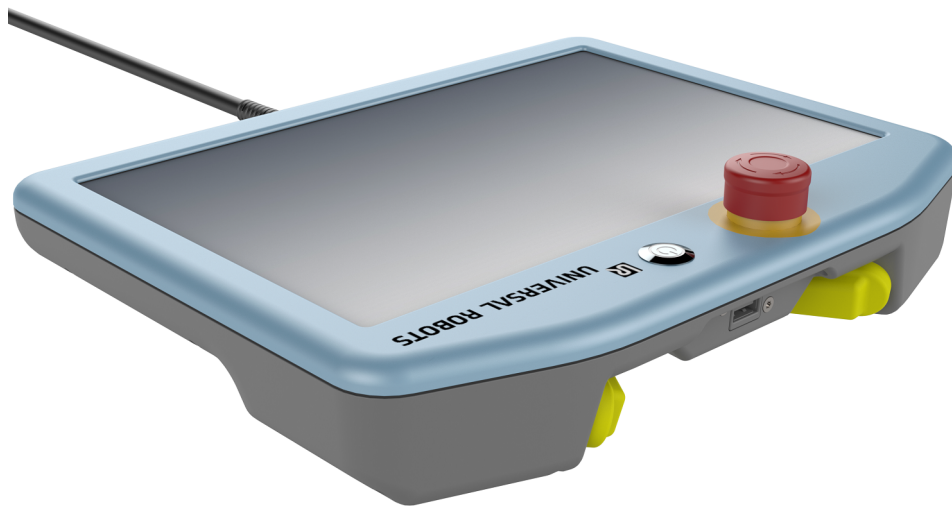**UNIVERSAL ROBOTS**

Teach Pendant with 3-Position Enabling Device

Installation Guide

Original instructions (en)

Contents

1. Introduction

1.1. About this document

This guide describes how to install a Universal Robots Teach Pendant with 3-Position Enabling (3PE) Device on a Universal Robots e-Series robot and how to configure the software.

The product is also referred to as the 3PE Teach Pendant (3PE TP).

1.2. What's in the box

The box contains the following parts:

- 3PE Teach Pendant
- This guide

1.3. Company Details

Universal Robots A/S

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2. Copyright and disclaimers

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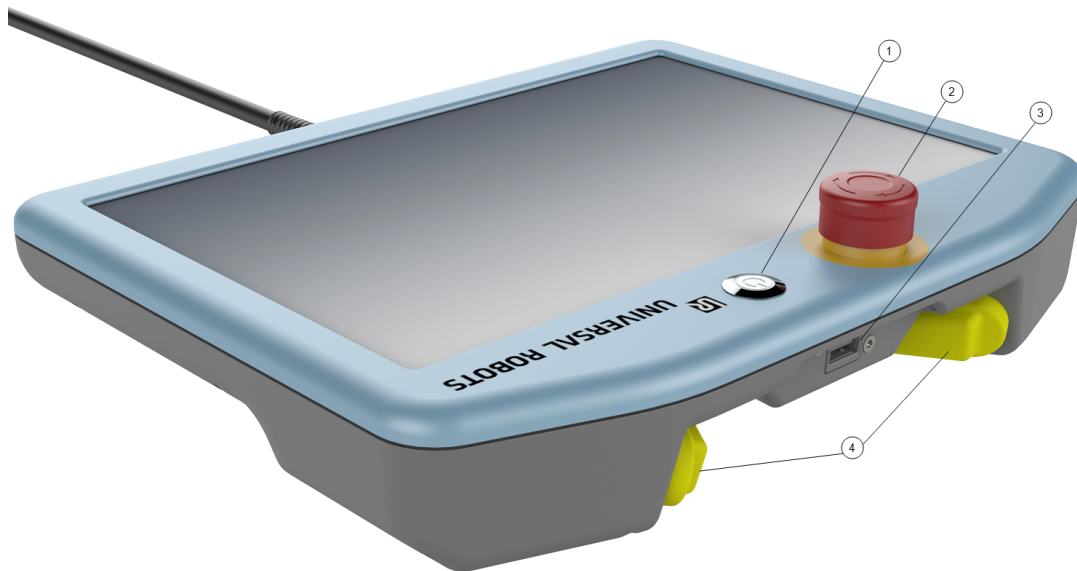
NOTICE
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3. Product description

The Teach Pendant with 3-Position Enabling Device is a Universal Robots Teach Pendant with built-in 3-Position Enabling Device functionality.

