

OPERATING INSTRUCTIONS

MATCH Comfort App

for Universal Robots
GuideZ for Laptop for SCM-F/
SCM-C

DDOC01737

THE KNOW-HOW FACTORY

MATCH

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1 Supporting documents

NOTICE



Read through the installation and operating instructions before installing or working with the product.

The installation and operating instructions contain important notes for your personal safety. They must be read and understood by all persons who work with or handle the product during any phase of the product lifetime.



The documents listed below are available for download on our website www.zimmer-group.com.

- Installation and operating instructions
 - Catalogs, drawings, CAD data, performance data
 - Information on accessories
 - Technical data sheets
 - General Terms and Conditions, including warranty information.
- ⇒ Only those documents currently available on the website are valid.

In these installation and operating instructions, "product" refers to the product designation on the title page!

1.1 Notices and graphics in the installation and operating instructions

DANGER



This notice warns of an imminent danger to the life and health of people. Ignoring these notices can lead to serious injury or even death.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

WARNING



This notice warns of a situation that is potentially hazardous to personal health. Ignoring these notices can cause serious injury or damage to health.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

CAUTION



This notice warns of a situation that is potentially hazardous for people or that may result in material or environmental damage. Ignoring these notices may result in slight, temporary injuries or damage to the product or to the environment.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

NOTICE



General notices contain usage tips and valuable information, but no warnings of dangers to health.

INFORMATION



This category contains useful tips for handling the product efficiently. Failure to observe these tips will not result in damage to the product. This information does not include any information relevant to health or workplace safety.

2 Proper use

NOTICE



The product is only to be used in its original state with its original accessories, with no unauthorized changes and within the stipulated parameter limits and operating conditions.

Any other or secondary use is deemed improper.

- ▶ Operate the product only in compliance with the associated installation and operating instructions.
- ▶ Operate the product only when it is in a technical condition that corresponds to the guaranteed parameters and operating conditions.
- ⇒ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

The product is intended for installation and operation on the robot control panel *3PE* of the *OEM* robot control system.

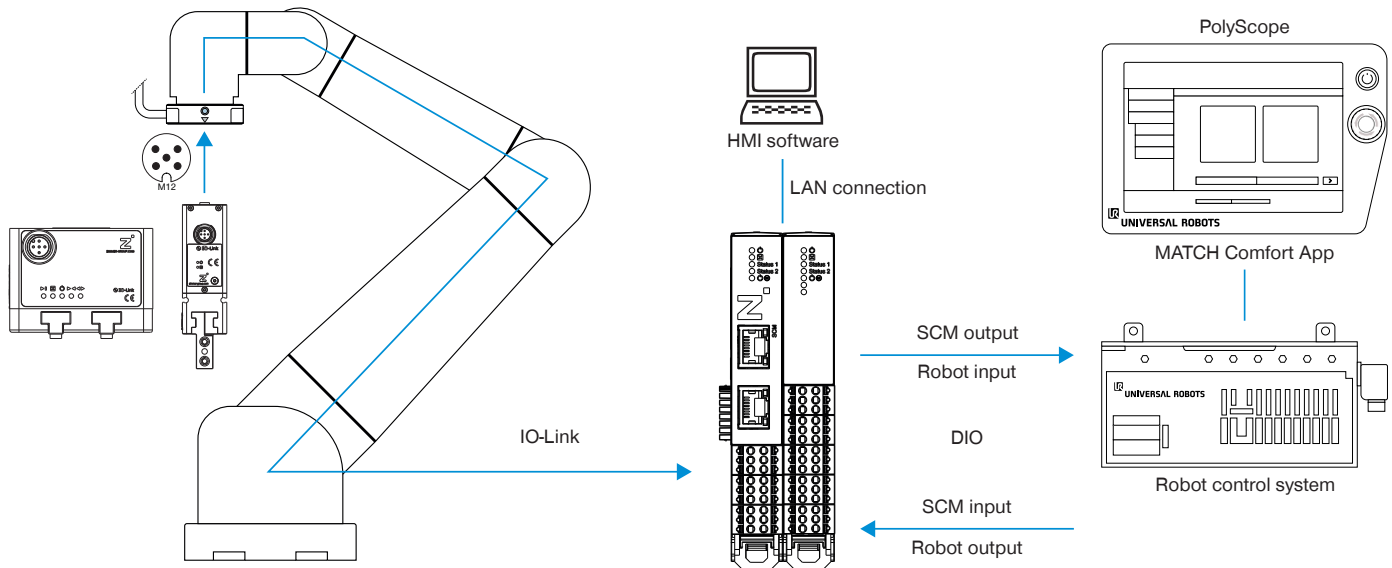
3 Personnel qualification

Installation, commissioning and maintenance may only be performed by trained specialists. These persons must have read and understood the installation and operating instructions in full.

4 Product description

The Smart Communication Module (SCM) is a gateway between the grippers and the robot control system. The SCM can be configured via the HMI software or MATCH Comfort App. The grippers can be controlled using the MATCH Comfort App on the robot control panel.

The image shows a simplified view of the structure of the overall system. All parts for the electrical connection of a gripper with the robot are included or are available from Zimmer GmbH as optional accessories.



5 Functional description

The MATCH Comfort App is used on the robot control panel to control grippers.

Depending on the configuration and the connection used, various robot jobs are available for interacting between robot inputs and robot outputs with the gripper.

The names of the dynamically generated robot jobs remain unchanged. The basic program does not have to be modified for configuration changes or redistribution of the robot inputs and robot outputs.

6 Accessories/scope of delivery

INFORMATION



If any accessories not sold or authorized by Zimmer GmbH are used, the function of the product cannot be guaranteed. Zimmer GmbH accessories are specifically tailored to the individual products.


► For optional accessories and those included in the scope of delivery, refer to our website.

