



# RCS-Lite V1.5 Forklift LMR System

## User Manual

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Symbol	Description
 <b>Note</b>	Provides additional information to emphasize or supplement important points of the main text.
 <b>Caution</b>	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
 <b>Danger</b>	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.

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# Chapter 1 Overview

RCS-Lite V1.5 supports LMR, FMR (omnidirectional and reach truck), forklift LMR, chassis, single-layer roller CMR, CMR, single-cargo CTU, and HMR.

## 1.1 Software Architecture

RCS-Lite is a streamlined version of RCS-2000. It is presented as a client, offering an excellent user interaction experience. It is mainly used in small-sized projects and demonstration projects. It features ultra-light deployment and one-click startup, integrating multiple services such as RCS, WCS, and AMS.

## 1.2 Function Module

RCS-Lite is composed of RCSSlite-Server and RCSSlite-Client. RCSSlite-Server provides API calling services, database storage, task scheduling and other functions. It supports data docking between each server and client. RCSSlite-Client provides data management and configuration for RCSSlite-Server. When RCS-Lite starts, it will load all services including RCSSlite-Server, WCS, RCS, and AMS.

# Chapter 2 Map Management

## 2.1 Home Page

### 2.1.1 Login Page

During the first run, you should choose task system type. According to different tasks, the system is divided into 5 types: moving system (including LMR and forklift LMR), FMR system, CMR system (including latent tractor and single-layer roller CMR), single-cargo CTU system, and mixed system. The mixed system offers multiple selections shown below.

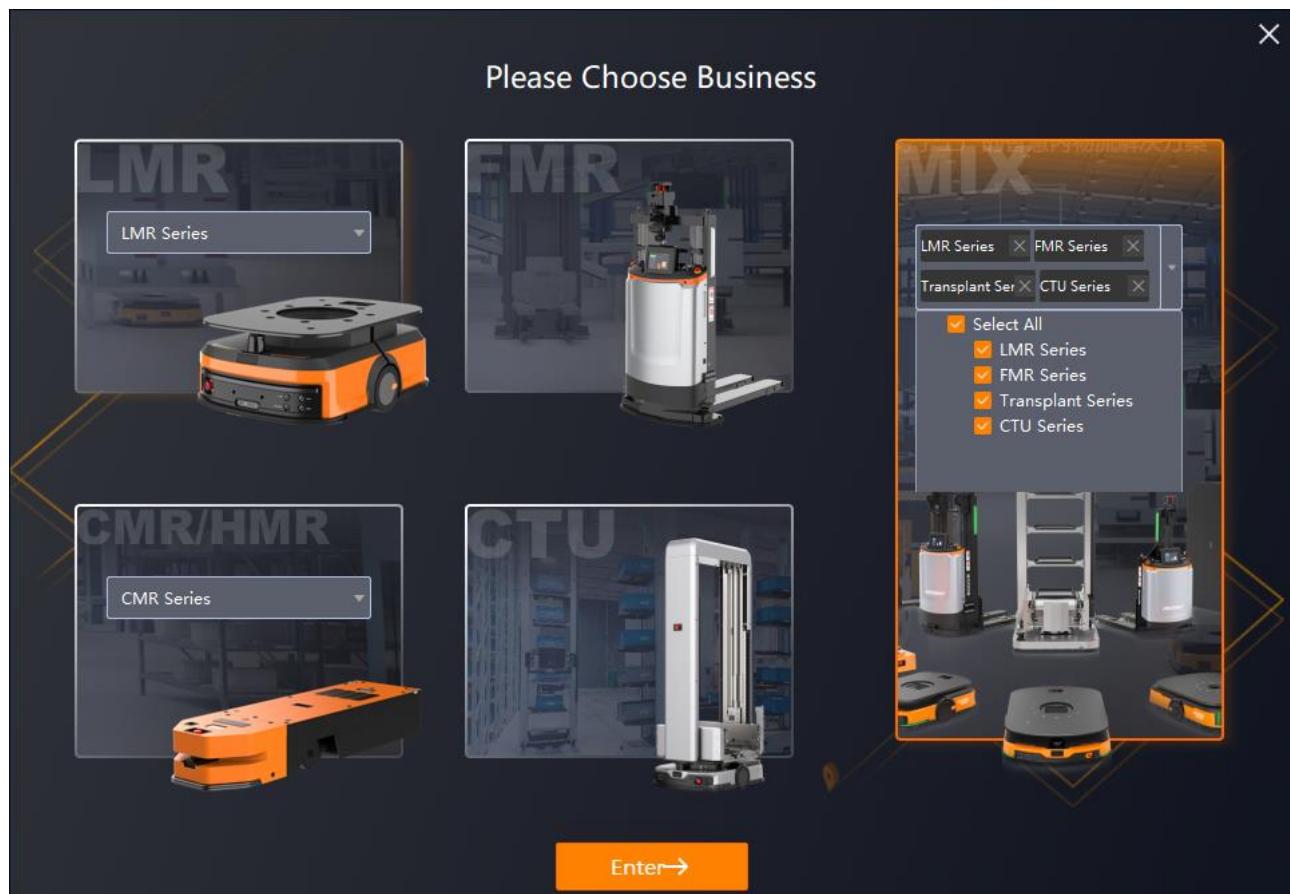


Figure 2-1 Select System Type

This manual applies to all AMR tasks except for latent tractor tasks.

Go to the login page, and enter user name and password. Local IP address is the local service IP address by default. RCS-Lite supports primary and secondary servers login. When the login IP is the local IP address, the current computer acts as the primary server. Otherwise, the current computer acts as the secondary server, connecting to RCS-Lite in the primary server. The default port cannot be changed. Subsequent login to MonitorClient requires the same IP address and port No.



Figure 2-2 Login Interface

Enter activation code for the first login, click **Activation > Export**, and export the activation request file (ActiveRequest.bin).

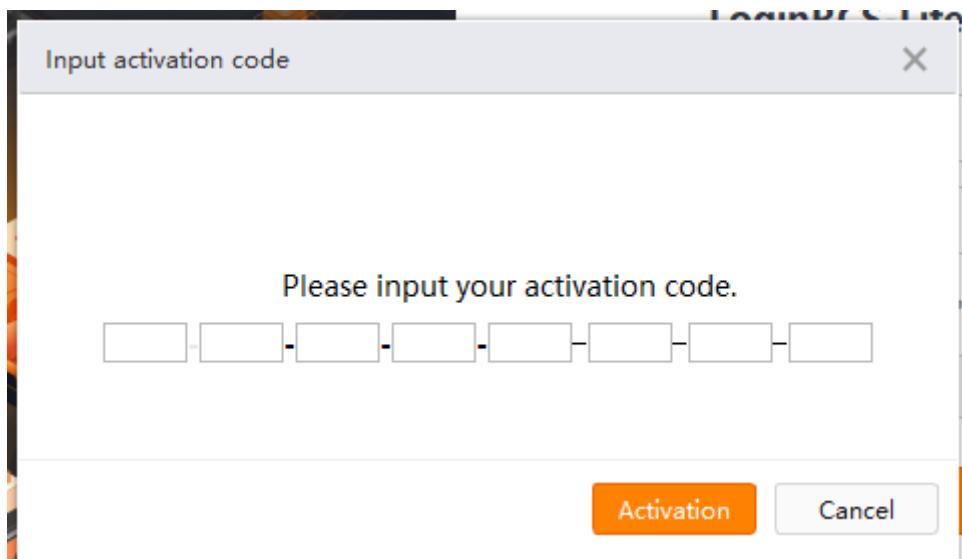


Figure 2-3 Enter Activation Code

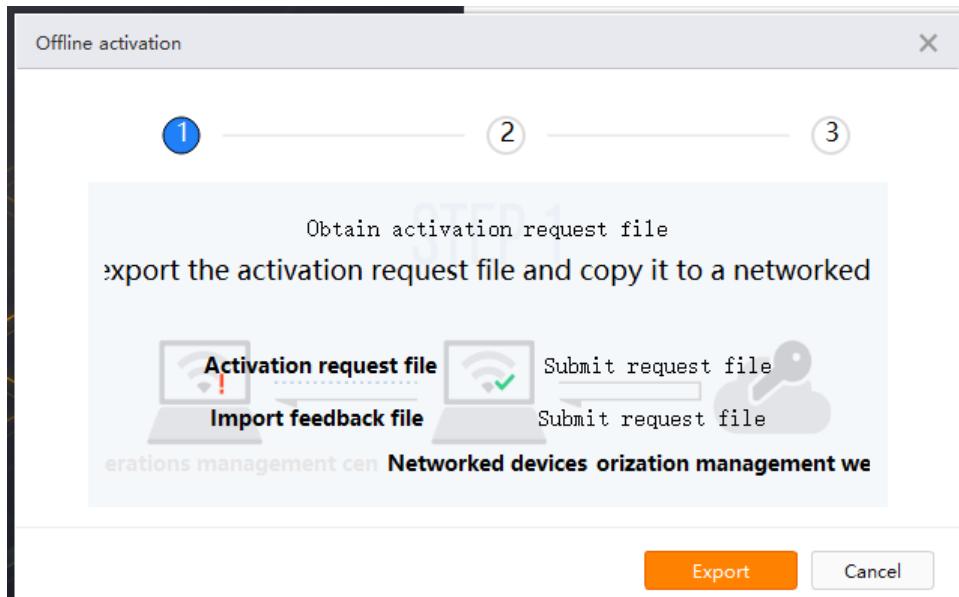


Figure 2-4 Export Activation Request File

Click **Activation** after getting an activation response file, and export the file. Then, RCS-Lite is activated.

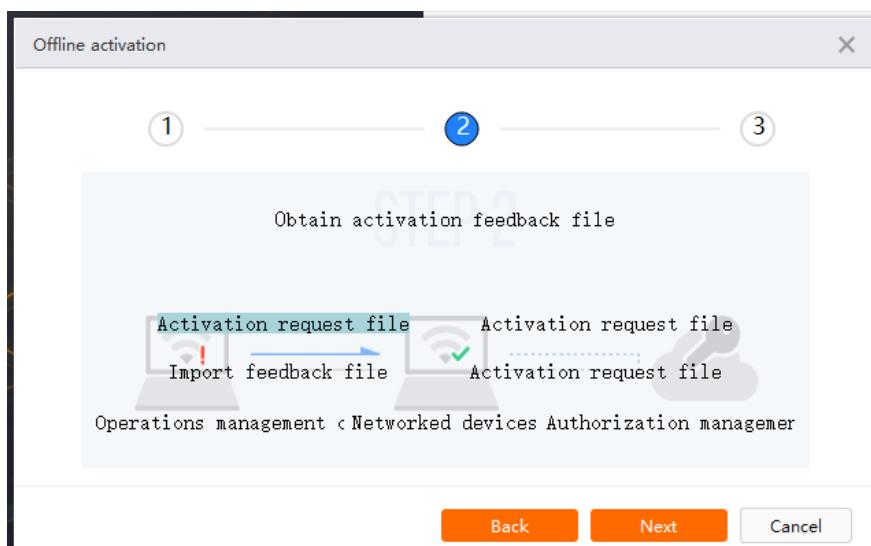


Figure 2-5 Get Activation Response File

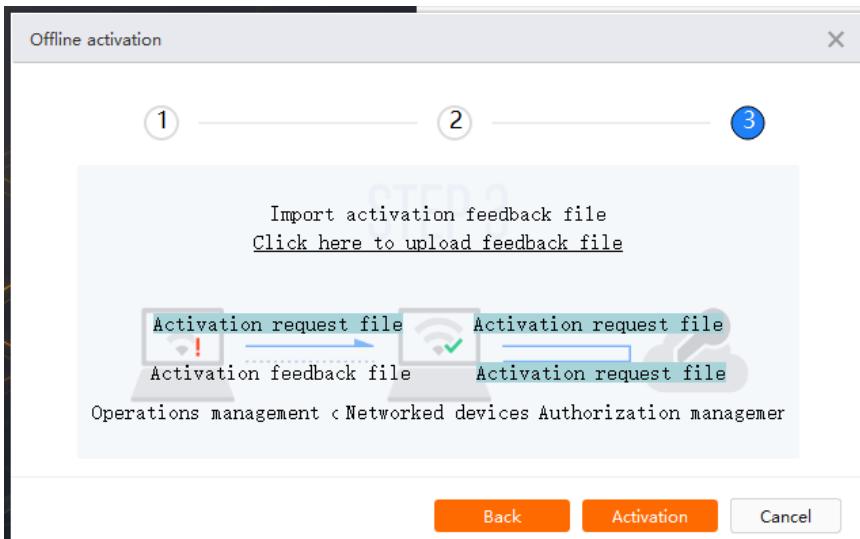


Figure 2-6 Upload Activation Response File

**Note**

Once the activation is completed, RCS-Lite will automatically connect baseline system or simulation system according to the activation code.

Before you log in to RCS-Lite, if the database service is abnormal, the system will automatically notify you to switch to another database.

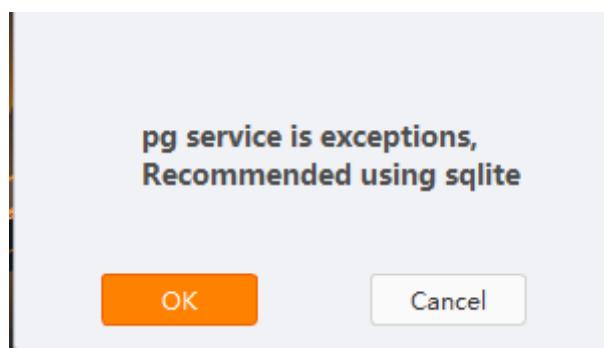


Figure 2-7 Switch Database

## 2.1.2 Switch Language

When you enter the client home page, if you want to switch language, go to **admin > Switch Language**.



Figure 2-8 Switch Language

### 2.1.3 Create Map

After the first login, you should create a topological map, click **New Topological Map**, enter the map name, location code, and code spacing X/Y. Then click **OK** to go to the map editing interface, and draw a map.

#### Note

**Refresh Map or Not:** If it is disabled, you need to select a rack type. The algorithm library determines whether the AMR can enter rack from the short side or rotate under rack according to the dimensions of the rack type.

New Topological Map X

---

Map ID *	ACC88DD63BEDA14D_1
Map Name *	Enter 1 to 32 characters.
Location Code *	Enter 2 letters.
Type	
Code Space X *	1000 mm
Code Space Y *	1000 mm

---

OK
Cancel

Figure 2-9 Map Creation Settings

## 2.1.4 Map List

In the interface, the title bar is the first-level menu including System Model and Operation Management, and the second-level menu is displayed on the left side. The Map Settings interface is entered by default. Map list is where you can choose and view existing topological maps. Right now you can create 5 topological maps.

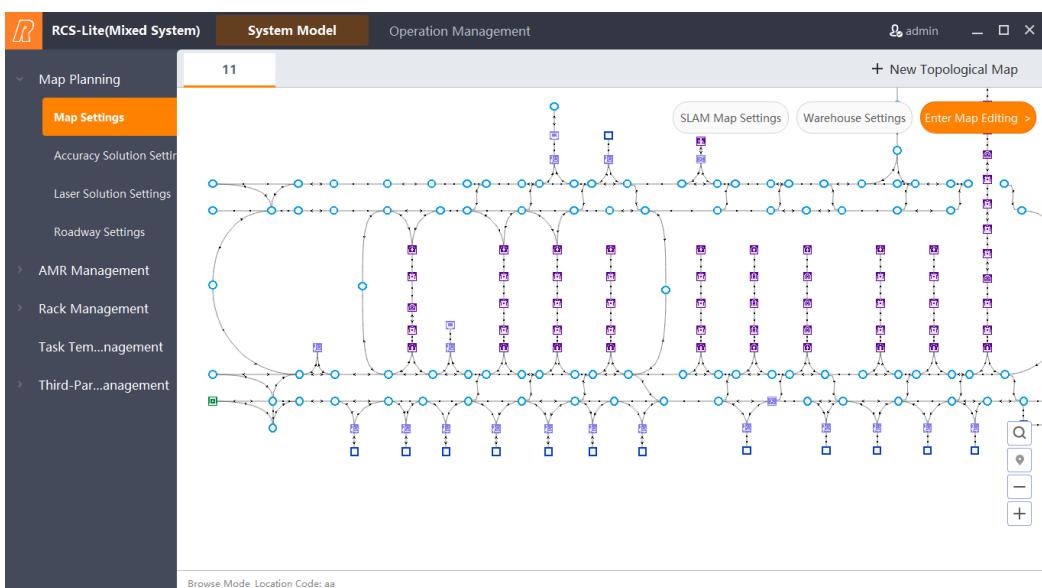


Figure 2-10 Map List

Click **admin** in the title bar, and a drop-down menu pops up.

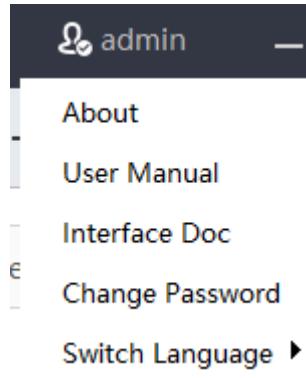


Figure 2-11 Admin Drop-Down Menu

## 2.2 Map Editing

Go to the topological map editing interface. The list of map elements is displayed on the left side. The editing toolbar is on the top, and the display control bar is in the lower-right corner.

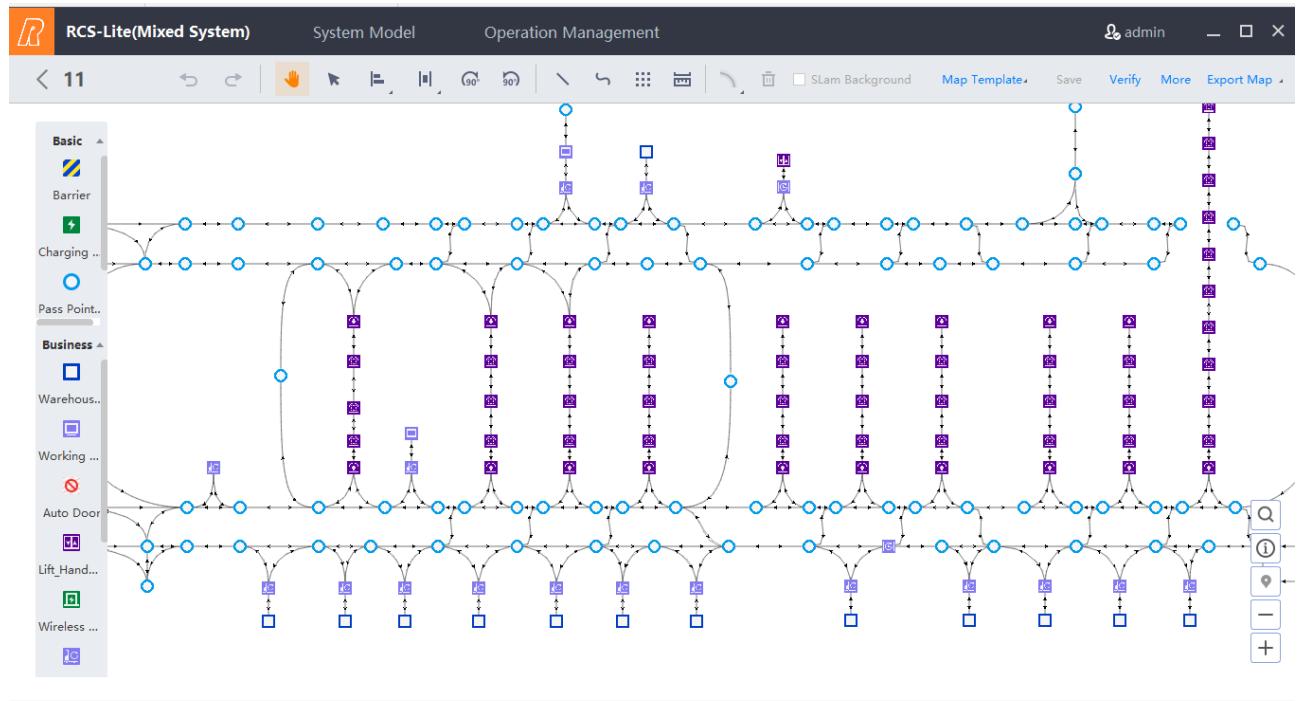


Figure 2-12 Edit Topological Map

### 2.2.1 Toolbar

Buttons on the toolbar are shown below. If you want to draw points, you can choose the list of point elements on the left side.

Undo: Click to undo the last action.

Redo: Click  to cancel the action that was undone.

Pan: Click , and then you can drag the map in panning mode. Zooming in and out are also available for viewing.

Select: Click , and then you can drag to select points and lines. Right-click a point or line element to pop up the menu. Double-click a point or a line element to view the corresponding attributes, and editing is supported.

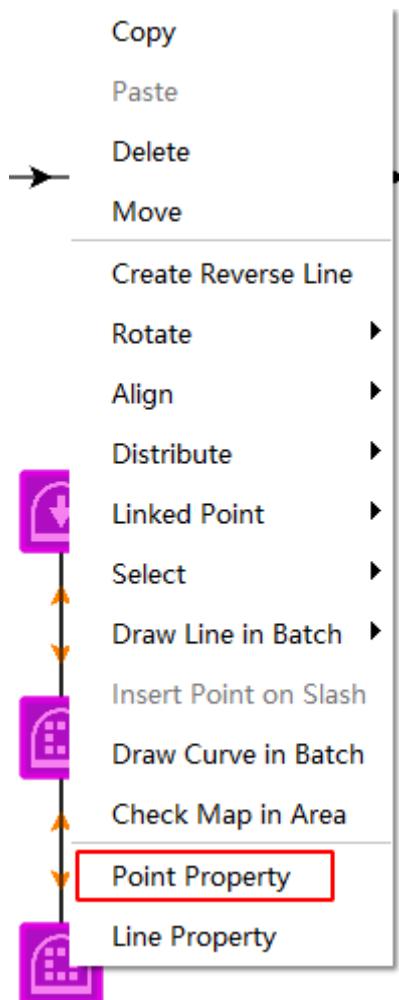


Figure 2-13 View Point and Line Property

**Point Property Info**

Point Type	Channel Tail
Point Size	1.0 , 1.0
Point Coordinate	122.137 , 113.000
Interim Park Property	Interim Park Not Allo
Route Property	Turnaround Route
Rotation AMR Type	
Rotation Container Type	Default
Allowed AMR Type	
Rotation Radius	<input checked="" type="checkbox"/>
Accuracy Solution	Default
Avoid or Not	Avoidance Allowed
Refresh Map	Refresh

**Save**   **Cancel**

Figure 2-14 Point Property

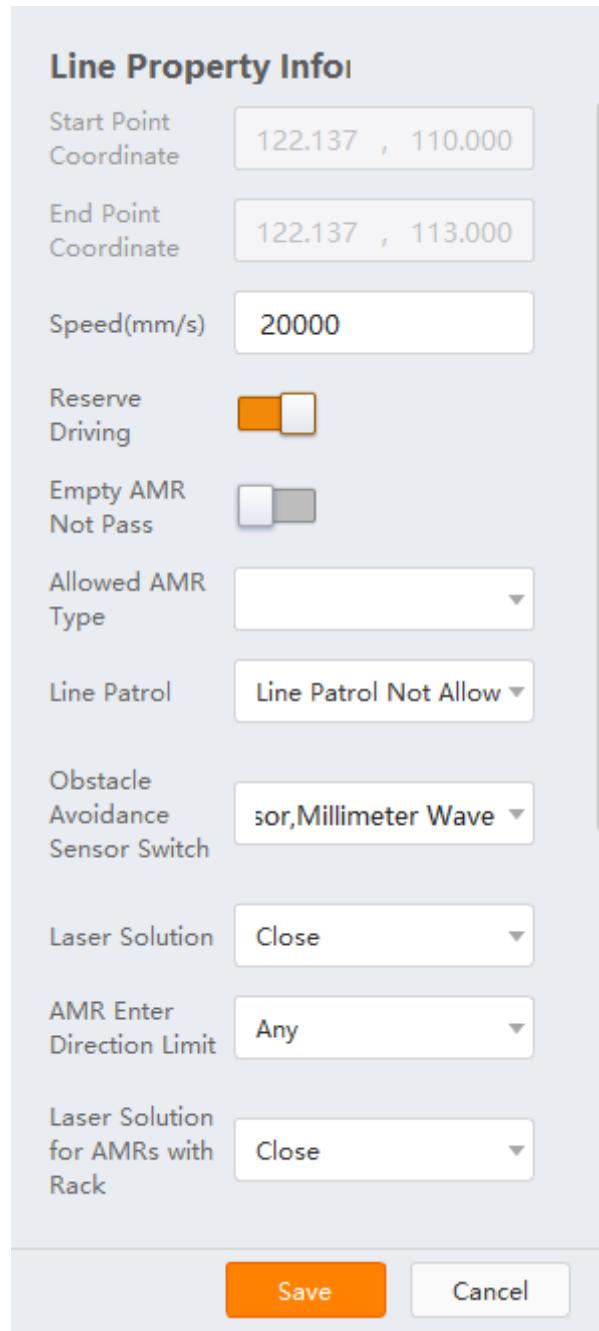


Figure 2-15 Line Property

Align: Click , and select vertical or horizontal alignment to align the selected points and lines.

Distribute: Click , and select vertical or horizontal layout to distribute the selected points and lines.

Rotate: Click  or  to rotate 90° clockwise or counterclockwise of the selected points and lines.

Draw Line: Click , select a point, and drag to another point to draw a line between the two points.

Draw Curve: Click , and the curve editing box pops up. In the curve editing box, you can select the curve type (General Curve or 180° Arc), and the starting or ending point direction (Horizontal, Vertical, Consecutive, or Custom). Select a point, and then drag to another point to draw a curve between the two points.

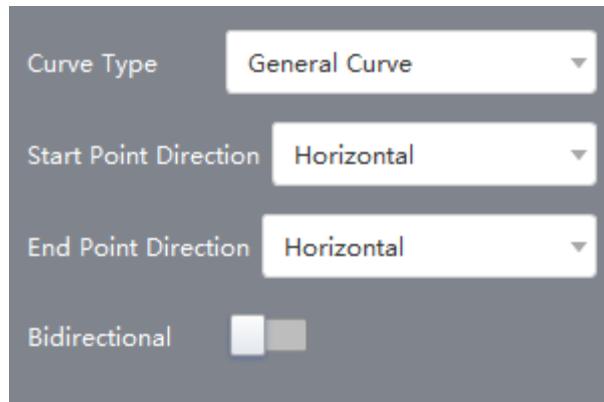


Figure 2-16 Curve Editing Box

Draw Point Array: Click , and select a desired point on the map, and the point coordinates will be displayed in the reference point coordinates editing box. Click **OK**, and set parameters for the array in the pop-up window.

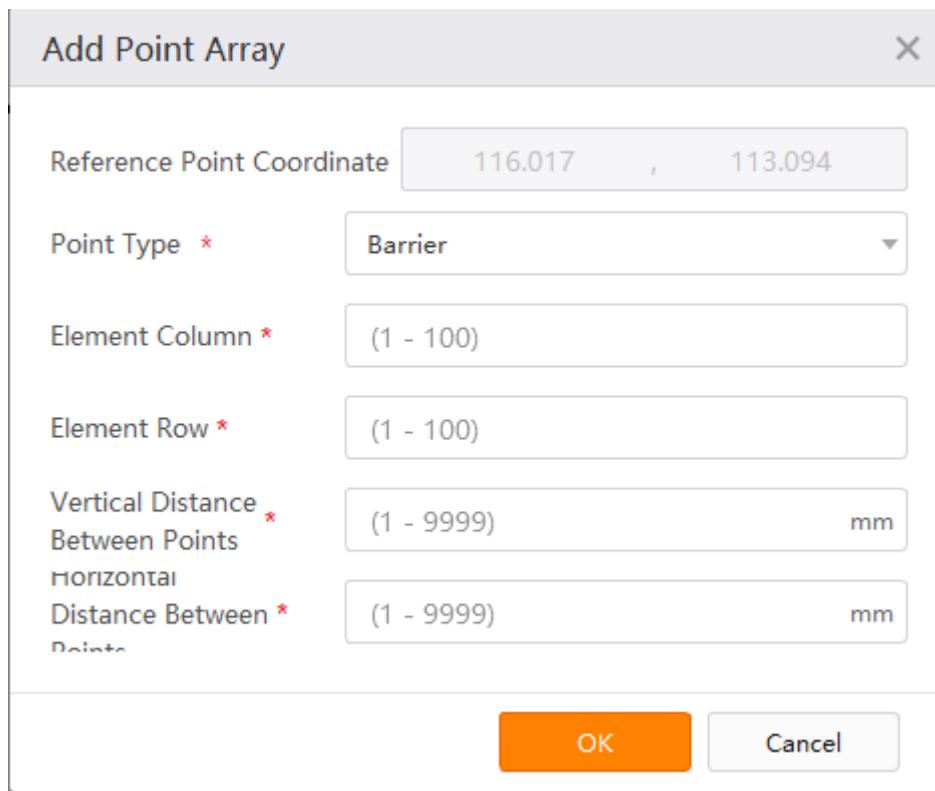


Figure 2-17 Edit Point Array

Draw Measurement Line: Click , and draw a measurement line on the map to view the distance between the two points.

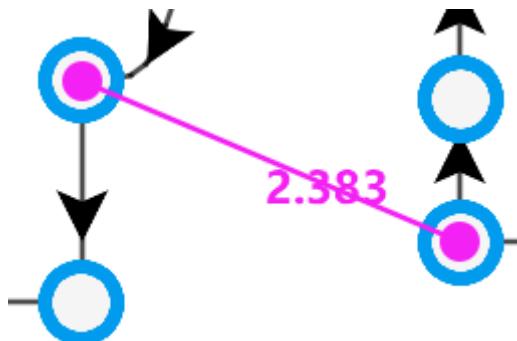


Figure 2-18 Measurement Line

Delete: Click  to select points and lines, and click  to delete them.

Envelope: Click , click or drag to select points and lines, and click  to display or hide envelop. If envelop is displayed, you can edit the envelop parameters. You can set Allowed AMR Type, AMR Head Direction, Rack Type, Rack Direction, and AMR Head Length.

#### Note

AMR head length refers to the distance from FMR head to mast, and it is only required for FMR.

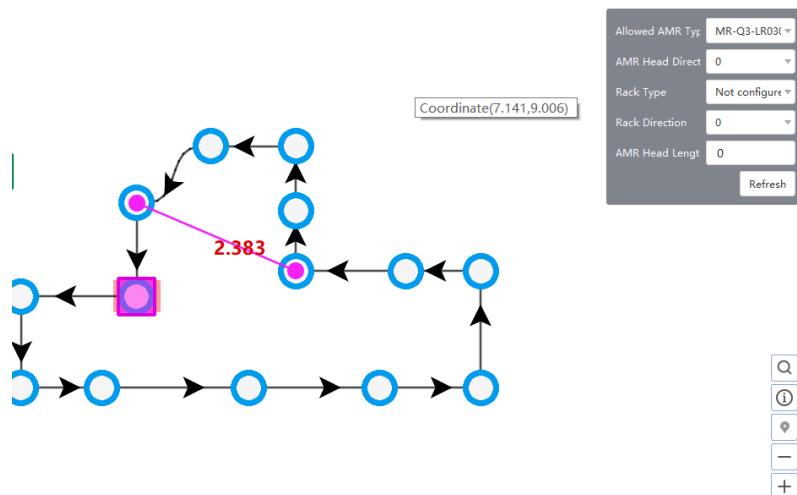


Figure 2-19 Edit Envelope Parameter

**SLAM Background:** If the current map is created by an AMR which supports laser navigation, Slam Background will be available. Click **SLAM Background**, and the SLAM map will be displayed on the current page.

**Note**

To use Slam Background, you can go to the home page, click **SLAM Map Settings > Add Map > Import** to import a LSLAM map.

**Verify:** Click **Verify** to check the topological map on point and line attributes configuration and route connectivity. Alarms will be shown in the alarm list. Double-click the alarm item in the list to locate the alarm to the specific point on the map. Alarm levels are indicated by a yellow exclamation mark or a red exclamation mark. The alarm with a red exclamation mark should be handled. Otherwise, it will severely affect operation.

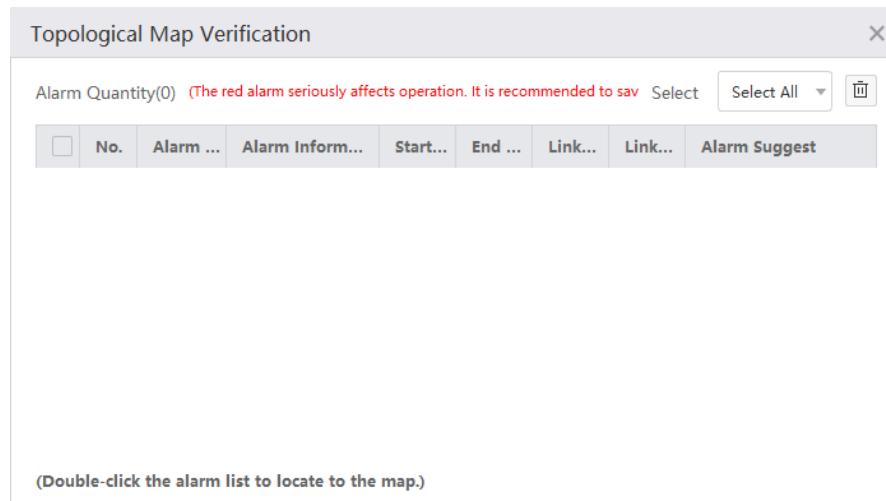


Figure 2-20 Verification Alarm List

**Map Template:** Click **Map Template**, and you can download the topological point template. And after being edited, it can be imported to the client. The template format is consistent with the platform format and can be imported from the platform.

