Benny Strömberg, SICK, Sweden - November 21, 2023, Updated: October 4, 2024

PLOC2D Robot mounted URCap 1.0 – Setup and configuration

IMPORTANT NOTE: The PLOC2D robot mounted URCap v1.0 requires Polyscope 3.15.0/5.10.0 or later. PLOC2D version 4.1+

System:

The connection to the PLOC2D device has to be set up in the system tab. By pressing the “Find PLOC2D Devices” button, URCap will scan the network for any connected PLOC2D devices. All found devices will be listed in the dropdown menu.

In case a device is not found on the network, the IP of the camera can be manually entered in the IP text field. The URCap will then use the entered IP.

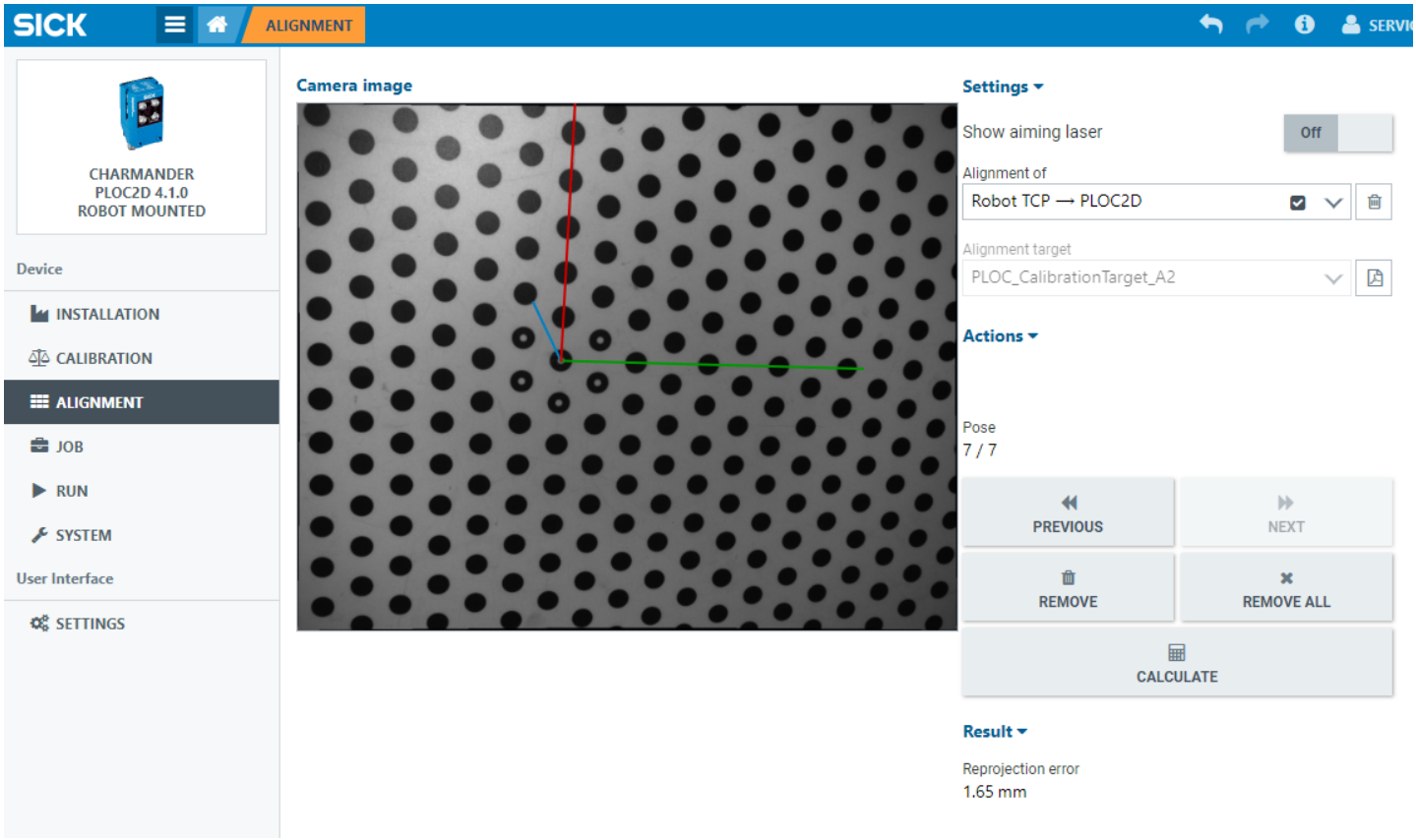
On the left bottom a PLOC2D camera device connection image is shown. The image will have a green check mark when a connection has been establish to the robot. If no connection is made a red cross will be shown.

Hand eye alignment

The purpose of the hand-eye-alignment step is to align the camera in the robot relative to the flange using an alignment target. After the alignment the offset between the camera coordinate system and the flange is known.

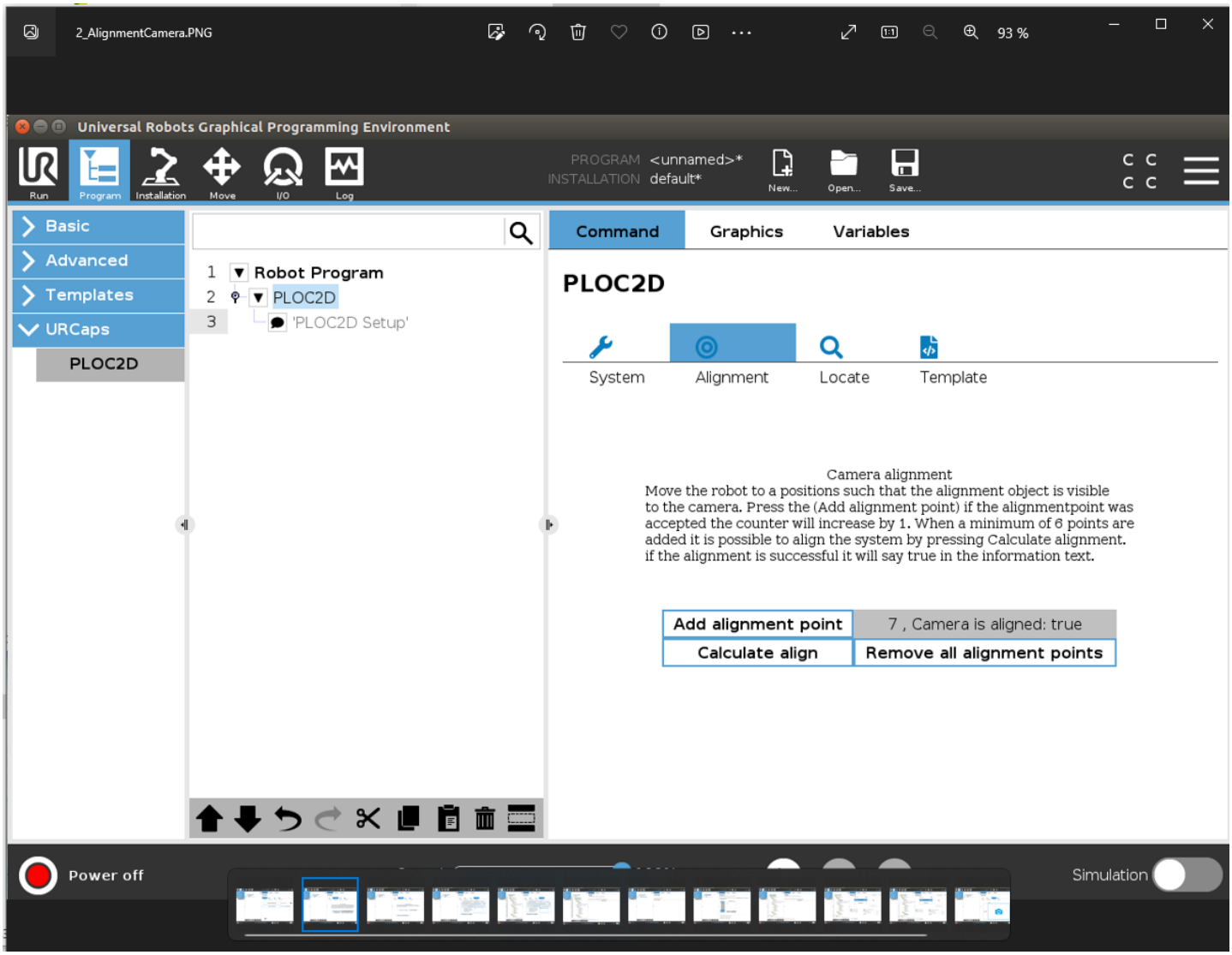
How to perform the hand eye alignment:

1. In the PLOC2D user interface, go to the Alignment tab -> Alignment of **Robot TCP -> PLOC2D**
Select the Alignment target that will be used.

