EWELLIX

EWELLIX Linear Module

SLIDEKIT 2.0

User Manual

We pioneer motion

SCHAEFFLER

Contents

1 About the manual

1.1 Information in this user manual

This manual provides important information on how to work with the device safely and efficiently.

The manual is part of the device, must always be kept in the device's direct proximity and should be available for personnel to read at any time. All personnel working with the device must read and understand this manual before starting any work. Strict compliance with all specified safety notes and instructions is a basic requirement for safety at work.

Moreover, the accident prevention guidelines and general safety regulations applicable at the place of use of the device must also be complied with.

The EWELLIX SLIDEKIT 2.0 will be referred to as SLIDEKIT in the following.

1.2 Symbols

Safety precautions are identified by symbols and signal words as shown. The signal words indicate the severity of the hazard and the chance it could occur. Follow these safety precautions and act cautiously in order to avoid accidents, personal injury and damage to property.

The warning and hazard symbols are defined in accordance with ANSI Z535.6-2011.

1 Warning and hazard symbols

Signs and descriptions	
⚠ DANGER	In case of non-compliance, death or serious injury will occur.
⚠ WARNING	In case of non-compliance, death or serious injury may occur.
⚠ CAUTION	In case of non-compliance, minor or slight injury may occur.
NOTICE	In case of non-compliance, damage or malfunctions in the product or the adjacent construction may occur.

1.3 Signs

The warning, prohibition, and mandatory signs are defined in accordance with DIN EN ISO 7010 or DIN 4844-2.

2 Warning, prohibition, and mandatory signs

Signs and descriptions	
	General warning
	Electrical voltage warning
	Hot surface warning
	Flammable materials warning
	Observe the manual

Signs and descriptions	
	Wear safety shoes
	Wear eye protection
	General mandatory sign

1.4 Legal notices

The information in this manual reflects the status at the time of publication.

Unauthorized modifications to or improper use of the product are not permitted. Schaeffler accepts no liability in these cases.

1.5 Limitation of liability

All information and notes in this manual were compiled with due consideration given to applicable standards and regulations, the present state of technology and our years of knowledge and experience.

The manufacturer is not liable for any damage resulting from:

- disregarding this manual
- unintended use
- employment of untrained personnel
- unauthorized conversions
- technical changes
- manipulation or removal of the screws on the drive
- use of unapproved spare parts.

Where the device has been customized, the actual product delivered may be different from what is described in this manual. In this case, ask Schaeffler for any additional instructions or safety precautions relevant to these devices.

We reserve the right to make technical modifications to the device to improve usability.

1.6 Availability

A current version of this manual is available at:
https://www.schaeffler.de/std/2224

Ensure that this manual is always complete and legible and is available to all persons engaged in transporting, fitting, dismantling, commissioning, operating, or maintaining the product.

Keep the manual in a safe place for immediate reference.

1.7 Images

The images in this manual may be schematic representations and may differ from the delivered device.

2 General safety regulations

This chapter contains generally applicable safety instructions, in addition to the safety instructions described in the chapters. Failure to comply with the guidelines and safety instructions contained in this manual may result in serious hazards that could cause death or serious injury to persons or damage to the device or equipment.

The safety instructions listed must always be taken into account before using SLIDEKIT.

2.1 Intended use

SLIDEKIT is a horizontal linear axis for robots.

SLIDEKIT has been designed and built for the intended use as described in the user manual of the linear module, with additional intended use defined as sliding of a robot to extend its operating range in an industrial environment.

Any use that extends beyond the intended use or a use different than the one described above is deemed misuse.

Any type of claims resulting from damage caused by misuse are excluded.

2.2 Non-intended Use

The device must not be operated in potentially explosive atmospheres.

Do not use the device to lift people.

2.3 Applicable documents

This user manual does not replace the user manuals of the supplied components but adds additional instructions relevant to the setup and operation of the SLIDEKIT system related to cobots.

Safe and proper operation is only possible if this user manual and the following information are heeded:

- user manual for the linear module and other components supplied
- regulations applicable at the place of use, according to the system into which the linear module is integrated and the prevailing environmental conditions
- regulations of the supervisory authorities (UVV accident prevention regulations)
- recognized technical rules for safe and professional work
- local laws and regulations
- environmental protection regulations
- other applicable regulations

Further information

Further information can be found in the following publication:

BA 129 | EWELLIX Linear Modules | CLSM |
https://www.schaeffler.de/std/2222

2.4 Qualified personnel

Operator duties:

- Ensure that only qualified and authorized personnel carry out the activities described in these instructions.
- Ensure that personal protective equipment is used.

Qualified personnel meet the following criteria:

- Product knowledge, e.g. by receiving training on how to use the product
- are fully familiar with the contents of this manual and, in particular, with all of the safety instructions
- are familiar with the relevant country-specific regulations

2.5 Safety regulations

The following safety regulations must be observed when working with the product. You can find further information on dangers and specific instructions in other chapters, including those entitled Installation, Commissioning, Operation, and Maintenance.

2.5.1 Functional safety

SLIDEKIT is not a functional safety system that meets ISO 13489-1 and IEC 62061 standards. To integrate the SLIDEKIT into a functional safety chain, external safety devices must be added to the overall system

2.5.2 Safety equipment

The following safety equipment has been integrated into SLIDEKIT to reduce the risk of personal injury or property damage:

- Pinching risk between the carriage and the end block of SLIDEKIT is minimized.
- Operation requires the SLIDEKIT controller to be connected to the safety I/O in the UR software.
- The SLIDEKIT controller checks the CANopen connection to the UR controller. If this connection is lost, the linear module movement is automatically stopped.
- Stopping or failure of the UR software sends a stop signal to the SLIDEKIT controller.

2.5.2.1 Emergency stop

- Integration with an emergency-stop system is required for its intended use.
- Ensure that emergency stop functions are installed for the linear module and integrated in the safety chain of the entire system before using SLIDEKIT.
- The emergency stop function must be connected in such a way that a disruption of the power supply or the activation of the power supply after a power disruption cannot cause a hazardous situation for persons and objects.
- The emergency-stop systems must always be freely accessible.
- To integrate SLIDEKIT into a functional safety system with a STO (Safe Torque Off) safe condition, an external safety relay must be connected to the SLIDEKIT controller power supply, triggered by a functional safety function, such as a UR safety I/O.

2.5.2.2 Safety relay

Activation of the UR emergency stop will trigger a stop of the controller via 2 safety relays, certified ISO 13849-1. If the UR system is turned off, SLIDEKIT cannot be operated.

2.5.3 Potential risks

The following risks during the SLIDEKIT operation must be considered in an application specific risk assessment

- SLIDEKIT does not detect an impact automatically and will not stop movement upon impact.
  This can lead to:
  - Crushing of a person or an object in the path of the linear module, which could cause significant harm.
  - Dynamic impact to a person or an object, which could cause significant harm.
- The SLIDEKIT movement does not stop at the desired position and the UR control software does not detect this.
  - Movement of the robot can occur at a different position than intended, causing significant harm or damage.

2.5.4 Commissioning

Only qualified personnel may start up the system.

Disconnect the power supply to the drive before performing installation or maintenance work.

Ensure that the drive is not under load or voltage before installation or maintenance work is performed.

Use suitable safety equipment when installing or maintaining the drive.

The power supply must comply with the technical specifications.

2.5.5 Maintenance and Repairs

Maintenance work and repairs may only be carried out by qualified personnel.

Disconnect the power supply to the drive before performing installation or maintenance work.

Ensure that the drive is not under load or voltage before installation or maintenance work is performed.

Use suitable safety equipment when installing or maintaining the drive.

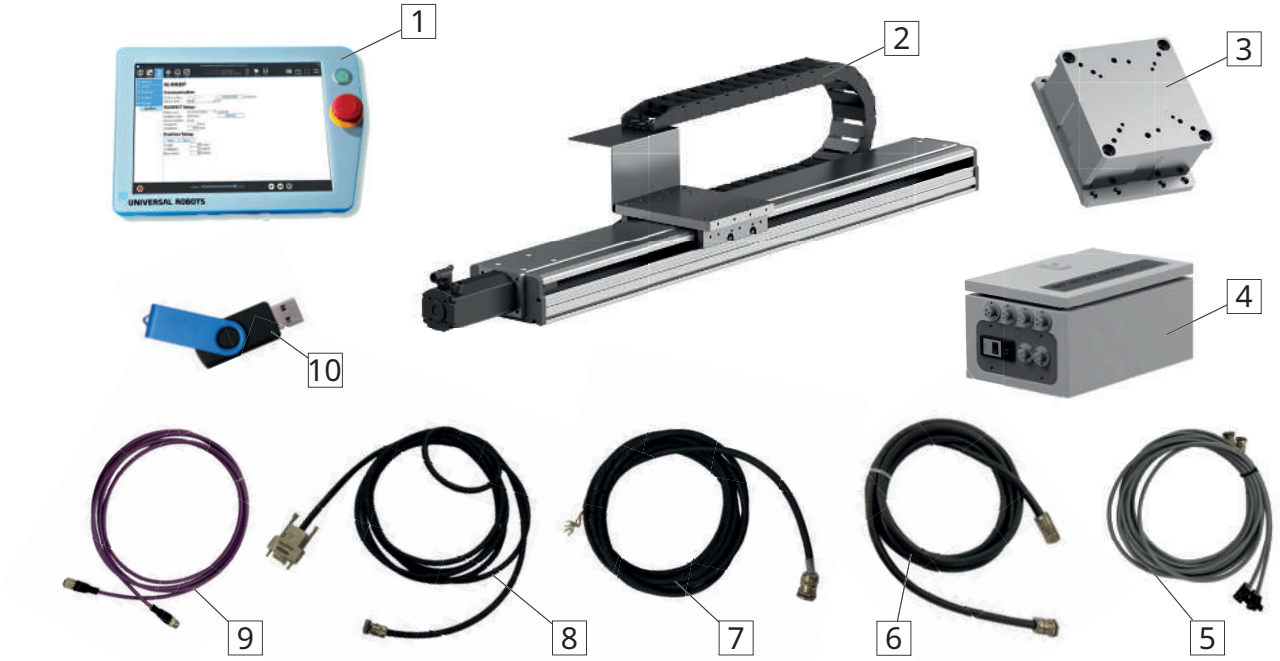
3 Scope of delivery

The scope of delivery comprises:

- 1 CLSM linear module (with motor)
- 1 fixation plate for UR3, UR5, UR10 and UR16 robots, with LIFTKIT
- 1 SLIDEKIT control box
- 1 main power cable (1.5 m)
- 1 motor power cable (3 m)
- 1 CANopen interface cable (3 m)
- 1 cable for proximity switches 1 and 2 (3 m)
- 1 safety-I/O cable (3 m)
- 1 cobot interface cable (3 m)
- 1 digital-I/O interface cable (3 m) (optional)
- 1 USB stick with URCaps software
- Cableveyor
- 2 limit switch with connection boxes
- 8 M6 screws for UR3 robots with LIFTKIT (M6 × 20L)
- 4 M8 screws for UR5, UR10 and UR16 robots (M8 × 25L)
- 2 Ø 5-mm pins for aligning a UR3 robot (Ø 5 × 10L)
- 2 Ø 8-mm pins for aligning UR5, UR10 and UR16 robots (Ø 8 × 16L)
- 2 Ø 6-mm pins for aligning LIFTKIT (Ø 6 × 12L)

Cables of other lengths are available on request.

