



DOBOT

User Guide

EPick Gripper

User Guide

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Shenzhen Yuejiang Technology Co., Ltd.

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Preface

Purpose

This manual introduces the parameters, installation and operation of EPick gripper, which is convenient for users to understand and use the grippers.

Intended Audience

This document is intended for:





- Customer
- Sales Engineer
- Installation and Commissioning Engineer
- Technical Support Engineer

Change History

Date	Change Description
2021-8-23	The first release

Symbol Conventions

The symbols that may be founded in this document are defined as follows.

Symbol	Description
 DANGER	Indicates a hazard with a high level of risk which, if not avoided, could result in death or serious injury
 WARNING	Indicates a hazard with a medium level or low level of risk which, if not avoided, could result in minor or moderate injury, robot damage
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, can result in equipment damage, data loss, or unanticipated result
 NOTE	Provides additional information to emphasize or supplement important points in the main text

Reference Documents

[*EPick Vacuum Gripper Instruction Manual*](#)

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1. Description on Gripper

The EPick Gripper is a vacuum Gripper that generates a vacuum with an electric vacuum pump. It is equipped with one or multiple suction cups. Each suction cup can be adapted to your application and grasping needs.



Figure 1.1 EPick gripper

1.1 Specifications

The specifications of EPick gripper are listed in Table 1.1.

Table 1.1 Specifications of EPick

Specification	Description
Gripper mass	706 g
Maximum vacuum level	80 %
Maximum vacuum flow	12L/min
Noise level	64 dBa
Operating ambient temperature	5 to 40°C
Operating supply voltage	24 VDC \pm 10%
Quiescent power (minimum power consumption)	1 W
Peak current	1.8 A for 80 ms when vacuum pump starts
Minimum Peak	600 mA (with current limitations)

1.2 Dimensions

Figure 1.2 represents the dimensions of the gripper.

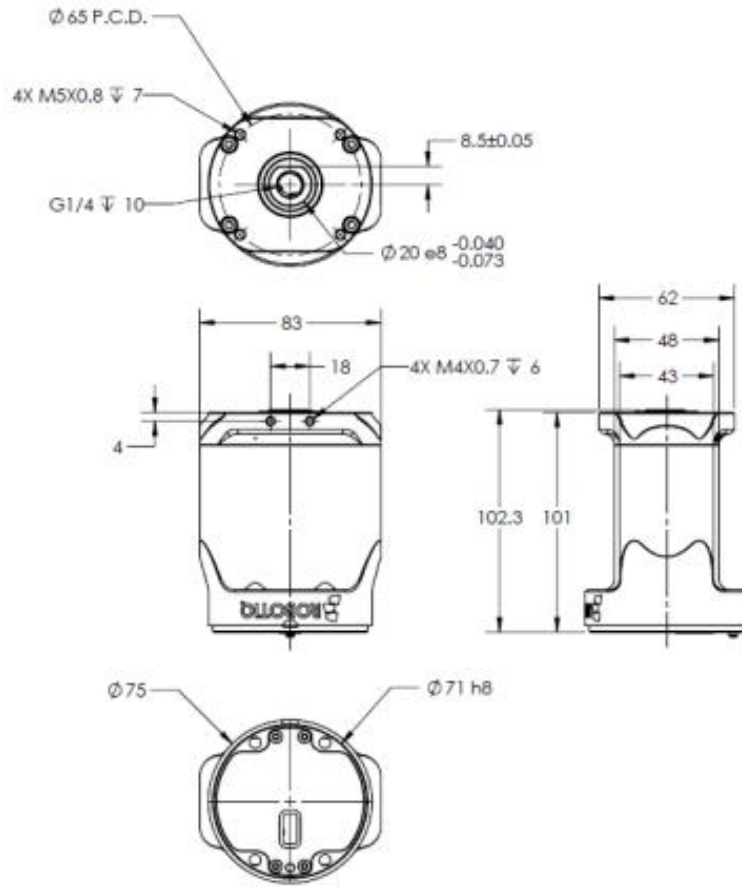


Figure 1.2 EPick general dimensions

The figures below represent the dimensions of the components of the suction cup systems.

