OVISO ROBOTICS

Package Case Erector

Table of Contents

I. Introduction

I.1 Document identification

This appendix to the **OVI** user manual contains information about the **OVI Package Case Erector**. It must be read and understood by the integrators/end clients of OVI before the system is powered on for the first time.

It is mandatory to follow all instructions and guidance provided in this appendix.

I.2 Scope and Purpose

The appendix provides a general product overview and description of the design, functionality, and basic operation and instructions of **Ovi Package Case Erector**.

This document is aimed at users with the following knowledge and skills:

- Basic knowledge of mechanical engineering;
- Basic knowledge of electrical and electronic systems;
- Knowledge of the Universal Robots programming concepts.

I.3 Intended use

Use is only permitted after performing a risk assessment for the complete robot system.

The complete system needs to be installed in accordance with the safety requirements specified in the standards and regulations of the country where it is installed.

Interfacing other machines is permitted only after the integrator eliminates any significant hazard that does not respect safety regulations.

NOTE:

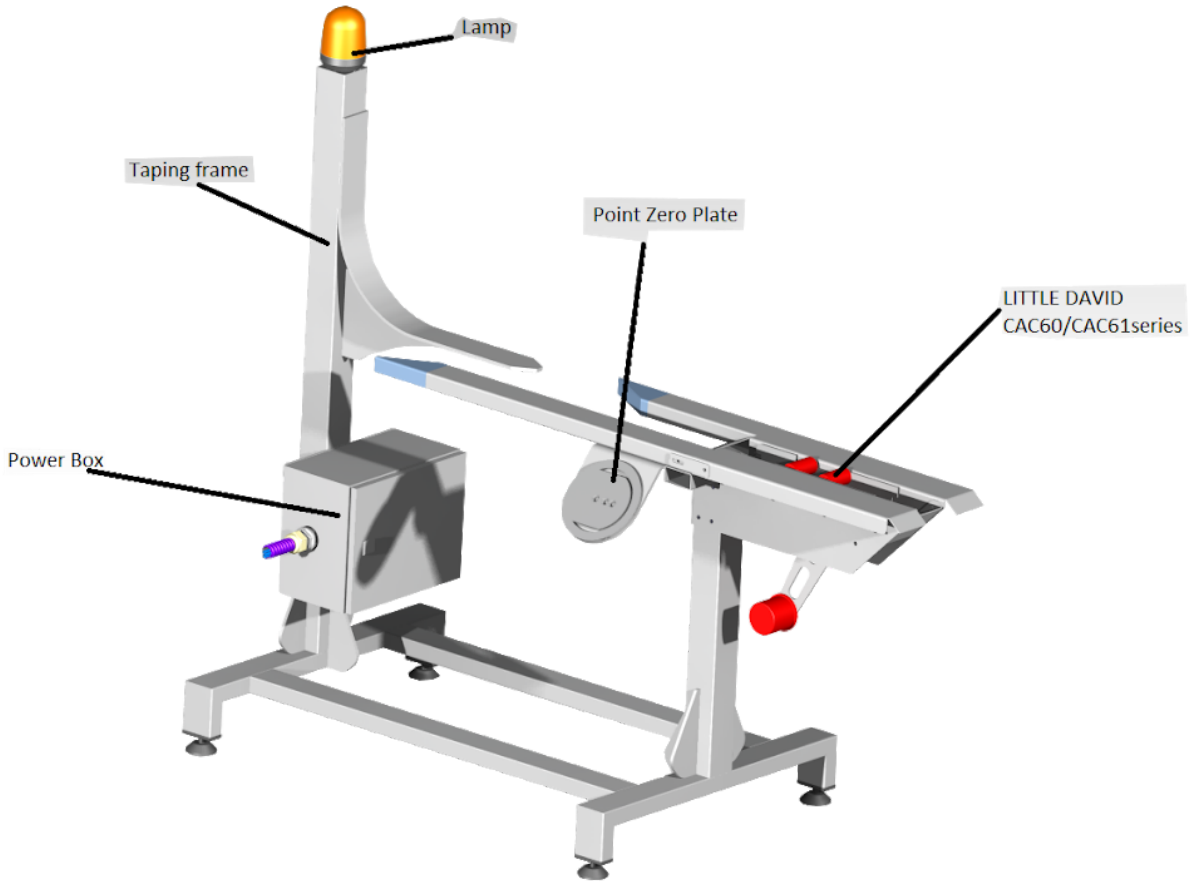
Changing the structure of the product, e.g. by drilling holes, etc. can result in damage to the components. This is considered improper use and leads to loss of warranty.

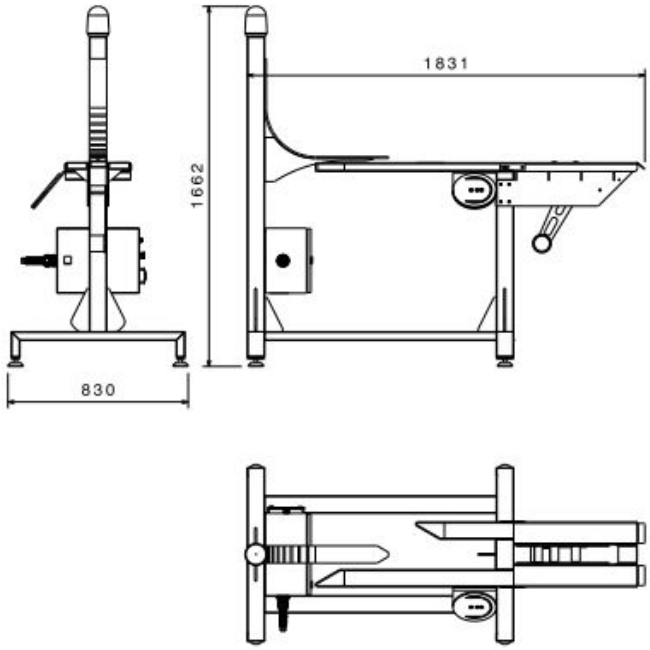
II. Feature Components

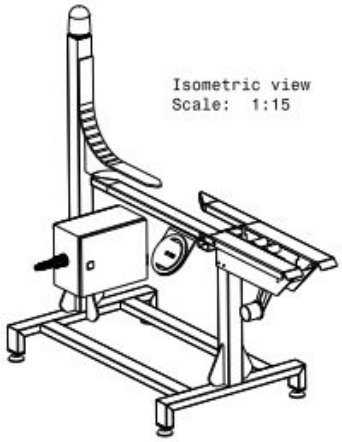
II Overview of the product

Ovi Package Case Erector is a quick setup solution that is easy integrable and allows users to change the configuration of the layout, forming a large variety of boxes. The package includes a Taping frame, LITTLE DAVID CAC60/CAC61series, Desteker, Ovi Package Case Erector URCap, URP, and Package Case Erector Gripper.

