VERSA BUILT ROBOTICS

Mill Automation System UR-10e Robot Installation, Configuration and Operation

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UR10e Robot Installation

Section 1

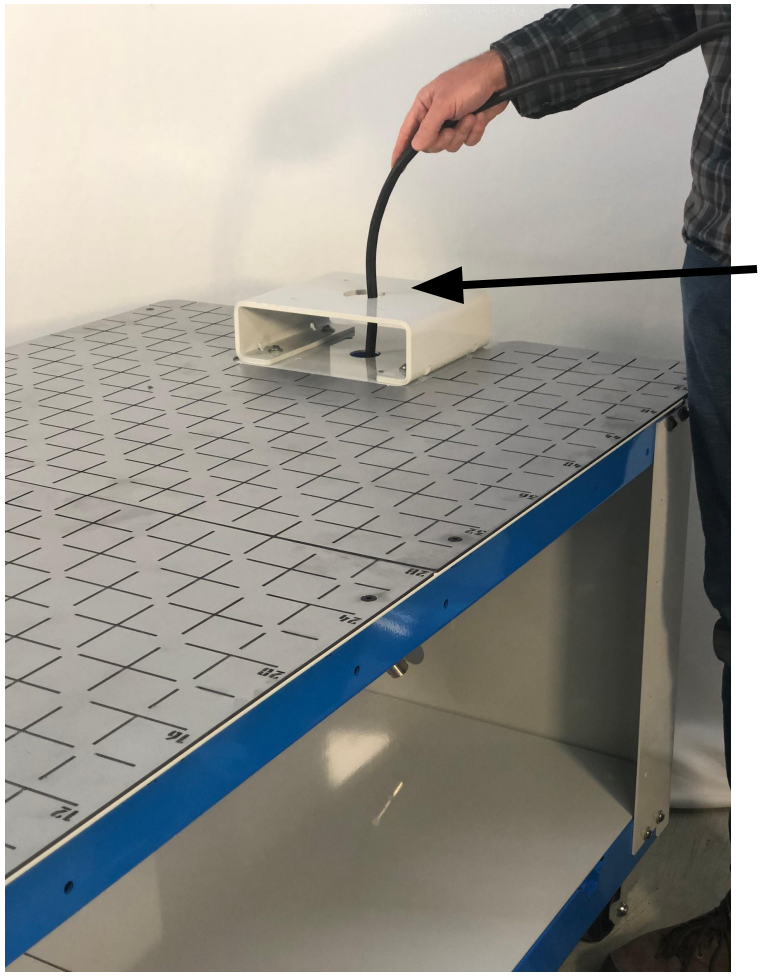
Install UR10e Robot onto VersaCart 1300

- Tools:
  - 6mm hex key
  - 13mm open-ended wrench

- Parts:
  - UR10e Robot
  - VersaCart 1300
  - 4 x M8 Socket Head Screws x 30mm L
  - 4 x M8 Hex Nuts

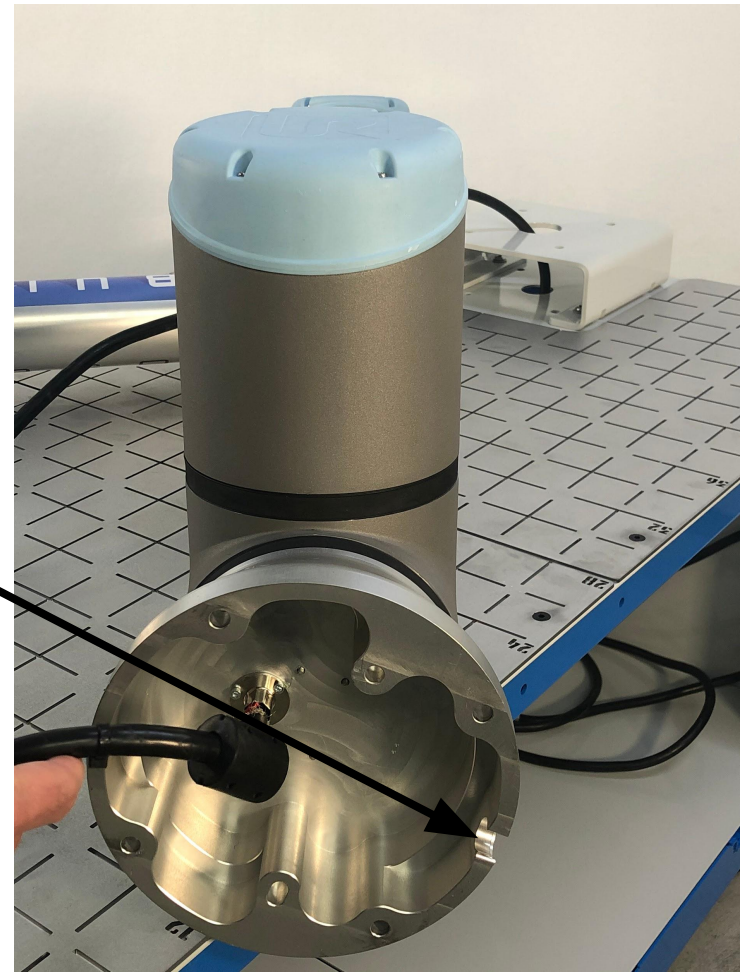
Note: before initial power-up and installation, please refer to the UR Manual for proper power-up, safety settings and any general guidance from Universal Robots.

