Robotiq Smart Infeed 100

INSTALLATION GUIDE

PCV-P01

THANK YOU FOR CHOOSING ROBOTIQ

This step-by-step guide will allow you to install and test your Robotiq Smart Infeed 100. Make sure to read the user manual before installing the Robotiq Smart Infeed 100.

1. WHAT IS SUPPLIED?

Standard upon delivery of Robotiq Smart Infeed 100

In the crate

- 1 x Smart Infeed system (INF100)
- 1 x Ethernet Cable
- 1 x Power Cable
- 1 x Safety Cable
- 2 x M5 x 8 mm SHCS
- 4 x 1/2"-13 concrete anchors
- 1 x Pneumatic Connector T 12 mm OD fittings
- Electrical Panel key
- Cable ties

2. SAFETY & WARNINGS

The operator(s) must have read and understood all of the Safety section in the user manual (available at support.robotiq.com).

The entire cell must go through a comprehensive risk assessment process before it can be used.

Do not turn on or operate the Robotiq Smart Infeed 100 before making sure that the air supply source is secured.

Make sure to follow all safety rules and regulations of your workplace. Always wear all recommended personal protective equipment in accordance with your workplace safety standards.

Failure to properly secure and install the equipment can result in material damage and bodily injury.

3. REQUIRED TOOLS AND EQUIPMENT

Already Provided with Your Palletizing Solution	Not included
• ½” x 6” Concrete Drill Bit	• Forklift (minimum length 0.9 m or 36”) or pallet jack • Drill • Hammer • Measuring Tape • Utility knife • Level Tool • Pneumatic Tubing Cutter • Adjustable Torque Wrench • Square/Phillips Screwdriver • 2 mm Flat Screwdriver • 13 mm or ½” Hex Socket & Wrench • 15 mm Hex Socket & Wrench • 19 mm or ¾” Hex Socket & Wrench • 24 mm Open End Wrench • 5 mm Hex Key • 6 mm Hex Key • Shortest Box planned (for transition testing) • Largest Box planned (for PowerPick Multi testing)

4. UNCRATING AND INSPECTION

The transport, lifting and moving of the Robotiq Smart Infeed 100 should be done by qualified and authorized personnel. Failure to do so may result in machine damage, serious injuries or death.

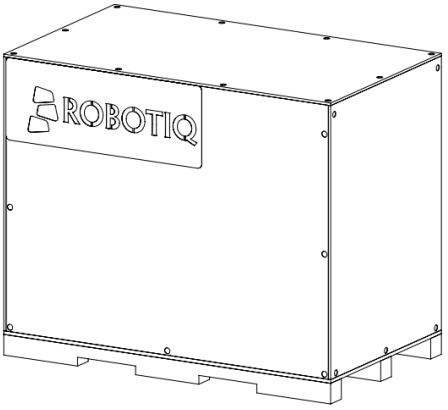
Installation hazard:

- DO NOT install this equipment without having read and understood the Robotiq Smart Infeed 100 User Manual.

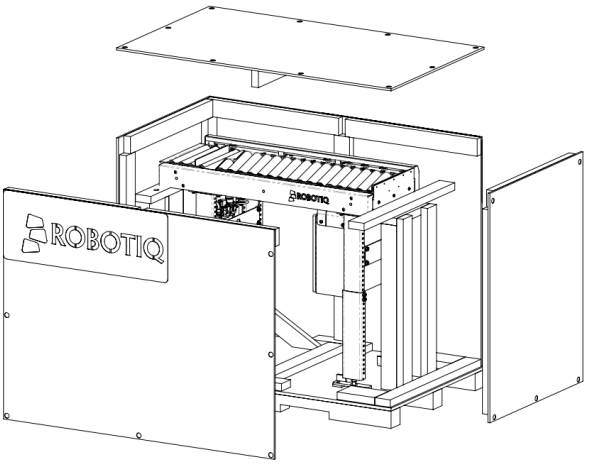
Failure to follow these instructions and to properly secure or install the equipment can result in material damage, death or serious injury.

1. Transport the crate to the designated working space using the forklift or pallet jack.

2. Inspect the unit for shipping damage and confirm all components listed on the packing slip are present. Report any damage or missing parts to Robotiq support at support@robotiq.com.



3. Unscrew all visible external screws (Square Drill bit) from the top and four side panels of the crate and remove the top and side panels.This step is best performed by two (2) people.



4. Remove and discard the four (4) bolts that secure the smart infeed feet to the bottom of the crate.

5. Locate the bag containing the provided hardware. Remove the bag and set it aside for future use.

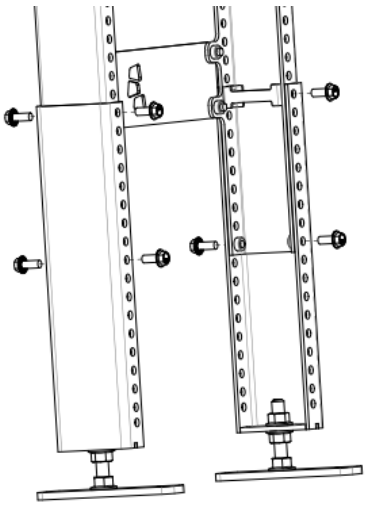
Caution: Do not remove the straps holding the conveyor in place.

6. Coarse height adjustment (This step is more conveniently performed with 2 people):

The Smart Infeed is shipped at its maximum height adjustment with only 2 bolts per leg with protective washer.

Warning: For structurally safe operation
Bolts are shipped with protective plastic washers that will need to be removed for final assembly.

At this step, you will adjust the legs at the right height to fit your upstream conveyor.



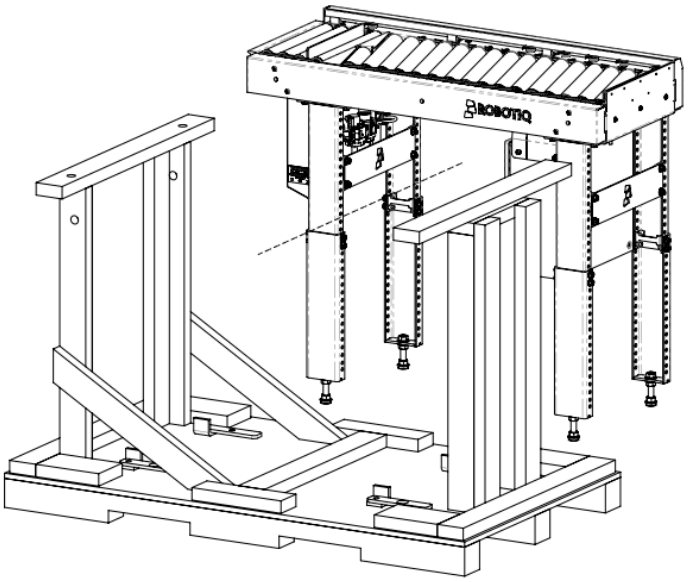
- Using a level and measuring tape, measure the required height on your existing conveyor.
- Unscrew the top bolt on the 1st leg while holding the bracket in which the bolt is screwed.
- Unscrew the lower bolt while holding the bottom of the leg. The bottom portion of the leg is now free to be adjusted.
- Set dimension G to a value within the height range listed in Appendix A-3. The feet adjustments are shipped at their lowest adjustment and you will be able to use them to fine tune to the final height at a later step.
- Install screws with the matching holes. (Do not forget to remove the plastic washer used for shipment).
- Using additional screws provided with your kit, screw the 2 lower bolts to fix the height. Replace the bracket so that its protruded side is completing a square share. Screw the 2 higher bolts through the bracket.
- Torque the 4 M10 bolts to 45 Nm.
- Repeat the same steps for the other conveyor legs.

7. Height fine-tuning.

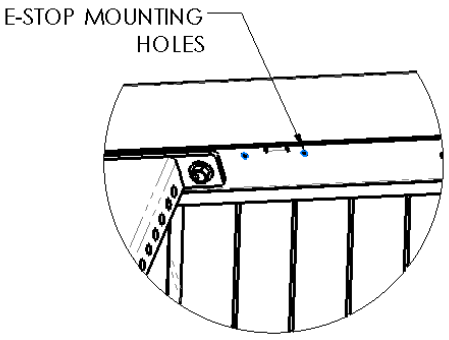
Once the adjustable legs are roughly at the desired height, fine-tuning (ranging from -0 to +36 mm) can be achieved using the leveling foot. You will need a 24 mm open wrench.

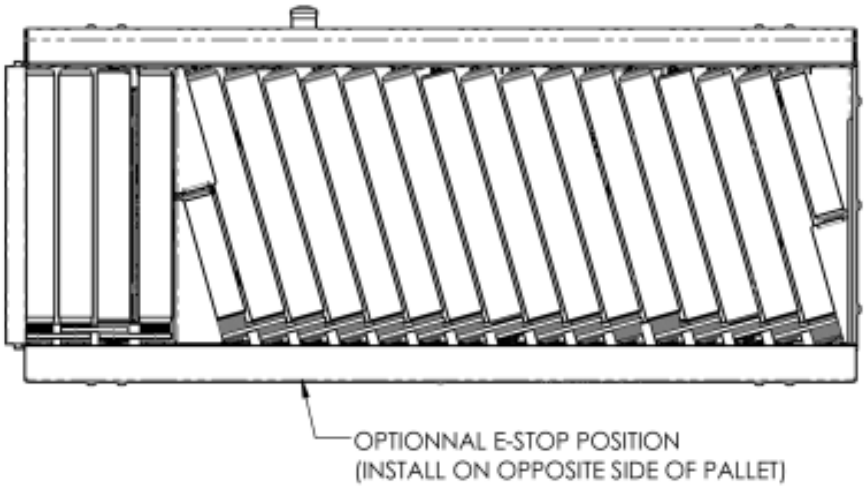
8. Cut the straps holding the conveyor in the crate.

9. Using a forklift, carefully lift the 124 kg (273 lb) conveyor from the side. Ensure the conveyor is stable before moving it. Pay close attention to the disconnect switch on the Robotiq control box, located underneath the conveyor.



10. Use the 2 provided M5 x 8 mm SHCS screws to mount the E-stop on the side of the Smart Infeed. There are 2 mounting options for the E-stop. For a perpendicular infeed configuration, place the E-Stop on the side of the Smart Infeed that is opposite to the pallet and robot operation. For direct inline installations, the E-Stop can be positioned on either side. Refer to Annex A-1 for suggested E-Stop mounting options.





