

Lesson 3 Action Group Programming

The value set in this section is for reference only. You can adjust it according to the actual situation.

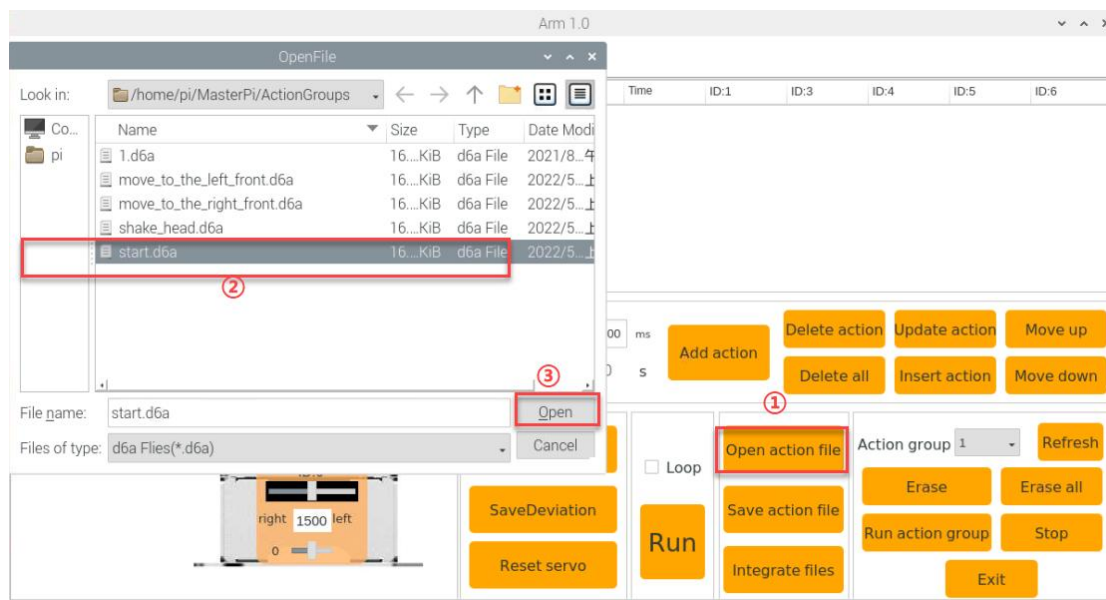
1. Project Outcome

Create an action group to perform “grasp downwards and place on the left side”.

2. Action Realization

2.1 Create Actions

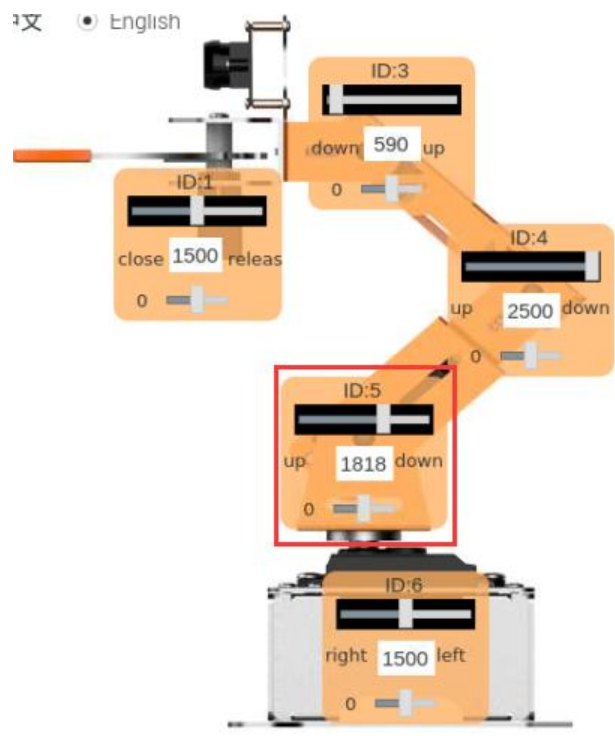
- 1) Click “Open action file” and select “start.d6a.” action file. Then click “open” to set an initial posture for MasterPi.



- 2) Click “▶” button in front of number “1” in action data list to run No.1 action, which updates the servo angle value to the servo control area.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
▶	1	200	1500	590	2500	700	1500

- 3) Drag the slider of No.5 servo to move the robotic arm down to block. The servo value is set to 1818.



