Tool Changer TC1 URCap Software

Setup and Programming Manual for UR Cobots

TC1 URCAP SOFTWARE
Setup and Programming Manual

Contents

Glossary

Term	Definition
TC1 URCap Software	A software program to be installed in UR Polyscope
TCP	Tool Center Point
UR Polyscope	UR Cobot user interface software, running on Teach Pendant
Waypoint	Cobot wrist interface/tool flange position

1. General

1.1. About this Setup and Programming Manual

This manual contains setup and programming instructions for the TC1 URCap software. This software is used to easily integrate the DESTACO TC1 tool changer with UR Cobots.

1.2. Reference Documents

For more information regarding the TC1 and UR Cobot, refer to the following documents:
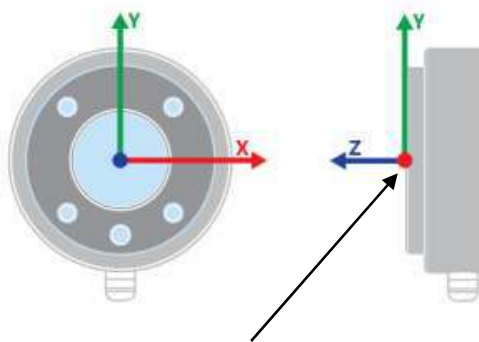
- TC1 Catalog
- TC1 Product Brochure
- TC1 Service Manual
- TC1 Product Video
- User Manual for UR Cobots

Note: TC1 URCap requires UR Polyscope software version 5.11.8 or higher, and lower version may not function properly. Current URCap revision is intended only for UR3e, UR5e, and UR10e.

2. Functionality of TC1 URCap

The TC1 URCap pre-sets the TCP to follow waypoints accounting for the TC1 thickness offset.
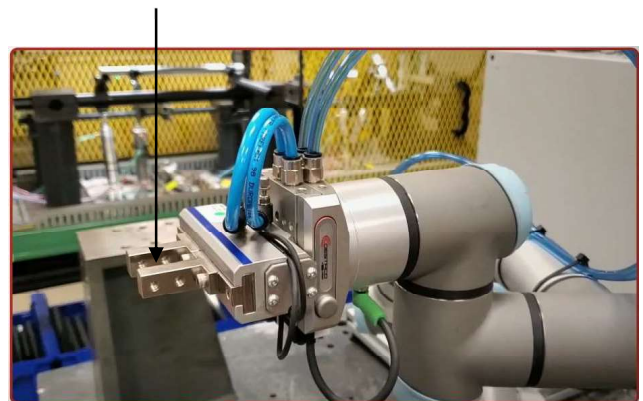
UR Cobot Tool Flange

2) TCP (when there is tool changer with tool installed)

1) Default TCP (when there is no tool changer)

Origin of reference frame (0, 0, 0)

TCP (3D coordinate needs to be calculated in mm unit, considering center of Tool Flange as origin. Also, angular orientation can be applicable if needed)

Figure 1: TCP

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3. URCap Installation

Note:

- Download TC1-URCap file and store into a USB flash drive.
- Insert flash drive with URCap file into UR Teach Pendant.
- Power on Pendant.
- Click on the menu button in the top right corner of screen.
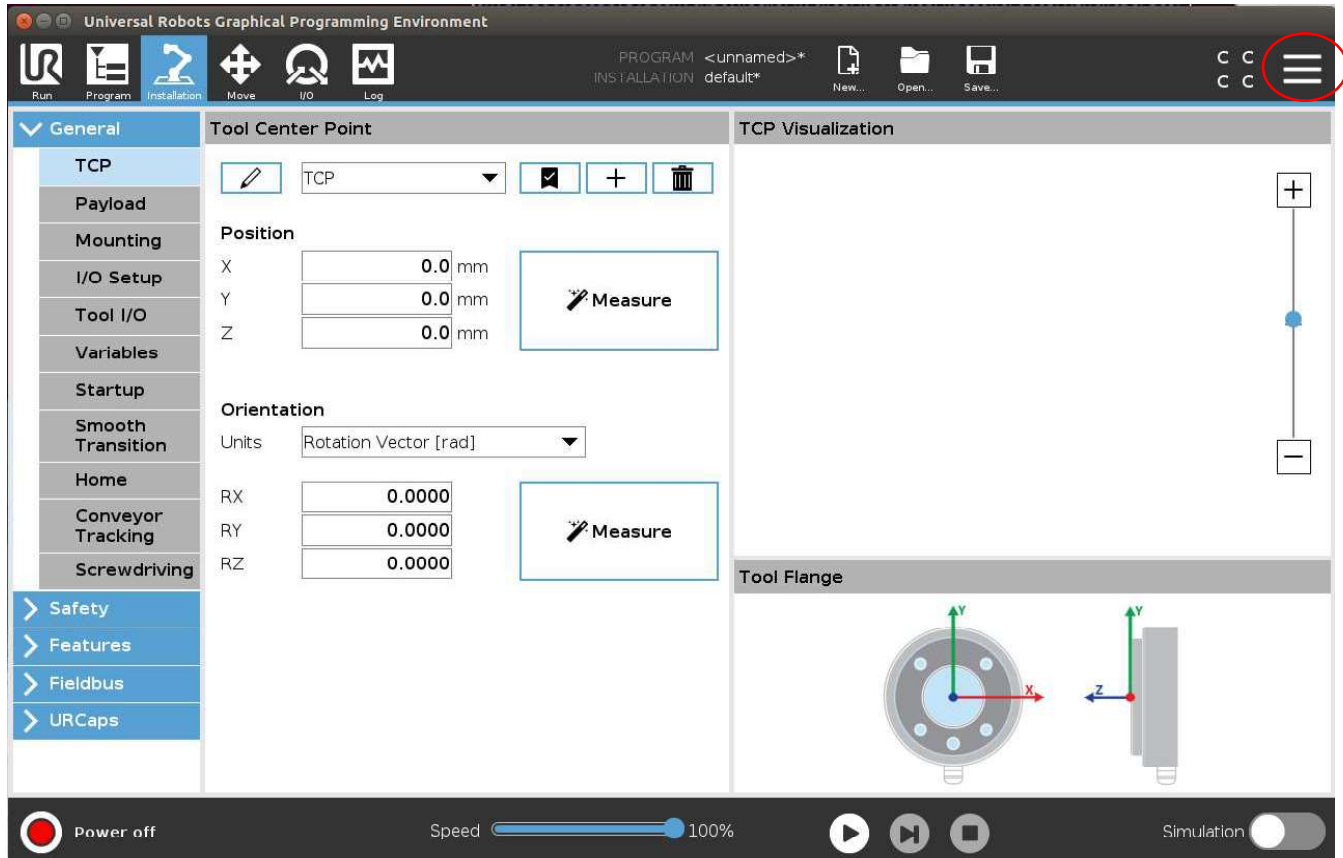

