



# MiR100 Web Interface

## User Guide

Version 1.1

MiR100 1.1

# Introduction - MiR100

MiR100 is an automatic vehicle that transports items internally in production companies, hospitals, warehouses, malls and other places.

Through a web interface, the user specifies a destination for the delivery of the goods. MiR100 can be set up to run a specific route (bus), come on demand (taxi), deliver goods (mail).

MiR100 has a map, which is build when the vehicle is first put in service. While driving, MiR100 automatically avoids obstacles (people, furniture) that are not on the map. MiR100's internal map contains defined positions (office, hall, John's place,...).

This user guide describes the Mir100 Web Interface for controlling the vehicle and building the map as well as other administrative tasks and information.



## Specification

Load area:	600 x 800 mm - ½ EU pallet
Load weight:	100 kg
Run time:	13 hours or 20 km
Maximum speed:	5.4 km/h

# Background knowledge and concepts for operation of MiR100

## MiR100 Web Interface

The vehicle is controlled and configured from a web interface through a browser. Control and configuration of the vehicle is described in this guide which is mainly targeting administrators and superusers.

Any MiR100 vehicle has its own web server which is accessible either through the internal network of the vehicle or through the network of the customer site.

*Web adress for the internal network of the vehicle: mir.com.*

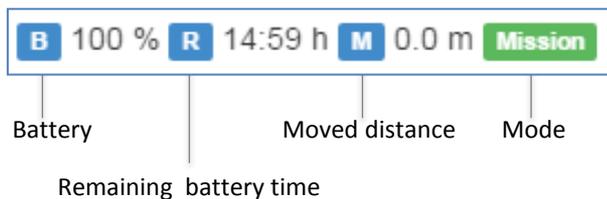
*Compatible browsers: IE 10 and 11, Firefox, Chrome.*

## MiR100 Modes

The vehicle has different modes that determine which commands are available and the behaviour of the vehicle:

- No map – the vehicle is waiting the assignment of a specific area or new map.
- Ready – the vehicle is ready for maneuvering by joystick or an operation pattern can be started.
- Operation patterns: taxi, mail, bus – these defines the daily driving at the customer site. The user receives and delivers goods.
- Map – creation and editing of a map of a specific area.
- Pause – waiting.

MiR100's operating status and mode are shown at the bottom of the page:



### Objects on the floor:

MiR100 “sees” objects of 5 cm and above and avoids them.

The rest is passed over.

When MiR100 is run in for the first time, areas with accompanying maps are created – eg. Ground Floor, Hall. For each area a number of positions are created – eg. John Smith’s office.

On start-up of MiR100 for daily usage an area is selected and the robot mode is set to mission.

The mission decides how MiR100 performs its transportation tasks and moves from position to position. MiR100 is delivered with predefined as well as configurable missions:

- Taxi
- Route

When the vehicle reaches a position, the MiR100 executes a number of actions determined by the current mission.

### **Taxi**

The vehicle’s destination is provided either through MiR Web Service or directly on the robot. The vehicle then determines the route from its current position to the new destination and starts moving.

### **Route**

The vehicle runs a route between positions. At each position, packages can be loaded and a text or mail message can be sent to recipients.

After finalising the route the vehicle either returns to the central station or starts over.

### **Mission**

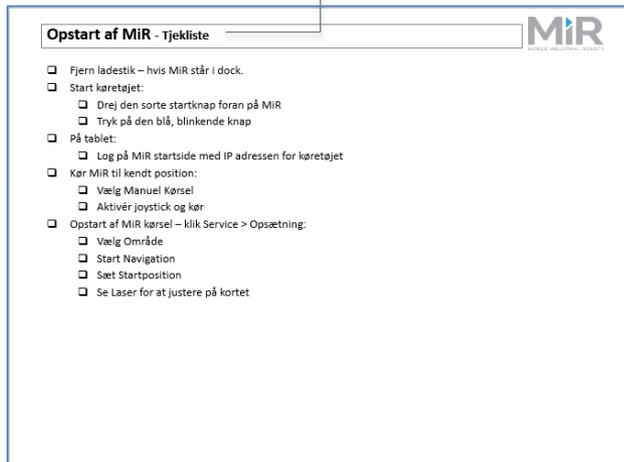
The Mission interface is used for controlling the robot’s queue of missions to execute. Each mission consists of a number of *actions* such as “go to position”, “make sound”, “call elevator”.

This user guide is divided into the following sections:

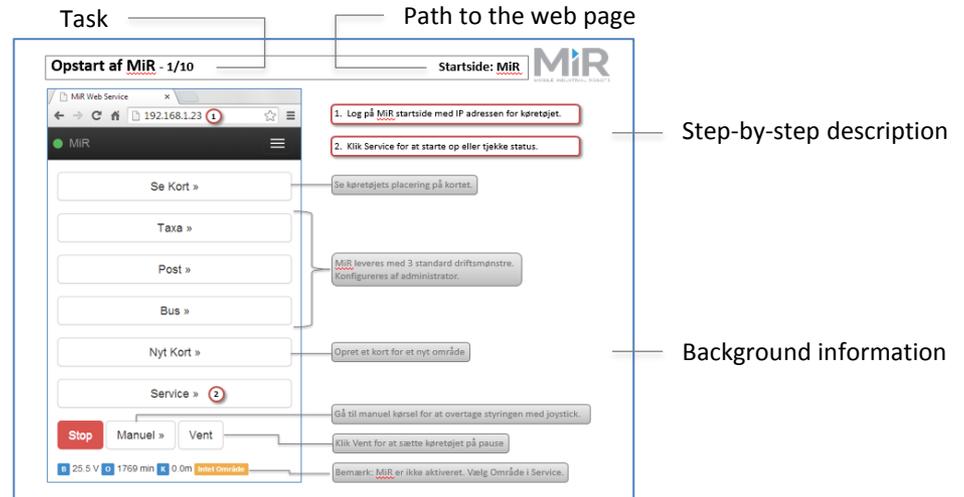
- Starting up of MiR100
- Taxi service by MiR100
- Route service by MiR100
- Mission queue
- Manually driving using joystick
- Creating a new map
- Editing a map - Administrator
- MiR100 status – Administrator
- MiR100 configuration - Administrator

Each section is introduced by a check list which is then elaborated by a picture and step-by-step description of the task:

Check list for the task



Check list for a task



Step-by-step procedure

## Start up of MiR100 – Check list

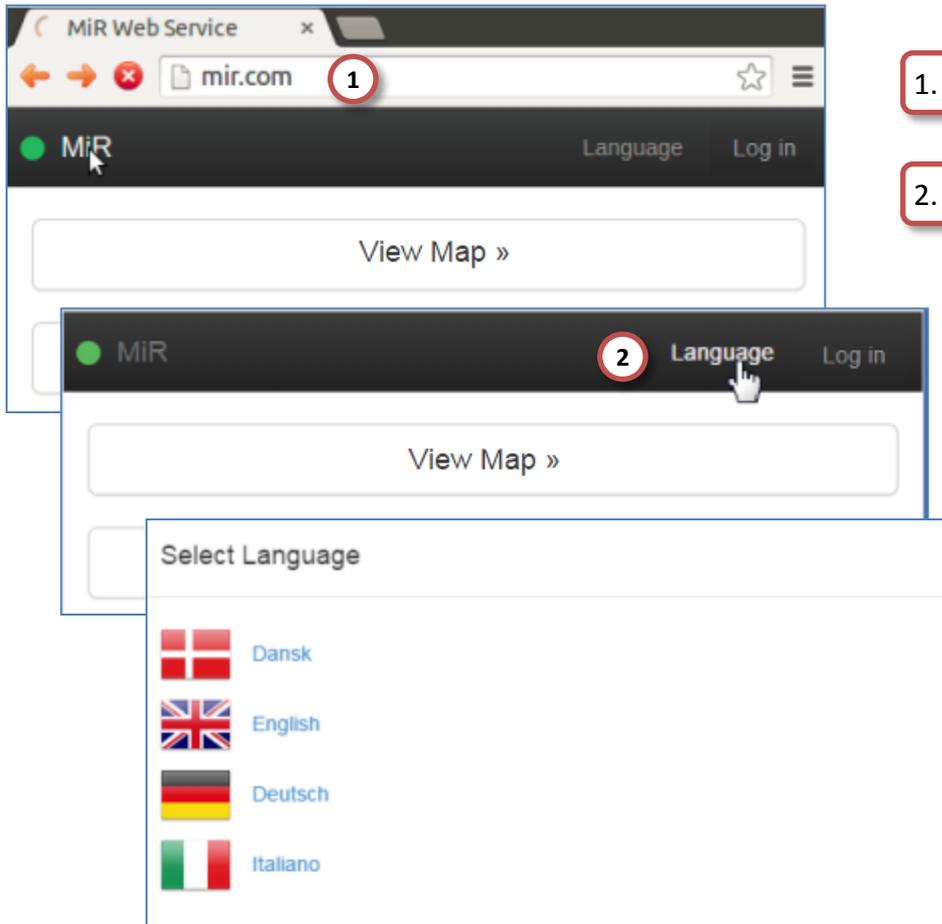
- Remove charger – if MiR100 is docked.
- Start up the vehicle:
  - Turn the black starter knob in the front of MiR100
  - Push the blue, blinking button
- On tablet:
  - Go to MiR100 start page [mir.com](http://mir.com) and log in
- To start up MiR100 driving – click Service > Choose Area
  - Set start position of the vehicle
  - Adjust map



Emergency stop

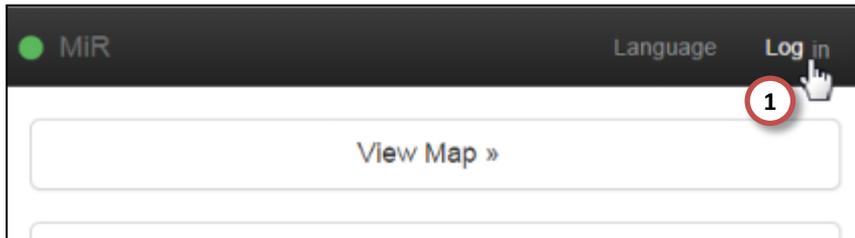
Start button

On/Off button



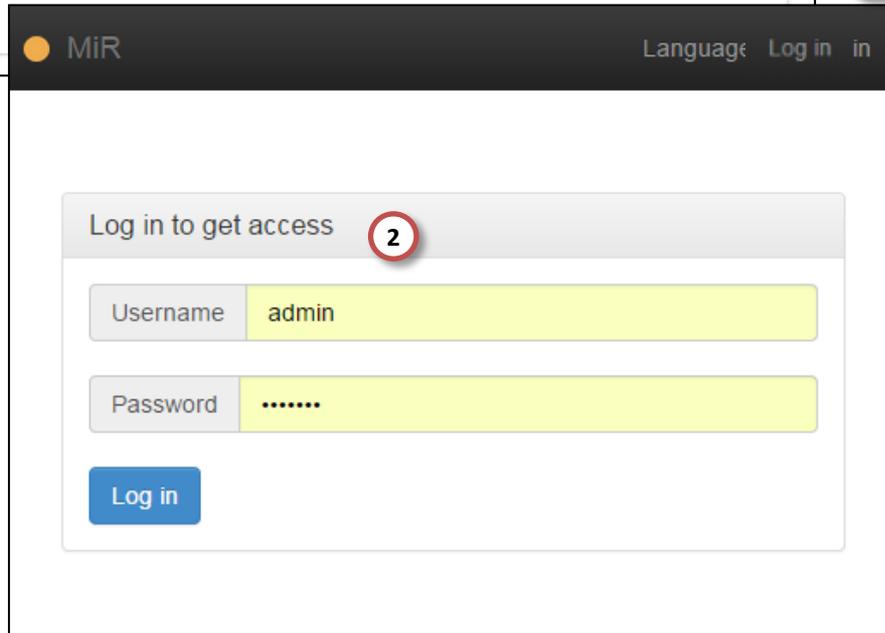
1. Navigate to MiR start page.

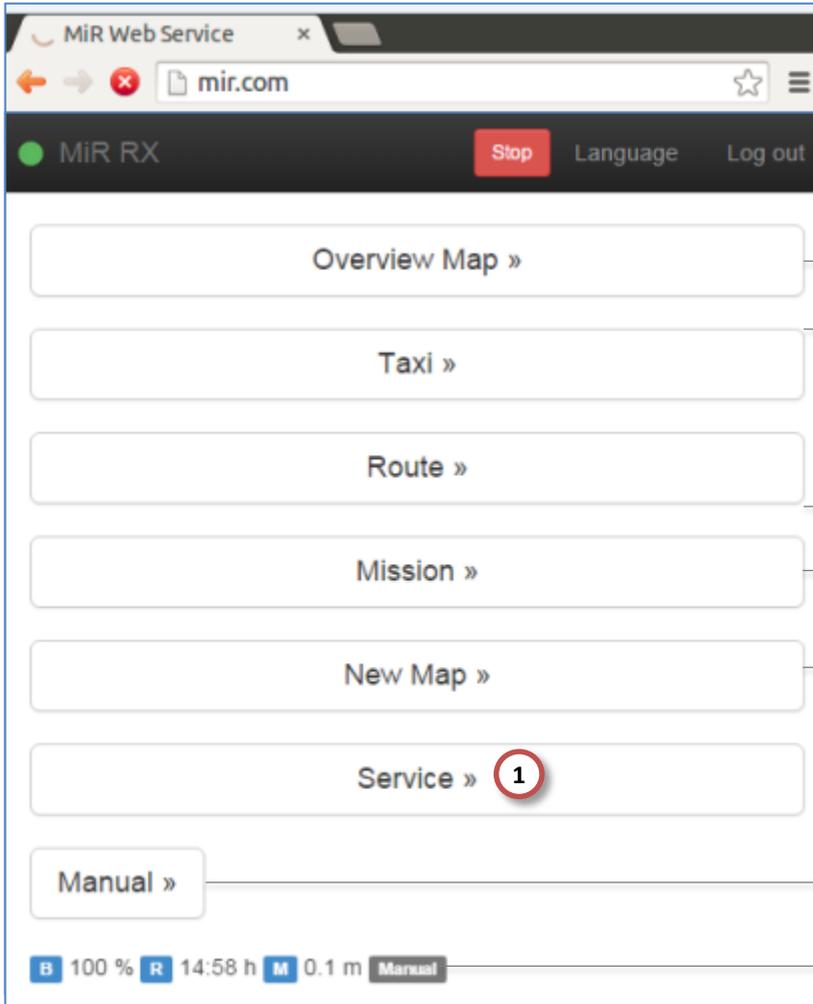
2. Choose language – Language.



1. Click Log in.

2. Log in with user name and password – this user guide describes tasks for the administrator role.





Has now logged in.

1. Click Service to start up or check status.

View the location of the vehicle on the map

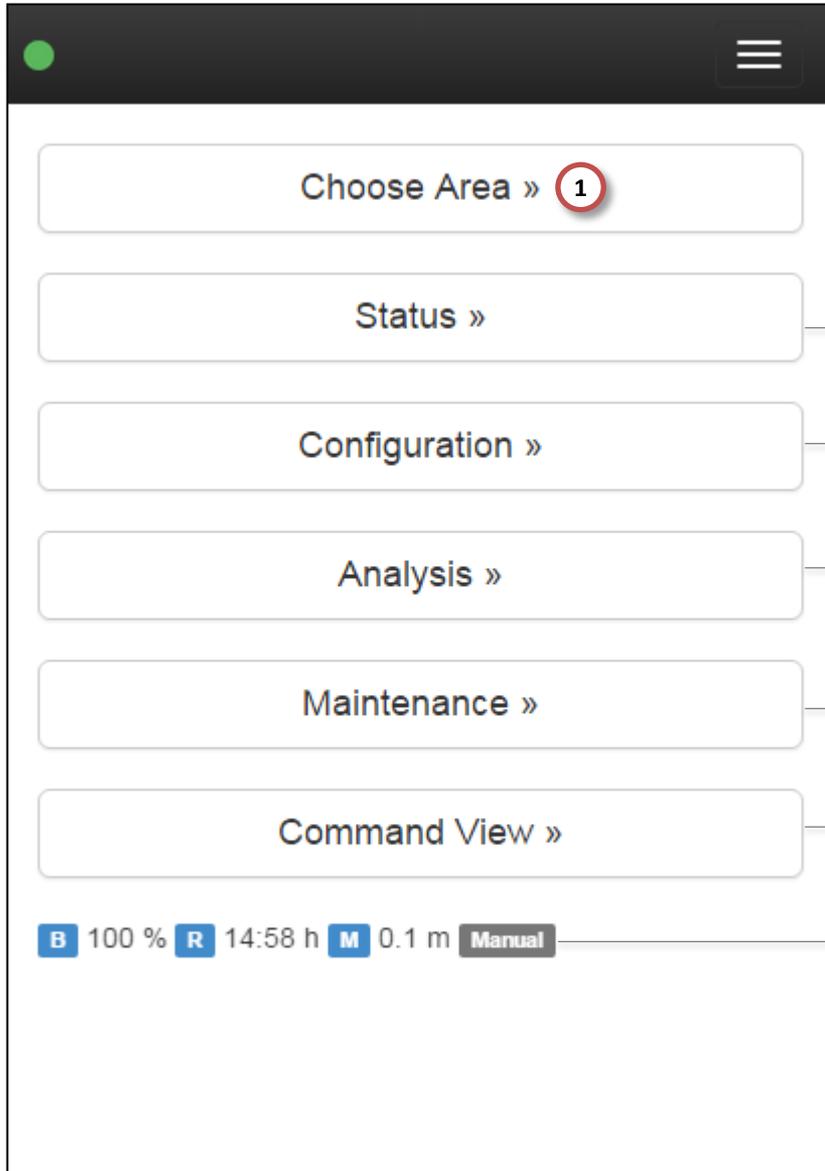
Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.



1. Choose the area - the vehicle is physically located here.

Log, status, system information.

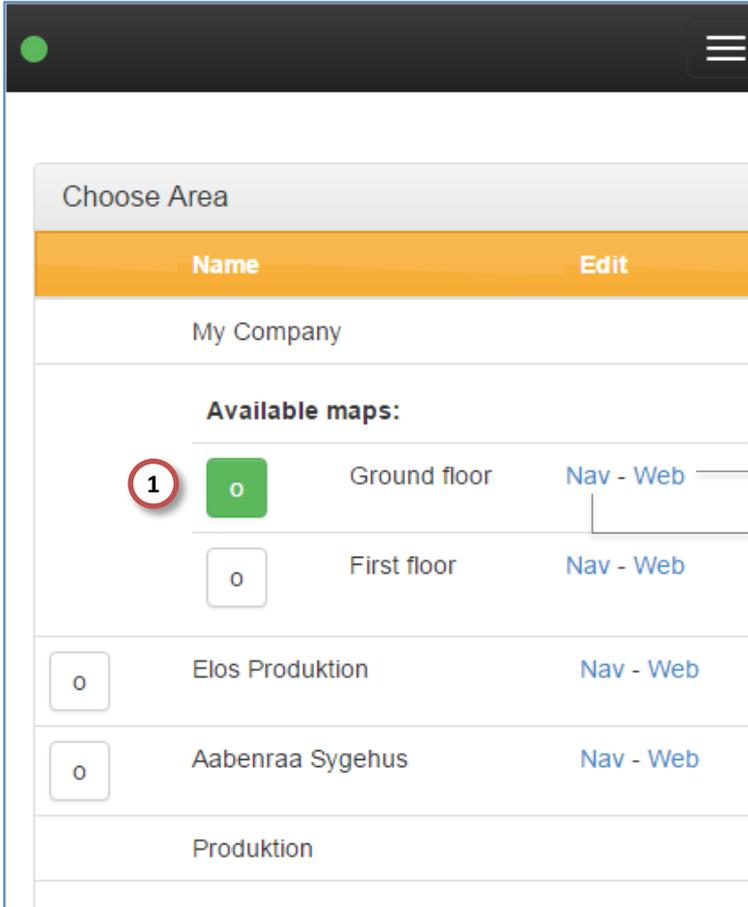
Basic setup – rarely used.

Overview over driving – location, distance, status.

Backup, restore, remote access, wifi.

Synchronizing the exact location of the vehicle with the map.

Note: MiR100 is on Manual. Select Area in Service to activate.

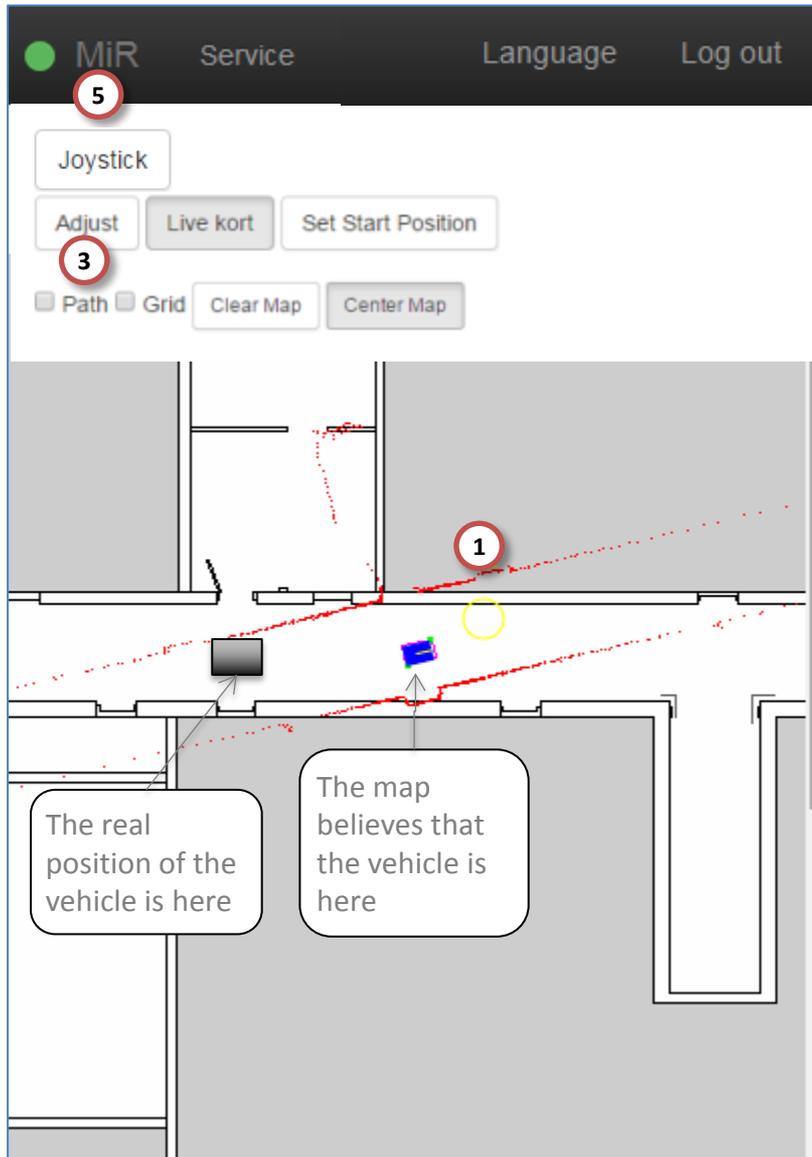


1. Activate area by clicking the square.

*Automatically enters command view for synchronizing the exact location of the vehicle with the map.*

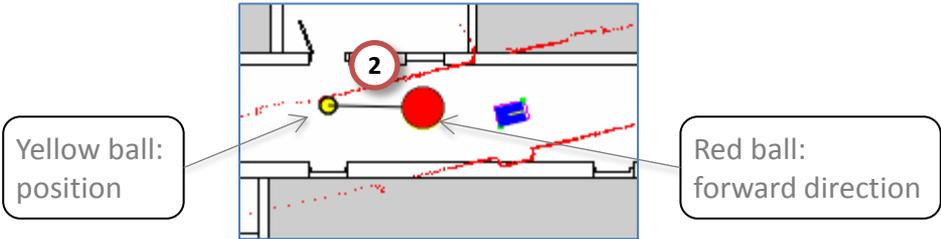
Edit the look of the map – not the navigation area.

Edit the map for MiR100 – edit allowed navigation area.



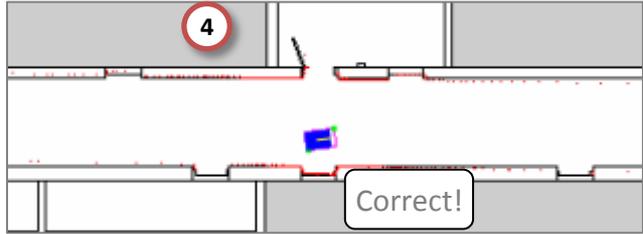
1. Red lines (the sensors of the vehicle) must match the black lines of the map. Done in step 2.

2. Mark the real location of the vehicle on the map: **click and drag the mouse** – like driving using joystick.

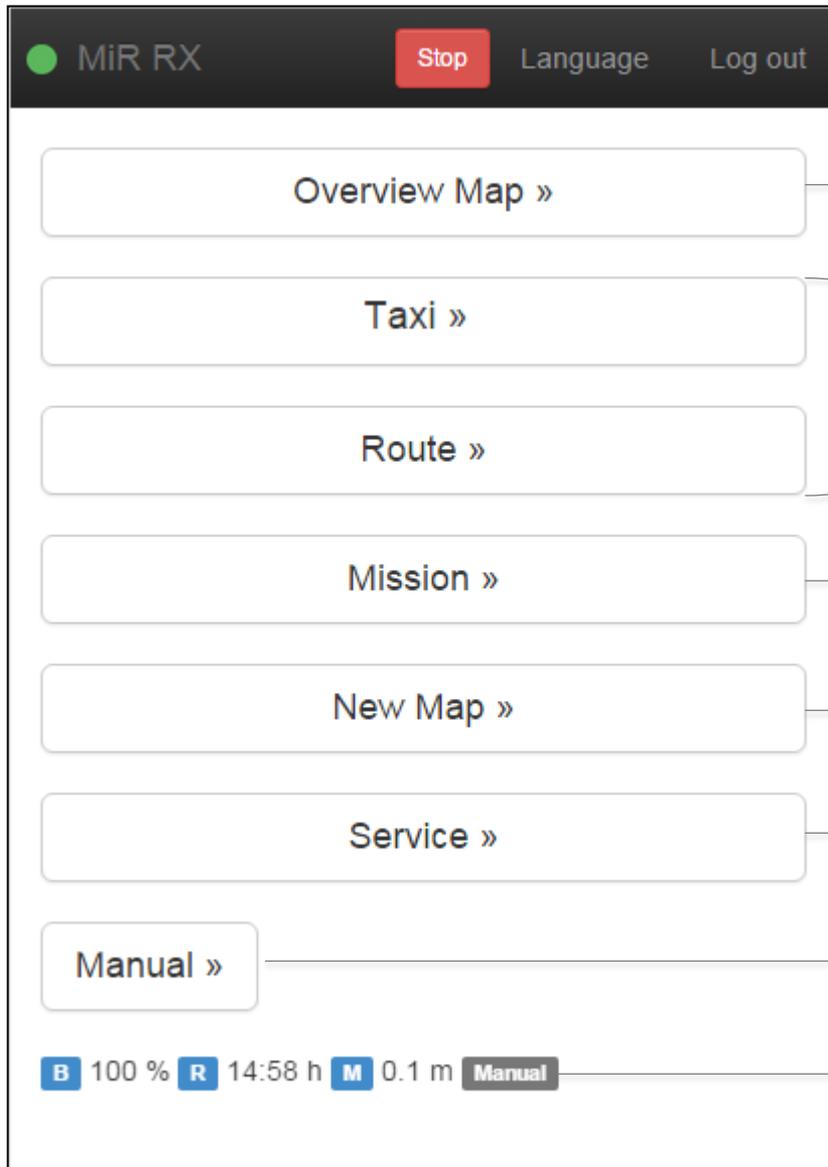


3. Update the map. Click Adjust.

4. The vehicle and the map are now in sync.



5. Go back to the MiR start page.



The screenshot shows the MiR RX control interface. At the top, there is a dark header with a green status indicator, the text 'MiR RX', a red 'Stop' button, and links for 'Language' and 'Log out'. Below the header is a vertical list of menu items: 'Overview Map »', 'Taxi »', 'Route »', 'Mission »', 'New Map »', 'Service »', and 'Manual »'. At the bottom, there is a status bar with icons and text: 'B 100 % R 14:58 h M 0.1 m Manual'.

MiR100 is now started and ready for driving.

View the location of the vehicle on the map

Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

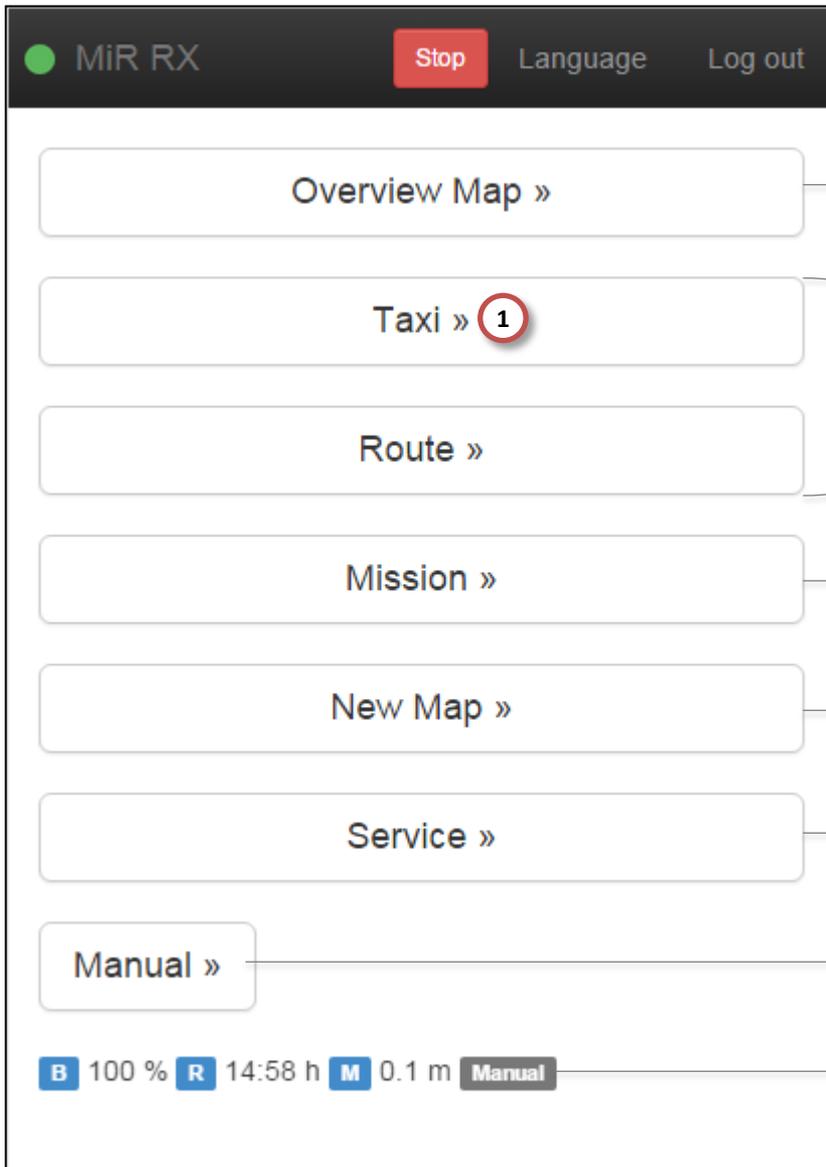
Click Service to start up MiR100 or check status.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.

## Taxi Service by MiR100 – Check list

- From the start page, select an operation pattern (Taxi)
- Start taxi service, then choose position
- Look at the Taxi page: next target, remaining distance, location on map...
  
- For administrator:
  - Edit and Create taxi positions



1. Click Taxi to start up taxi pattern by MiR100.

View the location of the vehicle on the map

Predefined mission types

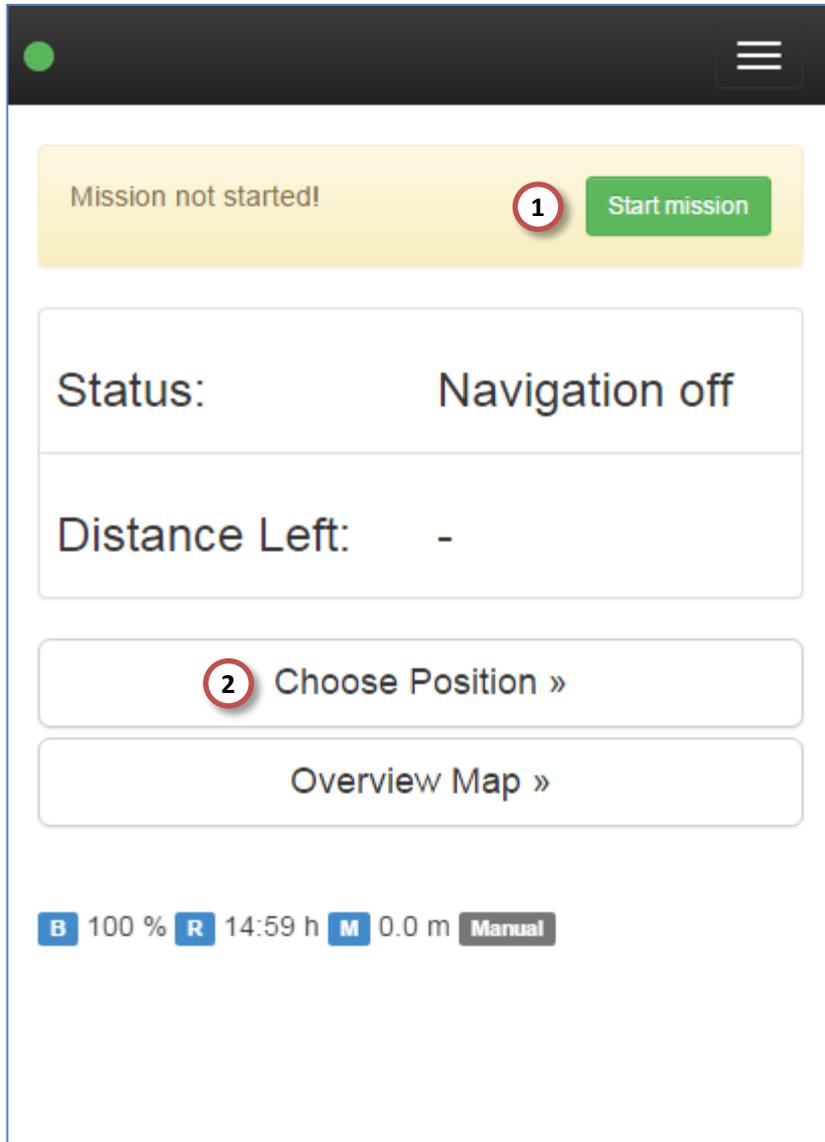
Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Click Service to start up MiR100 or check status.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.