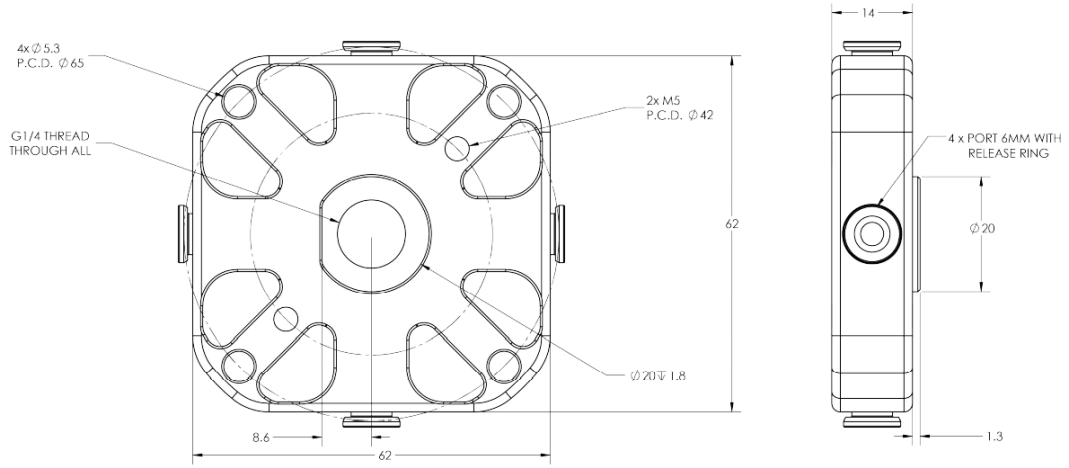


Figure 1.3 Manifold general dimensions

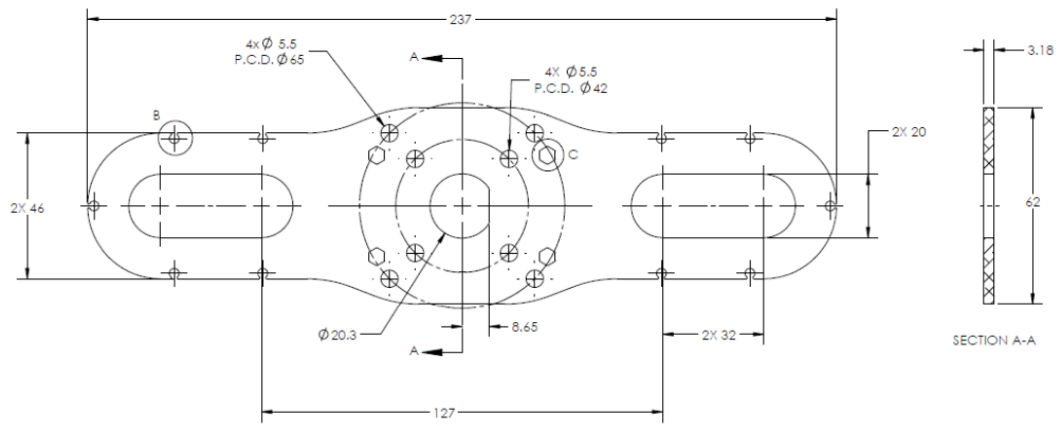


Figure 1.4 Two air nodes bracket's dimensions

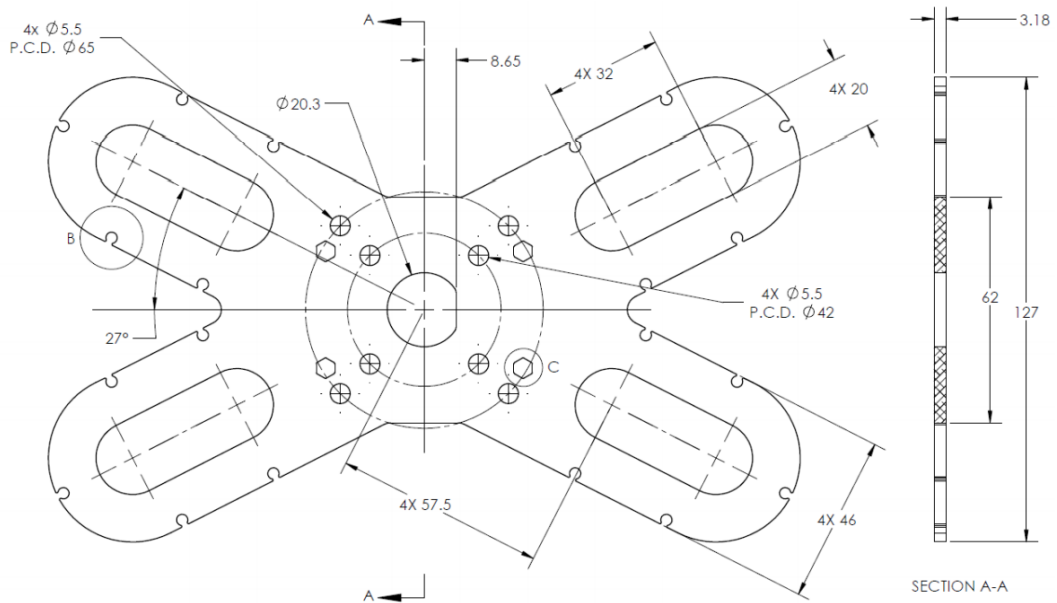


Figure 1.5 Four air nodes bracket's dimensions

1.3 Description on indicator lights

The indicator lights can reflect the state of the gripper in real time. You can judge the state from the color of the lights according to Table 1.2.

Table 1.2 Description on LED Status

LED status	Meaning	Solution
Not lit	Gripper not powered	Check Gripper power supply and electrical setup
Solid blue and red	Gripper is just powered	The gripper is in initialization. Please wait a moment.
Solid blue	No fault and communicating	
Solid red,	Gripper is not communicating	
Flashing blue and red (at a low speed)	Gripper is in fault or in auto-release	Fault: check status word Auto-release: wait for auto-release to be completed, then turn off auto-release and initialize the Gripper
Flashing blue and red (at a high speed)	Gripper may have a major fault	Check whether is overheated. If the alarm persists, please contact technical support

2. Gripper Installation

2.1 Mechanical installation

The installation of EPick gripper on CR robots is shown in Figure 2.1

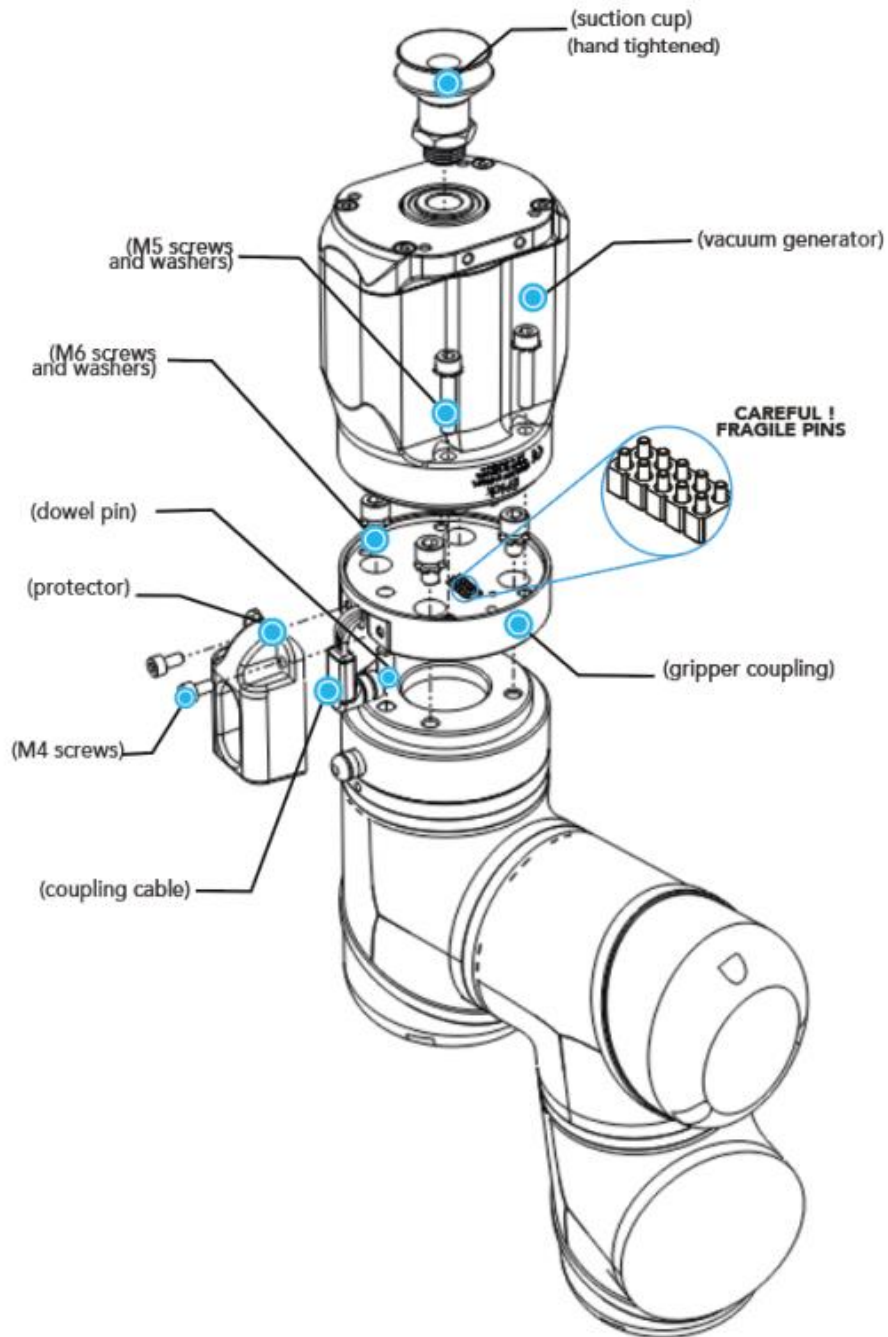


Figure 2.1 EPick installation diagram

For purposes of power and communication, a coupling must be used to attach the Vacuum Gripper to the robot.

