



## Software manual

# Flexible gripper EGH for cobots

SCHUNK software module for FANUC CRX  
cobots

Translation of original software  
manual

Hand in hand for tomorrow

## Imprint

### Copyright:

This manual is protected by copyright. The author is SCHUNK SE & Co. KG.  
All rights reserved.

### Technical changes:

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

**Document number:** 1482377

**Version:** 03.00 | 09/08/2023 | en

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

<b>1 General .....</b>	<b>4</b>
1.1 About this manual.....	4
1.2 Symbol definition.....	4
1.3 Presentation of Warning Labels .....	5
1.4 Applicable documents .....	5
<b>2 Description of function .....</b>	<b>6</b>
<b>3 Setting up EtherNet/IP .....</b>	<b>7</b>
<b>4 Installing the software module .....</b>	<b>11</b>
4.1 Uninstalling the software module .....	14
<b>5 Configuring and testing the software module.....</b>	<b>15</b>
<b>6 Using Gripper Commands in the Program .....</b>	<b>17</b>
6.1 Acknowledge.....	18
6.2 Reference .....	18
6.3 Grip .....	18
6.4 Release .....	19
6.5 Move Absolute .....	19
6.6 Move Relative .....	19
6.7 Stop .....	20
6.8 Light Band.....	20
6.9 Query EGH.....	21
<b>7 Setting the Tool Center Point (TCP) and gripper weight.....</b>	<b>22</b>
<b>8 Example of a robot program .....</b>	<b>25</b>

# 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:

- Flexible gripper EGH for cobots

**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 5] 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 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.

#### **CAUTION**

**Material damage!**

Information about avoiding material damage.

### 1.4 Applicable documents

- Assembly and operating manual for the product \*
- Software guide "SCHUNK gripper with IO-Link" \*
- Operating manual for FANUC CRX robots

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

## **2 Description of function**

The CRX software module is used for simple commissioning and programming of the SCHUNK gripper EGH in combination with FANUC CRX robots. The software module seamlessly integrates into the CRX robot's visual programming environment. Configuration of the gripper and manual control of most gripper functions are supported via the "Plugins | SCHUNK EGH" menu.

### 3 Setting up EtherNet/IP

#### NOTE

To use the software module, the FANUC software option "EtherNet/IP Scanner" needs to be installed on the robot control system. In case of any questions about obtaining or installing the software option, please contact FANUC Service.

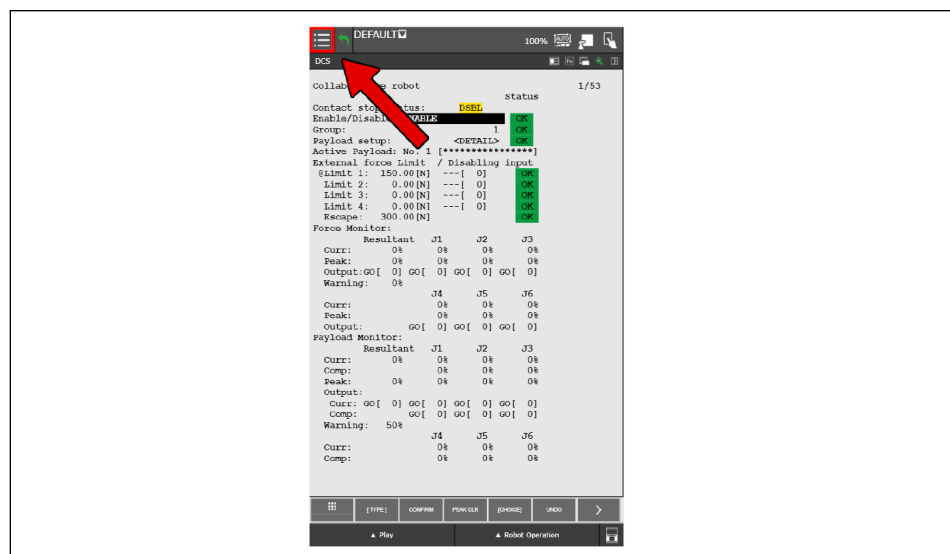
#### NOTE

EtherNet/IP slot 1 must be used for the software module. If this slot is already occupied in the application, contact SCHUNK.

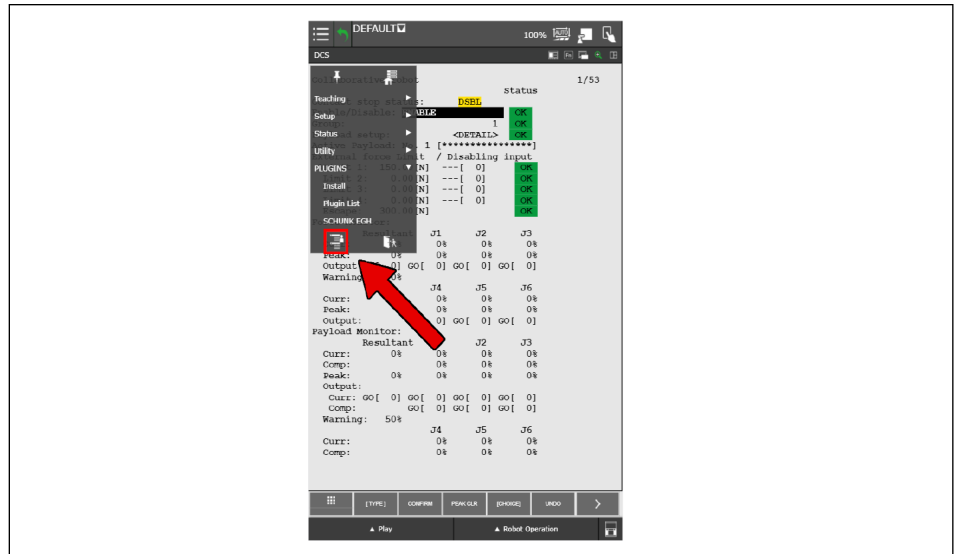
The CRX software module uses the EtherNet/IP protocol to communicate with the gripper. The EtherNet/IP protocol must be set up in order to use the gripper.