**Export Map:** Click **Export Map** to export edited map to local file.

**More:** Click **More**, and you can import map, edit map information, and delete map.

**Note**

The importing function is only available when a topological map is created, and importing external maps is not available for existing maps.

## 2.2.2 Display Control Bar

You can search coordinate, view map details, restore map to original size, zoom in or zoom out map by clicking corresponding buttons on the display control bar in the lower-right corner.

**Search Coordinate:** Click , and enter the coordinates to search the point on the map.

**Map Details:** Click  to view some map information including Map Size, Topo Point Number, Select Priority, Point Status Display, and Line Status Display.

**Select Priority:** When point, line, and control point are overlapped, you can select to display which element on the map.

**Point/Line Status Display:** Select the specified attribute of point and line status to display them on the map.

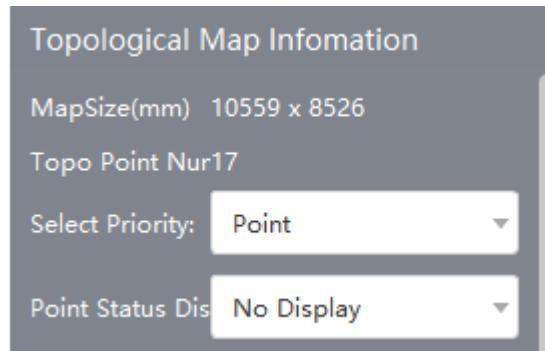


Figure 2-21 Map Attribute Information

Reset View: Click to restore the display scale to 100%.

Zoom In & Zoom Out: Click or to zoom in or zoom out the elements on the map.

### 2.2.3 Right-Click Toolbar

Click , click or drag to select points and lines, and right-click to show the right-click menu. Some functions are same as the toolbar. Different functions are detailed below.

**Create Reverse Line:** Click it to automatically create reverse lines to the selected unidirectional topological lines.

**Select:** It is used to filter specific points, lines, curves, and measurement lines. It is applicable when you want to filter specified points or lines for batch configuration, such as setting workstation attributes and setting curve attributes.

**Linked Point:** It is used to link FMR waiting points and other points. Select one FMR waiting point, right-click it to set linked point, select another point, and click **OK** to link the two points. Viewing and deleting linked point are also available.

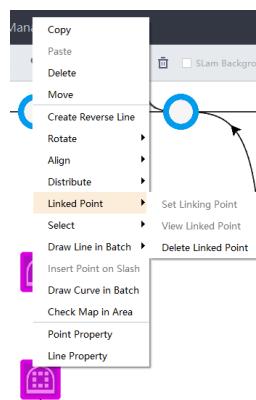


Figure 2-22 Linked Point

**Insert Point on Slash:** Select an oblique line on the map, right-click, and click **Insert Point on Slash**. Enter distributing distance and point quantity in the pop-up window, and click **OK**.

**Draw Lines in Batch:** Drag to select the point array, right-click, click **Draw Lines in Batch**, and select the line direction to draw lines in batch between points.

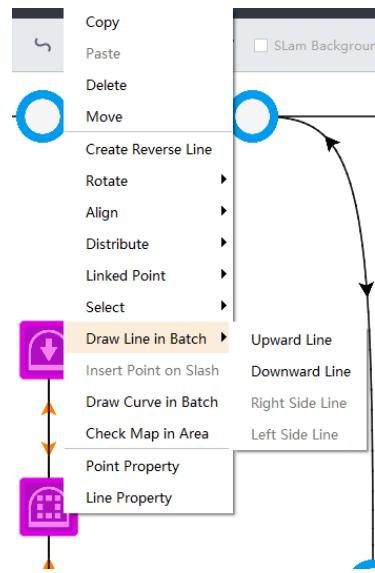


Figure 2-23 Batch Draw Lines

**Draw Curves in Batch:** It is mainly used for warehousing projects with fixed and symmetrical storage locations. Drag to select points, right-click, and click **Draw Curves in Batch**. Enter start point direction, end point direction, and relative distance from X-axis and Y-axis, and click **OK** to create corresponding high-speed areas and curves.

## 2.2.4 Edit Point and Line Attributes

Double-click the point, or drag to right-click it to select **Point Property** to view and edit its attributes. Take mixed system for example. The point attributes contain general attributes and exclusive attributes for AMR types.

**Point Property Info**

Point Type	Channel Tail
Point Size	1.0 , 1.0
Point Coordinate	106.000 , 113.000
Interim Park Property	Interim Park Not Allo
Route Property	Turnaround Route
Rotation AMR Type	
Rotation Container Type	Default
Allowed AMR Type	
Rotation Radius	<input type="checkbox"/> <input checked="" type="checkbox"/>
Accuracy Solution	Default
Avoid or Not	Avoidance Allowed
Refresh Map	Refresh

**Save**    **Cancel**

Figure 2-24 Edit Point Attribute

General point attributes include point type, point size, temporary parking attribute, route attribute, rotation AMR type, rotation container type, allowed AMR type, rotation radius for obstacle avoidance switch, accuracy plan, avoid obstacle, refresh map, obstacle avoidance sensor switch, point direction, point, linked location, linked warehouse, pallet recognition / dynamic docking with rack.

Exclusive attributes for LMR include rotation rack type, under-rack rotation, lifting tray, lifting tray direction, rack target direction, and automatic replenishment rack. Automatic replenishment racks are only available in the working area. After you click **Replenishment**,

racks should be linked to warehouse. When the current working area has no racks, racks will be automatically selected from the linked warehouse and carried to the working area.

Rotation obstacle avoidance area is exclusive for FMR and CTU.

Double-click the line, or drag to right-click it to select **Line Property** to view and edit its attributes.

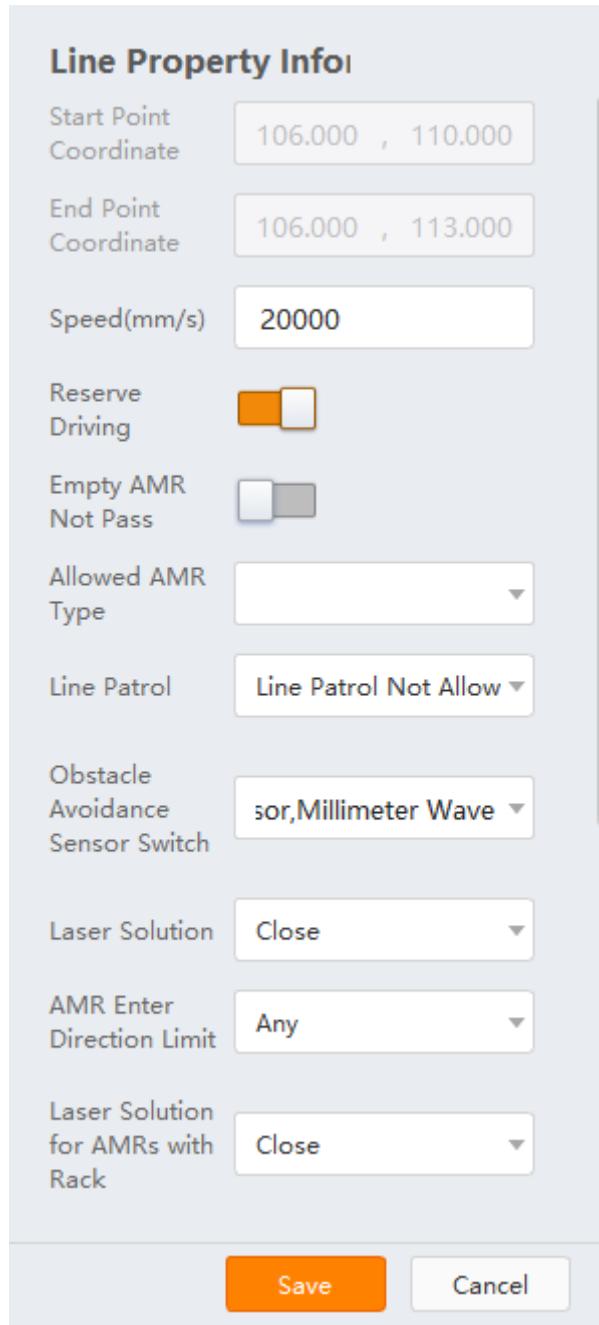


Figure 2-25 Edit Line Attribute

General line attributes include start point coordinates, end point coordinates, speed (mm/s), wrong way driving, empty AMR not allowed to move, allowed AMR type, patrol, obstacle

avoidance sensor switch, laser plan, limited AMR entry direction, and laser plan for AMR with rack.

Allowed rack type is exclusive for LMR.

Exclusive attributes for FMR and CTU include non-loaded fork pre-lifting/lowering, loaded fork pre-lifting/lowering, and allowed container type.

## 2.3 Map Settings

### 2.3.1 SLAM Map Settings

SLAM map settings are only applied to carrying system and FMR system. SLAM map includes LSLAM map and VSLAM map. One map can have multiple SLAM maps, but make sure they are under management. LMR system currently supports importing LSLAM map and VSLAM map whereas FMR system only supports importing LSLAM map.

SLAM map settings have two modules. The first one is about the functions of adding, deleting, viewing, and changing. The second one is about viewing the downloaded monitoring.

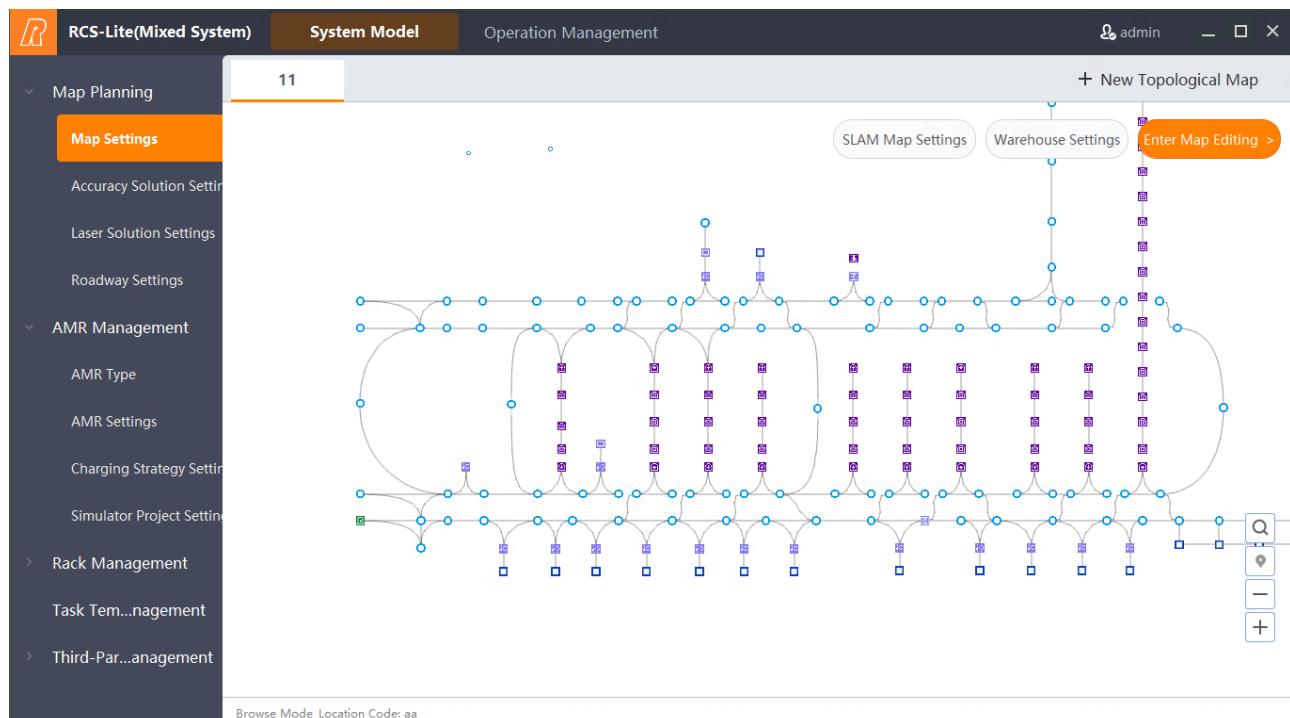


Figure 2-26 SLAM Map Settings

After the topological map has been added, open the client, and go to **System Model**. Click **Map Settings** in the left-side navigation bar, and click **SLAM Map Settings** to open the page.

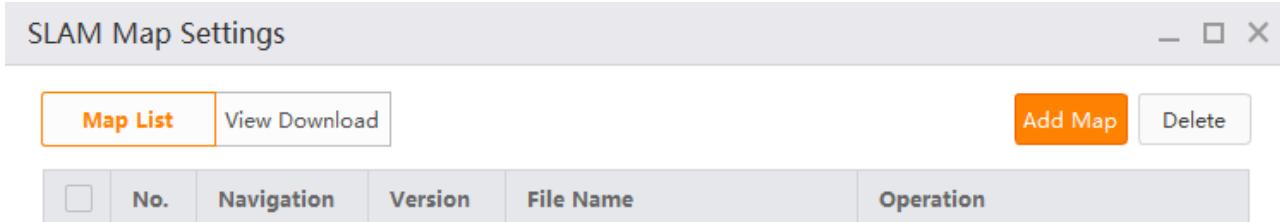


Figure 2-27 SLAM Map Settings

In Map List interface, you can view the SLAM map No., navigation mode, version No., file name, etc. Click **Add Map** to add a SLAM map.

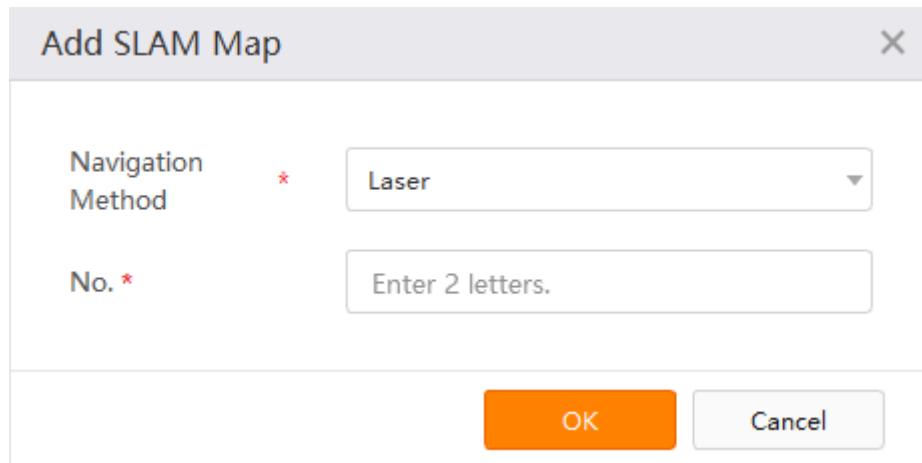


Figure 2-28 Add SLAM Map

Select laser or texture navigation mode, and enter the map No. Click **OK** to add a SLAM map.

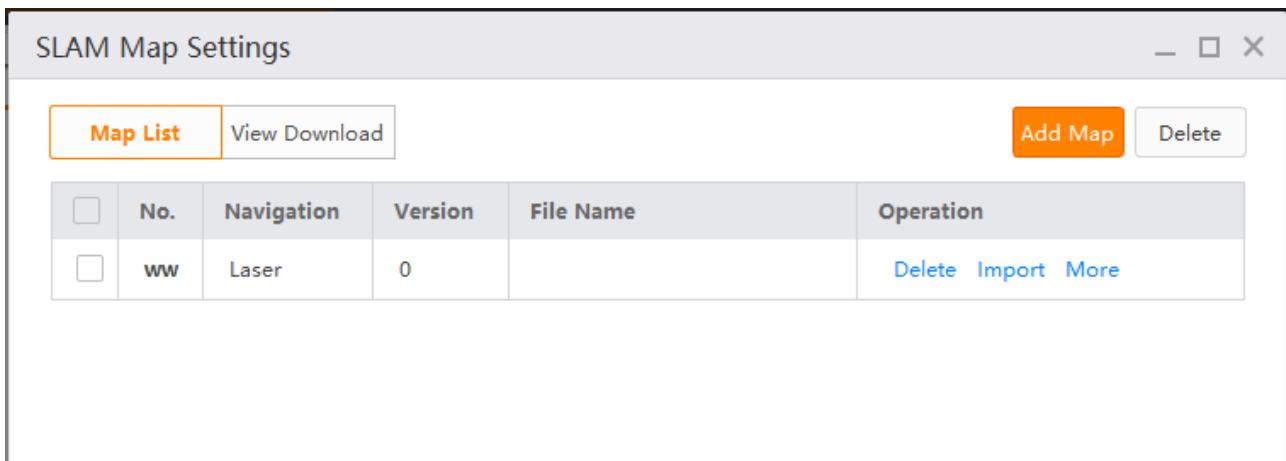


Figure 2-29 SLAM Map Added

The file name is empty because local map files have yet to be imported. You can click **Import** in the operation column to import the file. If you choose laser navigation, you can only import the file in HK format. If you choose texture navigation, you can only import the file in HKT format.

Click **Delete** to delete the map. Click **More > Export** to export the file. If the file name is empty, you should import a file first; if the file name is not empty, the current file will be exported to the selected directory. Click **More > Detail** to view file details.

SLAM File Detail	
File Name	File Size
2023-08-24-14.hkk	184
2024-07-26-10.hkb	5791
2024-07-26-10.pcd	1131310
2024-07-26-10.png	9880
SLAM_ww_1.3dmap	875953
SLAM_ww_1.3dmap4	555690

Figure 2-30 SLAM Map File Information

#### Note

If the newly added map adopts laser navigation, and local file in HK format has been imported, when you click **Enter Map Editing**, **SLAM Background** can be available.

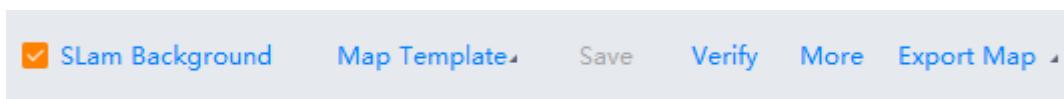


Figure 2-31 SLAM Background Map

Click **View Download**, and you can see the downloaded monitoring information of the corresponding AMR, including the file name, file length, downloading time, and downloading status.

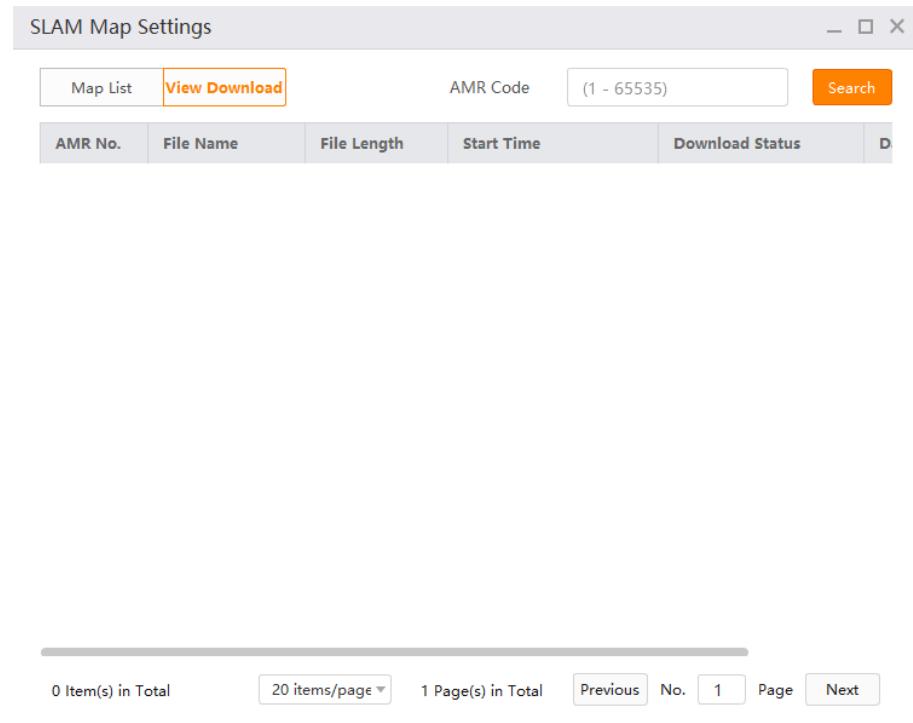


Figure 2-32 AMR Monitoring Information

### 2.3.2 Warehouse Area Settings

Same as SLAM map settings, warehouse area settings are also mainly applied to carrying system and FMR system. Click **Warehouse Settings** in the upper-right corner to enter the warehouse area settings page. You can click corresponding buttons in the top toolbar to exit map editing, cancel the last action, cancel the action that was undone, enter the panning mode or erasing mode, and save the editing.

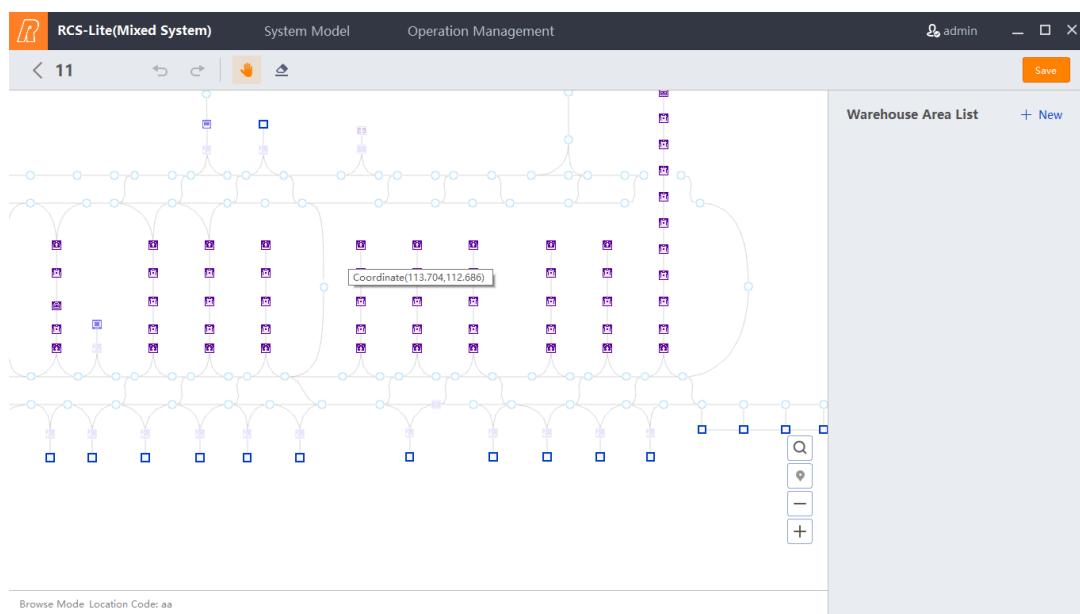


Figure 2-33 Warehouse Area Settings

When you first enter the page, click  in the upper-right corner. Then enter warehouse area No. and name, select a type, and click **OK**. Currently, ordinary area, block area, and roadway area are supported. Click  to create a new area. In addition to Area No. and Area Name, you can also set the priority (high, middle, and low) for the area.

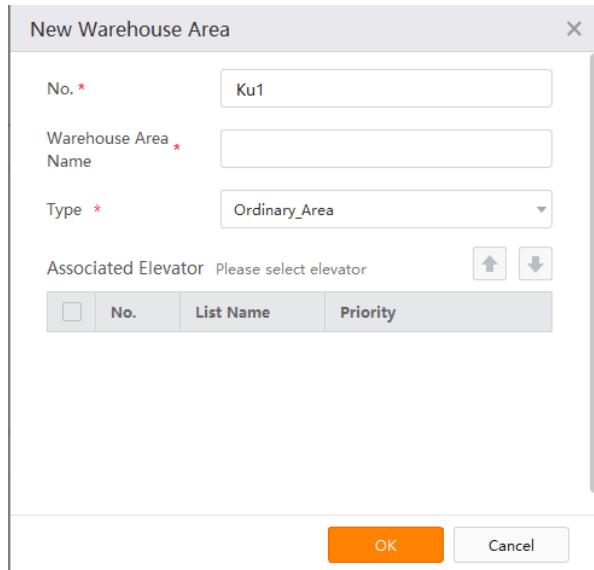


Figure 2-34 Create Warehouse Area

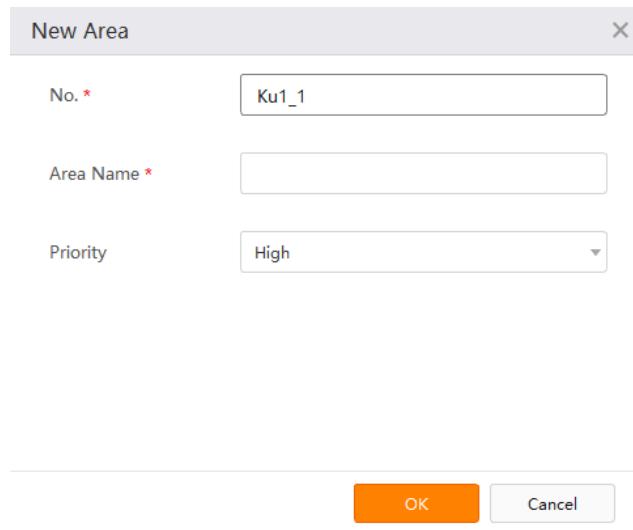


Figure 2-35 Create Area

After you create a new area, click **Select**, and drag to select an area. Currently, only working area and storage location can be selected in the topological map. Once the area is successfully selected, it will be highlighted in orange.

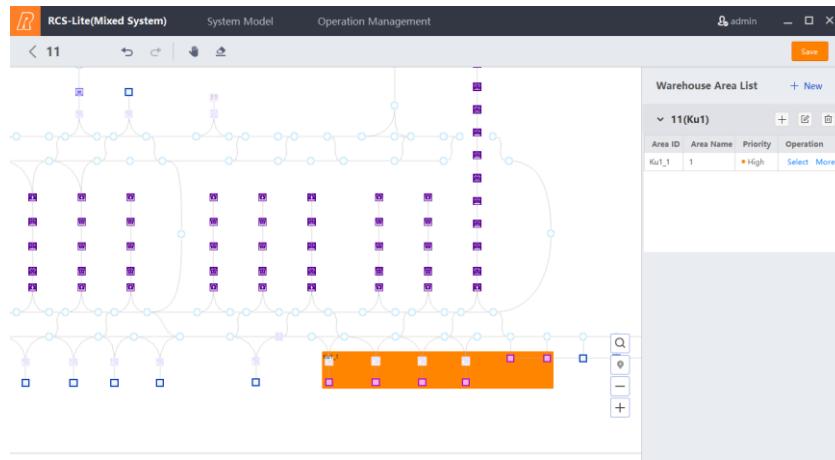


Figure 2-36 Draw Warehouse Area

Click and to reset the current operation. Click to exit the selection mode and enter the panning mode. Click to delete the selected warehouse area.

Click **Save** in the upper-right corner of the page to finish configuration.

#### Note

Rack No., rack name, area No., and area name of all maps should be unique.

### 2.3.3 Accuracy Solution Settings

- Add Accuracy Solution

Step 1 Go to the accuracy solution settings page, and click **Add**.

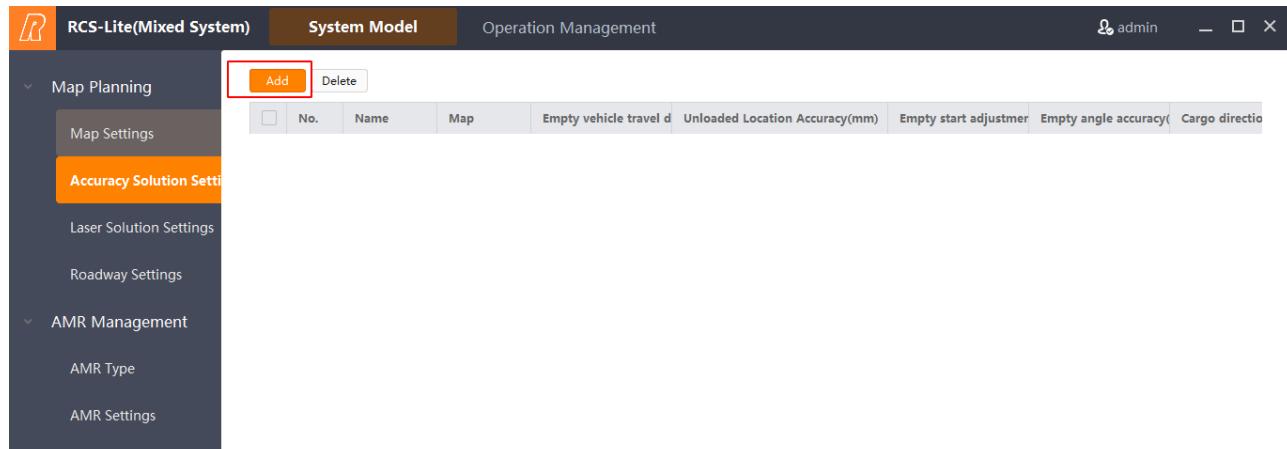


Figure 2-37 Add Accuracy Solution

Step 2 Enter related information in the respective boxes, and click OK to add accuracy solution.

New Accuracy Solution X

Map *	Select.
No. *	(1 - 254)
Name *	Enter 1 to 32 characters.
Movement Direction Accuracy for Empty * Empty AMR/mm	20
Non-movement Direction Accuracy for * Empty AMR/mm	65
Starting Adjustment Accuracy for Empty * Empty AMR/mm	35
Movement Direction Accuracy for Loaded * Loaded AMR/mm	20
Empty AMR Angle Accuracy(%) *	1000
Non-movement Direction Accuracy for * Loaded AMR/mm	40
Non-movement Direction Accuracy for * Loaded AMR/mm	30
Loaded AMR Angle Accuracy(%) *	2000
Movement direction Accuracy During Rack * During Rack	20
Non-movement Direction Accuracy * During Rack	20
Movement direction Accuracy During Rack * During Rack	20
Non-movement Direction Accuracy * During Rack	20

OK Cancel

Figure 2-38 Accuracy Solution Settings

Table 2-1 Field Table of Accuracy Solution

<b>Field</b>	<b>Attribute</b>	<b>Description</b>
Map	Req.	The map to which the accuracy solution is applied.
No.	Req.	Unique No. of the accuracy solution. Once added, it cannot be changed.
Name	Req.	Unique name of the accuracy solution.
Movement Direction Accuracy for Empty AMR	Req.	Check if AMR is at end point. Once the AMR is in position, task of accuracy range will not be generated. (Recommended value: 20, unit: mm.)
Non-Movement Direction Accuracy for Empty AMR	Req.	Generally when an AMR is at the end point, compare the non-movement direction lateral deviation for AMR with non-movement direction accuracy value for AMR. (Recommended value: 65, unit: mm.)
Starting Adjustment Accuracy for Empty AMR	Req.	Generally, when AMR transits from non-working state to working state, compare the deviation and accuracy value of movement direction and non-movement direction for AMR. (Recommended value: 35, unit: mm.)
Movement Direction Accuracy for Loaded AMR	Req.	To check if the AMR is in position, compare the movement direction deviation and accuracy value for rack coordinates. (Recommended value: 20, unit: mm.)
Empty AMR Angle Accuracy	Req.	Generally when an AMR is at the end point, compare the axial angle (0, 90, -90, and 180) deviation value with the empty AMR angle accuracy value. No adjustment is made unless the comparison value exceeds 1°. (Recommended value: 1, unit: °.)

Non-Movement Direction Accuracy for Loaded AMR	Req.	Generally when an AMR is at the end point, compare the non-movement direction lateral deviation for AMR with non-movement direction accuracy value for loaded AMR. (Recommended value: 40, unit: mm.)
Starting Adjustment Accuracy for Loaded AMR	Req.	When loaded AMR transits from non-working state to working state, compare the deviation and accuracy value of movement direction and non-movement direction for rack coordinates. (Recommended value: 30, unit: mm.)
Loaded AMR Angle Accuracy	Req.	Generally when an AMR is at the end point, compare the axial angle (0, 90, -90, and 180) deviation value with the loaded AMR angle accuracy value. No adjustment is made unless the comparison value exceeds 2°. (Recommended value: 2, unit: °.)
Movement Direction Accuracy During Rack Lowering	Req.	Compare the movement direction deviation and accuracy value for rack accuracy and rack coordinates used after rack lifting and before rack lowering. (Recommended value: 25, unit: mm.)
Non-Movement Direction Accuracy During Rack Lowering	Req.	Compare the non-movement direction deviation and accuracy value for rack accuracy and rack coordinates used after rack lifting and before rack lowering. (Recommended value: 25, unit: mm.)
Movement Direction Accuracy During Rack Lifting	Req.	Compare the movement direction deviation and accuracy value for rack accuracy and rack coordinates used before rack lifting. (Recommended value: 20, unit: mm.)
Non-Movement Direction Accuracy During Rack Lifting	Req.	Compare the non-movement direction deviation and accuracy value for rack accuracy and rack coordinates used before rack lifting. (Recommended value: 20, unit: mm.)

- Delete Accuracy Solution

Step 1 Go to the Point Property page, select **Default** in **Accuracy Solution**, and click **Save**.

**Point Property Info**

Point Type	Channel Buffer
Point Size	1.0 , 1.0
Point Coordinate	122.137 , 110.000
Interim Park Property	Interim Park Not Allo
Route Property	Turnaround Route
Rotation AMR Type	
Rotation Container Type	Default
Allowed AMR Type	
Rotation Radius	<input type="checkbox"/>
Accuracy Solution	Default
Avoid or Not	Avoidance Allowed

Figure 2-39 Cancel Accuracy Solution

Step 2 Go to the Accuracy Solution Configuration page, select the accuracy solution to be deleted, click **Delete**, and click **OK** to delete the accuracy solution.

