



IO Function Description



Contents

-  IO Environment Construction
-  Software IO Description
-  IO Command Application
-  IO Control Function

1

IO Environment Construction

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What is IO?

- IO function can specify the input and output items of a specific system, and associate the I/O signal with some special functions of the robot system, so that the signal can achieve some special functions. This allows us to control the robot and monitor the status of the robot system without using a teach pendant or other hardware. For example, by adding Start in the configured input, it can be used for the start control of the robot.

IO Board Introduction

- Electric cabinet IO information, view through IO board label

BAT系列IO标签 (A2.3)

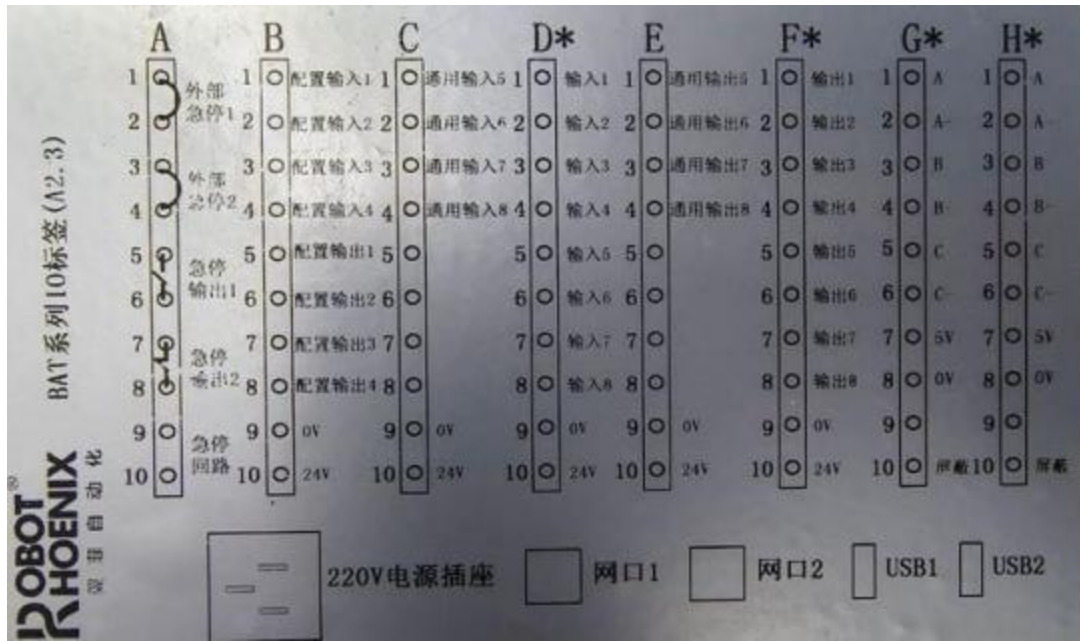
A		B		C		D*		E		F*		G*		H*	
1	外部急停1	1	配置输入1	1	通用输入5	1	输入1	1	通用输出5	1	输出1	1	A	1	A
2	外部急停2	2	配置输入2	2	通用输入6	2	输入2	2	通用输出6	2	输出2	2	A-	2	A-
3	外部急停3	3	配置输入3	3	通用输入7	3	输入3	3	通用输出7	3	输出3	3	B	3	B
4	外部急停4	4	配置输入4	4	通用输入8	4	输入4	4	通用输出8	4	输出4	4	B-	4	B-
5	急停输出1	5	配置输出1	5		5	输入5	5		5	输出5	5	C	5	C
6	急停输出2	6	配置输出2	6		6	输入6	6		6	输出6	6	C-	6	C-
7	急停输出3	7	配置输出3	7		7	输入7	7		7	输出7	7	5V	7	5V
8	急停输出4	8	配置输出4	8		8	输入8	8		8	输出8	8	0V	8	0V
9	急停回路	9	0V	9	0V	9	0V	9	0V	9	0V	9		9	
10		10	24V	10	24V	10	24V	10	24V	10	24V	10	屏蔽	10	屏蔽

