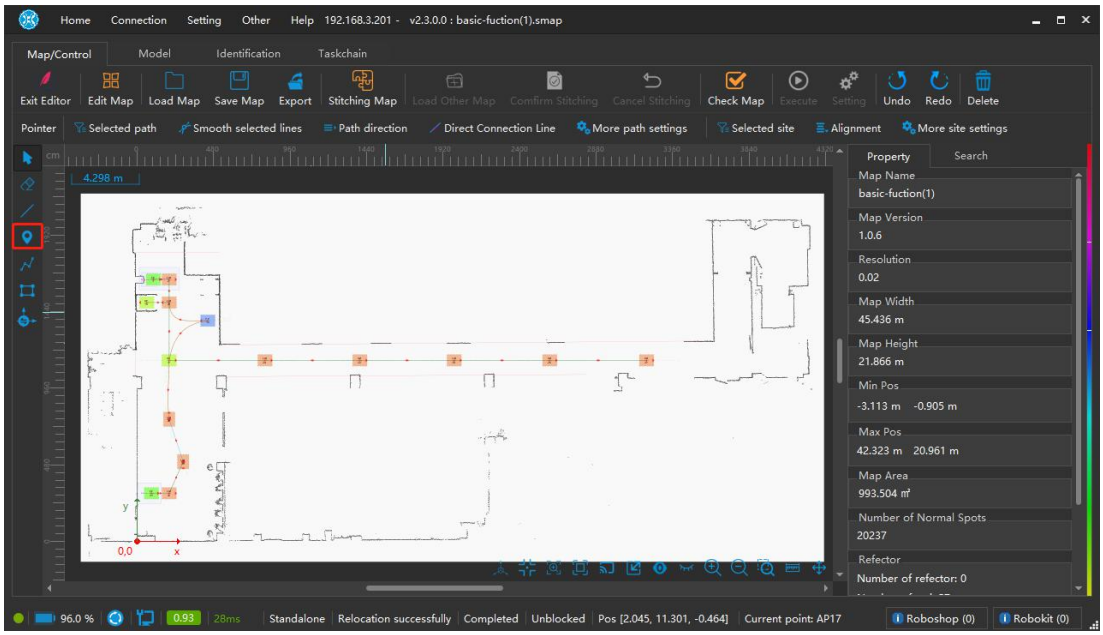


Map Modification

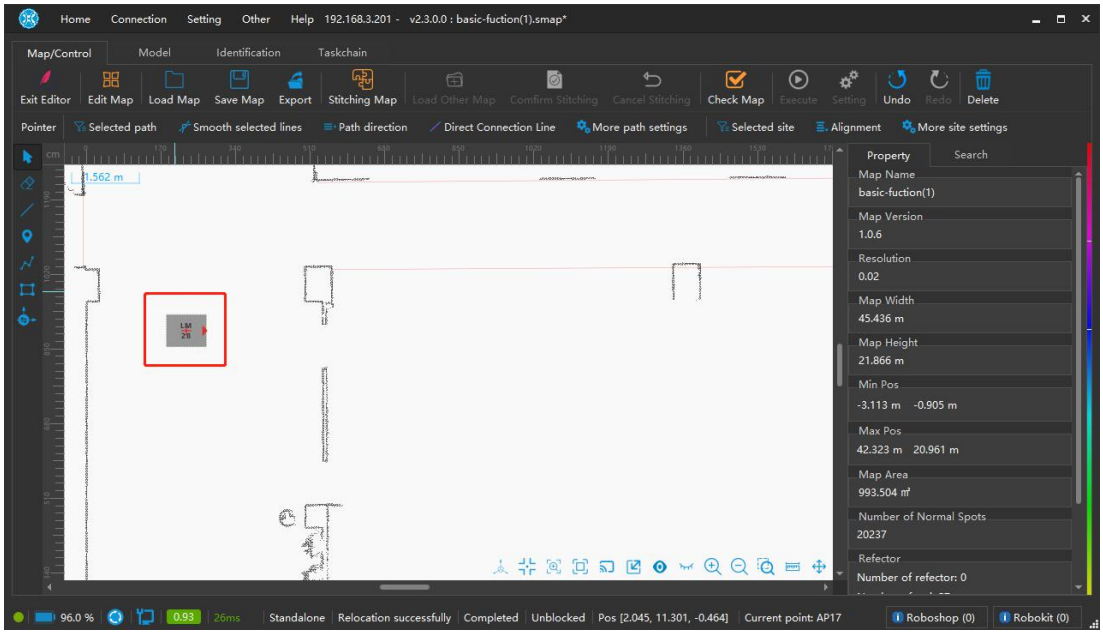
If you want to modify the map after the map is built (or open a map), you can enter the map editing page by clicking [Editor] in the toolbar.



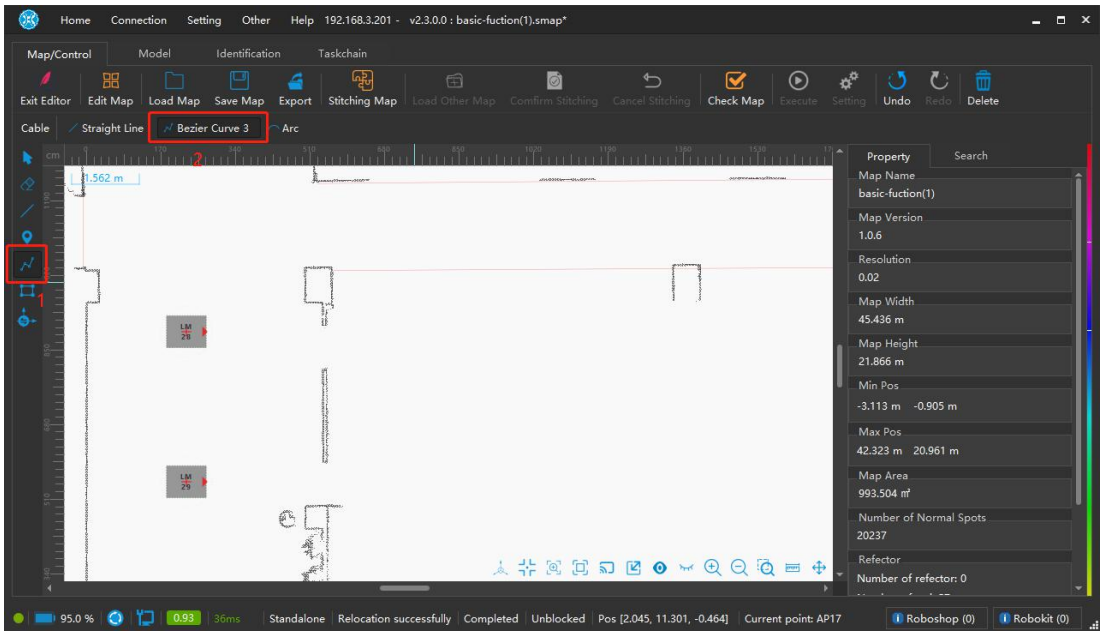
①. Click on the [Mark] shortcut button in the left toolbar



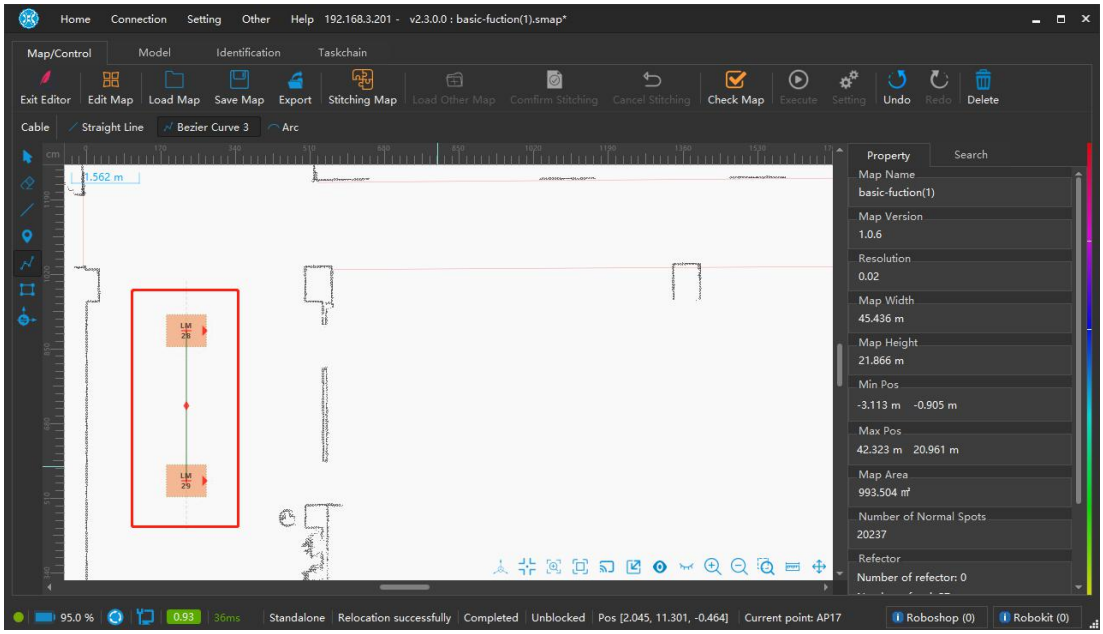
②. Move the mouse to the workspace and click to add a site, the following figure shows the added site



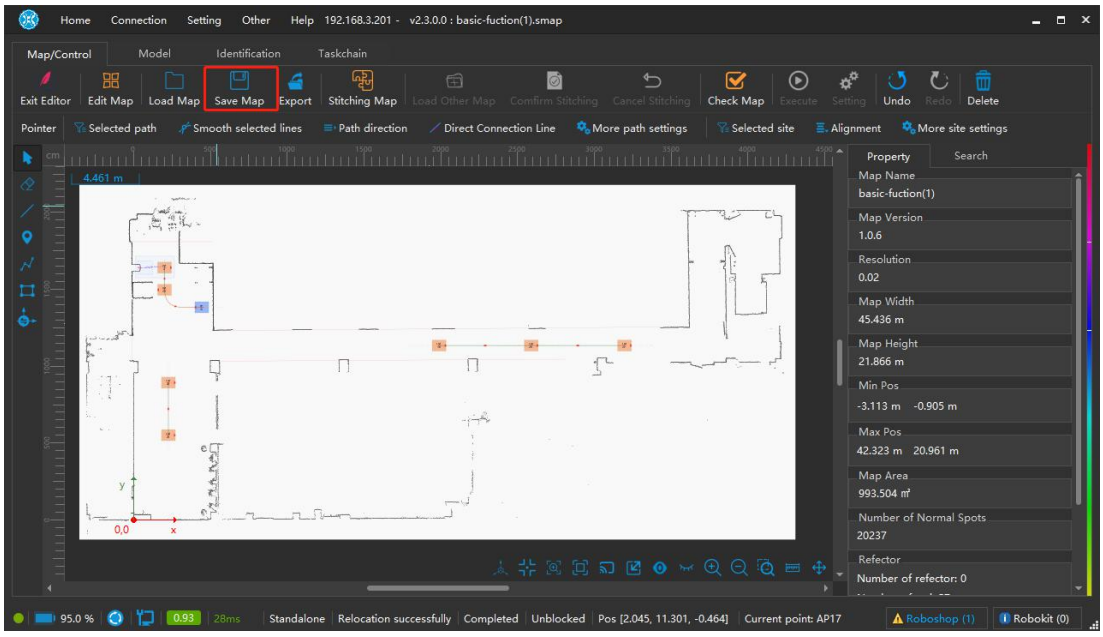
③. Continue to add an another site, then click on [Path] shortcut button in the left toolbar and select [Bezier Curve 3] in the upper toolbar.



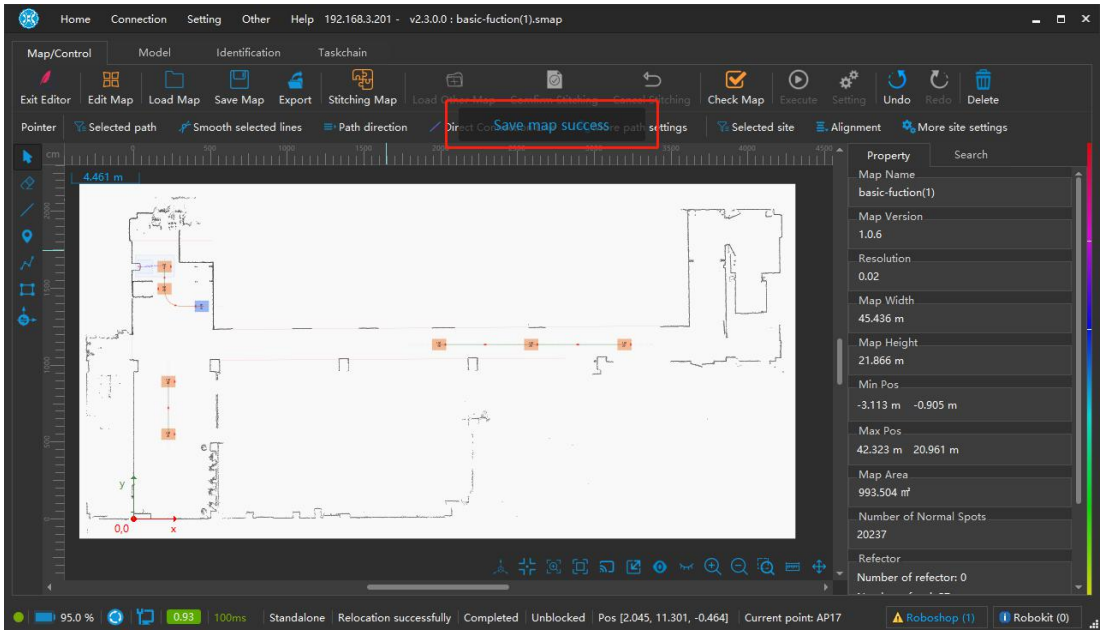
④. Move the mouse to the first site, click and drag it to the second site. The sites and pathes has been add to the map.



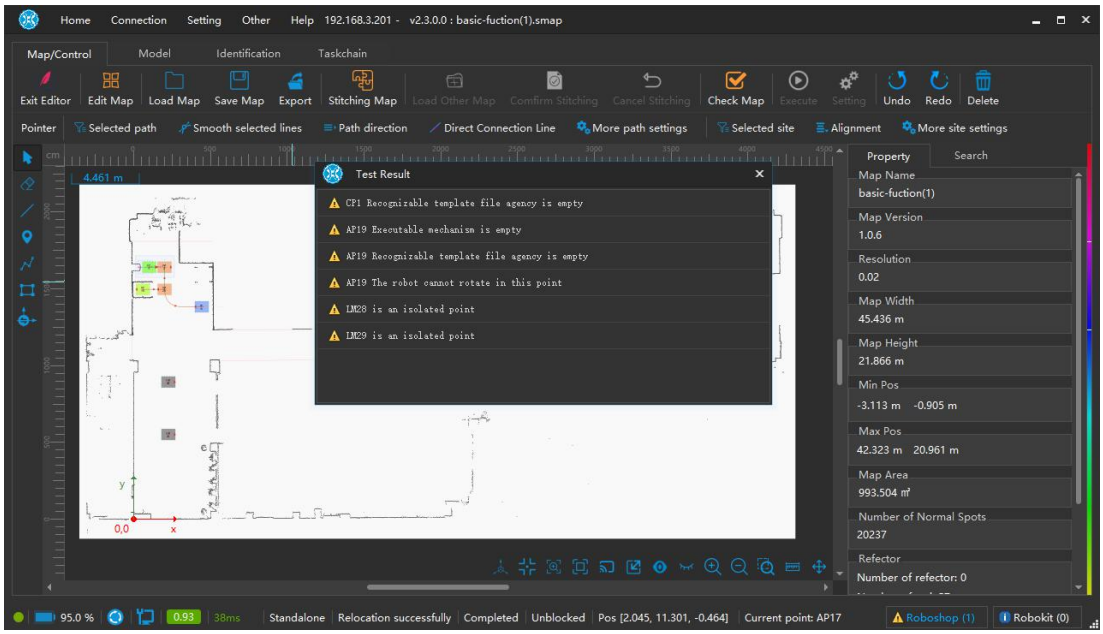
⑤. If the map modification has been completed, click on the [Save Map] button in the upper toolbar then the Roboshop Pro will check the map.



a.If there are no problems with the map, you can successfully save the map and see the message [Map correct] [Save map successfully].

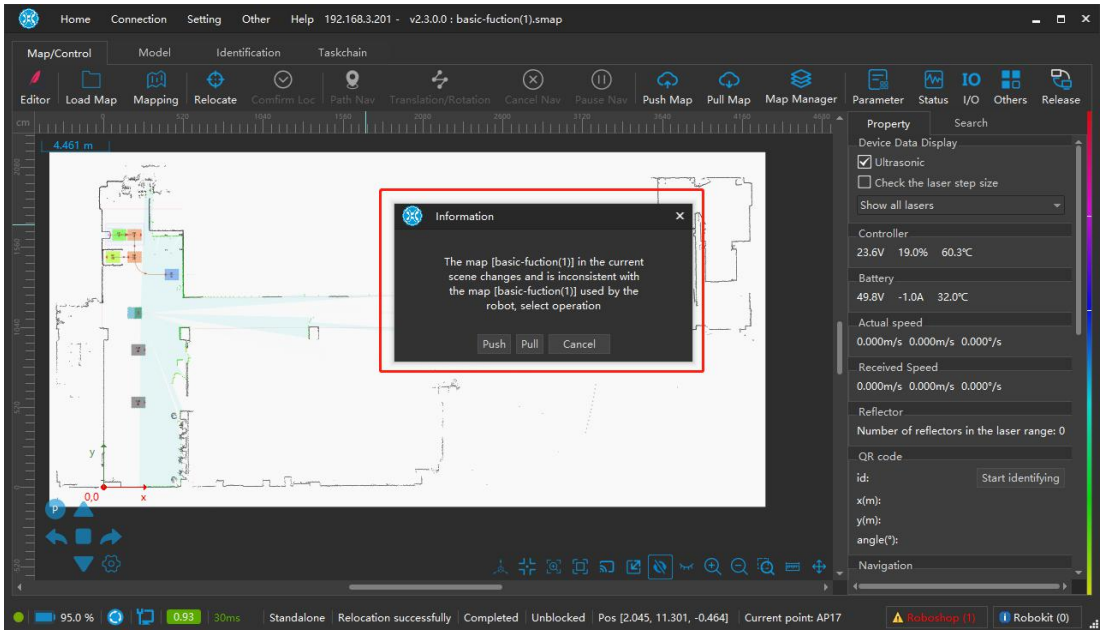


b. If there is a problem with the map, the map cannot be saved successfully, and you can see the warning message [Error: Save failed, please deal with the following error first] and a pop-up box [Check Result].



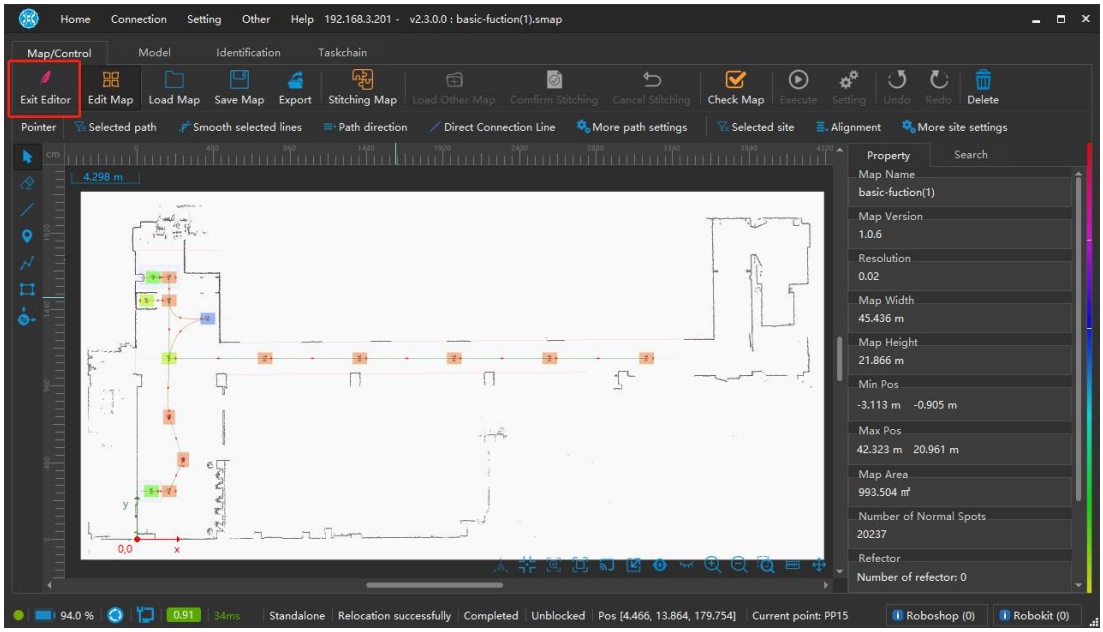
Make the appropriate changes to the map based on the problems indicated in the check results. After all the problems have been fixed, then click the [Save Map] button again to save the map successfully.

Note: The map modified in Roboshop Pro is stored in the local (computer's Roboshop Pro) directory, not the robot. Please select [Push], [Pull], [Cancel] according to your needs.



Map Synchronization

When the map changes have been completed and saved, you need to exit the editing mode, click "Exit Editor" in the upper left corner.



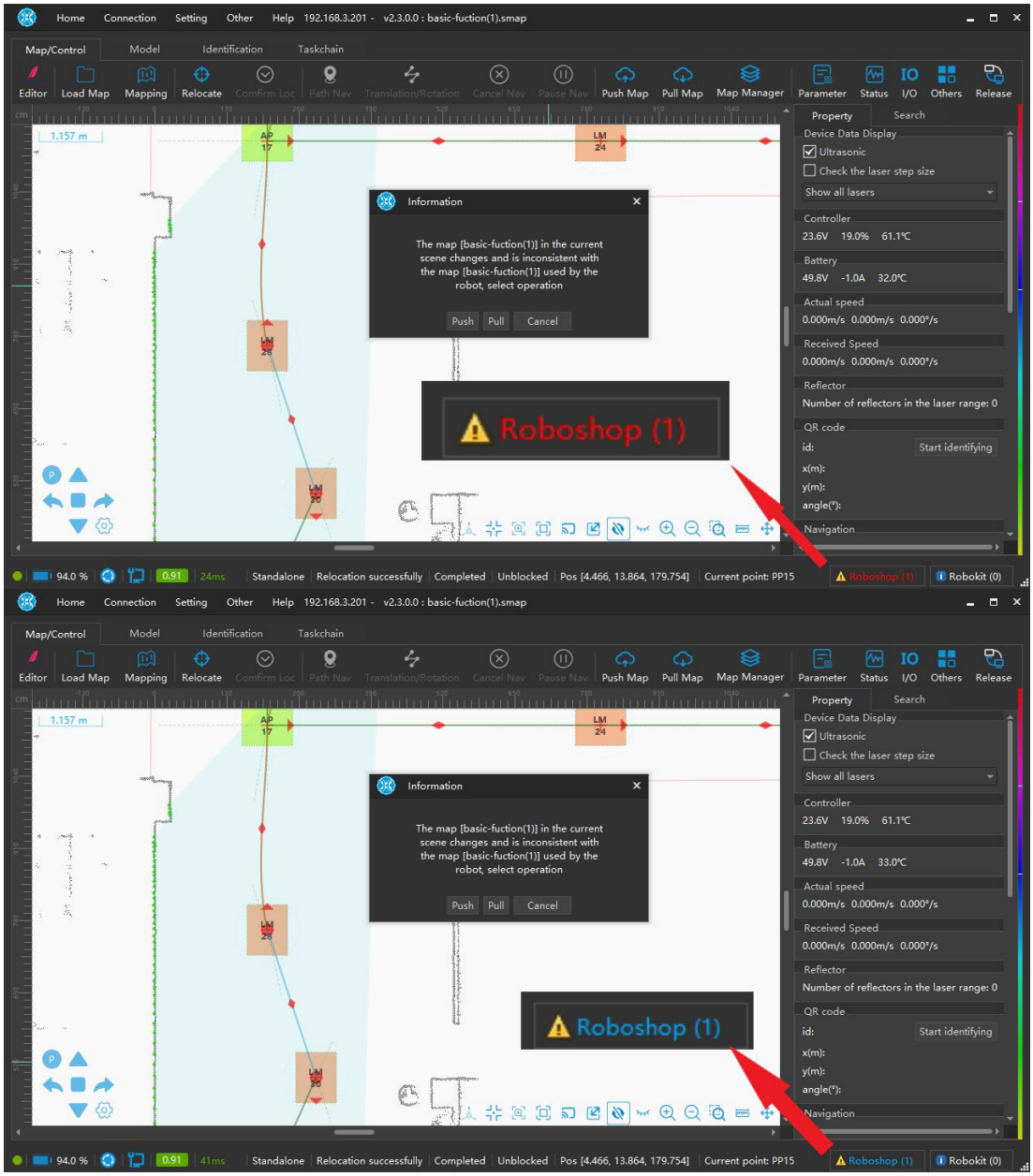
After exitting editing mode, a dialog box with inconsistent map data will pop up.

①. Push Map: upload the map that has just been modified and saved to the robot for map synchronization.

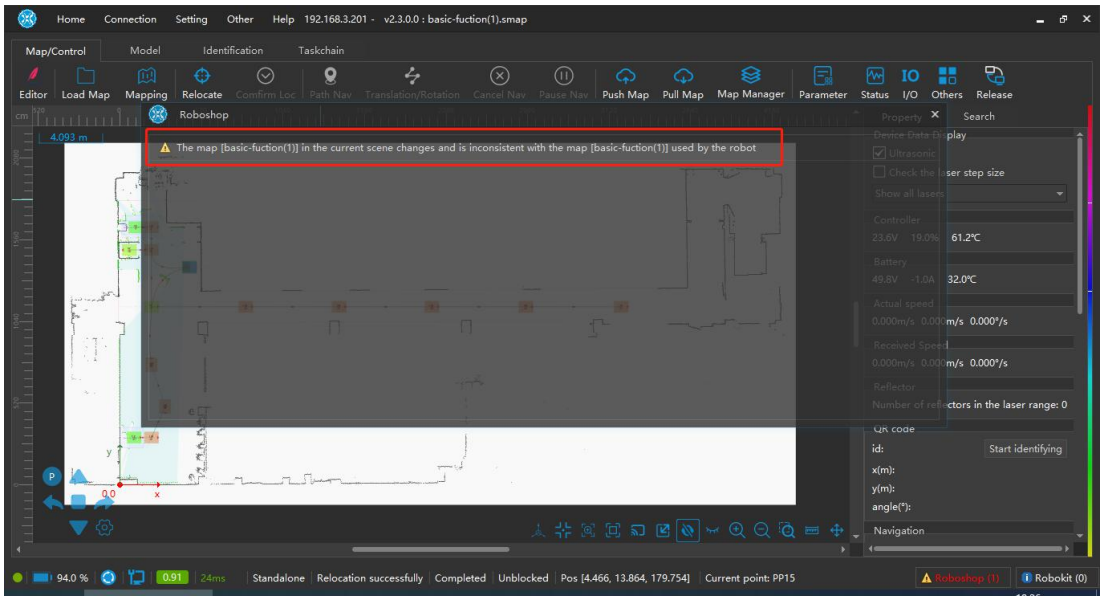
②. Pull Map: download the map loaded in the current robot to the Roboshop Pro directory for map synchronization.

③. [Cancel]: means to not do the push or pull map operation.

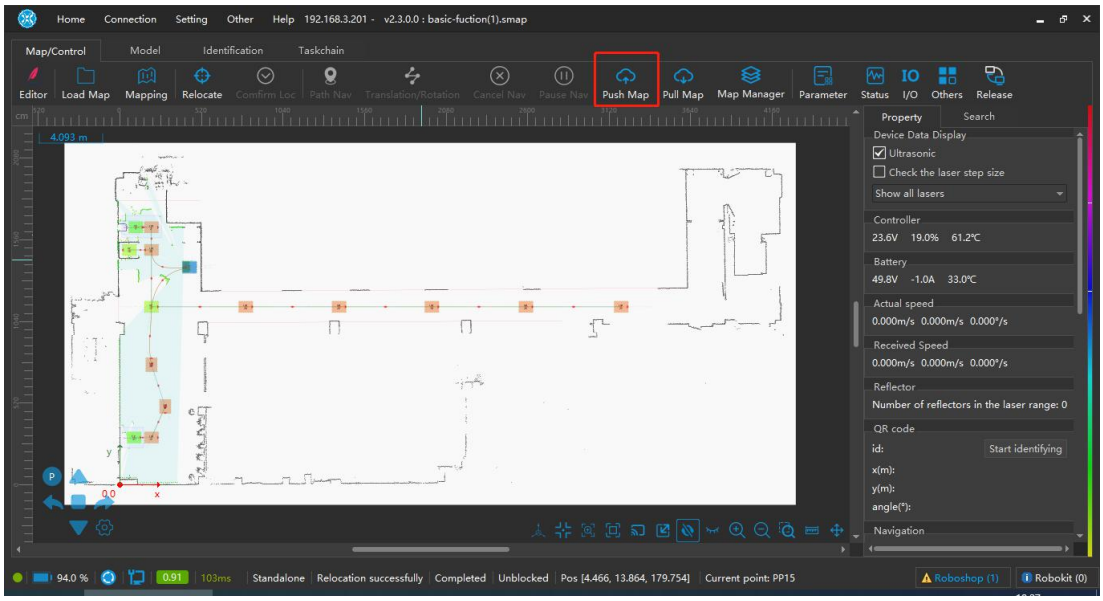
Since the map has been modified, the Roboshop alarm window in the lower right corner is activated and will flash alternately red and blue while the map is not being pushed or pulled, as shown in the following image.



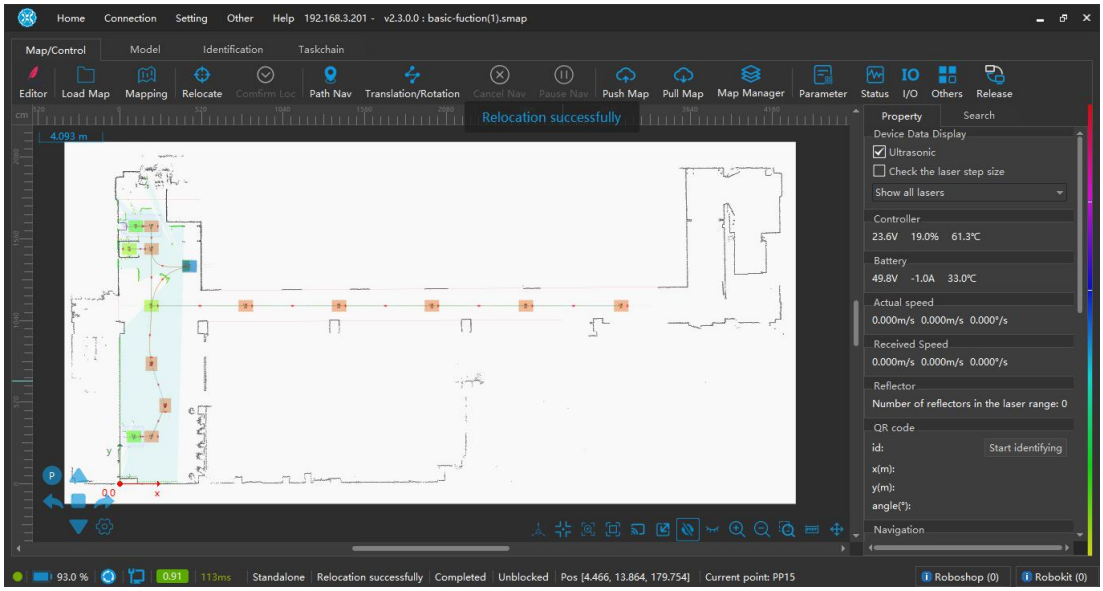
Click on the warning button and a pop-up will show the alarm message.



Click on [Push Map] in the upper toolbar to push the map so that the robot and Roboshop Pro are on the same map.



After finishing this step, the alarm window in the lower right corner error disappear and no longer flashes.

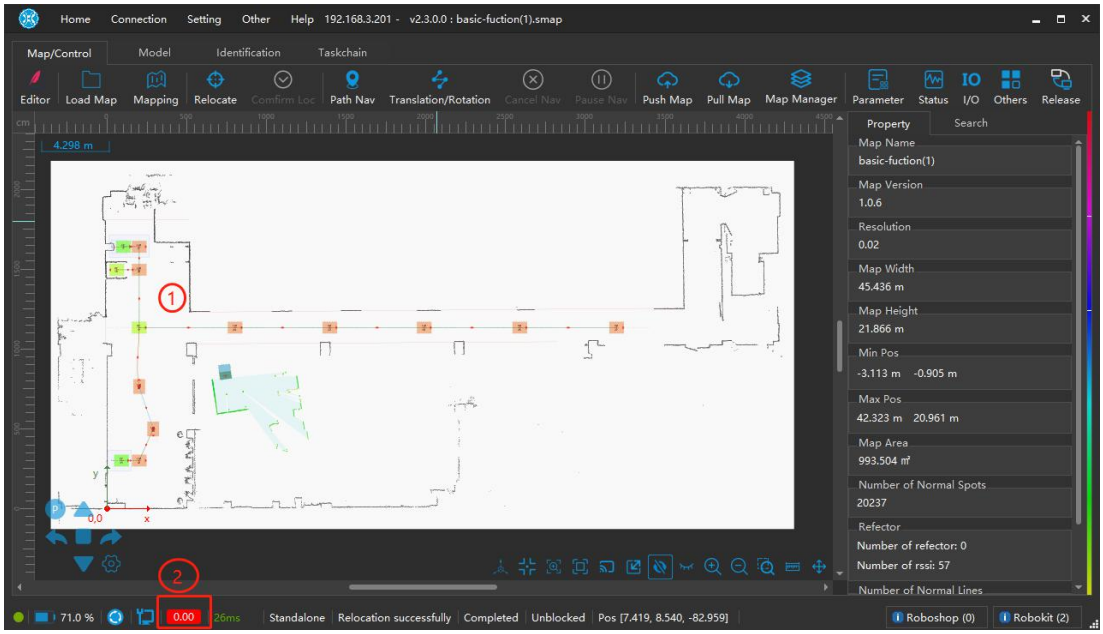


Control

1. Relocate

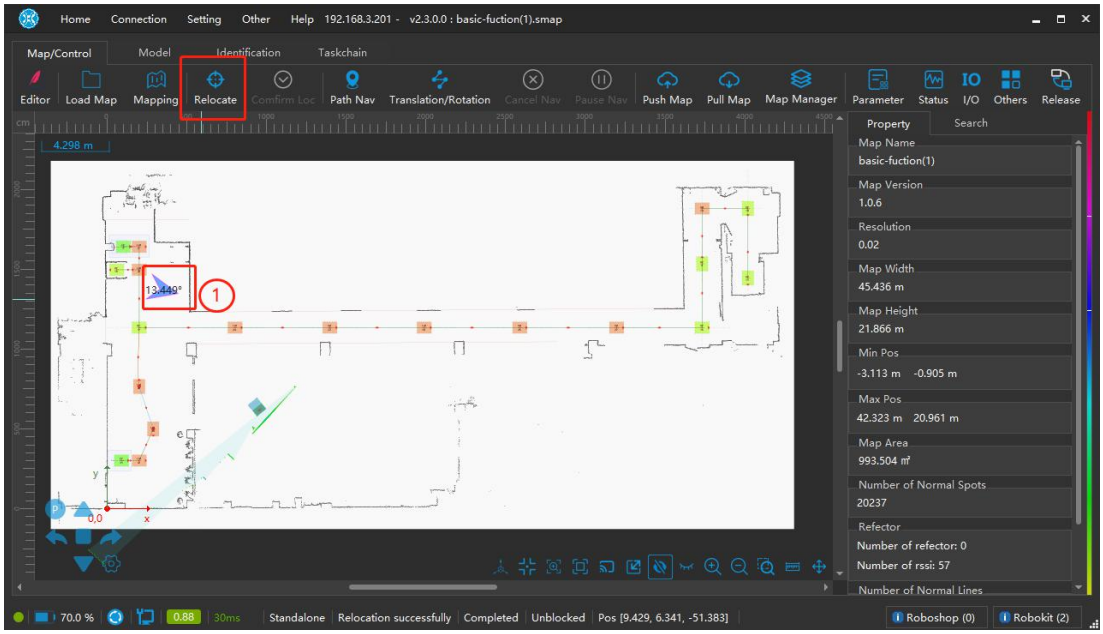
The relocation operation only can be performed when the map in Roboshop Pro is the same with that in the robot.

Relocation is used to make the robot in correct position of the map. By specifying a fuzzy initial position and direction, the robot can calculate out its exact position and direction by itself. Relocation is also an important step in enabling the robot to enter the correct working state.

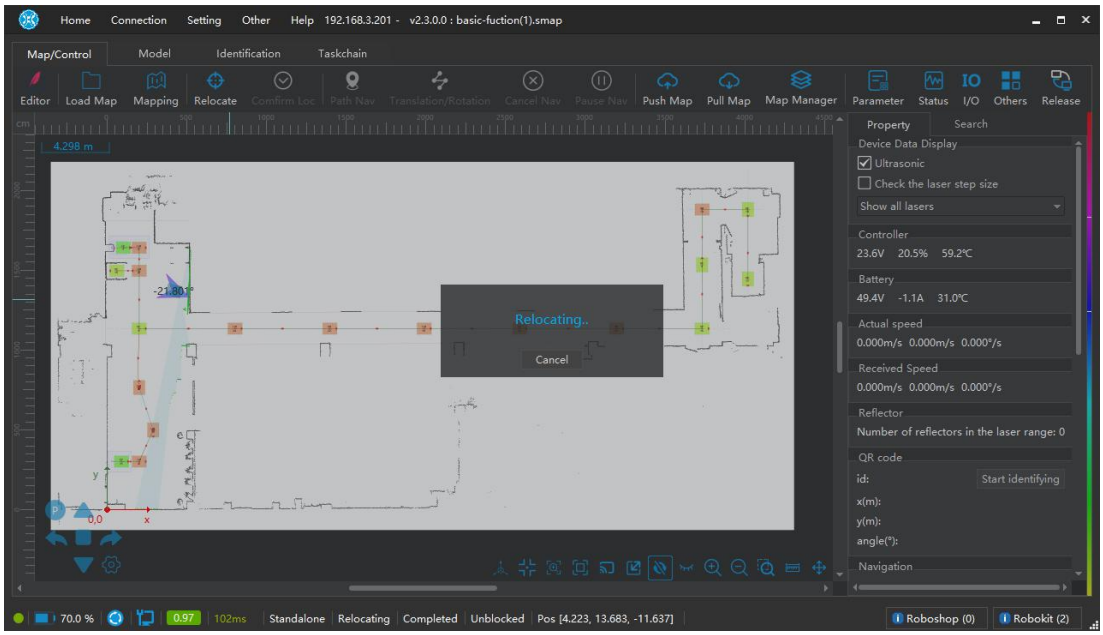


In the above picture, ① is the actual robot position and ② is the confidence level of the current robot position (higher confidence level means more correct robot position). This measn that the current robot's laser does not match the map, and the confidence level is too low, which means the current robot position is incorrect.

Next we click on [Relocate] button and move the mouse to the correct robot location in the workspace (①), click and hold to select the correct robot orientation.

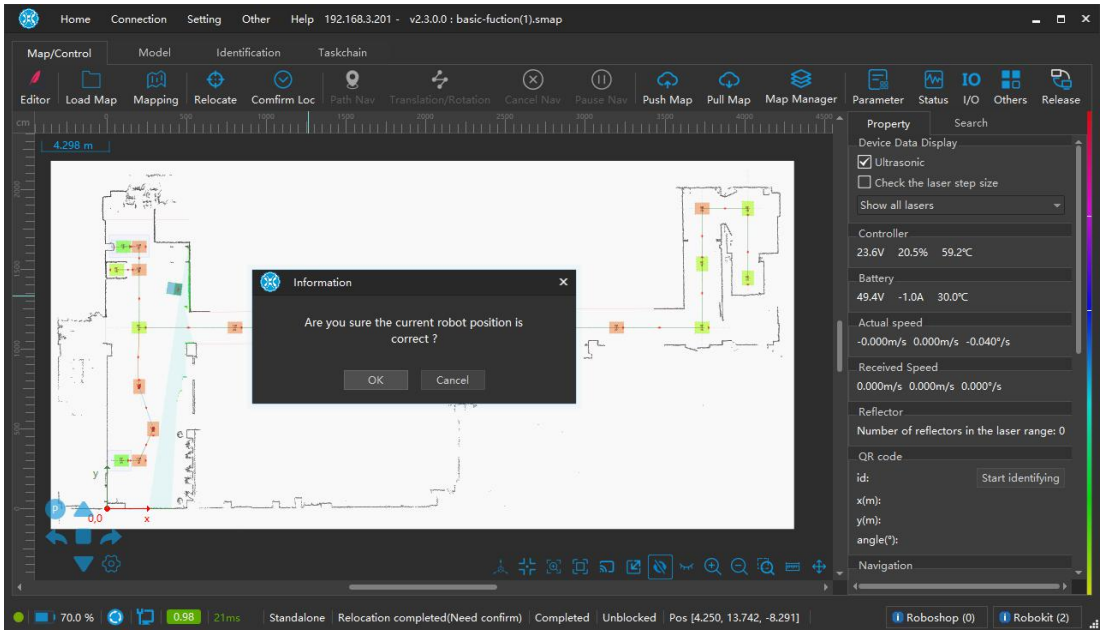


Waiting for the repositioning to complete.



When the repositioning is complete, there will be a prompt box. Choose [OK] or [Cancel] according to the laser match and confidence level of the robot. Here we can see the confidence level of 0.98, the laser match is very high, so we click on the [OK] button to complete the repositioning operation.

Note: If the match and confidence level is not very high, you need to click Cancel to perform the relocation operation again until the robot is in the correct positio.

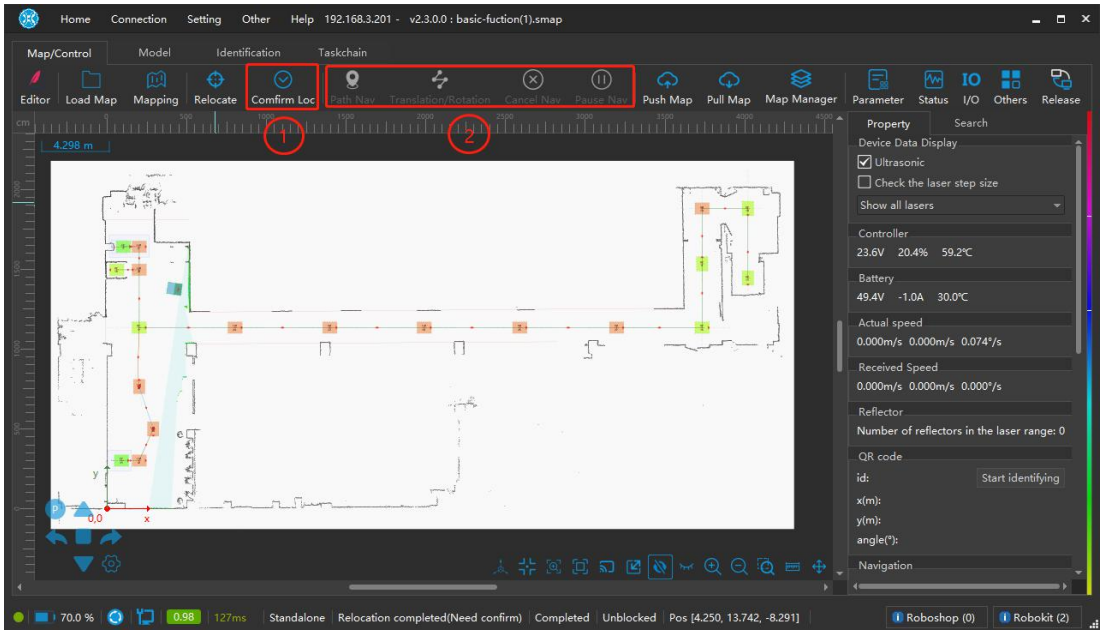


At this point, the repositioning operation is complete.

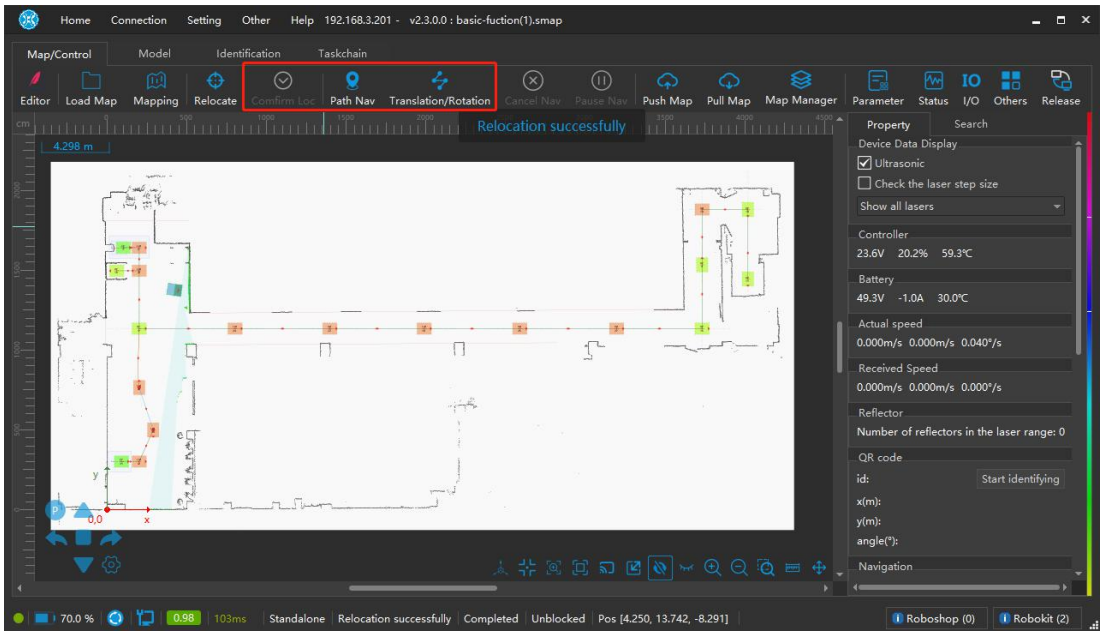
Note: If the map was changed, Roboshop Pro will trigger the relocation mechanism. And you need to check that the map data is consistent before you perform the relocation operation.

2. Comfirm Location

[Confirm Location] is used to confirm that the current robot is correct, as shown below.



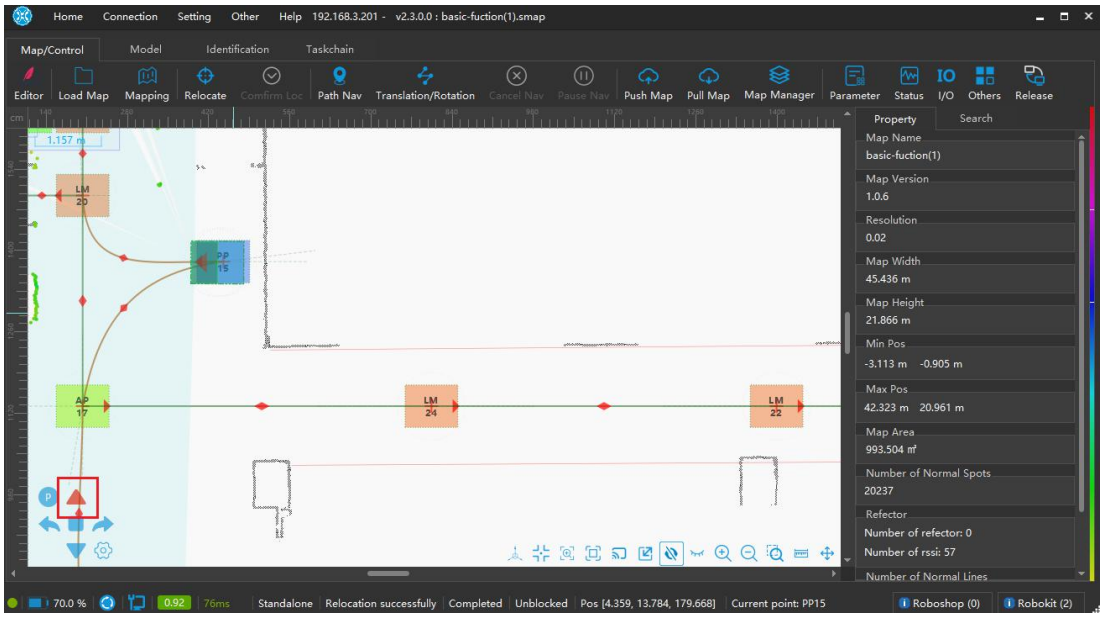
In the picture below, when ① is highlighted, the module toolbar in the ② area is gray and not available for use. If the robot's current position is correct, click the [Confirm Positioning] button, then ① will be gray and the ② area will be available for use, as shown below.



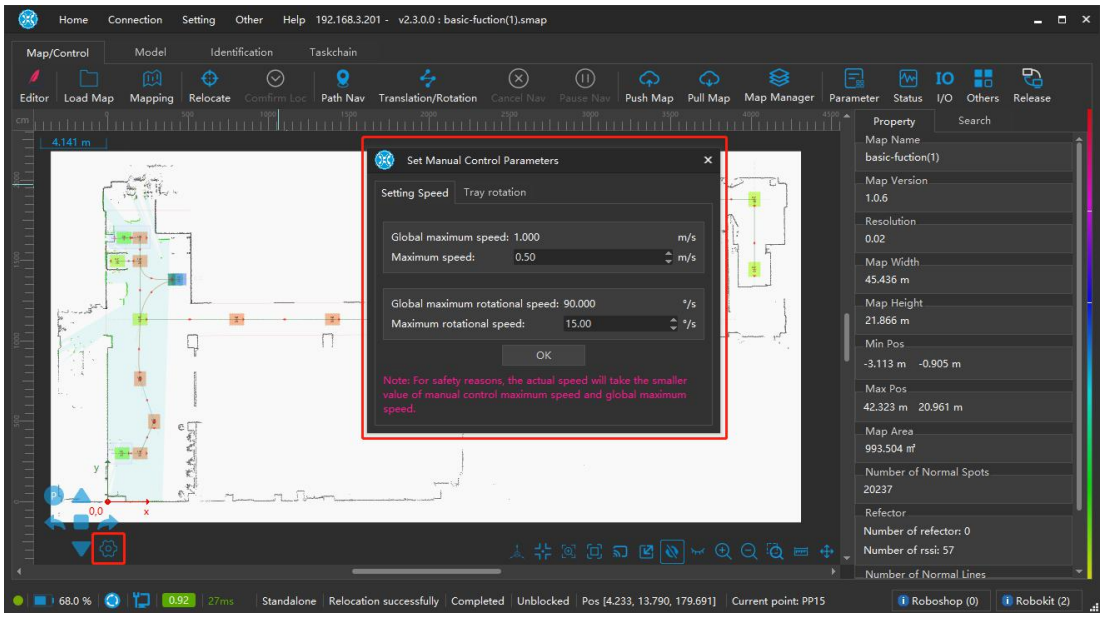
3. Manual Control

You can use the keyboard keys W (front), A (left), S (back), D (right) and Q (stop) to control the robot manually.

"W" is the forward button, as shown in the picture below. Pressing and holding it causes the robot to move forward (arrow direction).

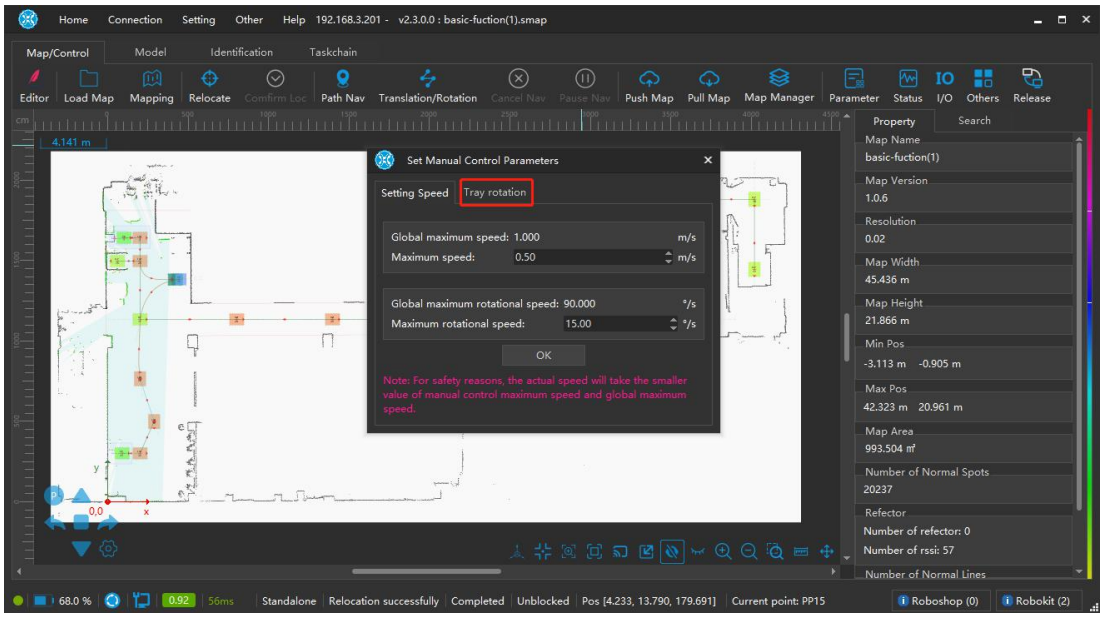


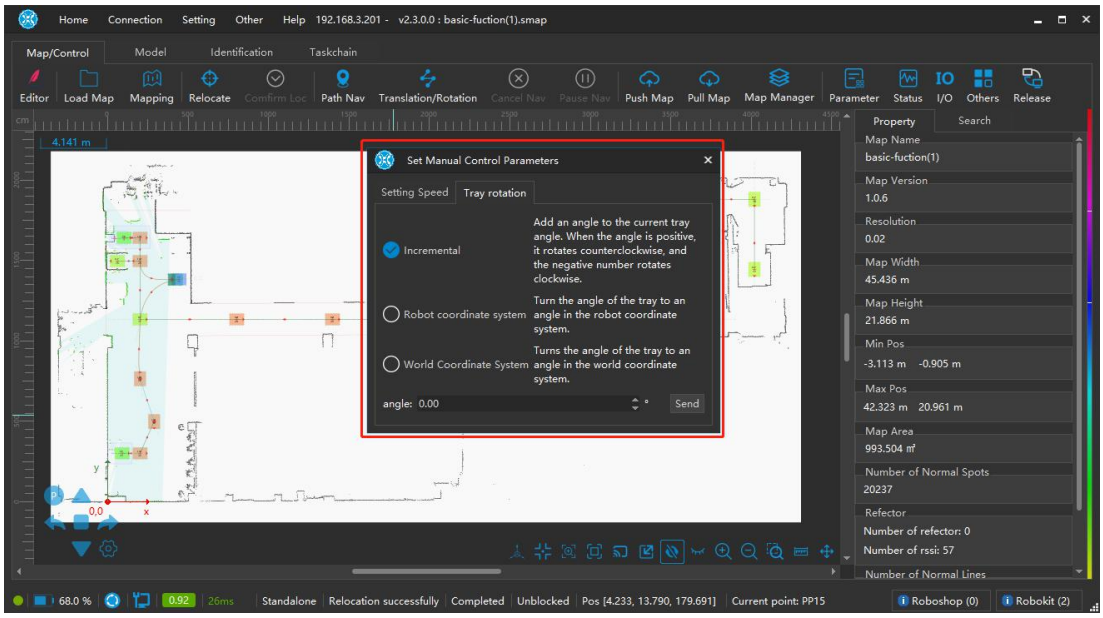
Click the gears button on the left lower postion to enter speed setting interface and top plate rotate control interface.



The maximun speed and maximum rotational spped are used for limitting the robot in manual conntrol mode.

Click [Tray rotation] button to enter top plate rotate control interface.

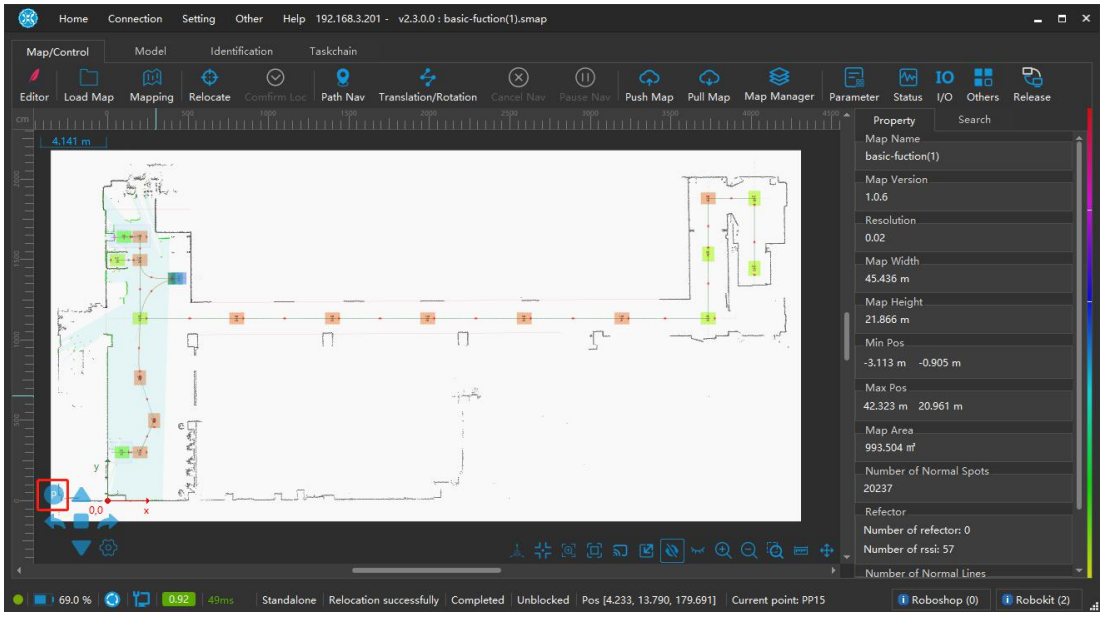


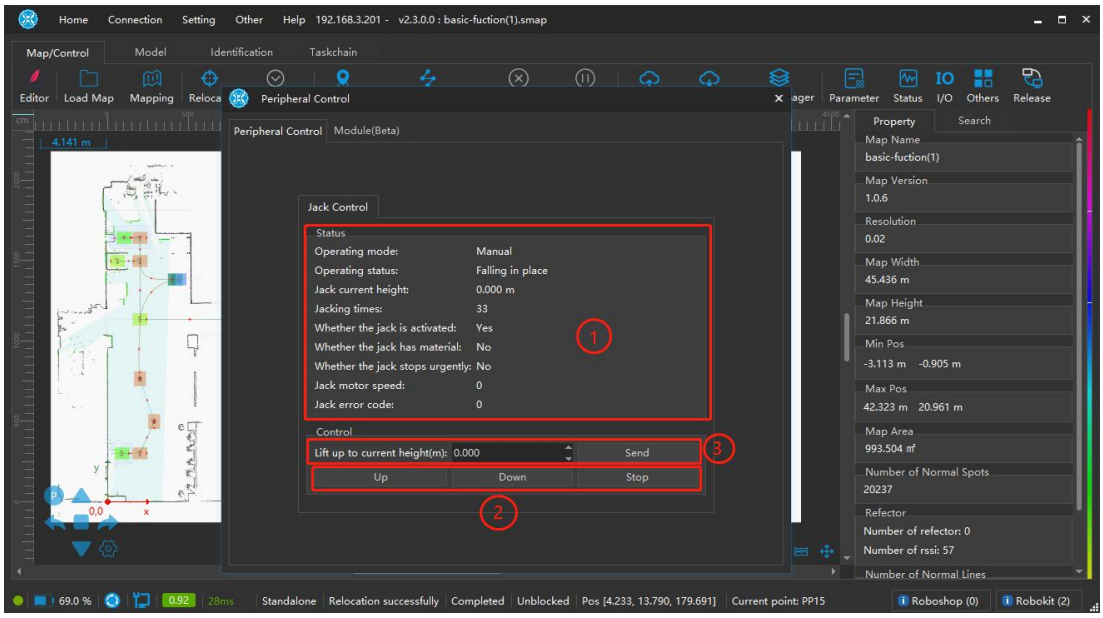


4. Lift top plate

[P] button on the left lower postion is used for control liftting the top plate.

Click this button to enter lift control interface.





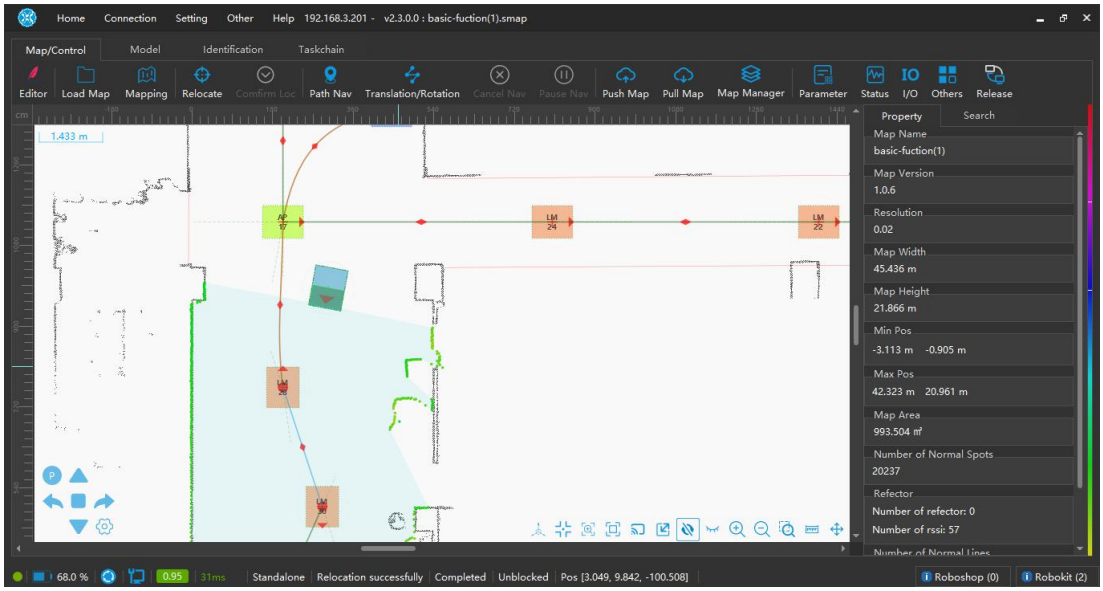
In the above picture, ① indicates the status of top plate, ② and ③ is used for control liftting top plate.

Click [Up] button, the top plate will rise up to the target height. Click [Down] button, the top plate will lower down to the buttom place. Click [Stop] button, the top plate would stop move.

Or set the target height and click [Send] button, the top plate will come to the target height.

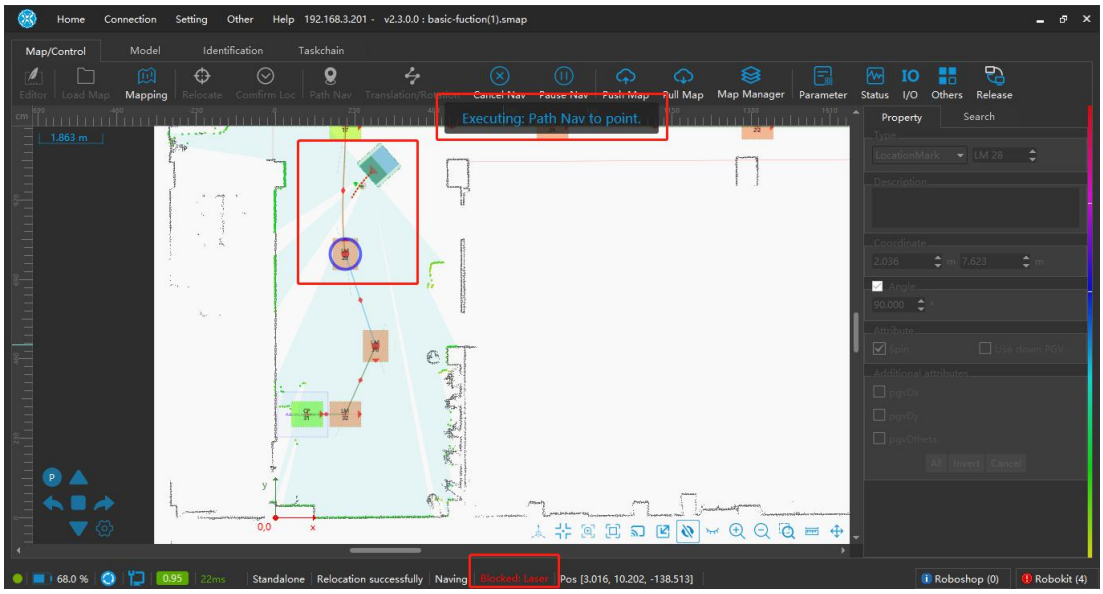
5. Path Navigation

Navigate the robot to a site from outside the path(prerequisite: there are at least two sites on the map and they are connected by a Bezier curve):

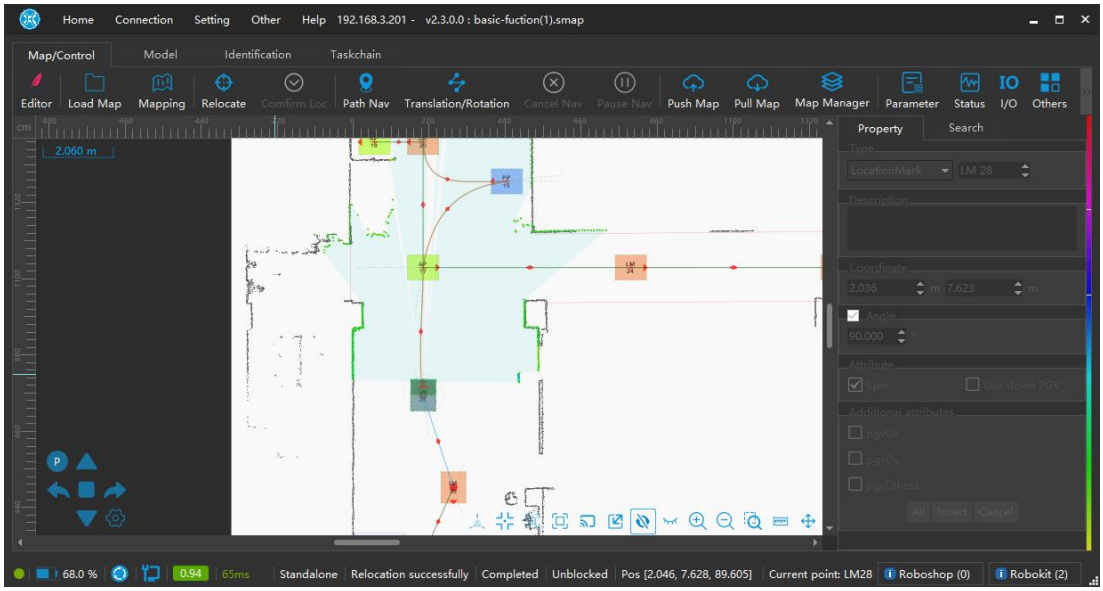


click [Path Nav] in the upper toolbar, and then click a site, if you click LM28, the robot will directly reach LM28 through path navigation, and the orientation of the robot to the point is the same as the orientation of the site.

If there are obstacle in the line, the robot will stop before the obstacle and will not continue to run until the obstacle is remved and the reason for the obstruction is indicated in the status bar.

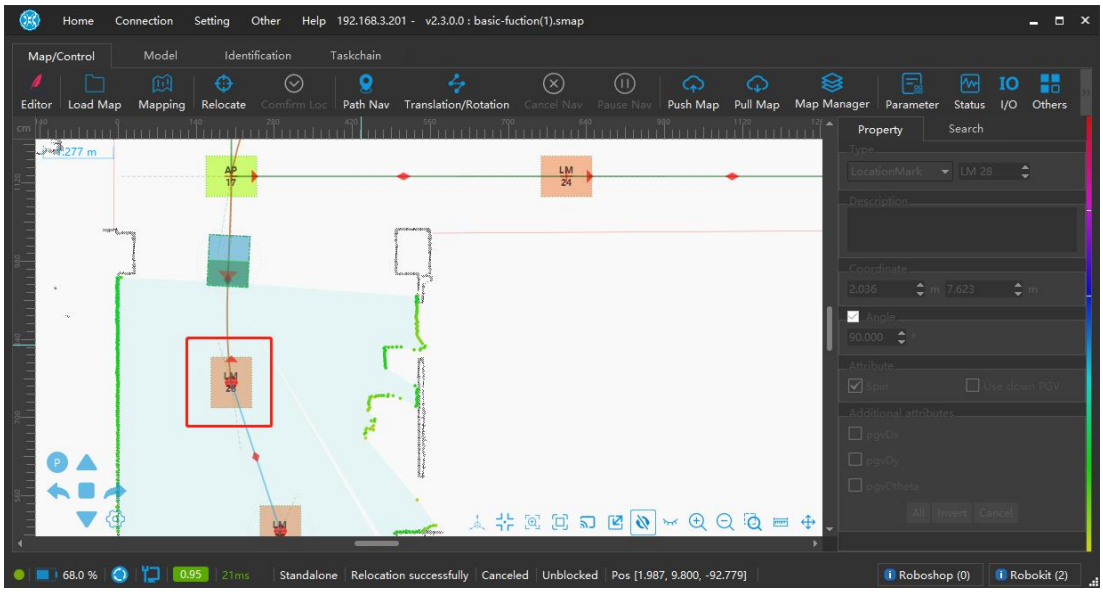


When the obstacle disappears, the blocking message in the status bar clears and the robot resumes operation to the target point.



Navigate the robot to a site from on the path(prerequisite: there are at least two sites on the map and they are connected by a Bezier curve):

Click [Path Nav] in the upper toolbar, then click a site. For example, click LM28 point, the robot will navigate the path and run along the line to the target point (LM28 point), and the orientation of the robot to the point is the same as the orientation of the site.

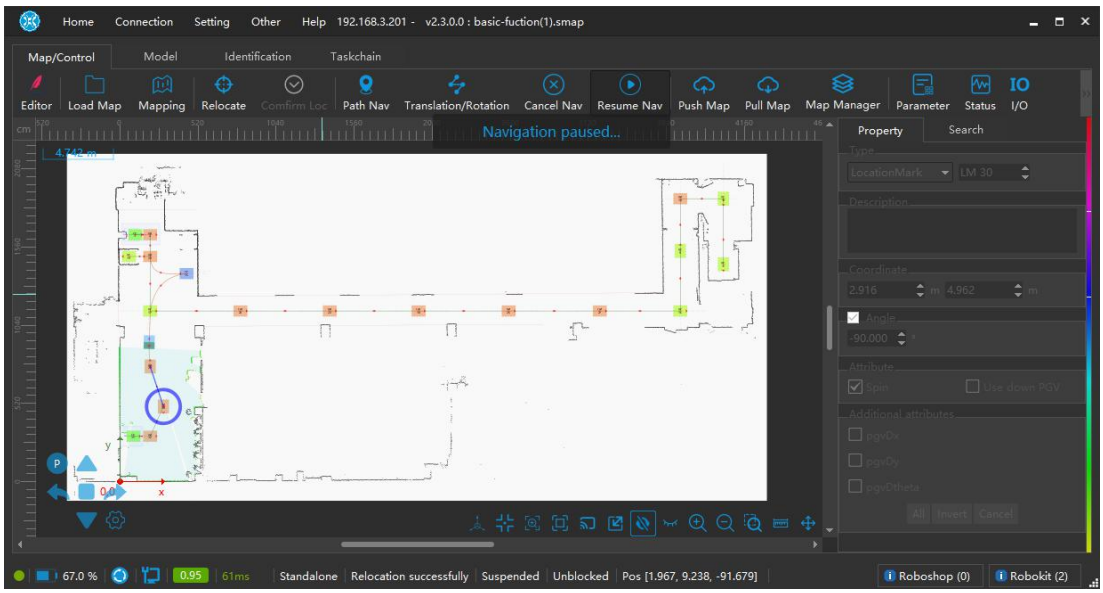


If there are obstacle in the line, the robot will stop before the obstacle and will not continue to run until the obstacle is remved and the reason for the obstruction is indicated in the status bar.

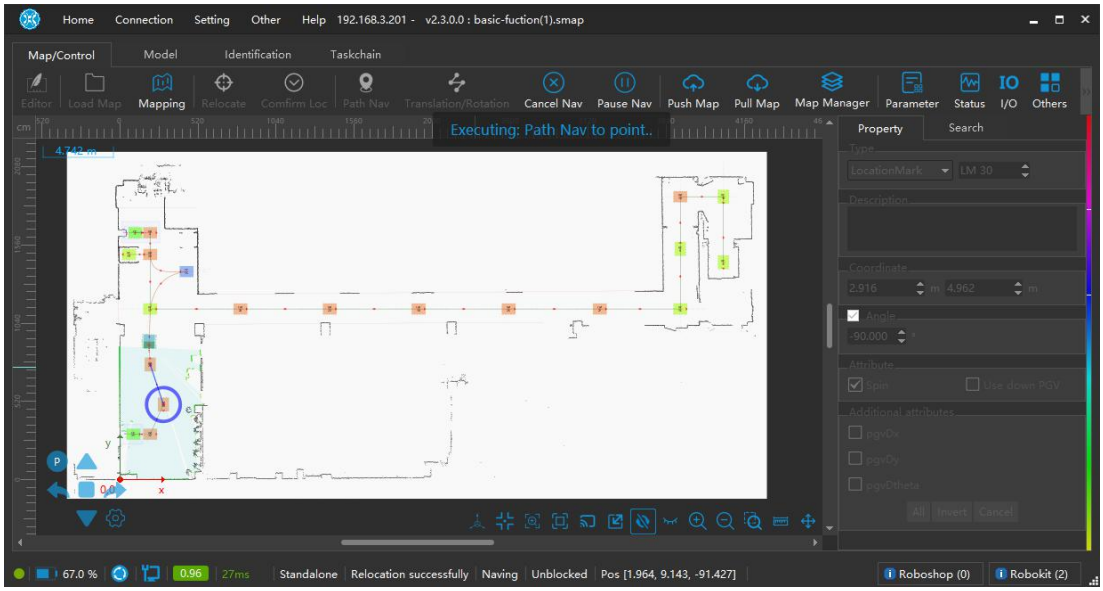
When the obstacle disappears, the blocking message in the status bar clears and the robot resumes operation to the target point.

6. Pause Navigation

This function is used when the robot needs to pause navigating. Click [Pause Nav], the navigation task will be paused and the icon will switch to [Resume Nav], as shown below.

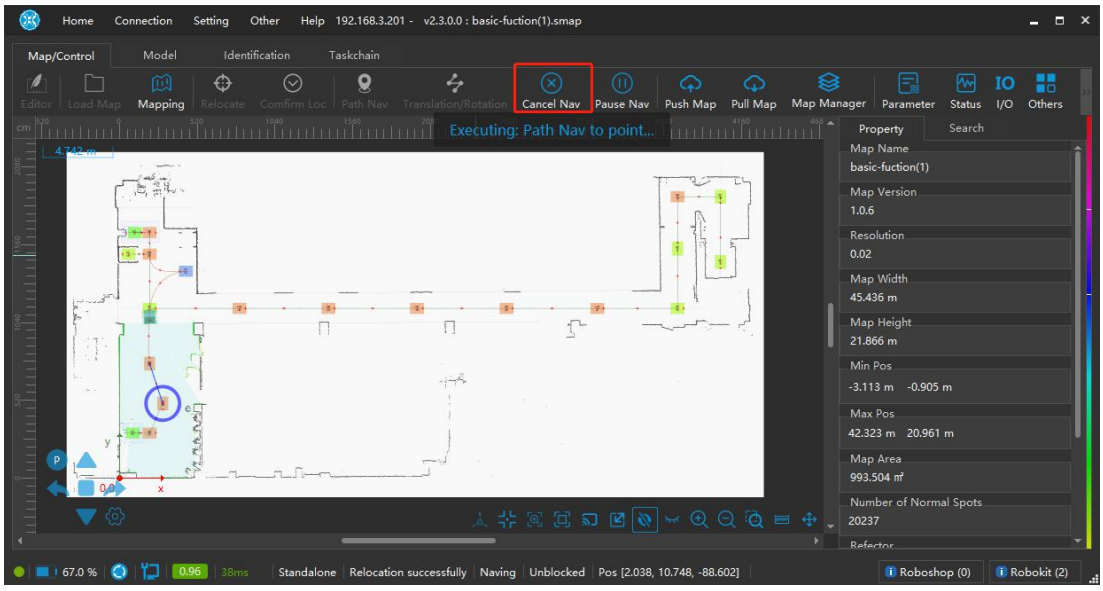


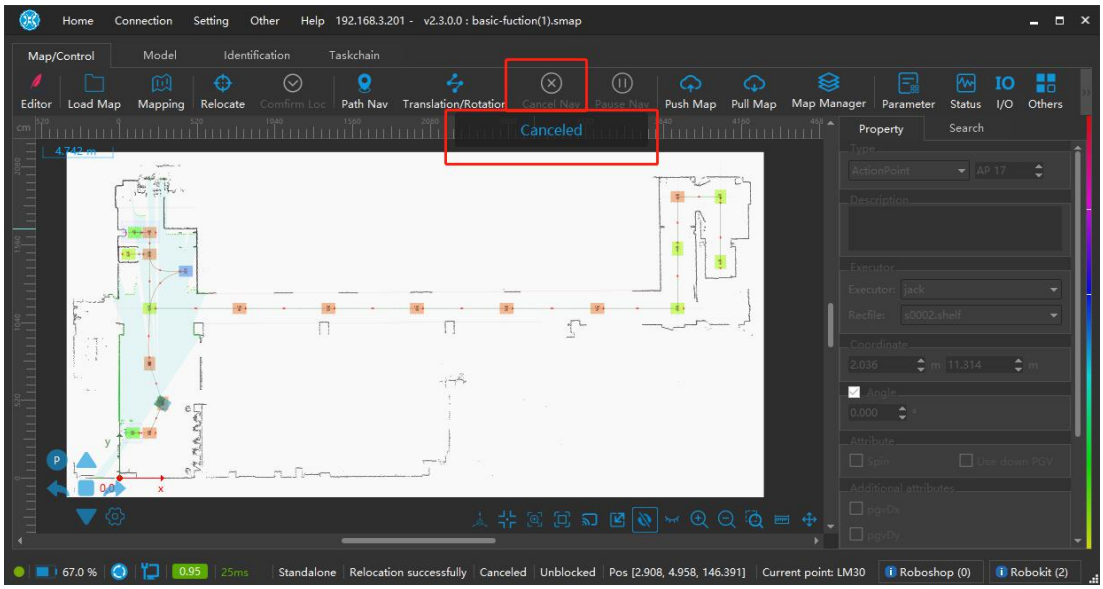
Clicking [Resume Nav] button, the robot will continue to the target site, as shown below.



7. Cancel Navigaton

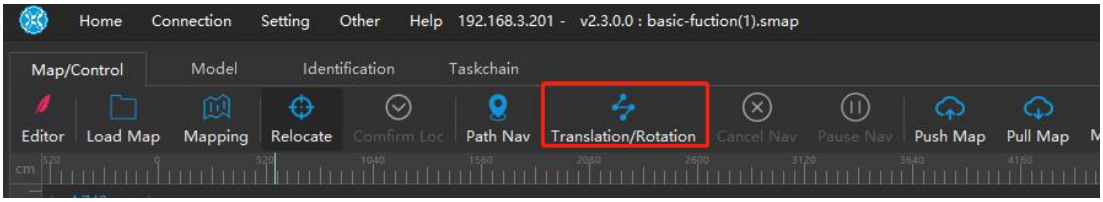
This function is used when the robot needs to immediately terminate the navigation. Click this the button, the navigation task will be immediately terminated, then the icon will be grayed out and the navigation will end, as shown below.



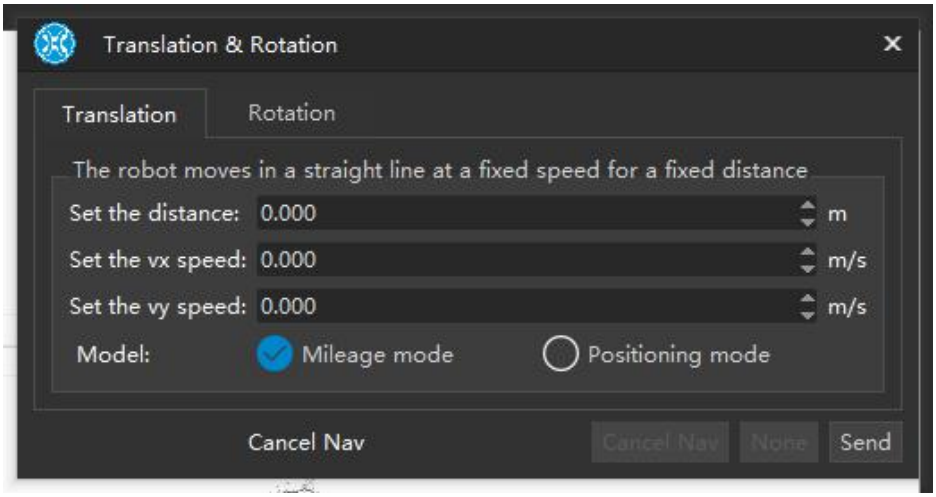


8. Translation/Rotation

You can control the robot to perform [Translation] and [Rotation] by clicking on the following buttons.

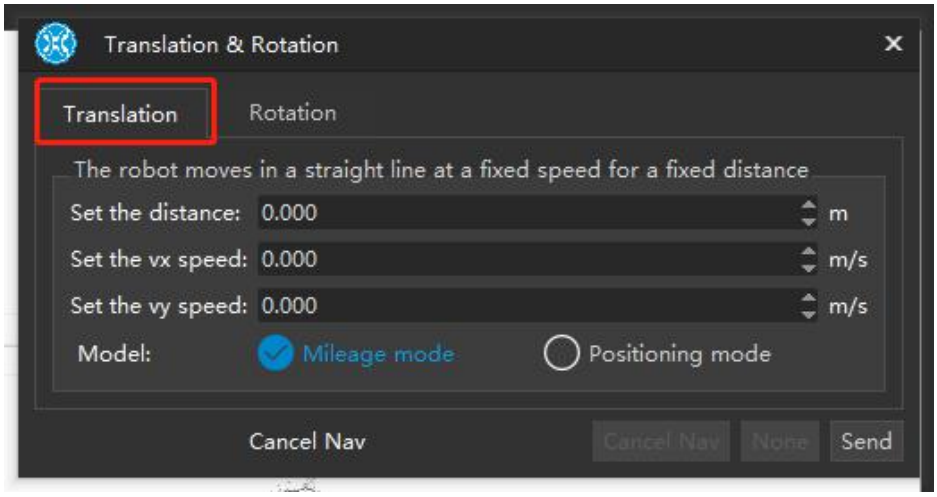


The interface for using [Translation/Rotation] pops up, as follows.



Translation

As shown in the picture, select the [Translation] tab, enter the relevant parameters, then click [Send] button.



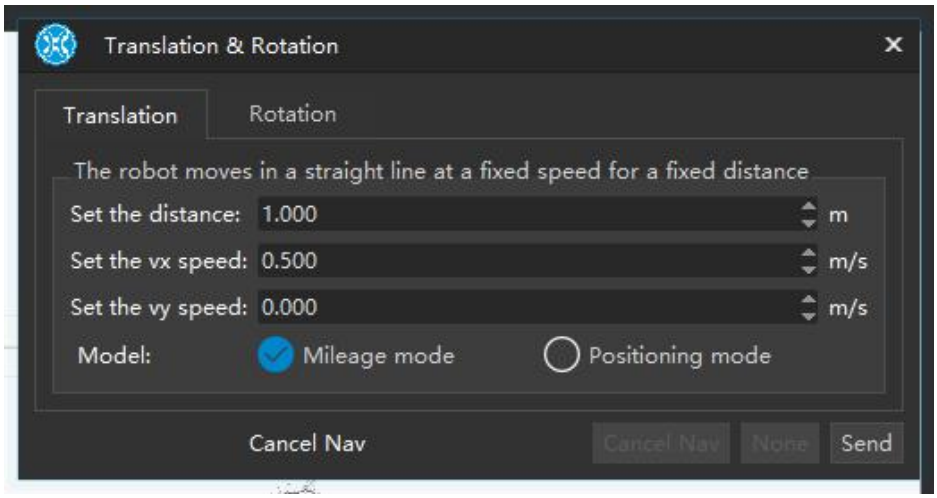
Make the robot move 1m in a straight line at Vx of 0.5m/s.

The steps of the operation are as follows.

① Select the [Translation] tab.

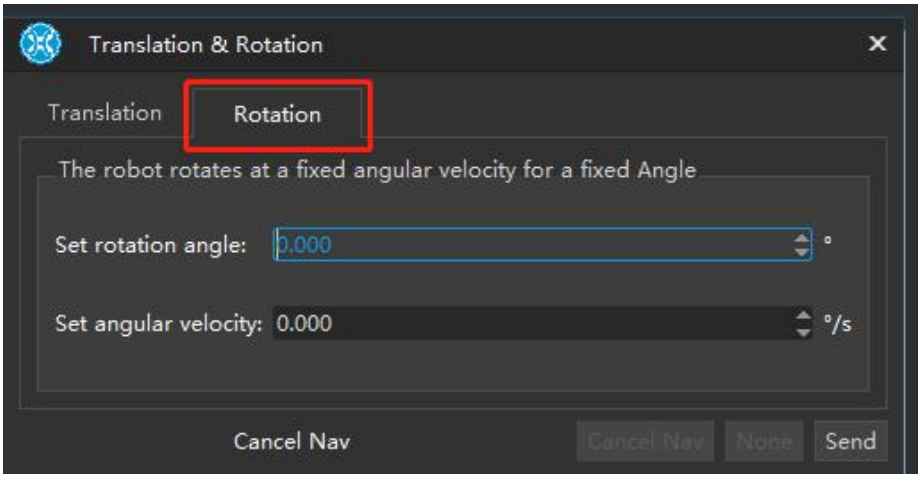
② [Set] [distance] to [1]; [Set] [vx] speed to [0.5]; as shown in the figure.

③ Click [Send].



Rotation

As shown in the picture, select the [Rotation] tab, enter the relevant parameters, then click [Send] button.



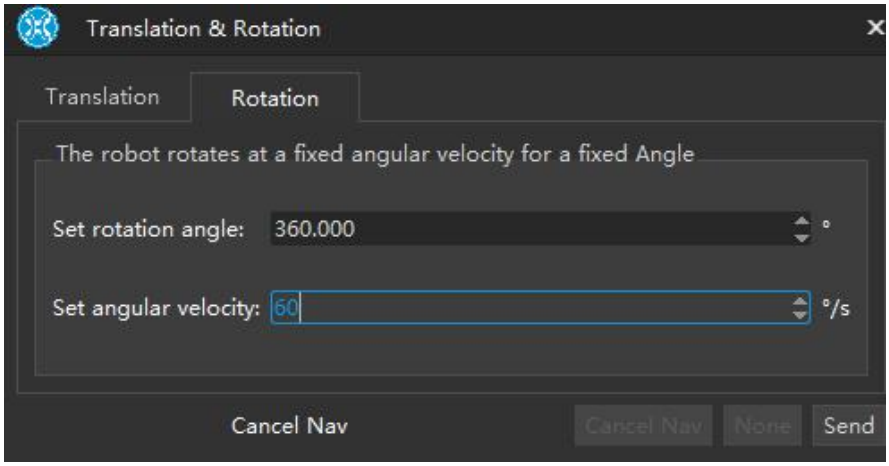
Make the robot rotate 360° in place at a speed of 60°/s.

The operation steps are as follows.

① Select the [Rotation] tab.

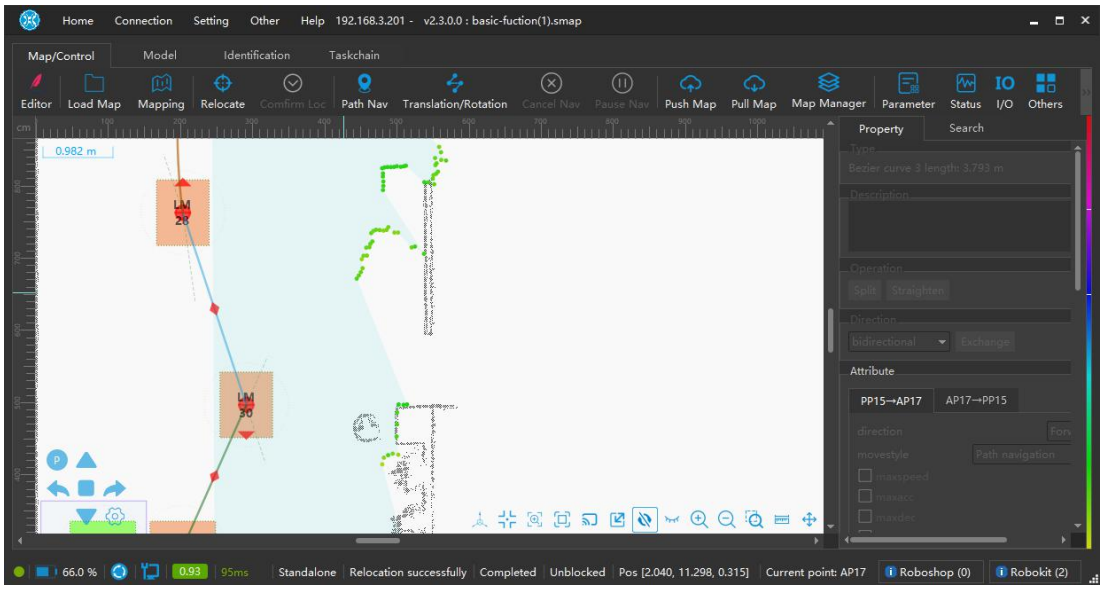
② [Set] [Rotation Angle] [360]; [Settings] [Angular Speed] [60].

③ Click [Send].