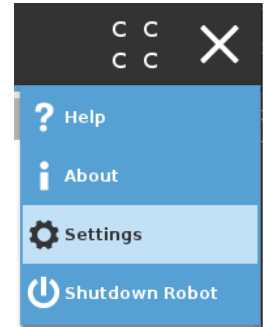
7 Installation

7.1 Installing the MATCH Comfort App

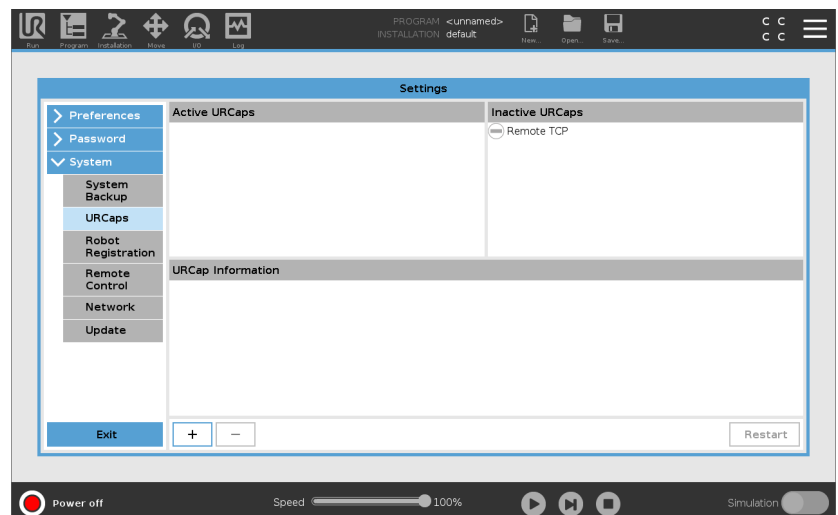
The MATCH Comfort App is installed to the robot control panel to enable direct control of the grippers.

- ▶ Download the *zimmerDigital-urcap* file in the *UR_Comfort_App* folder via the reference link listed in the digitalZ document or via the QR code.
- ▶ Copy the *zimmerDigital-urcap* file to a USB memory stick.
- ▶ Make sure that the robot control panel is already connected to the robot control system.
- ▶ Switch off the voltage supply on the robot tool I/O via the emergency stop button.
- ▶ Plug the USB memory stick with the installation files for the MATCH Comfort App into the robot control panel.

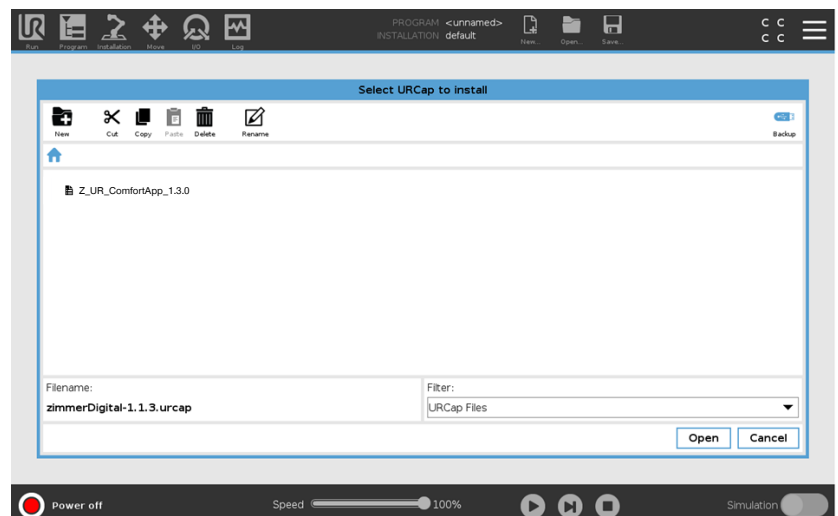
- ▶ Press the  button in the header.
- ▶ Press *Settings*.



- ▶ In the menu, press *System*.
- ▶ In the *System* menu item, press *URCaps*.
- ▶ Press the + Button.

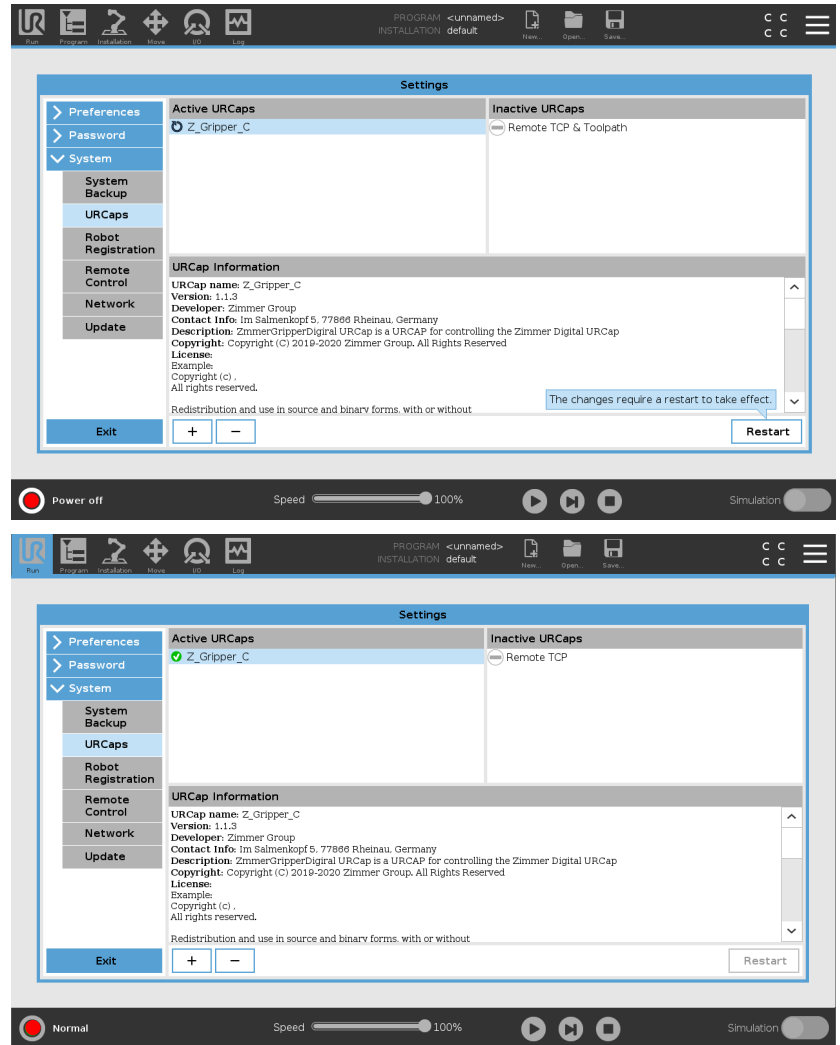


- ▶ Navigate to the file *zimmerDigital-urcap*.
- ▶ Select the file *Z_UR_ComfortApp_X.X.X*.
- ▶ Press the *Open* button.



