

DOBOT CRA/CRH Series Palletizing Workstation

Quick Start Guide

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Preface

Purpose

This document provides an overview of the DOBOT CRA/CRH palletizing workstation, including its operating procedures, hardware installation, software configuration, and the operation and monitoring of palletizing projects, helping users get started quickly.

Intended audience

This document is intended for:

- Customer
- Sales Engineer
- Installation and Commissioning Engineer
- Technical Support Engineer

Compatible versions

Product		Version	How to obtain
Palletizing Process Package		Palletizing_v2-4-2-stable	Contact technical support for access
CR20A	DobotStudio Pro (PC / Android / Teach Pendant)	4.6.4.0-stable or above	DOBOT Download Center
	Controller	4.6.6.0-pal-stable	Upgrade via Robot Maintenance Tool (Get the Robot Maintenance Tool from DOBOT Download Center)
CR30H	DobotStudio Pro (PC / Android / Teach Pendant)	4.7.0.0-stable	DOBOT Download Center
	Controller	4.7.3.1-stable	Upgrade via Robot Maintenance Tool (Get the Robot Maintenance Tool from DOBOT Download Center)

NOTE: The current version of DobotStudio Pro does not support import or export functions when running on the Teach Pendant.

Related documents

Document	Description	Download link
DOBOT Palletizing Workstation Safety Function Manual	Introduces the operations of Sick safety LiDAR.	Contact technical support for access.
DOBOT CRA Series Hardware User Guide	Introduces the functions, technical specifications, and installation guidance for DOBOT CRA series collaborative robots.	
DOBOT CRH Series Hardware User Guide	Introduces the functions, technical specifications, and installation guidance for DOBOT CRH series collaborative robots.	

Revision history

Date	Version	Revised content
2026-04-16	V2.4.2	The first release

Symbol conventions

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

Symbol	Description
 DANGER	Indicates a high potential hazard that, if not avoided, could result in death or serious injury.
 WARNING	Indicates a hazard with a medium level or low level of risk which, if not avoided, could result in minor or moderate injury, robot arm damage.
 NOTICE	Indicates a potential risk that, if ignored, could result in robot arm damage, data loss, or unpredictable result.
 NOTE	Provides additional information to emphasize or supplement important points in the main text.

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1. Palletizing Workstation Workflow

Module	Operation steps		Reference content
Hardware installation	1.	Prepare materials and confirm installation environment	Pre-installation preparation
	2.	Unpack to verify that the shipped items match the packing list	Unpacking
	3.	Transport the robot arm, base, controller, and related accessories	Unpackaged transportation
	4.	Install base pallet barriers and pallet position sensors	Base installation
	5.	Install and connect the controller to the base	Robot controller installation
	6.	Install and connect the robot arm to the base	Robot arm installation
		Install and connect the end-of-arm suction cup	End-of-arm suction cup installation
	7.	Install the conveyor	Conveyor installation
	8.	After confirming that all installation and wiring are correct, start the palletizing workstation	Power-on
Software configuration	9.	Get the corresponding palletizing process package plugin	Compatible versions
	10.	Install the palletizing process package plugin	Palletizing plugin installation
	11.	Set the palletizing workstation	a. Select column / lifting column, set suction cup type and size Set workstation basic parameters
			b. Create tool coordinate system Create tool coordinate system
	12.	Create a new project and configure parameters	a. Set interlayer coordinate system (required only for projects using interlayer) Set interlayer coordinate system
			b. Select "Palletizing mode", "Palletizing type", "Conveyor" Set basic parameters

Module	Operation steps		Reference content
		direction", "Interlayer", and "Box type"	
		c. Set box and pallet parameters	Set box/pallet parameters
		d. Self-define the stacking pattern or select an automatic stacking pattern	Set stacking pattern
		e. Set the number of layers and the stacking pattern used for each layer	Set number of layers
		f. Set the number, size, and position of interlayers (required only for projects using interlayer)	Set interlayer
		g. Set picking point, placing point and transition point	Set points
		h. Check if the points are reachable and save the project	Check reachability
Run and monitor project	13. Run palletizing project		Run palletizing project
	14. Monitor the project operation data in real time		Real-time monitoring of palletizing project

2. Hardware Installation

2.1 Pre-installation preparation

Material preparation	Recommended installation environment
- End-of-arm suction cup (purchased from DOBOT or self-provided). - Pneumatic equipment: airflow > 350 NL/min, air tube diameter 12 mm, stable air supply pressure at 0.6 MPa. - Conveyor. - Incoming material sensor. - Picking point fixing structure.	- Indoor installation. Ensure good ventilation, free from dust, oil mist, smoke, salinity, metal powder, corrosive gases, and other contaminants. - Keep away from excessive vibration and shock. - Do not use in a closed environment. - Keep away from flammable. - Keep away from sources of electromagnetic interference.

2.2 Unpacking

Before unpacking, carefully inspect the outer packaging. If any damage is found, please unpack in the presence of shipping company's representative. After unpacking, check the attached shipping list to ensure that all contents are included and intact. If anything is missing or damaged, contact your supplier.

2.3 Unpackaged transportation

Hoisting the robot arm

- During hoisting, the robot arm must remain in its packaged posture.
- While moving and installing the robot, manually support the arm until all base mounting bolts are fully tightened.
- Use only the factory-provided lifting sling for hoisting. For detailed hoisting instructions, refer to ["Robot arm installation"](#).

For CR20A: Secure the lifting sling to the J1 joint and the upper arm. Never secure the lifting sling to J3–J6 joints or the forearm.

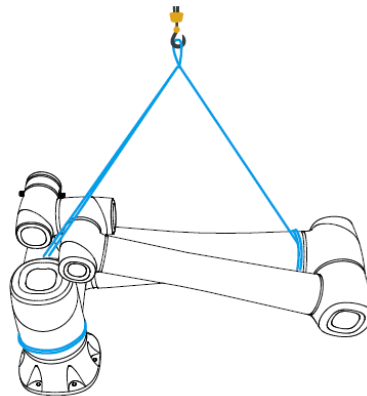


Figure 2.1 CR20A hoisting

For CR30H: Never secure the lifting sling to J3–J6 joints or the forearm.

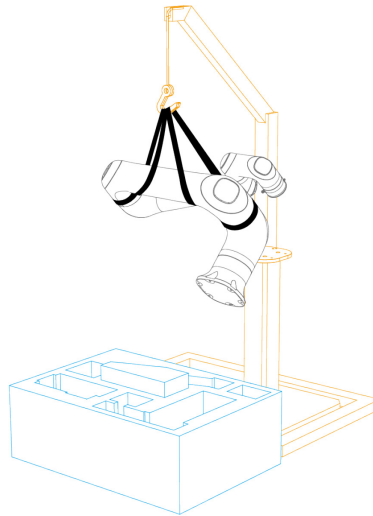


Figure 2.2 CR30H hoisting

Transporting the workstation (same for CR20A & CR30H)

Use a forklift to enter the palletizing base from the side and lift the workstation, as shown in the figure below:

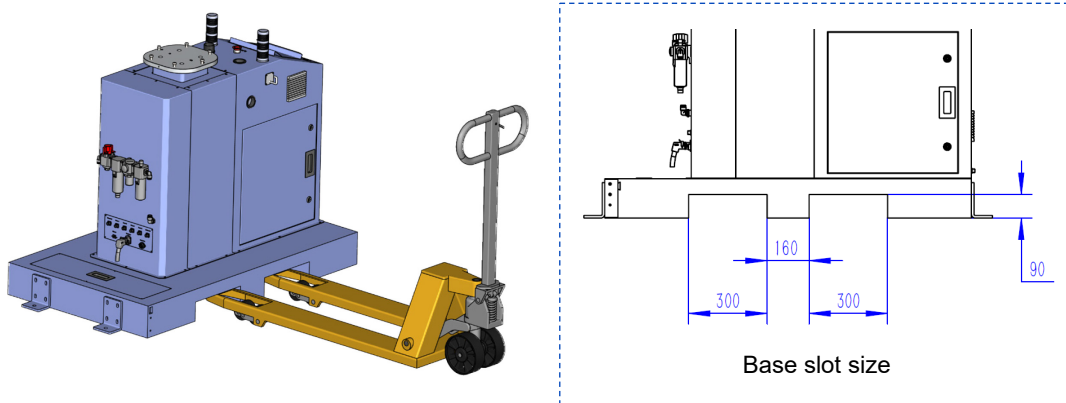


Figure 2.3 Transport the workstation

Adjusting the leveling feet (same for CR20A & CR30H)

If the ground where the workstation is placed is uneven, adjust the leveling feet to prevent the workstation from shaking.

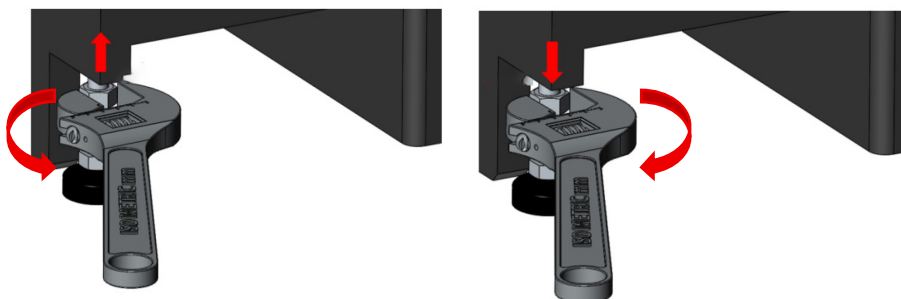


Figure 2.4 Leveling feet (counterclockwise to raise, clockwise to lower)

2.4 Installation of CR20A palletizing workstation

The pre-installation and wiring of the main parts of the Palletizing Workstation have been completed before delivery, and users only need to carry out simple assembly. This document takes the installation of the CR20A Lifting Palletizing Workstation as an example. The other models are installed in a similar way.