II.1 Taping frame

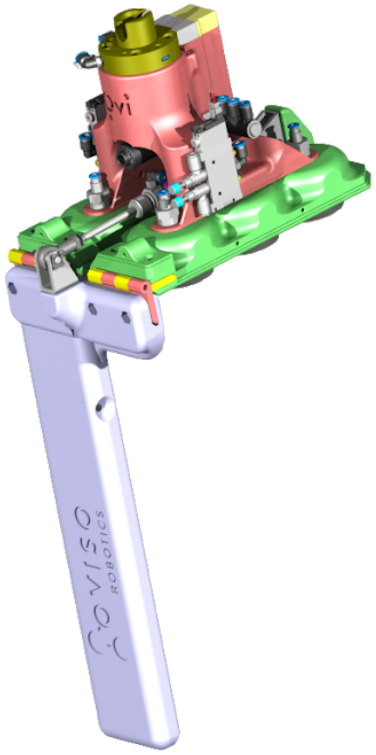






II.2 Package Case Erector Gripper

Custom gripper with vacuum area gripping system, flap for forming the box and quick changer tool system.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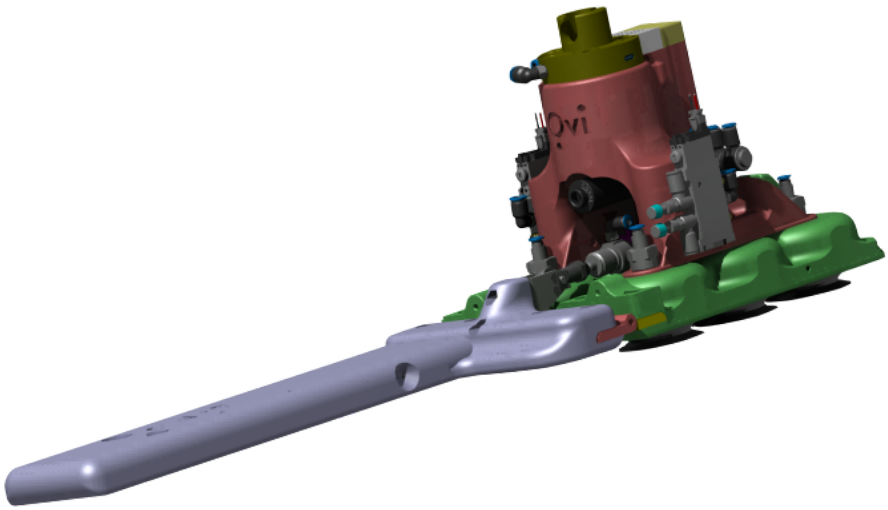
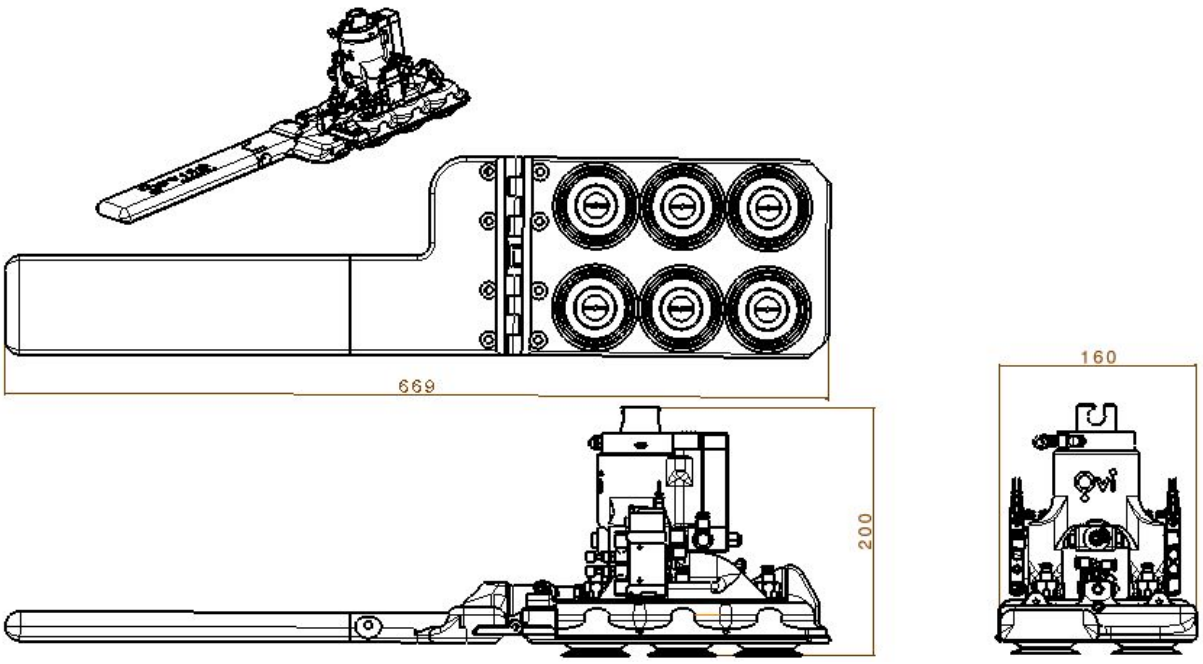

