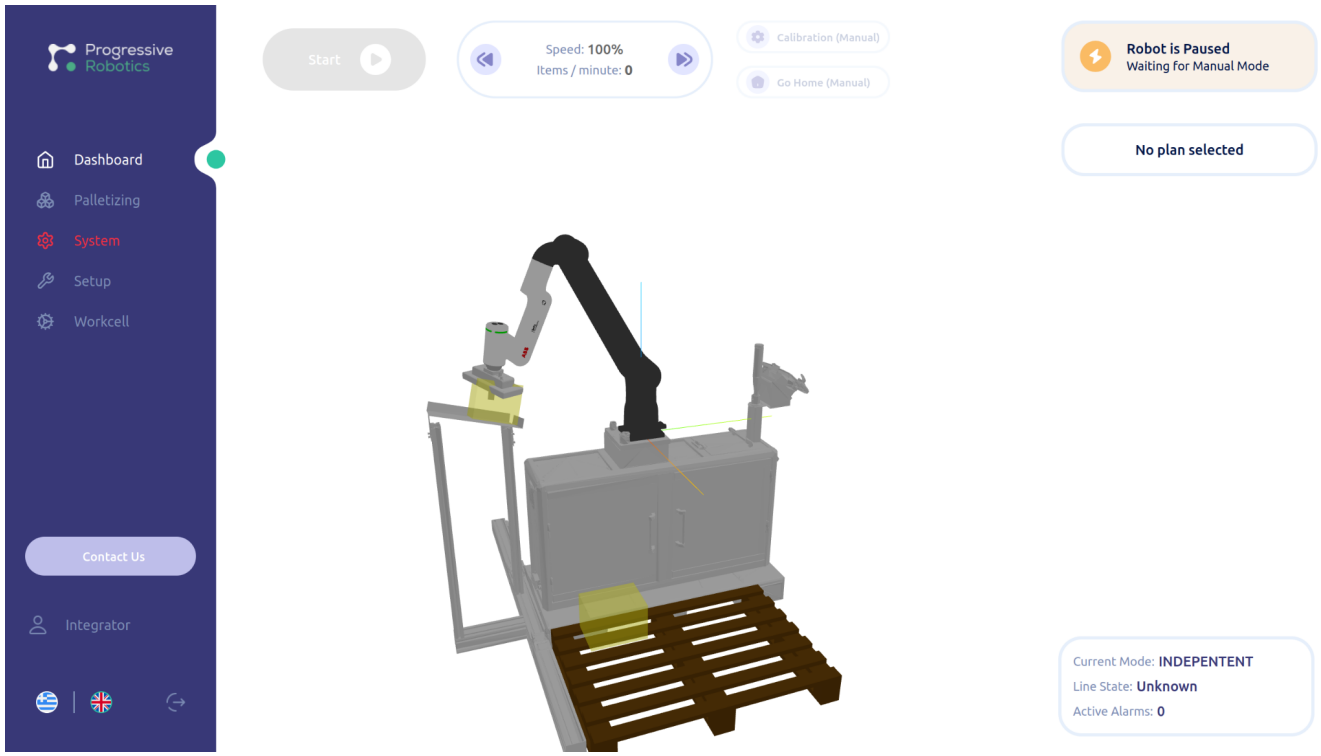
Progressive Robotics

Progressive Palletizer



Quick Guide

V0.9.1

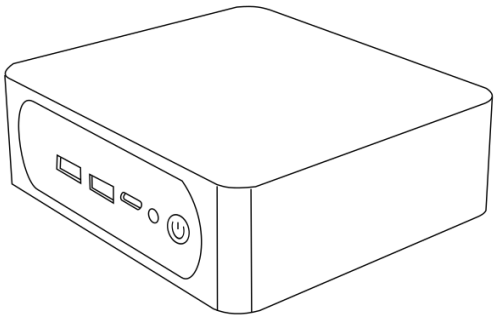
Last update: 29/1/2025

ALLIANCE AUTOMATION
INNOVATE. CREATE. ADVANCE.

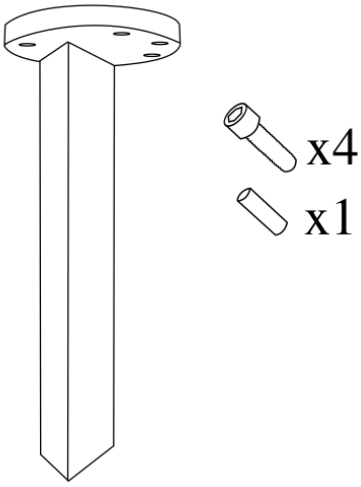
Progressive Robotics

What's inside the box?

- Progressive Controller (with power supply)



- Calibration tool (with screw set and alignment pin)



Progressive Robotics

Preparation

The Progressive Palletizer comes pre-configured to the workcell you have indicated, so that you don't have to worry about setting up the robot.

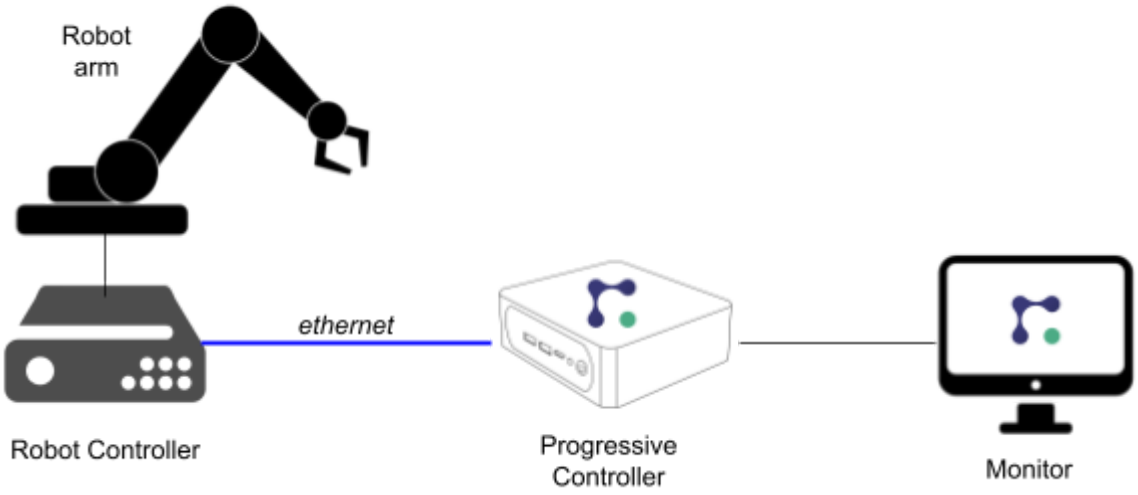
To prepare everything you will need:

- A touchscreen monitor to connect the Progressive Controller (or a simple monitor with a keyboard and mouse) and an HDMI cable.
- 1 ethernet cable.
- A hex key for mounting the calibration tool.

Progressive Robotics

Connect and Setup

The Progressive Controller is connected to the robot's controller, as in the figure below.



