



INSTALLATION AND OPERATING INSTRUCTIONS

Robot-specific SCM

for ABB robots

DDOC01632

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. |

Content

| | | |
|---------|---|----|
| 1 | Supporting documents | 5 |
| 1.1 | Notices and graphics in the installation and operating instructions | 5 |
| 2 | Safety notices | 6 |
| 3 | Proper use | 6 |
| 4 | Personnel qualification | 6 |
| 5 | Product description | 7 |
| 6 | Technical data | 8 |
| 7 | Accessories/scope of delivery | 8 |
| 8 | Transportation/storage/preservation | 8 |
| 9 | Installation | 9 |
| 9.1 | Installing hardware | 9 |
| 9.1.1 | Standard wiring | 10 |
| 9.1.2 | Standard wiring for individual grippers | 11 |
| 9.1.3 | Standard wiring for two grippers | 14 |
| 9.1.4 | Advanced configuration | 14 |
| 9.2 | Installing the energy supply | 15 |
| 9.2.1 | Mounting the pin assignment | 15 |
| 9.2.2 | Installing the power supply for the basic module | 16 |
| 9.2.3 | Installing the power supply for the IO module | 16 |
| 9.2.4 | Installing IO-Link | 17 |
| 10 | Installation | 18 |
| 10.1 | Setting up the Ethernet connection | 18 |
| 10.2 | Downloading software | 18 |
| 11 | Commissioning | 19 |
| 11.1 | Establishing the connection | 20 |
| 11.2 | Selecting the language | 21 |
| 11.3 | Checking the version | 21 |
| 11.4 | Selecting the gripper | 22 |
| 11.5 | Switching on and referencing the motor | 23 |
| 11.6 | Selecting the gripping direction | 24 |
| 11.7 | Teaching in the workpiece | 25 |
| 11.8 | Setting the workpiece tolerance | 26 |
| 11.9 | Setting the open position | 27 |
| 11.10 | Setting the gripping force | 28 |
| 11.11 | Setting the speed for opening the gripper | 29 |
| 11.12 | Checking the settings | 30 |
| 11.13 | Saving the workpiece recipe | 31 |
| 11.14 | Data storage ended | 32 |
| 11.15 | monitorZ control level | 33 |
| 11.16 | expertZ control level | 34 |
| 11.16.1 | Service | 35 |
| 11.16.2 | Starting the automatic sequence | 37 |
| 11.16.3 | Workpiece recipe management | 37 |
| 11.16.4 | ISDU | 39 |
| 11.17 | Selecting the active gripper(s) | 40 |
| 12 | Error diagnosis | 40 |
| 13 | RoHS declaration | 41 |

| | |
|------------------------------------|----|
| 14 Declaration of Conformity | 42 |
| 15 Declaration of Conformity | 43 |

1 Supporting documents

NOTICE



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

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



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

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

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

1.1 Notices and graphics in the installation and operating instructions

DANGER



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

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

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

WARNING



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

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

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

CAUTION



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

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

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

NOTICE



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

INFORMATION



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

2 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.

It is fitted to industrial machines and is used to hold, transport and store workpieces.

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.

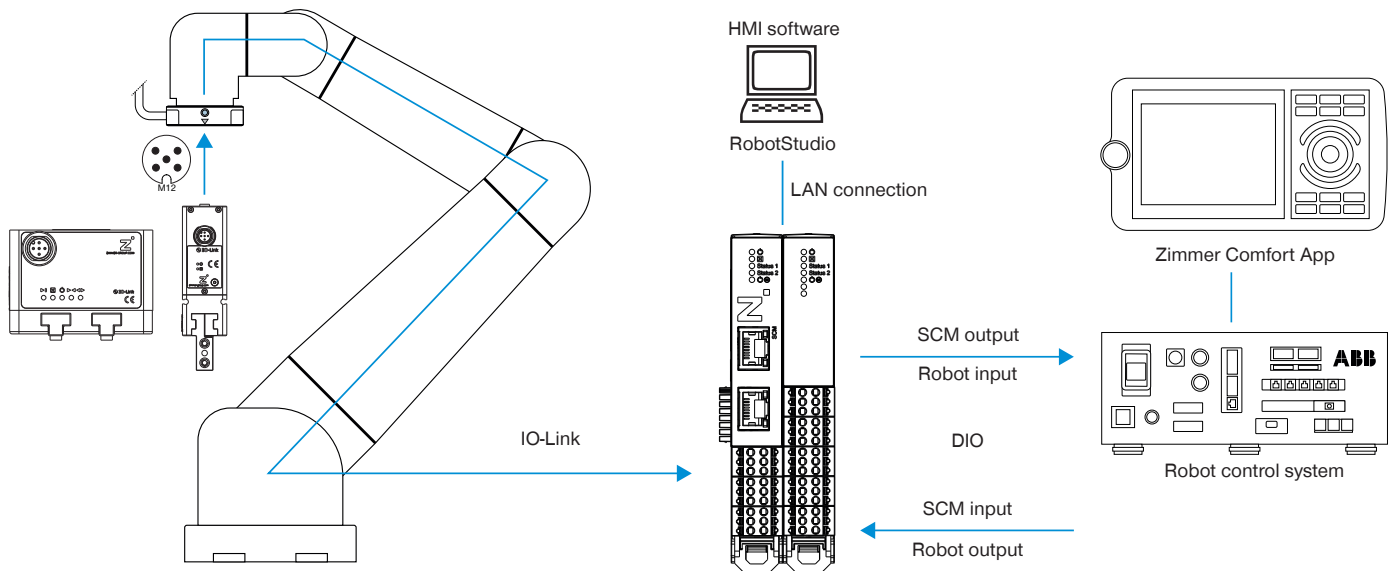
4 Personnel qualification

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

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 Zimmer Comfort app. The grippers can be controlled using the Zimmer Comfort app on the robot control panel.

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



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 Zimmer Comfort app, see the operating instructions for the robot-specific Zimmer Comfort app.

6 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.

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 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



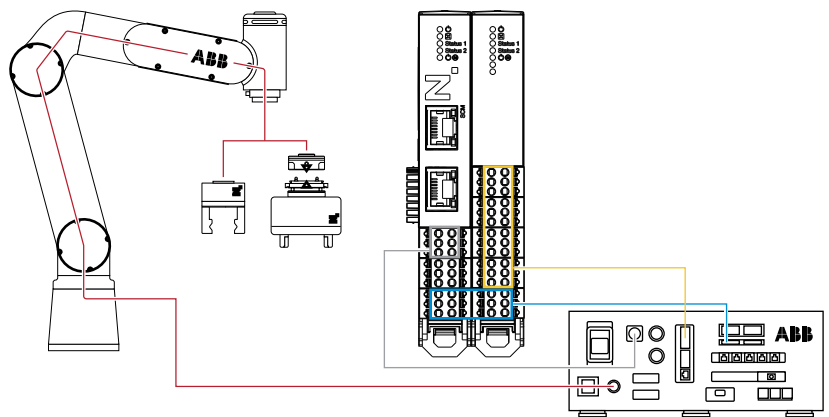
- ▶ Installation may only be carried out by qualified personnel in accordance with these installation and operating instructions.
- ▶ Switch off the power supply before any assembly, installation or maintenance work.

9.1 Installing hardware

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 Standard wiring

NOTICE

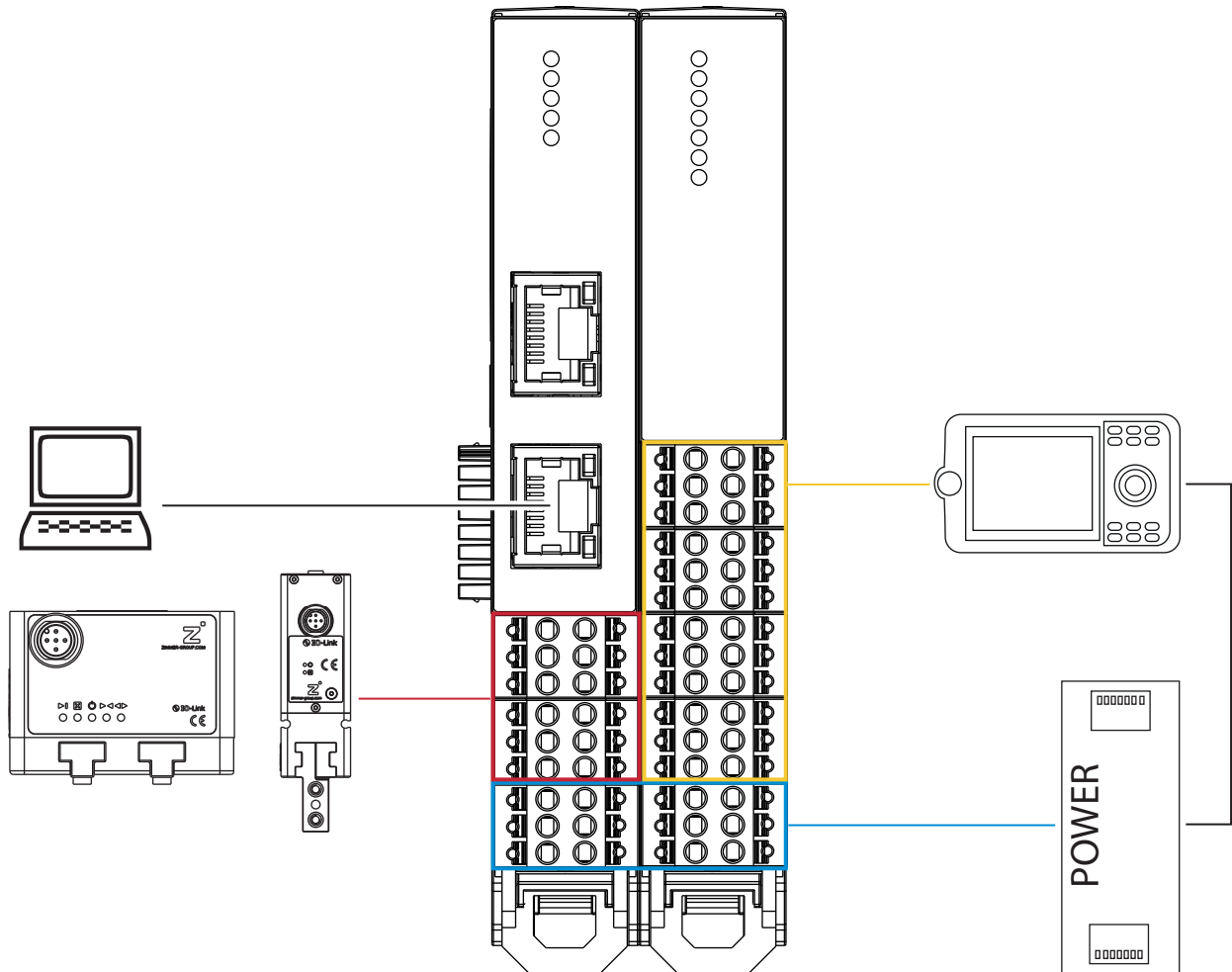


The gripper wiring must match the gripper configuration done in the Zimmer Comfort app.