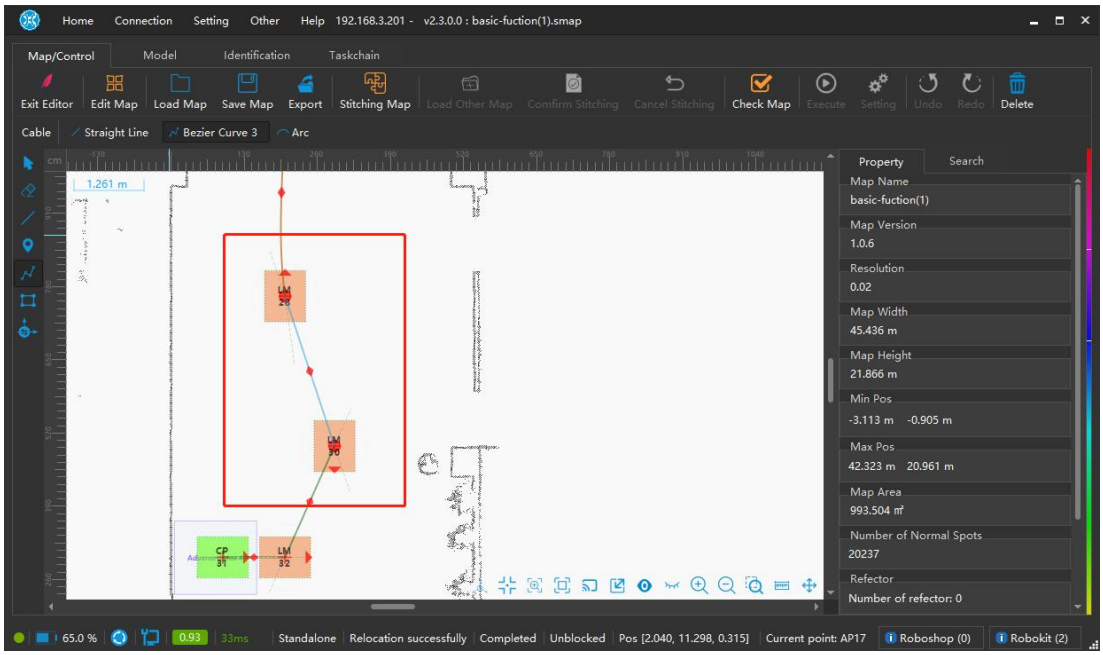
9. Taskchain

Make the robot move cyclically between two points. From LM28 to LM30, move backward along path navigation and stay for 10 seconds when it reaches the LM30. From LM30 to LM28, move forward along path navigation without stopping when reaching LM28. Follow this condition to make the robot move in a loop between the two points.

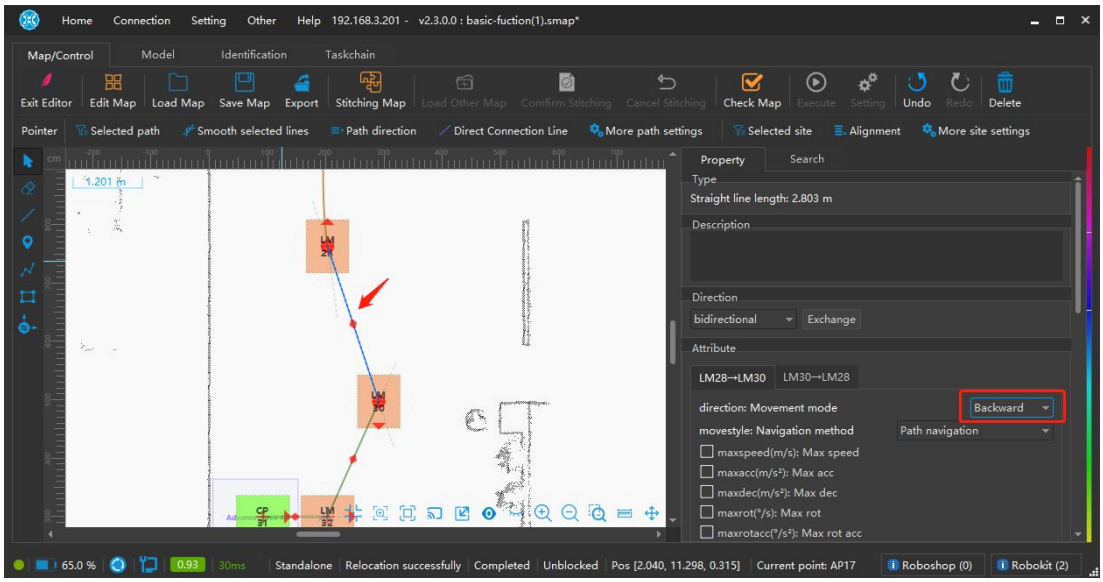


a. Make sure that the map in the Roboshop Pro is the same as the robot's current map.

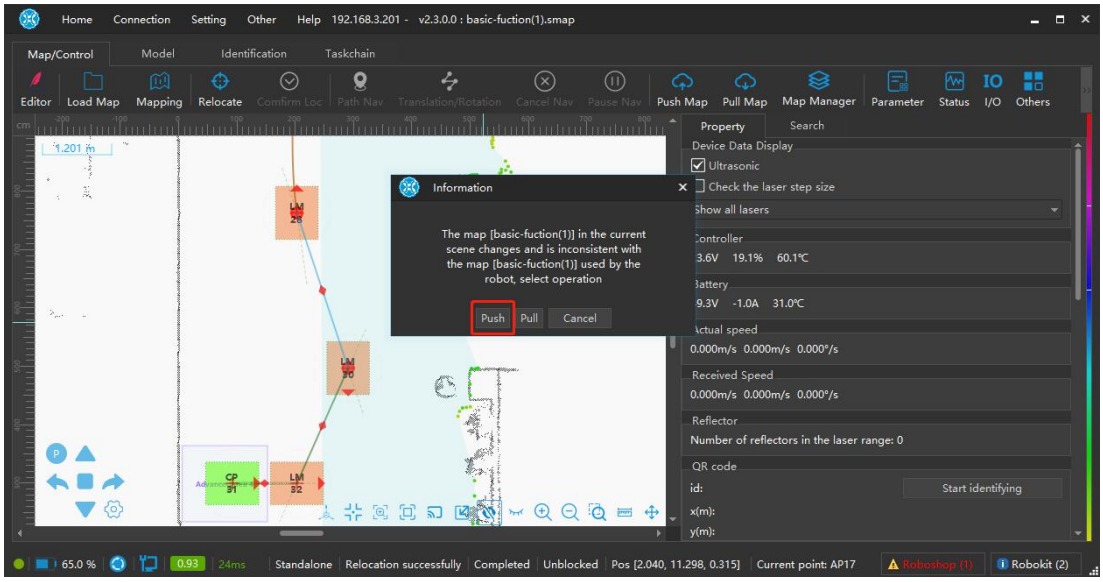
b.Use [Editor] to add two sites to the map, and then use [Bessel Curve 3] to connect.



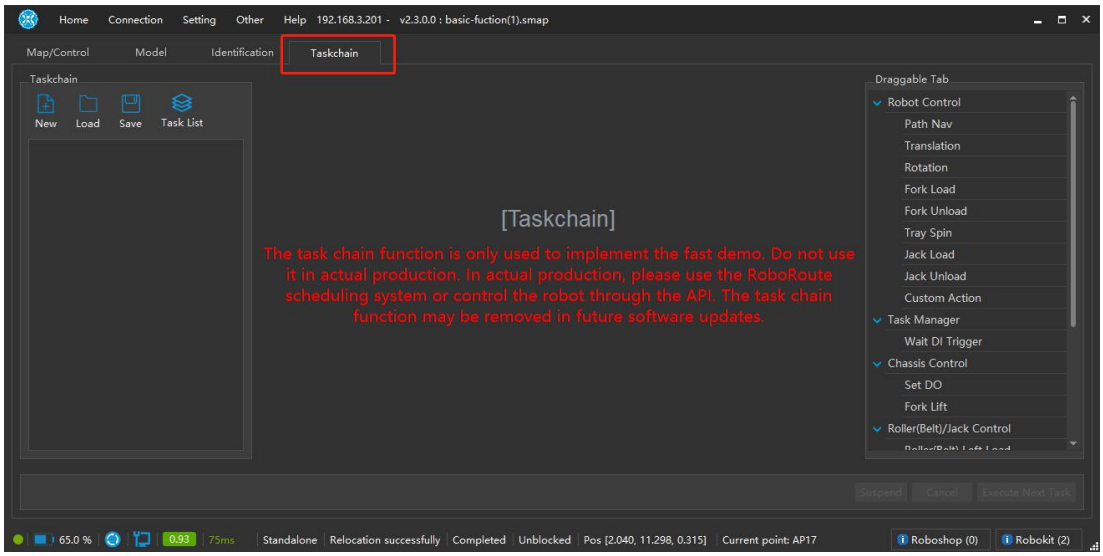
c.Click [Pointer] in the toolbar, then use the mouse to click on the line segment and change the direction of LM1->LM2 to [Reverse Walk] in the [Property Window].



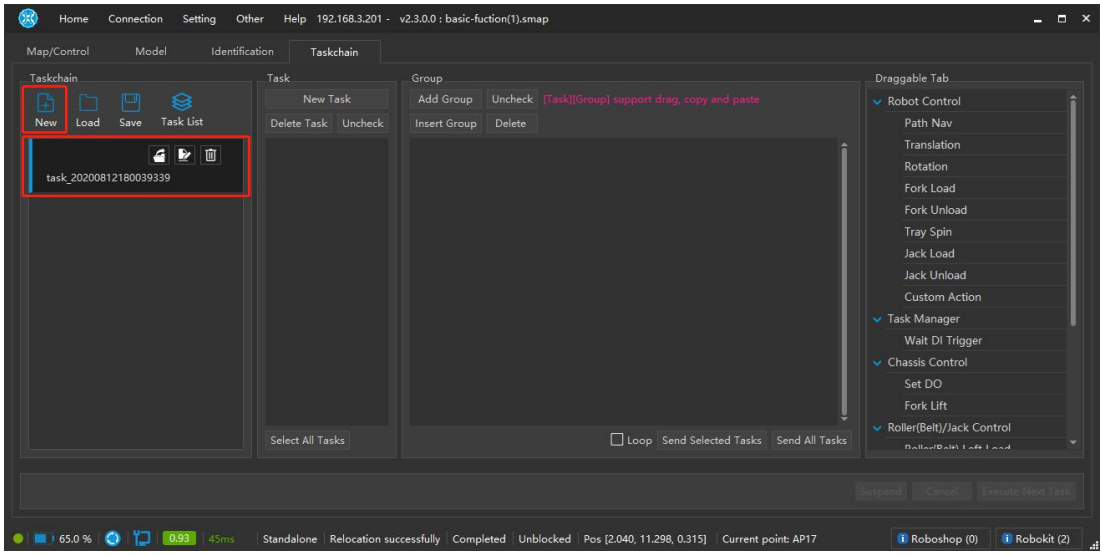
d. Save the map and exit the editor. Then [Push] the map to robot.



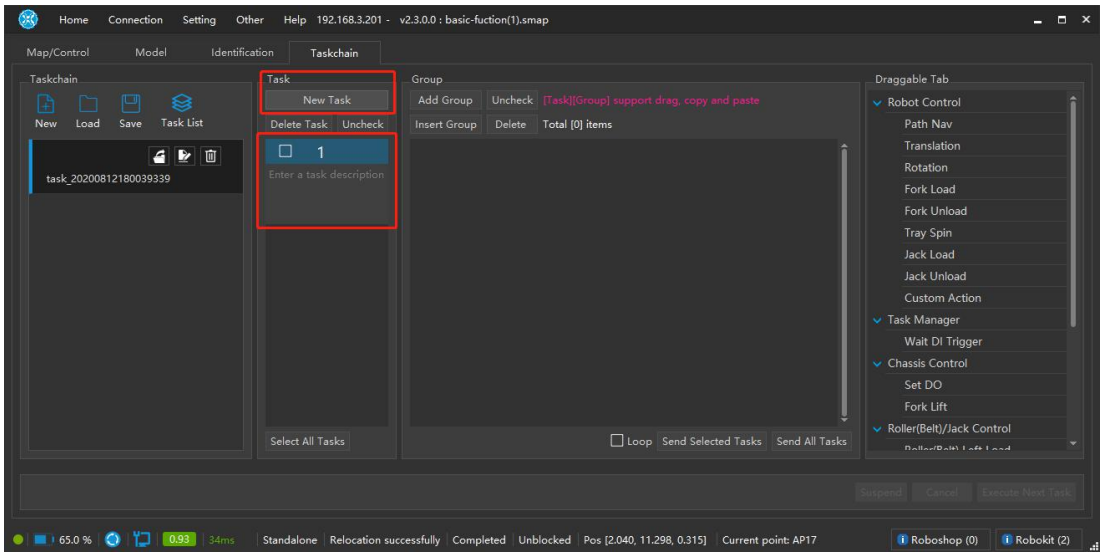
e. Click the [Taskchain] tab to enter the task chain function interface.



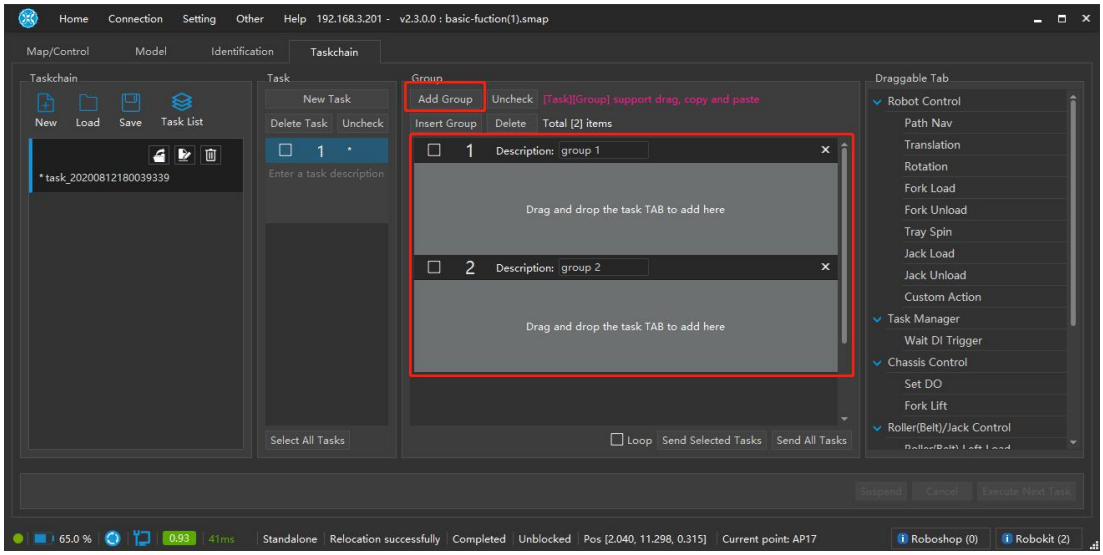
f. Click the [New] button, a empty task chain will be generated automatically.



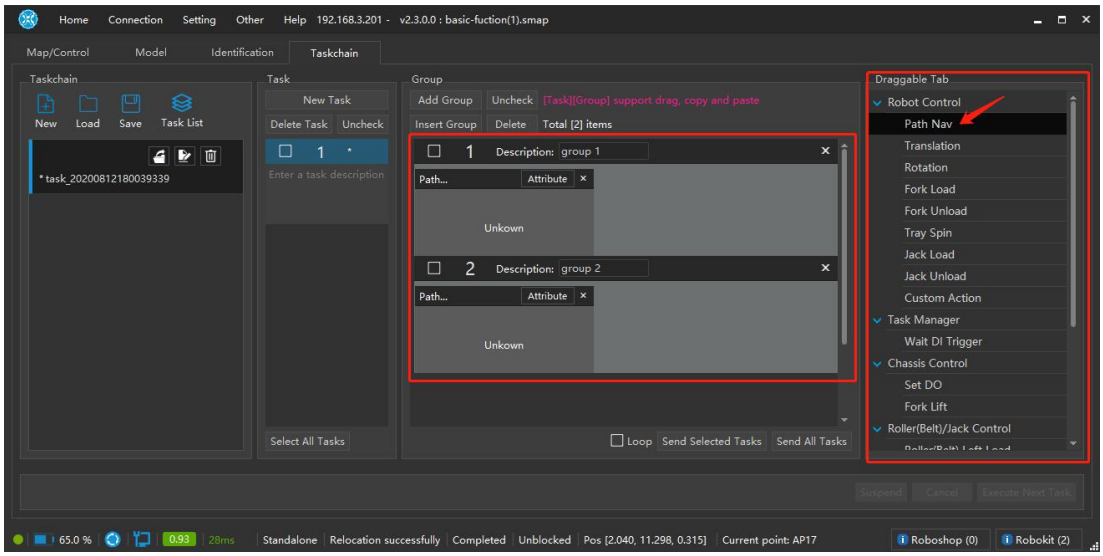
g.Clicking [New Task] in the task box will generate a task.



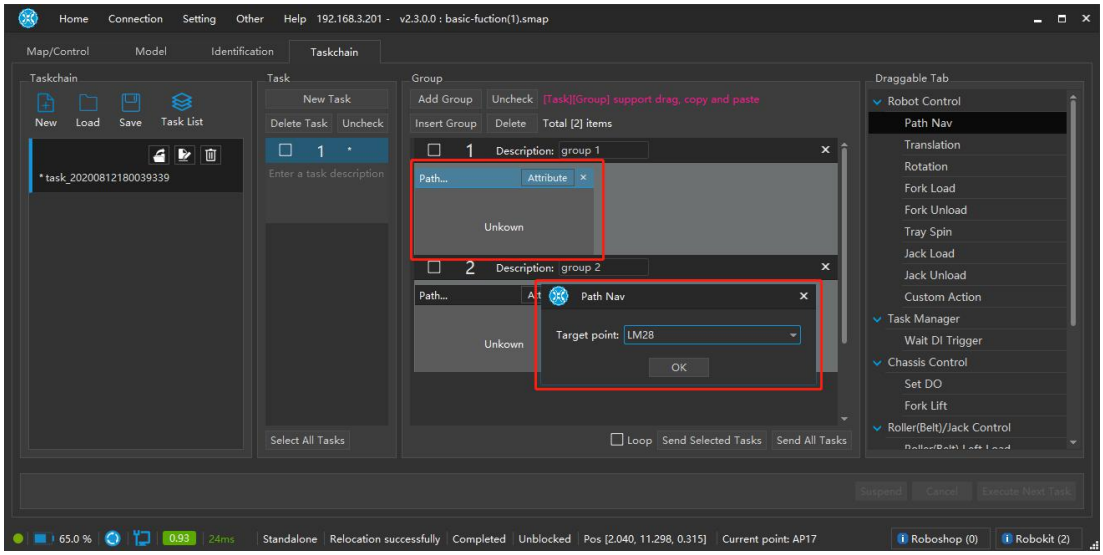
h. Add 2 groups to [Group].



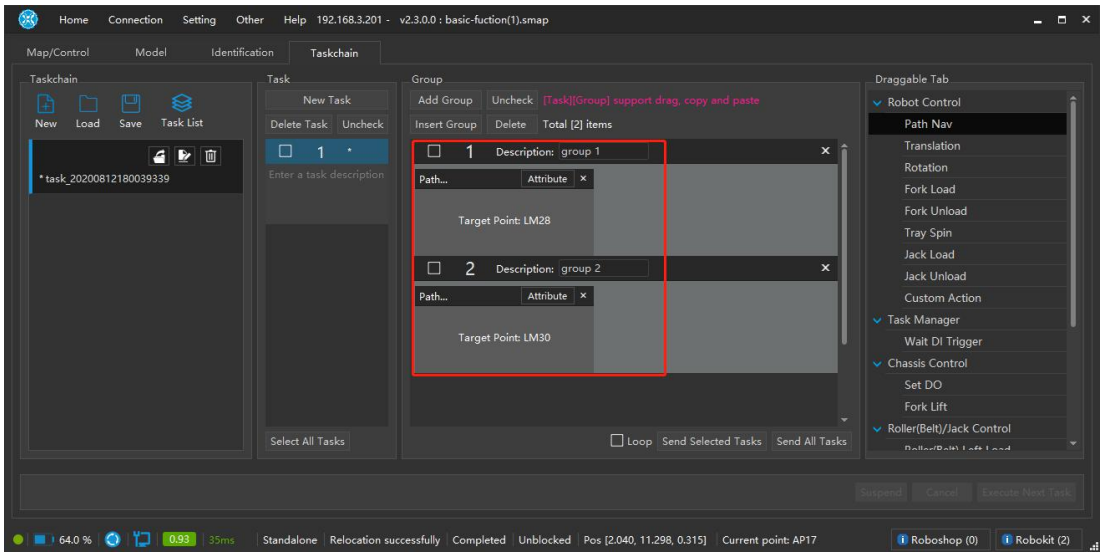
i. Drag the [Path Nav] tab of the [Draggable Tag] to each empty [Group].



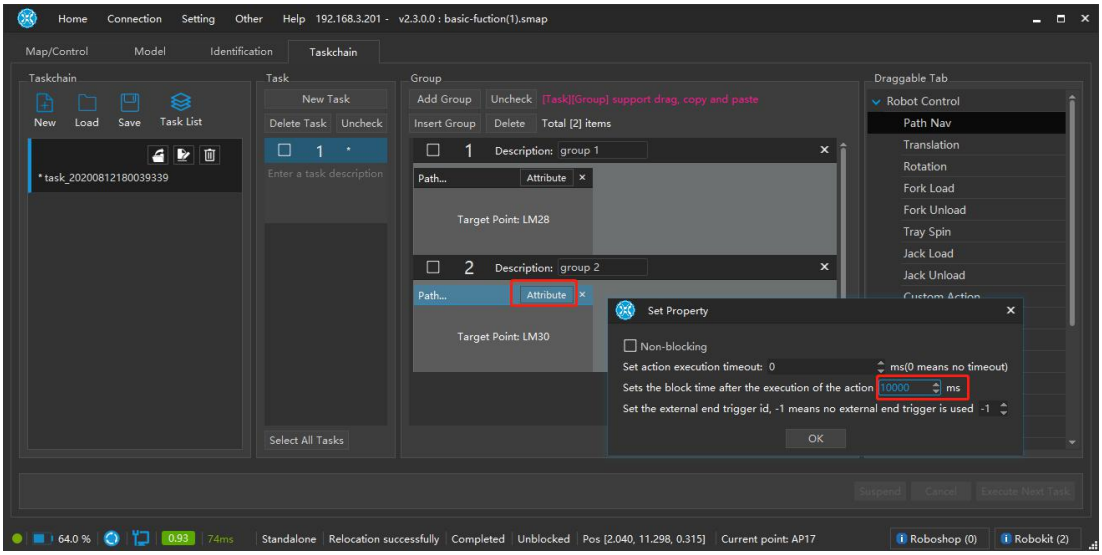
j. Click the [Unknown] area of each label in the groud, and select the path navigation site LM1 in the pop-up dialog box.



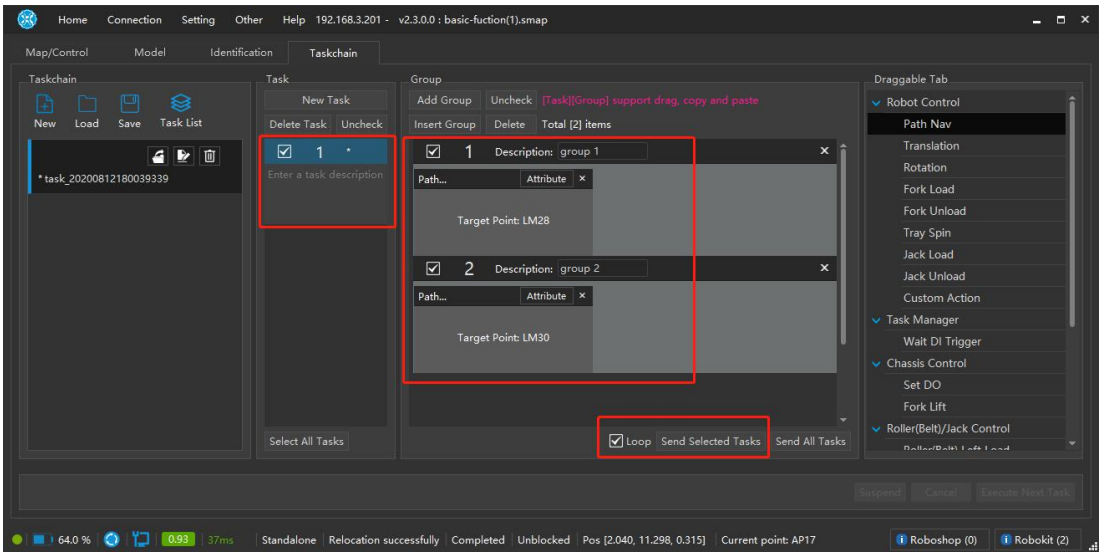
k. Do the same setting in the Group 2.



l. When the robot reaches LM30 point, it needs to stay for 10 seconds.Click the [Attributes] button in the LM30 tab, input 10000 (unit: ms) in the pop-up dialog box, then click OK button.



m. [Task Chain] has been set, then select [Task], [Loop] , and click [Send Selected Task].



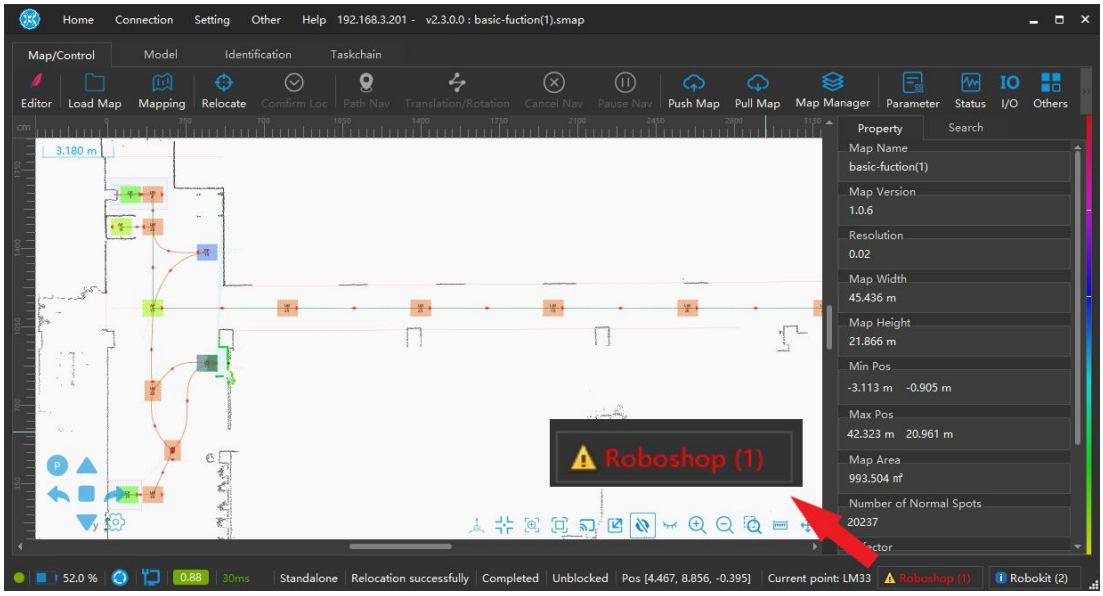
Note: When using the Task Chain, make sure that the task to be performed in the task chain and the group in the task must be checked.

Alarm and Warining

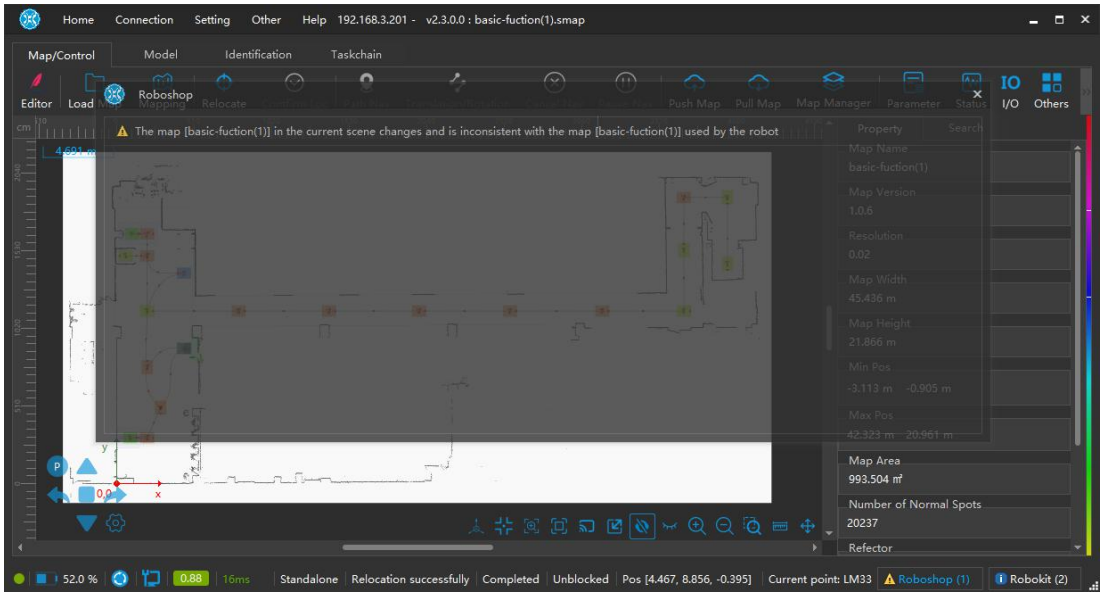
When there is error occurring in the robot, an error code can be found via the network protocol. And if the robot is equipped with an alarm light or buzzer, the robot will respond accordingly.

You can also use Roboshop Pro to view the alarms and identify the cause of the alarm.

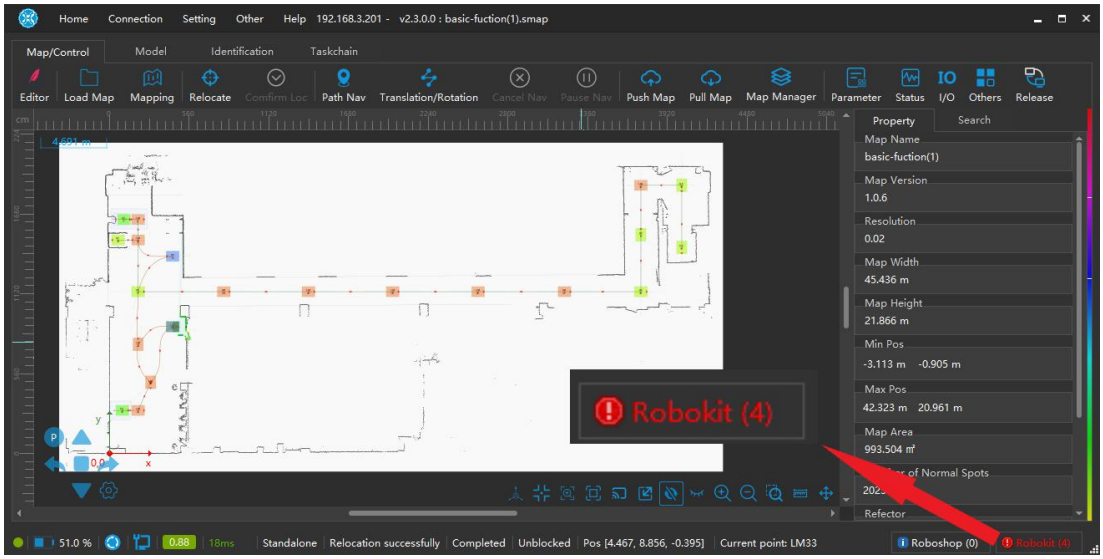
When an error alarm occurs, the alarm box in the lower right corner of the interface will be displayed as red and blue flashing alternately and will show the number of errors, as shown below.



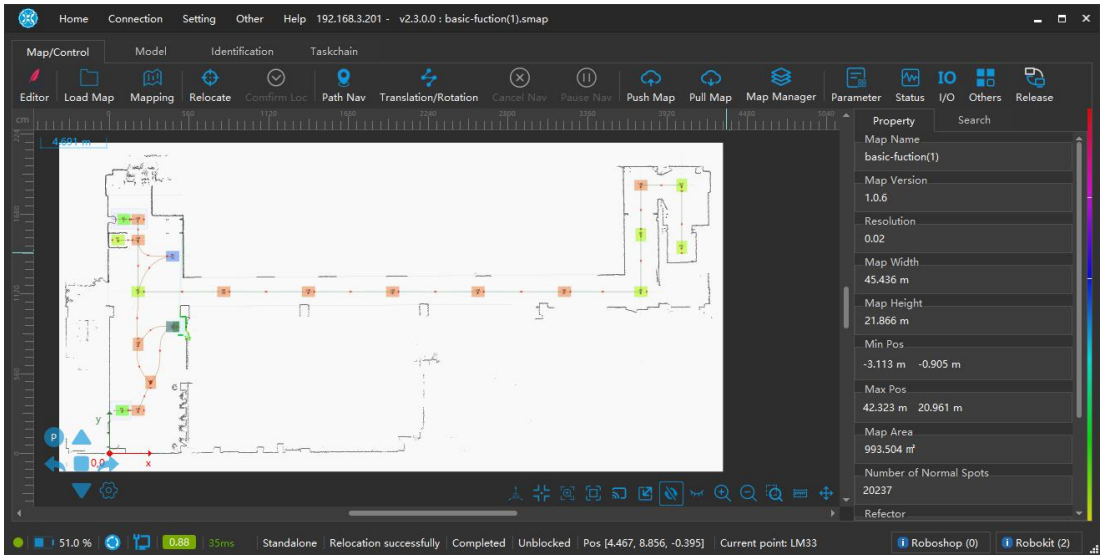
Clicking that button will show an alarm message view box to see the cause of the error. The example in below picture shows a map data inconformity error.



When there is a problem in the robot, Roboshop Pro will alert Robokit with an alarm box in the bottom right corner, displaying a blinking red and blue status and showing the number of errors, as shown in the following image.



Clicking this button will show an alarm message to view the cause of the error]. And afater the error is fixed successfully, the alarm box will no longer blink and the number of errors will be displayed as 0, as shown in the following image.



Some errors can be eliminated automatically, such as navigation-related errors (cancel or resume). Some errors cannot be eliminated automatically, such as robot hardware errors.

If there is error you cannot fixed, please contact with **SEER.**

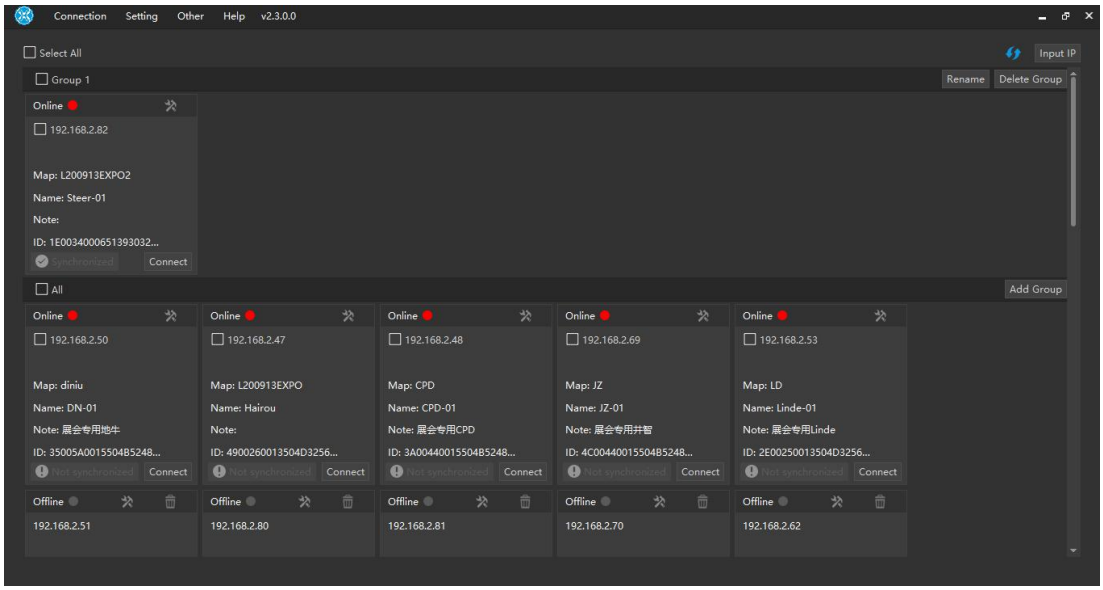
Roboshop Pro Usage Manual

Home

Main Interface

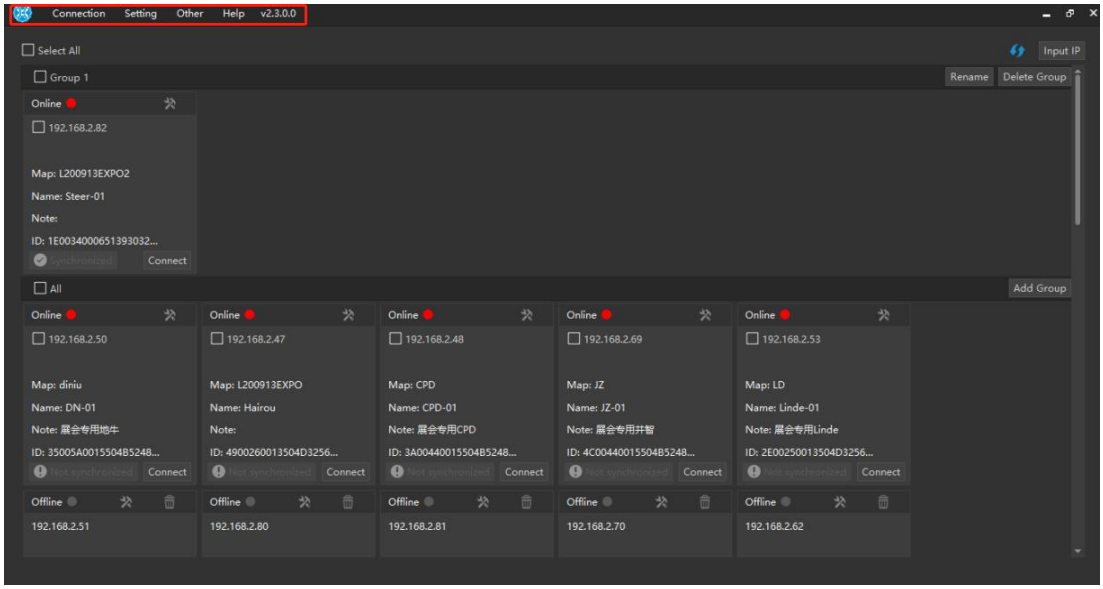
Connection

As shown below, launch Roboshop Pro software to enter the software [Home].

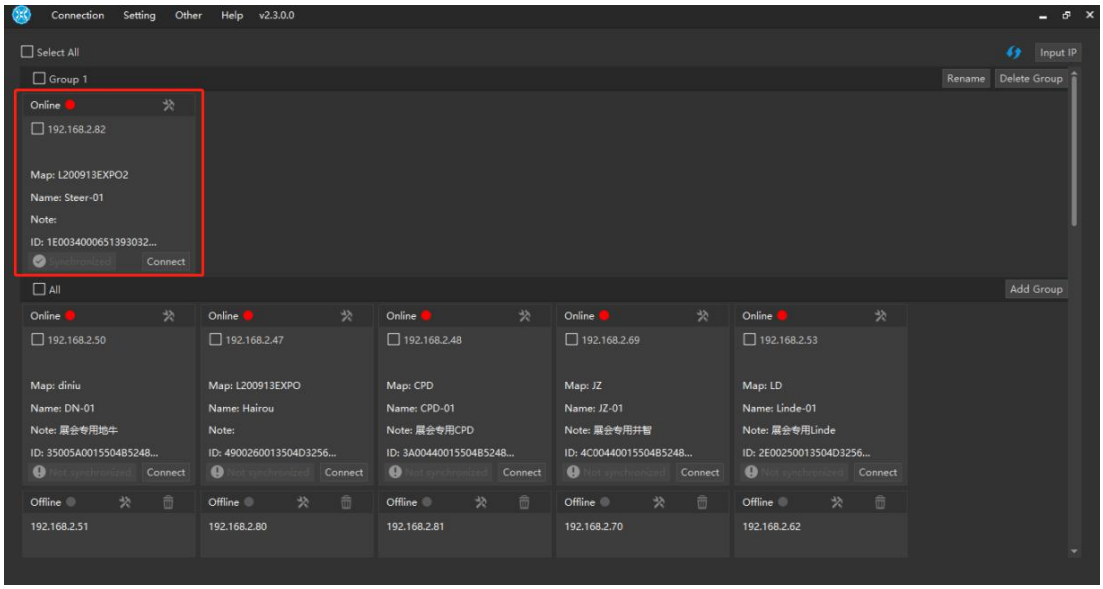


[Home] can be divided into the following three sections according to modules.

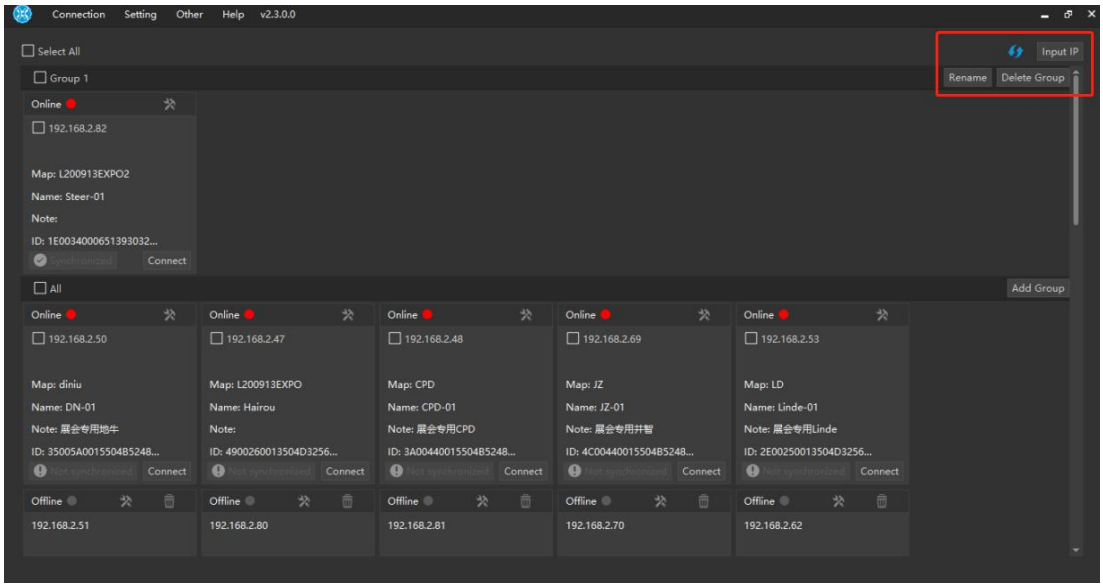
1. menu bar



2. robot selection tabs:

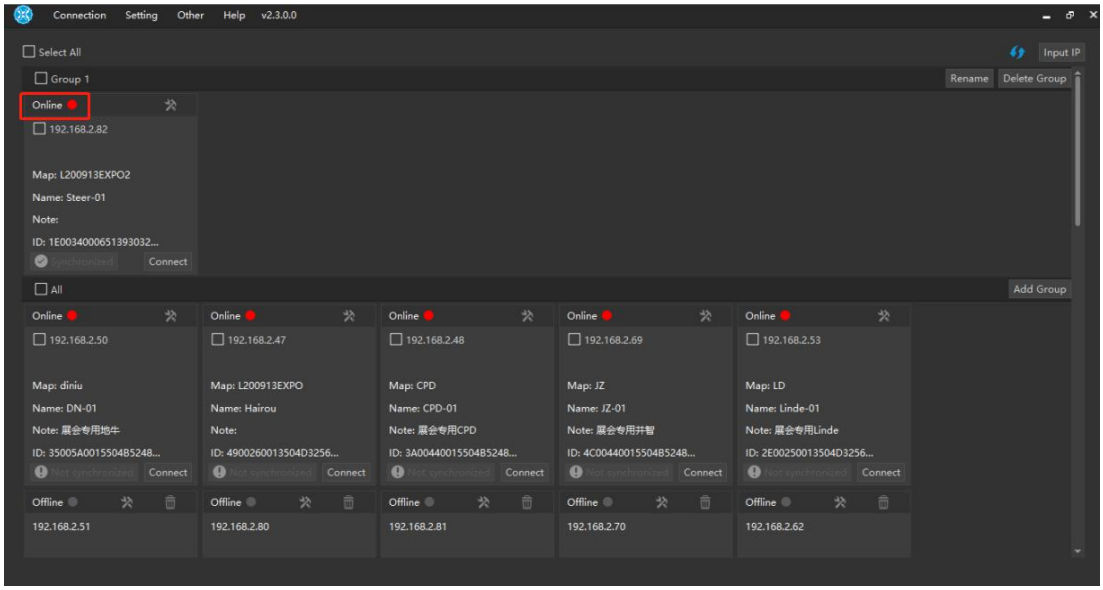


3. function buttons:

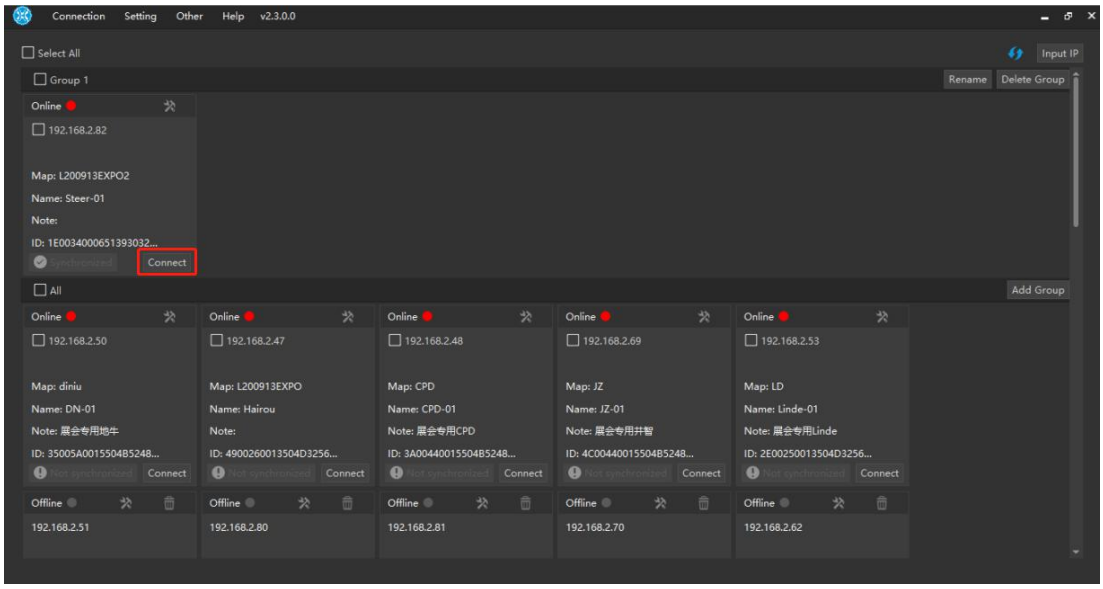


After entering the software [Home], if there are robots in the current area

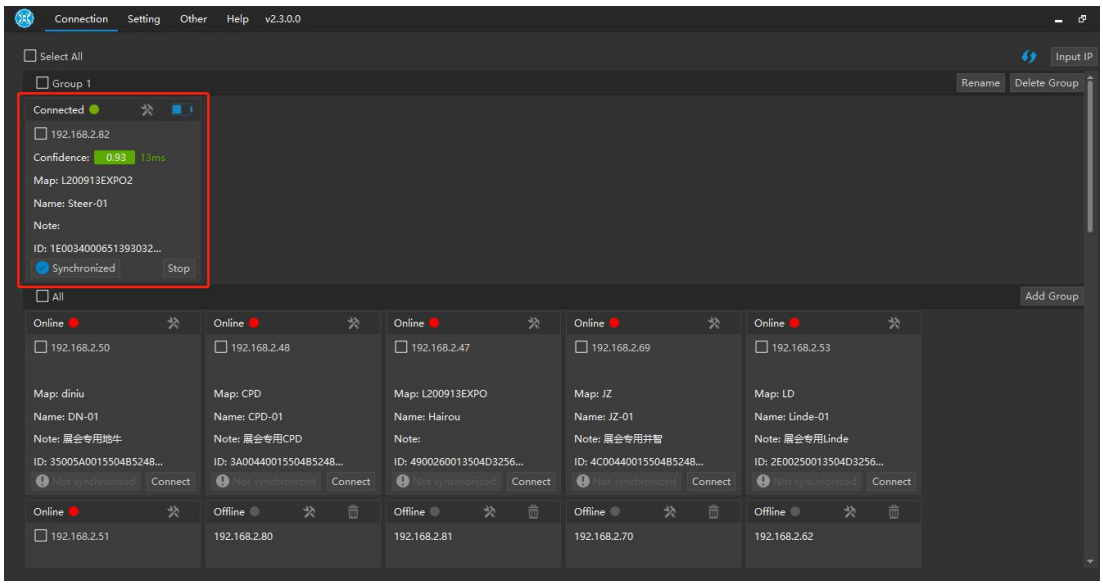
[Online]



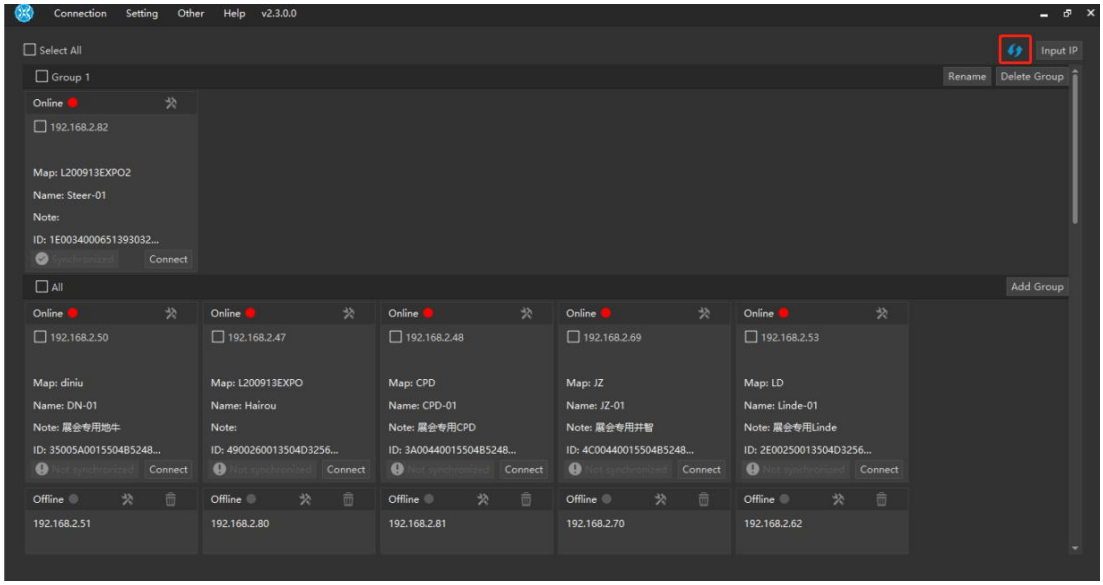
Click on the [Connect] button to connect the robot.



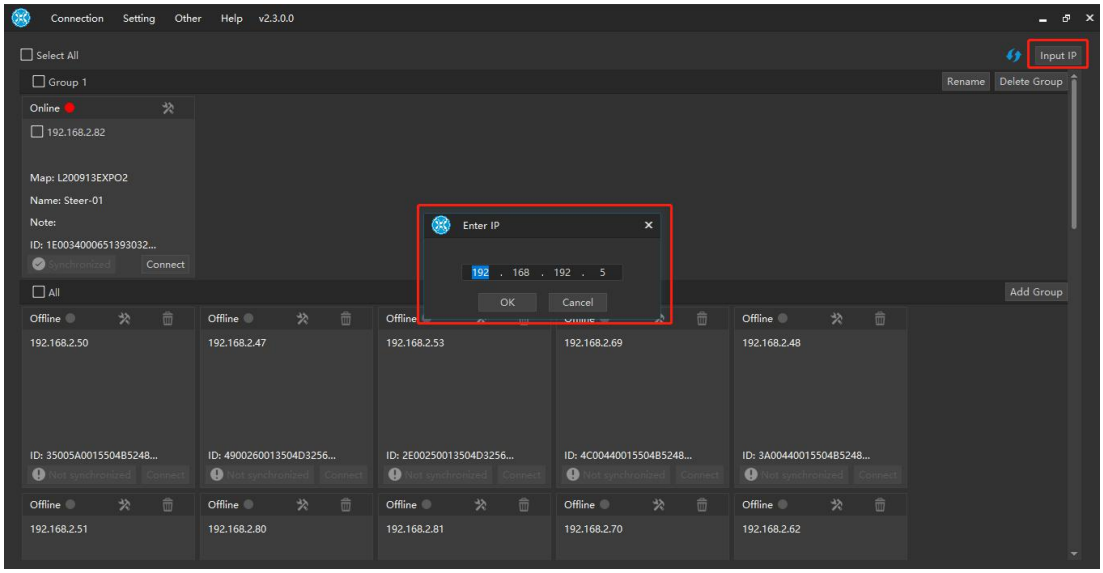
When the robot is successfully connected, the robot selection tab displays a green icon and shows [Stop], and basic information about the currently connected robot can be viewed.



If the robots in the current area are not shown in the list, you can refresh them by clicking the [Refresh] button.

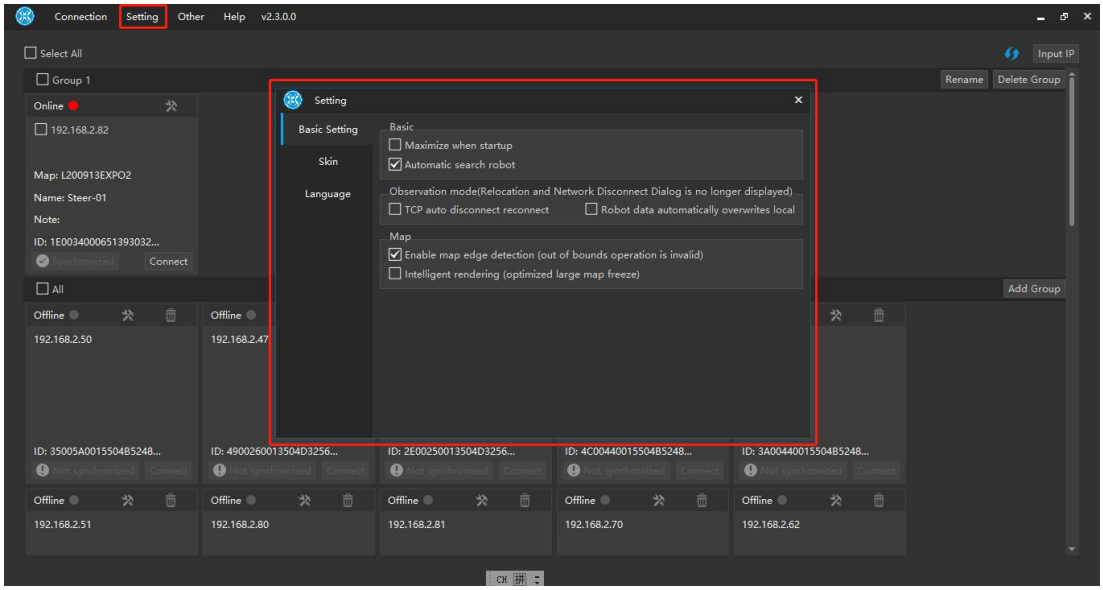


Or, if the IP address of the robot is known, you can use the Input IP to add the robot.



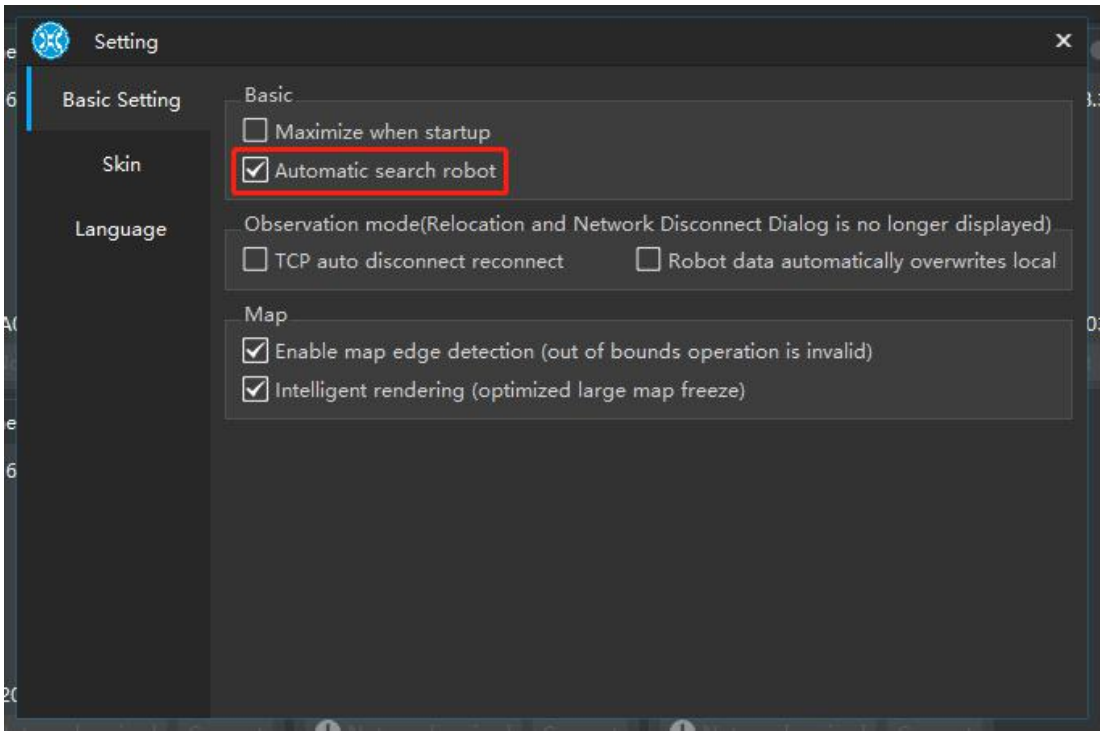
Setting

As shown in the image below, the [Settings] function is located on the second button of the menu bar. Then click on the [Settings] button to open some basic settings for Roboshop Pro.

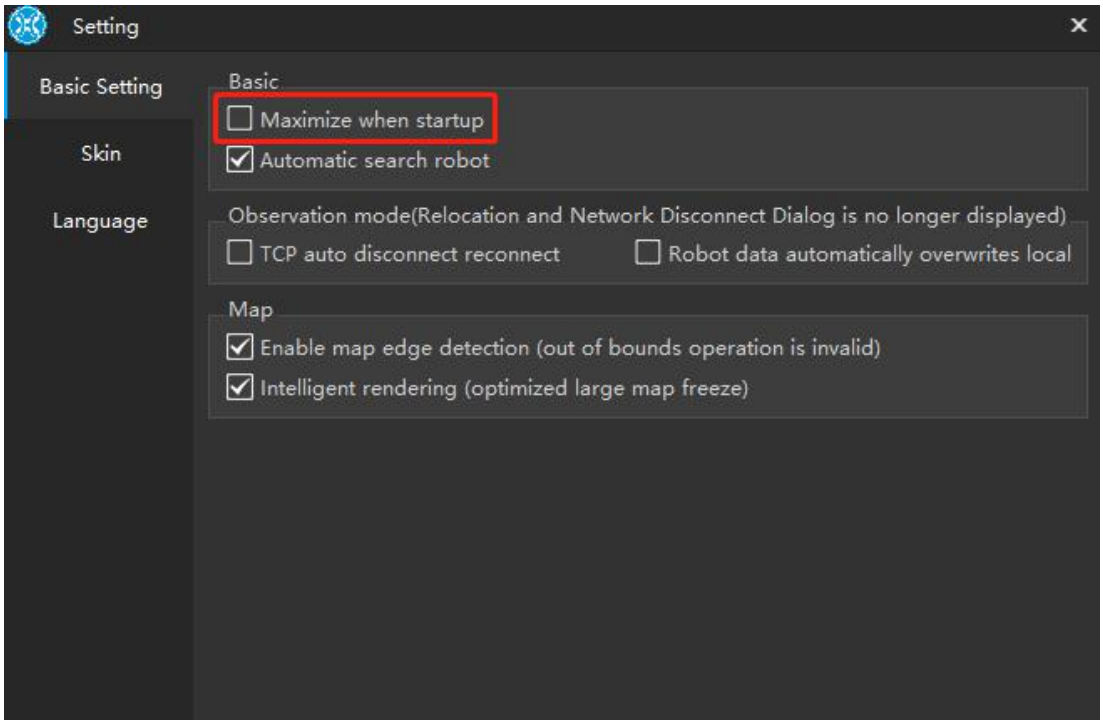


1.Basic Setting：

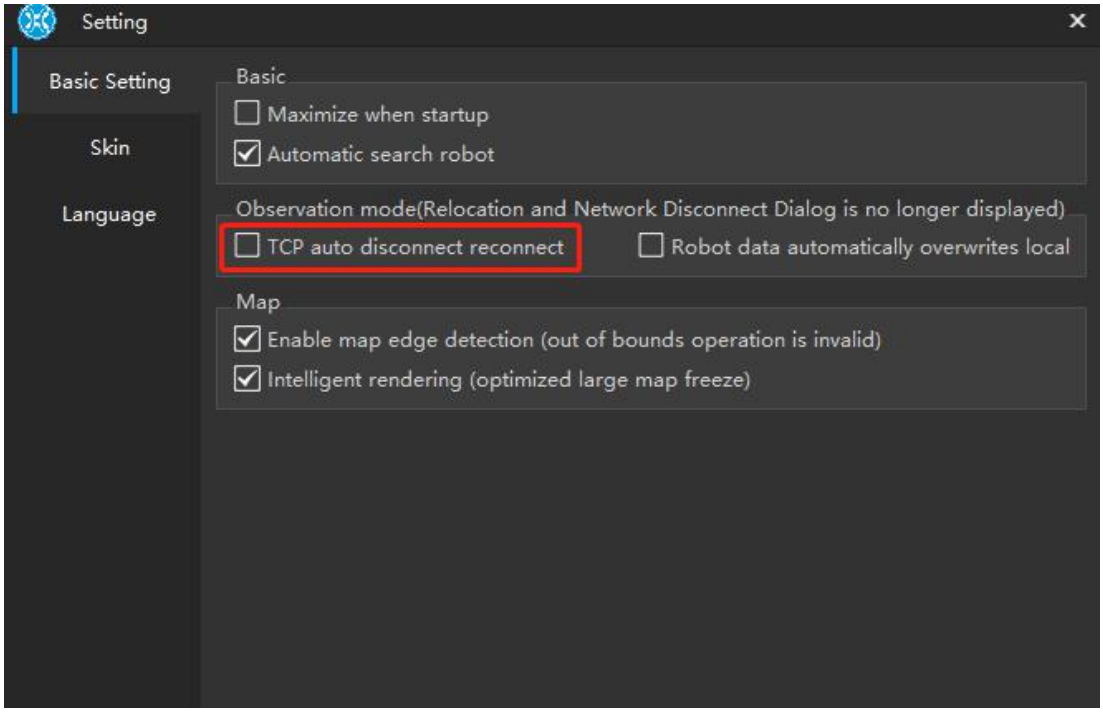
①The [Automatic search robot] action setting is located in the basic settings, and when turned on, it allows Roboshop Pro to search the robots automatically when the software start.



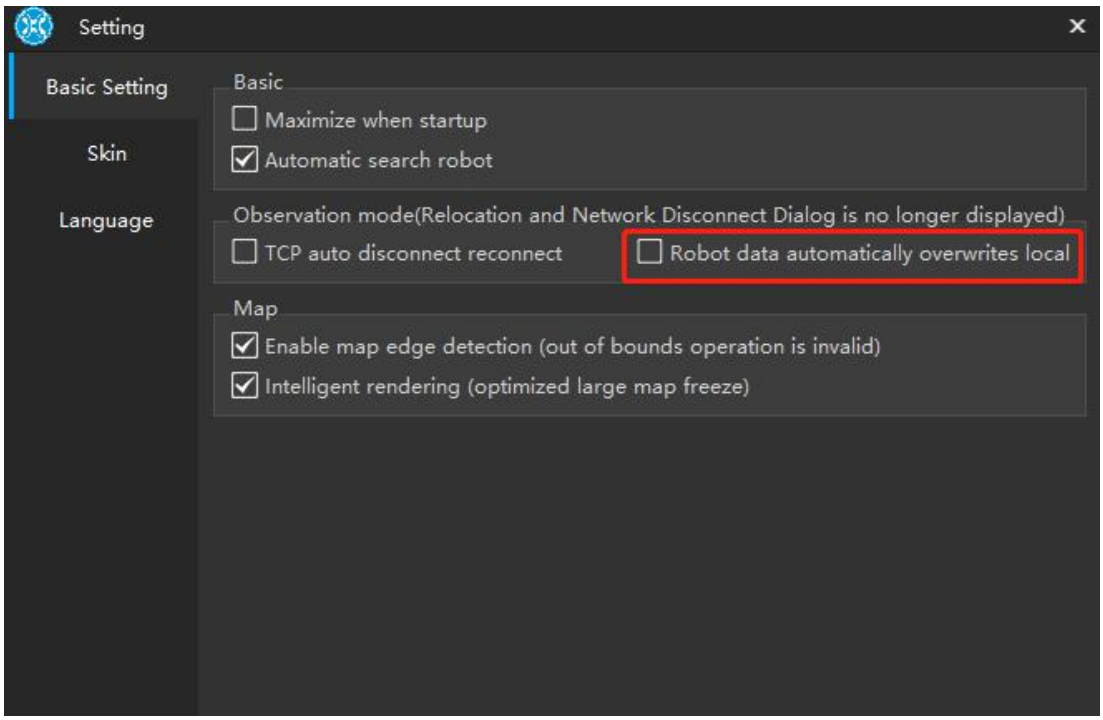
②. [Maximize when startup]: Roboshop Pro interface would at max size type at startup.



③. [TCP Auto Disconnect Reconnect is located] in Basic Setting's mode, and Roboshop Pro will constantly and automatically reconnect the connected robots when it is turned on.



④. [Robot data automatically overwrites local]: when enabled Roboshop Pro will constantly and automatically pull the latest data from the robot for synchronization.



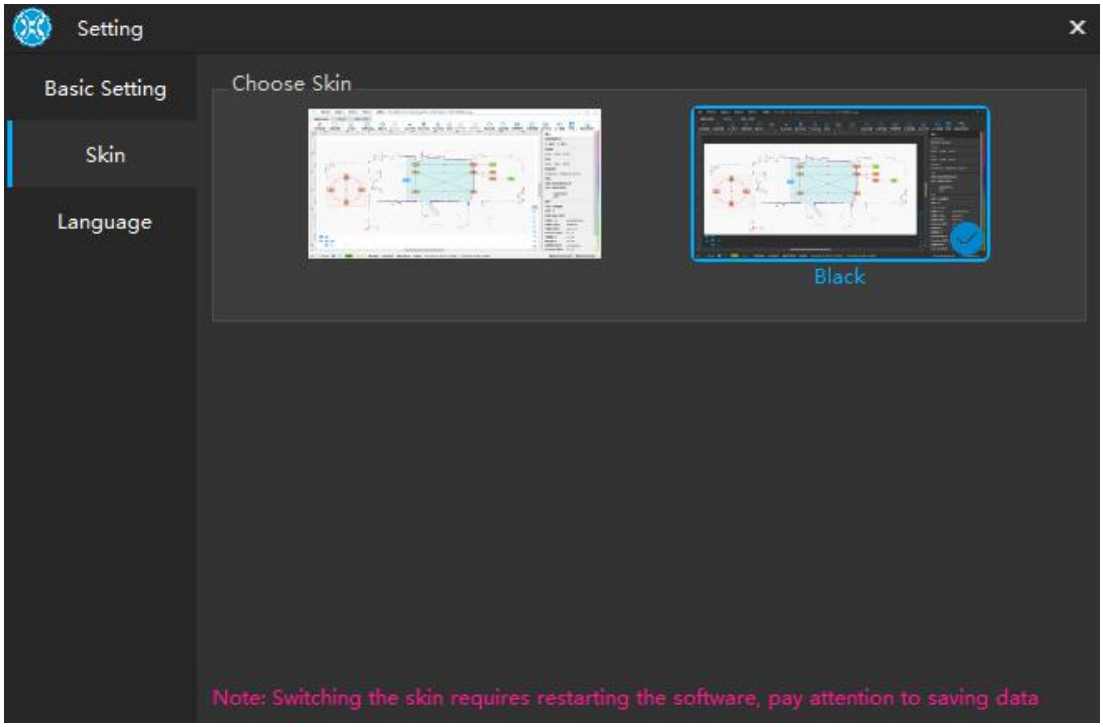
[Observation mode]: Roboshop Pro is a display software, it can be used to display basic information, control and status of the robot, etc. If ③ and ④ are checked, [Observation mode] will be enabled by default.

⑤ [Enable map edge detection (out if bounds operation is invalid)]

⑥ [Intelligent renderin (optimized large map freeze)]

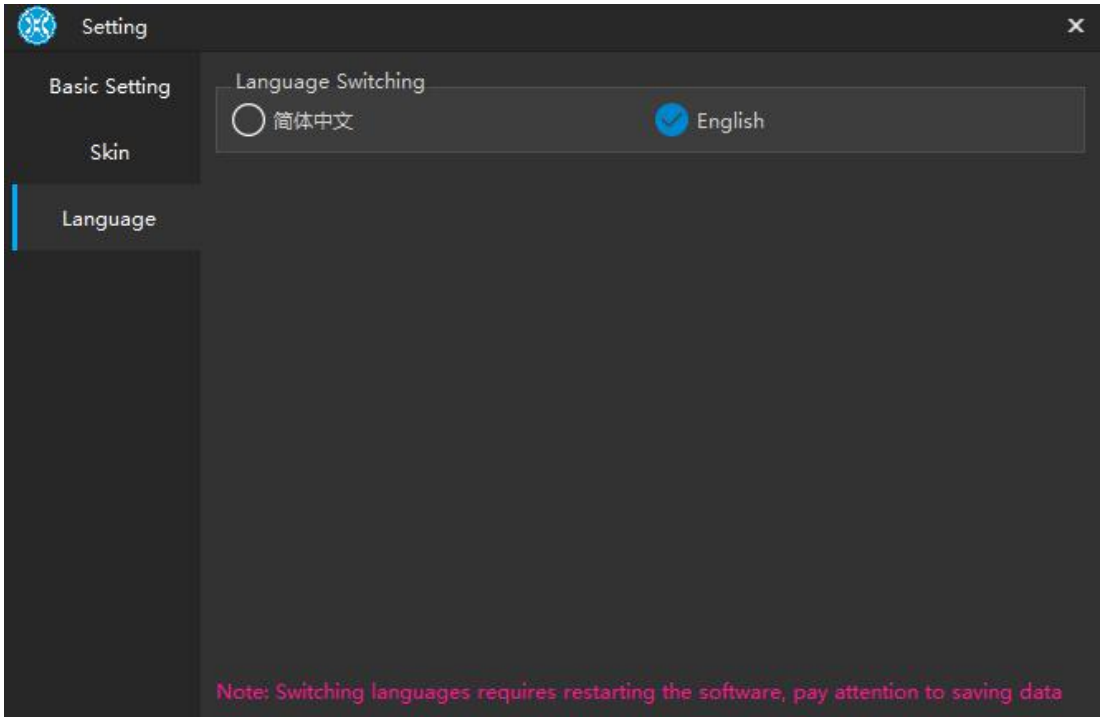
2.Skin:

Roboshop Pro can be set skin according to your personal preferences, and you will need to restart the software after making your selection for it to take effect.



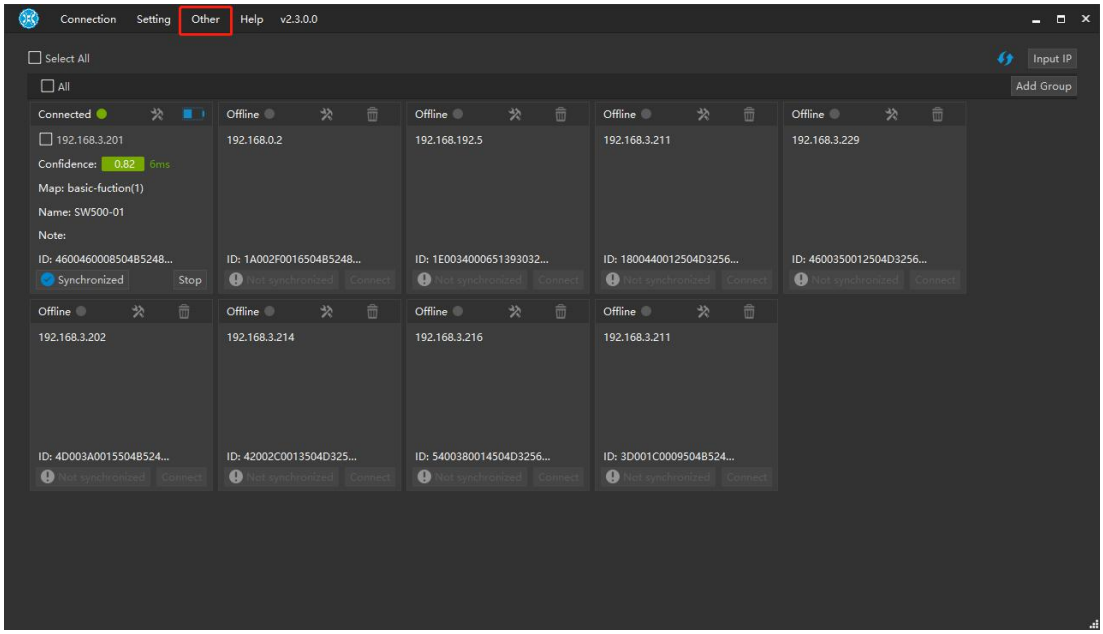
3.Language：

You can set the language for Roboshop Pro, after selecting it you need to restart the software for it to take effect.

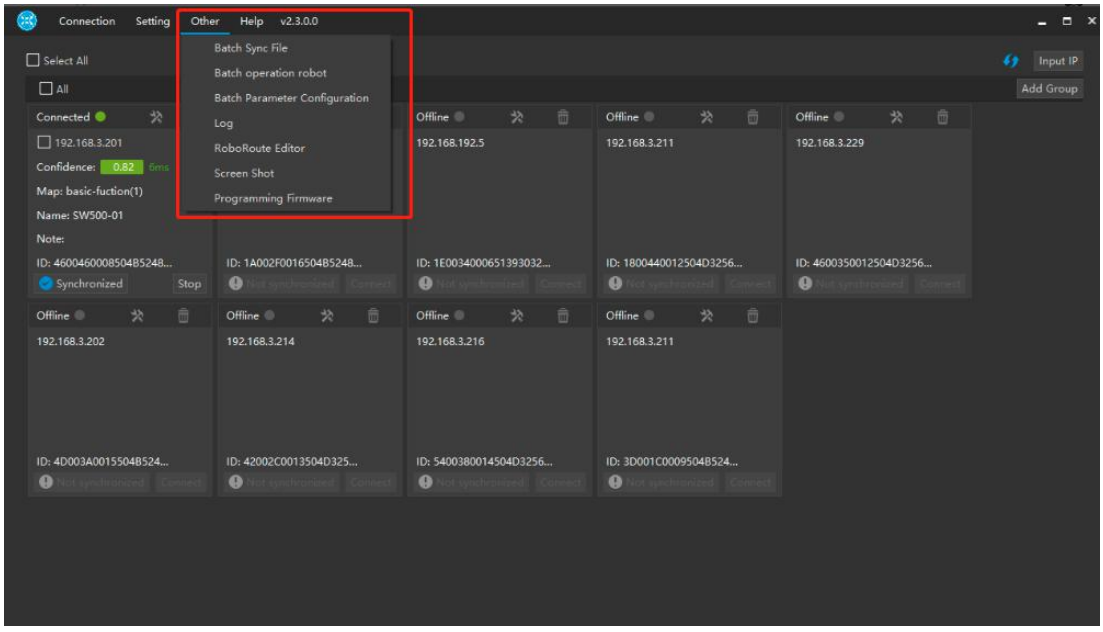


Other

[Other] functions are located on the third button of the menu bar, as shown below

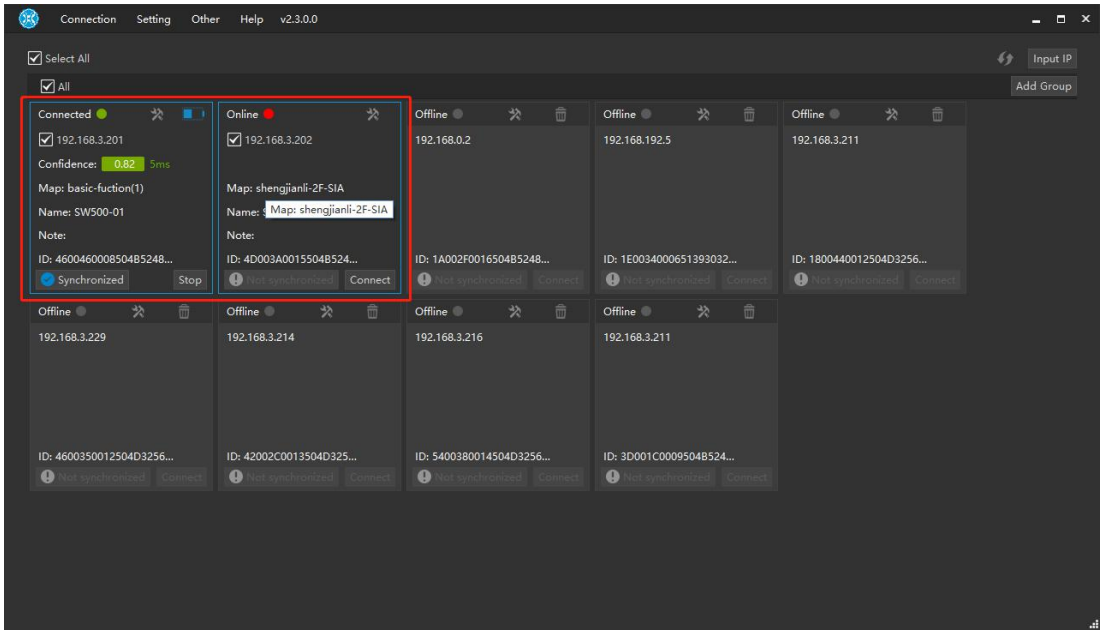


Clicking the [Other] button will bring up all the sub-functions included in Other.

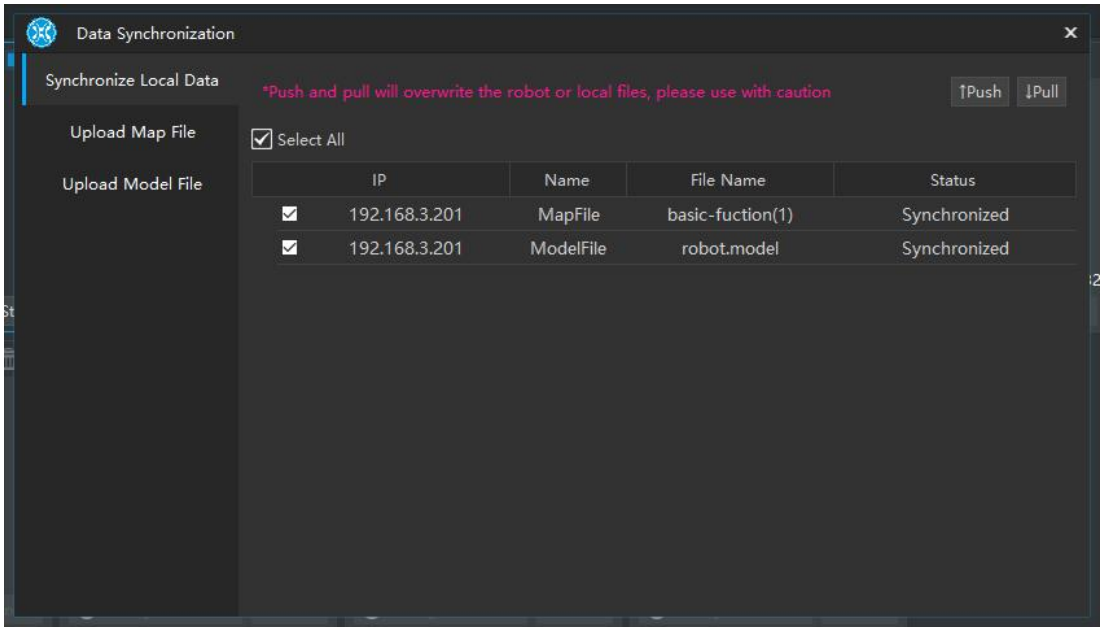


Batch Sync File

This feature can batch select multiple online robots for file synchronization, first you need to connect the robots you want to batch synchronize. As shown in the figure 192.168.3.201 and 192.168.3.202 two robots.



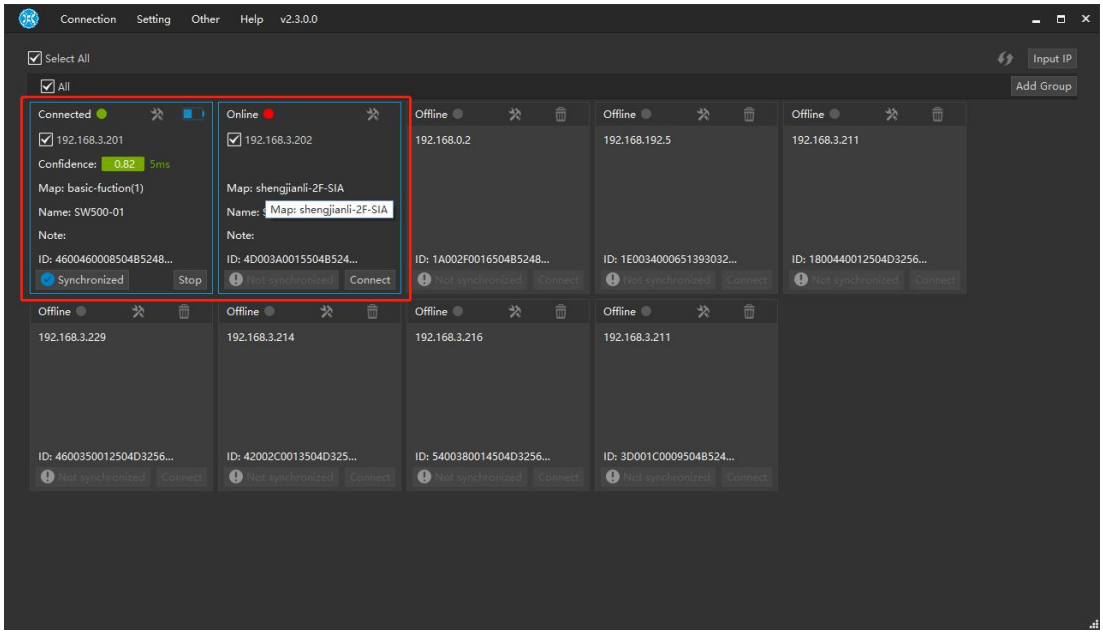
Click [Synchronize Local Data] in the [Other] menu to display the synchronization interface, and then use the corresponding function to synchronize the batch files.



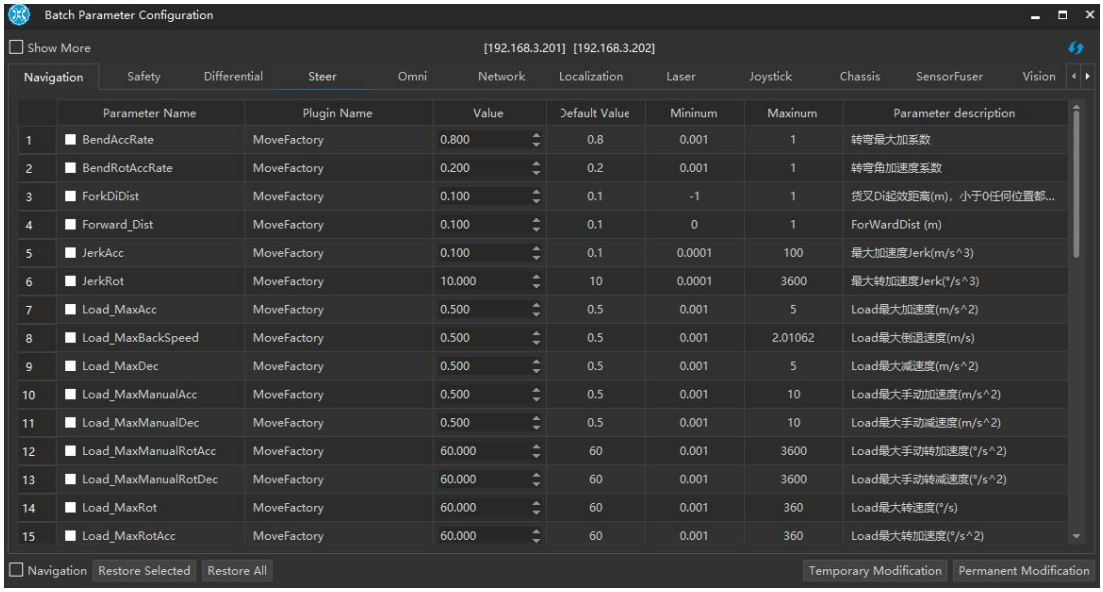
Batch operation robot

Batch Parameter Configuration

You can select multiple online robots for parameter configuration, first you need to connect the robots you want to modify and then check them. The two robots 1192.168.3.201 and 192.168.3.202 shown inbelow Figure.

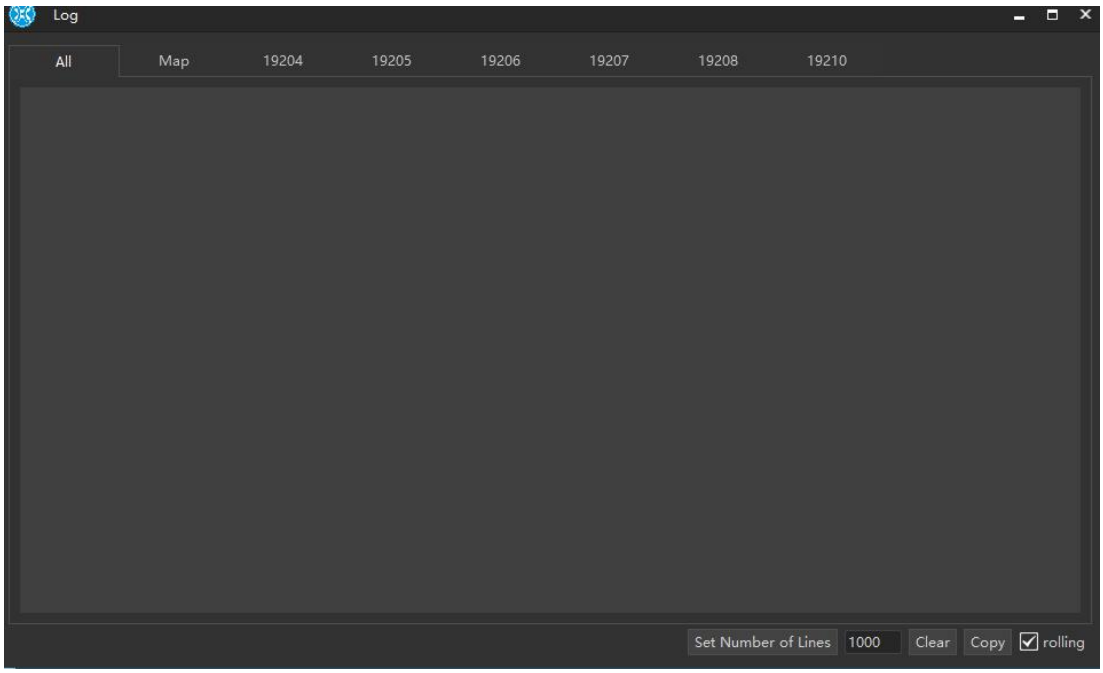


Click [Batch Parameter Configuration] in the [Other] menu to display the Batch Parameter Configuration interface.



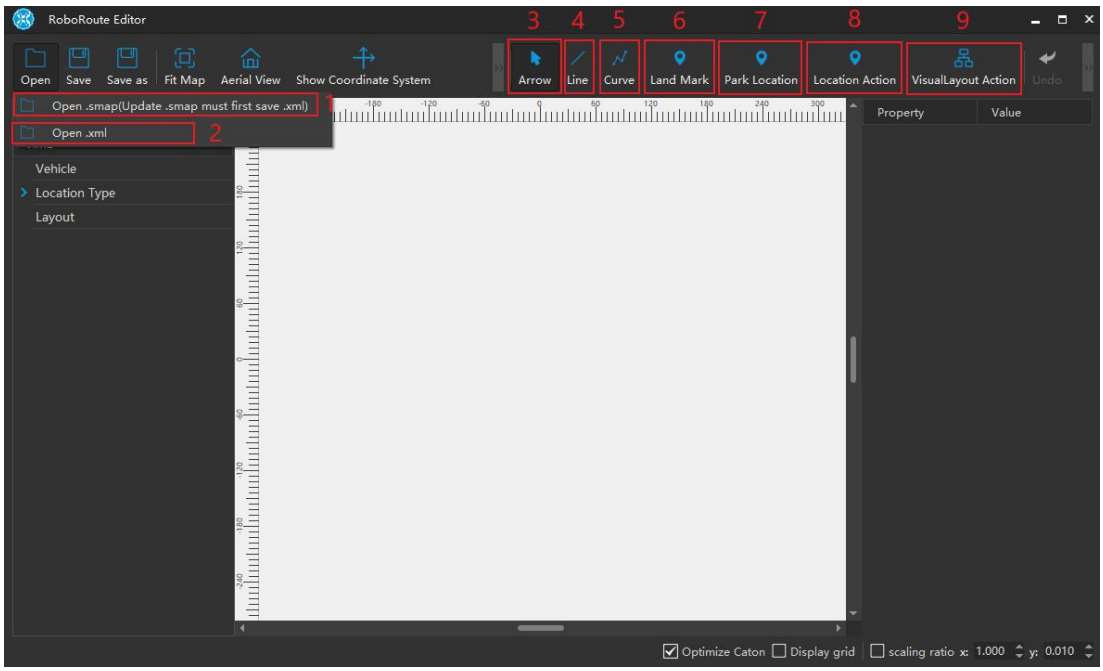
Log

Logging of network communication-related, RoboKit-related, and map-related information is generally useful for viewing logs and locating problems that occur during use.