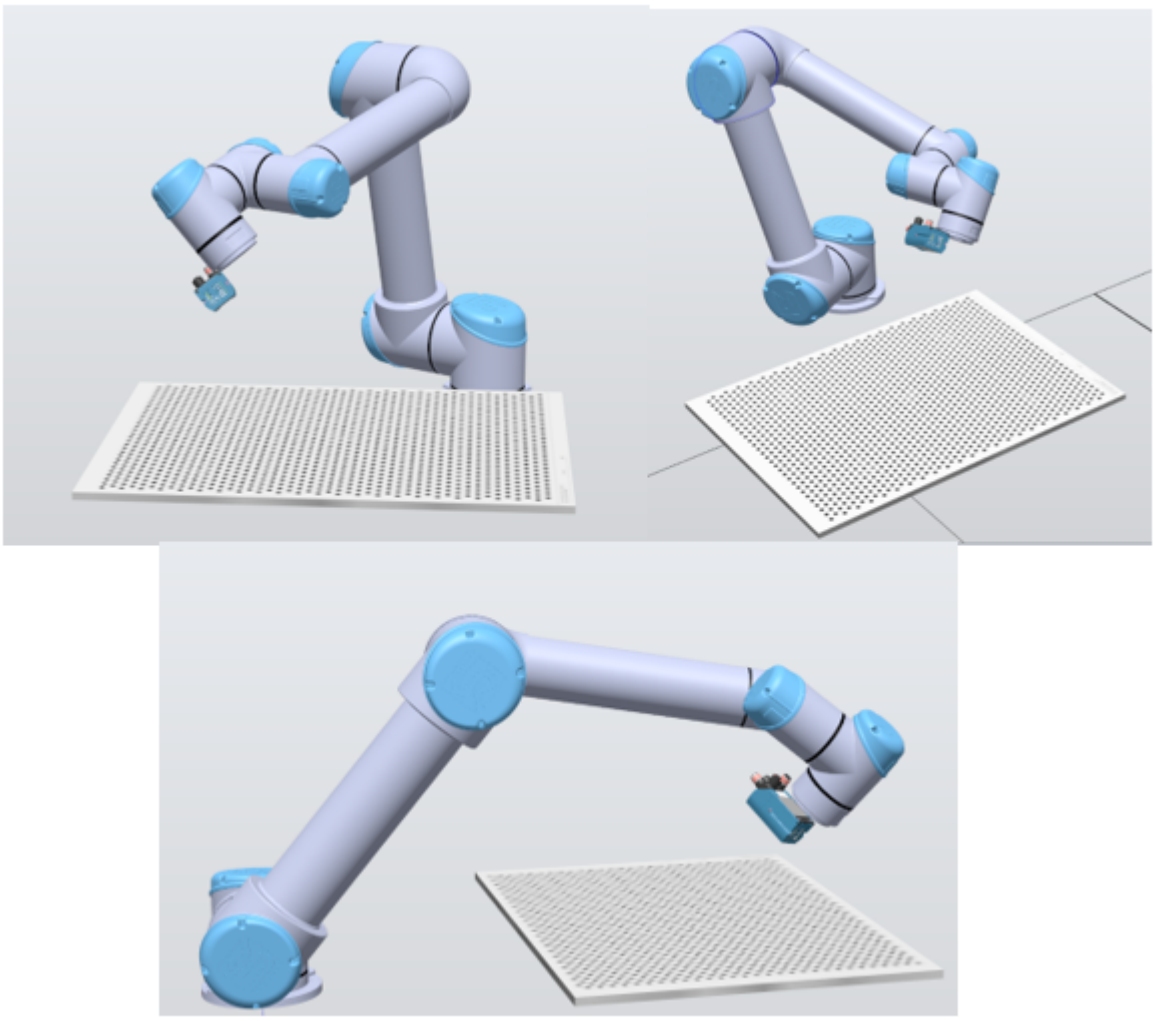


2. Place the alignment target on the target surface.

3. Position the robot arm in a position such that one of the calibration markers are visible in the camera.
(The calibration markers are the dots with a white center.)
In the robot interface alignment tab press the add **alignment point** the camera will be triggered and search for the alignment target (this can take some time).



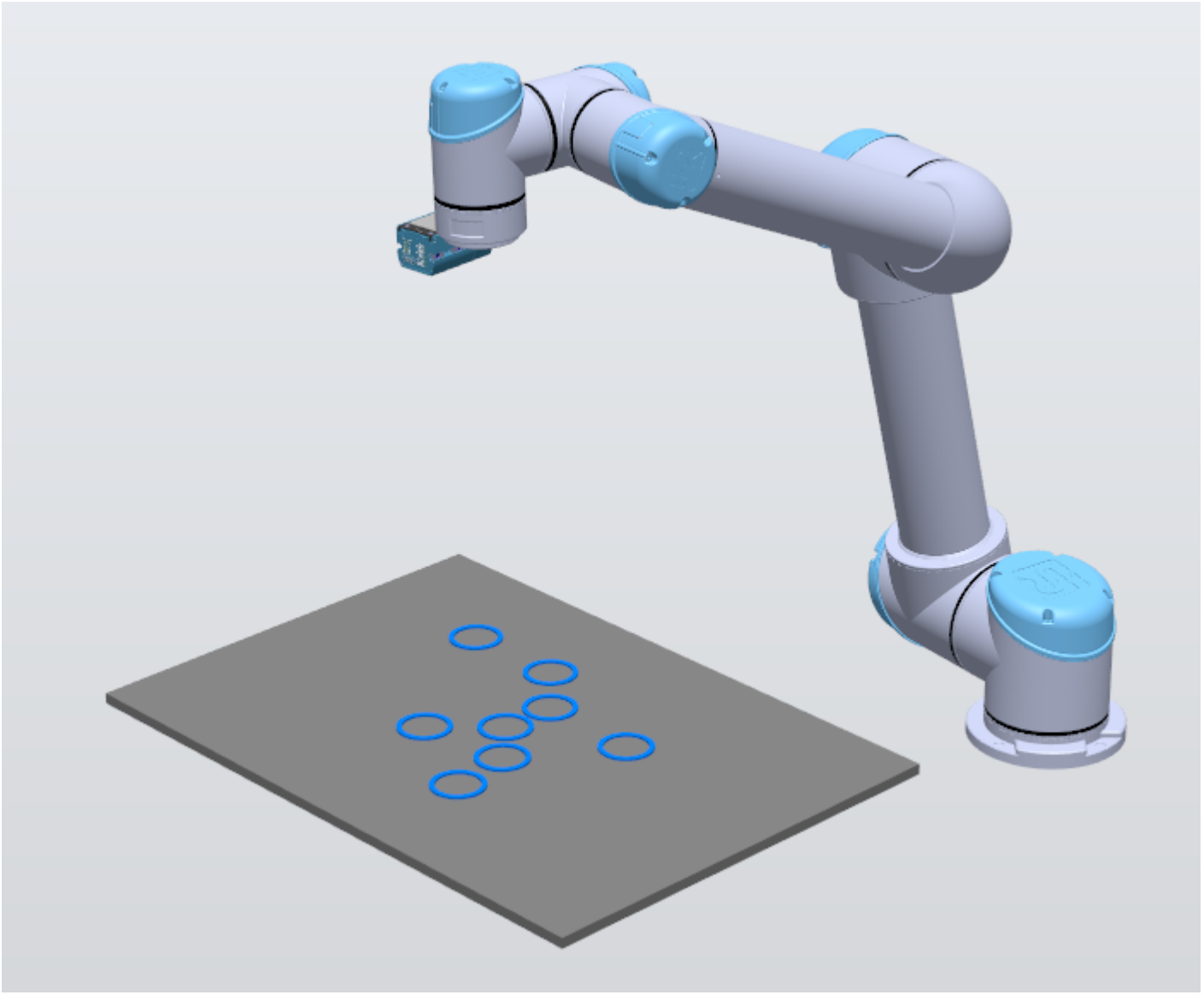
4. Repeat the above placing the robot in different position a minimum of 6 time.
Please note that the different positions needs to be varied and the camera needs big angles relative to the alignment target.