1 Scope of delivery



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1	Handheld programming device (not supplied)	2	CLSM linear module (with motor)
3	Fixation plate for UR3, UR5, UR10 and UR16 robots with LIFTKIT	4	SLIDEKIT control box
5	Cable for proximity switches 1 and 2 (3 m)	6	Motor power cable (3 m)
7	Safety-I/O cable (3 m)	8	Digital-I/O interface cable (3 m) (optional)
9	CobotInterface cable (3 m)	10	USBStick with URCaps software (not included with SLIDEKIT-00)

3.1 System requirements

- Compatible with UR3, UR5, UR10, UR16, UR3e, UR5e, UR10e and UR16e series robots and CB series
- UR controller: The URCaps plugin CB 3.1 requires at least
- Polyscope: Polyscope 3.6 software or higher
- Power input capacity (at rated load): AC 120 V to 230 V, 0.9 kVA

3.2 Check for transport damage

1. Check the product immediately upon delivery for any damage during transit.
2. Report any damage during transit promptly as a complaint to the carrier.

3.3 Check for defects

1. Check the product immediately upon delivery for any visible defects.
2. Report any defects promptly to the distributor of the product.
3. Do not put damaged products into operation.

4 Product description

SLIDEKIT is a horizontal linear axis for robots.

5 Assembly

5.1 Tools required

- 5-mm wrench
- 6-mm wrench

5.2 Robot installation on the linear module

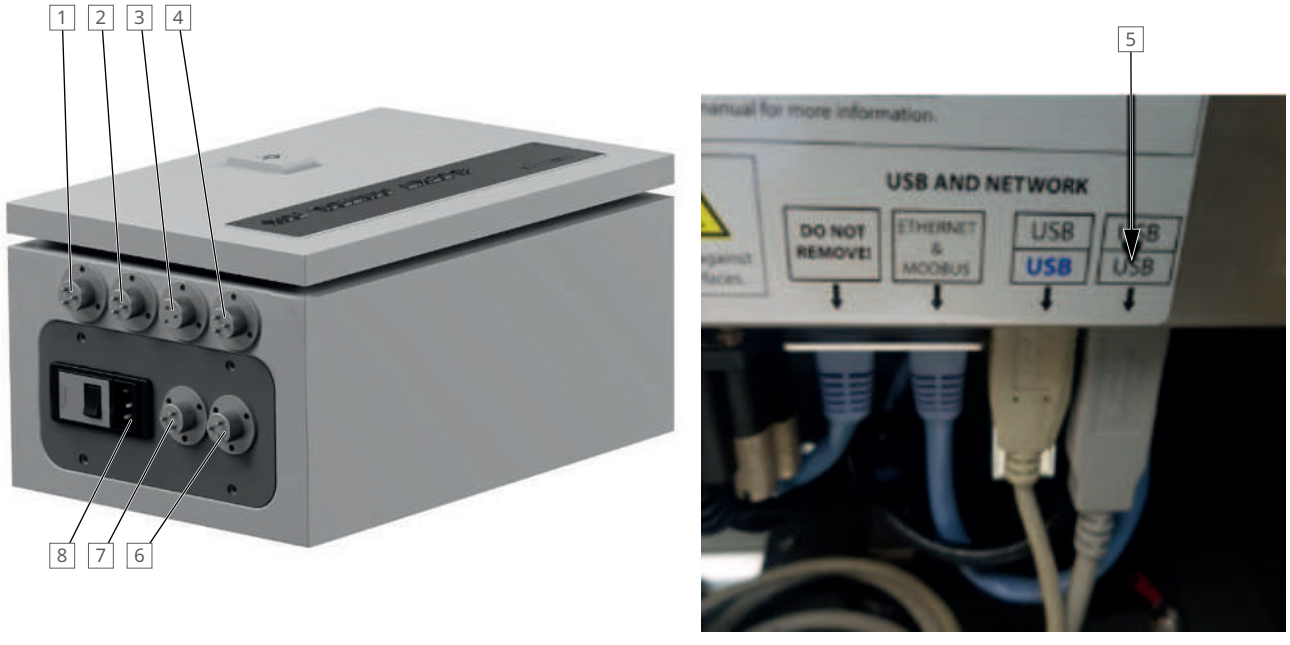
1. Attach the bottom plate to the SLIDEKIT base plate using M 6 screws (not included).
2. Support SLIDEKIT along its entire length or at least every 300 mm with a clamping unit or screw.
3. Place the two alignment pins on the upper plate:

- Ø 6 mm for UR3
- Ø 8 mm for UR5, UR10, UR16
- Ø 6 mm for LIFTKIT

4. Align the robot or SLIDEKIT using the alignment pins.
5. Attach the robot base using the four screws supplied or attach the SLIDEKIT base using the eight screws supplied.

5.3 Connecting the power supply

2 Connections on the control unit



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1	Cable for proximity switches 1 and 2	2	Safety-I/O cable
3	Cobot interface cable	4	Digital-I/O interface cable
5	CANOpen interface cable	6	Motor power cable
7	Main power cable	8	USB port for UR controller

1. Connect the main power cable to connection 7 on the SLIDEKIT controller.
2. Connect the two connectors of the motor power cable and the CANopen interface cable to the connections for the motor power cable (5) and the CANOpen interface cable (6).
3. Connect the digital-I/O interface cable to the input connection (4) (SLIDEKIT-00 version only).
4. Connect the Cobot interface to the connection (3).
5. Connect the safety-I/O cable to the connector (2).
6. Connect the cable for the proximity switch to the connection (1).
7. Insert the Cobot interface cable into the USB port (8) of the UR controller.
8. Attach the safety-I/O cable to a safety I/O on the UR controller.

6 Software operation

The SLIDEKIT URCaps plugin enables the movement of SLIDEKIT directly in the UR software.

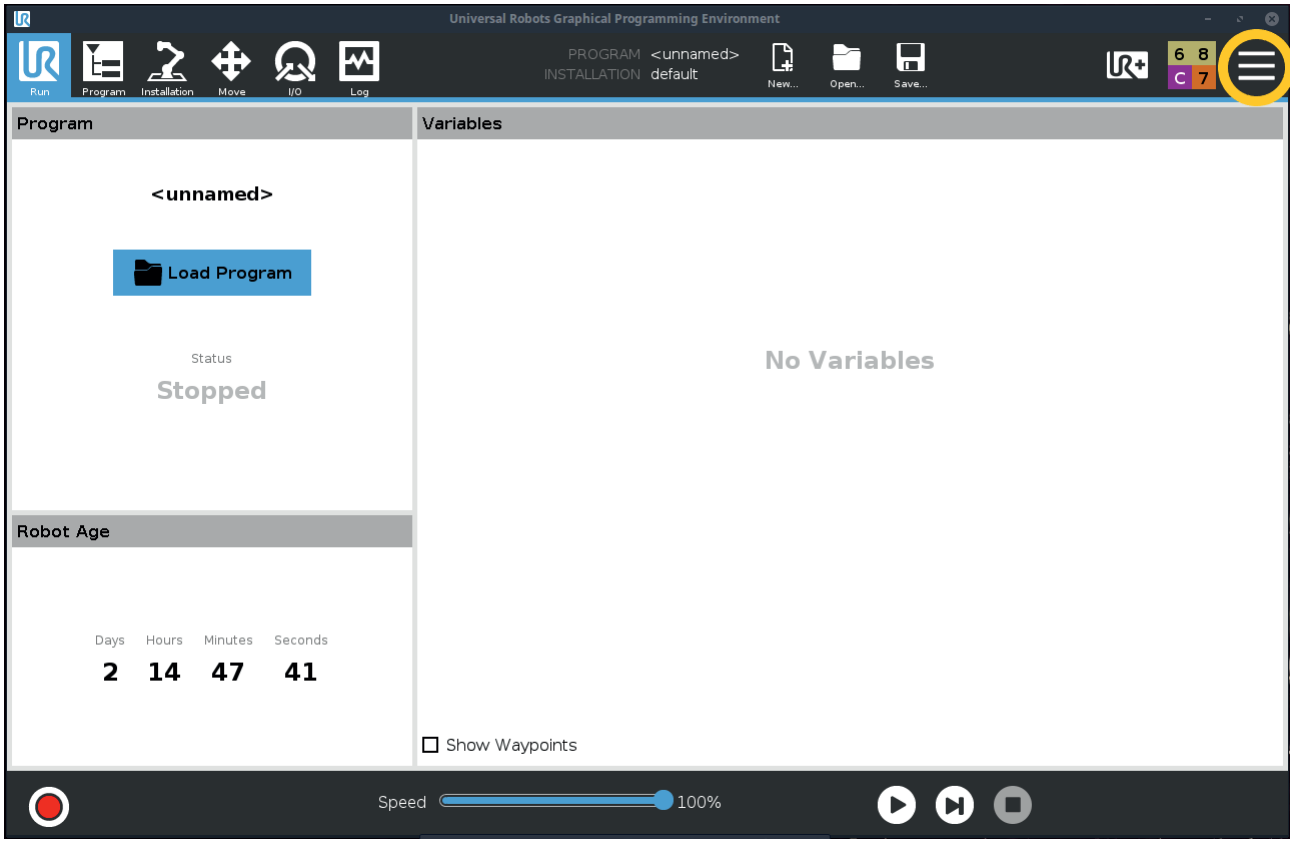
The SLIDEKIT setup can be accessed from the Installation tab in the Polyscope software.