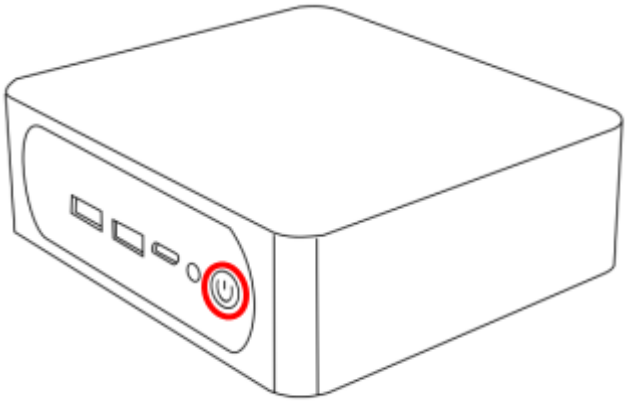
The initial setup depends on the robot brand that you are using. Refer the the appropriate one from the list below:

ABB	ABB setup manual
ROKAE	Rokae setup manual
FANUC	*coming soon*
ELITE ROBOTS	*coming soon*
KUKA	*coming soon*

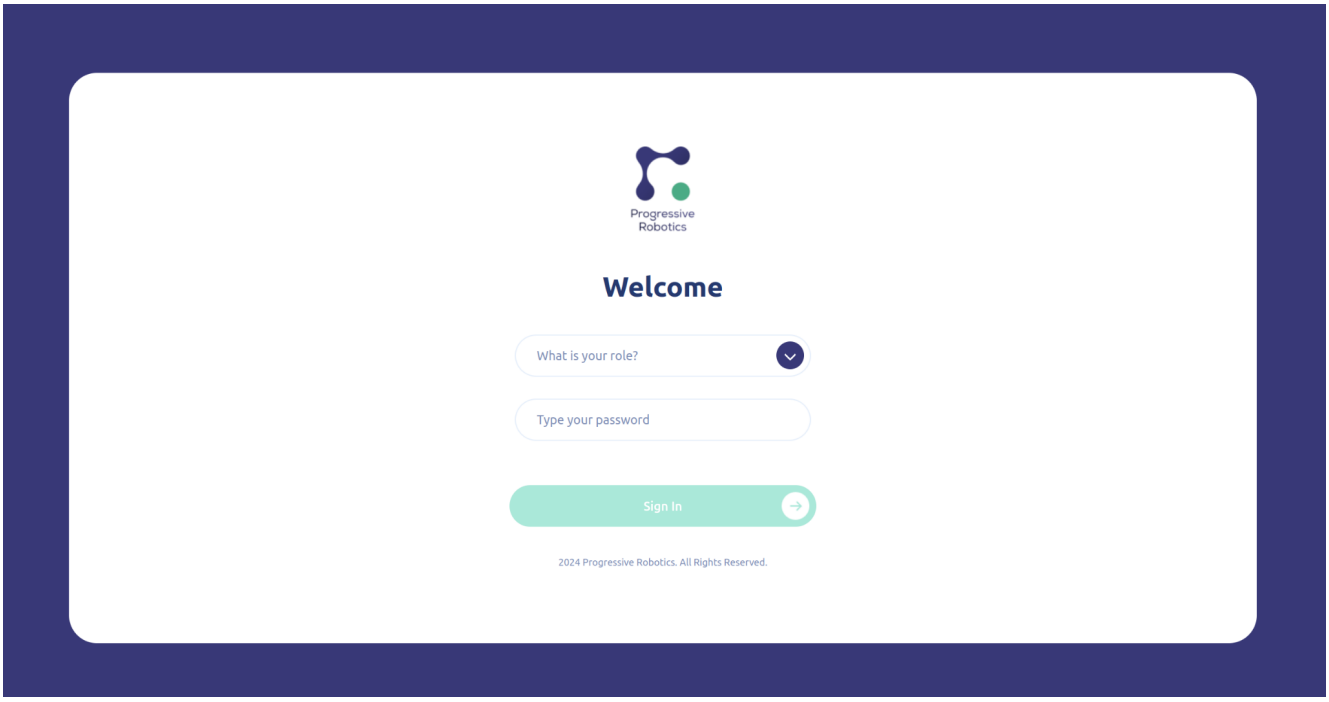
Progressive Robotics

Power On

1. After connecting and configuring everything, press the **power on** button on the Progressive Controller.



2. After about a minute, the login screen should appear:



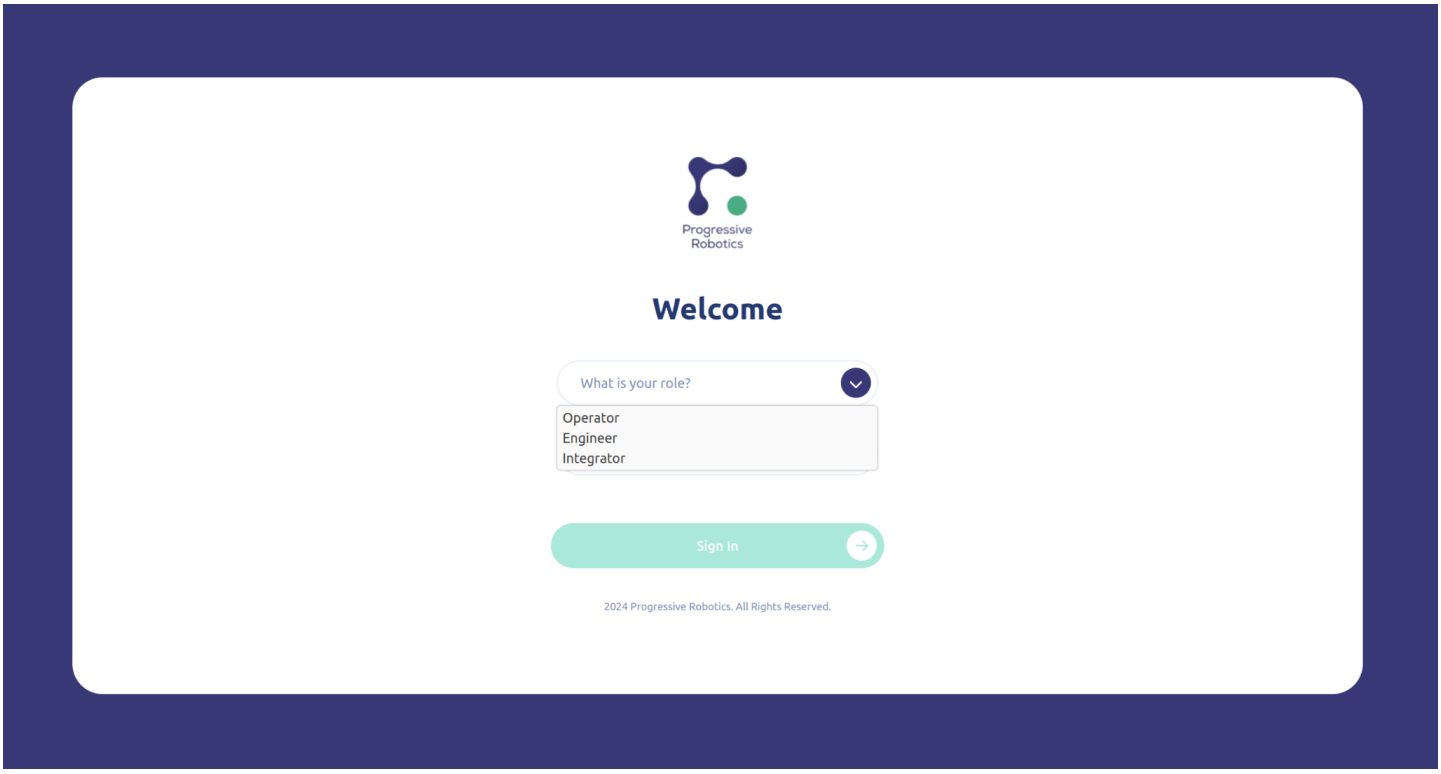
Login and get started

You can login as:

- **Operator:** Access to basic operations, with limited control over configurations.
- **Engineer:** Access to advanced features, suitable for setup adjustments.
- **Integrator:** Full access to advanced setup and configuration options, including cell setup and calibration.

Select "**Integrator**" for the initial setup.

