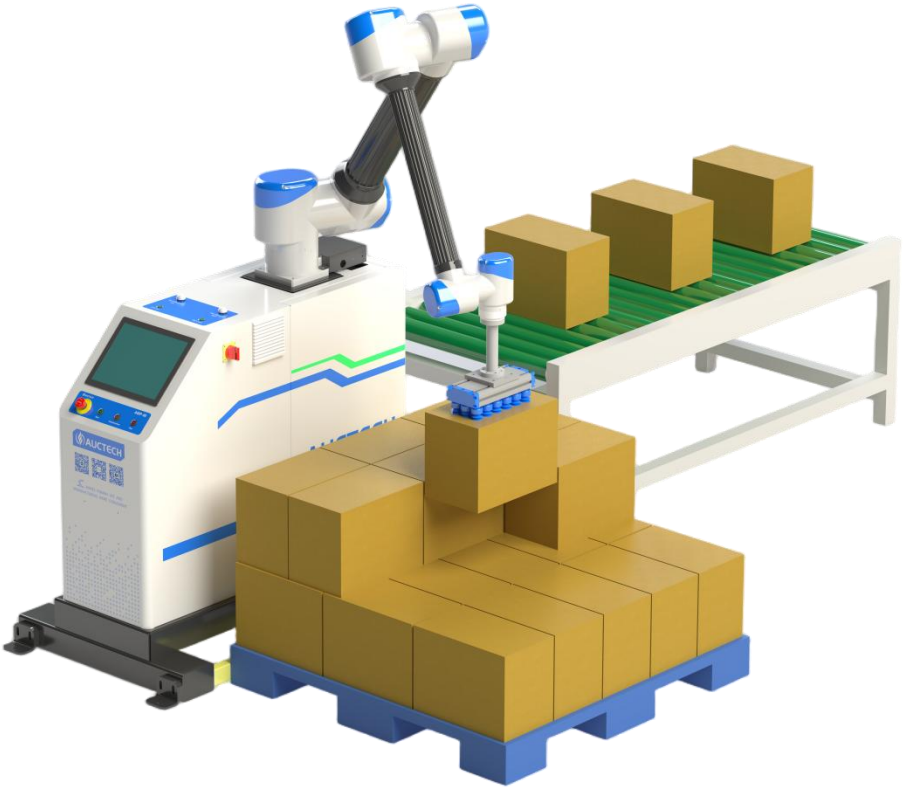
AWP Series Palletizing Workstation

User Manual

V3.0



FOREWORD

Thank you for choosing our collaborative palletizing robot. This manual is designed to provide you with comprehensive commissioning and maintenance guidelines to ensure your equipment operates safely and efficiently. Please read all guidelines and safety information carefully before using this equipment.

Definitions

Palletizing Robot:

An automated robot designed to work alongside human operators, capable of performing repetitive tasks such as palletizing.

User:

The person(s) who operate(s) and maintain(s) this equipment.

Maintenance Personnel:

Personnel who have undergone specialized training and are responsible for performing regular inspections and maintenance on this equipment.

Safety Operating Procedures:

A set of operational guidelines designed to ensure the safety of users and maintenance personnel when operating and maintaining the robot.

Content

1. SAFETY STANDARDS AND SAFETY ENVIRONMENT

1.1 Safety Operating Procedures

1.1.1 General Safety Guidelines

- **Electrical Safety**: Ensure the equipment is properly grounded to prevent electrical accidents.
- **Operating Environment**: Keep the operating area clean and free of obstacles, ensuring sufficient space for robot operation.
- **Personnel Training**: All operators and maintenance personnel must undergo professional training and be familiar with the equipment's functions and safe operating procedures.

1.1.2 Personal Protective Equipment Requirements

- **Safety Helmet**: To prevent head injuries.
- **Safety Shoes**: To prevent foot injuries.
- **Protective gloves**: To prevent hand injuries.
- **Hearing protection**: To be worn when working in high-noise environments.

1.1.3 Emergency Stop Procedure

- **Emergency Stop Button**: The equipment is equipped with an emergency stop button; press it immediately in case of an emergency.
- **Power Shutdown Procedure**: Familiarize yourself with the equipment's power shutdown procedure to ensure you can quickly cut off the power supply in an emergency.

1.1.4 Power Management

- **Power Connection**: Connect the equipment using a power cord that meets the specifications.
- **Voltage Stability**: Ensure the power supply voltage is stable to prevent damage to the equipment caused by voltage fluctuations.

1.1.5 Avoid Collisions and Pinch Hazards

- **Work Area Monitoring**: Before operation, ensure that there are no people or obstacles in the work area.
- **Robot Movement Range**: Be aware of the robot's movement range and avoid entering hazardous areas.

1.2 Installation Environment

1.2.1 Environmental Requirements

- **Temperature:** The equipment shall operate at ambient temperatures between 0°C and 45°C. (When operating under low-temperature conditions, the higher viscosity of lubricating grease and lubricating oil may cause errors or overloads; the robot must first be warmed up at low speed.)
- **Humidity:** Relative humidity must not exceed 85% (non-condensing).
- **Ground:** The equipment shall be installed on a solid and flat ground.

2. INSTALLATION AND SHUTDOWN OF THE PALLETIZING WORKSTATION

2.1 Return the Robot to Gohome

This is the robot's factory default posture [Figure 2-1]. To install it in the appropriate position, remove the robot's power cord [Figure 2-2], plug it into a 220V power source, and turn the rotary switch on the right side of the machine clockwise 90° [Figure 2-4] to the "ON" position. After the robot is powered on, ensure there are no obstructions in front of the machine. It is recommended to keep the speed at around 30%, return the robot to Gohome [Figure 2-2].

Figure 2-1

Figure 2-2

Figure 2-3

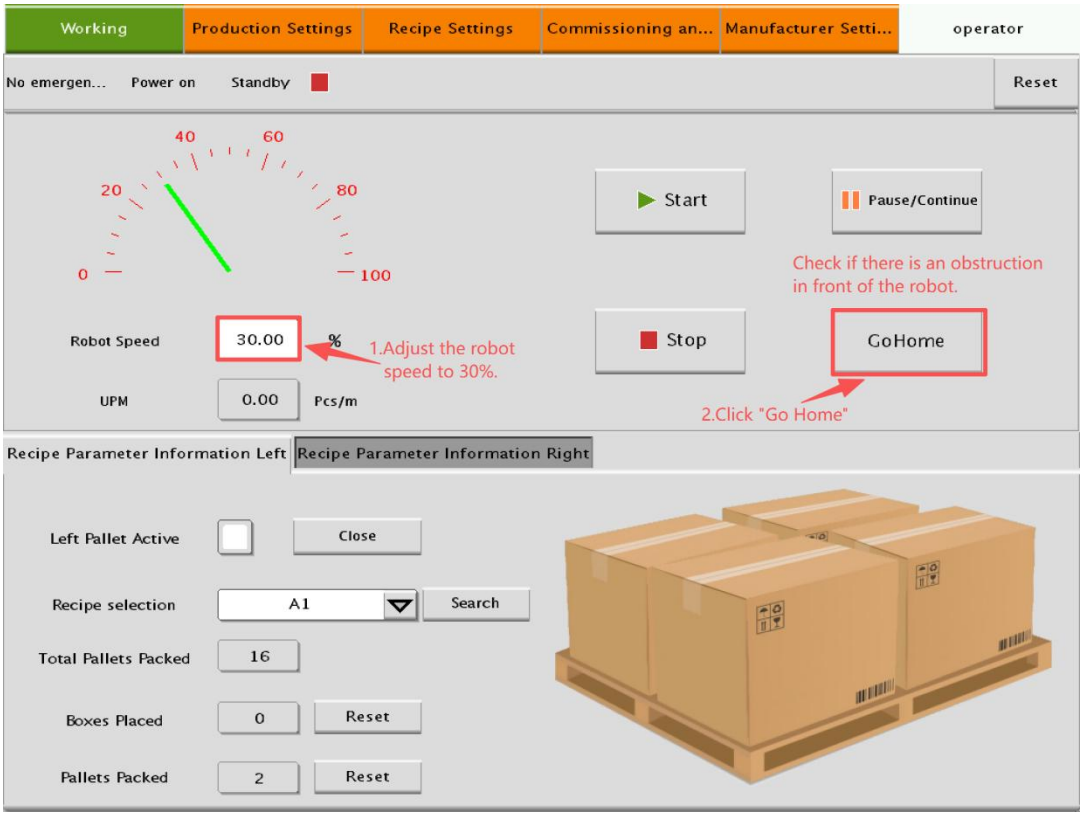


Figure 2-4

2.2 Check the Robot's Zero-Point Calibration and Components for Damage

This is the robot's zero-position posture. Check whether the robot's joint surfaces are damaged and whether the scale aligns with the robot's standard zero-position posture. Refer to (Robot Jog).
[Figure 2-5]

Figure 2-5

2.3 Installing the Pallet

Place the left or right pallet against the diagonal corner of the robot's bottom corner [Figure 2-6]

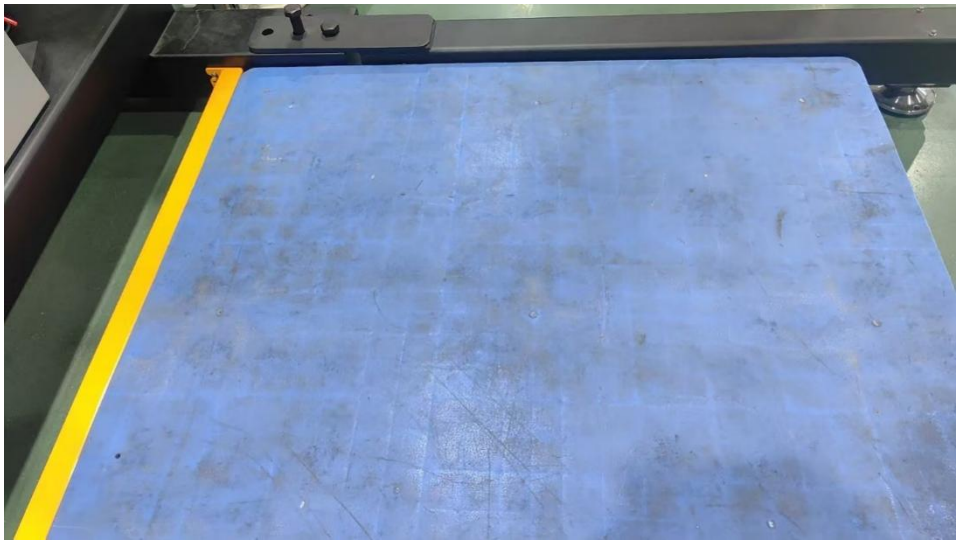


Figure 2-6

2.4 Installing the Photoelectric Sensors

Install the photoelectric sensors on the conveyor and adjust the sensitivity of the detection sensors for the left and right feed lines, as well as the conveyor [Figure 2-7]

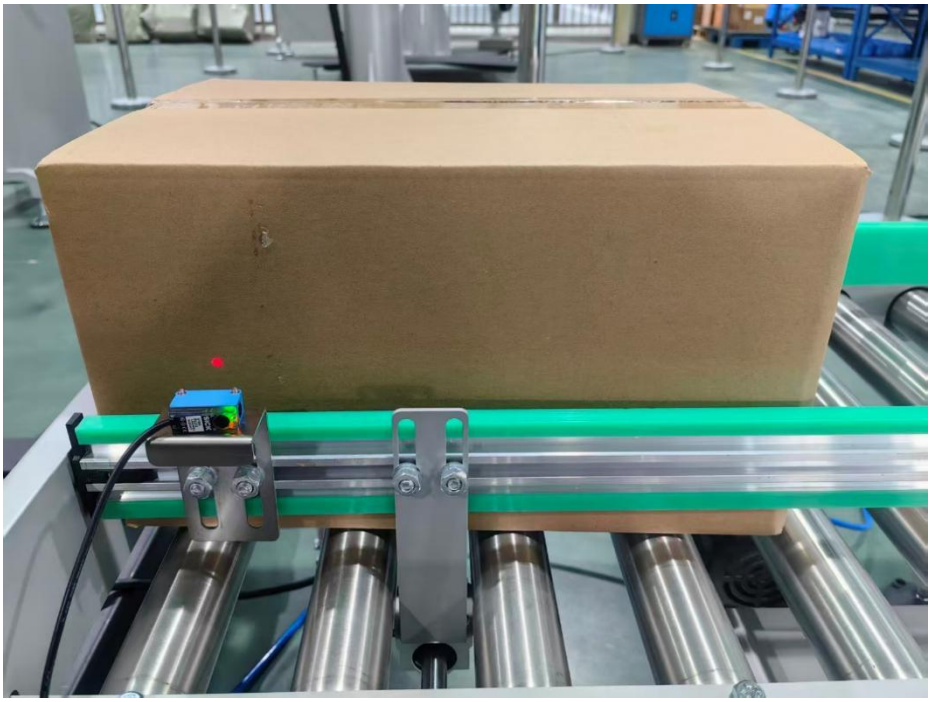


Figure 2-7

2.5 Installing the Suction Cup

Manually move the robot's fifth axis to the appropriate position, then install the suction cup and air hose. Once installation is complete, return the robot to the home position [Figure 2-8]

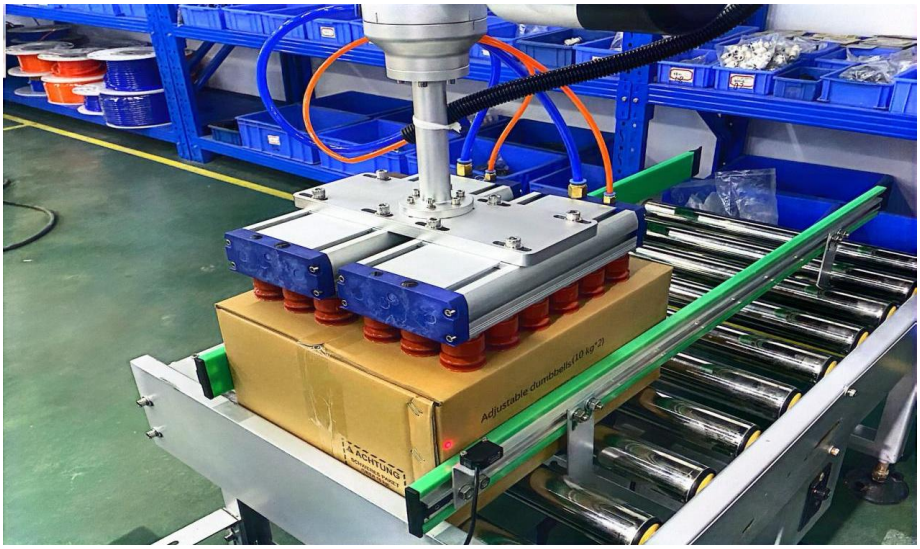


Figure 2-8

2.6 Precautions for Shutting Down the Robot

Precautions Before Starting the Robot [Figure 2-9]

First: Check if there are any personnel in front of the robot;

Second: Check whether the robot is currently in operation.

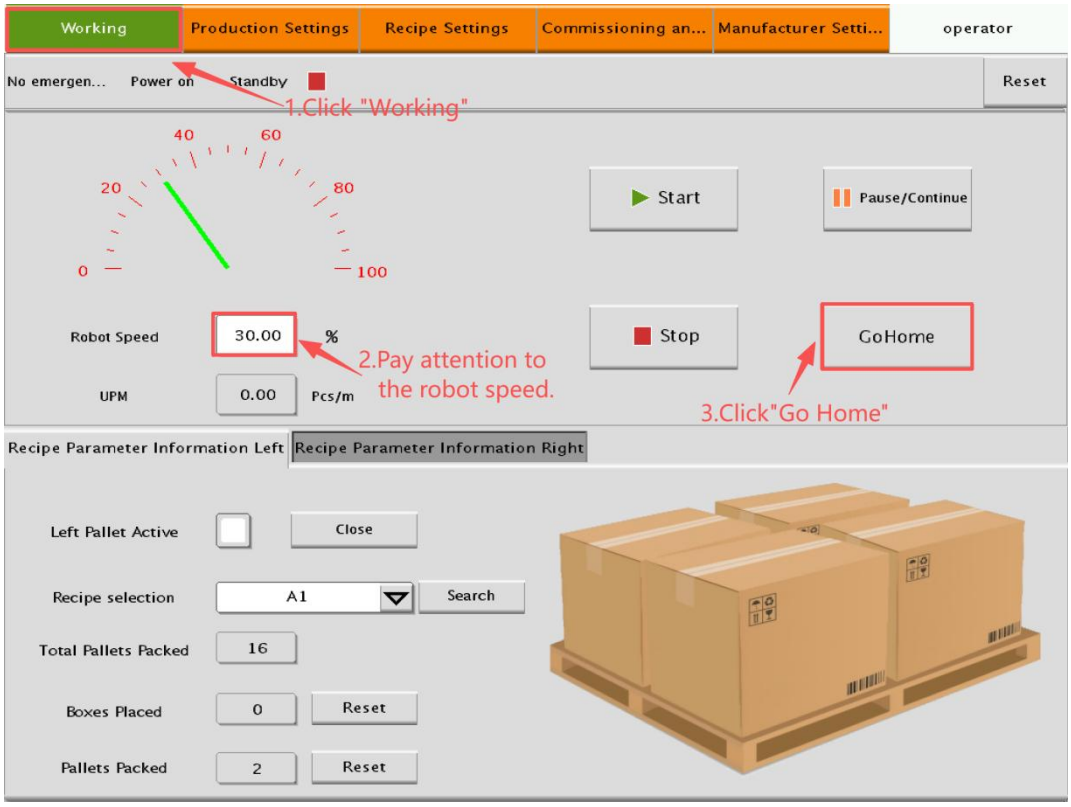


Figure 2-9

Once the robot returns to the home position, turn the rotary switch on the right side of the robot counterclockwise 90° to the OFF position [Figure 11-8]

Figure 2-10

3. SWITCH TO ADMINISTRATOR MODE

3.1 Setting Administrator Mode

Click "Recipe Settings". If the interface looks like [Figure 3-1], the current mode is Operator Mode. To switch to Administrator Mode—since Operator Mode does not allow modifying or creating new recipes or paperboard settings, and the function of Operator Mode is to preserve existing recipes in the event of a power outage. The way to switch to administrator mode is as follows.

