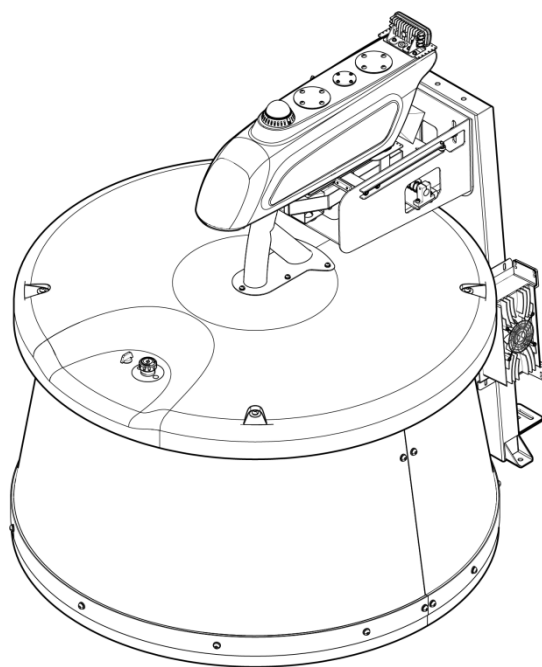




RoboPusher Nimbo

User Manual

9WZ-1.05A (SCP300)

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Contents

1. About the Manual	1
2. Product Introduction	1
2.1. Application	1
2.2. Overview	1
2.3. Nameplate	1
2.4. Standard Compliance	1
3. Safety Instructions	1
3.1. Electrical Safety	1
3.2. Operation Safety	2
3.3. Maintenance Safety	2
4. Specifications	3
5. Robot Information	4
6. Composition	4
6.1 Assembly	4
6.2 Feed Pushing Robot	5
6.3 Charging Pile	7
7. Software Operation	8
7.1 Connecting to Robot	8
7.2 Logging In	9
7.3 Modules	9
8. Installation and Commissioning	19
8.1 Deployment of Travel Routes	19
8.2 Installation of Charging Pile	19
8.3 Commissioning	19
8.4 Loading and Unloading	20
9. Maintenance	20
10. Transportation and Storage	20
11. Troubleshooting	21
12. Waste Disposal	21
13. After-sales Service	22
14. Manufacturer	22

1. About the Manual

This manual provides instructions regarding the operation, installation, commissioning, and maintenance of RoboPusher Nimbo. People who operate, install, commission, maintain, and repair this product must read and understand the content of this manual and follow the safety instructions.

The English language manual is the original manual. Refer to its cover for the version and translation information.

2. Product Introduction

2.1. Application

RoboPusher Nimbo provides automatic feed pushing and is applicable to all modern farms.

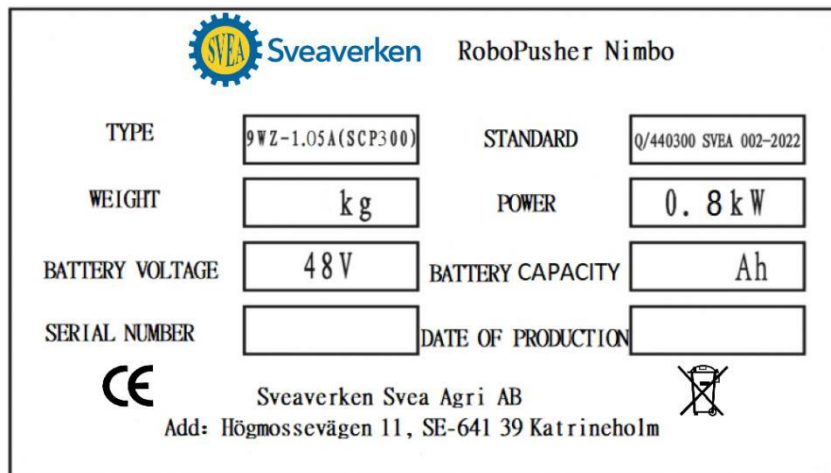
2.2. Overview

By providing automatic feed pushing, this product can reduce the labor costs and increase the feed intake, which improves the milk or meat production and maximizes the benefits for farms.

The robot pushes the feed into the feeding alley by rotating the drum. The computer vision technology enables the robot to control its moving direction and operate more flexibly. As long as the road conditions are ideal without any obstacle, the robot will automatically execute feed pushing tasks at set times and adjust its heading flexibly. After finishing the tasks, it automatically returns to the charging pile along the preset path.

You can remotely control the robot and manage feed pushing tasks at any time on the Website.

2.3. Nameplate



Note

Refer to Item 6 in the top figure in Section 6.2 for the nameplate installation position.

2.4. Standard Compliance

Model	Applied Standard
9WZ-1.05A (SCP300)	Q/440300 SVEA 002-2022

3. Safety Instructions

3.1. Electrical Safety

- Only authorized electrical engineers are allowed to install the power supply for the charging pile.
- Ensure that the grounding of the electrical system and all parts of the charging pile meet the local rules and regulations.
- Ensure that the charging pile is not exposed to rain.

- If any electrical wires, switches, or components are damaged, replace them immediately.
- Turn off the power button before maintaining the robot. Refer to Item 3 in the top figure in Section 6.2 for the location of the power button.
- Do not short-circuit or strike the lithium battery, or remove it without authorization.
- Unplug the power supply before working on the charging pile.

3.2. Operation Safety

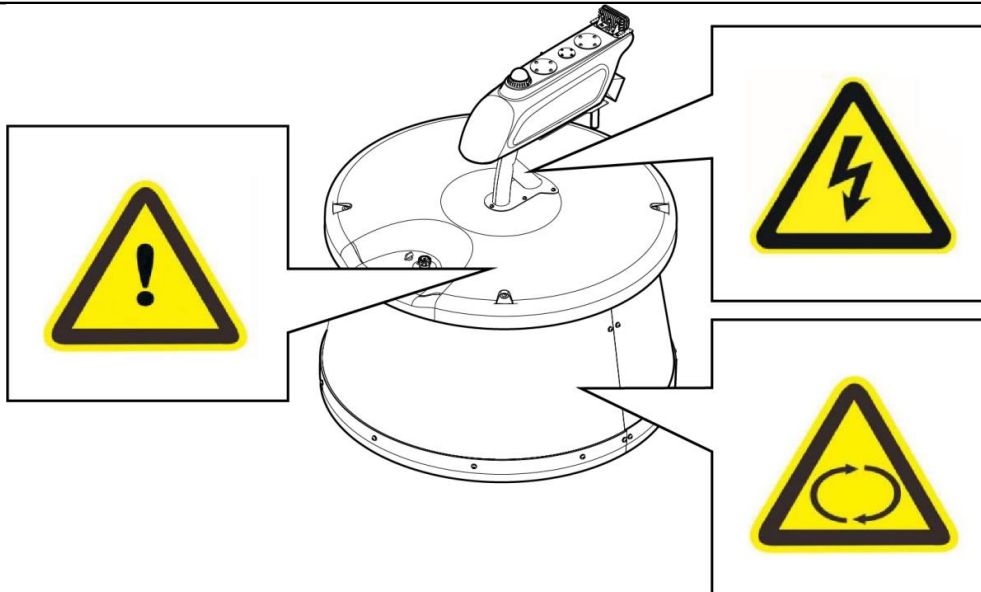
- Read and understand this manual and all the safety signs before powering on the robot for operations, maintenance, or adjustments.
- Only trained people are allowed to operate the robot.
- Operate the robot in places without moving vehicles and herds.
- Unauthorized people are not allowed to enter the traveling area and the working area of the robot. If unauthorized people are found in such areas, stop the robot.
- When you remotely control the robot with your smart phone or tablet, ensure that there are no obstacles and safety hazards on its path.
- Ensure that the robot is in your sight when you operate it manually.
- Keep hands, feet, hair, and clothing away from moving parts.
- All operators should review safety instructions regularly.

3.3. Maintenance Safety

- Read and understand this manual and all the safety signs before powering on the robot for operations, maintenance, or adjustments.
- Only trained people are allowed to maintain the robot.
- Keep tools and metal parts away from the battery.
- Do not spray water on the robot. Use a wet brush to clean the robot.
- Ensure that all parts are installed in place after maintenance.
- Do not alter the robot in any way.
- Only use approved spare parts, and ensure that they are installed by authorized technicians.

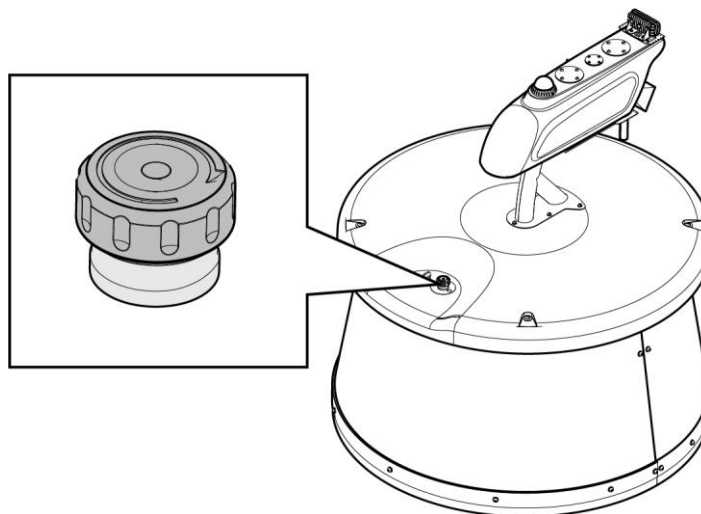
Warning: Electric shock hazard.	Warning: No heavy load.	Warning: Entanglement hazard.
		

Position of safety signs



Emergency stop button

The emergency stop button is located on the top of the robot. Press down the button to stop the robot immediately. Pull it up to reset it.