The enabling buttons are on the underside of the Teach Pendant, as illustrated below. You can use wither button, according to your preference. If the 3PE TP is disconnected, an external 3PE device must be connected and confirmed in the Installation.

1	Power button	2	Emergency Stop button
3	USB port (comes with a dust cover)	4	3PE buttons

A Freedrive robot symbol is located under each 3PE button, as illustrated below.

> **ℹ NOTICE**
>
> Failure to install the Teach Pendant with 3-Position Enabling Device properly can result in damage to equipment or property.
>
> - The 3PE Teach Pendant must be installed properly in order to meet regulatory requirements.

3.1. Use of Product

The Teach Pendant with 3-Position Enabling Device is only certified for use with Universal Robots e-Series control boxes.

3.2. Components

The Teach Pendant with 3-Position Enabling Device consists of the following components:

- 3PE Teach Pendant with attached Teach Pendant cable

3.3. Requirements

The robot system software, using the 3PE Teach Pendant must be newer than V5.8.0

> **ℹ NOTICE**
>
> Installing an Teach Pendant with 3-Position Enabling Device in a robot system using software version older than V5.8.0 can result in damage to equipment or property.
>
> - Verify your software system number before installing the Teach Pendant with 3-Position Enabling Device.

UNIVERSAL ROBOTS

To:	Universal Robots Customers of the UR Teach Pendant with 3PE (3-position enabling device)
From:	Universal Robots Global Technical Compliance
Date:	20 January 2021
Subject:	SAFETY NOTICE Universal Robots e-Series robots with software version 5.9.3 and 5.9.4

Unexpected motion can occur when a robot application is installed with the following combinations:

- Universal Robots e-Series robot
- UR software versions: 5.9.3 or 5.9.4
- UR Teach Pendant with 3-Position Enabling Device (3PE TP)
- External mode selector switch is connected to the UR Control Box

The risk due to unexpected motion requires all of the following circumstances:

- Automatic mode is selected on the external mode selector switch.
- No protective device is connected to the Safeguard Stop Input of the UR Control Box. (For example: when using a perimeter interlocked guard, light curtain, or safety scanner ect.).
- The operator uses the Teach Pendant to switch to manual mode for teaching or programming.
- The robot is not moving, but it is capable of moving according to its program/programming.
- The operator moves within reach of the robot/end-effector/workpiece, while holding the Teach Pendant.

The probability of unexpected motion happening is extremely low, because all of the above combinations and circumstance are required. As such, note the following:

- All safety functions are active and functioning properly. This includes the 3PE which is not active when the robot control is in automatic mode.
- The operator is typically more attentive to robot activity due to planned teaching or programming tasks.
- Operator attention is more likely to be directed to the robot application; it is unlikely that the incorrect Teach Pendant mode indication will be noticed.

To eliminate the risks associated with this issue, update to software version 5.10 or higher. The robot application can remain operational before updating the software ONLY if the external mode selector switch is disconnected from the UR Control Box. With 5.9.3 and 5.9.4 after removing the external mode selector, train personnel to select the mode using the UR Teach Pendant with 3PE.

Software version 5.10 or higher eliminates this issue and Teach Pendant with 3PE owners are urged to update.

As always, proper inspection and maintenance is required as stated in the UR Service Manual.

How to recognize the Teach Pendant with 3-Position Enabling Device (3PE TP)

Only the UR e-Series robots with software 5.9.3 or 5.9.4 and a 3PE TP are affected if an external mode selector is used.

The 3PE TP only functions with UR e-Series robots.

Helpful links:

- 3PE TP support article
- SW 5.10 release notes
- How to update software: Service Manual, Chapter 5
- 3PE TP Installation Guide

If you have any questions about this Safety Notice, you can email questions to: **SafetyNotice@Universal-Robots.com** It will be directed to the appropriate department.

