INSTALLATION AND OPERATING INSTRUCTIONS

Robot-specific SCM and Comfort App for ABB robots

DDOC01632

THE KNOW-HOW FACTORY

Glossary

Parameter	Explanation
Cmd_Grip	Motion command for gripping the workpiece
Cmd_Release	Motion command for releasing the workpiece
IsReleased	The gripper signals that it is open.
IsGrasped	The gripper has gripped the workpiece and the position is within the taught-in workpiece window.
IsClosed	The gripper has gripped but there is no workpiece, so it is in the maximum position.

Content

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 to persons. Ignoring these notices can cause minor, reversible injuries.

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

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

NOTICE

This notice warns of possible material and environmental damage. Ignoring these notices can result in damage to the product or 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.

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 Safety notices

CAUTION

Risk of injury and material damage in case of non-compliance

Installation, commissioning, maintenance and repairs may only be performed by qualified specialists in accordance with these installation and operating instructions.

The product is state-of-the-art.

Grippers with a control system are used on industrial machines for IO-Link communication.

The following are examples of situations in which the product may cause a hazard:

- The product is not properly installed, used or maintained.
- The product is not used for its designated purpose.
- The locally applicable regulations, laws, directives or guidelines are not observed.

► The product may only be used in accordance with these installation and operating instructions and the product's technical data.

⇨ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

3 Proper use

NOTICE

Material damage and malfunction in case of non-compliance

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 designed exclusively for electric operation using a 24 V DC power supply.
- Direct contact with perishable goods/food is not permitted.

4 Personnel qualification

WARNING

Inadequate qualification can cause injury and material damage

If inadequately qualified personnel perform work on the product, this can cause serious injuries and significant material damage.

- ► All work on the product must be performed by qualified personnel.
- ► Before working with the product, read the document in its entirety and make sure that you have understood everything.
- ► Observe country-specific accident prevention regulations and the general safety notices.

The following qualifications are a prerequisite for performing various work on the product.

4.1 Electricians

Electricians are able to perform work on electrical systems, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.2 Specialists

Specialists are able to perform the assigned work, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.3 Instructed personnel

Instructed personnel have been trained by the operating company on the tasks and possible dangers of improper behavior.

4.4 Service personnel

Service personnel are able to perform the assigned work and can recognize and avoid possible dangers due to their technical training, knowledge and experience.

4.5 Additional qualifications

Persons who work with the product must be familiar with the valid safety regulations and laws as well as the standards, guidelines and laws listed in this document.

Personnel who work with the product must have facility-issued authorization to commission, program, configure, operate, maintain and also decommission this product.

5 Product description

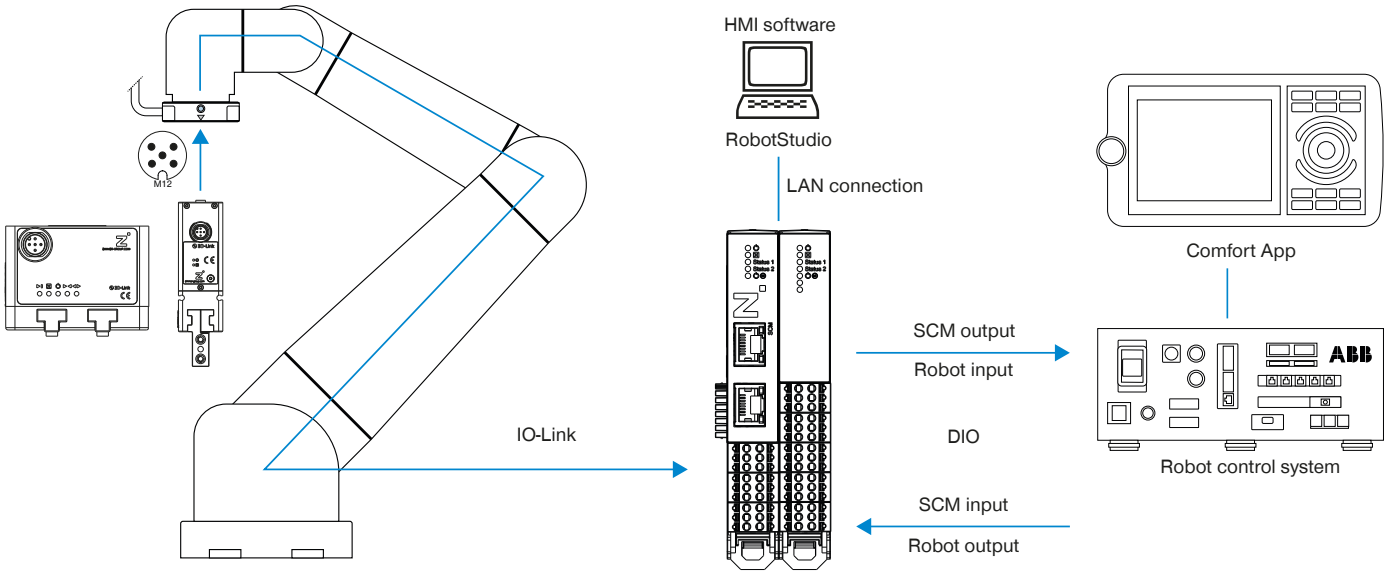
The Smart Communication Module (SCM) is a gateway between the grippers and the robot control system. The SCM can be configured via the HMI software or Comfort App. The grippers can be controlled using the Comfort App on the robot control panel.

Using the Comfort App, Zimmer GmbH grippers can be controlled directly from the robot control panel and generated robot jobs can be configured.

The generated robot tasks simplify the use of Zimmer GmbH grippers in the customer program and reduce the development time.

The names of the newly configured robot jobs remain unchanged. This means that the basic program does not have to be modified for configuration changes.

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.



Installation steps:

- ► Install the hardware.
- ► Establish the electrical connections at the robot control system.
- ► Install the HMI software and teach in the workpieces.
- ► Install the Comfort App, see the operating instructions for the robot-specific Comfort App.

6 Functional description

6.1 LED status display

The LED display is provided on each submodule. The left module with the network sockets is the basic module. The right module with the digital IO is the IO module.

6.1.1 Basic module LED display

Name	Status	Function
⏻	Continuous light	Supply voltage OK
	Flashing	HMI is connected, the SCM is teaching the IO-Link device.
	Flashing	HMI assumes control, the IO module LEDs are off.
	off	Supply voltage not OK
☒	Continuous light	An error is present
	Flashing	There is an external error, see the “Error diagnosis” section.
Status 1/2 (IO-Link device)	off	HMI is connected.
	Continuous light	HMI is disconnected, IO-Link device has an error.
	Flashing	IO-Link device is disconnected.
	Continuous light	HMI is disconnected, IO-LINK device is open or closed at a standstill.
	Continuous light	HMI is disconnected, IO-LINK device is in motion or on the workpiece.
⏻	Continuous light	Actuator voltage OK
(P 24 V)	off	Actuator voltage not OK

6.1.2 IO module LED display

Name	Status	Function
⏻	Continuous light	• Supply voltage OK
	off	• HMI is disconnected, supply voltage is not OK.
		• HMI is connected, supply voltage is OK.
☒	Continuous light	• An error is present
	Flashing	• There is an external error, see the “Error diagnosis” section.
Status 1/2 (IO-Link device)	off	• HMI is connected, the IO module is inactive.
	Continuous light	• Gripper has a motion task in the *release* direction.
	Continuous light	• Gripper has a motion task in the *grasp* direction.
⏻ Ⓜ	Continuous light	• Actuator voltage OK
(P 24 V)	off	• Actuator voltage not OK
-	Inactive	-

7 Technical data

INFORMATION

► You can find the information in the technical data sheet on our website.

This data varies within the series, depending on the specific design.

8 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.

9 Transportation/storage/preservation

► Transport and storage of the product must be done only with the original packaging.

► If the product has already been installed on the superordinate machine unit, care must be taken during transport to ensure that no unexpected movements can occur.

► Before commissioning the product and after transport, check all power and communication connections as well as all mechanical connections.

► Visually inspect all components.

10 Installation

WARNING

Risk of injury due to uncontrolled movements

Risk of injury in case of unexpected movement of the machine or system into which the product is to be installed.

- ► Switch off the energy supply of the machine before any work.
- ► Secure the power supply against being switched on unintentionally.
- ► Check the machine for any residual energy that may be present.

CAUTION

Risk of injury due to uncontrolled movements

Risk of injury in the event of uncontrolled movement of the product when the power supply is connected.

- ► Switch off the power supply to the machine before carrying out any work.
- ► Secure the power supply against being switched on unintentionally.
- ► Check the machine for any residual energy that may be present.

10.1 Installing hardware

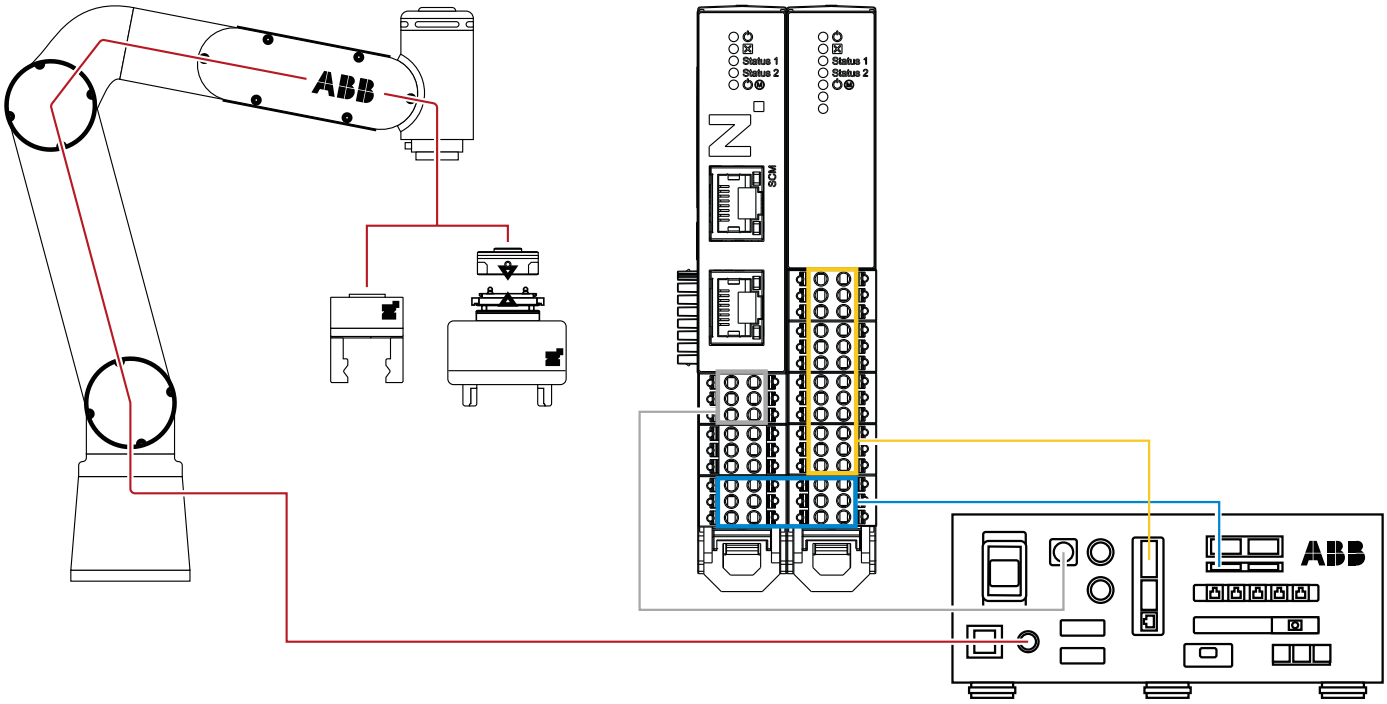
INFORMATION

- ► For more information, refer to the circuit diagram on our website.

The product is designed for installation on a standard 35 mm-wide profile rail.

The mounting position can be upright on the profile rail or suspended (profile rail mounted in the control cabinet).

- ► Keep a clearance of 5 cm each on the side of the ventilation slots of the product for air circulation.