- 4) The time is set to 1200ms. Click “Add action” to get the second action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
▶	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500

1
Running time
1200
ms

2
Add action

Delete action
Update action
Move up

Total time
1.4
s

Delete all
Insert action
Move down

- 5) To make the action smoother, each action is followed by a transition action. Based on the previous lesson, modify the running time to 300ms, and then click “Add action” to get the third action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500
▶	3	300	1500	590	2500	1818	1500

①
②

Running time ms

Add action

Delete action

Update action

Move up

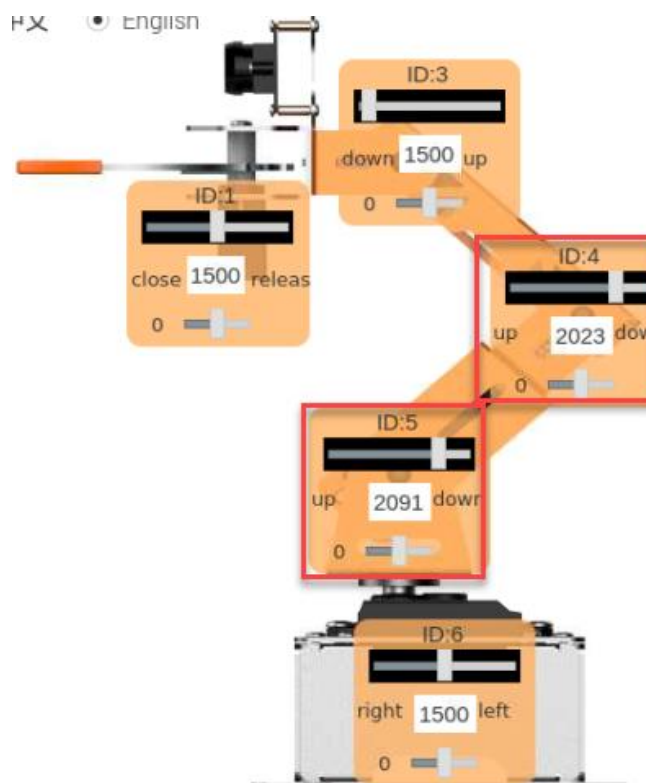
Total time 1.7 s

Delete all

Insert action

Move down

- 6) Next, drag the sliders of No.4 and No.5 servos to make the gripper close to the top of block.



7) Set the running time to 800ms and click “Add action” to get No.4 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500
	3	300	1500	590	2500	1818	1500
▶	4	800	1500	590	2023	2091	1500

①

②

Running time

ms

Total time
2.5
s

Add action

Delete action

Update action

Move up

Delete all

Insert action

Move down

8) Add a transition action and set the running time to 200ms. Then click “Add action” to get No.5 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500
	3	300	1500	590	2500	1818	1500
	4	800	1500	590	2023	2091	1500
▶	5	200	1500	590	2023	2091	1500

①

②

Running time

ms

Total time
2.7
s

Add action

Delete action

Update action

Move up

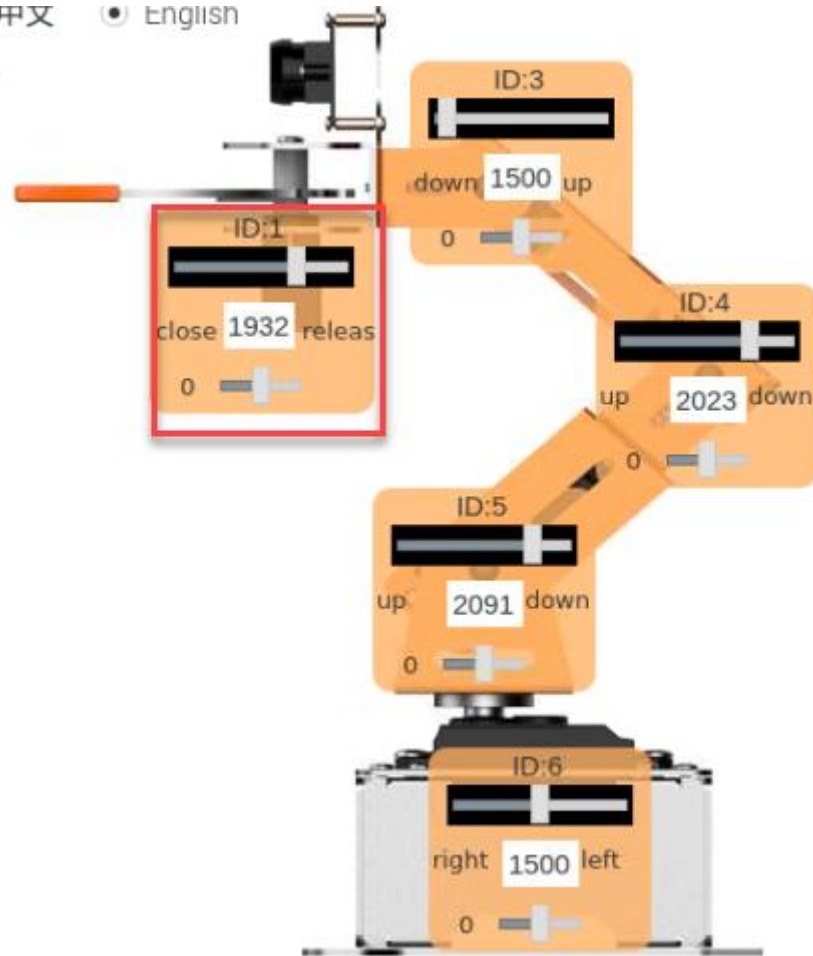
Delete all

Insert action

Move down

9) Then drag the slider of No.1 servo to make the gripper open.