You can directly contact your regional Universal Robots representative at: https://www.universal-robots.com/about-universal-robots/contact-info.

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4. Cleaning Your Robot

4.1. Everyday Cleaning

You can wipe away any dust/dirt/oil observed on the robot arm and/or Teach Pendant using a cloth and one of the following cleaning agents: Water, 70% Isopropyl alcohol, 10% Ethanol alcohol or 10% Naphtha. In rare cases, very small amounts of grease can be visible from the joint. This does not affect the function, use, or lifetime of the joint.

4.1.1. Additional Cleaning

Due to the added focus on cleaning your robot, Universal Robots recommends cleaning with 70% isopropyl alcohol (rubbing alcohol).

1. Wipe the robot with a hard twisted micro fiber cloth and 70% isopropyl alcohol (rubbing alcohol).

2. Let the 70% isopropyl alcohol dwell on the robot for 5 minutes, and then clean the robot using standard cleaning procedure.

DO NOT USE BLEACH. Do not use bleach in any diluted cleaning solution.

5. Safety

5.1. Safety Message Types

5.2. General safety precautions

Read the general safety precautions before installing the 3PE TP.

For more information on safety, refer to the Safety chapter in the robot User Manual.

> ⚠️ **WARNING**
>
> Incorrect connection of the power source or ground wires can result in equipment damage or personnel injury.
> Damage caused by invalid power source connection is not covered by warranty. Before starting the operation:
>
> - Ensure that the power source wiring is correct.
> - Ensure that the grounding is correct.

> ℹ️ **NOTICE**
>
> This product is designed for use as part of the Universal Robots e-Series robot. General safety considerations that are valid for the Universal Robots e-Series robot are also valid for this product.
>
> - For more information on safety, refer to the Safety section in the Universal Robots e-Series robot User Manual.

6. Hardware Installation

Description   UR20 and UR30 robots have a built-it 3 Position Enabling functionality.
e-Series robots do not have built-in 3 Position Enabling functionality. You can use the
following instructions to replace a Teach Pendant and install a 3 Position Enabling Teach
Pendant (3PE TP).

Required items   You need the following items to install the 3PE Teach Pendant:
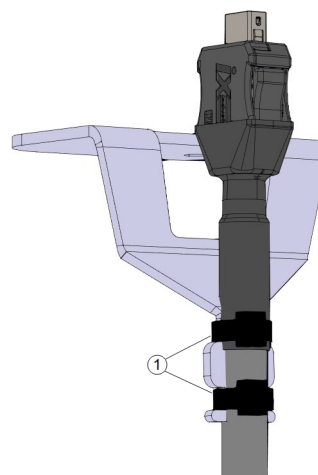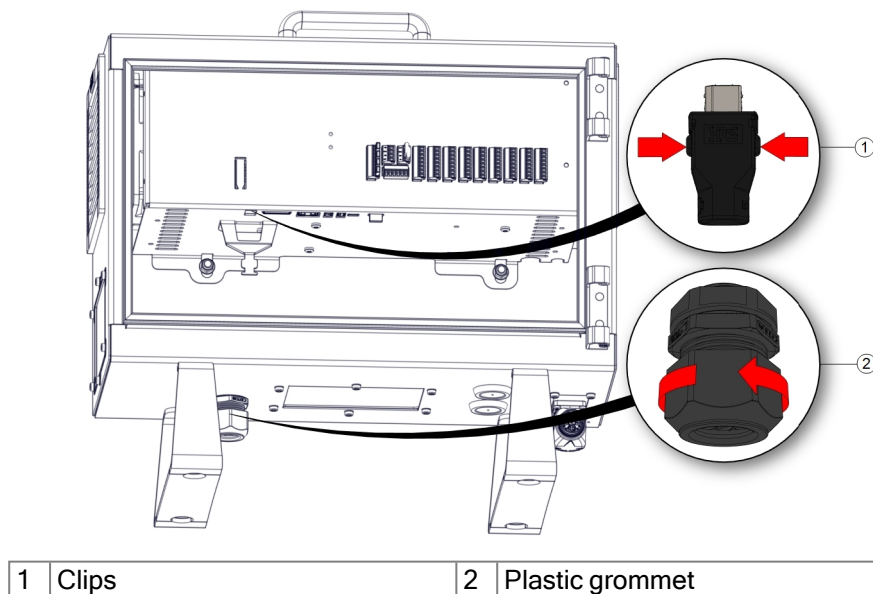
- 3PE Teach Pendant