#### Selecting EtherNet/IP

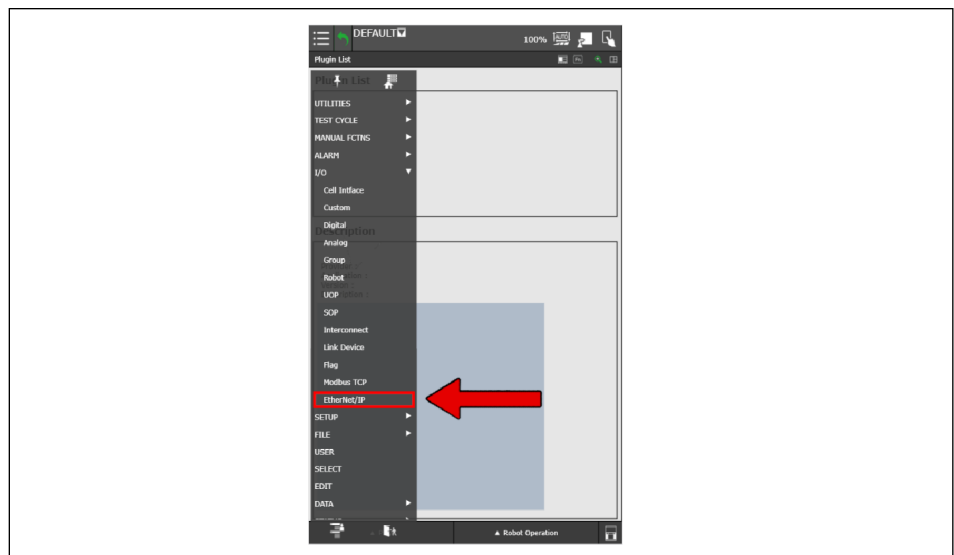
1. Select the "Menu" button at the top left of the Tablet Teach Pendant screen.



2. Select the "Full menu" button to expand the menu completely.



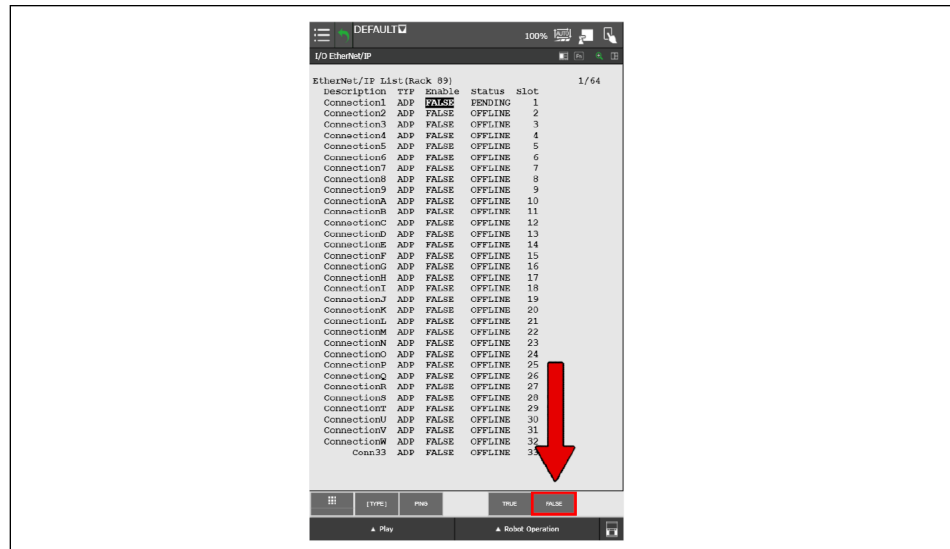
3. Select the "EtherNet/IP" button.



⇒ The "EtherNet/IP" page opens up.