RoboRoute Editor

Roboshop's RoboRoute Editor edits XML files for use with our RoboRoute Scheduling Server.



The button functions are described as follows.

①. Open the .smap file appended to the current view and the .smap file name will automatically update if it already exists.

②. Open the .xml file, and if the current view has other files open, this file will be deleted.

③. Arrow - used to select tuples and view graph elements properties

④. Line - used to connect graph elements

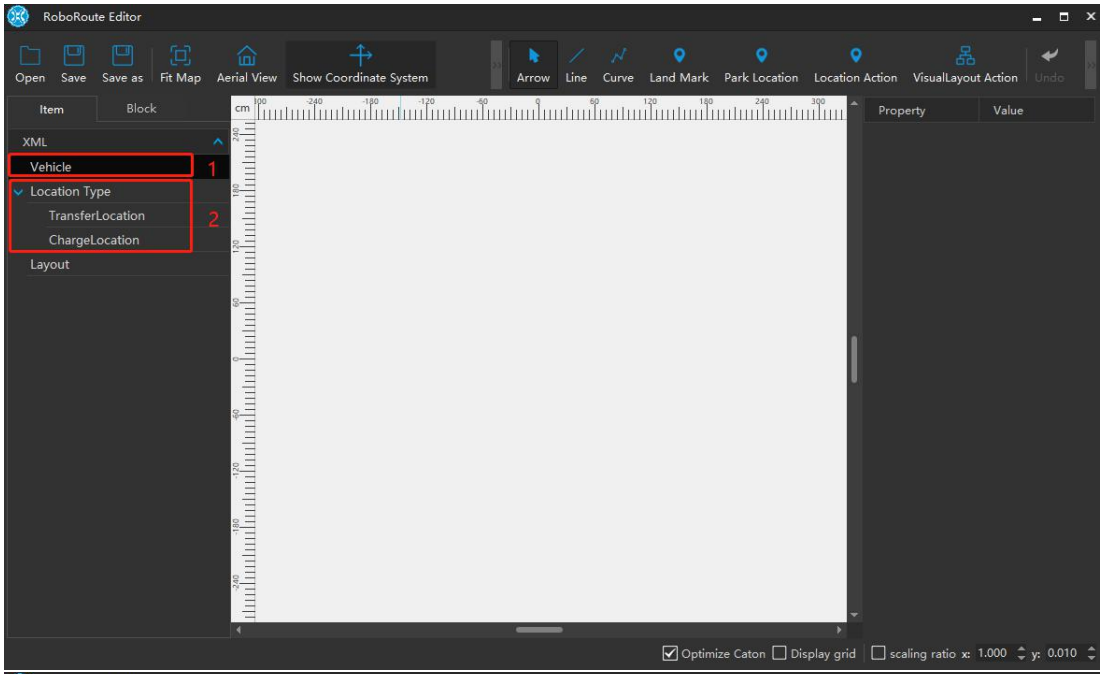
⑤. Curves - Bessel third-order curves are used to connect graph elements

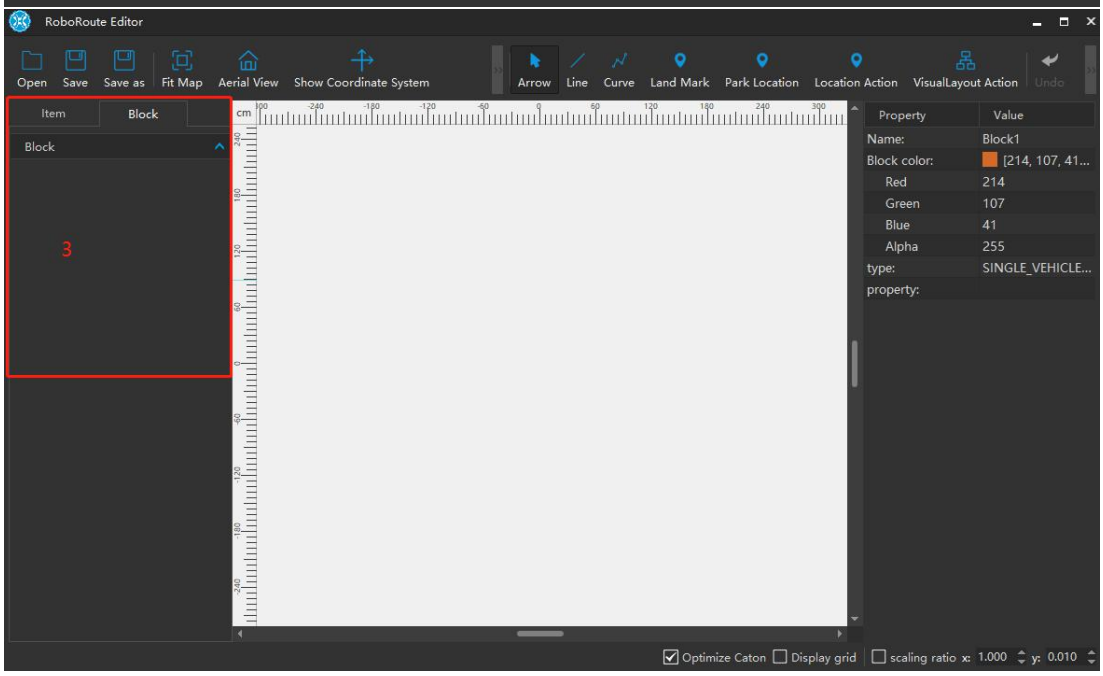
⑥. Land mark - The robot arrives at the designated point

⑦. Parking Location - Robot arrives at designated point

⑧. Location Action - Used in conjunction with landmark points, the robot needs to perform tasks at these positions

⑨. Visual Layout Action - one layout per map for multi-floor, multi-map robots to perform tasks, all other tuples to be put into the layout for it to work

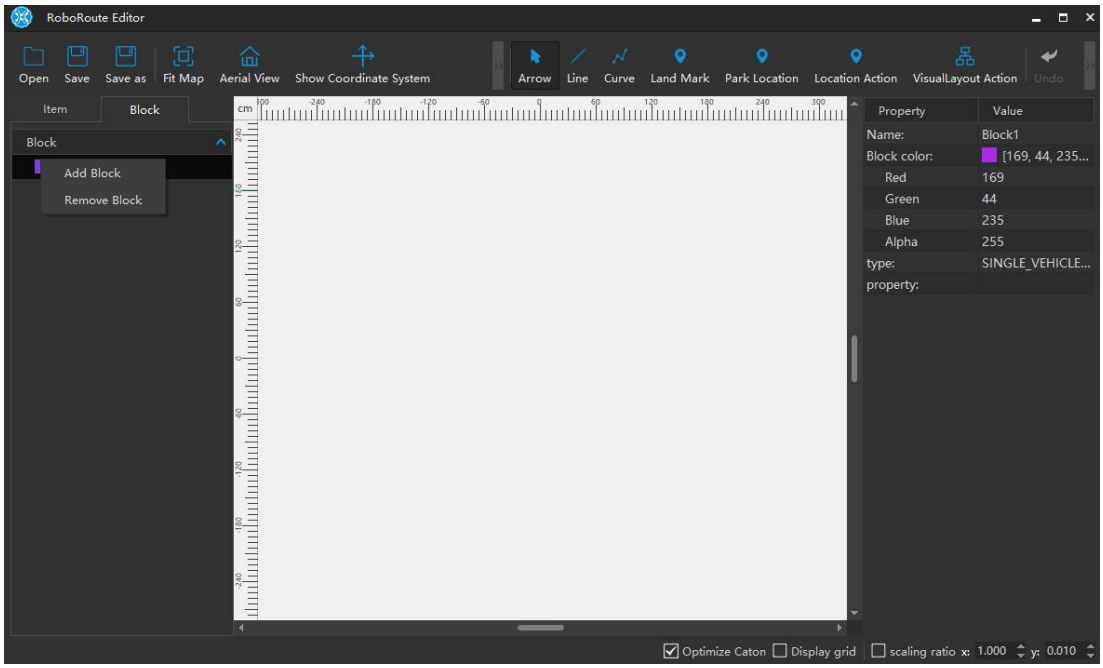




①. Right click on the [vehicle] to add the robot

②. Right click on the [location type] to add the location type

③. Right-click on a blank to add Block areas



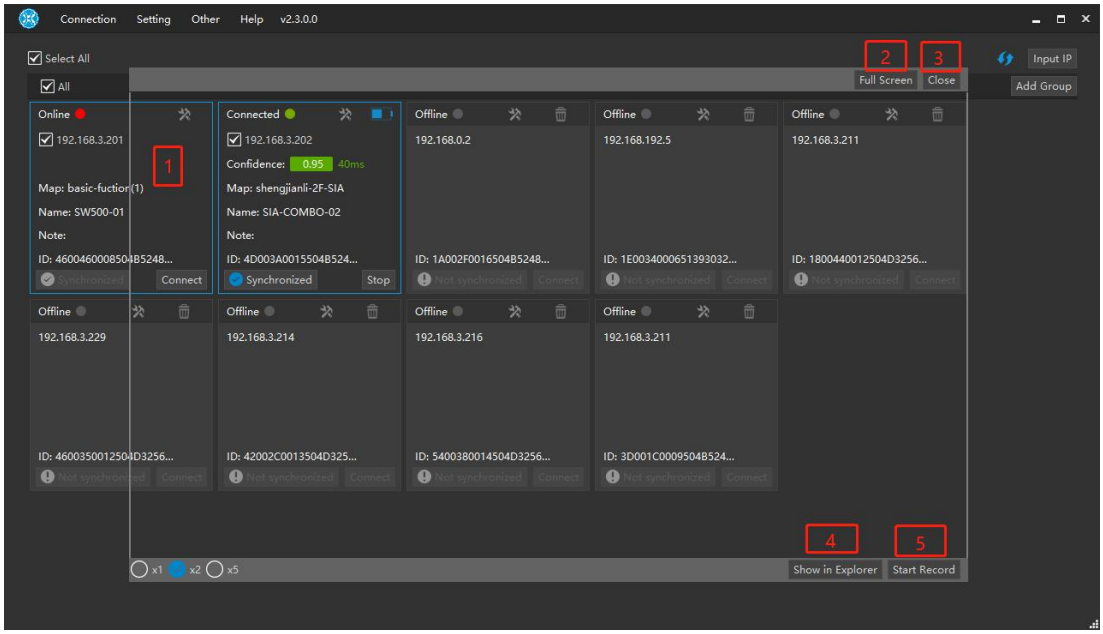
①.Choose elements in map

②.Add selected elements to block

Note: this function is advanced function and would be not shown much in this chapter. If you want to use this function, please contact with SEER.

Screen Shot

Use for seeking help when there is problem in use or do not understand how to use. This functions will be recorded in the form of dynamic GIF diagrams. Click [Other], and then click [Screen Shot] to open the function, the interface would be shown below.



which

①. Image acquisition area: used to record the operation process of the software in this area.

②. Full Screen: click to display the screen snapshot screen in full screen.

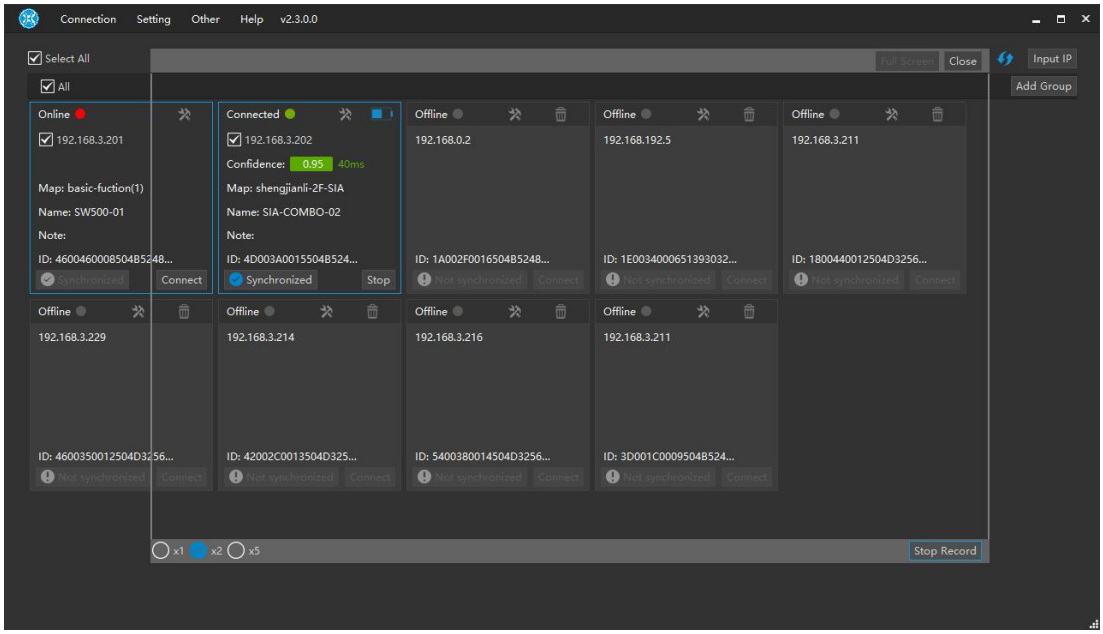
③. Close: Click this button to close the screen snapshot interface when finished using the function.

④. Show in Explorer: open the directory where the recorded .GIF file is stored.

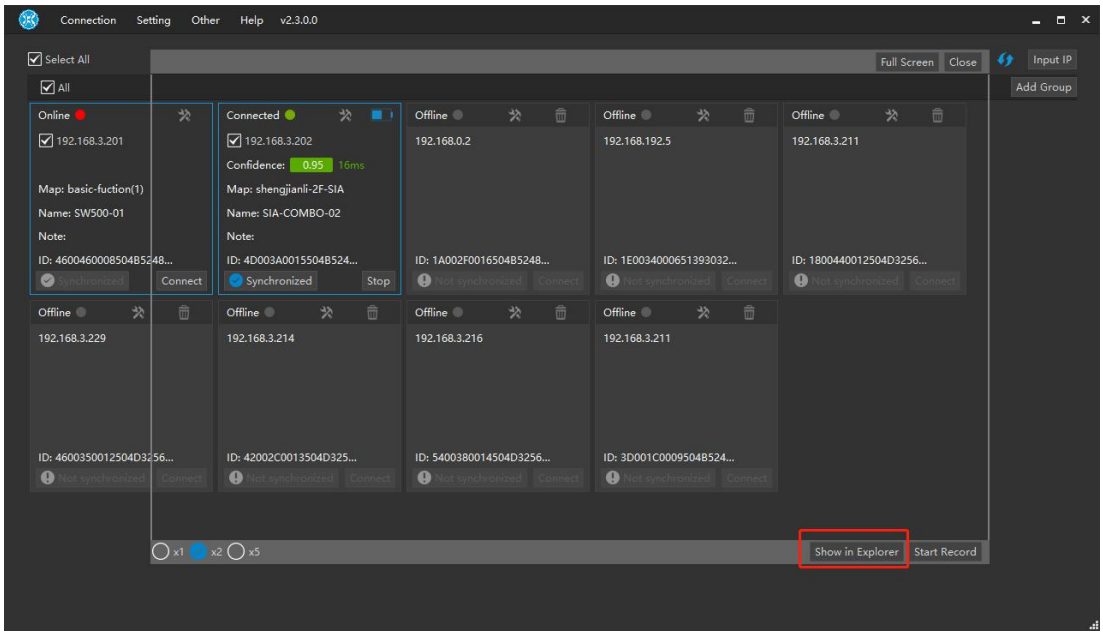
⑤. Start Record: Click this button to start recording images of the image acquisition area.

Usage:

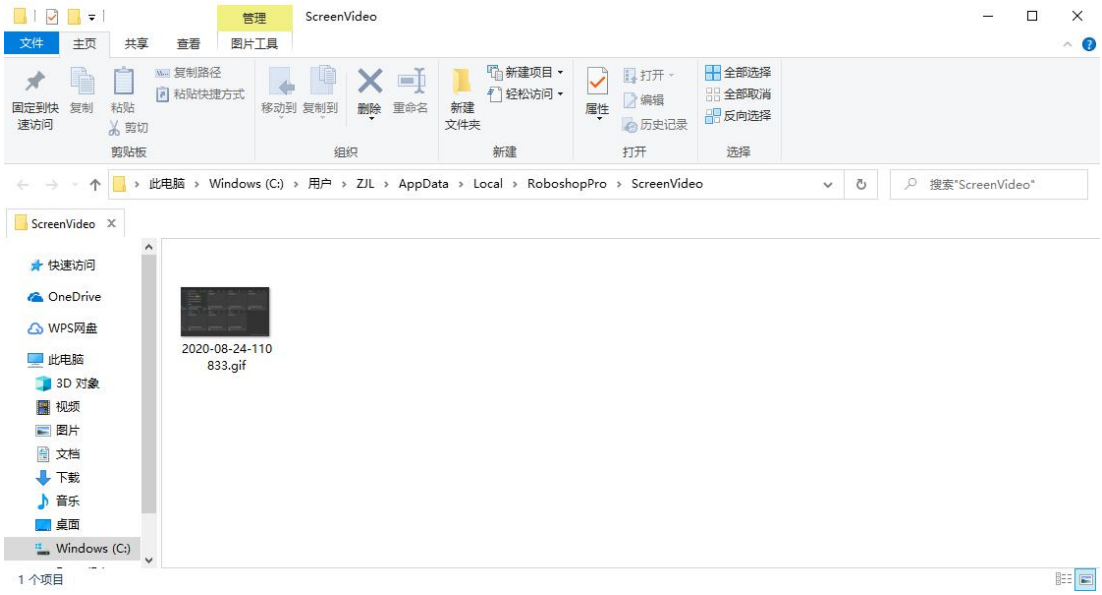
a. Click on [Other], and then click on [Screen Shot], in the open interface, click on [Start Record], the button will become [Stop Screen Recording], as shown below.



b. After the screen recording is complete, click [Stop Record] to complete this screen recording operation, click [Show in Explorer], as shown below.



c.In the pop-up interface, open the ScreenVideo folder to view the screen snapshot file, as shown in the following figure.

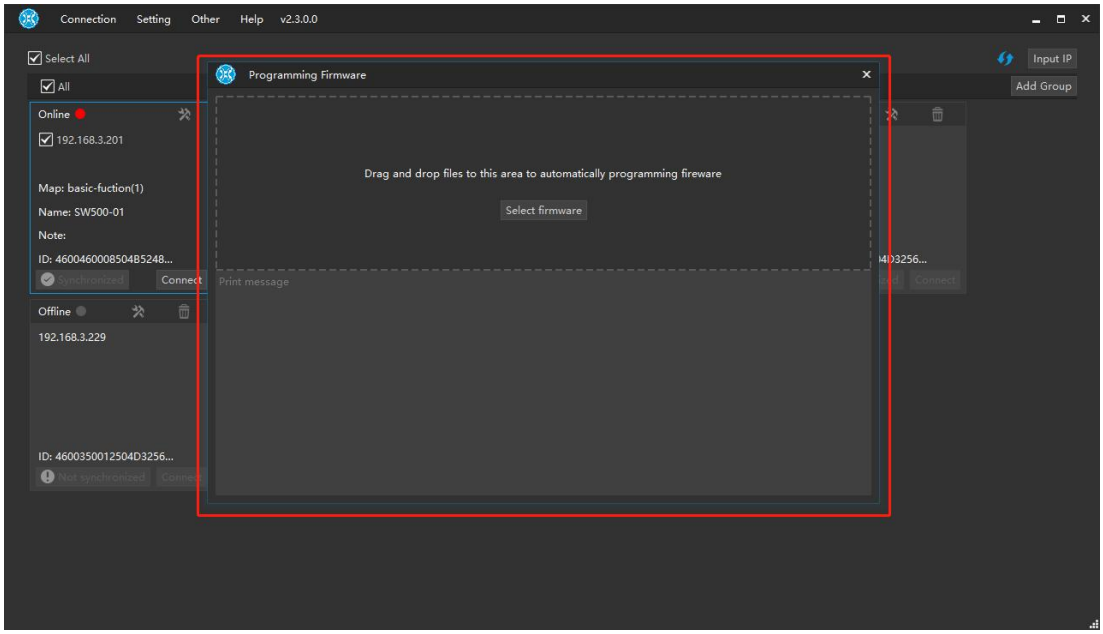


1. The [Screen Shot] interface will always be displayed at the top.

2. Please use a picture viewing software that can open pictures as .GIF format.

Programming Firmmware

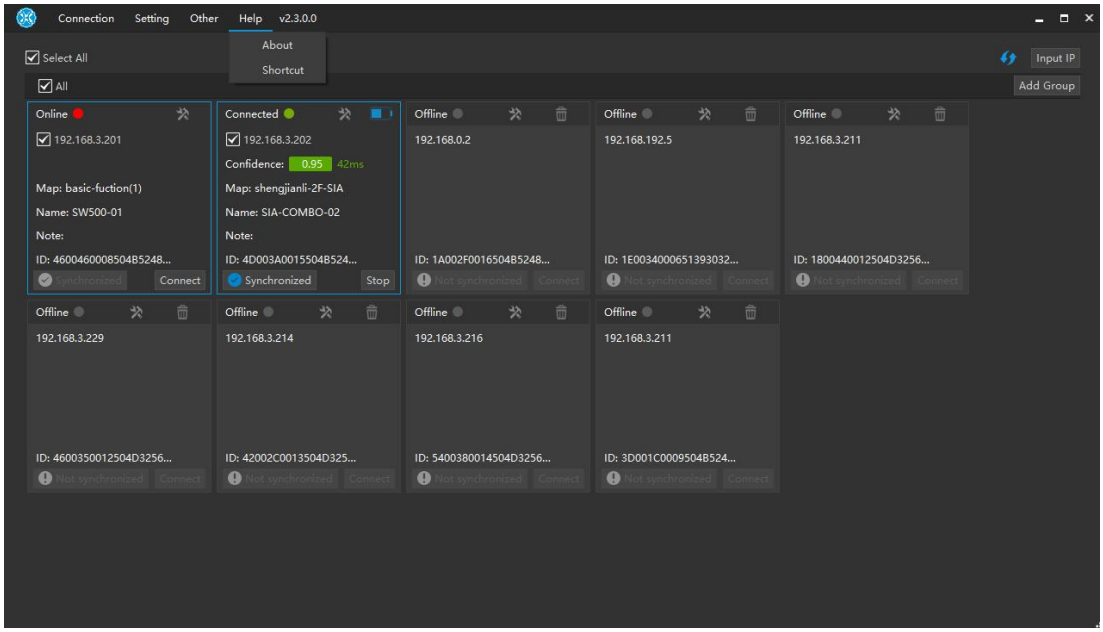
Use a network cable to connect to the robot you want to update the firmware to. Drag the acquired firmware file to the dashed area and wait for the prompt to complete the programming.



Note: The above functions are only available to customers who have received authorized training.

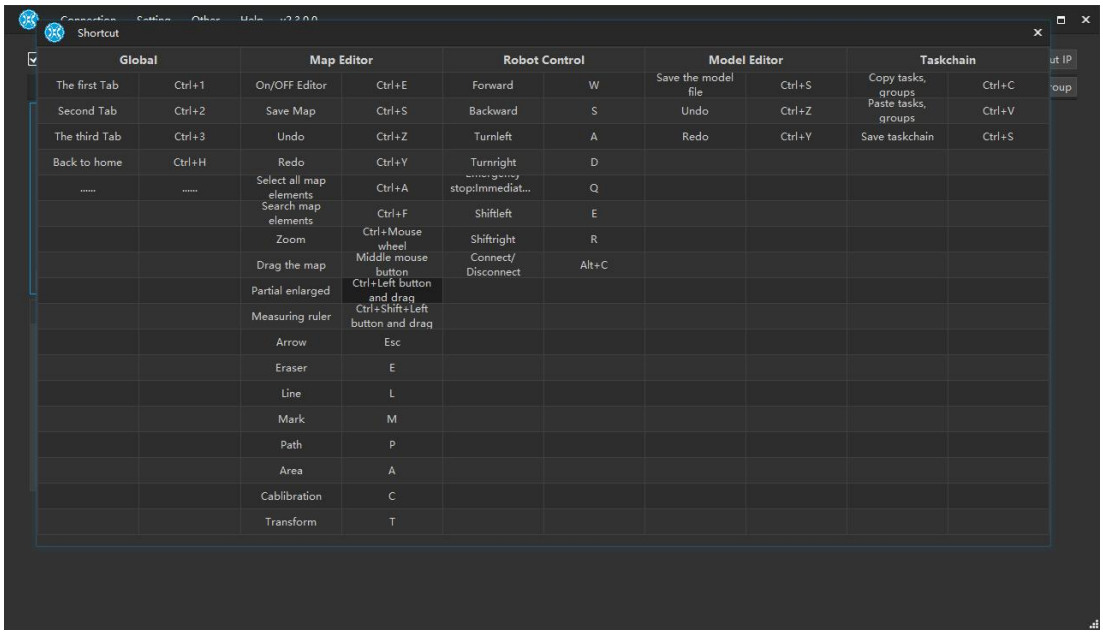
Help

As shown in the figure below, all sub-menus of the Help menu.



1.Shortcut

Shortcuts in the software operation and instructions on how to use them.



Advanced Configuration

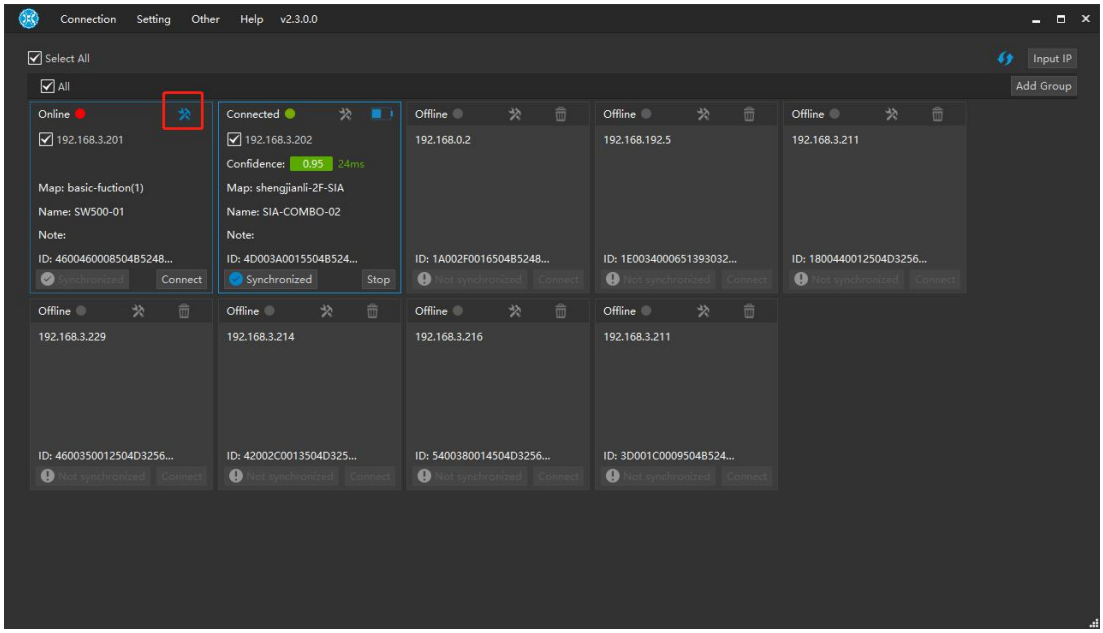
Note 1: This feature is technically supported only by authorized trained customers.

Note 2: This function must be used with the corresponding RobodPro.

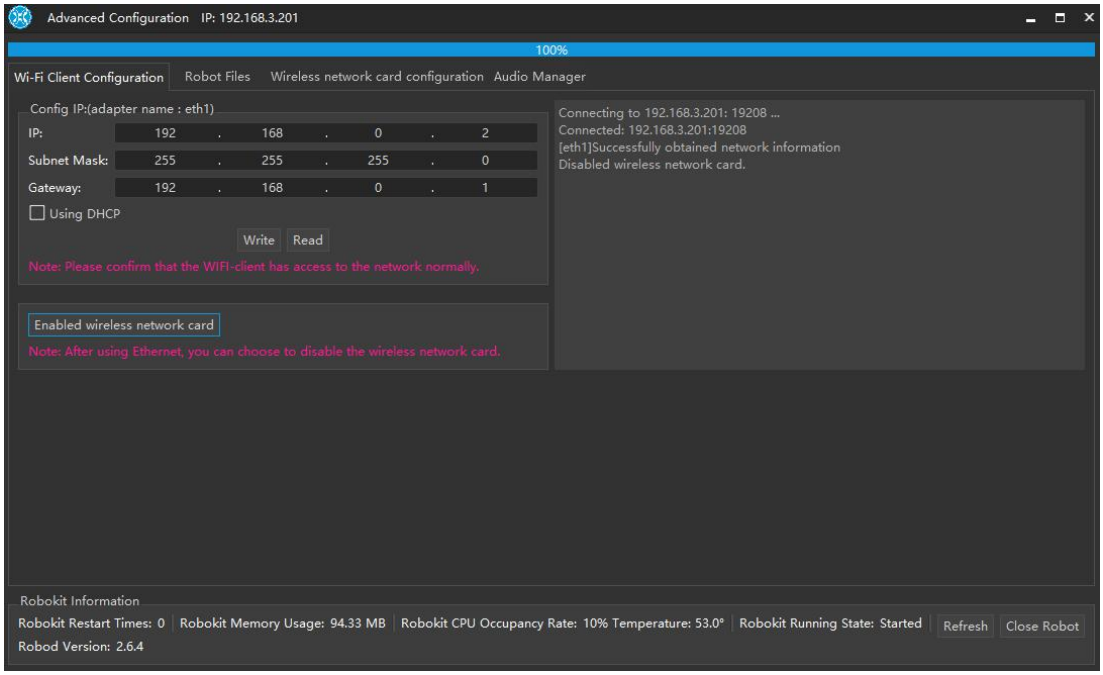
Note 3: To use this function for the first time, please connect the robot with a network cable, and find the robot with IP address [192.168.192.5] in the robot list in "Home", click "Advanced Configuration" button to enter the advanced configuration interface.

Note 4: Wifi connection may be slow at first time, please wait patiently and click "Refresh" button to check the connection.

The [Advanced Configuration] function is located in the top right corner of the robot tab, as shown below.



Clicking this button will enter the [Advanced Configuration] interface, as shown below.:



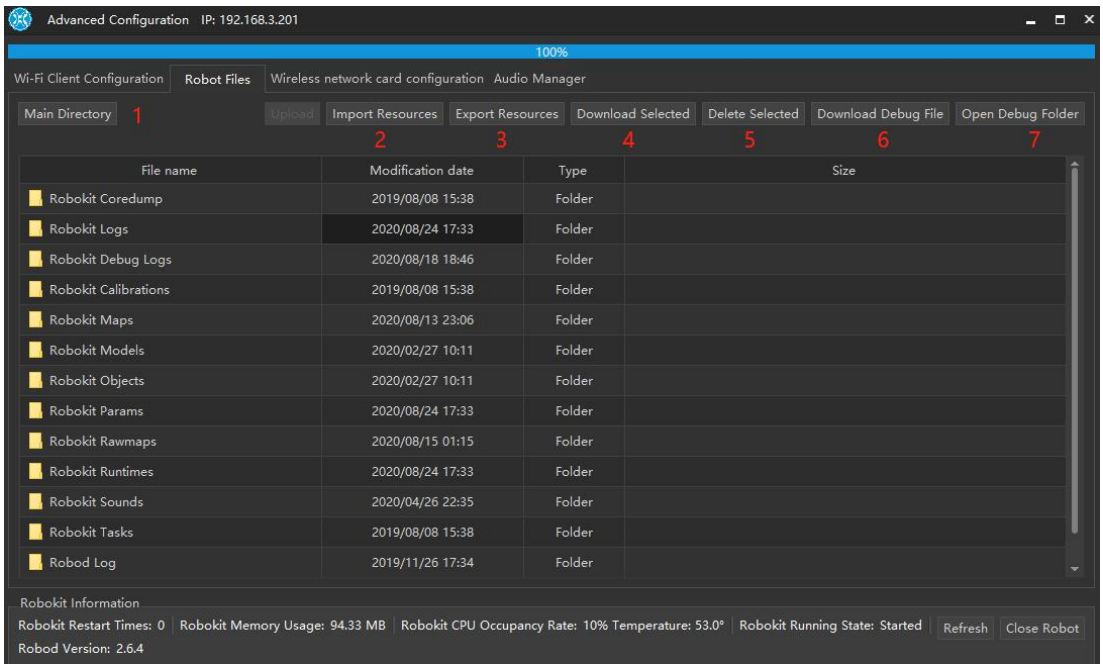
1. Wi-Fi Client Configuration and Wireless network card configuration

This function is refer to Using local area wireless network for connection.

2. Robot Files

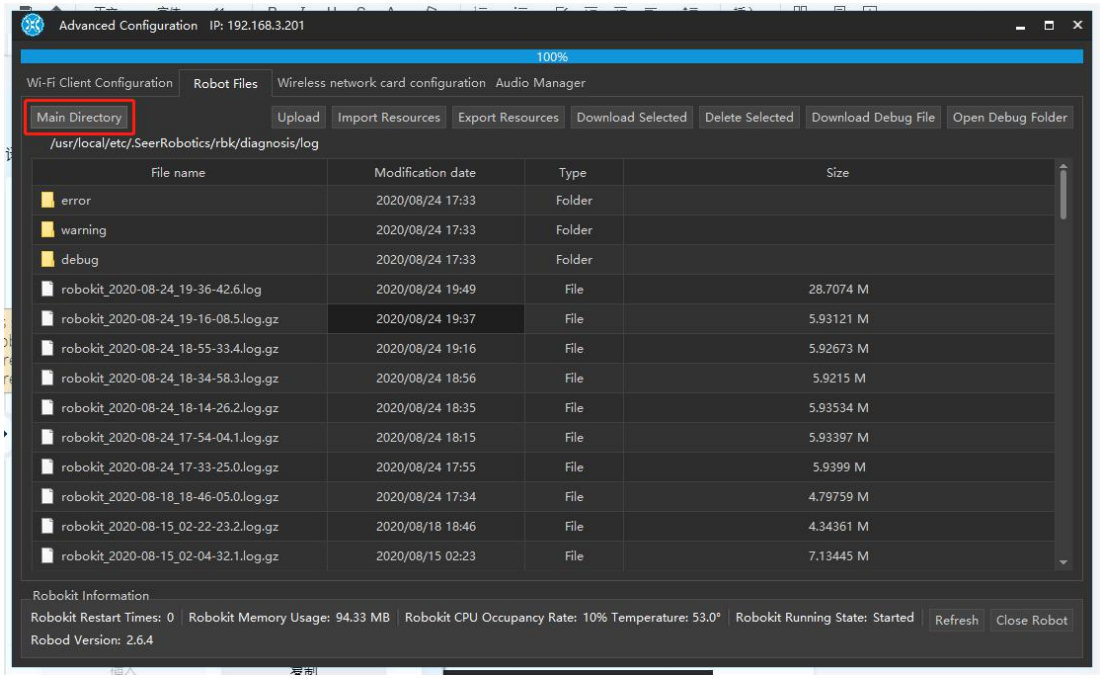
You can use Roboshop Pro to [Import Resources] [Export Resources], [Download Selected] [Delete Selected], [Download Debug Files] [Open Debug Folder] etc. to manage the files in the robot directory.

The robot files interface is shown in the following figure.:



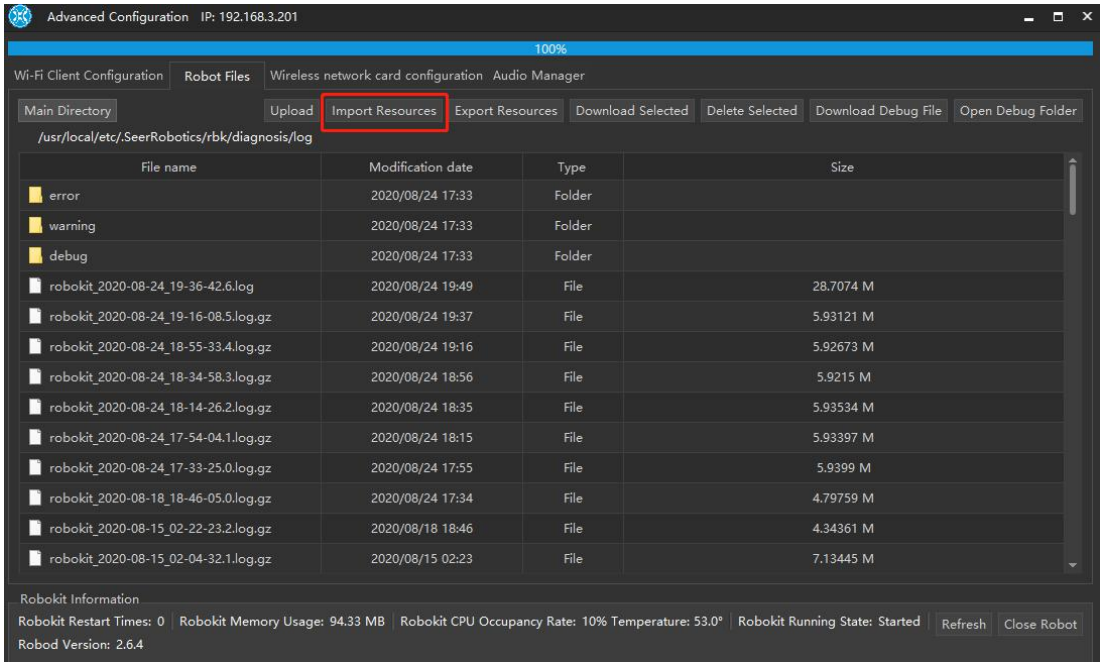
①.Main directory: used to return to the main directory after opening the secondary directory. main directory.

As shown in the figure below, we are in the file directory of Robokit Logs, and when we need to return to the home directory, click the [Home] button to return to the home directory of the robot files.

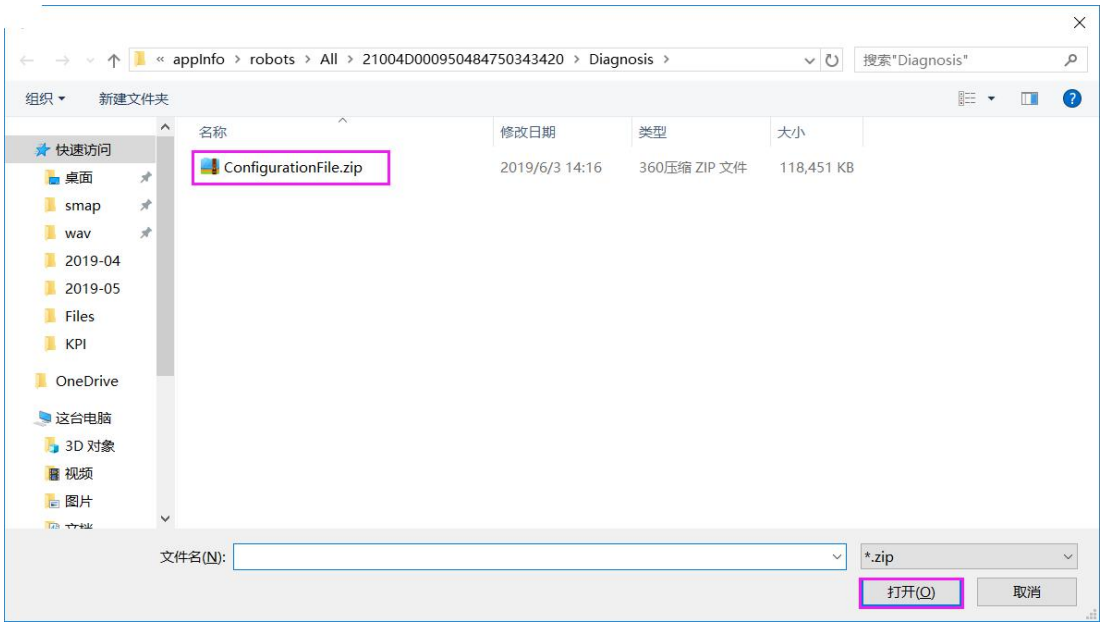


②.Import resources: This is used to import the required configuration files into the robot.

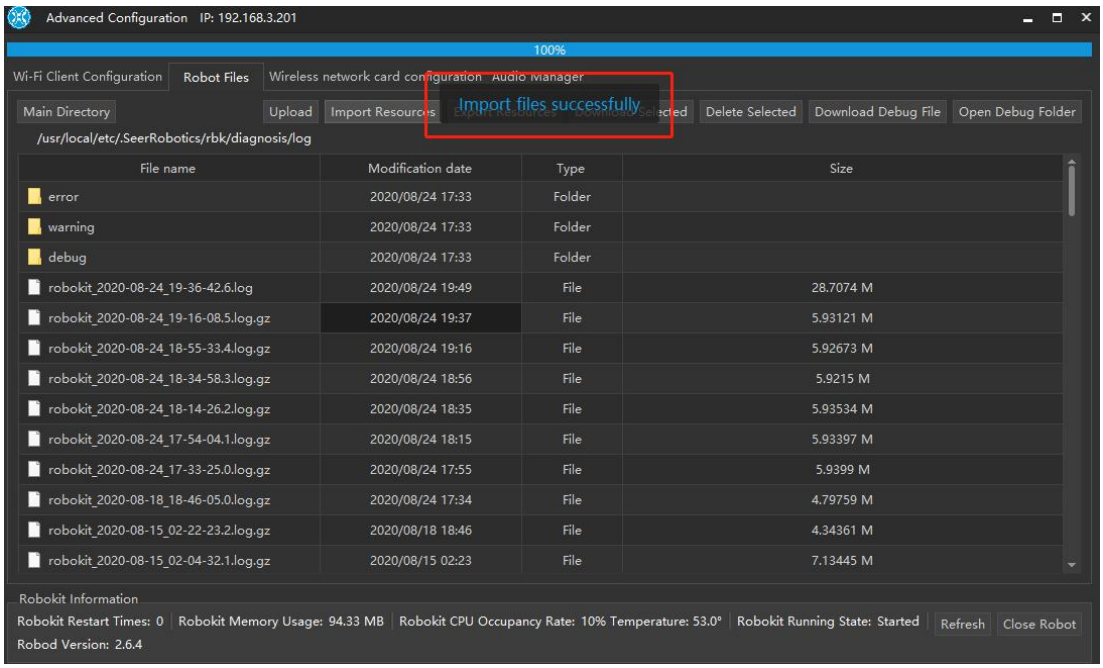
We will compress the files we need to import into the robot and then click the "Import Resources" button.



In the open file selection box, select the target file and click the [Open] button.



Wait for the file to be imported, and prompt: [Import file successfully].

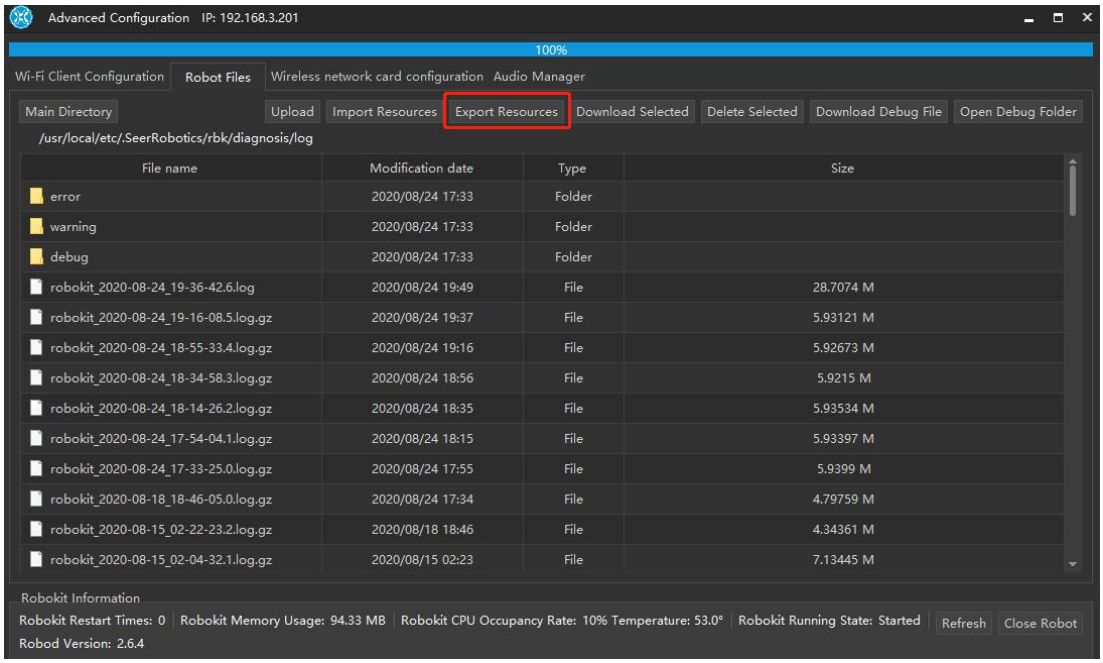


The "Import Resources" operation is complete.

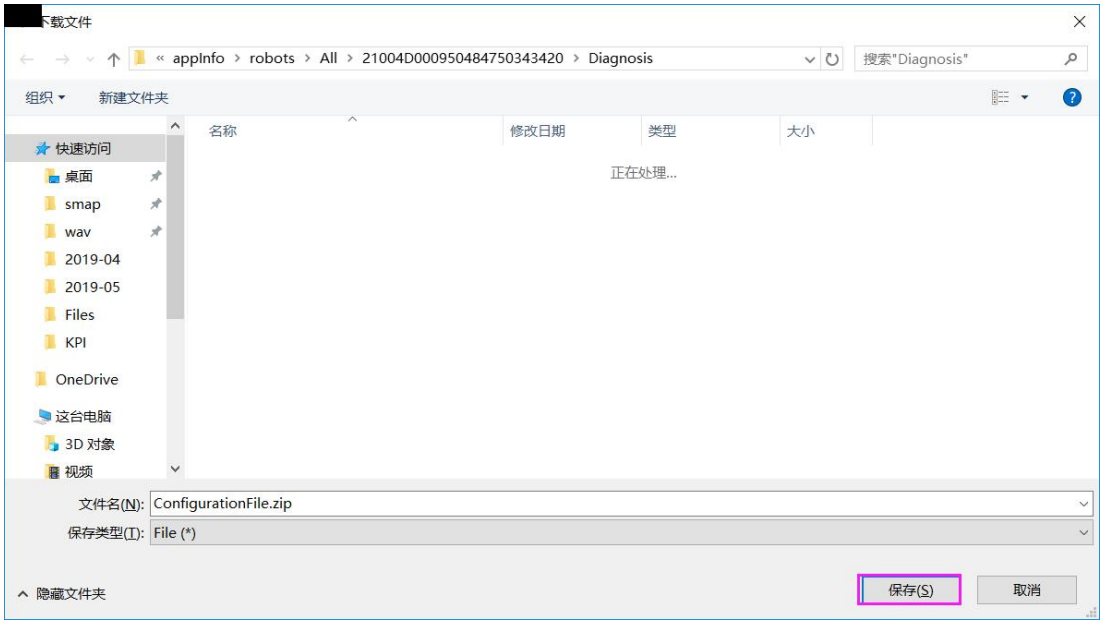
Note: This operation will cause Robokit to restart, and will automatically disconnect from the robot if the connection was made before using this function.

③.Export resources: This is used to export the configuration file of the current robot to the specified directory.

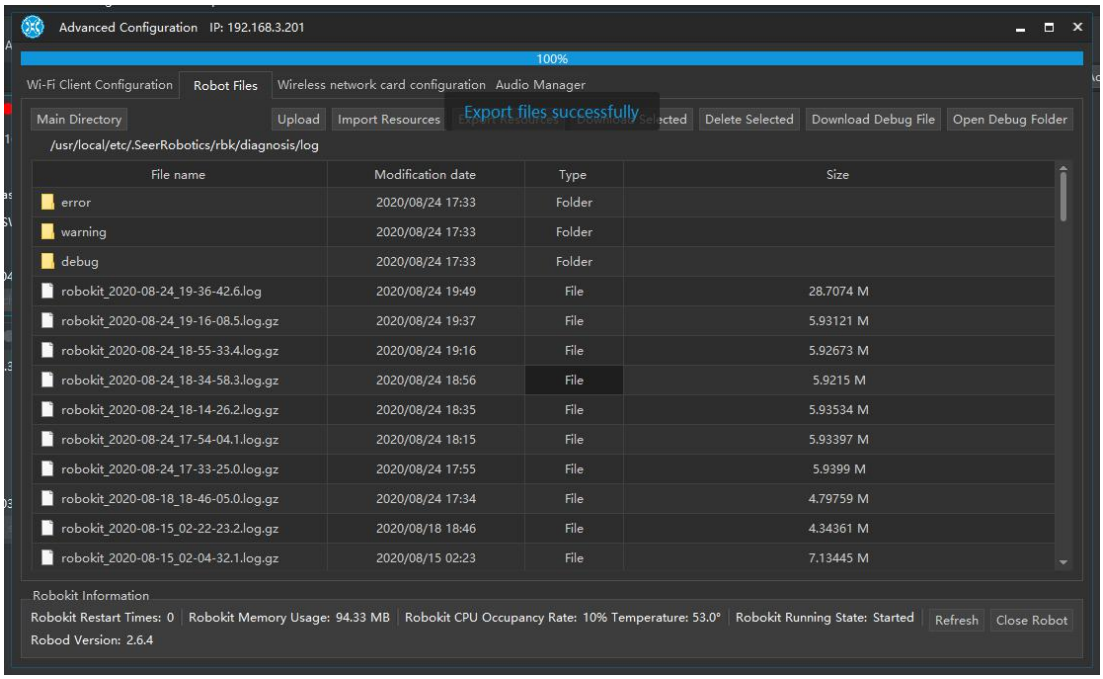
We want to perform an export operation on the current robot file, click the [Export Resources] button.



Wait for the progress bar to reach 100%, then the select file save path.



After successful saving, the software will automatically open the saved file directory, and prompt: [Export file successfully].



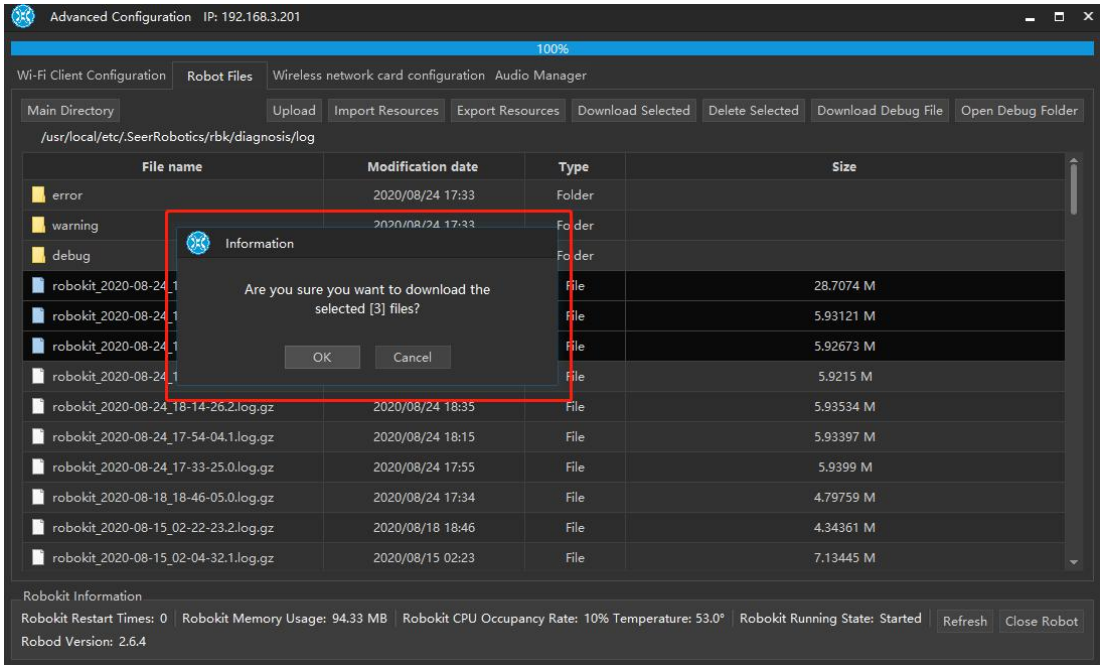
The "Export Resources" operation is complete.

Note: The default path for this operation is the Diagnosis folder in the current robot data folder in the AppData\Local\RoboshopPro\appInfo\robots\All\ directory.

The exported resources file contains: lua_scripts，resources . The resources folder contains：calibrations，maps，models，params，rawmaps，runtimes，sounds，tasks.

④.Download selected file: Used to download the current robot file to the specified directory.

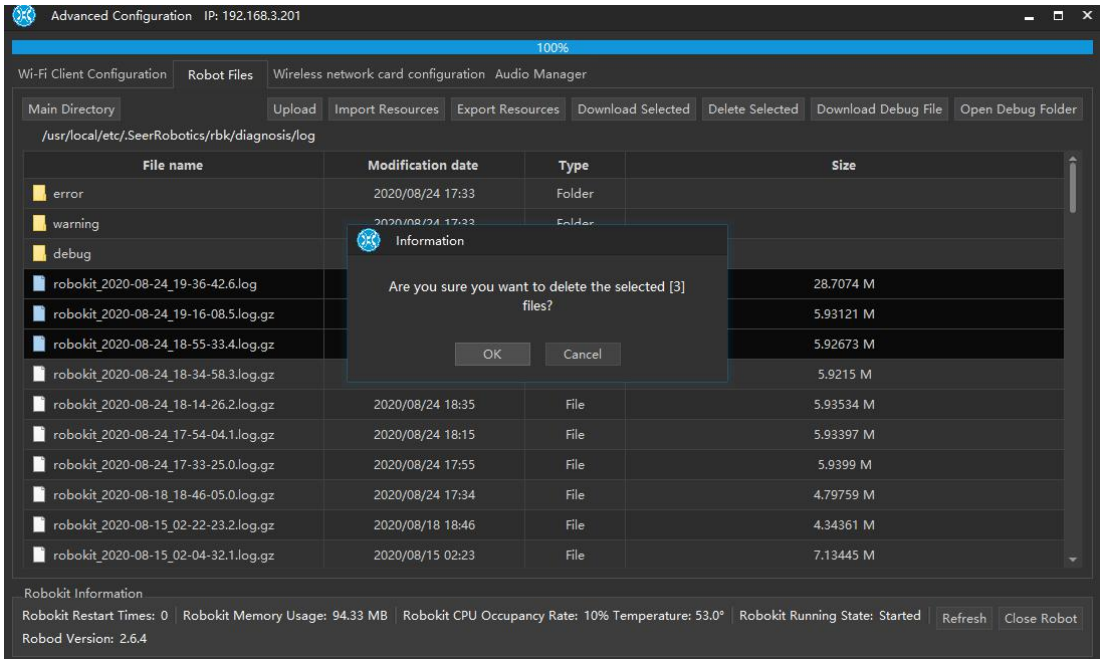
Select the file or hold Ctrl to select multiple files and click the Download Selected File button. Click the OK button in the dialog box that appears.



Wait for the progress bar to reach 100%, the file save dialog box will pop up, select the target path to save, after successful saving, the software will automatically open the directory of the saved file.

⑤.Delete Selected File: Used for deleting the current robot file.

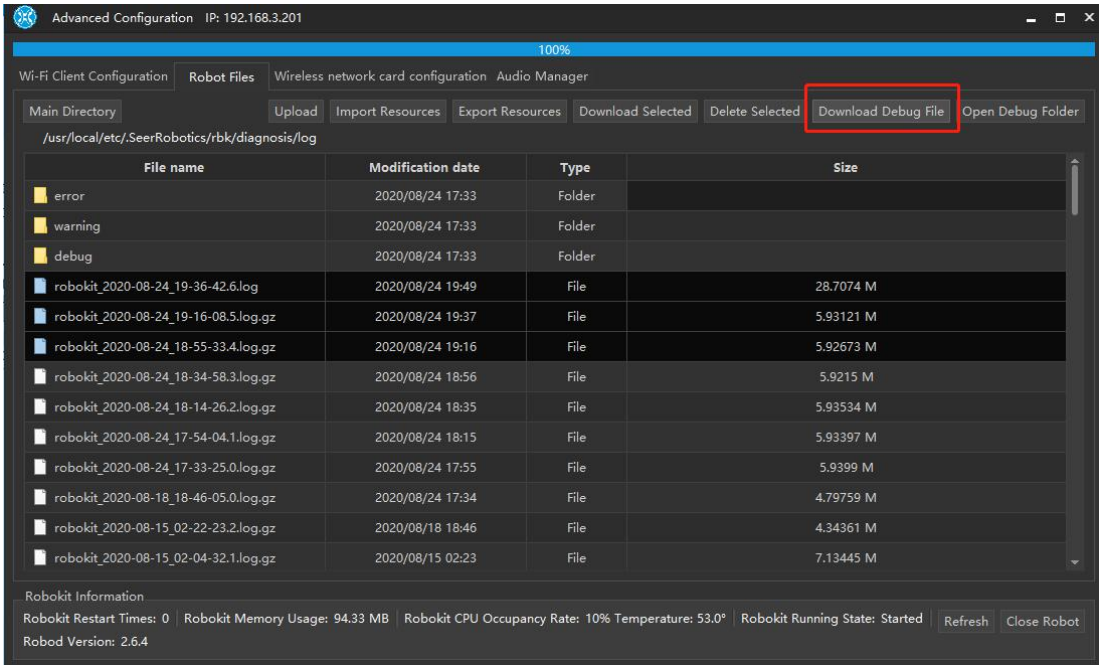
Select the file or press and hold Ctrl to select multiple files and click the Delete Selected File button. Click the OK button in the pop-up dialog to delete the selected file.



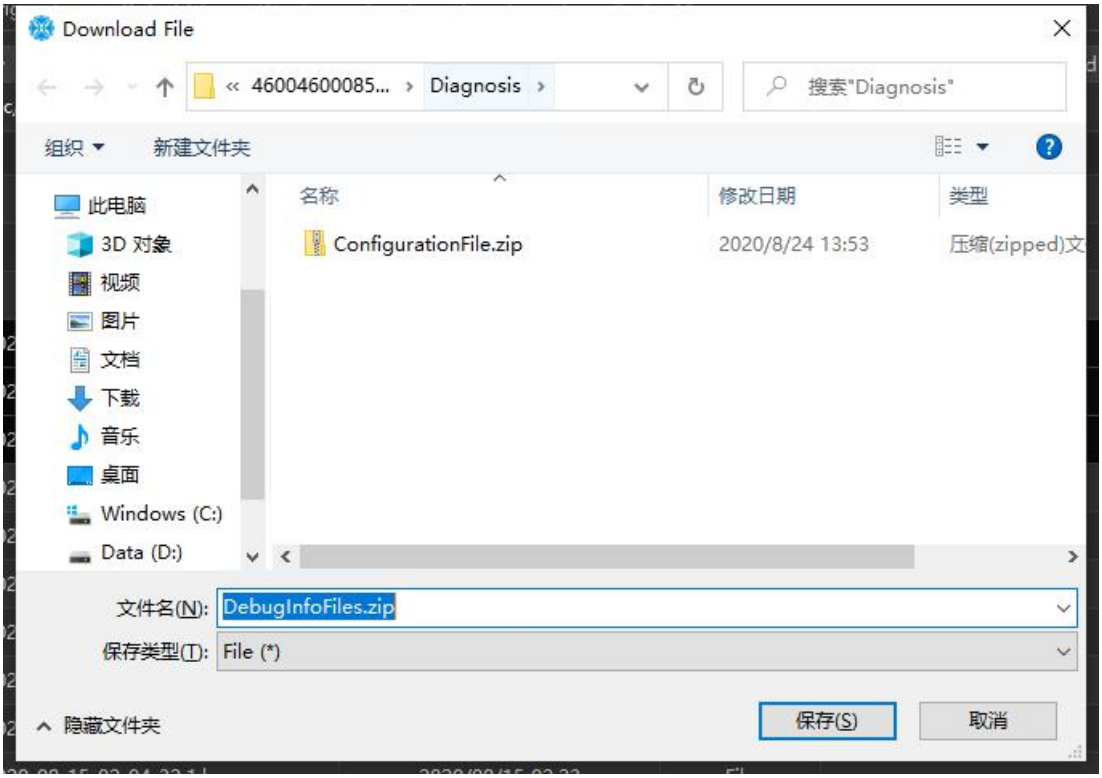
Note: This operation is applicable to single and multiple files, and does not support folder operation.

⑥.Download debugging files: This is used to package and download the files related to the current robot debugging to the specified directory.

We want to download the current debugging file, click the Download Debug File button.



Wait for the progress bar to reach 100%, then select the destination path in the popup dialog box and click save, after successful saving, the software will automatically open the saved file directory.



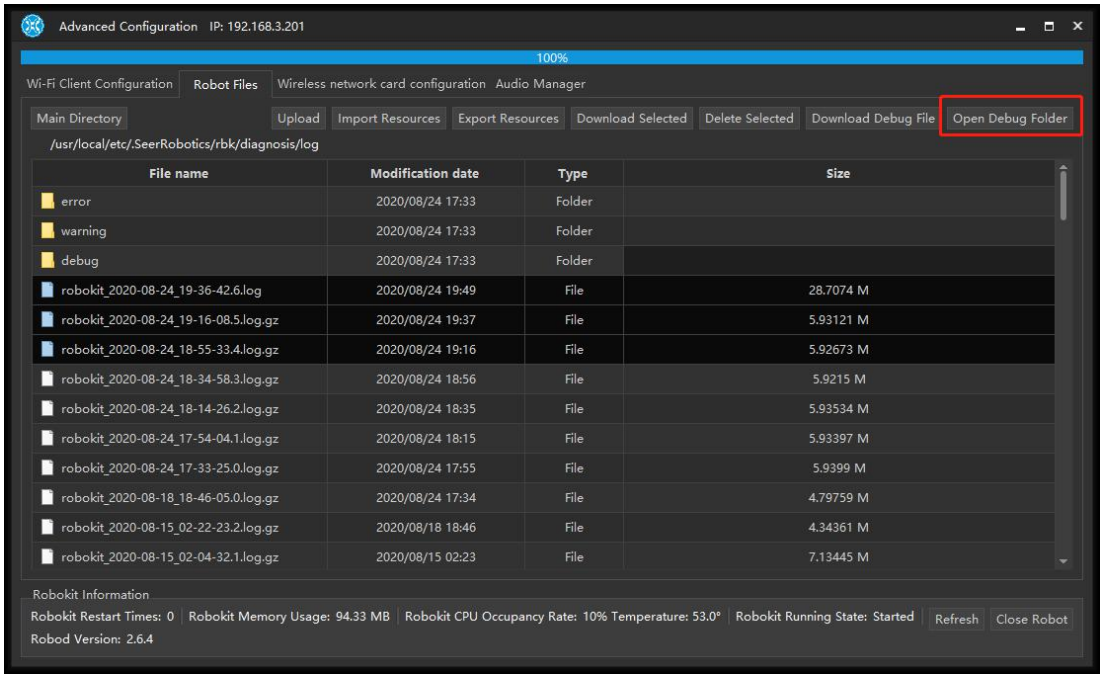
The operation of downloading the debug file has been completed.

Note: The default path for this operation is the Diagnosis folder in the current robot data folder in the AppData\Local\RoboshopPro\appInfo\robots\All\ directory.

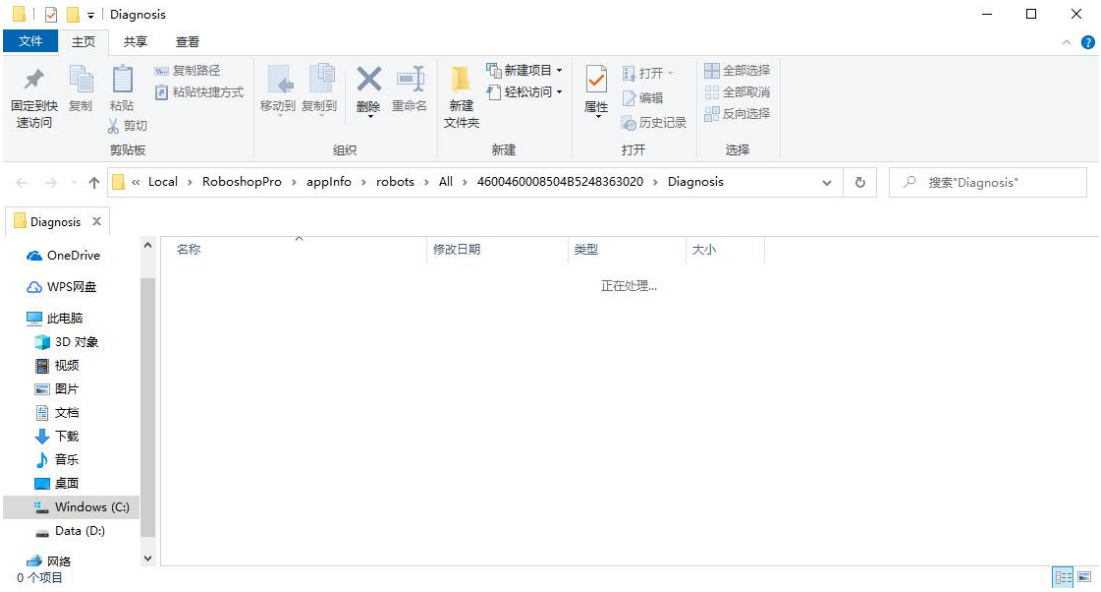
The debug file contains: crashes, log, lua_scripts, maps, models, params, and runtimes folders.

⑦.Open debug folder: used to open the default file directory where the debug files are stored.

We want to see the debugging files in the current robot, click the [Open Debug Folder] button.



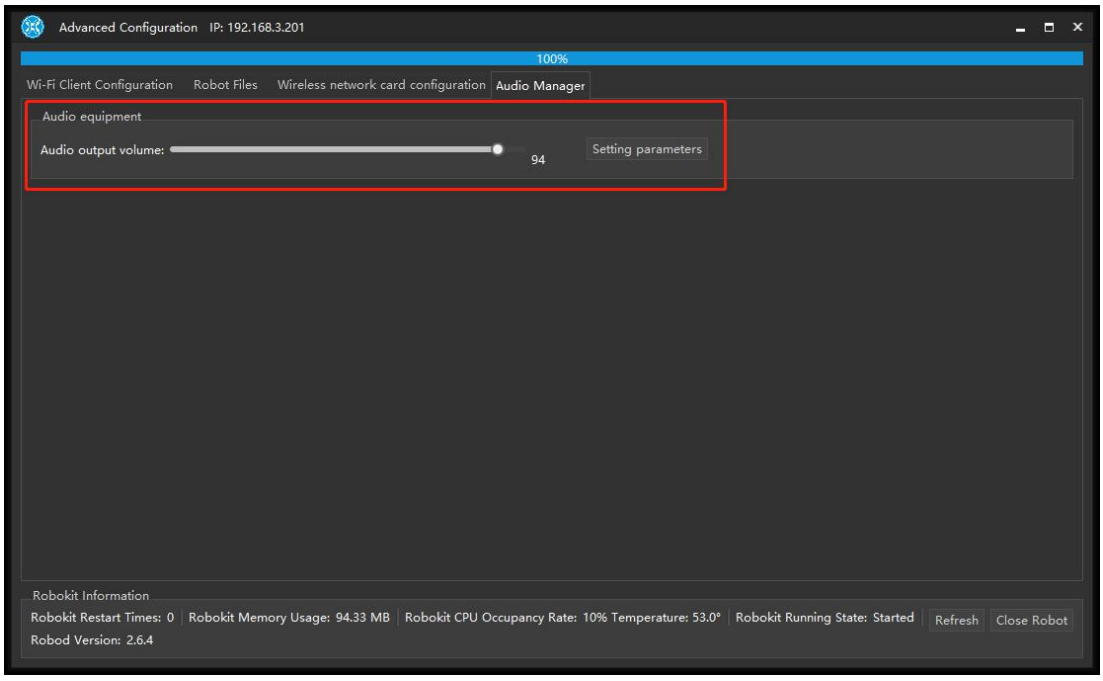
All the debugging files saved in the default path can be manipulated and viewed in this window.



Note: This action opens the default path for the Diagnosis folder in the current robotics data folder in the AppData\Local\RoboshopPro\appInfo\robots\All\ directory.

3.Audio Manager

This function is used for setting audio ouput volume.

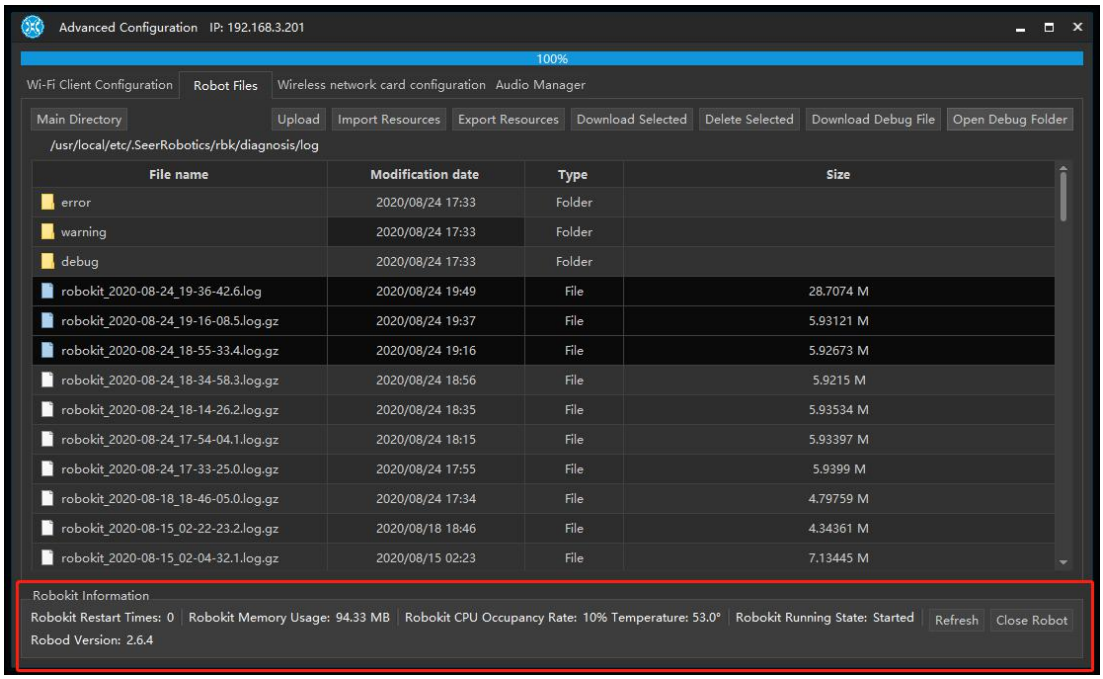


Drag the volume bar to select the appropriate volume, then click [Setting parameters] button.

4.Robokit Information

This is used to view the status of Robokit on the currently configured robot and to manage the robot's program.

The information interface is shown in the below figure:



其中

Robokit Restart Count: Used to display the number of restarts for the currently configured robot program.

Note: After shutdown (main controller power off), restarting the robot will reset the number of restarts.

Robokit Memory Usage: Used to display the memory usage of the currently configured robot.

Note: This value will change with map loading, robot navigation status, etc. This is normal.

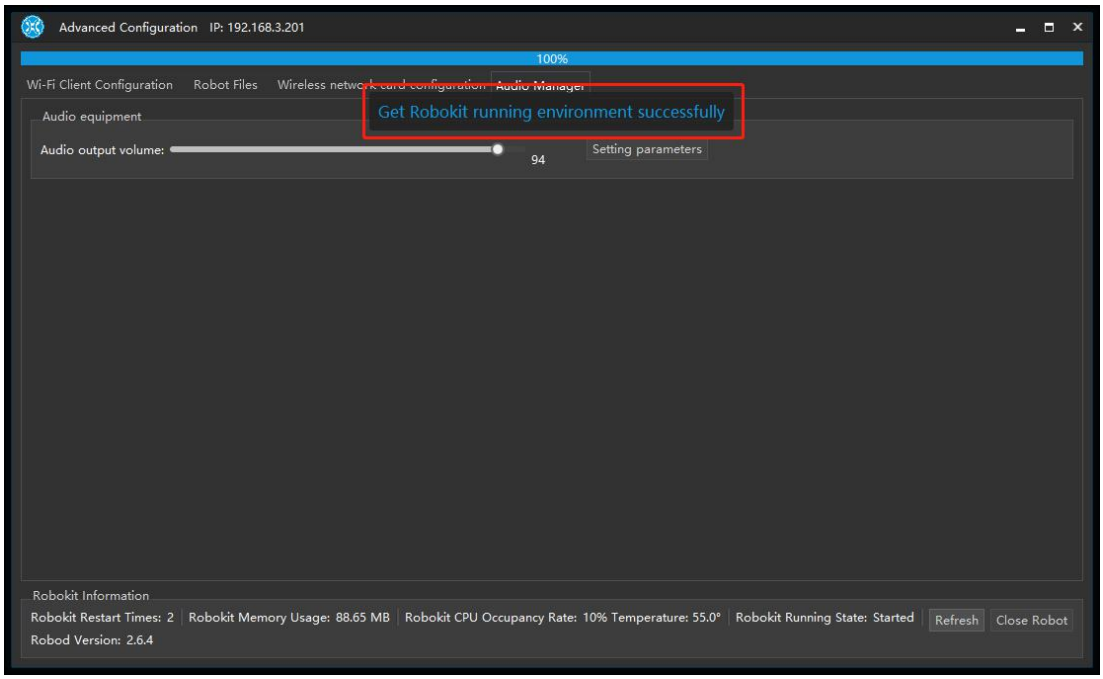
Robokit CPU Occupancy Rate: Used to display the CPU occupancy of the robot in the main controller.

Temperature: This is used to display the real-time temperature of the main controller.

Robokit running state: Used to show whether the robot is running or not.

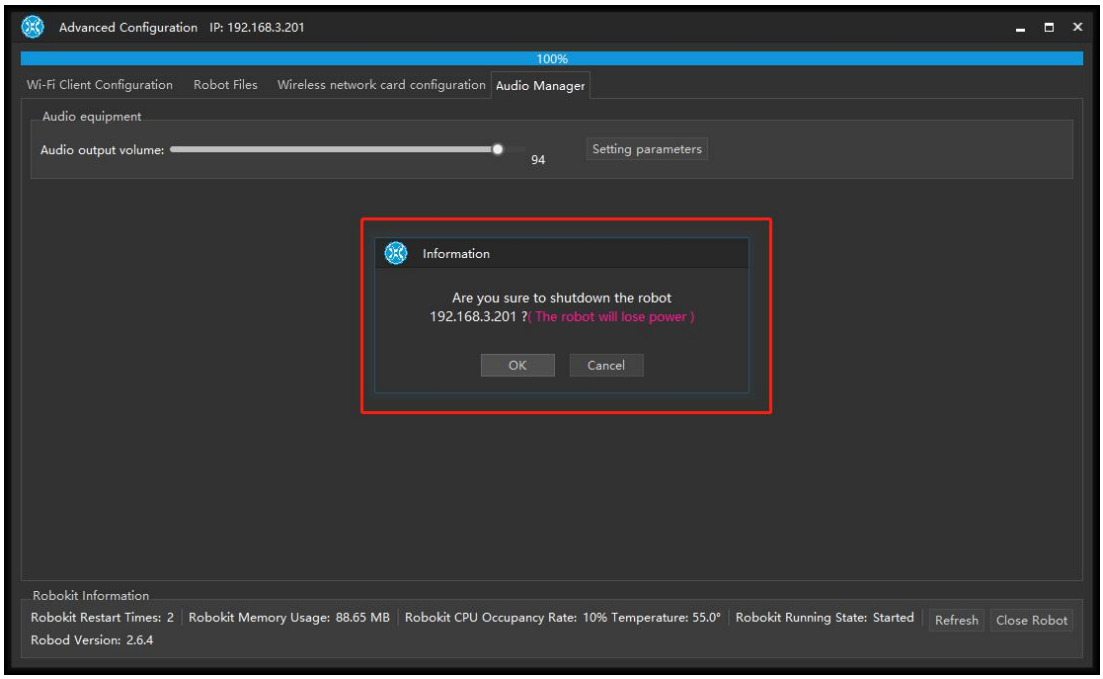
Robod version: Displays the version number of the Robod software for the currently configured robot.

Refresh: Used to refresh the Robokit environment of the currently configured robot, successful refresh will prompt: [Robokit environment acquired successfully]. The data in Robokit will be refreshed as well. As shown in the figure below.

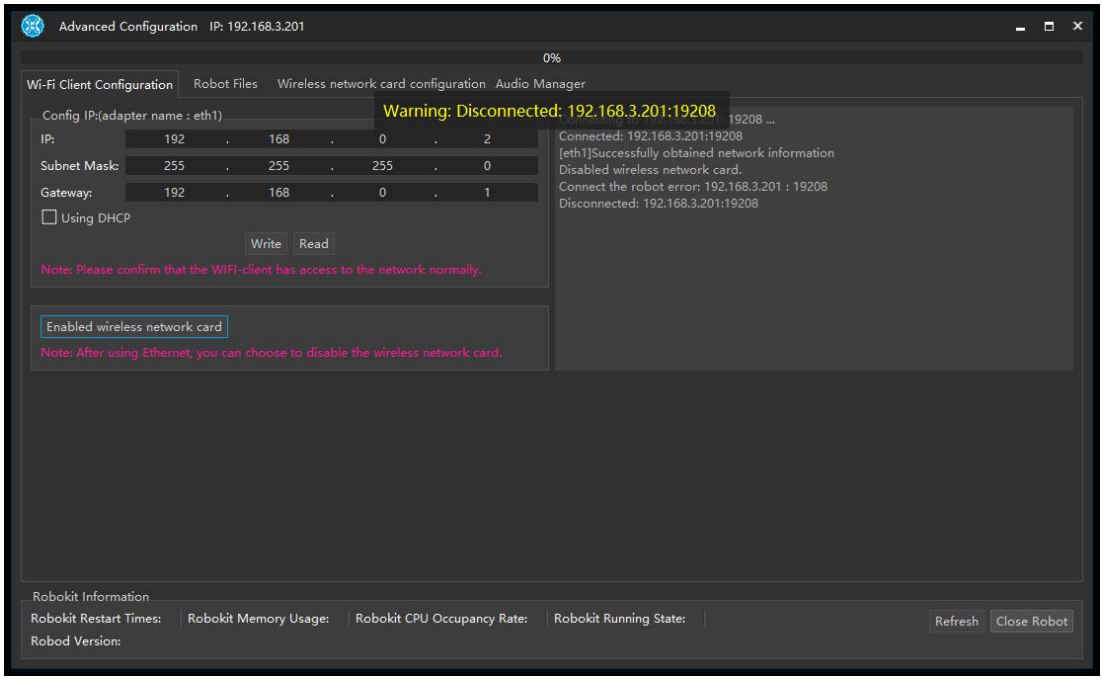


Close Robot : Used to shut down the main controller of the currently configured robot.

We want to shut down the robot, click the [Shutdown] button and select the [OK] button in the pop-up dialog box.



During shutdown, you will be prompted: [Warning: Disconnected: IP (for the currently configured robot): 19208], and Robokit information is empty.

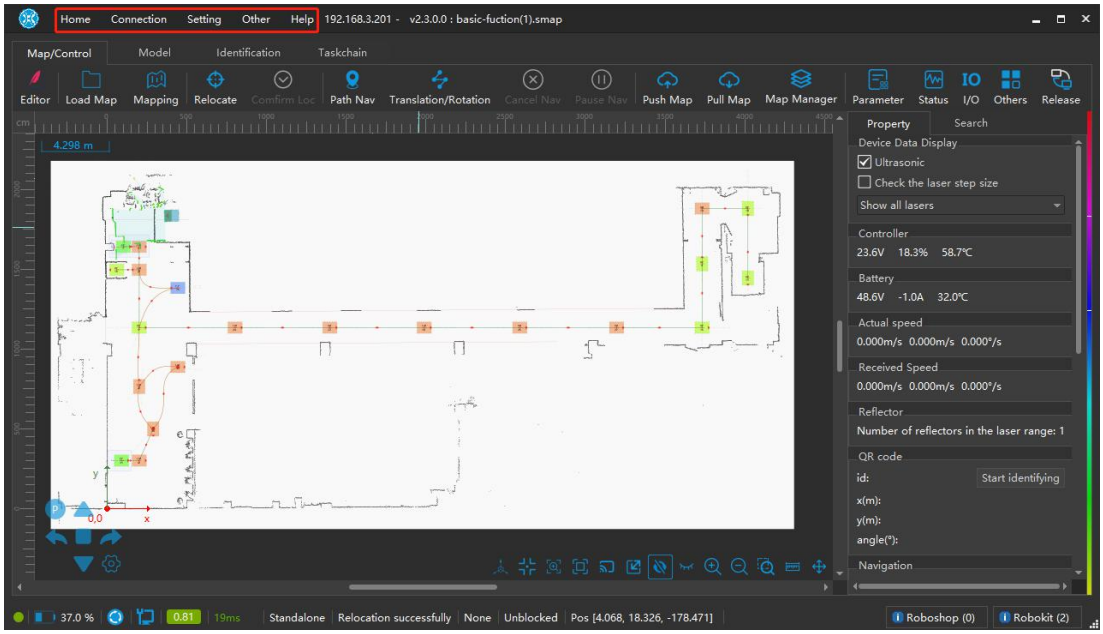


The robot completes the shutdown until the main controller shuts down.

Operator Interface

Menu Bar

The menu bar after entering the [Map & Control] interface from [Home] is shown below.



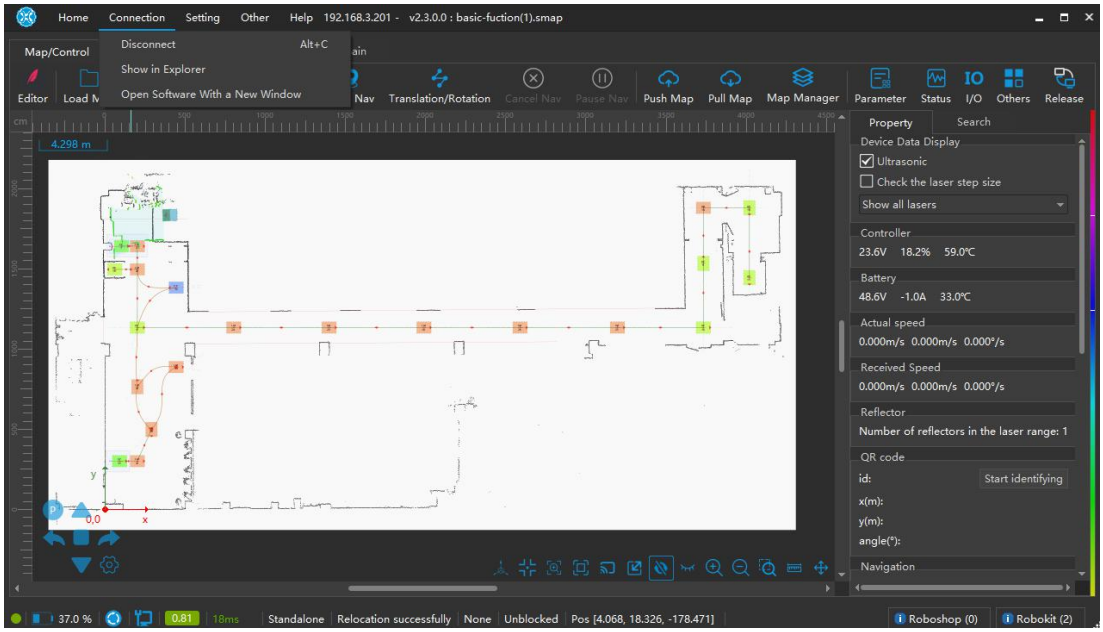
Of these, the menu bar is divided into five items.

1.Home

The button used to return to the software home page.

2. Connection

Control the connection and disconnection of the current robot, open the file directory of the current robot and open a new Roboshop Pro window.



3. Setting.

Same as the Setting section.

4. Other.

Same as the Other sections.

5. Help.

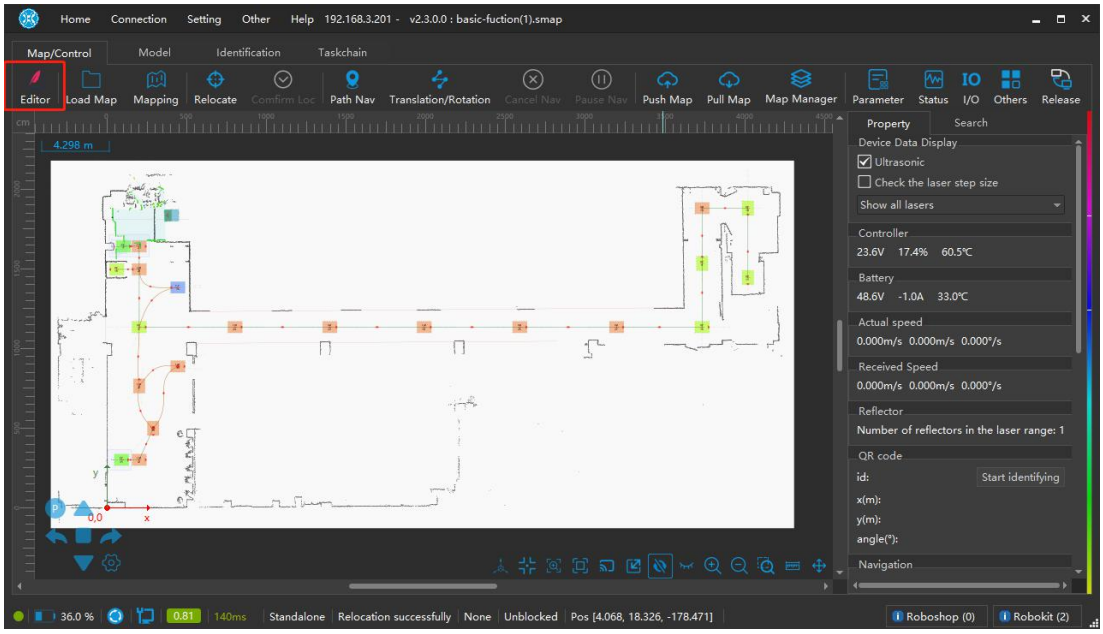
Same as the Help section.

Map/Control

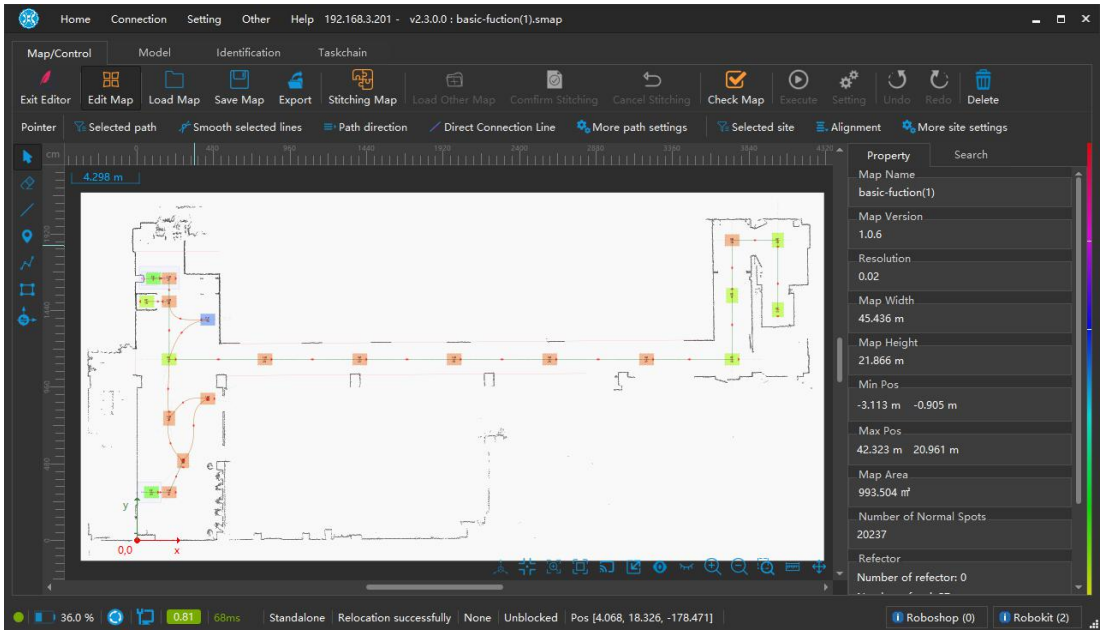
Map

Editor

Go to Roboshop Pro's Map / Control interface and click the [Editor] button in the toolbar.

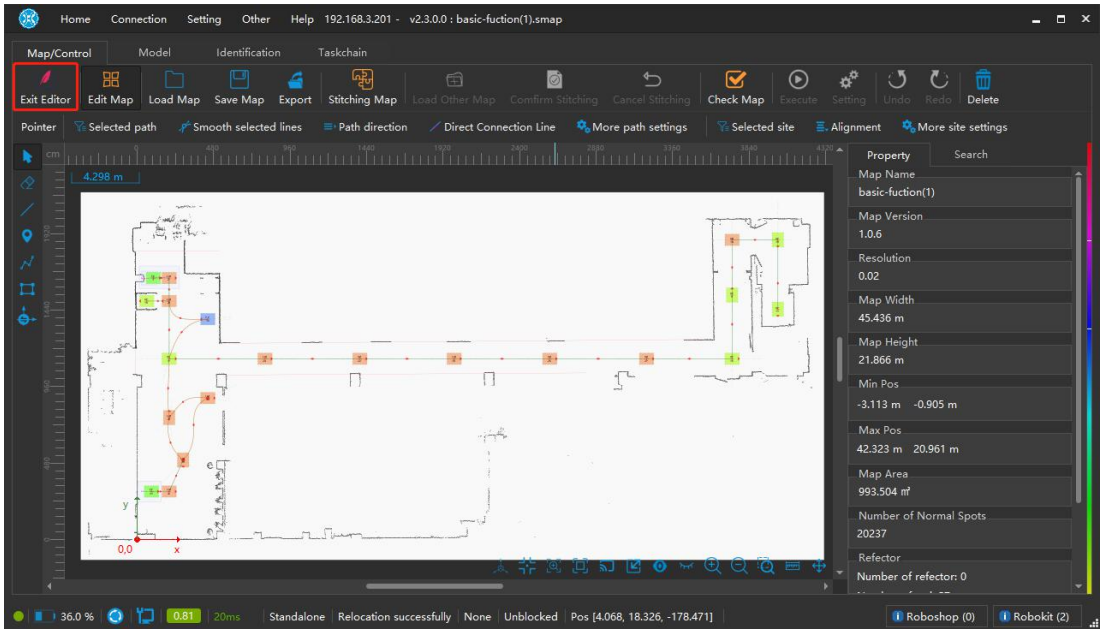


Enter the map editor's work screen.