Figure 2: Polyscope screen

- Navigate to Settings → System → URCaps
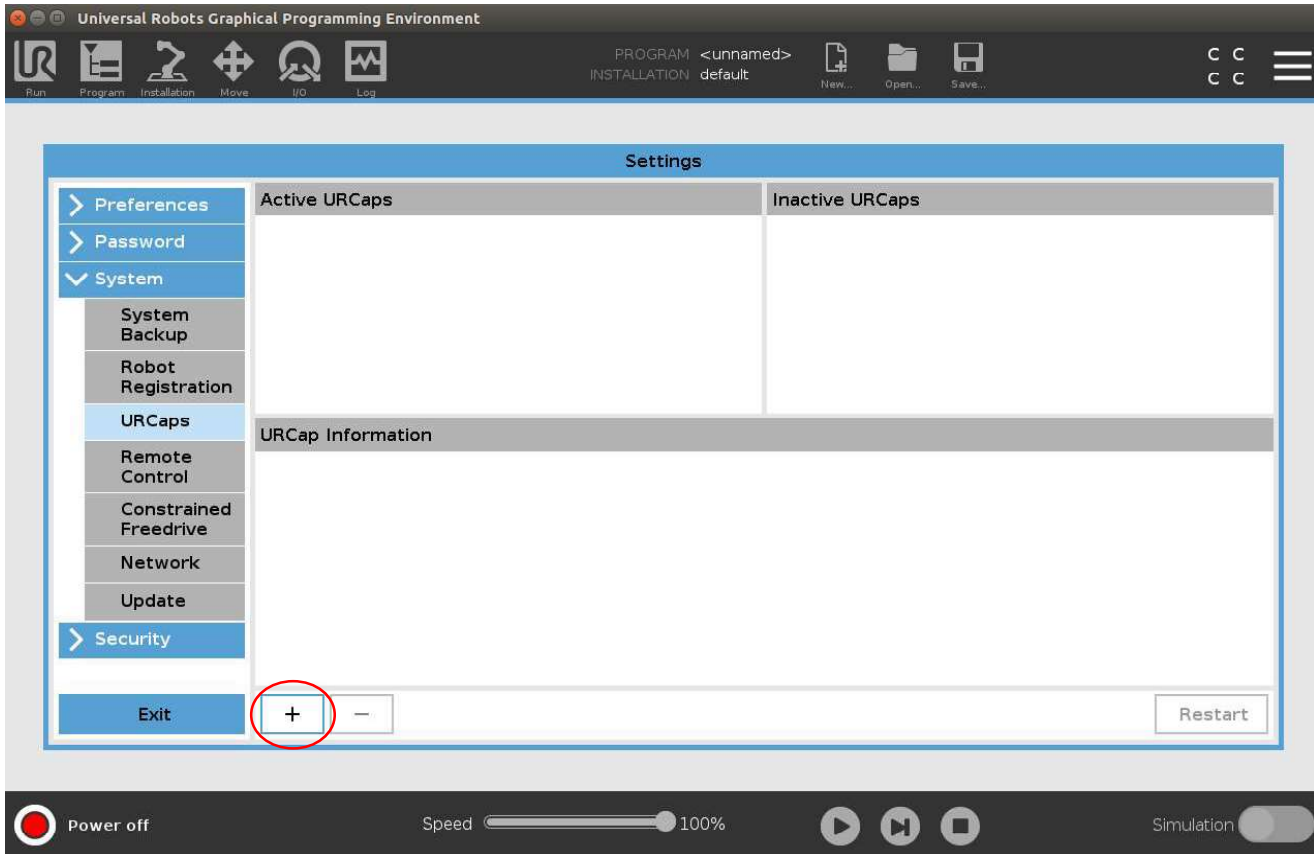- Click on '+' button in the lower left side of screen.

Figure 3: URCap Installation

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- Locate appropriate URCap file (e.g. DESTACOTC1-1.0.0.urcap in below screen) from USB drive and click on Open button in the lower right side of screen.
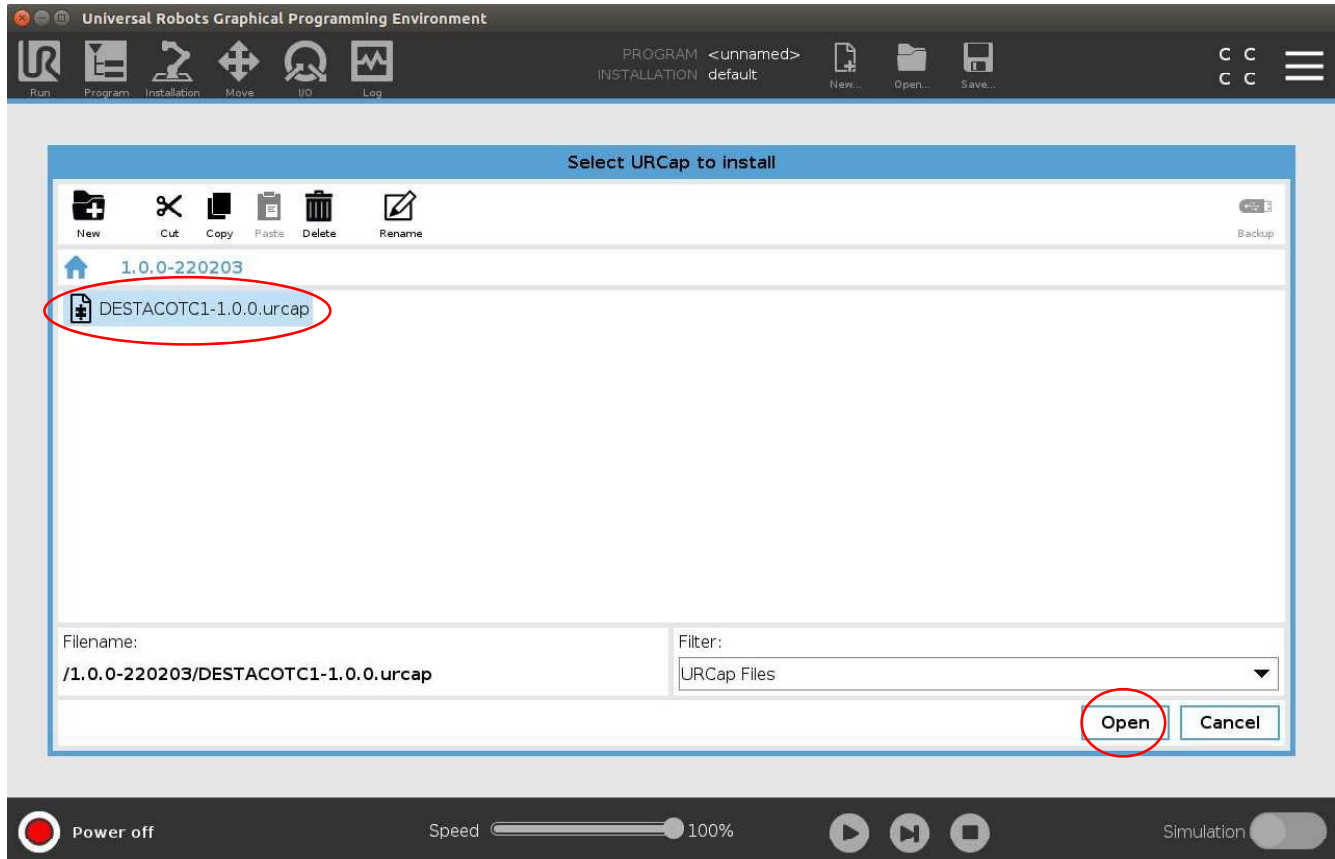