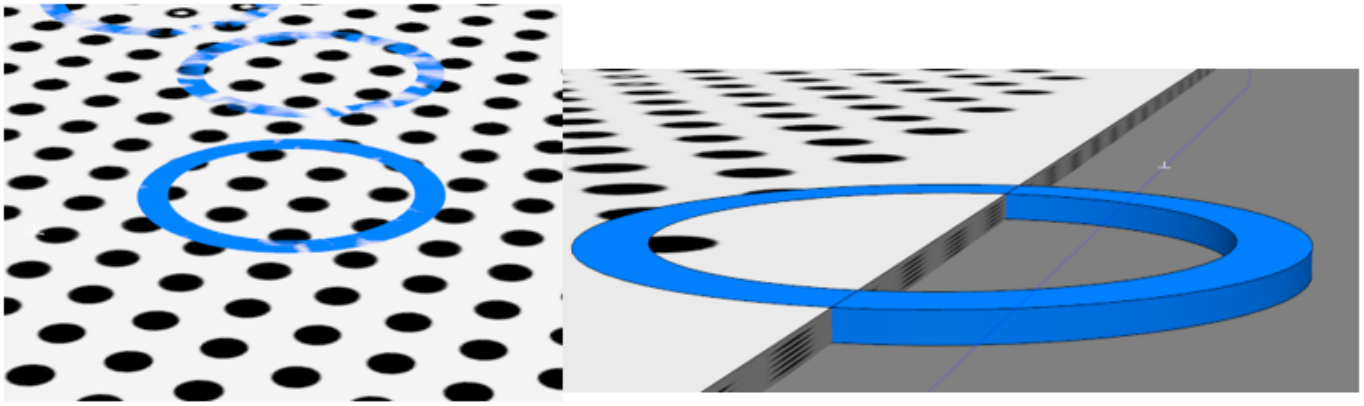
When a minimum of 6 alignment position are entered it is possible to press the Calculate alignment.
If the Hand-Eye alignment calculation was successful the page will automatically change to Work plane alignment.

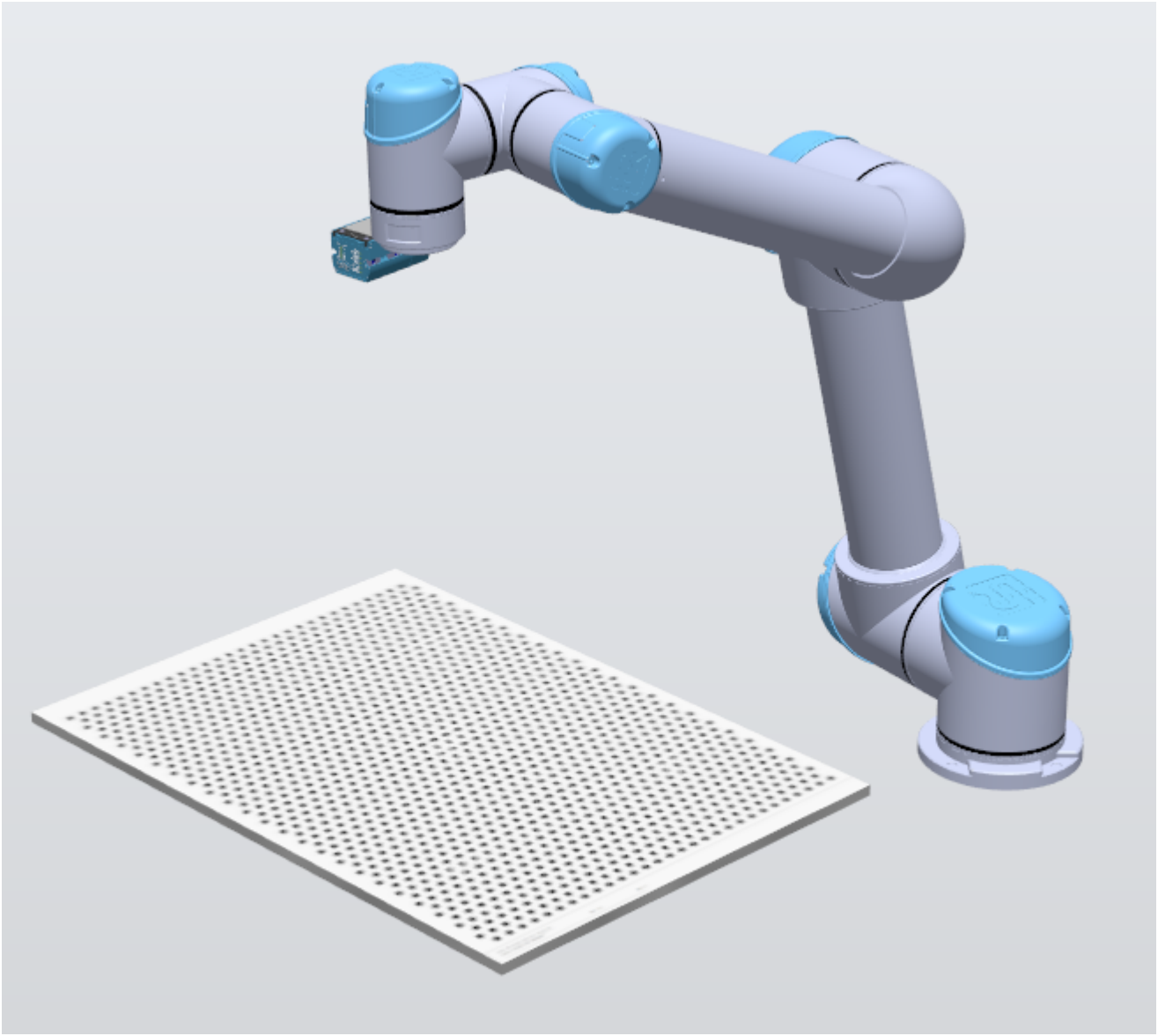
Work plane alignment

Place the robot over the area where the localization will take place.
The robot will always go to this position before localization.