Charging system controlled by software

The robot software controls the charging system and keeps the robot connected to the charging pile before it moves. The software ensures that the battery is fully charged until the next operation and also prevents battery overcharging.

4. Specifications

Diameter	1080 mm
Height	1120 mm (use) ; 665mm (transport)
Weight	410 kg
Travel speed	18 m/min
Max. operating time without feed pushing	10 h
Max. permissible slope	6°

Operating temperature		-20°C to 50°C
Tire number		3
Drive wheel number and size		2; ϕ 250mm×80 mm
Wheel motor	Number	2
	Power	400 W
Battery	Type	Lithium battery
	Rated voltage	48 V
	Capacity	40 Ah
Charger	Input voltage	220 V/110 V
	Input frequency	45 Hz - 65 Hz
	Output voltage	48 V
	Output current	10 A
Camera	FOV	Horizontal: 87.51° ; vertical: 47.58°
	Sensor	2 megapixels; 1/2.8; 1080p@30fps

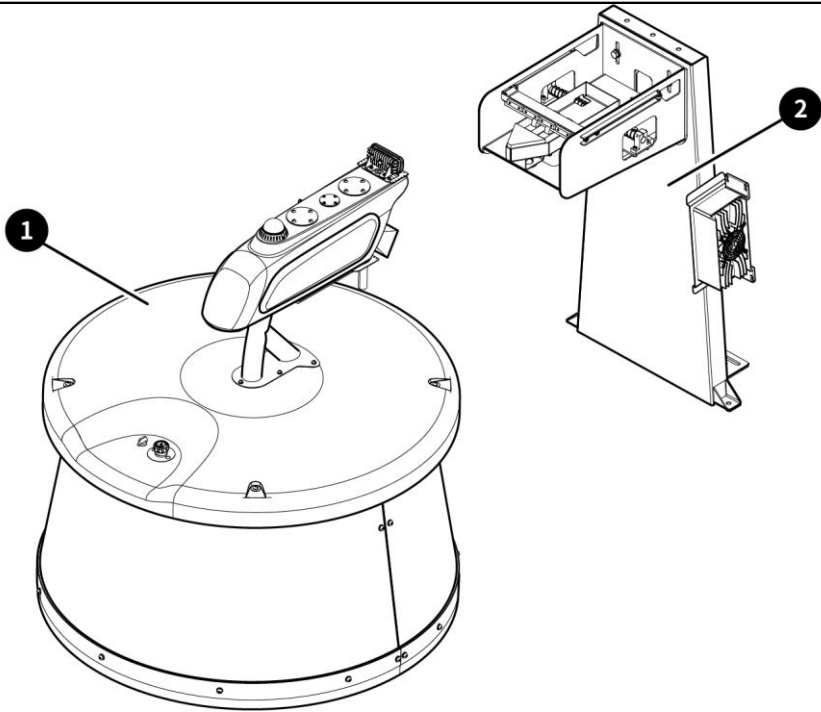
Note	The actual battery configuration may vary according to the requirements of local laws. Contact the technical personnel of Sveaverken for detailed specifications.
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5. Robot Information

No.	Item	Design Value
1	Model	9WZ-1.05A (SCP300) RoboPusher Nimbo
2	Feed pushing method	By rotating the drum
3	Dimensions	Φ 1080×1120 mm
4	Navigation method	Visual navigation and magnetic nail navigation
5	Charging method	Automatic charging
6	Total motor power	0.8 kW
7	Battery capacity	40 Ah
8	Battery voltage	48 V

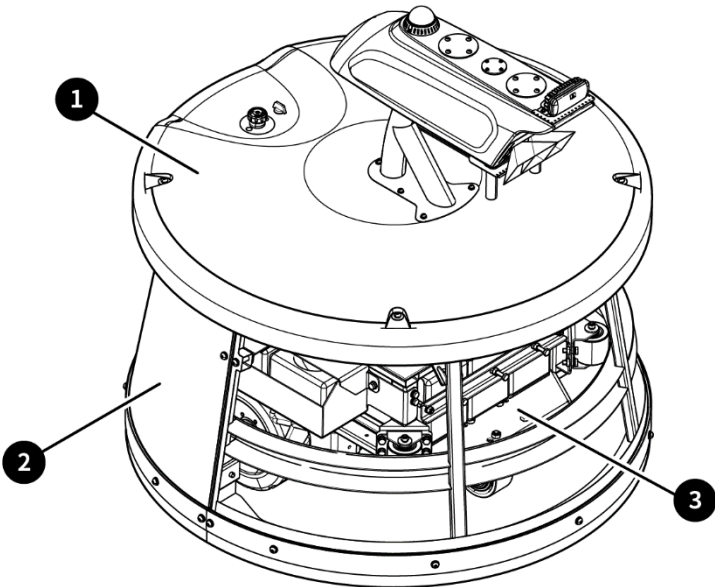
6. Composition

6.1 Assembly



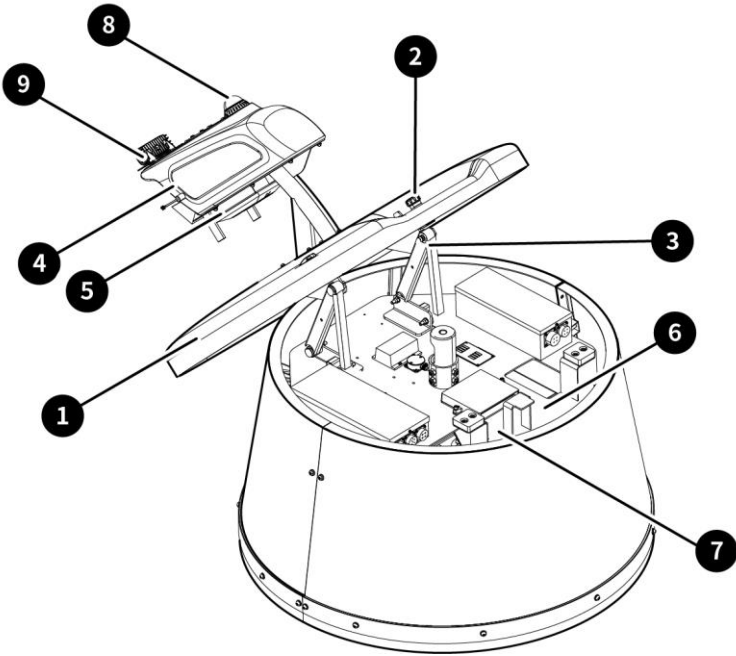
1. Feed pushing robot	2. Charging pile
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6.2 Feed Pushing Robot



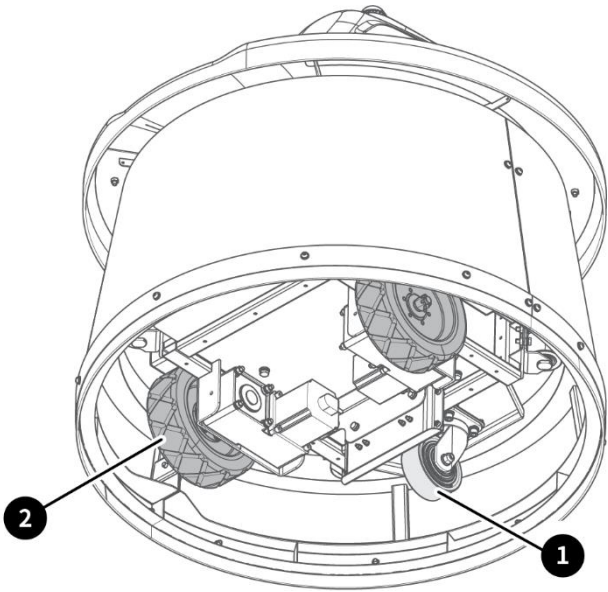
1. Top	2. Drum	3. Frame
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• Top



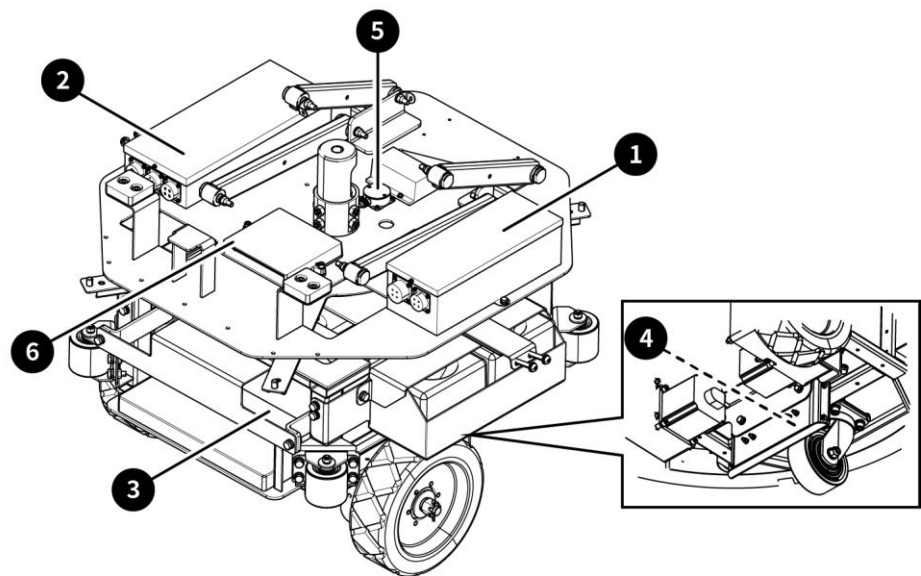
1. Top cover	2. Emergency stop button	3. Top cover opening mechanism
4. Vision box	5. Charging port	6. Nameplate
7. SN	8. Status indicator (Yellow, flashing)	9. Photosensitive sensor