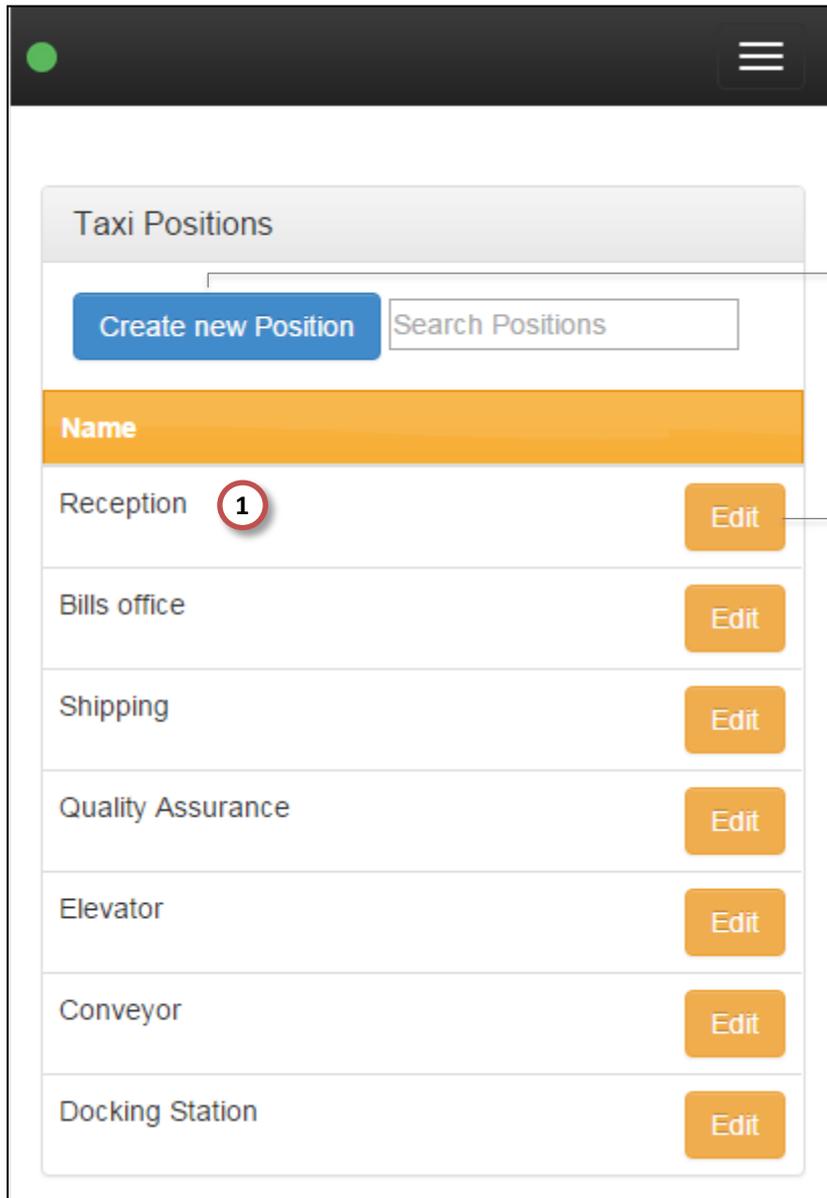
1. Start mission – if not already started.

2. Choose Position – this is the destination.

### MiR100's colors:

Green:	Waiting for job
Turquoise:	Driving to target
Purple:	Can't find target
Yellow-purple:	Skidding
Blue:	Joystick driving





Taxi Positions

Create new Position Search Positions

Name	
Reception <b>1</b>	Edit
Bills office	Edit
Shipping	Edit
Quality Assurance	Edit
Elevator	Edit
Conveyor	Edit
Docking Station	Edit

1. Select which position to drive to, eg Reception.

*The vehicle starts driving and the Taxi page is automatically shown.*

Only administrators can create and edit positions.

MiR RX Taxi **Stop** Language Log out

Status: Moving to "Reception" (Driving)

Distance Left: 0.5

Choose Position »

Overview Map » **1**

**B** 100 % **R** 14:58 h **M** 0.5 m **Mission**

1. See the position of the vehicle on the map...

Stop and pause mission when necessary. Then: Click Continue to resume mission.

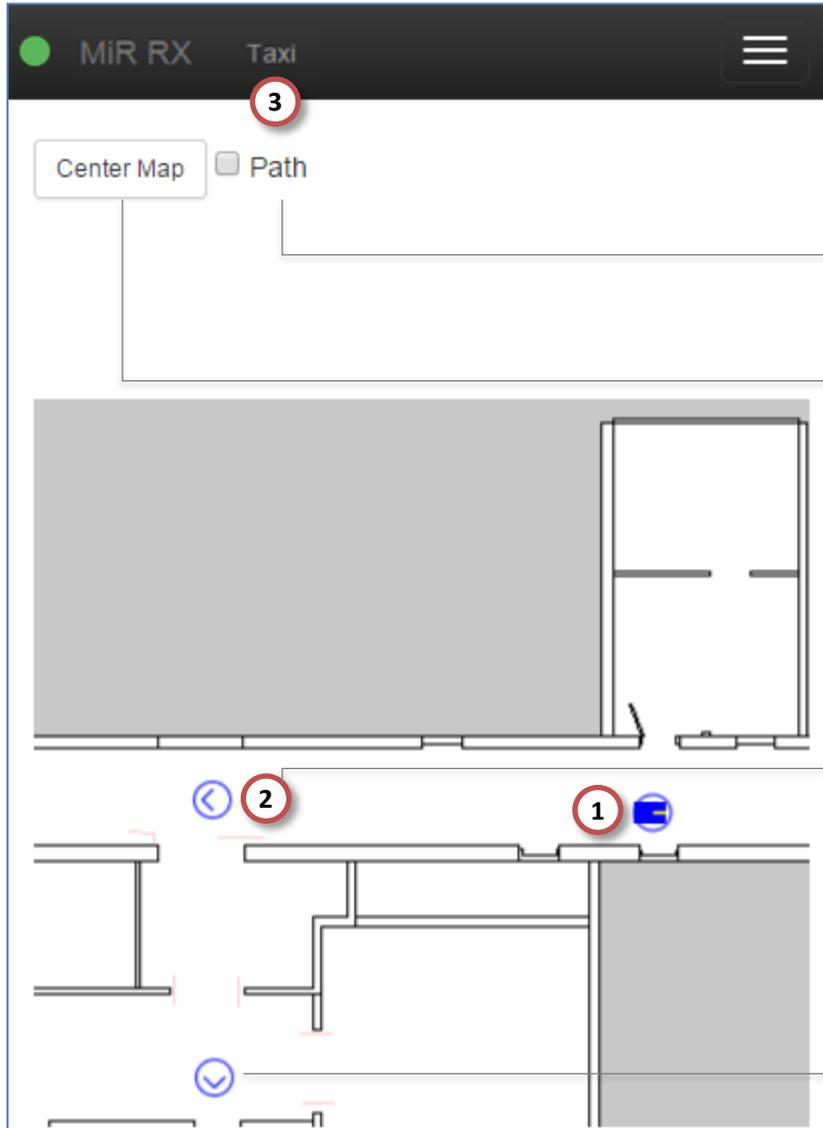
**Continue** Langu

When taxi service is active, Status shows the next destination of the vehicle...

..and how many meters remain to reach the target.

Choose next destination.

MiR100 now runs a mission.



1. See the position of the vehicle on the map...

2. Click a position and select Go to Position to set a new destination.  
If robot is moving, click Cancel to change destination.

3. Return to MiR > Taxi – ready for a new destination.

Show planned path to next position

Click to center the map on the vehicle.

Name: Bills office  
Rotation: 180

Go to position

Cancel current mission?

OK

Cancel

Position and orientation – blue circle and forward direction.

MiR RX Taxi **Stop** Language Log out

Status: Waiting for mission

Distance Left: 0.1

Choose Position » **1**

Overview Map »

**B** 100 % **R** 14:58 h **M** 12.4 m **Mission**

1. Create and edit positions.

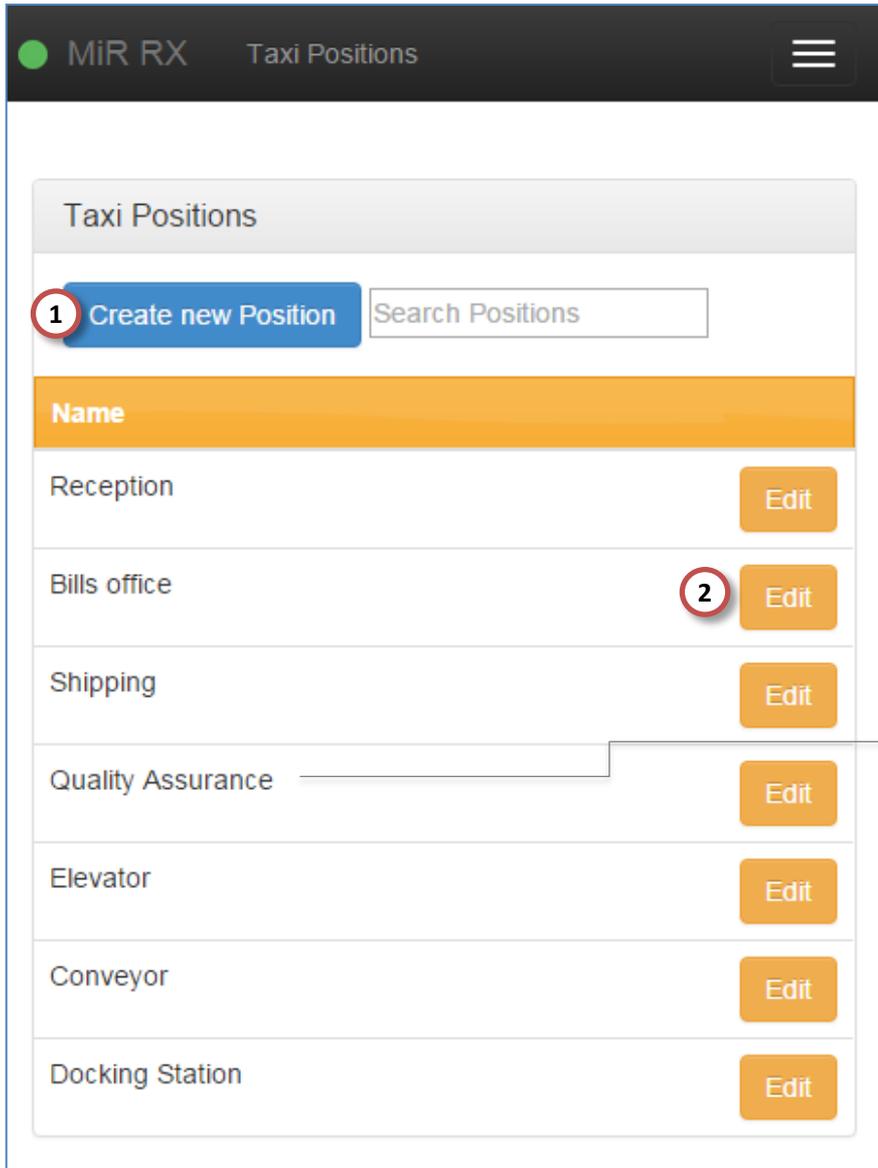
Stop mission when necessary.  
Then: Go to start page for Joystick driving or new mission.

When taxi service is active, Status shows the next destination of the vehicle...

..and how many meters remain to reach the target.

See the position of the vehicle on the map...

MiR100 is waiting for a mission.



MiR RX Taxi Positions

1 Create new Position Search Positions

Name	
Reception	Edit
Bills office	2 Edit
Shipping	Edit
Quality Assurance	Edit
Elevator	Edit
Conveyor	Edit
Docking Station	Edit

1. Create a new taxi position.

2. Edit an existing taxi position.

Click a position, eg. Quality Assurance.  
*The vehicle starts driving and the Taxi page is automatically shown.*

### Edit Position 1

Name

X

Y

Orientation

2

### Create new Position 1

Name

X

Y

Orientation

2

1. Fill in all fields.

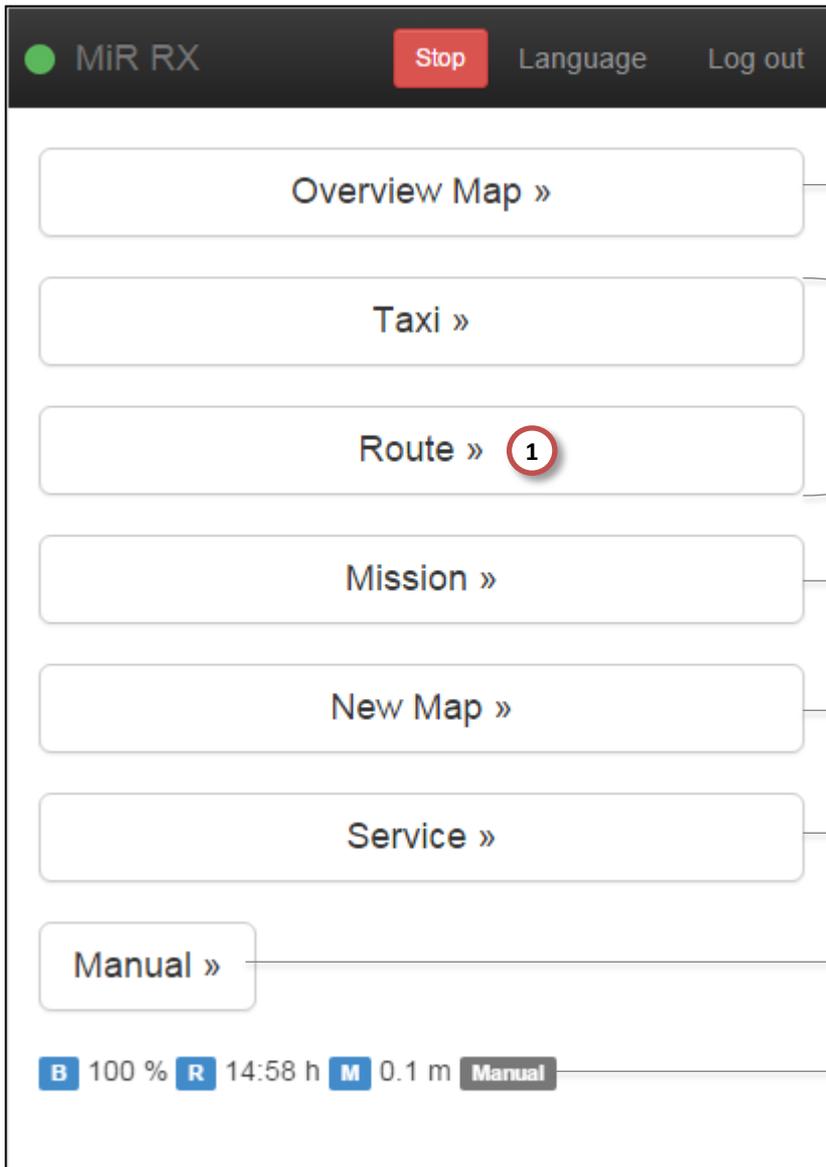
2. Accept the changes – click Save or Create button.

3. Go back to MiR > Taxi - ready for a new destination.

Use an existing position as a starting point - fields are automatically filled in and can be edited.

## Route by MiR100 – Check list

- From the start page, select Route to plan and add a mission to the queue
- Add packages and set the initial position
- Decide optional behaviour: Run the route without packages, use package types, ...
  
- For administrator:
  - Edit and Create route, stops, packages



1. Click Route to set up and start a route mission.

View the location of the vehicle on the map

Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Click Service to start up MiR100 or check status.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.

Route

Status: Waiting for mission

**Active route plan:**

Morning route 1 ▾

Packages » 2

Initial Stop »

**Mode:**

Positions  Contacts

**Loop:**

**Go to positions without packages:**

**Use package types:**

**Start route**

**Route configuration**

Route plans »

Package types »

1. Select a route.

2. Add packages.

Select destination type: Positions on map or Contacts with mail/phone. (Manage positions and contacts in MiR > Service > Configuration)

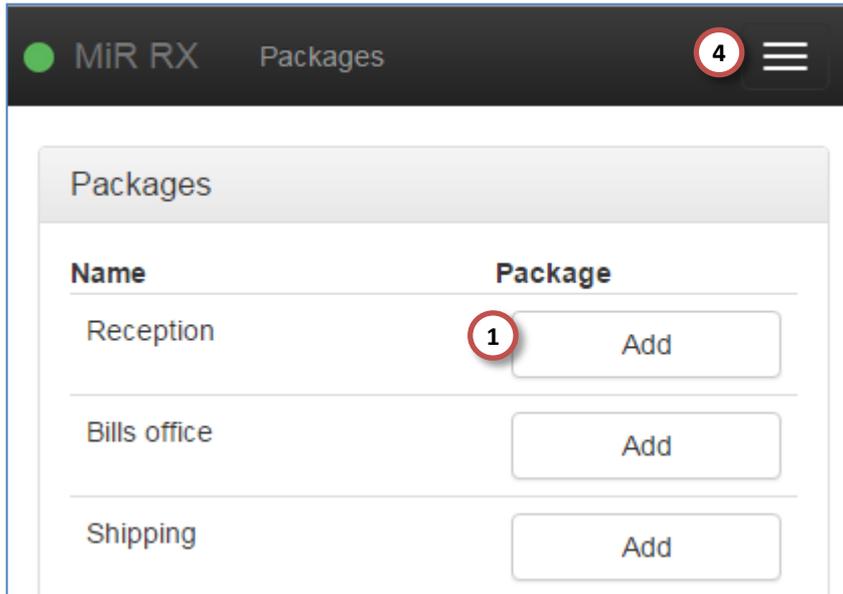
Check Loop to make the vehicle run the route continuously.

Check here to just stop at each destination – no waiting for package reception.

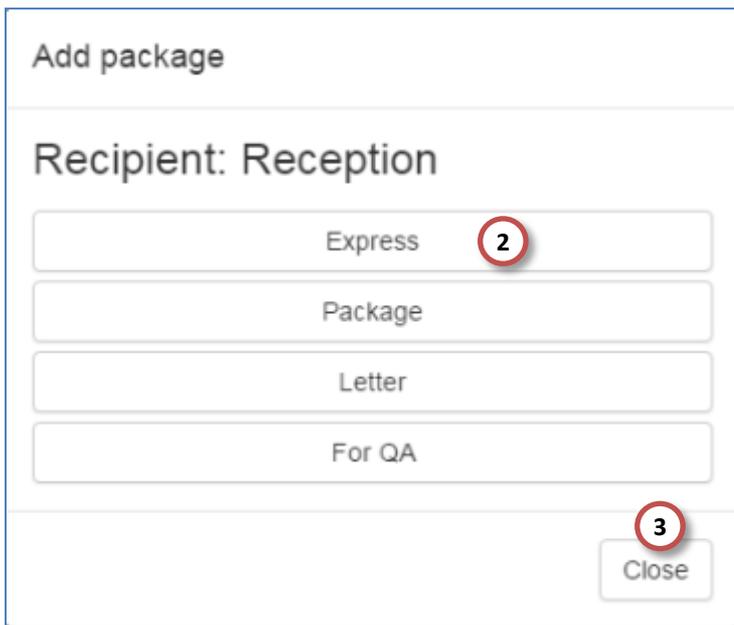
Package types are shown on the tablet on the robot.

Create and edit route name and stops.

Create and edit package types.



Name	Package
Reception	<b>1</b> Add
Bills office	Add
Shipping	Add



Add package

Recipient: Reception

Express **2**

Package

Letter

For QA

**3** Close

1. Click Add to add package types to each stop.

2. Click a package type to add it.

3. Close the window and add more packages to stops.

4. Go back to MIR > Route.

*The tablet on the robot shows the package type and the user receives it by clicking the tablet.*

Route

Status: Waiting for mission

Active route plan:  
Morning route ▾

Packages »

Initial Stop » **1**

Mode:  
 Positions  Contacts

Loop:

Go to positions without packages:

Use package types:

Start route

Route configuration

Route plans »

Package types »

Packages have now been added to the route stops.

1. Set the initial stop.

Select destination type: Positions on map or Contacts with mail/phone. (Manage positions and contacts in MiR > Service > Configuration)

Check Loop to make the vehicle run the route continuously.

Check here to just stop at each destination – no waiting for package reception.

Package types are shown on the tablet on the robot.

Create and edit route name and stops.

Create and edit package types.

MiR RX   Route   **Stop**   Language   Log out

Initial Stop

Choose the initial bus stop

<input checked="" type="radio"/>	Reception
<input type="radio"/>	Bills office
<input type="radio"/>	Shipping

1. Set the initial stop by clicking the square.

2. Go back to the Route page.

### Route

Status: Waiting for mission

#### Active route plan:

Morning route ▾

Packages »

Initial Stop »

#### Mode:

Positions  Contacts

Loop:

1

Go to positions without packages:

Use package types:

Start route

2

#### Route configuration

Route plans »

Package types »

*Ready to start moving.*

1. Select options.

2. Click Start route to add route to the mission queue.

Select destination type: Positions on map or Contacts with mail/phone. (Manage positions and contacts in MiR > Service > Configuration)

Check Loop to make the vehicle run the route continuously.

Check here to just stop at each destination – no waiting for package reception.

Package types are shown on the tablet on the robot.

Create and edit route name and stops.

Create and edit package types.

Route

Status: Waiting for mission

Active route plan:  
Morning route ▼

Packages »

Initial Stop »

Mode:  
 Positions  Contacts

Loop:

Go to positions without packages:

Use package types:

Start route

Route configuration

Route plans » **1**

Package types »

Configure the route plan and package types.

1. Click Route plans to add a new route or edit an existing.

Add or remove packages on the current route.

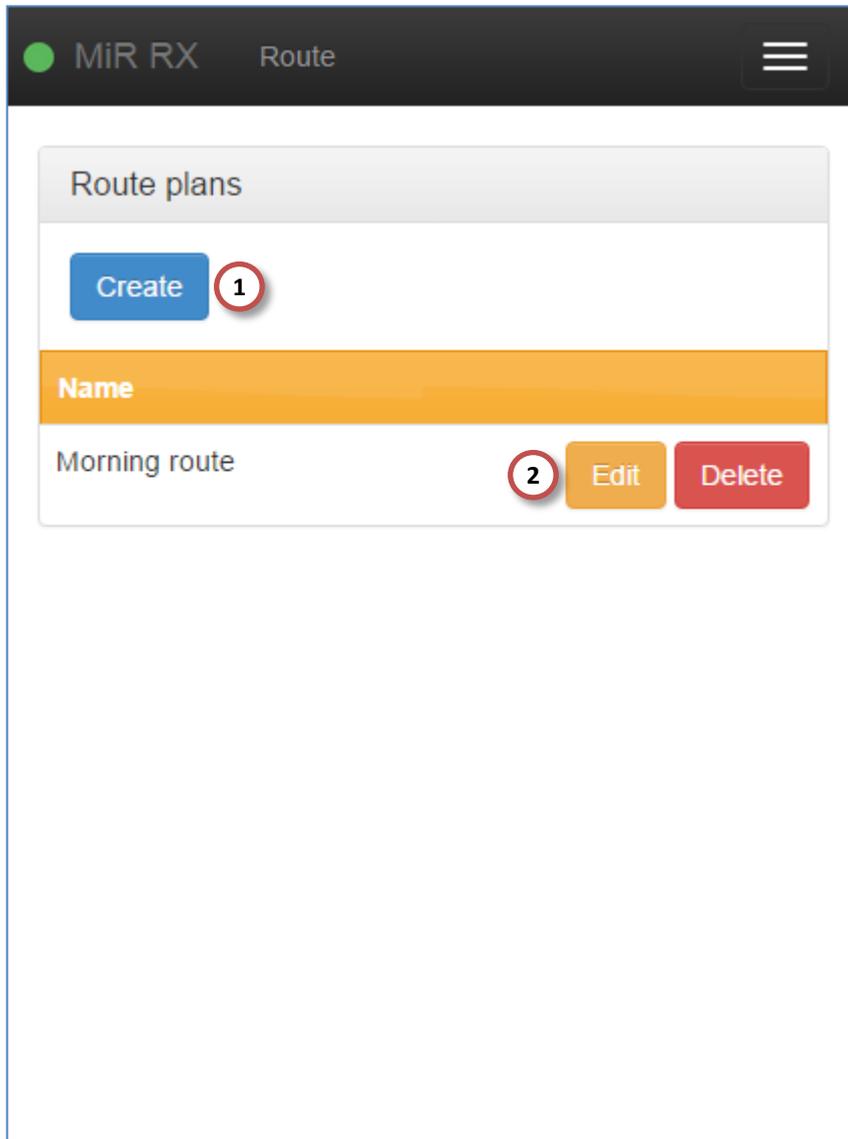
Select destination type: Positions on map or Contacts with mail/phone. (Manage positions and contacts in MiR > Service > Configuration)

Check Loop to make the vehicle run the route continuously.

Check here to just stop at each destination – no waiting for package reception.

Package types are shown on the tablet on the robot.

Create and edit package types.



The screenshot shows the 'Route plans' section of the MiR RX administrator interface. At the top, there is a dark header with 'MiR RX' and 'Route' text, and a hamburger menu icon. Below the header, the 'Route plans' section is displayed. It features a blue 'Create' button with a circled '1' next to it. Below the button is a table with a header row labeled 'Name' and a single row containing the text 'Morning route'. To the right of the 'Morning route' text are two buttons: 'Edit' (orange) and 'Delete' (red). A circled '2' is positioned to the left of the 'Edit' button.

1. Create to a new route.

2. Edit an existing route.

### Create

**Name:**  
1

**Area:**  
1

1. Write a name for the route and select an area.

2. The Stops window pops up. Click Create new stop.

### Stops

Name	X	Y	Orientation
------	---	---	-------------

2

### Create new Stop ✕

**Name**

**Use Existing Position**

**X**

**Y**

**Orientation**

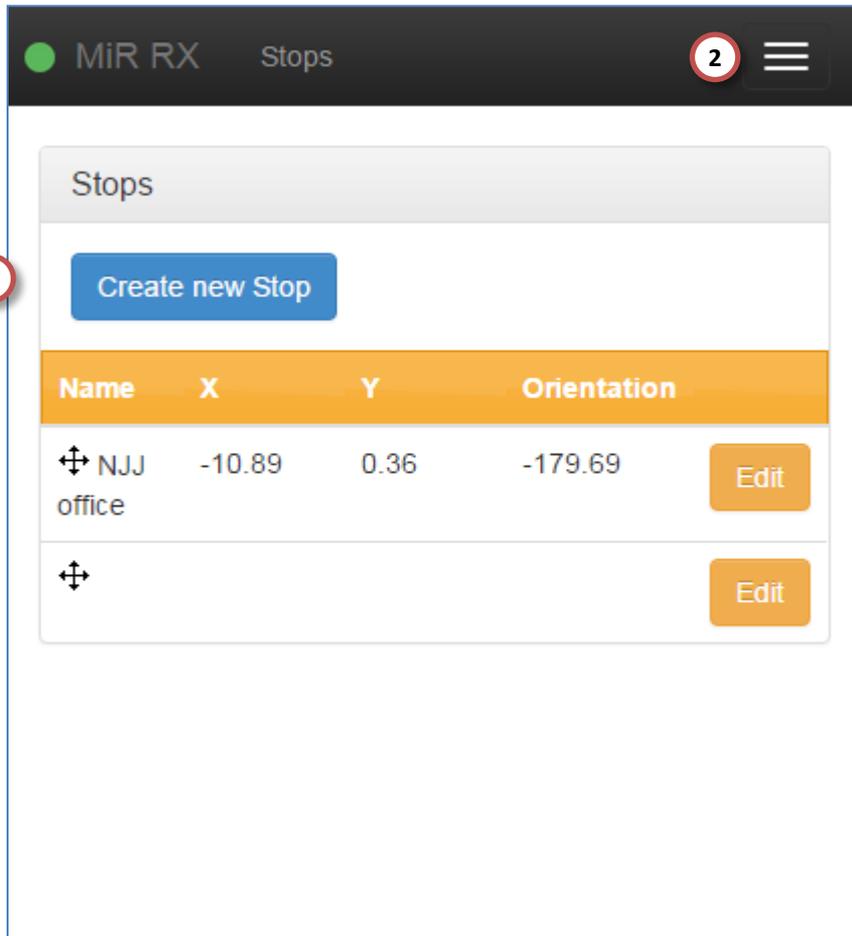
**Action**

1. Fill in all fields.

2. Click Create. Automatically returns to Create new stop.

Optionally add actions to the stop. (Manage actions in MiR > Service > Configuration > Missions)

Use an existing position as a starting point - fields are automatically filled in and can be edited.



MiR RX Stops

2

1

Stops

Create new Stop

Name	X	Y	Orientation	
↕ NJJ office	-10.89	0.36	-179.69	Edit
↕				Edit

1. Continue to built the route by creating new stops and edit existing.

2. Return to MIR > Route.

Route

Status: Waiting for mission

Active route plan:  
Morning route ▾

Packages »

Initial Stop »

Mode:  
 Positions  Contacts

Loop:

Go to positions without packages:

Use package types:

Start route

Route configuration

Route plans »

Package types » **1**

1. Click Package types to edit and create.

Add or remove packages on the current route.

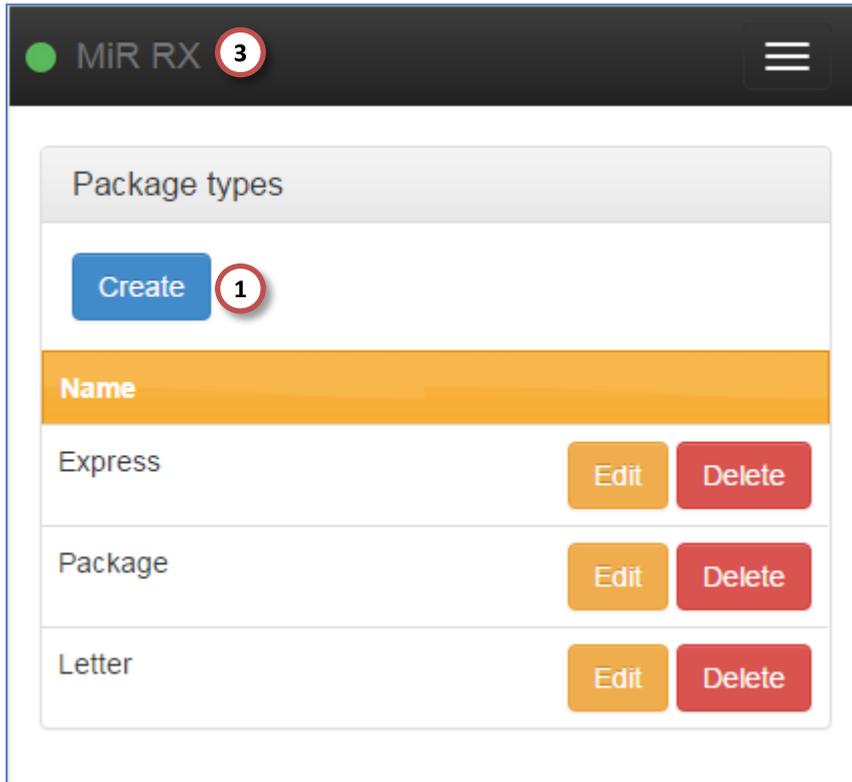
Select destination type: Positions on map or Contacts with mail/phone. (Manage positions and contacts in MiR > Service > Configuration)

Check Loop to make the vehicle run the route continuously.

Check here to just stop at each destination – no waiting for package reception.

Package types are shown on the tablet on the robot.

Create and edit routes and stops.



MiR RX 3

Package types

Create 1

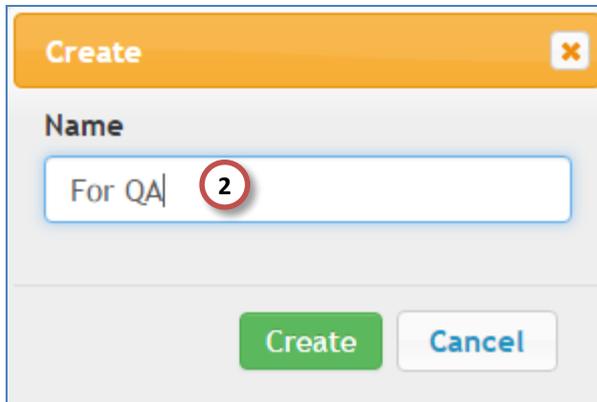
Name		
Express	Edit	Delete
Package	Edit	Delete
Letter	Edit	Delete

1. Create or Edit a package type

2. Fill in the name and click Create.

3. Return to MIR start page.

Package types are shown on the tablet on the robot.



Create

Name

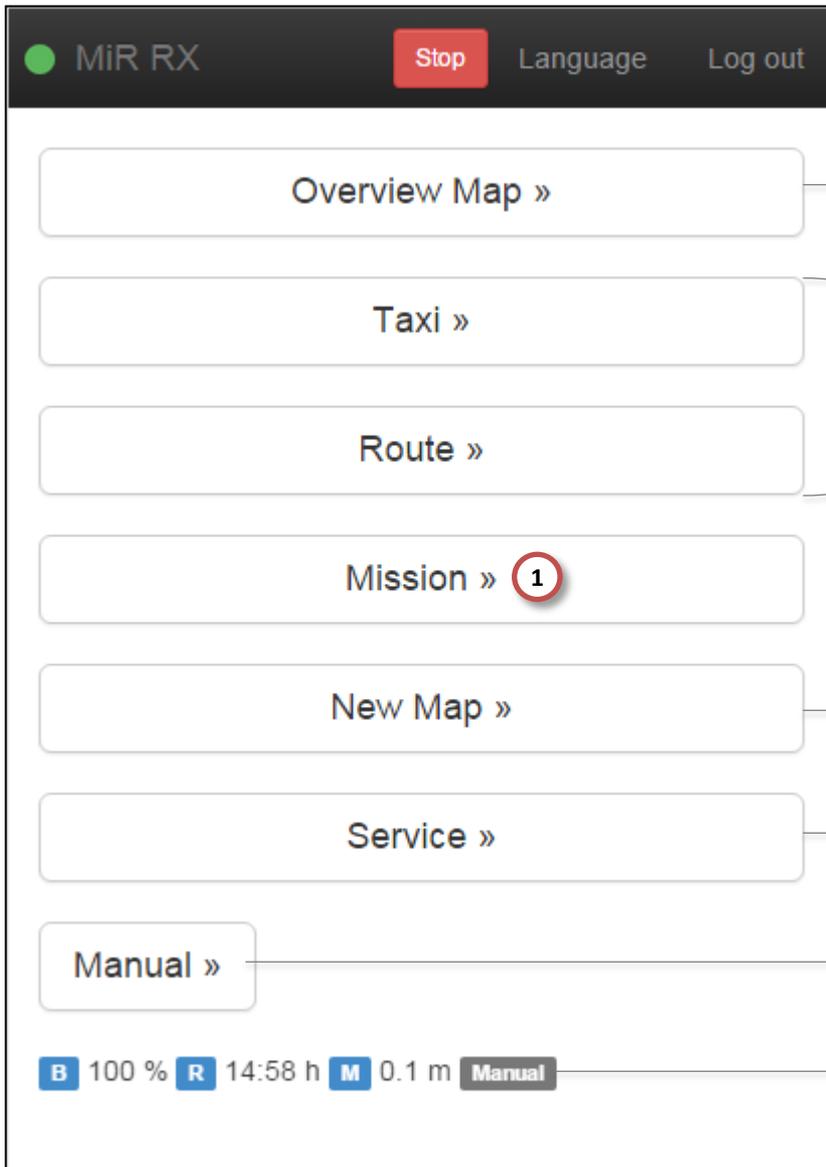
For QA 2

Create Cancel

## Mission by MiR100 – Check list

A mission is a number of actions such as: Move To Position, Play Sound, Relative Move. A missions control the vehicle's movement and behaviour.