Route UR10e Cable



ROBOT POWER DISCONNECTED

- Place robot on VersaCart table top
- Route robot cable through hole in VersaCart robot stand and table top
- Pull robot cable out of slot in robot base so the cable can pass through the bottom of the robot

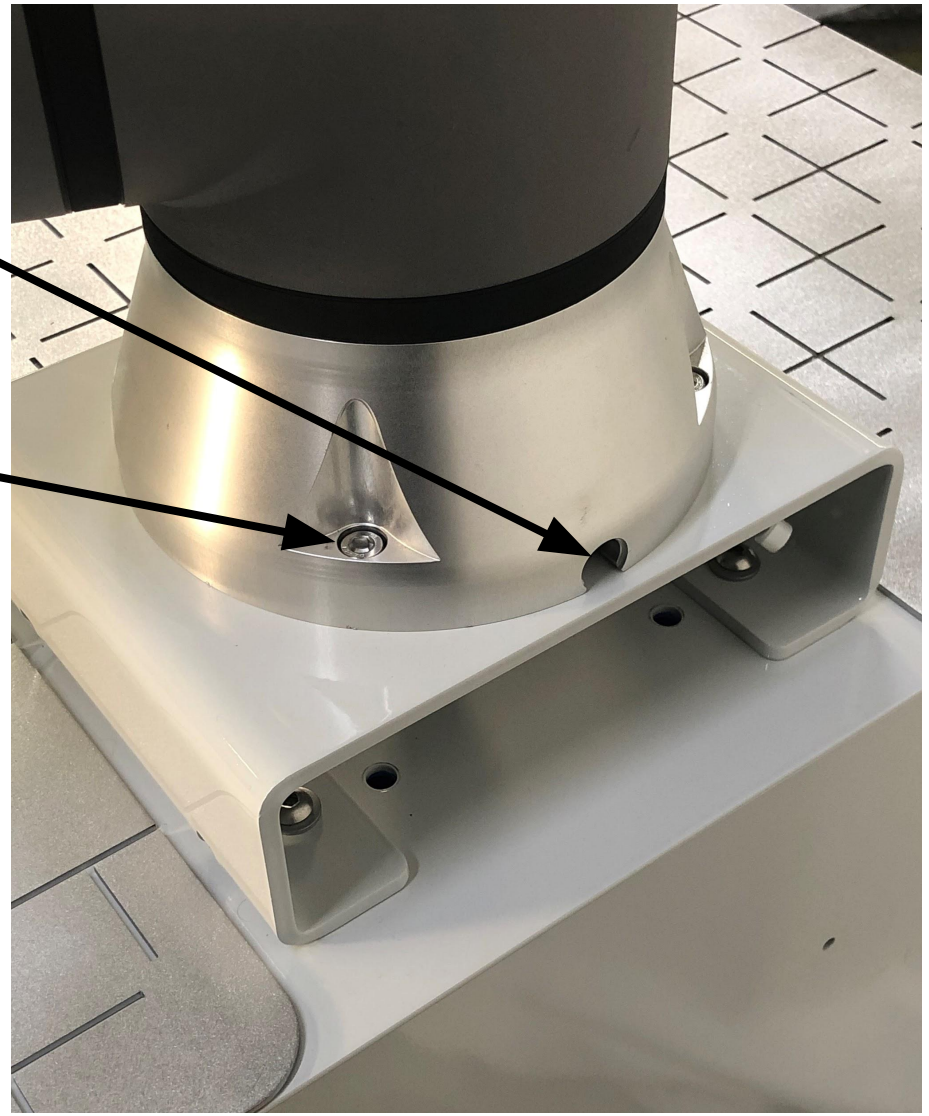


Locate and Secure UR10e Robot on VersaCart 1300

- Position UR10e robot on VersaCart pedestal, with the robot's cable slot in the base positioned to the back of the VersaCart

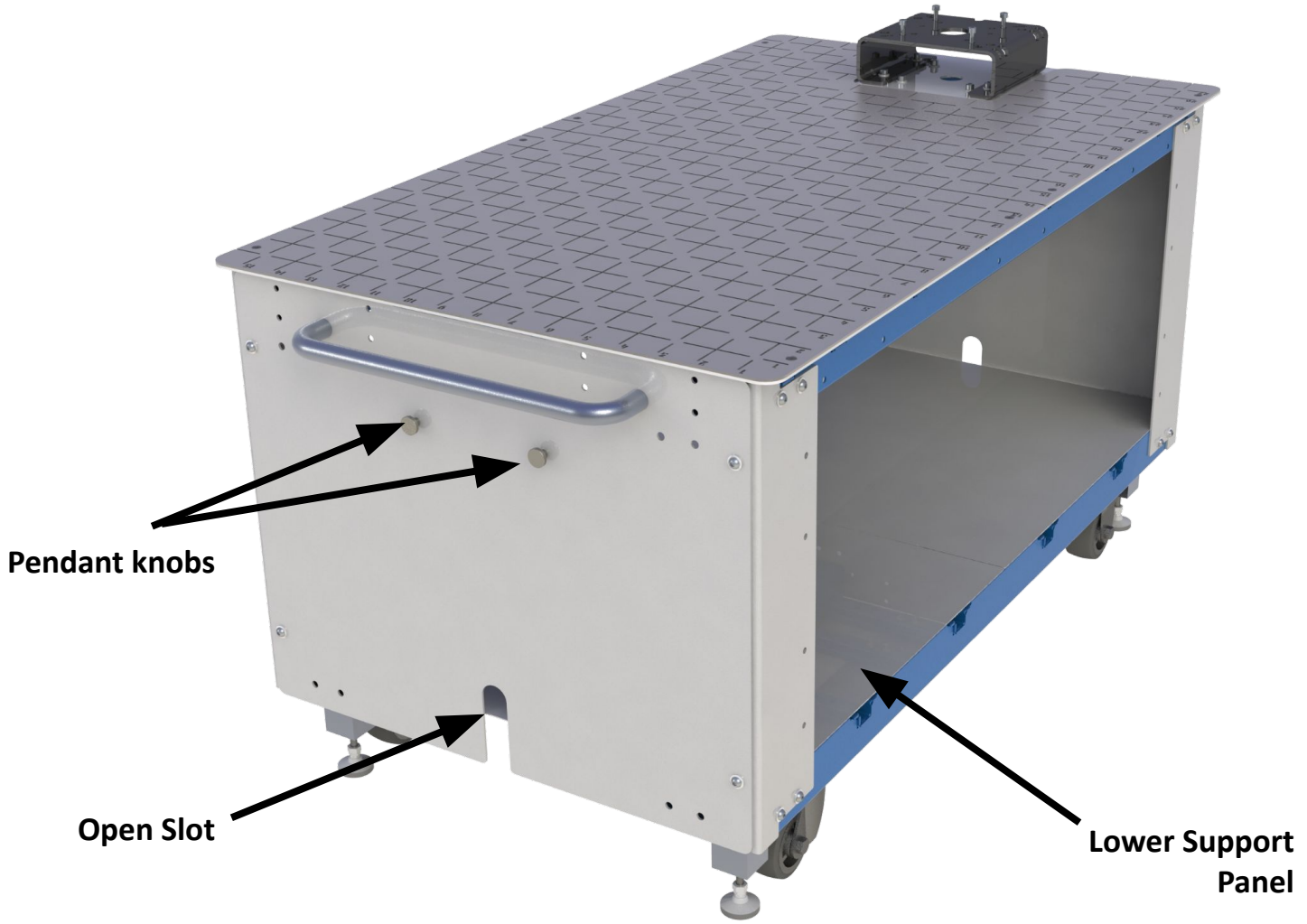
- Secure the UR10e robot to the VersaCart robot pedestal with 4 x M8 Socket Head Screw x 30mm Length - Apply a small drop of medium strength threadlocker to each fastener

