



## Quick start guide

# MATCH Comfort App

### Note

The Quick Start Guide were originally written in German. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

### Published by

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# 1 Notes on Quick Start Guide

This quick start guide was originally written in German. It provides important information regarding your first contact with the product and its installation. The quick start guide is intended for experienced users in the field of automation technology. Detailed information can be found in the documentation at [www.schmalz.com](http://www.schmalz.com) or via the QR code.

This information makes no claim to be exhaustive.

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## 2 Hardware Required for Using the App

The following hardware components are required to use the full range of functions of the end-of-arm ecosystem MATCH:

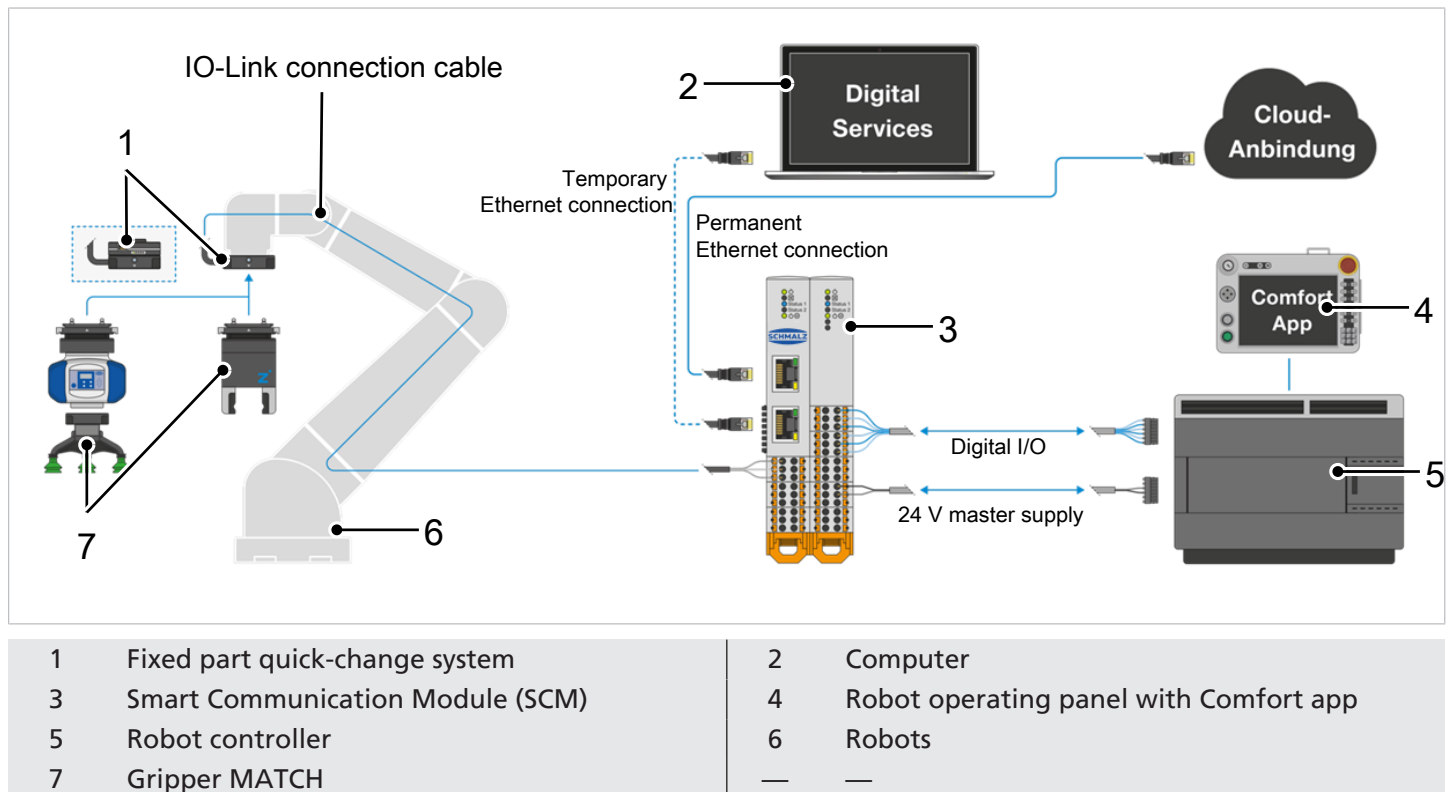
- SCM DIO 24V DC MATCH (operating instructions no. 30.30.01.02782)
- Quick-change module RMQC UR RS-485 FD LED-B MATCH, part no. 10.08.09.00010 (operating instructions 30.30.01.02732)
- Quick-change module RMQC 50 UNI IOL M12-5 MATCH, part no.: 10.08.09.00006 or RMQC 50 UNI IOL LED-B M12-5 MATCH, part no.: 10.08.09.00007 (operating instructions 30.30.01.02732)
- ECBPi 24V DC MATCH (operating instructions no. 30.30.01.02702) or ECBPMi 24V DC MATCH (operating instructions no. 30.30.01.02780)
- Station 150x110x22 MATCH (optional)

## 3 Checking the Delivery

1. Compare the entire delivery with the supplied delivery notes to make sure nothing is missing.
2. Damage caused by defective packaging or occurring in transit must be reported immediately to the carrier and J. Schmalz GmbH.

## 4 Mounting

### 4.1 Overview of the Overall System



Before the IO-Link gripper is controlled by the SCM, the gripping application must be trained in the SCM. To do so, download the HMI software and install it on a Windows PC.

### 4.2 General Mounting Information



#### **WARNING**

**Risk of injury due to the unexpected movement of the plant or machine in which the product is to be installed.**

Risk of injury

- ▶ Switch off the machine's power supply before performing any work.
- ▶ Secure the machine against unintentional activation.
- ▶ Check the machine for possible residual energy.



#### **CAUTION**

**Risk of injury due to the unexpected movement of the product while connecting the power supply.**

Risk of injury

- ▶ Switch off the product's power supply before performing any work.
- ▶ Secure the power supply against unintentional activation.
- ▶ Check the product for possible residual energy.



## ⚠ CAUTION

### Risk of getting caught by the connection cable when the robot moves.

Injury due to limbs or hair getting caught.

- ▶ Route the connection cable as close to the robot arm as possible.
- ▶ Avoid the danger zone.

The product must be mounted on a suitable screw-on surface that meets the requirements for evenness.

The permissible unevenness is: 0.03 mm

- The mounting bolts are not included in the scope of delivery.
- Strength class for the mounting bolts:  $\geq 8.8$  (DIN EN ISO 4762)
- You must switch off the power supply before mounting, installation and maintenance work.
- Refer to the specifications provided by the relevant robot manufacturer for the tightening torque of the mounting bolts.  
Schmalz also recommends verifying the permissible load capacity of the required screw connections in accordance with VDI 2230.

In high ambient temperatures, the product must be mounted on heat-dissipating materials. The service life of the product may be reduced if it is continuously operated under very high ambient temperatures and with rapid clock cycles.

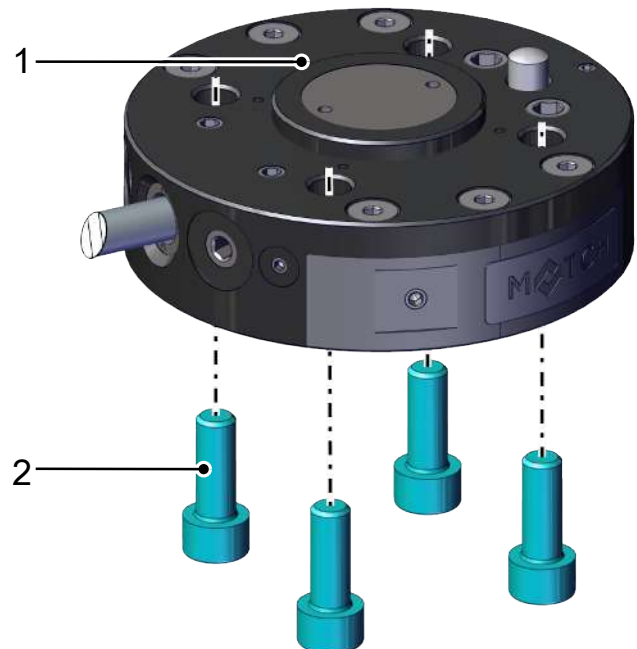
## 4.3 SCM Module

The SCM module is intended to be mounted on a conventional DIN rail with a width of 35 mm. The mounting position can be upright on the DIN rail or suspended (DIN rail installed in the control cabinet). Maintain a clearance of 5 cm for air circulation on the side of the SCM module ventilation slots.

## 4.4 Quick-Change Module RMQC on Robot

Follow the work steps below during mounting:

- ✓ The customer supplies the required number and type of mounting bolts.
1. Insert the product into the robot arm with the connection (1).
  2. Loosely attach the mounting bolts (2).
  3. Fasten the mounting bolts (2) cross-wise with the tightening torque specified by the robot manufacturer or in accordance with VDI 2230.



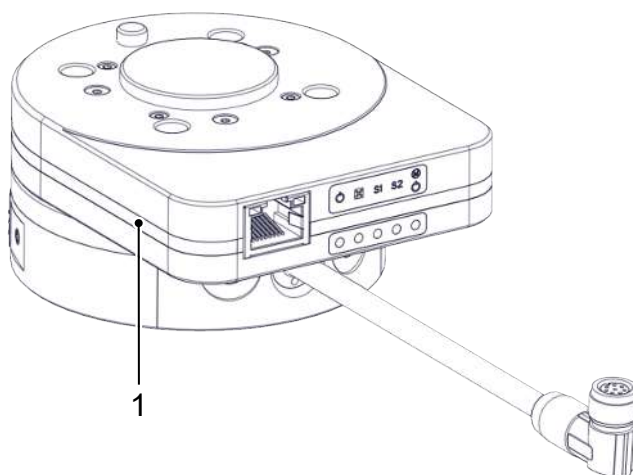
## 4.5 "IO-Link" RMQC Part No. 10.08.09.00010

For robots with an RS485 interface, the fixed component is available with the part number 10.08.09.00010.

The integrated Smart Communication Module (SCM) converts RS485 signals into IO-Link data and can therefore be used only for UR robot applications (RS485 interface).

There is an integrated LED display at position (1). The function of the LED display is identical to the IO-Link LED ring LED Display.

You can use the PC to access the SCM via the Ethernet connection and use the Schmalz or GuideZ software.



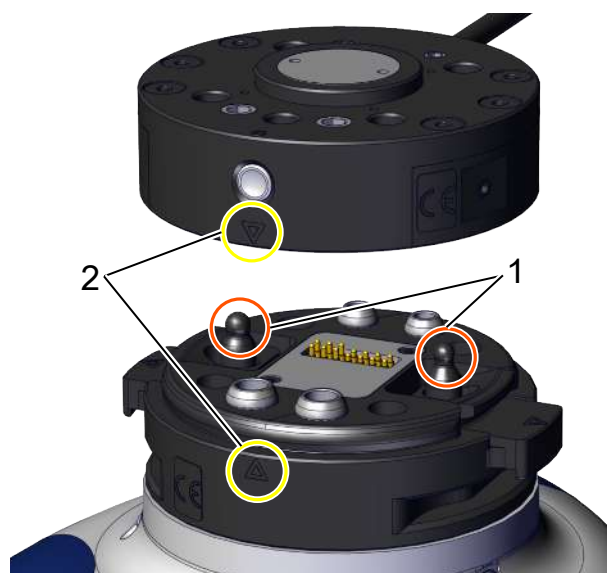
8-pin M8 socket	Pin	Litz wire color	Function
	1	White	Communication line RS485+
	2	Brown	Communication line RS485-
	3	Green	OUT2, "part present"/IO-Link signal output
	4	Yellow	OUT3, freedrive
	5	Gray	U, +24 V supply voltage
	6	Pink	Digital IN1
	7	Blue	Digital IN2
	8	Red	GND, ground

- Secure the voltage supply.