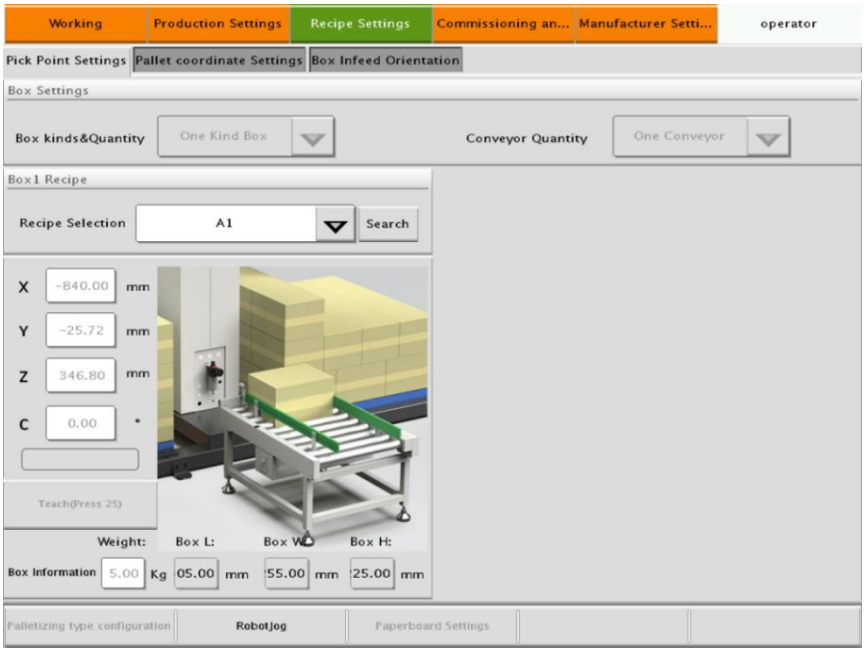


Figure 3-1

Click "operator" in the upper-right corner of the interface to enter the "User Login" interface and proceed to the next step [Figure 3-2]

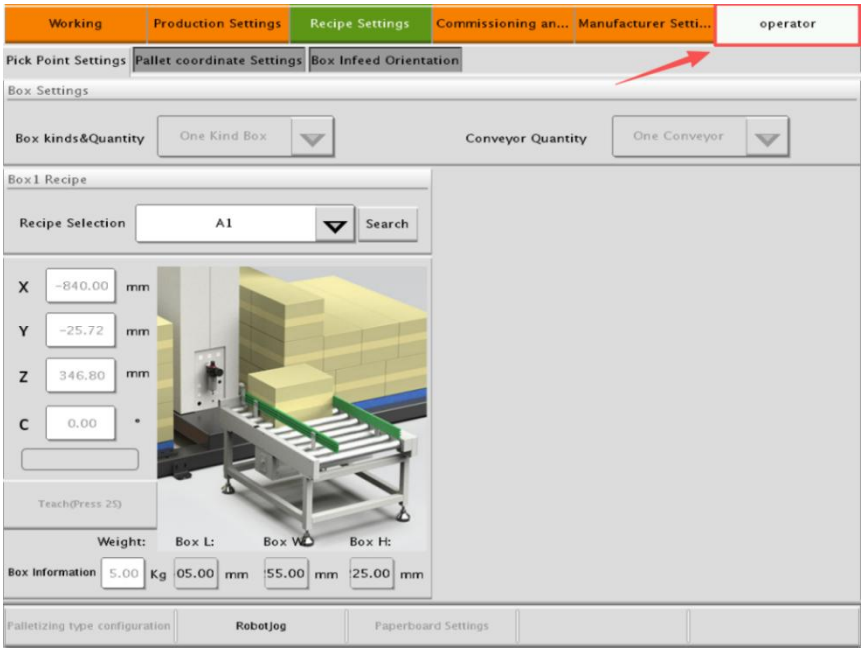


Figure 3-2

On the “Login” interface, click the drop-down arrow and select “Administrator” [Figure 3-3]

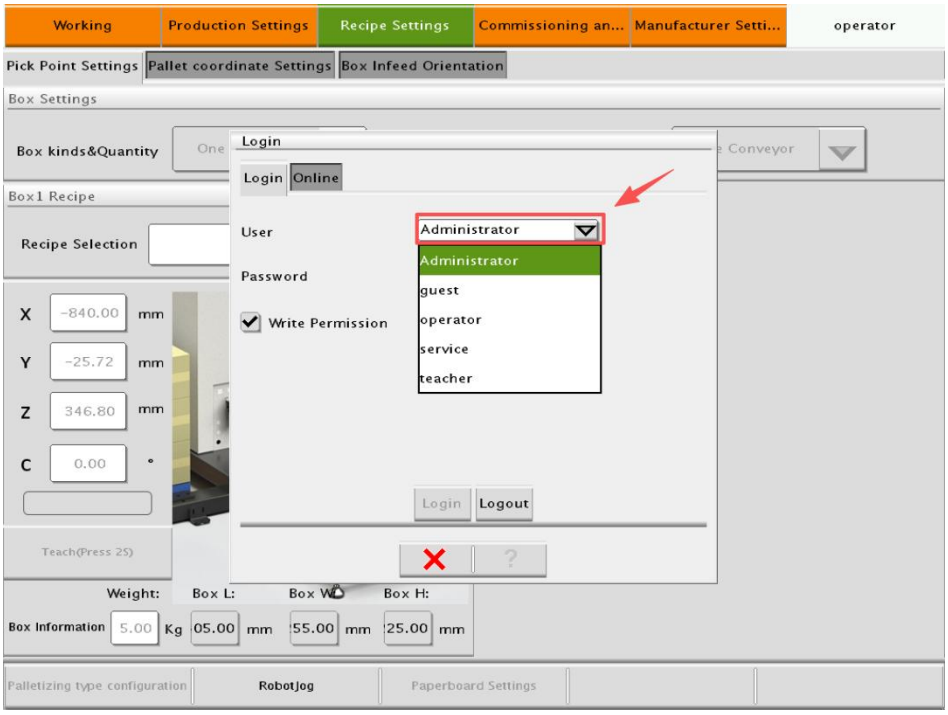


Figure 3-3

Enter the password: pass, then click "Login" to successfully switch to administrator mode

4. CREATING A NEW RECIPE

4.1 Box Palletizing Type Configuration

Click "Recipe" to enter the interface [Figure 4-1] , then click "Palletizing Type Configuration" to enter the interface [Figure 4-2]

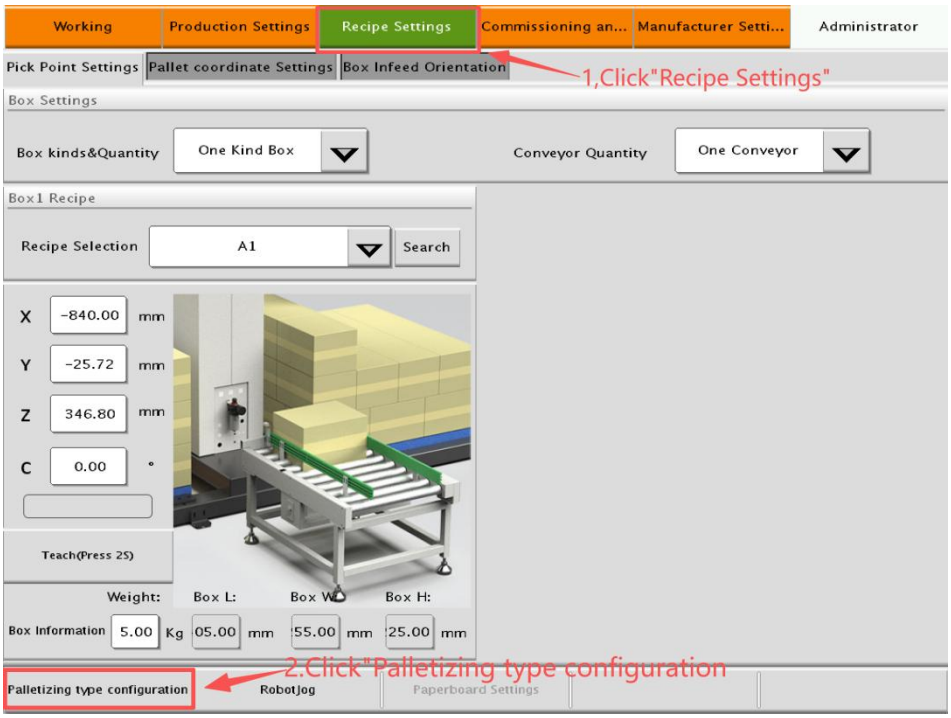


Figure 4-1

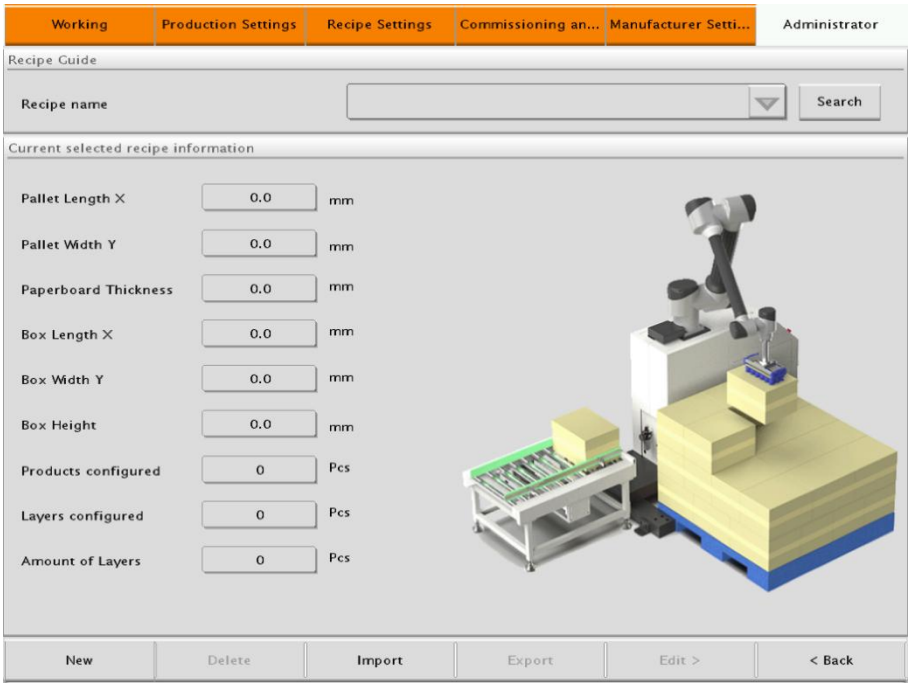


Figure 4-2

4.2 Creating a New Recipe

Click “New” to create a recipe [Figure 4-3]

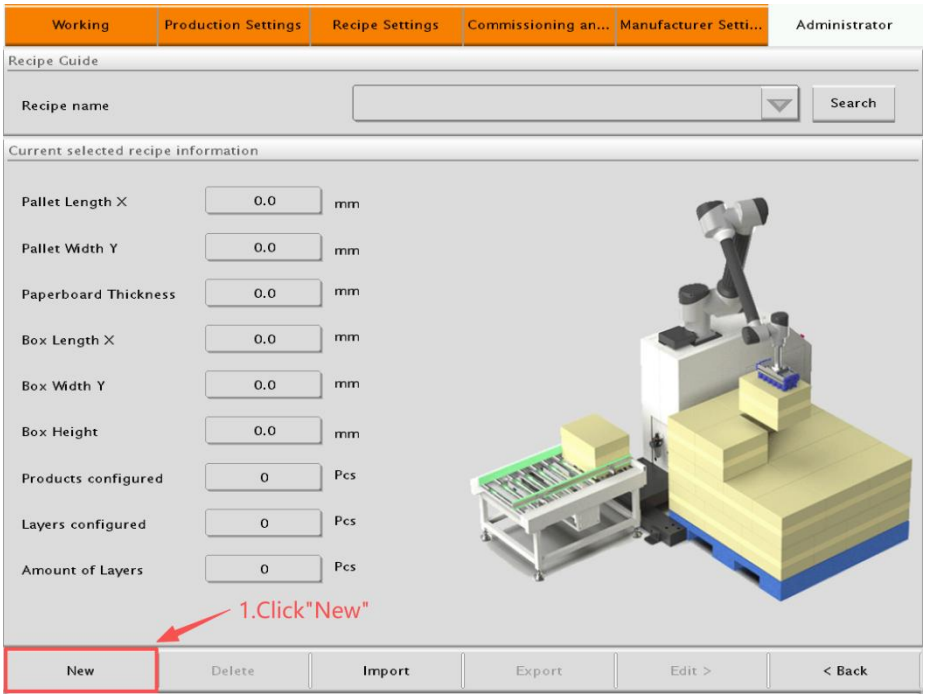


Figure 4-3

Enter the recipe name, then click “✔” [Figure 4-4]

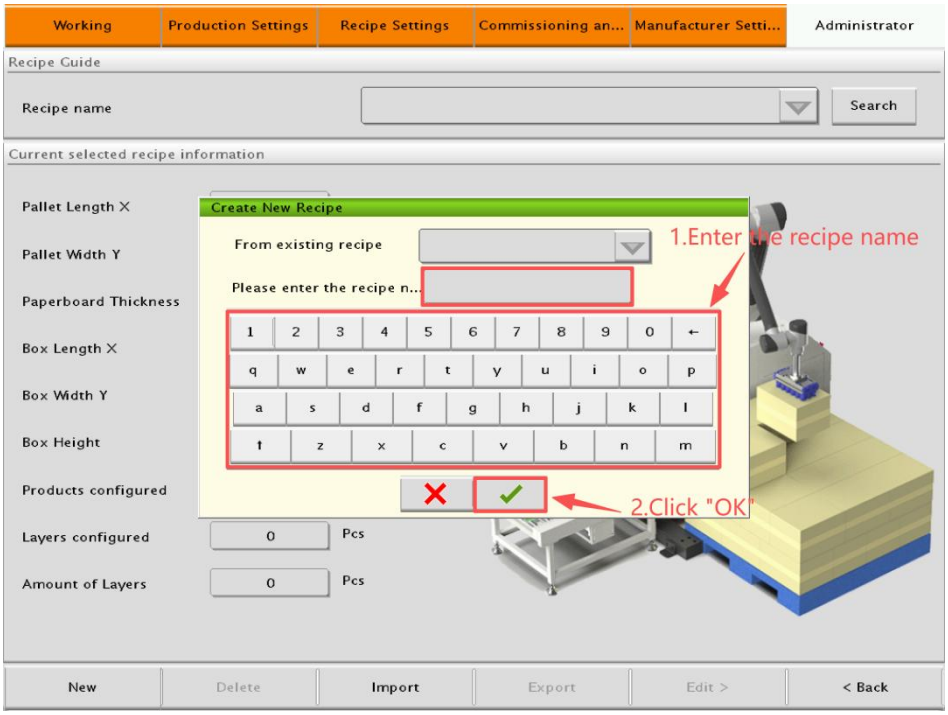


Figure 4-4

Click "Edit" for the recipe [Figure 4-5]

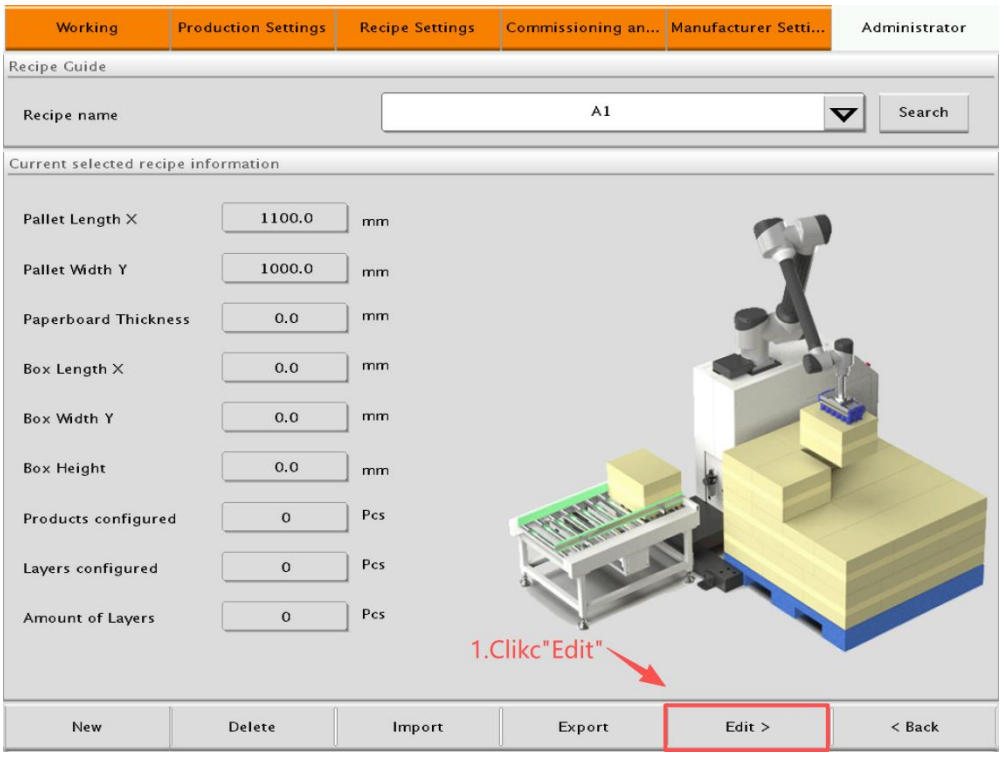


Figure 4-5

Click the “drop-down arrow” to select a standard pallet size or customize and manually input the pallet length (X) and width (Y) [Figure 4-6]. After entering the pallet size, click “Next”.