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 Zimmer Comfort app. If you do the standard wiring and keep the standard configuration in the Zimmer 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 Zimmer 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 | Rot/Blau | - |
| SCM connection | Command | Color | Robot input |
| 1 | IsReleased | White | ZG_DI0 |
| 2 | IsGripped | Brown | ZG_DI1 |
| 3 | IsClosed | Green | ZG_DI2 |
| 4 | OnUndefinedPos | Yellow | ZG_DI3 |
| 5 | Error | Gray | ZG_DI4 |
| 6 | - | - | - |
| 7 | - | - | - |
| 8 | - | - | - |
| 9 | Act_WP_Bit0 | Black | ZG_DI6 |
| 10 | Act_WP_Bit1 | Violet | ZG_DI7 |
| 11 | Act_WP_Bit2 | Gray/pink | - |
| 12 | Act_WP_Bit3 | Rot/Blau | - |

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 Zimmer 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 | Rot/Blau | - |
| SCM connection | Command | Color | Robot input |
| 1 | IsReleased | White | ZG_DI0 |
| 2 | IsGripped | Brown | ZG_DI1 |
| 3 | IsClosed | Green | ZG_DI2 |
| 4 | OnUndefinedPos | Yellow | ZG_DI3 |
| 5 | Error | Cmd_Homing | ZG_DI4 |
| 6 | MotorOn | Blue | ZG_DI5 |
| 7 | - | - | - |
| 8 | - | - | - |
| 9 | Act_WP_Bit0 | Black | ZG_DI6 |
| 10 | Act_WP_Bit1 | Violet | ZG_DI7 |
| 11 | Act_WP_Bit2 | Gray/pink | - |
| 12 | Act_WP_Bit3 | Rot/Blau | - |

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 Greifer an Anschluss 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 | - | - | - | - |

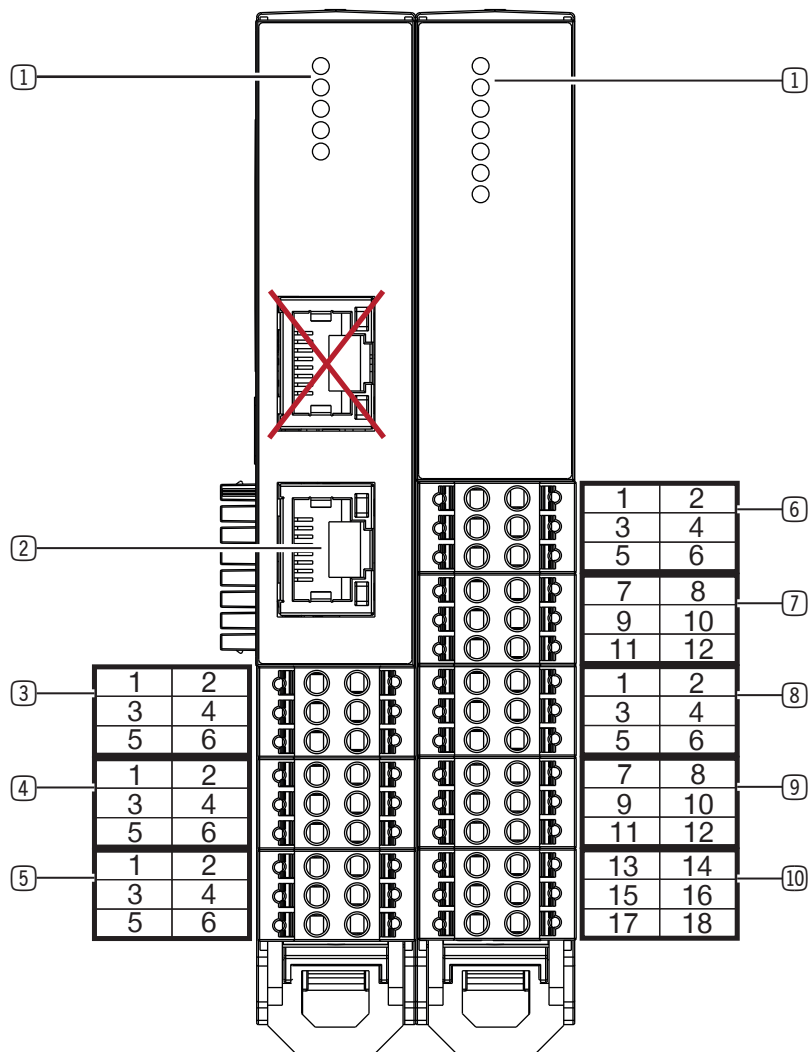
9.1.4 Advanced configuration

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 Zimmer Comfort app is required.

9.2 Installing the energy supply

9.2.1 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



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.

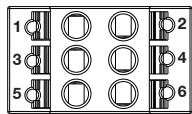
INFORMATION



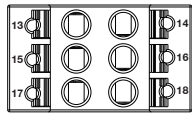
The signal and actuator voltage is electrically isolated in the product.

- 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.

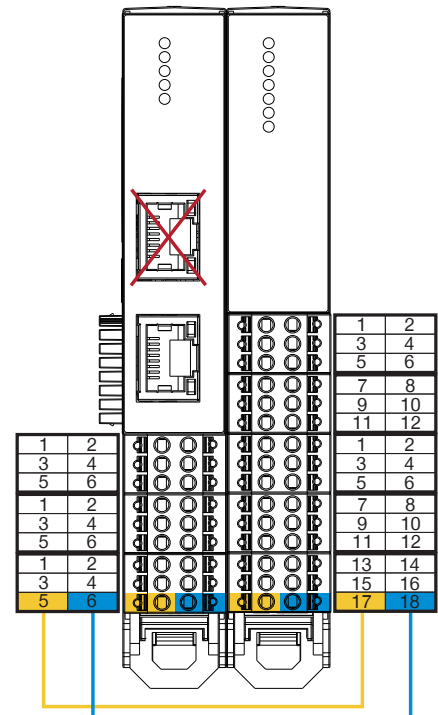
The maximum permitted current draw allows you to operate all grippers directly on the product. No Y-cable for a special power supply is required.

| pin | Function | Explanation |  <p>Power supply of basic module X3</p> |
|-----|------------------------|---|--|
| 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 |  <p>Power supply of IO module X8</p> |
|-----|-----------|--------------------------|---|
| 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.



9.2.4 Installing IO-Link

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

NOTICE

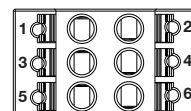


Non-compliance may result in material damage.

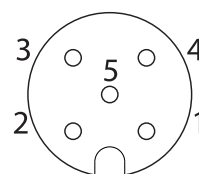
If the wiring is done differently, the gripper will be damaged.

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

| 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 Installation

10.1 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.

10.2 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.

11 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.