Note: *Screws are attached with captive hex nuts press-fit into the bottom side of the pedestal. If necessary, use a 13mm wrench on the captive hex nut while tighten screw into place.*



Route Teach Pendant (open slot end panel)

- Lay the controller on the top of the cart
- Slide lower support panel, on opposite side of the robot pedestal, on top of the lower support panel under the robot pedestal
- Route Teach Pendant under end panel, and hang pendant on knobs
- Replace lower support panel and place controller on a lower support panel



Connect Robot Power and Signal Cables

- Attach the robot cable to the robot controller
- Position robot controller in the VersaCart underneath the robot as shown
- **Do not power-up the robot yet**

Power Up Robot

Refer to UR Manual for initial power and safety settings

General instructions for initial setup:

- Power Up Robot
- Move robot from boxed position:
  - FreeDrive the robot

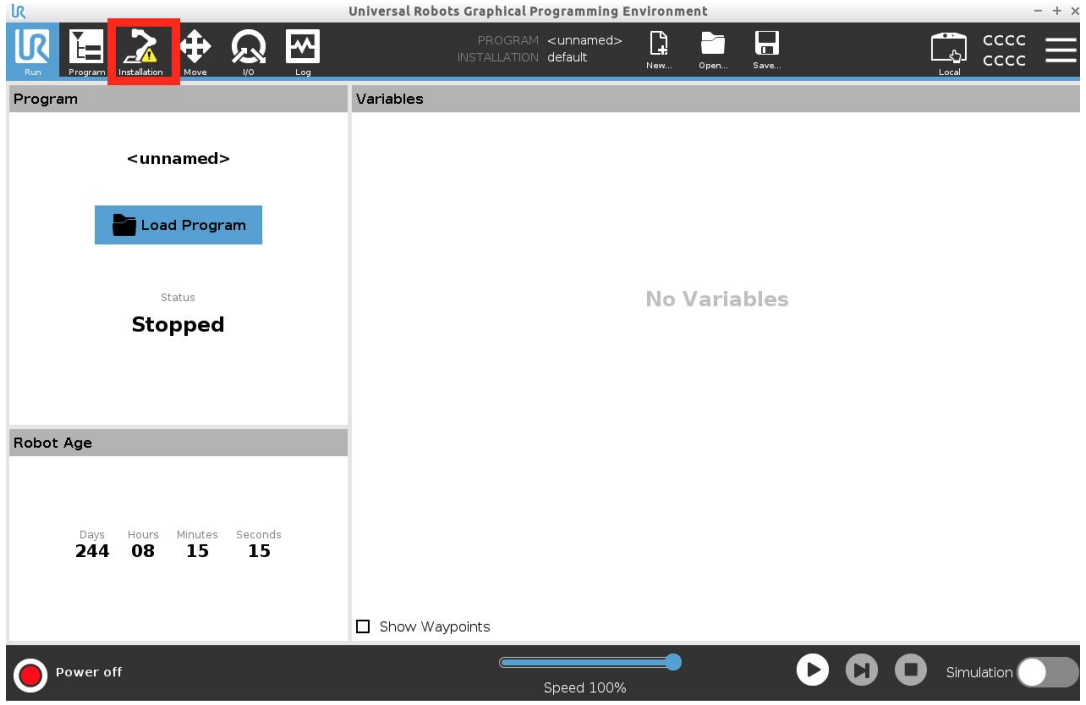
    or

  - Use pre-installed program on teach pendant to move the robot
    - Select OPEN > PROGRAM
    - Select “Put_into_box_E-Series_UR10.urp”
    - Hold down PLAY button to move the robot into a standing position

