7. First Boot

Description

The first boot is the initial sequence of actions you can take with the robot after assembly. This initial sequence requires you to:

- Start the robot
- Insert the serial number
- Intialize the robot arm
- Power down the robot

While the robot arm is powered on you can use Freedrive to move the robot.

⚠️ **CAUTION**

Failure to verify the payload and installation before starting up the robot arm can lead to injury to personnel and/or property damage.

- Always verify the actual payload and installation are correct before starting up the robot arm.

⚠️ **CAUTION**

Incorrect payload and installation settings prevent the robot arm and Control Box functioning correctly.

- Always verify the payload and installation setting are correct.

ℹ️ **NOTICE**

Verify the robot arm has ample space to operate freely.

ℹ️ **NOTICE**

Starting up the robot in lower temperatures can result in lower performance, or stops, due to temperature dependent oil and grease viscosity.

- Starting up the robot in low temperatures can require a warm-up phase.

**To start
the robot**

1. Tap the ON button with the green LED to start the initialization process. Then, the LED turns yellow to indicate the power is on and in **Idle**.

2. Tap the START button to release the breaks.

3. Tap the OFF button with the red LED to power off the robot arm.

- When the PolyScope starts, tap the ON button once to power the robot arm. Then, the status changes to yellow to indicate the robot is on and idle.

- When the robot arm state is **Idle**, tap the START button to start robot arm. At this point, sensor data is checked against the configured mounting of the robot arm.

  If a mismatch is found (with a tolerance of 30°), the button is disabled and an error message is displayed below it.

- If the mounting is verified, tap Start to release all joint brakes and the robot arm is ready for normal operation.

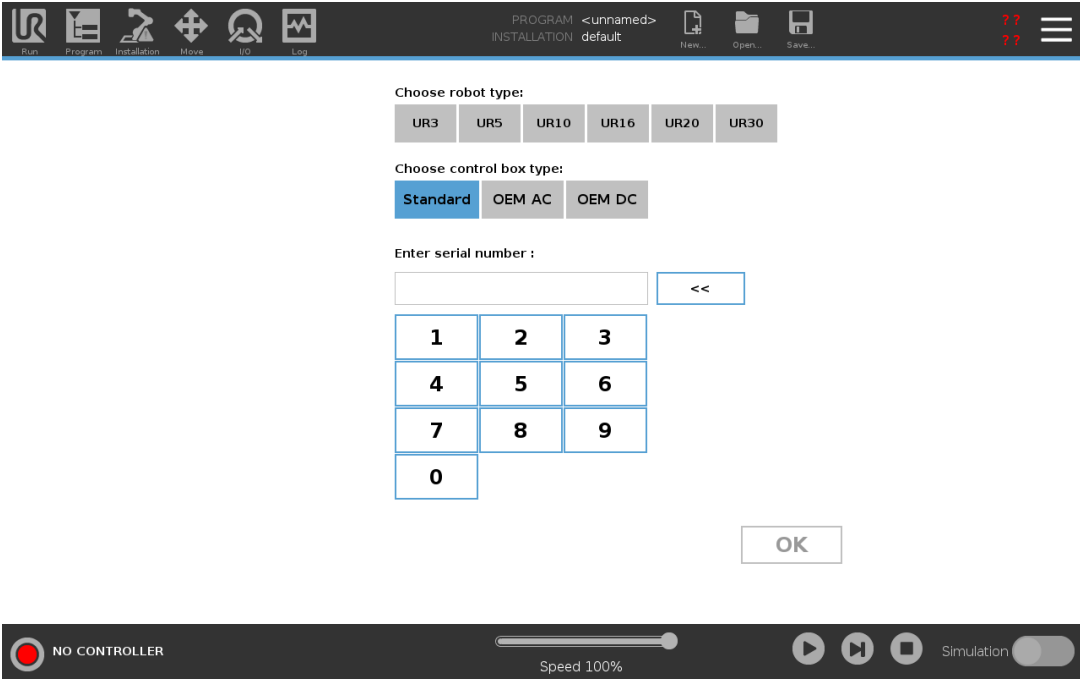Robot arm start up is accompanied by sound and slight movements as joint brakes are released.

**Insert serial
number
during first
boot**

When you install your robot for the first time, you need to configure serial number on the control box to match the robot arm.
This procedure is also required when you re-install the software on the control box, such as when receiving a software update.

When you boot the robot for the first time, please follow these steps:

1. Select the correct robot arm size.

2. Select the correct control box.

3. Add the serial number as it is written on the robot arm.

4. End with the OK button.

Turning the control box on/off

The Control Box mainly contains the physical electrical Input/Output that connects the robot arm, the Teach Pendant and any peripherals. You must turn on the Control Box to be able to power on the robot arm.