- Press the *Restart* button to activate the firmware.
- ⇒ The robot control panel performs a restart.

- After the restart, check whether the MATCH Comfort App has been installed correctly.
- ⇒ The MATCH Comfort App has been installed correctly if the green checkmark is displayed in the *Active URCaps* area.



8 Commissioning

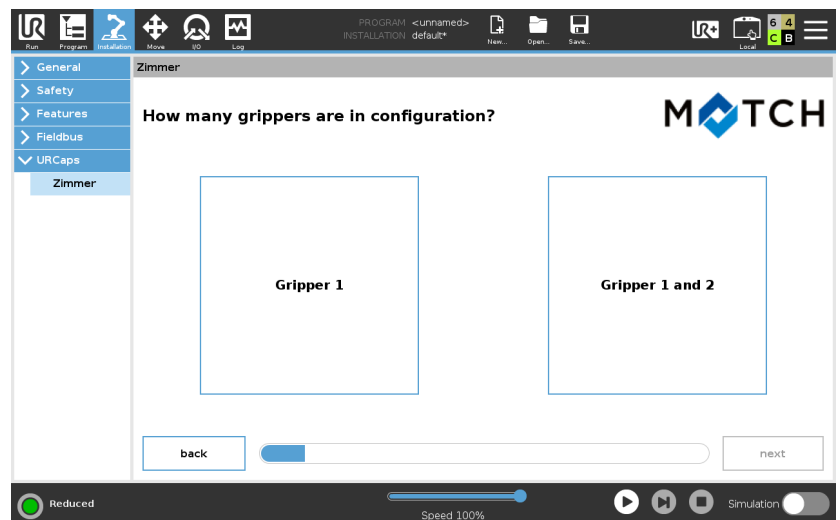
- Install the gripper to the robot.
- Switch the robot on.
- Press *Installation* in the menu bar.
- In the *URCaps* menu, press *Zimmer*.

8.1 Existing setup found

The following screen is displayed only if an existing setup is found for two grippers.

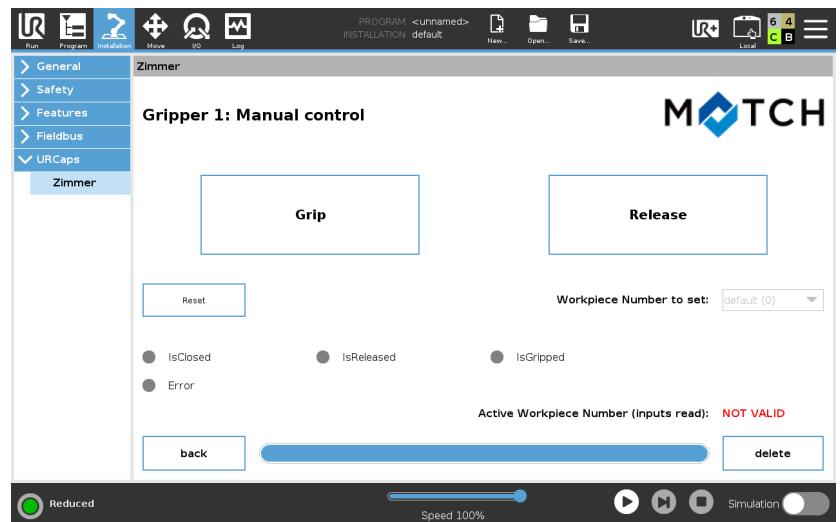
This screen does not appear if the available setup is only found for one gripper. In this case, the next screen is shown right away.

- Click the button of the desired gripper.
- ⇒ The *Manual control* screen for the manual control is displayed.

