



# INSTALLATION AND OPERATING INSTRUCTIONS

Smart Communication Module

SCM

DDOC00734

THE KNOW-HOW FACTORY

## Parameter explanation (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](http://www.zimmer-group.com).

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

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

### 1.1 Notices and graphics in the installation and operating instructions

#### DANGER



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

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

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

#### WARNING



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

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

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

#### CAUTION



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

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

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

### NOTICE



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

### INFORMATION



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

## 2 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



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



#### **Injuries and material damage due to inadequate qualification**

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**

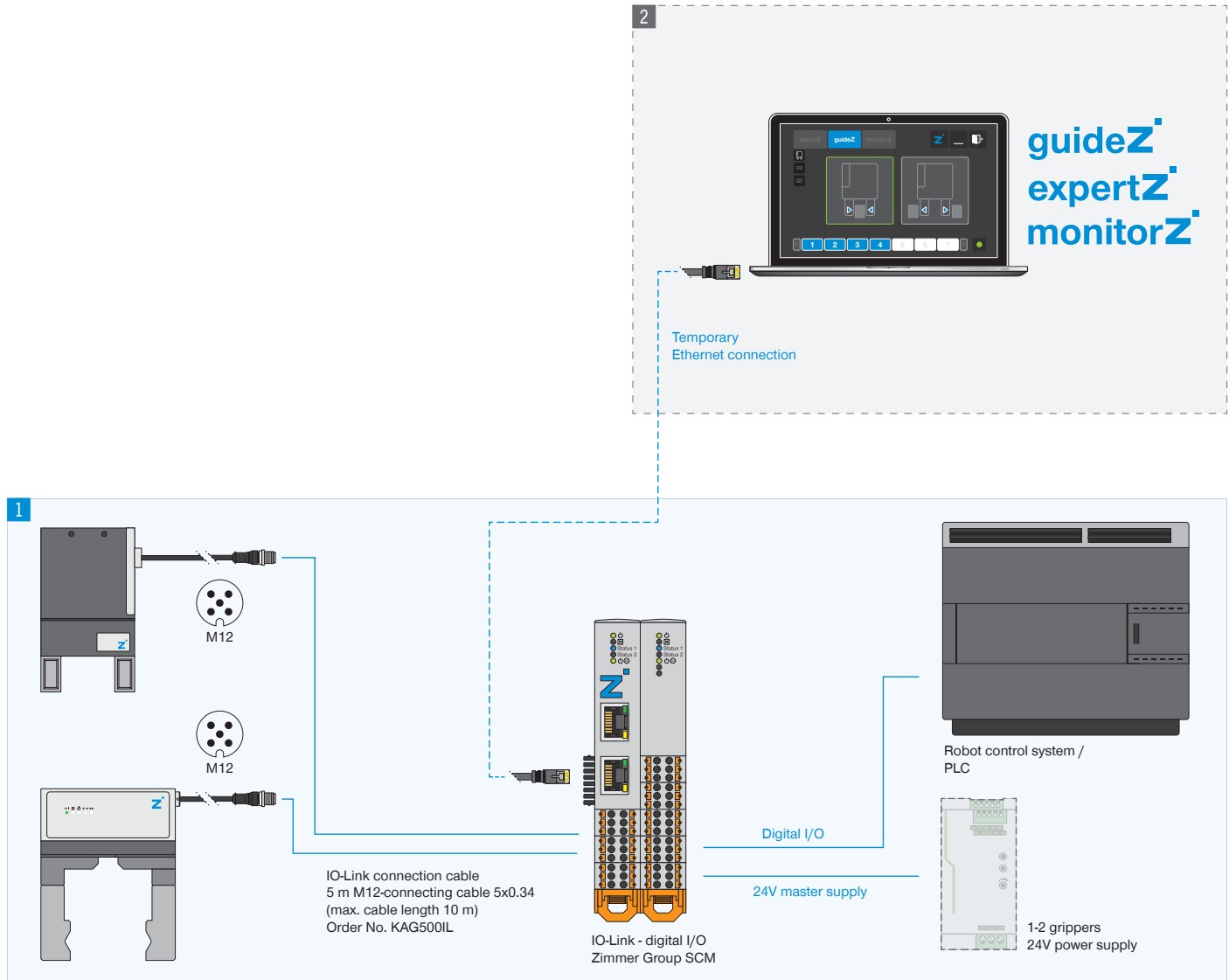
Persons who work with the product must be familiar with the valid safety regulations and laws as well as the standards, guidelines and laws listed in this document.

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 is configured via Human Machine Interface (HMI) software.

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.



## 6 Functional description

The SCM is the intelligent gateway between the grippers and the robot control system. It is used to easily control up to two grippers. The control connection is provided by 12 robot inputs and outputs.

For this purpose the SCM is initially configured using the *ZG\_IO\_LINK\_HMI* HMI software. Once the gripper has been taught, it can then be controlled via the HMI software.

### INFORMATION



The Zimmer GmbH SCM must be used for controlling the grippers via the robot control system.

Up to 15 workpieces can be configured and saved for grippers in the SCM setup. The workpiece numbers are available externally via bit coding in the form of digital SCM inputs and SCM outputs.




When using an individual gripper with SCM, the desired workpieces can be selected via the robot input and robot output connection in order to define the correct workpiece bit numbers. By default workpiece 1 is set when there is no robot input connection.

Work piece	Cmd_WP_			
	Bit0	Bit1	Bit2	Bit3
1	0	0	0	0
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
12	0	0	1	1
13	1	0	1	1
14	0	1	1	1
15	1	1	1	1




## 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.
 (P 24 V)	Continuous light	• Actuator voltage OK
	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 <i>release</i> direction.
	Continuous light	• Gripper has a motion task in the <i>grasp</i> direction.
 (P 24 V)	Continuous light	• Actuator voltage OK
	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.
- ▶ Please contact Zimmer Customer Service if you have any questions.

## 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 electrical voltage

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.

### NOTICE



Installation may only be carried out by qualified personnel in accordance with these installation and operating instructions.

- ▶ Switch off the power supply before any assembly, installation or maintenance work.

#### 10.1 Installing the product

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

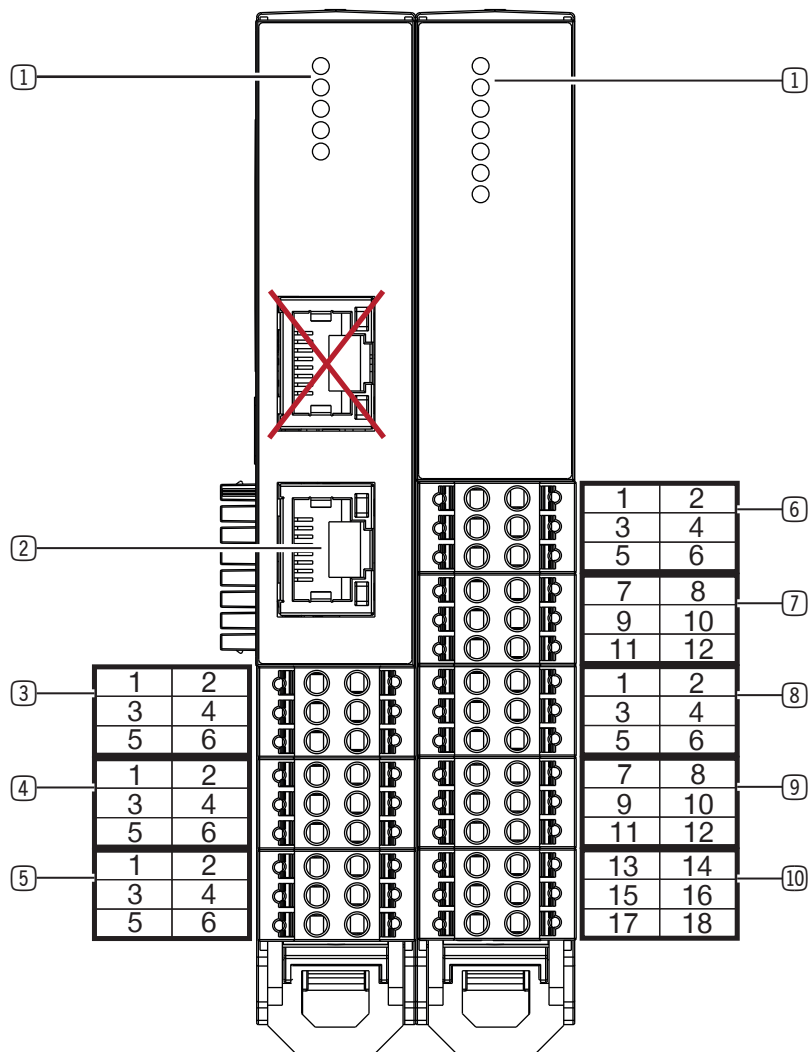
The mounting position can be upright on the profile rail or suspended (profile rail mounted in the control cabinet).

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

## 10.2 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.

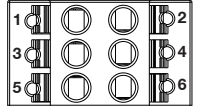
### INFORMATION



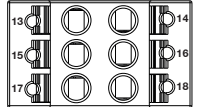
The signal and actuator voltage is electrically isolated in the product.

- 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.

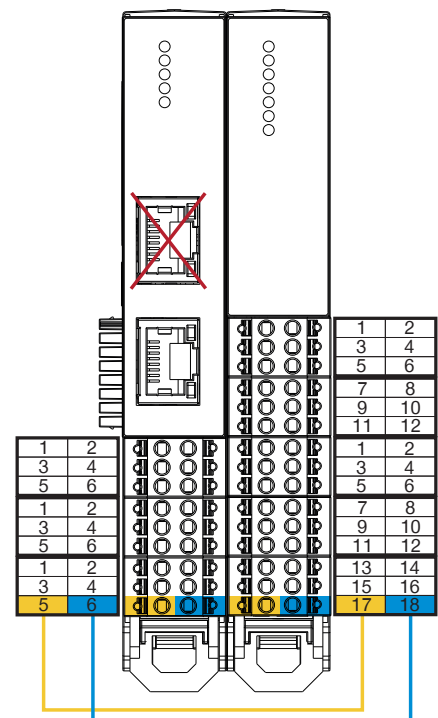
The maximum permitted current draw allows you to operate all grippers directly on the product. No Y-cable for a special power supply is required.

pin	Color	Function	Explanation	 <p>Power supply of basic module X3</p>
1	White	+ 24 V DC actuator	Actuator supply voltage	
2	Brown	GND actuator	0 V DC actuator supply voltage	
3	Green	+24 V DC input signal	SCM supply voltage and signal voltage for the grippers	
4	Yellow	GND input signal	SCM ground and signal voltage for the grippers	
5	Gray	+24 V DC output signal	Signal voltage output for supplying power to the I/O module (connect to pin 17)	
6	Pink	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	Color	Function	Explanation	 <p>Power supply of IO module X8</p>
13	-	-	-	
14	-	-	-	
15	-	-	-	
16	-	-	-	
17	Gray	+ 24 V DC	+ 24 V DC supply voltage	
18	Pink	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



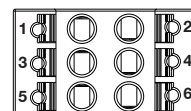
**Non-compliance may result in material damage.**

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

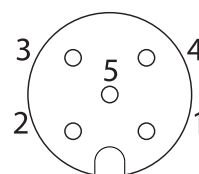
If the gripper has an additional STO cable (Safe-Torque-OFF), this is wired with the external safety circuit independently of the SCM.

