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Jinan Tianchuan Zhongcheng Electrical Equipment Co., Ltd

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List of extended and matched host series

The extension shall be matched with the host computer according to the following table. It is not allowed to mix with the host computer which is not marked. Cannot be mixed and matched with other brands.Otherwise, the normal operation will be affected.

Extended Family	Host family
HE series, HBD board	Series JH(H1X), JH2, JHM, JH2M
SE Series	JS, JSC,JM, JE, JEM, JC series
TE series	JT, JT2, JT3, JT5, JTM, JT5M series
CE series	Series JC, JS, JM

Troubleshooting of PLC Errors

1. RUN is on. The ERR error light of PLC is flashing. What is the reason?

If the RUN light is on, it is because the division instruction is used to divide 0 in the program. ERR will flash, which will not affect the normal operation of the program. The ERR stops flashing when it is detected that 0 is not divisible after power-up again.

2. RUN is out. What is the reason?

A: Check whether the 24V voltage of the power supply is insufficient and stop. Use a multimeter to measure the voltage (low voltage will prompt, high voltage will not, and lower than 21V will prompt). The status of M1009 can also be monitored in the program. If the voltage of M1009 is 24V normally, it is always OFF. If it is not normal, it will be ON. You can also add a sentence SET M1196 in the program to cover the STOP caused by 24V deficiency.

B: If 24V is normal, it is necessary to check whether the firmware version (D1133) is up-to-date in combination with the actual situation of the site. Then check whether there is communication interference or other on-site interference. Check whether there is a high-power AC motor, whether there is communication command, and how much baud rate is set. the latest firmware needs to be downloaded at the same time,   put the following address on the touch screen,   so that the problem can be analyzed next time,   Contact the manufacturer:

M1009: ON means the 24V voltage is insufficient.

D1004: Indicates error code, 16-bit hexadecimal display, read-only.

D1139: Indicates the error cause, 16-bit decimal display, read-only.

D1140: Indicates the error cause, 16-bit decimal display, read-only.

D1133:   Indicates PLC software firmware version, 16-bit decimal display, read-only.

PLC Host Function Query

- Currently, only JH(H1X), JHM, JH2, JH2M, JE and JEM series hosts have this function.
- The functions of the PLC host can be determined by monitoring the value of D1142 (32-bit, hexadecimal display) as follows:

D1142~D1143 address	Function
bit0-bit7	Number of digital output port points
bit8-bit15	Number of digital input port points
bit16~bit19	Number of analog output points
bit20~bit23	Number of analog input points
bit27~bit24	Product Family
	0: JC series
	1: JS Series
	2: JT series
	3: JT3 series
	4: JH(H1X) series
	5: JT5 Series
	6: JH2 Series
bit30~bit28	reserve
bit31	Ethernet Features

List of D1142 values corresponding to different hosts:

Series	Model	D1142~D1143 values (32-bit 16-bit monitoring display)
JH(H1X) Series	JH(H1X)-16T	H4000808
JH(H1X) Series	JH(H1X)-16T-E	H84000808
JH(H1X) Series	JH(H1X)-1212T	H4001212
JH(H1X) Series	JH(H1X-1410MR-A)-24T	H4001410
JH(H1X) Series	JH(H1X)-24T-2E	H84001410
JH(H1X) Series	JH(H1X)-32T	H4001616
JH(H1X) Series	JH(H1X)-32T-2E	H84001616
JH(H1X) Series	JH(H1X)-40T	H4002416
JH(H1X) Series	JH(H1X)-40T-2E	H84002416
JH(H1X) Series	JH(H1X)-48T	H4002424
JH(H1X) Series	JH(H1X)-48T-2E	H84002424
JH(H1X) Series	JH(H1X)-60T	H4003624
JH(H1X) Series	JH(H1X)-60T-2E	H84003624
JH2 Series	JH2-16T	H6000808
JH2 Series	JH2-24T	H6001410
JH2 series, JE series	JH2-32T-E, JE-1616T-E	H86001616
JH2 Series	JH2-40T-E	H86002416
JH2 Series	JH2-48T-E	H86002424
JH2 Series	JH2-60T-E	H86003624

Communications

1、serial communication

1.1 Communication interface

RS-232 :COM1 interface and pins

RS232 round 8-core pin definition RS232 DB9 interface pin definition
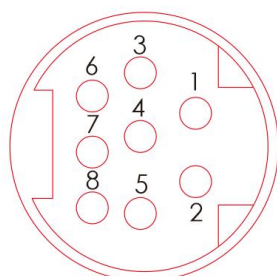
8 cores
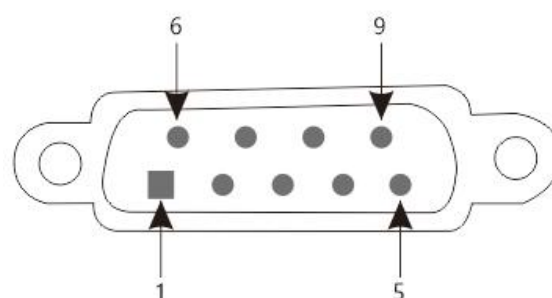
DB9

RS232 Round-mouth Pin Definition		
pin number	Description	Description
5	TXD	Send Data
4	RXD	Receive Data
8	GND	signal ground

RS232DB9 Pin Definition		
pin number	Description	Description
2	TXD	Send Data
3	RXD	Receive Data
5	GND	signal ground

RS-485：COM2、COM3 interface and pins

The RS485 interface pins are defined in the table below.

Pin	Function
D+ or D2+	COM2: 485 Phase A
D- or D2-	COM2: 485 Phase B
D3+	COM3: 485 Phase A
D3-	COM3: 485 Phase B
SG	485 signal ground

1.2 Communication format setting

1.2.1 Communication format

- When operating in RTU mode, select 8 bits of data length.
- If the PLC has one RS485, the default value is COM2. If the PLC has two RS485, D2+, D2- are COM2, D3+ and D3- are COM3.
- The host communication port (COM1:RS-232, COM2:RS-485, COM3:RS-485) supports MODBUS ASCII/RTU communication format. It can be used as master station or slave station. The baud rate can reach up to 115200 bps. COM1 or COM2 or COM3 can be used simultaneously. The default communication mode of each communication port is 9600 bps baud rate, 7 bits of data length, 1 bit of stop bit, even parity and ASCII mode.
- When there is only one RS485, it defaults to the COM2 communication port.
- The factory defaults for conventional COM1, COM2, and COM3 communication methods are (excluding JH(H1X), JHC, JHM, and JHCM series):

  -----------9600bps

  ----------Data length: 7 bits

  ---------- Stop bit 1

  ---------- Even Parity

  ----------Modbus ASCII mode.
- The factory default communication methods of JH(H1X), JHC, JHM and JHCM series COM1, COM2 and COM3 are:

  -----------38400bps

  ----------Data length: 7 bits

  ---------- Stop bit 1

  ---------- Even Parity

  ----------Modbus ASCII mode.

Communication Parameters		Communication port		
		RS-232(COM1)	RS-485 (COM2)	RS-485 (COM3)
baud rate	Depending on the communication port, it is determined by the following address: COM1:D1036 COM2:D1120 COM3:D1109	9600~115200bps		
Data Bit Length		7-bit to 8-bit		
parity bit		ODD/EVEN/NONE		
Stop Data Bit Length		1~2 Data Bits		
Communication parameter setting register		D1036	D1120	D1109
Communication format maintenance		M1138	M1120	M1136
ASCII mode/RTU mode (ON: RTU, OFF: ASCII)		M1139	M1143	M1320
Communication timeout ms (100ms recommended)		D1129	D1129	D1252
Interval time of command communication (unit: 0.1ms)		D1156	D1157	D1158
ASCII /RTU mode switching		Both master and slave stations are active		
Slave communication address setting register		D1121		

1.3 Parameter configuration of D1036, D1120 and D1109

	Content	0	1
b0	Data length	b0=0: 7,7 bits (factory default)	b0=1:8, 8 bits
b1 b2	parity	b2, b1=00	None
		b2, b1=01	odd parity (odd)
		b2, b1=11	Even (factory default)
b3	stop bit	1bit (factory default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps (Factory default) but does not include JSC, JHC, JSCM, JHCM series	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps (Factory default) JSC, JHC, JSCM, JHCM series only	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps	

1.4 Change method of serial communication setting

Method 1: Address assignment method:

Take the factory RS232 communication setting as 9600bps, data length 7, even parity, stop bit 1, ASCII mode as an example. According to the parameter configuration table in the previous section, it can be concluded as follows:

D1036	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	0	0	1	1	0
communication format	b7~b4=1000 (H8) 9600bps				stop bit 1 bit	b2, b1=11 even parity		Data length 7-bit

Then the b7~b0 values of D1036 are respectively 1000 0110 and converted into hexadecimal system H86, i.e. D1036 is assigned to H86.

The procedure is as follows:
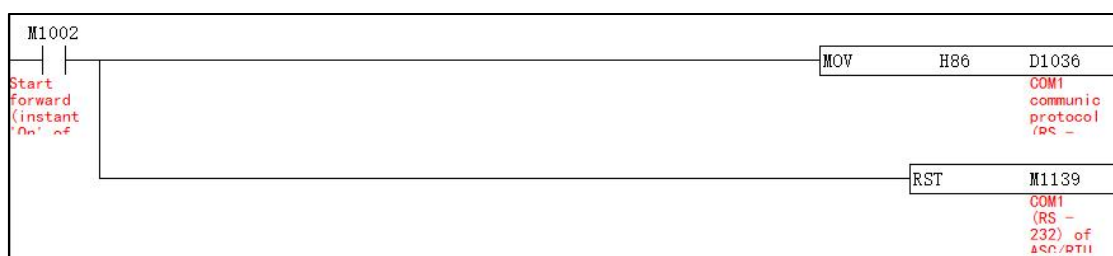
Similarly, if the communication setting of RS232 is required to be 19200bps, 8, no check, 1, RTU mode. As shown in the table below:

D1036	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	1	0	0	0	1
communication format	b7~b4=1001 (H9) 19200 bps				stop bit 1 bit	b2, b1=00 No verification		Data length 8 bits

The b7~b0 values of D1036 are respectively: 1001 0001, which is converted into hexadecimal H91, that is, D1036 is assigned to H91. Set M1139 ON at the same time. The procedure is as follows:
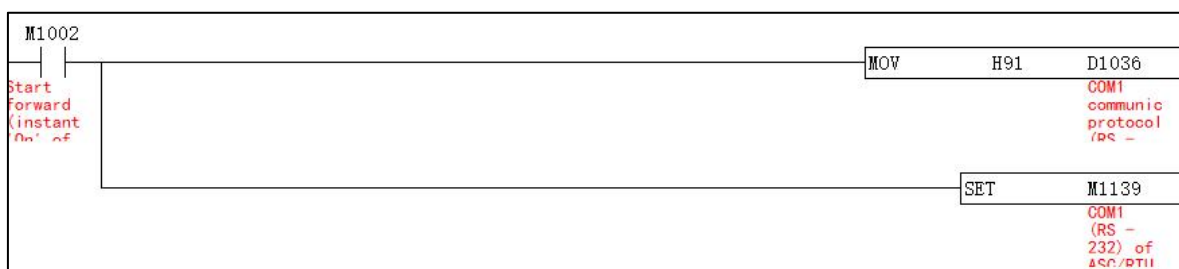
Method 2: Change the column of "Project Management ➝ "Configuration" of the programming software:

a. As shown in the figure, double click "COM1" to pop up the "COM1 communication parameter setting" dialog box, tick "√" in the option box of "Enable setting" column, select the required communication configuration in the drop-down box, and click "OK" after setting.
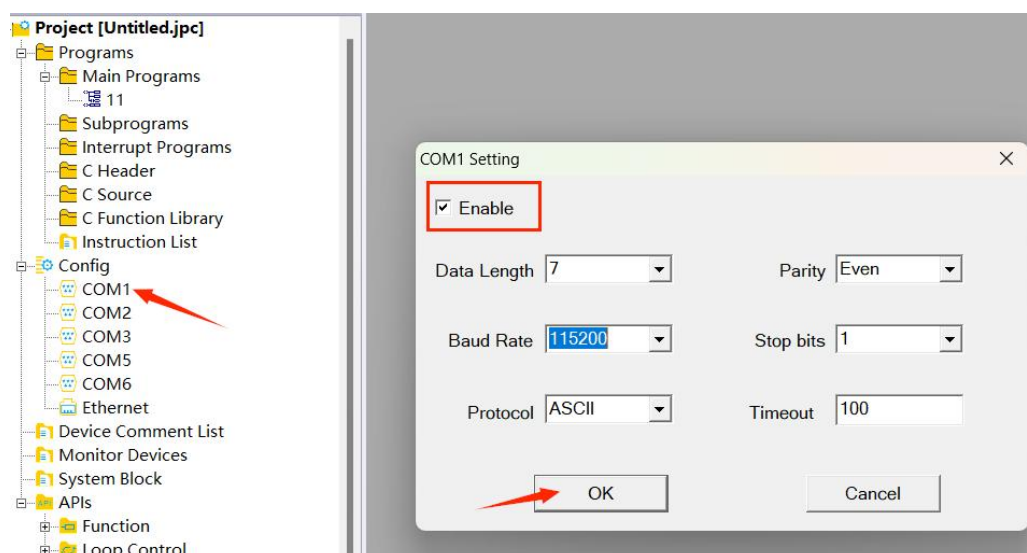
b. Click Download as shown. The download dialog box pops up, and click OK. Continue to the next step, click Compile, click Yes.
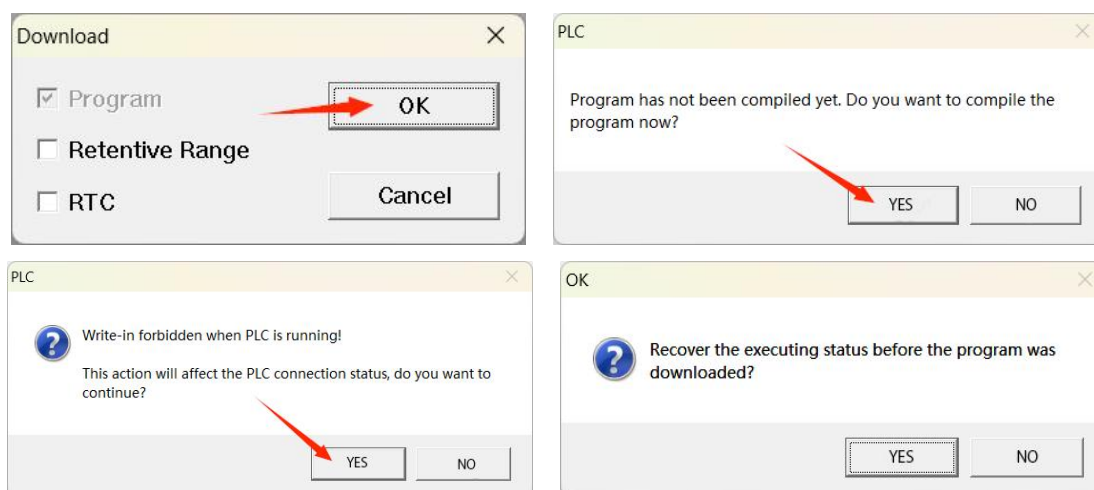
c．After the program is downloaded, communication timeout error will be prompted. Click "PLC" menu bar → "communication setting", select the set communication format, and click "communication test", the communication is successful.

d．
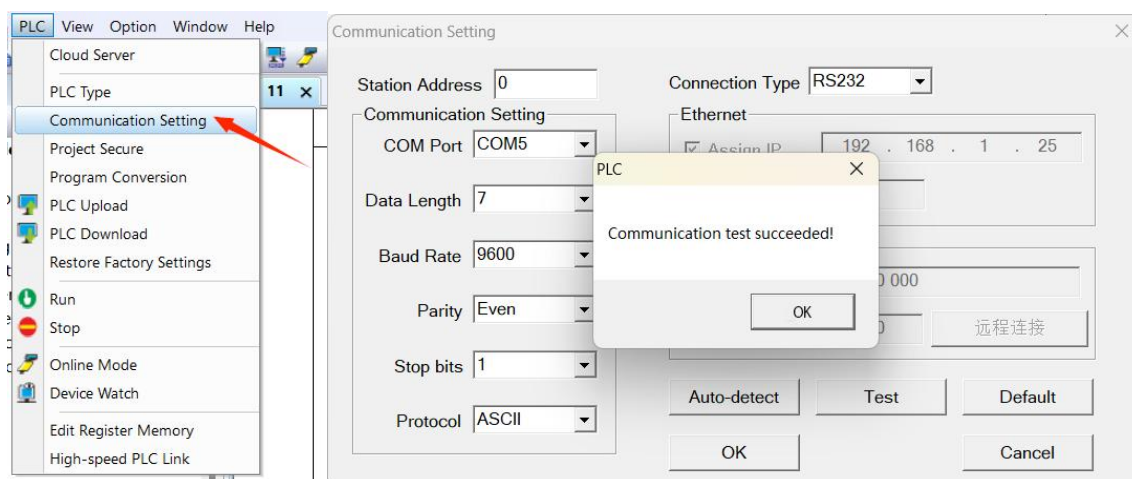
2. USB communication

2.1 Dual USB Cable Download Program

Depending on the computer system, download the appropriate USB drive (common to WIN8、WIN10、WIN11)

When M1293 is set to ON, it works in computer mode (using dual-head USB cable to download and monitor program), and when M1293 is OFF, it works in U disk mode (use U disk download program).

The method for downloading the program by using the dual-head USB cable is as follows:

1、If the host machine has no dial switch (only JH(H1X)/JHM/JH2/JH2M series with dial switch): a switch button of M1293 is set on the touch screen (M1293 factory default is OFF, power-down non-holding type).

2、If the host is equipped with a dial switch, you can open the small square cover on the left side to find the dial switch. The USB switch state can be changed by adjusting the up and down position of the No. 2 gear dial switch. When the USB switch is pulled in the upward direction of "2", it is in USB flash mode, and

M1293 can be controlled to be OFF. When you select the "ON" position in the downward direction, it is in the computer mode (using a double-ended USB cable). then m1293 may be controlled to be on. Note: Since the M1293 is readable and writable, it can also be controlled by the touch screen at the same time.

When the dip switch is at position "2", the operation is under in function 1-U disk mode. (M1293:OFF)

When the dip switch is at the "ON" position, the operation is under function 2 computer mode. (M1293:ON)
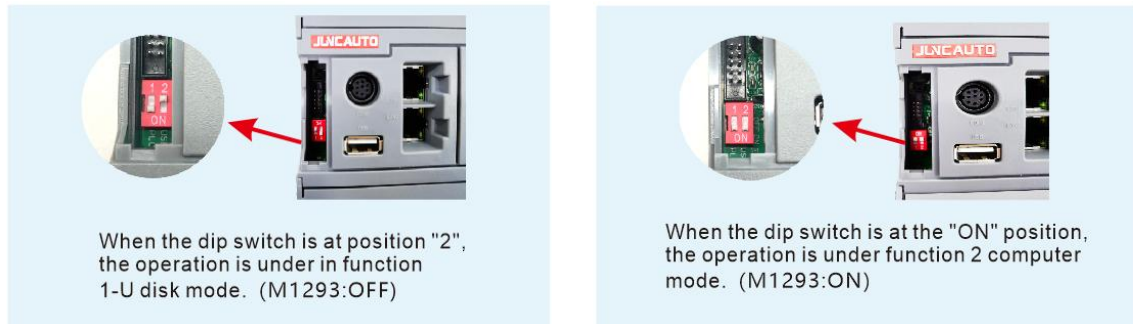
3、When M1293 is ON, it works in the computer mode. Connect both ends of the computer and PLC with double-ended USB cable. After the driver is installed successfully, a virtual serial port is automatically popped up in the computer equipment manager (only when M1293 is ON, the virtual serial port can be popped up). The virtual serial port can be directly used as a common serial port. The ordinary serial port needs to select the correct baud rate to be connected with the PLC. the virtual serial port, the baud rate is not important, Any selected baud rate can be connected to the PLC. As shown in the figure below:
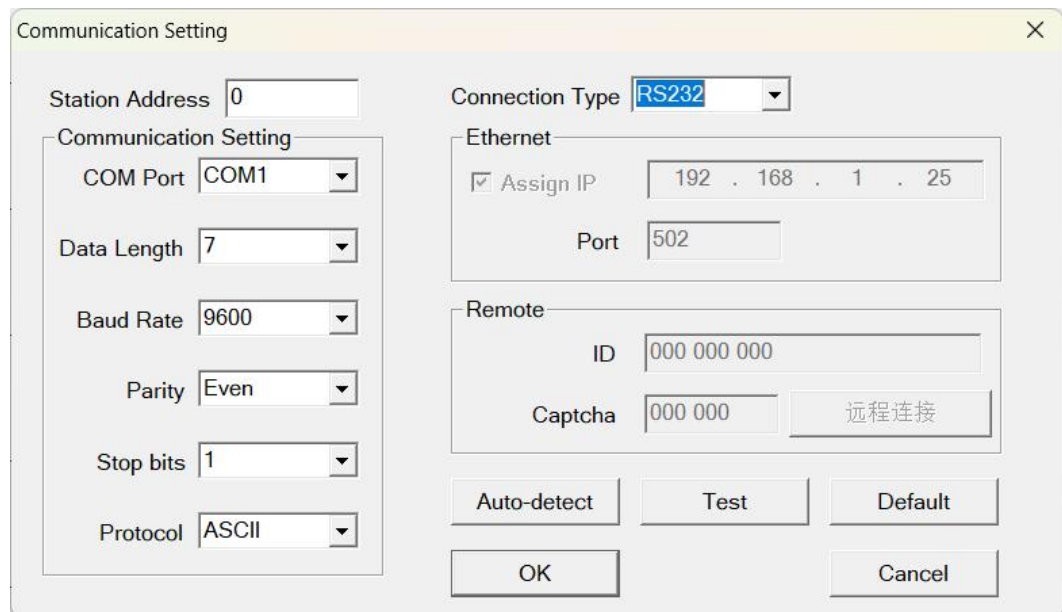
2.2 Notes for Communication Using Dual-Headed USB Cable

● When the PLC power is turned off, as the PC uses the double-ended USB cable to connect the PLC, it will also supply power to the CPU of the PLC. Therefore, the PLC is still running. When the PLC is powered on again, the USB cable may fail to communicate normally. Therefore, the specific operation must be followed: When the PLC is turned off, the USB cable on the computer or PLC end must be pulled out. The USB cable can only be plugged in when the POWER and RUN lights of PLC are turned on again.

● Recommended timing: PLC program upload/download, monitoring of the machine adjustment process.

- Timing is not strongly recommended:

   1. Long-time communication is required and communication disconnection is not allowed;

   2. The PLC is powered off, and the double-ended USB cable still supplies power to the PLC;

   3. During PLC online monitoring, the double-ended USB cable is forcibly pulled out;

- Communication disconnection processing mechanism: Remove the communication connector on either side and then plug it back, or set the status of M1293 to OFF and ON again, and then retry the communication.

- In addition to the first use of the USB communication of our products, the driver must be installed once. Sometimes the driver may be lost due to the upgrade of Windows operating system. Therefore, once the communication connector is reseated, it is still unable to communicate normally. Go to the Device Manager of the Windows operating system to see if the driver has failed. If it fails, reinstall it.

2.3 Download PLC program on USB flash disk

Method of downloading PLC program (PLC.UJC file) with USB flash disk:

When M1293 is OFF, it works in USB flash disk mode. You can use USB flash disk to download programs. M1293 factory default is OFF. Power-down non-holding type.

Operating steps: Tools: USB stick (attribute of FAT32)

1、   With programming software, the file format of PLC.UJC will be automatically generated under the root directory of the program storage path after compilation.

2、   The PLC.UJC file shall be directly copied to the USB flash disk. The name of the file name shall not be changed.

3、   Turn off the PLC and plug the USB disk into the USB interface of the PLC.

4、   Turn on the PLC again, and the program is updated successfully after 1S.

2.4 Instructions for using USB flash disk download program

- How to determine that the PLC program is updated successfully, it is recommended to make a version number in the program and display the address on the touch screen. For example, MOV K100 D100, MOV K101 D100 when the program is updated. Every time the program is updated, the value of D100 is changed.

- U disk download failure handling mechanism: Try to format the U disk and download the PLC program again.

2.5 USB flash disk updates PLC bottom firmware

How to update the underlying firmware (.UPD file) with the USB flash disk:

Operating steps: Tools: USB stick (attribute of FAT32)

1. Copy the upgraded file to the USB flash disk.

2. Power off PLC

3. Insert the USB flash disk.

4. Turn on the PLC

5. After the RUN lamp and ERROR lamp flash for 2-3 s alternately, the RUN light is normally on and stops flashing, then the upgrade is completed and the USB flash disk is pulled out.

2.6 Notes on Using USB Disk to Update Bottom Firmware

- How to determine whether the bottom layer is successfully updated: The upgraded file is marked with a version number. After successful upgrade, you can check whether the value of D1133 is consistent with the firmware version. If it is consistent, the update is successful. For example, the firmware is JE-1616T-E v2.59 software. After successful update, the value of D1133 is K259

- The firmware of different models cannot be used in common. For example, it is prohibited to refresh the 40-point firmware to the 60-point PLC. Otherwise, the normal operation will be affected.

3. Ethernet communication

3.1 Parameter configuration

The default factory IP address of PLC controller is 192.168.1.25 (Note: the address can be modified). If the IP address of PLC is modified, the PLC shall be restarted to continue the communication. Before connecting the PC to the PLC controller, set the IP address of the PC. The IP address of the controller can be set arbitrarily. Users can set different IP addresses for the controller according to their own needs. In this example, the IP address is 192.168.1.25. The IP set by the PC is the same as the first 3 fields of the PLC controller, and the 4th field is different. As shown in the figure below, it is sufficient to set the IP setting of the PC to 192.168.1.20.

The peripheral that is pre-linked to the controller must be in the same network segment as the controller (that is, the first three segments are the same) and the IP address cannot be duplicated, otherwise the link will fail.
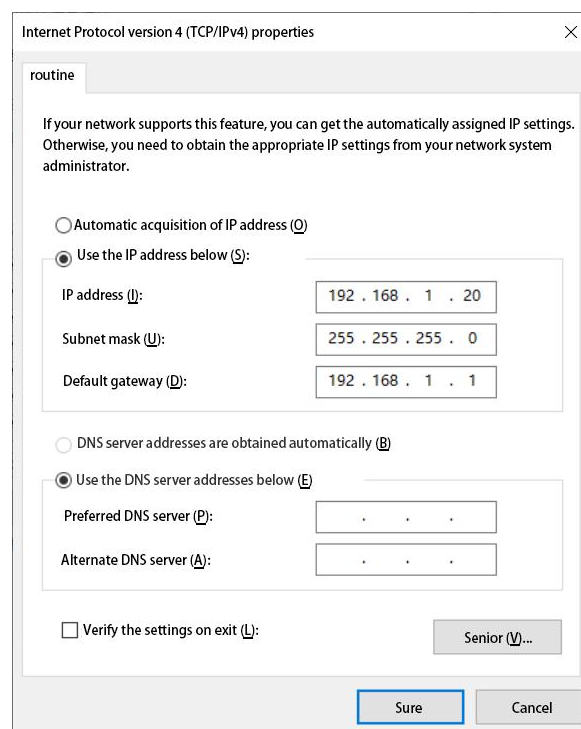
3.2 Definition of IP address and communication setting

1）Communication IP setting: two D components will be occupied consecutively, D1212 and D1213 respectively.

2）IP definition: IP3.IP2.IP1.IP0 is 192.168.1.25

K192 hex is HC0

K168 hex is HA8

K1 hex is H1

K25 hexadecimal is H19

then D1212=HA8C0, D1213=H1901

D1212		D1213	
High	Low	High	Low
IP1	IP0	IP3	IP2
192 (HC0)	168 (HA8)	1(H1)	25(H19)
HA8C0		H1901	

3) Subnet mask and gateway. In the above figure, the subnet mask is 255.255.255.0 (factory default), and the gateway is 192.168.1.1 factory default).