Exit Editor

When the map has been edited, click the [Exit Editor] button to exit the map editing mode.



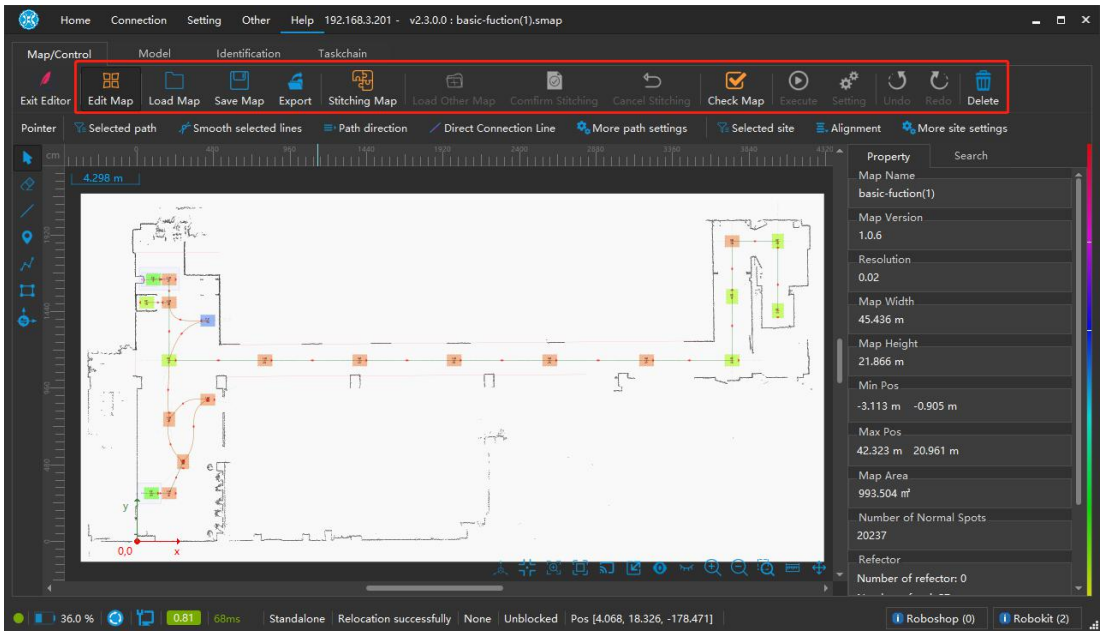
Note: When you exit the edit mode, the software checks the edited content.

①. If the map contents are correct, you can exit the map edit mode normally.

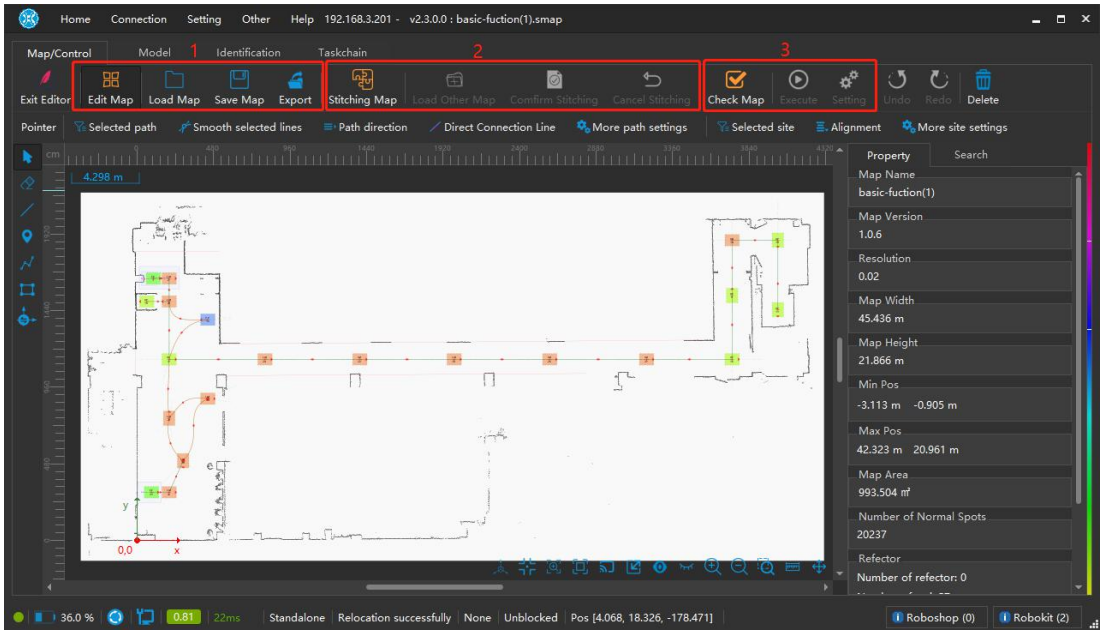
②. If the map content is wrong, an error will be displayed when you exit, and you cannot exit the editing mode and the map will not be saved.

Module Toolbar

After entering map editing, the [Module Toolbar] displays certain commands and functions commonly used by the currently active module. The active module icons are displayed in saturated colors, as shown in the following image.

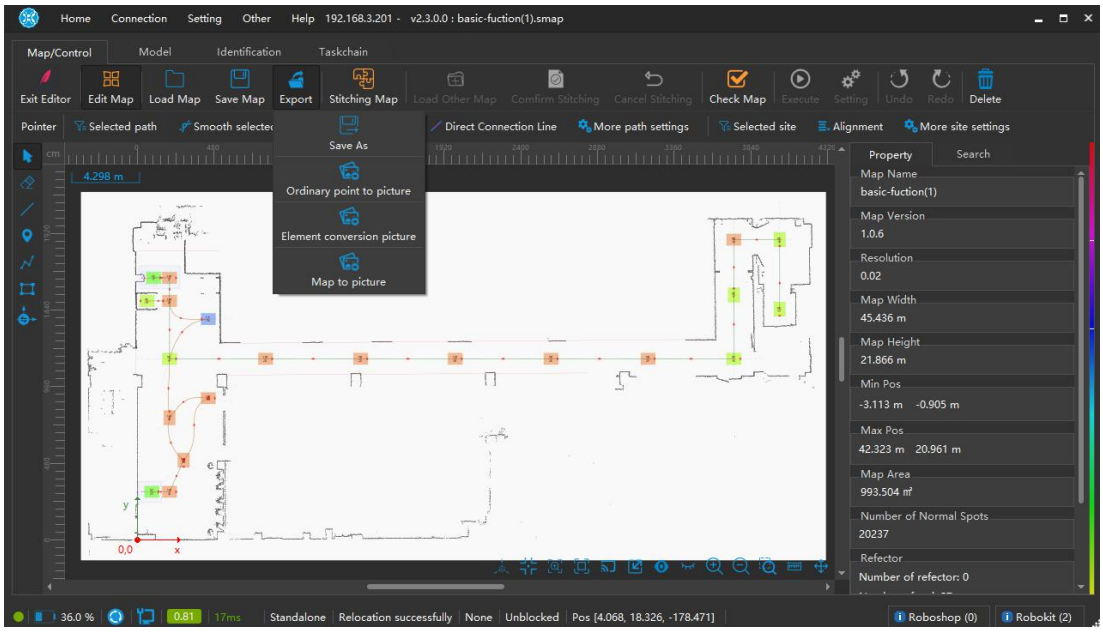


The module toolbar is divided into the following three sections: When you need to use a particular module function, you need to click on the corresponding module button to switch between them, and the module function button in use will be highlighted and available for use, while other unused module buttons will be shown as grayed out and unavailable.



①.Edit Map:

Click [Edit Map] in the ① area to activate all the functions of this module. You can load the map, save the current map and export it, among which the export function has three sub-functions, as shown below.



[Save As]: You can save the edited map file with .map or .smap suffix to the desired path for later use when loading the map.

[Map to picture]： You can save the edited map file with .png or .jpg suffix to the expected path.

[Ordinary point to picture]: Save the environmental profile with .png or .jpg suffix to the expected path.

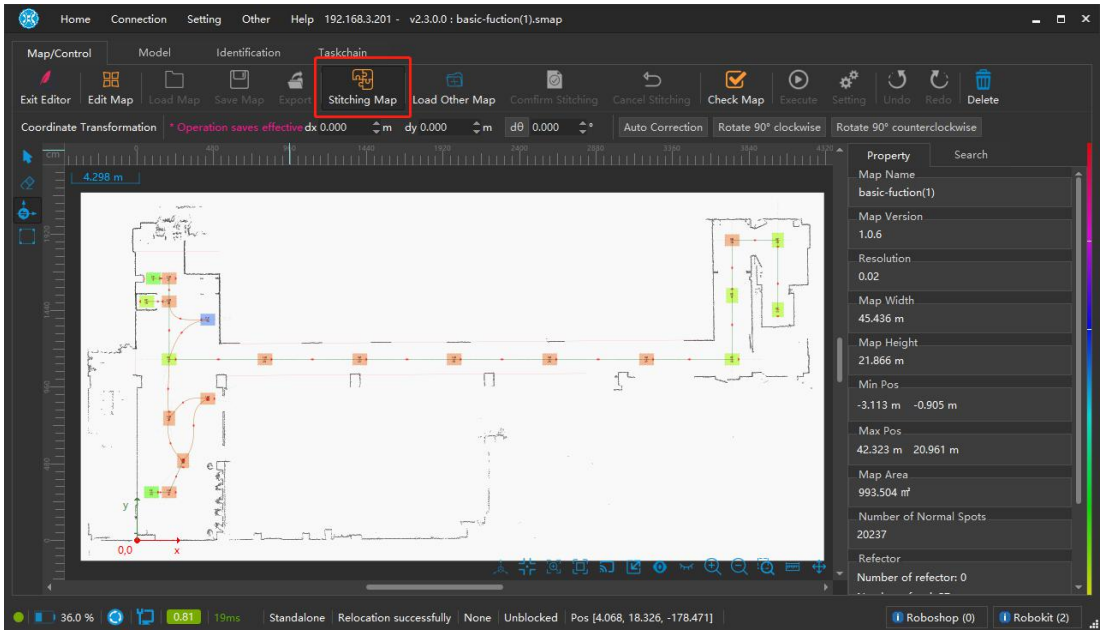
[Elements conversion picture]: Save the setting elements with .png or .jpg suffix to the expected path.

②.Stitching Map：

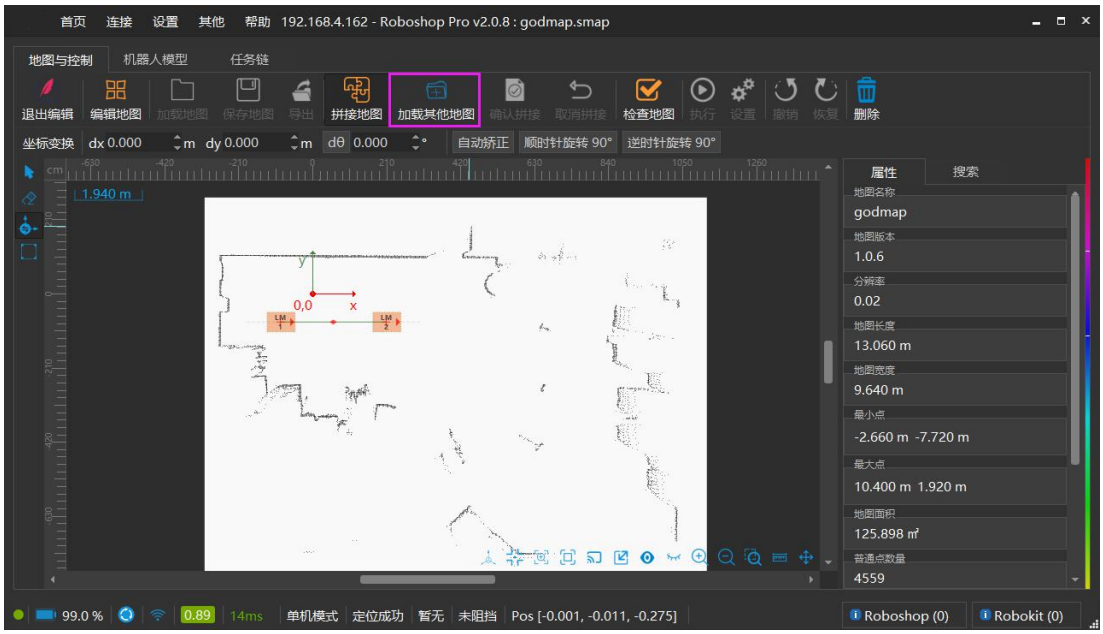
Two maps can be stitched together.

Note: Some areas of the environment have changed significantly and have affected the robot's positioning. If the environment is large, you will need to scan the map piece by piece and stitch it together to make a complete map.

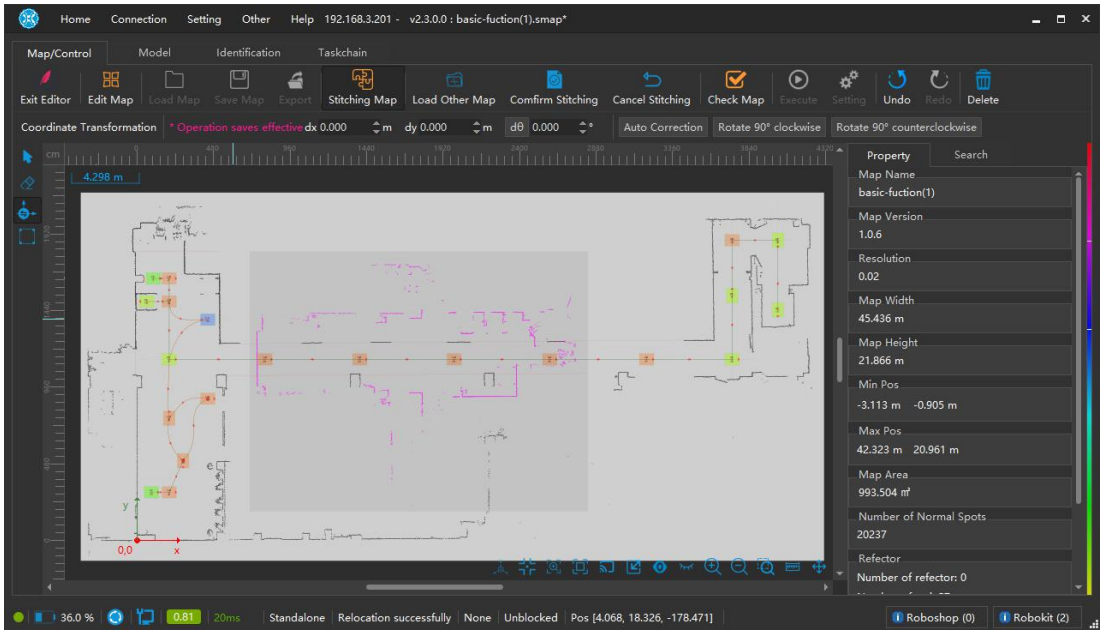
First, make sure you have a map loaded in your workspace, as the puzzle function requires a map as a base, and then click "Stitch Map".



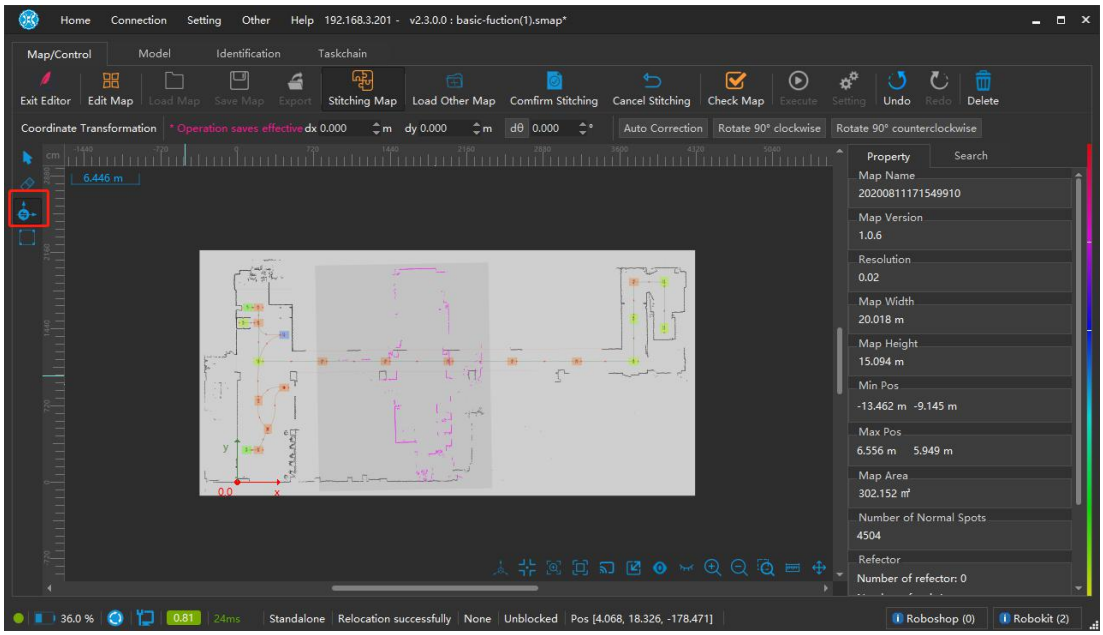
Click the [Load Other Map] button again to load a map to be stitched.



A successful load will be displayed with a translucent mask and pink outline.

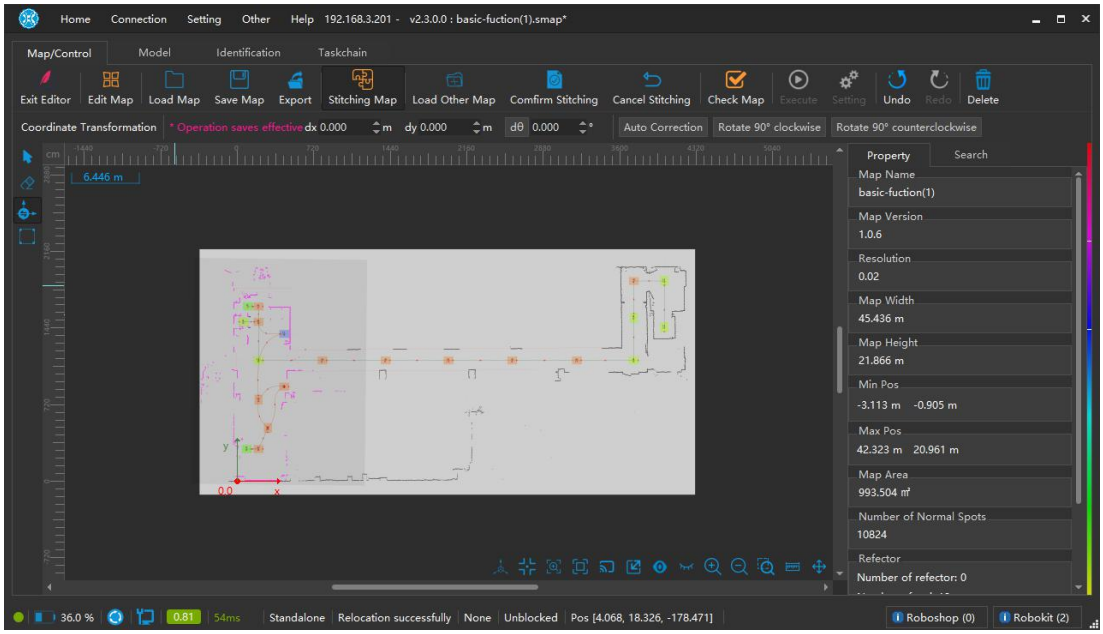


Using the [Coordinate Transform] button in the left toolbar.

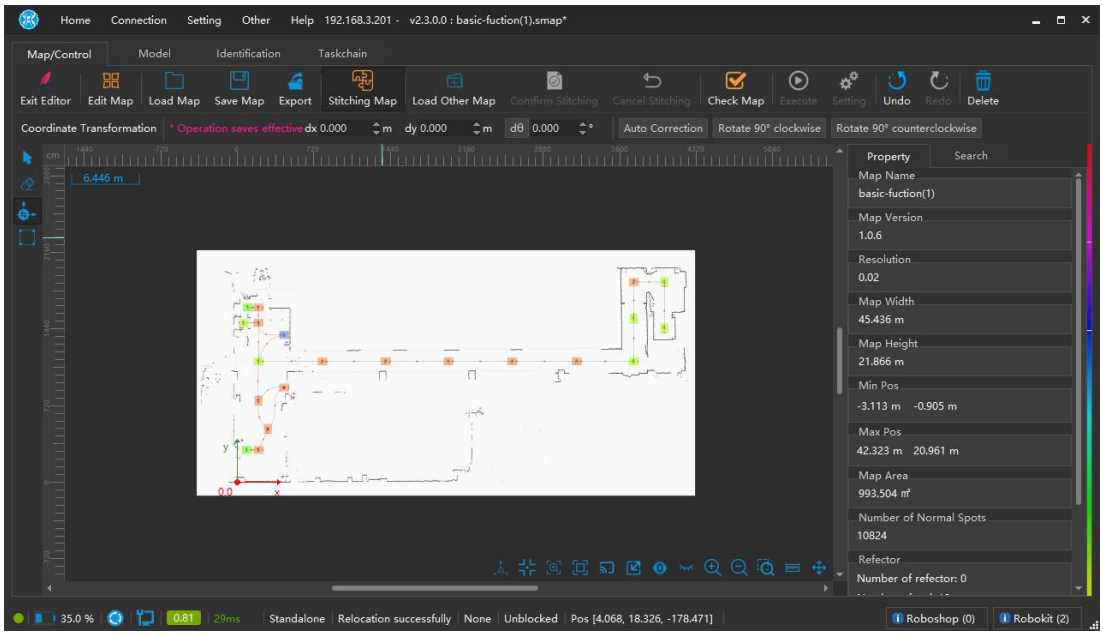


Move the map you want to stitch to the desired effect, and then click the

[Confirm Stitching] button in [Stitching Map].



Complete the melding of the two maps with the following effect



Finally, click [Edit Map] module in the [Export] can be successfully spliced map export operations.

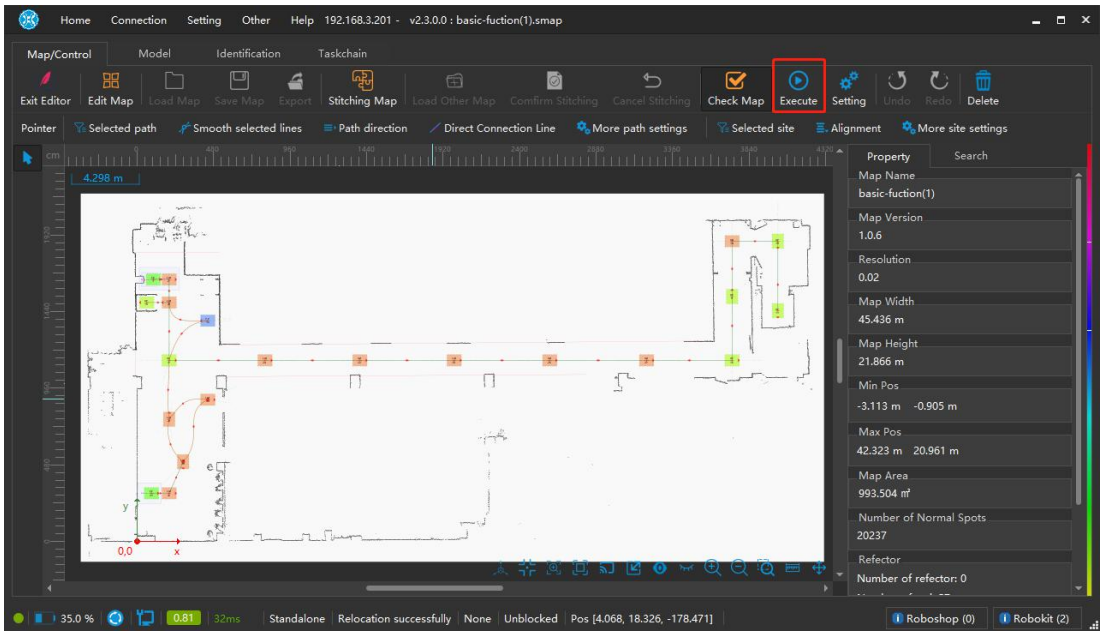
Note 1: After the map stitching is completed, if you want to use the stitched map, please click [Exit Editor] button to quit editing.

Note 2: Map stitching will produce some errors, which will cause slight loss of the robot's positioning accuracy.

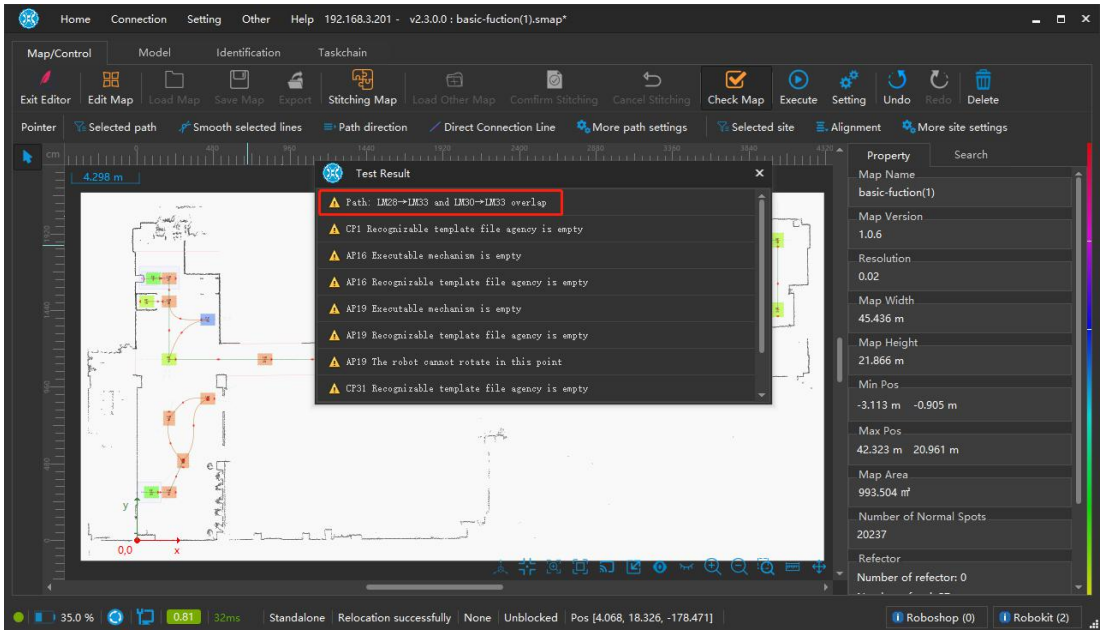
③.Check Map：

You can check the edited map manually.

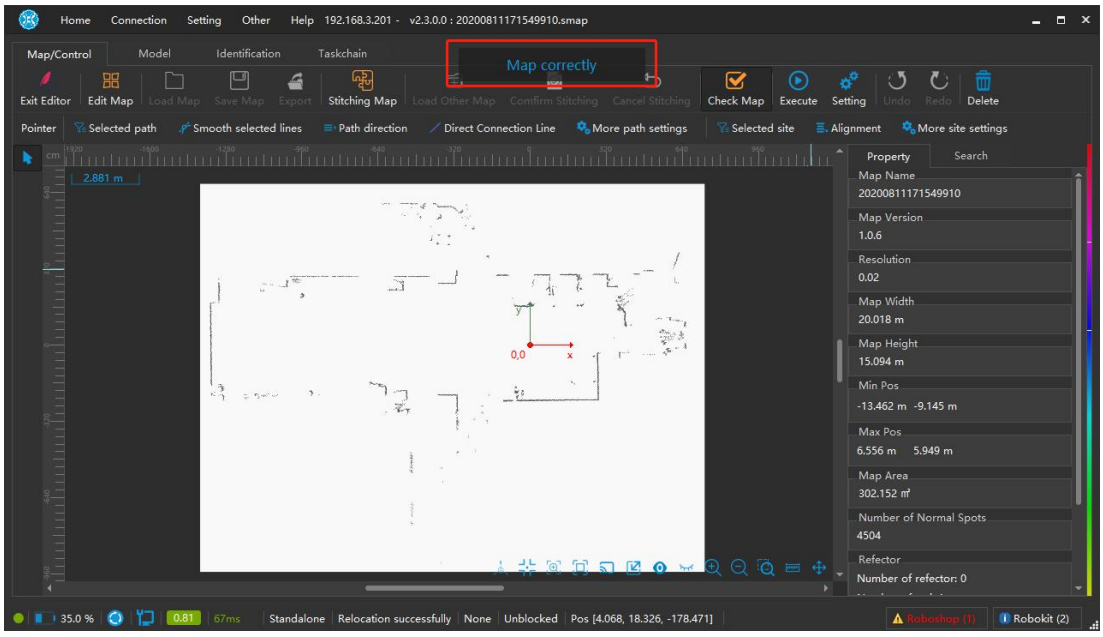
When the map has been edited, click [Execute] in [Check Map] to check the map.



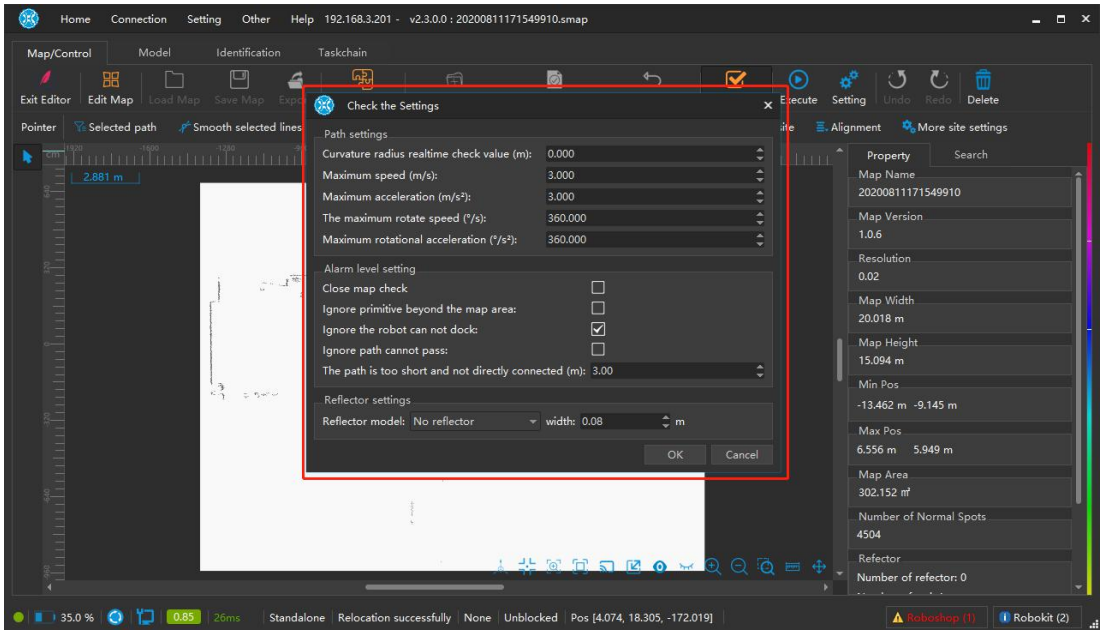
If there is an error in the map content, a check box will pop up, as shown below.



In this case, we need to fix the error and then run [Check] again until the prompt: [Map Correctly]



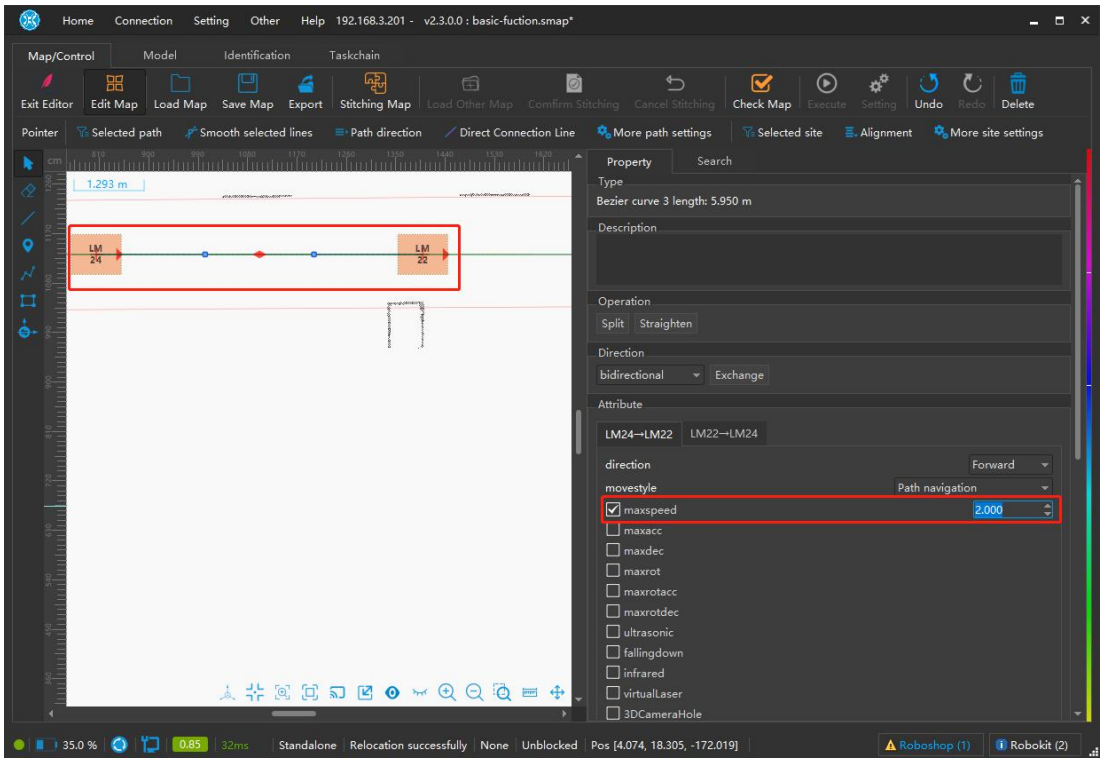
The [Settings] function in the map check is used to set the parameters when [Map Check], as shown.



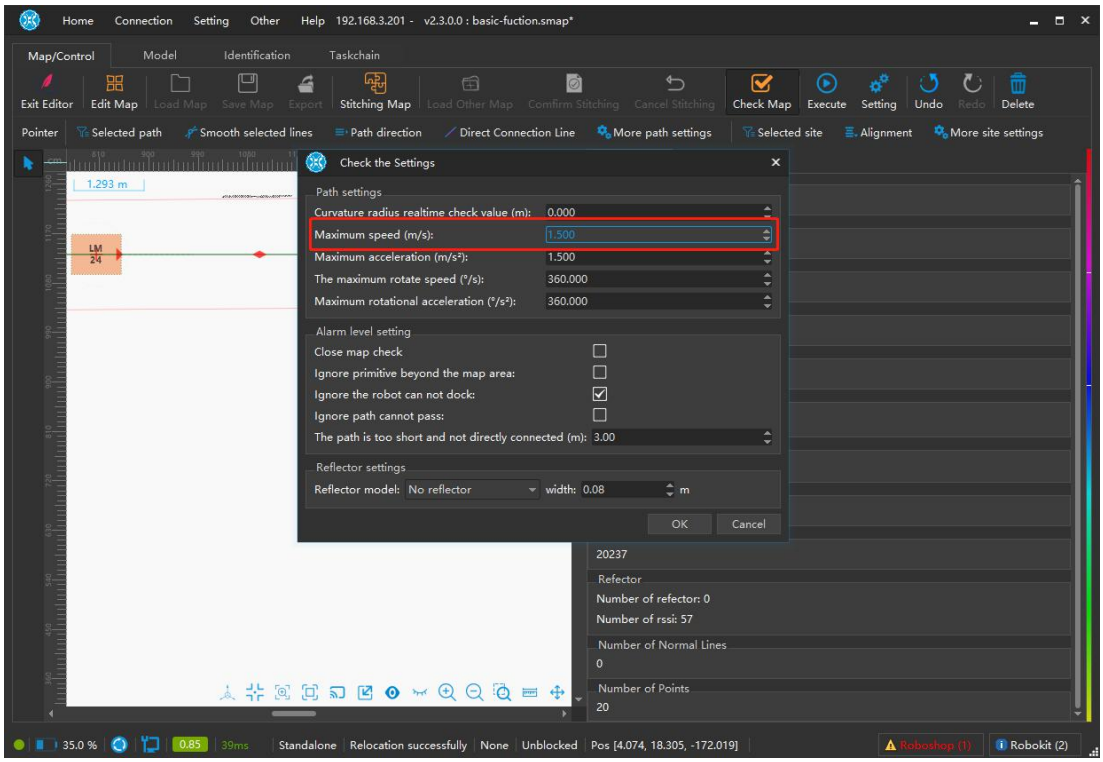
You can configure the parameters of the check settings according to the actual requirements, and the parameters in the map edit cannot be larger than the parameters set by this check.

Example.

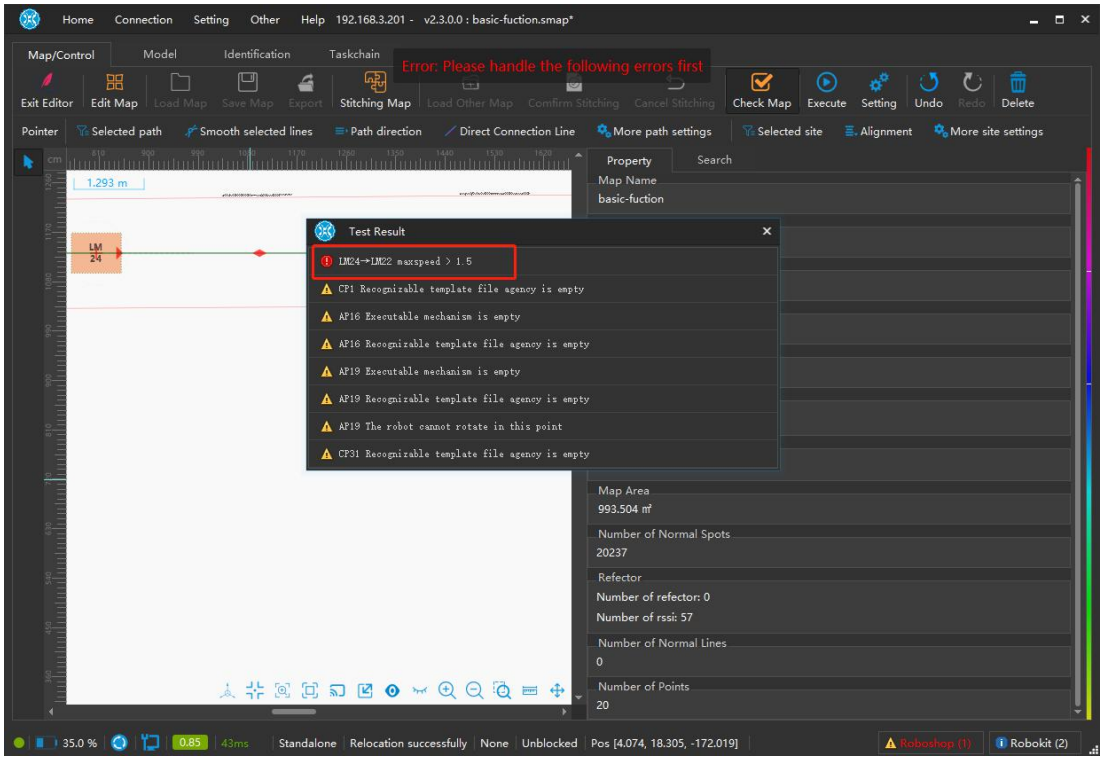
We have set the maximum speed of line segment LM24->LM22 to 2m/s, as shown in the following figure.



Then set the maximum speed to 1.5m/s in the [Settings] of [Check], and click [OK], as shown below.



Then click [Execute] in [Check Map] to check the map, which will bring up the following error message.

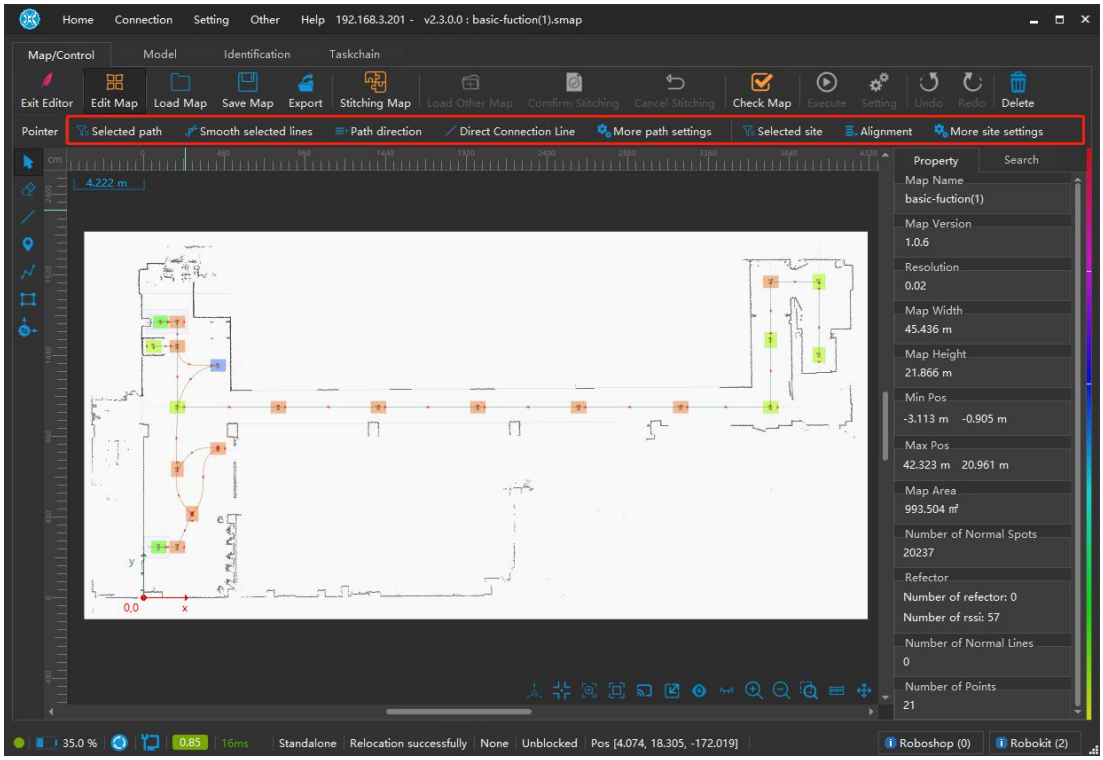


In this case, we need to fix the error, adjust the parameters according to the scene, so that the parameters in the map is smaller than the parameters set by the check, and then execute [Check] again, until the prompt: [Map correctly], before completing the map detection.

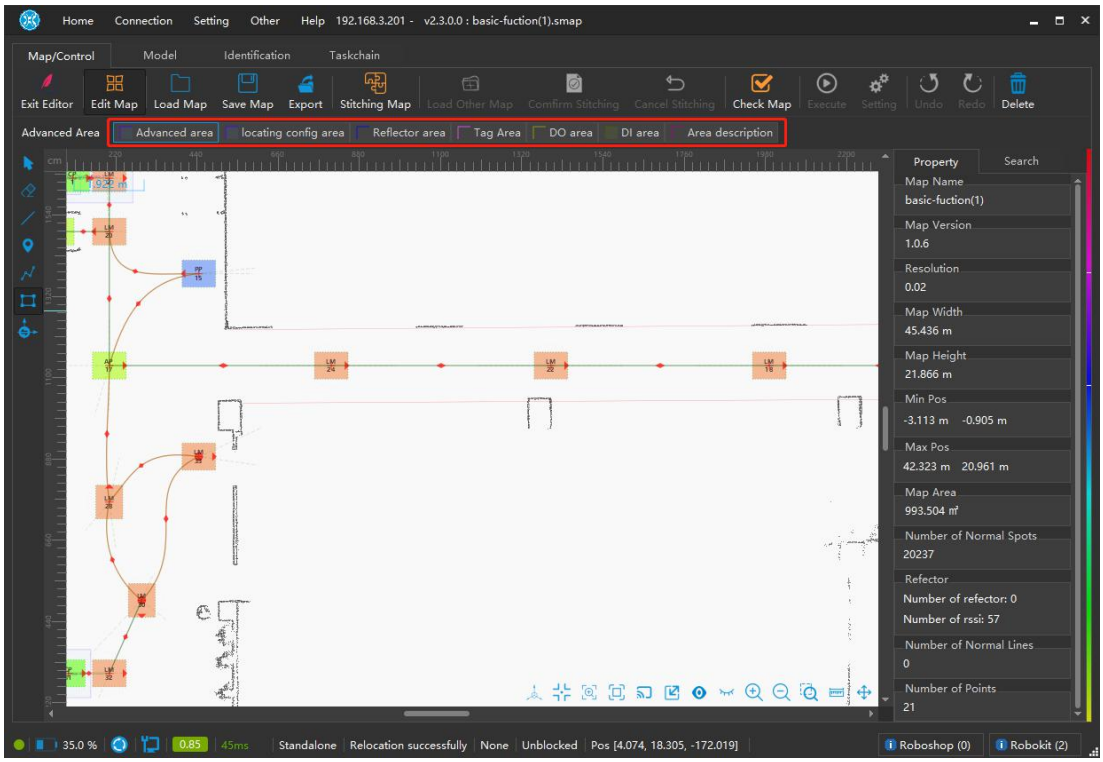
Note: When the software clicks on [Save Map], [Exit Edit], [Export Map] button, it will also check the map automatically, the prompt information is the same as the manual check.

Toolbar

Contains commands and options that are specific to the active tool. (The context toolbar changes with the selection of the edit toolbar), as shown in the following screen for selecting the pointer tool.

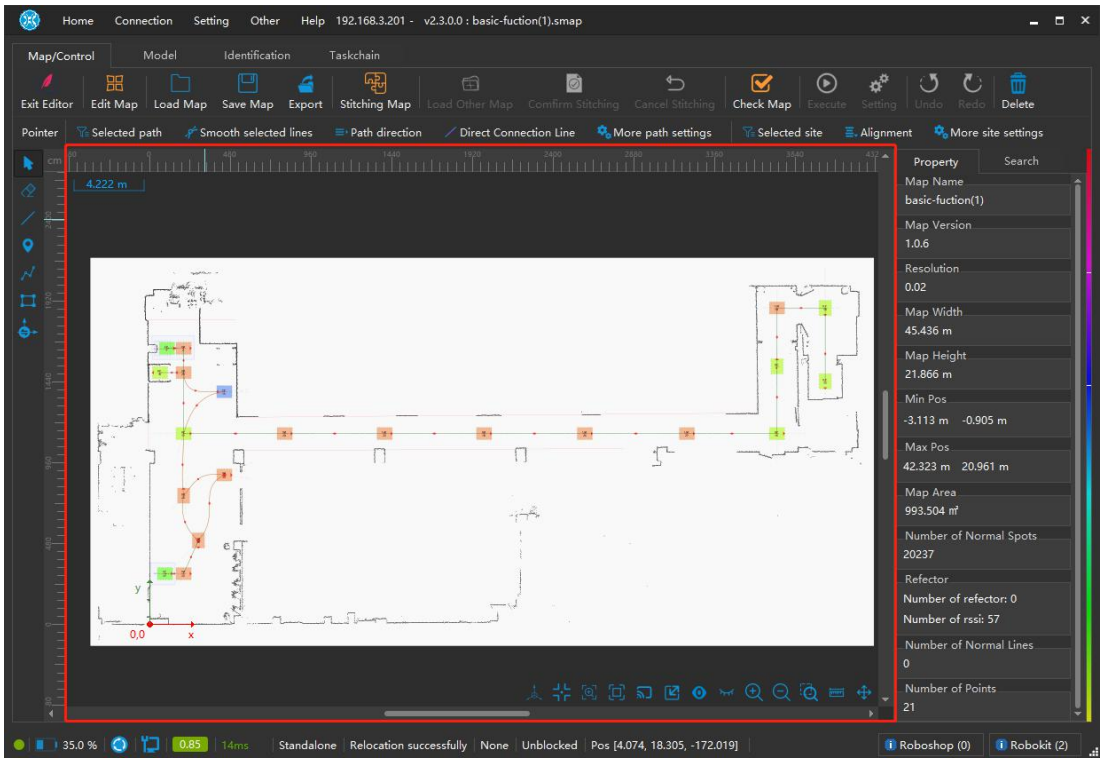


Interface when selecting advanced regional tools.



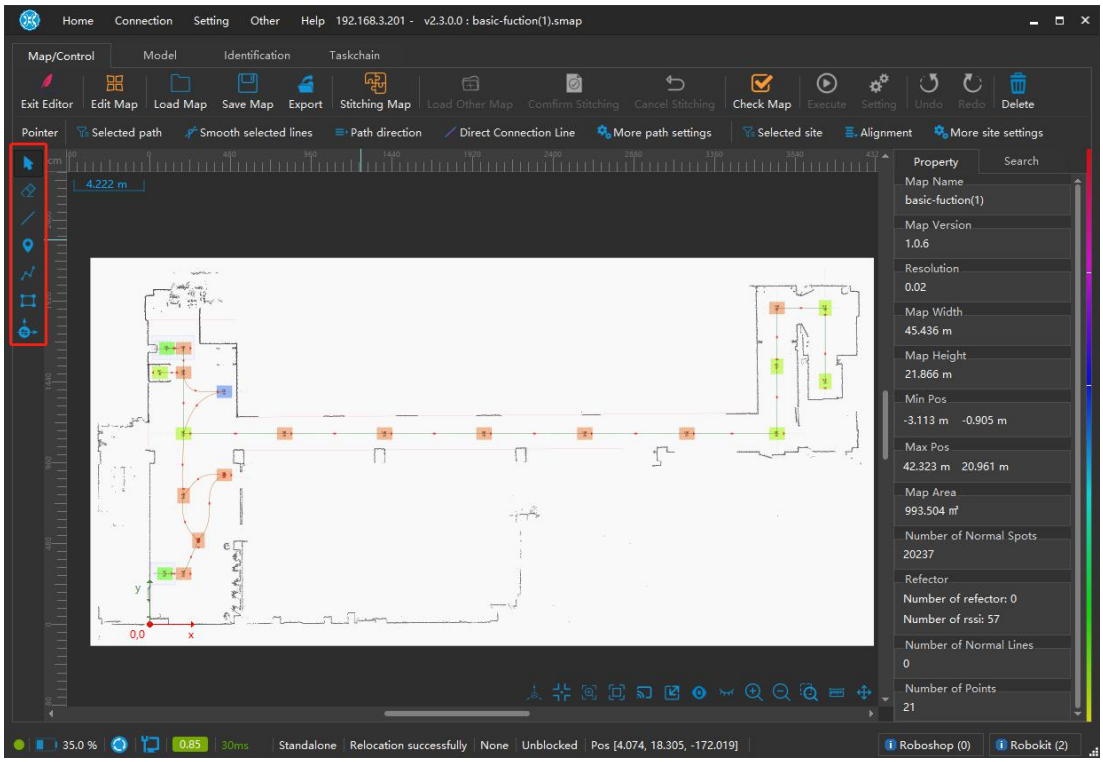
Workstation

The areas used for robot control and map editing are shown below.



Toolbar

When entering the map edit mode, the toolbar is located in the left-hand bar of the workspace, as shown in the following figure.

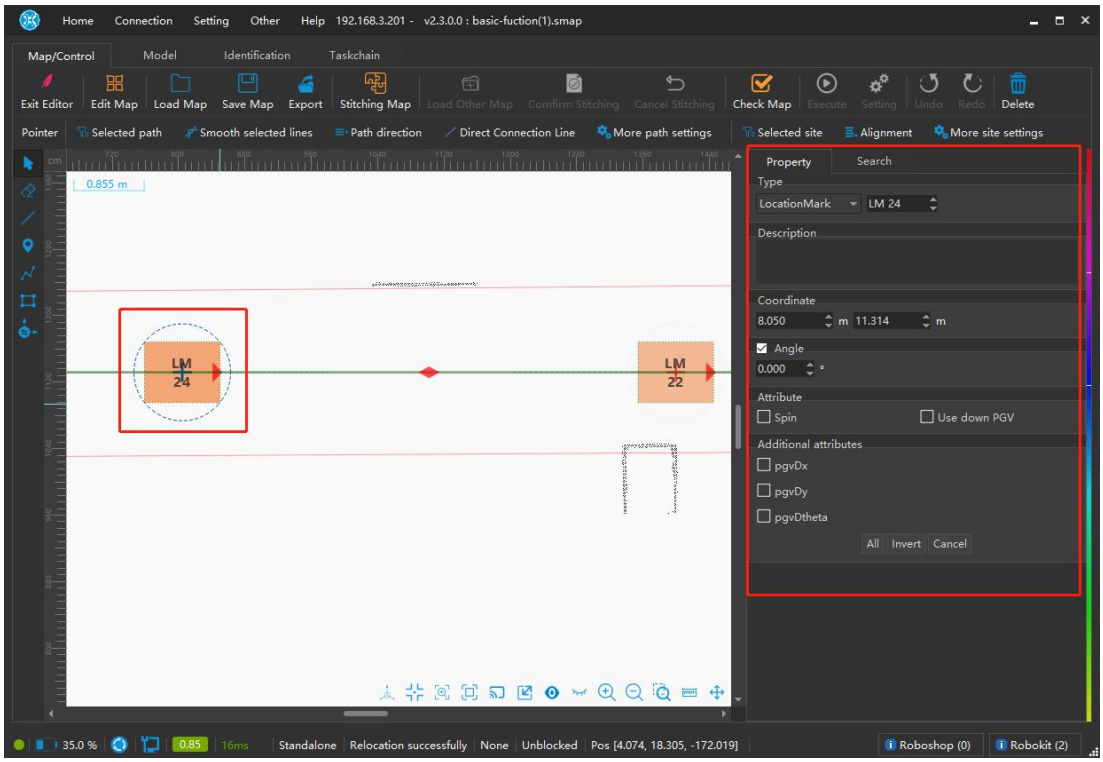


1.Pointer

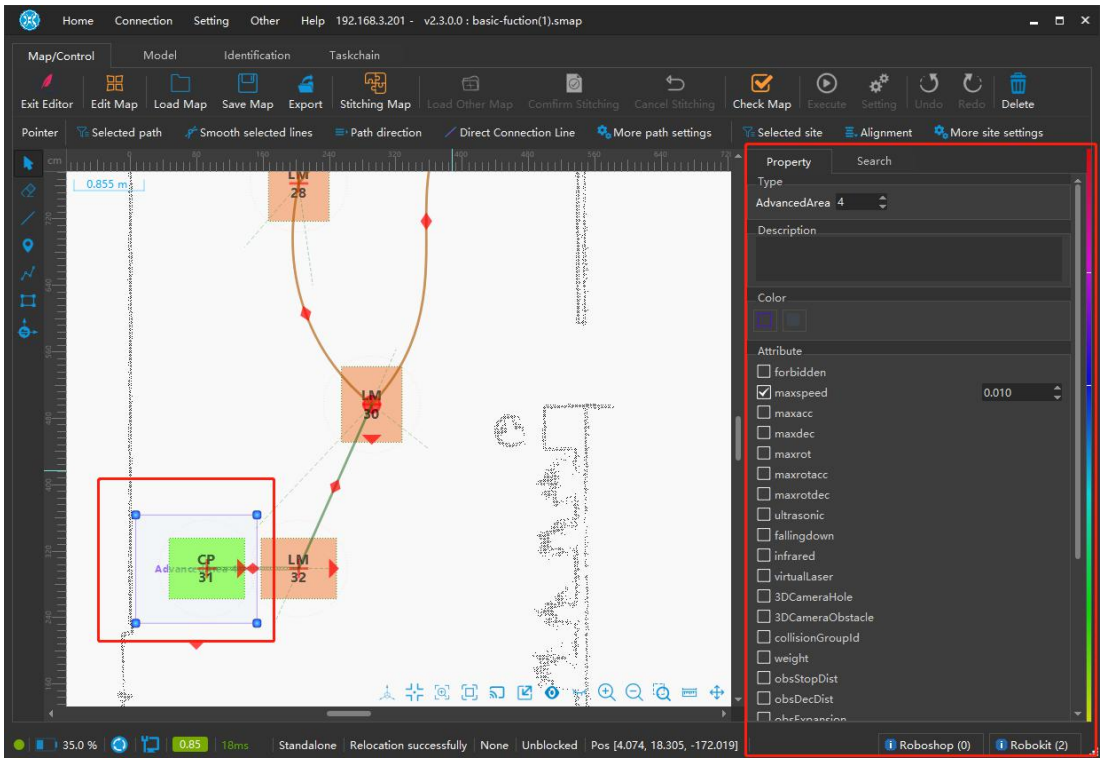
The pointer tool is used for selection and can be used to select an element by clicking on it in the map. It can also be used to select multiple elements.

To remove an element from the map (e.g., a site, an advanced area, etc.), simply select the element and press Backspace or Delete on the keyboard.

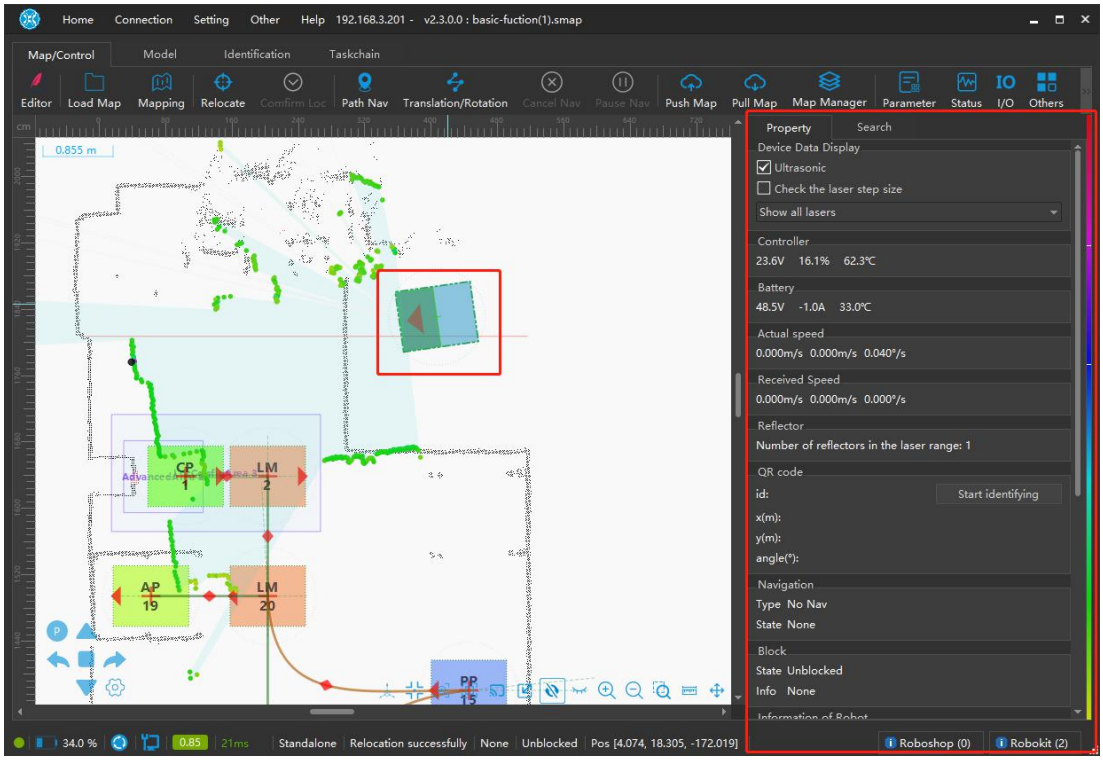
When the site is selected, the right property box is shown below.



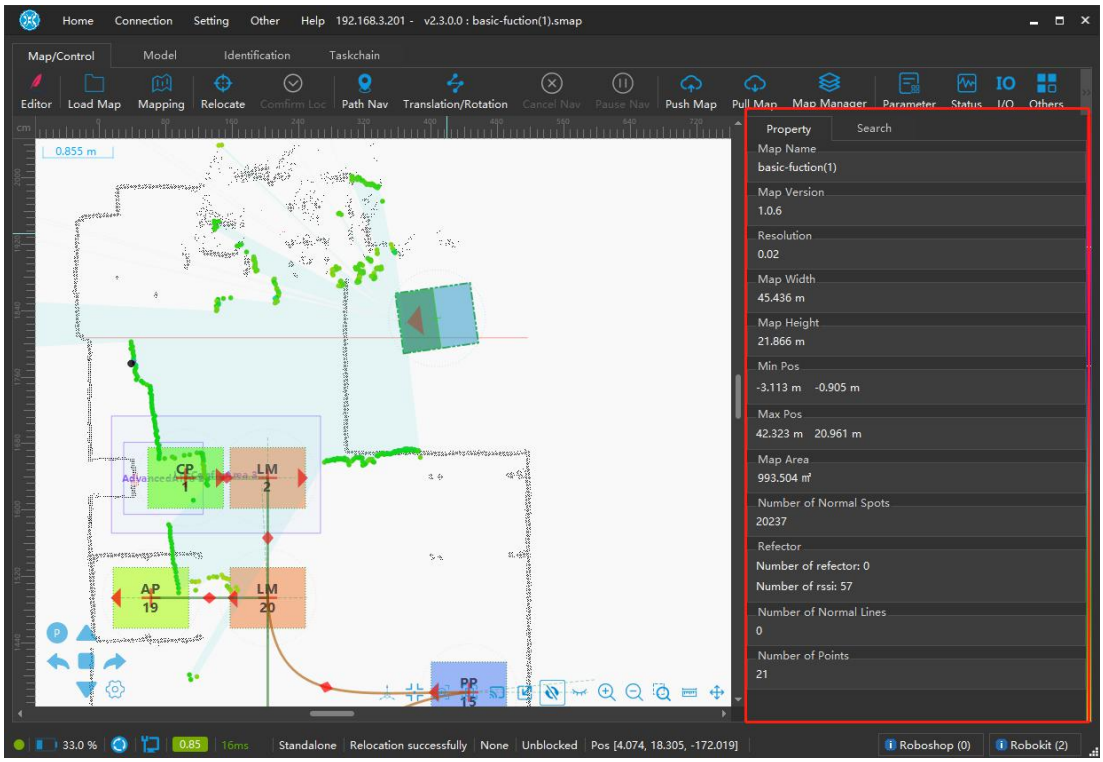
When an advanced area is selected, the property box on the right is shown below.



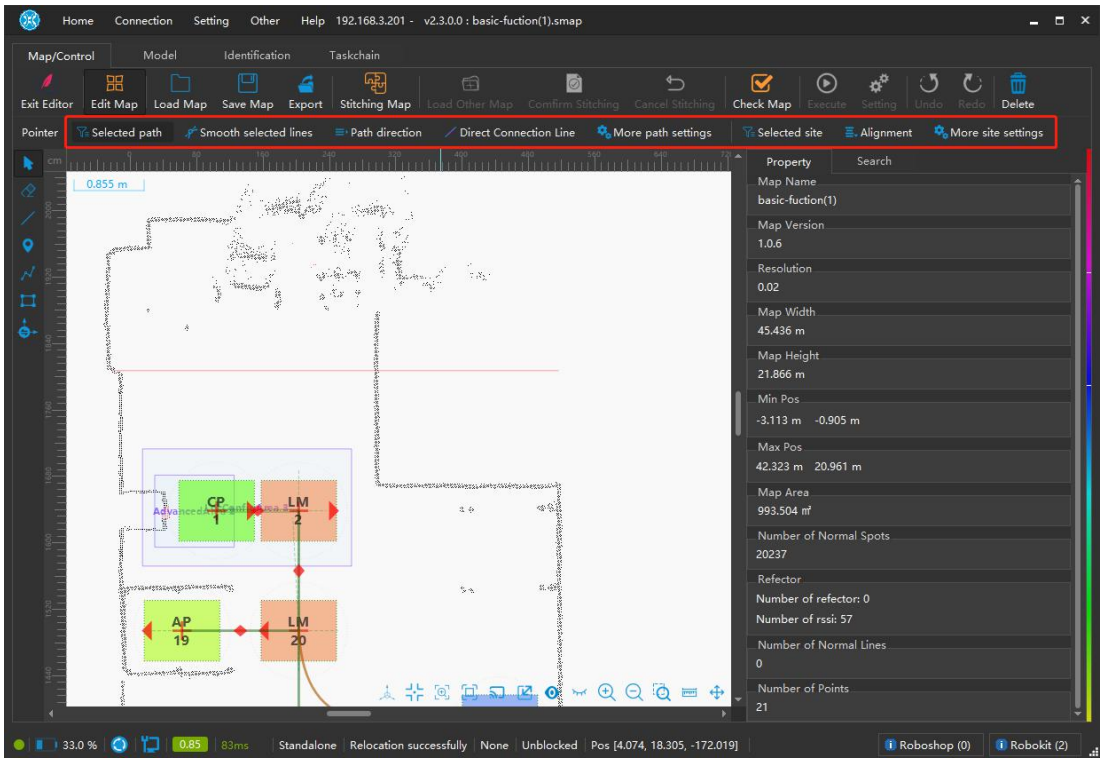
When the robot is selected, the property box on the right is shown below.



When clicking on the map in the work screen, the properties box on the right is shown below.



When the Pointer tool is selected, its contextual toolbar is as follows.

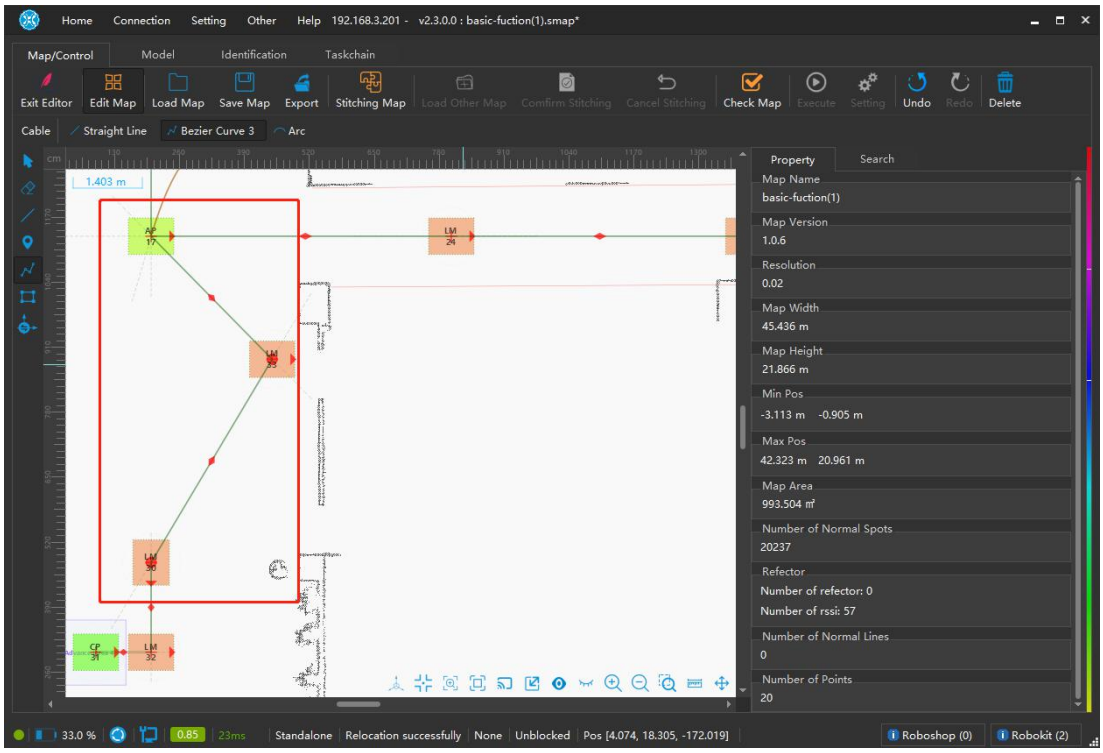


Select path:

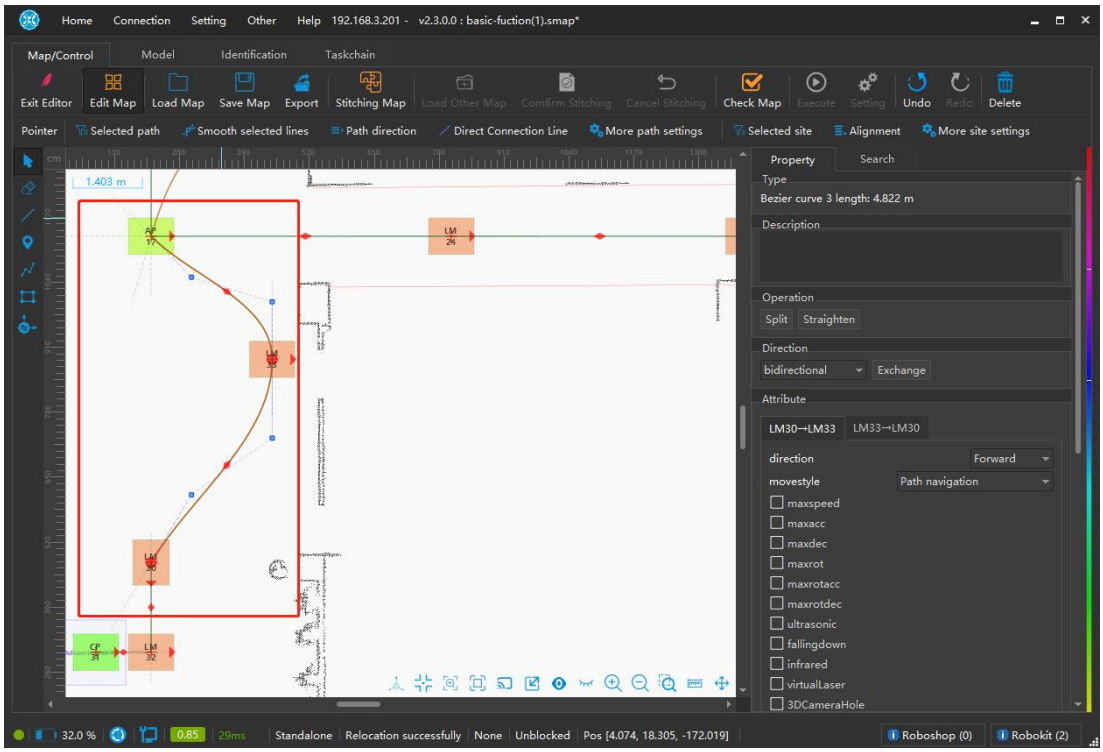
Click this button, all pathes in the map will be selected.

Smooth selected lines:

Used to smooth multiple Bézier curves as shown in the following figure.



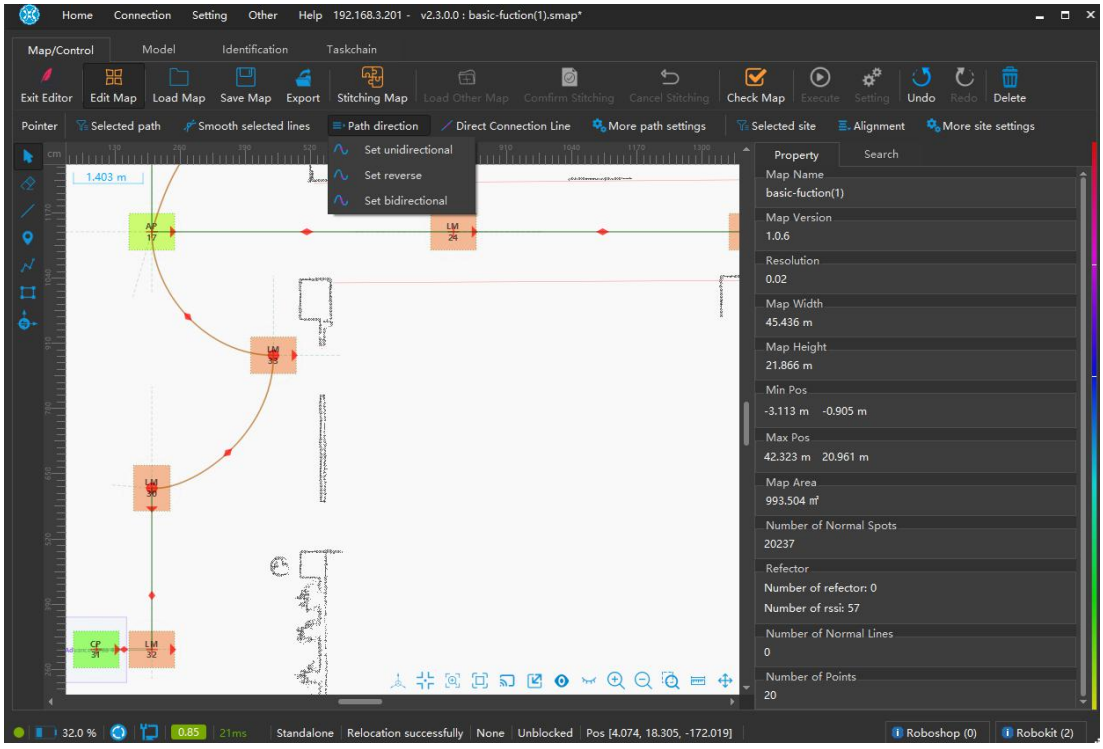
In the above figure, the Bezier curve connecting 3 stations is straight lines.Select the line to be smoothed operation, and then click [smooth selected lines] button can smooth curve, the effect is as follows.



This function is also suitable for batch operation of multiple lines.

Path direction:

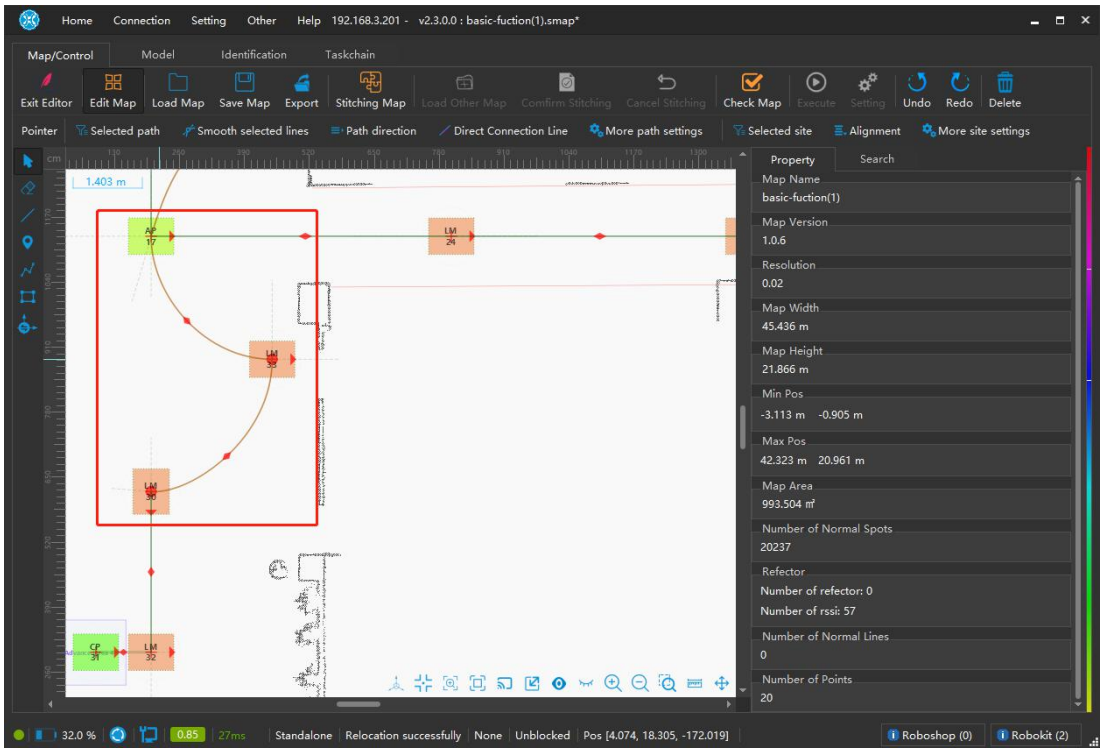
Click this button, you can set "undirectional", "reverse", "bidirectional" for your selected path lines.

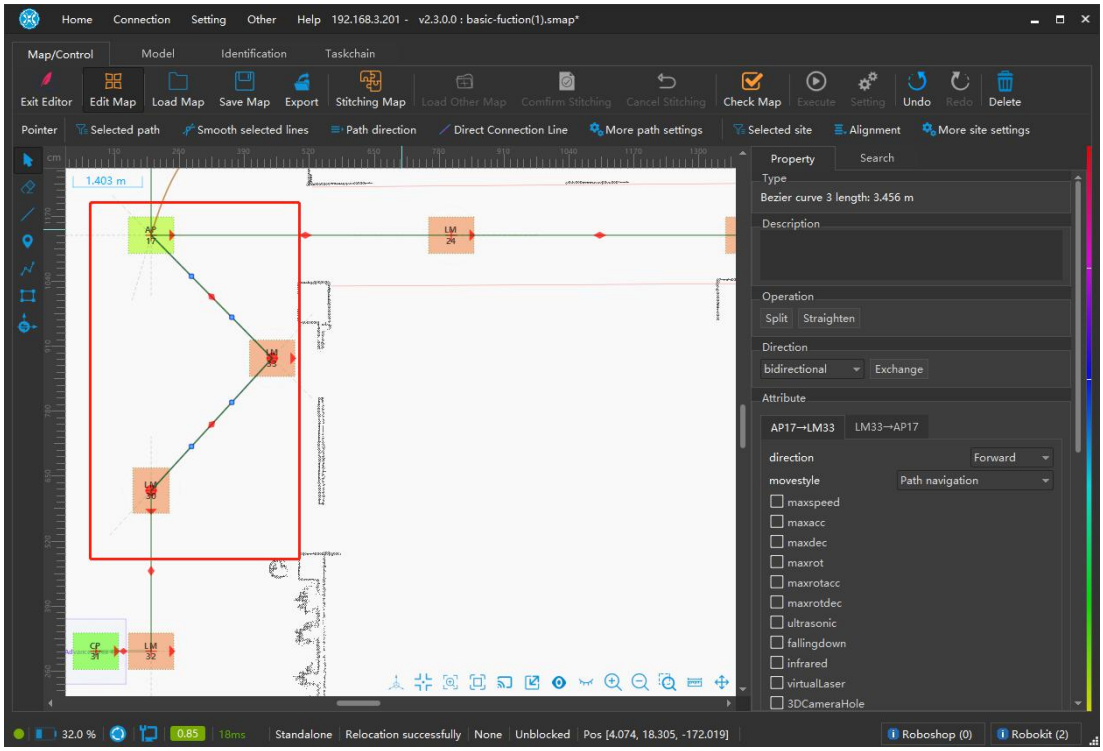


This function is also suitable for batch operation of multiple lines.

Direct Connection Line

This function is used for make curve direct.





More path settings

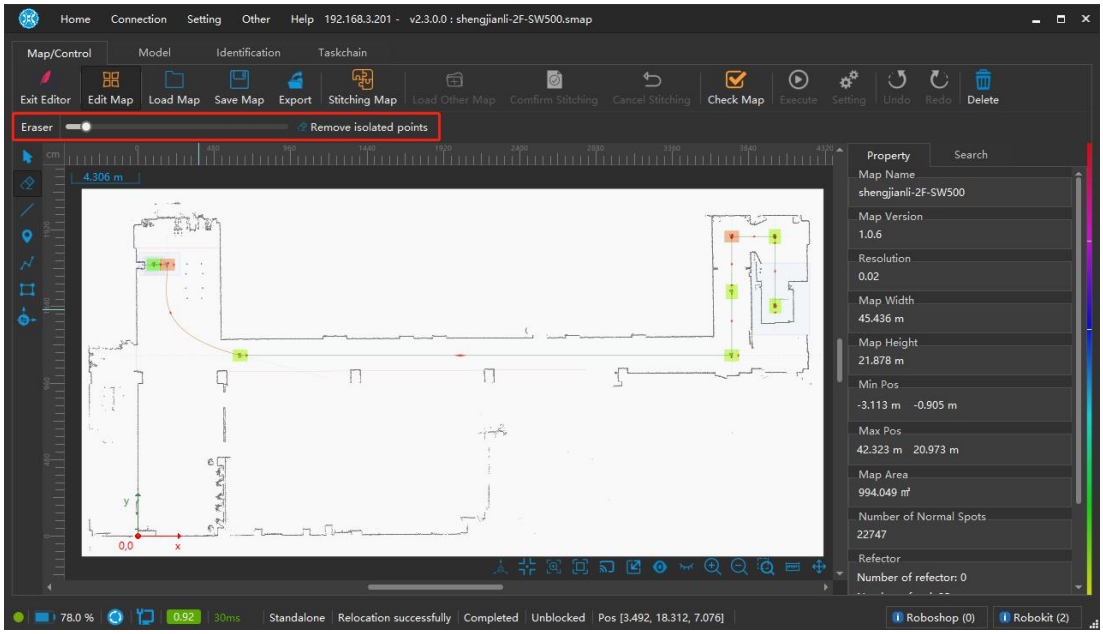
Selected site

Alignment

More site settings

2.Eraser

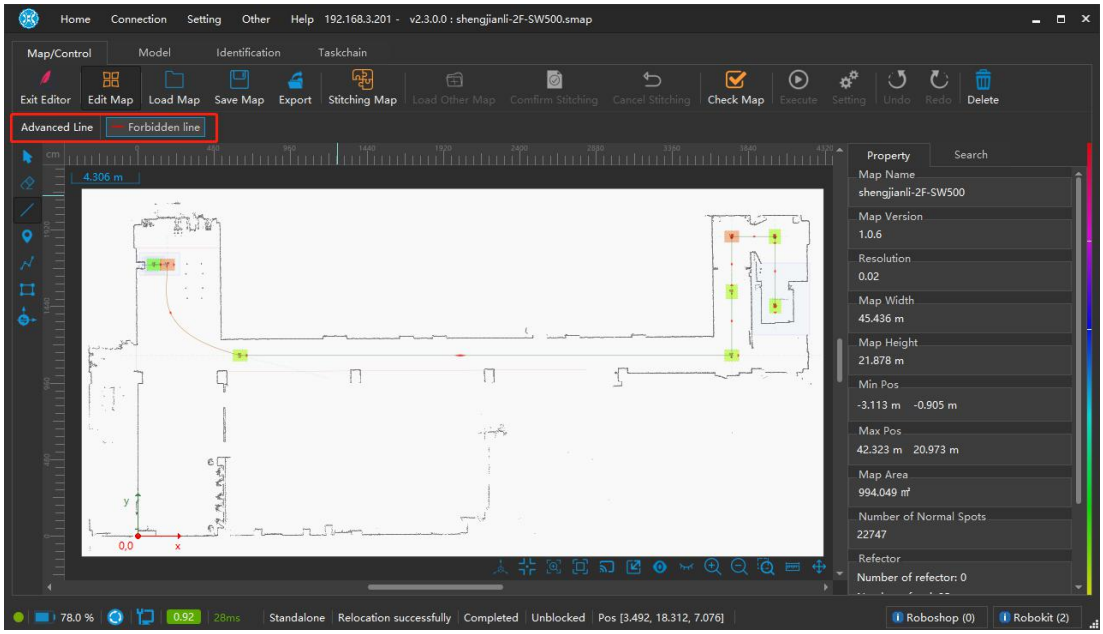
This tool is used to erase dots and lines on the map. When you click on the eraser, the mouse will change to a translucent orange square and you can erase it by clicking the left mouse button on the point you want to erase. Press and hold down the left mouse button and drag the mouse to erase common dots and lines within the mouse range. The size of the eraser can be changed in the upper toolbar of the eraser.



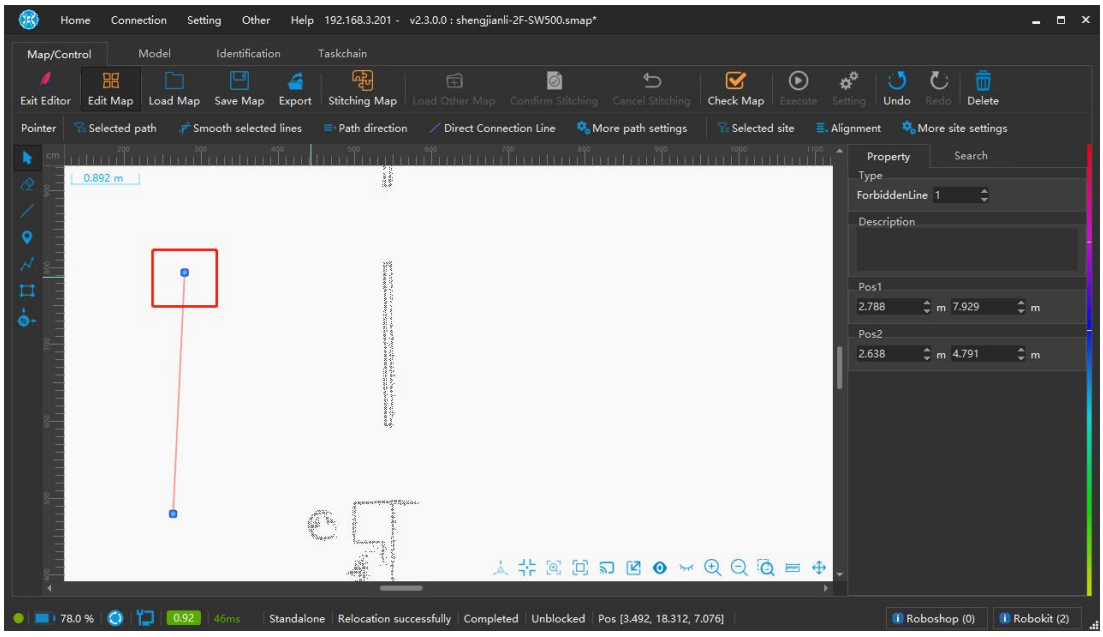
Note: The Eraser tool is only used to erase Normal Points and Normal Lines on the map, not advanced elements such as sites, advanced areas, Bezier curves, etc.

3.Advanced line

This tool is used for map editing to add special features to lines. There is an option in the context toolbar of the Advanced Line Tool: No Line



Once the line is selected using the pointer tool, the line can be dragged through the control points at both ends of the forbidden line.

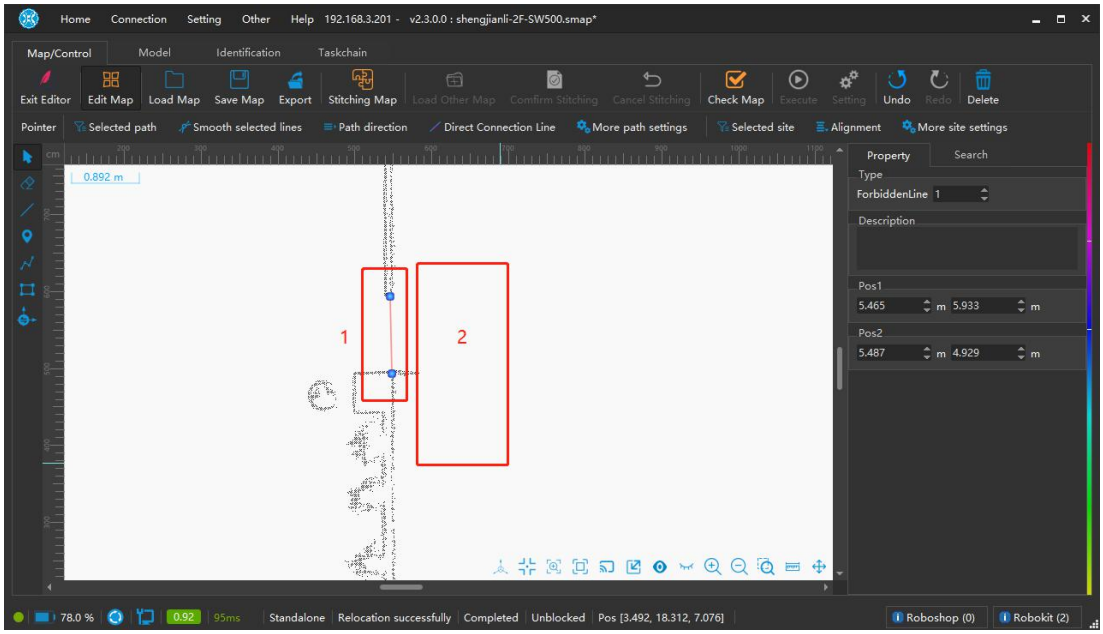


Note: Advanced lines only affect the robot's ability to navigate.

ForbiddenLine：

The forbidden lines (red) are used to block certain locations on the map, so that the robot cannot pass through the blocked locations when navigating

freely. As shown in the figure below, ② is an unknown area or an area that the user doesn't want the robot to enter, so we can add a forbidden line at ① so that the robot won't enter through ①.



Prohibited line properties:

When the forbidden line is selected using the pointer tool, the property bar on the right will show the properties of the corresponding advanced line, as shown below

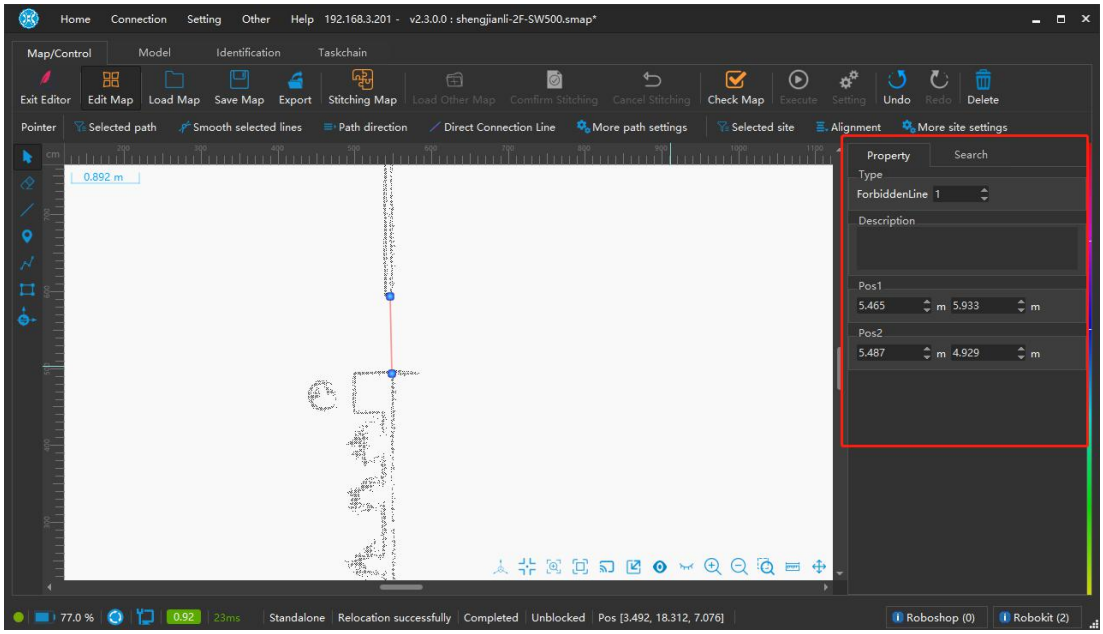
Each of these parameters is explained as follows:

[Type]: You can change the number of forbidden lines in the edit box.