Figure 4:URCap Open

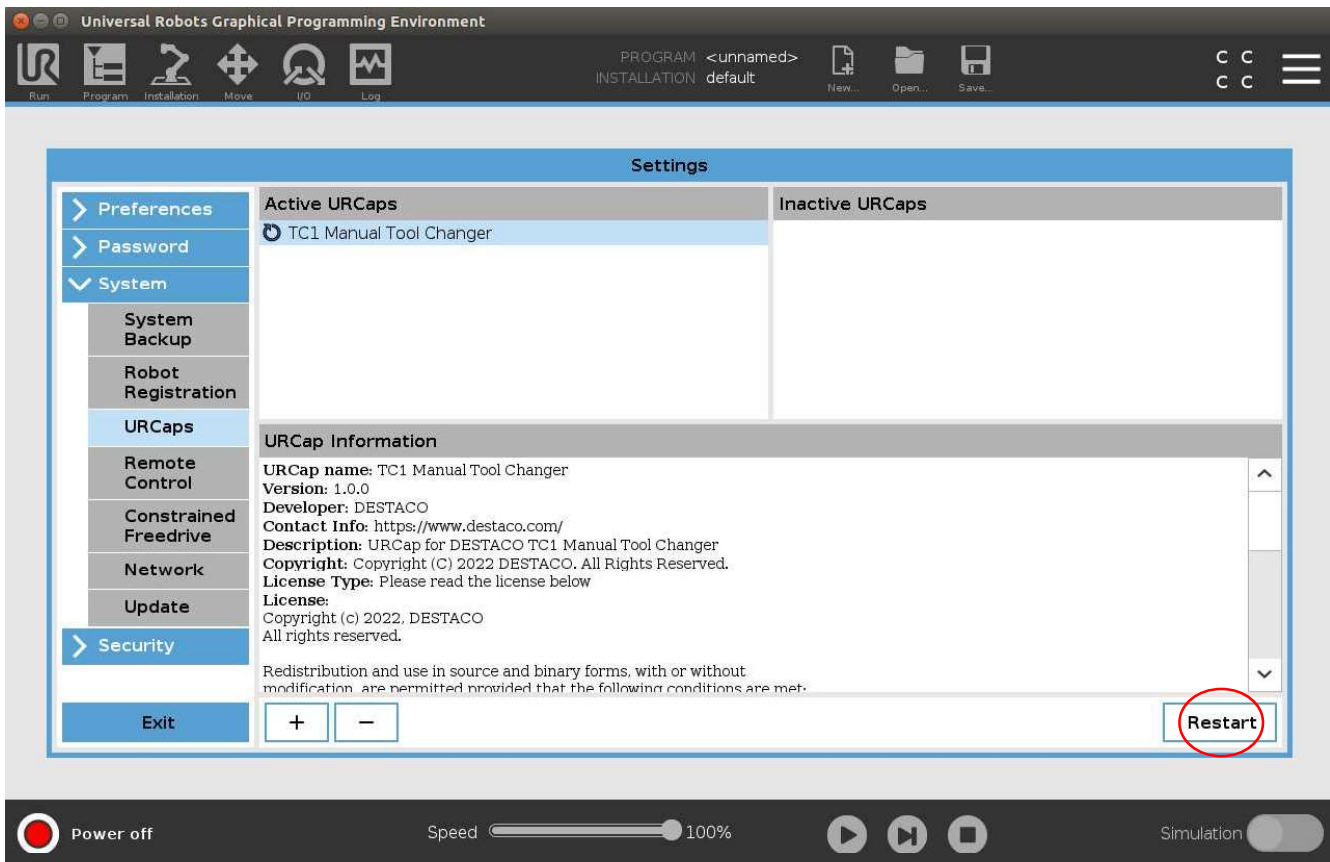- Restart robot when notified and remove USB drive.

Figure 5: URCap Installed

- Note: '-' button can be used to uninstall any installed URCap which is not required.

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4. URCap Configurations

After successful installation of TC1 URCap, the following steps can be used for implementation:

- TC1 URCap module is available as a Program Node under URCaps. Click on it to add it to Robot Program.
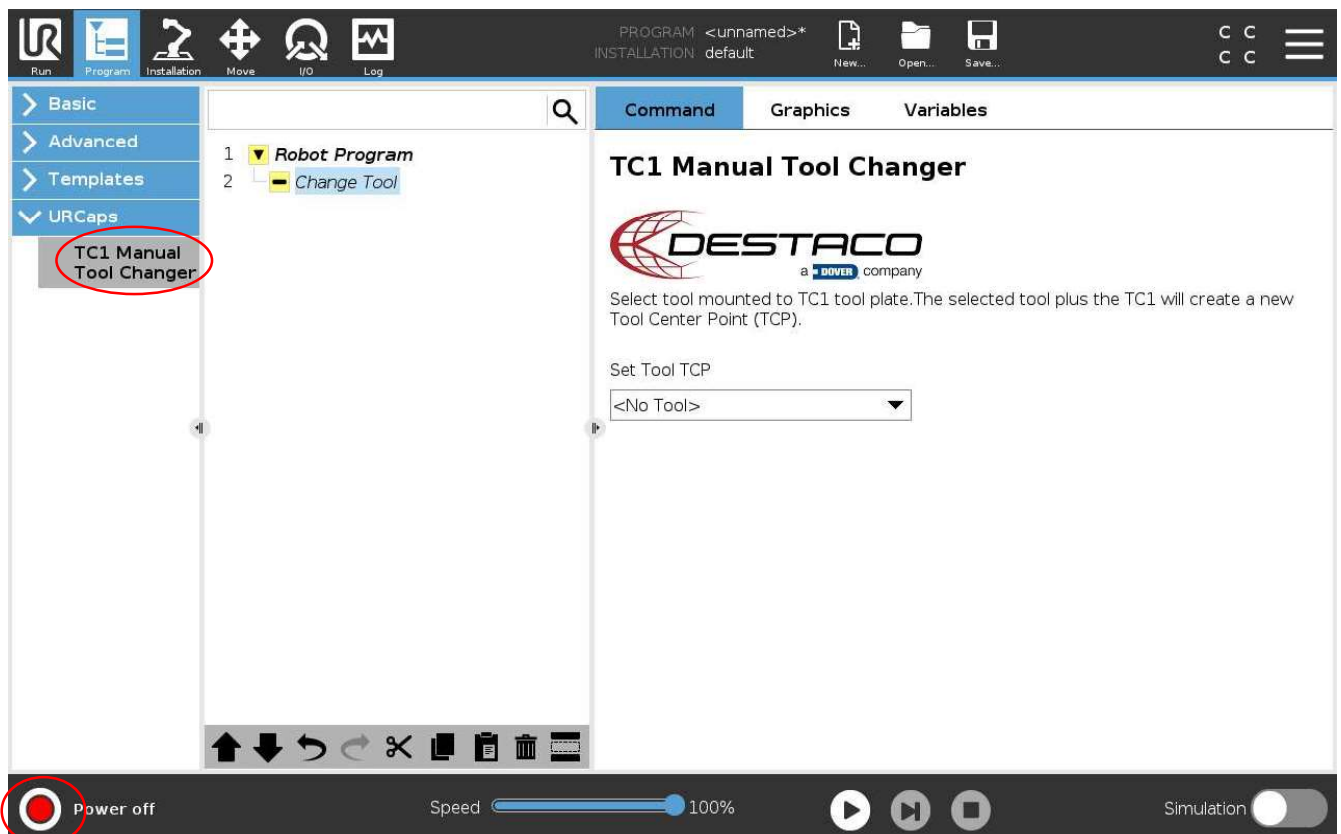- If necessary, power on the cobot using the red button in the lower left corner.
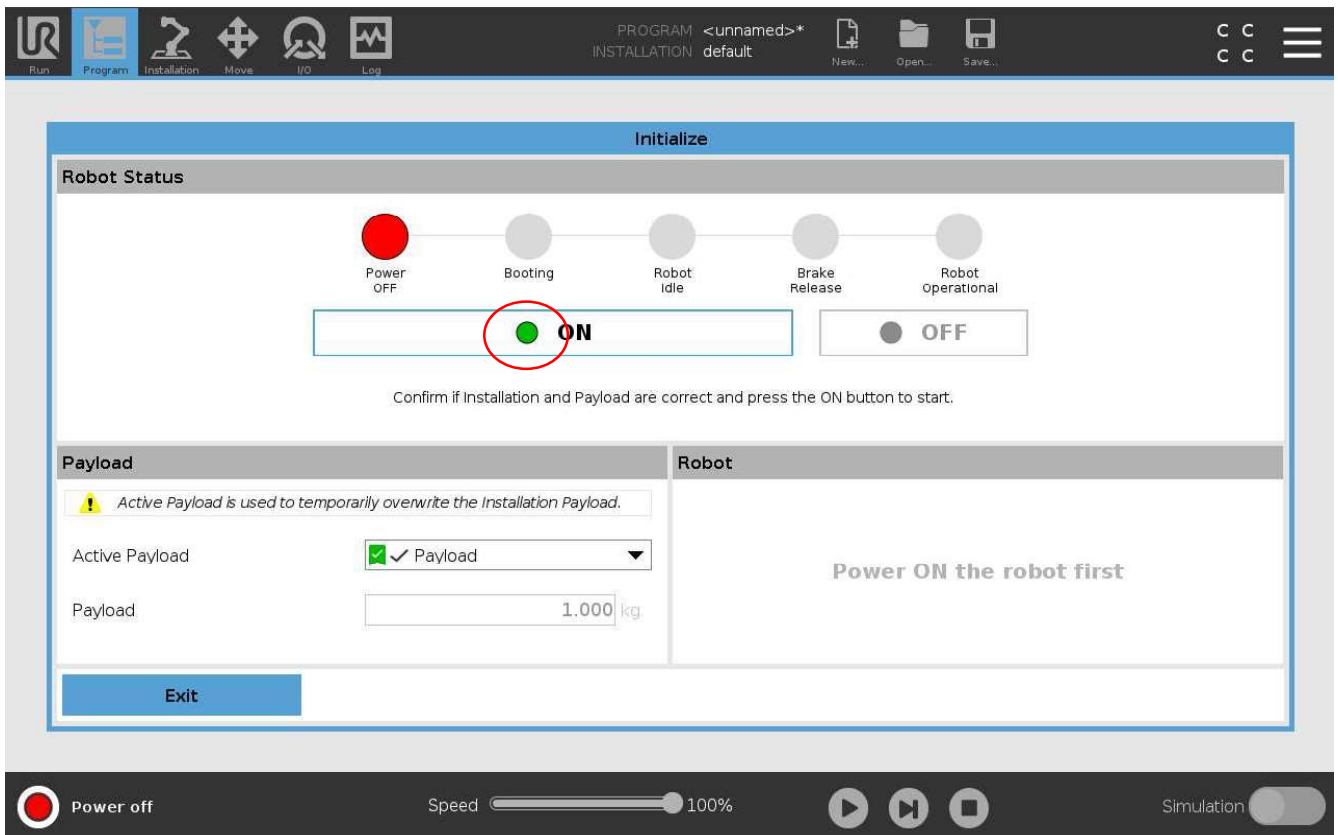

