



DOBOT

User Guide

Sliding Rail Kit

User Guide

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Shenzhen Yuejiang Technology Co., Ltd.

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Preface

Purpose

This manual introduces the technical specifications, parameters, installation and software operation of sliding rail kit, which is convenient for users to understand and use sliding rail kit.

Intended Audience

This document is intended for:





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

Change History

Date	Change Description
2021/12/03	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

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1. Introduction

When the MG400 movement space is not enough, the sliding rail kit can be used to maximize the expansion of its working space to complete the task of transporting devices and assembling.

MG400 sliding kit mainly includes linear module, servo motor and servo driver, as shown in Figure 1.1. In addition, 7 accessories are included in the packing case, as shown in Figure 1.2: Power wiring harness, Control wiring harness, Extended wiring harness of MG400 emergency stop unit, Emergency stop terminal of servo, DI wiring harness, DO wiring harness, and network cable. The accessories contain many cables. For details, see 2.2 Connecting Cables to the MG400.

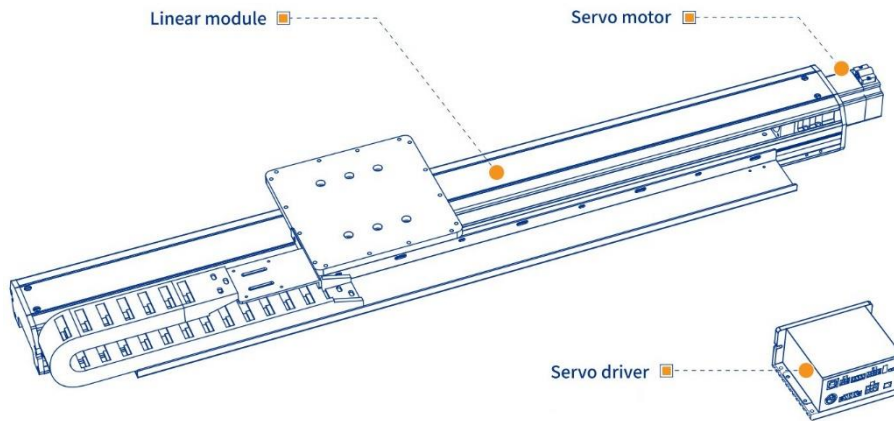


Figure 1.1 Sliding rail kit

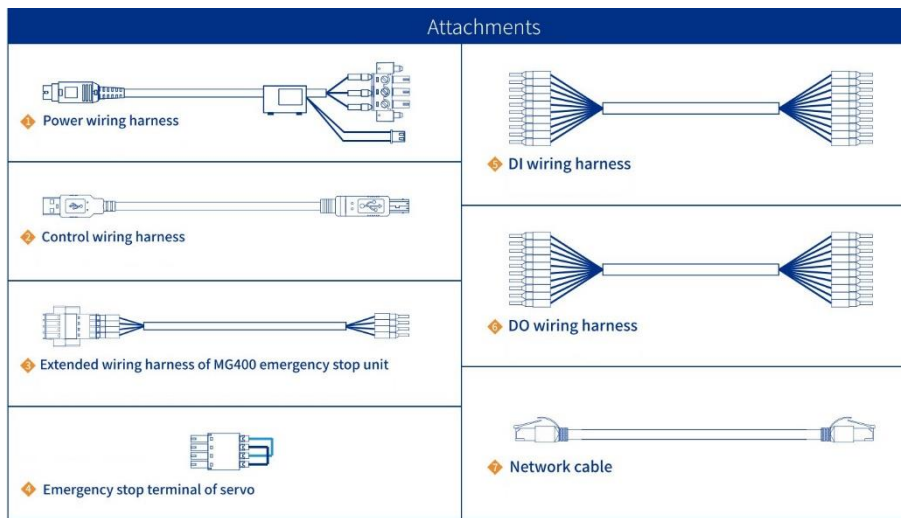


Figure 1.2 Accessories

Technical specifications of MG400 sliding rail kit is shown in Table 1.1.

