Commissioning instructions EGU/EGK/EZU for ABB Robotics

SCHUNK software module for ABB

Translation of original commissioning instructions

Hand in hand for tomorrow

Imprint

Technical changes:
We reserve the right to make alterations for the purpose of technical improvement.

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Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management
Tel. +49-7133-103-2503
Fax +49-7133-103-2189
cmg@de.schunk.com

Please read the operating manual in full and keep it close to the product.

Table of Contents

1 General

1.1 About this manual

This manual contains information on the SCHUNK software add-in for ABB robots and its use.

The add-in enables the simple integration and actuation of the following products in ABB applications:

- EGU EI: with EtherNet/IP™ interface
- EGK EI: with EtherNet/IP™ interface
- EZU EI: with EtherNet/IP™ interface

NOTE

The compatibility of the product with the robot depends on the current carrying capacity, for compatibility overview see ▸ 18.2 [🗋 56].

Definition of terms "Product"

The term "product" replaces the product names listed above in this manual.

This manual describes the software environment for an ABB robot.

NOTE: The illustrations in this manual are intended to provide a basic understanding and may deviate from the actual version.

In addition to these instructions, the documents listed under ▸ 1.5 [🗋 6] are applicable.

Abbreviations

The following abbreviations are used:

- GPE: Gripping force and position maintenance
- SG: Single Gripper
- DG: Double Gripper
- TCP: Tool Center Point
- COM: Center of Mass (center of gravity)

1.2 Target group

This manual is intended for robot integrators who have basic mechanical and electrical training skills and who are also familiar with elementary programming concepts.

Commissioning and troubleshooting may only be performed by qualified personnel with appropriate training.

The following knowledge is required:

- Basic knowledge of robotics
- Knowledge in handling ABB robots
- RAPID knowledge

Electrical installations may only be carried out by a suitably trained electrician.

1.3 Symbol definition

The following symbols are used in this manual:

■ Prerequisite for an action

1. Action 1
2. Action 2

   ⇨ Intermediate results

⇨ Final results

▸ 1.3 [🗋 5]: chapter number and [page number] in hyperlinks

1.4 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.

⚠ DANGER

Dangers for persons!

Non-observance will inevitably cause irreversible injury or death.

⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.

⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

NOTICE

Material damage!

Information about avoiding material damage.

1.5 Applicable documents

- Assembly and operating manual for the product:
  - Universal gripper EGU, electric *
  - Gripper for small components EGK, electric *
  - Electric centric gripper EZU *
- Commissioning instructions:
  - EGU with EtherNet/IP™ interface *
  - EGK with EtherNet/IP™ interface *
  - EZU with EtherNet/IP™ interface *
- Operating manual for the ABB robot
- Catalog data sheet of the product *

The documents labeled with an asterisk (*) can be downloaded from **schunk.com/downloads**.

1.6 Brands

- EtherNet/IP™ is a registered trademark of ODVA, Inc.
- ABB is a registered trademark of Asea Brown Boveri Ltd.
- RobotStudio is a registered trademark of Asea Brown Boveri Ltd.

2 Functional description

The software module facilitates operation and application creation for SCHUNK products on a collaborative ABB robot.

All necessary controls are installed via the software module. After the installation is complete, the programming elements are deployed within the graphical user interface (GUI). The GUI supports the entire configuration and parameterization of SCHUNK products as well as the necessary control and programming options.

The following functions are available in the software module and can be used in the SCHUNK app or in the programming and simulation software *RobotStudio* from ABB:

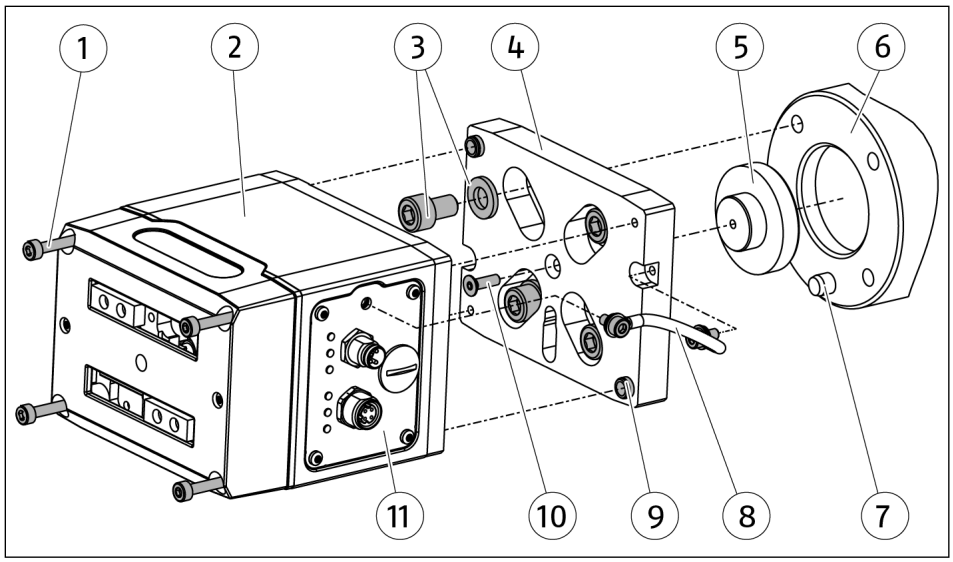
- **Grip**: When workpiece gripping (simple gripping movement), a workpiece is gripped with a specified gripping force value **without** specifying the workpiece position.
- **Grip workpiece at expected position**: When workpiece gripping at an expected position, a workpiece is gripped at the specified workpiece position with the specified gripping force value using a combined gripping movement.
- **Release**: When releasing a workpiece, the product executes a relative positioning movement. Starting from the current position, a defined distance is moved in the opposite direction to the gripping direction.
- **Jog mode**: With jog mode, a movement is executed to the outside or inside.
- **Absolute position**: Absolute positioning of the gripper fingers
- **Relative Position**: Relative positioning of the gripper fingers
- **Acknowledge**: Acknowledge pending warnings and errors
- **Stop**: Controlled stop
- **Fast Stop**: Cancel movements
- **Test Brake**: Perform brake test *(only for products of variant "M" and with firmware version 5.2 or higher)*

For more information on inserting the commands into the program code, see ▶ 16 [🗋 50].

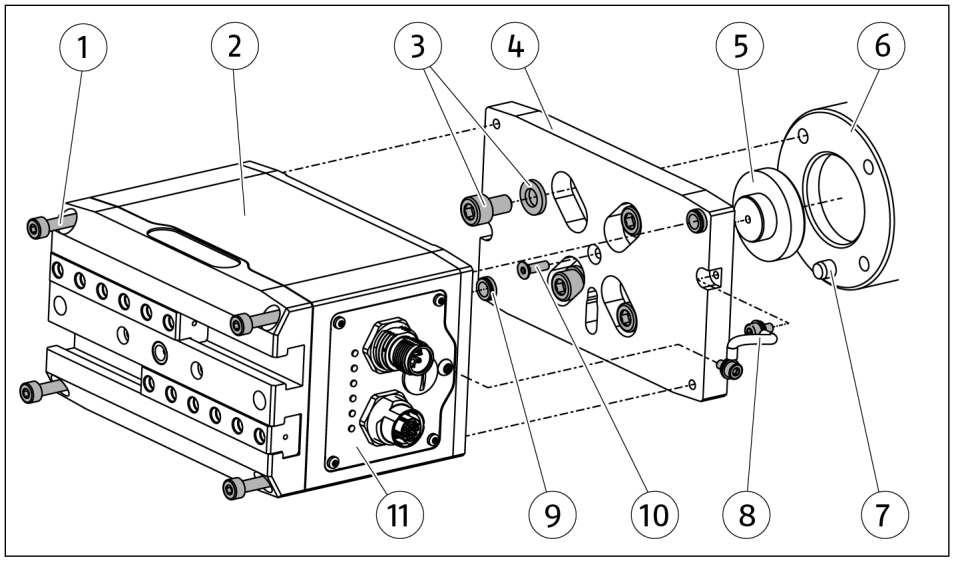
3 Mounting the product to the robot

SCHUNK provides robot adaptation packages as accessories for mounting the product on robots. These packages include matching screws, centering pins and centering collar for fastening to the desired robot flange. For more information, see the catalog data sheet at **schunk.com**.

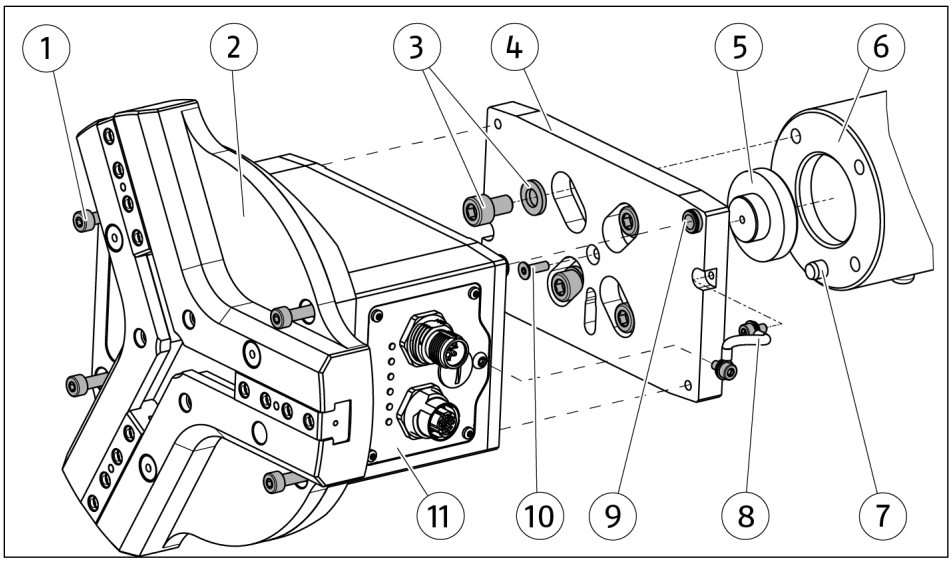
Single gripper (SG)



EGK-SG: Mounting on the robot



EGU-SG: Mounting on the robot



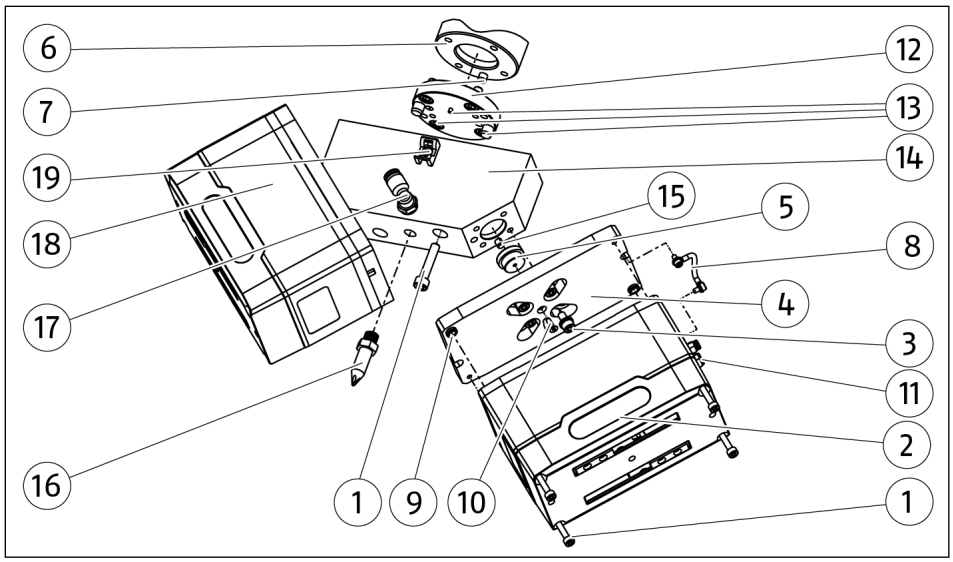
EZU-SG: Mounting on the robot

1. Insert centering pin (7) in robot flange (6).
2. Mount centering collar (5) with screw (10) on adapter plate (4).
3. Fasten adapter plate (4) to robot flange (6) with screws (3) and, if necessary, with washers.
4. Mount the functional earth (8) cable to the adapter plate (4) with screw and toothed lock washer.
5. Insert centering sleeves (9) into adapter plate (4).
6. Fasten the product (2) to the adapter plate (4) with screws (1). Note: Circuit board (11) and functional earth cable (8) must be on the same side.
7. Connect the functional earth cable (8) to the equipotential bonding of the product using a screw and toothed lock washer.

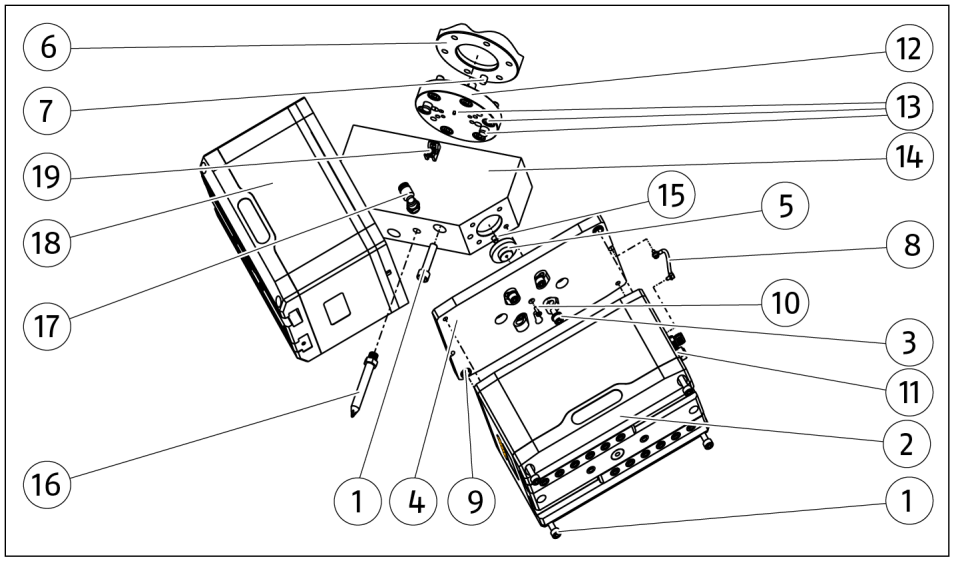
Double gripper (DG)

Note: When used as a double gripper, a blow-off nozzle can be mounted. In the process, the outgoing air from the blow-off nozzle cleans the workpiece of chips or other impurities.

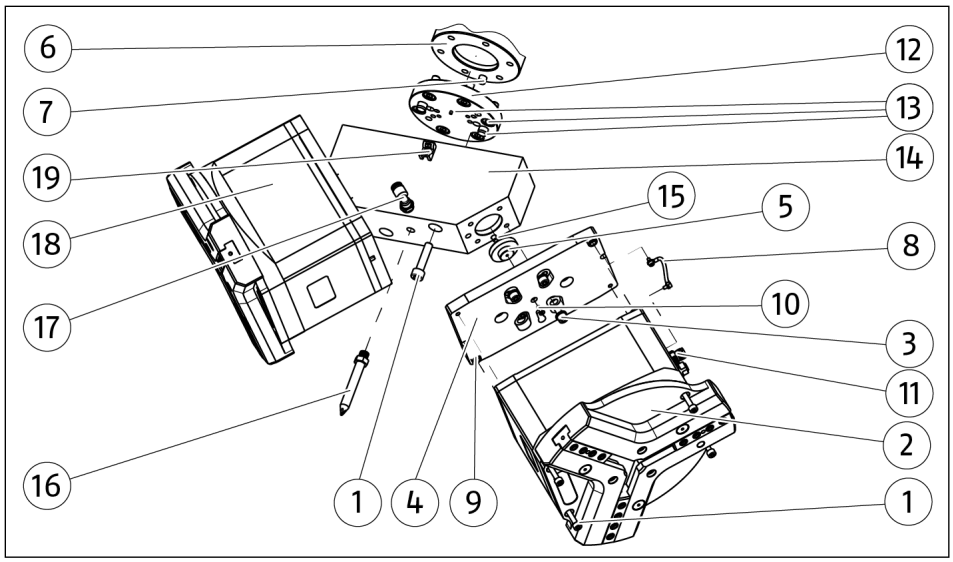
Blow-off nozzle and cable holder are available as accessories from SCHUNK, see catalog data sheet at **schunk.com**.



