HIKROBOT

RCS-2000 System

User Manual

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Available Model

This manual is applicable to the RCS-2000 system.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
Note	Provides additional information to emphasize or supplement important points of the main text.
Caution	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
Danger	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 Get Started

1.1 Homepage Description

After logging in the RCS-2000 system, you can see the homepage, as shown below.

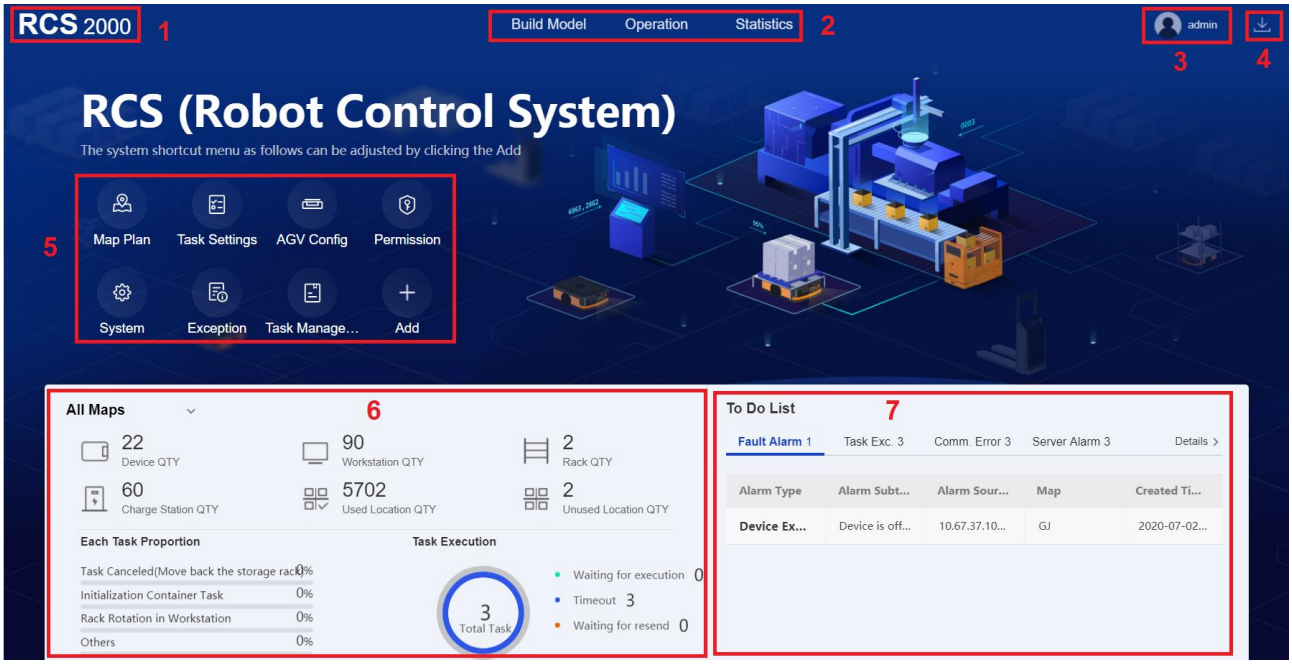


Figure 1-1 Homepage

Table 1-1 Module Inroduction

No.	Name	Description
1	System Name	Click it to back to the homepage.
2	Function Tab	Build Model: Click it to pop up the quick start wizard, and enter to the settings pages. Operation: Click it to enter pages for task management, exception message handling, log viewing, and AGV dispatchment. Statistics: Click it to enter pages for reports viewing.
3	Admin Info.	Click it to see the resource information, system veriosn, and operation center. Also you can modify the login password and exit the system.
4	Download Center	You can download all related apps and manuals here.
5	Customized Shortcut Menu	Provides a quick entrance for functions after you add the function into this menu.

		Click **Add** to add functions into this menu.
6	Information Panel	View information like device quantity, workstation quantity, rack quantity, etc in this area.
7	Alarm and Error	View alarm information and error message here.

1.2 Shortcut Menu Description

The RCS-2000 system provides the shortcut menu in the homepage as shown blow.

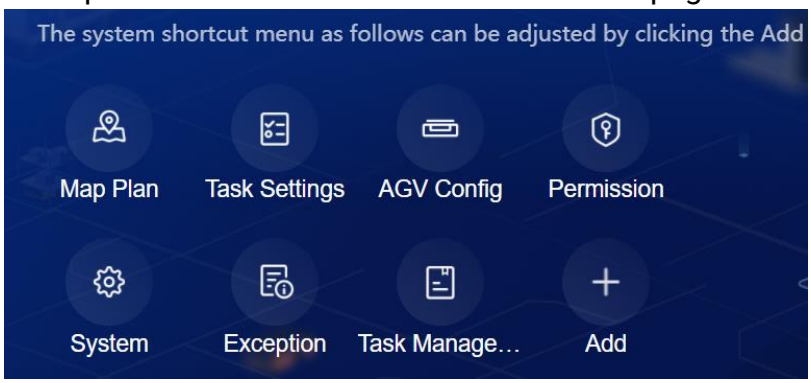


Figure 1-2 Shortcut Menu

You can click **Add** and check other functions to add into the shortcut menu.

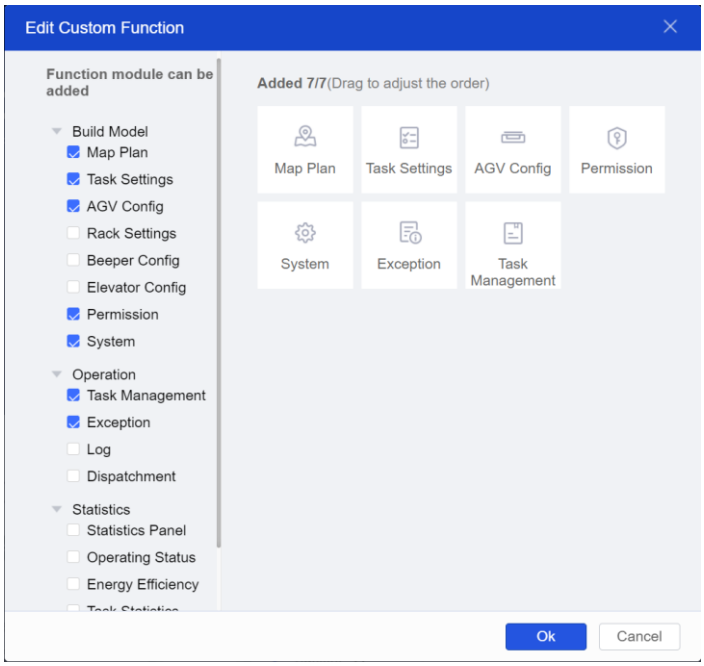


Figure 1-3 Edit Custom Function

By selecting different maps, you can view map operating data, including device quantity, charge station quantity, workstation quantity, etc.

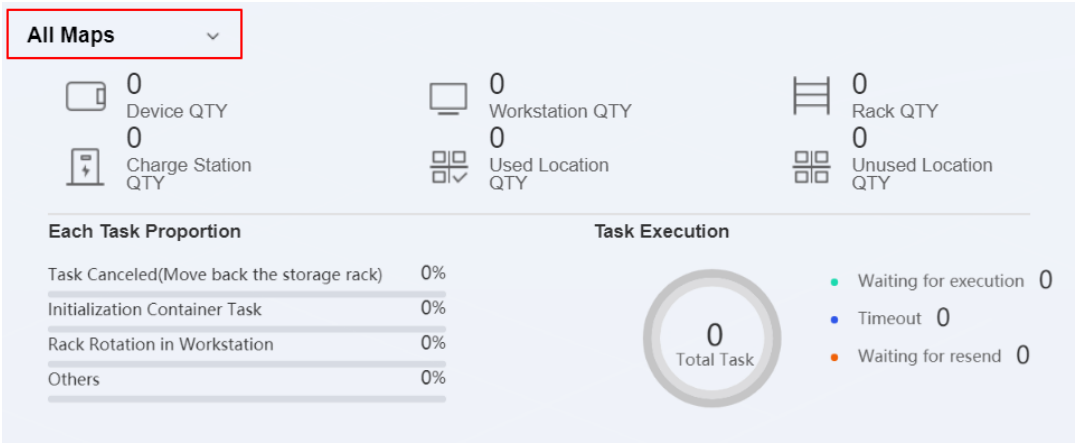


Figure 1-4 Map Operating Data

You can also view alarm information and error message in the alarm and error area.

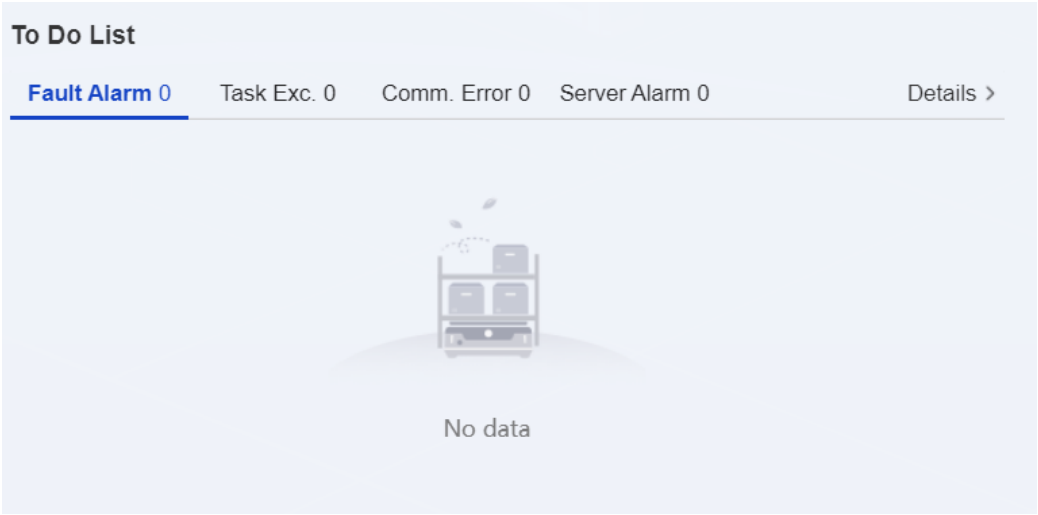


Figure 1-5 Alarm and Error Area

Chapter 2 Map Management

2.1 Map Settings

2.1.1 Map Editing Tool

On the upper left corner of the map, there are many tools for map editing, including roam, adding point, drawing line, drawing curve, batch point, etc.

Figure 2-1 Map Editing Tool

- **Roam:** Click **Roam** into the roam mode. You can drag and scale the map. Double click a point or a line to see its property.
- **Add Point:** Click **Add Point** to add points in batch. Set the following parameters to add points based on actual needs.

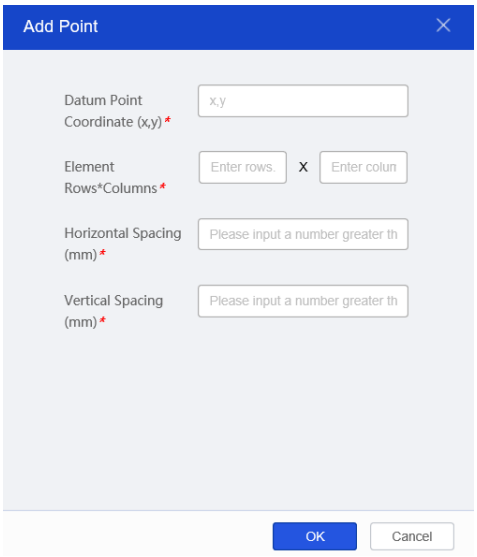


Figure 2-2 Add Points

Table 2-1 Map Parameters

Parameters	Required	Description
Datum Point Coordinate (x,y)	Required	Refers to the left-bottom coordinates of the points array.
Element Rows x Columns	Required	Refers to the row quantity and column quantity of the points array.

Horizontal Spacing	Required	Refers to the horizontal distance between two points in the point array.
Vertical Spacing	Required	Refers to the vertical distance between two points in the point array.

- **Draw Line:** Click **Draw Line**, click one element in the map as the start, and click and drag the mouse into another element as the end. And then a line is drew.
- **Draw Curve:** Click **Draw Curve** to pop up the curve parameter settings window. Set the direction of the start point and the end point, and then a curve is drew. Also you can enable **Double Direction**.
- **Batch Point:** Click **Batch Point**, and click and drag the mouse to select points. All selected points change into purple.

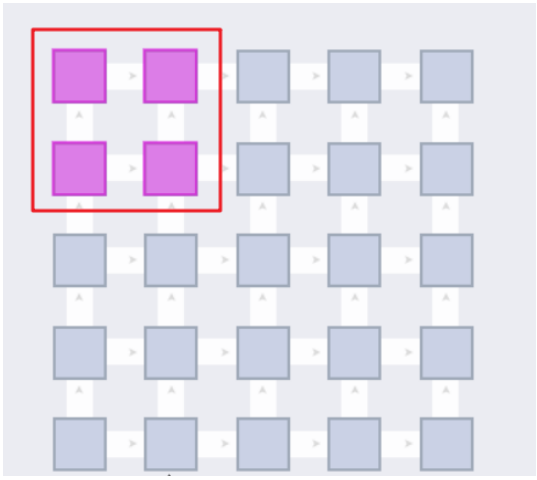


Figure 2-3 Selected Points

Right click selected points, and you can do following operations.

– **Copy:** Duplicate all selected points information, including point distance.

– **Delete:** Delete all selected points.

– **Align:**

  – Vertical Align: X coordinates of all selected points are the same.

  – Horizontal Align: Y coordinates of all selected points are the same.

– **Layout:**

  – Vertical Layout: The interval distances of all selected points in the X coordinate direction are the same.

  – Horizontal Layout: The interval distances of all selected points in the Y coordinate direction are the same.

– **Batch Line:** Draw lines in batch among the selected points. And you can set the line direction (up, down, left, right).

– **Point Properties:** Set properties of selected points in batch. Note that the coordinate information may not support setting in batch.

- **Batch Line:** Click **Select Lines** in **Batch**, and click and drag the mouse to select lines. All selected lines change into purple.

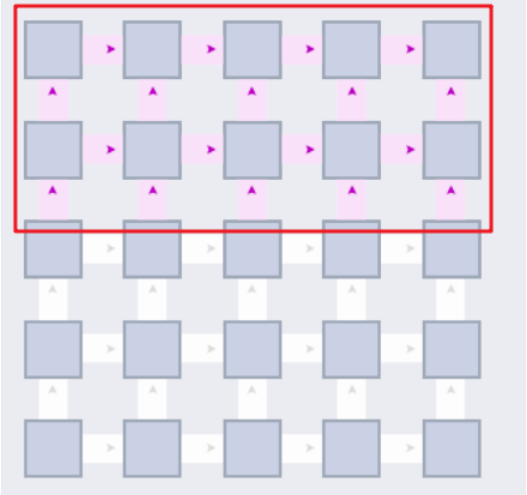


Figure 2-4 Selected Lines

Right click selected lines, and you can do following operations.

– Delete: Delete all selected lines.

– Line Properties: Set properties of the selected lines in batch.

- **Align:**

– Vertical Align: Make all selected pints align in vertical, and X coordinates of all selected points are the same.

– Horizontal Align: Make all selected pints align in horizontal; Y coordinates of all selected points are the same.

- **Layout:**

– Vertical Layout: The interval distances of all selected points in the X coordinate direction are the same.

– Horizontal Layout: The interval distances of all selected points in the Y coordinate direction are the same.

- Undo: Click **Undo** to cancel the history operations. You also can click Ctrl + z. Note that the system records the last four operations only.
- Redo: Click **Redo** or Ctrl + y to redo operations.

2.1.2 Map Element Introduction

Map elements are divided into basic elements and business elements.
Basic elements include charging area, high-speed area, queuing area, interim park area, rotating area, swerving area, obstacles.
Business elements include arc area, storage section, auto door, production line interim storage area, standby point, air shower, working area, self check area, standby point, switch to QR code, switch to SLAM, wireless charge station, forklift waiting point, elevator waiting point, roadway head, roadway end, roadway interim storage area, charging station related points, battery swap station, CTU waiting point, and CTU workstation.

- Charging area: The point where charge stations are deployed for charging AGVs.
- Arc area: It is used when AGVs go on arc area.
- Warehouse storage section: The location of racks in the warehouse.
- High-speed area: The area where AGVs run at high speed.
- Parking area: The area where AGVs temporarily park.
- Queuing area: The area in front of the workstation.
- Rotating area: The area where AGVs rotate to adjust the direction of racks.
- Working area: It refers to the workstation.
- Auto door: If the accessibility of an area needs to be applied to the upper level and points in the area have the same accessibility (all points in the area can pass after one application): Points in the area need to be configured as automatic door.
- Battery swap station: Refer to section 2.1.7 for details.
- CTU workstation (loader/unloader): Refer to section 2.1.7 for details.
- CTU waiting point: It is CTU's applied position before entering CTU workstation.

Note

Up to 30 points are supported in an area.

- Elevator transfer area: It is the points where racks are placed in the elevator.
- Elevator waiting point: It is the points where AGVs applying for elevators or where AGVs wait to carry racks from elevators.
- Switch to QR code: It sets AGV from SLAM mode to QR code mode.
- Switch to SLAM: It sets AGV from QR code mode to SLAM mode.
- Standby point: It is used to set standby points of the AGVs when rack sequence is outrounded.
- Swerving area: It is a point where AGVs cannot stop for a long time or wait for a long time. For example, in the intersection of busy road, AGVs that move horizontally stop at the intersection will affect the vertical movement of other AGVs. This point is mostly located at intersection of roads, swerving area, etc.
- Forklift waiting point: The point where the forklift adjusts the full-loaded fork height or empty-loaded fork height.

For example, AGV needs to go to No. 2 topological node via the turning area from No. 1 topological node, and if the No. 2 topological node is occupied by other AGV, the first AGV

cannot enter the swerving area.

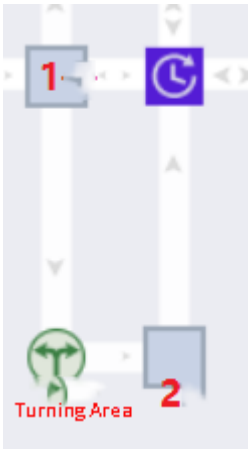


Figure 2-5 Example

Note

Condition for using the turning area: The point before the turning area must be larger than the length of the AGV.
Configuration method for the turning area: If the distance (configurable) that the AGV continues to run along the path after passing the turning point is less than the rotation diameter of the rack, the AGV will interfere with other AGVs and it will not reach the turning point, but will choose to wait before the turning point. The waiting position is a point before the turning point or a position one AGV rotation diameter from the turning point, whichever is more near the location.

- Storage section: It indicates that there may be a rack at this point. Without refreshing the map, if the point is not the end point, AGVs with rack will not pass this point.
- Workstation: It cannot be avoided by default. If you need to avoid, go to Homepage**-> System -> Service Settings**, click **Get Capacity Set**, enable **Workstation for Avoidance** in **RCS TRP Settings**, and click **Save**.
- Various transfer areas: Rack map appear. Without refreshing the map, if the point is not the end point, AGVs with rack will not pass this point. In these areas, AGVs cannot temporarily park. If do need, you need to configure it in the system.

Note

If some map elements are not displayed in the map toolbar, you can go to Map Plan **-> Map Element Details** to check them for displaying.

2.1.3 Add Map Element

Follow steps to add element into a map.

Steps:

Step 1 Initialize the element.

Note that only when the element is initialized, the element can be used in normal.

Step 2 Click **Roam** to change the map into the roam mode.

1) Select the element, and click on the map.

- If there is no red dot in the element, the element is initialized. You can skip the next step.
- If there is a red dot in the element, the element is uninitialized. Do the next step to initiate it.

2) Double click the point, and configure it in the pop-up property window, and click save.

Step 3 Add the element in the map: Select the element, and click a point in the map.

Note

Element attribute includes basic attribute and business attribute. If elements are not parsed, the business attribute will not display by default.

Table 2-2 Basic Attribute

Field	Attribute	Description
Element Type	Required	It selects element type of the point.
Coordinate	Required	It is the location of the element. **Note** The value cannot be negative.
Relative Coordinate	Required	It is the value of actual coordinate/code interval, and is used to print location code.
Point Size (Width/Height)	Required	It displays element size in the map.
Rotating Avoidance Radius Switch	Optional	It is disabled by default. If it is enabled, you should enter rotating avoidance radius.
Rotating Avoidance Radius	Optional	It is the safe range when rotation. It is 0 by default and the unit is mm.

Field	Attribute	Description
Interim Storage Attribute	Required	After setting it as interim storage allowed, the idle AGV can avoid obstacles here.
Chargeable or Not	Required	If it is chargeable, AGVs can be charged in the point.
Precise Solution	Required	It set precise solution for this element point.
Avoidable or Not	Required	● Avoidable: It is allowed to set element point as avoidance point. ● Not avoidable: It is not allowed to set element point as avoidance point. ● Cannot avoid when carrying racks: It is not allowed AGVs with rack to avoid obstacles here.
Accessible AGV	Required	It sets the AGV type that is allowed to enter.
Rotating Rack Type	Required	It sets the rack type that is allowed to rotate here.
Rotating Container Type	Optional	It sets the container type that is allowed to rotate here.
Obstacle Avoidance Sensor Switch	Optional	It sets obstacle avoidance sensor to be enabled.
Rotating AGV Type	Required	It sets the AGV type that is allowed to rotate here.
Route Attribute	Required	It includes for AGVs and for an AGV.
Route under Rack	Required	● Rotatable: The AGV can rotate in accordance with racks. ● Not Rotatable: The AGV cannot rotate in accordance with racks.

