

Commissioning instructions

EGU / EGK for CRX cobots

SCHUNK software module FANUC CRX

Translation of original commissioning
instructions

Hand in hand for tomorrow

Imprint

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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

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

Table of Contents

1 General	4
1.1 About this manual.....	4
1.2 Symbol definition.....	4
1.3 Presentation of Warning Labels	5
1.4 Applicable documents	5
2 Functional description	6
3 Connecting the product to the robot control system	7
4 Installing the software module	9
5 Uninstalling the software module	12
6 Adjusting the Tool Center Point (TCP) and gripper weight.....	13
6.1 Values for EGU	13
6.2 Values for EGK	14
7 Configuring and testing the software module.....	15
8 Using gripper commands in the program.....	19
8.1 Acknowledge.....	20
8.2 Grip Workpiece Unknown Size	20
8.3 Grip Workpiece	22
8.4 Release	23
8.5 Move Absolute	24
8.6 Move Relative.....	25
8.7 Stop	26
8.8 Get Status.....	27
9 Example of a robot program	28
10 Error messages	30
11 Appendix	31

1 General

1.1 About this manual

This manual contains information about the SCHUNK software module for FANUC CRX cobots.

The software is used to easily integrate and control the following products in FANUC CRX applications:

- EGU
- EGK

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 ► 1.4 [4] are applicable.

1.2 Symbol definition

The following symbols are used in this manual:

■ Prerequisite for an action

1. Action 1

2. Action 2

⇒ Intermediate results

⇒ Final results

► 1.2 [4]: chapter number and [page number] in hyperlinks

1.3 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.

1.4 Applicable documents

- Assembly and operating manual for the product:
 - Electric universal gripper EGU *
 - Electric small components gripper EGK *
- Operating manual for FANUC CRX robots

The documents labeled with an asterisk (*) can be downloaded from [schunk.com](https://www.schunk.com).

2 Functional description

The software module is used for the simple commissioning and programming of a SCHUNK EGU EGK plugin for FANUC CRX robots. The software module seamlessly integrates into the robot's visual programming environment. Configuration and manual control of most gripper functions are supported.

3 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.

NOTICE

Possible damage to product!

The product or the robot may get damaged if electrical cables are connected or disconnected during operation.

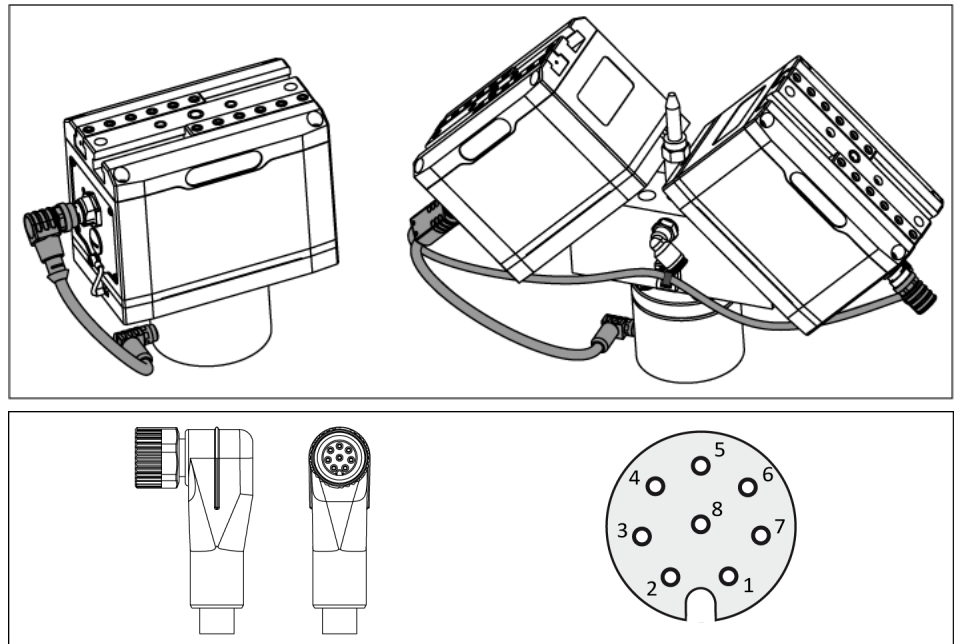
- Connect or disconnect electrical connections only when the device is switched off.

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.

- There is **no** energy supply.
- Product is mounted on the robot, cable is connected to the product (see assembly and operating manual of the product).



Pin-Belegung Anschlussstecker EGU / EGK an Roboter

1. Connect the cable to the robot.
2. When using 2 products: Fix the cable to the angle adapter with a cable tie.

Signal	Gripper Pin	Robot Pin
V+	1	5
Bus_A	2	1
GND	3	8
Bus_B	4	2
n.c.	5	3, 4, 6, 7

Tab.: Connection assignment EGU / EGK on FANUC CRX Robot

4 Installing the software module

NOTICE

Possible damage to product!

The product or the robot may get damaged if electrical cables are connected or disconnected during operation.

- Connect or disconnect electrical connections only when the device is switched off.