Figure 6: Program Node

- Click ON button.

Figure 7: On button
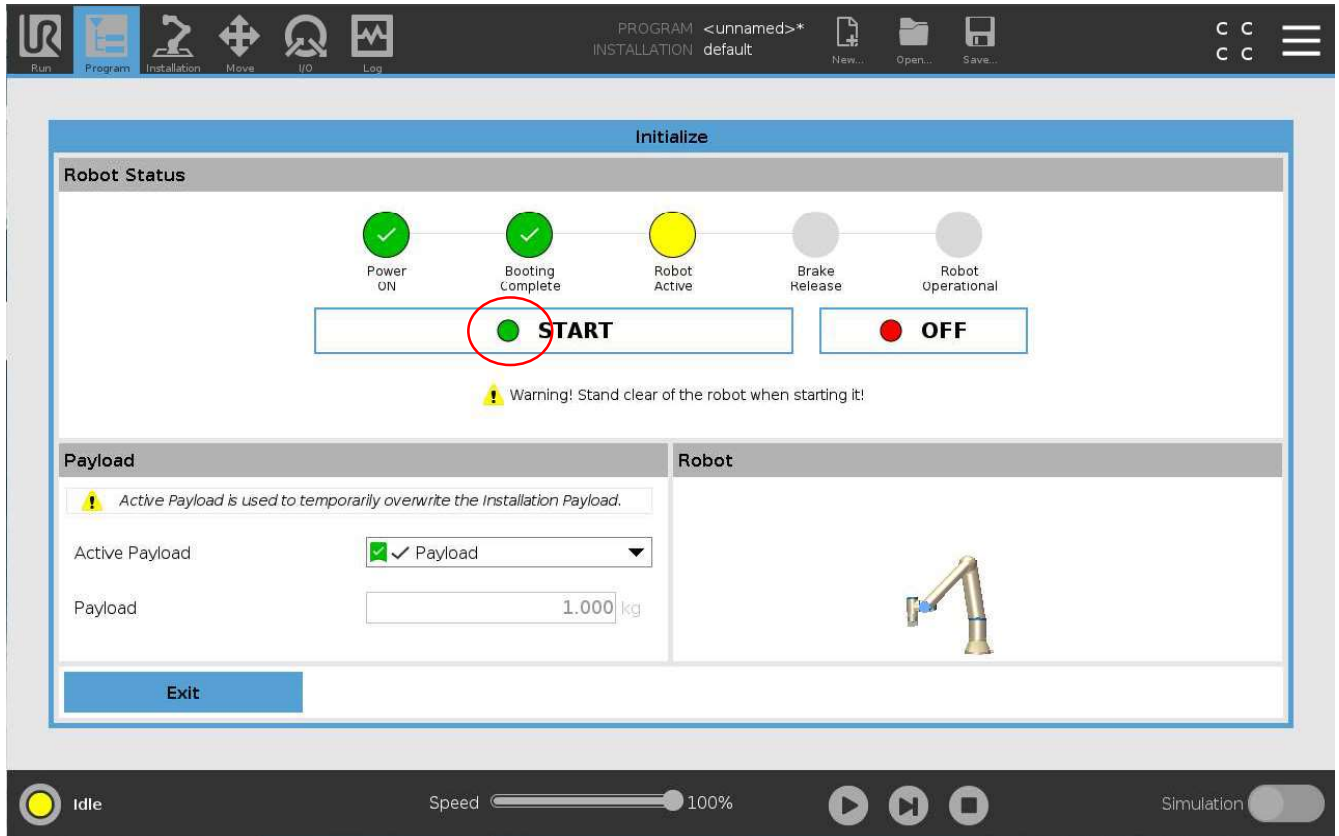
- Click START button.

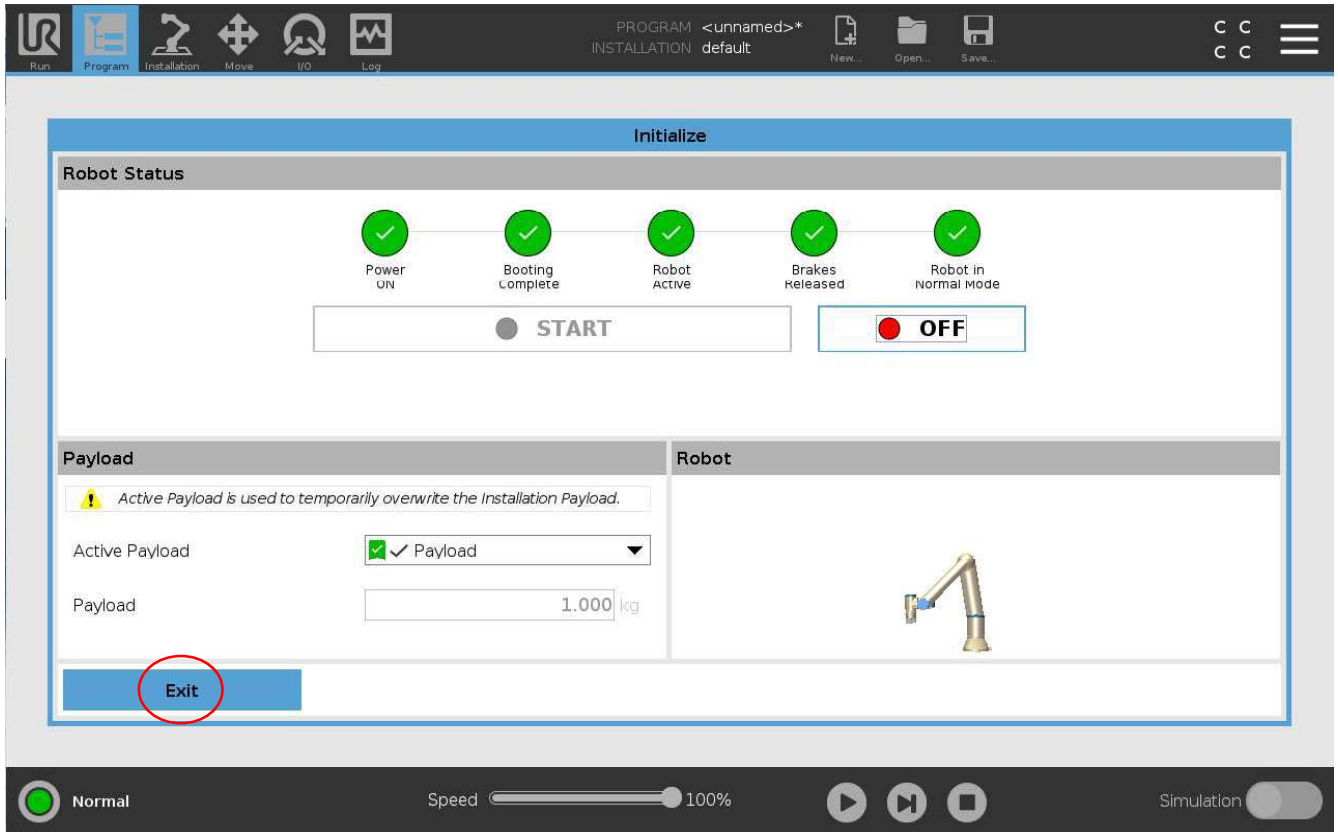Figure 8: Start button

- Click Exit button.