中文 ☒ English



10) Set the running time to 400ms and click “Add action” to get No.6 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500
	3	300	1500	590	2500	1818	1500
	4	800	1500	590	2023	2091	1500
	5	200	1500	590	2023	2091	1500
▶	6	400	1932	590	2023	2091	1500

Running time	400	ms	Add action	Delete action	Update action	Move up
Total time	3.1	s		Delete all	Insert action	Move down

11) Add a transition action and set the running time to 200ms. Then click “Add action” to get No.7 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500
	3	300	1500	590	2500	1818	1500
	4	800	1500	590	2023	2091	1500
	5	200	1500	590	2023	2091	1500
	6	400	1932	590	2023	2091	1500
▶	7	200	1932	590	2023	2091	1500

①
②

Running time ms
 Total time 3.3 s

Add action

Delete action

Update action

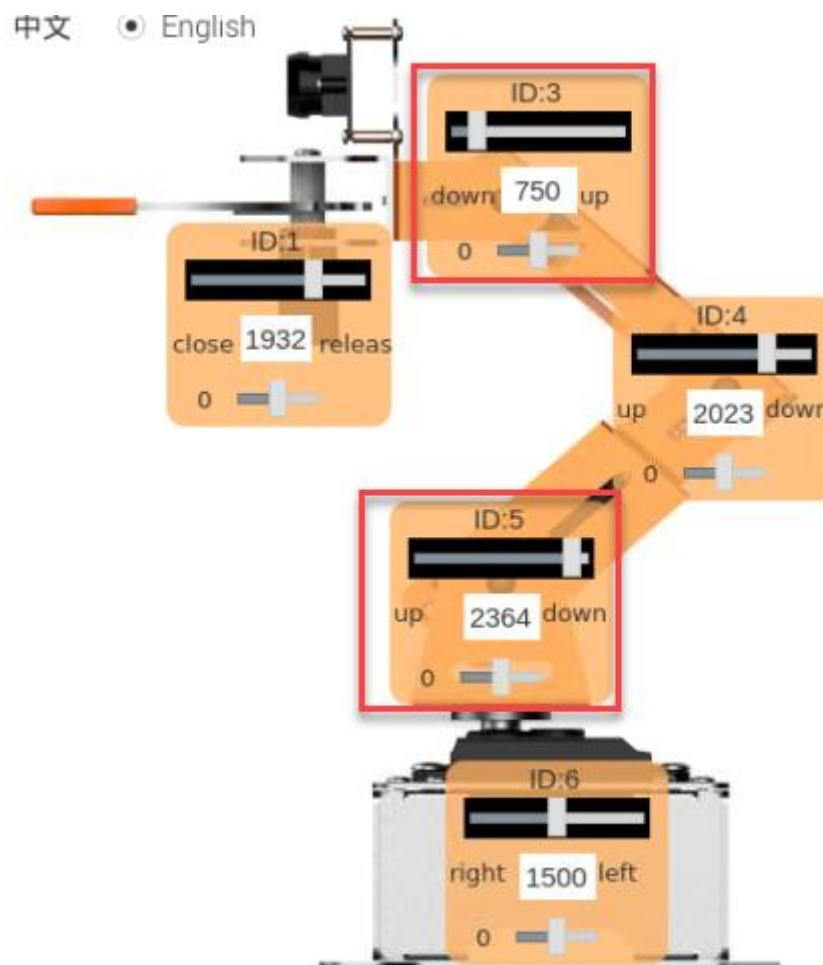
Move up

Delete all

Insert action

Move down

12) Drag the slider of No.3 and No.5 servo to 750 and 2364 to make robotic arm grasp the block.



13) Set the running time to 800ms and click “Add action” to get No.8 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500
	3	300	1500	590	2500	1818	1500
	4	800	1500	590	2023	2091	1500
	5	200	1500	590	2023	2091	1500
	6	400	1932	590	2023	2091	1500
	7	200	1932	590	2023	2091	1500
▶	8	800	1932	750	2023	2364	1500

Running time
800
ms

Add action

Delete action
Update action
Move up

Total time 4.1 s

Delete all
Insert action
Move down

14) Then, add a transition action and set the running time to 200ms.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	1	200	1500	590	2500	700	1500
	2	1200	1500	590	2500	1818	1500
	3	300	1500	590	2500	1818	1500
	4	800	1500	590	2023	2091	1500
	5	200	1500	590	2023	2091	1500
	6	400	1932	590	2023	2091	1500
	7	200	1932	590	2023	2091	1500
	8	800	1932	750	2023	2364	1500
▶	9	200	1932	750	2023	2364	1500