220V电源插座 网口1 网口2 USB1 USB2



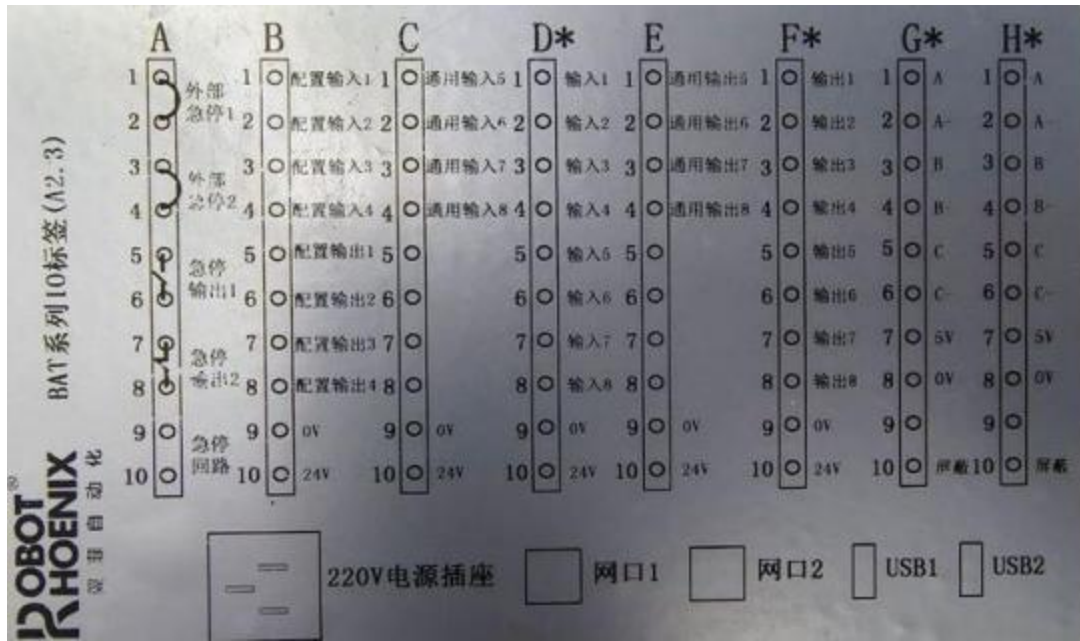
IO Board Introduction

- A: External emergency stop 1 and 2 are normally closed. If they are disconnected, the robot is in emergency stop status.
- Emergency stop output 1 and 2, used for external integrated devices to view the current emergency stop status.