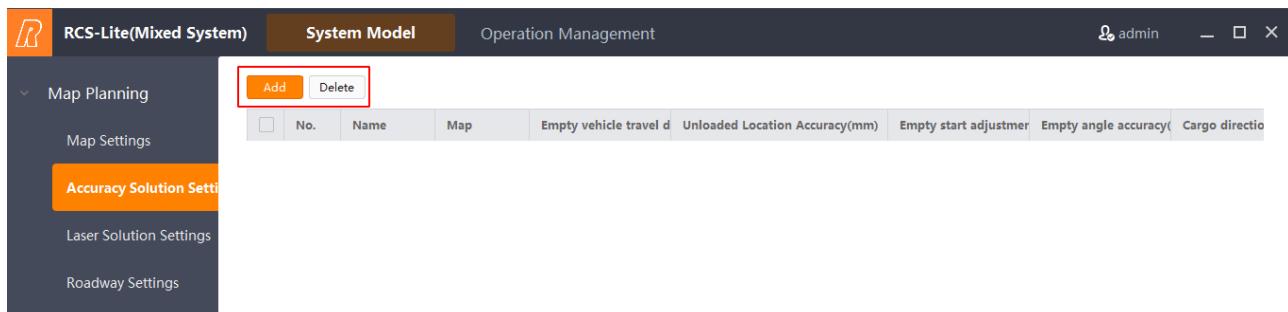


Figure 2-40 Delete Accuracy Plan

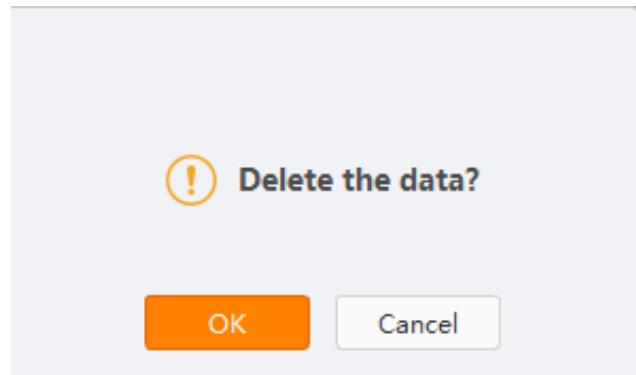


Figure 2-41 Confirm Deletion

### 2.3.4 Laser Solution Settings



You can configure the laser detection distance in the front, rear, left, and right direction for AMR on the specified map.

- Add Laser Solution

Step 1 Go to the laser solution configuration page, and click **Add**.



The screenshot shows the 'System Model' tab selected in the top navigation bar. On the left, there's a sidebar with 'Map Planning' expanded, showing 'Map Settings', 'Accuracy Solution Settings', 'Laser Solution Settings' (which is highlighted with an orange box), and 'Roadway Settings'. In the main area, there's a table header with columns: No., Name, Map, Front(mm), Rear(mm), Left(mm), Right(mm), and Operation. Below the header, there are two rows of data. The first row has a checkbox, 'No.', 'Name' (empty), 'Map' (empty), 'Front(mm)' (empty), 'Rear(mm)' (empty), 'Left(mm)' (empty), 'Right(mm)' (empty), and 'Operation' (empty). The second row has a checkbox, 'No.', 'Name' (empty), 'Map' (empty), 'Front(mm)' (empty), 'Rear(mm)' (empty), 'Left(mm)' (empty), 'Right(mm)' (empty), and 'Operation' (empty). The 'Add' and 'Delete' buttons are located at the top of the table area.

Figure 2-42 Add Laser Solution Configuration

Step 2 Enter related content in respective boxes, and click **OK** to add laser solution.

New Laser Solution

Map *	Select.
No. *	1
Name *	Enter 1 to 32 characters.
Front(mm) *	100
Rear(mm) *	100
Left(mm) *	100
Right(mm) *	100

**OK**   **Cancel**

Figure 2-43 Create Laser Solution

Filed table of laser solution is shown below:

Table 2-2 Field Table of Laser Solution

Field	Attribute	Description
Map	Req.	The map to which the laser plan is applied.
No.	Req.	Unique No. of the laser plan. Once added, it cannot be changed.
Name	Req.	Unique name of the laser plan.
Front	Req.	The front detection distance in the moving coordinate system. (Unit: mm.)
Rear	Req.	The rear detection distance in the moving coordinate system. (Unit: mm.)
Left	Req.	The left detection distance in the moving coordinate system. (Unit: mm.)
Right	Req.	The right detection distance in the moving coordinate system. (Unit: mm.)

- Delete Laser Plan

To fully delete the laser solution, you should go to the Line Property page first, select **Close** in **Laser Solution**, and click **Save**. Then go back to the laser solution configuration page, select the laser solution to be deleted, click **Delete**, and click **OK**.

# Chapter 3 Roadway Configuration

In this page, you can configure the basic attribute of roadway, which includes No., name, roadway type, entrance & exit method, map, outbound capacity, outbound locking capacity, inbound capacity, inbound locking capacity, container type, FMR roadway (LMR roadway) configuration, and the map No., sequence and corresponding locking source of roadway buffer areas.

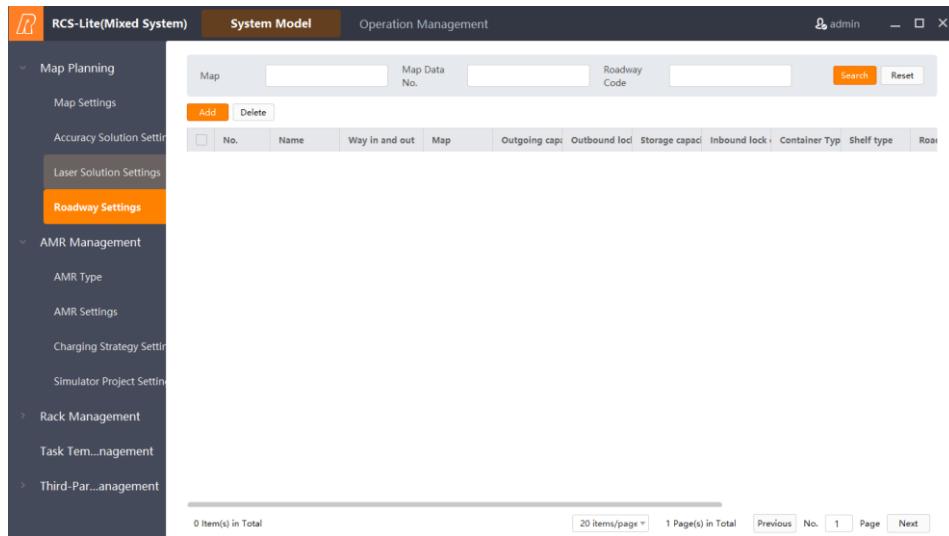


Figure 3-1 Roadway Configuration

Enter map No., map data No., or roadway No., click **Search** to search corresponding data. Click **Reset** to clear all content in the input boxes and search all data. At the bottom of the interface, you can click **Previous** or **Next** or enter a page No. to go to the corresponding page.

- Add Roadway

Click **Add** in the upper-left corner of the interface to add a roadway, and enter corresponding configuration information in the pop-up window, then click **OK**.

No. *	(1 - 65535)
Name *	Enter 1 to 32 characters. {1~?} {64 ?}
Roadway Type *	Transportation roadway
Entrance & Exit Method *	first in first out
Map *	11
Roadway Head *	Select.
Rack Type *	Select.
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 3-2 Create Roadway Configuration

Once the roadway is added, go to Operation Management interface, click **Service Management**, and click **Restart** of the Robot Control Service (RCS).



Figure 3-3 Prompt Message

- Delete Roadway Configuration

Click **Delete** in the operation column to delete a roadway. Select multiple rows, and click **Delete** on the top of the table to delete multiple roadways.

- Verify Roadway

Click **Verify**, and the system will verify the feasibility of roadways, including whether FMR roadway and roadway buffer areas are linked to a virtual rack, and whether roadway map data exists. If the verification is not passed, the list will be marked in red.

# Chapter 4 AMR Management

## 4.1 AMR Type

AMR Management includes AMR Type, AMR Settings, Charging Strategy Settings, and Simulator Project Settings. As for FMR, you can view such attributes in the AMR Type page as No., name, length, width, height, omnidirectional, quadrant control, lifting deviation, FMR Type, and safety height of fork lifting. As for LMR, you can view such attributes in the AMR Type page as No., name, length, width, rotation diameter, omnidirectional, and transparent transmission. As for latent tractor, you can view such attributes in the AMR Type page as No., name, length, and width. As for roller CMR, you can view such attributes in the AMR Type page as No., name, length, width, height, rotation diameter, omnidirectional, quadrant control, roller columns, roller layers, and offset.

No.	AMR Series	Name	AMR Length(mm)	AMR Width(mm)	Height(mm)	Rotation Diameter	Omnidirection	Operation
1	FMR Series	Default1	2190	1100	2190		No	<a href="#">Edit</a> <a href="#">Delete</a>
2	FMR Series	Default2	1730	940	2120		No	<a href="#">Edit</a> <a href="#">Delete</a>
3	FMR Series	Default3	1460	930	1920		Yes	<a href="#">Edit</a> <a href="#">Delete</a>
4	FMR Series	Default4	1440	890	1920		Yes	<a href="#">Edit</a> <a href="#">Delete</a>
5	FMR Series	Default5	1570	990	1870		Yes	<a href="#">Edit</a> <a href="#">Delete</a>
6	FMR Series	Default6	1780	1020	210		Yes	<a href="#">Edit</a> <a href="#">Delete</a>
7	FMR Series	Default7	1250	1160	195		No	<a href="#">Edit</a> <a href="#">Delete</a>
8	LMR Series	1	1	1		11	No	<a href="#">Edit</a> <a href="#">Delete</a>
9	Roller CMR Series	11	33	33	33	46	No	<a href="#">Edit</a> <a href="#">Delete</a>
10	CTU Series	333	44	44	44	62	No	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 4-1 AMR Type Home Page

Click **Add** at the upper-left corner of the home page, and you can create corresponding AMR types based on different system types. As for mixed system, you can choose different AMR series in the pop-up window including LMR series, FMR series, Roller CMR series, and CTU series.

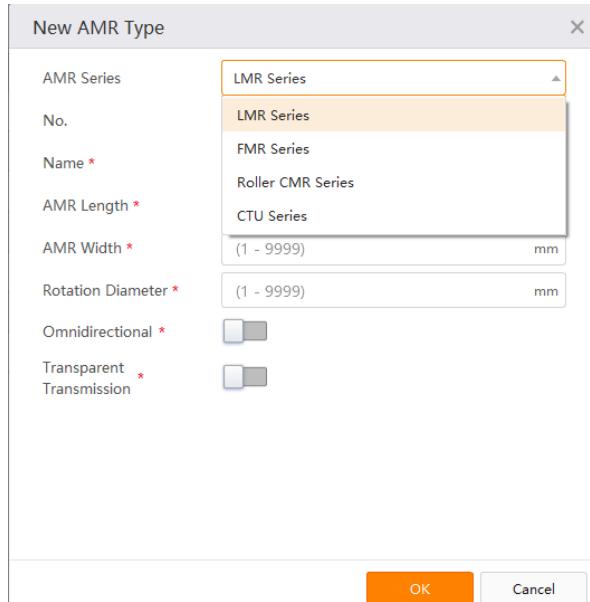


Figure 4-2 Create AMR Type

The No. is automatically generated according to the number of current AMR types. Name, length, width, rotation diameter, omnidirectional, quadrant control, lifting deviation and other items are required parameters. Then click **OK**.

In the table of the AMR Type home page, you can click **Edit** in the operation column to edit the attribute of the selected AMR type, and you can click **Delete** in the operation column or in the upper-right corner to delete the selected AMR type. When you click **Delete**, a prompt box will pop up.

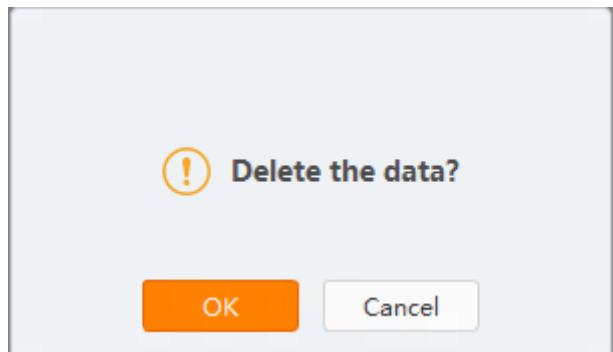


Figure 4-3 Confirm Deletion

Click **Cancel** to close the prompt box and go back to the home page. Click **OK**, and there are two scenarios. One is that the current AMR type has been in use, and a prompt box will pop up to remind that the current type has been linked to AMR, and if you delete the current type, all linked AMRs will be deleted.

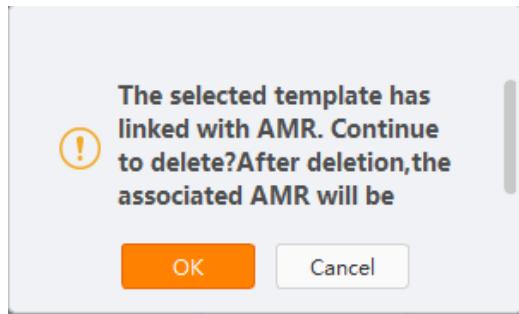


Figure 4-4 Confirm Deletion

Another scenario is that the current type has not been linked to any AMR and will be deleted directly. Then you will go back to the home page.

## 4.2 AMR Settings

In this page you can configure the basic attributes of AMR, including No., Name, Type, Map, and Navigation Type. In the AMR Settings home page, all AMR attributes are displayed in a table format.

AMR ID	Name	AMR Type	Affiliated Map	Current Map	Navigation Type	Operation
11	ssss		11	11	Laser	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 4-5 AMR Settings Home Page

- Add AMR Settings

Click **Add** in the upper-left corner of the page to add an AMR. In the pop-up window, enter corresponding configuration information, and click **OK** to add AMR settings.

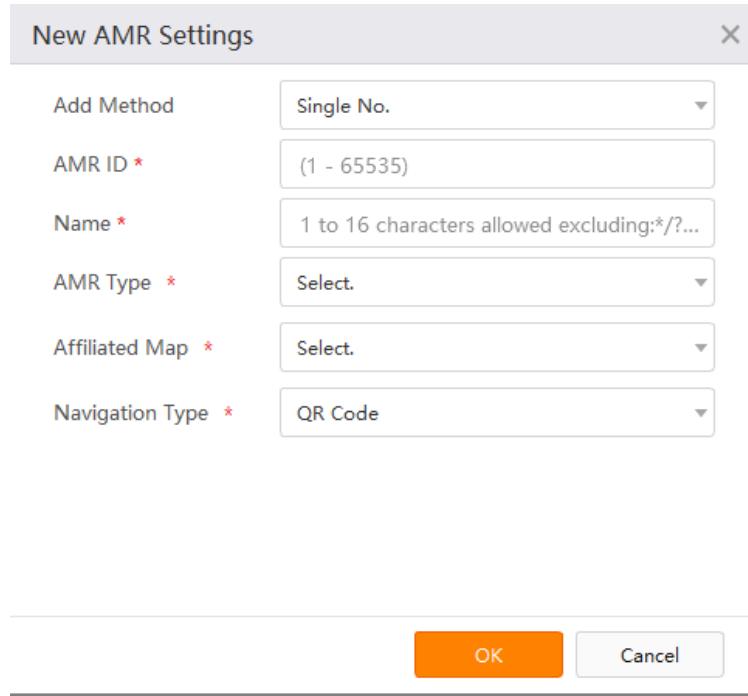


Figure 4-6 Create AMR Settings

Table 4-1 AMR Information Field

Field	Attribute	Description
Adding Mode	Req.	Single No. is added by default. Adding No. Segment is also supported.
AMR No.	Req.	Unique No. of AMR. Once added, it cannot be changed.
Name	Req.	Unique name of AMR.
AMR Type	Req.	AMR Model.
Map	Req.	AMR Map.
Navigation Type	Req.	Navigation mode applied in AMR during operation.

- Delete AMR Configuration

Click **Delete** in the top bar or click **Delete** in the operation column, and click **OK** in the prompt box to delete AMR configuration.

- Import

Click **Import**, then click **Select**, and select a local file to import the data to the table. Original data in the table will be deleted.

- Export

Click **Export** to export AMR data to your selected path.

- Download Template

Click **Download Template**, and the system will generate a template file. You can add AMR data based on the file format, and batch import the file into the system. Then AMR data will be added.

- Filter AMR by Map

Click the drop-down list in **All Maps**, and select the specified map to filter all AMRs configured in the map.

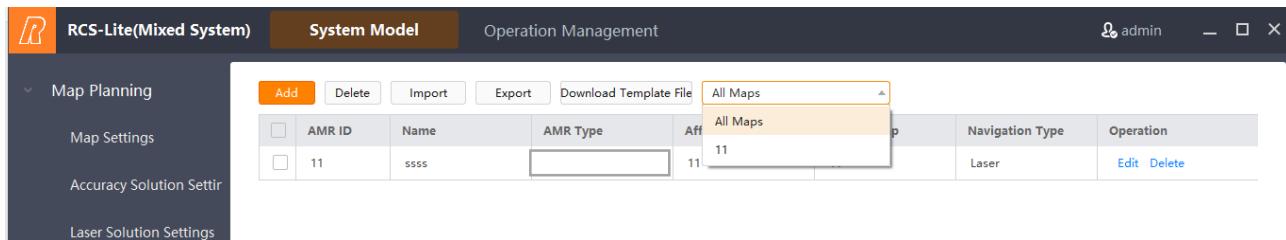


Figure 4-7 Filter AMR by Map

## 4.3 Charging Strategy Configuration



In this page you can add or delete AMR charging strategy, and configure the existing charging strategy. Charging strategy determines the threshold of auto-charging for AMR in the specified map. In this page you can configure the basic attributes of AMR charging, including No., map, high-battery charging threshold, normal charging threshold, low-battery charging threshold, charging start time, and charging end time. In the home page, all parameters of charging strategy configuration are displayed in a table format.

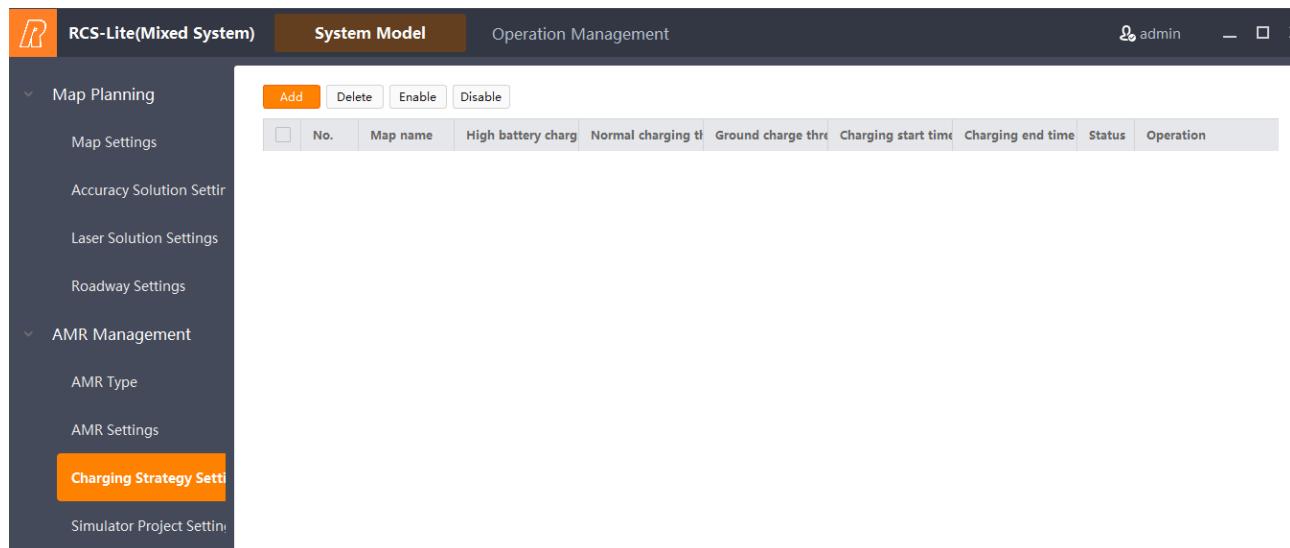


Figure 4-8 Charging Strategy Configuration Page

- Add Charging Strategy

Click **Add** in the upper-left corner of the page, enter corresponding configuration information, and click **OK** to add a charging strategy.

New Charging Strategy	
No. *	(1 - 65535)
Affiliated map *	Select.
High battery charge threshold *	(Please enter 1-100 numbers)
Normal charge threshold *	(Please enter 1-100 numbers)
Low battery charge threshold *	(Please enter 1-100 numbers)
Charging start time *	
Charging end time *	
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 4-9 Charging Strategy Configuration

Table 4-2 Charging Strategy Information Field

Field	Attribute	Description
No.	Req.	Unique No. of charging strategy. Once added, it cannot be edited.
Map	Req.	The map to which charging strategy is applied.
High-Battery Charging Threshold	Req.	Battery threshold for AMR after charging.
Normal Charging Threshold	Req.	Battery threshold for charging non-working AMR.
Low-Battery Charging Threshold	Req.	Battery threshold for AMR requiring charging.
Charging Start Time	Req.	The time when the charging strategy is applied.
Charging End Time	Req.	The time when the charging strategy is finished.



The application time of the charging strategy should not overlap with that of other charging strategies in the same map.

- Delete Charging Strategy

To delete the charging strategy, select it in the check box, click **Delete**, and click **OK** in the pop-up window.

- Enable and Disable Charging Strategy

To enable or disable the charging strategy, select it in the check box, and click **Enable** or **Disable**.

## 4.4 Simulator Project Settings

In the RCS-Lite V1.5, the concept of Simulator Project is introduced. After you enable the simulator, you should add a simulator project. Simulator Project supports adding simulator in the specified map, and configuring such parameters as battery, speed for AMR of the same type in the simulator. Each launch is considered a new project for the simulator platform.

- Enable Simulator

Click **AMR Simulator Switch** in the upper-right corner of the page, and click **OK** in the pop-up window to enable AMR simulator.

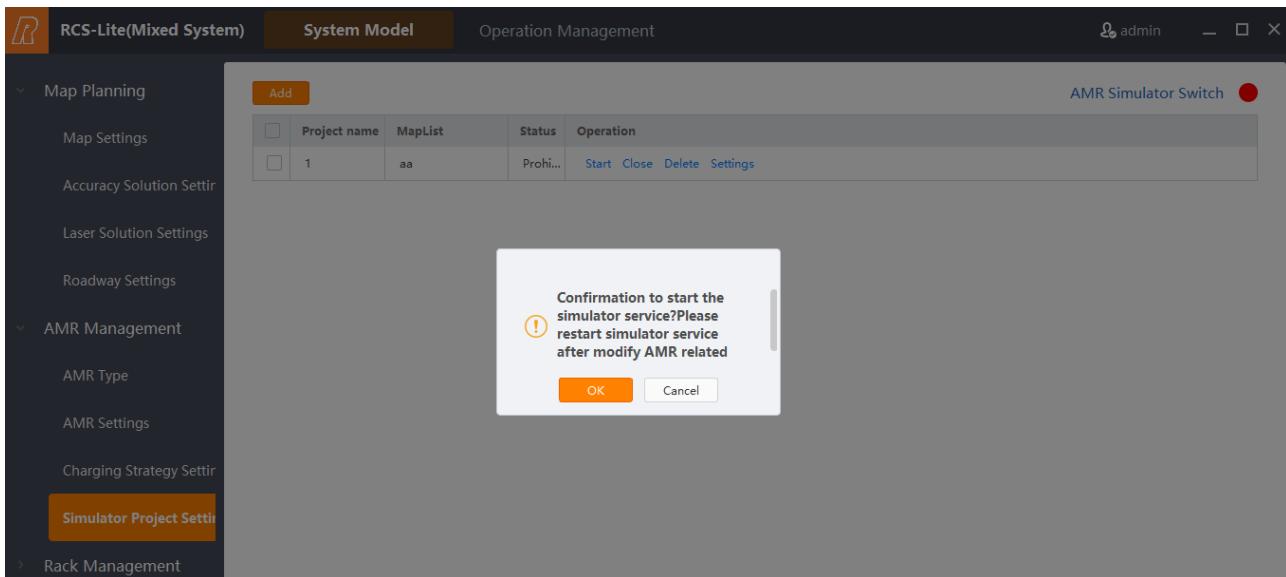


Figure 4-10 Enable Simulator

- Create Simulator Project

Click **Add** in the upper-left corner of the page, enter corresponding configuration information in the pop-up window, and click **OK** to create simulator project.

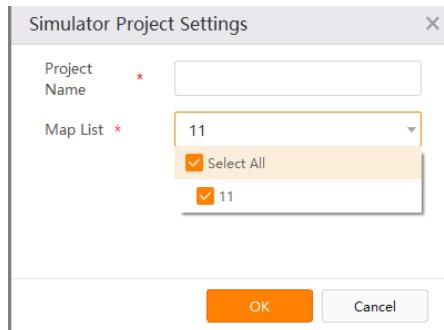


Figure 4-11 Create Simulator Project

Table 4-3 Simulator Project Configuration Field

Field	Attribute	Description
Project Name	Req.	Custom.
Map List	Req.	Select according to the actual demand.

- Enable/Disable/Delete Simulator Project
  - **Enable:** After the simulator project is successfully created, it is disabled by default. Click **Enable** in the operation column to enable the simulator project. Then the simulator project becomes enabled.
  - **Disable:** Click **Disable** in the operation column to disable the simulator project. Then the simulator project becomes disabled.
  - **Delete:** Click **Delete** in the operation column to delete the simulator project. If the simulator project is enabled, it cannot be deleted. You should disable it first and then click **Delete**.
- Configure Simulator Project

When the simulator project is enabled, click **Settings** in the operation column, and all AMR types in the corresponding map will be displayed in the prompt box.



Figure 4-12 Simulator Project Settings

Click  to expand the parameter list, and you can edit such parameters as battery, speed of the corresponding AMR type.

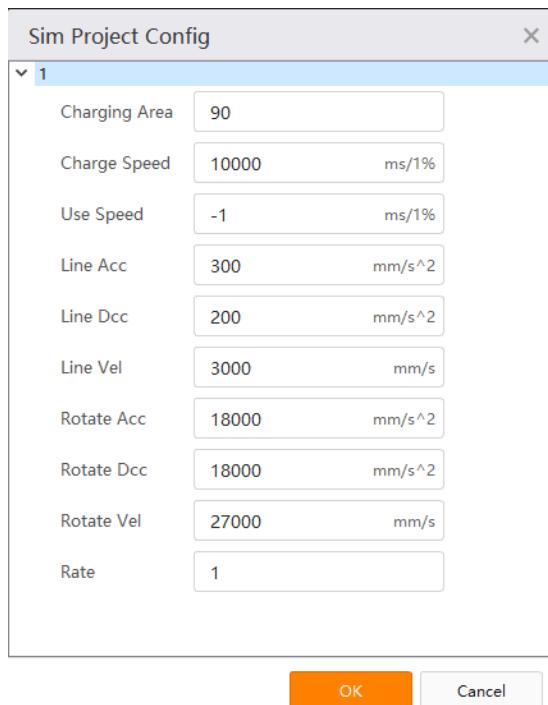


Figure 4-13 Simulator Parameter Settings

# Chapter 5 Rack Management

## 5.1 Non Mixed System Rack Management

### 5.1.1 Bin Type

In this page you can configure the basic attributes of a set of bins, including bin type No., name, bin depth, width, and height. After the bin type is configured, it will be used as a basic bin attribute. When one certain bin applies this type, its depth, width, and height will be determined.

No.	Name	Bin Depth(mm)	Bin Width(mm)	Bin Height(mm)	Operation
1	Default	1200	1200	300	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 5-1 Bin Type Configuration

Click **Add** in the upper-left corner of the page to add the bin type.

Bin Type Code *	(Please enter 1-32 letters or numbers) {1-...}
Bin Type Name *	(Please enter 1-32 letters or numbers)
Bin Depth *	(1 - 9999) mm
Bin Width *	(1 - 9999) mm
Bin Height *	(1 - 9999) mm
Bin QR Type	Select.
Bin QR Sub Type	Select.
Bin QR Height Type	Select.
Bin QR Height	(-100000 - 100000) mm
Second Pos Type	Select.
QR Offset	(-1000 - 1000) mm

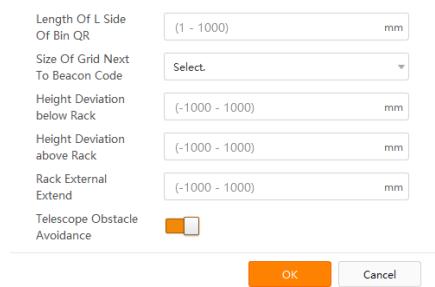


Figure 5-2 Create Bin Type

Click **Delete** on the top of the table to delete the selected bin type data.

Click **Delete** in the operation column to delete the data.

Click **Edit** in the operation column to edit the bin type.

### 5.1.2 Rack Type

In this page you can configure the basic attributes of a set of racks, including rack type No., name, rack type, rack length, rack width, rack leg length, rack leg width, rack leg height, inner diameter length, inner diameter width, rotatable AMR, AMR entering through short side, fixed rack type, and blind lifting.

No.	Rack Name	Rack Type	Rack Length(m)	Rack Width(m)	Rack Leg Length(m)	Rack Leg Width(m)	Rack Leg Height(m)	Inner Diameter(m)	Outer Diameter(m)
1	Default virtual rack	General Rack	1200	1200	0	0	0	1200	1200
2	Default multi-level rack	General Rack	1200	1200	50	50	300	1000	1000

Figure 5-3 Rack Type List

Click **Add** in the upper-left corner of the page to add rack type, and you can enter basic parameters in the pop-up window.

New Rack Type

Type No. 03

Type Name \* (Please enter 1-32 characters:excluding\*/?...)

Rack Type General Rack

Rack Length \* (1 - 9999) mm

Rack Width \* (1 - 9999) mm

Rack Leg Length \* (0 - 9999) mm

Rack Leg Width \* (0 - 9999) mm

Rack Leg Height \* (0 - 9999) mm

Inner Diameter Length (1 - 9999) mm

Inner Diameter .

Next step

Figure 5-4 Create Rack Type

Click **Next step**, and you can view corresponding rack type layer and direction attribute.

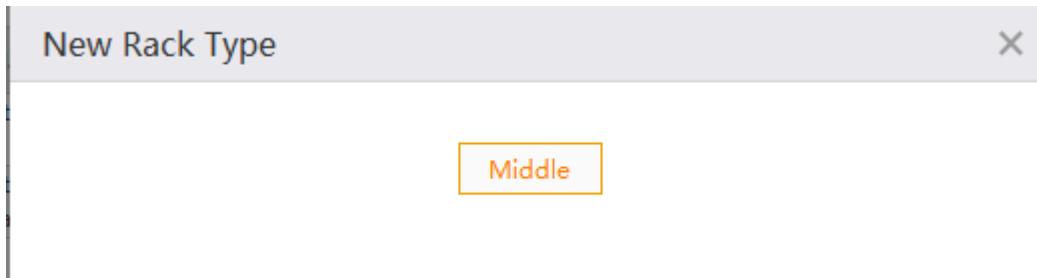


Figure 5-5 Rack Type Layer and Direction Attribute

Click **Delete** on the top of the table to delete the selected rack type data.

Click **Edit** or **Delete** in the operation column to edit or delete the data.

### 5.1.3 Rack Settings

In this page, you can configure rack attributes, including rack ID, rack description, rack type, and material batch.

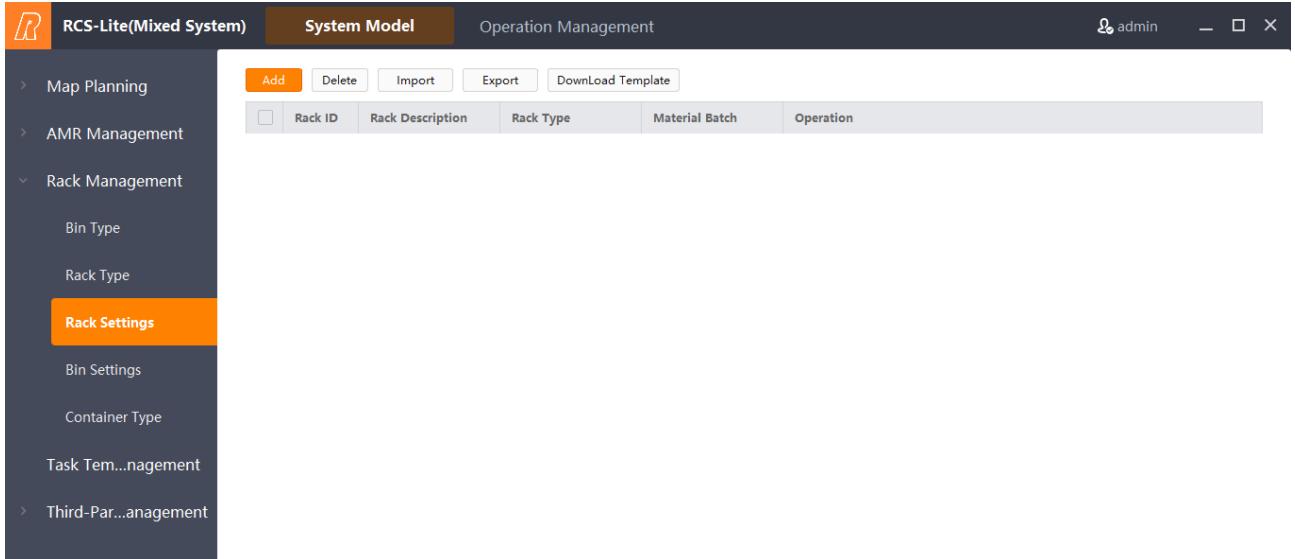


Figure 5-6 Rack Settings List

Click **Add** in the upper-left corner of the page to add rack.