**To remove a
Teach Pendant**

> **ℹ NOTICE**
>
> Replacing the Teach Pendant can result in the system reporting a fault on start-up.
>
> - Always select the correct configuration for the type of Teach Pendant.

To remove the standard Teach Pendant:

1. Power down the control box and disconnect the main power cable from the power source.
2. Remove and discard the two cable ties used for mounting the Teach Pendant cables.
3. Press in the clips on both sides of the Teach Pendant plug as illustrated, and pull down to disconnect from the Teach Pendant port.
4. Fully open/loosen the plastic grommet at the bottom of the control box and remove the Teach Pendant plug and cable.
5. Gently remove the Teach Pendant cable and Teach Pendant.

| 1	Clips	2	Plastic grommet

1	Cable ties

**To install a 3PE
Teach Pendant**

1. Place the Teach Pendant plug and cable in through the bottom of the control box and fully close/tighten the plastic grommet.

2. Push the Teach Pendant plug into the Teach Pendant port to connect.

3. Use two new cable ties to mount the Teach Pendant cables.

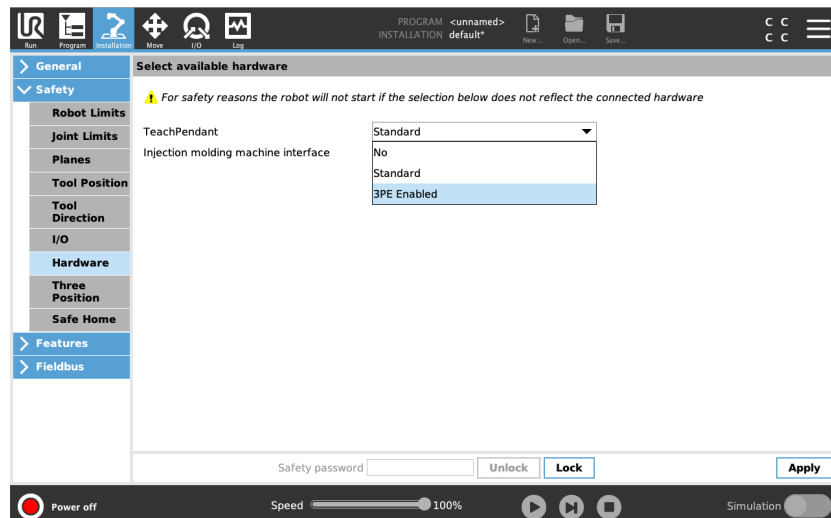4. Connect the main power cable to the power source and power on the control box.

7. Software Installation

To configure the 3PE TP software

1. On PolyScope, in the Header, tap Installation and select **Safety**.
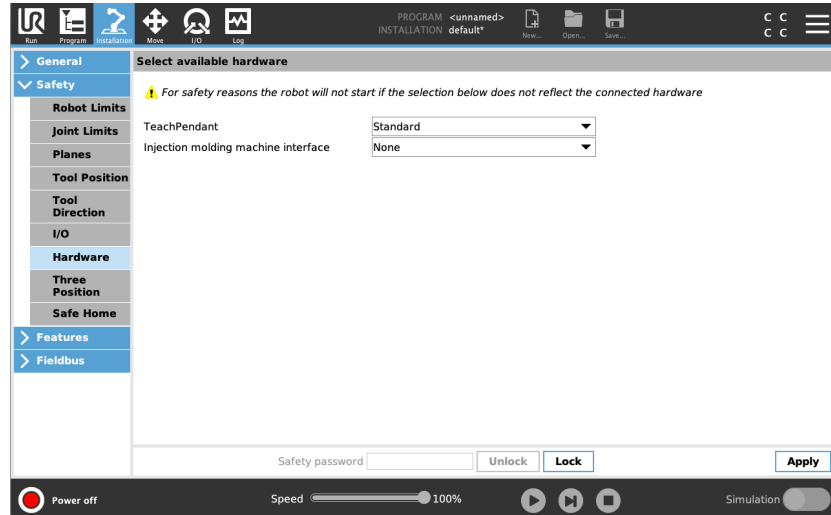
2. Tap Hardware and unlock the options on the **Select available hardware** screen. A password is required to unlock this screen.