[Description]: Used to add comments.

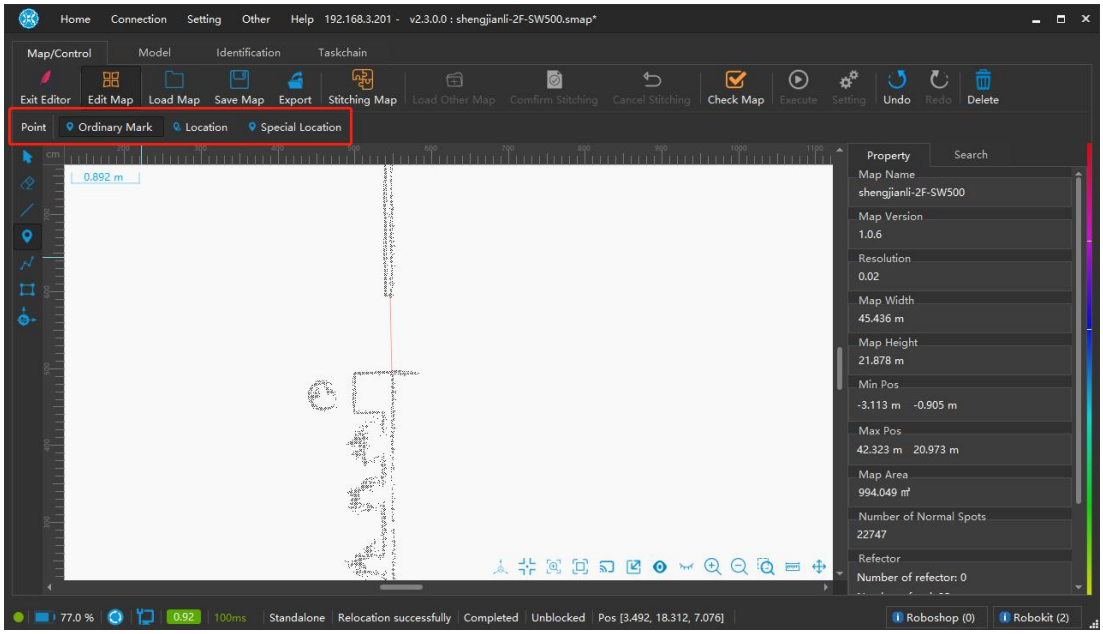
[Pos1]: The value of one endpoint of the advanced line, which will be changed in real time by dragging it with the mouse, or you can input a value to adjust the coordinate of the endpoint exactly.

[Pos2]: The coordinate of the other endpoint of the advanced line, the adjustment method is the same as that of Endpoint 1.

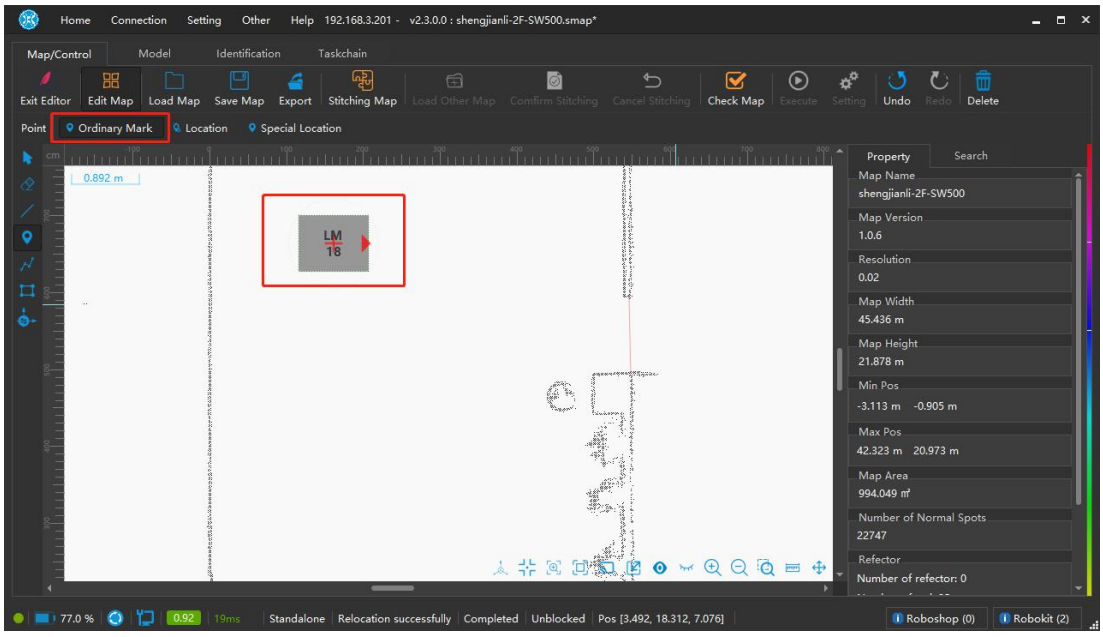


4.Point

Used for adding sites, the sites are divided into: Ordinary Mark, Location, Special Location. Select this tool, its toolbar will show as follows

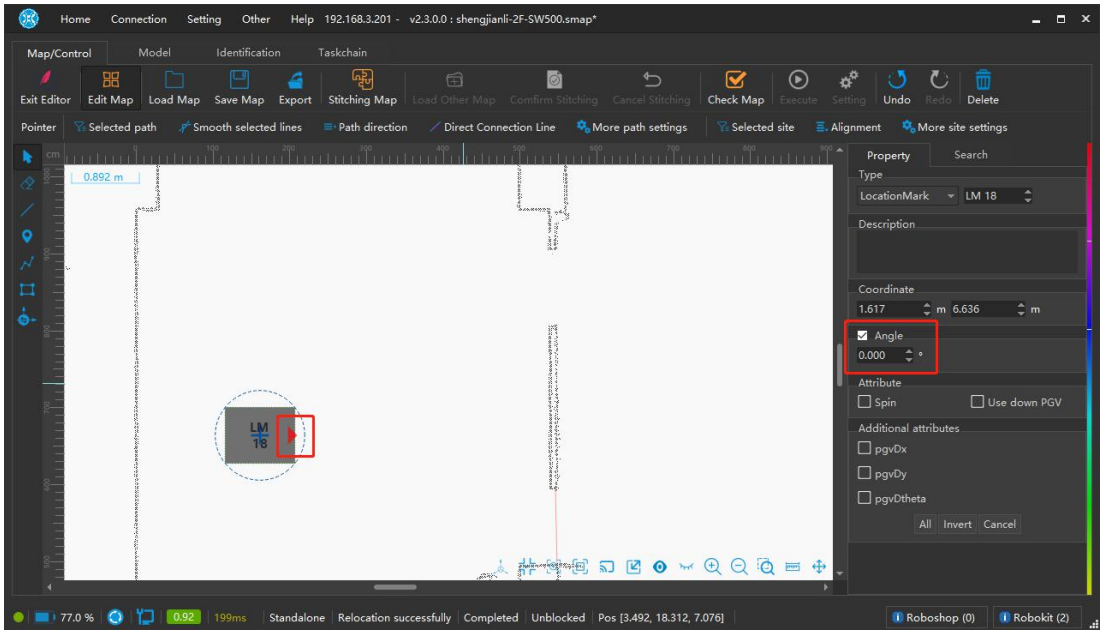


Select different types to add different types of sites. As shown below: Using the Site tool, a site LM18 is added to the workspace.

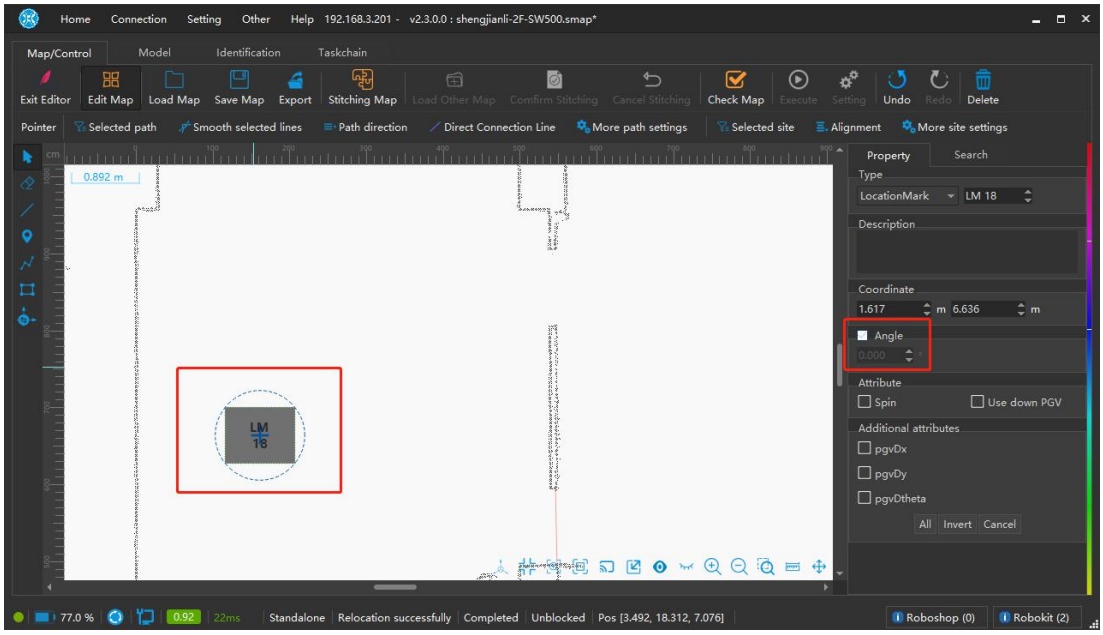


The site is displayed in the shape of the chassis configured in the model file, and the red triangle in front of the site indicates the orientation of the robot's arrival point, which can be adjusted by dragging the orientation of the site

with the pointer tool, or by clicking on the site and entering the angle value in the property box on the right.

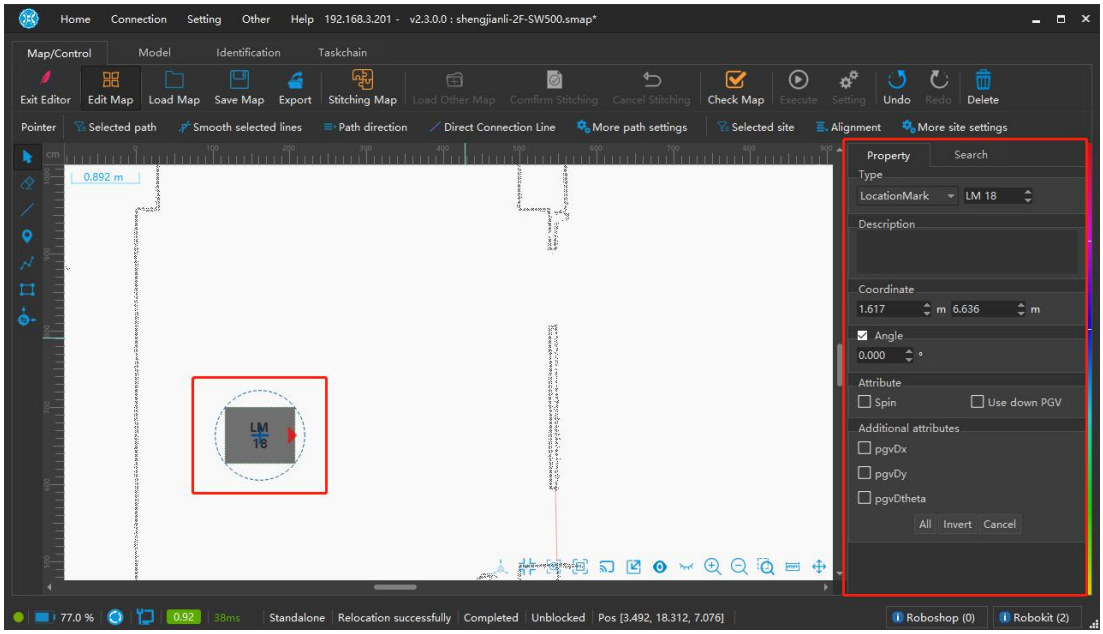


The site can also be a directionless point, with the angle unchecked in the right property box, when the robot arrives at the point without directional adjustment, the red triangle symbol will disappear and become a directionless site, as shown below.



Site Properties.

By clicking on a site, you can view the site's properties and set the site's properties in the properties box on the right, as shown below.



Each of these parameters is explained as follows.

[Type]: the type of the advanced line.

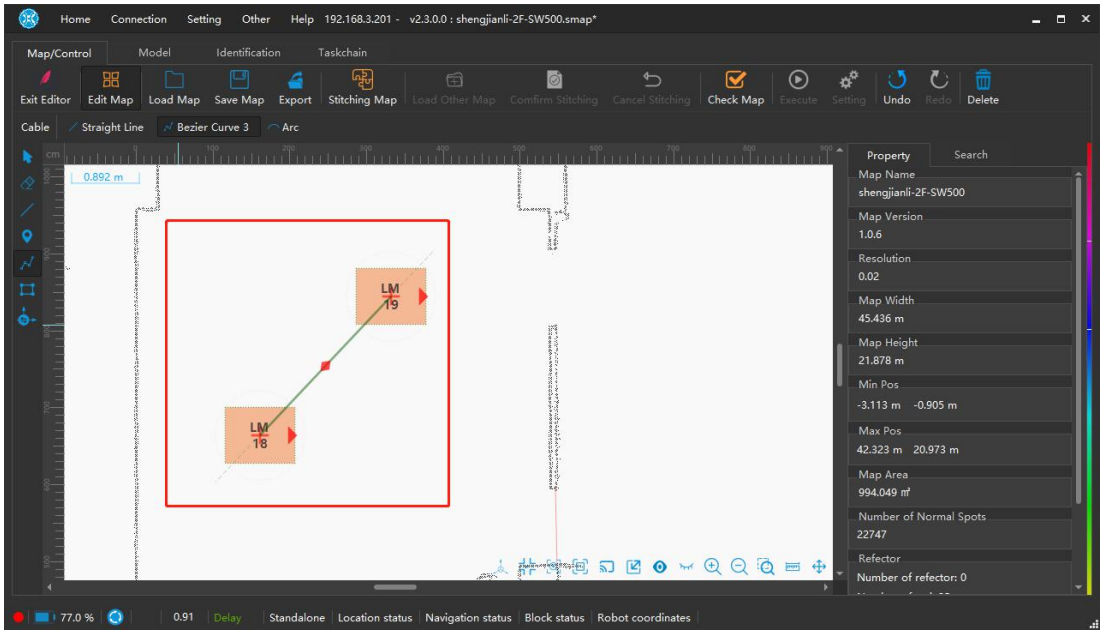
[Description]: Used to add comments.

[Coordinate]: The coordinates of the current site, you can move the site by inputting the value.

[Angle]: The angle of the site, you can change the angle by inputting the value, or unchoose it to be a directionless point.

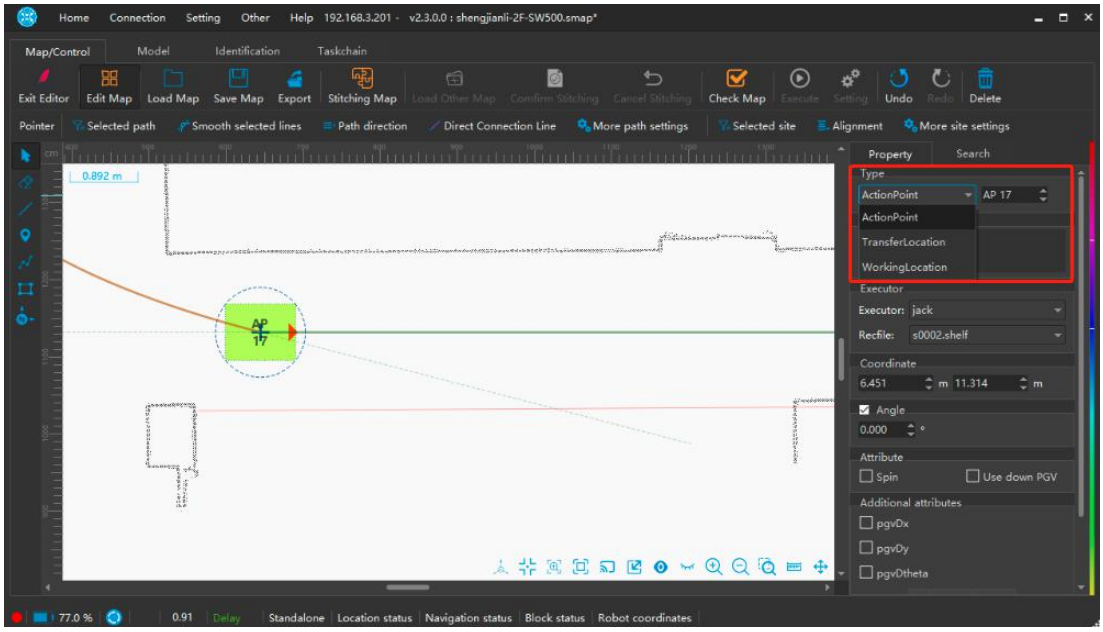
[Spin]: whether enable AGV follow the angle when moving.

Note 1: A single site is shown in gray, and will only turn orange when it is connected using a line, as shown below.



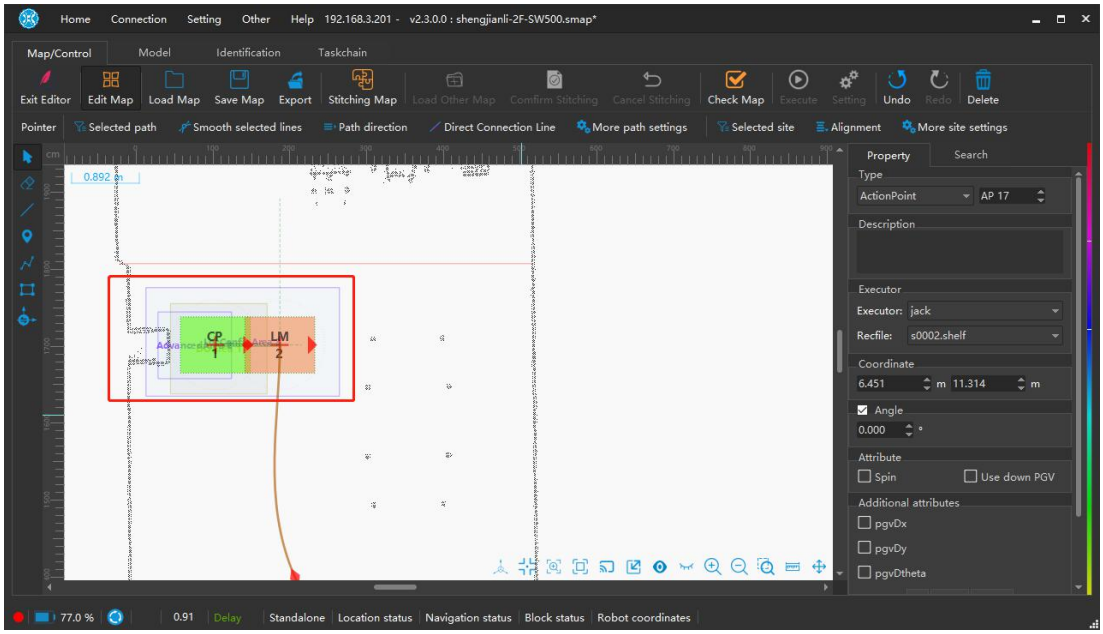
Location:

Requires our dispatching system RoboRoute, do not use this function without a dispatching system.



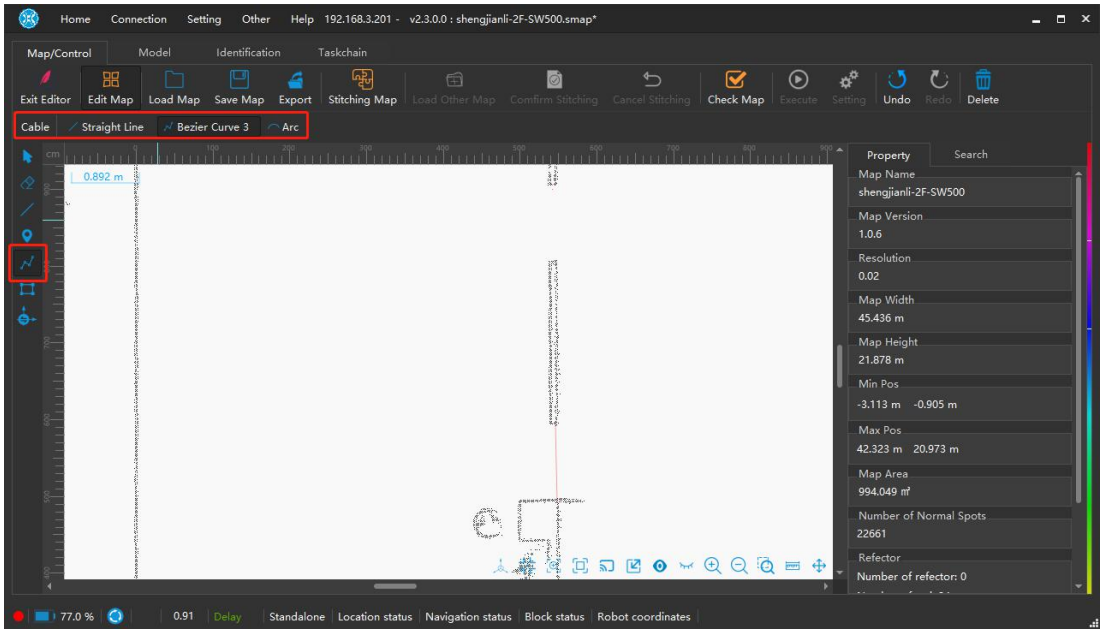
Special Location:

Use for autonomous charging, please refer to related chapter.



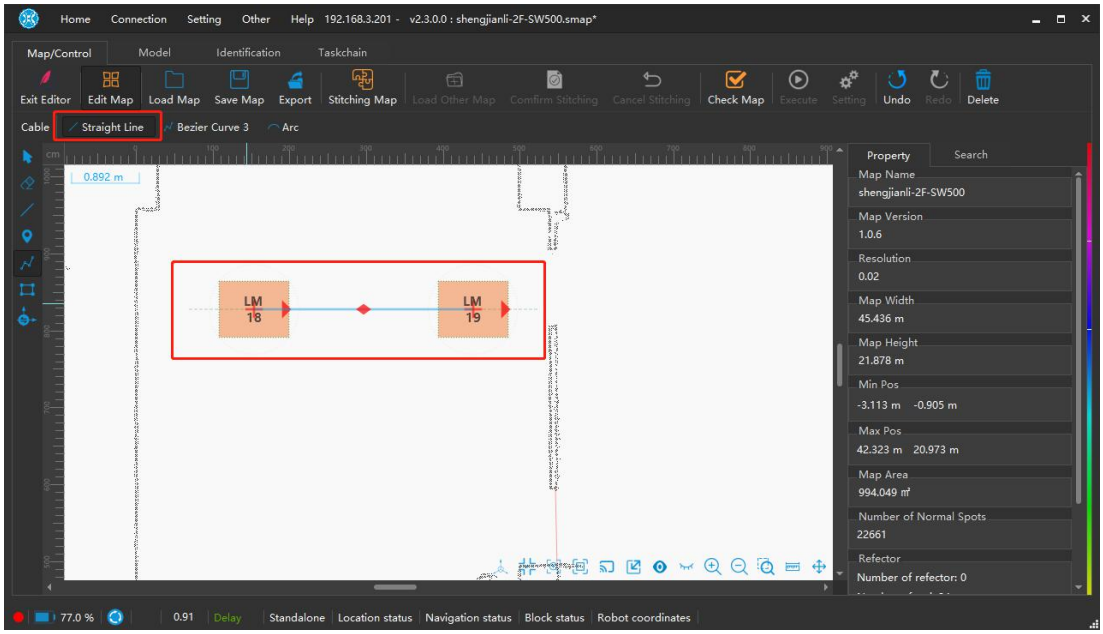
5.Cable

Use for append cable between elements. The cables are divided into Straight Line, Bezier curve 3 and Arc.



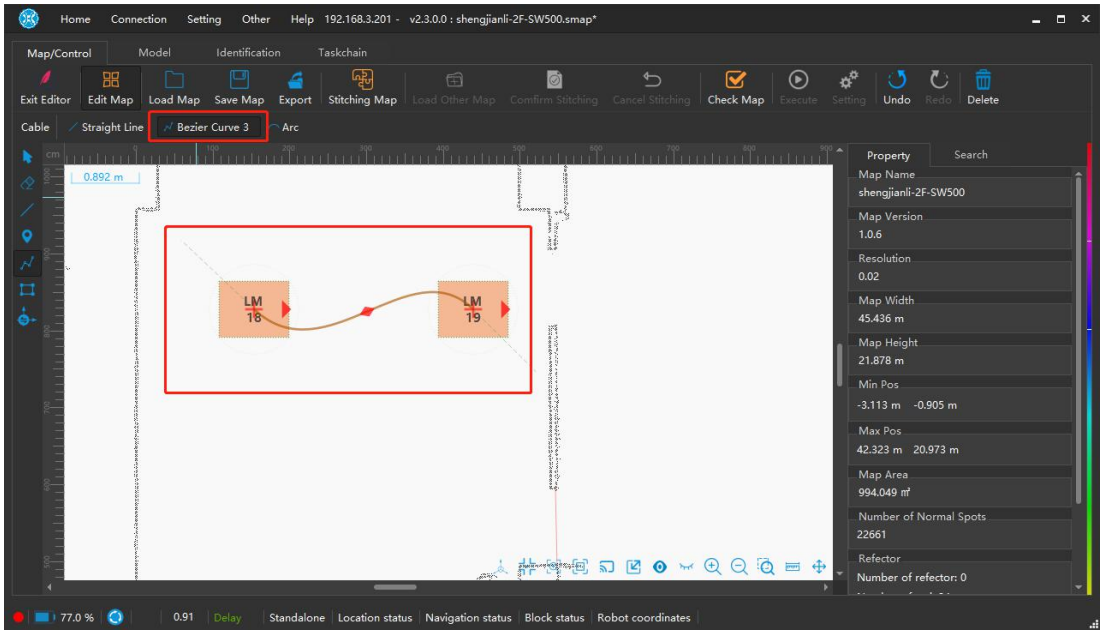
Straight lines.

The following picture shows the connection using [Straight Line], the line property of this connection method can only be a straight line, you can't change the connection type by dragging.



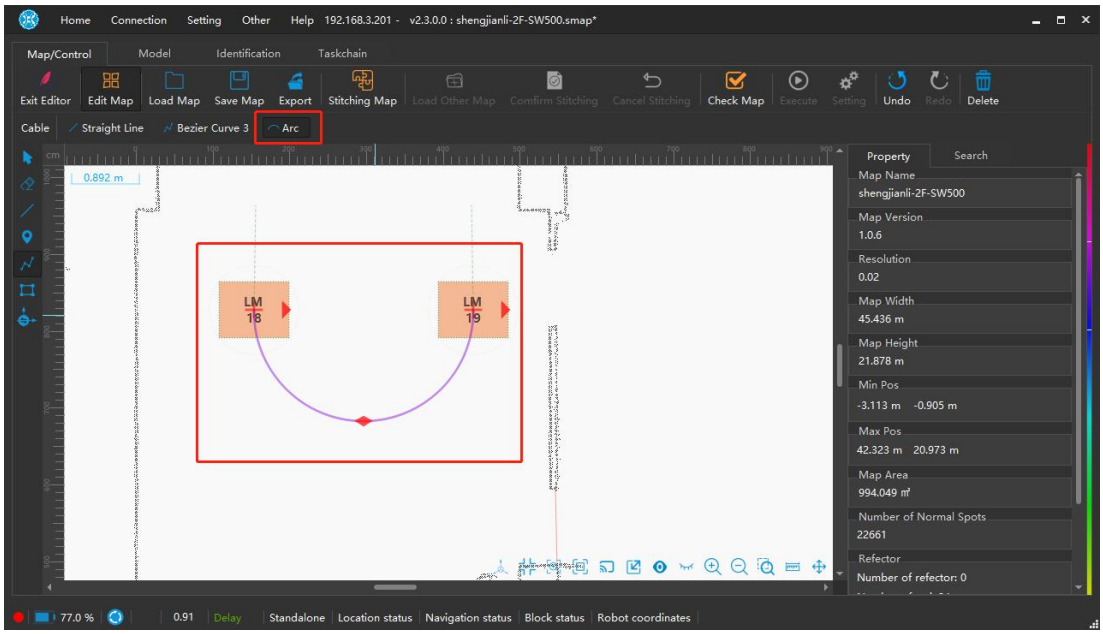
Bezier curve 3：

The picture below shows the connection using [Bessel Curve 3], the line of this type of connection can be changed by clicking on the line and then dragging the control point to change the shape of the line according to the actual demand.



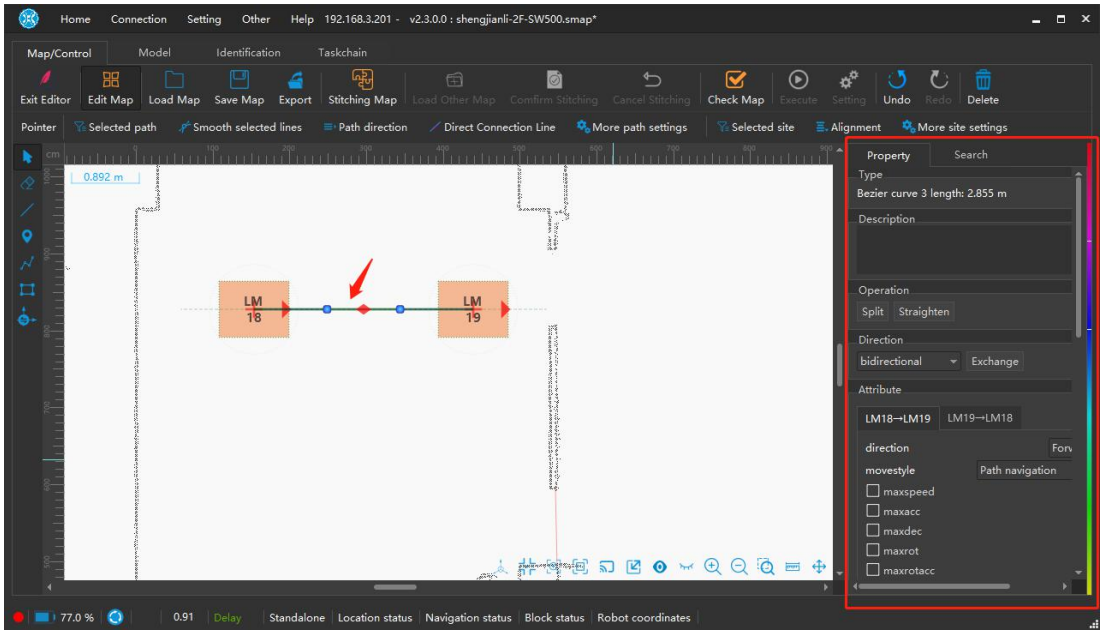
Arc:

You can change the arc shape and size of the line by clicking on the line and dragging the control point.



Path Attributes.

Once the line is selected using the pointer tool, the property bar on the right will display the properties of the corresponding line, as follows.



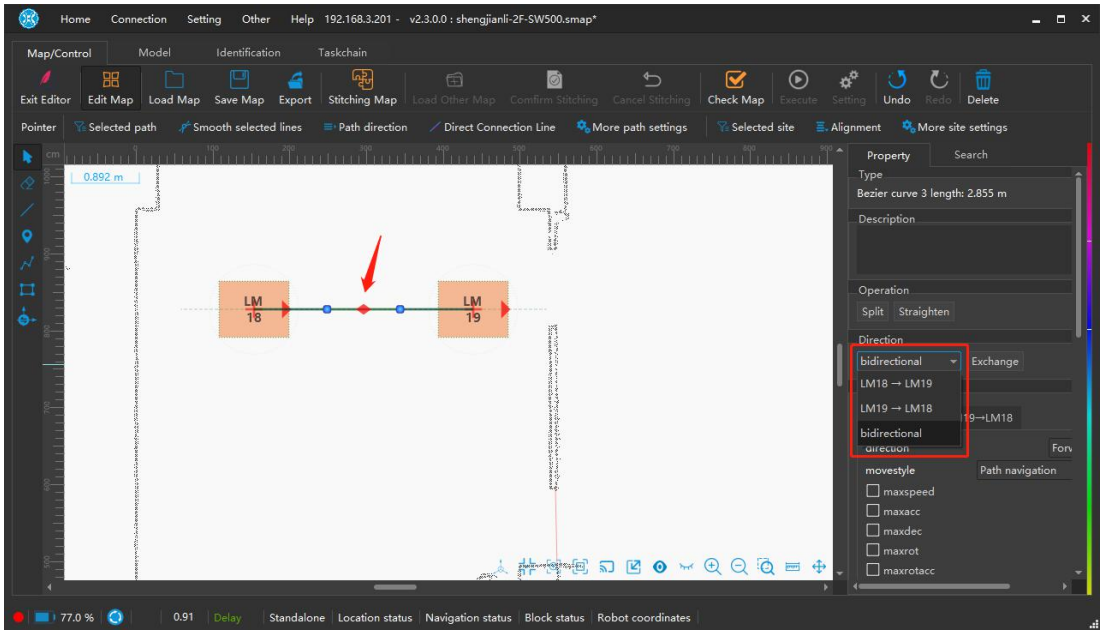
Each of these parameters is explained as follows.

[Type]: Type of cable.

[Description]: Used to add comments.

[Operation]: "Split" is used to split a bi-directional line into two unidirectional lines; "Straighten" is used to turn a line with a radius into a straight line.

[Direction]: Used to select the direction of this cable, which can be bi-directional, or LM19->LM18 uni-directional, or LM18->LM19 uni-directional, as shown in the figure.

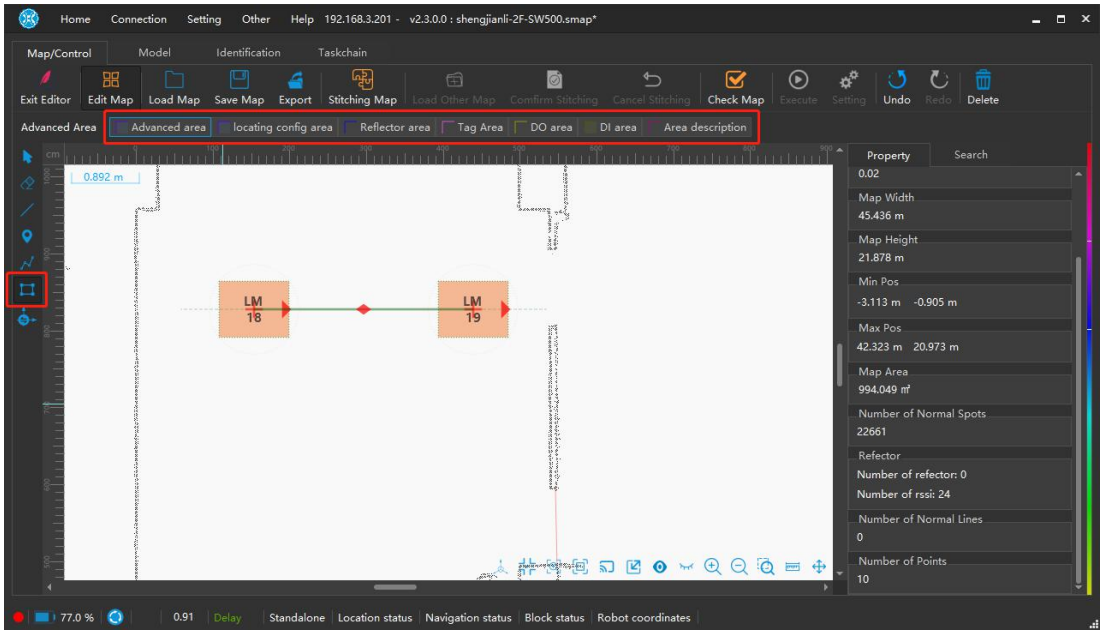


[Attribute]： used to set a special attribute in a certain direction that affects the behavior of the robot as it moves along this cable.

6.Advanced Area

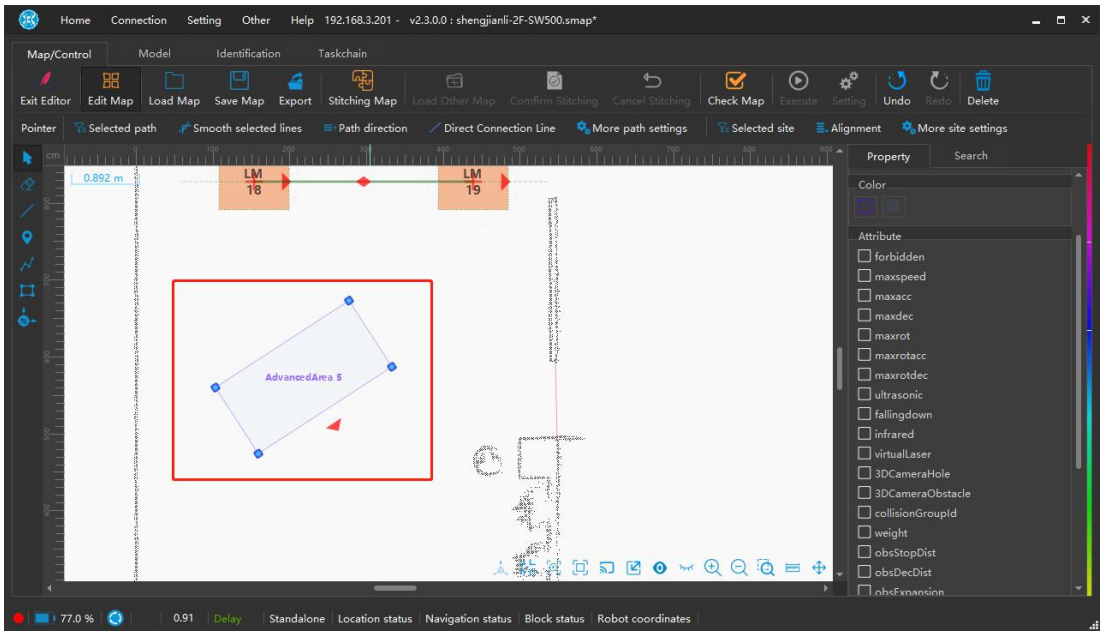
The Advanced Area tool is used to add areas with special features to the map. Click on the Advanced Areas tool and the mouse will change to a cross shape. Select the starting point of the advanced region on the map and click the left mouse button without releasing, drag the mouse to the desired position and release the mouse to add a rectangular advanced region.

There are six options in the contextual toolbar of the Advanced Region tool, which are Advanced area, locating config area, Reflector area, Tag area, DO area, DI area and Area Description Region, as shown below.



By default, an AdvancedArea is added, which can be selected as a different type by mouse click.

When the AdvancedArea is selected using the Pointer tool, the four zoom control points of the AdvancedArea will be highlighted in blue and one rotation control point will be highlighted in red, as shown below.

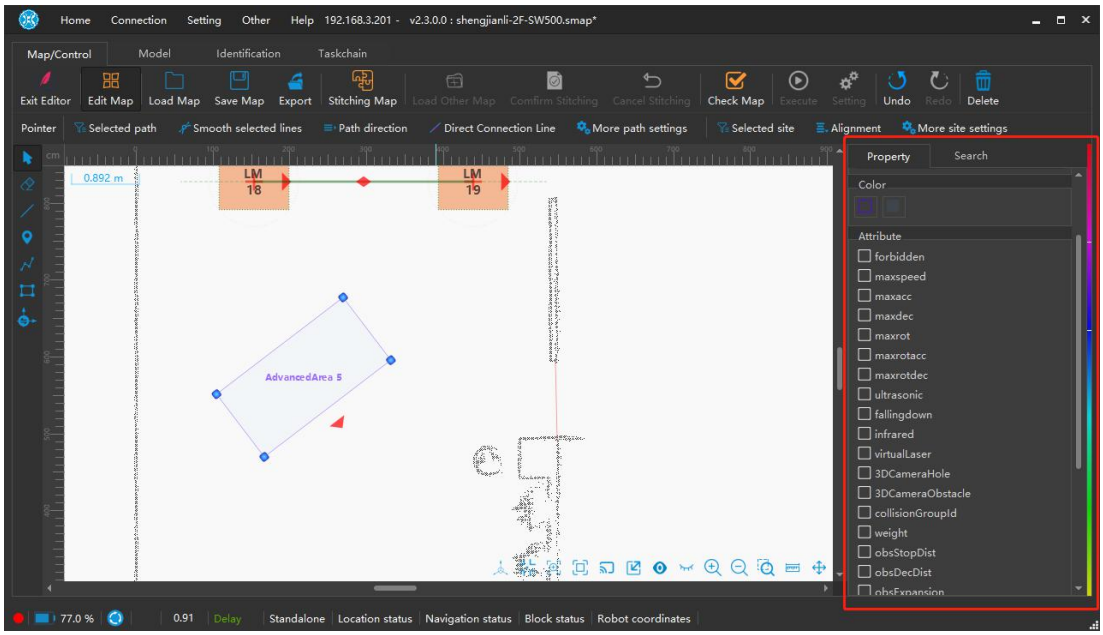


Use the Pointer tool to select and drag the blue Zoom [Control Point] [Rotate Control Point] to adjust the direction and angle of the advanced area.

Use the pointer tool to highlight and drag the [Non-Control Point Part] of the advanced area to move the advanced area's position as a whole.

Advanced Area Property:

Once the advanced area is selected using the pointer tool, the property bar on the right will display the properties of the corresponding advanced area, as shown below.



Each of these parameters is explained as follows.

[Type]: Type for the currently selected advanced area.

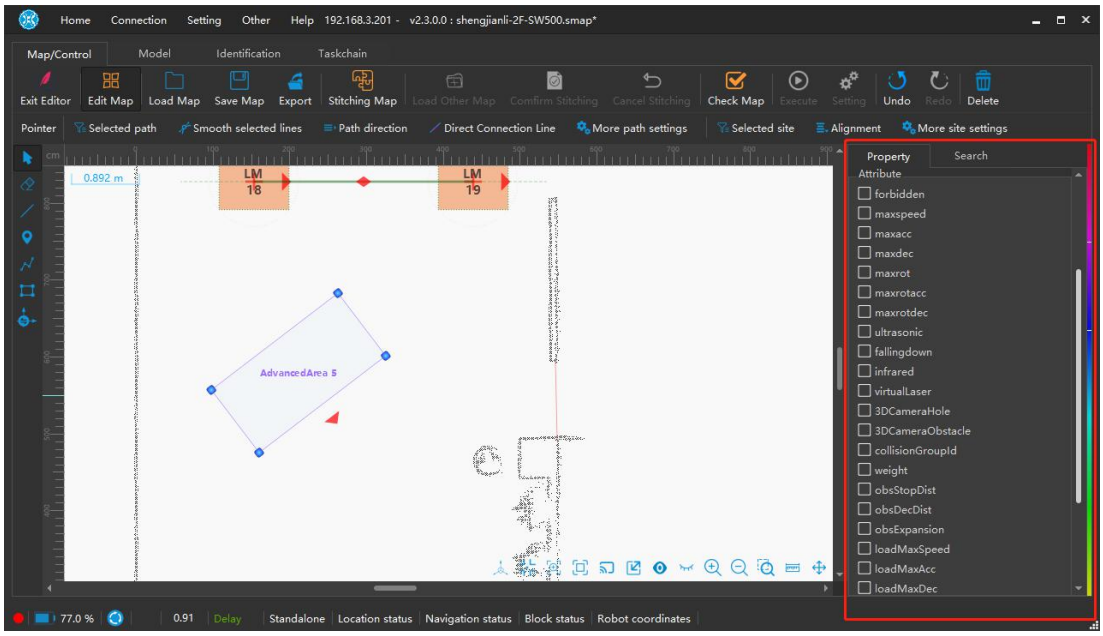
[DESCRIPTION] : Used to add comments.

[Color] : Used to adjust the border color and background color of the advanced area.

[Attribute] : Used to set a special attribute within a zone that affects the behavior of the robot when it moves within that zone.

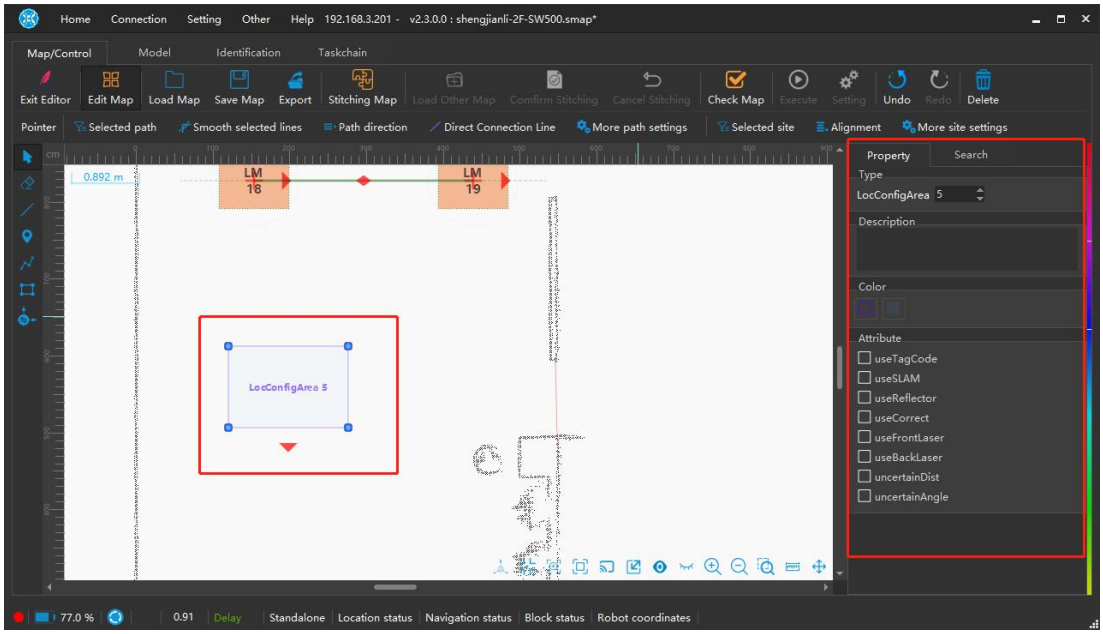
Advanced Area:

The General Advanced Attributes area contains attributes related to controlling the robot's movement within the area, such as whether or not to forbid access, limiting speed and acceleration, and controlling the enabling and stopping of ultrasound.



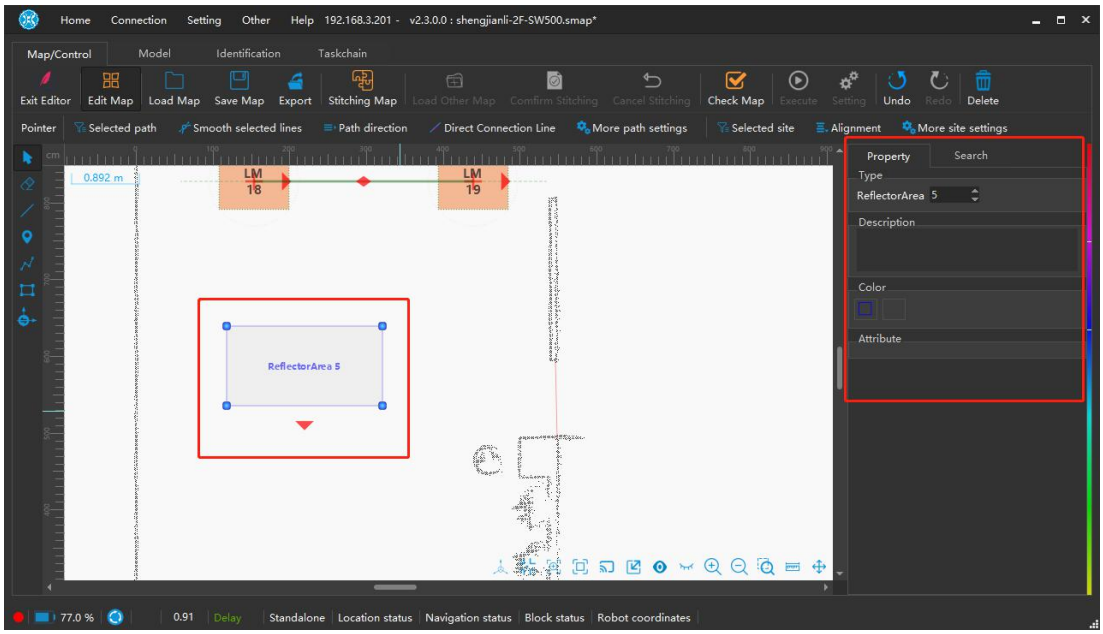
locating config area:

Used for contains attributes related to controlling the robot`s behaviors, such as useTagCode, useSLAM, useReflector, useCorrect and etc,.



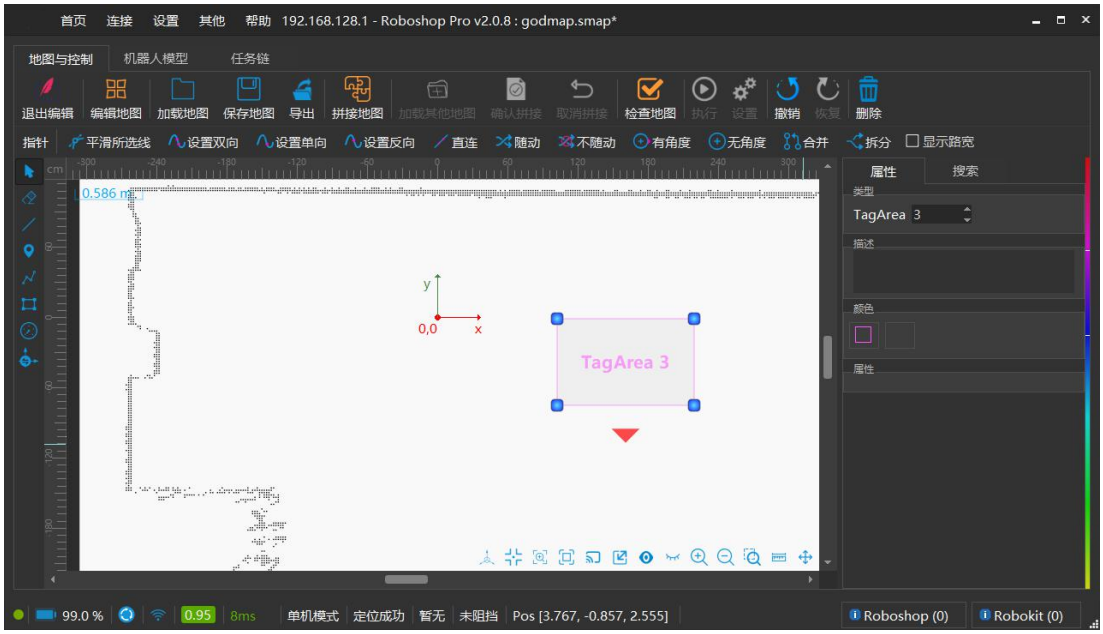
Reflector Area:

This type provides the robot with reflector identification and uses this advanced area on demand when reflectors are present in the area.



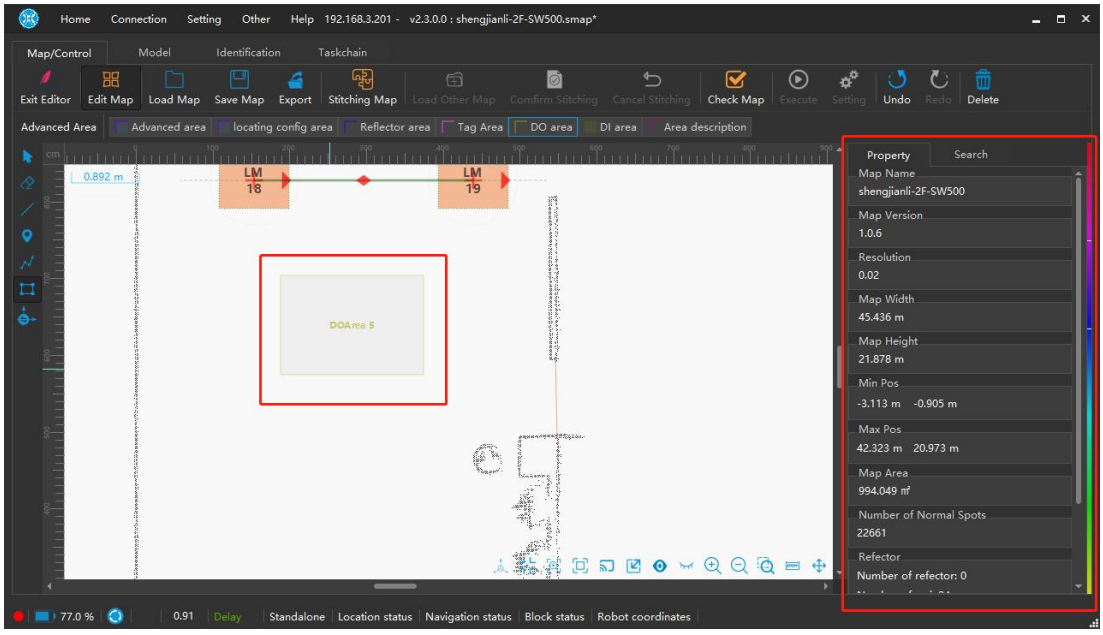
Tag Area:

This provides QR code recognition for the robot and uses this advanced area on demand when the area has QR codes.



DO Area：

This is an advanced area for setting the status of the DO in that area, and can be set in its property box.



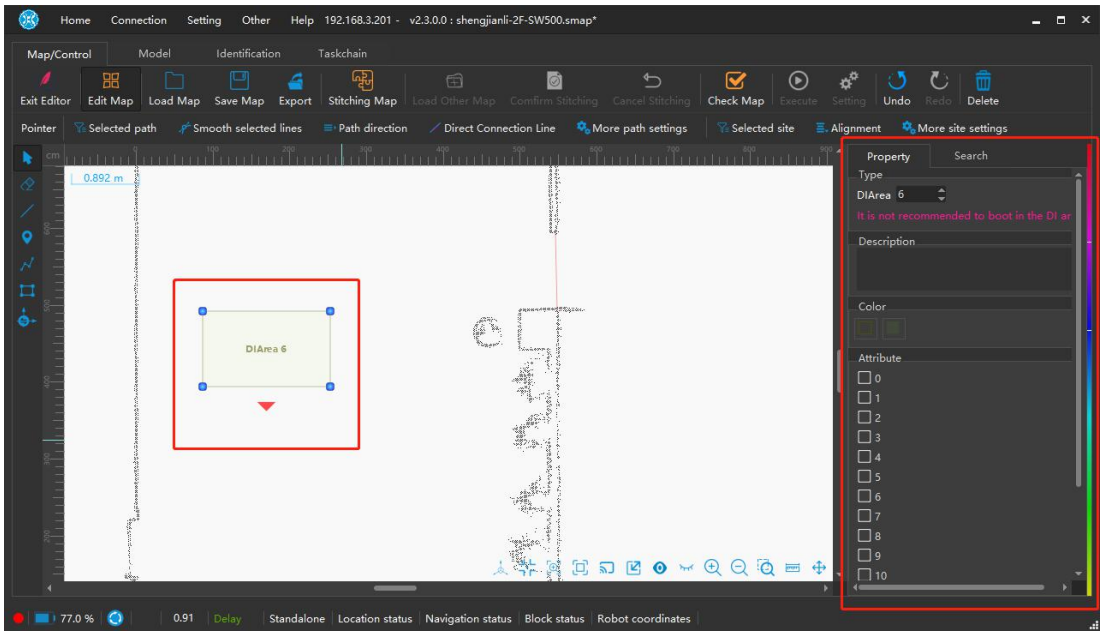
Its parameters relate to the default state of the DO.

Note 1: If the default value of DO is (1), then use FALSE as the parameter, and the response is: DO will set to 0 when entering the advanced area; DO will return to the default state of 1 when leaving the advanced area.

Note 2: If the default value of DO is (0), then use the parameter TRUE, and its response is: when entering the advanced area, DO sets 1; when leaving the advanced area, DO restores the default state 0.

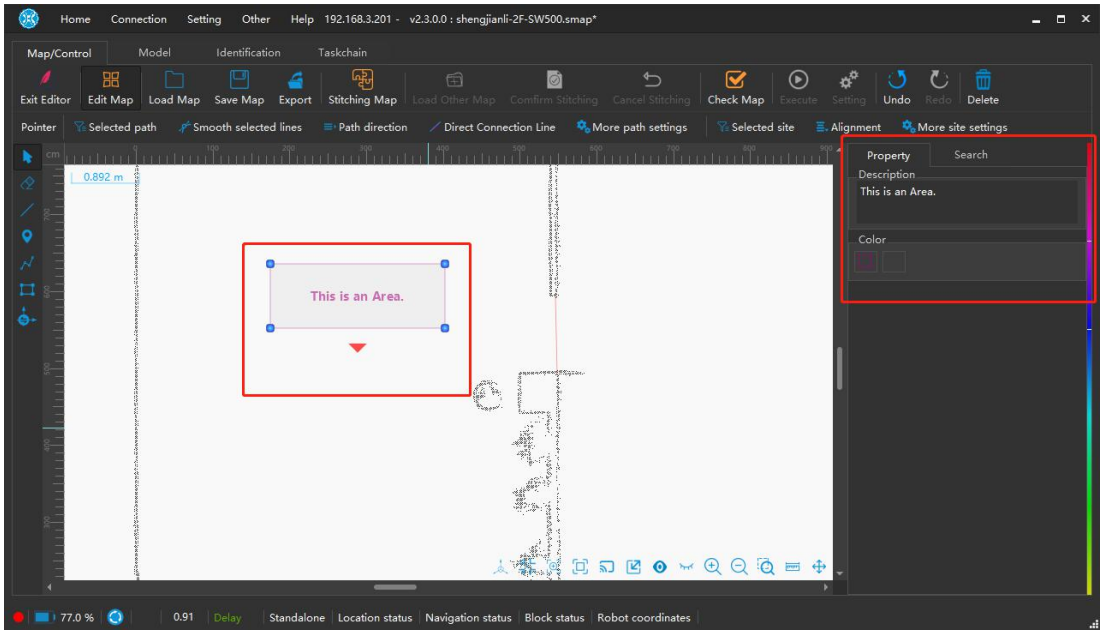
DI area:

This is an advanced area for setting the state of the DI in the area, and can be set in its property box, using the same parameters like the DO area.



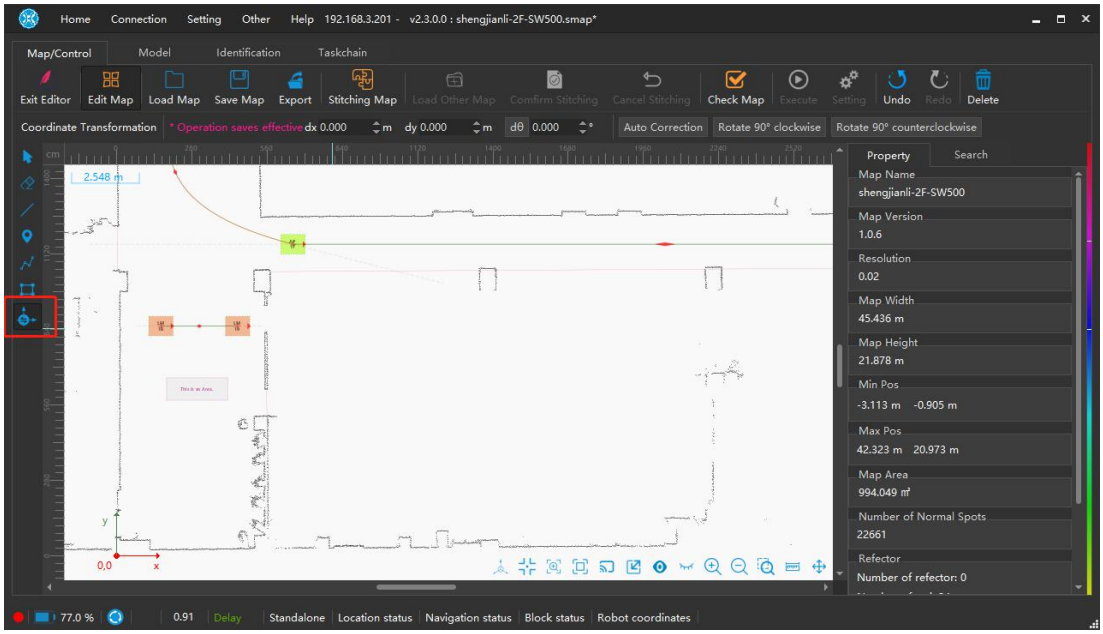
Area description:

This is used to set the area indication.



7.Coordinate Transformation

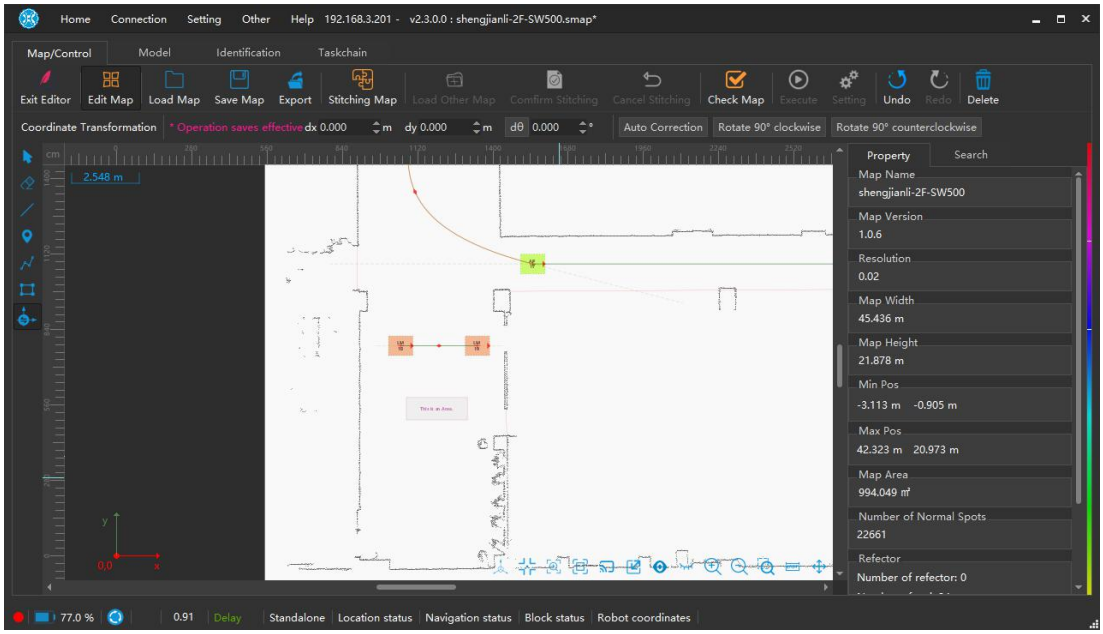
Used for panning and rotating the map. The main purpose is to rotate and pan the map to a state that is more suitable for the software user to view and edit.



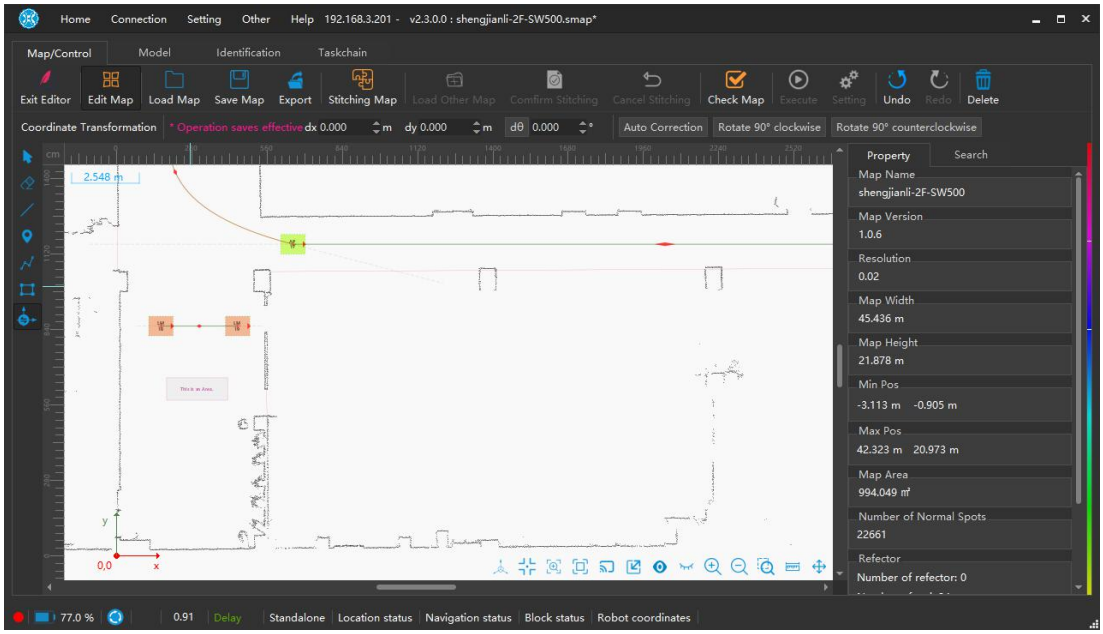
a. Pan Transform.

Move the map horizontally or vertically.

For example, pan the following map to the right.



Click on the [Coordinate Transform] button, then use the left click point to hold the map area without releasing, and drag in the direction of the arrow. After dragging to the desired position, release the mouse and click on the [Save Map] button, at this point the panning transformation has been completed.

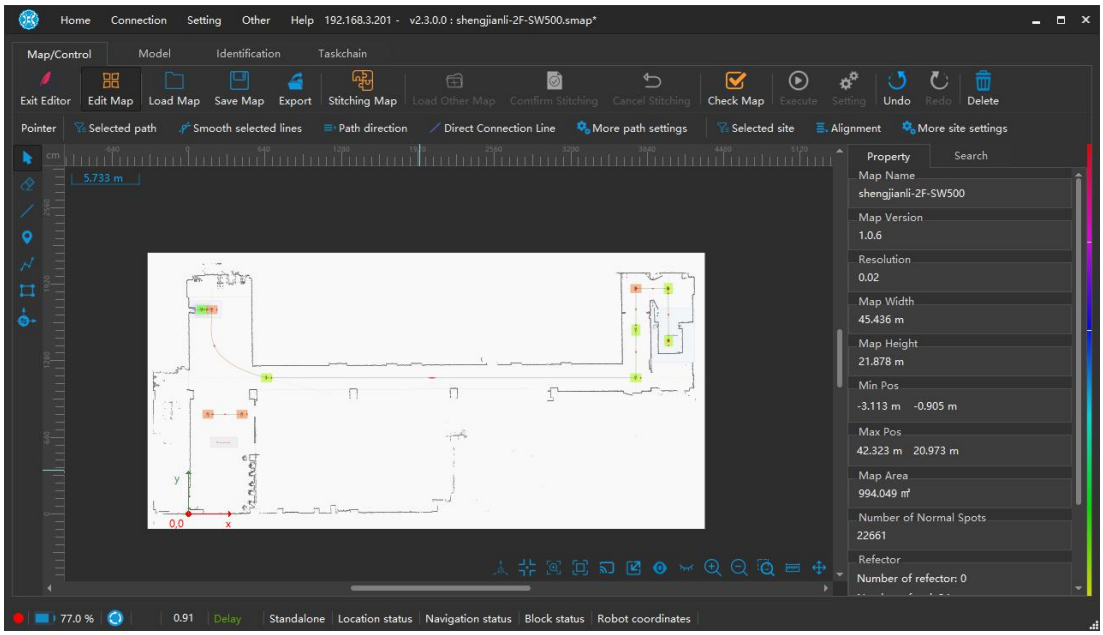


The origin of the coordinates has changed, and the values of all elements in the map have changed accordingly.

b. Rotational transformations.

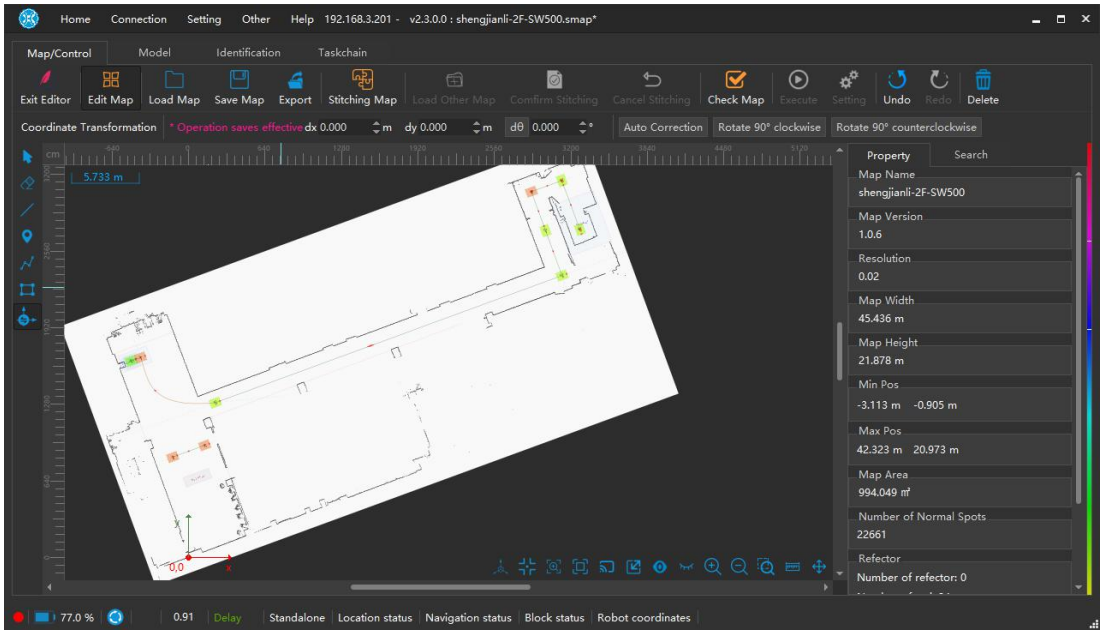
Rotate the map at a certain angle.

For example, rotate the following map counterclockwise by a certain angle.



Click the [Coordinate Transform] button, then use the right-click point to hold the map area without releasing it, and drag along the arrow.

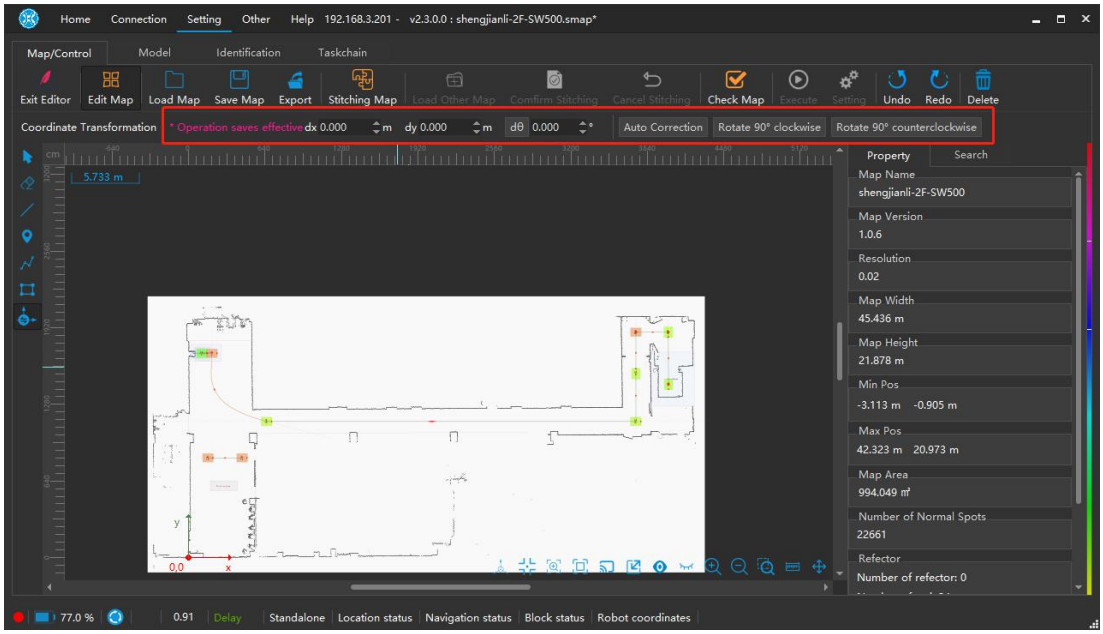
After dragging to the desired position, release the mouse and click the [Save Map] button, at this point the rotation transformation has been completed.



The rotation operation uses the origin (0,0) as the center of rotation.

Note: After the coordinate transformation operation, please save the map (Ctrl+S) and perform the following operation.

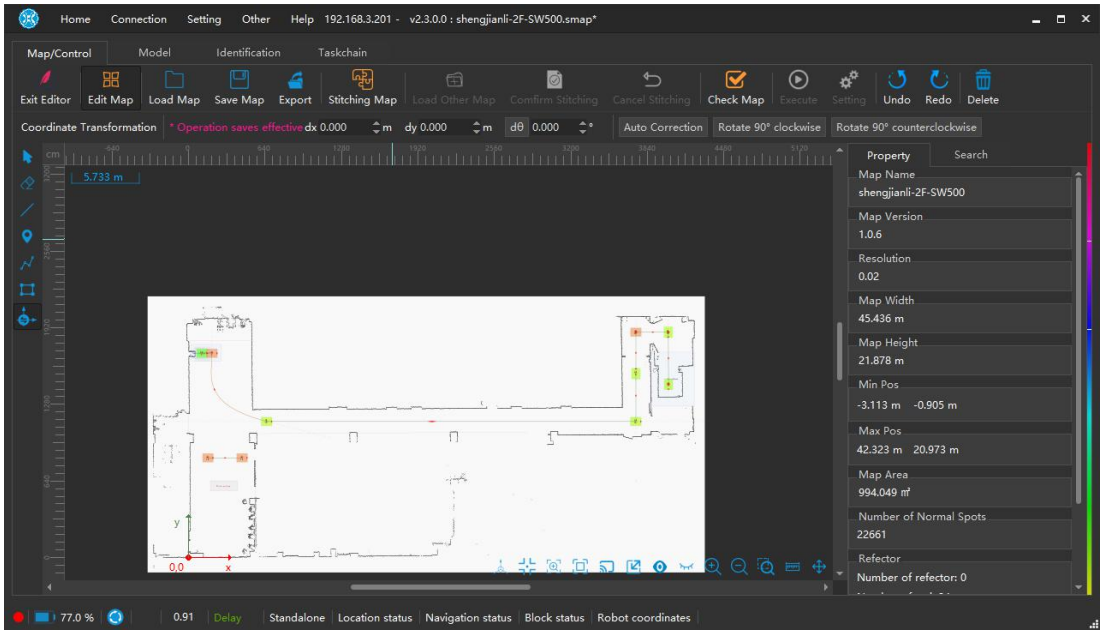
You can also use the toolbar to perform rotation and translation operations.



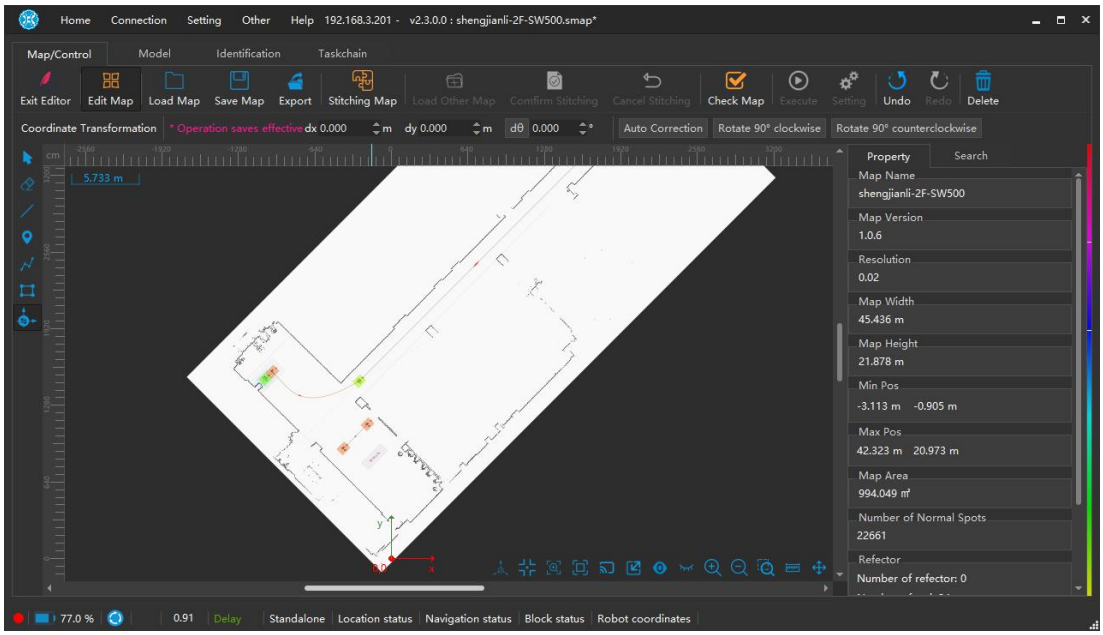
Where, [dx] [dy] can be entered as a value for translation transformation. [dθ] A value can be input to perform rotation transformation (the radian display is checked and the unit of rotation transformation is changed to radian).

Enter a value and then press Enter to apply the transformation to the set properties.

For example, we want to translate the following image by 1m to the left, 2m to the top and rotate it 45° counterclockwise.



Input "1" and "2" in [dx] and [dy], input 45 in [dθ].

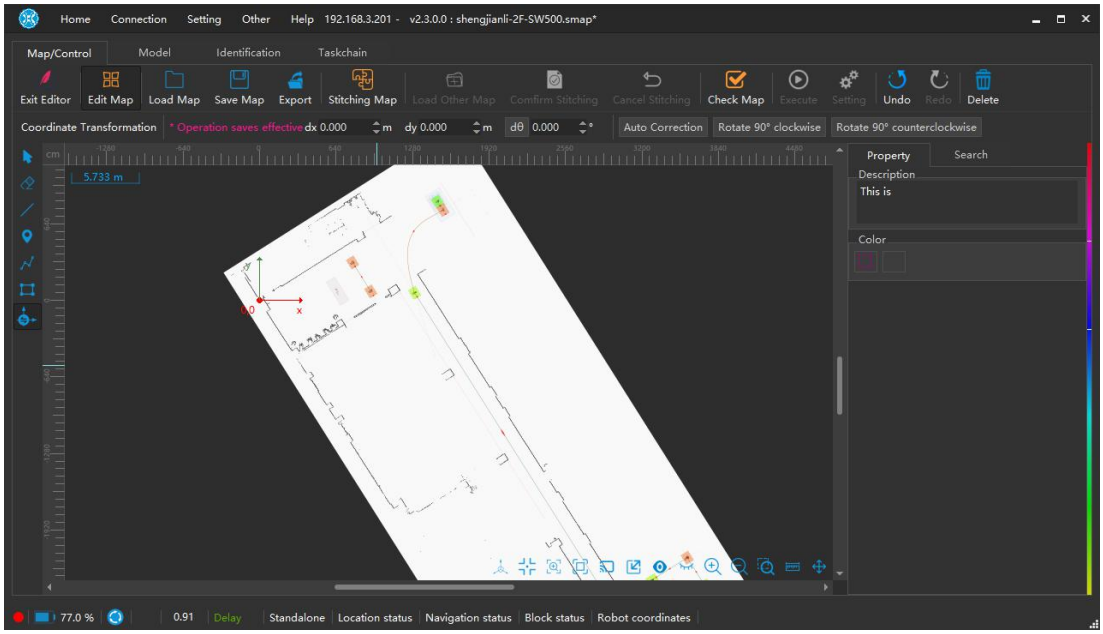


Then click on the [Save Map] button, at this point the pan and rotate transformations have been completed!

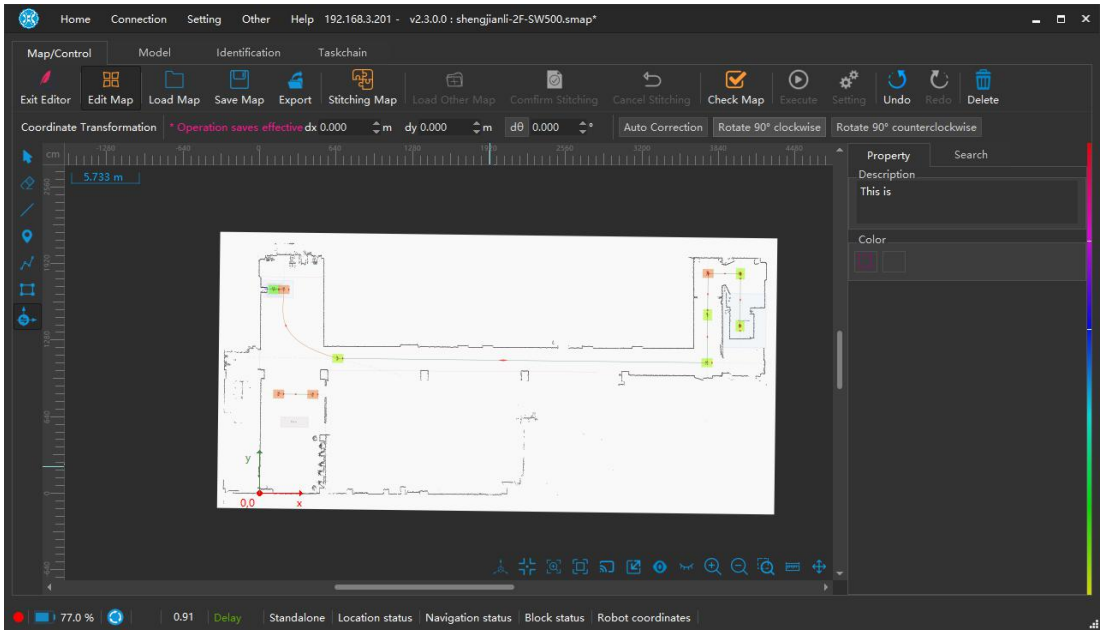
c. Auto-correction.

Suitable for quickly transforming maps that are not placed horizontally into horizontal maps.

For example, to autocorrect the following map.



Click on the [Coordinate Transformation] tool, click on the [Auto-correction] button, and then click on the [Save Map] button, the pan and rotate transform operations have been completed!



d. Rotate 90° clockwise.

Applies to the map in the current working interface, a quick 90° clockwise rotation, click on the button, the map will immediately rotate 90° clockwise.

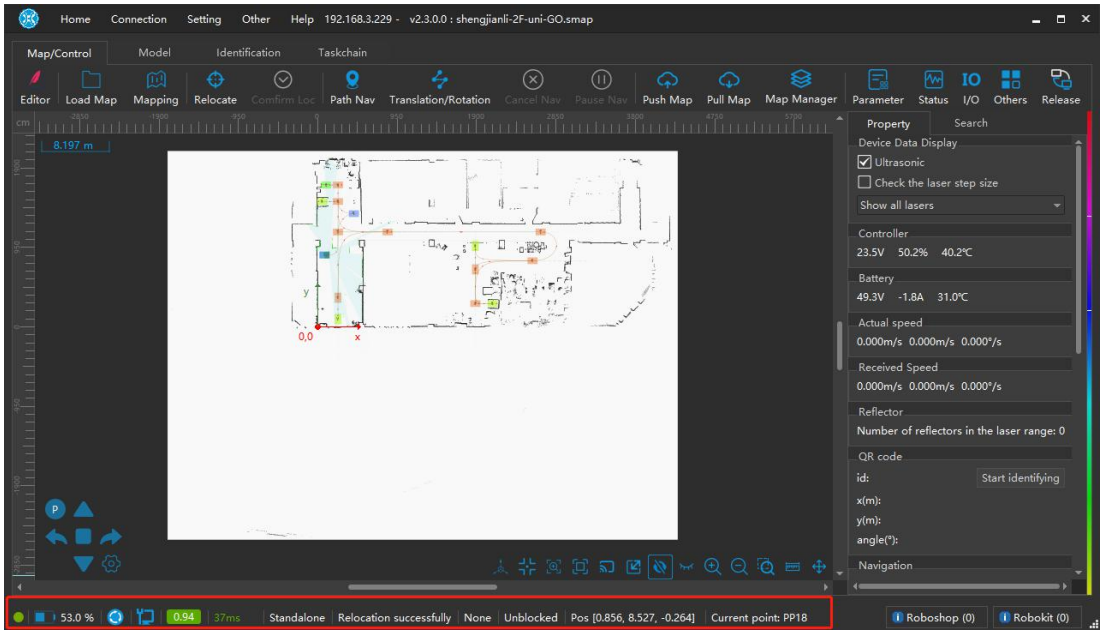
e. Rotate 90° counterclockwise.

Apply to the map in the current working interface, a quick counterclockwise rotation of 90 ° operation, click on the button, the map will immediately rotate 90 ° counterclockwise.

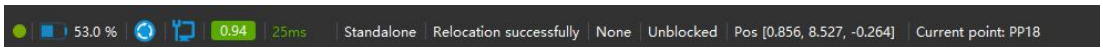
Note: It is not recommended to transform the map by coordinates when the positioning accuracy is high. This is because the coordinate transformation operation will cause a slight loss of positioning accuracy. It is recommended to adjust the robot's starting scanning direction to horizontal or vertical state when scanning the map.

Status

The status bar is located at the lowest end of the interface and is used to display real-time status information about the current robot, as shown in the following figure.



Let's zoom in to view the status bar, as shown below.

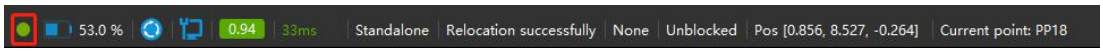


Each state is explained as follows.

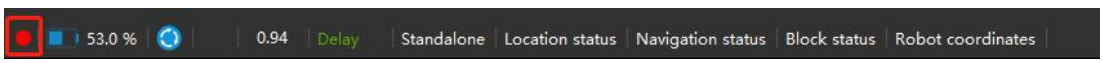
1. Connection status

It shows the robot's connection to Roboshop Pro.

a.The green icon is connected, as shown below.

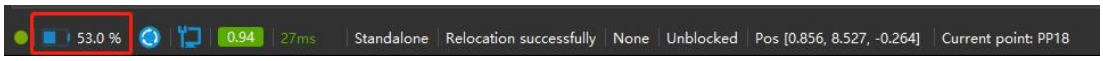


b. The red icon is not connected, as shown below.



2.Power status

The current robot battery charge information can be displayed, as shown in the following figure.



3.Emergency stop

It shows whether the current robot emergency stop button is taken or not.

a.If the Emergency Stop button is not taken, the icon is displayed in blue as shown below.



b.The emergency stop button has been taken and the icon is displayed in red as shown below.



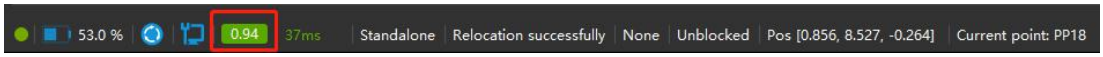
4.Network connection status

The current robot's network connection can be displayed, and hovering the mouse allows you to view details, as shown in the following image.



5.Confidence

It shows how well the shape scanned by the LIDAR matches the robot's current position on the map, and the higher the confidence level, the closer the robot's position is to the real position in the area, with an upper limit of 1.00, as shown in the following figure.



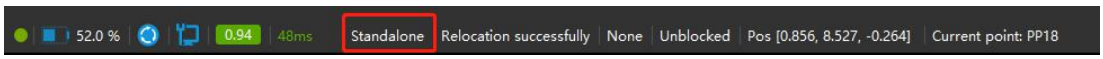
6.Network Delay

It shows the network connection delay. The lower the network latency, the more stable the network communication between Roboshop Pro and the robot, as shown in the following figure.



7.Robot mode

It can display the mode in which the robot is currently in, generally including standalone mode, scheduling mode, scheduling disconnection mode, etc. The following figure shows the status bar in standalone mode.



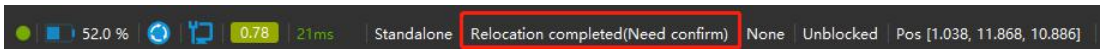
8.Location Status

It shows the current robot's Relocation status.

a. When relocation is successful, as shown in the figure below.



b.When relocation is finished but not confirmed, as shown in the figure below.



b.When the robot is relocating, as shown in the figure below.



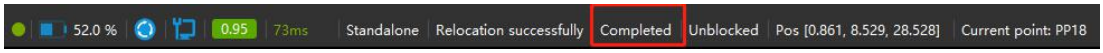
9.Navigation status

It shows the current navigation of the robot.

a. Being navigated, as shown in the figure below.



b.Navigation has been finished, as shown in the figure below.



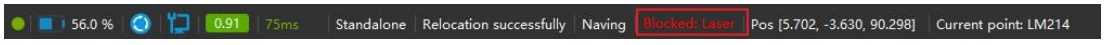
10.Blocked Status

Can show whether the robot is currently blocked and the reason for the block when it is.

a. When unblocked, as shown below.



b. When blocked，it will show blocked and the reason，as shown below:





11.Robot coordinates

The current coordinate position of the connected robot is displayed, and the data is updated in real time as the robot moves.



12.Real-time Position

Indicate which position the robot locates.