10.1.1 Installing standard wiring

NOTICE

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

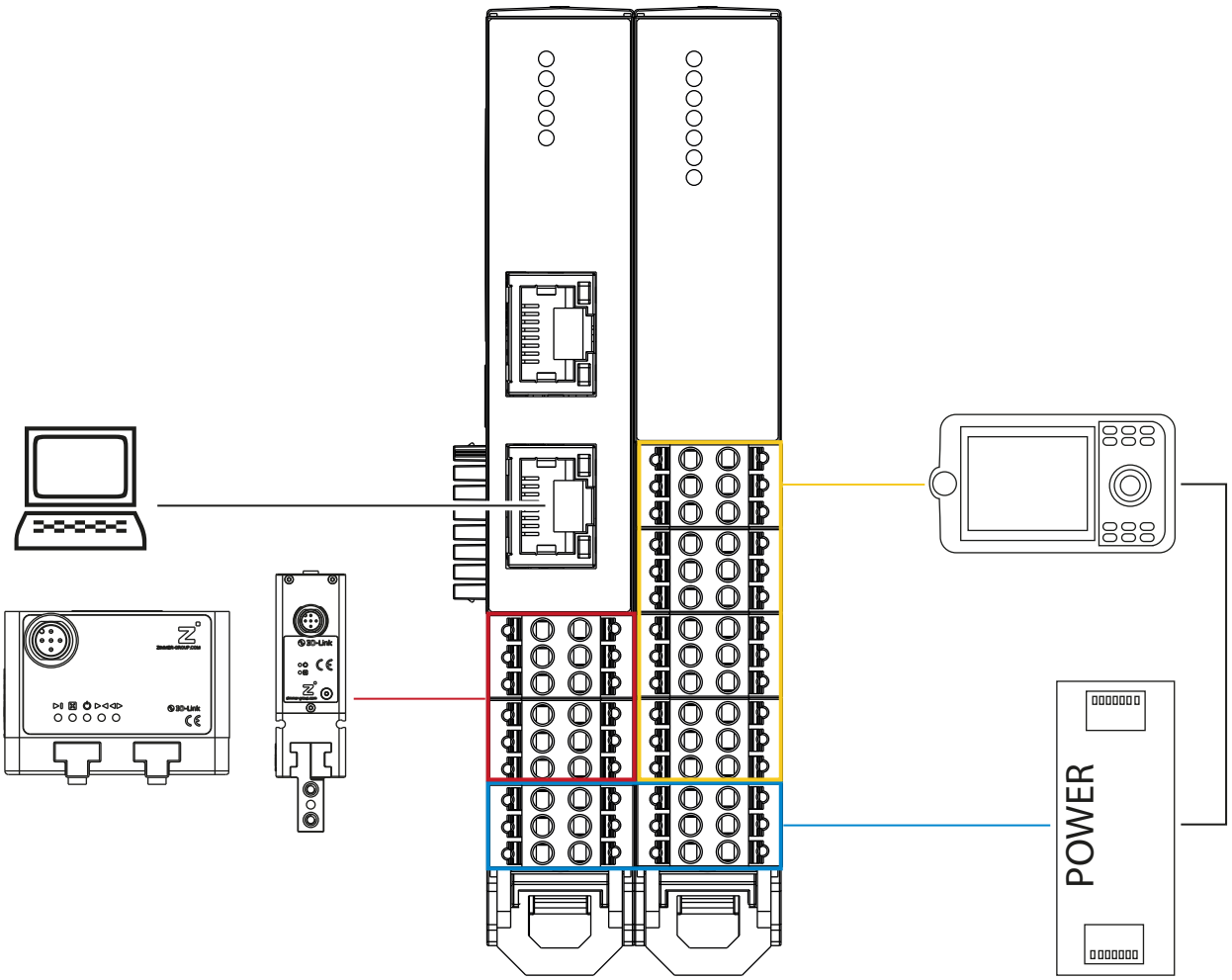
NOTICE

Because the robot control system does not provide sufficient power, an external power supply unit is necessary for the 24 V power supply.

For the connection assignment of the robot inputs and robot outputs, refer to the manufacturer documentation.

For the connection assignment of the SCM inputs and SCM outputs, refer to the installation and operating instructions of the SCM. The installation and operating instructions of the SCM are downloaded along with the Zimmer HMI.

► Note the potential equalization by connecting the GND/0V potentials of the SCM and robot control system.



The standard wiring corresponds to the standard configuration in the Comfort App. If you do the standard wiring and keep the standard configuration in the Comfort App, your grippers will function with the robot.

You have the option to change the standard wiring.

One reason for changing the standard wiring is when the robot input and output numbers are already used for a different external application and thus you cannot assign these to the gripper functions.

Another reason is if, on your robot, you can assign more than eight robot inputs and eight robot outputs to the gripper functions. In this case, you can use the full functionality of the SCM by assigning all SCM inputs and SCM outputs to the robot inputs and robot outputs.

10.1.2 Standard wiring for individual grippers

SCM input and SCM output		
	Basic gripper	**Advanced gripper**
Cmd_Release	Out1	Out1
Cmd_Grip	Out2	Out2
Cmd_Reset	Out3	Out3
Cmd_MotorOn	-	Out4
Cmd_Homing	-	Out5
Cmd_WP_Bit0	Out6	Out6
Cmd_WP_Bit1	Out7	Out7
Cmd_WP_Bit2	-	-
Cmd_WP_Bit3	-	-
IsReleased	In1	In1
IsGripped	In2	In2
IsClosed	In3	In3
OnUndefinedPos	In4	In4
Error	In5	In5
MotorOn	-	In6
HomingOk	-	-
Act_WP_Bit0	In7	In7
Act_WP_Bit1	In8	In8
Act_WP_Bit2	-	-
Act_WP_Bit3	-	-

10.1.2.1 Basic gripper

If you keep the standard wiring, you can address workpiece numbers 1 to 7 because the SCM input Cmd_WP_Bit3 and the SCM output Act_WP_Bit3 are not connected.

Deviate from the standard wiring and add the necessary signals in the wiring to address all workpiece numbers from 1 to 15. A corresponding assignment of the SCM inputs and SCM outputs in the Comfort App is required.

SCM connection	Command	Color	Robot output
1	Cmd_Release	White	ZG_DO0
2	Cmd_Grip	Brown	ZG_DO1
3	Cmd_Reset	Green	ZG_DO2
4	-	-	-
5	-	-	-
6	-	-	-
7	-	-	-
8	-	-	-
9	Cmd_WP_Bit0	Black	ZG_DO5
10	Cmd_WP_Bit1	Violet	ZG_DO6
11	Cmd_WP_Bit2	Gray/pink	-
12	Cmd_WP_Bit3	Red/blue	-
SCM connection	**Confirmation**	**Color**	**Robot input**
1	IsReleased	White	ZG_DI0
2	IsGripped	Brown	ZG_DI1
3	IsClosed	Green	ZG_DI2
4	OnUndefinedPos	Yellow	ZG_DI3
5	Error	Gray	ZG_DI4
6	-	-	-
7	-	-	-
8	-	-	-
9	Act_WP_Bit0	Black	ZG_DI6
10	Act_WP_Bit1	Violet	ZG_DI7
11	Act_WP_Bit2	Gray/pink	-
12	Act_WP_Bit3	Red/blue	-

10.1.2.2 Advanced gripper

If you keep the standard wiring, you can address workpiece numbers 1 to 3, because the SCM inputs (Cmd_WP_Bit2 and Cmd_WP_Bit3) and SCM outputs (Act_WP_Bit2 and Act_WP_Bit3) are not connected.

Deviate from the standard wiring and add the necessary signals in the wiring to address all workpiece numbers from 1 to 15. A corresponding assignment of the SCM inputs and SCM outputs in the Comfort App is required.

SCM connection	Command	Color	Robot output
1	Cmd_Release	White	ZG_DO0
2	Cmd_Grip	Brown	ZG_DO1
3	Cmd_Reset	Green	ZG_DO2
4	Cmd_MotorOn	Yellow	ZG_DO3
5	Cmd_Homing	Gray	ZG_DO4
6	-	-	-
7	-	-	-
8	-	-	-
9	Cmd_WP_Bit0	Black	ZG_DO5
10	Cmd_WP_Bit1	Violet	ZG_DO6
11	Cmd_WP_Bit2	Gray/pink	-
12	Cmd_WP_Bit3	Red/blue	-
SCM connection	**Confirmation**	**Color**	**Robot input**
1	IsReleased	White	ZG_DI0
2	IsGripped	Brown	ZG_DI1
3	IsClosed	Green	ZG_DI2
4	OnUndefinedPos	Yellow	ZG_DI3
5	Error	Gray	ZG_DI4
6	MotorOn	Blue	ZG_DI5
7	-	-	-
8	-	-	-
9	Act_WP_Bit0	Black	ZG_DI6
10	Act_WP_Bit1	Violet	ZG_DI7
11	Act_WP_Bit2	Gray/pink	-
12	Act_WP_Bit3	Red/blue	-

10.1.3 Standard wiring for two grippers

In the scenario with two grippers, the SCM does not add the SCM inputs and SCM outputs provided for the workpiece numbers. Even if your robot has additional robot input and robot output lines available, only one workpiece per gripper is addressed. Some of the status lines, such as *isUndefinedPosition*, *isHomingOK*, *isMotorOn* are not used in some of the standard configurations.

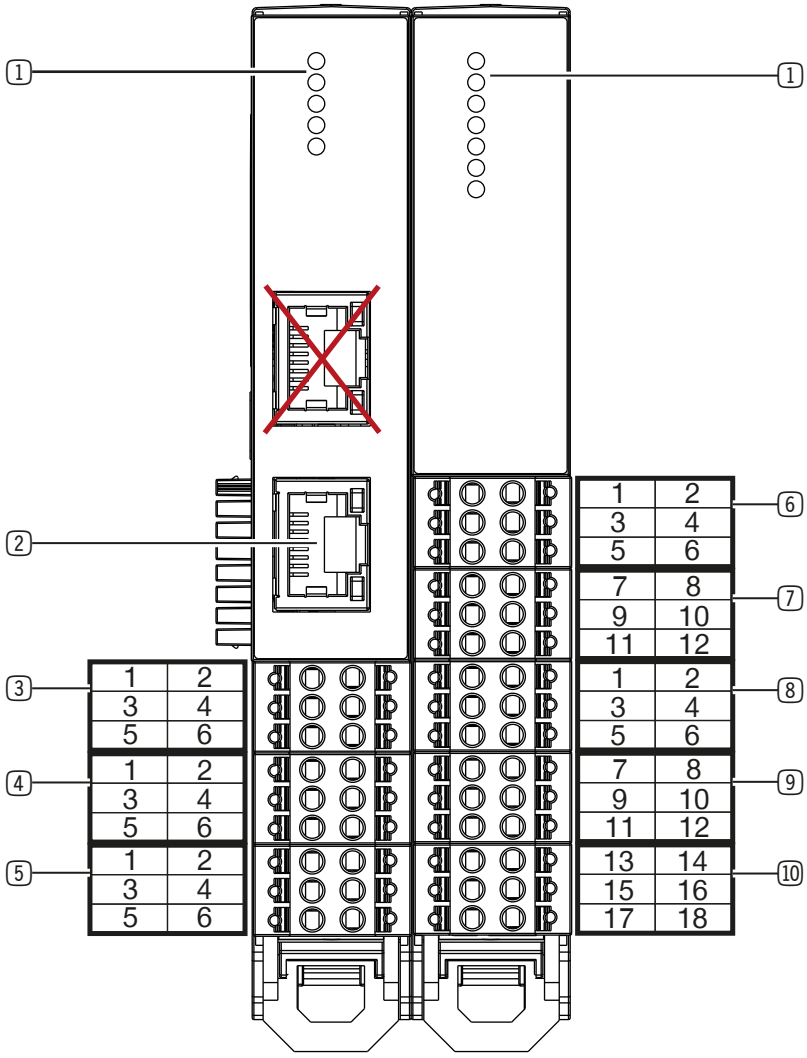
SCM input and SCM output				
	Basic gripper at port 1	**Advanced gripper at port 1**	**Basic gripper at port 2**	**Advanced gripper at port 2**
Cmd_Release	ZG_DO0	ZG_DO0	ZG_DO4	ZG_DO4
Cmd_Grip	ZG_DO1	ZG_DO1	ZG_DO5	ZG_DO5
Cmd_Reset	ZG_DO2	-	ZG_DO6	-
Cmd_MotorOn	-	ZG_DO2	-	ZG_DO6
Cmd_Homing	-	ZG_DO3	-	ZG_DO7
Cmd_WP_Bit0	-	-	-	-
Cmd_WP_Bit1	-	-	-	-
Cmd_WP_Bit2	-	-	-	-
Cmd_WP_Bit3	-	-	-	-
IsReleased	ZG_DI0	ZG_DI0	ZG_DI4	ZG_DI4
IsGripped	ZG_DI1	ZG_DI1	ZG_DI5	ZG_DI5
IsClosed	ZG_DI2	ZG_DI2	ZG_DI6	ZG_DI6
OnUndefinedPos	-	-	-	-
Error	ZG_DI3	ZG_DI3	ZG_DI7	ZG_DI7
MotorOn	-	-	-	-
HomingOk	-	-	-	-
Act_WP_Bit0	-	-	-	-
Act_WP_Bit1	-	-	-	-
Act_WP_Bit2	-	-	-	-
Act_WP_Bit3	-	-	-	-

10.1.4 Advanced configuration

You can use the full functionality of the SCM by using more robot inputs and robot outputs. The functional assignment of the robot input and robot output numbers can be modified. A corresponding configuration of the extended wiring in the Comfort App is required.

10.2 Installing the energy supply

10.2.1 Mounting the pin assignment



1. Status
2. Ethernet port
3. IO-Link X1
4. IO-Link X2
5. Power supply of basic module X3
6. Digital input X4
7. Digital input X5
8. Digital output X6
9. Digital output X7
10. Power supply of IO module X8

10.2.2 Installing the power supply for the basic module

► Fuse the product using a suitable circuit breaker in accordance with the expected current draw and the cable cross-sections used.

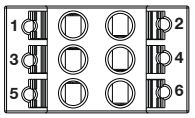
INFORMATION

The signal and actuator voltage is electrically isolated in the product.

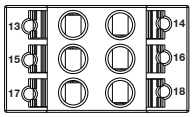
► Connect a maximum load of 10 A to pin 1 and pin 2.

► Connect a maximum load of 500 mA to pin 3 and pin 4.

The maximum permitted current draw allows you to operate all grippers directly on the product. No Y-plug-in connector for a special power supply is required.

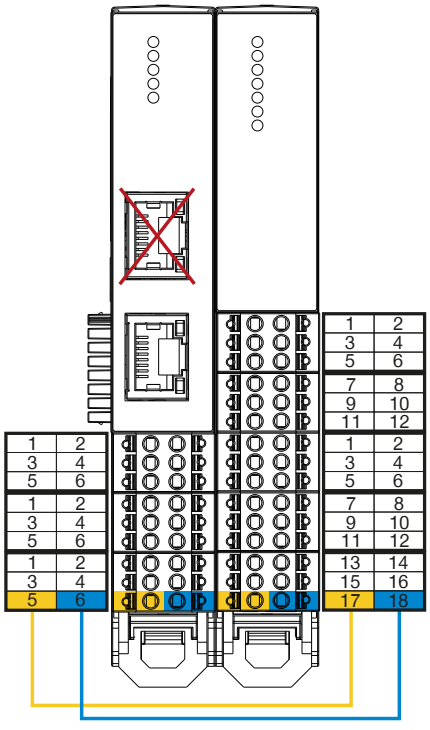
Pin	Function	Explanation	Power supply of basic module X3
1	24 V DC actuator	Actuator supply voltage	
2	GND actuator	0 V DC actuator supply voltage	
3	24 V DC input signal	SCM supply voltage and signal voltage for the grippers	
4	GND input signal	SCM ground and signal voltage for the grippers	
5	24 V DC output signal	Signal voltage output for supplying power to the I/O module (connect to pin 17)	
6	GND output signal	GND output for supplying power to the I/O module (connect to pin 18)	

10.2.3 Installing the power supply for the IO module

Pin	Function	Explanation	Power supply of IO module X8
13	-	-	
14	-	-	
15	-	-	
16	-	-	
17	24 V DC	24 V DC supply voltage	
18	GND	0 V DC supply voltage	

► Connect pin 5 of the basic module to pin 17 of the IO module.