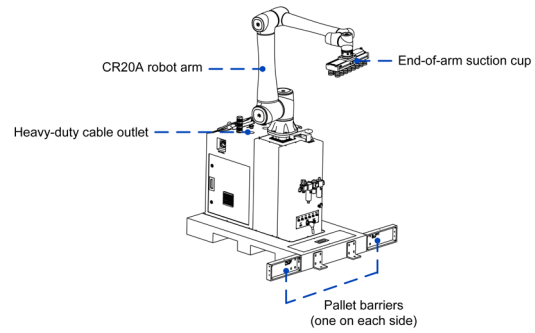
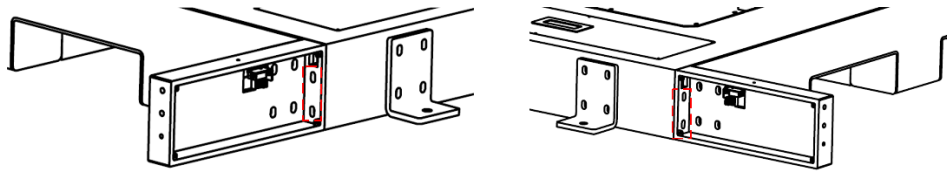


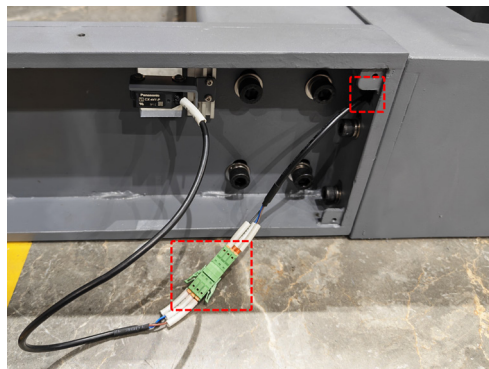
Figure 2.5 Assembly diagram of the workstation

2.4.1 Base installation

- ① Install the pallet barriers on both sides of the base and lock them with four M10*20 screws.



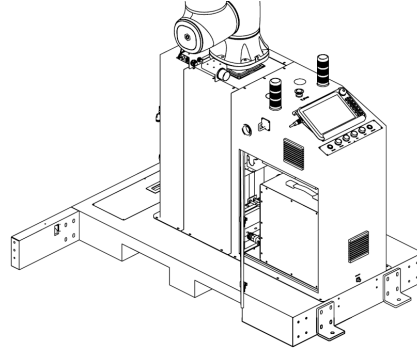
- ② Remove the plug of the pallet-in-position sensor from the base, route it through the cable hole, and connect it to the sensor cable.



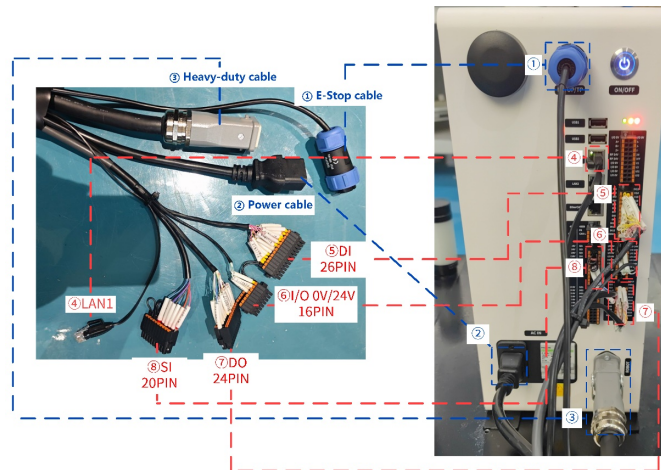
2.4.2 Robot controller installation

By default, the controller is factory-installed on the base of the palletizing workstation, no installation or wiring is required. If your controller is shipped separately, refer to the following instructions for installation:

- ① Place the controller in the position shown below.

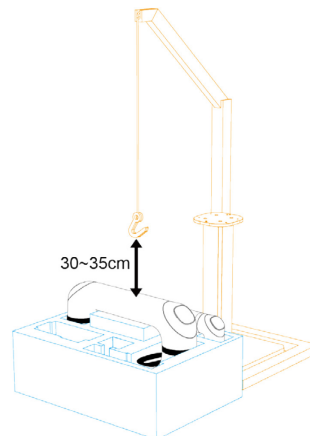


- ② Refer to the figure below to complete the wiring of the controller.

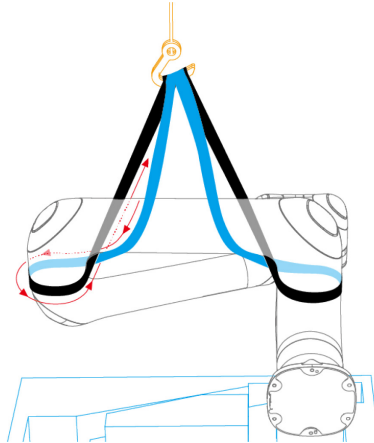


2.4.3 Robot arm installation

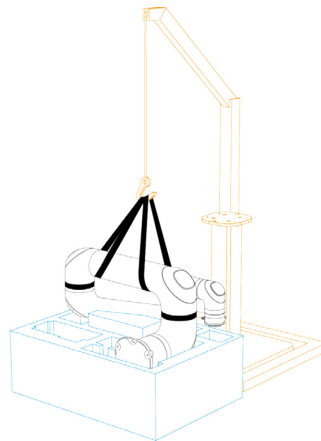
- ① Move the hoist so that the hook aligns with the central axis of the robot arm and is positioned approximately 30–35 cm away from it.



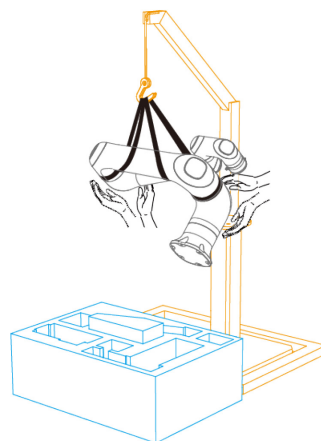
- ② Wrap the sling in a **figure-eight pattern** as shown in the diagram below.



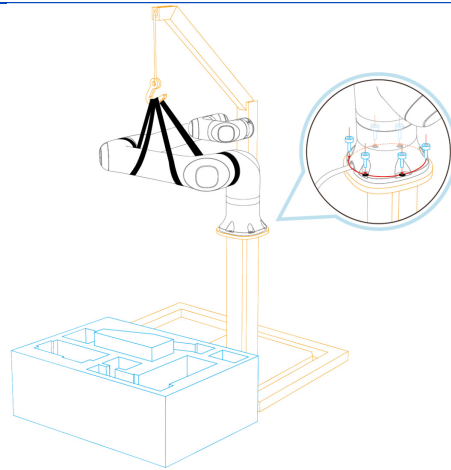
- ③ Hang the sling from the robot arm onto the hook.



- ④ Operate the hoist to slowly lift the robot arm, ensuring that staff hold and support the arm throughout the entire process.



- ⑤ Hoist the robot arm to the top of the workstation cabinet, aligning the **heavy-duty cable** toward the front panel of the workstation. Secure it using six M10*25 screws.



- ⑥ Connect the heavy-duty cable placed next to the column with the interface of the heavy-duty cable protruding from the robot base.

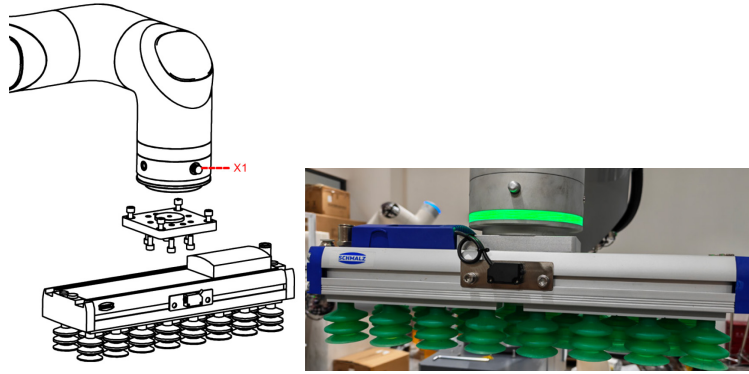


2.4.4 End-of-arm suction cup installation

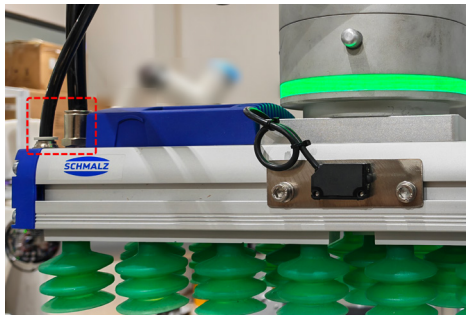
- ① Install the end-of arm suction cup. Lock it with ten M8*12 screws and one Ø8*15 pin. Refer to the figure below to install the suction cup. Then, connect the sensor cable attached to the suction cup to the aviation connector (X1) at the end of the robot arm.

NOTE

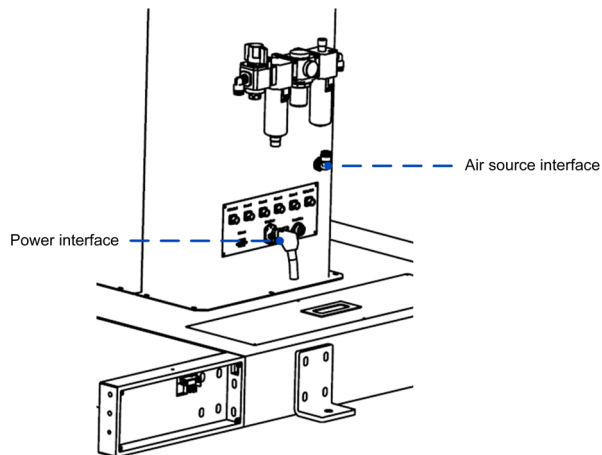
The direction of the X1 aviation connector must remain perpendicular to the suction cup's direction. Failure to do so may result in abnormalities during picking and placing operations.