EGK-DG: Mounting on the robot



EGU-DG: Mounting on the robot



EZU-DG: Mounting on the robot

1. Insert centering pin (7) in robot flange (6).
2. Fasten ISO flange (12) to the robot flange (6) using screws (13).

3. Insert centering pins (13) in ISO flange (12).
4. Fasten elbow adapter (14) with screws (1) to ISO flange (12) in correct position.
5. Insert centering pin (15) into elbow adapter (14).
6. Mount centering collar (5) with screw (10) on adapter plate (4).
7. Fasten the adapter plate (4) with screws (3) and if necessary with washers to the elbow adapter (14).
8. Mount the functional earth (8) cable to the adapter plate (4) with screw and toothed lock washer. Make sure that the functional earth cable (8) points outwards.
9. Insert centering sleeves (9) into adapter plate (4).
10. Fasten the product (2) to the adapter plate (4) with screws (1). Note: Circuit board (11) and functional earth cable (8) must be on the same side.
11. Connect the functional earth cable (8) to the equipotential bonding of the product using a screw and toothed lock washer.
12. Mount the second gripper (18) to the elbow adapter (14) in the same way.
13. Optional: Glue the blow-off nozzle (16) with the enclosed O-ring into the Z-axis of the elbow adapter (14) with liquid, medium-strength threadlocker (tightening torque 1 Nm). Screw the elbow fitting (17) into the elbow adapter (14).
14. Optional: Fasten cable holder (19) to elbow adapter (14) with enclosed screw.

4 Connecting the product to the robot control system

Before connecting or commissioning the product, read the operating manual of the robot and observe the instructions in this manual!

⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

⚠ CAUTION

Risk of injury from electric shock due to contact with live parts!

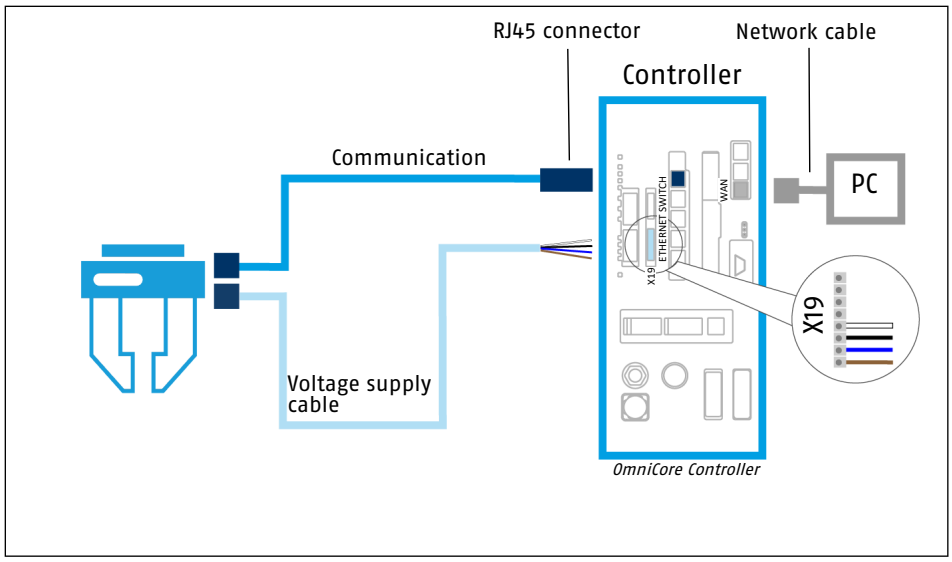
- Follow the operating manual for the robot.
- Before starting any work on the product: Switch off the energy supply and secure against re-connection.

NOTE

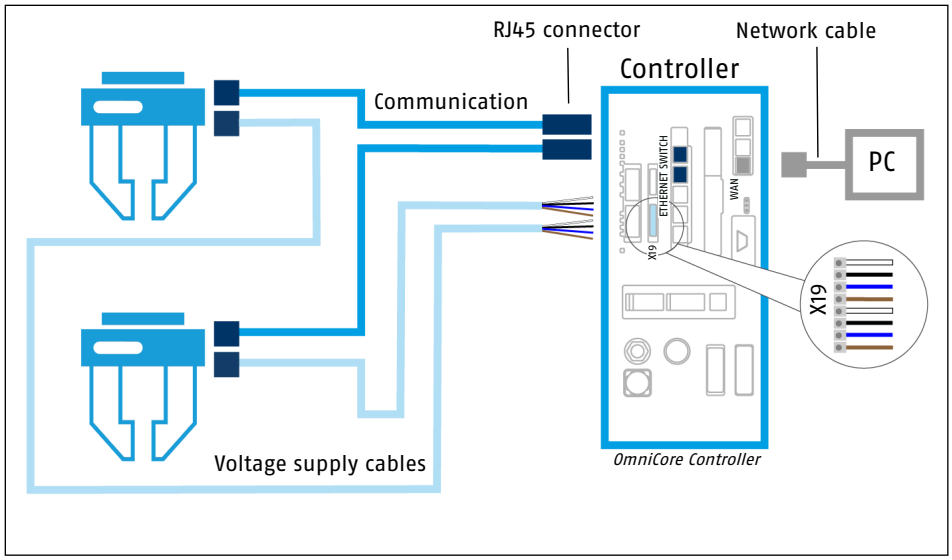
Safety-relevant signals (e.g. emergency stop) must be wired externally, e.g. via safety relays, thus completely disconnecting the product from the power supply.

- Perform a risk assessment for the entire robotic application based on legal requirements to evaluate all safety-related aspects of the application.

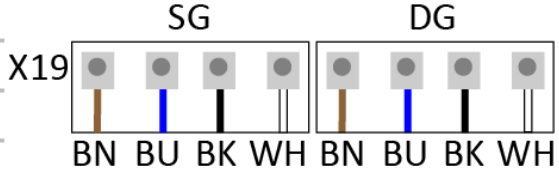
Connection diagram



Connection diagram for one product



Connection diagram for two products

Signal	Wire strand color voltage supply cable	Connection of wire strands to terminal X19
V_LOG	Brown – BN	
GND_PWR	White – WH	
GND_LOG	Blue –BU	
V_PWR	Black – BK	

SG: Gripper 1, DG: Gripper 2

Tab.: Voltage supply cable wire strands

Connecting the product

NOTE

- To operate the grippers with EtherNet/IP communication interface, it is *essential* to enable the "3024-1 EtherNet/IP Scanner" option on the OmniCore Controller.
- SCHUNK also recommends using the "3014-1 5 port Ethernet switch" option for the communication connection of the grippers.

- There is **no** energy supply.
- "3024-1 EtherNet/IP Scanner" option is enabled.
- Product is mounted on the robot.
- Gripper fingers are mounted. Cables are connected to the product (see product assembly and operating manual).

1. Connect the communication cable with the RJ45 connector to a vacant "ETHERNET SWITCH" slot on the robot control system.
2. Connect the wire strands of the voltage supply cable to terminal X19, for terminal assignment, see previous table.
3. Connect PC to "WAN" using a network cable.
4. Connect logic and power supply to the product.
   ⇨ On the product, the "LOG" and "PWR" LEDs light up green.

5 Installing the software module

There are two options for installing the software module:

- Installation on the FlexPendant handheld teaching unit, ▶ 5.1 [🗋 16]. No PC is required for this.
- Installation using *RobotStudio* programming and simulation software from ABB, ▶ 5.2 [🗋 18].

NOTE

SCHUNK recommends using the "EdgeHTML" browser engine, which is set as the default. Otherwise, display errors may occur.

5.1 Installation on the FlexPendant

NOTE

To install the software, SCHUNK recommends using a USB stick.

Preparing the USB stick

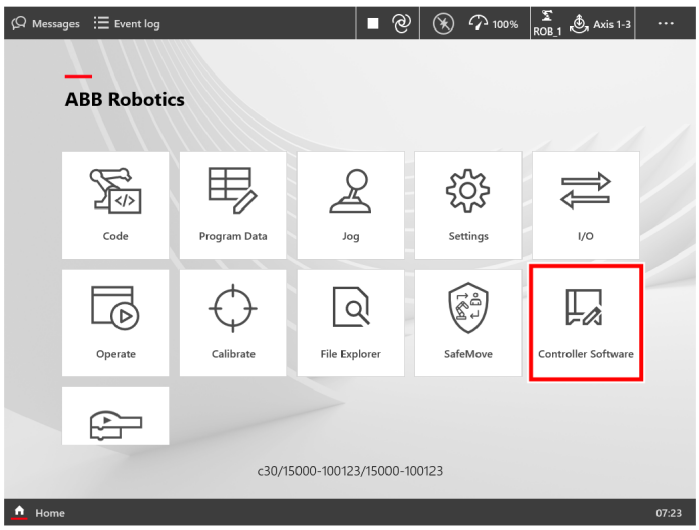
The USB stick must meet the following requirements:

- Formatted in FAT32 format
- Designation of the removable drive: "SCHUNK ...."

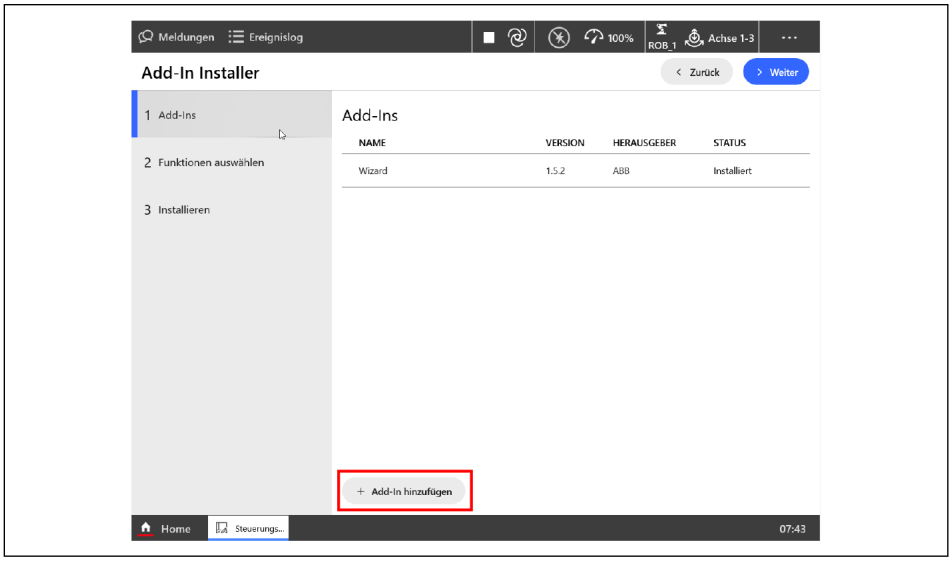
Installing

■ Product is mounted and connected to the robot control system.

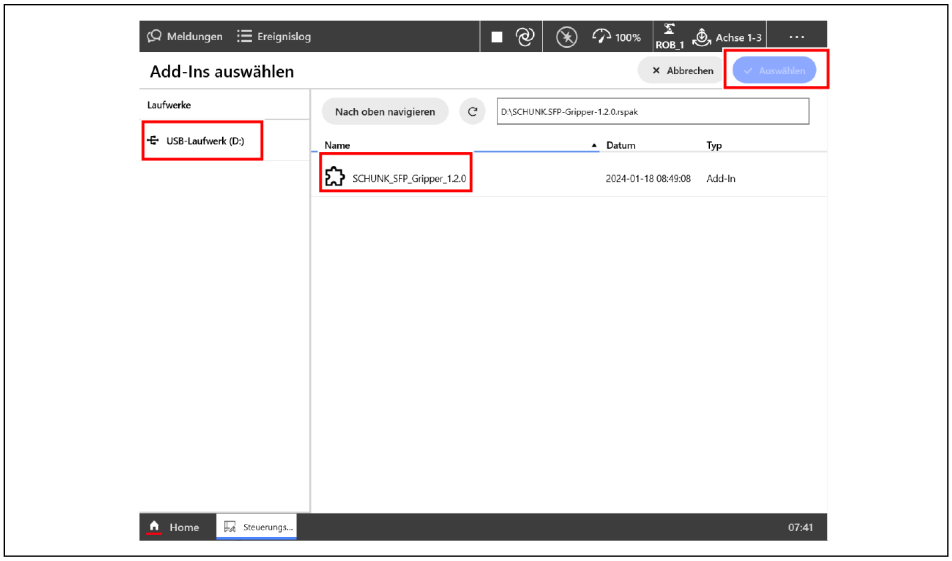
1. Download the current version of the software module from **schunk.com/downloads-software** and copy it to the USB stick.
2. Connect the USB stick to the FlexPendant.
3. Select the "Control software" button.



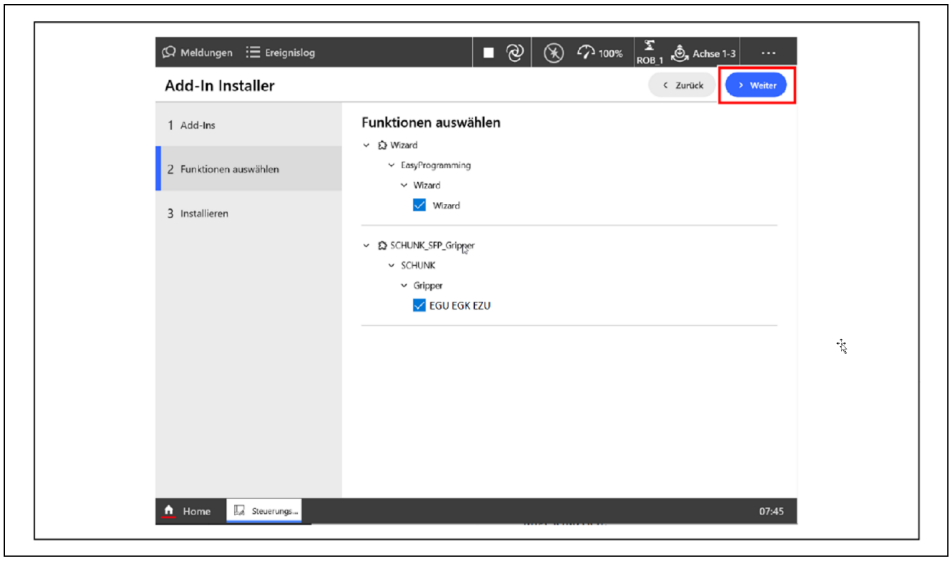
4. Select the "Add +Add-In" button.



5. Select the "SCHUNK ...." software module and confirm with "Select".



6. Under "Select functions" activate the "EGU EGK EZU" checkbox at "Wizard".
7. Select the "> Next" button.



⇨ The software module is installed. This may take a few seconds.

⇨ The robot performs a restart.

⇨ A "Mechatronic Grippers" app appears on the FlexPendant under "Home," ▶ 9 [🗋 31].