6.1 Installing the URCaps plugin

To install the URCaps plugin, proceed as follows:

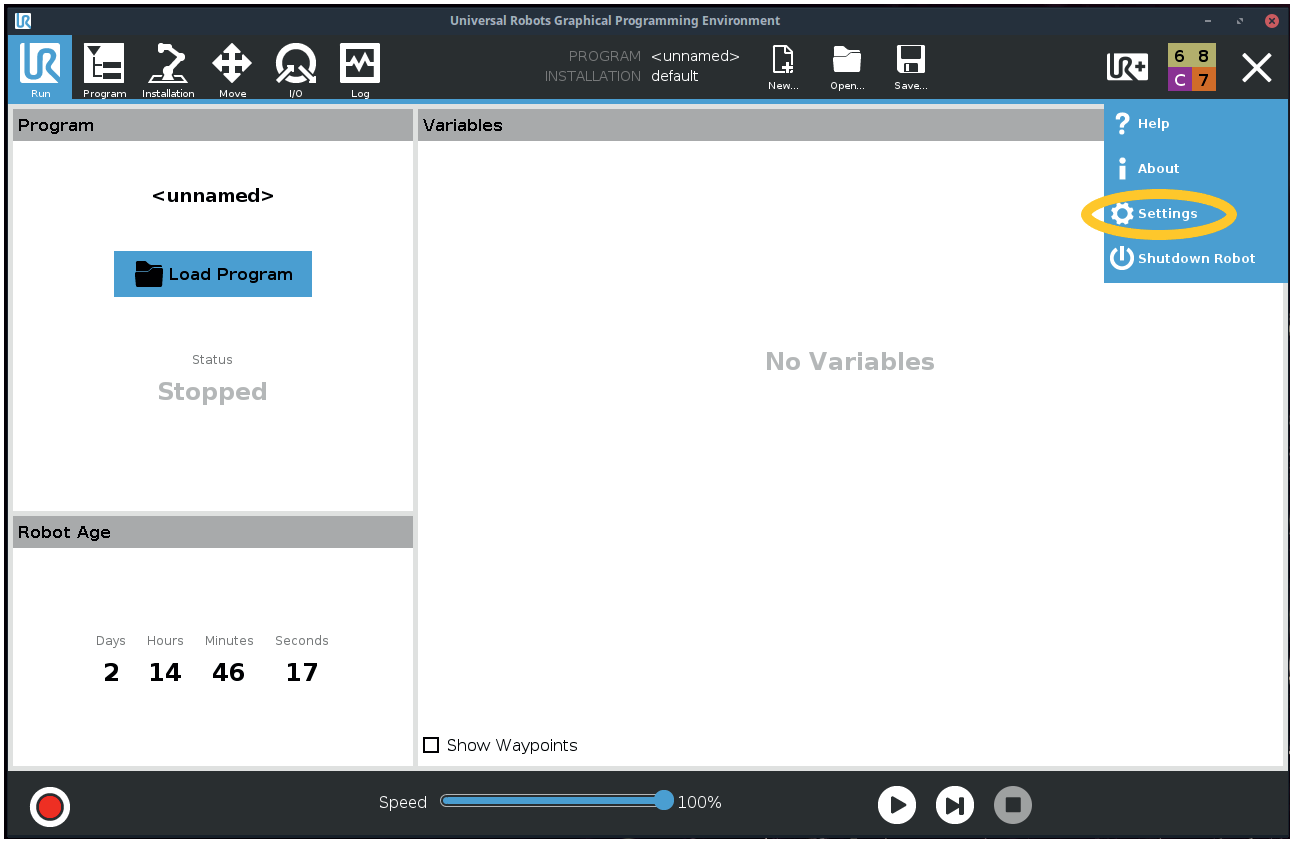
1. Click the Menu button in the top-right corner.

3 Open the menu



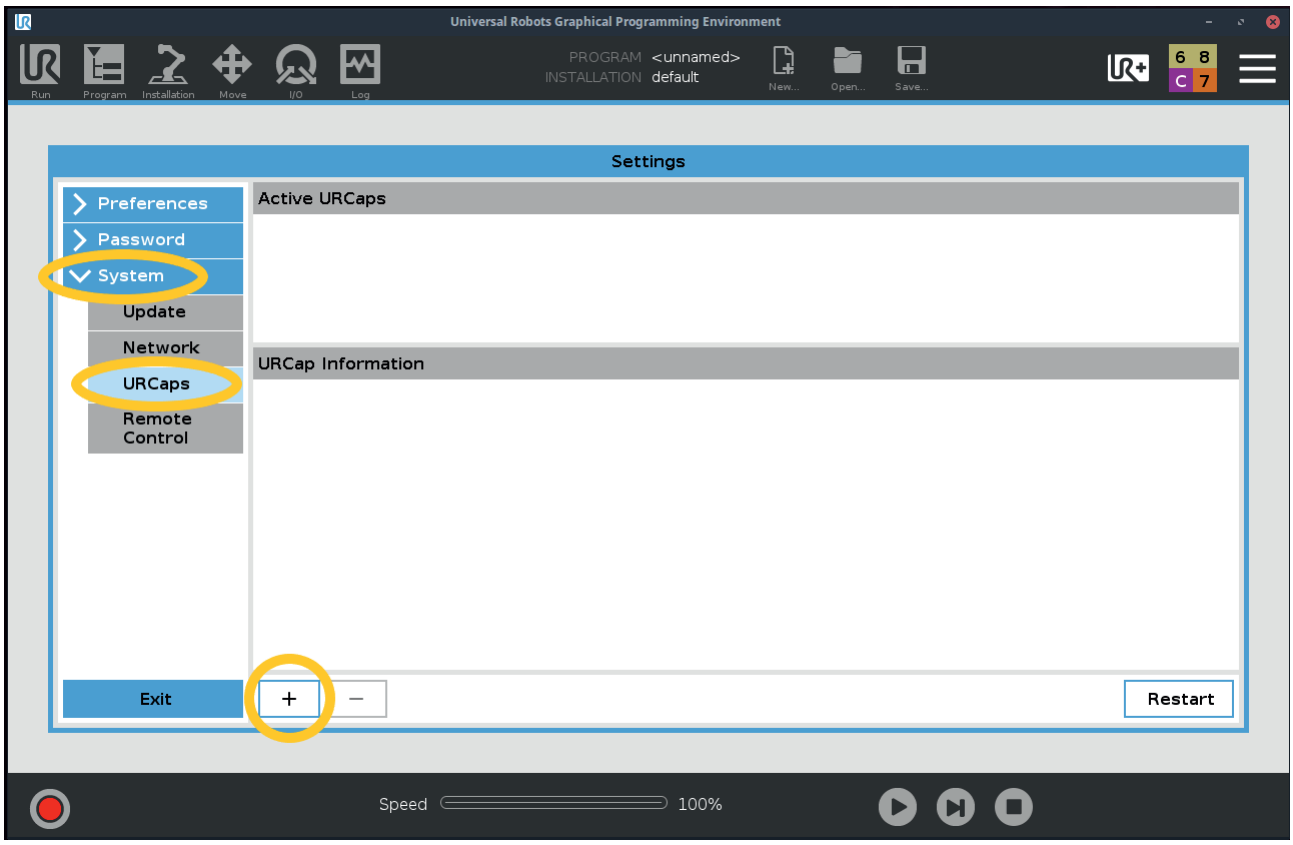
2. Click Settings.

4 Click Settings



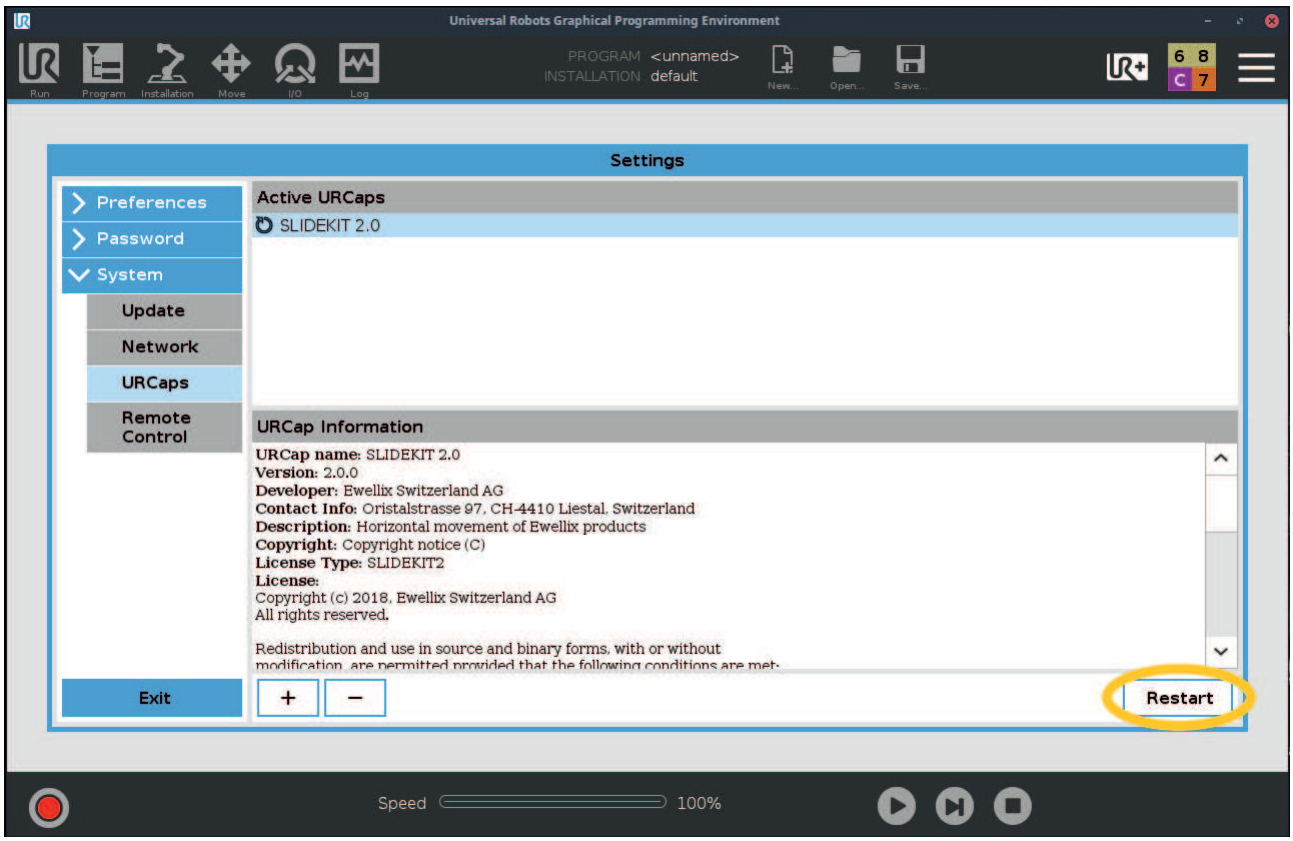
3. In the navigation bar, open the System menu item, select URCaps and click +.

5 Add the URCaps file



4. Insert the SLIDEKIT USB stick into the USB port of the handheld programming device.
5. Select the URCaps file from the SLIDEKIT USB stick.
6. Click the Restart button.

6 Click Restart



6.2 Configuring SLIDEKIT

The Installation tab can be used to set up 3 aspects for operating SLIDEKIT:

- ▸ To configure the three aspects for operating SLIDEKIT, open URCaps in the menu bar and select SLIDEKIT to set up the following:
  - » Communication
  - » SLIDEKIT setup
  - » Position setup

Save the installation file so that the values are retained after a restart.

6.2.1 Safety I/O setup on UR

To activate SLIDEKIT, the safety I/O setup must be configured correctly in the UR software.

1. Open Safety in the menu bar.
2. Set the corresponding safety input signal and safety output signal to System Emergency Stopped.

6.2.2 Communication

- Serial interface:
  Select the correct serial interface on the UR controller. If other devices are connected, select a free serial port.
- Daemon port:
  Select a daemon port that is not being used by another URCaps. If the same port is used for different URCaps, communication problems might occur and SLIDEKIT cannot operate normally.