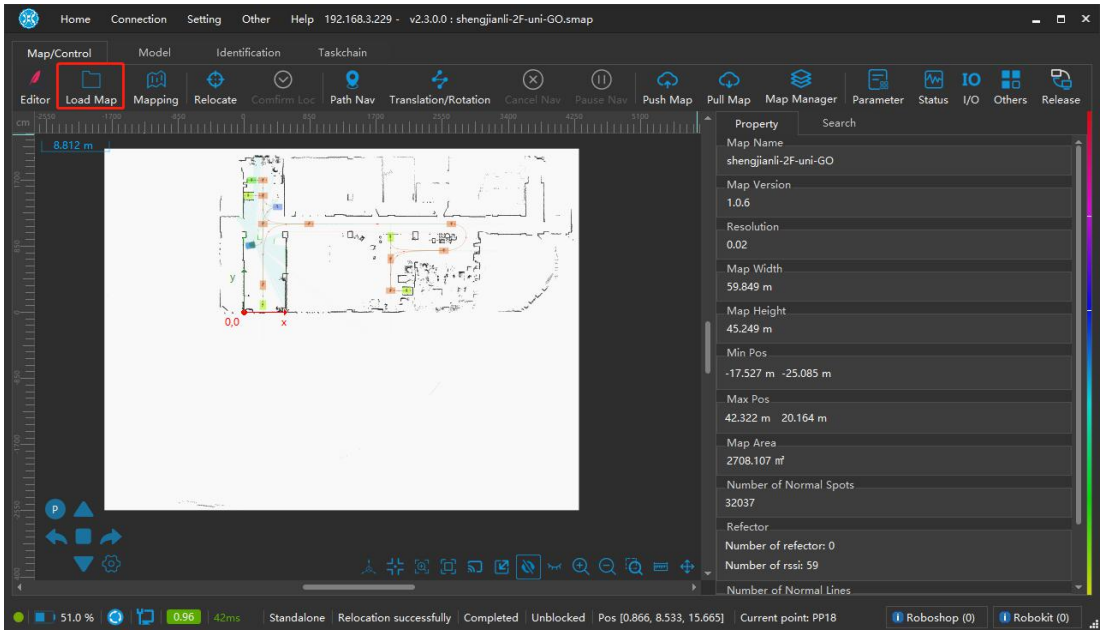
Control

Robot Control in Roboshop Pro

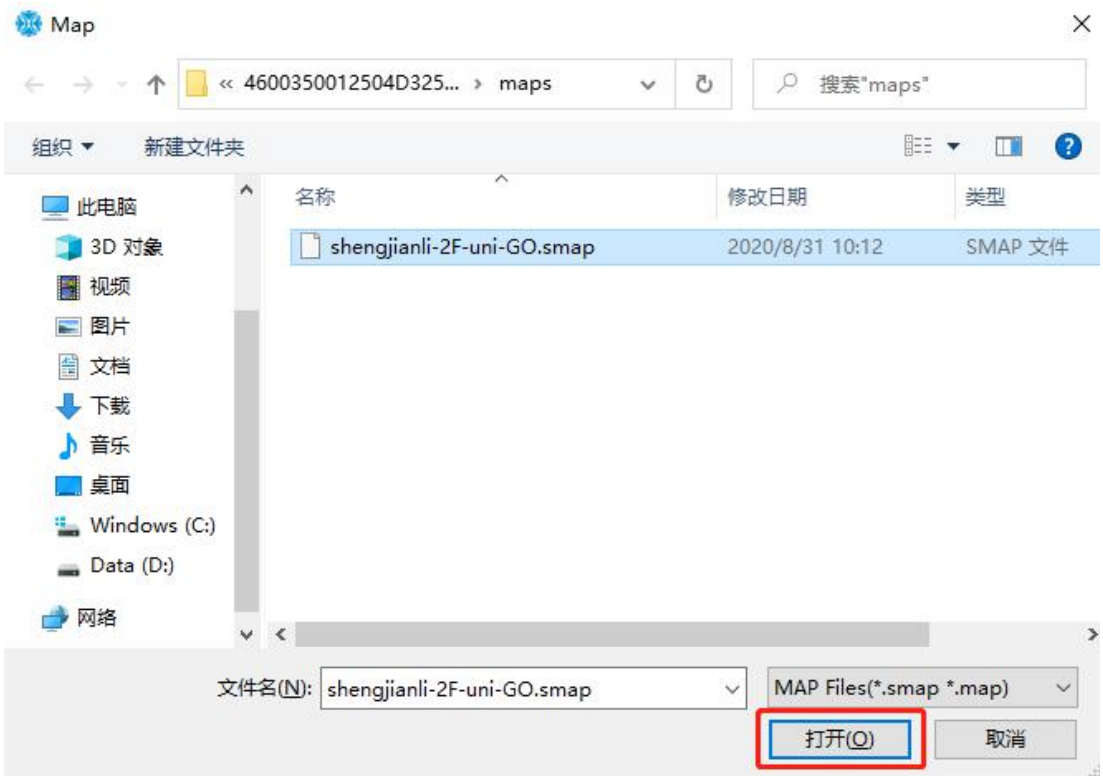
Load Map

Use to load an existing map file for use or to edit.

Click the [Load Map] button.



Select the path where the map is stored, then select the map you want to load and click the [Open] button.



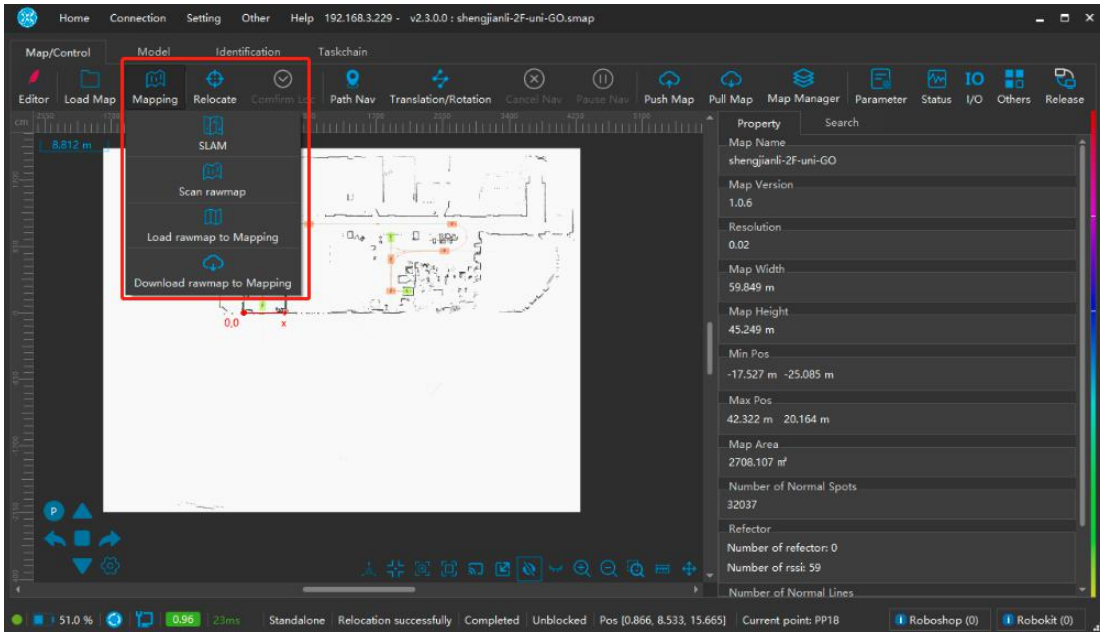
then the map can be loaded successfully.

Mapping

Constructing a map is a process of using the LIDAR on the robot to scan the contours of the environment and generate a point cloud map that the robot can parse.

A default map named “default.smap” is stored, which needs to be built before it can be used in the real environment. There are two ways to build the map: SLAM (online map building) and offline map building (scanning rawmap, loading rawmap for building, downloading rawmap for building).

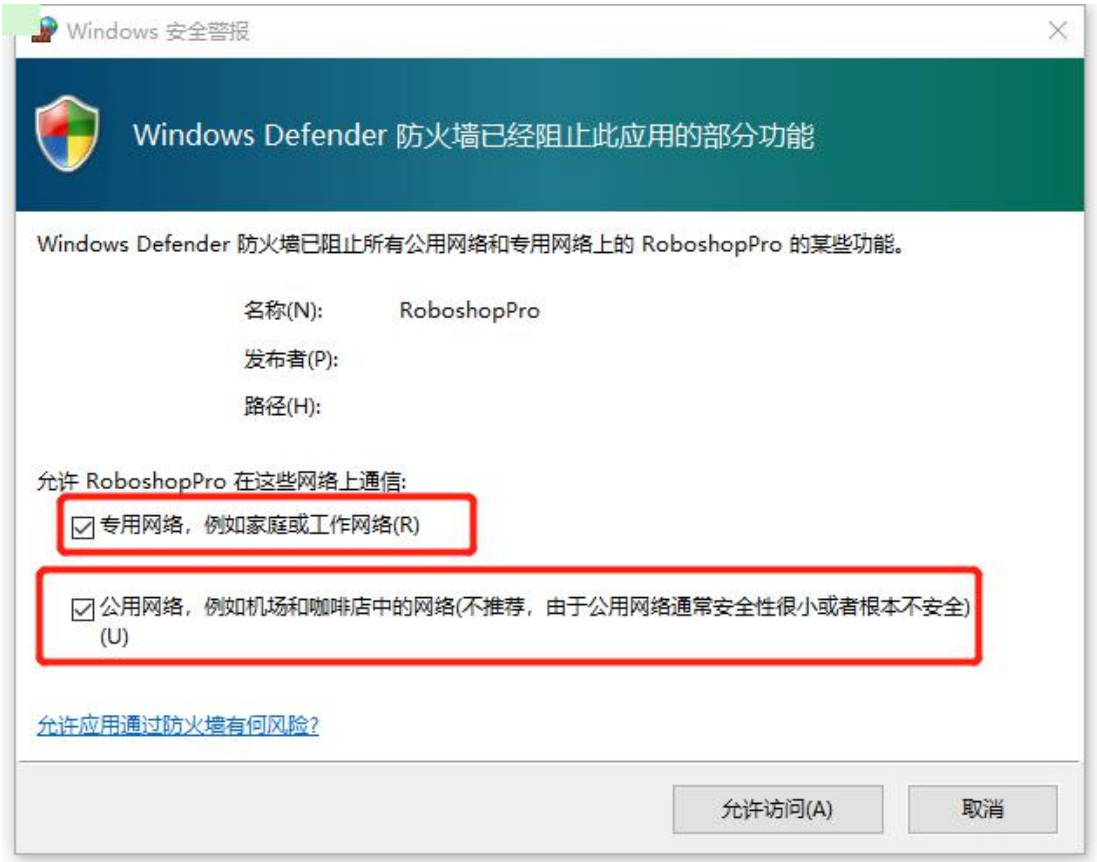
Clicking on the [Mapping] button in RoboshopPro will bring up the following 4 options.



1. SLAM（Online Building Map)

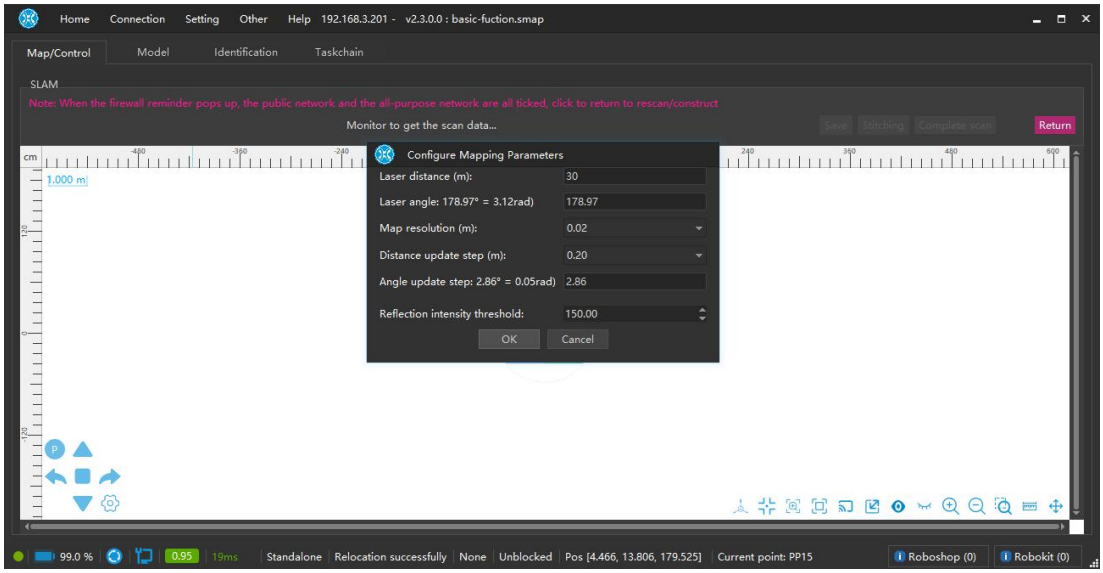
This method is scanning environmental data and building map at the same time. When the robot is running, it can generate the map in real time.

Click on [Mapping]-->[SLAM] in the module toolbar to access the SLAM map building function. If Windows firewall warning pops up, please check both private and public networks as shown below and click [Allow]. If only one is checked, RoboshopPro's SLAM function may not work properly when the computer is connected to another network. Please also click [Allow] if other antivirus software or firewalls are popping up to block it.



After popping up the firewall window for the first time and clicking Allow, you need to exit the SLAM window and then click [Mapping] --> [SLAM] again to use it normally.

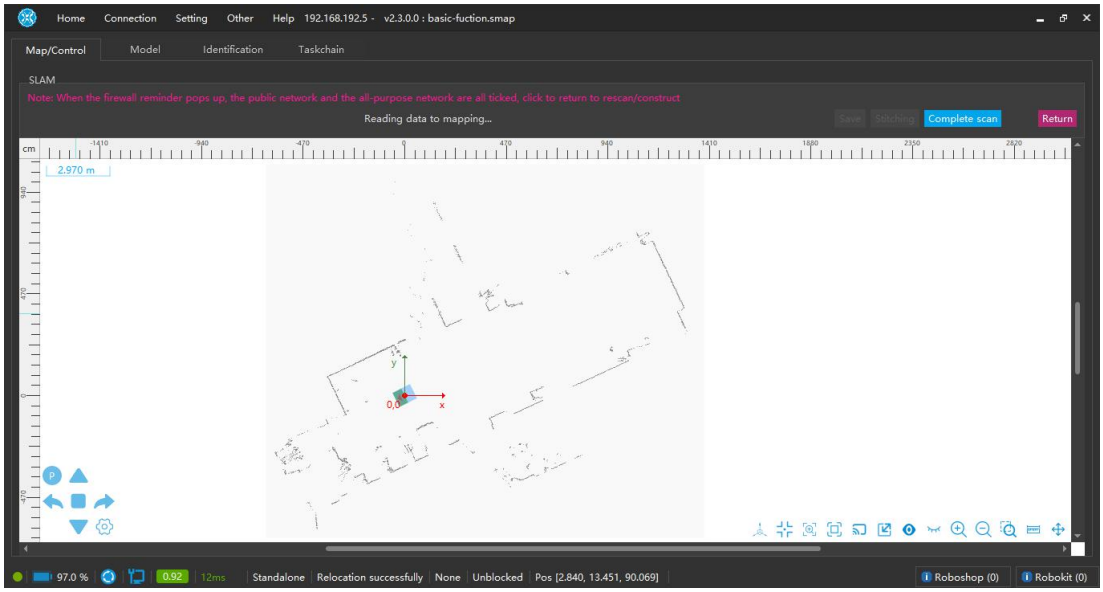
In the dialog box that pops up to configure the map build, click the [OK] button, as shown below.



Note 1: The parameters in the pop-up window are automatically identified according to the LIDAR used, please do not modify them under normal circumstances.

Note 2: If there is no automatic pop-up window for the parameters of the map, it means the data is intercepted, please turn off the firewall of antivirus software and Windows firewall.

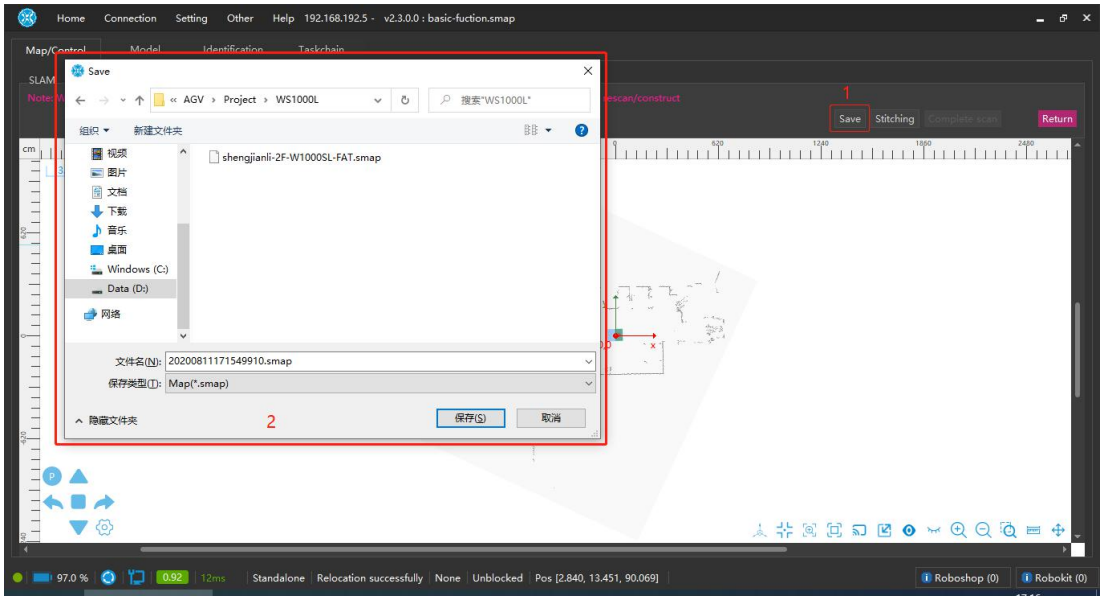
Then use the W, A, S and D keys of the keyboard to remotely control the robot so that it runs around the environment as shown in the following figure.



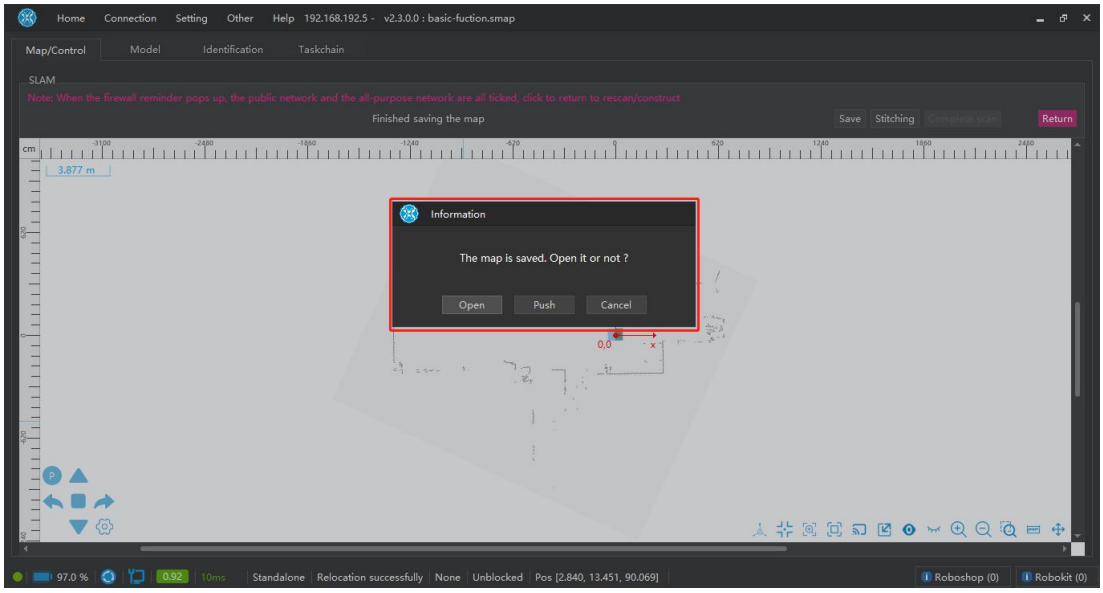
Make the laser scan objects in the environment from all angles as much as possible, i.e., control the robot to go back and forth twice on the actual line it is running on. Areas with features (non-flat walls) can be scanned clearly.

To see a full view of the currently constructed map, hold down Ctrl and roll the mouse wheel in SLAM's window to zoom in and out, or use the zoom in/out button in the lower right corner.

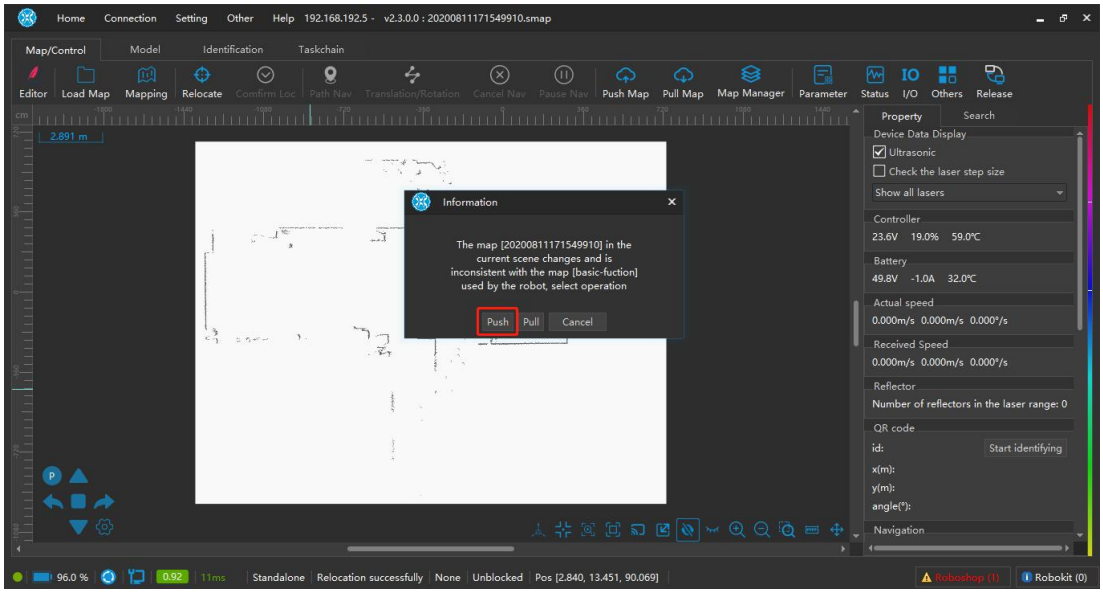
Click [Save] and select the target path to save the scanned map.



When the save is complete, the software will pop up the following dialog box, asking if you want to open the map you just saved. If you want to open it directly, click the [OK] button.



When you open the new map, it will pop up a prompt box with inconsistent map data, select [Push] to let the robot use the new map.



At this point, [SLAM] for online map building has been completed.

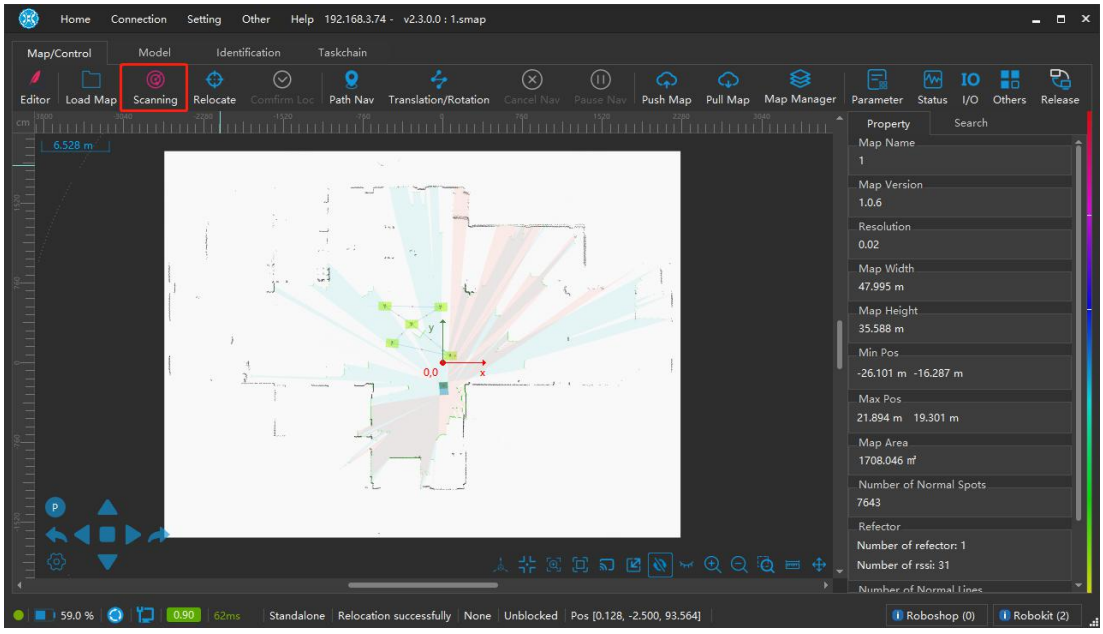
2. Offline Building Map

The first step is to scan the rawmap data, and then use the rawmap data to build the map.

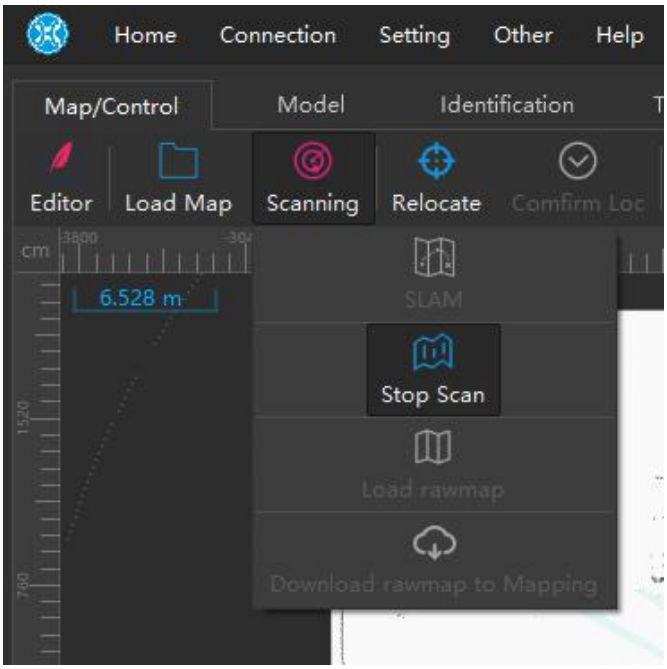
1. Scan

Scanning the [rawmap] file means scanning the environment data, which requires the robot to run around in the environment.

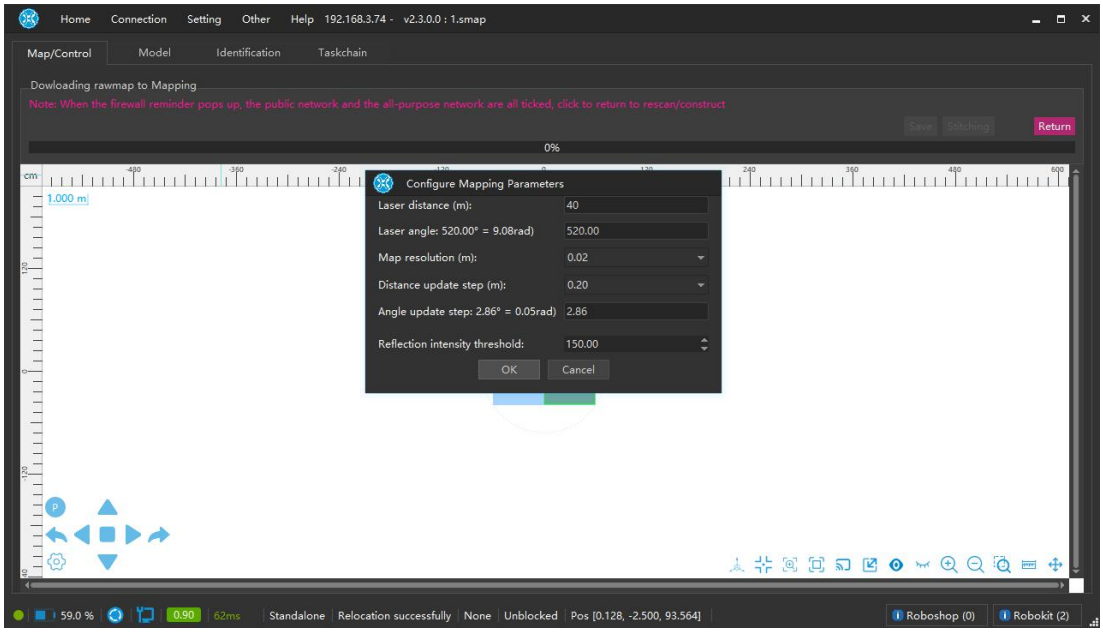
Unlike SLAM, this method doesn't display the robot's trajectory and the map built in real time. Click on [Mapping]-->[Scan rawmap] to enter the scanning mode, you can see the map building button has changed to the pink [Scanning Map] button in the picture below.



Then use the W, A, S, D keys of the keyboard to remote control the robot and make it run around the environment, then click [Mapping] --> [Stop Mapping].



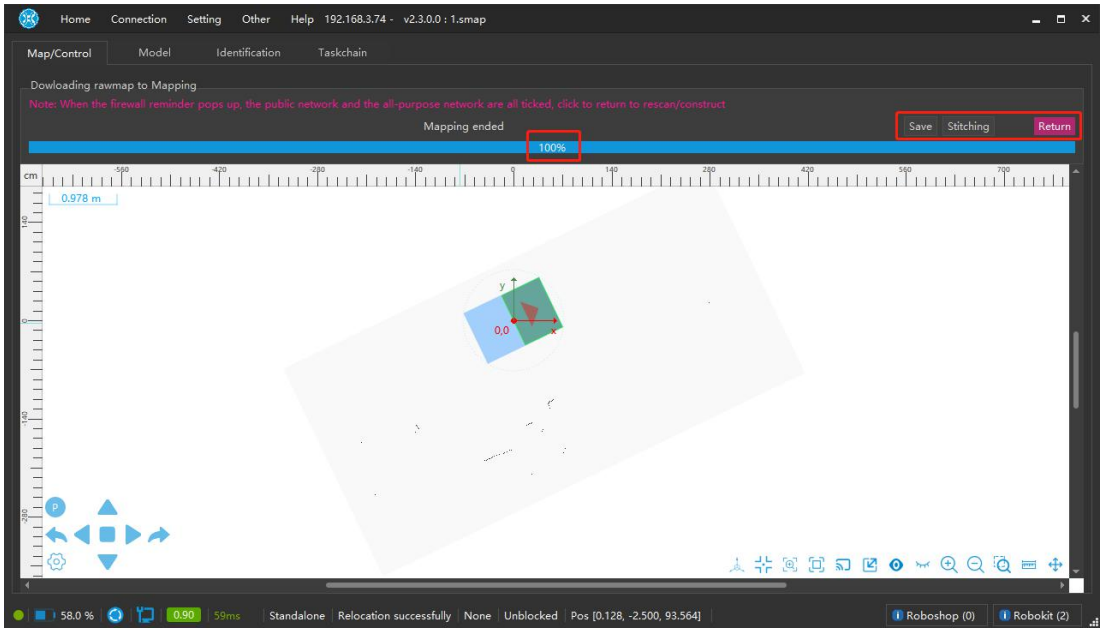
Roboshop will automatically download rawmap data from the robot, when the data download is complete, it will pop up a dialog box with the same map building parameters as [SLAM], click [OK] button to start map building.



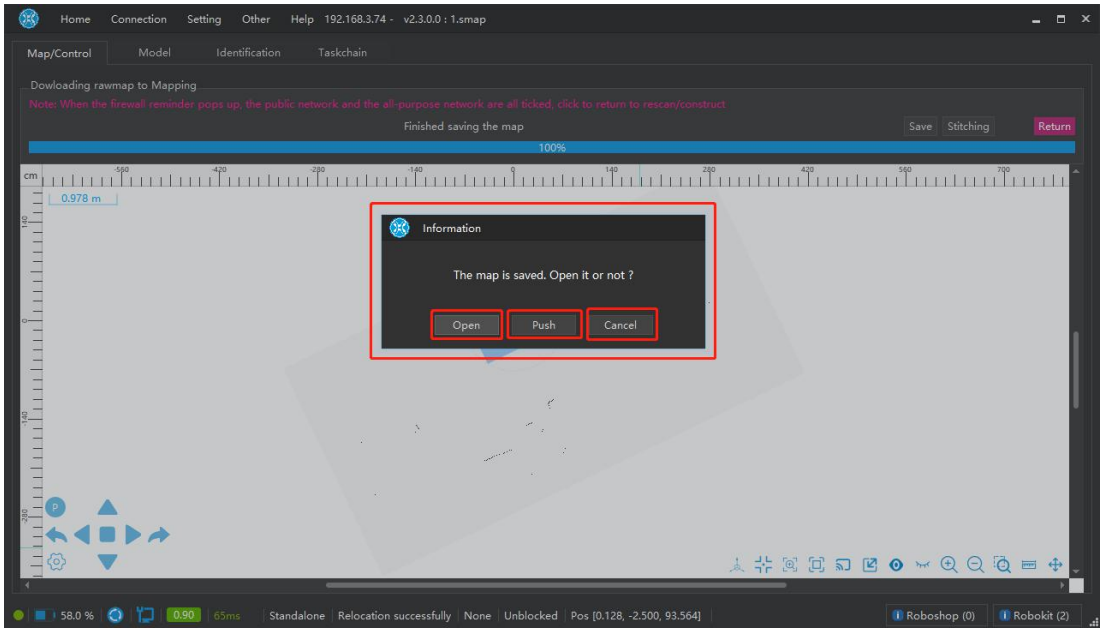
If you want to see the whole map, press Ctrl and roll the mouse wheel in the window to zoom in and out, or use the zoom in/out button in the lower right corner. When the progress bar reaches 100%, click the [Save] button to save

the map. After saving, the software will pop up a dialog box to ask if you want to open the saved map directly. Then click [OK] button.

Or you can click [Stiching] button to stich the map in the other map.And you can also click [Return] to get back to previous steps.



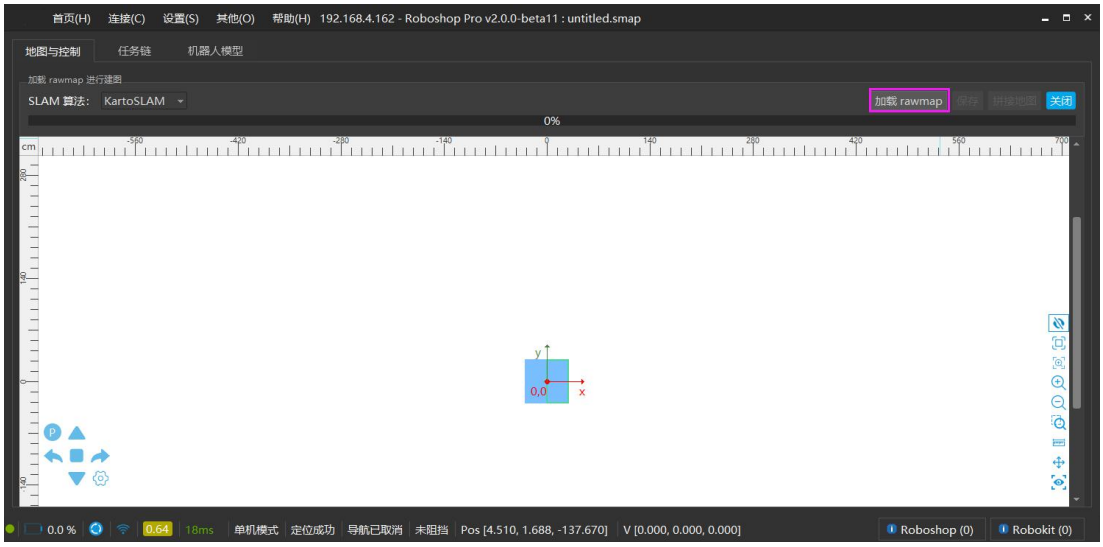
When you open the new map, it will pop up a prompt box with inconsistent map data, select [Push] to let the robot use the new map. Or you can click [Open] button to load this new map in Roboshop and click [Cancel] button to cancel all the operation.



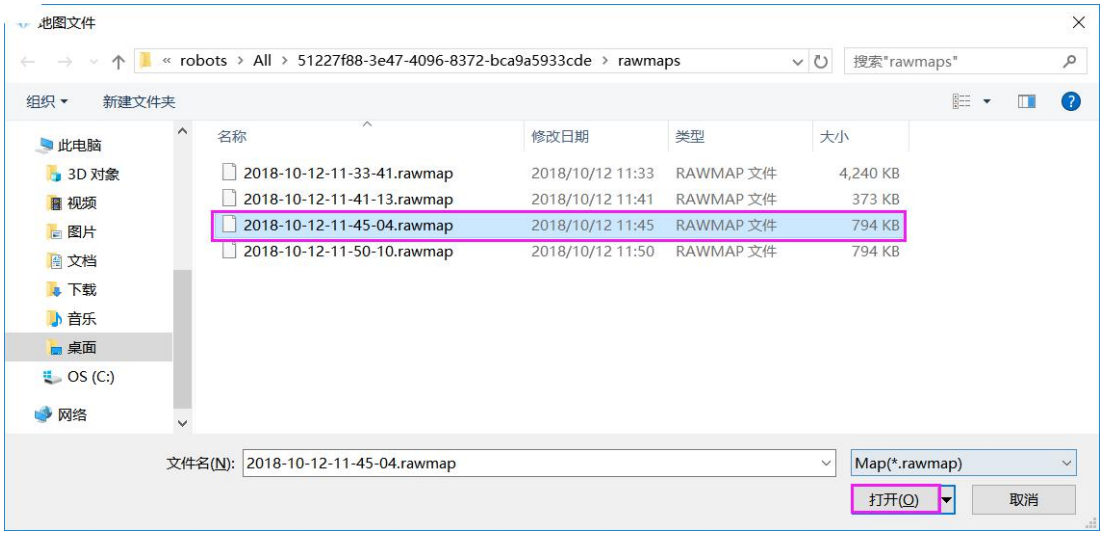
At this point, [Scan rawmap] for offline map building has been completed.

Load rawmap to Mapping

The rawmap is the raw data from the robot's scanned environment and can also be used to build maps by loading .rawmap files. Roboshop Pro makes a backup of the rawmap file after each offline map build, and stores it in the RoboshopPro installation directory in the appinfo/<robot data>/rawmaps folder (named after the date and time it was created). To build a map in this way, click [Mapping]-->[Load rawmap], and in the window that opens, click the [Load rawmap] button:



In the open file selection window, select the target .rawmap file and click [Open] button.



In the popup dialog box of map building parameters, click [OK] button, wait until the progress bar reaches 100%, then save the operation to finish building the map.

Download rawmap to build map

This method is mainly used when the map building window is closed during the building process, or the window is closed when you forget to save the map as .smap after the map building is finished. In this case, you can click on

[Mapping]-->[Load rawmap] button, Roboshop Pro will retrieve the last scanned data (if it exists) and bring up the build window again. The follow-up is the same as above.

3. Environment Requirement

The following is a list of some common environments that are not suitable for robot operation, so please avoid them or deal with them accordingly.

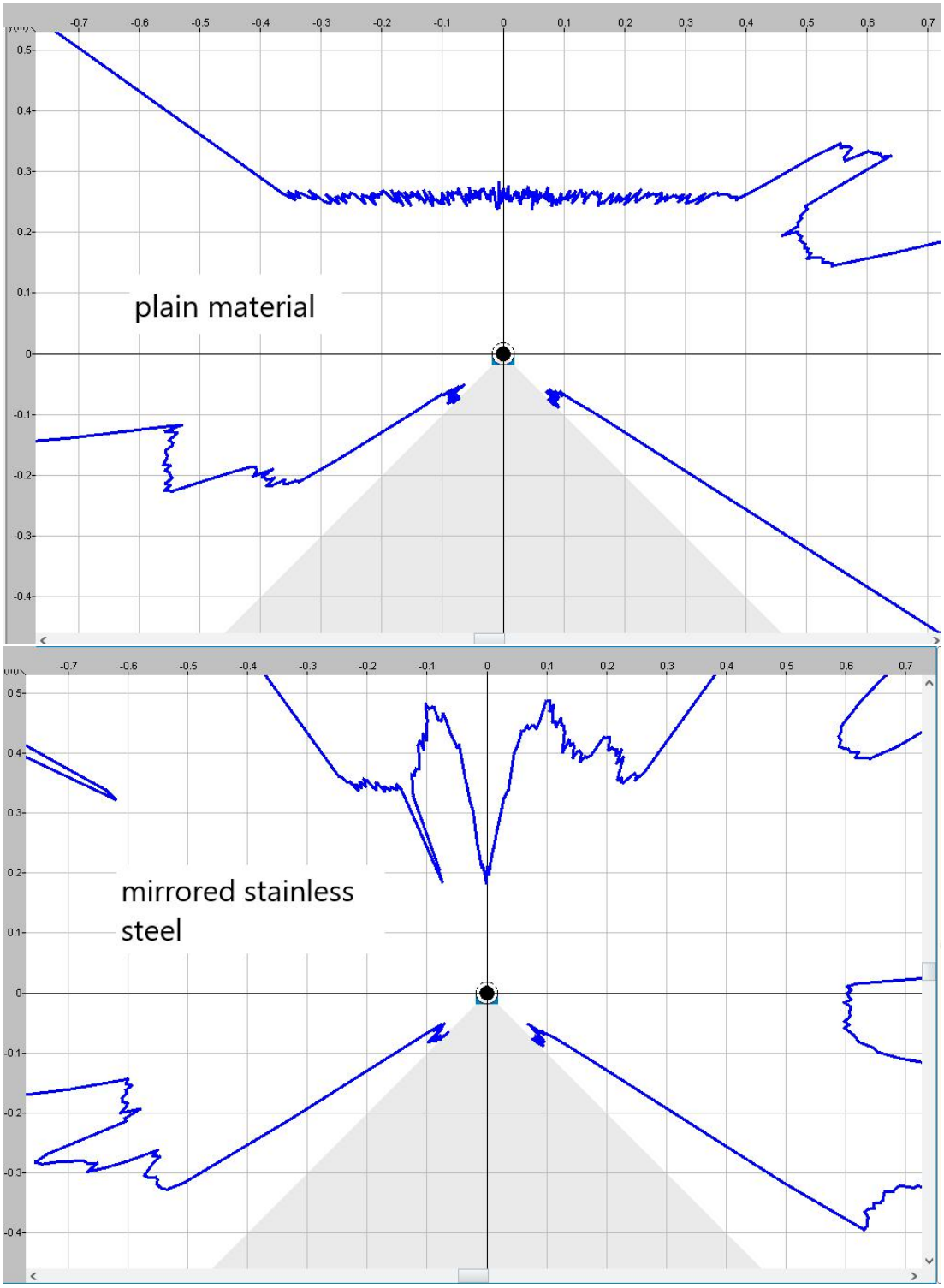
a. Material of the environment

The following environmental materials can affect the robot's mapping and position navigation.

1. The robot's LIDAR cannot correctly scan objects with specular reflective surfaces (e.g. mirrors, smooth metal surfaces, etc.)



The two images below show the raw LIDAR data in plain material and mirrored stainless steel panels. As you can see, the plain material is basically a flat surface, while the mirrored stainless steel panel is so cluttered with data that it is impossible to see that it is a flat surface.



2. The robot's LIDAR does not correctly scan transparent or translucent objects (e.g. glass, partially hairy glass, etc.).



3. The robot's LIDAR cannot scan black objects correctly, the black will absorb all the light, reducing the effective distance of the LIDAR or even rendering it ineffective.



In all three cases, 3M reflective strips need to be applied to the surface of the environment where the robotic LIDAR is located to block mirrors, glass or black objects.

b. Contours of the environment

The following environments can affect the robot's mapping and position navigation.

1. Very open environments, where there are more wide largerr open areas than the effective range of the LIDAR, i.e. the robot can barely scan the effective environment in these open areas.

Solution: Use of LIDAR with greater effective range

2. Very cluttered environment, the robot cannot get a good contour of the environment

Solution: Clean up the environment and remove unwanted objects.

3. There are more areas with very similar environments, and the robot cannot distinguish the location based on the contours of the environment.

Solution: add a few randomly characterized markers to the environment

4. A featureless promenade environment, where the walls on either side of the promenade have no references or are so regular that no effective features can be obtained.

Solution: add a few randomly characterized markers to the environment

5. Extremely changeable environments that can change dramatically in a short period of time will prevent the robot from constructing a normal map, or will make the constructed map irrelevant.

Solution: avoid or reduce large changes in the environment

4. Recommended Scanning Lines

Scan a close circle back to the start to form a closed loop.

5. Notification

Note 1: Try to scan the map along the line where the robot is working, so that the scanning route is closed for better mapping.

Note 2: When controlling the robot scanning environment, keep the network connection with the robot open.

Note 3: During map construction, scanning some corners, corners, and complex objects completely (close together and having the LIDAR scan from all directions) makes the map easier to close and the edges sharper.

Note 4: Please do not exit the map building window during the map building process, unless you need to abandon this map building.

Note 5: Do not minimize the RoboshopPro window while building or scanning a map, otherwise you will not be able to manipulate the robot movement.

Note 6: When building a map, if the ground is slippery, please do not control the robot's steering and forwarding at the same time, otherwise it may cause slipping and affect the map building effect.

Note 7: When building the map, please do not control the robot's movement too fast, the recommended scanning speed is < 0.5 m/s.

Note 8: The [Stitching Map] button after the map is built can be used to stitch the constructed map into the map already loaded in the workspace.

Note 9: After building a map, it is usually necessary to fix it before it can be used.

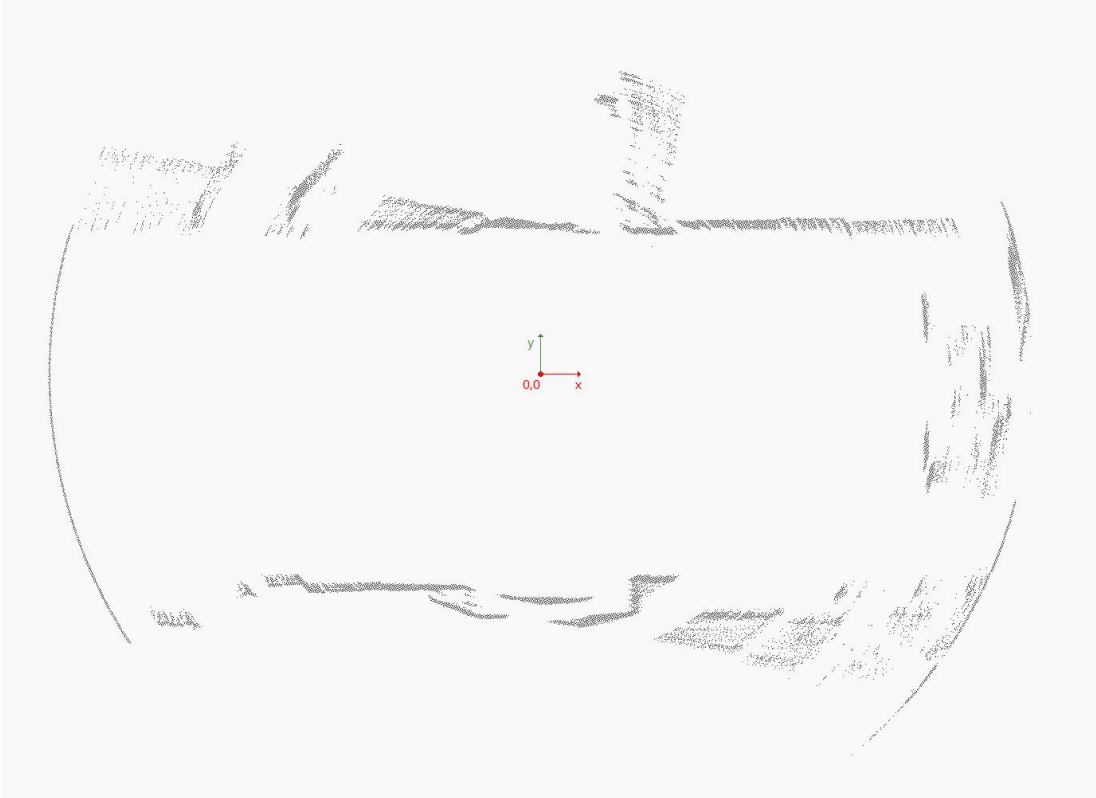
Note 10: When scanning the map, try not to let the robot scan moving objects (e.g. moving human legs)

Note 11: When sweeping the map, try to keep only stationary objects and remove objects that will move or move out of the environment first. Moving objects can be put back into the environment after the sweeping is completed.

Note 12: Most stationary objects can be scanned by the robot's LIDAR and cannot be obscured by movable objects.

6. Frequent Questions

a.Blurred maps



When the constructed map appears very fuzzy, the robot's model is not configured correctly, please check the following steps.

1. Check the laser configuration (x, y, r, upside).

2. Check shaft distance A, B, wheel radius, reduction ratio, number of encoder lines, and configuration of motor reversal.

3. Move forward 1m in flat motion with 0.1m/s, measure whether the actual distance is equal to 1m, the error should be less than 5cm,

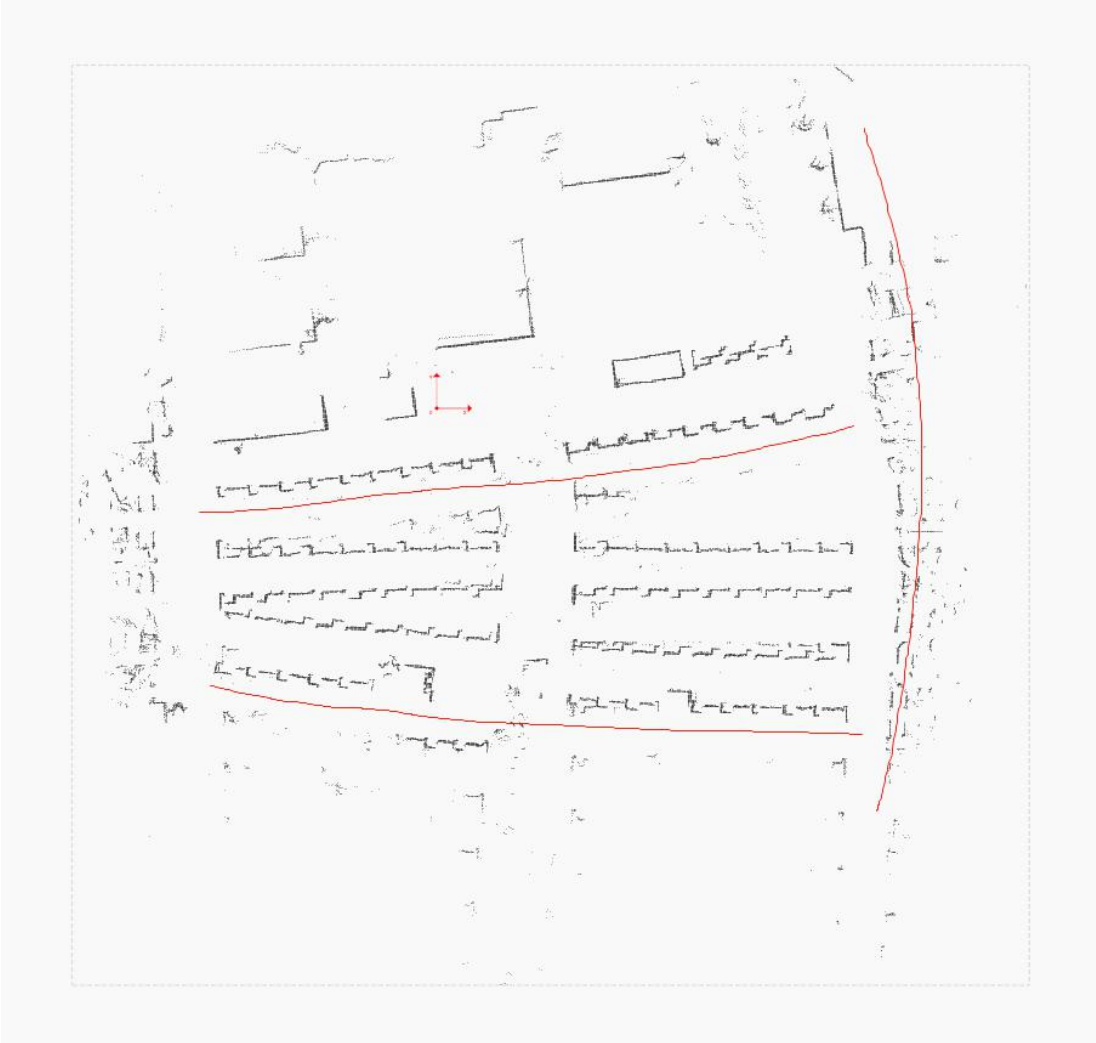
4. Rotate, rotate 360° by 20°/s, observe whether the actual rotation angle is approximately equal to 360°, the error should be less than 10°.

5. When 3 and 4 steps are normal, rebuild the map.

6. If the map you get is still fuzzy, please contact us.

b. Map distortion

There is no straight line where there should have been one, as shown below.



Possible cause

1. Long straights (the length of the straights is much longer than the effective distance of the laser)

Solution.

(1) Replacement of LIDAR with a longer effective range

(2) Rotate the robot 360° for every 10-20 m of scanning to give it more information about the route it has already crossed.

2. Slippage

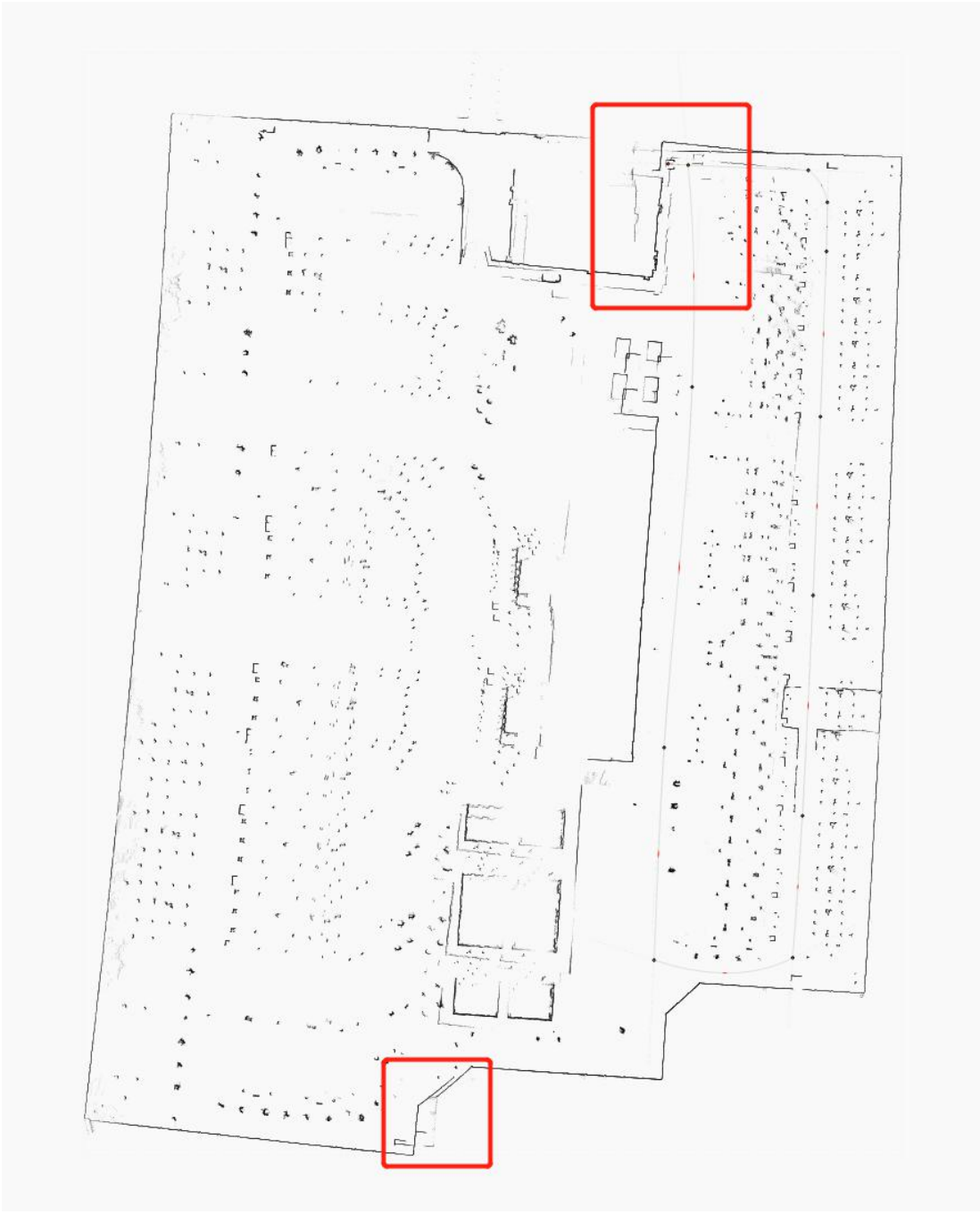
Solution.

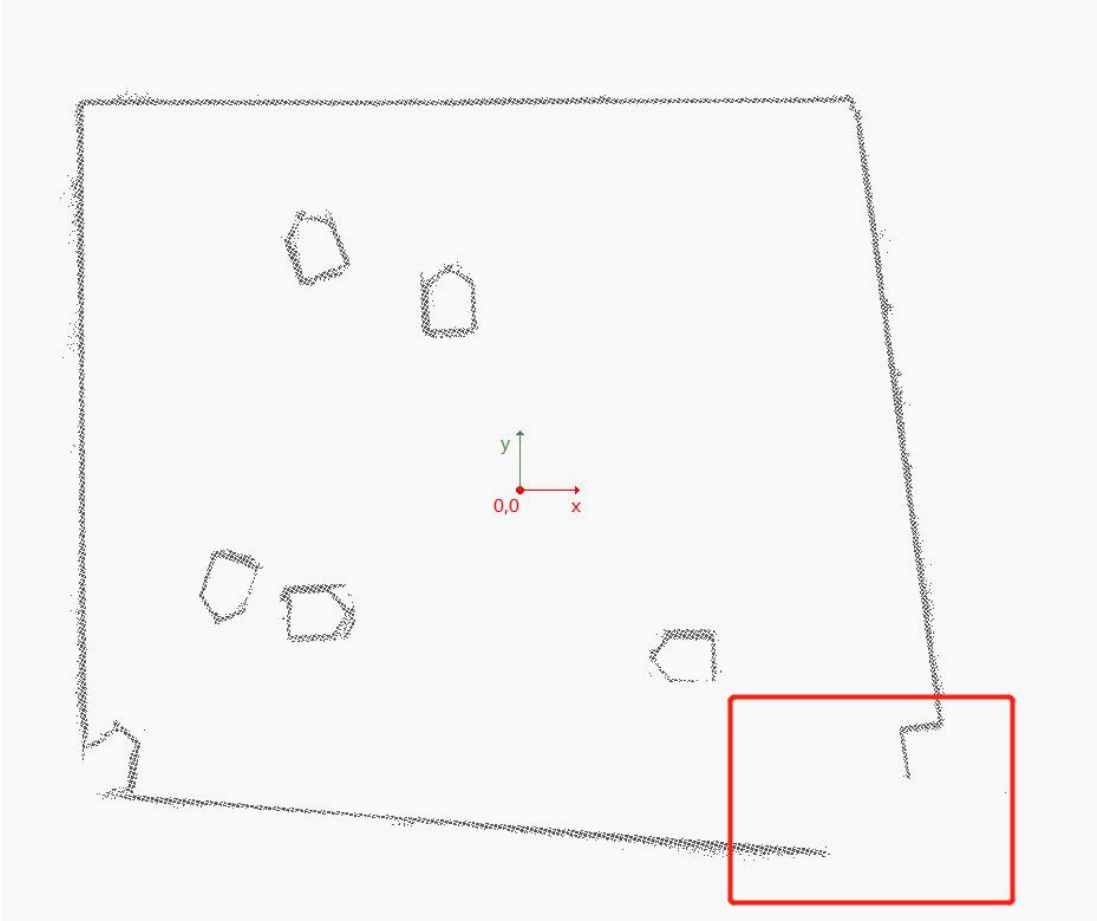
(1) Reduced operating speed when scanning the environment, avoiding forward and steering

(2) Verify that the ground is suitable for robot operation

(3) Choose wheels with better anti-slip properties

c. The map is not closed





Possible causes

1. Long straights (the length of the straights is much longer than the effective distance of the laser)

Solution:

(1) Replacement of LIDAR with a longer effective range

(2) Rotate the robot 360° every 10-20 meters of scanning to give the robot more information about the route it has already crossed

2.Skidding

Solution:

(1) Reduced operating speed when scanning the environment, avoiding forward and steering

(2) Verify that the ground is suitable for robot operation

(3) Choose a wheel with better anti-slip performance

3. Sweep the map when the environment dynamics change

Solution:

(1) Avoid dynamically changing objects or temporarily remove dynamically changing objects while sweeping the map

(2) Use a fence to block out dynamically changing objects while sweeping the map, and then erase the fence from the map after building the map

In short, only objects that are static in the environment and remain unchanged over time can be constructed into the map

d. Map Reshadow





Possible causes

1. Slippage

Solution:

(1) Reduced operating speed when scanning the environment, avoiding forward and steering

(2) Verify that the ground is suitable for robot operation

(3) Choose wheels with better anti-slip properties

2. The control robot does not take all the routes when scanning the environment

Solution:

(1) Try to control the robot all the way to the end.

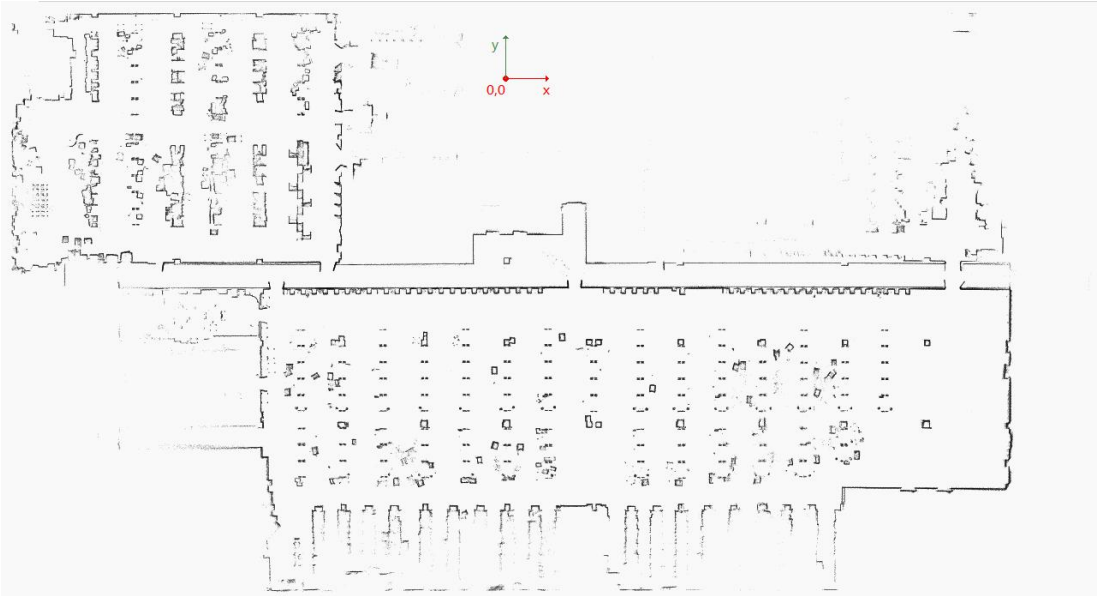
(2) For a certain route, take a round trip (compared to scanning only one way) can improve the effect of map building

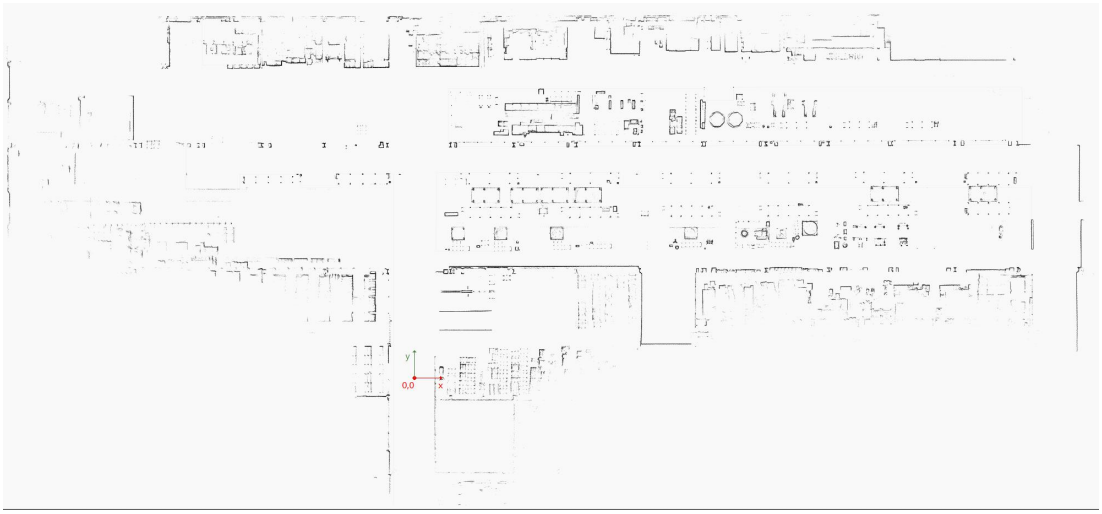
Note: If you find a situation where the map building effect is not good (and can not be resolved), please save the .rawmap file in time and send it to us for diagnostic analysis.

7. Correct Maps

Here are some examples of correct maps, containing various scenarios of varying sizes and complexity.

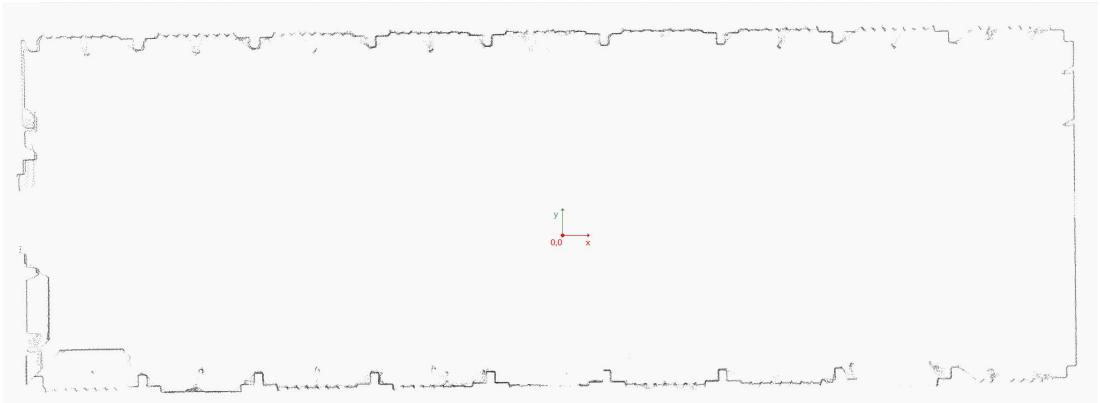
1. Large Complex Scene





2. Simple Mini Scene





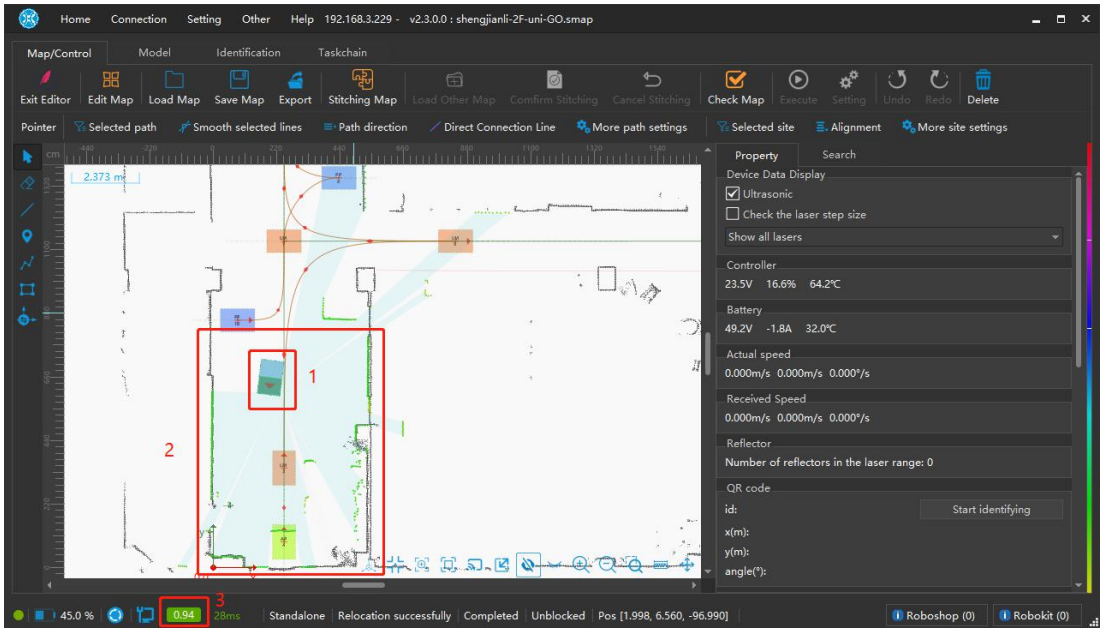
Relocation

Used to enable the robot to obtain the correct positioning state. Allow the robot to calculate its precise position and orientation by specifying a more ambiguous initial positioning point and direction.

To use this feature, the map currently loaded in the robot must be consistent with the map currently used by the software.

1. You don't need to use "Relocate" if the position is correct.

We can see the current robot's position in the software map, the laser match and the confidence level of its current position, as shown in the following figure.



Above.

①. The current location of the robot in the software map.

②. The laser match point formed by the laser emitted by the robot and the terrain contour.

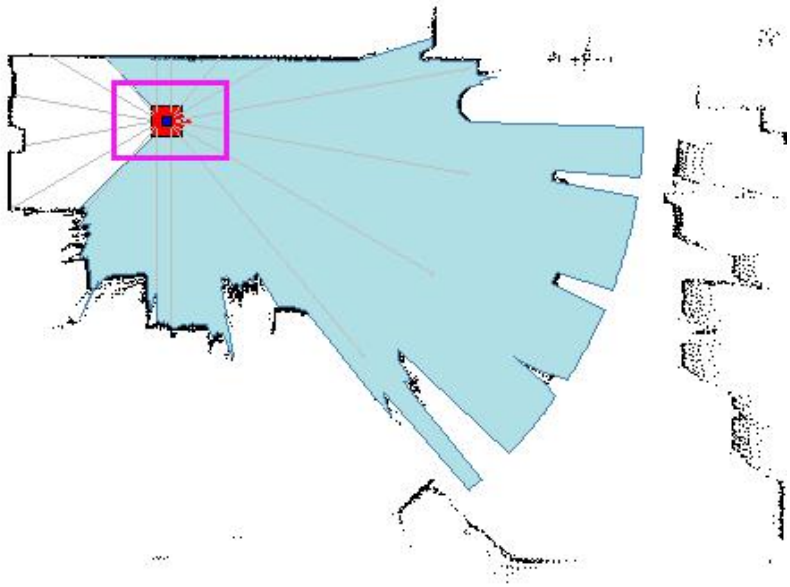
③. The current confidence level of the robot (the higher the confidence level, the more accurate the robot's position).

We can see from the above diagram that the match between the robot's laser and the outline of the map is very high, and the confidence level is also very high, so we can judge that the current robot's position is correct, there is no need to use the [Relocate] button to reposition the robot.

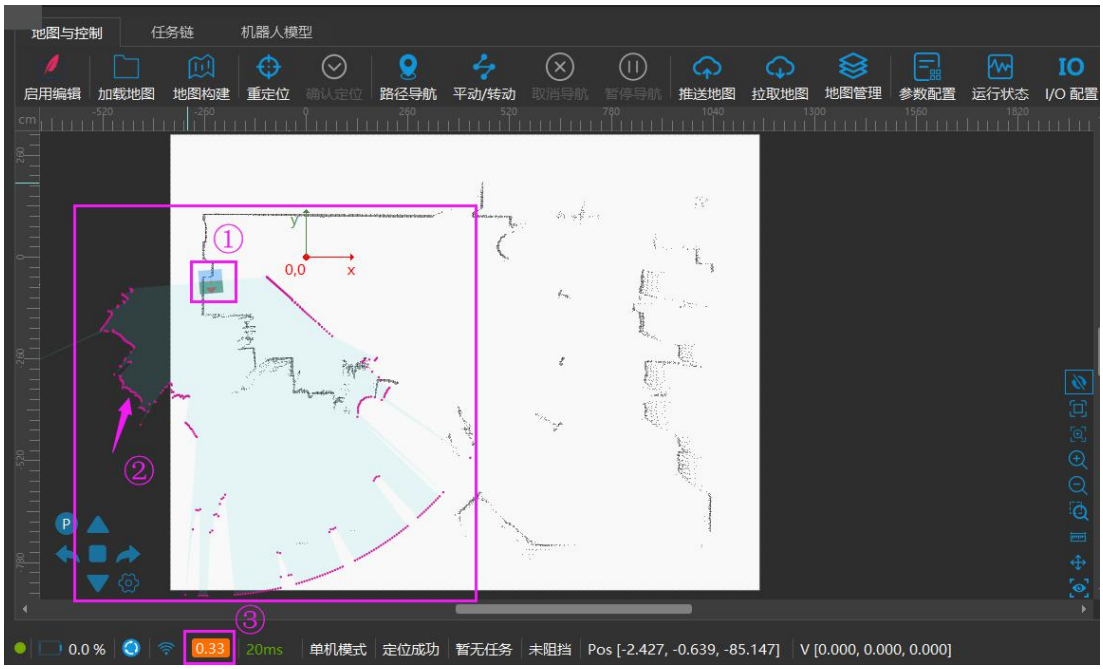
2.When the location is incorrect, you need to use the [Relocation] function.

When the location of the robot in real space does not match the location of the robot in the software map, as shown below.

Location in real space.



Location in the software map:



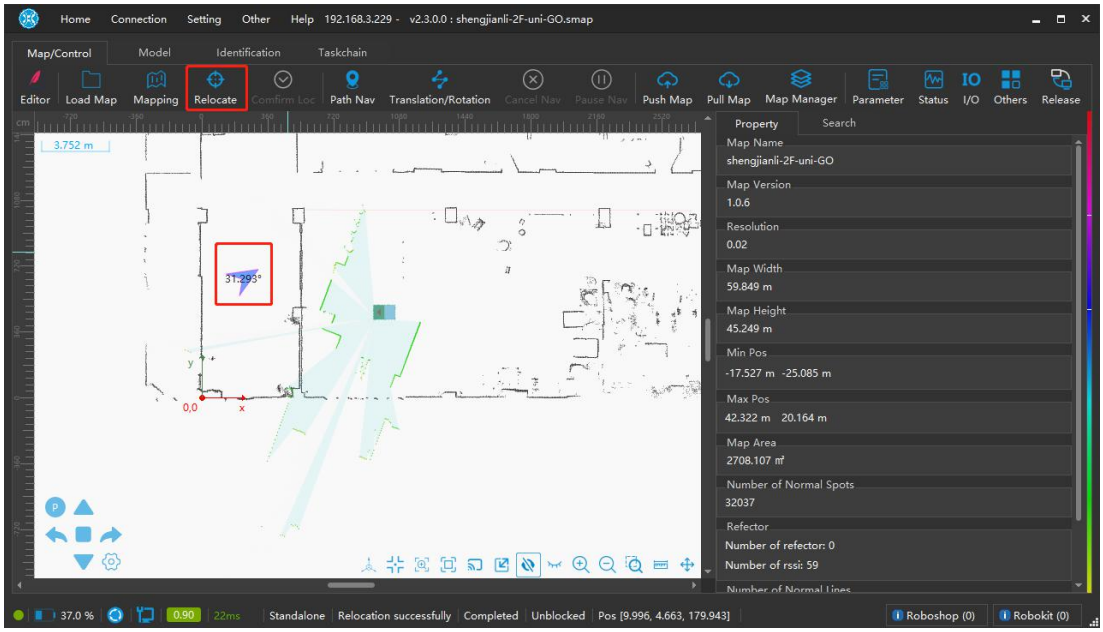
①.The robot is incorrectly positioned.

②.The laser does not match the outline in the map.

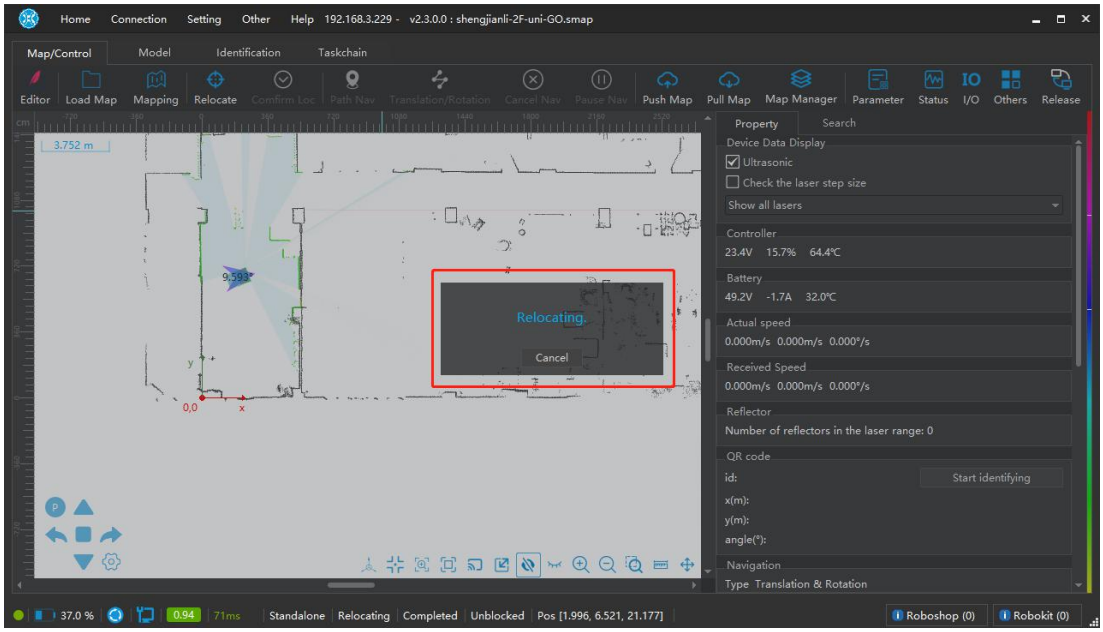
③.The confidence level is too low.

At this time, we need to perform [Relocate] operation on the robot, then we can use the robot normally.

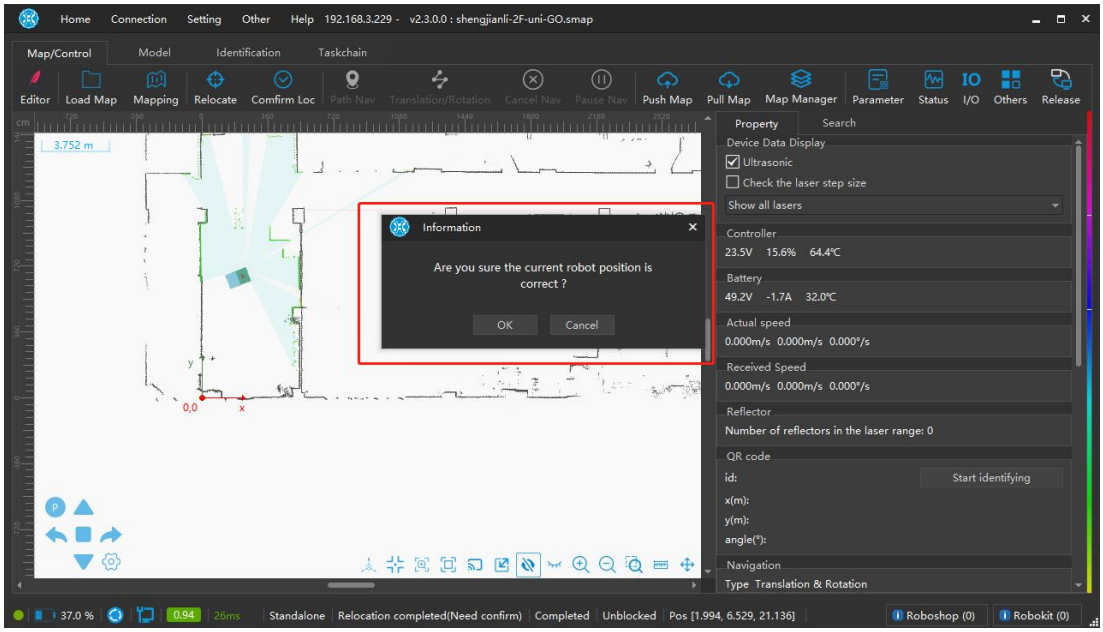
a. Click the [Relocate] button, select the location of the robot in real space on the software map, click the left mouse button and drag the direction (the direction of the robot).



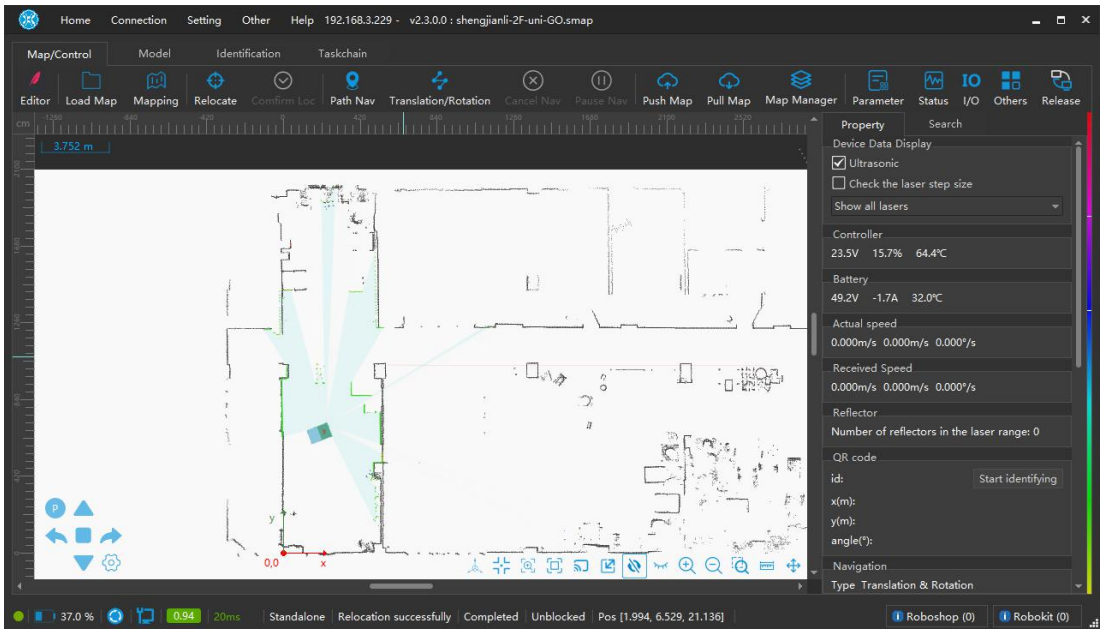
b.In the process of repositioning, a pop-up [Relocating...] dialog box, as shown below.



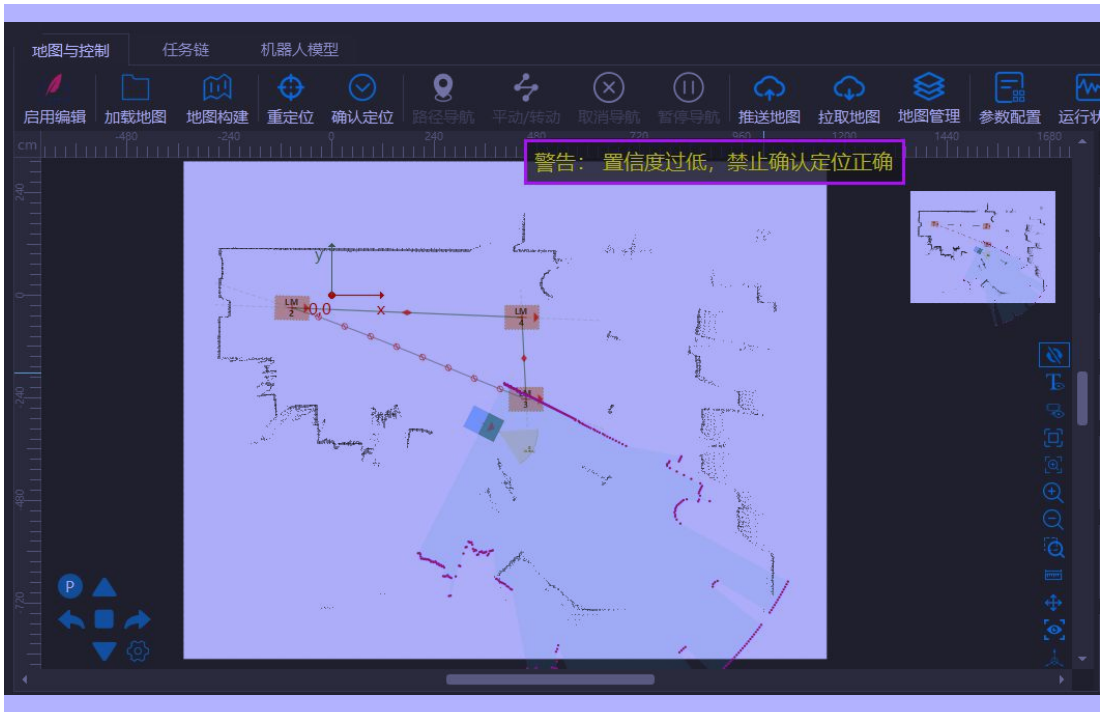
c. After waiting for the repositioning to complete, in the Confirm Position dialog box, click the [OK] button.



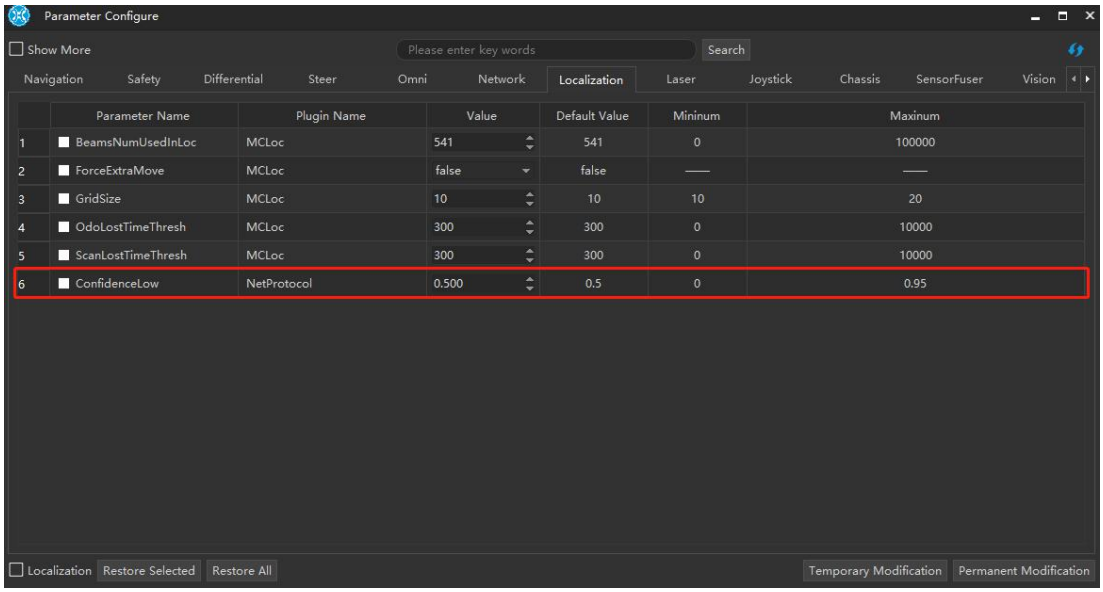
d. After the relocation is completed, you need to check whether the robot's position is correct, whether the laser and map contour match, and whether the confidence level is high. As shown in the figure below: we can see that the degree of match between the robot laser and the map outline is very high (by observing some special outline of the laser matching degree, such as the direction of the arrow in the figure), then the [repositioning] operation is successfully completed, you can use the robot normally.



When the confidence level is lower than 0.5 (default), the software is not allowed to confirm the positioning success



This value can also be modified through [Parameter Configuration] by modifying the following parameters.



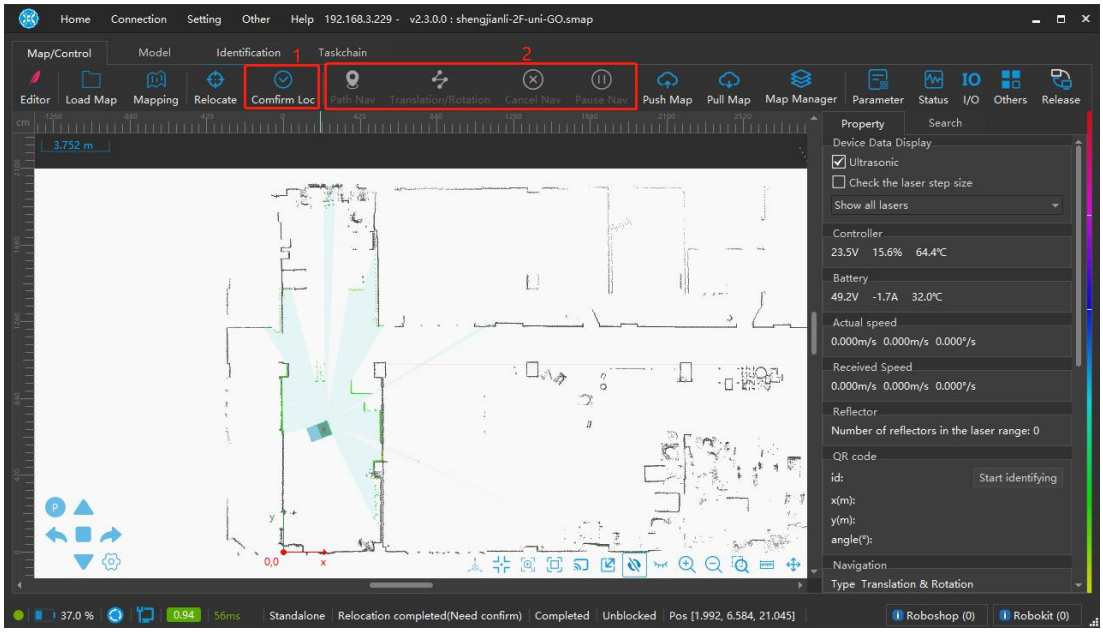
Note:

1. When this function is used, a certain range of error is allowed for selecting the robot's position and orientation, and the robot will automatically calculate and correct its own position and orientation. However, if the selected position and orientation are outside the allowed error range, the robot may not be able to locate the robot accurately.

