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SLAMTEC
SLAMWARE
Robo Studio
Android

SLAMTEC SLAMWARE Robo Studio Android User Guide

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Introduction

RoboStudio.Android is an Android app for easily deploying robots with multiple convenient functions, such as virtual walls, virtual tracks, restricted areas, etc.

Connect Device

There are some shortcuts in the main view. In portrait mode, you can click the "Connect" button and input the IP address and the port in the popping dialog to connect a device (Figure 1). In landscape mode you can input the IP address and the port on the right of the screen to connect a device (Figure 2).
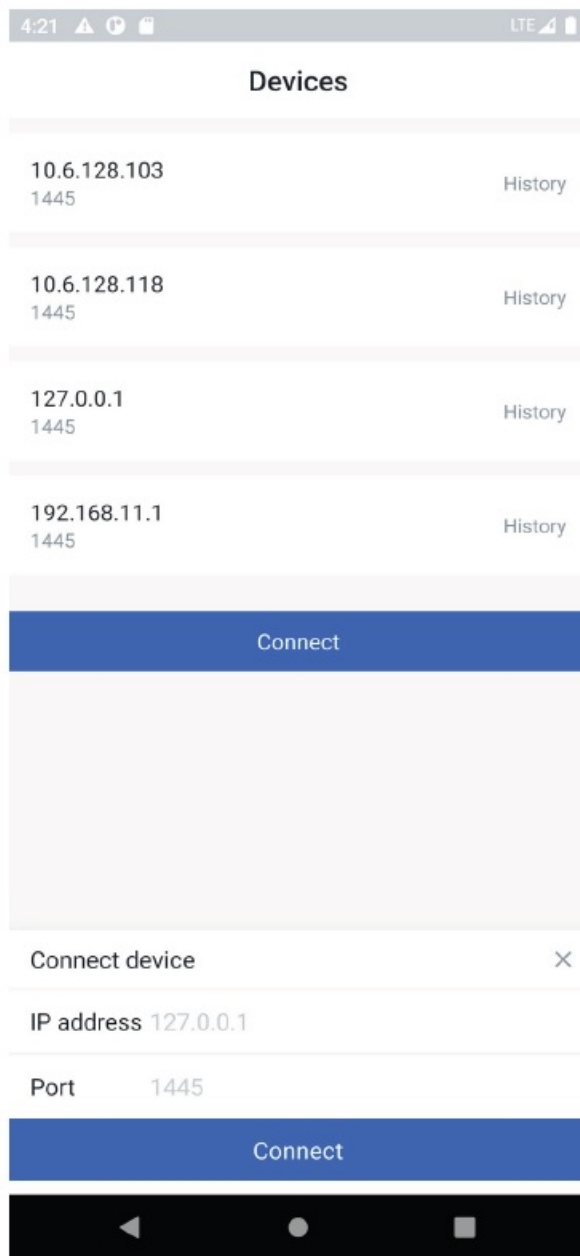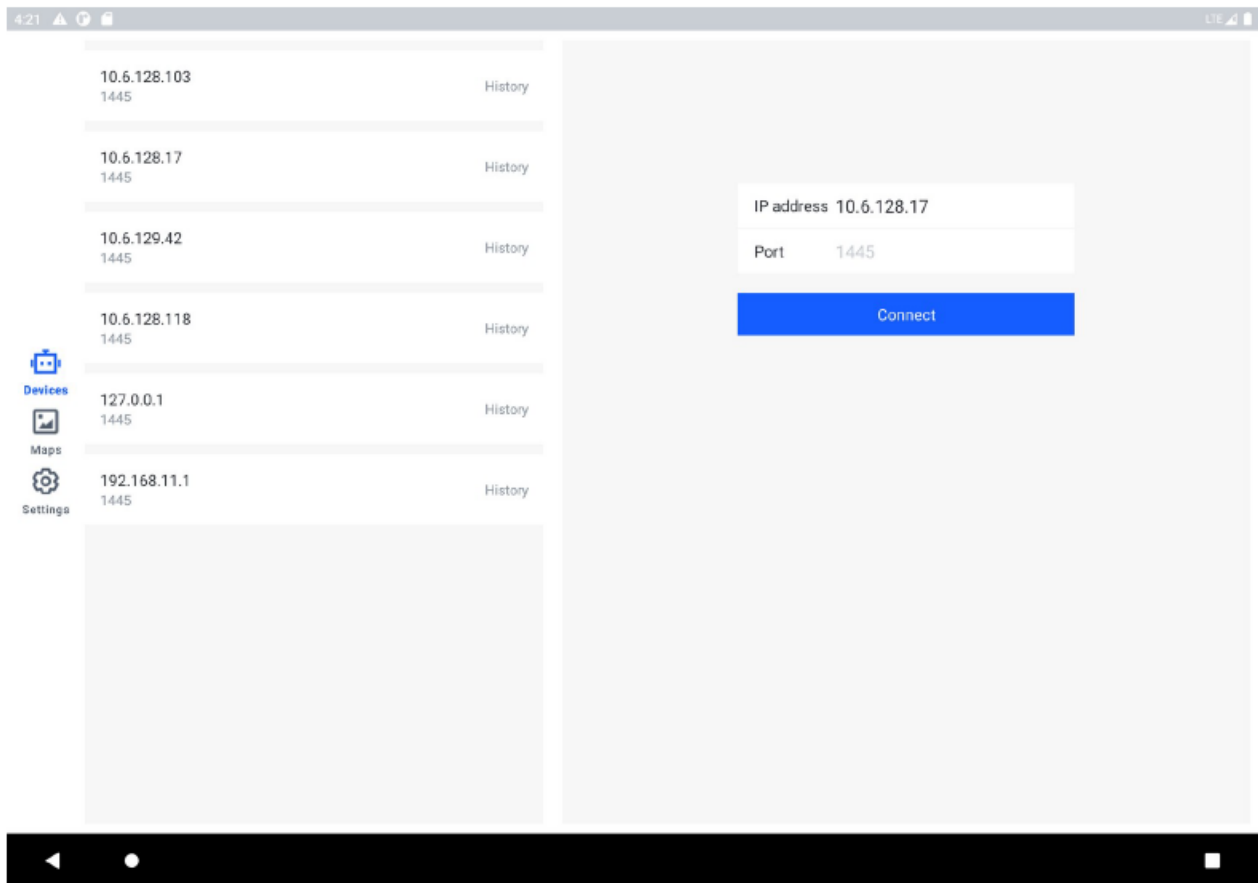
Figure 1: Connect Device (Portrait)