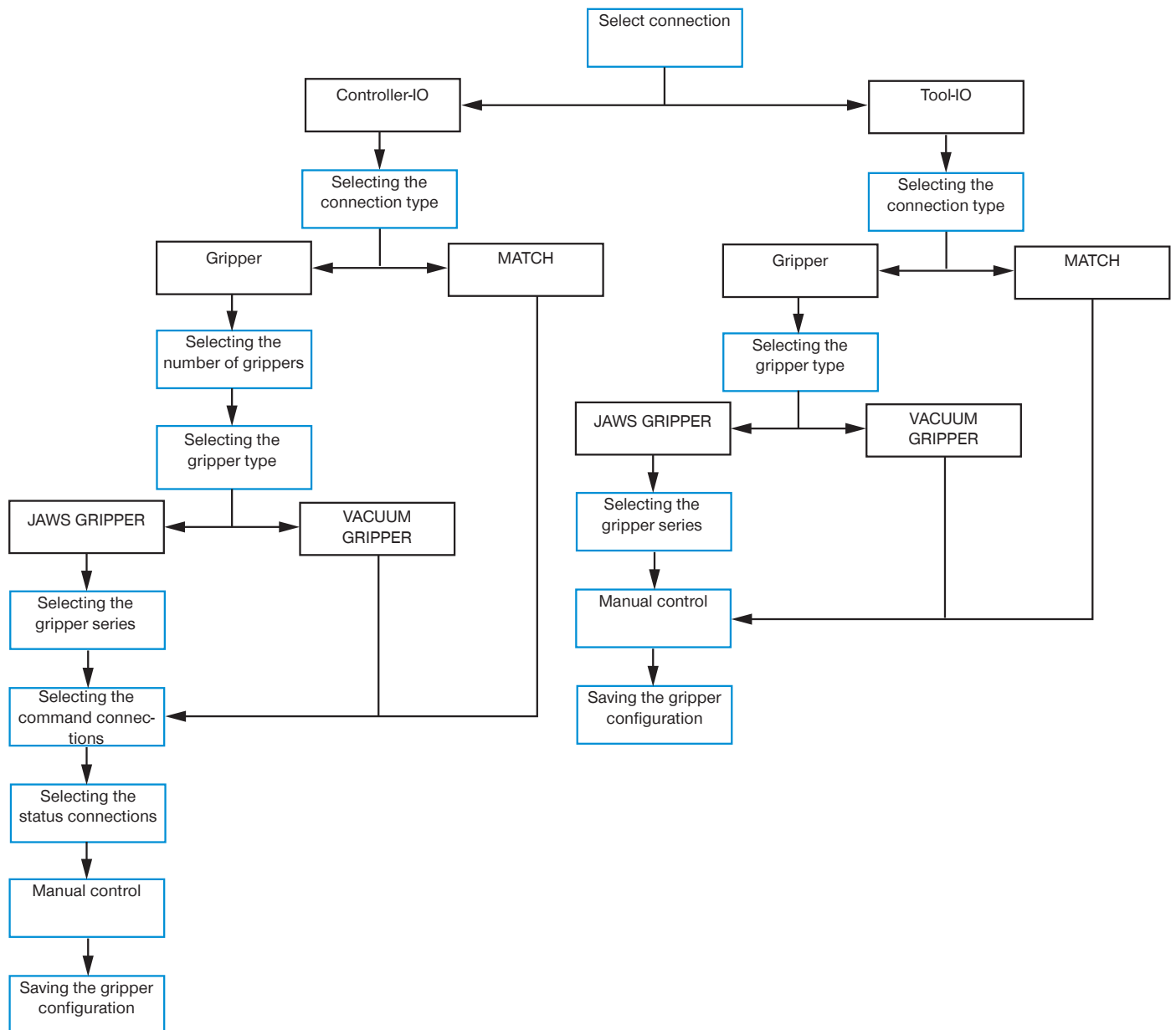


In the *Manual control* screen, you can operate the gripper manually and display the status.

- Click the *delete* button.

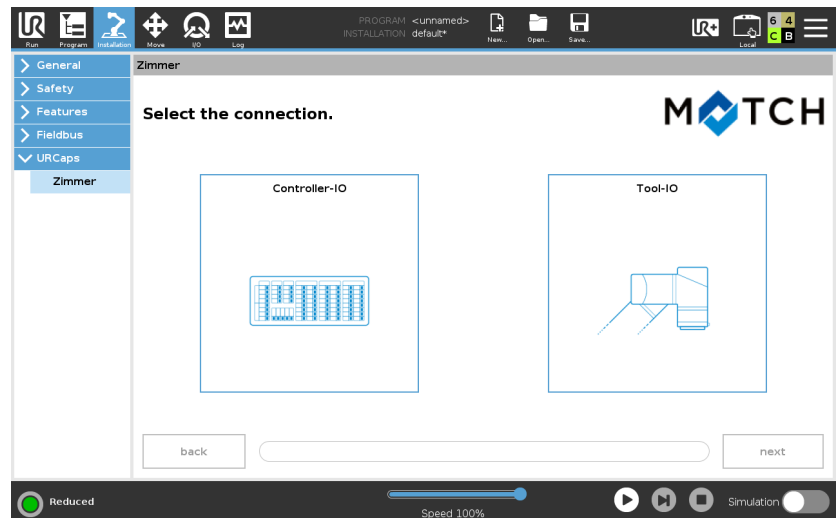


8.2 Creating a gripper configuration



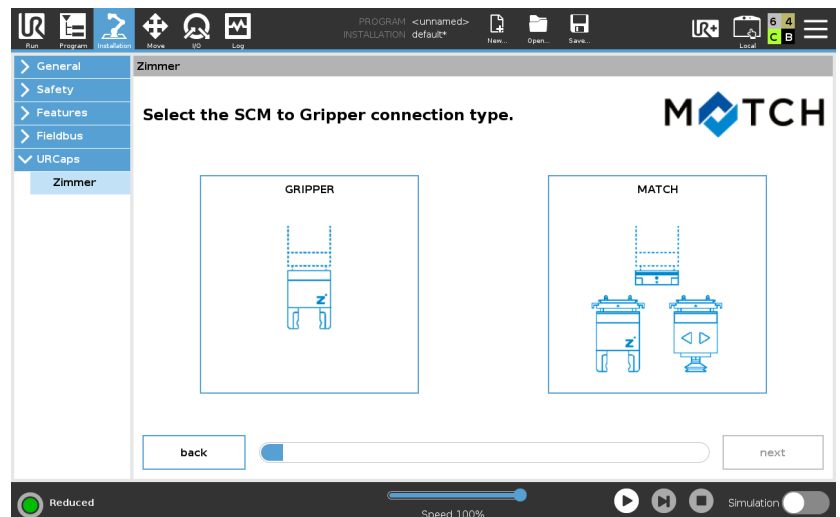
8.2.1 Selecting the connection

- ▶ Press the *Controller IO* button if you want to use a MATCH gripper without an integrated SCM on the MATCH robot module.
- ▶ Press the *Tool-IO* button if you want to use a gripper with an integrated SCM on the MATCH robot module.
- ▶ Click the *next* button.