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

IO-Link X1/IO-Link X2				M12 5-pin socket	
pin	Color	Function	Explanation	pin	Color
1	Black	C/Q	IO-Link communication	4	Black
2	-	-	-	6	-
3	White	+ 24 V DC actuator	Actuator supply voltage	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



IO-Link X1/IO-Link X2



M12 5-pin socket

### 10.2.5 IO assignment for connected gripper (single mode)

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

		Port 1 - Advanced_Gripping		Port 1 - Basic_Gripping
IO module pin		Function	Advanced_Gripping	Basic_Gripping
pin	Digital input X4			
1		Input 1	Cmd_Release	Cmd_Release
2		Input 2	Cmd_Grasp	Cmd_Grasp
3		Input 3	Cmd_Reset	Cmd_Reset
4		Input 4	Cmd_MotorOn/Cmd_MotorOff	-
5		Input 5	Cmd_Homing	-
6		Input 6	-	-
pin	Digital input X5			
7		Input 7	-	-
8		Input 8	-	-
9		Input 9	Cmd_WP_Bit0	Cmd_WP_Bit0
10		Input 10	Cmd_WP_Bit1	Cmd_WP_Bit1
11		Input 11	Cmd_WP_Bit2	Cmd_WP_Bit2
12		Input 12	Cmd_WP_Bit3	Cmd_WP_Bit3
pin	Digital output X6			
1		Output 1	IsReleased	IsReleased
2		Output 2	IsGrasped	IsGrasped
3		Output 3	IsClosed	IsClosed
4		Output 4	OnUndefinedPos	OnUndefinedPos
5		Output 5	Error	Error
6		Output 6	MotorOn	-
pin	Digital output X7			
7		Output 7	HomingOk	-
8		Output 8	-	-
9		Output 9	Act_WP_Bit0	Act_WP_Bit0
10		Output 10	Act_WP_Bit1	Act_WP_Bit1
11		Output 11	Act_WP_Bit2	Act_WP_Bit2
12		Output 12	Act_WP_Bit3	Act_WP_Bit3

### 10.2.6 IO assignment for two connected grippers (dual mode)

Port 2 is used as soon as two grippers are connected. Both ports divide up the available 12 pins for input and output. Therefore, it is no longer possible to actively select a workpiece recipe. In this case, the selection of workpiece recipe number 1 is fixed.

		Port 1 - Basic_Gripping	Port 1 - Advanced_Gripping	Port 1 - Advanced_Gripping	
		Port 2 - Basic_Gripping	Port 2 - Basic_Gripping	Port 2 - Advanced_Gripping	
IO module pin	Function	Basic_Gripping	Advanced_Gripping + Basic_Gripping	Advanced_Gripping	
<b>pin Digital input X4</b>					
1	Input 1	Cmd_Release	Cmd_Release	Cmd_Release	Port 1
2	Input 2	Cmd_Grasp	Cmd_Grasp	Cmd_Grasp	
3	Input 3	Cmd_Reset	Cmd_Reset	Cmd_Reset	
4	Input 4	-	Cmd_MotorOn/Cmd_MotorOff	Cmd_MotorOn/Cmd_MotorOff	
5	Input 5	-	Cmd_Homing	Cmd_Homing	
6	Input 6	-	-	-	
<b>pin Digital input X5</b>					
7	Input 7	Cmd_Release	Cmd_Release	Cmd_Release	Port 2
8	Input 8	Cmd_Grasp	Cmd_Grasp	Cmd_Grasp	
9	Input 9	Cmd_Reset	Cmd_Reset	Cmd_Reset	
10	Input 10	-	-	Cmd_MotorOn/Cmd_MotorOff	
11	Input 11	-	-	Cmd_Homing	
12	Input 12	-	-	-	
<b>pin Digital output X6</b>					
1	Output 1	IsReleased	IsReleased	IsReleased	Port 1
2	Output 2	IsGrasped	IsGrasped	IsGrasped	
3	Output 3	IsClosed	IsClosed	IsClosed	
4	Output 4	OnUndefinedPos	OnUndefinedPos	OnUndefinedPos	
5	Output 5	Error	Error	Error	
6	Output 6	-	MotorOn	MotorOn	
<b>pin Digital output X7</b>					
7	Output 7	-	HomingOk	HomingOk	Port 2
8	Output 8	IsReleased	IsReleased	IsReleased	
9	Output 9	IsGrasped	IsGrasped	IsGrasped	
10	Output 10	IsClosed	IsClosed	IsClosed	
11	Output 11	OnUndefinedPos	OnUndefinedPos	OnUndefinedPos	
12	Output 12	Error	Error	Error	

### 10.2.7 Connection examples

#### Minimal requirement for the upstream controller:

- Basic in single mode with 5 DIOs
  - 2x outputs: *Cmd\_Release*, *Cmd\_Grasp*
  - 3x inputs: *IsReleased*, *IsGrasped*, *IsClosed*
- Advanced in single mode with 7 DIOs
  - 4x outputs: *Cmd\_Release*, *Cmd\_Grasp*, *Cmd\_MotorOn*, *Cmd\_Homing*  
If *Cmd\_MotorOn* and *Cmd\_Homing* are not used, this must be set manually via the motor HMI software and a reference run of the gripper may need to be performed.
  - 3x inputs: *IsReleased*, *IsGrasped*, *IsClosed*

#### Wiring with 8 DIOs on the robot with a gripper:

- Basic in single mode
  - 3x outputs: *Cmd\_Release*, *Cmd\_Grasp*, *Cmd\_Reset*
  - 5x inputs: *IsReleased*, *IsGrasped*, *IsClosed*, *OnUndefinedPos*, *Error*
- Advanced in single mode
  - 4x outputs: *Cmd\_Release*, *Cmd\_Grasp*, *Cmd\_MotorOn*, *Cmd\_Homing*
  - 5x inputs: *IsReleased*, *IsGrasped*, *IsClosed*, *Error*

## 11 Installation

### 11.1 Setting up the Ethernet connection

Only the lower Ethernet port is active and is connected to a Windows PC to configure the product.

#### INFORMATION



Factory setting:

- IP: 10.0.0.5
- Network mask: 255.0.0.0

- ▶ Adapt your network card.
- ▶ Check whether your firewall supports communication with the product.

#### INFORMATION



The communication protocol used is UDP. Therefore, integration into a network is possible only with limitations.

- ▶ For more information on changing the IP address, refer to the section "SCM network settings".
- ▶ Please contact Zimmer Customer Service if you have any questions.

### 11.2 Downloading software

Every SCM device is delivered with a digitalZ document including a download code.

- ▶ Download the HMI software *ZG\_IO\_LINK\_HMI* using the reference link specified in the digitalZ document or the QR code.
- ▶ Install the HMI software *ZG\_IO\_LINK\_HMI* on a Windows PC.

## 12 Commissioning

This section describes how to configure the gripper using the product.

### NOTICE



- ▶ All workpiece recipes must be taught in in the *guideZ* control level.
- ▶ At least the first workpiece recipe must be assigned with a taught-in workpiece in the product.

The product boots if it is wired correctly, the desired grippers are connected and the power supply is switched on.

Depending on the most recently stored configuration on the product, the power LEDs light up in green. Then Status 1 and Status 2 flash on the basic module as long as the grippers are being searched for.

### NOTICE



- ▶ When cold booting the SCM, ensure that all digital SCM inputs are not connected so that the initialization sequence can finish successfully.
- ▶ Disconnect the SCM from the power supply only if both grippers are no longer moving.

## 12.1 Establishing the connection

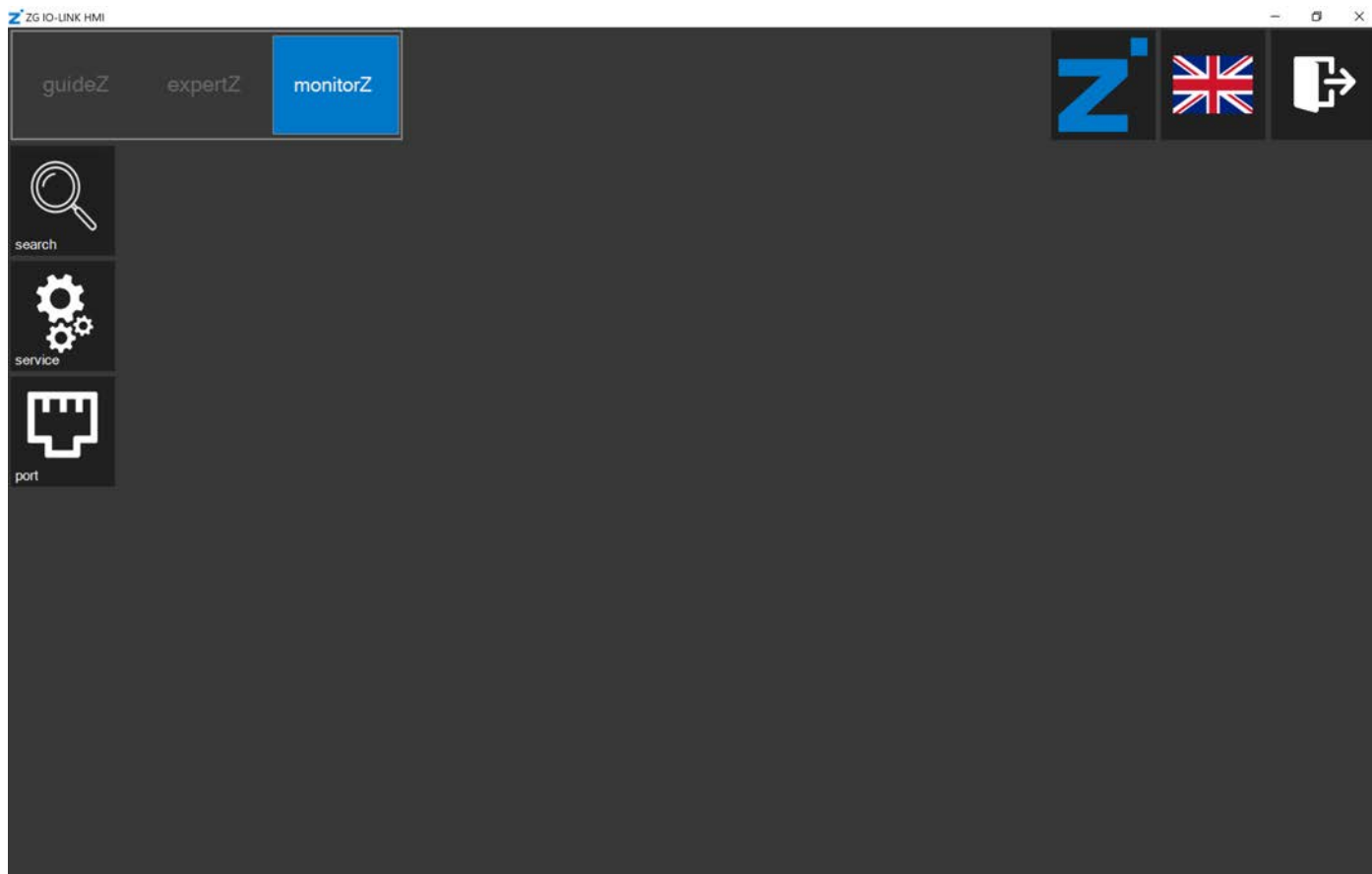
### INFORMATION



You need the HMI software *ZG\_IO\_Link\_HMI* from Zimmer GmbH in Version 2.0.3.10 or higher.