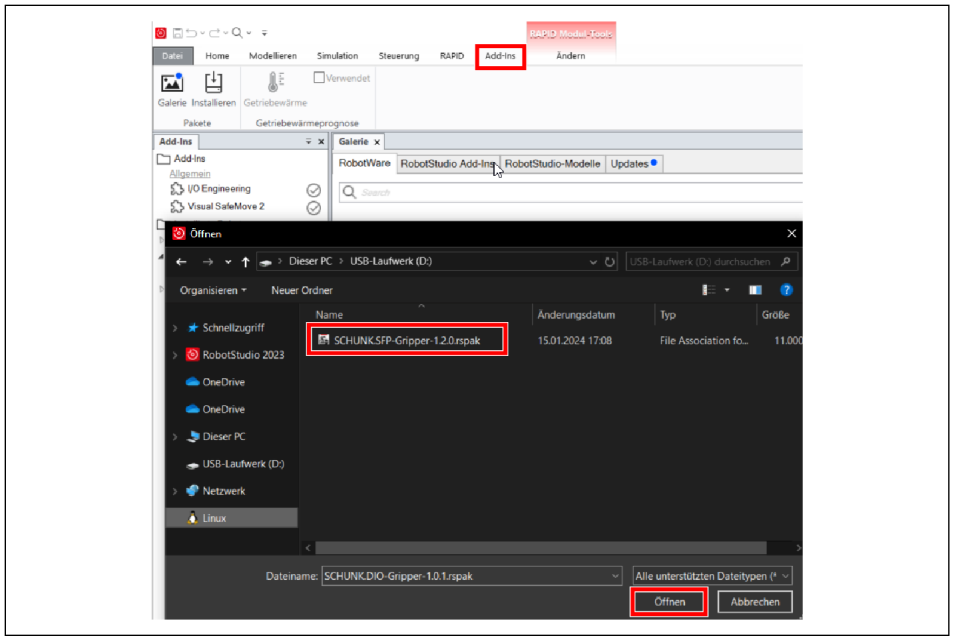
5.2 Installation in RobotStudio

Installing

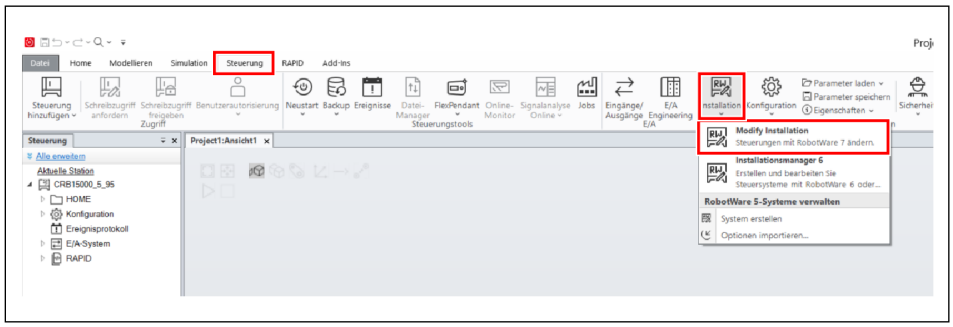
- Product is mounted and connected to the robot control system.
- User PC and robot control system are connected to each other.
- Programming and simulation software *RobotStudio* from ABB is installed on the PC.

1. Download the latest version of the software module at **schunk.com/downloads-software** and copy it into the directory of your choice.
2. Start the control and *RobotStudio*.
3. Select the tab "Add-Ins" > "Install" and select the *.rspak file saved for this.

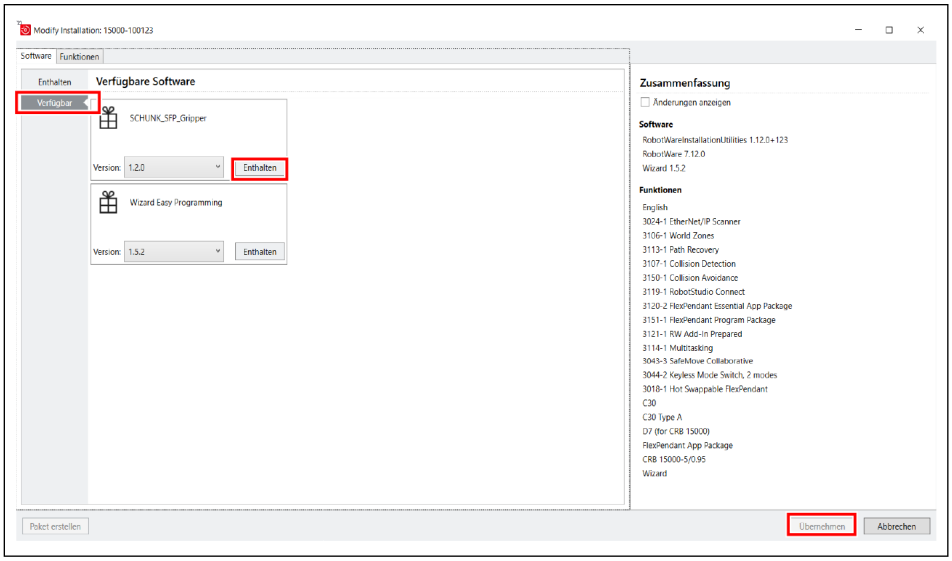
4. Select the "Open" button.



5. Select the "Control">"Installation">"Modify Installation" tab.



6. Adjust the configuration of the controller. Select the "Available" button.
7. Select the "Include" button for "SCHUNK_SFP_Gripper_ x.x.x" and confirm with "Apply".



⇨ The software module is installed. This may take a few seconds.

8. Confirm the pop-up menu with "Yes".

⇨ The robot performs a restart.

⇨ A "Mechatronic Grippers" app appears on the FlexPendant under "Home," ▶ 9 [🗋 31].

5.3 SCHUNK Control Center – Mechatronic Grippers app

The *Mechatronic grippers* application can be started via the SCHUNK Control Center. This app enables fast commissioning and parameterization of the module.

The software can be downloaded from **schunk.com/downloads-software**.

Range of functions of the *Mechatronic grippers* app

- Configuration and commissioning:
  - Display of status information
  - Execution of gripping and movement commands
  - Changing the IP address
  - Display and save error messages
  - Executing firmware updates
  - Saving and reading configuration files
- Automatic and manual search for modules in the network
- Optical display of the connected module
- Configuration and control via computer possible
- Resetting to factory settings

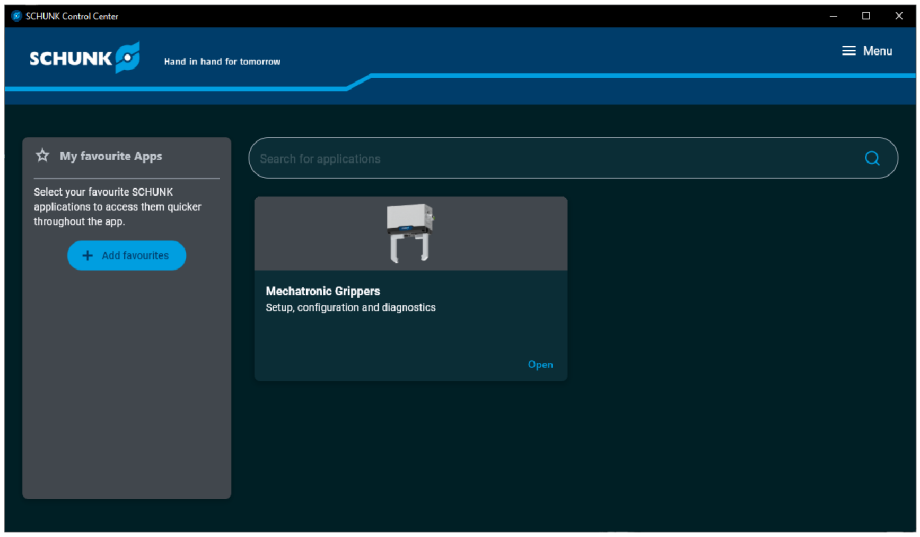
Start software

NOTE

In order to ensure the *Mechatronic Grippers* app communicates with the module via an Ethernet network, ensure that communication is not prevented by a firewall or any other network technology.

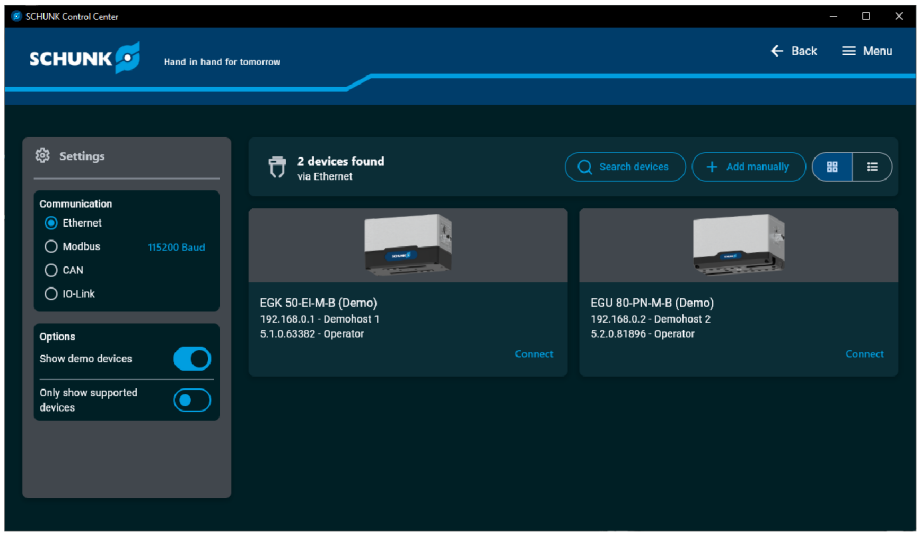
- The module is electrically connected to the power supply unit.
- SCHUNK Control Center is installed.

1. Connect the computer directly to the module via Ethernet.
   OR:
   Connect the computer to the network in which the module is integrated.
2. Open SCHUNK Control Center.
   ⇨ The start screen is displayed.



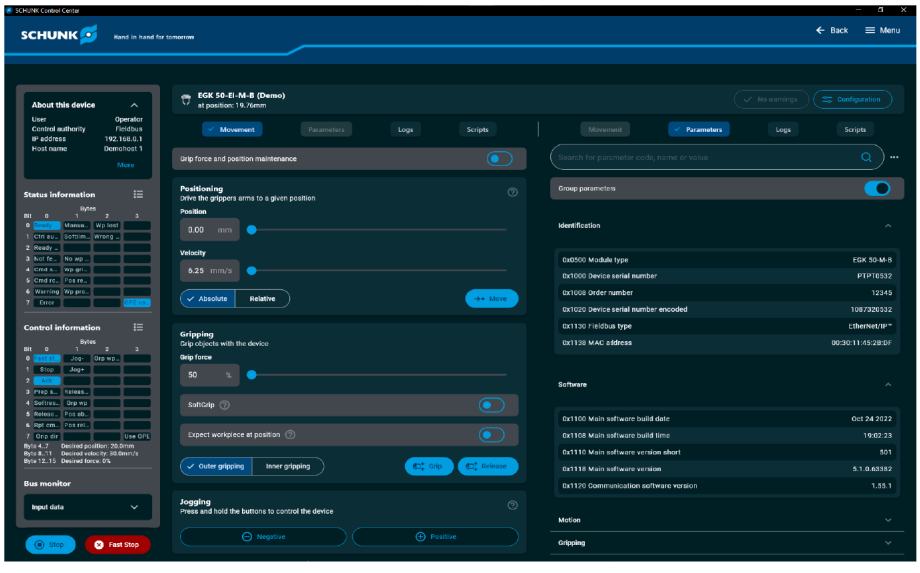
Start screen

3. Select the *Mechatronic grippers* app.
   ⇨ The system automatically searches for modules that are located in the network.
   ⇨ Modules found are displayed in the selection window of the communication interfaces.



Communication interfaces selection window

4. Select the desired module.
   - ⇨ The app connects to the module.
   - ⇨ Access to the functions of the module is possible.



Range of functions

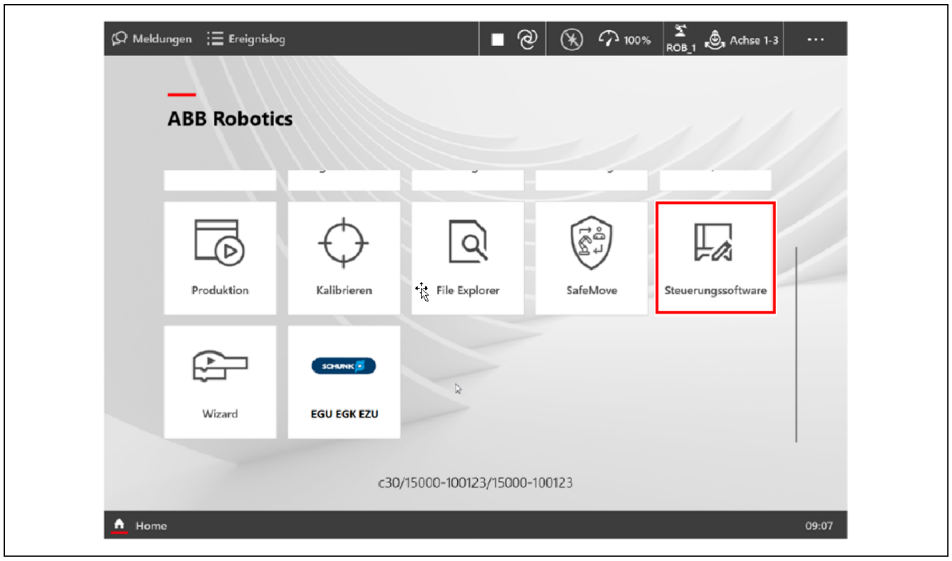
6 Uninstalling the software module

There are two options for uninstalling the software module:

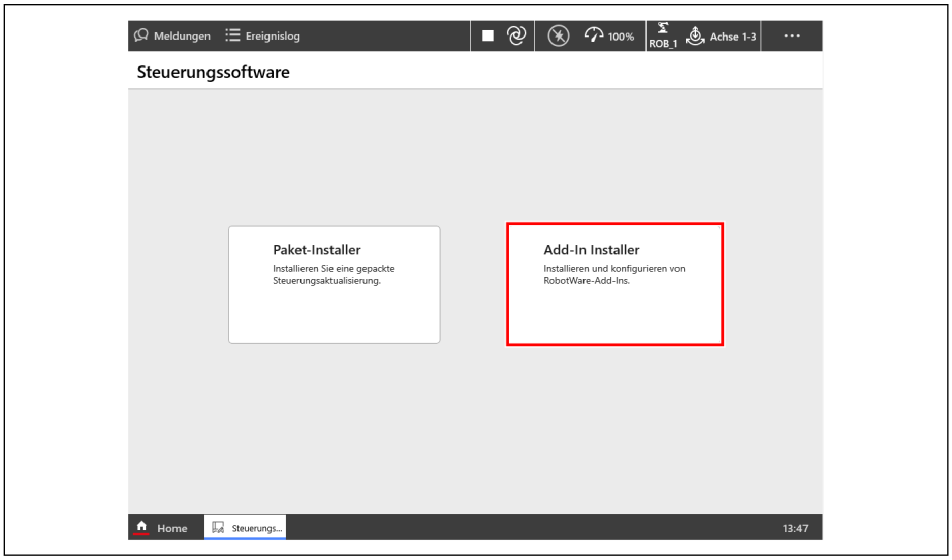
- Uninstallation on the FlexPendant handheld teaching unit, ▶ 6.1 [🗋 24]. No PC is required for this.
- Uninstallation using *RobotStudio* programming and simulation software from ABB, ▶ 6.2 [🗋 26].