Field	Attribute	Description
		● Adjustable: The AGV cannot rotate in a small angle (< 10°) in accordance with racks.
Rotating Structure	Required	● Rotatable: If the AGV is not loaded any racks, the rotating structure can rotate here. ● Not Rotatable: Even the AGV is not loaded any racks, the rotating structure cannot rotate here.
Point Direction	Required	It refers to the AGV head direction after it reaches this point.
Rack Direction	Required	It sets the rack's direction, including horizontal, vertical and omnidirectional.
Rotation Obstacle Area	Optional	It sets the quadrant that will be subject to spatial intervention when the AGV rotates at this point, which is effective in coordination with the quadrant control set in the AGV type configuration.
Verify Location Code	Optional	It sets whether it is necessary to check the location code at this point to judge whether the AGV position is correct.

Refer to the table below for the business attribute.

Table 2-3 Business Attribute

Field	Attribute	Description
Calling Point	Required	It refers to the code.
Linked Position	Optional	It refers to the position point for linking forward and backward points.
Link Area	Optional	It refers to the target area of triggered task.
Link Rack Type	Optional	It refers to the rack type involved in the triggered task.
Link Task Template	Optional	It is used to specify the task template for automatic supplementary tasks. LMR can not be configured. The

Field	Attribute	Description
		default task template is F01. FMR and CTU must be configured, otherwise automatic supplementary tasks cannot be generated. If cross-floor automatic supplementary is used, the corresponding cross-floor task template needs to be configured.
Link AGV Type	Optional	It refers to what type of AGV to execute the triggered task.
Datum Height	Optional	It is used by forklift AGV for calculating bin height.
Rack Target Direction	Optional	It refers to the place direction of racks.
IP Address	Optional	It refers to the IP address of the workstation.
Pre-dispatching AGV Category	Optional	Select the pre-dispatch AGV category corresponding to the change point.
Pre-dispatching AGV Type	Optional	Select the specific pre-dispatch model number of the change point according to the category.
Overtime Reminder Time for Moving Off Rack (s)	Optional	If the rack is not moved out within the specified time, an alarm message will be generated and displayed on the monitoring client.
Overtime Reminder Time for Supplement Rack (s)	Optional	If the rack is not replenished in place within the specified time, alarm information will be generated and displayed on the monitoring client.

2.1.4 Add Map Line

In the roam mode, select a line and set its property.

Table 2-4 Line Attribute

Field	Attribute	Description
Speed	Required	It set the AGV's speed when running. The speed is configured by RCS service by default.
Patrol or Not	Required	AGV executes patrolling or not.
Laser Mode	Required	It includes by distance and all sections.
Laser Configuration	Optional	It refers to the laser solution used when the AGV is running on the road.
Laser Solution of Carrying Rack	Optional	It refers to the laser solution used when the AGV with rack is running on the road.
Retreat to Avoid	Required	It allows the AGV to retreat on the road.
Rotate to the Line	Required	It allows the AGV to adjust head direction.
Accessible AGV	Required	It sets the allowed AGV type on the road.
Auto Online	Required	AGV executes auto online.
Obstacle Avoidance Sensor Switch	Optional	It refers to the obstacle avoidance devices like TOF, laser, ultrasound, etc.
Start/End Direction	Required	You need to set this parameter if the map element are arc and curve. **Note** You must set line attribute if there is a curve.
Left/Right Lane Line	Required	It sets the left and right distance from the marking line to the center of the road. It helps AGVs patrol.
Left/Right Obstacle Avoidance Margin	Optional	It is used to configure SLAM AGV.
Allowed Rack Type	Optional	It selects the rack type to be admitted on the line attribute. Multiple choices are allowed.
Allowed Container Type	Optional	Forklift business, the type of container admitted on the line attribute, multiple choices are allowed.

2.1.5 Edit Map Info.

You can edit the map info, including export the map, parse the map, verify the map, import the typographic map, modify the map information, and so on.

Figure 2-6 Edit Map Info.

- Export: Export the map in xml format.
- Import Typographic Point: Import the coordinates of points in batch.
- Parse: Parse the map into data. Note that only parsed elements can be parsed in the map. After parsing, you can view the map data in the Map Data module.
- Verify: Verify the map to avoid errors. It may verify following items:
  - Isolated Point: A point is not connected by any line.
  - Route of Charge Station: No route is set for the charge station, or the entrance route is not same as the exit route.
  - No charge station in the map.
  - The line is repeated.
  - Navigate coordinate.
  - The point is not initialized.
  - Stopping points quantity is less than the AGV quantity.
- Edit map information:

Table 2-5 Map Information

Field	Attribute	Description
Map ID	Created automatically	The only identification of the map, and it cannot be edited after entering.
Name	Required	The map name, and it can be edited after entering.
Map Alias	Required	The map alias, and it can be edited after entering.
Location Code	Required	The location code should be corresponded with the map.
Rows	Required	The map rows, and it can be edited after entering.
Columns	Required	The map columns, and it can be edited after entering.
Grid Length	Required	The size of point.

Field	Attribute	Description
Grid Width	Required	The size of point.
Configuration	Required	Point configuration: It indicates that rack angle is configured according to point. At this time, the rack direction (represents the absolute angle of rack posture at the topological point, including the placed rack and the rack carried by the AGV. The horizontal indicates 0° or 180°, and the vertical indicates -90° or 90 °) configuration item takes effect. Line configuration: It indicates that rack angle is configured according to line, and the rack angle in the line attribute can be configured. The rack direction in the point attribute will not be displayed.
Refresh Map	Required	● If this parameter is not enabled, you need to set default rack parameter. ● If this parameter is enabled, you cannot set rack direction as omnidirectional in point attribute, which may cause AGV to enter failed.
Map Direction	Required	It is 0° by default. You need to set it according to map direction when switches to another map.

- Delete: You can click **Delete** to delete added maps. If devices are added in the map, and map cannot be deleted. You need to delete devices first before deleting the map.

2.1.6 Edit Warehouse Area

Add Warehouse Area

Follow steps to add the warehouse area type.

Steps:

Step 1 Select a map, and click 

to enter warehouse area type editing page.

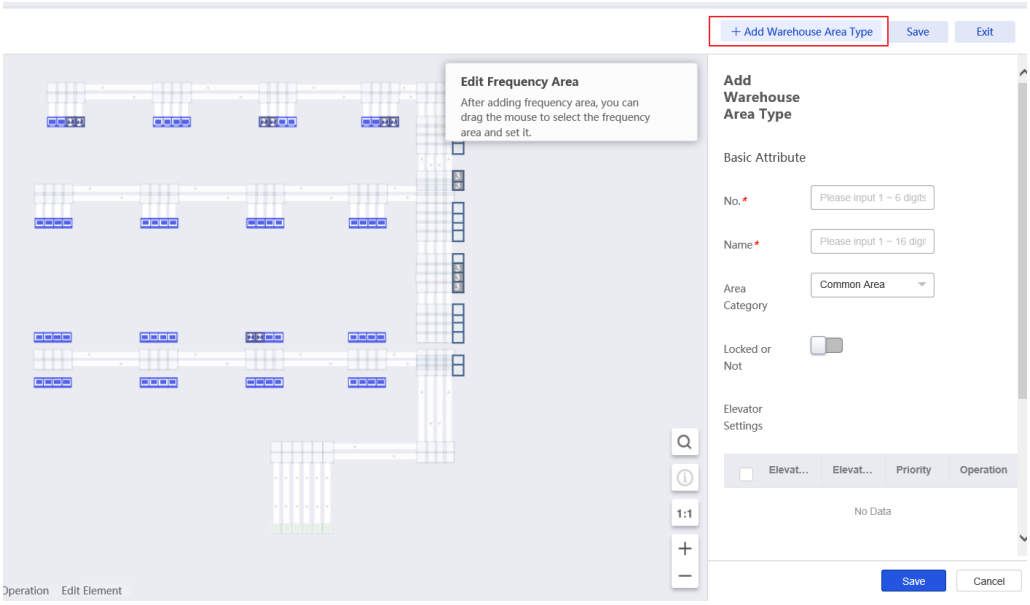


Figure 2-7 Add Warehouse Area Type

Step 2 Click **Add Warehouse Area Type**.

Step 3 Enter No., and Name, and set a type. You can refer to table below for field details.

Step 4 (Optional) Set Locked or Not, and Elevator Settings.

If you set **Locked or Not** as No, the system may prompt “Locking failed.” even the upper system locked this area.

In Elevator Settings, you can set the elevator priority for this area.

Step 5 Click **Save**.

Table 2-6 Field Description

Field	Attribute	Description
No.	Required	The only number of the area, and it cannot be edited after entering.
Name	Required	The name of the area.
Area Category	Required	Four kinds of warehouse area type available: Common Area, Road Way Area, Joint In Area, and Joint Out Area. ● Common Area: Refers to a common area. ● Roadway Area: Refers to a roadway area for storing materials. ● Inbound Transferring Area: Refers to the docking area for the forklift AGV and the latent AGV during the inbound process.

Field	Attribute	Description
		● Outbound Transferring Area: Refers to the docking area for the forklift AGV and the latent AGV during the outbound process. ● Clearing Area: AGV in this area will be moved out and AGV outside this area is prohibited into it. ● Conveyor Line Area: In this area, the CTU first completes task of sending material and then executes receiving material task. ● Vehicle Control Area: It sets the min. number of AGV in the area, which is dynamically controlled by the algorithm ● CTU Control Area: It sets the max. number of CTU in the area, which is dynamically controlled by the algorithm.
Elevator Settings	Optional	It sets the elevator priority in the area.

Add Frequency Priority

After adding the warehouse area, you can set the frequency/non-frequency property for the warehouse area.

Steps:

Step 6 Add Area with Different Frequency Priority.

1) Select one warehouse area, and click **Add** to enter to frequency priority settings page.

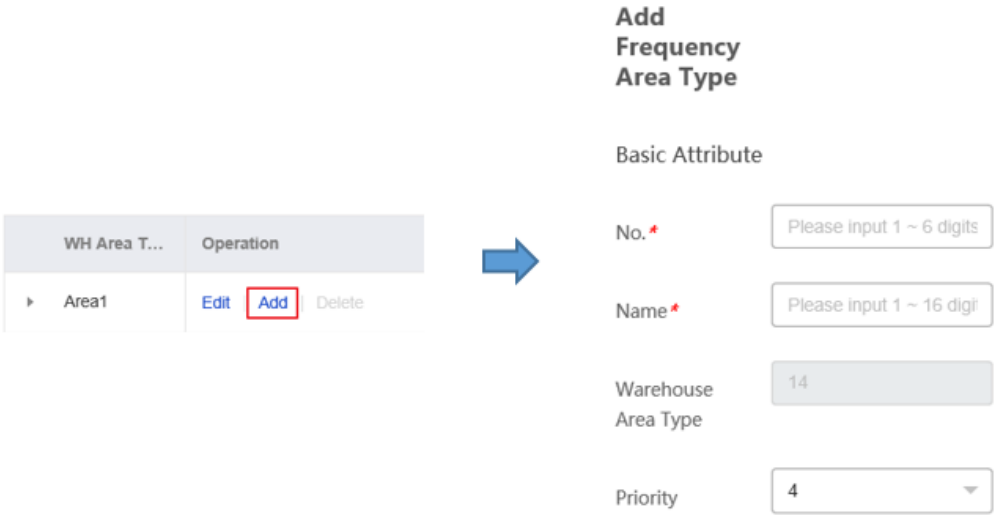


Figure 2-8 Set Frequency Priority

2) Set No and name.
3) Set Priority. The less the number is, the more frequency the area is.

Table 2-7 Field Description

Field	Attribute	Description
No.	Required	The only number of the storage area, and it cannot be edited after entering.
Name	Required	The name of the storage area.
Priority	Required	The priority of the storage area.

Step Result:

A item of Area with Frequency Level may be generated.

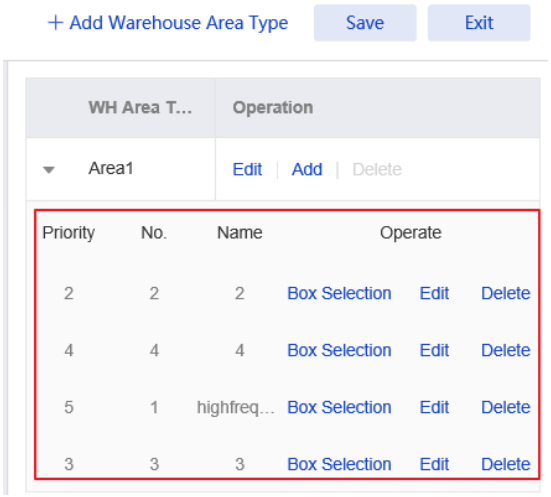


Figure 2-9 Item of Area with Frequency Level

Step 7 Edit frequency area.

4) Select one item of Area with Frequency Level, and click Box Selection.
5) Select storage sections.

You can add the storage section singly or in batch.

- Add a single storage section: Click the mouse to select a single storage section.
- Add storage sections in batch: Click and drag the mouse to select storage sections in batch.

Step 8 Click **Roam** to complete settings.

2.1.7 Add Peripherals

You can add peripherals in the map. Following kinds of peripherals are available: Traffic Light, Charge Station, Auto Door, Air Shower Door, and Others (Camera, Cargo Detection Device, Transmission Line, Pallet, and Roller).

Add Traffic Light

Steps:

Step 1 Select the peripheral type: Traffic Light.

Step 2 Click **Add Peripherals**.

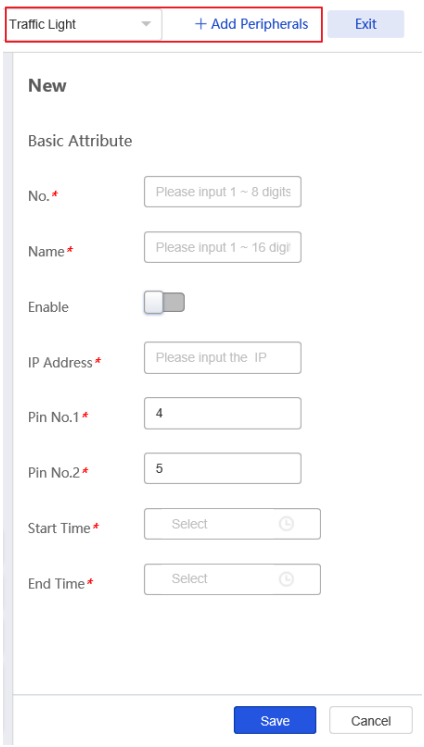


Figure 2-10 Add Traffic Light

Table 2-8 Field Description

Field	Attribute	Description
No.	Required	The only identification of traffic light, and it cannot be edited after entering.
Name	Required	The traffic light name.
Enable	Optional	It enables or disables traffic light.
IP Address	Required	The IP address of traffic light.

Field	Attribute	Description
Start Time	Required	The start working time of traffic light.
End Time.	Required	The end working time of traffic light.

Step 3 Set relevant parameters: No., Name, IP Address, Start Time, and End Time.

Step 4 Enable the traffic light, and click **Save**, and then an item of traffic light information is generated.

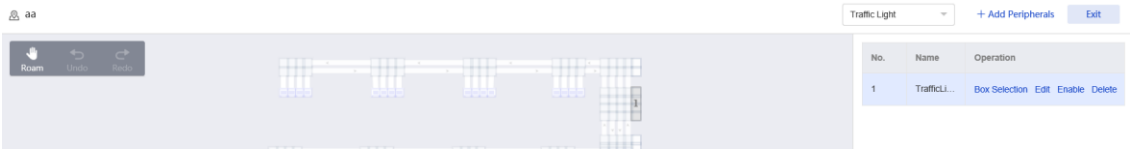


Figure 2-11 Item of Traffic Light Info.

Step 5 Select an area which is under the management of the traffic light.

1) Click **Box Selection**.
2) Click and drag the mouse to select storage sections.

Step 6 Click **Roam** to complete settings.

Add Wireless Charge Station

Charge station here refers to the wireless charge station. Make sure you have added the charge station element in the system before you start adding charge station to the map.

Table 2-9 Field Description

Field	Attribute	Description
No.	Required	The only identification of the device, and it cannot be edited after entering.
Peripheral Type	Required	It cannot be edited.
Box Selection	Required	After adding, select in the map.

Steps:

Step 1 Select the peripheral type: Charge Station.

Step 2 Click **Add Peripherals**.

Step 3 Set the charge station No. and click **Save**.

Step 4 Click **Box Selection**, and click the storage section.

Step 5 Click **Roam** to complete settings.

Add Auto Door

Steps:

Step 1 Select the peripheral type: Auto Door.

Step 2 Click **Add Peripherals**.

Step 3 Set relevant parameters, and click **Save**.

IP Address: If the auto door is connected to the WCS system, the IP address and the port are required.

Step 4 Click **Box Selection**, and click the storage section.

Step 5 Click **Roam** to complete settings.

Table 2-10 Field Description

Field	Attribute	Description
No.	Required	The only identification of the device, and it cannot be edited after entering.
Peripheral Type	Required	It cannot be edited.
Box Selection	Required	After adding, select in the map.
IP Address	Optional	● If the air shower door is connected to the WCS system, the IP address and the port are required. ● If the air shower door is connected to the REST system, the IP address and the port are optional.
Port	Optional	● If the air shower door is connected to the WCS system, the IP address and the port are required. ● If the air shower door is connected to the REST system, the IP address and the port are optional.

Add Air Shower Door

Steps:

Step 1 Select the peripheral type: Air Shower Door.

Step 2 Click **Add Peripherals**.

Step 3 Set relevant parameters, and click **Save**.

IP Address: If the air shower door is connected to the WCS system, the IP address and the port are required.

Step 4 Click **Box Selection**, and click the storage section.

Step 5 Click **Roam** to complete settings.

Table 2-11 Field Description

Field	Attribute	Description
No.	Required	The only identification of the device, and it cannot be edited after entering.
Peripheral Type	Required	It cannot be edited.
Front Air Shower Door	Required	The two doors of air shower door.
Back Air Shower Door	Required	The two doors of air shower door.
Enable	Optional	It enables or disables the device.
IP Address	Optional	● If the air shower door is connected to the WCS system, the IP address and the port are required. ● If the air shower door is connected to the REST system, the IP address and the port are optional.
Port	Optional	● If the air shower door is connected to the WCS system, the IP address and the port are required. ● If the air shower door is connected to the REST system, the IP address and the port are optional.

Add Charge Station

Steps:

Step 1 Select the peripheral type: Charge Station.

Step 2 Click **Add Peripherals**.

Step 3 Set relevant parameters, and click **Save**.

Table 2-12 Field Description

Field	Attribute	Description
No.	Required	The only identification of the device, and it cannot be edited after entering.
Peripheral Type	Required	It cannot be edited.
Coordinate Information	Required	You can select in the map after adding.

Step 4 Click Add Associated Point to add associated points after adding charge station.

Note

One charge station can add 5 associated points at most.

Step 5 Select elements in the map to associate.

Add Battery Swap Station

Steps:

Step 1 Select the peripheral type: Battery Swap Station.

Step 2 Click **Add Peripherals**.

Step 3 Set relevant parameters, and click **Save**.

Table 2-13 Field Description

Field	Attribute	Description
No.	Required	The only identification of the device, and it cannot be edited after entering.
Peripheral Type	Required	It cannot be edited.
Coordinate Information	Required	You can select in the map after adding.

Step 4 Select elements (should include battery swap station) in the map after adding.

Add Loader/Unloader

Steps:

Step 1 Select the peripheral type: Loader/Unloader.

Step 2 Click **Add Peripherals**.

Step 3 Set relevant parameters, and click **Save**.

Table 2-14 Field Description

Field	Attribute	Description
No.	Required	The only identification of the device, and it cannot be edited after entering.
Peripheral Type	Required	It cannot be edited.
Coordinate Information	Required	You can select in the map after adding.
Enable	Required	It enables or disables the device.
IP Address	Required	● If the device is connected to the WCS system, the IP address and the port are required. ● If the device is connected to the REST system, the IP address and the port are optional.
Port	Required	● If the device is connected to the WCS system, the IP address and the port are required. ● If the device is connected to the REST system, the IP address and the port are optional.
Layer No.	Required	The basic capacity of loader/unloader, the number of storage layers.
Column No.	Required	The basic capacity of loader/unloader, the number of storage columns.
Camera No.	Required	The camera number at the end of the conveyor line where the loader/unloader is connected.

Step 4 Select elements in the map after adding.

2.2 Inbound/Outbound Strategy Settings

In the in/outbound configuration page, you can add and delete inbound strategies and outbound strategies, or edit them. Make sure you have set storage areas in the map before you start setting the inbound/outbound strategy.

2.2.1 Add Inbound/Outbound Strategy

Steps:

Step 1 Click **Build Model -> Map Plan -> In/Outbound Config**.

Step 2 Click **Add**, and set relevant parameters.

Table 2-15 Field Description

Field	Attribute	Description
No.	Required	The only identification of the inbound/outbound strategy, and it cannot be edited after entering.
Name	Required	The name of the inbound/outbound strategy.
Map	Required	The map of applying inbound/outbound strategy.
Strategy Configuration	Required	Check storage areas, and click the arrow to adjust the inbound and outbound priority.

Step 3 Select storage areas.

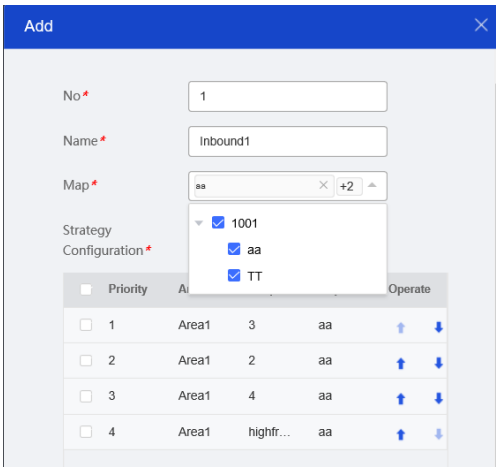


Figure 2-12 Add Inbound/Outbound Strategy

Step 4 Click the arrow to adjust the inbound and outbound priority.

Note

Note that the left arrow means the priority adjustment for the inbound strategy, and while the right arrow means the priority adjustment for the outbound strategy.

Step 5 Click **OK**.