Here are the steps to mount the Gripper on the robot arm. Please note that all screws should be

secured using medium strength threadlockers.

- Step 1** Mount the coupling on the robot wrist using the provided M6 screws and tooth lock washers. Align properly with the dowel pin.
- Step 2** Fasten the Gripper to the coupling using the provided M5 screws and tooth lock washers.
- Step 3** Plug the coupling's cable into the robot's wrist connector.
- Step 4** Cover the connection using the protector and the provided M4 screws.

In order to use several suction cups, you should assemble the vacuum generator to the bracket, as shown in the figure below, using four M5 socket head cap screws and four M5 tooth lock washers.

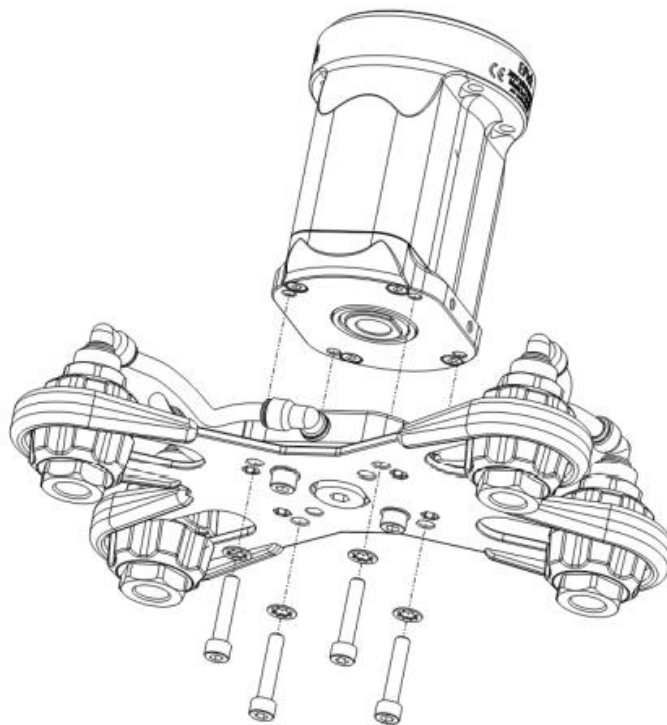


Figure 2.2 Use bracket

Air nodes are used to connect the suction cups and the air tubing, and to prevent air leakage as much as possible. Air nodes are easy to assemble, as shown in the figures below.

- Step 1** Screw by hand each suction cup to an air bolt.

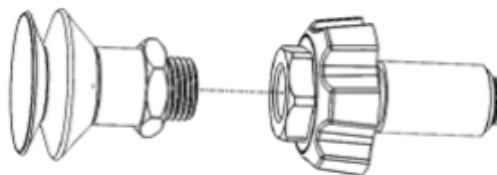


Figure 2.3 Screw suction cup to an air bolt.

- Step 2** Pass each air bolt through the mounting bracket, adjust the position of the node along

the bracket side, align with mating air nuts and tighten node by hand.

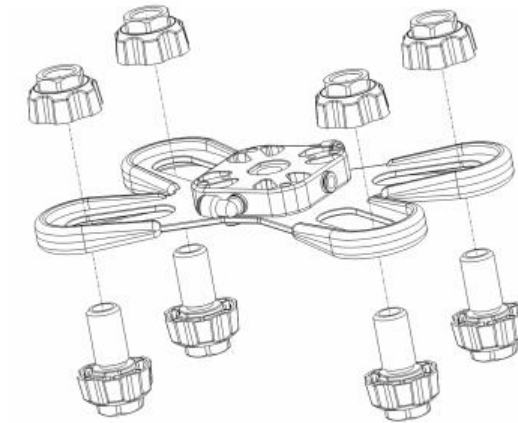


Figure 2.4 Install the suction cup to the bracket

2.2 Electrical connection

The gripper interfaces with its coupling via a 10-spring pin connector located on its outer surface.

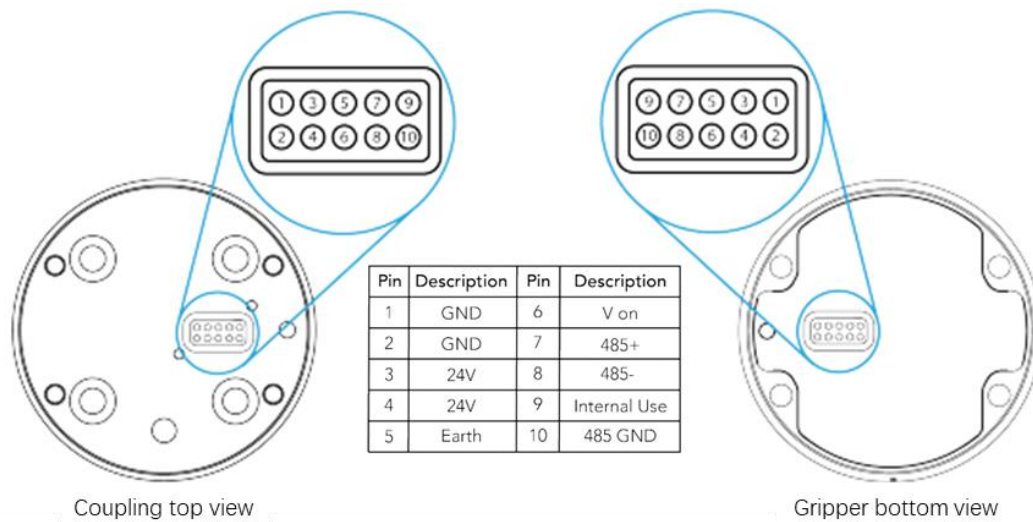


Figure 2.5 Pinout of EPick cable-to-arm coupling.

The figure below represents the wiring schematic of the EPick gripper with a coupling connecting directly to the robot arm.