## 4.6 Mounting of RMQC Fixed Member and RMQC Loose Member

### Anti-rotation guard (poka-yoke connection):

The different sized bolts (1) on the RMQC loose member as well as a marking (2) on the RMQC loose member and on the RMQC fixed member ensure safe mounting.



### Manual gripper change:

- ▶ Manually actuate (press) the locking mechanism on both sides of the RMQC loose member. Connect the RMQC loose member with the RMQC fixed member. The two markings (triangles) must point to each other. Then release the locking mechanism.



⇒ The RMQC fixed and loose members are locked together.

### Automatic gripper change:

In order to perform an automatic gripper change, the optionally available storage station is required.



- ▶ The quick-change module RMQC fixed member (on the robot arm) is moved onto the RMQC loose member in the storage station and automatically locked when it moves out of the storage position.

The RMQC fixed member is also separated from the RMQC loose member in the storage station.

Corresponding recesses (grooves) are provided in the RMQC loose member, which engage with the fork arms of the storage station. Due to the different heights of the grooves and fork arms, the RMQC loose member can only be moved into the storage station from one side; failure to do so may damage the storage station.

## 4.7 Electrical Connection

We recommend that you protect the device with a suitable miniature circuit breaker based on the expected current consumption and the cable cross-sections used.



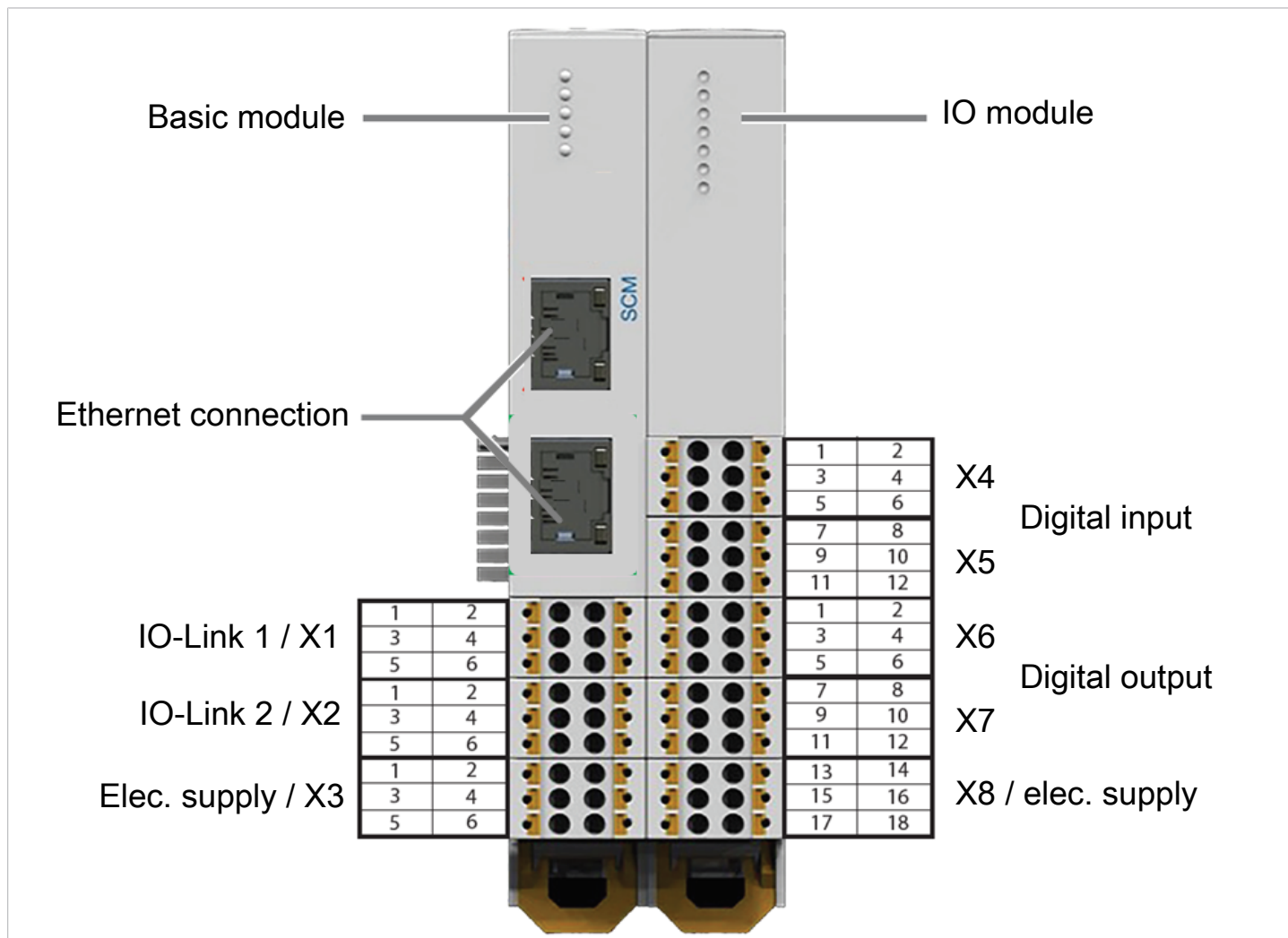
### NOTE

**PINs 5/6 are subject to currents higher than 10 A.**

Damage to the device

- ▶ Provide adequate fusing to ensure that the device is subjected to a maximum of 10 A.

The supply voltage for the sensors ( $U_s$ ) and the supply voltage for the actuators ( $U_A$ ) are electrically isolated and can come from different sources.



#### 4.7.1 Voltage Supply for the Basic Module

PIN	Function	Explanation
X3 - 1	24 V actuator voltage	Actuator voltage of the grippers
X3 - 2	GND actuator voltage	Ground for the actuator voltage of the grippers
X3 - 3	24 V signal IN	Voltage supply for the SCM module and the signal voltage of the grippers
X3 - 4	GND signal IN	Ground for the SCM module and the signal voltage of the grippers
X3 - 5	24 V signal OUT	"Signal voltage output" to supply the IO module
X3 - 6	GND signal OUT	"GND output" to supply the IO module

#### 4.7.2 Voltage Supply for the IO Module

PIN	Function	Explanation
X8 - 17	24 V	Signal voltage for IO module supply
X8 - 18	GND	GND for IO module supply



4.7.3 Standard Wiring between Robot and SCM Inputs and Outputs:

SCM I/O	Function	Robot I/O
PIN inputs X4 and X5		
1	Release	DO0
2	Grip	DO1
3	Reset   Error+warning	DO2
4	MotorOn	DO3
5	Homing   FreedriveEnable	DO4
9	WP_Bit0	DO5
10	WP_Bit1	DO6
PIN Outputs X6 and X7		
1	IsReleased   PartDetached	DI0
2	IsGripped   PartPresent	DI1
3	IsClosed   FreedriveDesired	DI2
4	OnUndefinedPos   IsReady	DI3
5	Error	DI4
6	MotorOn	DI5
9	Act_WP_Bit0	DI6
10	Act_WP_Bit1	DI7

4.7.4 IO-Link Connection between Quick-Change Module RMQC and IO Module SCM:

SCM I/O	Function	Robot I/O
PIN X1		
1	C/Q IO-Link communication	5-pin M12 connector
2	DI (not currently in use)	
3	P-24V actuator voltage of gripper	
4	P-GND ground to actuator voltage	
5	S-24V signal voltage of gripper	
6	S-GND ground to signal voltage	

5 Start of Operations

If the SCM module is wired correctly, the desired grippers are connected and the voltage supply is switched on, the device starts up.

The POWER LEDs light up green, then status 1 and 2 on the basic module flash while the grippers are searched for (depending on the last saved configuration for the SCM module).

5.1 Connecting to the SCM Module

Connect the PC to the SCM via an Ethernet connection (> see chap. 4.7 Electrical connection, page 6).

Default settings:

- IP: 10.0.0.5
- Netmask: 255.0.0.0

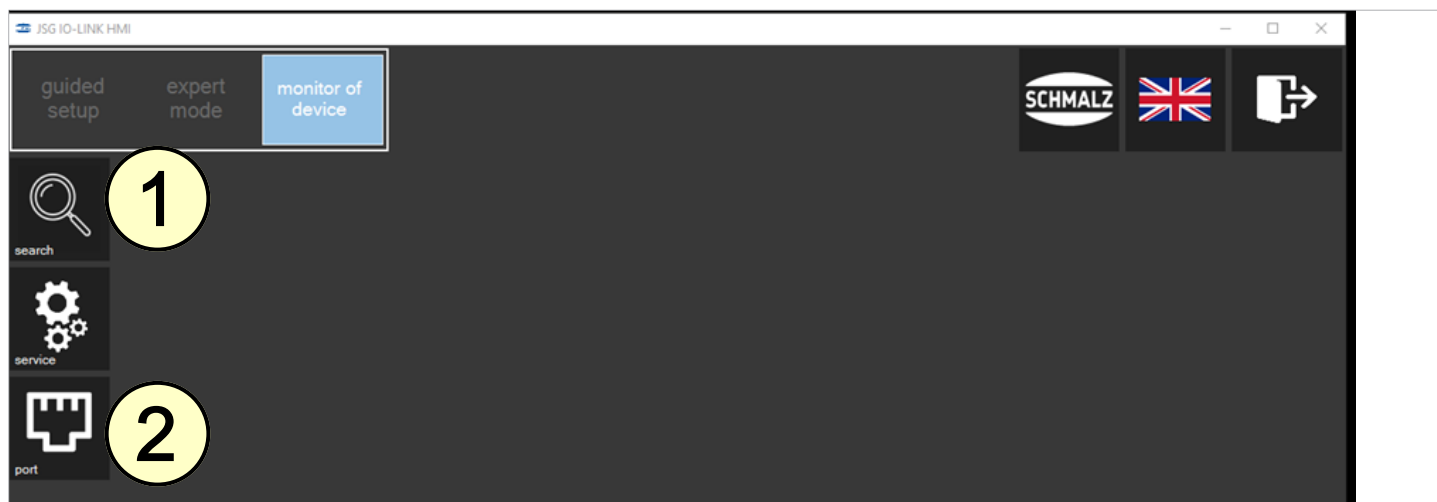
The Schmalz HMI software JSG\_IO\_Link\_HMI in version 2.0.1.3 or higher must be installed on your PC.

The three control levels are located in the top left corner of the software window:

- **[GUIDED SETUP]** is a configuration level where the gripper is taught-in for the work-piece
- **[EXPERT MODE]** is a level where you can access all the gripper data
- **[MONITOR OF DEVICE]** is a diagnostics and monitoring level for monitoring the grippers during operation



- (1) You can click the **[MAGNIFYING GLASS]** (search) button to search for **connected** devices.
- (2) You can click the **[PORT]** button to switch the two-port operating mode on the SCM module.