Table 1.1 Technical specifications

Model	DT-AC-HDSR-001	Rated Power	200 W
Payload	20 kg	Weight	15 kg

Effective Travel Distance	800 mm	Maximum Speed	800 mm/s
Repeat positioning accuracy	± 0.05 mm	Maximum acceleration	1600 mm/s ²
Screw lead	20 mm	Dimension	1150 mm*230 mm*90 mm

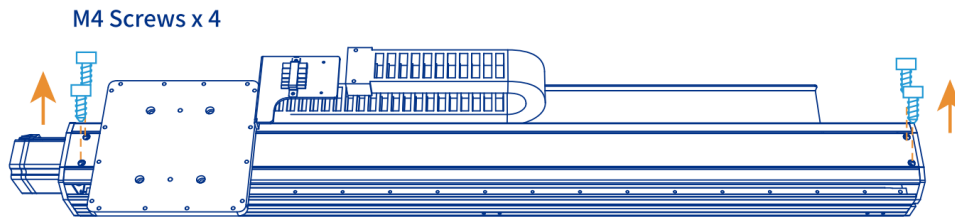
2. Installation Instruction

2.1 Installing Sliding Rail Kit

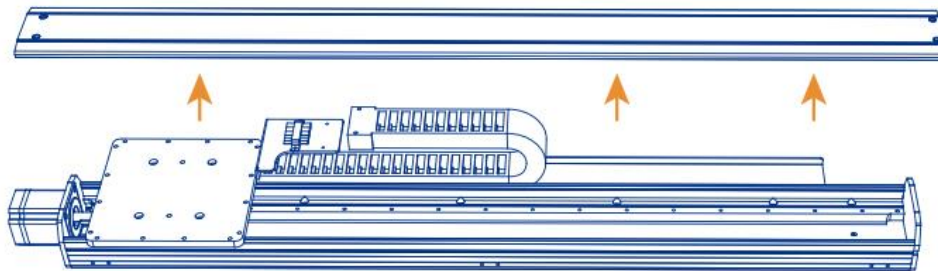
There are two installation methods for the sliding rail kit. Select either installation method according to actual situation.

Method 1:

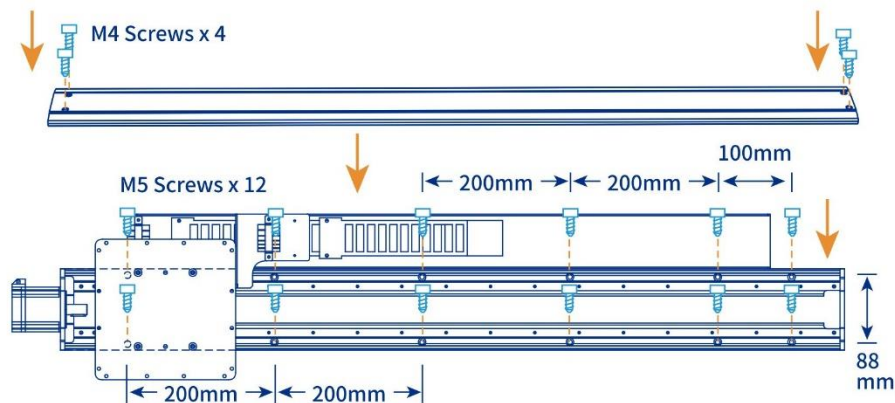
Step 1 Place the sliding rail on the workbench and unscrew the screws of upper cover.



Step 2 Remove the upper cover away the sliding rail.

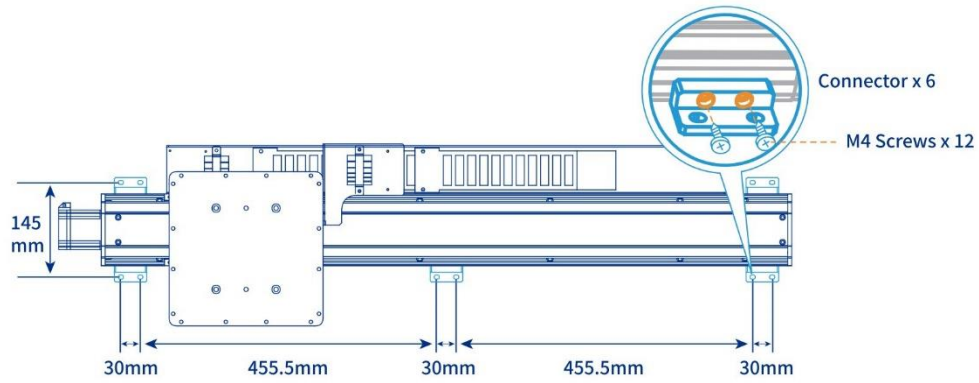


Step 3 Tighten screws to secure the sliding rail on the workbench and install the upper cover.

