



EVIXSCAN

URCap 2.0.0

User Manual

Software: **eviXscan URCap**
 Version: 2.0.0
 Release date: May 2021

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1. Introduction

The eviXscan 3D URCap is the Universal Robots plugin to automate scanning process using eviXscan 3D scanners. First of all the user is able to configure these applications through an installation node. In the programming node the URCap provides easy-to-use interface to set up most of require scanning process parameters.

The URCap provides the following functionalities:

- Single Scan
- Multi-exposure Scan – HDR Scan
- Macro-command execution – scanning automation

1.1. Symbols used

► Instructions

▷ Reaction, result

[...] Designation of keys and buttons

1.2. Safety instructions

This document assumes that the user is familiar with eviXscan 3D scanners and knows how to handle them.

This document assumes as well that the user is familiar with the eviXscan 3D Suite.

This document assumes as well that the user is familiar with UR robots and knows how to use and program them. It describes how to use the URCap on both CB3-Series and e-Series robots. In this documentation, screenshots and procedures are differentiated whether the user is programming on a CB3-Series robot or on an e-Series one. If there is no difference, whether the user is programming on a CB3-Series robot or an e-Series one, screenshots and procedures are described using an e-Series robot. Please read the operating instructions prior to set-up of the device. Ensure that the device is suitable for your application without any restrictions. If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property can occur

1.3. Further documents

- eviXscan 3D Suite User Guide
- eviXscan 3D HD Optima Installation Manual
- UR robot operating instructions

1.4. Copyrights

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2. System requirements

2.1. Software

- The URCap is exclusively compatible with CB3.1 and e-Series robots.
- The URCap is exclusively compatible with Polyscope 3.8.0 and higher for CB3.1 robots and 5.2.0 and higher for e-Series robots.
- eviXscan 3D Suite 2.8 and higher.

2.2. Hardware

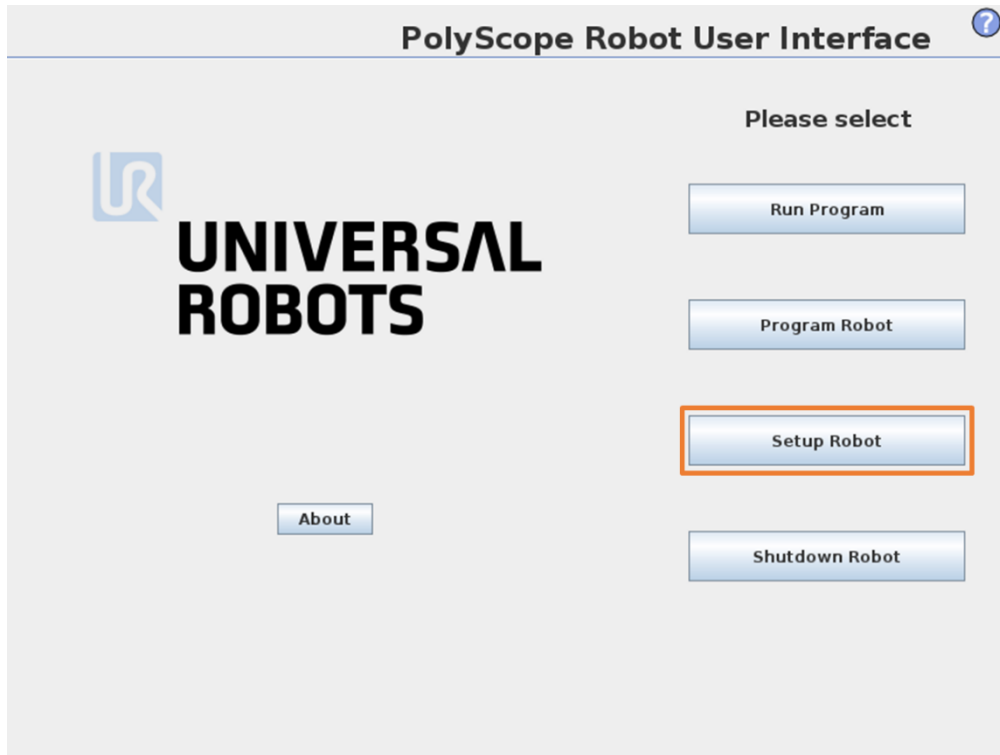
- eviXscan 3D HD Optima scanner – for the correct installation and setup please see [eviXscan 3D HD Optima Installation Manual](#).

3. URCap installation

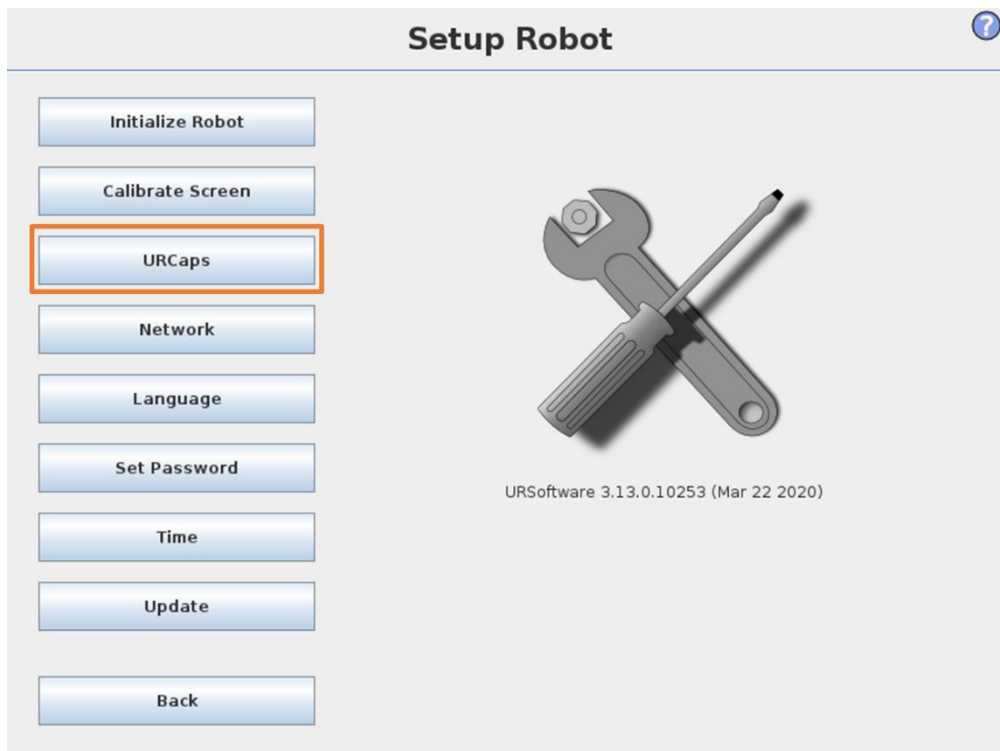
To install the URCap on the UR robot, the user must copy the URCap file `eviXscan-[version].urcap` on a USB storage device and insert it in one of the USB ports of the robot. The robot must be turned on. It is not necessary to initialise it.

3.1. Installation on CB-Series robots

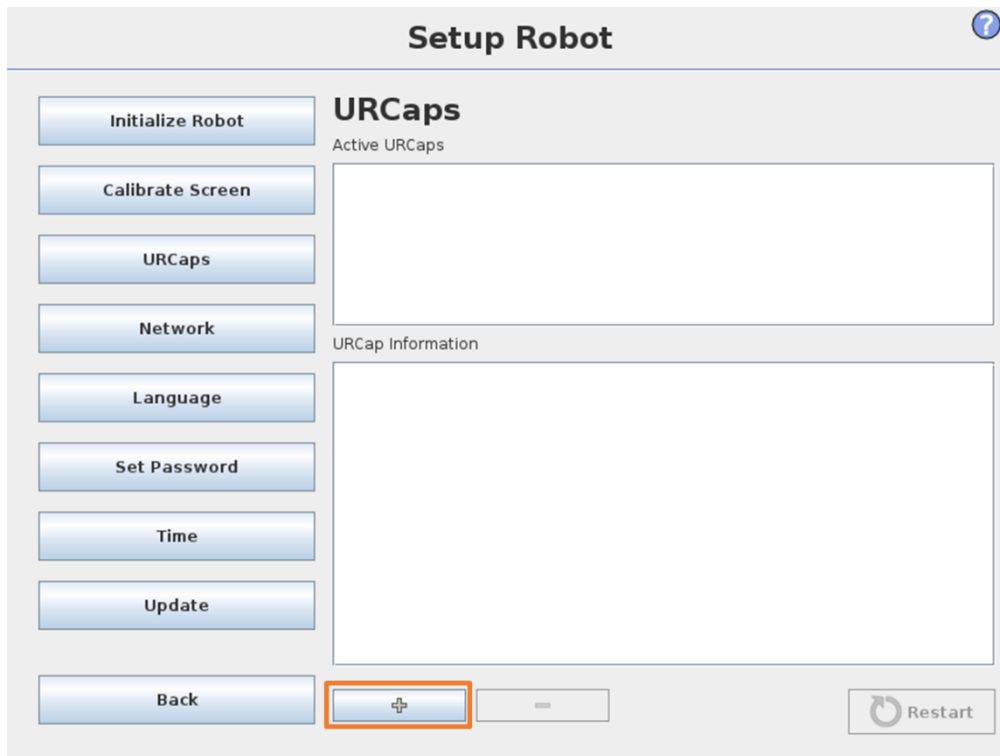
- In the main menu, click [Setup Robot].