11.1 Establishing the connection

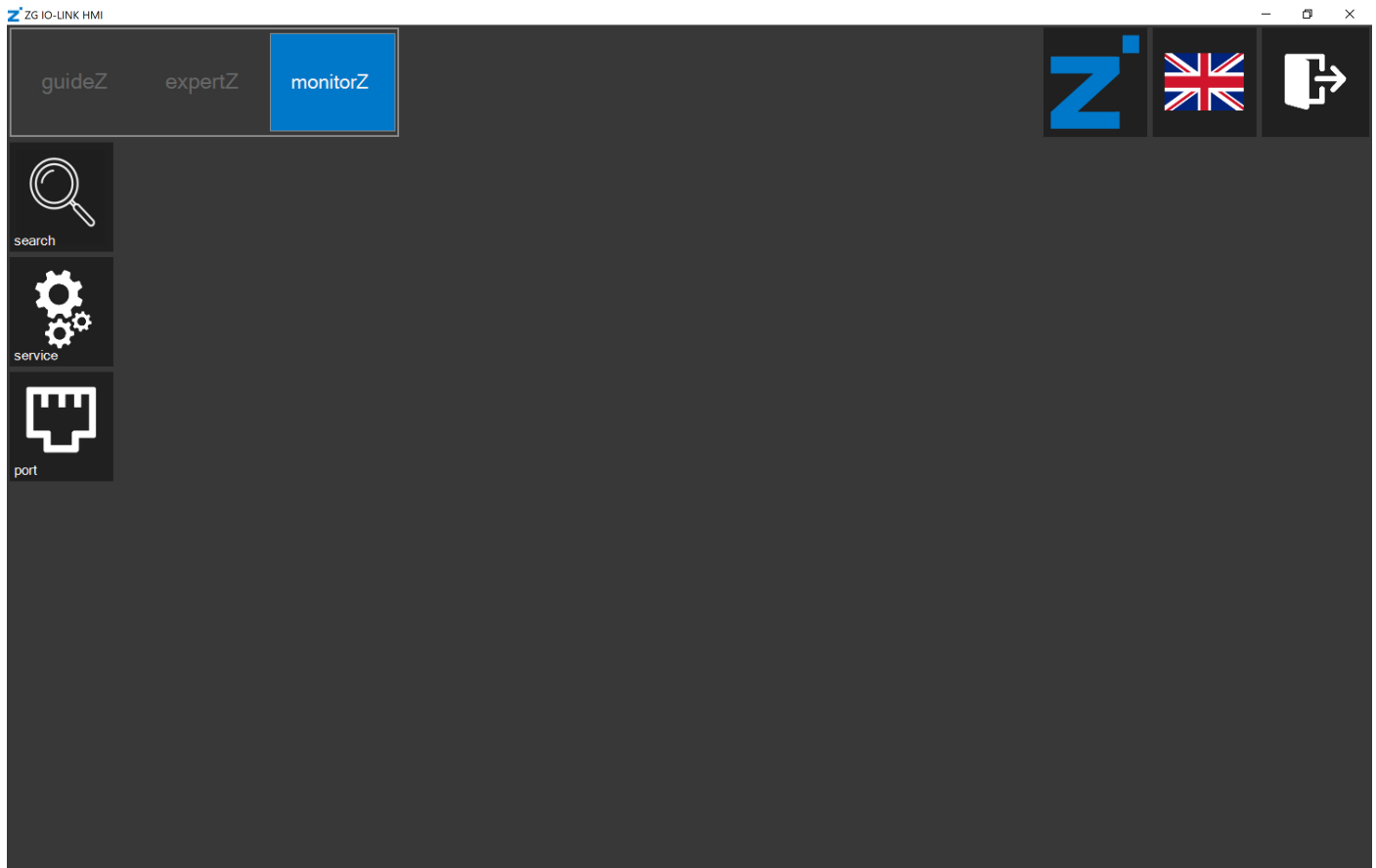
INFORMATION



You need the HMI software *ZG_IO_Link_HMI* from Zimmer GmbH in Version 2.0.1.22 or higher.

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

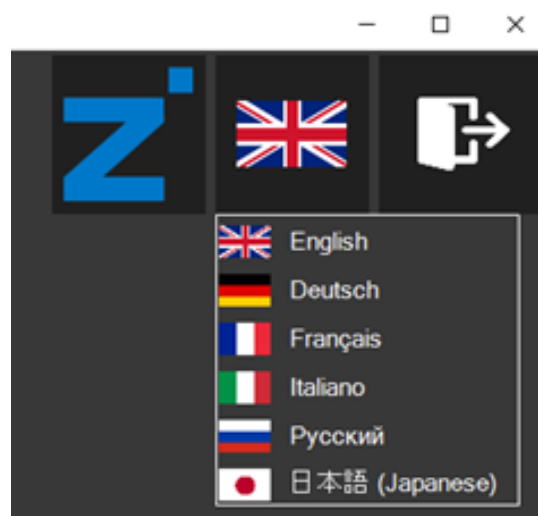
- *expertZ*: expert level where all gripper data can be accessed.
- *guideZ*: configuration level where the gripper can be taught in to the desired workpiece.
- *monitorZ*: diagnostic and observation level for monitoring the gripper during operation.



► Connect the Windows PC with the installed HMI software *ZG_IO_Link_HMI*.

11.2 Selecting the language

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



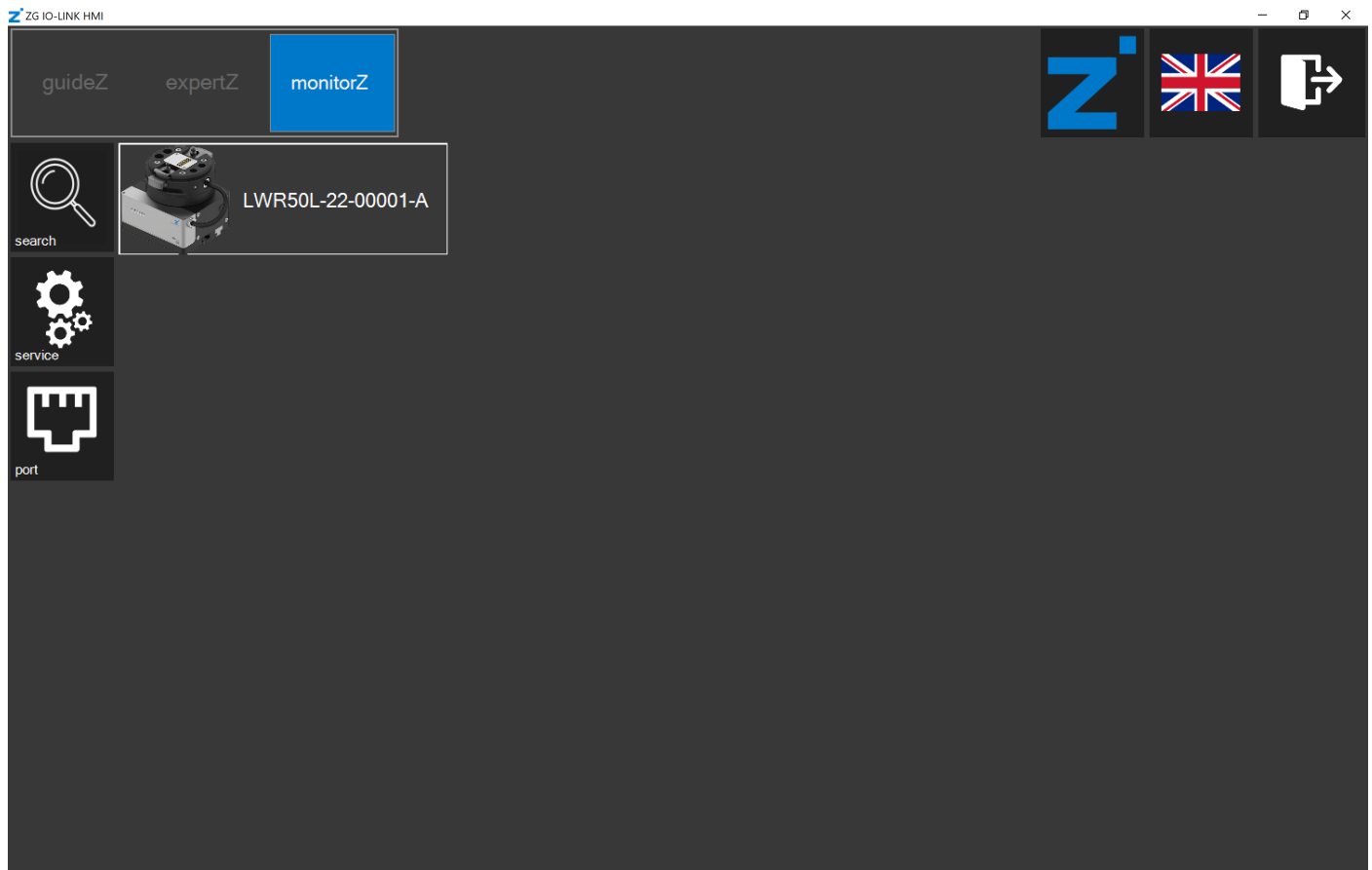
11.3 Checking the version

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



11.4 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.

11.5 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.

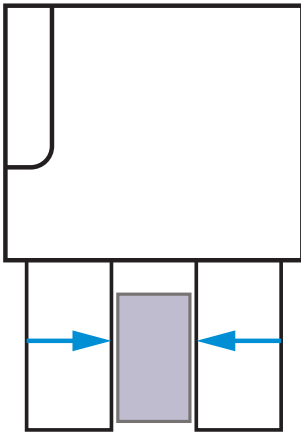


- Click the > button.

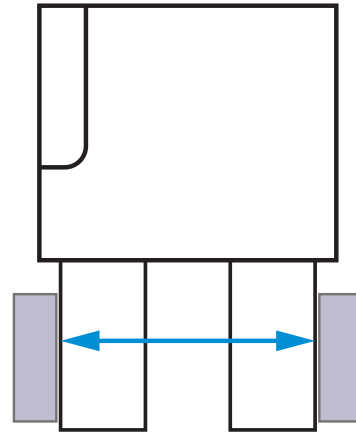
11.6 Selecting the gripping direction

- Select the gripping direction.