Password (for all roles): **progressive**

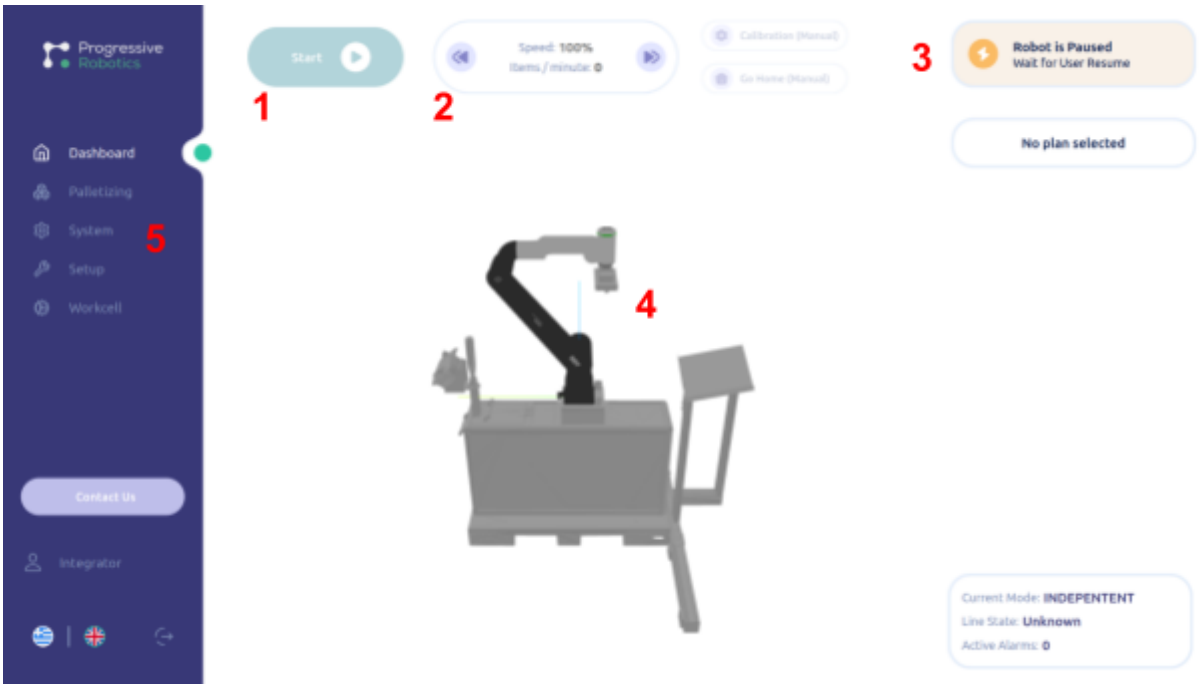


Progressive Robotics

Main Dashboard

In the **Dashboard,** the user can

1) Start/Pause the Robot
2) Adjust the Speed
3) See the execution steps (in this case the robot is Awaiting for Plan)
4) Inspect the overall palletizing process

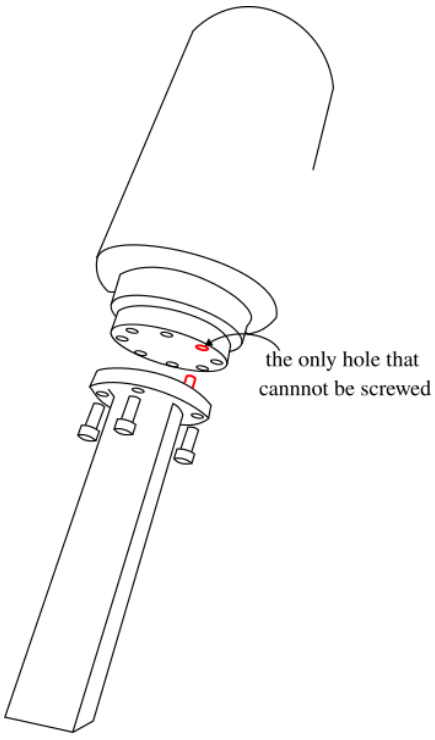


From the **Tab Menu (5)**, the user can navigate towards the various functionalities of the Progressive Palletizer.

- **Dashboard:** the main Dashboard seen above.
- **Palletizing:** create recipes and deploy them to the robot.
- **System:** restart application or computer.
- **Setup:** parameters for the system integrator.
- **Workcell:** workcell setup and calibration.

Workcell setup & calibration

Although the software comes preconfigured to the robot workcell, you need to use the accompanied calibration tool to fine tune the positions.

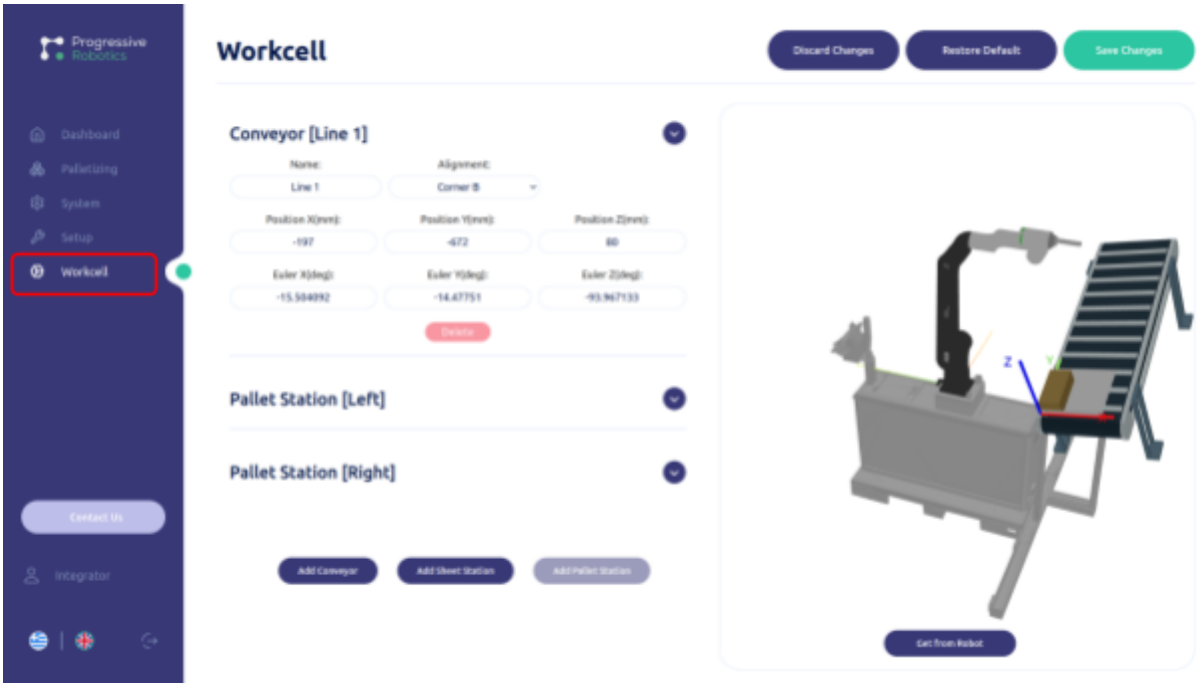


1. Mount the Calibration Tool

Remove any gripper and attach the calibration tool to the robot, ensuring it is oriented correctly.

2. Navigate to the Workcell menu

Make sure that you have logged in as “Integrator”.