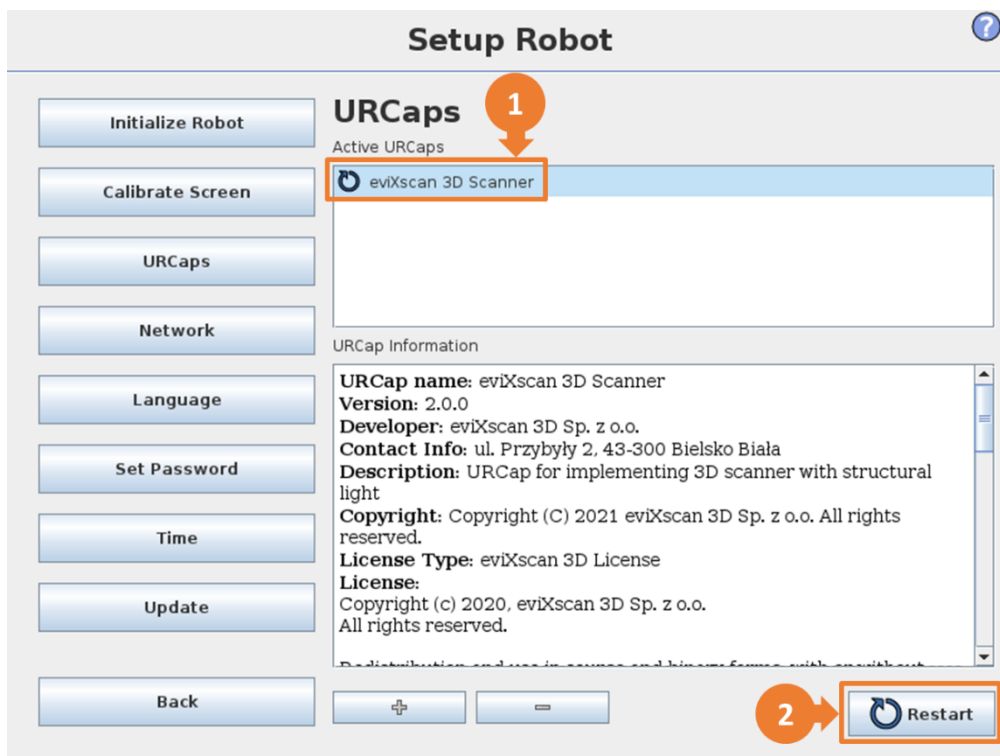
- In the Setup Robot menu, click [URCaps].



- In the URCaps menu, click the [+] button to add the URCap.

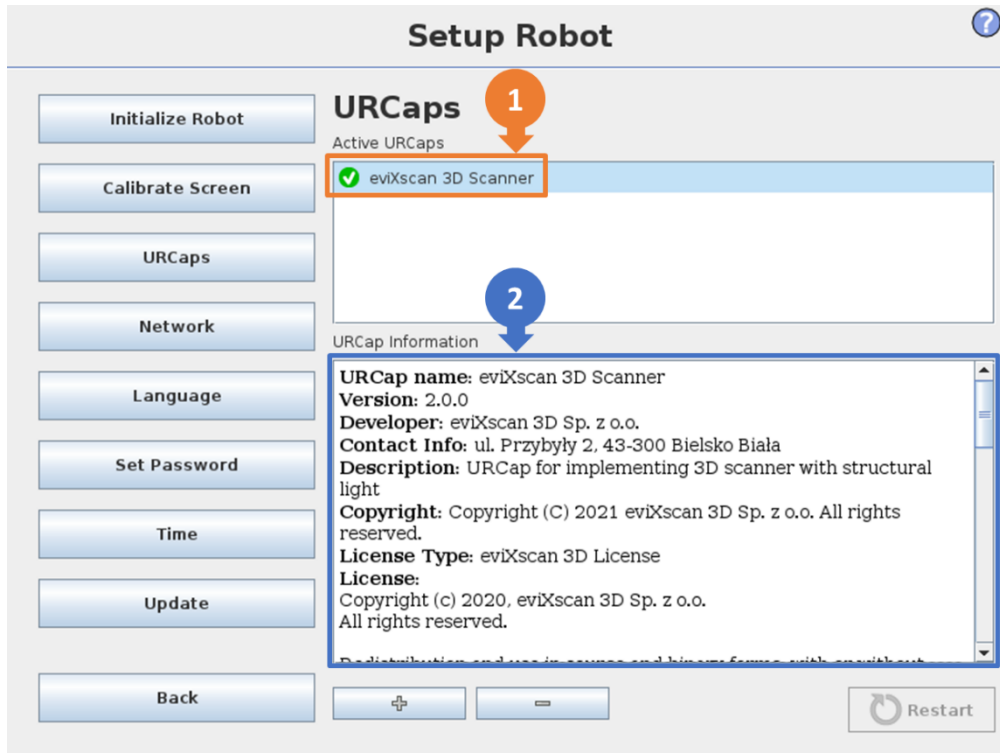


- Find USB mass storage device and select the URCap file.



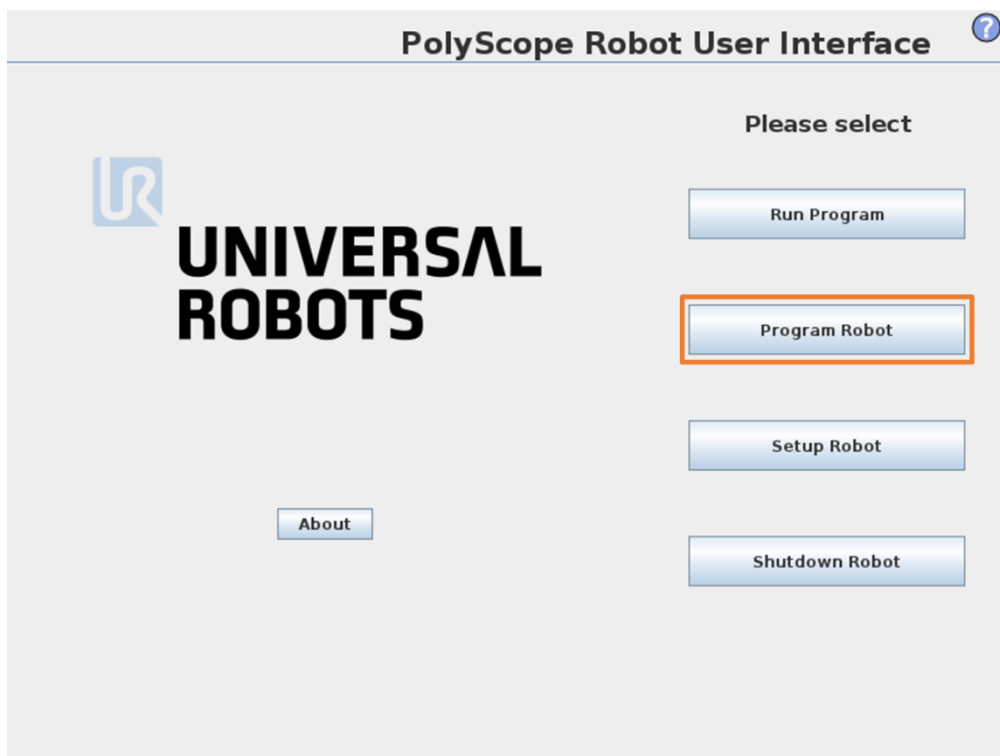
- ▷ URCap is now listed as active (1), restart is needed.
- Click [Restart] to finish the installation process (2).

- After restart, the URCap is installed on the UR robot. By clicking on the URCap name (1), it is possible to check all the licensing information related to the URCap (2).

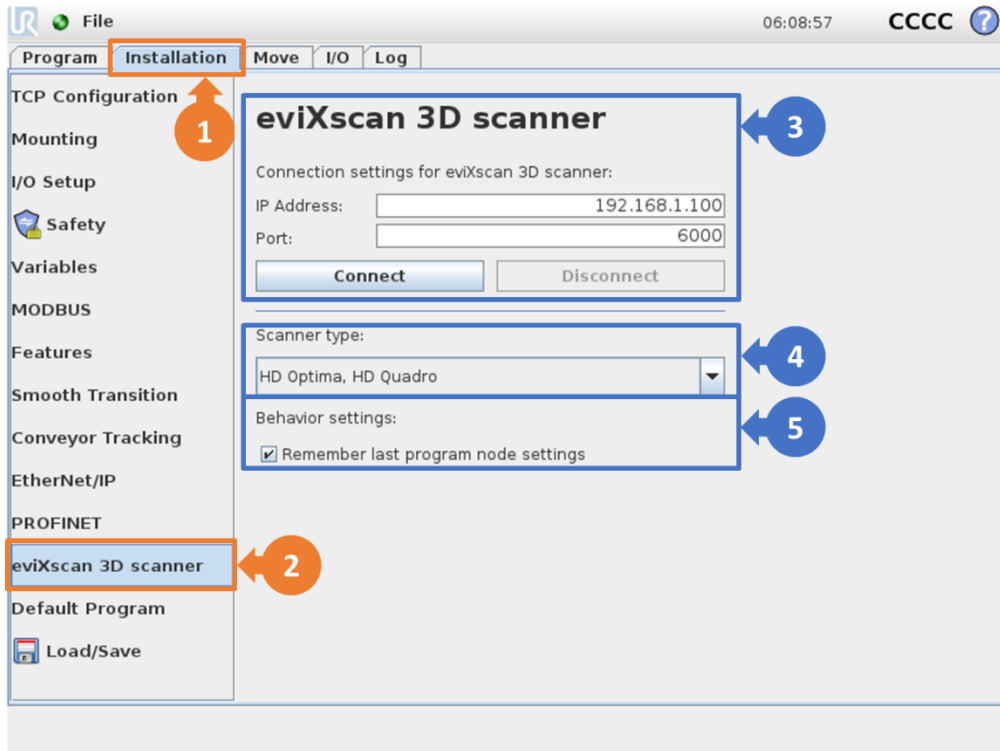


URCap first look – Installation

- In the main menu, click [Program Robot].



