



UNIVERSAL ROBOTS

Software Guide

Robot Image

The information contained herein is the property of Universal Robots A/S and shall not be reproduced in whole or in part without prior written approval of Universal Robots A/S. The information herein is subject to change without notice and should not be construed as a commitment by Universal Robots A/S. This document is periodically reviewed and revised.

Universal Robots A/S assumes no responsibility for any errors or omissions in this document.

Copyright © 2009-2026 by Universal Robots A/S.

The Universal Robots logo is a registered trademark of Universal Robots A/S.



Contents

1. Purpose	4
2. About This Document	5
3. Company Details	6
4. Copyright and Disclaimers	7
5. General Information	8
6. Files to Download	10
6.1. Create a Bootable Storage Device	10
6.2. Robot Image	11
7. Installing Robot Image	13
7.1. Back Up Before Proceeding	13
7.2. Recovery of Data	14
7.3. Image Installation and Re-imaging into USB Drive	15
7.4. Restoration of Recovered Image Files	21
8. Flashcard Replacement	22
9. USB Update Procedure	23
10. PolyScope X Software Update	24
11. PolyScope 5 Software Update	25

1. Purpose

Description

This guide informs and instructs you how to install a new robot image on storage devices for CB2, CB3, CB5 with e-Series and UR Series robots, and CB7 with g-series robots.

2. About This Document

Purpose

The purpose of this service manual is to help Universal Robots (UR) users and integrators to safely perform service-related operations and troubleshooting.

Universal Robots industrial robots are designed using high-quality components to ensure long product life cycle. However, improper use of a robot or robot parts will cause failures. If, for example, the robot is overloaded, dropped during relocation, damaged by collision or any other improper use, the warranty will be void.

Universal Robots recommends the user *not* to repair, adjust, or make other interventions in the mechanical or electrical systems of the robot without first consulting a UR-certified service engineer. Any unauthorized repair and/or troubleshooting work(s) voids the warranty. Service-related operations and troubleshooting should only be performed by qualified personnel.

Before performing service-related operations, stop the robot program and disconnect the main power to any potential dangerous tool on the robot or its surroundings.

In the event of a defect, Universal Robots recommends ordering new parts from the Universal Robot distributor where the robot was originally purchased. Alternately, parts can be ordered from the nearest distributor, details of which can be obtained from Universal Robots official website at www.universal-robots.com.

3. Company Details

Find us

Universal Robots A/S
Energivej 25
DK-5260 Odense Denmark
Tel.: +45 89 93 89 89
Fax: +45 38 79 89 89



4. Copyright and Disclaimers

The information contained herein is the property of Universal Robots A/S and shall not be reproduced in whole or in part without prior written approval of Universal Robots A/S. The information herein is subject to change without notice and should not be construed as a commitment by Universal Robots A/S. This document is periodically reviewed and revised.

Universal Robots A/S assumes no responsibility for any errors or omissions in this document.

Copyright © 2009-2026 by Universal Robots A/S.

The Universal Robots logo is a registered trademark of Universal Robots A/S.



NOTICE

Universal Robots continues to improve reliability and performance of its products, and therefore reserves the right to upgrade the product without prior warning.

Universal Robots takes care that the content of this document is precise and correct, but takes no responsibility for any errors or missing information.



NOTICE

Universal Robots disclaims any liability, even if all guidelines in this document are followed.

5. General Information

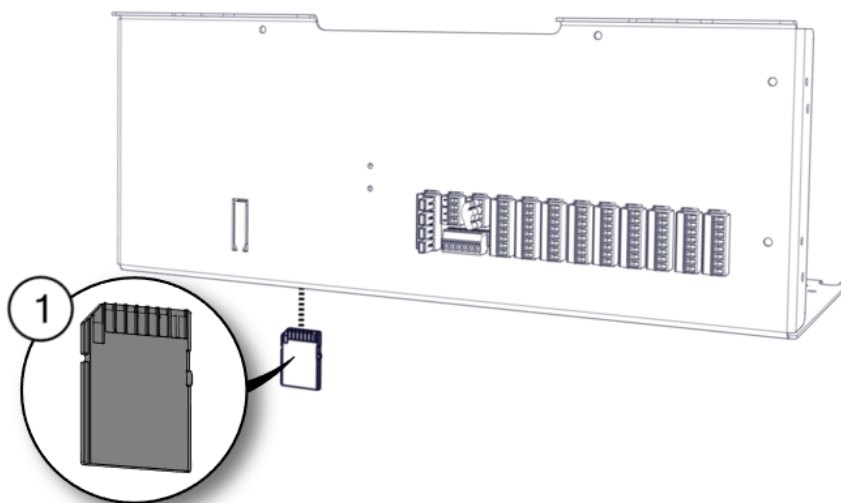
Description The Robot Image Installation Guide is intended for users and system integrators working with Universal Robots. It provides instructions for managing the robot's internal storage, including how to recover existing storage content, overwrite data when necessary, and create new storage media.

When to use The flashcard, USB drive, or SD card inside the Control Box serves as the permanent storage for robot data. If you must replace the flashcard or USB drive in a CB3 robot, or the SD card in e-Series and UR Series robots, this guide provides step-by-step instructions for the replacement.



NOTICE

Never attempt to replace the flashcard without prior guidance from UR Technical Support.



When not to use The procedures in this guide are not required for a regular software update. Regular updates do not involve removing the robot's internal storage or directly manipulating its data. For software update procedures, see the Robot Service Handbook:
For PolyScope 5: https://www.universal-robots.com/manuals/EN/HTML/SW5_24/Content/prod-serv-man/E-series/serv-man-update-software.htm
For PolyScope X: https://www.universal-robots.com/manuals/EN/HTML/SW10_11/Content/prod-usr-man/software/PolyScopeX/polyx-settings/polyx-update.htm



Universal Robots recommends users not to attempt to repair, adjust, or make other interventions in the mechanical or electrical systems of the robot without first consulting a UR-certified service engineer. Any unauthorized intervention voids the warranty. Service-related operations and troubleshooting should only be performed by qualified personnel.

