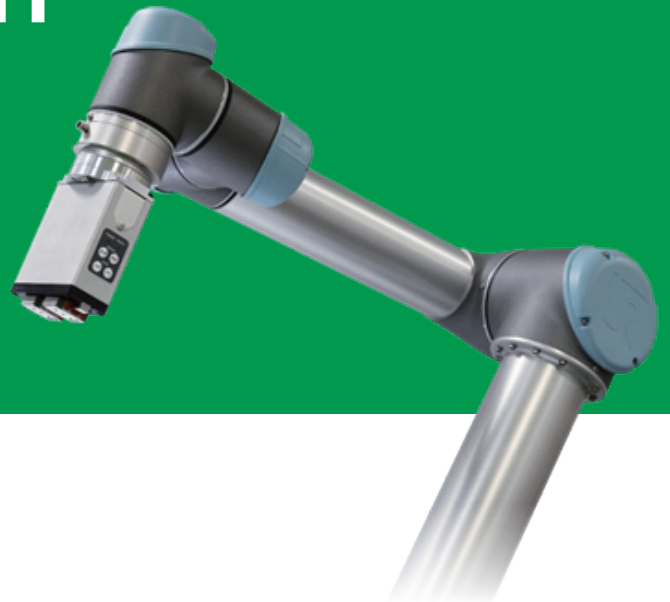




# UR+ Solution

Technical Manual Guide





## Semiconductor Subsystem

- Semiconductor/LED/Panel
- EFEM (Equipment Front End Module)
  - Wafer Robot
  - Load Port
  - Wafer Aligner



## Multi-Axis Robot

- Pick-and-Place / Assembly / Array and Packaging / Semiconductor / Electro-Optical Industry / Automotive Industry / Food Industry
- Articulated Robot
  - SCARA Robot
  - Electric Gripper
  - Integrated Electric Gripper



## Single-Axis Robot

- Precision / Semiconductor / Medical / FPD
- KK, SK
  - KS, KA
  - KU, KE, KC



## Torque Motor Rotary Table

- Medical / Automotive Industry / Machine Tools / Machinery Industry
- RAB Series
  - RAS Series
  - RCV Series
  - RCH Series



## Ball screw

- Precision Ground / Rolled
- Super S Series
  - Super T Series
  - Mini Roller
  - Ecological & Economical Lubrication Module E2
  - Rotating Nut (R1)
  - Energy-Saving & Thermal-Controlling (Cool Type)
  - Heavy Load Series (RD)
  - Ball Spline



## Linear Guideway

- Automation / Semiconductor / Medical
- Ball Type--HG, EG, WE, MG, CG
  - Quiet Type--QH, QE, QW, QR
  - Other--RG, E2, PG, SE, RC



## Bearing

- Machine Tools / Robot
- Crossed Roller Bearing
  - Ballscrew Bearing
  - Support Unit



## DATORKER® Strain Wave Gear

- Robot / Automation Equipment / Semiconductor Equipment / Machine Tools
- DSC Type
  - DSH Type
  - DGC Type
  - DGH Type
  - DLC Type



## AC Servo Motor & Drive

- Semiconductor / Packaging Machine / SMT / Food Industry / LCD
- Drives--D1, D2T/D2T-LM, E1
  - Motors--FR, E1



## Medical Equipment

- Hospital / Rehabilitation Centers / Nursing Homes
- Robotic Gait Training System
  - Robotic Endoscope Holder



## Linear Motor Stage

- Automated Transport / AOI Application / Precision / Semiconductor
- Iron-core Linear Motor
  - Coreless Linear Motor
  - Linear Turbo Motor LMT
  - Planar Servo Motor
  - Air Bearing Platform
  - X-Y Stage • Gantry Systems
  - Single-Axis Linear Motor Stage



## Torque Motor & Direct Drive Motor

- Machine Tools
- Torque Motor--TM-2/IM-2, TMRW Series
- Inspection / Testing Equipment / Robot
- Direct Drive Motor--DMS, DMY, DMN, DMT Series

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## 1. Warranty

The warranty period for the product is 12 months or 5 million operations (whichever comes first), but it does not include any of the following causes of failure:

- ◎ Beyond the operation method, operating environment and storage specifications defined in the product manual.
- ◎ The damage caused by installation place movement, change of working environment, or improper transfer after being installed by a professional installer.
- ◎ Product damaged due to collision or accident caused by improper operation or installation.

The following conditions are not covered by the warranty:

- ◎ Product serial number or date of production(month and year) cannot be verified.
- ◎ Gripper body and control components using non-HIWIN original products.
- ◎ Adding or removing any element into/out the gripper or the controller.
- ◎ Modifying the wire or the cables between the gripper body and the controller.
- ◎ Any modification of the appearance of the gripper or controller; Removal of the components inside the gripper or the controller. e.g., demolition of the outer covering, product drilling or cutting.
- ◎ Damage caused by any natural disaster. i.e., fire, earthquake, tsunami, lightning, windstorms, floods etc.

HIWIN does not provide any warranty or compensation to all the damage caused by above-mentioned circumstances unless the user can prove that the product is defective.

For more information towards warranty terms and conditions, please contact the technician or the dealer who you purchased with.

## 2. Technical Info

### 2.1 Integrated electric gripper S-series

Model			SEG-24	STG-16
Category	Item	Unit	Value	
Motion specifications	Stroke per side	mm	12	8
	Gripping force	N	35 [Note2]	40 [Note1]
	Gripping speed	mm/s	15(45) [Note3]	30
	Repeatability	mm	±0.1	±0.1
Power specifications	Operation voltage	V	24±10%	24±10%
	Operation current	A	0.5	0.5
Load	Load torque Mr	N-m	11.76	7
	Load torque Mp	N-m	7.35	4.5
	Load torque My	N-m	7.35	4.5
	Load strength F	N	254.8	196
Hardware specifications	Weight	kg	0.7	0.7
	IP class	-	IP20	IP40
	Cleanroom class	-	-	-
	Operation temperature	°C	5-45	5-45
	Operation humidity	%RH	< 85	< 85
	Storage temperature	°C	0-60	0-60
	Total length	mm	105.5	72.3
	Total height	mm	88	100
Total thickness	mm	38	100	

[Note 1] This gripping force is measured at a gripping point (L) of 20mm with a gripping force accuracy of ±25%.

[Note 2] This gripping force is measured at a gripping point (L) of 20mm with a gripping force accuracy of ±30%.

[Note 3] Moving velocity is 45mm/s.

[Description 1] Gripping force is recommended to be 10 to 20 times the weight of gripped object.

[Description 2] High-speed movement or rotation after gripping requires the weight of object to be reduced.

[Description 3] Material, shape, grip area, etc. of gripping part will affect the maximum weight of gripped object, and the gripping part required to be installed before gripping.

## 2.2 Electric gripper X-series

Model		XEG-16	XEG-32	XEG-64	
Electric gripper	Stroke [both sides](mm)	16 ±0.5	32 ±0.5	64 ±0.5	
	Gripping Force (N)	25~50	60~150	180~450	
	Speed (mm/s)	Motion	1~60	1~80	1~100
		Gripping[Note2]	1~10	1~20	1~20
	Repeatability (mm)	±0.01	±0.01	±0.02	
	Drive Device	Single axis robot			
	Grease Supply of Drive Device[Note3]	500,000 cycles or 6 months			
	Impact /Vibration Resistance (m/s <sup>2</sup> )	150 / 30			
	Operating Temperature Range (°C)	5 ~ 45			
	Operating Humidity Range (%)	RH 35~85 (No condensing)			
	IP Class	IP20			
Weight (kg)	0.4	0.7	1.9		
Controller	Motor Type	Stepper motor			
	Motor Size (mm)	<input type="checkbox"/> 20	<input type="checkbox"/> 28	<input type="checkbox"/> 42	
	Power Supply (V)	DC 24 ± 10%			
	Total Current (A)	0.5A			
	Weight (Kg)	0.15			

[Note 1] The weight of workpiece(kg) \* acceleration of gravity 9.81(m/s<sup>2</sup>) should be 1/10~1/20 of the gripping force(N). If the gripper holding a workpiece moves or turns with high-acceleration/ deceleration, choose the model with higher force allowance.

[Note 2] Set the parameters and operation mode to avoid application of excessive impact force to the attachments (fingers) during operation.

[Note 3] Apply proper amount of grease to the grease hole of single axis robot by a grease supply device or on the surface of ball screws with brushes.

[Note 4] Mass of a workpiece that the attachments (fingers) can grip greatly differs depending on the material quality, shape, and gripping surface condition of the attachments (fingers). Design the attachments (fingers) to be lightweight and minimum length.

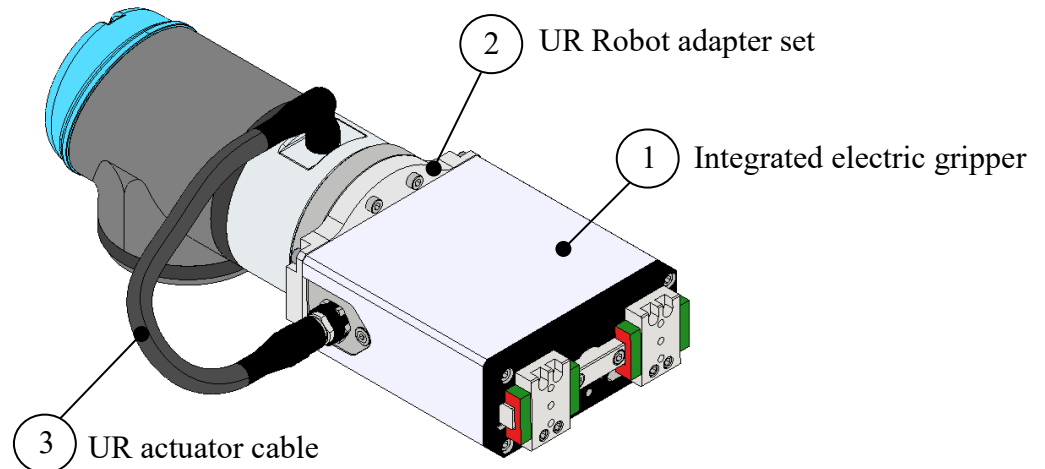
[Note 5] The gripping force of the specification sheet is measured at a speed of 2mm/s and a gripping point (L) of 20mm. The accuracy of the maximum gripping force is XEG-16 : ±30% · XEG-32 : ±16.6% · XEG-64 : ±13.3%.