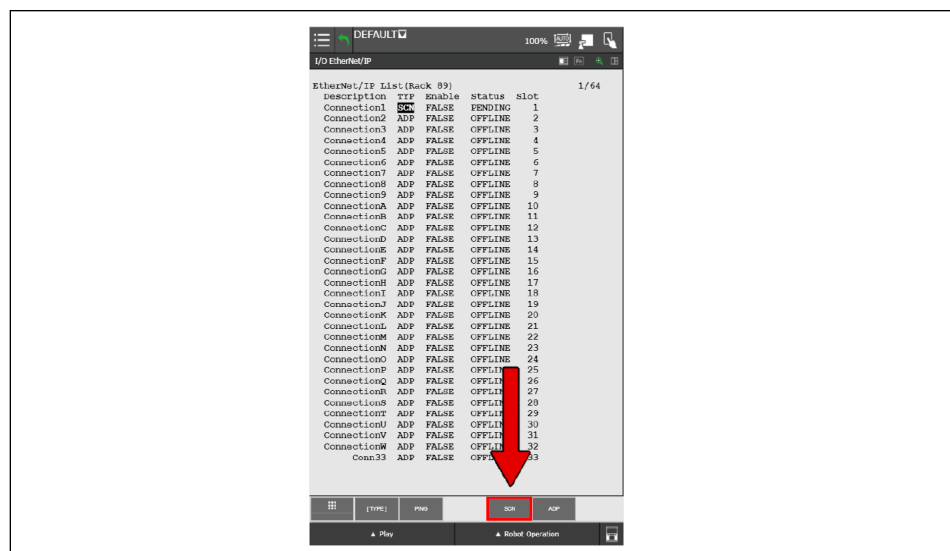
## Setting up the slot

1. Check the values for "Slot 1".
2. Click the "TRUE" value in the "Enable" column once.
3. Select the "FALSE" button.



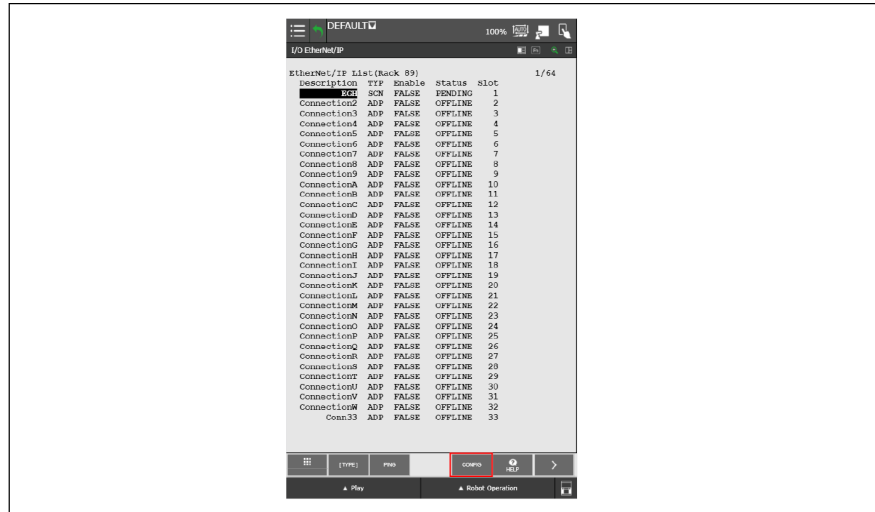
- ⇒ The value is changed to "FALSE".
- ⇒ The value assigned for "Slot 1" has been deactivated.

4. Click once on "ADP" (adapter) in the "Type" column.
5. Select the "SCN" button.



- ⇒ The value is changed to "SCN" (Scanner).

**6. IMPORTANT! SCHUNK recommends changing the value in the "Description" column to "EGH" to indicate use for the EGH! Select the "CONFIG" button.**



⇒ Setup of slot 1 has been completed.

**Storing values**

1. Double-click on the settings shown in Table 1 one after the other and enter the correct value.
2. Select the "ADV" (advanced) button at the bottom of the screen.
3. Double-click on the settings shown in Table 2 one after the other and enter the correct value.

Setting	Value
IP address	192.168.1.253
Vendor ID	48
Device Type	12
Product Code	14140
Input size	16
Output size	16
RPI	32
Assembly instance (input)	103
Assembly instance (output)	104
Configuration instance	106

Table 1

Setting	Value
I/O Data Type	8-BIT BYTES
Major Revision	2
Minor Revision	7

Table 2

## 4 Installing the software module

Before installing the software module, check the robot software and update it if necessary. The robot software must be compatible with the software of the module.

For information on mutually compatible software versions, see [schunk.com/egh-downloads](https://schunk.com/egh-downloads).

### CAUTION

#### 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.

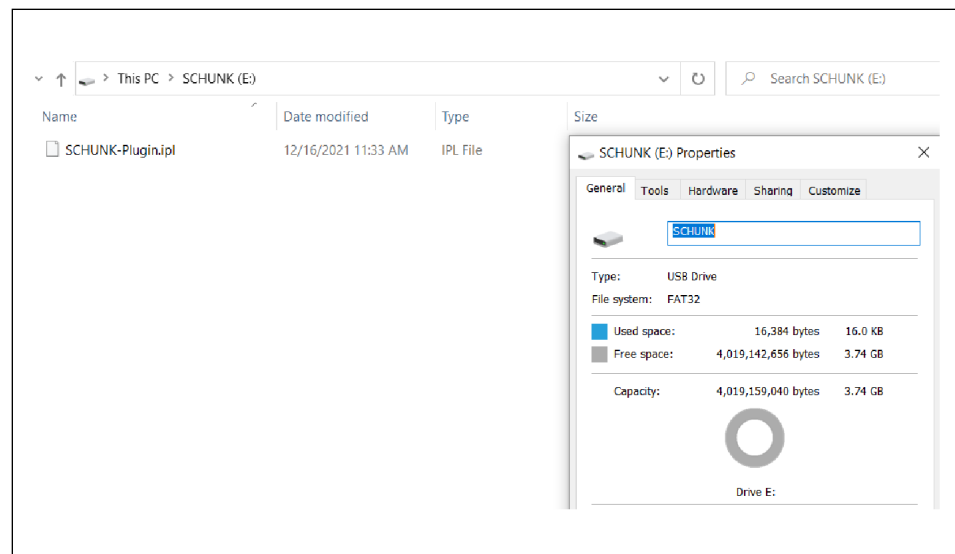
### NOTE

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

#### Prepare the USB stick

The USB stick must meet the following requirements:

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



Designation of the USB stick

## Installing the software module

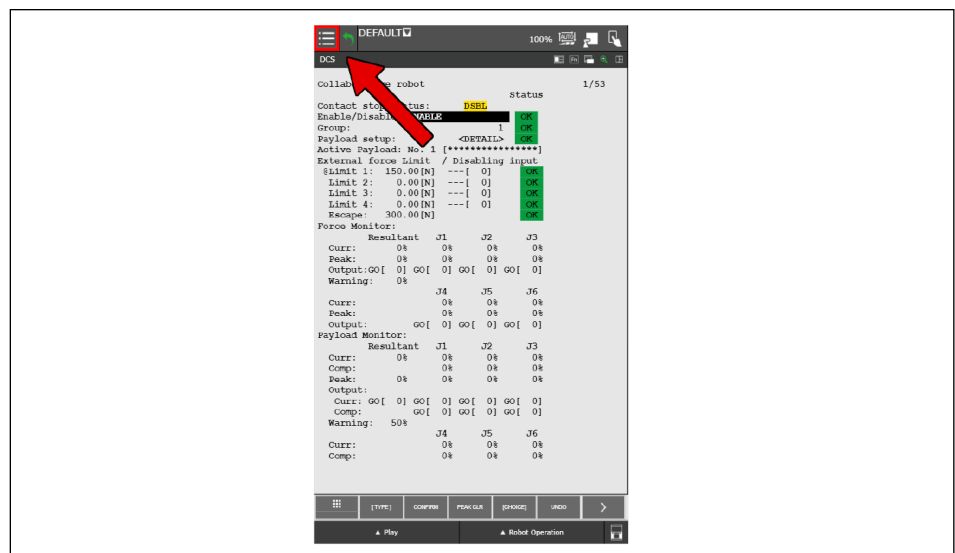
### NOTE

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

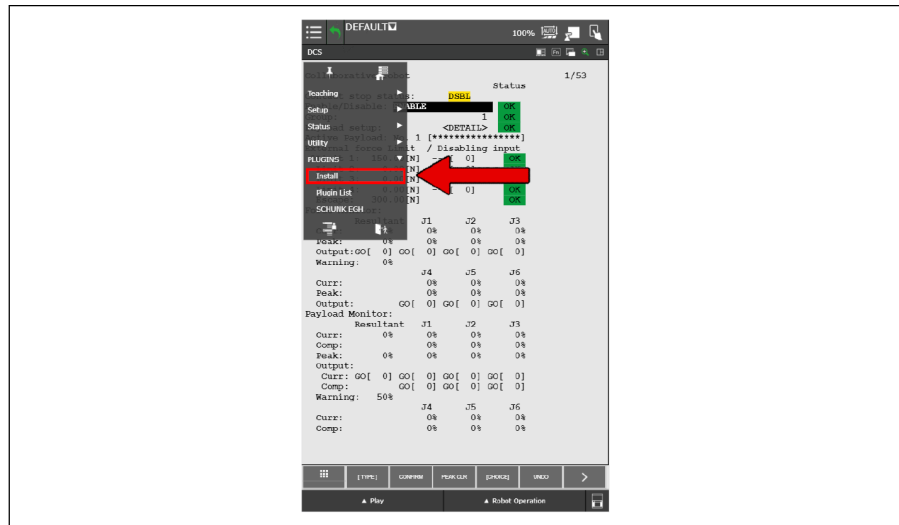
- The robot control system is updated to the compatible version.
- 1. Download the latest version of the software module (\*.ipf) at [schunk.com/egh-downloads](http://schunk.com/egh-downloads) and copy it to the USB stick.
- 2. Connect the USB stick to the robot control system (not to the USB port of the Tablet Teach Pendant).



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

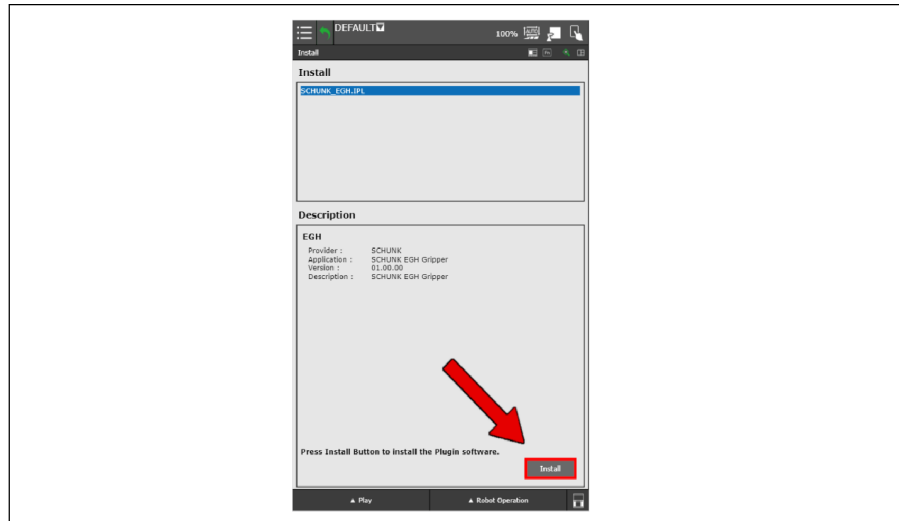


4. Select "PLUGINS" > "Install" in the menu.



⇒ The installation page opens.

5. Select the "Install" button.



⇒ The installation is executed.



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

## 4.1 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 "EGH" 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.

## 5 Configuring and testing the software module



### CAUTION

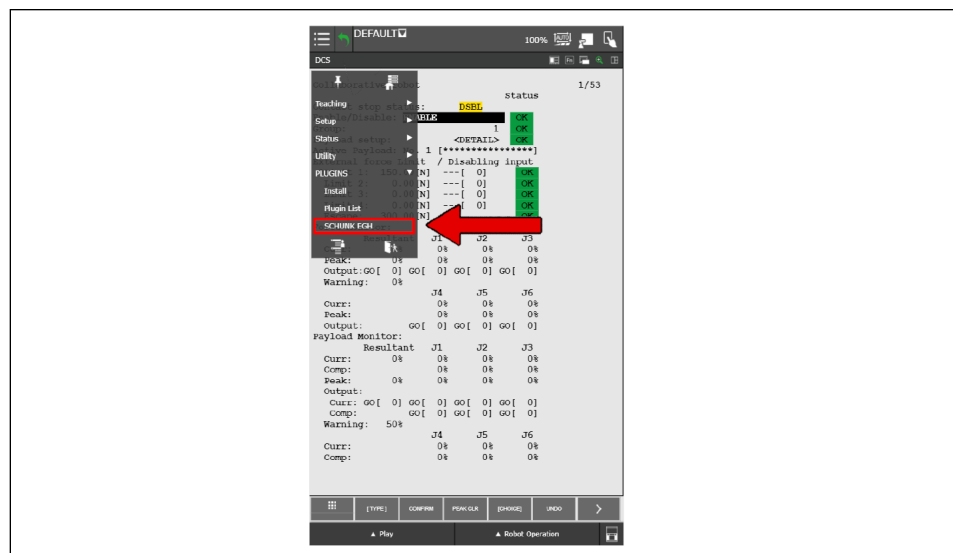
#### Risk of injury possible!

Safety-relevant signals (e.g. emergency stop) must be transmitted externally, e.g. using a safety relay. In this configuration the product will not be energized in the event of a safety incident.