Running time
200
ms

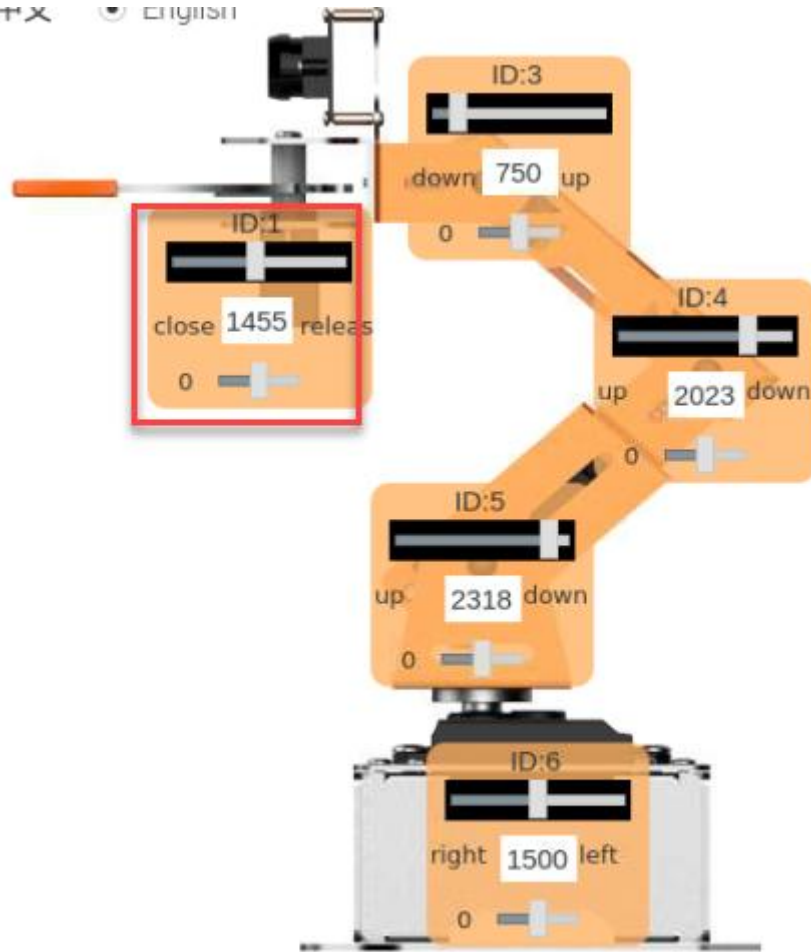
Add action

Delete action
Update action
Move up

Total time 4.3 s

Delete all
Insert action
Move down

15) Adjust No.1 servo to make robotic arm grasp the block.



16) Set the running time to 300ms and click “Add action” to get No.10 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	2	1200	1500	590	2500	1818	1500
	3	300	1500	590	2500	1818	1500
	4	800	1500	590	2023	2091	1500
	5	200	1500	590	2023	2091	1500
	6	400	1932	590	2023	2091	1500
	7	200	1932	590	2023	2091	1500
	8	800	1932	750	2023	2364	1500
	9	200	1932	750	2023	2364	1500
▶	10	300	1455	750	2023	2318	1500

① Running time ms

Total time 4.6 s

② Add action

Delete action Update action Move up

Delete all Insert action Move down

17) Add a transition action and set the running time to 200ms to get No.11 action.

Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
3	200	1500	590	2023	2091	1500
4	800	1500	590	2023	2091	1500
5	200	1500	590	2023	2091	1500
6	400	1932	590	2023	2091	1500
7	200	1932	590	2023	2091	1500
8	800	1932	750	2023	2364	1500
9	200	1932	750	2023	2364	1500
10	300	1455	750	2023	2318	1500
11	200	1455	750	2023	2318	1500