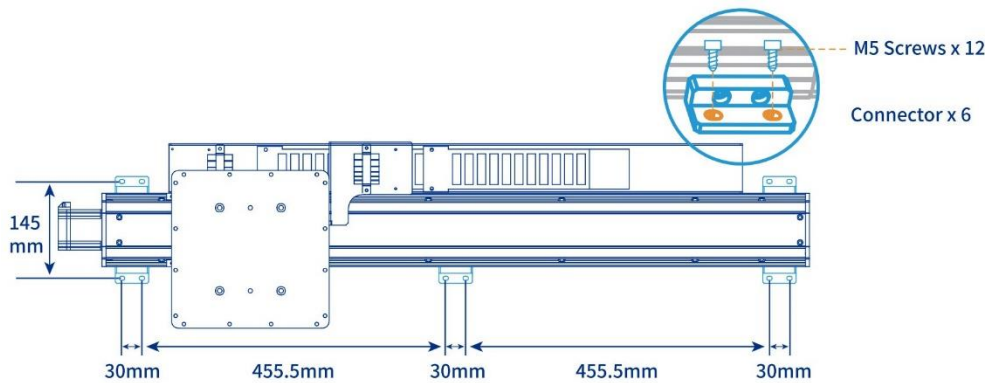


Method 2:

Step 1 Place the sliding rail on the workbench, and fix the connectors to the sliding rail.

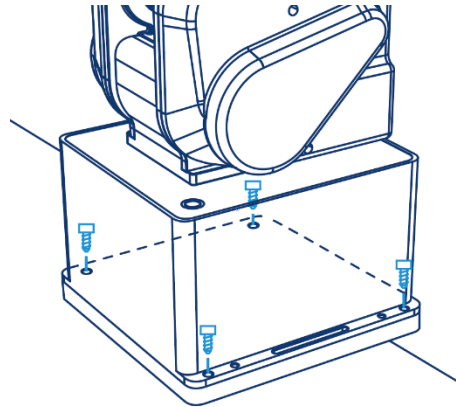


Step 2 Tighten screws to secure the sliding rail on the workbench.



2.2 Electrical Connection with MG400

Step 1 Install MG400 on the sliding rail and tighten screws.



Step 2 Connect each cable in the accessories to the corresponding interface of MG400 and servo driver.