### 3. S-Series Getting Started

#### 3.1 What's in the box?

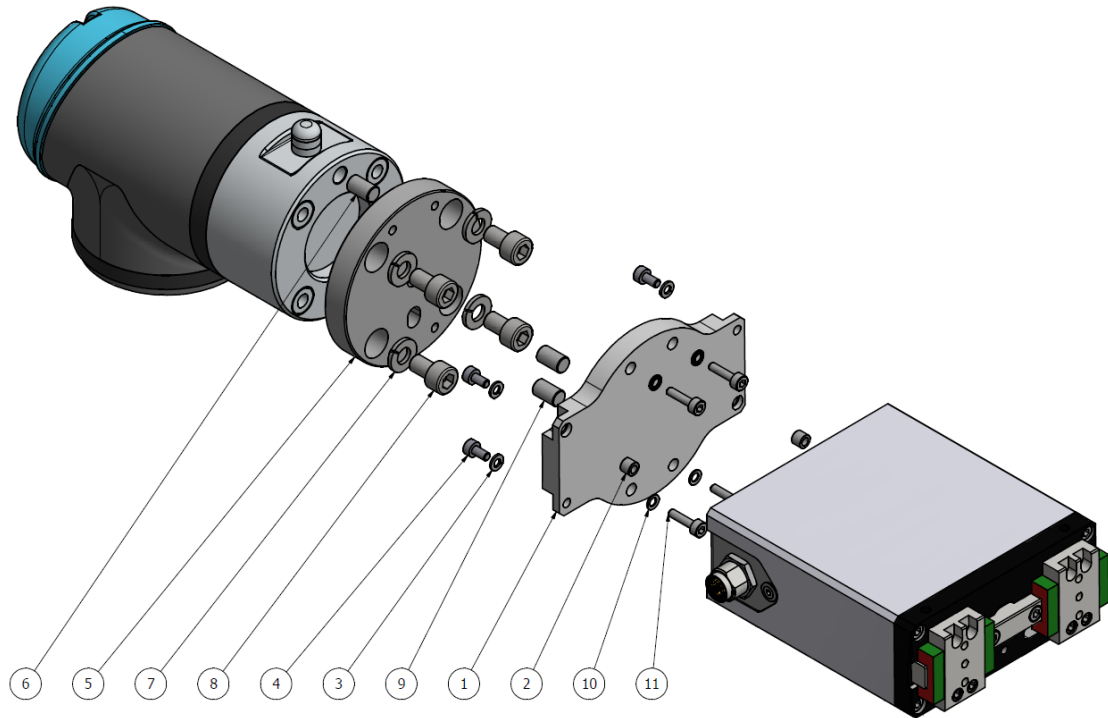
- Model: SEG-24-UR
  1. Integrated electric gripper SEG-24-UR
  2. UR Robot adapter set (ISO-9409-1-50-4-M6)
  3. UR actuator cable
  4. Accessory kit
    - Pin
    - Centering sleeve
  5. Software
    - URCap ([Download](#))
  
- Model: STG-16-UR
  1. Integrated electric gripper STG-16-UR
  2. UR Robot adapter set (ISO-9409-1-50-4-M6)
  3. UR actuator cable
  4. Accessory kit
    - Pin
    - Centering sleeve
  5. Software
    - URCap ([Download](#))

Example:



## 3.2 Mechanical mounting

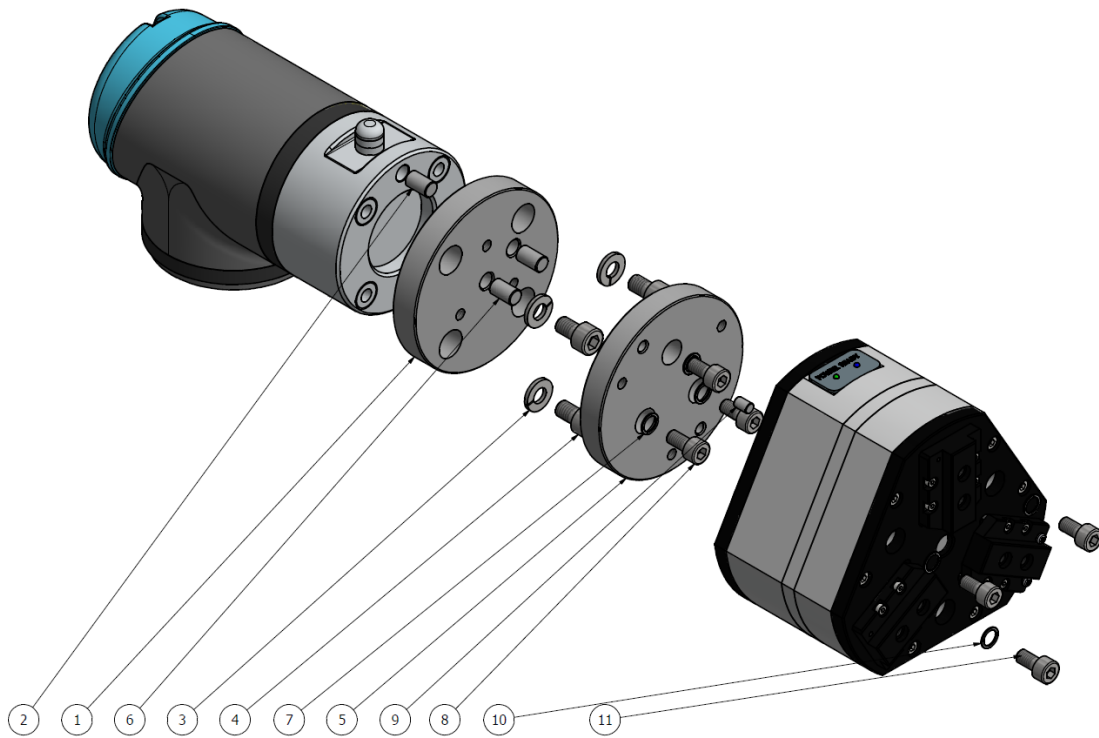
- Model: SEG-24-UR



Item	Parts	Description	Amount
1	SEG24 adapter		1
2	SEG24 Centering Sleeve	∅5x∅3x4L	2
3	Spring Washer	M3 SUS304	4
4	Bolt	M3x0.5Px8L SUS304	4
5	UR adapter		1
6	Pin	∅6x10L	1
7	Spring Washer	M6 SUS304	4
8	Bolt	M6x1Px8L SUS304	4
9	Pin	∅6x10L	2
10	Spring Washer	M4 SUS304	4
11	Bolt	M4x0.7Px16L SUS304	4

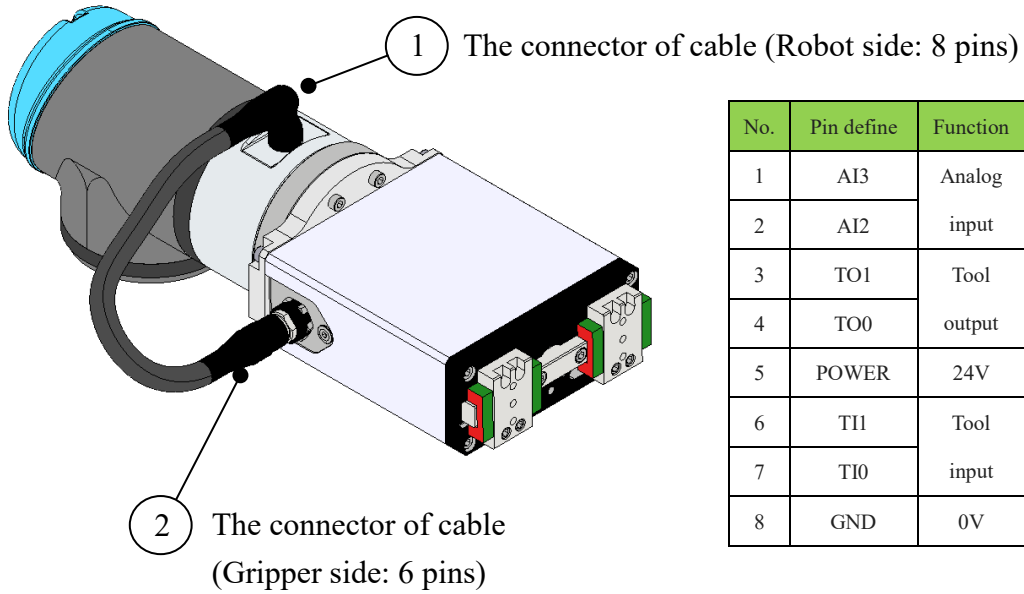


- Model: STG-16-UR



Item	Parts	Description	Amount
1	UR adapter		1
2	Pin	Ø6x10L	1
3	Spring Washer	M6 SUS304	4
4	Bolt	M6x1Px8L SUS304	4
5	STG16 adapter		1
6	Pin	Ø6x10L	2
7	Spring Washer	M5 SUS304	3
8	Bolt	M5x0.8Px12L SUS304	3
9	Pin	Ø4x6L	2
10	Spring Washer	M5 SUS304	3
11	Bolt	M5x0.8Px12L SUS304	3

### 3.3 Electrical mounting



No.	Pin define	Function	Wire color
1	AI3	Analog	NC
2	AI2	input	NC
3	TO1	Tool	Pink
4	TO0	output	Blue
5	POWER	24V	Black
6	TI1	Tool	White
7	TI0	input	Brown
8	GND	0V	Gray

No.	Pin define	Function	Wire color
1	IN1	Ready	Brown
2	IN2	O/C	White
3	OUT1	Busy	Blue
4	VCC	24V	Black
5	GND	0V	Gray
6	OUT2	Alarm	Pink

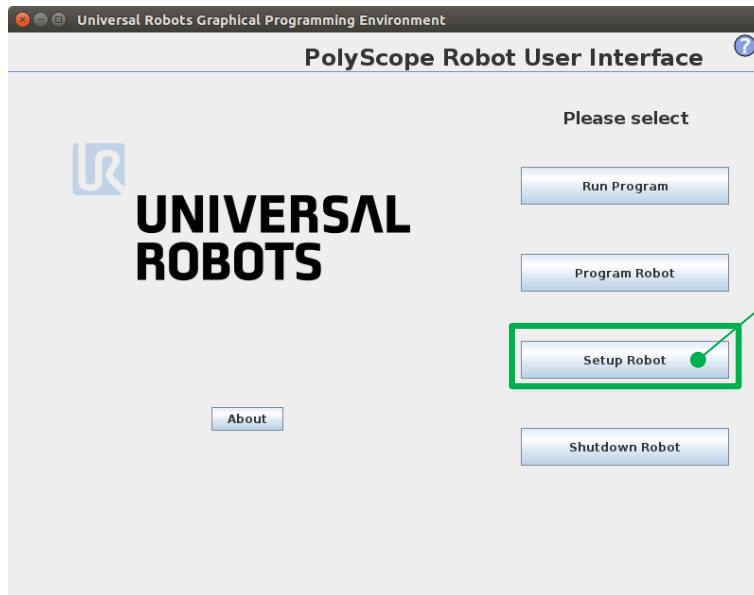
Note : The default tool digital outputs setting for S-Series is NPN type, while tool digital input is PNP type. The design is applied to UR3, UR5, UR10, CB3.0 and CB3.1.

