

# INSTALLATION AND OPERATING INSTRUCTIONS

Robot-specific SCM and Comfort App for ABB robots

DDOC01632

THE KNOW-HOW FACTORY



www.zimmer-group.com



# 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.



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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!
- $\Rightarrow$  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!
- $\Rightarrow$  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

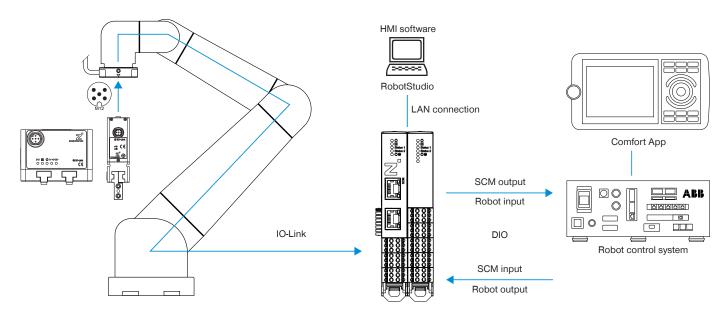
The Smart Communication Module (SCM) is a gateway between the grippers and the robot control system. The SCM can be configured via the HMI software or Comfort App. The grippers can be controlled using the Comfort App on the robot control panel.

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 Technical data

#### INFORMATION

 $(\mathbf{1})$ 

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

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

# 7 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.

### 8 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.



## 9 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.

#### 9.1 Installing hardware

# INFORMATION

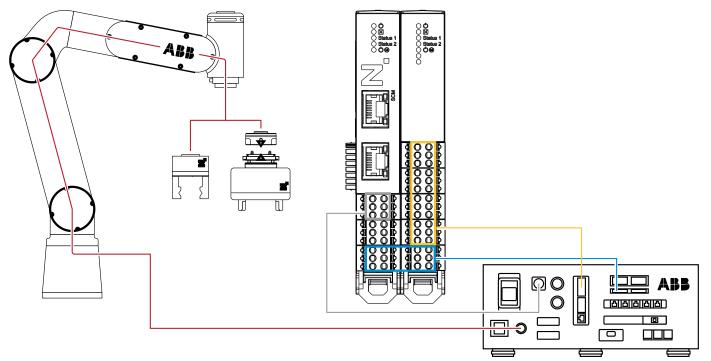


► For more information, refer to the circuit diagram on our website.

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.





#### 9.1.1 Installing standard wiring



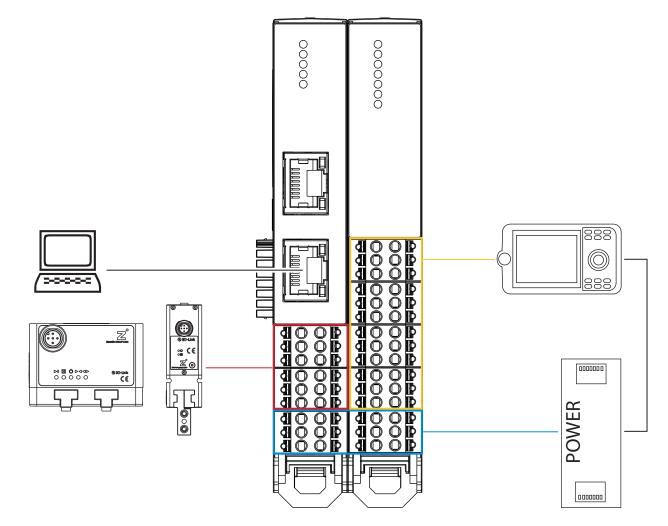
### NOTICE

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.



# 9.1.2 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	-	-		



### 9.1.2.1 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
1	IsReleased	White	ZG_DI0
1 2	IsReleased IsGripped	White Brown	ZG_DI0 ZG_DI1
1 2 3	IsReleased IsGripped IsClosed	White Brown Green	ZG_DI0 ZG_DI1 ZG_DI2
1 2 3 4	IsReleased IsGripped IsClosed OnUndefinedPos	White Brown Green Yellow	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3
1 2 3 4 5	IsReleased IsGripped IsClosed OnUndefinedPos	White Brown Green Yellow Gray	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4
1 2 3 4 5 6	IsReleased IsGripped IsClosed OnUndefinedPos	White Brown Green Yellow Gray -	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 -
1 2 3 4 5 6 7	IsReleased IsGripped IsClosed OnUndefinedPos	White Brown Green Yellow Gray -	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 -
1 2 3 4 5 6 7 8	IsReleased IsGripped IsClosed OnUndefinedPos Error - -	White Brown Green Yellow Gray - -	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 - -
1 2 3 4 5 6 7 8 9	IsReleasedIsGrippedIsClosedOnUndefinedPosErrorAct_WP_Bit0	White Brown Green Yellow Gray - - - Black	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 - - ZG_DI6



# 9.1.2.2 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
SCM connection	Confirmation IsReleased	Color White	Robot input ZG_DI0
1	IsReleased	White	ZG_DI0
1 2	IsReleased IsGripped	White Brown	ZG_DI0 ZG_DI1
1 2 3	IsReleased IsGripped IsClosed	White Brown Green	ZG_DI0 ZG_DI1 ZG_DI2
1 2 3 4	IsReleasedIsGrippedIsClosedOnUndefinedPos	White Brown Green Yellow	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3
1 2 3 4 5	IsReleased IsGripped IsClosed OnUndefinedPos Error	White Brown Green Yellow Gray	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4
1 2 3 4 5 6	IsReleased IsGripped IsClosed OnUndefinedPos Error	White Brown Green Yellow Gray Blue	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 ZG_DI5
1 2 3 4 5 6 7	IsReleased IsGripped IsClosed OnUndefinedPos Error	White Brown Green Yellow Gray Blue	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 ZG_DI5
1 2 3 4 5 6 7 8	IsReleasedIsGrippedIsClosedOnUndefinedPosErrorMotorOn	White Brown Green Yellow Gray Blue - -	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 ZG_DI5 -
1 2 3 4 5 6 7 8 9	IsReleasedIsGrippedIsClosedOnUndefinedPosErrorMotorOnAct_WP_Bit0	White Brown Green Yellow Gray Blue - - Black	ZG_DI0 ZG_DI1 ZG_DI2 ZG_DI3 ZG_DI4 ZG_DI5 - ZG_DI6