Power Up Robot - Safety Settings

Refer to UR Manual for initial power and safety settings

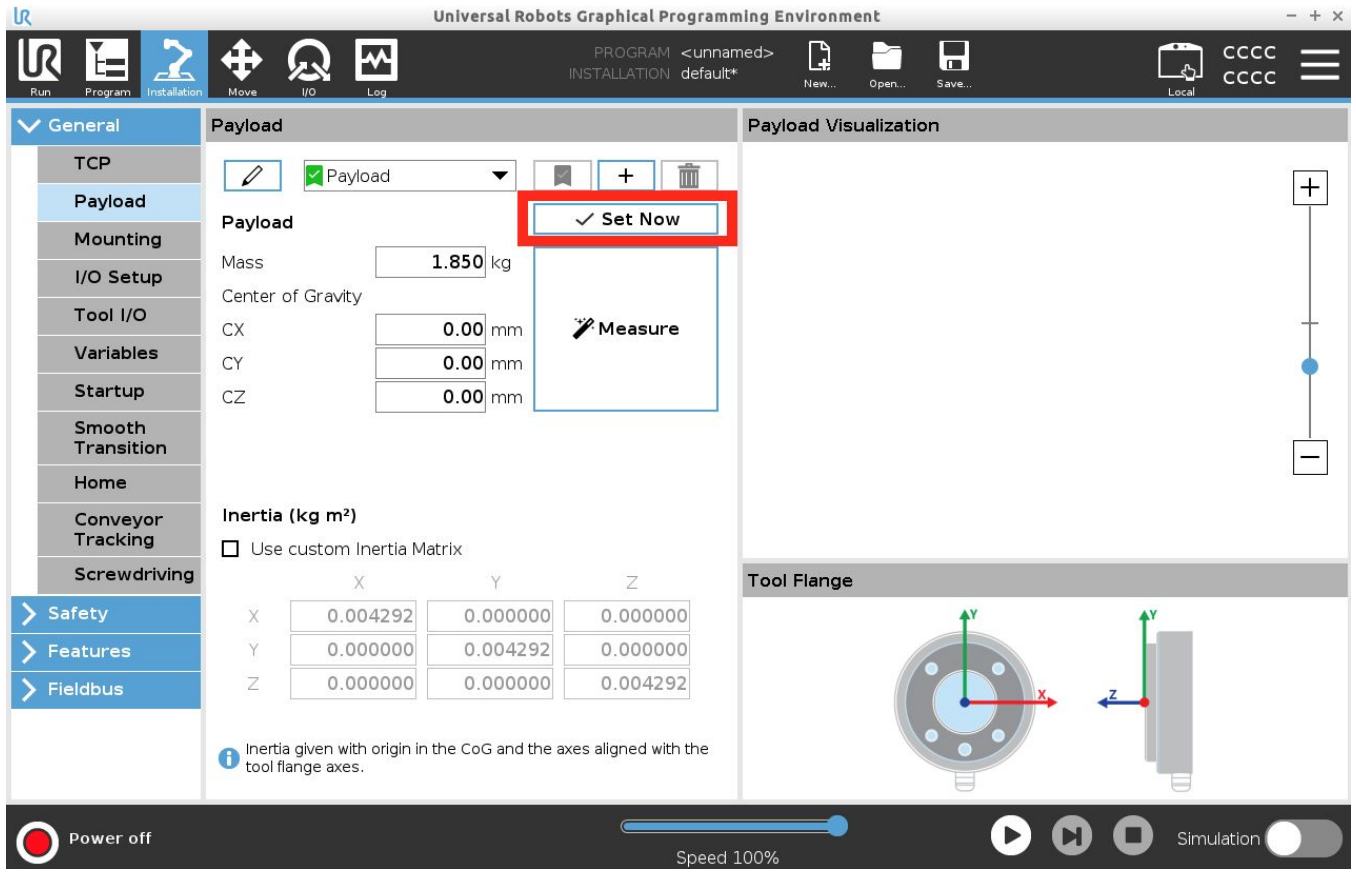
- Safety Settings are responsibility of the customer
- On Teach Pendant, Select:
    - Installation
    - Safety > Robot Limits
    - Factory Presets, 2nd from left (Most Restricted to Least Restricted)



Installation - Set default MultiGrip Gripper payload

- On Teach Pendant, Select:
  - Installation
  - General > Payload
  - Enter 1.85 kg in “Mass” field
  - Select “Set now”

**for Mill applications using the DuoGrip Gripper, set the payload to 2.92 kg*



Network Configuration and Remote Mode

Section 2

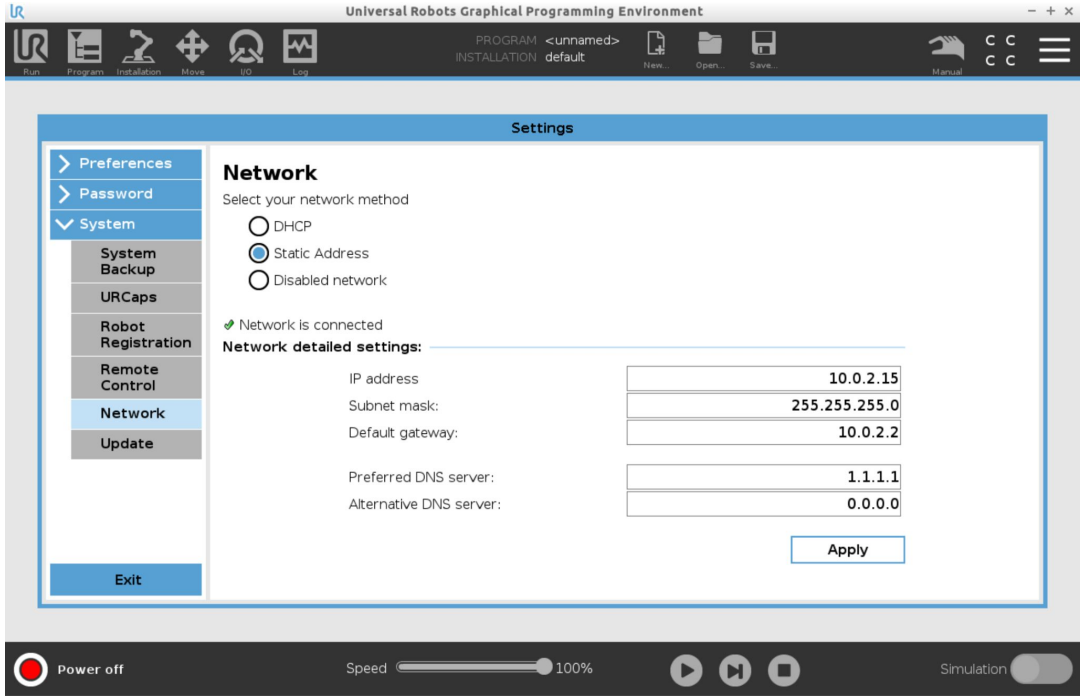
UR10e Network Settings

Navigate to the Settings page by clicking on the “Hamburger” menu (three horizontal bars in the upper right corner of the screen), then selecting System, then Network.