Subnet Mask Address:

D1220		D1221	
High	Low	High	Low
MASK1	MASK0	MASK3	MASK2
255 (HFF)	255 (HFF)	255 (HFF)	0(H0)
HFFFF		HFF	

Gateway Address:

D1222		D1223	
High	Low	High	Low
Gateway1	gateway0	Gateway3	Gateway2
192 (HC0)	168 (HA8)	1(H1)	1(H1)
HA8C0		H0101	

4）Select communication port: device port number (factory 502, unchangeable), address is D1211.

Method 1: Set ladder diagram. The procedure is as follows:
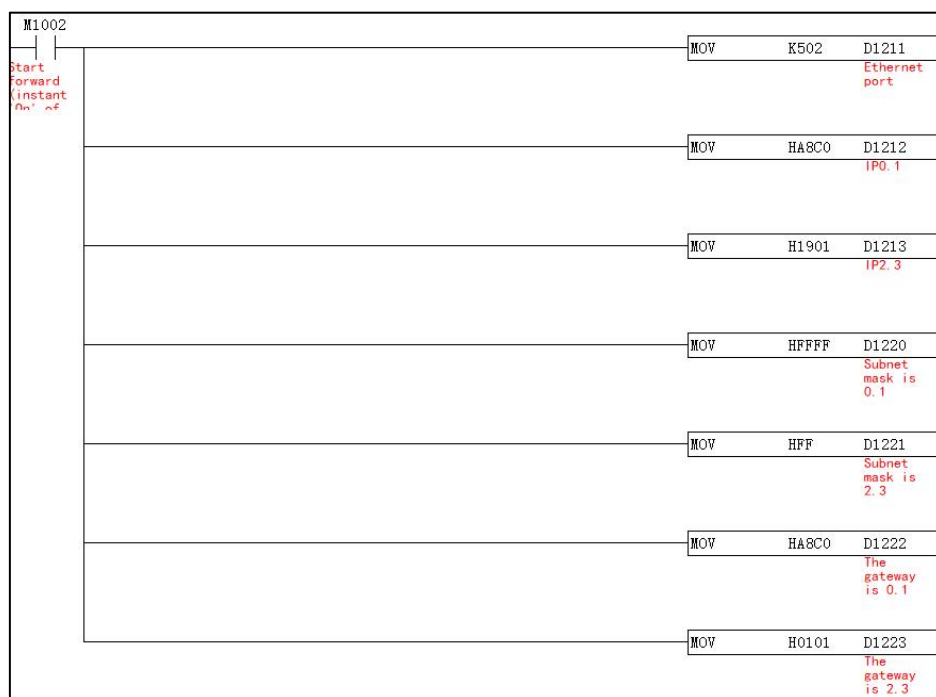
Method 2: Change the column of "Project Management → "Configuration" of the programming software:

As shown in the figure, double-click "Ethernet" to pop up the "Ethernet Settings" dialog box, tick "√" in the box of "Enable setting", select the required communication configuration in the drop-down box, and click "OK" after setting.
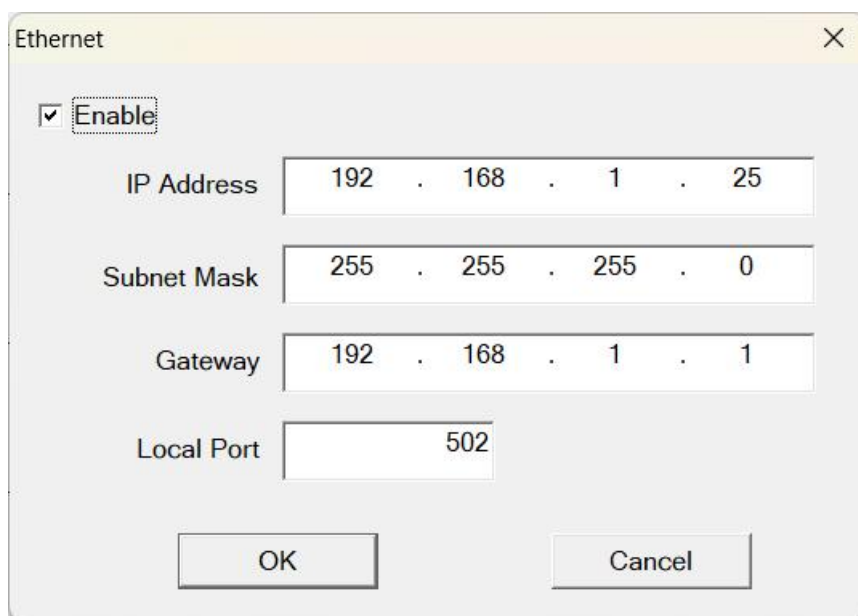
5) As shown in the figure, after compilation, click Download. The download dialog box pops up, and click OK. Continue to the next step, click Compile, click Yes.
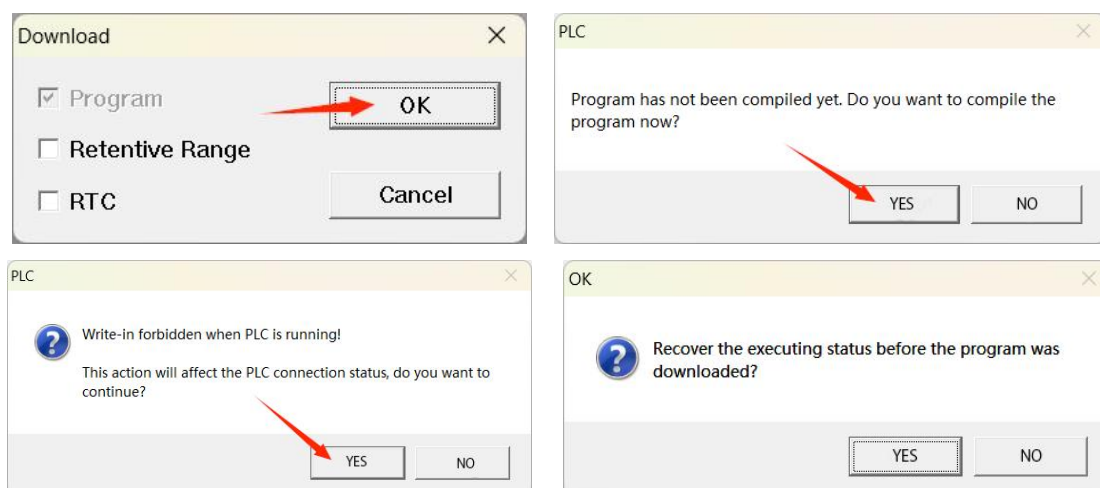
5）After the program is downloaded, communication timeout error will be prompted. Click "PLC" menu bar → "communication setting", select the set communication format, and click "communication test", the communication is successful.
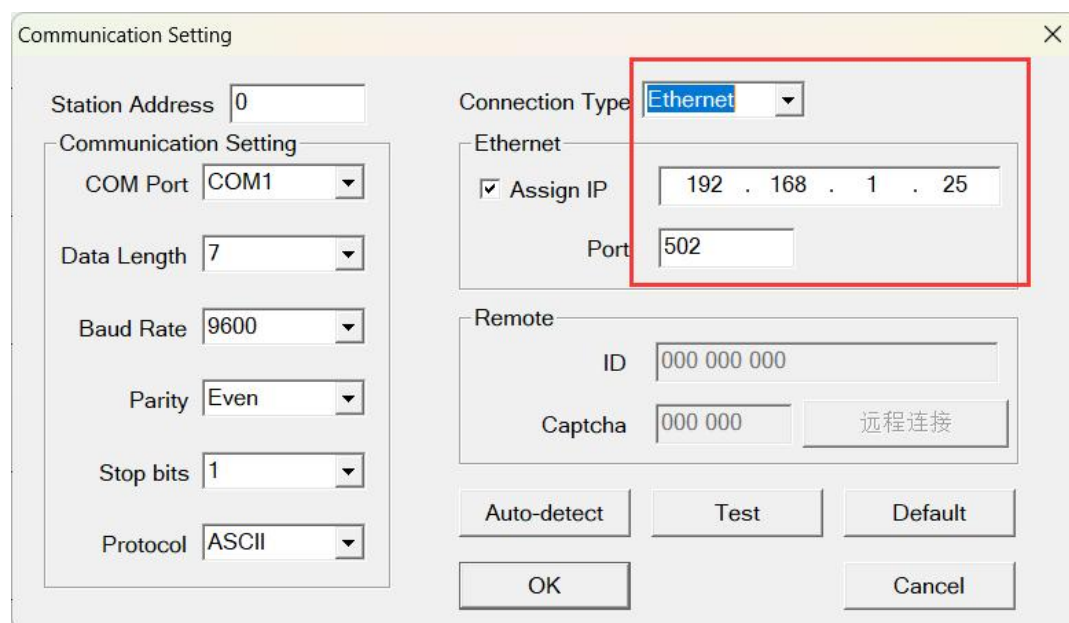
3.3 PING command

With the PING command, you can check whether the local TCP/IP protocol is normal and that you can connect to other computers in the LAN. If your PC has a Win7 operating system, follow these steps:

1、Click "Start" - "Run" and enter "cmd" in the input box: click OK to pop up the command window.
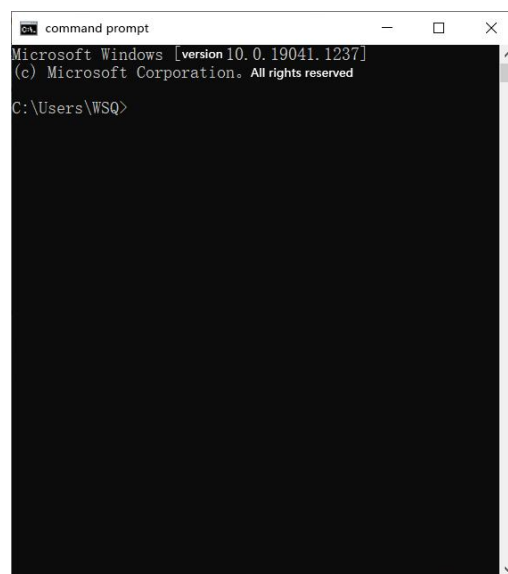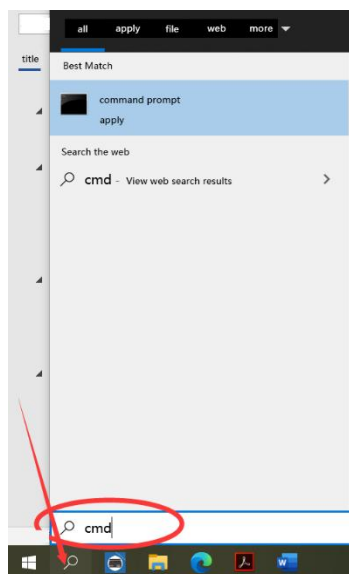
2、Enter the command "ping 192.168.1.25" to check whether the local TCP/IP protocol is normal. If the sending and receiving data are the same, it is normal, as shown in the following figure:
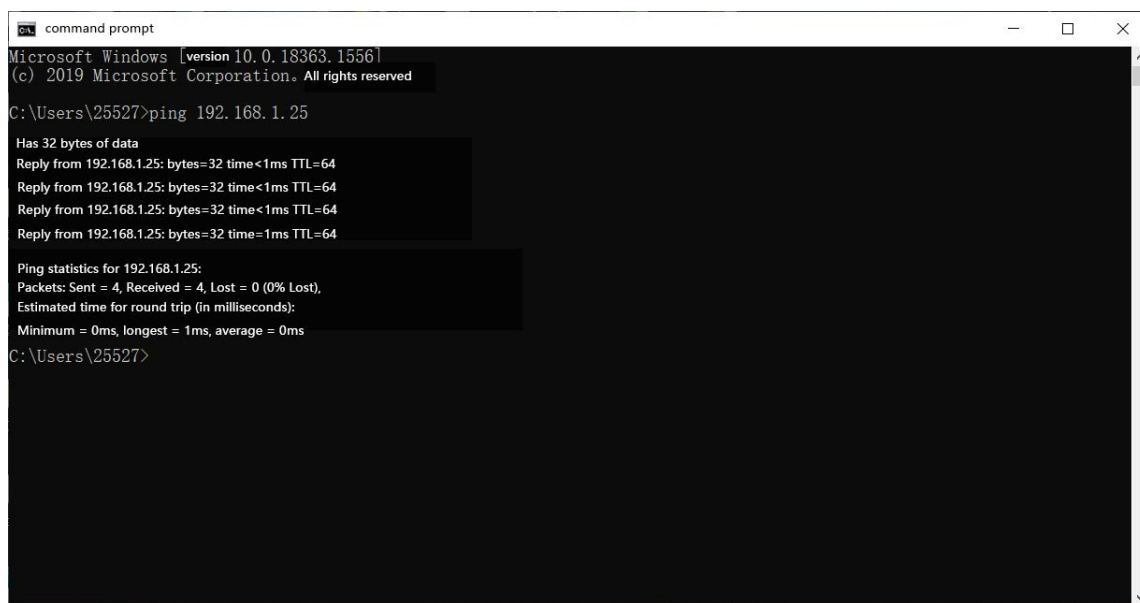
3.4 Ethernet Socket Communication Function Commands

The Socket communication function commands are shown below.

command	Content
SP.SOCOPEN	Establish a connection
SP.SOCCLOSE	cut off the connection
SP.SOCSND	data transmission
SP.SOCRCV	data reception

➢ **Establish a connection**

JC		SP.SOCOPEN	S1 S2 M	Establish a connection
506				

bit arrangement		word device													16-bit instruction
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	SP.SOCOPEN TRIGGERED
S1													*			EXEC
S2													*			32-bit instruction
M			*													None
See the following description.																

Instruction: SP.SOCOPEN(S1) (S2) (M)

Content, Scope, Data Type:

operand	Content	Scope	Data Type	soft component
(S1)	Connection No.	1-8	Unsigned BIN16 bit	Constant: K
(S2)	Software component start number for storing control data	Please refer to the following to describe the control data range	Word	D
(M)	At the end of the command, 1 soft component start number with scan ON	---	bit	M

Control Data

soft component	Project	Content	Setting Range	Set Side
(S2)+0	Executed/Ended	Specifies whether to use the parameter setting value set by the engineering tool or the setting value of the control data (S2)+2~S2)+9 when the connection is opened	0000H 8000H	User
(S2)+1	End Status	Status when storage is complete 0000H: normal end	---	System
(S2)+2	Usage Settings Area	<table><tr><td>b9</td><td>b8</td><td>b7~b0</td><td></td></tr><tr><td>[2]</td><td>[1]</td><td>0</td><td></td></tr><tr><td>b15</td><td>b14</td><td>b13~b11</td><td>b10</td></tr><tr><td>[4]</td><td></td><td>0</td><td>[3]</td></tr></table>[1] Communication mode (protocol) 　0: TCP/IP [2] Means of communication 　1: Fixed [3] Means of communication 　0: Fixed	---	User

		[4] Opening mode
		  00: Active Open
		  10: Unpassive open (IP address of object device, port number of object device will be ignored)
		  11: Fullpassive Open		

(S2)+3	Port No. of this station	Specify the port number of this station	1~1023	User
(S2)+4-(S2)+5	Opposite Device IP Address	Specify the IP Address of the Opposite Device	00000001H-DFFFFFEH	User
(S2)+6	Opposite Device Port Number	Specifies the port number of the other device	1~65535 (0001H~FFFFH)	User
(S2)+7~(S2)+9	---	Prohibited use	---	System

Procedure Example:
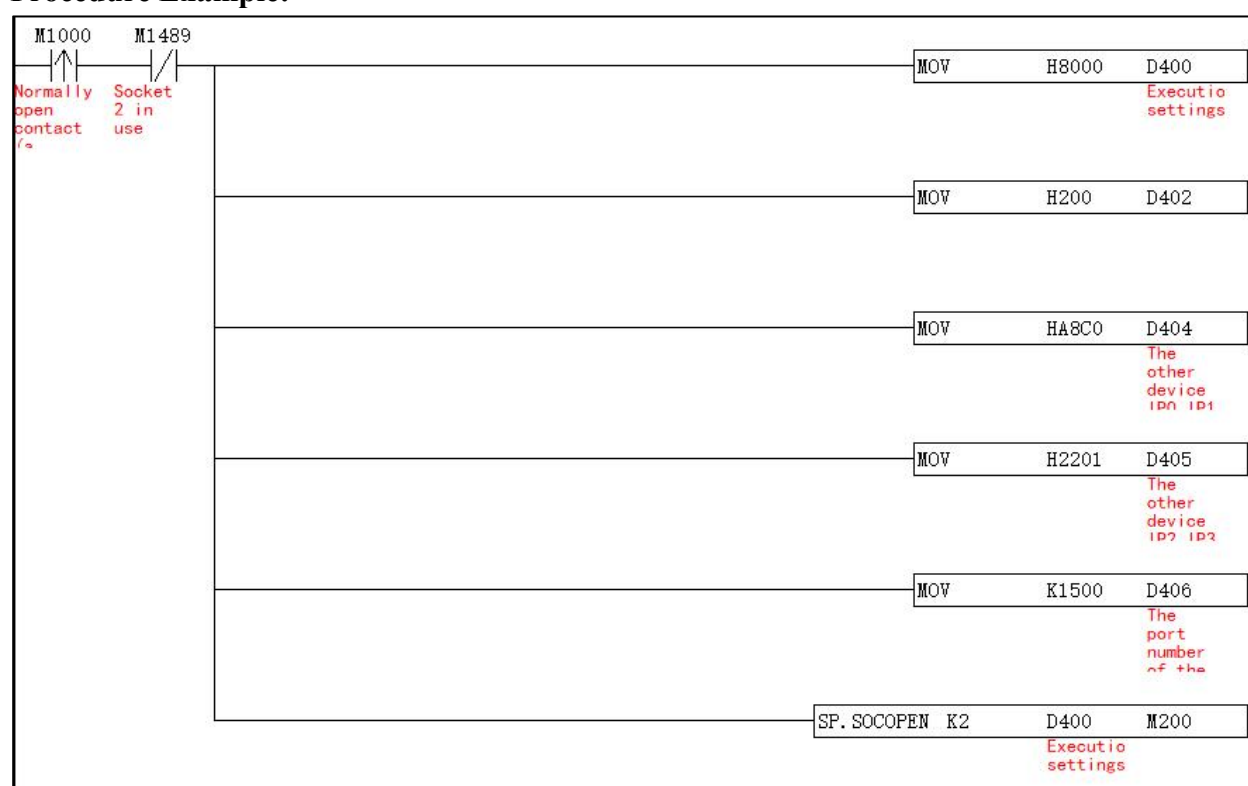
➢ **Connection cut-off**

JC				Connection cut-off
507		**SP.SOCCLOSE**	S1 S2 M	**Connection cut-off**
	bit arrangement		word device	16-bit instruction

	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	SP.SOCCLOSE Triggered Execution
S1													*			32-bit instruction
S2													*			None
M			*													

See the following description.

Instructions: SP.SOCCLOSE (S1) (S2) (M)

Content, Scope, Data Type:

operand	Content	Scope	Data Type	soft component
(S1)	Connection No.	1-8	Unsigned BIN16 bit	Constant: K
(S2)	Software component start number for storing control data	Please refer to the following to describe the control data range	Word	D
(M)	At the end of the command, 1 soft component start number with scan ON	---	bit	M

Control Data

soft component	Project	Content	Setting Range	Set Side
(S2)+0	System Area	Specifies whether to use the parameter setting value set by the engineering tool or the setting value of the control data (S2)+2~S2)+9 when the connection is opened	0000H 8000H	User
(S2)+1	End Status	Status when storage is complete 0000H: normal end	---	System

Procedure Example:
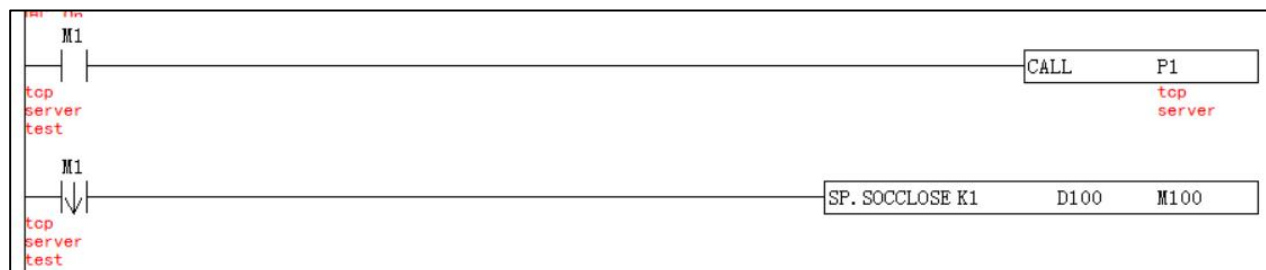
➢ **data transmission**

JC		SP.SOCSND				S1 S2 S3 M									data transmission
508		bit arrangement					word device								
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	16-bit instruction
S1													*			SP.SOCNSD
S2													*			Triggered/Continuous Exec
S3													*			32-bit instruction
M			*													None
See the following description.																

Instruction: SP.SOCSND(S1) (S2) (S3)(M)

Content, Scope, Data Type

operand	Content	Scope	Data Type	soft component
(S1)	Connection No.	1-8	Unsigned BIN16 bit	Constant: K
(S2)	Specifies the soft component start number of the control data	Please refer to Control Data Range on the next page	Word	D
(S3)	Store the soft component start number of the transmitted data	---	Word	D
(M)	At the end of the command, 1 soft component start number with scan ON	---	bit	M

Control Data

soft component	Project	Content	Setting Range	Set Side
(S2)+0	System Area	---	---	---
(S2)+1	End Status	Status when storage is complete 0000H: normal end Beyond 0000H: abnormal end	---	System
(S3)+0	Long send data	Specifies the length of the data to be sent. (Bytes)	1~2046	User
(S3)+1~(S3)+n	Send Data	Specify to send data	---	User

Note: For TCP, control the length of the transmitted data below the maximum window size of the opposite device (the TCP receive buffer). Data that exceeds the maximum window size of the other device cannot be sent.

sample program
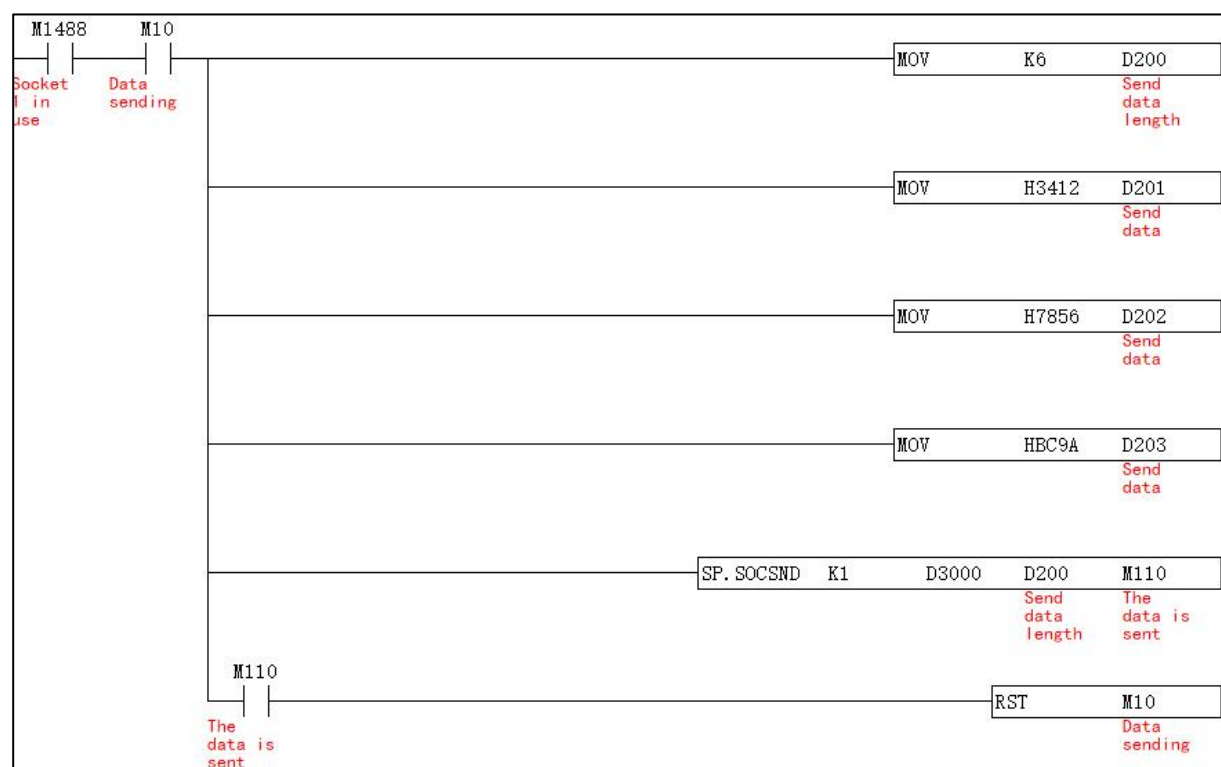
> ➤ **data reception**

JC		SP.SOCRCV			S1 S2 S3 M										data reception		
510	bit arrangement				word device												
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	16-bit instruction	
S1													*			SP.SOCRCV	
S2													*			Triggered/Continuous Exec	
S3													*			32-bit instruction	
M			*													None	
See the following description.																	

Instruction: SP.SOCRCV(S1) (S2) (D1)(M)

Content, Scope, Data Type

operand	Content	Scope	Data Type	soft component
(S1)	Connection No.	1-8	Unsigned BIN16 bit	Constant: K
(S2)	Specifies the soft component start number of the control data	Please refer to Control Data Range on the next page	Word	D
(D1)	Store the soft component start number of the received data	---	Word	D
(M)	At the end of the command, 1 soft component start number with scan ON	---	bit	M

Control Data

soft component	Project	Content	Setting Range	Set Side
(S2)+0	System Area	---	---	---
(S2)+1	End Status	Status when storage is complete 0000H: normal end Beyond 0000H: abnormal end	---	System
(D1)+0	Received data length	Stores the data length of the data read from the Socket communication reception data area. (Bytes)	0~2046	System
(D1)+1~(D1)+n	Receive Data	successively stores the data read from the Socket communication receiving data area	---	System

Note:

1. When the SP.SOCRCV command is executed, the received data will be read from the Socket communication received data area during END processing. Therefore, the scan time will be extended when the SP.SOCRCV command is executed.

2. In the case of odd-syllable data being received, invalid data will be placed in the high-order byte of the software element storing the last received data.

sample program
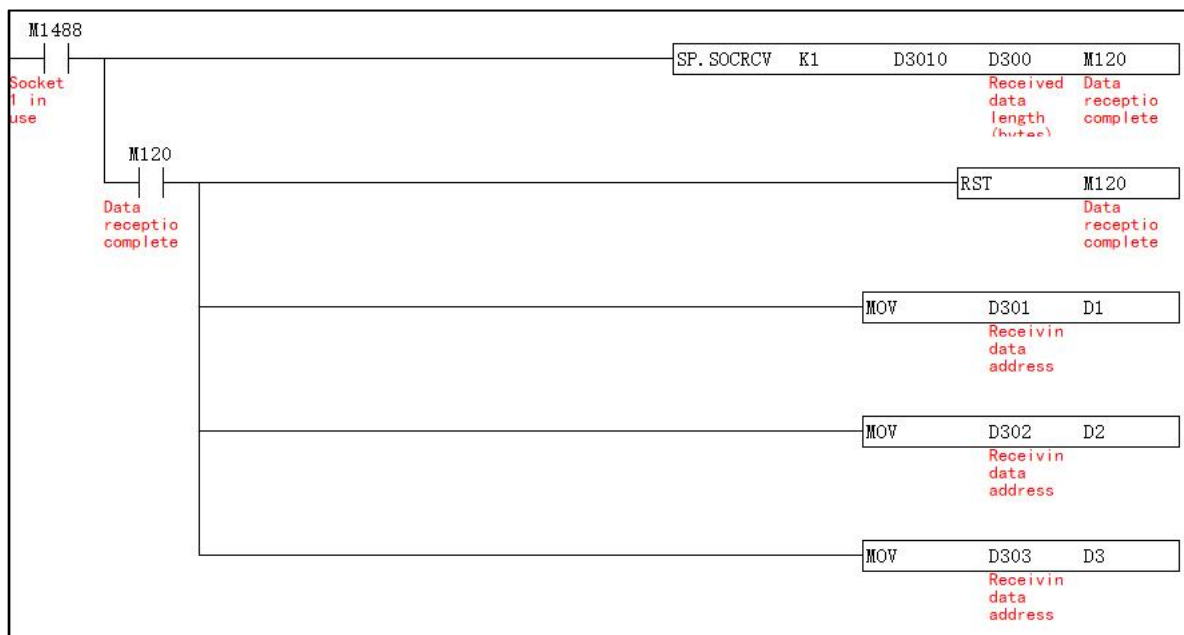
3.5 Ethernet Communication Cases

The Ethernet Communication Sample Procedure can be downloaded from https://tetranca.com/ on our website.