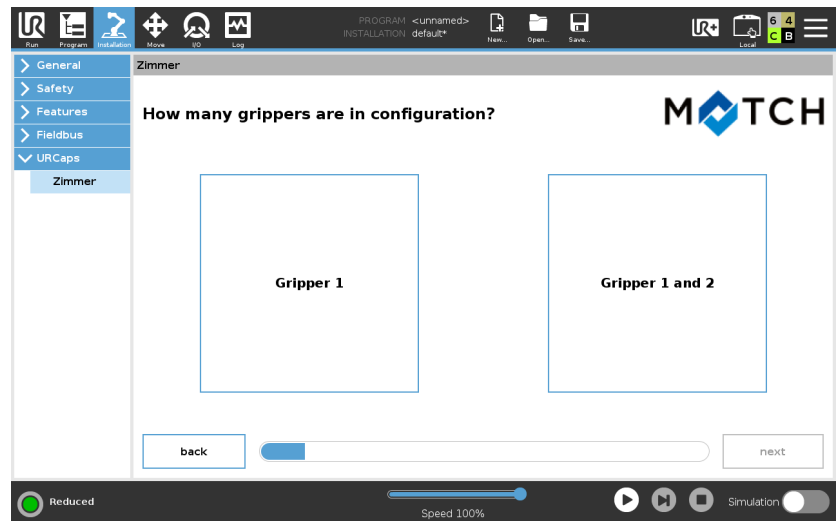
8.2.2 Selecting the connection type

- ▶ Click *Gripper* if you have connected a gripper.
- ▶ Click *MATCH* if you have connected a MATCH gripper.
- ▶ Click the *next* button.



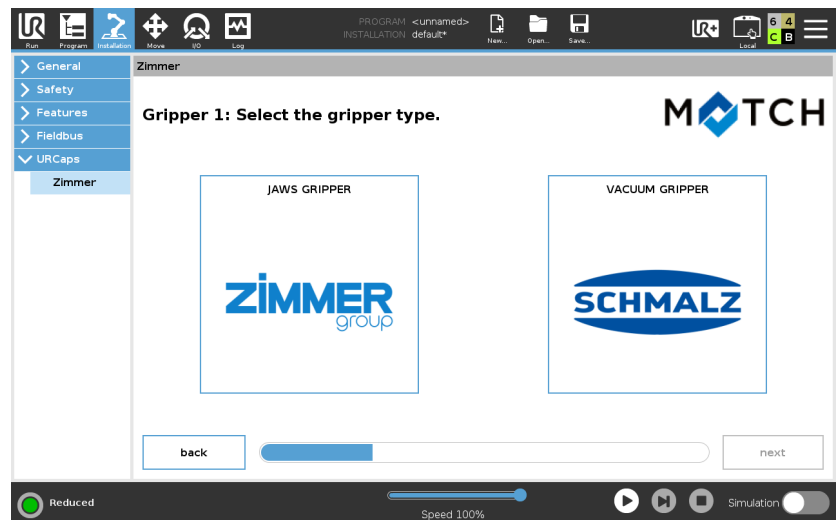
8.2.3 Selecting the number of grippers

- Click the desired number of grippers you want to have in your robot application.
- Click the *next* button.



8.2.4 Selecting the gripper type

- Click the desired gripper type.
- Click the *next* button.



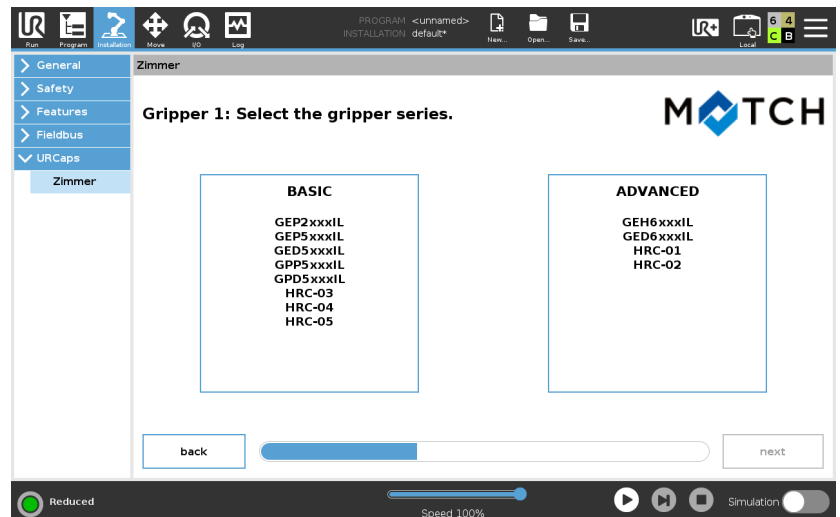
8.2.5 Selecting the gripper series

INFORMATION



Basic and *Advanced* designate different classes of grippers from Zimmer GmbH.

- Click the class of your gripper.
- Click the *next* button.



8.2.6 Selecting the command connections

NOTICE



The gripper wiring must match the gripper configuration done in the MATCH Comfort App.

NOTICE



If this screen is displayed for the first time, a standard assignment is displayed.

► Complete the wiring precisely as shown on this screen.

To reset the values to the defaults, edit the values or return to the selection of the number of grippers (see the section "Selecting the number of grippers").

► Establish the correspondence of the robot output number with the digital input function of the SCM.

You can accept the default assignment or change it.

► Click the *next* button if you want to keep the default assignment.

Editing the command connection

► Click the button of the desired signal.

- e.g. Release

► Click the desired output.

- e.g. DO7

⇒ The output has been assigned to the signal.