Select **Static Address** for the network method. Enter the following Network detailed settings:

IP Address: 192.168.2.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.2.1
Preferred DNS Server: 8.8.8.8
Alternate DNS Server: 0.0.0.0

Press the **Apply** button to save the changes.

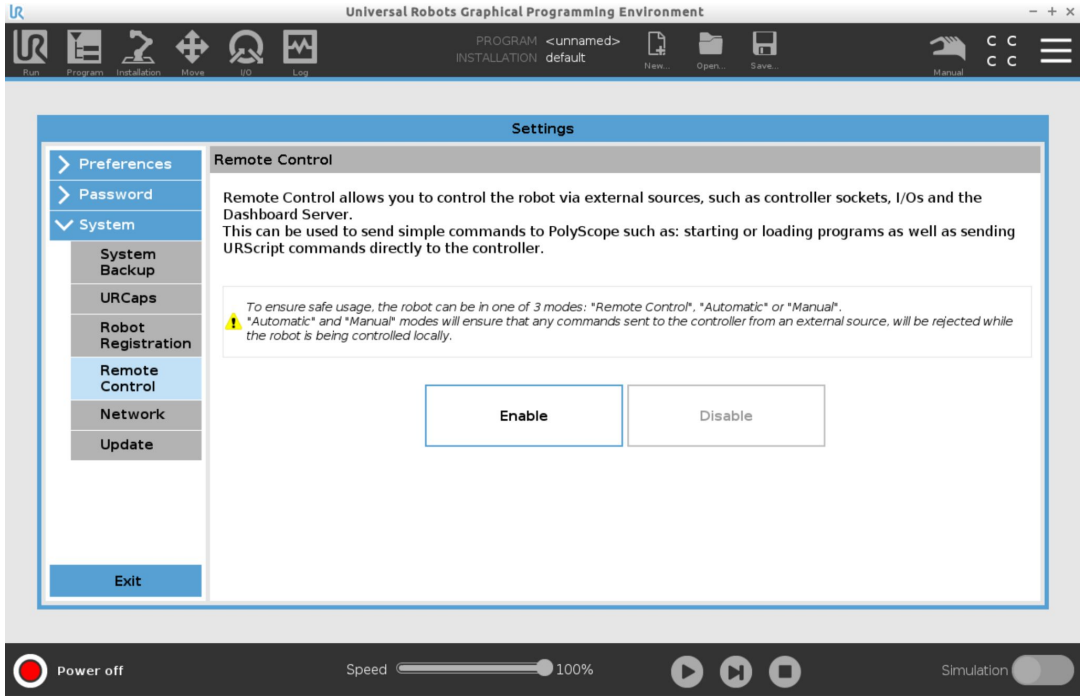


Enable Remote Control

Enable Remote Control Option

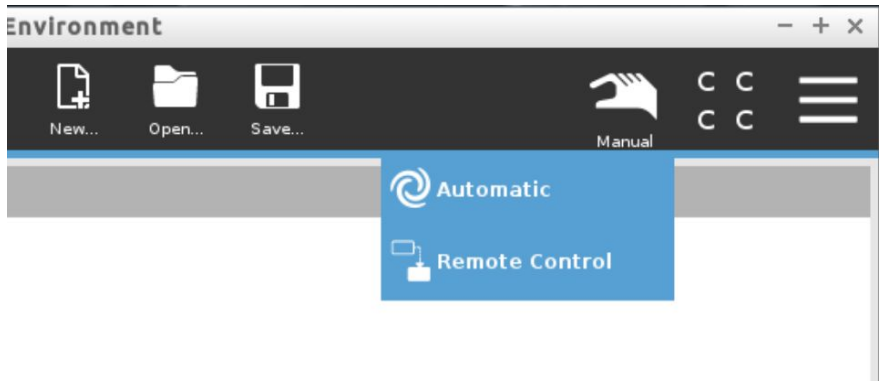
Navigate to the Settings page by clicking on the “Hamburger” menu (three horizontal bars in the upper right corner of the screen), then selecting System, then Remote Control.

Press the **Enable** button to enable ***the option*** to put the UR robot into remote control mode.



Enable Remote Control by the VSC

When the Remote Control option is enabled, an icon will appear next to the safety checksum. Click on the icon and select the **Remote Control** option to allow the VSC to control the robot. To shift control back to the UR robot teach pendant, click on the icon and select Manual or Automatic mode.