Before performing service-related operations, stop the robot program and disconnect the main power to any potentially dangerous tool on the robot or in the surroundings.

In the event of a defect, Universal Robots recommends ordering new parts from the Universal Robot distributor where the robot was originally purchased. Alternatively, parts can be ordered from the nearest distributor, details of which can be obtained from Universal Robots official website at www.universal-robots.com

Universal Robots A/S Energivej 25
DK-5260 Odense Denmark Tel.: +45 89 93 89 89
Fax: +45 38 79 89 89

6. Files to Download

Description

This section provides three links to download and install:

1. A free and open-source tool to create bootable USB drives.
2. Universal Robots robot image based on the robot arm size.
3. A software for managing Linux file system. See [Recovery of Data](#).

6.1. Create a Bootable Storage Device

Description

The creation of a bootable storage device system enables users to boot a control box with a new robot image in either Polyscope version. This is a practical and useful user action for recovery in case of emergency situation when a robot's internal storage gets damaged.

Download and install balenaEtcher

Here we use an open-source flashing tool called balenaEtcher to create our storage device with PolyScope installed. Other programs can be used as well, such as Rufus.

Follow the instructions found in balenaEtcher's own website to install the program. Click <https://etcher.balena.io/>.



NOTICE

BalenaEtcher is a third-party software and not associated with Universal Robots A/S. Universal Robot takes no responsibility for this software.

When you successfully install balenaEtcher in your computer, its icon is visible in your desktop, along with the other programs installed in your computer.

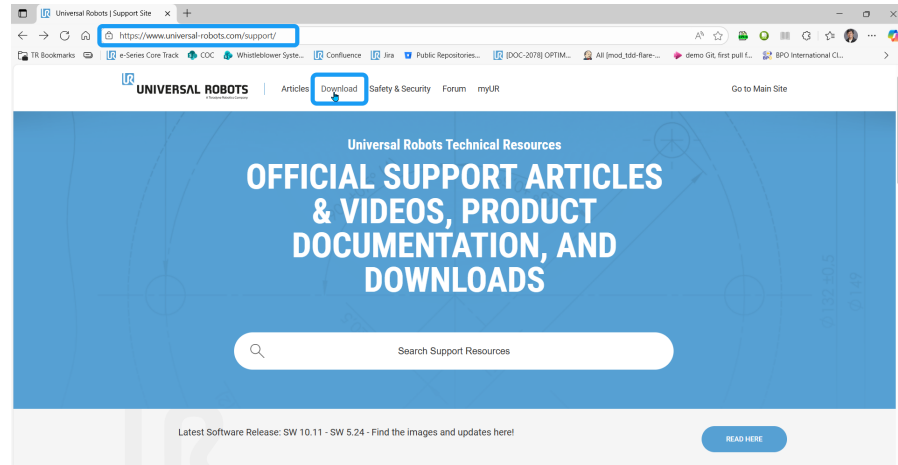


6.2. Robot Image

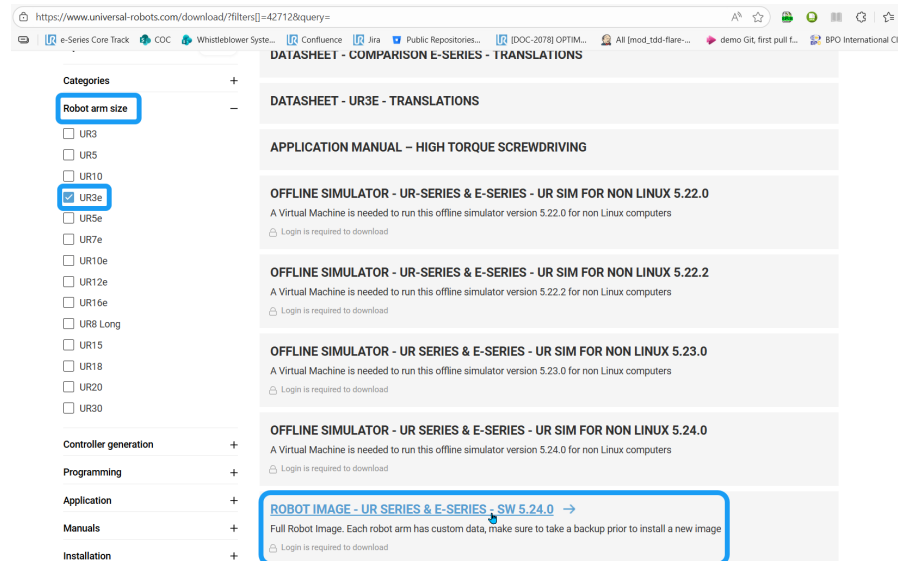
Download and install robot image

To download a robot image:

1. Go to <https://www.universal-robots.com/support/>.
2. In the header, click the download section.



3. Click **Robot arm size** and tick the checkbox of your robot type. Click the **Load More Results** button and scroll down to locate the **Robot Image** section.



4. Enter your log-in credentials to download.



NOTICE

Before you download, make sure to back up prior to installation of a new image. Each robot arm has custom data.

**NOTICE**

CF card	If you have a CF card, choose 2.0 for CB2 and CB3.0 for CB3.
USB	If you have a USB drive, choose 2.1 for CB2.1 and CB3.1 for CB3.
SD card	e-Series and UR Series

7. Installing Robot Image

Description In this section, users are given the details of USB storage device formatting.

7.1. Back Up Before Proceeding

Description When installing a new robot image, all data on your storage device will be deleted. If necessary, back up all data before proceeding. If the storage device has already been used, it must be formatted first. See [9 USB Update Procedure on page 23](#).