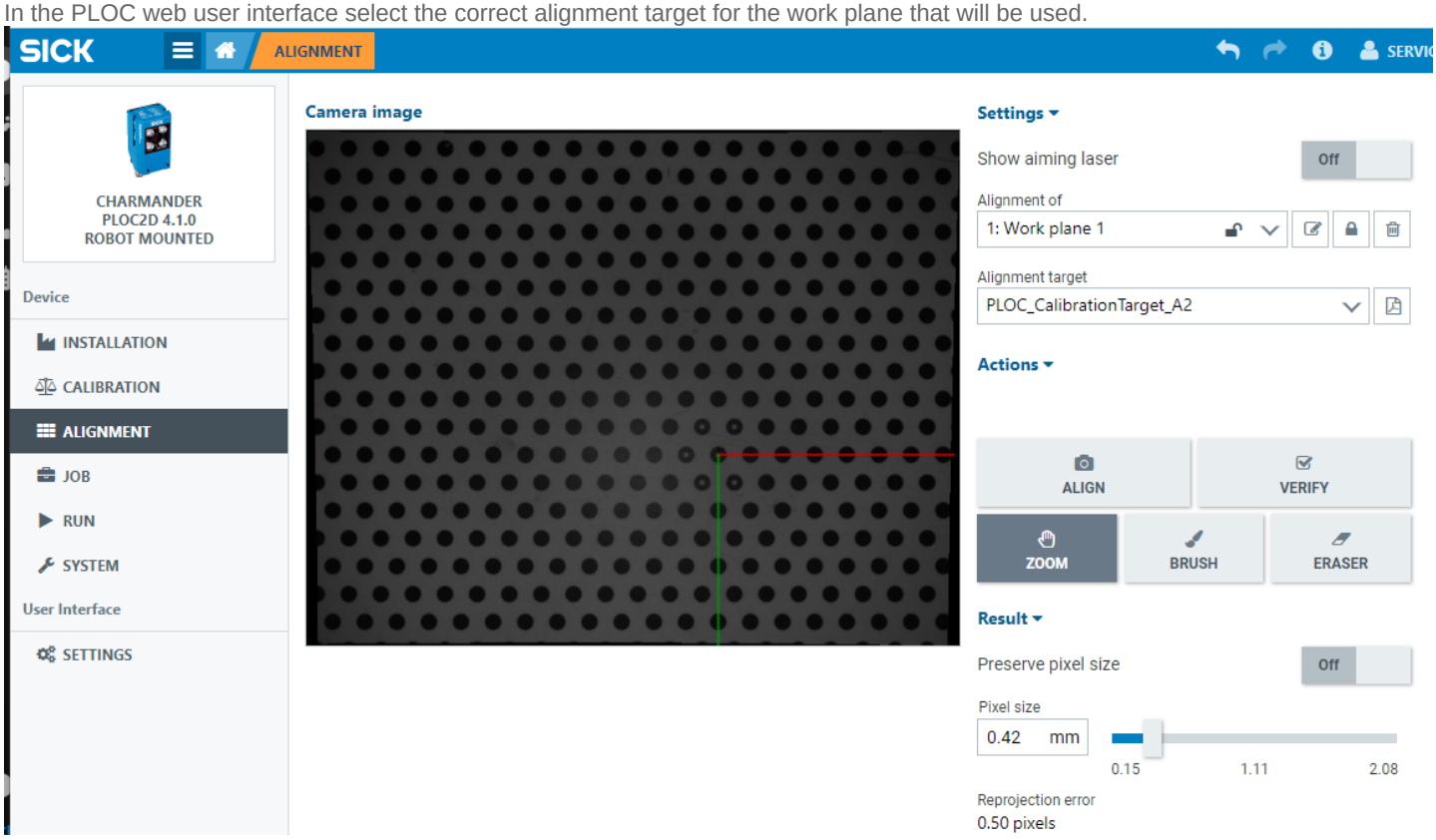


Place the Alignment target, please note that the alignment target top should be at the parts top will be.

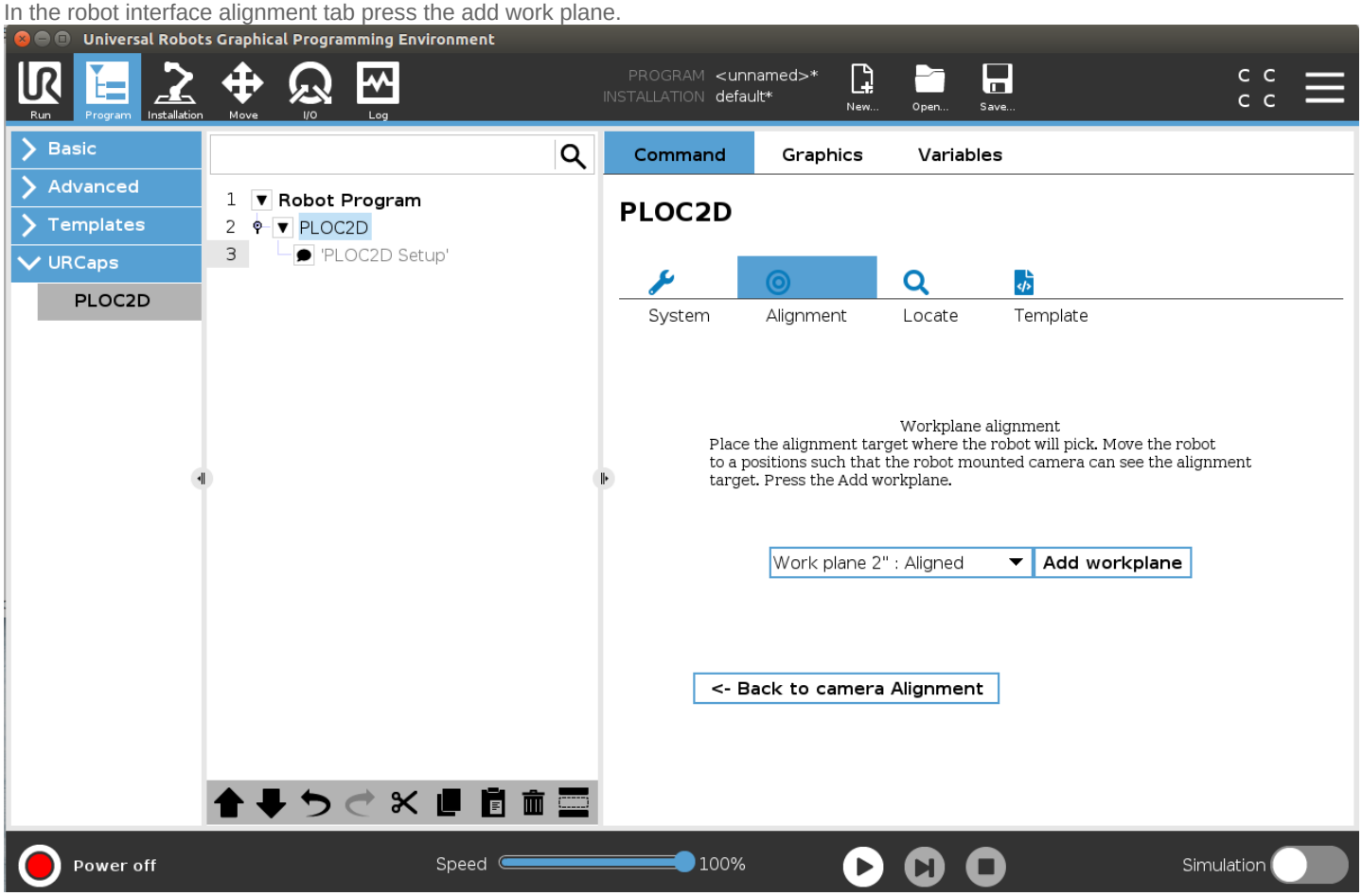




In the PLOC web user interface select the correct alignment target for the work plane that will be used.



In the robot interface alignment tab press the add work plane.