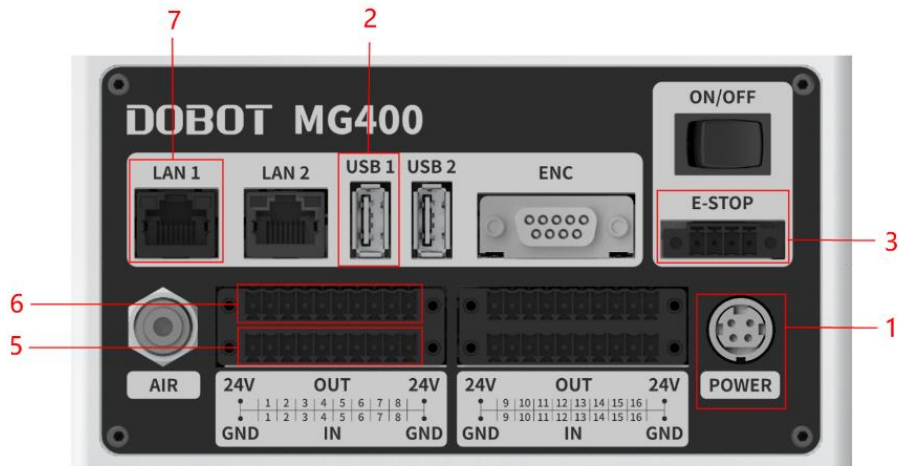


Figure 2.1 Interface of MG400 base

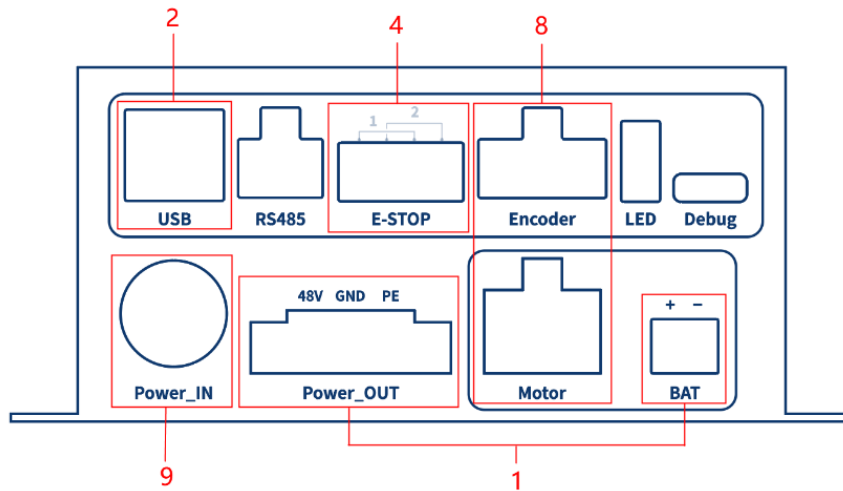
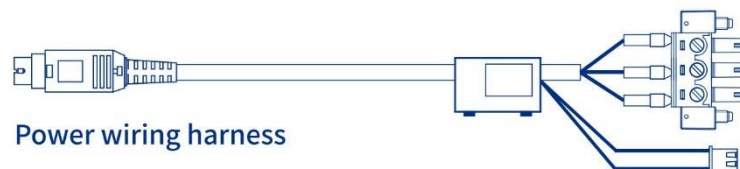


Figure 2.2 Interface of servo drive

1. Connect the MG400 "POWER" port to the servo driver "Power_OUT" and "BAT" ports using the Power wiring harness.



2. Connect the MG400 **USB1** port to the servo driver **USB** port using the Control wiring harness.



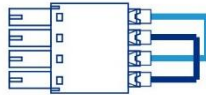
Control wiring harness

3. Connect the MG400 **E-STOP** port to the MG400 emergency stop switch using the Extended wiring harness of MG400 emergency stop unit.



Extended wiring harness of MG400 emergency stop unit

4. The emergency stop port of the servo drive is short-circuited. You can connect the Emergency stop terminal to the **E-STOP** port of the servo driver as required.