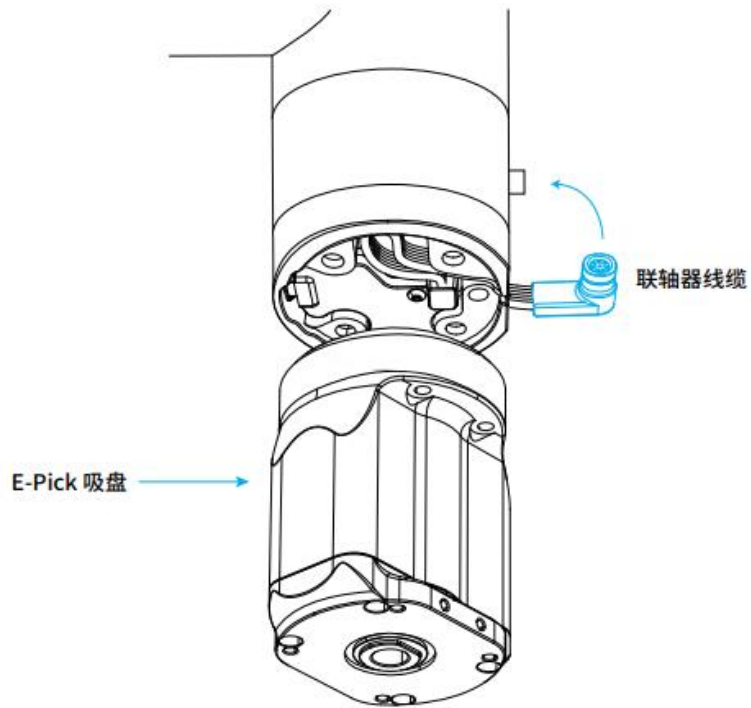


Figure 2.6 Electrical connection

Figure 2.7 shows the pinout of the coupling.

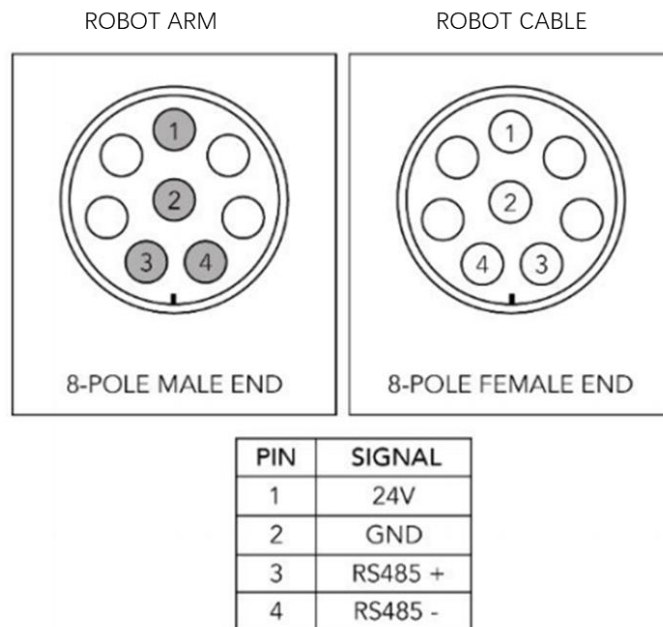


Figure 2.7 Pinout of the coupling

Figure 2.8 and Table 2.1 show the end effector pins of CR robots.

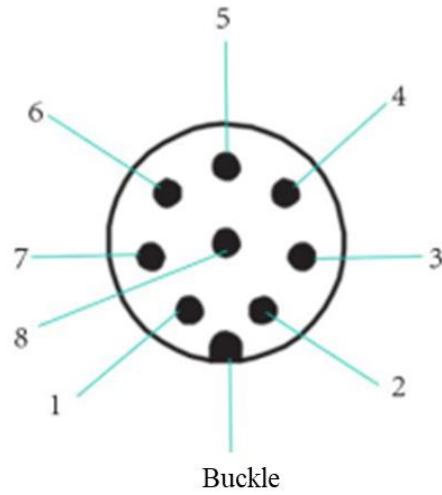


Figure 2.8 CR I/O interface

Table 2.1 Pin description

Pin	Name	Description
1	AI_1/485A	Analog input 1/485A
2	AI_2/485B	Analog input 2/485B
3	DI_2	Digital input 2
4	DI_1	Digital input 1
5	24V	24V output
6	DO_2	Digital output 2
7	DO_1	Digital output 1
8	GND	GND

3. Jogging Gripper

The parameter setting and jogging of the gripper need to be operated through CR software. For Windows, please use DobotSCStudio V2.0.6Beta or later versions; For Android, please use Android CRStudioV4.0.0.6 or later versions. For iOS, please use iOS CRStudio V2.1.0 or later versions.

3.1 Jogging gripper in Windows

This chapter mainly introduces how to use DobotSCStudio software in Windows to jog the gripper.

Step 1 Click **Install** on the **EndEffector** page of DobotSCStudio.

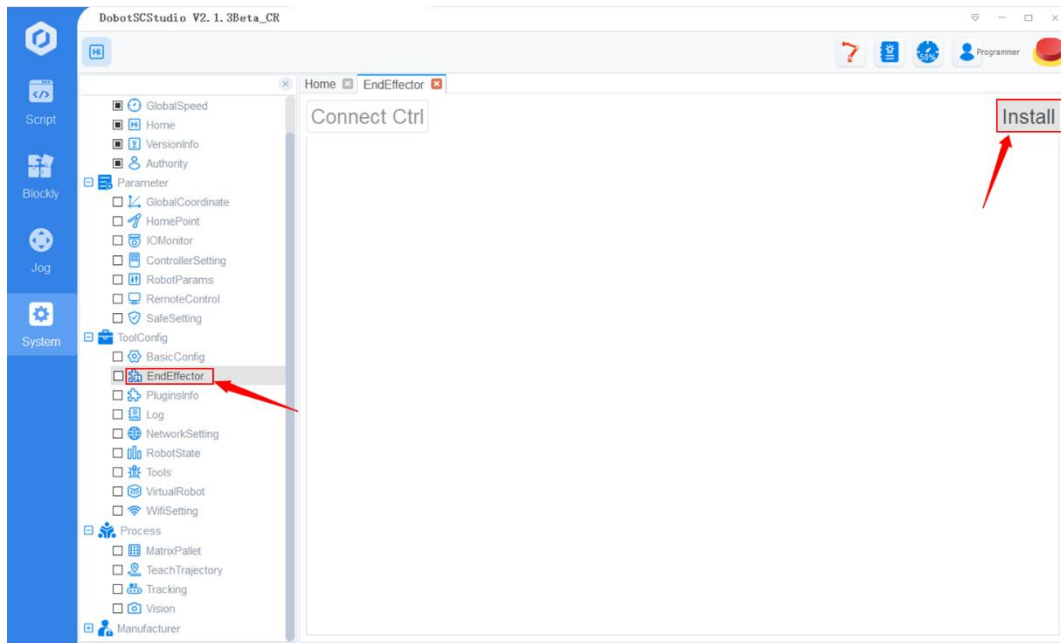


Figure 3.1 EndEffector Page

Step 2 Install **ROBOTIQ-EPick.zip**.