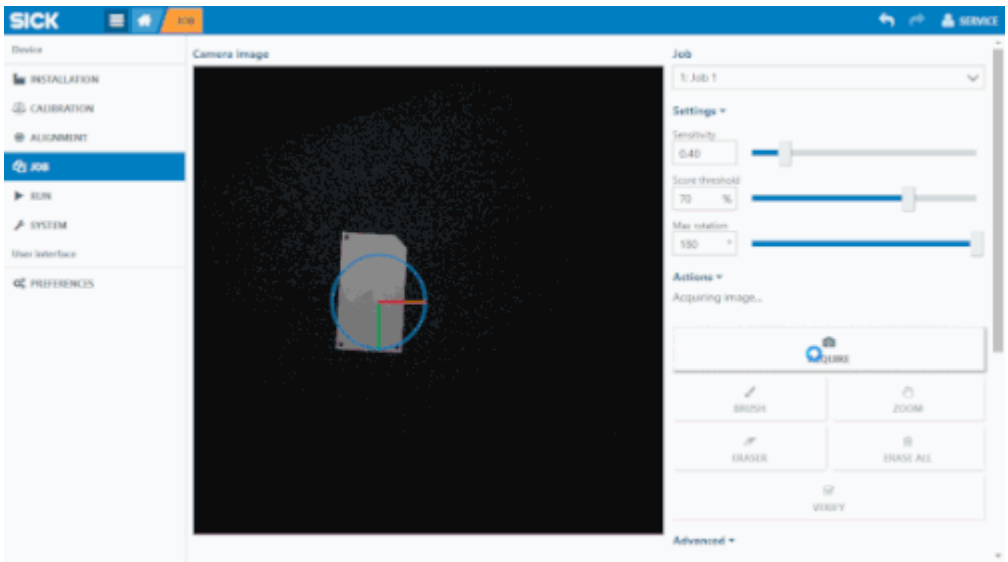


Job configuration:

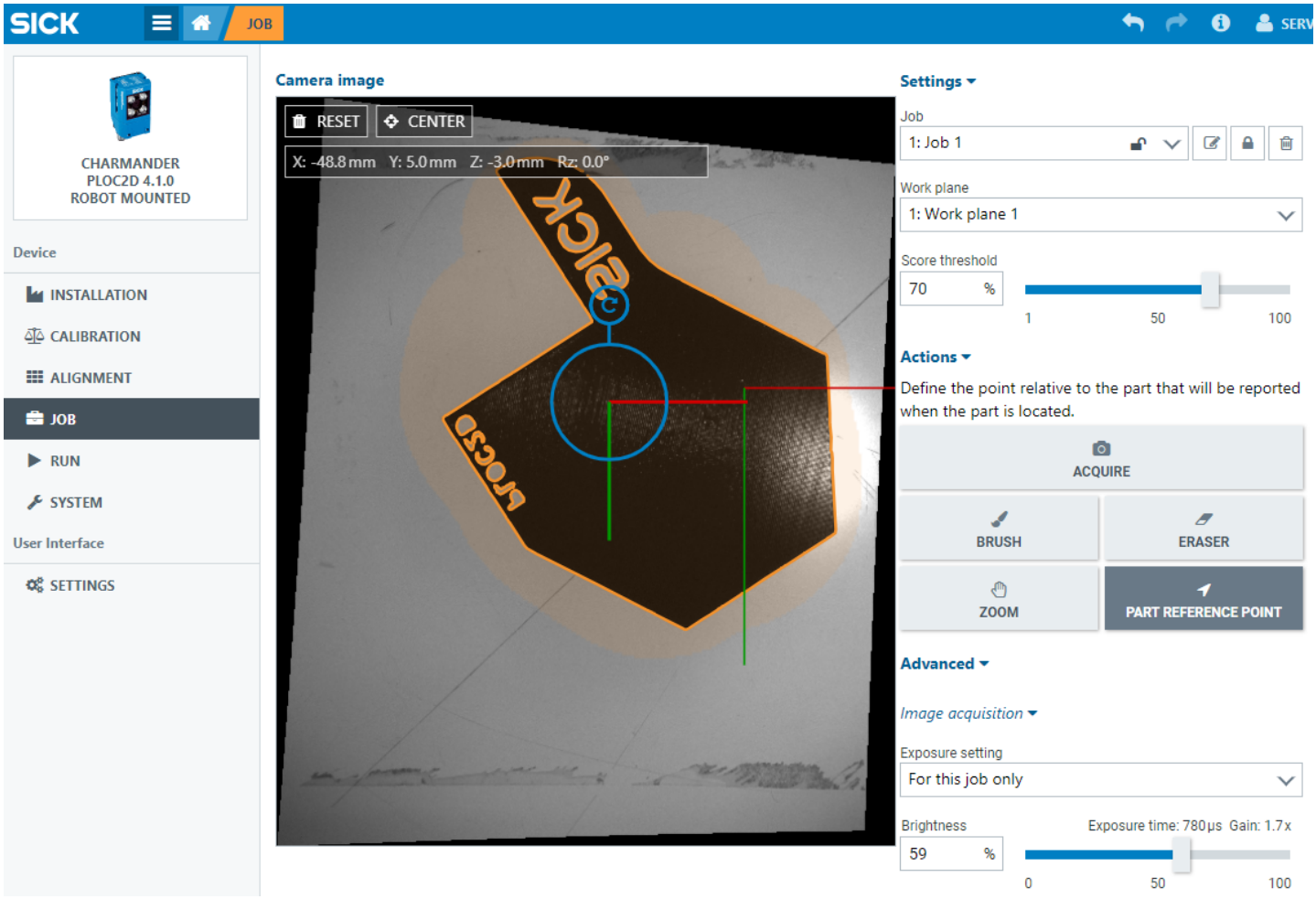
Do not move the robot!

Remove the alignment target and place a part.

In the PLOC2D web interface go to the Job tab and select the same work plane as used in the previous step.
Press the **AUTO ADJUST EXPOSURE**
Press the ACQUIRE button, press the brush button an paint the features that should be used for the localization.