Ovi

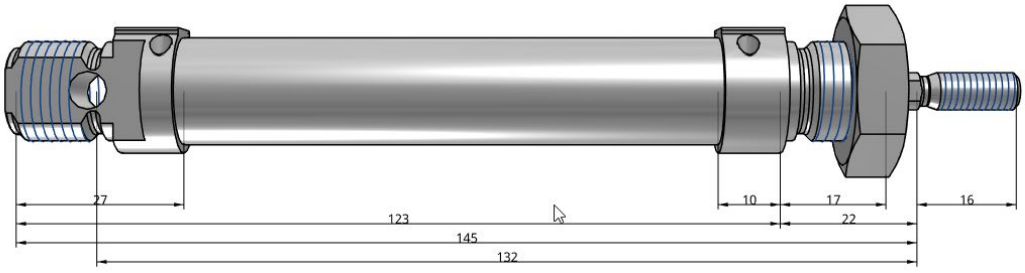
Design Data

Item	Value	Unit
Overall dimensions		
- **Length L**	669	[mm]
- **Width**	160	[mm]
- **Height**	200	[mm]
Arrangement	2 rows, 70mm	
Suct. cups	Bellows suction cup	
- **Diameter Ds**	50	[mm]
Weight	2500	[kg]



II.2.1 Cylinder

Vacuum and pressure switch with two digital output signals and IO-Link function.



Design Data

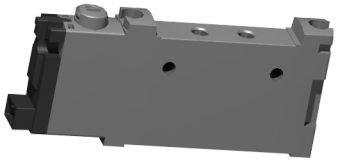
D	16	[mm]
L	148	[mm]

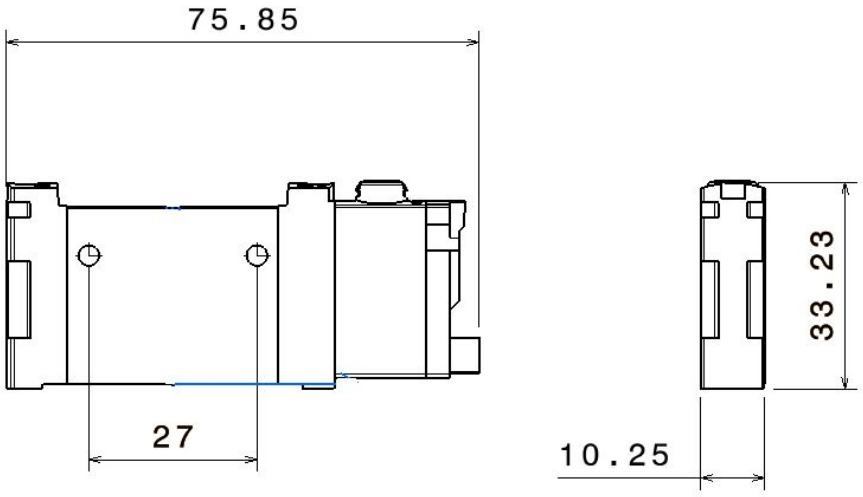
Technical Data

Item		**Unit**
Pneumatic connection	M5	
Stroke	50	[mm]
Cushioning	Adjustable cushioning at both ends	
Position sensing	Via proximity sensor	

II.2.2 Solenoid valve

The solenoid valve is used to pneumatically control the flap movements on / off and start / stop the vacuum.





Design Data

L	75.85	[mm]
W	10.25	[mm]
H	33.23	[mm]

Technical Data

Attribute		**Unit**
Functions and flow rate [l/min]	195	[l/min]
VoltageOperating pressure	2..7	[bar]
Ambient temperature	-5..+50	[°C]
Temperature of medium	-5..+50	[°C]
Operating voltage	24 ±10%	[V DC]
Power	0.7	[W]
Maximum switching frequency	2	[Hz
Signal status display	LED	

II.2.3 Proximity sensors

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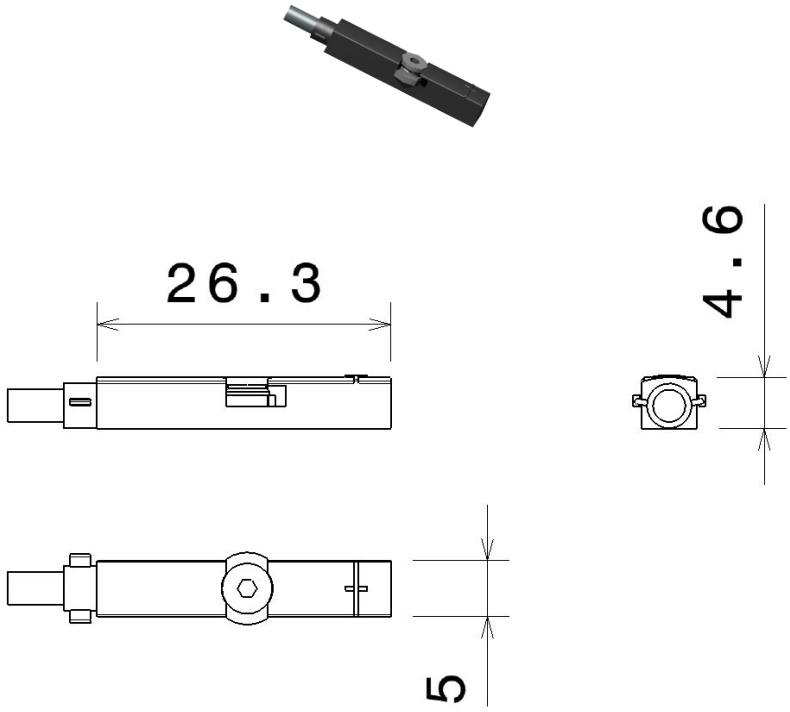

Design Data

L	26.3	[mm]
W	5	[mm]
H	4.6	[mm]

Technical Data

Attribute		Unit
Measured		
Closing time	<=1	[ms]
Disconnection time	<=1	[ms]
Maximum switching frequency	180	[Hz]
Maximum output current	100	[mA]
Rated DC operating voltage	24	[V]
DC operating voltages field	7..30	[V]