2.2.2 Delete Inbound/Outbound Strategy

In the inbound and outbound strategy page, click **Delete** to delete added strategy.

2.3 Map Data Management

In the map data page, you can manage all map information.

2.3.1 Import/Export Map Data

Click **Build Model -> Map Plan -> Map Data** to enter the map data management page. Select filter condition, and click Import to import all data in excel format. You can import the excel after modifying the information.

2.3.2 Import/Export Virtual Rack

For the forklift AGV, it supports importing and exporting the virtual rack information.

2.4 Map Element Info.

2.4.1 Parse/Display Map Element

Click **Build Model -> Map Plan -> Map Element Details** to enter the map element management page. You can parse, de-parse, show, and hide the map element.

- **Parse:** Parsing the element is a prerequisite for the map parsing. Only the element whose status is parsed can be parsed when parsing the map.
- **Show:** After showing the element here, you can view it and add it when you add or edit the map.

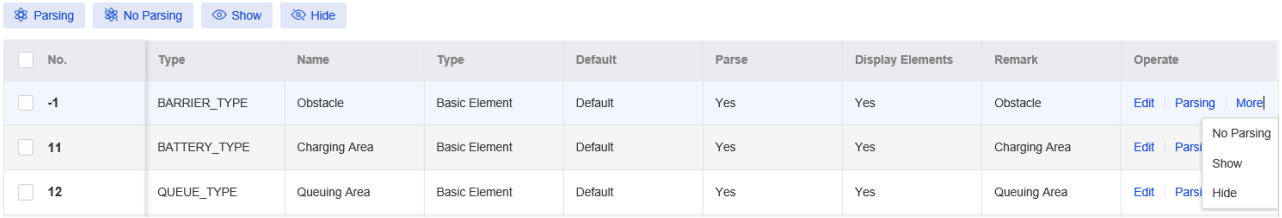


Figure 2-13 Parse/Display Map Element

2.4.2 Edit Map Element

Click **Build Model -> Map Plan -> Map Element Details** to enter the map element management page.
You can click **Edit** in **Operate** list to edit map element according to actual demands.

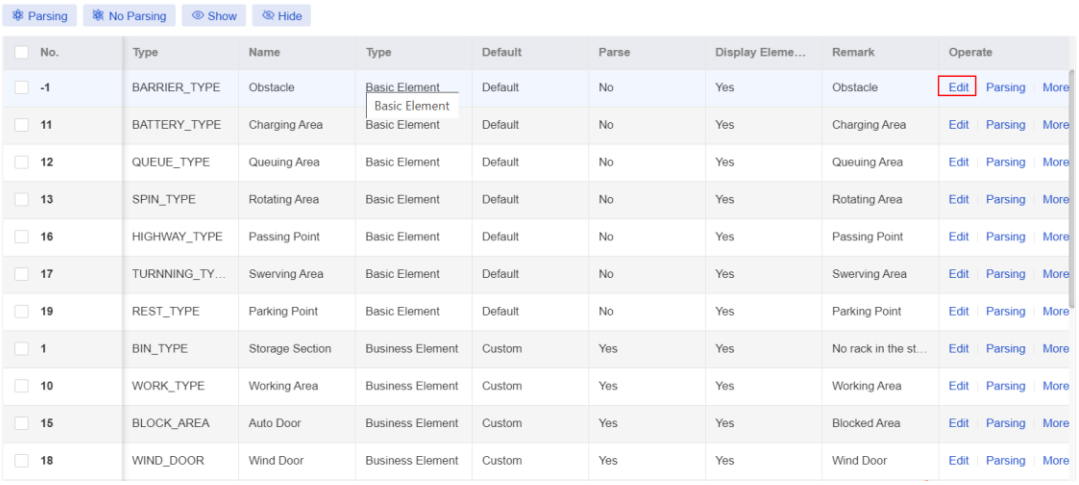


Figure 2-14 Click Edit

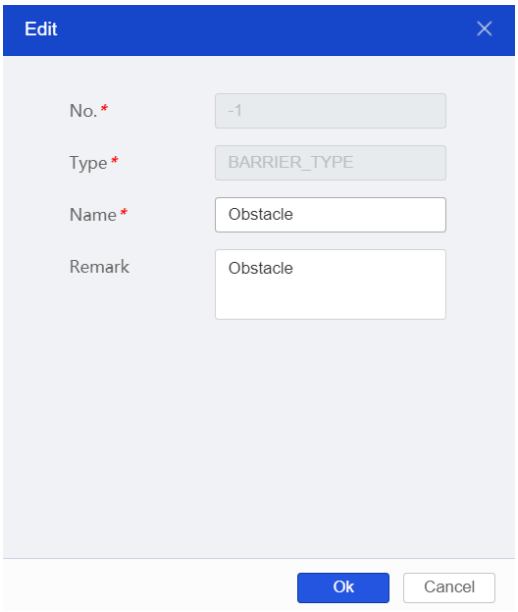


Figure 2-15 Edit Map Element

2.5 Manage Location Code

2.5.1 Add Location Code

Steps:

Step 1 Click **Build Model -> Map Plan -> Location Code** to enter the location code page.

Step 2 Click **Add**, and set relevant parameters.

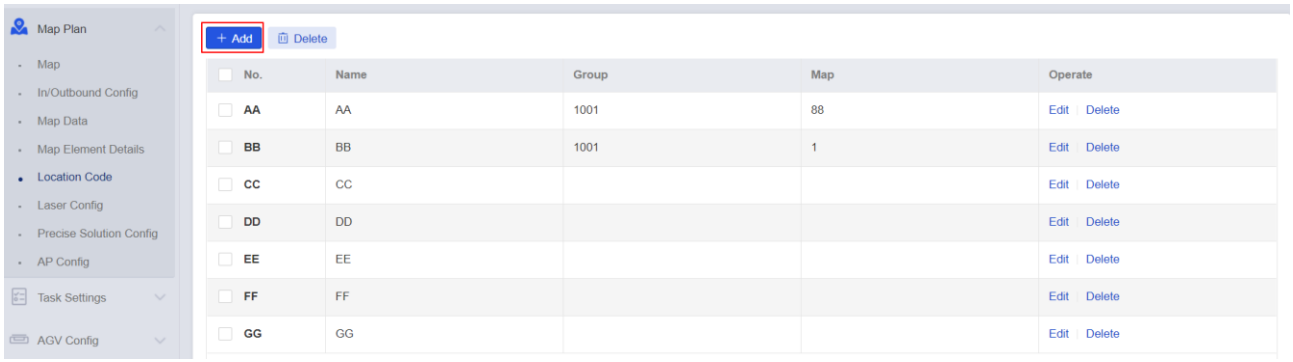


Figure 2-16 Click Add

Table 2-16 Field Description

Field	Attribute	Description
No.	Required	The only identification of location code, and it cannot be edited after entering.
Name	Required	The name of the location code.

Step 3 Click **OK** to save.

2.5.2 Delete Location Code

Check the location code that needs to be deleted, and click **Delete**. If the location code is linked with maps, it cannot be deleted.

2.6 Manage SLAM Map

Note

You should go to **Build Model -> System -> Scenario Settings** to check SLAM module first.

2.6.1 Add SLAM Map

Steps:

Step 1 Click **Build Model -> Map Plan -> SLAM Map**.

Step 2 Select a map you want to add SLAM map info.

Step 3 Click **Add**, and set its No. and its name.

Step 4 Click **OK**.

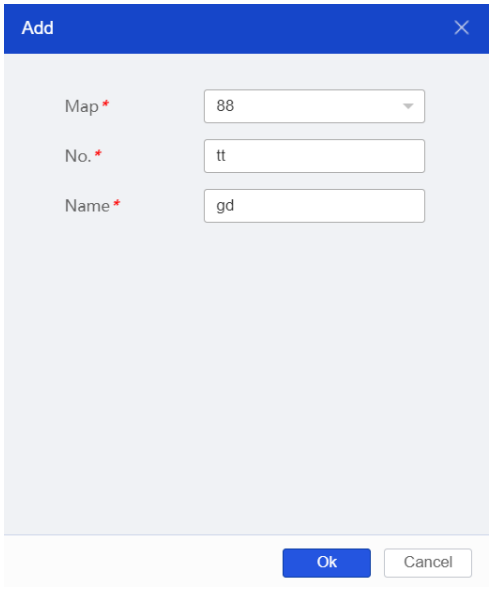


Figure 2-17 Add SLAM Map

2.6.2 Delete SLAM Map

Check the SLAM map you want to delete, click **Delete** to delete, and click **OK** to complete.

2.7 Laser Solution Settings

Via the laser solution settings, you can set the detection distance of the laser device, which is equipped with the AGV.

Steps:

Step 1 Click **Build Model -> Map Plan -> Laser Conifig**.

Step 2 Click **Add**, and select a map.

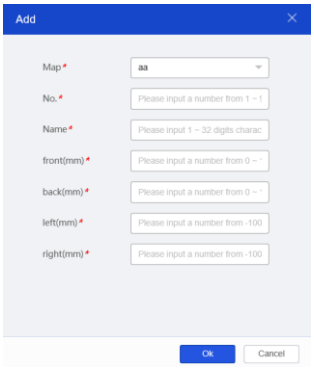


Figure 2-18 Design Menu

Table 2-17 Field Description

Field	Attribute	Description
Map	Required	The map that applies the laser solution.
No.	Required	The only identification of laser solution, and it cannot be edited after entering.
Name	Required	The name of laser solution.
Front	Required	The detection distance in front direction, and the unit is mm.
Back	Required	The detection distance in back direction, and the unit is mm.
Left	Required	The detection distance in left direction, and the unit is mm.
Right	Required	The detection distance in right direction, and the unit is mm.

Step 3 Set the laser detection distance (front, back, left, and right).

Step 4 Click **OK**.

Step 5 (Optional) Click **Delete** to delete the laser solution.

2.8 Precise Solution Settings

Via the precise solution settings, you can set the precise of the AGV action

Steps:

Step 1 Click **Build Model -> Map Plan -> Precise Solution Conifig**.

Step 2 Click **Add**, and select a map.

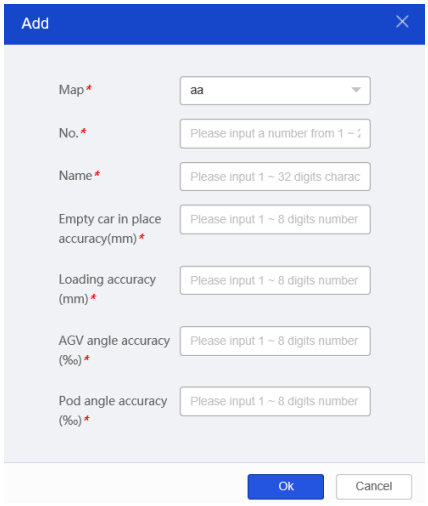


Figure 2-19 Precise Solution Settings

Step 3 Set relevant parameters.

Table 2-18 Field Description

Field	Attribute	Description
Map	Required	The map that applies the precise solution.
No.	Required	The only identification of precise solution, and it cannot be edited after entering.
Name	Required	The name of precise solution.
Empty AGV in place accuracy	Required	The location precise when the AGV arrives in the point.
Loading accuracy	Required	The loading accuracy when the AGV loads the material.
AGV angle accuracy	Required	The AGV angle accuracy when it moves.
Pod angle accuracy	Required	The rack accuracy when it is carried by the AGV.

Step 4 Click **OK**.

Step 5 (Optional) Click **Delete** to delete the precise solution.

2.9 Roadway Settings

In the window of roadway settings, you can see roadway number, map number, feature value, available outbound capacity, outbound lock capacity, available inbound capacity, inbound lock capacity, rack type/container type in roadway, roadway type, etc.

2.9.1 Add Roadway

Before adding a roadway, you need to draw the roadway in the map. Click **Add** and enter related parameters in the popped-up window.

2.9.2 Delete Roadway

Check the roadway that needs deleting, and click **Delete** to delete it.

Note

You cannot the roadway this is executing task or end of the roadway is not cleared.

2.9.3 Edit Roadway

Click **Roadway No.** to edit parameters of the corresponding roadways. The configurable parameters include roadway name, roadway type, rack/container type, ect.

Chapter 3 Task Settings

3.1 Task Template Settings

Task template defines the execution sequence of the AGV, all passing points of the AGV, and its destination.

3.1.1 Add Task Template

Steps:

Step 1 Click **Build Model -> Task Settings -> Task Template**.

Step 2 Click **Add**.

Step 3 Set parameters.

Step 4 Click **OK**.

Table 3-1 Field Description

Field	Attribute	Description
Task No.	Required	Unique number of task type. Cannot be modified after adding.
Task Name	Required	Describe the purpose of task type.
Interface Name	Required	Interface name for RCS-2000 CMS when executing the task type. Different applications correspond to different interfaces.
AGV Type	Optional	It refers to AGV type.
Rack Parameter	Optional	It can defines the parameters of rack that AGVs carry.
Remark	Optional	Other description for task type.
Task Priority	Required	The bigger the number, the higher the priority. The default value is 1.
Loop Execution	Required	Whether the task templates under the task type are loop executed. Set to No by default.

Field	Attribute	Description
Execute Multi-Task	Required	Whether tasks will be triggered according to task interval even if current tasks in task templates are not finished.
Cycle Finding Position/Rack	Optional	• Cycle finding rack: If there is no rack on start point, the system will search in cycle rather than task trigger failure. • Cycle finding position: If there is no position on start/end position, the system will search in cycle rather than task trigger failure.
Select Back Location	Optional	Whether AGV will locate back location at the start of the task.
Link Task Template	Optional	It is used to link two task templates.
Linking Elevator Mode	Optional	Link and configure elevator task type if the task is carried out on different floors.
Rack execute multi-task	Optional	Whether a rack can execute multiple tasks.
Verify Rack Code On End Point	Optional	Verify whether there is rack on end point. If there is rack, and task will be failed.
Task Timeout	Optional	It sets task time. If task time exceeds the configured value, and the system will send information on the homepage.
Interrupt Other Task	Optional	It is used in the scenario needs to be interrupted.
Monitor Cell Color	Optional	It is used for the display of CTU tasks in the monitoring client. Different task types can display the configured color in the monitoring client.

3.1.2 Set Task Template

Steps:

Step 1 Click **Build Model -> Task Settings -> Task Template**.

Step 2 Select a task template, and click **Config**.

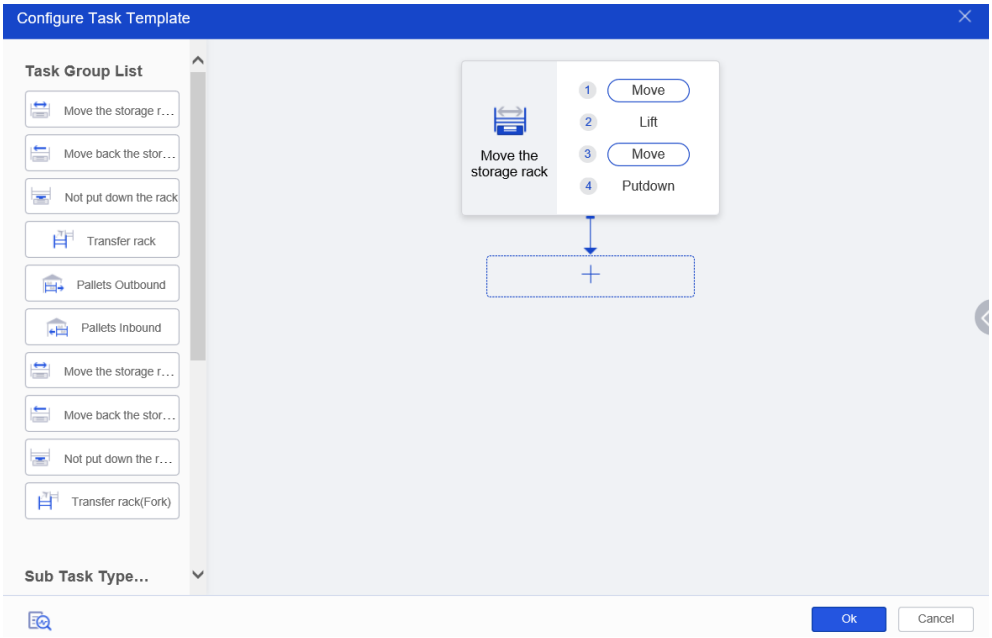


Figure 3-1 Set Task Template

Step 3 Drag items in sub task type list or task group list to the task template list on the left, and arrange them in order by dragging an item up or down.

Step 4 Click **OK** to go back the task template page.

Step 5 Select the task template, and click **Edit**.

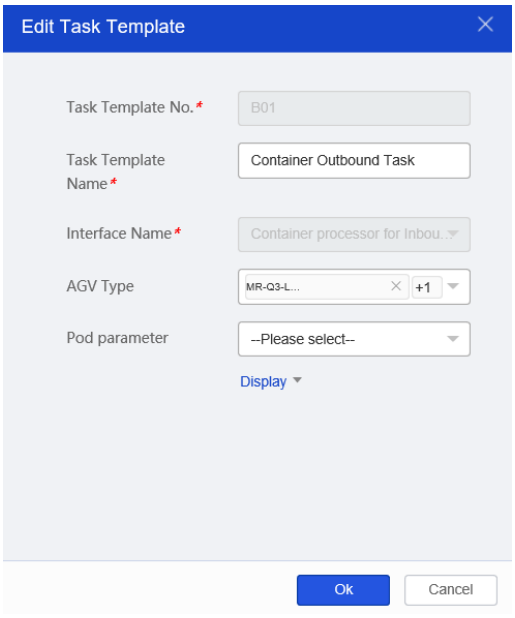


Figure 3-2 Edit Task Template

Step 6 Set corresponding parameters, and click **OK**.

Table 3-2 Field Description

Field	Attribute	Description
AGV Heading Towards	Required	The driving direction of AGV after it enters the target point, and default value is 1000. You can set is as 0, 90, 180, -90, and 999.
Locked	Optional	After the AGV is locked, the AGV will not be interrupted before the current task is completed.
Target Point Acquiring Method	Optional	It includes linked area, fixed locations, association point, current location, etc.
Notify Third-Party	Required	After enabling it, you need to enter following parameters: ● Third Party Type: After task is completed, the third party type that the RCS-2000 system notifies, including MES system and ladder control system. ● Third Party Application: After task is completed, the third party application type that the RCS-2000 system notifies. ● Third Party Path: After task is completed, the third party service address that the RCS-2000 system notifies. ● Third Party Calling Method: It includes TCP/REST/SOAP. ● Method Name (Task Begin): After task is started, the third party service method name that the RCS-2000 system notifies. ● Method Name (Task Complete):After task is completed, the third party service method name that the RCS-2000 system notifies.
Trigger	Required	It is disabled by default. If it is enabled, you need to select specific trigger type according to actual demands.

Field	Attribute	Description
Trigger Type	Required	It includes task number, call sign, AGV current position, AGV code, Rack No. etc.
Record Rack No.	Optional	If it is enabled, the target point of this moving subtask needs to manage the rack. After the task of transporting the rack is completed, the rack number will be recorded in the destination storage location map data.
Stopping Duration	Optional	It sets the stopping duration of AGVs, and the unit is sec.
Change Rack	Optional	One task type supports moving multiple racks.
Unlink Rack Material or Not	Optional	After lowering racks, clearing the workbin attribute should be decided according to actual conditions.
Move to Cache	Optional	If the target point is not available, the rack will be automatically moved to the cache area associated with the end point. When the target point is available, a task is automatically generated to transport the rack to the target point.

Note

In V3.2 version and above of RCS-2000, task reporting messages are allowed to notify multiple third parties.

3.1.3 Delete Task Template

Click **Delete** in the **Operate** list to delete task template, and click b to complete.

3.1.4 Import/Export Task Template

Export: Select the task template to be deleted in the task template list on the right. Click **Export** to pop up a prompt box and select the save path as shown below.

Import: Click Import to pop up a prompt box and select the import file path as shown below.

Supported Import Formats: rar or xml.

Figure 3-3 Import Task Template

Note

If the imported task template number is duplicate with the existing task template number in the system, the system will give a prompt interface, which can be modified directly, as shown in the figure below

Figure 3-4 Modify Number

3.1.5 Duplicate Task Template

In the task template page, select a task template and click Copy. Enter task template No. and name, and click OK. Then, the parameters may be copied to the selected one.

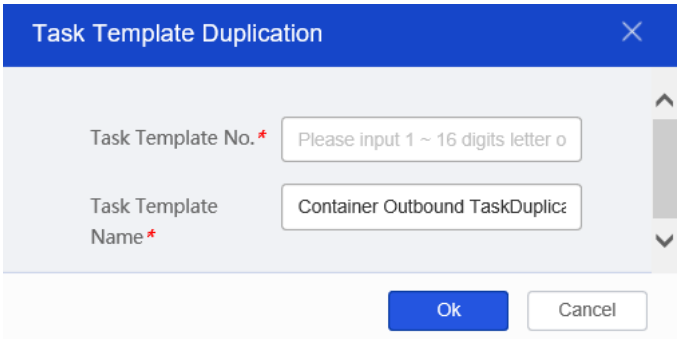


Figure 3-5 Duplicate Task Template

3.2 Sub Task Type Settings

3.2.1 Safety Detection

Default sub task type adds S023 safety detection.