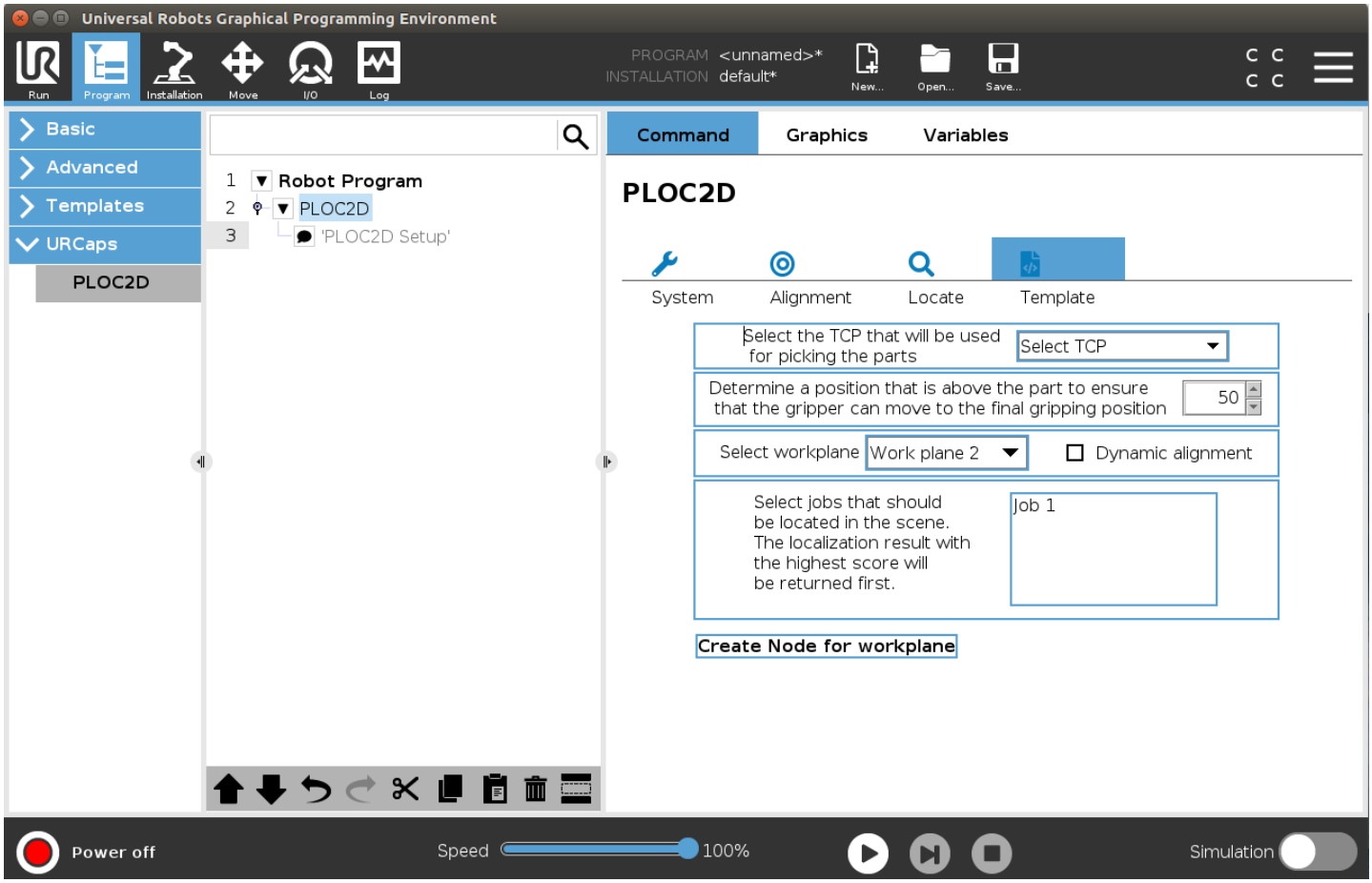


Press the PART REFERNCE POINT and select where the part should be picked.