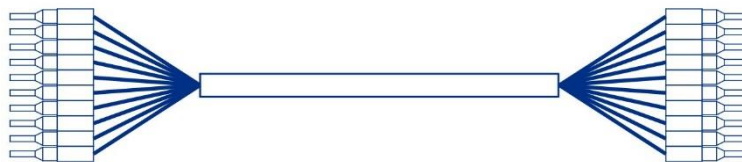
Emergency stop terminal of servo

5. Connect the DI wiring harness to the **DI** port of the MG400.



DI wiring harness

6. Connect the DO wiring harness to the **DO** port of the MG400.



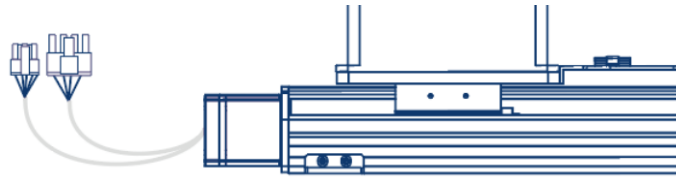
DO wiring harness

7. Connect **LAN1** port of the MG400 to the network port of the computer using network cable.



Network cable

8. Connect the Encoder & Power wiring harness of the servo motor to the Encoder and Motor ports of the servo driver.



9. Connect the MG400 power adapter to the **Power_IN** port of the servo driver.

3. Operation

3.1 Sliding Rail Setting

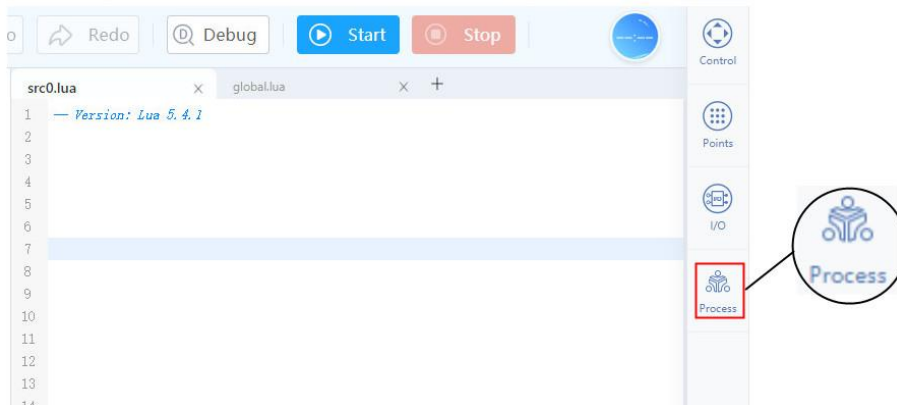
DobotSCStudio and DobotStudio2020 both support the operation of the sliding rail, and the setting parameters are similar. So we take the DobotStudio2020 operation as an example to describe how to use MG400 sliding rail kit.

Prerequisites

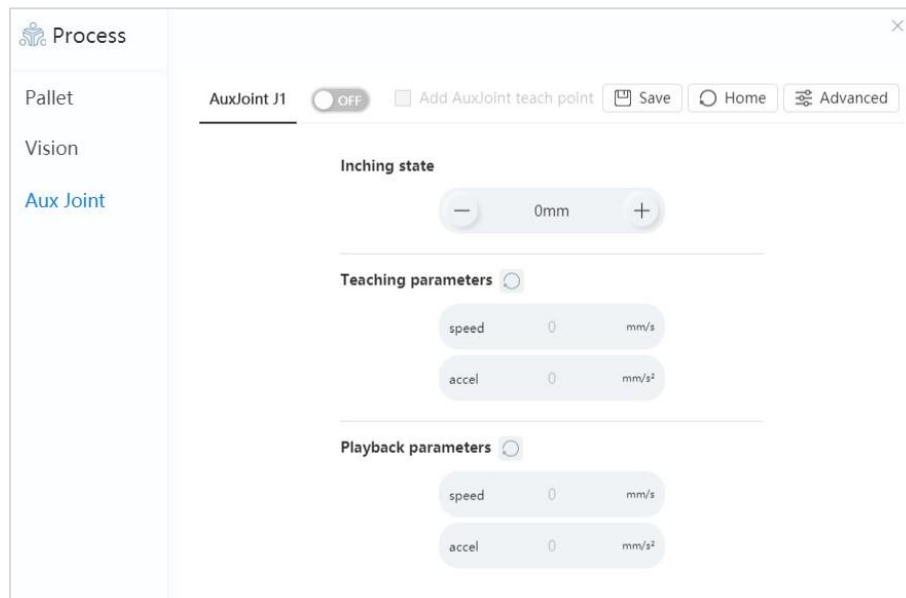
- The sliding rail has been installed and connected to the MG400.
- The MG400 has been powered on and connected to DobotStudio2020 properly.

Procedure

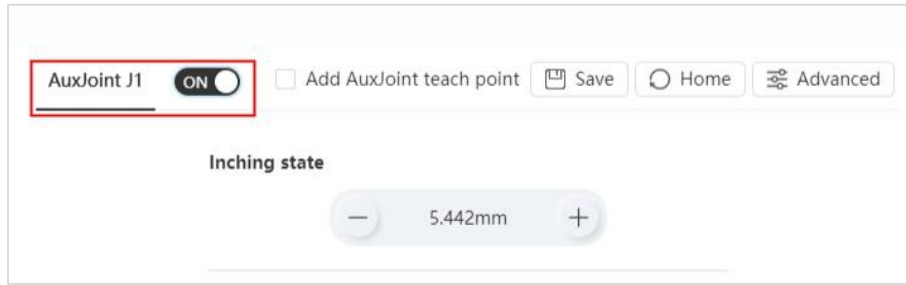
- Step 1** Click **DobotBlockly** or **Script** in DobotStudio2020 to enter the programming page. **Process** is displayed in the toolbar on the right.