► Connect pin 6 of the basic module to pin 18 of the IO module.



10.2.4 Installing IO-Link

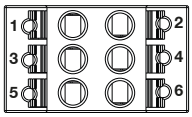
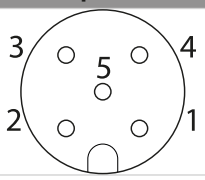
NOTICE

Non-compliance may result in material damage.

If the wiring is done differently, the gripper will be damaged.

If the gripper has an additional STO cable (Safe-Torque-OFF), this is wired with the external safety circuit independently of the SCM.

The pin assignments listed in the table are for both IO-Link channels.

IO-Link X1/IO-Link X2				IO-Link X1/IO-Link X2	M12 5-pin socket	
Pin	**Color**	**Function**	**Explanation**		**Pin**	**Color**
1	Black	C/Q	IO-Link communication		4	Black
2	-	-	-		6	-
3	White	PWR actuator	Actuator supply voltage	**M12 5-pin socket**	2	White
4	Gray	GND actuator	0 V DC actuator supply voltage		5	Gray
5	Brown	24 V DC sensor	Supply voltage of sensor		1	Brown
6	Blue	GND sensor	0 V DC sensor supply voltage		3	Blue

11 Installation HMI

INFORMATION

► For information, refer to the commissioning instructions for the HMI.

12 Commissioning HMI

13 Installation Comfort App

13.1 Setting up the Ethernet connection

The Comfort App is installed via *RobotStudio*.

INFORMATION

RobotStudio must be installed on a Windows PC. The Ethernet port of this Windows PC must have the same subnet mask as that of the robot.

- ► Connect the robot to the Windows PC via an Ethernet cable.
- ► Establish communication of *RobotStudio* with the robot.

13.2 Saving the parameters

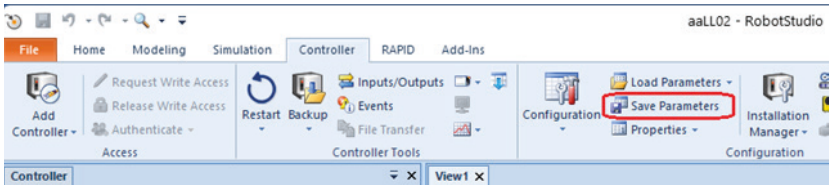
The process of installing the Comfort App creates 8 input signals and 8 output signals and assigns them to the I/O device.

NOTICE

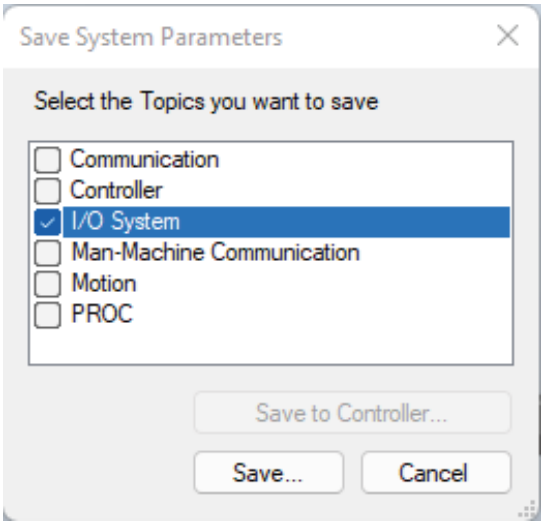
If your robot already has the I/O device *ABB_Scalable_IO* and its inputs or outputs are already assigned to another use, installing the Comfort App overwrites the assignment of these inputs and outputs.

You can use a backup copy to reload these parameters.

- ► Start *RobotStudio*.
- ► In the *Controller* tab, click the *Save Parameters* button.
- ⇨ The *Save System Parameters* window opens.



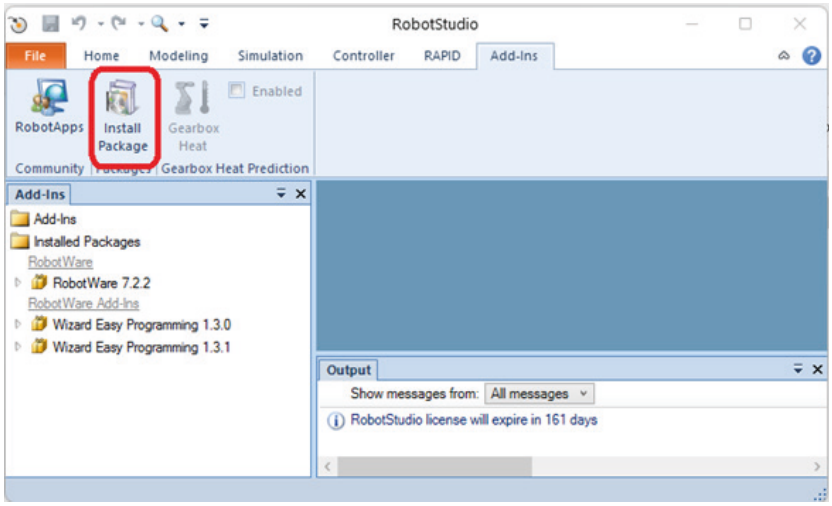
- ► Enable the *I/O System* checkbox.
- ► Click the *Save* button.
- ⇨ The window for saving files opens.
- ► Specify the path under which you want to save the backup copy *EIO.cfg* .



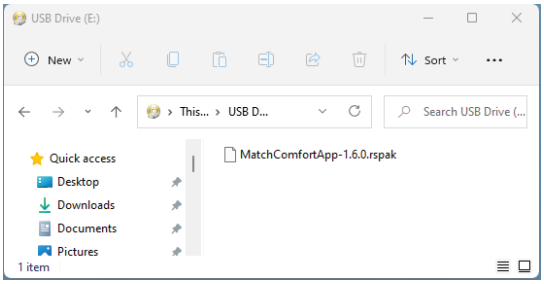
13.3 Installing the Comfort App

The Comfort App is installed as an add-in via *RobotStudio* on the Windows PC and can then be operated on the robot control panel.

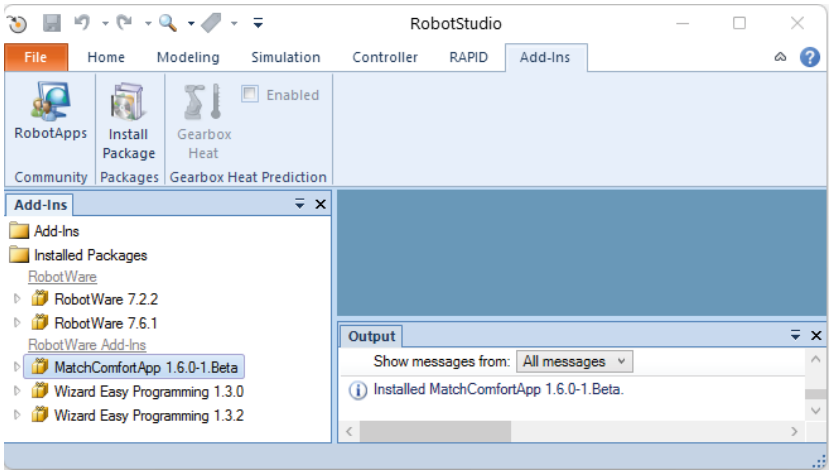
- ► Download the Comfort App from our website.
- ► Copy the installation file to a USB memory device.
- ► Plug the USB memory stick into the Windows PC.
- ► Copy the folder with the installation file onto the Windows PC.
- ► Start *RobotStudio*.
- ► In the *Add-Ins* tab, click the *Install Package* button.



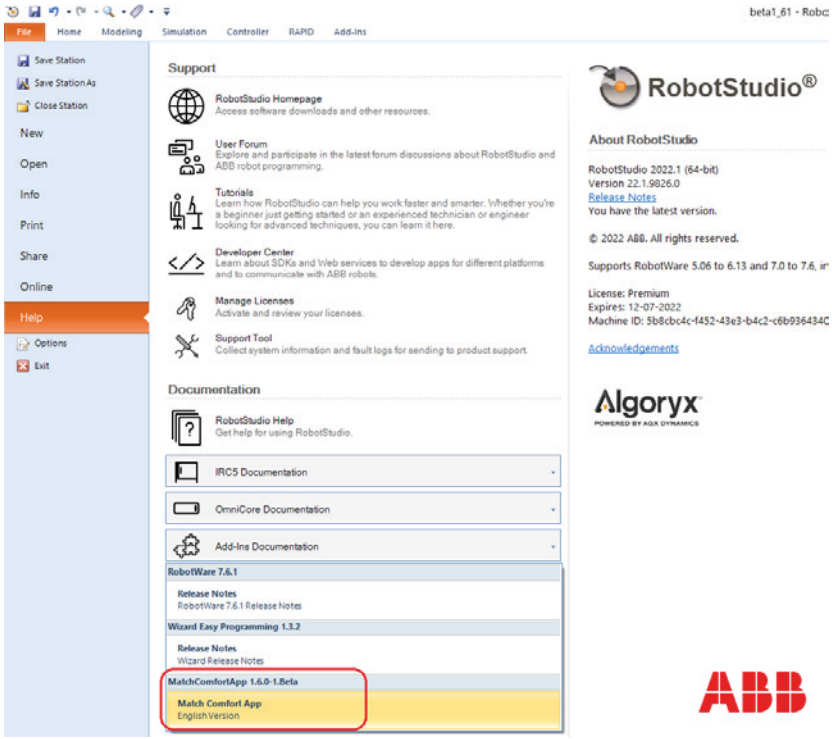
- ► Open the installation file.



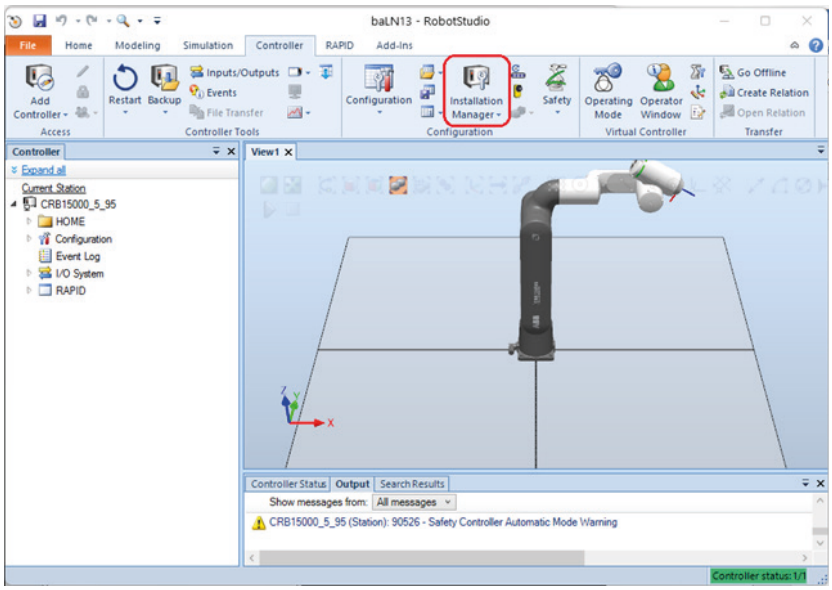
⇨ The Comfort App has been installed as an add-in.



⇨ The operating instructions of the Comfort App have been installed in *RobotStudio*.



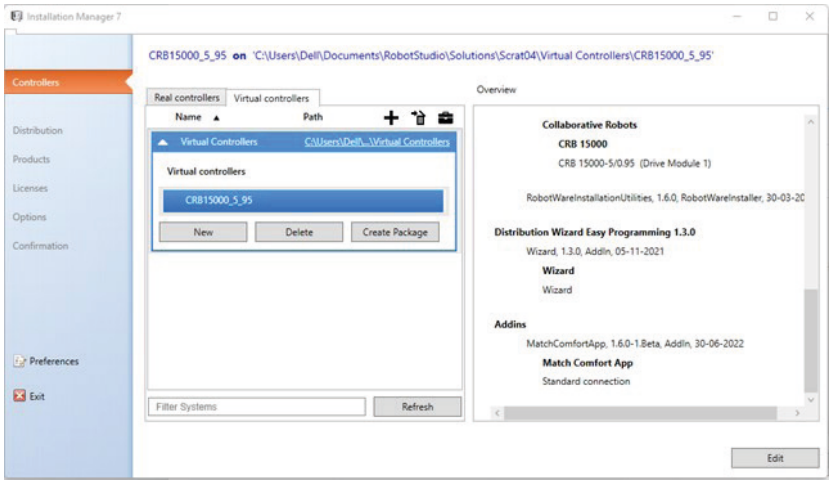
► In the *Controller* tab, click the *Installation Manager* button.



⇨ The *Installation Manager* window opens.