II.2.4 Vacuum Ejector

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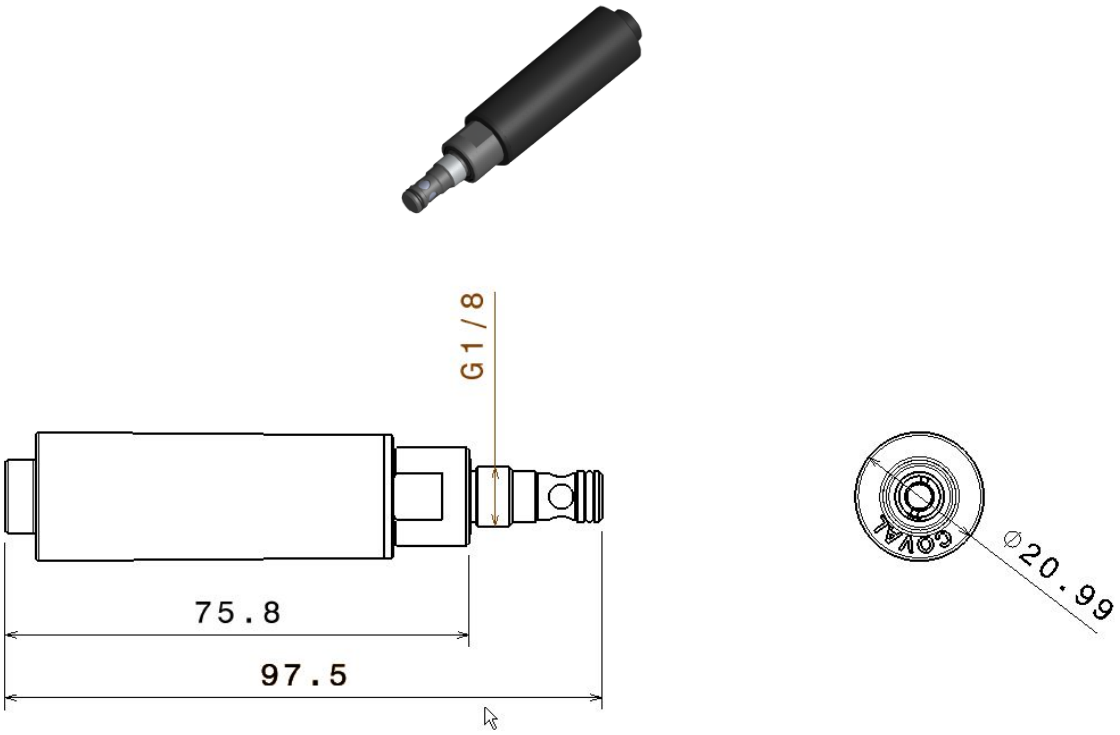


Design Data

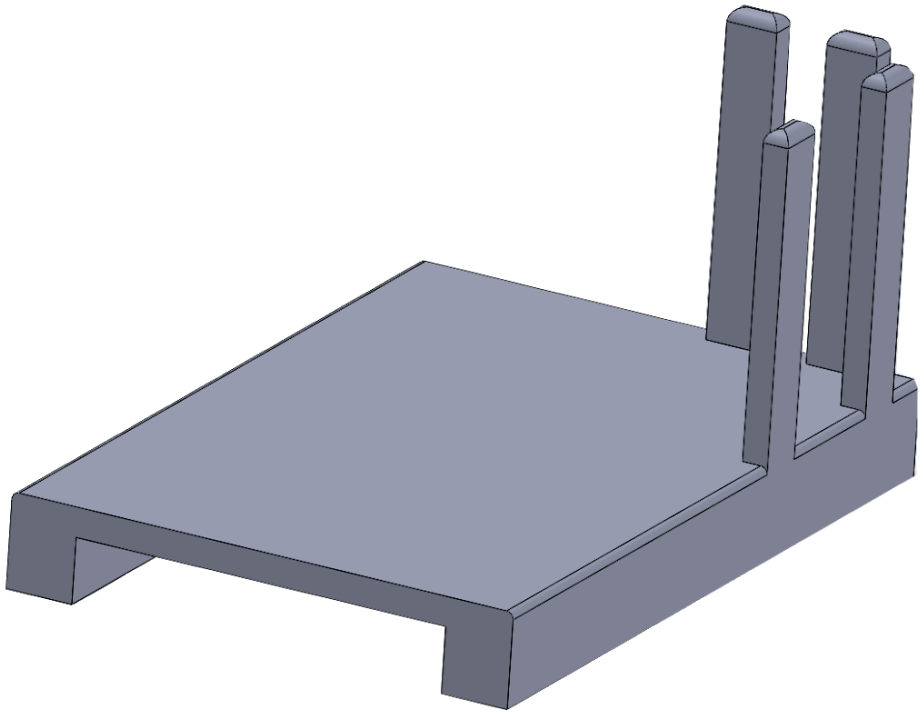
L	97.5	[mm]
D	20.99	[mm]
Fillet	G1/8	

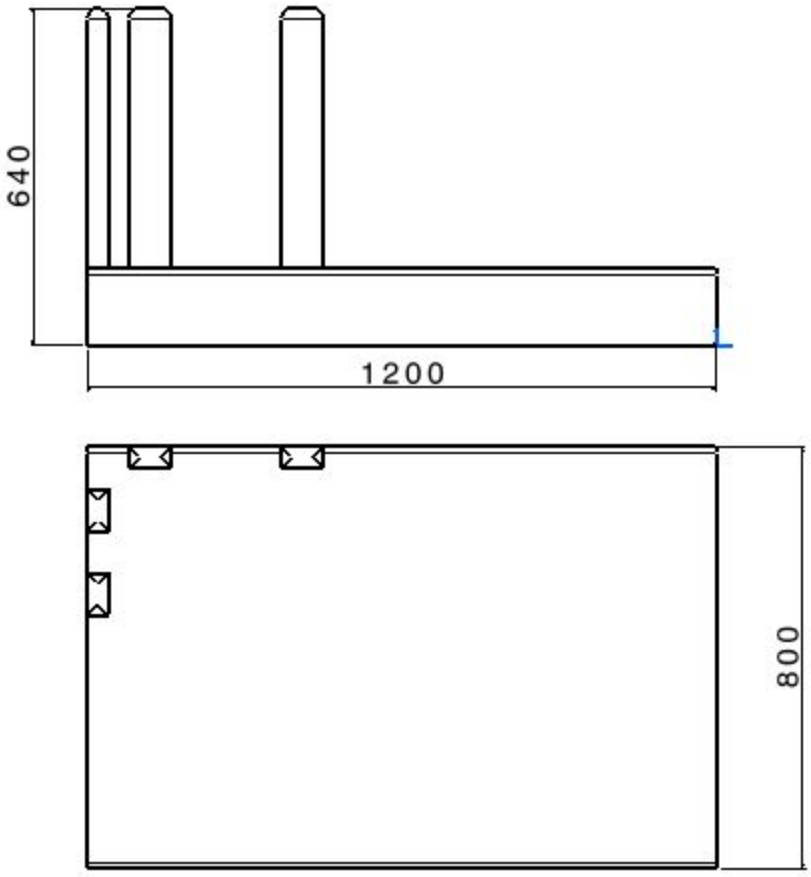
Technical Data

Attribute		**Unit**
Air Consuption	135	[Nl/min]
Air Suction	70	[Nl/min]

