

Multi-Robot Mode and Dual-Robot Collaboration



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Multi-Robot Mode and Dual-Robot Collaboration

> Multi-robot mode

Multi-robot mode refers to controlling multiple robots by debugging one teach pendant.

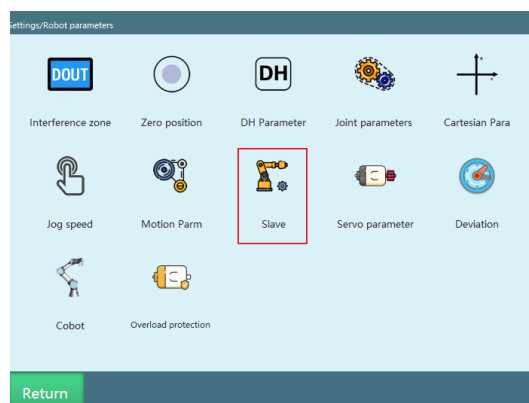
This product supports controlling up to 4 robots at the same time. This chapter will introduce the methods and steps for setting the number of robots to be controlled at the same time, switching robots, dual-robot collaboration, and multiple robots running programs at the same time.

Setting robot

In the robot selection interface under the "Settings" interface, you can select the number and type of robots.

The steps are as follows:

1. Switch the permission to "Admin";
2. Go to "Settings/Robot parameters/Slave configuration";



3. Go to "Settings/Robot parameters/Slave configuration/Slave list";

Settings/Robot parameters/Slave configuration/Slave list

Protocol: Cycle: ms

ENI file name: --

Slaves	Model	Servo number
1		
2		
3		
4		
5		
6		
7		

PgUp PgDn

Return Modify Import ENI Export ENI Robot

4. In the "Number of robots" drop-down box, you can select the number of robots to be controlled at the same time, as shown in the figure below. When the number is 1, it means single robot mode. In this case, if the model of robot 1 is changed, the interface of the teach pendant will also change accordingly. At present, the maximum number of controlled robots is 4, so the number of robots can be selected is in the range (1~4);

Settings/Robot parameters/Slaves/Configurations

Total robot:

Robot1

Robot type: External axis:

Axis	Servo
1 axis	Virtual servo
2 axis	Virtual servo
3 axis	Virtual servo
4 axis	Virtual servo
5 axis	Virtual servo
6 axis	Virtual servo

Return Modify Driven shaft

Settings/Robot parameters/Slaves/Configurations

Total robot:

Robot1 **Robot2** **Robot3** **Robot4**

Robot type: External axis:

Axis	Servo
1 axis	Virtual servo
2 axis	Virtual servo
3 axis	Virtual servo
4 axis	Virtual servo
5 axis	Virtual servo
6 axis	Virtual servo

Return Save Driven shaft

Settings/Robot parameters/Slaves/Configurations

Total robot: 4

Robot1 Robot2 Robot3 **Robot4**

Robot type: None External axis: 0

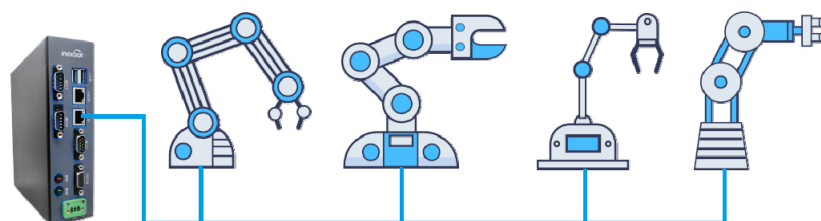
Axis Servo

Return Save Driven shaft

Axis	Servo
1 axis	Virtual servo
2 axis	Virtual servo
3 axis	Virtual servo
4 axis	Virtual servo
5 axis	Virtual servo
6 axis	Virtual servo

- After selecting the number, you need to set the model of each robot and the corresponding servo model. The order of the robot is determined by the order in which the controller is connected in series with the robot;
- After all robot models and servo models are set, press the [OK] button to save;
- Restart.