The three control levels are located in the top menu bar:

- *expertZ*: expert level where all gripper data can be accessed.
- *guideZ*: configuration level where the gripper can be taught in to the desired workpiece.
- *monitorZ*: diagnostic and observation level for monitoring the gripper during operation.



- Connect the Windows PC with the installed HMI software *ZG\_IO\_Link\_HMI*.

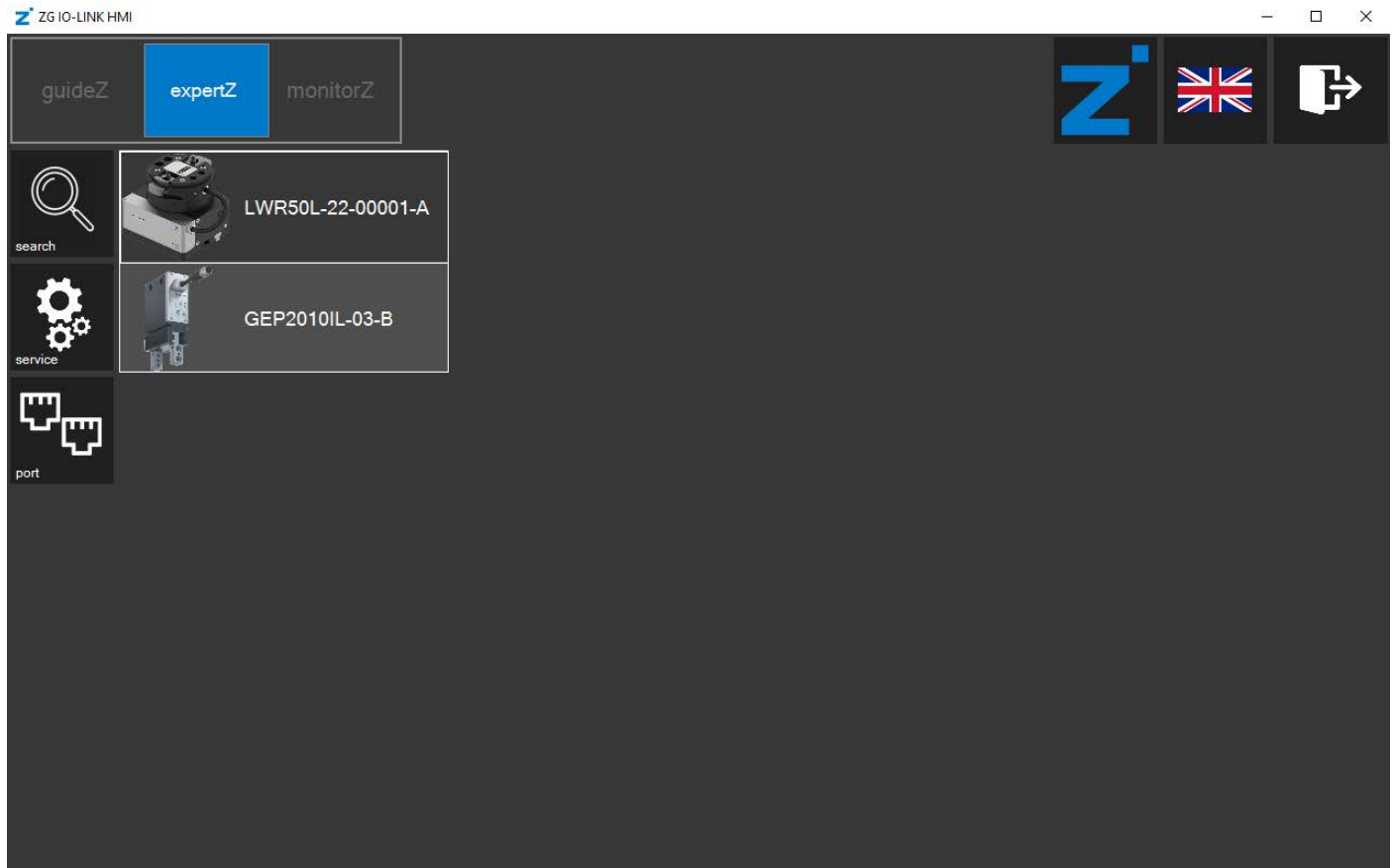
## 12.2 Selecting the active gripper(s)

### INFORMATION



Only single port can be used for the robot-specific SCM in combination with the default settings of the MATCH Comfort App.

If two grippers are connected, you can select whether both are to be active or only one of the two.

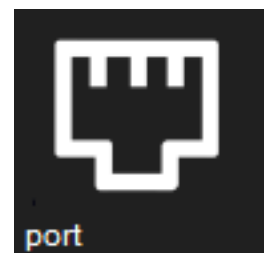


Dual port: Both connected grippers are active.



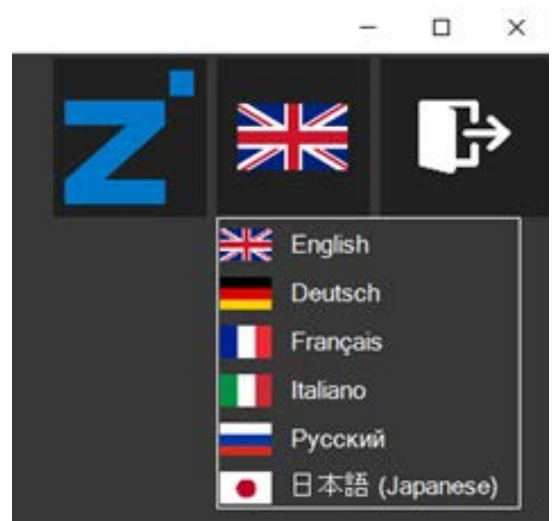
Single port: Only one of the two connected grippers is active.

► Click the corresponding gripper to select it.



### 12.3 Selecting the language

- Click the flag to change the language of the HMI software.



### 12.4 Checking the version

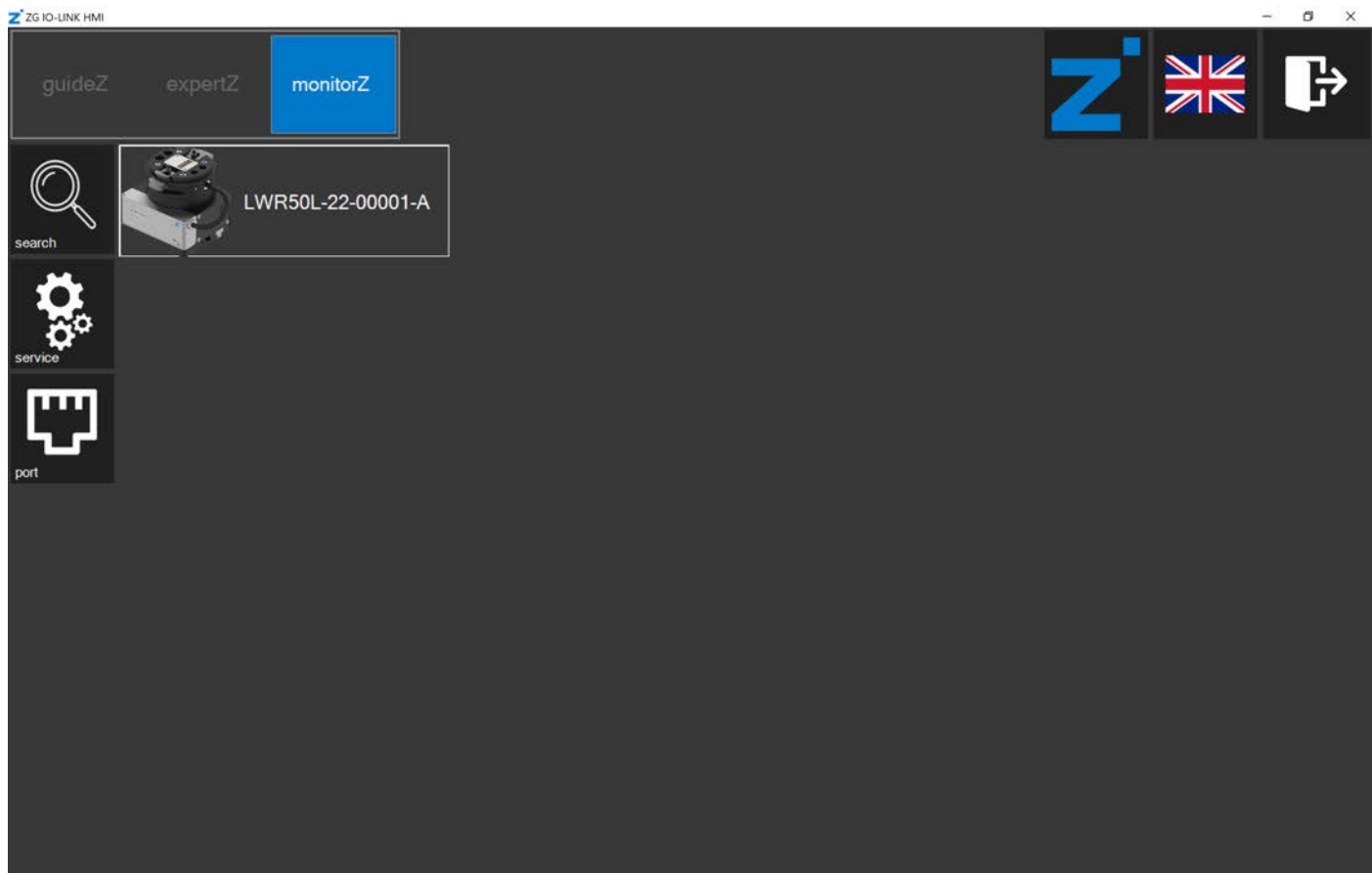
- Click the Zimmer logo to view information about the HMI software.



## 12.5 Selecting the gripper

► Click the *search* button.

⇒ The connected grippers are listed.



► Click the desired gripper to teach this in to the workpiece.

⇒ The *guideZ* control level opens.

## 12.6 Switching on and referencing the motor

### NOTICE



- Switch on the motor in the robot control panel also.

- Connect the actuator voltage.
- ⇒ The *power supply* LED lights up green if the actuator voltage is connected.
- Click the *on* button to switch on the motor.
- Click and hold the > < button for referencing the gripper.
- ⇒ This also references the gripper towards the outside or inside.

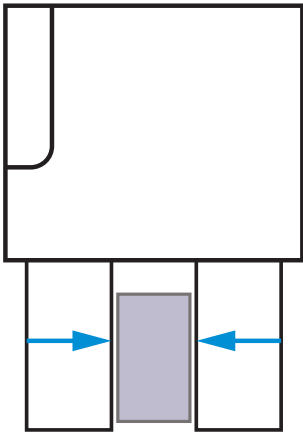


- Click the > button.