6.1 Uninstallation on the FlexPendant

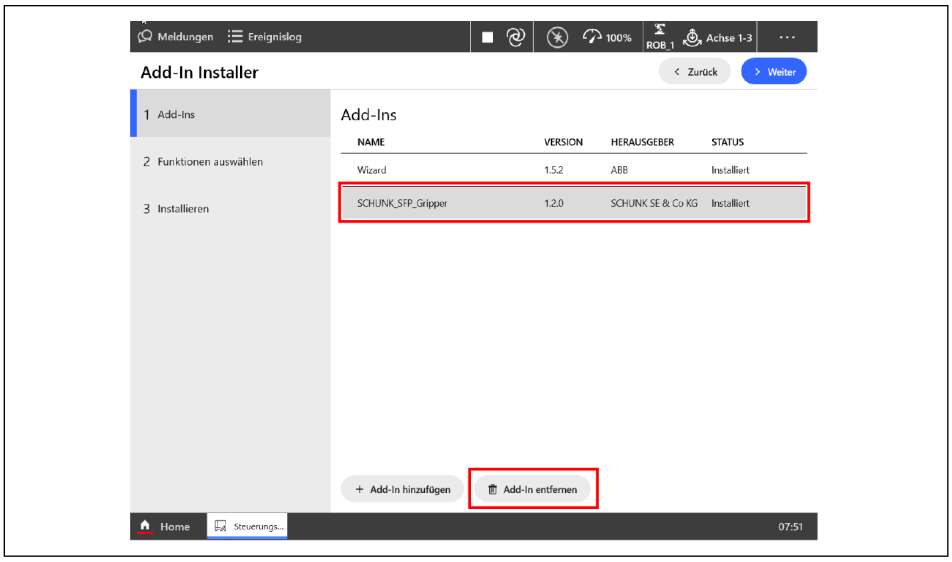
1. Select "Control software".



2. Select "Add-In Installer".

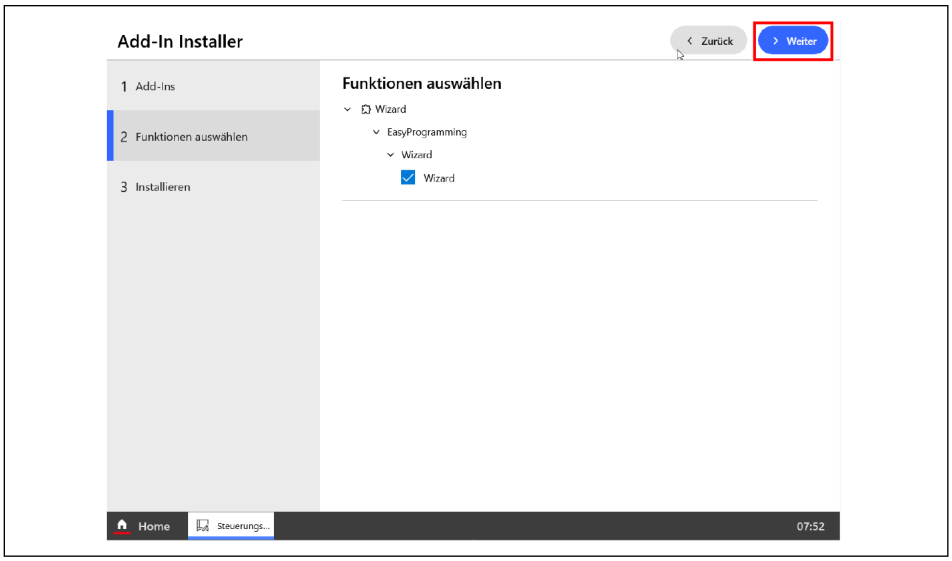


3. Select the "SCHUNK_SFP_Gripper_x.x.x" file.
4. Select "Remove add-in".



⇨ "SCHUNK_SFP_Gripper_x.x.x" no longer appears in "Select functions".

5. Select the "Next" button.

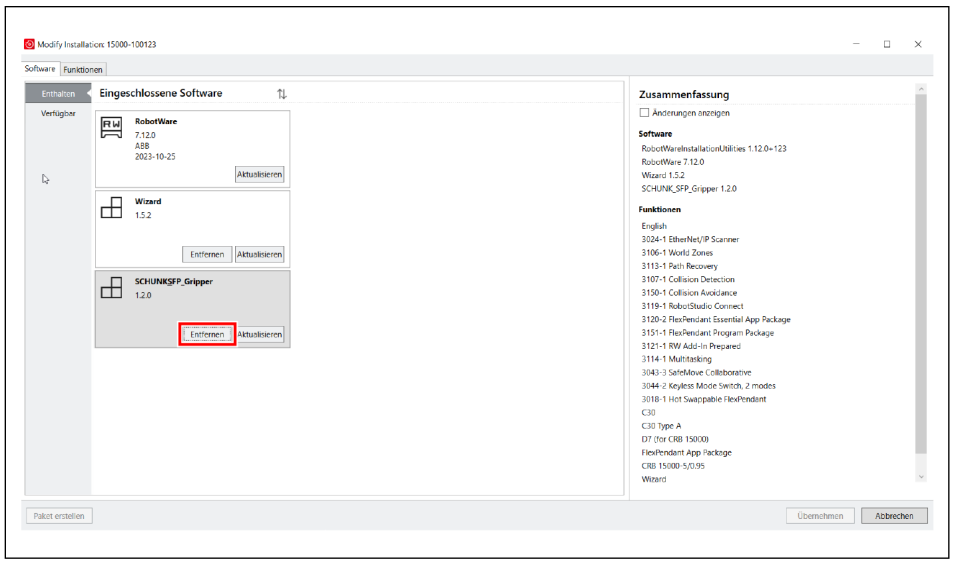


⇨ Robot performs a restart.

⇨ Software module has been uninstalled and no longer appears as an app in "Home".

6.2 Uninstallation in Robot Studio

1. Select the "Control" > "Installation" > "Modify Installation" tab.
2. Select the "SCHUNK_SFP_Gripper_x.x.x" file.
3. Select the "Remove" button.

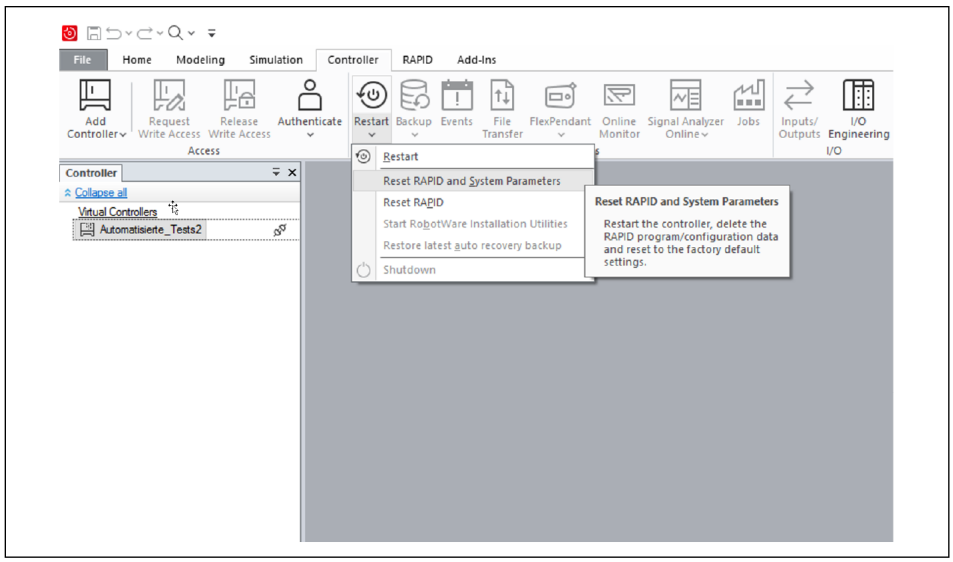


4. Select the "Apply" button.

⇨ The software module has been uninstalled.

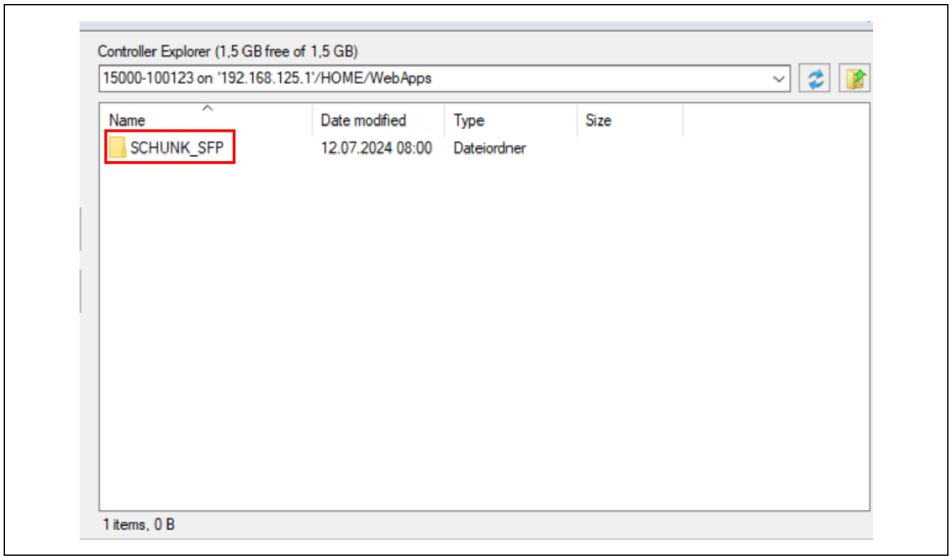
Further measures to remove all files from the robot:

- Delete the content on the robot at *HOME/WebApps/*.
- Delete all files on the robot at *HOME/BlockLibrary/*.
- Select "Reset Rapid and System Parameter" in RobotStudio. **Caution!** All values and settings have been reset.

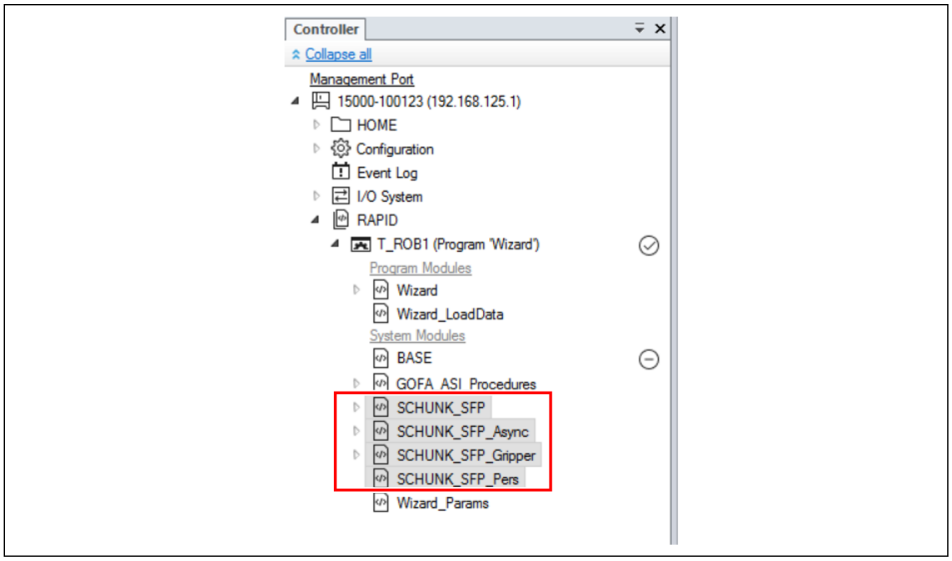


7 Updating the software module

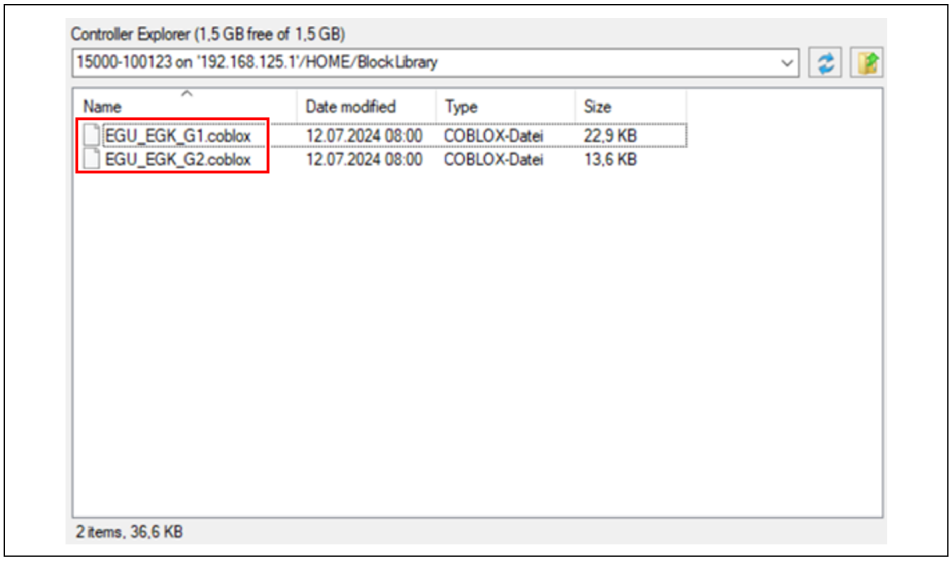
1. Delete the grippers created in the dashboard.
2. Uninstall the software module, ▸ 6.2 [🗋 26].
3. Delete the remaining files in Robotstudio:
   - ⇨ Open the "File transfer" menu in Robotstudio.
   - ⇨ Delete the "HOME/WebApps/SCHUNK_SFP" folder.



- ⇨ Delete the remaining SCHUNK-Rapid files.



⇨ Delete all Coblox files under "HOME/Block Library".



4. Download and install the new version of the software module, ▸ 5.2 [🗋 18].

8 Setting IP address

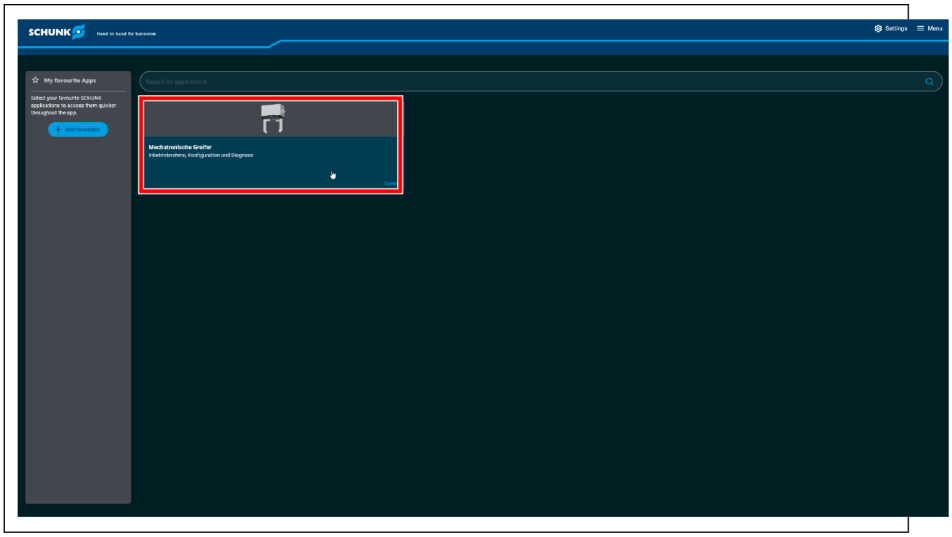
The product is shipped with the IP address 0.0.0.0 by default. DHCP is enabled.

- If the *private* port (IP controller: 192.168.125.1) of the controller is used, the controller can assign an IP address to the grippers. DHCP must be activated in the gripper for this. It is not necessary to assign the IP address via the SCHUNK Control Center.
- If the *public* port of the robot controller is used, the IP address must be changed before commissioning and must be in the address space of the public network, see ABB manual for configuration instructions.

