User Guide



Conveyor Belt User Guide

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Before using our product, please thoroughly read and understand the contents of this document and related technical documents that are published online, to ensure that the robotic arm is used on the premise of fully understanding the robotic arm and related knowledge. Please use this document with technical guidance from professionals. Even if follow this document or any other related instructions, Damages or losses will be happen in the using process, Dobot shall not be considered as a guarantee regarding to all security information contained in this document.

The user has the responsibility to make sure following the relevant practical laws and regulations of the country, in order that there is no significant danger in the use of the robotic arm.

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Preface

Purpose

This document describes that how to install Conveyor Belt kit and help user to use it.

Intended Audience

This document is intended for:

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

Change History

Date	Change Description
2019/03/26	Update picking and sorting demos
2017/7/3	The first release

Symbol Conventions

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

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



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1. Conveyor Belt Kit Overview

Conveyor belt kit contains conveyor belt, color sensor and photoelectric sensor as shown in Figure 1.1.



Figure 1.1 Conveyor Belt Kit

Please turn off the Dobot Magician completely before plugging or unplugging external modules, such as Infrared sensor, Color sensor and so on, otherwise, it will damage your Dobot. Magician. Only the status LED indicator turns off, the Dobot Magician has powered down completely after you turn off the power of the Dobot Magician.

The operational steps are shown below:

- Install the photoelectric sensor and color sensor.
- Turn on the Dobot Magician power, the buzzer beeps three times, indicating that the module has finished initializing.
- For the Dobot Magician details, please refer to Dobot Magician User Guide.



2. Hardware Connection

This topic describes how to connect Conveyor Belt Kit. The connection shown in this topic is available for Dobot Magician V1 and Dobot Magician V2, and we will use Dobot Magician V1 to give a connection example as shown in Figure 2.1.



Figure 2.1 The whole connection example

The Dobot 1 is used to pick block and the Dobot 2 is used to sort block.

2.1 Conveyor Belt Connection

Connect the motor wire of the conveyor belt to the interface Stepper1 on the base of the Dobot

1.



Figure 2.2 Conveyor Belt connection

2.2 Color Sensor Connection

Connect the power wire of the Color Sensor to the interface GP1, GP2, GP4 or GP5 on the Dobot 2 (This document takes interface GP2 as an example).

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Figure 2.3 Color Sensor connection

2.3 Photoelectric Sensor Connection

Connect the power wire of the photoelectric sensor to the interface GP1, GP4 or GP5 on the Dobot 2 (This document takes interface GP4 as an example).



Figure 2.4 Photoelectric Sensor connection

The final connection is shown in Figure 2.5 and Figure 2.6.



Figure 2.5 Dobot 1 connection





Figure 2.6 Dobot 2 connection



3. Conveyor Belt Picking and Sorting Demo

Preparation

- The DobotStudio has been installed.
- The Dobot Magician has been connected to your computer.
- The demos have been downloaded from our official website.

The download path of DobotStudio is <u>https://www.dobot.cc/downloadcenter.html</u>. As shown in Figure 3.1.

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Figure 3.1 Get DobotStudio

The download path of the demos is <u>https://www.dobot.cc/downloadcenter/conveyor-belt-kit.html?sub_cat=103#sub-download</u>. As shown in Figure 3.2.

	Conveyor Pick & Place Blockly Conveyor_pickplace.xml 2018. 10. 16	14 KB 📃 Download
	This blockly module can help you to execute the pick and place function ea	saily for the conveyor belt kit.
ì [Conveyor Belt Sorting Blockly	19 KB Download
	Conveyor_sorting.xmi 2018.10.15	

Figure 3.2 Get the demos

Step 1. Put the two demos for picking and sorting into the path *Installation* path/DobotSutido/config/bystore or other folders. As shown in Figure 3.3.



This	PC > Data2 (D:) > Program Files	DobotStudio > config > byst	ore	∨ Ö Sei	arch bystore
folder			_		
^	Name	Date modified	Туре	Size	
	Example.blockly	3/8/2018 5:57 PM	BLOCKLY File	4 KB	
	picking.blockly	4/19/2019 11:05 AM	BLOCKLY File	13 KB	
	sorting.blockly	4/19/2019 11:09 AM	BLOCKLY File	18 KB	

Figure 3.3 Save demos

Step 2. Launch two DobotStudio clients, and open **Blockly** module and import the picking demo and the sorting demo respectively. As shown in Figure 3.4 and Figure 3.5.



Figure 3.4 Open Blockly module



Figure 3.5 Import demo

Step 3. If the Dobot Studio client imports the picking demo, connect it to the Dobot 1, otherwise,



connect it to the Dobot 2. As shown in Figure 3.6 and Figure 3.7.