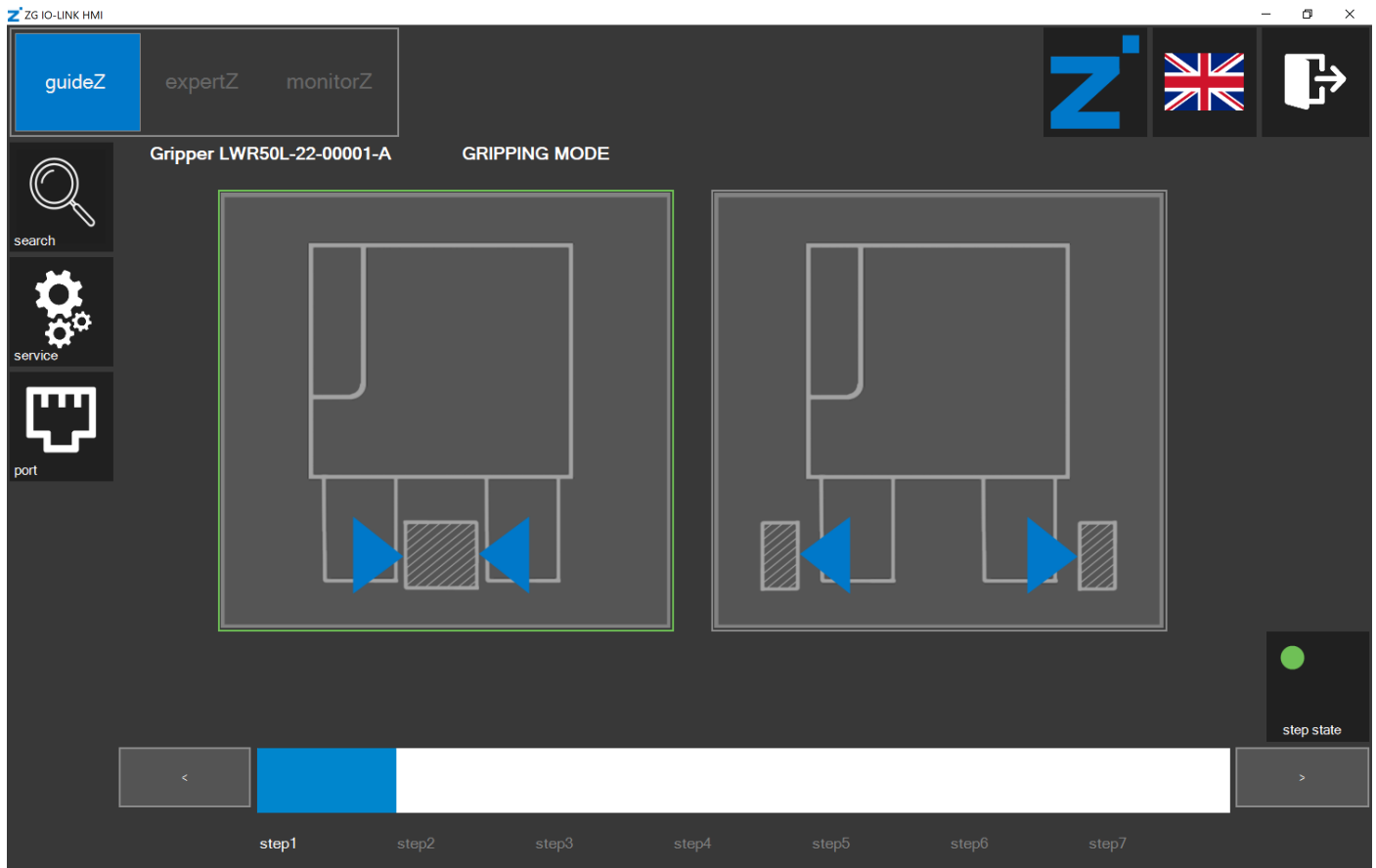
Outside gripping



Inside gripping



⇒ The parameters are set for the gripper automatically.



⇒ The *step state* LED lights up green.

- Click the > button.

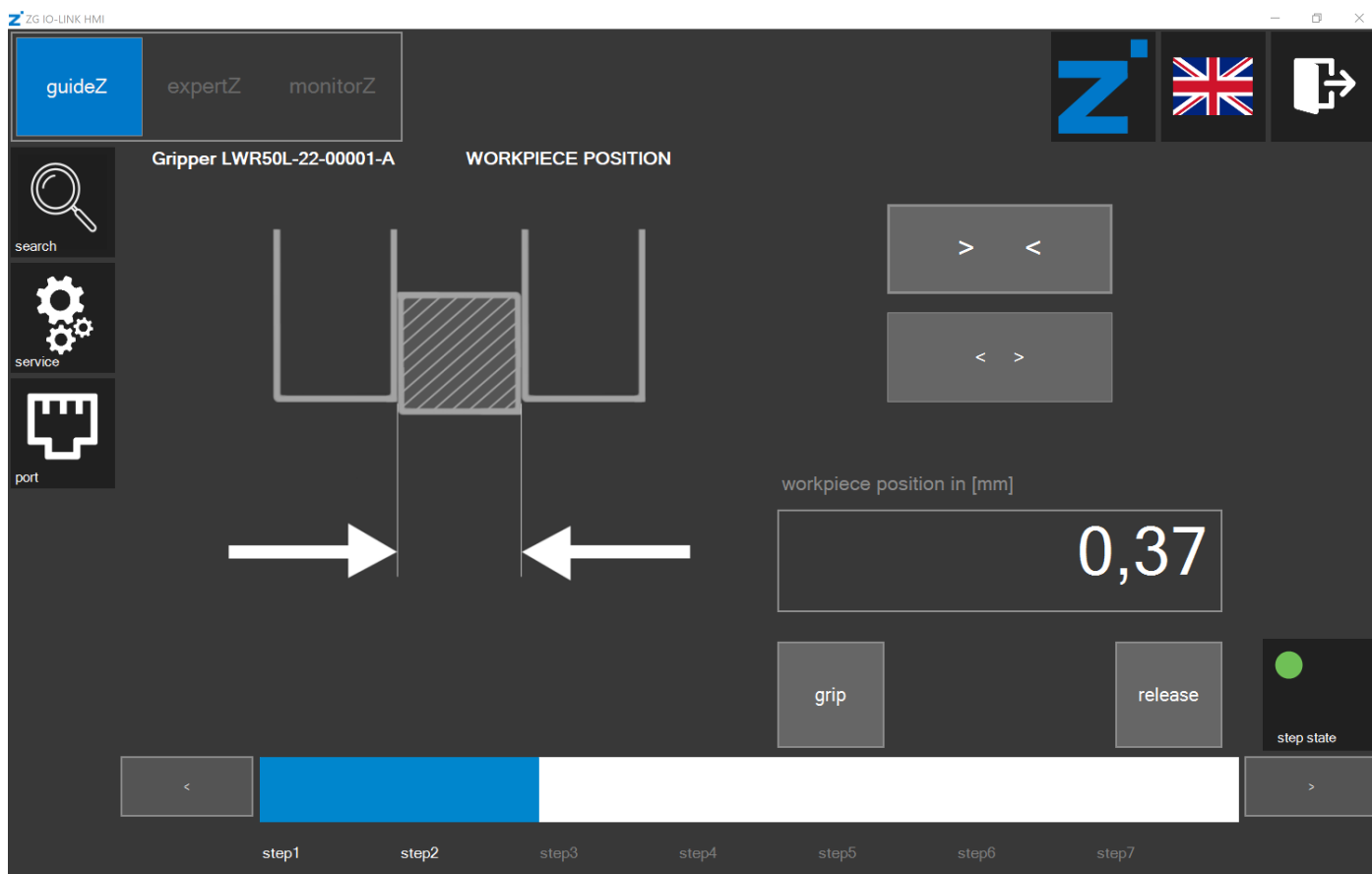
11.7 Teaching in the workpiece

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.

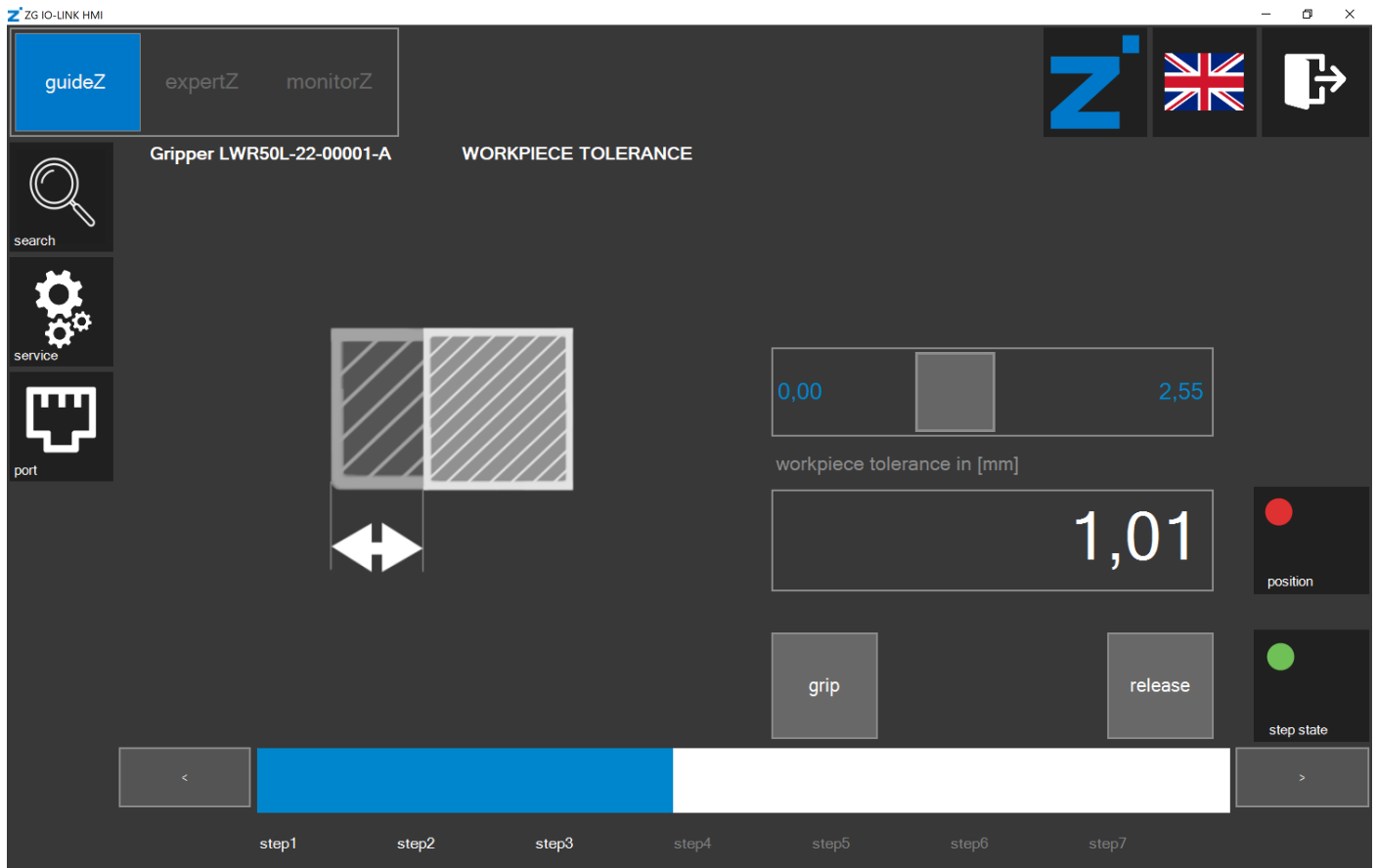
11.8 Setting the workpiece tolerance

- 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.