The modal dialog is titled 'New Rack Settings'. It contains three input fields: 'Rack ID \*' with a placeholder 'Please enter 6 letters or numbers', 'Rack Description' (empty), and 'Rack Type \*' with a dropdown menu showing 'Select...'. At the bottom are 'OK' and 'Cancel' buttons.

Figure 5-7 Create Rack Settings

After new rack settings are added, a prompt box will pop up to notify users to restart RCS Service.

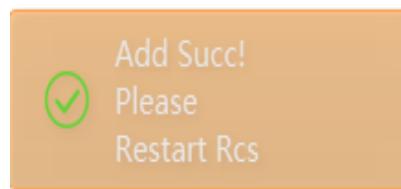


Figure 5-8 Restart RCS Service

Click **Delete** on the top of the table to delete the selected rack data.

Click **Delete** in the operation column to delete the data of the current row.

Click **Import** to batch import racks, click **Select** to choose local rack information files, and click **OK**.

Click **Export** to export rack data to local file.

Click **Download Template**, and the system will generate a template file. You can add rack data based on the file format and import the file.

## 5.1.4 Bin Settings

In this page, you can configure bin attributes, including bin code, customer bin code, rack code, bin type, lock mark, container type, and container code.

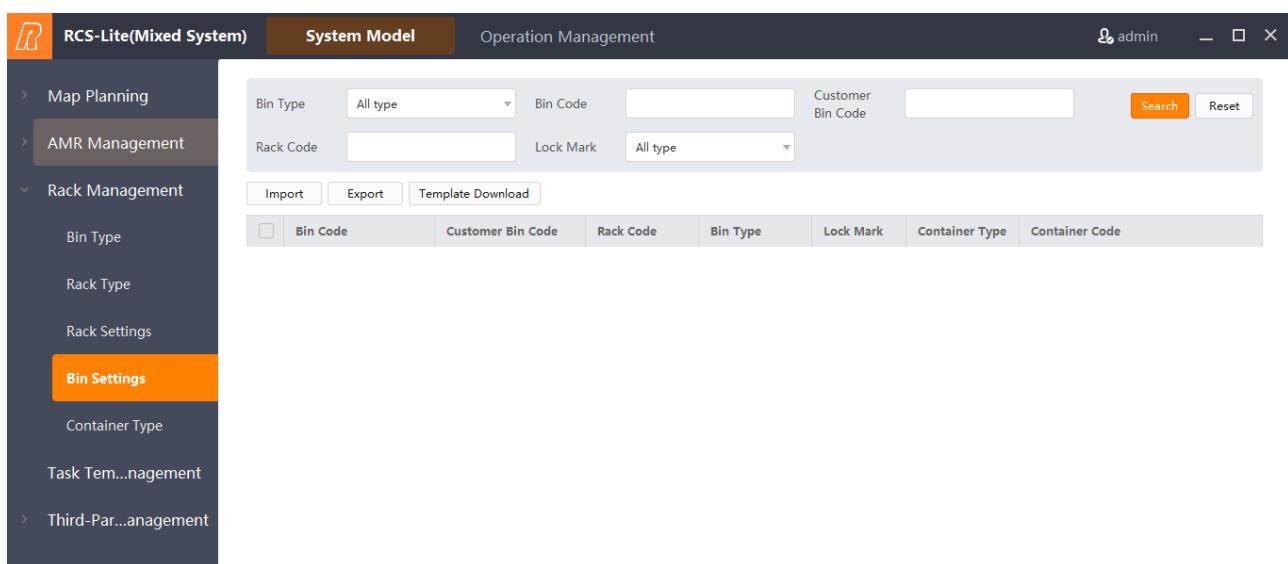


Figure 5-9 Bin Settings

Click **Import** on the top of the table to import local bin data to the system.

Click **Export** to export bin data in the table to local file.

Click **Template Download**, and the system will generate a template download file. You can enter data according to the requirements specified in the file and import the file to the system.

On the top of the page, you can enter conditions in the input boxes, and click **Search** to search corresponding data. Click **Reset** to clear all conditions in the input boxes, and all bin data will be displayed by default.

At the bottom of the interface, you can click **Previous** or **Next** to go to corresponding page. You can also choose how many items are displayed per page

## 5.1.5 Container Type

In this page, you can configure the basic attributes of a set of containers, including No., name, depth, width, height, full-loaded fork height, non-loaded fork height, and blind lifting.

No.	Name	Depth(mm)	AMR Width(m)	Height(mm)	Full-Loaded Fork	Non-Loaded Fork	Blind Lift	Operation
1	Default	1200	1200	170	320	150	No	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 5-10 Container Type List

Click **Add** in the upper-left corner to add a container type.

Name *	Please enter 1~32 letters, numbers, underscores, and hyphens.
Business Type *	FMR Series
Depth *	(100 - 6000) mm
AMR Width *	(100 - 6000) mm
Height *	(100 - 6000) mm
Full-Loaded FMR Height *	(100 - 10000) mm
Non-Loaded FMR Height *	(0 - 10000) mm
Blind Lift *	<input checked="" type="checkbox"/>
Forklift LMR Extend Distance	(-9999 - 9999) mm
<b>OK</b> <b>Cancel</b>	
Cabinet Width Inside	(0 - 10000) mm
Cabinet Width Outside	(0 - 10000) mm
<b>OK</b> <b>Cancel</b>	

Figure 5-11 Create Container Type

Click **Delete** on the top of the table to delete the selected container type data.

Click **Delete** in the operation column to delete the data.

Click **Edit** in the operation column to edit container type.

## 5.2 Rack Management in Mixed System

In the mixed system, rack management is composed of bin type, rack type, rack settings, bin settings, and container type. Among these, rack type configuration in the mixed system is different from that in other systems.

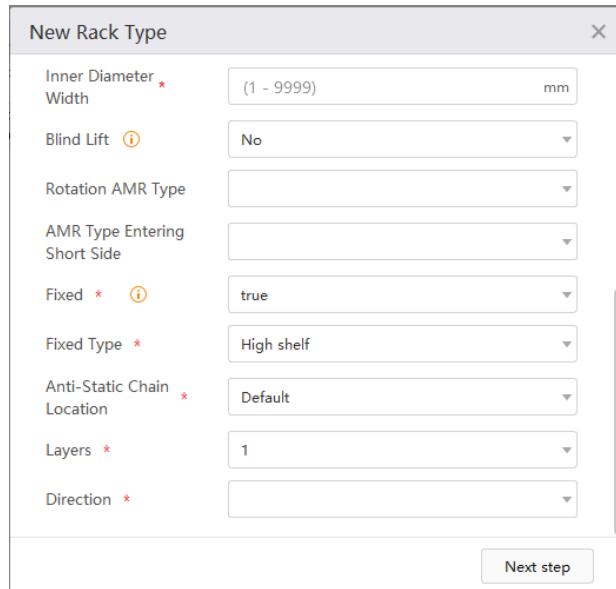


Figure 5-12 Rack Type in Mixed System

The main difference is layers. In the mixed system, the rack type is general whereas in the FMR/CTU system, single-layer rack will generate its corresponding bin. As for LMR, no bin attribute is required. Other content is same as that in mixed system.

# Chapter 6 Task Template Management

## 6.1 Add Task Template

Click **Add** to pop up the new task template interface. Enter template ID and name, and click **OK**. Template ID and name should be unique. Otherwise, the system will report an error. As for the mixed system, when you add a task template, you should select AMR series to display specified subtasks.

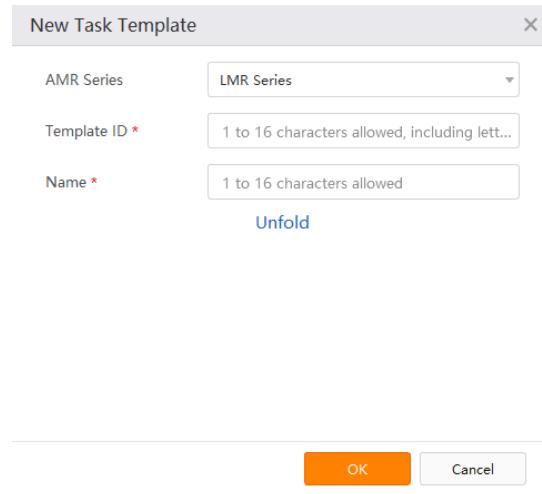


Figure 6-1 New Task Template

Click **Unfold** to display more options. As for carrying system, you can set AMR Type, Rack Parameter, Blind Lifting Placeholder, Cycle Find Location/Rack, Cycle Execution, Linked Auxiliary Task Template, and Task Completed Waiting Time. Rack parameter is mainly used for blind lifting. If the rack cannot be recognized, you should select rack parameter. Otherwise, you do not need to select rack parameter by default. Details are shown below.

Table 6-1 New Task Template Field Information

Parameter	Function
Task Template ID.	Unique ID of Task Template. Once added, it cannot be edited.
Name	Describe the specific usage of task template.
AMR Type	AMR Type.
Rack Parameter	Define rack parameter of AMR in the task template.
Blind Lifting Placeholder	When it is enabled, it will record whether there is a rack in storage area in the blind lifting condition.
Cycle Find Location/Rack	Cycle find rack: If there is no rack in the starting point or the ending point, AMR will keep looking for it instead of triggering task failed.
Cycle Execution	It is disabled by default. When it is enabled, you can configure cycle triggering time and cycle times.
Linked Auxiliary Task Template	After the task is completed, you can configure next task template to be executed.
Task Completed Waiting Time (s)	Configure AMR waiting time after the task is completed.

## 6.2 Delete Task Template

You can click **Delete** in the upper-left corner of the table to batch delete task templates. Or you can click **Delete** in the operation column to delete the task template of the current row.

	Template ID	AMR Series	Name	Status	Operation	Third Party Information
<input type="checkbox"/>	1	LMR Series	11	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F11	FMR Series	Default1	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F12	FMR Series	Default2	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F13	FMR Series	Default3	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F14	FMR Series	Default4	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F61	FMR Series	Default5	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F62	FMR Series	Default6	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F20	FMR Series	Default7	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	F201	FMR Series	Default8	Settings are completed.	Edit Settings Delete Copy	
<input type="checkbox"/>	11	Roller CMR Series	22	Not configured.	Edit Settings Delete Copy	
<input type="checkbox"/>	55	CTU Series	555	Not configured.	Edit Settings Delete Copy	

Figure 6-2 Task Template List

Click **Delete**, and click **OK** to delete task template.

## 6.3 Import and Export Task Template

- **Import:** Click **Import** on the top of the table to import existing task template file.
- **Export:** Select the task template to be exported, and click **Export** on the top of the table to export the selected task template to the local file (default path: RcsLite\SimExportData).

## 6.4 Edit Task Template

Click **Edit** to pop up the task template editing interface, which is same as the new task template. Set parameters as appropriate, and click **OK** to finish editing. The interface is shown below.

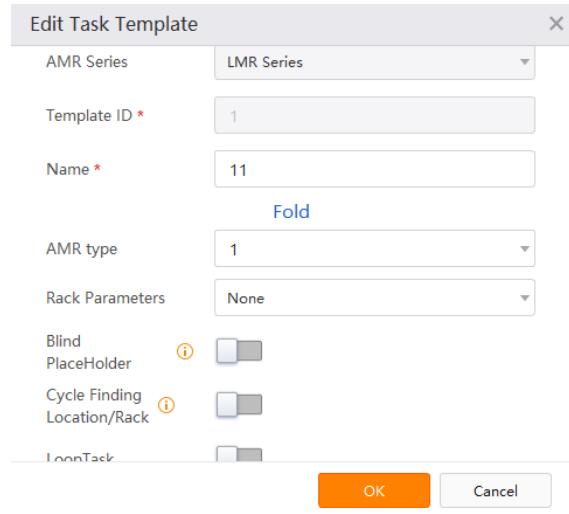


Figure 6-3 Edit Task Template

## 6.5 Configure Task Template

Click **Settings** to pop up the corresponding task template settings interface.

As for LMR tasks, task group list includes Carry Rack, No Rack, Carry Rack Back, and Transfer Rack.

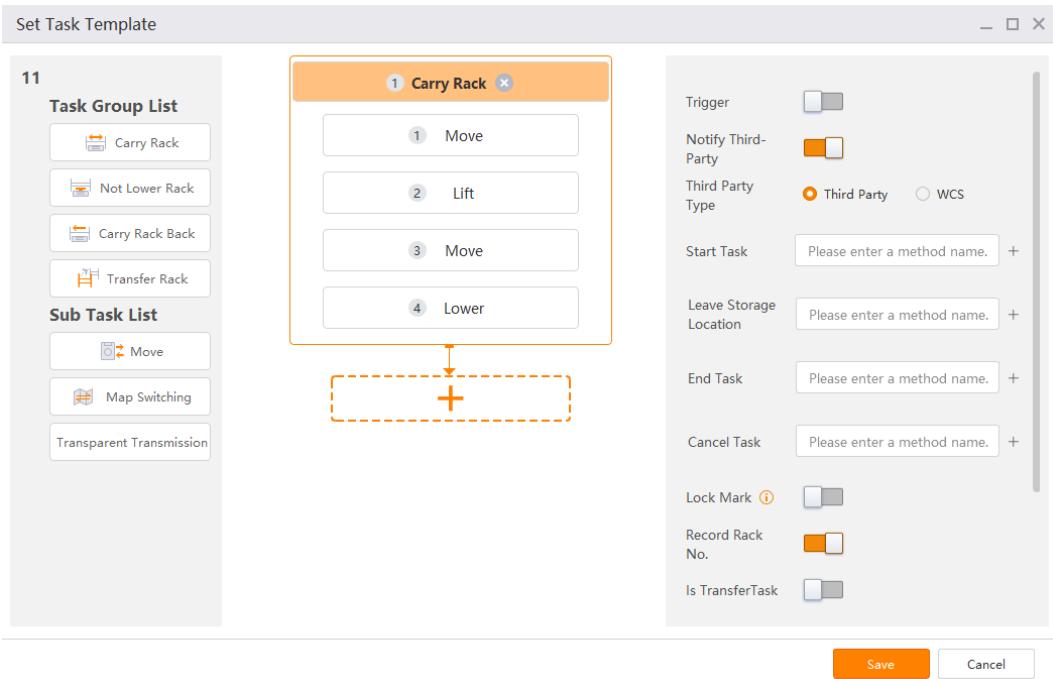


Figure 6-4 Configure LMR Task Template

As for FMR tasks, task group list includes Carry Container, No Container, Carry Container Back, and Transfer Container.

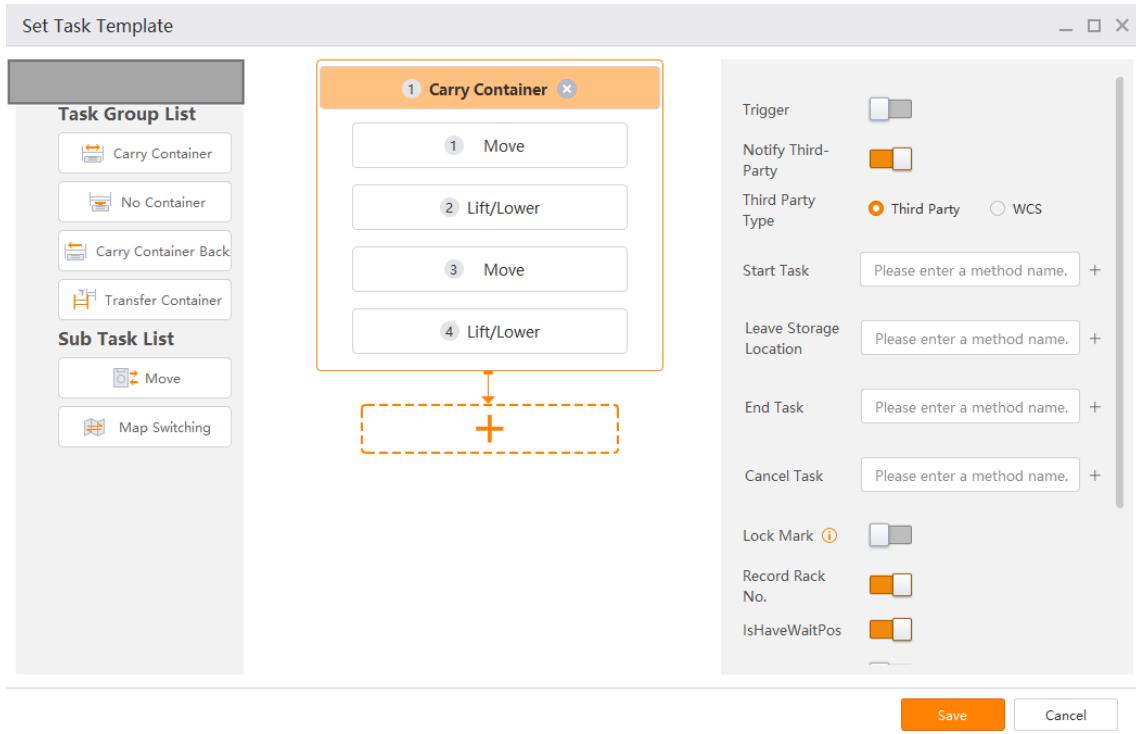


Figure 6-5 Configure FMR Task Template

As for roller CMR tasks, task group list includes Move Roller CMR and Rotate Roller CMR.

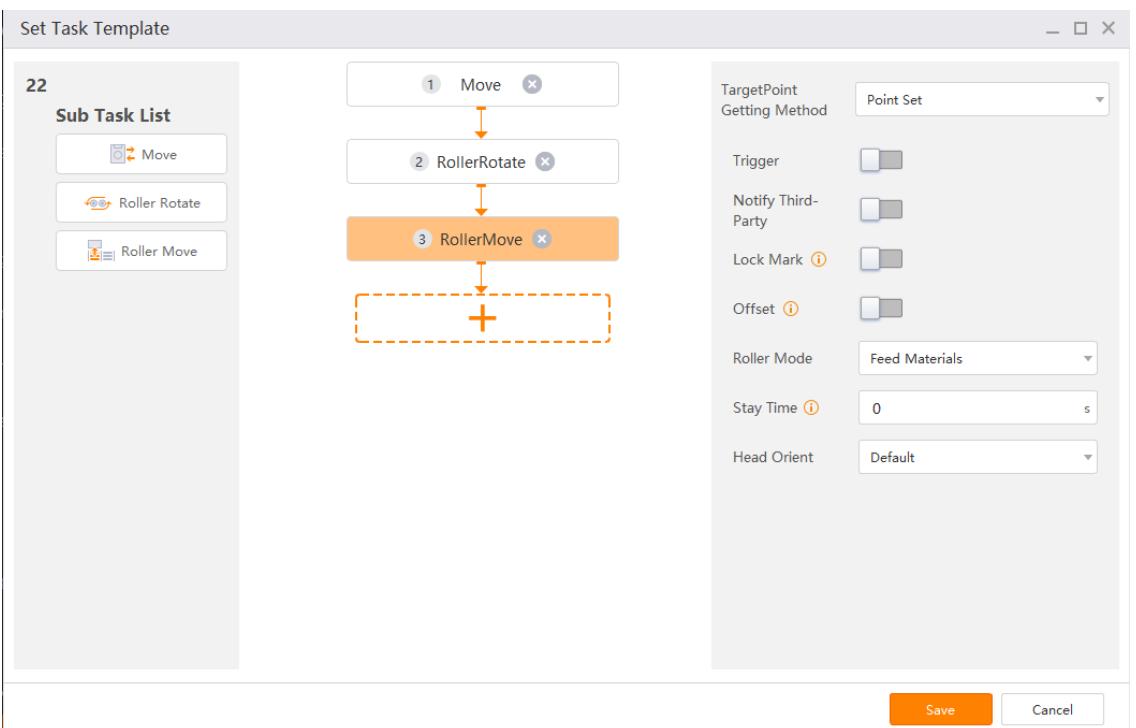


Figure 6-6 Configure Roller CMR Task Template

As for CTU tasks, task group list includes Move Container (CTU).

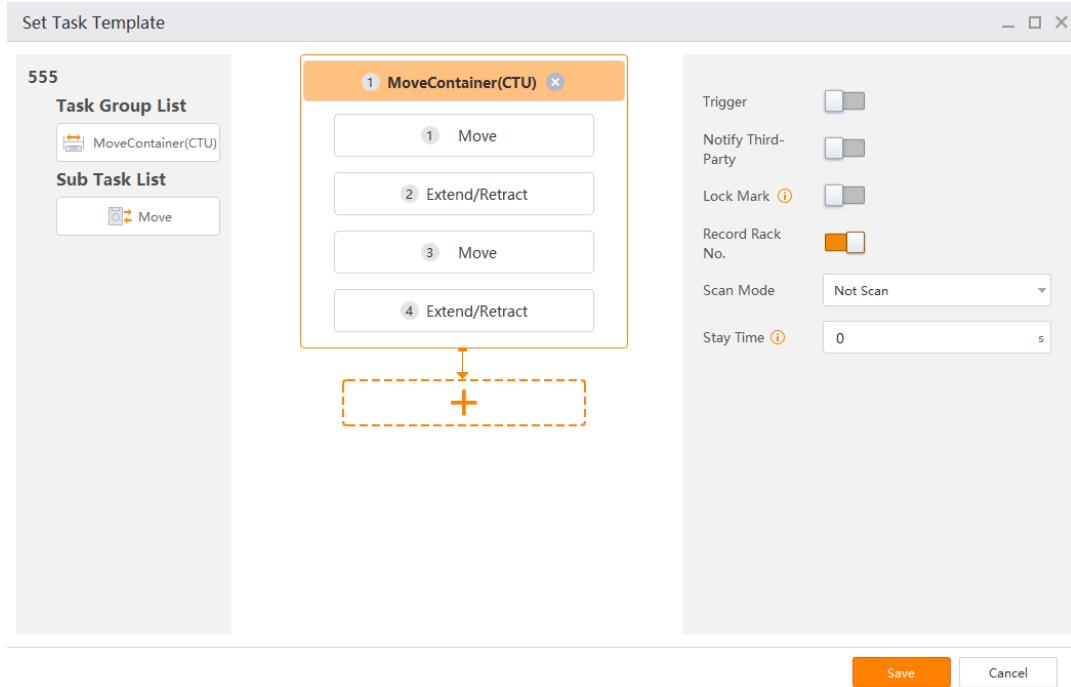


Figure 6-7 Roller CMR Task Template Settings

As for subtask list, it includes Non-Loaded AMR Moving, Map Switching, and Transparent Transmission Task.

There are four original sub tasks in Carry Container step, namely Move, Lift, Move, and Lower. There are three original sub tasks in No Rack step, namely Move, Lift, and Move. There are two original sub tasks in Carry Container Back step, namely Move, and Lower. There is only one original sub task in Transfer Rack step, namely Move.

Subtask attributes are displayed on the right side:

No Container and Carry Container Back should be used in the same task. No Container first, and then Carry Container Back.

Once you enable **Lock Mark**, AMR in this subtask will be locked and cannot be selected by other subtasks that do not designate this AMR.

If you want to enable **Record Rack No.**, you have to enable **Refresh Map**.

Target point getting method can be configured as a point set, point, fixed point, etc.

To let an AMR move, you can set a start point or an end point and pass the parameters of point set, point, fixed point, linked point, linked warehouse area, current point, and roadway to the start point or end point, so that the AMR can know where it should go.

Point Set: XX\${00} refers to location information; XX\${02} refers to warehouse area information; XX\${03} refers to rack information; XX\${05} refers to bin No.; XX\${06} refers to roadway No.; XX\${07} refers to container No.

Linked Point Type can be set as point, forward linking, or backward linking.

- If you configure the linked point type as point, the AMR will move to the linked point whose parameters are passed to a point.
- If you configure the linked point type as forward linking, the AMR will first move to point A and then move to point B which is linked to point A.
- If you configure the linked point type as backward linking, the AMR will first move to point A which is linked to point B and then move to point B.

If the target point getting method is configured as linked warehouse area, the AMR will move to the linked warehouse area which is linked to point.

Except the first subtask, other subtasks have triggering attribute. If you enable **Trigger**, you can select task No., rack No., AMR No., or point as the triggering mode. If you enable **Trigger**, AMR will be triggered to act.

As for CTU and roller CMR, their task attributes are different. Except general functions of triggering, locking, and notifying third-party, you can click **Roller Move** to enable **Offset** to control the AMR location of receiving materials and feeding materials, and select **Receive Materials** or **Feed Materials** as the roller mode. To rotate the roller, you can drag **Roller Rotate** to the dashed box, select a roller code, and enter roller number to control roller times.

The configuration method of notifying the third party is shown below.

Go to task template management page, click **Third Party Information** in the upper-right corner to edit the information. Enter the IP address, port No., and URL, and click **OK**.

The screenshot shows the 'System Model' tab selected in the top navigation bar. On the left, there's a sidebar with 'Map Planning' and 'AMR Management' sections. In the main content area, there's a table with columns: Template ID, AMR Series, Name, Status, and Operation. One row is visible with Template ID 1, AMR Series 'LMR Series', Name 11, and Status 'Settings are completed.' Below the table are buttons for Edit, Settings, Delete, and Copy. A red box highlights the 'Third Party Information' button in the top right corner of the main content area.

Figure 6-8 Third Party Information

The dialog box has a title 'Edit Third Party Information'. It contains five input fields: 'IP', 'Port No.', 'URL', 'Warning URL', and 'Device URL', each with an example value provided. At the bottom of the dialog are 'OK' and 'Cancel' buttons, and a link 'Clear Abnormal Third Party Information'.

Figure 6-9 Edit Third Party Information

If you enable **Notify Third-Party**, you can select third party or WCS as the third party type. Enter method name of starting task, leaving storage location, ending task, and cancelling task according to the actual situation.

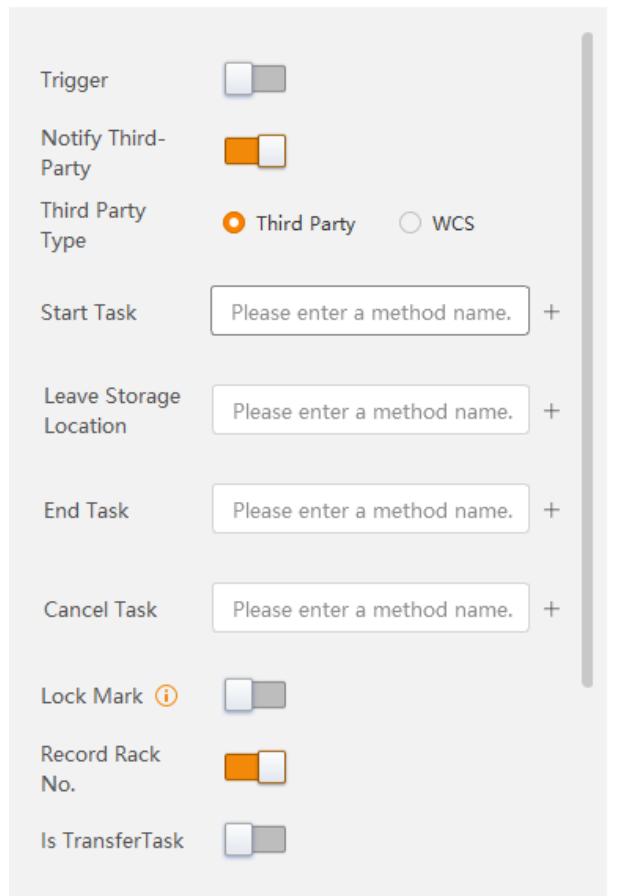


Figure 6-10 Third Party Information Settings

You can drag the task buttons from the left side to the task flow in the middle of the page and arrange them in the layout. Task template should be configured according to actual onsite needs.

In addition, the current version supports notifying multiple third parties. You can click to configure multiple third parties to notify them and display task order details.

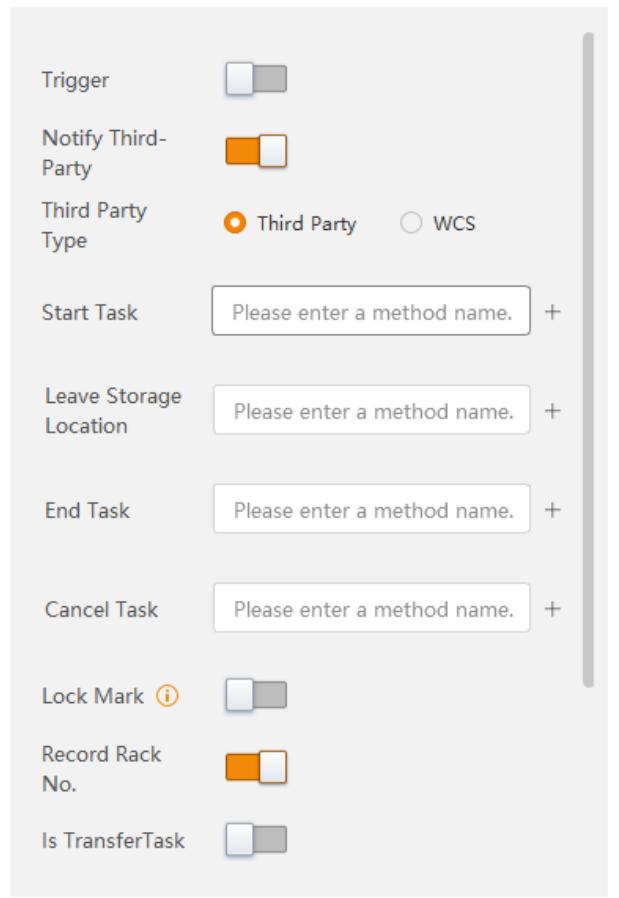


Figure 6-11 Add Method Name Buttons

## 6.6 Verify Task Template

After you configure a task template, the platform will verify its feasibility. If it is not feasible, it cannot be saved.

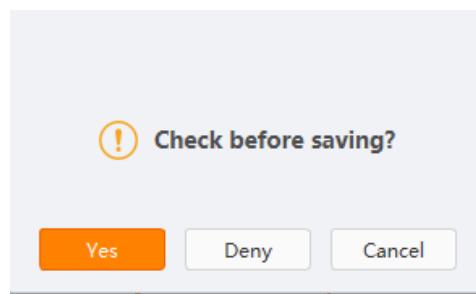


Figure 6-12 Task Template Verification

Verification rules are shown below:

- As for verifying LMR task template, No Rack (first) and Carry Rack Back (second) are required in the same task. Only Carry Rack Back and Transfer Rack can be dragged behind No Rack, and Transfer Rack, No Rack, and Carry Rack are required in the same task.
- As for verifying FMR task template, No Container (first) and Carry Container Back (second) are required in the same task. Only Carry Container Back and Transfer Container

can be dragged behind No Container, and Transfer Container, No Container, and Carry Container are required in the same task.

- You do not need to verify built-in task templates.

## 6.7 Copy Task Template

You can click **Copy** to configure template ID and name, and click **OK** to get a task template which is configured the same as the original one.

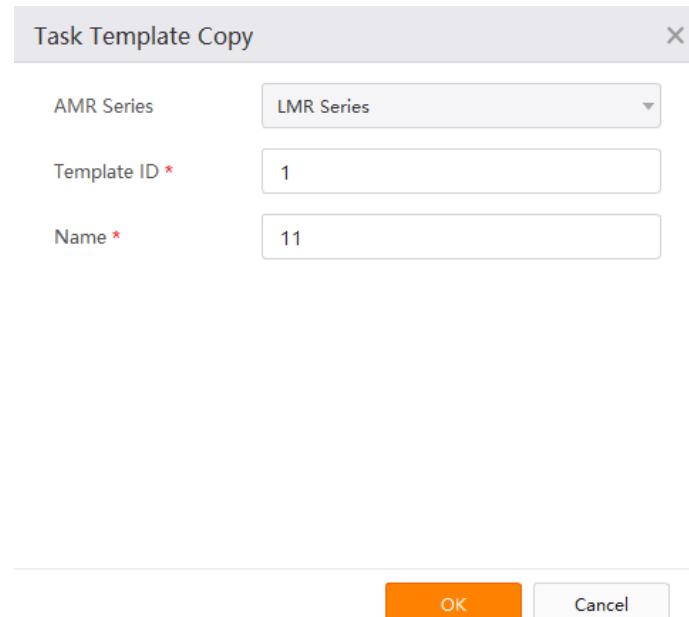


Figure 6-13 Copy Task Template

Click in the Template ID column to copy task template ID.

	Add	Delete	Import	Export		
	Template ID	AMR Series	Name	Status	Operation	
<input type="checkbox"/>	1	LMR Series	11	Settings are completed.	<a href="#">Edit</a> <a href="#">Settings</a> <a href="#">Delete</a> <a href="#">Copy</a>	
<input type="checkbox"/>		<a href="#">Copy Template ID</a>		Settings are		

Figure 6-14 Copy Task Template ID.