Figure 9: Exit button

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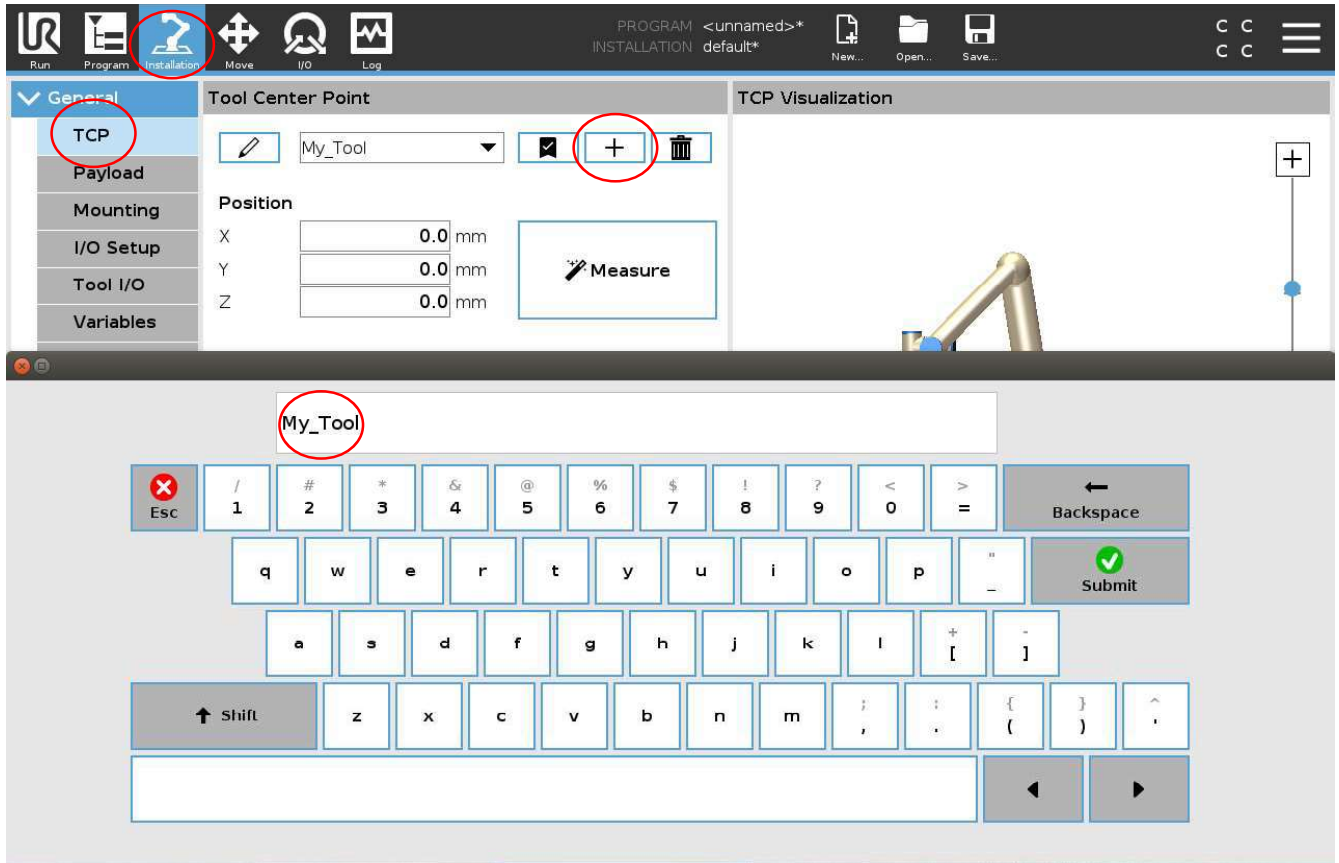- Go to Installation Node. Create TCP and assign a tool name. e.g. My_Tool

Figure 10: Create TCP

- Configure TCP. Enter coordinates and orientation of TCP (TC1 + Tool combined TCP)
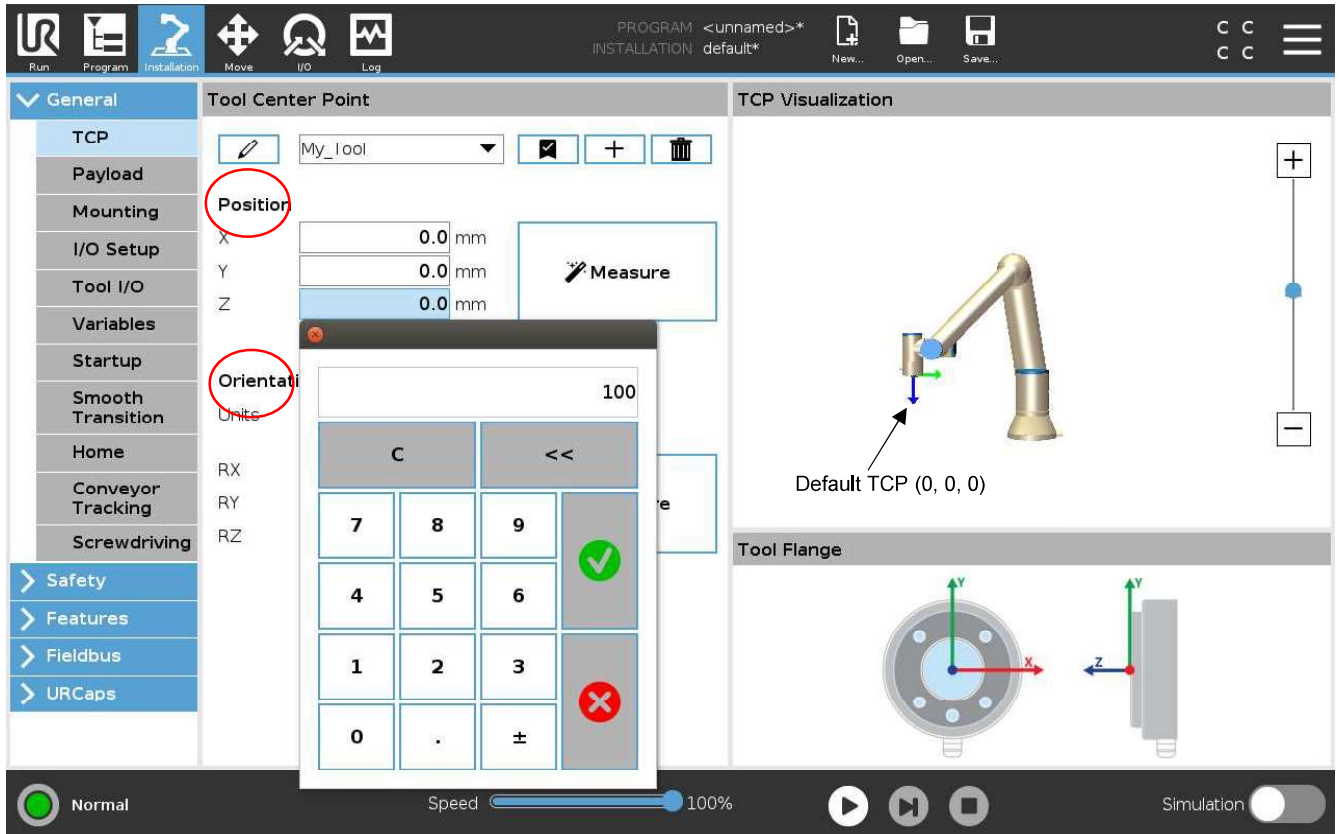