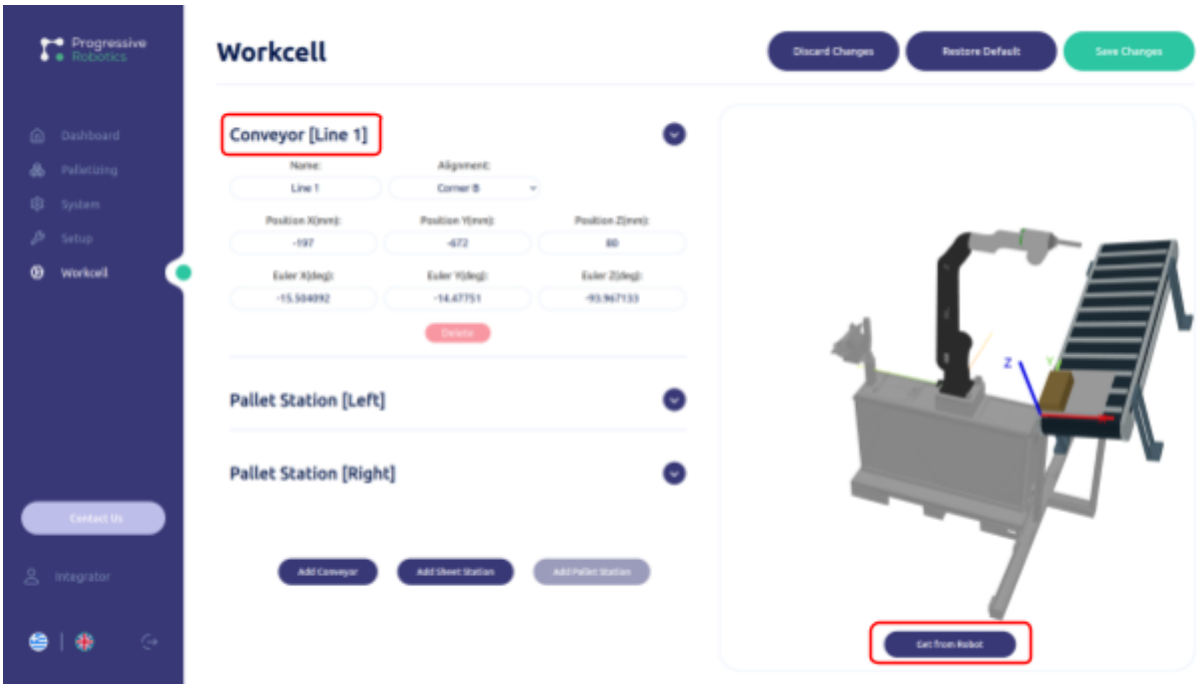


From there you can modify the pick position, the placement position for each pallet station, and the sheet station (optional).

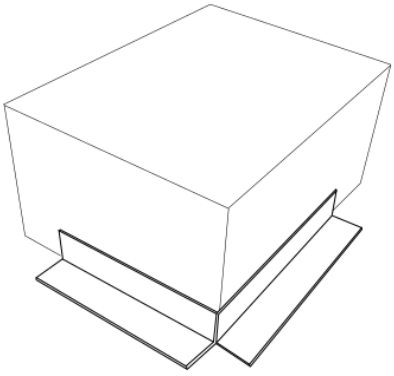
3. Set the Picking position - Conveyor

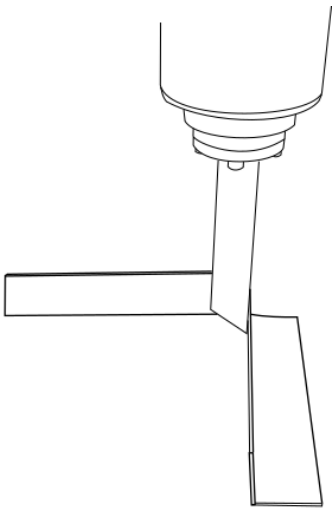
This should be the position of the conveyor, where the products are cornered, to be picked by the robot.

- Go to the **Workcell** tab and select the **Conveyor Station (Line 1)**.



- Jog the robot manually to position it so that the 90-degree corner of the calibration tool aligns with the corner of the designated pick position, as in the figures below.



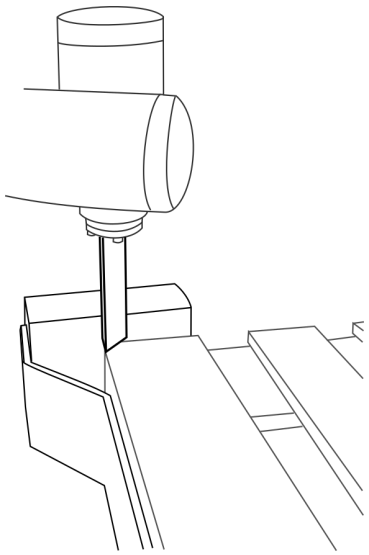


- Once the calibration tool is correctly positioned, click **Get From Robot** to measure the coordinates from the robot's current position.

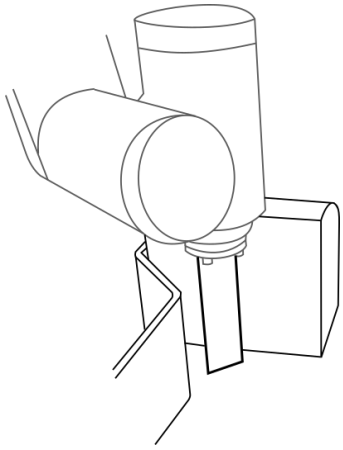
4. Set the Pallet Position

This should be the position where each pallet is cornered. You can set the position either with a pallet or without one.

- In the **Workcell** tab, locate and select **Pallet Station**.
- Jog the robot manually to move the calibration tool to align precisely with the corner of the pallet or the corner of the pallet station, as shown in the GUI.
- If you have placed a pallet, Select **Pallet Placed** > **Yes**.



- If you haven't placed a pallet, Select **Pallet Placed** > **No**.

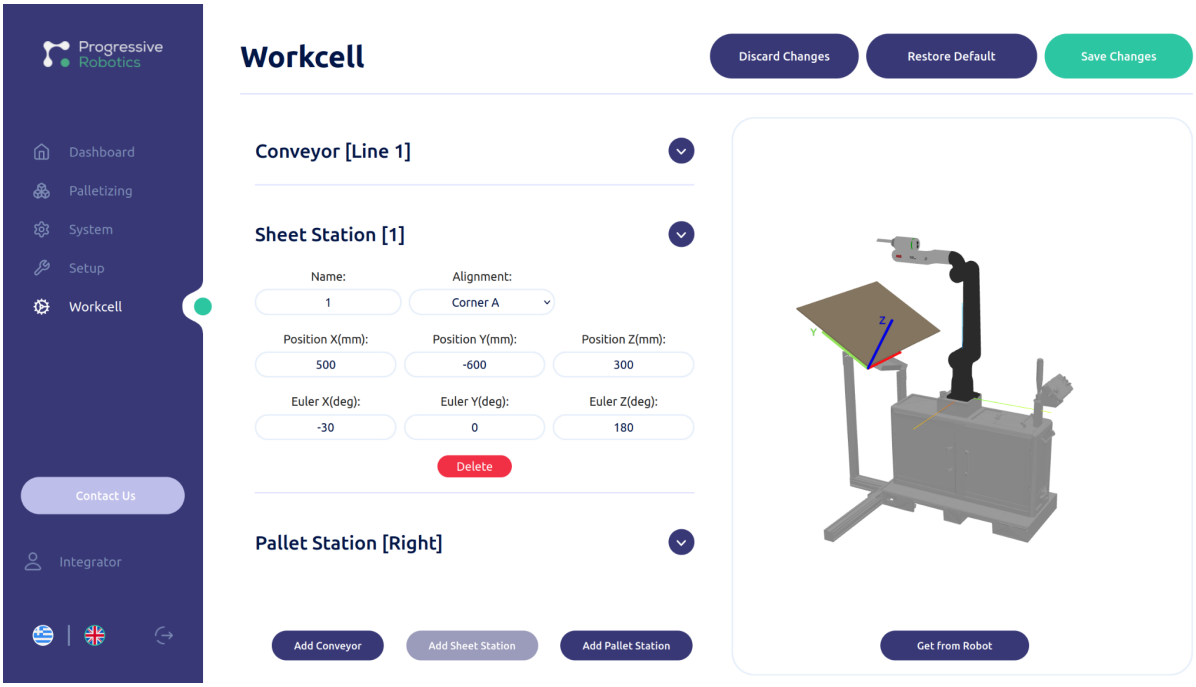


- When aligned accurately, click **Get From Robot** to measure the coordinates.