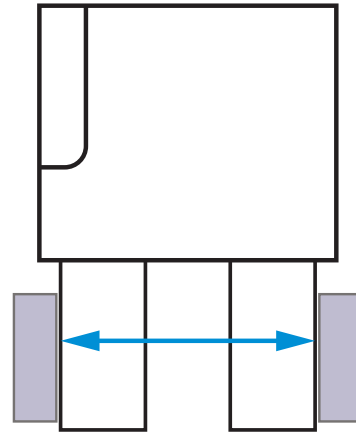
## 12.7 Selecting the gripping direction

- Select the gripping direction.

### Outside gripping



### Inside gripping



⇒ The parameters are set for the gripper automatically.



⇒ The *step state* LED lights up green.

- Click the > button.

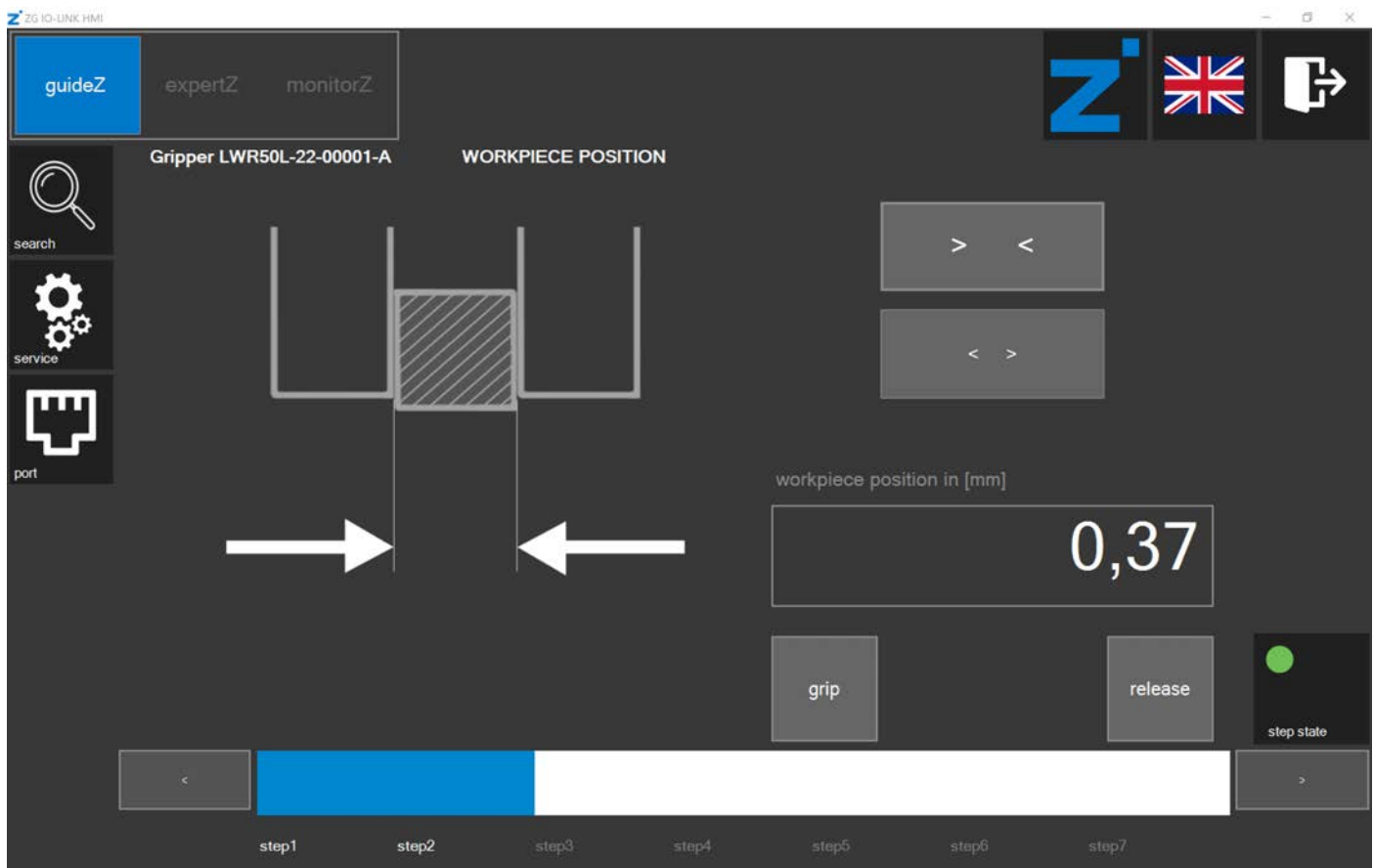
## 12.8 Teaching in the workpiece

### INFORMATION



The buttons for the preferred setting are highlighted visually.

- ▶ Click and hold the > < and < > buttons to teach in the workpiece parameters for the gripper.
- ⇒ The gripper detects the standstill and remembers the workpiece position.



### INFORMATION



You can use the *grip* button and the *release* button to test the settings.

- ▶ Click the > button.

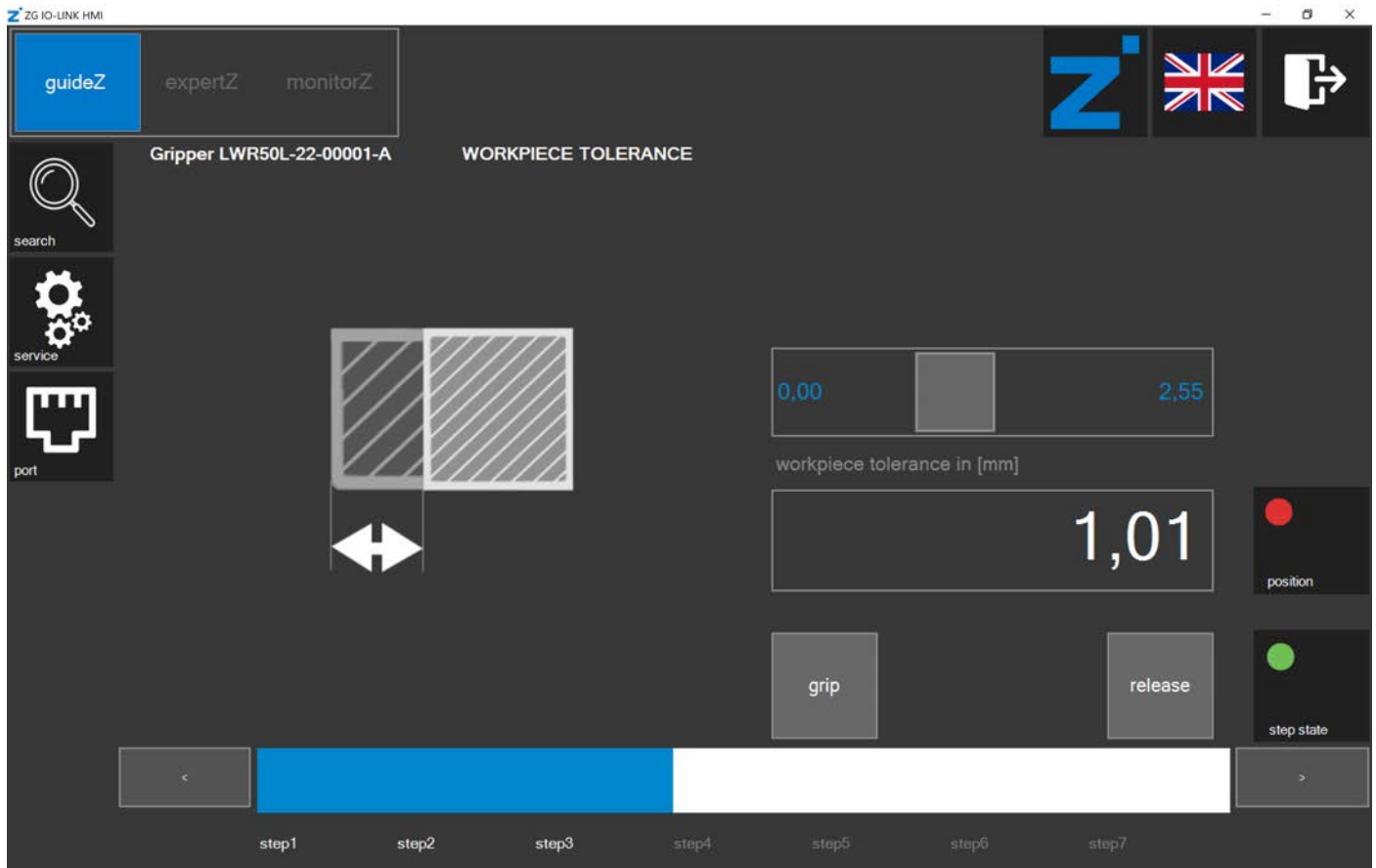
## 12.9 Setting the workpiece tolerance

- Slide the bar to a tolerance of 0.00 mm to 2.55 mm.

### INFORMATION



A gripper with servo function automatically sets its closed position just after the workpiece tolerance.



- Click the > button.

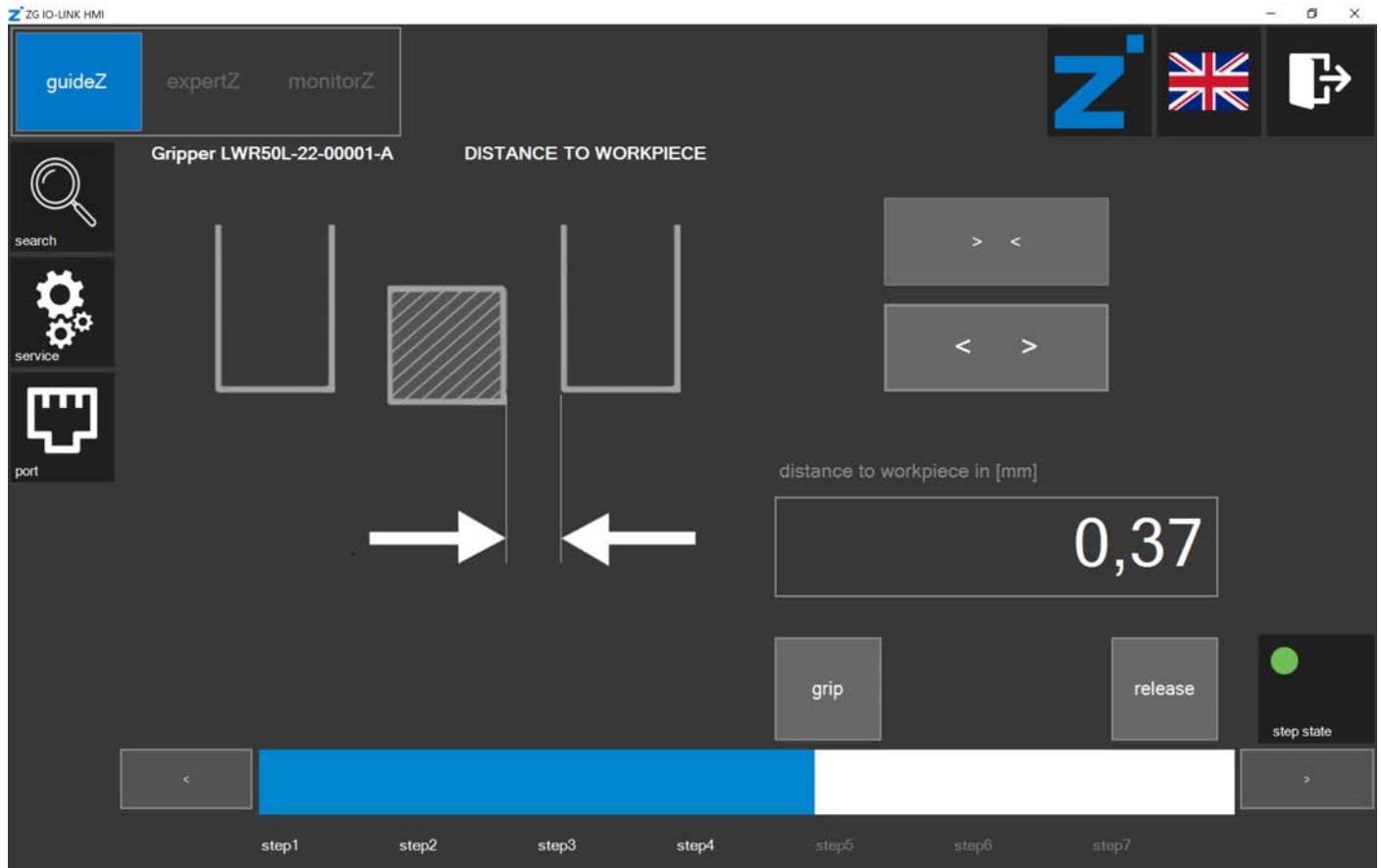
## 12.10 Setting the open position

### INFORMATION



The open position can only be set for grippers with a servo function.