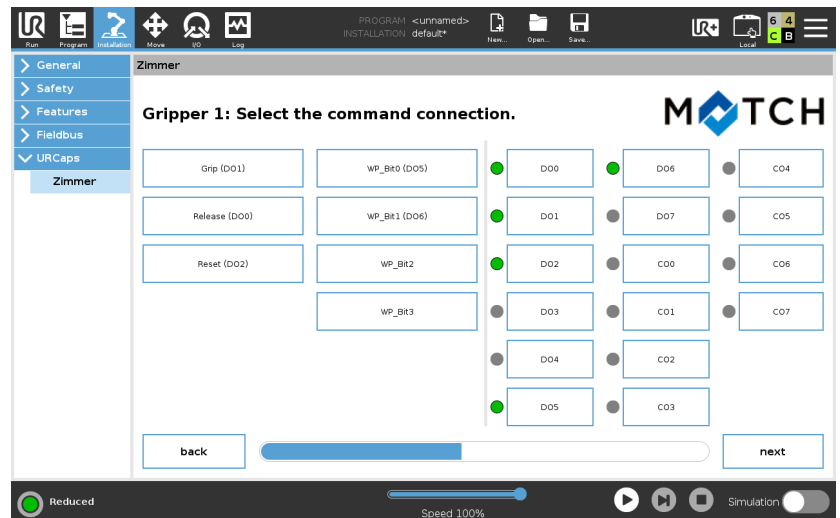
⇒ The button of the signal is expanded by adding the output.

- e.g. Release (DO7)

► Press the *Next* button.

► In the prompt, click the *YES* button.

⇒ The *Select status connections* screen for status connections is displayed.



Default assignment



Do you accept the default assignment?

✓ Yes

No

8.2.7 Selecting the status connections

- Establish the correspondence of the robot input number with the digital input function of the SCM.

NOTICE



If this screen is displayed for the first time, a standard assignment is displayed.

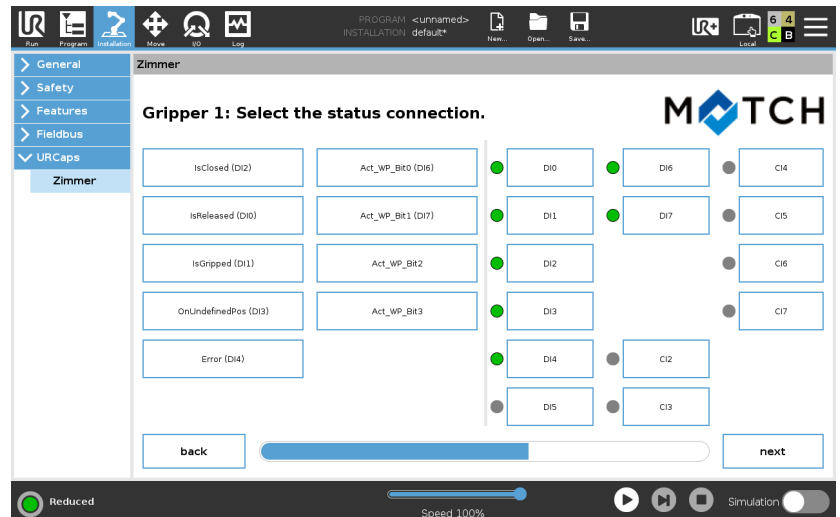
- Complete the wiring precisely as shown on this screen.

You can accept the default assignment or change it.

- Click the *next* button if you want to keep the default assignment.

Editing the status connections

- Click the button of the desired signal.
 - e.g. IsClosed
- Click the desired input.
 - e.g. DI7
- ⇒ The input has been assigned to the signal.
- ⇒ The button of the signal is expanded by adding the input.
 - e.g. IsClosed (DI7)
- Press the *Next* button.
- In the prompt, click the *YES* button.



Default assignment



Do you accept the default assignment?

✓ Yes

No

8.2.8 Manual control

NOTICE

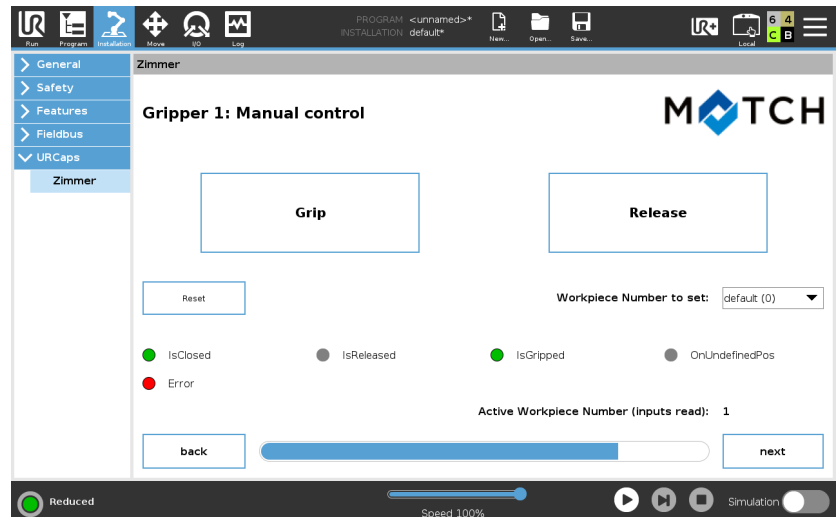


The prerequisite for the function test is that the wiring between the robot and SCM is present and that the robot, SCM and gripper are switched on.

You can test and operate the function of the gripper and view its status in the lower area of the screen.

Connection type: Gripper

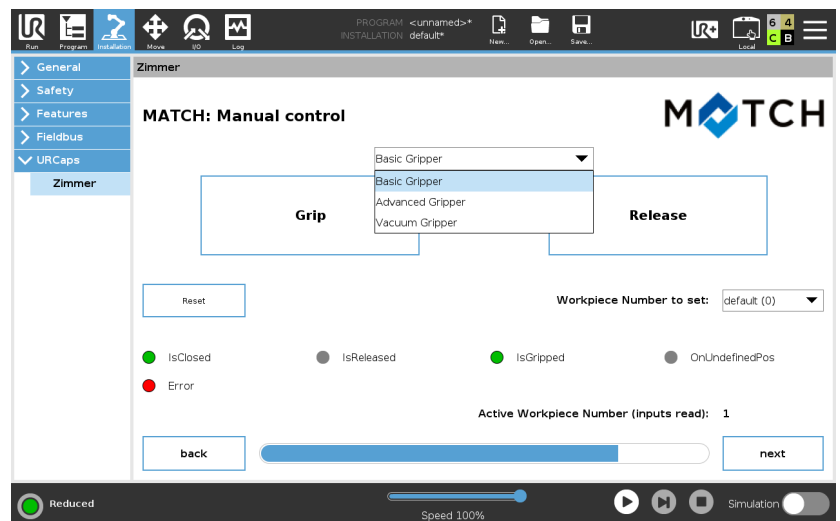
You can test and operate the function of the gripper and view its status in the lower area of the screen.