Running time 200 ms

Total time 4.8 s

Add action

Delete action

Update action

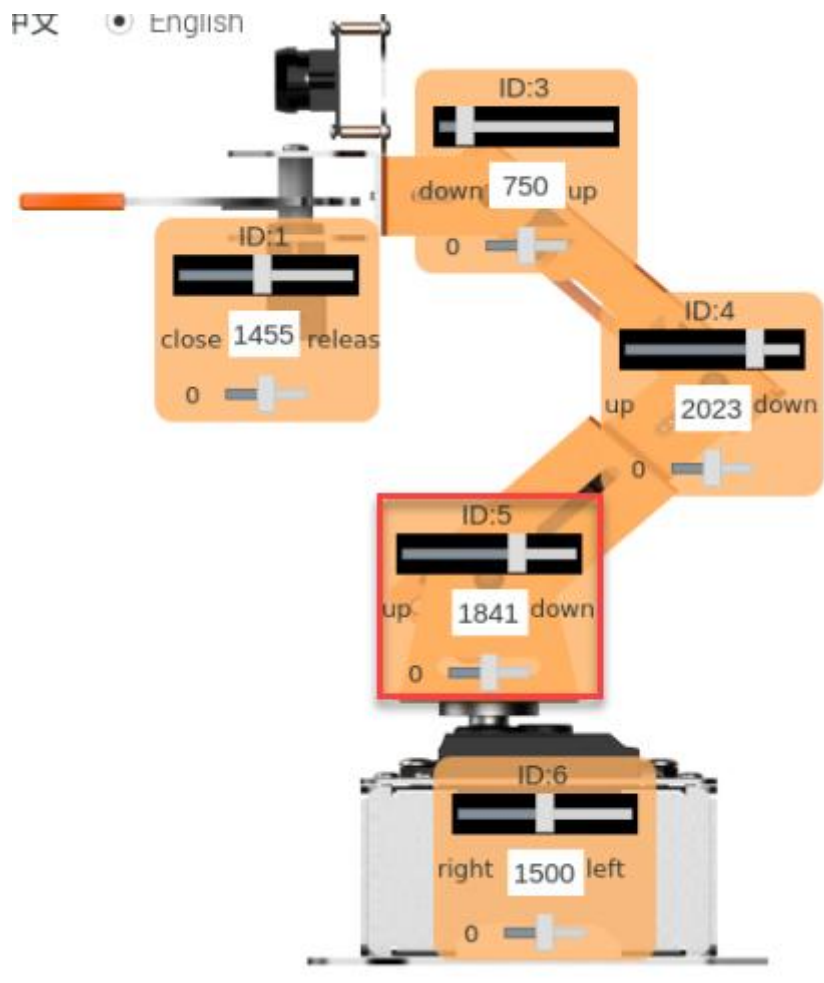
Move up

Delete all

Insert action

Move down

18) After grasping the block, drag the slider of No.5 servo to raise robotic arm.



19) Then set the running time to 1000ms and click “Add action” to get No.12 action.

编号	时间	ID:1	ID:3	ID:4	ID:5	ID:6
5	200	1500	590	2023	2091	1500
6	400	1932	590	2023	2091	1500
7	200	1932	590	2023	2091	1500
8	800	1932	750	2023	2364	1500
9	200	1932	750	2023	2364	1500
10	300	1455	750	2023	2318	1500
11	200	1455	750	2023	2318	1500
12	1000	1455	750	2023	1841	1500

①

动作时间 ms

②

添加动作

总时长 5.8 s

删除动作

更新动作

上移动作

删除全部

插入动作

下移动作

20) Add a transition action and set the running time to 300ms.

Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
6	400	1932	590	2023	2091	1500
7	200	1932	590	2023	2091	1500
8	800	1932	750	2023	2364	1500
9	200	1932	750	2023	2364	1500
10	300	1455	750	2023	2318	1500
11	200	1455	750	2023	2318	1500
12	1000	1455	750	2023	1841	1500
13	300	1455	750	2023	1841	1500

①

Running time ms

②

Add action

Total time 6.1 s

Delete action

Update action

Move up

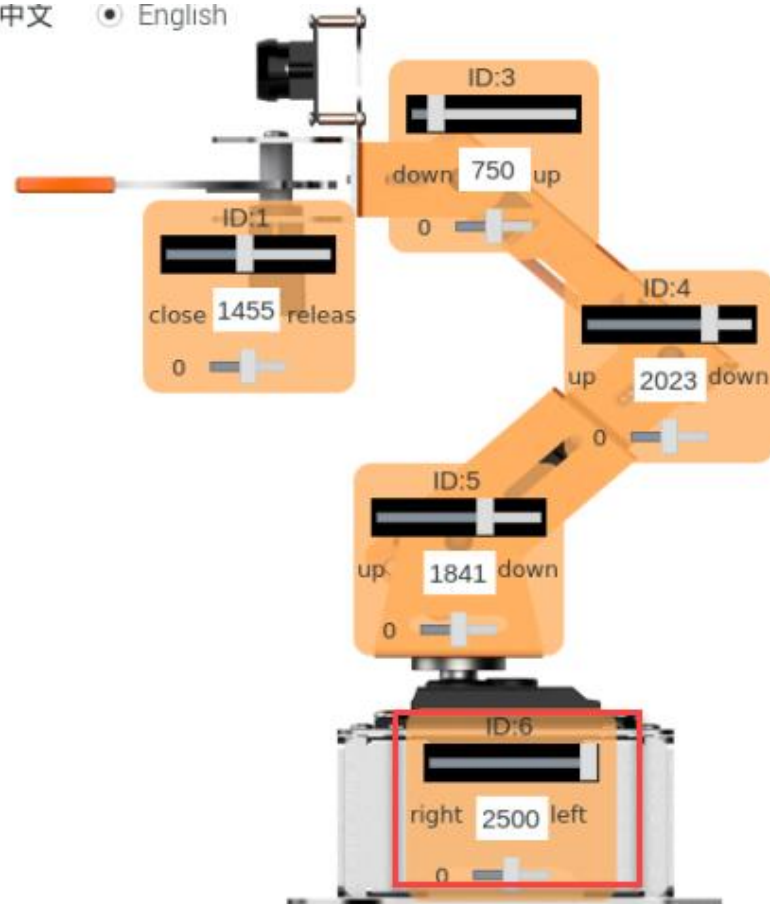
Delete all

Insert action

Move down

21) Now, robotic arm will move the block to the left side. Drag the slider of No.6 servo to set the servo value to 2500.