- Click and hold the > < and < > buttons to set the position at which the gripper is to be open.

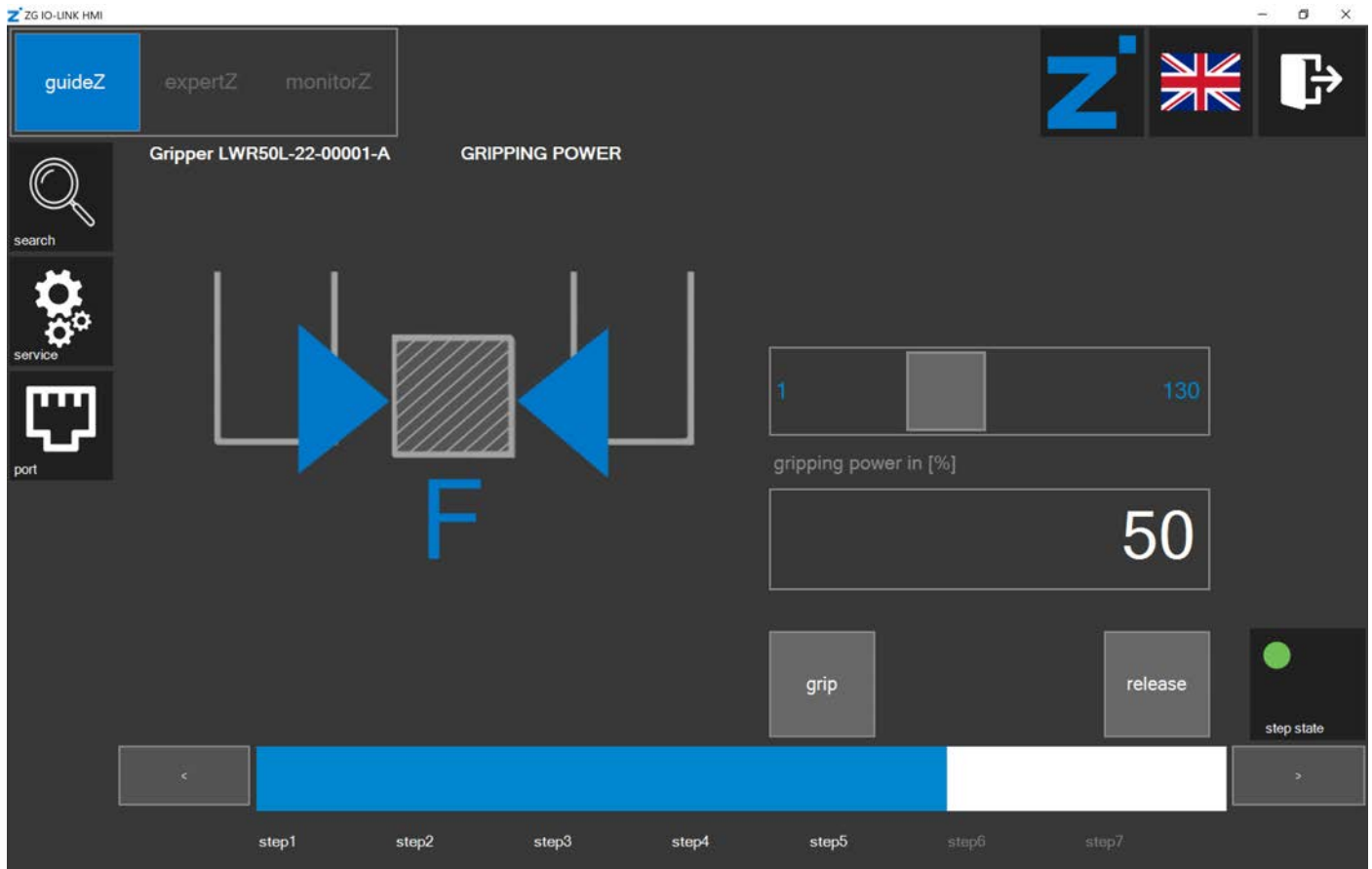


- Click the > button.

## 12.11 Setting the gripping force

Depending on the gripper, the gripping force can be configured and in addition, the speed for closing can be configured.

- Slide the bar to the desired gripping force.



- Click the > button.

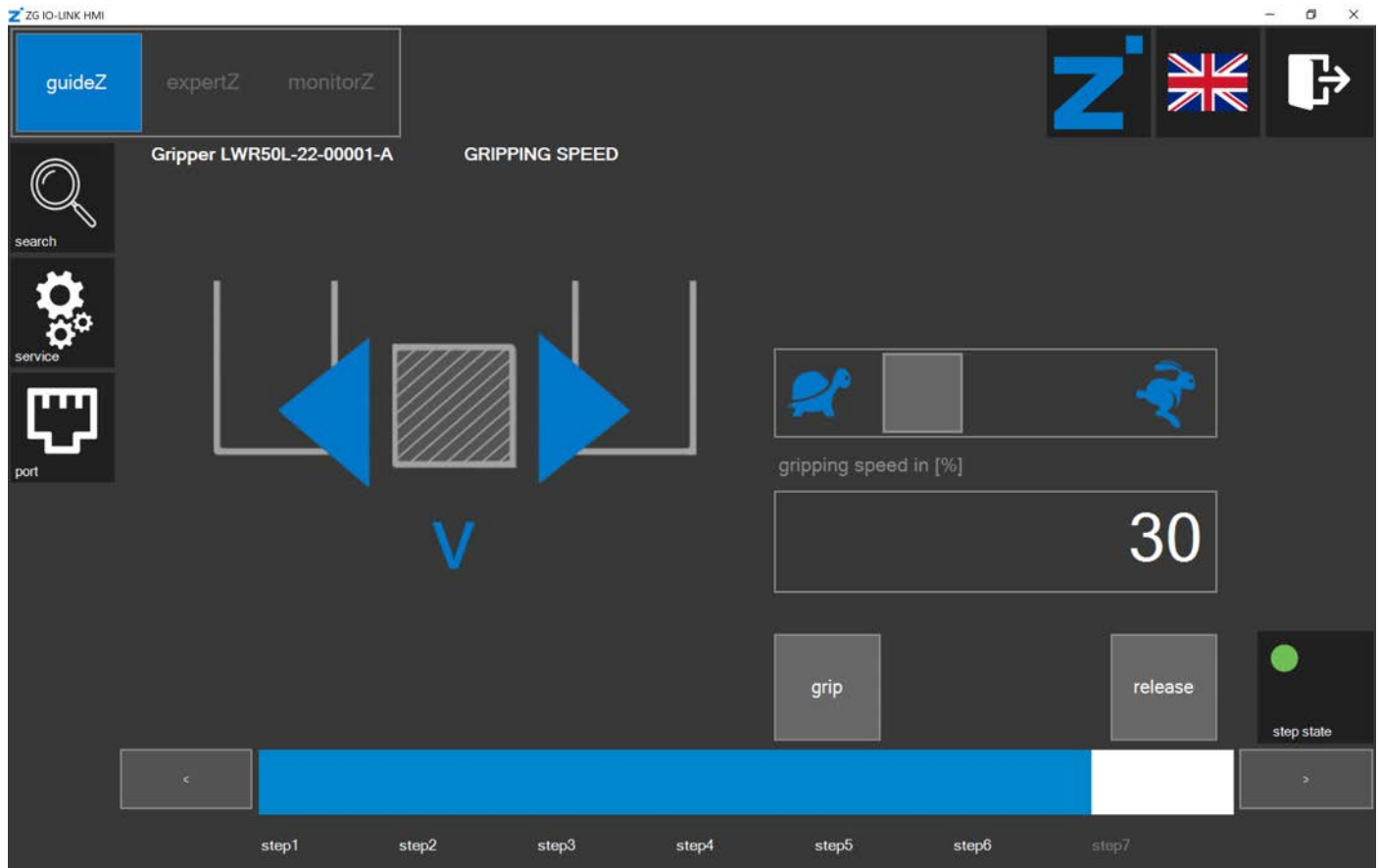
## 12.12 Setting the speed for opening the gripper

### INFORMATION



Setting the speed for opening the gripper is only possible for grippers with a servo function.

- Slide the bar to the desired speed.



- Click the > button.

## 12.13 Checking the settings

Workpiece training for the gripper is ended when the data is saved in the corresponding workpiece recipe.