## 9.1.3 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	-	-	-	-	

#### 9.1.4 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.



# 9.2 Installing the energy supply

# 9.2.1 Mounting the pin assignment

	1			0000000		1
Status Ethernet port	2			0     0 <td><math display="block"> \begin{array}{c ccccccccccccccccccccccccccccccccccc</math></td> <td>6 7</td>	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	6 7
IO-Link X1 IO-Link X2	3	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
Power supply of basic module X3 Digital input X4	4	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	400P 400P 400P	400P 400P 400P	3         6           7         8           9         10           11         12	9
Digital input X5 Digital output X6	5	1 2 3 4 5 6	44 400 0 0 0 0 0 0 0 0	<b>444</b> 000 000 000	13 14 15 16 17 18	10
Digital output X7 Power supply of IO module X8						



#### 9.2.2 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-cable for a special power supply is required.

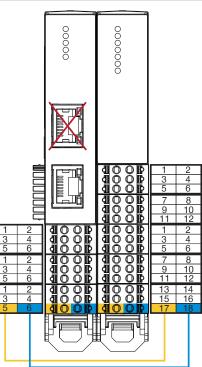
Pin	Function	Explanation	Power supply of basic module X3
1	24 V DC actuator	Actuator supply voltage	
2	GND actuator	0 V DC actuator supply voltage	
3	24 V DC input signal	SCM supply voltage and signal voltage for the grippers	
4	GND input signal	SCM ground and signal voltage for the grippers	
5	24 V 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)	

#### 9.2.3 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.



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## 9.2.4 Installing IO-Link



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 )	IO-Link X1/IO-Link X2		12 5-pin socket	
Pin	Color	Function	Explanation		Pin	Color
1	Black	C/Q	IO-Link communication	34100124	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	3 0 4	5	Gray
5	Brown	24 V DC sensor	Supply voltage of sensor		1	Brown
6	Blue	GND sensor	0 V DC sensor supply voltage	2 0 0 1	3	Blue

## **10 Installation HMI**



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

# **11 Commissioning HMI**



aaLL02 - RobotStudio

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Load Parameters •

Cancel

Save Parameters

# 12 Installation Comfort App

### 12.1 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.

#### 12.2 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.

Modeling

Request Write Access

Release Write Access

48. Authenticate

Access

Simulation Controller RAPID Add-Ins

Restart Backu

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😲 Events

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Home

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Add

Controller

Co

- Start RobotStudio.
- In the Controller tab, click the Save Parameters button.
- ⇒ The Save System Parameters window opens.
- Enable the I/O Systemcheckbox.
- Click the Save button.
- The window for saving files opens. ⇒
- Specify the path under which you want to save the backup copy cfg.

	Controller Tools	Configuration
	∓ x View1 x	
	Save System Param	eters X
	Select the Topics yo	ou want to save
EIO	Communication	
	✓ I/O System	
	Man-Machine C	ommunication
	Motion	
	PROC	
		Sausta Castallar

Save...

<u>\_</u>?]

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# 12.3 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.

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Home

Modeling

Simulation

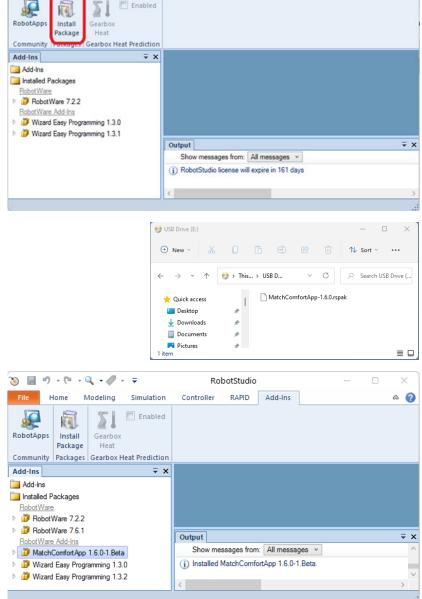
- ► Download the robot app from our website.
- Copy the installation file to a USB memory device.
- ▶ Plug the USB memory stick into the Windows PC.
- Copy the folder with the installation file onto the Windows PC.
- ► Start RobotStudio.

Open the installation file.

add-in.

⇒ The Comfort App has been installed as an

► In the *Add-Ins* tab, click the *Install Package* button.



RobotStudio

Controller

RAPID Add-Ins

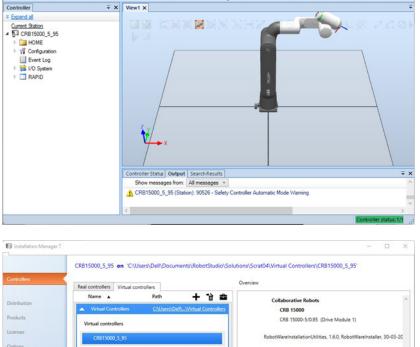
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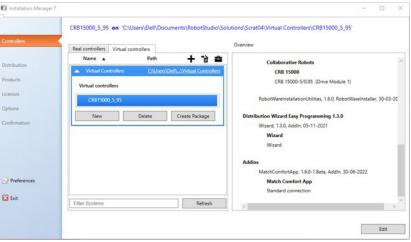
20