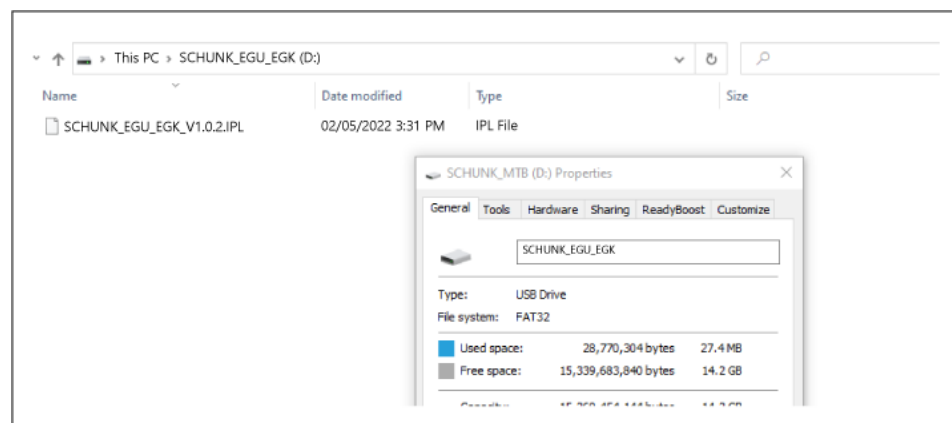
Preparing the installation

NOTE

A USB data carrier (type A) is required for installation.

The USB data carrier must comply with the following requirements:

- Formatted in FAT32 format
- Description: "SCHUNK_EGU_EGK".



1. Format the USB data carrier as shown.
2. Go to the SCHUNK website: <https://schunk.com/downloads-software/>
3. Use the search term "EGU" or "EGK".
4. Select the download for "CRX Plugin EGU and EGK für FANUC CRX" and save on the USB data carrier.

Installing

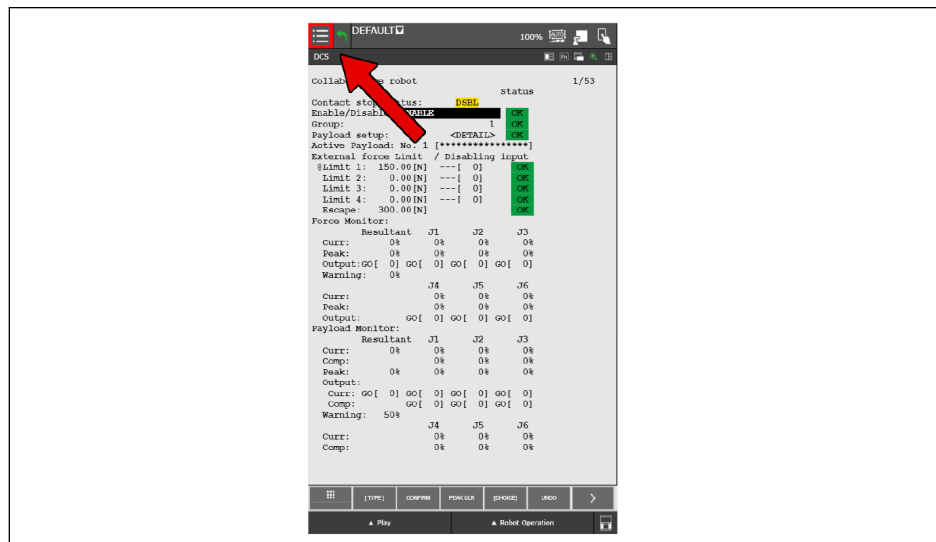
NOTE

To avoid malfunctions, SCHUNK recommends installing the current version of the software module.

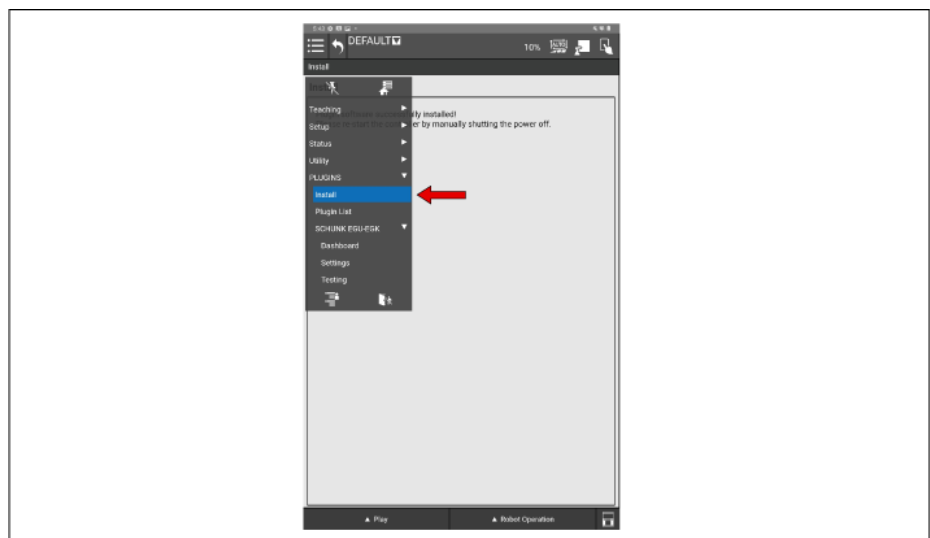
- Before installation, check whether the installed CRX control software is compatible with the software module. Information on this can be found in the SCHUNK download area <https://schunk.com/downloads-software/> under the search term "EGU" or "EGK".