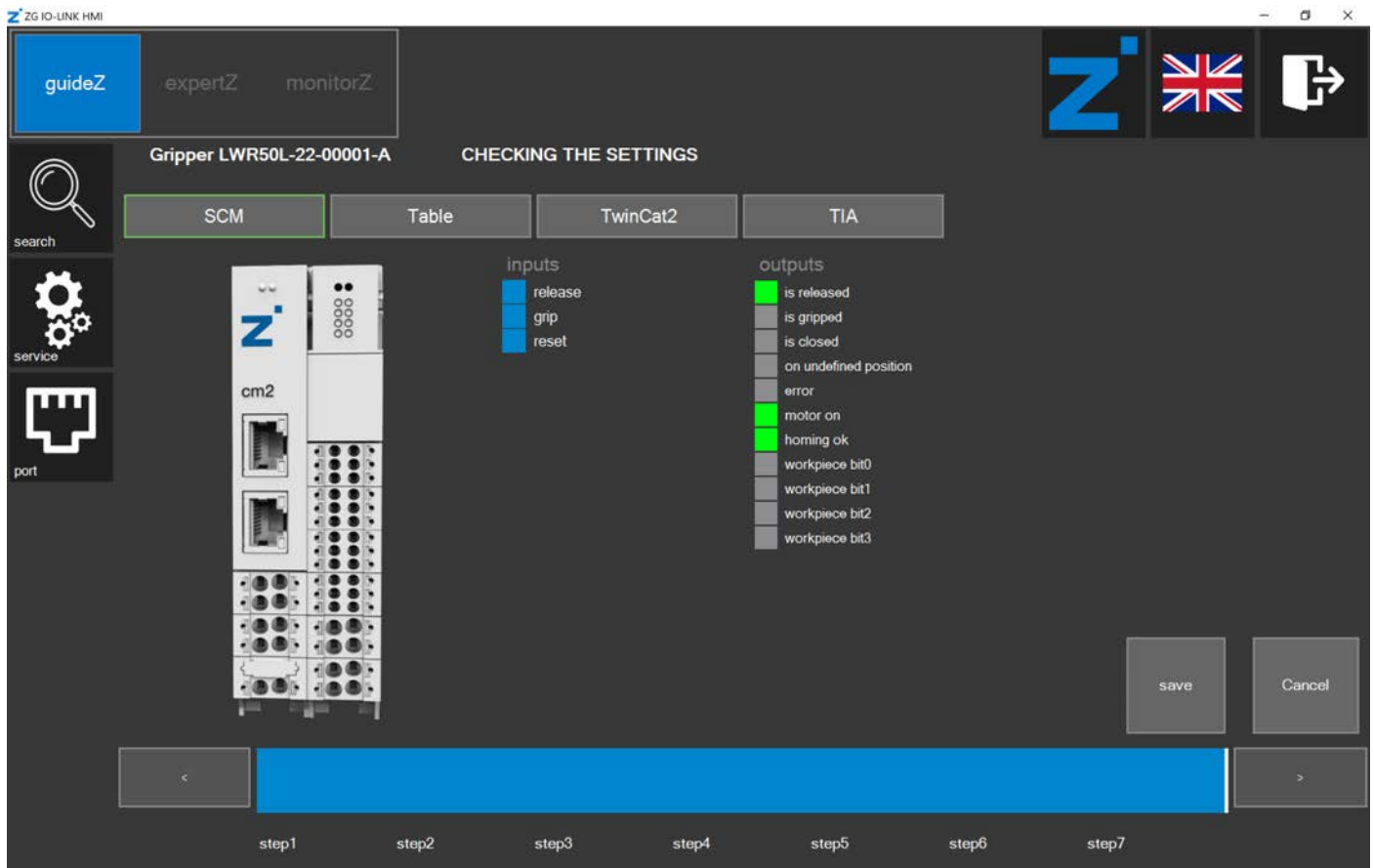
### INFORMATION



At this point, the set parameters are not yet saved in the corresponding workpiece recipe.

The settings can also be checked without the robot inputs and robot outputs of the robot control system.

- *inputs:*
  - ▶ Click the fields to set a command.
  - ⇒ The yellow commands are set.
- *outputs:*
  - ▶ The fields indicate the status of the gripper.
  - ⇒ The green statuses are active.



### INFORMATION



The *Table* view shows the parameters of the corresponding gripper generated in the background.

The *TwinCat2* and *TIA* views show the wiring of the PLC function blocks to fit the parameters of the gripper.

- ▶ Click the Save button.
- ⇒ The window for saving the workpiece recipe opens.

## 12.14 Saving the workpiece recipe

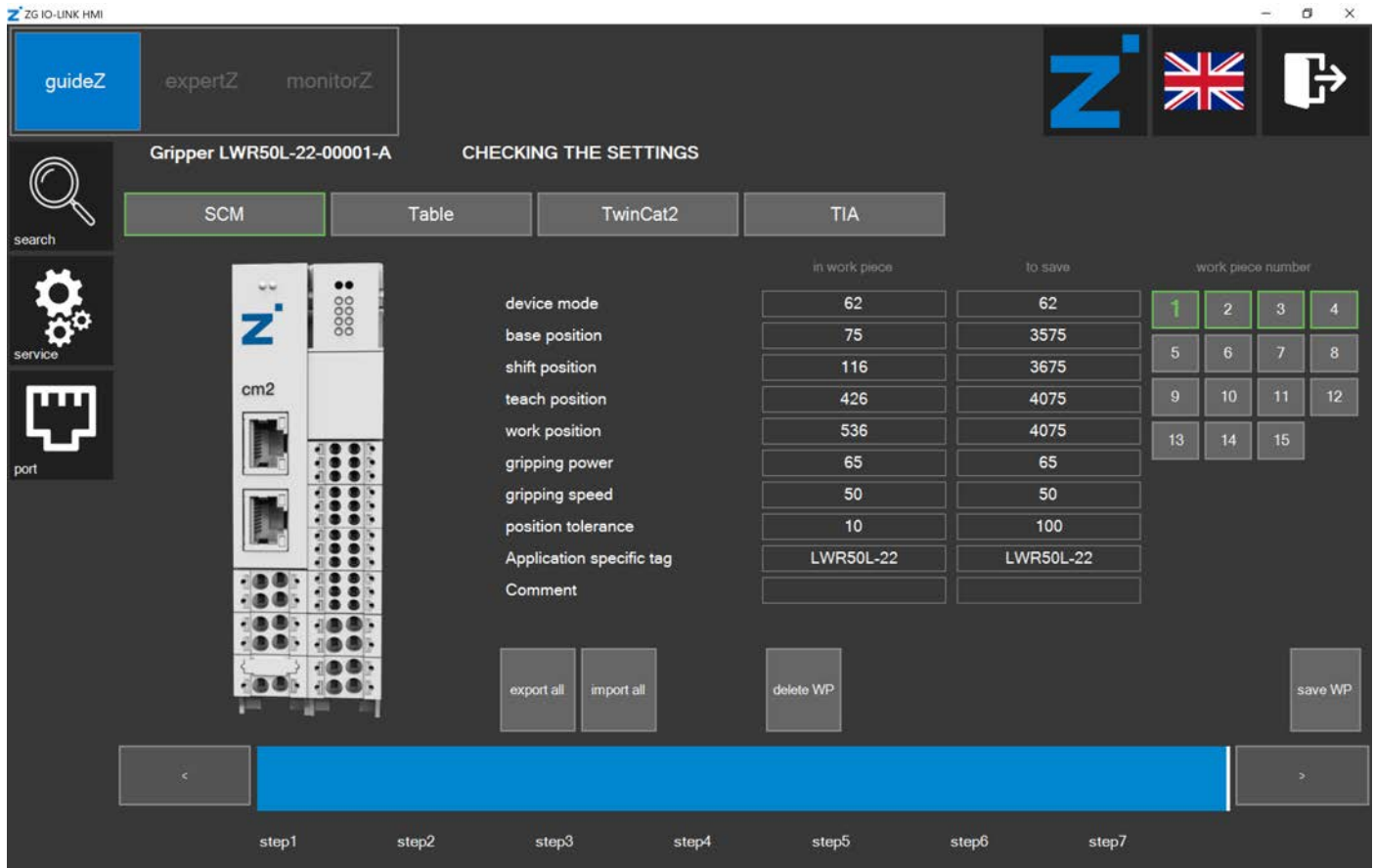
### INFORMATION



The highlighted digit in the workpiece number shows the respective selected workpiece recipe number.

The workpiece recipe numbers in a green frame show stored recipes of the current gripper.

The workpiece recipe numbers in an orange frame show stored recipes of another gripper.



- ▶ Click the desired workpiece recipe number.
- ▶ Click the save *WP* button.

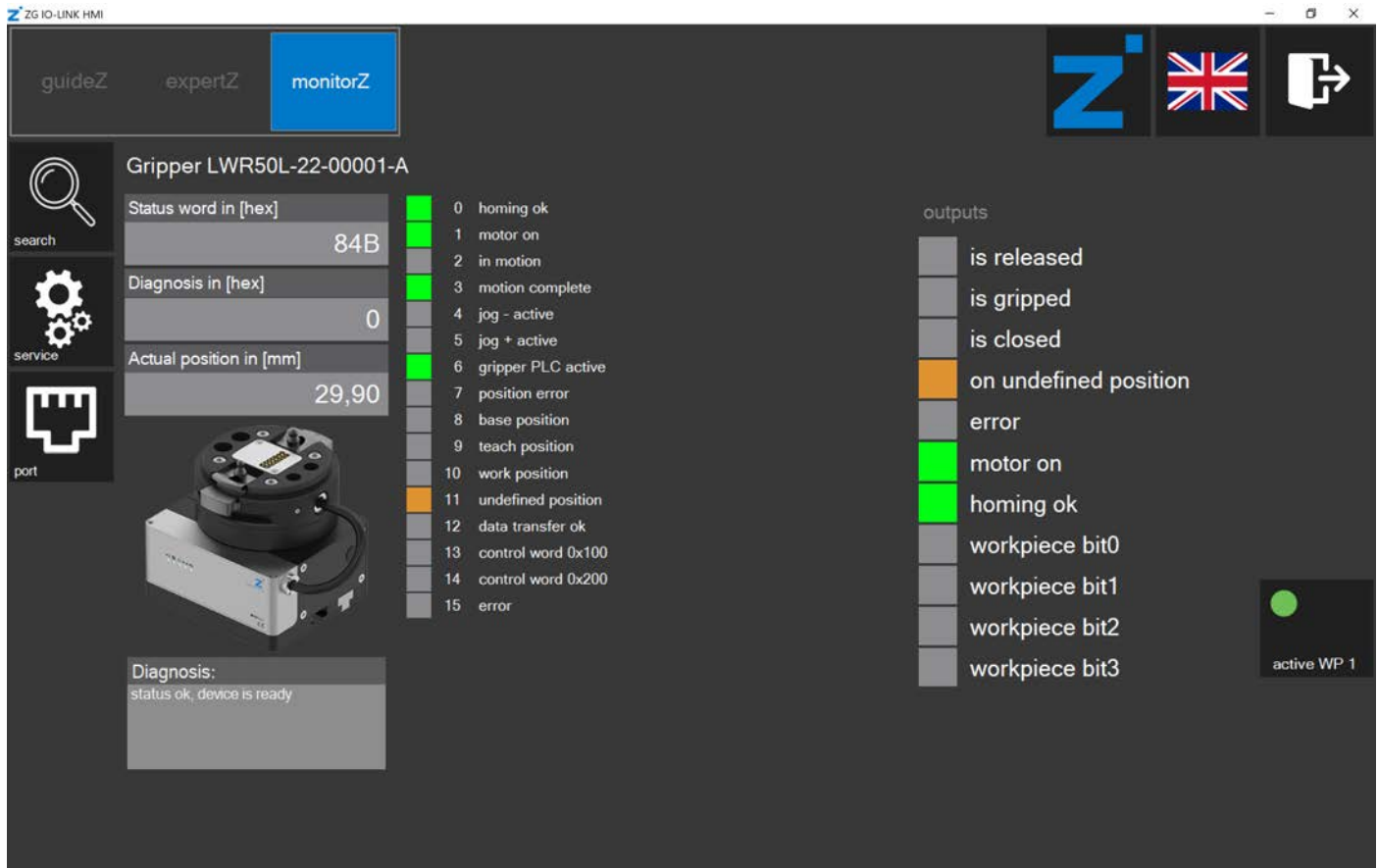
## 12.15 Data storage ended

- After successful data storage, the window for teaching in a new workpiece is displayed, see the section "Teaching in the workpiece".
- Click the *monitorZ* button if you want to switch to the *monitorZ* control level instead.