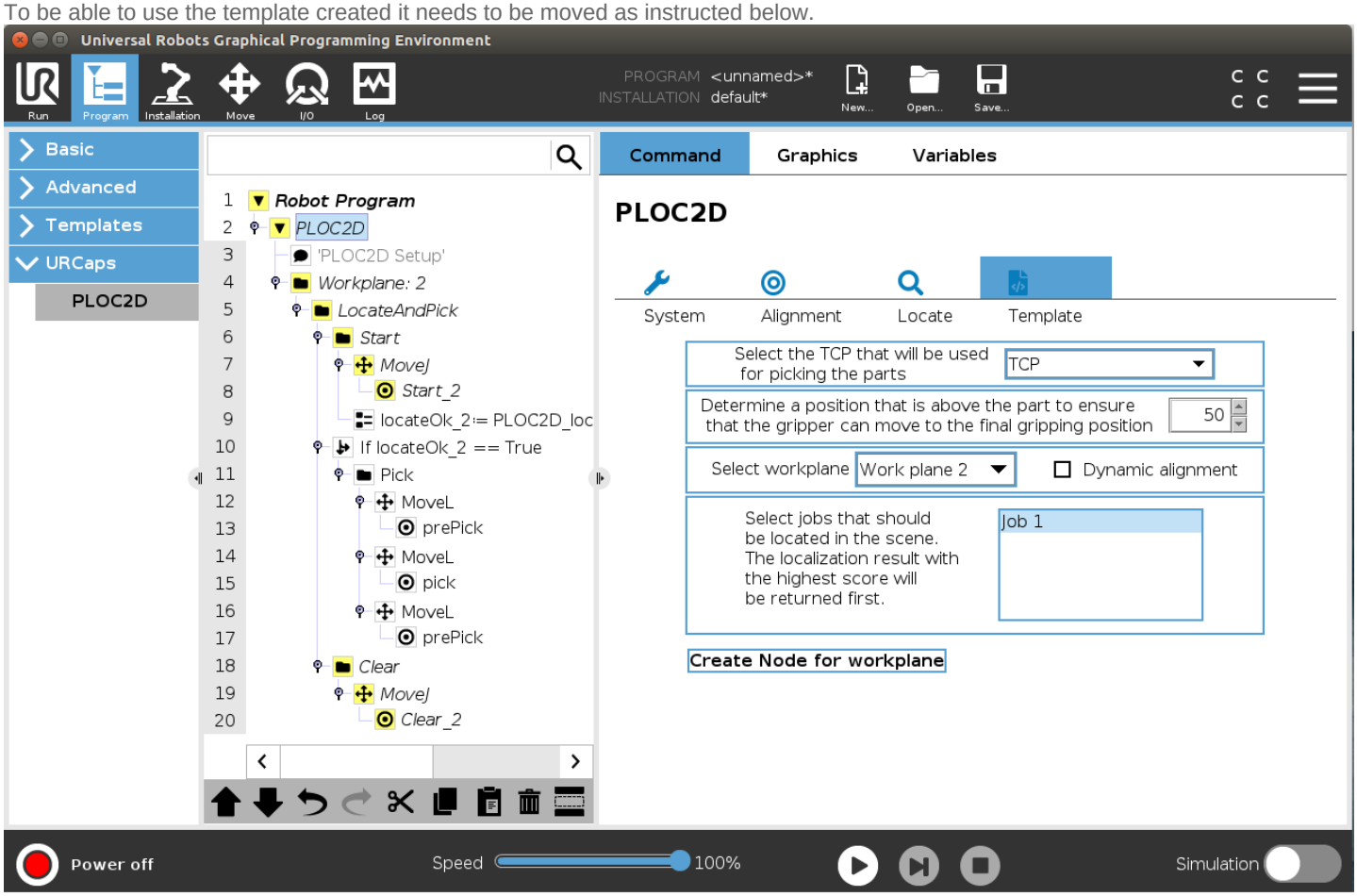


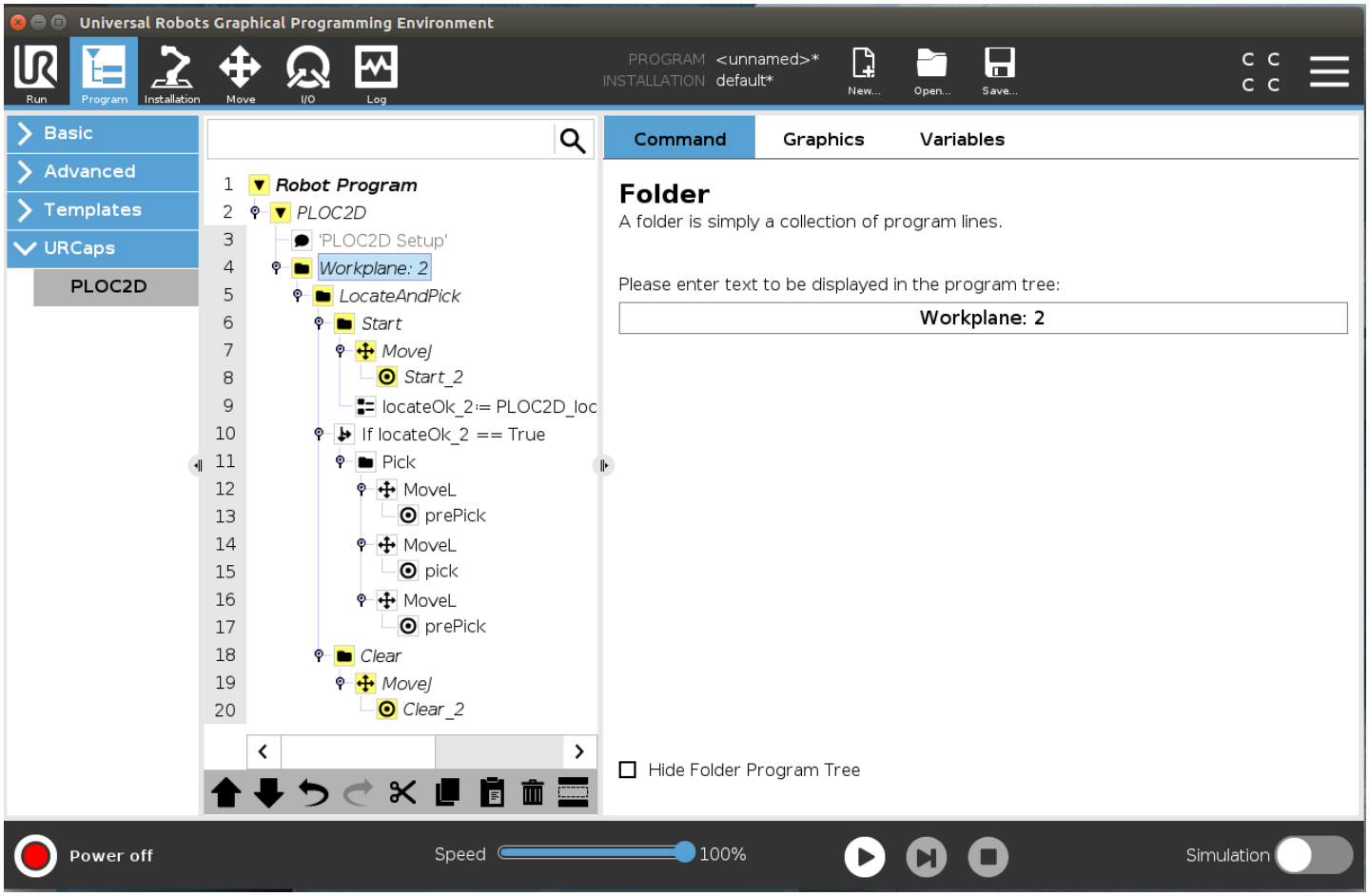
Template:

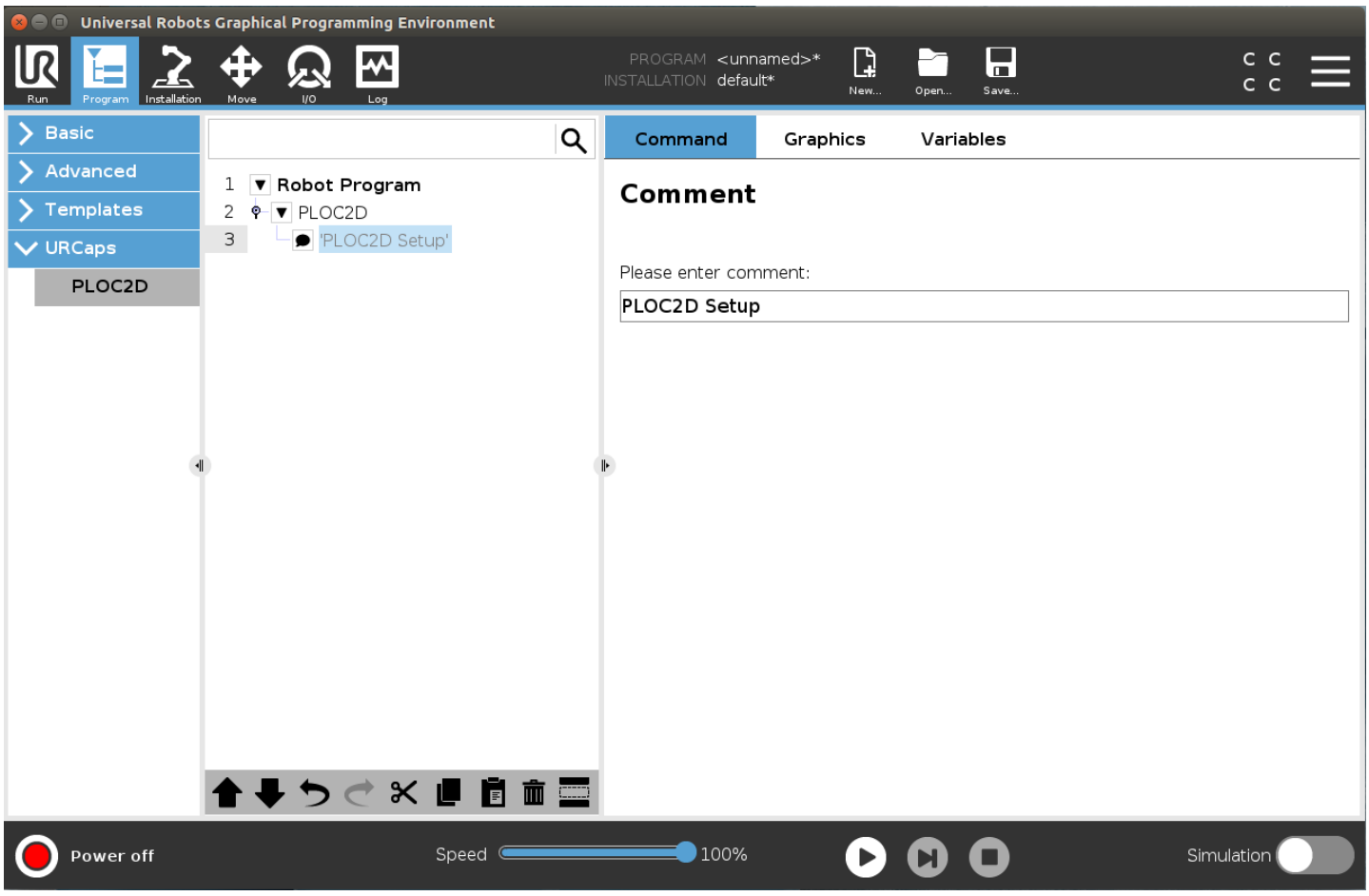
Please note that it is only possible to create an template if the following are defined: TCP, work plane with job/jobs.



To be able to use the template created it needs to be moved as instructed below.