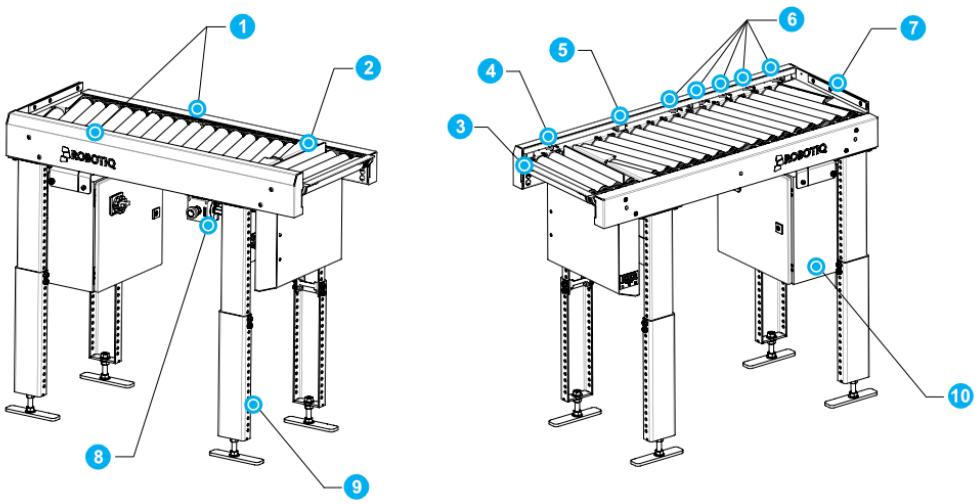
5. MECHANICAL & ELECTRICAL INSTALLATION

Main steps

- ☐ **A. Positioning**
- ☐ **B. Height Adjustment**
- ☐ **C. Palletizer Installation**
- ☐ **D. Electrical Connections**
- ☐ **E. Air Tube Connections**
- ☐ **F. System Startup**
- ☐ **F. Performance Checks & Fine Tuning**
- ☐ **G. Anchoring**

For details of each step, refer to the corresponding sections.

Main Components

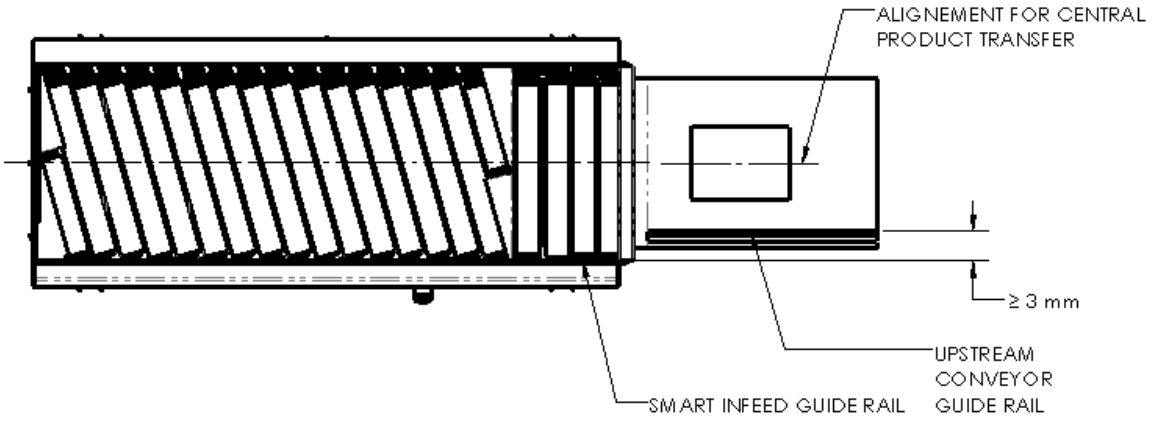


1. Side Covers
2. Gate
3. Transfer Plate
4. Photoelectric Gate Sensors
5. Side Rail
6. Photoelectric Accumulation Sensors
7. End Stop
8. E-stop Button
9. Adjustable Legs
10. Smart Infeed Control Box

A. Positioning

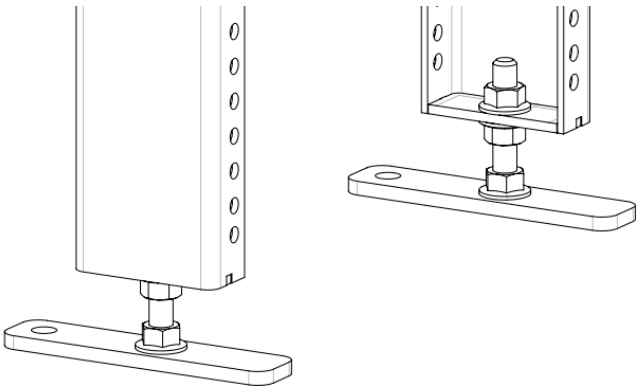
Position the Smart Infeed at the desired location. Align it so that the flow of products arriving from the upstream conveyor are entering centered or closer to the rail on the Smart Infeed.

To maximize the throughput and the product accumulation capacity of the Smart Infeed, the lateral travel distance of boxes should be limited. The Smart Infeed product specifications assume as worst case the case where the boxes are entering centered.



B. Height Adjustment

Using the leveling feet, fine-tune the adjustable stands until the Smart Infeed is level with the upstream conveyor or slightly lower (+0/-2.0 mm). Confirm the Smart Infeed's stability by ensuring all four foot plates are in contact with the ground and level the unit using an appropriate tool. Tighten the leveling feet nuts to 78 Nm.



C. Palletizer Installation

Install the palletizer, but do not anchor it yet. Default conveyor distances are provided in Annex A-1 and A-2. For customized layouts, use our web configuration tool.

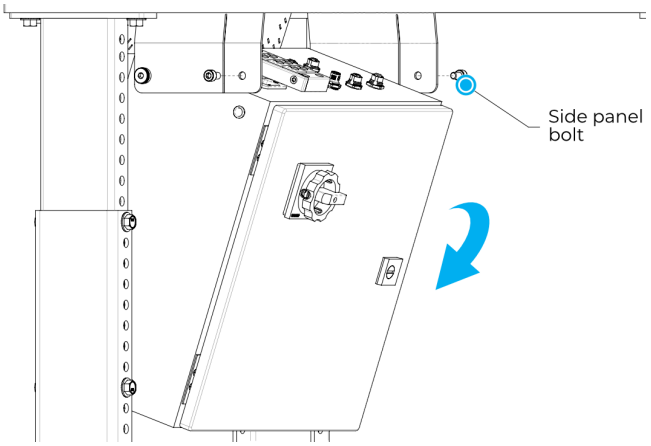
For detailed information, consult the manual for your Robotiq Palletizing Solution model, available at www.robotiq.com/support.

D. Electrical Connections

⚠️Before you proceed, confirm that the main power is off.

1. Connections to the Palletizer

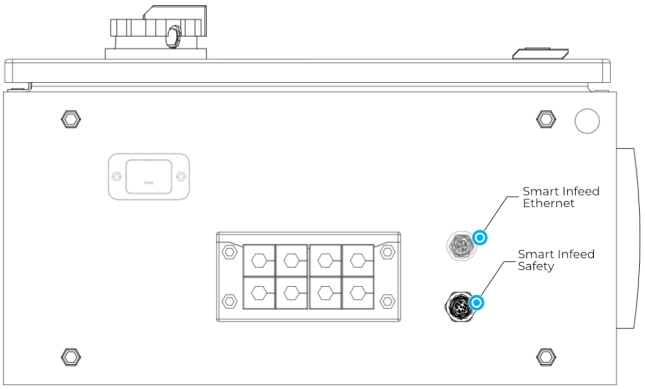
1.1. Unscrew the side panel bolts (6 mm Hex key) to allow the control box to rotate. This will simplify the connection of the power, Ethernet, and safety cables.



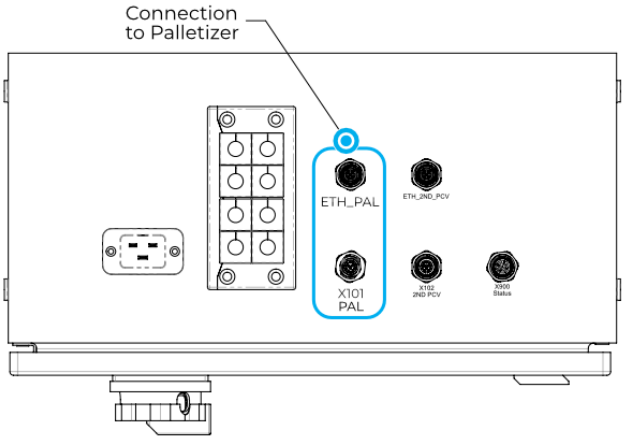
1.2. Open the Robotiq palletizer base cable compartment.

1.3. Route the Ethernet cable and the female end of the safety cable through the channel of the palletizer base up until the Palletizer controller.

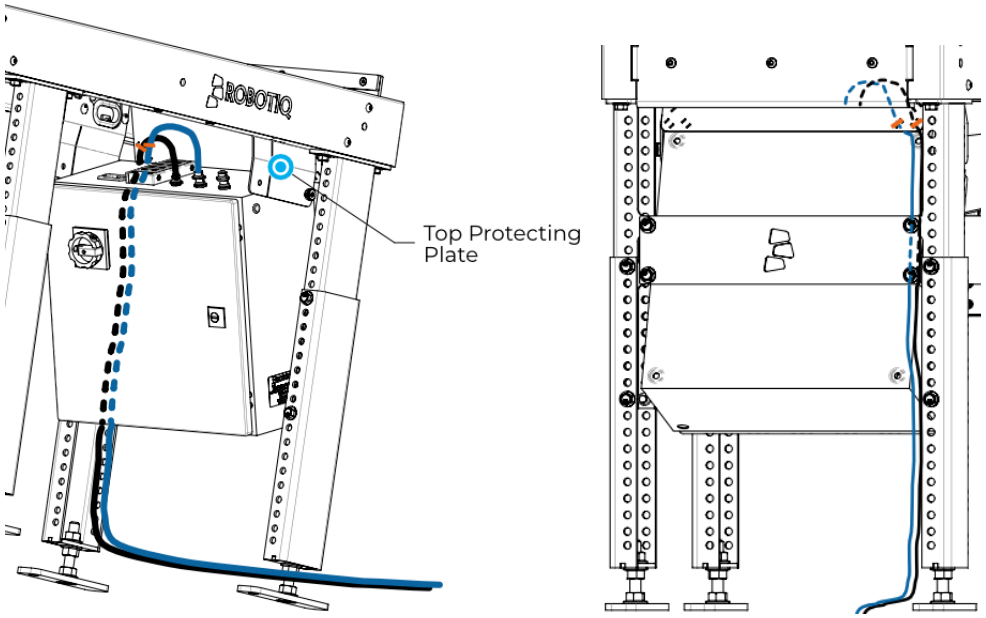
1.4. Carefully align and engage the keyway, then screw the network and safety cables to their designated ports on the Robotiq Palletizer control box.