5.5.1 The PLC controller works at the client.

if the opposite device port number is 1500 and the IP address is 192.168.1.34

● 1: establishing a connection
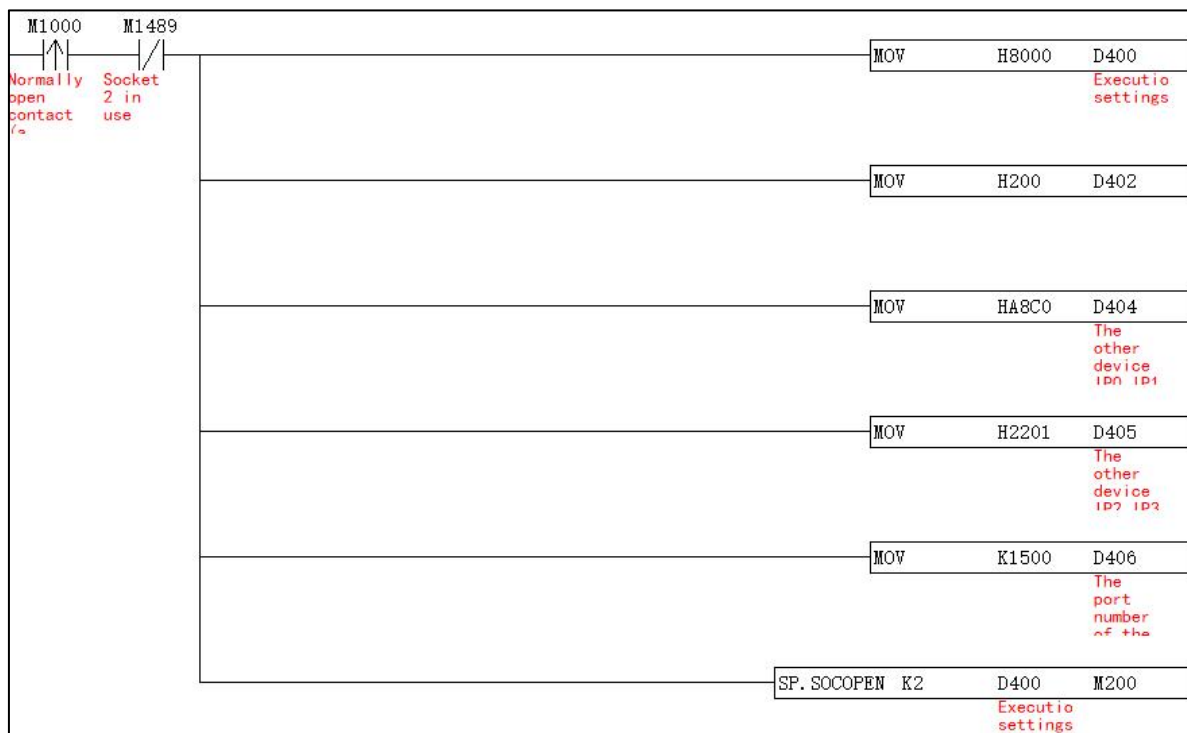
● 2: PLC sends data
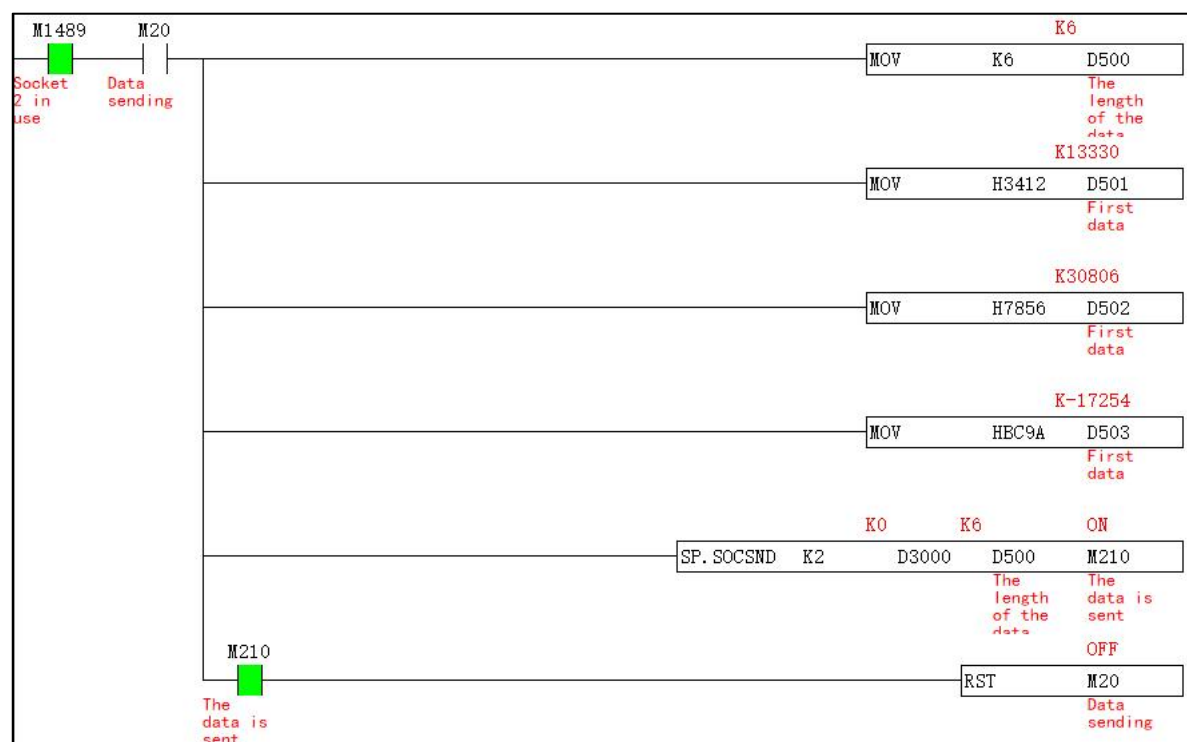
1）Set M20 to ON from OFF. The data sent from D501 to D503 are 1234 56 78 9A BC respectively. The serial port debugging assistant monitors that the data is successfully received.

2）After the data is sent successfully, the M210 system will automatically set it to ON and keep it. At the same time, the program will output M20 to OFF. If the data transmission fails, the M210 cannot be automatically ON. If M20 is manually set to ON again, the M210 system will be turned off automatically when the sending command is executed successfully, until the data is sent successfully, and M210 will be ON again.

3）Since the data length D500 is set to K6, the transmission data address occupies D501 to D503. If the data length is set to K8, the data address occupies D501~D504, and so on.

- 3: PLC receives data
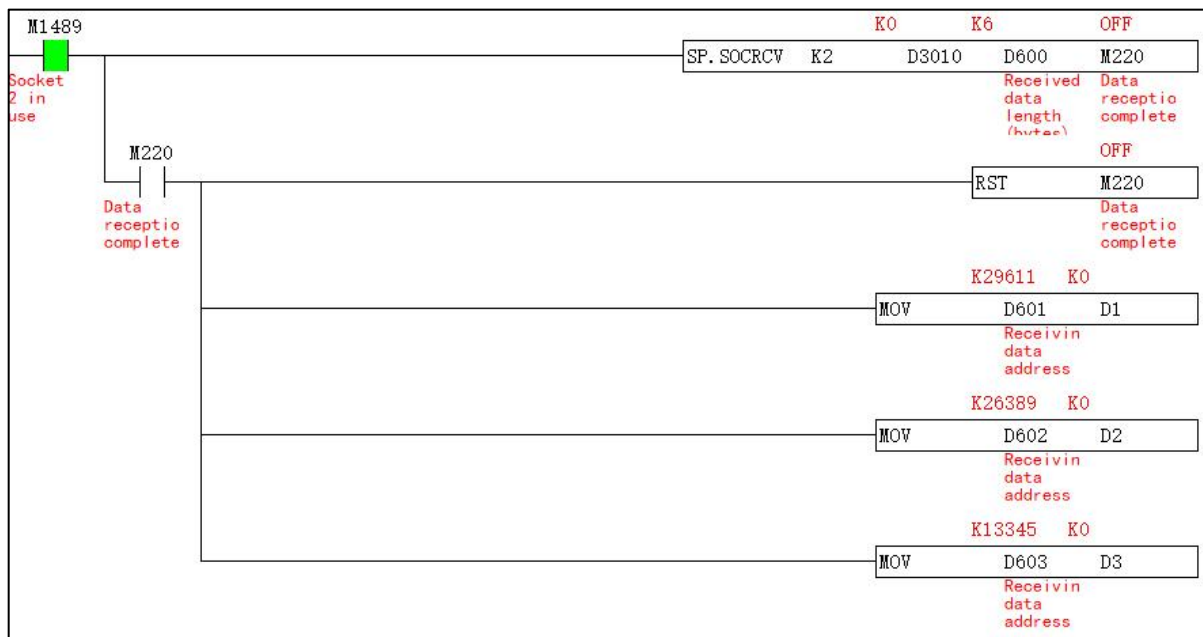
Device Name	Comment	Status	T/C Set Value	Present Value(16bit)
D601				H73ab
D602				H6715
D603				H3421

1）Serial port debugging assistant sends data and PLC end receives data successfully. At this time, M220 system turns ON once and then OFF. It can be observed that the data of D601~D603 are AB 73 15 67 21 34.

2）Since the data length D600 is set to K6, the received data address occupies D601 to D603. If the data length is set to K8, the data address occupies D601~D604, and so on.

- 4: Disconnected
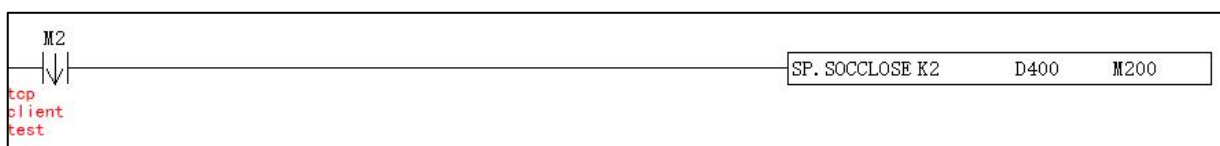
1）When executing the SP.SOCCLOSE command, the conditions preceding SP.SOCOREN, SP.SOCSND,

SP.SOCCV are disconnected.

2）The (S1), (S2), and (M) operand address of the SP.SOCCLOSE instruction must match the operand address of SP.SOCOPEN.

5.5.2 The PLC controller works on the server side.

If the PLC port number is 1024 and the IP address is 192.168.1.25

● 1: establishing a connection
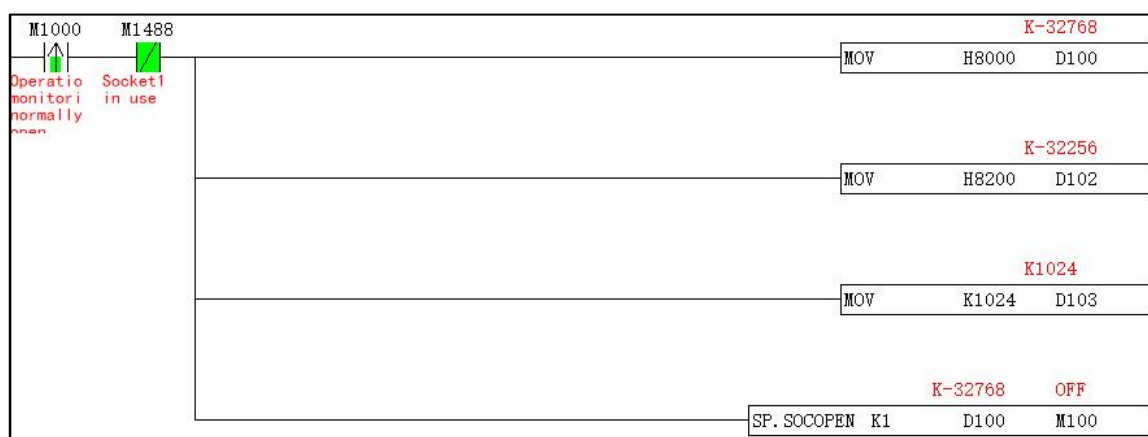
● 2: PLC sends data
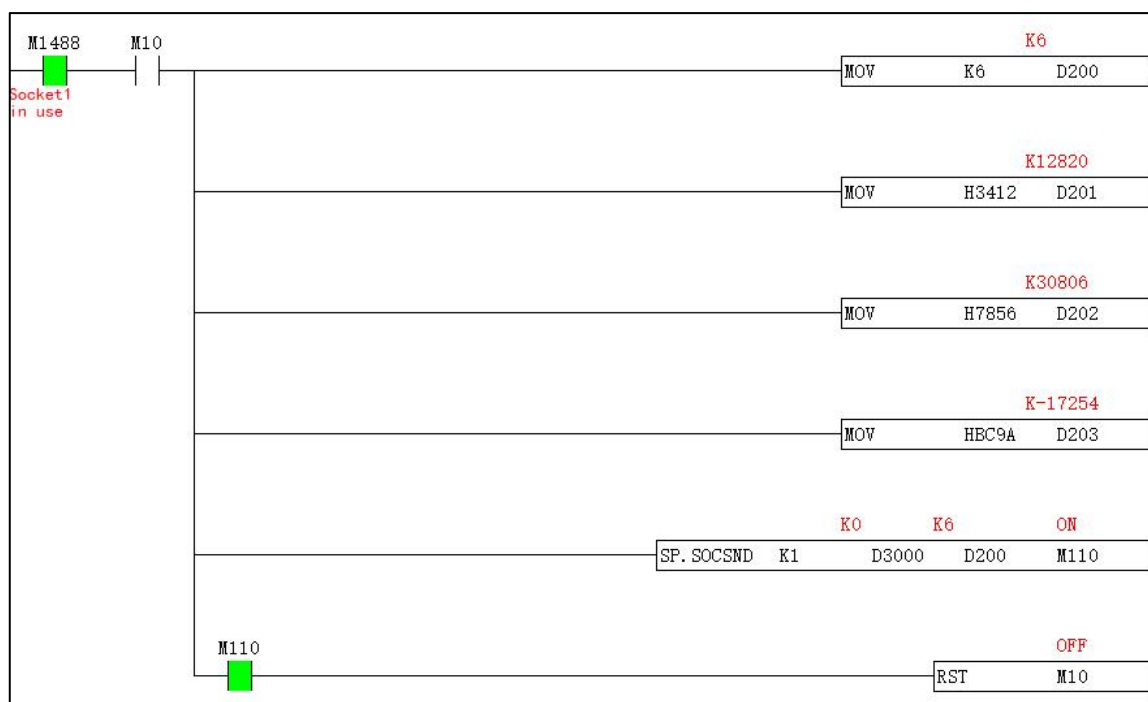
1）Set M10 to ON from OFF. The data sent from D201 to D203 are 1234 56 78 9A BC respectively. The serial port debugging assistant monitors that the data is successfully received.

2）After the data is sent successfully, the M110 system will automatically set to ON and keep it, and the program will output M10 to OFF. If M10 is manually set to ON again, the M110 system will be automatically OFF when the sending command is successfully executed until the data is successfully sent, and then M110 will be ON again.

3）Since the data length D200 is set to K6, the transmission data address occupies D201 to D203. If the data length is set to K8, the data address occupies D201~D204, and so on.

● 3: PLC receives data

Device Name	Comment	Status	T/C Set Value	Present Value(16bit)
D301				H3412
D302				H7856
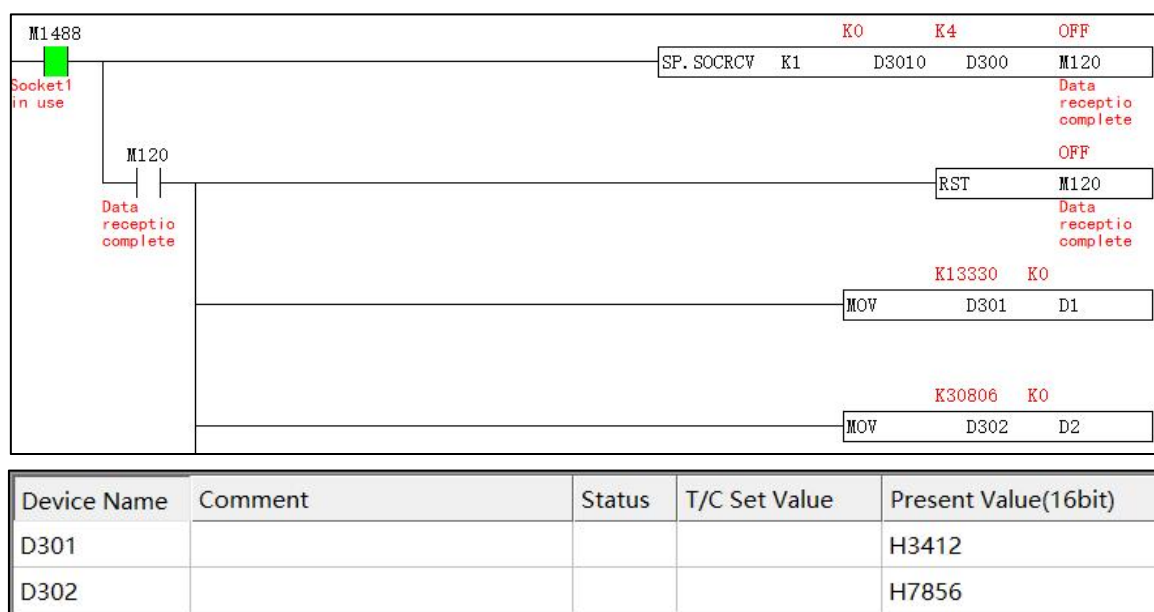
3）Serial port debugging assistant sends data. PLC end receives data successfully. At this time, M120 system turns ON once and then OFF. It can be observed that the data of D301~D302 are 12 34 56 78.

4）Since the data length D300 is set to K4, the received data address occupies D301 to D302. If the data length is set to K6, the data address occupies D301~D303, and so on.

● 4: Disconnected
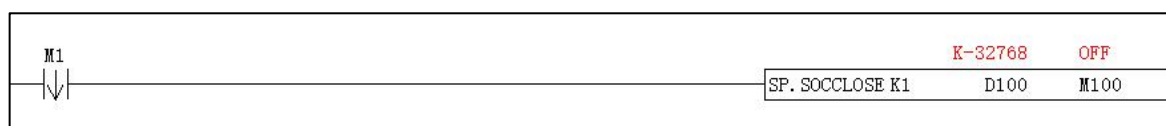
1）When executing the SP.SOCCLOSE command, the conditions preceding SP.SOCOREN, SP.SOCSND, SP.SOCCV are disconnected.

2）The (S1), (S2), and (M) operand address of the SP.SOCCLOSE instruction must match the operand address of SP.SOCOPEN.

4. high-speed online communication

4.1 485 high-speed online

Description:

1) Only RS485 communication ports between PLCs are supported for online data sharing.

2) Only D registers can be shared. If it is necessary to share the states of other components such as M and Y, they can be shared by programming MOV K4Y0 D0.

The application example is as follows: the high-speed online function is realized between four PLCs through RS485:
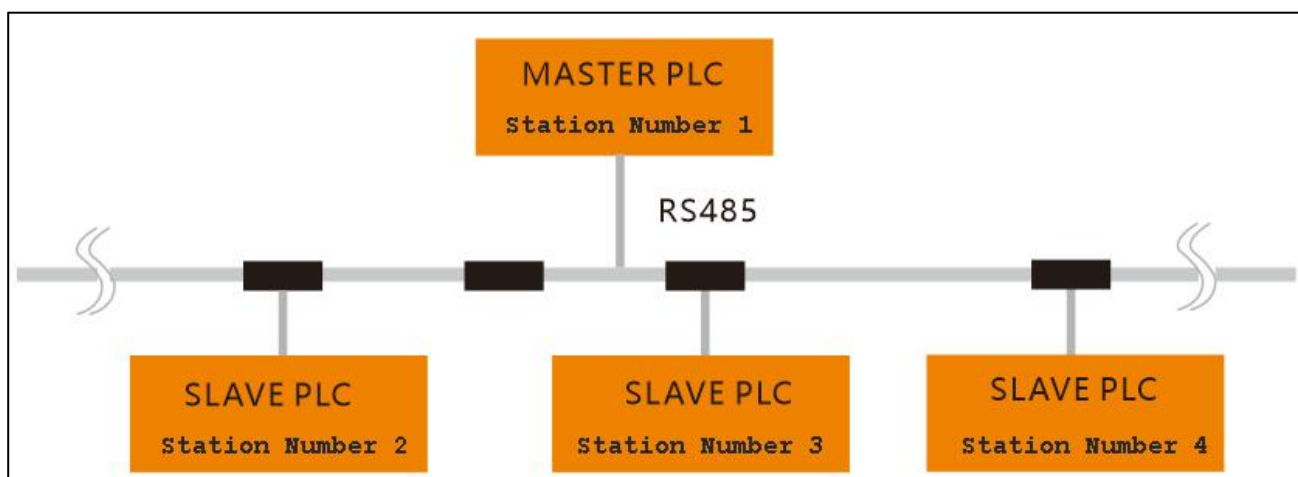
Start the high-speed on-line function, so that the master station (MASTER PLC) and 3 slave stations (SLAVE PLC) can share the data at high speed through the high-speed CLINK mode. That is, no matter which station controls the data sharing area changes, the other stations also need to update synchronously.

[PLC necessary parameter setting]

master-slave station	Station No.	Communication port	communication format	Flag bit enable
MASTER PLC	D1121(K1)	COM2 (RS485)	Baud rate (9600~115200) adjustable, custom, address D1020. The RS485 communication settings of the master and slave stations shall be consistent. The higher the baud rate, the faster the data online rate	M1198 High Speed Online Enable Flag Position 1
SLAVE PLC	D1121(K2)	COM2 (RS485)		
SLAVE PLC	D1121(K3)	COM2 (RS485)		
SLAVE PLC	D1121(K4)	COM2 (RS485)		
For the setting of the communication parameters, please refer to the column of communication→1.4				

Examples are as follows:

1. Configure the communication setting parameters of 4 PLCs and enable the high-speed online flag bit.
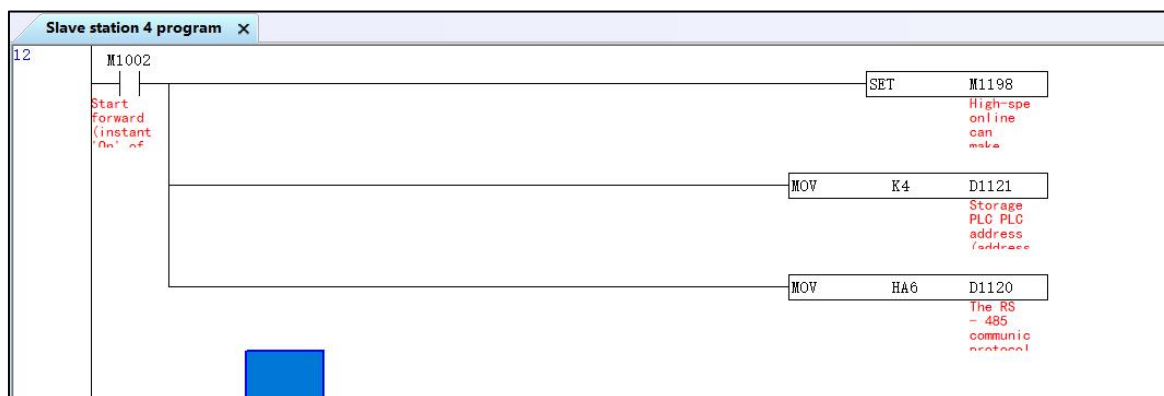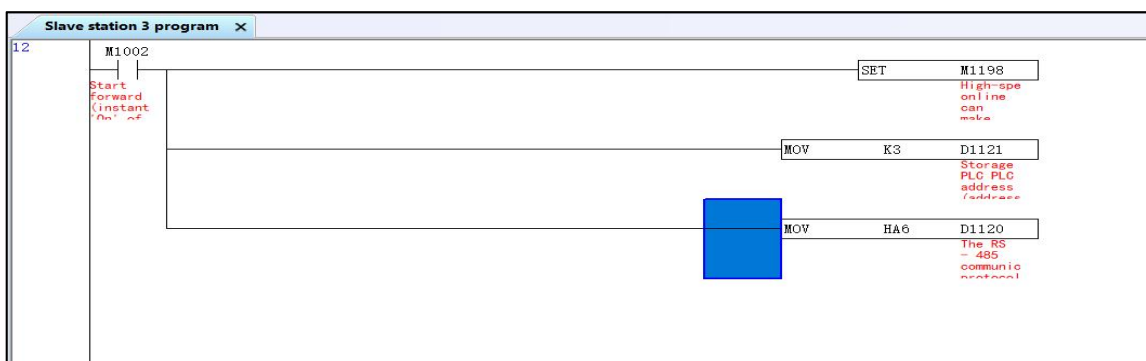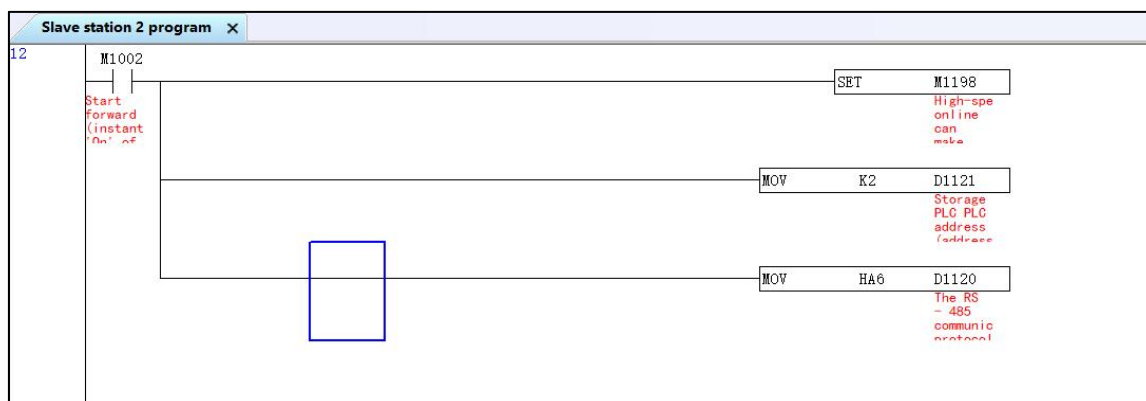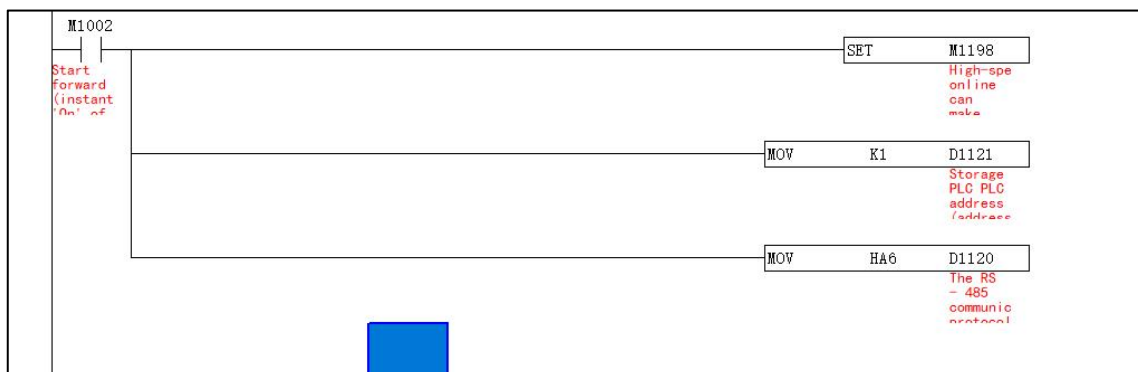
2. The master station is configured with a high-speed on-line meter (the slave station does not need to establish a high-speed on-line meter).