# Chapter 7 Third-Party Device Management

## 7.1 Caller

Go to the Caller page, and click **Add** to add a caller. Enter caller No., name, and IP address. Click **OK** to save it.

New Caller

No. \* 1 to 16 characters allowed, including lett...

Name \* 1 to 16 characters allowed

IP \*

OK Cancel

Figure 7-1 Create Caller

Once saved, the caller will be displayed.

	No.	Caller Name	IP	Status	Operation
<input type="checkbox"/>	1	1	0.0.0.1	Not Configured	Edit Settings Delete

Figure 7-2 Caller List

Click **Settings**. If the capability set of this caller can be obtained, you can configure the caller.

Beeper Button Settings

Button0 (Prohibit)	Enable Button <input type="checkbox"/>
Button1 (Prohibit)	<b>Parameter Setting</b>
Button2 (Prohibit)	Light Settings
Button3 (Prohibit)	IO Settings
Button4 (Prohibit)	
Button5 (Prohibit)	
Button6 (Prohibit)	
Button7 (Prohibit)	

Server IP Address \*: 10.111.76.36

Server Port \*: 7000

Button Function: Execute Next Task

Call Path: 1 to 32 characters allowed, including letters and digits.

AMR No.: (1 - 65535)

Third Party URL: Maximum length : 64

**Save** **Cancel**

Beeper Button Settings

Button0 (Prohibit)	Enable Button <input type="checkbox"/>
Button1 (Prohibit)	<b>Parameter Setting</b>
Button2 (Prohibit)	<b>Light Settings</b>
Button3 (Prohibit)	IO Settings
Button4 (Prohibit)	
Button5 (Prohibit)	
Button6 (Prohibit)	
Button7 (Prohibit)	

**Returned.**

Mode:  Normal  Alternative

Duration: 500 ms

Interval: 2000 ms

**Returning failed.**

Mode:  Normal  Alternative

Duration: 1000 ms

Interval: 5000 ms

**Save** **Cancel**

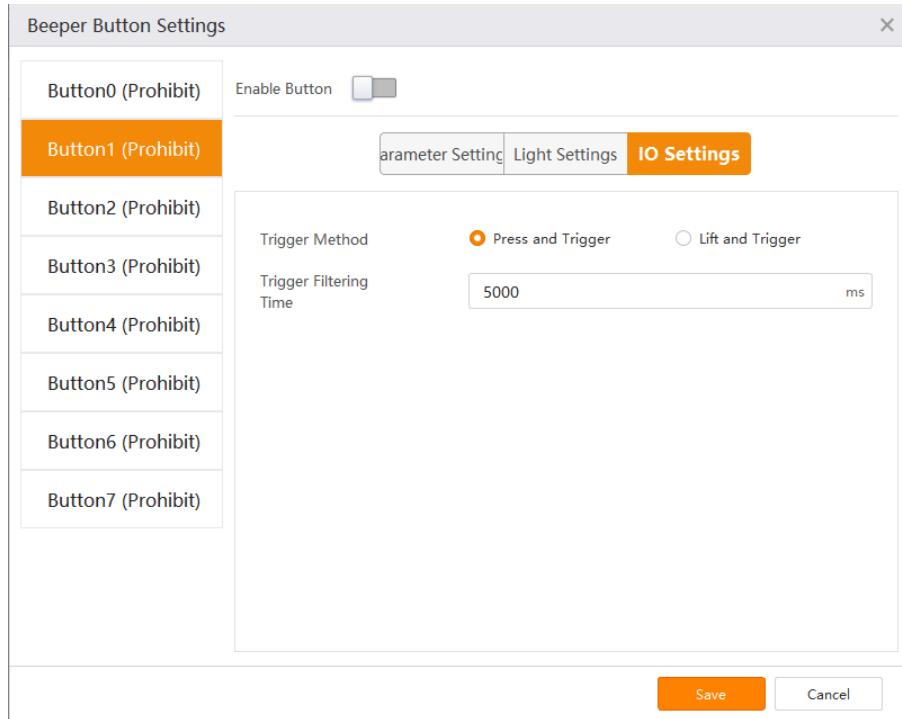


Figure 7-3 Caller Settings

You can configure the parameters, light, and I/O of the caller.

Parameter settings include Method Name (Execute next task, generate task order and customize), Main Task Type, Point Set, Container Type, AMR No., and Third Party URL.

Light settings include Light Displaying Mode (Solid mode and blinking mode), Duration, Time Interval, and Pin No. when a message is returned and failed.

I/O settings include Triggering Methods (Press to Trigger and Release to Trigger), Level (Low Level and High Level), Filtering Interval, and Pin No.

Click **Save**, and the caller is configured.

	Add	Delete	No.	Caller Name	IP	Status	Operation
			1	1	0.0.0.1	Settings are completed.	<a href="#">Edit</a> <a href="#">Settings</a> <a href="#">Delete</a>

Figure 7-4 Caller Configured Successfully

## 7.2 Auto Door

Go to the auto door settings page, click **Add**, and enter corresponding information in the relative boxes.



**Note**  
Auto Door No. should be unique.

New Automated Door

No. \* (1 - 99999)

Affiliated map \* Select.

IP \*

Port No. \* (1 - 65535)

Enable

Open Type none

OK Cancel

Figure 7-5 Create Auto Door

Click **OK**, and the added auto door is displayed. The coordinates of this auto door should be linked to the topological map. Click **Select**, and drag to select the auto door area.



**Note**  
Make sure the selected area includes auto door elements and cannot be overlapped with the existing auto door area.

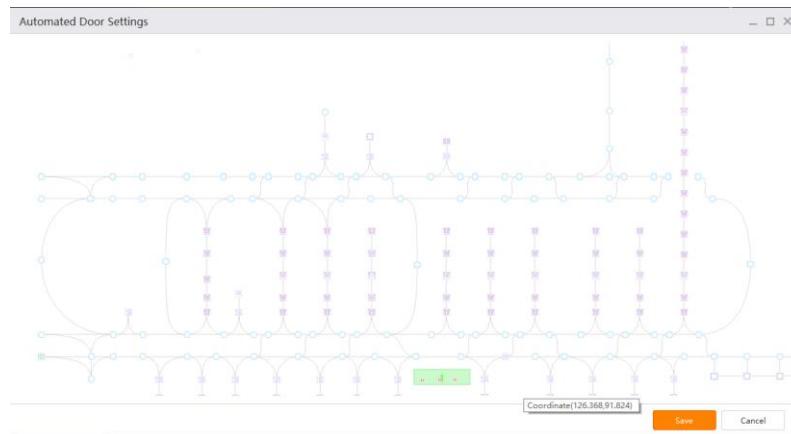


Figure 7-6 Draw Auto Door Area

Then, coordinates will be displayed. You can click **Edit** in the operation column to edit information. Click **Delete** to delete information. Click **Select** to drag to select the auto door area again. After the auto door is configured, you should restart RCS service and WCS service manually.

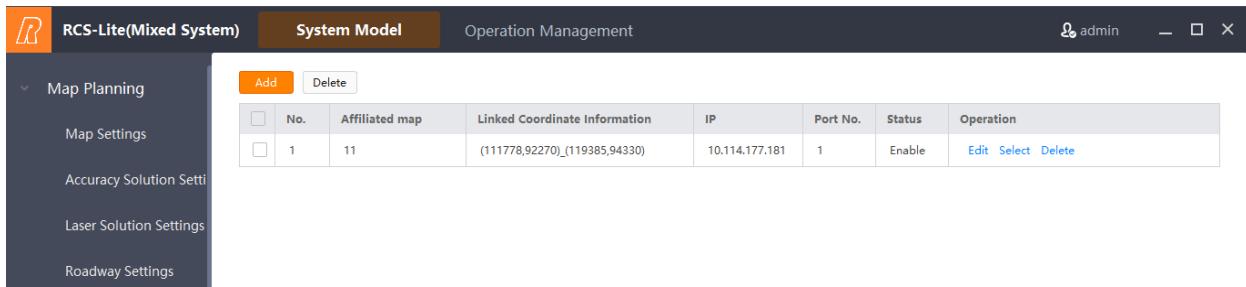


Figure 7-7 Auto Door Configured Successfully

## 7.3 Elevator

Go to the elevator settings page, click **Add** to add an elevator, and you can set elevator No., IP, port No., elevator name, elevator type, transferring points quantity, transferring points layout, elevator floor, AMR cross floor. The detailed description is shown below.



**Note**  
Elevator No., IP, Port No., and Elevator Name should be unique.

**Add Elevator**

Elevator No. *	<input type="text" value="Please enter 1-16 letters or numbers"/>
IP *	<input type="text" value="10.114.177.181"/>
Port No. *	<input style="border: 2px solid orange;" type="text" value="(1 - 65535)"/>
Elevator Name *	<input type="text" value="aaa"/>
Elevator Type *	<input type="text" value="hoist"/>
Transferring Point Quantity *	<input type="text" value="1"/>
Transferring Point Layout *	<input type="text" value="Select."/>
Elevator Floor *	<input type="text" value="2"/>
AMR Cross Floor	<input type="checkbox"/>

Figure 7-8 Add Elevator

Table 7-1 Add Elevator Field Information

Parameter	Function
Elevator No.	The No. of the elevator. Once added, it cannot be edited.
IP	The IP address of the elevator.
Port No.	The port No. of the elevator.
Elevator Name	The Name of the elevator. Once added, it cannot be edited.
Transferring Points Quantity	It refers to the capacity of elevator, i.e., the number of racks that can be placed in this elevator. The number of transferring points should match the capacity of elevator.
Transferring Points Layout	The distribution of transferring points, e.g., row 1 column1, row 2 column 2.
Elevator Floor	The target floor of the elevator.
AMR cross Floor	Enable it to allow the AMR to go with the elevator to the target floor.

Click **Next Step** and **Finished** to add an elevator. Click **Settings** to configure the parameters of each floor and elevator. The field description of the elevator settings page is shown below.

The screenshot shows the 'Add Elevator' configuration interface. The window title is 'Add Elevator'. On the left, there's a vertical navigation bar with tabs '1Layer' (selected) and '2Layer'. The main area contains several input fields and dropdown menus. At the bottom right are buttons for 'PrevStep' and 'Finished'.

Section	Setting
Use state	<input type="checkbox"/>
Associated map	Select...
Task num threshold	(0 - 99)
InterStation	11 Select...
Safe check point	Please enter 0~32 characters:excl...
Wait station	Entrance Select...

Figure 7-9 Configure Elevator Transferring Points

Table 7-2 Elevator Settings Field Information

Parameter	Function
Status	Enable or disable elevator.
Linked Map	Select a linked map.
Threshold for Task Number	Maximum number of elevator executed tasks.
Transferring Point	The point where the rack is placed in the elevator. It is the elevator connection point.
Waiting Point	The point for AMR to apply for the use of the elevator and the point for AMR to wait after exiting from elevator.
Entrance and Exit	Entrance: The point for AMR to apply for the use of the elevator. Exit: The point for AMR to exit from elevator.
Elevator Linked Point	The point of releasing elevator after AMR exits from elevator.

Click **Save** to save the elevator configuration. Then you can click corresponding buttons on the top of the page to add, delete, enable, and disable elevator.

- **Delete:** Select the elevator to be deleted in the list, and click **Delete** to delete the added elevator.
- **Enable:** Click **Enable** to restart the disabled elevator and the elevator of the same No. can be used.
- **Disable:** Click **Disable**, and the elevator of the same No. will be disabled.

No.	Name	Layer	Status	Operation
1	aaa	2	disabled	<a href="#">Edit</a> <a href="#">Settings</a> <a href="#">More</a>

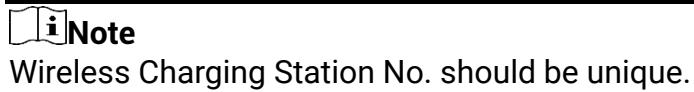
Figure 7-10 Elevator List



In RCS-Lite, AMR types that support elevator cross-floor tasks include LMR, FMR, and Forklift LMR.

## 7.4 Wireless Charging Station

Go to the wireless charging station page, click **Add** to enter corresponding information in the relative boxes.



New Wireless Charging Station X

No. \*

Affiliated map \*  ▼

Enable

Figure 7-11 Create Wireless Charging Station

Click **OK**, and the added wireless charging station will be displayed. The coordinates of this wireless charging station should be linked to the topological map. Click **Select**, and drag to select the wireless charging station area.

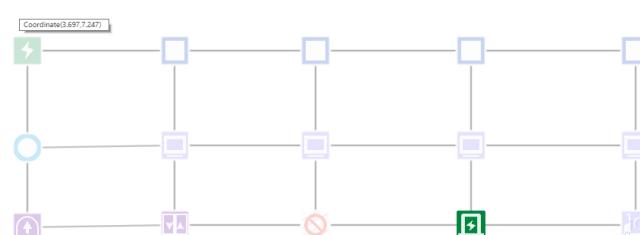


Figure 7-12 Select Wireless Charging Station Area

Then, coordinates will be displayed in the wireless charging station list. You can click **Edit** in the operation column to edit information. Click **Delete** to delete information. Click **Select** to drag to select the wireless charging station area again. After the wireless charging station is configured, you should restart RCS manually.

	No.	Affiliated map	Linked Coordinate Information	Status	Operation
<input type="checkbox"/>	2	11	(90762,110019)	Enabled	<a href="#">Edit</a> <a href="#">Select</a> <a href="#">Delete</a>

Figure 7-13 Wireless Charging Station Configured Successfully

## 7.5 Traffic Light

Go to the traffic light page, click **Add** to add a traffic light. You can set No., map, port No., IP address, pin 1, pin 2, starting time and ending time.



Traffic light No., IP, port No. should be unique, and IP address should be in the standard format.

No. *	(1 - 99999)
Affiliated map *	Select.
IP *	
Port No. *	(1 - 65535)
Enable	<input checked="" type="checkbox"/>
Pin1 *	(0 - 99)
Pin2 *	(0 - 99)
OK Cancel	
Starting Time *	
Ending Time *	
OK Cancel	

Figure 7-14 Create Traffic Light

Click **OK**, and the added traffic light will be displayed. The coordinates of this traffic light should be linked to the topological map. Click **Select** and drag to select the traffic light area to determine the coordinates.



The selected area should contain at least 2 traffic lights.

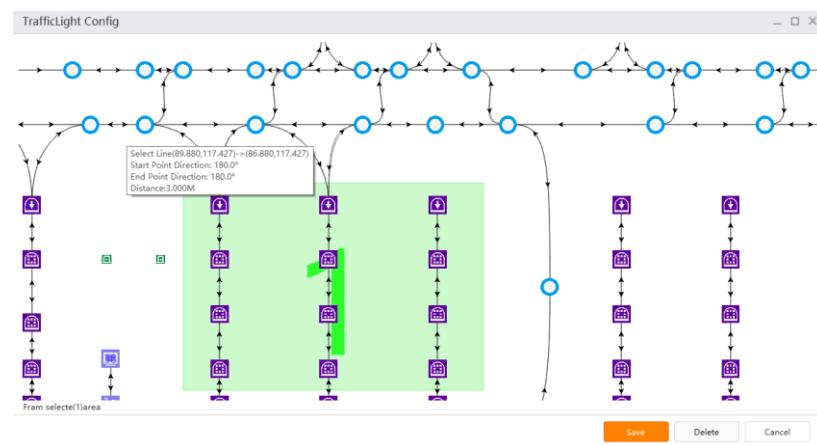


Figure 7-15 Select Traffic Light Area

Then, coordinates will be displayed. You can click **Edit** in the operation column to edit information. Click **Delete** to delete information. Click **Select** to drag to select the traffic light area again. After the traffic light is configured, you should restart RCS manually.

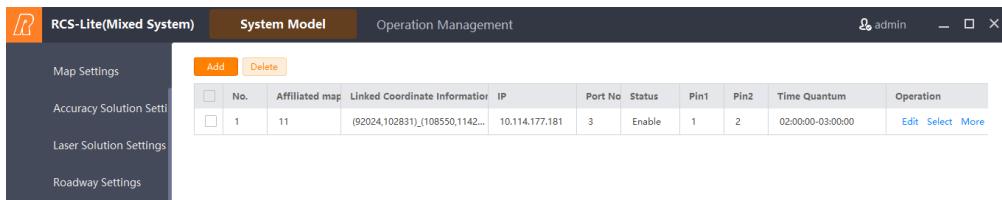


Figure 7-16 Traffic Light Configured Successfully

## 7.6 Other Third-Party Devices

Other third-party device types include goods detection device, roller, camera, stacker crane, and status detector. Go to the other third-party devices page, and click **Add** to pop up Create Other Third-Party Devices window. You can set No., Map, Third-Party Device Type, IP Address, and Port No. Click **OK** to save it.

The dialog box has the following fields:

- No. \*: 1
- Affiliated map \*: 11
- Third-Party Device Type \*: Goods Detection Device
- IP \*: (highlighted in orange)
- Port No. \*: (1 - 65535)
- Enabled: Switch (orange)

Figure 7-17 Create Other Third-Party Devices

Click **OK**, and the list will display the added other third-party devices. The coordinates of other third-party devices should be linked to the topological map. Click **Select** and drag to select the area to determine coordinates.



Make sure the selected area includes working area elements.

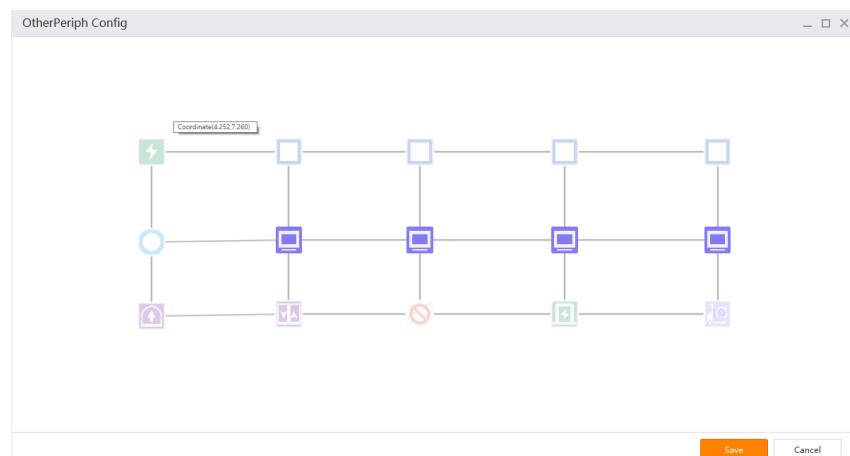


Figure 7-18 Configure Linked Coordinates of Other Third-Party Devices

Then, coordinates will be displayed in the list. You can click **Edit** in the operation column to edit information. Click **Delete** to delete information. Click **Select** to drag to select the other third-party devices area again. After the other third-party device is configured, you should restart WCS manually.



Figure 7-19 Other Third-Party Devices Configured Successfully

# Chapter 8 Control Scheduling

## 8.1 Generate AMR Scheduling Task Order

Main task type No. refers to task template ID, which is required. Enter point and point set according to the task template. AMR No. is the optional parameter. Enter AMR No. to specify the corresponding AMR. The parameters of the FMR system include container No. and container type. Enter container No. to specify the corresponding container. Container type is required. The parameters of the carrying system include rack No. and priority, which are optional parameters.

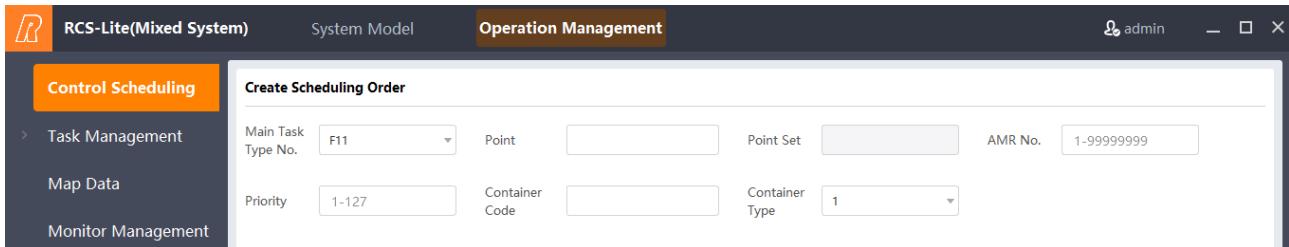


Figure 8-1 Generate Scheduling Task Order of FMR System



As for the non-blind lifting situation, RCS-Lite V1.5 supports automatically linking container type and bin. You do not need to set it manually.

Click **Create Scheduling Order**, and if the request succeeded, it means that a scheduling order has been generated. Otherwise, an error prompt will pop up.

## 8.2 Continue Executing Next Task

It refers to the situation that if you select **Trigger** in the subtask of the task template (Triggering conditions include point, AMR No., rack No., and task order No.), when the main task is executed, the subtask will not be executed automatically and needs to wait for external triggering conditions.

Figure 8-2 Continue Executing Next Task

Enter corresponding triggering conditions, and click **Continue Executing**. Only when the triggering conditions are matched, the subtask will be executed. Otherwise, an error prompt will pop up.

## 8.3 Set Priority

Set task priority to make the task execution sequence more prioritized. You can set the priority of multiple tasks. Click to add task priority, and click to delete task priority. When you set priority, two main parameters need to be configured. Task No. is the main task No. for setting the priority. Priority refers to task priority, and it should be between 1 and 127.

The screenshot shows a dialog box titled "Set Task Priority". It contains two input fields: "Task Order" and "Task Priority". Below these is a "+" button. At the bottom is an orange "OK" button.

Figure 8-3 Set Task Priority

## 8.4 Link Rack and Storage Location

Enter storage location point and rack No., select rack direction and linkage, and click **OK**. Then the rack will be linked to the storage location or unlinked from the storage location. If the conditions are not matched, an error prompt will pop up.

The screenshot shows a dialog box titled "Link Rack and Storage Location". It contains four input fields: "Storage Location Point", "Rack No.", "Rack Direction" (set to "Horizontal"), and "Linkage" (set to "Link"). At the bottom is an orange "OK" button.

Figure 8-4 Link Rack and Storage Location

After you select **Link** and **Unlink**, go to Map Data page, and you can see corresponding information in the Rack Status column.

## 8.5 Link Bin and Container

Enter bin No. and rack No., which is optional, select container type and linkage, and click **OK**. Then the rack will be linked to the storage location or unlinked from the storage location. If the conditions are not matched, an error prompt will pop up.

The screenshot shows a dialog box titled "Link Bin and Container". It contains four input fields: "Bin Code", "Container Code", "Container Type" (set to "1"), and "Linkage" (set to "Link"). At the bottom is an orange "OK" button.

Figure 8-5 Link Bin and Container



**Note**  
In RCS-Lite V1.5, you do not need to link bin, container No., and container type. Container No. is -1 by default.

After you select **Link** and **Unlink**, go to Bin Settings page, and you can see corresponding information in the Container Type and Container No. column.

## 8.6 Pause and Restart AMR

This function is used to pause or restart specified AMR or all AMRs.

AMR No.: -1 denotes all AMRs;

AMR Code: Use (,) to separate all AMR No., and the number of AMR code should match the number of AMRs;

Map No.: The No. of the map where you need to pause or restart AMR;

Operation Mode: You can pause or restart AMR.

The screenshot shows a user interface for pausing and restarting Autonomous Mobile Robots (AMRs). The top section has a title 'Pause and Restart AMR'. Below it are several input fields: 'AMR Quantity' (set to '-1 represents all AGVs'), 'AMR Code' (empty), 'AGV Code separate...', 'Map No.' (empty), 'Operation Mode' (set to 'Disconnect'), and a large orange 'Set' button.

Figure 8-6 Pause and Restart AMR

## 8.7 Release AMR

If AMR is locked, you should release it. Enter AMR No., and click **Release AMR** to release it. If releasing AMR is failed, a prompt will pop up.

The screenshot shows a user interface for releasing an Autonomous Mobile Robot (AMR). The top section has a title 'Release AMR'. Below it is an input field for 'AMR No.' containing '1 - 99999999', and a large orange 'Release AMR' button.

Figure 8-7 Release AMR

## 8.8 Unlock Bin

This function is used to restore the locking status of bin. Do not use it under normal circumstances. Enter bin No., and click **Unlock Bin** to unlock it. If unlocking bin is failed, a prompt will pop up.

The screenshot shows a user interface titled 'Unlock Bin'. It contains a single input field labeled 'Bin Code' with a placeholder 'Bin Code' and an orange rectangular button below it labeled 'Unlock Bin'.

Figure 8-8 Unlock Bin

## 8.9 Link Roadway and Container

Enter roadway No., select linkage, and click **OK**. Then the container will be linked to the roadway or unlinked from the roadway. If the conditions are not matched, an error prompt will pop up. Ensure that every buffer area in the roadway is linked to a virtual rack before you link roadway and container. And virtual racks should not be linked to the container.

The screenshot shows a user interface titled 'Link Roadway and Container'. It includes a 'Roadway Code' input field containing '1 - 65535', a 'Linkage' dropdown menu currently set to 'Link', and an orange rectangular button labeled 'OK'.

Figure 8-9 Link Roadway and Container

After you select **Link** and **Unlink**, go to Bin Settings page, and you can see corresponding information in the Container Type column.

## 8.10 Set Area Locking Status

This function is used to set area locking status and clear areas. You can see details shown below. Area Name refers to the No. of the area that needs to be locked. Lock (0/1) refers to the locking ID. 1 refers to locking, and 0 refers to unlocking. Lock modes include 4 types, namely Dispatch to Outside Area, Dispatch to Temporary Parking Area Out of Area, Dispatch to Specified Area, and Dispatch to Stop Area.

The screenshot shows a user interface titled 'Set Area Locking Status'. It features several input fields: 'Area Code' (containing '1'), 'Locking ID' (containing '0 / 1'), 'Locking Mode' (set to 'Specified Area'), 'Map No.' (empty), and an orange rectangular button labeled 'Set'.

Figure 8-10 Set Area Locking Status

## 8.11 WCS Exception Handling

This function is used to handle abnormal WCS tasks. You can select the device type to be handled, enter device No. and corresponding task No., and then click **Handle Exception** to handle abnormal WCS tasks.

**WCS Exception Handling**

Device Type	Elevator	Device No.	Main Task No.
<b>Handle Exception</b>			

Figure 8-11 WCS Exception Handling

# Chapter 9 Task Management

## 9.1 Search Main Task

After the main task is applied, you can search historical tasks. Go to the Task List page, enter corresponding parameters, and click **Search**. If you want to copy main task No., you can click  in the list.

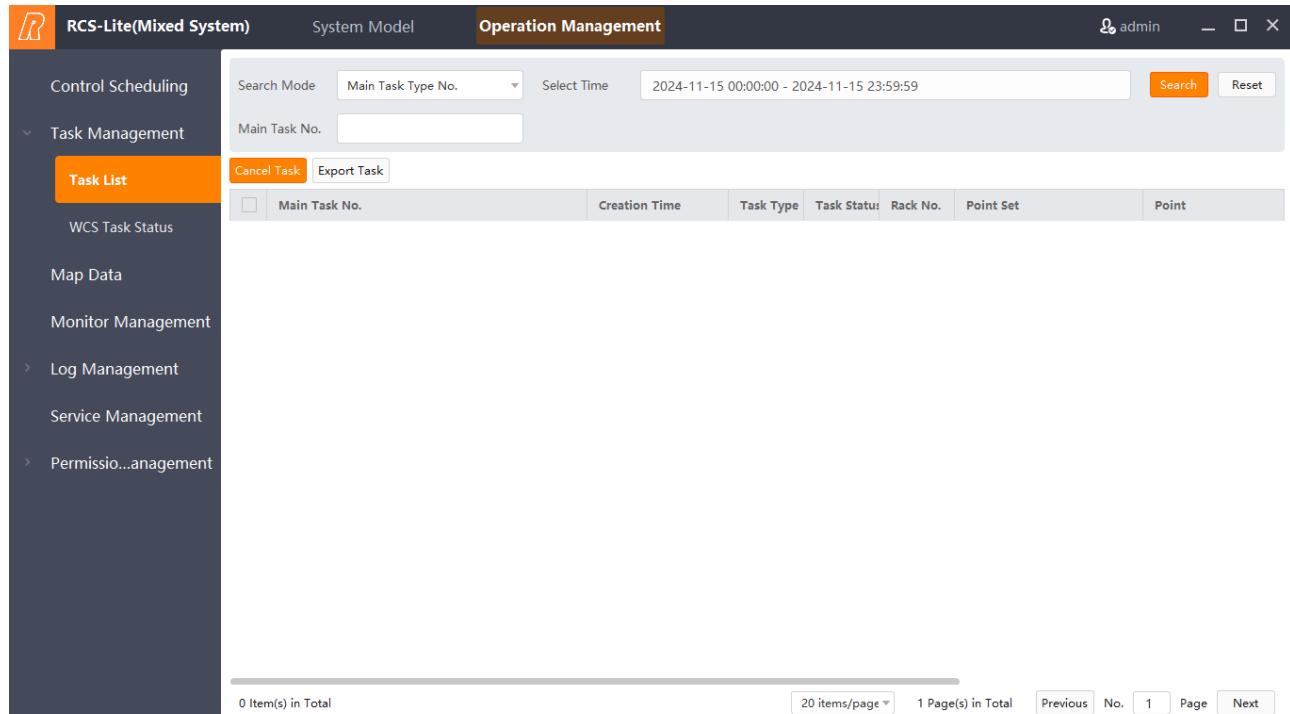


Figure 9-1 Task Management

## 9.2 Search Subtask Details

Click the main task No. in the list to search the details of the corresponding subtask. Then you can see subtask work flow, subtask details, and message information. The subtask which is being executed is displayed by default. Click  to update the subtask status.

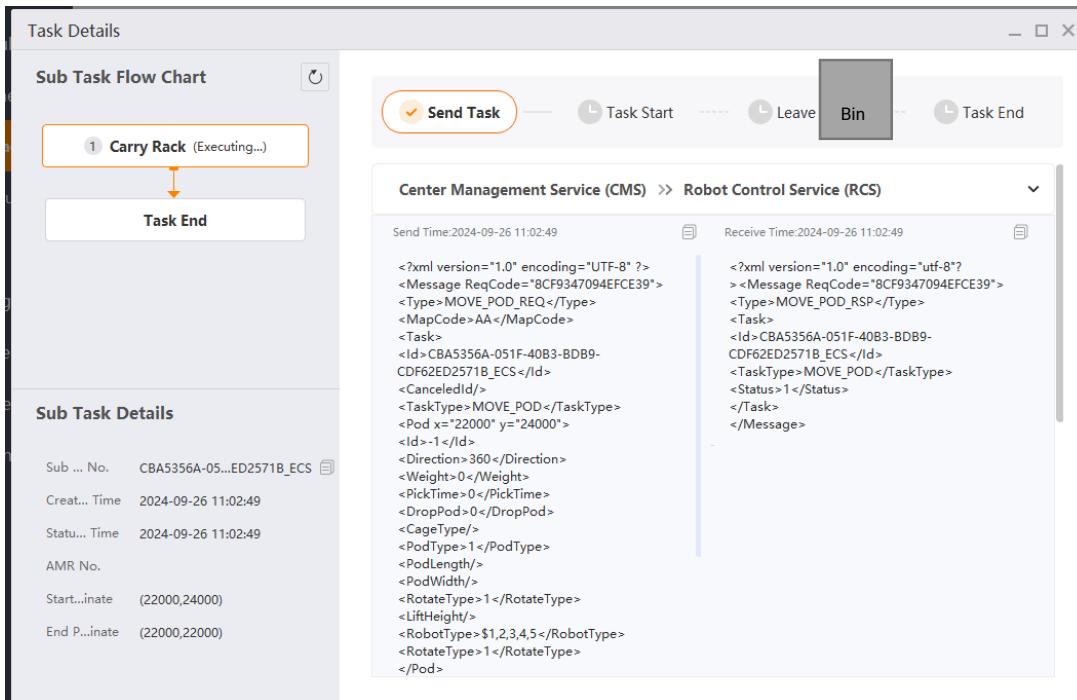


Figure 9-2 Subtask Execution Details

Click the task buttons, and you can see the corresponding message information. Different subtask has different operation steps. When AMR arrives at a specified point, it applies a request to the upper-level system, if the subtask needs triggering, the upper-level system will call a task API to trigger the subtask. If the subtask is triggered successfully, subsequent steps can be carried out. Click to see corresponding message. If exception occurs, the message list will be marked in red.



Figure 9-3 Subtask Execution Step Status

If a subtask execution exception occurs, click **Smart Analysis** in the subtask details to check the feedback from RCS Service.

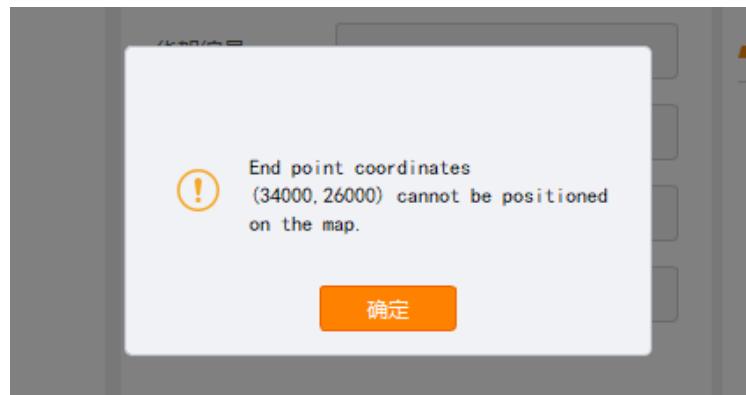


Figure 9-4 Exception Prompt

## 9.3 WCS Task Status

In this page, you can see the information of WCS task status, including task No., device No., action type, and action type description. You can search task information by choosing different device type and device No.