1.5. Route the cables to the top of the Smart Infeed control box. Plug the network and safety cables into their respective ports.



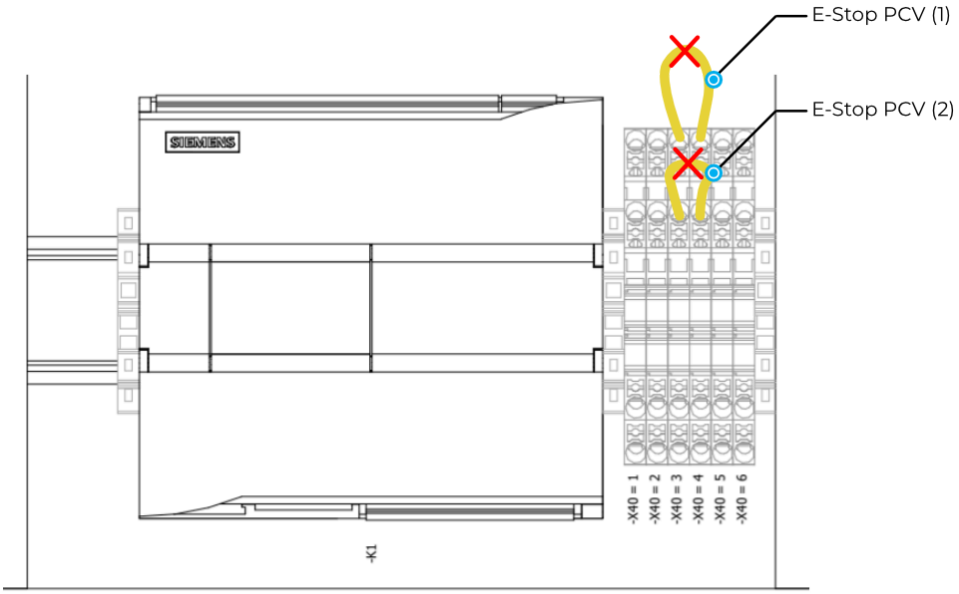
1.6. Secure the cables to the adjustable leg and the top protecting plate of the Smart Infeed Control Box using the provided cable ties.



1.7. Insert the excess cable length into the palletizer's base, securing it with tie wraps as needed.

Warning:
You must complete the next step to properly connect the Emergency Stop systems for both units.

1.8. Open the Palletizer control box door. Using the 2 mm flat head screwdriver, remove and discard the yellow jumper wires E-Stop PCV (1) and E-Stop PCV (2) located in the lower section of the controller box. Close the Palletizer control box door.



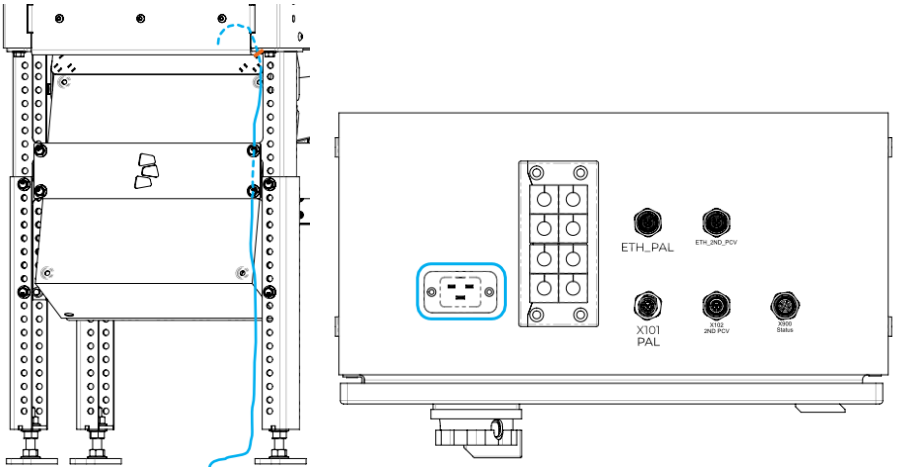
2. Power Connections

2.1. Route the cable from the rear of the control box.

2.2. Plug the power cord into the power plug located on top of the Smart Infeed Control Box.

2.3. Route the cable along one of the Smart Infeed's adjustable legs.

2.4. Secure it with cable ties.

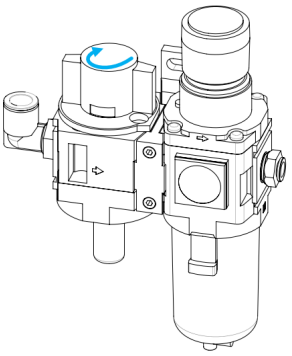


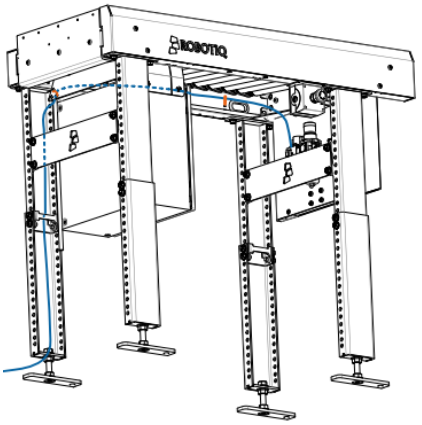
Wait until all electrical and pneumatic connections are complete before plugging the power cord into the wall outlet.

E. Air Tube Connections

Warning: This step must be performed by personnel competent in pneumatics. Protective eyewear is recommended when handling pneumatic equipment.

1. Make sure the manual shut-off valve on the Robotiq Smart Infeed is at OFF.
2. Shut off the air supply to the Robotiq Palletizer.
3. Use the Palletizer shut off valve to purge the air line by turning it on and off repetitively. Leave it at the OFF position when done.
4. Access the Ø12 mm main infeed line. For AX models, open the cable compartment on the Palletizer base. For PE models, open the UR Control Box Bay.
5. Using the tubing cutter, cut the main line and install the supplied Ø12 mm T-fitting approximately 200 mm from the entry point, making sure to reconnect both sides of the Palletizer tube.
6. Route the provided Ø12 mm hose from the Smart Infeed, where it comes pre-connected, to the cable compartment of the Palletizer base. Remove the dust cap and trim as needed.
7. Connect the Ø12 mm hose to the remaining outlet on the T-fitting.
8. Use cable ties to secure the hose as needed.





9. Pressurize the line and both systems by turning on both shut off valves and check for leaks.
10. Make sure the pressure is set between 4 to 6 bar (60 to 87 psi) for the Smart Infeed.
11. Turn off the pneumatic shut off valve of the Smart Infeed.
12. Once both the electrical and pneumatic connections are completed, close the palletizer base and screw back in place the Robotiq Smart Infeed Control Box

F. System Startup

Hardware

1. Connect the power cord to the wall outlet.
2. Ensure the E-Stop button is released.
3. Turn on the log out/tag out on the Smart Infeed Controller. You can verify the power is properly on by looking at the sensors on the side of the rail of the Smart Infeed.
4. Turn the pneumatic shut off valve on

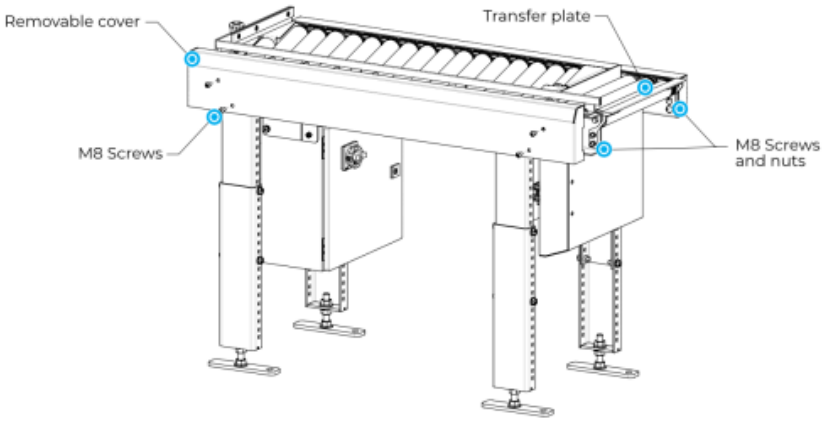
Software

1. Launch the control interface on the robot teach pendant.
2. Install Copilot on your palletizer. Refer to your Palletizer's manual for detailed instructions on installing the Copilot URCap.
3. Add and configure the Smart Infeed 100 under Installation → URCaps → Copilot → Configuration tab. Refer to 6. Software for detailed instructions.
4. Once ready to use, you will be able to use the “Start feed test” button for Step G Performance Check and Fine-tuning.

G. Performance Checks and Fine-Tuning

Transfer Plate

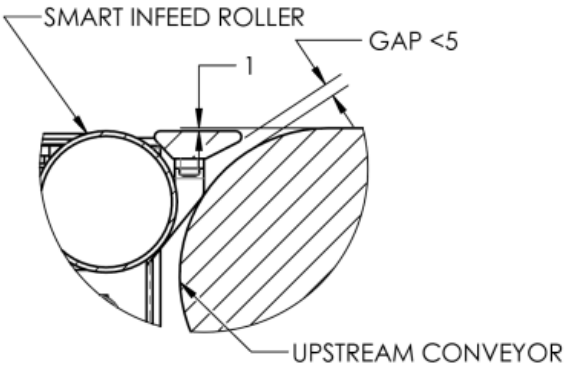
To validate the default transfer plate positioning:



1. Place the smallest box on the running upstream conveyor.
2. Ensure the gate is down and the shut-off valve is off.
3. Observe the box's transfer to the Smart Infeed. Verify that the product transfers correctly, without getting stuck before, on, or after the transfer plate. Also, ensure there is no product rotation, which can occur at the transition plate due to uneven left-to-right contact.
4. Adjust the Transfer Plate positioning if necessary.