1. On your Teach Pendant, press the power button to turn on the control box.

2. Wait as text from the underlying operating system, followed by buttons, appear on the screen.

3. A Getting Started screen can appear, prompting you to begin programming the robot.
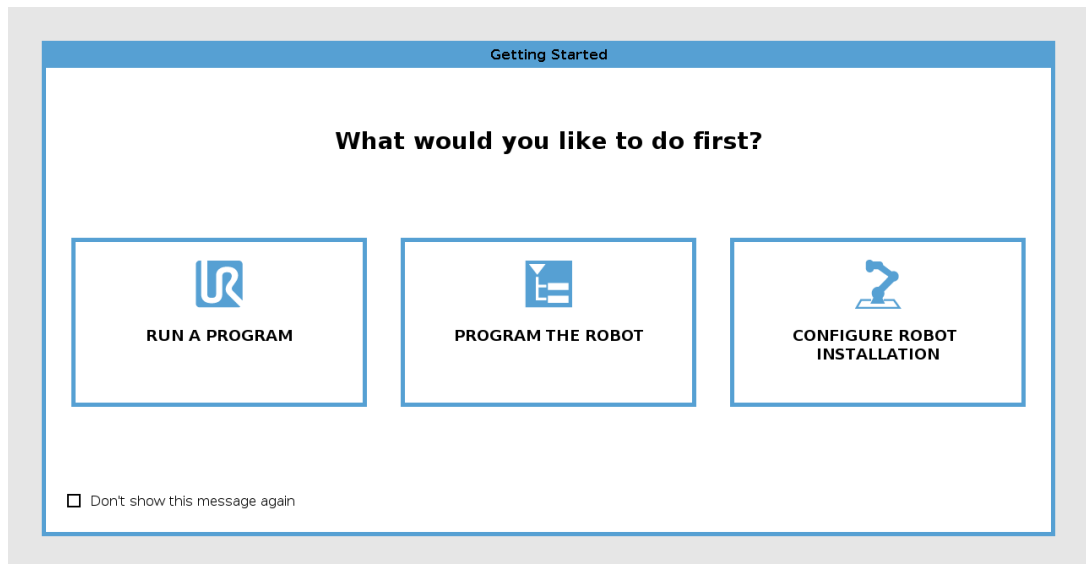
To power down the robot arm

⚠️ **WARNING**

Unexpected start-up and/or movement can lead to injury

• Power down the robot arm to prevent unexpected start-up during mounting and dismounting.

1. Press the power button on the Teach Pendant to turn off the robot.

2. Unplug the mains cable / power cord from the wall socket.

3. Allow 30 seconds for the robot to discharge any stored energy.

7.1. Freedrive

Description

Freedrive allows the robot arm to be manually pulled into desired positions and/or poses.

The joints move with little resistance because the brakes are released. While the robot arm is being moved manually, it is in Freedrive.
As the robot arm in Freedrive approaches a predefined limit or plane (see Software Safety Restrictions), resistance increases.
This makes pulling the robot into position feel heavy.

> ⚠️ **WARNING**
>
> Injury to personnel can occur due to unexpected motion.
>
> - Verify the configured payload is the payload being used.
> - Verify the correct payload is securely attached to the tool flange.

Enabling Freedrive

You can enable Freedrive in the following ways:

- Use the 3PE Teach Pendant.
- Use the Freedrive on robot.
- Use I/O Actions.

> ℹ️ **NOTICE**
>
> Enabling Freedrive while you are moving the robot arm, can cause it to drift leading to faults.
>
> - Do not enable Freedrive while you are pushing or touching the robot.

3PE Teach Pendant

To use the 3PE TP button to freedrive the robot arm:

1. Rapidly light-press, release, light-press again and keep holding the 3PE button in this position.

Now you can pull the robot arm into a desired position, while the light-press is maintained.

Freedrive on robot

To use Freedrive on robot to freedrive the robot arm:

1. Press-and-hold the button of switch configured for **Freedrive on robot**.

2. When the Freedrive panel appears in PolyScope, select the desired movement type for the robot arm's joints. Or use the list of axes to customize the movement type.

3. You can define the type of feature if required, by selecting an option from the Feature dropdown list.

   The robot arm can stop moving if it approaches a singularity scenario. Tap **All axes are free** in the Freedrive panel to resume movement.