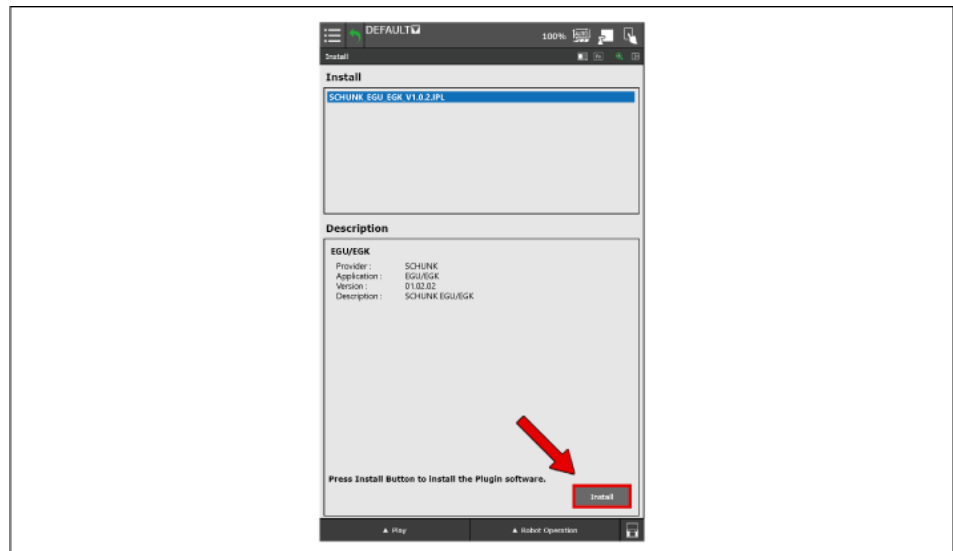
1. Connect the USB data carrier to the robot control system (not to the USB port of the Tablet Teach Pendant).



2. Select the "Menu" button at the top left of the Tablet Teach Pendant screen.



3. Select "PLUGINS" > "Install" in the menu.



4. Select the "Install" button.
⇒ The installation is executed.



5. Restart the robot controller as soon as the installation is complete.

5 Uninstalling the software module

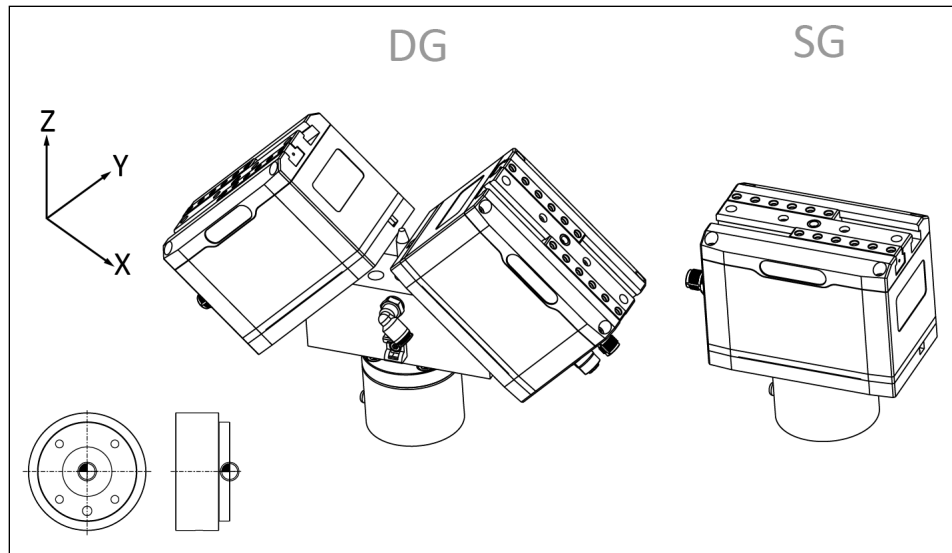
1. Select the "Menu" button at the top right of the Tablet Teach Pendant screen.
2. In the "PLUGINS" menu > "select Plugin List".
3. Select "EGU_EGK" from the list.
4. Select "Uninstall" on the lower right-hand side.
5. Confirm selection.
 - ⇒ The message appears saying the software module has been uninstalled.
6. Restart the robot controller.

6 Adjusting the Tool Center Point (TCP) and gripper weight

For information on adjusting the TCP and the gripper weight, refer to the operating manual of the robot.

The values from the following chapters can be used to adjust the TCP and the gripper weight.

6.1 Values for EGU



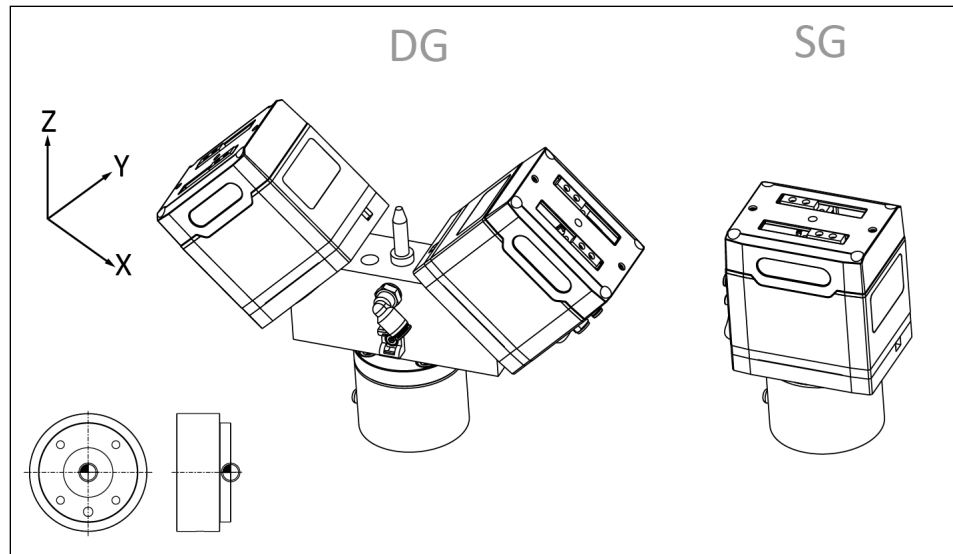
EGU: Tool Center Point, DG: two products mounted, SG: one product mounted