- ② Connect the air hose to the suction cup port.



- ③ Connect the pneumatic equipment (prepared by user, air flow $\geq 500\text{L/min}$, air tube diameter: 12mm) to the air source interface.

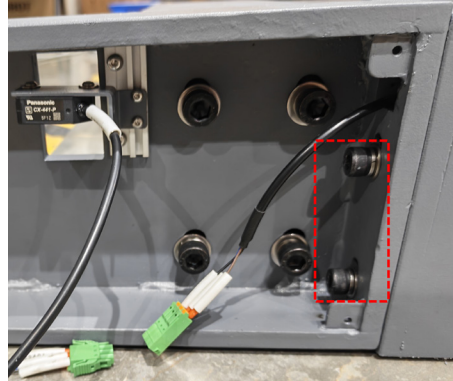
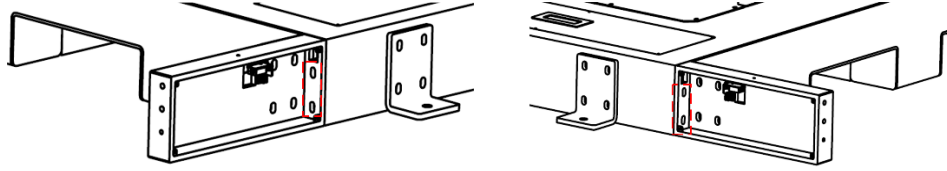


- ④ Connect one end of the power cable supplied with the device to the power interface and the other end to the external power.

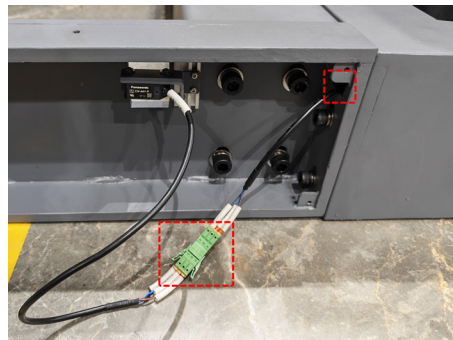
2.5 Installation of CR30H palletizing workstation

2.5.1 Base installation

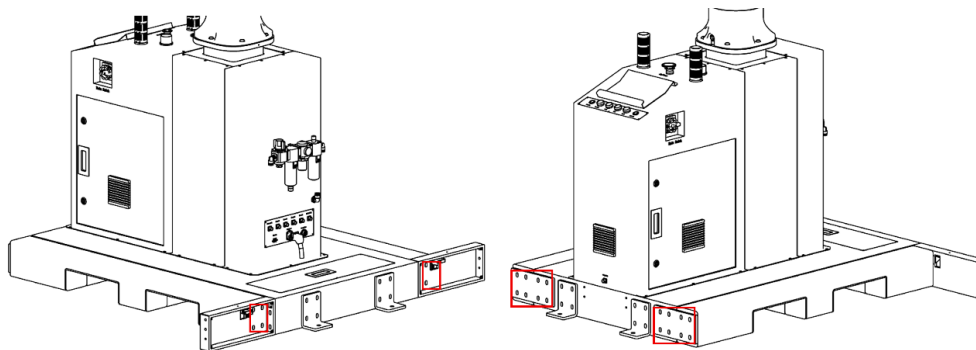
- ① Install the pallet barriers on both sides of the base and lock them with four M10x20 screws.



- ② Remove the plug of the pallet-in-position sensor from the base, route it through the cable hole, and connect it to the sensor cable.



- ③ Install the base extension plates on both sides. For each side, secure the front with eight M10x25 screws and the rear with four M10x25 screws.



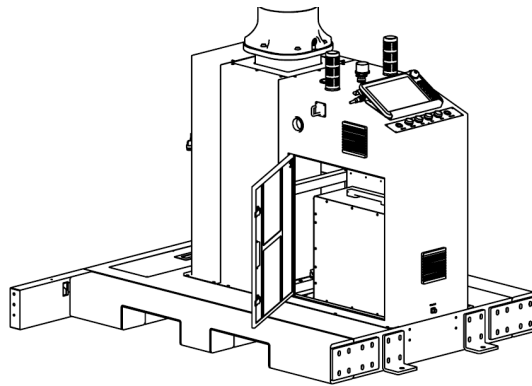
- ④ After installing the side cover for the pallet edges on both sides separately, fasten each side cover with four M10x25 screws.



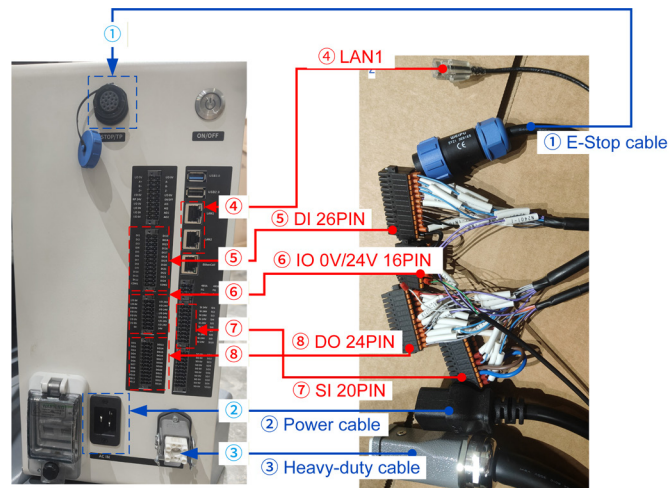
2.5.2 Robot controller installation

By default, the controller is factory-installed on the base of the palletizing workstation, no installation or wiring is required. If your controller is shipped separately, refer to the following instructions for installation:

- ① Place the controller in the position shown below.



- ② Refer to the figure below to complete the wiring of the controller.



2.5.3 Robot arm installation

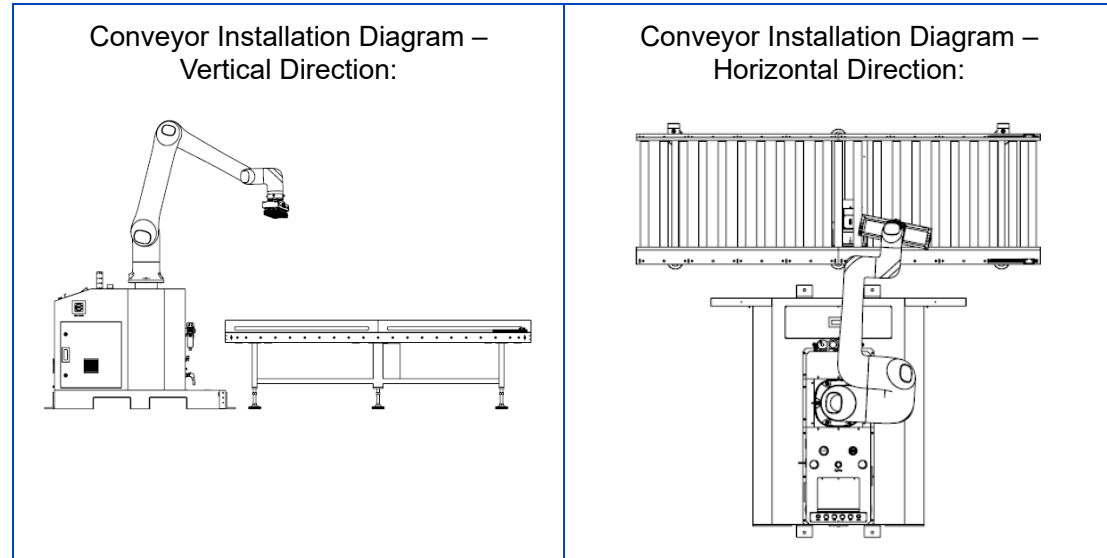
The same as for CR20A robot arm. Refer to ["2.4.3 Robot arm installation"](#).

2.5.4 End-of-arm suction cup installation

The same as for CR20A robot arm. Refer to ["2.4.4 End-of-arm suction cup installation"](#).

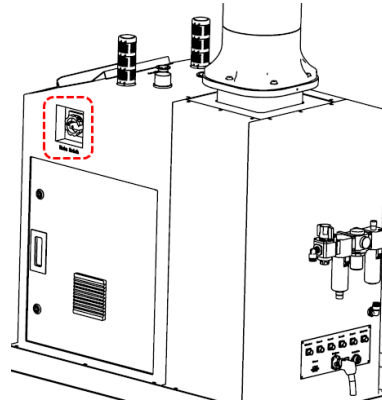
2.6 Conveyor installation

Install the conveyor either vertically or horizontally on the front of the palletizing workstation barriers (no special requirements for installation height). It is necessary to use barriers or photoelectric sensors to ensure that when the box reaches the picking point, it will stop and wait for the robot arm to pick it up (the picking point must be within the reach of the robot arm's suction cup and as close to the workstation as possible).



2.7 Power-on

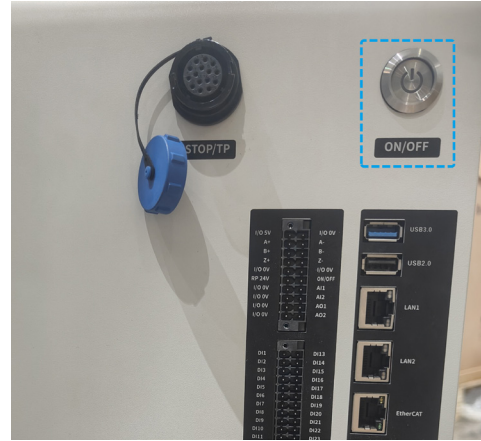
- ① After confirming that all wiring is correct, turn the main power switch to power on the workstation.