3. In the **Teach Pendant** drop-down list, select **3PE Enabled**.

4. Tap **Apply** to restart the system. PolyScope continues to run.

5. Tap **Confirm Safety Configuration** to complete the 3PE Teach Pendant software installation.

6. As the robot restarts and initializes, light-press the 3PE button and tap **Start** on PolyScope.

8. 3PE Teach Pendant button functions

This section describes the functions of the 3-Position Enabling Device buttons on the 3PE Teach Pendant.

8.1. Using the 3PE buttons

> **(i) NOTICE**
>
> The 3PE buttons are only active in Manual mode. In Automatic mode, robot movement does not require 3PE button action.

The following table contains the available functions of the 3PE buttons.

Position	Description		Action
1	Release	There is no pressure on the 3PE button. It is not pressed.	Robot movement is stopped in Manual mode. Power is not removed from the robot arm and the brakes remain released.
2	Light-press (Grip lightly)	There is some pressure on the 3PE button. It is pressed to a middle point.	Allows your program to play when the robot is in Manual mode.
3	Tight-press (Grip tightly)	There is full pressure on the 3PE button. It is pressed all the way down.	Robot movement is stopped in Manual mode. Robot is in 3PE Stop.

To play a program:

1. On PolyScope, ensure the robot is set to **Manual mode**, or switch to **Manual mode**.
2. Maintain a light-press on the 3PE button.
3. On PolyScope, tap **Play** to run the program.

   The program runs if the robot arm is in the first position of the program.

   If the robot is not in the first position of the program, the **Move Robot into Position screen** appears.

To stop a program:

1. Release the 3PE button or, on PolyScope, tap **Stop**.

To pause a program:

1. Release the 3PE button, or, on PolyScope, tap **Pause**.

   To continue the program execution, keep the 3PE button light pressed and tap **Resume** on PolyScope.

8.2. Using Freedrive

Freedrive allows the robot arm to be manually pulled into desired positions and/or poses. For more information, refer to the Freedrive section in the robot User Manual.

Description	Freedrive allows the robot arm to be manually pulled into desired positions and/or poses.
To use the 3PE 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.

8.3. Using Move Robot into Position

Move Robot into Position allows the robot arm to move to that start position, after you complete a program. The robot arm must be in the start position before you can run the program.

For more information, refer to the Move Robot into Position section in the robot User Manual.

To use the 3PE button to move the robot arm into position:

1. When your program is complete, press **Play**
2. Select **Play from beginning**.

    On PolyScope, the **Move Robot into Position** screen appears displaying robot arm movement.