- ⇒ The operating instructions of the Comfort App have been installed in *RobotStudio*.
- 3) 🛃 🗉 + 🗠 + 🔍 + 🖉 + ∓ beta1 61 - Robo File Home Modeling Simulation Controller RAPID Add-Ins 🛃 Save Station Support 😹 Save Station As RobotStudio<sup>®</sup> RobotStudio Homepage Access software downloa Close Station New About RobotStudio Ē te in the latest forum disc ine shout RobotStudio and Oper Explore and ABB robot p ഫ്പ് RobotStudio 2022.1 (64-bit) Version 22.1.9826.0 Info Tutorials Studio can help you work faster and si tting started or an experienced techni ced techniques, you can learn it here. <u>Release Notes</u> You have the latest version. ٩<u>4</u> Print © 2022 ABB. All rights reserved. Learn about SDKs and Web services to develop apps for different and to communicate with ABB robots. Share Supports RobotWare 5.06 to 6.13 and 7.0 to 7.6, in Online License: Premium Expires: 12-07-2022 Machine ID: 5b8cbc4c-f452-43e3-b4c2-c6b9364340 Manage Licenses Activate and review your license R Optio Support Tool Collect system information and fault logs for sending to product support. Acknowledgements 🔀 Exit Documentation Algoryx ? RobotStudio Help Get help for using RobotStudio IRC5 Documentation OmniCore Documentation Add-Ins Documentation otWare 7.6.1 Release Notes RobotWare 7.6.1 Release Notes Wizard Easy Programming 1.3.2 Release Notes Wizard Release Notes MatchComfortApp 1.6.0-1.Beta Match Comfort App 🅥 🖬 비 - 연 - ٩ + 두 baLN13 - RobotStudio Simulation Controller RAPID File Home Modeling Add-Ins a ? Restart Backup Stevents 1 8 📓 💁 Go Offline U, 1 0 2 8 . a l P 😽 🍶 Create Relatio Configura Operator Window 📝 🔎 Open Rela Backup Add Controller - 48 -Access Contre Transfer ∓ x View1 x Expand all
- ► 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.



#### Installation and operating instructions: Robot-specific SCM and Comfort App for ABB robots



2022-06-30

OK Ca

- ⇒ The *Distribution* menu is displayed.
- ► Click the *Add* button.

	CRB15000_5_95 on 'C:\User	s\Dell\Documents\Rob	otStudio\Solutions\b	aLN13\Virtual Controllers\0	CRB15000_5_95*	
ontrollers	Distributions					
	Name	Version	Publisher	Creation Date		
stribution	RobotWare	7.2.2				
oducts	Wizard Easy Programming	1.3.0	ABB	2021-11-05		
censes						
ptions						
onfirmation						
Preferences						
Exit	Add Repla	ce Remove				
		in the second se				
			< Previous			

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C) Se

Show only late:

- $\Rightarrow$  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.

Installation Manager	7				1		×
Controllers	CR815000_5_95 on 'C:\Usen Distributions Name	s\Dell\Documents\Robot! Version	Studio\Solutions\Sci Publisher	at04\Virtual Controllers\CRB15000_5_95*			
Distribution	RobotWare	7.6.1	ABB	2022-05-09			
Products	Wizard Easy Programming	1.3.0	ABB	2021-11-05			
Licenses	MatchComfortApp 1.6.0-1	1.6.0	Zimmer Group	2022-06-30			
Options							
Confirmation							
🕞 Preferences			-				
	Add Replac	e Remove					
			< Previous	Next > Apply		Cancel	2

- ► In the *Options* menu, click the *Applications* tab.
- Activate the Standard connection option field to assign 8 inputs and 8 outputs.
- Activate the All signals connection option field to assign all 12 inputs and 12 outputs.
- Click the Next button several times.

Installation Manager 7	-		×
Controllers	CR815000_5_95 on 'C:\Users\Dell\Documents\RobotStudio\Solutions\Scrat04\Virtual Controllers\CR815000_5_95' System Options Drive Modules Applications		_
Distribution Products	✓ EasyProgramming ✓ Wizard ✓ Wizard ✓ FleeXendant ✓ Apps		
Licenses	HerPendent App Package     Match Comfort App     Match Comfort App     Match Comfort App     Match Comfort App		
Options Confirmation	All signals connection		
Preferences			
🔀 Exit	Revert Export settings Add s	ettings	
	< Previous Next > Apply 0	Cancel	

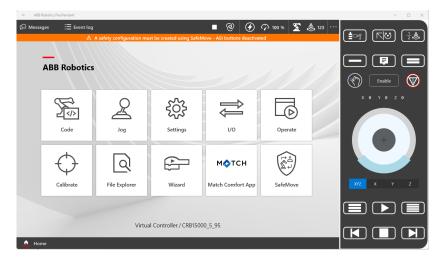
#### Installation and operating instructions: Robot-specific SCM and Comfort App for ABB robots



- Click the *Apply* button.
- $\Rightarrow$  The installation is complete.
- ► Close the Installation Manager window.

Installation Manager	r 7		-		>
	CRB15000_5	95 on 'C:\Users\Dell\Documents\RobotStudio\Solutions\baLN13\Virtual Controllers\CRB15000_5_95'			
Controllers		Robot OS			
		Robot Controller Operating System			
Distribution		Robots, 1.2.1, ABB			
Products		Collaborative Robots			
icenses		CRB 15000			
Licenses		CRB 15000-5/0.95 (Drive Module 1)			
Options					
Confirmation		RobotWareInstallationUtilities, 1.2.0, ABB			
		Distribution Wizard Easy Programming 1.3.0			
		Wizard, 1.3.0, ABB			
		Wizard			
		Wizord			
Preferences		Distribution open.zimmergroup.Matchcomfortapp			
	[Added]	MatchComfortApp, 1.6.0-1.Beta, Addin, 04-07-2022			
🔀 Exit					
		< Previous Next > Apply		Cancel	

- 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.