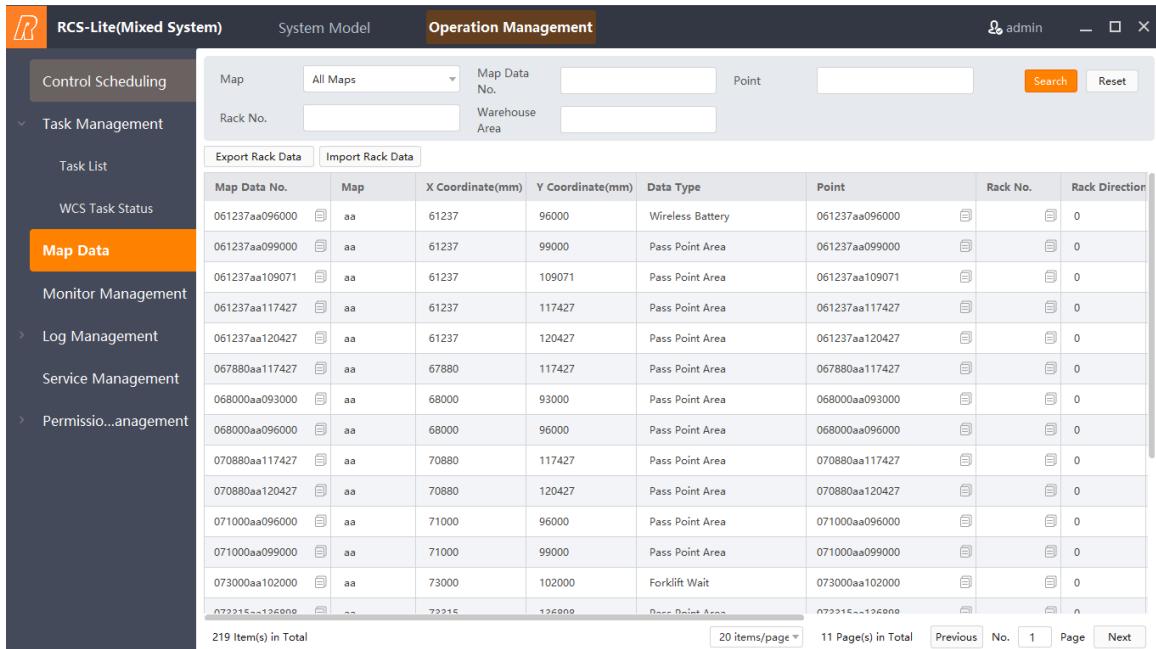
The screenshot shows the 'Operation Management' section of the RCS-Lite interface. On the left, a sidebar menu includes 'Control Scheduling', 'Task Management' (with 'WCS Task Status' highlighted in orange), 'Map Data', 'Monitor Management', 'Log Management', 'Service Management', and 'Permission Management'. The main area has a header with 'Device Type' set to 'Elevator', 'Device Code' input field, 'Search' and 'Reset' buttons, and a user 'admin'. Below is a table with columns: Main Task No., Device Code, Action Type, Action Describe, Pace Describe, Error Reason, and an 'Edit' button. At the bottom, there are pagination controls: '0 Item(s) in Total', '20 items/page', '1 Page(s) in Total', 'Previous', 'No. 1', 'Page', and 'Next'.

Figure 9-5 WCS Task Status

# Chapter 10 Map Data

## 10.1 Search Data

In this page, point information of the map will be displayed in a table format. You can search by selecting map, entering map data No., point, rack No., and warehouse area No. The details are shown below.



The screenshot shows the 'Operation Management' section of the RCS-Lite interface. On the left, a sidebar lists various management categories: Control Scheduling, Task Management, Task List, WCS Task Status, Map Data (which is selected and highlighted in orange), Monitor Management, Log Management, Service Management, and Permission Management. The main content area has tabs for 'Map' (set to 'All Maps') and 'Point'. It includes input fields for 'Map Data No.', 'Point', 'Rack No.', and 'Warehouse Area'. Below these are 'Export Rack Data' and 'Import Rack Data' buttons. The central part of the screen is a table displaying search results:

Map Data No.	Map	X Coordinate(mm)	Y Coordinate(mm)	Data Type	Point	Rack No.	Rack Direction
061237aa096000	aa	61237	96000	Wireless Battery	061237aa096000		0
061237aa099000	aa	61237	99000	Pass Point Area	061237aa099000		0
061237aa109071	aa	61237	109071	Pass Point Area	061237aa109071		0
061237aa117427	aa	61237	117427	Pass Point Area	061237aa117427		0
061237aa120427	aa	61237	120427	Pass Point Area	061237aa120427		0
067880aa117427	aa	67880	117427	Pass Point Area	067880aa117427		0
068000aa093000	aa	68000	93000	Pass Point Area	068000aa093000		0
068000aa096000	aa	68000	96000	Pass Point Area	068000aa096000		0
070880aa117427	aa	70880	117427	Pass Point Area	070880aa117427		0
070880aa120427	aa	70880	120427	Pass Point Area	070880aa120427		0
071000aa096000	aa	71000	96000	Pass Point Area	071000aa096000		0
071000aa099000	aa	71000	99000	Pass Point Area	071000aa099000		0
073000aa102000	aa	73000	102000	Forklift Wait	073000aa102000		0
073215aa126000	aa	73215	126000	Pass Point Area	073215aa126000		0

Below the table, it says '219 Item(s) in Total' and '11 Page(s) In Total'. At the bottom right are buttons for '20 items/page', 'Previous', 'No. 1', 'Page', and 'Next'.

Figure 10-1 Map Data

Click **Search**, and you can see the map data No., map name, X-coordinate, Y-coordinate, storage location, point, rack No., and rack direction of all points. Click  to copy the corresponding information. Element types in RCS-Lite V1.5 only include storage location, working area, roadway head, roadway end, and roadway buffer area. Other element types are not displayed here.

## 10.2 Link Rack

You can click **Export Rack Data** and **Import Rack Data** to batch link rack No., or go to Control Scheduling page to re-link rack No. Operation steps are shown below:

Go to the Control Scheduling page, and find **Link Rack and Storage Location** list.

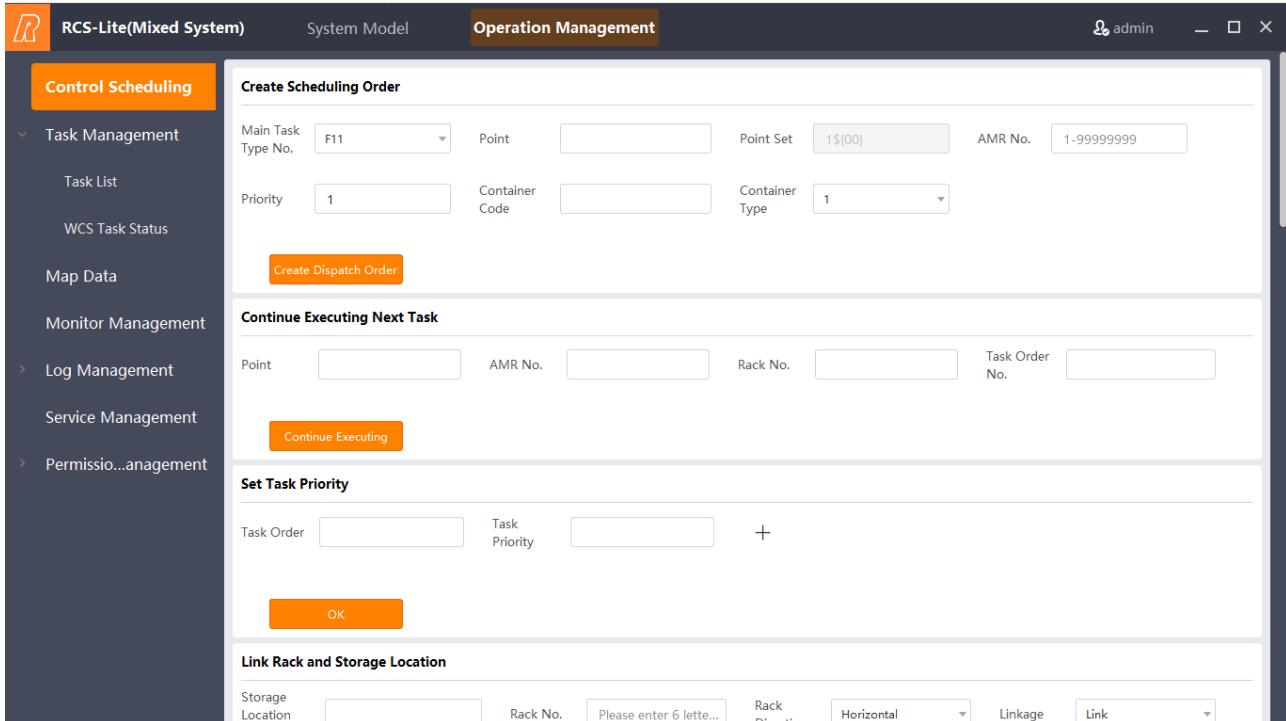


Figure 10-2 Link Rack and Storage Location

Storage location point refers to point data in the Map Data page. The rack No. corresponds to the rack No. in [Rack Settings](#). Rack direction includes horizontal and vertical. Select **Link**, and click **OK** to link point and rack No. Then a prompt will pop up.



Figure 10-3 Linked Successfully

Then go back to the Map Data page, and the data in the table is updated. The rack No. linked to point has been displayed.

Map Data							
Map Data No.	Point	Search	Reset				
Rack No.	Warehouse Area						
Export Rack Data	Import Rack Data						
Map Data No.	Map	X Coordinate(mm)	Y Coordinate(mm)	Data Type	Point	Rack No.	Rack Direction
061237aa096000	aa	61237	96000	Wireless Battery	061237aa096000	0	0
061237aa099000	aa	61237	99000	Pass Point Area	061237aa099000	0	0

Figure 10-4 Rack No. Linked Successfully

You can enter map No., point No., or rack No., and click **Search**. Then the corresponding information will be displayed.

Map	All Maps	Map Data No.	Point	Search	Reset
Rack No.		Warehouse Area			

Figure 10-5 Search Rack No.

Click **Reset** to clear all searching conditions. And all map data will be displayed in the table.

# Chapter 11 Monitoring Management

RCS-Lite V1.5 introduces Monitoring Management module, which integrates some functions of MonitorClient.

## 11.1 Map Management

### 11.1.1 Display Map

At most 4 maps can be displayed in this interface. You can select the specified map in the upper-left corner of the page.

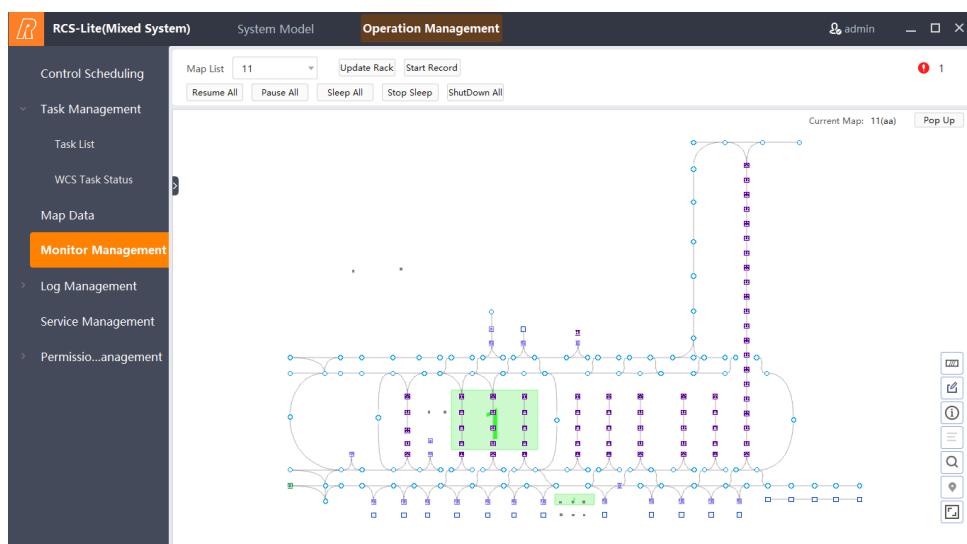


Figure 11-1 Select Map

In the upper-right corner of the map, you can see map name and location code type. In the lower-right corner, you can see the selected AMR No., IP, battery, and status information.

You can hover over the point to view its coordinates. Click to copy the point coordinates.

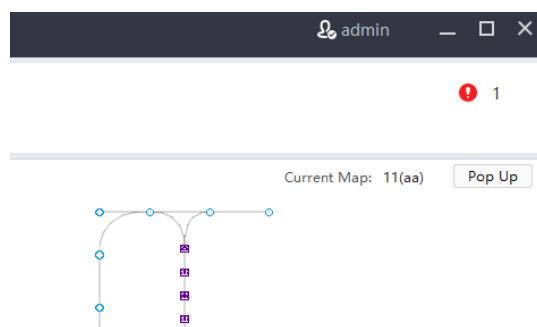


Figure 11-2 Copy Point Coordinates

### 11.1.2 Update Rack

Click **Update Rack** to update the rack information.

### 11.1.3 Pop up Map

Click **Pop Up** to open the map in a separate window.

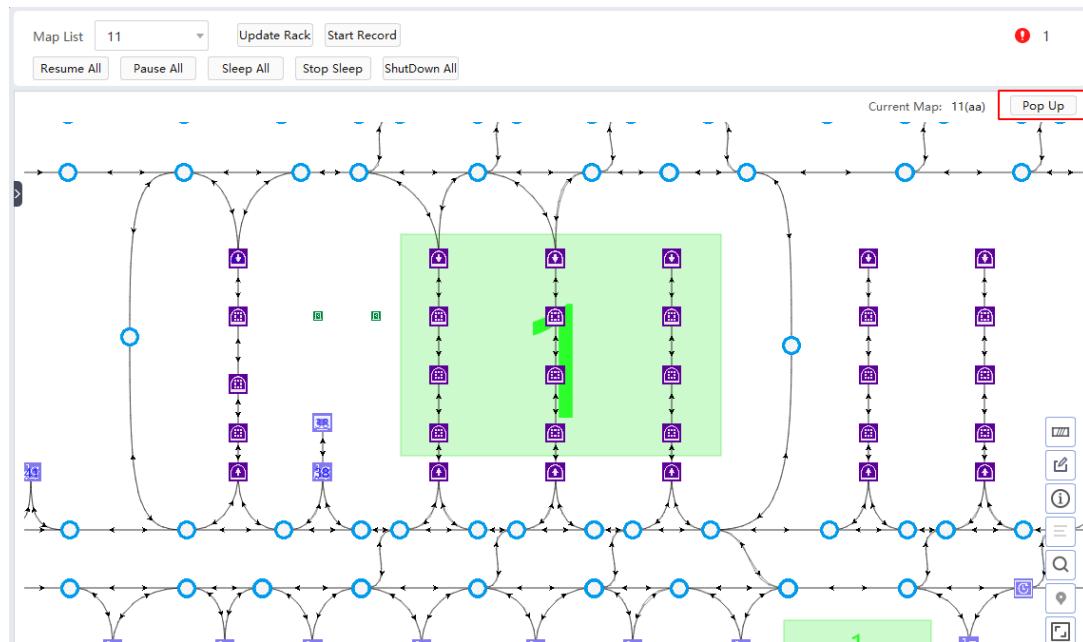


Figure 11-3 Click Pop

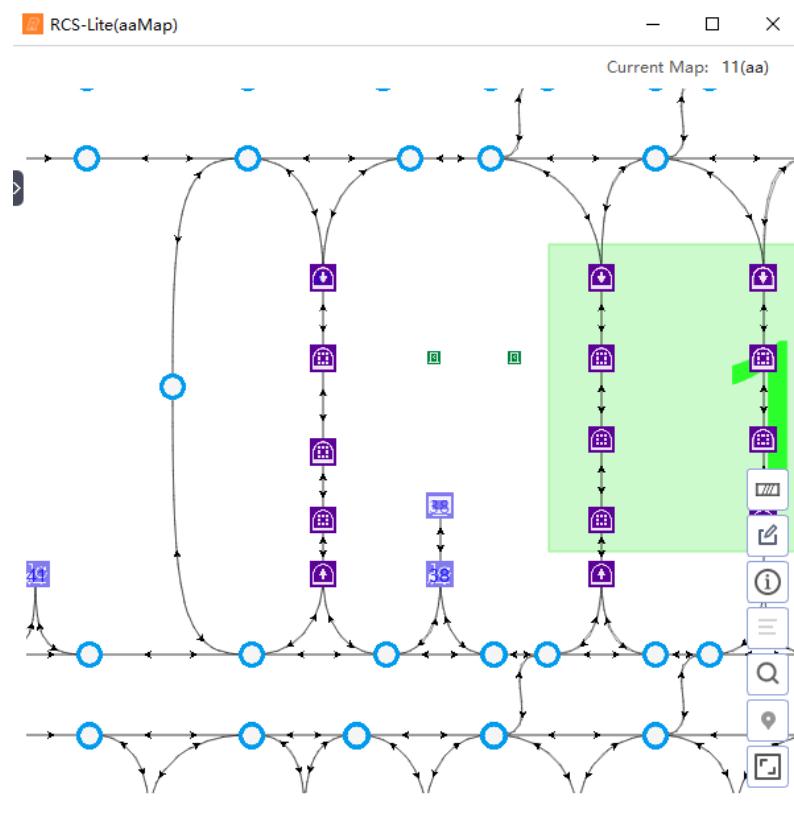


Figure 11-4 Separate Map Window

Click to go back to the Monitoring Management page.

## 11.2 Recording and Playback

Click **Start Record** to record the running status of devices in real time. Click **Stop Record** to finish recording.

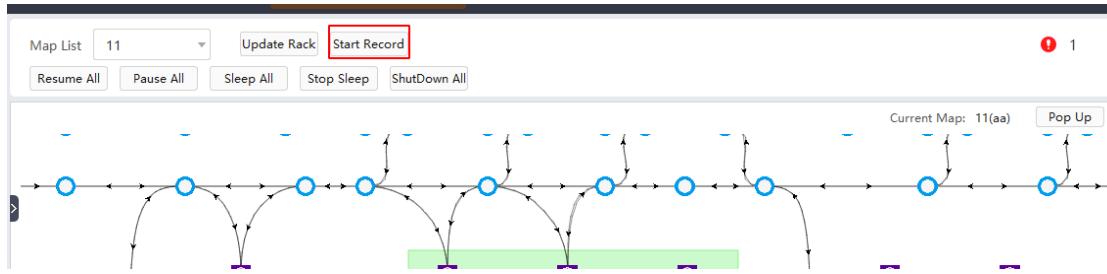


Figure 11-5 Start Recording

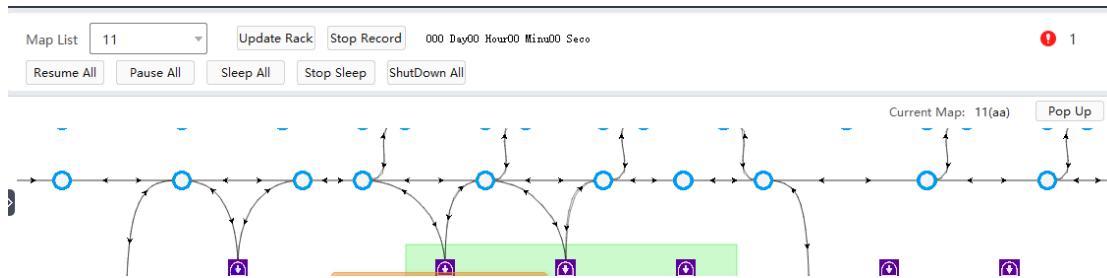


Figure 11-6 Stop Recording



**Note**  
Default video saving path: RcsLite\Video\map name.

Go to RcsLite\MonitorPlayer, and double-click **MonitorPlayer.exe**. Go to the default saving path, and open the video files.

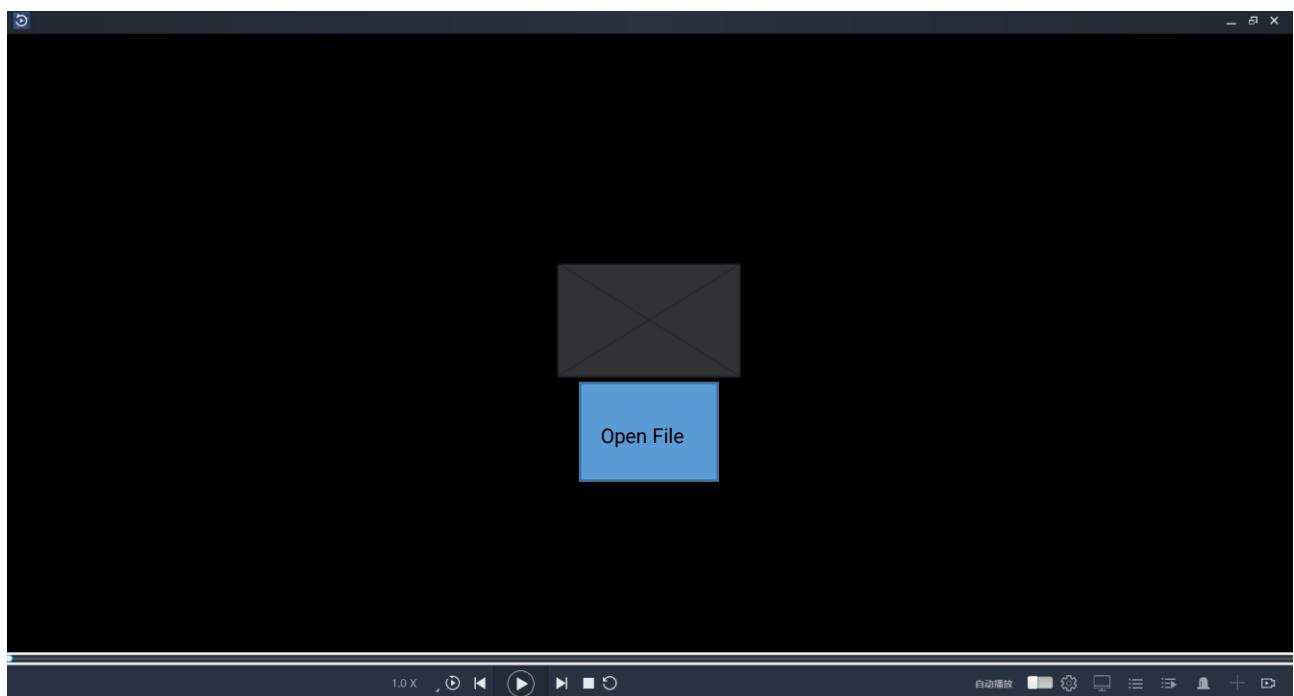


Figure 11-7 Open Video File

Click  to play back the video.

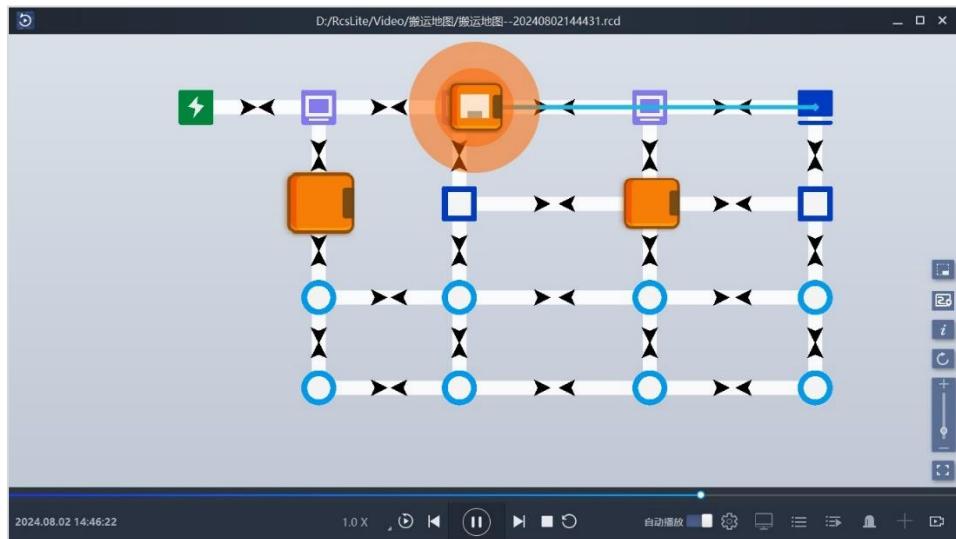


Figure 11-8 Play back Video

MonitorClient can display task, blocked area, trajectory, pre-scheduled task, device list, device details, file details, alarm, and other information.

## 11.3 Toolbar

### 11.3.1 Set Blocked Area

Click , select , and drag to select a blocked area in the map. After you select the blocked area, click **Add** to save the blocked area. Click , select a blocked area, and click **Delete** to delete the area.

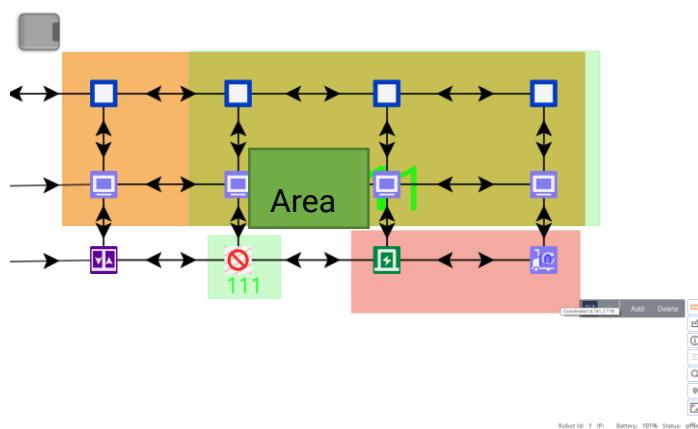


Figure 11-9 Select Blocked Area

### 11.3.2 Add Text

Click  , and select  to edit text in the blocked area. Select  to set text size and color. Click **Save** to save the editing.

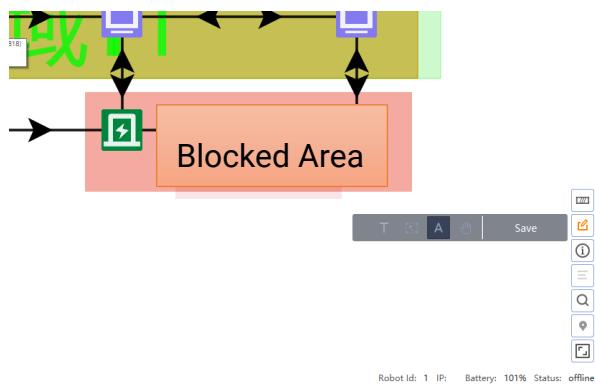


Figure 11-10 Add Text

### 11.3.3 Map Details

Click  to display the information of the current map, including map size and number of topo points, priority, point status display and line status display.

**Select Priority:** When point, line, and control point are overlapped, you can select to display which element on the map.

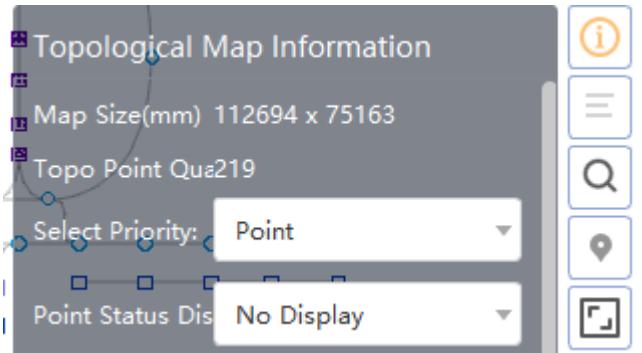


Figure 11-11 Map Details

### 11.3.4 Display Attribute

Click  to select **Display AMR No.** and **Display Area**.

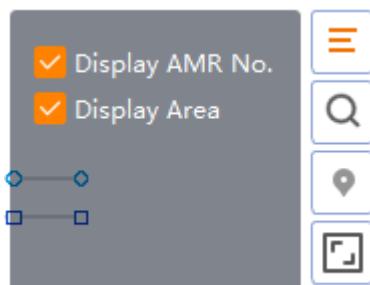


Figure 11-12 Display Attribute

### 11.3.5 Search Coordinates

Click , enter point code, and press **Enter** to locate this point on the map.

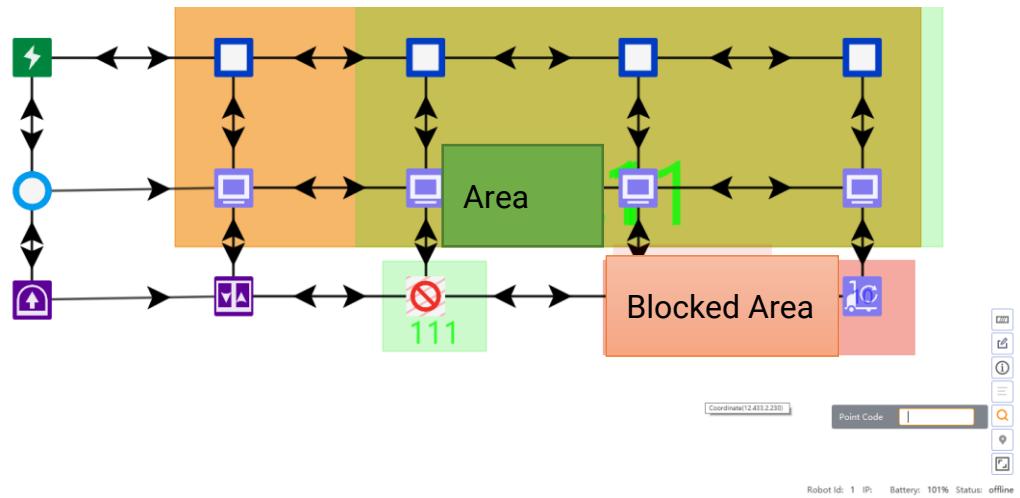


Figure 11-13 Search Coordinates

### 11.3.6 Search Coordinates

After you zoom in, zoom out, or drag the map, Click  to restore the display scale to 100%.

### 11.3.7 Full-Screen Map

Click  to view the map in full screen. Press **ESC** or click  again to exit full-screen mode.

## 11.4 Device Management

Double-click the AMR icon on the map, and you can see AMR battery, AMR IP, execution status, AMR name, rack No., current location, target location, AMR direction, rack direction, and other information. In addition, you can click **Pause**, **Resume**, **Move**, **Lift**, **Down** to control AMR to execute corresponding actions.

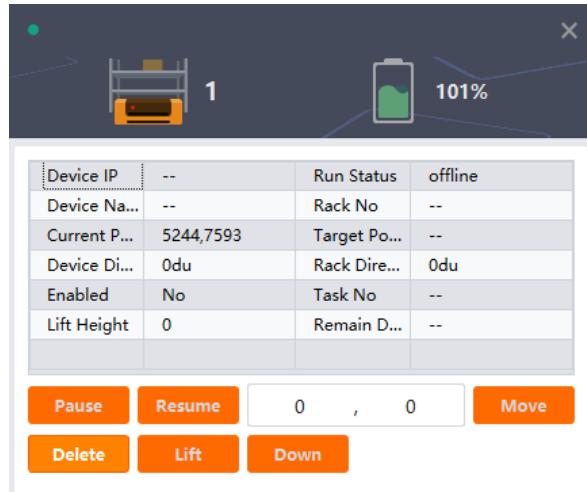


Figure 11-14 AMR Information

Click the arrow in the left side, and you can see AMR list information, including device No., status, execution status, and battery.

All(1) online(0) offline(1) abnormal(0)			
Device No	Status	Run Status	Energy
1	offline	offline	101 %

Figure 11-15 AMR List

Double-click the charging station icon on the map, and you can see charging station coordinates, rated voltage, single charging duration, battery level of single charging, whether the battery is detected, connection status, max current, charging station type and other information. Click **Disable** or **Enable** to disable or enable the charging station.

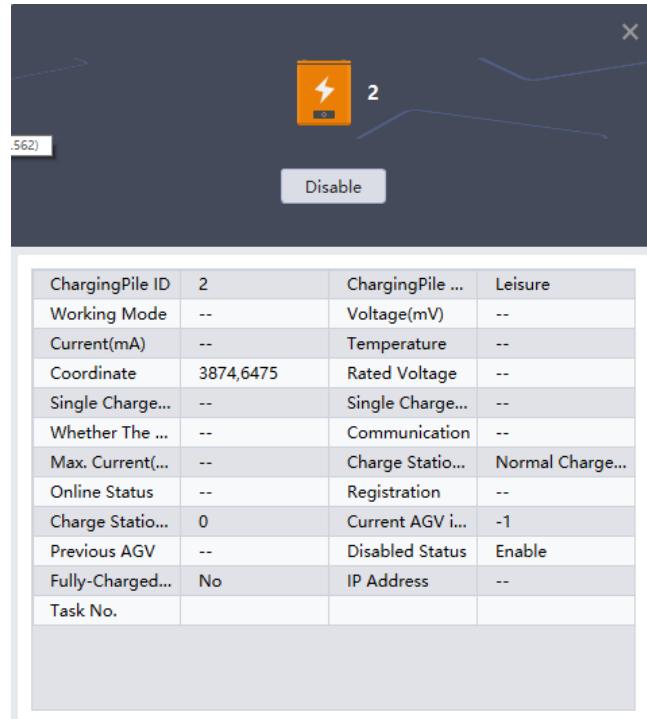


Figure 11-16 Charging Station Information

If AMR is locked, it will be marked in a red rectangle. There is a rectangle on the edge of FMR, and the number in it refers to fork height.