Figure 2: Connect Device (Landscape)

Disconnect Device

Just click the "Back" button to disconnect and go back to the connecting view. (Figure 3, Figure 4)
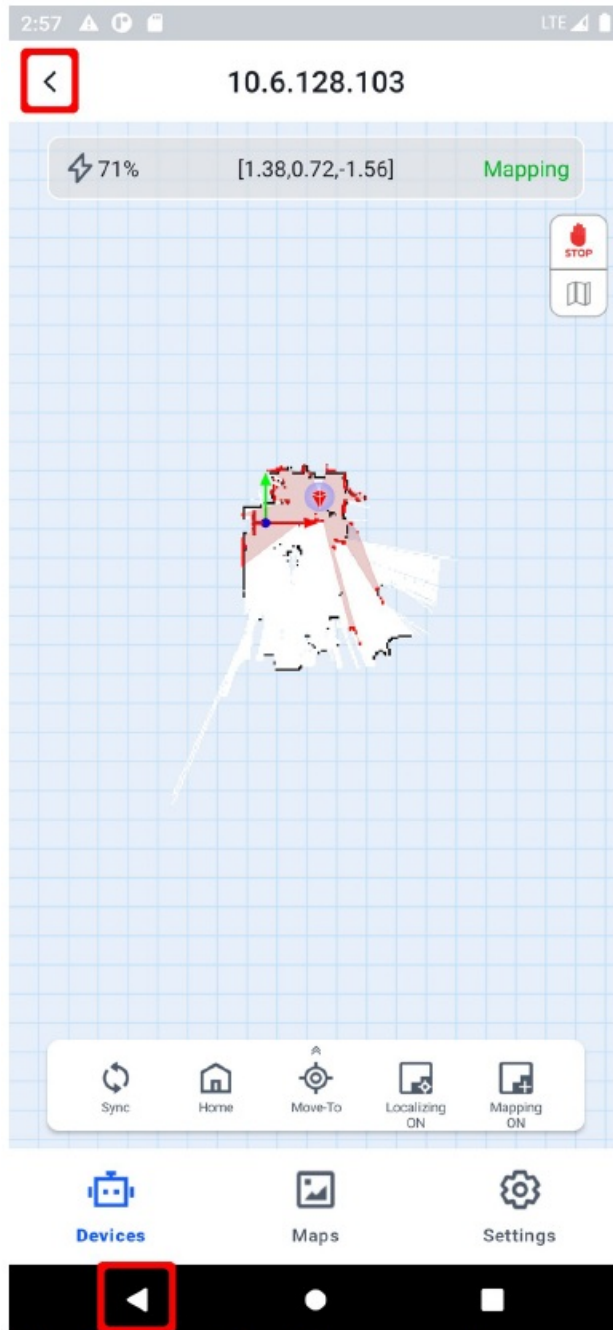
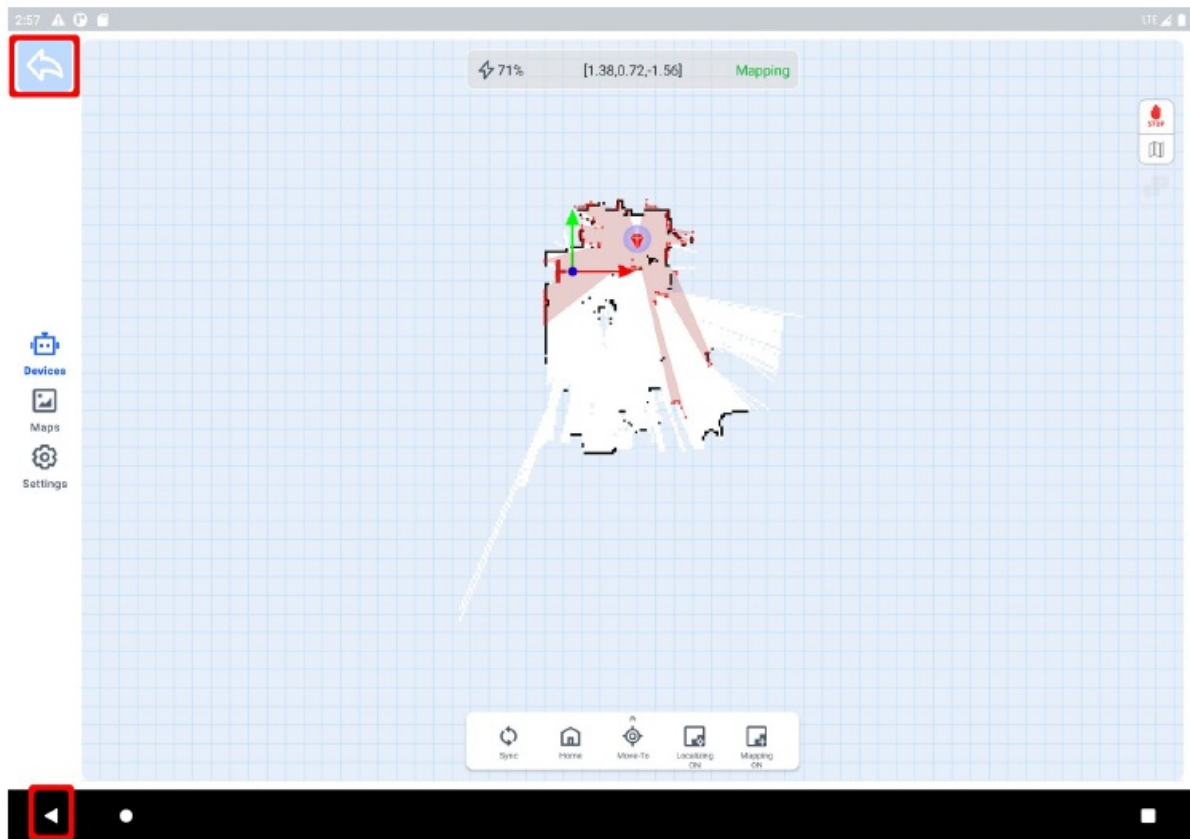*Figure 3: Use "Back" button to disconnect. (Portrait)*

Figure 4: Use "Back" button to disconnect. (Landscape)

Map Display

You can always use the following gestures to move, zoom or rotate the map.

- Use a pan gesture to move the map.
- Use a pinch gesture to zoom the map.
- Use a rotate gesture to rotate the map.

RoboStudio.Android also provides two viewpoints. By clicking the viewpoint image (see Figure 5), you can switch between the global mode and the following mode.

- **Global Mode:** you can see the whole map on the screen and the robot indicator will move on the map.
- **Following Mode:** the robot indicator will always keep steady and the map will move automatically according to the robot's position.

Figure 5: the viewpoint.

Move Device

RoboStudio.Android provides ways to move the robot. While controlling the robot moving, it can plan a path to the destination and avoid obstacles.

- **Use Move-To:** Click the button "Move To" (see Figure 6) to enable "Move To" mode. By tapping on the map to set a destination, the robot will stop the current action, then plan a path to the destination and start moving to it.
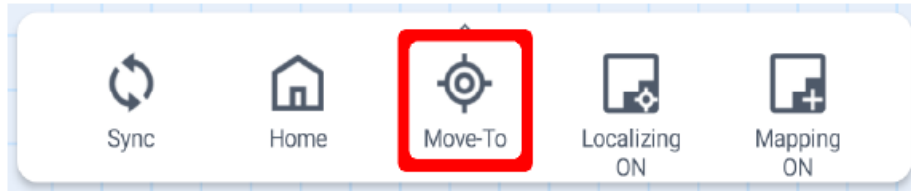

Figure 6: the "Move To" button.