# 13 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.

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File Home Modeling	g Simula	tion Contro	ller RAPI	D Add-Ins				۵ 🕜
Add Controller - Access	ickup			Configuration		ndow 📴 🔎 Op	Offline ate Relation en Relation ansfer	
Controller 🗸 🗙	View1	CRB15000_5_95	1 (Station)	ĸ				
☆ Collapse all	I/O Syste	m Configura	tion - I/O Sy	stem ×				- 9 + -
Current Station		Туре	Name	~	Type of Signal	Assigned to Device	Signal Identificat	ion Label
A CRB15000 5 95 1	Access Le	vel	ZG_DI0		Digital Input		ZG_DI0	~
4 HOME	Cross Con	nection	ZG_DI1		Digital Input		ZG_DI1	
Blocklibrary	Device Tru	ist Level	ZG_DI2		Digital Input		ZG_DI2	
		P Command	ZG_DI3		Digital Input		ZG_DI3	
WebApps	EtherNet/I		ZG_DI4		Digital Input		ZG_DI4	
Wizard	Ethernet/IP IO Connection EtherNet/IP Network		20_016		Digital Input		ZG_DI5	
4 🎬 Configuration					Digital Input		ZG_DI6	
Communication		PINetwork	ZG_DI7		Digital Input		ZG_DI7	
Controller	Signal		ZG_DI8	Edit Sign			ZG_DI8	
I/O System	Signal Saf		ZG_DI9				ZG_DI9	
	System Inj		ZG_DI10 New Si ZG_DI11 ZG_DO1 Copy S		al		ZG_DI10	
Man-Machine Com	System Ou	utput			nal		ZG_DI11	
Motion			ZG_DO0 ZG_DO1	Delete Sid			ZG_D00 ZG_D01	
PROC			ZG D02 -	Delete Sig	Digital Output		ZG D02	
Event Log			ZG_D02 ZG_D03		Digital Output		ZG_D02 ZG_D03	
I/O System			ZG_D04		Digital Output		ZG DO4	
BAPID			ZG DO5		Digital Output		ZG DO5	
			ZG_DO6		Digital Output		ZG_DO6	
			ZG_DO7		Digital Output		ZG_DO7	
			ZG_DO8		Digital Output		ZG_DO8	
			ZG_DO9		Digital Output		ZG_DO9	
			ZG_D010		Digital Output		ZG_D010	
			ZG_D011		Digital Output		ZG_D011	~
			<					>
	Controller	Status Output	Search Resu	lte				∓ ×
` /	controller	Status Output	searchikesu					• ^

- 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.
- $\Rightarrow$  The additional signals are displayed in the Comfort App.

	Information			
ZG_DI8				
Digital Input ~				
v				
ZG_DI8				
All *				
0				
	Digital Input v ZG_DI8 All v	Digital Input v ZG_DI8 All v	Digital Input	Digital Input



# 14 Commissioning Comfort App



# 14.1 Deleting existing setups

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

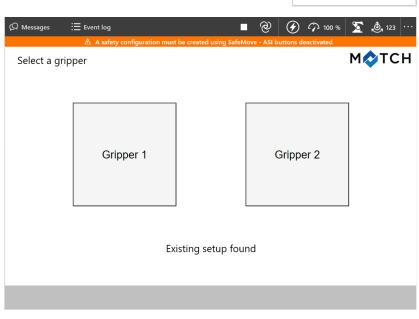
This screen does not appear if the available setup is only found for one gripper. In this case, the next screen is shown right away.

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

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

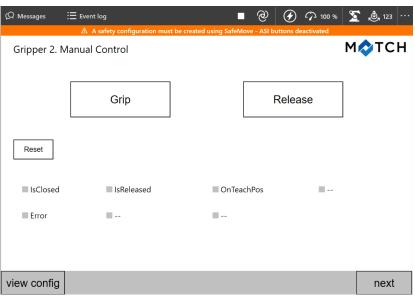


- Click the button of the desired gripper.
- ⇒ The Manual control screen for the manual control is displayed.



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

► Click the *view config* button.



#### Installation and operating instructions: Robot-specific SCM and Comfort App for ABB robots



- ⇒ The View Configuration screen for editing the gripper configuration is displayed.
- ► Click the *delete* button.

⟨♀ Messages	Event log	ration must be created		ව 🕑	في المحقق المحق محقق المحقق المحقق المحق المحقق المحقق المحق محقق المحقق محقق محقق المحقق محقق محقق محقق محقق محقق محقق محقق
Gripper 1	View Configuratio				м�тсн
	Robot	Outputs DO	Robot Inputs-	DI	
	Release	ZG_DO0	_ls_Opened	ZG_DI0	
	Grip	ZG_DO1	_Is_Gripped	ZG_DI1	
	Reset	ZG_DO2	_Is_Closed	ZG_DI2	
	MotorO	n ZG_DO3	_ Is_Undef_Pos	ZG_DI3	
	Homing	ZG_DO4	_ Is_Error	ZG_DI4	
	WP_Bit0	ZG_DO5	_ls_Motor_On	ZG_DI5	
	WP_Bit1	ZG_DO6	_ls_Homing_Ok		
	WP_Bit2		_Act_WP_Bit0	ZG_DI6	
	WP_Bit3		_Act_WP_Bit1	ZG_DI7	
			_Act_WP_Bit2		
			_Act_WP_Bit3		
back		mo	dify		delete

- ► In the prompt, click the YES button.
- $\Rightarrow$  The existing setup is deleted.
- $\Rightarrow~$  The screen sequence for configuring new grippers is displayed.

(?)