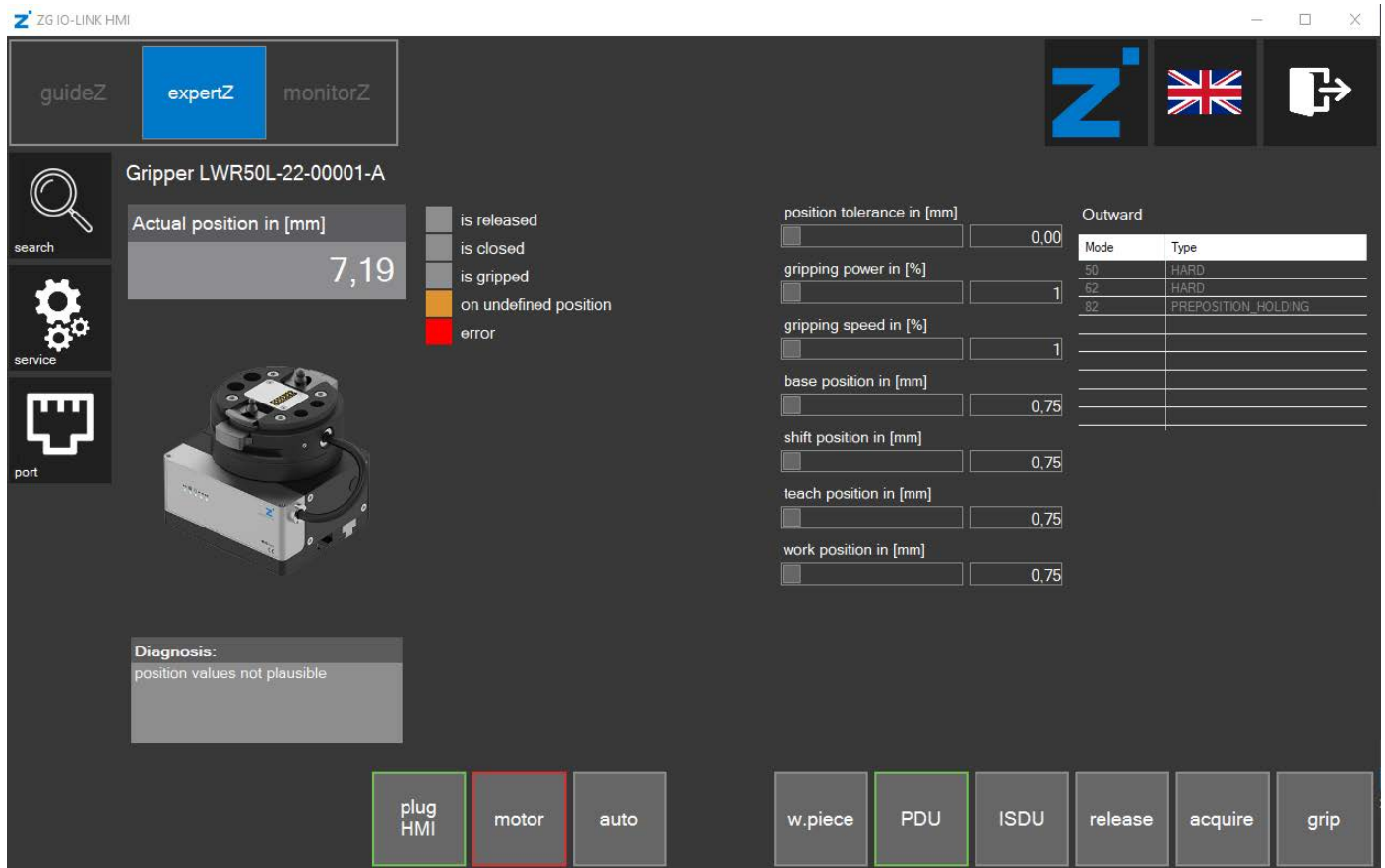
## 12.16 monitorZ control level

- Click the *plug HMI* button to transfer the control ability to the digital robot inputs and robot outputs.
- ⇒ The LED lights up red.
- ⇒ The control system of the gripper with the HMI software *ZG\_IO\_LINK\_HMI* is no longer possible because the input and output signals now have control.
- ⇒ You can move the gripper with the external control system and the saved settings.



## 12.17 expertZ control level

In the *expertZ* control level, fine tuning of the gripping parameters as well as access to all process data (PDU), service data (ISDU) and workpieces is possible.



By default, the *fine tuning* setting is active. This is a view based on the parameters configured in the *guideZ* control level. You can optimize these parameters in this view.

- Slide the bar to the desired value to change it.
  - In the *Outward* area, click the desired *mode* to change it.
  - Click the *release* button or the *grip* button to apply the changes and run the motion task.
- ⇒ The HMI software checks whether the value can be processed by the gripper and, if necessary, adapts these to its limit values.

### 12.17.1 Service

- Click the *service* button.
- ⇒ A login window opens.
- Enter the password: *Service*

A login window titled "PASSWORD" with a text input field and "Ok" and "Cancel" buttons.

- ⇒ The *Service* window opens.

The "Service" window interface. It has a title bar with the Zimmer logo and "Service". The main area is divided into several sections:

- User tools:** Contains a "service report" section with a "create" button.
- Data transfer time, [s]:** A large display showing "0,646".
- Automatic time, [ms]:** A slider bar and a numeric input field showing "4000".
- Application settings:** Includes checkboxes for "expertZ fine tuning", "expertZ as start mode", and "USB master only".
- IoLink communication:** Shows "Process data" with input and output hex strings.
- Master settings:**
  - DLL information:** Info about IOLUDPIF20 DLL, Revision of C DLL: 2.01, Revision of NET DLL: 2.0.1.
  - IO-Link UDP Master:** IP Address: 10.0.0.5, NetworkName: IOLTest, Firmware Revision: 1.1.8, IO-Link Stack Revision: 1.1.8.
  - SCM network settings:** HW: 2.0\_UART, FW: SWA000122\_F00, Serial number, IP address: 10.0.0.5, Network mask: 255.0.0.0, MAC address: 00:80:E1:00:00:00.
  - Load test profile:** Buttons for "profile 1", "profile 2", and a settings icon.
  - SCM WP import/export:** Buttons for "export all" and "import all".

#### 12.17.1.1 Service report

- In the *service report* area, click the create button to create a service report.

#### 12.17.1.2 Data transfer time

The *Data transfer time* is the time needed for data transmission to the gripper.

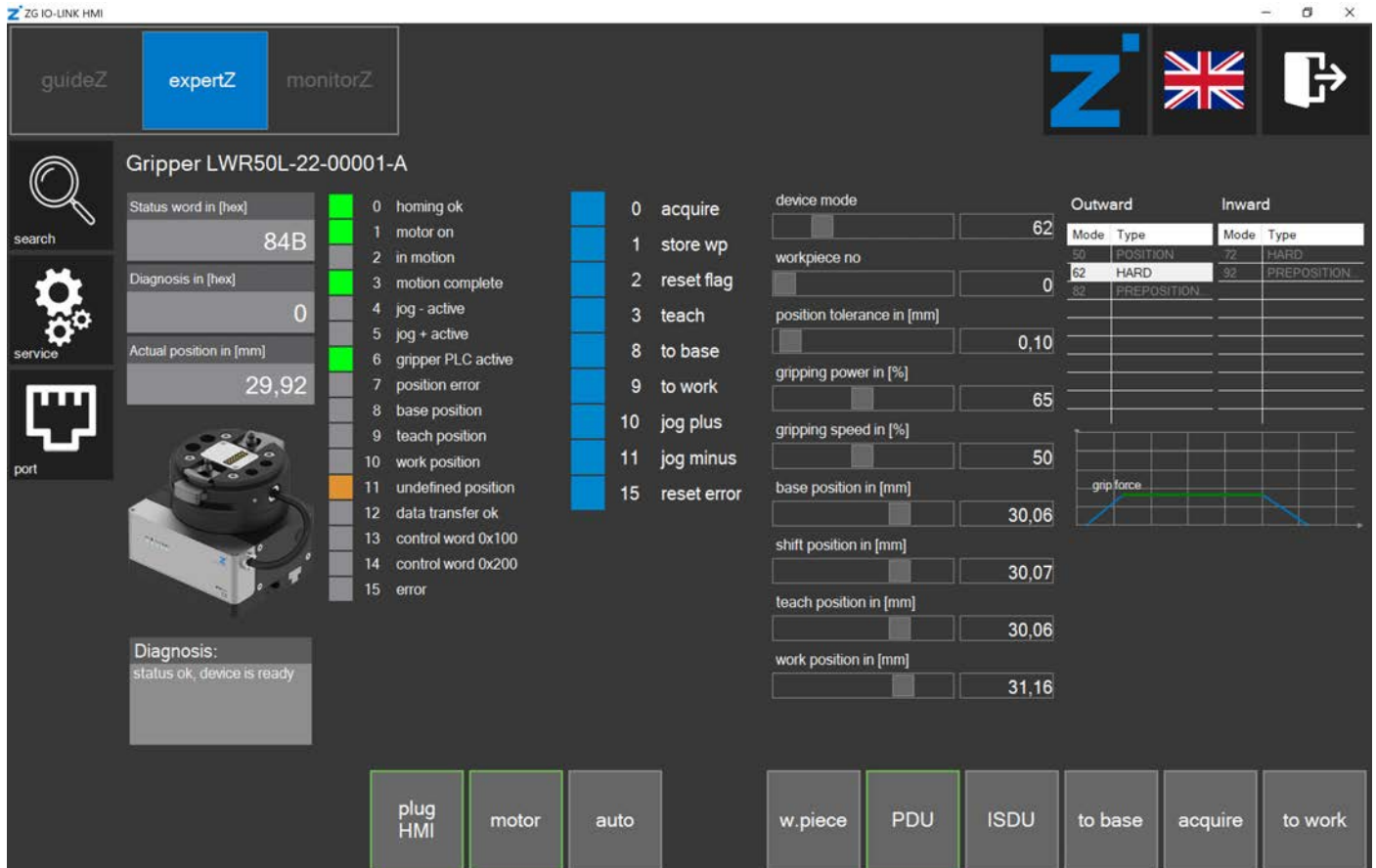
#### 12.17.1.3 Automatic time

The *Automatic time* is the pause time of the automatic sequence.

- Slide the bar to the desired time.

## 12.17.1.4 Application settings

- Enable the option *expertZ as start* if *expertZ* is to be displayed as the new start view.
- To get full access to all the parameters, *expertZ fine tuning* mode must be switched off.
- Disable the option *expertZ fine tuning*.



- In the *Application settings* area, enable the *USB master only* option if network communication is to be switched off.
  - Enable the option only if you have a Zimmer PrepBox with a USB cable.
- ⇒ The HMI software searches for USB nodes only.

## 12.17.1.5 SCM network settings

- In the *IP address* area, click the field to change the IP address of the SCM.
- Close the *Service* window.
- Run out a cold boot.

### 12.17.2 Starting the automatic sequence

In the automatic sequence, the gripper makes cyclical opening and closing movements.

► Click the *auto* button.