- **Use a joystick:** Click the button "Joystick" to show the joystick controller (see Figure 7). You can use it to control the robot moving anywhere. Please note the robot will execute your command directly in this mode. You have the responsibility to avoid obstacles.
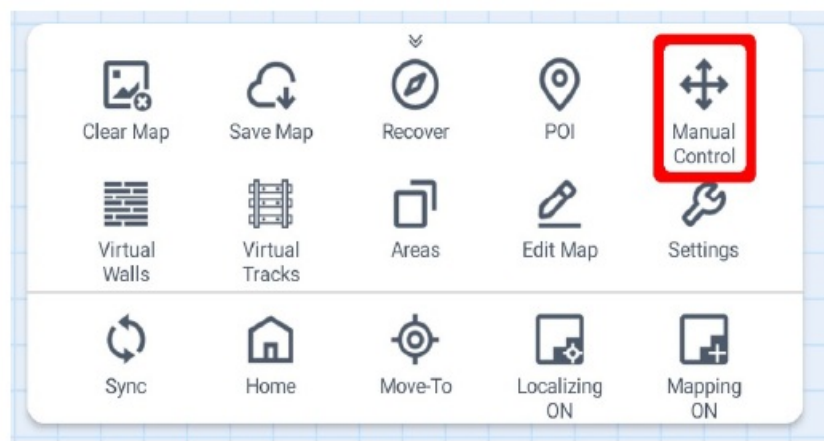

Figure 7: the Joystick.

- **Back to dock:** Click the button "Dock" to order the robot to go back to the dock (see Figure 8). If there is no dock registered, the app will ask you to set one. Please tap on the map to set a dock position.
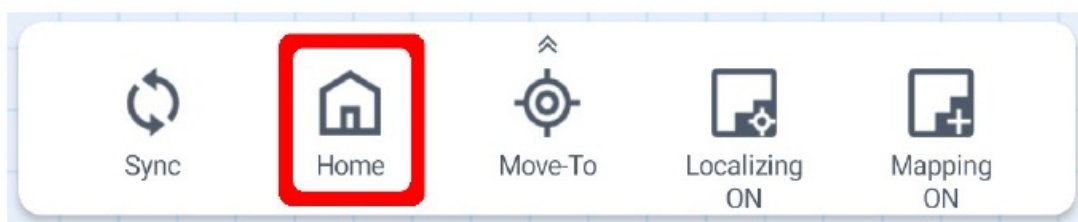

Figure 8: the Dock button.

Stop: At any time you can click the button "Stop" (see Figure 9) to stop the robot.

Figure 9: the
Stop button.

Localization and Mapping

Simultaneous localization and mapping are the core technology of autonomous robot movement. RoboStudio.Android provides functions to control how robots localize and map.

- **How To Understand The Map**
  - Simultaneous localization and mapping of Slamtec robots is based on raster graphics. Robots can keep updating the map while exploring the environment.
  - In RoboStudio.Android, the grayscale value of each raster pixel represents the probability of an obstacle. White means no obstacle exists and black means an obstacle exists. While mapping, not all raster pixels are white or black.
  - Unexplored areas are not blocked or clear. They will be gray.
- **Eraser**

  Click the button "Eraser" in "Edit" to enable eraser mode (see Figure 10). You can choose "gray" (unexplored area), "white" (clear area), or "black" (blocked area) and you can choose the eraser size. Please zoom in on the map then click the "eraser" image. Now you can use your finger moving on the map to edit it.
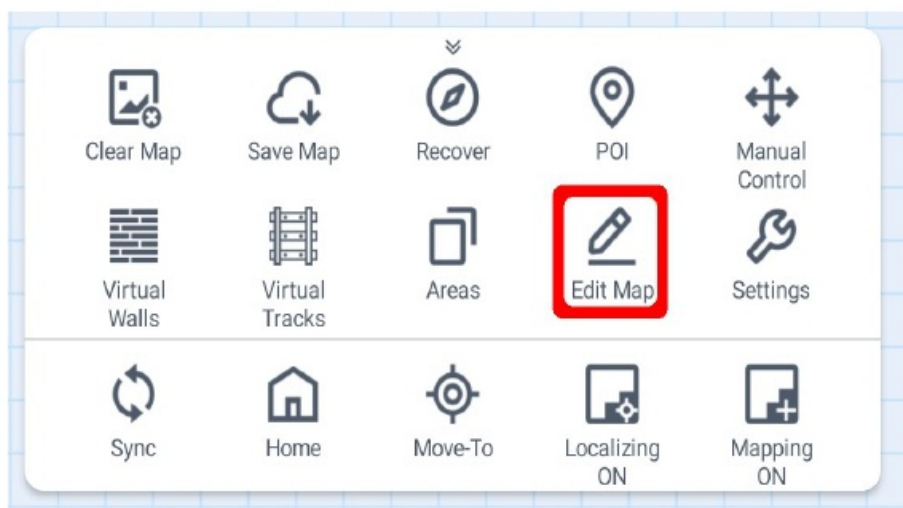

Figure 10: Eraser

- **Clear Map**

  Click the button "Clear Map" in "Map / Localization" to clear the map. The robot will then enable mapping automatically so you can build a new map.
- **Synchronize Map**

  RoboStudio.Android will update the area surrounding the robot by default. When you want to update the whole map, please click the button "Sync" on the right of the screen.