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

6.2 Values for EGK



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

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								
EGK 25	–	–	90.2	–	–1.5	–0.1	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: TCP, center of gravity and weight with ISO flange 50

7 Configuring and testing the software module



⚠ WARNING

Risk of injury due to sudden movements!

This can cause components to move unexpectedly when being dismantled, which may result in serious injuries.

- Keep a safe distance and wear suitable protective equipment.

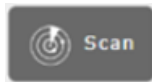
The following functions are included in the configuration menu:

- Dashboard
 - Search for gripper(s)
 - Show connection status
- Settings
 - Adjustments
 - Test the settings
 - Show status changes
- Testing
 - Manual operation
 - Show status changes

Dashboard



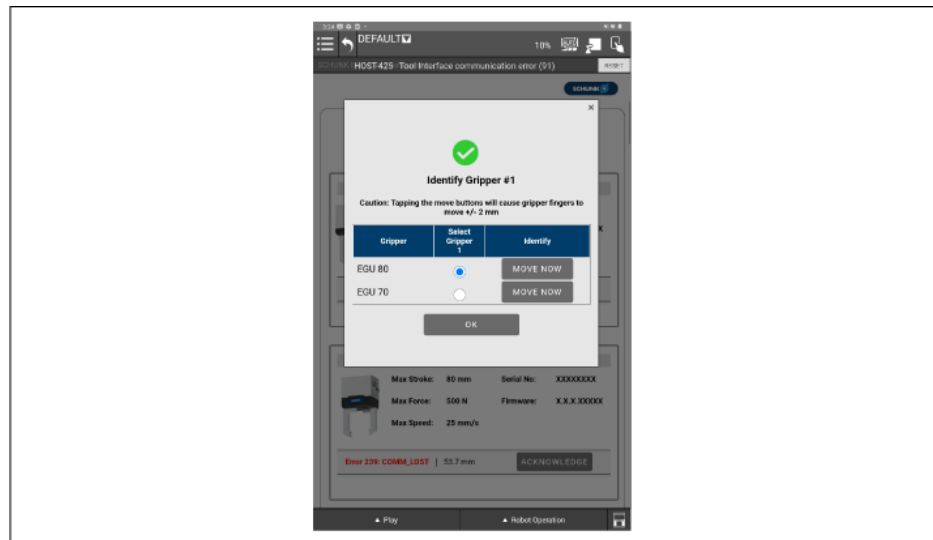
1. Select the "Menu" button at the top left of the Tablet Teach Pendant screen.
2. In the "PLUGINS" menu, select "SCHUNK EGU-EGK > Dashboard".



3. Select button .



4. The HOST-425 error message is displayed during the scanning process. Acknowledge this error message with RESET.



⇒ After the scan is complete, the connected grippers are listed.

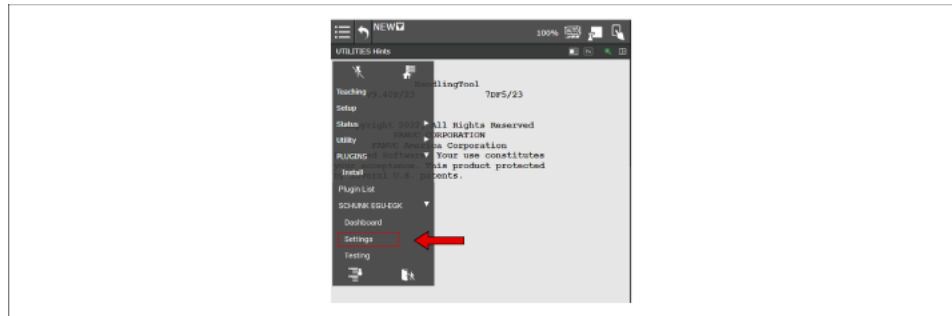
5. If several grippers were found:
Select which gripper is to be configured as "Gripper 1".
6. **WARNING! When the "Move Now" button is selected, move the gripper fingers.**
If necessary, to identify the grippers, select the "Move Now" button.
7. Select the "OK" button to continue with the configuration.