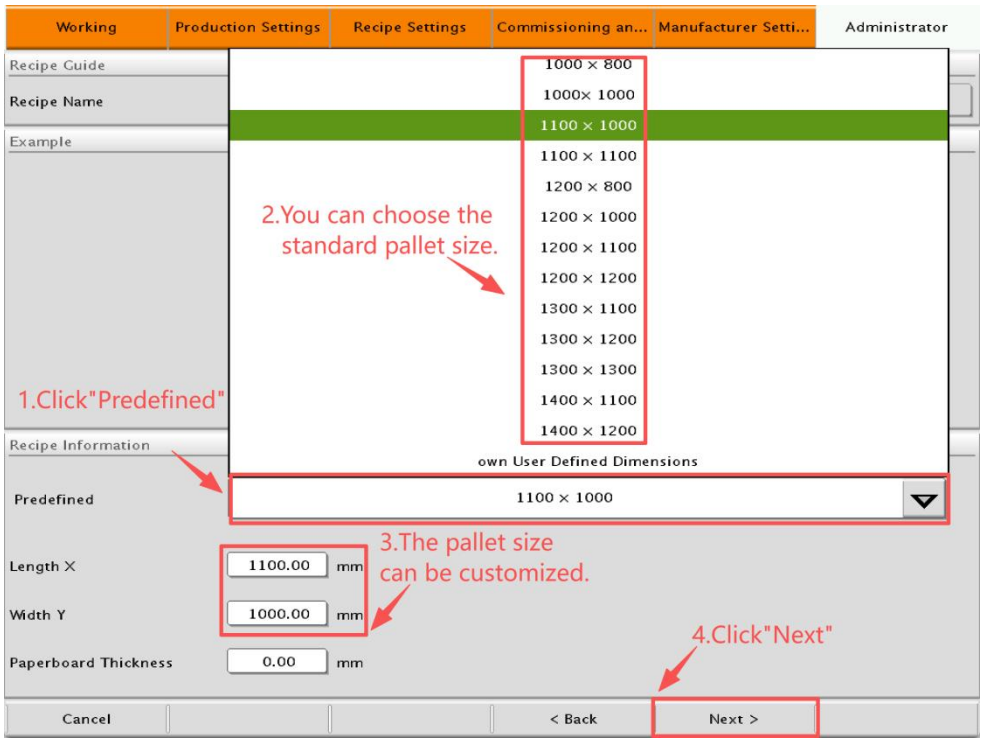


Figure 4-6

Click “New” to create a product (you can customize the name) [Figure 4-7]

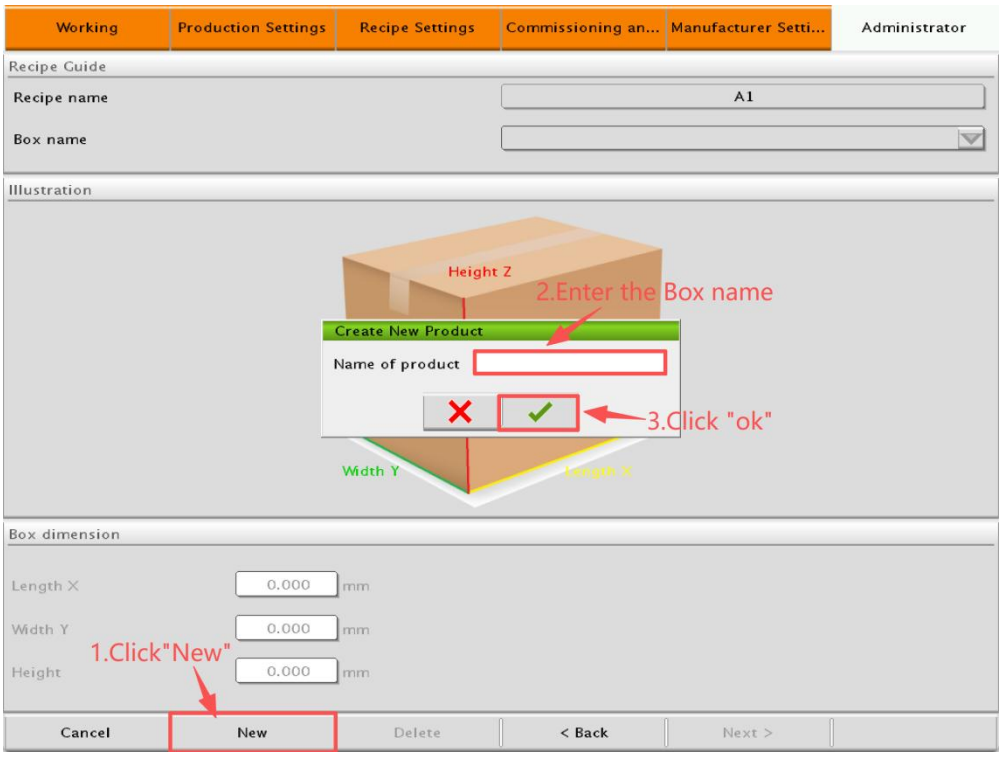


Figure 4-7

In the product parameters, enter the box size: length (X), width (Y), and height [Figure 4-8]. After entering the box size, click "Next" to proceed to the interface

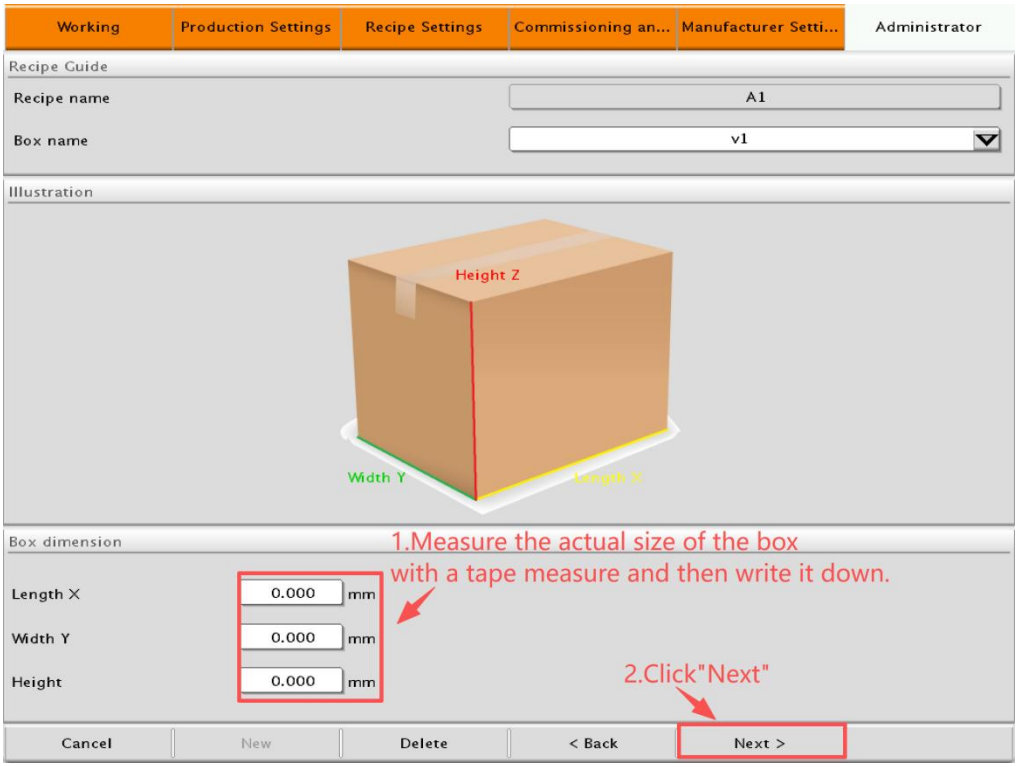


Figure 4-8

Click “Add” to create palletizing type; up to four palletizing types can be added [Figure 4-9]

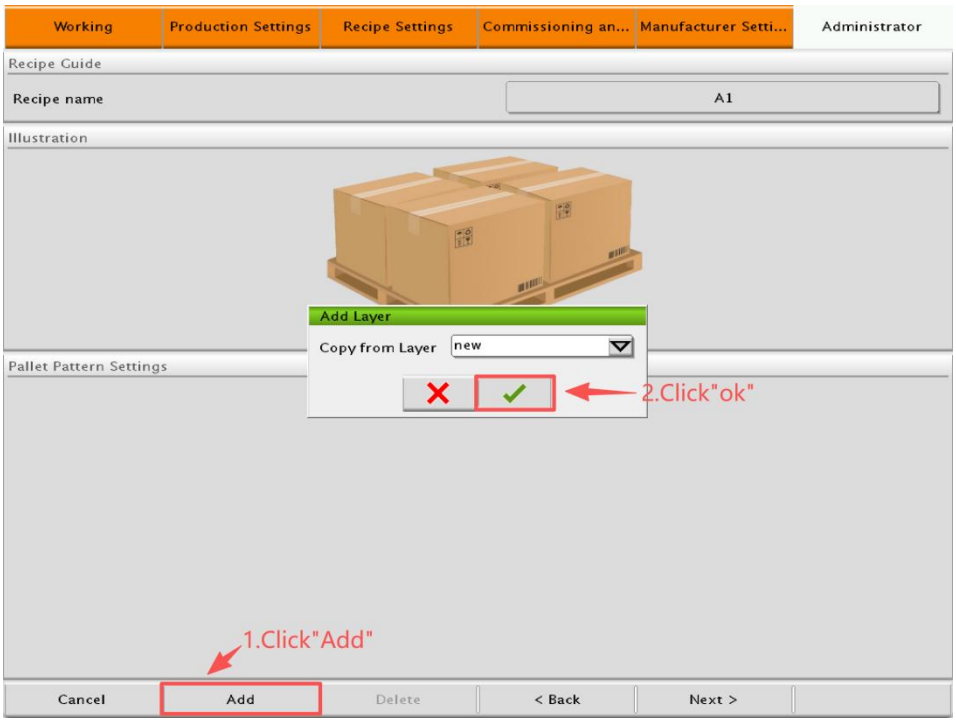


Figure 4-9

First, enter the number of boxes to be palletized for palletizing type A; do the same for palletizing type B [Figure 4-10]

Then click “Edit”

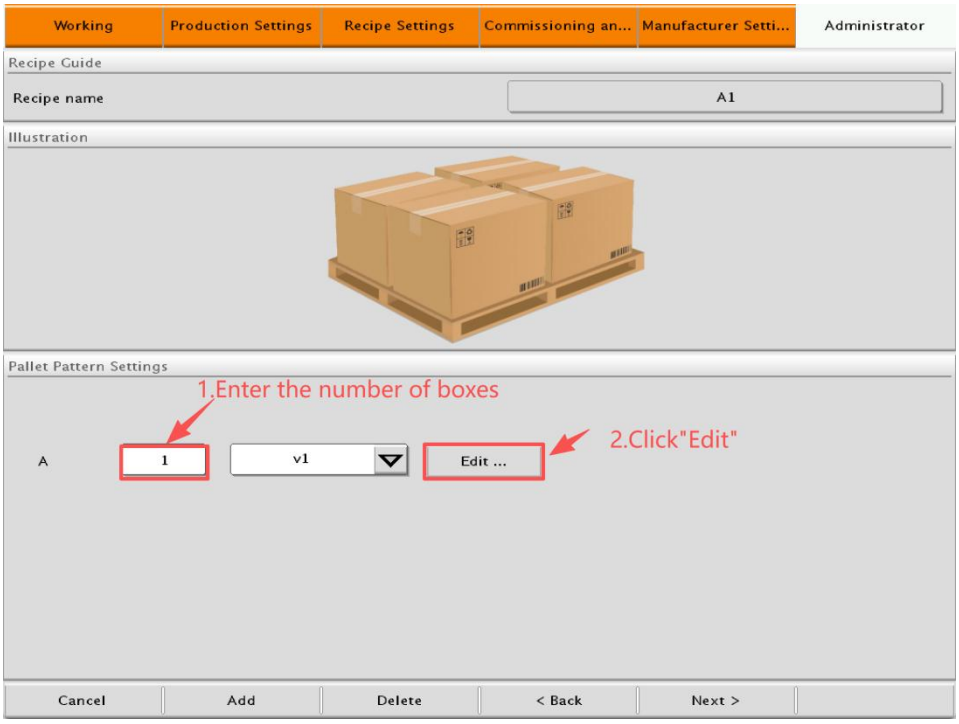


Figure 4-10

Select “Palletizing Type Template” to see if the required configuration is available [Figure 4-11]

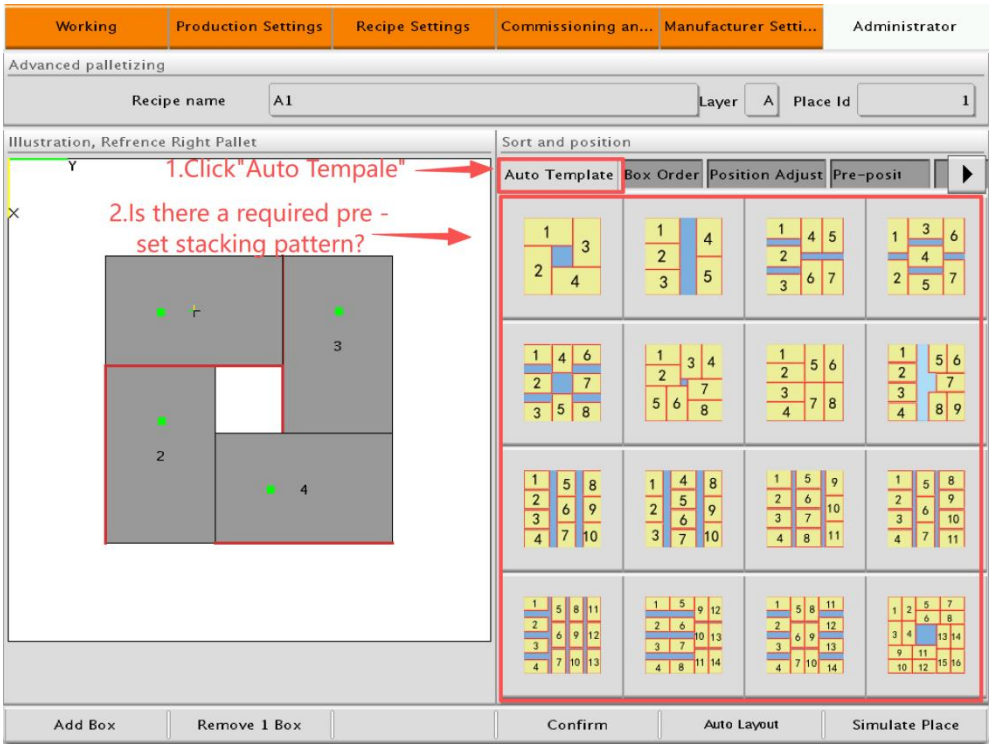


Figure 4-11

If the required palletizing type is not available in the palletizing template, refer to [Figure 4-12] to adjust the box positions. You can create the desired palletizing type by manually moving the boxes or using the functions in the table below

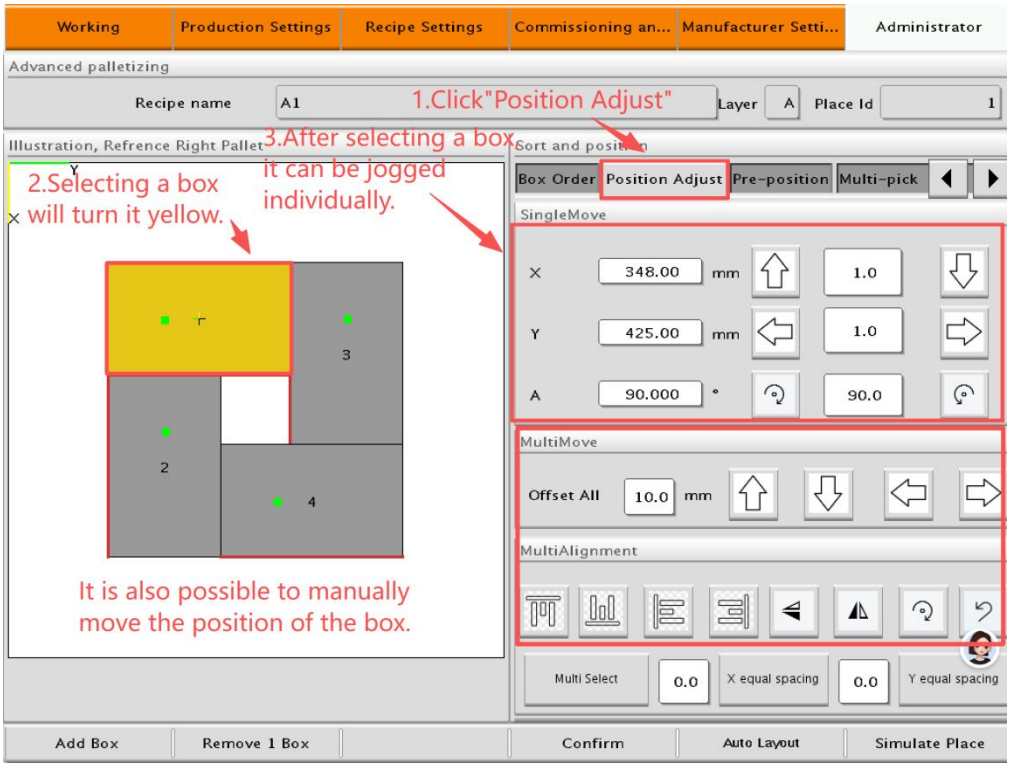


Figure 4-12

	1. Move Up: You can move a single box or select multiple boxes to move them up
	2. Move Down: You can move a single box or select multiple boxes to move them down
	3. Move Left: You can move a single box or select multiple boxes to move them to the left
	4. Move Right: You can move a single box or select multiple boxes to move them to the right
	5. Rotate Clockwise: Enter the desired rotation angle. You can rotate a single box or select multiple boxes to rotate them
	6. Rotate Counterclockwise: Enter the desired rotation angle. You can rotate a single box or select multiple boxes to rotate
	7. Move up as a whole: Move the entire pallet upward to allow the robot to place the the box(es) as a whole more precisely in the correct positions on the pallet
	8. Move down as a whole: Move the entire pallet downward so that the robot can place the the box(es) as a whole more precisely in the correct positions on the pallet
	9. Move left as a whole: Move the entire pallet to the left, allowing the robot to place the the box(es) as a whole more precisely in the correct positions on the pallet
	10. Move right as a whole: Move the entire pallet to the right, allowing the robot to place the box(es) as a whole more precisely in the correct positions on the pallet
	11. Align Up: A function to align boxes with each other. For example, to align Box 4 with Box 3, first select the "Multi-select" function on the interface, then select Box 4 and then select Box 3, and finally click the "Align Up" tab
	12. Align Down: A function to align boxes with each other. For example, to align Box 4 with Box 3, first select the "Multi-select" function on the interface, then select Box 4 and then select Box 3, and finally click the "Align Down" tab
	13. Align Left: A function to align boxes with each other. For example, to align Box 2 with Box 1, first select the "Multi-select" function on the interface, then select Box 2 and then select Box 1, and finally click the "Align Left" tab
	14. Right Align: A function to align boxes with each other. For example, to align Box 2 with Box 1, first select the "Multi-select" function on the interface, then select Box 2 and then select Box 1, and finally click the "Align Right" tab
	15. Flip up and down as a whole: Flip the entire stack of boxes on the pallet up and down
	16. Flip left and right as a whole: Flip the entire stack of boxes on the pallet left and right
	17. Rotate Entire Pallet Clockwise: Rotates all boxes on the pallet

Select "Box Order", choose the boxes whose numbers you want to change, and select the desired number from the "Switch Number" drop-down list. After arranging the order, click "Simulate Place" to ensure everything is correct.