II.3 Destacker

Destacker for unfolded boxes. It has the role of ensuring the proper pick.





Design Data

L	1200	[mm]
W	800	[mm]
H	640	[mm]

III Ovi Package Case Erector URCap

The URCap contains functionalities that allow the UR10 robot arm to perform case forming procedure. It allows the user to load the size of the box and save it, teach the place point in the desired place, open and close the flap, start and stop the vacuum and to add the number of the boxes from the Destacker. In case that the boxes are done the program will pop up a window which is requesting to add a number of boxes.

III.1 Software requirements

Ovi URCap

III.2 Installation

The Ovi Package Case Erector URCap can be installed following the same installation procedure as any other URCap.

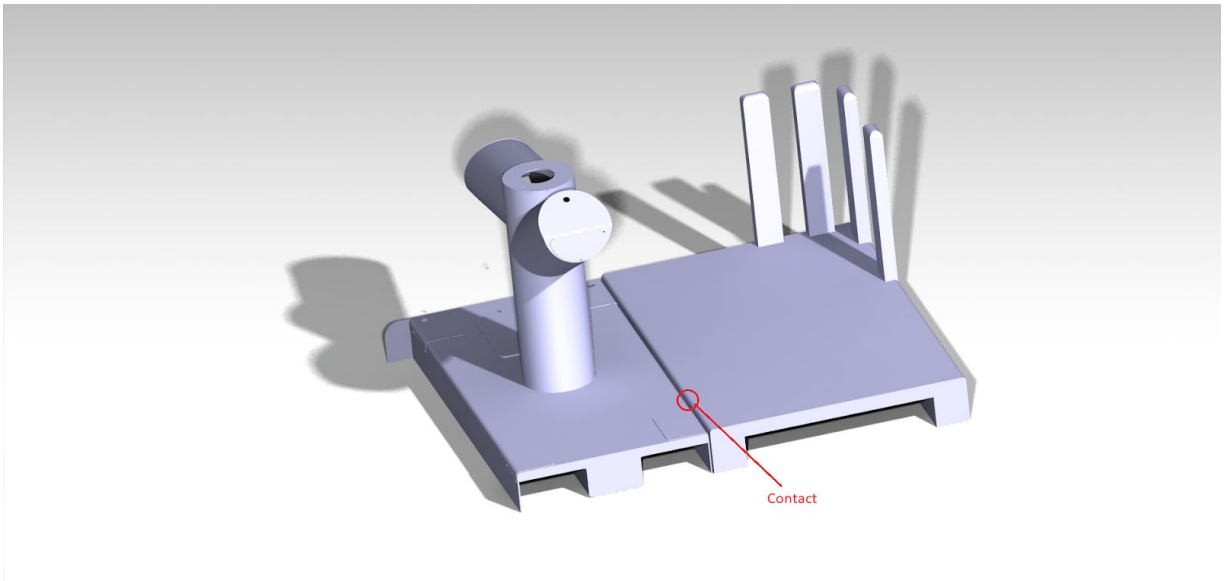
1. Navigate to the URCap setup screen: Settings -> URCaps;
2. Click the button labeled “+”;
3. Navigate to the location of the .urcap file;
4. Select the desired file;
5. Press “Open”;
6. Restart the robot to finish the installation.

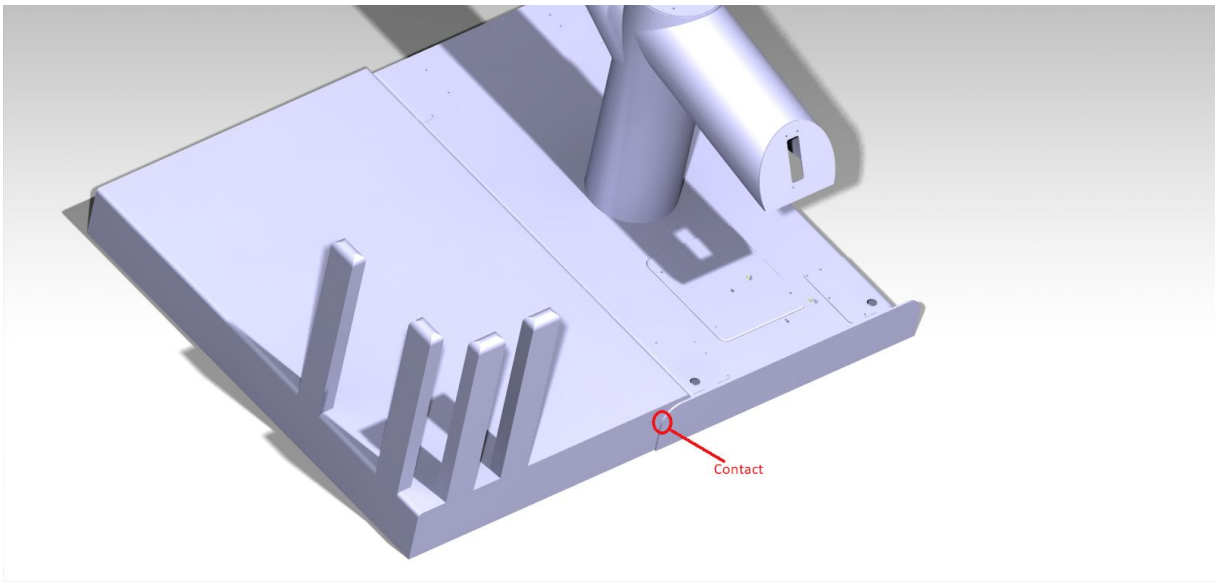
III.3 Features

1. Load dimensions of the boxes;
2. Save the dimensions of the box for future uses;
3. Teach the place point;
4. Open and close the flap;
5. Start and stop the vacuum;
6. Insert the number of the boxes from the Destacker;
7. load the Package Case Erector URP