Universal Robots Graphical Programming Environment
Run
Program
Installation
Move
I/O
Log
PROGRAM <unnamed>*
INSTALLATION default*
New...
Open...
Save...
Basic
Advanced
Templates
URCaps
PLOC2D
1 Robot Program
2 PLOC2D
3 'PLOC2D Setup'
4 Workplane: 2
5 LocateAndPick
6 Start
7 MoveJ
8 Start_2
9 locateOk_2 := PLOC2D_loc
10 If locateOk_2 == True
11 Pick
12 MoveL
13 prePick
14 MoveL
15 pick
16 MoveL
17 prePick
18 Clear
19 MoveJ
20 Clear_2
Command
Graphics
Variables
Folder
A folder is simply a collection of program lines.
Please enter text to be displayed in the program tree:
Workplane: 2
Hide Folder Program Tree
Power off
Speed
100%
Simulation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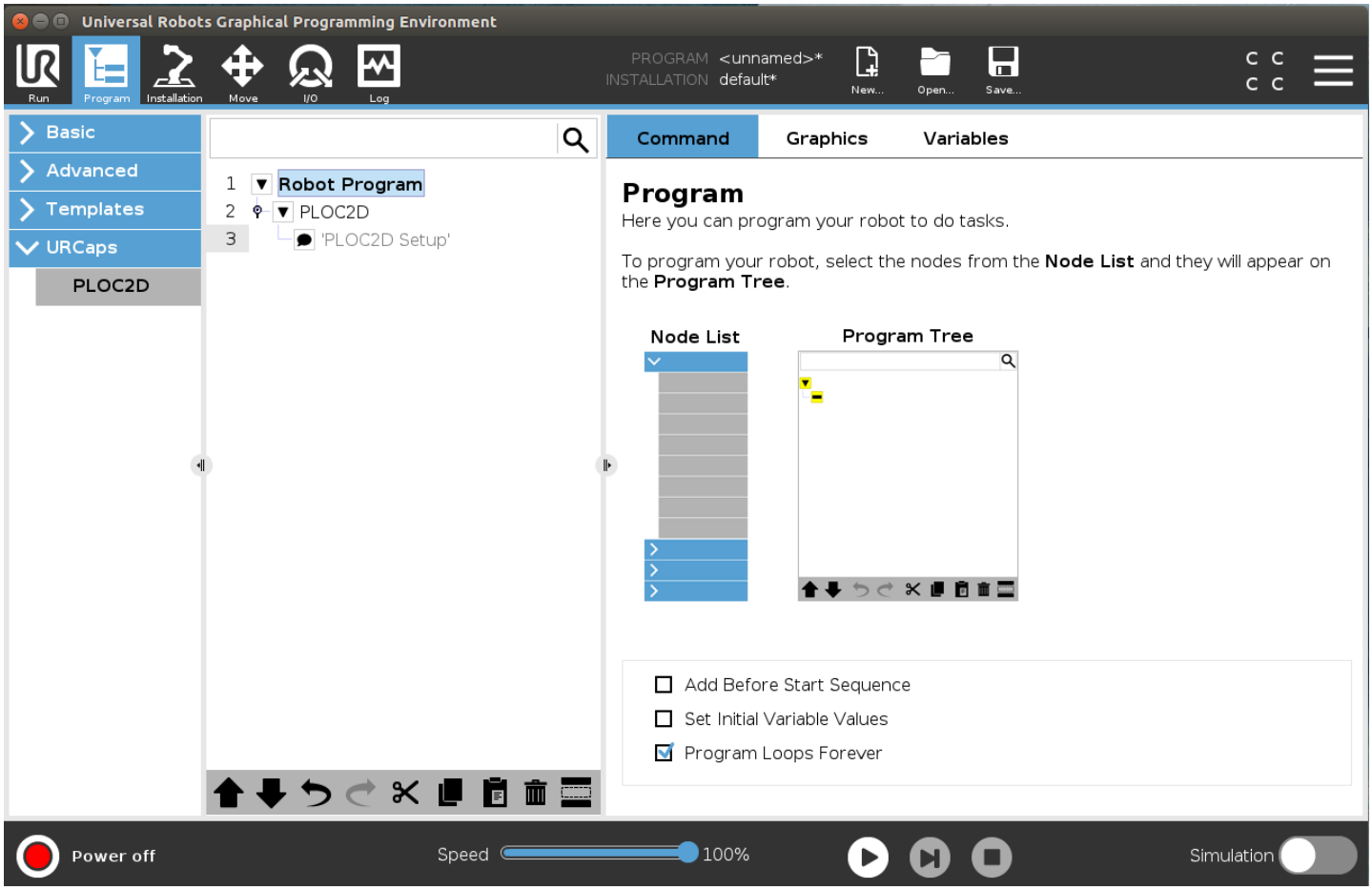
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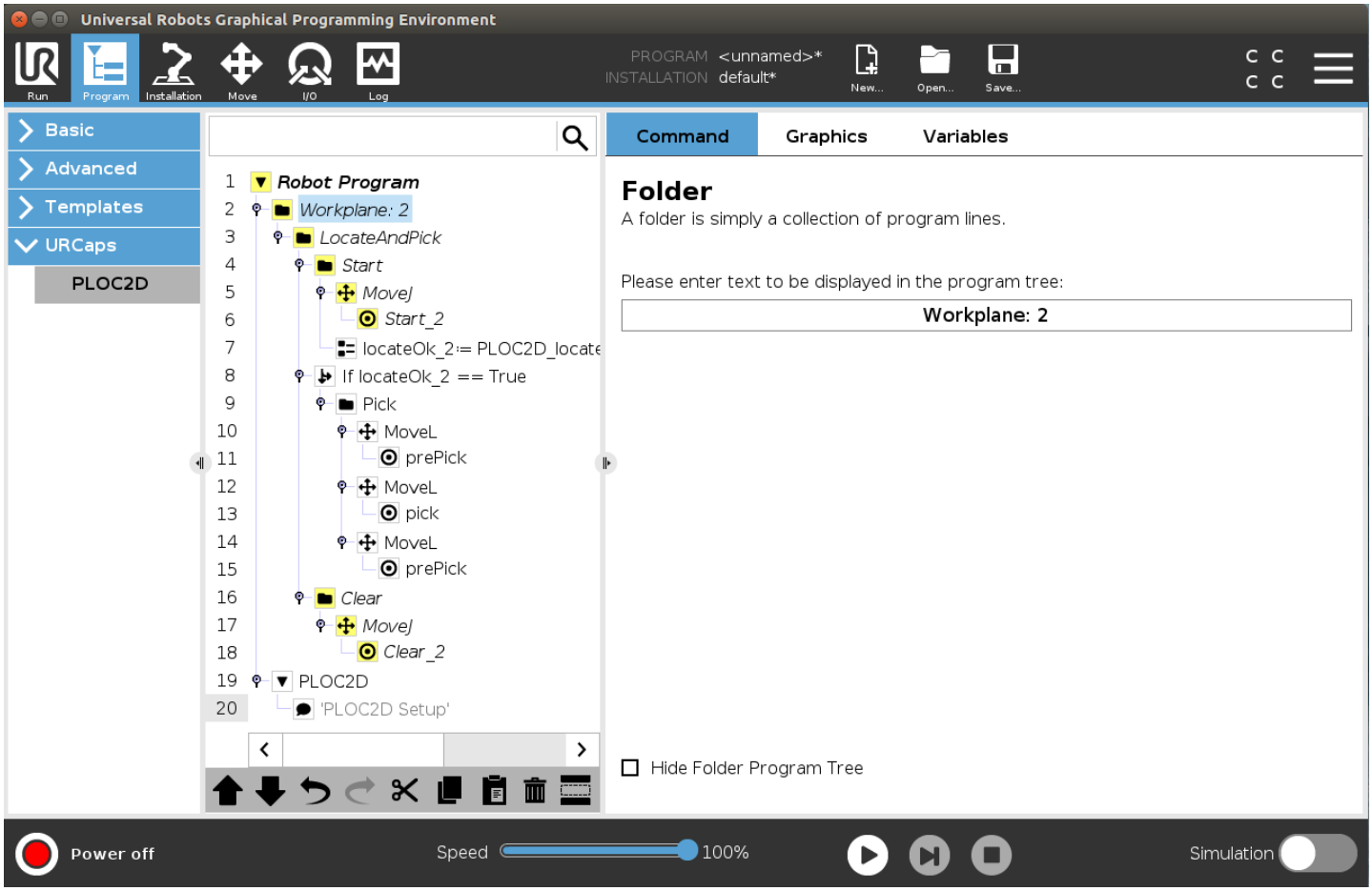
Command
Graphics
Variables
Program
Here you can program your robot to do tasks.
To program your robot, select the nodes from the Node List and they will appear on the Program Tree.
Node List
Program Tree
Add Before Start Sequence
Set Initial Variable Values
Program Loops Forever
Power off
Speed
100%
Simulation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Move
I/O
Log
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