CB2/CB3 data to back up

- programs** - folder
- .urcontrol** - folder/enable hidden folders
- flightreports folder** - ignore if not present (CB3 only)
- .urpass.file** - ignore if not present
- .ursafetypass.file** - ignore if not present (CB3 only)
- histogram.properties**
- log_history.txt**
- ur-serial**

e-Series and UR Series data to back up



NOTICE

e-Series SD card is divided into four partitions.

programs - folder

flightreports folder - ignore if not present

.urpass.file - ignore if not present

.ursafetypass.file - ignore if not present

histogram.properties

log_history.txt

ur-serial



NOTICE

Previous versions of this manual recommended backing up **.urcontrol**. It should no longer be backed up. The data is preserved in the joints and restoring it will prevent PolyScope from starting.

7.2. Recovery of Data

Description

This section helps users recover robot image data when a Windows-run computer cannot read the USB flash drive.

Linux file system



NOTICE

This is an optional process. Users who encounter a notification from the computer stating that the USB drive is not readable should implement this procedure.

If you insert an SD card or USB flash drive into a Windows PC, it will tell you that the drive is not readable and will offer to format it. Do not format the drive. Formatting it will destroy all robot data inside the flash drive.

Windows machines can't read SD card from robot because it is partitioned as ext3 and ext4. There are some additional software components that a user needs to install to access these partitions.



NOTICE

Choose any software for managing Linux file system, in case you choose to use Linux command line to reboot.

Install any software for accessing Linux file system on Windows.

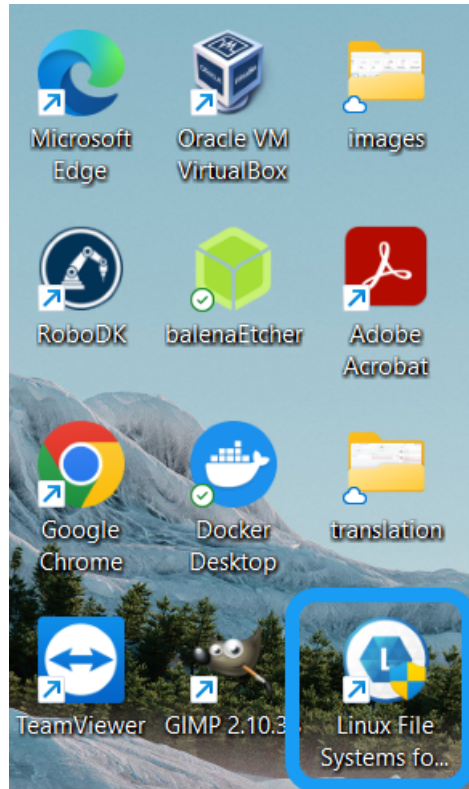


NOTICE

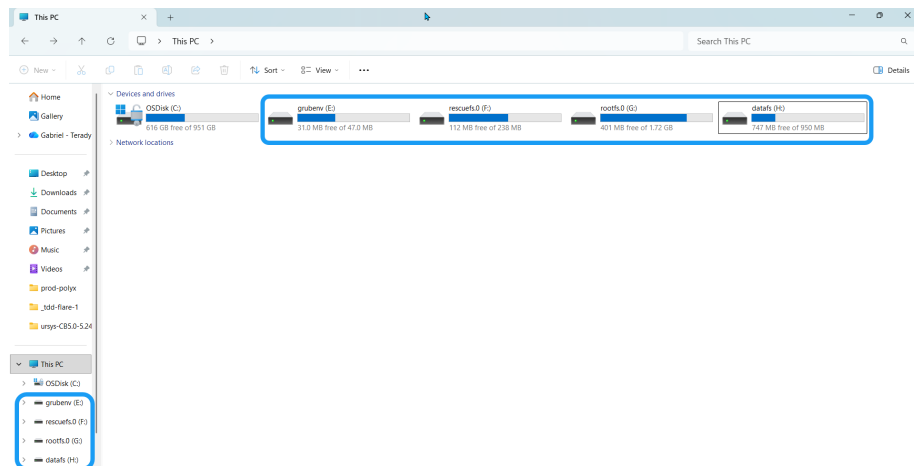
Linux File Systems for Windows by Paragon is a third-party software and not associated with Universal Robots A/S. Universal Robot takes no responsibility for this software.

When you successfully install Linux File Systems for Windows by Paragon in your computer, its icon is visible in your desktop, along with the other programs installed in your computer.

1. In your desktop, double click to open **Linux File Systems for Windows by Paragon** in your computer.



2. Insert the USB flash drive in your computer. Open **This PC** folder. You can see the USB flash drive appear in four partitions.



3. Proceed to [7.3 Image Installation and Re-imaging into USB Drive](#) below.

7.3. Image Installation and Re-imaging into USB Drive

Description A bootable USB enables users to boot a control box with a new robot image in either Polyscope 5 or Polyscope X software version, in case of emergency situation when a robot's internal storage gets damaged.

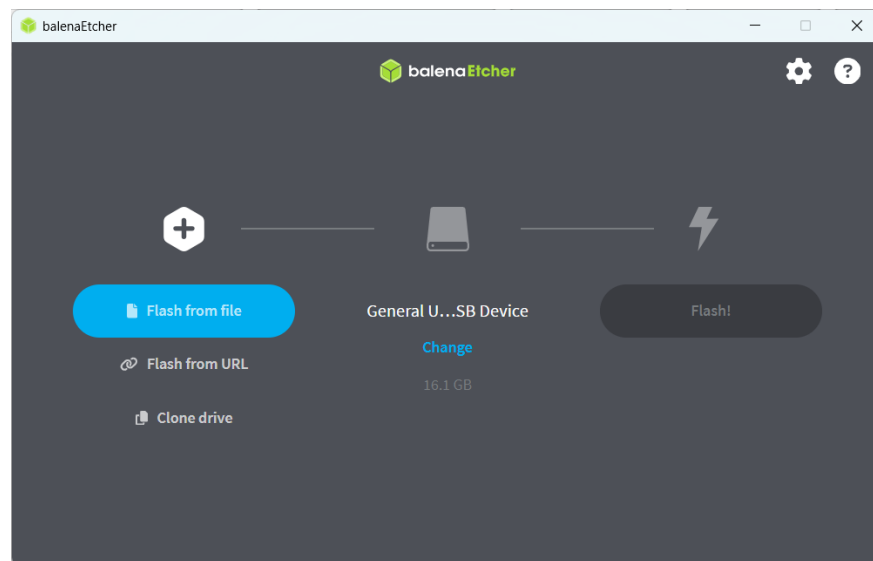
**Installing image
using
balenaEtcher**



NOTICE

If your USB flash drive was previously formatted as Windows partition, it will be fully erased, and partition type is changed to ext3 and ext4 making it unreadable for Windows. If Linux file system support is not installed, you have no way to access the USB flash drive.