• Frame



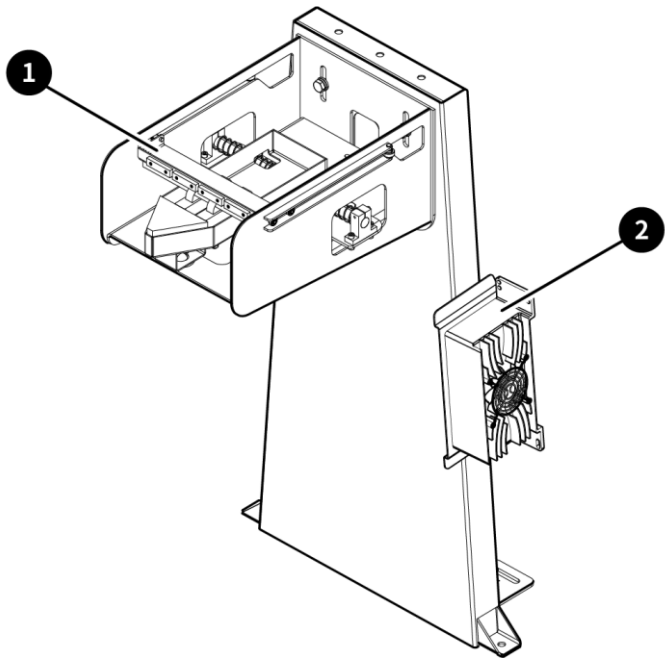
1. Front wheel (universal wheel)	2. Rear wheel (drive wheel)
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• Inner electrical parts



1	Distribution box	2	Wheel motor driver
3	Battery	4	Magnetic nail sensor
5	Gyroscope	6	Vehicle control box

6.3 Charging Pile



1. Side charging mechanism	2. Charger
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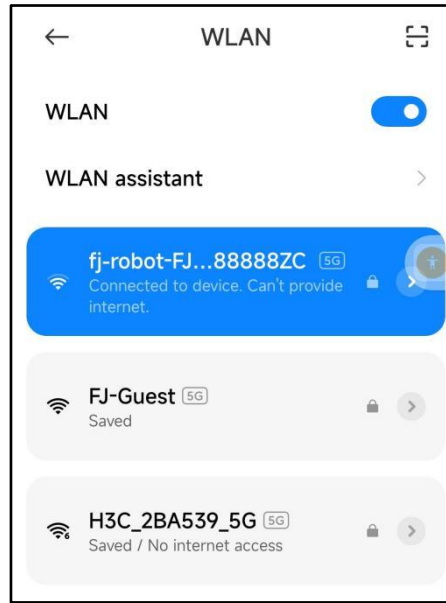
7. Software Operation

7.1 Connecting to Robot

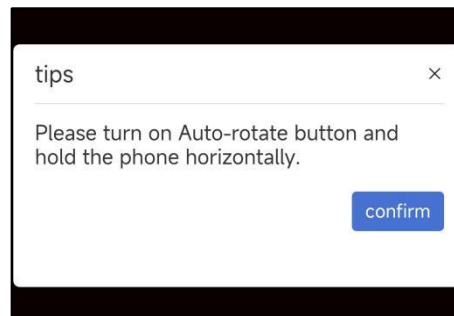
It supports major browsers such as Google Chrome, Microsoft Edge, and Firefox and is compatible with both personal computers and mobile phones.

(1) Direct connection

- Connect your computer or phone to the network in the format of fj-robot-SN, and the password is 123456789.



- Open a browser and enter 10.33.68.254 in the address bar to access the login screen.
- When logging in on the phone, enable Auto-rotate in the shortcut switch panel and hold the phone horizontally.

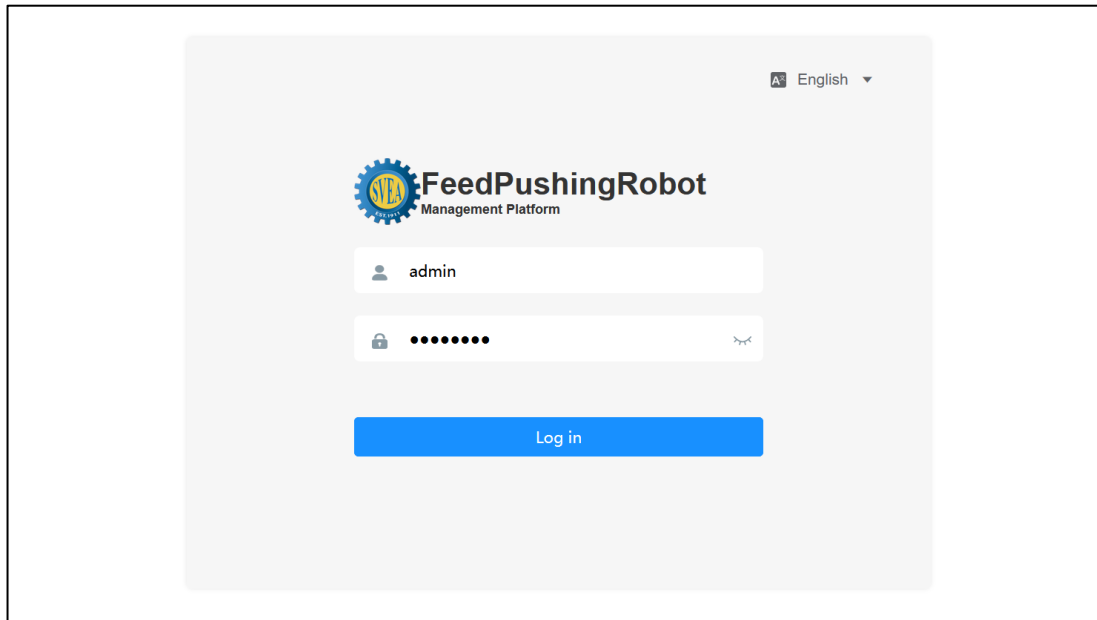


(2) Indirect connection

- Indirect connection means connecting the robot to the router and then controlling the robot on the Website.
- Connect the robot to the router via Wi-Fi connection, such as Wi-Fi_1 in **Configuration > Internet**.
- Log in to the backend page of the router and find the robot IP address in the format of fj-dynamics-SN.
- Open a browser and enter the address in the address bar to access the login screen.

The recommended browser is Google Chrome.

7.2 Logging In

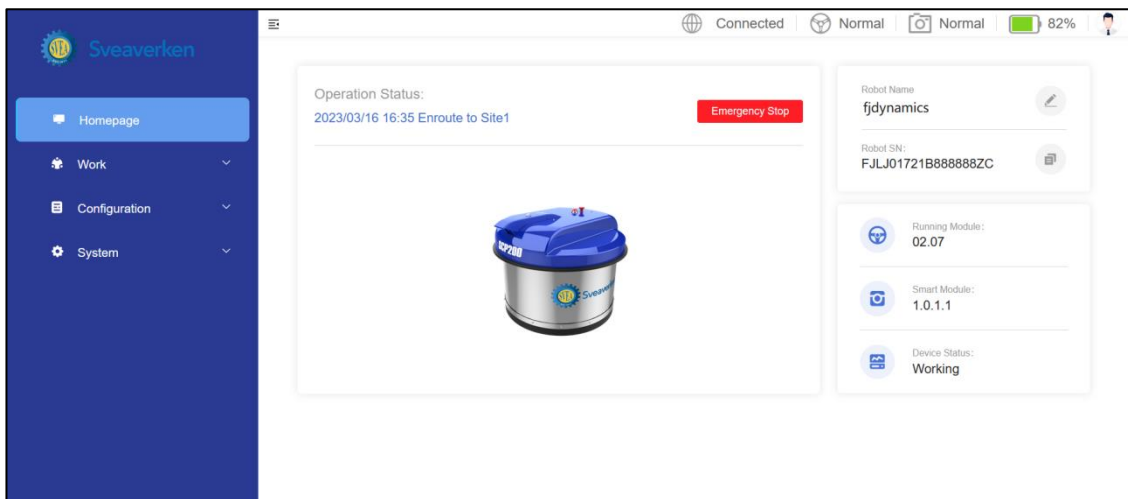


- Enter the username as admin and the password as svea1911.
- Click “ **Log In** ”.
- Click the language switch button to switch languages.

7.3 Modules

Four modules are available: **Homepage** — Robot status interface, **Work** — Work management interface, **Configuration** — Configuration management interface, **System** — System setting interface.

7.3.1 Homepage



The status bar at the top shows the network status, running module status, smart module status, and batter level in real time.

Operation Status	Shows the operation details of the robot in real time.
Emergency Stop	Click Emergency Stop and then click Confirm in the pop-up window to apply an emergency stop.
Robot Name	Click to modify the robot name.
Robot SN	Click the copy icon to copy the robot SN.
Running Module	Shows the version No. of the running module.
Smart Module	Shows the version No. of the smart module.