The standard palletizing sequence is to palletize the boxes closest to the pallet origin first; refer to [Figure 4-13].

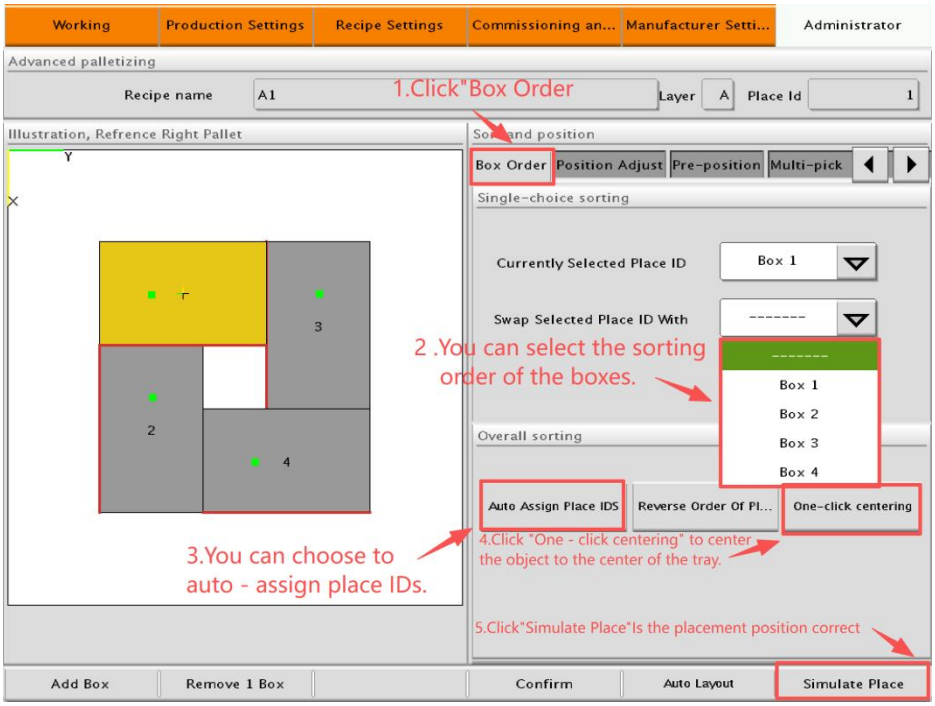


Figure 4-13

Select “Entry Point,” enter X: 60, Y: 60, Z: 325 (the Z value for the entry point is the box height 265 + 60 = 325), check “Use Entry Point,” then click “Write All.” If the palletizing order is to palletize the box farthest from the pallet origin first, then set X: -60 Y: -60. Once you have mastered the entry point settings, you can also set other desired values. After setting the entry point, you can observe whether the green small cross point on the box is located at the desired position. When the palletizing type editing is complete, click the “Confirm” button directly below to finalize the palletizing type. Refer to [Figure 4-14]

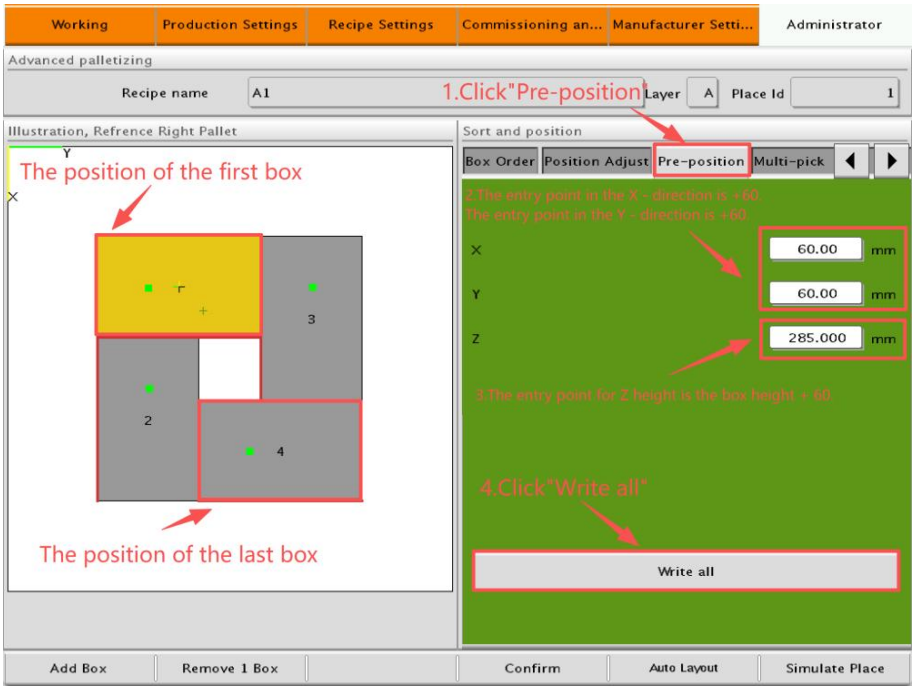


Figure 4-14

The following are examples of entry points

For example: The coordinate system of the box in [4-15] is based on the diagonal corners (X and Y) of the robot base. The entry point offset is calculated by referring to this coordinate system. If the box to be offset is in the negative direction of the coordinate system, set the offset value to "-"; if the box to be offset is in the positive direction, set the offset value to "+". Refer to the following physical image for understanding how to set the entry point offset

Figure 4-15

After clicking to create the staggered palletizing type of A and B, click "Next" [Figure 4-16]

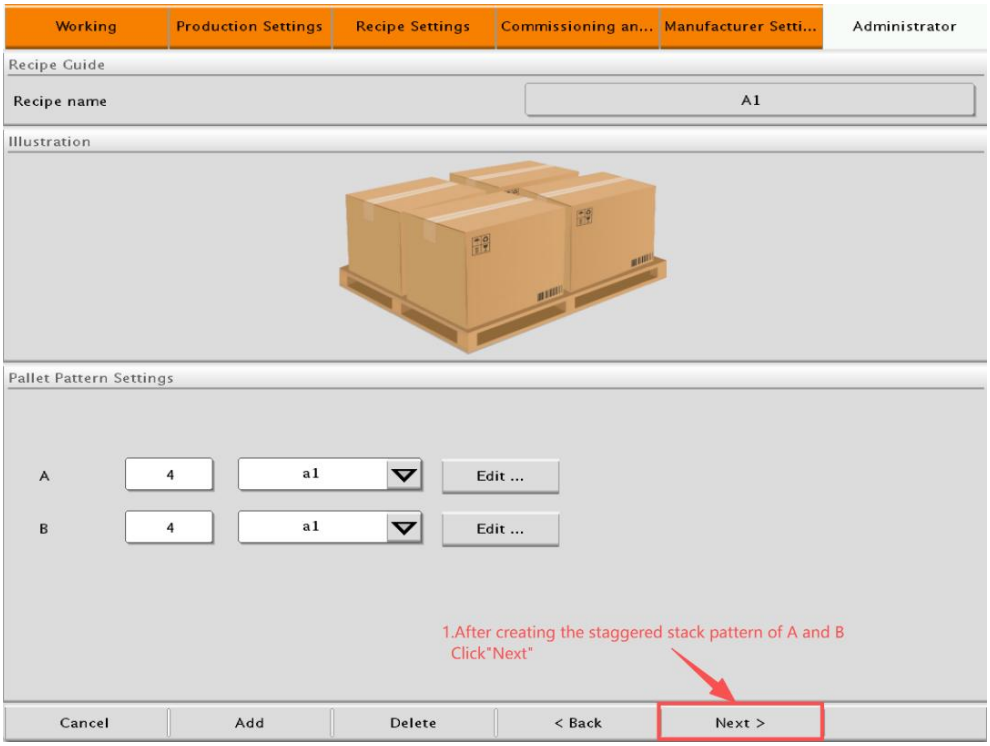


Figure 4-16

Once palletizing types A and B have been edited, select "the number of layers", then click "Save" to successfully create the recipe.

If the recipe fails to save, it is because the "Palletizing Activated" on the "Daily Operations" interface is red. Click "Close," return to the interface shown in [Figure 5-17] and save again, it is OK.

If you want to reduce one layer from the 5 layers, then choose “empty”

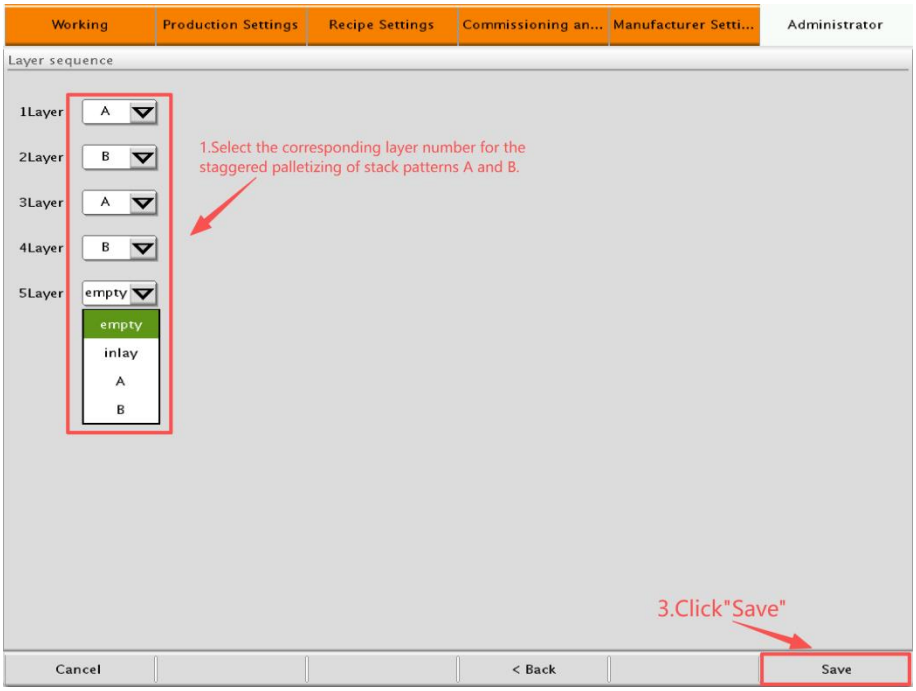


Figure 4-17

5. DESCRIPTION OF PAPERBOARD FUNCTION AND SETTINGS

5.1 Robot Configuration Requirements

1. The machine must be equipped with a 64-point I/O custom electrical baseplate
2. Sensor for detecting the number of paperboards
3. Sensor for detecting the height of the robot when grasping a paperboard
4. Program Version: V1.7.2; Touchscreen Version: 1.1.6 or higher

5.2 Functionality

5.2.1 Enabling the Paperboard Function

Go to “Production Settings-Other Settings” on the touchscreen, locate “Enable Paperboard Function,” and check the box. Refer to [Figure 5-1].

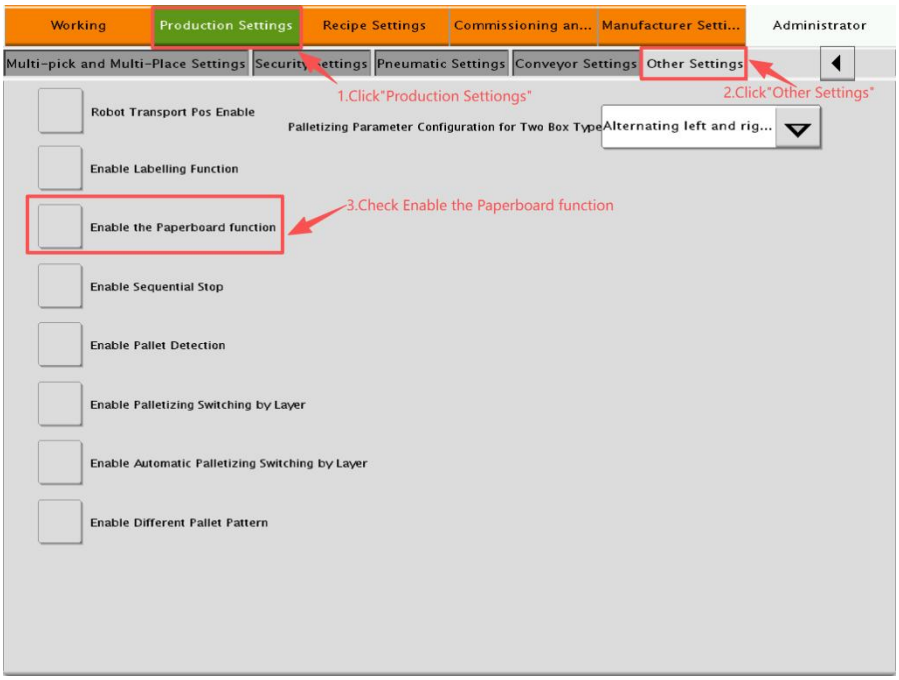


Figure 5-1

On the recipe settings page, click the "Paperboard Settings" button in recipe settings to access the page for teaching the position for grasping the paperboard and paperboard parameters setting. Refer to [Figure 5-2].

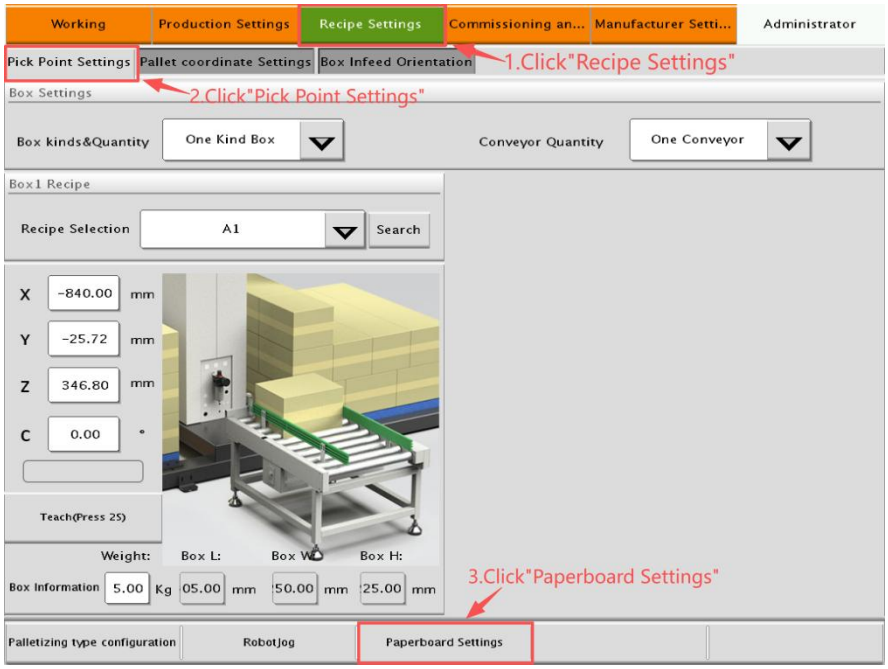


Figure 5-2

5.3 Teaching the Paperboard Grasp Point

On the Paperboard Settings page, locate the “Paperboard Grasp Point” section. This page is used to teach the robot the position for grasping the paperboard. Click the “Robot Jog” button at the bottom of the page to open the robot jog window. Use the buttons in the window to jog the robot to a position where it can just grasp the last paperboard, then press and hold the teaching button for 2 seconds. Refer to [Figure 5-3].

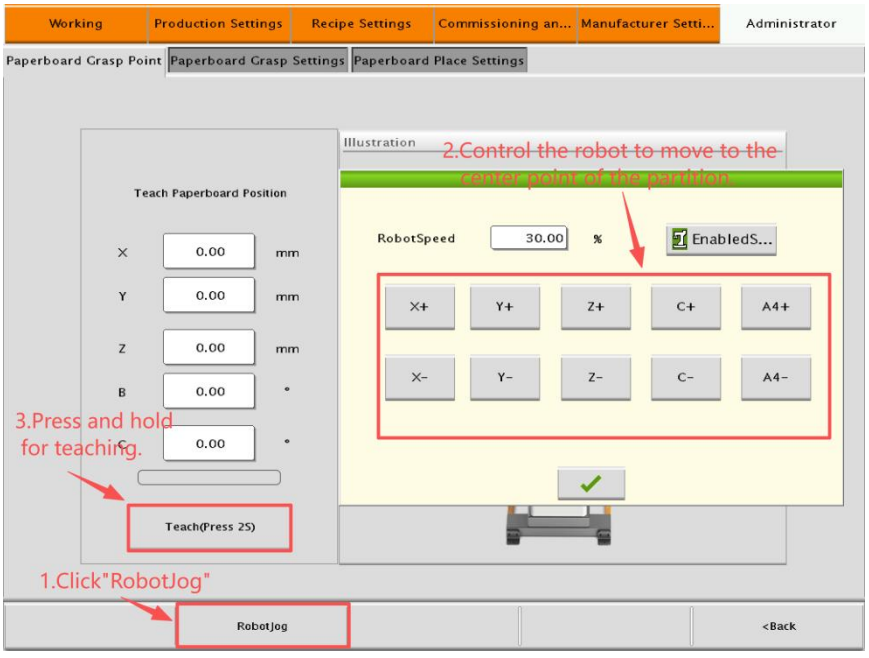


Figure 5-3

5.4 Description of Paperboard Grasp Parameters

In the "Paperboard Grasp Settings" section, for paperboard grasp parameter setting, for typical adjustment, making offset of the front and rear points of the paperboard, as well as the paperboard search speed. Refer to [Figure 5-4].