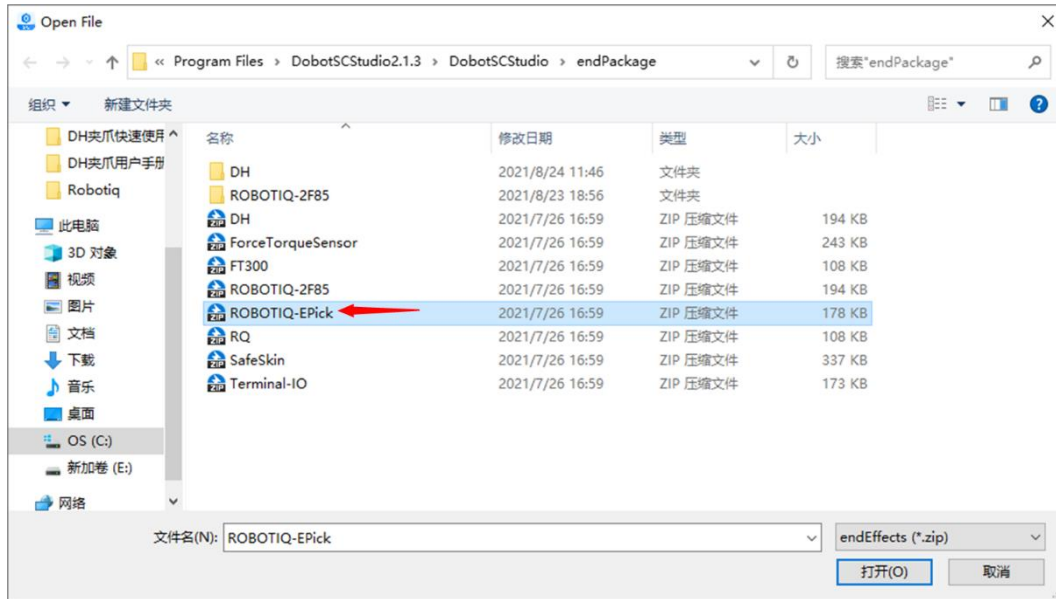


Figure 3.2 Install ROBOTIQ-EPick.zip

Step 3 Select the correct baud-rate and ID (Baud is 115200 and ID is 9 by default), and click **Confirm**.

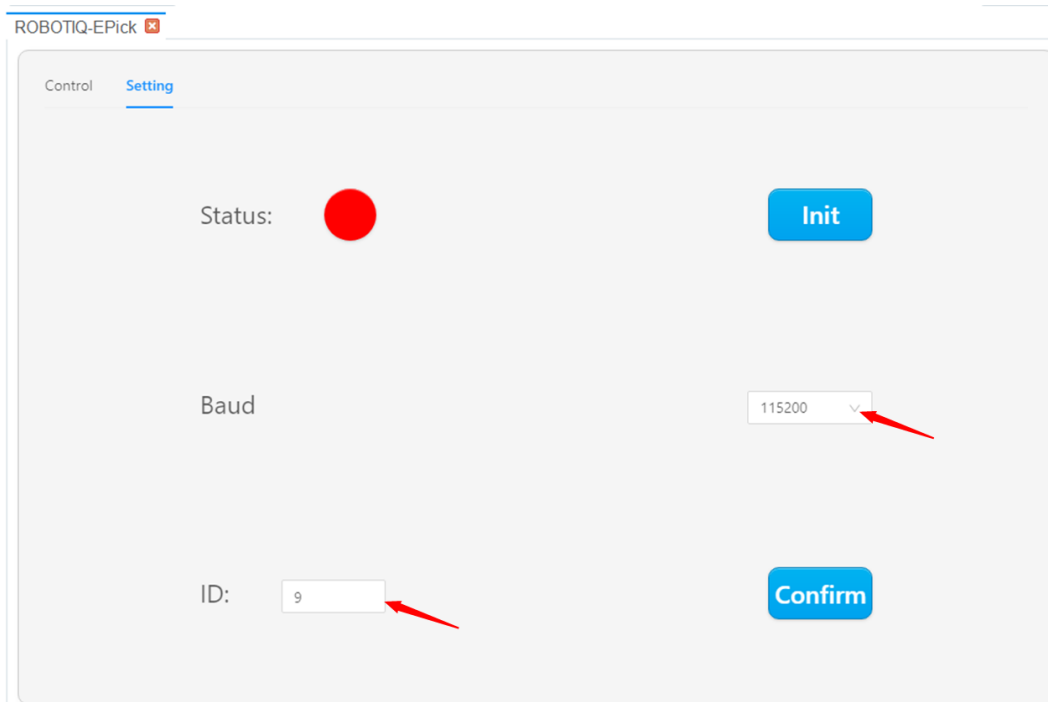


Figure 3.3 Set Baud and ID

Step 4 Click **Init** to initialize the EPick gripper.

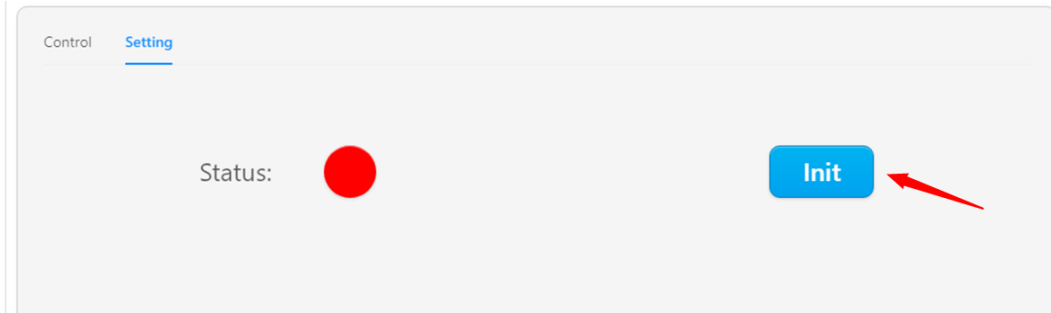


Figure 3.4 Initialize EPick

The color of Status will become green after the initialization is finished.

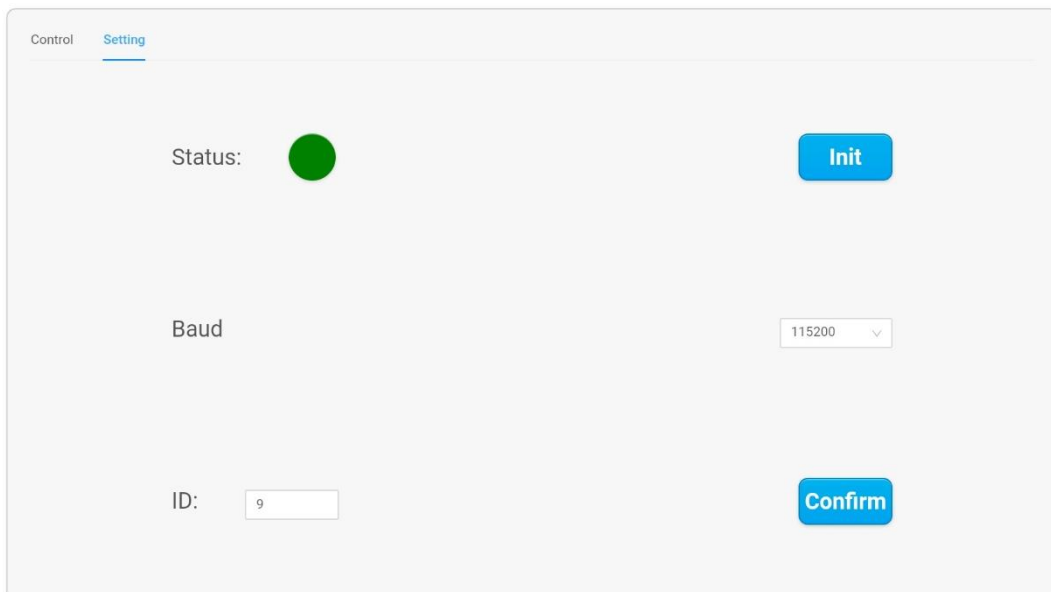


Figure 3.5 Initialization successful

Step 5 Click **Grip** and **Release** on “Control” page to test the gripper.