To adjust the transfer plate, begin by removing the two side covers. Use a 5 mm Hex key to unscrew the eight M8 screws that secure the covers.

Once the covers are off, adjust the transfer plate to bridge the gap between the Smart Infeed and the upstream conveyor. To do this, loosen the four M8 nuts using a 13 mm socket. It's recommended to leave the side cover open to confirm proper adjustment before closing them.



For safety, a maximum gap of 5 mm is recommended. Once the adjustment is complete, torque the four M8 nuts of the transfer plate to 20 Nm. Test again the box transfer test to confirm your adjustments. When adjustment is confirmed, place back the side covers. Torque to 20 Nm. Reopen the air shut off valve.

Smart Infeed Speed

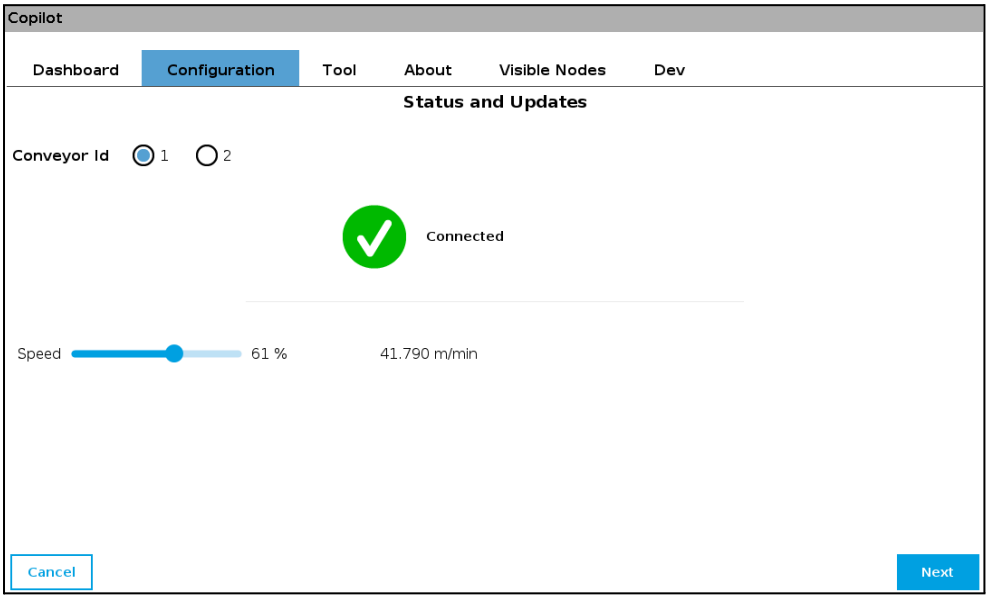
At this stage, validate the speed of the Smart Infeed using your smallest box.

You may need to adjust the Smart Infeed's speed for two primary reasons:

To increase speed: If the gate isn't separating boxes correctly.
To decrease speed: If boxes are unstable (e.g., very tall and slim) while traveling on the Smart Infeed.

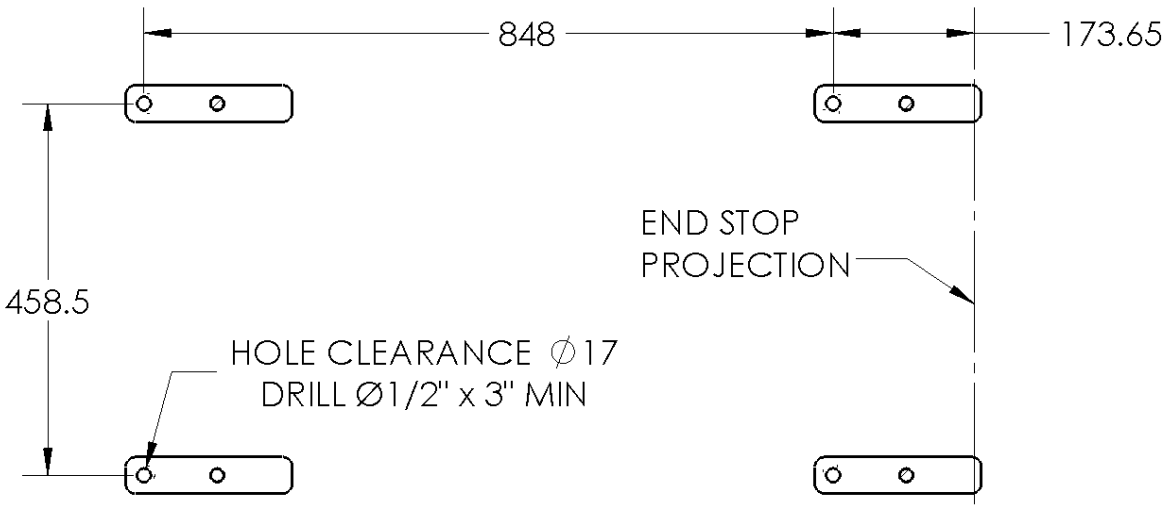
To do so:

1. Place your smallest box on your running upstream conveyor and observe how the Gate and rollers let through one box at a time on the Smart Infeed.
2. The Smart Infeed will automatically detect the box, accelerate it, and then decelerate to stop it precisely at the pick position.
3. The system will send a signal (e.g., Object Ready) to the robot controller, indicating the box is ready for picking.
4. If the desired box separation or a stable box travel is not achieved, adjust the conveyor speed. This is done with a speed slider in the Configuration menu of the URCap Installation Tab as shown in figure below. The speed can range from 18 to 57 m/s, with a default of 42 m/s. In the interface, this corresponds to 61%.



H. Anchoring

1. Once the setup is complete, use the conveyor foot as a drilling jig to accurately mark and drill the four holes in the concrete. A ½'' concrete drill bit is required for this step (included with your Palletizing Solution or Retrofit Kit).
2. Fasten the conveyor legs to the floor using the four provided concrete anchors. Torque to 68-74 Nm using a 19 mm or 3/4" socket.



3. Fasten the Palletizer securely to the floor using the supplied concrete anchors (4 anchors for PE20 and AX20/AX30, 6 anchors for PE10 and AX10). Torque them to 68 to 74 Nm. Refer to Annex A-1 and A-2, and the Anchor section of the Palletizing manual for more details.

6. SOFTWARE

The Smart Infeed 100 is configured through the Copilot URCap interface. Please refer to the Software section of your Palletizing System manual for detailed information regarding the Copilot software.

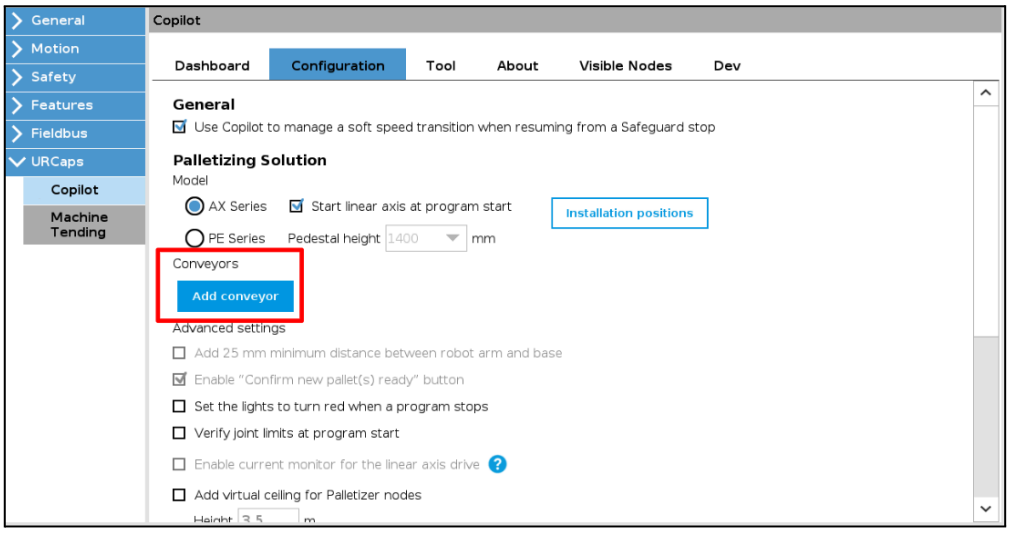
Safety Configuration

Before adding the conveyor:

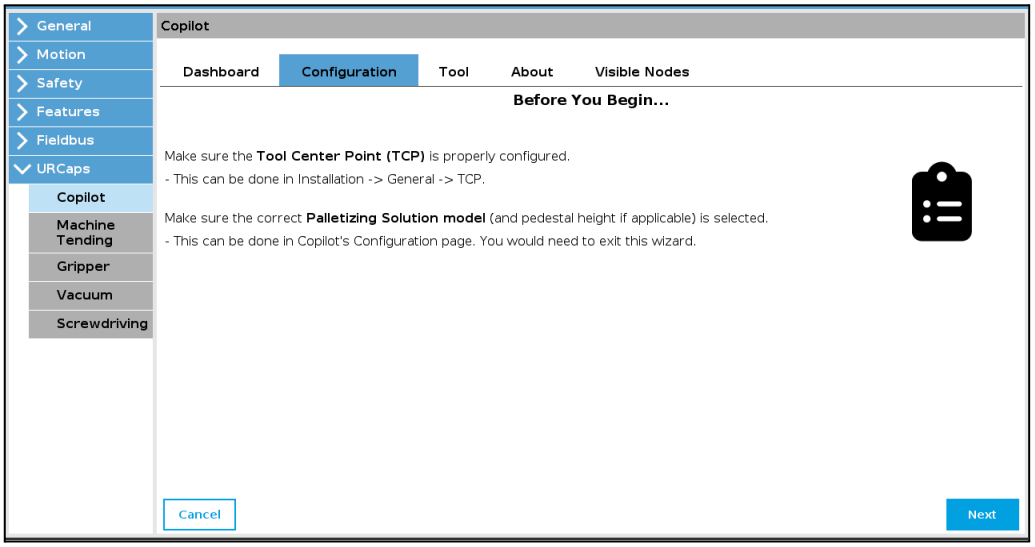
- In the Installation tab, tap Safety, then I/O.
- Set config_out[0], config_out[1] to System Emergency Stop and Apply.