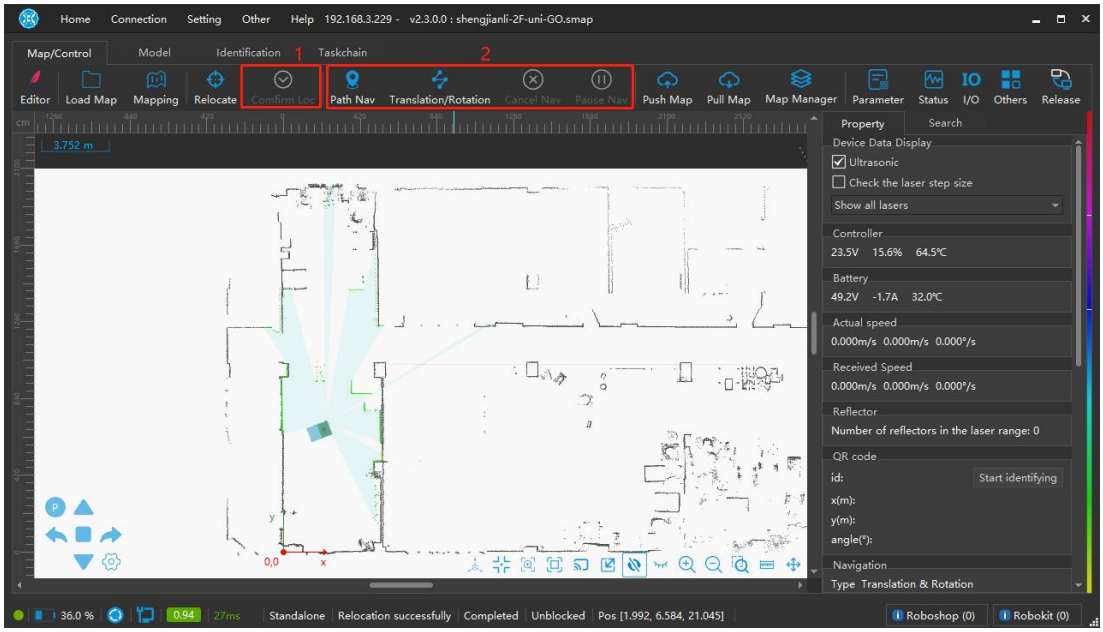
2. If the robot is still not positioned correctly after many times "Relocate" attempts, please check if the selected position is the same as the robot's orientation in real space.

Comfirm Loc

Used to confirm that the current robot is correct, as shown in the following figure.

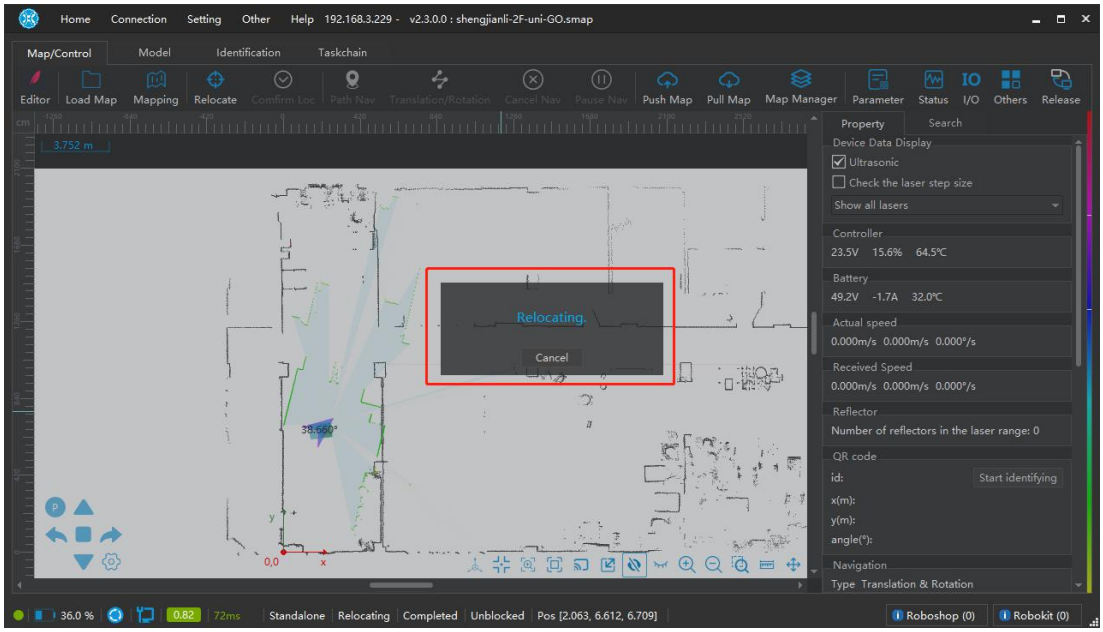


In the figure below, when ① is highlighted, the module toolbar in the ② area is grayed out and cannot be used. If the current position of the robot is correct, click the [Confirm Loc] button, the ① will be grayed out and the ② area will be activated as shown below.

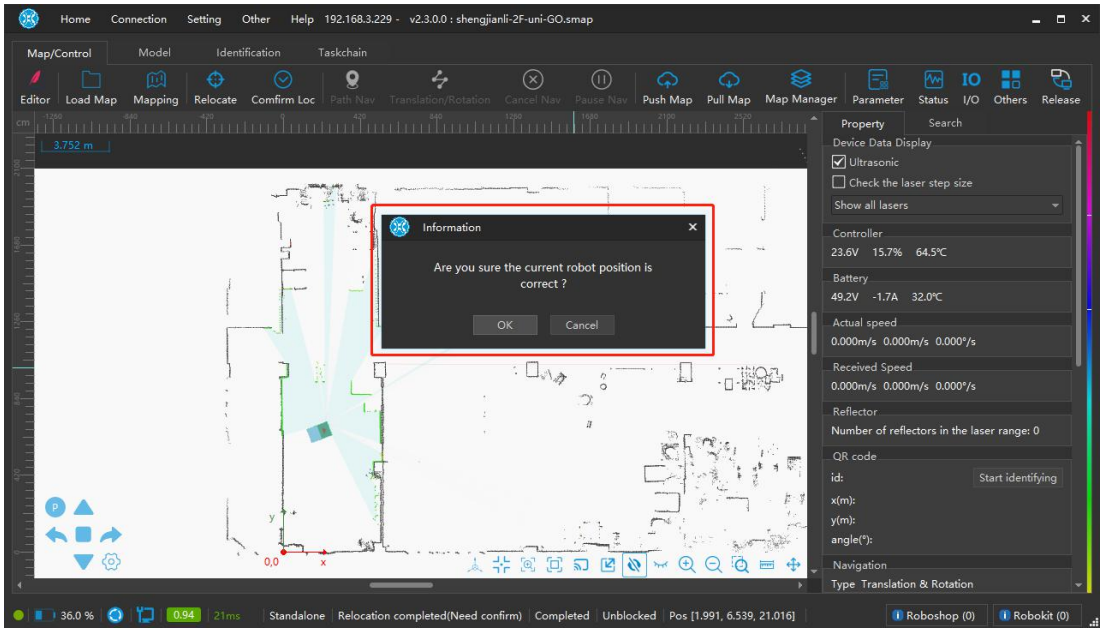


[Confirm Location] button is activated under the following conditions:

a. Clicked the [Cancel] button during the charging and positioning process, as shown below.



b.Click the [Cancel] button in the pop-up dialog box after successful relocation, as shown below.

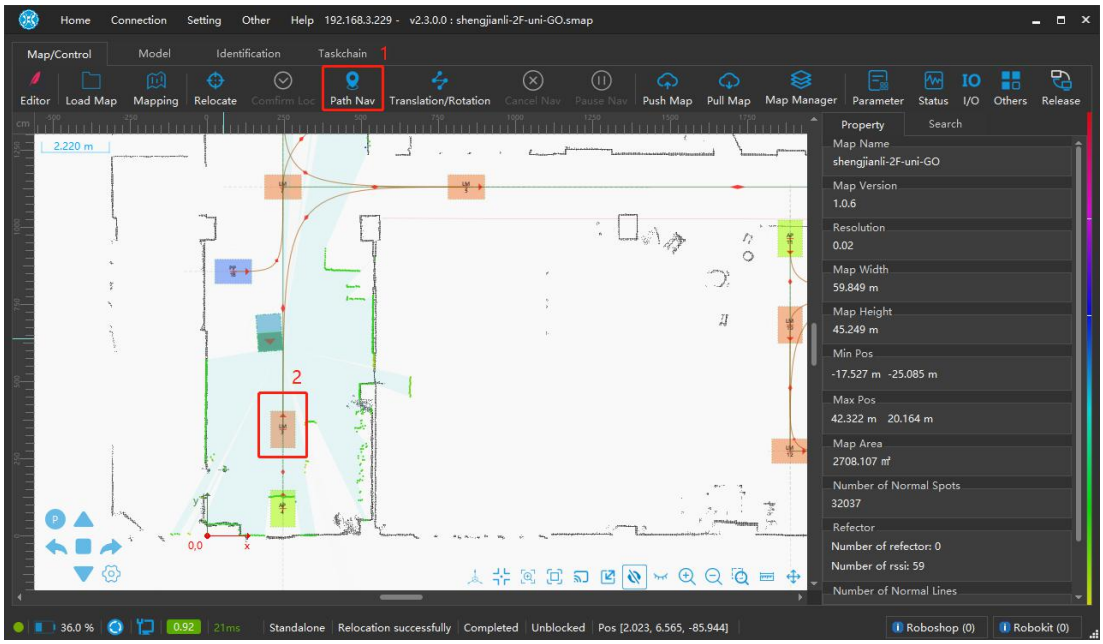


Path Nav

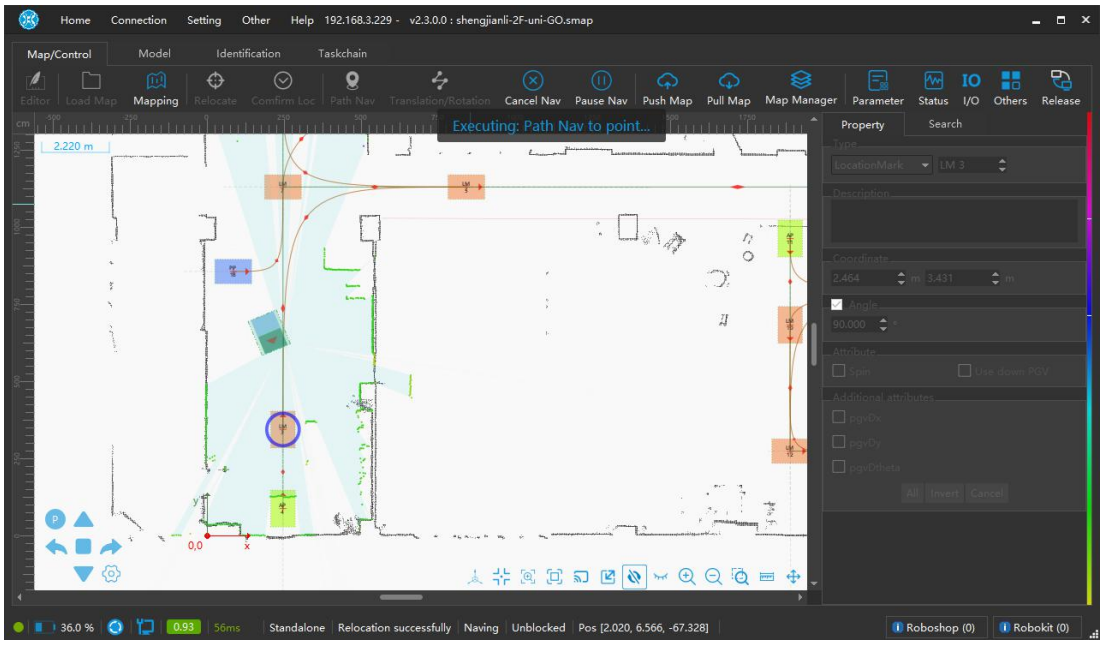
Robot's move along a fixed line.

1. Navigate to a site on a path from outside the line (at least two sites exist on the map and that they are connected by a Bessel curve).

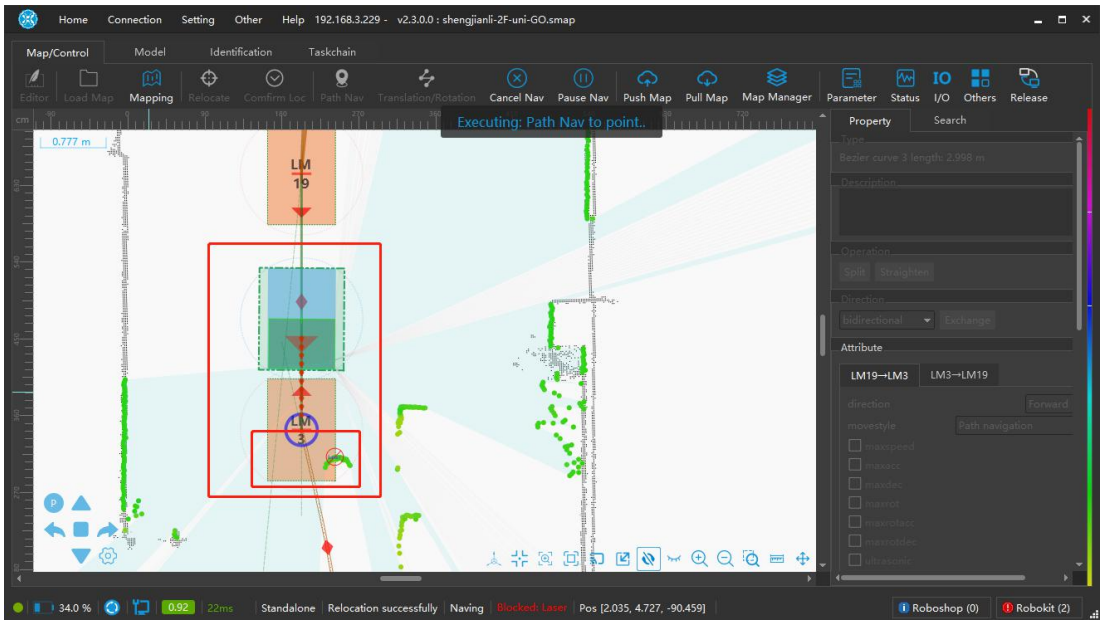
Click [Path Nav] ① in the module toolbar, then click a site, for example, click LM3 point ②, then the robot will first navigate freely to the line, and then run along the line to the target point (LM3 point), and the orientation of the robot to the point is the same as the orientation of the site.



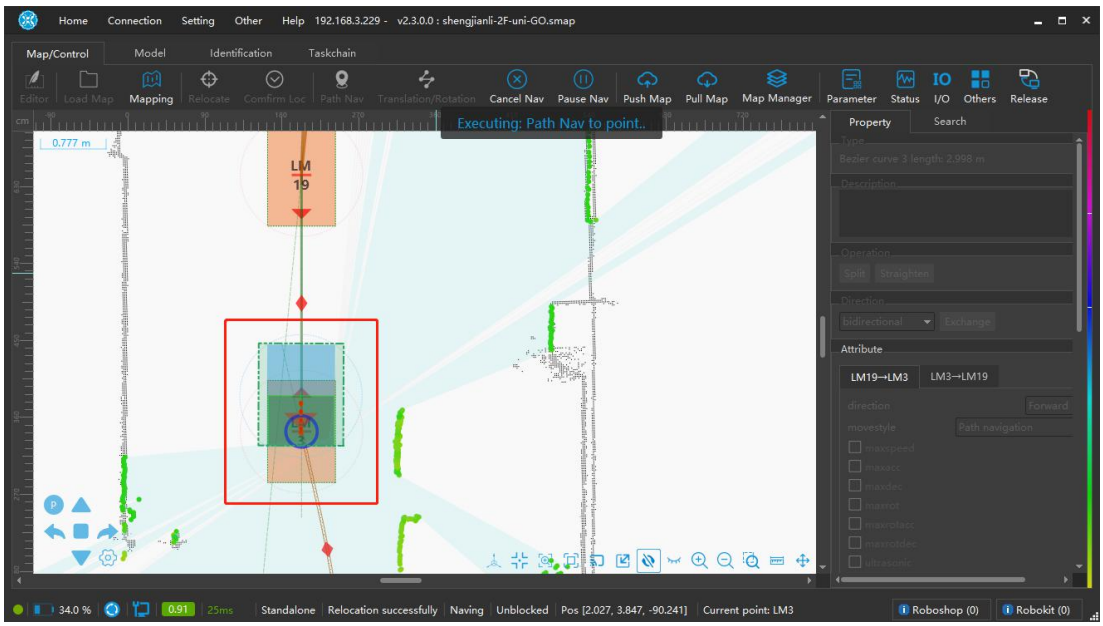
The robot begins to navigate, as shown in the following image.



If an obstacle appears on the line, the robot will stop before the obstacle and will not continue to run until the obstacle is gone and the reason for the obstruction is indicated in the status bar.

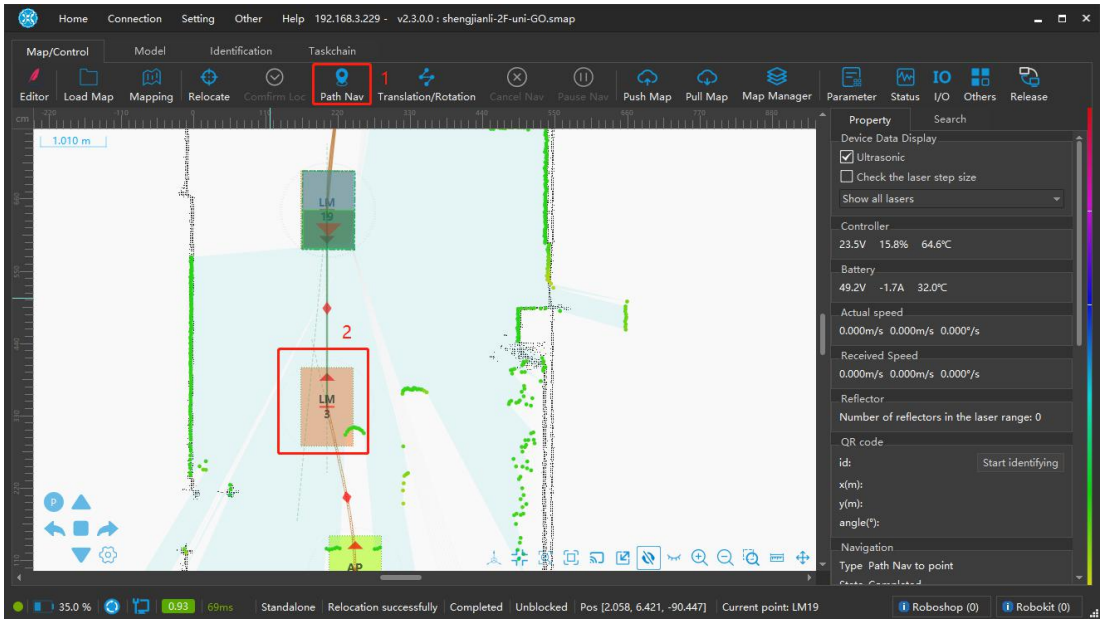


When the obstacle disappears, the blocking message in the status bar clears and the robot resumes move to the target point.



2. The robot navigates the path on the route (at least two stations exist on the map and that they are connected by a Bessel curve).

Click on [Path Nav] ① in the module toolbar, then click on a site, such as LM1 point ②, the robot will navigate the path and run along the line to the target point (LM1 point), and the orientation of the robot to the point is the same as the orientation of the site.



If there is an obstacle in the line, the robot will stop in front of the obstacle and will not continue to run until the obstacle is gone, and the reason for the obstruction is displayed in the status bar.

3. Path navigation between multiple sites.

The usage is the same as that above. The difference is that we can add more sites to the map as needed and connect them using Bessel curves to achieve the purpose of multi-site path navigation.

Note: the properity of cables or advanced area would act when path navigation.

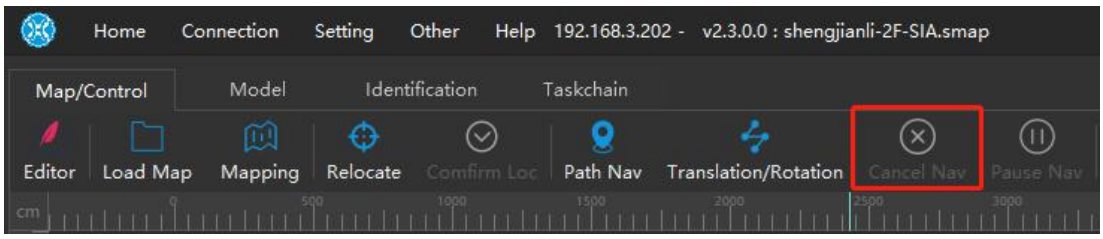
Translation/Rotation

The usage about [Translation/Rotation] is reffered to 8.Translation/Rotation.

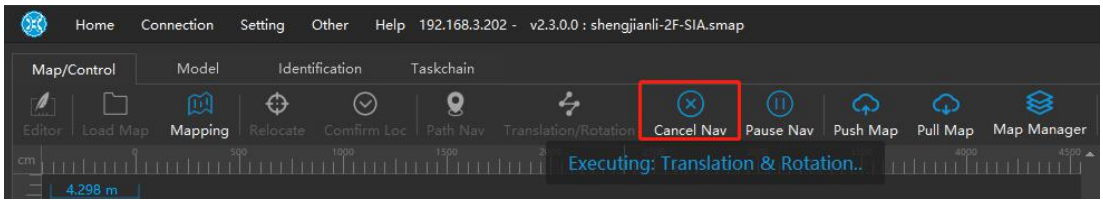
Cancel Nav

Used to cancel the execution of the navigation task the robot is currently performing.

When no navigational task is being performed, the button is grayed out and cannot be operated.



When a navigation task is being performed, the button is blue and can be operated.



Pause/Resume Nav

Used to pause and continue operations while the robot is navigating.

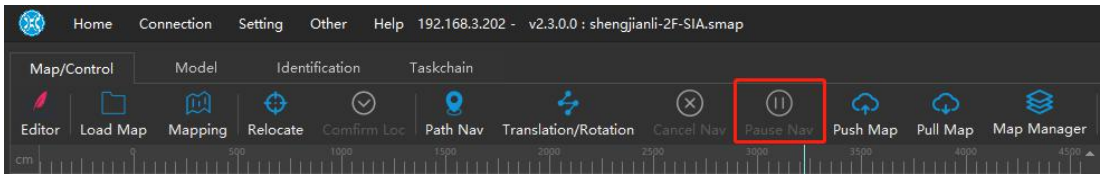
Click the [Pause nav] button to pause the current navigation when the robot is in the navigation state.

When the robot is in "Pause navigation" status, click the [Resume navigation] button to continue the current navigation.

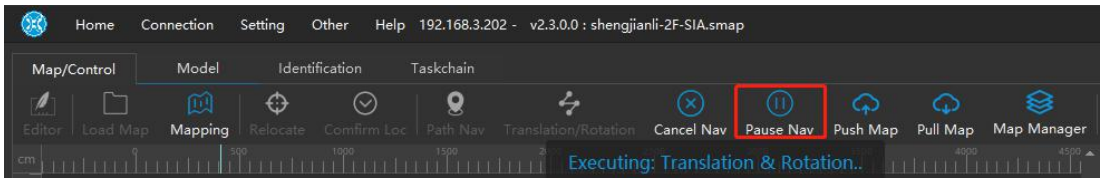
When the robot is not connected, the button is inactive, so you can't operate it.



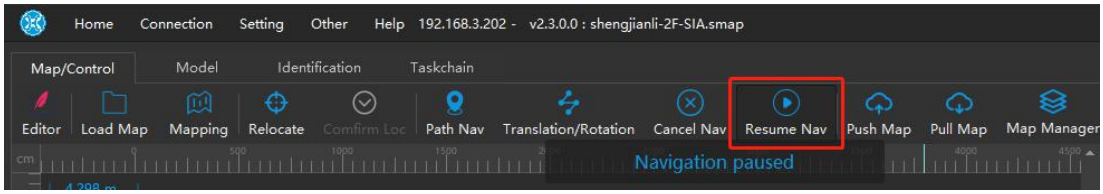
When the robot is connected, but the robot is not navigating, the button is inactive and cannot be operated.



When the robot is connected and the robot is navigating, the buttons are active and can be used for related operations.



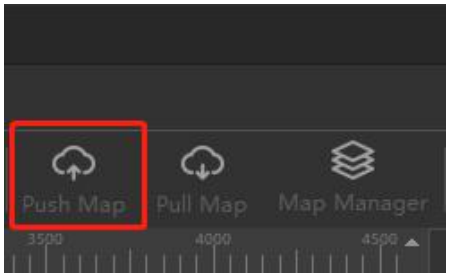
After you click on Pause Navigation, the button updates to [Resume Nav], and you can continue the navigation operation by clicking on it.



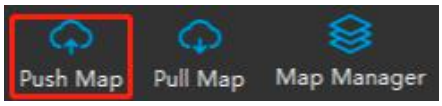
Push Map

Sync the local map that Roboshop Pro has load to the robot.

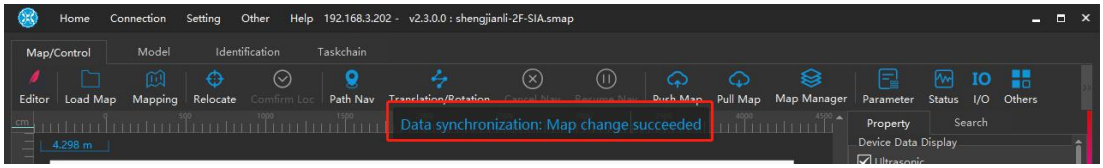
When the robot is not connected, the button is inactive and cannot be operated.



When the robot is connected, the button is active and can be operated.



After connecting to the robot, click [Push Map] to sync the current local map to the robot. After success, you will be prompted with the corresponding message, as shown below.



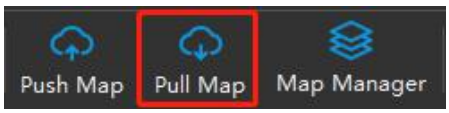
Pull Map

Synchronize the map the robot is using to the local area.

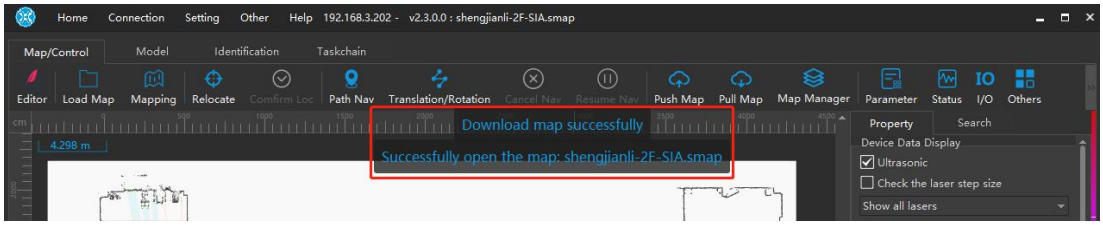
When the robot is not connected, the button is inactive and cannot be operated.



When the robot is successfully connected, the button is active and can be operated.



Once the robot is successfully connected, click the [Pull Map] button. After successful synchronization, you will be prompted with a corresponding message after success, as shown below.



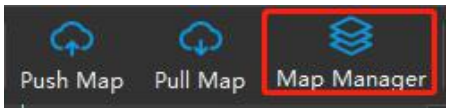
Map Manager

Used to manage the map inside the current robot and its corresponding local map in Roboshop Pro; enables pushing, pulling and deleting of maps from both the robot and Roboshop Pro.

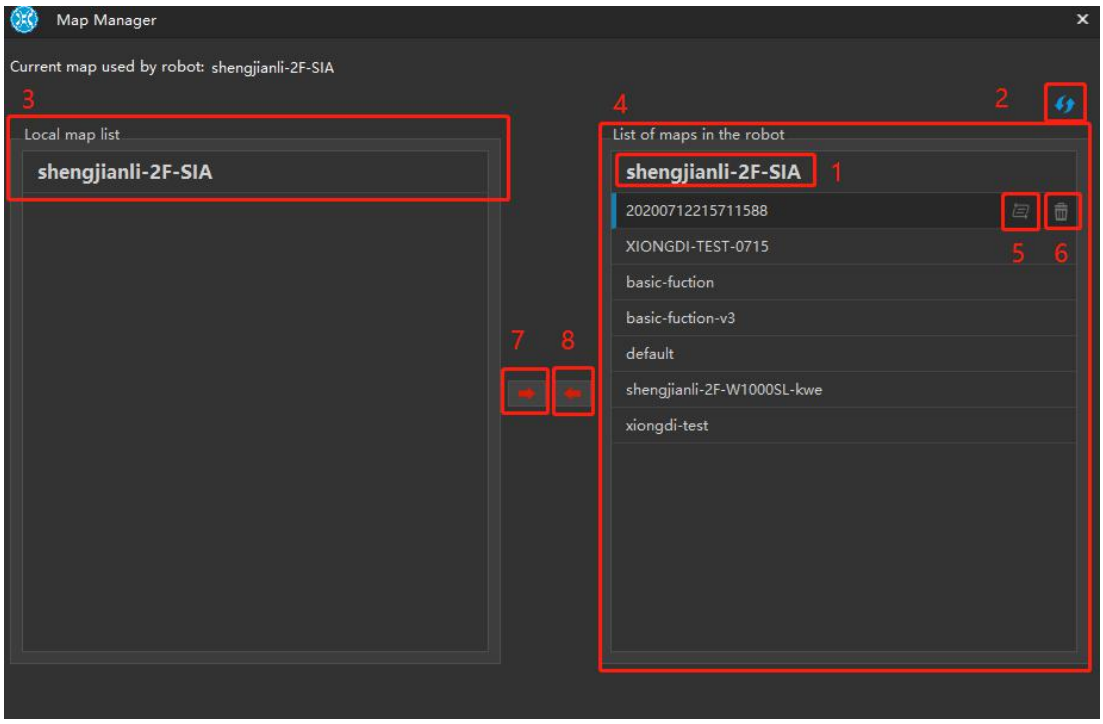
When the robot is not connected, the button is inactive and cannot be operated.



When the robot is connected, the button is active and can be operated.



After connecting the robot successfully, click on the [Map Managert] button, and the map management interface will pop up.



① Display the name of the map that the robot is using.

② Refresh the map existing in the robot, and display it in the "Maps in Robot List".

③ [Local map list], which displays the map of the current robot that has been downloaded in Roboshop Pro.

④ [List of maps in the robot], which displays the map existing in the robot (RoboKit).

⑤ [Switch], switches the selected map to the map in use.

⑥ [Delete], Deletes the map that exists in the selected robot (RoboKit).

⑦ [Upload]: Upload the local map to RoboKit.

⑧ [Download]: Download the map existing in RoboKit to your computer.

Parameter

Used to configure robot parameters.

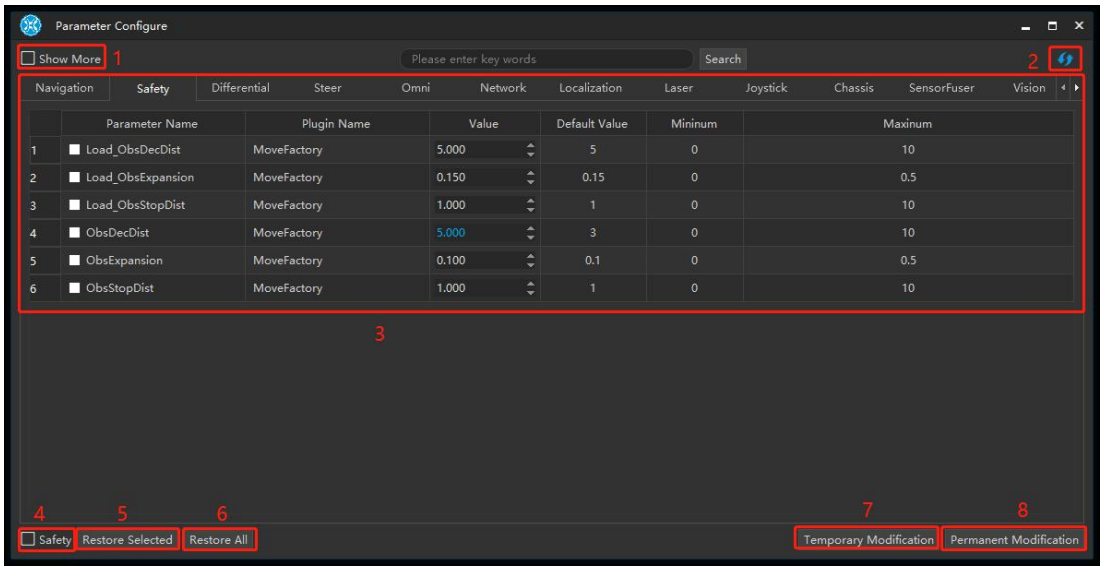
When the robot is not connected, the button is inactive and cannot be operated.



When the robot is connected, the buttons are active and can be operated.



After clicking the [Parameter] button, the operation interface of parameter configuration will pop up.



① When unchecked, only the main parameters of the robot will be displayed; when checked, all the information of the robot will be displayed.

② [Refresh], used to refresh the parameter information of the robot.

③ [Information Display Area], to display the parameters related to the robot and to configure the parameters.

④ When chosen, all the parameters in the current tab will be checked.

⑤ Restore the attributes of the selected robot to default values.

⑥ Restores all attributes of the robot to the default value.

⑦ [Temporary Modification] button. After modifying parameters, click this button to update the parameters of the robot; however, when the robot restarts, the modified parameters will be restored to their previous values.

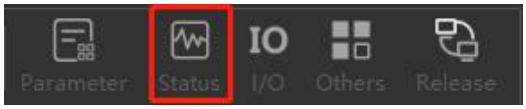
⑧ [Permanent Modification] button. When the robot is restarted, the modified parameters will not be restored to their previous values.

Note: This function only provides technical support to customers who have received authorized training.

Status

Used to display parameters about the robot in real time.

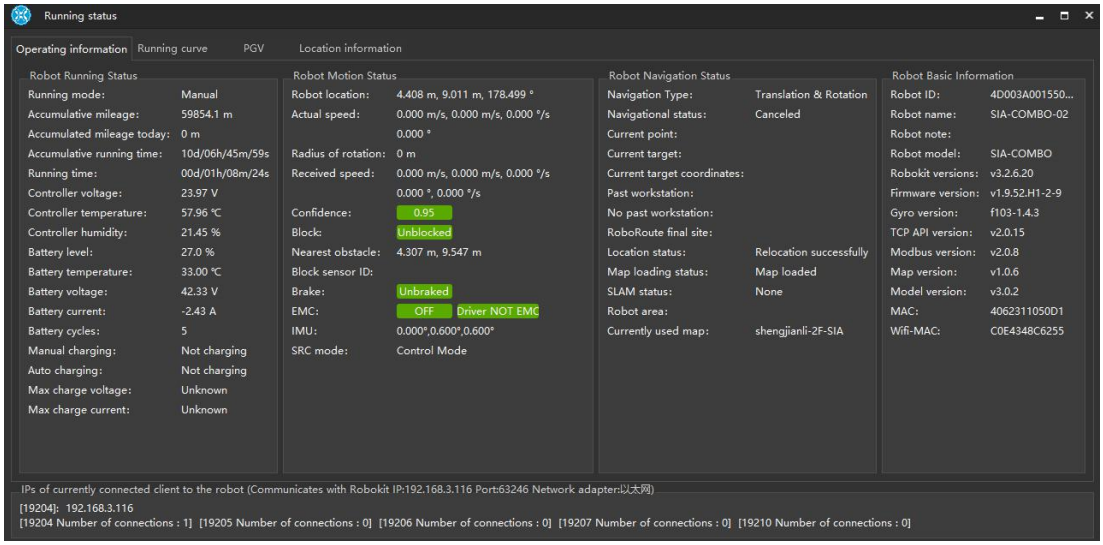
When the robot is not connected, the button is inactive and cannot be operated.



When the robot is connected, the buttons are active and can be operated.



After connecting the robot, click on the [Status] button, and the interface of [Status] will pop up.



I/O

The I/O status and ultrasonic status of the robot can be configured instantly according to the user's needs.

When the robot is not connected, the button is inactive and cannot be operated.



When the robot is connected, the buttons are active and can be operated.



After connecting the robot, click on the [I/O] button and the interface for configuring the robot's I/O status will pop up.



Notes.

Red indicates low level, indicated by the number 0; green indicates high level, indicated by the number 1.

1) [DI], the digital input signal received by the robot, can be configured. DIs with purple border are special DIs.

② [DO], digital output signal sent by the robot, can be configured.

③ [Ultrasonic], can be configurated.

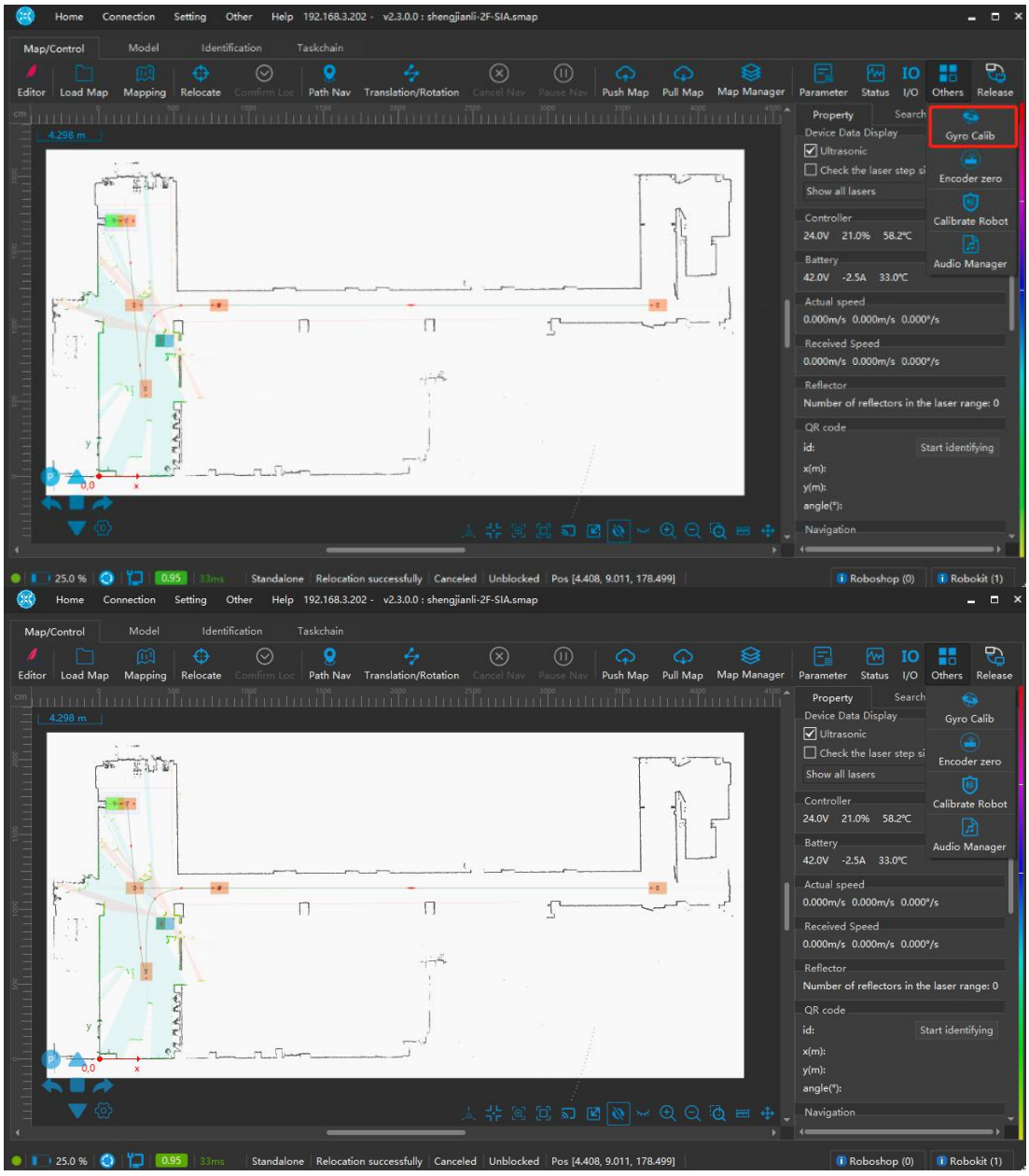
Note: This function is technically supported only for customers with authorized training.

Others

Gyro Calib

This function is used to perform a single gyroscope (IMU) calibration operation, which is not normally required.

The [Gyro Calib] button is only active when the robot is successfully connected.



Note: This function is technically supported only for customers with authorized training.

Calibration Robot

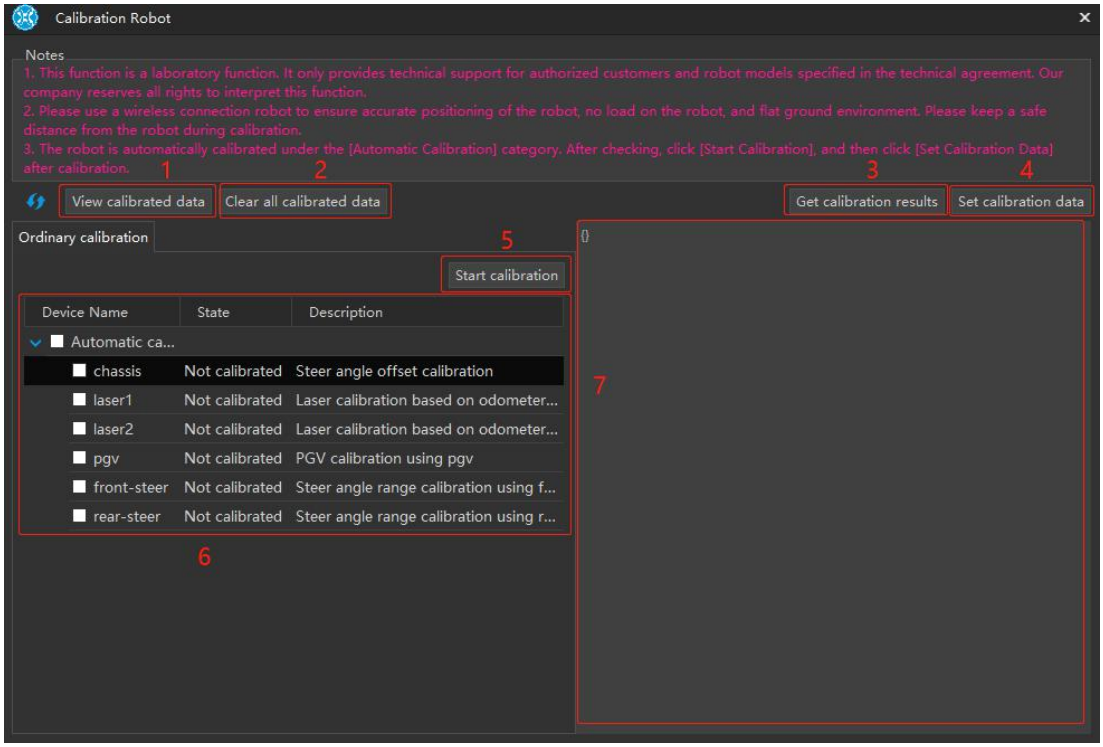
Note: The pixel used for external reference calibration does not support rotation yet.

1. This function is laboratory function. It ony provides technical support for authorized customers and robot models specified in the technical agreement. Our company reserves all rights to interpret this function.

2. Please use a wireless connection robot to ensure accurate positioning of the robot, no load on the robot, and flat ground environment. Please keep a safe distance from the robot during calibration.

3. The robot is automatically calibrated under the [Automatic Calibration] category. After checking, click [Start Calibration], and then click [Set Calibration Data] after calibration.

The Calibration interface is shown as below:



① View calibrated data: Get the selected calibrated data of the robot and display them in ⑦ [Calibration data display area].

② Clear all calibrated data: manually zeroes out the existing calibration data in the robot.

The data in the gyroLSB item will be set to the default value and all other data will be cleared.

③ Get calibration results:

④ Set calibration data: After calibration is finished, click this button and the calibration data would save into the robots.

⑤ Start calibration: click this button to start robot calibration. The details would be shown below.

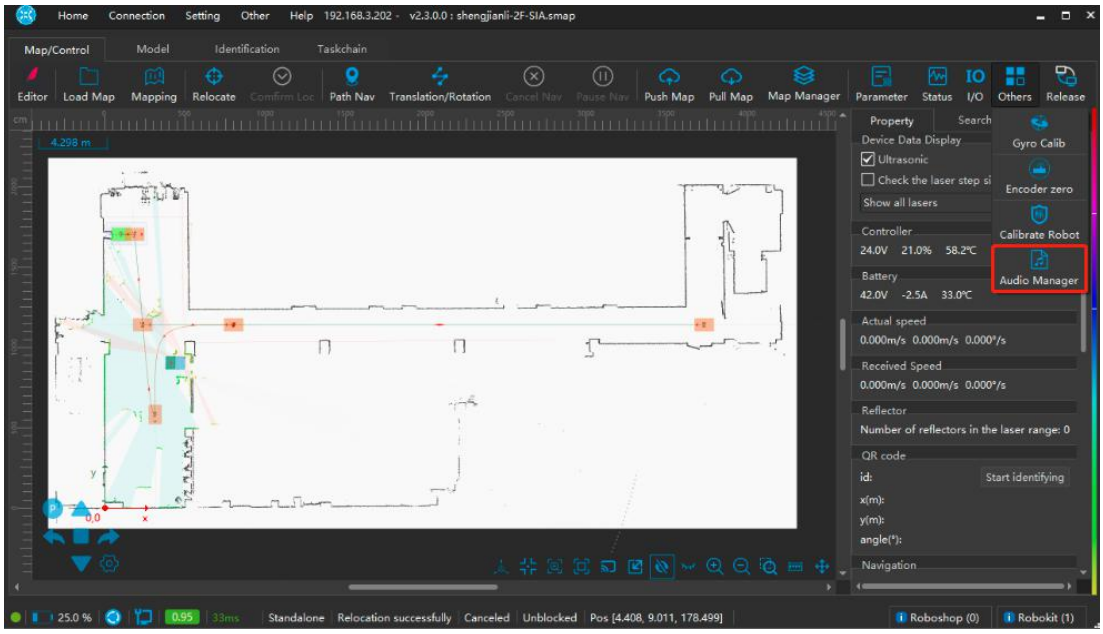
⑥ Calibration Items: the devices need to be calibrated.

⑦ Calibration data display area: the calibrated data would display in this area.

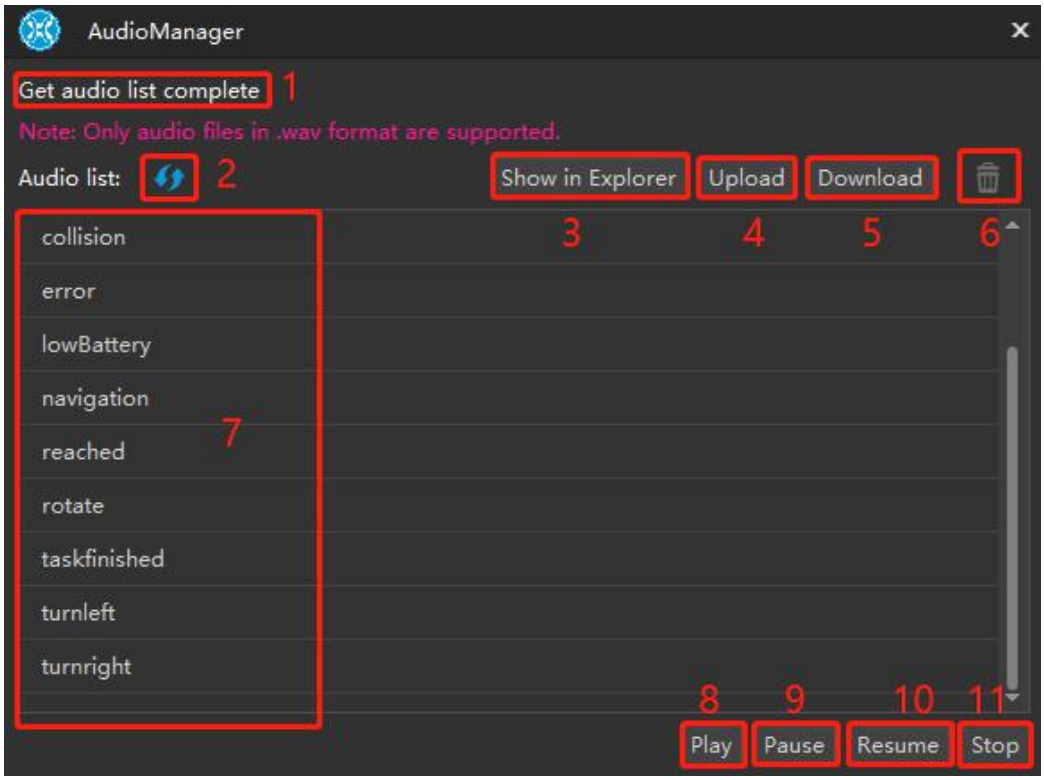
Audio Manager

Used to play audio files inside the robot, only [wav] format audio files can be played.

The [Audio Manager] button is active only when the robot is successfully connected.



After clicking the [Audio Managert] button, the [Audio Manager] interface will pop up.



①Prompt the text box.

②Refresh the audio file that exists inside the robot.

③Open the local path used to cache the robot's audio files.

④Upload the local audio file to the robot.

⑤Download the audio file in the robot to the local path.

⑥Delete the selected audio files from the robot.

⑦Display the audio files obtained from the robot.

⑧Play the audio files from the selected robot.

⑨Pause the playback of the audio file.

⑩Continue playing the audio file.

⑪Stop playing the audio file.

Control

Release

When the robot is in [Standalone] Mode, click on the [Release] button and Roboshop Pro will release control of the robot and hand it over to the scheduling server to switch from [Standalone] Mode to [Dispatch] Mode

When the robot is not connected, the [Release] button is inactive and cannot be operated.



After successfully connecting the robot, the [Release] button is active and can be operated.



Note: This function is technically supported only for customers with authorized training.

Require

Clicking this [Require] button when the robot is in [Dispatch] will allow Roboshop Pro to regain control of the robot from the dispatch server and enable the robot to switch from [Dispatch] Mode to [Standalone] Mode.

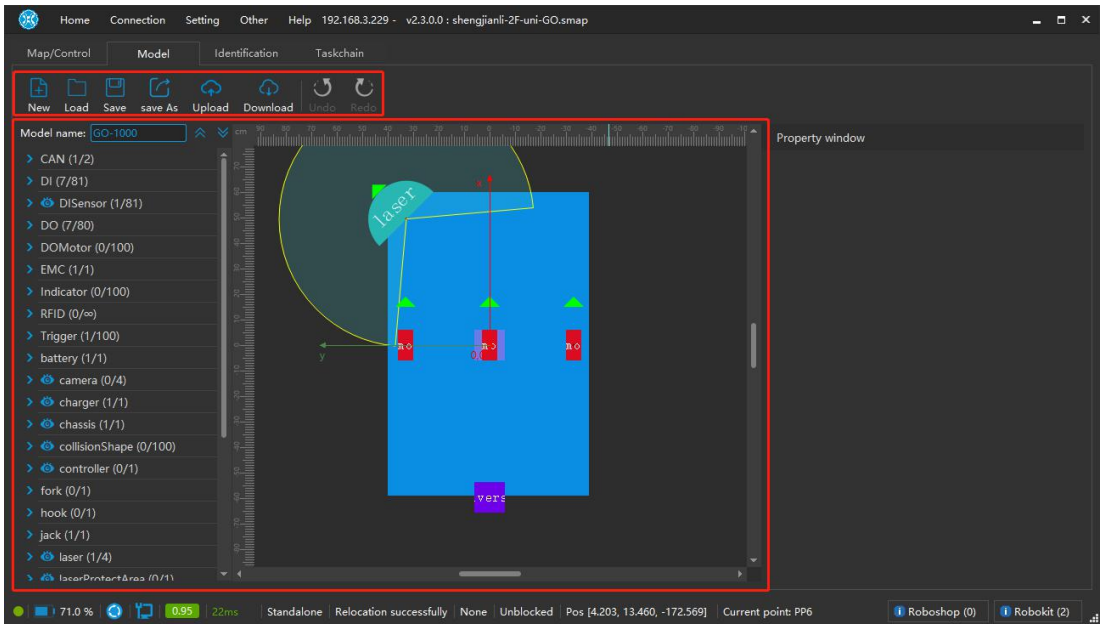
Only after Roboshop Pro releases control, the [Require] Control button will be active and able to operate.



Note: This function is technically supported only for customers with authorized training.

Model

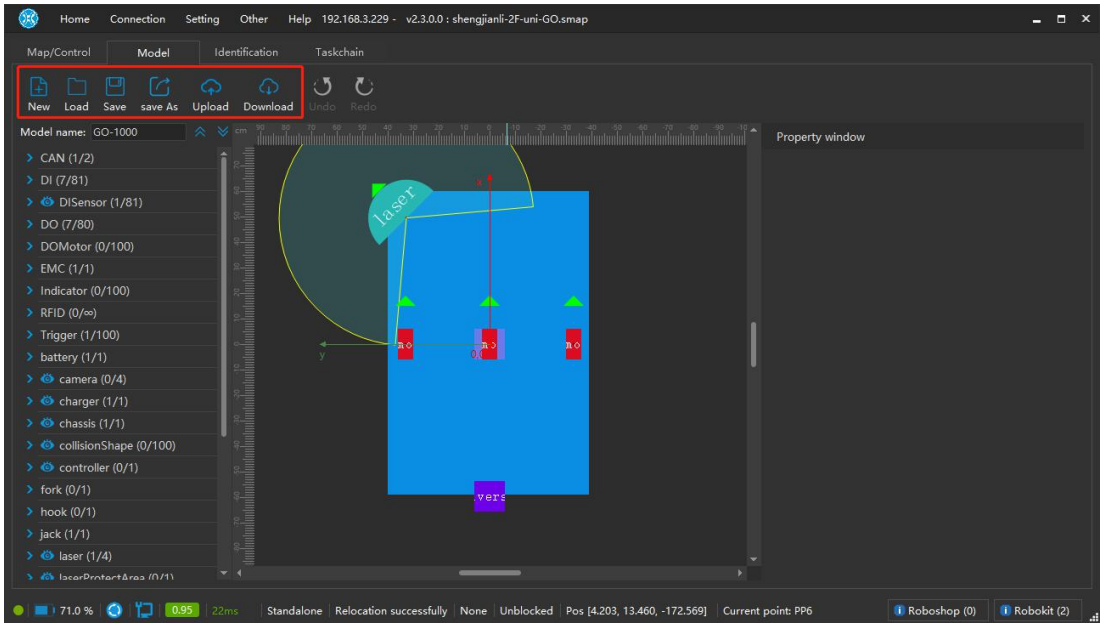
As shown in the figure below, the interface of the robot [Model] module is divided into [Module toolbar] and [Model editing area].



Note: This function is technically supported only for customers with authorized training.

Model Toolbar

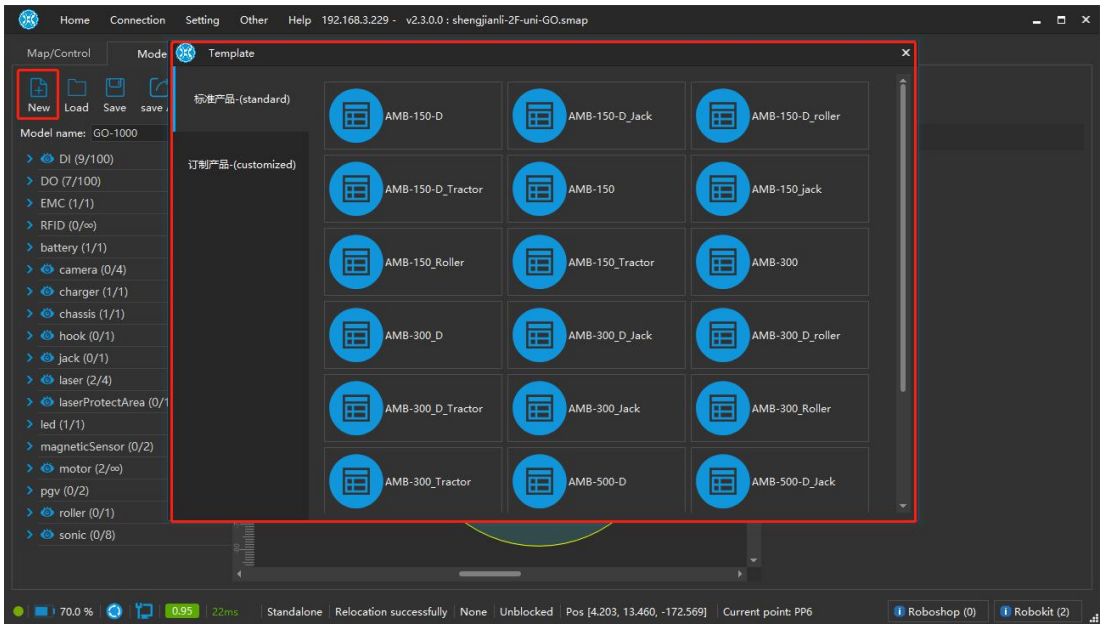
As shown in the figure below, the Module Toolbar is composed of [New], [Load], [Save], [Save As], [Upload], [Undo], [Download].



New

This is used to create a new robot model.

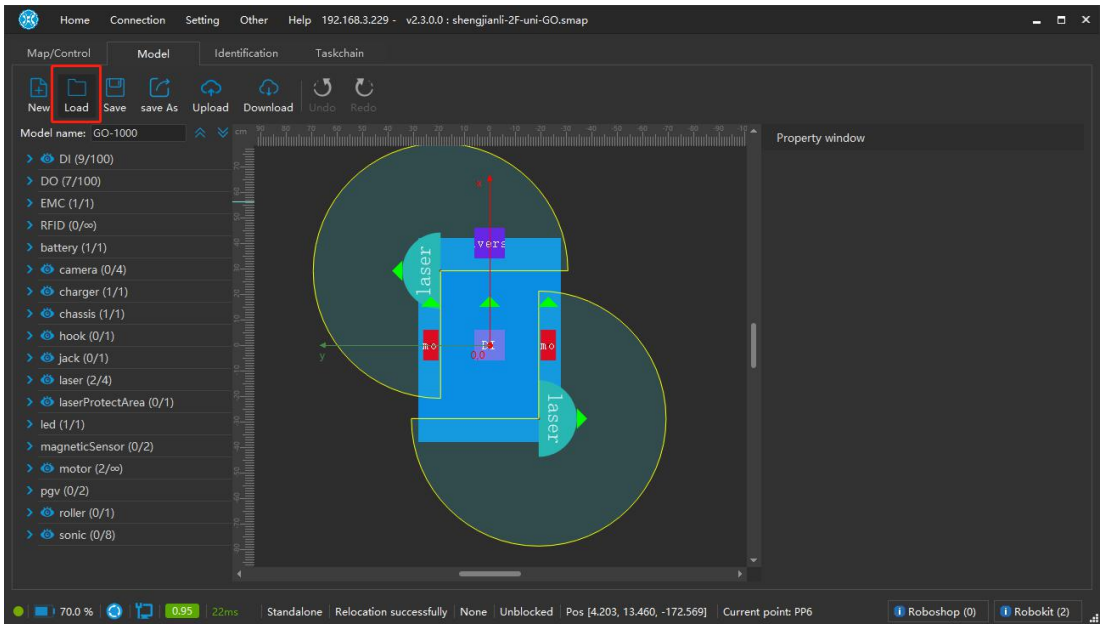
Click the [New] button, the [Template] interface will pop up, and you can build a new robot model according to the template.



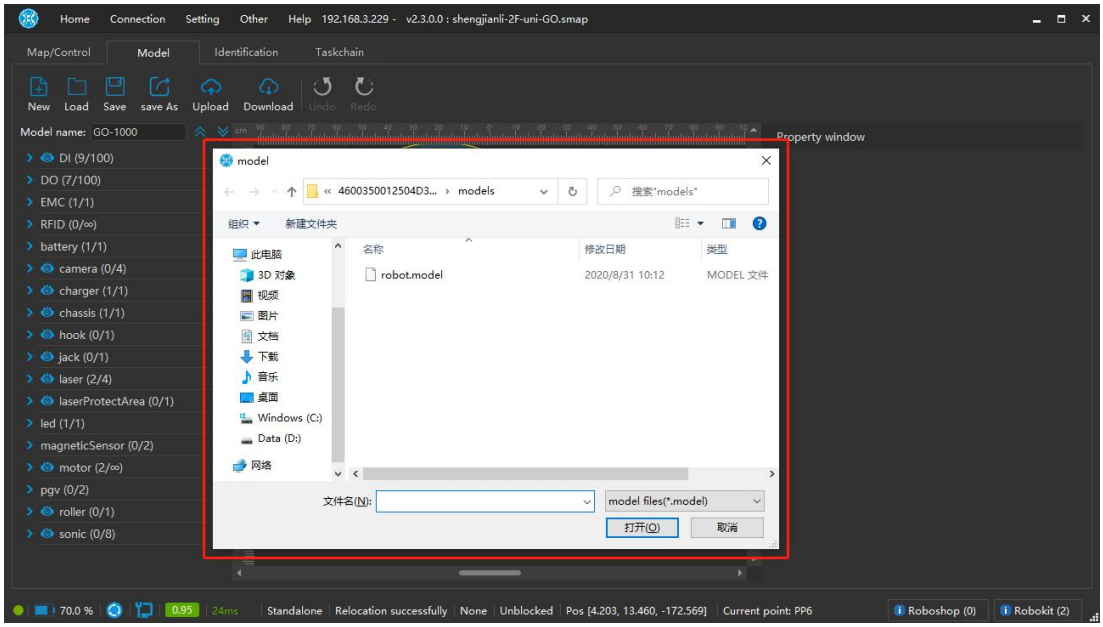
Load

This is used to open an existing robot model file.

As shown in the figure below, it is the [Load] button.



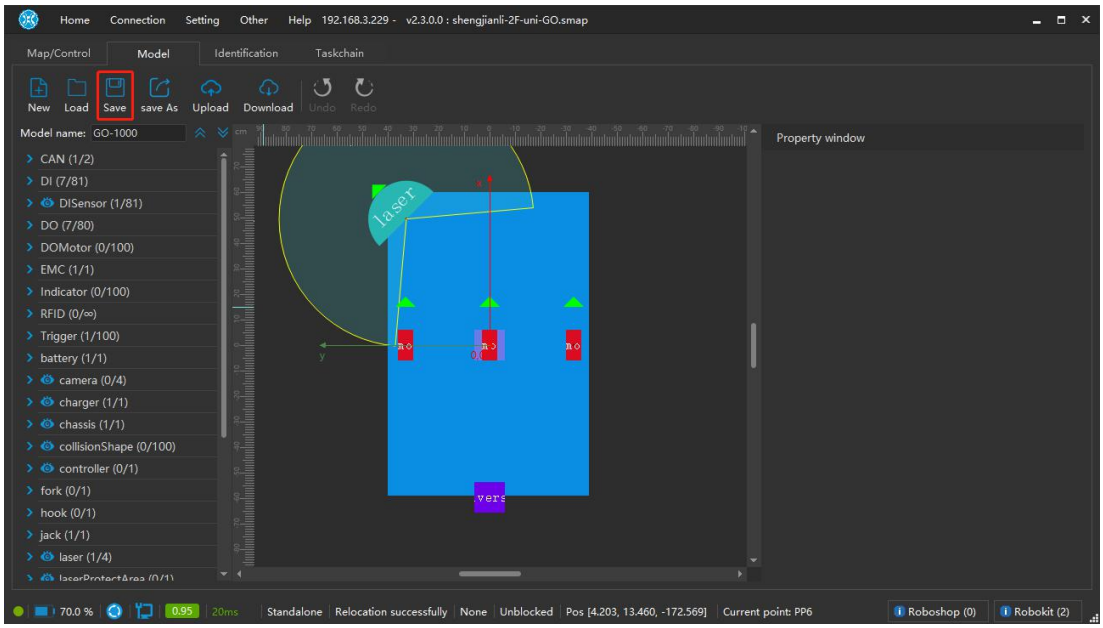
Click the [Load] button, the [Model File] window will appear, and users can open the corresponding robot model file as needs.



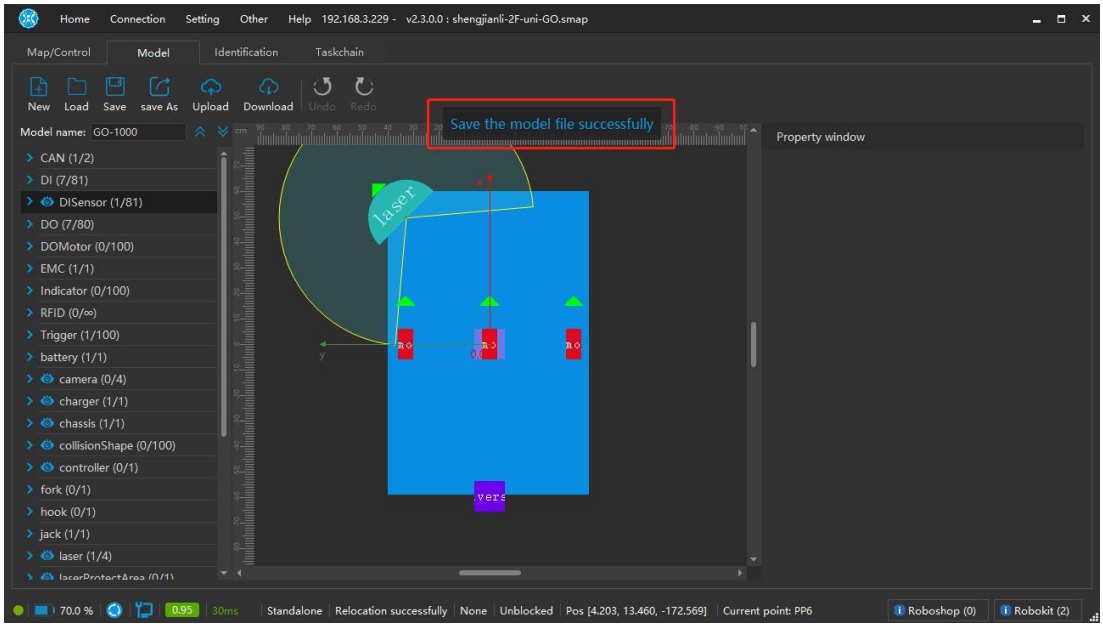
If the user wants to load another model file, copy that model file to this path and load that model file.

Save

It is used to save the edited model file. As shown below, the model file has been edited, click the [Save] button.

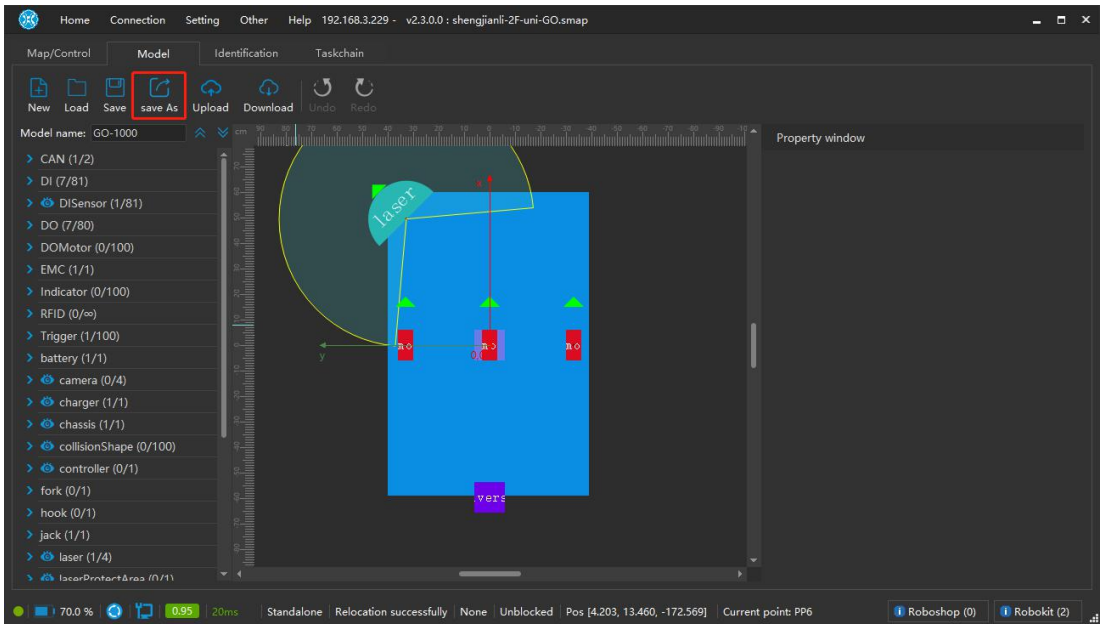


After successful saving, there will be a message: [Save the model file successfully], as shown below.



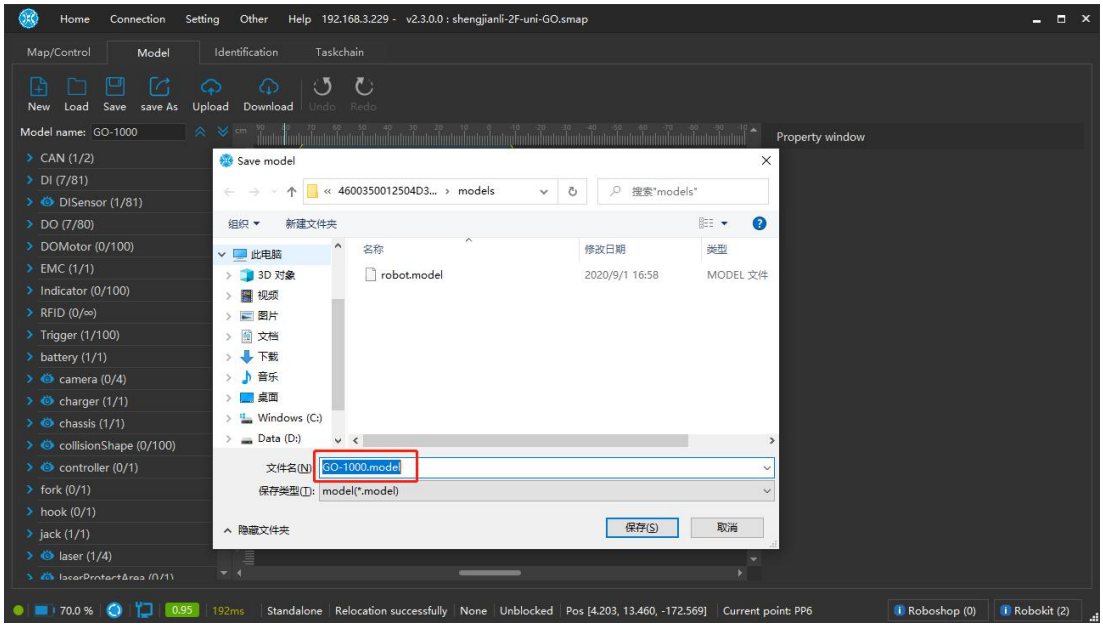
Save As

The operation to save the current model file to the specified path.



Click [Save As] button, the Model File window will pop up, as shown below;

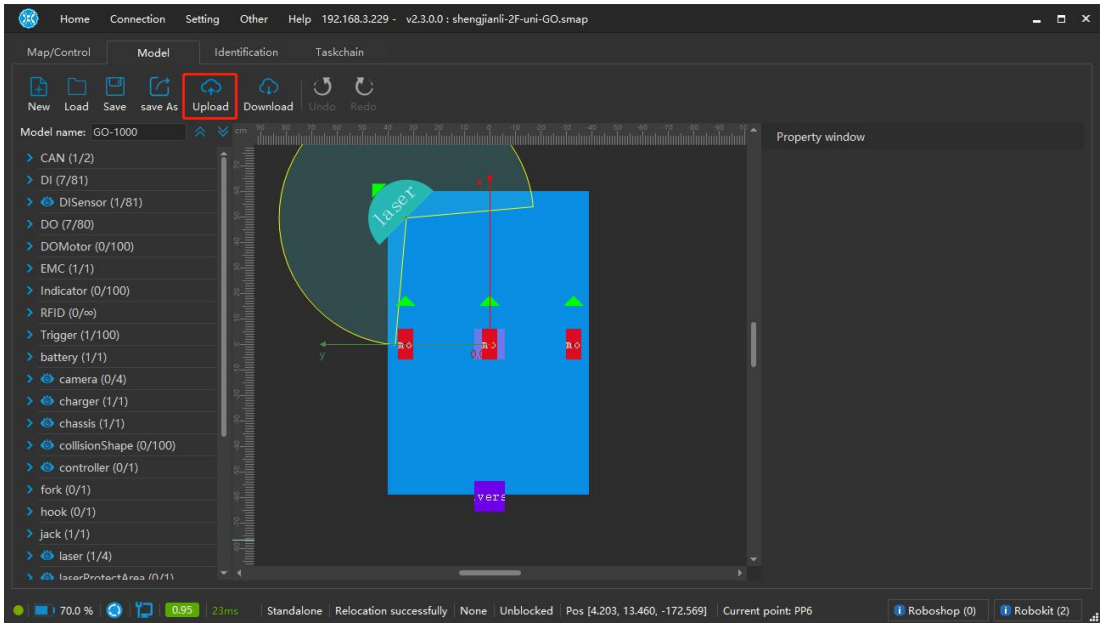
you can set the name of the model file, and choose the path to save it.



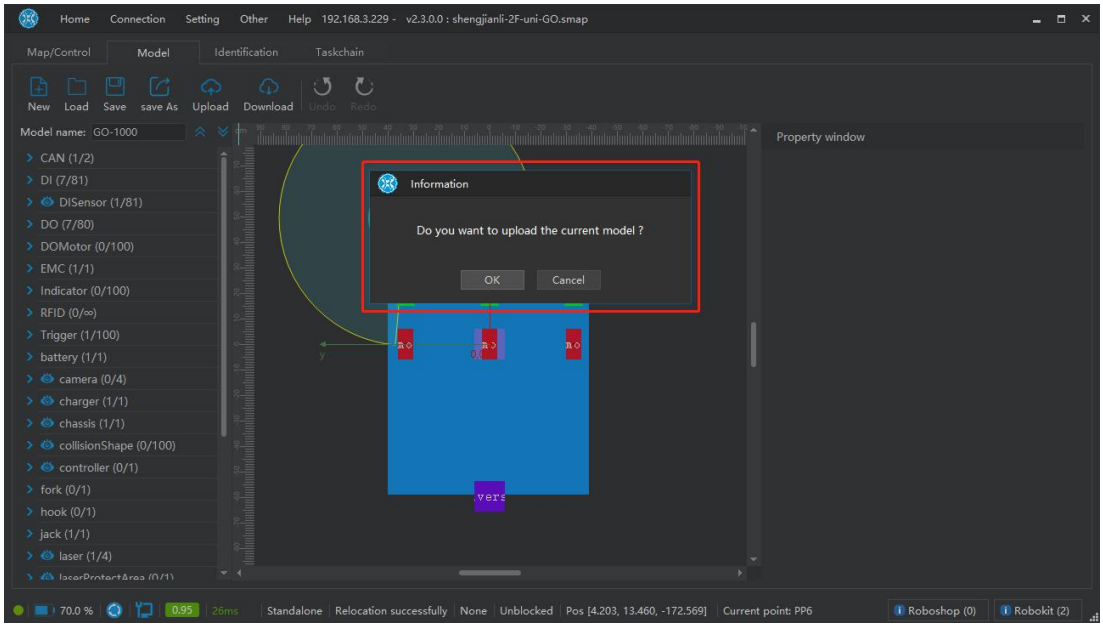
Upload

This operation is used to push the currently edited model file to the robot.

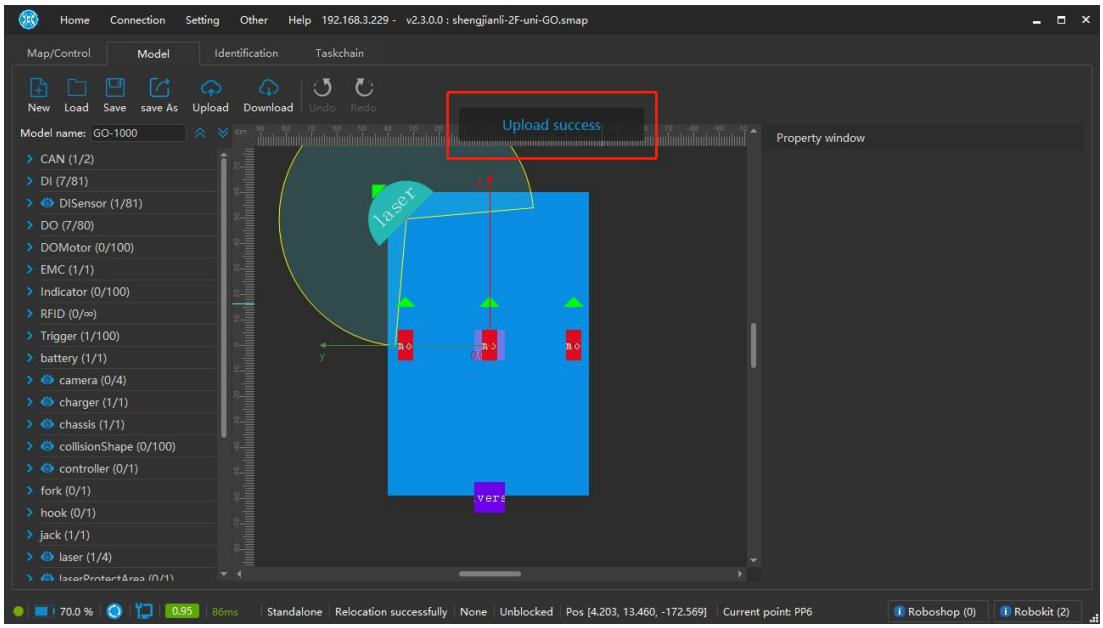
This action overwrites the robot's model file, so please proceed with caution.



Click the [Upload] button, a prompt screen will pop up, click [OK] to proceed.



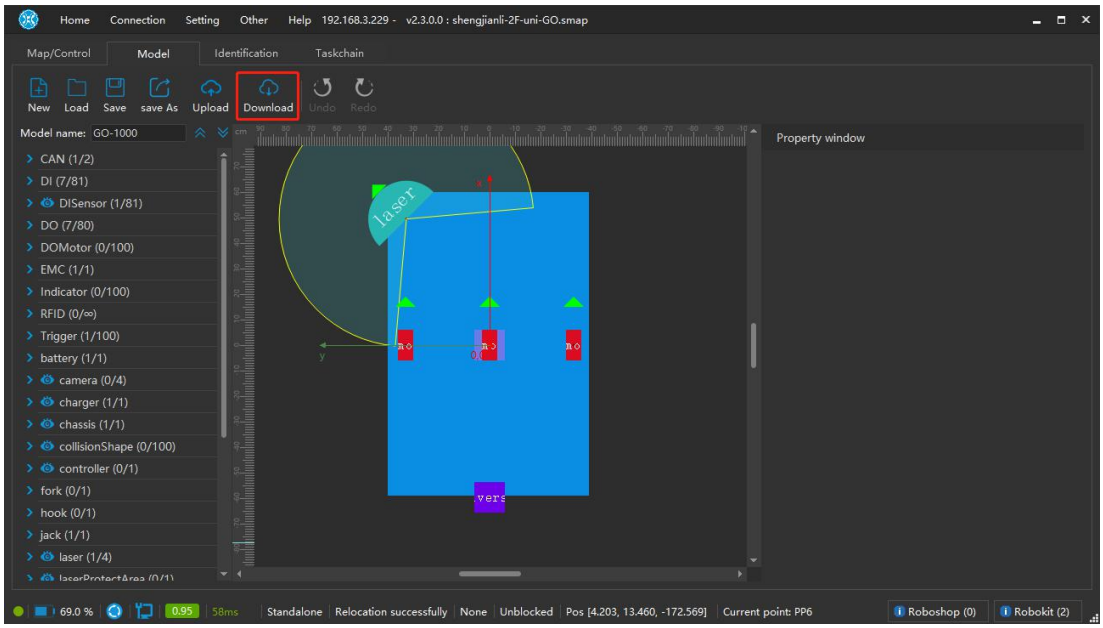
When the upload is successful, a prompt will be given: [Upload success], and the upload operation is completed.



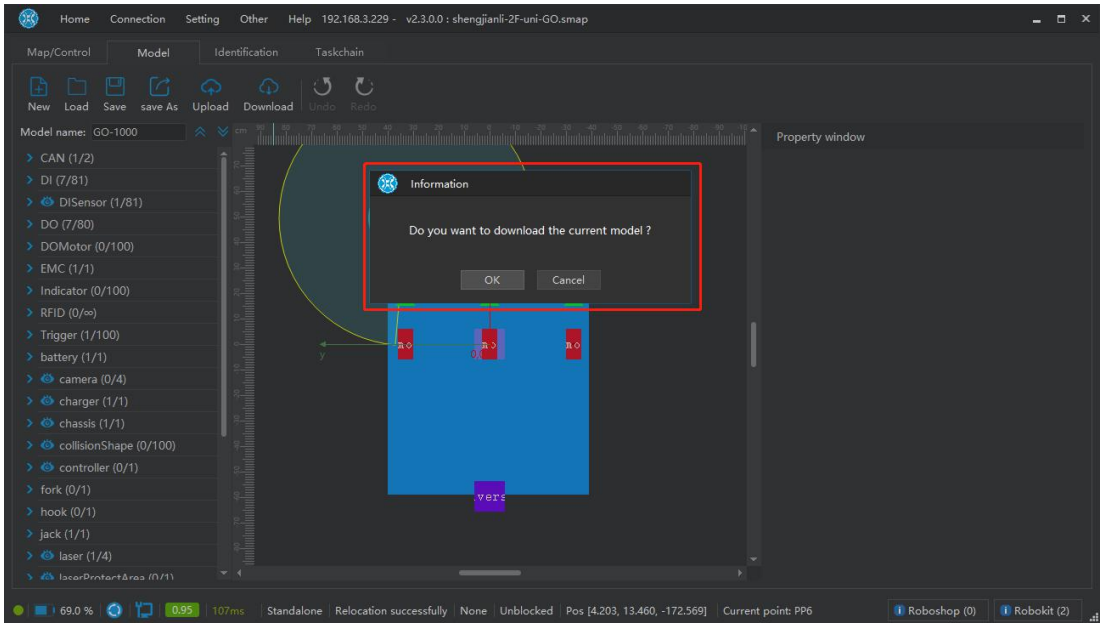
Download

An action to pull the model file currently used by the robot to the local area.

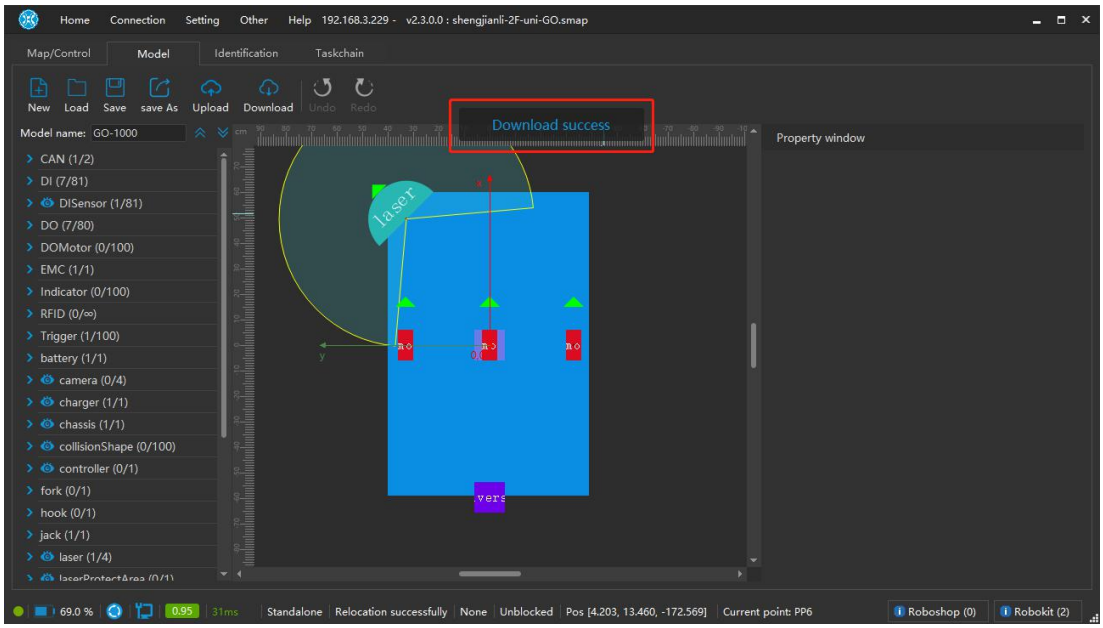
This action will overwrite the local model file, so please use caution.



Click the [Download] button, the prompt interface will pop up, click [OK] to proceed.

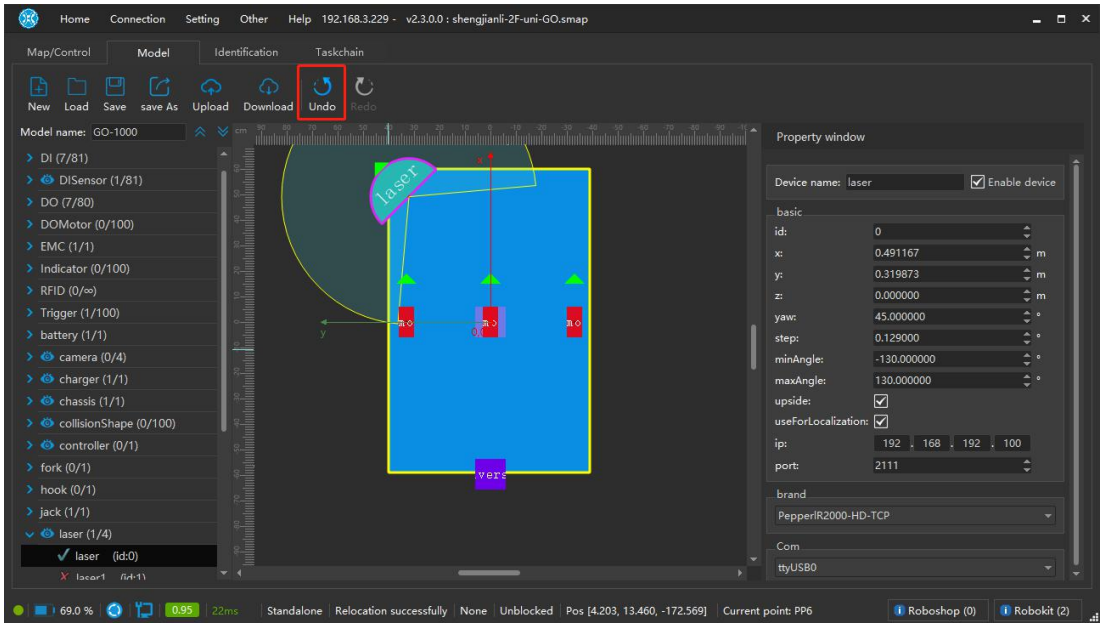


When the download is successful, a prompt will be given: [Download success], and the download operation is completed.

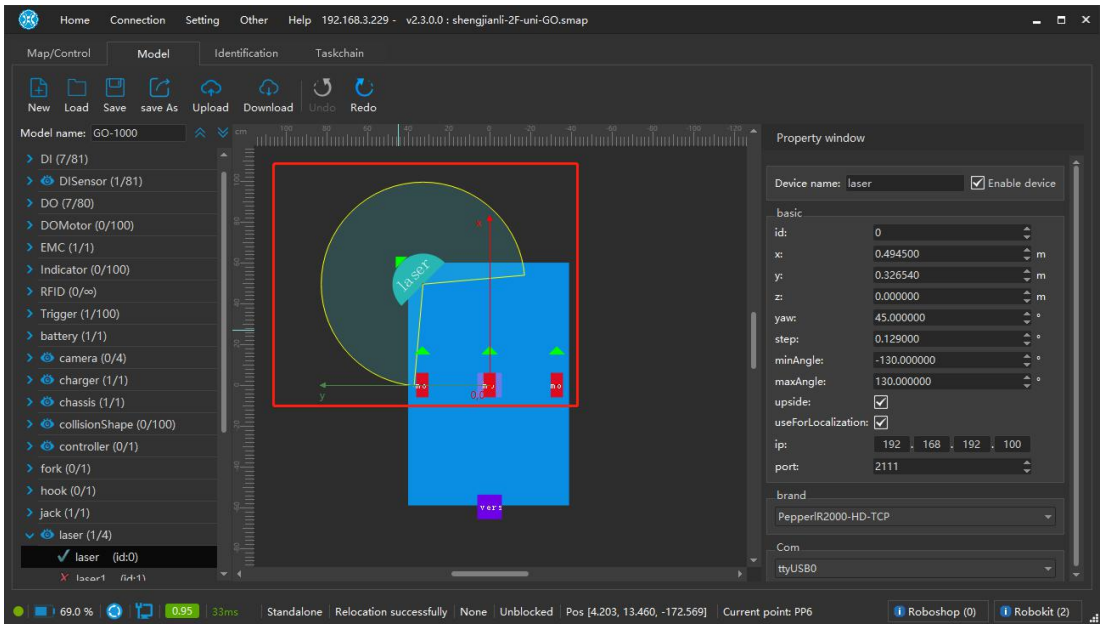


Undo

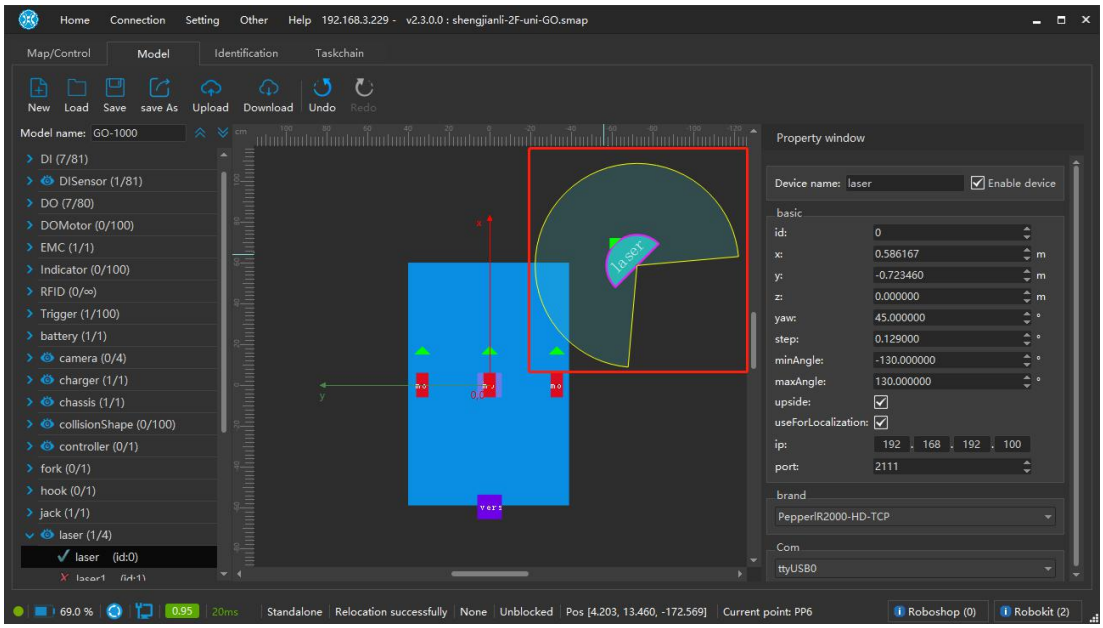
This is used when editing a model file to restore the state from the previous edit.