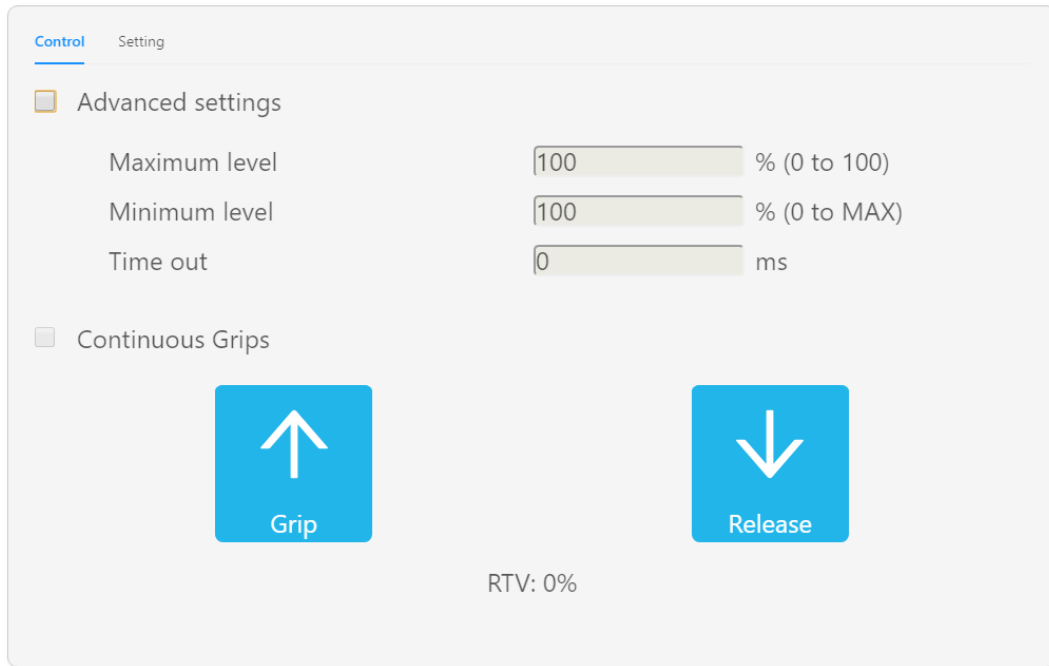




Figure 3.6 Jog the gripper


You can set maximum level, minimum level and timeout of automatic release in Advanced settings. Click , the sucker pumps the vacuum; click , the sucker breaks the vacuum.

3.2 Jogging gripper in Android

Prerequisites

Select the right WiFi of the robot and connect it. The default WiFi name of CR robots is Dobot_WIFI_xxx and the default password is 1234567890.

Procedure

Step 1 Click **Monitor** or  to enter the monitor page. Select **Dobot+** in the left-side menu, as shown in Figure 3.7. Double click **ROBOTIQ-EPick** plug-in to install it.

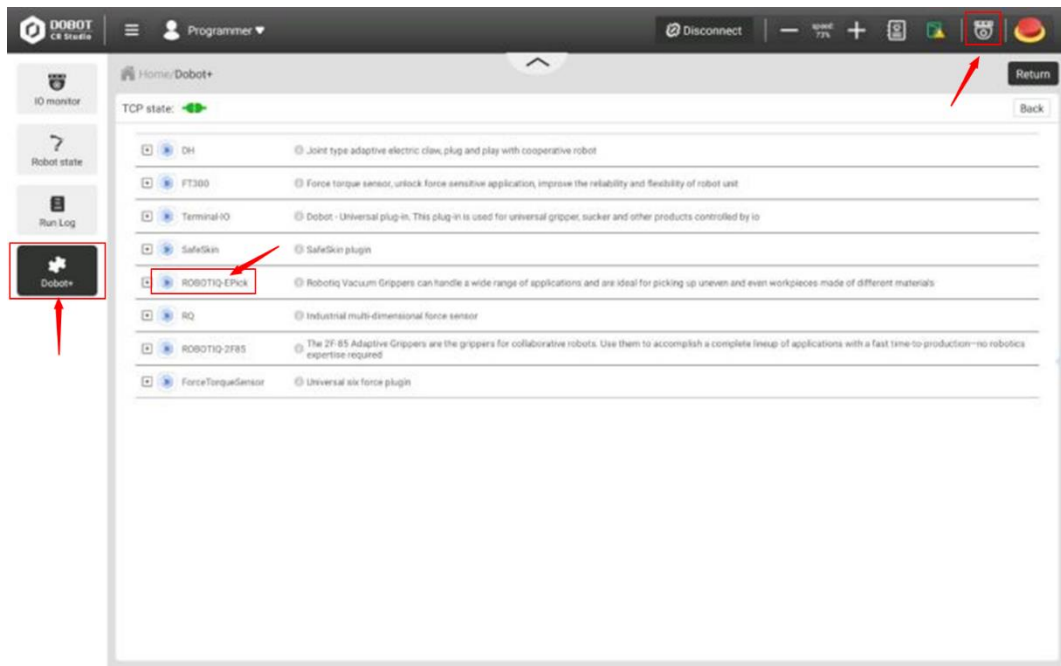


Figure 3.7 Install ROBOTIQ-EPick plug-in

The ROBOTIQ-EPick icon will be displayed on the screen if the installation is successful, as shown in Figure 3.8.