Adding a Conveyor

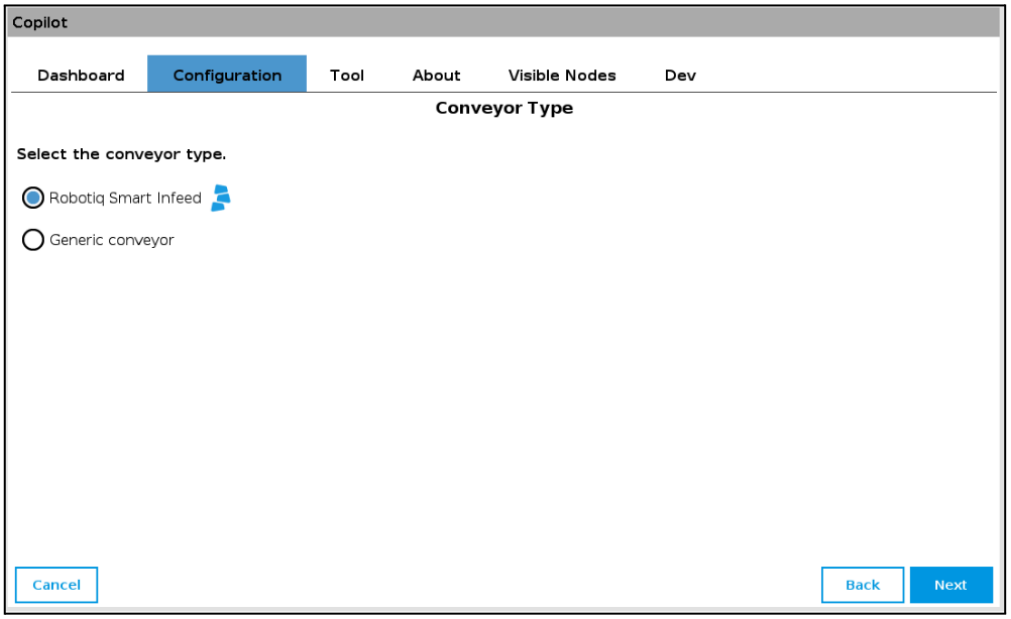
1. To add a conveyor, go to the "Configuration" tab and tap "Add conveyor."



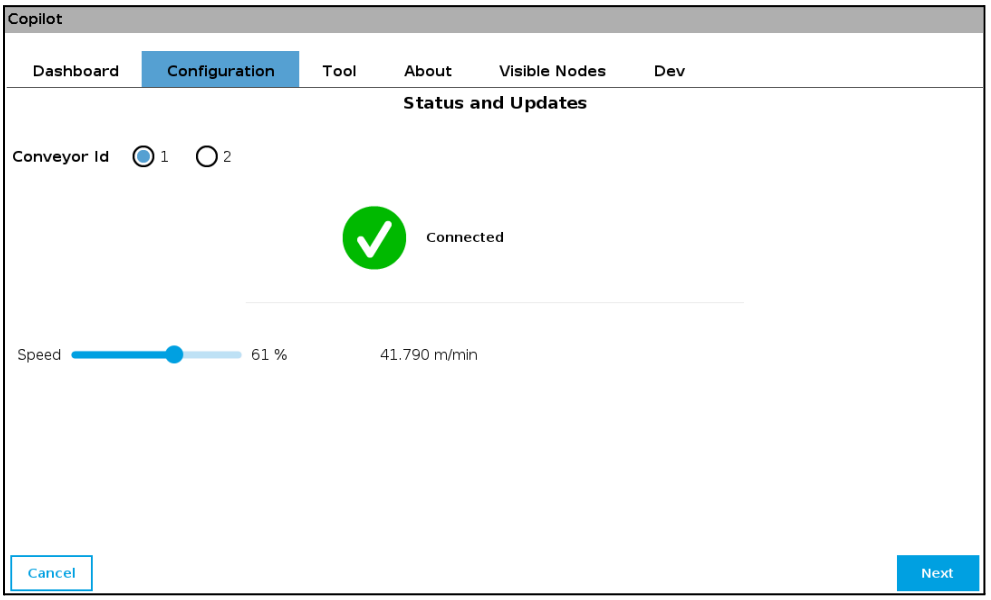
2. Read the instructions carefully and confirm that all requirements have been met. Once confirmed, press "Next."



3. Select Robotiq Smart Infeed as the conveyor type. Once selected, press “Next”.

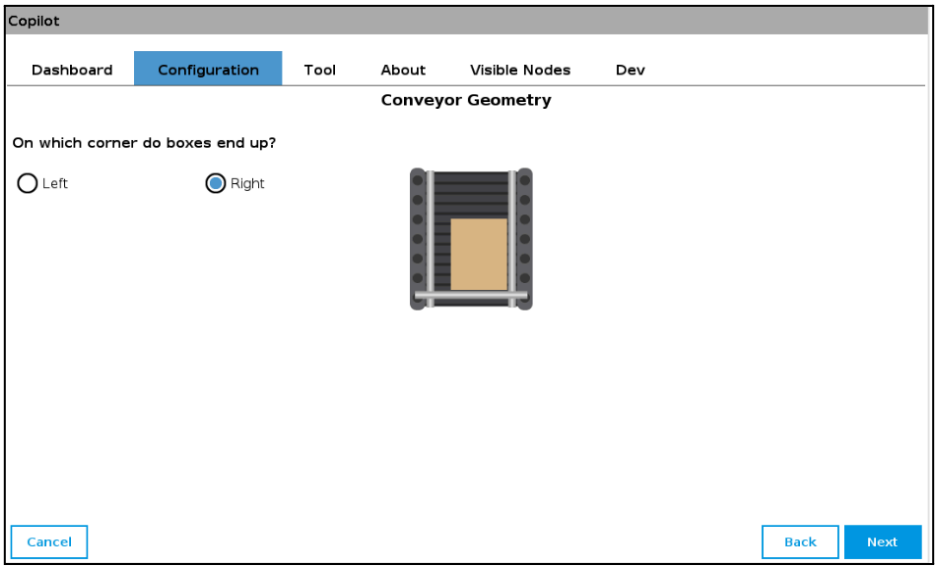


4. Choose your conveyor ID. You can connect as many as two Smart Infeeds to your Palletizer.
5. Adjust the conveyor speed as needed. The factory setting is 61% (42 m/min). See section Smart Infeed Speed for more information.
6. When finished, press "Next."



Caution: Occasionally, an update for the conveyor may be necessary to prevent errors. When an update is available, a button will appear on the Status and Updates page. Click this button and follow the on-screen instructions to update the conveyor software. After the update is complete, the conveyor will function as intended.

7. Based on your system, select the corner to which the box is normalized. Once selected, press “Next”.



8. To teach a box using the Conveyor Pose interface, follow these steps:

8.1. Prepare the Box:

8.1.1. Select the largest box. A high quality and square box is recommended to ensure a precise pick position.

8.1.2. Place it at the furthest picking corner meeting the end stop and the guard rail.

8.2. Input Box Information:

8.2.1. Choose between "short side leading" or "long side leading."

8.2.2. Enter the precise dimensions of the box.

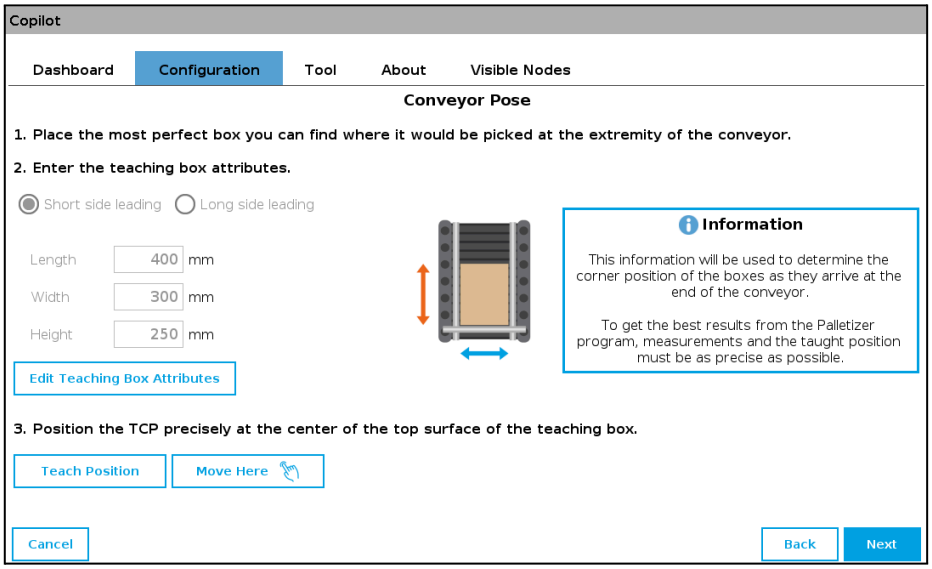
8.3. Teach Position:

8.3.1. Center the TCP (Tool Center Point) precisely on the top surface of the teaching box.

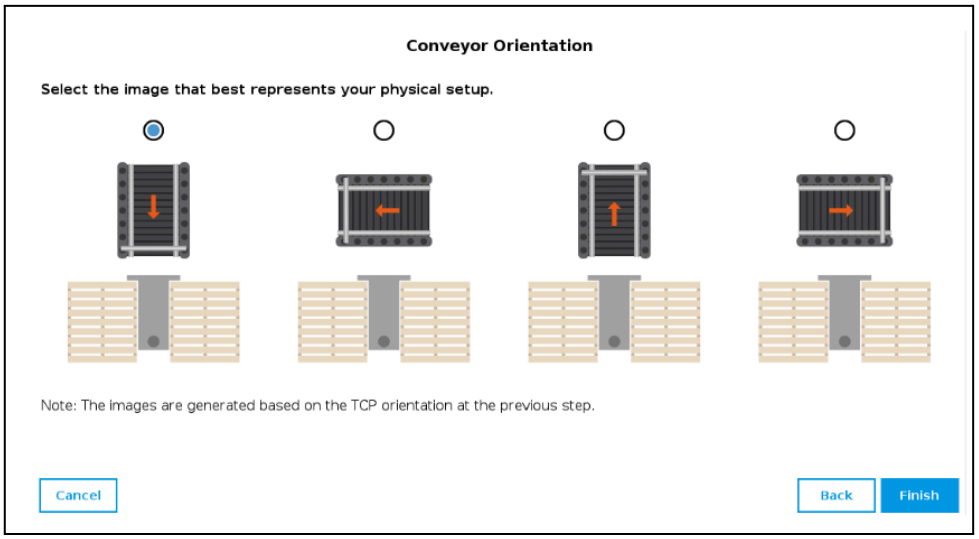
8.3.2. Press "Teach Position."