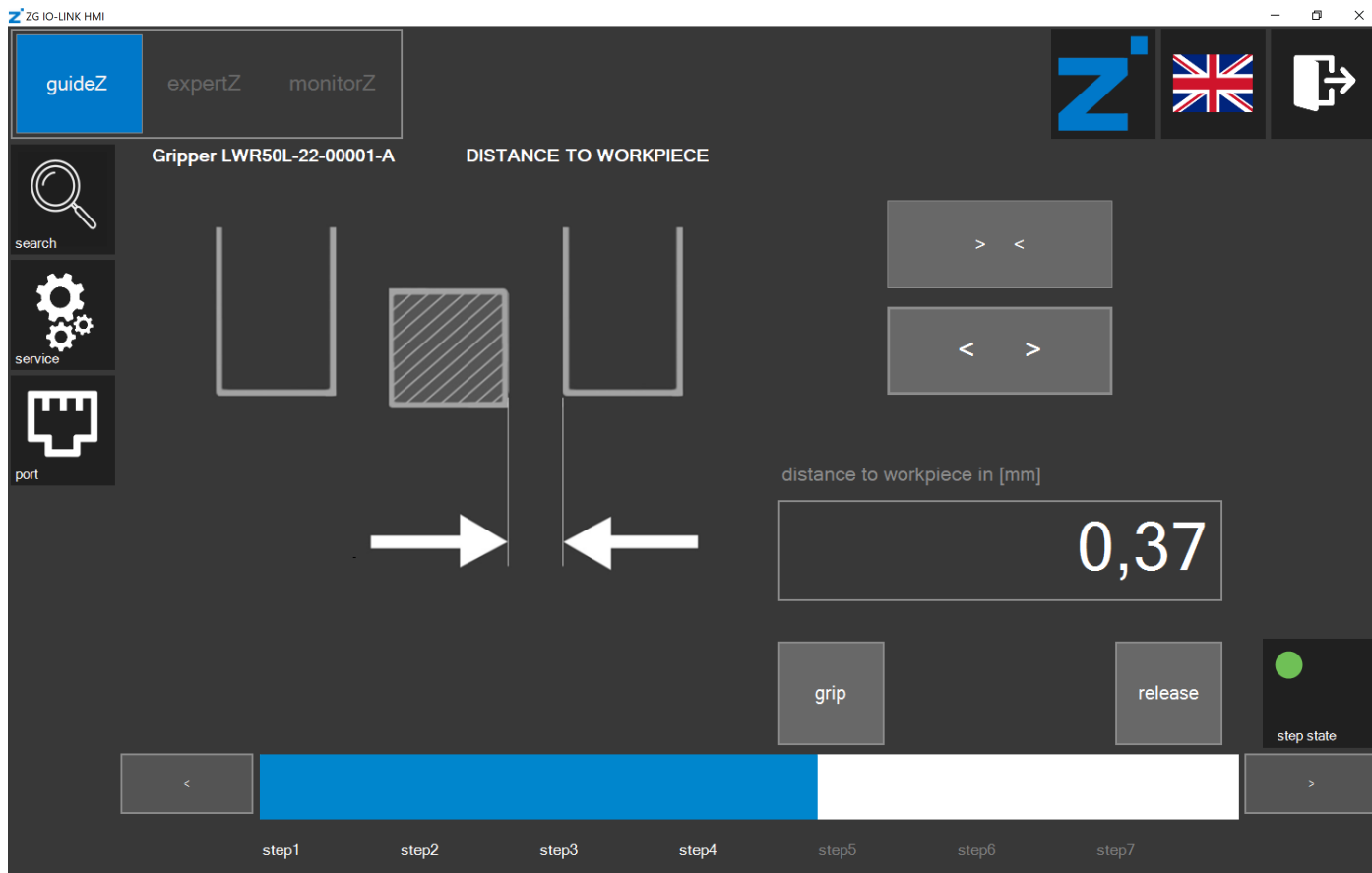
11.9 Setting the open position

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.

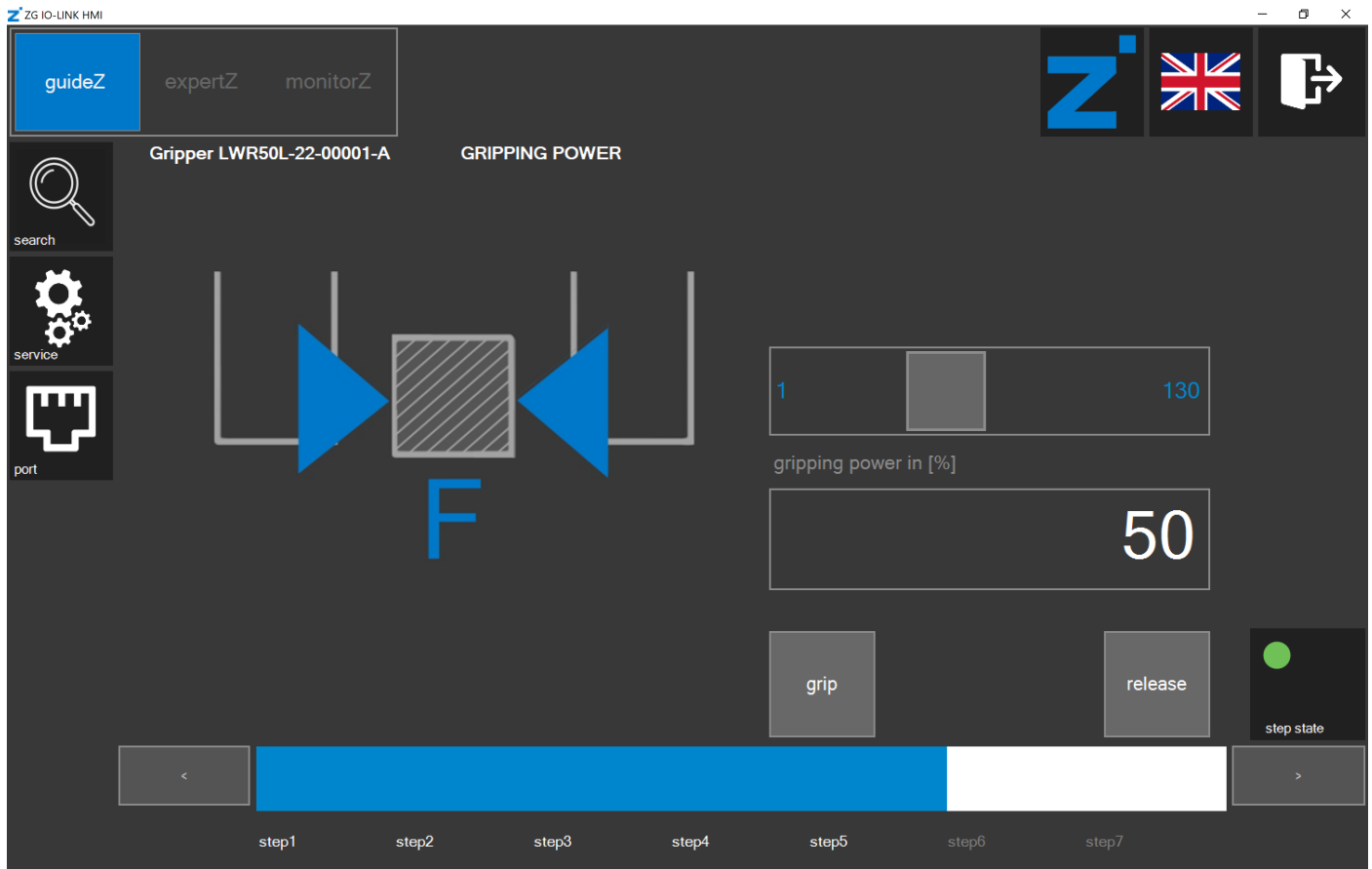


- Click the > button.

11.10 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.

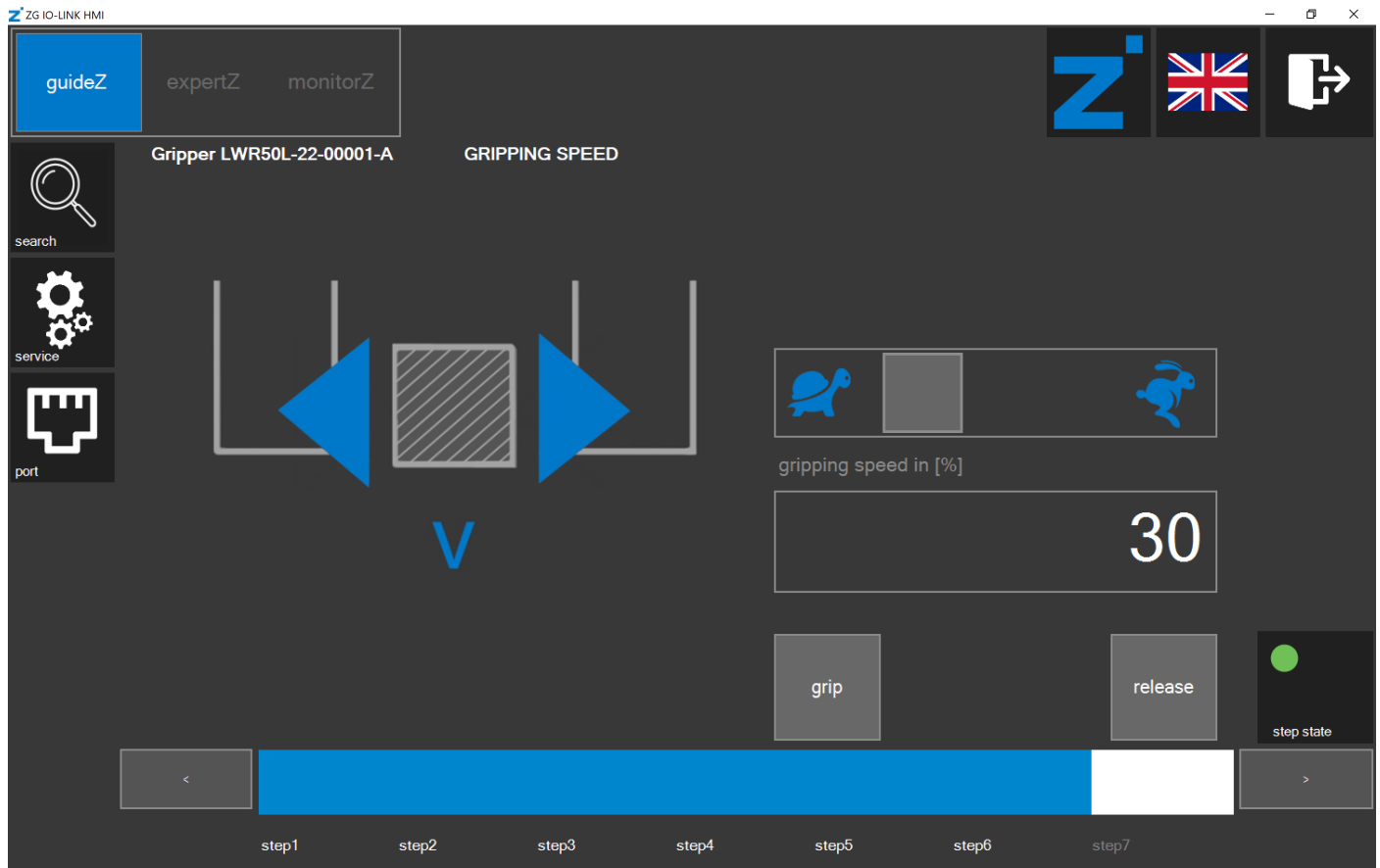
11.11 Setting the speed for opening the gripper