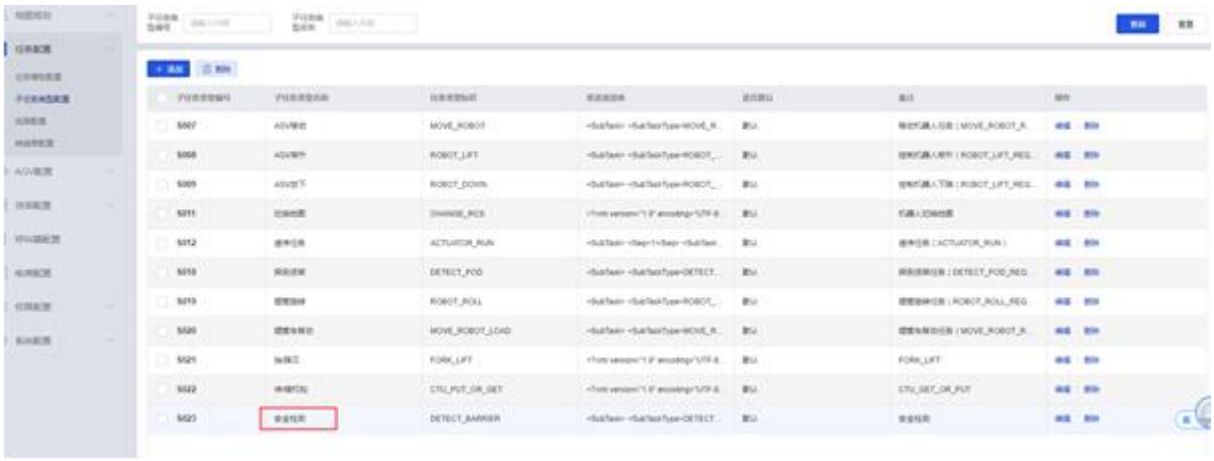


Figure 3-6 Add Safety Detection

3.2.2 Add Sub Task Type

Steps:

Step 1 Click **Build Model -> Task Settings -> Sub Task Type**.

Step 2 Click **Add**.

Step 3 Set parameters.

Table 3-3 Field Description

Field	Attribute	Description
Sub Task Type No.	Required	The unique No. of sub ask type, and it cannot be edited after entering.
Sub Task Type Name	Required	The name of sub task type.
Task Type Identification	Required	It is used to communicate with RCS.
Send Message Body	Required	The basic message content sent to RCS.
Remark	Required	Other remarks.

Step 4 Click **OK**.

3.2.3 Delete Sub Task Type

Check the sub task type you want to delete, click **Delete** to delete, and click **OK** to complete.

Note

The sub task type that is associated with the task template cannot be deleted, and the default sub task type also cannot be deleted.

3.3 Route Settings

The task point that the AGV needs to pass through to perform the task is defined by the route, and the route number can be imported in the task template to generate the carry task.

3.3.1 Add Route

Steps:

Step 1 Click **Add** to open adding window.

Step 2 Enter parameters according to actual demands.

Step 3 Click **Save**.

Table 3-4 Field Description

Field	Attribute	Description
Affiliated Map	Required	It is the route's map.

Field	Attribute	Description
Point Type	Required	It selects the point type associated with the route.
Calling Position	Required	The specific task call position (path position) after selecting the point type.
No.	Required	It is the route's number.
Task Template	Required	It is the task template of the corresponding route.

3.4 Transfer Order Settings

3.4.1 Add Transfer Order Type

Steps:

Step 1 Click **Build Model -> Task Settings -> Transfer Order Settings**.

Step 2 Click **Add**.

Step 3 Set parameters.

Table 3-5 Field Description

Field	Attribute	Description
Transfer Category	Required	The category of transfer order.
Transfer Order Type No.	Required	The unique No. of transfer order.
Transfer Order Type Name	Required	The unique name of transfer order.
Original Order Type	Required	The original order type.
Task Temple	Required	The task template of transfer order.
Inbound Strategy	Optional	The inbound strategy of transfer order.

Step 4 Click **OK**.

3.4.2 Delete Sub Task Type

Check the transfer order type you want to delete, click **Delete** to delete, and click **OK** to complete.

Chapter 4 AGV Management

4.1 AGV Type Management

Click **Build Model -> AGV Config -> AGV Type** to enter the AGV type management page. In this page, you can add AGV type, enable/disable the AGV type, and delete the AGV type.

4.1.1 Add AGV Type

Steps:

Step 1 Click **Build Model -> AGV Config -> AGV Type**, and click **Add**.

Step 2 Select a device type: LMR series, Transfer series, FMR series, CTU series.

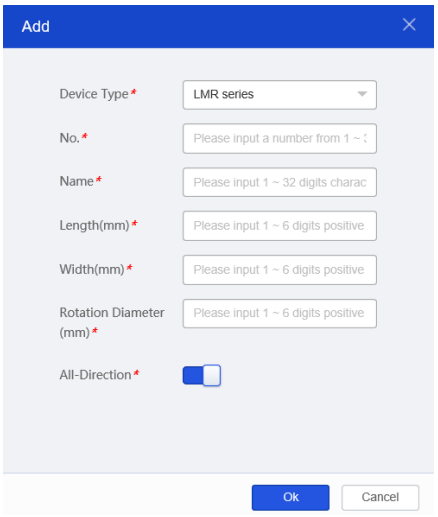


Figure 4-1 Add AGV Type

Step 3 Enter corresponding parameters.

Table 4-1 Field Description

Field	Attribute	Description
Device Type	Required	It refers to the category that the device belongs to.
No.	Required	The unique No. of device type, and it cannot be edited after entering.
Name	Required	The name of device type.
Alias	Required	The alias of device type.
Length	Required	The device length of the device, and unit is cm.

Field	Attribute	Description
Width	Required	The device width of the device, and unit is cm.
Rotation Diameter	Required	The rotation diameter that the system is calculated according to length and width, and it can be edited.
All-Direction	Required	If it is enabled, and it will be an all-directional AGV.

Step 4 Click **Save**.

4.1.2 Delete AGV Type

Check the AGV type you want to delete, click **Delete** to delete, and click **OK** to complete.

4.1.3 Enable/Disable AGV Type

Select an AGV type, and click Enable or Disable to enable or disable it.

4.1.4 Update AGV

Select an AGV type, click **Update**, and select updating package to update.

4.2 Charging Strategy Settings

In the charging strategy settings, you can set the charging threshold, and the start time and end time of charging.

4.2.1 Add Charging Strategy

Steps:

Step 1 Click **Build Model -> AGV Config -> Charging Strategy**.

Step 2 Click **Add**.

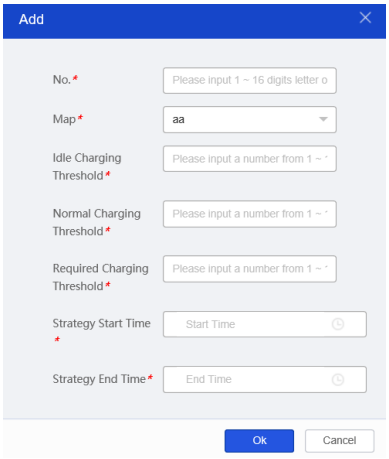


Figure 4-2 Add Charging Strategy

Step 3 Set a strategy No., and link a map.

Step 4 Set charging threshold, charging start time, and charging end time.

Table 4-2 Field Description

Field	Attribute	Description
No.	Required	The unique No. of charging strategy, and it cannot be edited after settings.
Map	Required	The map that applies the charging strategy.
Idle Charging Threshold	Required	The battery level after the AGV completes charging task.
Normal Charging Threshold	Required	The battery level when the AGV is charging in normal condition.
Required Charging Threshold	Required	The required battery level for the AGV.
Strategy Start Time	Required	The start time of applying charging strategy.
Strategy End Time	Required	The end time of applying charging strategy.

Note

The applying time of charging strategy cannot be overlapped with other charging strategy in the same map.

4.2.2 Delete Charging Strategy

Check the charging strategy you want to delete, click **Delete** to delete, and click **OK** to

complete.

4.2.3 Enable/Disable Charging Strategy

Select a charging strategy, and click Enable or Disable to enable or disable it.

4.3 AGV Settings

4.3.1 Add AGV

Steps:

Step 1 Click **Build Model -> AGV Config -> AGV Config**.

Step 2 Click **Add**.

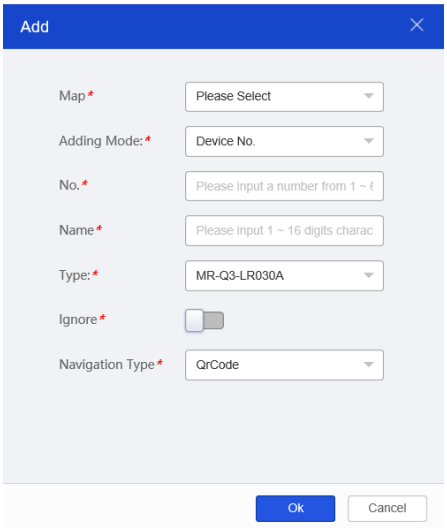


Figure 4-3 Add AGV

Table 4-3 Field Description

Field	Attribute	Description
Map	Required	It selects maps.
Adding Mode	Required	It adds by device number or segment number.
No.	Required	The device number.
Name	Required	The device name.
Type	Required	The device type.
Ignore	Optional	If it is enabled, the system will ignore version.

Field	Attribute	Description
Navigation Type	Required	It includes 2D barcode, laser navigation, or texture navigation.

Note

Adding AGVs may be failed if the current map does not add the RCS server.

Step 3 Select a map.

Step 4 Set Adding Mode.

If you set Adding Mode as Device No., you add the AGV one by one.

If you set Adding Mode as No. Segment, you add AGVs in batch.

Step 5 Set No. information, name, and AGV type.

Step 6 Set Navigation Type.

Step 7 Click **OK**.

4.3.2 Delete AGV

Check the AGV that you want to delete, click **Delete** to delete, and click **OK** to complete.

Note

If the selected AGVs are executing tasks, they cannot be deleted, and you need to stop the current device first in the remote RCS first.

4.3.3 Switch Map

Click **Build Model -> AGV Config -> AGV Config**, select an AGV, and click **Switch Map**, you can switch a map for the AGV.

Note

Make sure you have stopped the AGV before you start switching the map for it.

4.3.4 Export Device Info.

In the AGV Config page, select an AGV, and click Export to export AGV information.

4.3.5 Get Version Information

You can get the version information of the AGV's program.

4.4 AGV Status Settings

Note

In the AGV status Config page, maintain AGV status, language and AGV status description.

4.4.1 Add AGV Status

Steps:

Step 1 Enter AGV status Config page and click **Add** to add AGV status value, status type, AGV status description and other information as shown below.

Figure 4-4 Add AGV Status

4.4.2 Edit AGV Status

Support edit AGV status description as shown below.

Figure 4-5 Edit AGV Status

4.4.3 Delete AGV Status

Support delete the newly added AGV status data. It is forbidden to delete the default AGV status data.

4.5 Battery Management

The RCMS regularly receives the battery information reported by the RCS. The battery management displays the maintained battery information, including: battery level, cycle

times, last full maintenance time, last cycle times, device type and device number. The battery information can be searched according to the device type and device number.

Chapter 5 Rack Management

5.1 Storage Bin Settings

To build an intelligent warehouse, you should add Storage Bin, Rack, Container, and PTL in order.

5.1.1 Add Storage Bin Type

Steps:

Step 1 Click **Build Model -> Rack Settings -> Bin Type**.

Step 2 Click **Add,** and select a group.

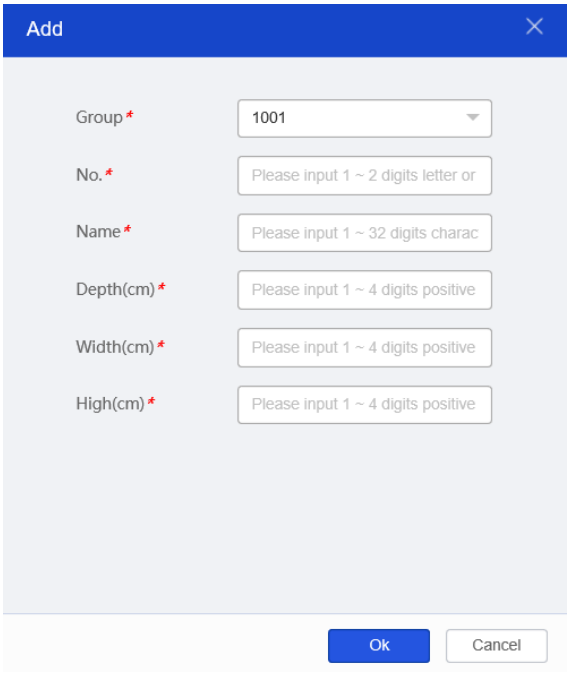


Figure 5-1 Add Storage Bin Type

Step 3 Set parameters and click **Save**.

5.1.2 Delete Storage Bin Type

Check the storage bin type that you want to delete, click **Delete** to delete, and click **OK** to complete.

Note

The storage bin type that has been used by rack type cannot be deleted.

5.1.3 Configure Passage

It configures passage for the storage bin in the map, and is used for WMS storage bin distribution and CTU task distribution.

5.2 Rack Parameter Settings

5.2.1 Add Rack Parameters

Steps:

Step 1 Click **Build Model -> Rack Settings -> Rack Parameters**.

Step 2 Click **Add** to add rack parameters.

Step 3 Set relative parameters.

Step 4 Click OK.

Table 5-1 Field Description

Field	Description
Name	The name of rack parameter.
Type	It includes towing pods, tray, and ordinary pods.
Length	The rack length, and you need to set it 50 mm larger than the actual one.
Width	The rack width, and you need to set it 50 mm larger than the actual one.
Leg Length	The rack leg length in X direction. If racks have wheels, and it should be calculated according to wheel's length and width. If racks are tray, this parameter can be ignored.
Leg Width	The rack leg length in Y direction. If racks have wheels, and it should be calculated according to wheel's length and width. If racks are tray, this parameter can be ignored.
Leg Height	The distance between rack leg and tray in Z direction. It is used by the forklift.

Field	Description
Inner X	The inner distance between two rack legs in X direction. If the type is tray, and this parameter can be ignored.
Inner Y	The inner distance between two rack legs in Y direction. If the type is tray, and this parameter can be ignored.
Anti-Static Chain Orientation	If the rack has no chain and you should select default. If the rack has chai, and you should select the chain's rack angle direction
Whether to Blind Move	You should enable this parameter if there is no code.
AGVs to Rotate	It selects AGV type that can rotate under the rack.
AGVs Enter Through Shorter Side	It selects AGV type that can enter through rack's short side.
Rack Offset	It is used to configure the rack of tractor.

5.2.2 Delete Rack Parameters

Check the rack parameters that you want to delete, click **Delete** to delete, and click **OK** to complete.

Note

If rack has been used by the rack type, and the rack parameter cannot be deleted.

5.3 Rack Type Settings

5.3.1 Add Rack Type

Make sure you have set the storage bin type and the rack parameter template.

Steps:

Step 1 Click **Build Model -> Rack Settings -> Rack Type**.

Step 2 Click **Add**.

Step 3 Set parameters, and select a rack parameters template.

Table 5-2 Field Description

Field	Attribute	Description
Group	Required	Map group of rack type.
No.	Required	Unique number of rack type.
Name	Required	Unique name of rack type.
Property	Required	1. Storage Rack: If it is defined as a storage rack, the data managed by the rack will be synchronized to the upper level (The “WMS basic data synchronization” needs to be enabled in the system parameter configuration). 2. Moving Rack: If it is defined as moving rack, the data managed by rack will not be synchronized to the upper level. 3. Virtual rack is used in CTU and forklift projects. A: High rack. (it is real but cannot move.) B: PTL used in CTU project. C: Roadway in forklift project. D: Relay point between forklift and latent AGV.
Synchronize WMS	Required	If it is enabled, data will be synchronized to WMS.
Whether Fixed	Required	You can select yea or no according to actual demands.
Pod Parameter	Required	It refers to rack parameters.
Weight	Required	It refers to rack weight.
Layers	Required	It refers to layer quantity of rack.
Rack Direction	Required	It includes east, south, west, north, and central.
Grid Count	Required	It refers to bin’s grid quantity in specific rack layer.
Bin Type	Required	It refers to bin type in specific rack layer.

Step 4 Click **Done**.

5.3.2 Delete Rack Type

Check the rack type that you want to delete, click **Delete** to delete, and click **OK** to complete.

Note

If the rack type has rack, and then it cannot be deleted.

5.4 Rack Management

5.4.1 Add Rack

Steps:

Step 1 Click **Build Model -> Rack Settings -> Rack Management**.

Step 2 Click **Add**.

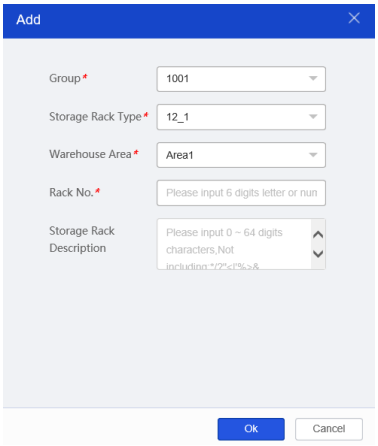


Figure 5-2 Add Rack

Step 3 Set group, storage bin type, warehouse area, etc.

Table 5-3 Field Description

Field	Attribute	Description
Group	Required	It refers to the group that rack locates.
Storage Rack Type	Required	It refers to the storage type that rack locates.
Warehouse Area	Required	It refers to the rack's warehouse area.
Rack No.	Required	The unique number of rack.

Field	Attribute	Description
Storage Rack Description	Required	The description information of rack.

5.4.2 Delete Rack

Check the rack that you want to delete, click **Delete** to delete, and click **OK** to complete.

Note

If the rack is in frozen status, and then it cannot be deleted.

5.4.3 Download Template and Import/Export

In the rack management page, you can click Download the template to download excel template. Click Import or Export to import or export rack information in batch.

5.4.4 Freeze/Unfreeze Rack

In the rack management page, you can check rack that needs to be frozen or unfrozen, and click Unfreeze or Freeze according to actual demands.

Note

You need to enter reason for freezing racks.

5.5 Storage Bin Management

5.5.1 Freeze/Unfreeze Storage Bin

In the storage bin management page, you can freeze and unfreeze storage bin. When the storage bin is unfrozen, it is available.

5.5.2 Export Storage Bin Info.

Steps:

Step 1 Check the bin to be exported in the bin management list, click **Export** and pop up the prompt box, click **Save** to export the selected bin data as shown below.

Step 2 Click **Import** to import files from local PC to import.

5.6 Container Type Management

5.6.1 Add Container Type

Steps:

Step 1 Click **Build Model -> Rack Settings -> Carton Type**.

Step 2 Click **Add**.

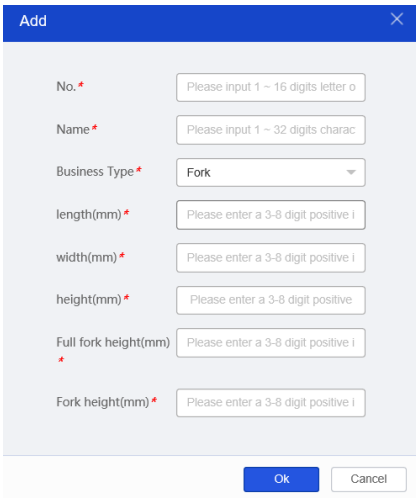


Figure 5-3 Add Container

Step 3 Set parameters.

Step 4 Click **OK**.

Table 5-4 Field Description

Field	Attribute	Description
No.	Required	The unique number of the container type.
Name	Required	The unique name of the container type.
Business Type	Required	It includes fork and CTU.
Length	Required	The depth of the container.
Width	Required	The width of the container.
Height	Required	The height of the container.
Full Fork Height	Required	The full-loaded fork height
Fork Height	Required	The empty-loaded fork height.
Blind Lift	Required	It is off by default.

The code scanning position is added in the CTU container type. The code scanning positions are divided into non-verification, side and top. If select the side or top, the scanning height is configured. If select non-verification, the scanning height will not be displayed.

Figure 5-4 Add Code Scanning Position

5.6.2 Delete Container Type

Check the container type that you want to delete, click **Delete** to delete, and click **OK** to complete.

Note

If the container type that you want to delete has containers, and then it t cannot be deleted.

5.6.3 Download, Export and Import Template

Steps:

Step 1 Click **Download Template** to download Excel.

Step 2 Click **Import** to upload the Excel.

Step 3 Click the container type to be exported, and click **Export** to export Excel.

5.7 Frameless Rack Container Management

It is used to display the storage capacity of the forklift stacking business. The data comes from the rack management (multi-layer frameless rack type).

Table 5-5 Field Description

Field	Description
Rack No.	It is rack's number.
Organization	It is the organization the rack in.
Rack Type	It is the rack's type.

Field	Description
Warehouse Area	It is the warehouse are.
Available Inbound Capacity	It is the remaining stacking bin quantity.
Inbound Locked Capacity	It is locked stacking bin quantity.
Available Outbound Capacity	It is the remaining unstacking bin quantity.
Outbound Locked Capacity	It is locked unstacking bin quantity.
Container Type	It is the container type of the corresponding rack.
Bin No.	It is the bin No. in the rack.
Container No.	It is the container No. in the bin.
Locked Task No.	It is the locked task No.
Pickup and Putaway Mark	It marks whether it is pickup or putaway task.

5.8 PTL Management

The PTL management is used to add, delete and set PTL used in the CTU projects.

5.8.1 Add PTL

Steps:

Step 1 Click **Build Model -> Rack Settings -> PTL Management**.

Step 2 Click **Add**.

Step 3 Set parameters.

Table 5-6 Field Description

Field	Attribute	Description
Group	Required	The PTL's group.
Map	Required	The PTL's map.
PTL No.	Required	The unique number of the PTL.
Workstation No.	Required	The selected workstation number.

Step 4 Click **OK**.

5.8.2 Delete PTL

Check the PTL that you want to delete, click **Delete** to delete, and click **OK** to complete.

Chapter 6 Caller Settings

In the caller settings, you can manage callers, including adding or deleting them, and set the added caller, and get callers capacity set. Make sure you have finished WCS settings before you adding the caller.

6.1 Add Caller

Steps:

Step 1 Click **Build Model -> Beeper Config**.

Step 2 Click **Add**.