Are you sure ? The assignment will be deleted.



YES

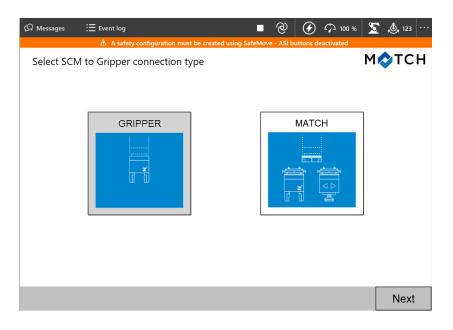
NO



# 14.2 Creating a gripper configuration

### 14.2.1 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.



#### 14.2.2 Gripper connection type

### 14.2.2.1 Selecting the number of grippers

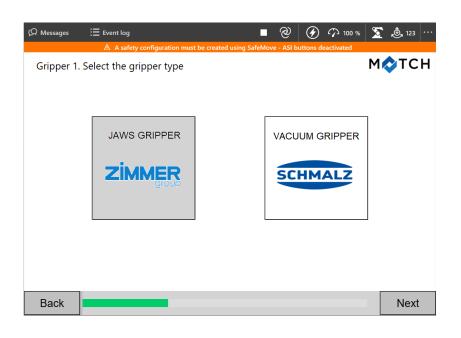
- Click the desired number of grippers you want to have in your robot application.
- ► Click the *next* button.

Ø Messages	Ξ Event log		ଡ	(*) 100 %	∑ ,∲, 123 ····
	A safety configuration mus	t be created using SafeM	ove - ASI bu	ttons deactivated	
How man	y grippers in configuratior				м�тсн
	Gripper 1		Gript	per 1 and 2	
		l			J
Back					Next



#### 14.2.2.2 Selecting the gripper type

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

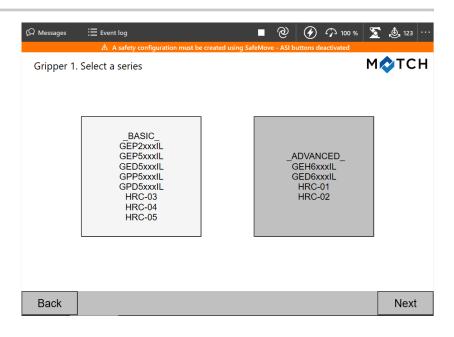


#### 14.2.2.3 Selecting the gripper series

# INFORMATION

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

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





#### 14.2.2.4 Manual control

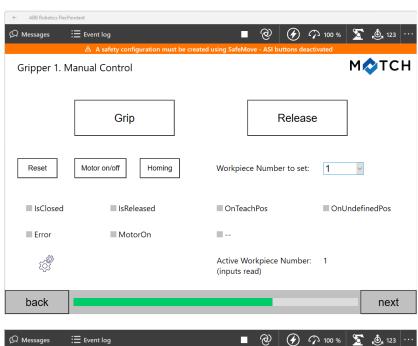


The prerequisite for the function test is that the wiring between the robot and SCM is present and that the robot, SCM and gripper are switched on.

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 <sup>\*</sup><sup>a</sup> 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.

(Q Messages	Event log			<b>્</b> (૪)	(A) 100 %	∑ <u>,</u> ⊕, 123 ····
p. i meesuges	A safety configuration mu	et he created				
Gripper 1.	View Configuration	st de createu	using salemove -	ASI BULLONS	ueactivateu	м�тсн
	Robot Outputs	DO	Robot Inputs-	DI		
	Release	ZG_DO0	_ls_Opened	ZG_DI0		
	Grip	ZG_DO1	_ls_Gripped	ZG_DI1		
	Reset	ZG_DO2	_ls_Closed	ZG_DI2		
	MotorOn	ZG_DO3	_ls_Undef_Pos	ZG_DI3		
	Homing	ZG_DO4	_ls_Error	ZG_DI4		
	WP_Bit0	ZG_DO5	_ls_Motor_On	ZG_DI5		
	WP_Bit1	ZG_DO6	_ls_Homing_Ok			
	WP_Bit2		Act_WP_Bit0	ZG_DI6		
	WP_Bit3		Act_WP_Bit1	ZG_DI7		
			Act_WP_Bit2			
			_Act_WP_Bit3			
back		mo	dify			delete



### 14.2.2.5 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").

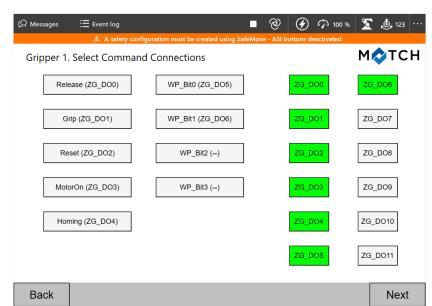
Establish the correspondence of the robot output number with the digital input function of the SCM.

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
- $\Rightarrow$  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.





#### 14.2.2.6 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.

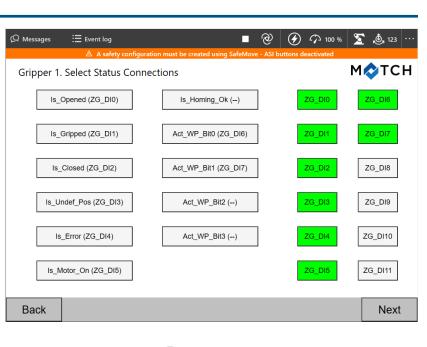
Complete the wiring precisely as shown on this screen.

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. ls\_Opened
- Click the desired input.
  - e.g. ZG\_DI7
- $\Rightarrow$  The input has been assigned to the signal.
- ⇒ The button of the signal is expanded by adding the input.
  - e.g. ls\_Opened (ZG\_DI7)
- Click the Next button.
- ► In the prompt, click the YES button.