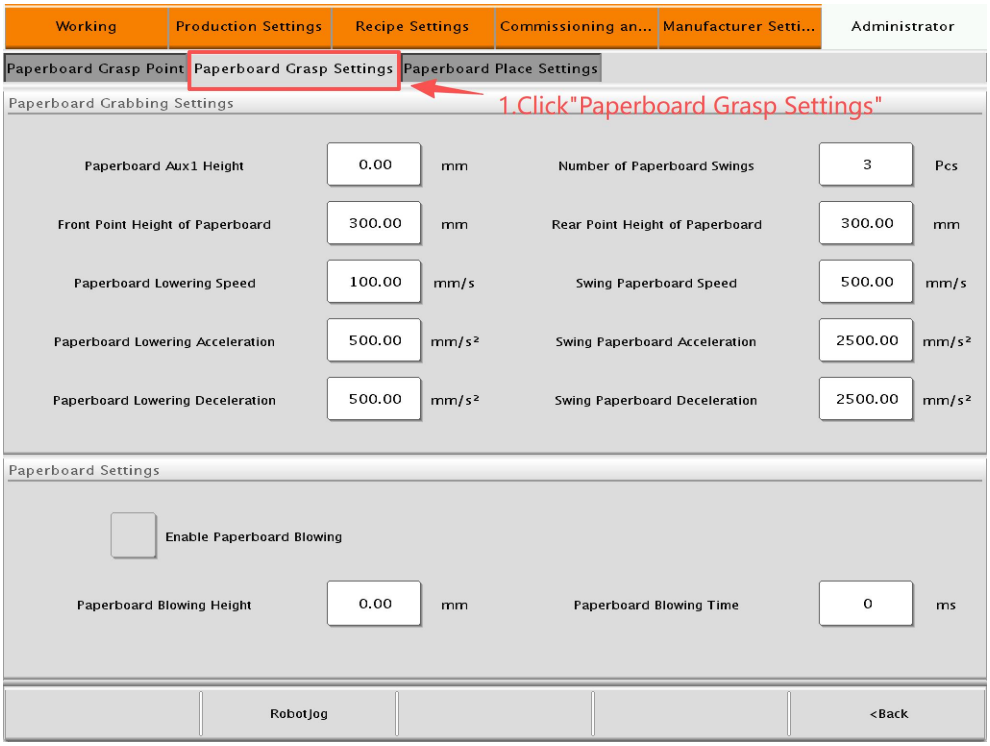


Figure 5-4

Paperboard Aux1 Height: Set the height of the lift axis when grasping the paperboard; the maximum value is 600mm (set according to actual conditions; the default is 0).

Number of Paperboard Swings: After the robot grasps the paperboard and lifts it, it shake off the attached paperboard by swinging.

Front Point Height of Paperboard: Height directly above the distance from the teach point to front point of paperboard (before grasping the paperboard).

Front Point Height of Paperboard: Height directly above distance from the teach point to rear point of paperboard (after grasping the paperboard).

Paperboard Lowering Speed: The speed at which the robot moves from above the picking position to the paperboard grasping position; generally, deceleration is required when searching for the paperboard (Note: This speed shall not be set too high).

Swing Paperboard speed: The speed at which the robot swings after grasping the paperboard.

Enable Paperboard Blowing: This function is generally used when the paperboard position is equipped with a blow gun. After grasping the paperboard, it blows away any adhered paperboard after grasping paperboard (when enabled, this function cannot be used simultaneously with the swing function).

Paperboard Blowing Height: Sets the height to which the paperboard is raised for air blowing after grasping the paperboard based on the paperboard grasping position.

Paperboard Blowing Time: The delay before reaching paperboard blowing height.

5.6 Description of Paperboard Place Parameter

In the "Paperboard Place Settings" section, for configuring parameters for placing paperboards, including the entry points for placing paperboard at the left and right pallets and the offset parameters for the placement points. Refer to [Figure 5-5].

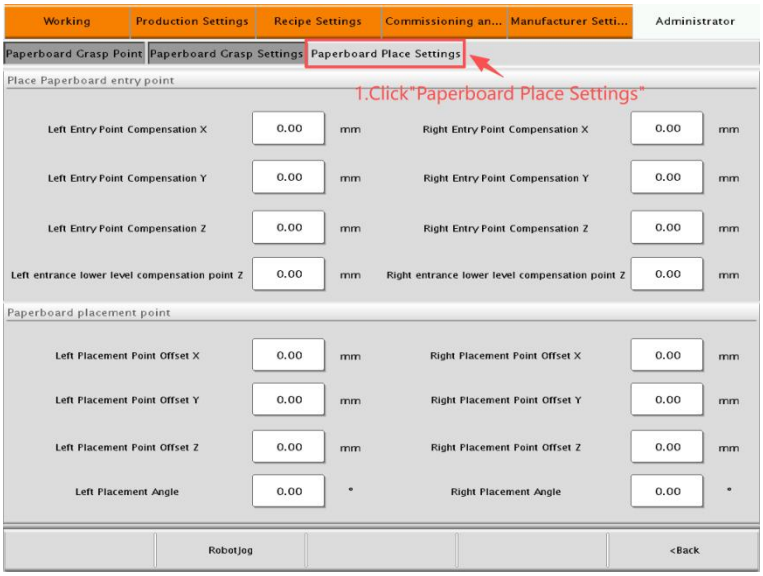


Figure 5-5

Paperboard Place Entry Point Parameters:

Entry point position compensation is based on the pallet coordinate system; compensation values are superimposed on the default entry point position to adjust the entry point. The following explains the compensation values for the left entry point. Left Entry Point Compensation (X): Compensation is applied in the X direction of the left pallet coordinate system; a positive value indicates an offset toward the positive direction X, while a negative value indicates an offset toward the negative direction X. The principles for the Y and Z directions are the same. Left Entry Point Lower Layer Compensation Point Z: This parameter takes effect when the paperboard placement position is lower than the height after the paperboard is grasped; otherwise, the entry point compensation Z is used. The right entry point compensation values are based on the right coordinate system, and the principle is the same as that for the left entry point compensation. Refer to [Figure 5-6] for the pallet coordinate system:

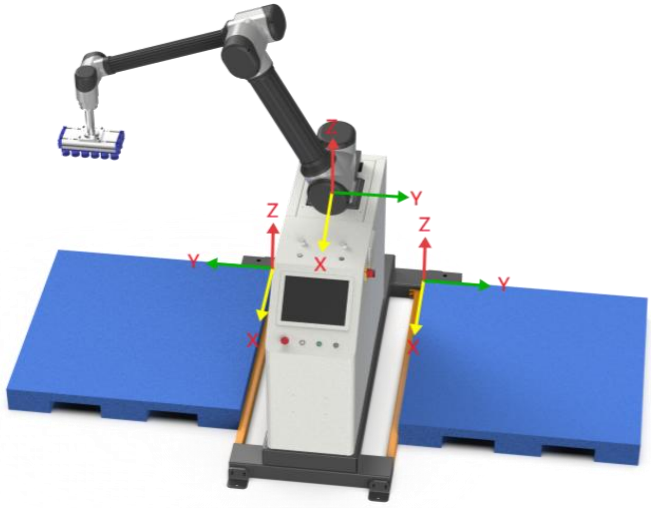


Figure 5-6

5.7 Paperboard Thickness Settings

When using the paperboard function, the paperboard thickness must be included in the total palletizing height calculation; set it according to the actual paperboard thickness. To set the paperboard thickness, go to "Recipe Settings-Palletizing Type Configuration," refer to [Figure 5-7].

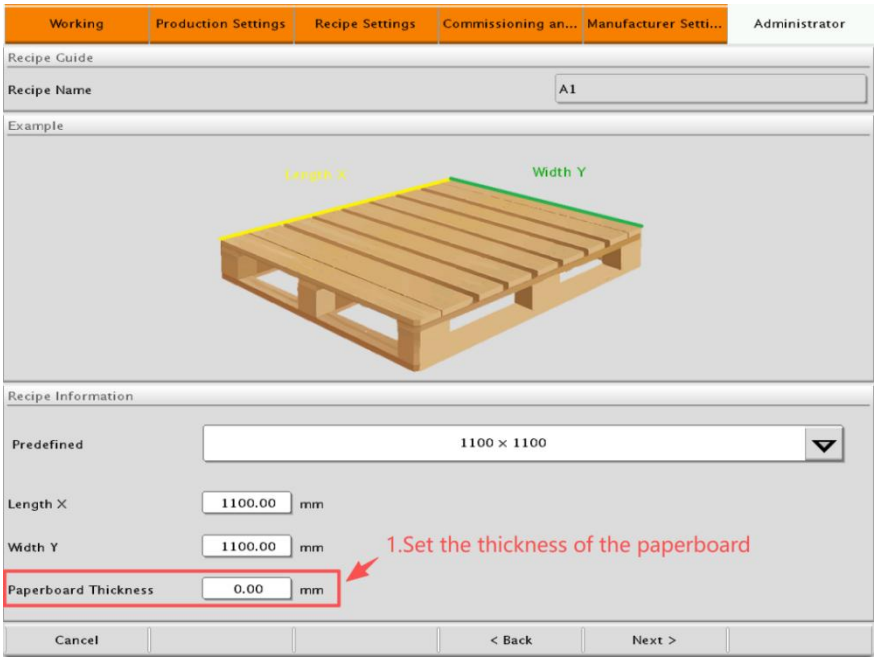


Figure 5-7

5.8 Paperboard Layer Settings

After configuring the relevant parameters, you can freely assign paperboards between layers. In the "Number of Layers" setting of the recipe editor, you can select inlay as the paperboard layer through the drop-down menu, refer to [Figure 5-8].

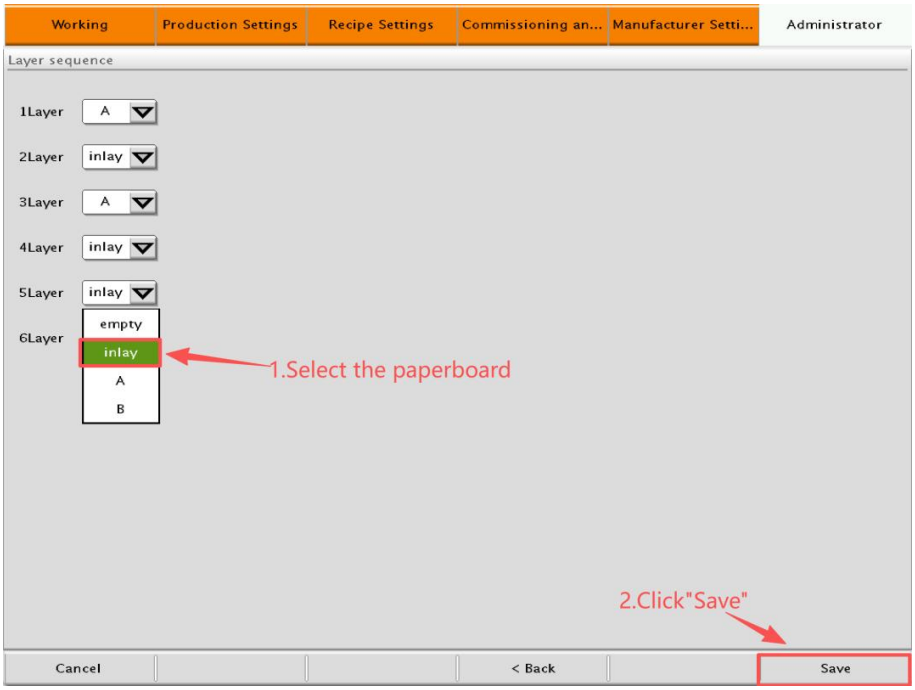


Figure 5-8

6. CREATING MULTI-PICK AND MULTI-PLACE

6.1 Creating Multi-pick and Multi-place Configuration

Text description of Multi-pick and Multi-place Settings

6.1.1 First, check the box to enable the multi-pick function;

6.1.2 Set the number of suction cups for the multi-pick function. Note: The number set must match the actual number of suction cups, and ensure that each suction cup is controlled by an independent solenoid valve for suction;

6.1.3. Install the suction cups along the robot's X-axis in the order 1/2/3/4, with the suction cup closest to the robot base numbered 1, and farthest from the base as 4;

6.1.4 In the "one-time pick and one-time place" mode, the program determines the number of boxes to be picked based on the attributes of the boxes to be palletized, if the boxes to be palletized consists of three separate boxes, then pick 3 boxes at once, open suction cups 1, 2, and 3 for suction, suck up 3 boxes at the rear end of the conveyor at once, and then place 3 boxes at once;

6.1.5 Box palletizing configurations are set on the "Multi-Pick and Multi-Place" page of the palletizing type recipe. To add boxes for multi-pick operations, such boxes must be added via the "Add Box" button on the Multi-Pick page. Note: Depending on the actual incoming material to select either horizontal or vertical feed. Click "Produce" and then click "Multi-Pick" [Figure 6-1]

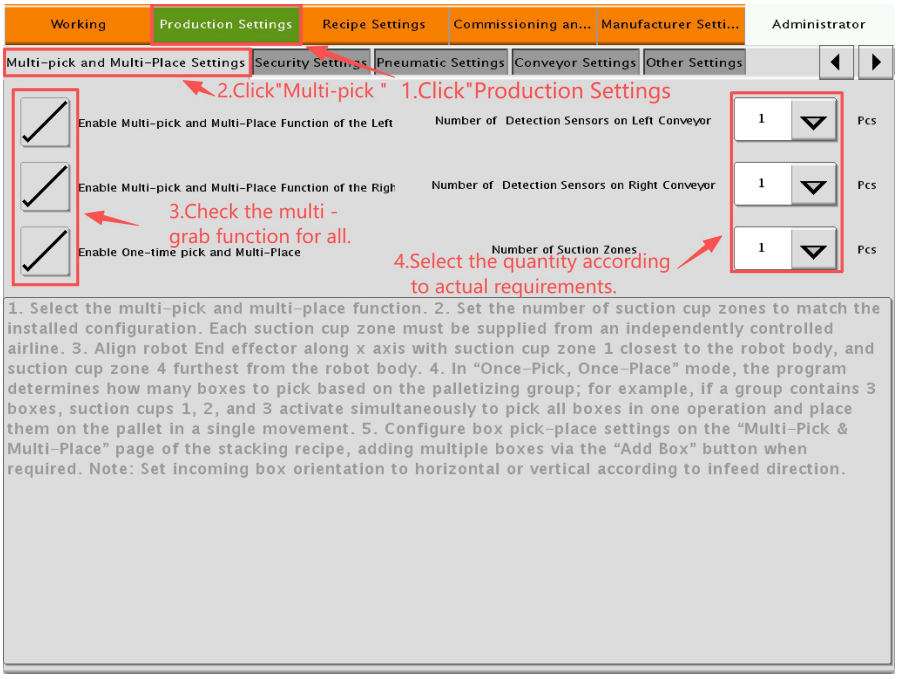


Figure 6-1

6.2 Conveyor Settings

Click “Recipe” and then “Picking Points” to enter the interface shown in Figure 6-2
First, select the box type, then the number of conveyors, and finally the previously created recipe.

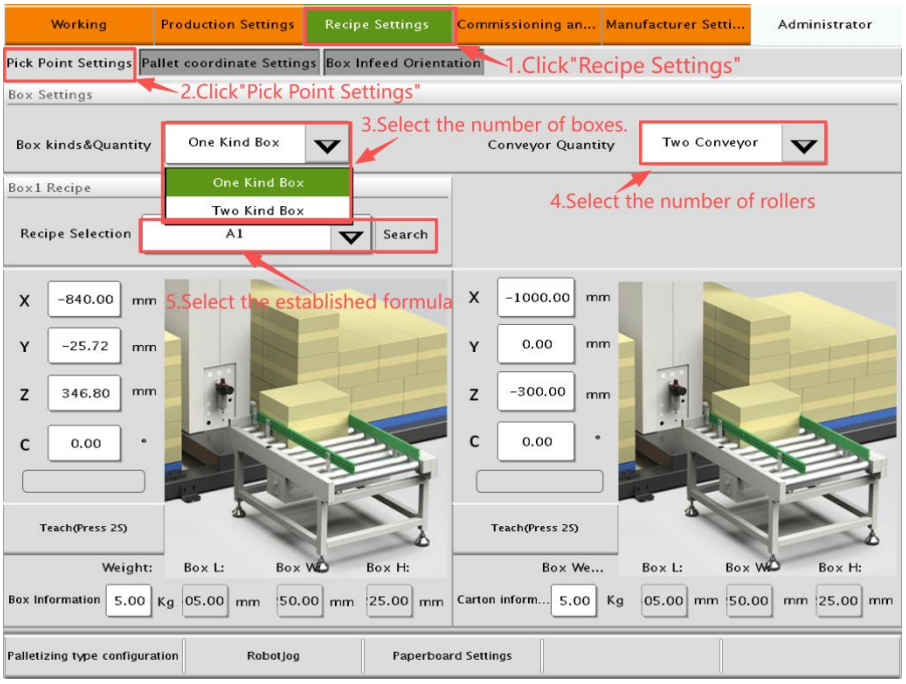


Figure 6-2

6.3 Box Infeed Selection

Click "Recipe" and then select "Infeed Orientation." There are two types of box infeed orientations: vertical and horizontal orientations. Select based on the actual orientation of the boxes. Refer to [Figure 6-3]

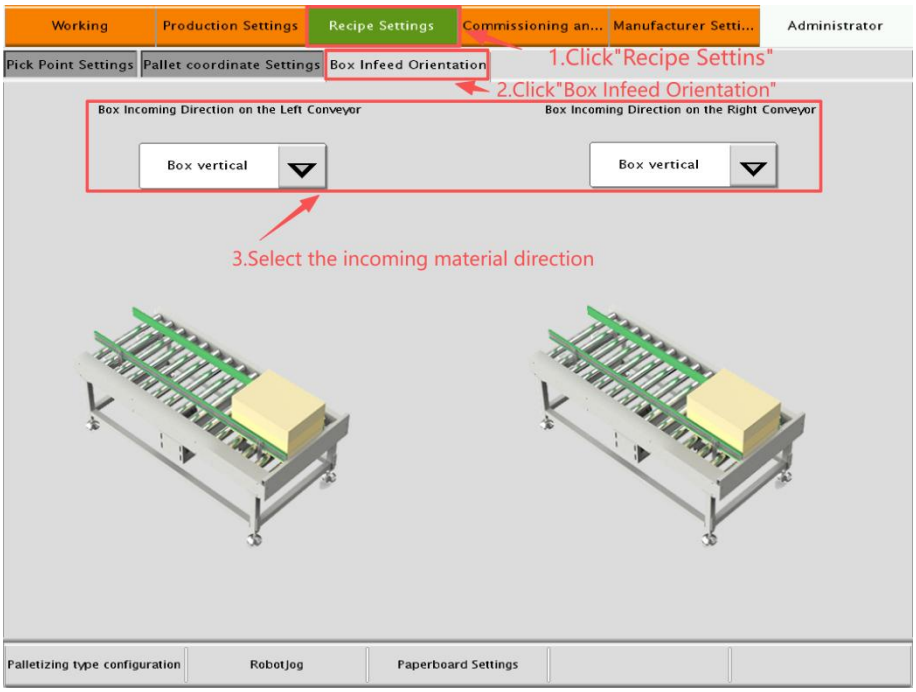


Figure 6-3

6.4 Creating a Multi-Pick and Multi-Place Recipe

The feed orientation mode must match the box's "Feed Orientation." Then select the number of boxes to pick each time and confirm to add the box. If you choose to one-time pick and multi-place-for example, picking 4 boxes and placing 3 first followed by placing 1—pay attention to the rotation direction of the boxes to avoid crushing them. Refer to [Figure 6-4]

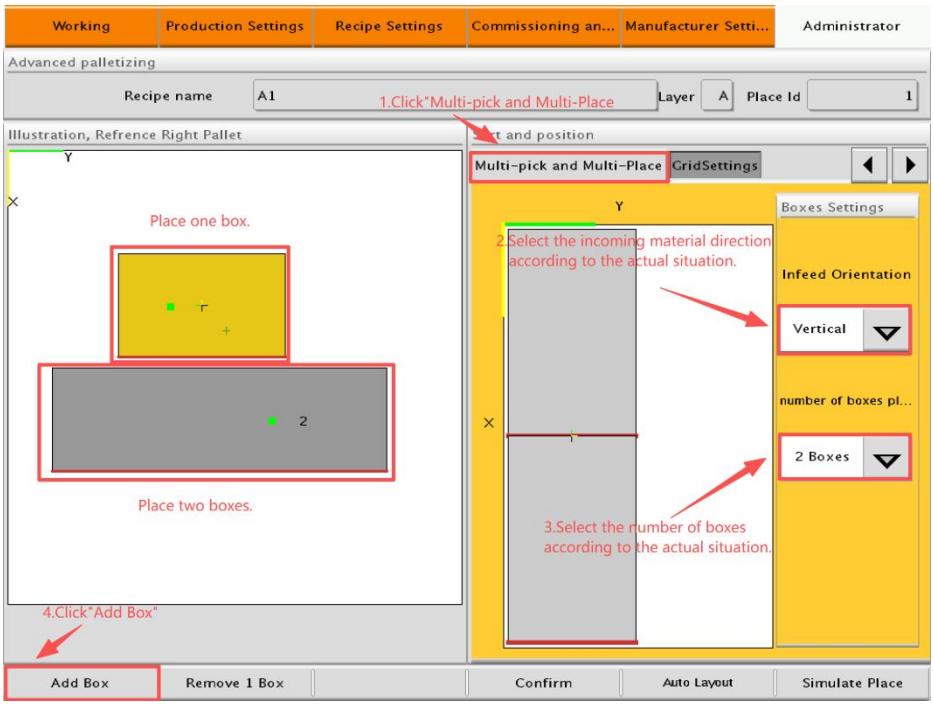


Figure 6-4

7. TEACHING PICK POINTS

7.1 Box Pick Configuration

Select the box type, quantity, and number of incoming conveyor. For example, if there is only one box type on a single conveyor, select the corresponding recipe. Jo the robot to the center point above the box, then “Teach” the pick point (press and hold for 2 seconds).