Select the "PLC(P)" function from the function bar and click "High-speed on-line meter (H)" to pop up the dialog box as shown in the following figure. Click Add and select the data D register and data length to be shared for the corresponding station number. The following figure shows that D0~D9 of master station 1, D10~D19 of slave station 2, D20~D29 of slave station 3 and D30~D39 of slave station 4 are shared with other stations.
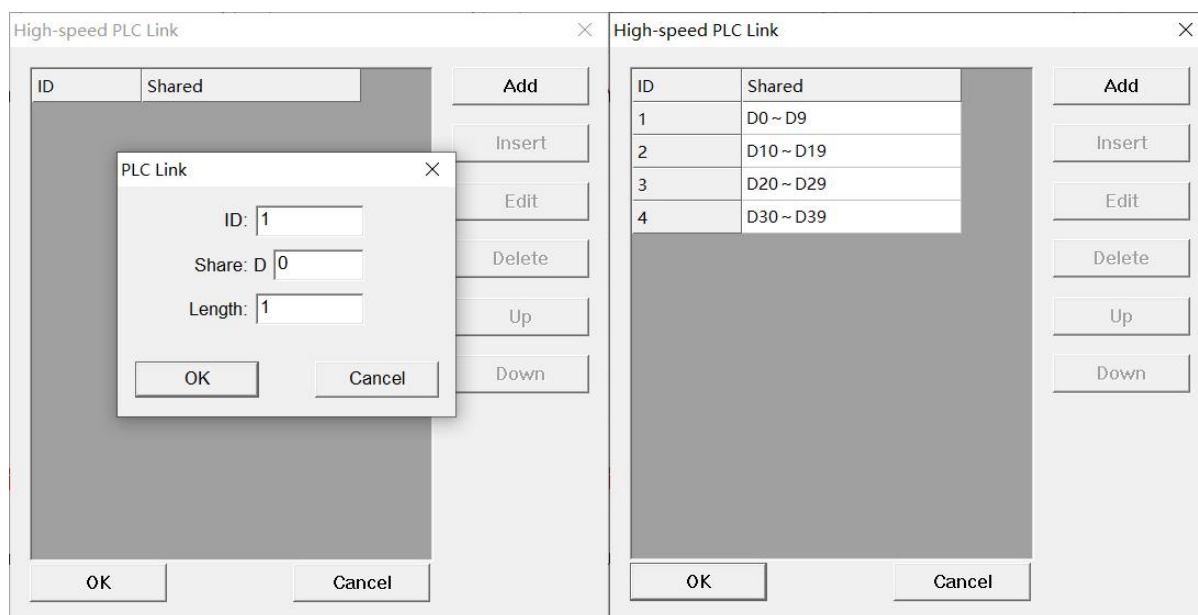
3. After the high-speed on-line meter is established, it needs to be recompiled. After downloading the program to the master station PLC successfully, the high-speed on-line function is effective.

4.2 Ethernet high-speed connection

illustrate:

1) Only the Ethernet communication ports between Tianchuan Zhongcheng PLCs are supported for online connection and data sharing.
2) Ethernet can work as master and slave at the same time.

The application case is as follows, three PLCs realize high-speed connection function through Ethernet:
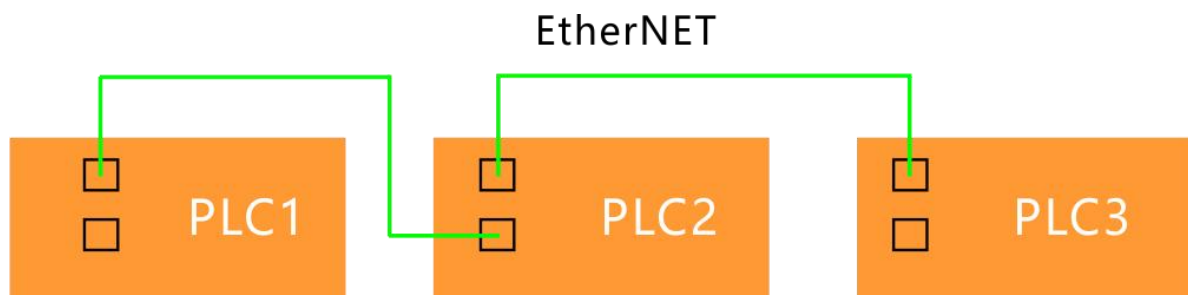
Activate the high-speed connection function to continuously enable 3 PLCs to realize high-speed data sharing between stations through high-speed CLINK. That is: no matter which PLC controls the data in the data sharing area changes, other stations also need to be updated synchronously.

[PLC necessary parameter settings]

Flag bit	illustrate
M1188	The Ethernet high-speed connection function is enabled, and the polling period is fixed at 5ms.

Steps:

Special note: The operation method of Ethernet high-speed connection is somewhat different from that of 485 high-speed connection:

1. 485 high-speed connection is divided into master-slave communication, so the shared data of the master-slave PLC is unified to establish a high-speed connection table in the master PLC program.

2. Ethernet high-speed connection does not distinguish between master and slave, so PLCs that need to share data can just create a high-speed connection table in their respective PLC programs. At the same time, the IP address of each PLC is different.

details as follows:

1. Configure the Ethernet IP communication setting parameters of the three PLCs and enable the high-speed connection flag M1988.

In the example, the IP addresses of the three PLCs are 192.16.1.25, 192.168.1.26, and 192.168.1.27. The user can set them according to the actual situation.

2. In the menu bar, double-click the "Ethernet" configuration function
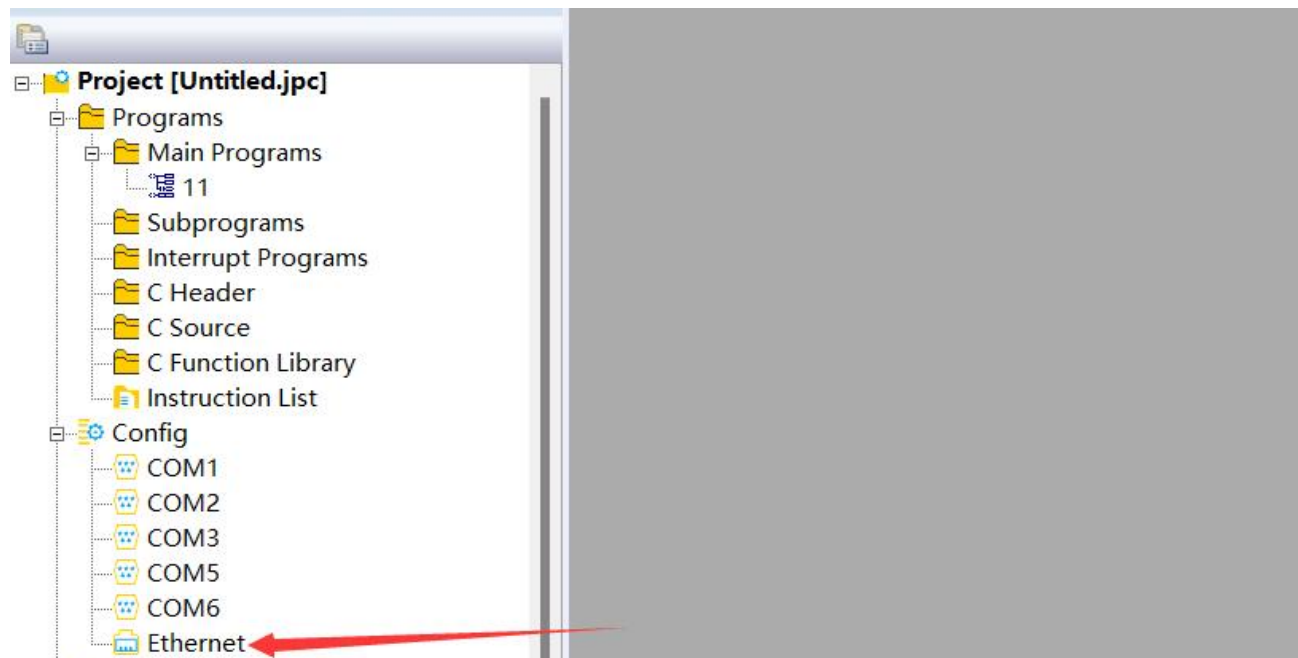
3. The Ethernet settings dialog box pops up.
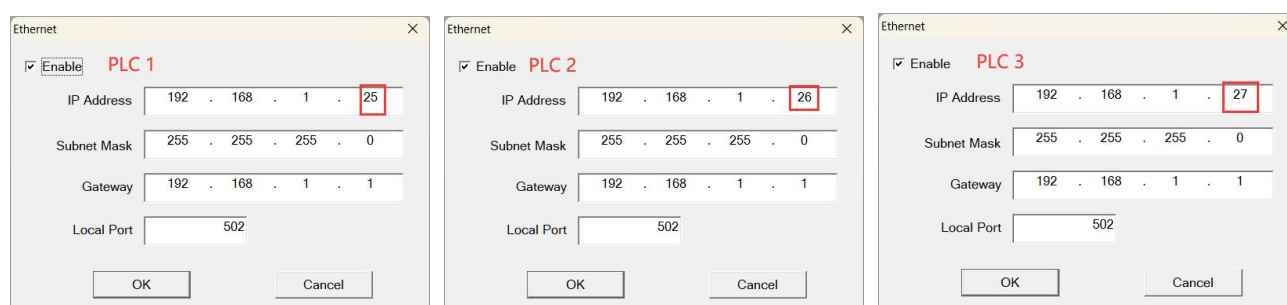
4、编写指令，将 3 台 PLC 的以太网高速联机功能标志位 M1988 置 ON。
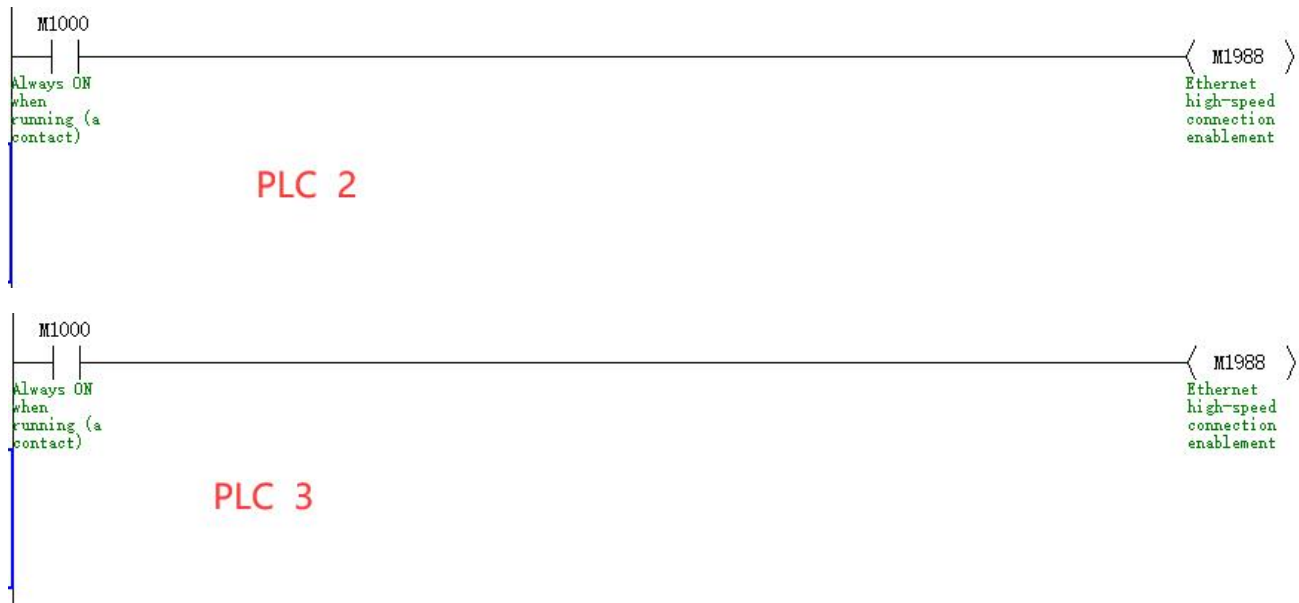
PLC 2

PLC 3

5. Recommended high-speed connection table

For example: share the data D0~D10 of PLC 1 with other PLCs, share the data D20~D30 of PLC2 with other

PLCs, and share the data D40~D50 of PLC3 with other PLCs.

Note: After D0~D10 in PLC 1 is shared, D0~D10 in the PLC of other stations will display the data of PLC 1

D0~D10, and the data of other stations are the same.

PLC	Shared data address
PLC 1	D0~D10
PLC 2	D20~D30
PLC 3	D40~D50
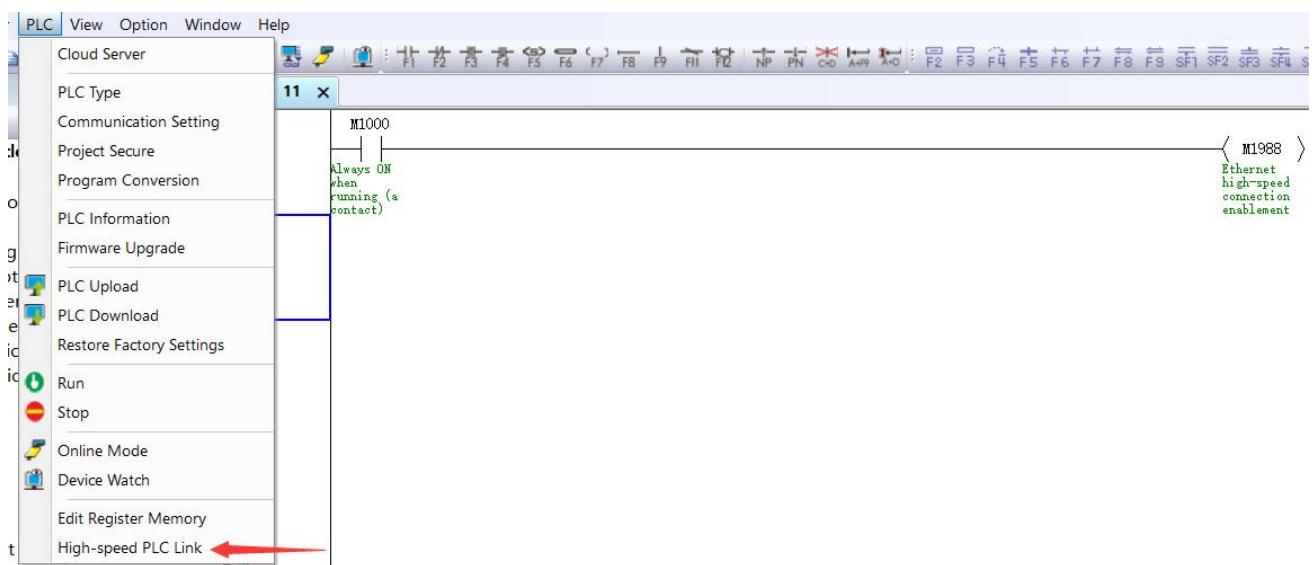
The high-speed connection table is as follows:

Note: The station number in the high-speed connection table maps to the address of D1121, so the station number set in the high-speed connection table only needs to match the current value of D1121 (the factory value of D1121 is 1). Ethernet high-speed is executed between each PLC. During online communication, since the PLC is identified by IP address, there is no need to distinguish the station number. Only the 485 high-speed connection function requires distinguishing the station number.
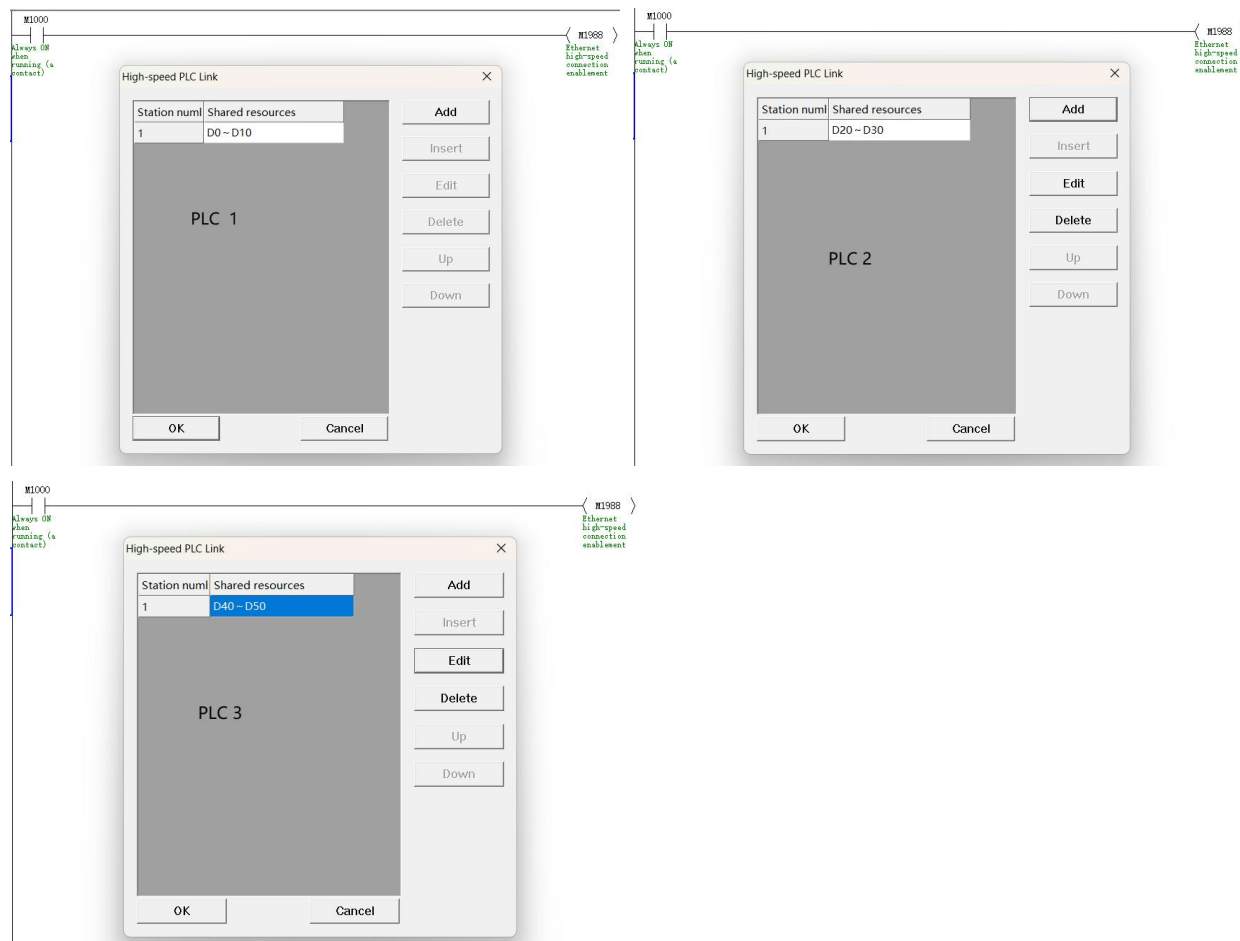
Click "Compile" to download the program to each PLC, then the data sharing is successful.

PLC host series

Safety Precautions

Thank you for purchasing our PLC. For safe use, be sure to read this manual and the manual of the PLC host and the reference manuals of the corresponding modules.

● Meaning of warning/attention indication

⚠ Warn	If used incorrectly, it may cause minor or moderate injury and, in exceptional cases, serious injury or death. It is also possible to cause significant material damage.

⚠ Note	If used incorrectly, it can sometimes cause minor or moderate injury to the person, damage to items, etc.

● Warning indication

⚠ Warn
Do not disassemble the product and contact the inside of the product when powering on, otherwise there may be electric shock.
Do not touch the wiring terminal when powering on to avoid oxidation of the terminal or the danger of electric shock.
When the programmable controller (hereinafter referred to as PLC) detects abnormality through the self-diagnosis function, the operation shall be stopped and all outputs shall be OFF. In order to enable the system to operate on a safe side, take appropriate measures outside the PLC.
If the PLC output is overloaded or shorted, the voltage will drop and sometimes the output will become OFF. At this point, in order for the system to operate on the safe side, please take appropriate measures outside the PLC.
In case of abnormal signal due to disconnection of signal line and instantaneous power failure, the user shall take safety protection measures. Abnormal actions can cause serious accidents.
The voltage/current of the I/O module shall be used according to the specified voltage/current range. The use of voltages/currents out of range will cause a fault.

⚠ Note
Pay attention to +/- polarity when wiring the DC power input. If the connection is wrong, it will cause system error.

Please screw in the terminal block of the input power terminal. Loose screws may cause system errors

Safety Precautions

- In view of the short circuit of the external wiring, be sure to take safety measures such as the use of disconnect switches.
- The unit shall be installed after thorough inspection of its terminal block.
- Please install the reference manual to properly connect all wiring.
- Please use the supply voltage specified in the reference manual.
- Please take appropriate measures to ensure that the specified power supply is provided with rated voltage and frequency. Please pay special attention to areas where the power supply is unstable. An incorrect power supply may cause malfunction.
- Crimp terminals shall be used for wiring. Please don't just twist the wire directly to the terminal block.
- Never connect a voltage or load that exceeds the maximum switching capacity to the output terminal.
- PLC is equipped with locking structure device. Please confirm that it is locked before use.
- Please fully confirm the setting of wiring, switch, etc. before powering on.
- User programs need to be fully checked before they are formally run in the unit.
- Do not disassemble, repair or modify this product.
- Turn off the power applied to the PLC before proceeding to any of the following operations.
  - ➢ When removing the expansion unit from the CPU unit
  - ➢ When loading and unloading alternate plates
  - ➢ When connecting cables or wires
- Make sure there is no impact on the device before performing the following operations.
  - ➢ Force setting/resetting of contacts
  - ➢ Change of current value or set value
- When replacing parts, make sure that the new parts are correctly rated.
- In order to prevent electrostatic damage during transportation or storage of circuit boards, the circuit boards shall be packed with conductive materials or put into electrostatic bags, and attention shall be paid to the proper storage temperature.
- Please fully confirm the wiring number before wiring.
- Follow the instructions in the reference manual for wiring.
- Unanticipated operation may result if inappropriate parameters are set. Even if the appropriate parameters have been set, verify that the control system is not adversely affected before starting or stopping the parameters.
- Do not cut off the power during data transfer, otherwise the data transfer will be interrupted.
- For the disposal of the host, please comply with the relevant local abandonment laws and regulations.
- This product is suitable for EMC directives when assembling a complete PLC system within a specified PLC family.

Precautions for use

- Follow the instructions in the reference manual for proper setting.
- Do not use in the following places:

- ➢ direct sunlight
- ➢ Locations where ambient temperature and relative humidity are out of specification
- ➢ Places prone to dew condensation due to rapid temperature change
- ➢ Locations with corrosive and flammable gases
- ➢ Places with a lot of dust, dust, salt and iron powder
- ➢ Places where droplets such as water, oil and drugs may be splashed
- ➢ Places that bring direct vibration and impact to the main engine

Product Maintenance

In order to ensure the normal operation of PLC system functions, please check the product according to the following items. If there is any abnormality, please carry out maintenance immediately according to the disposal method.

Inspection items	check	Judgment Criteria	Disposal Method
Visual inspection	Visual inspection	Whether there is dirt accumulation	Clean with alcohol and cotton cloth dust and dirt
Product Installation	Product and DIN rail Is it installed properly	Whether the product is firmly installed	Check DIN rail Plastic fixing buckle
Connectivity	Check for loose terminals Check the connection port of the cable	The terminal must not be loose The connection port must not be loose	Properly connect the terminals Check that the cables and ports are securely installed
POW indicator light	Check the POW indication after power-on Is the lamp always on	The POW indicator must be permanently on	Check whether 24VDC power supply is normal
RUN indicator	Check the operation status of PLC Does the RUN indicator light stay on	The RUN indicator must be permanently on	Check whether the PLC program operates normally
ERR indicator	Check if the ERR indicator is off	The ERR indicator must be off	

Commitments at the time of use

Pay attention to +/- polarity when wiring the DC power input. If the connection is wrong, it will cause system error.

Please screw in the terminal block of the input power terminal. Loose screws may cause system errors

When using under the following conditions and environments, we hope to consult and confirm the specification from our technical personnel, make allowance for the use of rated functions, take safety insurance measures into account, and seek safety countermeasures that can control the risk to a minimum even if there is a failure.

- For outdoor use, with potential chemical contamination, electrical radiation, conditions not recorded in the product samples or instructions, and in the environment
- for atomic energy control, railway, aviation, vehicle equipment, combustion devices, medical instruments, safety,
- Machinery, administrative organs and special industries, etc.
- Systems, machinery, devices, etc. expected to have a significant impact on personnel and property
- Highly reliable equipment for gas, water pipe, electric power supply system and 24-hour uninterrupted operation system

Specifications are subject to change without notice.

Chapter V JH(H1X) Standard Series PLC

Thank you for using JH(H1X) standard PLC series programmable controller. This series provides host computer with 14~40 points and 8~40 point digital input/output module. The maximum input/output expansion of host computer can reach 512 points at most. In addition, it can be used with analog I/O module, temperature module and weighing module to meet various applications.

1. Product size
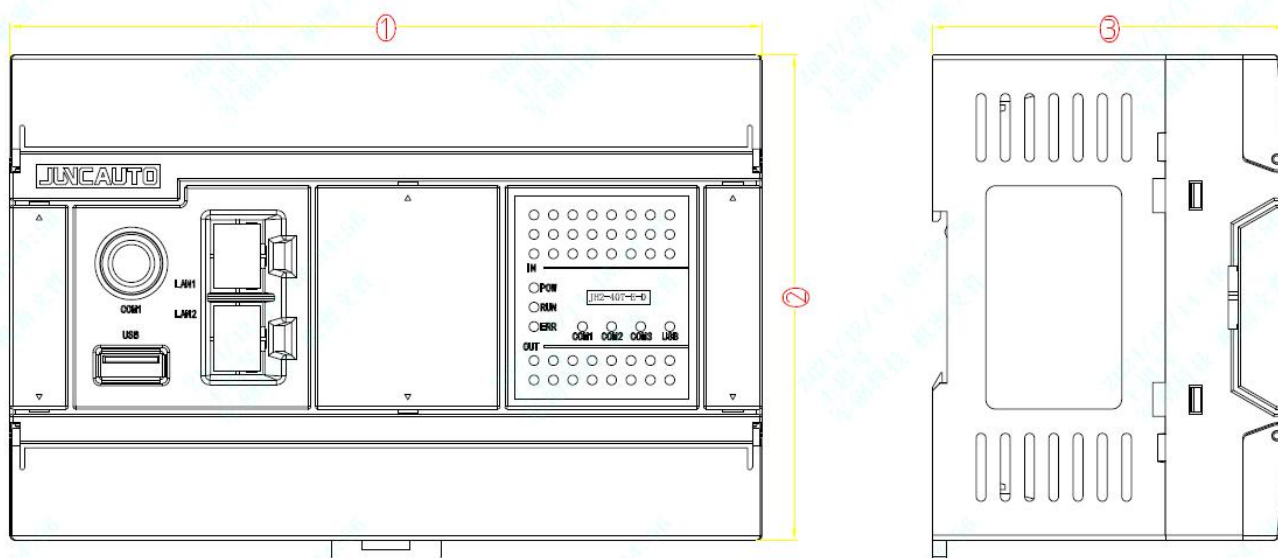
Host computer	Dimensions (mm)		
	（1）	（2）	（3）
14-24 points	114	100	73
32-40 points	155	100	73
48-60 points	278	100	73

PLC Extended Series

List of extended and matched host series

The extension shall be matched with the host computer according to the description in the following table. It is not allowed to mix with the host computer which is not marked. Cannot be mixed and matched with other brands.Otherwise, the normal operation will be affected.