Figure 11: Configure TCP

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- Example TCP: TC1 + Sample Tool
  TC1 thickness = 25mm
  Sample tool effective height after connecting to TC1 = 75mm
  TCP z dimension = 25 + 75 mm = 100mm
  Refer "Figure *1*: TCP" section of this document for more info on TCP.
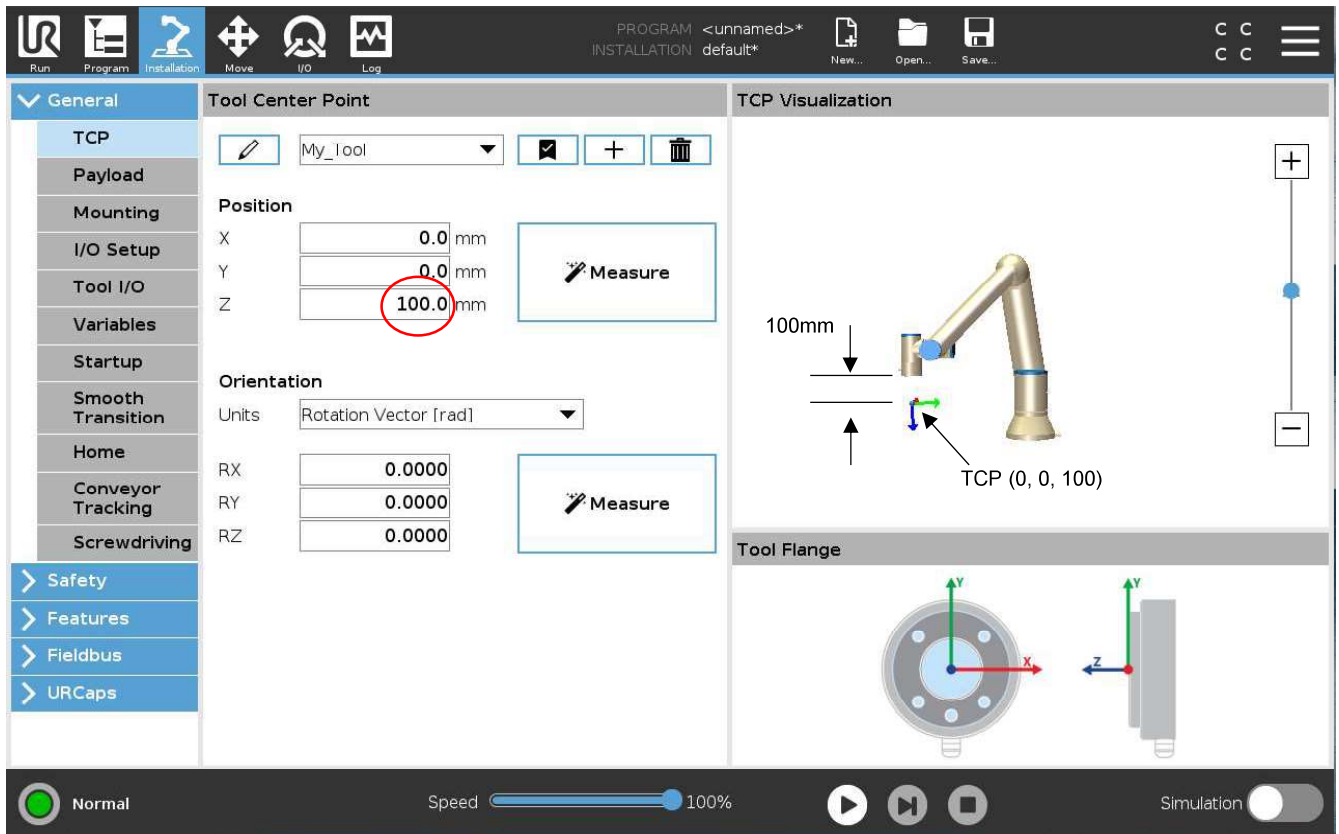

Figure 12: TCP Configured

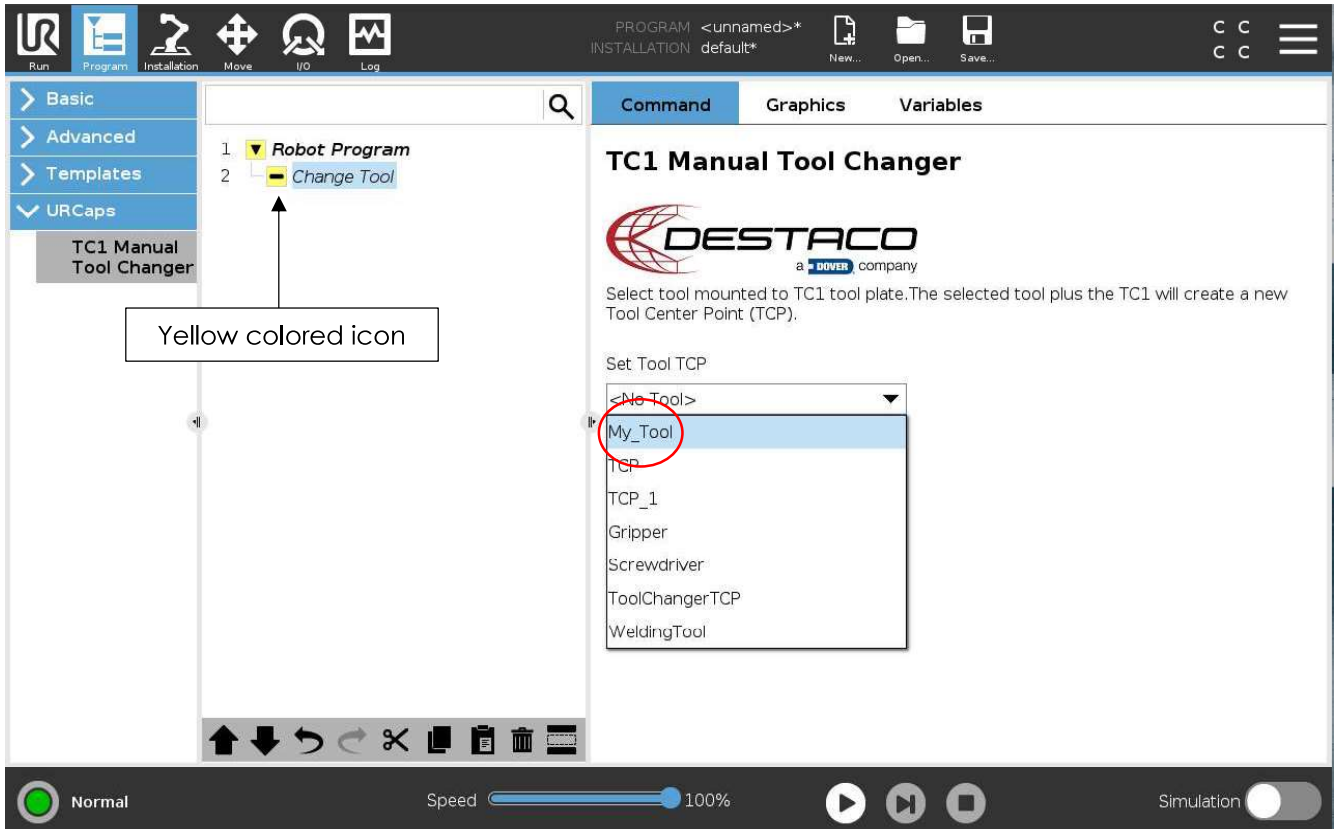- Go to Program Node. Select required TCP from drop-down at home screen of TC1 URCap.