Refer to [Figure 7-1]

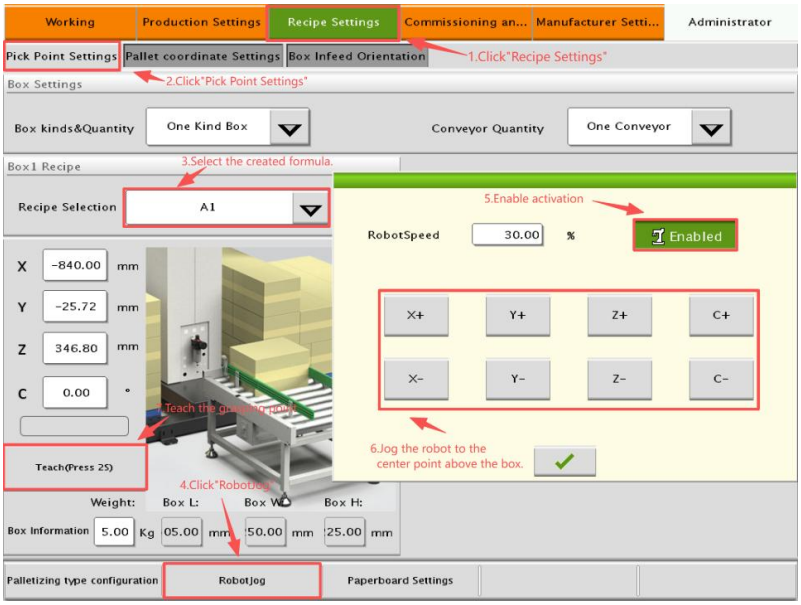


Figure 7-1

If there are two types of boxes, select "Two Kind Box". This will display two teaching pick point functions (left and right). However, for the recipes for the left and right pick, it shall select recipes corresponding to the respective box types. Proceed with teaching the pick points, move the robot to the point above the left box, perform left teaching (press and hold for 2 seconds) on the left incoming material conveyor; similarly, move the robot to the point above the right box, then perform “Teaching” (press and hold for 2 seconds)” on the right incoming material conveyor. Refer to [Figure 7-2]

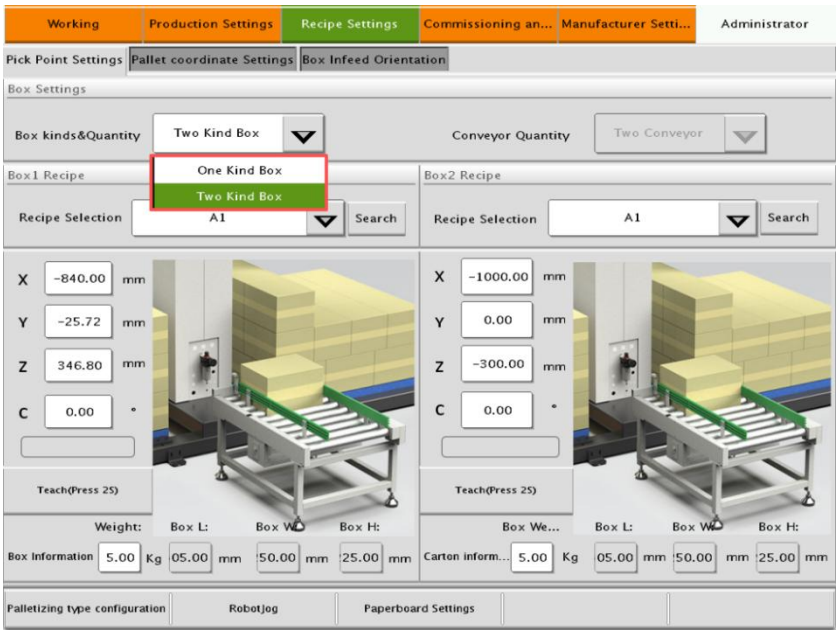


Figure 7-2

If there is only one type of box but the feed consists of two conveyors, the procedure is the same as in Case 2. Select the two conveyors, and the left and right teaching pick point functions will appear. Select the corresponding recipes: for the left side, perform a teaching (press for 2 seconds) on the left feed conveyor; for the right side, perform a teaching (press for 2 seconds) on the right feed conveyor. Refer to [Figure 7-3]

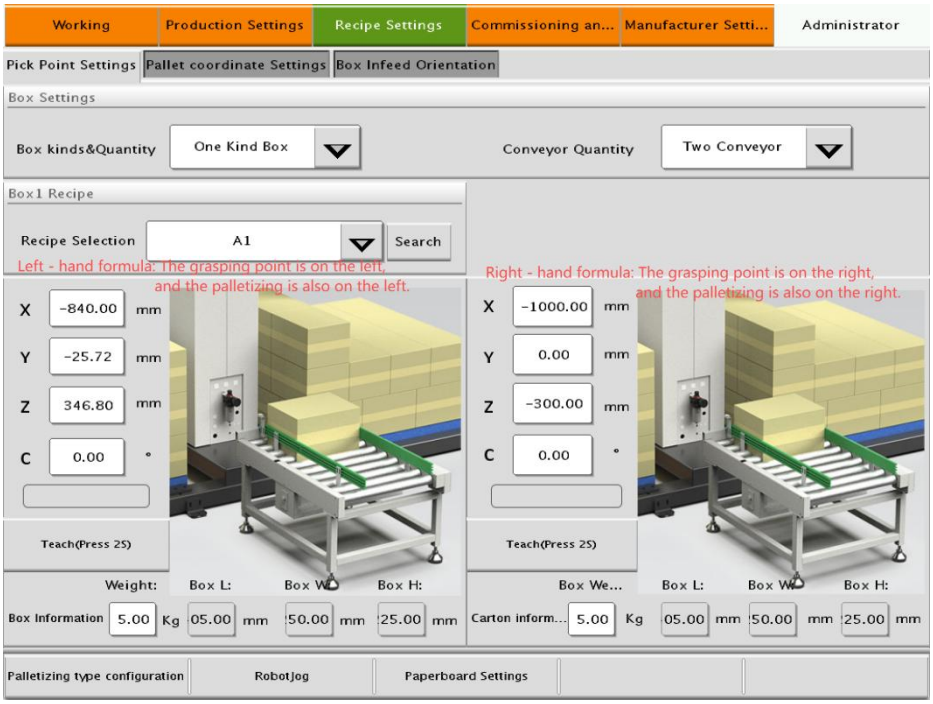
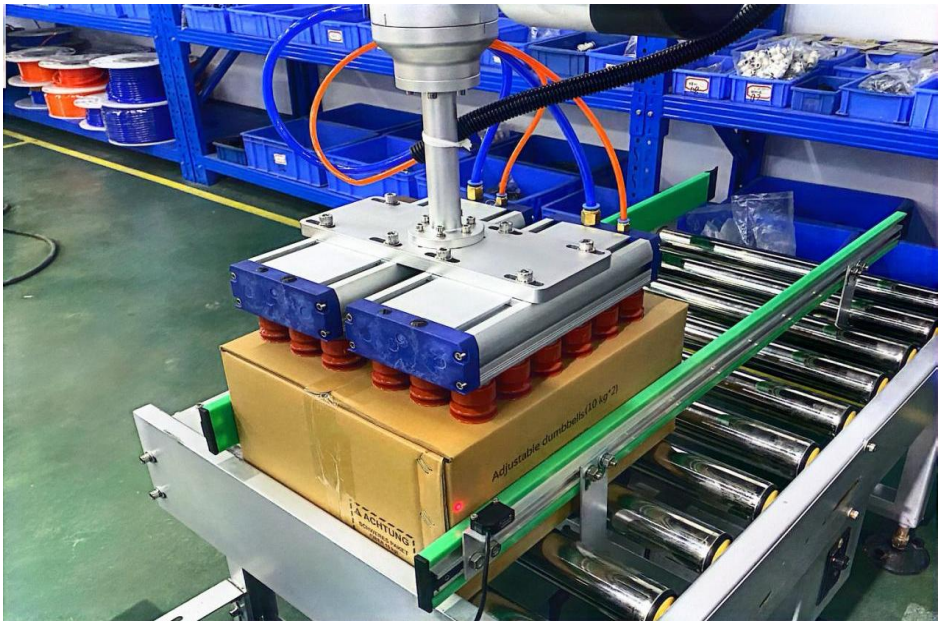


Figure 7-3

Left-side recipe: Pick point is on the left, and palletizing is also on the left.

Right-side recipe: Pick point is on the right, and palletizing is also on the right.



After successfully teaching the pick points, return to the "Daily Production" interface and click "GoHome" [Figure 7-4]

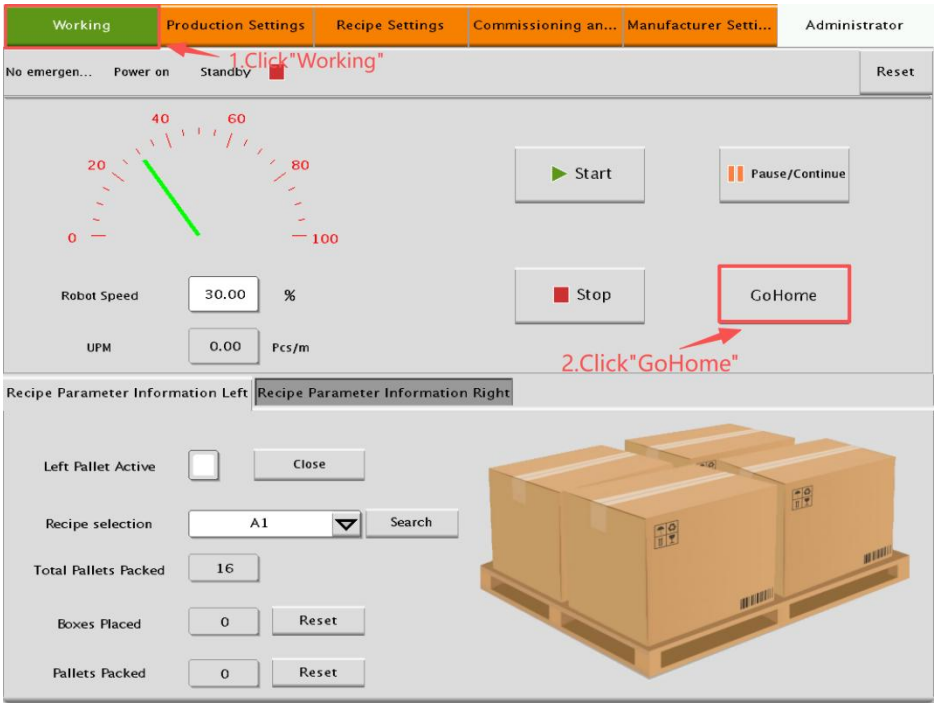


Figure 7-4

8. PALLET COORDINATE SYSTEM SETTINGS AND COLLISION PREVENTION SETTINGS

8.1 Settings Pallet Height Differences

On the "Pallet Coordinate System" page, you only need to modify the "Left Pallet Height Difference" and "Right Pallet Height Difference." These values represent the height between the top surface of the pallet and the top surface of the robot base or the yellow limit rod. Use a tape measure to measure the height difference between the pallet and the robot base or yellow limit rod, then enter the measured value into the "Pallet Height Difference" field for the left or right side. Refer to [Figure 8-1]

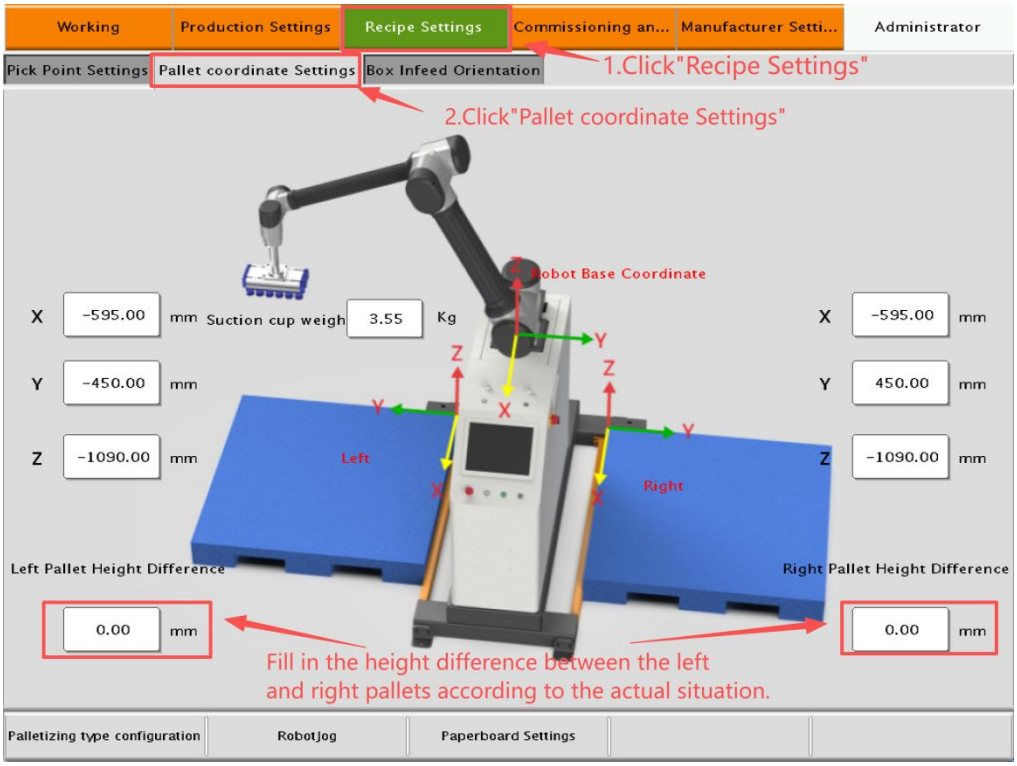


Figure 8-1

8.2 Configuring the Collision Prevention Function

The collision prevention settings are located on the Commissioning and Maintenance page. Simply check the "Enable" box to activate the collision prevention function. You can also modify the collision alarm threshold for each axis to accommodate different sensitivity requirements.

The default alarm threshold is 30; the lower the value, the higher the sensitivity. Refer to [Figure 8-2]

Note: The collision prevention function described above serves only auxiliary safety protection to a certain extent, and cannot fully replace safety equipment such as safety gates and safety optical grating. In certain situations—such as when picking heavy loads or when a high collision prevention redundancy value has been set—a collision with a person, particularly with vulnerable body parts such as the head, may still result in harm. Therefore, when using this collaborative palletizing robot, a safe distance must still be maintained. If necessary, auxiliary safety equipment such as safety gates, safety optical grating, and human detection devices may also be installed.

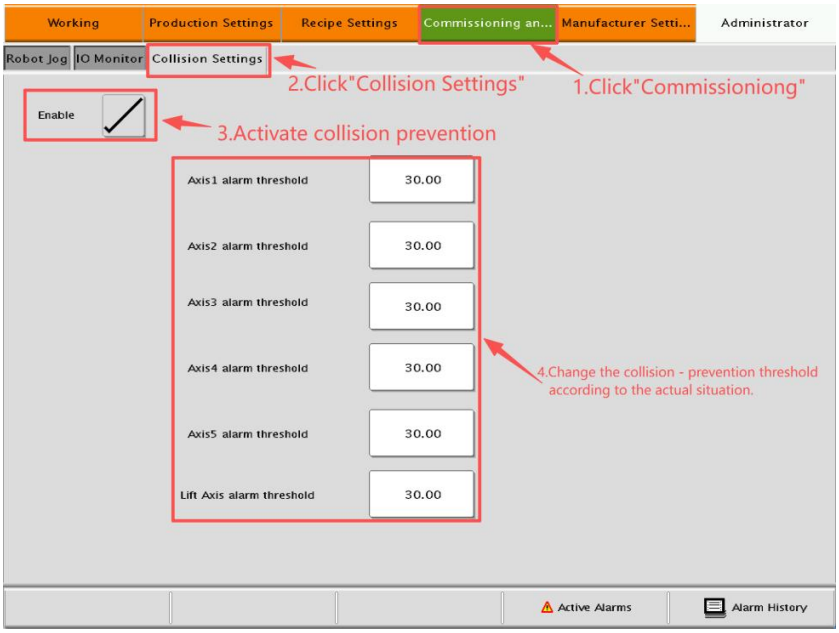


Figure 8-2

Handling a collision alarm:

If operations can continue, first click “Reset” to clear the alarm prompt, then click the “Pause/Continue” button, and the robotic arm will resume its current operation.