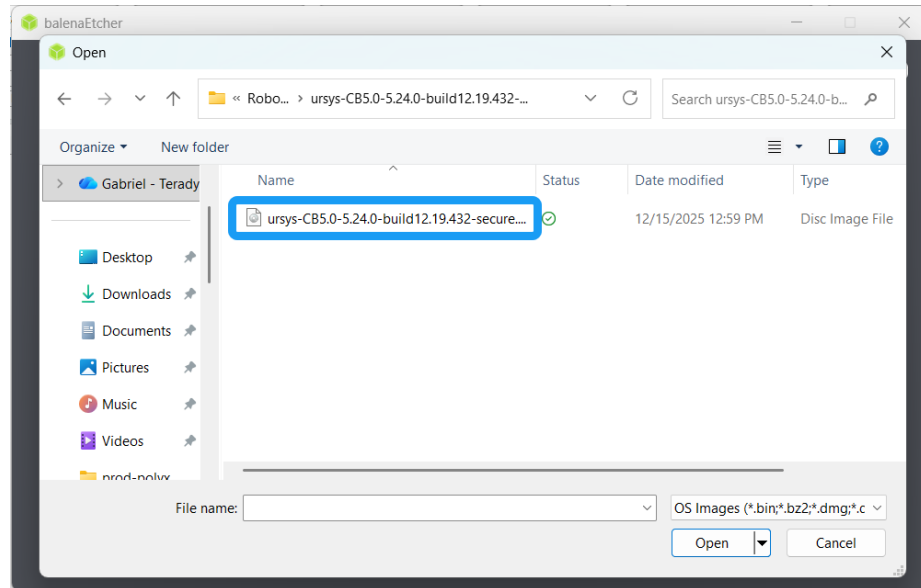
1. In your desktop, double click to open balenaEtcher in your computer.



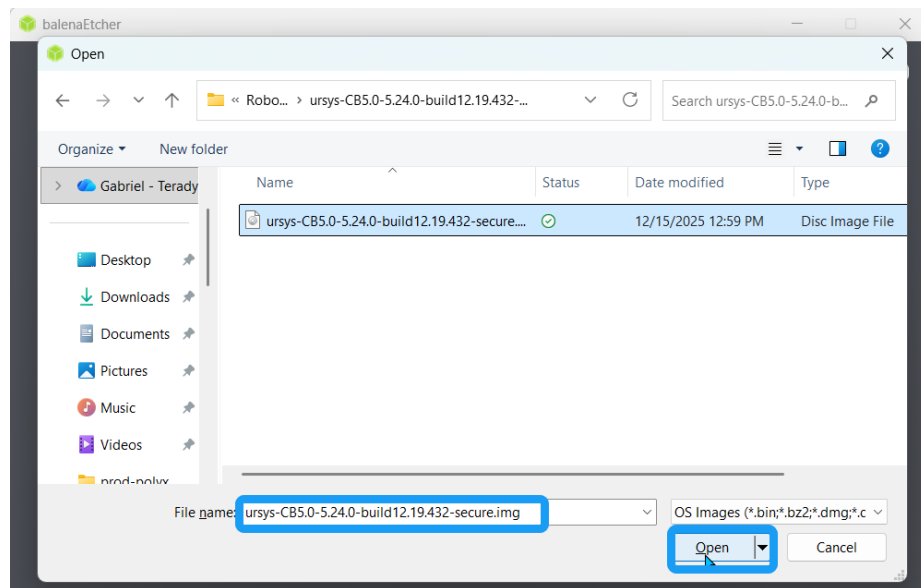
2. Insert a USB flash drive in your computer if it is not yet inserted.

**Robot
Image into
USB**

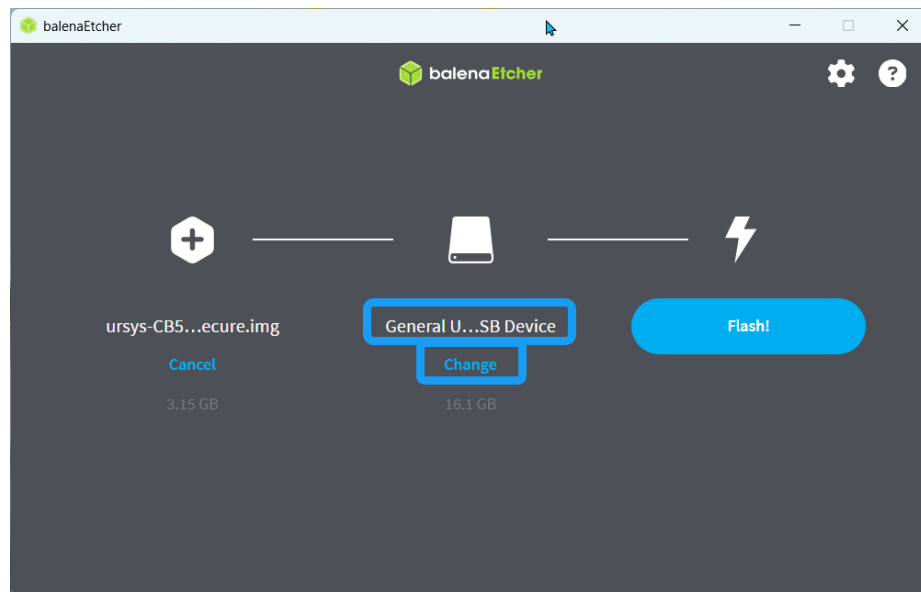
3. Click the blue **Flash from file** button. A pop-up dialogue box appears where you can locate the folder that contains the downloaded robot image file.