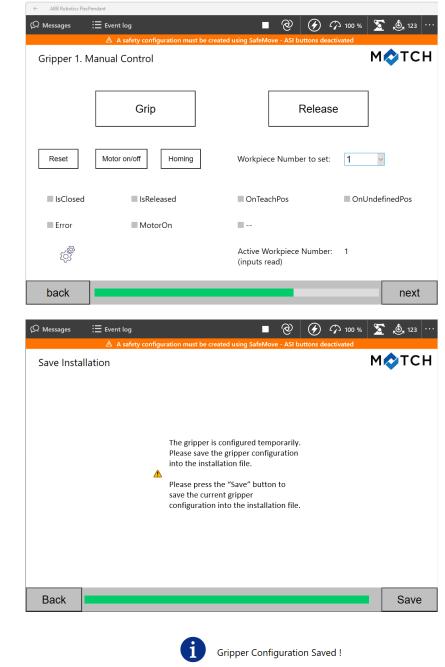
YES

NO



### 14.2.2.7 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.



OK

- ► In the prompt, click the *Save* button.
- $\Rightarrow$  The gripper configuration has been stored.

- ▶ In the prompt, click the *Ok* button.
- $\Rightarrow$  The gripper configuration is complete.
- ⇒ The function blocks/subprograms have been created and are available for programming.



### 14.2.3 MATCH connection type

#### 14.2.3.1 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 <sup>\*</sup><sup>o</sup> button to modify the default assignment.
- ⇒ The Select command connections screen for selecting the command connections is displayed.

← ABB Robotics F	lexPendant					
(C) Messages	Ξ Event log		ම	<ul> <li>4</li> </ul>	% 100 ک	S 👲 123 ····
	${\mathbb A}$ A safety configuration must be creat	ed using SafeMove	e - ASI bu	ttons deacti	vated	
Gripper 1.	Manual Control					м�тсн
		ripper ced gripper n gripper		Rele	ase	
Reset	Motor on/off Homing	Workpiece	Numbe	r to set:	1	×
IsClosed	IsReleased	OnTeach	Pos		OnU	IndefinedPos
Error	MotorOn					
ŝ		Active Worl (inputs read		Number:	1	
back						next

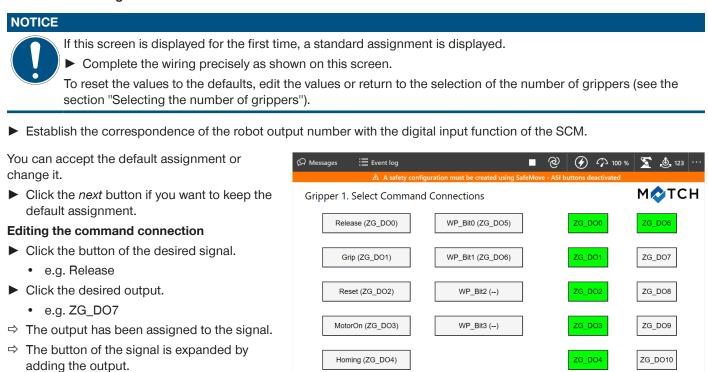


ZG\_DO5

ZG\_DO11

Next

### 14.2.3.2 Selecting the command connections



Back

- e.g. Release (ZG\_DO7)
- ► Click the Next button.

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#### 14.2.3.3 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.

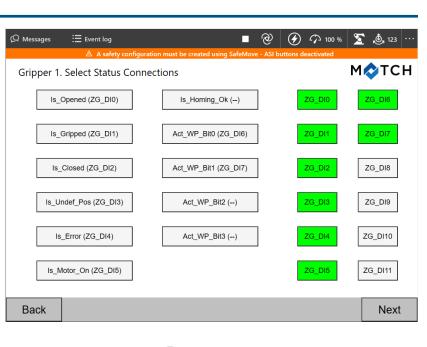
Complete the wiring precisely as shown on this screen.

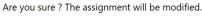
You can accept the default assignment or change it.

 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. ls\_Opened
- Click the desired input.
  - e.g. ZG\_DI7
- $\Rightarrow$  The input has been assigned to the signal.
- ⇒ The button of the signal is expanded by adding the input.
  - e.g. ls\_Opened (ZG\_DI7)
- Click the Next button.
- ► In the prompt, click the YES button.





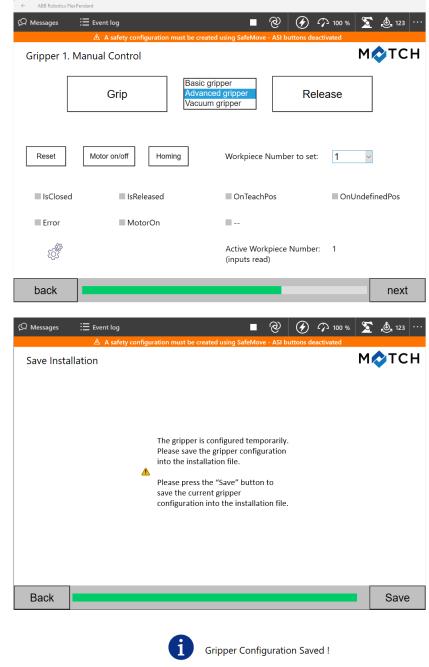
YES

NO



### 14.2.3.4 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.



OK

- ► In the prompt, click the *Save* button.
- $\Rightarrow$  The gripper configuration has been stored.

- ▶ In the prompt, click the *Ok* button.
- $\Rightarrow$  The gripper configuration is complete.
- ⇒ The function blocks/subprograms have been created and are available for programming.

### **15 Operation**

#### 15.1 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).
- $\Rightarrow$  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).