- ② Press the power switch on the robot controller to start it.



CR20A Controller ON/OFF button



CR30H Controller ON/OFF button

NOTICE

- After power-on, press and hold the reset button on the workstation control panel to clear the emergency stop error.
- It is recommended to run the robot at low speed for about 5 minutes after power-on to warm it up before performing other operations. Setting the robot to 100% speed immediately after power-on may damage the robot.

3. Software Configuration

This chapter takes the PC control software (DobotStudio Pro) as an example to explain the operation method (which is basically the same as that of the App control software). For basic operations of DobotStudio Pro (such as connecting to the robot, enabling and jogging), please refer to its help document.

3.1 Palletizing plugin installation

NOTE

If a version 2.4.1 or earlier of the Palletizing plugin has been previously installed and configured, you must first uninstall the old version. Then, import and install version 2.4.2 of the plugin. After installation, the [Palletizing workstation settings](#) must be reconfigured.

1. After connecting the robot with DobotStudio Pro, open the Dobot+ page and import the Palletizing plugin.

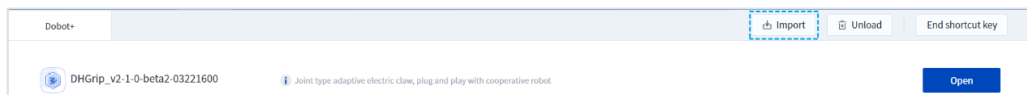


Figure 3.1 Install the plugin

2. The currently installed plugin is the Basic Version. To upgrade to the Professional Version, open the Palletizing plugin and click "Upgrade to Pro Version" or any  icon to enter the upgrade page.

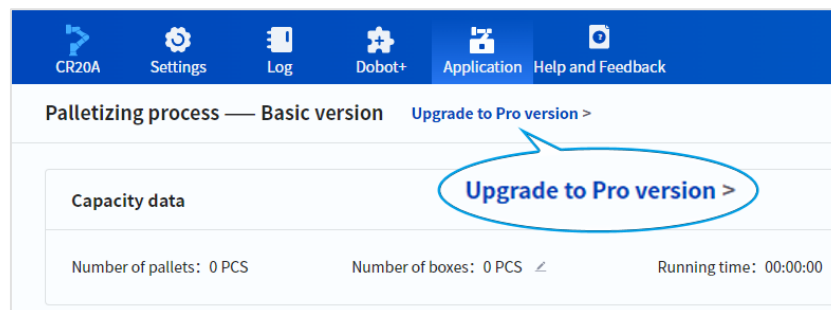


Figure 3.2 Upgrade to Pro Version

3. Click "Upgrade Now" to enter the license interface and copy the device serial number.

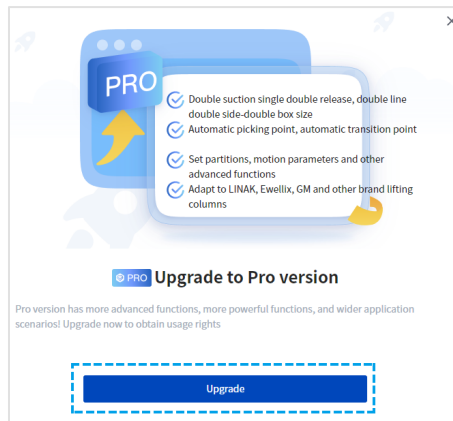


Figure 3.3 Upgrade

4. Visit dobotplus.dobot-robots.com to obtain a registration code. Return to the Palletizing plugin license window, paste the registration code or import the registration file, then click "Upgrade Now" and wait for the upgrade to complete.

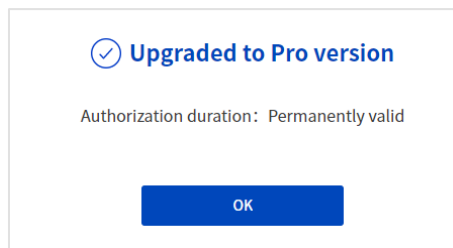


Figure 3.4 Upgrade Successful

3.2 Set the palletizing workstation

If you're using the Palletizing plugin for the first time, or if you've recently replaced or adjusted the workstation hardware, you'll need to configure the workstation settings. Click "⚙️ **Workstation settings**" at the top right corner to open the workstation settings page.

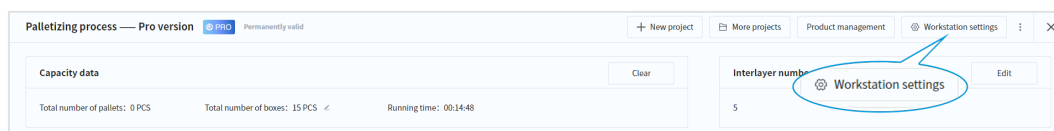


Figure 3.5 Workstation settings

3.2.1 Set workstation basic parameters

Figure 3.6 Basic settings

No.	Module	Description
①	Unit	Set the units of length and weight used for configuring suction cup, pallet, and box parameters.
②	Workstation Hardware	Select column or lifting column, suction cup type and size. For multi-channel suction cups, please contact DOBOT Technical Support for customization.
③	Enable safety protection	Palletizing height limit: When checked, allows setting the maximum stacking height for the current workstation. Box collision detection: When checked, enables the box collision detection function.
④	IO signals	Pre-configured by default. No modification is required unless the hardware configuration has been changed.

3.2.2 Set coordinate system

Figure 3.7 Coordinate system settings

No.	Module	Description
①	Tool coordinate system	A reference coordinate system based on the end-of-arm suction cup. See Create tool coordinate system for details.
②	Pallet user coordinate system	A label indicating the pallet's user coordinate system is included with the shipment. Enter the pallet's user coordinate system according to the label. If recalibration is required, please refer to the <i>Palletizing Workstation User Guide</i> .
③	Picking-point user coordinate system	Disabled by default. When enabled, there is no need to teach the picking point separately. For instructions on creating a new picking point's user coordinate system, please refer to the <i>Palletizing Workstation User Guide</i> .

Create tool coordinate system

A maximum of 50 tool coordinate systems are supported. You can create a new system using either "Numeric input" or "Process teaching". The following steps use "Process teaching" as an example:

1. Click "New > Process teaching". Confirm that the end-of-arm suction cup is installed correctly, then click "Next".

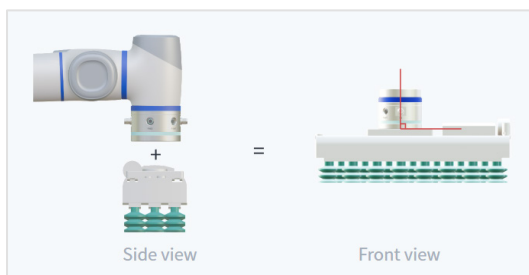


Figure 3.8 Suction cup installation

This procedure applies only to the installation method shown for the suction cup. If there is a rotational angle between the suction cup and the robot arm's end effector, measure the rotational angle and manually adjust it on the tool coordinate system settings page in DobotStudio Pro.

2. Jog the robot arm to align the center of the suction cup with the center of the box (if using a dual-channel suction cup, treat the two boxes being picked as a single unit to calculate the center point). Press the suction cup tightly against the box surface, then click "Grip". Once the suction cup picks up the box, click "Next".

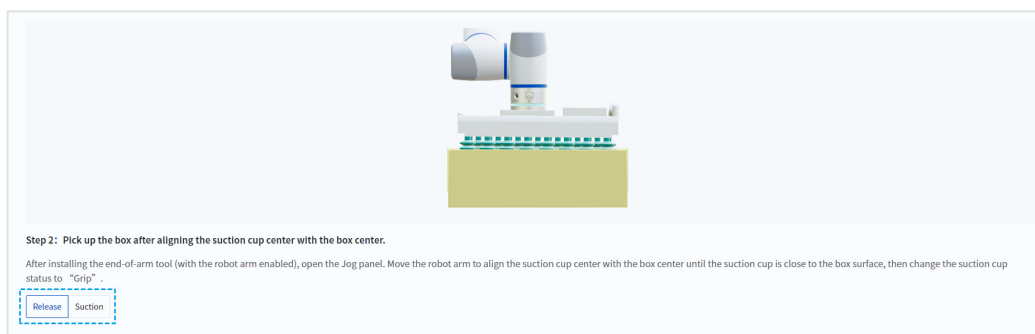


Figure 3.9 Pick up box

3. Measure and fill in the suction cup offset values as described below, then click "Next".

- ① Measure the vertical distance from the robot arm's end flange to the top surface of the box, and enter this value as the "Z-axis offset" (if using an optional suction

cup, this distance is about 110mm).

- ② Measure the offset from the center of the robot arm's end flange to the center of the box and enter it (if there is no offset, enter 0. If using an optional suction cup, set the "X-axis offset" to -10mm and leave the "Y-axis offset" at 0mm).