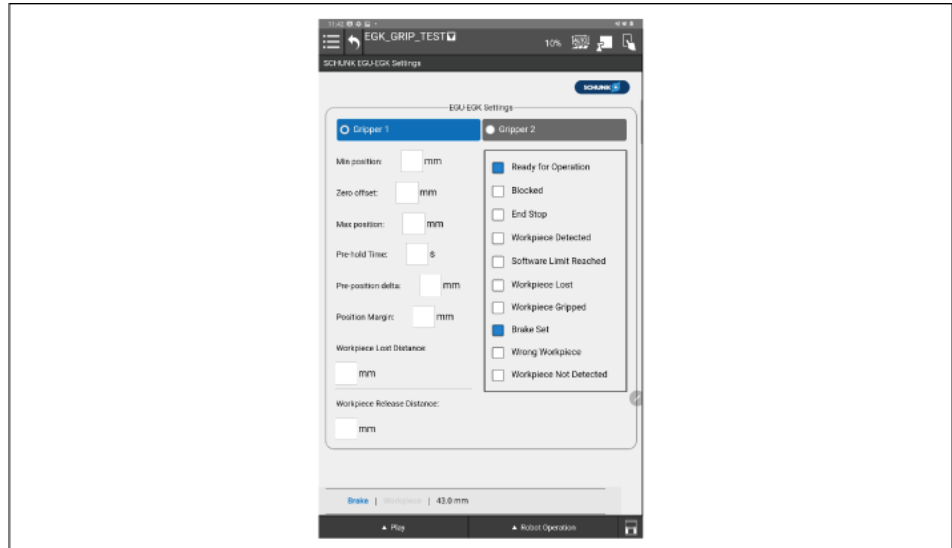
⇒ The connected grippers are displayed

8. If `Error` is displayed in the status bar.
⇒ Check that the communication and/or power cables are properly connected.
⇒ Restart the robot and perform the scan again.

Settings



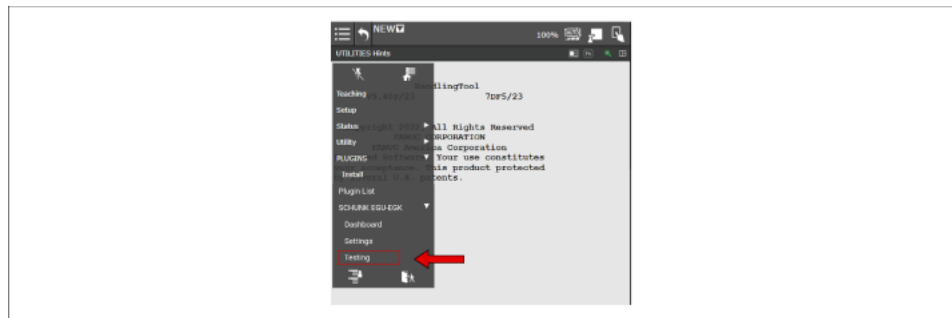
1. In the "PLUGINS" menu, select "SCHUNK EGU-EGK > Config".



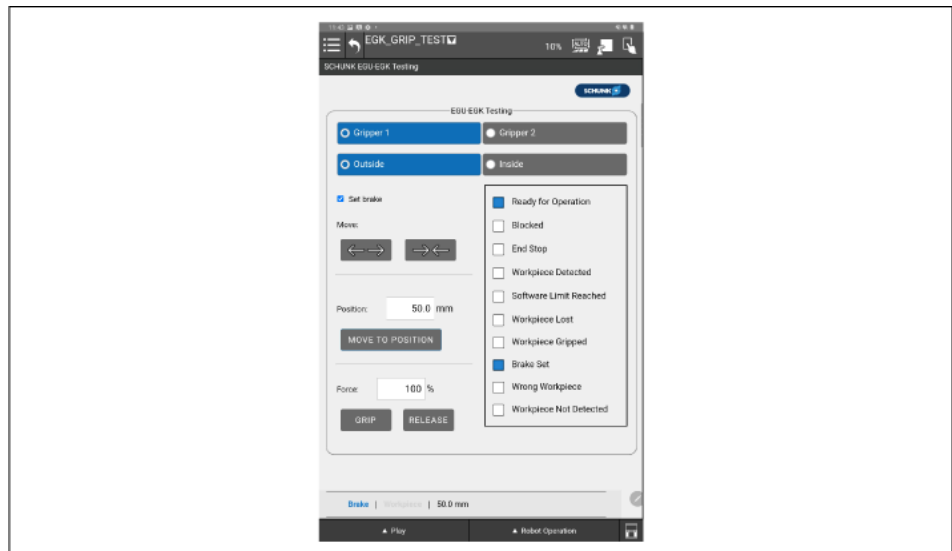
2. Make the settings individually for each gripper.

Parameter	Description
Min. Position	Smallest position value that can be approached.
Zero Offset	The zero point can be adapted to the application with this parameter.
Max. Position	Largest position value that can be approached.
Grip Prehold Time	Time span of the re-gripping The maximum time span for re-gripping is 5 seconds. In "Strong Grip" mode, the maximum value is reduced to 2 seconds.
Grip Pre-Position Delta	Delta between pre-position and gripping position (in mm).
Grip Position Margin	Workpiece tolerance: Margin around the workpiece that determines whether a gripping operation was successful (in mm).
Workpiece Release Distance	Distance over which the gripper finger moves when releasing the workpiece (in mm).
Workpiece Lost Distance	The distance that the gripper fingers are permitted to travel after the workpiece is lost before a workpiece loss is detected (in mm).