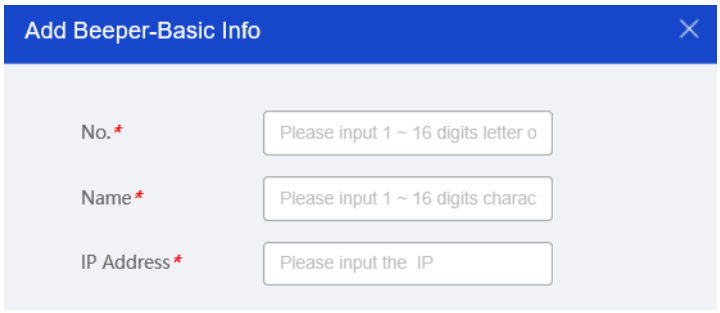


Figure 6-1 Add Caller

Step 3 Set parameters.

Table 6-1 Field Description

Field	Attribute	Description
No.	Required	The unique number of the caller.
Name	Required	The name the caller.
IP Address	Required	The IP address of the caller.

Step 4 Click **Next** to complete.

6.2 Delete Caller

Check the call that you want to delete, click **Delete** to delete, and click **OK** to complete.

6.3 Import/Export/Remotely Configure Caller

You can click different tool icons to set the caller.

Figure 6-2 Import/Export/Remotely Configure Caller

Table 6-2 Tool Description

Name	Description
Basic Import	It is used to import basic data of the caller like No., name, and IP address.
Configuration Import	It is used to import the specific information of the caller.
Basic Export	It is used to export the template of basic data.
Configuration Export	It is used to export the configured data of the caller.
Remote	It is to remotely configure the caller and notify the WCS.

6.4 Edit Caller Info.

In the caller management page, select a caller, and click **Setting** to set caller parameters.

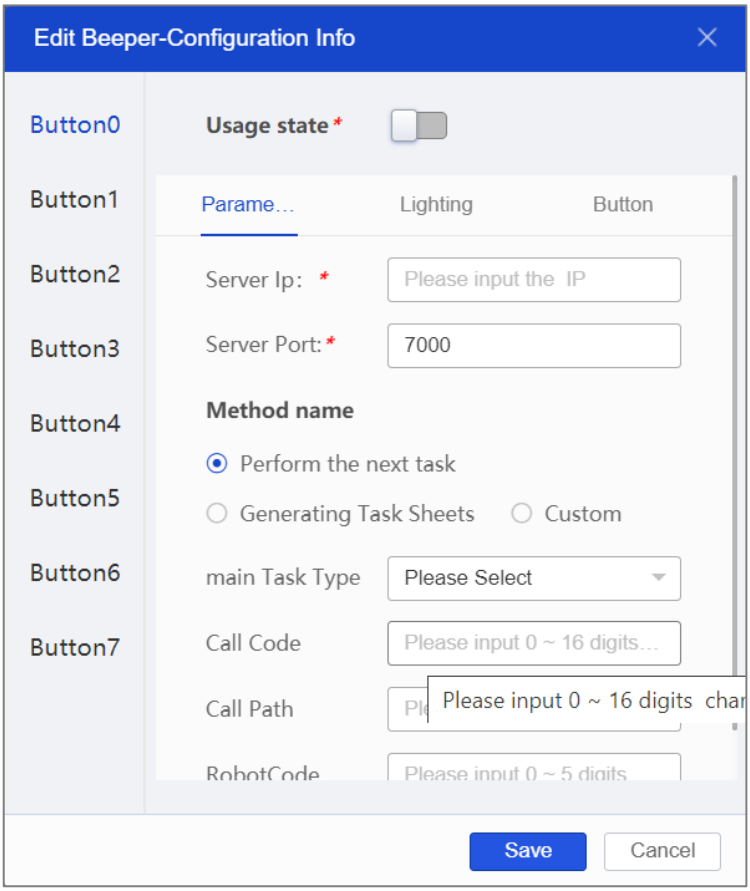


Figure 6-3 Edit Caller Information

Table 6-3 Field Description

Module	Name	Description
Common	Usage State	It enables or disables beeper function.
Parameter	Server IP	The IP address of the WCS and WatchDog.
	Server Port	The port of the WCS.
	Method Name	It includes performing the next task, generating task sheet and customization.
Lighting	Return Success	● Mode: It returns successfully, and the light mode includes solid and alternately flashing. ● Duration: The duration of the light, and the unit is ms. ● Pin Number: The corresponding pin number of the beeper button. Each button corresponds to one pin.
	Return Failed	● Mode: It returns failed, and the light mode includes solid and alternately flashing. ● Duration: The duration of the light, and the unit is ms. ● Interval: If the mode is alternately, you need to enter the interval time. ● Pin Number: The corresponding pin number of the beeper button. Each button/light corresponds to one pin.
Button	Trigger Method	It includes press trigger and lift trigger.
	Press Level	It includes low level and high level, and it is high level by default.
	Trigger Filtering Time	It refers to the trigger filtering time, and the unit is ms.
	Pin Number	It refers to the pin number of the pressed button.

Note

The data filled in by default does not need to be modified. Just fill in part of the time and select the corresponding pin number.

Chapter 7 Permission Settings

7.1 User Management

In the user management page, you can manage accounts for the RCS-2000 system.

7.1.1 Add User

Steps:

Step 1 Click **Build Model -> Permission -> User**.

Step 2 Click **Add**.

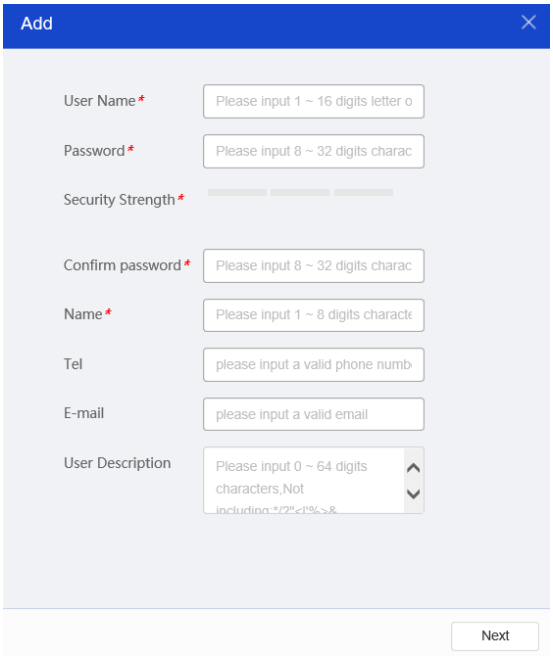


Figure 7-1 Add User

Step 3 Set name, password, and other important parameters.

Step 4 Click **OK**.

7.1.2 Delete User

Check users that you want to delete, and click **Delete** to complete.

Note

The admin and the users that are currently logged in cannot be deleted.

7.1.3 Edit User

You can click different tools to edit users, as shown below.

Figure 7-2 Edit User

Table 7-1 Tool Description

Name	Description
Unlock	The user will be locked if wrong password is entered for several times. The admin can use this tool to unlock locked users.
Reset Password	The login password will be reset into Hik@1234 by clicking it.
Enable/Disable	If the user is disabled, and it will not be able to login to the system.
Download Template	Click it to download user information template.
Import	Import user information from local PC via Excel template.
Export	Export user information into local PC via Excel template.

7.2 Role Management

In the role management, you can link the role to the user. Different roles stand for different operation permissions in the RCS-2000 system.

7.2.1 Add Role

Steps:

Step 1 Click **Build Model -> Permission -> Role**.

Step 2 Click **Add**.

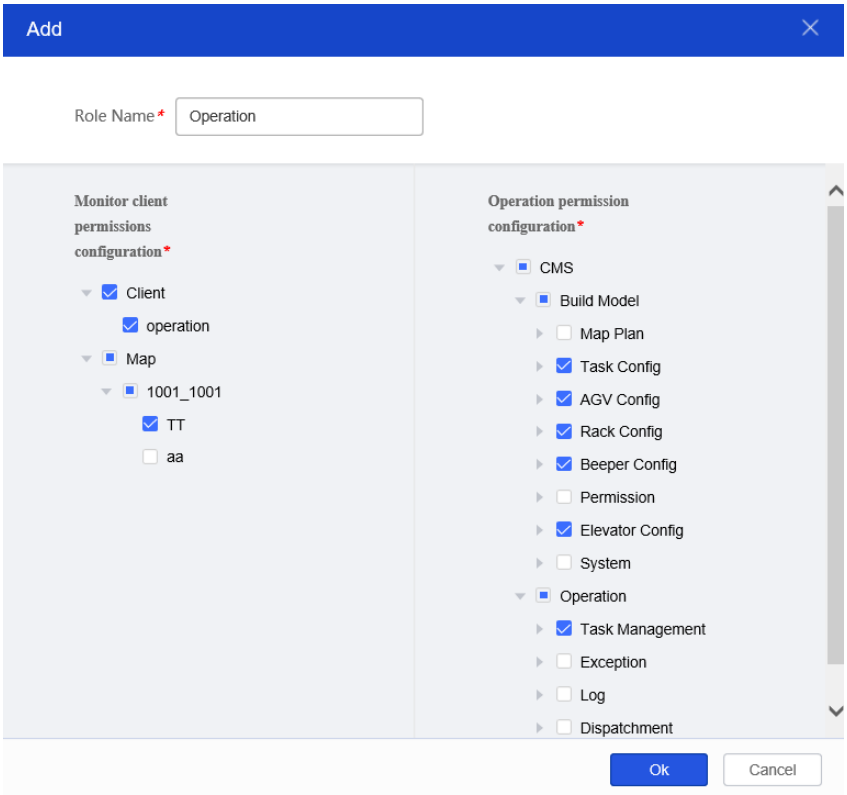


Figure 7-3 Add Role

Step 3 Set a role name.

Step 4 Set its permission: select modules that the role has the permission to access.

Step 5 Click **OK**.

7.2.2 Delete Role

Check roles that you want to delete, and click **Delete** to complete.

7.2.3 Enable/Disable Role

You can enable or disable roles in the role management page.

- When the role is disabled, the role does not have the configured permission.
- When the role is enabled, the role has the configured permission.

Chapter 8 Elevator Settings

Elevator is useful in the cross-floor tasks. You can add elevator and get elevator point information in the elevator settings.

8.1 Add Elevator

Steps:

Step 1 Click **Build Model -> Elevator Config**.

Step 2 Click **Add**.

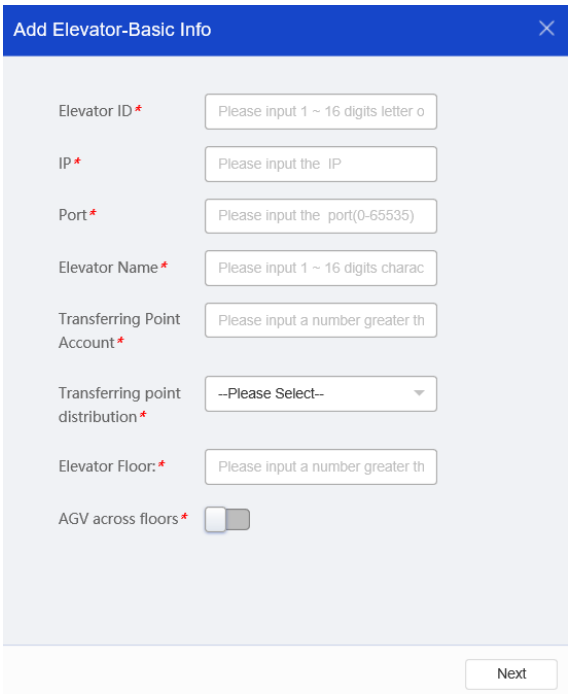


Figure 8-1 Add Elevator

Step 3 Set parameters.

Table 8-1 Field Description

Field	Description
Elevator ID	The elevator number, and it cannot be edited after settings.
IP	The IP address of elevator.
Port	The port of elevator.
Elevator Name	The name of elevator, and it cannot be edited after settings.
Elevator Type	The elevator type includes hoist and elevator cabin.

Field	Description
Transferring Point Account	The allowed rack quantity that can be put in the elevator. You need to set the transferring point account according to rack quantity.
Transferring Point Distribution	The transferring point distribution like one row two columns, and two rows and two columns.
Elevator Floor	It refers to the elevator can reach how many floors.
AGV Across Floors	If it is enabled, AGV can enter elevator.

Step 4 Click **Next**.

Step 5 Set specific parameters for the elevator.

Table 8-2 Field Description

Field	Description
Usage Status	It enables or disables elevator usage status.
Associated Map	It select maps.
Task Quantity Threshold	It limits the elevator task quantity to avoid locking.
Transferring Area	It refers to the rack point in the elevator.
Waiting Area	The applying point for the elevator.
Safety Detection Point	It is the position for safety detection before entering the elevator.
Entrance &Export	It is used to set whether the waiting point is used to deliver the rack to the elevator or to take the rack from the elevator. If one elevator has one rack, and the entrance and exit can be configured to be the same. If one elevator has multiple racks, the elevator waiting point in the configuration page should be configured as the entrance.
Elevator Association Point	The available point after the AGV exits from the elevator.

8.2 Delete Elevator

Check the elevator that you want to delete, and click **Delete** to complete.

Note

Deleting elevator will delete corresponding information of the elevator in the map data.

8.3 Enable/Disable Elevator

You can enable or disable the selected elevator by click Enable or Disable in the elevator configuration page.

Chapter 9 System Settings

9.1 System Parameters Settings

System parameters here refer to default parameters in the system, including the API path for the third-party docking, API information, auto-unlocking time, log time, and so on.

Click **Build Model -> System -> System Parameters**, you can search and view system parameters. Also, you can edit the parameter.

9.2 Service Settings

Service settings is important for the intelligent warehouse usage. Via setting the RCS (Robot Control Service) service and AMS (Alarm Management Service) service, you can link maps to the RCS and AMS, and link devices to the map.

9.2.1 Add AMS Service

Steps:

Step 1 Click **Build Model -> System -> Service**.

Step 2 Click **Add**.

Step 3 Select the type as Alarm Management Service (AMS).

Step 4 Enter all required parameters. All the default parameters have been entered in the text field.

Table 9-1 AMS Parameters

Field	Attribute	Description
No.	Auto-Generated	The only identification of service.
Name	Required	Service name.
Type	Required	AMS.
IP Address	Required	IP address of service.
Configuration Port	Required	The configuration port of service.
Log Port	Required	The log port of service configuration.

Field	Attribute	Description
Allow IPs Configuration	Required	Anti hijacking, only the local IP and IP of the service cluster are allowed.
Alarm Receiving Port	Required	The port of receiving alarm.
ZMQ Control Port	Required	ZMQ control port.
ZMQ Message Port	Required	ZMQ message port.
Synchronization Service IP	Required	Synchronization service IP.
Synchronization Service Port	Required	Synchronization service port.

Step 5 Click **Save**.

Step 6 Select the added AMS service, and click **Remote Configuration**.

9.2.2 Add RCS Service

Make sure you have added AMS service before you start adding the RCS service

Steps:

Step 1 Click **Build Model -> System -> Service**.

Step 2 Click **Add**.

Step 3 Select the type as Robot Control Service (RCS).

Step 4 Enter all required parameters. All the default parameters have been entered in the text field.

Step 5 Click **Save**.

Step 6 Select the added RCS service, and click **Remote Configuration**.

Note

Remote Configuration is required to take the settings into effect.

Table 9-2 RCS Parameters

Field	Attribute	Description
No.	Auto-Generated	The only identification of service.

Field	Attribute	Description
Name	Required	Service name.
Type	Required	RCS (unavailable for editing if service exists).
Group	Required	Unavailable for changing if service exists.
Associated Map	Optional	Associated maps are the maps included in group.
IP Address	Required	IP address of service.
Configuration Port	Required	The configuration port of service.
Log Port	Required	The log port of service configuration.
Allow IPs Configuration	Required	Anti hijacking, only the local IP and IP of the service cluster are allowed.
Report Period	Required	Unit: ms.
Report Angle Interval	Required	Unit: °.
Report Distance Interval	Required	Unit: mm.
Device Registering Port	Required	Device registering port.
Rest Service Port	Required	Rest Service Port
ZMQControl Port	Required	ZMQ control port.
ZMQMessage Port	Required	ZMQ message port.
UDPControl Port	Required	UDPControl Port
Alarm Service	Required	The corresponding alarm service.
Synchronization Service IP	Required	Synchronization service IP.
Synchronization Service Port	Required	Synchronization service port.
Database Type	Required	RCS service database type PostgreSQL.
Database Name	Required	RCS service database name.
Database User Name	Required	Database user name.
Database Password	Required	Database password.
Communication Mode	Required	

Field	Attribute	Description
Public Key	Auto-Generated	Public key

Note

An AMS service needs to be selected from RCS services. If the current system does not contain any optional AMS services, an AMS service needs to be added first before adding RCS services.

9.2.3 Link/Unlink Map to RCS Service

Steps:

Step 1 Select an added RCS service, and click **Edit**.

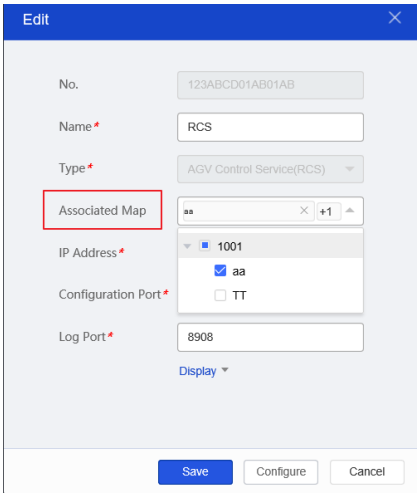


Figure 9-1 Link Map

Step 2 Select a map, and click **Save**.

If you want to unlink the map, repeat the step 1, and de-select the map.

9.2.4 Edit Service Configuration

You can click different tool icons on the service page to edit the service configuration.

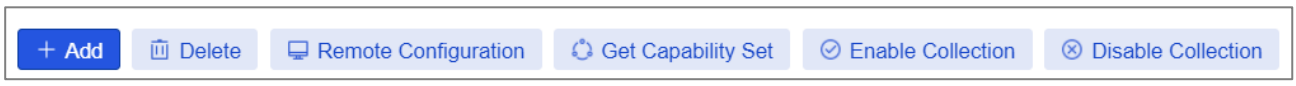


Table 9-3 Tool Description

Name	Description
Delete	It is used to deleted added AMS or RCS.
Remote Configuration	Check added services to verify the remote configuration.
Get Capability Set	Click it to edit the corresponding parameters.
Enable Collection	Click it to collect AGV's maintenance information.
Disable Collection	Click it and the AGV's maintenance information will not be collected.
Restart	Click it to restart the service after checking it.

9.3 Extension Field Settings

Note

It includes extension of User, Map Data, Device Type, Precision Plan, Rack Parameter, and Container Type.

User extension field is used to extend the field content of the declaration, such as QQ number, in addition to the user's basic information, when customizing to add user.

In the map data extension field parsed by the user, in addition to the basic information, the declared field contents need to be extended, such as operating platform direction, maximum queue number, issued task number, associated pre-dispatching point of elevator and roadway crossing direction.

The device type extension field is mainly used for device specific attributes, such as roller columns, forklift moving height, etc.

The precision scheme extension field is mainly used to configure various precision parameters when AGV travels, such as empty car in place precision, cargo in place precision, etc;

The shelf parameter extension field is mainly used to set extension items in shelf parameter configuration, such as shelf offset;

The container type extension field is mainly used to set CTU-related configuration items in container type configuration. Most of them are used for CTU body identification, such as container code type and container code position.

Path: System Configuration -> Extension Field.

9.3.1 Add User

Steps:

Step 1 Click **Build Model -> System -> Extension Field -> User**.

Step 2 Click **Add**.

Step 3 Set corresponding parameters, and click **OK**.

Table 9-4 Field Description

Field	Attribute	Description
No.	Required	The number of the extension field, and it cannot be edited after entering.
Table Name	Default	The associated table name, and it is default by the system.
Name	Required	The name of the extension field.
Type	Required	It includes text field, data box, drop-down box, switch, etc.
Input Box Type	Required	It includes letter, number, letter or number, etc.
The Maximum Length	Required	The max. length allowed for characters you entered
Display Name	Required	The text name displayed in the page.
Weight	Required	The weight of user extension field.
Remark	Optional	You can add additional information here about the extension field.

9.3.2 Add Map Data

Steps:

Step 1 Click **Build Model -> System -> Extension Field -> Map Data**.

Step 2 Click **Add**.

Step 3 Set corresponding parameters, and click **OK**.

9.3.3 Add Device Type

Steps:

Step 1 Click **Build Model -> System -> Extension Field -> Device Map**.

Step 2 Click **Add**.

Step 3 Set corresponding parameters, and click **OK**.

9.3.4 Precision Plan

Steps:

Step 1 Click **Build Model -> System -> Extension Field -> Precision Plan**.

Step 2 Click **Add**.

Step 3 Set corresponding parameters, and click **OK**.

9.3.5 Rack Parameters

Steps:

Step 1 Click **Build Model -> System -> Extension Field -> Rack Parameters**.

Step 2 View specific parameters.

9.3.6 Container Type

Steps:

Step 1 Click **Build Model -> System -> Extension Field -> Container Type**.

Step 2 View specific parameters.

9.3.7 Enable/Disable Extension Field

You can enable and disable the extension field. In the extension filed page, select added extension contents, click **Enable** or **Disable**, and the added extension contents will display or will not display on the corresponding page.

9.4 Data Dictionary Settings

Data dictionary helps manage parameters in the system, it is like a parameter set. You can manage parameters following structure: Category – Directory Type – Parameters.