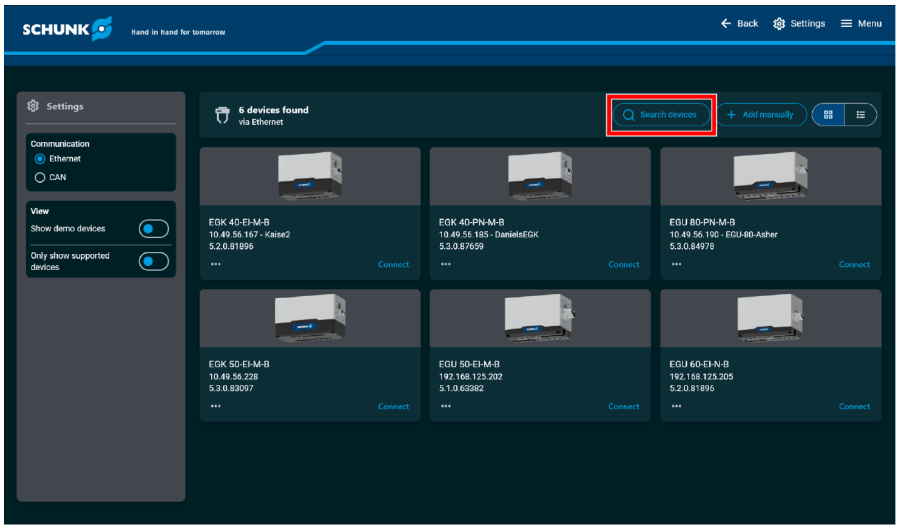
■ Product is connected to a PC.

■ SCHUNK Control Center is installed, ▶ 5.3 [🗋 21].

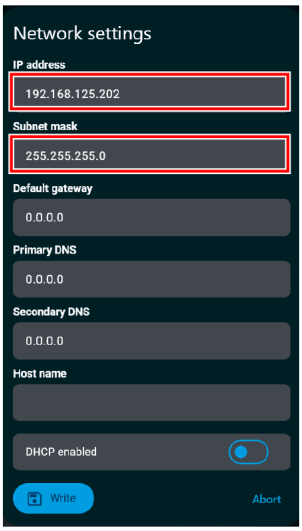
1. Open the SCHUNK Control Center and select the *Mechatronic grippers* app on the start page.



2. Select the "Search for device" button.
   ⇨ The products are displayed.
   ⇨ *If the product does not appear in the list:*
   – Check the firewall settings and add exception for SCHUNK Control Center.
   – Enable DHCP for the network adapter.



3. Select the gripper and open the Quick Select menu (•••) Select "Settings > Network settings".
4. Enter values for IP address and subnet mask.

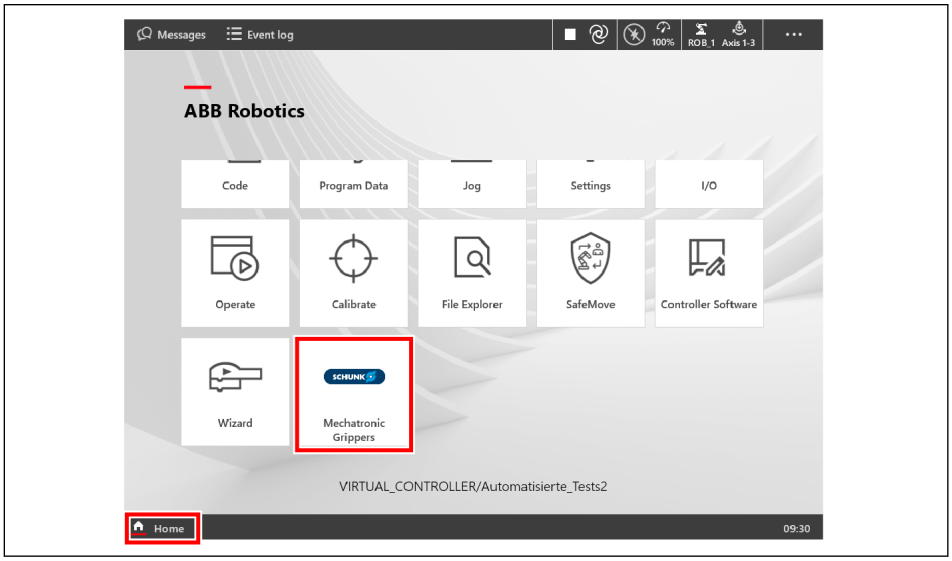


9 Starting the SCHUNK app

After the software module has been installed, the SCHUNK app is available on the FlexPendant.

Starting the SCHUNK app

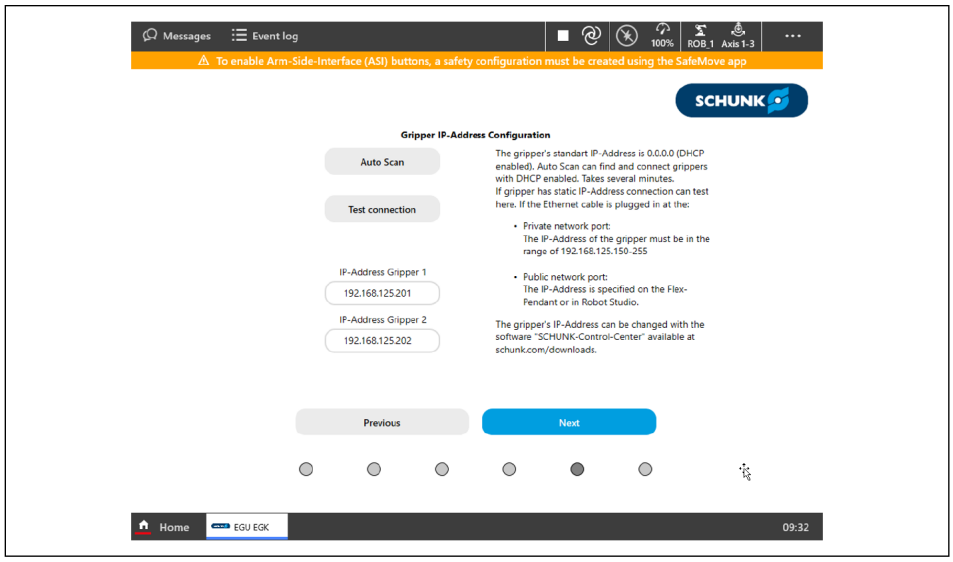
- Select the "SCHUNK Mechatronic Grippers" button.



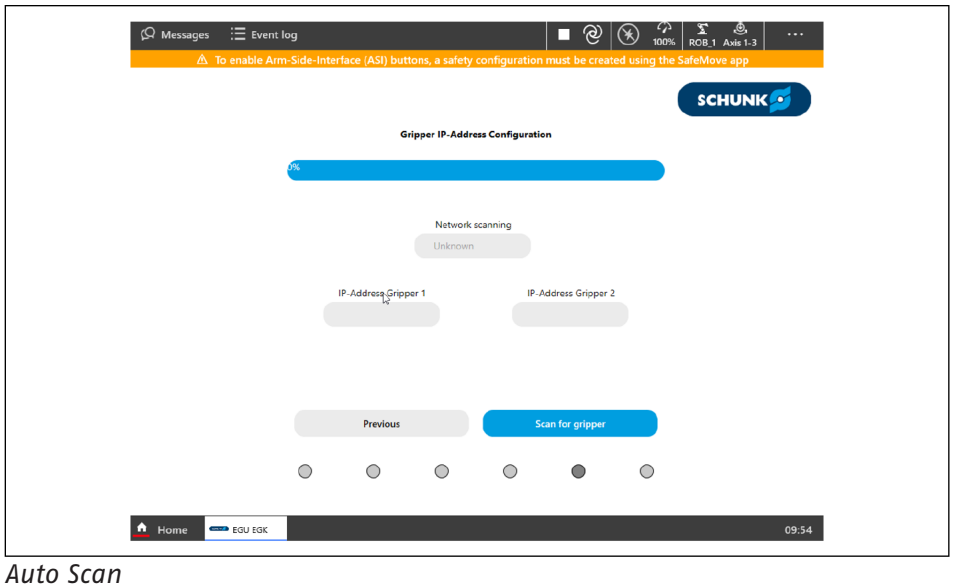
1. Under "Select Gripper", select whether one or two products are to be configured.
2. Press the "Let's get started" button.
   ⇨ The walk-through is started. The end user is guided step by step. The following information is displayed or queried:

- Notes on mounting and the electrical connection
- Configuration details, e.g. IP address.
  Note: SCHUNK recommends reading out or adjusting the IP address via the commissioning and configuration software for mechatronic grippers (**schunk.com/downloads-software**).

IP address



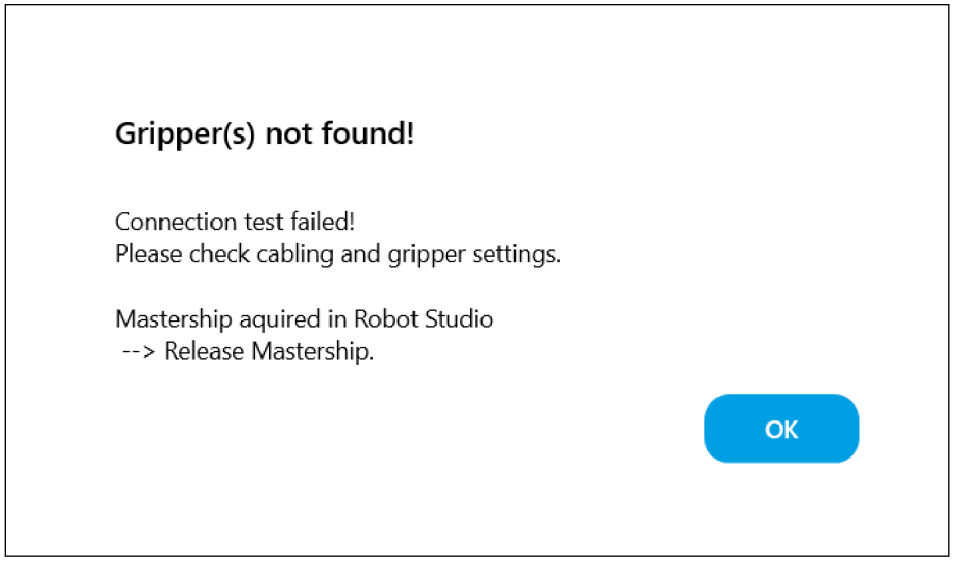
Designation	Description
Test connection	An attempt is made to establish a connection to the gripper with the registered IP address.
Next	The connection test is skipped. If it is ensured that all connection parameters have been set correctly and there are no other errors, the connection test can be skipped. If the settings are incorrect, the software may behave unexpectedly.
Auto Scan	The system searches for available grippers. If DHCP is activated in the gripper, the controller assigns an IP address to the gripper (only on the *private* port). DHCP is then deactivated in the gripper and the assigned IP address is converted to a static one. The scan process can take several minutes.



Auto Scan

Connection failed

"Test Connection" does not work:



1. Check cable.
2. Check whether the gripper IP address matches the parameterized IP address. If necessary, adjust the IP address of the gripper using the commissioning software (**schunk.com/downloads-software**).
3. Check whether RobotStudio has write access. If so, return write access to the FlexPendant.

If a "GoFa" robot is not connected to the controller:

- Perform test again with motors switched on:
  - ⇨ Hold down the enabling switch
  - ⇨ Activating automatic mode

⇨ If the test works, all gripper functions can only ever be executed with the motors switched on. (Exception for jog, parameterization)

Restart after walkthrough

After the walk-through is completed, the robot control system restarts.

- Information on the TCP for the stored product is displayed. For the factory settings, see ▸ 15 [🗋 44].
- A dashboard will appear. The product can now be parameterized, ▸ 11 [🗋 36].
- For general notes on the user interface, see ▸ 10 [🗋 34].

NOTE

After each restart of the robot, the SCHUNK app must be restarted.

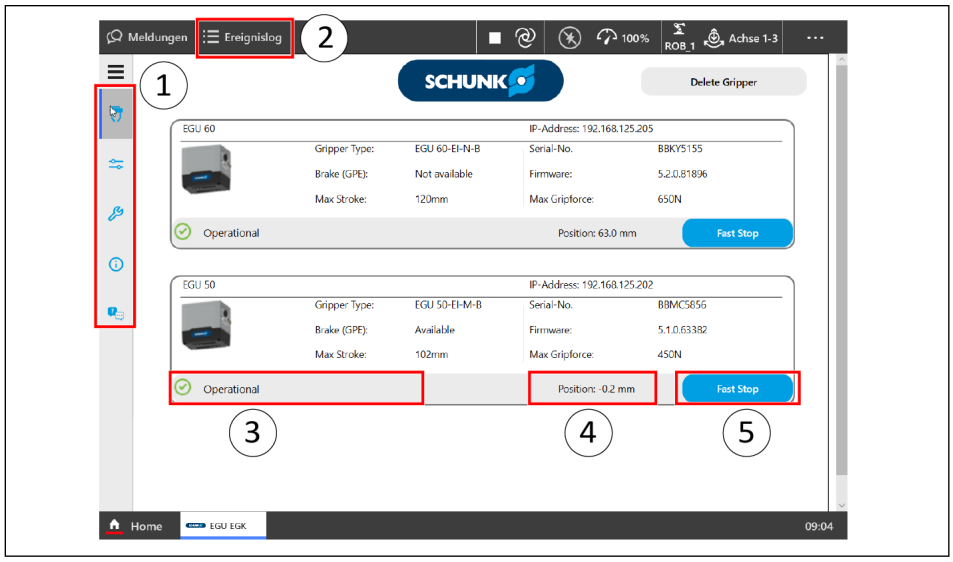
10 General operating instructions

After successful installation of the software module, a dashboard will be available: Products can be parameterized and tested here.

Note: The gripper starts in "FastStop". To be able to use the gripper, this message must be acknowledged by pressing "Acknowledge".

SCHUNK dashboard

View: Select the button.



SCHUNK dashboard

Item	Designation	Description
1	SCHUNK dashboard menu	In various menu items, products can be parameterized, tested and the manufacturer information displayed.
2	Event log	Display of pending errors and warnings, ▶ 10 [🗋 35].
3	Status	The following symbols indicate the current status of the product.
		The product is ready for operation.
		There is a warning. The warning code and a description of the warning are displayed.
		There is an error. The error code and a description of the error are displayed. Acknowledge present errors by selecting the "Ack" button.
4	Position	The current approached position is displayed.

Item	Designation	Description
5	Button	Depending on the current status of the product, the display of the buttons alternates between "Fast Stop" and "Ack".
	Fast Stop	When "Fast Stop" is selected, the product is stopped immediately. The movement is stopped immediately.
	Ack	When "Ack" is selected, errors requiring acknowledgment are confirmed.

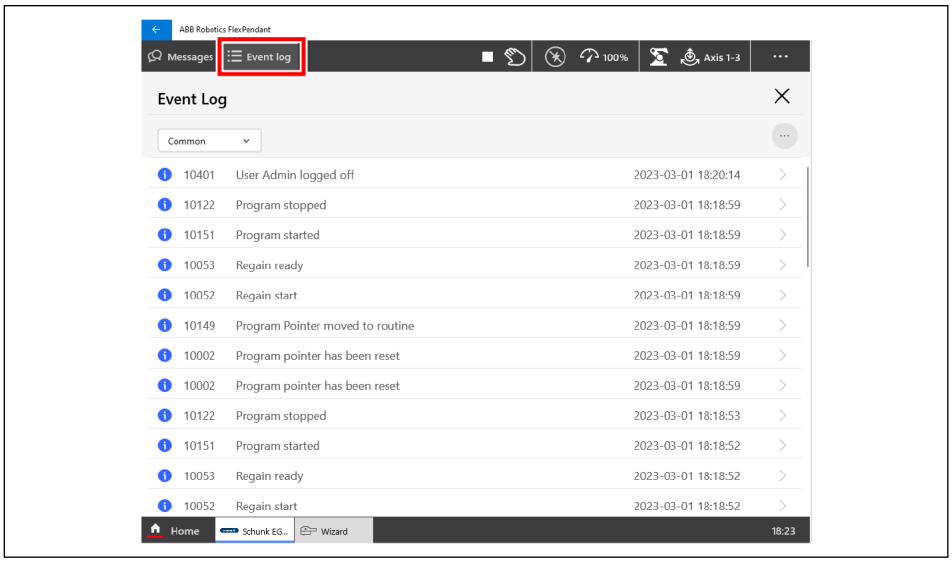
NOTE

Depending on the selected products, the display in the different menu items may vary.