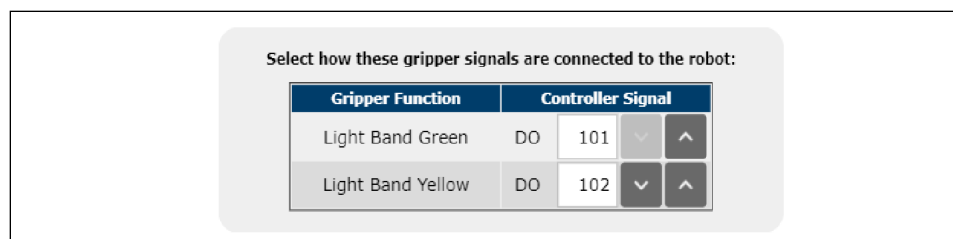
- Review safety aspects as part of a risk assessment.

The following settings may be adjusted:

- Selection of the digital output signals (DO) connected to the gripper in conjunction with the light band signals
- Select the "Menu" button at the top right of the Tablet Teach Pendant screen.
  - In the "PLUGINS" menu > Select "SCHUNK EGH".

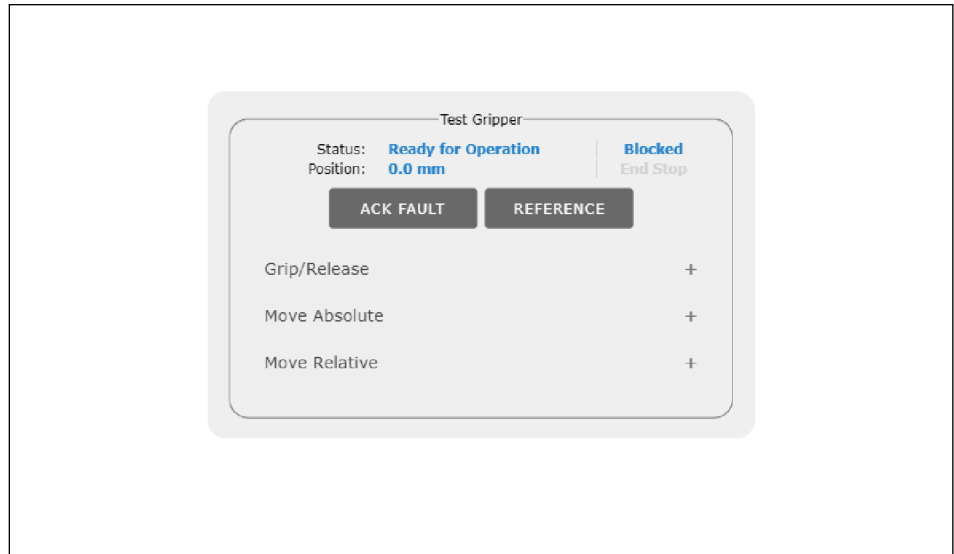


- ⇒ On this page the digital output signals (DO) of the gripper can be configured.
- ⇒ The standard (recommended) signal connections are shown.



- ⇒ Settings have been configured.

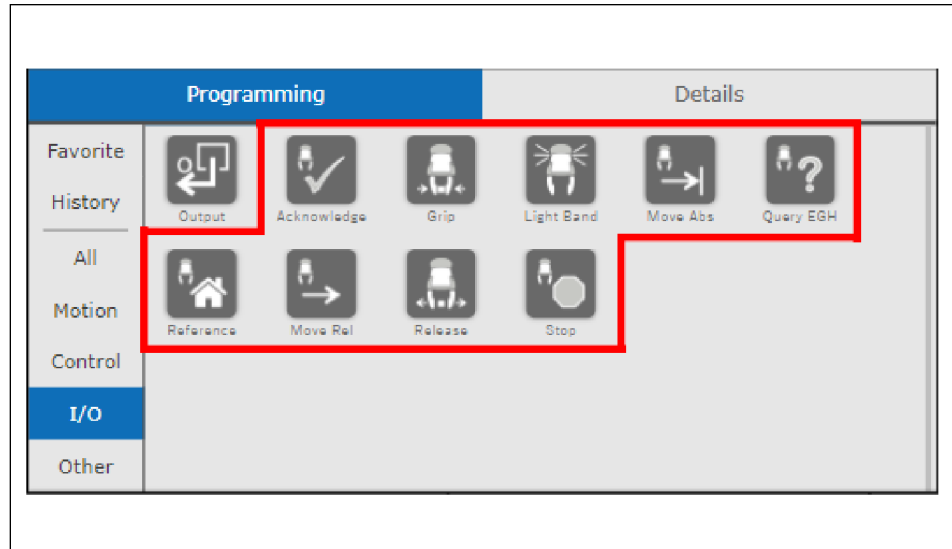
3. Select the "+" button next to the section headings to view commands.



4. Test the gripper using the commands. **CAUTION Moving parts! Do not handle or interfere with moving parts.**

## 6 Using Gripper Commands in the Program

As soon as the CRX plug-in for SCHUNK gripper EGH is installed, all gripper commands will become visible in the "I/O" section of the CRX program editor.



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

The available gripper commands that can be dragged into a program and their parameters are described below. For all CRX commands, the parameters of a command can be edited. To do this, select the command in a program and select the "Details" tab.

### NOTE

A single gripper status line is displayed for each command at the bottom of the respective detail screen. This line shows the current status of the gripper and contains the most important gripper controls for the respective command. **CAUTION Moving parts! Do not handle or interfere with moving parts.**



Details of gripper commands are shown in the chapter "Configuring and testing the software module", ▶ 5 [15].

## 6.1 Acknowledge

This command acknowledges all faults present on the gripper.

---

### NOTE

The gripper is in error state immediately after startup. Execute the Acknowledge command to be able to execute all other gripper commands.

---

Parameter

*none*

## 6.2 Reference

This command moves the gripper to its home position and sets this position to zero. This command activates position feedback for the gripper as well as commands that use a target position.

Parameter

- **(optional) Wait for command to complete:**  
Using this parameter, the program will wait after the command until the operation is completed before it moves to the next command.

## 6.3 Grip

This command is used to grab a part.