III.4 Usage

Step 1:Position the destacker on the desired side (left or right) of the robot frame

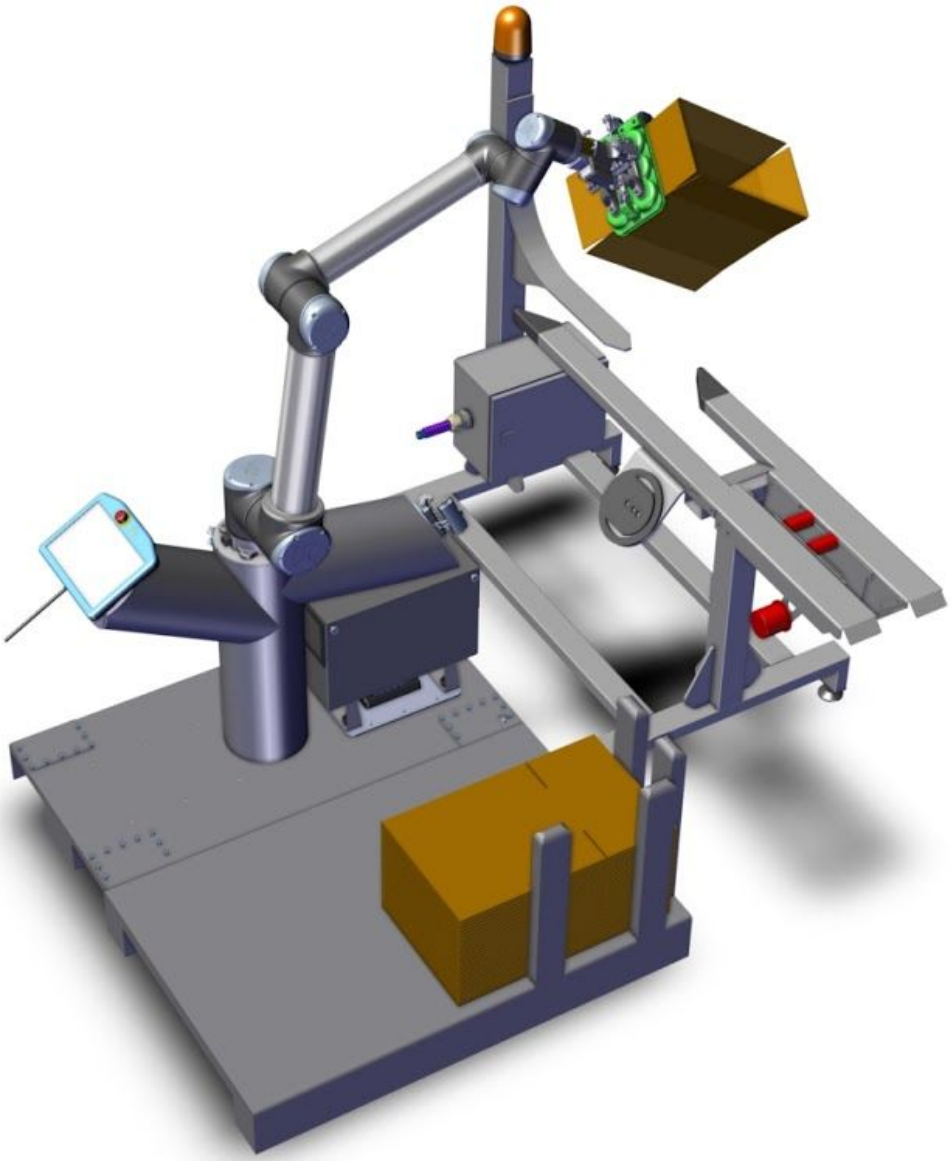




NOTE:

The destacker must be placed next to the robot as specified in the images from above for optimal operation of the application.

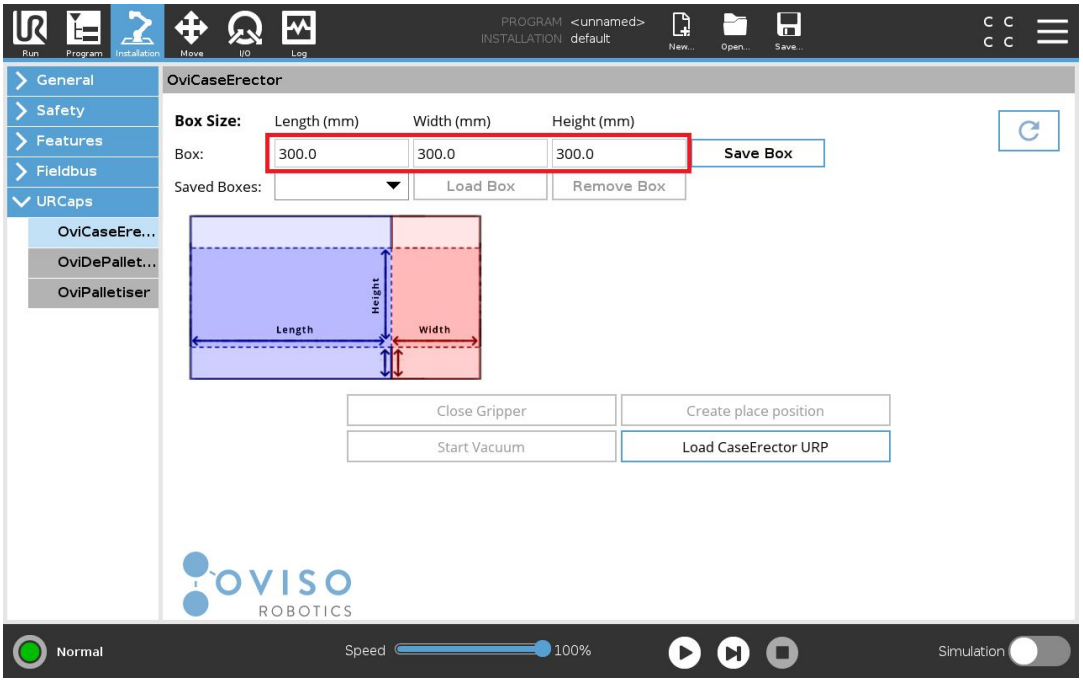
Step 2:Position the folding and taping box in position



NOTE:

If the folding and taping frame is positioned outside the robot's working area it will inform the operator and it is necessary to move the station to another position.