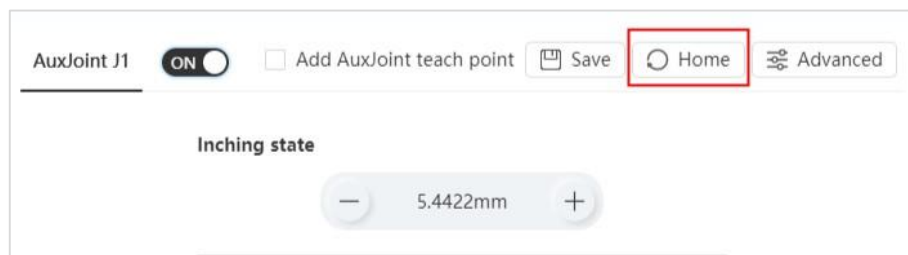
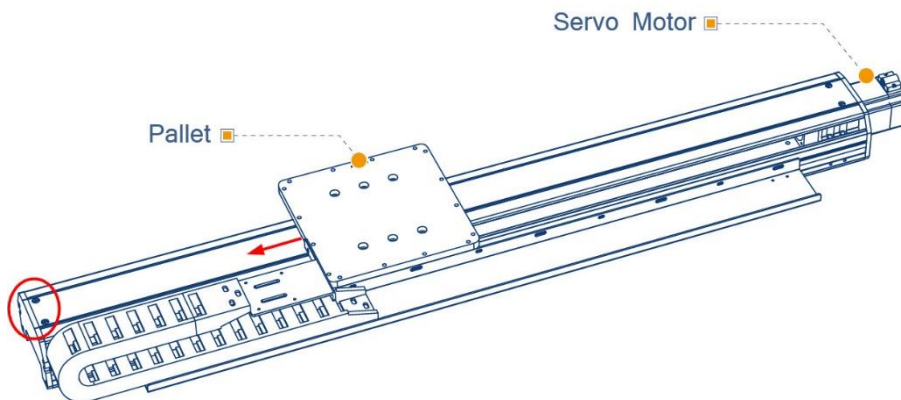
- Step 2** Click **Process** > **Aux Joint** to enter the aux joint page.



- Step 3** Set **AuxJoint J1** to **ON** to enable the sliding rail.




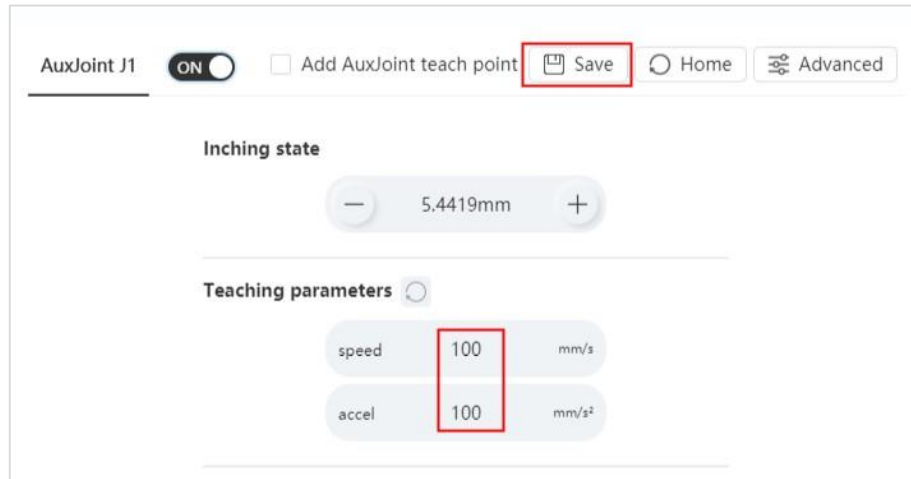
- Step 4** Move the pallet on the sliding rail to the edge of the sliding rail (no servo motor side), and ensure that there is a certain gap between the pallet and the anti-collision block, e.g. 1 cm. Click **Home** to set the starting position of the sliding rail.