Figure 3.6 Import the picking demo



Figure 3.7 Import the sorting demo



4. Position Adjustment

4.1 Adjusting Picking and Placing Positions of Dobot 1

- Adjusting picking position
 - 1. Press and hold down the **Unlock** button on the forearm to move the Dobot 1 to make suction cup on the block. As shown in Figure 4.1.



Figure 4.1 Picking position

You can move the Dobot 1 by the DobotStudio to make the suction cup on the center of the block.

2. The operation panel on the DobotStudio will record the values of X, Y, Z axes automatically, and write the values of the X, Y, Z axes in the picking demo as shown in Figure 4.2.



Figure 4.2 Modify the picking position



- Adjusting the Placing Position
 - Select SuctionCup to pick up the blocks, and then press and hold down the Unlock button to move the Dobot 1 to make the blocks on the conveyor belt. As shown in Figure 4.3.



Figure 4.3 Adjust Placing position

2. Unselect **SuctionCup** to put down blocks on the conveyor belt. The operation panel on the DobotStudio will record the values of X, Y, Z axes automatically, and write the values of the X, Y, Z axes in the picking demo as shown in Figure 4.4.



Figure 4.4 Modify the placing position

• Adjusting the stopping position

Control the conveyor belt move a distance by setting the speed and time in the picking demo to make these blocks in a position where is in the workspace of the Dobot 2.



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Figure 4.5 Adjust the stopping position

4.2 Adjusting Sorting Position of Dobot 2

- Adjust picking position
 - 1. Press and hold down the **Unlock** button on the forearm to move the Dobot 2 to make the suction cup on the center of the block. As shown in Figure 4.6.



Figure 4.6 Adjust picking position

You can move the Dobot 2 by the DobotStudio to make the suction cup on the center of the block.

2. The operation panel in DobotStudio will record the values of X, Y, Z axes automatically, and write the values of the X, Y, Z axes in the sorting demo as shown in Figure 4.7.





Figure 4.7 Modify picking position

- Adjust color-identified position
 - Select SuctionCup to pick up the block, and then press and hold down the Unlock button to move the Dobot 2 to make the block above the color sensor. The distance range between the color sensor and block should be 5mm to 10mm. As shown in Figure 4.8.



Figure 4.8 Adjust color-identified position

2. The operation panel on the DobotStudio will record the values of X, Y, Z axes automatically, and write the values of the X, Y, Z axes in the sorting demo as shown in Figure 4.9.





Figure 4.9 Modify color- identified position

- Adjust placing position
 - 1. Press and hold down the **Unlock** button to move the Dobot 2 to make the block on a placing position. As shown in Figure 4.10.



Figure 4.10 A placing position

Make sure that this position is in the workspace of the Dobot Magician.

2. The operation panel on the DobotStudio will record the values of X, Y, Z axes automatically, and write the values of the X, Y, Z axes in the sorting demo as shown in Figure 4.11.





Figure 4.11 Modify placing position

- 3. Click **Save** to save the settings.

Figure 4.12 Save the settings



5. Run the Conveyor Belt

1. Modify 0 to 1 in the **Test:0; Run:1** module when running the picking demo as shown in Figure 5.1.

set Test:0;Run:1 - to		+	
set Standby point X - to	78.7	8	
set Standby point Y - to	273.	833	8
set Standby point Z T to	-35	÷	
set pick X T to 260		5	
set pick Y to 16.4		e.	
set pick Z to 20		5	

Figure 5.1 Modify 0 to 1

2. Click **Start** to run the Dobot 2 first, and then run the Dobot 1.



Figure 5.2 Start the Dobot 2





Figure 5.3 Start the Dobot 1



6. Precautions

- You need to reset Dobot Magician before running the conveyor belt, adjust and save positions after 20s. Reset Dobot Magician again, and run conveyor belt after 20s.
- The homing point should be set higher to avoid crash. If Dobot Magician loses step, you need to operate homing procedure again.



Appendix A Setting home position

Step 1. Open DobotStudio, connect Dobot Magician and click **Teaching&Playback** as shown in Attach Figure 6.1.



Attach Figure 6.1 Teaching&Playback

Step 2. Click + **point** to save a point of which the axes X, Y, Z, R are 250, 0, 50, 0 respectively. You can set the point based on site requirements.



Attach Figure 6.2 Add Point

Make sure that this position is in the workspace of the Dobot Magician.

Step 3. Select this point and right-click SetHome. As shown in Attach Figure 6.3.







Step 4. If the settings are successful, it will pop up a tip as shown Attach Figure 6.4, click OK.Click Home to check whether the setting is available, if not, please set the homing position again after pressing down the reset key on base of Dobot Magician.



Attach Figure 6.4 Setting tip