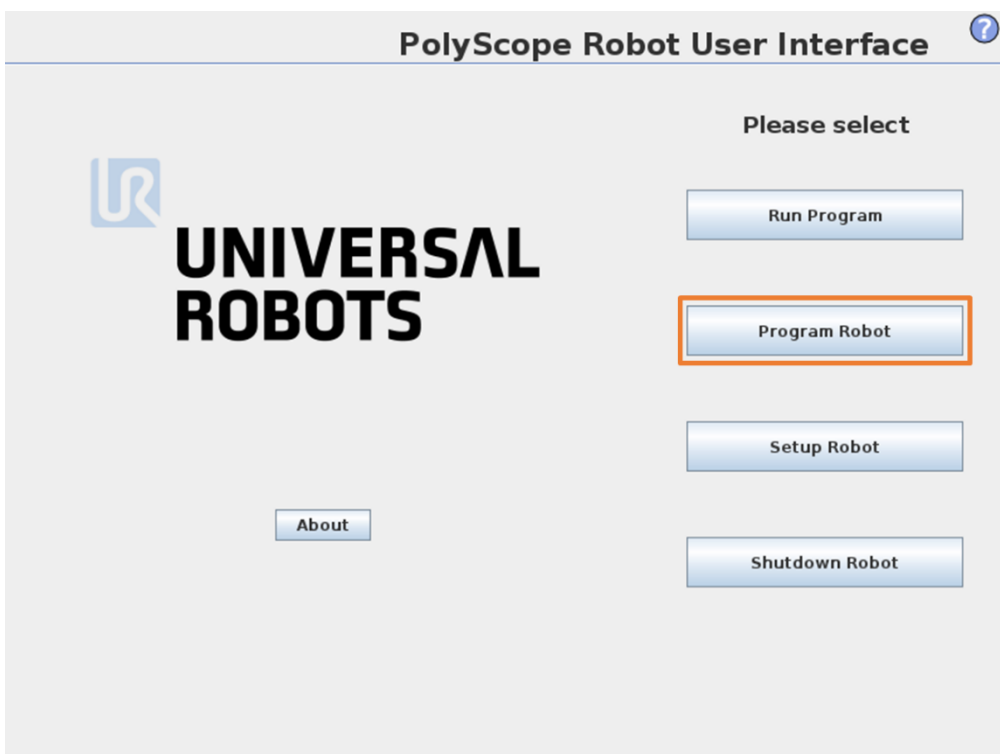
- Click the [Installation] tab (1).
- In the list on the left, click the URCap name (2).



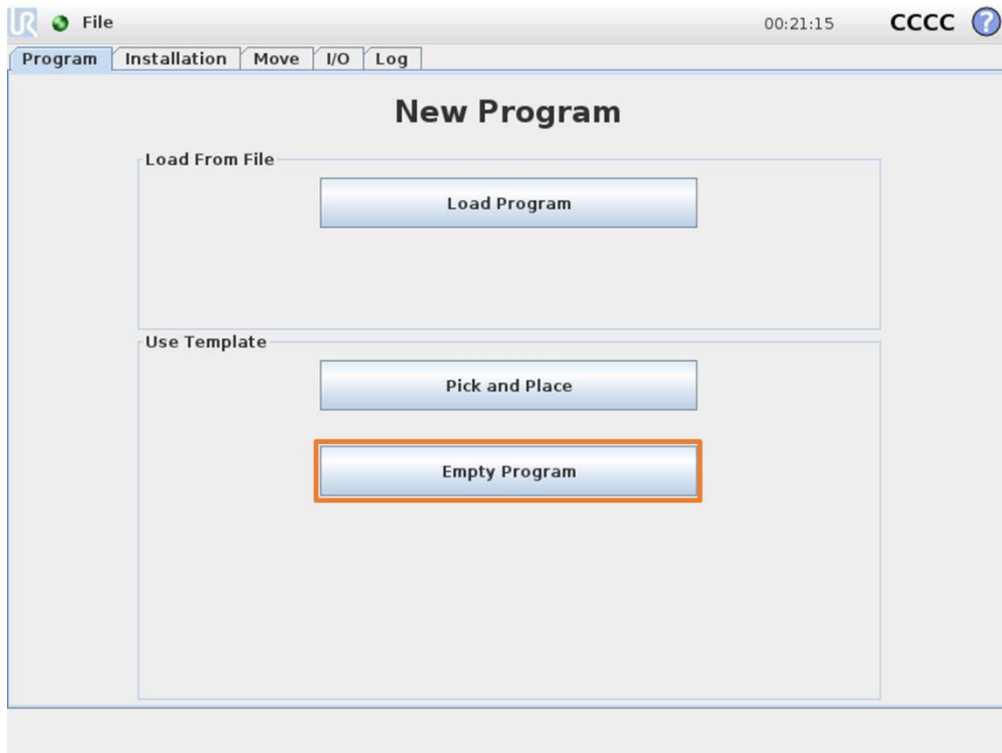
- There are main configuration of network (3). More details in section [Connection handling](#).
- (4) Scanner type select.
- (5) If this option is set, the new added program node will be a copy of the last edited one.

URCap first look – Program Node

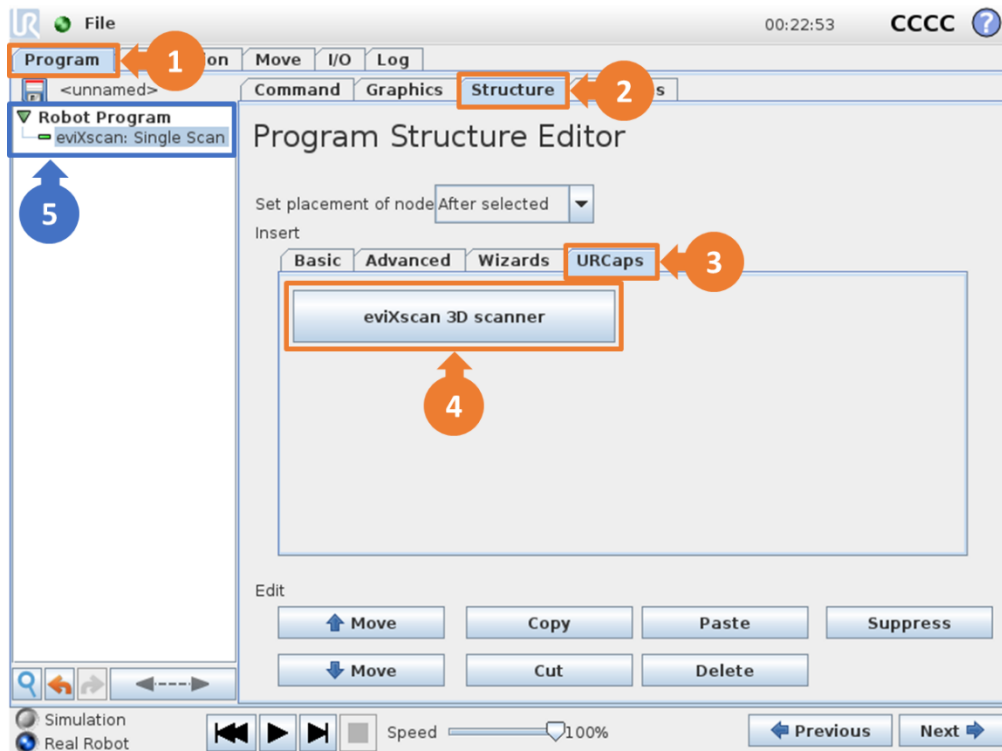
- In the main menu, click [Program Robot].



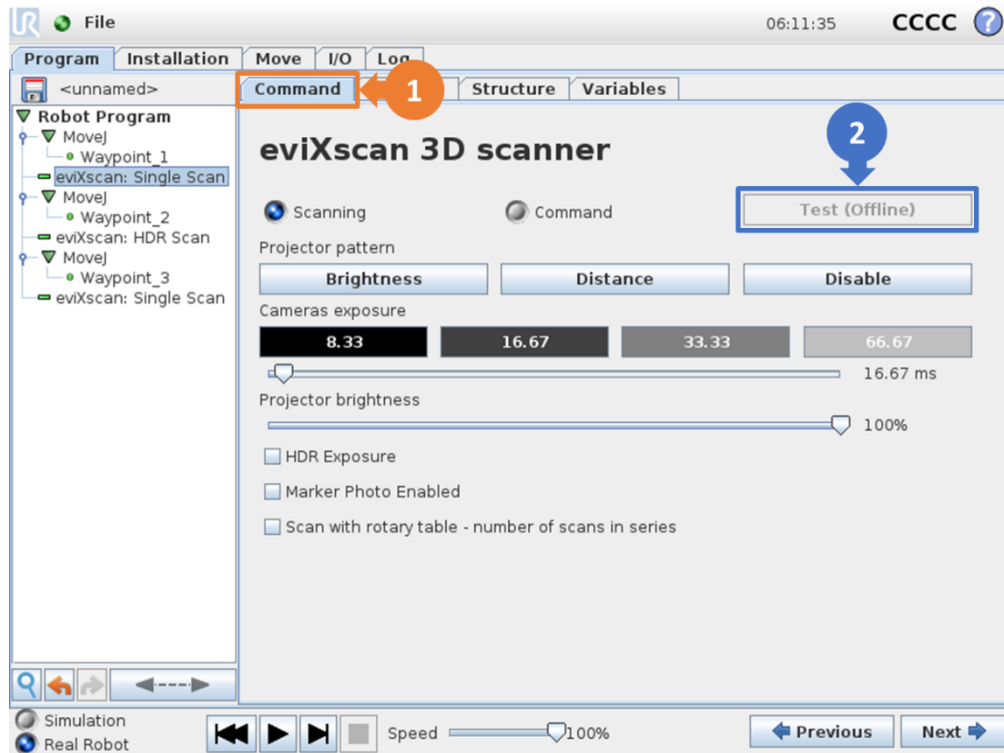
- Create a new program by clicking [Empty Program]



- On the [Program] tab (1) click the [Structure] tab (2) and then the [URCaps] tab (3).
- Click the program node (4) provided by the URCap to use it in the robot program (5).