9.4.1 System Configuration

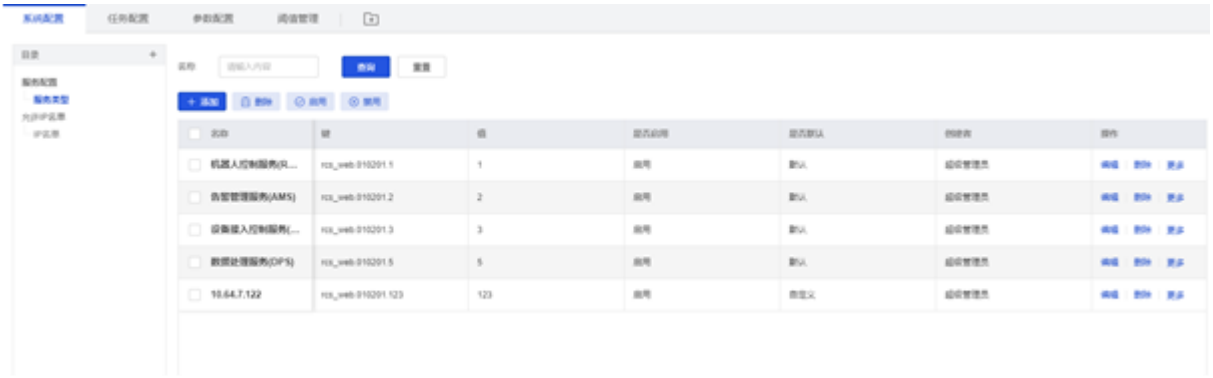
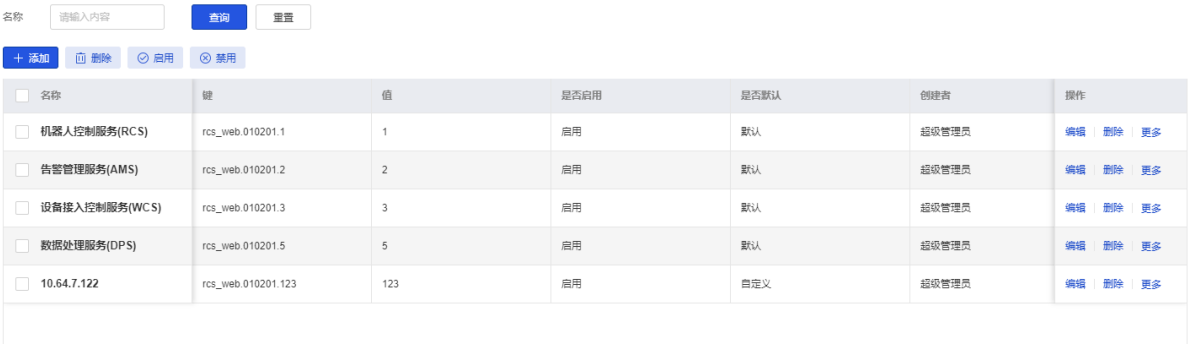


Figure 9-2 System Configuration

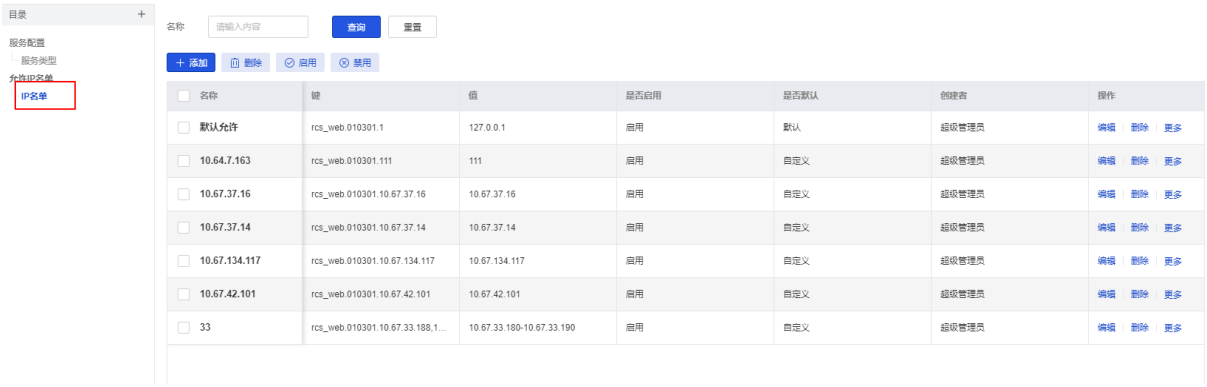
The default service type data dictionary under the service configuration structure is RCS, AMS, WCS, and DPS. You can add, delete, enable and disable data.



名称	键	值	是否启用	是否默认	创建者	操作
机器人控制服务(RCS)	rcs_web.010201.1	1	启用	默认	超级管理员	编辑 | 删除 | 更多
告警管理服务(AMS)	rcs_web.010201.2	2	启用	默认	超级管理员	编辑 | 删除 | 更多
设备接入控制服务(WCS)	rcs_web.010201.3	3	启用	默认	超级管理员	编辑 | 删除 | 更多
数据处理服务(DPS)	rcs_web.010201.5	5	启用	默认	超级管理员	编辑 | 删除 | 更多
10.64.7.122	rcs_web.010201.123	123	启用	自定义	超级管理员	编辑 | 删除 | 更多

Figure 9-3 Service Configuration

The added custom service data dictionary can be selected when selecting the service configuration type. Default service data cannot be deleted. The data dictionary takes effect after enabled. The data dictionary does not take effect after disabled.



名称	键	值	是否启用	是否默认	创建者	操作
默认允许	rcs_web.010301.1	127.0.0.1	启用	默认	超级管理员	编辑 | 删除 | 更多
10.64.7.163	rcs_web.010301.111	111	启用	自定义	超级管理员	编辑 | 删除 | 更多
10.67.37.16	rcs_web.010301.10.67.37.16	10.67.37.16	启用	自定义	超级管理员	编辑 | 删除 | 更多
10.67.37.14	rcs_web.010301.10.67.37.14	10.67.37.14	启用	自定义	超级管理员	编辑 | 删除 | 更多
10.67.134.117	rcs_web.010301.10.67.134.117	10.67.134.117	启用	自定义	超级管理员	编辑 | 删除 | 更多
10.67.42.101	rcs_web.010301.10.67.42.101	10.67.42.101	启用	自定义	超级管理员	编辑 | 删除 | 更多
33	rcs_web.010301.10.67.33.188.1...	10.67.33.180-10.67.33.190	启用	自定义	超级管理员	编辑 | 删除 | 更多

Figure 9-4 IP Allowed List

9.4.2 Task Configuration

The main task type interface includes: default task processor, initial rack processor, storage in/out processor, etc. The custom processor includes forklift in/out processor and roadway related processor.

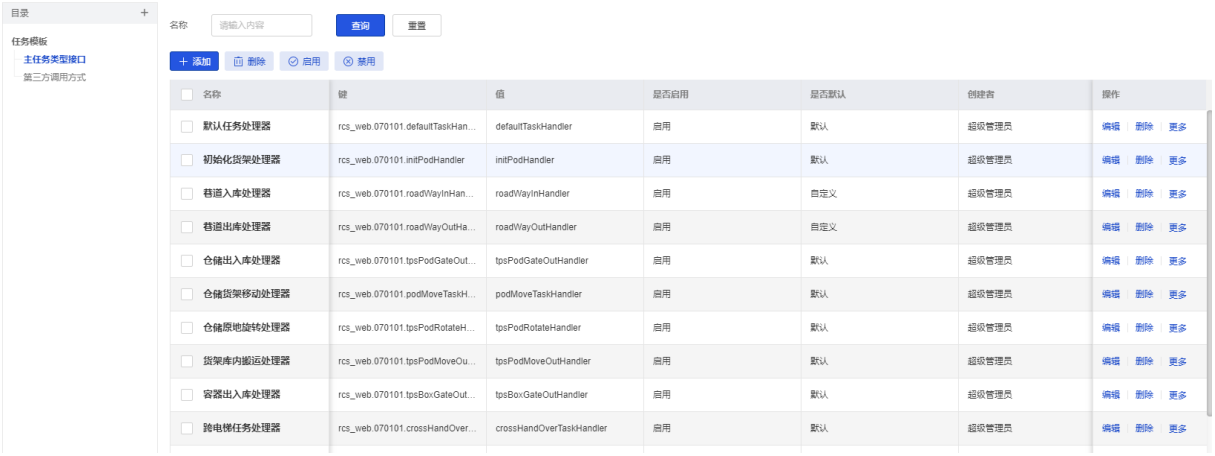


Figure 9-5 Main Task Type Interface

The third-party dispatch mode is REST, TCP and SOAP by default. Other dispatch modes can be customized and added.

Figure 9-6 Third-Party Dispatch Mode

9.4.3 Parameters Configuration

Parameter configuration includes the quantity control of device quantity, map quantity, map management, service management, transport module and TPS module.

Figure 9-7 Parameter Configuration

Extension field, such as the configuration of roadway direction, operation platform direction, rotation mode, automatic storage, operation platform device type, forklift type, CTU target point application mode, roadway access mode and peripheral type.

Table 9-5 Extension Field

Name	Extension Field
Roadway Direction	Horizontal and vertical direction.
Operation Platform Direction	East, south, west and north.
Operation Platform Rotation Mode	Rotate in place, rotate in circle.
Automatic Storage	Not allowed, storage supplement and transport supplement.
Operation Platform Device Type	PTL
Forklift Type	Stacking forklift, transport forklift.
CTU Target Point Application Mode	WMS
Roadway Access Mode	First-in first-out.
Peripheral Type	First-in last-out.

The chain direction and crossbeam direction of rack.

Table 9-6 Specific Direction

Name	Extension Field
Chain Direction	Default, -90, 0, 90, 180
Crossbeam Direction	Default, -90, 0, 90, 180

9.4.4 Threshold Management

It mainly includes the data dictionary of system information threshold and module information threshold.

Figure 9-8 Threshold Management

9.5 Alarm Settings

9.5.1 Add Alarm Type

Steps:

Step 1 Click **Build Model -> System -> Alarm Type Config**.

Step 2 Click **Add**.

Step 3 Set corresponding parameters.

Table 9-7 Field Description

Field	Attribute	Description
Alarm Module	Required	It refers to the alarm module, including device and server.
Alarm Type	Required	It refers to the alarm type, including alarm main type and alarm sub type.
No.	Required	The unique number of the alarm type.
Name	Required	The name of the alarm type.
Sorting	Required	The sorting of alarm types under the same alarm module and alarm type.
Description	Optional	You can add additional information about the alarm type here.
Solution	Optional	The corresponding solution of alarm.

9.5.2 Delete/Import/Export Alarm Type

You can click different tools to delete, import, and export alarm type.

Figure 9-9 Alarm Type

Table 9-8 Tool Description

Name	Description
Delete	Click it to delete the selected alarm type.
Import	Click it to import the alarm type in batch.
Export	Click it to export the selected alarm type.
Download Template	Click it to download data template for importing.

9.6 Application Registration

In the application registration page, a token can be generated for the specific application. When the third party uses the RCS-2000 system, functions are available only when using registered application No. and its right token.

9.6.1 Add Application Registration

Steps:

Step 1 Click **Build Model -> System -> Application Registration**.

Step 2 Click **Add**.

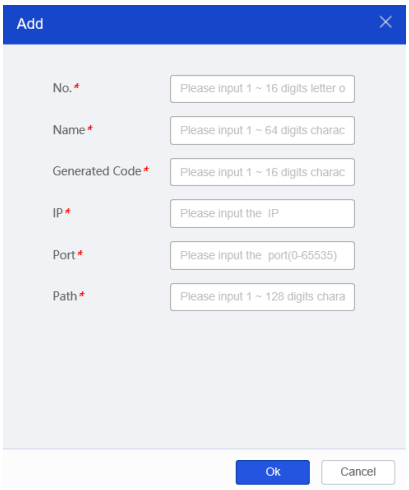


Figure 9-10 Add Application Registration

Step 3 Set parameters.

Table 9-9 Application Registration Parameters

Field	Attribute	Description
No.	Required	The number of application registration. No modification after adding.
Name	Required	The name of application registration and indicates application type.
Generated Code	Required	It is used to generate a token. The availability of different applications can be judged by identifying the token.
Type	Required	Distinguish whether it is an external upper system or an internal device control system WCS
Address Type	Required	By domain name or IP
Domain	Optional	If you select the domain name address type, you need to fill in.
IP	Required	IP address.
Port	Required	Port.
Basic Path	Required	It is the basic path of the interface.
Calling Method	Required	REST or SOAP
Enable Encryption	Required	It is enabled by default to control whether verification permission is required for application registration.

9.7 Business Notification

Note: Configure several business message notifications supported by the system, including alarm notification, container and position binding and unbinding notification, shelf and storage binding and unbinding notification, shelf and batch binding and unbinding notification. Each notification can be configured with multiple upper-layer systems, and 4 of the above will be loaded with system initialization.

Path: System Configuration -> Application Registration -> Business Notification

9.7.1 Add Business Notification

Steps:

Step 1 Click **Build Model -> System -> Application Registration -> Business Notification**.

Step 2 Click **Add**.

Step 3 Enter parameters according to actual demands.

Table 9-10 Parameters

Field	Attribute	Description
No.	Required	The number of business notification.
Name	Required	The name of business notification.
Method	Required	Enter the name of the method to be notified to the upper system and the notification path.

9.7.2 Delete Business Notification

Check items that need to be deleted and click **Delete**.

Note

The 4 data initialized with the system cannot be deleted.

9.7.3 Enable/Disable Business Notification

Select the service notification to be enabled (or disabled) and click Enable (or Disable). Only the service notification in the disabled (enabled) state can be enabled (disabled). In the displayed prompt box, click OK to enable (or disable) the service notification.

9.8 uthorization Management

License file is required for the normal usage of RCS-2000 system. You can upload the license file in the authorization management page (**Build Model -> System -> Authorization Management**).

The license file defines the service life of the RCS-2000 system, and limits the device quantity and map quantity in the system. Without authorization or the authorization license expired, the system cannot work normally.

You can click **Upload** file to upload the license file.

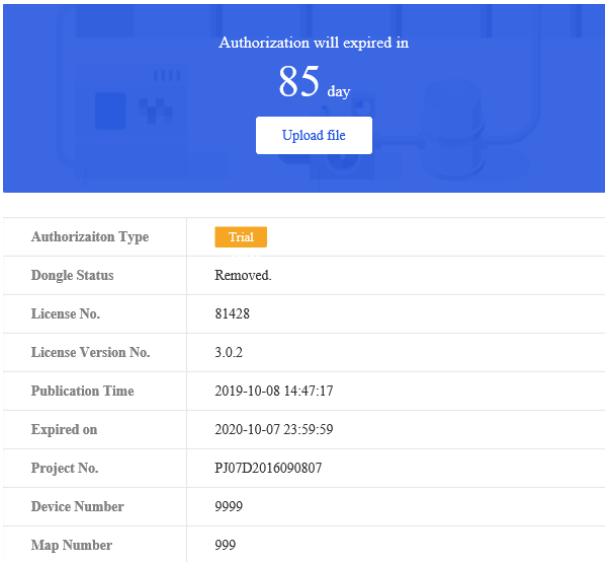


Figure 9-11 Authorization Management Page

9.9 Scenario Settings

Select scene elements in the scenario settings before you start setting the system. Scene elements here include Fork, Warehouse Area, SLAM, Beeper, Elevator, Peripheral Device, Rack, TPS, CTU.

Steps:

Step 1 Click **Build Model -> System -> Scenario Settings** to enter the scenario settings page.

Step 2 Select elements.

Step 3 Click **OK**.

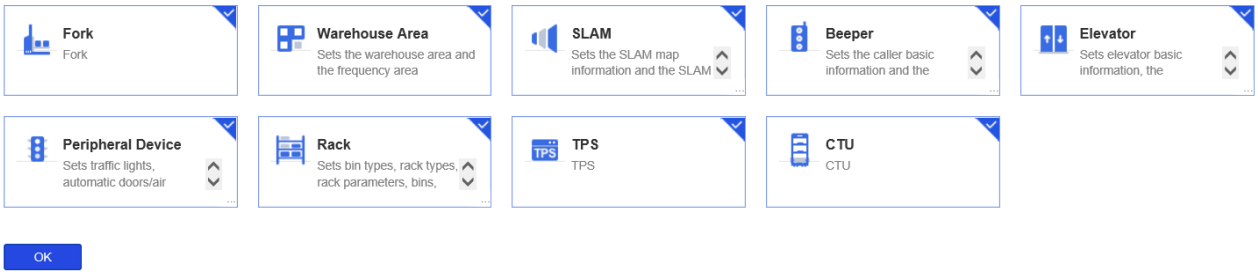


Figure 9-12 Scene Settings

9.10 Cache Management

You can go to **Build Model -> System -> Cache Management** to view all cache data in the system. You can clear cache or copy cache information into the local.

9.11 Alarm Statistics Task

You can go to **Build Model -> System -> Alarm Statistics Task** to add and delete alarm task, enable, disable and trigger alarm task.

Chapter 10 Task Management

10.1 Task Order Management

Task order management includes all the task order records and status information sent to RCS. You can search the execution status of the current task order through task order management page, and cancel the task order being executed, or set priority to make it execute as soon as possible or delay.

Path: Operation->Task Management->Task Order

10.1.1 Move Rack

Click **Move Rack**, you can select task type for moving rack, including modify storage area, swap storage, select mobile racks and move racks.

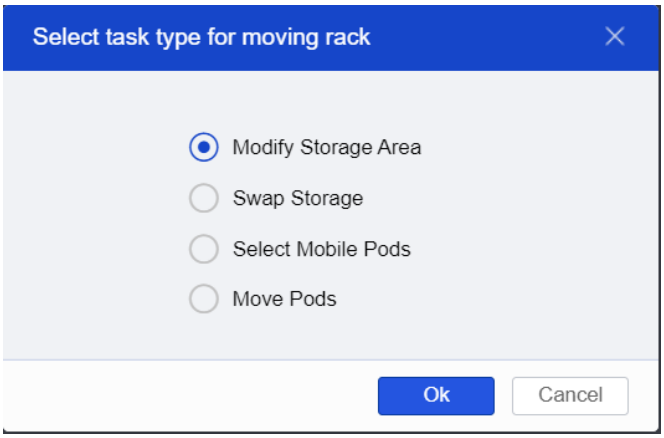


Figure 10-1 Select Task Type

Move Rack Task

Steps:

Step 1 Enter Move Rack and select the map that the rack located in.

Step 2 Click **Box Selection**, and click and drag the mouse to select the storage sections.

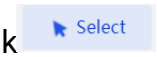
Step 3 Set the strategy code, and click **Create Task Order**.

10.1.2 Swap Storage

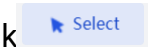
You can exchange the location of two racks in Swap Storage.

Create Swap Storage Task

Steps:

Step 1 Click 

in the left, and click corresponding rack in the map.

Step 2 Click 

in the right, and click corresponding rack in the map.

Step 3 Click 

, two racks can be exchanged.

10.1.3 Select Mobile Racks

You can move racks in Select Mobile Racks.

Create Select Mobile Racks

Steps:

Step 1 Click and drag the mouse to select the rack.

Step 2 Click Move out of storage.

Step 3 Click **OK**.

Step 4 Click move back to storage.

10.1.4 Move Racks

You can move racks to the selected available storage in Move Racks.

Create Move Racks Task

Steps:

Step 1 Select the rack.

Step 2 Select the available storage.

Step 3 Click **Create Task Order**.

10.1.5 Cancel Task

In the task order page, select task orders, and click Cancel to cancel task orders.

Note

Once the main task order is cancelled, all sub task orders of this main task orders are also cancelled.

10.1.6 Set Priority

You can set the priority for task in execution. In the task order page, select task orders and click **Priority**.

10.1.7 Export Information

In the task order page, select task orders, and click **Export** to export main task order info.

10.2 Sub Task Order Management

The sub task order management page lists all sub task orders sent to the RCS in the main task orders. One main task order contains one or more sub task orders. All sub task orders are sent and executed by order. You can check sub task order status, cancel sub task order, and resend exceptional sub task order to the system.

Note

The main task order will be marked as completed when all sub task orders are completed.

Path: Operation -> Task Management -> Sub Task Order.

10.2.1 Export

Check the sub task to be exported in the sub task order. Click **Export** to pop up the prompt box, and click **Save** to export the selected sub task data sheet.

10.2.2 Replace AGV

Steps:

Step 1 Check a sub task in the sub task order, click **Replace**, and a prompt box will pop up. Only the subtasks in "**Executing**" status can be rerun.

Step 2 Enter the robot number and initial coordinates of the sub task of AGV according to the requirements, and click **OK**.

10.2.3 Cancel Task

Check the sub task to cancel in the sub task order, click **Cancel Task** to pop up the prompt box, and click **OK** to cancel the selected sub task

Note

Only sub tasks in "**Executing**" status and "**Exception**" can be cancelled.

10.2.4 Rerun

Steps:

Step 1 Check a sub task to be rerun in the sub task order, and click **Rerun** to pop up the prompt box. Only sub tasks in **"Canceled"** status can be rerun.

Step 2 Enter the robot number and initial coordinates of the sub task of AGV according to the requirements, and click **OK**.

10.2.5 Resend

Steps:

Step 1 Check a sub task to be resend in the sub task order, and click **Resend.**

Step 2 Click **OK** in prompt box.

10.3 TPS Scheduling Task

TPS scheduling task records all TPS scheduling task information, and can filter and search required TPS scheduling tasks according to conditions.
Path: Operation->Task Management-> TPS Scheduling Task.

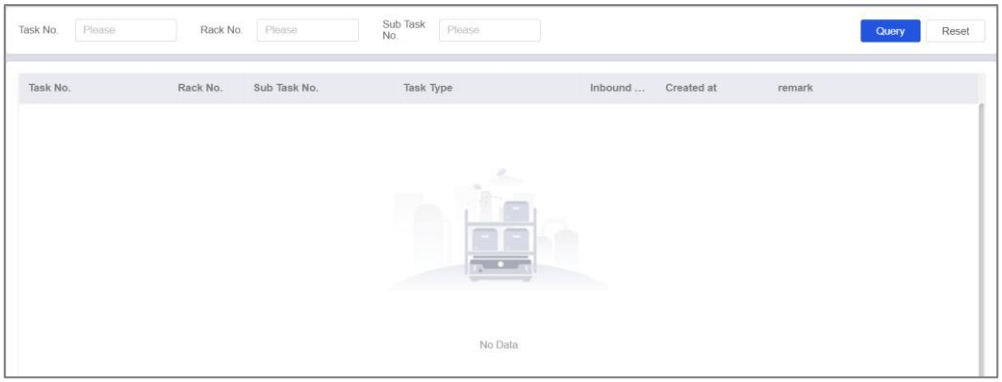


Figure 10-2 TPS Scheduling Task

Table 10-1 TPS Scheduling ask Management Description

Field	Description
Task No.	Task No.
Rack No.	Rack No.
Sub Task No.	Sub Task No.
Task Type	TPS Task Type

Inbound Strategy	Inbound Strategy
Create at	Create Time
Remark	–

10.4 Pick-up Order

Pick-up order management records all the pick-up order information. You can filter and search the required pick-up order according to the pick-up order information.