Parameter

- **Grip direction:** This parameter defines the direction of the gripping process. With O.D. gripping, the gripper fingers are moved from the "gripper open" state to the "gripper closed" state and the workpiece is gripped from the outside. With I.D. gripping, the gripper fingers are moved from the "gripper open" state to the "gripper closed" state and the workpiece is gripped from the outside.
- **Grip force:** This parameter defines what percentage of the maximum grip force should be applied: 100%, 75%, 50% or 25%.
- **(optional) Wait for command to complete:**  
Using this parameter, the program will wait after the command until the operation is completed before it moves to the next command.

## 6.4 Release

This command releases the gripped workpiece. In the process, the gripper fingers move in the opposite direction to that defined in the "Grip direction" parameter until end position is reached.

### Parameter

- **Grip direction:** This parameter defines the direction of the gripping process. With O.D. gripping, the gripper fingers are moved from the "gripper open" state to the "gripper closed" state and the workpiece is gripped from the outside. With I.D. gripping, the gripper fingers are moved from the "gripper open" state to the "gripper closed" state and the workpiece is gripped from the outside.
- *(optional)* **Wait for command to complete:**  
Using this parameter, the program will wait after the command until the operation is completed before it moves to the next command.

## 6.5 Move Absolute

This command moves the gripper fingers to a defined position.

### Parameter

- **Target position:** The gripper fingers move to the position defined by this parameter. In zero position, the gripper fingers are fully open. The further the fingers are closed, the more the position values increase.
- *(optional)* **Wait for command to complete:**  
Using this parameter, the program will wait after the command until the operation is completed before it moves to the next command.

## 6.6 Move Relative

This command moves the gripper fingers a defined distance from their current position.

### Parameter

- **Step size:** The gripper fingers move by the distance defined by this parameter. Positive step sizes close the gripper fingers, negative step sizes open the gripper fingers.
- *(optional)* **Wait for command to complete:**  
Using this parameter, the program will wait after the command until the operation is completed before it moves to the next command.

## 6.7 Stop

This command is used to stop all current movement processes on the gripper.

### Parameter

- **Stop / Fast stop:** This parameter can be used to trigger a stop process or a fast stop process. A normal stopping process brings the gripper to a controlled standstill with constant gripping force. In contrast, in the case of a quick stop, the electrical supply is interrupted immediately and the gripper is stopped in an uncontrolled manner. A quick stop creates an error condition that must be cleared using the Acknowledge command.

## 6.8 Light Band

This command is used to switch the light band on or off and to set the color of the light band.

### Parameter

- **State / Color:** This parameter indicates the new state of the light band. The following options are available:
  - Off
  - Green
  - Yellow
  - Red

## 6.9 Query EGH

This command is used to retrieve information about the current state of the gripper and store it in a register. This information can then be used in conditional statements and other control logic in a program.

### Parameter

- **Register number:** This parameter determines which register number is assigned to the value.
- **Value:** This parameter determines which value is retrieved. The following values can be read out:
  - **Status**
    - 0: Errors
    - 1: Outside of the specification
    - 2: Maintenance required
    - 3: Ready for operation
  - **Referenced**
    - 0: Not referenced
    - 1: Referenced
  - **Success**
    - 0: Previous command was not executed successfully
    - 1: Previous command was executed successfully
  - **End Stop**
    - 0: End stop not reached
    - 1: End stop reached
  - **Blocked**
    - 0: Not blocked
    - 1: Blocked
  - **Position**
    - The current position of the gripper fingers in millimeters.

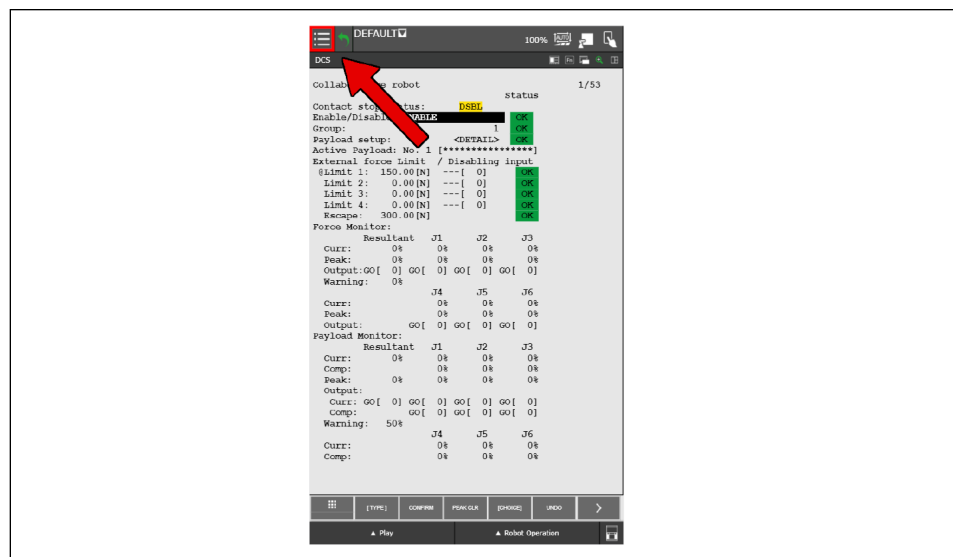
## 7 Setting the Tool Center Point (TCP) and gripper weight