### 12.17.3 Workpiece recipe management

In workpiece recipe management, the previously adapted parameters can be stored to the workpiece database again. In the *in work piece* area, the data with workpiece recipe numbers that are currently selected in the *work piece number* is displayed. In the *to save* area, the data that can be stored to the selected workpiece recipe number with the save *WP* button is displayed.

► Click the *w.piece* button to open workpiece recipe management.

ZG IO-LINK HMI

guideZ
**expertZ**
monitorZ

search

service

port

Gripper LWR50L-22-00001-A

	in work piece	to save
device mode	62	82
base position	317	692
shift position	961	1525
teach position	1256	1874
work position	1927	2625
gripping power	13	47
gripping speed	47	67
position tolerance	31	65
Application specific tag	LWR50L-22	LWR50L-22
Comment	LWR	

work piece number

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	

export all

import all

delete WP

load from WP

save WP

plug HMI

motor

auto

w.piece

PDU

ISDU

to base

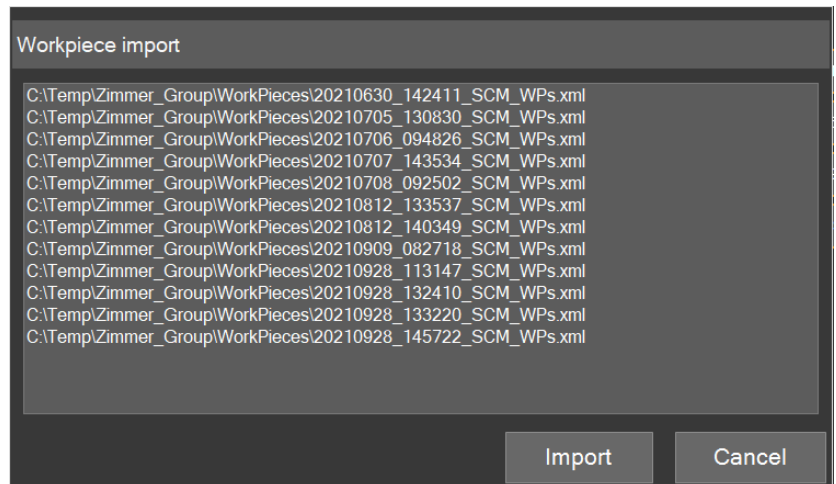
acquire

to work

## 12.17.3.1 Importing workpiece recipes

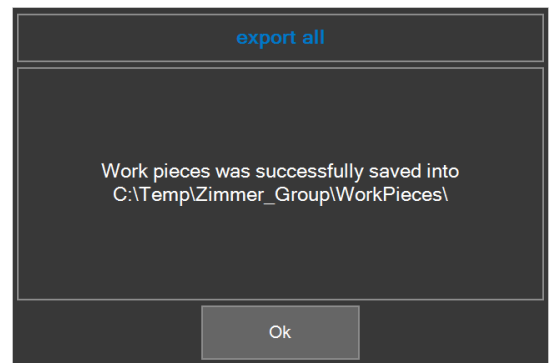
Only the entire data set can be loaded. All 15 workpiece recipes are overwritten during import.

- ▶ Click the *import all* button.
- ⇒ The *Workpiece import* window with the previously stored data sets is displayed.
- ▶ Click the desired data set.
- ▶ Click the *Import* button.



## 12.17.3.2 Exporting workpiece recipes

- ▶ Click the *export all* button.
- ⇒ All workpiece recipes are stored on the hard drive: *C:\Temp\Zimmer\_Group\WorkPieces*



## 12.17.4 ISDU

The ISDU is acyclic service data that is written directly to the memory of the gripper. This data is thus not stored in the SCM. Acyclic service data that is writable can be adapted here.

► Click the ISDU button to view the acyclic service data.

ZG IO-LINK HMI

guideZ **expertZ** monitorZ

search

service

port

Gripper LWR50L-22-00001-A

Status word in [hex]  
884B

Diagnosis in [hex]  
301

Actual position in [mm]  
7,69

Diagnosis:  
position values not plausible

0 homing ok  
1 motor on  
2 in motion  
3 motion complete  
4 jog - active  
5 jog + active  
6 gripper PLC active  
7 position error  
8 base position  
9 teach position  
10 work position  
11 undefined position  
12 data transfer ok  
13 control word 0x100  
14 control word 0x200  
15 error

0 acquire  
1 store wp  
2 reset flag  
3 teach  
8 to base  
9 to work  
10 jog plus  
11 jog minus  
15 reset error

idx	sdx	name	value	rights	type	iol_type	
+	0	0	Direct Parameters - Page 1	rw	0	recordt	
+	1	0	Direct Parameters - Page 2	rw	0	recordt	
	2	0	System Command	wo	uint8	std_d_system	
+	12	0	Device Access Locks	rw	0	recordt	
	16	0	Vendor Name	Zimmer GmbH	ro	string	stringt
	17	0	Vendor Text	www.zimmer-group.c	ro	string	stringt
	18	0	Product Name	LWR50L	ro	string	stringt
	19	0	Product ID	LWR50L-22-00001-	ro	string	stringt
	20	0	Product Text	gripper electric: 2-jär	ro	string	stringt
	21	0	Serial Number	01-00025505	ro	string	stringt
	22	0	Hardware Revision	BG00104 F00	ro	string	stringt
	23	0	Firmware Revision	SWA000058 Q00+5	ro	string	stringt

plug HMI motor auto w.piece PDU **ISDU** to base acquire to work

## 13 Operation

The gripper is controlled via the digital robot inputs and robot outputs of the external control system.

All commands (SCM outputs) can remain wired with the corresponding level until the command is supposed to change.

Example: *Cmd\_Release* can remain TRUE as long as the gripper is supposed to stay at the release position.

### NOTICE



► Move the gripper to a standstill before you enter the *Cmd\_WP\_BitX* command.

Command	Function
Cmd_Release	Open gripper
Cmd_Grasp	Close gripper
Cmd_MotorOn	Switch on the motor.
Cmd_MotorOFF	Shut off motor.
Cmd_Homing	Start gripper reference run outwards.
Cmd_Reset	Perform a reset in the gripper. The activated workpiece recipe is reloaded. If no workpiece has been loaded, the workpiece recipe for workpiece 1 is loaded automatically. Because the Cmd_Reset command has no feedback signal, this requires a slight delay time to run provided that no MATCH Comfort App is being used: <ul style="list-style-type: none"> <li>• Set Cmd_Reset = TRUE</li> <li>• Wait 0.2 s</li> <li>• Set Cmd_Reset = FALSE</li> <li>• Wait 0.2 s</li> </ul>
Cmd_WP_Bit0	Activate the saved workpiece recipe in the product.
Cmd_WP_Bit1	Activate the saved workpiece recipe in the product.
Cmd_WP_Bit2	Activate the saved workpiece recipe in the product.
Cmd_WP_Bit3	Activate the saved workpiece recipe in the product.
Act_WP_Bit0	Feedback signal as soon as the workpiece recipe is active
Act_WP_Bit1	Feedback signal as soon as the workpiece recipe is active
Act_WP_Bit2	Feedback signal as soon as the workpiece recipe is active
Act_WP_Bit3	Feedback signal as soon as the workpiece recipe is active
IsReleased	Feedback signal of the gripper for the control system
IsGrasped	Feedback signal of the gripper for the control system
IsClosed	Feedback signal of the gripper for the control system

### INFORMATION



After a cold start, the SCM starts without HMI software, first with the primacy of the input and output signals with the last saved configuration.

► Please contact Zimmer Customer Service if you have any questions.

► After configuration, close the *ZG\_IO\_LINK\_HMI* HMI software.

► Disconnect the Windows PC via the network cable.

⇒ The product and connected grippers are now functional with the control system.

### 13.1 Selecting and changing workpiece recipes

The workpiece recipes taught in SCM are selected from the robot control system using the SCM inputs 9 to 12.

► Create a binary number from these four SCM inputs.

⇒ This is the selected workpiece recipe number: Input 9 stands for  $2^0$  and input 12 stands for  $2^3$ .

Input 9	Input 10	Input 11	Input 12	Workpiece recipe number
TRUE	FALSE	FALSE	TRUE	9
TRUE	TRUE	FALSE	FALSE	3

► Do not execute any other commands.

⇒ The gripper may not display any errors.

⇒ The successful implementation of the new workpiece recipe is displayed in SCM: SCM outputs 9 to 12 accept the same logical status as the SCM inputs 9 to 12.

Workpiece recipe number 3 sequence example:

- Set Cmd\_WP\_Bit0 = TRUE
- Set Cmd\_WP\_Bit1 = TRUE
- Wait (Act\_WP\_Bit0 == TRUE & Act\_WP\_Bit1 == TRUE)

⇒ Then you can re-open or re-close the gripper.

### 13.2 Assignment of input and output signals after a cold start

The SCM only accepts commands from one source. The grippers can either be controlled by the HMI software or via the superordinate Robot control system.

After a cold start, the SCM starts without HMI software, first with the primacy of the input and output signals with the last saved configuration.

Therefore, the HMI software can be closed after a successful configuration and the Windows PC can be disconnected via the network cable. The SCM and the connected grippers are now only operational with the robot control system and retain this configuration even after a cold start.

## 14 Error diagnosis

### INFORMATION



- ▶ For further information on troubleshooting for grippers, refer to the current installation and operating instructions of the gripper on our website.
- ▶ Please contact Zimmer Customer Service if you have any questions.

## 15 Resetting to factory settings

### NOTICE



When a reset to factory settings is performed, all saved information is deleted.

- ▶ Disconnect the voltage supply.
  - ▶ Create a jumper between IO-Link X1 pin 1 (C/Q1) and IO-Link X2 pin 1 (C/Q2).
  - ▶ Reconnect the voltage supply.
- ⇒ The SCM initializes and resets the settings.
- ▶ Disconnect the voltage supply.
  - ▶ Remove the jumper.

## 16 Decommissioning/disposal

### INFORMATION



When the product reaches the end of its operational phase, it can be completely disassembled and disposed of.

- ▶ Disconnect the product completely from the power supply.
- ▶ Dispose of the components properly according to the material groups.
- ▶ Comply with the locally applicable environmental and disposal regulations.

## 17 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](mailto:info@zimmer-group.com)

💻 [www.zimmer-group.com](http://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

Authorized representative for the  
compilation of relevant technical  
documents

Rheinau, Germany, 2020-02-28

(Place and date of issuance)



Martin Zimmer  
(Legally binding signature)  
Managing Partner

## 18 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](mailto:info@zimmer-group.com)  
[www.zimmer-group.com](http://www.zimmer-group.com)

We hereby declare that the products described below

**Product designation:** Smart Communication Module

**Type designation:** SCM

conform 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

Authorized representative for the compilation of relevant technical documents

Rheinau, Germany, 2020-02-28

(Place and date of issuance)



Martin Zimmer  
(Legally binding signature)  
Managing Partner

## 19 Declaration of Conformity

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

### Name and address of the manufacturer:

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🌐 [www.zimmer-group.com](http://www.zimmer-group.com)

We hereby declare that the products 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

Authorized representative for the  
compilation of relevant technical  
documents

Rheinau, Germany, 2020-02-28

(Place and date of issuance)



Martin Zimmer  
(Legally binding signature)  
Managing Partner