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.

11.12 Checking the settings

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

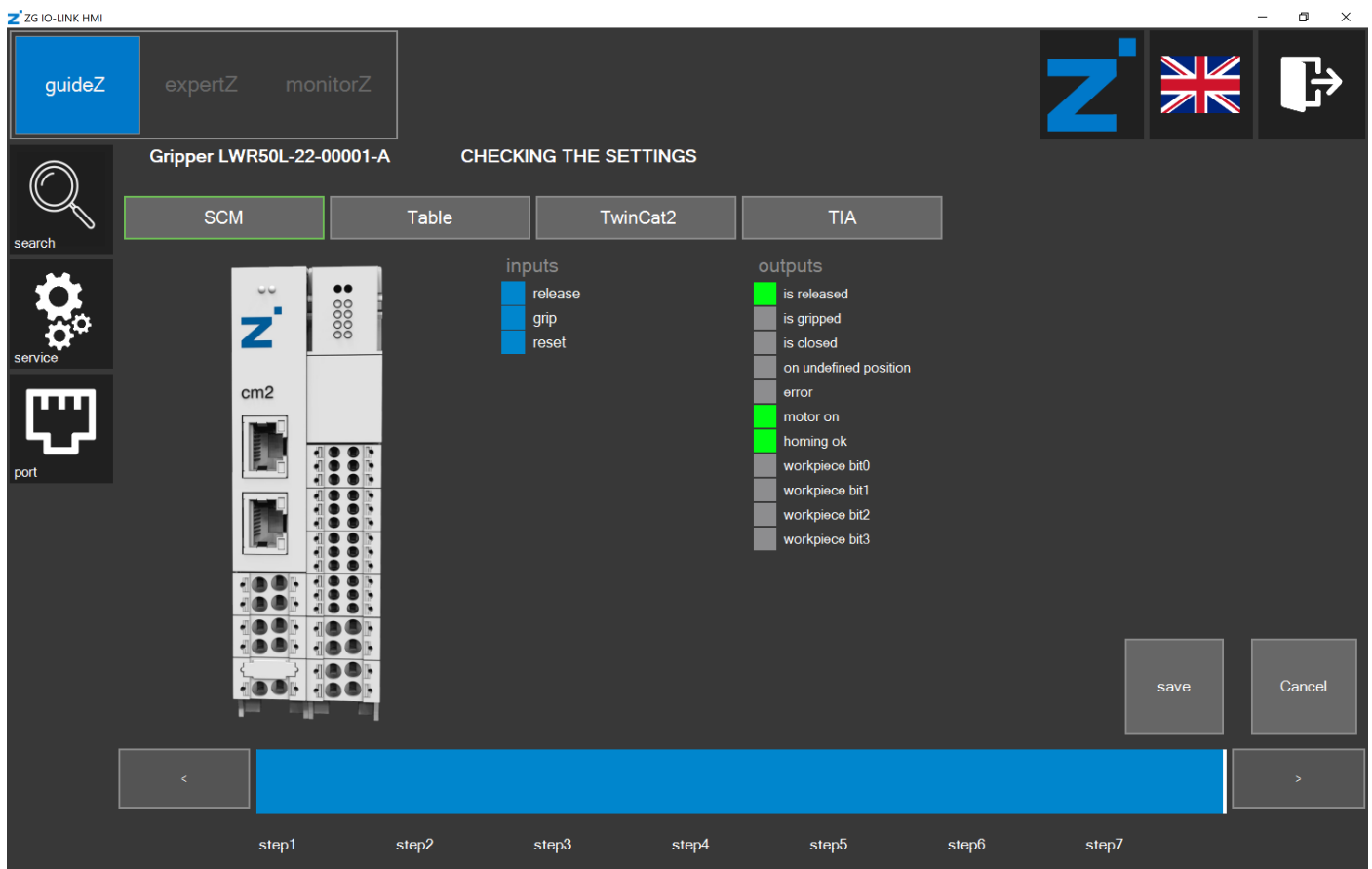
INFORMATION



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.

11.13 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.