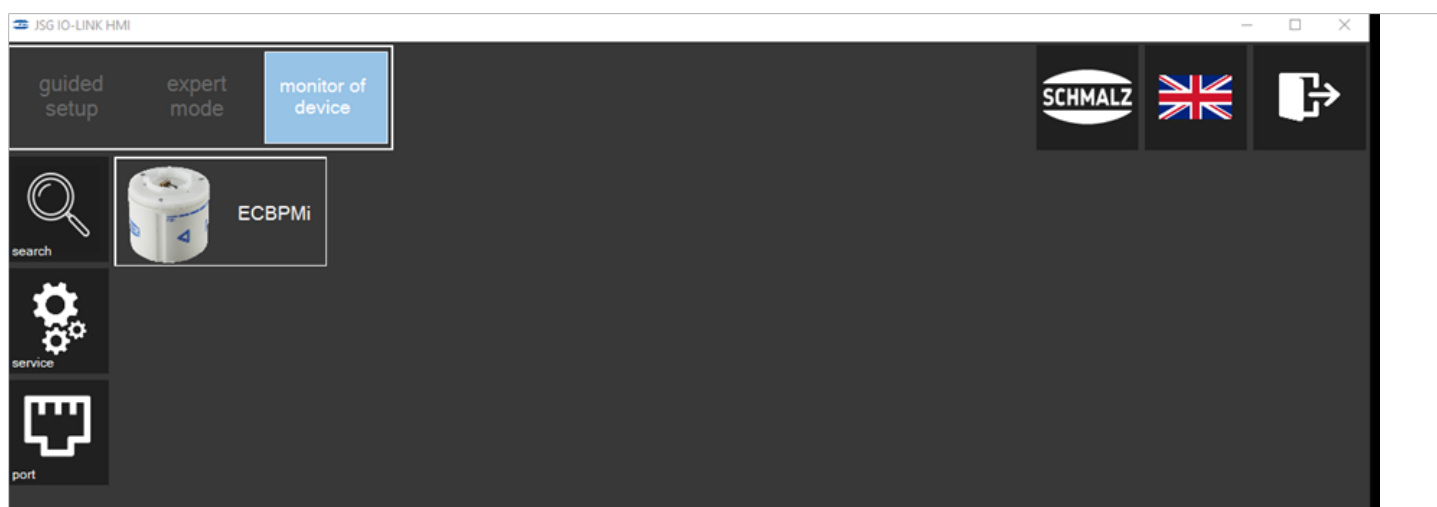
#### See also

📄 Electrical Connection [ ] 6]

## 5.2 Selecting the Gripper in the "Guided Setup"

All the found devices are displayed as tiles.

Click your required gripper to start the guided setup function and, in this example, teach in the ECBPMi gripper for the workpiece.



## 5.3 Configuration

The vacuum suction cup must be correctly positioned (in the ideal position) for the configuration to be successful:

- It is positioned on a clean surface.
- It is resting fully on the workpiece.
- There is no leakage.

The configuration window initially displays important product information, such as the part number.


Now follow the instructions on the screen.

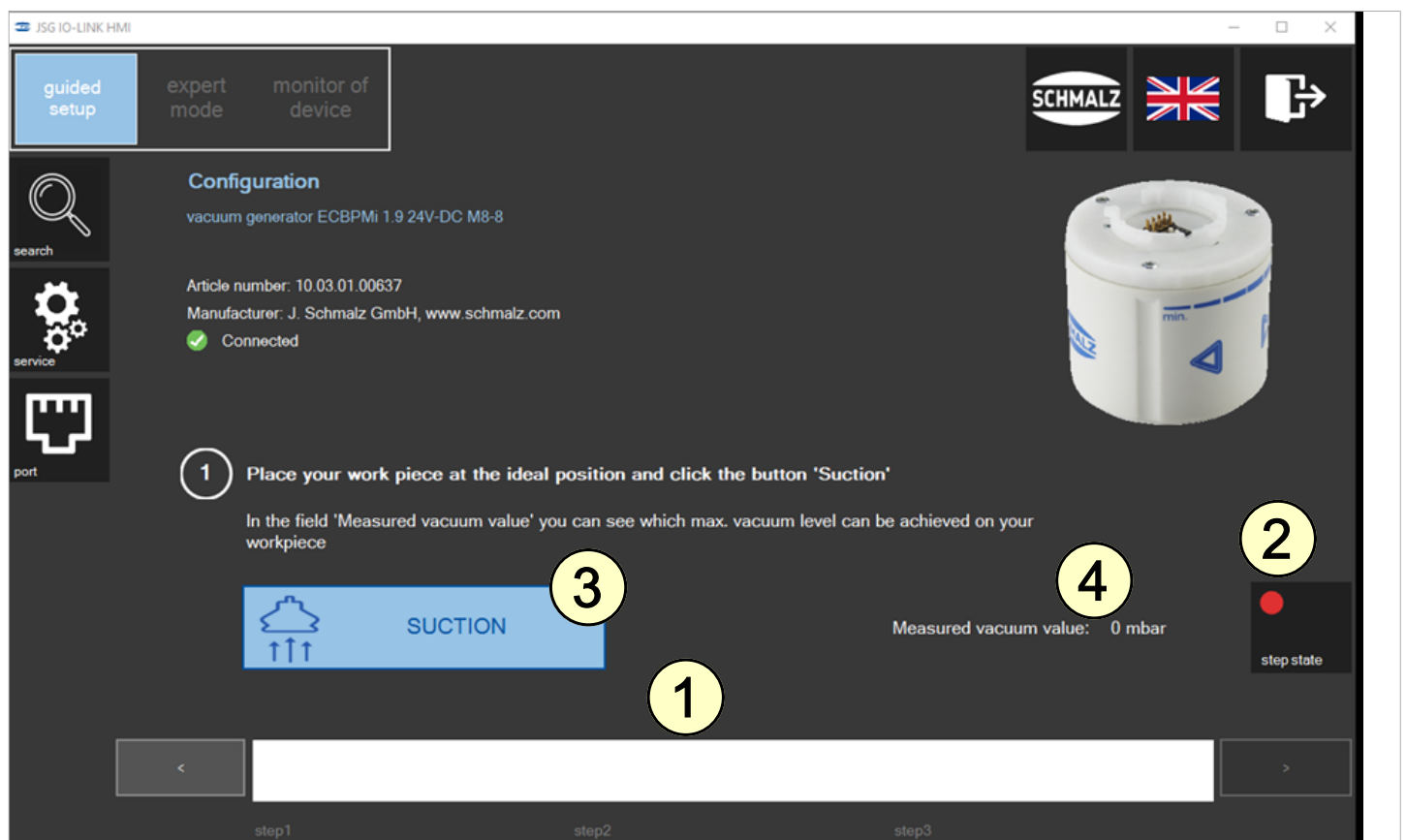
In the "guided setup," progress is displayed via the white bar (1) in the lower area of the window.

In the left-hand side of the window, the green "Connected" checkmark shows whether the actuator voltage is connected.

1. Place your workpiece in the ideal position and click the "[SUCTION]" button (3).

(4) At this point, the vacuum value measured by the product is displayed on the workpiece.

If the value is 100 mbar or more, the indicator in the bottom right corner of the window (2) turns green and there is a holding force. You cannot click the  button to proceed to the next step until the indicator (2) lights up green.



The current measured vacuum value (live) is displayed here (5).

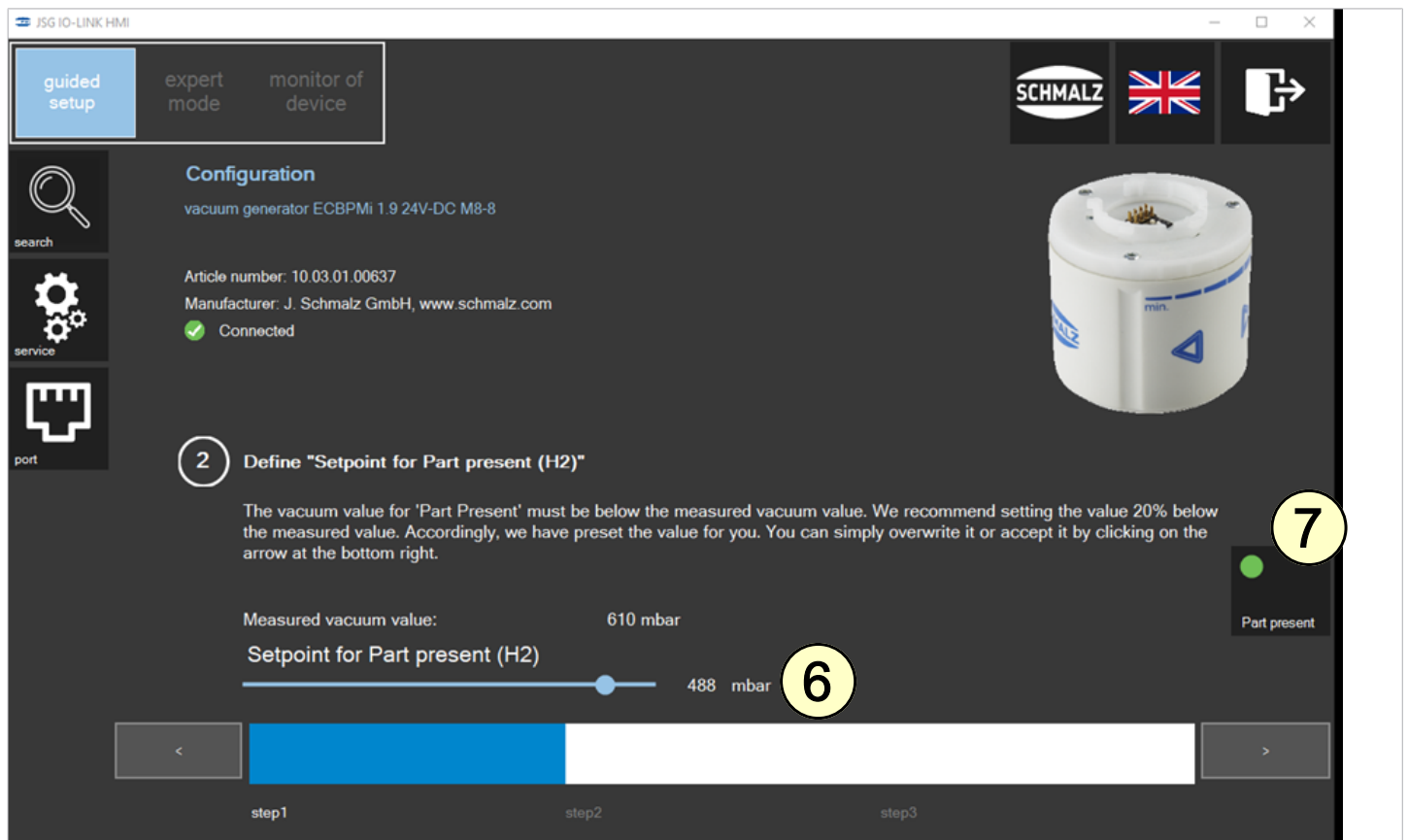


2. Define the vacuum value for the "Setpoint for Part present (H2)" (6).

The vacuum value H2 can be changed by overwriting it, using the slider or using the arrow keys on the keyboard.


As soon as the "Part present" indicator (7) lights up green, the workpiece is detected as picked up. When you click

the  button to go to the next step, the set vacuum value H2 is applied.



Suction is deactivated following the switch to step 3.

Pressing "[RELEASE]" opens the vacuum circuit from the gripper to the atmosphere and the workpiece is put down. The indicator (8) switches to green below 10 mbar.

3. Click the "[RELEASE]" button to release the workpiece from your gripper and complete the configuration by clicking the arrow in the bottom right corner .




JSG IO-LINK HMI


guided setup


expert mode


monitor of device

SCHMALZ





  
search

  
service


  
port


Configuration

vacuum generator ECBPMi 1.9 24V-DC M8-8

Article number: 10.03.01.00637

Manufacturer: J. Schmalz GmbH, [www.schmalz.com](http://www.schmalz.com)

 Connected




3

Detach the workpiece from your gripper with 'Release' and complete configuration at the bottom right.



RELEASE



step1

step2

step3

 step state

## 5.4 Checking the Settings

The set parameters are not yet saved in the relevant recipe at this point.

The workpiece training for the gripper is finished when the data is stored in the relevant recipe.