Testing



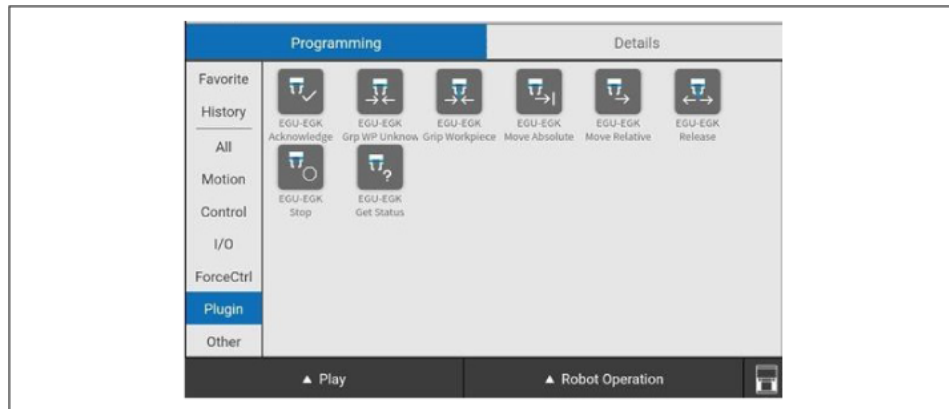
1. In the "PLUGINS" menu, select "SCHUNK EGU-EGK > Testing".



2. Select the gripper to be tested.
3. Select the gripping direction.
4. To move the gripper fingers manually by 1 mm, use the arrow buttons.
5. To move the gripper fingers to an absolute position, enter a target position in the "Position" field and then select the "Move Absolute" button.
6. To grip with a defined force, enter the value in percent (50 to 100) in the "Force" field.

8 Using gripper commands in the program

Once the software module is installed, all available commands are located in the "Plugin" section of the CRX program editor.



Refer to the FANUC CRX manuals for more information about programming using the visual editor.

The following chapters describe the available commands:

- Acknowledge
- Grip Workpiece Unknown Size
- Grip Workpiece
- Release
- Move Absolute
- Move Relative
- Stop
- Get status

(For validation of the gripping process and/or detection of workpiece losses)

1. Drag the desired command into the program. **CAUTION! Do not handle or interfere with moving parts.**
2. Adjust parameters. To do this, select the command in the program and choose the "Details" tab.

8.1 Acknowledge



This command is used to acknowledge an error status. After acknowledgment, the gripper is ready for operation again.

8.2 Grip Workpiece Unknown Size



This command is used to clamp a workpiece using parameters.

Grip Workpiece Unknown Size

When workpiece gripping, a workpiece is gripped with the specified gripping force value without specifying the workpiece position.

Strong Grip (EGU gripper with GPE only)

StrongGrip mode can be used to grip workpieces with a gripping force between 101% and 150%.

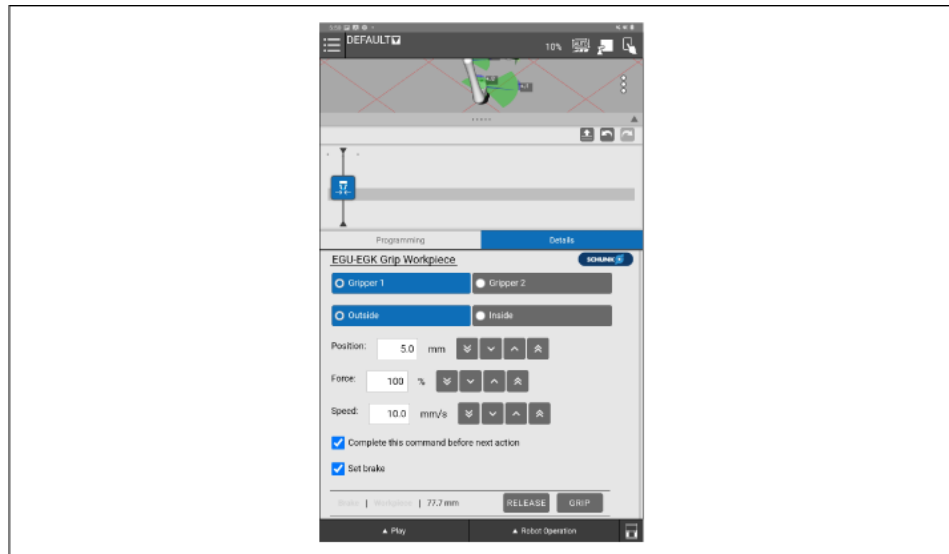
- Use arrow buttons or the input field to set the percentage of force to any value between 101% and 150%.
 - ⇒ The "Set brake" checkbox is activated if a gripping force above 100% is set. The checkbox is deactivated again when a gripping force of 100% or less is set.
 - ⇒ The operating manual contains more information about the gripping velocity in "Strong Grip" mode.

Soft Grip (EGK gripper only)

1. Select the "Soft Grip" checkbox.
 - ⇒ Makes it possible to control the gripping velocity independently of the set force, reducing the impulse forces on a workpiece.
2. Adjusting gripping parameters for speed.
 - ⇒ The maximum possible speed depends on the selected gripping force.
 - ⇒ For more information on the "Soft Grip" mode, refer to the appendix or the operating manual of the gripper.

Complete gripper motion before next action: The motion is completed before the next program step is executed.

8.3 Grip Workpiece



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.

The combination consists of optional pre-positioning and the gripping movement. The decision as to whether the correct or wrong workpiece has been gripped is made on the basis of the gripping position detected:

Set Brake: "M" variant grippers are equipped with gripping force and position maintenance (GPE). When sending control commands with these grippers, you can specify whether workpieces and positions are to be retained by the drive control or GPE. The type of workpieces and positions to be retained are selected via Set Brake.