Figure 13: TC1 URCap TCP selection

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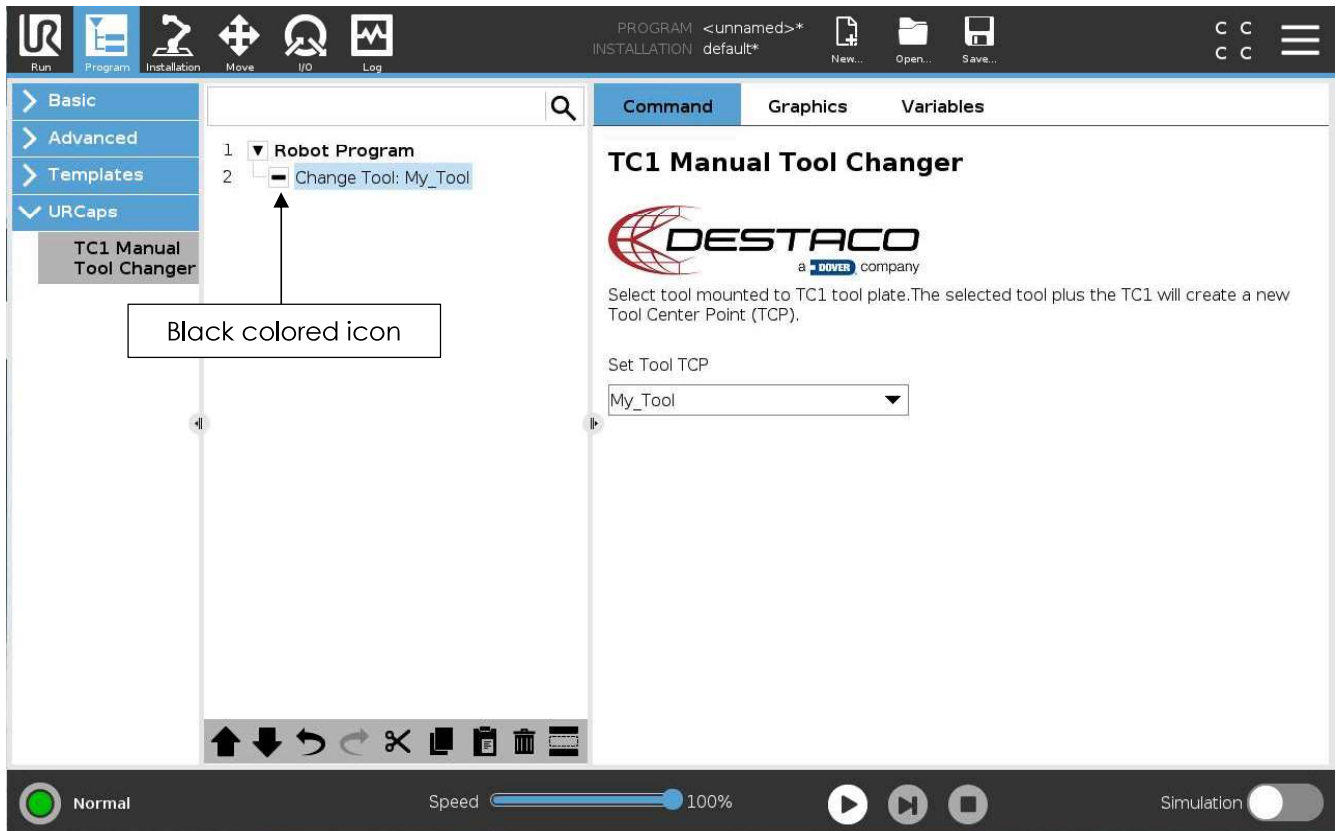- "Change Tool" icon has now become black colored, which signifies TCP selected.

Figure 14: TCP selected

- Go to Installation → URCaps tab to configure desired position of TC1 for tool changing operation. Since this URCap is built for Manual Tool changer, therefore, only a common position is kept for all tool changing operation. That means whenever any tool needs to be assembled for the first time to TC1 or changed/replaced by another tool, UR wrist interface/tool flange will reach a specific preconfigured position every time where human operator will be present for carrying out tool changing operation.
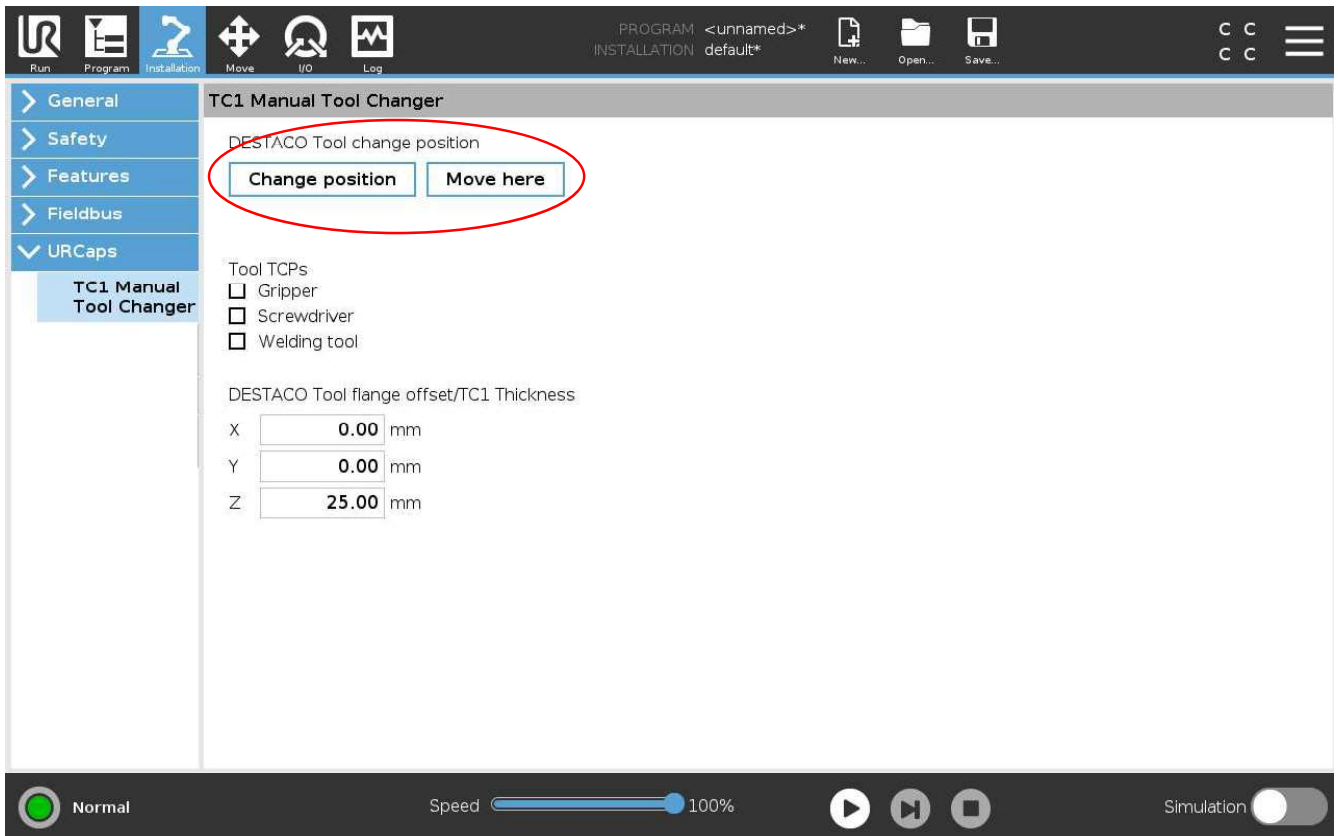