Virtual Walls

RoboStudio.Android provides a virtual wall function that you don't need any extra items to achieve it. Robot treats virtual walls as solid walls and will bypass them. You can always edit virtual walls whenever you want. Click the button "V-Walls" in "Edit" to enable virtual wall editing mode.

- **Add A New Virtual Wall**

  There are two types of virtual walls, straight wall and curve wall. Add a wall by clicking "Stright" or "Curve".

- **Move A Virtual Wall**

  See Figure 11. There is a dot at each endpoint of a virtual wall. Drag the dot to move the virtual wall.
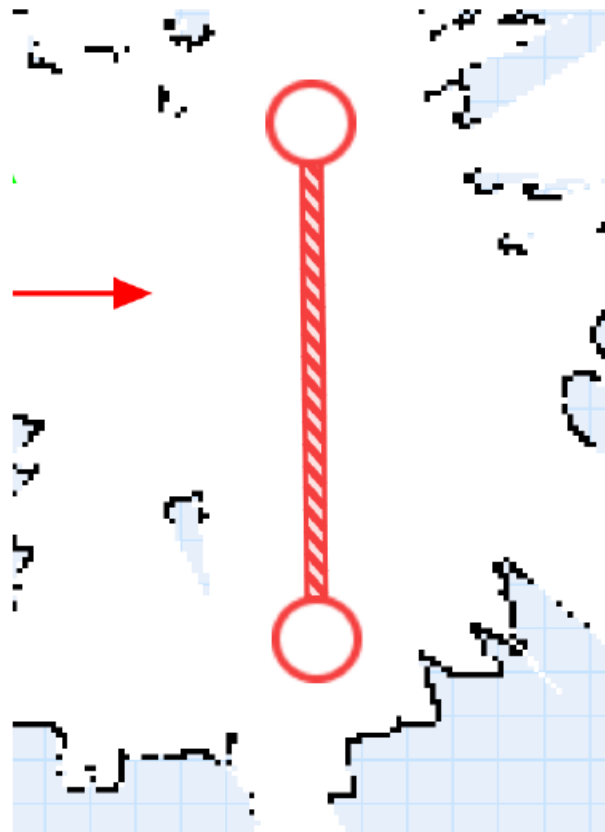

Figure 11: Move the virtual wall.

- **Delete A Virtual Wall**

  Click "Delete" and an "X" image will display in the middle of each virtual wall. Click the image to delete the virtual wall.

- **Save**

  Remember to click "Save" to save the result.

- **Precaution**

  If you have used the Windows version of RoboStudio to edit virtual walls, please don't reference the virtual walls displayed in RoboStudio.Android. And please don't use RoboStudio.Android to edit those virtual walls. Please use the Windows version of RoboStudio to reference and edit those virtual walls.

Virtual Tracks

Like virtual walls, virtual tracks allow you to draw tracks on RoboStudio.Android to guide robots following the path to move. Virtual tracks are very useful in scenarios of require robots to follow fixed paths to patrol, such as indoor delivery, patrolling, factory transporting, etc. Robots will search the nearest location of the tracks while planning a route. Then it will go to that location to enter the tracks and follow the tracks to move. Click "V-Tracks" in "Edit" to

enable virtual tracks editing mode.

- **Add A New Virtual Track**

  There are two types of virtual tracks, straight virtual track and curve virtual track. Click "Straight" or "Curve" to add a new track.

- **Move A Virtual Track**

  There is a dot at each endpoint of a virtual track. Drag it to move the virtual track.

- **Delete A Virtual Track**

  Click "Delete" and then a "X" image will display in the middle of each virtual track. Click the image to delete the virtual track.

- **Save**

  Remember to click "Save" to save the result.

- **Navigation Mode**
  - Robots will not follow the virtual tracks to plan movements in the default mode. You have to set the navigation mode in the "Setting" view. There are two navigation modes in which robots can follow the virtual tracks.
  - When the "Track Restrictive" mode activates, robots will follow the virtual tracks restrictively. If there is an obstacle on the track, robots will stop moving until the path is clear.
  - When the "Track Prioritized" mode activates, robots will follow the virtual tracks at best. If there is an obstacle on the track, robots will be off the track to bypass it and then go back to the track.