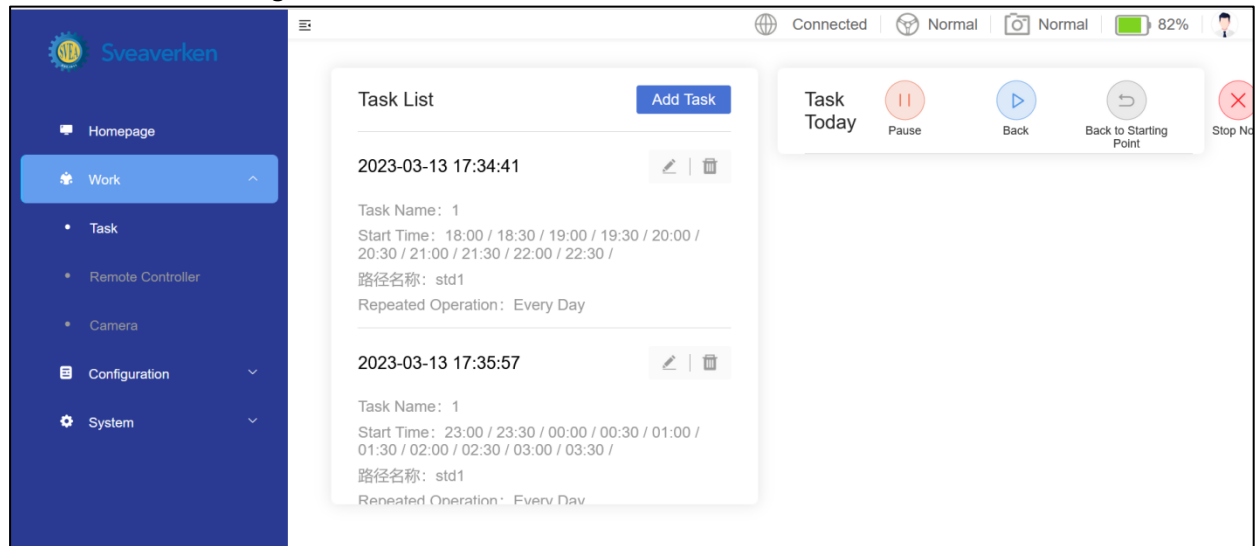
Device Status	Shows the robot status in real time, including Operating, Charging, Idle, and Suspended.
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7.3.2 Work

The module contains three parts: **Task**, **Remote Controller**, and **Camera**.

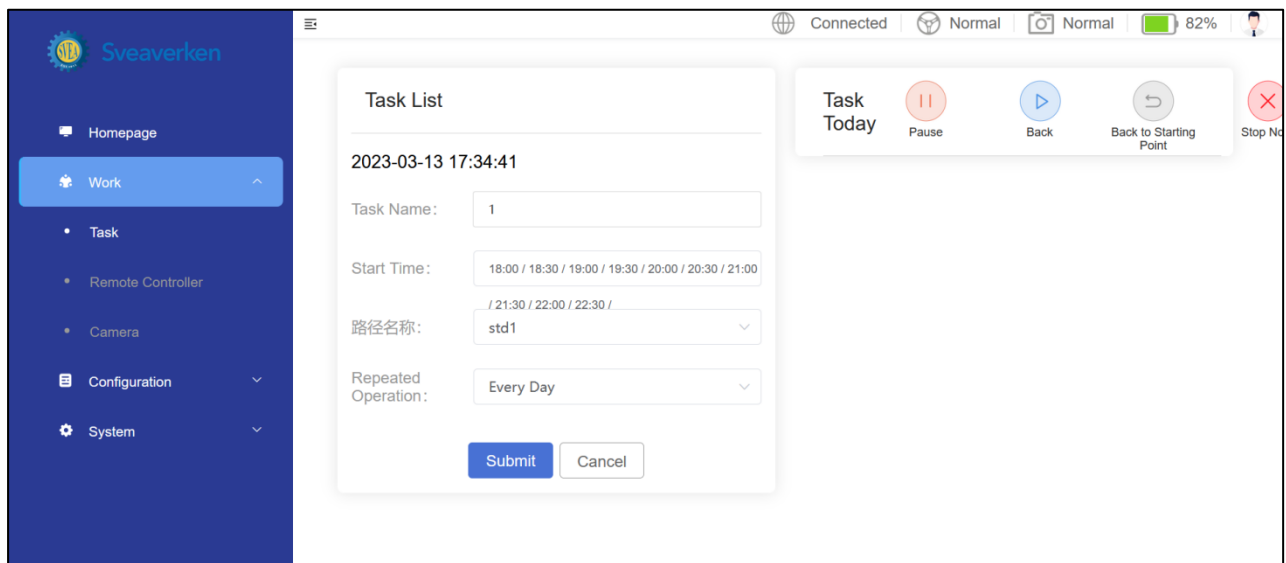
(1) Task

Click **Task** to add and manage tasks.

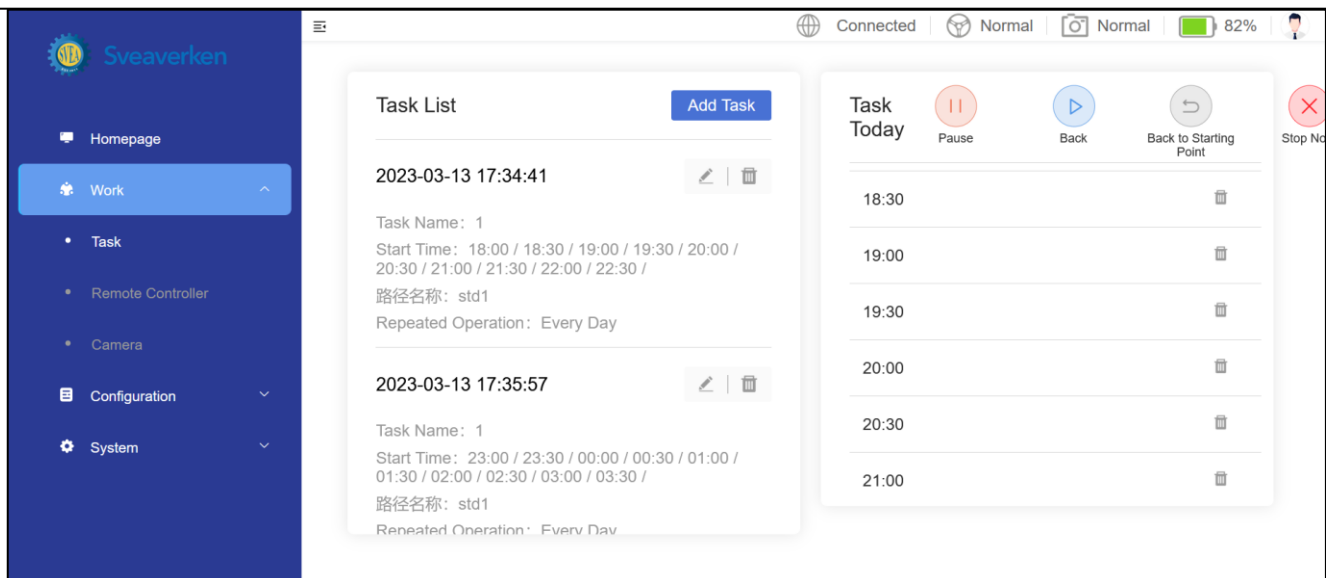


Adding Task:

- Click **“Add Task”**.
- Input parameters.
- Click **“Submit”**.



Tasks added on the current day, including its start time, status, and operation details, are displayed in **“Task Today”**.



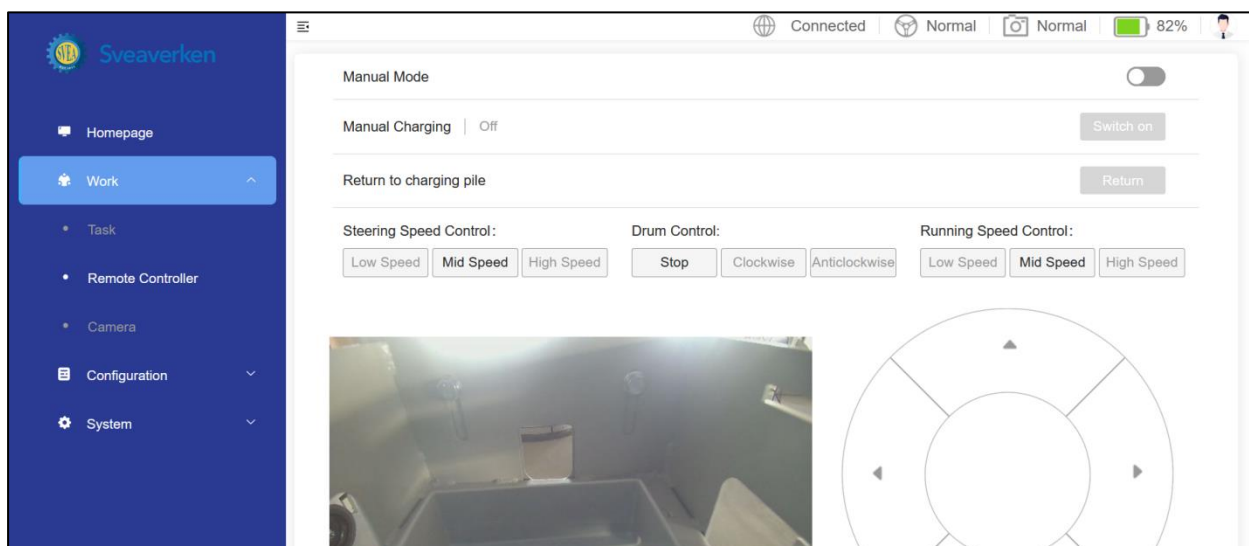
Managing Task:

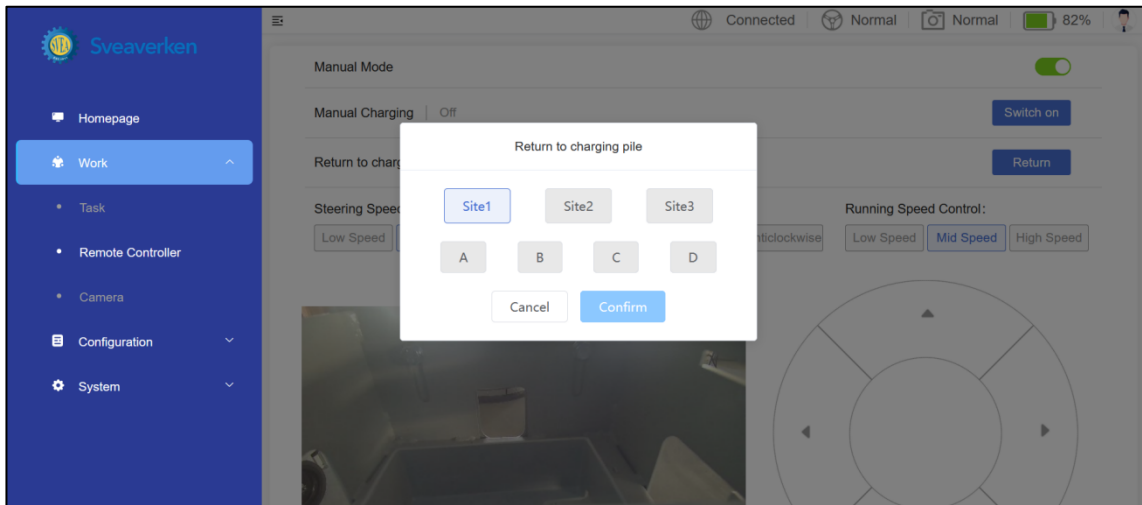
- Click  to access the edit screen.
- Modify parameters.
- Click **“Submit”**.
- Click  and then click **“Confirm”** to delete a task.