8.4. Complete the Process:

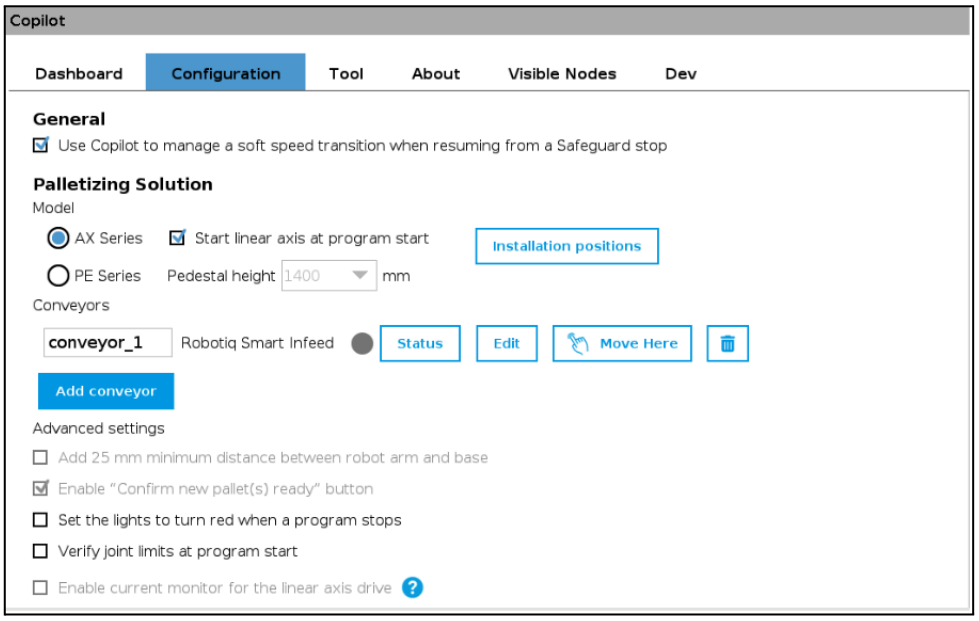
8.4.1. Once the position is taught, press "Next."



9. Select the conveyor's orientation. Then, press "Finish."



10. Your Smart Infeed will now be listed among the available Conveyors.

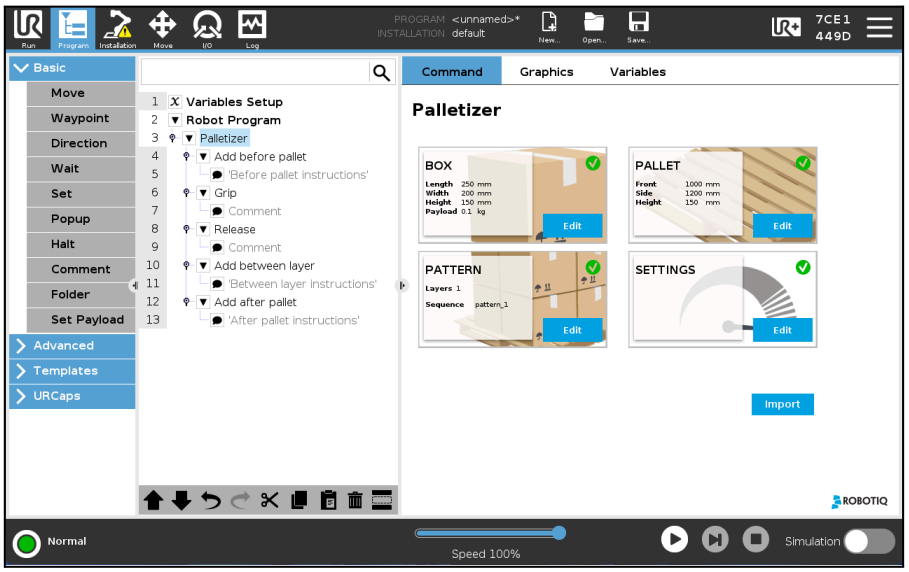


Note: You will be able to select it directly from the Box edit menu of the Palletizer node.

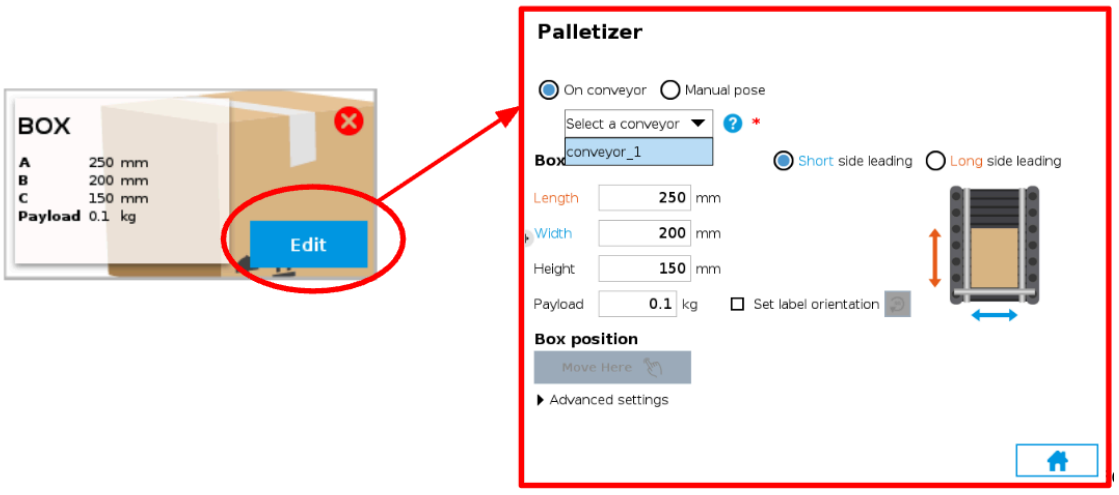
Integrating the Smart Infeed in a Palletizer Node

1. Box Attributes and Feed Test

1.1. Go to Robot Program --> Palletizer.

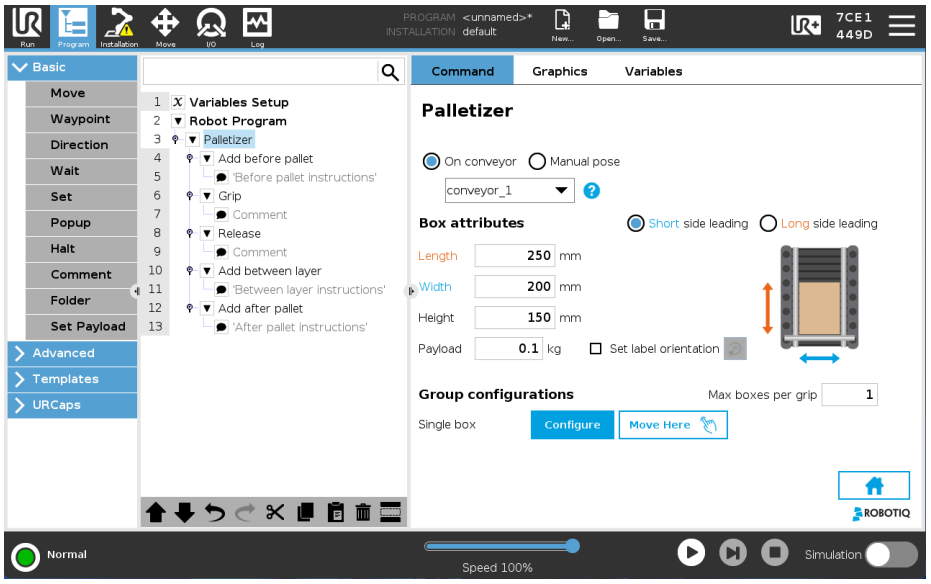


1.2. Access the Palletizer node, then tap the "Edit" button from the box tile.



1.3. Enter all box attributes.

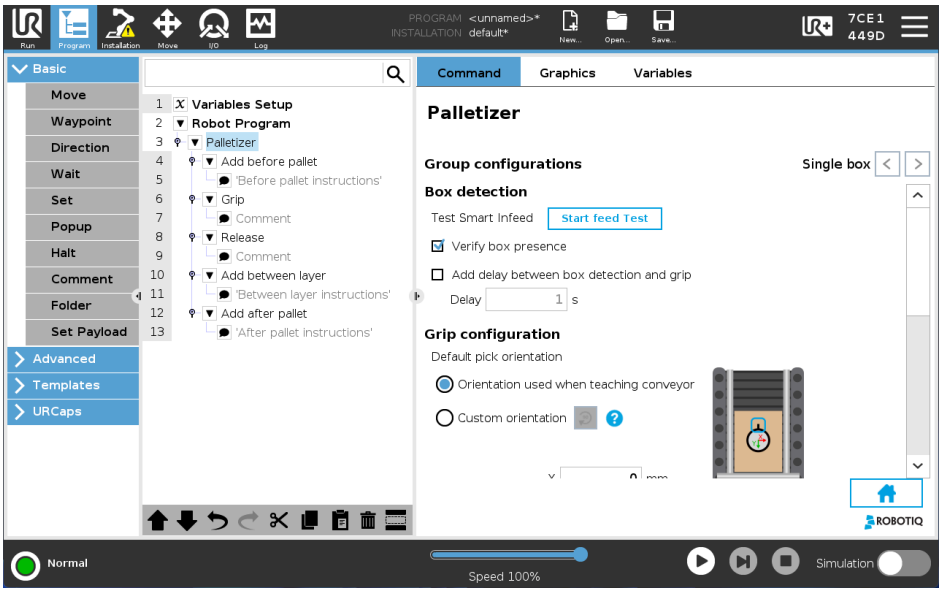
1.4. Tap the "Configure" button to set up the single box row.