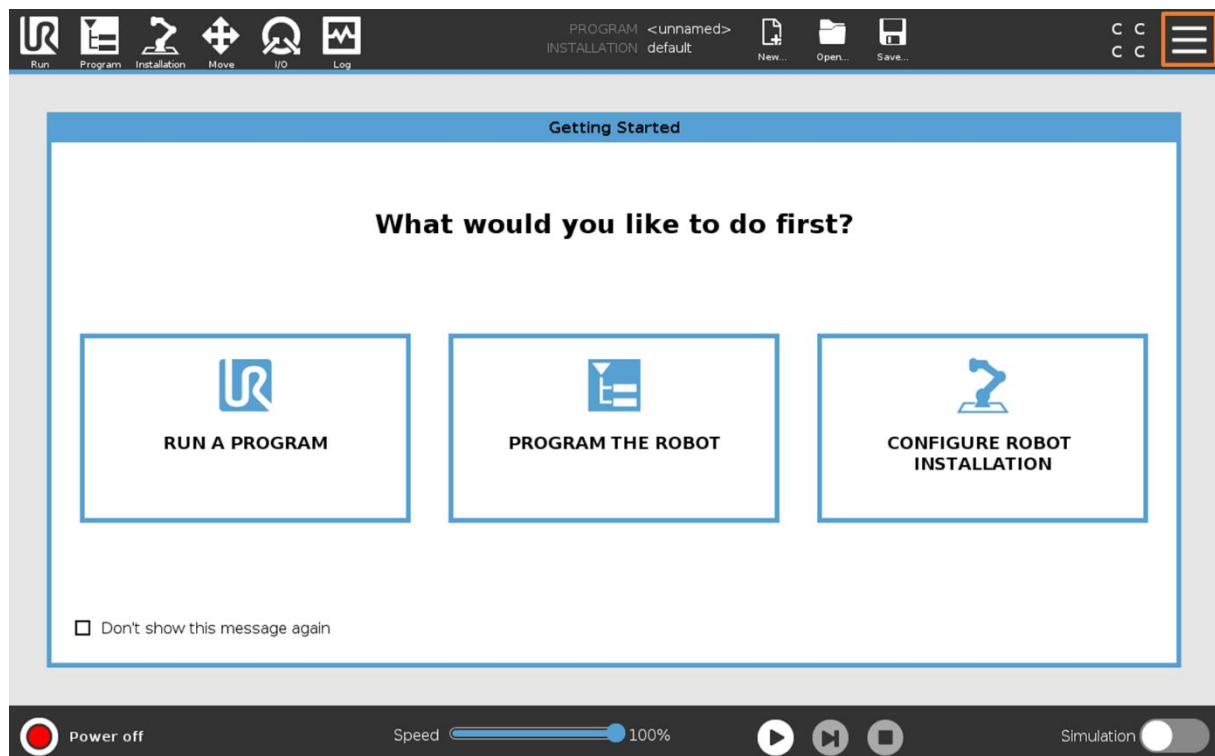
- Click the [Command] tab (1) to see the eviXscan 3D Program Node.



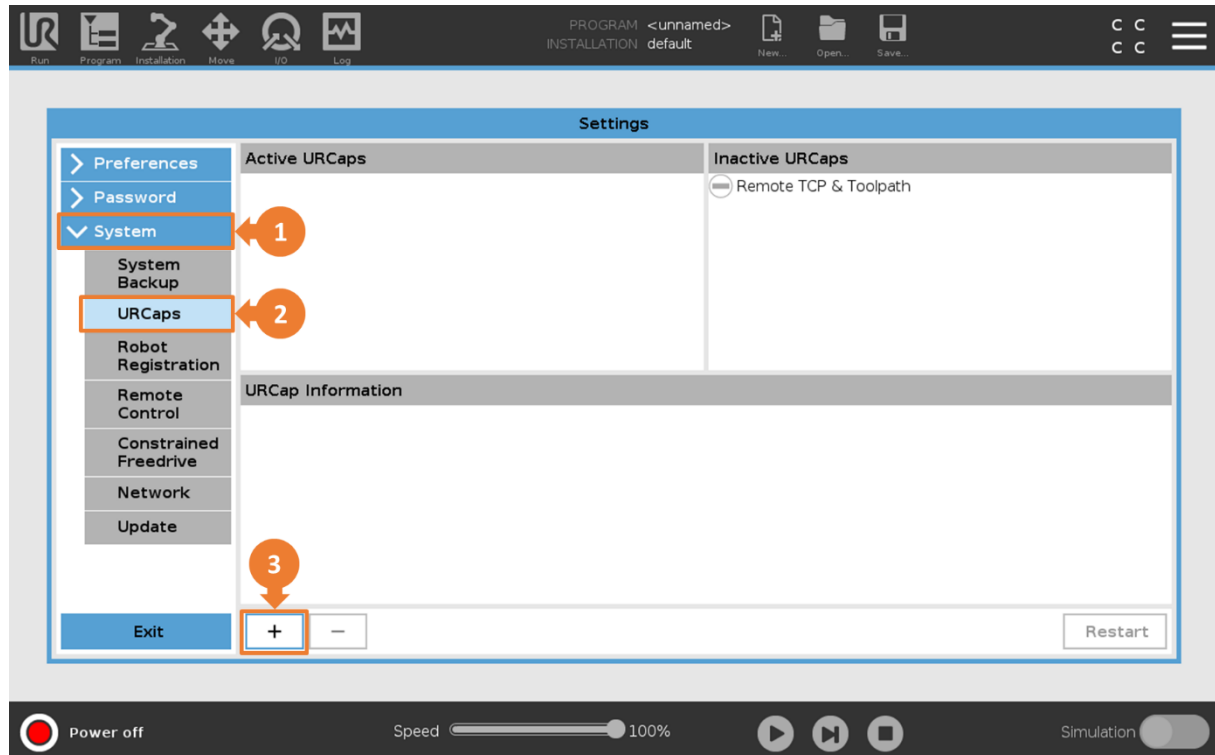
- The eviXscan 3D is now offline (2), setup is needed. For more details see sections: [Network configuration](#) and [Installation Node](#).

3.2. Installation on e-Series robots

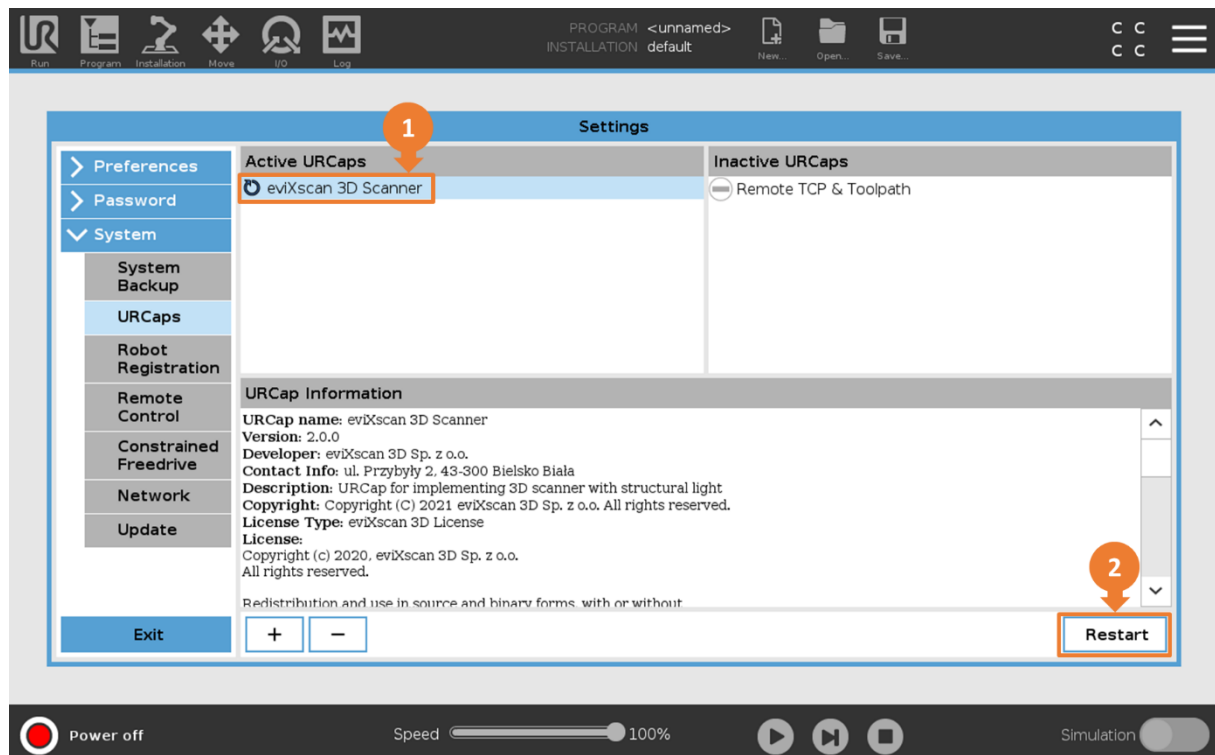
- Make the main menu appear by clicking on the button in the upper right corner and click [Settings].



- Select [System] in the menu located on the left and then URCaps (1).
- In the URCaps menu (2), click the button [+] to add the URCap (3).



- Find USB mass storage device and select the URCap file.