Other Features:

Pause	Click  , and the robot will stop in the current status.
Back	Click  , and the robot will resume operation.
Back to Starting Point	Click  , and the robot will cancel the current task and return for charging.
Stop Now	Click  , and the robot will stop and cancel the current task, then you can control the robot in Work > Remote Controller or with an updated remote controller.
Task Today	Click  of an Operating task to view the operation screen in real time (see the "Camera" section). Click  to delete a Done or Not Start task.

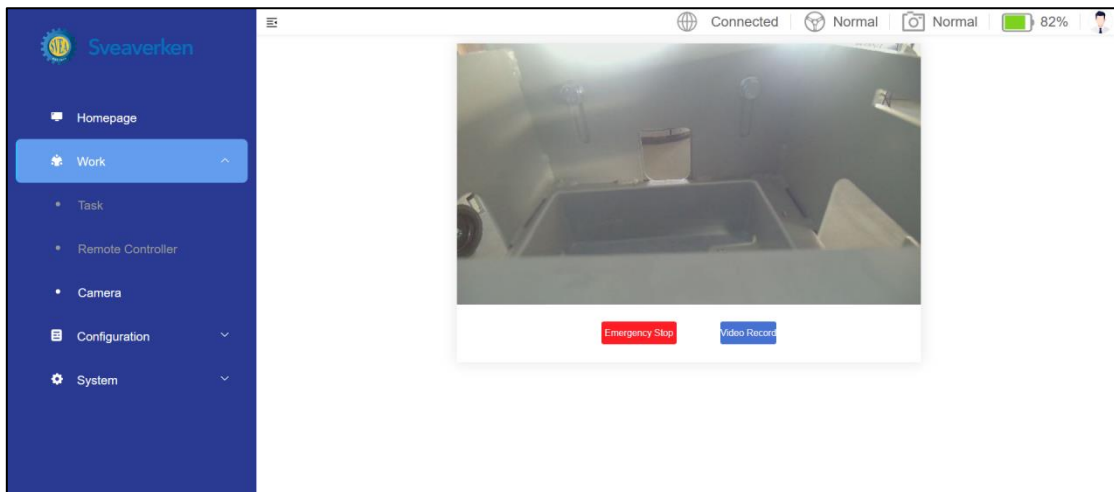
(2) Remote controller

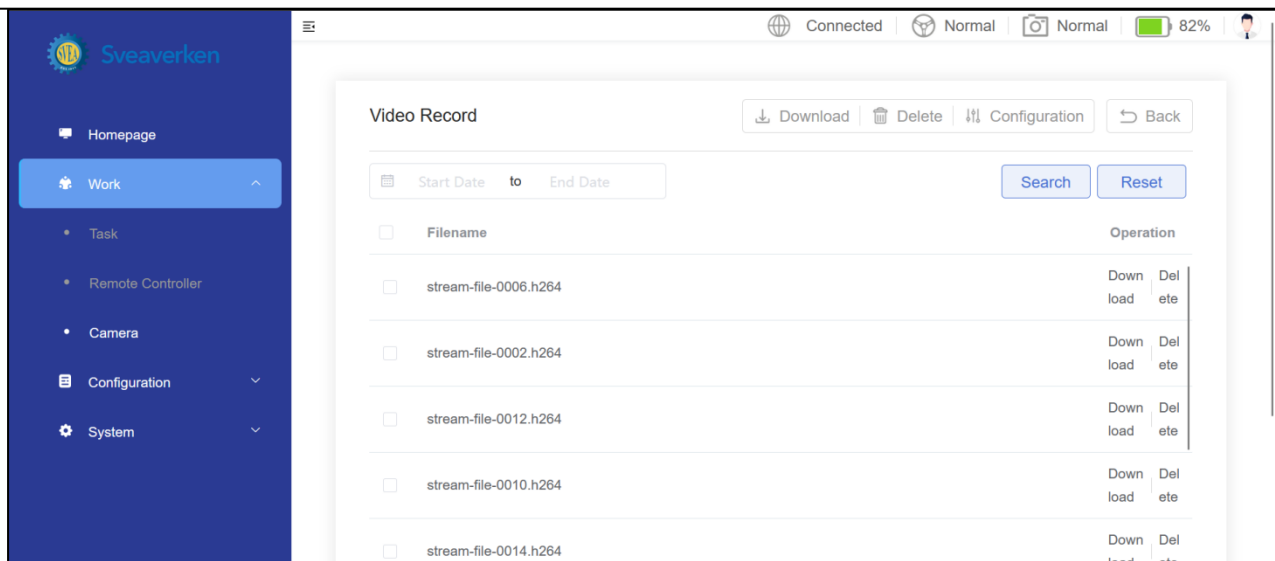




Manual Mode	Turn on the toggle on the right of Manual Mode to remotely control the robot. Turn off the toggle to enter the auto mode.
Direction Control	Click the forward or backward button, and the robot will move forward or backward at the set speed. Click the left or right button, and the robot will turn at the set speed.
Running Speed Control	Click Low Speed , Mid Speed , or High Speed to set the running speed.
Drum Control	Click Stop , Clockwise , or Anticlockwise , and the drum will rotate in the corresponding direction.
Battery level icon	In red when the battery level is $\geq 80\%$, in blue when $80\% > \text{battery level} \geq 35\%$, in orange when $35\% > \text{battery level} \geq 15\%$, and in red when the battery level is $< 15\%$.
Manual Charging	Click Switch On on the right of Manual Charging to extend the electrodes, and the icon turns green. Click Switch On again to retract the electrodes, and the icon turns gray.
Return to Charging Pile	Click Return and then click A , B , C , or D , and the robot will return to the charging pile.

(3) Camera





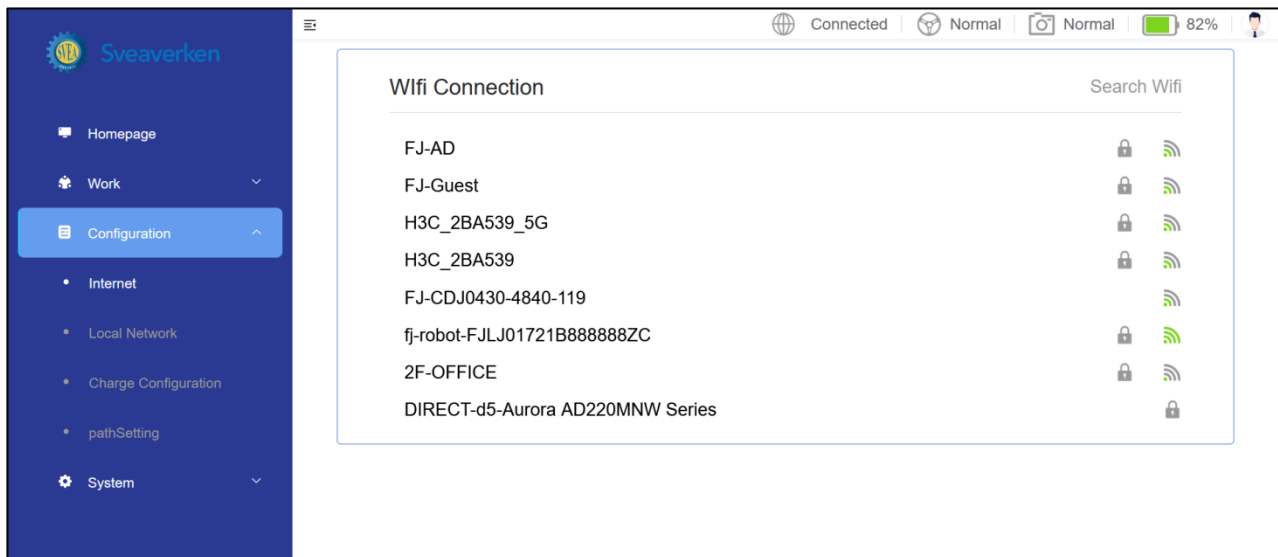
The screen displays the real-time images. When there is no signal, it is a black screen and displays "No signal".

Emergency Stop	Click Emergency Stop and then click Confirm , and the robot will stop.
Video Record	Click Video Record to view recorded videos. Videos are displayed in pages from the newest to the oldest. Select a file to download or delete it, or operate in batch.
Configuration	Click Configuration to enable the recording feature. The recording duration can be set to a maximum of 30 min.