Figure 11-17 AMR in Locking Status

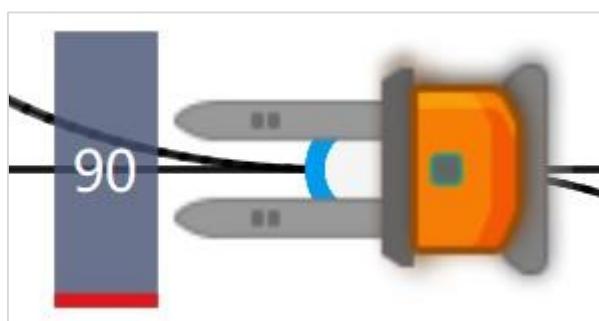


Figure 11-18 Fork Height

## 11.5 Alarm Information

In the upper-right corner of the Monitoring Management page, there is an exclamation (!) mark, which refers to alarm, and the number refers to the quantity of alarms. Click ! to open the alarm information page. Alarm information mainly includes map, main type, subtype, alarm source, starting time, description, and solution.

Alarm Infomation						
Map	Main Type	Sub Type	Alarm Source	Start Time	Description	Solution
	Service Errro...	Local file is mis...	--	2024-11-14 10:49:47	(0, 0)	"According to the output file n

Figure 11-19 Alarm Information

# Chapter 12 Log Management

## 12.1 Operation Log

Log management is divided into operation log and API calling log. In the Operation Log page, you can see all of your operations, which are displayed in a table format, including user name, user IP, log content, and operation time.

The screenshot shows the 'Operation Management' section of the RCS-Lite interface. On the left, a sidebar lists various system modules: Control Scheduling, Task Management, WCS Task Status, Map Data, Monitor Management, Log Management (with 'Operation Log' selected), API Calling Log, Service Management, and Permission Management. The main area displays a table of logs for user 'admin'. The columns are 'User Name', 'User IP Address', 'Log Content', and 'Operation Time'. The logs show various actions like creating task dispatch orders, selecting other peripherals, and adding traffic lights. At the bottom, there are pagination controls for '20 items/page' and '2 Page(s) in Total'.

User Name	User IP Address	Log Content	Operation Time
admin	10.114.177.181	Create Task Dispatch Order	2024-11-15 10:58:03
admin	10.114.177.181	Select OtherPeriph	2024-11-15 10:44:41
admin	10.114.177.181	Add OtherPeriph	2024-11-15 10:44:39
admin	10.114.177.181	Edit TrafficLight	2024-11-15 10:43:07
admin	10.114.177.181	Select TrafficLight	2024-11-15 10:42:21
admin	10.114.177.181	Add TrafficLight	2024-11-15 10:42:02
admin	10.114.177.181	Select Charge	2024-11-15 10:41:29
admin	10.114.177.181	Select Charge	2024-11-15 10:39:36
admin	10.114.177.181	<a href="#">Save Topological Map_241115103931745_aa</a>	2024-11-15 10:39:31
admin	10.114.177.181	Select Charge	2024-11-15 10:38:06
admin	10.114.177.181	<a href="#">Save Topological Map_241115103801702_aa</a>	2024-11-15 10:38:01
admin	10.114.177.181	Select Charge	2024-11-15 10:37:19
admin	10.114.177.181	Select Charge	2024-11-15 10:36:09
admin	10.114.177.181	Add Charge	2024-11-15 10:34:04

Figure 12-1 Operation Log Management

You can search the log by selecting the specified user in the user drop-down list, entering IP address and content, and select time.

The screenshot shows the 'Operation Management' section of the RCS-Lite interface. The sidebar includes 'Control Scheduling', 'Task Management', 'WCS Task Status', 'Map Data', 'Monitor Management', 'Log Management' (with 'Operation Log' selected), 'API Calling Log', 'Service Management', and 'Permission Management'. The main area features a date and time selector. It has fields for 'User Name' (set to 'All Users'), 'User IP Address', and 'Contents'. Below these are 'Select Time' and 'Operation Time' sections. The 'Select Time' section includes a date range from '2024-11-15 00:00:00' to '2024-11-15 23:59:59' and a calendar for selecting specific dates. The 'Operation Time' section shows a detailed timeline with hours and minutes. At the bottom, there are buttons for 'OK' and 'Cancel'.

Figure 12-2 Time Selector

You can just select start date and end date, and click **OK**. In addition, you can click **Today**, **Last Week**, **Last Month**, and **Last Season** to search the corresponding information. Click **Reset** to clear all searching conditions. At the bottom of the interface, you can click **Previous** or **Next** or enter a page No. to go to corresponding page. You can also choose how many items are displayed per page.

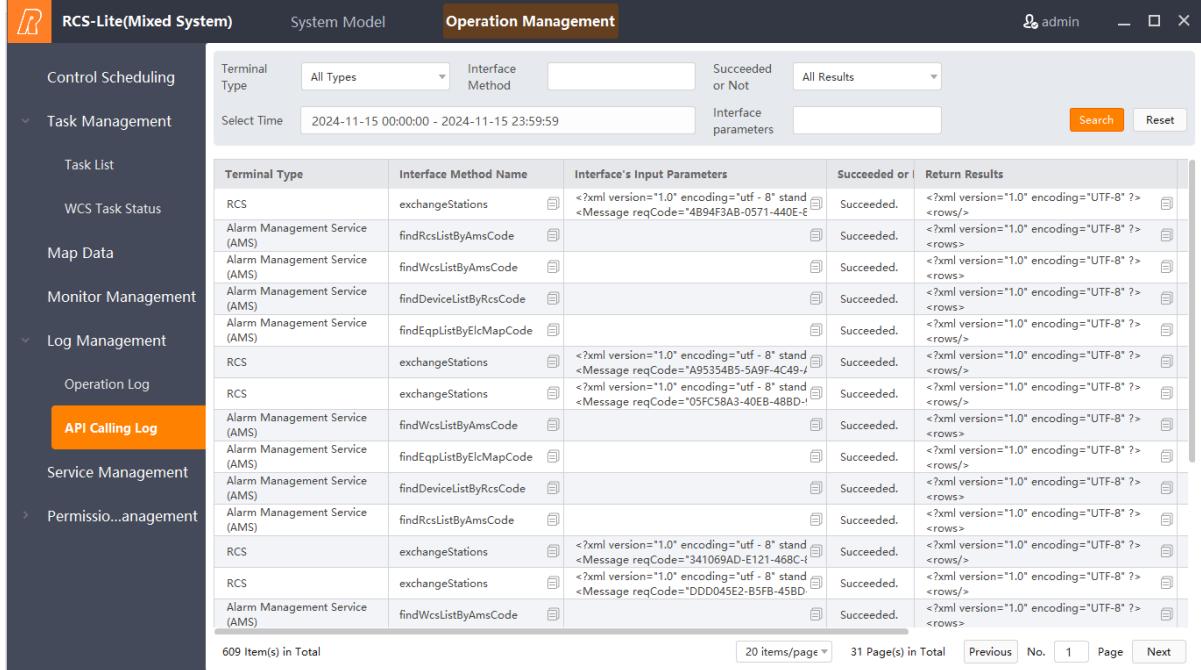
You can download historical maps by clicking the item marked in blue in the log content column. Saving path of historical maps by default: RcsLite\cms\mapBak.

User Name	User IP Address	Log Content	Operation Time
admin	10.114.177.181	Create Task Dispatch Order	2024-11-15 10:58:03
admin	10.114.177.181	Select OtherPeriph	2024-11-15 10:44:41
admin	10.114.177.181	Add OtherPeriph	2024-11-15 10:44:39
admin	10.114.177.181	Edit TrafficLight	2024-11-15 10:43:07
admin	10.114.177.181	Select TrafficLight	2024-11-15 10:42:21
admin	10.114.177.181	Add TrafficLight	2024-11-15 10:42:02
admin	10.114.177.181	Select Charge	2024-11-15 10:41:29
admin	10.114.177.181	Select Charge	2024-11-15 10:39:36
admin	10.114.177.181	<a href="#">Save Topological Map_241115103931745_aa</a>	2024-11-15 10:39:31
admin	10.114.177.181	Select Charge	2024-11-15 10:38:06
admin	10.114.177.181	<a href="#">Save Topological Map_241115103801702_aa</a>	2024-11-15 10:38:01
admin	10.114.177.181	Select Charge	2024-11-15 10:37:19
admin	10.114.177.181	Select Charge	2024-11-15 10:36:09
admin	10.114.177.181	Add Charge	2024-11-15 10:34:04

Figure 12-3 Download Historical Maps

## 12.2 API Calling Log

In this page, you can see the status information of all called APIs, including terminal type, interface method name, interface's input parameters, status, and returning result.



The screenshot shows the 'Operation Management' section of the RCS-Lite interface. On the left, a sidebar lists various management categories like Control Scheduling, Task Management, Map Data, Monitor Management, Log Management, Operation Log, and Service Management. The 'API Calling Log' option is highlighted with an orange box. The main area has search filters for Terminal Type (All Types), Interface Method, Succeeded or Not (All Results), Select Time (2024-11-15 00:00:00 - 2024-11-15 23:59:59), and Interface parameters. Below these are two tables of log entries. The first table has columns: Terminal Type, Interface Method Name, Interface's Input Parameters, Succeeded or Not, and Return Results. The second table has similar columns. At the bottom, there are buttons for 20 items/page, 31 Page(s) in Total, Previous, Page No. (1), and Next. A copy icon is also present.

Terminal Type	Interface Method Name	Interface's Input Parameters	Succeeded or Not	Return Results
RCS	exchangeStations	<?xml version="1.0" encoding="utf - 8" stand<Message reqCode="4B94F3AB-0571-440E-E'	Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
Alarm Management Service (AMS)	findRcsListByAmsCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows>
Alarm Management Service (AMS)	findWcsListByAmsCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows>
Alarm Management Service (AMS)	findDeviceListByRcsCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows>
Alarm Management Service (AMS)	findEqpListByElcMapCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
RCS	exchangeStations	<?xml version="1.0" encoding="utf - 8" stand<Message reqCode="A95354B5-5A9F-4C49-4	Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
RCS	exchangeStations	<?xml version="1.0" encoding="utf - 8" stand<Message reqCode="05FC58A3-40EB-48BD-4	Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
Alarm Management Service (AMS)	findWcsListByAmsCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
Alarm Management Service (AMS)	findEqpListByElcMapCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
Alarm Management Service (AMS)	findDeviceListByRcsCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
Alarm Management Service (AMS)	findRcsListByAmsCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
RCS	exchangeStations	<?xml version="1.0" encoding="utf - 8" stand<Message reqCode="341069AD-E121-468C-4	Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
RCS	exchangeStations	<?xml version="1.0" encoding="utf - 8" stand<Message reqCode="DDD045E2-B5FB-45BD-4	Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows/>
Alarm Management Service (AMS)	findWcsListByAmsCode		Succeeded.	<?xml version="1.0" encoding="UTF-8" ?><rows>

Figure 12-4 API Calling Log

It is similar to operation log. You can search the log by terminal type, interface method name, status, time, and interface's input parameters. At the bottom of the interface, you can click **Previous** or **Next** or enter a page No. to go to the corresponding page. You can also choose how many items are displayed per page. You can clear all searching conditions by clicking **Reset**, and the page will display all data. Click  to copy the corresponding data.

# Chapter 13 Service Management

## 13.1 Service Management

You can restart, close, enable, and edit AMS, CMS, WCS, RCS, and nginx service.

The status indicator in the table shows whether the server is enabled. If it is enabled, the indicator turns green. Otherwise, it turns red.

The screenshot shows the 'Operation Management' tab of the RCS-Lite interface. On the left, a sidebar menu includes 'Control Scheduling', 'Task Management' (with 'Task List' and 'WCS Task Status' options), 'Map Data', 'Monitor Management', 'Log Management' (with 'Operation Log' and 'API Calling Log' options), 'Service Management' (which is selected and highlighted in orange), and 'Permission Management'. The main content area has tabs for 'Restart Service' and 'Get Ability'. A table lists five services: 'Alarm Management Service (AMS)' (Status: Green, Operations: Restart, Close, Start, Edit), 'Center Management Service (CMS)' (Status: Green, Operations: Restart, Close, Start, Edit), 'Device Access Control Service (WCS)' (Status: Red, Operations: Restart, Close, Start, Edit), 'Robot Control Service (RCS)' (Status: Green, Operations: Restart, Close, Start, Edit), and 'nginx' (Status: Green, Operations: Restart, Close, Start, More). The status column uses green circles for enabled services and red circles for disabled ones. The operations column contains links for each service. A message at the bottom right says 'Remaining Days of License Expiry Date : 60' and a button labeled 'Import License'.

	No.	Name	Status	Operation
<input type="checkbox"/>	1	Alarm Management Service (AMS)	<span style="color: green;">●</span>	<a href="#">Restart</a> <a href="#">Close</a> <a href="#">Start</a> <a href="#">Edit</a>
<input type="checkbox"/>	2	Center Management Service (CMS)	<span style="color: green;">●</span>	<a href="#">Restart</a> <a href="#">Close</a> <a href="#">Start</a> <a href="#">Edit</a>
<input type="checkbox"/>	3	Device Access Control Service (WCS)	<span style="color: red;">●</span>	<a href="#">Restart</a> <a href="#">Close</a> <a href="#">Start</a> <a href="#">Edit</a>
<input type="checkbox"/>	4	Robot Control Service (RCS)	<span style="color: green;">●</span>	<a href="#">Restart</a> <a href="#">Close</a> <a href="#">Start</a> <a href="#">Edit</a>
<input type="checkbox"/>	5	nginx	<span style="color: green;">●</span>	<a href="#">Restart</a> <a href="#">Close</a> <a href="#">Start</a> <a href="#">More</a>

Figure 13-1 Task Management

Select the corresponding service, and click **Restart** to restart it.

Click **Close** to close the corresponding service.

Click **Enable** to enable the corresponding service.

Click **Edit** in the AMS, WCS, and RCS list to edit the configuration information of the corresponding service.

The dialog box is titled "Edit". It contains the following fields:

- Http Port \*: 8182
- Http File Port \*: 3180
- Https Port \*: 6543
- Robot Msg Port \*: 8988
- IP \*: 10.114.177.181
- DB Type \*: PostgreSQL
- Server IP Address \*: 127.0.0.1
- Server Port \*: 5432
- DB Name \*: rcslite\_cms
- User Name \*: postgres

At the bottom are "Save" and "Cancel" buttons.

Figure 13-2 RCS Settings Information

Click **More** in the nginx list to import or export the configuration files of PDA.

The table has columns: No., Name, Status, and Operation. The rows are:

- No. 1: Alarm Management Service (AMS), Status green, Operations: Restart, Close, Start, Edit
- No. 2: Center Management Service (CMS), Status green, Operations: Restart, Close, Start, Edit
- No. 3: Device Access Control Service (WCS), Status red, Operations: Restart, Close, Start, Edit
- No. 4: Robot Control Service (RCS), Status green, Operations: Restart, Close, Start, Edit
- No. 5: nginx, Status green, Operations: Restart, Close, Start, More (context menu shown)

Context menu for nginx:

- Import
- Export
- Detail

Local IP: 10.114.177.181

Figure 13-3 Import/Export Nginx Configuration Files

## 13.2 License Management

You can view the remaining days before the license expires. If the remaining days are less than 7 days, a message will be prompted when you log in to RCS-Lite.



Figure 13-4 License Prompt

After the license expired, you should enter a new activation code in the login page. Otherwise, you will be prompted that the license expired and you cannot use the system.

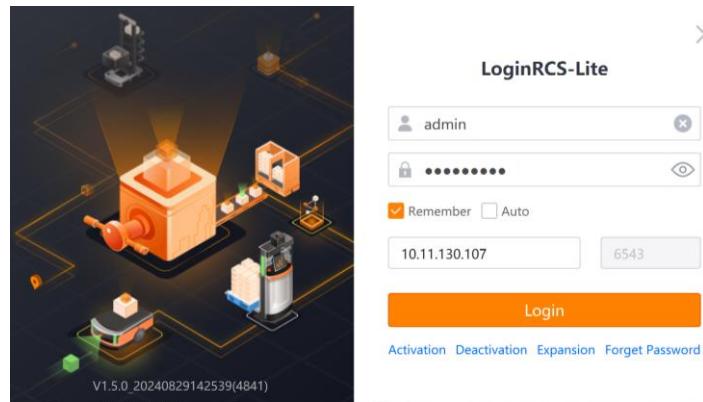


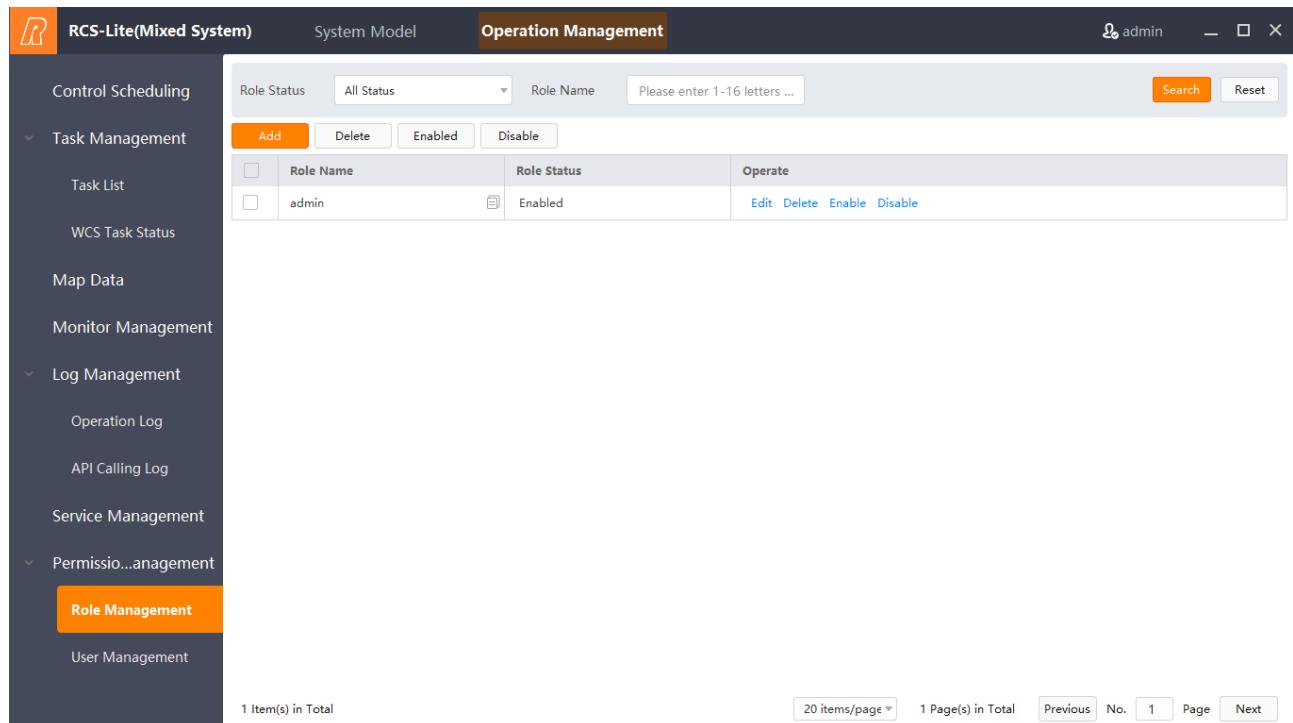
Figure 13-5 Activation

# Chapter 14 Permission Management

RCS-Lite V1.5 introduces Permission Management function, which is composed of role management and user management. With this function, you can control the pages that can be operated by roles with different permissions.

## 14.1 Role Management

In this page, you can see the information of each role displayed in a table format, including role name and role status.



The screenshot shows the 'Operation Management' section of the RCS-Lite interface. On the left, a sidebar lists various system modules: Control Scheduling, Task Management (Task List, WCS Task Status), Map Data, Monitor Management, Log Management (Operation Log, API Calling Log), Service Management, Permissions Management (Role Management, User Management). The 'Role Management' option is highlighted with an orange box. The main area displays a table of roles:

<input type="checkbox"/>	Role Name	Role Status	Operate
<input type="checkbox"/>	admin	Enabled	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Enable</a> <a href="#">Disable</a>

At the bottom of the main area, there are pagination controls: '20 items/page', '1 Page(s) in Total', 'Previous', 'No. 1', 'Page', and 'Next'.

Figure 14-1 Role Management

- Add Role: Click **Add** to add a new role and configure its permission to access each page.

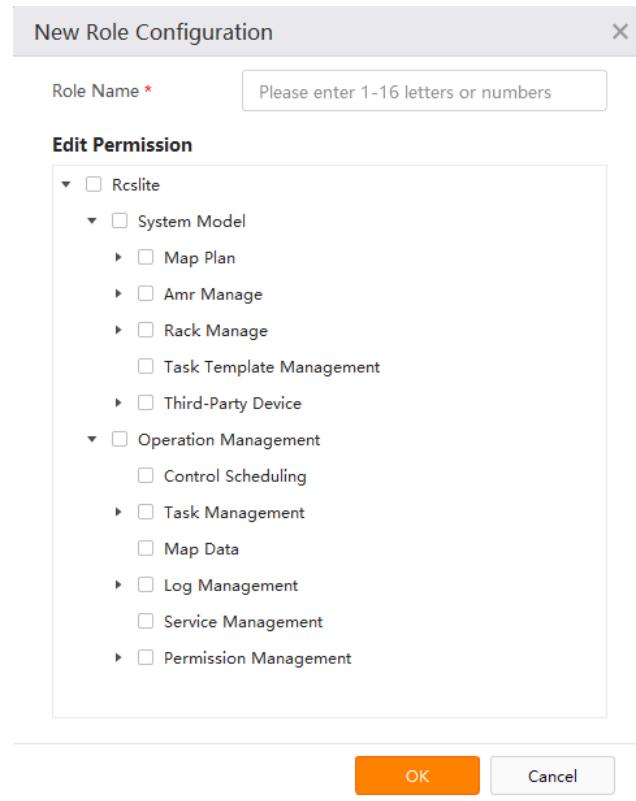


Figure 14-2 Create Role

- Edit Role: Click **Edit** in the operation column to edit this role to access pages. Role name cannot be changed in the Role Permission Editing page.
- Delete Role: Click **Delete** in the operation column to delete a single role. You can also select multiple roles and click Delete on the top of the table to batch delete them.
- Enable/Disable Role: Click **Enable** or **Disable** in the operation column to enable or disable a single role. You can also select multiple roles and click **Enable** or **Disable** on the top of the table to batch enable or disable them.

#### Note

Super administrator (admin) cannot be changed, deleted, or disabled.

- Search Role: You can search the role by selecting role status or entering role name on the top of the page.

## 14.2 User Management

In this page, you can see the information of each user displayed in a table format, including user No., user name, user status, and linked role.

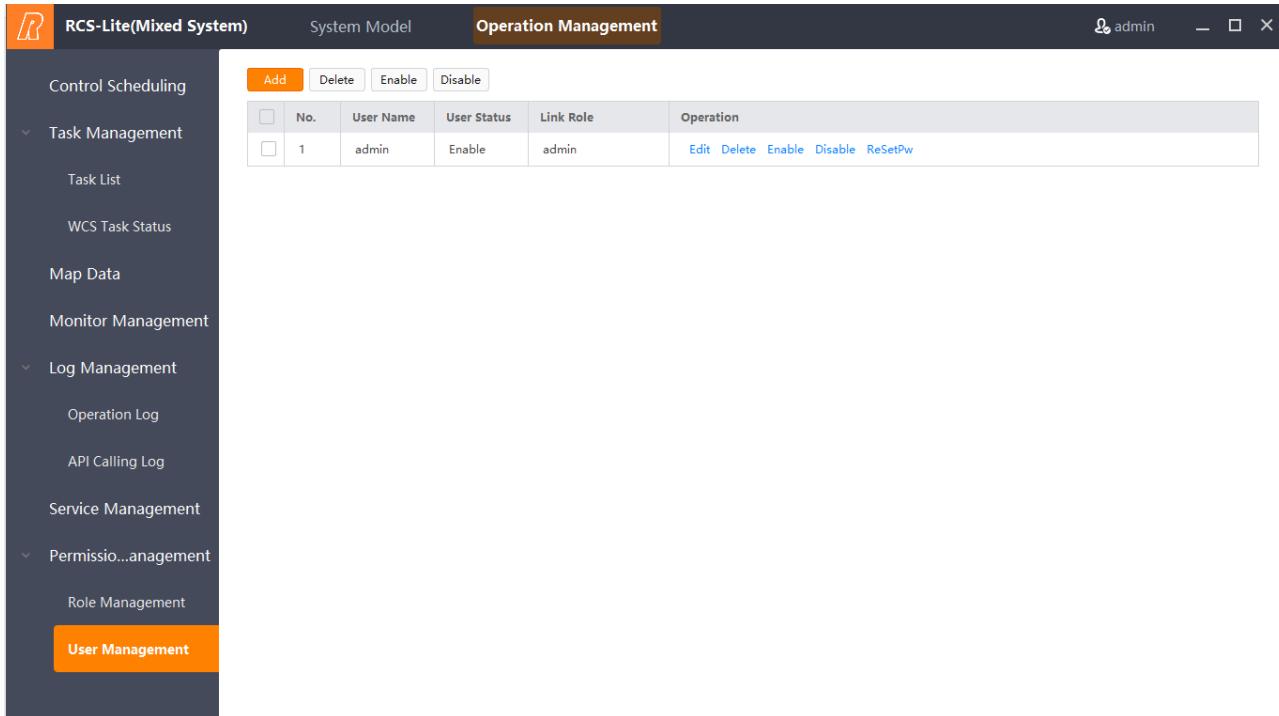


Figure 14-3 User Management

- Add User: Click **Add** on the top of the page to add a new user and configure user name, user password, and its corresponding role.

This is a modal dialog titled 'New User Configuration'. It contains four input fields with validation messages: 'User Name \*' (Please enter 1-16 characters or number), 'Password \*' (Please enter 8-32 characters:excluding:\*/?<|%>&), 'Confirm Password \*' (Please enter 8-32 characters:excluding:\*/?<|%>&), and 'Role Code \*' (admin). At the bottom are 'OK' and 'Cancel' buttons.

Figure 14-4 Create User

- Edit User: Click **Edit** in the operation column to edit this user's role. User name cannot be changed in the User Editing page.
- Delete User: Click **Delete** in the operation column to delete a single user You can also select multiple users and click **Delete** on the top of the table to batch delete them.

- Enable/Disable User: Click **Enable** or **Disable** in the operation column to enable or disable a single user. You can also select multiple users and click **Enable** or **Disable** on the top of the table to batch enable or disable them.
- Reset Password: Click **ResetPw** in the operation column to reset this user's password.



**Note**  
Super administrator (admin) cannot be changed, deleted, disabled, and its password cannot be reset.

---

# Chapter 15 Simulation Business

RCS-Lite V1.5 supports the running of the simulation system. The activation code decides whether to enter the simulation system or not. If the activation code contains permission to the simulation system, the platform will automatically enter the simulation system.

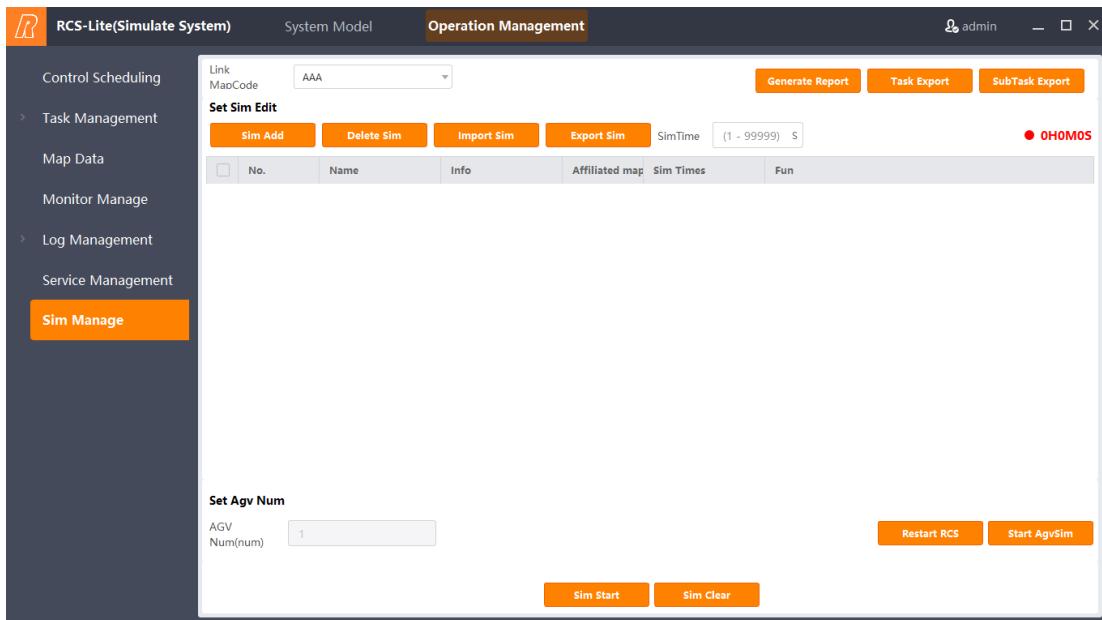


Figure 15-1 Simulation System



For more details of the simulation system, please refer to RCS-Lite Simulation User Manual. Click **admin** in the upper-right corner, and click **User Manual**.

# Chapter 16 PDA Management

## 16.1 Prepare Configuration Files

Go to the ClientView page, click **More**, and click **Export Zip** to export the configuration file.

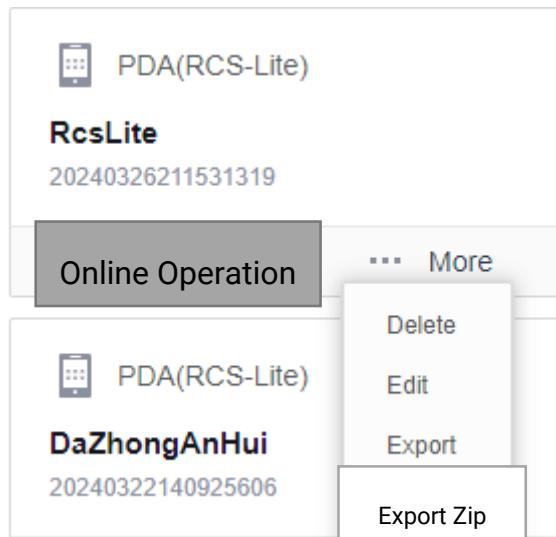


Figure 16-1 Export Configuration Files

Extract app.zip and put it on RCS\_Lite\nginx\html\clientview\app. Double-click **app.json**, and locate the host field where you should change the port No. as 18182 and find an appId. The appId of this project is 20230807184043582.

```
{"apis": [{"interceptor": "", "key": "RCSLite.bindPodAndBerth", "method": "post", "timeout": 30000, "url": "/services/rest/nikRpcService/bindPodAndBerth"}], "appId": "20230807184043582", "appName": "RCS-Lite", "appType": "rcs-lite-pda", "context": "[{"name": "GET_AUTH", "value": "RCSLite.A", "type": "String"}]", "extend": "console.log(111111111111111)", "host": "http://10.13.130.101:18182/rcms", "persist": 0, "projectId": "*", "serverId": "20230807200802248", "serverKey": "RCSLite", "weight": 0}
```

Figure 16-2 Prepare Configuration Files

## 16.2 Configure PDA

Step 1 After you install PDA, go to the home page. Enter HTTP and the IP address of the server. Port No. is 18182.

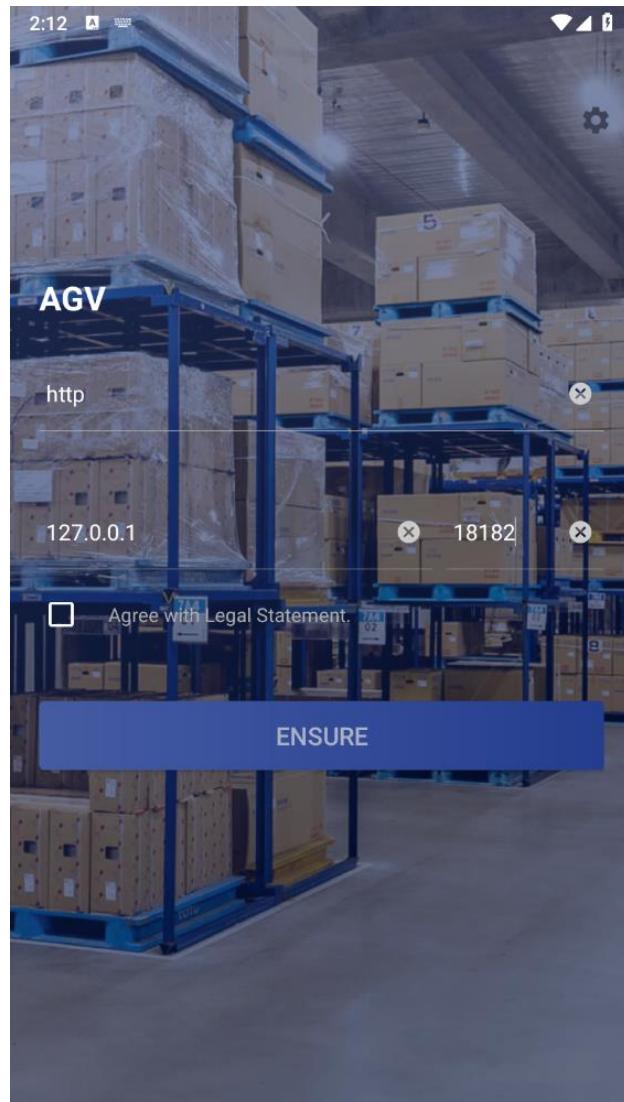


Figure 16-3 PDA Home Page

Step 2 Click in the upper-right corner of the page to configure the path of ClientView. This step is very important. You should change the appId in the pop-up prompt.