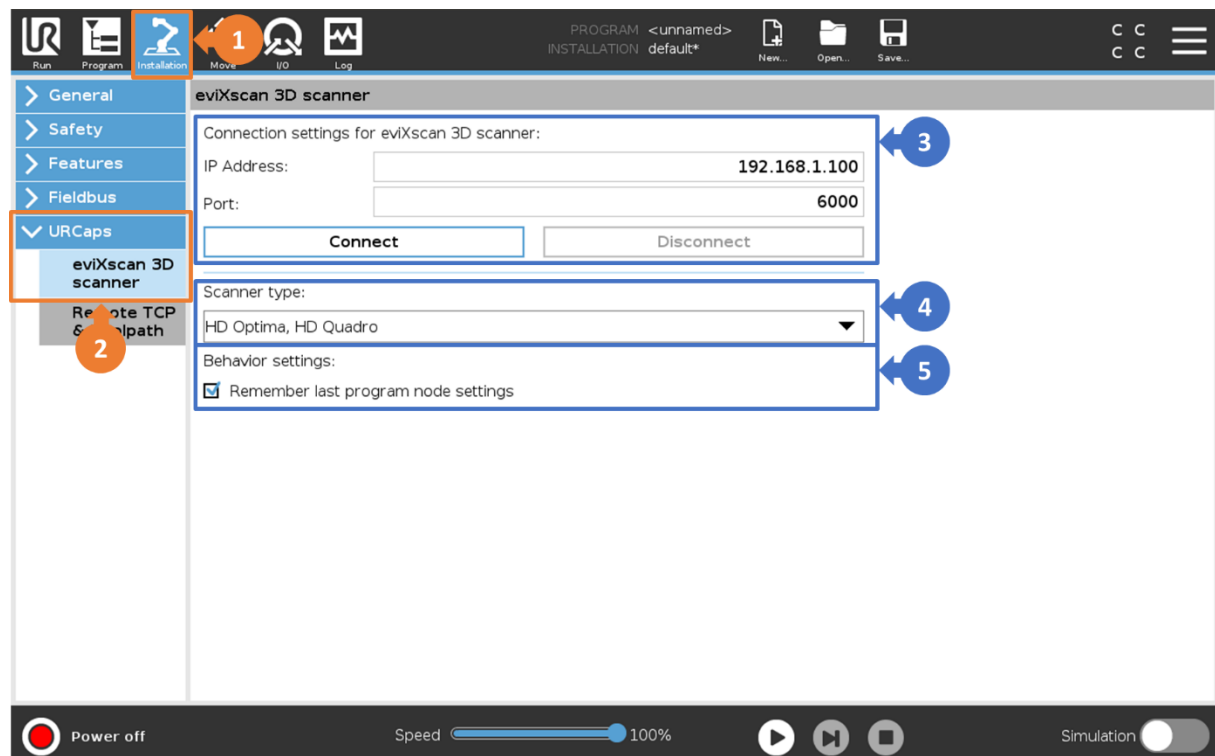
- URCap is now listed as active (1), restart is needed.
- Click [Restart] to finish the installation process (2).

- After restart, the URCap is installed on the UR robot. By clicking on the URCap name (1), it is possible to check all the licensing information related to the URCap (2).



URCap first look – Installation

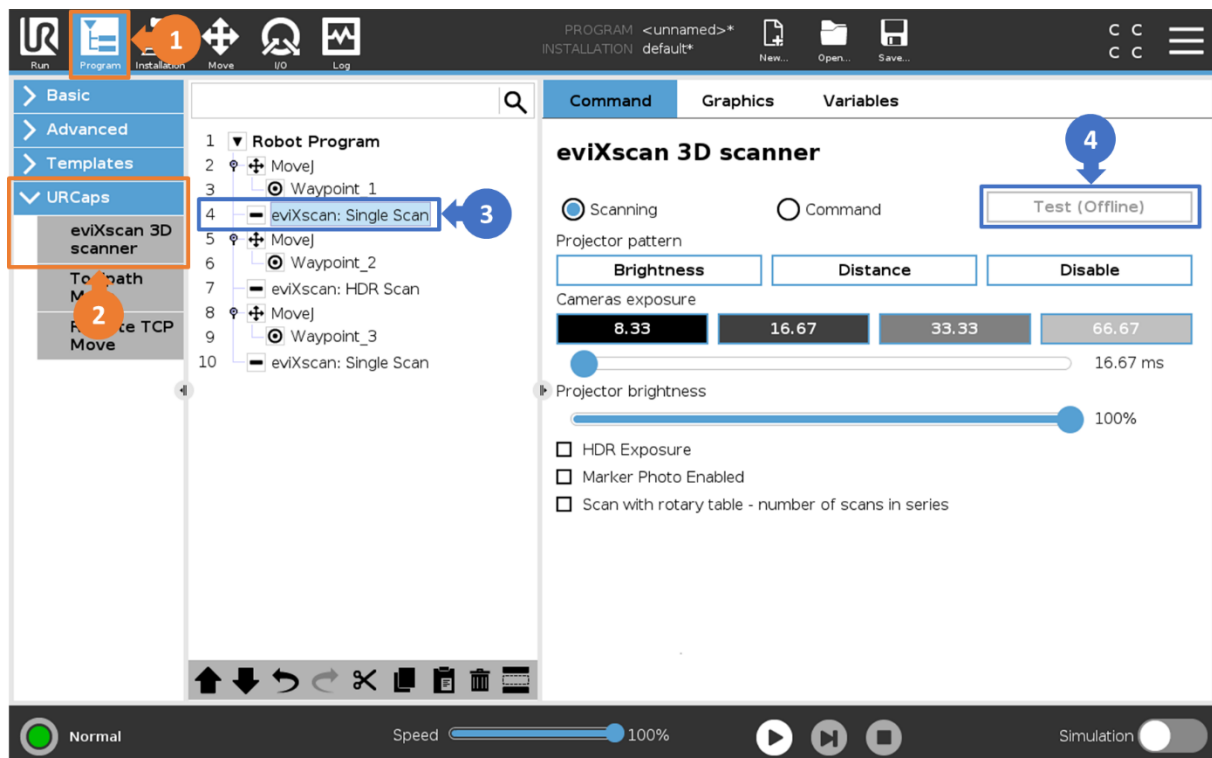
- Click the [Installation] tab (1).
- In the list on the left, click the URCap name (2).



- There are main configuration of network (3). More details in section [Connection handling](#). (4) Scanner type select. (5) If this option is set, the new added program node will be a copy of the last edited one.

URCap first look – Program Node

- ▶ Click the [Program] tab (1).
- ▶ In the list on the left, under the URCaps menu (2), click the program node provided by the URCap to use it in the robot program (3).

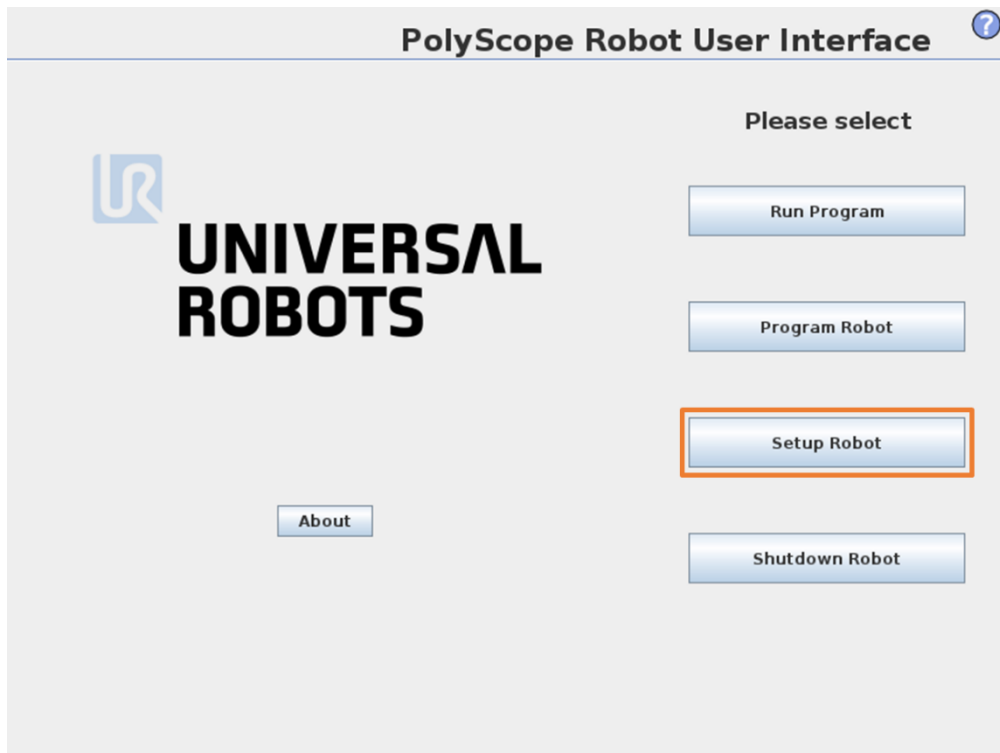


- ▶ The eviXscan 3D is now offline (4), setup is needed. For more details see sections: [Network configuration](#) and [Installation Node](#).