### 3.4 Installing URCap

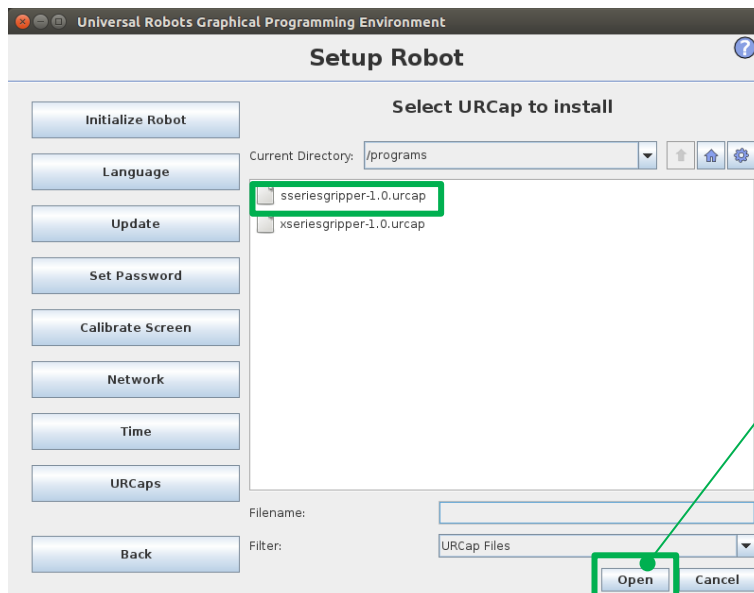
1. Click [here](#) for free downloading of URCap, and save it to a USB stick.
2. Insert the USB with the URCaps file into the UR teach pendant. From the main menu, please select “Setup Robot”.
3. Click “+” on the button side of page to open the URCap file.
4. Restart the robot when prompted.

Note : The HIWIN URCaps requires Universal Robots Polyscope software version above 3.3 or higher, and lower version may not function properly. The current URCaps only limited to UR3, UR5, UR10, CB3.0 and CB3.1.

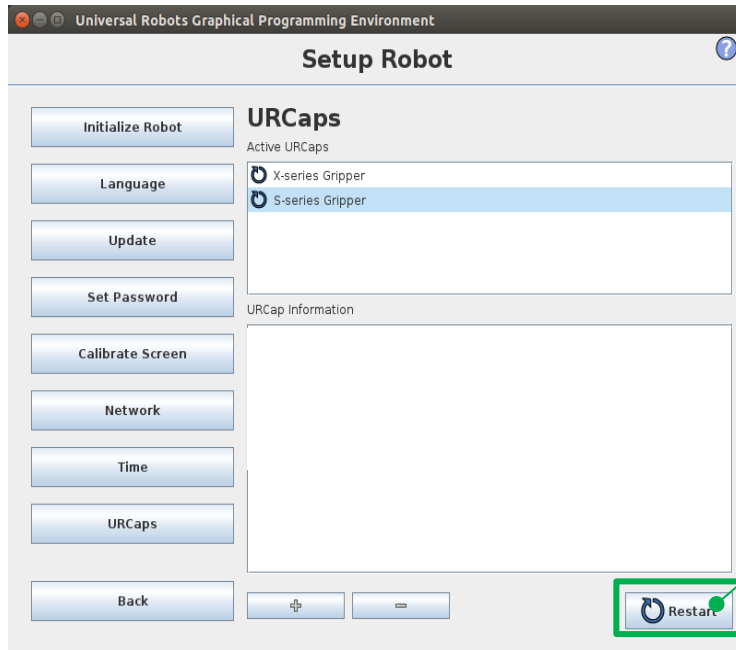
5. After successfully installing the URCaps, please follow the instruction to initialize UR Robot.
6. Set the voltage of the tool output to 24V under IO page.



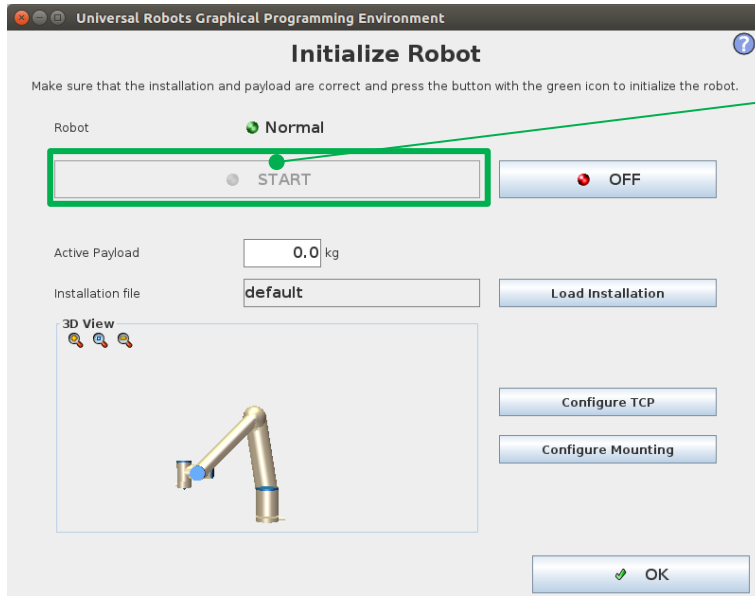
Step 2



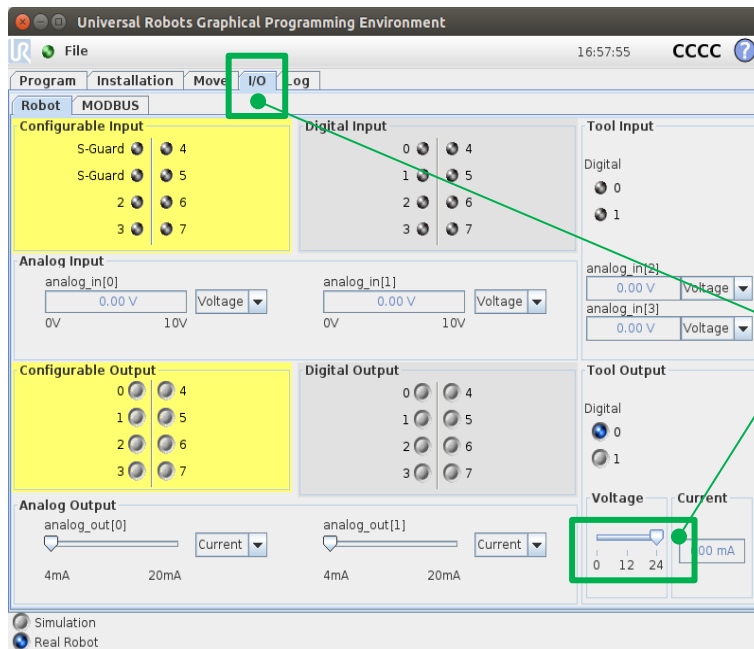
Step 3



Step 4



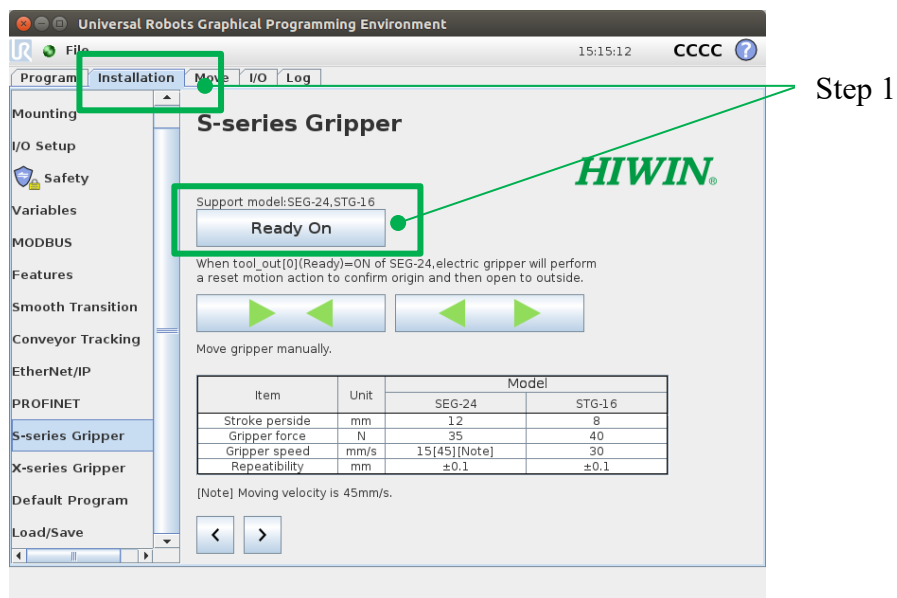
Step 5

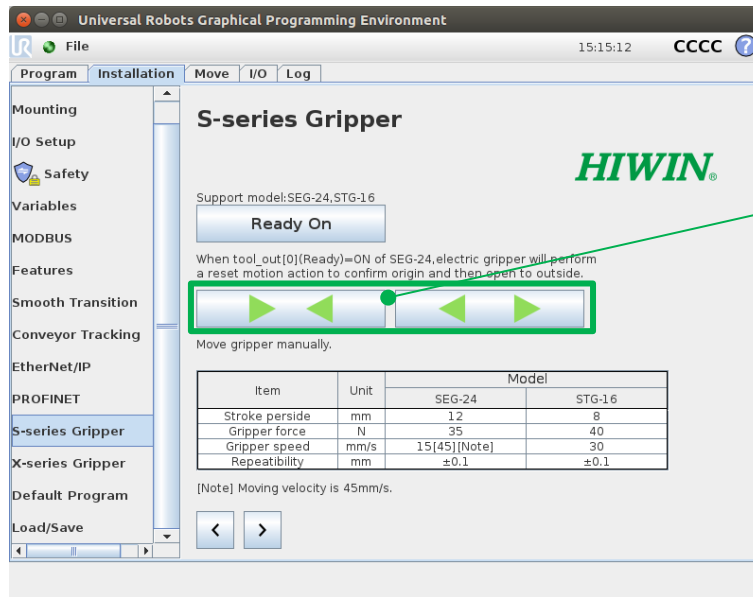


Step 6

### 3.5 Installation page

1. Click the “Ready On” to initialize the center point of gripper under installation page.
2. To make sure the gripper function well before programming, please click “> <” and “< >” shape button to manually move gripper.