Strong Grip: StrongGrip mode can be used to grip workpieces with a gripping force between 101%–and 150%. If the gripper has a brake, the brake engages automatically. Strong Grip mode is only available for EGU grippers with GPE.

Soft Grip: Soft Grip mode enables the gripping velocity to be controlled independently of the set force, reducing the impulse force on a workpiece. Soft Grip mode is only available for EGK grippers.

Parameters: Adjust the gripper, gripping direction, expected position (mm), gripping force (%) and speed (mm/s).

Complete gripper motion before next action: The motion is completed before the next program step is executed.

8.4 Release



When releasing the workpiece, the gripper carries out a relative positioning movement.

Parameters: Adjust the gripper, opening direction and distance (mm).

Complete gripper motion before next action: The motion is completed before the next program step is executed.

8.5 Move Absolute



With absolute positioning, the gripper moves to the cyclically transferred position value. This position value refers to the gripper's parameterized zero point.

NOTICE

Possible material damage to the workpiece!

The "Move Absolute" command is not suitable for gripping since the movement always takes place at maximum speed

Set Brake: "M" variant grippers are equipped with gripping force and position maintenance (GPE). When sending control commands with these grippers, you can specify whether workpieces and positions are to be retained by the drive control or GPE. The type of workpieces and positions to be retained are selected via Set Brake.

Parameters: Adjust gripper and position (mm).

Complete gripper motion before next action: The motion is completed before the next program step is executed.

8.6 Move Relative



With relative positioning, the gripper moves from the current position by the cyclically transferred and signed position value.

Set Brake: "M" variant grippers are equipped with gripping force and position maintenance (GPE). When sending control commands with these grippers, you can specify whether workpieces and positions are to be retained by the drive control or GPE. The type of workpieces and positions to be retained are selected via Set Brake.

Parameter: Adjust gripper, direction and distance (mm).

Complete gripper motion before next action: The motion is completed before the next program step is executed.

8.7 Stop



This command stops the movement of the gripper.

- Select "Stop" for a controlled stop.
- "Fast Stop" to interrupt the gripping movement and put the gripper in the known "FastStop error" state.
For safety reasons, the quick stop automatically applies the brake when it is available.

Parameters: Gripper and desired stop command.

Complete gripper motion before next action: The motion is completed before the next program step is executed.

Set Brake: "M" variant grippers are equipped with gripping force and position maintenance (GPE). When sending control commands with these grippers, you can specify whether workpieces and positions are to be retained by the drive control or GPE. The type of workpieces and positions to be retained are selected via Set Brake.

Command	Description
Stop	The gripper is brought to a controlled stop. The gripping force is maintained.
Fast stop	The power supply is interrupted immediately and the gripper is stopped in an uncontrolled manner. An error message is generated that requires acknowledgment. CAUTION: Possible material damage to the workpiece! Ensure that all workpieces have been removed and that the gripper fingers can move freely in the reference direction up to the end stop.

8.8 Get Status



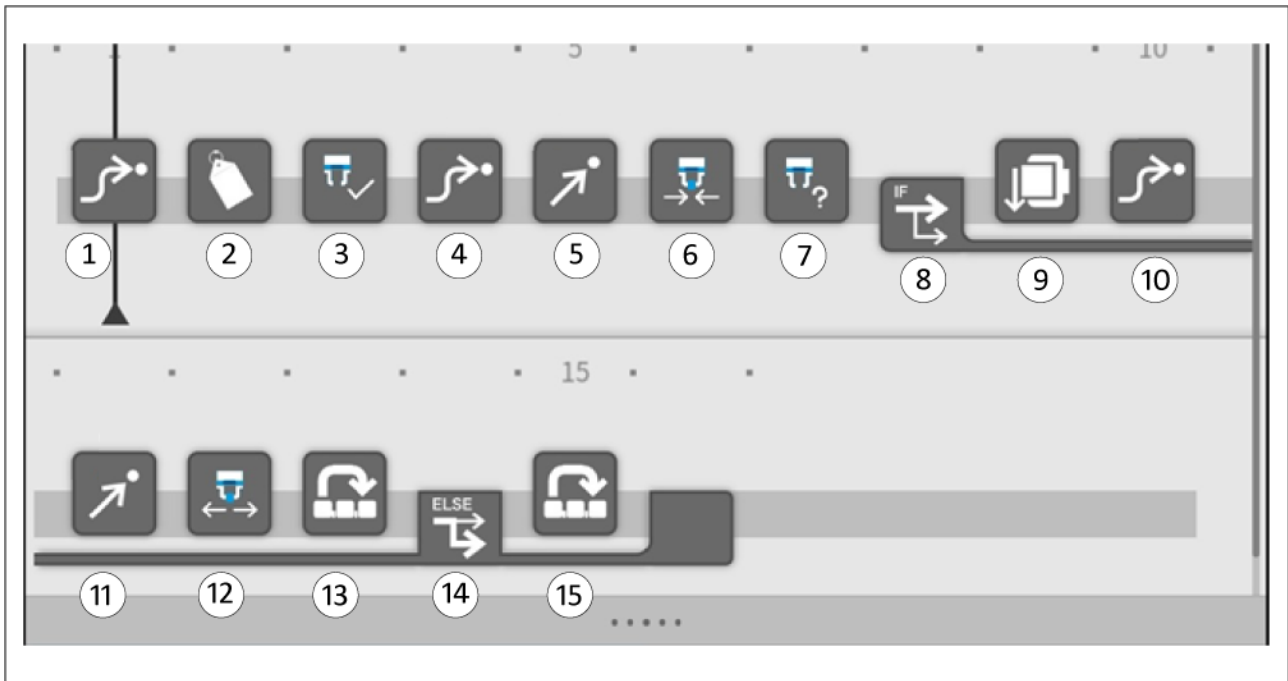
Purpose: Validation of the gripping process and/or workpiece loss detection