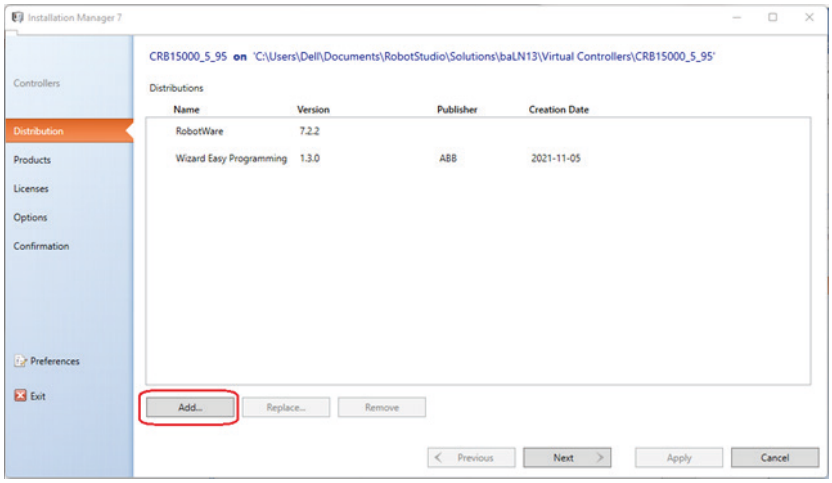
► In the *Controllers* menu, select the control system.

► Click the *Edit* button.



⇨ The *Distribution* menu is displayed.

► Click the *Add* button.



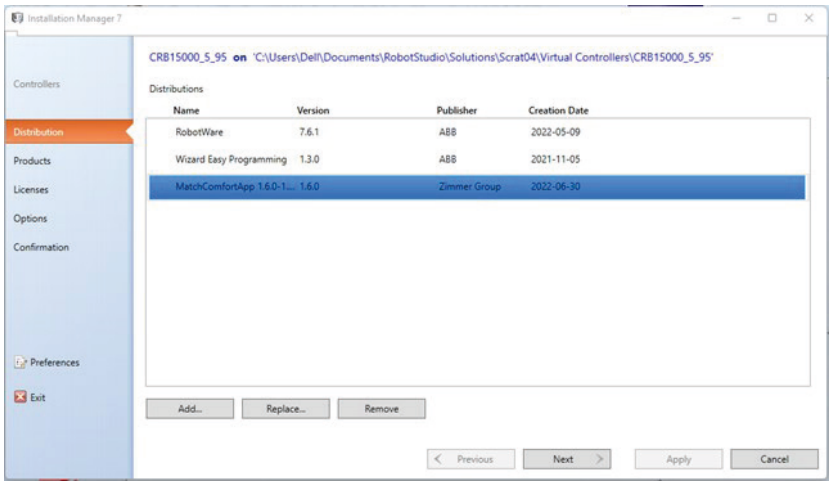
⇨ The *Select Distribution* window opens.

► Select the Comfort App.

► Click the *OK* button.

⇨ The Comfort App is installed as an add-in in the *Distribution* menu.

► Click the *Next* button several times.

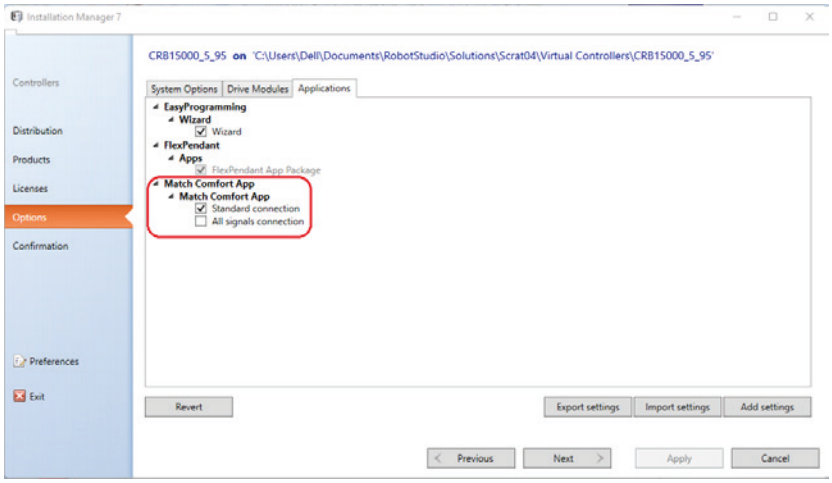


► In the *Options* menu, click the *Applications* tab.

► Activate the *Standard connection* checkbox to assign 8 inputs and 8 outputs.

► Activate the *All signals connection* checkbox to assign all 12 inputs and 12 outputs.

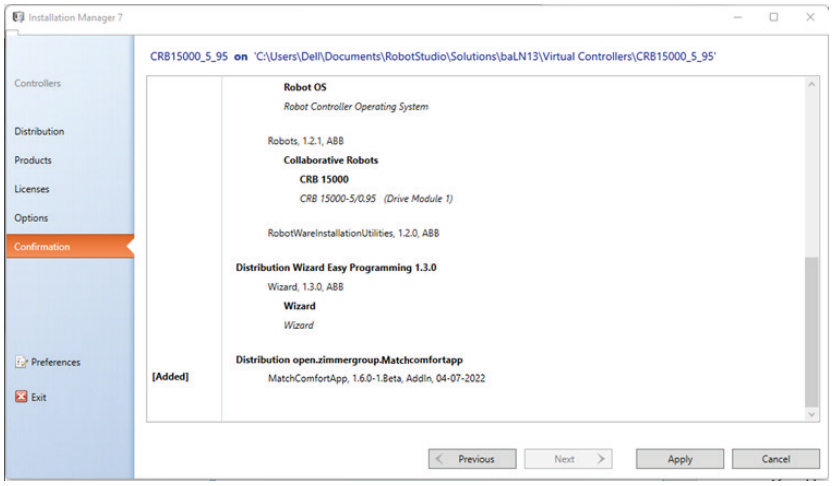
► Click the *Next* button several times.



► Click the *Apply* button.

⇨ The installation is complete.

► Close the *Installation Manager window*.

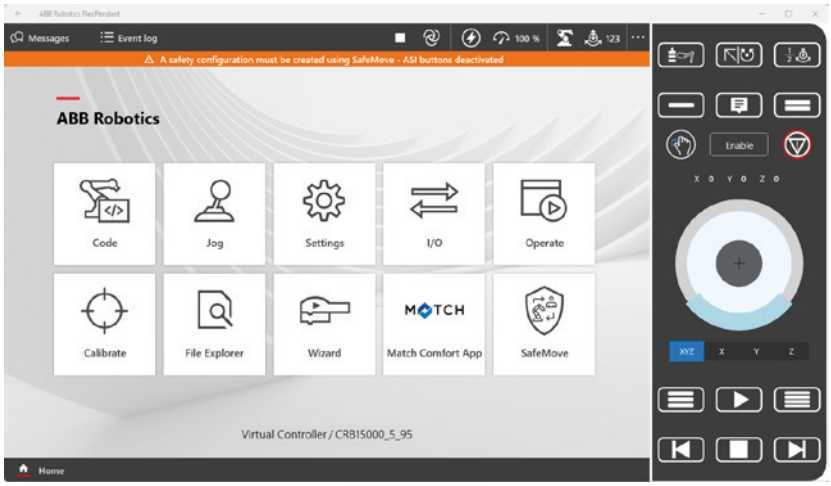


► Switch off the power supply of the robot control system and robot control panel.

► After a few seconds, switch on the power supply of the robot control system and robot control panel again.

► Switch on the robot control system and robot control panel.

⇨ The robot control panel displays the *MATCH Comfort App* button.



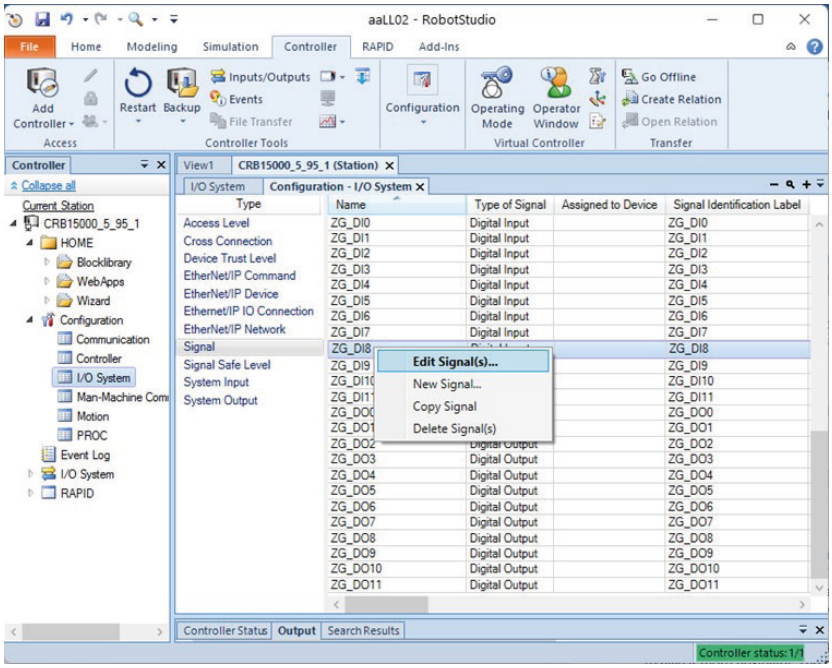
14 Assigning additional input signals and output signals

After installing the Comfort App with the *Standard connection* option, 8 digital inputs and 8 digital outputs are configured.

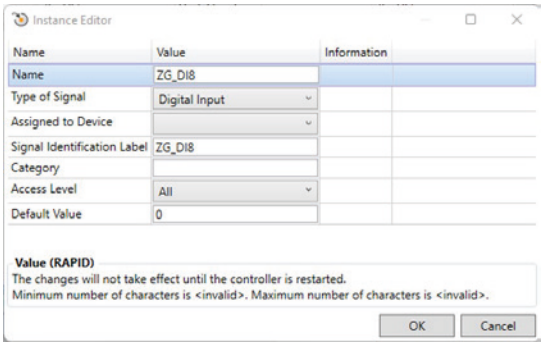
The signals of the standard configuration are assigned to the *ABB_Scalable_IO* I/O device. Because the I/O device can have more than eight digital inputs and outputs, the rest of the inputs and outputs can be used for other purposes.

After installing the Comfort App with the *All signals connection* option, 12 digital inputs and 12 digital outputs are configured.

► Right-click the signal you want to assign.
  • e.g. ZG_DI8
► In the context menu, click *Edit Signal*.
⇨ The *Instance Editor* window opens.



► Select the desired values in the drop-down menus.
► In the *Assigned to Device* drop-down menu, select the option *ABB_Scalable_IO*.
► Click the *OK* button.
► Configure the rest of the signals.
► Switch off the power supply of the robot control system and robot control panel.
► After a few seconds, switch on the power supply of the robot control system and robot control panel again.
► Switch on the robot control system and robot control panel.
⇨ The additional signals are displayed in the Comfort App.



15 Commissioning Comfort App

NOTICE

► Switch on the robot so that you can use the Comfort App.

15.1 Deleting existing setups

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

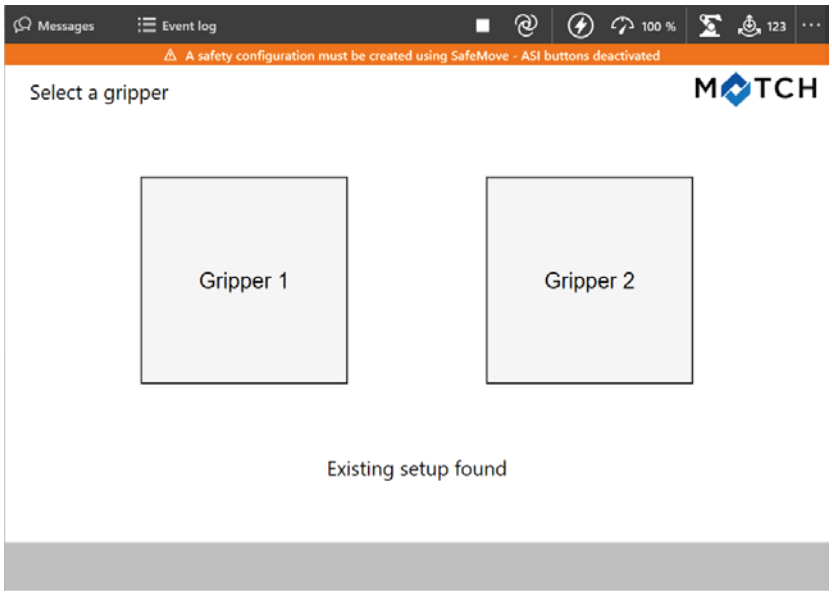
This screen does not appear if the available setup is only found for one gripper. In this case, the next screen is shown right away.

The *MATCH Comfort App* button is displayed on the robot control panel.

► Click the *MATCH Comfort App* button to start the Comfort App.

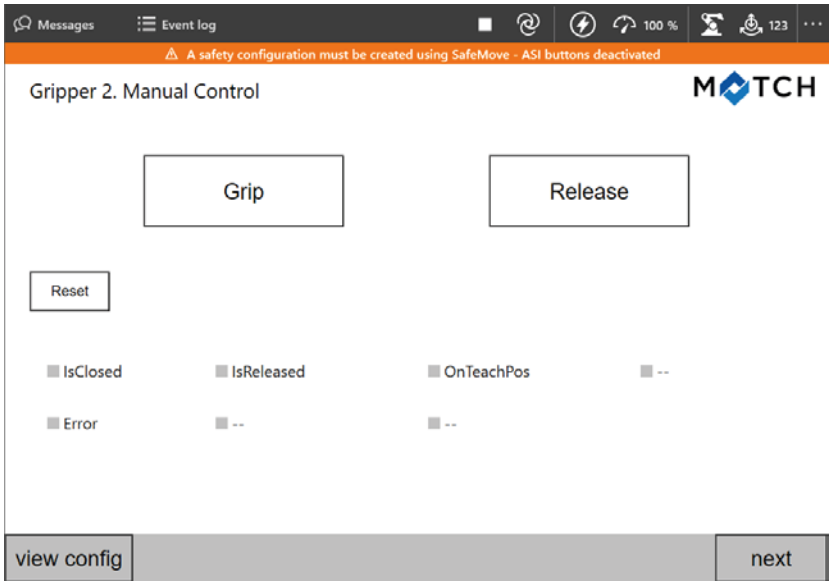
► Click the button of the desired gripper.

⇨ The *Manual control* screen for the manual control is displayed.