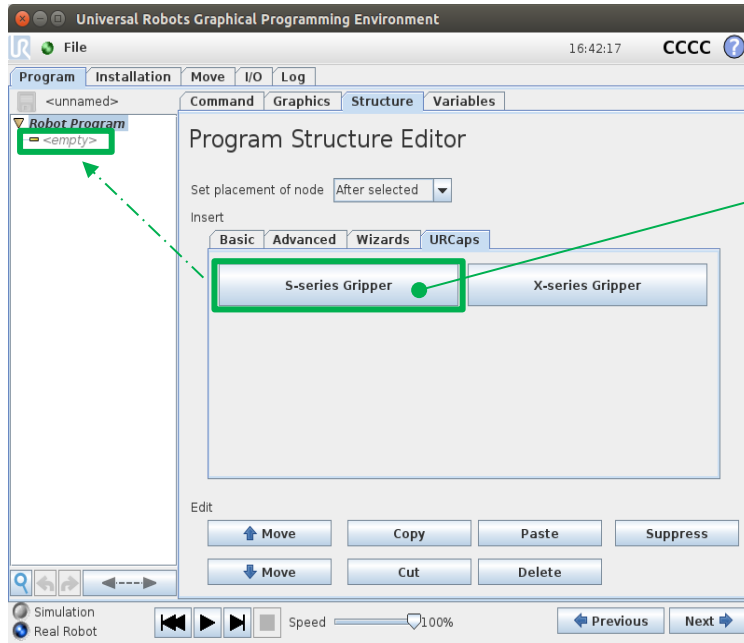




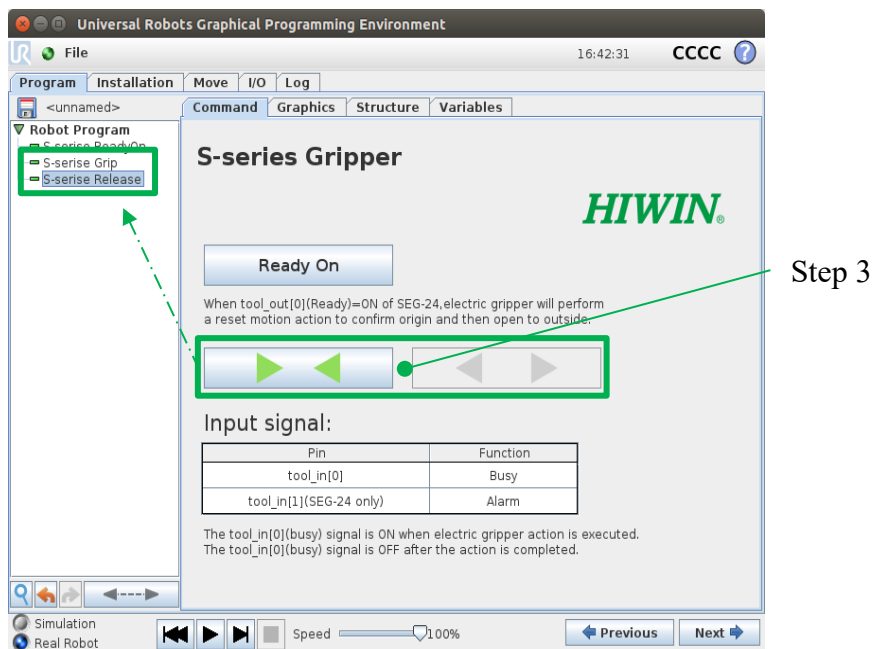
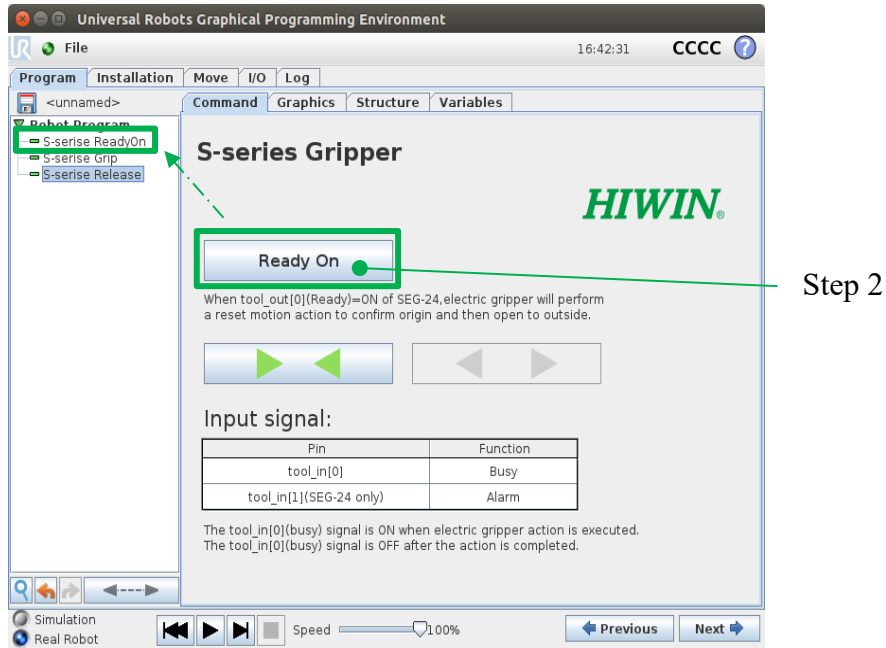
### 3.6 Program page

1. Please go to Program→Structure→URCaps to insert “S-series Gripper” under robot program. Undefined function will be labeled as yellow.
2. Set “Ready On” to confirm the central point of gripper. Normally, it happen when the first time supply the power.
3. Set grip and release stroke through “> <” and “< >” shape button.



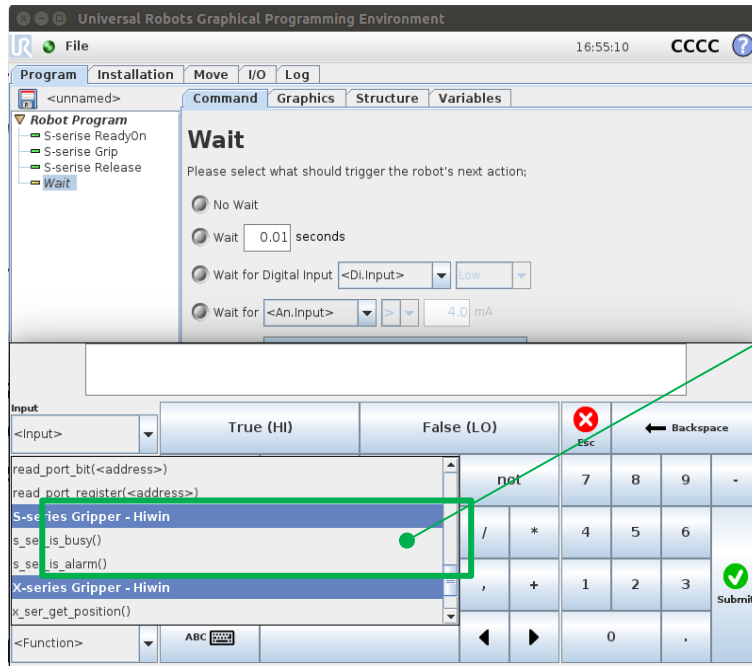


Step 1



## 1.7 Any specific functions for UR

Busy and alarm signal are provided, and user can use it depends on the actual application. The busy signal happens when gripper is executing the program. The alarm signal happens when error shows up during gripper operation.



Busy and  
alarm signal

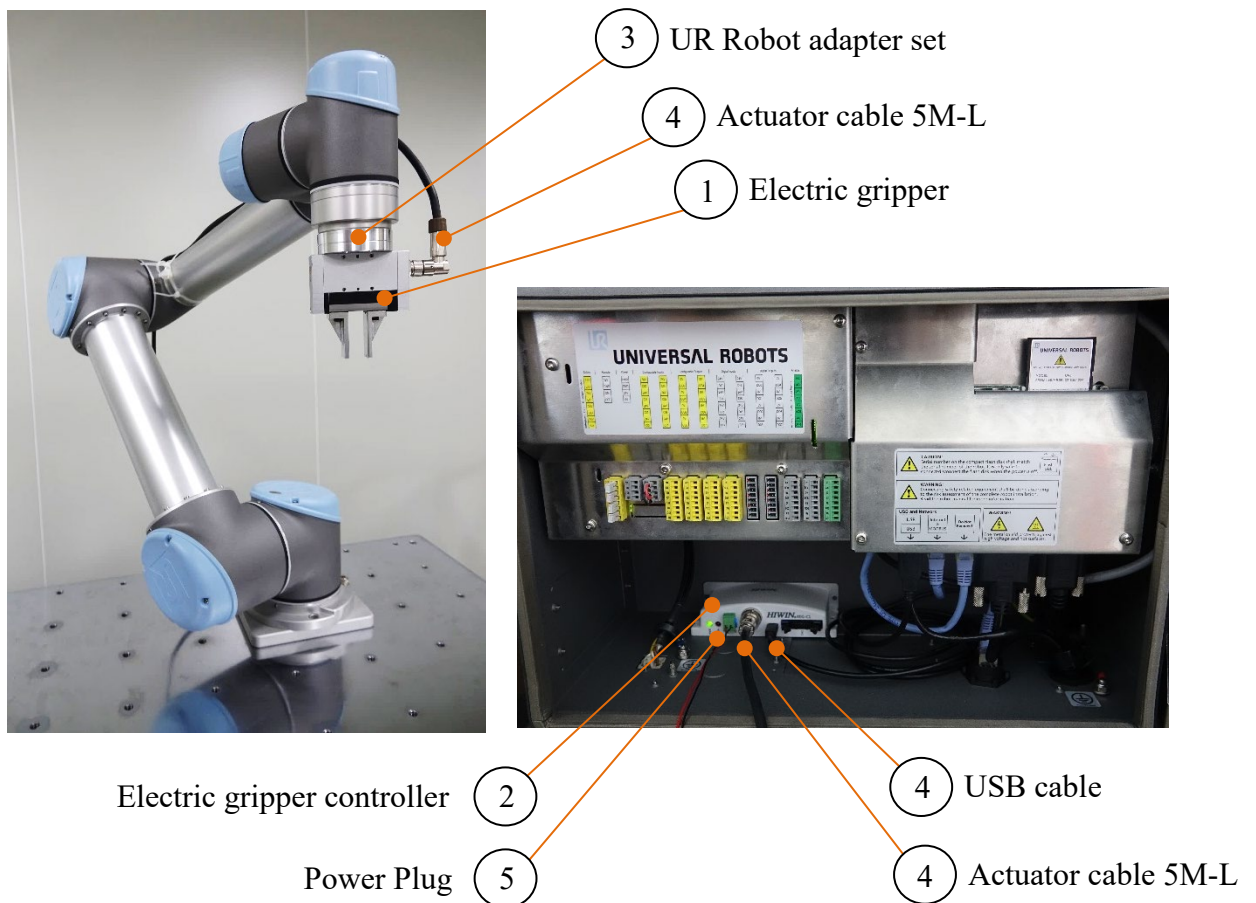
## 4. X-Series Getting Started

### 4.1 What's in the box?

- Model: XEG-16-C15L1-W1-UR
  1. Electric gripper XEG-16
  2. Electric gripper controller XEG-C1
  3. UR Robot adapter set (ISO-9409-1-50-4-M6)
  4. Cable
    - Actuator cable 5M-L
    - I/O cable 1.5M
    - USB cable 1.5M
  5. Accessory kit
    - Power plug
    - Pin
    - Greasing nozzle/tubing
  6. Software
    - URCap ([download](#))
  