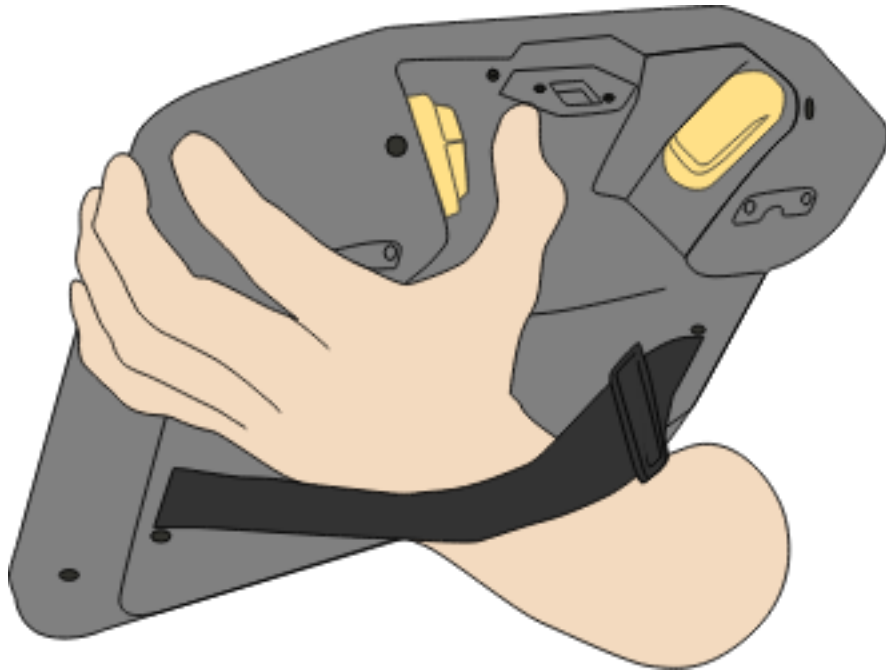3. Light-press and hold the 3PE button.
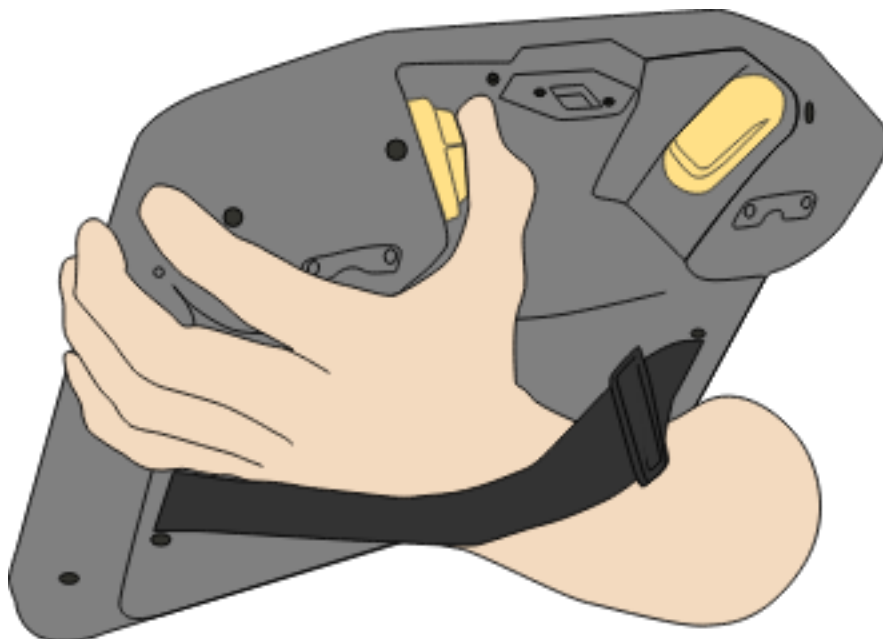
4. Now, on PolyScope, press and hold Automove, for the robot arm to move to the start position.

The Play Program screen appears.

5. Maintain a light-press on the 3PE button to run your program.

6. Release the 3PE button to stop your program.

9. Compliance

The recommendations, certificates and declarations, below, are valid for Universal Robots Teach Pendant with integrated 3-position enabling (3PE) device.

9.1. Shipping Materials

As stated by our suppliers, Universal Robots e-Series robots shipping materials comply with the ISPM-15 requirements for producing wood packaging material and are marked accordingly.

9.2. Certification of Quality

Universal Robots is certified compliant with the standard ISO 9001:2015 by Bureau Veritas.

Universal Robots e-Series robots undergo continuous internal testing and end-of-line test procedures. UR testing processes undergo continuous review and improvement.

9.3. Third Party Certification

Universal Robots Teach Pendant with 3-Position Enabling (3PE) Device is certified compliant with the standard EN ISO 10218-1.

Software Name: PolyScope 5
Software Version: 5.22
Document Version: 10.12.15