Connection type: MATCH

You can test and operate the function of the gripper and view its status in the lower area of the screen.

You can choose between the grippers in the drop-down menu.



► Click the *next* button.

8.2.9 Saving the gripper configuration

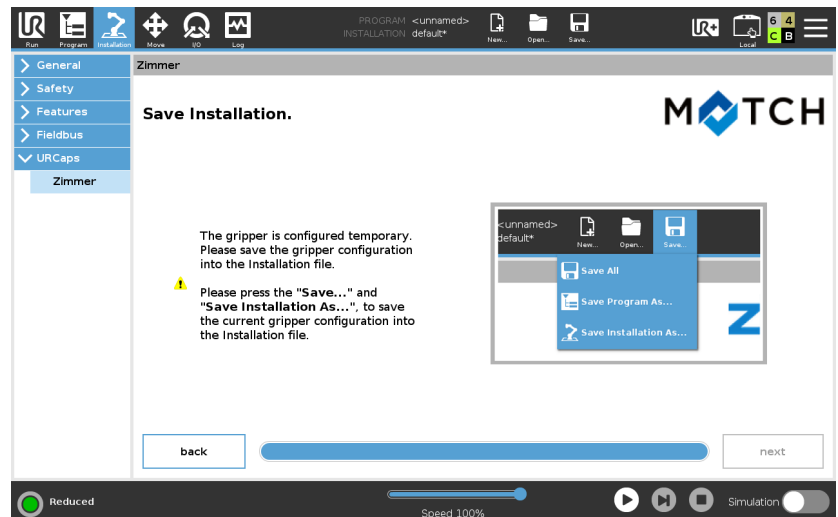
NOTICE



The settings are temporary.

- Save the settings to the installation file.

- In the prompt, press the *Save All* or *Save Installation As* button.
- ⇒ The gripper configuration has been stored.
- In the prompt, click the *Ok* button.
- ⇒ The gripper configuration is complete.
- ⇒ The function blocks/subprograms have been created and are available for programming.



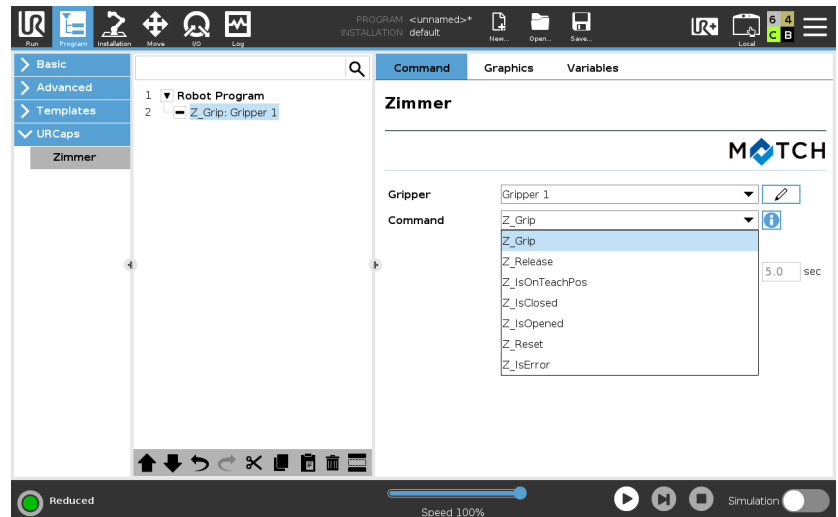
8.3 URCaps

Program nodes can be set in the *URCaps* menu item.

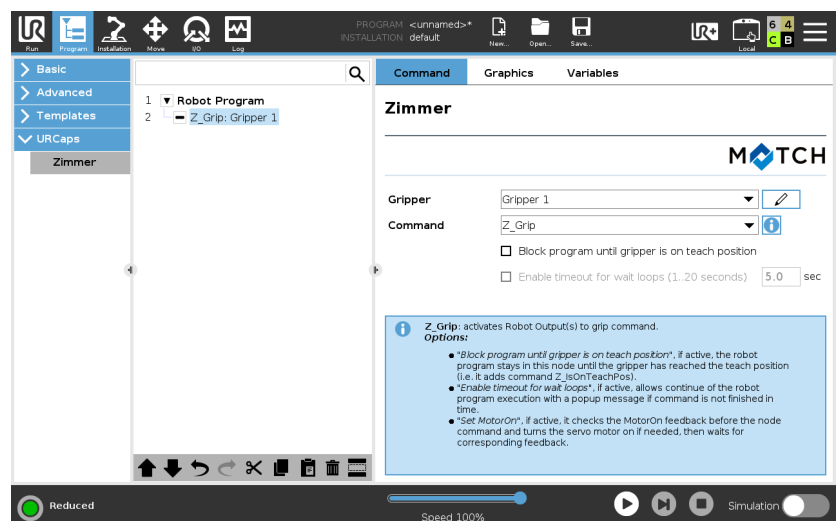
- Press *Program* in the menu bar.
- In the *URCaps* menu, press *Zimmer*.

8.3.1 URCaps Zimmer

- In the *Command* drop-down menu, select the robot job that you want to define for the gripper.



- Activate the desired checkboxes.