If operations cannot continue, the first press of the stop button will reset the alarm, and the second press of the stop button will turn off the suction cup negative pressure. If there is a falling risk for the product on the suction cup, after resetting the alarm, jog the robotic arm to a safe position, then the second press of the stop button will turn off the suction cup negative pressure, allowing the product to drop safely. You can then press the “GoHome” button to return the robotic arm to its home position.

(But it is necessary to ensure that there are no obstacles within the working range of the robot returning to Gohome position. If there are obstacles, remove them or manually move the robot to a safe area before performing “GoHome.” Also, pay attention to whether the number of palletized matches the quantity on the pallet to prevent secondary collision)

Refer to [Figure 8-3]

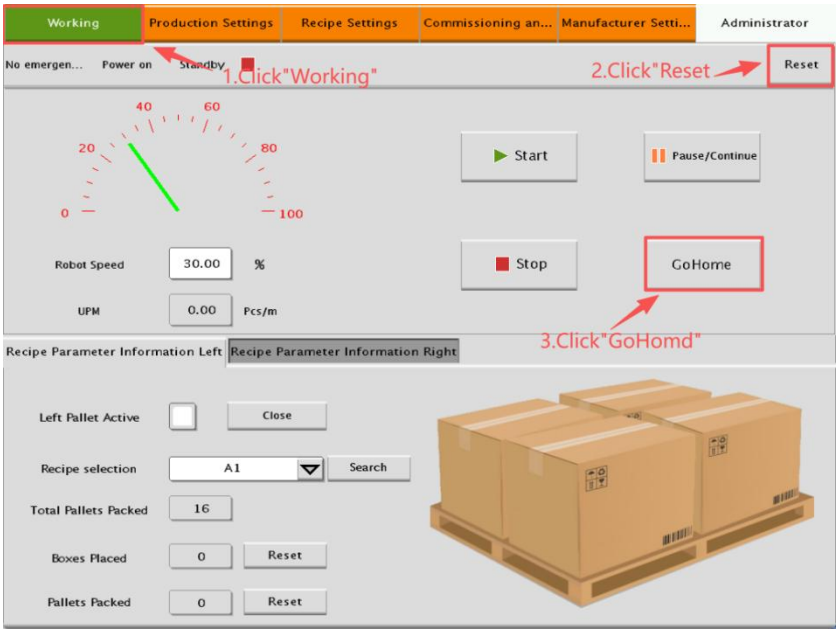


Figure 8-3

9. PRODUCTION SETTINGS

The "Production Settings" page is primarily used to configure the palletizer's parameters, which are typically set during the initial installation of the robotic arm. As shown in the figure below. [Figure 9-1]

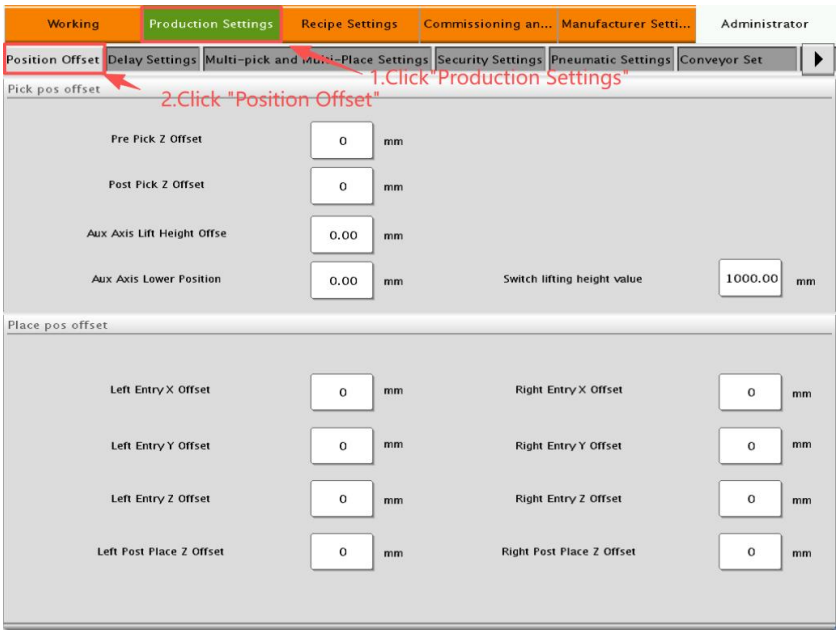


Figure 9-1

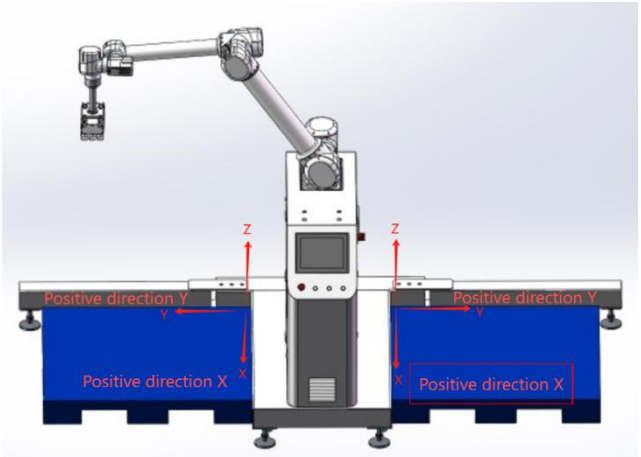
9.1 Description of Entry Point Position Compensation Parameters

Entry point position compensation is based on the pallet coordinate system, and the compensation value is superimposed on the default entry point position to adjust the entry point. The following describes the compensation values for the left entry point.

Left Entry Point Front and Rear (X) Compensation: This applies compensation along the X direction of the left pallet coordinate system. A positive value indicates an offset toward the positive direction X, while a negative value indicates an offset toward the negative direction X. The same principle applies to the Y and Z directions.

The compensation values for the right entry point are based on the right coordinate system, and the principle is the same as for the left entry point.

Refer to the figure below for the pallet coordinate system



10. ROBOT JOG

10.1 Robot Single-Axis Jog

Click "Commissioning & Maintenance" to enter the interface, then click "Enable" to perform manual jog, world coordinate jog, and zero-point calibration. Refer to [Figure 10-1] and [Figure 10-2] **(Note: Zero-point calibration requires a long press of 2 seconds to prevent accidental operation. Unless the robot motor encoder battery is dead or the motor has been replaced, generally there is no need to reset to zero.)**

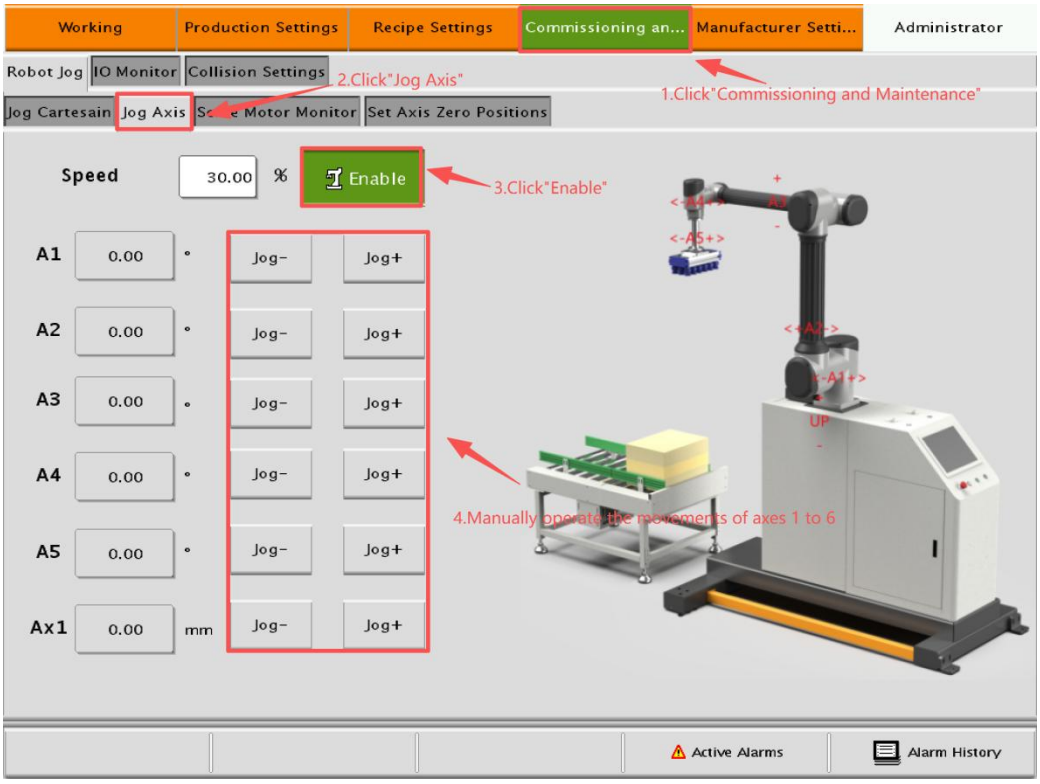


Figure 10-1

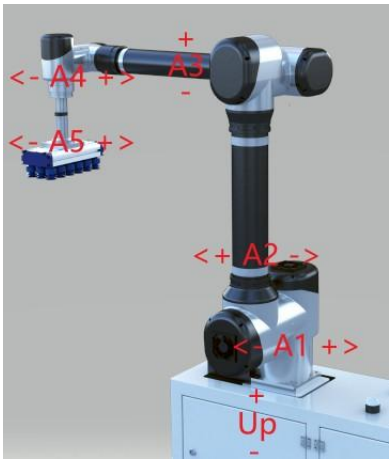


Figure 10-2

Jog Operation {Note: When the lifting and lowering axis is at the zero position, it is recommended not to use the "Jog -" function, as this will trigger an axis limit alarm}

A1 -0.37 ° Axis 1	Click Jog- to turn left	Click " Jog+ " to turn right
A2 84.03 ° Axis 2	Click Jog- to move up	Click Jog+ to move down
A3 -0.06 ° Axis 3	Click Jog- to move down	Click Jog+ to move up
A4 -84.06 ° Axis 4	Click Jog- to move straight ahead	Click Jog+ to move backward and forward
A5 -0.37 ° Axis 5	Click Jog- to rotate counterclockwise	Click Jog+ to rotate clockwise
Ax1 -0.01 mm Lifting and Lowering Axis	Jog- Move down	Click Jog+ to move up

10.2 Robot World Coordinate Jog

Refer to [Figure 10-3] and [Figure 10-4]

- **Press the "+" or "-" button corresponding to the X/Y/Z direction to control the robot's movement along the X/Y/Z direction and the rotation of the C-end.**

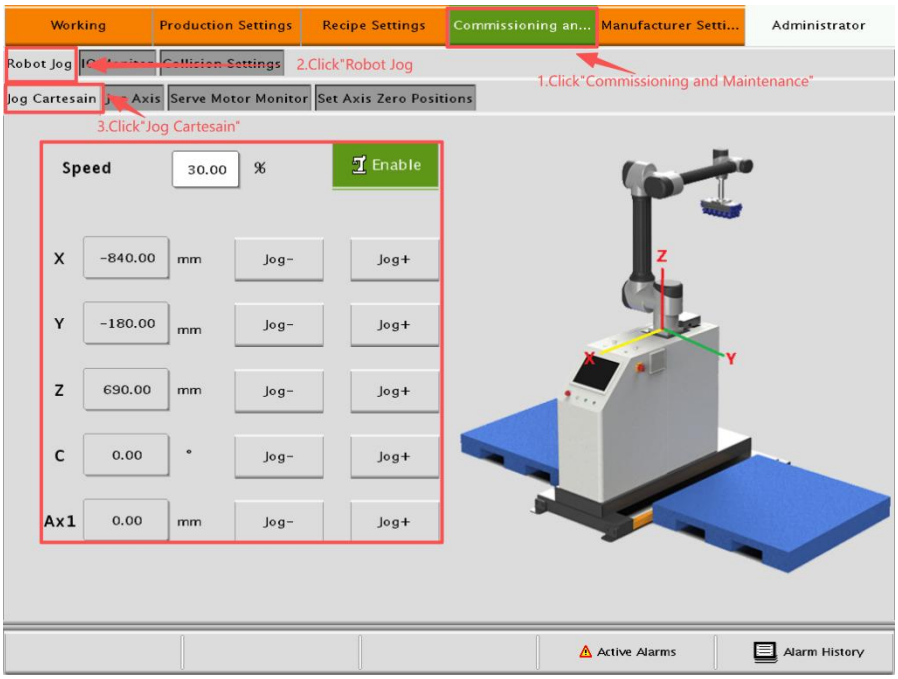


Figure 10-3

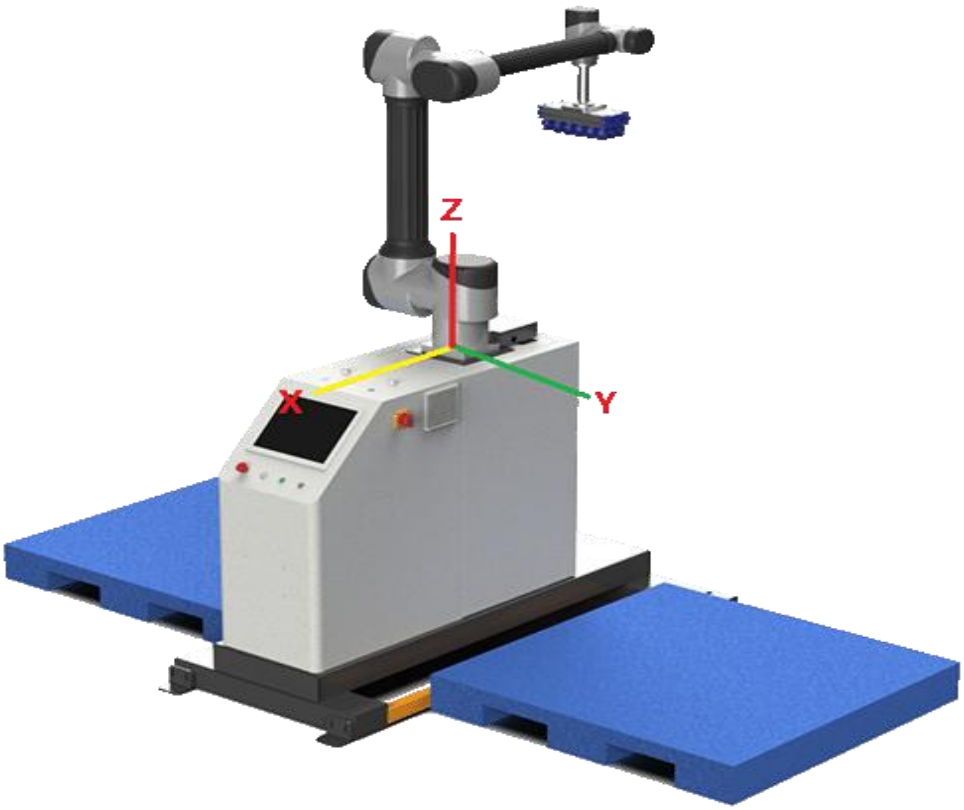


Figure 10-4

10.3 Set Axis Zero Positions

If the zero point of the robot's axes is lost due to battery or motor replacement, follow these steps (Important: If there is no zero point loss, do not set the zero point yourself, as it may cause the robot's position to be incorrect). Refer to [Figure 10-5]

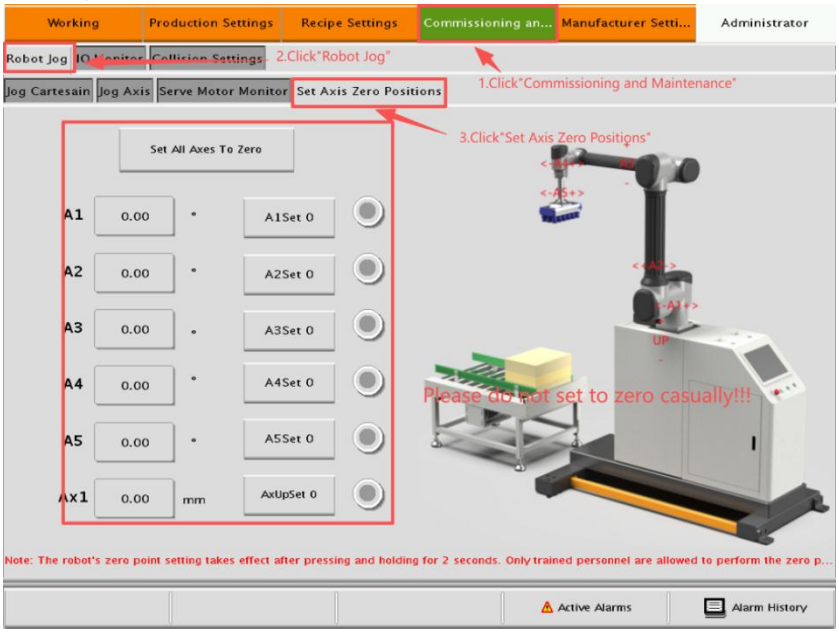


Figure 10-5

To zero Axis 1, jog the robotic arm to move Axis 1 to the mechanical zero point and align it with the scale [Figure 10-6]. Then, press and hold the "A1 Set 0" button for 2 seconds. The current position will display as 0 degree, and the circular icon on the right will turn black, indicating successful zeroing [Figure 10-7]