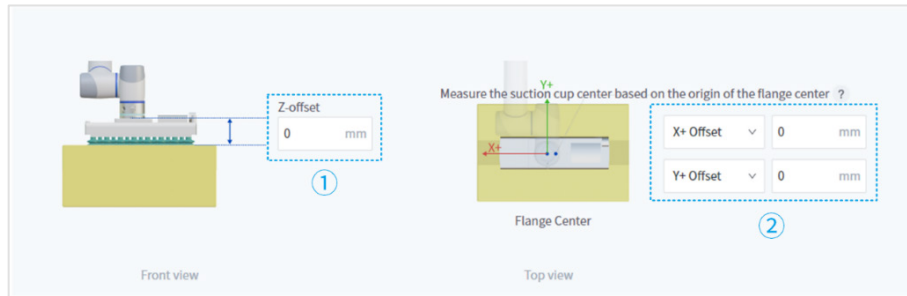


Figure 3.10 Set suction cup offset values

4. After successful calibration, release the suction cup on this page and click "Finish".

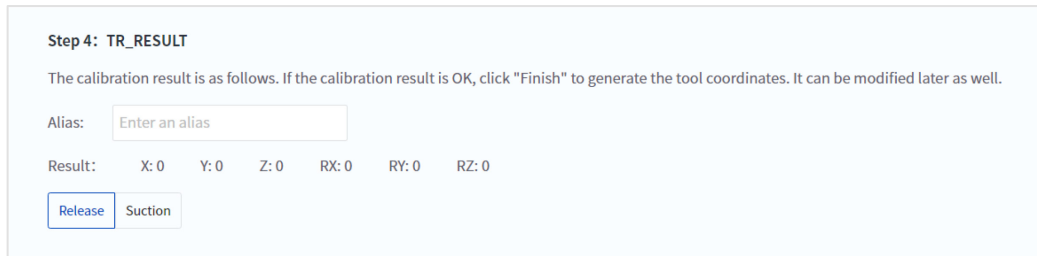


Figure 3.11 Save tool coordinate system

3.3 New palletizing project (without interlayer)

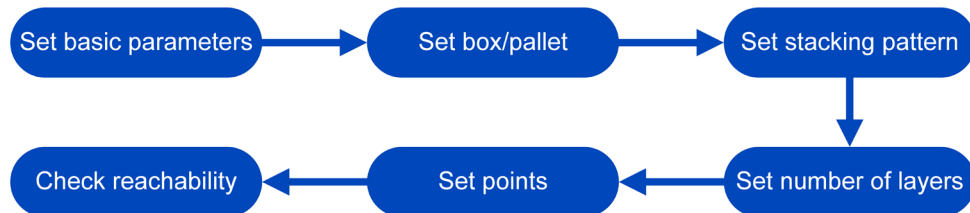


Figure 3.12 Workflow for a New Palletizing Project Without Interlayer

3.3.1 Set basic parameters

1. Click "New project" in the upper-right corner of the home page.

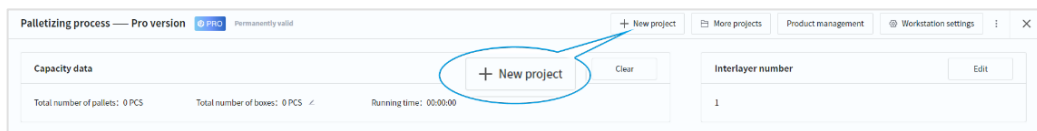


Figure 3.13 New palletizing project

2. Configure the basic parameters according to the actual scenario. Once configuration is complete, click "Next" to proceed to the box/pallet settings page.

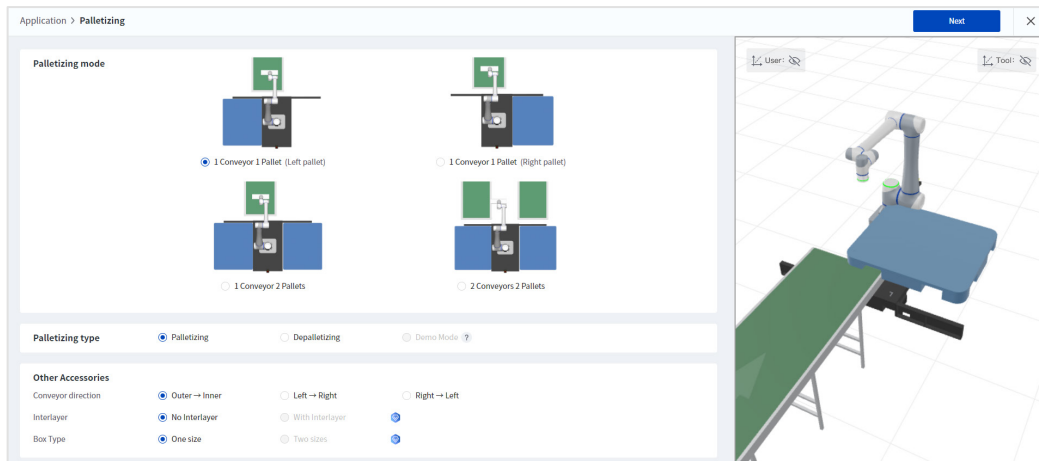


Figure 3.14 Project basic parameters (without interlayer)

Parameter	Description
Palletizing mode	1 Conveyor 2 Pallets: When both pallets are in position, first complete the full stack on the left pallet, then stack the right pallet. 2 Conveyors 2 Pallets: When both pallets are in position, alternate stacking the pallets on both sides. The conveyor is integrated with the pallet system. This setup is suitable for scenarios where the production capacities of the two corresponding conveyor lines are similar and box sizes are comparable. A buffer zone must be established on the conveyor to manage material backlogs.
Palletizing type	Palletizing: Pick the boxes from the conveyor and stack them on the pallet. Depalletizing: Remove boxes from the pallet and place them onto the conveyor. Demo mode: Available only when the palletizing mode is "1 Conveyor 2 Pallets". Used to demonstrate the palletizing workstation at trade shows.
Conveyor direction	When the palletizing mode is "2 Conveyors 2 Pallets", only "Outer → Inner" is available.
Interlayer	Select "No Interlayer". For creating a palletizing project with interlayer, refer to "New palletizing project (with interlayer)" .
Box type	Default is "One size". "Two sizes" can be set only when the palletizing mode is "2 Conveyors 2 Pallets". Each box size is paired with one specific conveyor and one pallet. For example, the boxes arriving on Conveyor 1 must be of the same size and are only stacked onto the left pallet.

3.3.2 Set box/pallet parameters

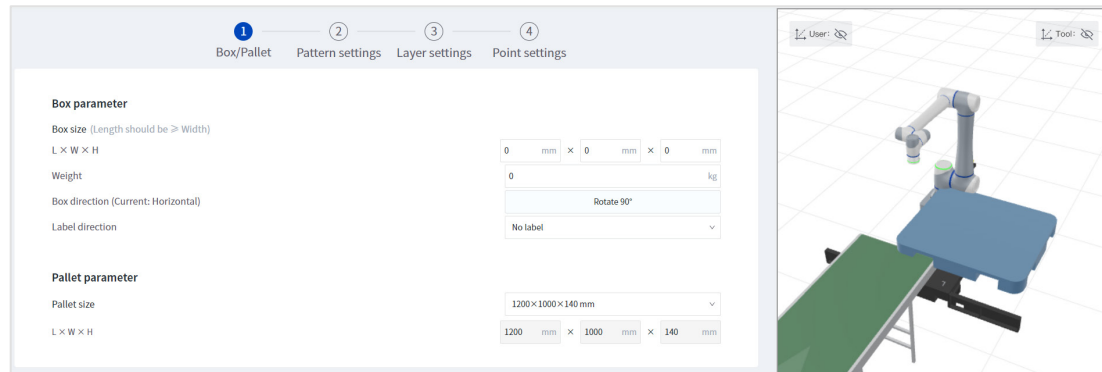


Figure 3.15 Box/pallet parameter

Parameter	Description
Box parameter	Enter the box sizes. Length must be greater than width. Use "Rotate 90°" to adjust the box direction. If there are two box sizes, configure them separately.
Pallet parameter	Select a pallet size from the dropdown menu, or choose "Custom" to enter pallet dimensions. In a two-conveyor, two-box scenario, the pallet sizes on the left and right sides must be set separately.

3.3.3 Set stacking pattern

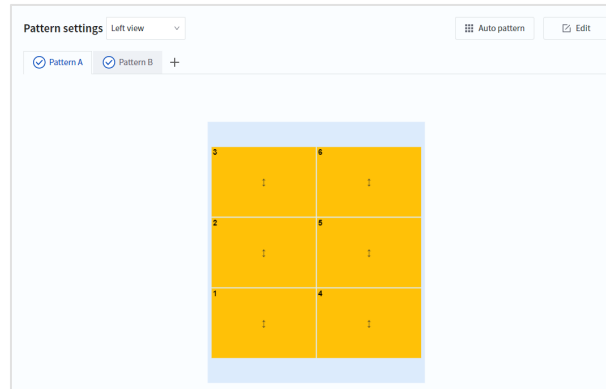


Figure 3.16 Pattern settings

Set the stacking pattern of boxes on the pallet. Click "+" next to Pattern A or Pattern B to add a new pattern. A maximum of 5 patterns are supported.

- For one size: The stacking pattern for both left and right pallets is the same.
- For two box sizes: You need to set the stacking patterns for the left and right pallets separately. Set the left pallet's pattern based on the size of Box 1, and the right pallet's pattern based on the size of Box 2.

Parameter	Description
Auto pattern	Select a recommended pattern that automatically generated by the system. Suitable for scenarios where only one box is picked

Parameter	Description
	up at a time.
Edit pattern	To self-define the current stacking pattern, see "Edit pattern" for details.