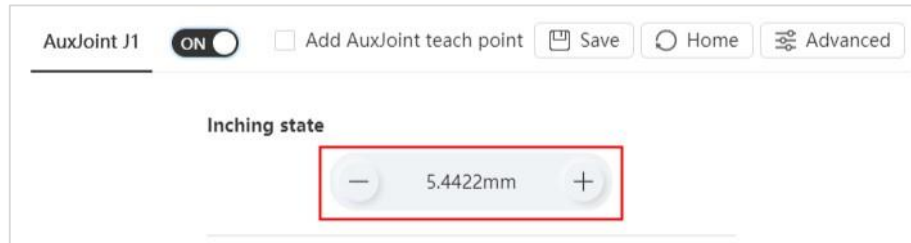
- Step 5** Directly input the speed and acceleration to set the **Teaching parameters**, and Click **Save**.

Usually you can set the speed without changing the acceleration. It is recommended to set the speed to a smaller value, and then gradually increase the speed when the sliding rail runs normally.

(Optional) Click  to restore the speed and acceleration to the default values.



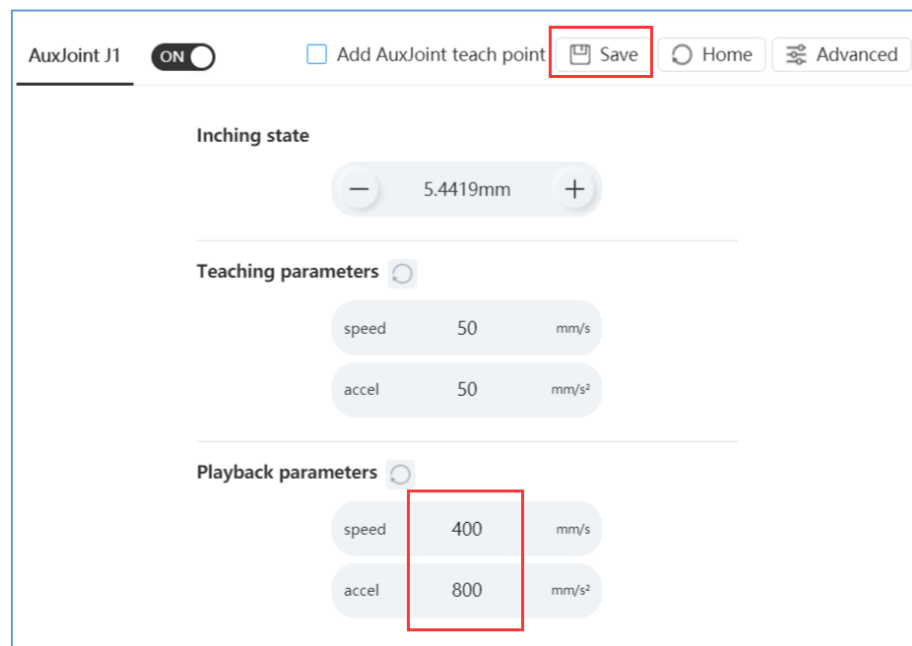
- Step 6** Click  or  button to check whether the sliding rail can move normally. Ensure that there is no interference within the 0-800mm movement range of the sliding rail.



- Step 7** Directly input the speed and acceleration to set the **Playback parameters**, and Click **Save**.

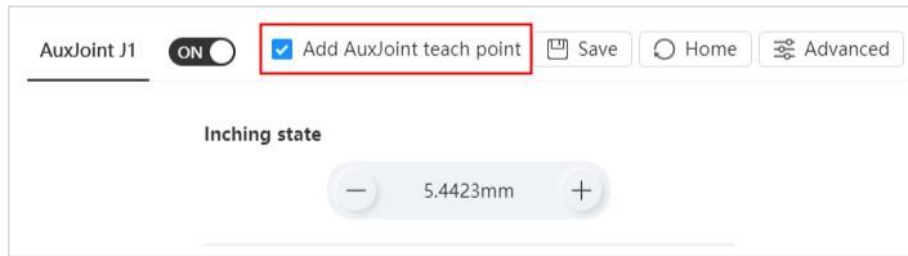
Usually you can set the speed without changing the acceleration.

(Optional) Click  to restore the speed and acceleration to the default values.