Extended Family	Host family
HE series, HBD board	Series JH(H1X), JH2(H2X), JHM, JH2M
SE Series	JS, JM, JE, JEM, JC series
TE series	JT, JT2, JT3, JT5, JTM, JT5M series
CE series	Series JC, JS, JM

Note: A host can be connected with 16 extensions at most, and the maximum number of digital measuring points is 256/256 points.

Extended Special Address and Sequential Configuration

1、 The extended model connected to the host needs to be configured by the addresses of D1968~D1983 and D1984~D1999. Please refer to the programming example of each model for specific configuration method.

2、 The address definition of D1968~D1983 and D1984~D1999 is not required for digital quantity expansion, but the address of one extension module is still occupied.

TeD	Description
D1966	Number of modules detected at power-up
D1967	Number of modules detected in real time
D1968	Expansion Module 1 Read Address
D1969	Expansion Module 2 Read Address
D1970	Expansion Module 3 Read Address
D1971	Expansion Module 4 Read Address
D1972	Expansion Module 5 Read Address
D1973	Expansion Module 6 Read Address
D1974	Expansion Module 7 Read Address
D1975	Expansion module 8 reads the address
D1976	Expansion module 9 reads the address
D1977	the expansion module 10 reads the address
D1978	The expansion module 11 reads the address

D1979	the expansion module 12 reads the address
D1980	The expansion module 13 reads the address
D1981	the expansion module 14 reads the address
D1982	The expansion module 15 reads the address
D1983	the expansion module 16 reads the address
D1984	Expansion module 1 write address
D1985	Expansion module 2 write address
D1986	Expansion module 3 write address
D1987	Expansion module 4 write address
D1988	Expansion module 5 write address
D1989	Expansion module 6 write address
D1990	Expansion module 7 write address
D1991	Expansion module 8 write address
D1992	Expansion module 9 write address
D1993	the expansion module 10 write address
D1994	Expansion module 11 write address
D1995	the expansion module 12 write address
D1996	Expansion module 13 write address
D1997	the expansion module 14 write address
D1998	Expansion module 15 write address
D1999	Expansion module 16 write address

Extended ID Number

The ID number of each expansion module can be read by special D:

TeD	Description
D1950	1st module ID No. on the right
D1951	Right-hand 2nd Module ID No.
D1952	Right 3rd Module ID No.
D1953	Right 4th Module ID No.
D1954	5th module ID No. on the right
D1955	Right-hand 6th Module ID No.
D1956	Right-hand 7th Module ID No.
D1957	Right-hand 8th Module ID No.
D1958	Right 9th Module ID No.
D1959	10th module ID No. on the right
D1960	Right-hand 11th Module ID No.
D1961	Right-hand 12th Module ID No.
D1962	Right-hand 13th Module ID No.
D1963	Right 14th Module ID No.
D1964	Right-hand 15th Module ID No.

D1965	Right 16th Module ID No.	

Corresponding ID numbers of each extension model are as follows:

Model	Functional Description	Module ID Number
TE/SE/HE-8X	8Input	0x1030
TE/SE/HE-8X-S	8Input	0x1030
TE/SE/HE-8YT	8 Output	0x1003
TE/SE/HE-8YR	8 Output	0x1003
TE/SE/HE-16X	16Input	0x1070
TE/SE/HE-16X2	16Input	0x1070
TE/SE/HE-16YT	16 Output	0x1007
TE/SE/HE-16YR	16 Output	0x1007
TE/SE/HE-16T	8Input/8Output	0x1033
TE/SE/HE-16T2	8Input/8Output	0x1033
TE/SE/HE -16T-S	8Input/8Output	0x1033
TE/SE/HE -16P-S	8Input/8Output	0x1033
TE/SE/HE-16R	8Input/8Output	0x1033
TE/SE/HE-16R-S	8Input/8Output	0x1033
TE/SE/HE -32R	16Input/16Output	0x1077
TE/SE/HE -32T	16Input/16Output	0x1077
HE/SE-2L	2-way weighing	0xAF00
HE/SE-4L	4-way weighing	0xAF10
HE/SE-4AO	4-channel analog output	0xA001
HE/SE-8AO	8-channel analog output	0xA003
HE/TE/SE-4AI2AOS	4 In 2 Out Analog	0xA010
HE/SE/TE-8AI	8-channel analog input	0xA030
HE/SE/TE-4AI	4-channel analog input	0xA020
HE/SE-8AI8AO	8-channel analog input and 8-channel analog output	0xA033
HE/SE-8AI4AO	8-channel analog input and 4-channel analog output	0xA031
HE/SE-16AI	16-channel analog input	0xA070
HE/SE-8TC	8 Thermocouple Inputs	0xAC03

TE-1TC-1AO	1 thermocouple input, 1 analog 0-10V output	0xAC01
HE/SE-2TCY	2 Thermocouple Inputs	0xAC02
HE/SE-4TCY	4 Thermocouple Inputs	0xAC04
HE/SE-8TCY	8 Thermocouple Inputs	0xAC08
HE/SE-8TC	8 Thermocouple Inputs	0xAC09
SE-2TC-A	Two-way thermocouple input and two-way Y-port output	0xAC00
SE/HE-4PT	4-way PT100	0xAC20
SE/HE-8PT	8-way PT100	0xAC30
TE-4PTY	4-way PT100, 4-way Y-port output	0xAC40
SE-4PTC	4-way PT100/thermocouple optional	0xAC44

Chapter I Extension of HE Series

Thank you for using the TianChuan Zhongcheng HE series standard expansion module. This series provides digital module, analog module, temperature module, functional module, etc. The expansion module can only be connected to the host of the company. To ensure proper installation and operation of this product, please read this instruction manual carefully before use.

- This installation manual provides the user with electrical specifications, functional specifications and relevant precautions for wiring installation.
- When the user uses the machine, it must be installed in a dust-proof, moisture-proof and shock-proof enclosure distribution box. In addition, protective measures (e.g. special tools or keys can only be opened) shall be provided to prevent non-maintenance personnel from operating or accidentally impacting the body, resulting in danger or damage.
- AC power supply shall not be connected to input/output signal terminal, otherwise serious damage may occur. Please confirm the power wiring again before power-on. Do not touch any terminals while powering up.
- When installing the PLC, please install it in the enclosed control box, and a certain space shall be kept around it to ensure the normal heat dissipation function of the PLC.
- Installation method of DIN guide rail: When hanging the main unit on the guide rail, please insert the fixed plastic sheet under the main unit into the groove with a straight screwdriver and pull it out, then hang the main unit on the guide rail, and then press the fixed plastic sheet back. When the main machine is to be taken down, the fixed plastic sheet is also supported by an in-line screwdriver, and then the main machine is taken out in an upward and outward manner. the plastic sheet of the fixing mechanism is of a holding type, so that the plastic sheet can not bounce back after being unfolded.

Product Dimensions
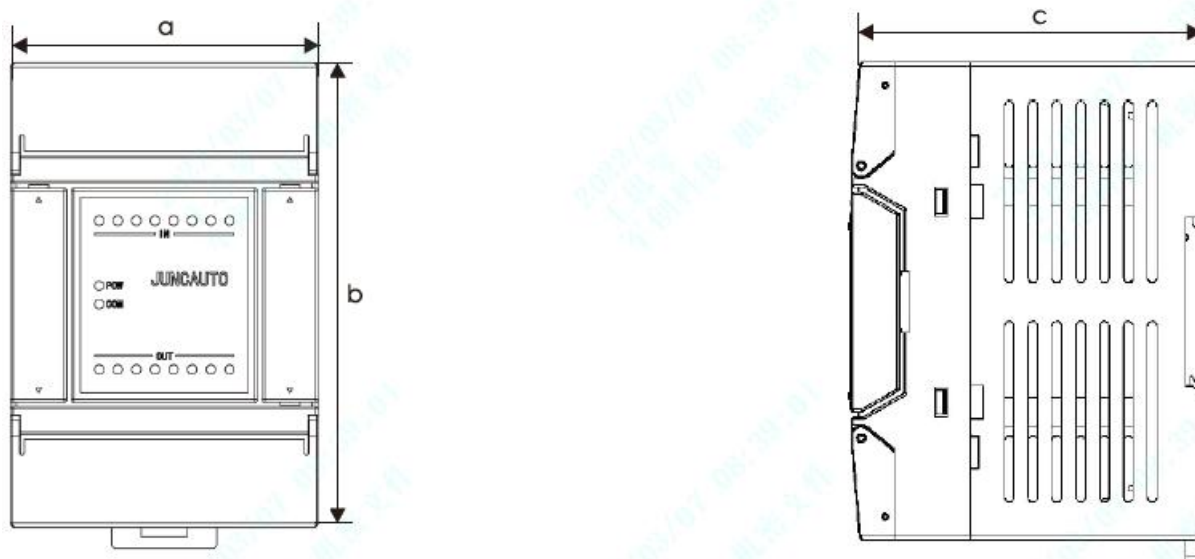
Host computer	Dimensions (mm)		
	a	b	c
8-16 point digital quantity expansion HE-4AI2AO	66	100	73
Extension of digital quantity of 24-32 points	114	100	73

LED system status self-diagnosis

- POW (24V power indicator)

  On: 24VDC power supply is normal Off: no 24VDC power supply
- COM (Extended Light)

  On: successfully accessed expansion module Off: not accessed/incorrectly accessed expansion module

Note 1: The expansion module shall not be plugged or unplugged with electricity, otherwise it will affect the normal use.

Note 2: Only JH/JHM/JH2/JH2M series of hosts can be used. It is not allowed to mix with other series of hosts. Otherwise, normal operation will be affected.

I. Extension of HE Series Digital Quantity

It can only be used with JH/JHM/JH2/JH2M/JHC/JHCM series of hosts. It is not allowed to mix with other series of hosts. Otherwise, normal operation will be affected.

- Note: The extended I/O I/O start number starts with the last number of the host or extended I/O point to which the module is connected. The number of the extended I/O is arranged in sequential order. If the last point of the host is X n□ (the number range in □ is 0-7), the starting number of the digital quantity expansion input is X (n+1)0. The same applies to the extended output start number.

  For example, if the last point of the host is Y27, the starting number of the first extended output point connected to the host is Y30. If the last point of the master is Y34, the start number of the extended output point is Y40.

Extended Models

Model	I/O points	Enter Points	Number of output points	Input mode	Output mode	RS485 communication	Module ID Number
HE-8X	8 points	8 points	---	NPN	---	---	0x1030
HE-8X-S	8 points	8 points	---	NPN/PNP	---	---	0x1030
HE-8YT	8 points	---	8 points	---	NPN	---	0x1003
HE-8YR	8 points	---	8 points	---	relay	---	0x1003
HE-16X	16 points	16 points	---	NPN	---	---	0x1070
HE-16X2	16 points	16 points	---	NPN	---	With 1-way RS485	0x1070
HE-16YT	16 points	---	16 points	---	NPN	---	0x1007
HE-16YR	16 points	---	16 points	---	relay	---	0x1007
HE-16T	16 points	8 points	8 points	NPN	NPN	---	0x1033
HE-16T2	16 points	8 points	8 points	NPN	NPN	With 1-way RS485	0x1033
HE-16T-S	16 points	8 points	8 points	NPN/PNP	NPN	---	0x1033
HE-16P-S	16 points	8 points	8 points	NPN/PNP	PNP	---	0x1033
HE-16R	16 points	---	---	NPN	relay	---	0x1033
HE-16R-S	16 points	---	---	NPN/PNP	relay	---	0x1033
HE-32R	32 points	16 points	16 points	NPN	relay	---	0x1077
HE-32T	32 points	16 points	16 points	NPN	NPN	---	0x1077

II. Extension of HE-16X2 and HE-16T2 digital quantity

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCMseries can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

1、 Product Features

Model	I/O points	Enter Points	Number of output points	Input mode	Output mode	RS485 communication
HE-16X2	16 points	16 points	---	NPN	---	With 1-way RS485
HE-16T2	16 points	8 points	8 points	NPN	NPN	With 1-way RS485
485 communication	RS485 (screen printing D+, D-), factory baud rate is 115200bps, data length is 8 bits, stop bit 1, no check N, RTU mode.					

Note:

1、 Compared with HE-16X and HE-16T extensions, there is one more RS485 communication. It can not only match with military innovation host, but also can be used as slave station to communicate with external module 485.

2、 If it is matched with the military innovation host, the expansion module has been connected to supply power to the expansion module through the expansion cable, so there is no need to separately connect the DC24V power supply.

This instruction only introduces the 485 communication function of the module. If you do not use the 485 communication function, use the conventional method to communicate with the military innovation host through the extension line. Refer to the description of HE series digital quantity expansion.

2. Description of mailing address

Function	MODBUS communication address	Format	read coil function code	write coil function code
Input point X0~X7	0x400~0x407 (hex)	Bit	0x1	/
Input points X10~X17	0x408~0x40E (in hexadecimal)	Bit	0x1	/
Output point Y0~Y7	0x500~0x507 (hex)	Bit	0x1	0xF
Output points	0x508~0x50E	Bit	0x1	0xF

Y10~Y17	(in hexadecimal)			
Function	**MODBUS communication address**	**Format**	**Read Address function code**	**write address function code**
Station No.	180 (Dec Decimal)	16-bit integer, read/write, default to 1. If the station number is uncertain, the station number 0 can also be used for communication. If the dial switch SW1-SW4 is fully ON or OFF, the communication change station number is effective.	0x3	0x10
Communication Settings	181 (Dec Decimal)	After the communication setting and baud rate are changed, the module shall be restarted to be effective. Factory default: 0, indicating that the communication is set as baud rate: 115200, data length: 8 bits, stop bit 1, no check N, RTU mode k1 represents a baud rate of 9600 bps k2 represents a baud rate of 19200 bps k3 represents a baud rate of 38400 bps Other values are 115200 bps Note: Only baud rate can be changed	0x3	0x10
System area	182~183 (Dec decimal)	/	/	/
Communication Timeout (ms)	184 (Dec Decimal)	It means that all outputs will be automatically turned off if RS485 is not communicating within a certain number of milliseconds. If the setting value is less than or equal to 0, the communication timeout function is cancelled.	0x3	0x10

Note:

1. The station number can be changed in two ways: one is to change the station number by using the communication mode, and the other is to set the station number by dialing the code switch.

2. The priority of changing the station number through dial switch is the highest. If the gear of dial switch 1-4 is fully ON or OFF, the communication change station number is effective. If it is in other states, the station number of dial switch shall prevail, and the communication modification is invalid.

3. Setting of dialing station number

code 8421	8	4	2	1
Station No.	SW1	SW2	SW3	SW4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

4. Extended state read

The extended numeric mapping address table is as follows:

Address	Description
0x146D	Displays the expansion module version number
0x146E	Display the ID number of the expansion module. See the extension model for details. ID 号详见扩展型号
0x146F	Displays the expansion module hardware version number
0x1470	Display the status of dial switch (SW1~SW4)

III. HE-4AO Analog Output Expansion

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

The functions of HE-4AO and SE-4AO are the same. Please click SE-4AO data description in SE series extension column.

IV. HE-8AO Analog Output Expansion

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

1. Product Features

Model	SE-8AO
Number of analog output points	8
Voltage output range	-10V-10V (K-4095~K4095)
Current output range	0-20mA (K0-K4095); 4-20mA
Resolution	12-bit

2. Wiring

Output: current type

Wiring mode: V is not connected, signal is connected to I, G is connected to 0V

Voltage type

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

3. Programming Example

Note: An example is the first extension after the host. If the extension is not the first module connected to the host, please refer to D1968~D1983 and D1984~D1999 extension sequence definition below.

```
M1002
─┤├──────────────────────────────────────────[ MOV    K300    D1984 ]
Start                                                       Expansion
positive                                                    module 1
(instant                                                    write
'On' of                                                     address
  M0
─┤├──────────────────────────────────────────[ MOV    K4095   D300 ]
HMI route                                                   Channel 1
1                                                           analog
self-tuning                                                 output
starts
        ─────────────────────────────────────[ MOV    K4095   D301 ]
                                                            Channel 2
                                                            analog
                                                            output
        ─────────────────────────────────────[ MOV    K4095   D302 ]
                                                            Channel 3
                                                            analog
                                                            output
        ─────────────────────────────────────[ MOV    K4095   D303 ]
                                                            Channel 4
                                                            analog
                                                            output
        ─────────────────────────────────────[ MOV    K4095   D304 ]
                                                            Channel 5
                                                            analog
                                                            output
        ─────────────────────────────────────[ MOV    K4095   D305 ]
                                                            Channel 6
                                                            analog
                                                            output
        ─────────────────────────────────────[ MOV    K4095   D306 ]
                                                            Channel 7
                                                            analog
                                                            output
```

Example Description:

1) Definition of expansion module read address

Expansion Module Read Address	Function
D1968	Connected to expansion module 1
D1969	Connected to expansion module 2
D1970	Connected to expansion module 3
D1971	Connected to expansion module 4
D1972	Connected to expansion module 5
and so on	and so on
...	...

2) Extension module write address definition

Expansion module write address	Function
D1984	Connected to expansion module 1
D1985	Connected to expansion module 2
D1986	Connected to expansion module 3
D1987	Connected to expansion module 4

D1988	Connected to expansion module 5
and so on	and so on
...	...

3) Analog output address:

✧ As described above, the write address D1984 of the first expansion module is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1), and the user can customize the start address, i.e. change the value of K300. The analog output address is represented in the following table:

Passageway	Analog Output Address	Function
CH0-OUT	D300: (S)	1st analog output
CH1-OUT	D301: (S)+1	Channel 2 analog output
CH2-OUT	D302: (S)+2	Analog output of the third channel
CH3-OUT	D303:(S)+3	The 4th analog output
CH4-OUT	D304:(S)+4	The 5th analog output
CH5-OUT	D305: (S) +5	The 6th analog output
CH6-OUT	D306:(S)+6	The 7th analog output
CH7-OUT	D307:(S)+7	The 8th analog output

V. HE-4AI、 HE-4AI2 Analog Input Expansion

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

1. Features of expansion module

Model	HE-4AI	HE-4AI2
Number of analog input points	4 points	4 points
Voltage input range	0-10V (K0-K4095, 12-bit resolution);	0-10V (K0-K4095, 12-bit resolution);
Current input range	0-20mA (K0-K4095, 12-bit resolution);	0-20mA (K0-K4095, 12-bit resolution);
RS485 communication	NO	RS485 (screen printing D+, D-), factory baud rate is 115200bps, data length is 8 bits, stop bit 1, no check N, RTU mode.

Note:

1、 Compared with HE-4AI, HE-4AI2 has an additional RS485 communication channel.， which can be matched with the military innovation host and can also communicate with the external module 485.

2、If it is matched with the military innovation host, the expansion module has been connected to supply power to the expansion module through the expansion cable, so there is no need to separately connect the DC24V power supply.

2. Analog quantity wiring mode

Input: current type (0-20mA)

Wiring mode: I and V are short-circuited, signal is connected to I, G is connected to 0V

Voltage type (0-10V)

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

3. Programming Example - Match with Military Innovation Host

3.1 Description of Analog Input Example Procedure

Note: An example is taken as the first extension connected to the host, and the analog input type is current input. If the extension is not the first module connected to the host, please refer to D1968~D1983 and D1984~D1999 extension sequence definition below.

Example Description:

1) Definition of expansion module read address

Expansion Module Read Address	Function
D1968	Connected to expansion module 1
D1969	Connected to expansion module 2
D1970	Connected to expansion module 3
D1971	Connected to expansion module 4
D1972	Connected to expansion module 5
and so on	and so on
...	...

2) Extension module write address definition

Expansion module write address	Function
D1984	Connected to expansion module 1
D1985	Connected to expansion module 2
D1986	Connected to expansion module 3
D1987	Connected to expansion module 4
D1988	Connected to expansion module 5
and so on	and so on
...	...

3) D300 (S1) refers to the setting of average times, which is expressed as follows:

✧ The read address D1984 of the first expansion module in the example program is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1). The user can customize the start address, that is, change the value of K300.

Average times setting:

D300:S1	Analog Input Channel	Value Setting	Function
bit0~bit3	1st analog input AI0	H2~H7	● The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. ● If 4 channels are set simultaneously, the default value is (H22222), and the value is between H2222 and H7777, as shown in the following. MOV H3333 D300 ● The larger the value, the more stable, but the slower the acquisition rate.
bit4~bit7	Channel 2 analog input AI1	H2~H7	
bit8~bit11	3rd analog input AI2	H2~H7	
bit12~bit15	The 4th analog input AI3	H2~H7	

4) The mode of D301 analog input operation mode is as follows:

D301: (S1)+1	Analog Input Channel	Analog Input Type	
		Current type; Voltage type (0-5V)	Voltage type (0-10v)
Bit0	1st analog input AI0	0	1
Bit1	Channel 2 analog input AI1	0	1
Bit2	3rd analog input AI2	0	1
Bit3	The 4th analog input AI3	0	1

Example: Input: The 1st and 4th analog inputs are of current type, and the 2nd and 3rd analog inputs are of voltage type (0-10V)

Then: the first analog input bit0 =0, the second analog input bit1 =1, the third analog input bit2 =1, and the fourth analog input bit3 =0

The binary representation of bit3~bit0 of D301 is 0110, and the value shall be assigned to MOV H6 D301 when it is converted into hexadecimal.

5) Analog input address

✧ The read address D1968 of the first expansion module in the example program is assigned to K500, indicating that the start address of the channel input of the expansion module is D500 (S2). The user can customize the start address, that is, change the value of K500. The specific expression is shown in the following table:

Passageway	Function	Analog Input Address
CH0-IN	1st analog input	D500: (S2)
CH1-IN	The 2nd analog input	D501: (S2)+1
CH2-IN	The 3rd analog input	D502:(S2)+2

| CH3-IN | The 4th analog input | D503:(S2)+3 |

4. Description of RS485 communication address

RS2 command can be used for 485 communication with the host computer.

Read address function code 0x03 and write address function code 0x10.

MODBUS communication address (decimal)	Function	Description	Format
0~3	AD Acquisition Input Address	Analog quantity of channel AI0~AI3 is input to AD acquisition address.	16-bit integer, read-only
50	Average times setting	Set the value of bit0~bit15 of this address to determine the average number of analog quantity input acquisition of AI0~AI3 channels. See the next section for the setting of the average times.	16-bit integer, read/write
51	Working mode setting	It is used to set the operation in voltage or current mode. Refer to the description of operation mode in the next section.	16-bit integer, read-only
The default baud rate of the communication parameters of this module is 115200, the data length is 8 bits, the stop bit is 1, there is no check N, RTU mode. Only station number and baud rate can be changed. The corresponding address and setting method are as follows:			
180	Station No.	The default is 1. If the station number is uncertain, the station number 0 can also be used for communication. If the dial switch SW1-SW4 is fully ON or OFF, the communication change station number is effective. To set the station number by dialing, see the next section	16-bit integer, read/write
181	Communication Settings	Refer to the following description for communication settings: 181 Communication format settings. The module needs to be restarted after the baud rate is changed. Factory default: 0, indicating that the communication is set as baud rate: 115200, data length: 8 bits, stop bit 1, no check N, RTU mode	16-bit integer, read/write

Address for system (read only, no write): function code 0x03 for read address.

MODBUS communication address (decimal)	Function	Description	Format	Description
4-channel analog current input k and b value				

60	Current input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog current input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
62	Current input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
64	Current input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
66	Current input mode b value	Analog value b of channel AI1	32-bit floating-point number	
68	Current input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
70	Current input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
72	Current input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
74	Current input mode b value	Analog value b of channel AI3	32-bit floating-point number	
4-channel analog voltage input k and b value				
92	Voltage input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog voltage input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
94	Voltage input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
96	Voltage input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
98	Voltage input mode b value	Analog value b of channel AI1	32-bit floating-point number	
100	Voltage input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
102	Voltage input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
104	Voltage input mode k	Analog k value of AI3	32-bit	

	value	channel	floating-point number	
106	Voltage input mode b value	Analog value b of channel AI3	32-bit floating-point number	

4.1 Setting of average times

Analog Input Channel	Value Setting	Address: 50
1st analog input AI0	H2~H7	bit0~bit3
Channel 2 analog input AI1	H2~H7	bit4~bit7
3rd analog input AI2	H2~H7	bit8~bit11
The 4th analog input AI3	H2~H7	bit12~bit15

The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. For simultaneous setting of 4 channels, the default value is (H22222), and the value is between H2222 and H7777. The larger the value, the more stable, but the slower the acquisition rate.

4.2 Working mode setting

Analog Input Channel	Analog Input Type		Address: 51
	Current type; Voltage type (0-5V)	Voltage type (0-10v)	
1st analog input AI0	0	1	Bit0
Channel 2 analog input AI1	0	1	Bit1
3rd analog input AI2	0	1	Bit2
The 4th analog input AI3	0	1	Bit3

Example: Input: The 1st and 4th analog inputs are of current type, and the 2nd and 3rd analog inputs are of voltage type (0-10V)

Then: the first analog input bit0 =0, the second analog input bit1 =1, the third analog input bit2 =1, and the fourth analog input bit3 =0

The binary representation of bit3~bit0 of address 51 is 0110, and the hexadecimal value shall be assigned to H6

4.3 181 Communication format setting

181	Content	0	1
b0	Data length	b0: 7 bits (ASCII mode)	b0: 8 bits (RTU mode) (factory default)
b1	parity	b2, b1=00	None (factory default)

b2		b2, b1=01	odd parity (odd)
		b2, b1=11	even parity (even)
b3	stop bit	1bit (factory default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps (factory default)	

181 How to Change Communication Settings

For example, the communication setting is 9600bps, data length 8 (RTU mode), no check and stop bit 1.

According to the parameter configuration table in the previous section, it can be concluded as follows:

Address: 181	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	0	0	0	0	1
communication format	b7~b4=1000 (H8) 9600bps				stop bit 1 bit	b2, b1=00 No verification		Data length 8 bits

the b7 to b0 values of the communication address 181 are respectively 1000 0001 and converted into hexadecimal H81, i.e. the communication address 181 is assigned to H81.

4.4 Setting of dialing station number

code 8421	8	4	2	1
Station No.	SW1	SW2	SW3	SW4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON

8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

VI. HE-8AI Analog Input Expansion

The functions of HE-8AI and TE-8AI are the same. Please refer to TE-8AI information description in the extension column of TE series.

VII. HE-8AI2 Analog Input Extension

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

RS2 command can be used for 485 communication with the host computer.

1. Features of expansion module

Model	HE-8AI2
Number of analog input points	8 points
Voltage input range	0-10V (K0-K4095, 12-bit resolution);
Current input range	0-20mA (K0-K4095, 12-bit resolution);
RS485 communication	RS485 (screen printing D+, D-), factory baud rate is 115200bps, data length is 8 bits, stop bit 1, no check N, RTU mode.

Note:

1、 Compared with the HE-8AI extension, it has an additional RS485 communication, which can be matched with the military innovation host and can also communicate with the external module 485.

2、 If it is matched with the military innovation host, the expansion module has been connected to supply power to the expansion module through the expansion cable, so there is no need to separately connect the DC24V power supply.

This instruction only introduces the RS485 communication of the module. If 485 communication is not used, communicate with the military innovation host through the extension line in a conventional way. Refer to the description of HE-8AI.

2. Analog quantity wiring mode

Input: current type (0-20mA)

Wiring mode: I and V are short-circuited, signal is connected to I, G is connected to 0V

Voltage type (0-10V)

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

3. Description of mailing address

Read address function code 0x03 and write address function code 0x10.

MODBUS communication address (decimal)	Function	Description	Format
0~7	AD Acquisition Input Address	Analog quantity of channel AI0~AI7 is input to AD acquisition address.	16-bit integer, read-only
50~51	Average times setting	Set the value of bit0~bit31 of this address to determine the average number of analog quantity input acquisition of AI0~AI7 channels. See the next section for the setting of the average times.	32-bit integer, read/write
52	Working mode setting	for setting the operation in a voltage or current mode, See the next section for the operation mode setting	16-bit integer, read-only
The default baud rate of the communication parameters of this module is 115200, the data length is 8 bits, the stop bit is 1, there is no check N, RTU mode. Only station number and baud rate can be changed. The corresponding address and setting method are as follows:			
180	Station No.	The default is 1. If the station number is uncertain, the station number 0 can also be used for communication. If the dial switch SW1-SW4 is fully ON or OFF, the communication change station number is effective. Refer to the next section by dialing the station number	16-bit integer, read/write
181	Communication Settings	Refer to the following description for communication settings: 181 Communication format settings. The module needs to be restarted after the baud rate is changed. Factory default: 0, indicating that the communication is set as baud rate: 115200, data length: 8 bits, stop bit 1,	16-bit integer, read/write

		no check N, RTU mode	

Address for system (read only, no write): function code 0x03 for read address.