9 Operation

9.1 Control principle of the gripper

- ▶ Prepare the *Advanced* gripper for the control system:
 - ▶ If necessary, do a reference run (Z_Homing).
 - ▶ Switch on the motor (Z_MotorOn).
 - ▶ Check whether the motor is switched on (Z_IsMotorOn).
 ⇒ The gripper is prepared for the control system if no error is present (Z_IsError).
- ▶ If more than one workpiece is being used, adjust the workpiece (Z_ChangeWP(number)) configured using the HMI software ZG_IO_LINK_HMI.
- ▶ Check whether a workpiece has changed (Z_IsWpChanged(number)).
- ▶ Grip (Z_Grip) or release (Z_Release) the workpiece.
- ▶ Check the position of the gripper jaw (Z_IsOnTeachPos, Z_IsOpened, Z_IsClosed or Z_IsOnUndefPos).

9.2 Overview of generated robot jobs


After successful configuration of the grippers using the HMI software ZG_IO_LINK_HMI, robot jobs for various functions are generated in the robot control panel. The robot jobs can be called up from user jobs. The following robot jobs can be created using the MATCH Comfort App.

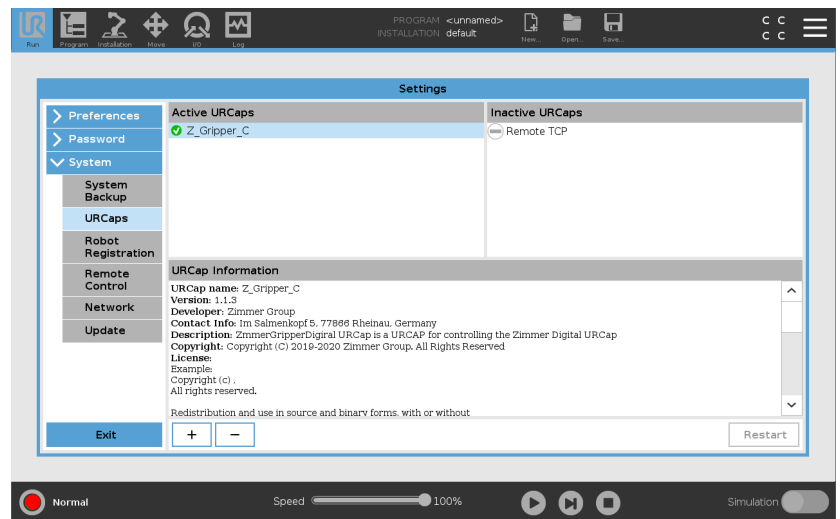
Not all robot jobs are generated after successful configuration of the grippers. The job is created only if the corresponding command or status is wired and used by the equipped gripper(s).

Generated robot job name	Parameter In	Parameter Out	Function
Z_Grip1 Z_Grip2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Gripping
Z_Release1 Z_Release2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Release
Z_MotorOn1 Z_MotorOn2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Switch on motor for <i>Advanced</i> grippers.
Z_MotorOff1 Z_MotorOff2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Switch off motor if gripper is present.
Z_Homing1 Z_Homing2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Perform reference run for <i>Advanced</i> grippers.
Z_Reset1 Z_Reset2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Reset if gripper is present.
Z_ChangeWP1 Z_ChangeWP2	<i>WpNumber</i> = workpiece number (1 to 15)	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Set workpiece number (n) for use with SCM.
Z_IsWpChanged1 Z_IsWpChanged2	<i>WpNumber</i> = workpiece number (1 to 15)	<i>bWpchanged</i> = <i>TRUE</i> , if workpiece is active = <i>FALSE</i> , if workpiece is not active <i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Disables Error/Warning for robot if gripper present.

Generated robot job name	Parameter In	Parameter Out	Function
Z_IsOpened1 Z_IsOpened2	1: Address gripper 1 2: Address gripper 2	<i>bOpened</i> = <i>TRUE</i> , if gripper is open = <i>FALSE</i> , if gripper is closed <i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Outputs <i>TRUE</i> if the gripper is open.
Z_IsClosed1 Z_IsClosed2	1: Address gripper 1 2: Address gripper 2	<i>bClosed</i> = <i>TRUE</i> , if gripper is open = <i>FALSE</i> , if gripper is closed <i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Outputs <i>TRUE</i> if the gripper is closed.
Z_IsOnTeachPos1 Z_IsOnTeachPos2	1: Address gripper 1 2: Address gripper 2	<i>bIsOnTeachPos</i> = <i>TRUE</i> , if gripper is set to TeachPosition = <i>FALSE</i> , if gripper is not set to TeachPosition <i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Outputs <i>TRUE</i> if the gripper is set to <i>Teach-Position</i> .
Z_IsOnUndefPos1 Z_IsOnUndefPos2	1: Address gripper 1 2: Address gripper 2	<i>bUndefPos</i> = <i>TRUE</i> , if gripper is set to Undefined-Position = <i>FALSE</i> , if gripper is not set to UndefinedPosition <i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Outputs <i>TRUE</i> if the gripper is set to <i>OnUndefinedPos</i> .
Z_IsError1 Z_IsError2	1: Address gripper 1 2: Address gripper 2	<i>bError</i> = <i>TRUE</i> , if gripper is in error state = <i>FALSE</i> , if gripper is not in error state <i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Outputs <i>TRUE</i> if the gripper is in an error state.
Z_IsMotorOn1 Z_IsMotorOn2	1: Address gripper 1 2: Address gripper 2	<i>bMotorOn</i> = <i>TRUE</i> , if motor is on = <i>FALSE</i> , if motor is off <i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Outputs <i>TRUE</i> if the motor of the gripper is switched on.

10 Uninstalling the MATCH Comfort app

- ▶ Press the  button in the header.
- ▶ Press *Settings*.
- ▶ In the menu, press *System*.
- ▶ In the *System* menu item, press *URCaps*.
- ▶ In the *Active URCaps* area, press *Z_Gripper_C*.
- ▶ Press the - Button.
- ⇒ Uninstallation is complete.
- ▶ Press the *Restart* button to activate the firmware.
- ⇒ The robot control panel performs a restart.



11 Error diagnosis

INFORMATION



- ▶ More information can be found in the installation and operating instructions of the gripper.
- ▶ Please contact Zimmer Customer Service if you have any questions.