- Model: XEG-32-C15L1-W1-UR
  1. Electric gripper XEG-32
  2. Electric gripper controller XEG-C1
  3. UR Robot adapter set (ISO-9409-1-50-4-M6)
  4. Cable
    - Actuator cable 5M-L
    - I/O cable 1.5M
    - USB cable 1.5M
  5. Accessory kit
    - Power plug
    - Pin
    - Greasing nozzle/tubing
  6. Software
    - URCap ([download](#))

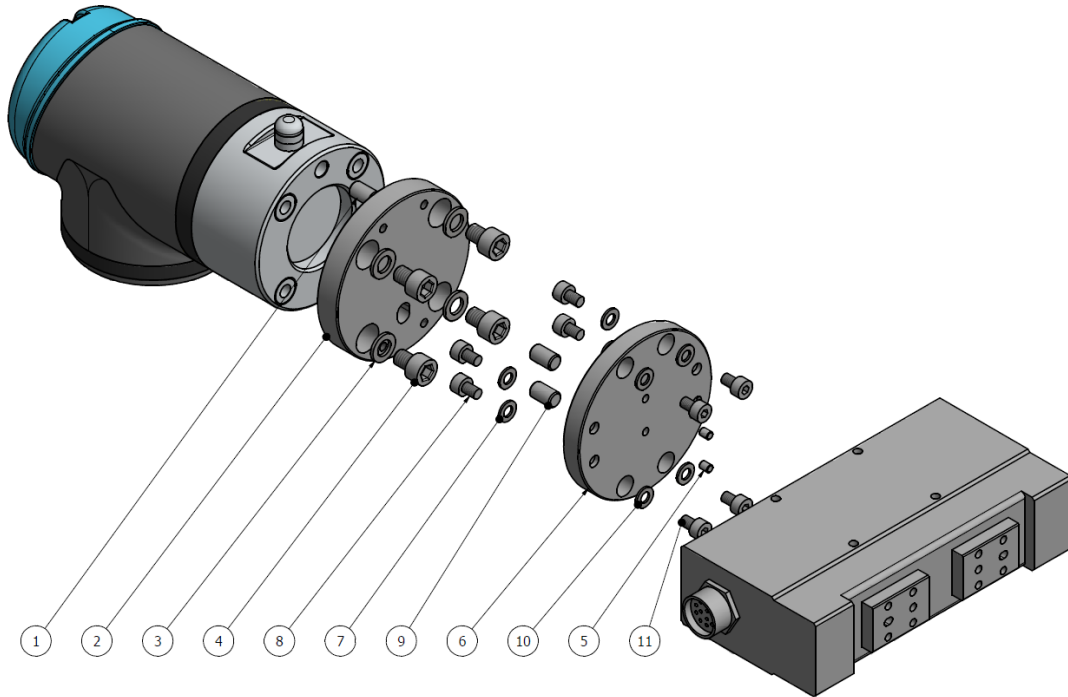
- Model: XEG-64-C15L1-W1-UR
  1. Electric gripper XEG-64
  2. Electric gripper controller XEG-C1
  3. UR Robot adapter set (ISO-9409-1-50-4-M6)
  4. Cable
    - Actuator cable 5M-L
    - I/O cable 1.5M
    - USB cable 1.5M
  5. Accessory kit
    - Power plug
    - Pin
    - Greasing nozzle/tubing
  6. Software
    - URCap ([download](#))

Example:



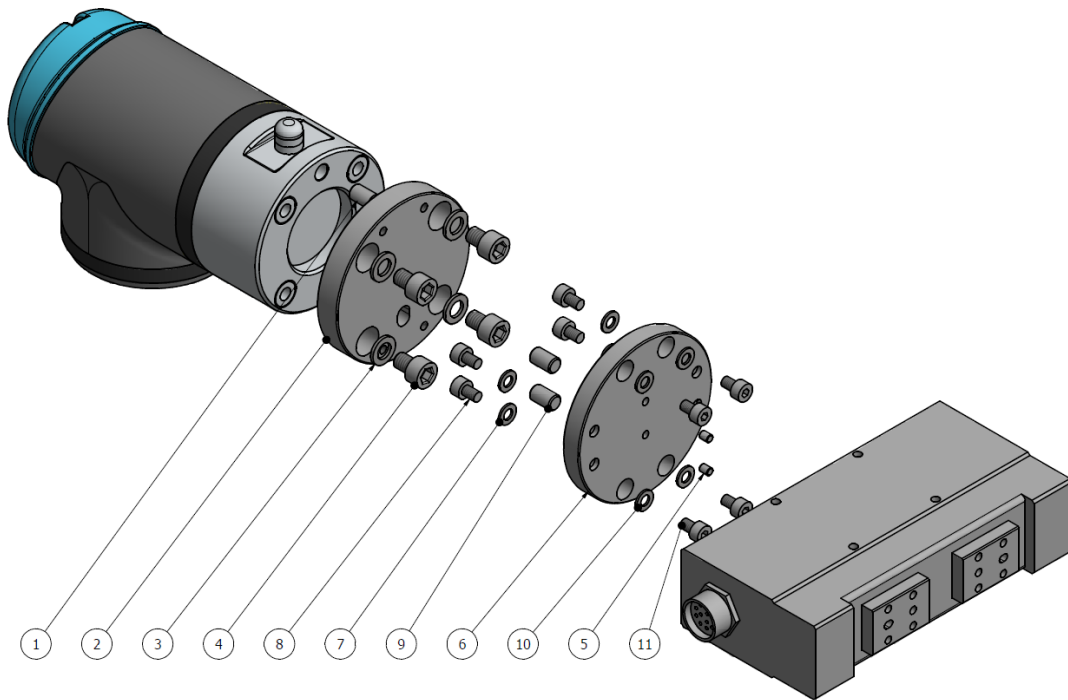
## 4.2 Mechanical mounting

- Model: XEG-16-C15L1-W1-UR



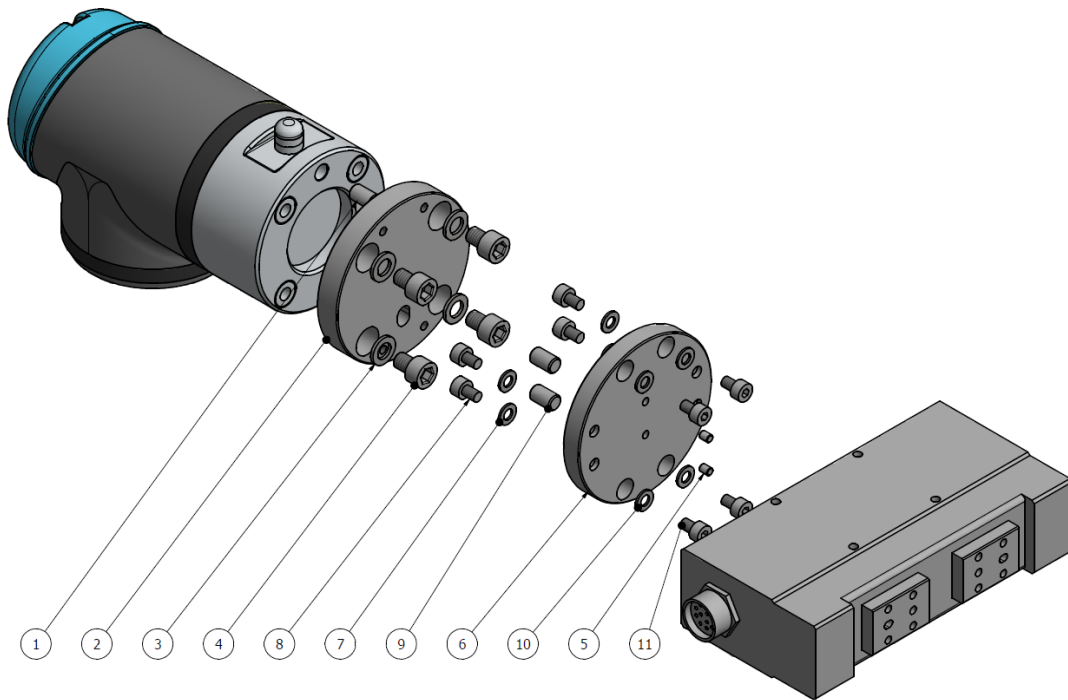
11	Bolt	M4X0.7PX6L SUS304	4
10	Spring washer	M4 SUS304	4
9	Pin	φ6X10L	2
8	Bolt	M3X0.5PX5L SUS304	4
7	Spring washer	M3 SUS304	4
6	XEG-16 adapter	—	1
5	Pin	φ2X4.4L	2
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	UR adapter	—	1
1	Pin	φ6X10L	1
Items	Parts	Description	Amount

- Model: XEG-32-C15L1-W1-UR



11	Bolt	M4X0.7PX6L SUS304	4
10	Spring washer	M4 SUS304	4
9	Pin	φ6X10L	2
8	Bolt	M4X0.7PX6L SUS304	4
7	Spring washer	M4 SUS304	4
6	XEG-32 adapter	—	1
5	Pin	φ3X4L	2
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	UR adapter	—	1
1	Pin	φ6X10L	1
Items	Parts	Description	Amount