Edit pattern

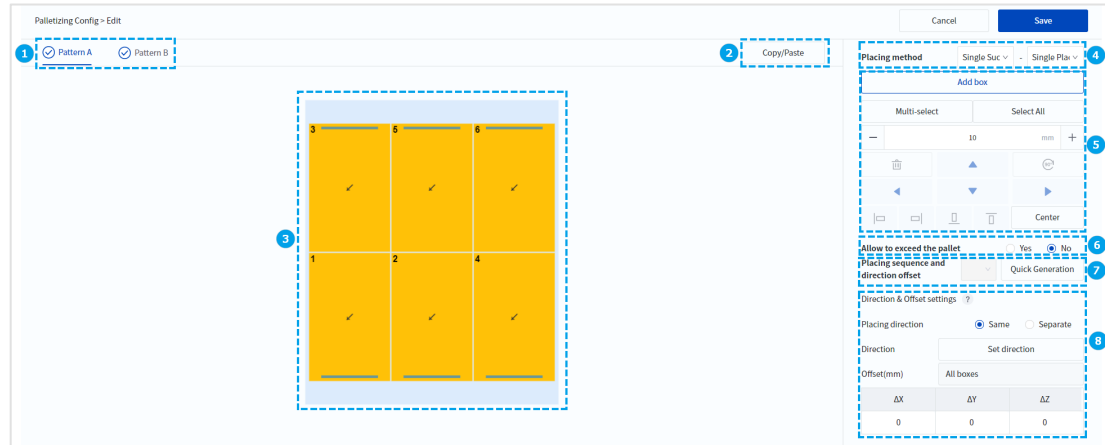


Figure 3.17 Edit pattern

No.	Description
①	Switch to the stacking pattern you want to edit.
②	"Copy/Paste" button: Used to copy the current pattern to another one.
③	Displays a preview of the current pattern.
④	Define how the suction cup picks up and places the boxes. For "Double Suction, Single Place" (Pick Two, Place One) : When adding boxes, boxes in the same group must have the same serial number. When deleting, boxes in the same group are deleted together. One-click generation and manual modification of serial numbers are not supported.
⑤	See "Edit box placement pattern" for details.
⑥	Yes: Boxes may overhang the pallet edge, up to a maximum of 40% of the box's shorter side. No: If there are already boxes overhanging the pallet edge, they will be automatically adjusted to align flush with the pallet edge.
⑦	Placing sequence and direction offset: Click "Quick Generation" to open a pop-up window with sorting rule options. Select the desired sorting rule. Use the dropdown menu to set the placement order for the currently selected box. The robot arm will place boxes one by one according to the numerical order.

No.	Description
⑧	Set the direction and distance of the approach point relative to the point directly above the placing position. See " Set placing direction and offset " for details. For double pallets, the direction and offset set here are based on the current pallet's perspective. The values for the opposite pallet are automatically mirrored left-right by the palletizing plugin.

Edit box placement pattern

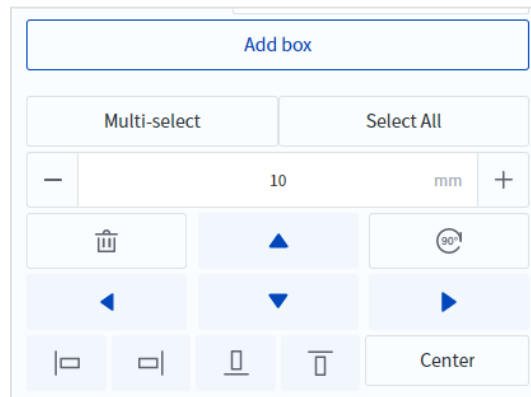


Figure 3.18 Box placement

Icon	Description
Add box	Click "Add box" to add one box. For "Dual pick-and-place" (pick two, place two), two boxes are added at a time, but they are treated as a single unit. The same logic applies to "Triple Suction, Triple Place" (pick three, place three) and "Quadruple Suction, Quadruple Place" (pick four, place four). A maximum of 50 boxes can be added to one pattern.
Multi-select / Select All	Click "Multi-select" to select or deselect multiple boxes. Click "Select All" to select all boxes on the current pallet.
— 10 mm +	Set the jogging distance for the box, unit: mm.
     	- Jog the selected box forward, backward, left, or right. - Delete the selected box. - Rotate the selected box 90° clockwise.
   	Align the selected box with the edge of the nearest box in the chosen direction. If there is no box in that direction, it will align with the pallet edge.
Center	Move all boxes in the current pattern as a single unit to the center of the pallet. When boxes overlap, the corresponding box icon will be displayed in red.

Set placing direction and offset

ΔX	ΔY	ΔZ
0	0	0

Figure 3.19 Placing direction & offset settings

The "Placing direction" setting is generally used to avoid interference between boxes during placement, which could affect the palletizing result. It is recommended to start with the default settings and adjust them later during debugging based on the actual palletizing result.

- When "Placing direction" is set to "Same", all boxes approach the point directly above the placing position from the same direction. You can set the placing direction and offset for all boxes.
- When "Placing direction" is set to "Separate", you need to select each box separately and set its placing direction and offset.
- Offset: The absolute value of the offset between the approach point and the point directly above the placing position. Unit: mm. Value range: [0, 1500]. Different approach directions require different offset settings.

3.3.4 Set number of layers

Layer(s)	Pattern
Layer 1	☒ A ☐ B

Figure 3.20 Layer settings (one box)

Set the number of layers for palletizing/depalletizing and the stacking pattern used for each layer according to actual needs. When there are two box sizes, you need to set the palletizing/depalletizing method separately for the left and right pallets.

3.3.5 Set points

Picking point / placing point

Picking point	Operate	X	Y	Z	RX	RY	RZ
A	<input checked="" type="button" value="Obtain"/> Run to	0	0	0	0	0	0

Figure 3.21 Picking point settings

In palletizing mode, this point is the picking point; in depalletizing mode, this point is the placing point. The setting method is the same for both modes. The coordinates of the picking/placing point are based on the left pallet coordinate system.

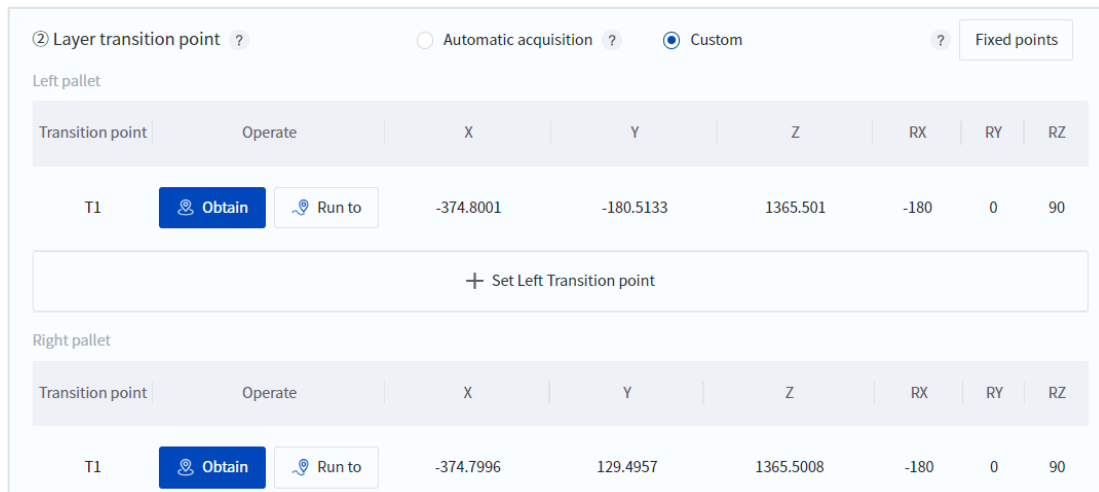
In "2 Conveyors 2 Pallets" mode, picking/placing points for each conveyor must be set separately. Here's how to obtain the points:

- ① Place the box on the conveyor, then jog the robot arm so that the end-of-arm suction cup is flush against the box, with the box center vertically aligned with the suction cup center (for dual-suction cups, treat the two boxes to be picked as a single unit). The long side of the suction cup must be parallel to the long side of the box (if the long or short side of the box is parallel to the palletizing workstation, set Rz to 90° or 180° to avoid abnormal rotation).
- ② Click "Obtain".

Layer transition point

The coordinates of layer transition points are based on the pallet coordinate system on the side where the transition point is located.

- **Custom layer transition point (default settings)**



② Layer transition point ? ☐ Automatic acquisition ? ☒ Custom ? Fixed points

Left pallet

Transition point	Operate	X	Y	Z	RX	RY	RZ
T1	Obtain Run to	-374.8001	-180.5133	1365.501	-180	0	90

+ Set Left Transition point

Right pallet

Transition point	Operate	X	Y	Z	RX	RY	RZ
T1	Obtain Run to	-374.7996	129.4957	1365.5008	-180	0	90

Figure 3.22 Custom layer transition point

After jogging the robot arm to the desired point, click "Obtain" next to the transition point (e.g., T1) to obtain the transition point position.

NOTE

The height of the transition point set here is the height of the transition point corresponding to the first layer of boxes. During actual operation, the system automatically adjusts the height of the transition point based on the number of layers being palletized or depalletized.

The left and right transition points need to be set separately, with each side allowing a minimum of 1 and a maximum of 5 transition points. It is recommended to set two transition points on each pallet: one outside the pallet and one inside the pallet, both positioned above the picking point. Configure according to the actual scenario to ensure smooth robot motion without collisions.

In depalletizing mode, the order in which the transition points are added is opposite to the

order in which the robot arm moves.

- **Auto-generated layer transition point**

Figure 3.23 Auto-generated layer transition point

After enabling the auto-generated transition point function, there is no need to set layer transition points separately. Refer to the *Palletizing Workstation User Guide* for detailed information on auto-generated transition points.

3.3.6 Check reachability

After configuring the palletizing project parameters, enter the project name and click "Reachability detection" to verify that all required parameters have been set and that all points in the stacking pattern are reachable. After the reachability detection passes, click "Save" to complete the palletizing project configuration.

3.4 New palletizing project (with interlayer)

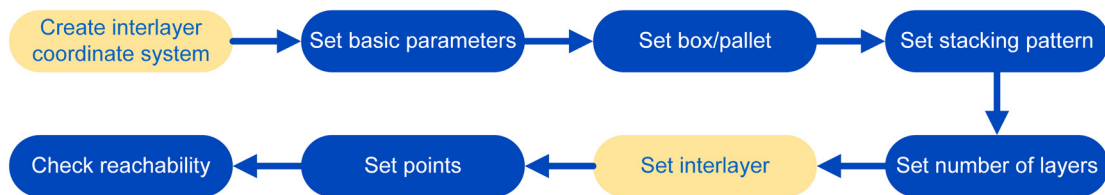


Figure 3.24 Workflow for a New Palletizing Project With Interlayer

If creating a palletizing project that uses interlayer, you must first [set the interlayer coordinate system](#). When creating the project, select "With Interlayer" and [configure the interlayer parameters](#); the configuration of other parameters is the same as for a [new palletizing project without interlayer](#).