### NOTE

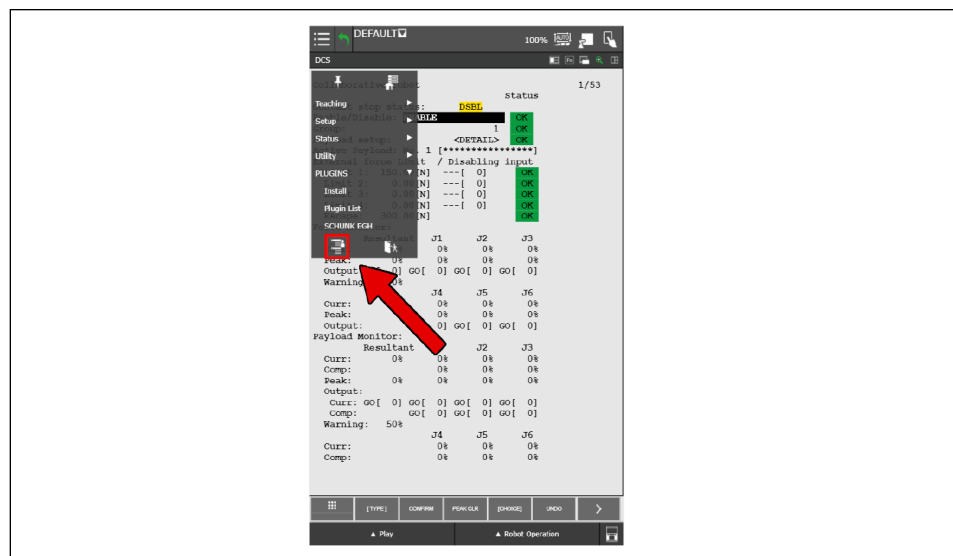
For further information on Tool Center Point (TCP), see the operating manual of the FANUC CRX robot, ▶ 1.4 [ 5].

To use the EGH correctly on the FANUC CRX robot, we recommend storing the Tool Center Point (TCP) and the gripper weight in the robot settings. The following procedure shows only one of several possibilities for the configuration.

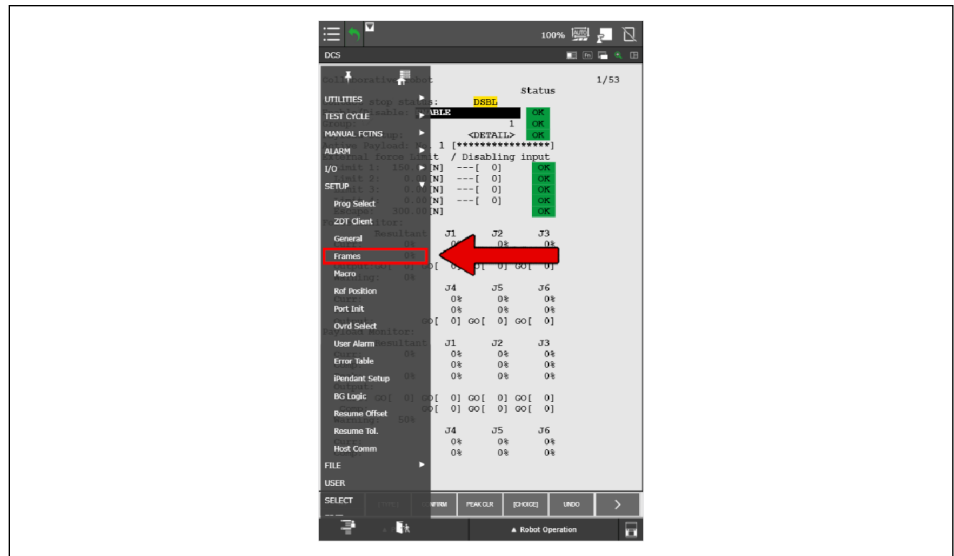
1. Select the "Menu" button at the top left of the Tablet Teach Pendant screen.



2. Select the "Full menu" button to expand the menu completely.

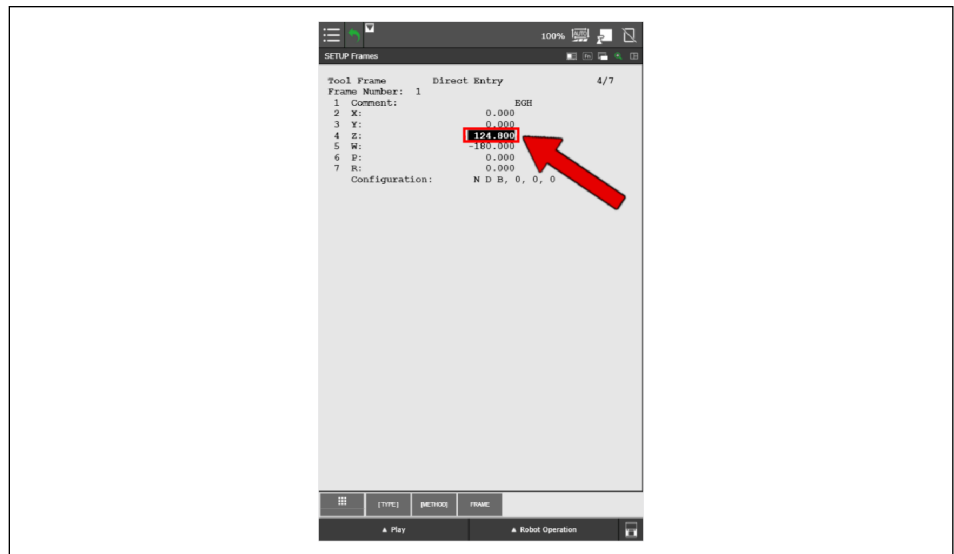


3. Select "SETUP" > "Frames" in the menu.

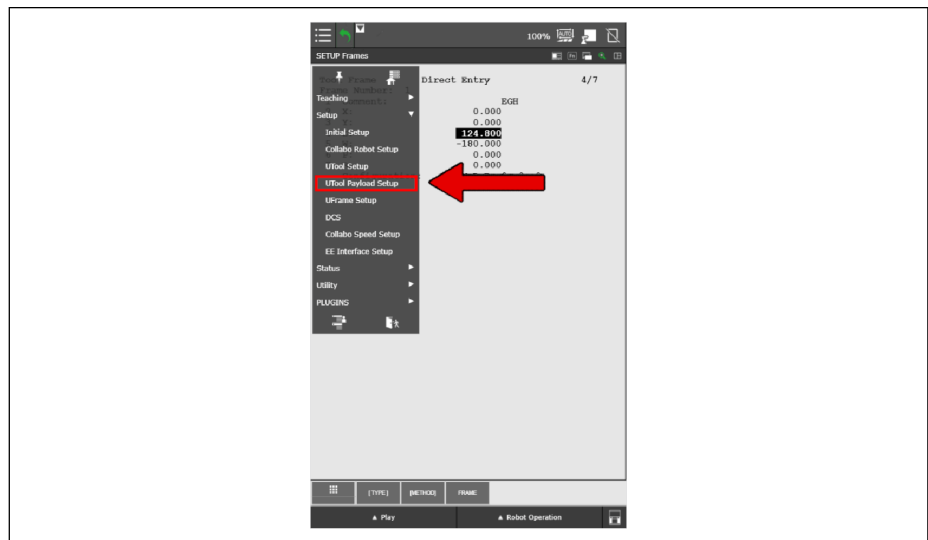


⇒ The SETUP Frames page opens.