Path: Operation->Task Management-> Pick-up Order.

10.4.1 Pick-up Order Management Description

Table 10-2 Pick-up Order Management Description

Field	Description
Task Order Item	Task Order No.
Pickup Order Item	Pickup Order Item
Group	Group No.
Work Station	Work Station
Source Bin	Source Bin of Pickup Item
Rack No.	Rack No.
Rack Direction	Rack Terminal Direction
Create at	Create Time

10.5 WCS Task Status

WCS task status records WCS task status information, including task number, device number, action type and action description. You can query the corresponding task information by device type and device number.

Figure 10-3 WCS Task Status

Chapter 11 Exception Handling

11.1 Search and Handle Sent Message (RCS)

Sent message (RCS) module records all messages that the RCS-2000 sends to the RCS system, including IP address and message contents. For some messages that are sent failed or some messages in exceptional status, you can re-process these messages or cancel these messages in the sent message (RCS) module.

Steps:

Step 1 Click **Operation -> Exception -> Sent Message (RCS)**.

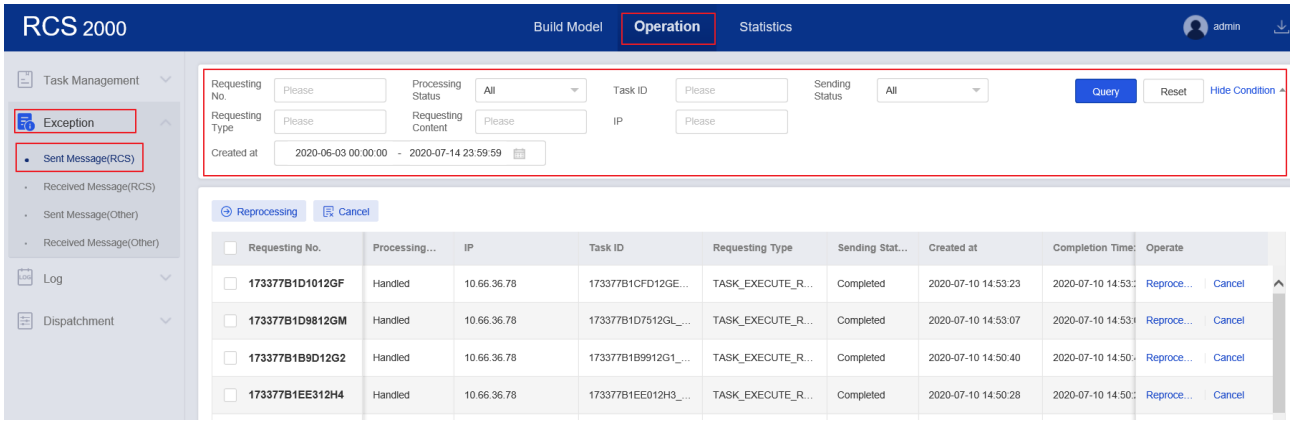


Figure 11-1 Search Message

Step 2 Set filtering conditions, and click **Query** to search.

Step 3 (Optional) Handle messages.

Re-process Message: Click **Reprocessing** to re-process the selected messages.

Cancel Message: Click **Cancel** to cancel the selected messages.

11.2 Search and Handle Received Message (RCS)

Received message (RCS) module records all messages, which are sent from the RCS system. You can re-process these messages or cancel these messages in the received message (RCS) module.

Steps:

Step 1 Click **Operation -> Exception -> Received Message (RCS)**.

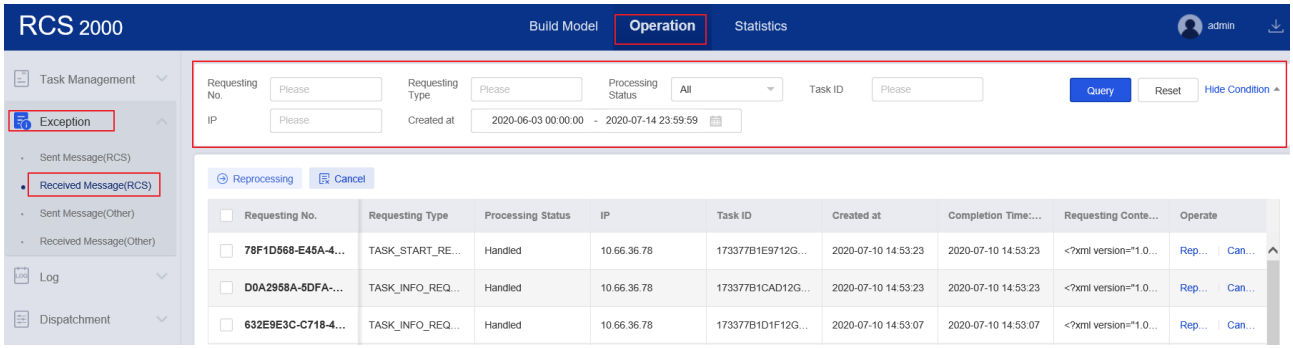


Figure 11-2 Search Message

Step 2 Set filtering conditions, and click **Query** to search.

Step 3 (Optional) Handle messages.

Re-process Message: Click **Reprocessing** to re-process the selected messages.

Cancel Message: Click **Cancel** to cancel the selected messages.

11.3 Search and Handle Sent Message (Other)

Sent message (other) module records all messages that the RCS-2000 sends to the other systems (except for RCS system), including IP address and message contents. For some messages that are sent failed or some messages in exceptional status, you can re-process these messages or cancel these messages in the sent message (other) module.

Steps:

Step 1 Click **Operation -> Exception -> Sent Message (Other)**.

Step 2 Set filtering conditions, and click **Query** to search.

Step 3 (Optional) Handle messages.

Re-process Message: Click **Reprocessing** to re-process the selected messages.

Cancel Message: Click **Cancel** to cancel the selected messages.

11.4 Search and Handle Received Message (Other)

Received message (other) module records all messages, which are sent from other systems (except for RCS system). You can re-process these messages or cancel these messages in the received message (other) module.

Steps:

Step 1 Click **Operation -> Exception -> Received Message (Other)**.

Step 2 Set filtering conditions, and click **Query** to search.

Step 3 (Optional) Handle messages.

Re-process Message: Click **Reprocessing** to re-process the selected messages.

Cancel Message: Click **Cancel** to cancel the selected messages.

Chapter 12 Log Management

12.1 Operation Log

Operation log records all the operations in the system after the user logs in to the system, including the specific operation user, IP address, operation time, etc.
Path: Operation -> Log -> Operating Log.

12.1.1 Operation Log Description

Table 12-1 Operation Log Description

Field	Description
User	The user name of the user who performed the current operation.
IP User IP	The IP address of the user who performs the current operation.
Operation Module	The module which the user operation belongs to.
Log Content	The operation (add, delete, modify, etc.) which the user performed.
Operation Time	Specific time of operation.

12.2 Client Log

Client Log records all operations done in the client, including users, IP address, and operating time, etc.
Path: Operation -> Log -> Client Log.

12.2.1 Client Log Description

Table 12-2 Client Log Description

Field	Description
User	The user name of the user who performed the current operation.
IP User IP	The IP address of the user who performs the current operation.
Operation Type	The type which the user operation belongs to.

Log Content	The operation (add, delete, modify, etc.) which the user performed.
Contacts	The information related to user.
Remarks	Remarks
Operation Time	Specific time of operation.

Note

Log supports exporting information.

12.3 Recent Task

The recent task log records the execution status and transition process of all sub tasks distributed by the system. You can analyze the execution of the whole task by viewing the task log.

Path: Operation -> Log -> Recent Task.

12.3.1 Recent Task Log Description

Table 12-3 Recent Task Log Description

Field	Description
Task No.	Task No. corresponds to No. of task management and sub task management.
Task Type	Task Type
Sub Task No.	Sub Task No. corresponds to No. of Sub task management.
Sub Task Execution Order	Sub Task Execution Order
Subtask/Task Group Type	Subtask/Task Group Type
Status	Status of Task Log
Rack No.	Rack No.
AGV No.	AGV No. of Executing Task
Target Map No.	Target Map No.

Execution Message	Message content sent to RCS when executing task.
Call Sign	Call Sign
Stopping Duration	AGV Stopping Duration
X Coordinate of End Point	X Coordinate of End Point
Y Coordinate of End Point	Y Coordinate of End Point
Resend X Coordinate	Resend X Coordinate
Resend Y Coordinate	Resend Y Coordinate
Modified at	Time of Modification
Creating Date	Creating Date
Trigger	Trigger or not.
Trigger Type	Task Number, Call Sign, AGV Location, Trigger Condition, AGV Number, Rack Number
Trigger Source No.	Trigger Source No.
Task Priority	Task Priority
Task Group	Whether it is task group.
Third Party Type	Third Party Type
Third Party Path	Third Party Path
Task Start Method Name	Task Start Method Name
Task End Method Name	Task End Method Name
Task Cancel Method Name	The Name of Cancelling the Task

12.4 Interface Call Log

Interface call log records all the interface call operations, which can be filtered and searched according to the information about interface call.
Path: Operation -> Log -> Interface Call Log.

12.4.1 Interface Call Log Description

Table 12-4 Interface Call Log Description

Field	Description
Terminal Type	Terminal Type
Interface Method Name	Interface Method Name
Interface Input Parameter	Interface Input Parameter
Result	Result of calling Interface
Returned Result	Returned Result
Start Time	Start Time of Calling Interface
Time for Calling Interface	Time for Calling Interface

12.5 System Log

System log records logs of various logs, including CMS log, service log, and AGV log, and you can download logs here.
Path: Operation -> Log -> System Log.

12.5.1 CMS Log

You can download CMS log. Click **Download File** to download corresponding log.

12.5.2 Service Log

Service log includes RCS service log, AMS service log, DPS service log, and WCS service log. Click
Visit Download Page to skip to the downloading page to download corresponding log.

12.5.3 AGV Log

Click **Visit Download Page**, and visit download page to download corresponding log.

12.6 History Map Log

History map log records the map history. You can select logs and restore the map settings by time.
Path: Operation -> Log -> History Map Log.

12.6.1 Download Map

Click **Download** to download the corresponding map XML file.

12.6.2 Restore Map

Steps:

Step 1 Select a map. Click **Restore** to restore the map settings.

Step 2 Click **OK** in prompt box.

12.7 SLAM Map Version

SLAM map log records all versions of SLAM map. You can select logs and restore the SLAM to previous version by time.

Path: Operation -> Log -> SLAM Map Log.

12.7.1 Restore SLAM Map Version

Enter the Slam version management interface, select the map, click Restore SlamMap Version to pop up the prompt box, and click OK.

Figure 12-1 Restore Slam Map

12.8 AGV Tyep Version

It displays AGV device and their corresponding version numbers.

Path: Operation -> Log -> AGV Version.

Chapter 13 Dispatchment

13.1 Control and Intervention

Control and Intervention includes some basic operations of AGV, including move, stop, restore, remove, exclude AGV, and the operation of charge station, rack and other devices.

Path: Operation -> Dispatchment ->Control and Intervention.

13.1.1 Set Charging-Station Status

Purpose: Exclude specified AGV.

Table 13-1 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
Map Alias	Required	The map which the AGV belongs to.
Charge Station Status	Required	Format: X Coordinate, Y Coordinate, Status.

13.1.2 Global Lock Monitor

Purpose: Monitor the global lock of CallCode Monitor and OutBin Monitor.

13.1.3 Send Message to Third-Party

Purpose: Check if the method provided by the third-party is available.

Table 13-2 Parameters Description

Field	Attribute	Description
IP	Required	The IP address of third-party.
Port	Required	The port No. of third-party.
URL	Required	The URL of third-party.
Method Name	Required	The method name of third-party.

13.1.4 TCP Client

Purpose: Test the TCP Client connection.

13.1.5 Move AGV

Purpose: Move AGV to the target point configured.

Table 13-3 Parameters Description

Field	Required	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
Call Sign	Optional	Enter Call Sign, AGV No. and coordinates X, Y are optional. Call Sign, AGV No. and coordinates X, Y cannot be empty at the same time.
AGV No.	Optional	AGV (In Operation) No.
X Coordinate of End Point	Optional	X Coordinate of End Point.
Y Coordinate of End Point	Optional	Y Coordinate of End Point

Note

Fill in at least one of call sign and coordinate.

13.1.6 Stop AGV

Purpose: Stop appointed AGV(s).

Table 13-4 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)

Stopped AGV Quantity	Optional	Enter a quantity. Note: if you want to stop all stops, enter -1.
Stopped AGV No. List	Optional	Lists AGV No.
Map Alias	Optional	AGV Map; When Stopped AGV is -1, this field is required and AGV No. can be ignored.

13.1.7 Restore AGV

Purpose: Restore appointed AGV(s).

Table 13-5 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
AGV Quantity	Optional	-1 means restoring all AGVs; Restored AGV No. list can this field cannot be empty at the same time.
AGV No. List	Optional	Restored AGV No.; when it (cannot be-1) is entered, it is subject to input No.
Map Alias	Optional	AGV Map; when it is -1, this field is required; Restored AGV No. can be ignored.

13.1.8 Remove AGV

Purpose: Remove appointed AGV(s).

Table 13-6 Parameters Description

Field	Attribute	Description

Client No.	Required	Client No. (The client is the one you want to operate AGV.)
AGV No.	Required	The removed AGV. Enter the removed AGV and this item.

13.1.9 Exclude AGV

Purpose: Exclude appointed AGV(s).

Table 13-7 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
AGV No. List	Required	Excluded AGV No. and Status.

13.1.10 Control AGV for Action

Purpose: Control AGV to lift or put down.

Table 13-8 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
AGV No.	Required	AGV No.
Action Code	Required	1: Lift 2: Put Down

13.1.11 Release AGV

Purpose: Release the appointed AGV.

Table 13-9 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
AGV No.	Required	AGV No.

13.1.12 AGV Charging

Purpose: Control charging or discharging the AGV.

Table 13-10 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
AGV No.	Required	AGV No.
Charge No.	Required	1: start charging; 0: stop charging

13.1.13 Set AGV Max. Speed

Purpose: Set Max. speed for the AGV.

Table 13-11 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
Map Alias	Required	AGV Map
Max. Speed	Required	Max. AGV Move Speed

13.1.14 Release Rack

Purpose: Release the appointed rack.

Table 13-12 Parameters Description

Field	Attribute	Description
Client No.	Required	Client No. (The client is the one you want to operate AGV.)
Map Alias	Optional	Map alias of which the rack belongs to.
Rack No.	Required	Rack No.

13.1.15 Release Container

Purpose: Release the specific container.

Table 13-13 Parameters Description

Field	Attribute	Description
Client No.	Required	Client Number of Performing the Operation
Map Alias	Optional	Map to which the container belongs.
Container No.	Required	Container No.

13.1.16 One-Button Shutdown

Purpose: Provide interface for one-button shutdown and timing startup of the device.

Table 13-14 Parameters Description

Field	Attribute	Description
Map No.	Required	Map No.
AGV No.	Required	AGV No.
Reboot Time	Required	0 means not start. 1 to 60 means delay and restore discharge between 1 sec and 60 sec. 61-204 means delay 61 min to 204 min. 205-255 means delay 1 h to 51 h.

13.2 Task Scheduling

13.2.1 Create AGV Dispatch Order

Purpose: Create a whole set of task order based on Main Task Type, Call Sign Position and etc.

Table 13-15 Parameters Description

Field	Attribute	Description
Task No.	Required	Task No.

Call Site	Optional	Call site when generating task order.
Site Collection	Optional	The main task type corresponds to the call site collection required by the subtask whose target point acquisition method is set as "site collection" in the task template, separated by “,” in order, and the number is consistent with the number of subtasks whose target point acquisition method is “site collection”.
AGV No.	Optional	The AGV No. of the task to be performed, if not filled in, will be selected by RCS.
Rack No.	Optional	Rack No.
Rack Direction	Optional	Task Rack Direction
Priority	Optional	Task Priority
Task ID	Optional	Task ID
Rack Type	Optional	Task Rack Type
Container Code	Optional	Container Code
Container Type	Optional	Container Type
Material Batch	Optional	Material Batch
Start Floor	Optional	Start Floor
End Floor	Optional	End Floor
Container Quantity	Optional	Container Quantity

Note

Fill in at least one of call code and call path. You can fill in the contents of custom fields as required. All custom fields are optional.

13.2.2 Continue to the Next Action

Purpose: Execute the next task.

Table 13-16 Parameters Description

Field	Attribute	Description
Call Sign	Optional	The next subtask is triggered by Call Sign.
Task Order	Optional	The next subtask is triggered by Task Order.
Rack No.	Optional	The rack that used in the task.
Next Location	Optional	The target location of net subtask.

Note

Fill in at least one of Call Sign and task No.

13.2.3 Cancel Task

Purpose: Cancel all tasks in the task order.

Table 13-17 Parameters Description

Field	Attribute	Description
Task No.	Optional	Task No. of canceled task.
Task Group No.	Optional	Task Group No. of canceled task.

Note

Fill in at least one of task No. and task group No.

13.2.4 Set Priority

Purpose: Set the priority of the task to improve the execution order of the task. You can set the priority of multiple tasks at the same time, click **+** to add tasks, and click **-** to delete tasks.

Table 13-18 Parameters Description

Field	Attribute	Description
Task No.	Required	Task No
Priority	Required	Set Priority

13.2.5 Cancel Sub Task

Purpose: Cancel the appointed sub task.

Table 13-19 Parameters Description

Field	Attribute	Description
Sub Task No.	Optional	Sub Task No. of canceled sub task.
Task Order No.	Optional	Task Order No. which is canceled sub tasks belong to.
Sub Task No.	Optional	The sequence number of sub tasks in the task to which they belong.

Note

Fill in at least one of sub task No. and Task Order No. or Sub Task No.

13.2.6 Redo Subtask

Purpose: Re-execute cancelled sub tasks.

Table 13-20 Parameters Description

Field	Attribute	Description
Sub task No.	Required	Sub task No.
AGV No.	Required	The AGV No. to re-execute the sub task.
Resend X Coordinate	Required	Resend the X coordinate.
Resend Y Coordinate	Required	Resend the Y coordinate.
Original Bin	Optional	Bin regarding the CTU.

13.2.7 Set the Binding Relationship between Container and Storage Bin

Purpose: Link or unlink the appointed container and the appointed storage bin.

Table 13-21 Parameters Description

Field	Attribute	Description

Storage Bin No.	Required	Storage bin No. you need to set.
Container Code	Required	Container code you need to set.
Container Type	Required	Container type you need to set.
Feature Value	Optional	It is for selecting tasks.
Bind	Required	1: Bind, 0: Unbind

13.2.8 Set Inbound Destination of Workbin

Purpose: Specify inbound destination for CTU task of sending workbins.

Table 13-22 Parameters Description

Field	Attribute	Description
Container Type	Required	The container type that sends task.
Container No.	Required	The container No. that sends task.
Target Position No.	Required	It is the target position number.
Type	Optional	It is the type of target position.

13.2.9 Bind Storage Section to Rack

Purpose: Link or unlink the appointed rack and the appointed storage section.

Table 13-23 Parameters Description

Field	Attribute	Description
Storage Section Call	Required	Storage section call you need to set.
Rack No.	Required	Rack No. you need to set.
Rack Direction	Optional	Rack direction you need to set.
Characteristic	Optional	The characteristic value of binding and

Value		unbinding roadway.
Bind	Required	1: Bind, 0:Unbind

13.2.10 Empty Roadway

Purpose: Link or unlink the appointed rack and the appointed storage section. It is divided into forklift roadway emptying and transport forklift emptying. Pass in the roadway number, and the forklift roadway empties the containers on the virtual shelf, and the transport roadway emptying means unbind the rack at points in the roadway.

Table 13-24 Parameters Description

Field	Attribute	Description
Roadway No.	Required	Roadway No. you need to empty.

13.2.11 Setting Area Locked State

Purpose: Lock and unlock the storage area.

Table 13-25 Parameters Description

Field	Attribute	Description
Area	Required	Area number to set the binding.
Bind	Required	1: Bind, 0:Unbind
Lock Mode	Required	1. Dispatch outside the area. 2. Dispatch to temporary settlements outside the area. 3. Dispatch to the specific area. 4. Pause in the area.

13.2.12 Set the Bind between Batch and Rack

Purpose: Set the binding of rack and batch. Bind or unbind the appointed rack and batch.

Table 13-26 Parameters Description

Field	Attribute	Description
Material Batch	Required	Material Batch to set the binding.
Rack No.	Required	Rack No. to set the binding.

Bind	Required	1: Bind, 0:Unbind

13.2.13 Unlock Storage Bin

Table 13-27 Parameters Description

Field	Attribute	Description
Storage Bin No.	Required	Storage Bin No.

13.2.14 Release Elevator

Purpose: Release the appointed elevator.

Table 13-28 Parameters Description

Field	Attribute	Description
Task No.	Required	Task No.
Lift No.	Required	Lift No.
Destination Floor	Required	The floor needed to locked.

13.2.15 Task Count

Purpose: Set the task quantity for the workstation.

Table 13-29 Parameters Description

Field	Attribute	Description
Work Station No.	Required	Work Station No.
Task Count	Required	Task Count

13.2.16 Elevator Task Finished

Purpose: Send a notification when the elevator finishes a task.

Table 13-30 Parameters Description

Field	Attribute	Description
Transferring Point	Required	Transferring Point No.