- From the start page, select Mission
- Add missions to the queue
- Delete missions
- View active mission
- View log of executed missions



1. Click Mission to control the mission queue.

View the location of the vehicle on the map

Predefined mission types

Create a map of a new area.  
You must be logged in to see this button.

Click Service to start up MiR100 or check status.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.

MiR RX   Mission   **Stop**   Language   Log out

Missions in queue [Show log](#)

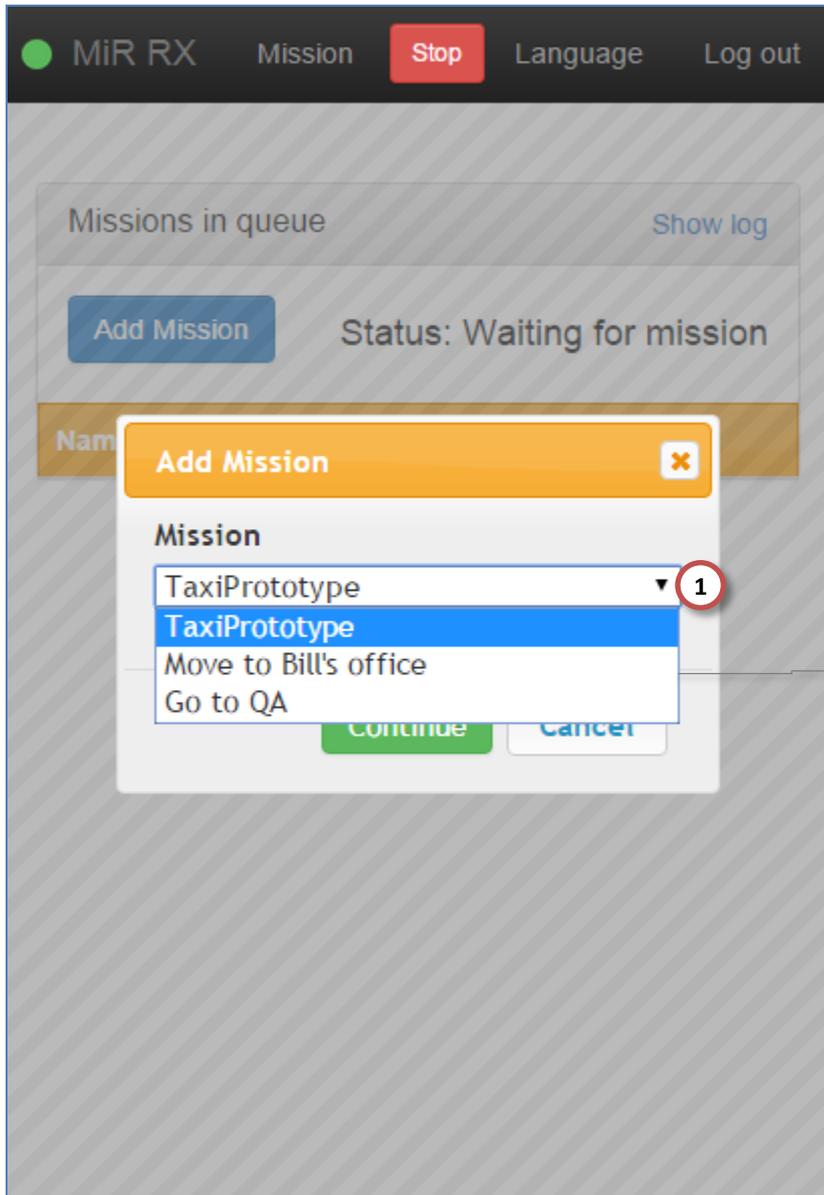
**1** **Add Mission**   Status: Waiting for mission

Name	State
------	-------

1. Add mission to queue.

Active mission will be shown here.

Queued missions will be shown here.



1. Select missions to put in queue.

*The mission is immediately put to the queue and started if no other mission is running.*

Missions are created in Service > Configuration > Missions.

MiR RX   Mission   **Stop**   Language   Log out

Missions in queue [Show log](#)

**1** **Add Mission**

Status: Moving to "Bills office" (Driving)

Name	State		
Move to Bill's office	Executing	<b>View</b>	<b>Delete</b>

1. Add another mission to the queue while a current mission is running.

Missions are created in Service > Configuration > Missions.

MiR RX   Mission   **Stop**   Language   Log out

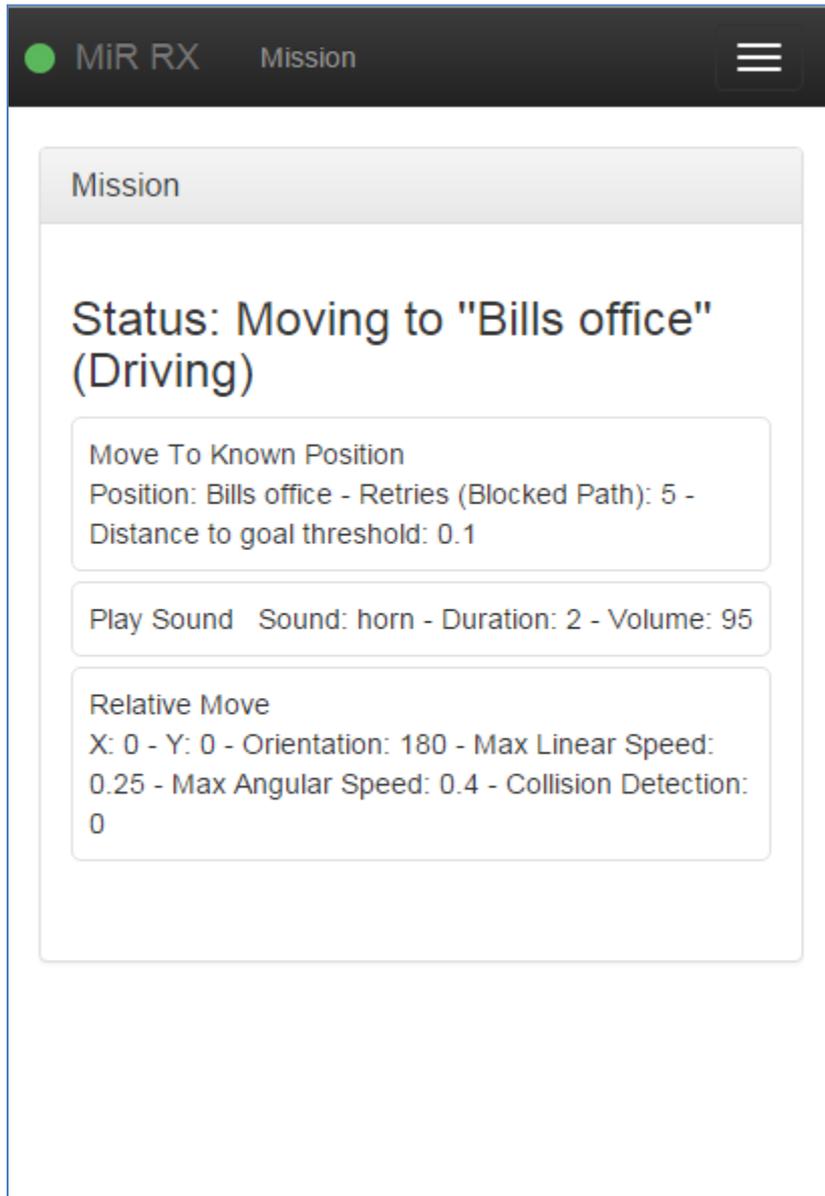
Missions in queue [Show log](#)

**Add Mission**

Status: Moving to "Bills office" (Driving)

Name	State	
Move to Bill's office	Executing	<b>1</b> <b>View</b> <b>Delete</b>
Go to QA	Pending	<b>Delete</b>

1. View the current mission.



The screenshot shows the MiR RX Mission View interface. At the top, there is a header with a green circle, 'MiR RX', and 'Mission'. Below this is a 'Mission' title bar. The main content area displays the status: 'Status: Moving to "Bills office" (Driving)'. Below the status, there are three action cards: 'Move To Known Position' with details 'Position: Bills office - Retries (Blocked Path): 5 - Distance to goal threshold: 0.1', 'Play Sound' with details 'Sound: horn - Duration: 2 - Volume: 95', and 'Relative Move' with details 'X: 0 - Y: 0 - Orientation: 180 - Max Linear Speed: 0.25 - Max Angular Speed: 0.4 - Collision Detection: 0'.

1. After looking at the mission, go back to Mission.

A mission is built as a list of actions:

- Move To Known Position
- Play Sound
- Relative Move

These are examples of actions.

Missions are created in Service > Configuration > Missions.

Actions are delivered by MiR.

MiR RX   Mission   **Stop**   Language   Log out

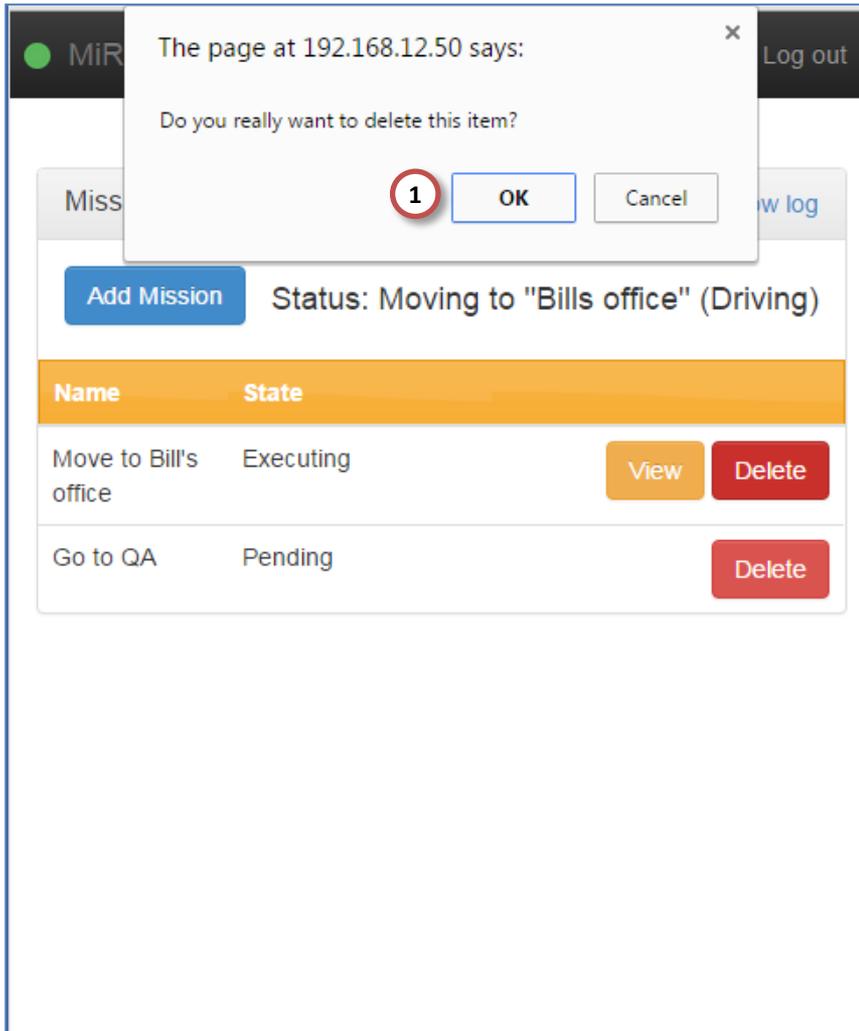
Missions in queue [Show log](#)

**Add Mission**

Status: Moving to "Bills office" (Driving)

Name	State	
Move to Bill's office	Executing	<a href="#">View</a> <a href="#">Delete</a>
Go to QA	Pending	<a href="#">Delete</a>

1. Delete the active mission.



The page at 192.168.12.50 says:

Do you really want to delete this item?

1 OK Cancel

Add Mission Status: Moving to "Bills office" (Driving)

Name	State	
Move to Bill's office	Executing	View Delete
Go to QA	Pending	Delete

1. Click OK to accept deleting the mission.

When deleting an active mission, the vehicle will stop its current movement, calculate a new path and start the next mission.

MiR RX Mission Stop Language Log out

Missions in queue [2 Show log](#)

[Add Mission](#)

Status: Moving to "Quality Assurance" (Driving)

Name	State		
Go to QA	Executing <a href="#">1</a>	<a href="#">View</a>	<a href="#">Delete</a>

1. After deleting a mission, the next mission will automatically start.

2. Click Show log for to see the end state of previous missions.

MiR RX Mission Mission log **Stop** Language Log out

1

### Mission log

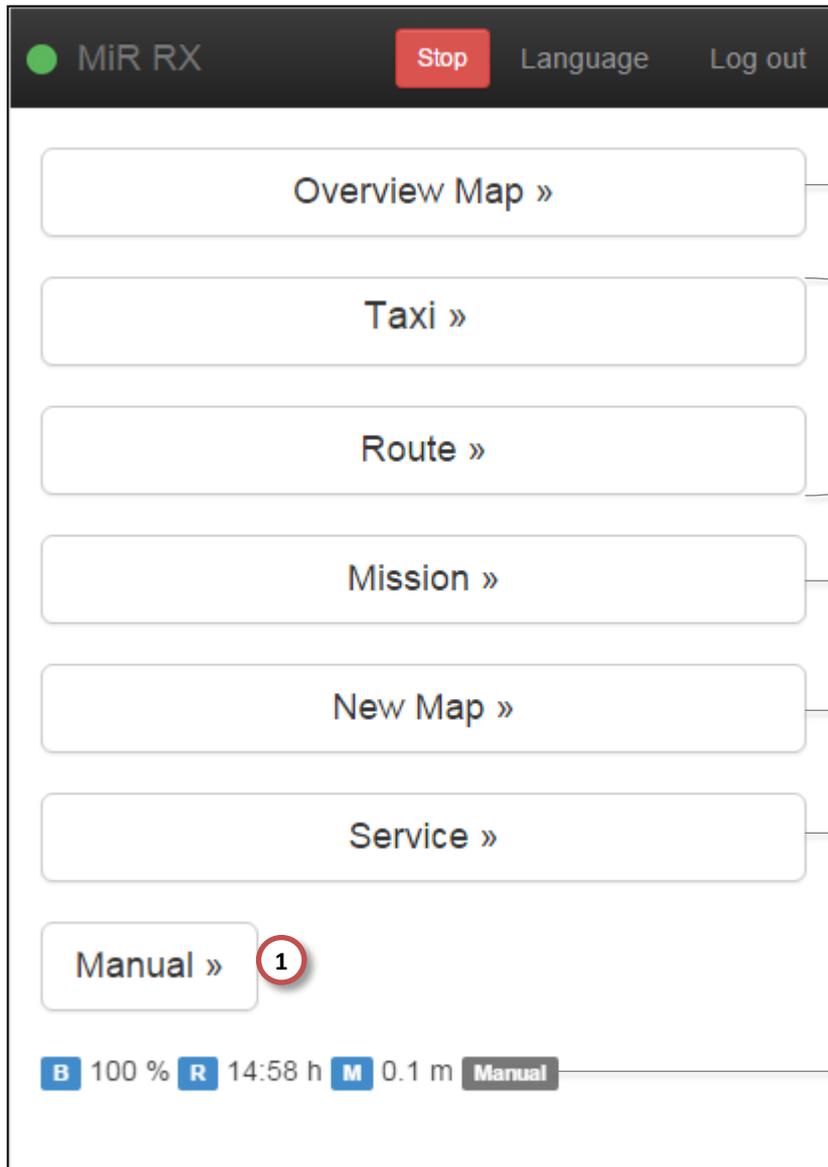
Order time	Start time	Stop time	End state	Mission
2015-09-01 21:47:10	2015-09-01 21:47:10	2015-09-01 21:47:50	Deleted	Move to Bill's office
2015-09-01 21:46:51	2015-09-01 21:46:51	2015-09-01 21:47:06	Succeeded	Move to Bill's office
2015-09-01 21:46:22	2015-09-01 21:46:22	2015-09-01 21:46:40	Aborted	Go to QA
2015-09-01 21:40:52	2015-09-01 21:41:05	2015-09-01 21:41:20	Succeeded	Move to Bill's office
2015-09-01 21:29:23	2015-09-01 21:30:11	2015-09-01 21:30:50	Aborted	Go to QA

1. After looking at the log, go back to MiR start page.

The log is useful for analysing the outcome of missions – see End State.

## Manual Driving Using Joystick – Check list

- From the start page, select Manual driving
- Activate joystick
- After completion of driving – return to the start page



1. Go to Manual driving to take control using joystick.

View the location of the vehicle on the map

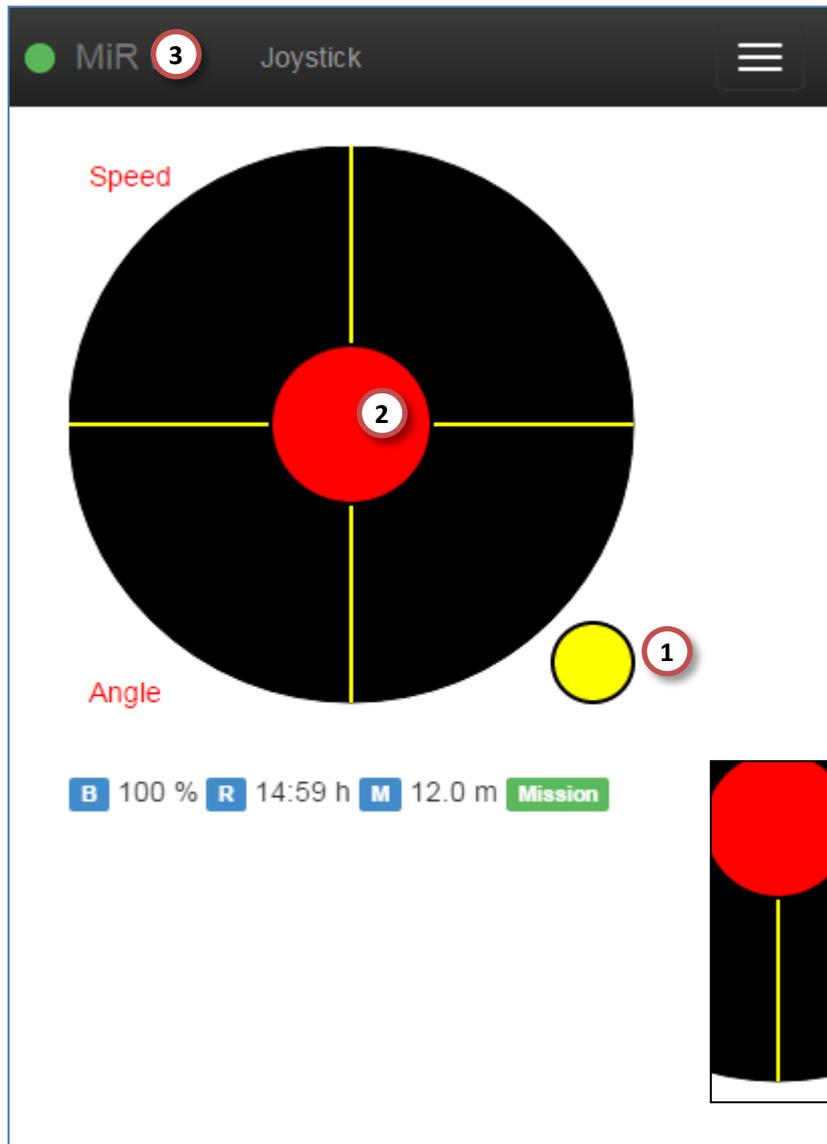
Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Click Service to start up MiR100 or check status.

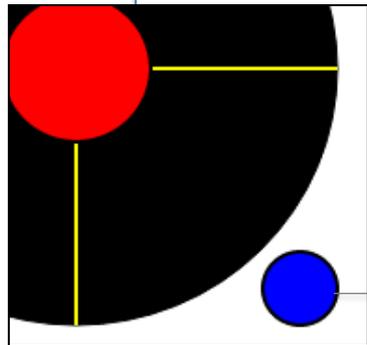
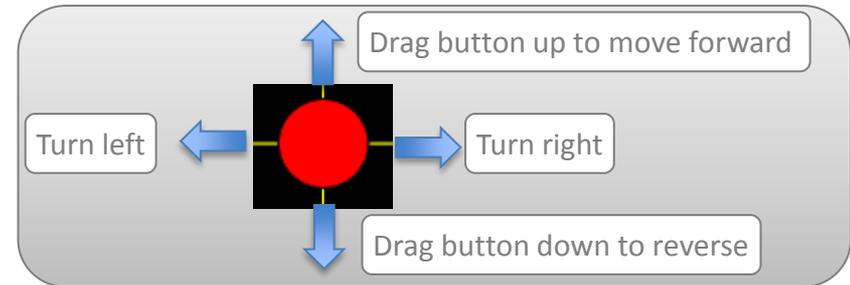
Note: MiR100 is on Manual. Select Area in Service to activate.



1. Activate joystick – click the lower right button.

2. Guide the vehicle using the middle red button.

3. Go to the start page after completing manual driving.



The button turns blue upon activation.

## Create New Map – Check list

- From the start page, click New Map
- Choose existing area or create a new area
- Start mapping
  - Guide MiR100 through the area using joystick
  - During driving, create positions for operation (Taxi, Route)
- After completion of mapping – save the map and go to the start page or create more maps for the area

MiR RX Stop Language Log out

Overview Map »

Taxi »

Route »

Mission »

New Map » **1**

Service »

Manual »

**B** 100 % **R** 14:58 h **M** 0.1 m **Manual**

1. Create a map of a new area.

View the location of the vehicle on the map

Predefined mission types

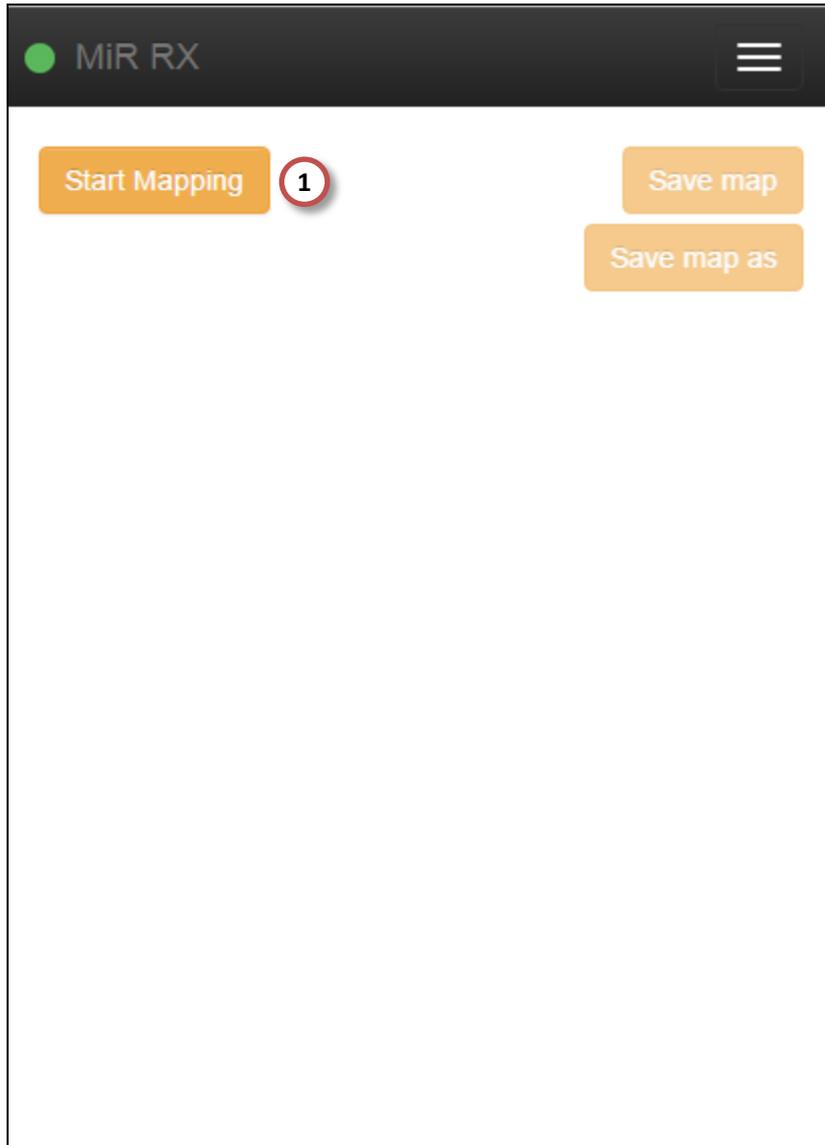
Controlling the mission queue

*You must be logged in to see this button.*

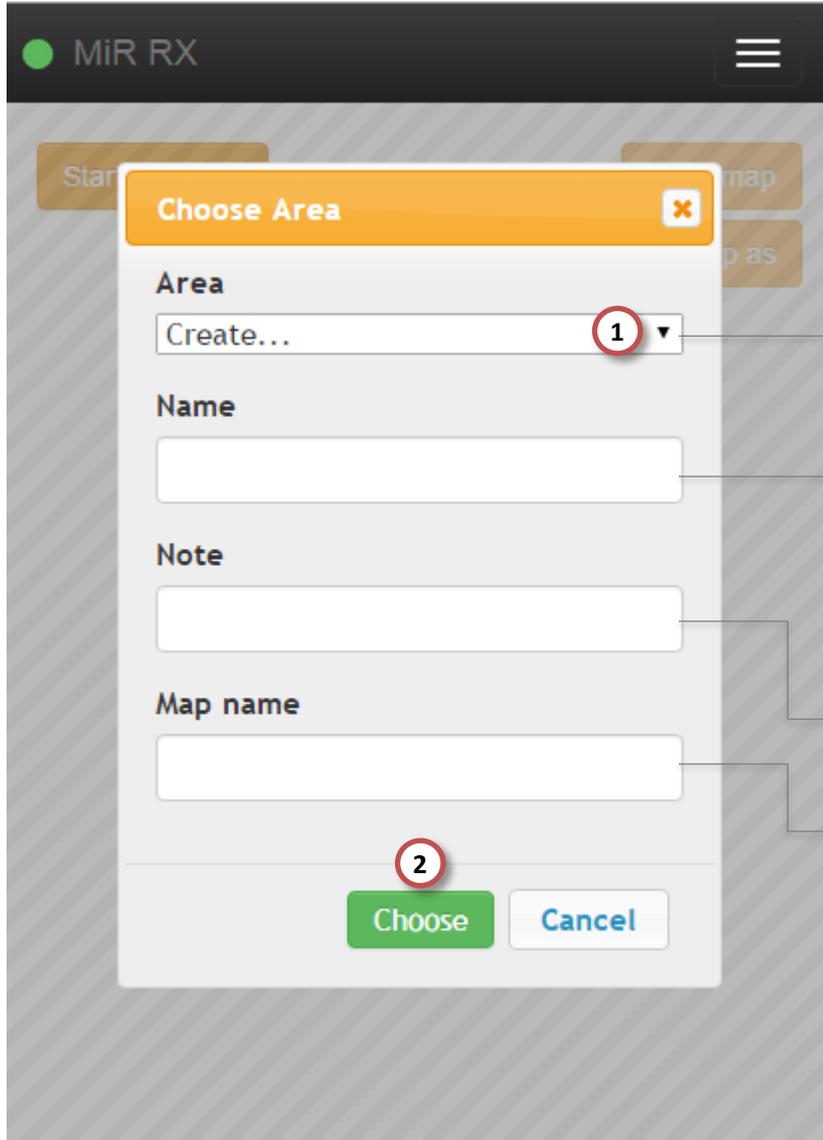
Click Service to start up MiR100 or check status.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.



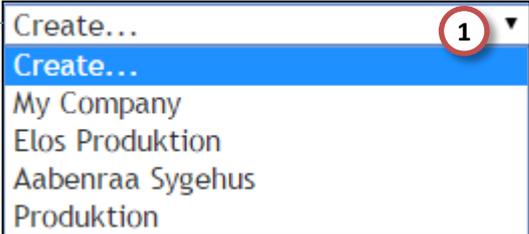
1. Start mapping with MiR100 – must be done before MiR100 can drive in a new area.



1. In the pop-up window, choose an area or create a new area by filling in the fields.

2. Accept by clicking Choose.

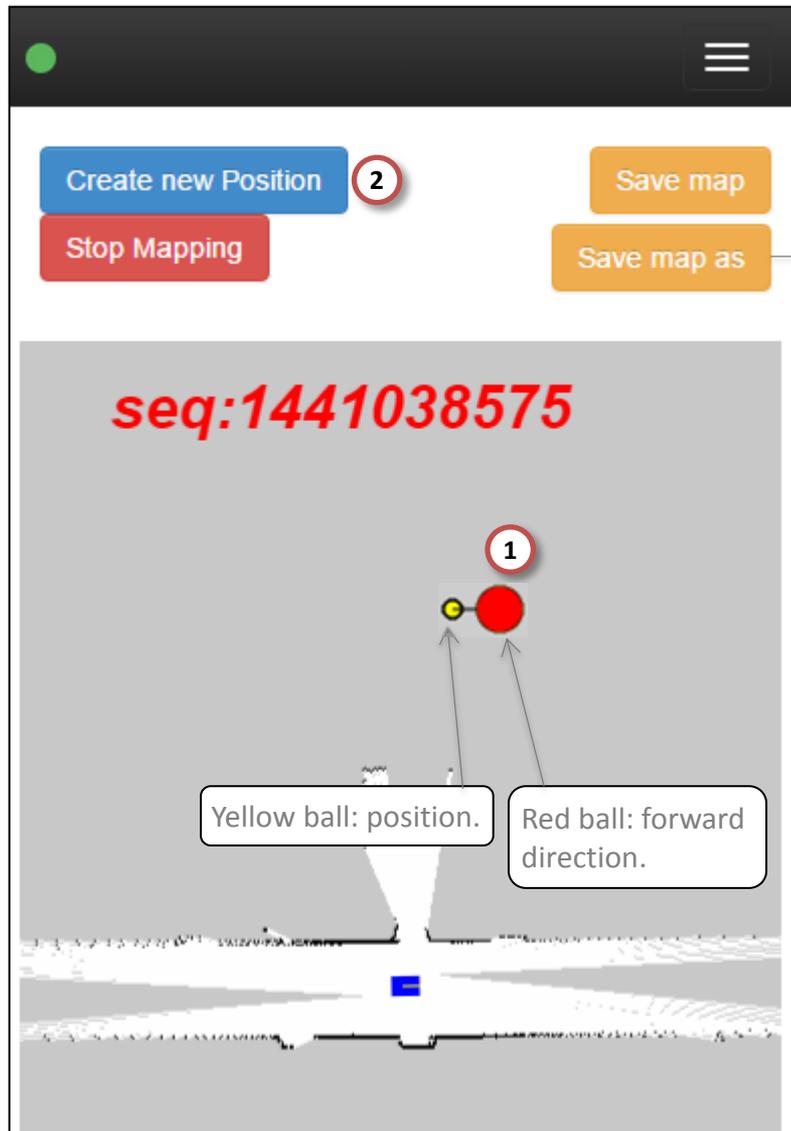
*Automatically goes to mapping.*



Name of new area.

Map note – this note is shown in the Choose Area page.

Name of new map.



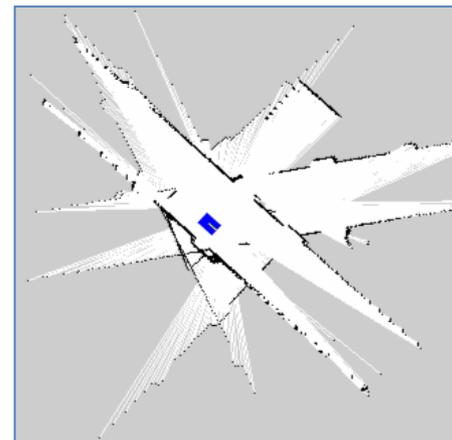
1. Click the map and drag the mouse like driving using joystick – the vehicle moves around the area..

2. Create a position for later use in operation.

Save the map with a new name.

The map displays what MiR100's sensors see.