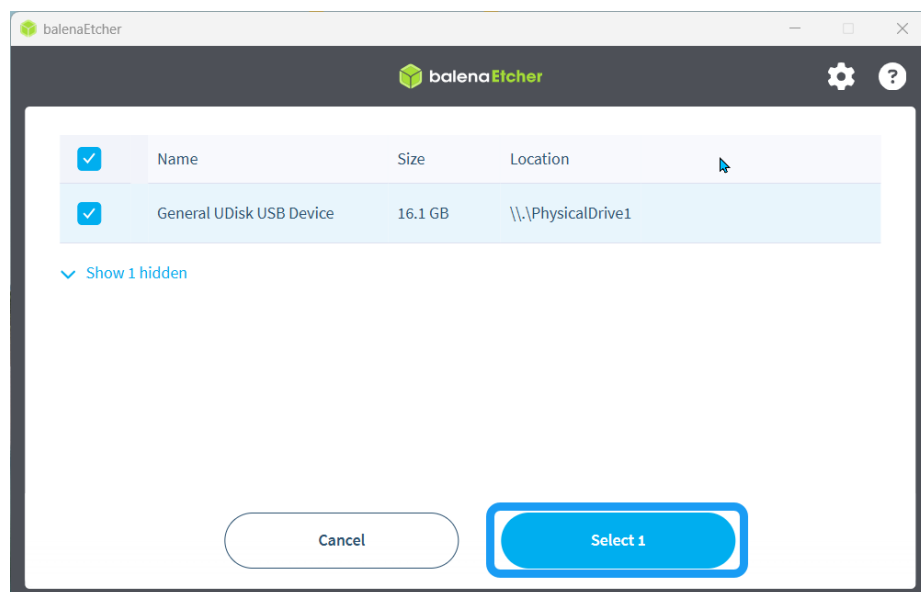
4. Choose the pertinent robot image (.dmg) file. Click **Open**.



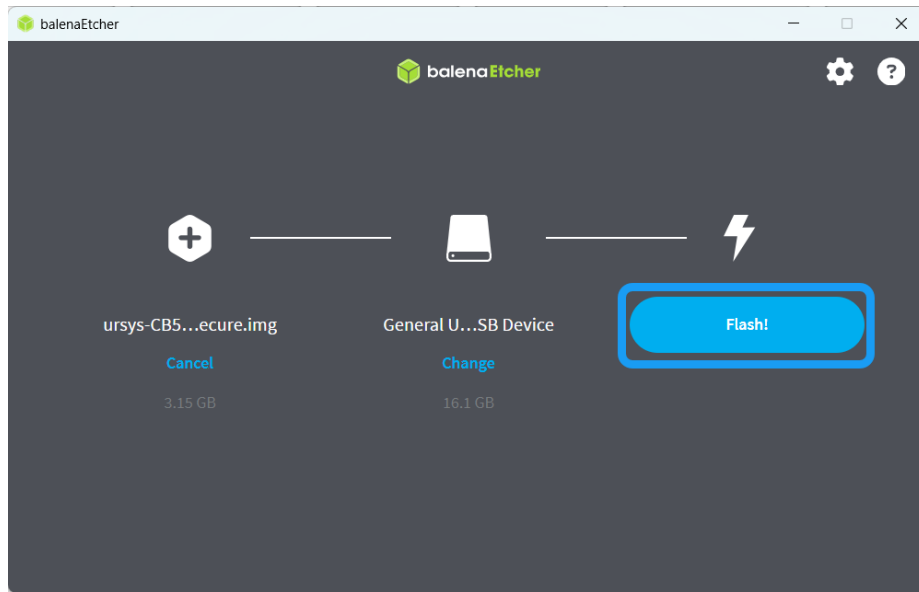
5. The partitioned USB flash drive is automatically selected as target.



6. To confirm that the partitioned USB flash drive is selected, click **Change** under it. A pop-up dialogue box appears that shows your inserted USB flash drive checked and selected. Click the **Select** button.



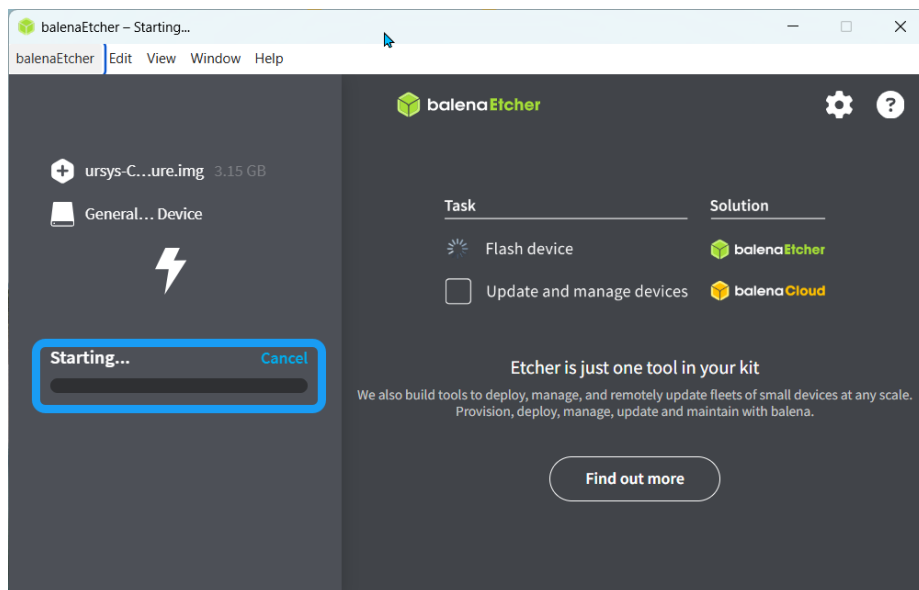
7. Click the activated blue **Flash!** button.