4. Network connection setup

4.1. Network setup on CB-Series robots

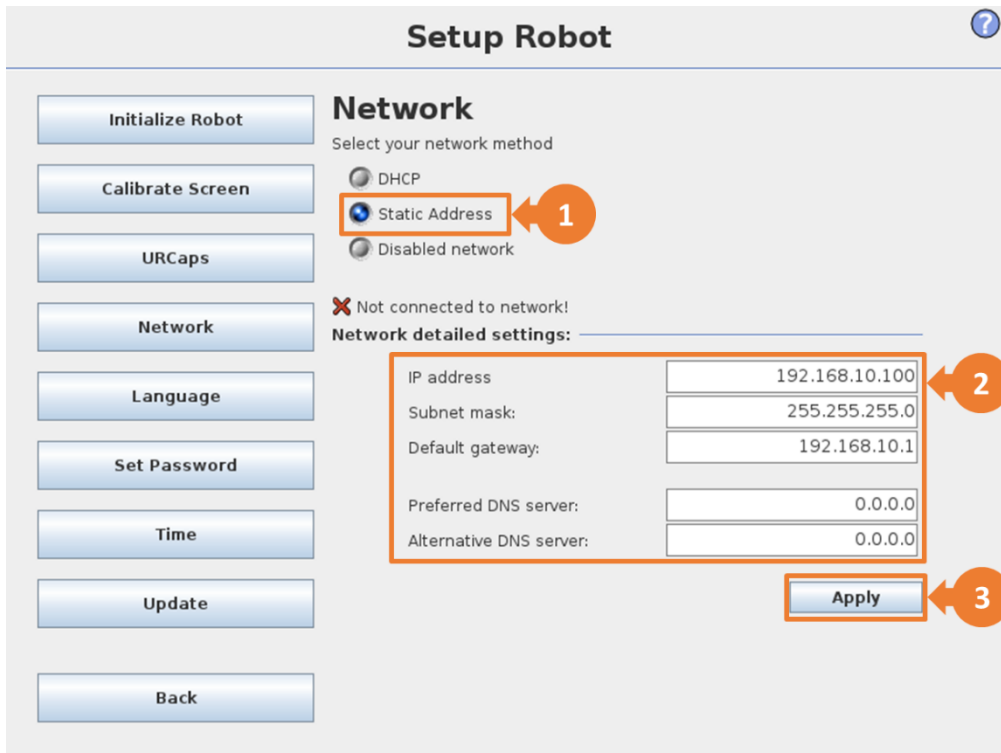
- In the main menu, click [Setup Robot].



- In the Setup Robot menu, click [Network].



- In the [Network] menu, set up the right network configuration of your robot.
- ▷ The IP address of the robot have to be in the same subnet as the scanning device.
- Click the button [Apply].



Setup Robot

Network

Select your network method

☒ Static Address (1)

☐ Disabled network

✗ Not connected to network!

Network detailed settings:

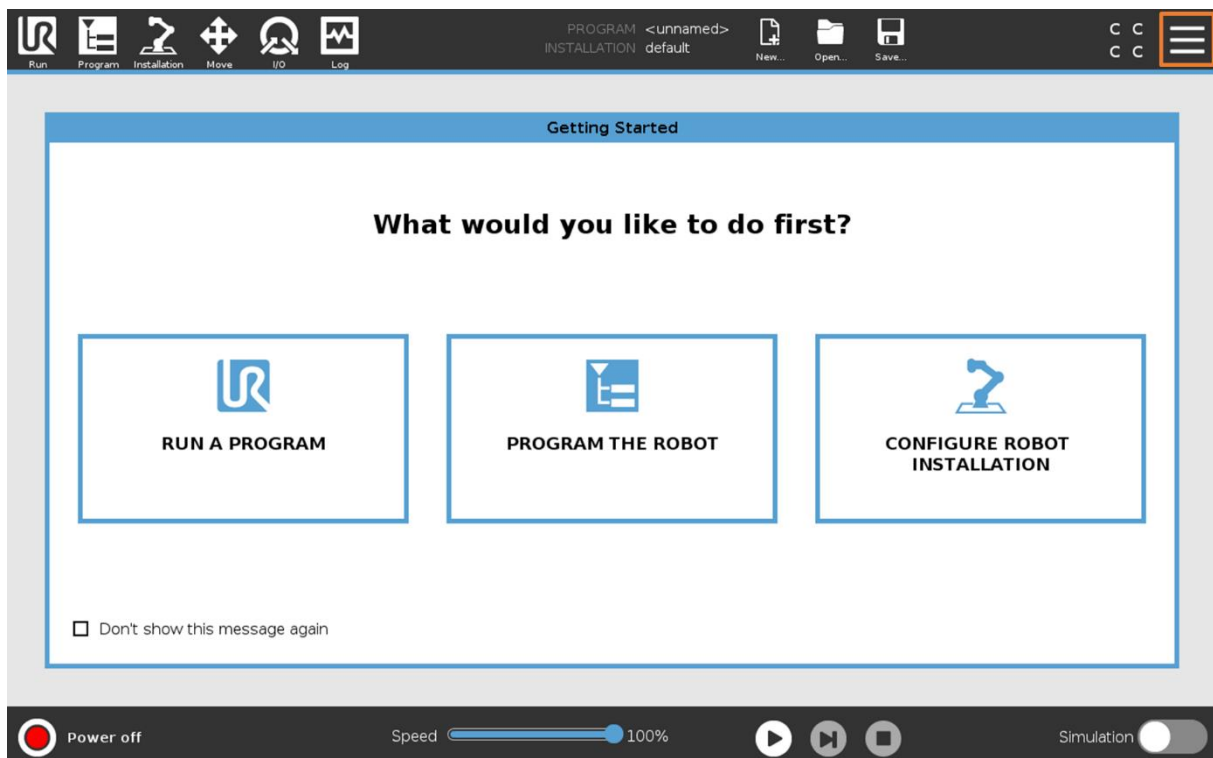
IP address	192.168.10.100 (2)
Subnet mask:	255.255.255.0
Default gateway:	192.168.10.1
Preferred DNS server:	0.0.0.0
Alternative DNS server:	0.0.0.0

Apply (3)

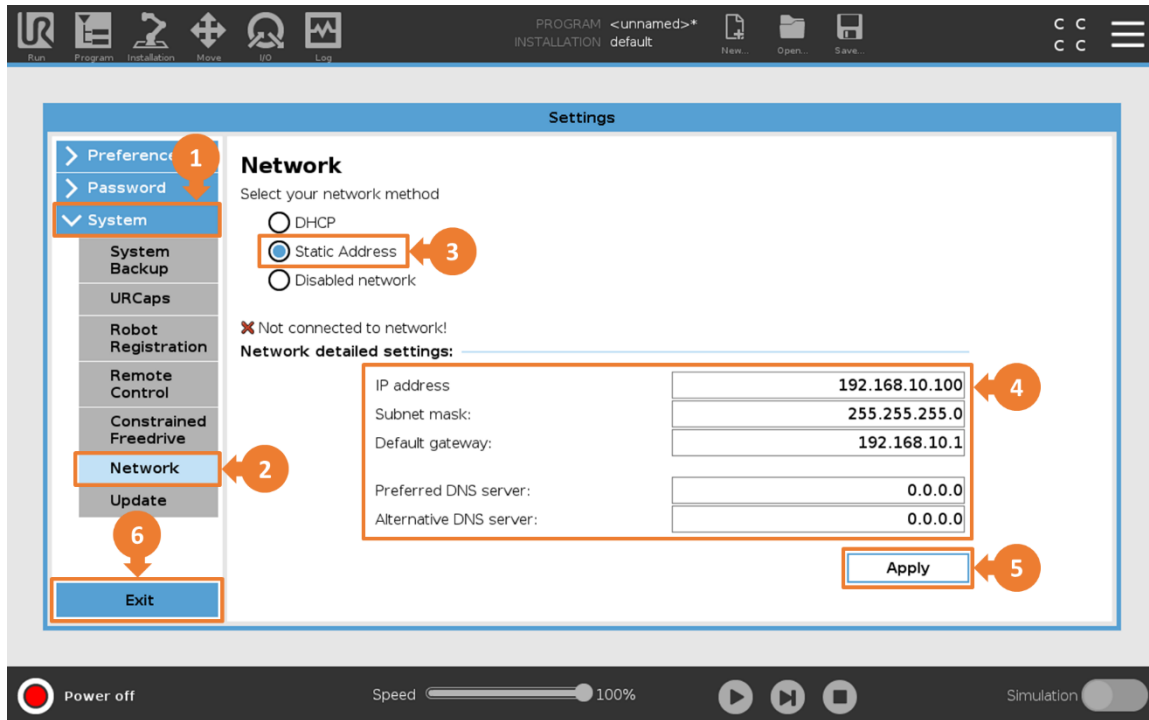
Buttons on the left: Initialize Robot, Calibrate Screen, URCaps, Network, Language, Set Password, Time, Update, Back.

4.2. Network setup on e-Series robots

- Make the main menu appear by clicking the button in the upper right corner and click [Settings].



- Select [System] in the menu located on the left and then [Network].

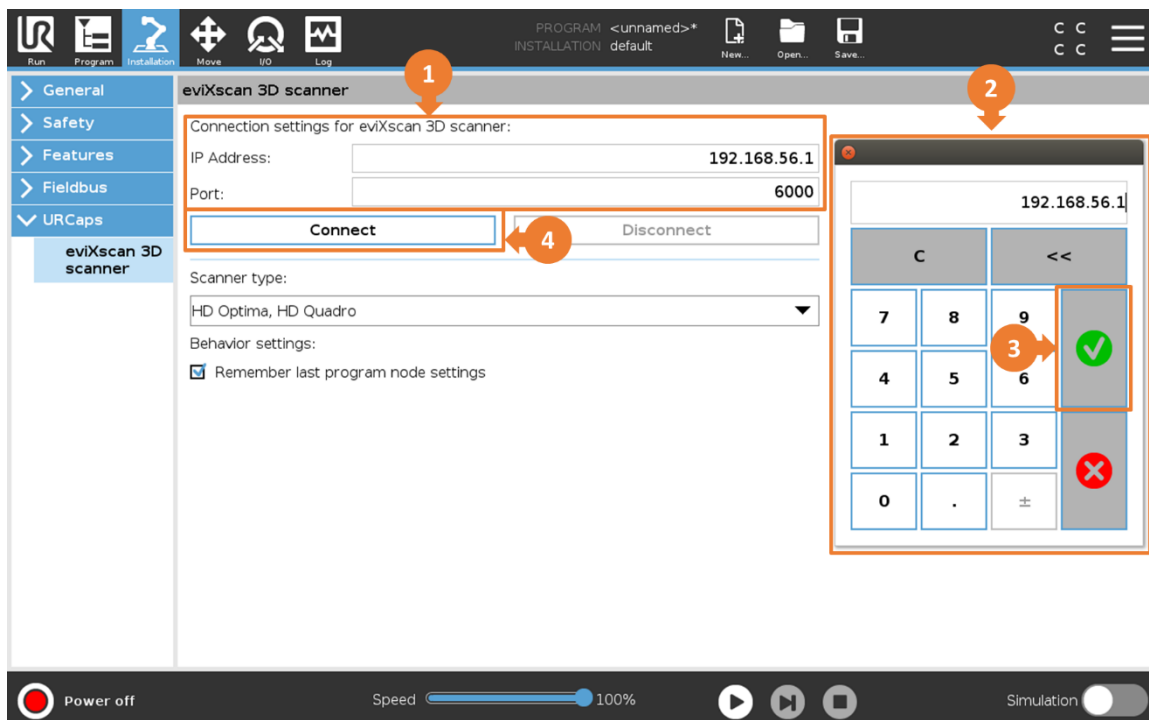


- In the [Network] menu, set up the right network configuration of your robot.
- ▷ The IP address of the robot have to be in the same subnet as the scanning device.
- Click the button [Apply] and [Exit].