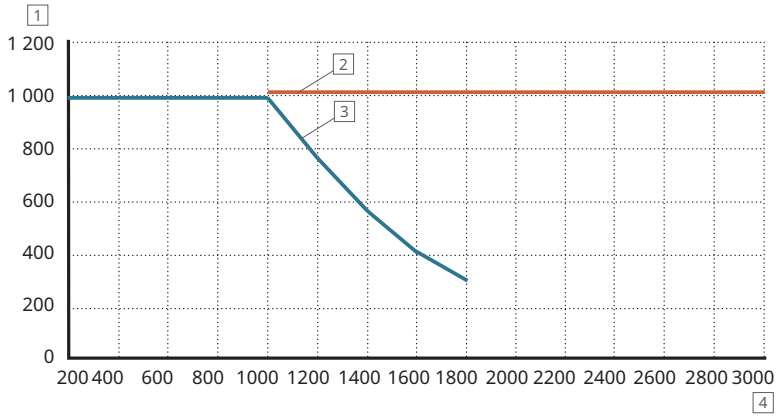
6.2.3 SLIDEKIT Setup

- Select the correct SLIDEKIT from the drop-down menu.
  The following can be selected:
  - SK 20×20 BG65S (default) for the ball screw variant (B20 in the ordering key)
  - SK BELT 40 BG65S for the belt drive (P40 in the ordering key)
  - SLIDEKIT for UR20 and UR30
  - SK BELT 40 BG65S-C for SLIDEKIT PE S20
- If the wrong configuration is selected, normal operation of SLIDEKIT cannot be guaranteed. If the linear module has been initialized correctly, the maximum stroke accessible is displayed underneath. Ensure that this value matches the connected product.
- **Homing**: With the HOMING button, a new homing can be started.
  During the homing process all other functions are blocked. The slide automatically moves first to the limit switch close the motor, then to the limit switch on the other side.
- **Virtual limits**: Virtual limits can be set to limit the SLIDEKIT movement. They can set following the rule: 0 mm ≤ Virtual Min < Virtual Max ≤ Available Stroke.

6.2.4 Position Setup

- The MOVE - and MOVE + buttons can be used to move SLIDEKIT manually as long as a button is pressed.
- Enter the default parameters for the movement profile, velocity, acceleration and deceleration. These values are set at each step of the program.
- The velocity can be set to a maximum of 1000 mm/s. The maximum velocities for the different SLIDEKITlengths can be found in the performance diagram.

7 Performance diagram



1	Linear speed	2	Belt drive width 40
3	Ball screw (lead 20)	4	Stroke

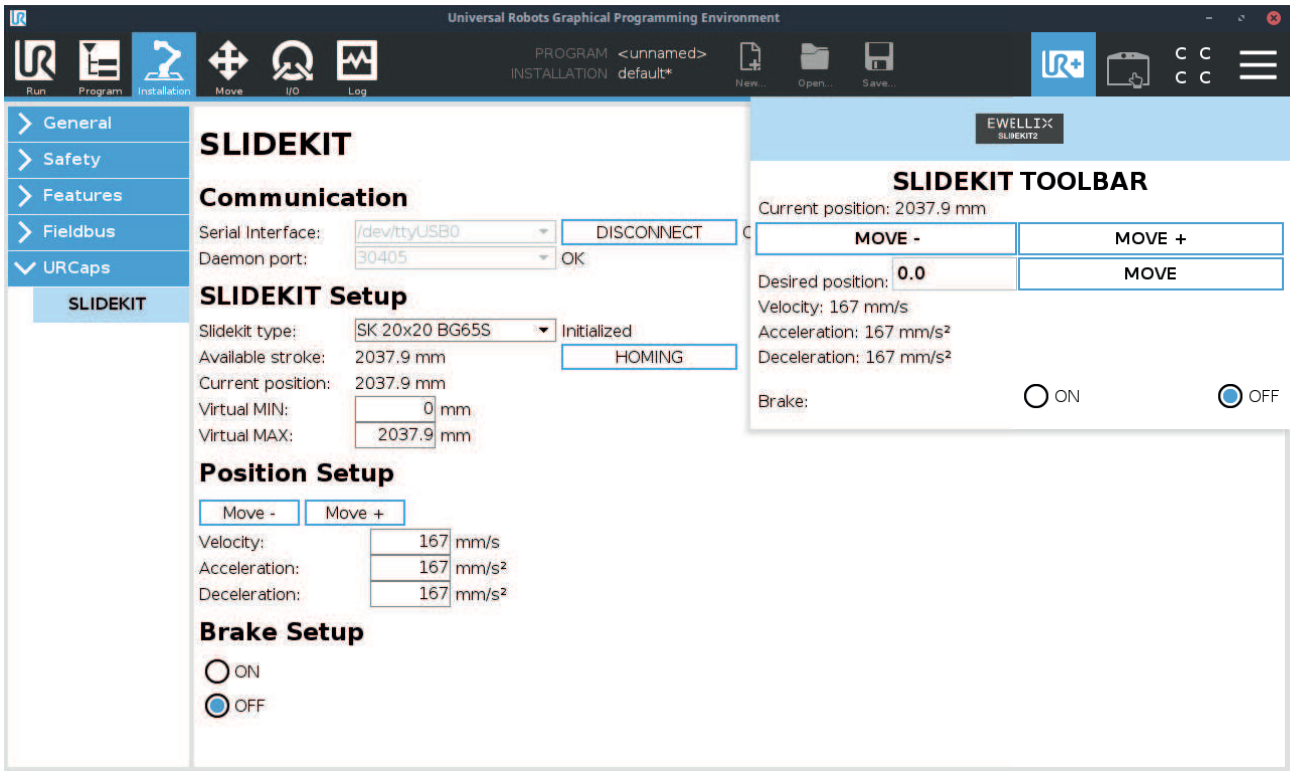
6.2.5 Brake setup

The motor current brake can be activated or deactivated using the ON and OFF buttons. The brake is automatically deactivated after 15 min to prevent overheating of the motor.

6.2.6 Toolbar

- Call up the toolbar by clicking the UR+ symbol in the top-right corner. SLIDEKIT can be moved manually by pressing the MOVE - and MOVE + buttons. Alternatively, SLIDEKIT can be moved to a particular position by entering said and clicking the MOVE button.
- Brake management is also available via the toolbar and in installation mode, where the brake for SLIDEKIT can be activated using the ON button and deactivated using the OFF button.

8 Toolbar


Universal Robots Graphical Programming Environment
Run
Program
Installation
Move
I/O
Log
PROGRAM <unnamed>
INSTALLATION default*
New...
Open...
Save...
General
Safety
Features
Fieldbus
URCaps
SLIDEKIT
SLIDEKIT
Communication
Serial Interface: /dev/ttyUSB0 DISCONNECT
Daemon port: 30405 OK
SLIDEKIT Setup
Slidekit type: SK 20x20 BG65S Initialized
Available stroke: 2037.9 mm HOMING
Current position: 2037.9 mm
Virtual MIN: 0 mm
Virtual MAX: 2037.9 mm
Position Setup
Move - Move +
Velocity: 167 mm/s
Acceleration: 167 mm/s²
Deceleration: 167 mm/s²
Brake Setup
ON
OFF
EWELLIX
SLIDEKIT2
SLIDEKIT TOOLBAR
Current position: 2037.9 mm
MOVE - MOVE +
Desired position: 0.0 MOVE
Velocity: 167 mm/s
Acceleration: 167 mm/s²
Deceleration: 167 mm/s²
Brake: ON OFF
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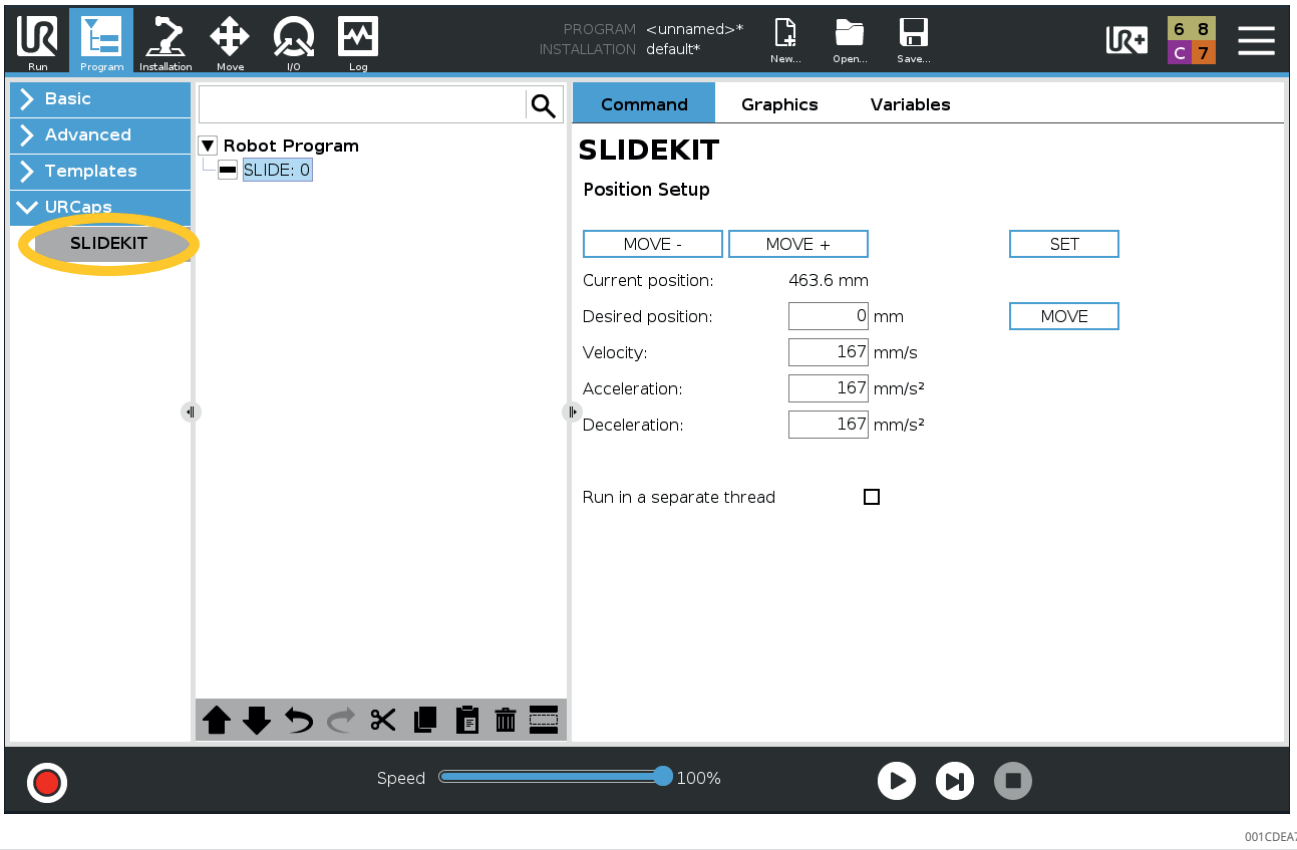
6.3 Programming SLIDEKIT

6.3.1 Adding a URCap command

To add a new command, open URCaps in the menu bar and select SLIDEKIT to set up the following:

9 Adding a URCap command

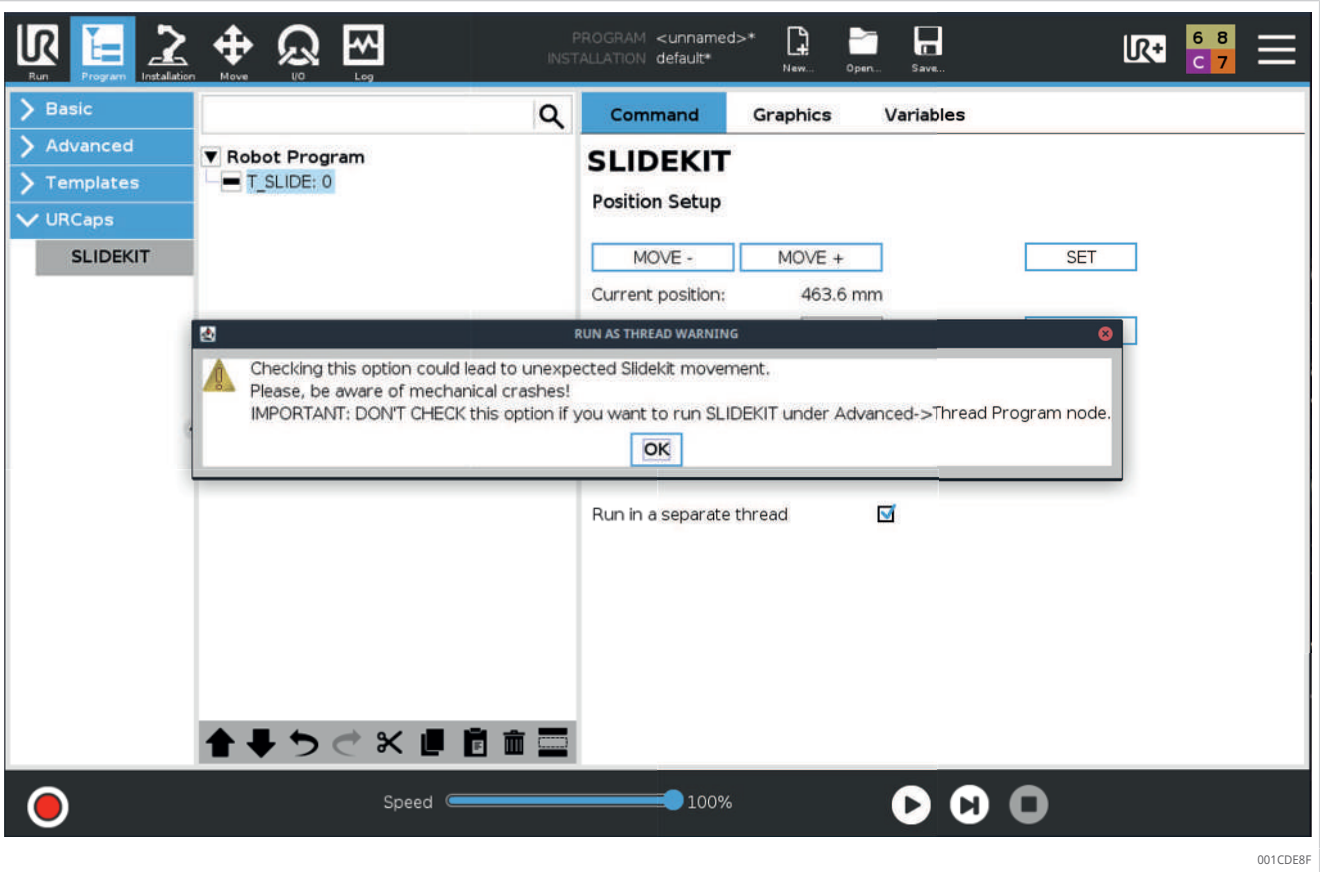


The MOVE buttons can be used to move SLIDEKIT manually by pressing the MOVE- and MOVE+ buttons. Alternatively, SLIDEKIT can be moved to a particular position by entering said and pressing the MOVE button.

- Change the movement profile parameters:
  - For each step that is added, the default movement profile parameters set in the “Installation” tab are used. However, for each step the parameters can be changed.
- Run in a separated thread:
  - If this option is clicked, the movement is executed in parallel to the rest of the program. However, two movements cannot be executed at the same time. The program blocks at the next movement command until the previous movement is finished.

Be aware that checking this option could lead to unexpected SLIDEKIT movements.

Do not activate the Run in a separate thread option if you want SLIDEKIT to run under Advanced > Thread.



6.3.2 Call up script (for advanced users only)

Script commands can be used in addition to the URCap command.

3 Script commands

Script command	Results
get_slidekit_check_connection()	• returns True if SLIDEKIT connection status is established, else False.
get_slidekit_is_moving()	• returns True if SLIDEKIT is moving, else False.
get_slidekit_reached_position()	• returns True if SLIDEKIT reached is position, else False.
get_slidekit_position()	• returns the actual SLIDEKIT position in float point value with one decimal place.
get_slidekit_actual_current()	• returns the actual current of SLIDEKIT in mA. • returns positive or negative value depending on rotation direction. • can be used in separate thread to monitor the used current during operation. • actual current can be used to detect anomalies (e.g. un intended end stops).
move_slidekit (position, velocity, acceleration, deceleration)	• moves SLIDEKIT to the desired position using movement profile parameters. • This command is blocked until SLIDEKIT has reached its position.

7 Troubleshooting

The explanations provided for possible error messages have been used to identify and correct programming problems within the Polyscope software in connection with the SLIDEKIT 2.0.

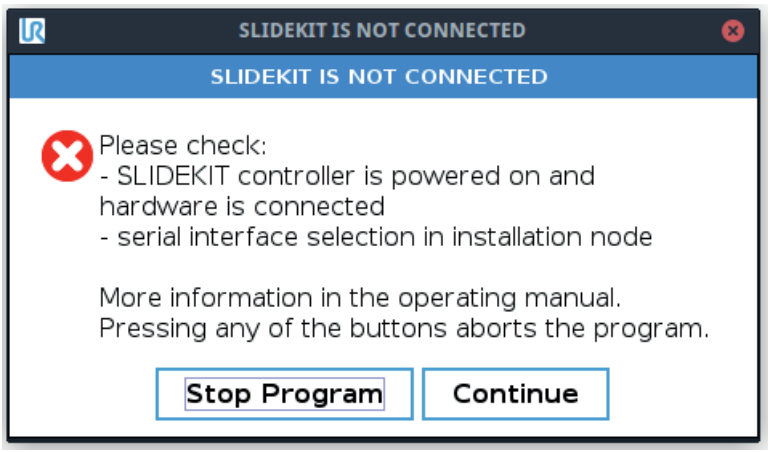
Users of SLIDEKIT 2.0 must be familiar with:

- using Polyscope software
- SLIDEKIT 2.0 as an extension of Polyscope software
- programming the robot program in Polyscope software in relation to SLIDEKIT 2.0
- hardware limitations of SLIDEKIT 2.0
- how SLIDEKIT 2.0 works

7.1 Program errors

7.1.1 Connection with SLIDEKIT is not established

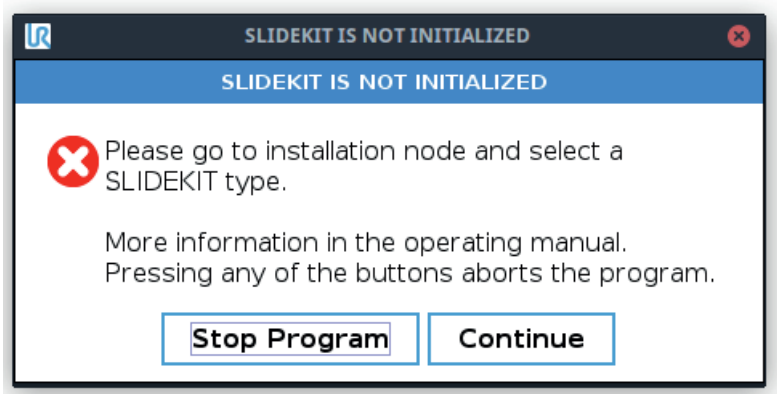
10 SLIDEKIT is not connected



Problem	Possible causes	Solutions
Program can't run since SLIDEKIT is not connected.	• There is no hardware connection, or the connection is broken. • SLIDEKIT is switched off.	• Check whether the hardware connection with SLIDEKIT is broken. • Ensure that SLIDEKIT is being supplied with power and is switched on. • Go to the installation node and check whether the serial interface is selected and SLIDEKIT is connected.

7.1.2 SLIDEKIT is not initialized

11 SLIDEKIT is not initialized



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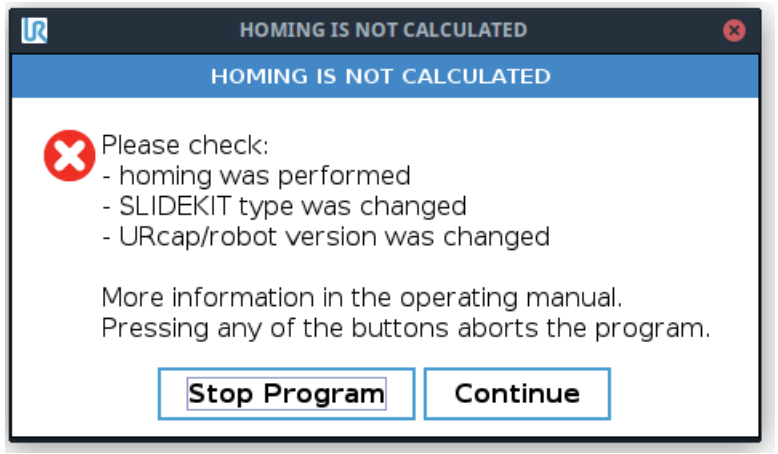
Problem	Possible causes	Solution
Program can't run since SLIDEKIT has not been initialized.	• The SLIDEKIT configuration is not selected. • The SLIDEKIT configuration was selected, but is missing after SLIDEKIT was updated to the new version.	• Ensure that the desired SLIDEKIT configuration is selected in the "Installation" node.

7.1.3 Homing is not finished

12 Homing is not calculated



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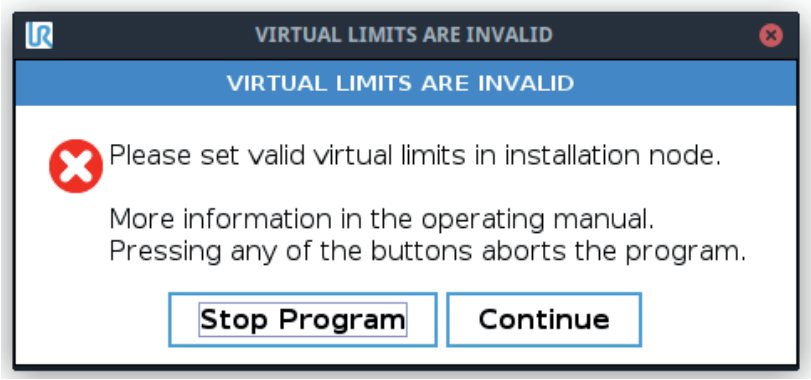
Problem	Possible causes	Solution
Program can't run SLIDEKIT has not been calibrated.	• Homing is not performed (e.g. started but not finished, canceled by the user, or there were connection issues during homing, so it did not finish properly without errors). • After restarting the Polyscope software, the loaded installation file does not contain any information about valid homing (e.g. "first time" homing), or the current position of SLIDEKIT is outside the available stroke range (0 to max. stroke). • After restarting the Polyscope software, the selected SLIDEKIT configuration is missing (the previously selected configuration is no longer present in the newly loaded *.URCap file).	• Select IN and execute homing again. It is highly recommended to save installation after homing procedure is finished.