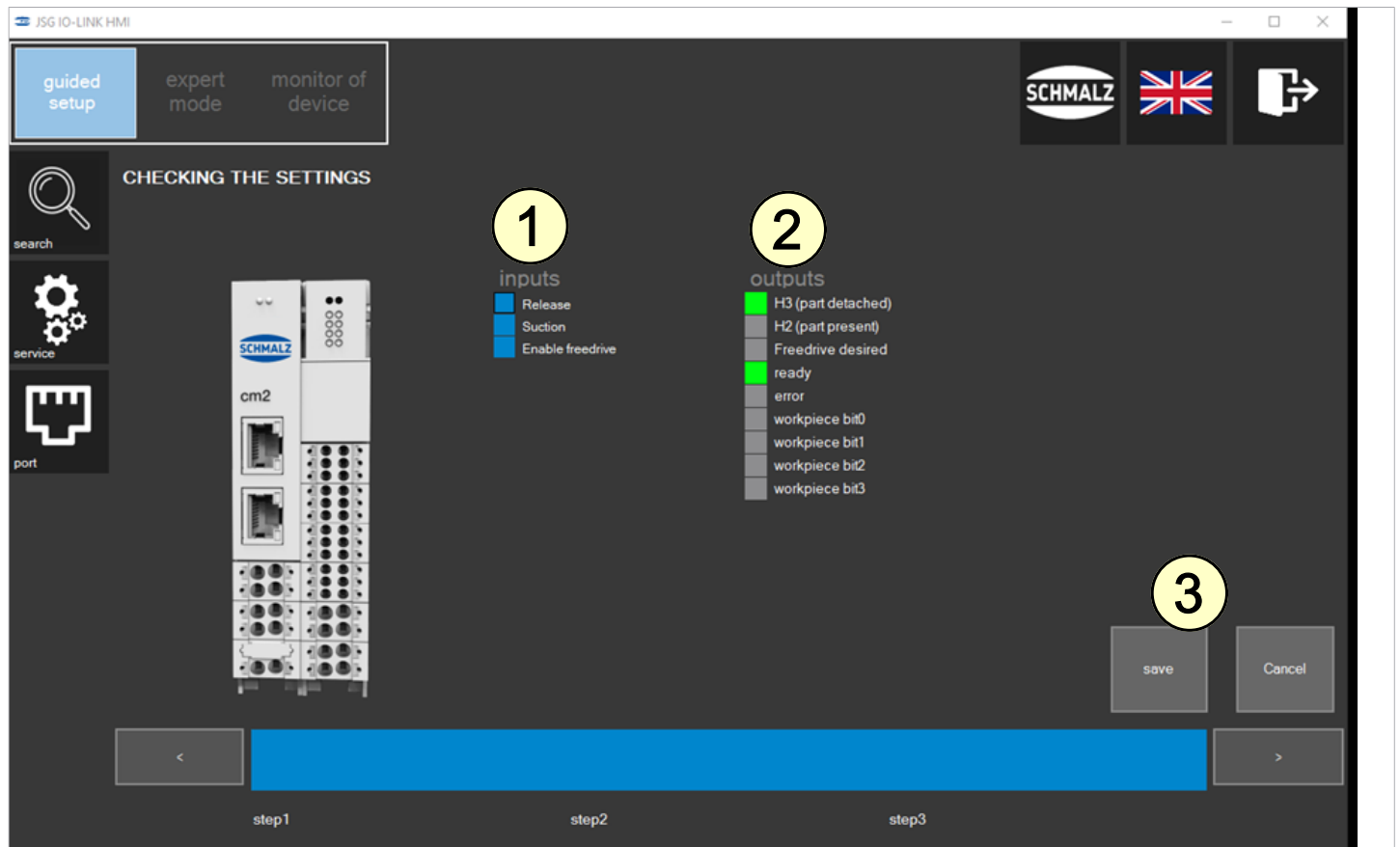
The settings can also be checked without the actual controller I/Os.

Input field (1):

- ▶ Click the blue fields to set a command.

Output field (2):

- ▶ The fields show the relevant gripper status.
- ▶ You can click "[SAVE]" (3) to open the recipe window.



## 5.5 Saving

The recipe can now be saved in the SCM module.


- ▶ Select the required workpiece number (1) and click the "[SAVE WP]" button (2) to save the data.

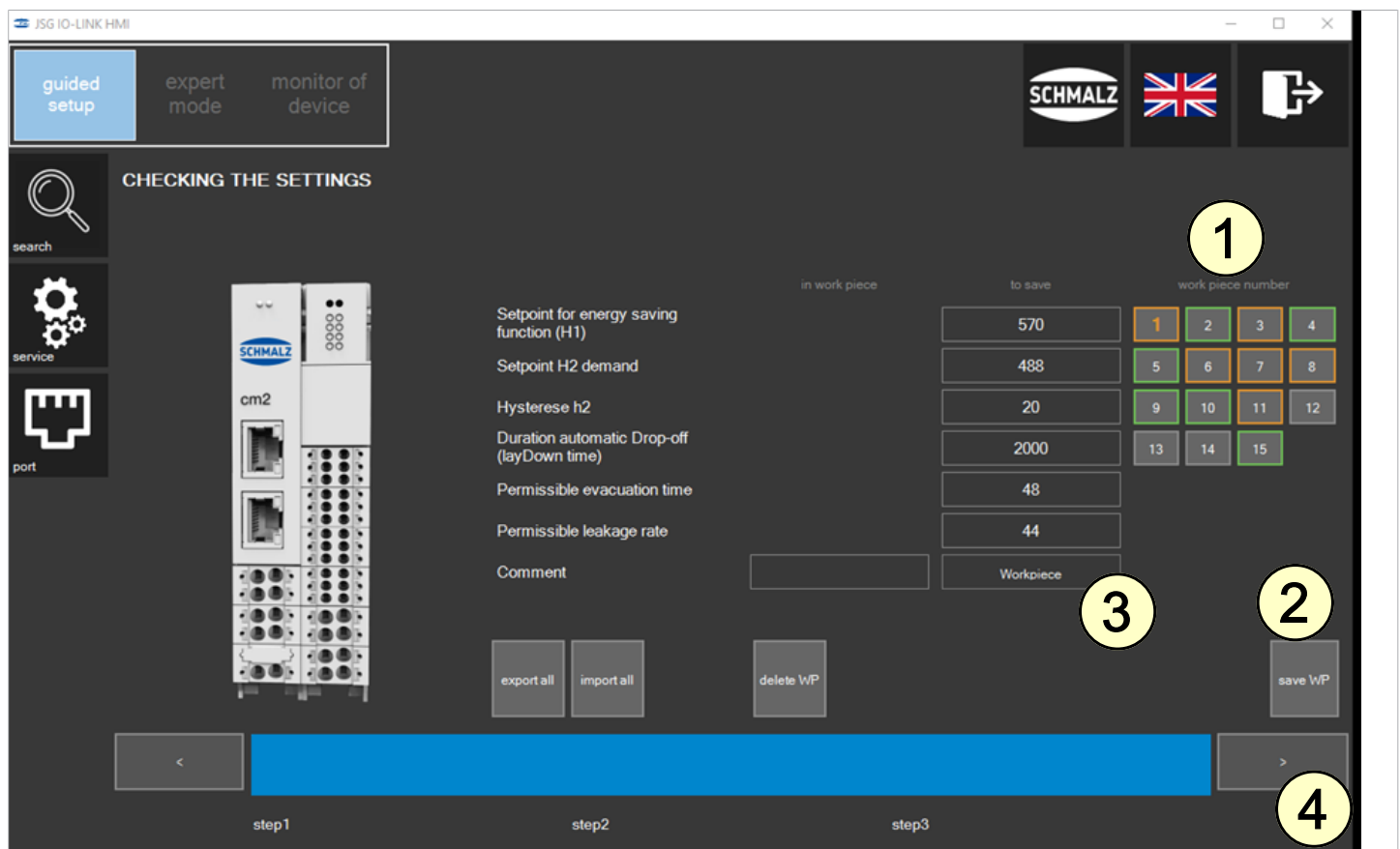
The selected workpiece number is highlighted in color and in bold.

Workpiece numbers that are highlighted in green are assigned with configurations from the device that is currently connected. Workpiece numbers that are highlighted in orange are assigned with the configurations of a device that is not currently connected. Numbers highlighted in white are free. Each recipe can be overwritten at any time.

With Schmalz devices (e.g. ECBPi, ECBPMi, RECB), workpiece recipes are generally saved in the IO-Link parameters of section P0.

In the comment field (3), you can provide a name for the recipe.

You can click the  button (4) to start the Guided Setup from the beginning and teach in another workpiece.



## 6 Installing the Software

The Comfort app, which is tailored to the robot manufacturer, makes it possible to actuate and operate the gripper conveniently and directly using the respective robot operating panel. Setup mode and all necessary commands for smooth operation in Automatic mode.

**Software status:** Polyscope (UR robot software) must have the following software version:

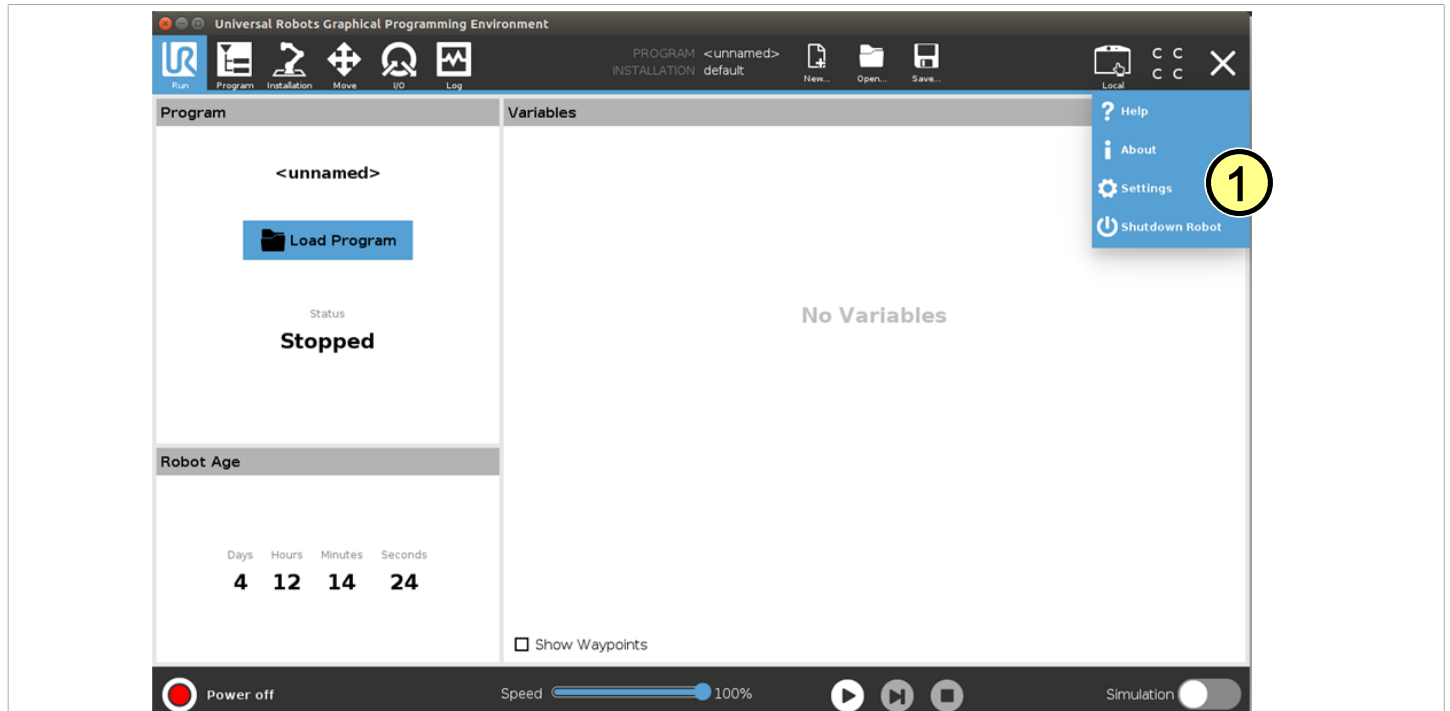
**e series:** Version 5.6 or higher

**CB series:** Version 3.12 or higher

Update the robot software, if necessary, at: <https://www.universal-robots.com/download/>