MultiGrip Gripper Installation

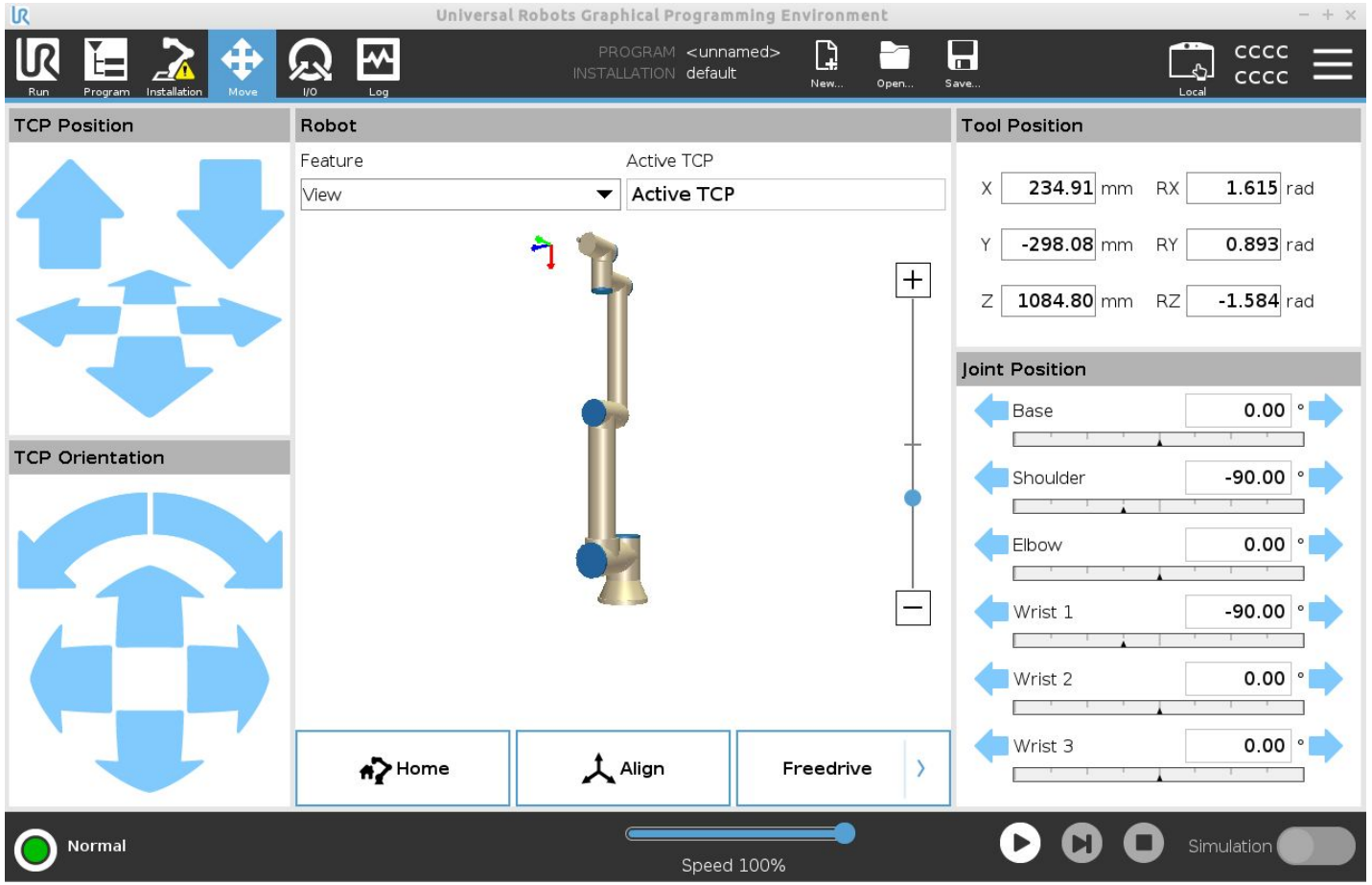
Section 3

Install MultiGrip Gripper

- <u>In order to move the robot remotely it must be moved to the zero position.</u>
  - To do this:
    - Select the Open folder icon at the top center of the UR teach pendant screen.
    - Select Program, a list of programs will appear.
    - Select Put_into_box_E-series_UR10.urp and select Open.
    - From the Run page on the UR teach pendant with Put_into_box_E-series_UR10.urp as the Program hit the Play button on the bottom right corner of the teach pendant.
    - A panel will appear the says Move Robot into Position.
    - Press and hold the Move robot to: 4: Home button until the robot is in the zero position with all axes at zero and the robot standing straight up.
    - Switch from Local to Remote mode on the UR teach pendant. Restart and enable VSC then hit the Home button in the Recovery Panel on Home page of the VSC.
    - Note: **Do not mount gripper until robot is placed in remote mode and moved via VSC Home button in Recovery to the table gripper home position.**

Install MultiGrip Gripper

If the Put_into_box_E-series_UR10.urp does not exist in the UR teach pendant then manually move the robot to these joint positions (0, -90, 0, -90, 0, 0) before moving in remote mode.



Install MultiGrip Gripper

- Tools:
  - 4mm hex key
  - 5mm hex key
  - 2 x Lineman's Pliers
  - Side cutting pliers
  - Medium Strength Threadlocker

- Parts:
  - MultiGrip Gripper assembly
  - 4 x M6x1.0 SHCS x 12mm L
  - 1 x 15-foot length of Red 5/32" tubing
  - 1 x 15-foot length of Blue 5/32" tubing
  - 8 x 16" Long Cable Ties (Zip ties)

Install MultiGrip Gripper

1. **Power up the robot** and position the end of arm in a convenient location for Gripper assembly