Parameters: Use the drop-down menu to select the status to be monitored. Use the "arrow" button to select the register number.

Status	Return value	Description
Brake Set	True / False	True: Brake is activated. False: Brake is not activated.
Get Current Position	Float (mm)	Returns the current position, which is also displayed in the status bar.
Error	True / False	True: An error has to be acknowledged. False: Ready for operation.
No Workpiece Detected	True / False	True: No workpiece detected. False: Workpiece detected.
Position Reached	True / False	Indicates whether the target position has been reached.
Success	True / False	True: Command successful. False: Command incorrect.
Software Limit Reached	True / False	True: The gripper fingers cannot move beyond the set min/max position. False: The gripper fingers can still move.
Warning	True / False	True: A warning has occurred. False: Ready for operation.
Workpiece Grippped	True / False	True: Workpiece gripped. False: Workpiece not gripped.
Workpiece Lost	True / False	True: Workpiece lost. False: Workpiece gripped.
Wrong Workpiece Grippped	True / False	True: Wrong workpiece gripped. False: Correct workpiece gripped.

9 Example of a robot program

This "Pick&Place" example program can be used as a guide for creating individual applications.



1. Home position



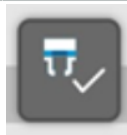
Move gripper to the starting position.

2. Label



Set up marking, by selecting the number "1" in the drop-down menu. The program will return to this step later in the timeline.

3. Acknowledge



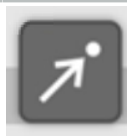
Acknowledge gripper to clear any errors such as "Fast stop" or "Movement blocked".

4. Pick Approach Position



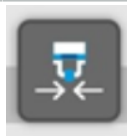
Move gripper over the "Pick" position.

5. Pick Position

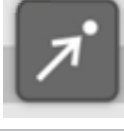
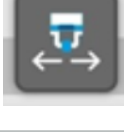


Move the gripper to the gripping position to grip the workpiece.

6. Grip



Grip with the appropriate percentage force required to hold the workpiece securely.

7. Get Status		Use up arrow to set the register number to "1". Select "Workpiece gripped" from the drop-down menu to query the gripper whether the workpiece was gripped successfully.
8. If		Insert block with an if statement. Select "Details" and select radio button for register. Use the arrow to set the register to "1".
9. Payload		Adjust the payload so that it matches the weight of the workpiece.
10. Place Approach Position		Move the robot arm over the "Place" position.
11. Place Position		Lower the workpiece to the place position.
12. Release		Release the workpiece by the desired distance. In the basic setting, this distance is 5 mm. In the configuration menu <i>Plugins > EGU-EGK > Settings</i> the specified release distance can be changed.
13. Jump		Return the robot arm to the removal position for the next workpiece. Use the drop-down menu to select the label no. "1". Instructions for the feeder system used have to be added to the program here.
14. Else		If the workpiece was not gripped successfully, the program executes the following instruction.
15. Jump		Return the robot arm to the program's start position to acknowledge any errors and repeat the removal process.

10 Error messages

Error messages must be acknowledged by selecting the "Acknowledge" button.

Alarm code	Possible cause	Corrective action
SCHUNK-EGK-001	Internal plugin error	1. Update to the latest plugin and CRX robot software. 2. Clear cache and restart the CRX control manually.
SCHUNK-EGK-009	Communication error	1. Check that all cables are connected correctly. 2. Clear cache and restart the CRX control manually.
SCHUNK-EGK-010	Command timeout alarm: The gripper has not received the command correctly	1. Check whether the gripper assembly is supplied with power 2. Check cable at end effector. 3. Restart CRX control.

11 Appendix

EGK

Size	BasicGrip				SoftGrip			
	Gripping force [N]		Gripping speed [mm/s]		Gripping force [N]		Gripping speed [mm/s]	
	min.	max.	min.	max.	min.	max.	min.	max.
EGK 25	25	50	10	20	20	50	5	10
EGK 40	75	150	11	22	75	150	5.5	11
EGK 50	150	300	12.5	25	150	300	6.25	12.5

Tab.: Exact limits for gripping force and speed for EGK

EGU

Size	BasicGrip				StrongGrip			
	Gripping force [N]		Gripping speed [mm/s]		Gripping force [N]		Gripping speed [mm/s]	
	min.	max.	min.	max.	min.	max.	min.	max.
EGU 50	150	250	12.5	25	–	450	12.5	25
EGU 60	300	600	12.5	25	–	975	12.5	25
EGU 70	550	1100	12.5	25	–	1950	12.5	25
EGU 80	1000	2000	12.5	25	–	3000	12.5	25

Tab.: Exact limits for gripping force and speed for EGU



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