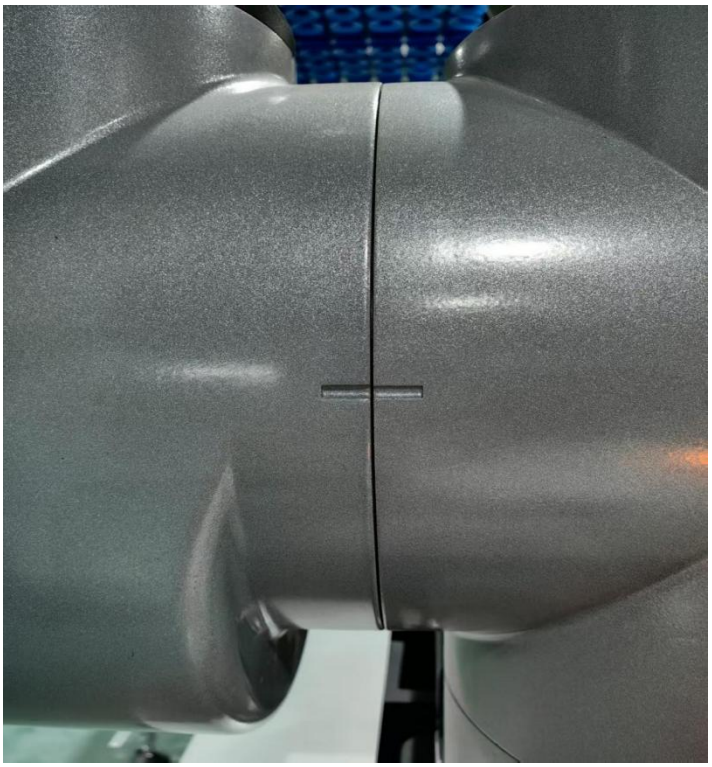


Figure 10-6

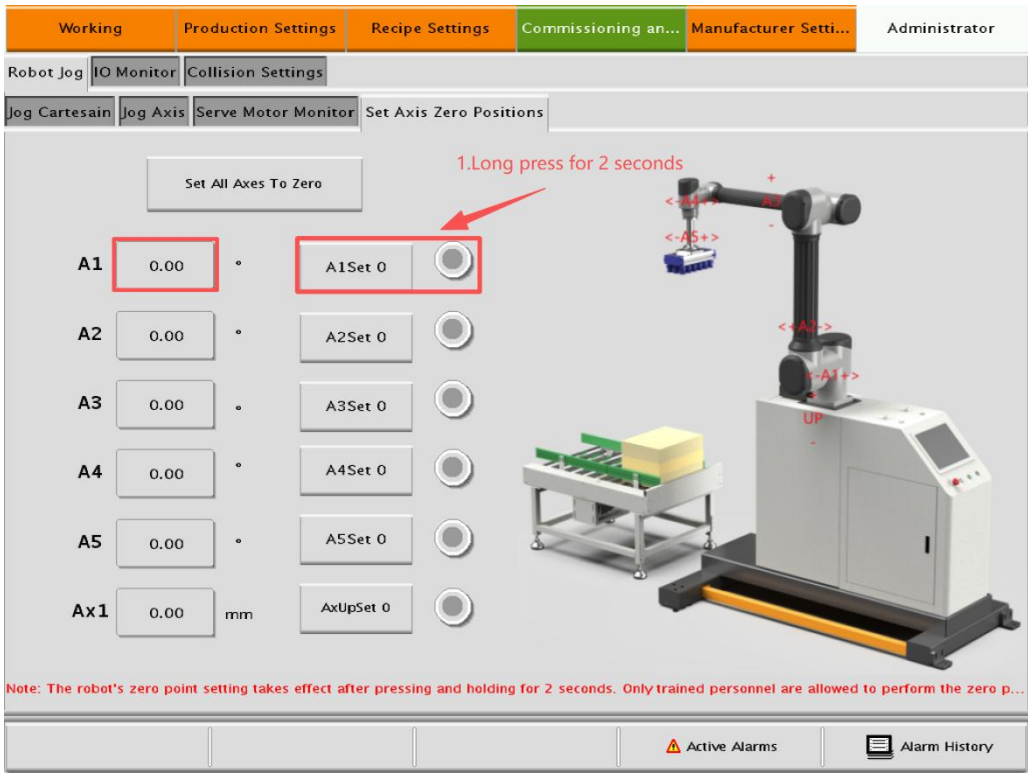


Figure 10-7

The zeroing procedure for Axes 2, 3, 4 and 5 is the same as for Axis 1.

To zero the lifting and lowering axis, manually move the lifting and lowering axis to the position shown in [Figure 10-8]. The base of the lifting and lowering axis shall be slightly higher than the chassis surface. Then, press and hold the “set lifting and lowering axis zero” button for 2 seconds. When the display shows 0 degree and the circular icon on the right turns black, zeroing is successful.

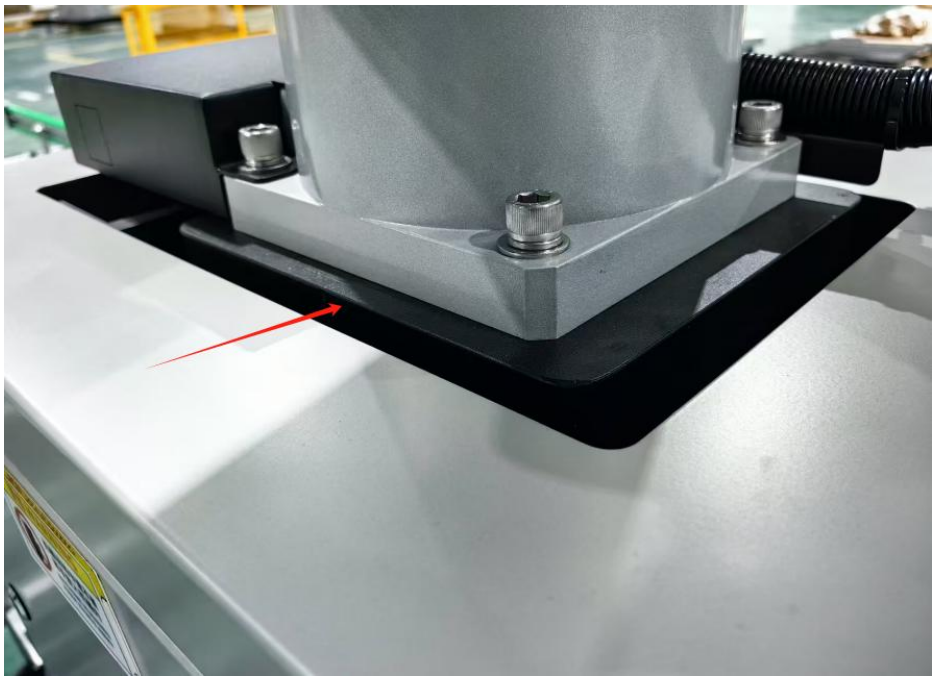


Figure 10-8

The robot's posture at the zero point is shown in the figure below [Figure 10-9]

Figure 10-9

11. STARTING THE ROBOT

11.1 Precautions for Starting the Robot

Precautions Before Starting the Robot [Figure 11-1]

First: Check whether the number of palletized boxes displayed on the interface matches the number of boxes on the pallet;

Second: Check whether that the recipe names for the left and right pallets are correct.

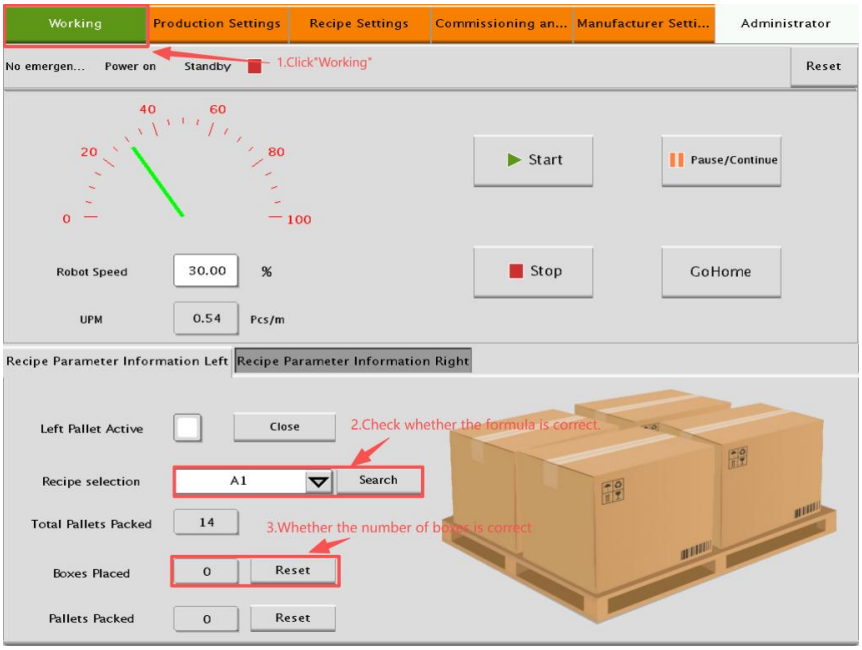


Figure 11-1

Check whether the input signals are normal, such as the photoelectric sensor signals for IO.6 and IO.7, which are commonly used. [Figure 11-2]

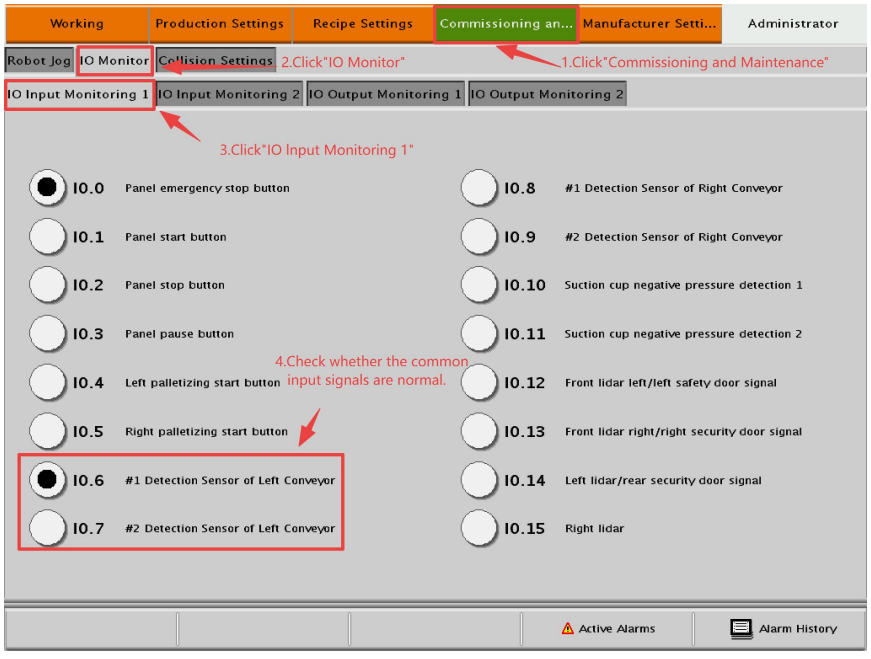


Figure 11-2

Check whether the required output signals are normal. [Figure 11-3]

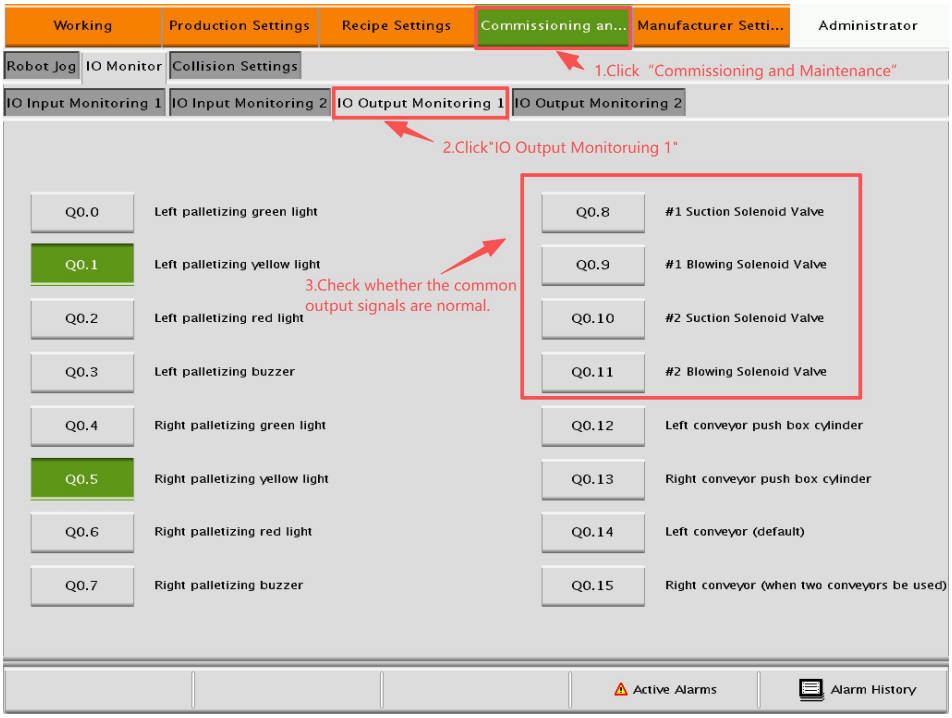


Figure 11-3

Check whether the "pallet height difference" on the left and right sides is correct or not. [Figure 11-4]

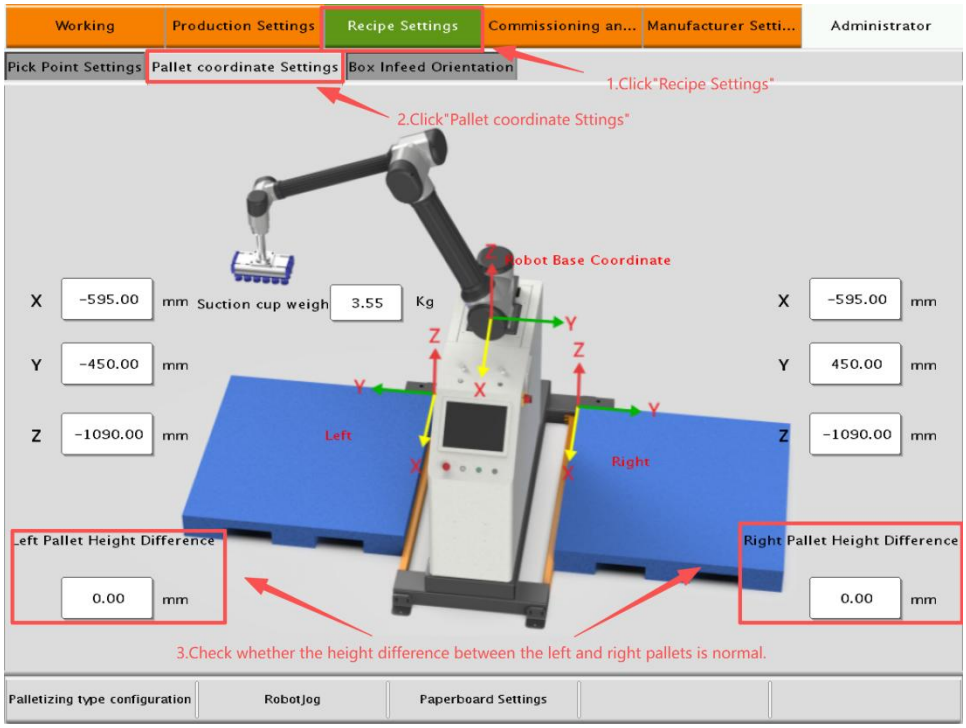


Figure 11-4

After check, reduce the speed to below 30% to prevent collisions. Once everything is confirmed to be correct, click "Start" [Figure 11-5]

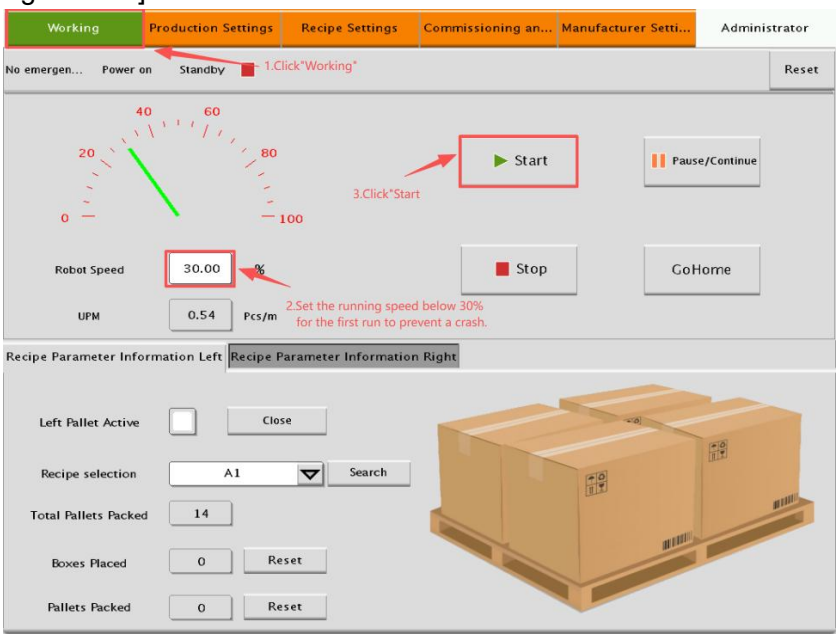


Figure 11-5

After clicking the Start button, wait for the robot to finish running. Then, press the "Left Start Button" and "Right Start Button"; when the lights turn green, the robot enters working mode.

Note: After clicking the "Start" button, pressing only the "Right Start Button" will cause the robot to palletize on the right side; similarly, for the left side. If both the "Left" and "Right" palletizing start buttons are pressed, the robot will begin palletizing on both the left and right sides simultaneously. [Figure 11-6]

Figure 11-6

CONCLUDING REMARKS

Thank you for using this Company's product!

This product has a warranty period of twelve months. During the warranty period, if the product malfunctions or is damaged under normal use as described in the user manual, this Company will provide free repairs.

During the warranty period, repair fees will be charged for damage caused by the following reasons:

a) Damage to the machine caused by misuse, unauthorized disassembly, repair, or modification;

b) Damage to the machine caused by fire, flood, abnormal voltage, other natural disasters, or secondary disasters;

c) Hardware damage resulting from accidental drops or transportation after purchase;

d) Damage to the machine resulting from failure to follow the user manual provided by this Company;

e) Malfunctions or damage caused by factors unrelated to the machine (such as external equipment);

f) Damage to the machine caused by improper commissioning procedures

Precautions During Commissioning

a) During the commissioning, ensure that no personnel approach the robot's working area to prevent unnecessary safety incidents

b) During commissioning, keep your hand on the emergency stop button

c) During commissioning, keep the speed between 10% and 30%

d) Ensure the collision prevention function is enabled while the robot is in operation

e) When production stops, stop and reset the robot, then disconnect the power supply

f) If any unusual noises or malfunctions occur during production, stop the machine immediately and inspect it

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