When done, click **Save**.

5. Set the Sheet Station Position (Optional)

If you have an intermediate sheet station, measure the corner of the tray where the sheets align, and follow the same process as with the Picking Position.

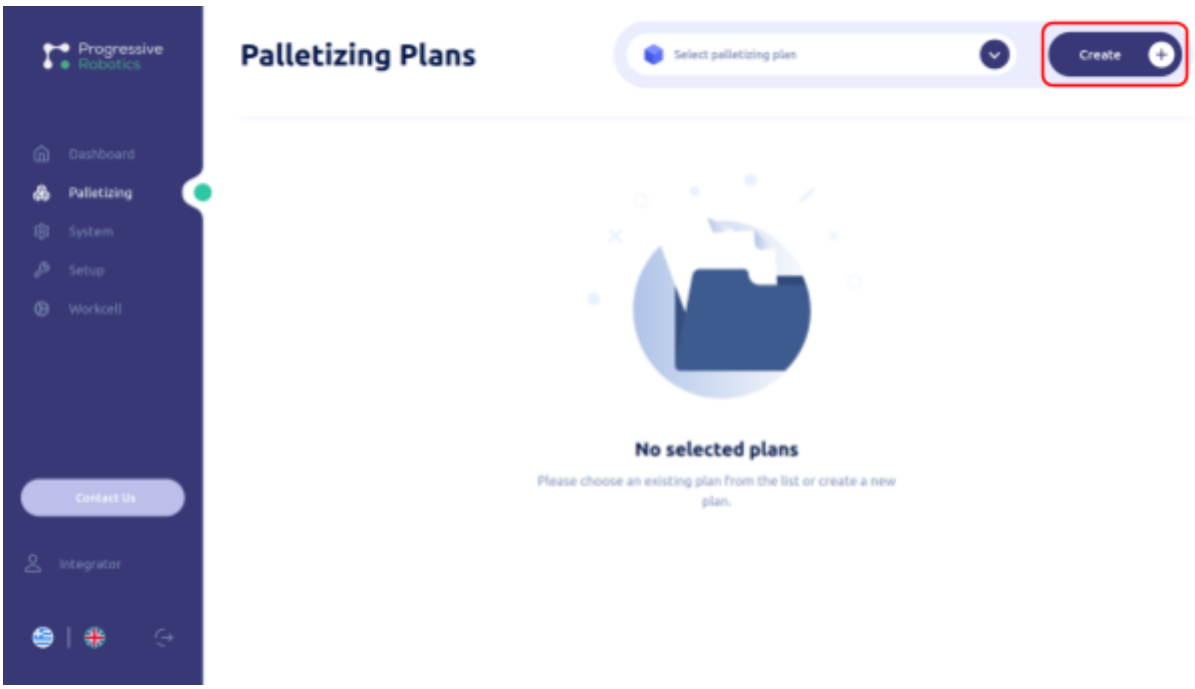


Tip: Ensure the calibration tool is positioned accurately, as this will affect the efficiency and reliability of the palletizing process.

Create your first recipe

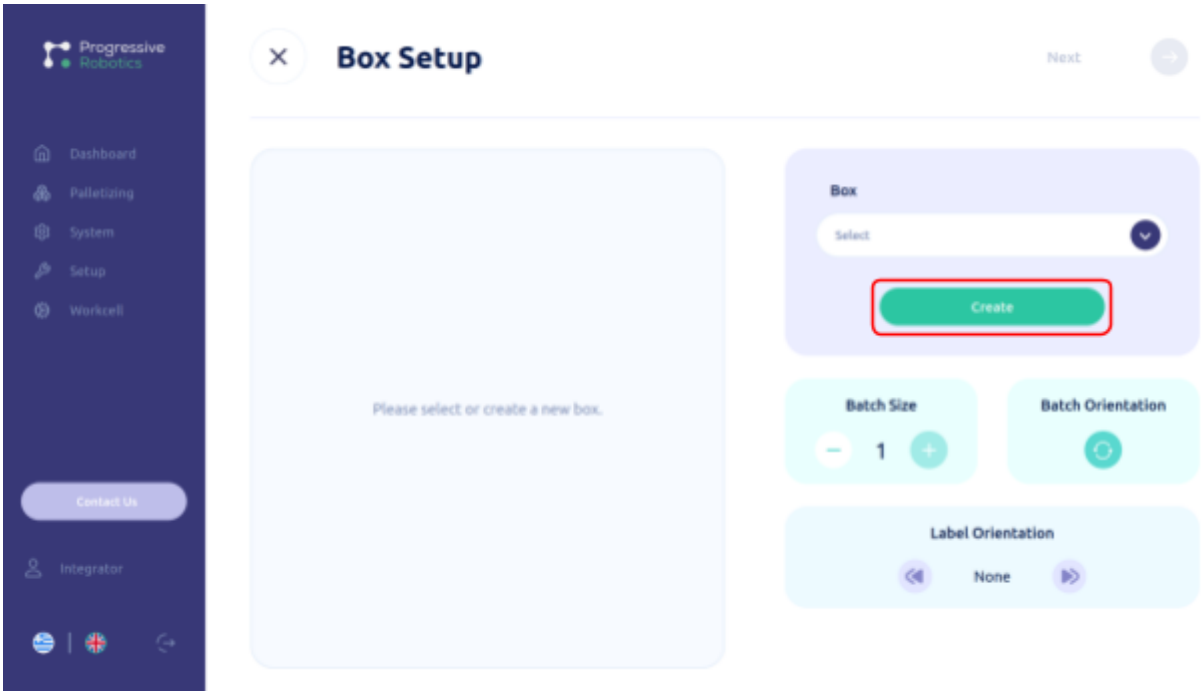
Once the workcell setup is complete, go to the **Palletizing** tab to make a new recipe.

Create a New Recipe: Click **Create** to add a new recipe.