- **Precaution**

  If you have used the Windows version of RoboStudio to edit virtual tracks, please don't reference virtual tracks displayed in RoboStudio.Android. And please don't use RoboStudio.Android to edit those virtual tracks. Please use the Windows version of RoboStudio to reference and edit those virtual tracks.

Areas

There are three types of areas – Restricted Areas, Dangerous Areas, and Maintenance Areas. Restricted Areas prevent robots from entering these zones. It's convenient to use restricted areas to achieve it instead of creating four virtual walls. A dangerous area is an area that robots have to slow down to pass inside to avoid danger. When a part of the environment has changed and you just want this part of the environment to be updated, you can use the maintenance areas feature. Create maintenance areas, enable the mapping mode, and move the robot. The robot will only update map data inside the maintenance areas. Areas outside maintenance areas won't be updated. Click "Areas" to enable area editing mode.

- **Add A New Area**

  Click the area button for what you need to add a new area.

- **Move An Area**

  Tap the area and drag it to move.

- **Scale An Area**

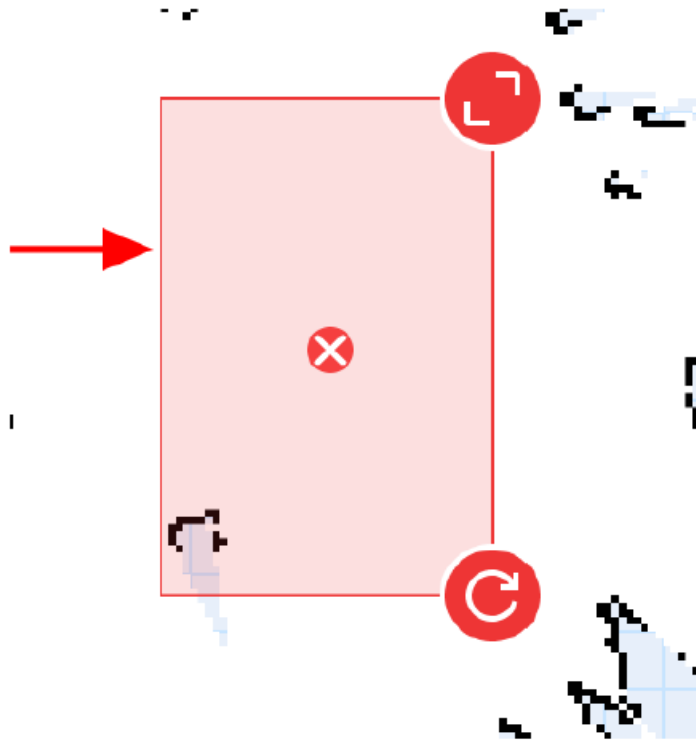 Tap the right bottom image of the area and drag it to scale. (See Figure 12)

Figure 12: Scale the restricted zone.

- **Delete An Area**

  Click the "X" icon in the center of the area to delete. (Figure 12)
- **Save**

  After editing all areas, click the "Save" button to save all changes.
- **Precaution**

  Robots only support rectangle zones that are parallel to the robot's physical coordinate system. So when saving zones that are not parallel to the coordinate system, robots will calculate a rectangle that is tangential to the original restricted zone and parallel to the coordinate system and then save the calculated rectangle zone.
- **Set the maximum speed for the dangerous zone**

  Click the right top icon to enter the "Setting" view. Move the slider in the dangerous zone section to set the speed.

POI

You can use RoboStudio.Android to manage POIs.

- **POI List**

  Click the "POI List" button to open the list dialog. (See Figure 13)
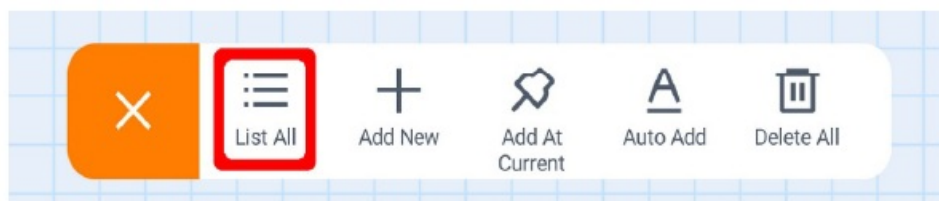

Figure 13: POI List.

- **B. Create A New POI**

  There are two ways to create a new POI.
    - **Create A New POI At Current Position**

You can create a new POI at the robot's current position. Click the "Current As POI" button to open the "Create" dialog and input the information for this new POI to create it.

○ **Free As POI**

You can also choose a position freely on the map to create a new POI. Click the "Free As POI" button. Then you can tap on the map anywhere you want the POI located. After the tap, you have to choose the yaw of the POI (see Figure 14). Click the "✓" icon to continue editing POI information. Finally, input the information and save the new POI.