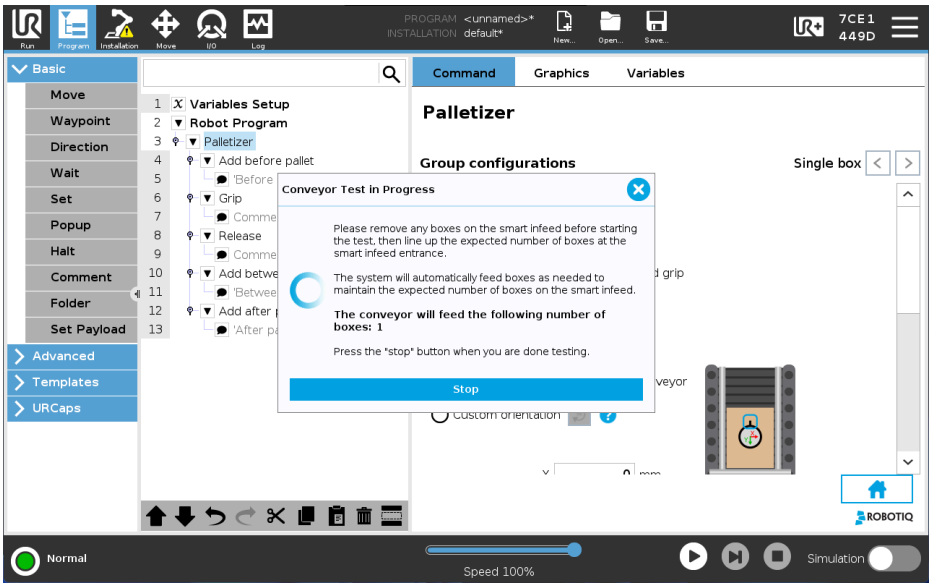
1.5. Allow one box to pass.

1.5.1. Please remove any boxes on the Smart Infeed before starting the test, then line up the expected number of boxes at the Smart Infeed entrance. The system will automatically feed boxes as needed to maintain the expected number of boxes on the Smart Infeed.

1.5.2. Tap the "Start feed test" button.



1.6. The following pop-up will appear, closing it or pushing stop button will stop the test:

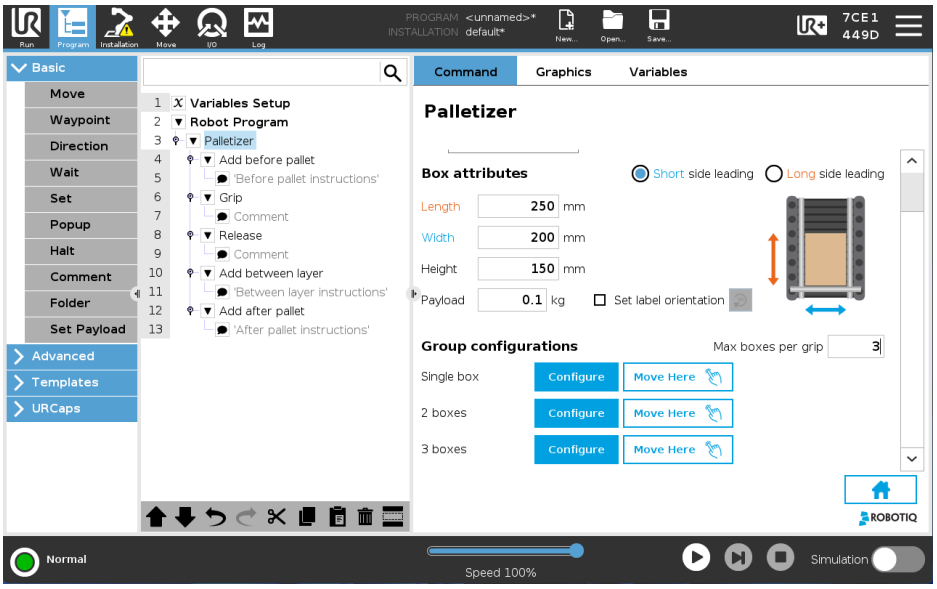


1.7. Test to let through 2 boxes (if length permits).

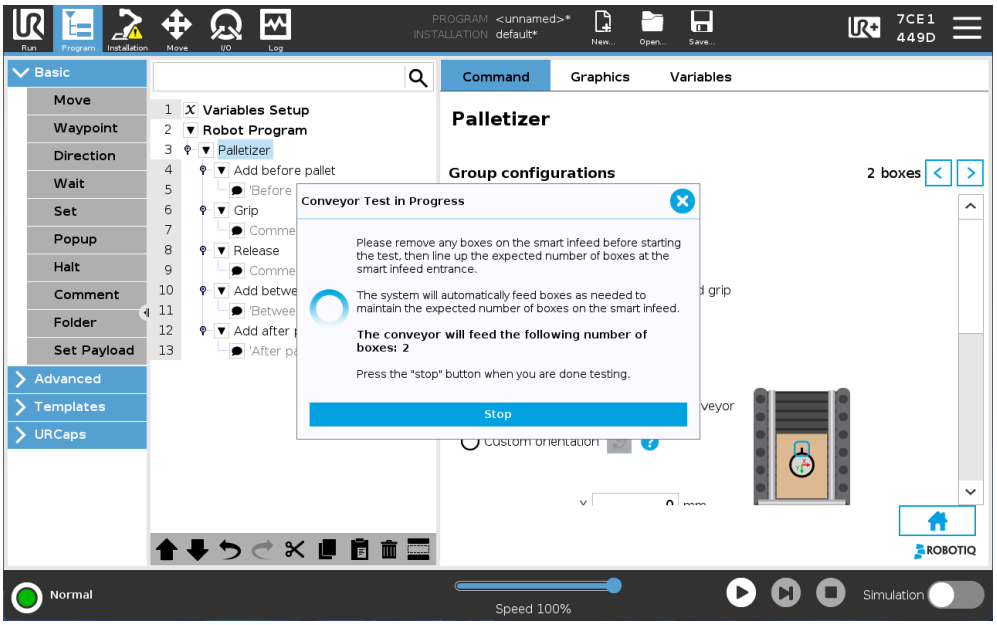
1.7.1. To test multiple boxes (more than one), access the box edition page and navigate to the group configurations section. Be aware that product length and their combined length might limit the max boxes per grip.

1.7.2. Increase the value of "Max boxes per grip".

1.7.3. New group configurations will appear, allowing associated box count tests.



1.8. Follow the same instructions as for a single box, adjusting for the desired number of boxes to be tested.



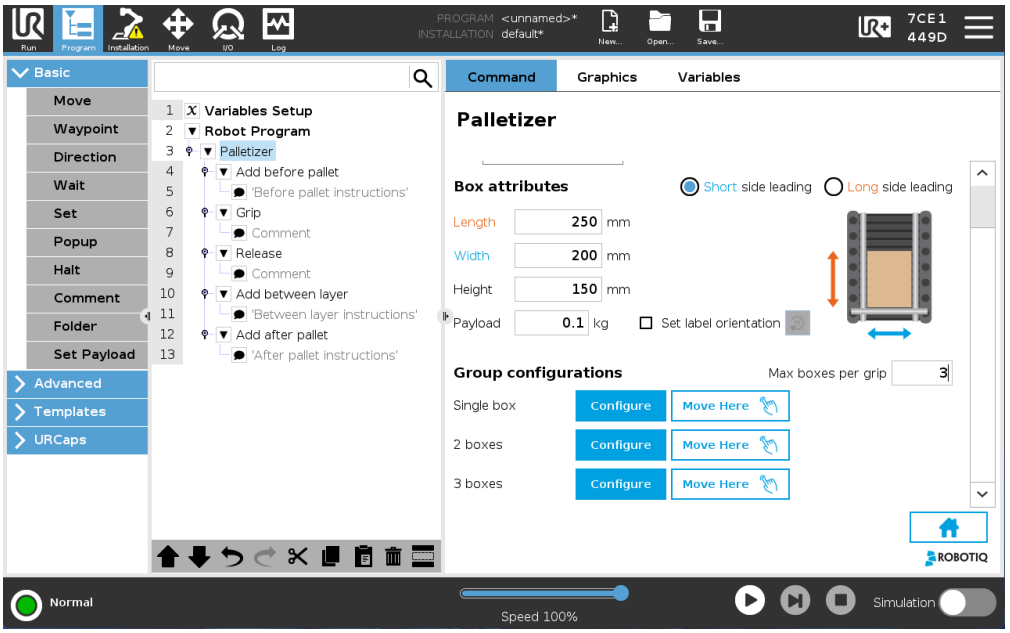
2. Pick Position Test

Autopick Functionality: The Smart Infeed includes an Autopick feature that automatically determines the most efficient way to pick boxes for palletizing. This eliminates the need for manual robot position teaching for individual boxes.

For comprehensive details on the Autopick feature and how to teach a group of boxes, please refer to your palletizer manual.

2.1. Access the palletizer node, then tap the "Edit" button from the box tile.

2.2. Under the group configurations section, tap the "Configure" button for a specific group configuration.



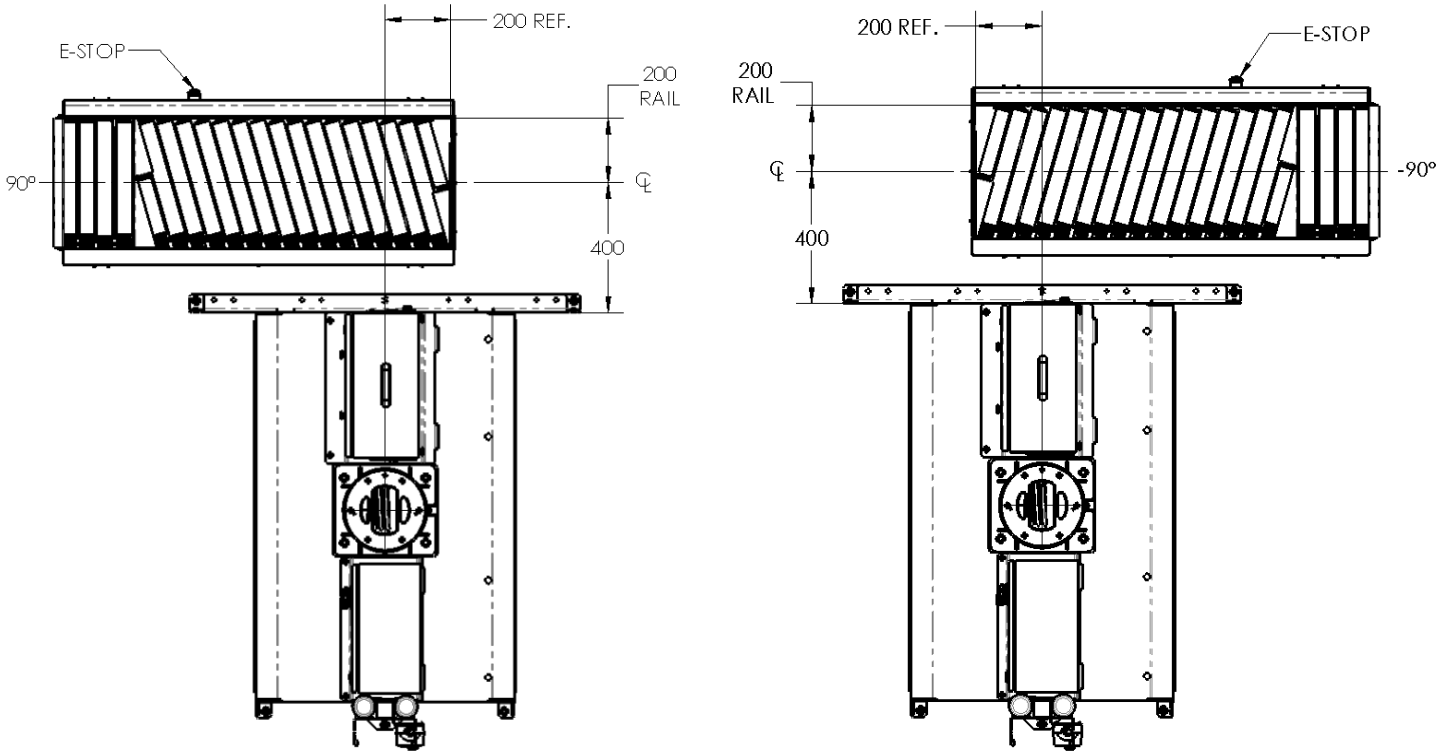
2.3. Tap and hold the "Move Here" button. The gripper will now move to the pick position.