7.3.3 Configuration

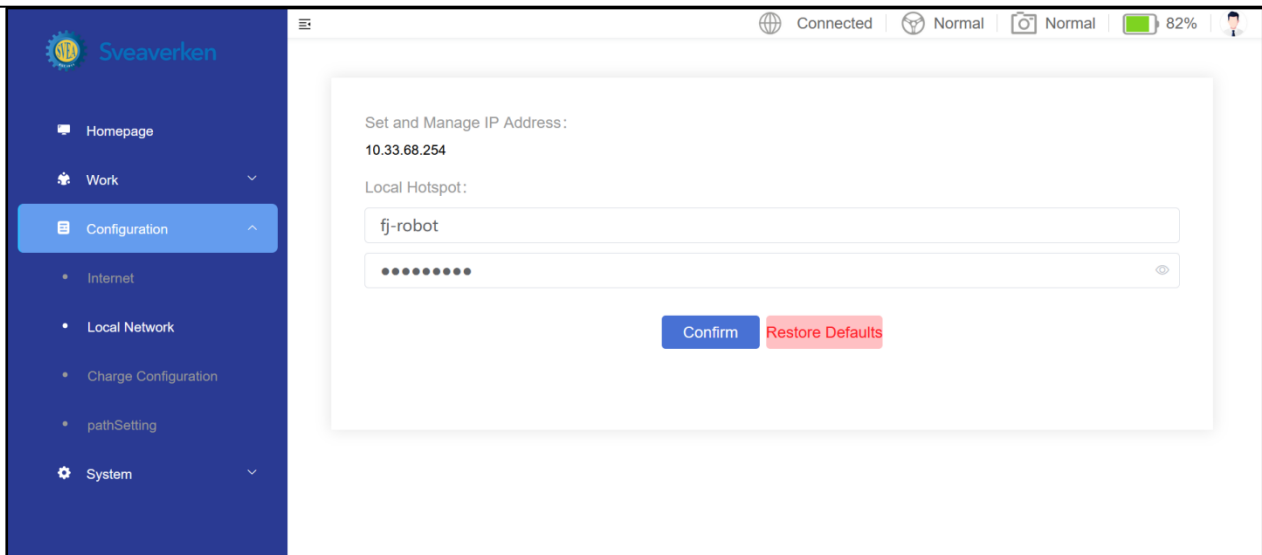
The module contains four parts: **Internet**, **Local Network**, **Specs in Site**, and **Charge Configuration**.

1. Internet



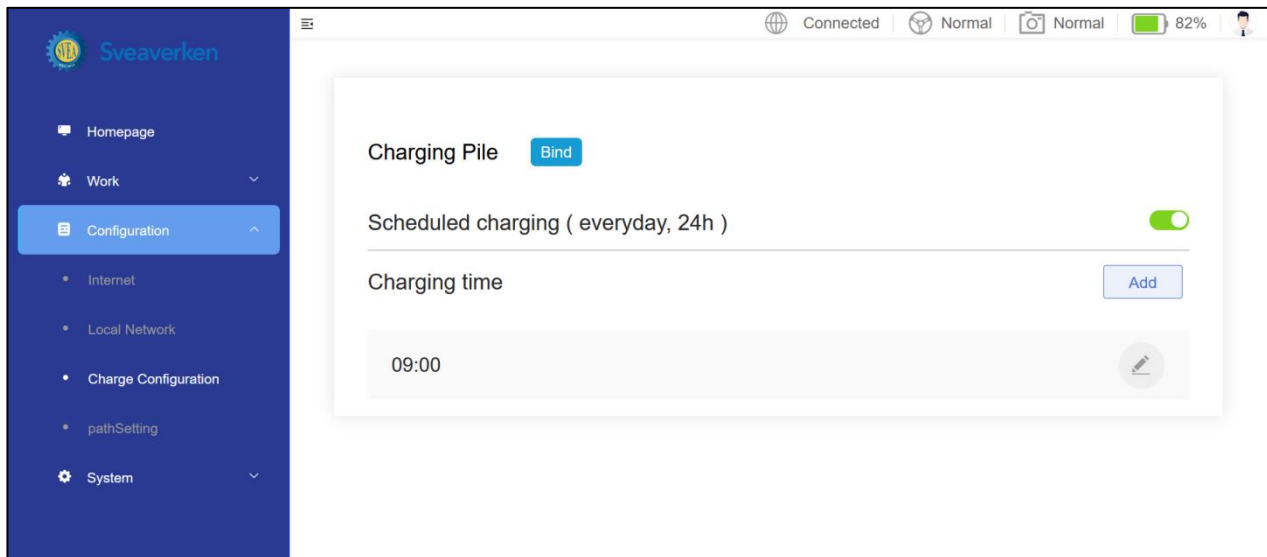
- Access the Internet via Wi-Fi.
- Enter the correct password to connect to the network. The connected Wi-Fi account and password will be recorded for future use.

2. Local network



- Modify the local hotspot name and password in **Local Network**.
- Click **Confirm** to apply the modification, otherwise it will not be saved.
- Click **Restore Defaults** and then click **Confirm** to restore to factory settings.

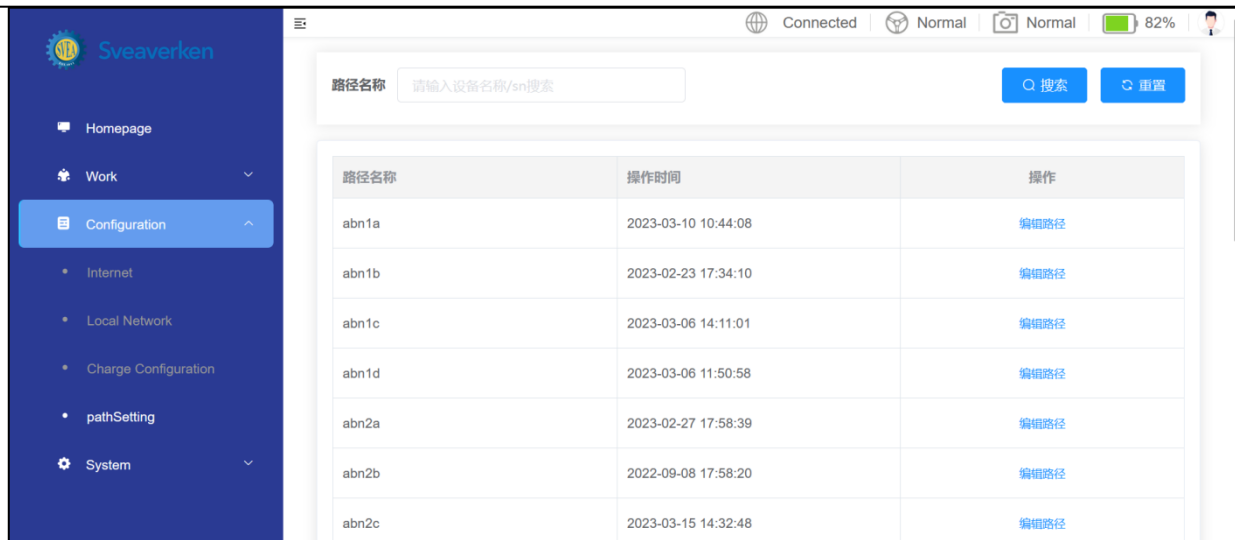
3. Charge configuration



- Set the charging time (24-hour system) of the robot on this page. The robot will end the task and return to the charging pile to charge for 2 h at the set time. The feature is disabled during robot initialization.
- Enable or disable the feature with the toggle.
- Click **Add** to add the charging time.