The gripping force modes "StrongGrip" and "SoftGrip" as well as gripping force and speed displays depend on the product and size, ▶ 18 [🗋 55]

Event log

All errors and warnings are displayed in the "EventLog".



11 Parameterizing products

⚠ WARNING

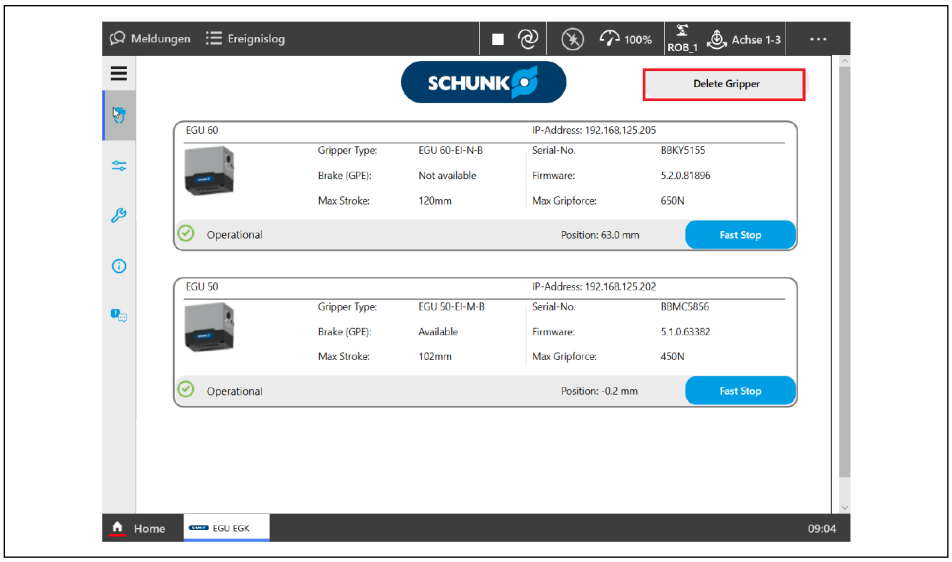
Risk of injury due to sudden movements!

Components could move unexpectedly and result in serious injuries.

- During commissioning, observe all warnings displayed on the software interface.
- Keep a safe distance and wear suitable protective equipment.

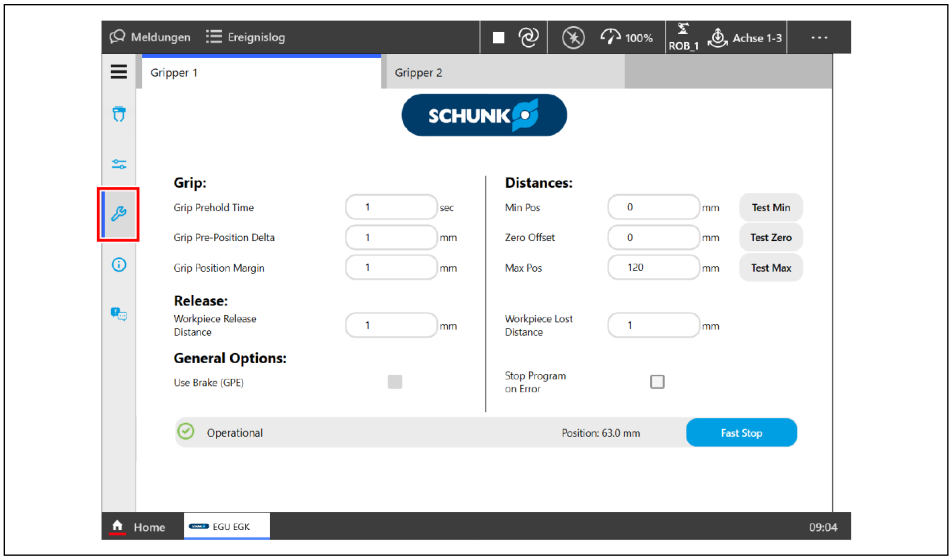
- The robot control system is switched on.
- The SCHUNK software module is installed.
- SCHUNK products are configured.

1. Select the "SCHUNK EGU EGK EZU" app.
   ⇨ Configured SCHUNK products are displayed in the dashboard.
2. Optional: Select the "Delete Gripper" button to delete all grippers from the configuration.
   ⇨ If grippers have been deleted, the walk-through starts again.



Parameterizing products

1. Select the button.
   ⇨ Commands and the corresponding parameters are displayed.
2. Enter parameter values.
   ⇨ Help texts are displayed.
   ⇨ For more information on the parameters, see the following table and illustrations, ▶ 11 [🗋 37].
3. Select the desired "TEST ...." button to approach the exact limits for the minimum, maximum or zero positions.
   ⇨ The product moves to the specified minimum, maximum and zero positions.



Designation	Description
Grip Prehold Time	• The parameter can be used to parameterize the time span of the re-gripping. The maximum time span for re-gripping is 60,000 ms (1 minute). In StrongGrip mode, the maximum gripping time is 2000 ms.
Grip Pre-Position Delta	• The parameter can be used to set the difference in position amount between the workpiece position window and the pre-position, see the following section "Pre-position", ▶ 11 [🗋 40].
Grip Position Margin	• The parameter can be used to parameterize the value from which the minimum and maximum positions of the workpiece position window are

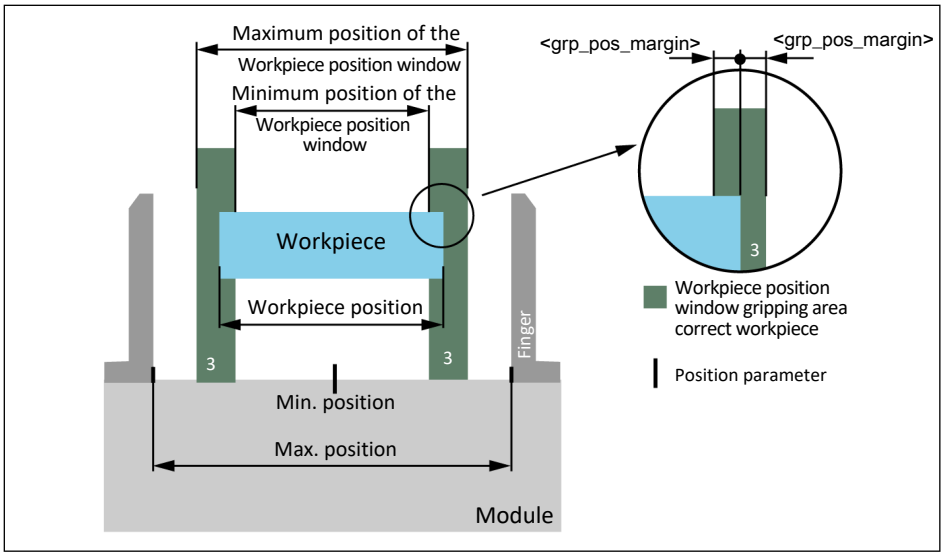
Designation	Description
	calculated, see the following section "Minimum and maximum position", ▶ 11 [🗋 39].
Workpiece Release Distance	• The parameter can be used to parameterize the relative distance that the module moves during release.
Min Pos	• The parameter can be used to define the position limit within which movements are permitted. The value of the parameter corresponds to the smallest position value that can be approached.
Zero Offset	• The parameter can be used to parameterize the distance by which the zero point is shifted with a sign.
Max Pos	• The parameter can be used to define the position limit within which movements are permitted. The value of the parameter corresponds to the largest position value that can be approached.
Workpiece Lost Distance	• The parameter can be used to parameterize the distance that the gripper fingers are allowed to travel after the workpiece is lost before a workpiece loss is detected.
Use Brake	• This function is only available for products of the "M" variant. If the checkbox is selected, the brake of the product is engaged by default after each movement command, if nothing else is configured in the command.
Stop Program on Error	• If the checkbox is selected, the robot program stops automatically when the maximum waiting time is reached when the "Wait for Complete" parameter is configured.

Minimum and maximum position

The parameter <grp_pos_margin> can be used to parameterize the value from which the minimum and maximum positions of the workpiece position window are calculated.

NOTE

- The minimum position of the workpiece position window is calculated according to: *workpiece position* – <grp_pos_margin>.
- The maximum position of the workpiece position window is calculated according to: *workpiece position* + <grp_pos_margin>.



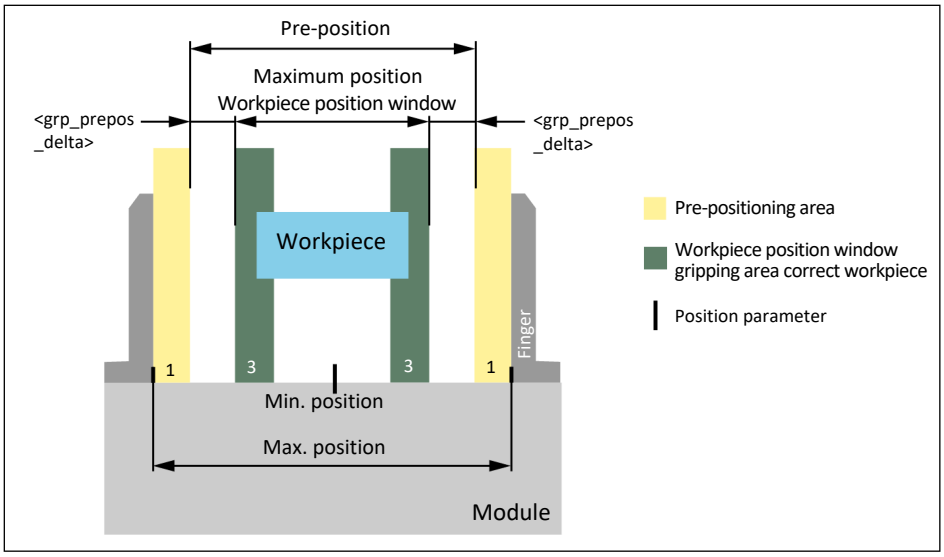
Minimum and maximum position of the workpiece position window

Pre-position

The parameter <grp_prepos_delta> can be used to parameterize the difference in position amount between the workpiece position window and the pre-position.

NOTE

- The pre-position is calculated from the minimum or maximum position of the workpiece position window depending on the direction from which a workpiece is gripped.
- The pre-position during I.D. gripping is calculated according to: minimum position workpiece position window **-** <grp_prepos_delta>.
- The pre-position during O.D. gripping is calculated according to: maximum position workpiece position window **+** <grp_prepos_delta>



Pre-positioning area for O.D. gripping

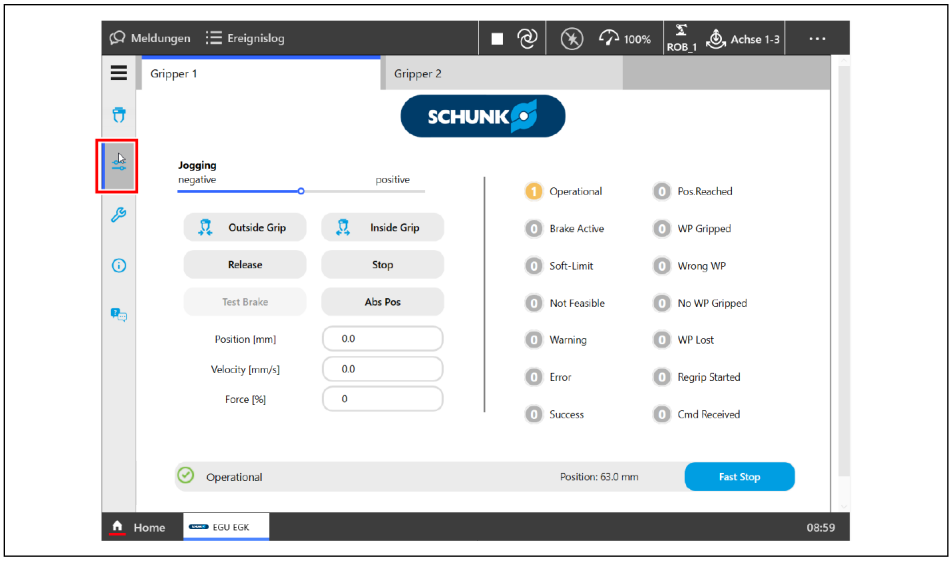
12 Testing products

The following commands can be tested:

- Jog mode "JOG negative" and "JOG positive"
- Grip workpiece "Outside Grip" or "Inside Grip
- Release workpiece "Release"
- Finish movement "Stop"
- Absolute positioning movement "Abs Pos"
- "Test Brake" (only available for products of variant "M")

Testing products

1. Select the button.
2. Move the "Jogging" slider in the desired direction to move the gripper fingers gradually.
3. Enter gripping force and position.
   Note: By default, values that were last entered are displayed.
4. **CAUTION! Risk of injury due to moving parts!** Select the desired button to test the command.
   ⇨ Activated functions, errors, warnings and statuses are indicated by yellow symbols on the right.
   ⇨ Command is executed.

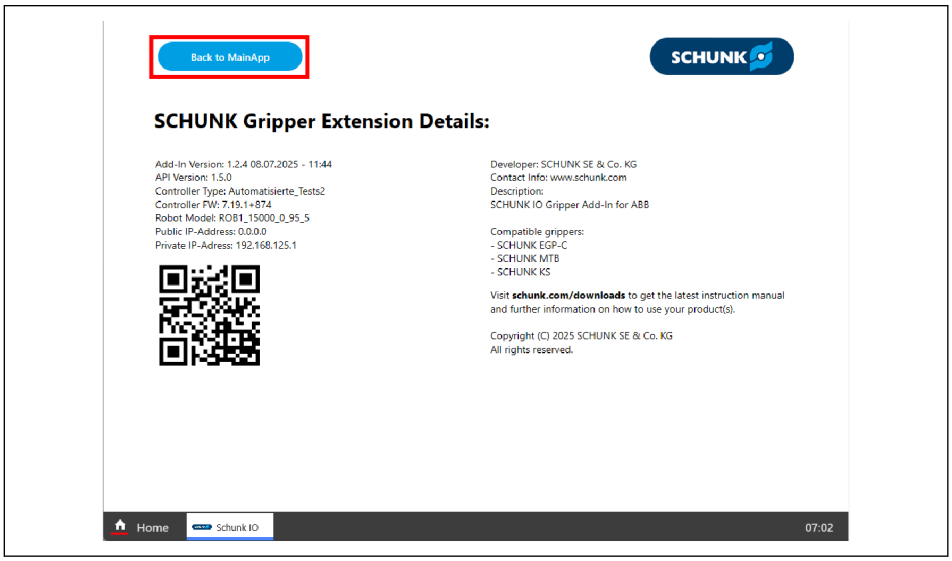


NOTE

For more information on commands and bits, refer to the commissioning instructions for EtherNet/IP™.