The robot sequence is as follows:



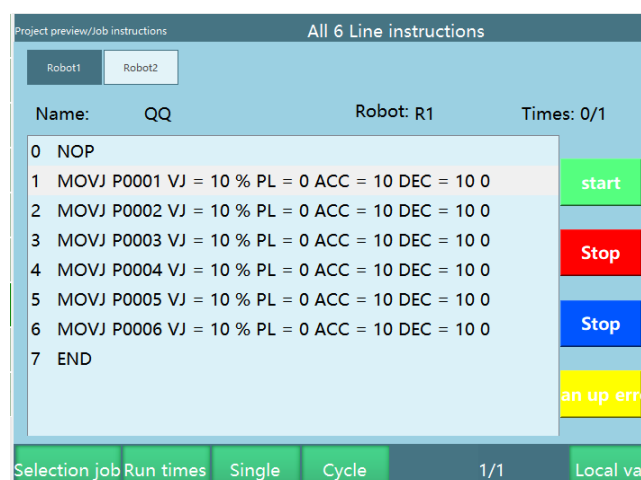
Switching robot

- When the mode selection key is at "Teach mode", press the [Robot] button to switch between the robots and teach them separately. At this time, the "Robot" column in the upper status bar will display the serial number of the currently operating robot.
- The job files are not common between robots, and the job files are also switched when the robot is switched.
- If the robot is switched to a different type, the related interfaces will also change. When the switched robot type is a 4-axis SCARA robot, "DH parameter setting", "User coordinate system setting", "Joint parameter setting", "Robot zero position", "Servo status", "IMOV instruction insertion" and other interfaces will switch to the corresponding interfaces according to the number of the axis of the current robot.
- The coordinate system on the right side of the interface will also change, how many axes the current robot has, how many axes will be displayed there.

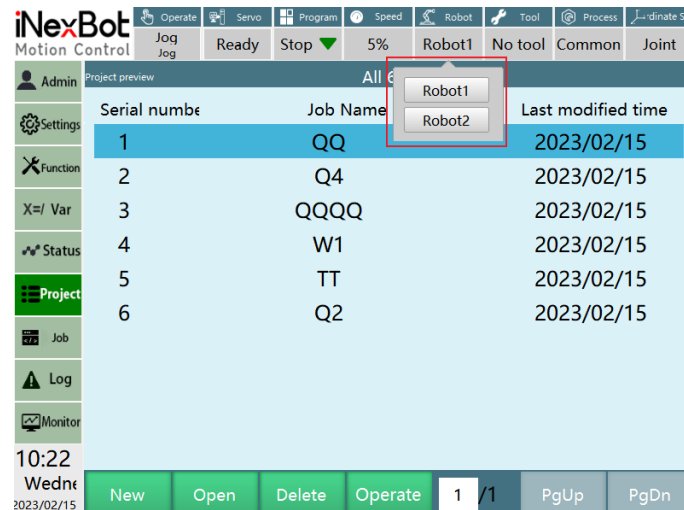
➤ Multi-robot mode

- Main interface

When the mode selection key is at "Run mode", press the [Robot] button to switch between each robot and enter the multi-robot mode. The interface is as follows:



Press [Select program] to choose among various programs, and the interface is as follows:



After selecting the program, click the [Open] button in the operation area at the bottom of the interface, set the current program as the program running by the current robot.

- Operation area

In this mode, you can only start and stop the running programs.

Click the [Robot 1] button, [Robot 2] button, [Robot 3] button, and [Robot 4] button in the operation area at the top of the interface to switch the display interface of each robot.

Click the [Start] button in the operation area on the right side of the interface to run the selected program for the current robot.

Click the [Stop] button in the operation area on the right side of the interface to stop the operation of the current robot.

Click the [Servo ready] button in the operation area on the right side of the interface to enter the servo ready state for the current robot.

Click the [Clear error] button in the operation area on the right side of the interface to clear up any servo errors occurred for the current robot.

Click the [Set times] button in the operation area at the bottom of the interface to set the running times after which the current robot will stop.

Click the [Cycle mode] button in the operation area at the bottom of the interface to set the current robot to run for infinite times.

Click the [Select program] button in the operation area at the bottom of the interface to set the programs that the current robot runs.

The physical buttons [Start] and [Stop] on the teach pendant are for all robots, when pressed, all robots will start or stop running.