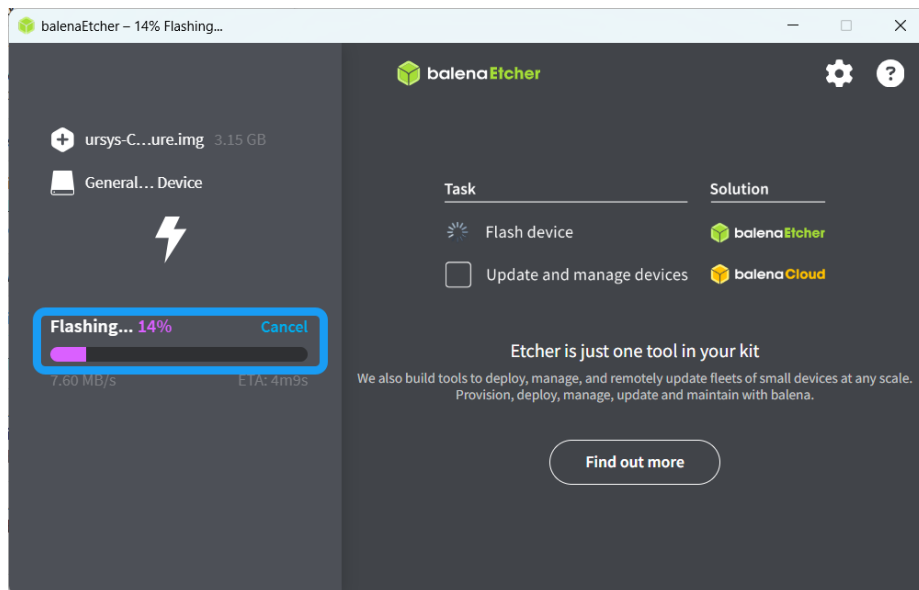
WARNING

Do not remove the USB while flashing and avoid unnecessary movements in your computer to stabilize the USB in its port.

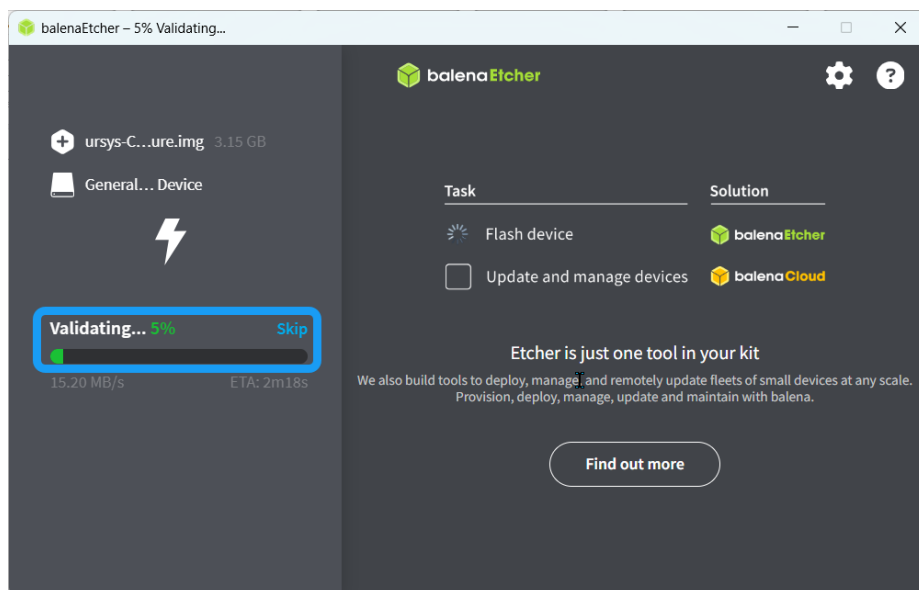
8. A pop-up screen shows Flashing process is starting.



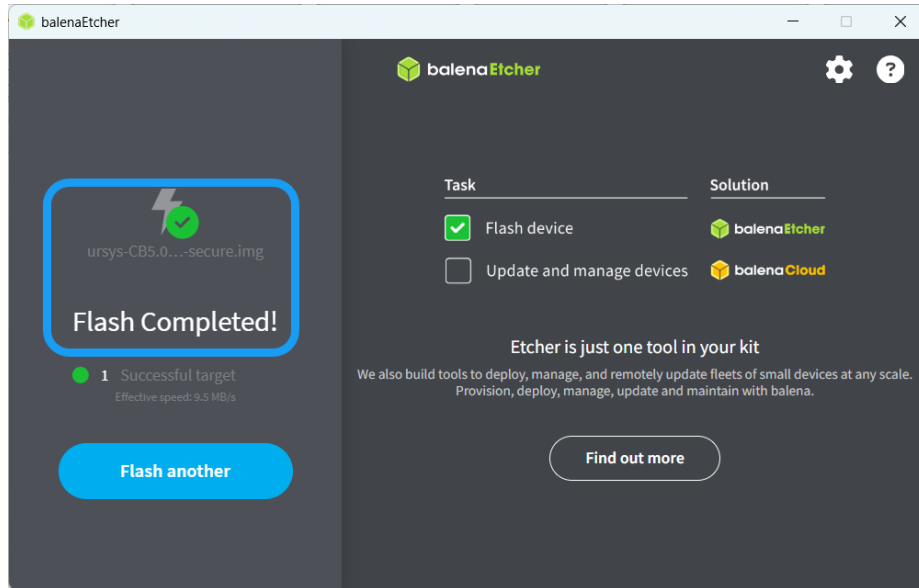
9. After, the Flashing process screen appears. Wait until flashing is at 100 percent.



10. When flashing is done, a screen appears that shows the percentage of the validation process. Wait until completed.



11. When validation is completed, a screen appears confirming that USB flash is completed. A Windows Explorer notification pops up with the information that balenaEtcher has successfully flashed a file into the USB.