13.2.17 Rack Bind Info Query

Purpose: Search the linking information of rack.

Table 13-31 Parameters Description

Field	Attribute	Description
Map Alias	Required	Map alias of which the rack belongs to.
Rack No.	Required	Rack No.
Material Batch	Required	Material Batch
Transferring Point	Required	Transferring Point No.
Strategy No.	Required	Strategy No.

13.2.18 WCS Exception Handle

Purpose: Handle exceptions in the WCS system.

Table 13-32 Parameters Description

Field	Attribute	Description
Device Type	Required	Device Type
Device No.	Required	Device No.
Task No.	Required	Task No.

13.2.19 Exception Handle of Pick-and-Place Application

Purpose: Handle exceptions of CTU pick-and-place tasks.

Table 13-33 Parameters Description

Field	Attribute	Description
Sub Task No.	Required	Sub Task No.
Pick-and-Place Type	Required	Pick or place.

13.2.20 Current Limited Control

Purpose: Search or reset the current limited concurrency. The parameters include global current limited concurrency, interface current limited concurrency, Action current limited

concurrency, statistical board current limited concurrency and count current limit concurrency.

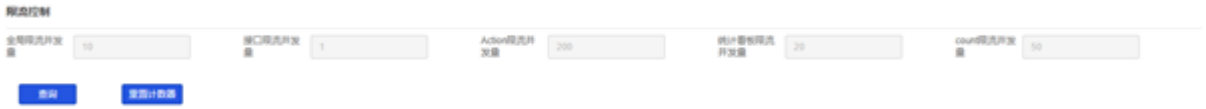


Figure 13-1 Current Limited Control

13.2.21 Batch Generation of Rack Detection Tasks

Purpose: Import file and download imported template.

Figure 13-2 Import and Download

13.3 Search Devices

13.3.1 Get all AGV Information

Purpose: Search all AGV information of the appointed client.

Table 13-34 Parameters Description

Field	Attribute	Description
Map Alias	Optional	The alias of the map which the AGV belongs to. Note: it is required if the AGV No. is -1.

13.3.2 AGV Status Query

Purpose: Search the status of the appointed AGV.

Table 13-35 Parameters Description

Field	Attribute	Description
Client No.	Optional	Client No. (The client is the one you want to operate AGV.)
Map Alias	Optional	The alias of the map which the AGV

		belongs to. Note: it is required if the AGV No. is -1.
Number of Search AGV	Optional	-1 means all AGVs.
Search AGV No. List	Optional	List of AGV numbers in query status; When the number of search AGVs (not -1) is entered at the same time, the number of AGV numbers entered shall prevail.

13.3.3 Search AGV Real-time Path

Purpose: Search the real-time route of the appointed AGV.

Table 13-36 Parameters Description

Field	Attribute	Description
Client No.	Optional	Client No. (The client is the one you want to operate AGV.)
Map Alias	Optional	The map which the AGV belongs to.
AGV No.	Required	AGV No.

13.3.4 Free AGV

Purpose: Search free AGV information.

Table 13-37 Parameters Description

Field	Attribute	Description
Client No.	Optional	Client No. (The client is the one you want to operate AGV.)
AGV No.	Required	AGV No.

13.3.5 Charging Station Query

Purpose: Search the charge station information.

Table 13-38 Parameters Description

Field	Attribute	Description
Client No.	Optional	Client No. (The client is the one you want to operate AGV.)
AGV No.	Required	AGV No.

13.4 TPS Task Test

13.4.1 Outbound Task

Purpose: Execute rack outbound task.

Table 13-39 Parameters Description

Field	Attribute	Description
Task Order No.	Required	Task Order No.
Storage Bin No.	Required	Storage Bin No.
Work Station No.	Required	Work Station No.
Task Type	Optional	The task type that is executed.
Priority	Optional	1-6, the higher the number, the higher the priority.
Lift Status	Optional	0: lift(default), 1: put down, 2: put down and release.
Device Type	Optional	It is the AGV type.
Container No.	Optional	It is the container No. that executes carry task.

13.4.2 Return Task

Purpose: Execute rack return task.

Table 13-40 Parameters Description

Field	Attribute	Description
Task Order No.	Optional	Task Order No.
Task Type	Optional	0: default, 1: initialize inbound, 4: automatic return.
Starting Bin No.	Optional	It is the number of starting bin.

Ending Bin No.	Optional	It is the number of ending bin.
Work Station No.	Optional	Work Station No.
Strategy No.	Required	Strategy No.
Target Store Section	Optional	It is target position of inbound again.
Pick in Advance	Optional	Pick in Advance Sign
Container No.	Optional	It is the container No. that executes carry task.

Note

Fill in at least one of task number, storage bin No. and work station No.

13.4.3Initialize Inbound

Purpose: Create and execute initialize inbound task according to the appointed policy.

Table 13-41 Parameters Description

Field	Attribute	Description
Work Station No.	Required	Work Station No. when initializing inbound.
Storage Bin No.	Required	Storage Bin No. when initializing inbound.
Strategy No.	Required	Strategy No. when initializing inbound.

Or

Table 13-42 Parameters Description

Field	Attribute	Description
Work Station No.	Required	Work Station No. when initializing inbound.
Rack Number	Required	Rack Number when initializing inbound.
Strategy No.	Required	Strategy No. when initializing inbound.

13.4.4 Disable/Enable Workstation

Purpose: Disable/enable workstations.

Table 13-43 Parameters Description

Field	Attribute	Description
Workstation No.	Required	Workstation No.
Status	Required	Enabled/Disabled

13.4.5 End All Tasks

Purpose: End all tasks.

Table 13-44 Parameters Description

Field	Attribute	Description
Workstation No.	Required	Workstation No.
Scene Type	Required	It is the corresponding scene type.

Chapter 14 Statistics Reports

14.1 Add Statistics Panel

Steps:

Step 1 Click **Statistics -> Statistics Panel**.

Step 2 Click  .

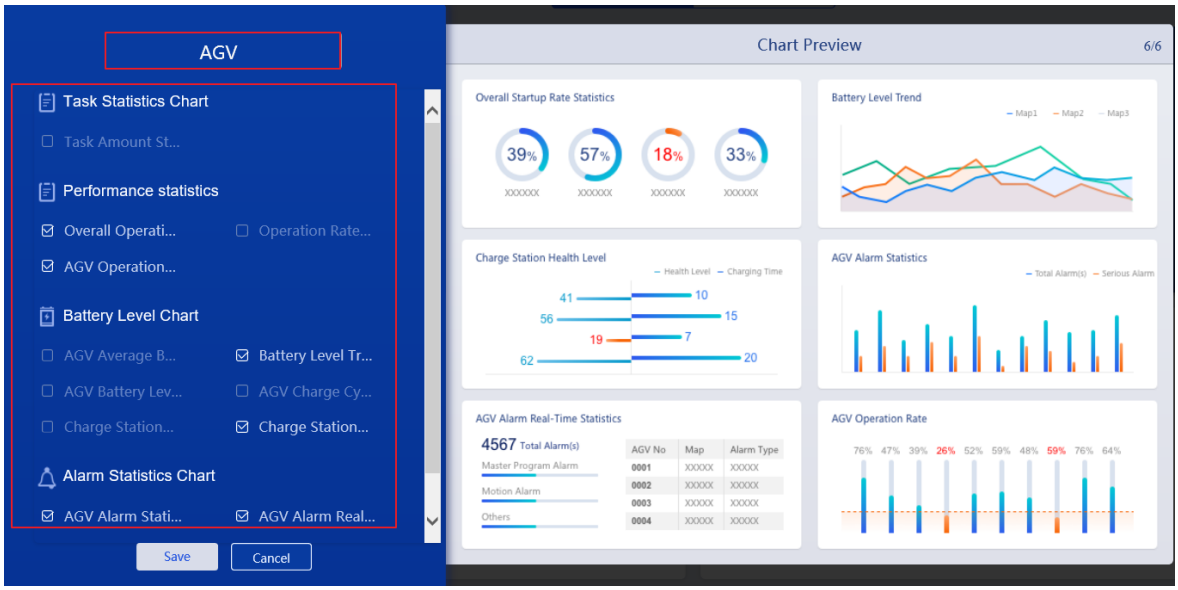


Figure 14-1 Adding Panel

Step 3 Set a panel name, and select statistic types.

The chart preview in the right displays the statistics model you select from the type.

Step 4 Click **Save**.

14.2 Edit Statistics Panel

Steps:

Step 1 Click  to edit the panel.

Step 2 Select statistic types you need to edit, click **Save**.

14.3 Delete Statistics Panel

Click  to delete the panel.

14.4 Full-screen Display

Click  to have a full-screen display of the statistics panel.

Chapter 15 New Appendix Description

15.1 Pre-Dispatch Scenario

Pre-dispatch scenario: CMS pre-scheduling scenarios are mainly divided into scheduled task, pre-dispatch of elevator cross floor and non-scheduled tasks.
Scheduled transport task: dispatch the AGV to the machine in advance to wait, so as to improve the transportation efficiency. AGV does not follow the elevator into the scene, dispatch the AGV in the target floor to the elevator waiting point in advance during the elevator operation, in order to improve the elevator operation efficiency.
Non-scheduled tasks: when each cargo is transported into a certain stage, it can estimate how long it will generate the transportation task. The upper system can send out the pre dispatch task and in advance dispatch AGV to wait so as to improve the transportation efficiency.

15.1.1 Task Beat Settings

The machine will generate transportation tasks regularly according to the produced beat. The task beat, as the machine attribute, is configured in the map data of the extended field. The display name is task beat and the field name is taskSchedule. The input number is limited, greater than 60 and less than 2000, and the unit is seconds as shown below.

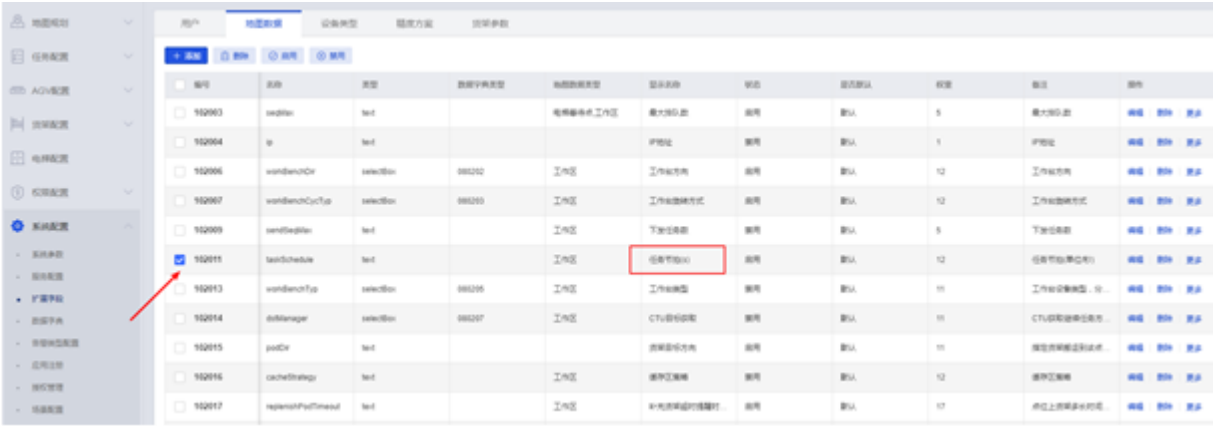


Figure 15-1 Task Beat

15.1.2 Point Association Settings

In the pre-dispatch scenario, the pre-dispatch waiting location is not consistent with the real task location. The real task point is in the elevator, and it is sure that the AGV will not enter in advance. Therefore, it is necessary to dispatch a related location first. When the real location generates tasks, the pre-dispatch AGV can be switched to perform the real task. Because multiple task points may be associated with the same pre-dispatch location, the

association relationship is configured on the real task point. Only one pre-dispatch associated location can be configured for each task point.
Add a new extended field in the extended field of map data. The display name is associated pre-dispatch location, and the field name is relSchedulePoint. It is limited to enter number of letter, and the input content is the map data No. of associated pre-dispatch point.

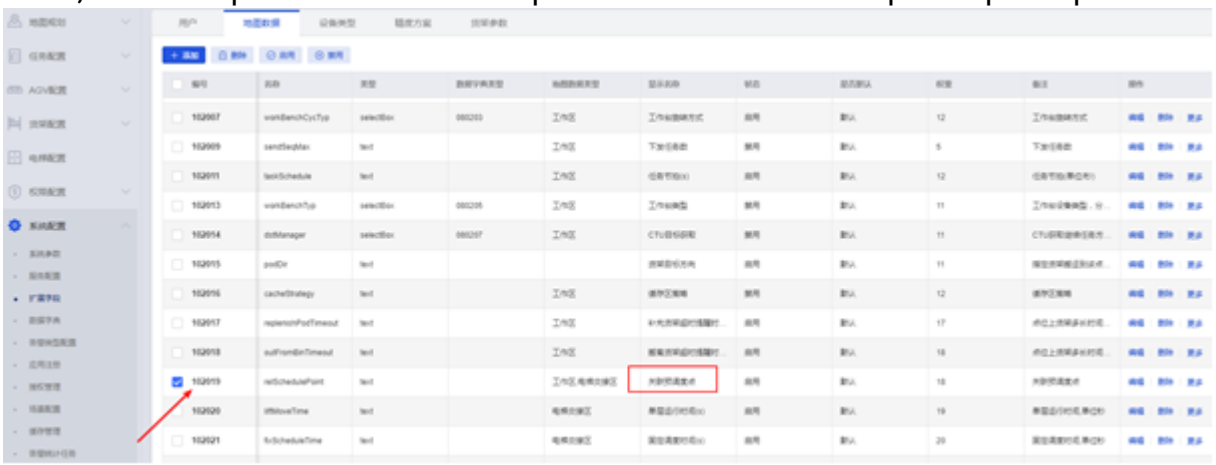


Figure 15-2 Associated Pre-Dispatch Point

15.1.3 Time Settings of Elevator Pre-Dispatch

Different elevator moving floors correspond to different pre-dispatch time. The time from applying the elevator in place to elevator closing operation does not change with the number of transportation floors. Therefore, the estimation formula of elevator pre-dispatch time is

$$T_{Pre\text{-}Dispatch} = t * X + T$$

X means the number of floors crossed, which is change with the task. t means the time of elevator running one floor. T represents the fixed duration. The fixed duration of internal and external towing may be different.
Therefore, take these two parameters as the extended attributes of the elevator junction point, and add two new extended fields in the extended field of map data. The display names are single running time and fixed dispatching time, and the field names are liftMoveTime and FixScheduleTime. The input digit is limited and the unit is second as shown below.
The fixed time configuration of multi lift is different. The time is not very accurate, and the reservation time need to be longer.

Figure 15-3 Lift Pre-Dispatch Time Settings

15.2 Safety Red Line

It is necessary that RCS-200 V3.1.4 shall meet the provisions of safety red line v2.1 to improve the safety of the system. Rectification is mainly required for the client and server.

15.2.1 System Safety

Whether to check access permissions is set in system parameters, which can control whether safety needs to be enabled globally. It is enabled by default. Projects that need to be closed can be closed automatically. After closing, the security verification mechanism will not take effect, and the external interface can be accessed directly.

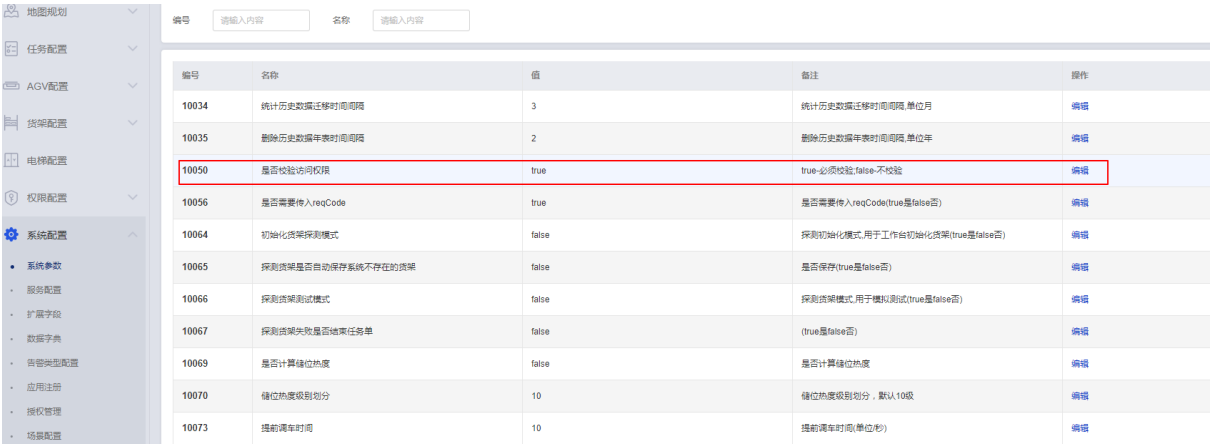


Figure 15-4 Access Right Settings

When adding application registration, encryption can be enabled or disabled. The user controls whether the application registration needs verification permission and whether the interface can be called. Encryption is enabled by default for application registration. If it is enabled, you need to verify whether the authorization in the HTTP header is consistent with

the message encryption. If it is disabled, it will pass without verification. The application registration disabled status indicates that the application does not have access to the platform.
IP Allow List: added to the system data dictionary.
Port Limit: RCMS configures the service port, which is limited to within 10000. The port limit is 0 to 9999.

15.2.2 Interaction

When interacting with the client, the client logs in through HTTPS.
The message AES is encrypted through secret key exchange with the server

15.3 Interface Error Code

CMS Interface Error Code: Error code information will be added to the returned information when calling the interface of generating task, continuing task and cancelling task. Return according to the error code in the CMS interface error code document.

Figure 15-5 CMS Error Code

TPS Interface Error Code: When calling TPS rack ex-warehouse, rack warehouse, end working platform task, rack ex-warehouse to the working platform in the area, and specify rack warehouse policy interface, error code description will be added to the returned information, and return according to the error in the TPS interface error code document.

15.4 Current Limit

RCMS Import/Export Optimization: Add a mask for all imports and exports in the system. Click Import/Export, the page will be covered by a mask and other operations are prohibited. When the import/export is completed, the mask is removed.

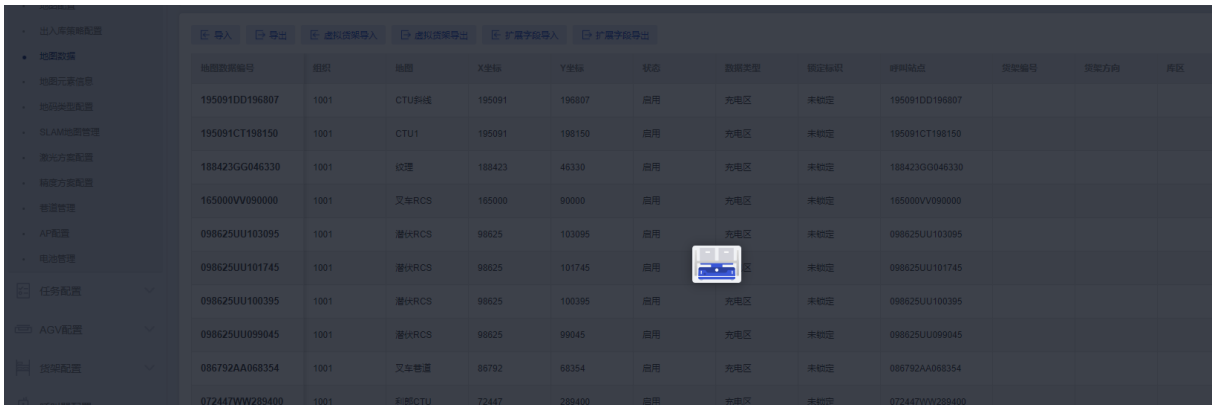


Figure 15-6 Export Mask

Current Limit: The system has a built-in current limit for import and export, and the limit for simultaneous import and export operations is no more than 1. When multiple users perform import or export operations, it will give a current limit prompt.

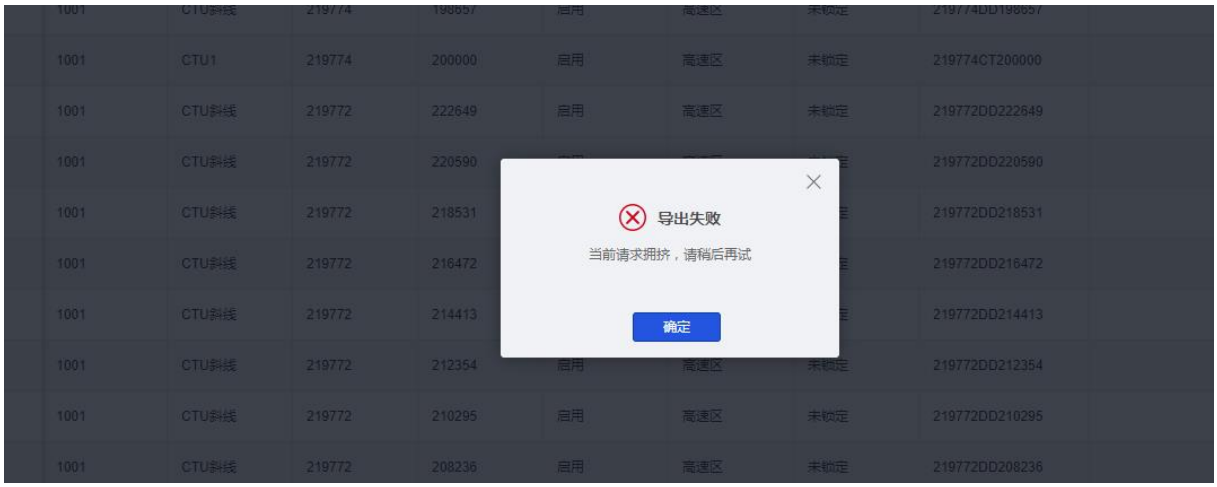


Figure 15-7 Current Limit Prompt