A failed map can occur in case of too strong mouse movements or when moving close to the boundary of the map:



### Create new Position ✕

Name  
Hall| 1

X  
-1.49 1

Y  
-0.92 1

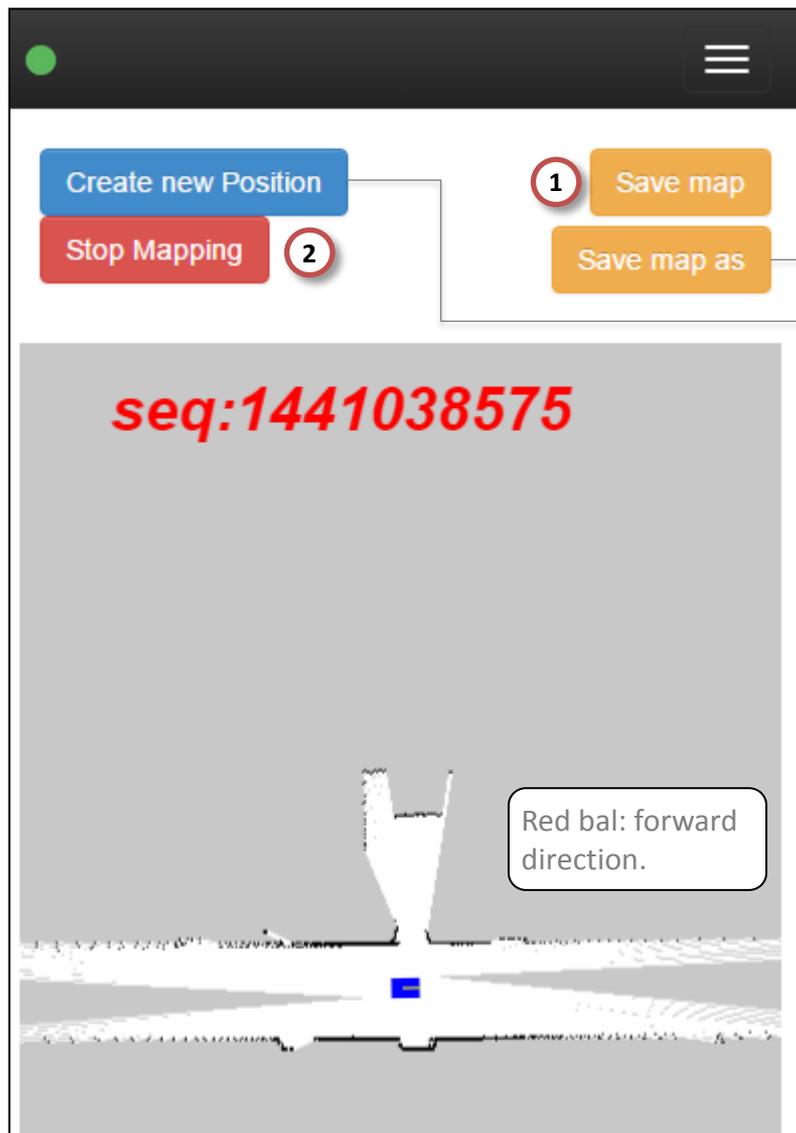
Orientation  
45 1

2

1. Fill in Name – X, Y and Orientering is given but can later be edited.

2. Click Create to save the position.

*Automatically goes back to mapping.*



1. Save the map.

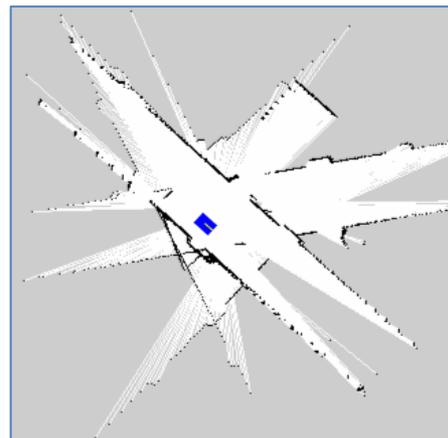
2. Stop mapping.

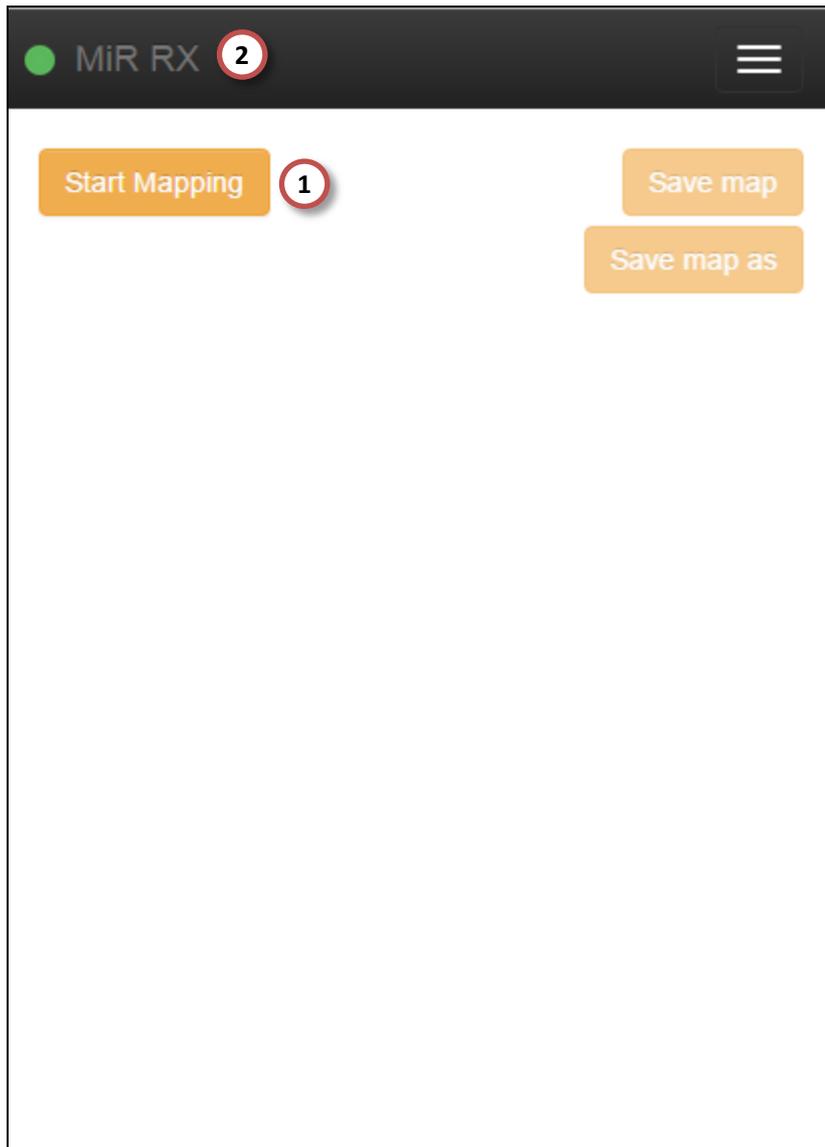
Save the map with a new name.

Create as many new positions as needed.

The map displays what MiR100's sensors see.

If too strong mouse movements:





1. Create more maps for the same area (e.g. first floor).

2. Go MiR start page.

## Edit Map – Check list

- From the start page, select Service > Configuration > Choose Area to edit a specific map
- Edit either the appearance of the map (Nav) or MiR100's navigation on the map (Web).
- Draw lines to specify forbidden areas, walls, free areas.
  
- Tip: Save the map before editing by downloading to your PC.
- Tip: A downloaded map can be edited in a picture editing tool.
- Tip: Get a map by uploading it from your PC.

MiR RX Stop Language Log out

Overview Map »

Taxi »

Route »

Mission »

New Map »

Service » **1**

Manual »

**B** 100 % **R** 14:58 h **M** 0.1 m **Manual**

1. Click Service to navigate to Setup menu in order to edit the map.

View the location of the vehicle on the map

Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.

1. Go to Choose Area.

Choose Area » **1**

Status »

Log, status, system information.

Configuration »

Basic setup – rarely used.

Analysis »

Overview over driving – location, distance, status.

Maintenance »

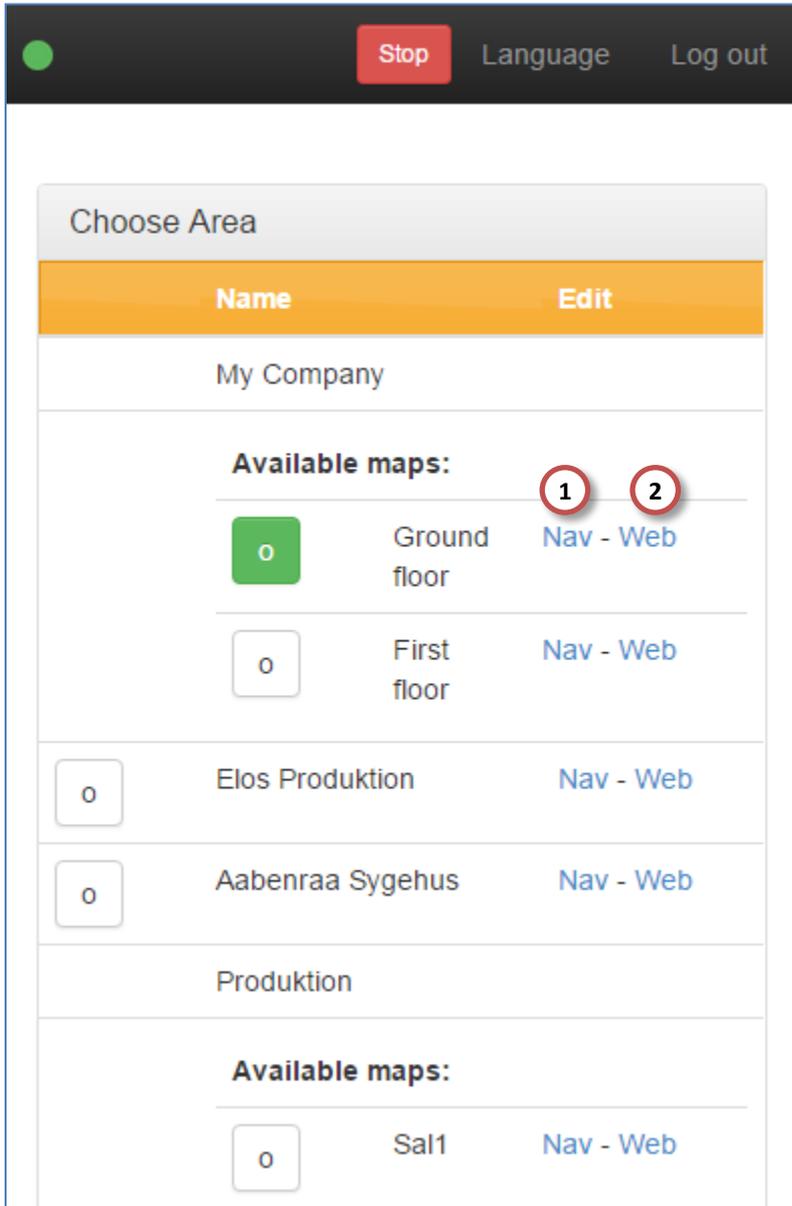
Backup, restore, remote access, wifi.

Command View »

Synchronizing the exact location of the vehicle with the map.

**B** 100 % **R** 14:58 h **M** 0.1 m **Manual**

Note: MiR100 is on Manual. Select Area in Service to activate.



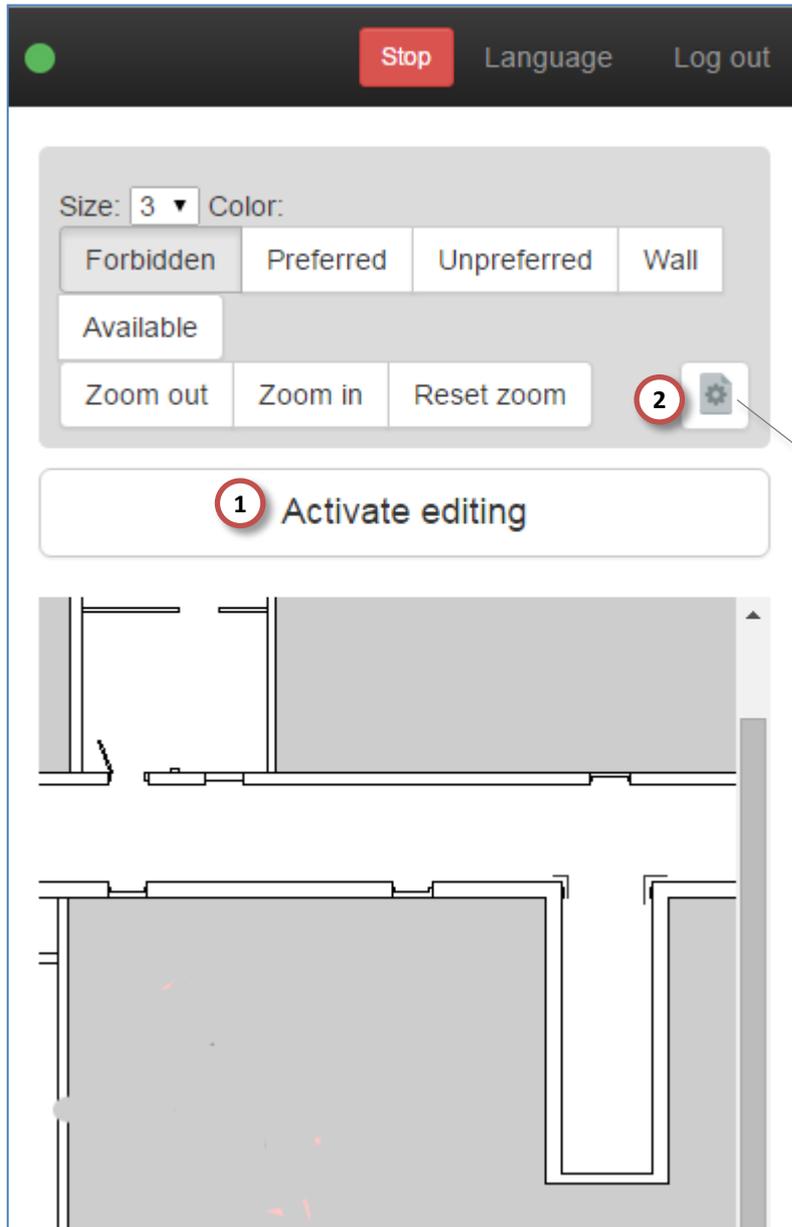
Choose Area

Name	Edit
My Company	
<b>Available maps:</b>	
<input checked="" type="checkbox"/> Ground floor	<b>1</b> <a href="#">Nav - Web</a>
<input type="checkbox"/> First floor	<b>2</b> <a href="#">Nav - Web</a>
<input type="checkbox"/> Elos Produktion	<a href="#">Nav - Web</a>
<input type="checkbox"/> Aabenraa Sygehus	<a href="#">Nav - Web</a>
Produktion	
<b>Available maps:</b>	
<input type="checkbox"/> Sal1	<a href="#">Nav - Web</a>

1. Click Nav to edit the look of the map.
- OR
2. Click Web to edit the allowed navigation area.

*Nav and Web have the same commands and are described as one during the following pages..*

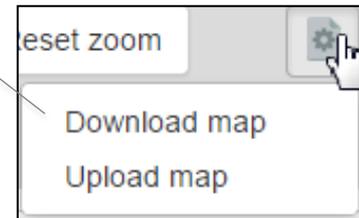
The map with the green square is the current active map.

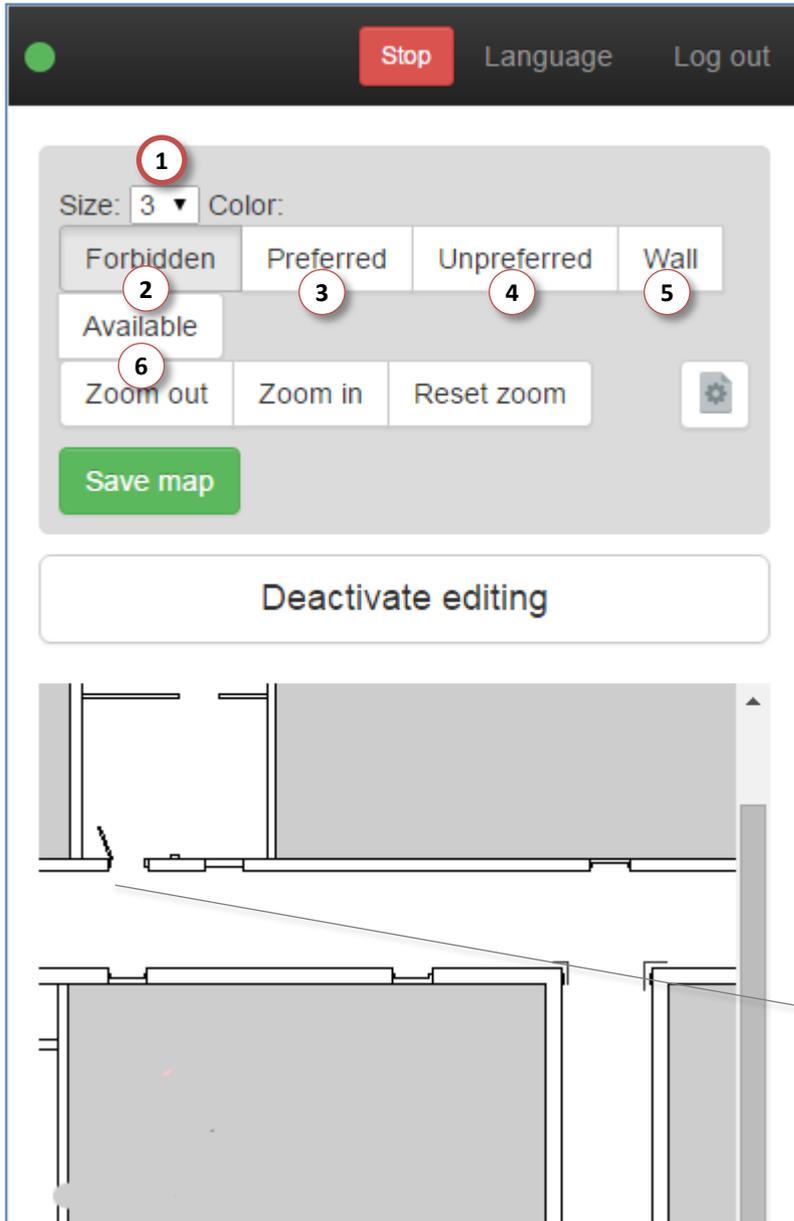


1. Click Activate editing. MiR100 is now in editing mode.

2. To edit the map in an external editor:

- a. Download the map and save it locally (backup).
- b. Edit the map using a picture editing tool (use the correct colors – see next page).
- c. Upload the map to add it back into MiR100 again.





1. To edit the map directly from the MiR page:  
Select line thickness. 1 = thin.

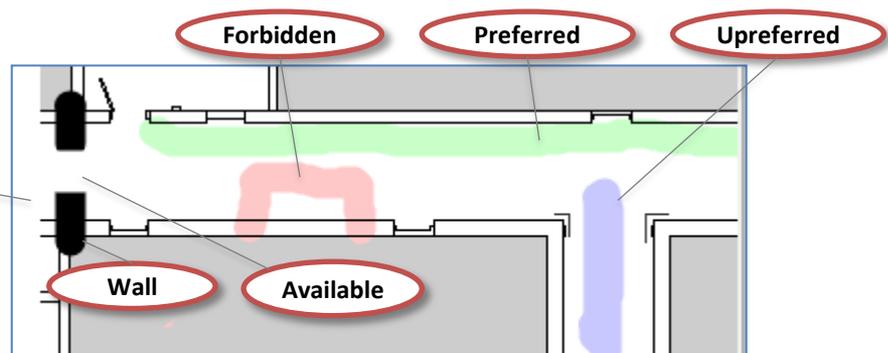
2. Forbidden: red line. MiR100 does not go here.

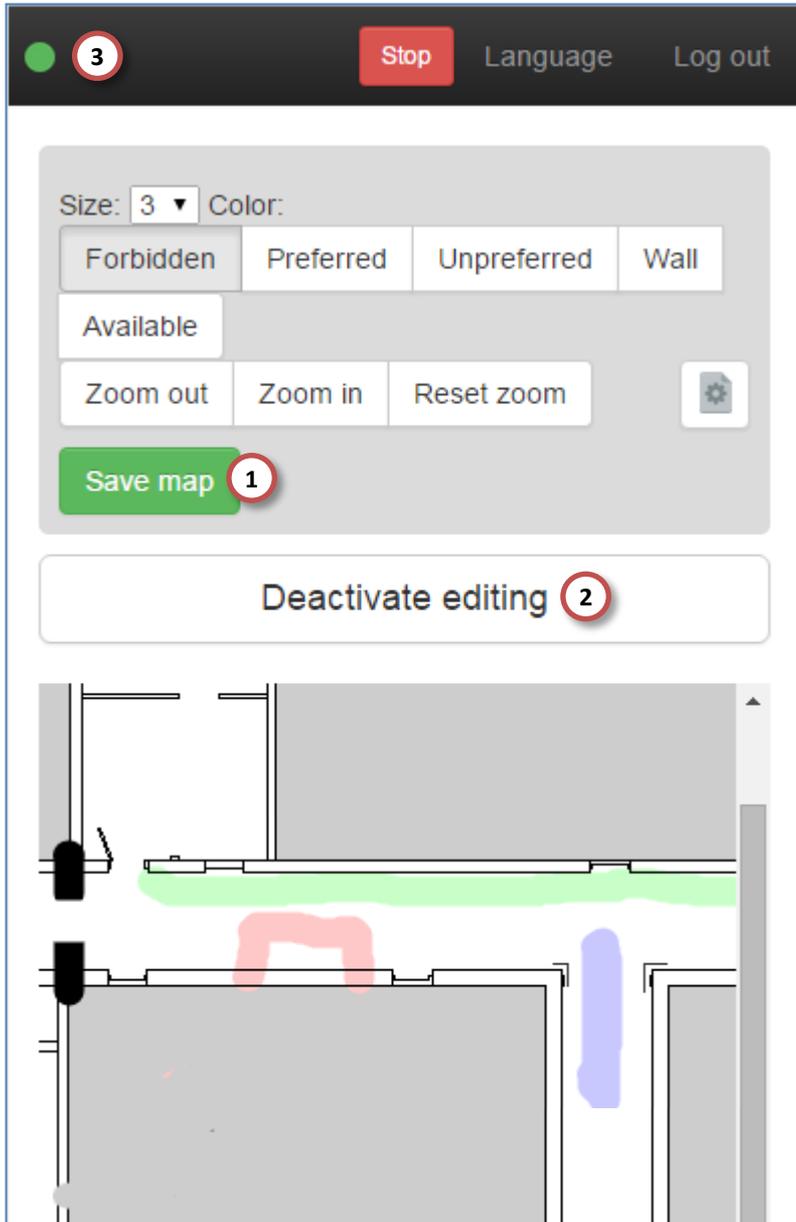
3. Preferred: green line. MiR100 strives to drive here.

4. Unpreferred: purple line. MiR100 strives not to drive here.

5. Wall: black line. MiR100 treats the line as a wall.

6. Available: white line. "Eraser" that removes existing and editing lines.





1. When editing is satisfactory: Click Save map.

2. Deactivate editing to stop MiR100's editing mode..

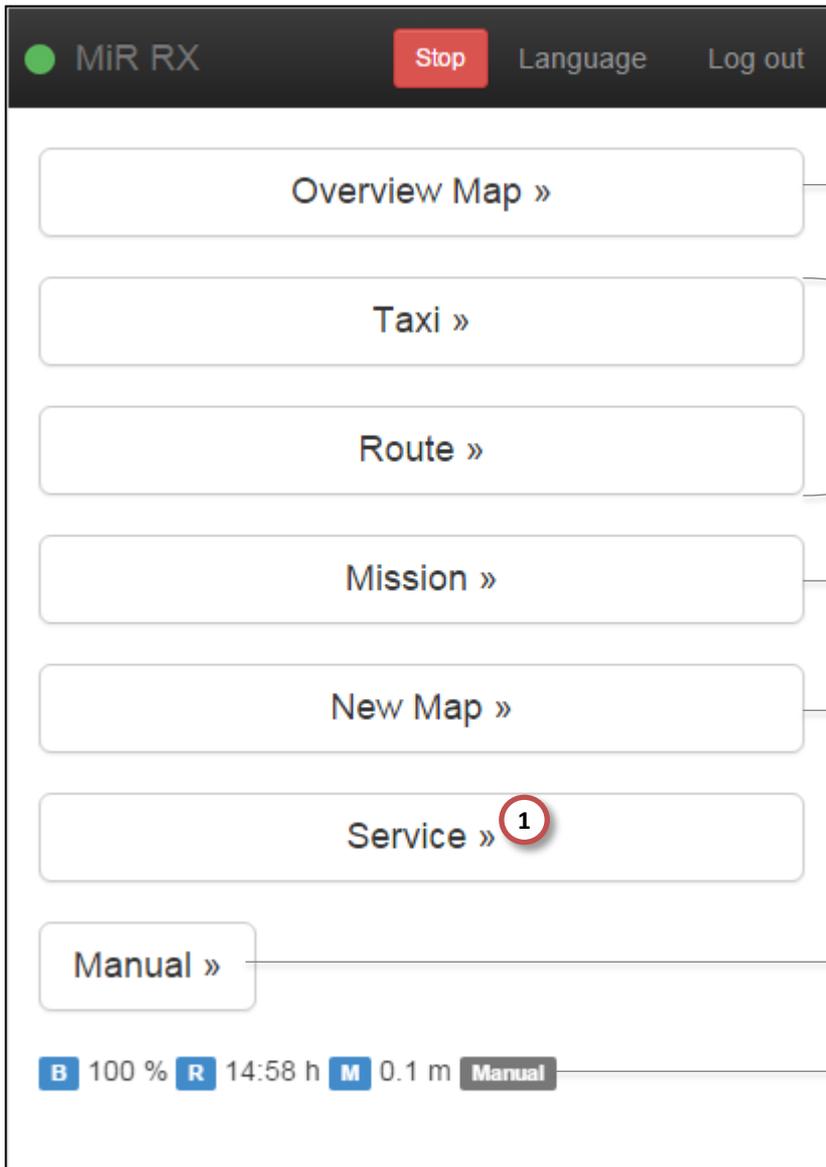
*To reload the map and undo editing BEFORE SAVING: Press F5.*

3. Go back to MiR start page.

## Adjust the Position of the Vehicle on the Map – Check list

If the vehicle has been moved physically so that its location in reality and on the map no longer matches, the position must be adjusted on the map.

- From the start page, click Service
- Select Command View
- After adjustment – return to the start page



1. Click Service to navigate to the Setup menu in order to synchronize the map and the vehicle positions.

View the location of the vehicle on the map

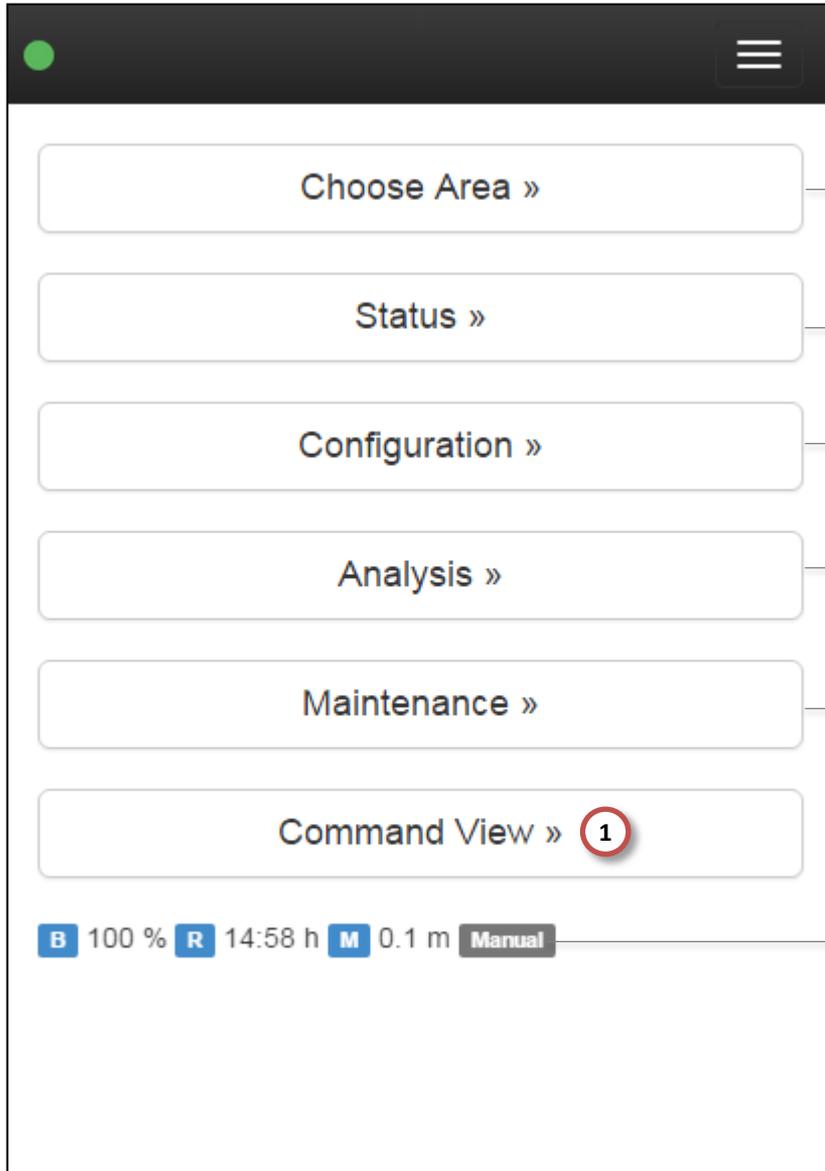
Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.



1. Select Command view.

Choose area, start up MiR100, see and edit map.

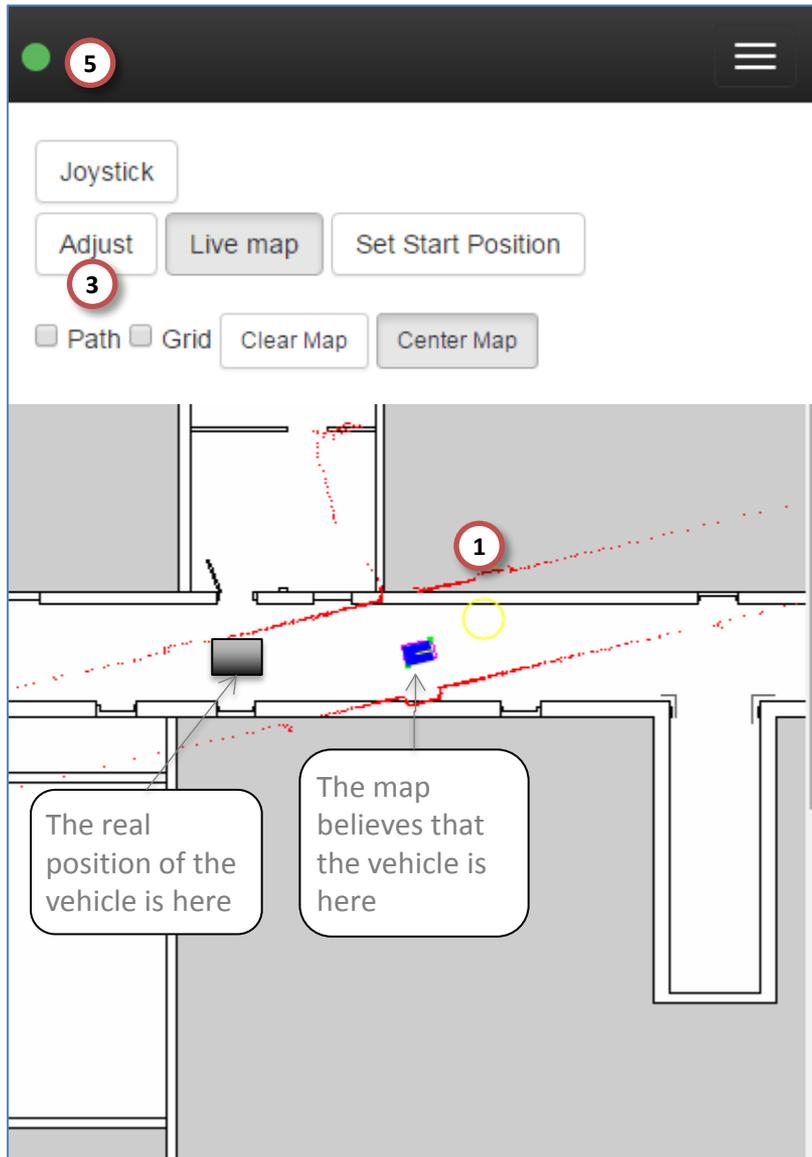
Log, status, system information.

Basic setup – rarely used.

Overview over driving – location, distance, status.

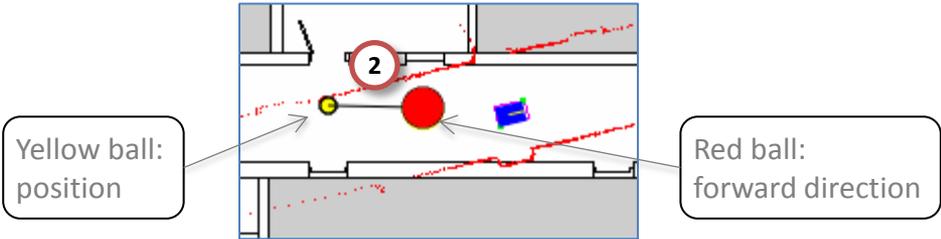
Backup, restore, remote access, wifi.

Note: MiR100 is on Manual. Select Area in Service to activate.



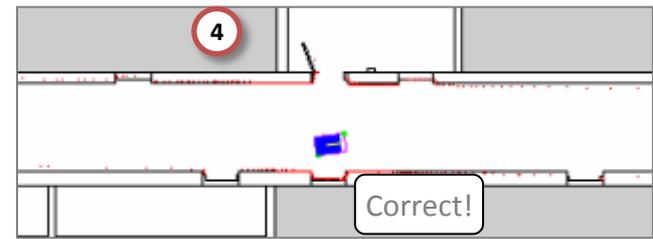
1. Red lines (the sensors of the vehicle) must match the black lines of the map. Done in step 2.