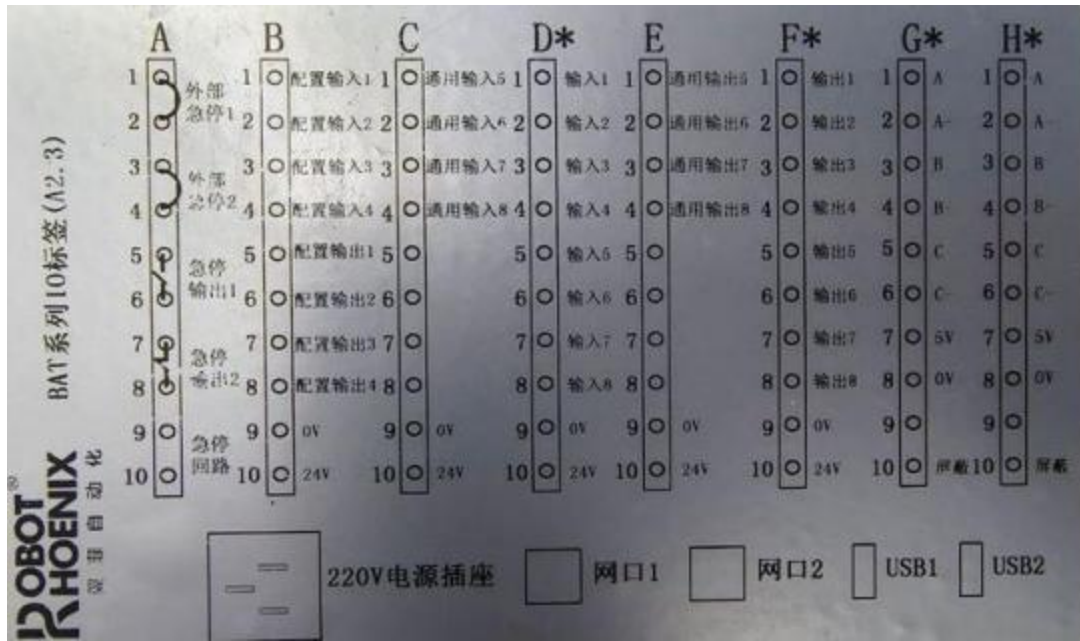
IO Board Introduction

- B: The configured inputs 1, 2, 3, and 4 can be used to start, stop, pause, resume, and error reset of external robots.
- The configured outputs 1, 2, 3, and 4 can be used for external integrated devices to read the robot status and configure camera trigger signals.



IO Board Introduction

- C, E: Common input and output signals, used to control software program segments, solenoid valve suction and deflation, etc.
- D*, F*, G*, H*: Factory default is empty, and wiring is performed according to customer requirements.