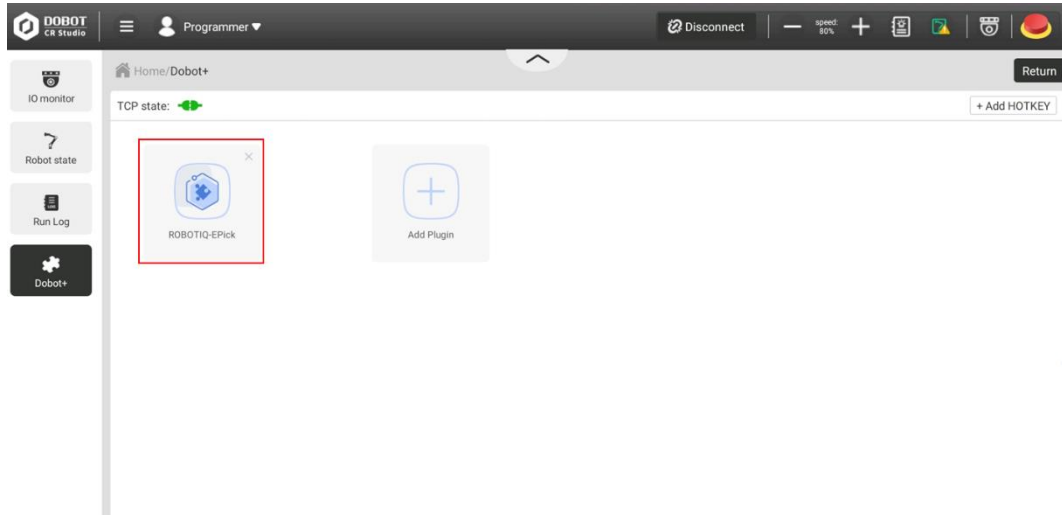


Figure 3.8

Step 2 Select the correct baud-rate and ID (Baud is 115200 and ID is 9 by default), and click **Confirm**.

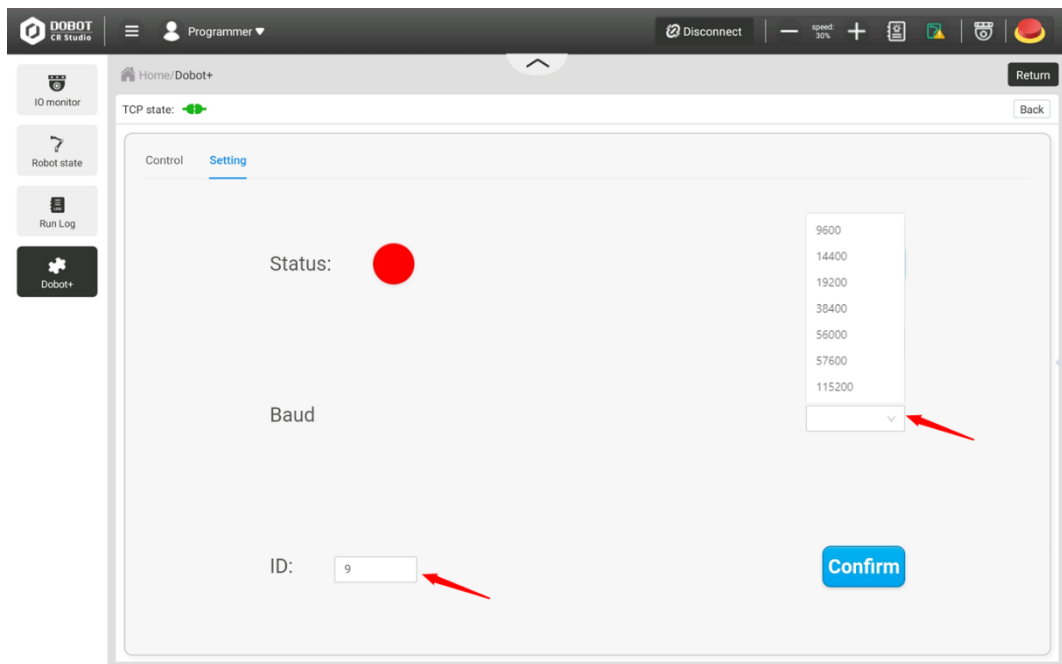


Figure 3.9 Initialize the gripper

Step 3 Click **Init**. The color of **Status** will turn green after the initialization is finished.

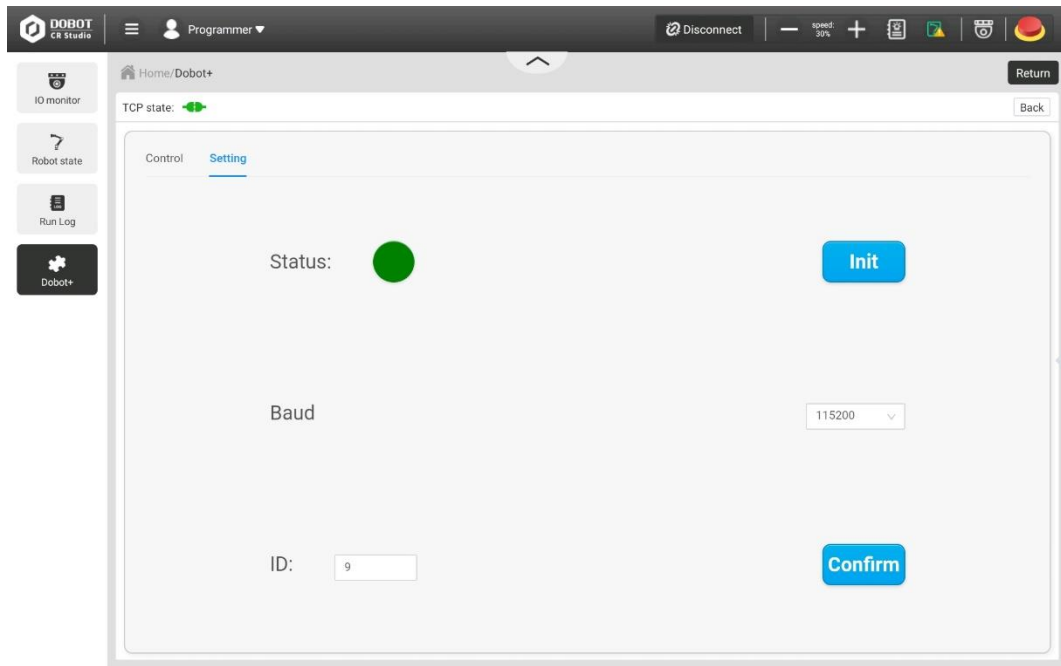


Figure 3.10 Initialization successful

Step 4 Click **Grip** and **Release** to test the gripper.