2. Mark the real location of the vehicle on the map: **click and drag the mouse** – like driving using joystick.



3. Update the map. Click Adjust.

4. The vehicle and the map are now in sync.



5. Go back to the MiR start page.

## MiR100 Status – Administrator Check list

- From the start page, select Service > Status > Diagnostics to see the status of physical components:
  - Component
  - Hardware ID
  - Seq
  - Key Values
- From the start page, select Service > Status > ROS Log to see the conditions of the system:
  - Comments and information
  - Warnings
  - Errors
- From the start page, select Service > Status > Topics to see the internal messages of the system:
  - Robot pose
  - Odometry topic
  - Cmd Vel
  - AMCL covar
  - MC/encoder

MiR RX Stop Language Log out

Overview Map »

Taxi »

Route »

Mission »

New Map »

Service » **1**

Manual »

**B** 100 % **R** 14:58 h **M** 0.1 m **Manual**

1. Click Service to navigate to the Status menu.

View the location of the vehicle on the map

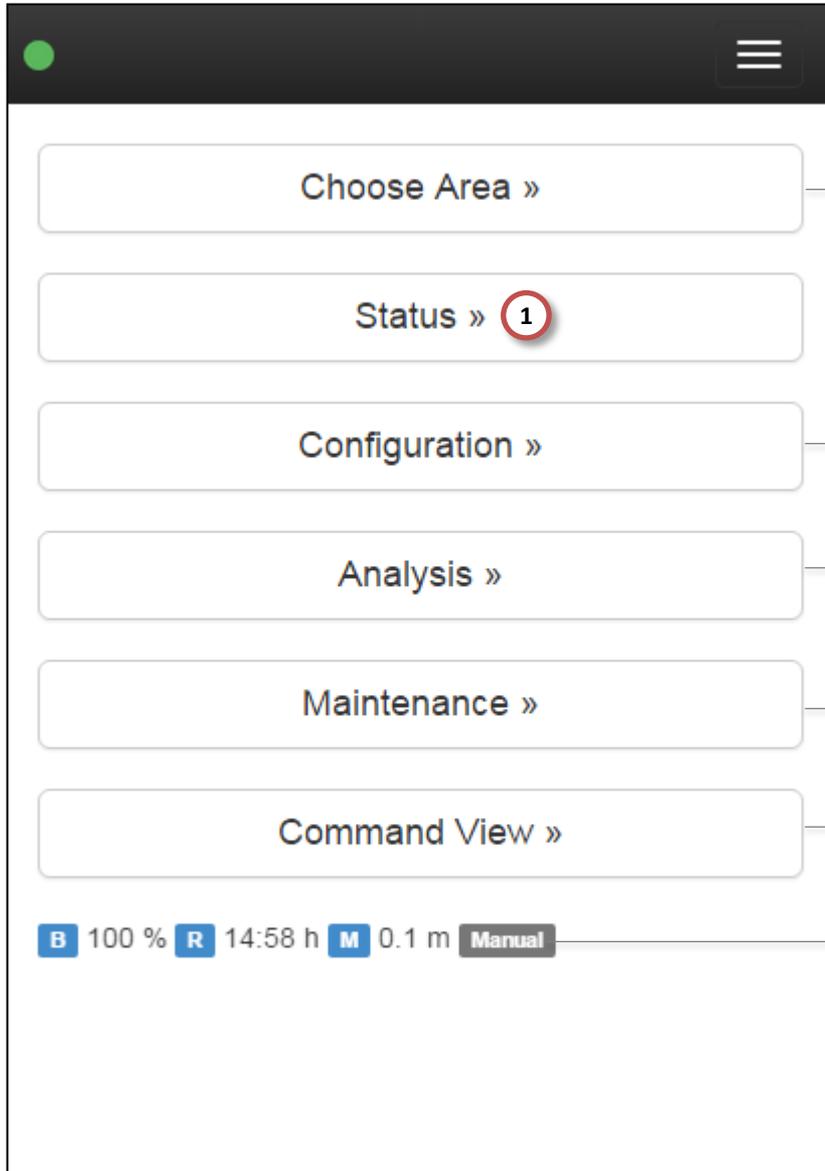
Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.



1. Click Status to see log, status, system information.

Choose area, start up MiR100, see and edit map.

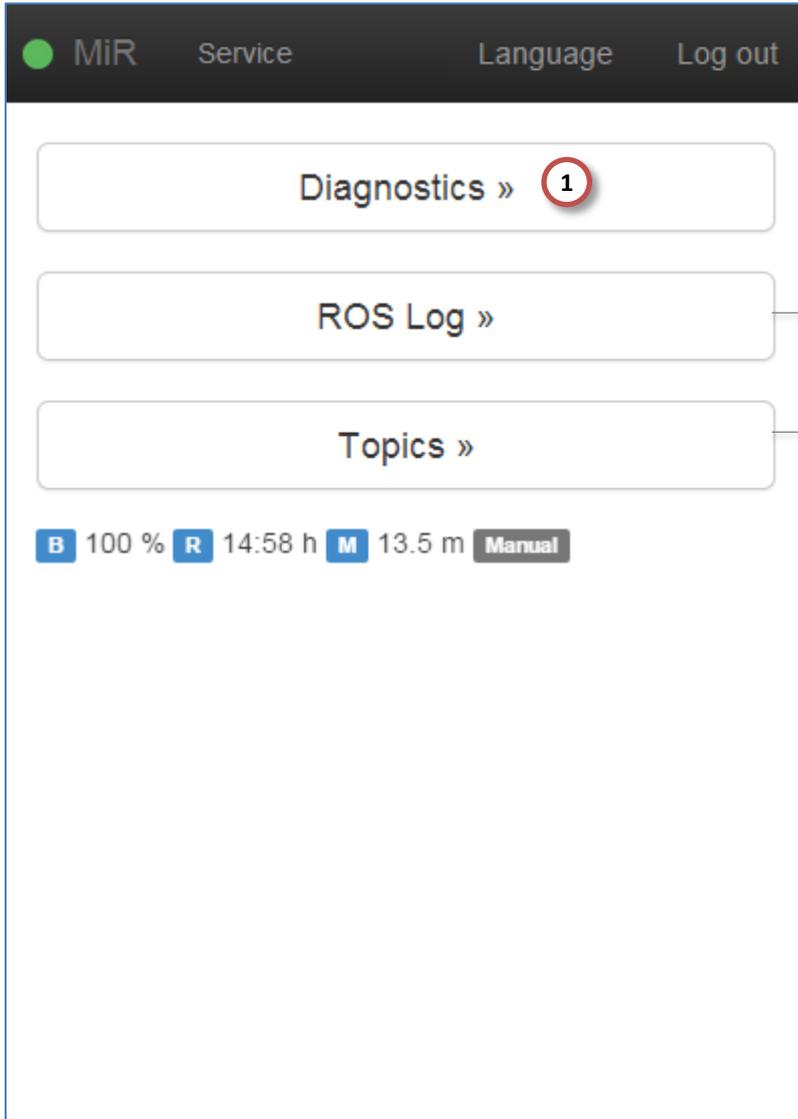
Basic setup – rarely used.

Overview over driving – location, distance, status.

Backup, restore, remote access, wifi.

Synchronizing the exact location of the vehicle with the map.

Note: MiR100 is on Manual. Select Area in Service to activate.



MiR Service Language Log out

Diagnostics » 1

ROS Log »

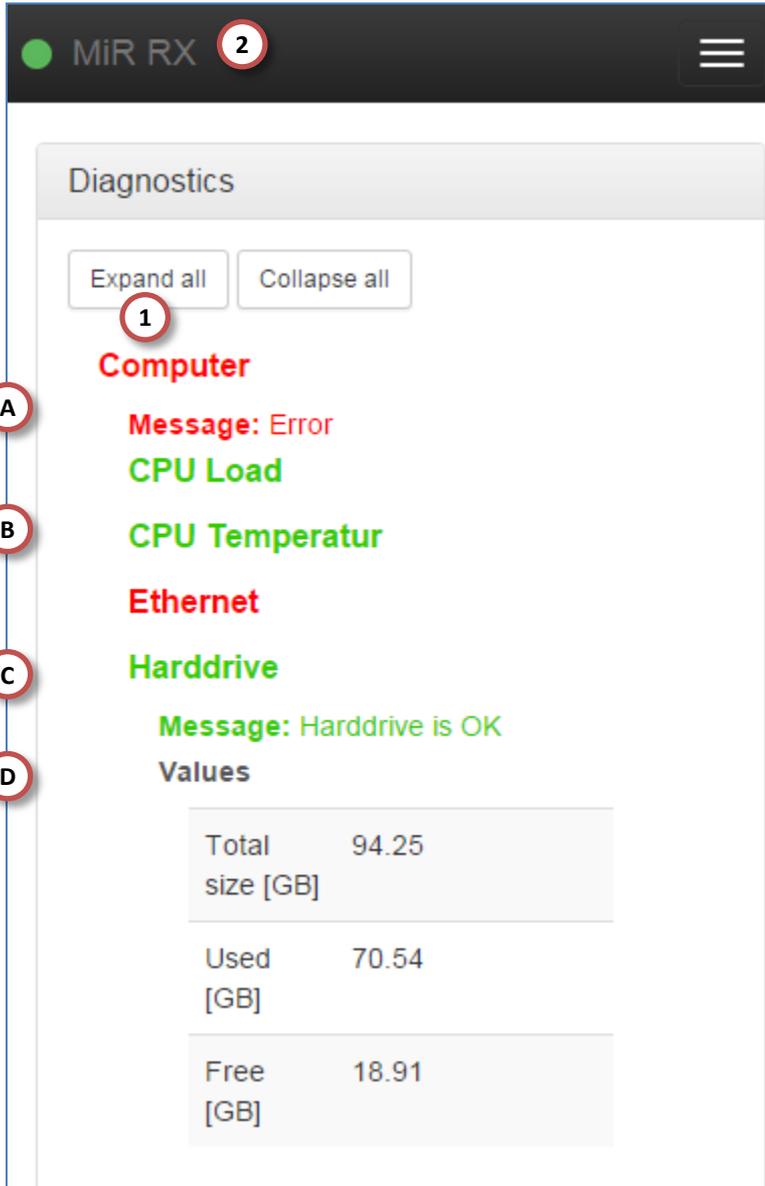
Topics »

**B** 100 % **R** 14:58 h **M** 13.5 m **Manual**

1. Click Diagnostics to see status of physical components (motor control, laser,...)

Status of the conditions of the system. A service technician uses ROS log for troubleshooting.

Shows the content of internal messages.



**MI R RX** 2

**Diagnostics**

Expand all Collapse all

1

**Computer**

**Message:** Error

**CPU Load**

**CPU Temperatur**

**Ethernet**

**Harddrive**

**Message:** Harddrive is OK

**Values**

Total size [GB]	94.25
Used [GB]	70.54
Free [GB]	18.91

**A**

**B**

**C**

**D**

1. Shows all physical components of the system:

- Motor control
- Laser
- Teensy (ultrasound and gyro)
- Xtion (3D camera)
- CPU load

**A. Message color:**

Green: OK  
 Yellow: Warning  
 Red: Lost connection or critical error

**B. Component:**

Specific unit (eg front or rear laser..)

**C. Hardware ID:**

Type of unit (eg a laser).

**D. Key Values:**

Each unit has a specific status. Shown here: motor control. Error number description is found in the service manual for MiR100.

2. Go back to Status.

**MiR** Service Language Log out

[Diagnostics »](#)

[ROS Log »](#) **1**

[Topics »](#)

**B** 25.4 V **O** 792 min **K** 410.1m **Manuel**

1. Click ROS Log to see the conditions of the system.

Status of physical components (motor control, laser,...)

Shows the content of internal messages.

MiR Service Status Language Log out

1

2

```
[0] [ROS_INFO] : Got 8 CPU's (Node :/cpu_load)
[0] [ROS_INFO] : Starting to spin physics dynamic
reconfigure node... (Node :/gazebo)
[337] [ROS_INFO] : Rosapi started (Node :/bridge_api)
[0] [ROS_INFO] : mir supervisor started - sending status to
/mir_status (Node :/supervisor)
[0] [ROS_INFO] : Ready to roll (Node :/mirspawn)
[0] [ROS_WARN] : The root link base_footprintx has an
inertia specified in the URDF, but KDL does not support a
root link with an inertia. As a workaround, you can add an
extra dummy link to your URDF. (Node
:/robot_state_publisher)
[2440] [ROS_INFO] : [Client 31] Subscribed to /rosout (Node
:/bridge)
[2441] [ROS_INFO] : Client disconnected. 1 clients total.
(Node :/bridge)
[2441] [ROS_INFO] : Client connected. 2 clients total. (Node
:/bridge)
[2441] [ROS_INFO] : [Client 32] Subscribed to /mir_status
(Node :/bridge)
[2441] [ROS_INFO] : [Client 32] Subscribed to /rosout (Node
:/bridge)
```

1. Internal ROS log.

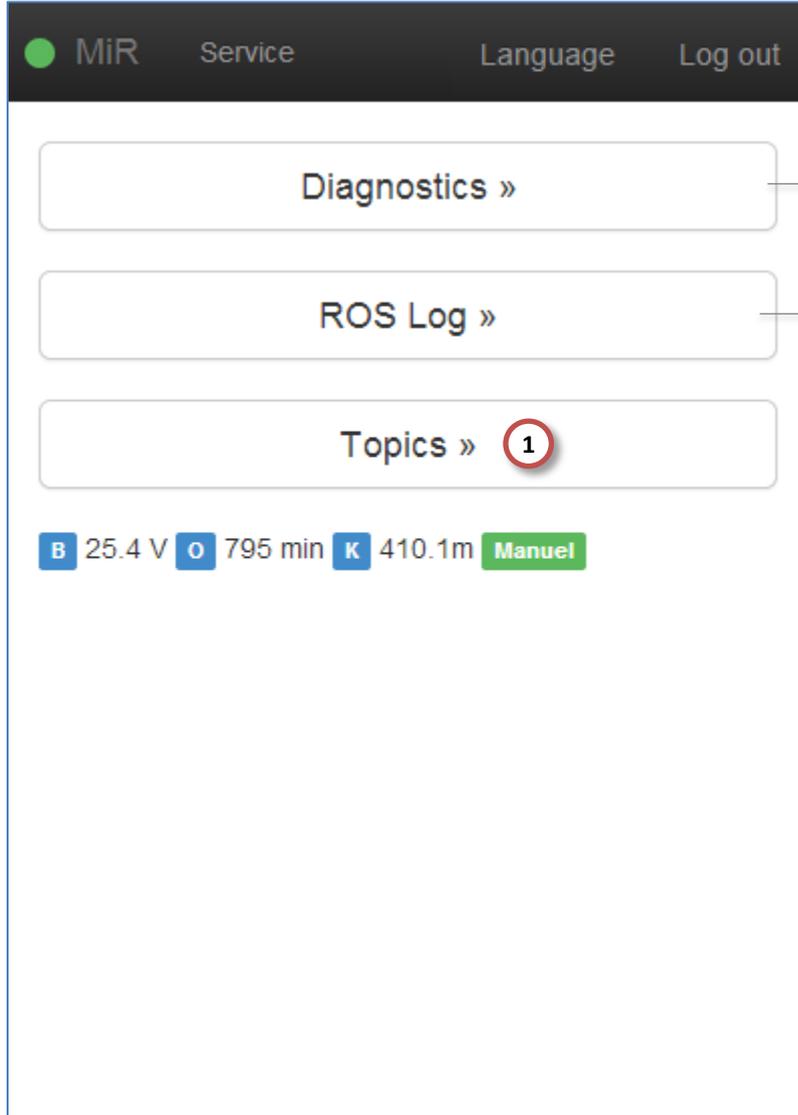
### Message color:

Green [ROS\_INFO]: Comments and information

Rust [ROS\_WARN]: Warning

Red [ROS\_ERROR]: Error

2. Go back to Status.

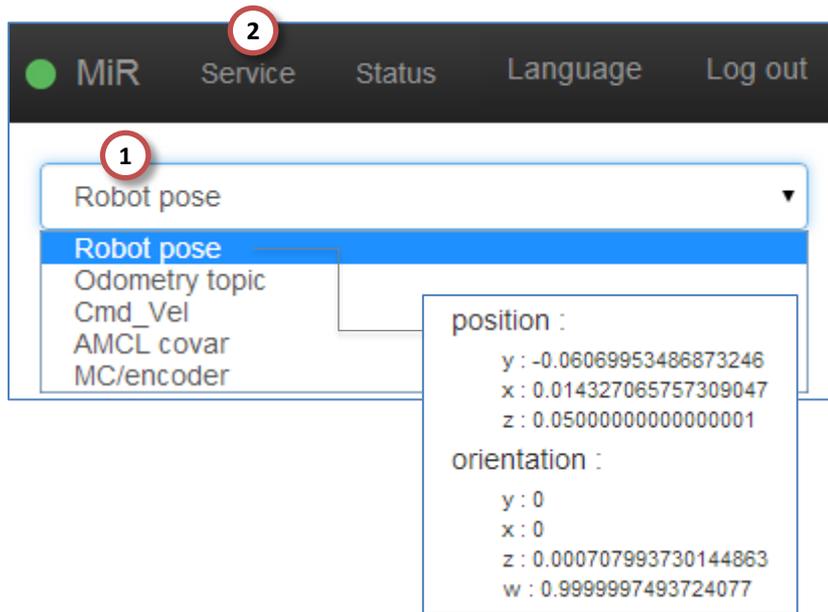


The screenshot shows the MiR100 Status interface. At the top, there is a dark navigation bar with a green circle icon, the text 'MiR', and buttons for 'Service', 'Language', and 'Log out'. Below this, there are three main menu items: 'Diagnostics »', 'ROS Log »', and 'Topics »'. The 'Topics »' item is highlighted with a red circle containing the number '1'. At the bottom of the interface, there is a status bar with four colored boxes: a blue box with 'B' and '25.4 V', a blue box with 'O' and '795 min', a blue box with 'K' and '410.1m', and a green box with the text 'Manuel'.

1. Click Topics to see internal system messages.

Status of physical components (motor control, laser,...)

Status of the conditions of the system. A service technician uses ROS log for troubleshooting.



1. Displays the content of internal messages.

### Robot Pose:

The current position and orientation of the vehicle (pose) relative to all external and internal maps and sensor input. This position is used for ongoing navigation.

### Odometry topic

The current position of the vehicle relative to the odometry of the vehicle. This position is a part component of the overall navigation.

### Cmd\_Vel

Velocity command that is sent to the motor control as a forward speed and rotational velocity.

### AMCL covar

Accordance between the calculated position of the vehicle's internal map and its sensor inputs. Based on walls, openings and other characteristics the vehicle analyses at which position it is located. The smaller the co-variance (*covar*) the better accordance. (*AMCL = Addaptive Monte Carlo Localization* = the name of a particle filter method. This is a probability method.)

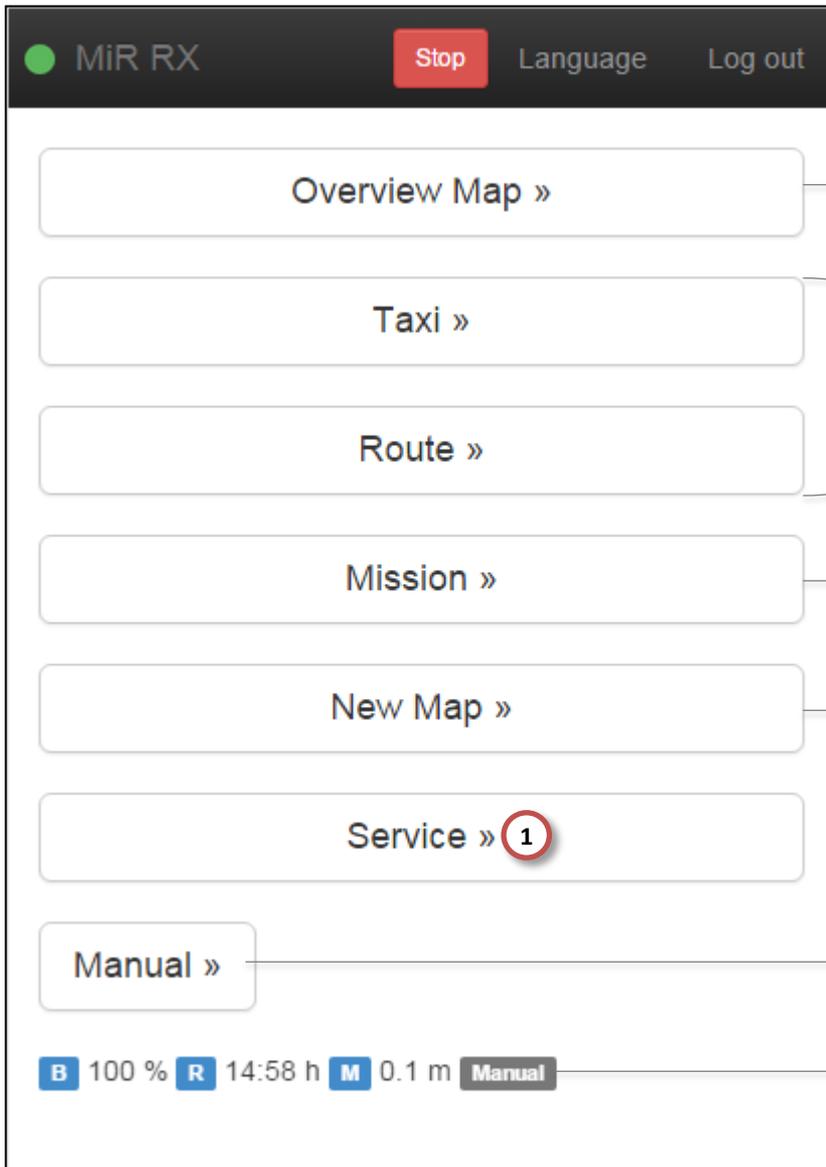
### MC/encoder

(*Motor Control*) Provides counter positions (*encoder*) for the right and left motors.

2. Go back to Service.

## MiR100 Configuration – Administrator Check list

- From the start page, select Service > Configuration to see status and edit:
  - Software modules
  - Positions
  - Contacts
  - Sounds
  - Missions
  - Maps
  - Areas
  - PLC Registers
  - Manual functionality (sounds, light)
  - System settings



1. Click Service to navigate to the Configuration menu.

View the location of the vehicle on the map

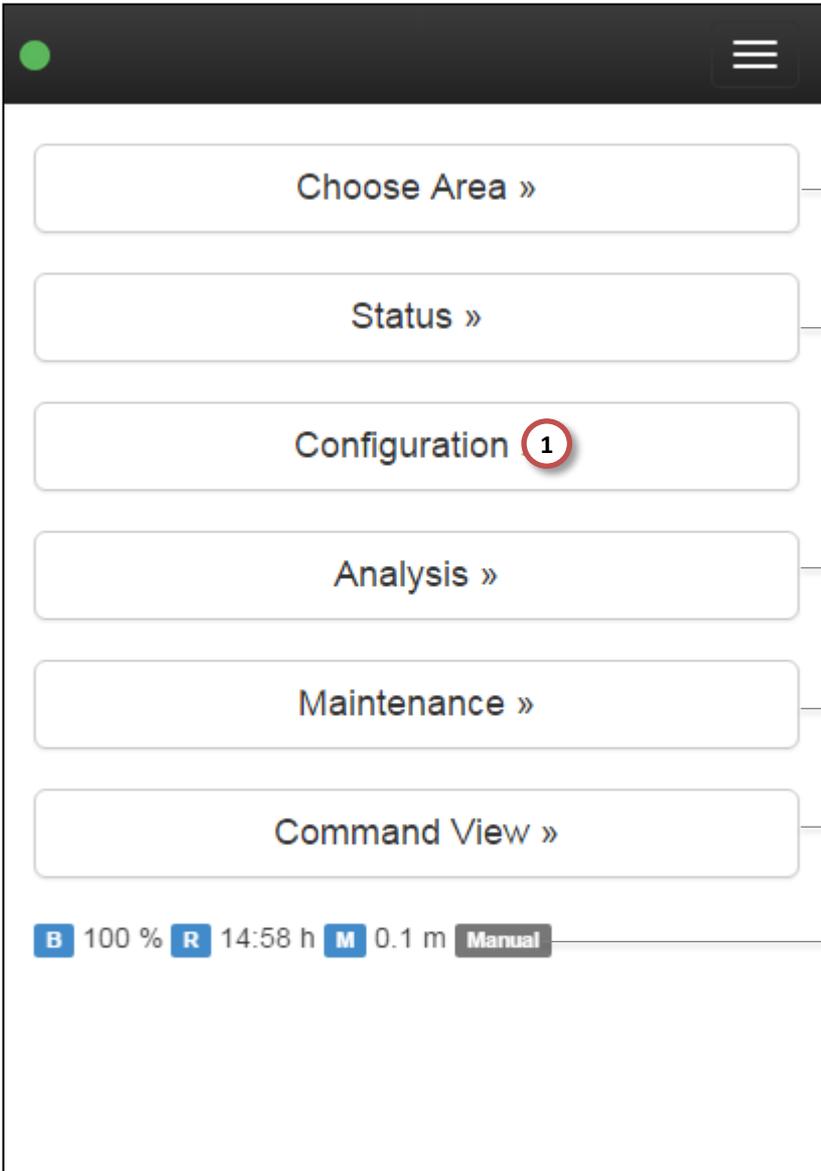
Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.



1. Select Configuration for setting up positions, light, sound, map, system.

Choose area, start up MiR100, see and edit map.

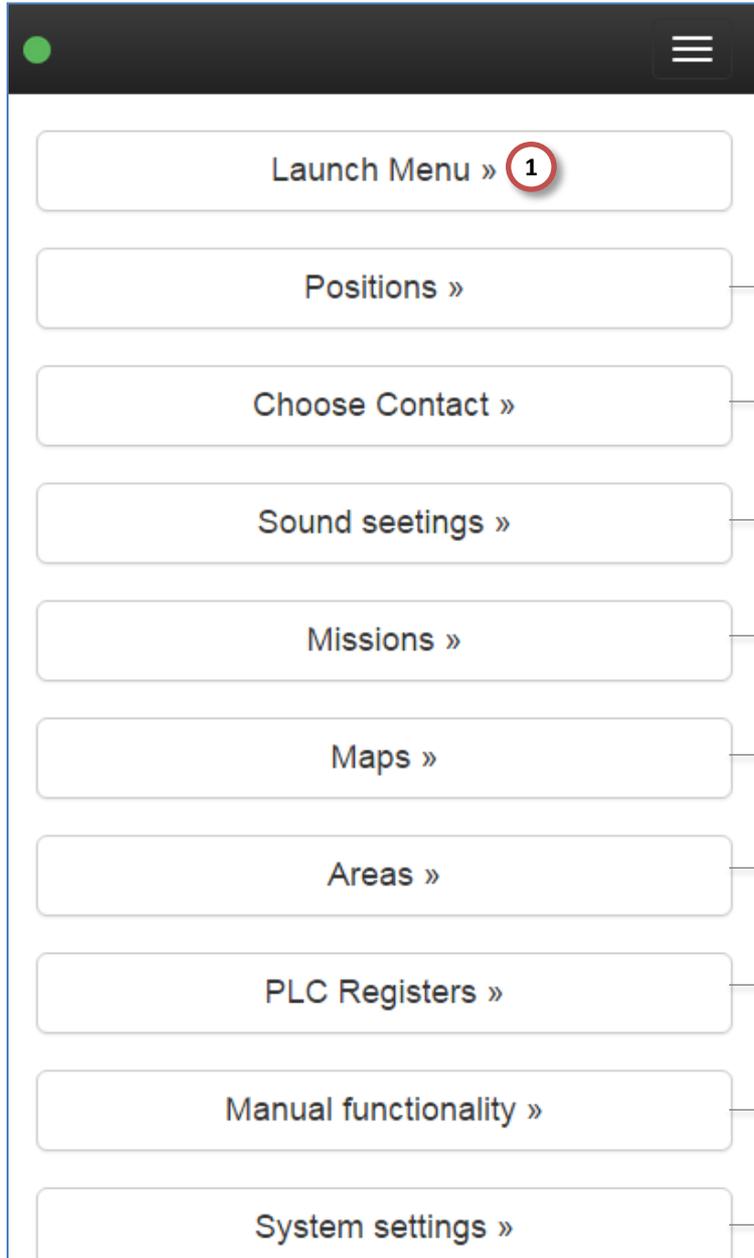
Log, status, system information.

Overview over driving – location, distance, status.

Backup, restore, remote access, wifi.

Synchronizing the exact location of the vehicle with the map.

Note: MiR100 is on Manual. Select Area in Service to activate.



1. Click Launch Menu to see the list of the vehicle's constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Manage contacts: name, mail, phone.

Create sounds.

Build missions as sequences of actions.

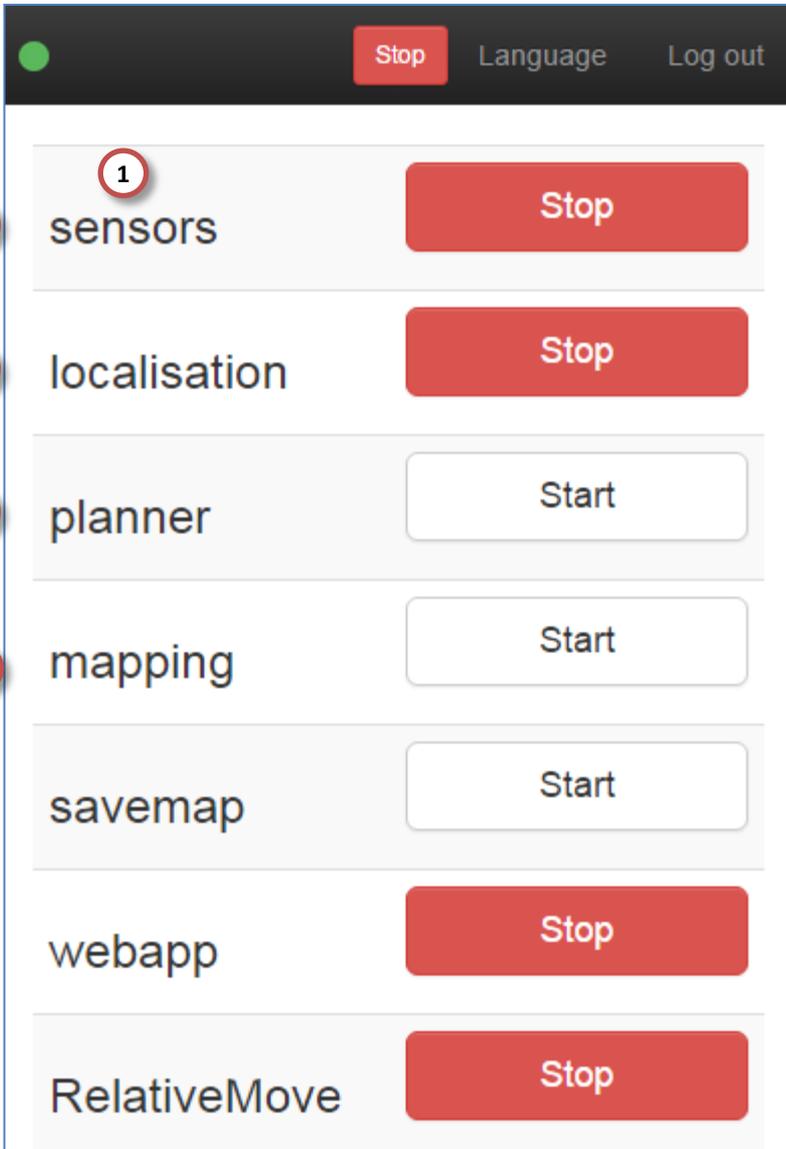
Edit map metadata (origo, name, resolution).

Manage areas: name, maps.

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.



Module	Status
<b>1</b> sensors	Stop
localisation	Stop
planner	Start
mapping	Start
savemap	Start
webapp	Stop
RelativeMove	Stop

1. Constituent elements (software modules) of the vehicle systems, which can be started/stopped directly from MiR web interface.

#### A. sensors:

Handles data from laser and camera.

#### B. localisation:

AMCL navigational system and odometry. These systems calculate the position of the vehicle for that area of the map where it's currently located.

#### C. planner:

Path planning. Consists of two parts: a global *planner* that does the general route planning between two positions and a local *planner* that causes the vehicle to follow the global route and also take into account the surrounding environment so that the vehicle avoids dynamic obstacles based on sensor input. Eg. people are avoided by the vehicle..

#### D. mapping:

This module is activated during mapping of a new area. It gathers walls, obstacles, positions and creates MiR100's internal map based on manual driving of the vehicle. This module can be regarded as an operation pattern.

Continued...



Module	Status	Action
sound	Running	Stop
backup	Failed	Start
mission	Running	Stop
mailer	Stopped	Start
rosbridge	Running	Stop
service	Running	Stop
Motorcontroller	Running	Stop

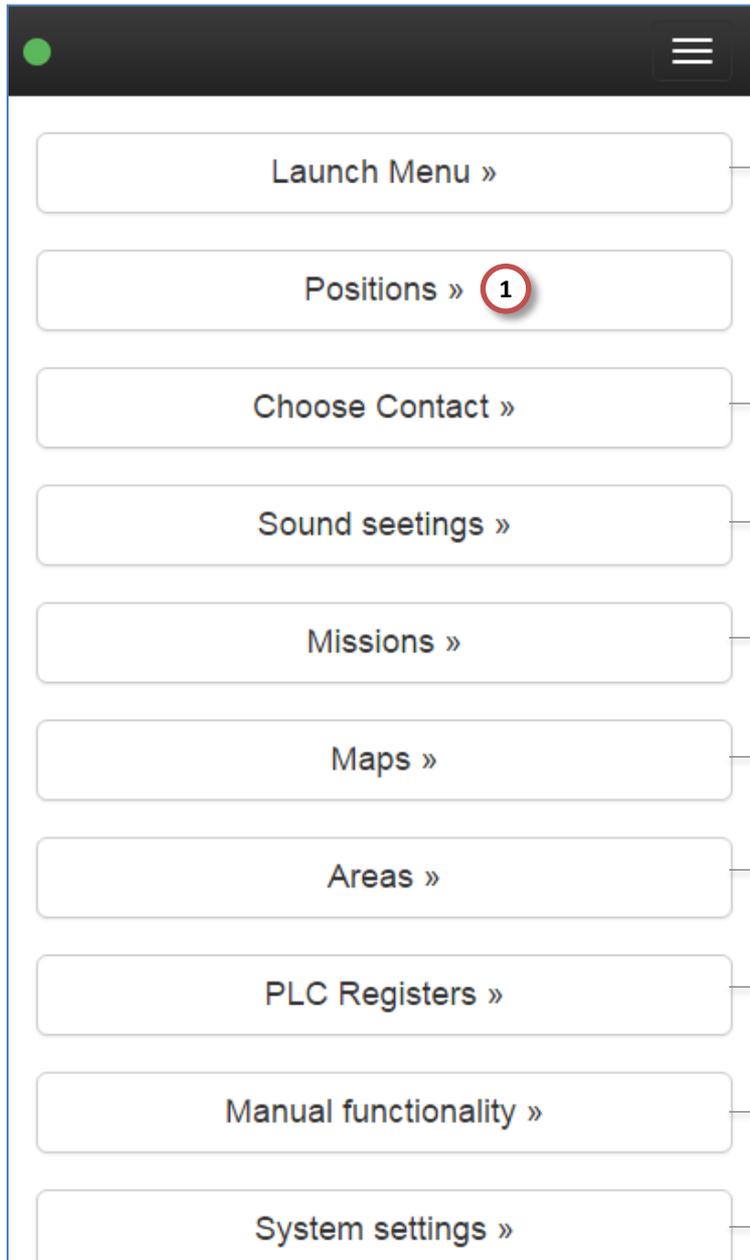
### E. Backup – pink background:

A module is shown with pink background when it has failed to start or stop unexpectedly.