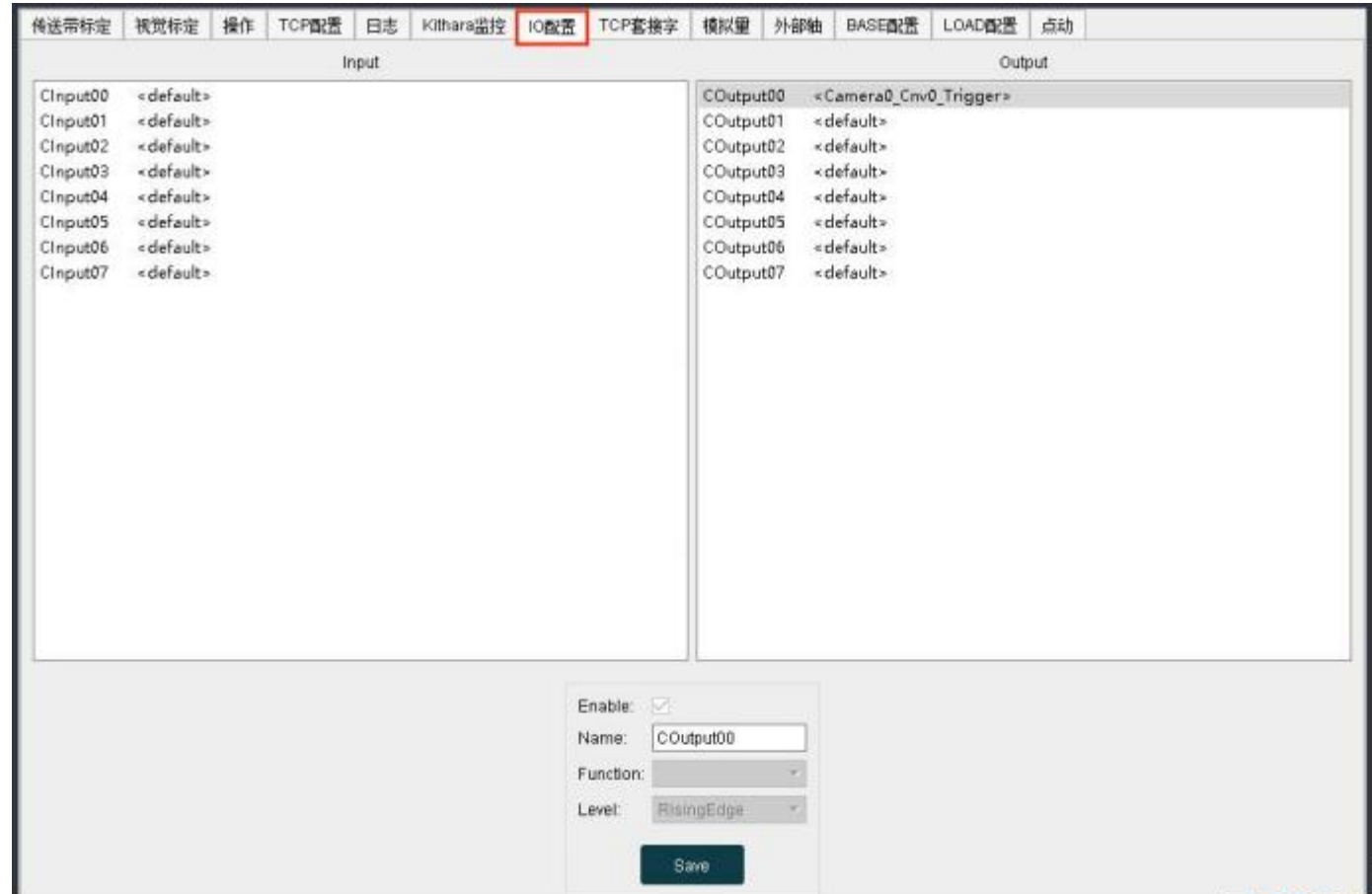
2

Software IO Description

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IO interface

- Enter YiKingSoft software
- Click the “Function Operation” button
- After entering, select “IO Configuration”



Configured IO Description

- If the PLC wants to control the robot through the configured input and output, it needs to be configured in the software

Input	
CInput00	<default>
CInput01	<default>
CInput02	<default>
CInput03	<default>
CInput04	<default>
CInput05	<default>
CInput06	<default>
CInput07	<default>

Output	
COutput00	<Camera0_Cnv0_Trigger>
COutput01	<default>
COutput02	<default>
COutput03	<default>
COutput04	<default>
COutput05	<default>
COutput06	<default>
COutput07	<default>

Configured Input IO Description

- Configured input IO:
First, select “Enable”,
then you can configure it.

Enable: ☒

Name:

Function: Start ▼

Level: Start

Stop

Pause

Resume

CmdGroup

ResetError

Input	Output
CInput00 <default>	COutput00 <Camera0_Cnv0_Trigger>
CInput01 <default>	COutput01 <default>
CInput02 <default>	COutput02 <default>
CInput03 <default>	COutput03 <default>
CInput04 <default>	COutput04 <default>
CInput05 <default>	COutput05 <default>
CInput06 <default>	COutput06 <default>
CInput07 <default>	COutput07 <default>

Enable: ☐

Name:

Function: Start ▼

Level: RisingEdge ▼

Save

Configured Input IO Description

- After configuration, click “save” to save.

Input		Output	
CInput00	<Start>	COutput00	<Camera0_Cnv0_Trigger>
CInput01	<Stop>	COutput01	<default>
CInput02	<Pause>	COutput02	<default>
CInput03	<Resume>	COutput03	<default>
CInput04	<CmdGroup>	COutput04	<default>
CInput05	<ResetError>	COutput05	<default>
CInput06	<default>	COutput06	<default>
CInput07	<default>	COutput07	<default>

Enable:	☒
Name:	CInput03
Function:	Resume
Level:	RisingEdge
Save	

Configured Output IO Description

- The same applies to the configured outputs.
- Note: The configured output 0 cannot be changed,
- It is a dedicated trigger for the camera.
The configured output monitors the robot status.

COutput00	<Camera0_Cnv0_Trigger>
COutput01	<RunStatus>
COutput02	<PauseStatus>
COutput03	<AlarmStatus>
COutput04	<StartOut>

Enable: ☒

Name:

Function:

Level:

Output

COutput00	<Camera0_Cnv0_Trigger>
COutput01	<RunStatus>
COutput02	<default>
COutput03	<default>
COutput04	<default>
COutput05	<default>
COutput06	<default>
COutput07	<default>