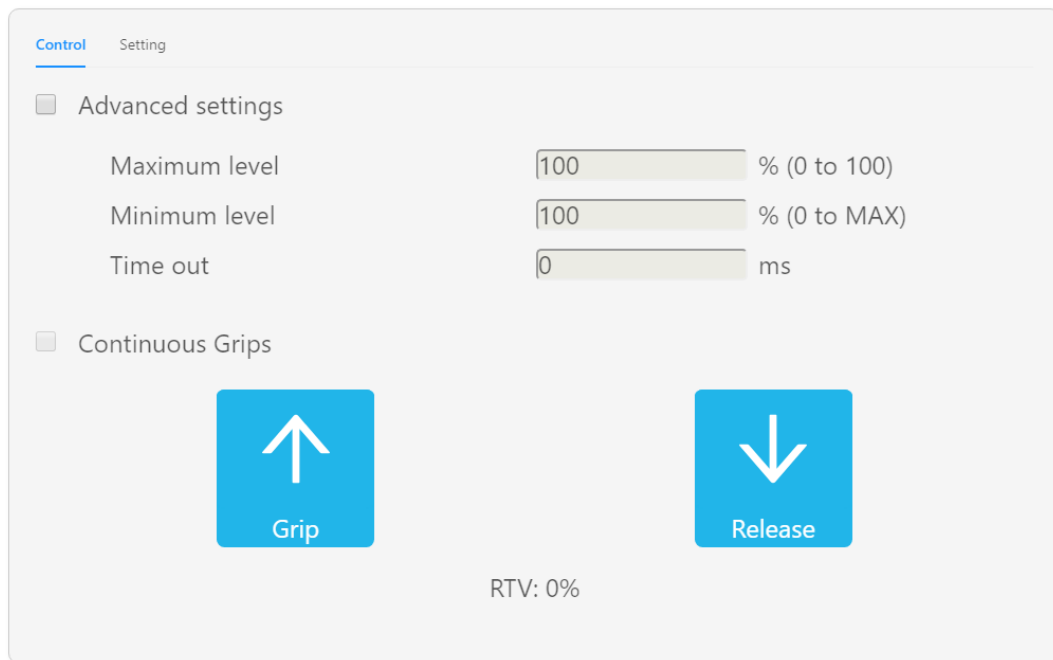




Figure 3.11 Jog the gripper

You can set maximum level, minimum level and timeout of automatic release in Advanced setting. Click , the sucker pumps the vacuum; click , the sucker breaks the vacuum.

3.3 Gripper programming

The description on APIs of EPick gripper is shown in Table 3.1.

Table 3.1 API description

Function	Description	Parameters
RiqEPickInit	Initialize the gripper	Auto/Advanced
RiqEPickGrip	Grip in automatic mode	Null
RiqEPickRelease	Release in automatic mode	Null
RiqEPickSet	Set the maximum vacuum level, minimum vacuum level and timeout in advanced mode	See Table 3.2

Table 3.2 Parameters of RiqEPickSet

Parameter	Scope	Description
maximum vacuum level	0-255	0: continuous grip 1-99: grip 100: passive release 101-255: active release
timeout	0-255	
minimum vacuum level	0-255	

Now take Android & iOS operation as an example to illustrate the steps of script programming.

Step 1 Enter the **Script** page, and click **Function**, as shown in Figure 3.12.

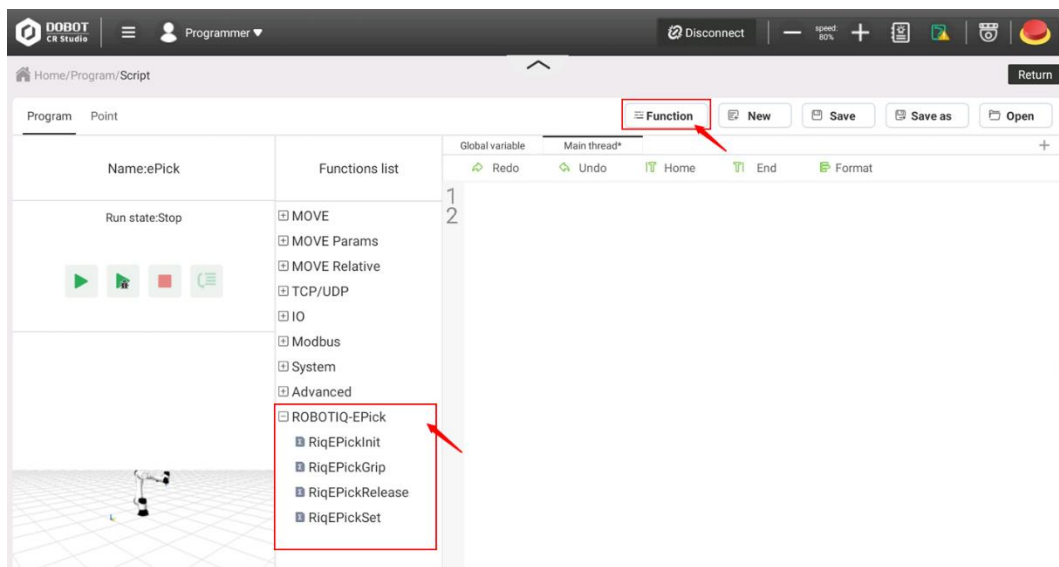


Figure 3.12 Select functions to operate the gripper

Step 2 Write programs by using the APIs that ROBOTIQ-EPick plug-in supports, as shown in Figure 3.13.

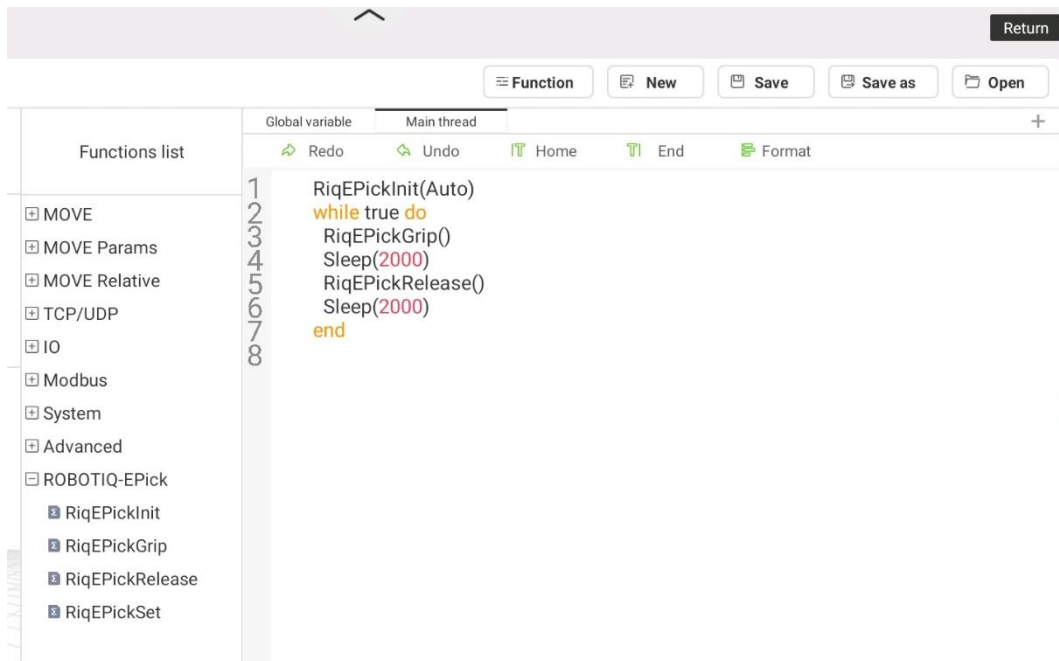


Figure 3.13 Write a program