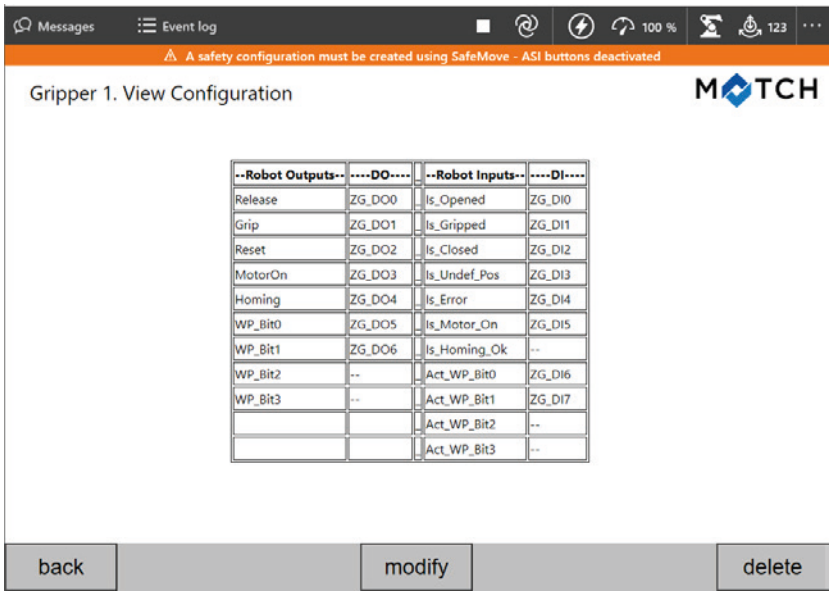
In the *Manual control* screen, you can operate the gripper manually and display the status.

► Click the *view config* button.



⇨ The *View Configuration* screen for editing the gripper configuration is displayed.

► Click the *delete* button.

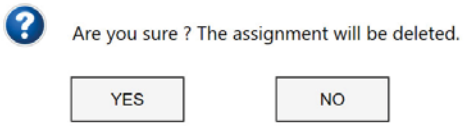


--Robot Outputs--	----DO----	--Robot Inputs--	----DI----
Release	ZG_DO0	Is_Opened	ZG_DI0
Grip	ZG_DO1	Is_Gripped	ZG_DI1
Reset	ZG_DO2	Is_Closed	ZG_DI2
MotorOn	ZG_DO3	Is_Undef_Pos	ZG_DI3
Homing	ZG_DO4	Is_Error	ZG_DI4
WP_Bit0	ZG_DO5	Is_Motor_On	ZG_DI5
WP_Bit1	ZG_DO6	Is_Homing_Ok	--
WP_Bit2	--	Act_WP_Bit0	ZG_DI6
WP_Bit3	--	Act_WP_Bit1	ZG_DI7
		Act_WP_Bit2	--
		Act_WP_Bit3	--

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

⇨ The existing setup is deleted.

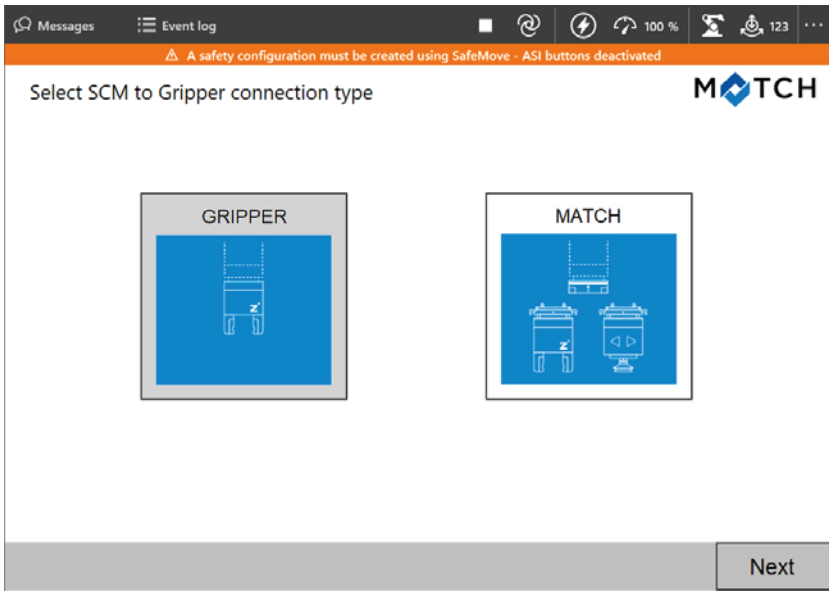
⇨ The screen sequence for configuring new grippers is displayed.



15.2 Creating a gripper configuration

15.2.1 Selecting the connection type

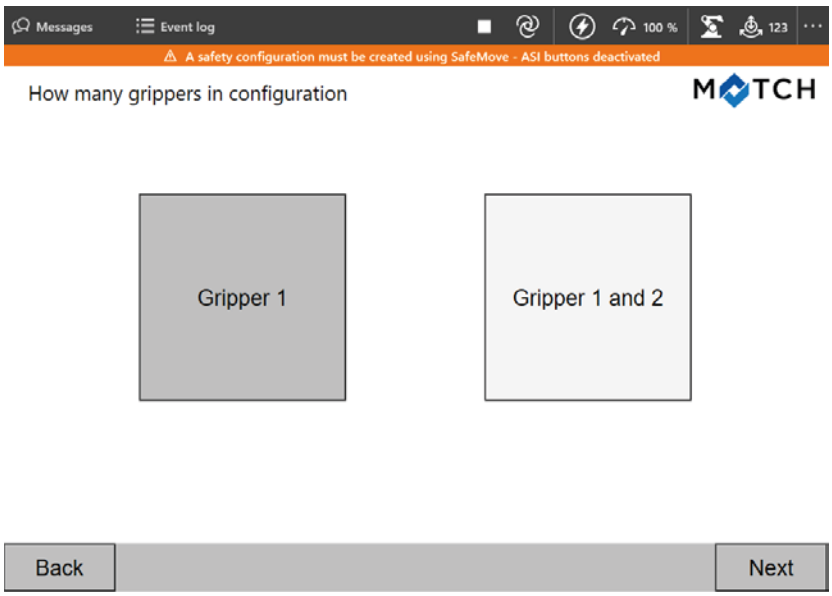
- ▶ Click *Gripper* if you have connected a gripper.
- ▶ Click *MATCH* if you have connected a MATCH gripper.
- ▶ Click the *next* button.



15.2.2 Gripper connection type

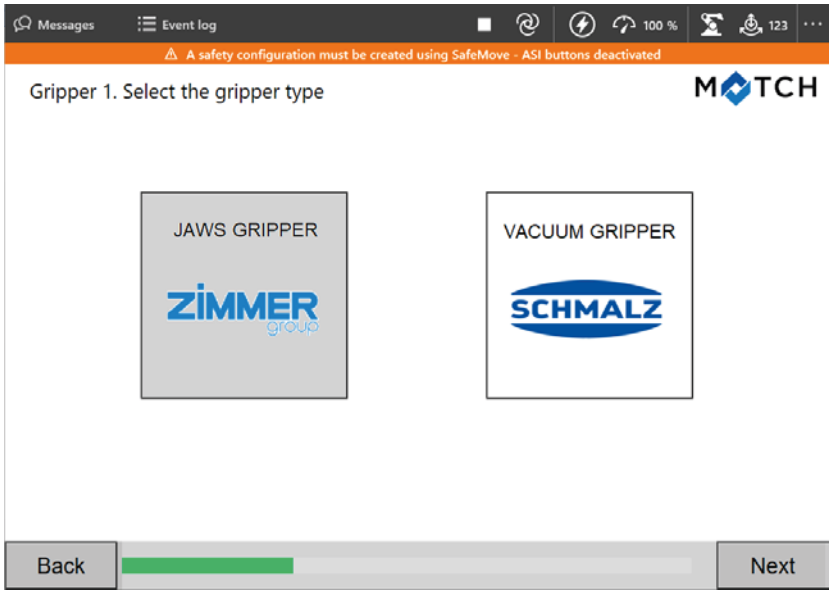
15.2.2.1 Selecting the number of grippers

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



15.2.2.2 Selecting the gripper type

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

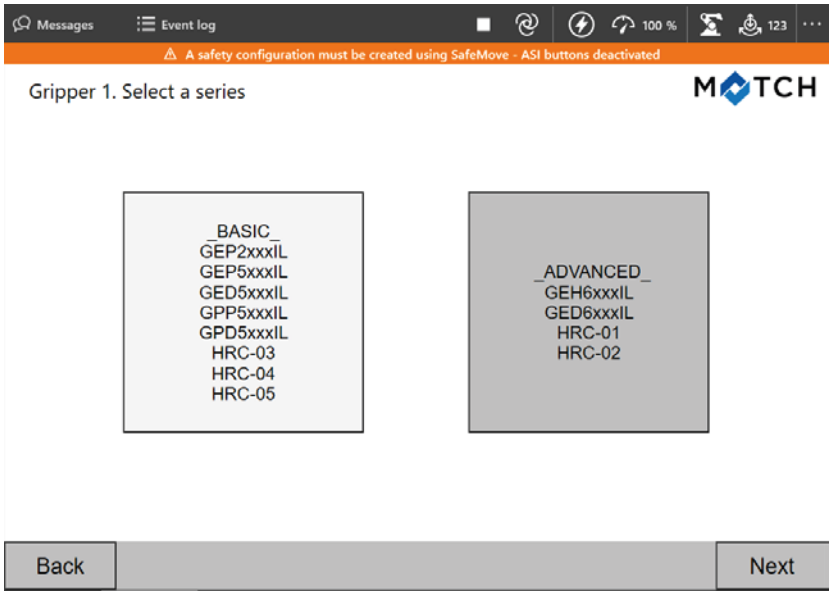


15.2.2.3 Selecting the gripper series

INFORMATION

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

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



15.2.2.4 Manual control

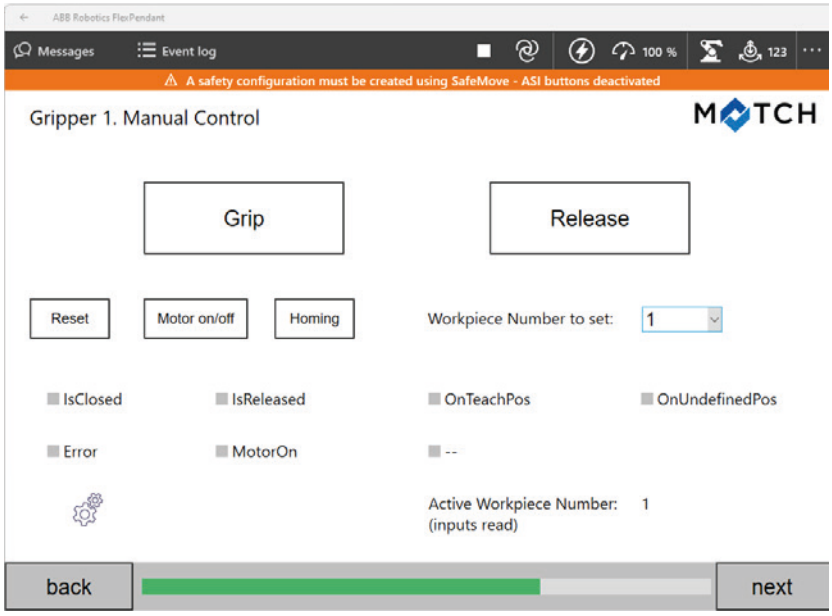
NOTICE

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.

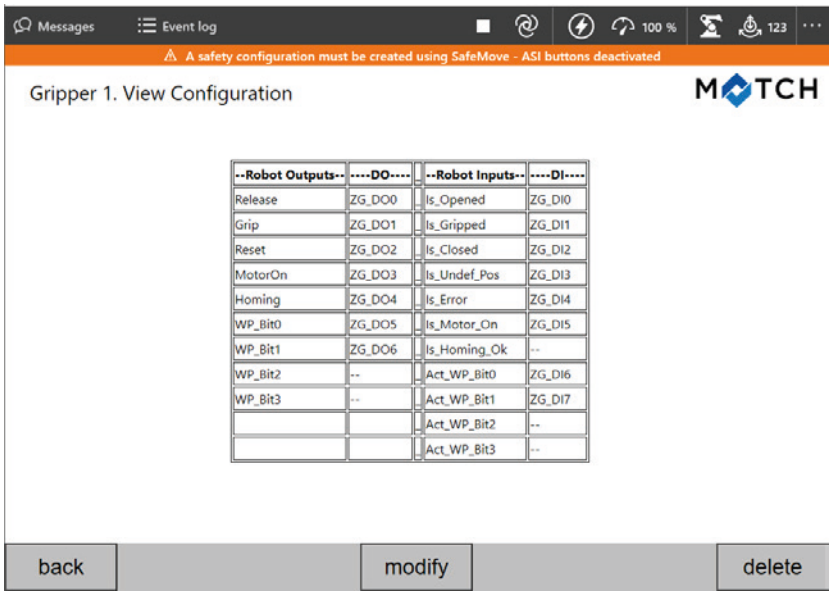
You can test and operate the function of the gripper and view its status in the lower area of the screen.

You can accept the default assignment or change it.

- ► Click the *next* button if you want to keep the default assignment.
- ► Click the ⚙ button to modify the default assignment.
- ⇨ The *View Configuration* screen for editing the gripper configuration is displayed.



- ► Click the *modify* button to modify the default assignment.
- ⇨ The *Select command connections* screen for selecting the command connections is displayed.