MODBUS communication address (decimal)	Function	Description	Format	Description
8-channel analog current input k and b value				
60	Current input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	
62	Current input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
64	Current input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
66	Current input mode b value	Analog value b of channel AI1	32-bit floating-point number	
68	Current input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
70	Current input mode b value	Analog value b of AI2 channel	32-bit floating-point number	This function is used to correct the analog current input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
72	Current input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
74	Current input mode b value	Analog value b of channel AI3	32-bit floating-point number	
76	Current input mode k value	Analog k value of AI4 channel	32-bit floating-point number	
78	Current input mode b value	Analog value b of channel AI4	32-bit floating-point number	
80	Current input mode k value	Analog k value of AI5 channel	32-bit floating-point number	
82	Current input mode b value	Analog value b of channel AI5	32-bit floating-point number	

84	Current input mode k value	Analog k value of AI6 channel	32-bit floating-point number	
86	Current input mode b value	Analog value b of channel AI6	32-bit floating-point number	
88	Current input mode k value	Analog k value of AI7 channel	32-bit floating-point number	
90	Current input mode b value	Analog value b of channel AI7	32-bit floating-point number	
8-channel analog voltage input k and b value				
92	Voltage input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	
94	Voltage input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
96	Voltage input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
98	Voltage input mode b value	Analog value b of channel AI1	32-bit floating-point number	This function is used to correct the analog voltage input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
100	Voltage input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
102	Voltage input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
104	Voltage input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
106	Voltage input mode b value	Analog value b of channel AI3	32-bit floating-point number	
108	Voltage input mode k value	Analog k value of AI4 channel	32-bit floating-point number	
110	Voltage input mode b value	Analog value b of channel AI4	32-bit floating-point number	
112	Voltage input mode k	Analog k value of AI5	32-bit	

	value	channel	floating-point number	
114	Voltage input mode b value	Analog value b of channel AI5	32-bit floating-point number	
116	Voltage input mode k value	Analog k value of AI6 channel	32-bit floating-point number	
118	Voltage input mode b value	Analog value b of channel AI6	32-bit floating-point number	
120	Voltage input mode k value	Analog k value of AI7 channel	32-bit floating-point number	
122	Voltage input mode b value	Analog value b of channel AI7	32-bit floating-point number	

4. Setting of average times

Analog Input Channel	Value Setting	Address: 50~51
1st analog input AI0	H2~H9	bit0~bit3
Channel 2 analog input AI1	H2~H9	bit4~bit7
3rd analog input AI2	H2~H9	bit8~bit11
The 4th analog input AI3	H2~H9	bit12~bit15
...	H2~H9	...
The 8th analog input AI7	H2~H9	bit28~bit31

The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. If 8 channels are set at the same time, the default value is (H22222222), and the value is between H22222222 and H99999999. The larger the value, the more stable, but the slower the acquisition rate.

5. Working mode setting

Analog Input Channel	Analog Input Type		Address: 52
	Current type; Voltage type (0-5V)	Voltage type (0-10v)	
1st analog input AI0	0	1	Bit0
Channel 2 analog input AI1	0	1	Bit1

3rd analog input AI2	0	1	Bit2
The 4th analog input AI3	0	1	Bit3
...	0	1	...
The 8th analog input AI7	0	1	Bit7

Example: Input: the 1st and 4-8 analog inputs are current type, and the 2nd and 3rd analog inputs are voltage (0-10V)

Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the 4th to 8th analog input bit3~bit7=0000

The binary representation of bit7~bit0 of address 52 is 0000 0110, and the hexadecimal value shall be assigned to H6

6. 181 Communication format setting

181	Content	0	1
b0	Data length	b0: 7 bits (ASCII mode)	b0: 8 bits (RTU mode) (factory default)
b1 b2	parity	b2, b1=00	None (factory default)
		b2, b1=01	odd parity (odd)
		b2, b1=11	even parity (even)
b3	stop bit	1bit (factory default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps (factory default)	

181 How to Change Communication Settings

For example, the communication setting is 9600bps, data length 8 (RTU mode), no check and stop bit 1.

According to the parameter configuration table in the previous section, it can be concluded as follows:

Address: 181	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	0	0	0	0	1
communication format	b7~b4=1000 (H8) 9600bps				stop bit 1 bit	b2, b1=00 No verification		Data length

				8 bits

the b7 to b0 values of the communication address 181 are respectively 1000 0001 and converted into hexadecimal H81, i.e. the communication address 181 is assigned to H81.

7. Setting of dialing station number

code 8421	8	4	2	1
Station No.	SW1	SW2	SW3	SW4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

VIII. HE-4AI2AO/4AI2AO2 analog input/output expansion

It can only be used with JH/JHM/JH2/JH2M/JHC/JHCM series of hosts. It is not allowed to mix with other series of hosts. Otherwise, normal operation will be affected.

1. Product Features

Model	HE-4AI2AO	HE-4AI2AO2
Number of analog input points	4	4
Number of analog output points	2	2
Voltage input range	0-5V; 0-10V	0-5V; 0-10V
Voltage output range	-10V-10V	-10V-10V
Current input/output range	0-20mA; 4-20mA	0-20mA; 4-20mA

Communications	/	RS485 (screen printing D+, D-), factory baud rate is 115200bps, data length is 8 bits, stop bit 1, no check N, RTU mode.

The resolution is expressed as follows:

Type	Resolution
0-5V; 0-10V (voltage input)	K0-K4095 (12-bit resolution)
0-20mA	K0-K4095 (12-bit resolution)
-10V-10V (voltage output)	-K4095-K4095 (12-bit resolution)

2. Wiring

Input: current type

Wiring mode: short circuit between I and V, signal connected to V, G connected to 0V

Voltage type

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

Output: current type

Wiring mode: V is not connected, signal is connected to I, G is connected to 0V

Voltage type

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

3. Programming Example - Match with Military Innovation Host

Applicable to HE-4AI2AO and HE-4AI2AO2 models

3.1 Description of Analog Input Example Procedure

Note: 1. For example, the first extension is connected to the host, and the analog input type is current input. If the extension is not the first module connected to the host, please refer to D1968~D1983 and D1984~D1999 extension order definition below.

Example Description:

1) Definition of expansion module read address

Expansion Module Read Address	Function
D1968	Connected to expansion module 1
D1969	Connected to expansion module 2
D1970	Connected to expansion module 3
D1971	Connected to expansion module 4
D1972	Connected to expansion module 5
and so on	and so on
...	...

2) Extension module write address definition

Expansion module write address	Function
D1984	Connected to expansion module 1
D1985	Connected to expansion module 2
D1986	Connected to expansion module 3
D1987	Connected to expansion module 4
D1988	Connected to expansion module 5
and so on	and so on
...	...

3）D300 is expressed as follows:

✧ The read address D1984 of the first expansion module in the example program is assigned to K300,

indicating that the start address of the channel output of the expansion module is D300 (S1). The user can customize the start address, that is, change the value of K300.

Output Start Address	Function
D300: (S1)	Average number of acquisitions H2222-H77777 (default H3333)

4) The mode of D301 analog input operation mode is as follows:

| Passageway | Analog Input Type | | D301 (S1)+1 |
	Current type; Voltage type (0-5V)	Voltage type (0-10v)	
1st analog input bit0	0	1	(bit3~bit0)
Analog input bit1 of channel 2	0	1	
Analog input bit2 of channel 3	0	1	
The 4th analog input bit3	0	1	

Example: Input: The 1st and 4th analog inputs are of current type, and the 2nd and 3rd analog inputs are of voltage type (0-10V)

Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the fourth analog input bit3 = 0

The binary representation of bit3~bit0 of D301 is 0110, and the value shall be assigned to MOV H6 D301 when it is converted into hexadecimal.

5) Analog input address
✧ The read address D1968 of the first expansion module in the example program is assigned to K500, indicating that the start address of the channel input of the expansion module is D500 (S2). The user can customize the start address, that is, change the value of K500. The specific expression is shown in the following table:

Passageway	Function	Analog Input Address
CH0-IN	1st analog input	D500: (S2)
CH1-IN	The 2nd analog input	D501: (S2)+1
CH2-IN	The 3rd analog input	D502:(S2)+2
CH3-IN	The 4th analog input	D503:(S2)+3

3.2 Description of Analog Output Example Procedure

Example Description

Analog output address:

✧ As described above, the write address D1984 of the first expansion module is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1), and the user can customize the start address, i.e. change the value of K300. The analog output address is represented in the following table:

Passageway	Function	Analog Output Address
	Average number of acquisitions (default H3333)	D300: (S1)
	Input Mode of Operation	D301: (S1)+1
CH0-OUT	1st analog output	D302:(S1)+2
CH1-OUT	Channel 2 analog output	D303: (S1)+3

In the example, D302 is assigned to K4095, which indicates that the output voltage is 10V.

4. HE-4AI2AO2: RS485 Communication Address Description

RS2 command can be used for 485 communication with the host computer.

Common address: function code 0x03 for reading address and 0x10 for writing address.

MODBUS communication address (decimal)	Function	Description	Format
0~3	AD Analog Input Address	Analog quantity of channel AI0~AI3 is input to AD acquisition address.	16-bit integer, read-only
10~11	DA Analog Output Address	AO0~AO3 channel analog output DA address.	16-bit integer, read and write
50	Average times	Set the value of bit0~bit15 of this address to determine	16-bit

	setting	the average number of analog quantity input acquisition of AI0~AI3 channels. See the next section for the setting of the average times.	integer, read/write
51	Working mode setting	for setting the operation in a voltage or current mode, See the next section for working mode setting instructions	16-bit integer, read-only
The default baud rate of the communication parameters of this module is 115200, the data length is 8 bits, the stop bit is 1, there is no check N, RTU mode. Only station number and baud rate can be changed. The corresponding address and setting method are as follows:			
180	Station No.	The default is 1. If the station number is uncertain, the station number 0 can also be used for communication. If the dial switch SW1-SW4 is fully ON or OFF, the communication change station number is effective. Refer to the next section by dialing the station number	16-bit integer, read/write
181	Communication Settings	Refer to the following description for communication settings: 181 Communication format settings. After the baud rate is changed, the module needs to be restarted. Factory default: 0, indicating that the baud rate of communication setting is 115200, data length: 8 bits, stop bit 1, no check N, RTU mode	16-bit integer, read/write
184	Communication Timeout (ms)	It means that all outputs will be automatically turned off if RS485 is not communicating within a certain number of milliseconds. If the setting value is less than or equal to 0, the communication timeout function is cancelled.	16-bit integer, read/write

Address for system (read only, no write): function code 0x03 for read address.

MODBUS communication address (decimal)	Function	Description	Format	Description
4-channel analog current input k and b value				
60	Current input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog current input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input address (0~3) is always 0, and the analog input signal cannot be displayed.
62	Current input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
64	Current input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
66	Current input mode b value	Analog value b of channel AI1	32-bit floating-point	

			number	
68	Current input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
70	Current input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
72	Current input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
74	Current input mode b value	Analog value b of channel AI3	32-bit floating-point number	
4-channel analog voltage input k and b value				
92	Voltage input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	
94	Voltage input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
96	Voltage input mode k value	Analog k value of AI1 channel	32-bit floating-point number	This function is used to correct the analog voltage input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input address (0~3) is always 0, and the analog input signal cannot be displayed.
98	Voltage input mode b value	Analog value b of channel AI1	32-bit floating-point number	
100	Voltage input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
102	Voltage input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
104	Voltage input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
106	Voltage input mode b value	Analog value b of channel AI3	32-bit floating-point number	
2-channel analog output k and b values				
124	Voltage output mode k value	Analog quantity k value of AO0 channel	32-bit floating-point number	This function is used to correct the analog output. Calibration has been made at the factory, so k, b are of value. if that value of k and
126	Voltage output mode b value	AO0 channel analog quantity b value	32-bit floating-point	

			number	b are 0, the analog output signal cannot be given.
128	Voltage output mode k value	Analog k value of AO1 channel	32-bit floating-point number	
130	Voltage output mode b value	AO1 channel analog quantity b value	32-bit floating-point number	

4.1 Setting of average times

Analog Input Channel	Value Setting	Address: 50~51
1st analog input AI0	H2~H7	bit0~bit3
Channel 2 analog input AI1	H2~H7	bit4~bit7
3rd analog input AI2	H2~H7	bit8~bit11
The 4th analog input AI3	H2~H7	bit12~bit15
The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. If 8 channels are set simultaneously, the default value is (H22222), and the value is between H2222 and H7777. The larger the value, the more stable, but the slower the acquisition rate.		

4.2 Working mode setting

Analog Input Channel	Analog Input Type		Address: 52
	Current type; Voltage type (0-5V)	Voltage type (0-10v)	
1st analog input AI0	0	1	Bit0
Channel 2 analog input AI1	0	1	Bit1
3rd analog input AI2	0	1	Bit2
The 4th analog input AI3	0	1	Bit3
Example: Input: The 1st and 4th analog inputs are of current type, and the 2nd and 3rd analog inputs are of voltage type (0-10V)			
Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the fourth analog input bit3 = 0			
The binary representation of bit7~bit0 of address 52 is 0110, which is converted to hexadecimal and should be assigned to H6			

4.3 181 Communication format setting

181	Content	0	1
b0	Data length	b0: 7 bits (ASCII mode)	b0: 8 bits (RTU mode) (factory default)
b1 b2	parity	b2, b1=00	None (factory default)
		b2, b1=01	odd parity (odd)
		b2, b1=11	even parity (even)
b3	stop bit	1bit (factory default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps (factory default)	

181 How to Change Communication Settings

For example, the communication setting is 9600bps, data length 8 (RTU mode), no check and stop bit 1.

According to the parameter configuration table in the previous section, it can be concluded as follows:

Address: 181	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	0	0	0	0	1
communication format	b7~b4=1000 (H8) 9600bps				stop bit 1 bit	b2, b1=00 No verification		Data length 8 bits

the b7 to b0 values of the communication address 181 are respectively 1000 0001 and converted into hexadecimal H86, that is, the communication address 181 is assigned to H81.

4.4 Setting of dialing station number

code 8421	8	4	2	1
Station No.	SW1	SW2	SW3	SW4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

IX. HE-8AI4AOS2 Analog Input/Output Extension

If the extended line is used to connect with Juncauto host, only JH/JHM/JH2/JH2M/JHC/JHCM series host can be used. It is not allowed to mix with other series of host. Otherwise, normal use will be affected.

1. Product Features

Function	Model: HE-8AI4AOS2
Number of analog input points	8
Number of analog output points	4
Voltage input range	0-5V; 0-10V
Voltage output range	0V-10V
Current input/output range	0-20mA; 4-20mA
Communications	RS485 (screen printing D+, D-), factory baud rate is 115200bps, data length is 8 bits, stop bit 1, no check N, RTU mode.

If it is matched with the military innovation host, the expansion module has been connected to supply power to the expansion module through the expansion cable, so there is no need to separately connect the DC24V power supply.

The resolution is expressed as follows:

Type	Resolution
0-5V; 0-10V (voltage input)	K0-K4095 (12-bit resolution)
0-20mA	K0-K4095 (12-bit resolution)

0V-10V (voltage output)	K0-K4095 (12-bit resolution)

2. Wiring

Input: current type

Wiring mode: short circuit between I and V, signal connected to V, G connected to 0V

Voltage type

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

Output: current type

Wiring mode: V is not connected, signal is connected to I, G is connected to 0V

Voltage type

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

3. Programming Example - Match with Military Innovation Host

3.1 Description of Analog Input Example Procedure

Note: An example is taken as the first extension connected to the host, and the analog input type is current input. If the extension is not the first module connected to the host, please refer to D1968~D1983 and D1984~D1999 extension order definition below.

```
M1000
│
Always ON
when
running (a
contact)
                                            ┌─────────────────────────┐
                                            │ MOV    D500       D0    │
                                            └─────────────────────────┘
                                              Channel 1
                                              analog
                                              input
                                            ┌─────────────────────────┐
                                            │ MOV    D501       D0    │
                                            └─────────────────────────┘
                                              Channel 2
                                              analog
                                              input
                                            ┌─────────────────────────┐
                                            │ MOV    D502       D0    │
                                            └─────────────────────────┘
                                              Channel 3
                                              analog
                                              input
                                            ┌─────────────────────────┐
                                            │ MOV    D503       D0    │
                                            └─────────────────────────┘
                                              Channel 4
                                              analog
                                              input
                                            ┌─────────────────────────┐
                                            │ MOV    D504       D0    │
                                            └─────────────────────────┘
                                              Channel 5
                                              analog
                                              input
                                            ┌─────────────────────────┐
                                            │ MOV    D505       D0    │
                                            └─────────────────────────┘
                                              Channel 6
                                              analog
                                              input
                                            ┌─────────────────────────┐
                                            │ MOV    D506       D0    │
                                            └─────────────────────────┘
                                              Channel 7
                                              analog
                                              input
```

Example Description:

1) Definition of expansion module read address

Expansion Module Read Address	Function
D1968	Connected to expansion module 1
D1969	Connected to expansion module 2
D1970	Connected to expansion module 3
D1971	Connected to expansion module 4
D1972	Connected to expansion module 5
and so on	and so on
...	...

2) Extension module write address definition

Expansion module write address	Function
D1984	Connected to expansion module 1
D1985	Connected to expansion module 2
D1986	Connected to expansion module 3
D1987	Connected to expansion module 4
D1988	Connected to expansion module 5
and so on	and so on
...	...

3) D300 (S1) refers to the setting of average times, which is expressed as follows:

✧ The read address D1984 of the first expansion module in the example program is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1). The user can customize the start address, that is, change the value of K300.

Average times setting:

D300~D301: S1~S1+1 (32-bit)	Analog Input Channel	Value Setting	Function
bit0~bit3	1st analog input AI0	H2~H9	● The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. ● If 8 channels are set simultaneously, the default value is (H33333333), and the value is between H22222222 and H99999999, such as DMOV H33333333 D300 ● The larger the value, the more stable, but the slower the acquisition rate.
bit4~bit7	Channel 2 analog input AI1	H2~H9	
bit8~bit11	3rd analog input AI2	H2~H9	
bit12~bit15	The 4th analog input AI3	H2~H9	
...	...	H2~H9	
bit28~bit31	The 8th analog input AI7	H2~H9	

5) The mode of D302 analog input operation mode is as follows:

D302:(S1)+2	Analog Input Channel	Analog Input Type	
		Current type; Voltage type (0-5V)	Voltage type (0-10v)
Bit0	1st analog input AI0	0	1
Bit1	Channel 2 analog input AI1	0	1
Bit2	3rd analog input AI2	0	1
Bit3	The 4th analog input AI3	0	1
...	...	0	1
Bit7	The 8th analog input AI7	0	1
Example: Input: the 1st and 4-8 analog inputs are current type, and the 2nd and 3rd analog inputs are voltage (0-10V) Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the 4th to 8th analog input bit3~bit7=0000 The binary representation of bit7~bit0 of D302 is 0000 0110, and it shall be assigned to MOV H6 D302 in hexadecimal.			

5) Analog input address

✧ The read address D1968 of the first expansion module in the example program is assigned to K500, indicating that the start address of the channel input of the expansion module is D500 (S2). The user can customize the start address, that is, change the value of K500. The specific expression is shown in the

following table:

Passageway	Function	Analog Input Address
CH0-IN	1st analog input	D500: (S2)
CH1-IN	The 2nd analog input	D501: (S2)+1
CH2-IN	The 3rd analog input	D502:(S2)+2
CH3-IN	The 4th analog input	D503:(S2)+3
CH4-IN	The 5th analog input	D504:(S2)+4
CH5-IN	The 6th analog input	D505: (S2) +5
CH6-IN	The 7th analog input	D506: (S2)+6
CH7-IN	The 8th analog input	D507:(S2)+7

3.2 Description of Analog Output Example Procedure

Control 8 analog output 10V voltage:

Example Description

✧ Analog output address:

As described above, the write address D1984 of the first expansion module is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1), and the user can customize the start address, i.e. change the value of K300. The analog output address is represented in the following table:

Passageway	Function	Analog Output Address
	Average number of acquisitions (default H33333333)	D300~D301:S1~(S1)+1
	Input Mode of Operation	D302:(S1)+2
CH0-OUT	1st analog output	D303: (S1)+3
CH1-OUT	Channel 2 analog output	D304:(S1)+4
CH2-OUT	Analog output of the third channel	D305: (S1) +5
CH3-OUT	The 4th analog output	D306: (S1)+6

4. Description of RS485 communication address

RS2 command can be used for 485 communication with the host computer.

Common address: function code 0x03 for reading address and 0x10 for writing address.

MODBUS communication address (decimal)	Function	Description	Format
0~7	AD Acquisition Input Address	Analog quantity of channel AI0~AI7 is input to AD acquisition address.	16-bit integer, read-only
10~13	DA Output Address	AO0~AO3 channel analog output DA acquisition address.	16-bit integer, read and write
50~51	Average times setting	Set the value of bit0~bit31 of this address to determine the average number of analog quantity input acquisition of AI0~AI7 channels. See the next section for the setting of the average times.	32-bit integer, read/write
52	Working mode setting	for setting the operation in a voltage or current mode, See the next section for the operation mode setting	16-bit integer, read-only
The default baud rate of the communication parameters of this module is 115200, the data length is 8 bits, the stop bit is 1, there is no check N, RTU mode. Only station number and baud rate can be changed. The corresponding address and setting method are as follows:			
180	Station No.	The default is 1. If the station number is uncertain, the station number 0 can also be used for communication. If the dial switch SW1-SW4 is fully ON or OFF, the communication change station number is effective.	16-bit integer, read/write

		Refer to the next section by dialing the station number	
181	Communication Settings	Refer to the following description for communication settings: 181 Communication format settings. After the baud rate is changed, the module needs to be restarted. Factory default: 0, indicating that the communication is set as baud rate: 115200, data length: 8 bits, stop bit 1, no check N, RTU mode	16-bit integer, read/write
184	Communication Timeout (ms)	It means that all outputs will be automatically turned off if RS485 is not communicating within a certain number of milliseconds. If the setting value is less than or equal to 0, the communication timeout function is cancelled.	16-bit integer, read/write

Address for system (read only, no write): function code 0x03 for read address.

MODBUS communication address (decimal)	Function	Description	Format	Description
8-channel analog current input k and b value				
60	Current input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog current input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
62	Current input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
64	Current input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
66	Current input mode b value	Analog value b of channel AI1	32-bit floating-point number	
68	Current input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
70	Current input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
72	Current input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
74	Current input mode b value	Analog value b of channel AI3	32-bit floating-point number	
76	Current input mode k	Analog k value of AI4	32-bit	

	value	channel	floating-point number	
78	Current input mode b value	Analog value b of channel AI4	32-bit floating-point number	
80	Current input mode k value	Analog k value of AI5 channel	32-bit floating-point number	
82	Current input mode b value	Analog value b of channel AI5	32-bit floating-point number	
84	Current input mode k value	Analog k value of AI6 channel	32-bit floating-point number	
86	Current input mode b value	Analog value b of channel AI6	32-bit floating-point number	
88	Current input mode k value	Analog k value of AI7 channel	32-bit floating-point number	
90	Current input mode b value	Analog value b of channel AI7	32-bit floating-point number	
8-channel analog voltage input k and b value				
92	Voltage input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog voltage input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
94	Voltage input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
96	Voltage input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
98	Voltage input mode b value	Analog value b of channel AI1	32-bit floating-point number	
100	Voltage input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
102	Voltage input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
104	Voltage input mode k value	Analog k value of AI3 channel	32-bit floating-point

			number	
106	Voltage input mode b value	Analog value b of channel AI3	32-bit floating-point number	
108	Voltage input mode k value	Analog k value of AI4 channel	32-bit floating-point number	
110	Voltage input mode b value	Analog value b of channel AI4	32-bit floating-point number	
112	Voltage input mode k value	Analog k value of AI5 channel	32-bit floating-point number	
114	Voltage input mode b value	Analog value b of channel AI5	32-bit floating-point number	
116	Voltage input mode k value	Analog k value of AI6 channel	32-bit floating-point number	
118	Voltage input mode b value	Analog value b of channel AI6	32-bit floating-point number	
120	Voltage input mode k value	Analog k value of AI7 channel	32-bit floating-point number	
122	Voltage input mode b value	Analog value b of channel AI7	32-bit floating-point number	
4-channel analog output k and b values				
124	Voltage output mode k value	Analog quantity k value of AO0 channel	32-bit floating-point number	This function is used to correct the analog voltage output. Calibration has been made at the factory, so k, b are of value. if that value of k and b are 0, the analog output signal cannot be given.
126	Voltage output mode b value	AO0 channel analog quantity b value	32-bit floating-point number	
128	Voltage output mode k value	Analog k value of AO1 channel	32-bit floating-point number	
130	Voltage output mode b value	AO1 channel analog quantity b value	32-bit floating-point number	
132	Voltage output mode k value	k value of analog quantity of AO2 channel	32-bit floating-point number	

134	Voltage output mode b value	b value of analog quantity of AO2 channel	32-bit floating-point number	
136	Voltage output mode k value	Analog k value of AO3 channel	32-bit floating-point number	
138	Voltage output mode b value	b value of analog quantity of AO3 channel	32-bit floating-point number	

4.1 Setting of average times

Analog Input Channel	Value Setting	Address: 50~51
1st analog input AI0	H2~H9	bit0~bit3
Channel 2 analog input AI1	H2~H9	bit4~bit7
3rd analog input AI2	H2~H9	bit8~bit11
The 4th analog input AI3	H2~H9	bit12~bit15
...	H2~H9	...
The 8th analog input AI7	H2~H9	bit28~bit31

The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. If 8 channels are set at the same time, the default value is (H22222222), and the value is between H22222222 and H99999999. The larger the value, the more stable, but the slower the acquisition rate.

4.2 Working mode setting

Analog Input Channel	Analog Input Type		Address: 52
	Current type; Voltage type (0-5V)	Voltage type (0-10v)	
1st analog input AI0	0	1	Bit0
Channel 2 analog input AI1	0	1	Bit1
3rd analog input AI2	0	1	Bit2
The 4th analog input AI3	0	1	Bit3
...	0	1	...
The 8th analog input AI7	0	1	Bit7

Example: Input: the 1st and 4-8 analog inputs are current type, and the 2nd and 3rd analog inputs are voltage (0-10V)

Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the 4th to 8th

> analog input bit3~bit7=0000
>
> The binary representation of bit7~bit0 of address 52 is 0000 0110, and the hexadecimal value shall be assigned to H6

4.3 181 Communication format setting

181	Content	0	1
b0	Data length	b0: 7 bits (ASCII mode)	b0: 8 bits (RTU mode) (factory default)
b1 b2	parity	b2, b1=00	None (factory default)
		b2, b1=01	odd parity (odd)
		b2, b1=11	even parity (even)
b3	stop bit	1bit (factory default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps (factory default)	

181 How to Change Communication Settings

For example, the communication setting is 9600bps, data length 8 (RTU mode), no check and stop bit 1.

According to the parameter configuration table in the previous section, it can be concluded as follows:

Address: 181	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	0	0	0	0	1
communication format	b7~b4=1000 (H8) 9600bps				stop bit 1 bit	b2, b1=00 No verification		Data length 8 bits

the b7 to b0 values of the communication address 181 are respectively 1000 0001 and converted into hexadecimal H86, that is, the communication address 181 is assigned to H81.

4.4 Setting of dialing station number

code 8421	8	4	2	1
Station No.	SW1	SW2	SW3	SW4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

X. HE-8AI8AOS2 Analog Input/Output Expansion

If the extended line is used to connect with Juncauto host, only JH/JHM/JH2/JH2M/JHC/JHCM series host can be used. It is not allowed to mix with other series of host. Otherwise, normal use will be affected.