(1) Press the "Menu > Settings > System > URCaps" menu tab



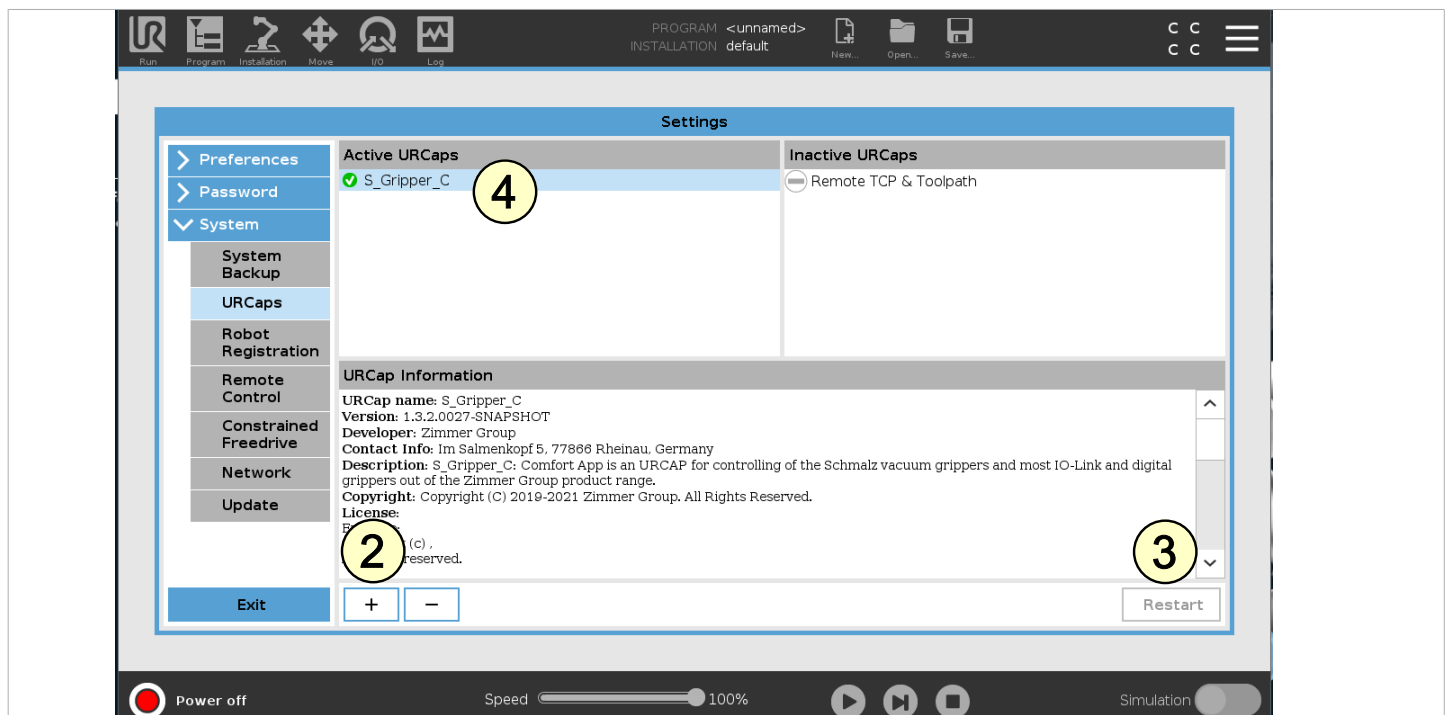
With the system switched on, insert the USB stick into the programming unit

(2) Select "+" to install the new URCap

Select USB Stick > URCap > "Schmalz\_ComfortApp.1.4.1-SNAPSHOT.urcap" to install and confirm with "Open."

(3) Press "Restart" and wait for the system to restart

(4) The URCap is activated after restarting



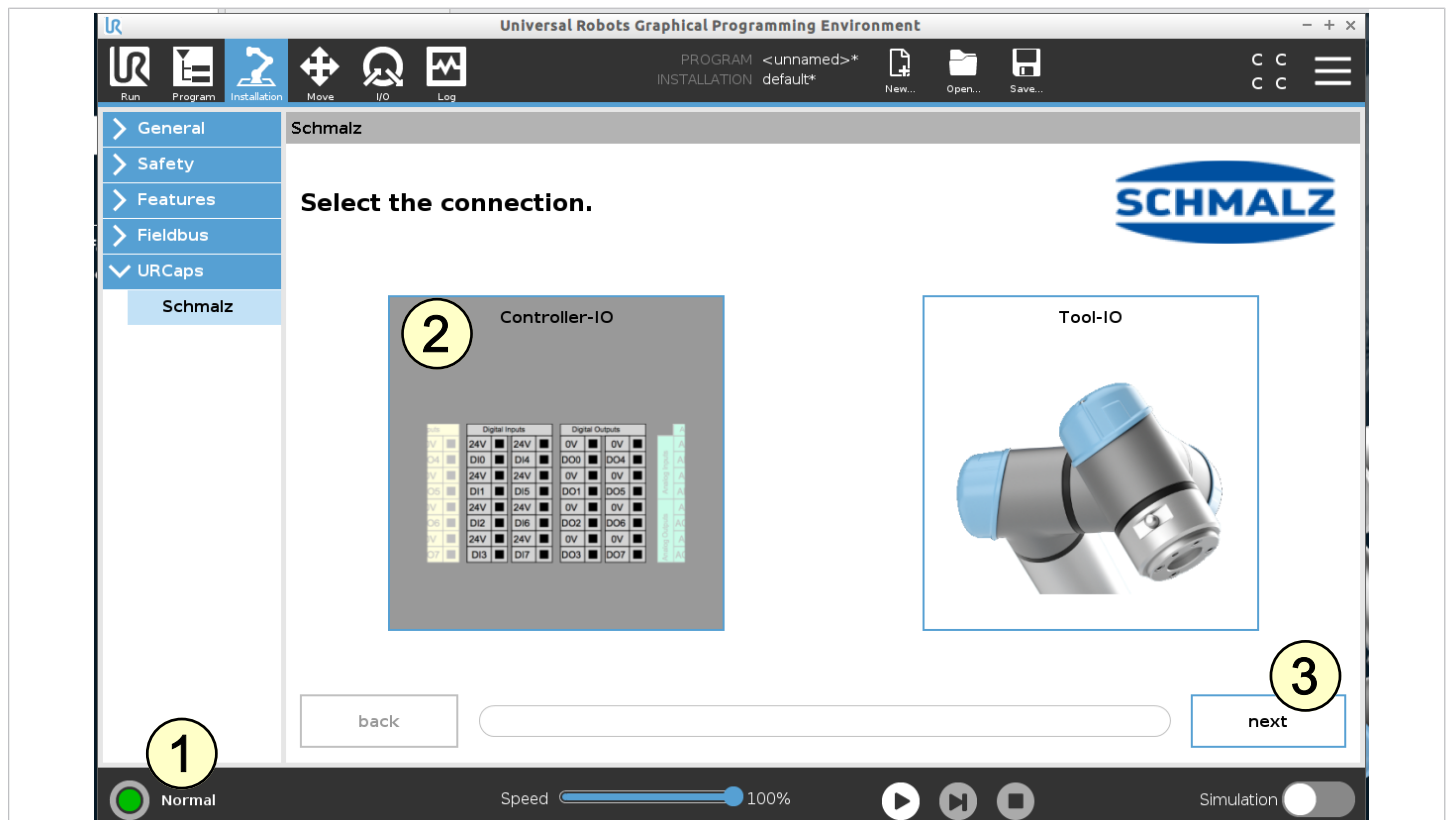
## 7 New Gripper Configuration

Before you can start, the URCap must be configured.

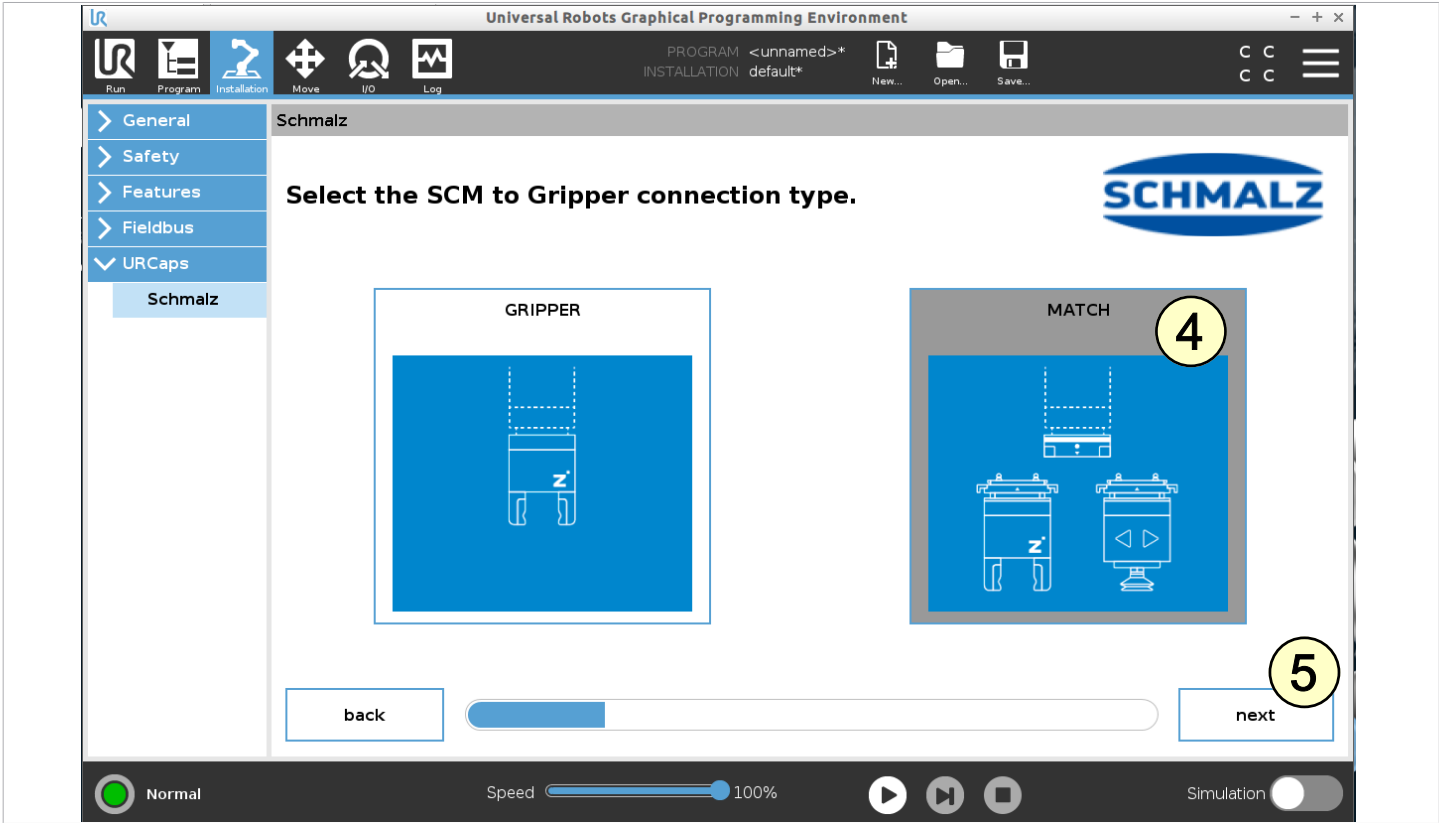
- ✓ As a minimum, workpiece recipe no. 1 in the SCM must be assigned a preconfigured workpiece.
- ✓ The complete MATCH system is mounted on the robot (> see section 4/5)
- ✓ (1) The robot must be fully operational (robot status lights up green)

(2) Press the "Installation > URCaps > Schmalz" menu tab and select the communication type. Select "**Controller IO**" for the hardware configuration described with the SCM and digital inputs and outputs of the robot.