4. Move the robot arm as desired.

Backdrive

During initialization of the robot arm, minor vibrations may be observed when the robot brakes are released. In some situations, such as when the robot is close to collision, these vibrations are undesirable. Use Backdrive to force specific joints to a desired position without releasing all brakes in the robot arm.

7.1.1. Freedrive Panel

**Description** When the robot arm is in Freedrive, a panel appears on PolyScope, as illustrated below.
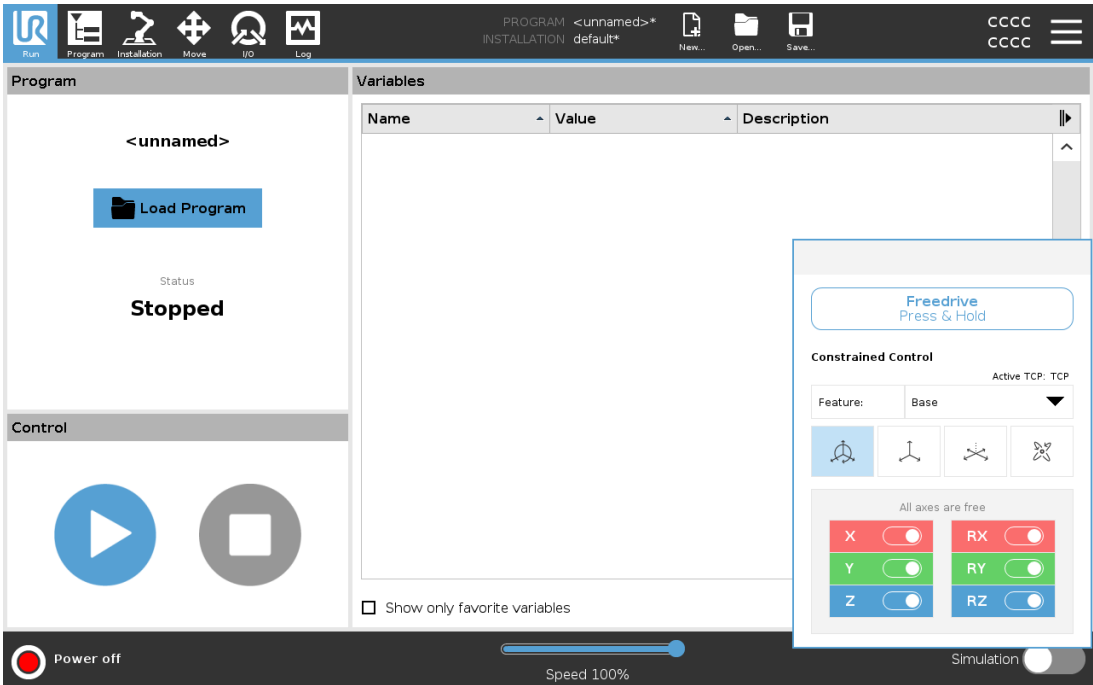

LED Freedrive panel

The LED on the status bar of the Freedrive panel indicates:

- When one or more joints are approaching their joint limits.

- When the robot arm's positioning is approaching singularity. Resistance increases as the robot approaches singularity, making it feel heavy to position.
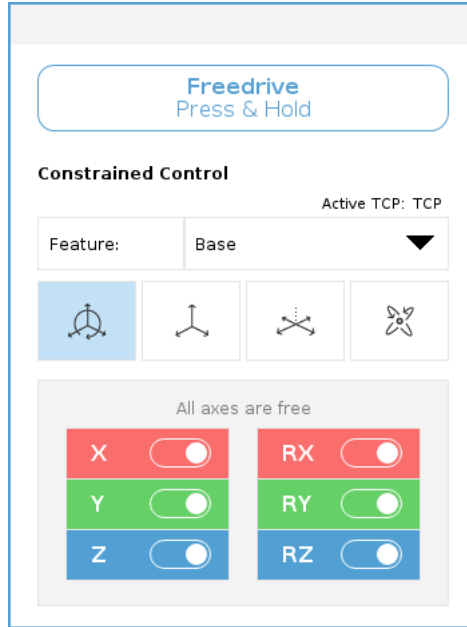
Icons

You can lock one or more of the axes allowing the TCP to move in a particular direction, as defined in the table below.

 All axes are free	Movement is allowed through all axes.
 Plane	Movement is only allowed through the X-axis and Y-axis.
 Translation	Movement is allowed through all axes, without rotation.
 Rotation	Movement is allowed through all axes, in a spherical motion, around the TCP.

> ⚠️ **CAUTION**
> Moving the robot arm in some axes when a tool is attached, can present a pinch point.
> - Use caution when moving the robot arm in any axis.