### F. Modules – read only buttons:

If a module's start/stop button is set to read only it cannot be stopped and is shown for information only.

Go back to MiR > Service > Configuration.



### 1. Create and Edit positions for operation patterns.

Constituent elements that can be started/stopped.

Manage contacts: name, mail, phone.

Create sounds.

Build missions as sequences of actions.

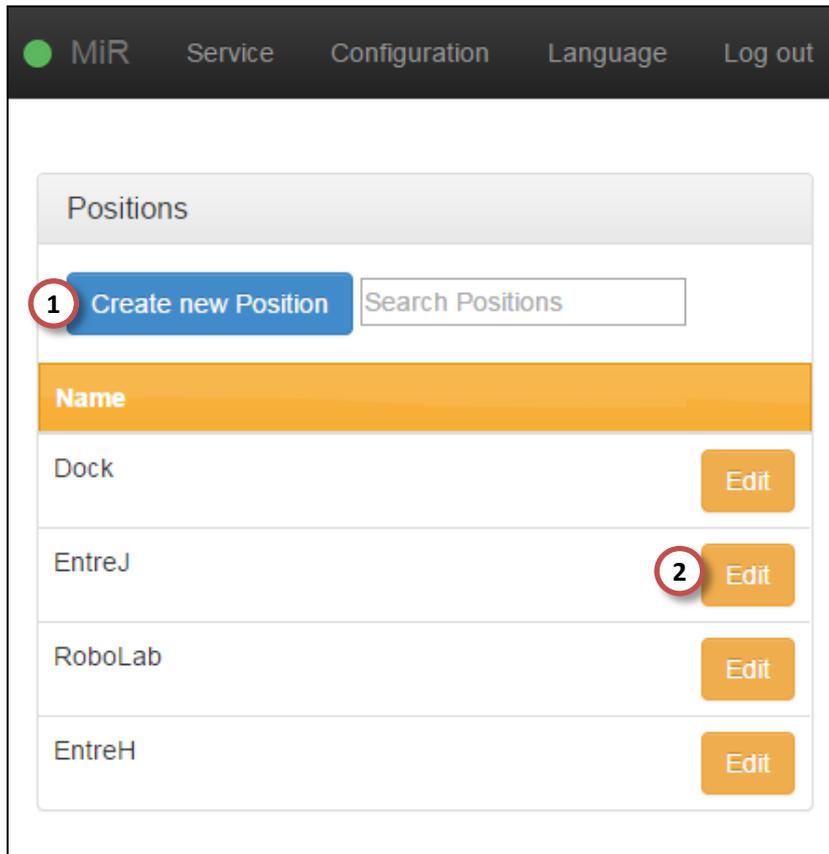
Edit map metadata (origo, name, resolution).

Manage areas: name, maps.

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.



MiR Service Configuration Language Log out

Positions

1 Create new Position Search Positions

Name	
Dock	Edit
EntreJ	2 Edit
RoboLab	Edit
EntreH	Edit

1. Create a new position or...

2. Edit an existing position.

**Edit Position** 1

Name

X

Y

Orientation

2

**Create new Position** 1

Name

X

Y

Orientation

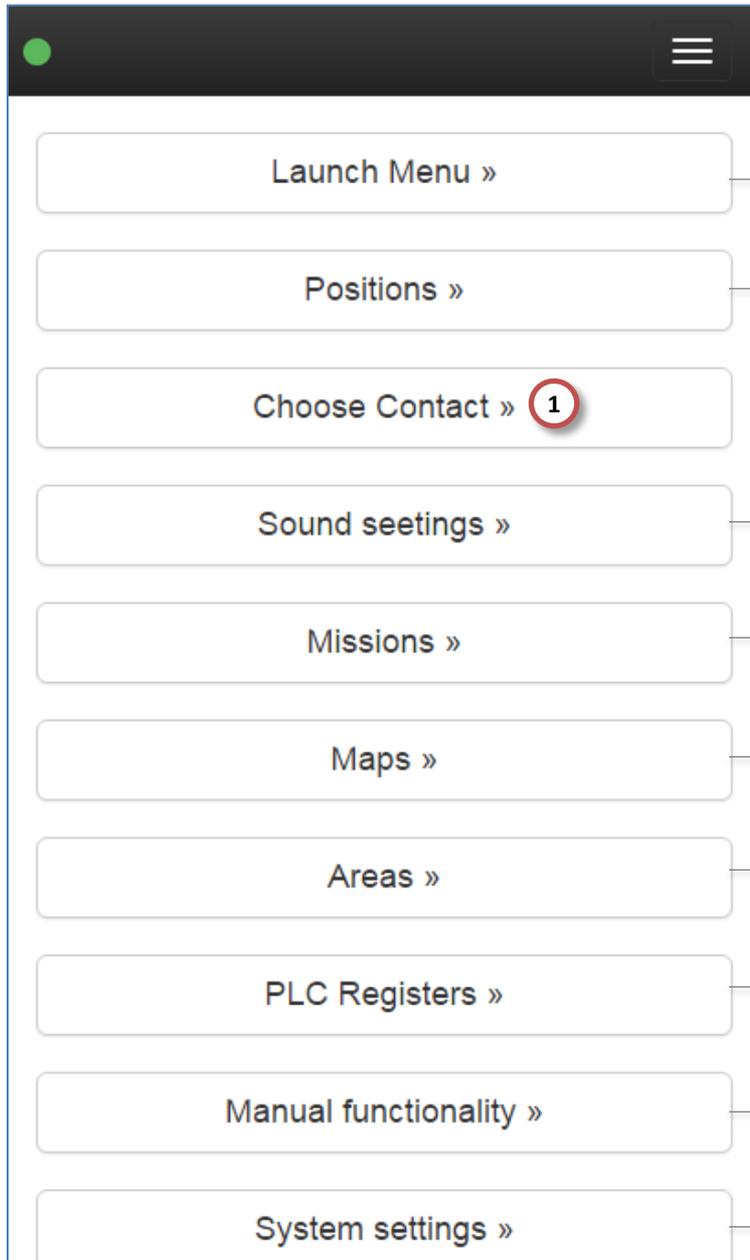
2

1. Fill in all fields.

2. Accept the changes – click Save or Create button.

3. Go back to MiR > Service > Configuration.

Use an existing position as a starting point - fields are automatically filled in and can be edited.



1. Click Choose Contact to create and edit name, mail, phone.

Constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Create sounds.

Build missions as sequences of actions.

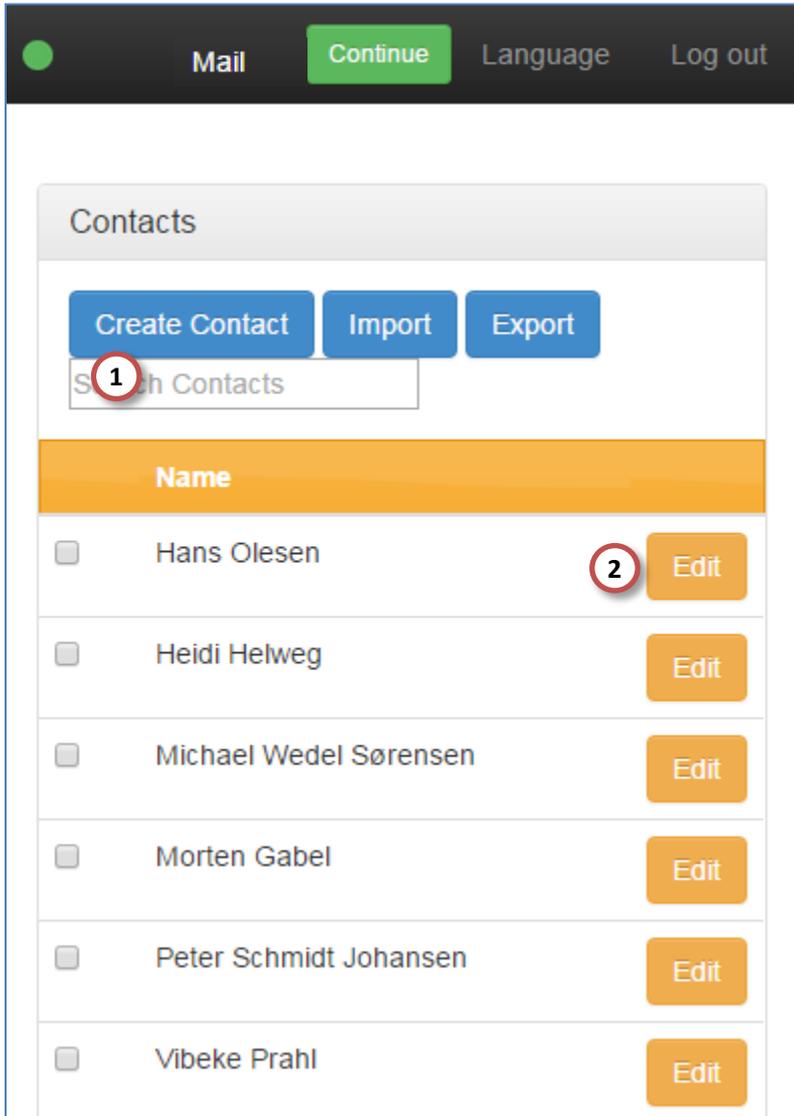
Edit map metadata (origo, name, resolution).

Manage areas: name, maps.

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.



Mail Continue Language Log out

### Contacts

Create Contact Import Export

Search Contacts

Name		
<input type="checkbox"/>	Hans Olesen	Edit
<input type="checkbox"/>	Heidi Helweg	Edit
<input type="checkbox"/>	Michael Wedel Sørensen	Edit
<input type="checkbox"/>	Morten Gabel	Edit
<input type="checkbox"/>	Peter Schmidt Johansen	Edit
<input type="checkbox"/>	Vibeke Prah	Edit

1. Create a new contact.

2. Click Edit to update or delete a contact.

**Edit** 1 ✕

**Name**

**E-mail**

**Phone**

**Location**

**Action**

2

**Create Contact** 1 ✕

**Name**

**E-mail**

**Phone**

**Location**

**Position name**

**X**

**Y**

**Orientation**

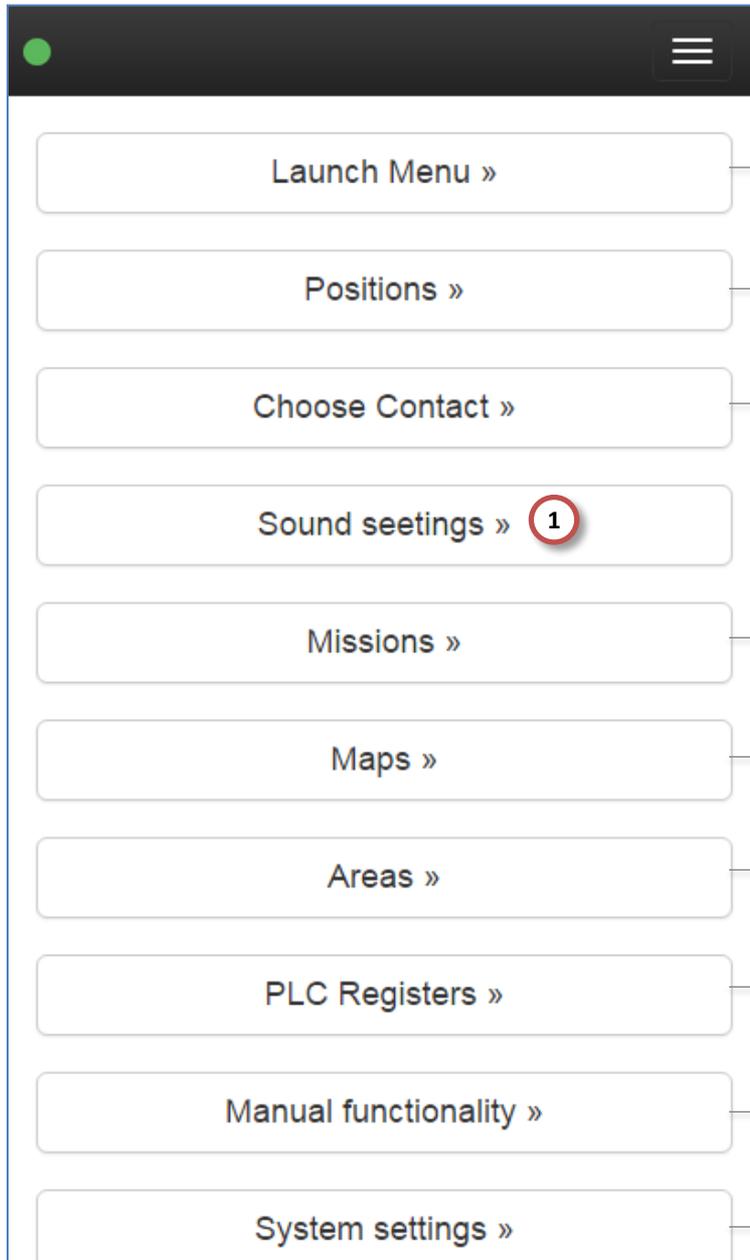
**Action**

2

1. Fill in all fields.

2. Accept the changes – click Save or Create button.

3. Go back to Service > Configuration



1. Click Sound settings to create and edit sounds.

Constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Manage contacts: name, mail, phone.

Build missions as sequences of actions.

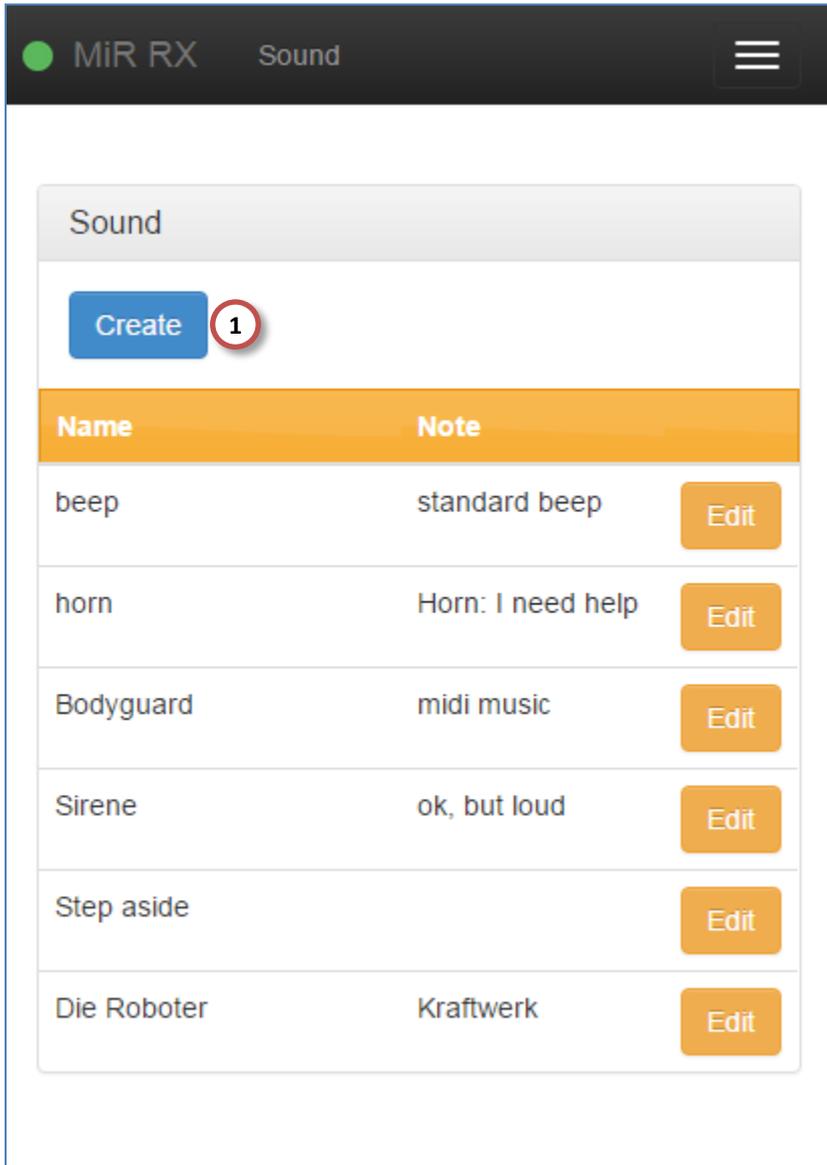
Edit map metadata (origo, name, resolution).

Manage areas: name, maps.

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.



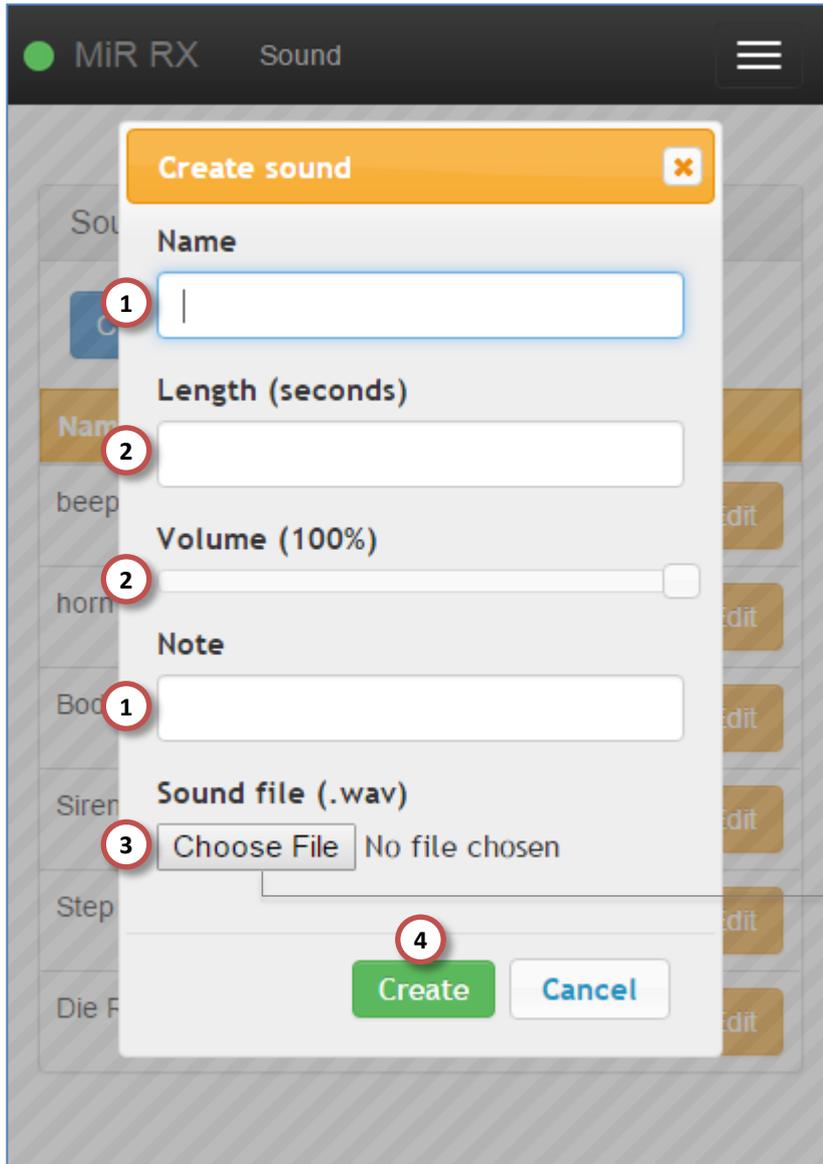
MiR RX Sound

Sound

Create **1**

Name	Note	
beep	standard beep	Edit
horn	Horn: I need help	Edit
Bodyguard	midi music	Edit
Sirene	ok, but loud	Edit
Step aside		Edit
Die Roboter	Kraftwerk	Edit

1. Click Create to add a new sound.



1. Fill in Name and Note.

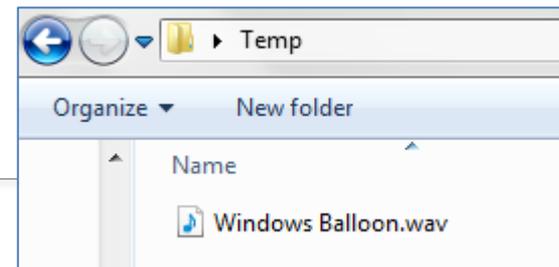
2. Set duration and volume.

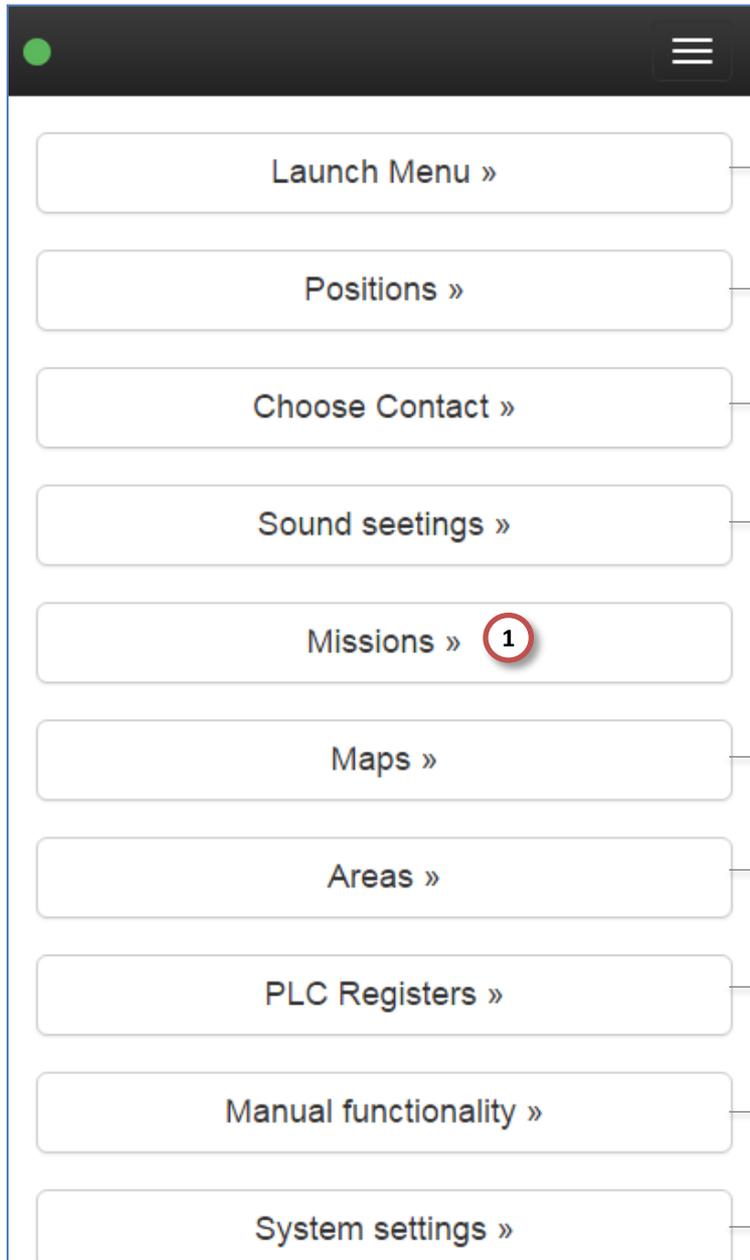
3. Select a sound file.

4. Click Create to save the sound.

5. Go back to MiR > Service > Configuration.

*This new sound can now be used in an Action.*





1. Click Missions to build operation patterns as sequences of actions.

Constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Manage contacts: name, mail, phone.

Create sounds.

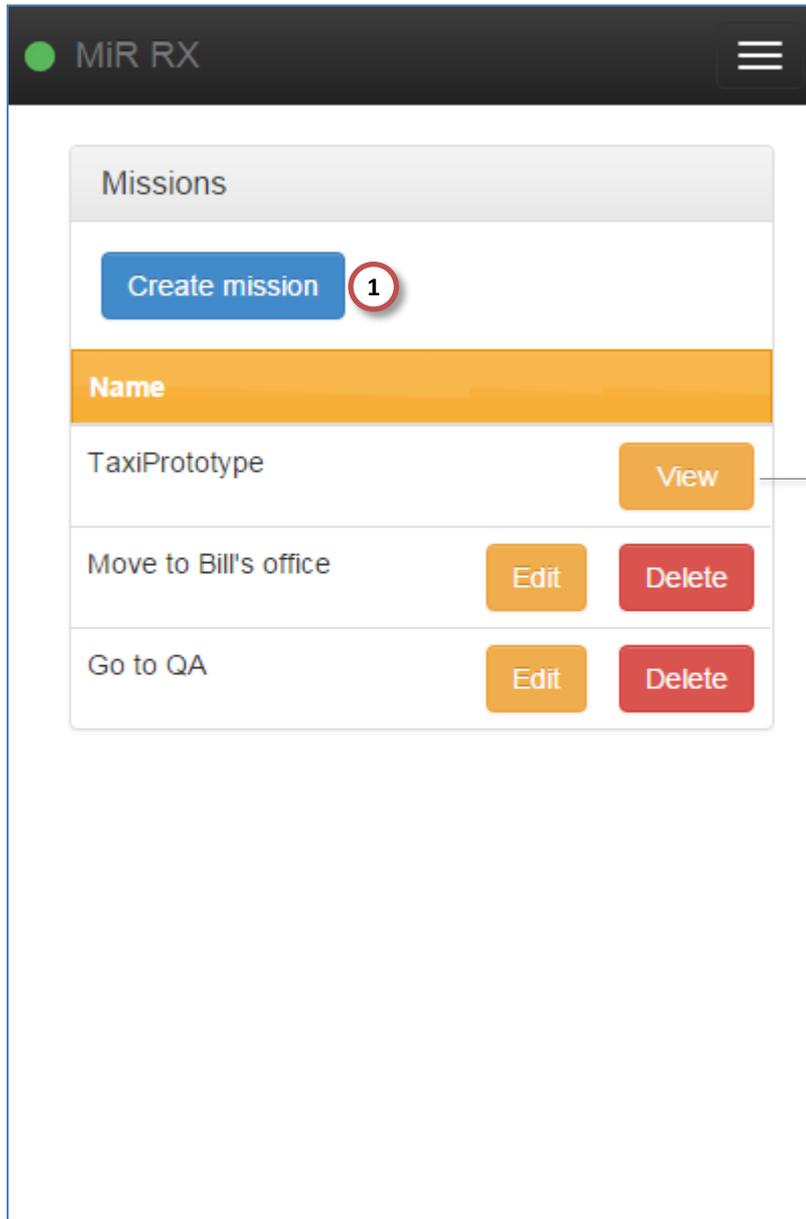
Edit map metadata (origo, name, resolution).

Manage areas: name, maps.

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.



Missions

Create mission **1**

Name	
TaxiPrototype	View
Move to Bill's office	Edit Delete
Go to QA	Edit Delete

1. Click Create mission.

TaxiPrototype is an in-built mission for use as a template.

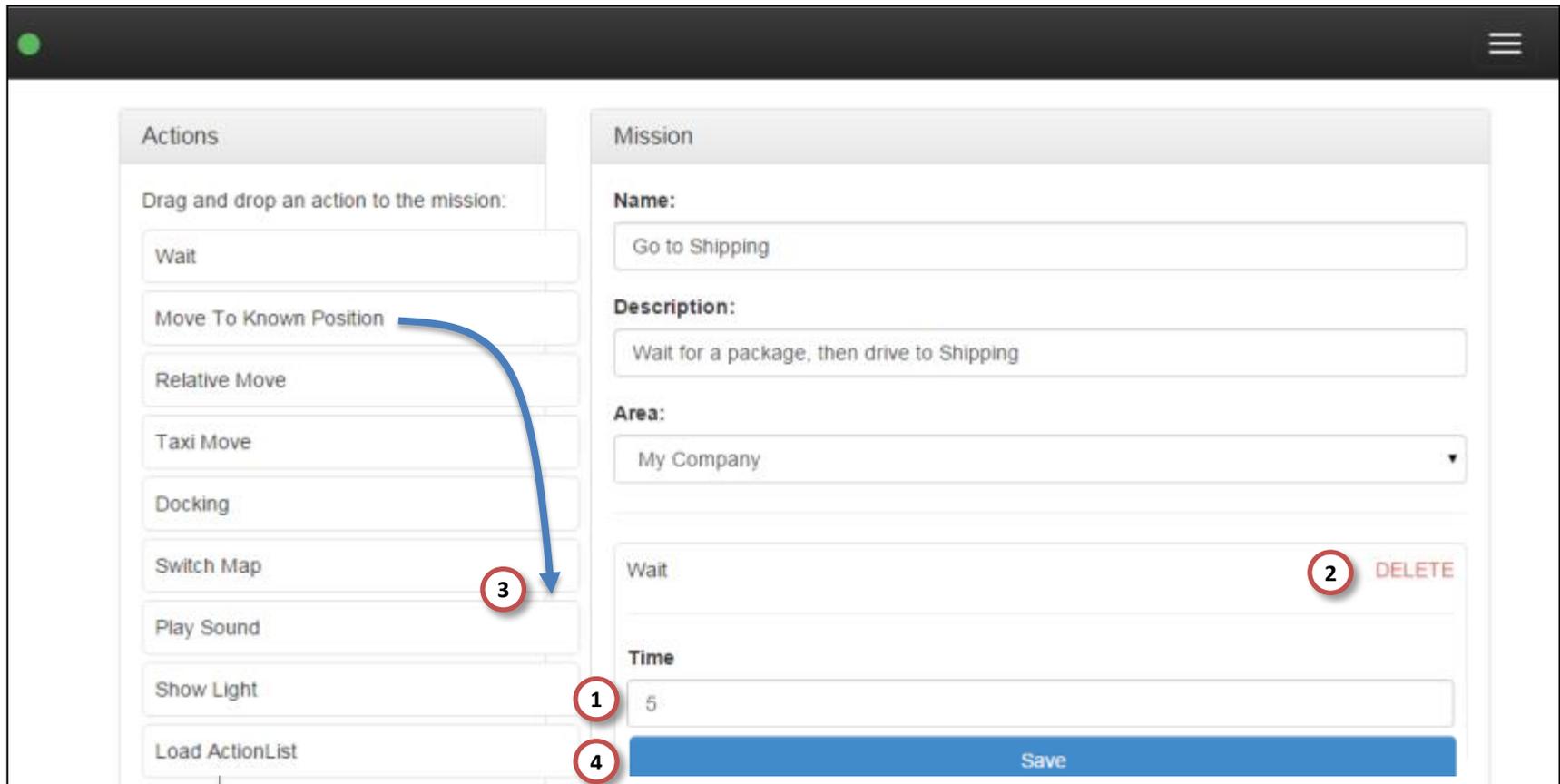
The cursor changes when dragging.

Actions are pre-defined building blocks. See separate documentation.

1. Write Name and Description.

2. Select Area.

3. Drag actions to the mission.



**Actions**

Drag and drop an action to the mission:

- Wait
- Move To Known Position
- Relative Move
- Taxi Move
- Docking
- Switch Map
- Play Sound
- Show Light
- Load ActionList

**Mission**

**Name:**  
Go to Shipping

**Description:**  
Wait for a package, then drive to Shipping

**Area:**  
My Company

Wait 2 DELETE

**Time**  
5

Save

Actions are pre-defined building blocks.  
See separate documentation.

1. Actions can have parameters to be filled in.

2. Delete the action.

3. Drag more actions to the mission.

4. Save the mission. Automatically returns to Missions.

MiR RX 2

### Missions

Create mission

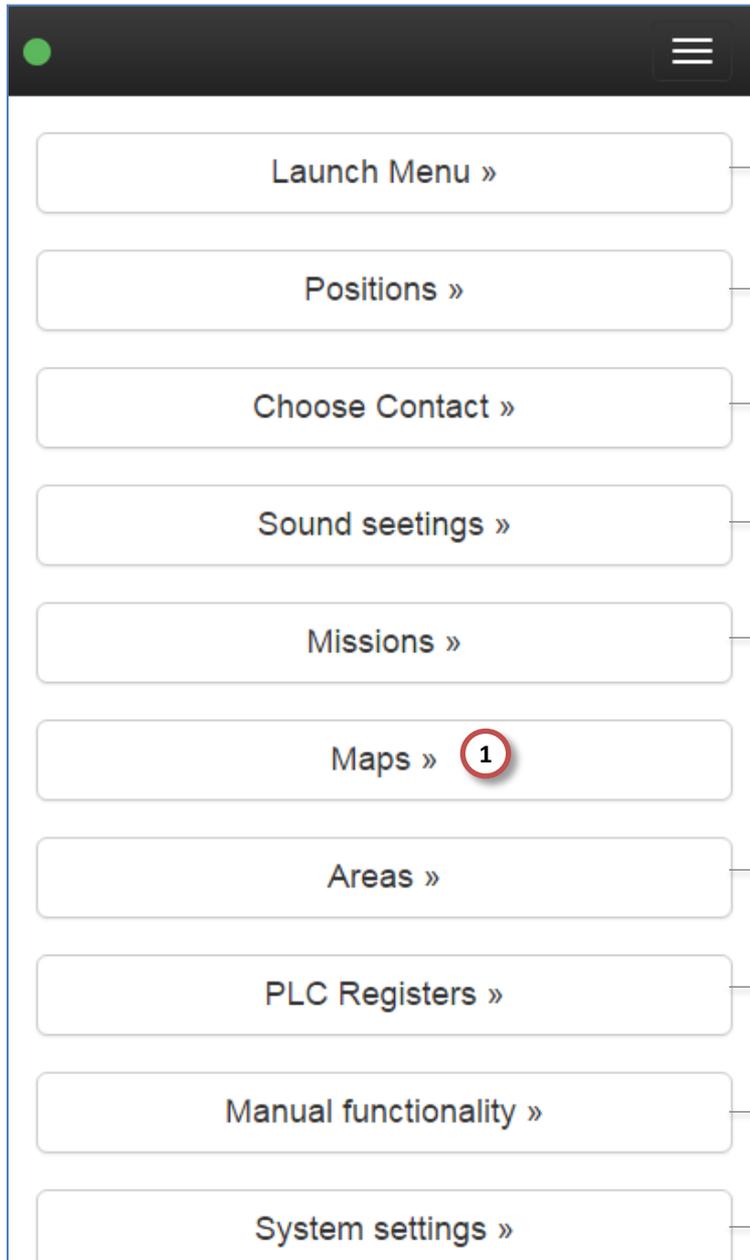
Name	
TaxiPrototype	View
Move to Bill's office	Edit Delete
Go to QA	Edit Delete
Go to Shipping	Edit Delete

1

1. Edit, Delete, Create missions as needed.

2. Go back to MiR > Service > Configuration.

TaxiPrototype is an in-built mission for use as a template.