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22) Set the running time to 1500ms and click “Add action” to get No.14 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	6	400	1932	590	2023	2091	1500
	7	200	1932	590	2023	2091	1500
	8	800	1932	750	2023	2364	1500
	9	200	1932	750	2023	2364	1500
	10	300	1455	750	2023	2318	1500
	11	200	1455	750	2023	2318	1500
	12	1000	1455	750	2023	1841	1500
	13	300	1455	750	2023	1841	1500
▶	14	1500	1455	750	2023	1841	2500

Running time 1500 ms
Add action
Delete action
Update action
Move up

Total time 7.6 s
Delete all
Insert action
Move down

23) Then add a transition action and set the running time to 300ms to get No.15 action.

Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
7	200	1932	750	2023	2364	1500
8	800	1932	750	2023	2364	1500
9	200	1932	750	2023	2364	1500
10	300	1455	750	2023	2318	1500
11	200	1455	750	2023	2318	1500
12	1000	1455	750	2023	1841	1500
13	300	1455	750	2023	1841	1500
14	1500	1455	750	2023	1841	2500
15	300	1455	750	2023	1841	2500

Running time

300

ms

Total time

7.9

s

Add action

Delete action

Update action

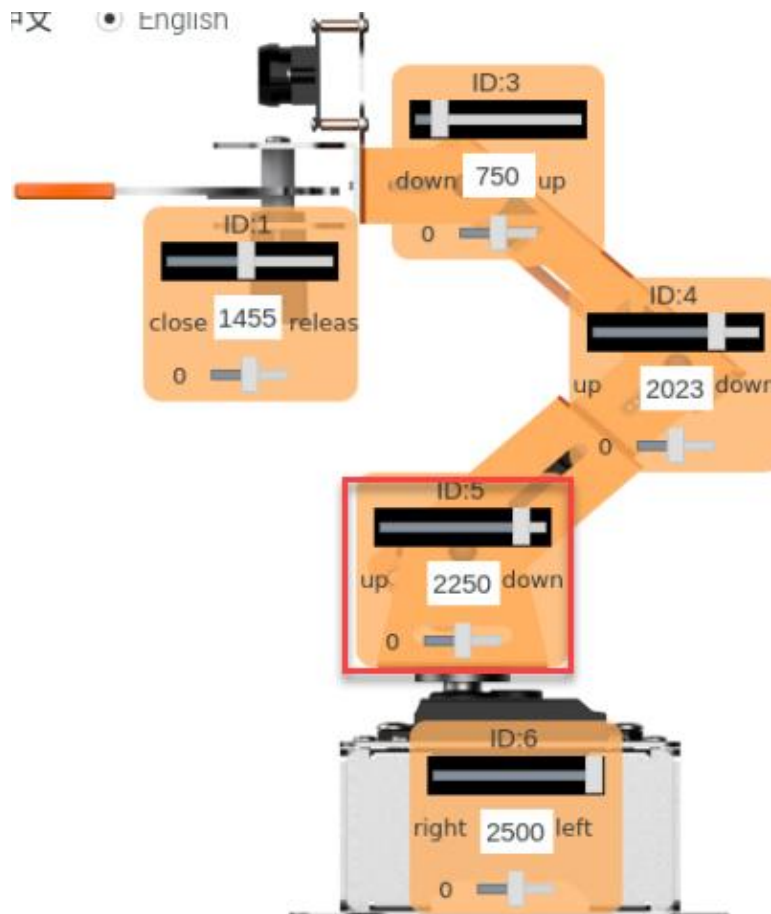
Move up

Delete all

Insert action

Move down

24) After the block is transported to the left side, drag the slider of No.5 servo to place it down.



25) Set the running time to 800ms and click “Add action” action to get No.16 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	8	800	1932	750	2023	2364	1500
	9	200	1932	750	2023	2364	1500
	10	300	1455	750	2023	2318	1500
	11	200	1455	750	2023	2318	1500
	12	1000	1455	750	2023	1841	1500
	13	300	1455	750	2023	1841	1500
	14	1500	1455	750	2023	1841	2500
	15	300	1455	750	2023	1841	2500
▶	16	800	1455	750	2023	2250	2500

Running time 800 ms

Add action

Delete action Update action Move up

Total time 8.7 s

Delete all Insert action Move down

26) Then add a transition action and set the running time to 300ms.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	9	200	1932	750	2023	2364	1500
	10	300	1455	750	2023	2318	1500
	11	200	1455	750	2023	2318	1500
	12	1000	1455	750	2023	1841	1500
	13	300	1455	750	2023	1841	1500
	14	1500	1455	750	2023	1841	2500
	15	300	1455	750	2023	1841	2500
	16	800	1455	750	2023	2250	2500
▶	17	300	1455	750	2023	2250	2500