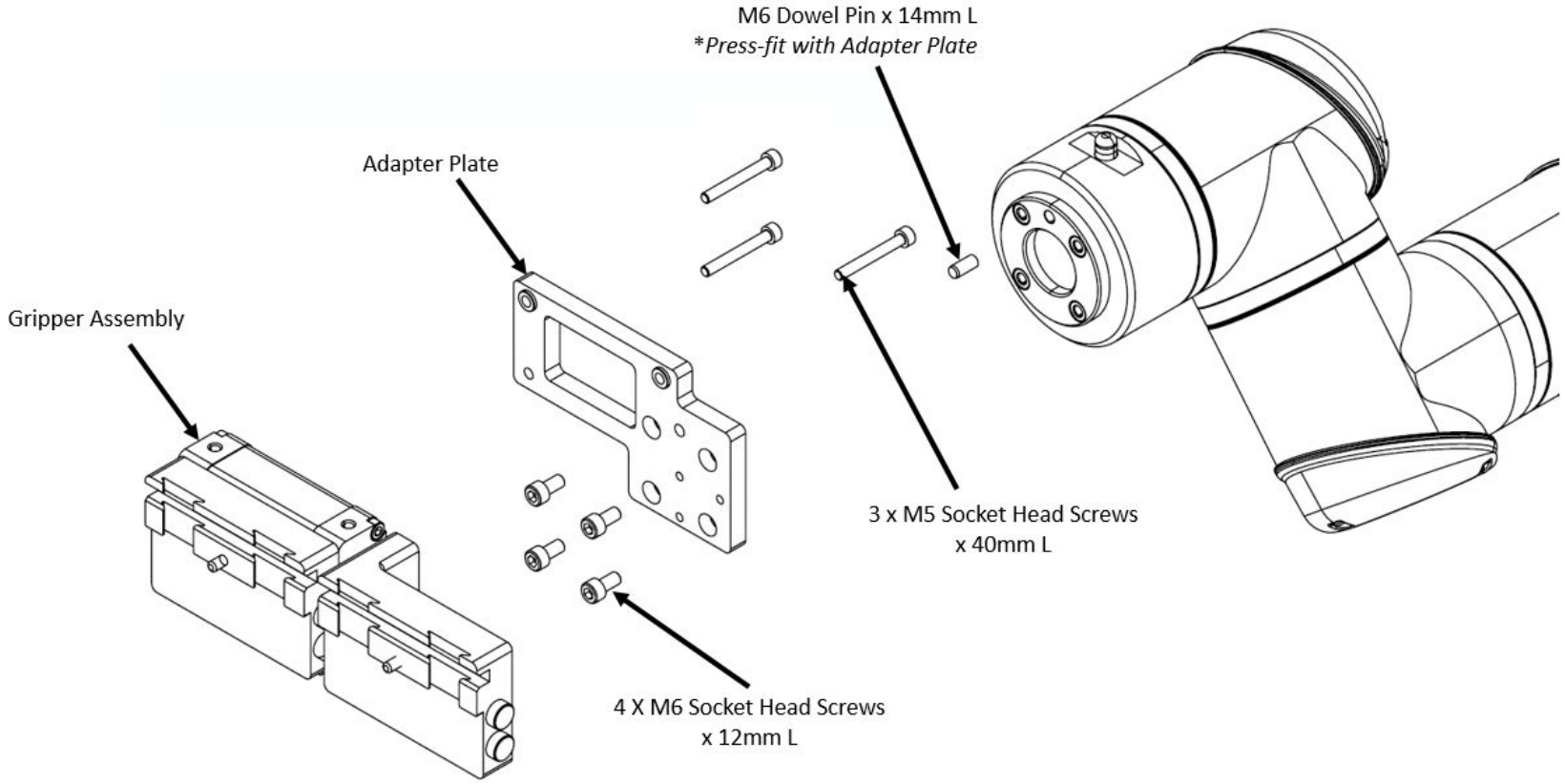
2. Place a small drop of thread locker onto each bolt in the MultiGrip Gripper Fasteners package

3. Attach the Adapter Plate to the robot:

   Align the Adapter Plate with the M6 dowel pin to mating features on the robot end of arm

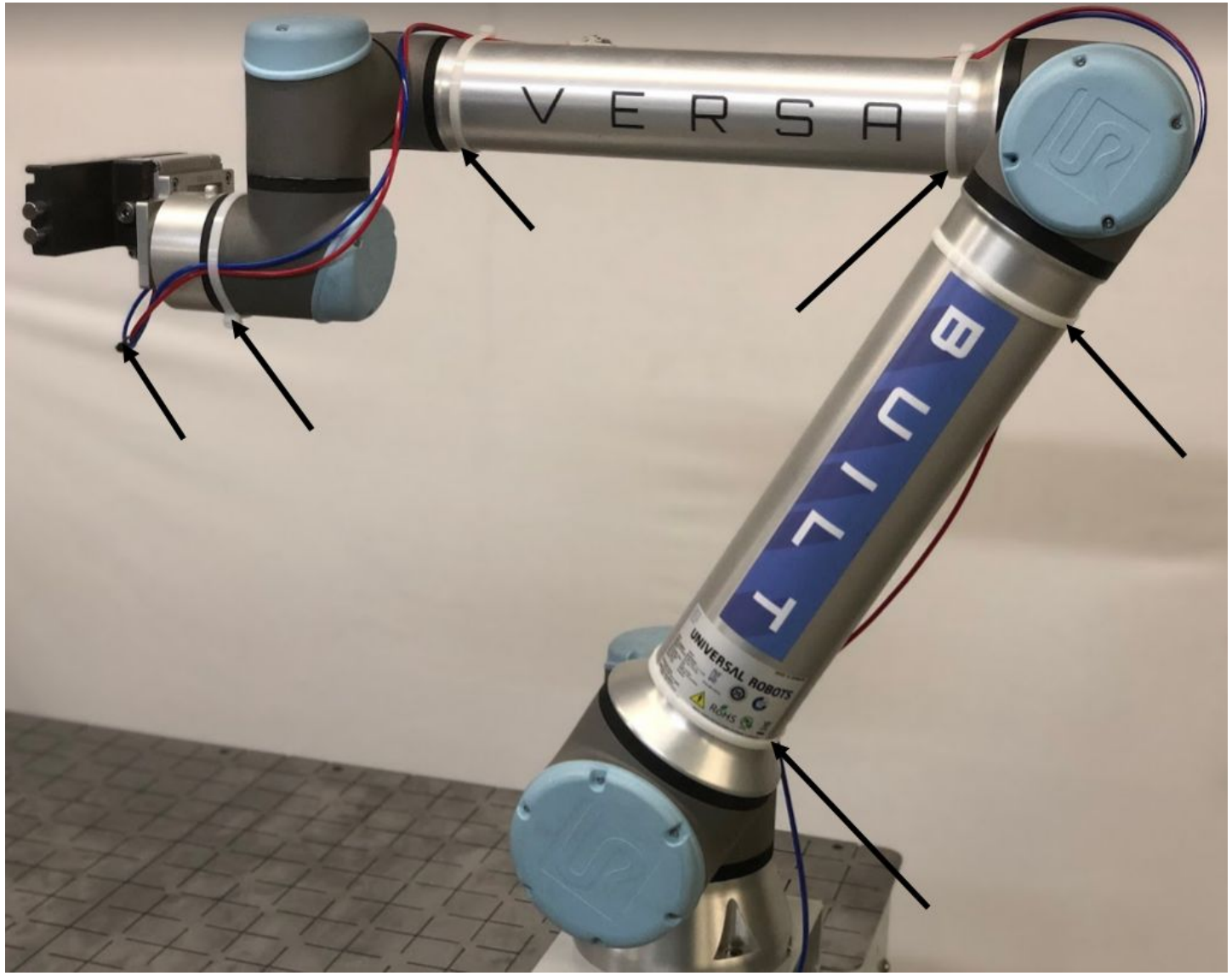
   Secure the Adapter plate with 4 x M6 Socket Head Screws x 12mm L