7.1.4 Invalid virtual limits

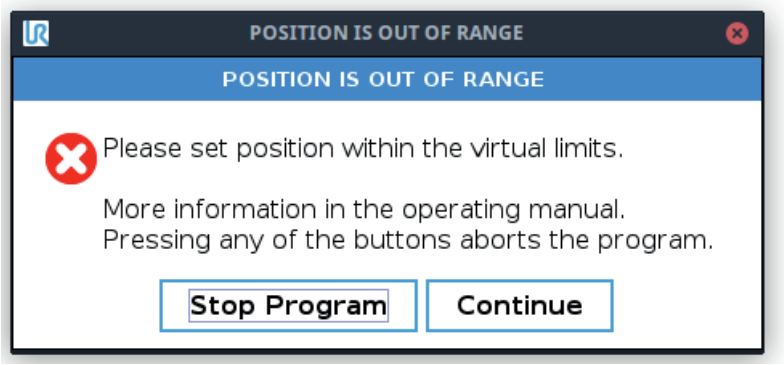
13 Virtual limits are invalid



Problem	Possible cause	Solution
Program can't run since set virtual limits are not valid.	• Virtual minimum and virtual maximum have been incorrectly defined.	• Select IN and set virtual minimum and virtual maximum correctly: 0 ≤ virtual min. < virtual max. < max. available stroke.

7.1.5 Position out of range

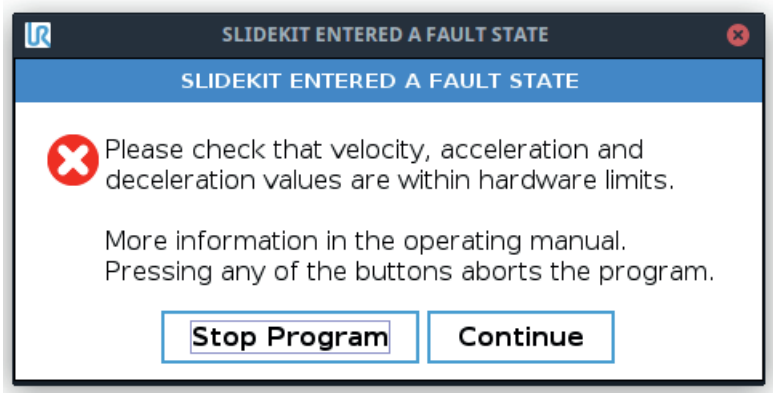
14 Position is out of range



Problem	Possible cause	Solutions
Program can't run, desired position is out or range.	• Desired position is outside virtual minimum – virtual maximum range.	• S1: Select PN and set desired position to virtual min. <= desired position ≤ virtual max. • S2 (if possible): Select IN and change virtual minimum/virtual maximum to meet the condition of S1.

7.1.6 Invalid program data

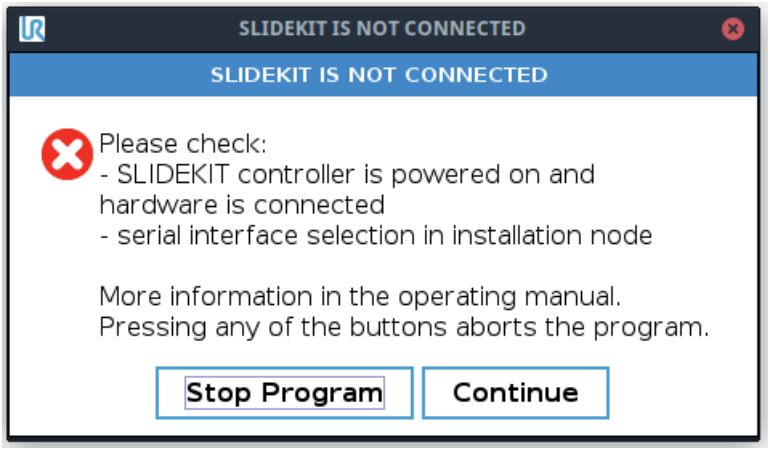
15 SLIDEKIT entered a fault state



Problem	Possible causes	Solutions
Program can't run, entered program data is invalid.	• The entered program value for velocity is outside the range for the minimum and maximum velocity of the selected SLIDEKIT configuration. • The entered program value for acceleration is outside the range for the minimum and maximum acceleration of the selected SLIDEKIT configuration. • The entered program value for deceleration is outside the range for the minimum and maximum deceleration of the selected SLIDEKIT configuration.	• Select PN and change the program value for velocity, acceleration or deceleration to be within the appropriate range of the selected SLIDEKIT configuration. • Change the SLIDEKIT configuration and execute homing again if the selected range does not meet your requirements.

7.1.7 Not connected to SLIDEKIT

16 SLIDEKIT is not connected

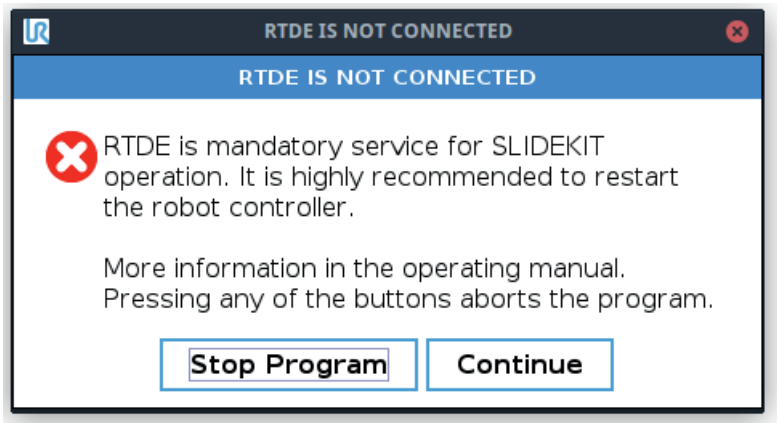


Problem	Possible cause	Solution
Same as "Connection with SLIDEKIT is not established."	• Same as "Connection with SLIDEKIT is not established."	• Same as "Connection with SLIDEKIT is not established."

"Connection with SLIDEKIT is not established" ➤24|7.1.1.

7.1.8 Not connected to Polyscope's RTDE

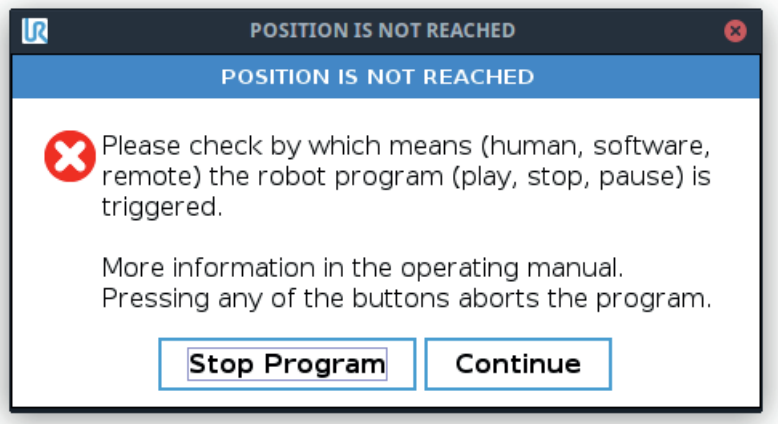
17 RTDE is not connected



Problem	Possible causes	Solution
Program can't run, no connection with Polyscope's service RTDE.	• The RTDE service failed to start. • A new Polyscope version was installed and the Polyscope software's RTDE service uses now a different port. • Poor input/output recipe (signal? or values?) of SLIDEKIT for synchronization with RTDE. • Not enough resources.	• Restart the Polyscope software. If problems persist, contact Schaeffler.

7.1.9 SLIDEKIT has not reached target position

18 Position is not reached



Problem	Possible causes	Solution
SLIDEKIT did not reach the target position within the expected time period.	• The tolerance in the selected SLIDEKIT configuration is too narrow. • SLIDEKIT did not respond in the desired time period.	• Contact Schaeffler.

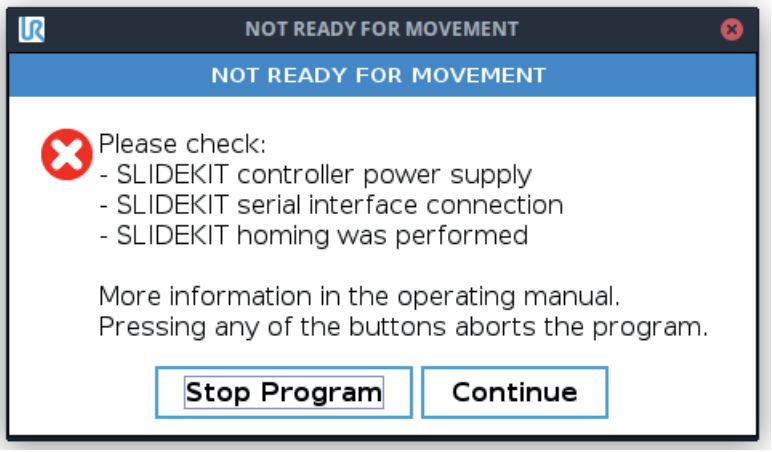
7.1.10 Disconnection while program is running

19 Unexpected connection loss

Problem	Possible causes	Solutions
No response in communication with SLIDEKIT.	• Hardware connection is broken. • SLIDEKIT is switched off.	• Ensure that the hardware connection with SLIDEKIT has been established. • Ensure that SLIDEKIT is being supplied with power and is switched on.

7.1.11 Program general exception

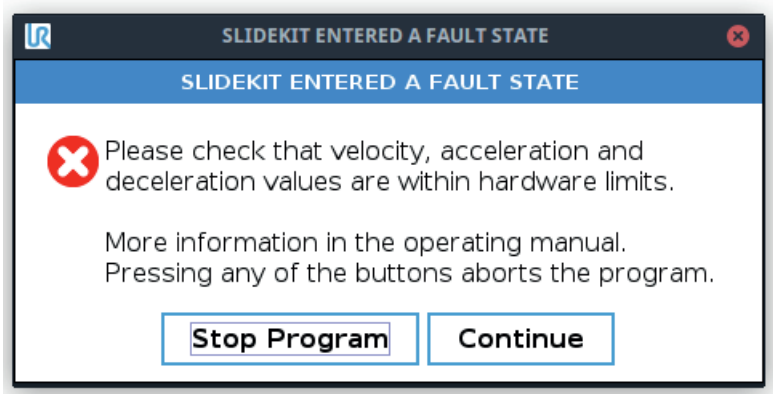
20 Not ready for movement



Problem	Possible cause	Solutions
General communication error.	• The connection with SLIDEKIT is not stable, and there are likely to be brief disconnections.	• Check system resources, • Restart the system. If the problem reoccurs, contact Schaeffler.