Running time 300 ms

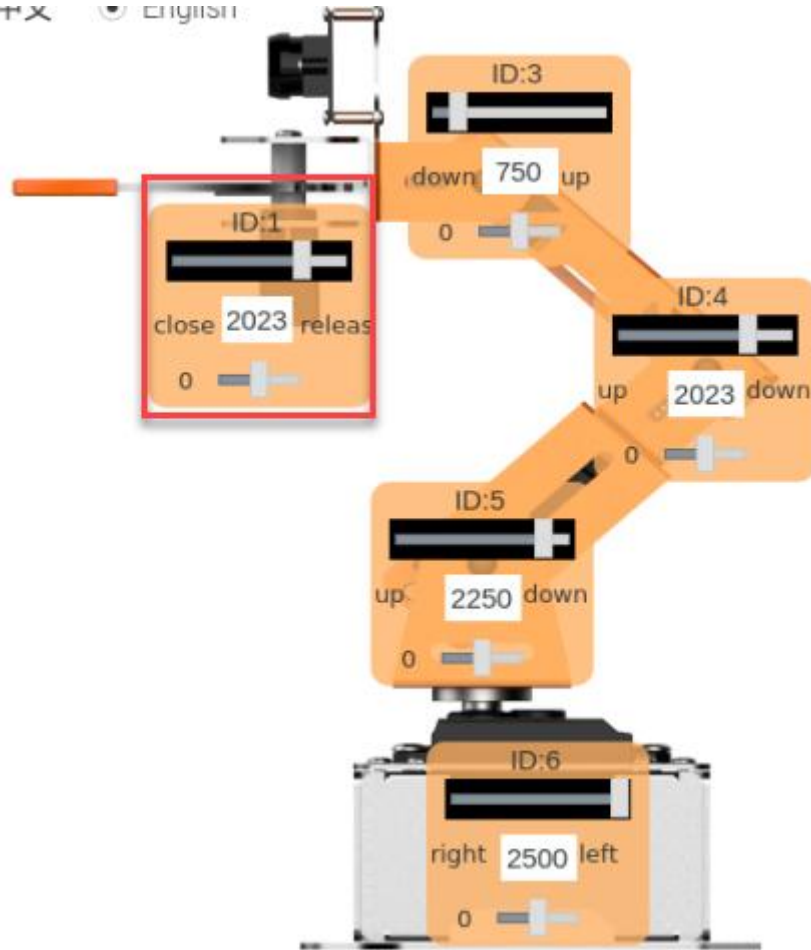
Add action

Delete action Update action Move up

Total time 9.0 s

Delete all Insert action Move down

27) Now, drag the slider of No.1 servo to release the block.



28) Set the running time to 400ms and click “Add action” to get No.18 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	10	300	1455	750	2023	2318	1500
	11	200	1455	750	2023	2318	1500
	12	1000	1455	750	2023	1841	1500
	13	300	1455	750	2023	1841	1500
	14	1500	1455	750	2023	1841	2500
	15	300	1455	750	2023	1841	2500
	16	800	1455	750	2023	2250	2500
	17	300	1455	750	2023	2250	2500
▶	18	400	2023	750	2023	2250	2500

①

Running time ms

Total time 9.4 s

②

Add action

Delete action

Update action

Move up

Delete all

Insert action

Move down

29) Then add a transition action and set the running time to 200ms to get No.19 action.

14

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	11	200	1455	750	2023	2510	1500
	12	1000	1455	750	2023	1841	1500
	13	300	1455	750	2023	1841	1500
	14	1500	1455	750	2023	1841	2500
	15	300	1455	750	2023	1841	2500
	16	800	1455	750	2023	2250	2500
	17	300	1455	750	2023	2250	2500
	18	400	2023	750	2023	2250	2500
▶	19	200	2023	750	2023	2250	2500