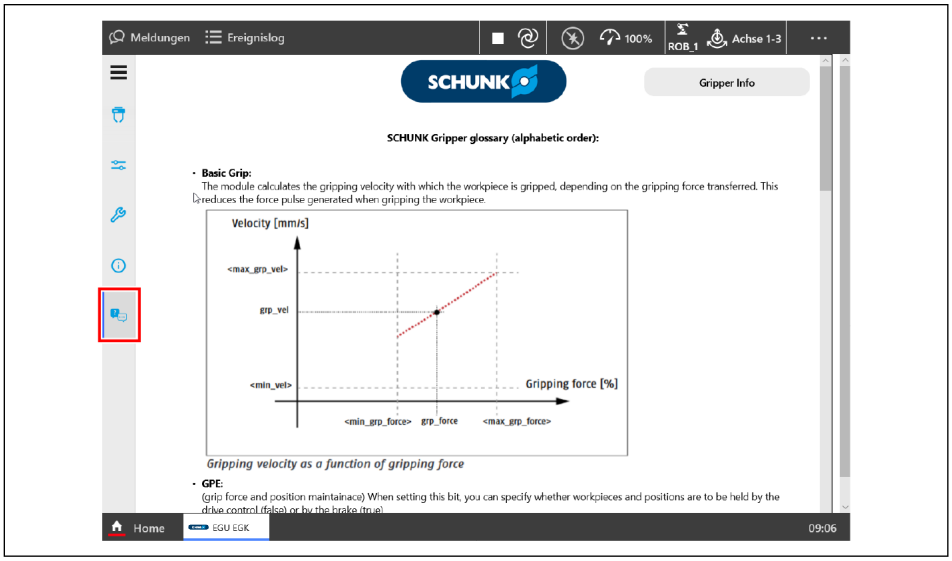
13 Displaying manufacturer information

1. Select the button.
   ⇨ Detailed information about the software module is displayed.
2. Select the "Back to MainApps" button to return to the walkthrough and view the installation instructions again.



14 Show glossary

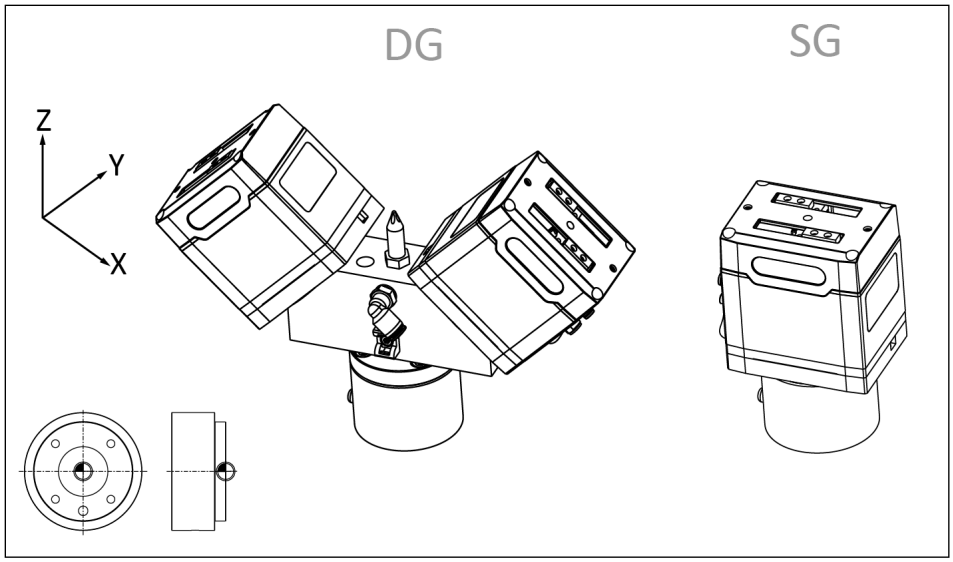
- Select the  button.
  ⇨ Descriptions of the gripper functions are displayed.



15 Adjusting the Tool Center Point (TCP), center of gravity and weight

For proper use of the product on an ABB robot, it is recommended to store the Tool Center Point (TCP), center of gravity and gripper weight in the robot settings.

15.1 Values for EGK



EGK: Tool Center Point, DG: two products mounted, SG: one product mounted

ISO 31.5

Size	TCP				Center of gravity			
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	Weight [kg]
SG: one mounted product								
EGK 25	-	-	90.2	-	-1.6	-0.05	42.8	0.8
EGK 40	-	-	94.5	-	-0.5	-0.3	44.6	1.3
EGK 50	-	-	102	-	0.5	-0.2	48.5	2.1
DG: two mounted products								
EGK 25	±111.8	-	113.7	±45°	0	0	65.4	2.3
EGK 40	±114.8	-	116.7	±45°	0	0	71.4	3.3

Tab.: EGK with ISO flange 31.5: TCP, center of gravity and weight

ISO 40

Size	TCP				Center of gravity			
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	Weight [kg]
SG: one mounted product								
EGK 25	–	–	90.2	–	-1.5	-0.05	43	0.8
EGK 40	–	–	94.5	–	-0.5	-0.3	45.1	1.3
EGK 50	–	–	102	–	0.5	-0.2	49.2	2.1
DG: two mounted products								
EGK 25	±111.8	–	114.6	±45°	0	0	65.3	2.3
EGK 40	±114.8	–	117.6	±45°	0	0	71.5	3.3

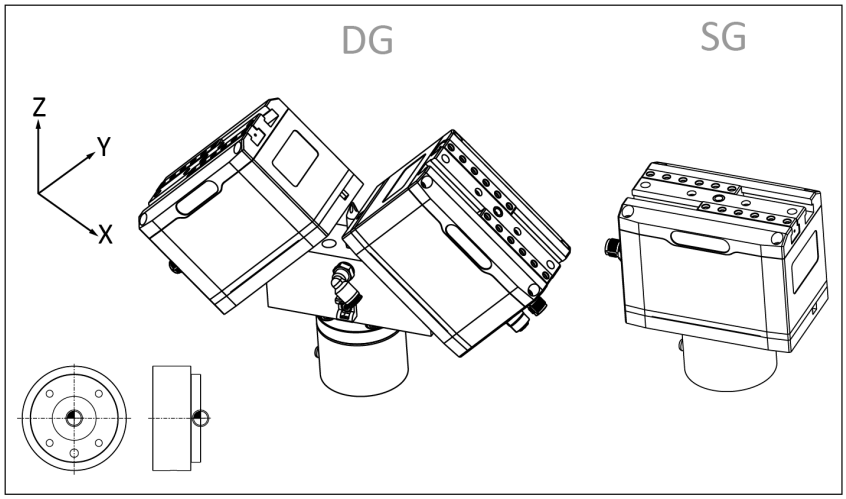
Tab.: EGK with ISO flange 40: TCP, center of gravity and weight

ISO 50

Size	TCP				Center of gravity			
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	Weight [kg]
SG: one mounted product								
EGK 25	–	–	90.2	–	-1.5	-0.05	42.7	0.8
EGK 40	–	–	94.5	–	-0.5	-0.3	44.9	1.3
EGK 50	–	–	102	–	0.5	-0.2	49.1	2.1
DG: two mounted products								
EGK 25	±111.8	–	114.6	±45°	0	0	64.7	2.3
EGK 40	±114.8	–	117.6	±45°	0	0	71	3.3
EGK 50	±131.6	–	137.9	±45°	0	0	87.3	5.3

Tab.: EGK with ISO flange 50: TCP, center of gravity and weight

15.2 Values for EGU



EGU: Tool Center Point, DG: two products mounted, SG: one product mounted

ISO 31.5

Size	TCP				Center of gravity			
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	Weight [kg]
SG: one mounted product								
EGU 50	–	–	93.5	–	−0.3	−0.3	47.5	1.7
EGU 60	–	–	119	–	1.7	−0.7	60.7	3.3

Tab.: EGU with ISO flange 31.5: TCP, center of gravity and weight

ISO 40

Size	TCP				Center of gravity			
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	Weight [kg]
SG: one mounted product								
EGU 50	–	–	93.5	–	−0.3	−0.3	48	1.8
EGU 60	–	–	119	–	1.7	−0.7	61.4	3.3

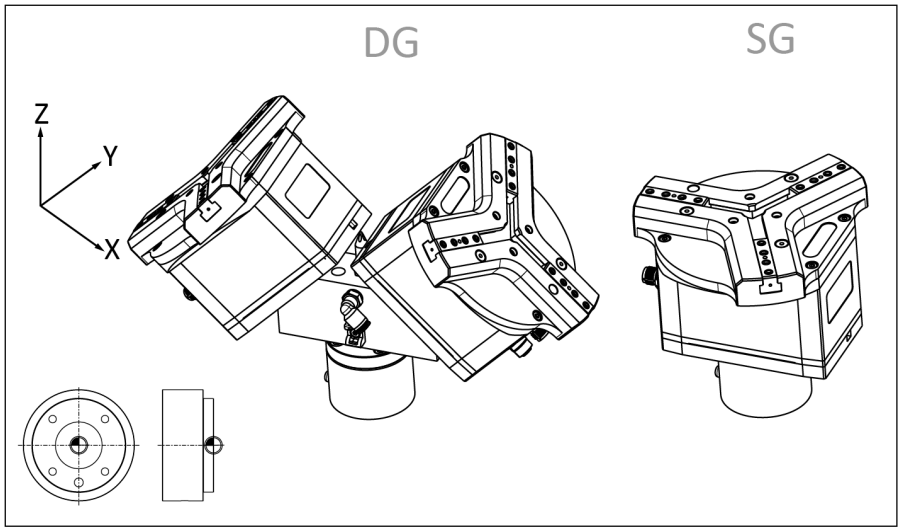
Tab.: EGU with ISO flange 40: TCP, center of gravity and weight

ISO 50

Size	TCP				Center of gravity			
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	Weight [kg]
SG: one mounted product								
EGU 50	–	–	93.5	–	−0.3	−0.3	47.9	1.8
EGU 60	–	–	119	–	1.6	−0.7	61.3	3.3
EGU 70	–	–	135.4	–	0.8	−0.8	71.4	5.2
EGU 80	–	–	142.9	–	3	−0.2	73.4	8.4
DG: two mounted products								
EGU 50	±114.1	–	116.9	±45°	0	0	75.2	4.2
EGU 60	±143.6	–	149.9	±45°	0	0	99.7	7.7

Tab.: EGU with ISO flange 50: TCP, center of gravity and weight

15.3 Values for EZU



EZU: Tool Center Point, DG: two products mounted, SG: one product mounted

ISO 31.5

Size	TCP				Center of gravity			Weight [kg]
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	
SG: one mounted product								
EGU 50	–	–	93.5	–	−0.3	−0.3	47.5	1.7
EGU 60	–	–	119	–	1.7	−0.7	60.7	3.3

Tab.: EGU with ISO flange 31.5: TCP, center of gravity and weight

ISO 40

Size	TCP				Center of gravity			Weight [kg]
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	
SG: one mounted product								
EGU 50	–	–	93.5	–	−0.3	−0.3	48	1.8
EGU 60	–	–	119	–	1.7	−0.7	61.4	3.3

Tab.: EGU with ISO flange 40: TCP, center of gravity and weight

ISO 50

Size	TCP				Center of gravity			Weight [kg]
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	
SG: one mounted product								
EGU 50	–	–	93.5	–	−0.3	−0.3	47.9	1.8
EGU 60	–	–	119	–	1.6	−0.7	61.3	3.3
EGU 70	–	–	135.4	–	0.8	−0.8	71.4	5.2
EGU 80	–	–	142.9	–	3	−0.2	73.4	8.4
DG: two mounted products								
EGU 50	±114.1	–	116.9	±45°	0	0	75.2	4.2
EGU 60	±143.6	–	149.9	±45°	0	0	99.7	7.7

Tab.: EGU with ISO flange 50: TCP, center of gravity and weight

16 Inserting the functions into the program code

The Wizard app simplifies the programming procedure on ABB robots. All commands listed below can be inserted into the robot program using drag & drop. The generated sequences are translated into RAPID code.

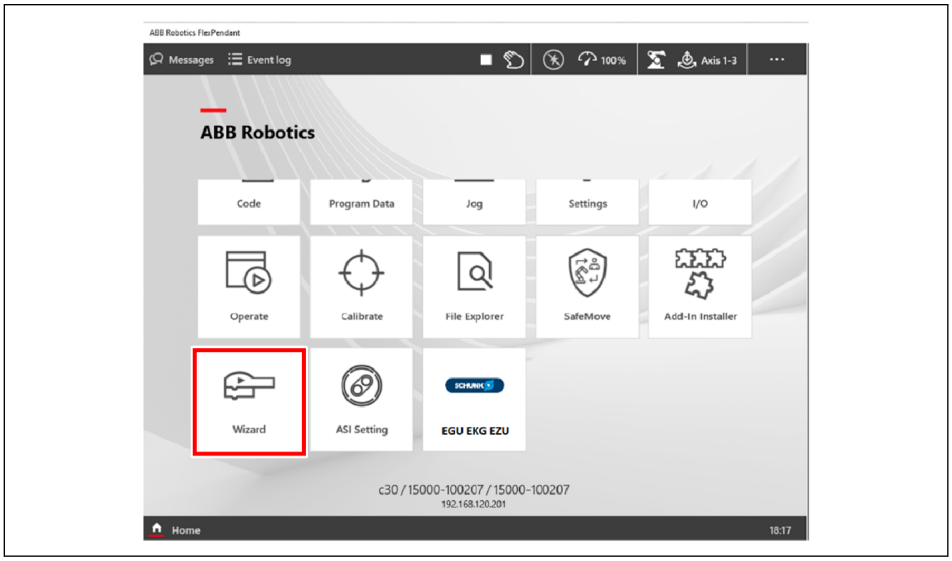
SCHUNK recommends creating the commands of the program sequence in the Wizard app. Experienced users can write the program code in *RobotStudio*. The following knowledge/ preconditions are required:

- RAPID knowledge
- *RobotStudio* knowledge
- Familiarity with signal handling

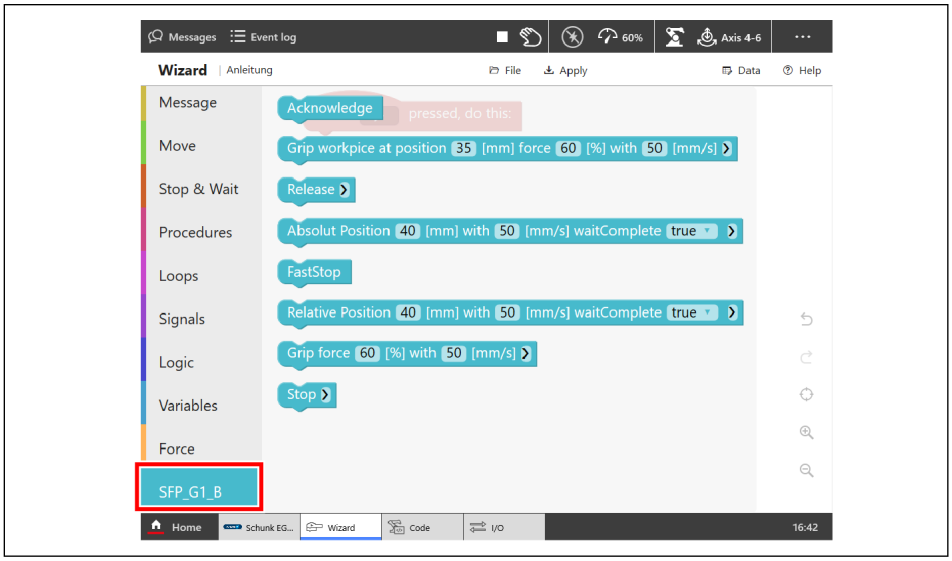
NOTE

If the gripper configuration changes, the old configuration must be removed in the dashboard via the "Delete Grippers" button and a new configuration must be created by going through the walk-through again.