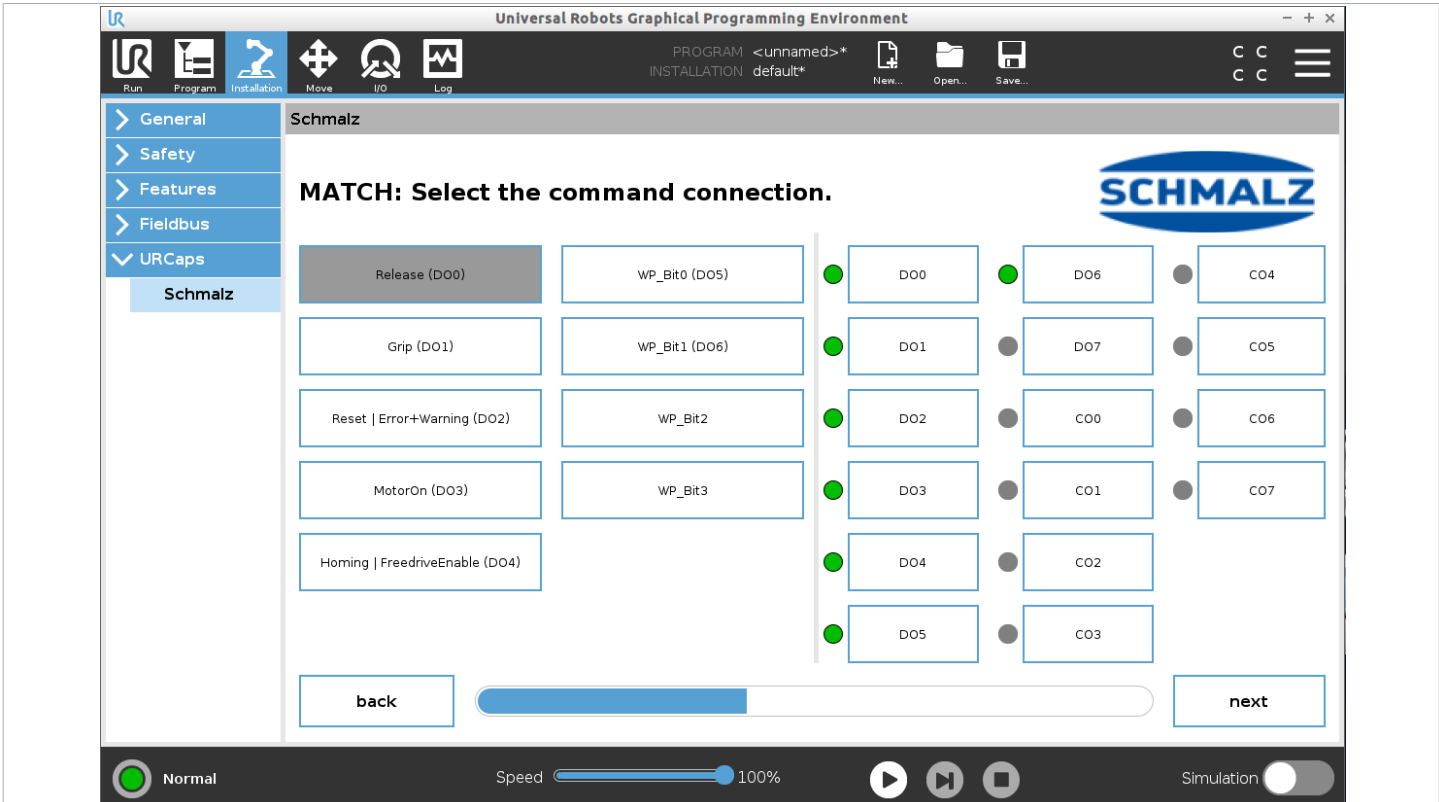
(3) Click "Next" to go to the next configuration step.



- (4) Select the connection type between the SMC and gripper.  
Select "MATCH" for connection with the quick-change system MATCH.
- (5)Click "Next" to go to the next configuration step.

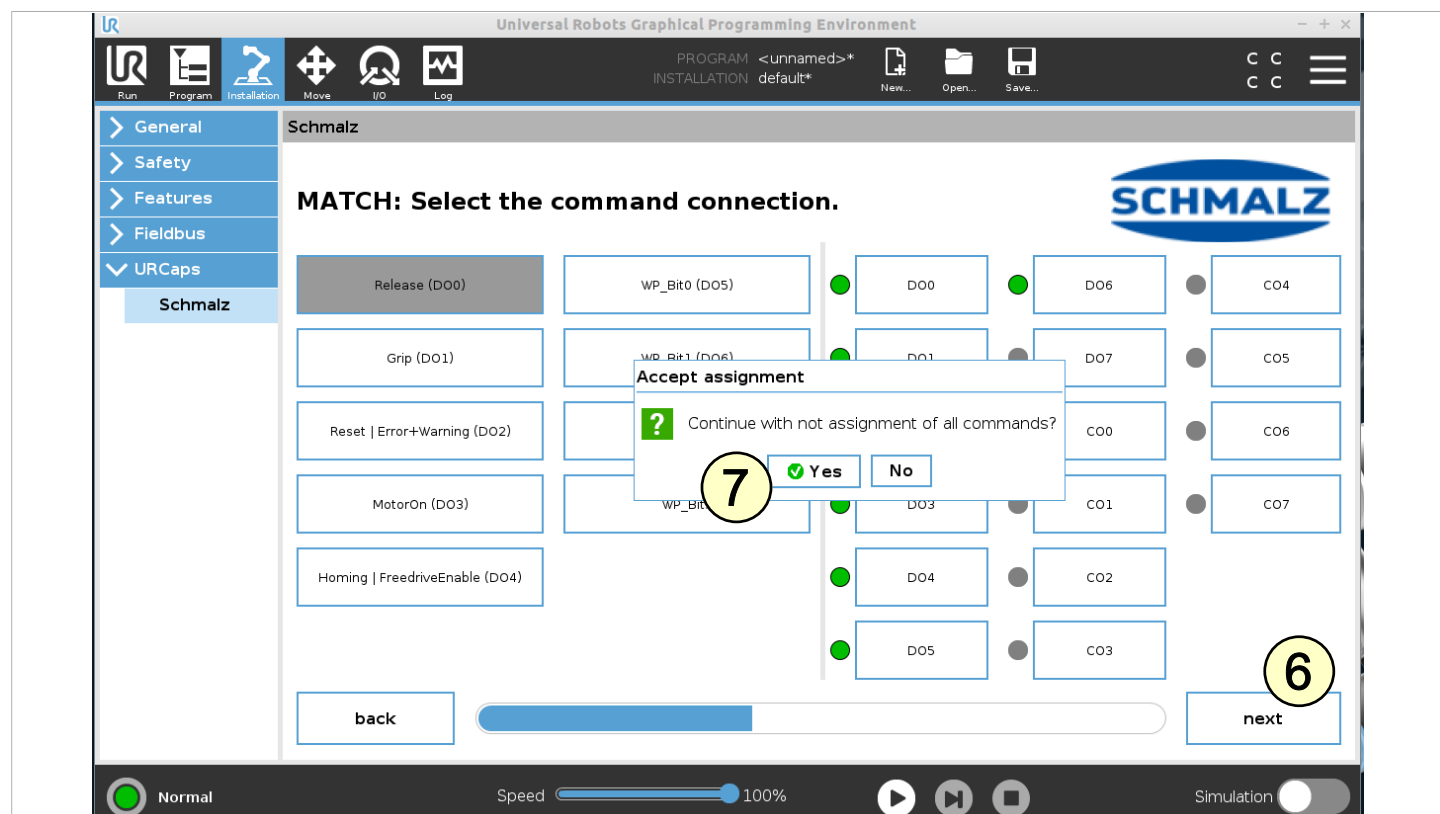


The assignment between the number of the digital robot output and the function of the digital SCM input can be established here. This setting must be made based on the wiring between SCM and robot IOs. The default assignment (section 5) is displayed on the start screen.

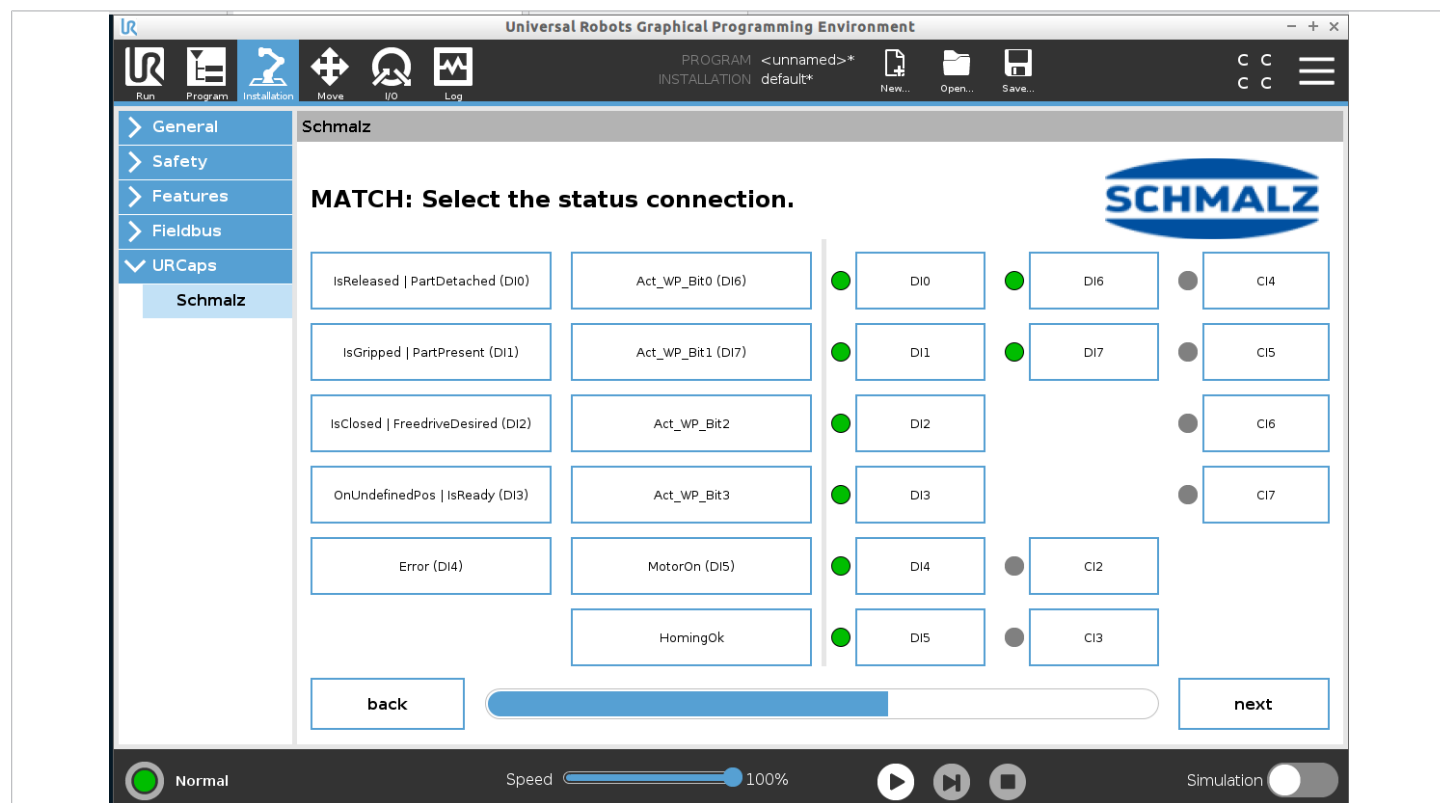


(6) If the wiring has been configured according to the standard assignment or has been adjusted accordingly, you can select “Next.”