1. Click Maps to edit map metadata (origo, name, resolution).

Constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Manage contacts: name, mail, phone.

Create sounds.

Build missions as sequences of actions.

Manage areas: name, maps.

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.

1. Click Create map to add a new map to an area.

The screenshot shows the 'Maps' configuration page. At the top, there is a navigation bar with 'MIR', 'Service', 'Configuration', 'Language', and 'Log out'. Below this is a 'Maps' section with a 'Create map' button circled with a '1'. The main content is a table with columns 'Name' and 'Edit'. The table lists several areas and their associated maps:

Name	Edit
<b>Aabenraa Sygehus</b>	
Aabenraa Sygehus Kælder	Action ▾
<b>Elos Produktion</b>	
Elos Produktion	Action ▾
<b>My Company</b>	
Ground floor	Action ▾
First floor	Action ▾
<b>Produktion</b>	

Area.

- Nav
- Web
- Map data
- Area events

Edit the look of the map.

Edit the allowed navigation area.

Edit Name, Origo, Resolution

Create sections of special robot behaviour (e.g. slow)

An area can have multiple maps.

The screenshot shows the 'Create' dialog for a map in the MiR100 configuration tool. The top navigation bar includes 'MIR', 'Service', 'Configuration', 'Language', and 'Log out'. The form fields are as follows:

- Name:** A text input field with a red circle '1' next to it.
- Area:** A dropdown menu showing 'My Company' with a red circle '1' next to it.
- X:** A text input field.
- Y:** A text input field with a red circle 'A' next to it.
- Resolution:** A text input field with the value '0.05' and a red circle 'B' next to it.
- Theta:** A text input field with a red circle 'C' next to it.

At the bottom of the form are two buttons: 'Create' (green) and 'Cancel' (blue). Below the form is a 'Action' dropdown menu.

1. Edit the map metadata:

The map is described by:

- Name
- Area
- Origo, X Y
- Resolution (*pixels to meters in reality*)
- Angle (*Origin Theta*)

### A. Origo X Y:

Point of origin for the map. Often, the origo is given as the point of origin belonging to a docking station.

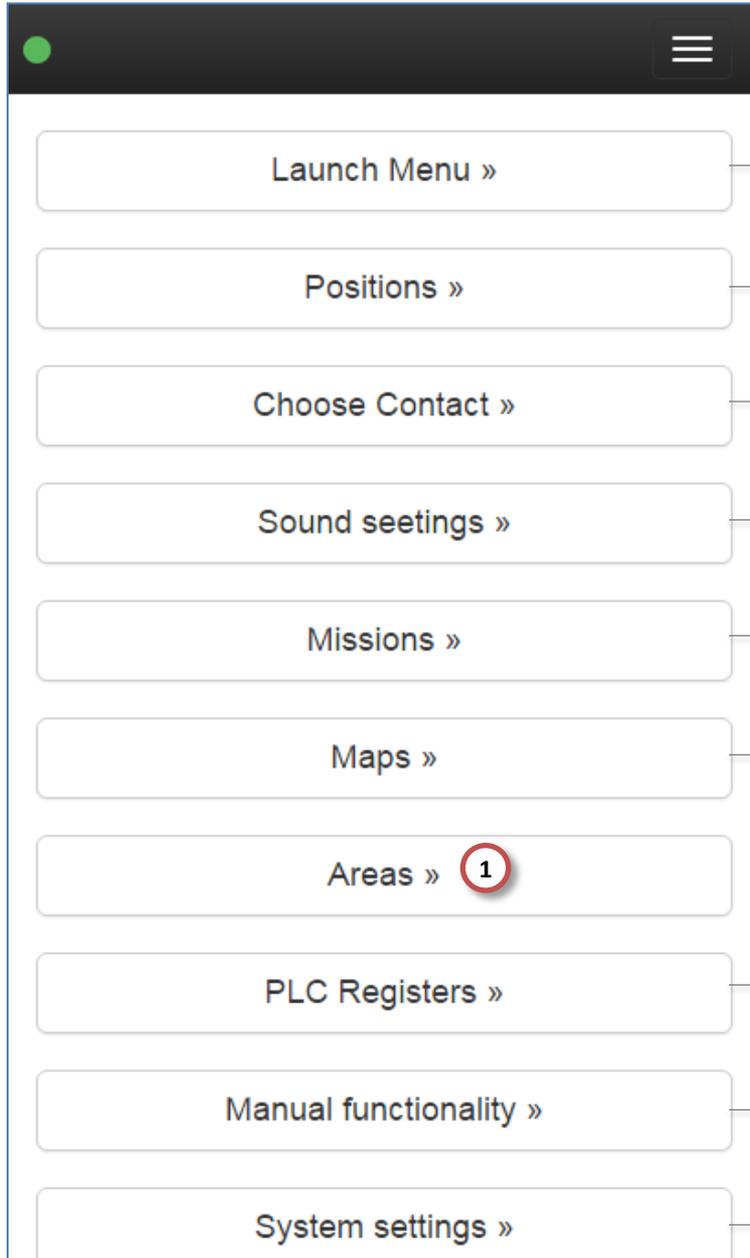
### B. Resolution

0,05: each pixel on the map corresponds to 5 cm in reality.

### C. Origin Theta

Angle of the vehicle (360 degrees) – 0 degrees is when the forward direction of the corresponds to the x-axis of the map.

2. Go back to MiR > Service > Configuration.



1. Click Areas to create and edit area metadata.

Constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Manage contacts: name, mail, phone.

Create sounds.

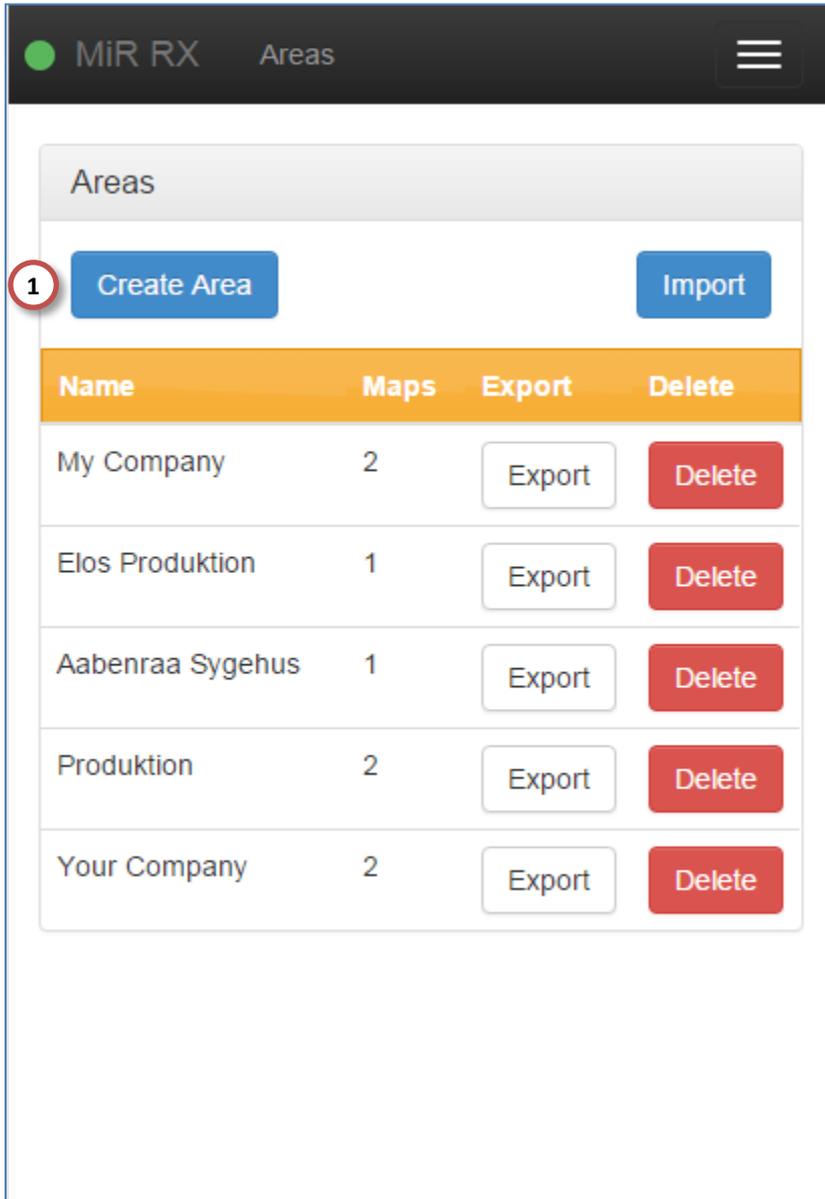
Build missions as sequences of actions.

Edit map metadata (origo, name, resolution).

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.

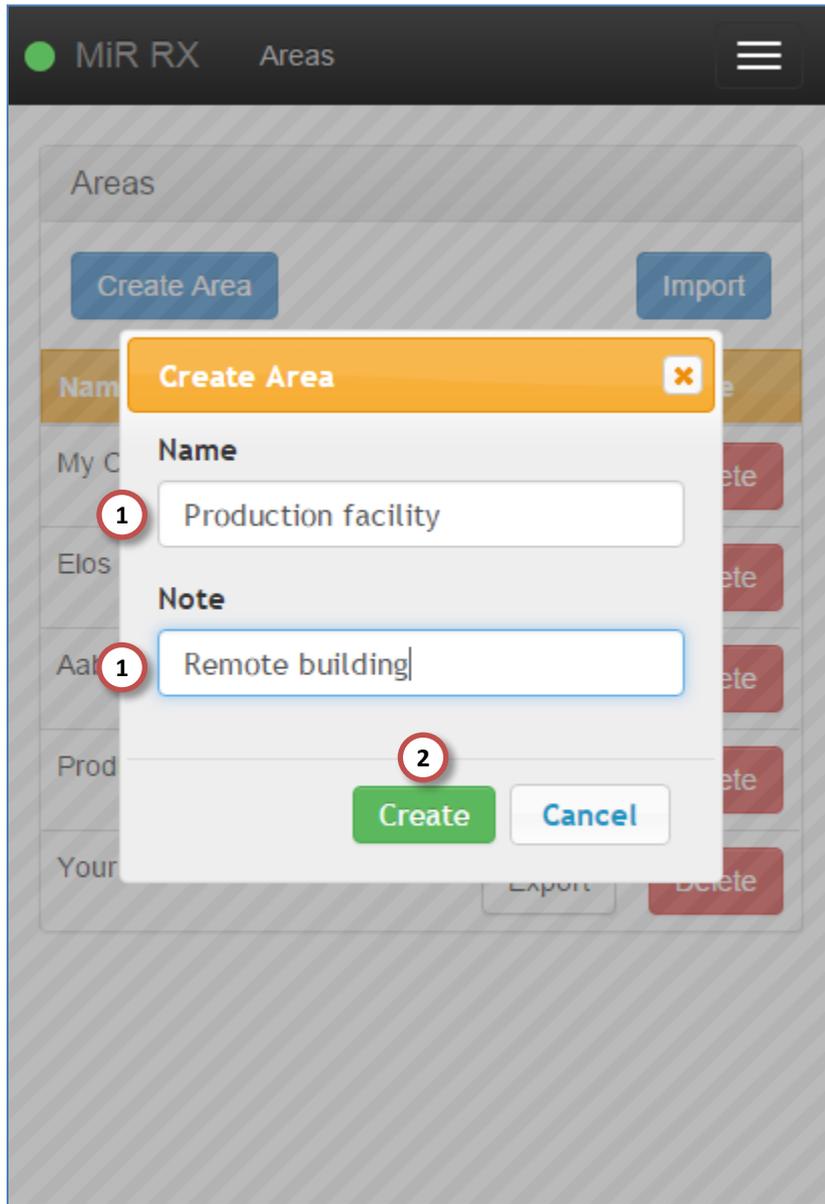


MiR RX Areas

1 Create Area Import

Name	Maps	Export	Delete
My Company	2	Export	Delete
Elos Produktion	1	Export	Delete
Aabenraa Sygehus	1	Export	Delete
Produktion	2	Export	Delete
Your Company	2	Export	Delete

1. Click Create Area to add a new area.



1. Fill in Name and Note.

2. Click Create to save the area.

*Maps and missions can now be added to this new area.*

MiR RX Areas

Create Area Import

Name	Maps	Export	Delete
My Company	2	Export	Delete
Elos Produktion	1	Export	Delete
Aabenraa Sygehus	1	Export	Delete
Produktion	2	Export	Delete
Your Company	2	Export	Delete
Production facility	0	Export	Delete

1. Click Export to save the area to a file.

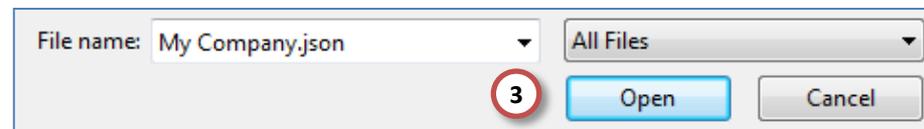
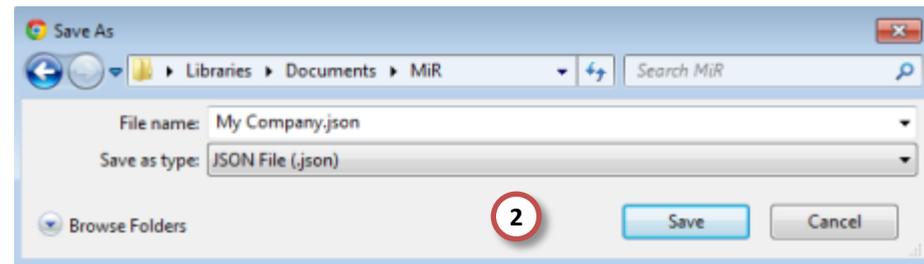
2. In the browser, select a location and click Save.

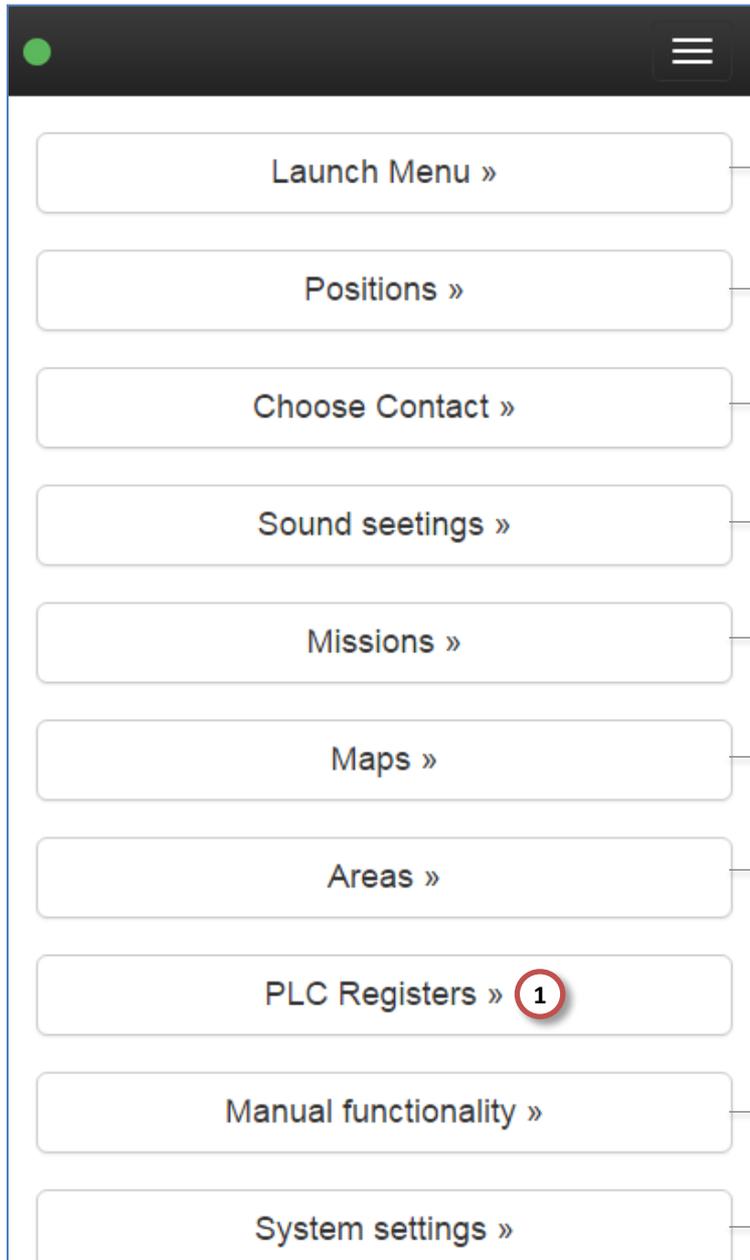
3. Click Import to load a file.

4. Go back to MiR > Service > Configuration.

*The Export/Import functions make it easy to copy an area from one robot to another.*

*The JSON file contains: Area, maps, positions.*





1. Click PLC registers to create and edit values for PLC-controlled devices.

Constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Manage contacts: name, mail, phone.

Create sounds.

Build missions as sequences of actions.

Edit map metadata (origo, name, resolution).

Manage areas: name, maps.

Real time activation of light, speed, sound.

MiR settings: email, ROS parameters, hardware setup.

●
Stop
Language
Log out

Quick edit

Integer

#	Value	
0	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px 5px; display: inline-block;">1</span> <span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px; margin-left: 5px;">Edit</span>
1	0	<span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px;">Edit</span>
2	0	<span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px;">Edit</span>
3	0	<span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px;">Edit</span>
4	0	<span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px;">Edit</span>
5	132345	<span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px;">Edit</span>
6	0	<span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px;">Edit</span>
7	55	<span style="background-color: #f79646; color: white; padding: 5px 10px; border-radius: 3px;">Edit</span>

1. Click Edit to change values.

Use Quick Edit to enter a register # instead of scrolling.

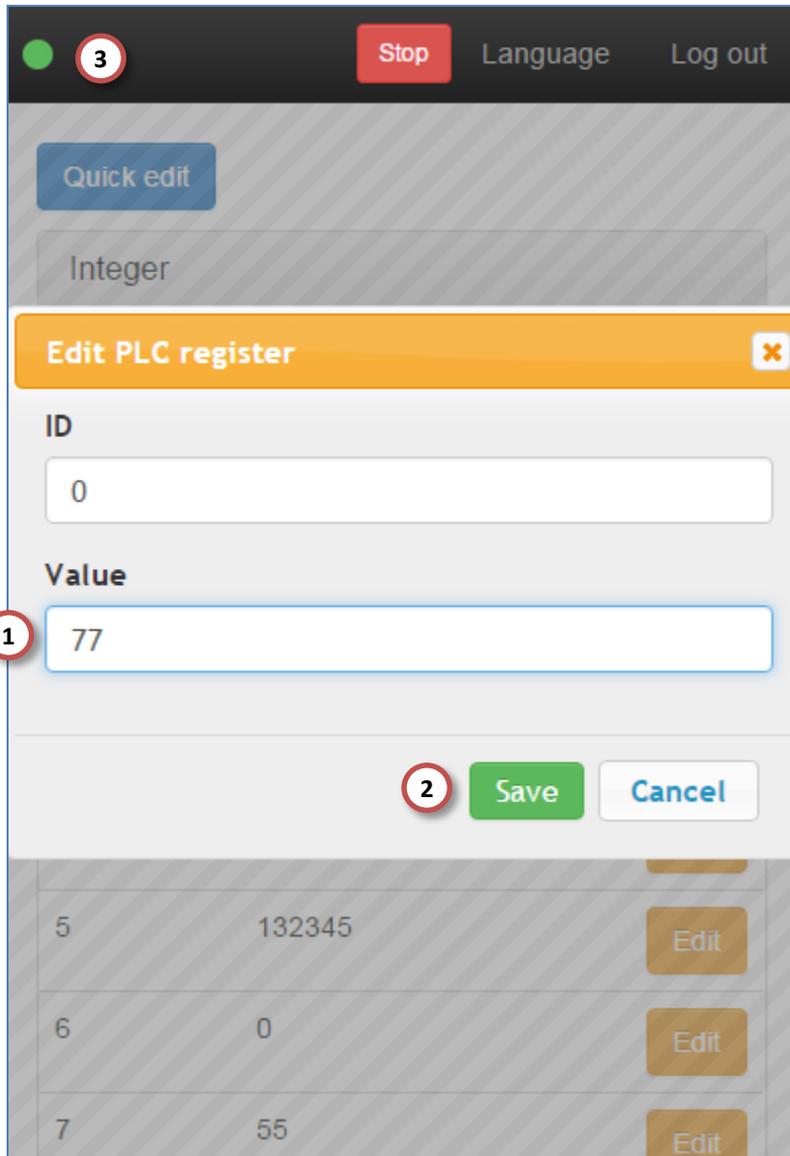
The robot has 200 registers.  
 First 100: integer  
 Next 100: float

Registers are shared by actions that: set a value, wait for a value, read a value.

Registers can be accessed locally through a serial interface and externally through a REST interface via wifi connecting to a remote computer.

Registers are used for hand-shake signals – for example for communication between robot and a conveyor PLC.

Quick Edit: Go to know # - avoid scrolling



3 Stop Language Log out

Quick edit

Integer

**Edit PLC register** ✕

ID

0

Value

1 77

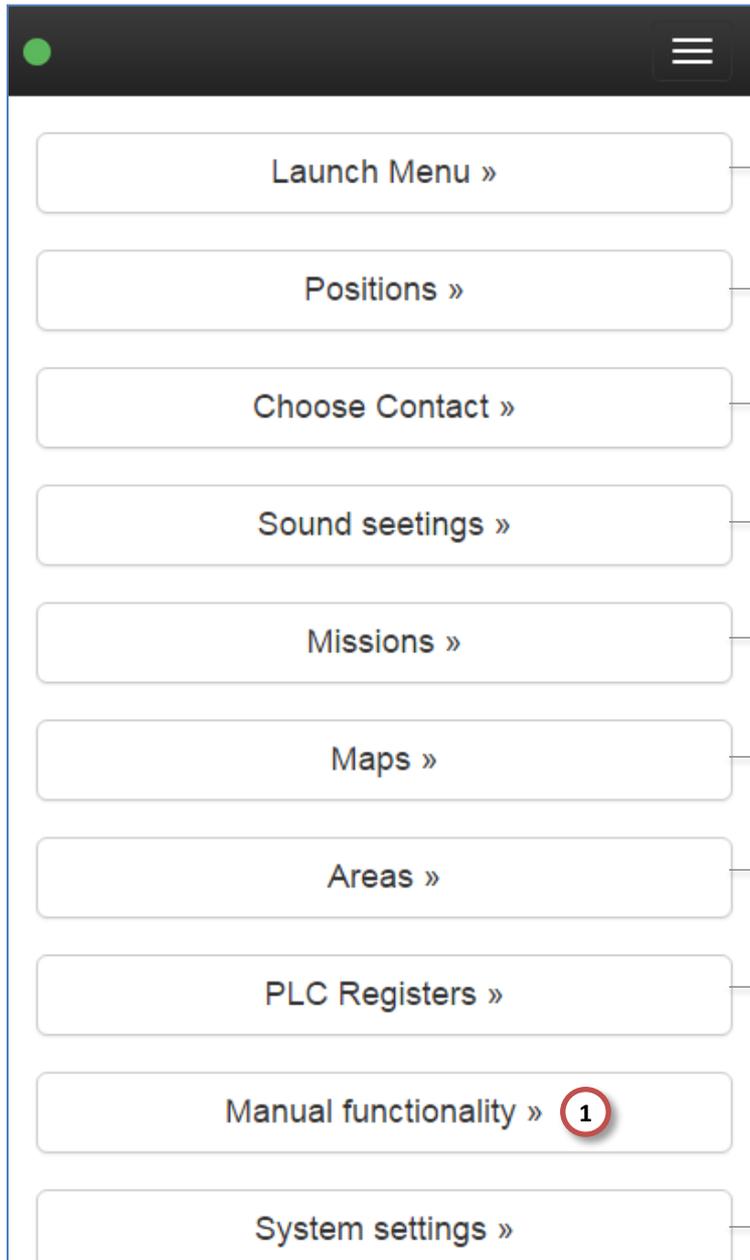
2 Save Cancel

5	132345	Edit
6	0	Edit
7	55	Edit

1. Fill in value.

2. Click Save.

3. Go back to MiR > Service > Configuration.



1. Click Manual functionality for real time activation of light, speed, sound. Especially useful for demos.

Launch Menu »: Constituent elements that can be started/stopped.

Positions »: Create and Edit positions for operation patterns.

Choose Contact »: Manage contacts: name, mail, phone.

Sound settings »: Create sounds.

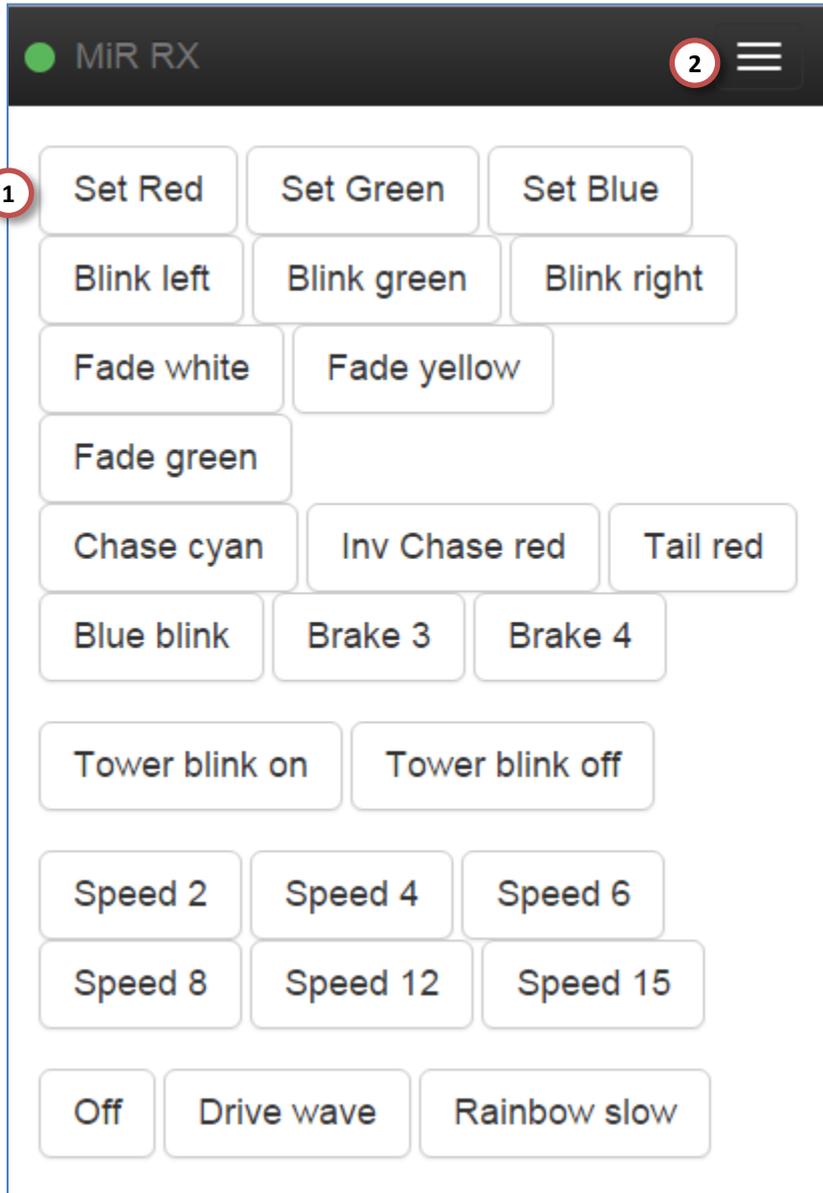
Missions »: Build missions as sequences of actions.

Maps »: Edit map metadata (origo, name, resolution).

Areas »: Manage areas: name, maps.

PLC Registers »: Interface with PLC devices: conveyors, machines.

System settings »: MiR settings: email, ROS parameters, hardware setup.

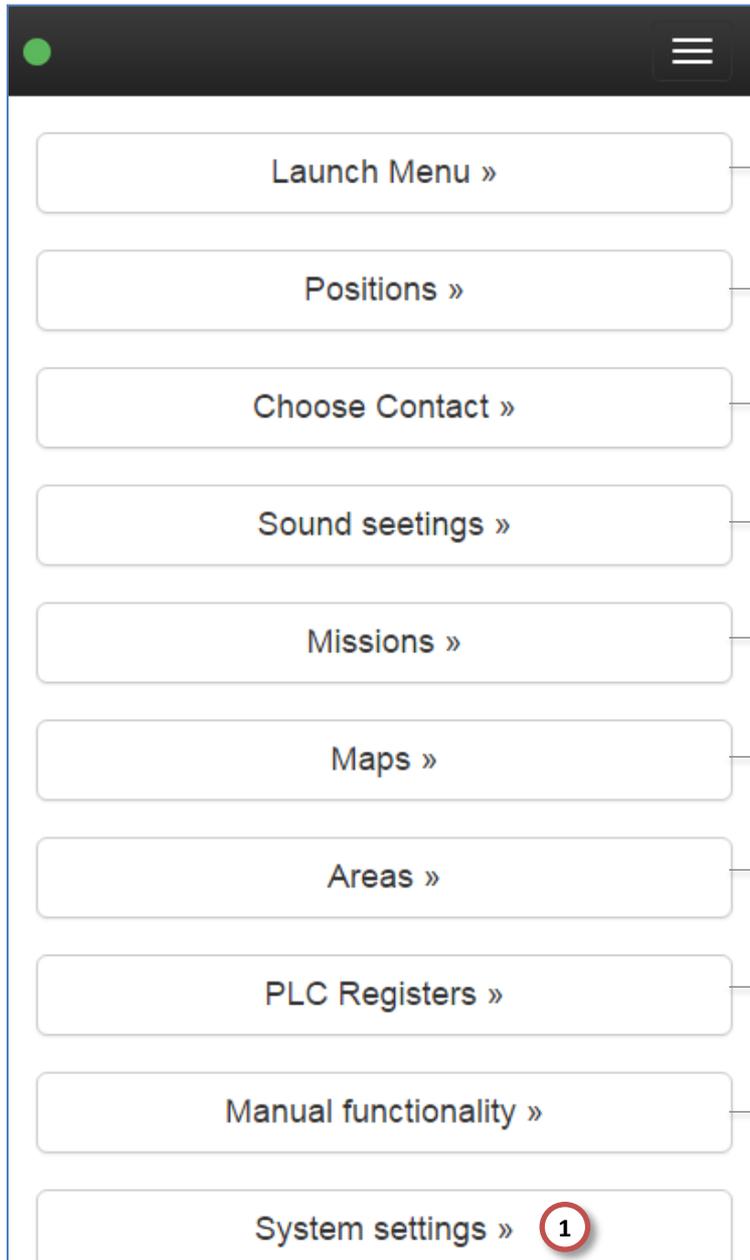


The screenshot shows the MiR RX configuration interface. At the top left, there is a green circle followed by the text "MiR RX". At the top right, there is a red circle with the number "2" and a hamburger menu icon. A red circle with the number "1" is positioned to the left of the first row of buttons. The interface contains the following buttons:

- Set Red
- Set Green
- Set Blue
- Blink left
- Blink green
- Blink right
- Fade white
- Fade yellow
- Fade green
- Chase cyan
- Inv Chase red
- Tail red
- Blue blink
- Brake 3
- Brake 4
- Tower blink on
- Tower blink off
- Speed 2
- Speed 4
- Speed 6
- Speed 8
- Speed 12
- Speed 15
- Off
- Drive wave
- Rainbow slow

1. Click a behaviour to invoke real time activation of light, speed, sound on the vehicle.

2. Go back to MiR > Service > Configuration.



1. Click System settings to manage MiR settings: email, ROS parameters, hardware setup.

Constituent elements that can be started/stopped.

Create and Edit positions for operation patterns.

Manage contacts: name, mail, phone.

Create sounds.

Build missions as sequences of actions.

Edit map metadata (origo, name, resolution).

Manage areas: name, maps.

Interface with PLC devices: conveyors, machines.

Real time activation of light, speed, sound.

MiR RX



E-mail configuration »

ROS parameters »

Available pages »

MiR Setup »

System Settings are described in a separate document. Below is given a short note.

Configure e-mail address, name, server, security for each vehicle.

Control and optimize parameters such as distance to reached destination, cameras on/off.

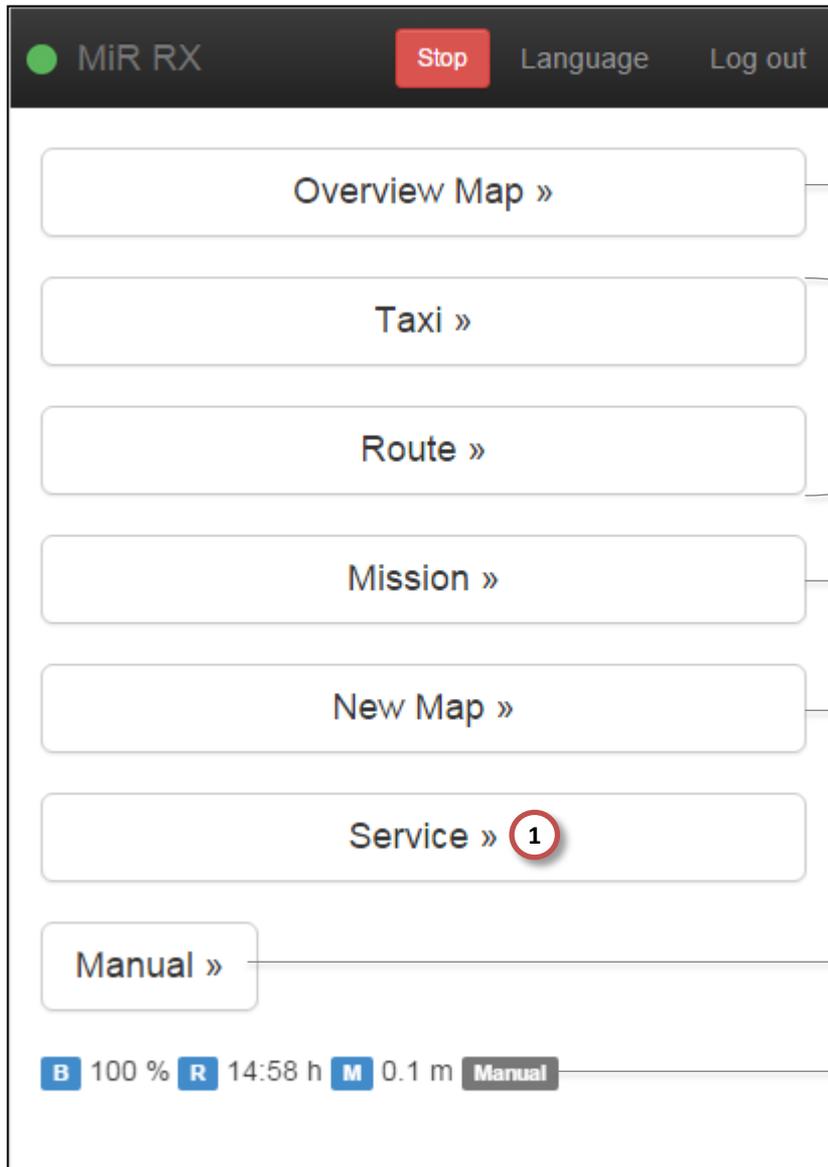
Configure which pages to show on MiR Web Interface.