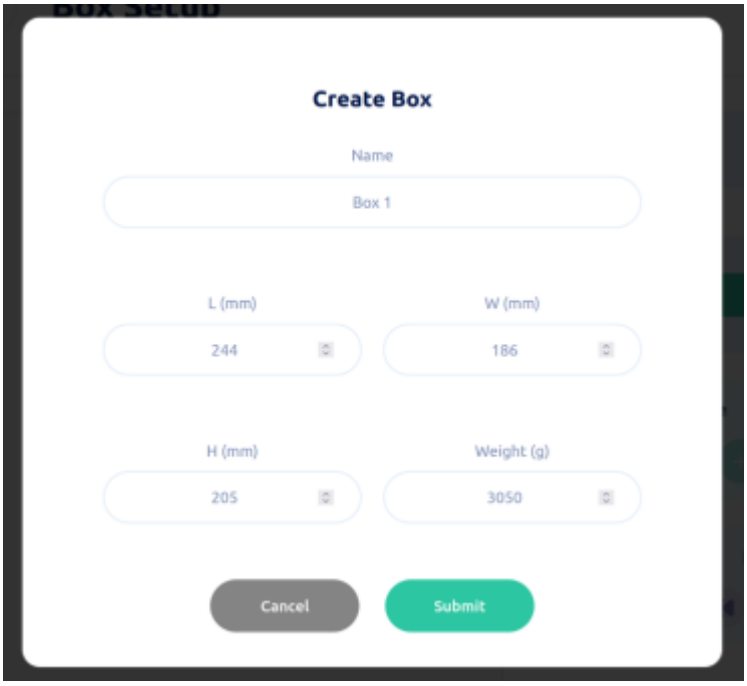


Enter Box Specifications

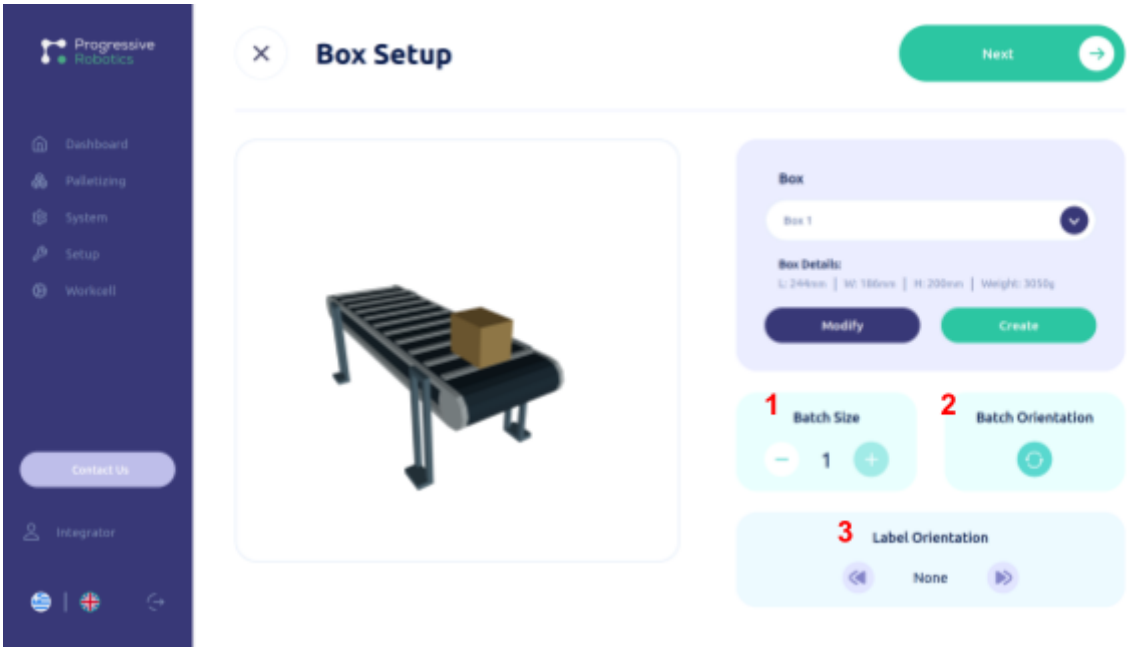
Create a new box by clicking **Create**.



1. **Name**: Enter a unique name for the new box.
2. **Dimensions**: Provide the box dimensions in millimeters (length, width, height).
3. **Weight**: Enter the box weight in grams.



Once created, the box is saved to the database.

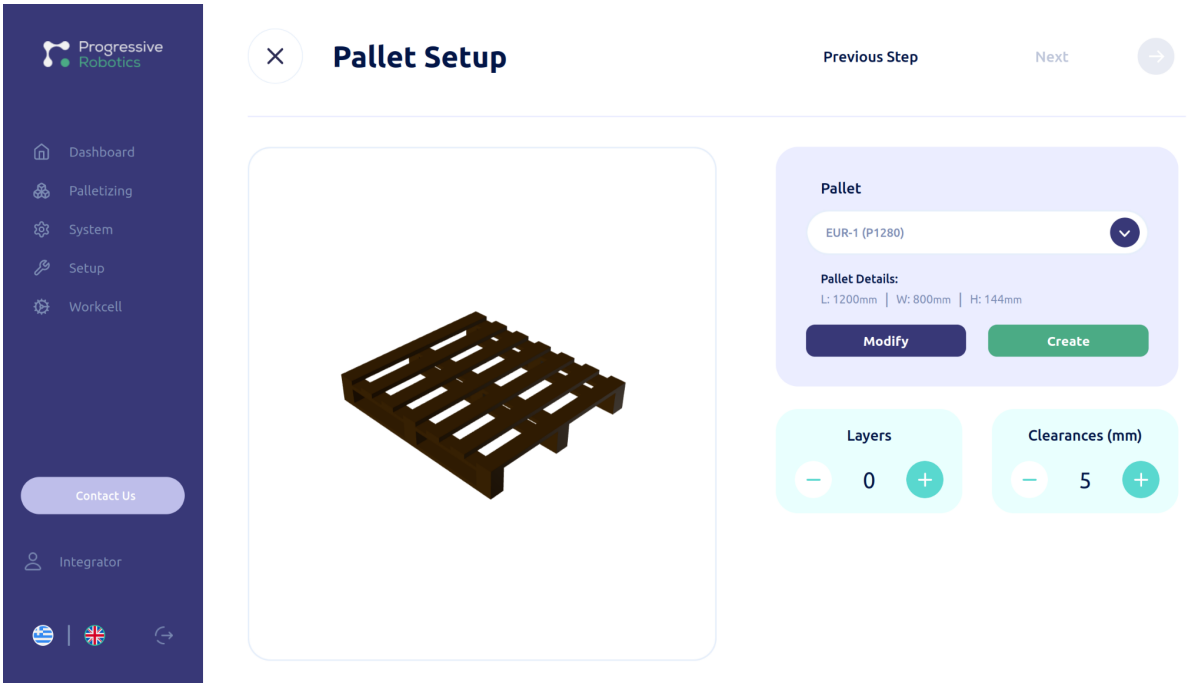


1. **Batch Size:** If the gripper can hold multiple boxes at once, specify the batch size.
2. **Batch Orientation**: Choose the orientation in which the boxes will arrive (horizontal or vertical).
3. **Label Orientation**: If there is a label on the box, specify the side on which it is located.

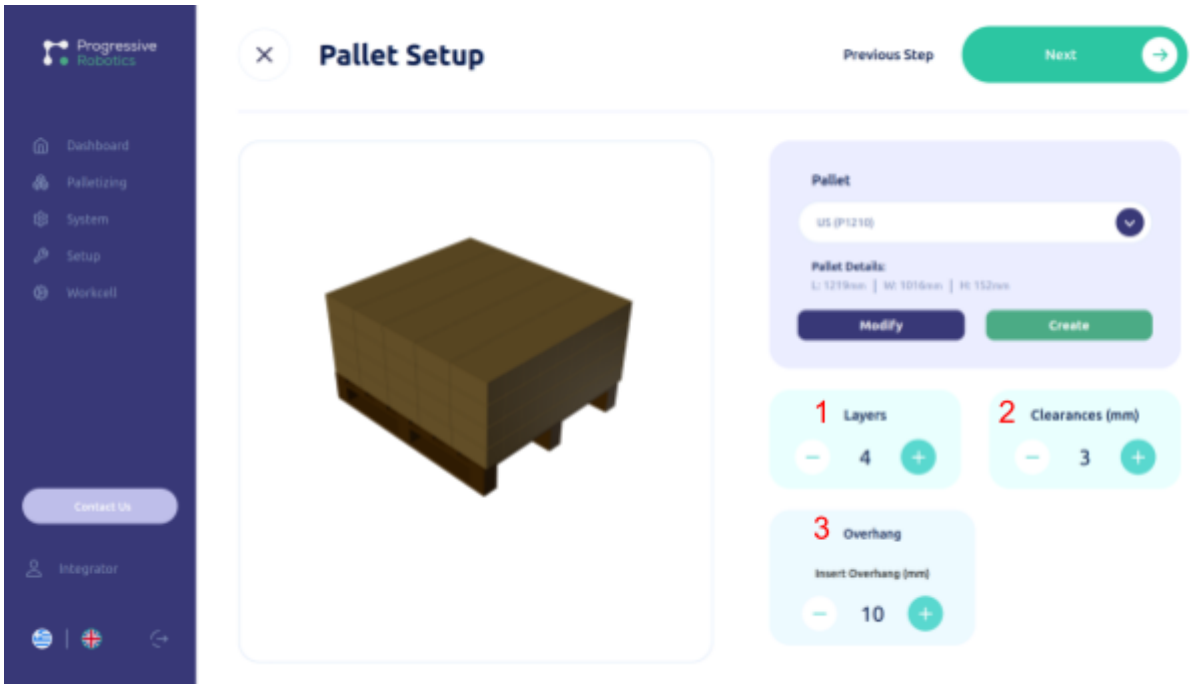
Click **Next**.