ZG IO-LINK HMI

guideZ expertZ monitorZ

Gripper LWR50L-22-00001-A CHECKING THE SETTINGS

SCM Table TwinCat2 TIA

device mode 62 62 1 2 3 4

base position 75 3575 5 6 7 8

shift position 116 3675 9 10 11 12

teach position 426 4075 13 14 15

work position 536 4075

gripping power 65 65

gripping speed 50 50

position tolerance 10 100

Application specific tag LWR50L-22 LWR50L-22

Comment

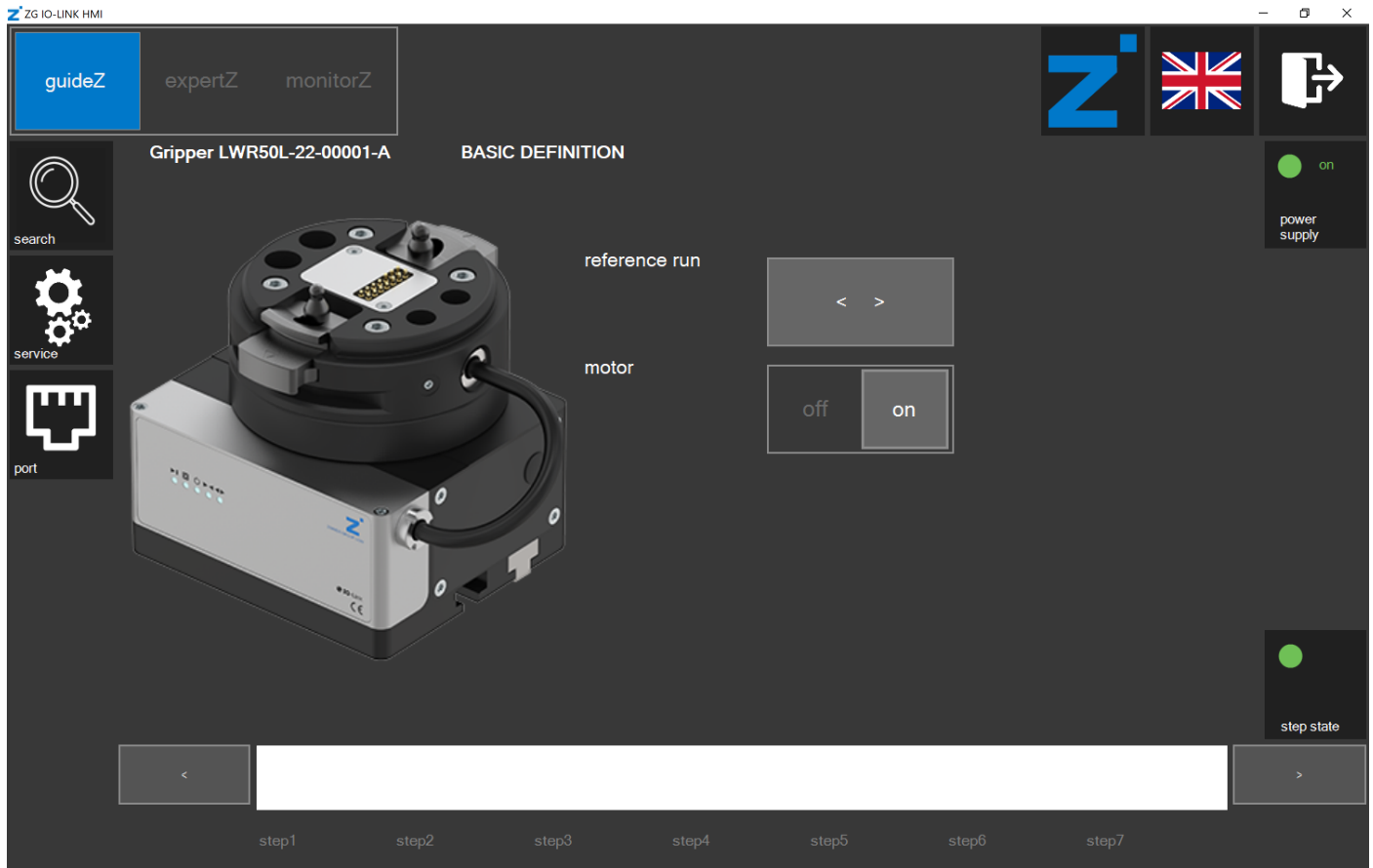
export all import all delete WP save WP

step1 step2 step3 step4 step5 step6 step7

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

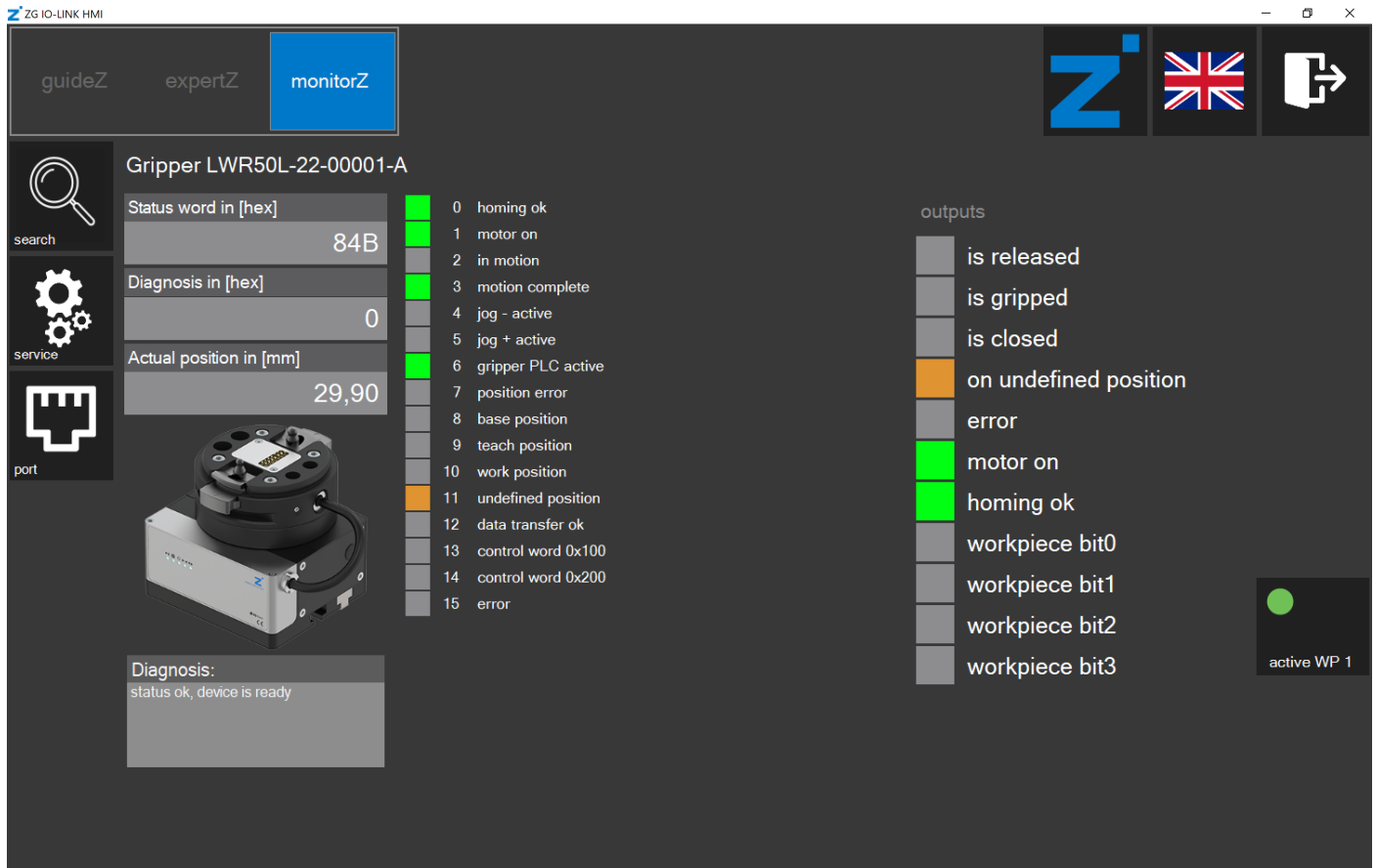
11.14 Data storage ended

- 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.



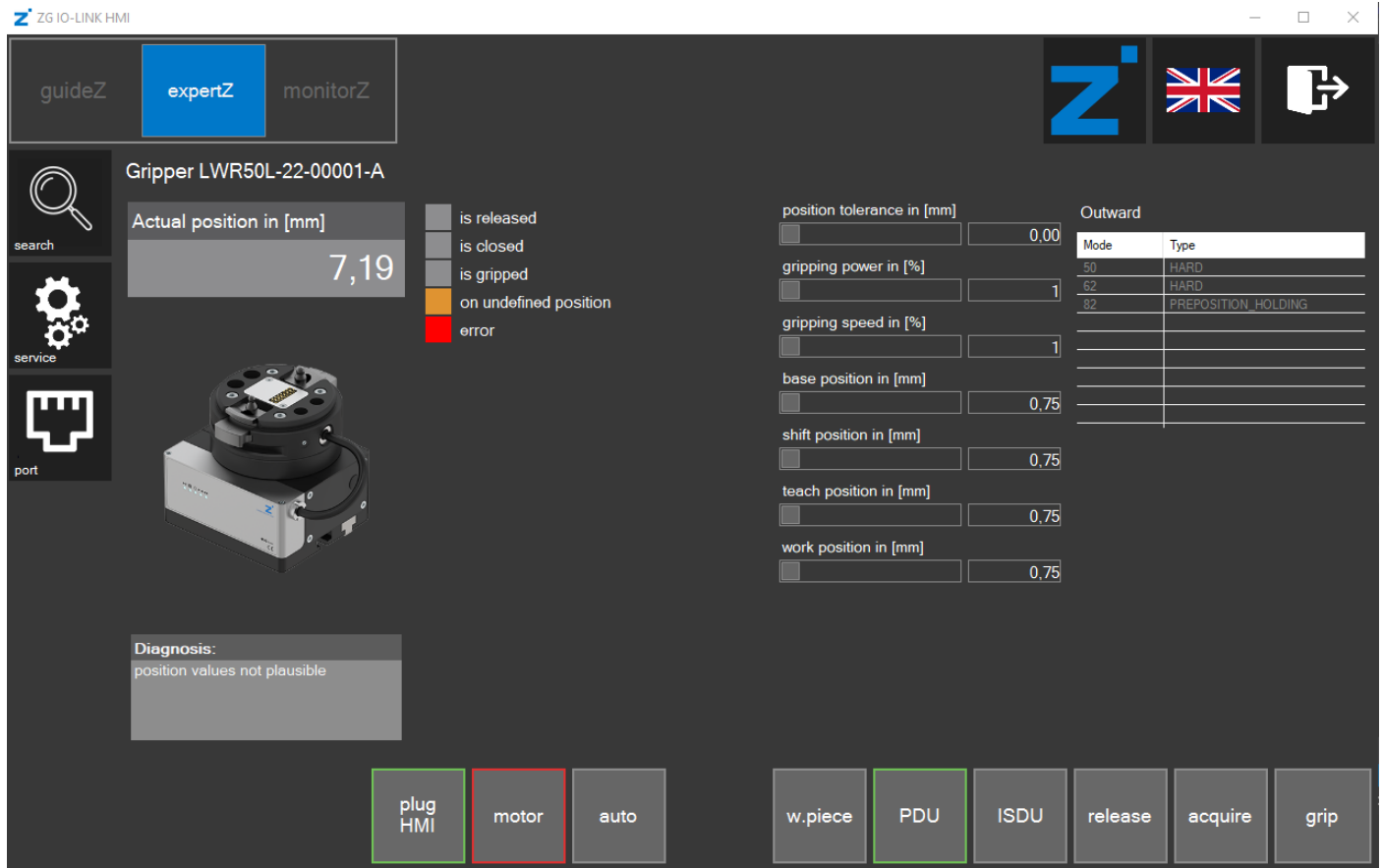
11.15 monitorZ control level

- 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.



11.16 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.

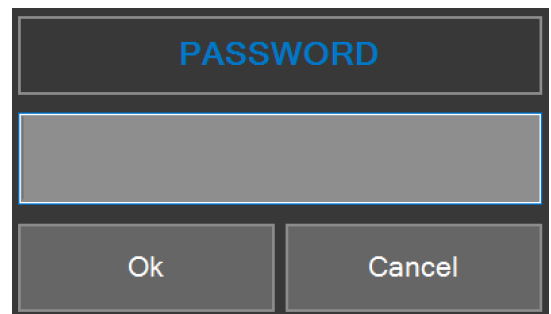


By default, the *fine tuning* setting is active. This is a view based on the parameters configured in the *guideZ* control level. You can optimize these parameters in this view.

- 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.

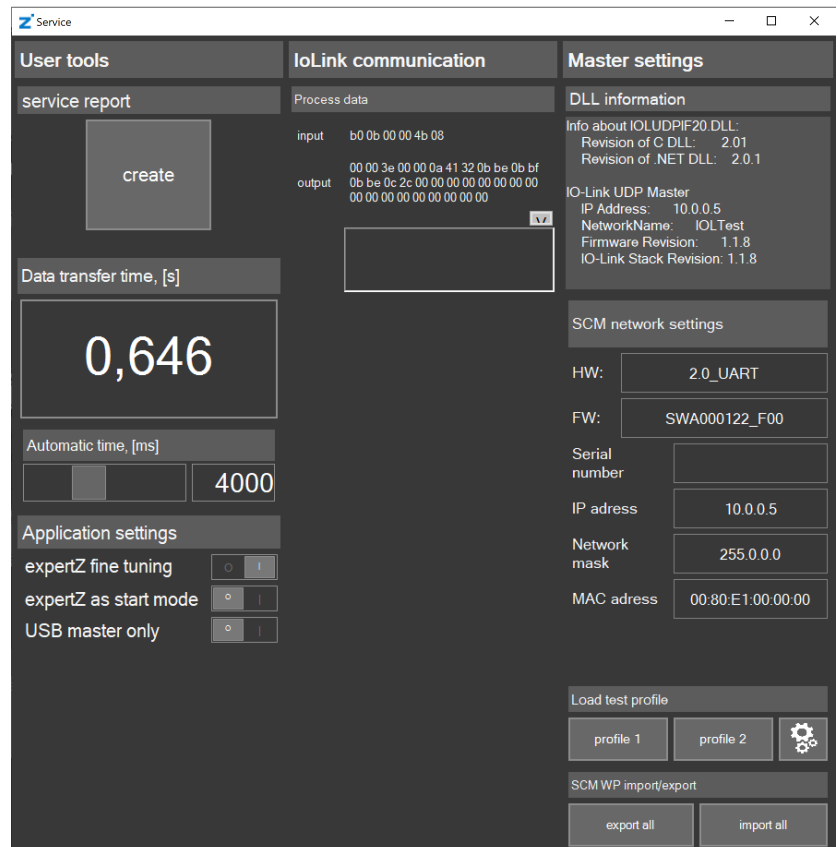
11.16.1 Service

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



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

- ⇒ The *Service* window opens.