3.4.1 Create interlayer coordinate system

1. In DobotStudio Pro, click "Settings > Coordinate system > User coordinate system" to enter the user coordinate system settings page, and add or modify a user coordinate system.

Id	Alias	X	Y	Z	Rx	Ry	Rz
0		0	0	0	0	0	0
1		50	50	0	-167.411457	0	90
3		111	111	111	111	111	111

Figure 3.25 User coordinate system

2. Click the "Three-point setting" button on the "Add user coordinate system" page.

Figure 3.26 Add user coordinate system

3. In the "Three-point setting" page, teach the system and obtain any three non-collinear points on the plane of the interlayer stacking zone (refer to the figure below, the Z-axis should be oriented towards the interlayer stacking direction), then click "Confirm".

Point	Save	x	y	z	rx	ry	rz
P1	Obtain Run to	0	0	0	0	0	0
P2	Obtain Run to	0	0	0	0	0	0
P3	Obtain Run to	0	0	0	0	0	0

Figure 3.27 User coordinate system - Three-point setting

4. The system automatically returns to the "Add user coordinate system" page, and the coordinate system values are updated to the calibrated values. Click "Save" to complete the user coordinate system settings for the interlayer.

Define the interlayer stacking zone

First, place the interlayers in the designated stacking zone first, then jog or drag the robot arm to confirm that the end-of-arm suction cup can grip the topmost and bottommost interlayers.

It is recommended to plan the interlayer stacking zone and the picking point on the same side. If interlayer must be stacked on the opposite side of the picking point and require routing around the already palletized boxes, a customized version of the palletizing process package will be required. See the example image on the right for normal use:



Figure 3.28 Recommended interlayer stacking position

3.4.2 Set interlayer

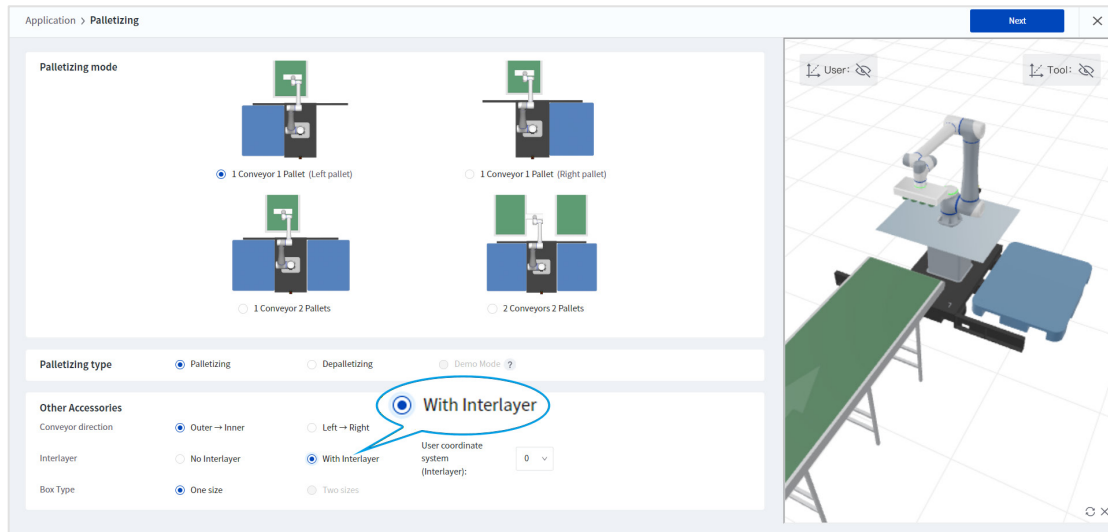


Figure 3.29 Project basic parameters (with interlayer)

When creating a palletizing project, select "With Interlayer" and choose "User coordinate system (Interlayer)". Click "Next" to enter the "Interlayer settings" page. For parameter configuration on other pages, refer to ["New palletizing project \(without interlayer\)"](#).

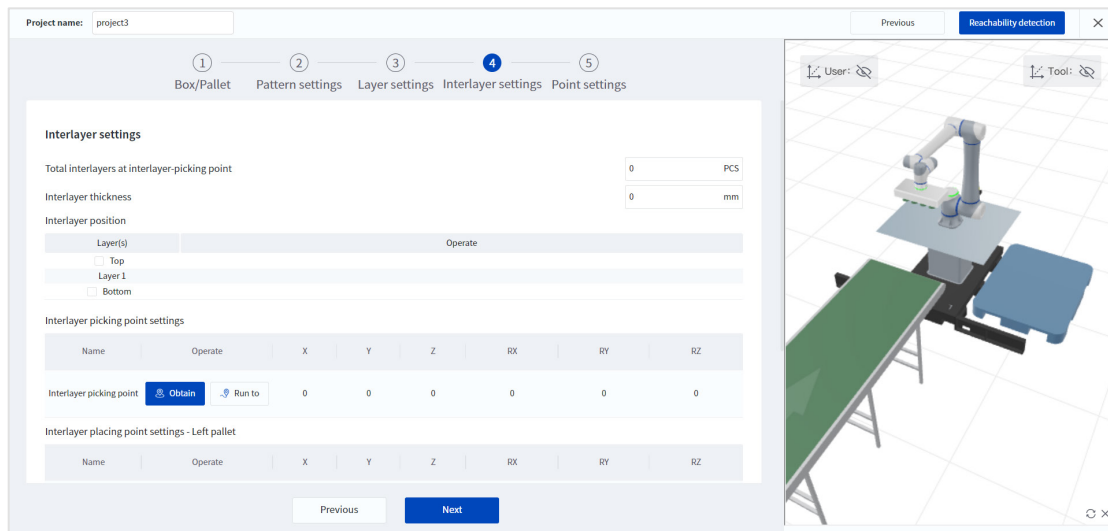


Figure 3.30 Interlayer parameter (palletizing)

Parameter	Description
Total interlayers at interlayer-picking point / Max capacity at interlayer-placing point	- Palletizing: The number of interlayers. After the interlayers have been removed, the system pauses and prompts the user to replenish them. The placement and quantity of the added interlayers must match those of the previous set; otherwise, it will result in an incorrect interlayer count and cause the project to fail. - Depalletizing: The maximum number of interlayers that can be stacked at the interlayer-placing point. When the interlayer stack is full, the system pauses and prompts the user to remove them. After resuming, the system will

Parameter	Description
	continue placing interlayers at the same position. Value range: [0, 100].
Interlayer thickness	Enter the actual thickness of the interlayer. Value range: [0, 200].
Interlayer position	Check or click the empty space between layers to add an interlayer for that layer, including the top and bottom layers.
Interlayer picking point Interlayer placing point Transition point	For palletizing: Set the first point as the interlayer picking point, which should be at the bottommost interlayer in the stacking zone. The system will automatically calculate the picking points for the remaining interlayers based on the number of interlayers already used and their thickness. The interlayer placing point is where the first interlayer will be placed on each pallet. For depalletizing: Set the first point as the interlayer placing point, which should be at the bottommost interlayer in the stacking zone. The system will automatically calculate the placing points for the remaining interlayers based on the number of interlayers already placed and their thickness. The interlayer picking point is where the first interlayer will be picked up from each pallet. - The coordinates for picking/placing points are based on the interlayer coordinate system, while the coordinates for interlayer transition points (at least 1, but no more than 5) are based on the pallet coordinate system on the same side as the transition point.

4. Palletizing Project Run & Monitoring

4.1 Run palletizing project

4.1.1 Run via palletizing process package

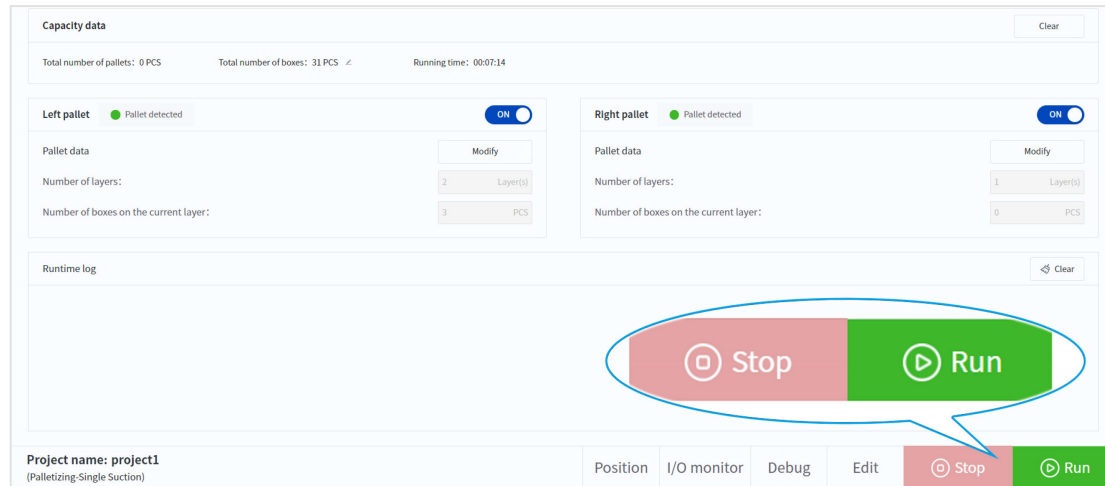


Figure 4.1 Run/stop button

Before running the project, ensure that the end-of-arm suction cup is properly installed and that the pallet user coordinate system has been calibrated.

NOTICE

If the project is stopped during palletizing (due to an alarm or manual stop), the workstation must be manually reset before restarting the project. The reset steps are as follows:

1. If there is a box gripped by the suction cup, hold the box and manually release the suction cup, then place the box to a safe area.
2. Use the jog function to move the robot arm to a safe position (the hover point that the arm first moves to after the project starts).