Sample path:

</clientview/apps/ras-lite-pda/index.html?appId=20230807184043582>.

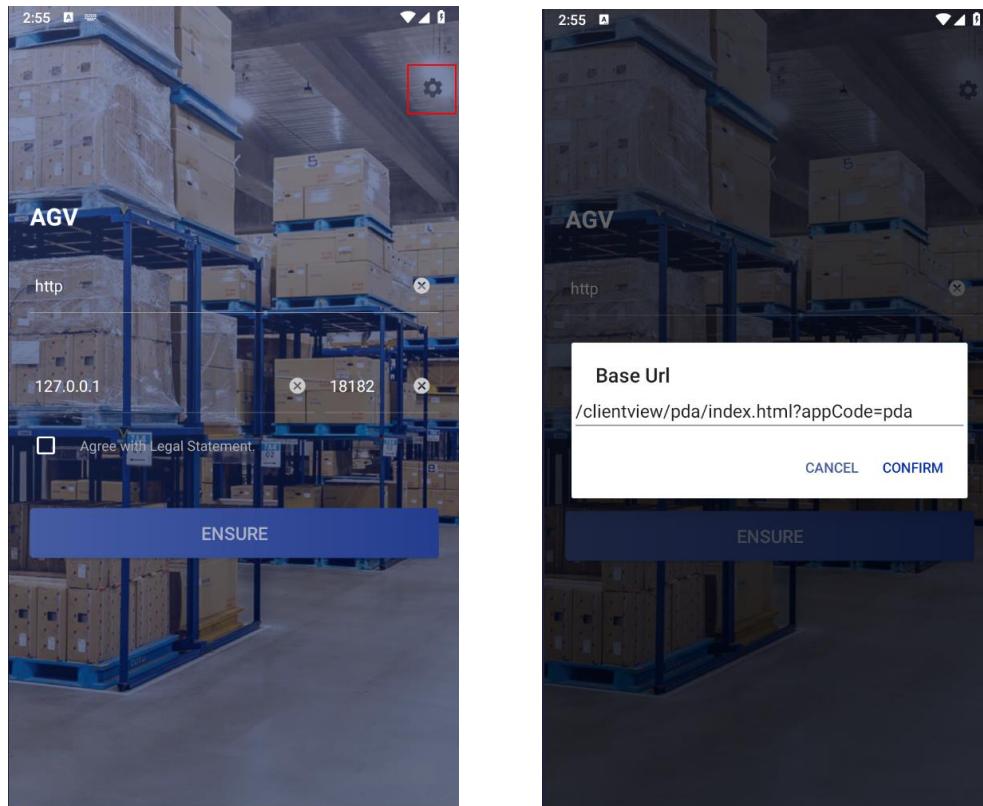


Figure 16-4 PDA Path Configuration

Step 3 Click **OK**, go to the login page, and enter user name and password.

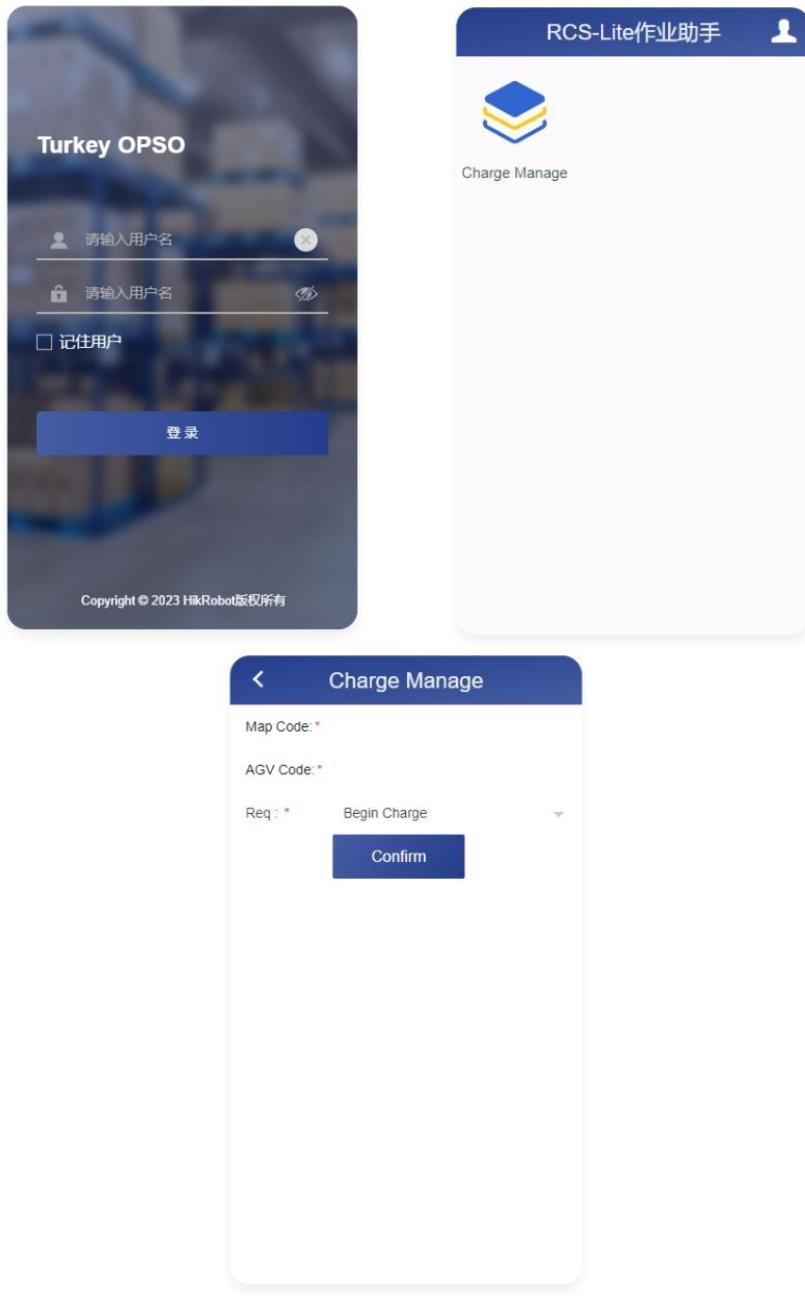


Figure 16-5 PDA Login Home Page

# Chapter 17 ROSE Settings

## 17.1 Configure RCS-Lite

When Rose hot standby is used, the RCS-Lite client will not load RCS, AMS, WCS, and CMS. The launch of each service will be controlled by Rose.

- Enable Rose Configuration

Step 1 Go to the root directory: Rcs\_Lite/Param/clientType.xml. Then, configure <IsRose>1</IsRose>. After that, each service will not be loaded when RCS-Lite starts.



If clientType.xml does not exist, you can create it by double-clicking **RcsliteClient.exe**, selecting AMR type, and exiting the client.

```
<?xml version="1.0" encoding="UTF-8" ?>
<ClientType>
  <Type>0</Type>
  <IsRose>1</IsRose>
  <Straddle>0</Straddle>
</ClientType>
```

Figure 17-1 Enable Rose Configuration

Step 2 Register CMS.

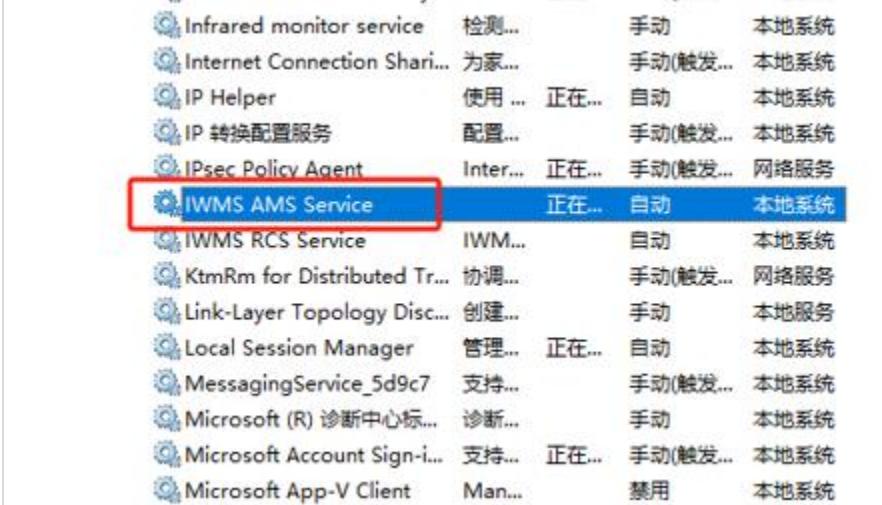
Go to D:\RcsLite\cms, locate install\_cms\_service.bat, and run it as an administrator. After CMS is installed, open Task Manager and click **Service**, then you can see CMS is running.

服务名	状态	启动类型	描述	所在计算机
BitLocker Drive Encryption	BDE...	手动(触发...)	本地系统	
Block Level Backup Engi...	Win...	手动	本地系统	
BranchCache	此服...	手动	网络服务	
CaptureService_5d9c7	One...	手动	本地系统	
Certificate Propagation	将用...	正在...	手动(触发...)	本地系统
Client License Service (Cli...	提供...	正在...	手动(触发...)	本地系统
CMS Service	CMS...	正在...	自动	本地系统
CNG Key Isolation	CNG...	正在...	手动(触发...)	本地系统
COM+ Event System	支持...	正在...	自动	本地服务

Figure 17-2 Register CMS

Step 3 Register AMS.

Go to D:\RcsLite\ams, locate install\_ams\_service.bat, and run it as an administrator. After AMS is installed, open Task Manager and click **Service**, then you can see AMS is running.

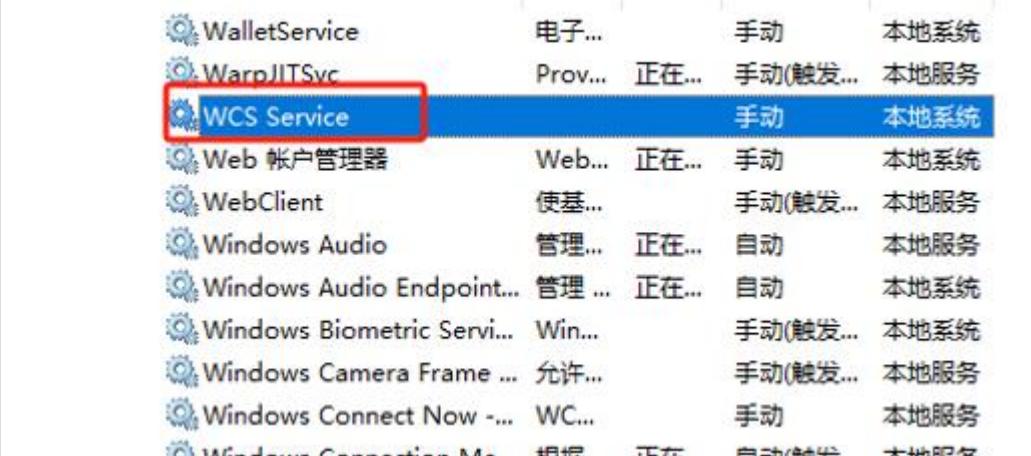


Infrared monitor service	检测...	手动	本地系统
Internet Connection Shari...	为家...	手动(触发...	本地系统
IP Helper	使用...	正在...	自动
IP 转换配置服务	配置...	手动(触发...	本地系统
IPsec Policy Agent	Inter...	正在...	手动(触发...
IWMS AMS Service	正在...	自动	本地系统
IWMS RCS Service	IWM...	自动	本地系统
KtmRm for Distributed Tr...	协调...	手动(触发...	网络服务
Link-Layer Topology Disc...	创建...	手动	本地服务
Local Session Manager	管理...	正在...	自动
MessagingService_5d9c7	支持...	手动(触发...	本地系统
Microsoft (R) 诊断中心标...	诊断...	手动	本地系统
Microsoft Account Sign-i...	支持...	正在...	手动(触发...
Microsoft App-V Client	Man...	禁用	本地系统

Figure 17-3 Register AMS

#### Step 4 Register WCS.

Go to D:\RcsLite\wcs, locate install\_wcs\_service.bat, and run it as an administrator. After WCS is installed, open Task Manager and click **Service**, then you can see WCS is running.

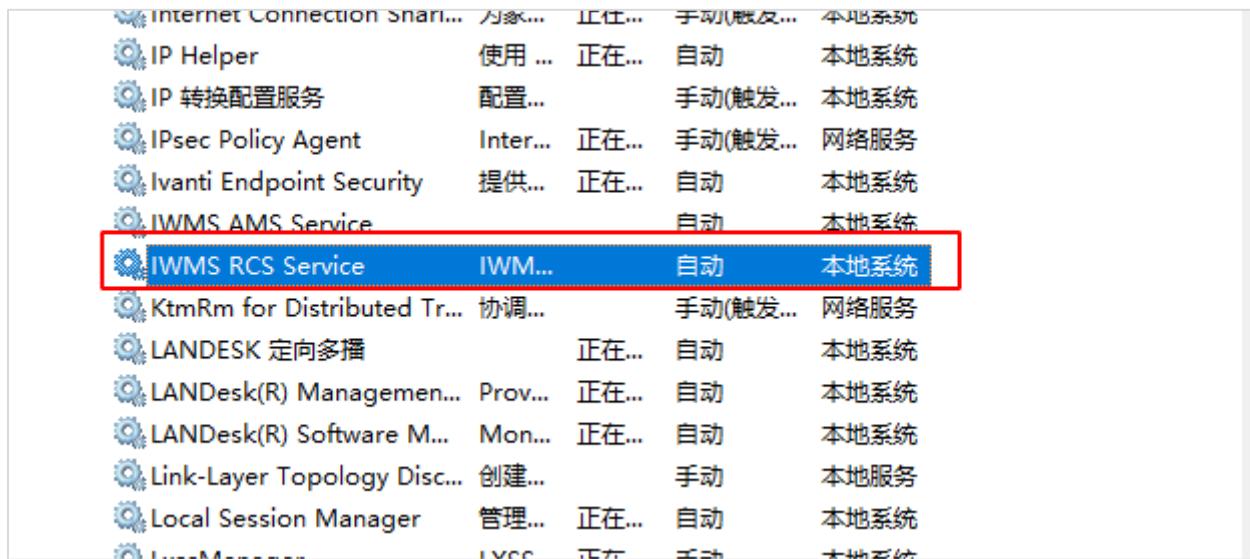


WalletService	电子...	手动	本地系统
WarpJITSvc	Prov...	正在...	手动(触发...
WCS Service		手动	本地系统
Web 帐户管理器	Web...	正在...	手动
WebClient	使基...	手动(触发...	本地服务
Windows Audio	管理...	正在...	自动
Windows Audio Endpoint...	管理 ...	正在...	自动
Windows Biometric Servi...	Win...	手动(触发...	本地系统
Windows Camera Frame ...	允许...	手动(触发...	本地服务
Windows Connect Now -...	WC...	手动	本地服务
Windows Connection Ma...	相...	正在...	手动(触发...

Figure 17-4 Register WCS

#### Step 5 Register RCS.

Go to D:\RcsLite\rcs, locate install\_rcs\_service.bat, and run it as an administrator. After RCS is installed, open Task Manager and click **Service**, then you can see RCS is running.

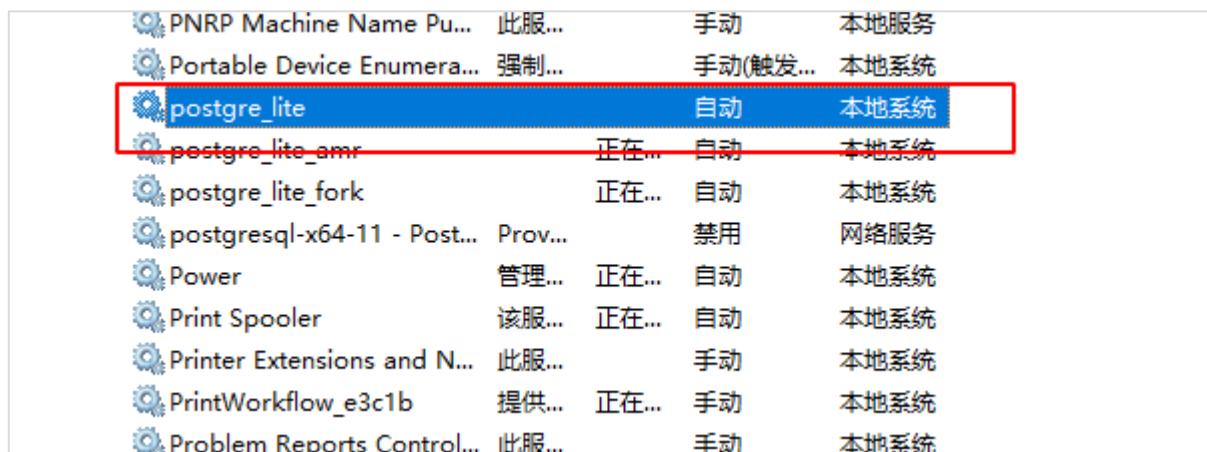


Internet Connection Share...	正在...	手动(触发...)	本地系统
IP Helper	使用...	正在...	自动
IP 转换配置服务	配置...	手动(触发...)	本地系统
IPsec Policy Agent	Inter...	正在...	手动(触发...)
Ivanti Endpoint Security	提供...	正在...	自动
IWMS AMS Service		自动	本地系统
<b>IWMS RCS Service</b>	<b>IWM...</b>	<b>自动</b>	<b>本地系统</b>
KtmRm for Distributed Tr...	协调...	手动(触发...)	网络服务
LANDesk 定向多播	正在...	自动	本地系统
LANDesk(R) Management...	Prov...	正在...	自动
LANDesk(R) Software M...	Mon...	正在...	自动
Link-Layer Topology Disc...	创建...	手动	本地服务
Local Session Manager	管理...	正在...	自动
Local User...	LVCS	正在...	手动

Figure 17-5 Register RCS

### Step 6 Register PG.

Go to D:\RcsLite\pgInstall, locate install.bat, and run it as an administrator. After PG is installed, open Task Manager and click **Service**, then you can see postgres\_lite is running.



PNRP Machine Name Pu...	此服...	手动	本地服务
Portable Device Enumera...	强制...	手动(触发...)	本地系统
<b>postgres_lite</b>		<b>自动</b>	<b>本地系统</b>
postgres_lite_amr	正在...	自动	本地系统
postgres_lite_fork	正在...	自动	本地系统
postgresql-x64-11 - Post...	Prov...	禁用	网络服务
Power	管理...	正在...	自动
Print Spooler	该服...	正在...	自动
Printer Extensions and N...	此服...	手动	本地系统
PrintWorkflow_e3c1b	提供...	正在...	手动
Problem Reports Control...	此服...	手动	本地系统

Figure 17-6 Register PG

### Step 7 Configure IP address.

Go to ams/ams.xml, rcs/rcs.xml, and wcs/wcs\_config\_json to configure their corresponding IP, CMS IP Address, and database IP Address.

## 17.2 Configure ROSE

For more details, please refer to RCS-2000 ROSE Hot Standby (Custom)\_Configuration Manual.

# Chapter 18 DBTool User Manual

RCS-Lite V1.4.0 or later provides an auxiliary operation tool, DBTool.exe, with the features shown below.

- Configure database type.
- Upgrade database field.
- Migrate database from SQLite to PostgreSQL.
- Migrate database from PostgreSQL to SQLite.
- Restore Pgsql data.
- Migrate data to RCS-2000.

## 18.1 Configure Database Type

RCS-Lite V1.4.0 or later supports two database types, PG and SQLite. After installation, the database is PG by default. Double-click DBTool.exe, select **Configuration Database Type** in the Operation Type drop-down list, and select **SQLite** or **PostgreSQL** in the DB Type drop-down list. If you select **PostgreSQL**, you should enter DB Name, User Name, Password, Server IP, and Server Port in the corresponding box.

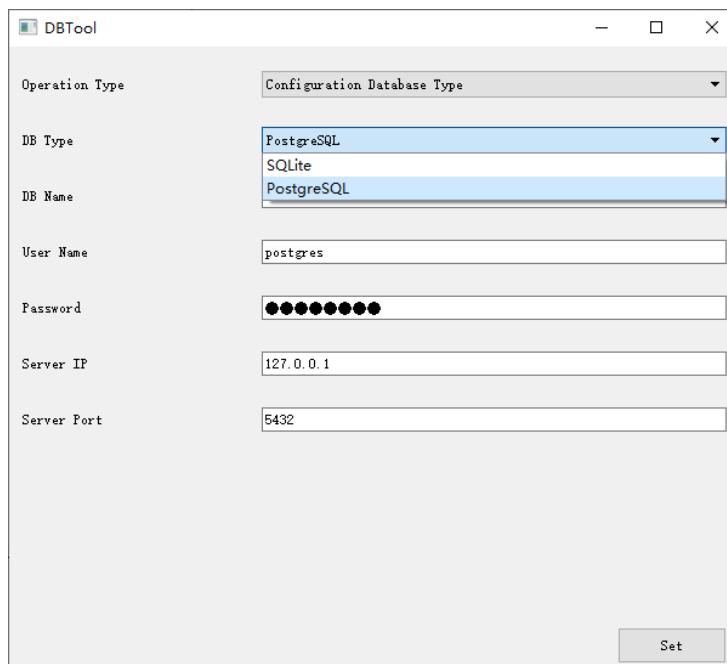


Figure 18-1 Configure Database Type

Click **Set**, and a prompt window will pop up. That means the database is successfully switched.

Default PG database is recommended for field use because PG database is more stable than SQLite database.

## 18.2 Upgrade the Database to the Current Version

When the database table field in an upgraded patch package is changed, you should use DBTool to upgrade the database to the current version.

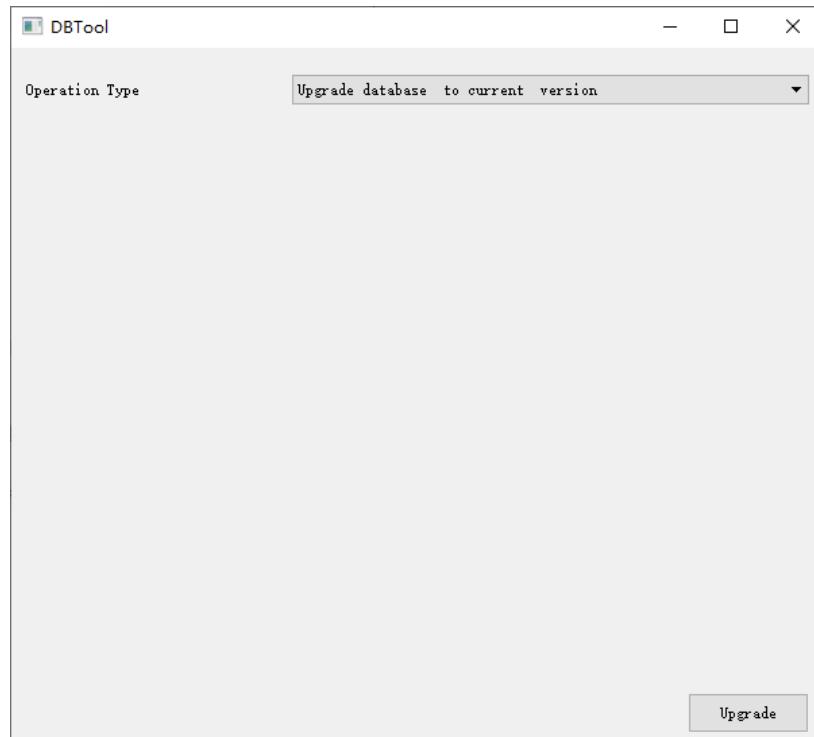


Figure 18-2 Upgrade the Database to the Current Version

The upgrading means reading and synchronizing the field in DBToolUpgradeParam.xml (Release/dbtool) to the database table fields. You can check whether the database is upgraded or not by viewing the database table structure.

## 18.3 Migrate data from PostgreSQL and SQLite

When you select **SQLite migration to PostgreSQL** or **PostgreSQL migration to SQLite** in the Operation Type drop-down list, you can enter DB Name, User Name, Password, Server IP, and Server Port to migrate database.

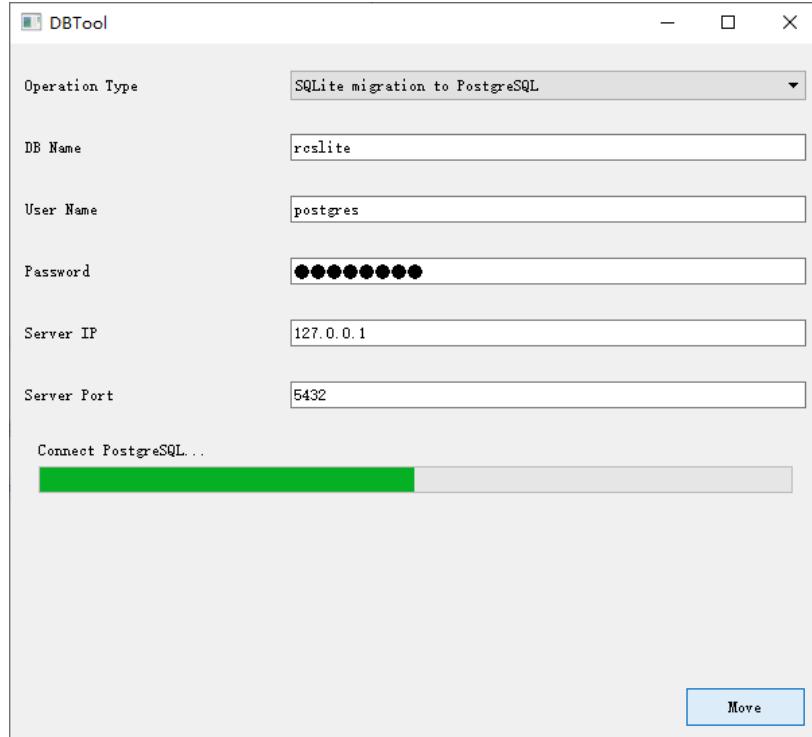


Figure 18-3 SQLite Migration to PostgreSQL

## 18.4 Migrate data from RCS-Lite to RCS-2000

RCS-Lite V1.4.0 or later supports migrating some of its data to RCS-2000 V3.3, mainly some configuration item, including AMR type, AMR settings, map information, map data, warehouse area information, area information, rack type, rack settings, bin settings, bin type, container type, accuracy plan, and laser plan.

In the DBTool page, select **Data Migration to 2000**, click **Move**, and then click **OK** in the migration complete pop-up window. After that, the DBTo2000TempDir directory will be generated under the Release\dbtool directory according to the latest date.

Code > Rcs_lite > trunk > Target > Release > dbtool > DBTo2000TempDir > 20240411202228			
名称	修改日期	类型	大小
ecs_device.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
ecs_device_type.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
ecs_elc_map.csv	2024/4/11 20:22	Microsoft Excel ...	1,026 KB
ecs_laser_cfg.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
ecs_pre_cfg.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
ecs_slam_map.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
frm_field_ext_value.csv	2024/4/11 20:22	Microsoft Excel ...	3 KB
tcs_app_register.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tcs_area_type.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tcs_ctnr_typ.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tcs_map_data.csv	2024/4/11 20:22	Microsoft Excel ...	22 KB
tcs_pod.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tcs_pod_trans_log.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tps_pod_typ.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tps_pod_typ_info.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tps_stg_bin.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tps_stg_bin_typ.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB
tps_stg_sec.csv	2024/4/11 20:22	Microsoft Excel ...	1 KB

Figure 18-4 Generated File after Data Migrated to 2000

Before import the generated CSV file to the database of 2000, you should use DBeaver tool to connect the database of 2000. Steps: Import data > Import from CSV file, select all generated files, and click **Table Mapping**. You can see details shown below.

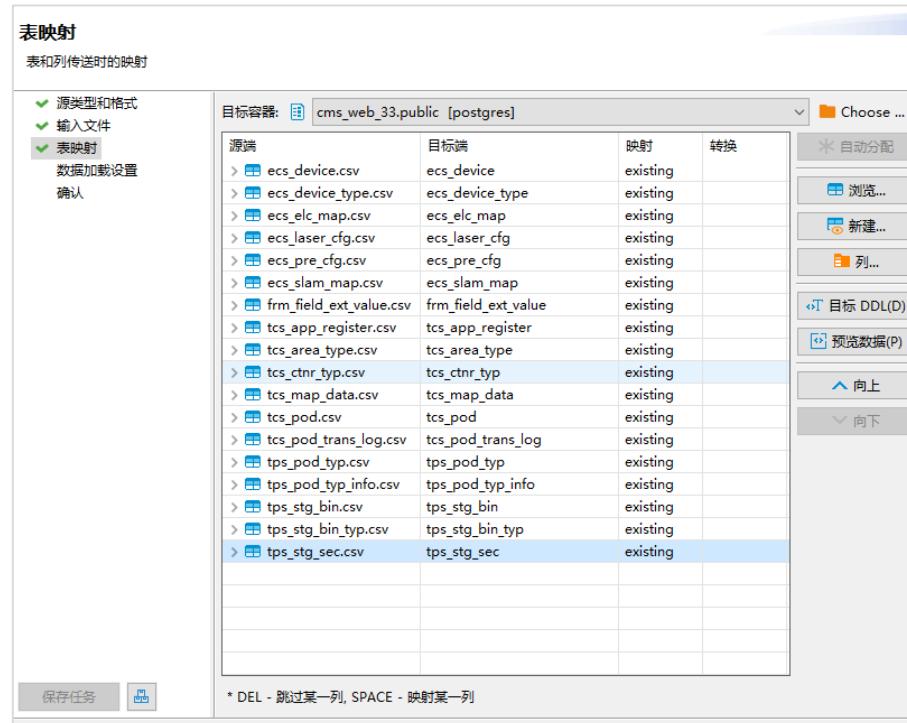


Figure 18-5 Table Mapping Generated Files

Click **Next** to configure data loading.

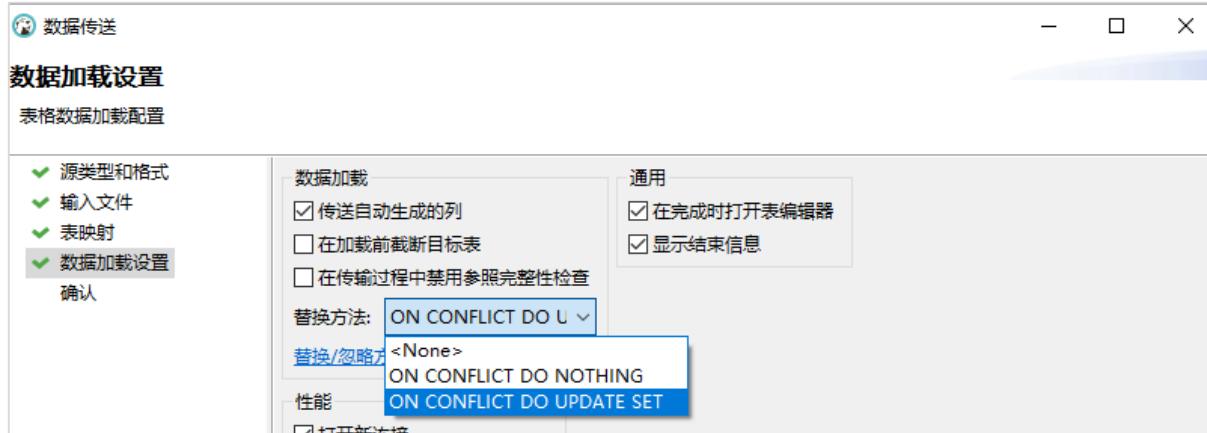


Figure 18-6 Configure Data Loading

Select **ON CONFLICT DO UPDATE SET** in the Alternation drop-down list, and then click **OK** to import data to RCS-2000.

## Appendix A Revision History

No.	Version	Revision Date	Revision Details
1	V1.0.0	2022-01	Created. Added the content of Task Template, Control Scheduling, and Service Management. Added the content of AMR Management, Rack Management, and Log Management. Added the content of Map Management, Task Management.
2	V1.1.0	2022-04	Added the function descriptions about Task Template Management, Control Scheduling, Caller Settings. Added the function descriptions about Slam Map Settings, Laser Plan, Accuracy Plan. Added the function descriptions about Task Attribute, Auto Door, Warehouse Area Settings, Task Management.
3	V1.2.0	2022-09	Added descriptions about Third-Party Device, Control Scheduling. Added descriptions about Roadway Management, Rack Management. Added descriptions about Map Settings, and Task Template.
4	V1.4.0	2024-04	Revised descriptions about Roadway Management and AMR Management. Revise descriptions about Rack Management and Task Template Management. Revised and refined descriptions about Control Scheduling. Added descriptions about Rose Hot Standby. Revised and refined descriptions about Map Management. Added descriptions about DBTool.

5	V1.5.0	2024-08	Updated document style. Added introduction to the authorization method of activation code. Added introduction to Simulator Project and NGINX service. Added introduction to Permission Management, Monitoring Management, Task Template Verification, and Simulation Business.
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## Appendix B Terminology

Term/Abbreviation	Description
AMR	Autonomous Mobile Robot
RCS	Robot Control System
AMS	Alarm Management System
WCS	Warehouse Control System.
CMS	Central Management System



**UD40219B**