Step 3:Load dimensions of the boxes

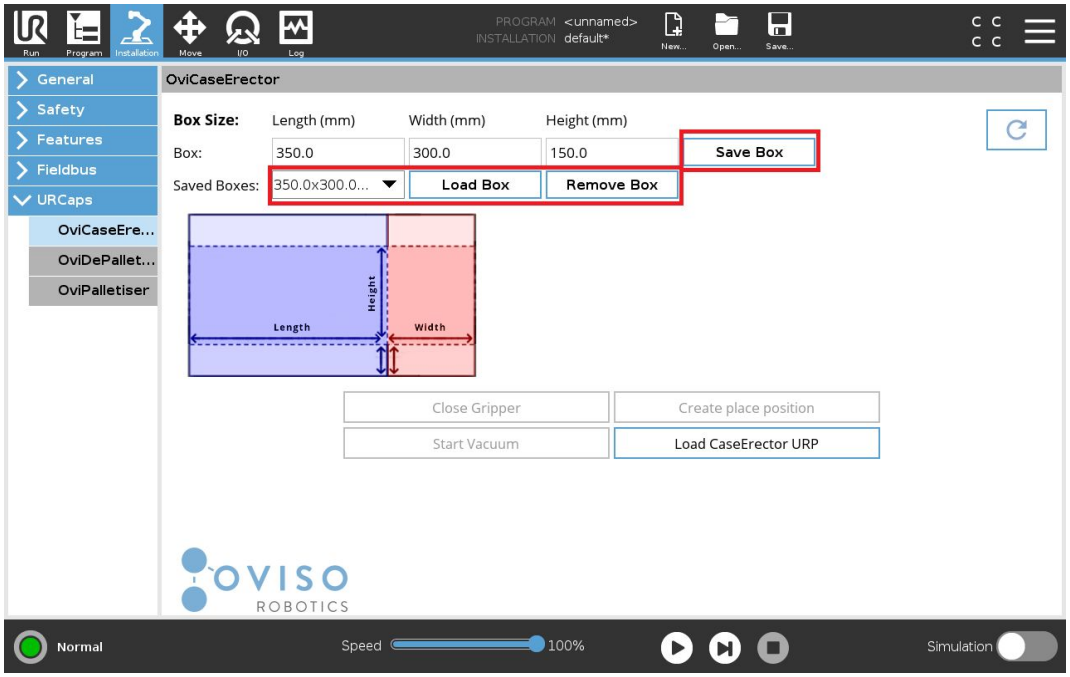


The dimensions of the boxes can be entered manually (with the possibility of saving the size) or automatically if it has been entered previously and saved in the field of Save Boxes (for that press the arrow, select the size and press Load Box). When inserting the size of the box it should be taken into account that the length is larger than the width.

NOTE:

In order to correctly enter the dimensions we encourage you to be according to the actual real size of the box so a real box measurement from the stack of boxes is required.

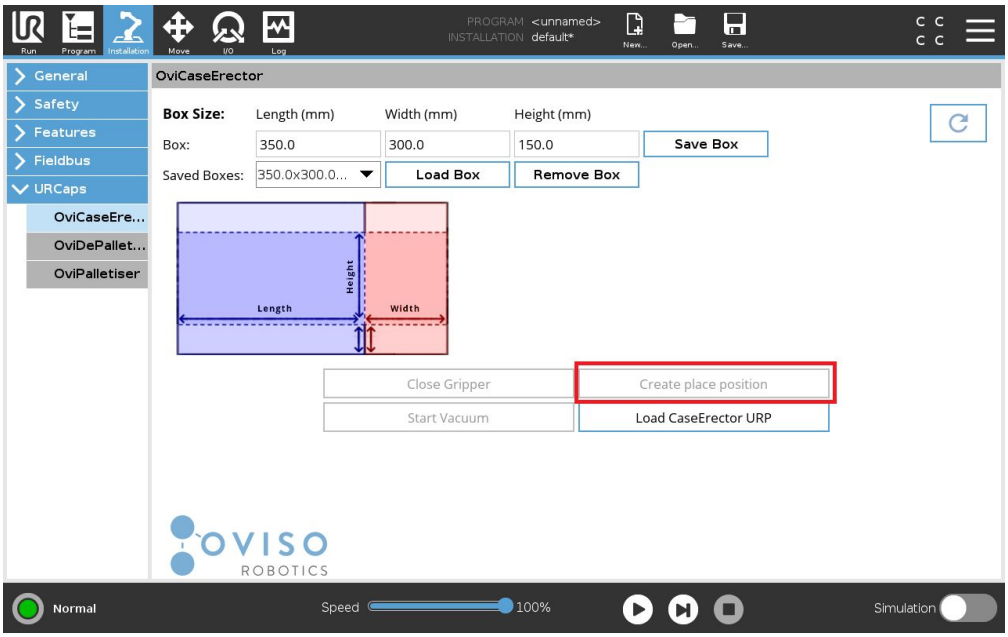
Step 4: Save the dimensions of the box for future uses



By pressing the Save Box button you can save a certain size of box for future use so it is saved in the Saved Boxes field from where they can be selected and loaded later.