4.3. Connection handling with the eviXscan 3D

To establish connection between UR robot and the scanning device you need configure and start scanning automation server with eviXscan Suite software. Server and UR robot have to be connected to the same subnet. For more details, see eviXscan 3D Suite User Guide.

Network settings

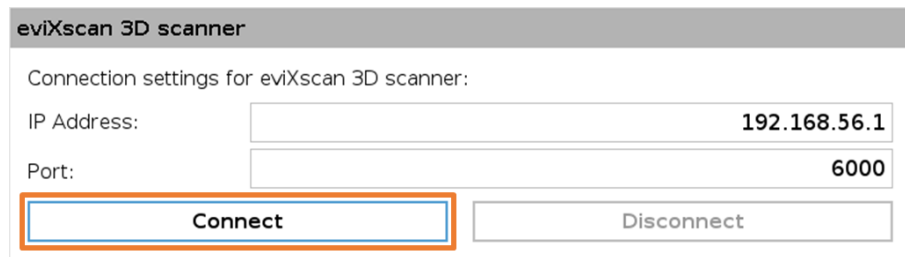


- ▶ In the [Installation] tab, set up IP address and port number (1) of eviXscan Suite scanning automation server.
- ▶ Use screen keyboard (2) to write correct values and use accept button (3) to save changes.
- ▶ If the server is started use [Connect] button to verify connection.

Connection and disconnection

If the connection setting are correct and the scanning automation server is running, it is possible to connect and disconnect. Current connection status is shown by enabling [Connect] or [Disconnect] button.

URCap disconnected – connection possible:



eviXscan 3D scanner

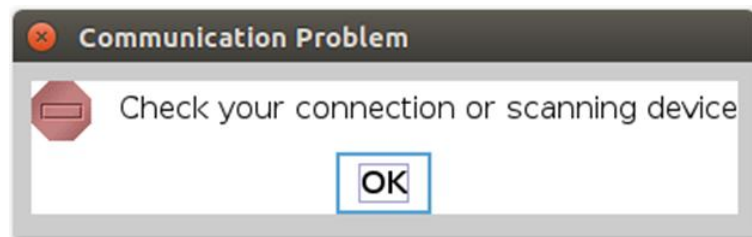
Connection settings for eviXscan 3D scanner:

IP Address: 192.168.56.1

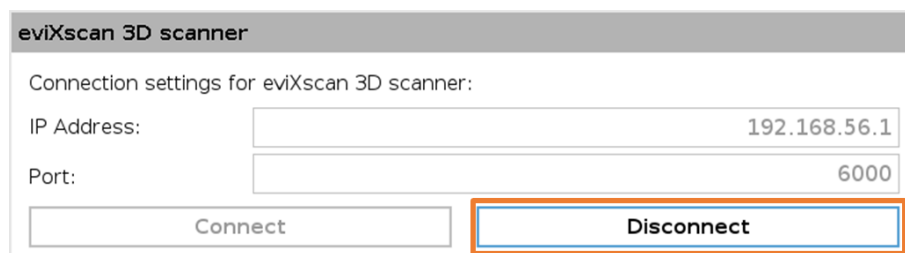
Port: 6000

Connect Disconnect

If network settings are incorrect or the scanning automation server is not running, a connection error will be displayed:



URCap connected – disconnection possible:



eviXscan 3D scanner

Connection settings for eviXscan 3D scanner:

IP Address: 192.168.56.1

Port: 6000

Connect **Disconnect**

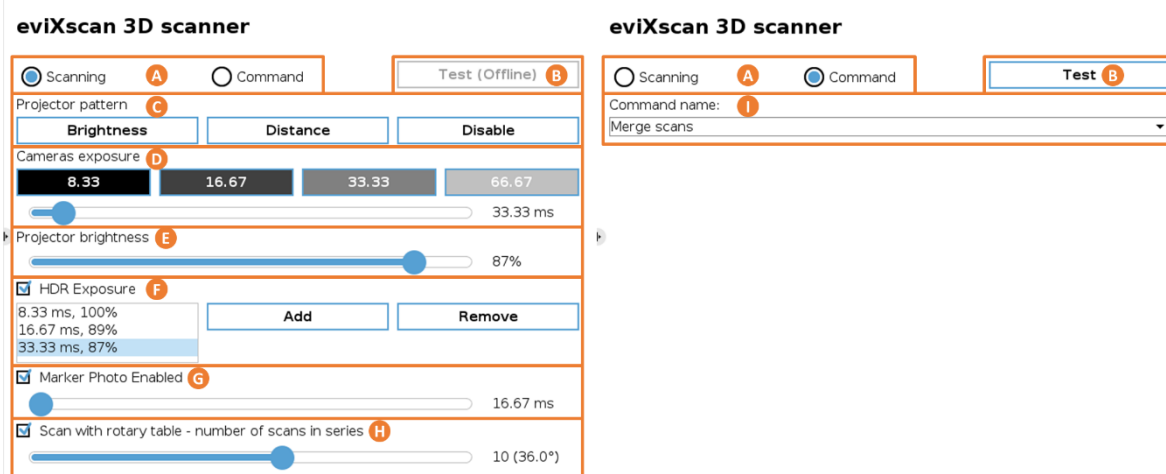
5. Scanning applications

5.1. Overview

The eviXscan URCap is intended to very close cooperation with the eviXscan 3D Suite to automate scanning process using UR robot. User have to be very familiar with the eviXscan 3D Suite and the scanning process to use this URCap. The whole scanning process is very complex and contains many post-processing operations. The URCap provides only scan capturing and executing special user macro-commands defined in mentioned software such as scan merging. Only the most important scanning parameters such as cameras exposure time are available on the URCap program node.

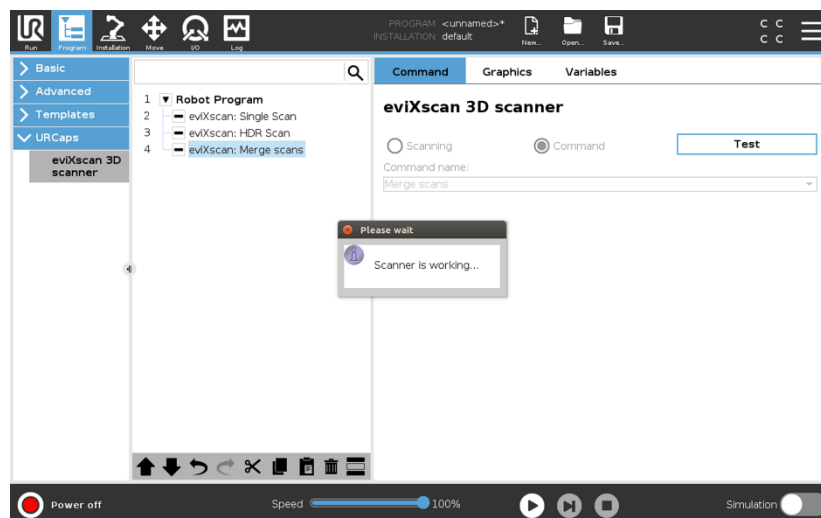
There are 3 modes of operations with this URCap:

- Single Scan mode
- Multi-exposure Scan – HDR mode
- Macro-command mode – scanning automation



There are 2 views of the eviXscan URCap related to scanning modes or macro-command mode (A). Using button (B) you can test node execution without running robot program. Sections: (C), (D), (E), (F), (G) and (H) are used to adjust scan capturing process in single or HDR scanning modes. Section (I) is used for execution macro-commands.

While the test is in progress (B), the entire interface is disabled and a wait dialog is displayed:



For more details about scanning process parameters, see eviXscan 3D Suite User Guide.

5.2. Single scan

To add new **eviXscan 3D scanner** program node, simply select it from the URCaps dropdown list. The new added node can be a copy of the last edited one when this option is set on the installation tab – see [URCap first look – Installation](#). This is the default and desired behaviour to speed up programming. Otherwise the new added node has default settings.

This view provides some scanning process parameters:

Projector pattern (C):

- Brightness – screens clear pattern to setting the brightness level and cameras exposure time
- Distance – screens ellipses with target to set correct distance between scanner and scanned object
- Disable – turned off the light source

Cameras exposure (D):

Both the buttons and the slider can be used for adjusting correct cameras exposure time value.