The *Service* window is divided into several sections:

- User tools:** Contains a "service report" section with a "create" button.
- Data transfer time, [s]:** Displays a large value of "0,646".
- Automatic time, [ms]:** A slider control set to "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 values.
- Master settings:**
 - DLL information:** Details about IOLUDPIF20 DLL, including revision and IO-Link UDP Master info.
 - SCM network settings:** Fields for HW (2.0_UART), FW (SWA000122_F00), Serial number, IP address (10.0.0.5), Network mask (255.0.0.0), and 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".

11.16.1.1 Service report

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

11.16.1.2 Data transfer time

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

11.16.1.3 Automatic time

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

- Slide the bar to the desired time.

11.16.1.4 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*.

Gripper LWR50L-22-00001-A

Status word in [hex]: 84B

Diagnosis in [hex]: 0

Actual position in [mm]: 29,92

Diagnosis: status ok, device is ready

| Status Word | Description |
|-------------|--------------------|
| 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 |

device mode: 62

workpiece no: 0

position tolerance in [mm]: 0,10

gripping power in [%]: 65

gripping speed in [%]: 50

base position in [mm]: 30,06

shift position in [mm]: 30,07

teach position in [mm]: 30,06

work position in [mm]: 31,16

| Outward | | Inward | |
|---------|-------------|--------|-------------|
| Mode | Type | Mode | Type |
| 50 | POSITION | 72 | HARD |
| 62 | HARD | 92 | PREPOSITION |
| 82 | PREPOSITION | | |

grip force graph: [Graph showing grip force over time]

Buttons: plug HMI, motor, auto, w.piece, PDU, ISDU, to base, acquire, to work

- 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.

11.16.1.5 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.

11.16.2 Starting the automatic sequence

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

► Click the *autobutton*.

11.16.3 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 | |

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

work piece number

export all

import all

delete WP

load from WP

save WP

plug HMI

motor

auto

w.piece

PDU

ISDU

to base

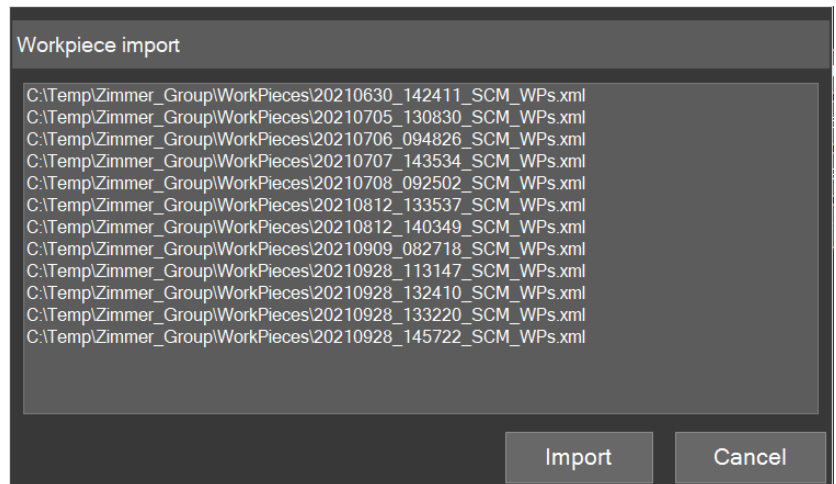
acquire

to work

11.16.3.1 Importing workpiece recipes

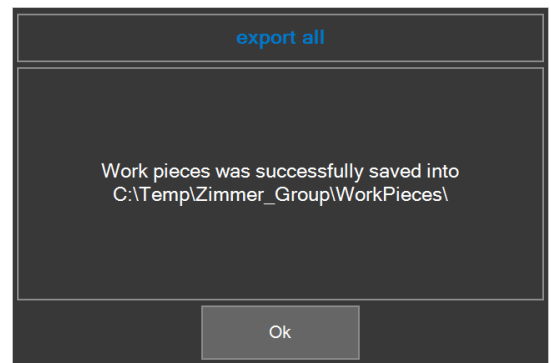
Only the entire data set can be loaded. All 15 workpiece recipes are overwritten during import.

- ▶ 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.



11.16.3.2 Exporting workpiece recipes

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



11.16.4 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

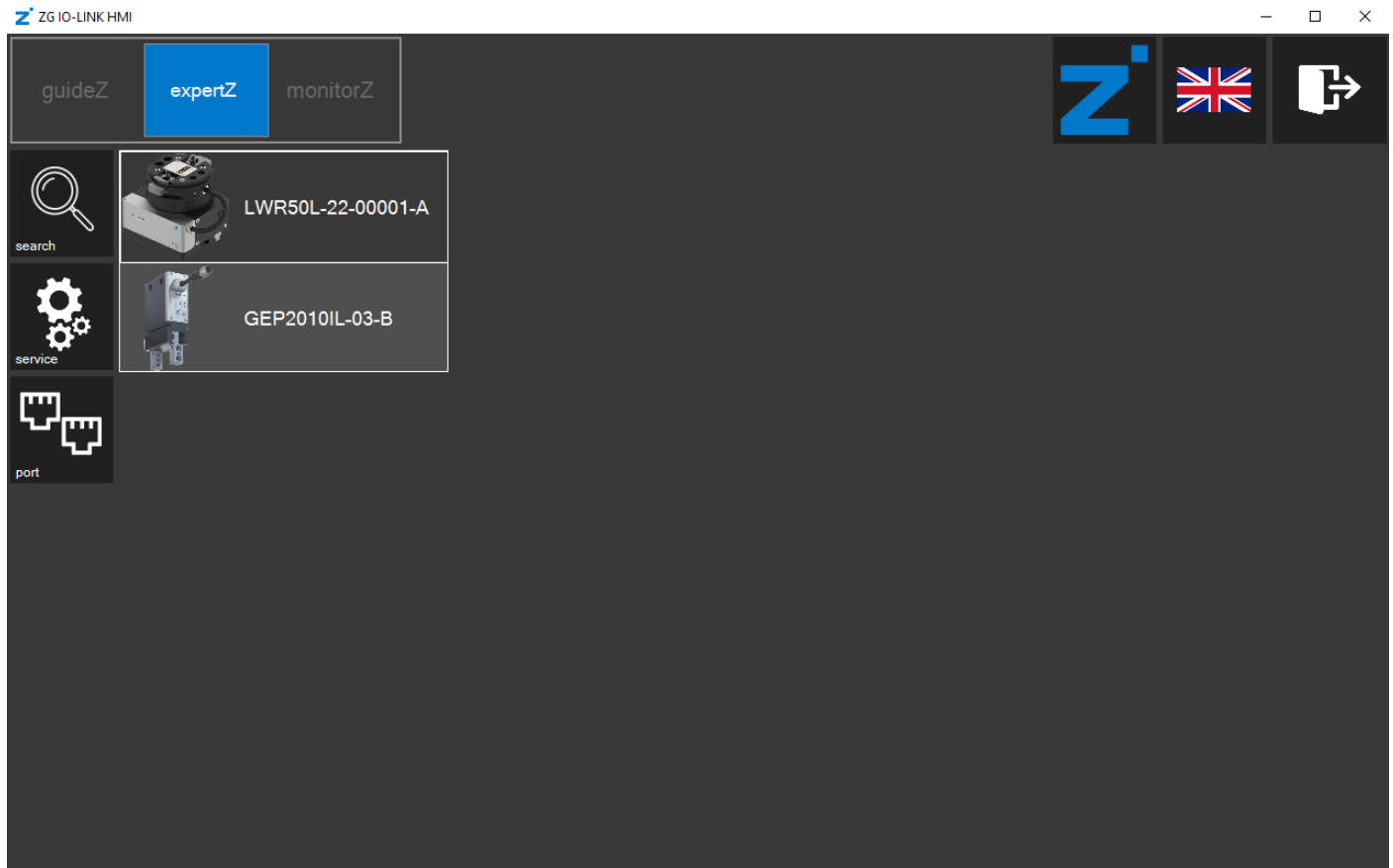
0 acquire
1 store wp
2 reset flag
3 teach
8 to base
9 to work
10 jog plus
11 jog minus
15 reset error

| 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

11.17 Selecting the active gripper(s)

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

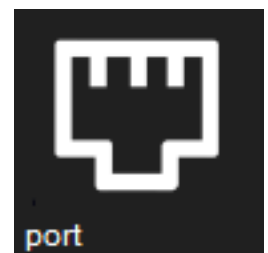


Both connected grippers are active.



Only one of the two connected grippers is active.

- Click the corresponding gripper to select it.



12 Error diagnosis

INFORMATION



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

13 RoHS declaration

in terms of the EU Regulation 2011/65/EU

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf

77866 Rheinau, Germany

☎ +49 7844 9138 0

✉ info@zimmer-group.com

💻 www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: Smart Communication Module

Type designation: SCM

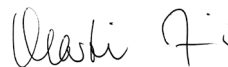
conforms to the requirements of the directive in its design and the version we put on the market.

Michael Hoch

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

14 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 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

15 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 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 |

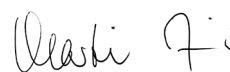
A full list of applied standards can be obtained from the manufacturer.

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