4. Set the value for "Z" to 124.8 mm added to the length of the mounted gripper fingers.
5. Set value for "W" to -180 degrees.
6. Set values for "X", "Y", "P" and "R" to 0.

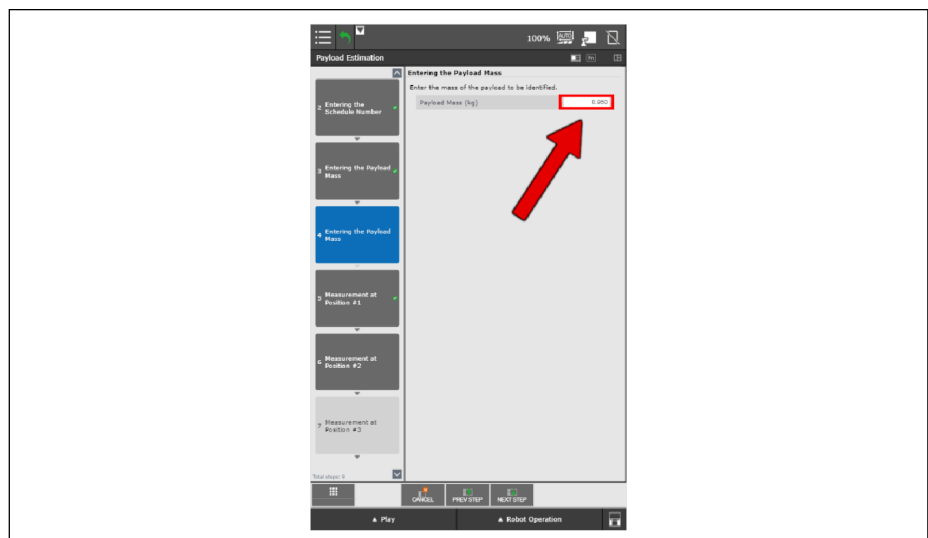


7. Select the "Menu" button at the top left of the Tablet Teach Pendant screen.
8. Select "Setup" > "UTool Payload Setup" in the menu.



⇒ The process for configuring the payload opens.

9. Follow individual steps of the setup process.
  - ⇒ Set the "Payload Mass" value to 0.95 kg.



10. Complete the configuration process.

⇒ The payload has been configured for the gripper without a gripped workpiece.

11. Configure the payload for each workpiece to be handled. Add the mass of the gripper (0.95 kg) to the workpiece mass for the "Payload Mass" value and enter it in the configuration process.

Commands for switching between configured payloads can be found in the FANUC CRX Robot Instruction Manual, ▶ 1.4 [ 5 ]

## 8 Example of a robot program



Acknowledge



Directly after commissioning, the gripper will be in error state. This command resets the error state.

Reference



Approach the zero point of the gripper fingers.

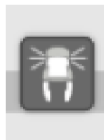
- **Parameter:** Wait for command to complete [YES]

Linear Move



Move the robot to the program's start position.

Light Band



Set the color of the light band to yellow.


- **Parameter:** Color [Yellow]

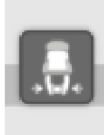
Move Absolute




Move the gripper finger to a defined position.

- **Parameter:**  
Target Position [15.0 mm]  
Wait for command to complete [YES]


Linear Move		Move the robot to the workpiece.
-------------	---	----------------------------------

Grip		Grip the workpiece
------	---	--------------------


- **Parameter:**  
Direction [OUTER DIAMETER]  
Grip force [100%]  
Wait for command to complete [YES]

Query Gripper		Acknowledge whether the previous "Grip" command was executed successfully and store success in R[1].
---------------	---	--

- **Parameter:** R[1] = SUCCESS

Query Gripper		Acknowledge whether the gripper is located at one of the two end stops. If it is, this means the gripper has missed the workpiece.
---------------	--	--

- **Parameter:** R[2] = END STOP

IF statement		The IF statement uses the results of the two "query" commands to determine the subsequent course of the program.
--------------	---	--

- **Parameter:** R[1] = 1 AND R[2] = 0
- If the grip command was successful and the gripper is not located at one of the two end stops (R[1] = 1 AND R[2] = 0), the next three commands "Light Band = green", "Linear Move" and "Release" will be executed. Otherwise the program will jump to the last command "Light Band = red".

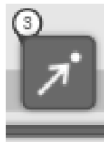
Light Band



Sets the color of the light band to green.

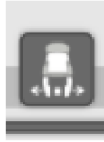
- **Parameter:** Color [Green]

Linear Move



Move the gripper to the position at which it is to deposit the workpiece.

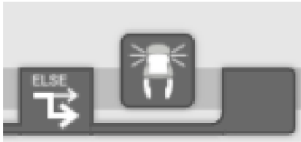
Release



Release the workpiece.

- **Parameter:**  
Direction [OUTER DIAMETER]  
Wait for command to complete [YES]

ELSE Light Band



Set the color of the light band to red.

- **Parameter:** Color [Red]



**SCHUNK SE & Co. KG**  
Toolholding and workholding | Gripping Technology |  
Automation technology

Bahnhofstr. 106 - 134  
D-74348 Lauffen/Neckar  
Tel. +49-7133-103-0  
Fax +49-7133-103-2399  
info@de.schunk.com  
schunk.com

Folgen Sie uns | *Follow us*



Wir drucken nachhaltig | *We print sustainable*