Projector brightness (E):

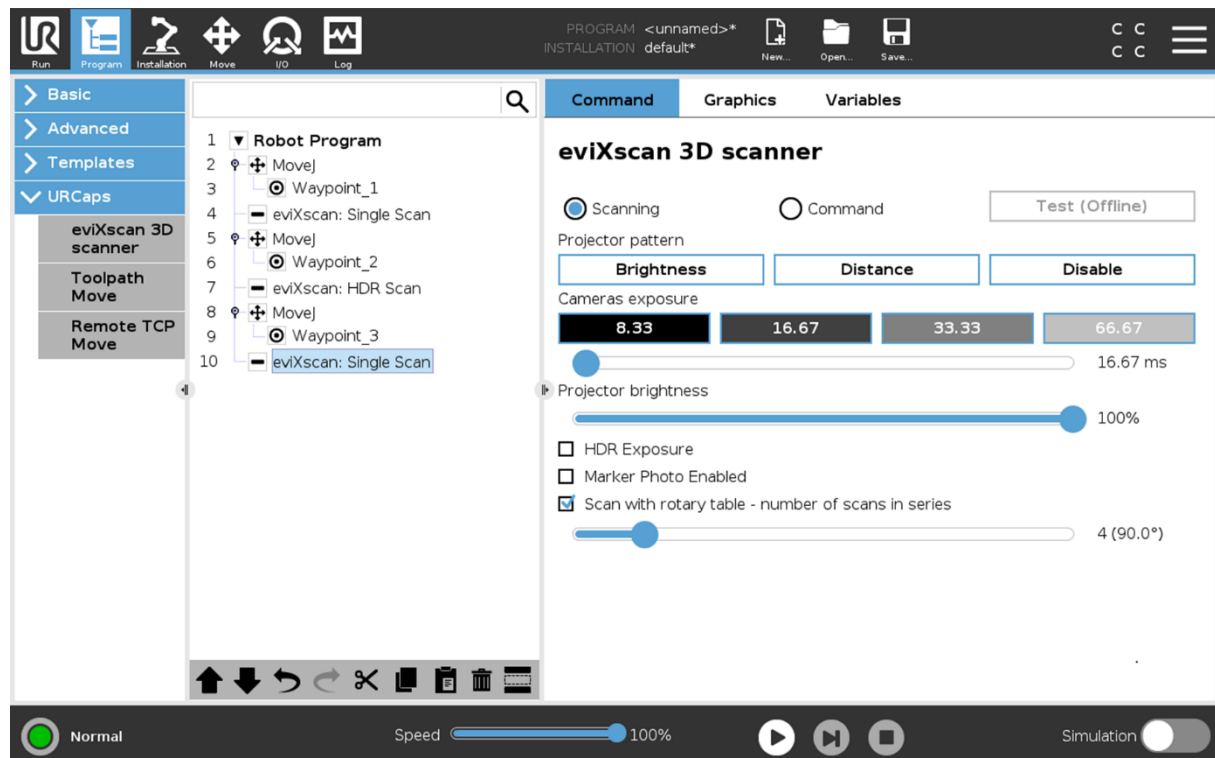
Allows to adjust the right intensity of light on the projector.

Marker Photo Enabled (G):

With that option the scanner capture additional photo on low exposure time especially dedicated to the correct markers detection. It is dedicated specially to scanning the objects which require the high light intensity and the high level of exposure time.

Number of scans in series (H):

Enables series scan mode using rotary table.



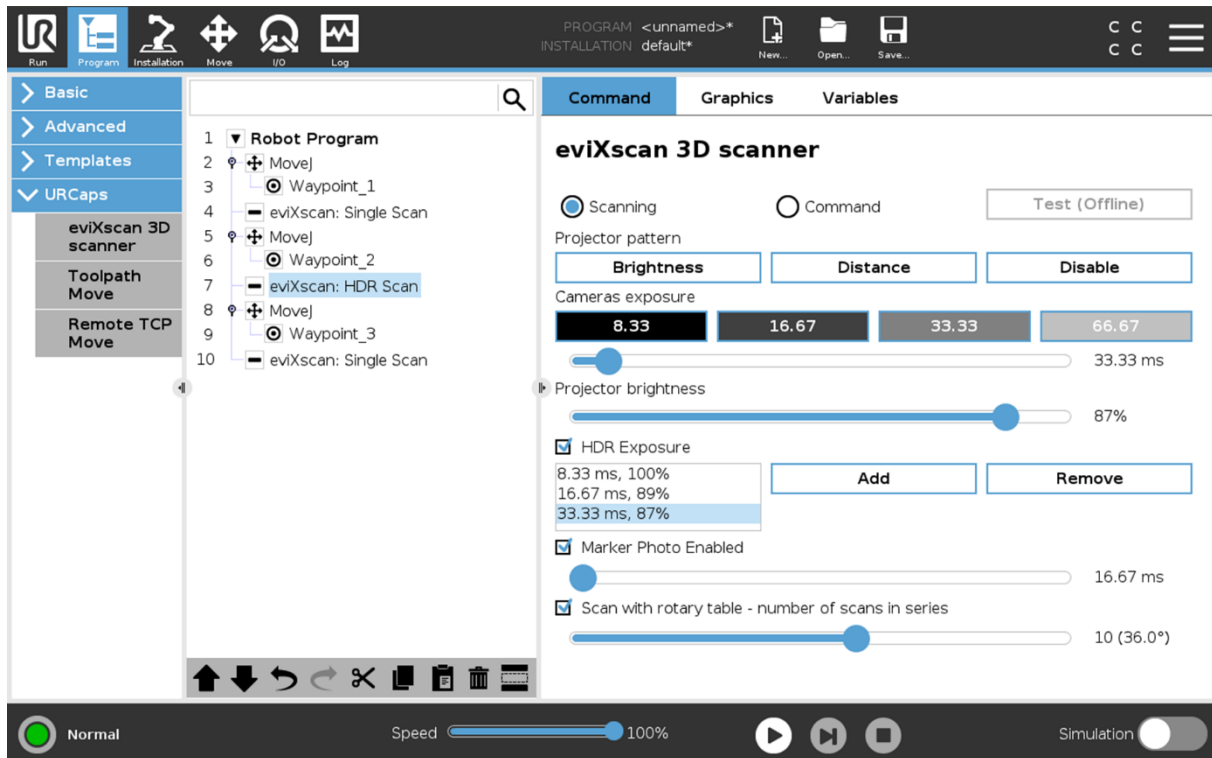
For more details about scanning process parameters, see eviXscan 3D Suite User Guide.

5.3. Multi-exposure Scan – HDR mode

This view provides additional parameters to control multi-exposure mode:

HDR Exposure (E):

Allows to manage a set of camera exposures times. It is possible to add, remove and change values of this set. The active item of the list is displayed on the sliders and can be modified with the sliders or buttons (D) and (E).



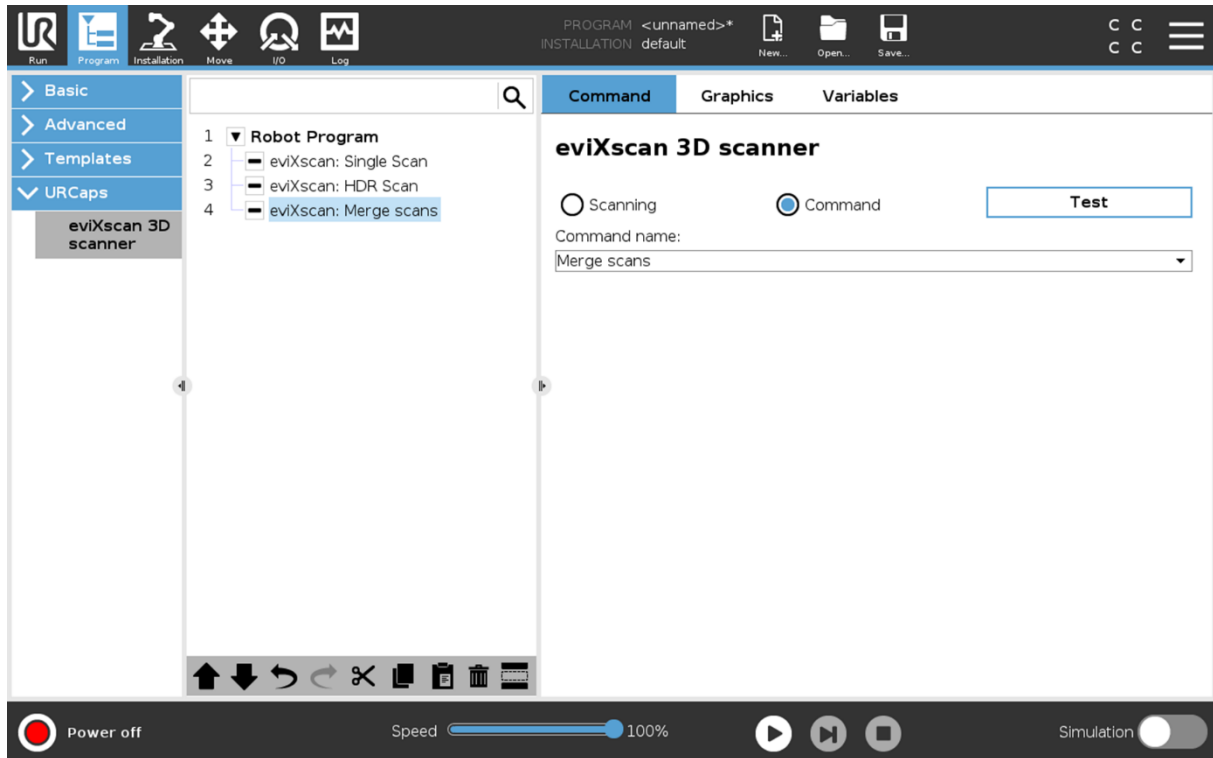
In this mode scanner takes set of photos with different exposure times and then the photos are combined. This gives better quality than single scan but takes more time. Every additional exposure level added to scan process increase the scanning time significantly.

For more details about scanning process parameters, see eviXscan 3D Suite User Guide.

5.4. Macro-command mode – scanning automation

This view is intended to execute scanning automation macro-command provided by eviXscan 3D Suite software. Every time when user clicks on [Command] URCap downloads a set of available macro-commands. It is possible to choose one command from dropdown list and test it by pressing [Test] button (B).

For more details about using macro-commands, see eviXscan 3D Suite User Guide.



6. Technical support

In case of problems, please contact our technical support:

Phone: +48 33 499 59 32

e-mail: support@evatronix.com