Figure 15: Tool Change Position Configuration

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- Set tool changing position very carefully and click on Ok button. Click on Cancel button if no need to change position.
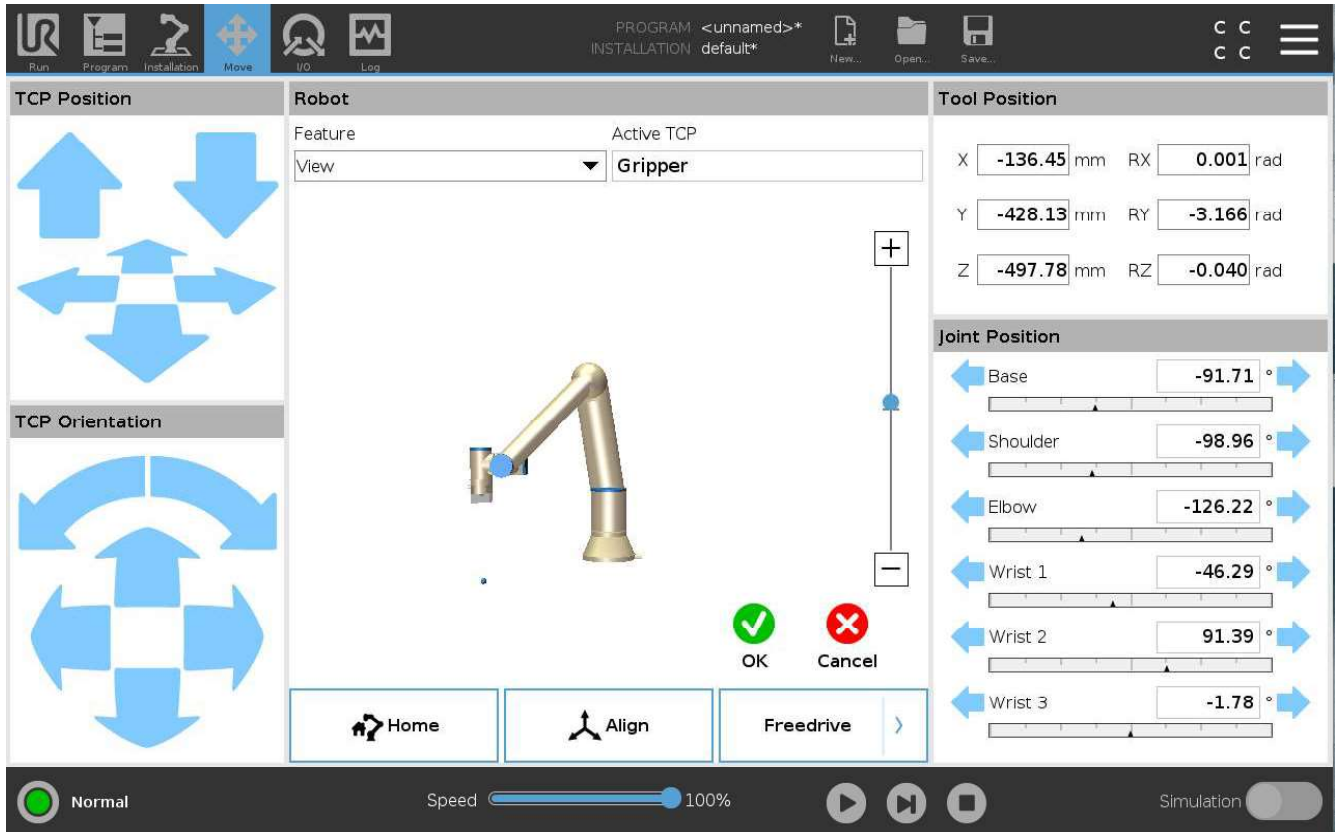

Figure 16: Tool Change Position Defined

- Use TC1 URCap module wherever needed in complete Robot Program Tree and run the program.
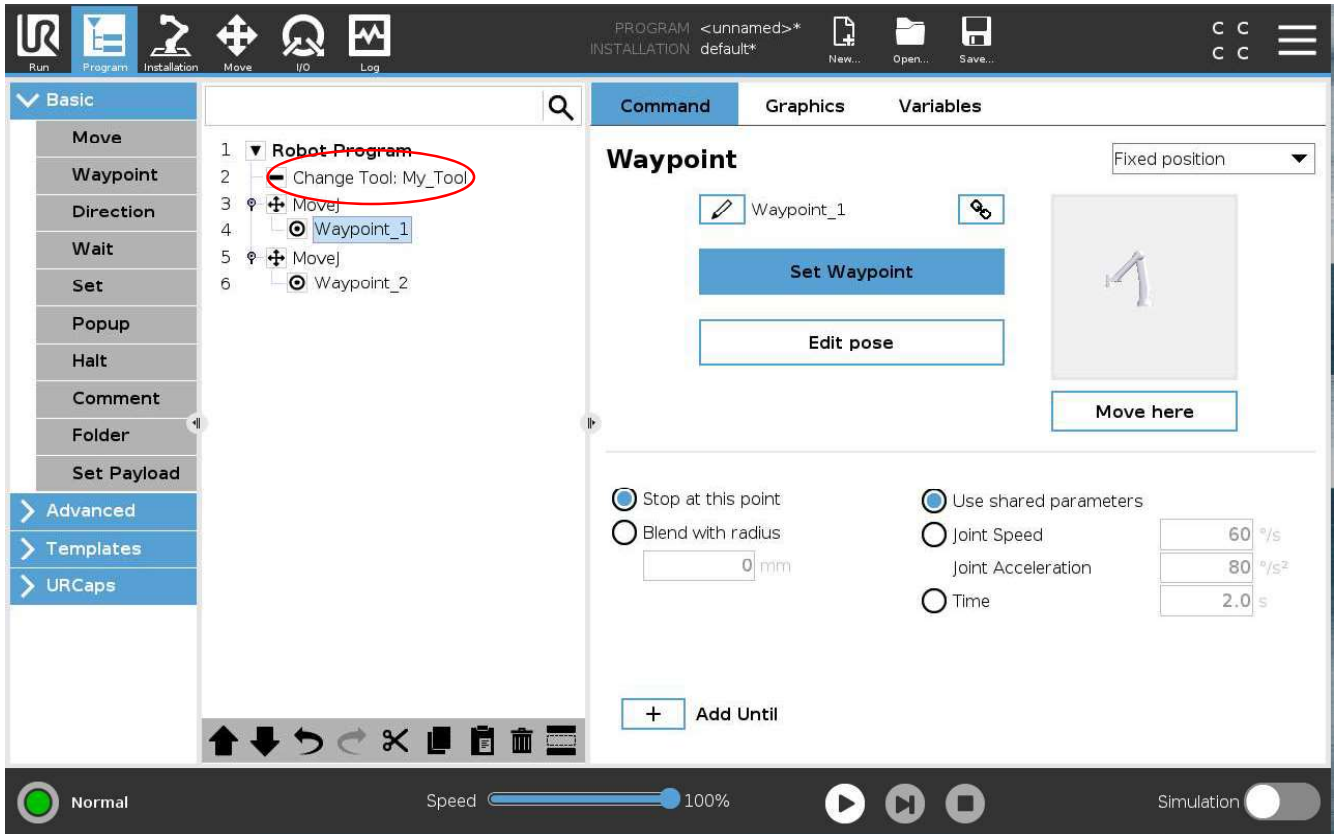

Figure 17: Develop Robot Program using TC1

5. Document Revision History

REVISION	ECN	DESCRIPTION	DATE	BY
A	-	INITIAL RELEASE	2022-05-20	AAG

GLOBAL LOCATIONS

NORTH AMERICA

Corporate Headquarters
Auburn Hills, Michigan
Toll Free: 1.888.DESTACO
Marketing: marketing@destaco.com

Global Technology Center
Auburn Hills, Michigan
Tel: 1.248.836.6700
Customer Service: customerservice@destaco.com

Mt. Juliet, Tennessee
Tel: 1.888.DESTACO
Customer Service: customerservice@destaco.com

Wheeling, Illinois
Tel: 1.800.645.5207
Customer Service: camco@destaco.com

Red Wing, Minnesota (Central Research Laboratories)
Tel: 651.385.2142
Customer Service: sales@centres.com

ASIA

Thailand
Tel: +66-2-326-0812
Customer Service: info@destaco.com

China
Tel: +86-21-6081-2888
Customer Service: china@destaco.com

India
Tel: +91-80-41123421-426
Customer Service: india@destaco.com

EUROPE

Germany
Tel: +49-6171-705-0
Customer Service: europe@destaco.com

France
Tel: +33-4-73545001
Customer Service: france@destaco.com

Great Britain
Tel: +44-1902-797980
Customer Service: uk@destaco.com

Spain
Tel: +34-936361680
Customer Service: spain@destaco.com

Netherlands
Tel: +31-297285332
Customer Service: benelux@destaco.com

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