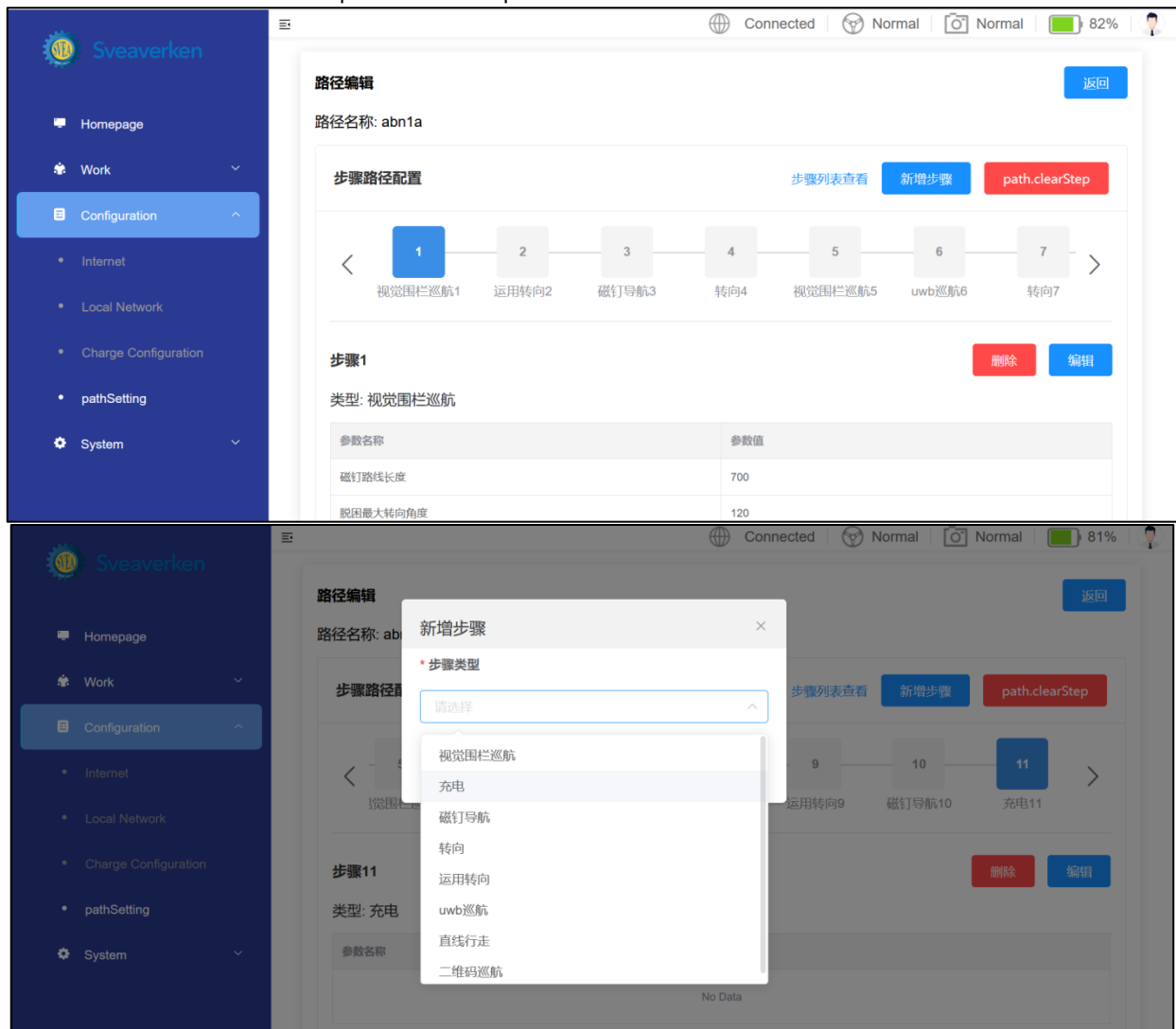
4. Path configuration

- On this screen, you can edit the path configuration. Each path name matches a different material track.
- Enter a path name and click Search to find the path that matches the path name.
- Click "Reset" to display all path names.
- Operation Time Indicates the time when the path was recently edited.



4.1 Path editing

Click "Edit Path" to edit all steps under the path.



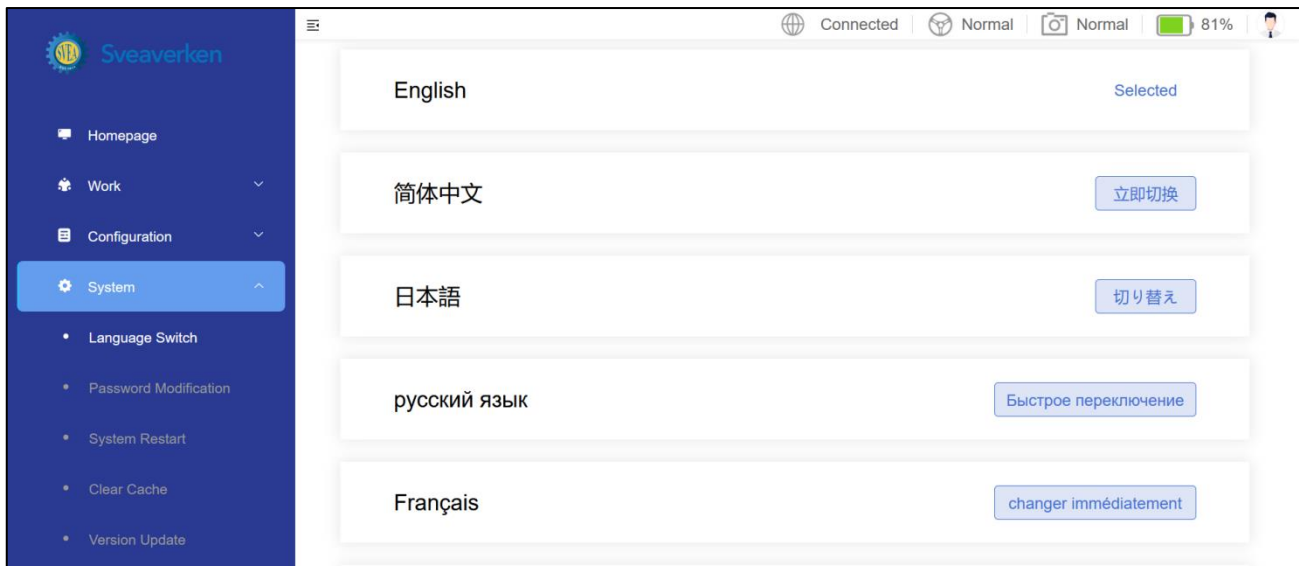


- Step Path Configuration displays all steps in the path.
- Click "Add step" to add new steps, which are visual fence cruise, charging, magnetic nail navigation, steering, no-stop steering, uwbcruise, straight line walking, QR code cruise, walk along the wall cruise.
- Set the selected parameters and click "Save". This step will be saved to the path (Optional parameters can be added based on site requirements).
- Click "Clear Steps" to clear all steps.
- Selection step.
- Displays configuration information and management.
- Click "Delete" to delete the step.
- Click "Edit" to edit the step. After editing the step, click "Save" to take effect.

7.3.4 System Modules

Six modules are **Language Switch**, **Password Modification**, **System Restart**, **Clear Cache**, **Version Update**, and **System Information**.

1. Language switch



All available languages are displayed on this screen. Click the button beside a language to switch to the language.

Note	Supported languages will be updated constantly.
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2. Password modification

The password can be modified on this screen.

- Enter the current password.
- Enter the new password twice.
- Click **Submit**.

Note

The new password must have 6 to 30 letters or numbers.

3. System restart

The **System Timed Restart** is disabled by default. The time setting zone appears when the feature is enabled; otherwise, it is hidden. To restart the system at a certain time, you need to:

- Set the restart time.

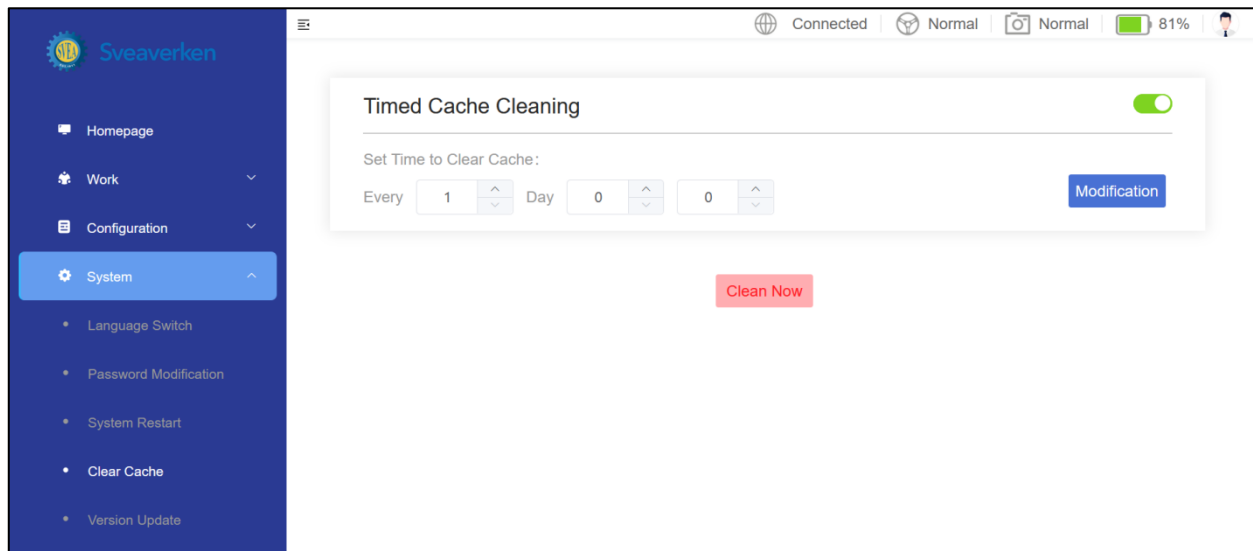
Note

The default restart time is 5 am every day and can be modified. The **Day** field supports the maximum value of 3.

- Click **Modification**. The change takes effect immediately. If you forget to click **Modification** and leave the page, the system restores the former setting.

To restart the robot immediately, click **Restart Now** and **Confirm**.

4. Clear cache



The **Timed Cache Cleaning** is disabled by default. The time setting zone appears when the feature is enabled; otherwise, it is hidden. To clear cache at a certain time, you need to:

- Set the cache clearing time.

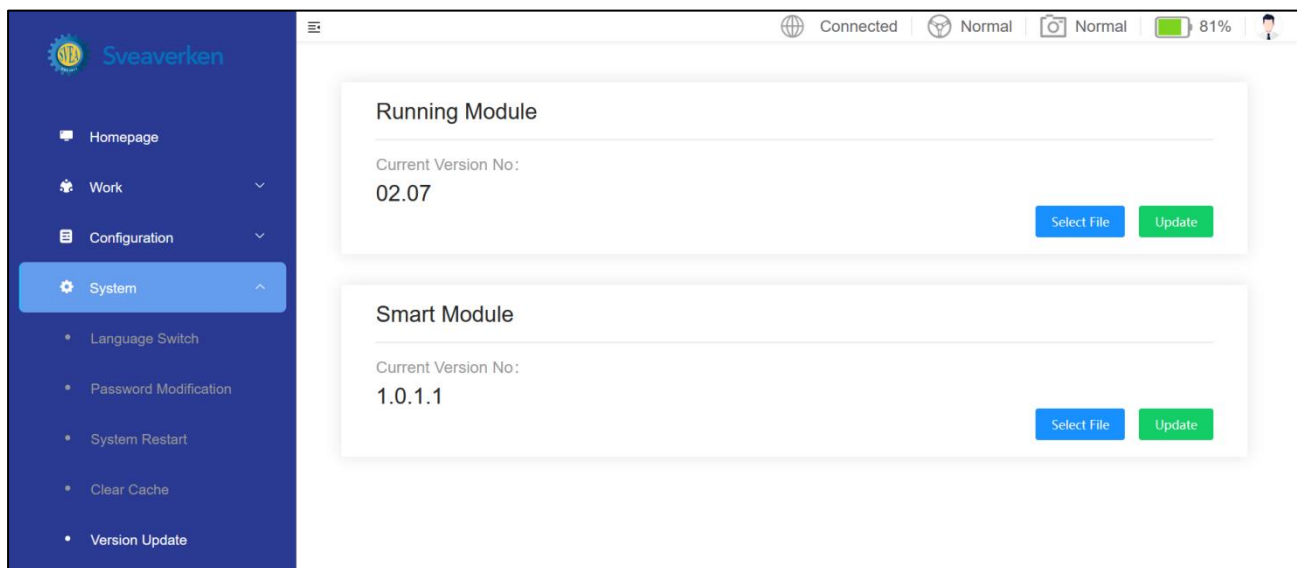
Note

The default cache clearing time is 2 am every day and can be modified. The **Day** field supports the maximum value of 3.