12. You can close the program and remove the USB flash drive.

7.4. Restoration of Recovered Image Files

Description To restore recovered robot image files, a Linux file support system is needed, the same as in data recovery.

Re-imaging using Linux command



NOTICE

This is an optional process. Users who successfully recovered and re-imaged robot file should implement this procedure.

To re-image a recovered file, a Linux command such as this can be used:

```
sudo dd if="/path/to/ursys-CB5.0-5.24.0-build12.19.432-secure.img" of=/dev/sdb bs=4M status=progress
```

Where:

- **if=** → Input file (your disk image).
- **of=** → Output device (your USB drive, e.g., /dev/sdb).
- **bs=4M** → Block size for faster copying.
- **status=progress** → Shows progress during the operation.

8. Flashcard Replacement

Description This section provides instructions on how to replace flashcard, USB or SD card, in CB3 and e-Series.

Details



NOTICE

Flashcard replacement is valid for the following:

- CB3 software version: 3.1.17336
- e-Series software version: PolyScope 5, all versions.



WARNING

Older or newer software versions may behave differently.

The flashcard, USB, or SD card in the robot control box (CB) acts as the hard drive of the robot. It must never be removed while the power is on, as this may corrupt the operating system. The flashcard, USB, or SD card runs in a Linux file system and cannot be read directly using Windows PC or Mac. In that case, you can use third-party tools that enable to read/write access on Linux-partitioned drives (e.g. Ext2Fsd or WSL2 on Windows and macFUSE on macOS). In this guide, balenaEtcher is the third-party tool being used.

Data back up

Back up all data from old flashcard, USB, or SD card before changing to new ones. All files, including joint calibration data, may be permanently lost.

If the flashcard or USB needs to be replaced in a CB3 robot (SD card on e-Series), take note of the following prerequisites:

- UR control box CB3, CB3.1 or e-Series
- New and old flashcard, USB, or SD card
- PC with Ethernet plug and FTP client (e.g. FileZilla) installed
- Ethernet cable



WARNING

Flashcard replacement should NEVER be done without prior instructions from UR Technical Support.

9. USB Update Procedure

Prerequisites

This procedure requires a USB storage device that is detectable by Windows and is FAT32 formatted.

If the storage device is not FAT32 formatted, perform the following procedures:



NOTICE

- You might need admin privileges to perform the procedure.
- Back up any important data on the USB storage device before formatting. The process will erase all existing information.

1. Connect the USB to your computer.
2. Open **File Explorer**.
3. Right-click on the USB drive and select **Format**.
4. In the format window, select **Restore device defaults**.
5. In the **Volume label**, specify the robot's product line as shown in the following table.

e-Series and UR Series	Generation 3
Standard	G3
UR20	CB3

6. Select **Start** to begin formatting.
7. Confirm any warning messages.

10. PolyScope X Software Update

Description

When you receive your robot, update the software to the most recent version released by Universal Robots.

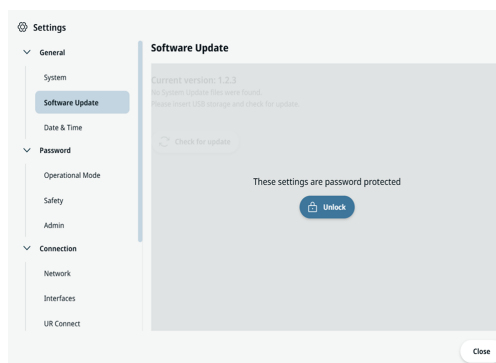
For the latest software update, see: [Download Latest Software](#)

Update software

Update software

Update the software as follows:

1. Tap the hamburger menu in the main navigation.
2. Go to **Update** in the **general settings**.
3. Insert the USB drive with the software update.
4. Tap the **Check for update** button.



Robot Tools You can use the **Robot Tools** for additional robot image actions related to software updates:

- [Install Robot](#)
- [Clone Robot](#)
- [Restore Robot](#)
- [Erase Robot](#)

Installing a robot image with the Robot Tools overwrites the robot disk and replaces the software on the Control Box.



WARNING

Before you use the Robot Tools to install, restore, or erase, back up any data that you want to keep.

For Robot Tools procedures, see [Robot Tools](#).

11. PolyScope 5 Software Update

Description

Install updates from a USB drive to ensure that the robot software is up to date.

For the latest software update, see: [Download Latest Software](#)

Update software

1. In the Header, tap the hamburger menu icon and select **Settings**.
2. Under **System**, tap **Update**.
3. Insert a USB drive in the Control Box, and tap **Search** to list the valid update files.
4. In the list of valid update files, select the desired version and tap **Update** to install it.

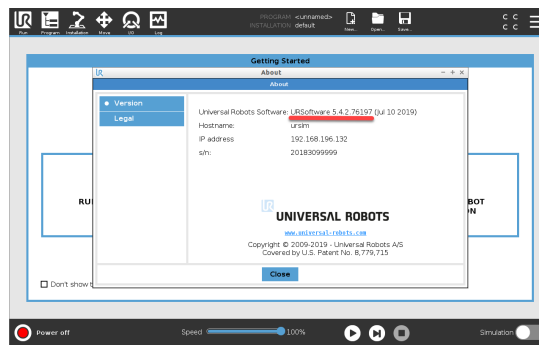


WARNING

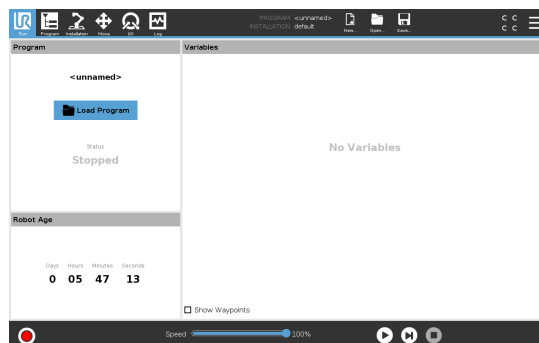
Always check your programs after a software upgrade. The upgrade might change the trajectories in your programs.