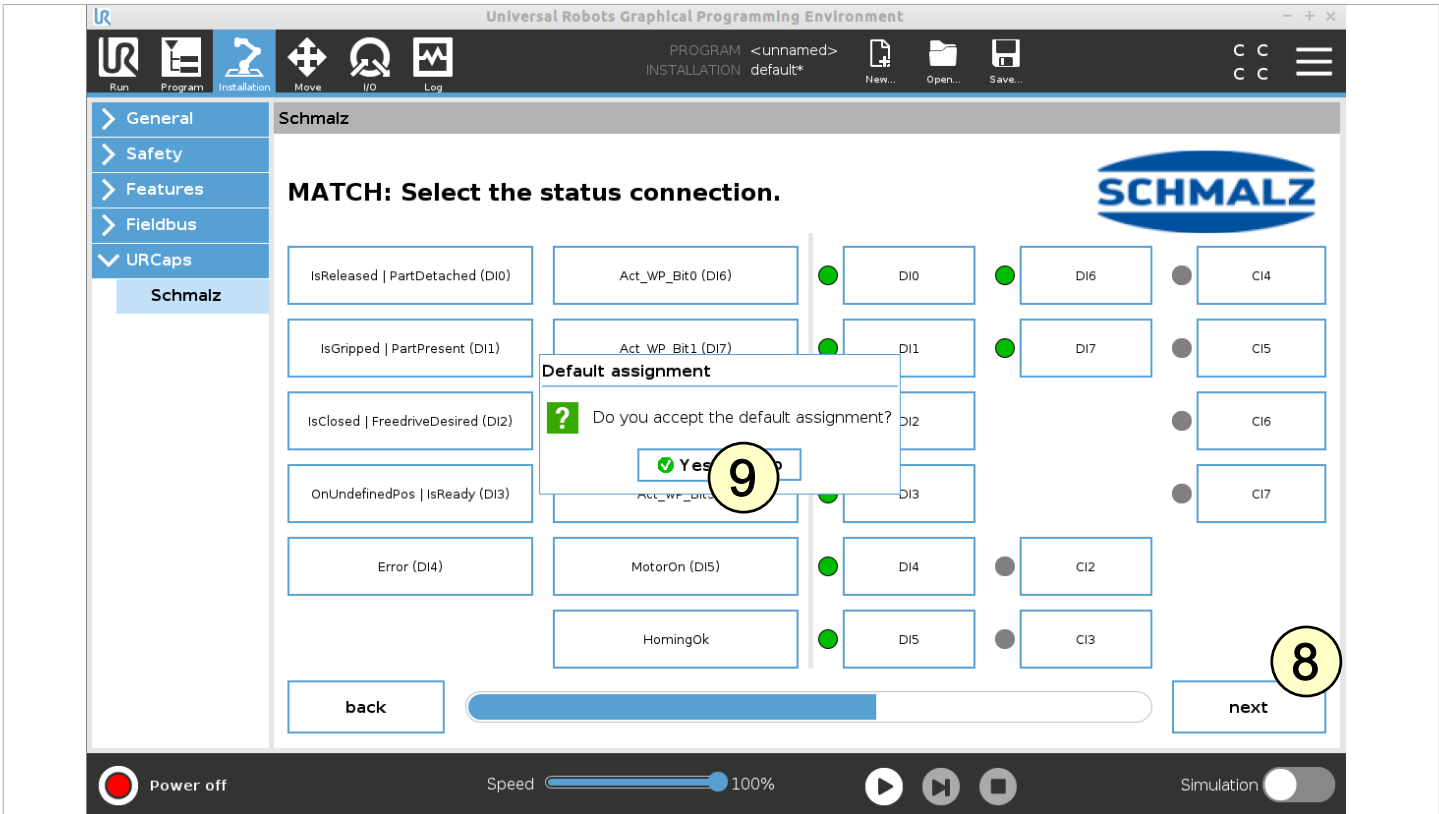
(7) Click on “Yes” to confirm and save the setting.



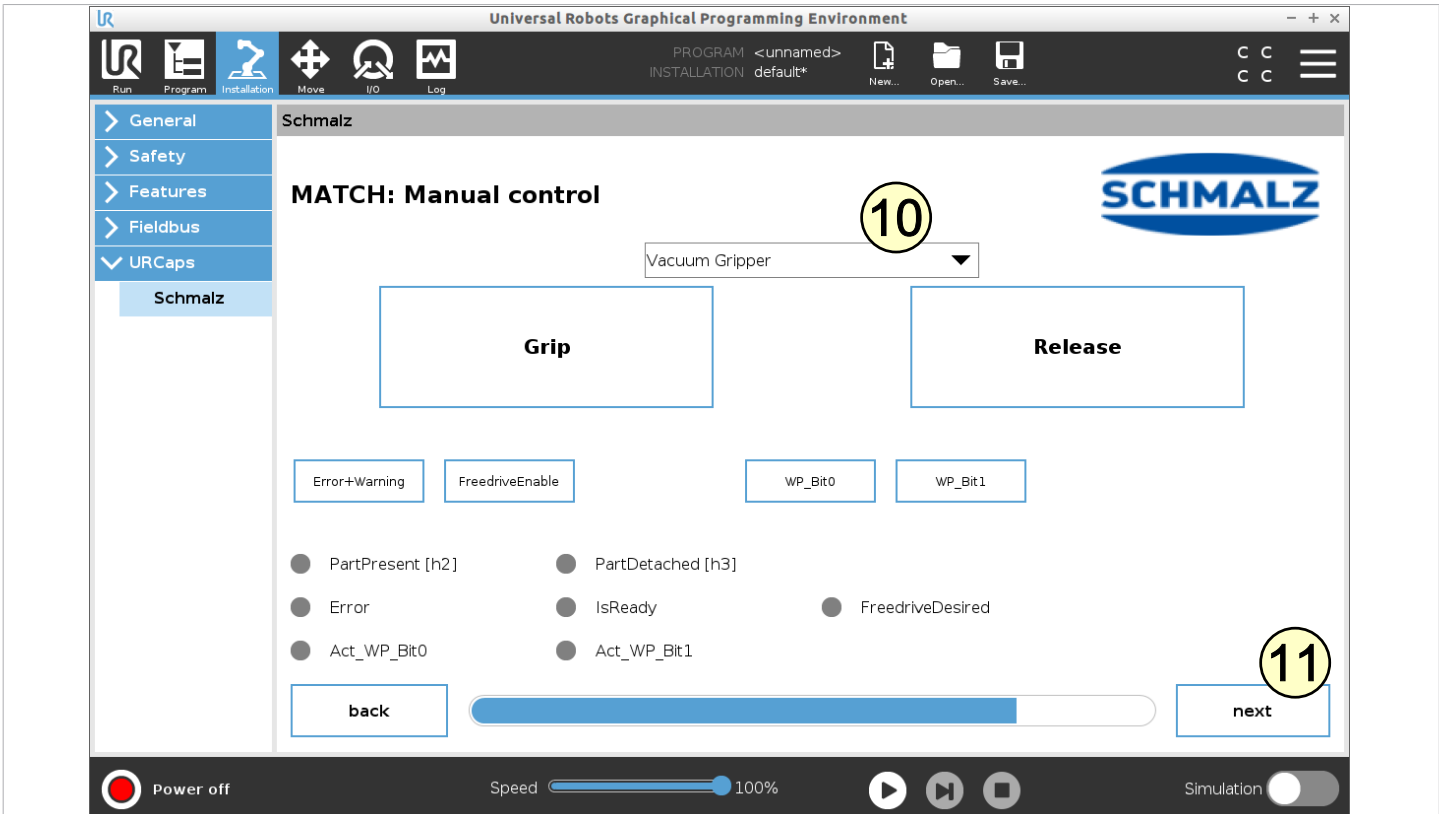
In the next step, the same process is repeated for the assignment between the number of the digital robot input and the function of the digital SCM output.



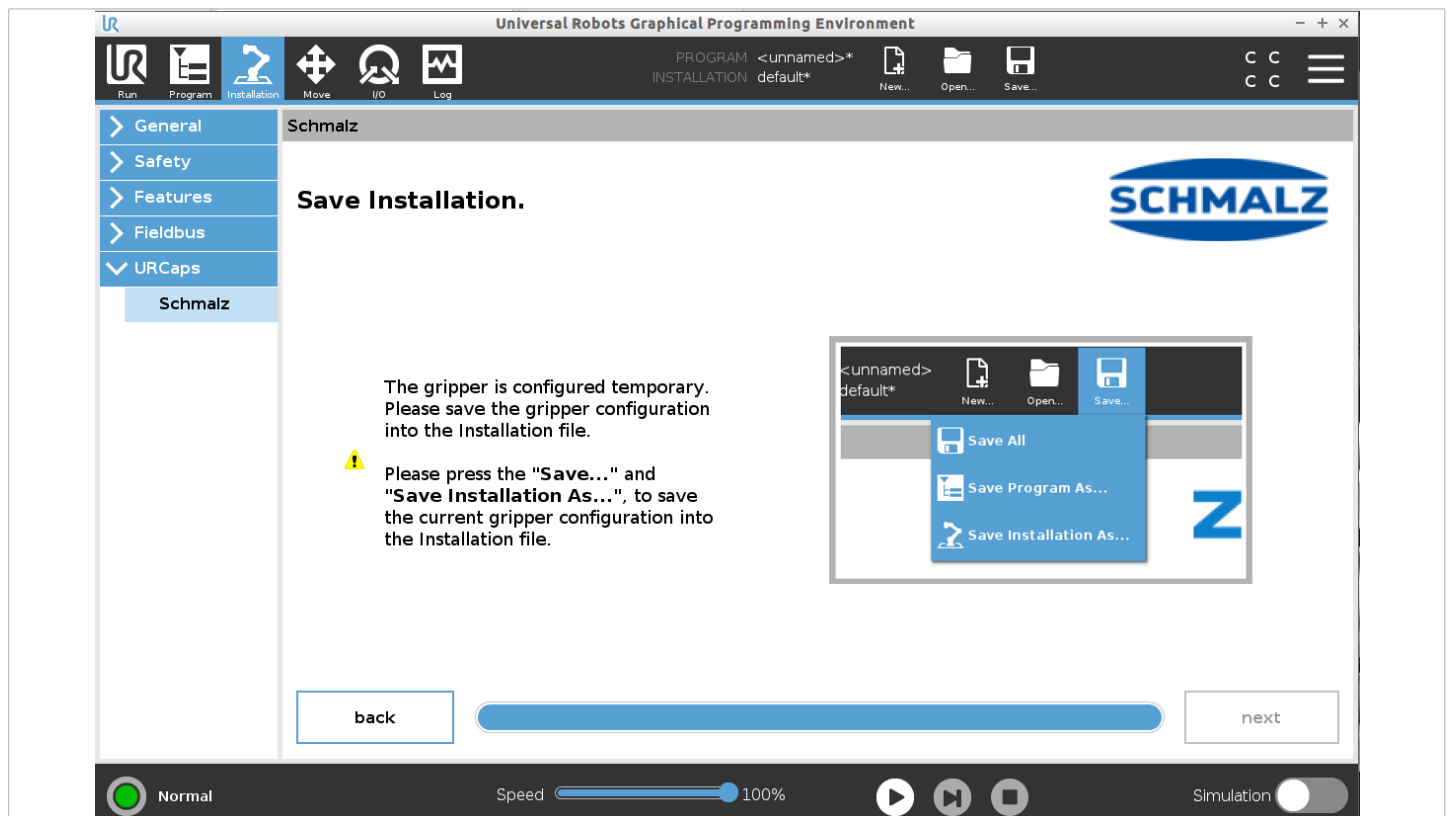
- (8) If the wiring has been configured according to the standard assignment or has been adjusted accordingly, you can select “Next.”
- (9) Click on “Yes” to confirm and save the setting.