- Click **Modification**. The change takes effect immediately. If you forget to click **Modification** and leave the page, the system restores the former setting.

To clear cache immediately, click **Clean Now** and **Confirm**. A prompt message appears after successful clearing.

5. Version update (no user action required)



An update package is required for version update.

- Click **Select File** and select the update package to be uploaded.

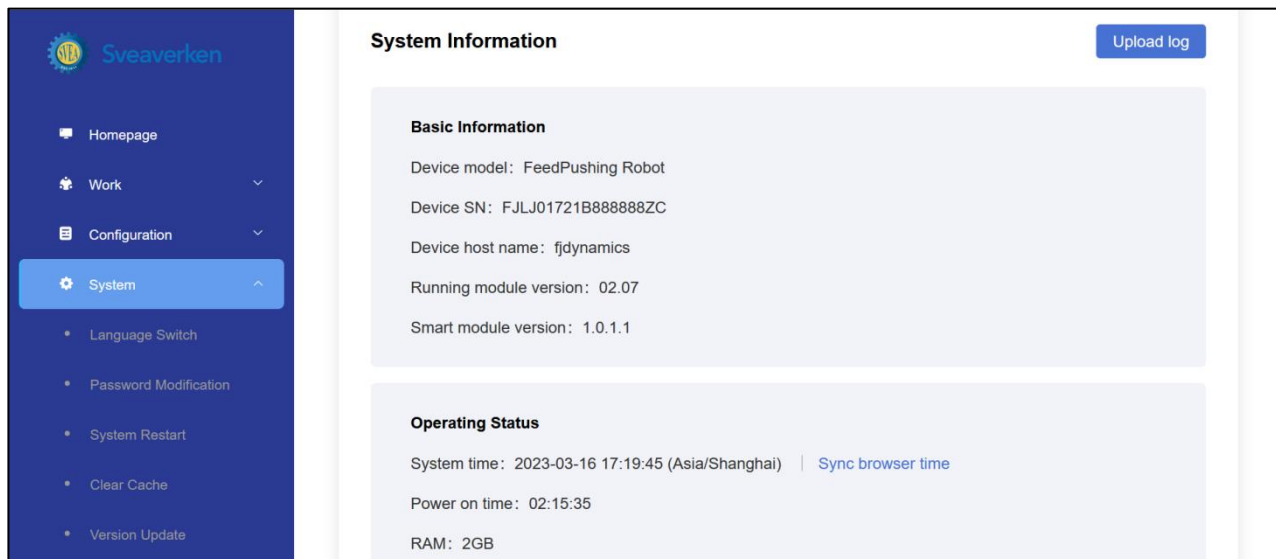
Note

The package size cannot exceed 10 M.
To execute the update, click **Update**. A prompt message appears after successful update.

Note

The wrong package uploaded can be deleted.

- System information



The basic information, operating status, local network and external network of the device are displayed on this screen.

8. Installation and Commissioning

8.1 Deployment of Travel Routes

- Setup of travel routes may be performed by engineers of your local dealer. After design drawings of your farm feeding alley are provided, engineers will deploy the travel routes, including visual navigation routes and magnetic nail navigation routes. You may do this on your own in accordance with instructions and tutorials.
- The charging pile is usually installed near the entrance of a barn to avoid interfering with other work done in the barn.
- The travel routes start with the charging pile. Keep clean every travel route, especially left and right quarter turns and T intersections. Ensure that magnetic nails are intact and embedded in the ground. Prevent damage to or loss of magnetic nails.

8.2 Installation of Charging Pile

- Install the charger and the telescopic electrode mechanism in a dry and ventilated place, sheltered from rain.
- Connect the charger to the telescopic electrode mechanism via circular connectors and Anderson connectors.
- Use expansion bolts to fix the charging pile bracket on the ground.

8.3 Commissioning

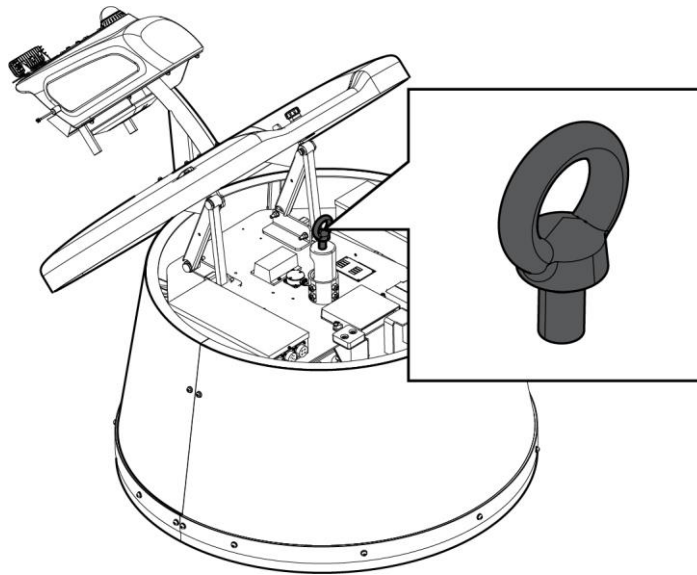
Plan the travel routes of the robot on the Website. When the charging threshold is reached, the robot will return to the charging pile for charging.

Note

The installation and commissioning must be performed by authorized technicians.

8.4 Loading and Unloading

Use the hoisting eye to hoist the robot during loading and unloading.



9. Maintenance

Preventive maintenance schedule:

Maintenance task	Frequency	
	<u>Every 3 months</u>	<u>Every 6 months</u>
Check the charger	▲	
Check the telescopic electrode mechanism	▲	
Clean the electrodes of the robot and the telescopic electrode mechanism	▲	
Clean the camera		▲
Clean the drum		▲
Check the drive wheels		▲
Test the emergency stop button	▲	
Clean the travel routes	▲	
Check the universal wheel		▲
Check the magnetic nails for signs of damage	▲	

If maintenance cannot be performed on your own, contact your local dealer.

10. Transportation and Storage

- Disconnect the robot from the power supply before transportation or storage.
- Handle the robot with care during transportation to prevent damage.

- Avoid collision and squeezing during transportation.
- Store the robot in a dry and ventilated environment at a temperature of $25\pm 3^{\circ}\text{C}$ and a humidity of $65\pm 20\%$. Avoid direct sunlight.
- Keep the robot away from flammables, explosives, and metal objects.
- Use the hoisting eye to hoist the robot during loading and unloading.
- If the robot will not be used for a long time, ensure that its battery level is around 50% before storage and charge it every two months to avoid failure caused by over-discharge.

11. Troubleshooting

Fault	Cause	Solution
The Website is not connected to or disconnected from the robot.	The vision box is not connected to the specified Wi-Fi network.	• Enable Wi-Fi on the vision box. • Check the Wi-Fi settings of the vision box.
	The vision box is not connected to the robot.	• Connect the vision box to the robot.
	The robot is powered off.	• Power on the robot.
The robot does not move.	The robot is powered off.	• Power on the robot. • Make the robot start work.
	An obstacle stands on the feeding alley.	• Remove the obstacle.
	Magnetic nails lose magnetism or are damaged.	• Check and replace magnetic nails.
	The battery is low.	• Manually operate the robot to the charging pile. • Manually start the charging.
	The emergency stop button is pressed.	• Power off the robot. • Reset the emergency stop button. • Power on the robot.
The robot swings or makes improper turns.	The gyroscope is drifting.	• Replace the gyroscope.
	The camera malfunctions.	• Clean the camera. • Test the robot.
The robot does not work.	The emergency stop button is pressed.	• Power off the robot. • Reset the emergency stop button. • Power on the robot.
	No task is assigned.	• Assign a task on the Website.
Charging failure	The charger is not connected to the power supply.	• Connect the charger to the power supply.
	The electrodes of the telescopic electrode mechanism and the robot do not contact.	• Clean the electrodes of the telescopic electrode mechanism. • Clean the robot electrodes.

If the above solutions do not work, or you have other problems than those mentioned, contact your local dealer.

12. Waste Disposal

This product contains metals and electronic components. Any waste (including packaging materials, metal

parts, and electronic components) shall be transported to recycling centers or proper places for destruction. The disposal of waste shall comply with local laws and regulations for the purpose of environmental protection.

13. After-sales Service

- We will assume no responsibility for any consequences resulting from your failure to follow safety instructions.
- We will assume no responsibility for any consequences resulting from your failure to meet operation requirements.
- We will assume no responsibility for any consequences resulting from any artificial damage to the device.

14. Manufacturer

Manufacturer: Sveaverken Svea Agri AB

Address: Hö gmossevä gen 11, 641 39 Katrineholm, Sweden

Telephone: +46 (0)150-48 77 00