Update software

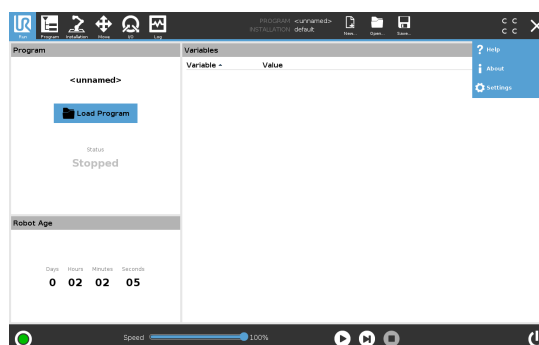
1. On your robot, go to **About** and check your current software version.



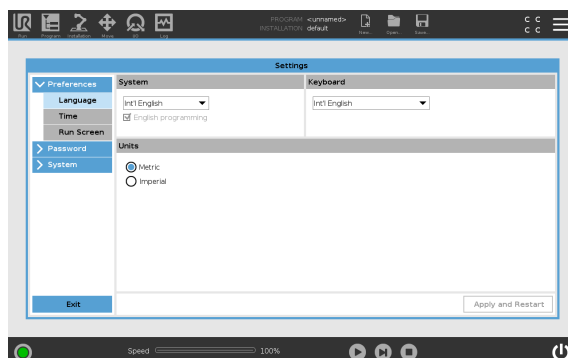
2. Download to your computer the software versions needed to be installed, you can download from Universal Robot's website (www.universal-robots.com/support).
 - If your SW is below 5.5 (E.g.: 5.3), you will need to incrementally update until you reach 5.5 (E.g.: 5.3 to 5.4, then 5.4 to 5.5), after updating to software 5.5 you can download the most up to date software and go straight from 5.5 to this last update (E.g.: 5.5 to 5.8).
 - If your SW is equal or above 5.5, just download the most updated software version file and install it straight from your current software version (E.g: 5.5 to 5.8).
3. Download the software version(s) needed to update your software and save file(s) in the root of a USB stick on your computer.
4. Insert the USB stick into the USB slot in the Control Box.
5. On teach pendant screen, press the right top corner icon  to access the settings menu.



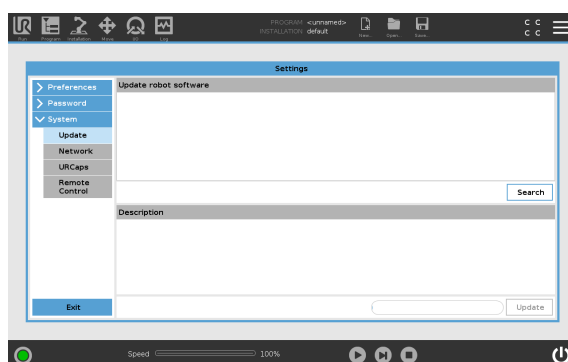
6. Press **Settings** to access the settings menu.



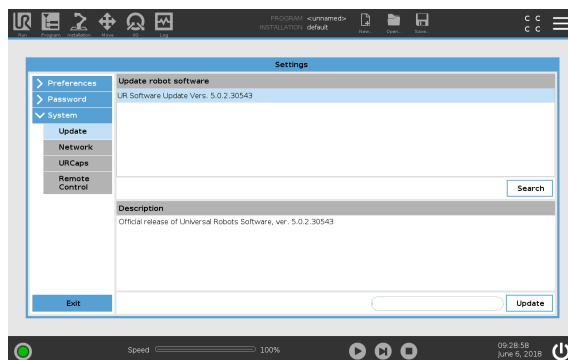
- On the left side menu, select **System**.



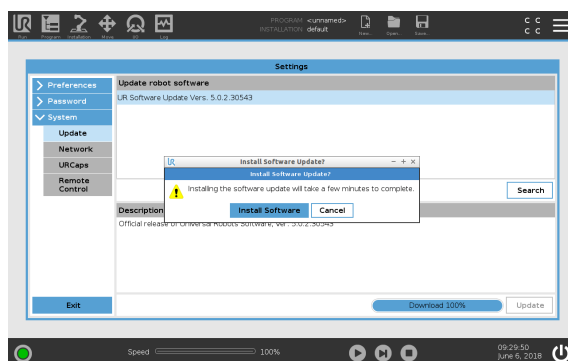
- Press **Update**, then **Search** to locate software update on USB stick.



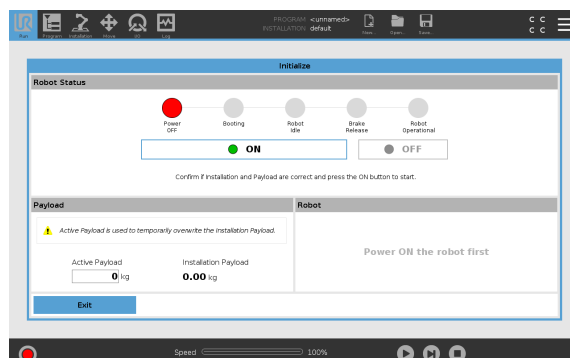
- Select the desired software update and press **Update**.



- Press **Install Software** to update the software.



11. The robot will power off and power on again. Once the update is complete, the Control Box automatically reboots. **Do not power off or unplug the robot from the outlet during startup.**
12. Wait until the reboot is complete. Firmware for the control Box and Tech Pendant is updated.
13. When complete, go to the Initialize screen and press **ON**, if available joint firmware is going to update.



14. Remove the USB stick.
15. Repeat steps 4 to 14, if your installed software is earlier than 5.5.

**NOTICE**

From software version 5.5 beyond, the most updated version available in UR's website can be installed direct, no need to incrementally install updates.

More info is displayed on release notes on support site. Read it for new features releases and improvements.

Software Name: PolyScope 5/X
Software Version: 3.14
Document Version: 10.20.358