Figure 14: Free As POI.

- **Edit A POI**

Click "POI List" in "POI". A POI list dialog will display. (See Figure 15) You can click the edit icon to choose a POI to change its property.
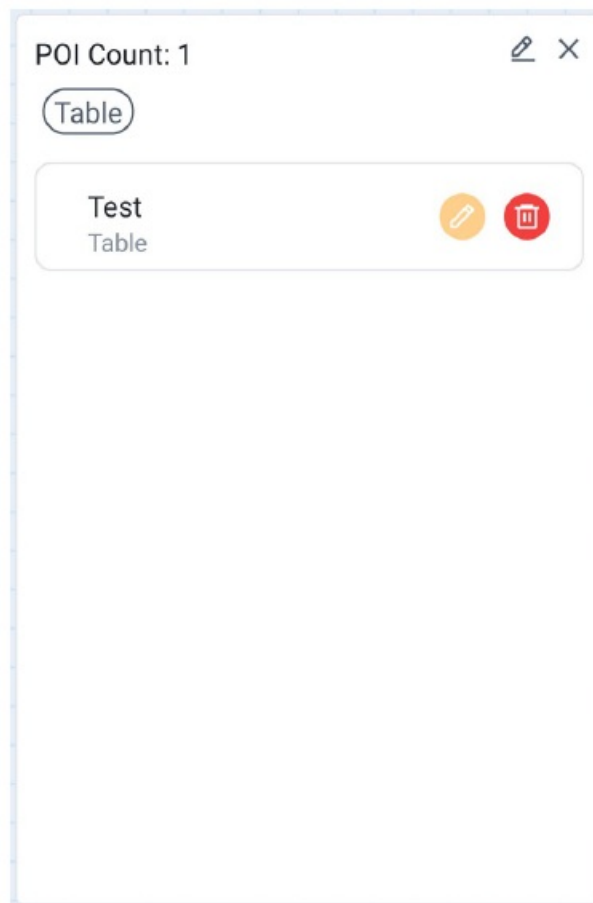
Figure 15: POI List.

- **Move To A POI**

  In the POI list dialog, you can click a POI to order a robot to move to it.

- **Delete A POI**

  In the POI list dialog, you can click the "delete" icon to delete a POI. (See Figure 16)
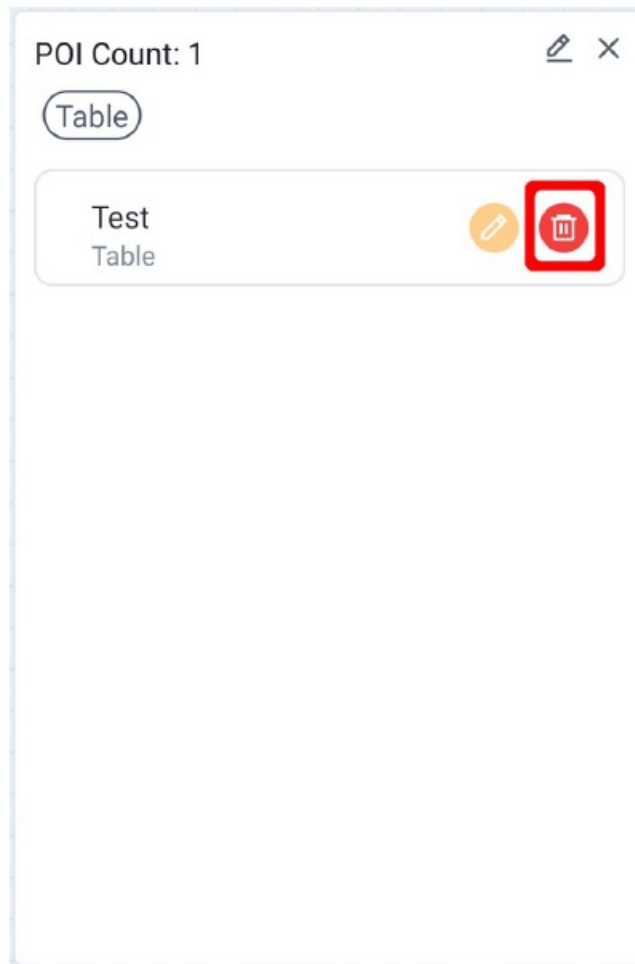
Figure 16: Delete a POI.

Manage Local Maps

You can upload a map to the robot, save a map to your Android device, and edit local maps via RoboStudio.Android.