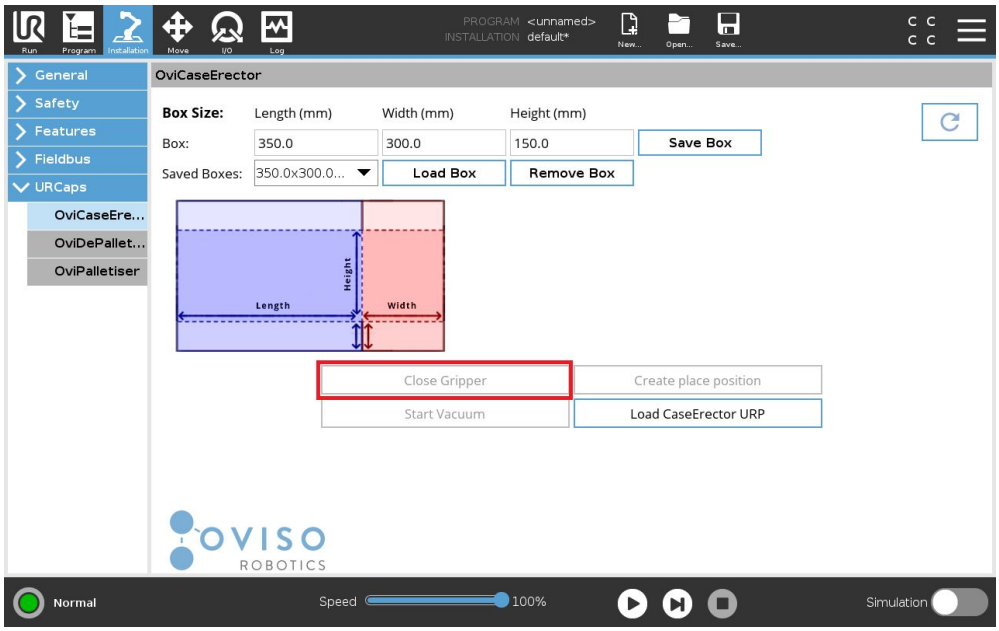
Inserting an already saved dimension is done by selecting the arrow in the Saved Boxes field, then selecting the desired size and clicking on the Load Box. You can also delete a dimension by calling the Remove Box button as incipient steps are the same as when loading an existing dimension.

Step 5:Teach the place point



After pressing the Create Place Position button, the robot will enter your free movement so it allows you to place the position of the formed boxes. After it has been teached, press the checkbox.

Step 6:Open and close the flap



Pressing the Open Gripper / Close Gripper button will open and close the gripper flap

Step 7:Start and stop the vacuum.

Pressing the Start Vacuum / Stop Vacuum button will start and stop the vacuum on the suction cups.

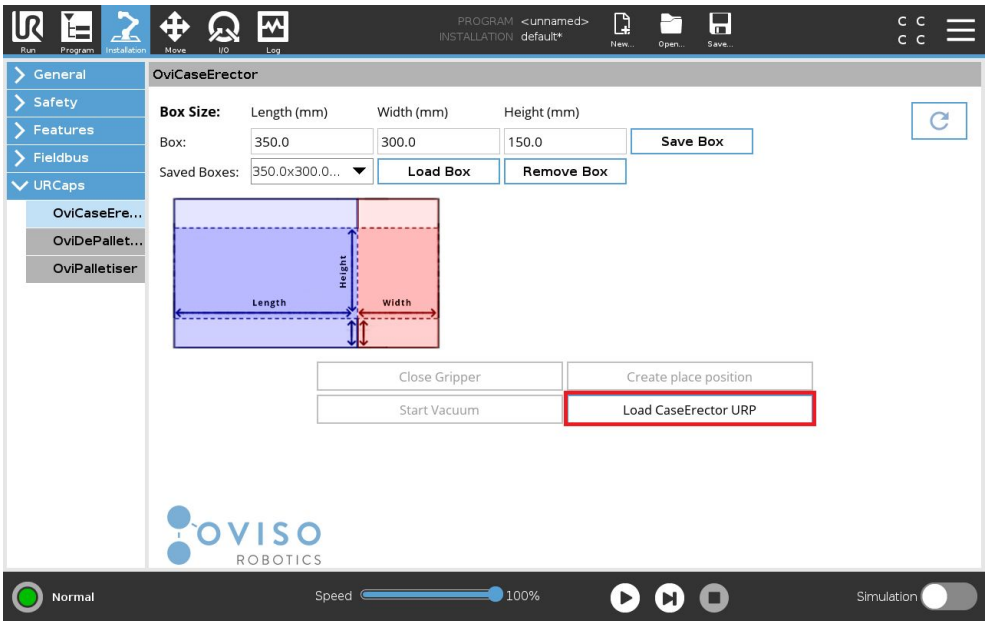
Step 8:Insert the number of the boxes from the Destacker

In the window that appears at the beginning of the running of the program, enter the number of unfolded boxes on the Destacker.

If a smaller number of boxes is introduced than the existing ones, the program will stop and ask you again if the operator has placed unfolded boxes on Destacker. If the operator has inserted a larger number of boxes on the surface of the Destacker the robot will stop and will ask you if the operator has added any boxes.

If the two conditions are not met, the program will stop.

Step 9:load the Package Case Erector URP



Pressing the URP Load Program button will load the Ovi Package Case Erector program.

IV Ovi Package Case Erector URP

The Ovi Package Case Erector URP makes use of the functionalities implemented by the URCap and contains the commands that move the robot to the appropriate place in order to complete the box forming and taping. The URP perfectly integrates the functionality of PointZero adjusting each point of trajectory with respect to the last recorded PointZero coordinates.

IV.1 Software requirements

Ovi Package Case Erector URCap

IV.2 Installation

There is no installation required for this step. The user simply has to load the URP provided with the Package Case Erector package in the Polyscope interface of the UR robot.

IV.3 Features

- PointZero: waypoints are adjusted according to PointZero coordinates allowing the robot to self-calibrate after its position has changed;
- Stop/Resume case erecting process: if the process was interrupted, the user is able to resume the operation from the point where the interruption occurred;
- Destacker detection: The frame is fitted with presence sensor on each side

IV.4 Usage

Step 1: Load the URP by clicking “Load CaseErector Urp” in the Polyscope interface.

Step 2: Insert the box size in the specific fields.

Step 3: Teach the place point of the folded box.

Step 4: Press the play button in order to start the process.

Step 5: Insert the number of boxes from the Desteker.