Select a Pallet type

1. Choose between EUR / US pallet, or
2. Create a custom pallet by clicking **Create** and specify the following:
    - **Name**: Name the custom pallet.
    - **Dimensions**: Enter pallet dimensions in millimeters.
3. If an existing pallet should be modified, click on **Modify**.



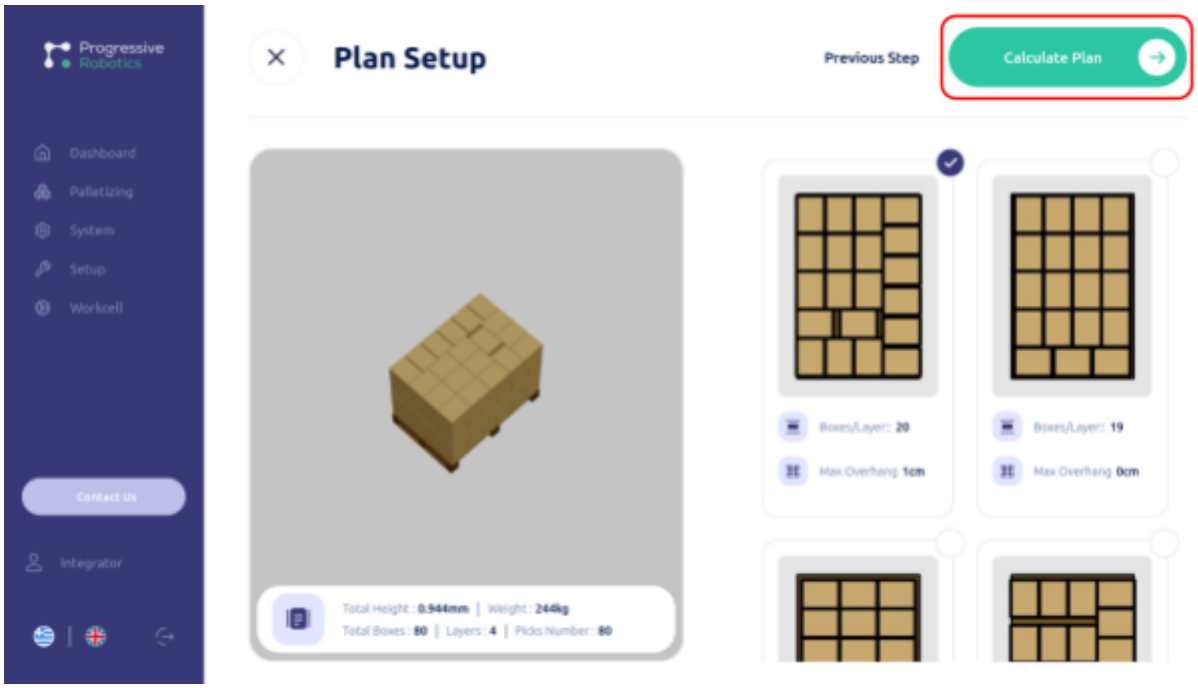
Define Palletizing Parameters



1. **Layers**: Specify the number of layers the robot will build on the pallet.
2. **Clearances**: Set the minimum space between boxes for proper alignment and stability.
3. **Overhang**: Define the maximum allowed overhang in millimeters, indicating how much a box can extend beyond the pallet edge.

When setup is complete, click **Next** to calculate the palletizing plan.

Select and Configure a Palletizing Plan



1. Each plan includes details such as:
    - **Number of boxes per layer**
    - **Amount of overhang** (how much each box extends beyond the pallet edge)
2. Review the plans and select the one that best fits your palletizing requirements.
3. After selecting a plan, click **Calculate Plan** to generate the robot's trajectories for the palletizing process.

Calculate Trajectories, Review Simulation, and Save the Recipe

1. Once the trajectories are calculated, view a **simulation** of the palletizing process to ensure accuracy.
2. If satisfied with the plan and simulation:
    - Click **Save**, enter a name for the recipe, and finalize the configuration.

The trajectory generation might fail for the following reasons:

- Placement positions out of workspace,
- Pallet too high
- No feasible solution due to collisions

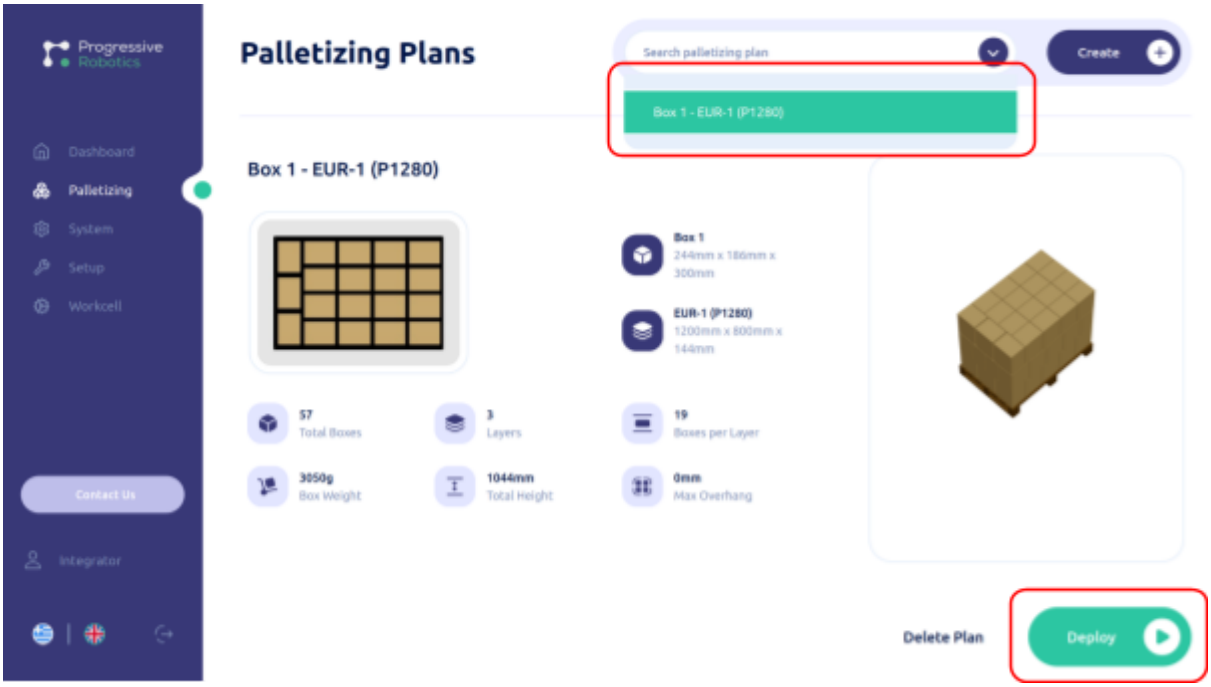
Click "**Previous Step**" to modify the palletizing parameters and try again.

The recipe is now saved and ready for use, enabling the robot to follow the specified palletizing process.