- **Browse Local Maps**

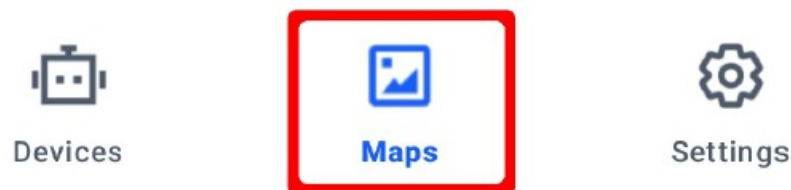 Click the "Maps" tab at the bottom of the screen to browse local maps. (See Figure 17)

Figure 17: Local Maps

  - If it is your first time clicking the "Maps" tab, the Android system will ask you whether to allow RoboStudio.Android to access the file system. Please permit the request otherwise RoboStudio.Android is unable to manage local maps.
  - All local maps have to be saved in /sdcard/Documents/robot studio folder.

- **Edit A Local Map**

  Click a map in the "Maps" view to enter the "Map Detail" view. You can use functions at the bottom to edit the map (see Figure 18). RoboStudio.Android supports virtual walls, virtual tracks, erasers, and a new dock for local map editing.
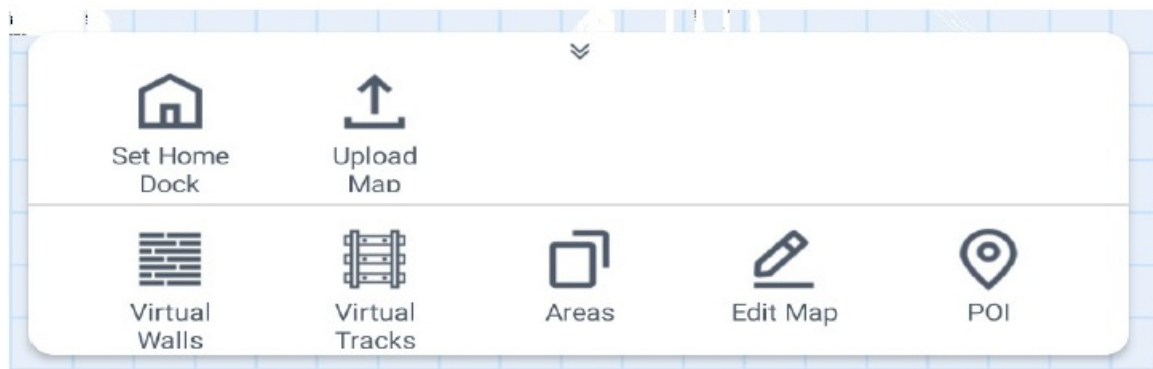
Figure 18: Local map editing.

- **Upload a map to a robot**

  Please connect a robot first in the "Robot" view. Then open the map you want to upload in the "Maps" view.

  Click the upload icon at the top right of the screen. When the upload finishes, the robot will load the new map.
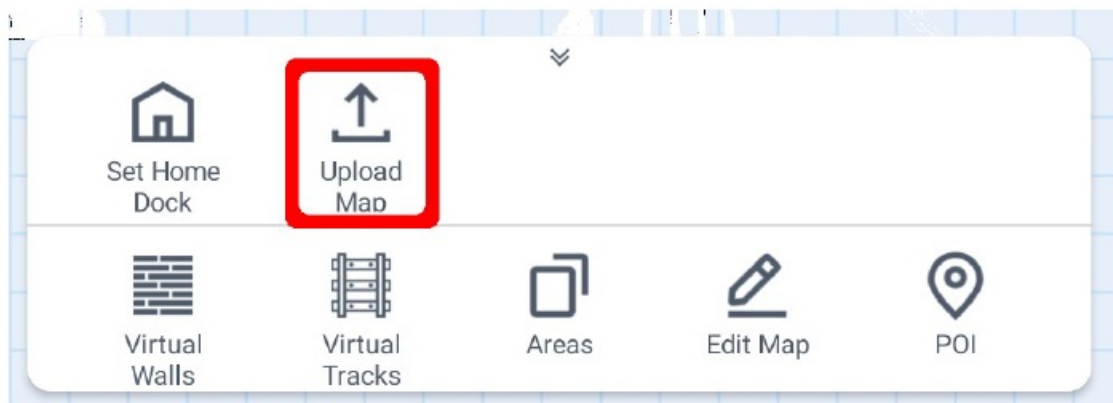
  (See Figure 19)

Figure 19: Upload a map.

Revision

Date	Version	Description
2023-06-13	1.0	First edition. This edition is made for RoboStudio.Android 1.0 version.
2023-12-25	2.0	Update for RoboStudio.Android 2.0.

Documents / Resources

SLAMTEC SLAMWARE Robo Studio Android [pdf] User Guide
SLAMWARE Robo Studio Android, SLAMWARE, Robo Studio Android, Studio Android, Android

References

- [**User Manual**](#)