7.1.12 SLIDEKIT has entered in fault state

21 SLIDEKIT entered a fault state



Problem	Possible causes	Solutions
SLIDEKIT has entered a fault state.	• Unknow error that can put SLIDEKIT in the fault state. • Causes lie in the calculations of the configuration: see below.	• Use the correct configuration that matches the SLIDEKIT hardware configuration. • If the configuration matches the SLIDEKIThardware configuration: Ensure that the selected SLIDEKIT configuration contains the correct values.

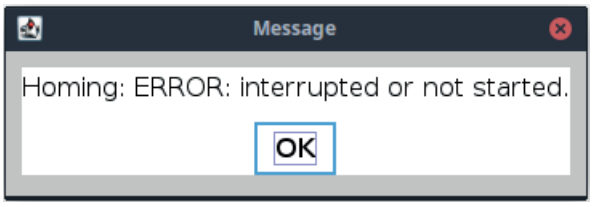
Causes lie in the calculations of the SLIDEKIT configuration:

- The desired value for velocity is within the SLIDEKIT configuration range (configured minimum velocity, configured maximum velocity) but outside the SLIDEKIT hardware limit (SLIDEKIT minimum velocity, SLIDEKIT maximum velocity). Consequently, the selected configuration's min.–max. velocity range does not match SLIDEKIT's min.–max. velocity range.
- The desired value for acceleration is within the SLIDEKIT configuration range (configured minimum acceleration, configured maximum acceleration) but outside the SLIDEKIT hardware limit (SLIDEKIT minimum acceleration, SLIDEKIT maximum acceleration). Consequently, the selected configuration's min.–max. acceleration range does not match SLIDEKIT's min.–max. acceleration range.
- The desired value for deceleration is within the SLIDEKIT configuration range (configured minimum deceleration, configured maximum deceleration) but outside the SLIDEKIT hardware limit (SLIDEKIT minimum deceleration, SLIDEKIT maximum deceleration). Consequently, the selected configuration's min.–max. deceleration range does not match SLIDEKIT's min.–max. deceleration range.

7.2 Homing errors

7.2.1 Homing error: interrupted or not started

22 Velocity is zero



001CDE57

Problem	Possible cause	Solution
Homing procedure is interrupted or not started.	-	• Confirm message and try to perform homing again. If the problem persists, contact Schaeffler.

7.2.2 Homing error: attained but target not reached

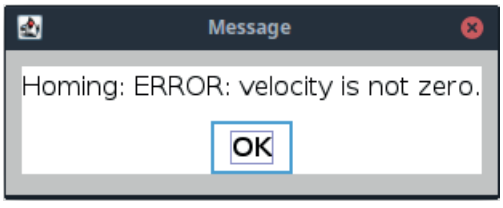
23 Target not reached

001CDE55

Problem	Possible cause	Solution
Homing has started but the target has not been reached.	• Unexpected SLIDEKIT problem.	• Confirm message and try to perform homing again. If the problem persists, contact Schaeffler.

7.2.3 Homing error: velocity is not zero

24 Velocity error

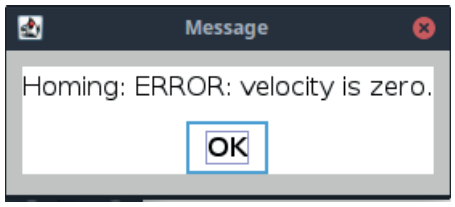


001CDE61

Problem	Possible cause	Solution
Homing procedure is stopped automatically.	• The homing parameters defined in the SLIDEKIT configuration are not correct.	• Check the parameters defined in the SLIDEKIT configuration to check homing.

7.2.4 Homing error: velocity is zero

25 Velocity is zero

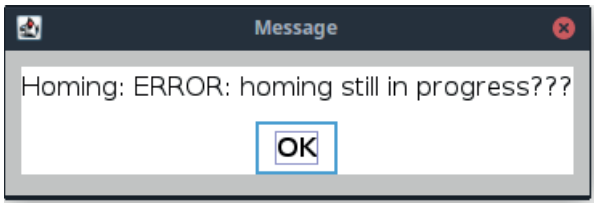


001CDE63

Problem	Possible cause	Solution
Homing procedure is stopped automatically.	• The homing parameters defined in the SLIDEKIT configuration are not correct.	• The homing parameters defined in the SLIDEKIT configuration are not correct.

7.2.5 Homing error: homing still in progress

26 Homing in progress

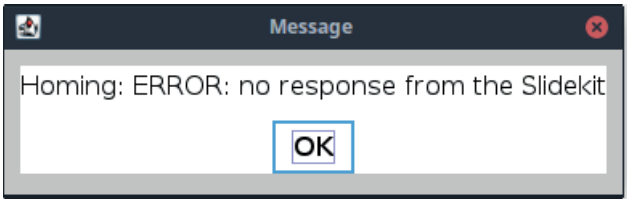


001CDE5A

Problem	Possible cause	Solution
Homing procedure is finished, but the message means it's still in progress.	• Implementation issue.	• Contact Schaeffler.

7.2.6 Homing error: no response from the motor

27 No response from the motor

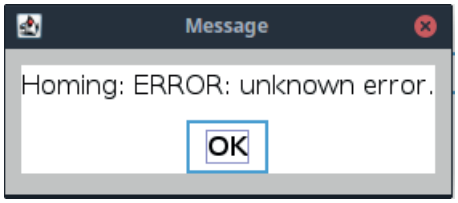


001CDE59

Problem	Possible cause	Solution
Homing procedure is stopped automatically.	• The homing parameters defined in the SLIDEKIT configuration are not correct.	• Check the parameters defined in the SLIDEKIT configuration to check homing.

7.2.7 Homing error: unknown error

28 Unknown error



Problem	Possible cause	Solution
Homing procedure is finished, but the message means it's still in progress.	• Implementation issue.	• Contact Schaeffler.

8 Maintenance

Maintenance work and repairs may only be carried out by qualified personnel.

1. Disconnect the power supply before performing maintenance and repairs.
2. Ensure that the linear module is not under load or under tension.
3. Use suitable safety equipment.

DANGER

Risk of fatal injury from unauthorized reconnection of the power supply

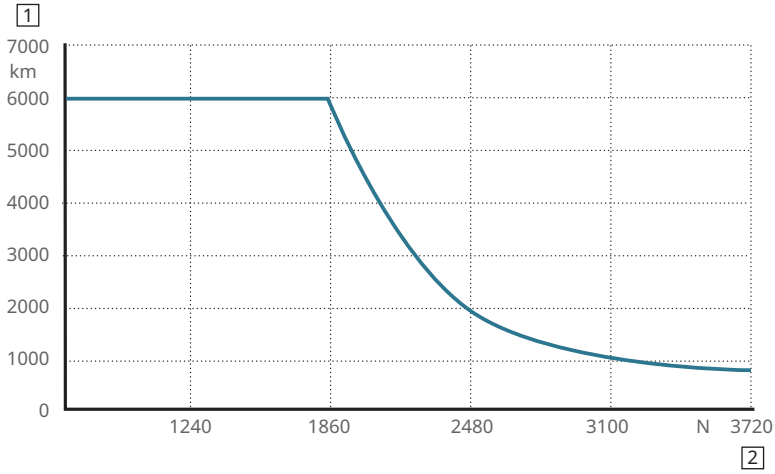
Risk of fatal injury to persons in the hazard area due to moving parts or electric shock if the power supply is switched on without authorization during work on the system and causes the system to restart.

- Before starting work, switch off the system and secure it against reconnection.

8.1 Lubrication intervals

Under normal operating conditions (v ≤ 1 m/s, travel below Fm ≤ 0.3 c.) 4.08 cm^3, inject grease as per the conditions in the diagram below.

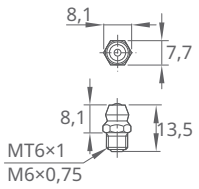
29 Lubrication intervals



1	Lubrication interval	2	Load

Lubrication can be carried out via the special lubricating nipple.

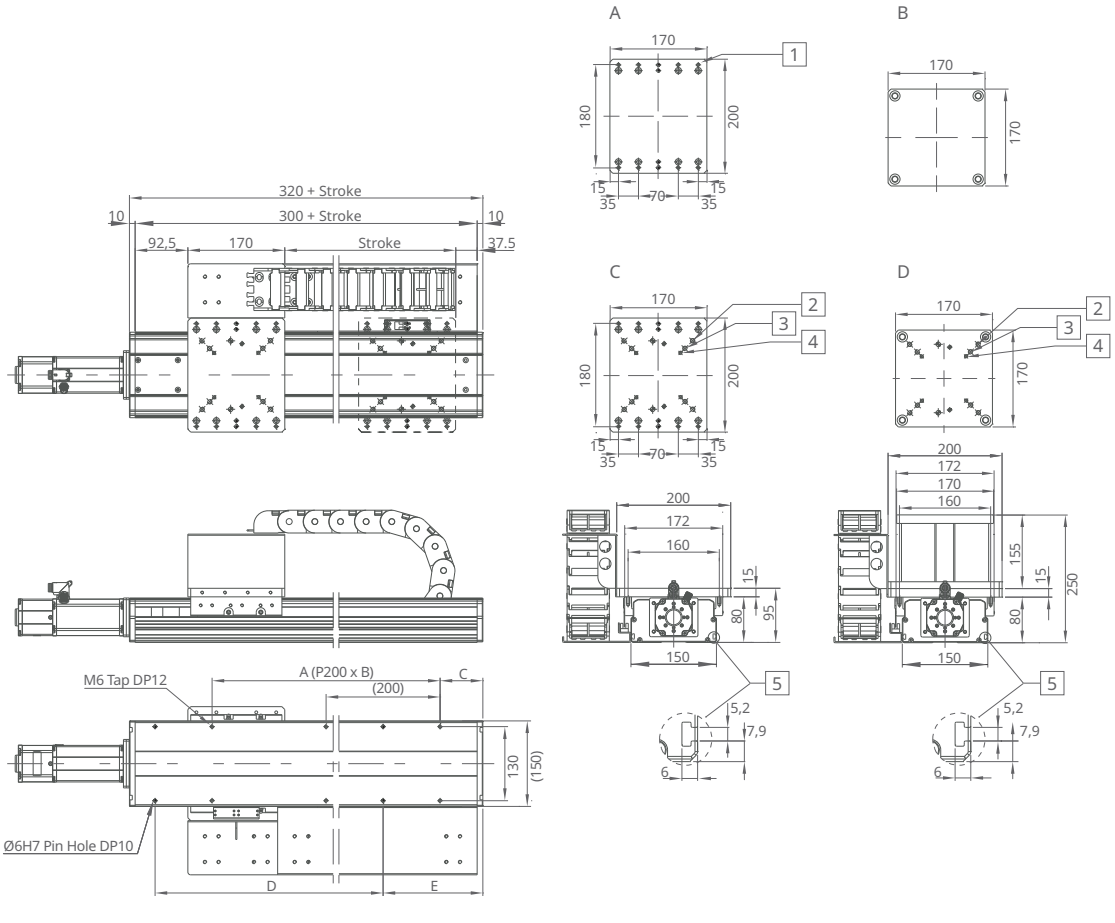
30 Lubricating nipple



9 Technical information

9.1 Ball Screw version

31 Ball Screw version



A	for LIFTKIT	B	for other robots
C	for LIFTKIT and UR robots	D	for URrobots
1	4×2 M6, Tap Thru	2	UR10, UR16
3	UR5	4	UR3
5	Side T-slot (on both sides)		