> Dual-robot collaboration

As to dual-robot collaboration, please use **two identical 6-axis robots**, and configure them according to multi-robot mode settings.

Please fill in the same values for the joint parameters and DH parameters of the two robots.

To enable dual-robot collaboration, please enable dual-robot collaboration in **"Settings-Robot parameters-Motion parameters"**.

Notes



- Turning off the dual-robot collaboration button requires a restart of the controller system; but turning it on does not require a restart.
- If the number of robots is greater than 2, the dual-robot collaboration function will be automatically turned off when restarting.
- Dual-robot collaboration cannot be used in conjunction with multi-robot mode.
- Dual-robot mode and external axes cannot be used at the same time.

Settings/Robot parameters/Motion parameters

Interpolate:

Pos resolution: ° (0.0001-0.1)

Machine synchronization mode: ☐

Delay time: ms (500-20000)

Pause time: ms (240-2000)

After enabling the dual-robot collaboration, the first robot is the master robot and the second robot is the slave robot. Please use the [Robot] button on the left side of the teach pendant to switch the master and slave robots for teaching. After switching to the slave robot, "Robot2" will be displayed at the current operating robot in the status bar above the teach pendant. Please do not use the [External axis] button to switch to robot 2 for teaching.

Project preview/job instructions/Instruction insertion/Parameter

MOVJDOUBLE

Paramet	Value	Comment	Jo
E	New	More	Saved points:0
VJ	10	More	Range (1-100)
ACC	1	More	1-100
DEC	1	More	1-100
TIME	0	More	/ execution,N

MOVJDOUBLE E001 VJ = 10 % ACC = 10 DEC = 10 0

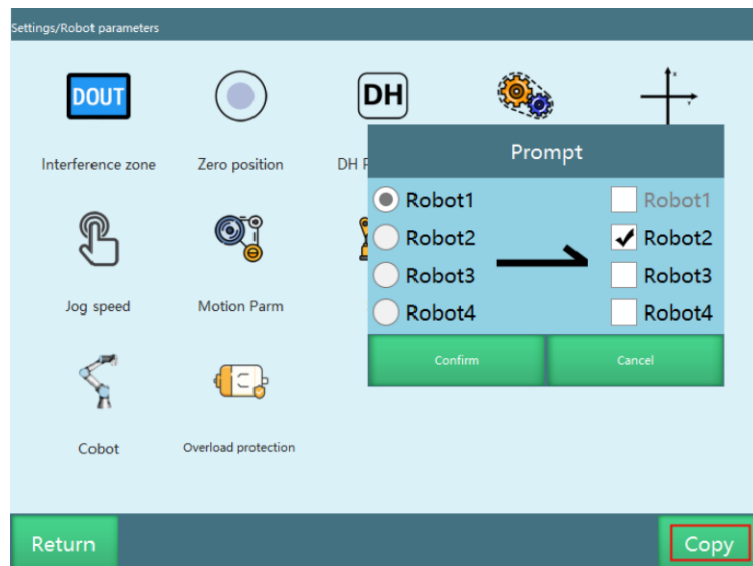
Move robot to E point

Current point is set to E

The instructions to control the simultaneous movement of the two robots are MOVJDOUBLE, MOVLDDOUBLE, MOVCDDOUBLE and MOVCADOUBLE. For example, both robots can move to the position point with joint interpolation or linear interpolation.

> "Copy parameter" function

Function: Copy the parameters of the current robot to other robots



Note: 1. The "Copy parameter" button is only displayed when the number of robots is greater than 1

2. The copied parameters do not include: zero position, slave configuration, NP parameters, servo parameters, collaborative robot

3. The target robot copied to does not contain the original robot

> Instructions

Dual-robot point-to-point MOVJDOUBLE

When set to two robots, make the two robots move to the target position with joint interpolation at the same time; start and stop at the same time

Dual-robot linear MOVLDDOUBLE

When set to two robots, make the two robots move to the target position with linear interpolation at the same time; start and stop at the same time

Dual-robot circular MOVCDDOUBLE

When set to two robots, make the two robots move to the target position with circular interpolation at the same time; start and stop at the same time

Dual-robot full circle MOVCA DOUBBLE

When set to two robots, make the two robots move to the target position with full circle interpolation at the same time; start and stop at the same time