4.1.2 Run via control panel buttons

Before running a palletizing project via the control panel buttons, associate the configured palletizing project with the remote I/O as the running project.

1. Go to the "Monitor" page in DobotStudio Pro and check whether the DI/DO configurations of the controller are correct. If the I/O configuration is incorrect, click "Settings" to modify the function configuration.

Controller DI/DO	Function
DI_7	Enable button
DI_11	Start button
DI_12	Stop button
DI_13	Reset button (clear alarm)
DO_7	Enable status indicator
DO_11	Running status indicator
DO_12	Alarm status indicator
DO_13	Stop status indicator

I/O

Controller DI/DO

DI	Alias	Status	DO	Alias	Status
DI_5	/		DO_5	/	OFF
DI_6	/		DO_6	/	OFF
DI_7	Enable		DO_7	Enabling status	OFF
DI_8	/		DO_8	/	OFF
DI_9	/		DO_9	/	OFF
DI_10	/		DO_10	/	OFF
DI_11	Start		DO_11	Running status	OFF
DI_12	Stop		DO_12	Alarm status	OFF
DI_13	Clear alarm		DO_13	Stop status	ON
DI_14	/		DO_14	/	OFF
DI_15	/		DO_15	/	OFF

Remote Control

Settings

X

Figure 4.2 Correct I/O configuration

- Click "Remote Control" to navigate to the "Settings > Remote Control > I/O Remote Control" page in DobotStudio Pro. Select the desired palletizing project and click "Set as Default Operating Project" on the right.

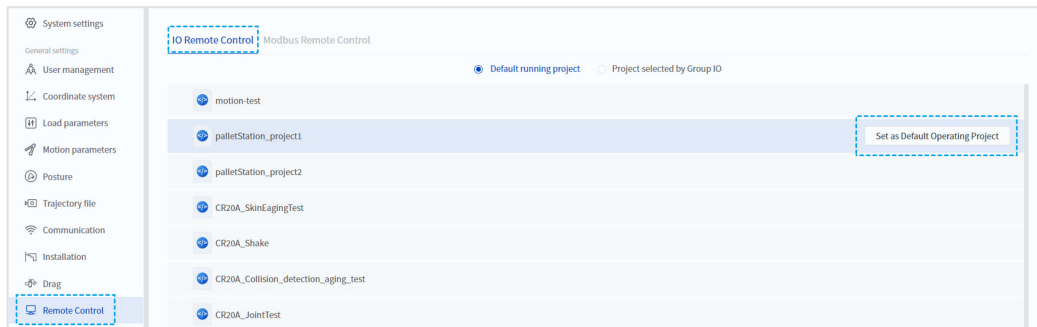


Figure 4.3 Select project

- Return to the DobotStudio Pro home page and check that the "Default I/O Project" is correct. Then, change the "I/O/Modbus Configuration" switch to "ON".

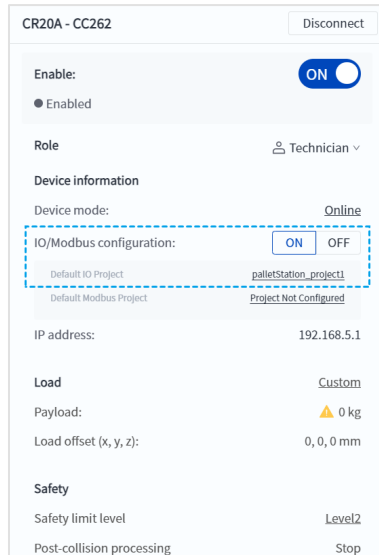


Figure 4.4 Enable I/O/Modbus configuration

4. [Power on](#) the palletizing workstation, then press the corresponding buttons on the palletizing workstation in the following order to run the palletizing project:
 - ① Press the "Enable" button. Wait for the "Enable" button indicator to light up, indicating that the robot arm has been successfully enabled.
 - ② Press the "Start" button. Wait for the "Start" indicator to light up, indicating that the palletizing project has begun running.

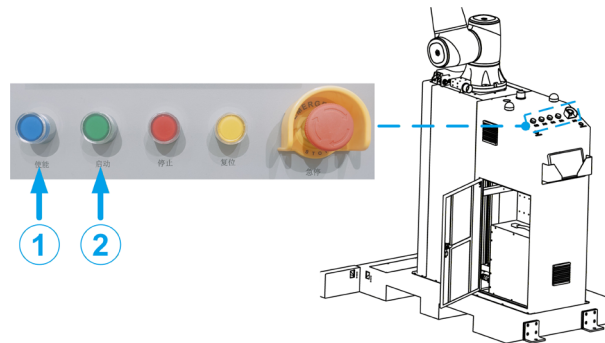


Figure 4.5 Workstation control buttons

4.2 Real-time monitoring of palletizing project

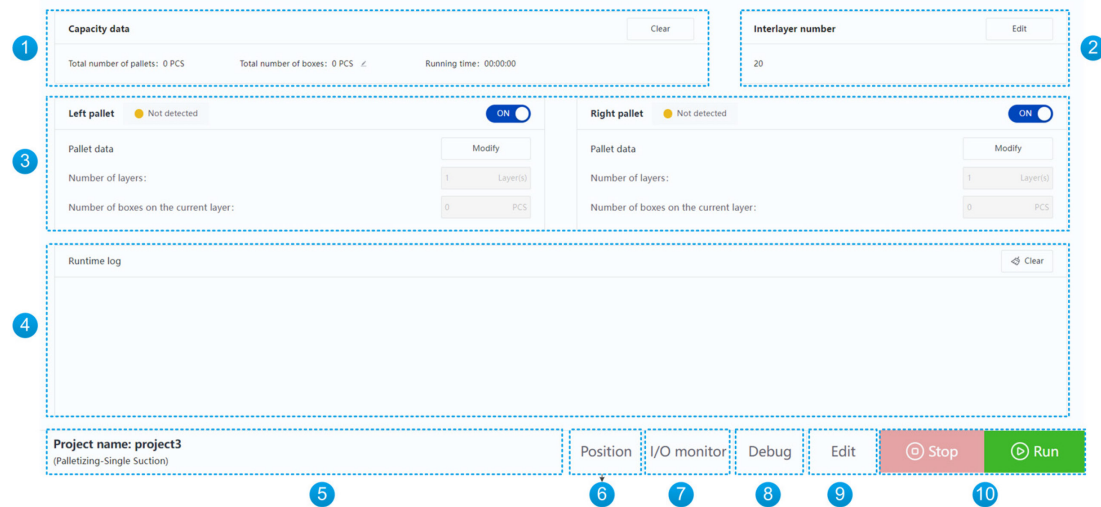


Figure 4.6 Palletizing monitoring page

No.	Parameter	Description
①	Capacity data	Indicates the total production capacity of the palletizing workstation. When the actual number of boxes placed is a multiple of the number of placement cycles, click and enter the multiplier. The total number of boxes displayed = Number of placement cycles × Multiplier.
②	Interlayer count	For projects with interlayers, here displays the number of interlayers. Click "Edit" to modify based on the actual interlayer count.
③	Pallet monitor	See "Monitor pallet data" for details.
④	Running log	Displays user print messages, error messages, and custom errors generated during palletizing operations. Click "Clear" to clear the running logs.
⑤	Project information	The name and type of the currently open project.
⑥	Position	Enable the robot arm, click "Position" button to jog the robot arm, or long-press "Safe Home" button to return the arm to the workstation's safe home position.
⑦	I/O monitor	View the I/O signals configured for the palletizing workstation.
⑧	Debug	Manually control the lifting column and suction cup, as well as set debugging-related parameters. Under normal conditions, no adjustment is needed. If adjustment is required, refer to the <i>Palletizing Workstation User Guide</i> .

No.	Parameter	Description
⑨	Edit	Enter the palletizing project configuration page to modify parameters of the current project.
⑩	Stop / Run	Run the palletizing project or stop the project.

4.2.1 Monitor pallet data

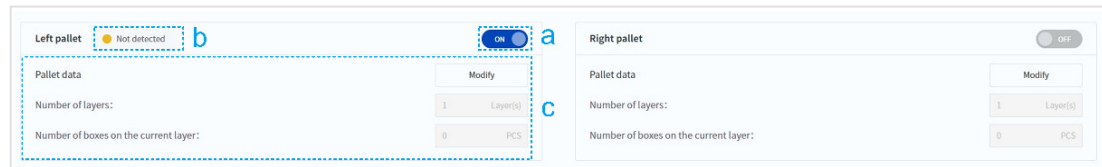


Figure 4.7 Pallet monitor

If "1 Conveyor 1 Pallet" was selected as the palletizing mode when creating the project, the unselected pallet will be locked in a disabled status and cannot be enabled or modified.

No.	Parameter	Description
a	Pallet ON/OFF switch	Enable or disable the left/right pallet as needed. The workstation will only perform palletizing on the enabled pallet.
b	Pallet status indicator	Indicates the current status of the pallet via color and text (when the pallet is disabled, no color or text is displayed). See "Pallet status description" for details.
c	Pallet data	Displays the number of layers being stacked on the pallet and the number of boxes already on that layer. For example, if the system is currently palletizing the 3rd box on the 1st layer, the displayed layer is 1 and the number of boxes is 2. After the current box is palletized, the number of layers remains 1, and the number of boxes updates to 3. Before starting the palletizing project, if the number of boxes already on the pallet differs from the number displayed on this page, click the "Modify" button to manually adjust the data.

4.2.2 Pallet status description

Table 4.1 Pallet status description

Scenario	Color	Text	Scenario	Color	Text
Palletizing	Yellow	Pallet not detected	Depalletizing	Yellow	Pallet not detected
		Pallet detected but not enabled			Pallet detected but not enabled
		Idle			Idle
		Pallet full			Pallet empty
	Green	Palletizing in progress		Green	Depalletizing in progress
	Red	Error		Red	Error