2.3.1. If the suggested pick position is not adequate, you can override the default value with specific grouping TCP offset.

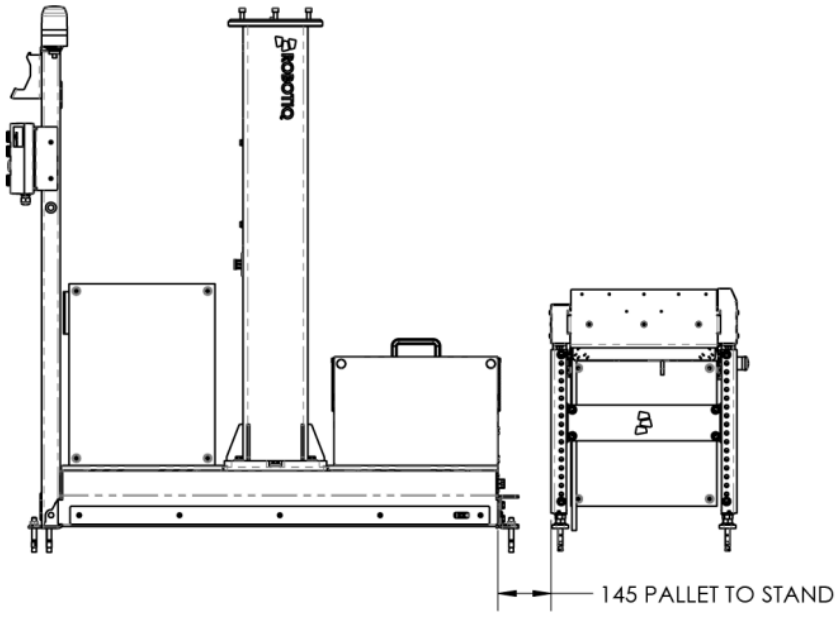
2.3.2. Validate all group configurations for the specified box.

2.3.3. Specific steps associated with the Smart Infeed are now completed, please refer to the palletizer manual for further details about pallet and pattern configuration.

Appendix A-1 - Recommended Default Layout (-90 or 90°)

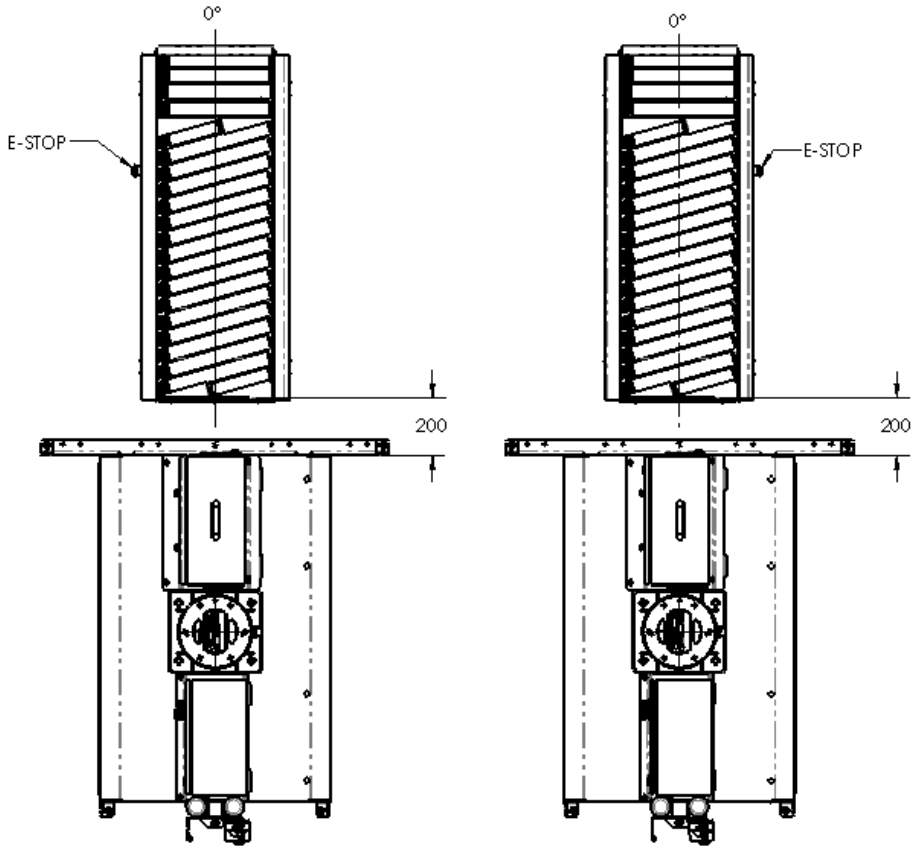


Recommended Default Layout (90°)- Top View (Left)
Recommended Default Layout (-90°) - Top View (Right)

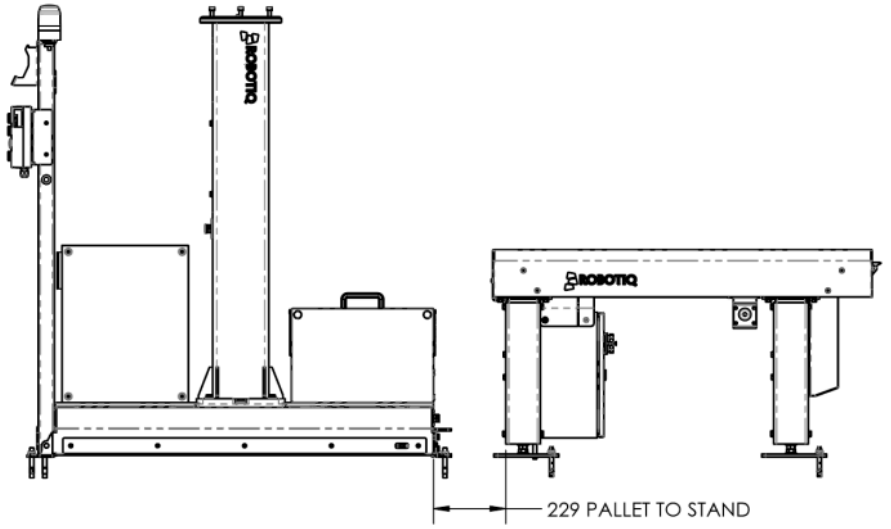


Recommended Default Layout (-90 or 90°) - Lateral View

Appendix A-2 - Recommended Default Layout (0°)

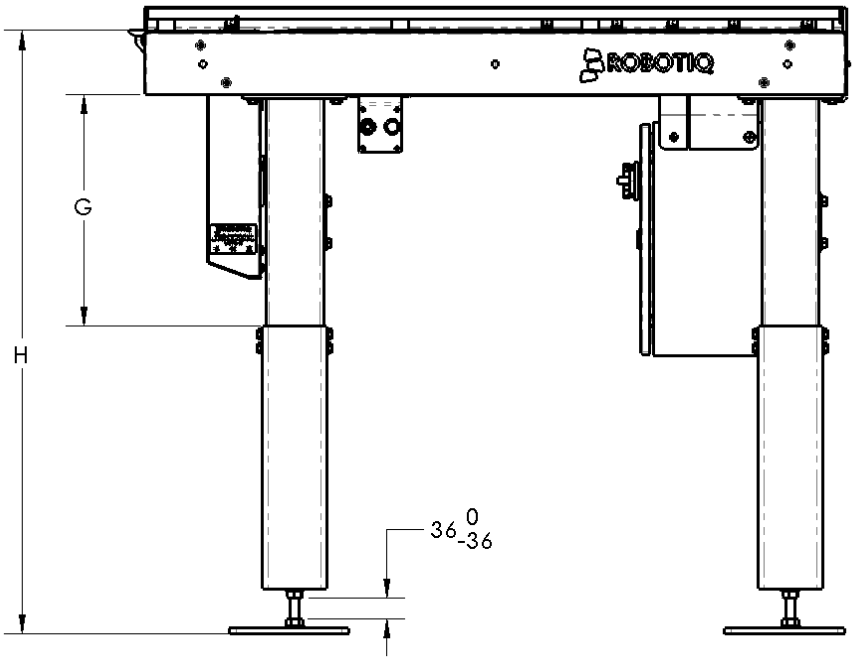


Recommended Default Layout (0°) - Top View



Recommended Default Layout (0°) - Lateral View

Appendix A-3 - Coarse Height Adjustment:



Gap (mm)	H (mm) Rolling Surface Height	
G	**H min**	**H Max**
397	999	1035
373	975	1011
349	951	987
325	927	963
301	903	939
277	879	915
253	855	891
229	831	867
205	807	843
181	783	819
157	759	795
133	735	771
109	711	747
85	687	723
61	663	699
37	639	675
17	619	655