#### 15.2 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	<i>bCmdFail</i> <i>= TRUE</i> , if command fails <i>= FALSE</i> , if command was successful	Gripping	
ZRELEASE1 ZRELEASE2	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	
ZMOTORON1 ZMOTORON2	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.	
ZMOTOROFF1 ZMOTOROFF2	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.	
ZHOMING1 ZHOMING2	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.	
ZRESET1 ZRESET2	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.	
ZCHANGEWP1 ZCHANGEWP2	<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.	
ZISWPCHANGED1 ZISWPCHANGED2	<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	Outputs TRUE if workpiece number (n) is activated.	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		





Generated robot job name	Parameter In	Parameter Out	Function	
ZISOPENED1 ZISOPENED2	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	Outputs TRUE if the gripper is open.	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		
ZISCLOSED1 ZISCLOSED2	1: Address gripper 1 2: Address gripper 2	<i>bClosed</i> = TRUE, if gripper is open = FALSE, if gripper is closed	Outputs TRUE if the gripper is closed.	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		
ZISONTEACHPOS1 ZISONTEACHPOS2	1: Address gripper 1 2: Address gripper 2	<i>blsOnTeachPos</i> = <i>TRUE</i> , if gripper is set to TeachPo- sition = <i>FALSE</i> , if gripper is not set to TeachPosition	Outputs TRUE if the gripper is set to <i>TeachPosition</i> .	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		
ZISONUNDEFPOS1 ZISONUNDEFPOS2	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	Outputs TRUE if the gripper is set to OnUnde finedPos.	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		
ZISERROR1 ZISERROR2	ERROR2 2: Address gripper 2 = TRUE, if gripper is in error state		Outputs TRUE if the gripper is in an error state.	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		
ZISMOTORON1 ZISMOTORON2	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	Outputs TRUE if the motor of the gripper is switched on.	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		
ZISHOMINGOK1 ZISHOMINGOK2	1: Address gripper 1 2: Address gripper 2	<i>bHomeOk</i> = <i>TRUE</i> , if homing is OK = <i>FALSE</i> , if homing is not OK	Outputs TRUE if the referencing of the gripper is OK.	
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful		



Generated robot job name	Parameter In	Parameter Out	Function		
successful = <i>FALSE</i> , if grippe		= TRUE, if ZHOMING command was	Outputs TRUE if the referencing of the gripper is successful.		
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful			
ZERRORWARNINGON1 ZERRORWARNINGON2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Enables Error/Warning for robot if gripper is present.		
ZERRORWARNINGOFF1 ZERRORWARNINGOFF2	1: Address gripper 1 2: Address gripper 2	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Disables Error/Warning for robot if gripper present.		
ZISPARTDETACHED11: Address gripper 1bPartDetachedIZISPARTDETACHED22: Address gripper 2= TRUE, if part is detached9		B[n] = 1, if gripper of gripper type <i>Vacuum</i> signals <i>Part detached</i> .			
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	B[n] = 0, if part is not detached.		
ZISPARTPRESENT1 ZISPARTPRESENT2	1: Address gripper 1 2: Address gripper 2	<i>bPartPresent</i> <i>= TRUE</i> , if part is present <i>= FALSE</i> , if part is not present	<ul> <li>B[n] = 1, if gripper of gripper type Vacuum signals Part present.</li> <li>B[n] = 0 if part is not present.</li> <li>B[n] = 1 if gripper of gripper type Vacuum signals Ready.</li> </ul>		
		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful			
ZISREADY1 ZISREADY2	1: Address gripper 1 2: Address gripper 2	<i>bReady</i> = <i>TRUE</i> , if input is switched on = <i>FALSE</i> , if input is not switched on			
= TF		<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	B[n] = 0 if gripper is not ready.		
ZMATCHSTARTCHANGE1 ZMATCHSTARTCHANGE2	-	<i>bCmdFail</i> = <i>TRUE</i> , if command fails = <i>FALSE</i> , if command was successful	Is output before the gripper is changed for <i>MATCH</i> .		
ZISMATCHCHANGEDONE1 ZISMATCHCHANGEDONE2	-	<i>bMatchChangeDone</i> = <i>TRUE</i> , if match was changed = <i>FALSE</i> , if match was not changed	For <i>MATCH</i> B[n] = 1 if gripper is connected successfully.		
		<i>bCmdFail</i> <i>= TRUE</i> , if command fails <i>= FALSE</i> , if command was successful	B[n] = 0, if gripper is not connected successfully.		



#### 15.3 Wizard function blocks

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

Ω Messages 🗄	Event log		ଡ	$\otimes$	P 100 %	T	<b>.</b> , 1	23	
	▲ A safety configuration must be created using SafeMove	- ASI but	ttons dea	ctivated					
Wizard Wizard	🗈 File 🗸 A	pplied				🗊 Da	ita C	) Help	
Message	Grip First gripper with timeout 5 seconds and	Stop	💌 if e	rror or	timeout o	ccurs			
Move	Release First gripper with timeout 5 seconds	and St	ор 🔹	if erro	r or timeou	it occu	irs		
Stop & Wait	Do Homing for <b>First</b> gripper with timeout <b>8</b> s	econds	and 🚺	top 🔹	if error or	timeo	out oc	urs	
Procedures	Set Workpiece Number <b>0</b> with timeout <b>4</b> second	onds an	d Sto	p 💌 if	error or tir	neout	occur	s	
Loops	Prepare for changing the Match gripper and Stop	💌 if er	ror occ	urs					
Signals	Check OK to operate after changing Match gripper	Stop	) 🔨 if (	error o	ccurs				
Logic									
Variables									
Zimmer									
🛕 Home 🗁 Wiz	tard								

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

Global variables	Function
z_Success	Outputs <i>TRUE</i> if the <i>function block</i> was run successfully. Outputs <i>FALSE</i> if the <i>function block</i> was not run successfully.
z_Error	Outputs <i>TRUE</i> if errors occur when running the <i>function block</i> . Outputs <i>FALSE</i> if no errors occur when running the <i>function block</i> . Errors are logged in the event log.
z_Timeout	Outputs <i>TRUE</i> if the confirmation time was exceeded when running the <i>function block</i> . Outputs <i>FALSE</i> if the confirmation time was not exceeded when running the <i>function block</i> . If the confirmation time is exceeded, the <i>function block</i> 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.