1. Product Features

Function	Model: HE-8AI8AOS2
Number of analog input points	8
Number of analog output points	8
Voltage input range	0-5V; 0-10V
Voltage output range	0V-10V
Current input/output range	0-20mA; 4-20mA
Communications	RS485 (screen printing D+, D-), factory baud rate is 115200bps, data length is 8 bits, stop bit 1, no check N, RTU mode.

If it is matched with the military innovation host, the expansion module has been connected to supply power to the expansion module through the expansion cable, so there is no need to separately connect the DC24V power supply.

The resolution is expressed as follows:

Type	Resolution
0-5V; 0-10V (voltage input)	K0-K4095 (12-bit resolution)
0-20mA	K0-K4095 (12-bit resolution)
0V-10V (voltage output)	K0-K4095 (12-bit resolution)

2. Wiring

Input: current type

Wiring mode: short circuit between I and V, signal connected to V, G connected to 0V

Voltage type

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

Output: current type

Wiring mode: V is not connected, signal is connected to I, G is connected to 0V

Voltage type

Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

3. Programming Example - Match with Military Innovation Host

3.1 Description of Analog Input Example Procedure

Note: An example is taken as the first extension connected to the host, and the analog input type is current input. If the extension is not the first module connected to the host, please refer to D1968~D1983 and D1984~D1999 extension order definition below.

```
M1002
 | |                                              ┤MOV    K500        D1968
Start                                                         Expansion
positive                                                      module 1
(instant                                                      read
'On' of                                                       address

                                                 ┤MOV    K300        D1984
                                                              Expansion
                                                              module 1
                                                              write
                                                              address

M1000
 | |                                              ┤DMOV   H33333333   D300
Always ON                                                     Average
when                                                          frequency
running (a
contact)
                                                 ┤MOV    K0          D302
                                                              Online
                                                              mode
```

Example Description:

1) Definition of expansion module read address

Expansion Module Read Address	Function
D1968	Connected to expansion module 1
D1969	Connected to expansion module 2
D1970	Connected to expansion module 3
D1971	Connected to expansion module 4
D1972	Connected to expansion module 5
and so on	and so on
...	...

2) Extension module write address definition

Expansion module write address	Function
D1984	Connected to expansion module 1
D1985	Connected to expansion module 2
D1986	Connected to expansion module 3
D1987	Connected to expansion module 4
D1988	Connected to expansion module 5
and so on	and so on
...	...

3) D300 (S1) refers to the setting of average times, which is expressed as follows:

✧ The read address D1984 of the first expansion module in the example program is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1). The user can customize the start address, that is, change the value of K300.

Average times setting:

D300~D301: S1~S1+1 (32-bit)	Analog Input Channel	Value Setting	Function
bit0~bit3	1st analog input AI0	H2~H9	● The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. ● If 8 channels are set simultaneously, the default value is (H33333333), and the value is between H22222222 and H99999999, such as DMOV H33333333 D300 ● The larger the value, the more stable, but the slower the acquisition rate.
bit4~bit7	Channel 2 analog input AI1	H2~H9	
bit8~bit11	3rd analog input AI2	H2~H9	
bit12~bit15	The 4th analog input AI3	H2~H9	
...	...	H2~H9	
bit28~bit31	The 8th analog input AI7	H2~H9	

6) The mode of D302 analog input operation mode is as follows:

D302:(S1)+2	Analog Input Channel	Analog Input Type	
		Current type; Voltage type (0-5V)	Voltage type (0-10v)
Bit0	1st analog input AI0	0	1
Bit1	Channel 2 analog input AI1	0	1
Bit2	3rd analog input AI2	0	1
Bit3	The 4th analog input AI3	0	1
...	...	0	1
Bit7	The 8th analog input AI7	0	1

Example: Input: The 1st and 4-8 analog inputs are current type, and the 2nd and 3rd analog inputs are voltage (0-10V)

Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the 4th to 8th analog input bit3~bit7=0000

The binary representation of bit7~bit0 of D302 is 0000 0110, and it shall be assigned to MOV H6 D302 in hexadecimal.

5) Analog input address

✧ The read address D1968 of the first expansion module in the example program is assigned to K500, indicating that the start address of the channel input of the expansion module is D500 (S2). The user can customize the start address, that is, change the value of K500. The specific expression is shown in the

following table:

Passageway	Function	Analog Input Address
CH0-IN	1st analog input	D500: (S2)
CH1-IN	The 2nd analog input	D501: (S2)+1
CH2-IN	The 3rd analog input	D502:(S2)+2
CH3-IN	The 4th analog input	D503:(S2)+3
CH4-IN	The 5th analog input	D504:(S2)+4
CH5-IN	The 6th analog input	D505: (S2) +5
CH6-IN	The 7th analog input	D506: (S2)+6
CH7-IN	The 8th analog input	D507:(S2)+7

3.2 Description of Analog Output Example Procedure

Control 8 analog output 10V voltage:

```
M1000
  │ │                                          MOV   K300    D1984
Always ON                                               Expansion
when                                                    module 1
running (a                                              write
contact)                                                address

                                            MOV   K4095   D303
                                                        Channel 1
                                                        analog
                                                        output

                                            MOV   K4095   D304
                                                        Channel 2
                                                        analog
                                                        output

                                            MOV   K4095   D305
                                                        Channel 3
                                                        analog
                                                        output

                                            MOV   K4095   D306
                                                        Channel 4
                                                        analog
                                                        output

                                            MOV   K4095   D307
                                                        Channel 5
                                                        analog
                                                        output

                                            MOV   K4095   D308
                                                        Channel 6
                                                        analog
                                                        output

                                            MOV   K4095   D309
                                                        Channel 7
                                                        analog
                                                        output

                                            MOV   K4095   D310
                                                        Channel 8
                                                        analog
                                                        output
```

Example Description

◇   Analog output address:

As described above, the write address D1984 of the first expansion module is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1), and the user can customize the start address, i.e. change the value of K300. The analog output address is represented in the following table:

Passageway	Function	Analog Output Address
	Average number of acquisitions (default H33333333)	D300~D301:S1~(S1)+1
	Input Mode of Operation	D302:(S1)+2
CH0-OUT	1st analog output	D303: (S1)+3
CH1-OUT	Channel 2 analog output	D304:(S1)+4
CH2-OUT	Analog output of the third channel	D305: (S1) +5
CH3-OUT	The 4th analog output	D306: (S1)+6
CH4-OUT	The 5th analog output	D307: (S1)+7
CH5-OUT	The 6th analog output	D308: (S1)+8
CH6-OUT	The 7th analog output	D309: (S1)+9
CH7-OUT	The 8th analog output	D310: (S1)+10

4. Description of RS485 communication address

RS2 command can be used for 485 communication with the host computer.

Common address: function code 0x03 for reading address and 0x10 for writing address.

MODBUS communication address (decimal)	Function	Description	Format
0~7	AD Acquisition Input Address	Analog quantity of channel AI0~AI7 is input to AD acquisition address.	16-bit integer, read-only
10~17	DA Output Address	AO0~AO7 channel analog output DA acquisition address.	16-bit integer, read and write
50~51	Average times setting	Set the value of bit0~bit31 of this address to determine the average number of analog quantity input acquisition of AI0~AI7 channels. See the next section for the setting of the average times.	32-bit integer, read/write
52	Working mode setting	for setting the operation in a voltage or current mode, See the next section for the operation mode setting	16-bit integer, read-only
The default baud rate of the communication parameters of this module is 115200, the data length is 8 bits, the stop bit is 1, there is no check N, RTU mode. Only station number and baud rate can be changed. The corresponding address and setting method are as follows:			
180	Station No.	The default is 1. If the station number is uncertain, the station number 0 can also be used for communication. If the dial switch SW1-SW4 is fully ON or OFF, the communication change station number is effective. To set the station number by dialing, see the next section	16-bit integer, read/write
181	Communication Settings	Refer to the following description for communication settings: 181 Communication format settings. After the baud rate is changed, the module needs to be restarted. Factory default: 0, indicating that the communication is set as baud rate: 115200, data length: 8 bits, stop bit 1, no check N, RTU mode	16-bit integer, read/write
184	Communication Timeout (ms)	It means that all outputs will be automatically turned off if RS485 is not communicating within a certain number of milliseconds. If the setting value is less than or equal to 0, the communication timeout function is cancelled.	16-bit integer, read/write

Address for system (read only, no write): function code 0x03 for read address.

MODBUS communication address (decimal)	Function	Description	Format	Description
8-channel analog current input k and b value				
60	Current input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog current input. Calibration has been made at the factory, so k and b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
62	Current input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
64	Current input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
66	Current input mode b value	Analog value b of channel AI1	32-bit floating-point number	
68	Current input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
70	Current input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
72	Current input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
74	Current input mode b value	Analog value b of channel AI3	32-bit floating-point number	
76	Current input mode k value	Analog k value of AI4 channel	32-bit floating-point number	
78	Current input mode b value	Analog value b of channel AI4	32-bit floating-point number	
80	Current input mode k value	Analog k value of AI5 channel	32-bit floating-point number	
82	Current input mode b value	Analog value b of channel AI5	32-bit floating-point number	
84	Current input mode k	Analog k value of AI6	32-bit	

	value	channel	floating-point number	
86	Current input mode b value	Analog value b of channel AI6	32-bit floating-point number	
88	Current input mode k value	Analog k value of AI7 channel	32-bit floating-point number	
90	Current input mode b value	Analog value b of channel AI7	32-bit floating-point number	
8-channel analog voltage input k and b value				
92	Voltage input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog voltage input. Calibration has been made at the factory, so k and b are of value. If the k and b values are 0, the acquisition analog input addresses (0~7) are always 0, and analog input signals cannot be displayed.
94	Voltage input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
96	Voltage input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
98	Voltage input mode b value	Analog value b of channel AI1	32-bit floating-point number	
100	Voltage input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
102	Voltage input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
104	Voltage input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
106	Voltage input mode b value	Analog value b of channel AI3	32-bit floating-point number	
108	Voltage input mode k value	Analog k value of AI4 channel	32-bit floating-point number	
110	Voltage input mode b value	Analog value b of channel AI4	32-bit floating-point number	
112	Voltage input mode k value	Analog k value of AI5 channel	32-bit floating-point	

			number	
114	Voltage input mode b value	Analog value b of channel AI5	32-bit floating-point number	
116	Voltage input mode k value	Analog k value of AI6 channel	32-bit floating-point number	
118	Voltage input mode b value	Analog value b of channel AI6	32-bit floating-point number	
120	Voltage input mode k value	Analog k value of AI7 channel	32-bit floating-point number	
122	Voltage input mode b value	Analog value b of channel AI7	32-bit floating-point number	
8-channel analog voltage output k and b value				
124	Voltage output mode k value	Analog quantity k value of AO0 channel	32-bit floating-point number	
126	Voltage output mode b value	AO0 channel analog quantity b value	32-bit floating-point number	
128	Voltage output mode k value	Analog k value of AO1 channel	32-bit floating-point number	
130	Voltage output mode b value	AO1 channel analog quantity b value	32-bit floating-point number	This function is used to correct the analog voltage output. Calibration has been made at the factory, so k and b are of value. if that value of k and b are 0, the analog output signal cannot be given.
132	Voltage output mode k value	k value of analog quantity of AO2 channel	32-bit floating-point number	
134	Voltage output mode b value	b value of analog quantity of AO2 channel	32-bit floating-point number	
136	Voltage output mode k value	Analog k value of AO3 channel	32-bit floating-point number	
138	Voltage output mode b value	b value of analog quantity of AO3 channel	32-bit floating-point number	
140	Voltage output mode k value	k value of analog quantity of AO4 channel	32-bit floating-point number	

142	Voltage output mode b value	b value of analog quantity of AO4 channel	32-bit floating-point number	
144	Voltage output mode k value	Analog k value of AO5 channel	32-bit floating-point number	
146	Voltage output mode b value	b value of analog quantity of AO5 channel	32-bit floating-point number	
148	Voltage output mode k value	Analog k value of AO6 channel	32-bit floating-point number	
150	Voltage output mode b value	b value of analog quantity of AO6 channel	32-bit floating-point number	
152	Voltage output mode k value	Analog k value of AO7 channel	32-bit floating-point number	
154	Voltage output mode b value	AO7 channel analog quantity b value	32-bit floating-point number	

4.1 Setting of average times

Analog Input Channel	Value Setting	Address: 50~51
1st analog input AI0	H2~H9	bit0~bit3
Channel 2 analog input AI1	H2~H9	bit4~bit7
3rd analog input AI2	H2~H9	bit8~bit11
The 4th analog input AI3	H2~H9	bit12~bit15
...	H2~H9	...
The 8th analog input AI7	H2~H9	bit28~bit31
The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. If 8 channels are set at the same time, the default value is (H22222222), and the value is between H22222222 and H99999999. The larger the value, the more stable, but the slower the acquisition rate. Note: The average number of changes needs to be reset.		

4.2 Working mode setting

Analog Input Channel	Analog Input Type		Address: 52
	Current type; Voltage type (0-5V)	Voltage type (0-10v)	
1st analog input AI0	0	1	Bit0
Channel 2 analog input AI1	0	1	Bit1
3rd analog input AI2	0	1	Bit2
The 4th analog input AI3	0	1	Bit3
...	0	1	...
The 8th analog input AI7	0	1	Bit7
Example: Input: The 1st and 4-8 analog inputs are current type, and the 2nd and 3rd analog inputs are voltage (0-10V) Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the 4th to 8th analog input bit3~bit7=0000 The binary representation of bit7~bit0 of address 52 is 0000 0110, and the hexadecimal value shall be assigned to H6			

4.3 181 Communication format setting

181	Content	0	1
b0	Data length	b0: 7 bits (ASCII mode)	b0: 8 bits (RTU mode) (factory default)
b1 b2	parity	b2, b1=00	None (factory default)
		b2, b1=01	odd parity (odd)
		b2, b1=11	even parity (even)
b3	stop bit	1bit (factory default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps (factory default)	

181 How to Change Communication Settings

For example, the communication setting is 9600bps, data length 8 (RTU mode), no check and stop bit 1.

According to the parameter configuration table in the previous section, it can be concluded as follows:

Address: 181	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	0	0	0	0	1
communication format	b7~b4=1000 (H8) 9600bps				stop bit 1 bit	b2, b1=00 No verification		Data length 8 bits

the b7 to b0 values of the communication address 181 are respectively 1000 0001 and converted into hexadecimal H86, that is, the communication address 181 is assigned to H81.

4.4 Setting of dialing station number

code 8421	8	4	2	1
Station No.	SW1	SW2	SW3	SW4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

XI. Temperature Extension of

HE-2TC/n2TC/2TCY/n2TCY/2TCY2/n2TCY2 Thermocouple

Same as SE series extension temperature function, please click SE-2TC/n2TC/2TCY/n2TCY/2TCY2/n2TCY2 in SE series extension column.

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

XII. Temperature expansion of

HE-4TC/n4TC/4TCY/n4TCY/4TCY2/n4TCY2 thermocouple

Same as SE series extension temperature function, please click SE-2TC/n2TC/2TCY/n2TCY/2TCY2/n2TCY2 in SE series extension column.

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

XIII. HE-8TC/n8TC/8TCY/n8TCY/8TCY2/n8TCY2 Thermocouple

Temperature Extension

Same as SE series extension temperature function, please click SE-8TC/n8TC/8TCY/n8TCY/8TCY2/n8TCY2 in SE series extension column.

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

XIV. HE-4PT, HE-4PT2 Thermal Resistance Temperature Extension

The functions of HE-4PT and HE-4PT2 are the same as SE-4PT and SE-4PT2. Please refer to SE-4PT and SE-4PT2 data description in the SE series extension column.

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

XV. HE-8PT, HE-8PT2 Thermal Resistance Temperature Extension

The functions of HE-8PT and HE-8PT2 are the same as SE-8PT and SE-8PT2. Please refer to SE-8PT and SE-8PT2 data description in the SE series extension column.

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

XVI. HE-2L, HE-4L Weighing Extension

HE-2L, HE-4L and SE-4L have the same function. Please click SE-2L and SE-4L in the SE series extension column. 请点击栏中 SS 资料说明。

If it is connected to the mainframe of Juncauto, only the mainframe of JH/JHM/JH2/JH2M/JHC/JHCM series can be used. It is not allowed to mix with the mainframe of other series of Juncauto. Otherwise, the normal use will be affected.

XVII. HE-4hAI2AO/4hAI2AO2 analog input/output expansion

It can only be used with JH/JHM/JH2/JH2M/JHC/JHCM series of hosts. It is not allowed to mix with other series of hosts. Otherwise, normal operation will be affected.

1. Product Features

Model	HE-4hAI2AO	HE-4hAI2AO2
Number of analog input points	4	4
Number of analog output points	2	2
Voltage input range	−10V−10V	−10V−10V
Voltage output range	−10V−10V	−10V−10V
Current input/output range	0-20mA; 4-20mA	0-20mA; 4-20mA
Communications	/	RS485 (screen printing D+, D-), factory baud rate is 115200bps, data length is 8 bits, stop bit 1, no check N, RTU mode.

The resolution is expressed as follows:

Type	Resolution
−10V~10V (voltage input)	k−30000~K30000 (16-bit resolution)
0-20mA	K0~K30000 (16-bit resolution)
−10V~10V (voltage output)	-K4095-K4095 (12-bit resolution)

2. Wiring

Input: current type

    Wiring mode: short circuit between I and V, signal connected to V, G connected to 0V

    Voltage type

    Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

Output: current type

    Wiring mode: V is not connected, signal is connected to I, G is connected to 0V

    Voltage type

    Wiring mode: I is not connected, signal is connected to V, G is connected to 0V

3. Programming Example - Match with Military Innovation Host

Applicable to HE-4hAI2AO and HE-4hAI2AO2 models

3.1 Description of Analog Input Example Procedure

Note: 1. For example, the first extension is connected to the host, and the analog input type is current input. If the extension is not the first module connected to the host, please refer to D1968~D1983 and D1984~D1999 extension order definition below.

Example Description:

1) Definition of expansion module read address

Expansion Module Read Address	Function
D1968	Connected to expansion module 1
D1969	Connected to expansion module 2
D1970	Connected to expansion module 3
D1971	Connected to expansion module 4
D1972	Connected to expansion module 5
and so on	and so on
...	...

2) Extension module write address definition

Expansion module write address	Function
D1984	Connected to expansion module 1
D1985	Connected to expansion module 2
D1986	Connected to expansion module 3
D1987	Connected to expansion module 4
D1988	Connected to expansion module 5
and so on	and so on
...	...

4）D300 is expressed as follows:

✧   The read address D1984 of the first expansion module in the example program is assigned to K300,

indicating that the start address of the channel output of the expansion module is D300 (S1). The user can customize the start address, that is, change the value of K300.

Output Start Address	Function
D300: (S1)	Average number of acquisitions H2222-H77777 (default H3333)

4) The mode of D301 analog input operation mode is as follows:

Passageway	Analog Input Type		D301 (S1)+1
	Current type	Voltage type	
1st analog input bit0	0	1	(bit3~bit0)
Analog input bit1 of channel 2	0	1	
Analog input bit2 of channel 3	0	1	
The 4th analog input bit3	0	1	
Example: Input: The 1st and 4th analog inputs are of current type, and the 2nd and 3rd analog inputs are of voltage type Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the fourth analog input bit3 = 0 The binary representation of bit3~bit0 of D301 is 0110, and the value shall be assigned to MOV H6 D301 when it is converted into hexadecimal.			

5) Analog input address

✧ The read address D1968 of the first expansion module in the example program is assigned to K500, indicating that the start address of the channel input of the expansion module is D500 (S2). The user can customize the start address, that is, change the value of K500. The specific expression is shown in the following table:

Passageway	Function	Analog Input Address
CH0-IN	1st analog input	D500: (S2)
CH1-IN	The 2nd analog input	D501: (S2)+1
CH2-IN	The 3rd analog input	D502:(S2)+2
CH3-IN	The 4th analog input	D503:(S2)+3

3.2 Description of Analog Output Example Procedure

Example Description

Analog output address:

✧ As described above, the write address D1984 of the first expansion module is assigned to K300, indicating that the start address of the channel output of the expansion module is D300 (S1), and the user can customize the start address, i.e. change the value of K300. The analog output address is represented in the following table:

Passageway	Function	Analog Output Address
	Average number of acquisitions (default H3333)	D300: (S1)
	Input Mode of Operation	D301: (S1)+1
CH0-OUT	1st analog output	D302:(S1)+2
CH1-OUT	Channel 2 analog output	D303: (S1)+3

In the example, D302 is assigned to K4095, which indicates that the output voltage is 10V.

4. HE-4AI2AO2: RS485 Communication Address Description

RS2 command can be used for 485 communication with the host computer.

Common address: function code 0x03 for reading address and 0x10 for writing address.

MODBUS communication address (decimal)	Function	Description	Format
0~3	AD Analog Input Address	Analog quantity of channel AI0~AI3 is input to AD acquisition address.	16-bit integer, read-only
10~11	DA Analog Output Address	AO0~AO3 channel analog output DA address.	16-bit integer, read and write
50	Average times setting	Set the value of bit0~bit15 of this address to determine the average number of analog quantity input acquisition of AI0~AI3 channels. See the next section for the setting of the average times.	16-bit integer, read/write
51	Working mode setting	for setting the operation in a voltage or current mode, See the next section for working mode setting instructions	16-bit integer, read-only
The default baud rate of the communication parameters of this module is 115200, the data length is 8 bits, the stop bit is 1, there is no check N, RTU mode. Only station number and baud rate can be changed. The corresponding address and setting method are as follows:			
180	Station No.	The default is 1. If the station number is uncertain, the station number 0 can also be used for communication. If the dial switch SW1-SW4 is fully ON or OFF, the communication change station number is effective.	16-bit integer, read/write

		Refer to the next section by dialing the station number	
181	Communication Settings	Refer to the following description for communication settings: 181 Communication format settings. After the baud rate is changed, the module needs to be restarted. Factory default: 0, indicating that the baud rate of communication setting is 115200, data length: 8 bits, stop bit 1, no check N, RTU mode	16-bit integer, read/write
184	Communication Timeout (ms)	It means that all outputs will be automatically turned off if RS485 is not communicating within a certain number of milliseconds. If the setting value is less than or equal to 0, the communication timeout function is cancelled.	16-bit integer, read/write

Address for system (read only, no write): function code 0x03 for read address.

MODBUS communication address (decimal)	Function	Description	Format	Description
4-channel analog current input k and b value				
60	Current input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog current input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input address (0~3) is always 0, and the analog input signal cannot be displayed.
62	Current input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
64	Current input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
66	Current input mode b value	Analog value b of channel AI1	32-bit floating-point number	
68	Current input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
70	Current input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
72	Current input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
74	Current input mode b value	Analog value b of channel AI3	32-bit floating-point number	
4-channel analog voltage input k and b value				

92	Voltage input mode k value	Analog quantity k value of AI0 channel	32-bit floating-point number	This function is used to correct the analog voltage input. Calibration has been made at the factory, so k, b are of value. If the k and b values are 0, the acquisition analog input address (0~3) is always 0, and the analog input signal cannot be displayed.
94	Voltage input mode b value	AI0 channel analog quantity b value	32-bit floating-point number	
96	Voltage input mode k value	Analog k value of AI1 channel	32-bit floating-point number	
98	Voltage input mode b value	Analog value b of channel AI1	32-bit floating-point number	
100	Voltage input mode k value	Analog k value of AI2 channel	32-bit floating-point number	
102	Voltage input mode b value	Analog value b of AI2 channel	32-bit floating-point number	
104	Voltage input mode k value	Analog k value of AI3 channel	32-bit floating-point number	
106	Voltage input mode b value	Analog value b of channel AI3	32-bit floating-point number	
2-channel analog output k and b values				
124	Voltage output mode k value	Analog quantity k value of AO0 channel	32-bit floating-point number	This function is used to correct the analog output. Calibration has been made at the factory, so k, b are of value. if that value of k and b are 0, the analog output signal cannot be given.
126	Voltage output mode b value	AO0 channel analog quantity b value	32-bit floating-point number	
128	Voltage output mode k value	Analog k value of AO1 channel	32-bit floating-point number	
130	Voltage output mode b value	AO1 channel analog quantity b value	32-bit floating-point number	

4.1 Setting of average times

Analog Input Channel	Value Setting	Address: 50~51

1st analog input AI0	H2~H7	bit0~bit3
Channel 2 analog input AI1	H2~H7	bit4~bit7
3rd analog input AI2	H2~H7	bit8~bit11
The 4th analog input AI3	H2~H7	bit12~bit15

The average number of times of each channel is generally set to H2 by default, which means that the analog quantity acquisition times of the channel is 2 to the power of 2. If 8 channels are set simultaneously, the default value is (H22222), and the value is between H2222 and H7777. The larger the value, the more stable, but the slower the acquisition rate.

4.2 Working mode setting

Analog Input Channel	Analog Input Type		Address: 52
	Current type	Voltage type	
1st analog input AI0	0	1	Bit0
Channel 2 analog input AI1	0	1	Bit1
3rd analog input AI2	0	1	Bit2
The 4th analog input AI3	0	1	Bit3

Example: Input: The 1st and 4th analog inputs are of current type, and the 2nd and 3rd analog inputs are of voltage type

Then: the first analog input bit0 = 0, the second analog input bit1 = 1, the third analog input bit2 = 1, and the fourth analog input bit3 = 0

The binary representation of bit7~bit0 of address 52 is 0110, which is converted to hexadecimal and should be assigned to H6

4.3 181 Communication format setting

181	Content	0	1
b0	Data length	b0: 7 bits (ASCII mode)	b0: 8 bits (RTU mode) (factory default)
b1 b2	parity	b2, b1=00	None (factory default)
		b2, b1=01	odd parity (odd)
		b2, b1=11	even parity (even)
b3	stop bit	1bit (factory default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	

b7~b4=1011 (HB)	57600bps
b7~b4=1100 (HC)	115200bps (factory default)

181 How to Change Communication Settings

For example, the communication setting is 9600bps, data length 8 (RTU mode), no check and stop bit 1.

According to the parameter configuration table in the previous section, it can be concluded as follows:

Address: 181	b7	b6	b5	b4	b3	b2	b1	b0
Value	1	0	0	0	0	0	0	1
communication format	b7~b4=1000 (H8) 9600bps				stop bit 1 bit	b2, b1=00 No verification		Data length 8 bits

the b7 to b0 values of the communication address 181 are respectively 1000 0001 and converted into hexadecimal H86, that is, the communication address 181 is assigned to H81.