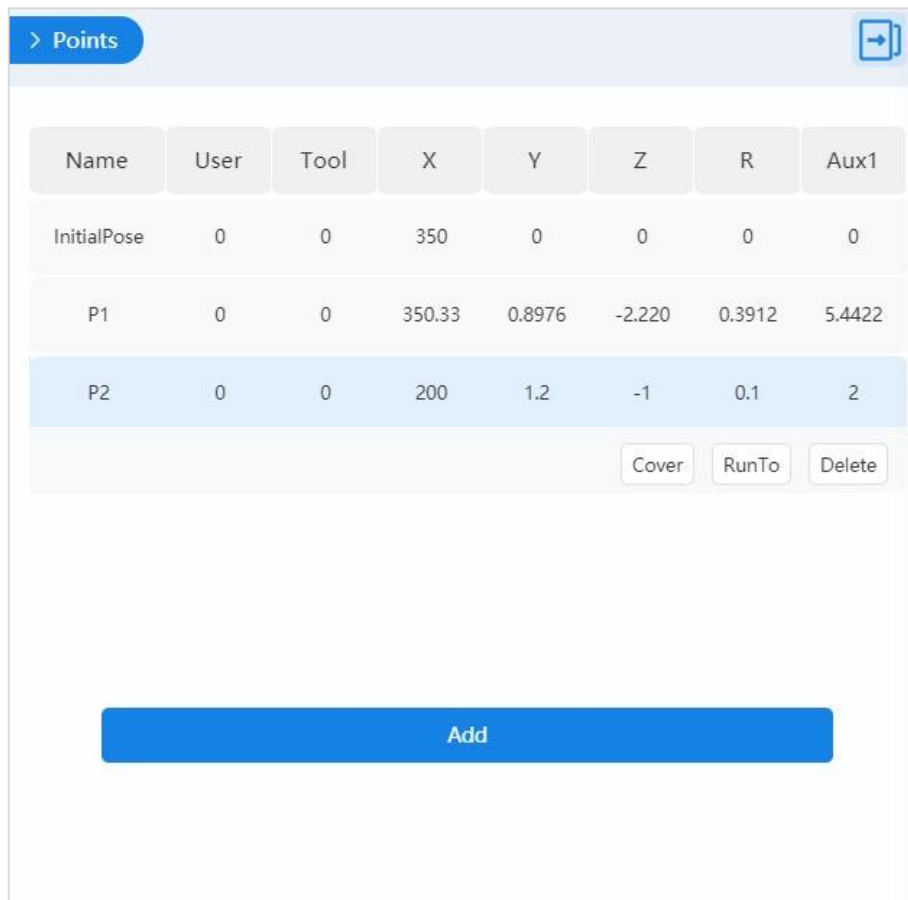
Step 8 Select **Add AuxJoint teach point** and click **Points**.

Add the extension axis Aux1 to the teaching point coordinates.



Step 9 Click **Add** to add a teaching point.

In addition, you can click each coordinate value of the teaching point to modify the data.



Step 10 In DobotStudio2020 to control the movement of MG400 on the sliding rail by block programming or script programming.

Please refer to the *DobotStudio2020 User Guide* for block programming and script programming.

3.2 Commands

This section introduces the commands related to the sliding rail.

Table 3.1 MovJExt command

Function	MovJExt(Angle/Position, OPTIONS)
Description	The extension axis moves to the target angle or position
Parameter	<p>Required parameter:</p> <p>Angle/Position, related to types in advanced settings.</p> <ul style="list-style-type: none"> • if the type is joint, the parameters is Angle • if the type is line, the parameters is Position <p>Optional parameter:</p> <p>Option={SpeedE=50, AccE=50, SYNC=1}</p> <ul style="list-style-type: none"> • SpeedE: Velocity rate. Value range:1~100 • AccE: Acceleration rate. Value range:1~100 • Synchronization flag. Value range: 0 or 1. If SYNC is 0, it indicates asynchronous execution, this command has a return immediately after calling it, regardless of the command process. If SYNC is 1, it indicates synchronous execution. After calling this command, it will not return until it is executed completely
Return	None
Example	<pre>local Option={SpeedE=50, AccE=50, SYNC=1} MovJExt(20,Option)</pre> <p>The extension axis moves to position 20 and waits for the command to complete before executing the next command</p>

Table 3.2 SyncAll Command

Function	SyncAll()
Description	Synchronous execution, wait for the full movement commands of the robot and the extension axis to be completed.
Parameter	None
Return	None
Example	<pre>SyncAll ()</pre> <p>Wait for the full movement commands to be completed.</p>