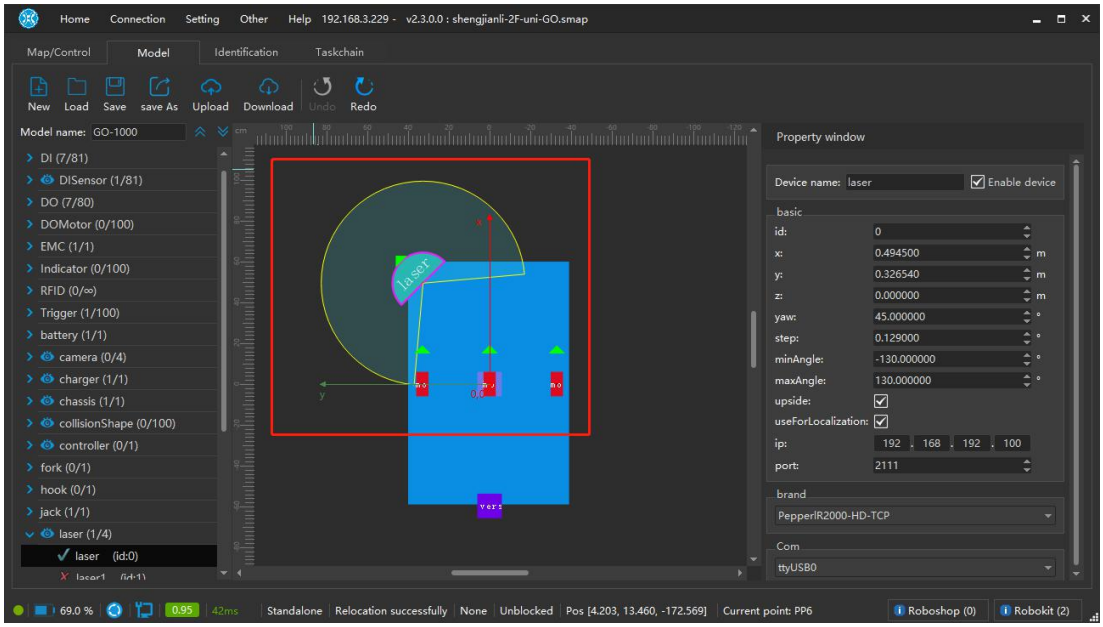
The location of the current laser device is shown below.



Move the laser device to the position shown below



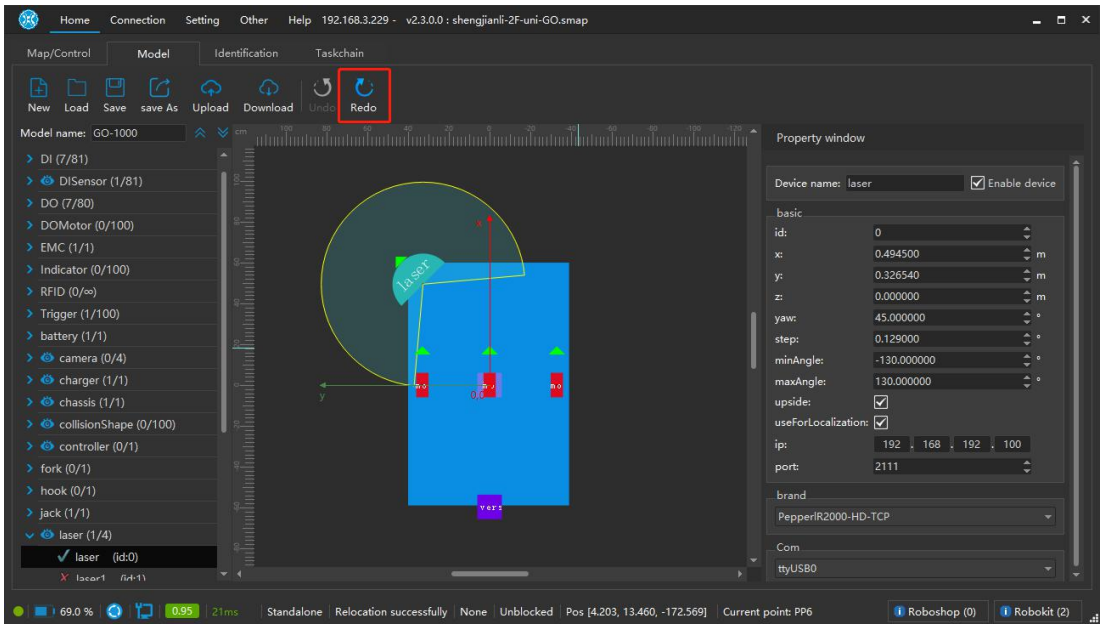
Click the [Undo] button to revert to the state edited in the previous step, as shown below.



The [Undo] operation also applies to the parameter operations.

Redo

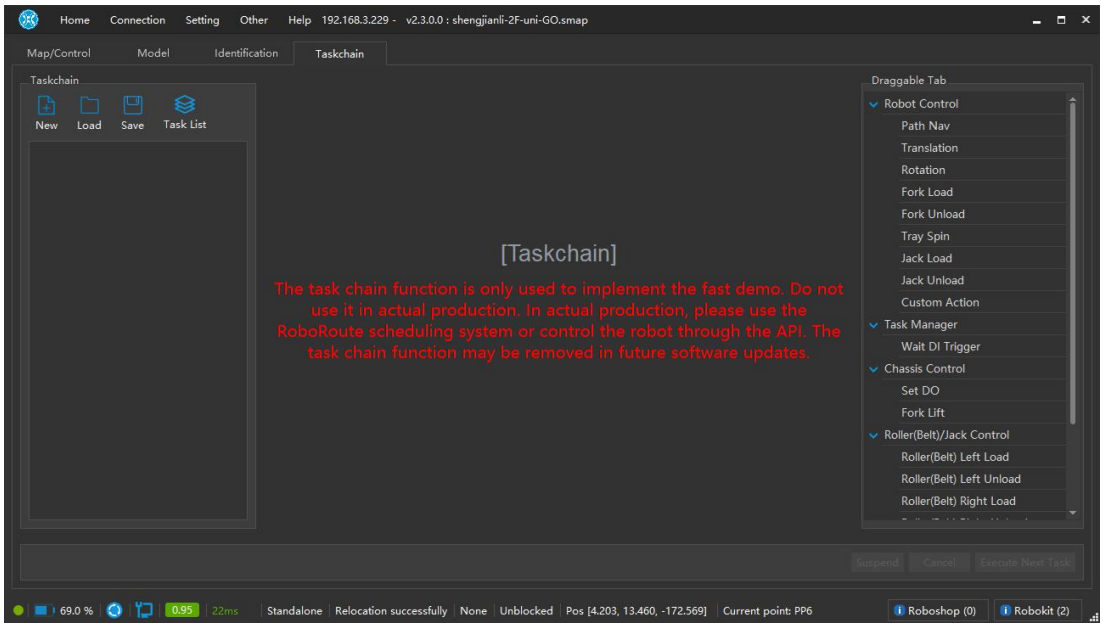
This used to restore the undo operation when editing a model file.



The [Redo] operation also applies to the parameter operations.

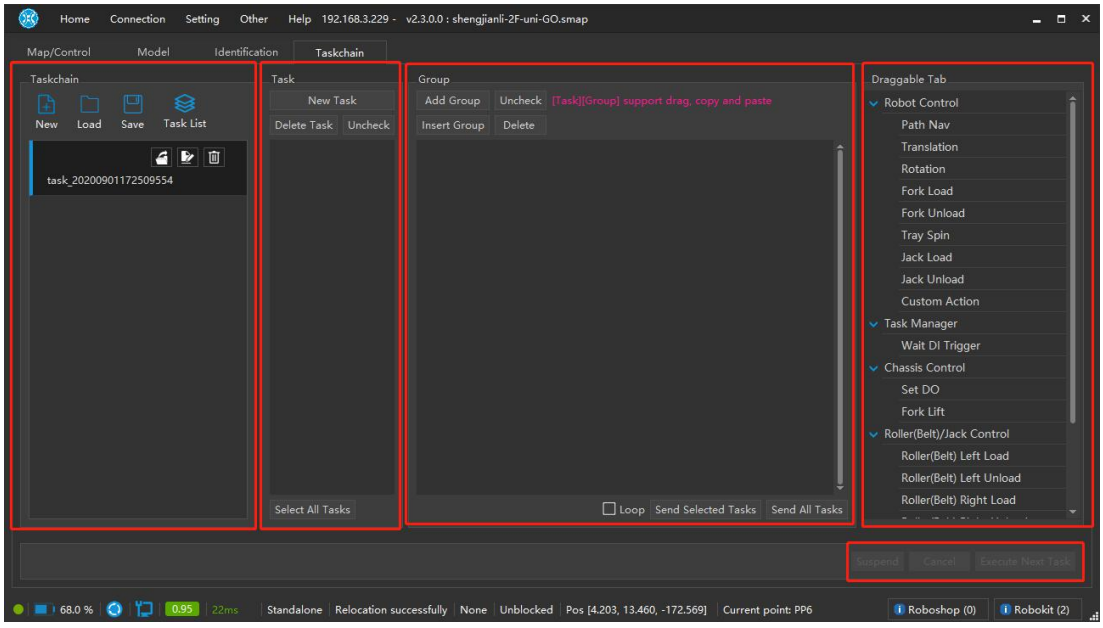
Taskchain

As shown in the figure below, this is the operation interface for the initialization of the task chain tag.



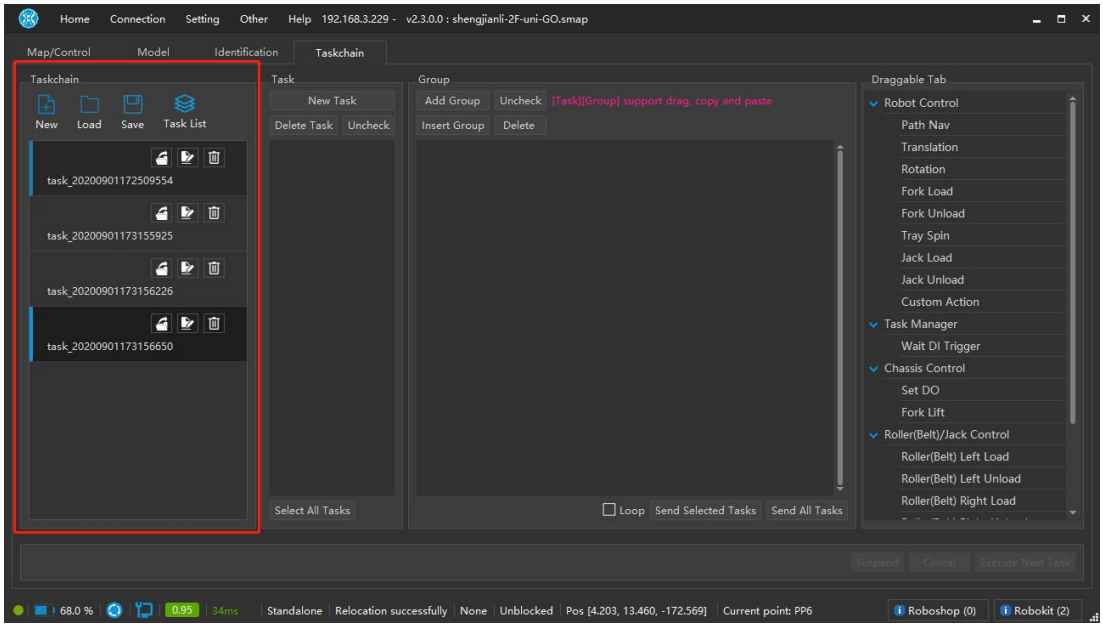
After a task chain is selected, the full contents of the task chain operation interface will appear as shown in the figure. From the diagram, we can see that the task chain module consists of five parts, from left to right are "Taskchain", "Task", "Group", "Draggable Tab", "task chain operation". One "Taskchain" contains multiple "Task", one "Task" contains multiple "Group", one "Group" contains multiple "Draggable Tab".

The task chain operation part becomes operable only after the robot starts executing the task chain.



Taskchain

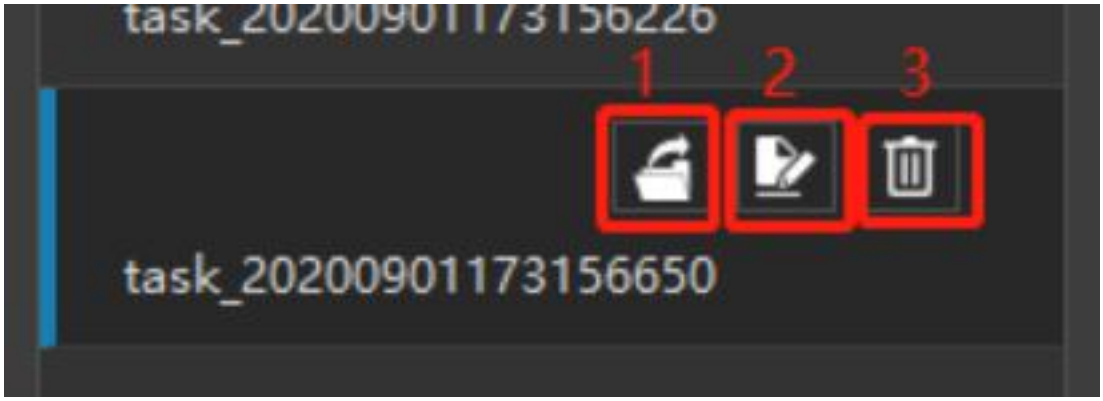
As shown in the figure below, the boxed part is the task chain operation area of the task chain module, and its functions include: [New], [Load], [Save] and [Task List].



1.New

Function: Create a new task chain.

After clicking [New], a new task chain will be added in the list area below.



After selecting a task chain, you can perform related operations on that task chain, including:

① [Export]：Save the selected task chain to the specified local path.

② [Rename]: rename the selected task chain, the name of the task chain is unique.

③ [Delete]: Delete the selected task chain.

2.Load

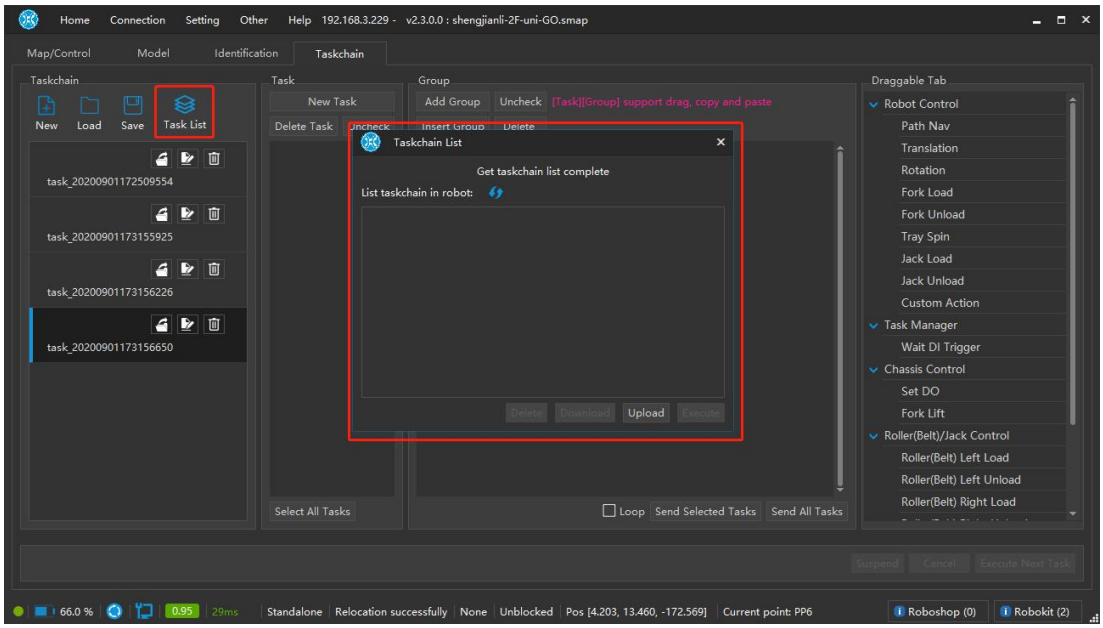
Load the saved task chains from robot into Roboshop Pro.

3.Save

Save the task chain you are editing.

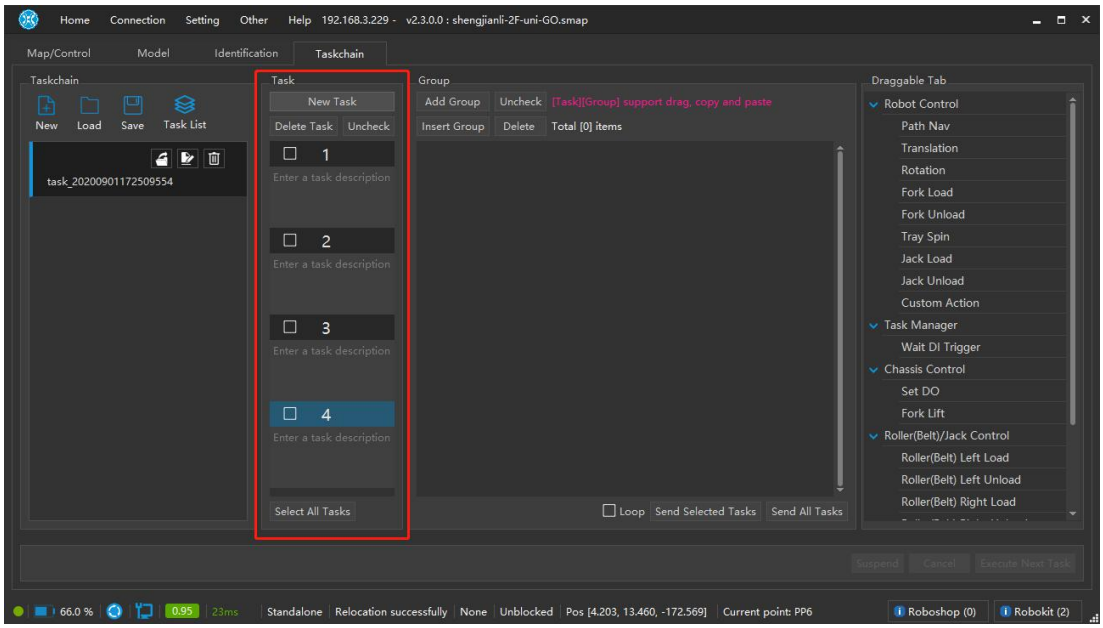
4Task List

Show all the task lists in the robot. Click this button, an interface will pop up.



Task

As shown below, the functions of [Task Chain] module include: [New Task], [Delete Task], [Uncheck], [Selected All Tasks].



1. New Task

Append new task.

2. Delete Task

Delete the selected task.

3. Uncheck

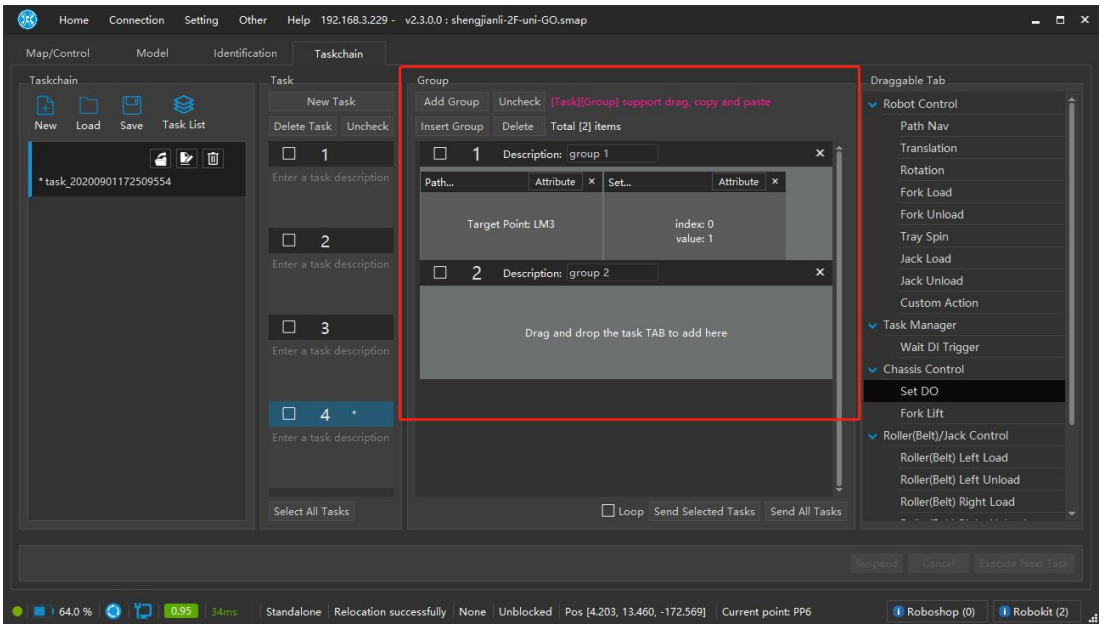
Set all tasks to be unselected.

4. Select All Tasks

Function: Set all Tasks to be selected. After [Task] is selected, the check box in the upper left corner of the [Task] will be displayed with [√].

Group

As shown below, each [Group] contains a number of [draggable tabs]. Tts functions include: [Add group], [Insert group], [Uncheck], [Delete], [Loop], [Send Selected Tasks], [Send All Tasks].



1. Add Group

Append a new group in the lowest place.

2. Insert Group

Insert a new group below the selected group.

3. Uncheck

Set all groups unselected.

4. Delete

Delete the selected groups.

5. Loop

Make the robot repeat operate the selected task chains.

Note: The default is unchecked. If this option is unchecked, the robot will only execute the selected "Task Chain" once.

6. Send Selected Tasks

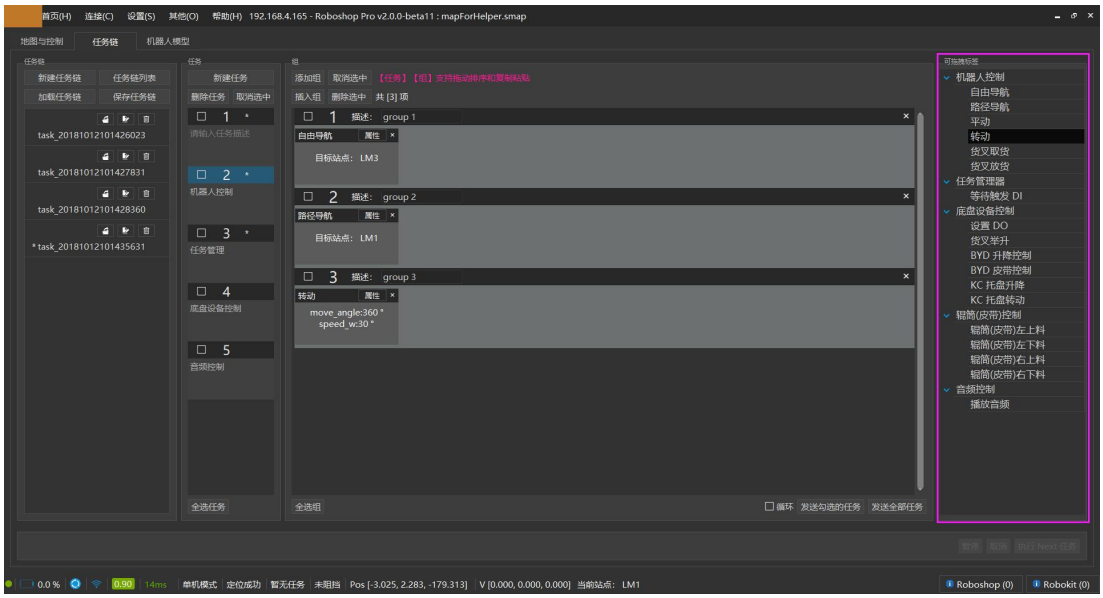
Send only a number of tasks that are checked in the current [Task Chain] to the robot, and make the robot execute them.

7. Send All Tasks

Send all the tasks in the current [Task Chain] to the robot and have the robot execute it.

Draggable Tab

As shown in the figure below, the categories of draggable tabs can be divided into six categories, namely: [Robot Control], [Task Manager], [Chassis Control], [Roller (Belt) control/Jack Control], [Audio Control] and [Custorm Tag].



To use it, just drag the target tag directly into the corresponding group. After adding a tag to a group, you must click on the tag to edit it as necessary.

1. Robot Control

[Path Nav]: Let the robot move to the target point according to the specified path.

[Translation]: Allows the robot to move a specified distance at a given speed.

[Rotation]: Allows the robot to rotate at a given angle at a given speed.

[Fork Load]: control the forklift to lift the goods (only available for forklift).

[Fork Unload]: control the forklift to lower the goods (only available to forklift).

[Tray Spin]: control the tray spin at a given angle speed.

[Jack Load]: control the

[Jack Unload]:

[Custom Action]:

2. Task Manager

[Wait DI Trigger]: Wait until the DI state trigger

3. Chassis Control

[Set DO]:Sets the DO states

[Fork Lift]: Controls the forks of the forklift move to a specified height (valid for forklifts only).

4. Roller (Belt) control/Jack Control

[Roller(Belt) Left Load]: The control roller (belt) loads goods from the left.

[Roller(Belt) Left Unload]: The control roller (belt) unloads goods from the left.

[Roller(Belt) Right Load]: The control roller (belt) loads goods from the right.

[Roller(Belt) Right Unload]: The control roller (belt) unloads goods from the right.

This function is only available for robots with rollers or belts.

5. Audio Control]

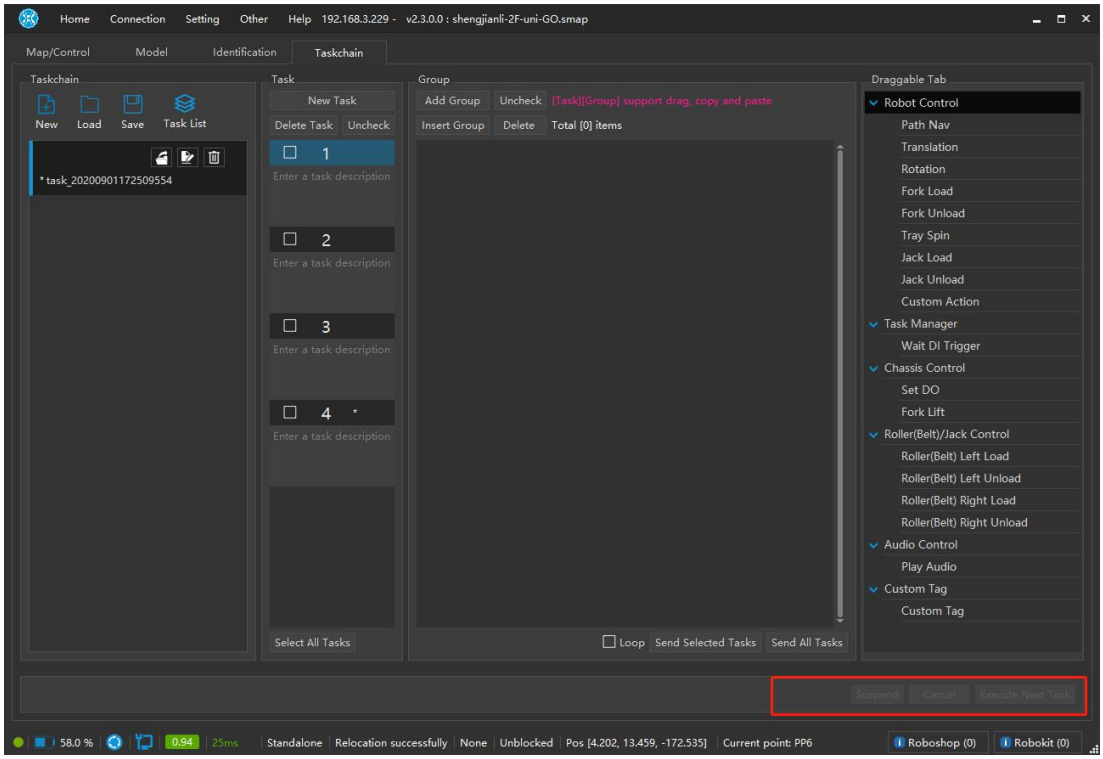
[Play Audio]: Play the audio file that exists in the specified robot.

6. Custom Tag

[Custom Tag]: Reserve the tags to users custom function (need to set before)

Taskchain Operation

As shown in the figure below, functions of the [Task Chain Operation] include: [Suspend\Resume taskchain], [Cancel], and [Execute Next Task]. These three functions are only active when the robot is executing the task chain.



1.Suspend\Resume taskchain

When the robot is executing a task chain, control the robot to pause the task chain it is executing; when the robot pauses the task chain, or control the robot to continue executing the original task chain.

2.Cancel

When the robot is executing a task chain, the control robot abandons execution of the current task chain.

3.Execute Next Task

When the robot is executing a task chain, control the robot to execute the next task in the task chain in sequence; if the robot is executing the last task in the task chain, the current task chain will be completed directly after clicking this button.

Operation Example

Example 1 Save the new task chain and make the robot repeat executing

The contents of the task chain:

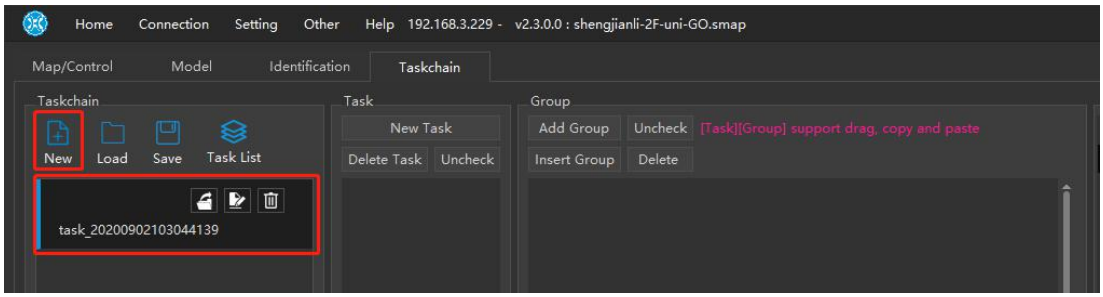
① Control the robot [Path Nav] to LM3 position;

② After the robot reaches LM3, it rotates 360° at an angular velocity of 30°/s.

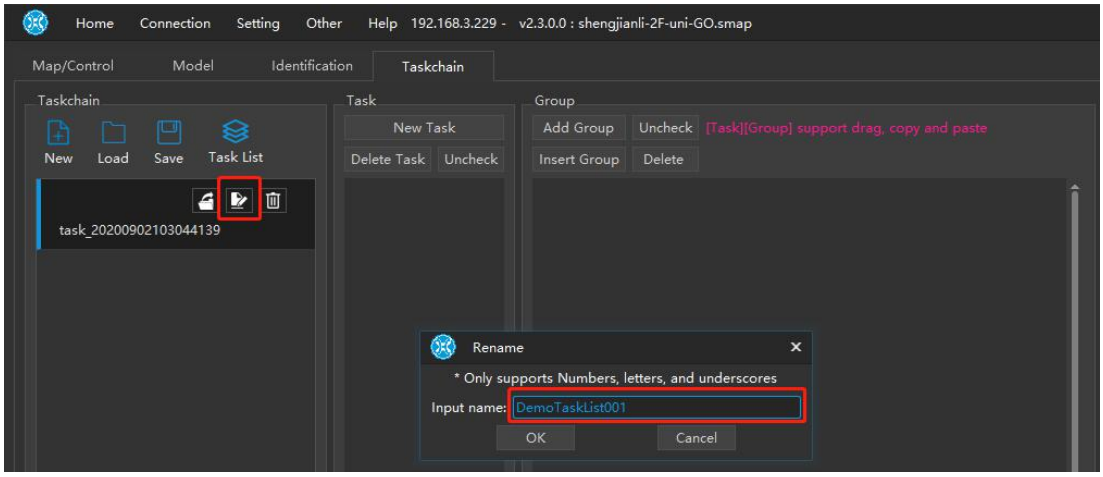
③ Control the robot [Path Nav] to LM5 position;

Operational steps:

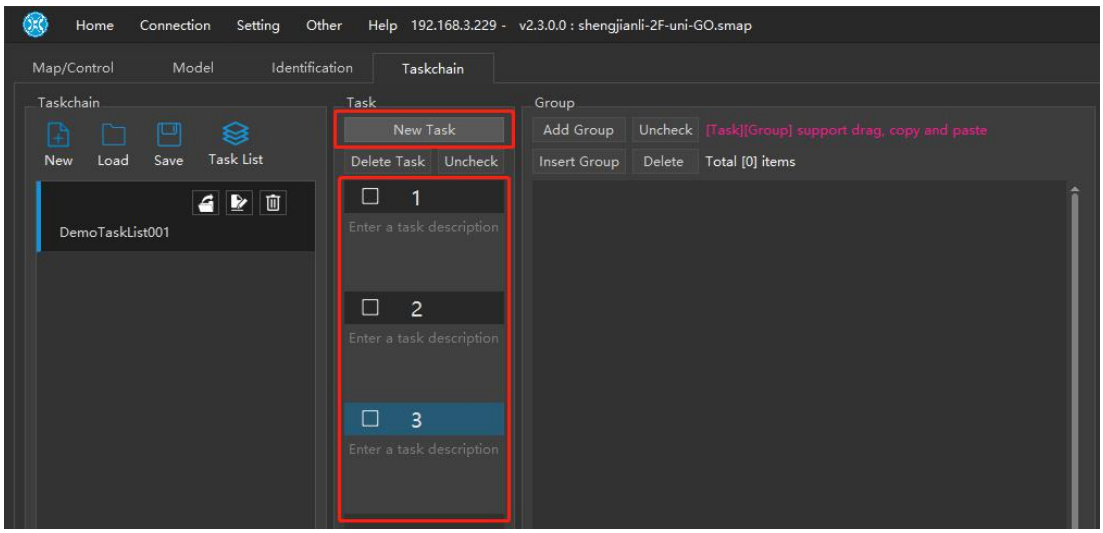
1.1 In the [Task Chain] operation module, click the [New Task Chain] button to create a new task chain, as shown in the following figure.



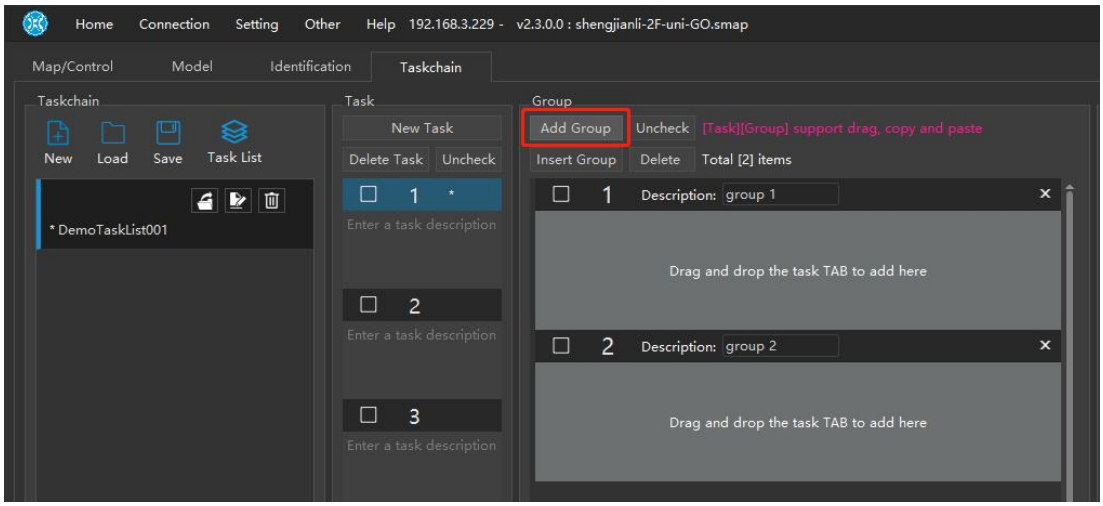
1.2 Select the new task chain, click the [Rename] button, and rename it to [DemoTaskList001] as required, as shown in the following figure.



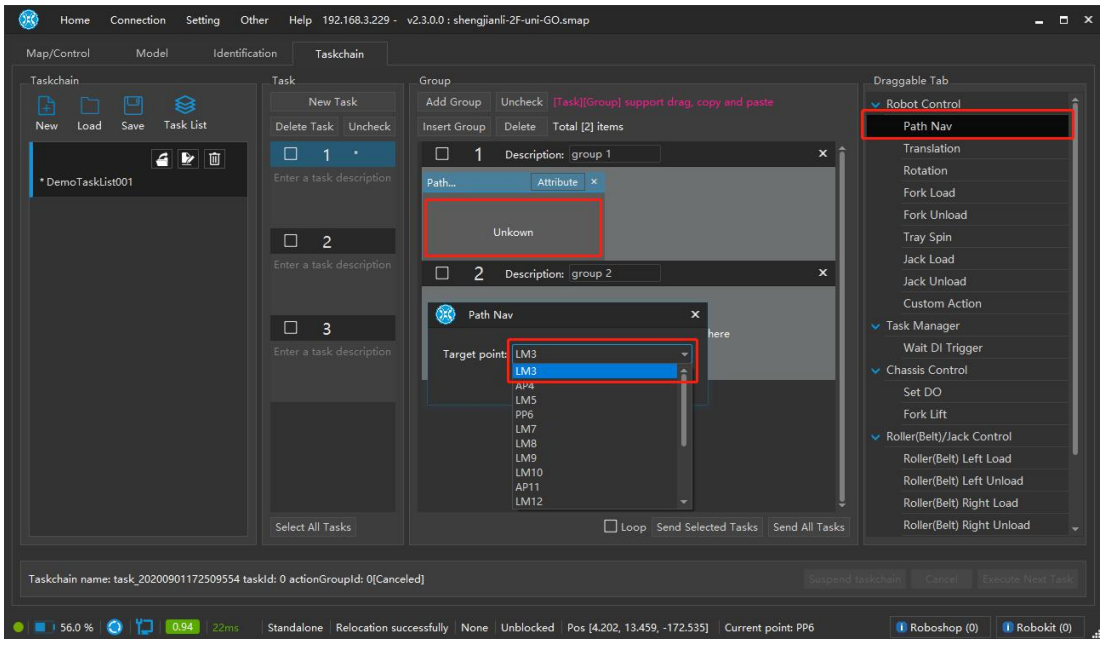
1.3 Select the new task chain, click the [New Task] button in the [Task] operation module, add three tasks in turn, and enter the relevant task description in the task description area, as shown below.



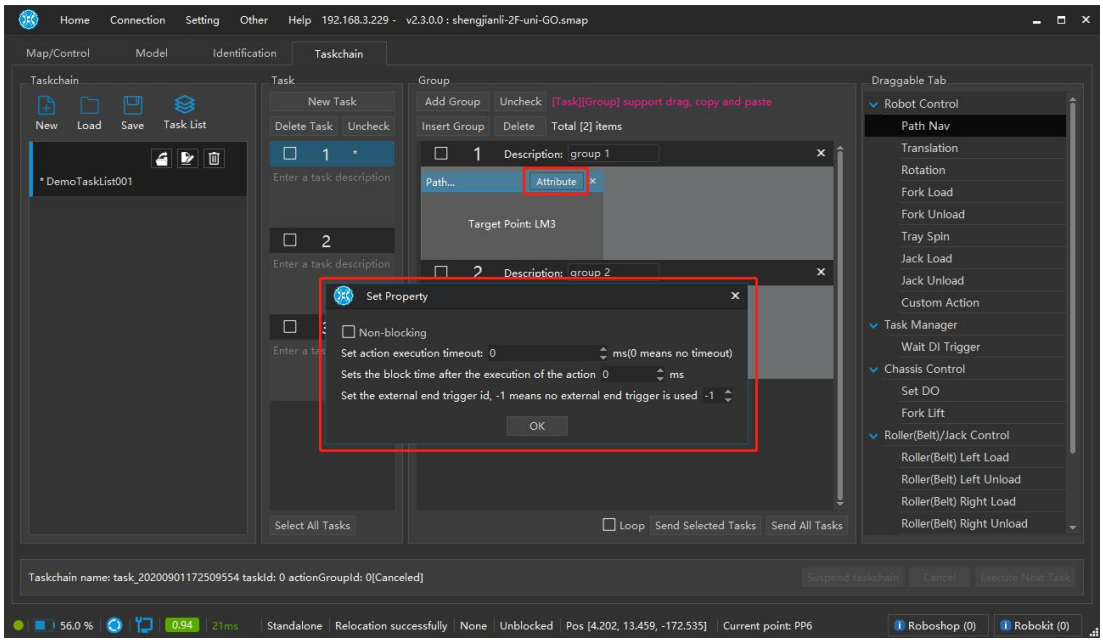
1.4 Select the number of [1] task, in the right side of the [Group] operation module, click the [Add Group] button, in order to add two [Group], as shown below.



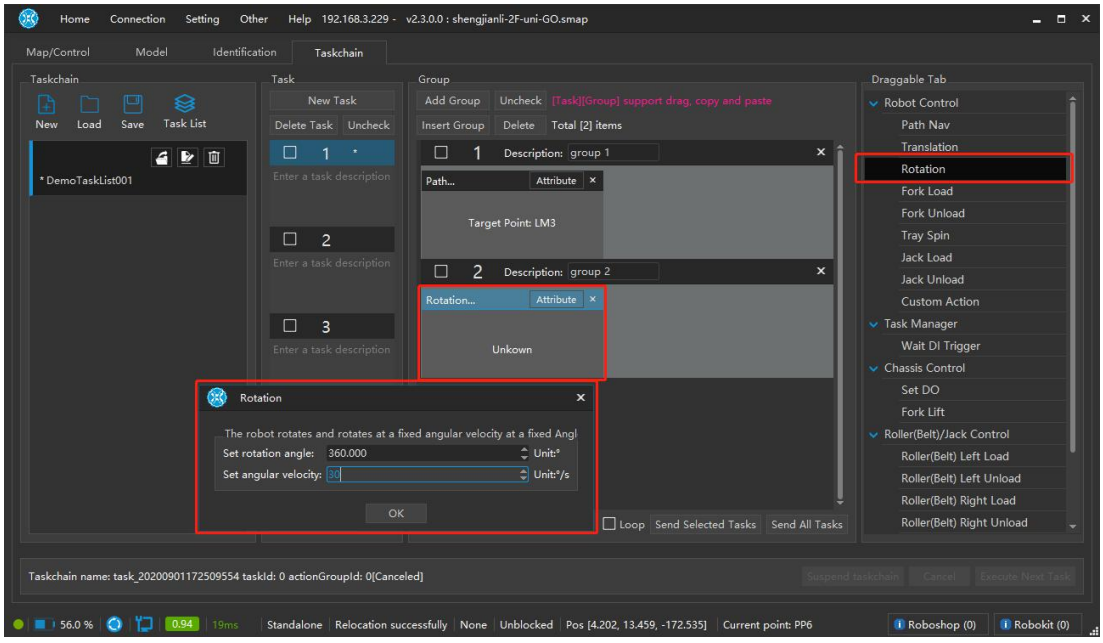
1.5 Select the [ath Nav] tag from the right side of the [Draggable Tag] action module, and drag it to [group1], then click on the [unknown] part of the new [Path Nav] tag to add [Target Point] for [LM3], as shown below.



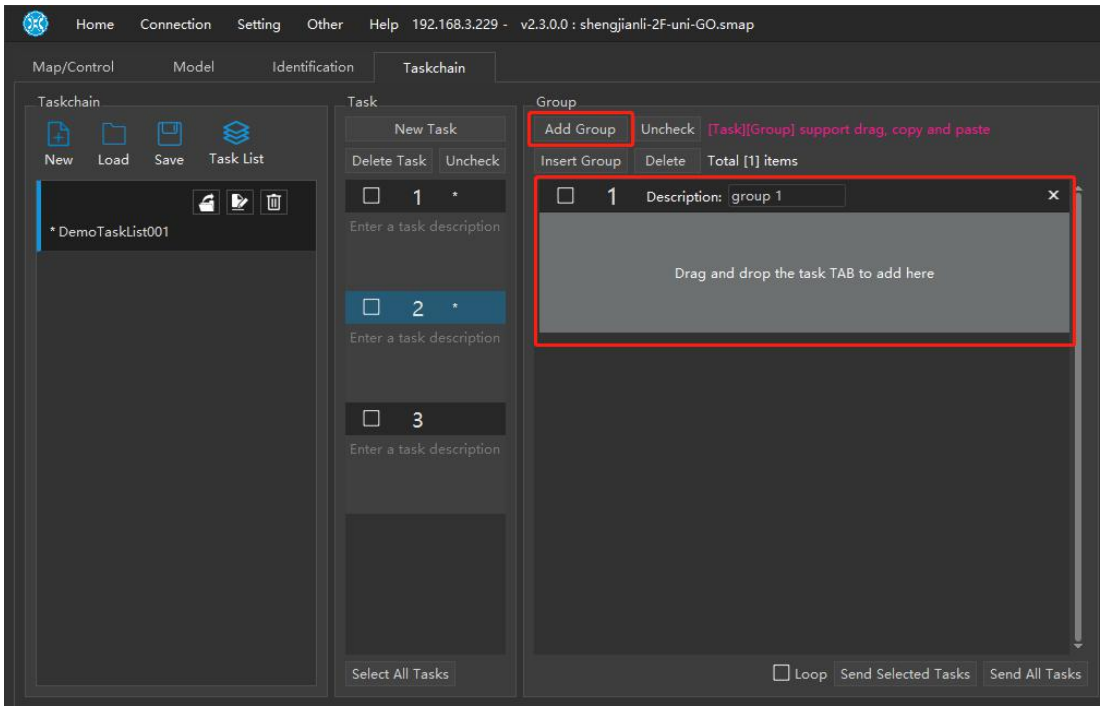
Note: Click the [Attributes] button in the upper right corner of the label to make advanced settings for the actions corresponding to the current label, as shown below.



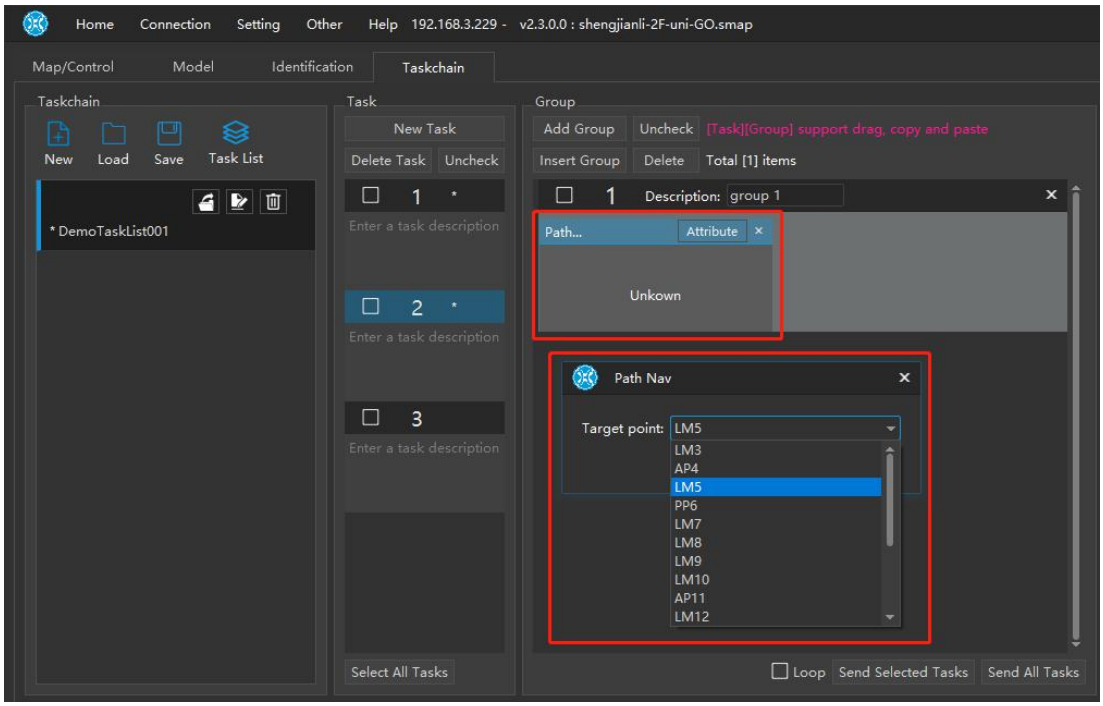
1.6 Select the [Rotation] tag from the right side of the [Draggable Tag] operation module, and drag it to [group2], then click the [Unknown] part of the newly added [Rotation] tag, and set the [Rotation Angle] to [360°] [30°/s].



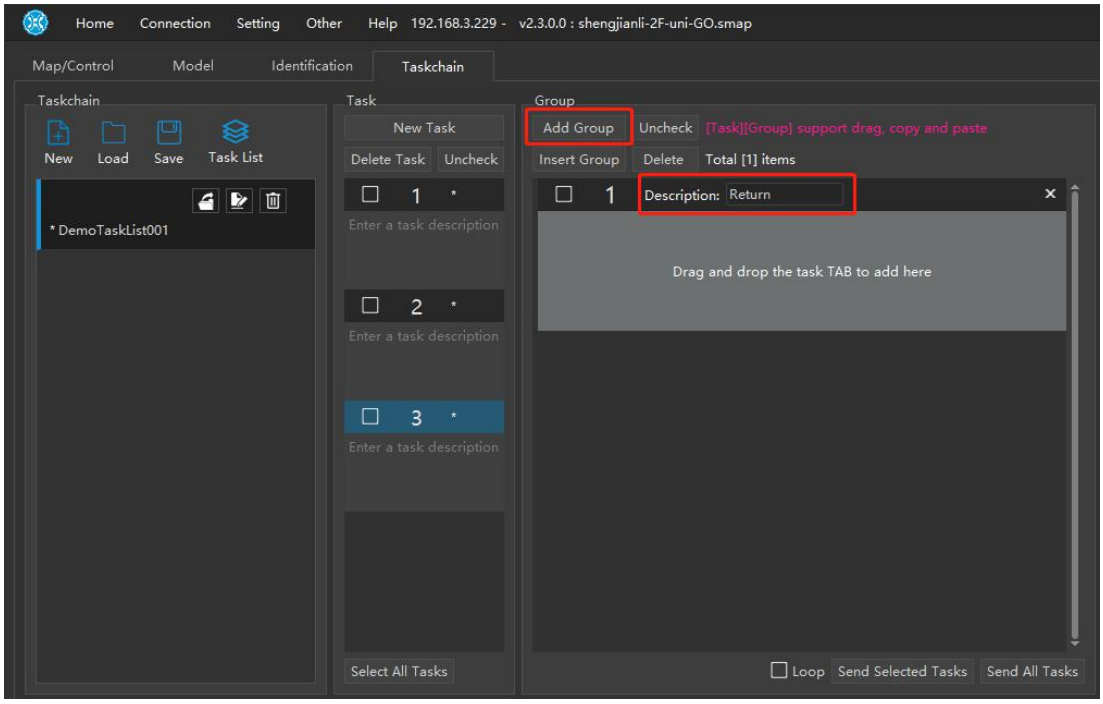
1.7 Select the task 2, click the [Add Group] button to add a [Group] in the right side of the Group operation module,, as shown below.



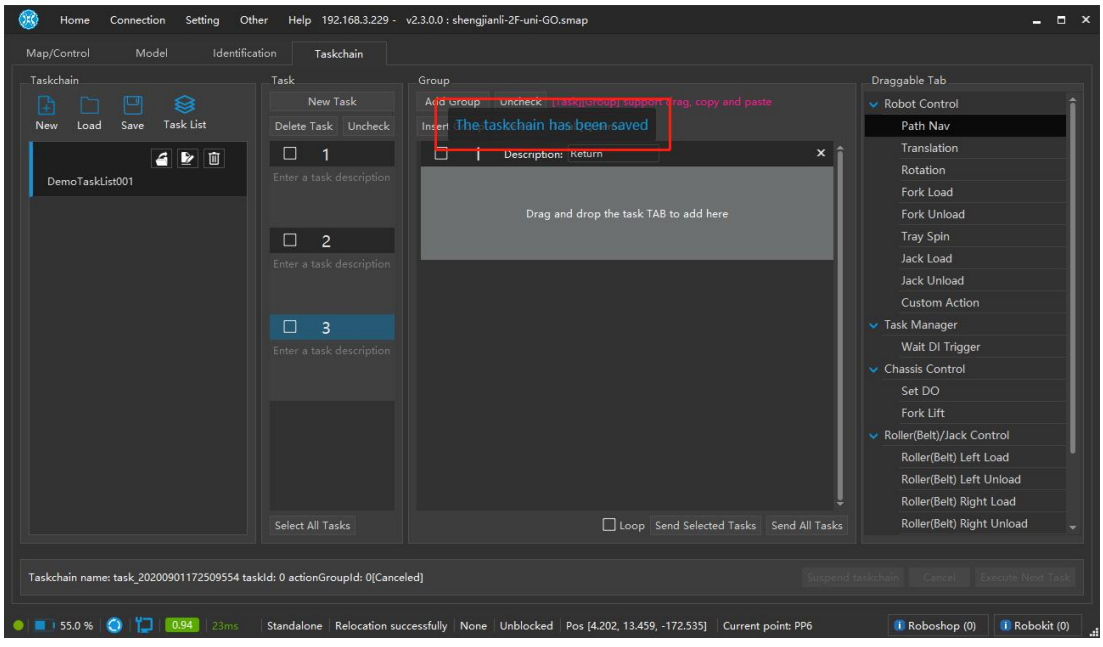
1.8 Select the [Path Nav] tag from the right side of the [Draggable Tag] action module, and drag it to [group 1], then click on the [unknown] part of the new [Path Navigation] tag to add [target point] for [LM5], as shown below.



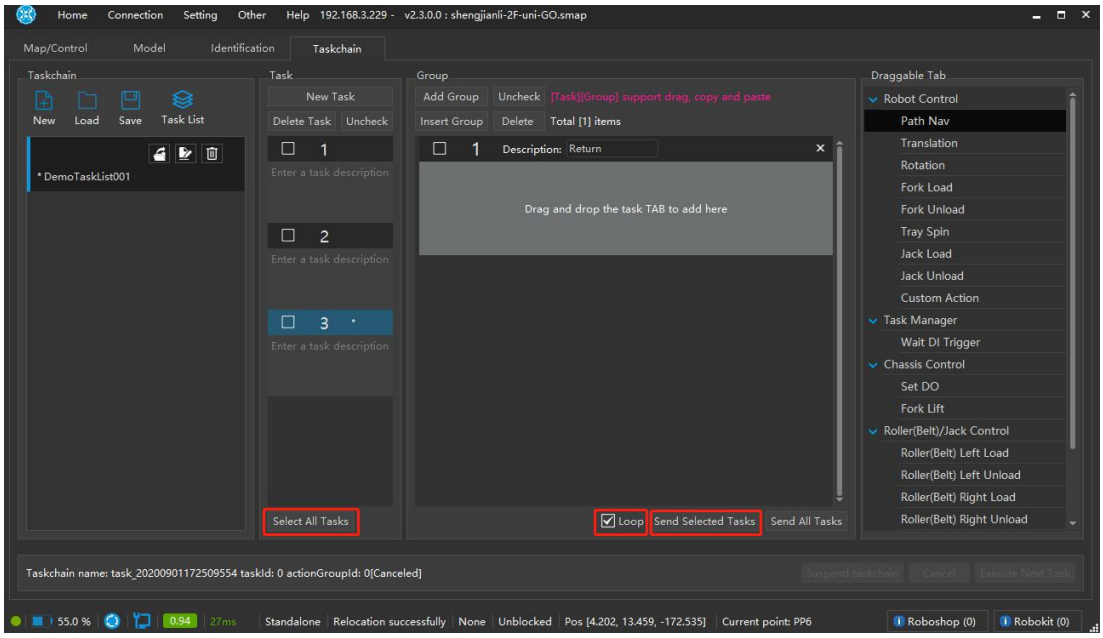
1.9 Select the task 3, click the [Add Group] button in the [Group] operation module on the right to add a [Group] and rename the group to [Return], as shown below.



1.10 Click the [Save Task Chain] button in the [Task Chain] operation module, or use [Ctrl+S] to save the current task chain to the default path, as shown in the following figure.



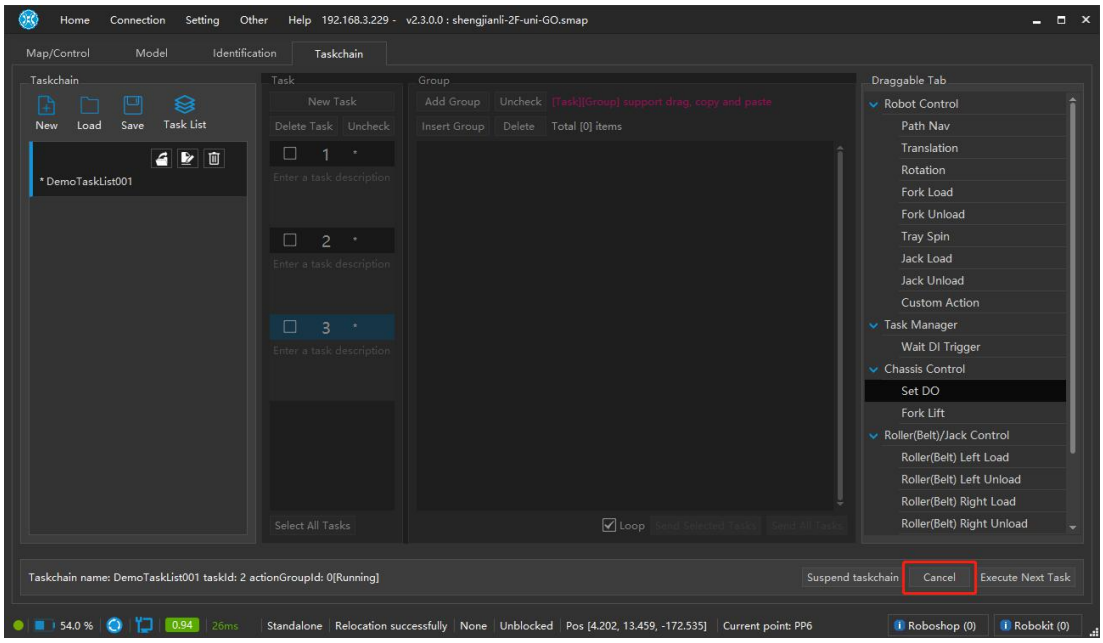
1.11 Click the the [Select All Tasks] button, then click the group operation module of the [Loop] option, and finally click the [Send Selected Tasks] button, as shown below.



Example 2 Control robot terminates the [Example 1] task chain

Operational steps:

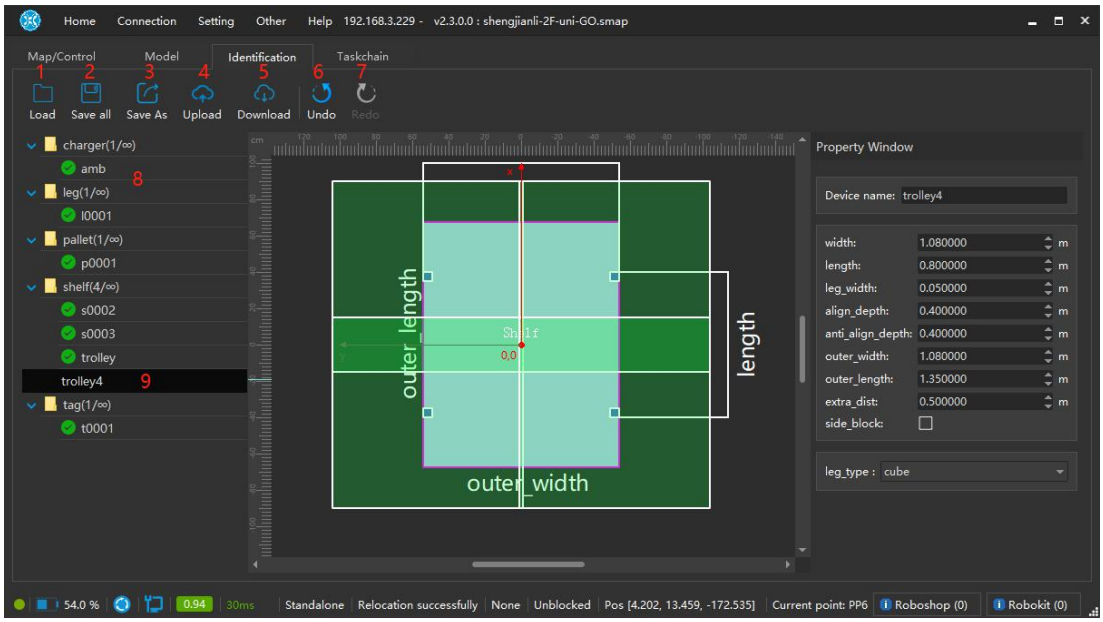
2.1 When the robot is executing the task chain in Example 1, you can control the robot to "terminate" the current task chain by clicking the [Cancel] button.



Identification

Function

As shown in the figure below, the toolbar of the robot's [Identification] module consists of [Load], [Save all], [Save As], [Upload], [Dwonload], [Undo], [Redo].



① Load: used to add identification files from outside, before loading, select the folder corresponding to the file type to load, such as adding shelf files, you need to select the "shelf folder" in the list and then click [Load].

② Save all：Save the file after editing

③ Save As：Same as save function, you can specify save path.

④ Upload：Upload all local files to the robot.

⑤ Download：download all the identification files in the robot to the local, the icon that successfully downloaded identification files will be the 

⑥Undo：Undo some operations (shortcut: Ctrl+Z)

⑦Redo：You can recover some operations (shortcut: Ctrl+Y)

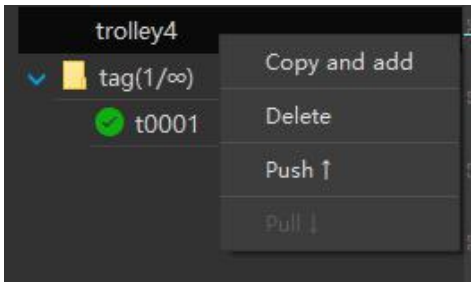
⑧：this identification file exists both RoboshopPro and in the robot, and that the content of the files are the same.

⑨If the file does not have an icon, the file does not exist in the robot.

⑩ ：the file exists locally and in the robot, but are different files.

⑪: indicates that it does not exist locally, exists on the robot, and will prompt when clicked.

Select a node and right-click and you can upload or pull this file:



Appendix

Property Description

Description of Bessel Curve Properties

Bessel curve has the following properties (which are not set if not select this property):

1.direction: set whether the robot is walking forward or backward.

2.movestyle: set the robot's motion guidance method.

3.maxspeed (m/s): set the max speed of the robot along the curve.

4.maxacc (m/s^2): the maximum acceleration of the robot along the curve.

5.maxdec (m/s^2): the maximum deceleration of the robot moving along the curve.

6.maxrot (°/s): the maximum rotational velocity of the robot moving along the curve.

7.maxrotacc (°/s^2): the maximum rotational acceleration of the robot moving along this curve.

8.maxrotdec (°/s^2): the maximum rotational deceleration of the robot moving along the curve.

ultrasonic

fallingdown

infrared

virtualLaser

3DCameraHole

3DCameraObstacle

collisionGroupId

9.reachdist (m): pre distance to the target point, don`t change generally.

10.reachangle(°): pre reach angle to the target position, don`t change generally.

11.width(m): set the path of cable and affect the detour function, don`t change generally.

12.length(m): adjust the result of the shortest path search algorithm, don`t change generally.

13.holdDir: robot moving direction on the line and only valid for robot, don`t change generally.

14.obsStopDist(m): stopping distance before obstacle, don`t change generally.

15.obsDecDist(m): advance deceleration distance before obstacle, don`t change generally.

16.obsExpansion(m): expansion width when robot predicts collision, don`t change generally.

broken:

loadMaxSpeed:

loadMaxAcc:

loadMaxDec:

loadMaxRot

loadMaxRotAcc:

loadMaxRotDec:

loadObsStopDist:

loadObsDecDist:

goAngle:

loadObsExpansion:

collisionPointThreshold

Note:

Movestyle generally only uses path guidance, infrared guidance (self-charging) and magnetic stripe guidance (requires magnetic navigation accessories), please contact us for more details.

Description of Advanced Area Properties

Advanced Area has the following properties (which are not set if not select this property):

1.forbidden: whether forbidden to enter this area, only valid for free navigation.

2.maxspeed(m/s): the maximum speed of the robot when it moves within the area.

3.maxacc(m/s^2): the maximum acceleration when the robot moves within the area.

4.maxdec(m/s^2): the maximum deceleration of the robot when it moves within this area.

5.maxrot(°/s): the maximum deceleration of the robot when it moves within this area.

6.maxrotacc(°/s^2): the maximum rotational acceleration of the robot when moves within this area.

7.maxrotdec(°/s^2): the maximum rotational deceleration of the robot during motion within this area.

8.ultrasonic: if or not the ultrasonic is enabled when the robot moves within the range (if not set, it will be enabled by default if the robot has this sensor).

9.fallingdown: if or not the sensor is enabled when the robot is moving within the area (if not set, it is enabled by default if the robot has the sensor).

10.infrared: if or not the infrared sensor will be enabled when the robot moves within the area (if not set, it will be enabled by default if the robot has this sensor).

virtualLaser

3DCameraHole

3DCameraObstacle

collisionGroupId

11.weight: to be set

12.obsStopDist(m): stopping distance before obstacle, don`t change generally.

13.obsDecDist(m): advance deceleration distance before obstacle, don`t change generally.

14.obsExpansion(m): expansion width when robot predicts collision, don`t change generally.

loadMaxSpeed:

loadMaxAcc:

loadMaxDec:

loadMaxRot

loadMaxRotAcc:

loadMaxRotDec:

loadObsStopDist:

loadObsDecDist:

loadObsExpansion:

collisionPointThreshold

Priority of multiple Properity

The four attributes "maxspeed, maxacc, maxrot, maxrotacc" exist in both the Bezier curve and the general advanced attributes area and can also be configured in the robot parameter configuration. Therefore the priority of the attributes needs to be specified. The robot configuration sets global parameters, if the robot is along a curve where these attributes are not set and the robot does not enter the area where these attributes are set, then the robot will use the global parameters. If the robot moves only along the curve where these attributes are set and does not enter the area where these attributes are set, the robot will use the attributes set on the curve and the global parameters will be ignored. If the robot only enters the area where these attributes are set, but does not move along the curve where these attributes are set, the robot will adopt the attributes set in the area, and the global parameters will be ignored. If the robot both moves along a curve with these attributes set and enters an area with these attributes set, the robot will adopt the more stringent attributes and the global attributes will still be ignored. For example, if maxspeed is set to 0.4 m/s in the curve, and

maxspeed is set to 0.1 m/s in the region, the so-called stricter is smaller, 0.1 < 0.4, so the robot will adopt 0.1 m/s. The other 3 parameters are the same. These 4 attributes are independent of each other.

For the properties "obsStopDist, obsDecDist, obsExpansion", they exist in both the Bezier curve and the general advanced properties area, and can also be configured in the robot parameter configuration. Therefore, the priority of the attributes needs to be specified. The robot configuration sets global parameters. If the robot is along a curve where these properties are not set and the robot does not enter a region where these properties are set, then the robot will use the global parameters. If the robot moves only along the curve where these attributes are set and does not enter the area where these attributes are set, the robot will use the attributes set on the curve and the global parameters will be ignored. If the robot only enters the region where these attributes are set, but does not move along the curve where these attributes are set, the robot will adopt the attributes set in the region, and the global parameters will be ignored. If the robot both moves along a curve with these attributes set and enters an area with these attributes set, the robot will adopt the safer attributes, and the global attributes will still be ignored. For example, if obsStopDist is set to 0.4m in the curve, and obsStopDist is set to 1.0m in the region, safer i.e. larger, 0.4 < 1.0, so the robot will adopt

obsStopDist = 1.0m. The same applies to the other 2 parameters. These 3 attributes are independent of each other.

Alarm Code Specification

Alarm codes are divided into 4 categories, namely Fatal, Error, Warning, and Notice. When an Error or Fatal error occurs, the robot will not move until the error is removed.

All alarm codes and their corresponding explanations are listed below.

A. Fatal Code

Code	Name	Specification	Solution
50000	internal error	internal error	1. Please contact with our after-sale service.
50001	resource exhaustion	Depletion of internal resources	1. Please contact with our after-sale service.
50002	lua error	Internal lua scripts call error	1. Please contact with our after-sale service.
50100	map parse error	Map Analysis Error	1. Please try upload the map again by Roboshop. 2. Please contact with our after-sale service.

50101	map load error	Load map error	1. Please try upload the map again by Roboshop. 2. Please contact with our after-sale service.
50102	map is too large	The map is too large.	1. Check whether the map area less than 40000 ㎡ 2. Please contact with our after-sale service.
50103	map is empty	Map data is empty	1. Please try upload the map again by Roboshop. 2. Please contact with our after-sale service.
50104	map meta error	Map metadata errors	1. Please try upload the map again by Roboshop. 2. Please contact with our after-sale service.
50105	map resolution is illegal	map resolution is illegal	1. Please try upload the map again by Roboshop. 2. Please contact with our after-sale service.
50106	map format invaild	map format invaild	1. Please try upload the map again by Roboshop. 2. Please contact with our after-sale service.
50200	mobilerobots path error	Mobilerobots path is wrong.	1. Please try upload the map again by Roboshop.
50201	mobilerobots init error	Mobilerobots initiation is wrong.	11. Please try upload the map again by Roboshop.
50202	mobilerobots register error	Mobilerobots registers wrong.	1. Please try upload the map again by Roboshop.
50203	unsupported robot motion model	Robot motion model is unsupported.	1. Check the robot model is correct by Roboshop. 2. Please try upload the map again.

50204	can not find mobilerobots dll	The corresponding motion model cannot be found.	1. Check the robot model is correct by Roboshop. 2.Please try upload the map again.
50300	hardware connect error	Hardware connection error	1. Please try upload the map again by Roboshop.
50301	seer dio heart beat loss	Microcontroller heartbeat packet timeout	1. Please try upload the map again by Roboshop.
50302	subsystem error	Subsystem connection failure	1. Please try upload the map again by Roboshop.
50303	network connection error	Network connection error	1. Please try upload the map again by Roboshop.
50304	firmware version too low	Firmmware version is too old.	1. Please try upload the map again by Roboshop.
50400	gyro original data error	Gyro original data is wrong.	1. Please try upload the map again by Roboshop.
...	...	...	

. Error Code

Code	Name	Description	Solution
52019	less than 3 reflectors detected	Less than 3 reflctors are detected.	1. Please read the reflctors position manual. 2. If you still can't recover, please contact after sales
52030	roller error	Roller is wrong	1.Send a new and reasonable roller command to eliminate the roller alarm 2. Press the emergency stop button and resume to eliminate the roller

			alarm 3. If you still can't recover, please contact after sales
52031	roller or jack or hook disconnected	Peripheral device (roller, jack or hook) disconnected	1. Check whether the configuration of the peripheral devices in Roboshop is OK. 2. Chek whether the peripheral device is powered or not. 3. Check whether the peripheral device connection is OK. 4. If you still can't recover, please contact after sales
52034	jack error	Jack is wrong	1.Send a new and reasonable roller command to eliminate the jack alarm 2. Press the emergency stop button and resume to eliminate the roller alarm 3. If you still can't recover, please contact after sales
52039	hook error	Hook is wrong	1.Send a new and reasonable roller command to eliminate the hook alarm 2. Press the emergency stop button and resume to eliminate the roller alarm 3. If you still can't recover, please contact after sales
52050	arm disconnected	Robot arm disconnected.	——
52051	arm error	Robot arm is wrong.	——

52100	laser error	Comminication with laser device lost.	1. Check whether the laser device work normally. 2. Check whether the configuration of the laserl devices in Roboshop is OK. 3. Check whether the peripheral device connection is OK. 4. Check that the laser device IP settings are correct 5. Check the IP conflict or not. 6. If you still can't recover, please contact after sales
52101	laser data invalid	All laser data is invalid.	1. Check the laser device work normally. 2. Check whether the configuration of the laserl devices in Roboshop is OK. 3. Check the configuration of laser device by manufacturer`s software 4. If you still can't recover, please contact after sales.
52102	laser data lost	The laser data lost.	1. Check the laser device work normally. 2. Check whether the configuration of the laserl devices in Roboshop is OK. 3. If it occurs frequently and cannot be automatically restored, please contact the after-sales service.
52106	odo data lost	The odo data lost.	1. If it occurs frequently and cannot be automatically restored, please contact the after-sales service.
52107	localization error	The localization is wrong.	1. Check that the two maps used to switch are using the same SM site. 2. If you still can't recover, please contact after sales.

52108	time synchronization error	The time synchronization is wrong.	1. Please contact after sales.
52110	imu error	The gyroscope has faults.	1. Restart the robot 2. If it occurs frequently and cannot be automatically restored, please contact the after-sales service.
52111	motor driver connection error	The motor driver connection is wrong.	1. Check that the drive is working normally, including checking the baud rate and ID. 2. Check that the driver connection is correct. Be aware that the CAN bus have a termination resistor 3. Check whether the configuration of the motor driver in Roboshop is OK. 4. Check whether the configuration of the motor driver brand in robot model is OK. 5. Please refer to our driver error checking process document. 6. If you still can't recover, please contact after sales.
52112	ultera sonic error	The ultra sonic deice is wrong.	1. Check the ultra sonic device work normally. 2. Check whether the configuration of the ultra sonic device in Roboshop is OK. 3. Check whether the connection of the ultra sonic device is OK. 4. Check whether the configuration of the ultra sonic device in robot model is OK. 5. If you still can't recover, please contact after sales.

52113	RFID reader error	The RFID reader is wrong.	1. Check the RFID reader work normally. 2. Check whether the configuration of the RFID reader in Roboshop is OK. 3. Check whether the connection of the RFID reader is OK. 4. Check whether the configuration of the RFID reader in robot model is OK. 5. If you still can't recover, please contact after sales.
52114	magnetic 0 tracker error	The magnetic 0 tracker is wrong.	1. Check the magnetic tracker work normally. 2. Check whether the configuration of the magnetic tracker in Roboshop is OK. 3. Check whether the connection of the magnetic tracker is OK. 4. Check whether the configuration of the magnetic tracker in robot model is OK. 5. If you still can't recover, please contact after sales.
52115	magnetic 1 tracker error	The magnetic 1 tracker is wrong.	1. Check the magnetic tracker work normally. 2. Check whether the configuration of the magnetic tracker in Roboshop is OK. 3. Check whether the connection of the magnetic tracker is OK. 4. Check whether the configuration of the magnetic tracker in robot model is OK. 5. If you still can't recover, please contact after sales.

52116	controller net down	Controller network connection fail.	1. If it cannot be automatically restored, please contact the after-sales service.
52117	controller link down	Controller network disconnection.	1. If it cannot be automatically restored, please contact the after-sales service.
52119	task frequency is low	Task frequency of controller is too low.	1. If it cannot be automatically restored, please contact the after-sales service.
52122	robot fall down	The robot fall down.	1. Set the robot upright on a horizontal surface 2. If it occurs frequently and cannot be automatically restored, please contact the after-sales service.
52123	DSPChassis modbus IO error	Modbus IO is wrong.	1. Check the modbus IO board work normally. 2. Check whether the configuration of the modbus IO board in Roboshop is OK. 3. Check whether the connection of the modbus IO board is OK. 4. the configuration of the modbus IO board in robot model is OK. 5. Please refer to the modbus IO board usage document. 6. If you still can't recover, please contact after sales.
52124	controller under voltage seriourly	Controller is under low voltage.	1. Check whether the electrical connection is OK. 2. If you still can't recover, please contact after sales.
52125	controller over voltage seriourly	Controller is under over voltage.	1. Check whether the electrical connection is OK. 2. If you still can't recover, please contact after sales.

52126	copley connection error	Copley connection is wrong.	1. Check that the Copley is working normally. 2. Check that the Copley connection is correct. 3. Check whether the configuration of the Copley in Roboshop is OK. 4. Check whether the configuration of the Copley in robot model is OK. 5. Please refer to our error checking process document. 6. If you still can't recover, please contact after sales.
52127	PGV connection error	PGV connection is wrong.	1. Check that the PGV is working normally. 2. Check that the PGV connection is correct. 3. Check whether the configuration of the PGV in Roboshop is OK. 4. Check whether the configuration of the PGV in robot model is OK. 5. Please refer to our error checking process document. 6. If you still can't recover, please contact after sales.
52128	lift driver connection error	The connection of lift driver is wrong.	1. Check whether the configuration of the lift driver in Roboshop is OK. 2. Please refer to our lift driver configuration document. 3. If you still can't recover, please contact after sales.
52129	lift driver fault	The lift driver is wrong.	1. Check whether the configuration of the lift driver in Roboshop is OK. 2. Please refer to our lift driver configuration document. 3. If you still can't recover, please contact after sales.

52130	motor GVDD over voltage	The motor GVDD is over voltage.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52131	motor FET over current	The motor FET is over current.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52132	motor over tempreture	The motor is over-heat.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52133	motor VDD under voltege	The motor VDD is under voltage.	1. Testart and if it cannot be automatically restored, please contact the after-sales service.
52135	motor error see log	The motor is wrong, please refer to log.	1. Please refer to our motor error checking process document. 2. If you still can't recover, please contact after sales.
52136	new speed timeout	The speed order is timeout.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52137	steer angle overflow	Rudder angle overflow.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52138	fork encode connection error	The fork encoder connection is wrong.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52139	steer error see log	The steer is wrong, please refer to log.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52140	pump error see log	The pump is wrong, please refer to log.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52141	pump connect error	The pump connection is wrong,	1. Restart and if it cannot be automatically restored, please contact the after-sales service.

52142	lose connection with battery can	——	——
52143	lose connection with lift driver	Connection with lift driver lost.	1. Please refer to our motor error checking process document. 2. If you still can't recover, please contact after sales.
52144	lift encoder has not configured	The lift encoder has not configurated.	1. Please refer to our lift configuration document. 2. If you still can't recover, please contact after sales.
52145	lift safe control trigger	Rise height is over threshold but DI don`t trigger.	1. Please verify the lift DI. 2. Please refer to our lift configuration document. 3. If you still can't recover, please contact after sales.
52146	lose connection with lift rotation driver	Lift rotation driver disconnect.	1. Please refer to our error checking process document. 2. If you still can't recover, please contact after sales.
52152	lift rotation vel too large	Lift rotation is over speed.	1. Please refer to our lift configuration document. 2. If you still can't recover, please contact after sales.
52153	lift elevation error see log	Lift elevation motor is wrong, please refer to log.	1. Please refer to our motor error checking process document. 2. If you still can't recover, please contact after sales.
52154	lift rotation error see log	Lift rotation motor is wrong, please refer to log.	1. Please refer to our motor error checking process document. 2. If you still can't recover, please contact after sales.

52160	robot received an illegal speed	The robot received an illegal speed command.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52200	robot is blocked	Robot is blocked	1. Remove the barriers.
52201	robot out of path	Robot is out of path	1. Power off and push the robot to the path. Or use Roboshop to control the robot to the path. 2. Using Roboshop to control the robot manually can resume the errors.
52202	auto charge failed	Auto charge failed.	1. Please refer tor our auto-charging configuration document. 2. Using Roboshop to control the robot manually can resume the errors. 3. If you still can't recover, please contact after sales.
52203	charge path direction error	The direction in charge path is wrong.	1. Please refer tor our auto-charging configuration document. 2. Using Roboshop to control the robot manually can resume the errors. 3. If you still can't recover, please contact after sales.
52250	3D camera disconnected	Connection with 3D camera is wrong.	1. Check that the 3D camera is working normally. 2. Check that the 3D camera connection is correct. 3. Check whether the configuration of the 3D camera in Roboshop is OK. 4. Check whether the 3D camera IP is OK. 5. Check the IP conflict or not. 6. If you still can't recover, please contact after sales.

52300	too low confidence of localization	The confidence level is too low.	1. Identify whether there have been significant changes in the environment. 2. Relocate in well environment. 3. If it occurs frequently and cannot be automatically restored, please contact the after-sales service.
52400	battery connect error during charging	The connection with battery is wrong during charging.	1. Check that the battery is working normally. 2. Check that the battery connection is correct. 3. Check whether the configuration of the battery in Roboshop is OK. 4. If you still can't recover, please contact after sales.
52500	disconnect from RoboRoute	The connection with RoboRoute is broken.	1. Check the network. 2. Require and release control when the network returns to normalcy. 3. If it occurs frequently and cannot be automatically restored, please contact the after-sales service.
52501	button timeout	——	——
52502	RoboRoute command error	RoboRoute command is wrong.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52600	low reach accuracy	Reach accuracy is too low.	1. Using Roboshop to control the robot manually can resuming the errors. 2. Check the environment is suitable for robot location and navigation. 3. Inspect the robot's mechanical structure. 4. Calibrate the robot. 5. If you still can't recover, please contact after sales.

52700	can not find a feasible path	The robot can not find a feasible path.	1. Check whether the paths in the map are correct. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
52701	can not find target id	The robot cannot find target.	1. Check whether the points in the map are correct. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
52702	path planning failed	The robot failed to plan path.	1. Remove the barriers. 2. Check the width of the path is suitable.
52703	unsupported navigation method	——	——
52704	charge failed and not set prepoint	Robot charging failed and no set prepoints.	1. Please refer to our auto-charge configuration document. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
52705	motion planning failed	The robot failed to plan motion.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
52706	can not find magstripe	The robot can not find magstripe.	1. Check that the magnetic stripes are properly laid. 2. Using Roboshop to control the robot manually can resuming the errors.

52707	stay in forbidden area	The robot is in in forbidden area.	1. Power off and push the robot out of the forbidden area, then restart.
52708	destination has obstacles	——	——
52710	can not find patrol route	——	——
52712	can not find charge point	Robot cannot find charge point.	1. Please refer to our auto-charge configuration document. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
52713	DO or DI area overlap	DO area and DI area are overlap.	1. Check whether the DI areas and DO areas overlap. 2. Using Roboshop to control the robot manually can resuming the errors.
52714	go into shelf failed	The robot failed to go into shelf.	1. Please refer to our configuration document about going into shelf. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
52715	current pos has obstacles	——	——
52800	gowithfork failed	Fork-related movement errors.	1. Please refer to our configuration document about folk usage. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please

			contact after sales.
52900	third-party error	Third-party error	1. The user handles and clears it.
52950	no shelf	Cannot find shelf.	1. Please refer to our configuration document about shelf. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
52951	a shelf already there	There is already a shelf on the target position.	1. Remove the shelf. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
52952	other go with jack error	Fail jacking the shelf.	1. Please refer to our configuration document about shelf. 2. Using Roboshop to control the robot manually can resuming the errors. 3. If you still can't recover, please contact after sales.
...	...	...	

. Warnning Code

Code	Name	Description	Solution

54000	joystick error	The handle controller connect error.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
54001	battery error	Battery comminicate error.	1. Check that the battery is working normally. 2. Check that the battery communication is correct. 3. Check whether the configuration of the battery in Roboshop is OK. 4. Please refer to our battery configuration document. 5. If you still can't recover, please contact after sales.
54002	temperature sensor error	Temperature sensor error	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
54003	motor overspeed	The motor is oversppped.	1. Check if the maximum speed of the motor in the robot model configuration is properly configured 2. If you can't recover automatically, please contact after sales
54004	controller emergency stop trigger	Controller emergency stop is triggerred.	1. Please refer to our controller error document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54006	task list is executing	There is taskchain is executing and not responsing other commands.	1. It is normal and no need to fix.
54008	task frequency is a bit low	Task frequency of controller is a little low.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
54010	controller under voltage	Controller is under voltage.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.

54011	controller over voltage	Controller is over voltage.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
54012	timestamp error	——	——
54013	driver disabling	Driver is disable.	1. Please refer to our driver error document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54014	jitter occurs when robot is stationary	Jitter when the robot is stationary	1. Please verify the upper device is OK. 2. Please refer to our driver error document. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54016	RS485 hardware error	R485 hardware error.	1. Please refer to our SRC-2000 document. 2. Please comfirm the RS485 comminication device is OK. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54017	DO hardware error	PDO hardware error.	1. Please refer to our SRC-2000 document. 2. Please comfirm the PDO device is OK. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54018	reflectors in map not enough	The reflectors in the map is not enough.	1. Please refer to the reflector location usage document. 2. Restart and if it cannot be automatically restored, please

			contact the after-sales service.
54019	less than 3 reflectors detected	Less than 3 reflectors are detected.	1. Please refer to the reflector location usage document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54020	reflectors match failed, please set right init pose	Reflectors match failed, please set right init positions.	1. Please refer to the reflector location usage document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54021	driver emergency stop 1	Driver 1 emergency stop.	1. Please refer to our driver error document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54022	driver emergency stop 2	Driver 2 emergency stop.	1. Please refer to our driver error document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54023	driver emergency stop 3	Driver 3 emergency stop.	1. Please refer to our driver error document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54024	driver emergency stop 4	Driver 4 emergency stop.	1. Please refer to our driver error document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.

54041	driver 1 has error code	Driver 1 has error code.	1. Check error code in driver document. 2. Please refer to our driver error document. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54042	driver 2 has error code	Driver 2 has error code.	1. Check error code in driver document. 2. Please refer to our driver error document. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54043	driver 3 has error code	Driver 3 has error code.	1. Check error code in driver document. 2. Please refer to our driver error document. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54044	driver 4 has error code	Driver 4 has error code.	1. Check error code in driver document. 2. Please refer to our driver error document. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54061	lift elevation emergency stop	Lift elevation driver emergency stop.	1. Please refer to our driver error document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54062	lift rotation emergency stop	Lift rotation driver emergency stop.	1. Please refer to our driver error document. 2. Restart and if it cannot be

			automatically restored, please contact the after-sales service.
54063	lift elevation has error code	The lift rotation driver has error code.	1. Check error code in driver document. 2. Please refer to our driver error document. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54064	lift rotation has error code	The lift rotation driver has error code.	1. Check error code in driver document. 2. Please refer to our driver error document. 3. Restart and if it cannot be automatically restored, please contact the after-sales service.
54100	DSP reconfiging	The base firmware is being reconfigured.	1. It is normal. It will appear after robot calibration. Please wait 10~30s, the warning will be cleared automatically.
54209	charge failed and go to pre-point	Robot fail charging and return to pre point.	1. Please refer to our auto-charge document. 2. Restart and if it cannot be automatically restored, please contact the after-sales service.
54211	low battery	The robot is in low battery.	1. Please charge the robot battery.
54300	imu noise is too large	The gyro noise is too large.	1. Restart and if it cannot be automatically restored, please contact the after-sales service.
54900	third-party warning	Third party warning.	1. User fix it.
...	...	...	

. Notice Code

Code	Name	Description	solution
56000	odometer jump	Odo meter data jumps.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57000	file system error	File-related operation errors.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57001	param system error	Parameter related operation error.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57002	database error	Database related operation errors.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57003	play audio error	Audio play error.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57004	gyro calibration completed	Gyro finish calibration.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57005	json conversion error	JSON conversion error	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57006	robot is not stationary during gyro calibration	Robot not static during gyroscope calibration.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57007	self checking failed	Controller self-test failure.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57008	gyro_calibration_acked	Gyroscope with asking version finish calibration.	Notice is only a notification, not an error and does not affect the robot. No need to fix.

57009	gyro is fly after calibration	The gyroscope drifts after calibration.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57010	motor hall encoder mismatch	Motor Hall encoder mismatch.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57011	motor current sum not zero	The sum of all motot current is not zero.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57012	motor hall error	Motor Hall error.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57013	motor dc bus low	Motor DC bus is low voltage.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57014	gyro calibration block speed	Block speed during gyro calibration.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57015	fork target too high	The fork target is too high.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57016	fork target too low	The fork target is too low.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
57017	robot is not stationary before gyro calibration	Robot is not static before gyro calibration.	Notice is only a notification, not an error and does not affect the robot. No need to fix.
...	...	...	

Contact Us

Website: https://www.troysupply.com

Notice:

1. Please make sure the network is OK and stable when using the keyboard to control robot.

2. Non-experts are not allowed to modify the parameters of manually controlled robots. The shortcut key Q is for emergency stop and not allow to use unless emergency situation.

3. Non-experts should not manually modify or delete any files under Roboshop's path to avoid data errors and unexpected problems.

Disclaim & Copyright

- This manual is periodically reviewed and revised, and updates will appear in new versions. The contents or information in this manual are subject to change without notice.
- Please read this manual before installing and using our product.
- Please keep this manual for reading and reference.
- There may be errors or omissions in the contents of this manual, so please contact us if you have any questions about the contents of this manual.