--Robot Outputs--	----DO----	--Robot Inputs--	----DI----
Release	ZG_DO0	Is_Opened	ZG_DI0
Grip	ZG_DO1	Is_Gripped	ZG_DI1
Reset	ZG_DO2	Is_Closed	ZG_DI2
MotorOn	ZG_DO3	Is_Undef_Pos	ZG_DI3
Homing	ZG_DO4	Is_Error	ZG_DI4
WP_Bit0	ZG_DO5	Is_Motor_On	ZG_DI5
WP_Bit1	ZG_DO6	Is_Homing_Ok	--
WP_Bit2	--	Act_WP_Bit0	ZG_DI6
WP_Bit3	--	Act_WP_Bit1	ZG_DI7
		Act_WP_Bit2	--
		Act_WP_Bit3	--

15.2.2.5 Selecting the command connections

NOTICE

The gripper wiring must match the gripper configuration done in the 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

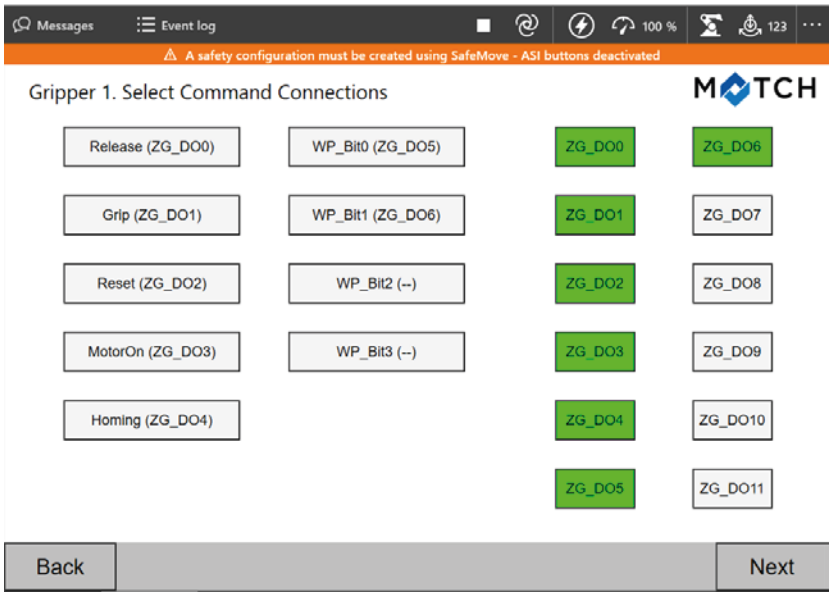
► Click the button of the desired signal.
- e.g. Release

► Click the desired output.
- e.g. ZG_DO7

⇨ The output has been assigned to the signal.

⇨ The button of the signal is expanded by adding the output.
- e.g. Release (ZG_DO7)

► Click the *Next* button.



15.2.2.6 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

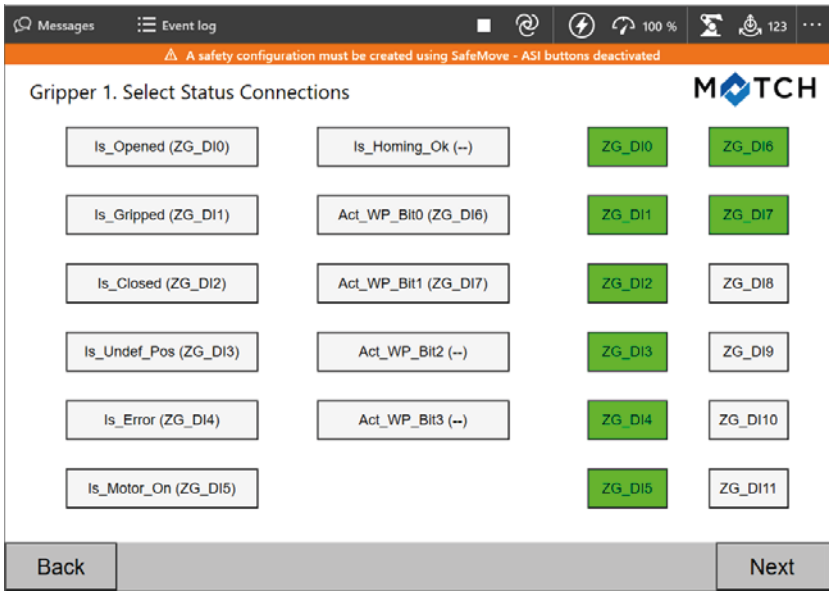
► Click the button of the desired signal.
- e.g. Is_Opened

► Click the desired input.
- e.g. ZG_DI7

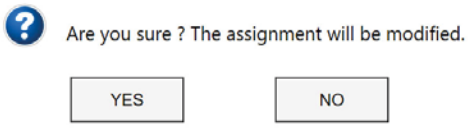
⇨ The input has been assigned to the signal.

⇨ The button of the signal is expanded by adding the input.
- e.g. Is_Opened (ZG_DI7)

► Click the *Next* button.



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

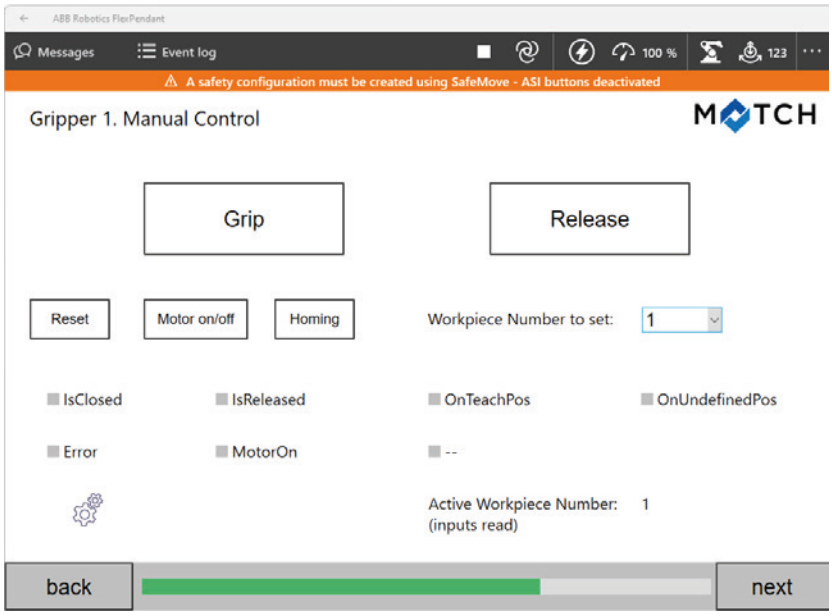


15.2.2.7 Storing gripper configuration

⇨ The *Manual control* screen for the manual control is displayed.

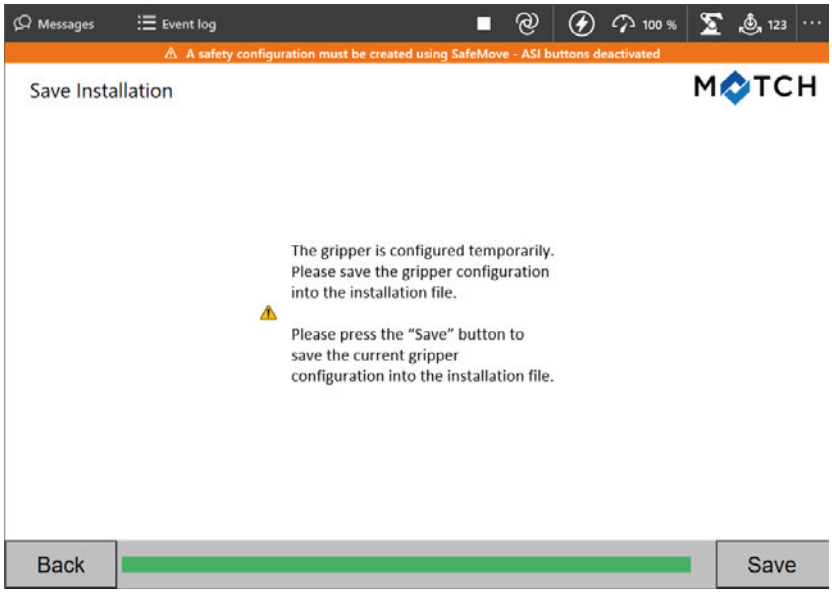
► For more information, refer to the section "Manual control".

► Click the *next* button.



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

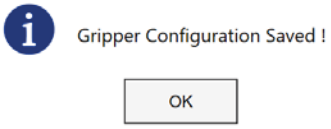
⇨ The gripper configuration has been stored.



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

⇨ The gripper configuration is complete.

⇨ The function blocks/subprograms have been created and are available for programming.



15.2.3 MATCH connection type

15.2.3.1 Manual control

NOTICE

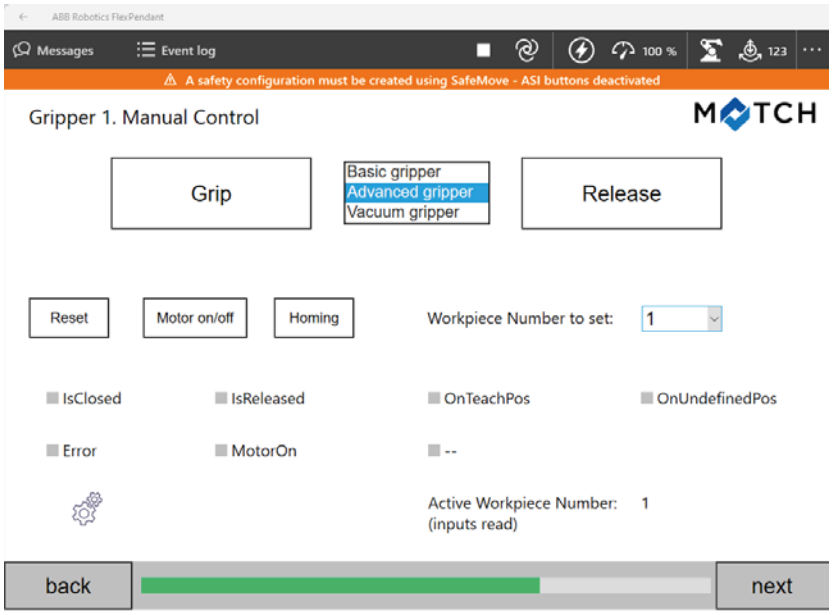
The prerequisite for the function test is that the wiring between the robot and SCM is present and that the robot, SCM and gripper are switched on.

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

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

► Click the ⚙ button to modify the default assignment.

⇨ The *Select command connections* screen for selecting the command connections is displayed.



15.2.3.2 Selecting the command connections

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

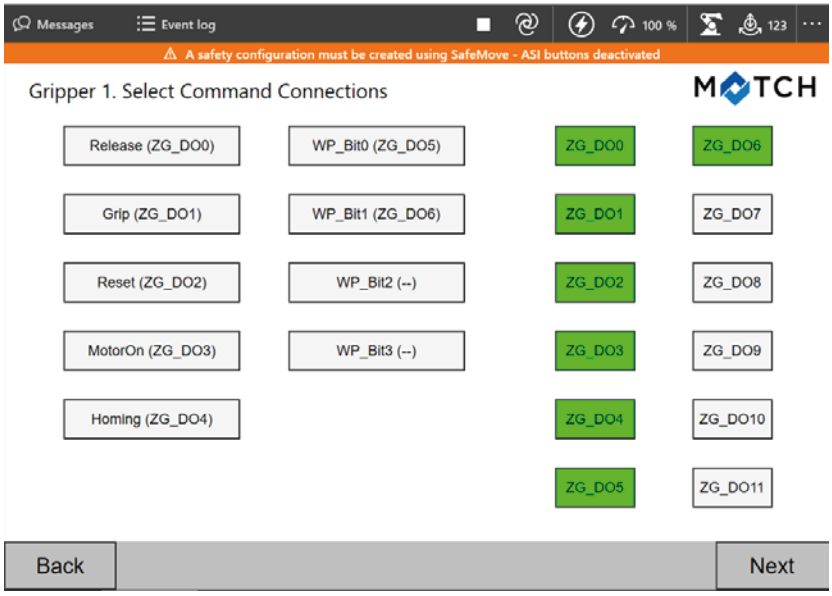
► Click the button of the desired signal.
- e.g. Release

► Click the desired output.
- e.g. ZG_DO7

⇨ The output has been assigned to the signal.

⇨ The button of the signal is expanded by adding the output.
- e.g. Release (ZG_DO7)

► Click the *Next* button.



15.2.3.3 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

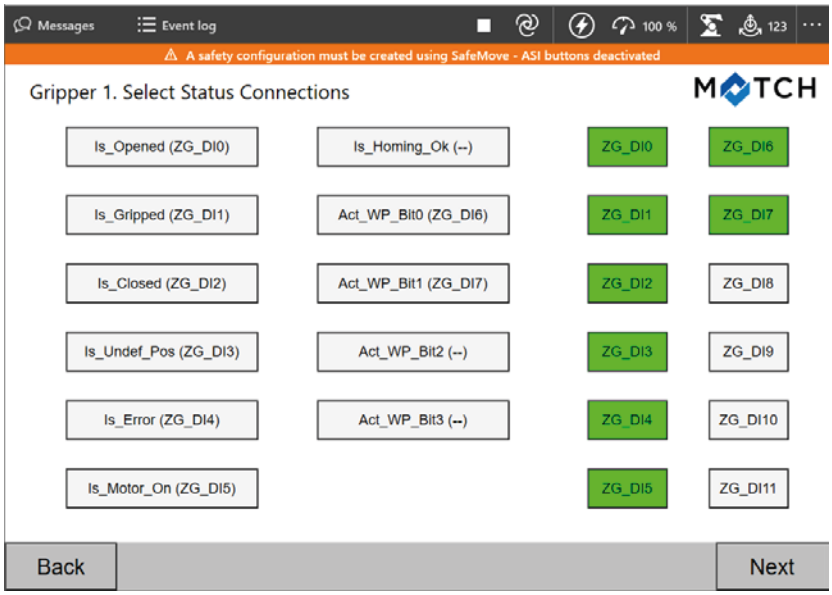
► Click the button of the desired signal.
- e.g. Is_Opened

► Click the desired input.
- e.g. ZG_DI7

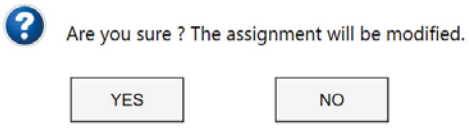
⇨ The input has been assigned to the signal.