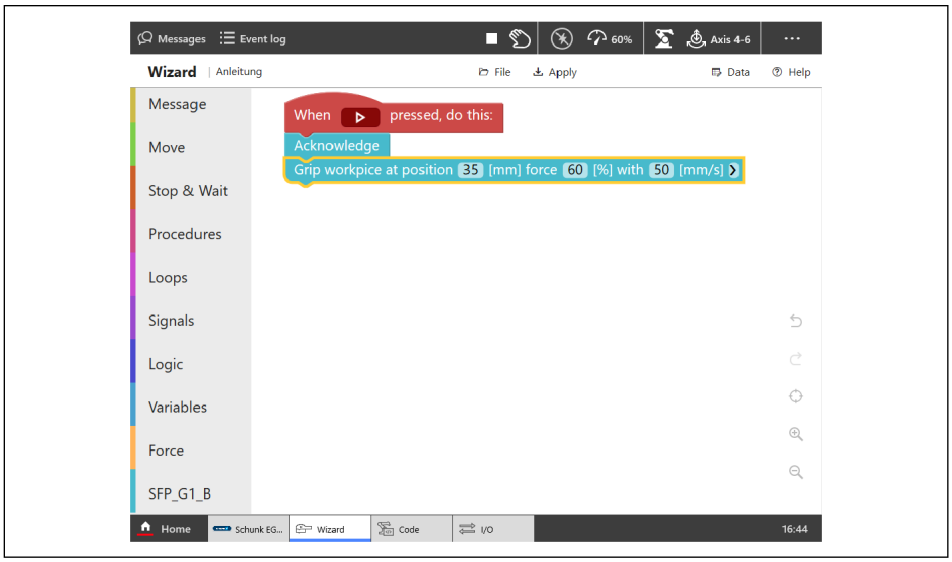
1. Select the "Wizard" app.



⇨ SCHUNK commands are available under "SFP_G....".



2. Select the command and drag it to the desired location in the program. For more information on the commands and their parameters, see the following table, ▸ 16 [🗋 50].



3. If necessary, adjust the program code in *RobotStudio*.

```
    PROC main()

①       SFP_SCHUNK_G1_ACK;
②       MoveJ Location1, v500, fine, tool0;
③       SFP_SCHUNK_G1_GripWpAtPos 35,60,50 \outerGrip:=TRUE, \GPEActive:=FALSE;
④       MoveJ Location2, v500, fine, tool0;
⑤       SFP_SCHUNK_G2_Grip 70,50, \outerGrip:=FALSE, \GPEActive:=TRUE;
⑥       MoveJ Location3, v500, fine, tool0;
⑦       SFP_SCHUNK_G1_Release \GPEActive:=FALSE;
⑧       MoveJ Location4, v500, fine, tool0;
⑨       SFP_SCHUNK_G2_Release \GPEActive:=TRUE;
⑩       SFP_SCHUNK_G2_PosAbs 40,55,TRUE, \GPEActive:=TRUE;
⑪       SFP_SCHUNK_G1_PosRel -10,55,TRUE, \GPEActive:=TRUE;
    ENDPROC
ENDMODULE
```

Tab.: Possible commands with associated parameters (G*x*: G1 or G2 (gripper 1 or gripper 2))

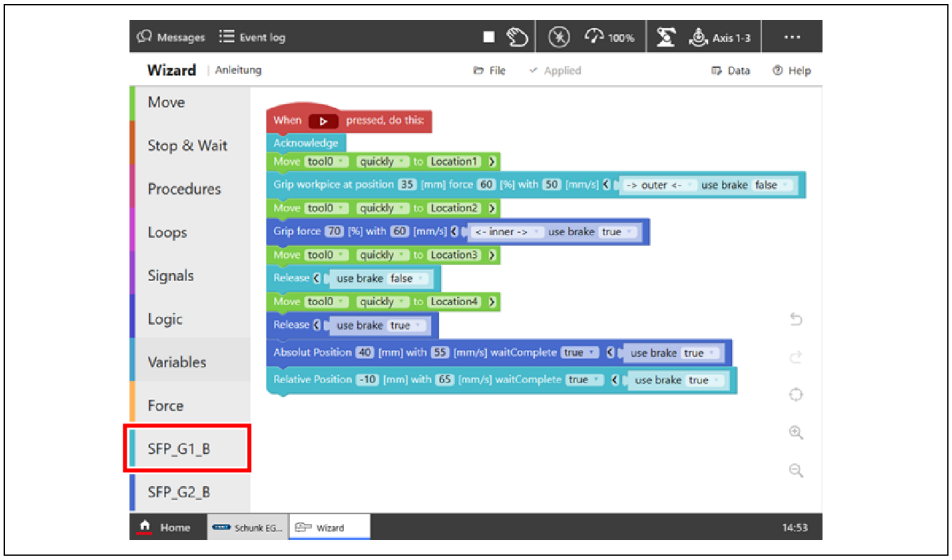
SCHUNK command in the wizard • *Parameter*	RAPID command (parameter)	Description
Stop	SFP_SCHUNK_G*x*_Stop (\bool GPEActive)	This command is used to stop the current movement as quickly as possible until it comes to a controlled standstill.
• *use brake*	\bool GPEActive	For products of the "M" variant, the brake is activated after a controlled stop; GPE is active.
Fast Stop	SFP_SCHUNK_G*x*_ FastStop()	This command stops the current movement immediately and forces it to standstill. An error requiring acknowledgment is set.
Acknowledge	SFP_SCHUNK_G*x*_ACK()	If errors requiring acknowledgment are present, they are actuated by this command.
Grip	SFP_SCHUNK_G*x*_Grip (num force, num speed, \bool outerGrip, \bool GPEActive)	When workpiece gripping (simple gripping movement), a workpiece is gripped with the specified gripping force value **without** specifying the workpiece position.
• *force __[%]*	num force	Gripping force, exact limits see catalog data sheet
• *with __[mm/s]*	num speed	Gripping speed, exact limits see catalog data sheet Note: Only available with EGK.
• *-> outer <-* or • *-> inner <-*	\bool outerGrip	*outer*: A workpiece is gripped from the outside. The gripper fingers move toward each other. *inner*: A workpiece is gripped from the inside. The gripper fingers move away from each other.
• *use brake*	\bool GPEActive	For products of the "M" variant, the brake is activated; GPE is active.
Grip workpiece at position	SFP_SCHUNK_G*x*_ GripWpAtPos(num pos, num force, num speed, \bool outerGrip, \bool GPEActive)	When workpiece gripping at an expected position, a workpiece is gripped at the specified workpiece position with the specified gripping force value using a combined gripping movement.
• *__[mm]*	num pos	Workpiece position

SCHUNK command in the wizard • *Parameter*	RAPID command (parameter)	Description
• *force __[%]*	num force	Gripping force, exact limits see catalog data sheet
• *with __[mm/s]*	num speed	Gripping speed, exact limits see catalog data sheet Note: Only available with EGK.
• *-> outer <-* or • *-> inner <-*	\bool outerGrip	*outer*: A workpiece is gripped from the outside. The gripper fingers move toward each other. *inner*: A workpiece is gripped from the inside. The gripper fingers move away from each other.
• *use brake*	\bool GPEActive	For products of the "M" variant, the brake is activated; GPE is active.
Release	SFP_SCHUNK_G*x*_ Release(\bool GPEActive)	This command releases the workpiece.
• *use brake*	\bool GPEActive	For products of the "M" variant, the brake is activated; GPE is active.
Absolute Position	SFP_SCHUNK_G*x*_ PosAbs(num position, num speed, bool waitComplete, \bool GPEActive)	With absolute positioning, the product moves to the entered position value. This position value refers to the parameterized zero point of the module.
• *__[mm]*	num pos	absolute target position
• *with __[mm/s]*	num speed	Velocity of movement
• *waitComplete*	bool waitComplete	The following command is only executed after the inserted gripping command has been completely processed or the maximum waiting time of 10 seconds has been reached.
• *use brake*	\bool GPEActive	For products of the "M" variant, the brake is activated; GPE is active.
Relative Position	SFP_SCHUNK_G*x*_ PosRel(num pos, num speed, bool waitComplete, \bool GPEActive)	With relative positioning, the product moves from the current position by the cyclically transferred and signed position value.
• *__[mm]*	num pos	relative target position
• *with __[mm/s]*	num speed	Velocity of movement

SCHUNK command in the wizard • *Parameter*	RAPID command (parameter)	Description
• *waitComplete*	bool waitComplete	The following command is only executed after the inserted gripping command has been completely processed or the maximum waiting time of 10 seconds has been reached.
• *use brake*	\bool GPEActive	For products of the "M" variant, the brake is activated; GPE is active.
Test Brake	SFP_SCHUNK_Gx_ BrakeTest()	*For products of variant "M" and with firmware version 5.2 or higher:* During the brake test, the product checks the holding force of the brake by applying a defined moment alternately in both directions against the applied brake.

17 Example of a robot program

This example shows the use of a gripper to pick up an object with 2 grippers at a given position and place it.



Example program in the wizard

```
    PROC main()

①       SFP_SCHUNK_G1_ACK;
②       MoveJ Location1, v500, fine, tool0;
③       SFP_SCHUNK_G1_GripWpAtPos 35,60,50 \outerGrip:=TRUE, \GPEActive:=FALSE;
④       MoveJ Location2, v500, fine, tool0;
⑤       SFP_SCHUNK_G2_Grip 70,50, \outerGrip:=FALSE, \GPEActive:=TRUE;
⑥       MoveJ Location3, v500, fine, tool0;
⑦       SFP_SCHUNK_G1_Release \GPEActive:=FALSE;
⑧       MoveJ Location4, v500, fine, tool0;
⑨       SFP_SCHUNK_G2_Release \GPEActive:=TRUE;
⑩       SFP_SCHUNK_G2_PosAbs 40,55,TRUE, \GPEActive:=TRUE;
⑪       SFP_SCHUNK_G1_PosRel -10,55,TRUE, \GPEActive:=TRUE;
    ENDPROC
ENDMODULE
```

Example program in RobotStudio (RAPID)

Item	Description
1	Any errors that may be present are acknowledged for gripper 1.
2	The robot arm moves to position 1, where gripper 1 is to grip a workpiece.
3	Gripper 1 grips the workpiece at the expected workpiece position of 35 mm, with a gripping force of 60% of the maximum gripping force and a speed of 50 mm/s. The workpiece is gripped from the inside. GPE is not active.
4	The robot arm moves to position 2, where the second workpiece is to be gripped.
5	Gripper 2 grips the workpiece with a force of 70% of the maximum gripping force and a speed of 60 mm/s. The workpiece is gripped from the inside. GPE is active.

Item	Description
6 – 9	The robot arm moves to the respective position where the workpieces are to be placed. The grippers release the workpieces.
10 – 11	The two grippers perform an absolute or relative positioning movement to optimally position the fingers for picking up new workpieces. The "WaitComplete" option can be deactivated so that the gripping movement takes place simultaneously with a movement of the robot.

Tab.: Robot example description

18 Appendix

18.1 Definition of gripping force mode

BasicGrip

This gripping mode is available for all variants of the product. In BasicGrip, the workpiece is gripped with the nominal gripping force or less. The motor is permanently energized, which allows the workpieces to be continuously re-gripped.

Note: The gripping velocity changes depending on the set gripping force.

SoftGrip

This gripping mode is available for all EGK variants.

The SoftGrip mode can be used to gently grip delicate, fragile or fracture-sensitive workpieces such as electronics, glass and ceramics.

To influence the force pulse at SoftGrip, a gripping velocity value must be transferred. This gripping velocity value must be between the minimum gripping velocity <min_vel> and the calculated gripping velocity used in BasicGrip mode with the same gripping force.

Note: The gripping force changes depending on the set gripping velocity.

StrongGrip

This gripping mode is only available for the "M" variant with the EGU and EZU.

In StrongGrip mode, the workpiece is gripped with a gripping force greater than 100 percent, which makes it possible to grip heavy workpieces.

In this mode, the motor briefly activates a higher power level, and an elastomer stores the high gripping force. After an adjustable time, the motor brake engages and the workpiece is held.

18.2 Compatibility overview regarding current carrying capacity

The following tables show the compatibility of the grippers with the robot. The maximum power consumption of the gripper and the maximum power output of the robot are considered. The payload and the dead weight of the gripper unit are not balanced. SCHUNK recommends that the payload of the robot will be considered in detail.

NOTE

Due to technical changes, the compatibility overviews may be outdated. Therefore, SCHUNK recommends performing a detailed comparison with the current data sheets of the robot model. For further questions please contact SCHUNK!

Compatibility overview: EGK with ABB robots

Size	Gripping force mode/ Nominal gripping force	ABB					
		CRB 1100	CRB 1300	CRB 15000	IRB 1100	IRB 1200	IRB 1300
SG: one mounted product							
EGK 25	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EGK 40	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EGK 50	BasicGrip/100%	✓	✓	✓	✓	✓	✓
DG: two mounted products							
EGK 25	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EGK 40	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EGK 50	BasicGrip/100%	✓	✓	✓	✓	✓	✓

Legend:

✓ The power consumption of the gripper is within the range of the power delivered by the robot.

Compatibility overview: EGU with ABB robots

Size	Gripping force mode/ Nominal gripping force	ABB					
		CRB 1100	CRB 1300	CRB 15000	IRB 1100	IRB 1200	IRB 1300
SG: one mounted product							
EGU 50	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EGU 50	StrongGrip/200%	✓	✓	✓	✓	✓	✓
EGU 60	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EGU 60	StrongGrip/200%	!	!	!	!	!	!
EGU 70	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EGU 70	StrongGrip/150%	✓	✓	✓	✓	✓	✓
EGU 80	BasicGrip/100%	!	!	!	!	!	!
EGU 80	StrongGrip/200%	!	!	!	!	!	!
DG: two mounted products							
EGU 50	BasicGrip/100%	!	!	!	!	!	!
EGU 50	StrongGrip/200%	✓	✓	✓	✓	✓	✓
EGU 60	BasicGrip/100%	!	!	!	!	!	!
EGU 60	StrongGrip/200%	✗	✗	✗	✗	✗	✗
EGU 70	BasicGrip/100%	!	!	!	!	!	!
EGU 70	StrongGrip/150%	✗	✗	✗	✗	✗	✗
EGU 80	BasicGrip/100%	!	!	!	!	!	!
EGU 80	StrongGrip/200%	✗	✗	✗	✗	✗	✗

Legend:

✓ The power consumption of the gripper is within the range of the power delivered by the robot.

! The power consumption of the gripper exceeds the power delivered by the robot. Compatibility could be possible through restrictions of gripping parameters, e.g. by reducing the gripping force.

✗ The power consumption of the gripper exceeds the power delivered by the robot. Gripper and robot are not compatible.

Compatibility overview: EZU with ABB robots

Size	Gripping force mode/ Nominal gripping force	ABB					
		CRB 1100	CRB 1300	CRB 15000	IRB 1100	IRB 1200	IRB 1300
SG: one mounted product							
EZU 30	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EZU 30	StrongGrip/200%	✓	✓	✓	✓	✓	✓
EZU 35	BasicGrip/100%	✓	✓	✓	✓	✓	✓

Size	Gripping force mode/ Nominal gripping force	ABB					
		CRB 1100	CRB 1300	CRB 15000	IRB 1100	IRB 1200	IRB 1300
EZU 35	StrongGrip/200%	!	!	!	!	!	!
EZU 40	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EZU 40	StrongGrip/200%	!	!	!	!	!	!
DG: two mounted products							
EZU 30	BasicGrip/100%	✓	✓	✓	✓	✓	✓
EZU 30	StrongGrip/200%	✓	✓	✓	✓	✓	✓
EZU 35	BasicGrip/100%	!	!	!	!	!	!
EZU 35	StrongGrip/200%	✗	✗	✗	✗	✗	✗
EZU 40	BasicGrip/100%	!	!	!	!	!	!
EZU 40	StrongGrip/200%	✗	✗	✗	✗	✗	✗

Legend:

✓ The power consumption of the gripper is within the range of the power delivered by the robot.

! The power consumption of the gripper exceeds the power delivered by the robot. Compatibility could be possible through restrictions of gripping parameters, e.g. by reducing the gripping force.

✗ The power consumption of the gripper exceeds the power delivered by the robot. Gripper and robot are not compatible.

SCHUNK SE & Co. KG
Spanntechnik | Greiftechnik | Automatisierungstechnik

Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar
Tel. +49-7133-103-0
info@de.schunk.com
schunk.com

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