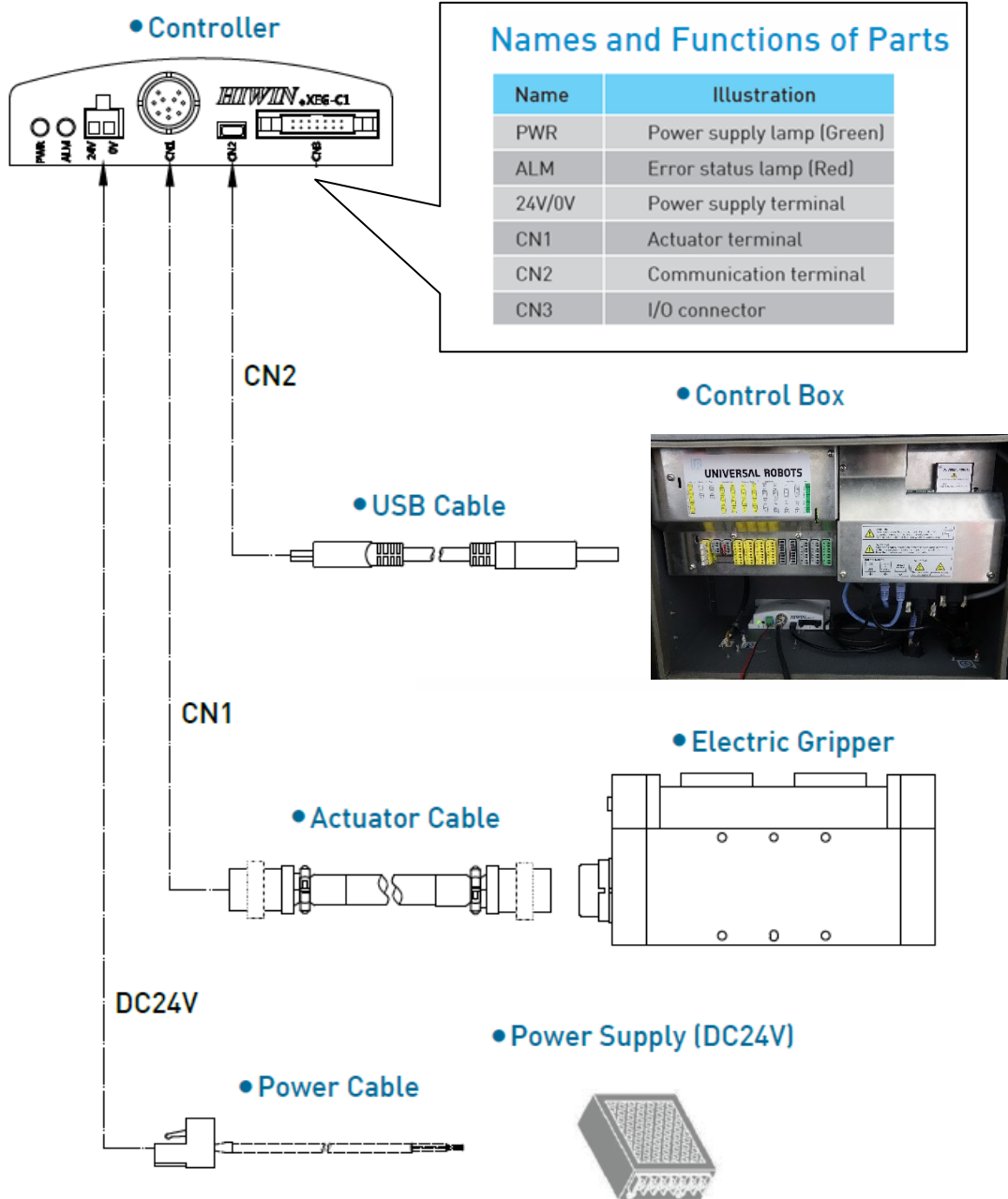
- Model: XEG-64-C15L1-W1-UR



11	Bolt	M6X1PX8L SUS304	4
10	Spring washer	M6 SUS304	4
9	Pin	∅5X6L	2
8	Bolt	M6X1PX8L SUS304	4
7	Spring washer	M6 SUS304	4
6	XEG-64 adapter	—	1
5	Pin	∅5X6L	2
4	Bolt	M6X1PX8L SUS304	4
3	Spring washer	M6 SUS304	4
2	UR adapter	—	1
1	Pin	∅6X10L	1
Items	Parts	Description	Amount



### 4.3 Electric mounting

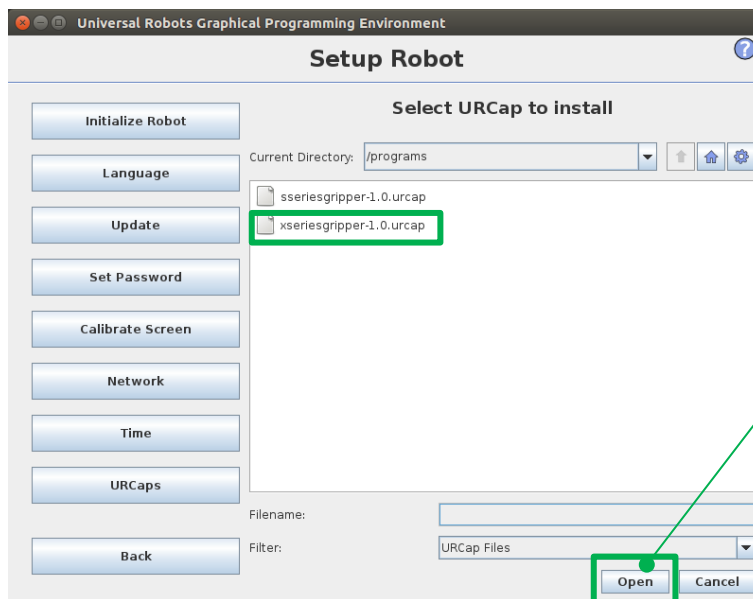
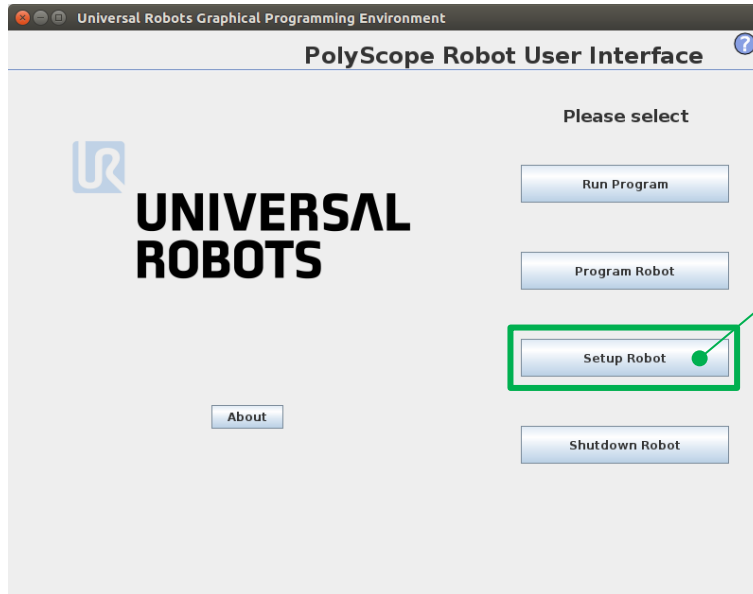


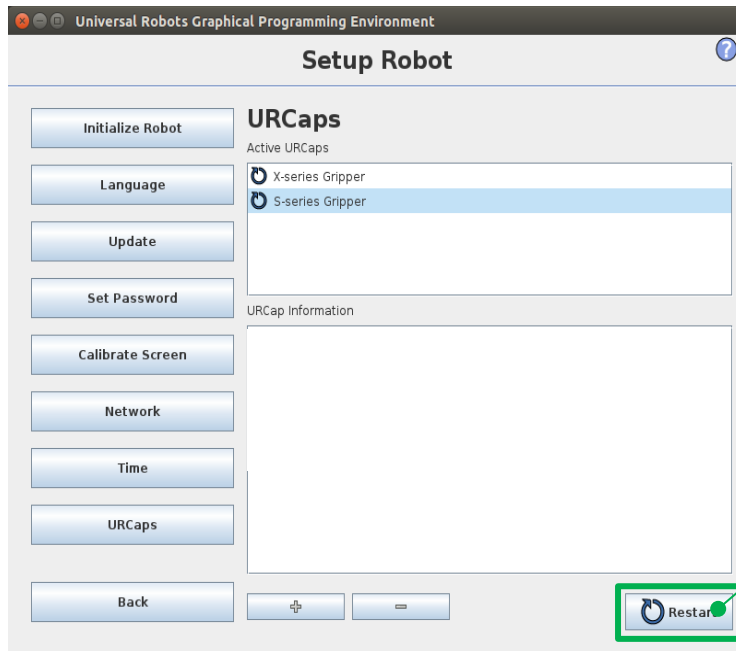
#### 4.4 Installing URCap

1. Click [here](#) for free downloading of URCap, and save it to a USB stick.
2. Insert the USB with the URCaps file into the UR teach pendant. From the main menu, please select “Setup Robot”.
3. Click “+” on the button side of page to open the URCap file.
4. Restart the robot when prompted.

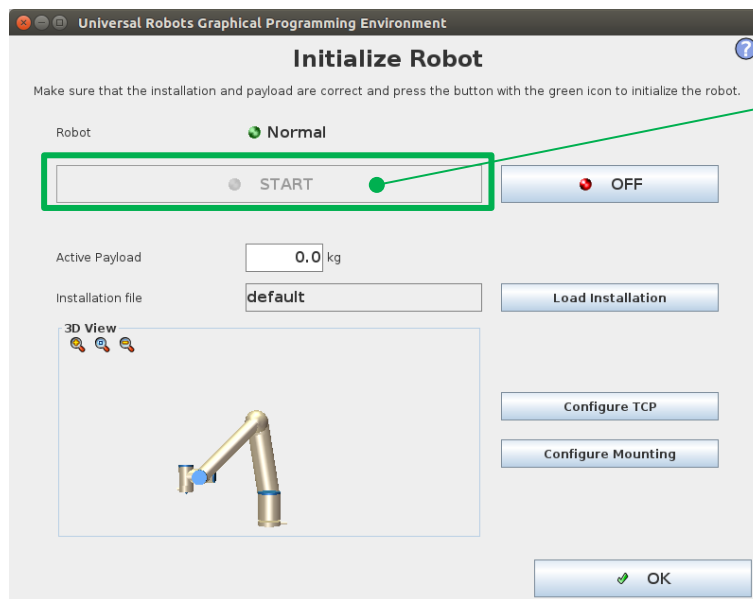
Note : The HIWIN URCaps requires Universal Robots Polyscope software version above 3.3 or higher, and lower version may not function properly. The current URCaps only limited to UR3, UR5, UR10, CB3.0 and CB3.1.