⇨ The button of the signal is expanded by adding the input.
- e.g. Is_Opened (ZG_DI7)

► Click the *Next* button.



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

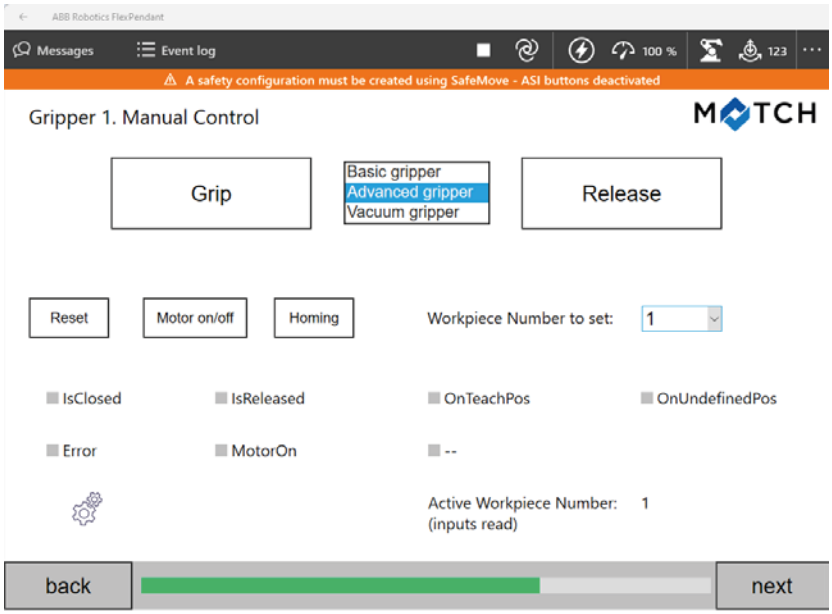


15.2.3.4 Storing gripper configuration

⇨ The *Manual control* screen for the manual control is displayed.

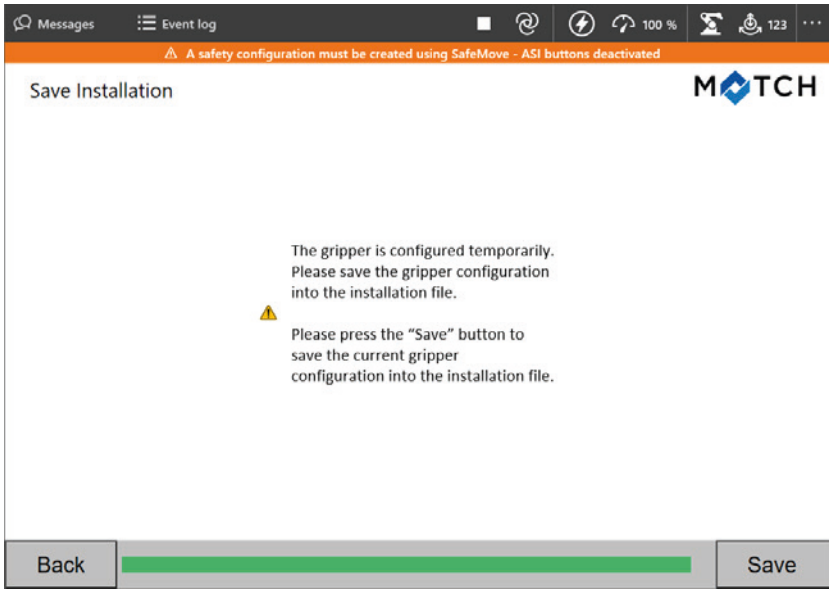
► For more information, refer to the section "Manual control".

► Click the *next* button.



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

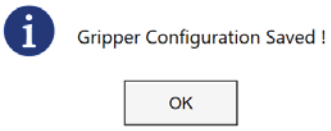
⇨ The gripper configuration has been stored.



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

⇨ The gripper configuration is complete.

⇨ The function blocks/subprograms have been created and are available for programming.



16 Operation

16.1 Control principle of the gripper

- ▶ Prepare *Advanced* grippers for the control system:
  - ▶ If necessary, do a reference run (ZHOMING).
  - ▶ Check if the reference run was done (ZISHOMINGOK or ZISHOMINGSUCCESS).
  - ▶ Switch on the motor (ZMOTORON).
  - ▶ Check whether the motor is switched on (ZISMOTORON).
  - ⇨ The gripper is prepared for the control system if no error is present (ZISERROR).
- ▶ Set a workpiece configured with the HMI software *ZG_IO_LINK_HMI* (ZCHANGEWP(number)) if more than one workpiece is used.
- ▶ Check whether a workpiece has changed (Z_ISWPCHANGED(number)).
- ▶ Grip (ZGRIP) or release (ZRELEASE) the workpiece.
- ▶ Check the position of the gripper jaw (ZISONTEACHPOS, ZISOPENED, ZISCLOSED or ZISONUNDEFPOS).

16.2 Overview of generated robot jobs

After successful configuration of the grippers using the HMI software, 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 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).

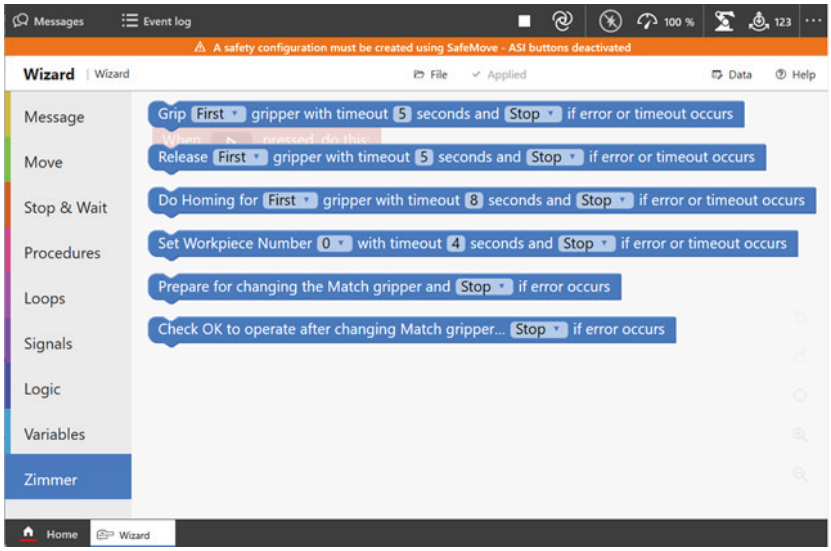
Generated robot job name	Parameter In	Parameter Out	Function
ZGRIP1 ZGRIP2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Gripping
ZRELEASE1 ZRELEASE2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Release
ZMOTORON1 ZMOTORON2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Switch on motor for *Advanced* grippers.
ZMOTOROFF1 ZMOTOROFF2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Switch off motor if gripper is present.
ZHOMING1 ZHOMING2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Perform reference run for *Advanced* grippers.
ZRESET1 ZRESET2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Reset if gripper is present.
ZCHANGEWP1 ZCHANGEWP2	*WpNumber* = workpiece number (1 to 15)	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Set workpiece number (n) for use with SCM.
ZISWPCHANGED1 ZISWPCHANGED2	*WpNumber* = workpiece number (1 to 15)	*bWPchanged* = *TRUE*, if workpiece is active = *FALSE*, if workpiece is not active *bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Outputs TRUE if workpiece number (n) is activated.

Generated robot job name	Parameter In	Parameter Out	Function
ZISOPENED1 ZISOPENED2	*1*: Address gripper 1 *2:* Address gripper 2	*bOpened* = *TRUE*, if gripper is open = *FALSE*, if gripper is closed	Outputs TRUE if the gripper is open.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISCLOSED1 ZISCLOSED2	*1*: Address gripper 1 *2:* Address gripper 2	*bClosed* = TRUE, if gripper is open = FALSE, if gripper is closed	Outputs TRUE if the gripper is closed.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISONTEACHPOS1 ZISONTEACHPOS2	*1*: Address gripper 1 *2:* Address gripper 2	*bIsOnTeachPos* = *TRUE*, if gripper is set to TeachPosition = *FALSE*, if gripper is not set to TeachPosition	Outputs TRUE if the gripper is set to *TeachPosition*.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISONUNDEFPOS1 ZISONUNDEFPOS2	*1*: Address gripper 1 *2:* Address gripper 2	*bUndefPos* = *TRUE*, if gripper is set to UndefinedPosition = *FALSE*, if gripper is not set to UndefinedPosition	Outputs TRUE if the gripper is set to *OnUndefinedPos*.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISERROR1 ZISERROR2	*1*: Address gripper 1 *2:* Address gripper 2	*bError* = *TRUE*, if gripper is in error state = *FALSE*, if gripper is not in error state	Outputs TRUE if the gripper is in an error state.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISMOTORON1 ZISMOTORON2	*1*: Address gripper 1 *2:* Address gripper 2	*bMotorOn* = *TRUE*, if motor is on = *FALSE*, if motor is off	Outputs TRUE if the motor of the gripper is switched on.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISHOMINGOK1 ZISHOMINGOK2	*1*: Address gripper 1 *2:* Address gripper 2	*bHomeOk* = *TRUE*, if homing is OK = *FALSE*, if homing is not OK	Outputs TRUE if the referencing of the gripper is OK.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	

Generated robot job name	Parameter In	Parameter Out	Function
ZISHOMINGSUCCESS1 ZISHOMINGSUCCESS2	*1*: Address gripper 1 *2:* Address gripper 2	*bHomeSuccess* = *TRUE*, if ZHOMING command was successful = *FALSE*, if gripper is not in error state at ZHOMING command	Outputs TRUE if the referencing of the gripper is successful.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZERRORWARNINGON1 ZERRORWARNINGON2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Enables Error/Warning for robot if gripper is present.
ZERRORWARNINGOFF1 ZERRORWARNINGOFF2	*1*: Address gripper 1 *2:* Address gripper 2	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Disables Error/Warning for robot if gripper present.
ZISPARTDETACHED1 ZISPARTDETACHED2	*1*: Address gripper 1 *2:* Address gripper 2	*bPartDetached* = *TRUE*, if part is detached = *FALSE*, if part is not detached	B[n] = 1, if gripper of gripper type *Vacuum* signals *Part detached*. B[n] = 0, if part is not detached.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISPARTPRESENT1 ZISPARTPRESENT2	*1*: Address gripper 1 *2:* Address gripper 2	*bPartPresent* = *TRUE*, if part is present = *FALSE*, if part is not present	B[n] = 1, if gripper of gripper type *Vacuum* signals *Part present*. B[n] = 0 if part is not present.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZISREADY1 ZISREADY2	*1*: Address gripper 1 *2:* Address gripper 2	*bReady* = *TRUE*, if input is switched on = *FALSE*, if input is not switched on	B[n] = 1 if gripper of gripper type *Vacuum* signals *Ready*. B[n] = 0 if gripper is not ready.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	
ZMATCHSTARTCHANGE1 ZMATCHSTARTCHANGE2	-	*bCmdFail* = *TRUE*, if command fails = *FALSE*, if command was successful	Is output before the gripper is changed for *MATCH* .
ZISMATCHCHANGEDONE1 ZISMATCHCHANGEDONE2	-	*bMatchChangeDone* = *TRUE*, if match was changed = *FALSE*, if match was not changed	For *MATCH* B[n] = 1 if gripper is connected successfully. B[n] = 0, if gripper is not connected successfully.
		bCmdFail = *TRUE*, if command fails = *FALSE*, if command was successful	

16.3 Wizard function blocks

Using the *Wizard function blocks,* the grippers can be programmed easily. The parameters can be configured using drop-down combo boxes.



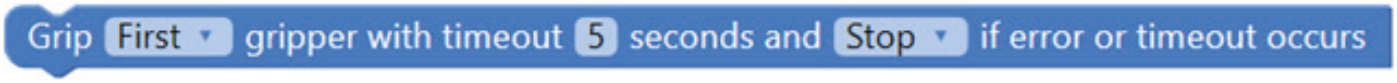
All *function blocks* use predefined global variables that are returned after running.

Global variables	Function
z_Success	Outputs *TRUE* if the *function block* was run successfully. Outputs *FALSE* if the *function block* was not run successfully.
z_Error	Outputs *TRUE* if errors occur when running the *function block* . Outputs *FALSE* if no errors occur when running the *function block* . Errors are logged in the event log.
z_Timeout	Outputs *TRUE* if the confirmation time was exceeded when running the *function block* . Outputs *FALSE* if the confirmation time was not exceeded when running the *function block* . If the confirmation time is exceeded, the *function block* is ended. Occurrences of the confirmation time being exceeded are logged in the event log.

INFORMATION

► For more information about *Wizard function blocks* , refer to the manufacturer documentation.

16.3.1 Grip



In this *function block,* you can configure whether you want to address the *first* or *second* gripper.
You can configure which action is to be taken in case of an error or if the confirmation time is exceeded.

- *Stop*: Running of the application is stopped.
- *Continue*: Running of the application is resumed.

Sequence of the *function block* for *MATCH* and *Advanced* grippers:

- Checks whether the motor in the gripper is switched on and switches it on if necessary: *Motor on*
- Close gripper: *Gripper closed*
- *Function block* exited.

Sequence of the *function block* for all other grippers:

- Close gripper: *Gripper closed*
- *Function block* exited.

16.3.2 Release

In this *function block,* you can configure whether you want to address the *first* or *second* gripper.
You can configure which action is to be taken in case of an error or if the confirmation time is exceeded.

- *Stop*: Running of the application is stopped.
- *Continue*: Running of the application is resumed.

Sequence of the *function block* for *MATCH* and *Advanced* grippers:

- Checks whether the motor in the gripper is switched on and switches it on if necessary: *Motor on*
- Open gripper: *Gripper open*
- *Function block* exited.

Sequence of the *function block* for all other grippers:

- Open gripper: *Gripper open*
- *Function block* exited.