4. Attach the Gripper Assembly to the Adapter Plate with 3 x M5 Socket Head Screws x 40mm L



Route MultiGrip Gripper Air Lines

- Insert the Gripper Air Lines into the gripper air fittings as shown
  - Blue tubing is Gripper Open
  - Red tubing is Gripper Close
- Using 1 x 18” cable ties, loosely secure the airline on the lower and upper aluminum arms (*arrows in image to the right show cable tie location*)
- Allow for a loop of airline length between the last anchor point on the upper arm and the gripper as shown
- Route air lines behind rear side of robot, then thru hole below pedestal and attach to the Controller Panel, as shown on the following pages



Route MultiGrip Gripper Air Lines

- Using two sets of pliers, tighten each cable tie by pulling on the end of the cable tie with one pair of pliers while pushing on the locking mechanism with the other pliers
- The air lines should be slightly compressed by the cable ties
- Connect air lines from VersaBuilt System Controller (VSC) to gripper air lines with 5/32” union fittings, supplied in 5008790 - Mill Automation Tubing Kit

Entering and Exiting Freedrive Mode

Section 4

UR10e Freedrive Mode

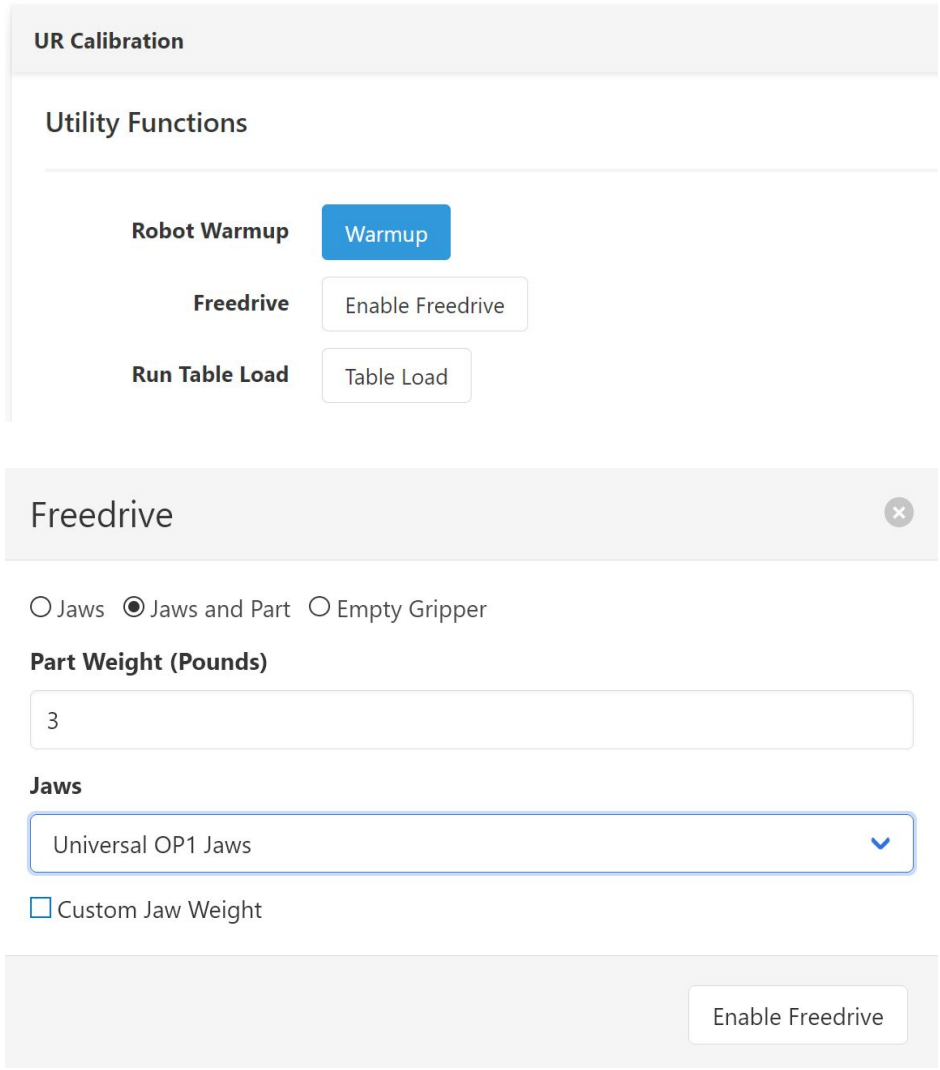
Freedrive Pop-up Menu

Calibration of the VersaCart table and the vises requires the robot to be placed into Freedrive mode. Additionally, Freedrive mode is sometimes useful when recovering from collision errors. The Enable Freedrive button is also available in the Extended Recovery panel.

After pressing the Enable Freedrive button a popup will appear. Select the jaws the robot is holding from the drop-down menu and if the robot is also holding a part, the part weight. If the robot is holding the Calibration Plate, select the Calibration Plate from the drop-down jaw menu.

Exiting Freedrive Mode

When finished with Freedrive mode, press the Stop Program or Continue button on the **UR Teach Pendant** to properly exit Freedrive mode. **Don't dismiss the pop-up message on the VSC.** The pop-up message will disappear after the Stop Program button is pressed on the UR Teach Pendant.



Appendices

Cleaning and Maintenance

Daily Maintenance

Using a clean damp cloth, wipe down robot arm and gripper removing any oil or chips.

Monthly Maintenance:

- Remove UR control cabinet air filter by pulling where the red arrows are shown
- Inspect and replace when air filter becomes visibly dirty

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