5. After successfully installing the URCaps, please follow the instruction to initialize UR Robot.





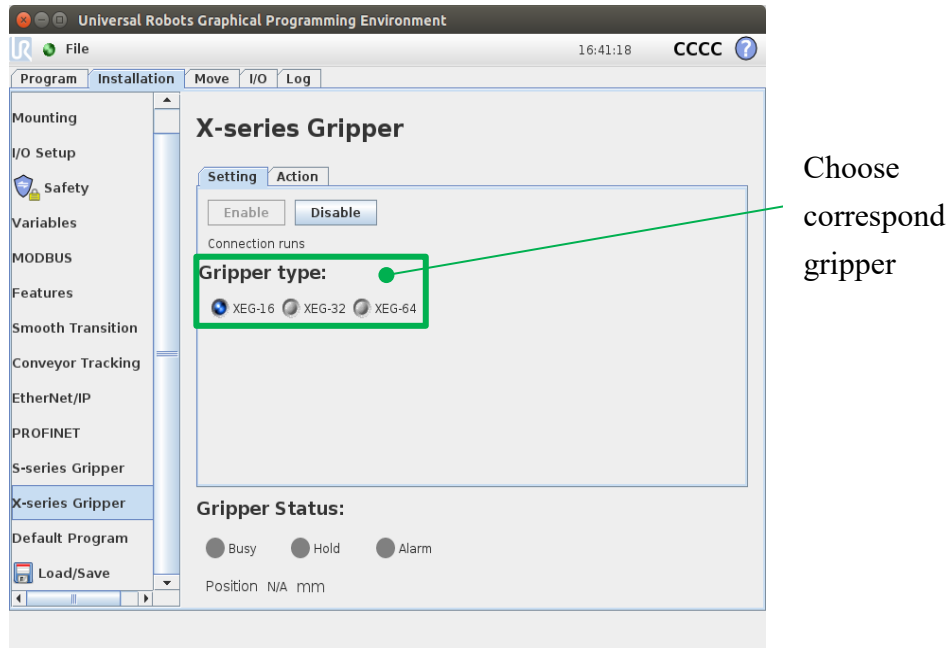
Step 4

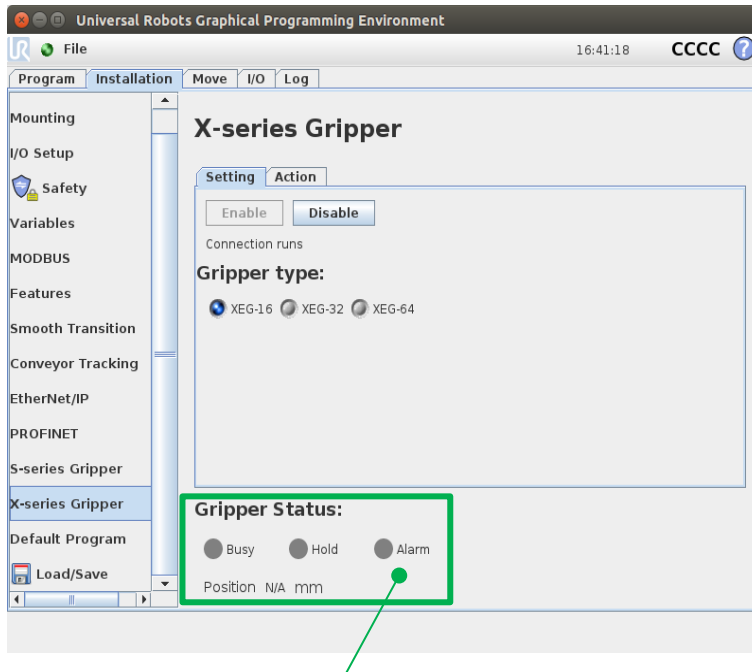


Step 5

## 4.5 Installation page

Here are some detailed description under setting and action page.



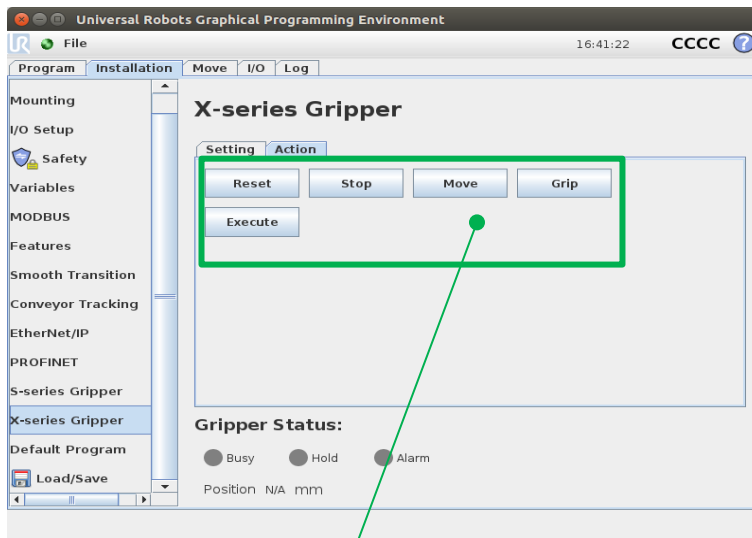


**Busy** : The busy signal happens when gripper is executing the program.

**Hold** : When the gripper exactly grips the gripped part, then the hold signal will show up.

**Alarm** : The alarm signal happens when error shows up during gripper operation.

**Position** : Gripper absolute position.



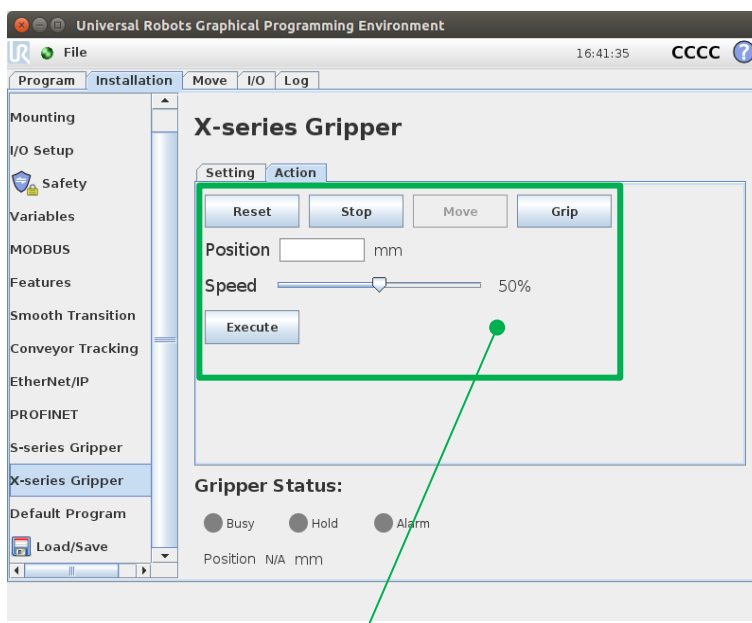
Reset : Initializing the center point of gripper.

Stop : Manually stop for any function.

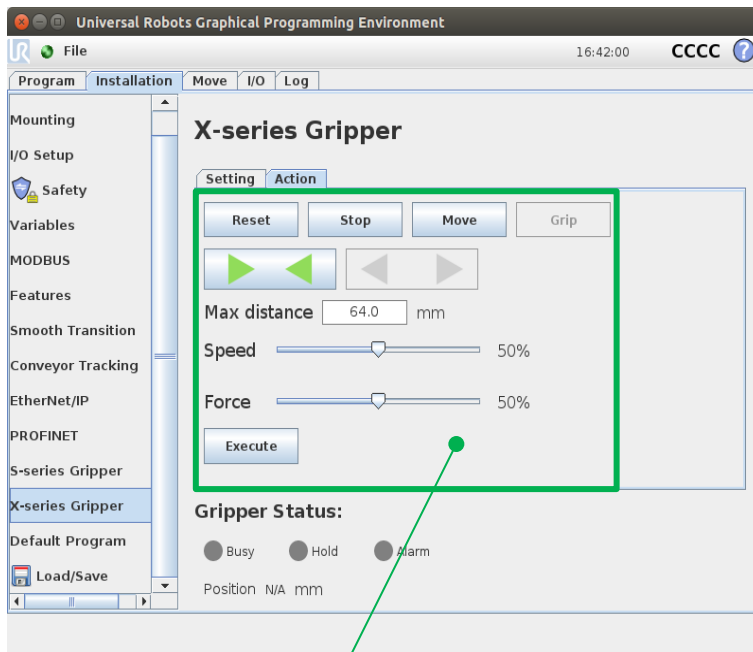
Move : Manually move gripper in an absolute position.

Grip : Manually move gripper in a relative position. When the gripper exactly grips the gripped part, then the hold signal will show up.

Execute : Manually execute above function after clicking, and each time can only run one movement.



Set position and speed according to actual application, and then manually execute the gripper.

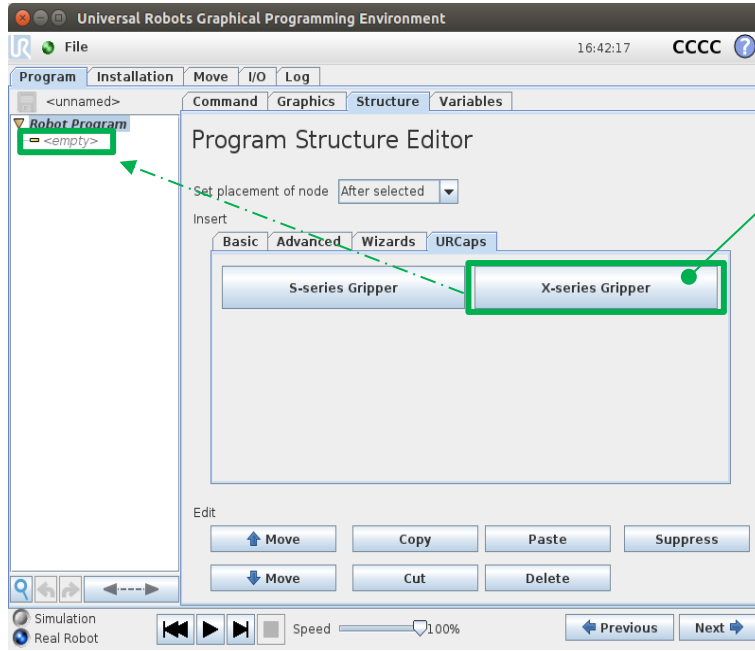


Set distance, speed and force according to actual application, and then manually execute the gripper.