- (10) For ECBPi / ECBPMi, select “Vacuum Gripper” as the gripper type. In this view, you can test the functions manually.
- (11) If all functions are available, click the “Next” button.



The device is now successfully set up. To save the settings, follow the instructions on the final configuration view.



#### Important:

- ✓ Before using the grippers, ensure that TCP and Payload are correctly set.
  - ▶ To do so, set the parameters for TCP and Payload configuration under the menu item "Installation > General > TCP."
- For more detailed technical data, refer to the operating instructions of the individual grippers.

## 8 Operation

- ✓ The robot is fully operational (robot status lights up green)

(1) Click the "Program" button

(2) Click "UPCaps"

(3) Select the "Schmalz" URCap

(4) Several of the following functions can be selected in the drop-down menu:

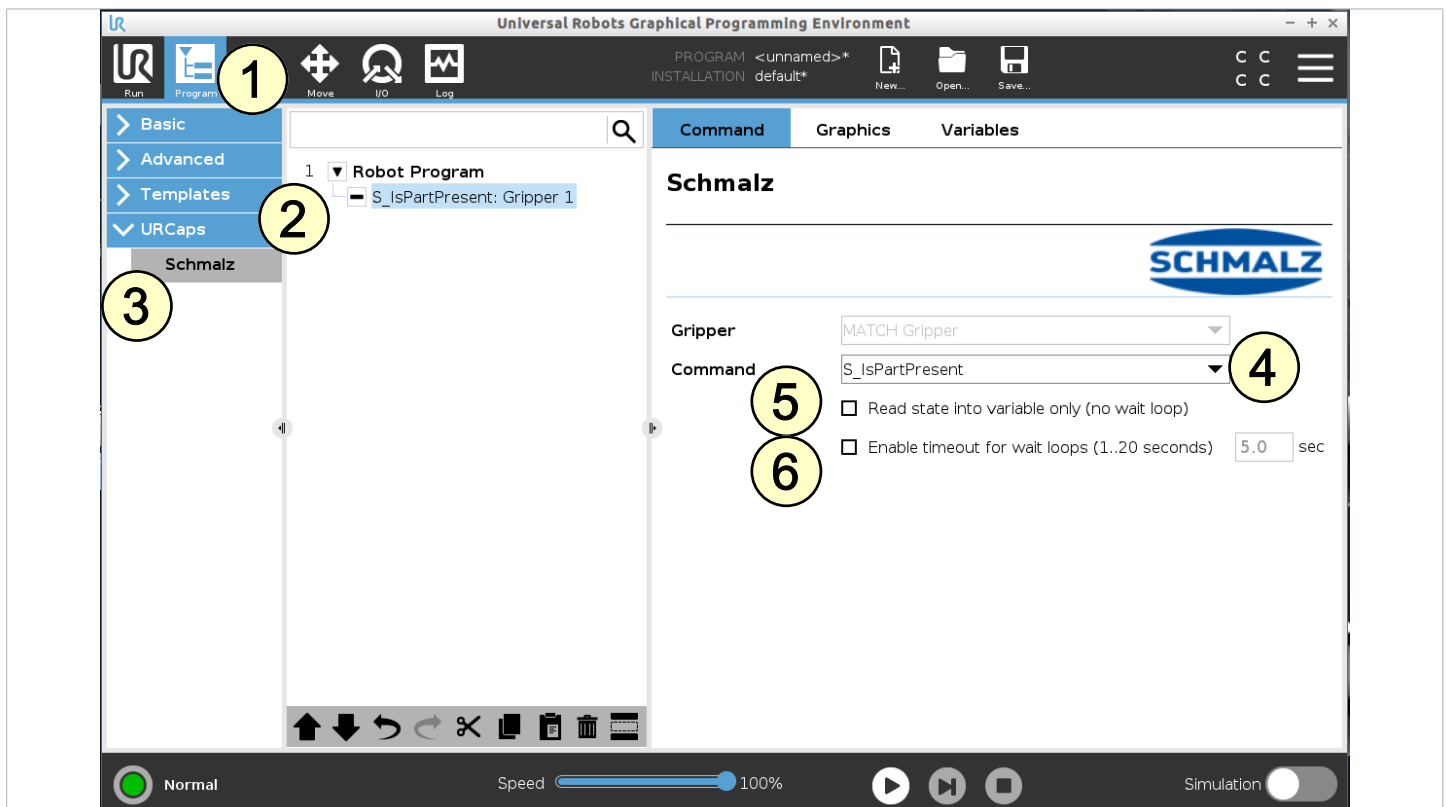
Command	Description	Gripper
S_Grip	Command for picking up the workpiece	All grippers
S_Release	Command for releasing the workpiece	All grippers
S_ErrorWarningOn	Command for activating the error or warning display	Vacuum grippers
S_ErrorWarningOff	Command for deactivating the display of errors or warnings, only errors are displayed	Vacuum grippers
S_Reset	Command for performing a reset on the gripper	Mechanical grippers
S_MotorOn	Command for activating the motor	Mechanical grippers
S_MotorOff	Command for deactivating the motor	Mechanical grippers
S_Homing	Command for performing a reference run	Mechanical grippers
S_MatchStartChange	Command for changing a gripper, sets all robot outputs to 0	Vacuum grippers
S_IsPartDetached	Checks that a workpiece that was previously picked up is fully deposited	Vacuum grippers
S_IsOpened	Checks whether the gripper jaws are completely open and ready to grip a workpiece	Mechanical grippers
S_IsPartPresent	Checks that a workpiece is picked up completely by exceeding the H2 vacuum limit value	Vacuum grippers
S_IsReady	Checks that the gripper is correctly adapted to the quick-change flange	Vacuum grippers
S_IsOnTeachPos	Checks whether the gripper jaws are in contact with the workpiece	Mechanical grippers
S_IsOnUndefPos	Checks whether the gripper jaws are not in the open or closed position or on the workpiece	Mechanical grippers
S_IsError	Checks whether an error message or a warning message is present.	Vacuum grippers
S_IsMatchChangeDone	Checks that the gripper has been changed successfully	Vacuum grippers

In standard cases, the commands for checking the status are continuously queried in an endless loop until they are set. Some additional settings are available to change this type of status request:

(5) "Read state into variable only (no wait loop)": Activating the check box reads the status into a variable. The program is continued regardless of the status.

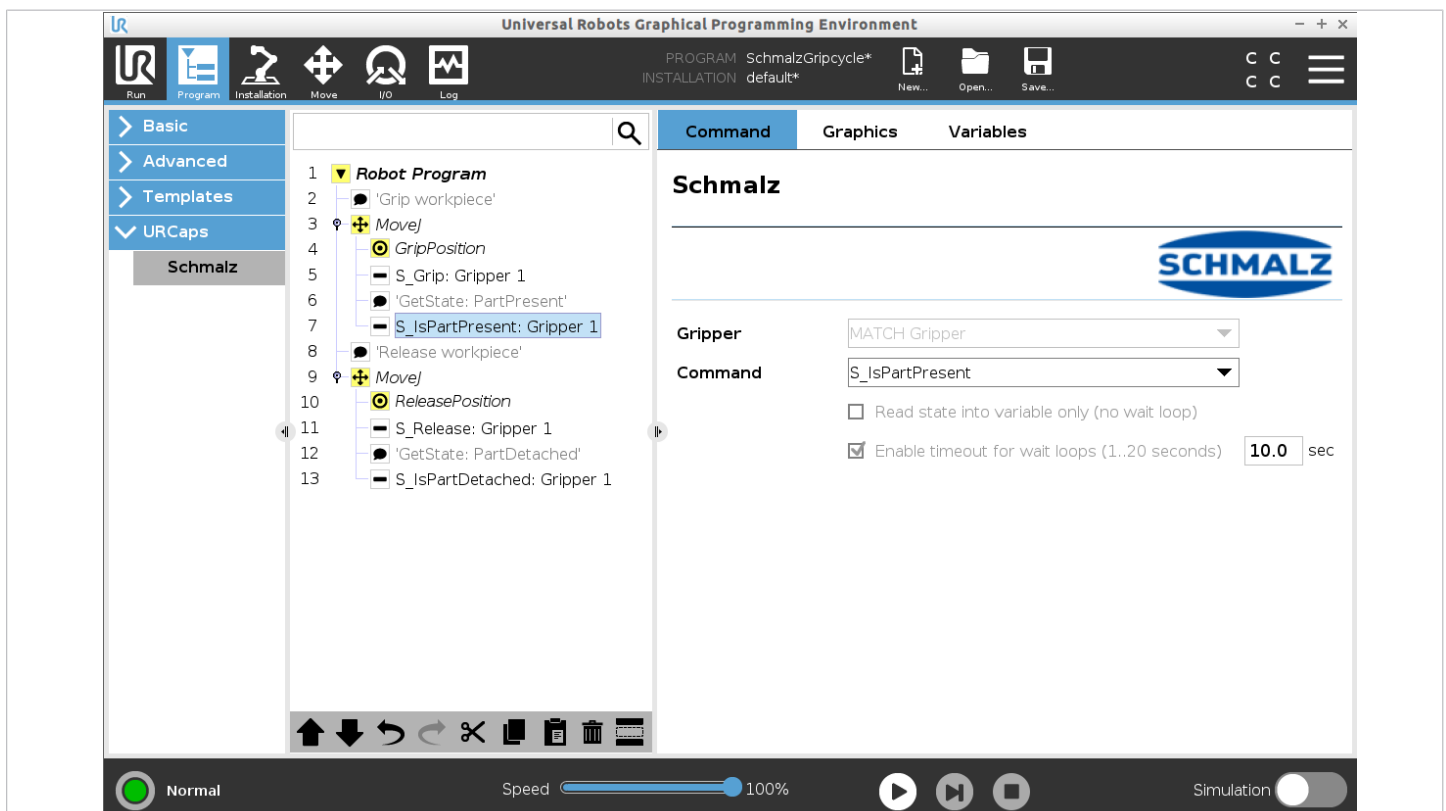
(6) "Enable timeout for wait loops (1..20 seconds)": The endless loop is interrupted after a timer has elapsed. The duration of the timer can be defined in the text box.





The following program example illustrates the use of the functions for a suction cycle:

1. "GripPosition" must be approached to grip a workpiece. (line 3/4)
2. Suction is activated (line 5)
3. The system checks whether the H2 value is reached and the workpiece is securely picked up. If the signal is not triggered after 10 seconds, the program stops. (line 7)
4. The release position is reached (line 9/10)
5. The Release function is activated and a check is carried out to ensure the workpiece is fully released. (line 11/13)



The following sample program shows how to use the functions for a change cycle for two grippers:

1. Change process is activated (line 3)
2. Position in front of the changing station (same height, can be smoothly retracted) is approached (line 5/7)
3. Robot moves to the storage station with a linear movement and quick-change flange (line 10)
4. The robot moves upwards without the gripper to be deposited (line 12)
5. A check is carried out and, if necessary, the system waits until the gripper has been released (line 14/15)
6. Without a gripper, the position is approached directly via the changing station of gripper 2 (line 17/19)
7. Robot moves to gripper 2 with a linear movement (line 22)
8. The system checks whether gripper 2 has been correctly set up (line 24)
9. Robot moves with linear movement and gripper 2 moves from the storage station (line 26)