16.3.3 Do Homing

In this *function block,* you can configure whether you want to address the *first* or *second* gripper.

You can configure which action is to be taken in case of an error or if the confirmation time is exceeded.

- *Stop*: Running of the application is stopped.
- *Continue*: Running of the application is resumed.

Sequence of the *function block* for *MATCH* and *Advanced* grippers:

- Checks whether the motor in the gripper is switched on and switches it on if necessary: *Motor on*
- A reference run is performed.
- *Function block* exited.

16.3.4 Set Workpiece Number

This *function block* can be used if you have configured only one gripper. It cannot be used if you have configured two grippers in your application.

The workpiece number must be configured according to the number of bits configured in the Comfort App.

If you keep the default settings of the Comfort App, only two bits for the workpiece number are provided. In this case, you have to select either 1, 2 or 3 as the setting for the workpiece number.

You can configure which action is to be taken in case of an error or if the confirmation time is exceeded.

- *Stop*: Running of the application is stopped.
- *Continue*: Running of the application is resumed.

Sequence of the *function block*:

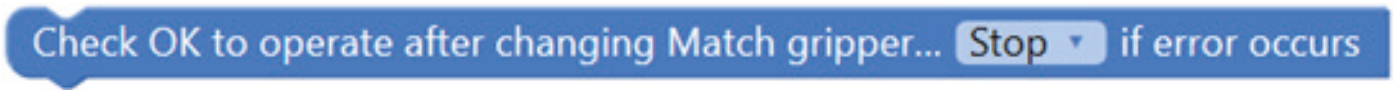
- Outputs for the workpiece number are assigned according to the setting.
- Workpiece numbers *set successfully*
- *Function block* exited.

16.3.5 Prepare for changing the MATCH gripper (ZMATCHSTARTCHANGE)

This *function block* can be used only for *MATCH*grippers.

All configured robot outputs for *MATCH*grippers are switched off. This *function block* does not wait for confirmation. The global variables *z_Success* and *z_Error* are set or reset depending on the result.

16.3.6 Check OK to operate after changing Match gripper (ZISMATCHCHANGEDONE)



This *function block* can be used only for *MATCH*grippers.

The check of whether operation is possible after changing the *MATCH*gripper is run.

Sequence of the *function block*:

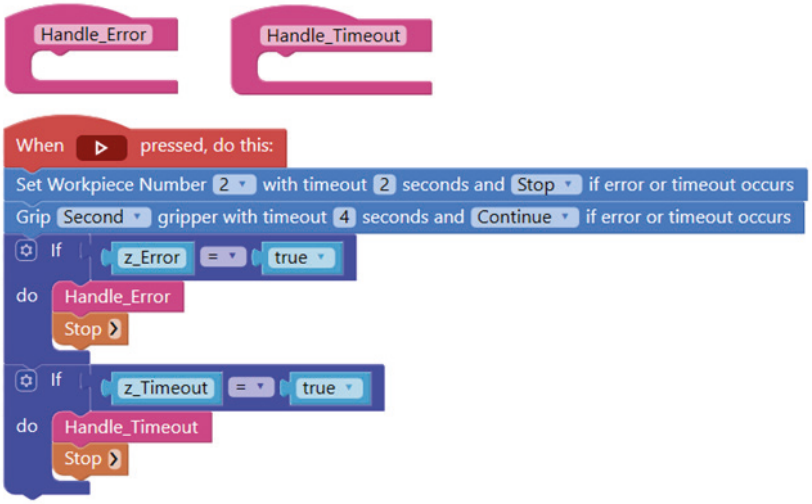
- Check of whether at least one of the input signals is set:
  - *Is_Opened*
  - *Is_Gripped*
  - *Is_Closed*
  - *Is_Undef_Pos*
- At least one input signal is set: *z_Return_Value = TRUE*
- *Function block* exited.

16.3.7 Example of Wizard function blocks

The sequences *Handle_Error* and *Handle_Timeout* are written according to the requirements of the application.

Set Workpiece Number sets workpiece number 2. If the confirmation time of 2 seconds is exceeded or an error occurs, the sequence is ended *Stop*.

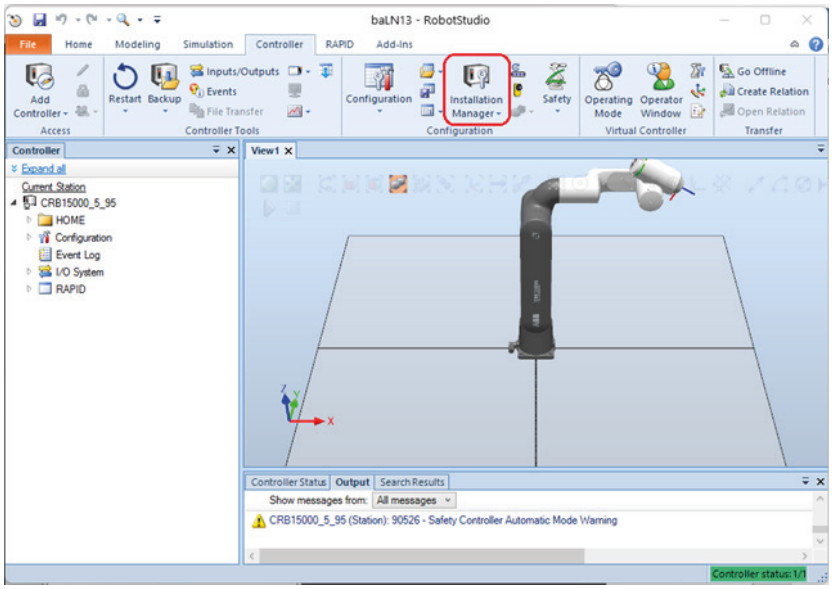
Grip closes the second gripper. If the confirmation time of 4 seconds is exceeded or an error occurs, the sequence continues running *Continue*.



17 Uninstalling the Comfort App

► Start *RobotStudio*.

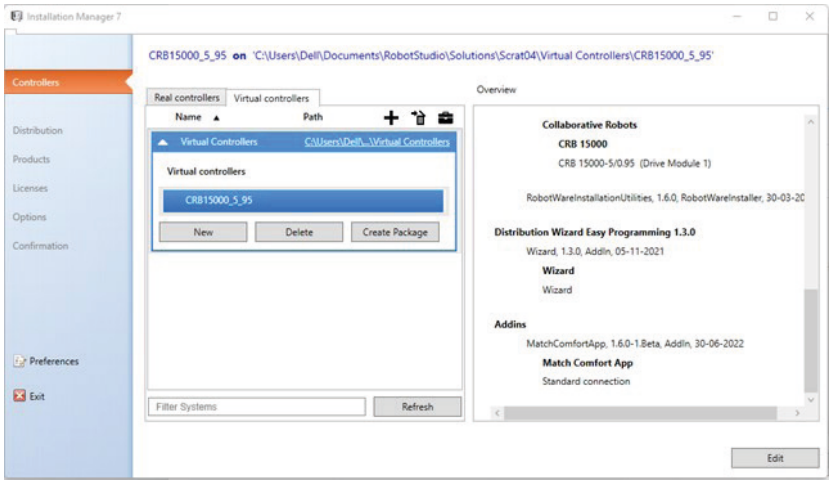
► In the *Controller* tab, click the *Installation Manager* button.



⇨ The *Installation Manager* window opens.

► In the *Controllers* menu, select the control system.

► Click the *Edit* button.



⇨ The *Distribution* menu is displayed.

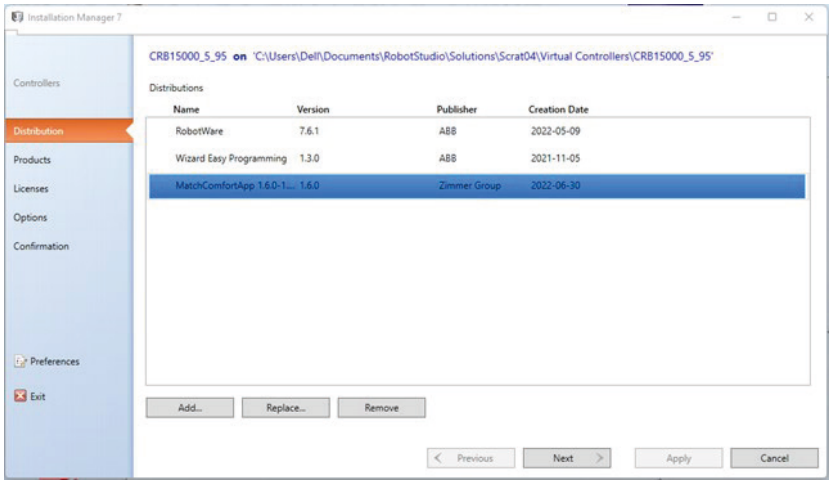
► Select the Comfort App.

► Click the *Remove button*.

► Click the *Next* button several times.

► Click the *Apply* button.

► Wait until the uninstallation is complete.

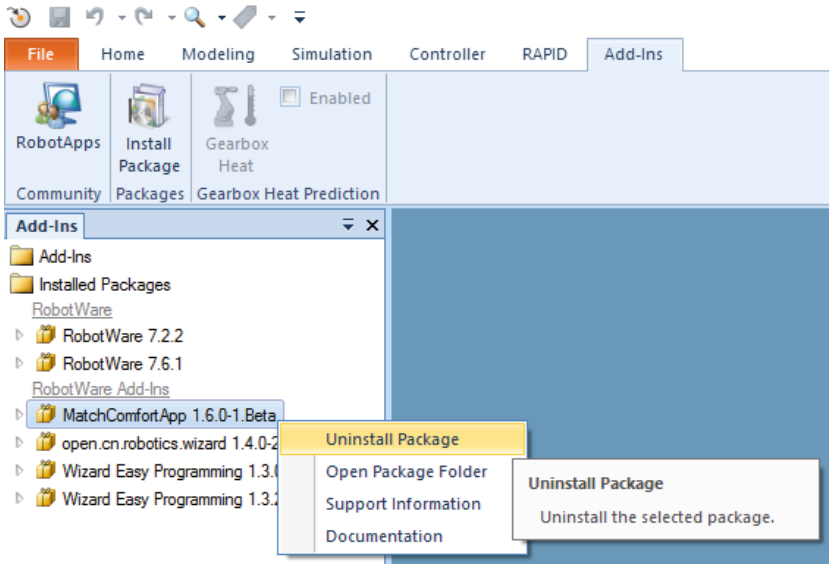


17.1 Uninstall add-in

INFORMATION

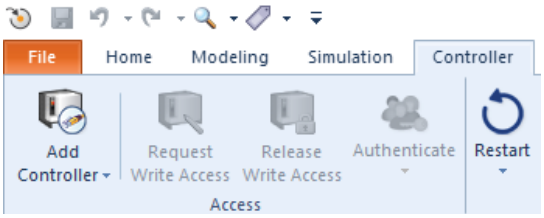
To update the Comfort App to a higher version, the add-in in *RobotStudio* must be uninstalled.

- ▶ Click the *Add-In tab*.
- ▶ In the *Add-Ins menu,* right-click the add-in of the Comfort App.
- ⇨ The context menu is opened.
- ▶ Click *Uninstall package*.
- ⇨ The add-in has been uninstalled.



17.2 Uninstall the rest of the files

- ▶ Connect the robot control system with *RobotStudio*.
- ▶ Request write access by clicking the *Request Write Access* button.
- ▶ Remove the file */HOME/Blocklibrary/Match.coblox*.
- ▶ Remove the folder */HOME/WebApps/MatchComfortApp*.



18 Error diagnosis

INFORMATION

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

19 RoHS declaration

in terms of the EU Regulation 2011/65/EU

Name and address of the manufacturer:

Zimmer GmbH

Im Salmenkopf
77866 Rheinau, Germany
+49 7844 9138 0
info@zimmer-group.com
www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: Smart Communication Module

Type designation: SCM

conforms to the requirements of the directive in its design and the version we put on the market.

Michael Hoch	Rheinau, Germany, 2020-02-28	
Authorized representative for the compilation of relevant technical documents	(Place and date of issuance)	Martin Zimmer (Legally binding signature) Managing Partner

20 Declaration of Conformity

As defined by the EC Directive 2014/30/EU on electromagnetic compatibility

Name and address of the manufacturer:

Zimmer GmbH

Im Salmenkopf
77866 Rheinau, Germany
+49 7844 9138 0
info@zimmer-group.com
www.zimmer-group.com

We hereby declare that the product described below

Product designation:	Smart Communication Module
Type designation:	SCM

conforms to the requirements of the Electromagnetic Compatibility Directive 2014/30/EU in its design and the version we put on the market.

The following harmonized standards have been used:

DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN 61000-6-3	EMC Generic standard, Emission standard for residential, commercial and light-industrial
DIN EN 61000-6-2	EMC Generic standard, Emission standard for industrial environments
DIN EN 61000-6-4	EMC Generic standard, Immunity for industrial environments

A full list of applied standards can be obtained from the manufacturer.

Kurt Ross	Rheinau, Germany, 2020-02-28	
Authorized representative for the compilation of relevant technical documents	(Place and date of issuance)	Martin Zimmer (Legally binding signature) Managing Partner

21 Declaration of Conformity

In terms of the EU Directive 2014/35/EU (Low voltage directive)

Name and address of the manufacturer:

Zimmer GmbH

Im Salmenkopf
77866 Rheinau, Germany
+49 7844 9138 0
info@zimmer-group.com
www.zimmer-group.com

We hereby declare that the product described below

Product designation:	Smart Communication Module
Type designation:	SCM

conforms to the requirements of the 2014/35/EC directive in its design and the version we put on the market.

The following harmonized standards have been used:

DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN 60204-1	Safety of machinery – Electrical equipment of machines - Part 1: General requirements

A full list of applied standards can be obtained from the manufacturer.

Kurt Ross	Rheinau, Germany, 2020-02-28	
Authorized representative for the compilation of relevant technical documents	(Place and date of issuance)	Martin Zimmer (Legally binding signature) Managing Partner