#### 15.3.1 Grip

Grip First gripper with timeout 5 seconds and Stop if error or timeout occurs

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.

#### 15.3.2 Release

## Release First T gripper with timeout 5 seconds and Stop T if error or timeout occurs

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.



#### 15.3.3 Do Homing

## Do Homing for First r gripper with timeout 8 seconds and Stop r if error or timeout occurs

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.

#### 15.3.4 Set Workpiece Number

## Set Workpiece Number **1** with timeout **4** seconds and **Stop** if error or timeout occurs

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.



### 15.3.5 Prepare for changing the MATCH gripper (ZMATCHSTARTCHANGE)

# Prepare for changing the Match gripper and Stop • if error occurs

This function block can be used only for MATCHgrippers.

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.

#### 15.3.6 Check OK to operate after changing Match gripper (ZISMATCHCHANGEDONE)

# Check OK to operate after changing Match gripper... Stop 🔨 if error occurs

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:

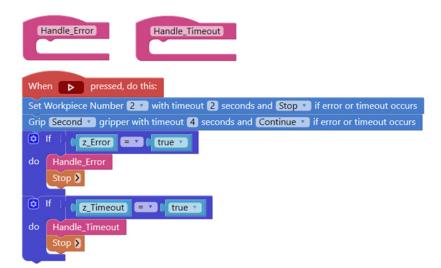
- Check of whether at least one of the input signals is set:
  - Is\_Opened
  - Is\_Gripped
  - Is\_Closed
  - Is\_Undef\_Pos
- At least one input signal is set: z\_Return\_Value = TRUE
- Function block exited.

#### 15.3.7 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*.

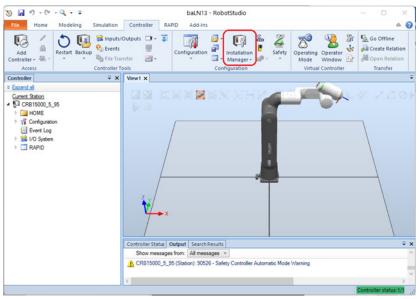
*Grip* closes the second gripper. If the confirmation time of 4 seconds is exceeded or an error occurs, the sequence continues running *Continue*.



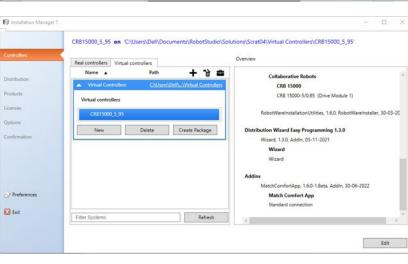


## 16 Uninstalling the Comfort App

- 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.



- $\Rightarrow$  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.

Installation Manager 7	_			- 0 ×
Controllers	CRB15000_5_95 on 'C:\User	s\Dell\Documents\RobotSt	udio\Solutions\Scr	at04\Virtual Controllers\CRB15000_5_95'
	Name	Version	Publisher	Creation Date
	RobotWare	7.6.1	ABB	2022-05-09
Products	Wizard Easy Programming	1.3.0	ABB	2021-11-05
Licenses	MatchComfortApp 1.6.0-1.	. 1.6.0	Zimmer Group	2022-06-30
Options				
Confirmation				
Preferences				
🔀 Exit	Add Repla	Remove	]	
			< Previous	Next > Apply Cancel



#### 16.1 Uninstall add-in

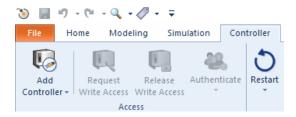


- Click the Add-In tab.
- In the Add-Ins menu, right-click the add-in of the Comfort App.
- $\Rightarrow$  The context menu is opened.
- ► Click Uninstall package.
- $\Rightarrow$  The add-in has been uninstalled.

30 📓 10 × 01 × 02 ▼ // ▼ ∓						
File Home	Modeling	Simulation	Controller	RAPID	Add-Ins	
	1	Enabled				
	stall Gearbox kage Heat					
	kages Gearbox H	eat Prediction				
Add-Ins		∓ x				
🚞 Add-Ins	Add-Ins					
📜 Installed Packages						
Robot Ware						
BobotWare 7.2.2						
BobotWare 7.6.1						
RobotWare Add-Ins						
MatchComf			_			
open.cn.rob	otics.wizard 1.4.0-2	Uninstal	ll Package			
Wizard Easy Programming 1.3. Open Pa			ackage Folder	Uninsta	II Package	
Wizard Easy Programming 1.3.: Support			Information		-	
Docume			ntation	Unins	tall the selected package.	

#### 16.2 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.



#### 17 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.



## **18 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

SCM

Type designation:

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)

Clasti 7: Martin Zimmer

(Legally binding signature) Managing Partner



## **19 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

SCM

Type designation:

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-in- dustrial
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)

Verti 7.

Martin Zimmer (Legally binding signature) Managing Partner



## 20 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

Authorized representative for the

compilation of relevant technical

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 12100Safety of machinery - General principles for design - Risk assessment and risk<br/>reductionDIN EN 60204-1Safety of machinery - Electrical equipment of machines - Part 1: General<br/>requirements

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

Ross

documents

Rheinau, Germany, 2020-02-28 (Place and date of issuance)

Reali Ti

Martin Zimmer (Legally binding signature) Managing Partner