Enable: ☒

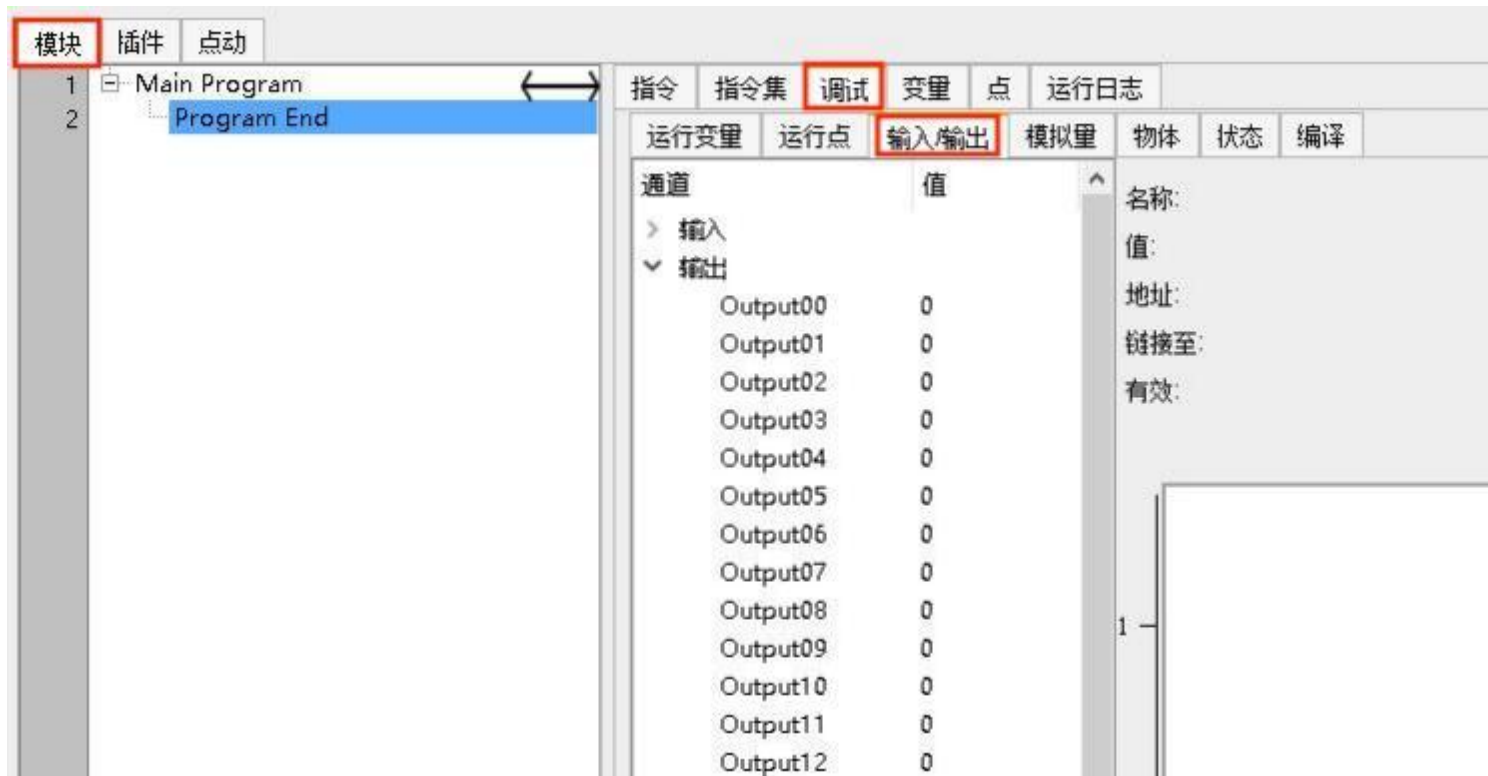
Name:

Function:

Level:

Configuration of common IO input and output description

- Common input and output IO configuration, through wiring with IO board, and displayed in robot programming → debugging → input/output.