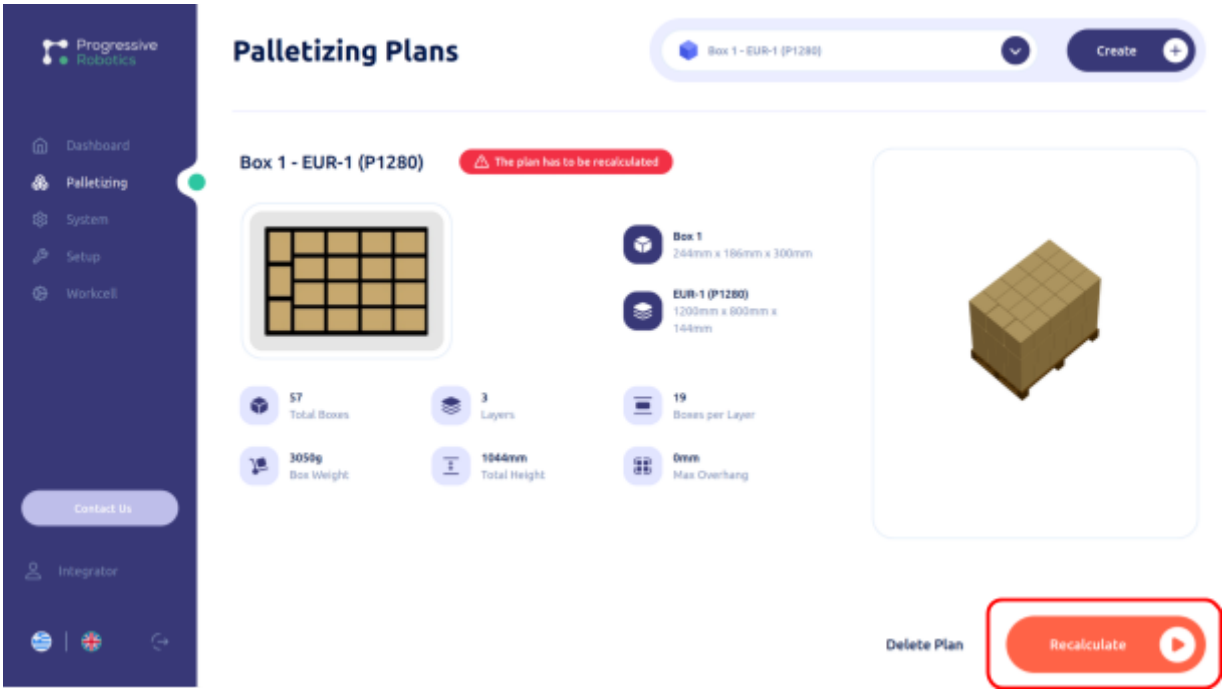
If you make adjustments in the "Workcell" menu, you have to recalculate the trajectories for all saved recipes.

Deploy to robot

To deploy a recipe to the robot, select it from the **Palletizing Tab,** and press **Deploy.**

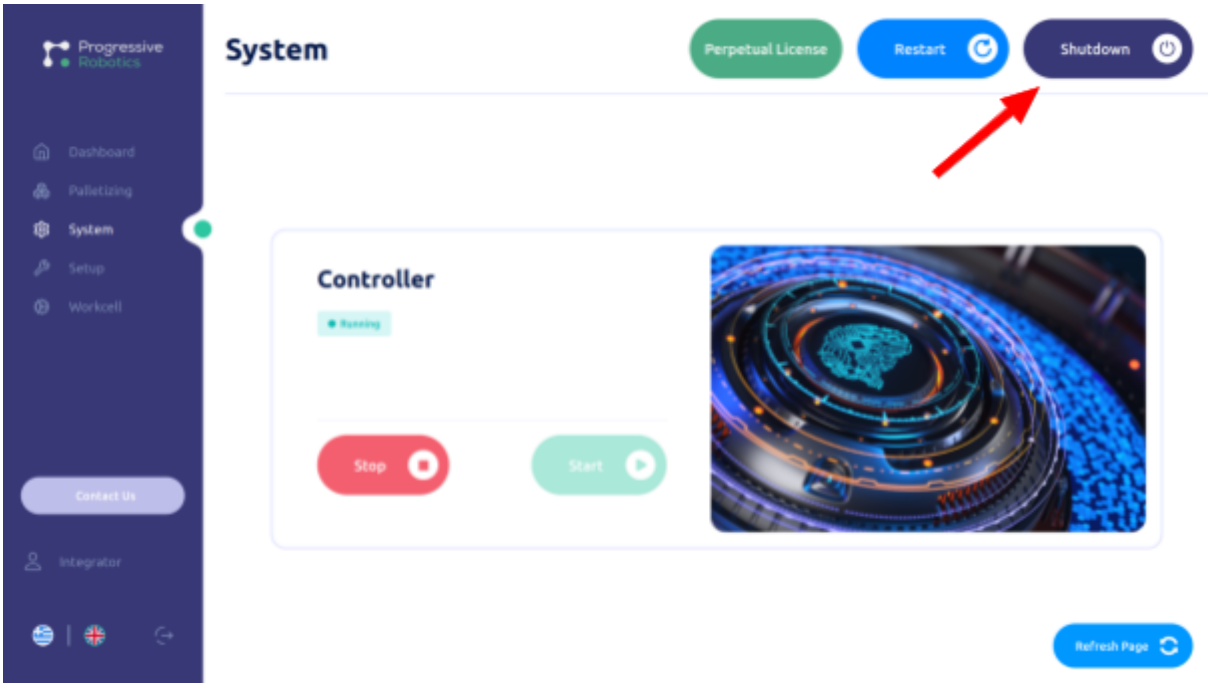


In case the Workcell has changed since the creation of the plan, the system will automatically prompt the user to **recalculate** the desired plan before deployment



Power off

To safely power off the Progressive Controller, go to the System tab and press **Shutdown**.



Troubleshoot

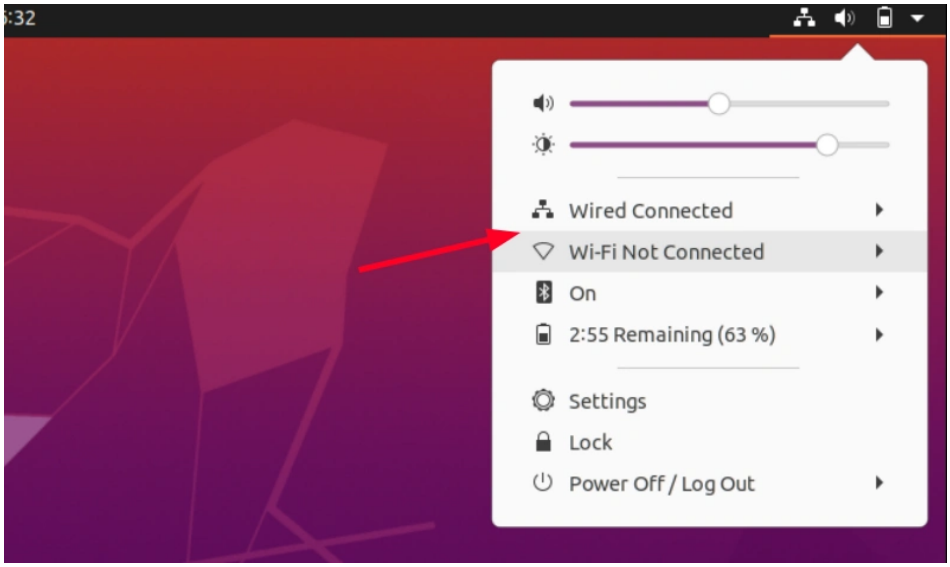
Reset Workcell defaults

To restore the workcell to the default definition just press **Restore Defaults** and then **Save Changes.** This will revert changes that have been made by the user, and restore the workcell calibration to its factory defaults.

Enable remote access for Progressive Robotics

To get remote support from Progressive Robotics with desktop access, you need to connect the Progressive Controller to the Internet.

1. While the device is powered on, press the button on the keyboard.
2. Connect to your WiFi to give the computer internet access



Contact Progressive Robotics

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