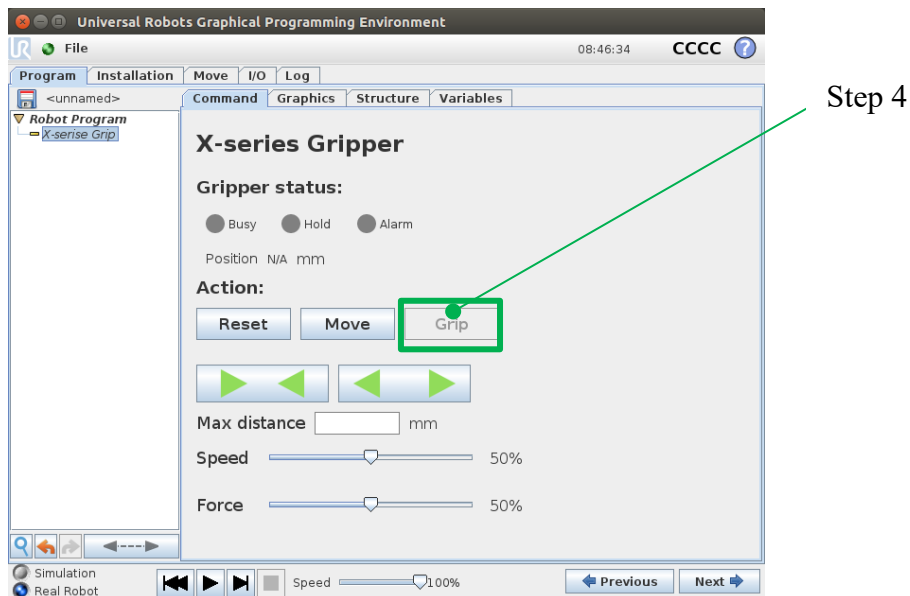
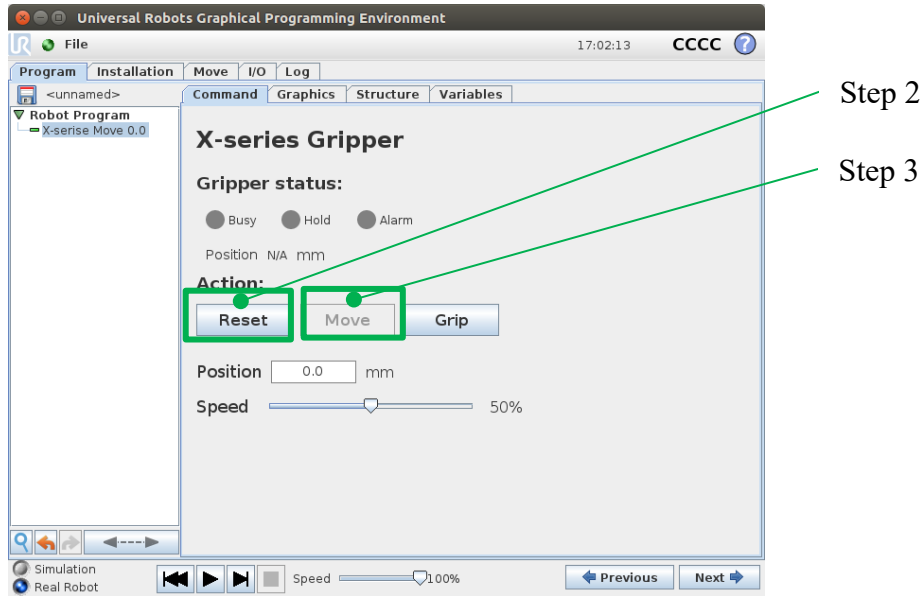
## 4.6 Program page

1. Please go to Program→Structure→URCaps to insert “X-series Gripper” under robot program. Undefined function will be labeled as yellow.
2. Set “Reset” to confirm the central point of gripper.
3. Set “Move” to define position and speed.
4. Set “Grip” to define distance, speed and force.





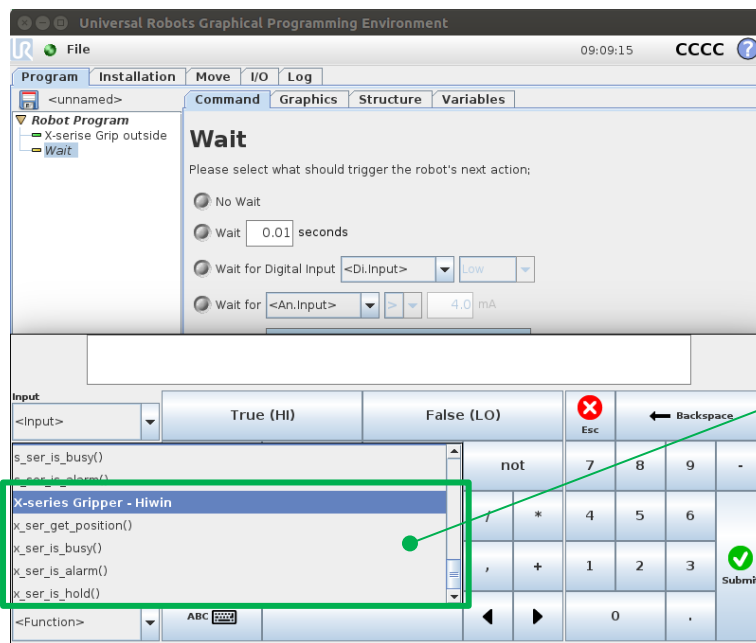
Step 1



#### 4.7 Any specific functions for UR

Position, busy, alarm and hold signal are provided, and user can use it depends on the actual application. The position signal happens when gripper finishes the position movement. The busy signal happens when gripper is

executing the program. The alarm signal happens when error shows up during gripper operation. The hold signal happens when gripped part was exactly hold with grip function.



Position, busy, alarm and hold signal.

## Appendix.1 : Example program

To set up the HIWIN Electric gripper with Universal Robot, a quick example is provided as below.

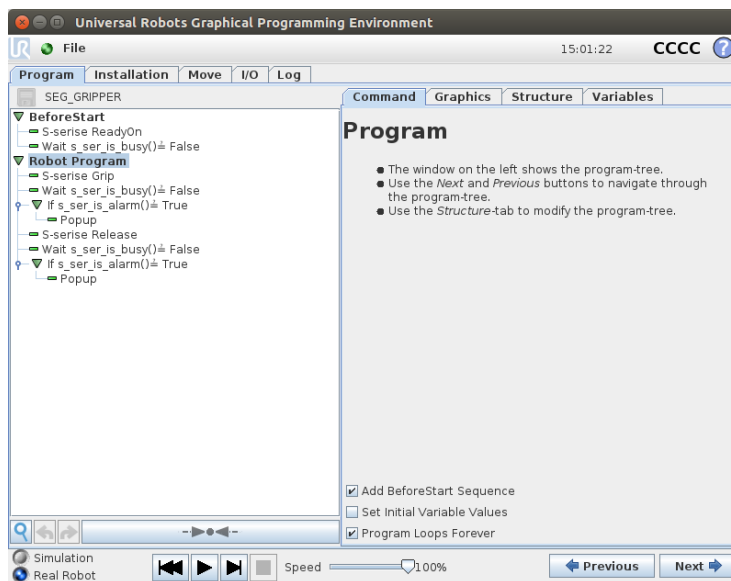
Universal Robot model : UR5 with CB3.0

Software version : Polyscope version above 3.3

URCap version: URCap 1.0

Gripper type : SEG24

1. S-series ReadyOn → Initialize the center point of gripper under installation page. Normally, it happens when the first time supply the power. Therefore, we put it before executing the main program.
2. Wait s\_ser\_is\_busy → To make sure gripper finishes the movement, then it will run the next program line.
3. S-series Grip → Set grip stroke according to the actual application.
4. Wait s\_ser\_is\_busy → To make sure gripper finishes the movement, then it will run the next program line.
5. If s\_ser\_is\_alam → Popup an alarm warning when there is a one.
6. S-series Release → Set release stroke according to the actual application.
7. Wait s\_ser\_is\_busy → To make sure gripper finishes the movement, then it will run the next program line.
8. If s\_ser\_is\_alam → Popup an alarm warning when there is a one.



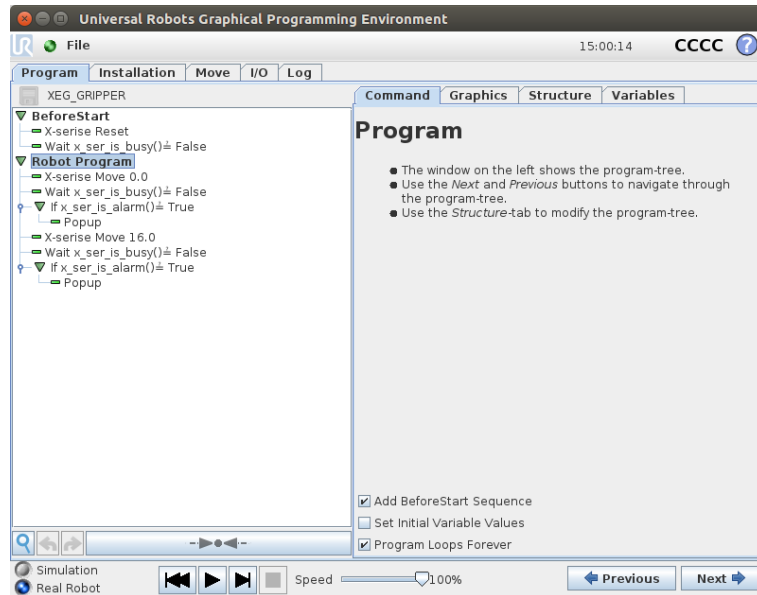
Universal Robot model : UR5 with CB3.0

Software version : Polyscope version above 3.3

URCap version: URCap 1.0

Gripper type : XEG16

1. X-series Reset → Initialize the center point of gripper under installation page.  
Normally, it happens when the first time supply the power. Therefore, we put it before executing the main program.
2. Wait x\_ser\_is\_busy → To make sure gripper finishes the movement, then it will run the next program line.
2. X-series Grip → Set grip stroke according to the actual application.
3. Wait x\_ser\_is\_busy → To make sure gripper finishes the movement, then it will run the next program line.
4. If x\_ser\_is\_alarm → Popup an alarm warning when there is a one.
5. X-series Release → Set release stroke according to the actual application.
6. Wait x\_ser\_is\_busy → To make sure gripper finishes the movement, then it will run the next program line.
7. If x\_ser\_is\_alarm → Popup an alarm warning when there is a one.



## Appendix.2 : Certification

Declarations of conformity with the following directives and standards are available on request.

CE Compliance	
Machinery Directives	2006/42/EC
Low Voltage Directives (LVD)	2014/35/EU
Safety of Machinery	EN ISO 12100:2010
	EN 60204-1:2006+AC:2010
Electromagnetic Compatibility Directives (EMC)	EN 61000-6-2:2005
	EN 61000-6-4:2007+A1:2011
Hazardous Substances Restriction Directives (RoHS)	2011/65/EU

## UR+ Solution Technical Manual Guide

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