3

IO Command Application

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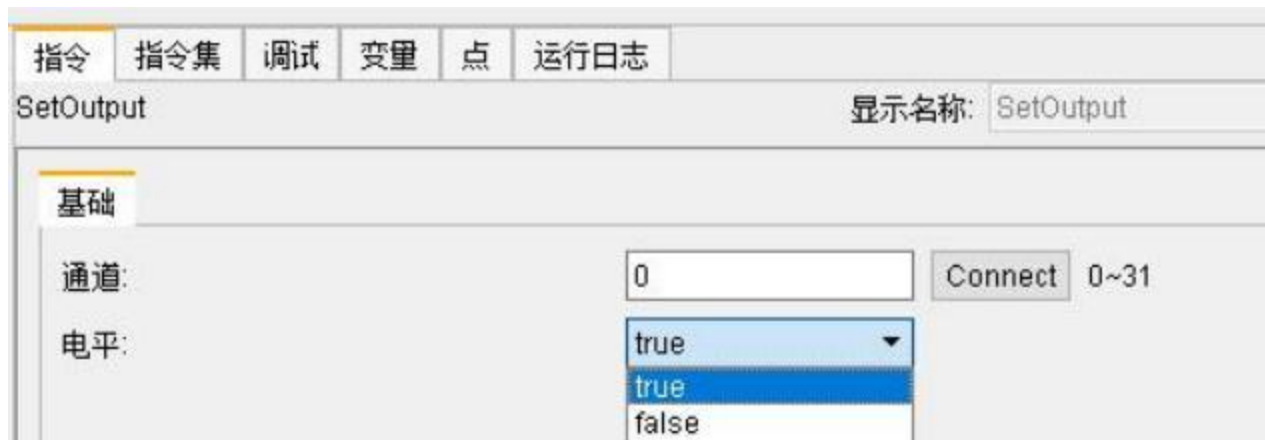
IO Command

- IO commands mainly include

SetOutput	SetRobotOutput
SetOutPulse	SetRobotOutPulse
setcutputF	SetRobotOutputPWM
setoutputBeforEnd	SetADValue
Triggercamera	

IO Command

- SetOutput: Controls the output channel to switch on and off, that is, true&false.
- Example: After connecting the solenoid valve and the vacuum generator, when Output03 controls the switch of the solenoid valve, write 3 in the channel of the SetOutput command, set it to true before motion, and set it to false when moving to the target point, and the robot can complete suction and deflation.



IO Command

- SetOutputBeforEnd: Controls the output channel to switch on and off in advance, that is, true&false.
- Example: After connecting the solenoid valve and the vacuum generator, when Output03 controls the solenoid valve switch, write 3 in the channel of the SetOutput command, set it to true before motion, and set the time to 0.1s. The command can suction 0.1s in advance. When moving to the target point, it is set to false, and set the time to 0.1s. The command can deflate 0.1s in advance. The robot can complete the suction and deflation.

The screenshot shows a configuration window titled "SetOutputBeforEnd". In the top right corner, there is a label "显示名称:" followed by a text box containing "SetOutputBeforEnd". Below this, there is a tab labeled "基础". The main area contains three configuration fields: "通道:" (Channel) with a text box containing "0" and a "Connect" button with the range "0~31"; "时间(s):" (Time(s)) with a text box containing "0" and a "Connect" button; and "电平:" (Level) with a dropdown menu showing "true" selected, with "true" and "false" as options.

IO Command

- TriggerCamera: Camera trigger command. After selecting the camera ID, set the YiVision trigger mode to command trigger. Add this command in the program. When running to this command, the camera will be triggered once.

The screenshot shows a software interface for configuring the 'TriggerCamera' command. At the top, there is a tabbed menu with '指令' (Command) selected. Below the menu, the command name 'TriggerCamera' is displayed on the left, and '显示名称: TriggerCamer' (Display Name: TriggerCamer) is on the right. Underneath, there is a sub-tab labeled '基础' (Basic). In the '基础' section, there is a label '相机ID:' (Camera ID:) followed by a text input field containing the number '0'. To the right of the input field is a 'Connect' button.

4

IO Control Function

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IO control error reset

- Before using the IO for error reset, the IO needs to be configured first.
- Enter YiKingSoft software → Function Operation → IO Configuration Interface and select an input IO to configure.
- Select the configured input 5 as the error reset function, select the rising edge or the falling edge, and click Save.

Input	
CInput00	<Start>
CInput01	<Stop>
CInput02	<Pause>
CInput03	<Resume>
CInput04	<CmdGroup>
CInput05	<ResetError>
CInput06	<default>
CInput07	<default>

Enable: ☒

Name:

Function:

Level:

IO control error reset

- When the robot alarms, the error reset can be successful by forcing the configured input 5 to change it from 0 to 1.



THANKS!

谢谢