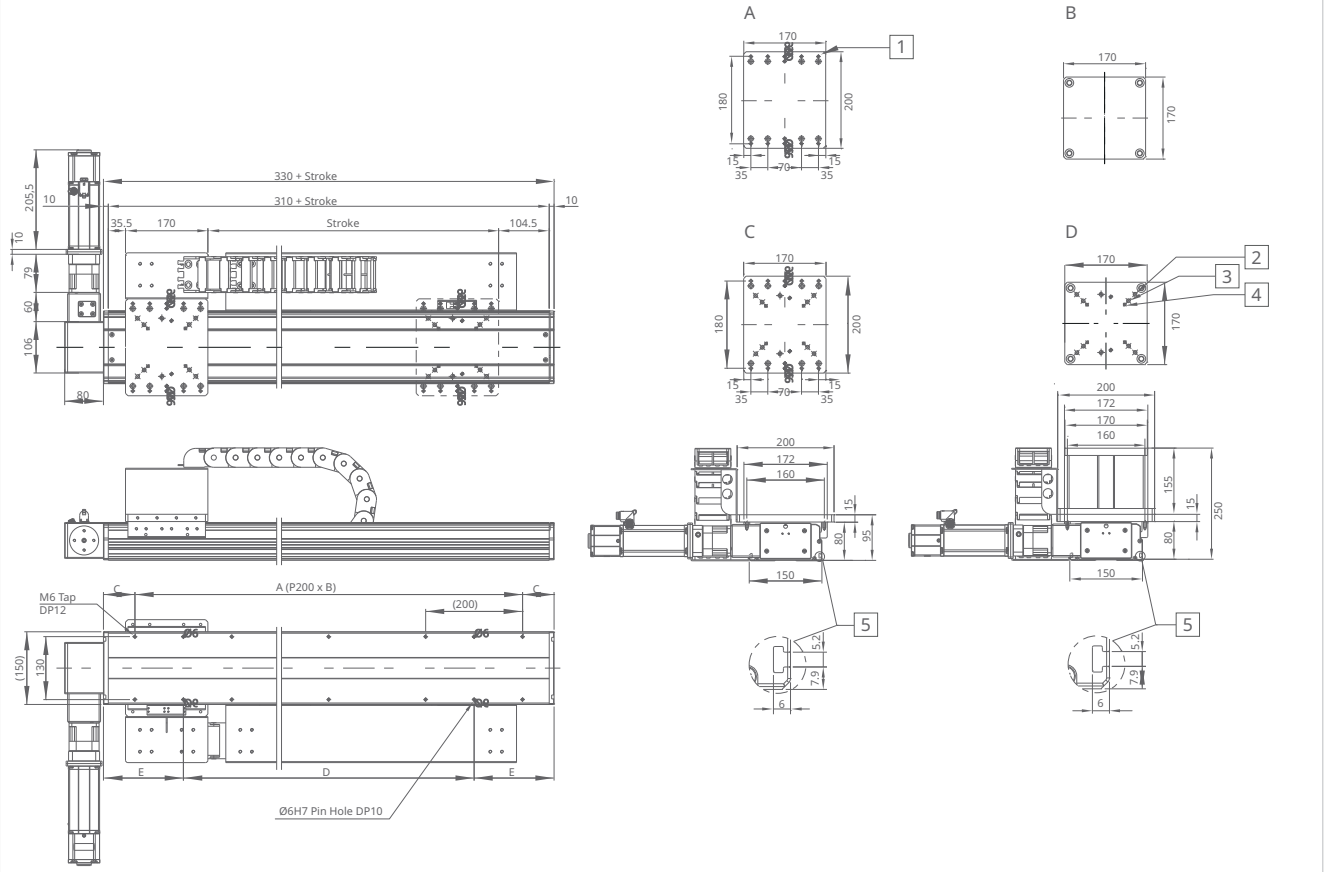
4 Technical information for versions with a ball screw

Point	Stroke	A	B	C	D	E
	mm					
1	100	200	1	75	200	175
2	200	400	2	25		125
3	300	400	2	75	400	175
4	400	600	3	25		125
5	500	600	3	75	600	175
6	600	800	4	25		125
7	700	800	4	75	800	175
8	800	1000	5	25		125
9	900	1000	5	75	1000	175
10 [1)]	1000 [1)]	1200 [1)]	6 [1)]	25 [1)]		125 [1)]
11	1100	1200	6	75	1200	175
12	1200	1400	7	25		125
13	1300	1400	7	75	1400	175
14	1400	1600	8	25		125
15	1500	1600	8	75	1600	175
16	1600	1800	9	25		125
17	1700	1800	9	75	1800	175
18 [1)]	1800 [1)]	2000 [1)]	10 [1)]	25 [1)]		125 [1)]

[1)] Standard stroke

9.2 Version with belt drive

32 Version with belt drive



A	for LIFTKIT	B	for other robots
C	for LIFTKIT and UR robots	D	for URrobots
1	4×2 M6, Tap Thru	2	UR10, UR16
3	UR5	4	UR3
5	Side T-slot (on both sides)		

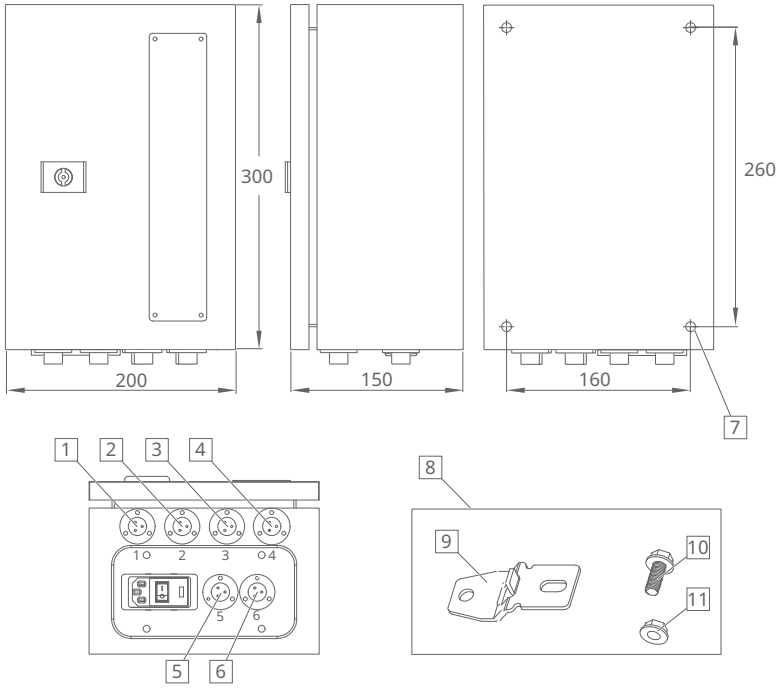
5 Technical information for versions with a belt drive

Item	Stroke	A	B	C	D	E
	mm					
10	1000	1200	6	65	1000	165
11	1100	1200	6	115	1000	215
12	1200	1400	7	65	1200	165
13	1300	1400	7	115	1200	215
14	1400	1600	8	65	1400	165
15	1500	1600	8	115	1400	215
16	1600	1800	9	65	1600	165
17	1700	1800	9	115	1600	215
18	1800	2000	10	65	1800	165
19	1900	2000	10	115	1800	215
20	2000	2200	11	65	2000	165
21	2100	2200	11	115	2000	215
22	2200	2400	12	65	2200	165
23	2300	2400	12	115	2200	215
24	2400	2600	13	65	2400	165
25 [1)]	2500 [1)]	2600 [1)]	13 [1)]	115 [1)]	2400 [1)]	215 [1)]
26	2600	2800	14	65	2600	165
27	2700	2800	14	115	2600	215
28	2800	3000	15	65	2800	165
29	2900	3000	15	115	2800	215
30 [1)]	3000 [1)]	3200 [1)]	16 [1)]	65 [1)]	3000 [1)]	165 [1)]

[1)] Standard stroke

9.3 Controller

33 Controller

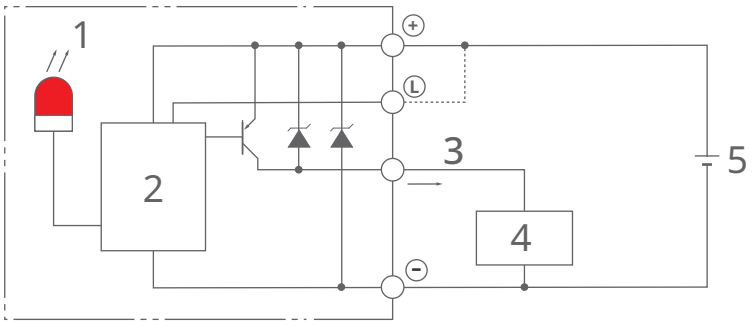


001CDE4B

1	Connection for proximity switch 1 (Home) Connection for proximity switch 2 (+Limits)	2	Connection for safety-I/O cable
3	Connection for cobot interface cable	4	Connection for digital-I/O interface cable
5	CANopen interface connection	6	Motor power cable connection
7	Ø 4–Ø 8.5 (connection opening to SLIDEKIT control box)	8	Wall bracket (optional)
9	Clip: 4EA	10	Screw: 4EA
11	Nut: 4EA		

9.4 Limit switches

34 Limit switches



001CDE30

1	Indicator light (red)	2	Main circuit
3	OUT IC	4	Load
5	DC 5V to 25 V		

6 EE-SX574P-WR 1M

Model	Configuration of the output	Times			End conditions
EE-SX67P EE-SX67P-WR	Lights-ON		Incident		Short circuit between (L) terminal and positive (+) terminal
			Interrupted		
		Indicator light (red)	ON		
			OFF		
	Dark-ON	Output transistor	ON		
			OFF		
		Load (relay)	Operates		
			Releases		
	Lights-ON		Incident		Open between (L) terminal and positive (+) terminal *1 *2
			Interrupted		
		Indicator light (red)	ON		
			OFF		
	Dark-ON	Output transistor	ON		
			OFF		
		Load (relay)	Operates		
			Releases		

1	+	V_{CC}
2	L	L [1)]
3	OUT	OUTPUT
4	–	GND (0 V)

1) Pin 2 is not required for the EE-SX474.

9

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