Running time

200

ms

Total time

9.6

s

Add action

Delete action

Update action

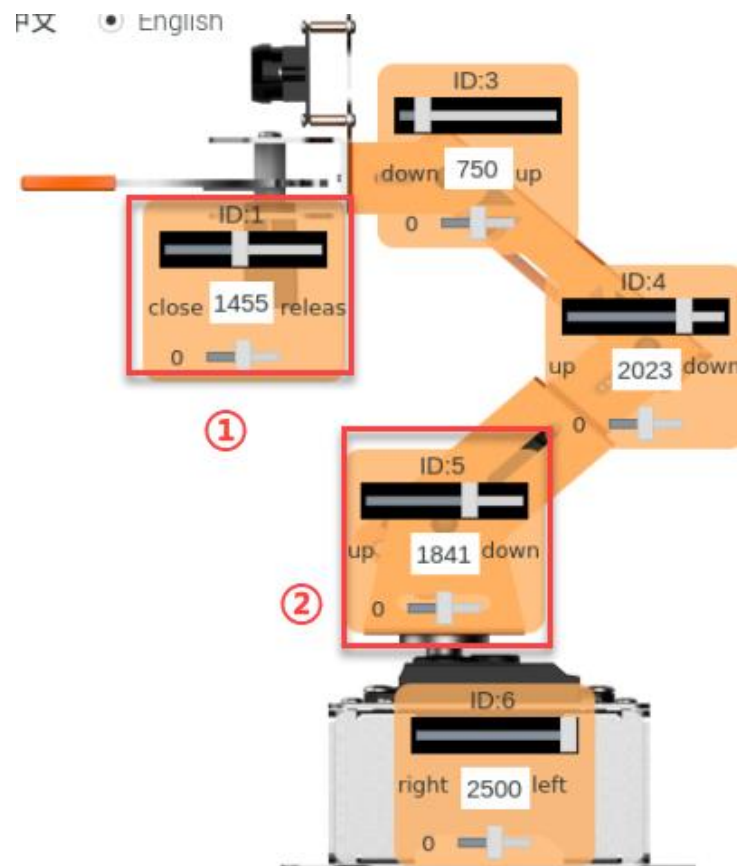
Move up

Delete all

Insert action

Move down

30) After releasing the block, drag the slider of No.1 servo to close gripper, and then adjust the value of No.5 servo to raise robotic arm.



31) Set the running time to 500ms and click “Add action” to get No.20 action.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	12	1000	1455	750	2023	1841	1500
	13	300	1455	750	2023	1841	1500
	14	1500	1455	750	2023	1841	2500
	15	300	1455	750	2023	1841	2500
	16	800	1455	750	2023	2250	2500
	17	300	1455	750	2023	2250	2500
	18	400	2023	750	2023	2250	2500
	19	200	2023	750	2023	2250	2500
▶	20	500	1455	750	2023	1841	2500

①

Running time ms

②

Add action

Delete action

Update action

Move up

Total time 10.1 s

Delete all

Insert action

Move down

32) Then add a transition action and set the running time to 300ms.

	Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
	13	300	1455	750	2023	1841	1500
	14	1500	1455	750	2023	1841	2500
	15	300	1455	750	2023	1841	2500
	16	800	1455	750	2023	2250	2500
	17	300	1455	750	2023	2250	2500
	18	400	2023	750	2023	2250	2500
	19	200	2023	750	2023	2250	2500
	20	500	1455	750	2023	1841	2500
▶	21	300	1455	750	2023	1841	2500

①

Running time ms

②

Add action

Delete action

Update action

Move up

Total time 10.4 s

Delete all

Insert action

Move down

33) Finally, make robotic arm back to the initial posture. Click “▶” button in front of number “1” to run No.1 action. Then set the running time to 1500ms and click “Add action” to get No.22 action.

The screenshot shows the Hiwonder software interface. At the top, there is a table with columns: Index, Time, ID:1, ID:3, ID:4, ID:5, and ID:6. The table contains 9 rows of data. Below the table, there is a control panel with a 'Running time' input field set to 1500 ms, a 'Total time' display showing 10.4 s, and several action buttons: 'Delete action', 'Update action', 'Move up', 'Delete all', 'Insert action', 'Move down', and a prominent 'Add action' button. Red annotations are present: a red box with a right arrow and the number 1 points to the first row of the table; a red circle with the number 2 points to the 'Running time' input field; and a red circle with the number 3 points to the 'Add action' button.

Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
1	200	1500	590	2500	700	1500
2	1200	1500	590	2500	1818	1500
3	300	1500	590	2500	1818	1500
4	800	1500	590	2023	2091	1500
5	200	1500	590	2023	2091	1500
6	400	1932	590	2023	2091	1500
7	200	1932	590	2023	2091	1500
8	800	1932	750	2023	2364	1500
9	200	1932	750	2023	2364	1500

Running time: 1500 ms
Total time: 10.4 s

Buttons: Delete action, Update action, Move up, Delete all, Insert action, Move down, Add action

Index	Time	ID:1	ID:3	ID:4	ID:5	ID:6
14	1500	1455	750	2023	1841	2500
15	300	1455	750	2023	2250	2500
16	800	1455	750	2023	2250	2500
17	300	1455	750	2023	2250	2500
18	400	2023	750	2023	2250	2500
19	200	2023	750	2023	2250	2500
20	500	1455	750	2023	1841	2500
21	300	1455	750	2023	1841	2500
22	1500	1500	590	2500	700	1500

Running time: 1500 ms
Total time: 11.9 s

Buttons: Add action, Delete action, Update action, Move up, Delete all, Insert action, Move down

2.2 Save Action

Note: When you name a action group file, please do not use the spaces to result in failure saving during debugging. It is recommended to use “-” instead of the spaces.

You’d better save the action for later debugging and management. Click “Save action file” and name the file “Hiwonder” as an example, and then click “Save”.