Set up robot name and laser scanners before putting the robot to operation.

Go back to MiR start page.

## MiR100 Analysis – Administrator Check list

- From the start page, select Service > Analysis to get an overview over the operation of the vehicle during a specific period.
  - Log Analysis – various analyses and collections of logged data during a specified period of time.
  - Job route overview – shows for each operation pattern the end condition and the path on the map during a specified period of time.



1. Click Service to navigate to the Analysis menu.

View the location of the vehicle on the map

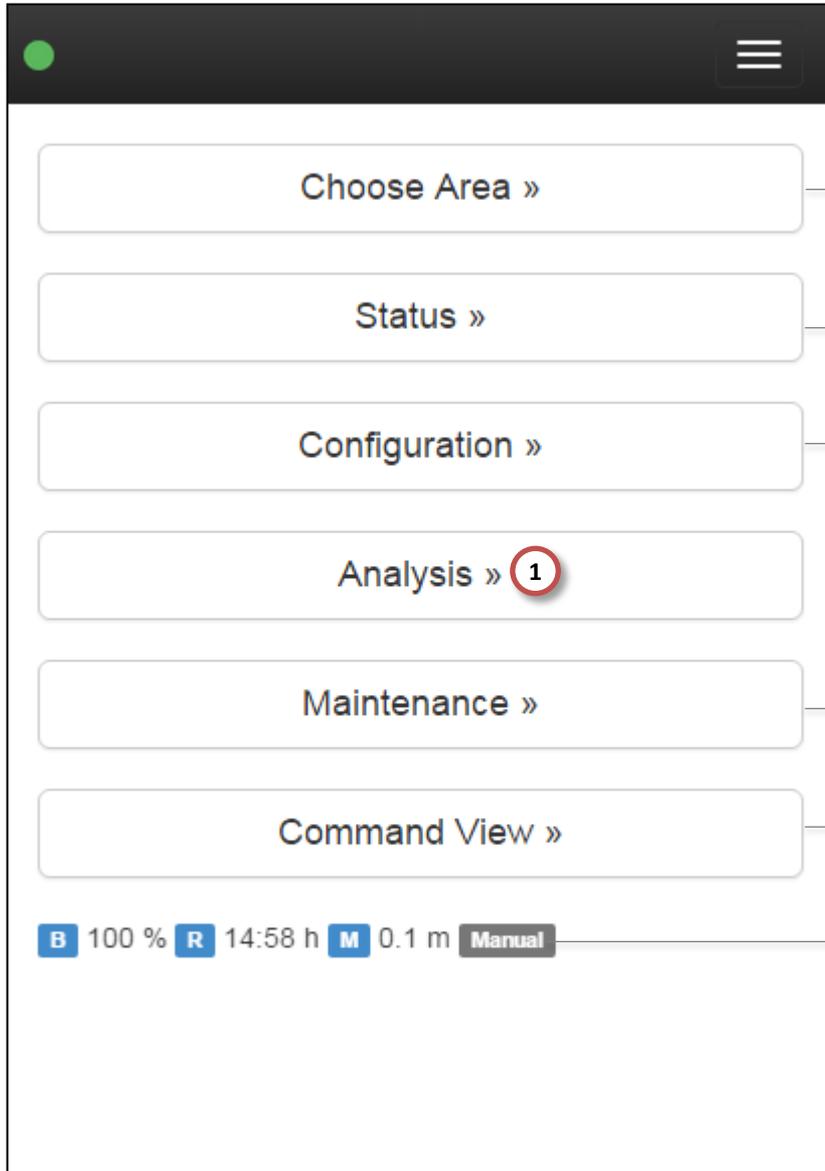
Predefined mission types

Controlling the mission queue

Create a map of a new area.  
You must be logged in to see this button.

Go to manual driving to take control using joystick.

Note: MiR100 is on Manual. Select Area in Service to activate.



1. Click Analysis to get an overview over driving – location, distance, status.

Choose area, start up MiR100, see and edit map.

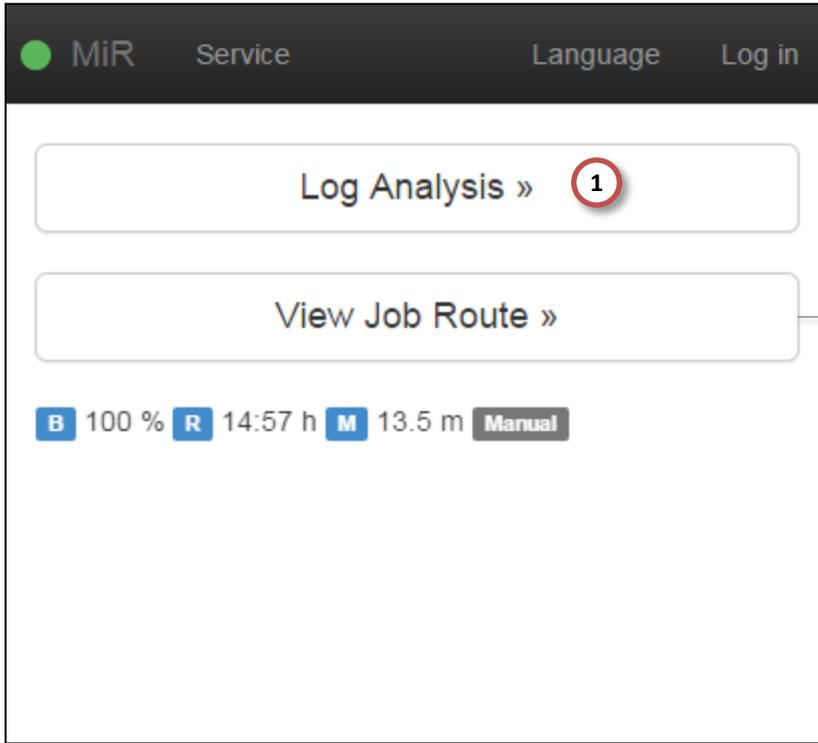
Log, status, system information.

Basic setup – rarely used.

Backup, restore, remote access, wifi.

Synchronizing the exact location of the vehicle with the map.

Note: MiR100 is on Manual. Select Area in Service to activate.



The screenshot shows the MiR100 Analysis interface. At the top, there is a dark header with a green circle icon, the text 'MiR', 'Service', 'Language', and 'Log in'. Below the header, there are two main buttons: 'Log Analysis »' and 'View Job Route »'. The 'Log Analysis »' button has a red circle with the number '1' next to it. At the bottom of the interface, there is a status bar with the following information: 'B 100 %', 'R 14:57 h', 'M 13.5 m', and 'Manual'.

1. Click Log Analysis to view logged data graphically over a period of time.

1. Click View Job Route to see driving status over a specified period of time.

MiR RX

### Log Analysis

Show: Today Week Month Year

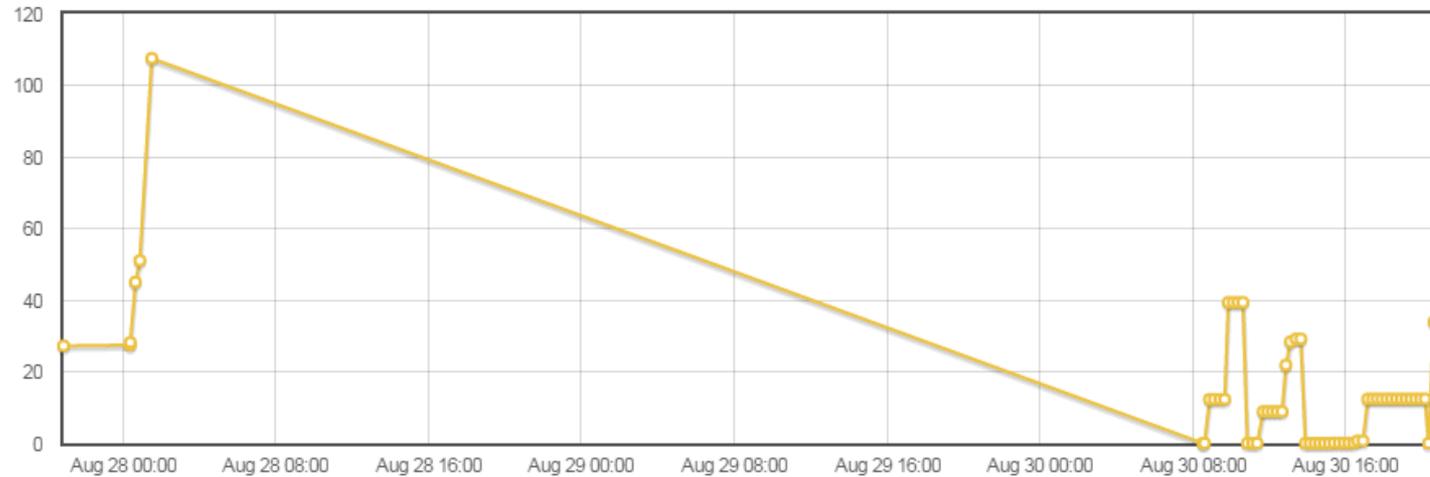
1

1. Select a period of time for viewing log data.

## Log Analysis

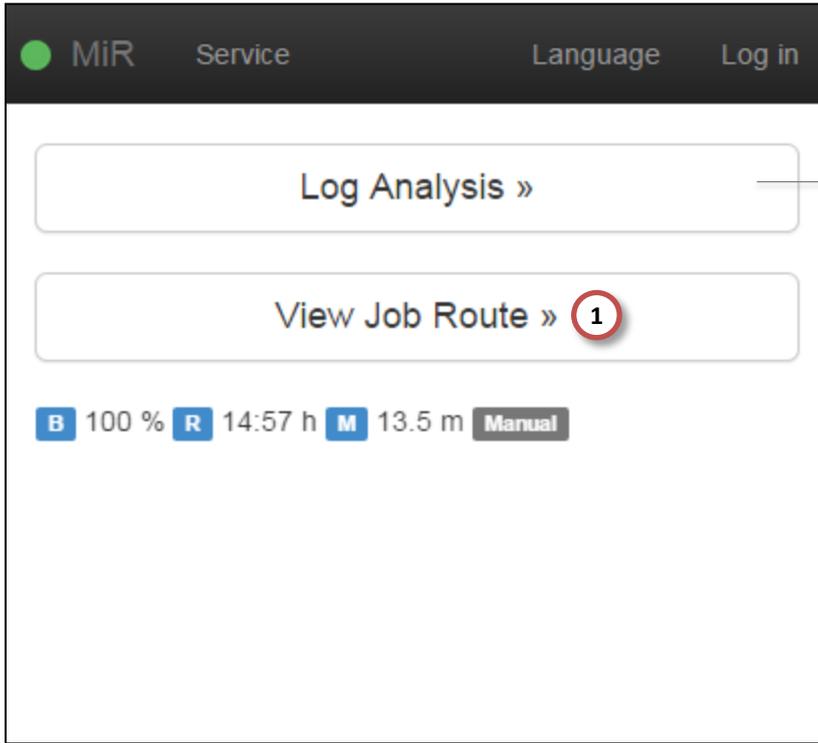
Show: Today Week Month Year

Distance Charges



Date	Distance
2015-08-27 22:52:52	27.2
2015-08-28 02:21:59	27.43
2015-08-28 02:22:33	28.15
2015-08-28 02:38:51	45.01

1. Return to Service > Analysis.



MiR Service Language Log in

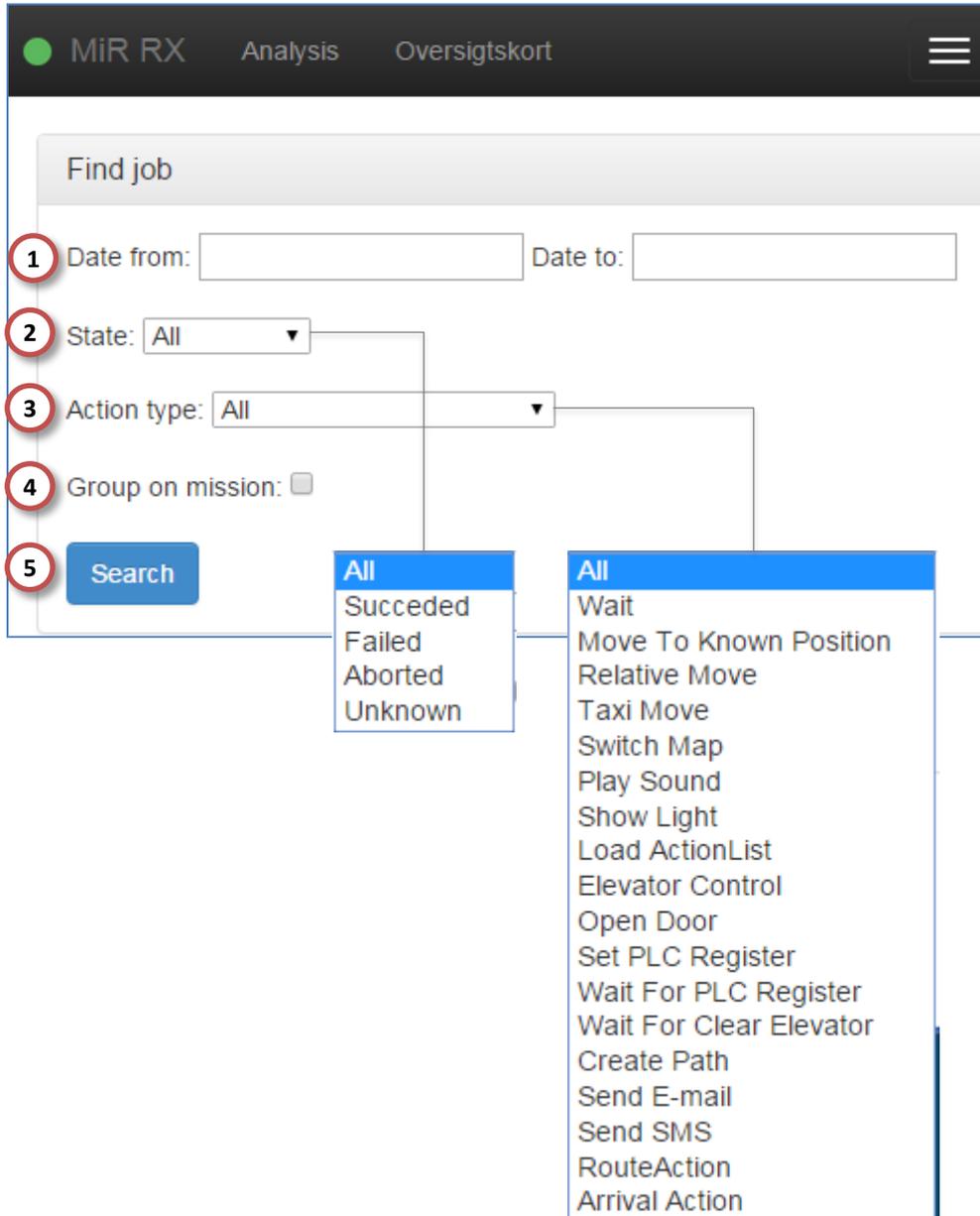
Log Analysis »

View Job Route » 1

B 100 % R 14:57 h M 13.5 m Manual

1. Click View Job Route to see driving status over a specified period of time.

See analyses of various logged data over a period of time.



The screenshot shows the 'Find job' search interface. It includes a header with 'MiR RX', 'Analysis', and 'Oversigtskort'. The search area contains the following elements:

- 1** Date from:  Date to:
- 2** State:
- 3** Action type:
- 4** Group on mission:
- 5** Search button

Two dropdown menus are open below the filters:

- State dropdown:** All, Succeeded, Failed, Aborted, Unknown
- Action type dropdown:** All, Wait, Move To Known Position, Relative Move, Taxi Move, Switch Map, Play Sound, Show Light, Load ActionList, Elevator Control, Open Door, Set PLC Register, Wait For PLC Register, Wait For Clear Elevator, Create Path, Send E-mail, Send SMS, RouteAction, Arrival Action

1. Specify time interval for the analysis.  
Hour and Minute are optional – typically used within a single day.

2. Leave the State field blank to see all operations and their end conditions.  
OR select a specific end condition.

3. Narrow the search further by selecting a specific action.

4. Select Group on mission to see only missions – not actions.

5. Click Search.

See an example search result on the next page.

MiR Service Analysis Language Log in

5

Find job

Date from: 2015-09-01 00:00 Date to: 2015-09-01 23:59

State: All

Action type: All

Group on mission:

1 Search View all results on map 2

	ID	Type	State	Created
4 Show	438	Taxa	InTransit	2014-12-12 15:30:29
Show	437	Taxa	GoalReached	2014-12-12 15:29:51
Show	435	Taxa	InTransit	2014-12-12 15:15:36
Show	434	Bus	GoalReached	2014-12-10 11:00:53
Show	433	Bus	GoalReached	2014-12-10 11:00:22
Show	432	Bus	GoalReached	2014-12-10 10:59:37
Show	431	Bus	GoalReached	2014-12-10 10:58:27

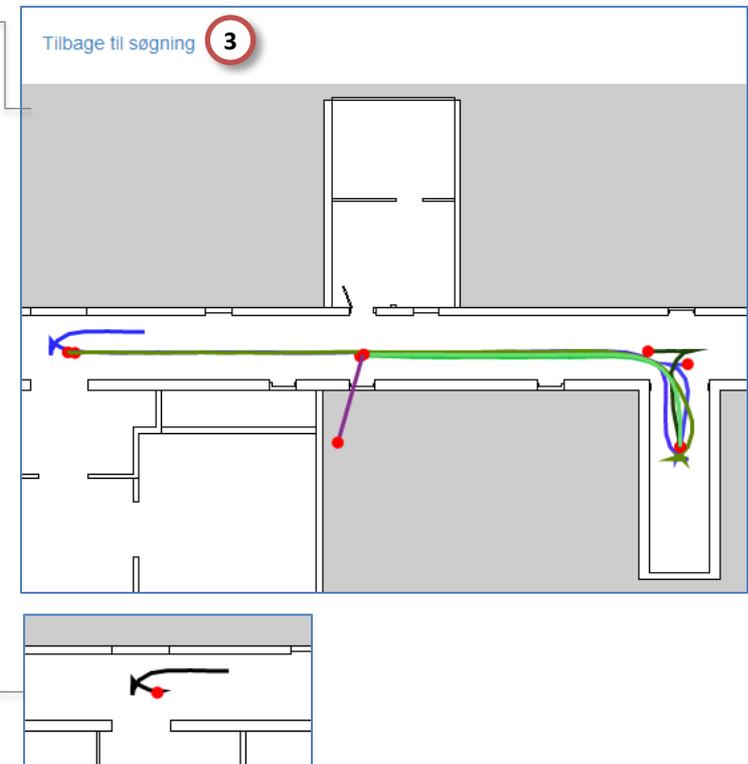
1. The search returned taxi and bus operations for the specified period of time.

2. Show operations on map. Red dots: start position.

3. Return to the search to show a single path.

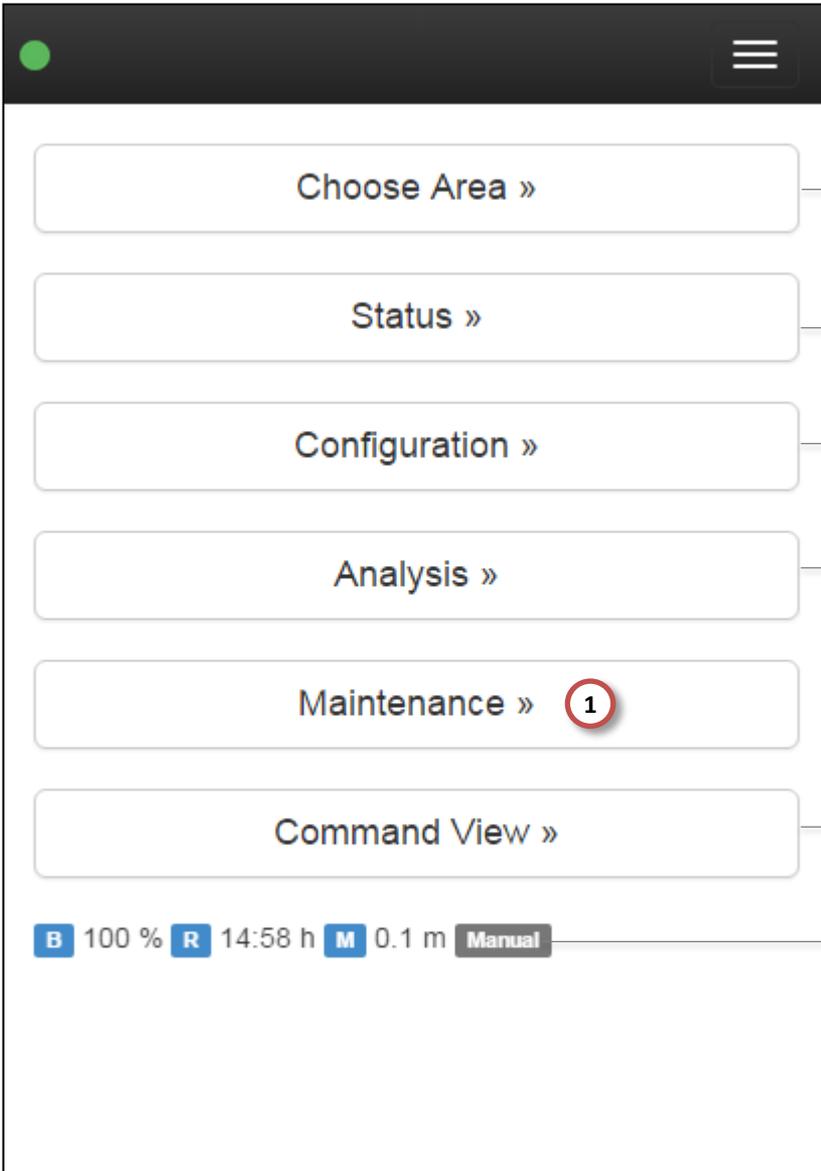
4. Show a single path.

5. Return to Service.



## MiR100 Maintenance – Administrator Check list

- From the start page, select Service > Maintenance to backup current data and restore from a previously saved backup. Maintenance also manages remot access and wifi setup.
  - Backup/Restore – save or get data.
  - Remote access – manage remote access and wifi for each vehicle.



1. Select Maintenance for managing backup, restore, remote access, wifi.

Choose area, start up MiR100, see and edit map.

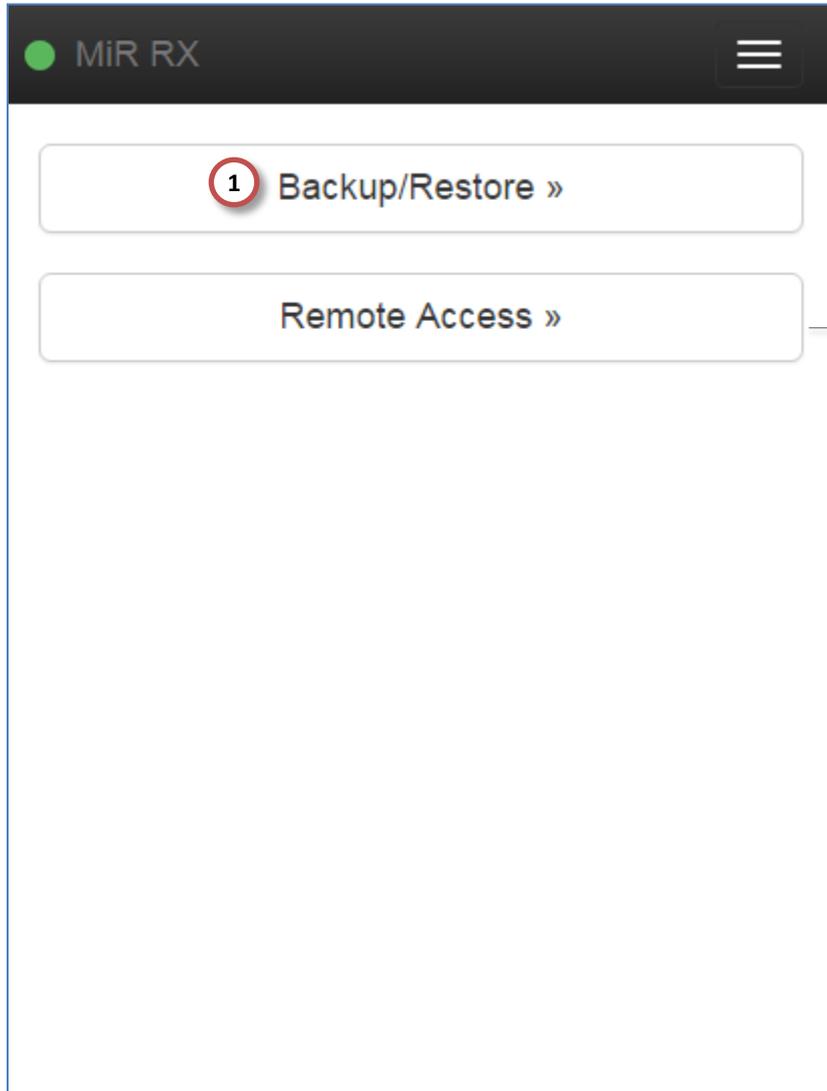
Log, status, system information.

Basic setup – rarely used.

Overview over driving – location, distance, status.

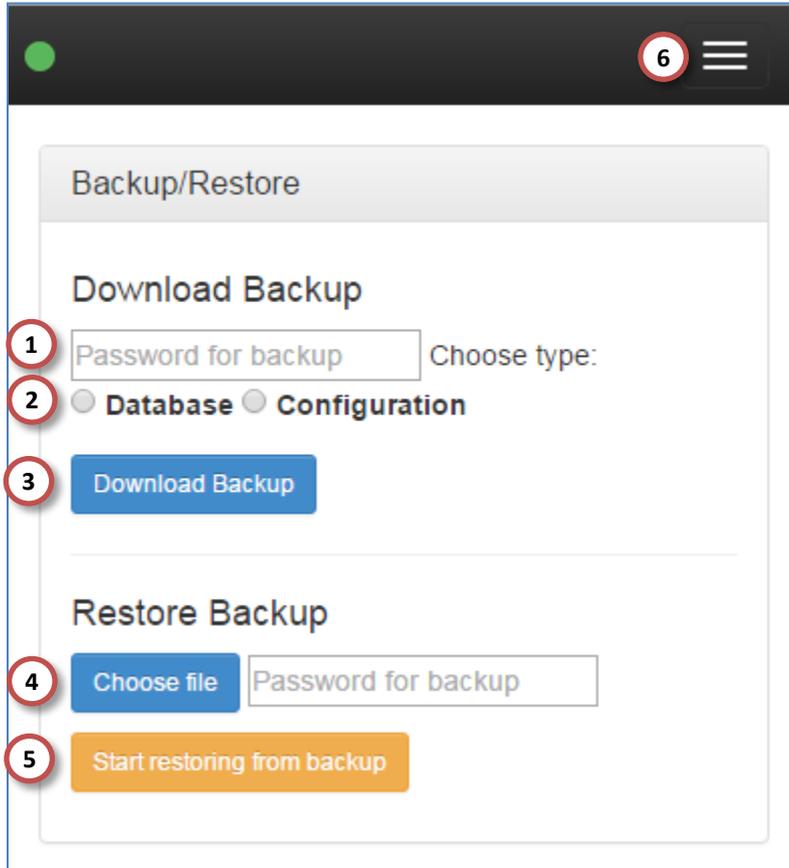
Synchronizing the exact location of the vehicle with the map.

Note: MiR100 is on Manual. Select Area in Service to activate.



1. Select Backup/restore to either save a backup of current data or load a previously saved backup.

Remote access, wifi, local network for the vehicle.



1. Write a password for the backup.

2. Database: saves area, maps, missions, - all data for the vehicle.

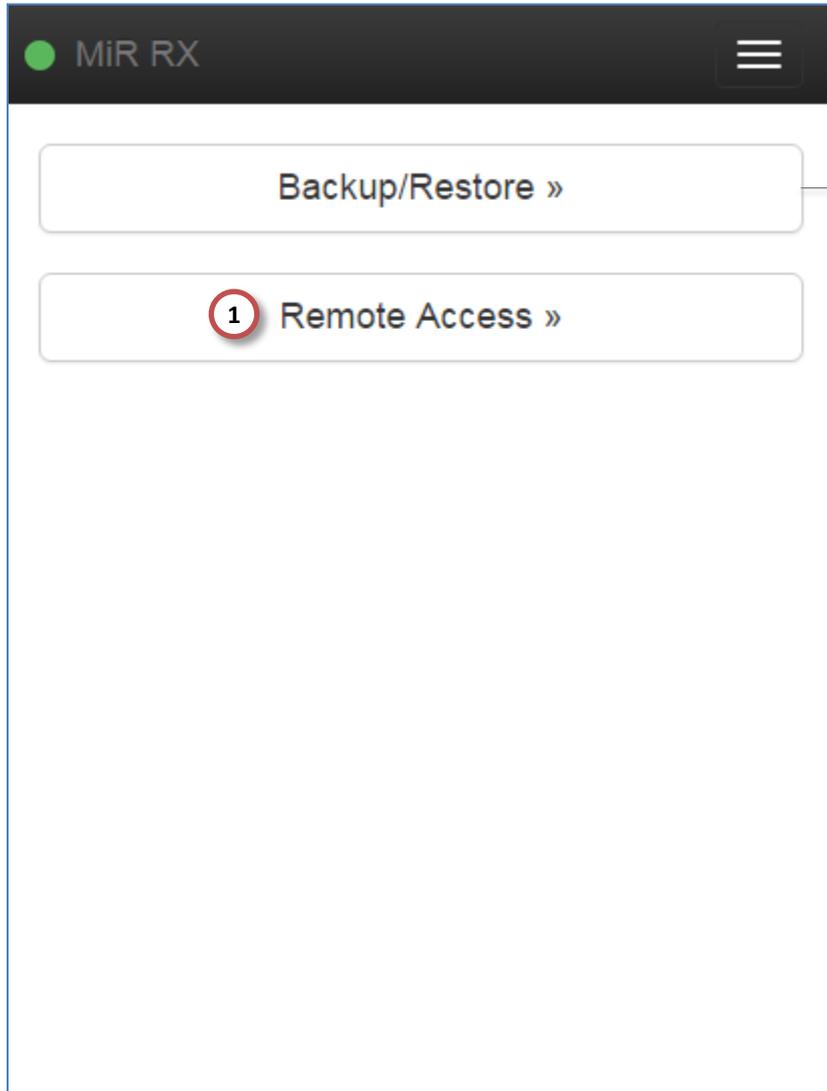
2. Configuration: saves sounds, actions, missions – saves data for MiR Webinterface.

3. Click Download Backup to save data to a selected location.

4. To restore data from backup, click Choose file. Write the password and select location.

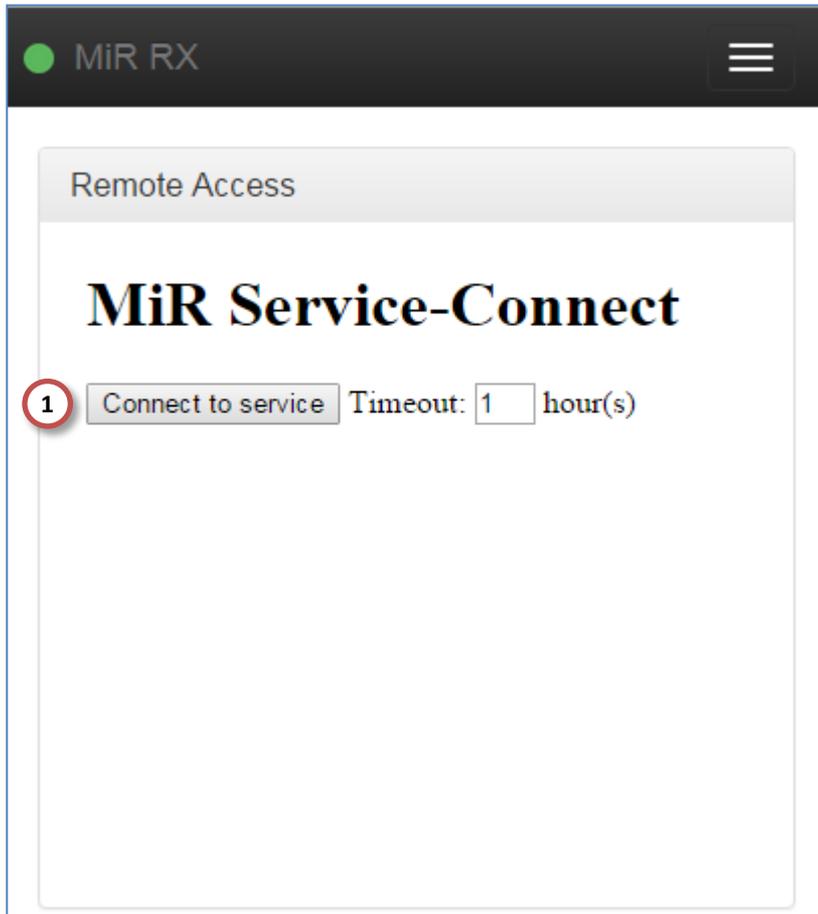
5. Click Start restoring from backup and wait for the data to load.

6. Return to Service > Maintenance.



1. Select Remote Access to manage remote access, wifi, local network for the vehicle.

Save a backup of current data or load a previously saved backup.



1. Click Connect to service to manage remote access, wifi, local network for the vehicle.

Continues...

4 Stop Language Log out

## Available networks

Refresh

SSID Type Signal Connected

No WiFi networks detected

Password to network:

1

2 Connect to WiFi

## Connections

Name Type Last Connection

No WiFi configurations detected

3 Delete selected configurations

1. Use this page to set up wifi and connections.

4. Return to MiR start page.