4.4 Setting of dialing station number

code 8421	8	4	2	1
Station No.	SW1	SW2	SW3	SW4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

Appendix 1 Example of Multiple Extension Definitions

For example: The following figure shows the PLC installation sequence

```
host: JS-24T-D === Extension 1 === Extension 2 === Extension 3 === Extension 4
                     SE-16T          SE-4AI2AOS       SE-8PT          SE-4AOS
```

Host computer	Extension 1	Extension 2	Extension 3	Extension 4
JS-24T-D	SE-16T (Expansion of digital quantity need not be defined, but still occupied)	SE-4AI2AOS	SE-8PT	SE-4AOS
Read System Address	D1968	D1969	D1970	D1971
Write System Address	D1984	D1985	D1986	D1987

1. SE-16T is the first extension connected to the host. Therefore, the extension defines the read/write start system address as D1968/D1984 (the extension of digital quantity only occupies the system address and does not need to be defined). The example procedure is as follows:
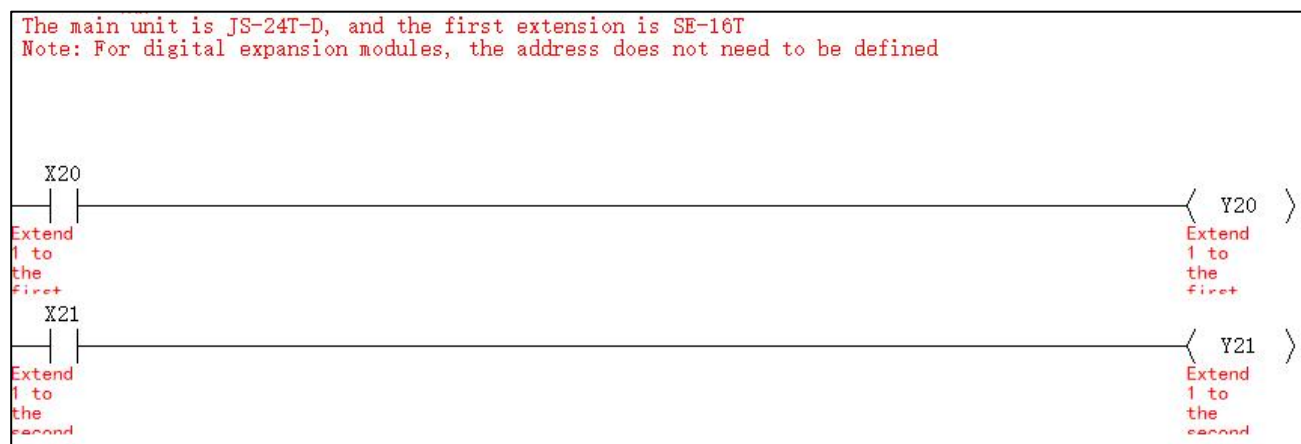
2. SE-4AI2AOS is the second extension connected to the host. Therefore, the extension defines the read/write system address as D1969/D1985. The example procedure is as follows:

```
Example of the second expansion module: SE-4AI2AOS (if current type input)

M1002
Start
forward
(instant
'On' of                                                          MOV    K2000    D1969
                                                                                 extensio
                                                                                 module
                                                                                 2 Read
                                                                                 the

                                                                          MOV    K3000    D1985
                                                                                 extensio
                                                                                 module
                                                                                 2 Write
                                                                                 the

                                                                          MOV    K0       D3001
                                                                                 Working
                                                                                 mode

                                                                          MOV    H2222    D3000
                                                                                 Average
                                                                                 number
                                                                                 of
                                                                                 acquisit
```
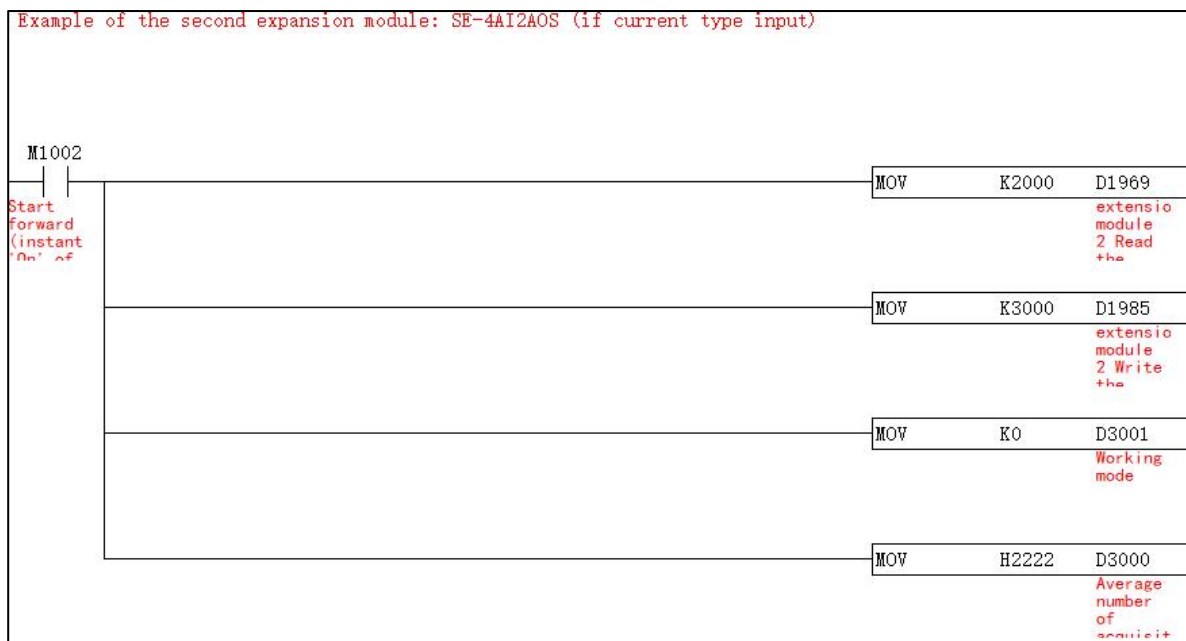
3. SE-8PT is the third extension connected to the host. Therefore, the extension defines the starting system address of read/write as D1970/D1986. The example procedure is as follows:

```
M1002
Start
forward
(instant
'On' of                                                          MOV    K2100    D1970
                                                                                 extensio
                                                                                 module
                                                                                 3 Read
                                                                                 the

                                                                          MOV    K3100    D1986
                                                                                 extensio
                                                                                 module
                                                                                 3 Write
                                                                                 the

                                                                          DMOV   H99999999 D3100
                                                                                 Average
                                                                                 number
                                                                                 of
                                                                                 8-way

                                                                          MOV    K0       D3102
                                                                                 PT100
                                                                                 mode

M1000
Operatio
monitori
normally                                                         MOV    D2100    D0
open                                                                             Read
                                                                                 temperat
                                                                                 1

                                                                          MOV    D2101    D0
                                                                                 Read
                                                                                 temperat
                                                                                 2
```
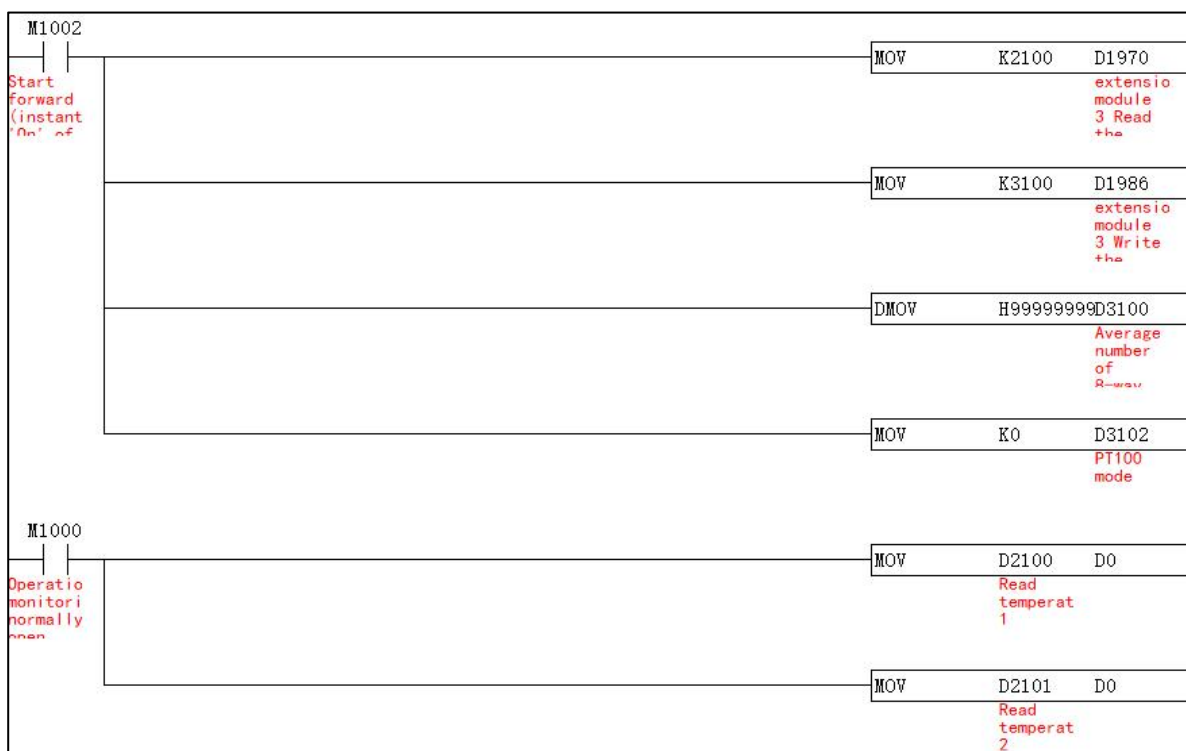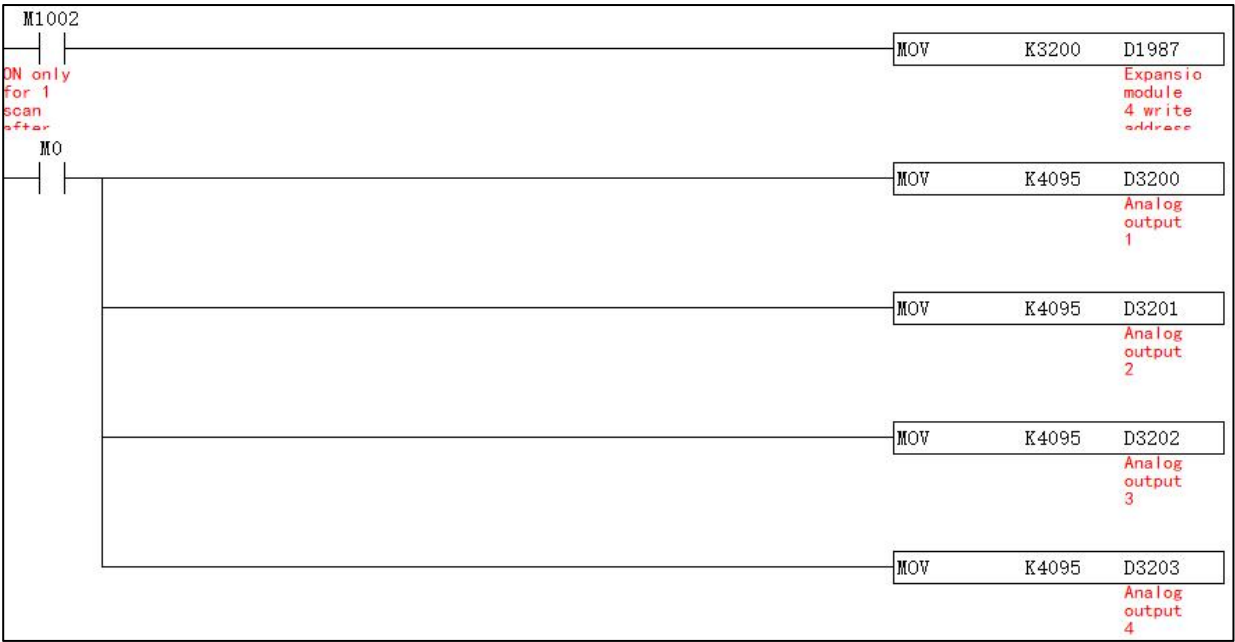
4. SE-4AOS is the fourth extension connected to the host. Therefore, the extension defines the read/write start system address as D1971/D1987. Since SE-4AOS is an analog input, D1971 does not need to be defined. The example procedure is as follows:

```
M1002
 | |                                                    ┌MOV    K3200    D1987
ON only                                                            Expansio
for 1                                                              module
scan                                                               4 write
after                                                              address
 M0
 | |  ┬                                                 ┌MOV    K4095    D3200
      │                                                            Analog
      │                                                            output
      │                                                            1
      │
      ├                                                 ┌MOV    K4095    D3201
      │                                                            Analog
      │                                                            output
      │                                                            2
      │
      ├                                                 ┌MOV    K4095    D3202
      │                                                            Analog
      │                                                            output
      │                                                            3
      │
      └                                                 ┌MOV    K4095    D3203
                                                                   Analog
                                                                   output
                                                                   4
```

Appendix 2 Motor Command Parameter Table

Passageway	pulse	Direction	Output the current number of pulses	Pulse completion flag	Pulse transmission in progress	non-deceleration emergency stop position	Start frequency K10-K32767 Default K200
			32-bit integer				16-bit integer
CH0(Y0, Y1)	Y0	Y1	D1648	M1029	M1344	M1308	D1340
CH1(Y2, Y3)	Y2	Y3	D1664	M1030	M1345	M1309	D1352
CH2(Y4, Y5)	Y4	Y5	D1680	M1036	M1346	M1310	D1379
CH3(Y6, Y7)	Y6	Y7	D1696	M1037	M1347	M1311	D1380
CH4(Y10, Y11)	Y10	Y11	D1712	M1102	M1348	M1312	D1400
CH5 (Y12, Y13)	Y12	Y13	D1728	M1103	M1349	M1313	D1401
CH6 (Y14, Y15)	Y14	Y15	D1744	M1104	M1350	M1314	D1402
CH7 (Y16, Y17)	Y16	Y17	D1760	M1105	M1351	M1315	D1403
CH8(Y20, Y21)	Y20	Y21	D1776	M1106	M1352		D1404
CH9(Y22, Y23)	Y22	Y23	D1792	M1107	M1353		D1405
CH10(Y24, Y25)	Y24	Y25	D1808	M1108	M1354		D1406
CH11(Y26, Y27)	Y26	Y27	D1824	M1109	M1355		D1407
CH12 (Y30, Y31)	Y30	Y31	D1840	M1110	M1356		D1408
CH13 (Y32, Y33)	Y32	Y33	D1856	M1111	M1357		D1409
CH14 (Y34, Y35)	Y34	Y35	D1872	M1112	M1358		D1410
CH15 (Y36, Y37)	Y36	Y37	D1888	M1113	M1359		D1411

Passageway	Acceleration/deceleration time K10-K10000 Default K100	deceleration time K10-K10000 Default K0	Target Location	acceleration	Current Speed	Target speed	Max Speed
	16-bit integer	16-bit integer	32-bit integer	32-bit floating-point number	32-bit floating-point number	32-bit floating-point number	32-bit integer
CH0(Y0, Y1)	D1343	D1936	D1650	D1654	D1656	D1658	D1426
CH1(Y2, Y3)	D1353	D1937	D1666	D1670	D1672	D1674	D1428
CH2(Y4, Y5)	D1381	D1938	D1682	D1686	D1688	D1690	D1430
CH3(Y6, Y7)	D1382	D1939	D1698	D1702	D1704	D1706	D1432
CH4(Y10, Y11)	D1383	D1940	D1714	D1718	D1720	D1722	D1434
CH5 (Y12, Y13)	D1384	D1941	D1730	D1734	D1736	D1738	D1436
CH6 (Y14, Y15)	D1385	D1942	D1746	D1750	D1752	D1754	D1438
CH7 (Y16, Y17)	D1386	D1943	D1762	D1766	D1768	D1770	D1440
CH8(Y20, Y21)	D1387	D1944	D1778	D1782	D1784	D1786	D1442
CH9(Y22, Y23)	D1388	D1945	D1794	D1798	D1800	D1802	D1444
CH10(Y24, Y25)	D1389	D1946	D1810	D1814	D1816	D1818	D1446
CH11(Y26, Y27)	D1390	D1947	D1826	D1830	D1832	D1834	D1448
CH12 (Y30, Y31)	D1391	D1948	D1842	D1846	D1848	D1850	
CH13 (Y32, Y33)	D1392	D1949	D1858	D1862	D1864	D1866	
CH14 (Y34, Y35)	D1393		D1874	D1878	D1880	D1882	
CH15 (Y36, Y37)	D1394		D1890	D1894	D1896	D1898	

Description:

1. Pulse transmission completion flag bit M1029: start pulse command. When pulse output is completed, the corresponding pulse output completion flag bit system will be automatically turned on. When the command is restarted next time, the corresponding pulse completion flag bit M1029 will automatically change from ON to OFF. After the pulse is sent, the system will be set to ON again.

2. Flag bit M1344 in pulse transmission: start the pulse command. When the pulse is in the process of sending, the corresponding flag bit in pulse transmission M1344 will be automatically turned on by the system. When the pulse output is completed, the flag bit M1344 in pulse transmission will be automatically OFF.

3. No-deceleration emergency stop position M1308: After the emergency stop, besides the relevant M1308 shall be turned off, the front

condition switches of DRVA, DRVI, ZRN and other commands shall be disconnected and then connected before the operation can continue.
4. The deceleration time D1936 refers to the independent deceleration time of Y0 axis. D1936 defaults to K0. When the value of D1936 is not 0, the acceleration and deceleration times are separately indicated. The deceleration time of Y0 axis is subject to the value of D1936 and the acceleration time is subject to D1343. When the value of D1936 is 0, it indicates that the acceleration/deceleration time is indicated by D1343 in common. Similar to other channels, only CH0 to CH13 channels have independent deceleration time.
5. The maximum speed shall be set before the triggering of positioning command.

Appendix 3 Product Parameter Specifications

1. Power supply specification

Project		AC AC power supply	DC DC power supply
Input Voltage		100-240VAC	24VDC -15%~+20%
Power supply frequency		50-60Hz	——
transient surge		MAX 20A 1.5ms @220VAC	MAX 12A 1.5ms @24VDC
Power supply output		MAX 25VA	——
Allowable instantaneous power interruption time		Within 20ms @220VAC	Within 10ms
Power fuse		2A, 250V	
Action (operation) specification		Start the operation when the voltage slowly rises to 95~100VAC, and stop when the power supply slowly drops to 70VAC	——
output power supply	24VDC output circuit and expansion module	24V, -15%~+15%, 1.2A (maximum)	24V, -15%~+15%, 2A (maximum)
	24VDC input circuit, for peripherals	24V, -15%~+15%, 1.2A (maximum)	Direct access to 24VDC input power supply
Isolation mode		Photoelectric isolation of transformer, 1500VAC/1min	No electrical isolation
Power supply protection		24VDC output overcurrent protection	Reverse polarity of DC input power supply, overvoltage protection

2. Specification of switching value input (DI)

Project	Switching value input DI
input signal	No voltage contact or NPN, PNP
action drive	ON: above 3.5mA, OFF: below 1.5mA
input impedance	About 4.7K Ω
Input maximum current	10mA
Response time	Default 10ms, can be configured as 1-500ms

3. Switching value output (DO) specification

Project	Switching value output DI
output signal	Transistor NPN or PNP
maximum load	Resistivity: 0.3A/1 point Inductance: 15W

Project	Switching value output DI
output signal	relay
maximum load	AC250V 2A/DC30V 2A
Response time	Approx. 10ms

4. Analog Input (AI) Specifications

Project	Voltage Input			Current Input		Thermal resistance input	Thermocouple Input
Input Range	0V~+10V	0V~+5V	1V~+5V	0~20mA	4~20mA	Pt100	Type K and J
resolution	2.5mV	1.25mV	1.25mV	5μA	5μA	1°C	1°C
input impedance	6MΩ			250Ω		0-300R	710KΩ
Maximum Input Range	±13V			±30mA		-50~300°C	-20~800°C
input indication	When the LED is on, it indicates that it is normal, and when it is off, it indicates external disconnection.						
Response time	288us/each channel					250ms/Single Channel 1000ms/4 channel	100ms/Single Channel 400ms/4 channels
Number of digits input	12bit					16bit	
measurement accuracy	1% F.S					/	
Power Input	The host is internally powered, and the expansion module is powered by the host or external 24VDC+10% 5VA						
Isolation mode	Powered by host or externally 24VDC ±10% 5VA						
Power consumption	24VDC+20%, 100mA (maximum)					24VDC+20%, 50mA max.	

5. Output (AO) Specifications

Project	Voltage mode output		current mode output	
Output Range	-10V~+10V	0V~+10V	0-20mA	4~20mA
resolution	2.5mV	2.5mV	5μA	5μA
External load impedance	≥5KΩ		≤500Ω	
output indication	LED is on to indicate normal			
Driving capacity	2mA			
Response time	125us/each channel			
Digital Output Range	12-bit, code value range: 0~4095			
measurement accuracy	0.2% F.S			
Power Input	The host is internally powered, and the expansion module is powered by the host or external 24VDC+10% 5VA			
Isolation mode	Photoelectric isolation, no isolation between channels, analog and digital photoelectric isolation			
Power consumption	24VDC+20%, 100mA (maximum)			

# Appendix 4 Wiring Diagram of Main Engine

Input Wiring Method

## Leakage input: S/S connected to external +24V

Connect a voltage-free contact between the input (X) terminal and the [0V] terminal, or an NPN open-collector transistor output, and turn ON the input (X). At this time, the LED for display input is on.

Source input: S/S connected to external 0V

Connect a voltage-free contact between the input (X) terminal and the [24V] terminal, or the PNP open-type transistor output, when conducting, the input (X) is ON. At this time, the LED for display input is on.
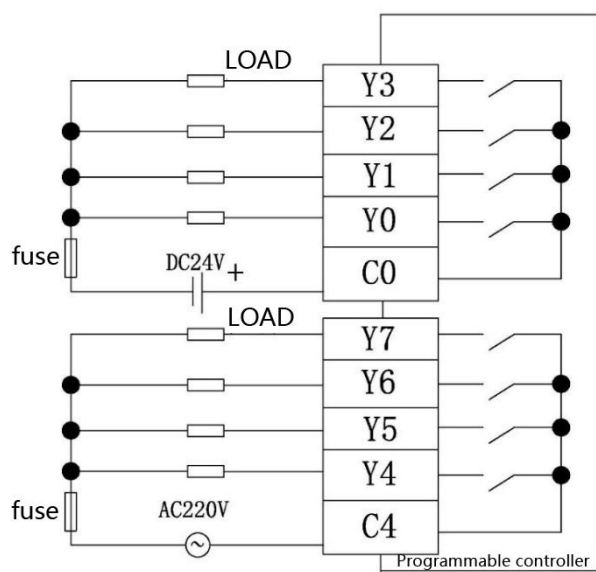
NPN input

NPN/PNP input

Output wiring method

NPN transistor output
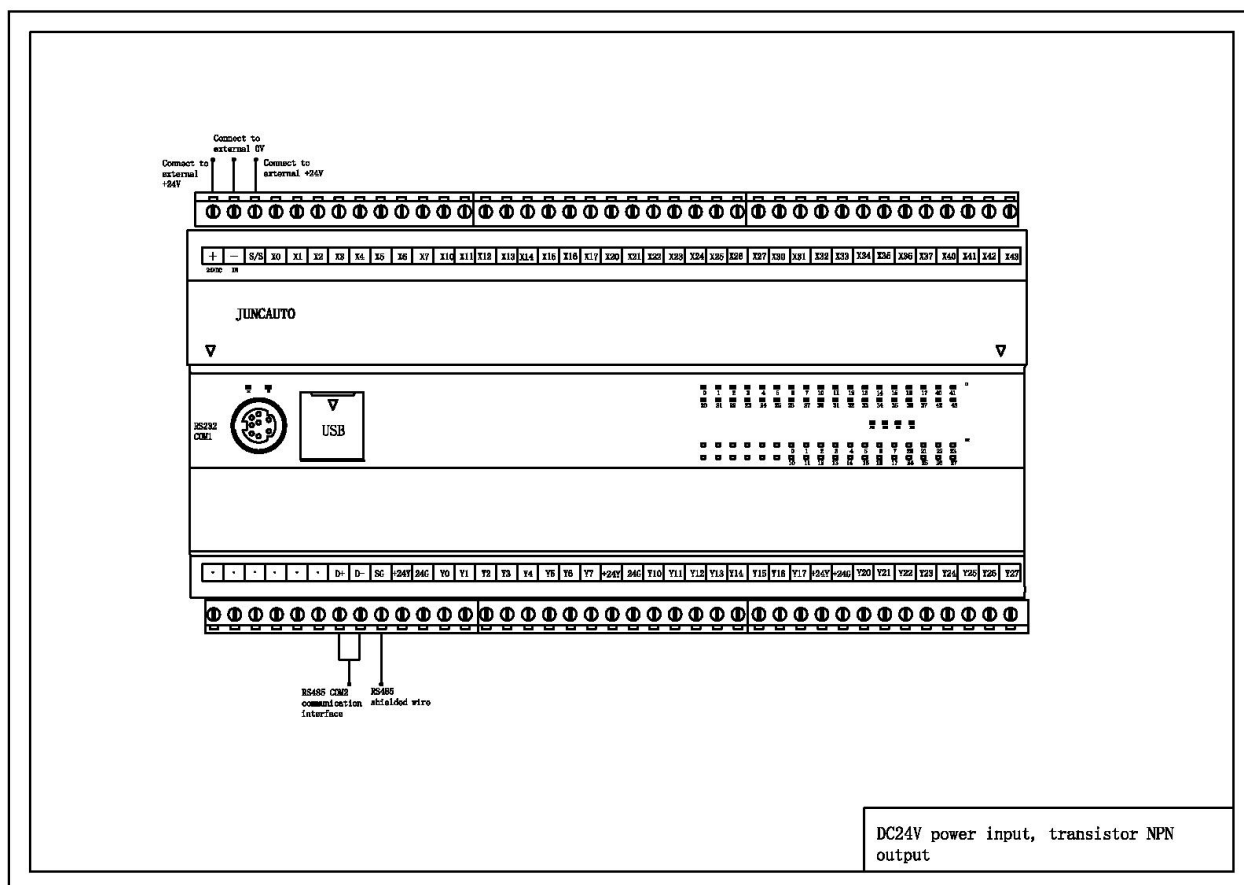

PNP transistor output
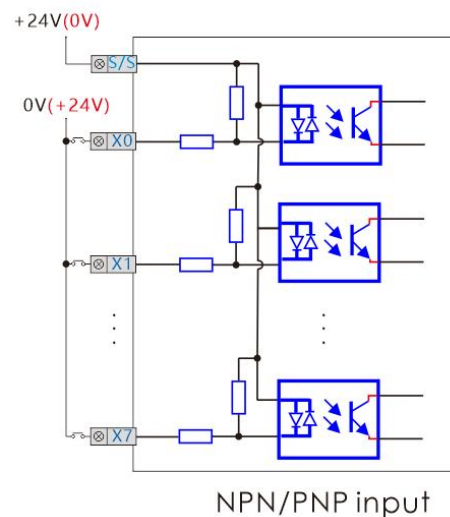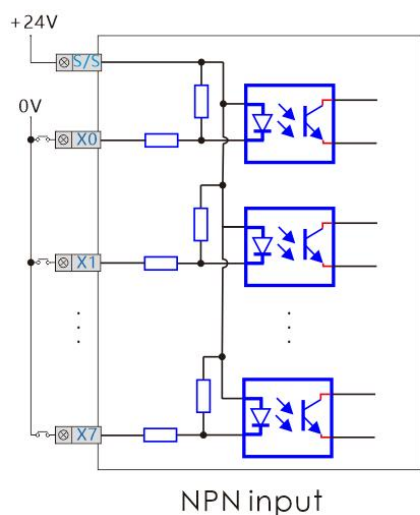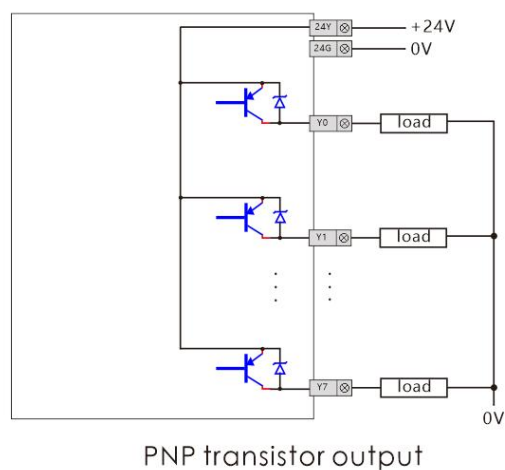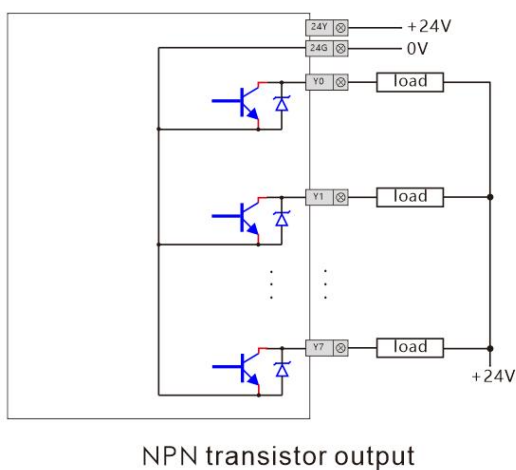
Relay Output

The relay output type product is a four-point common terminal output type product, and can drive loads of different loop voltage systems (e.g., AC200V, DC24V, etc.) in units of each common terminal.
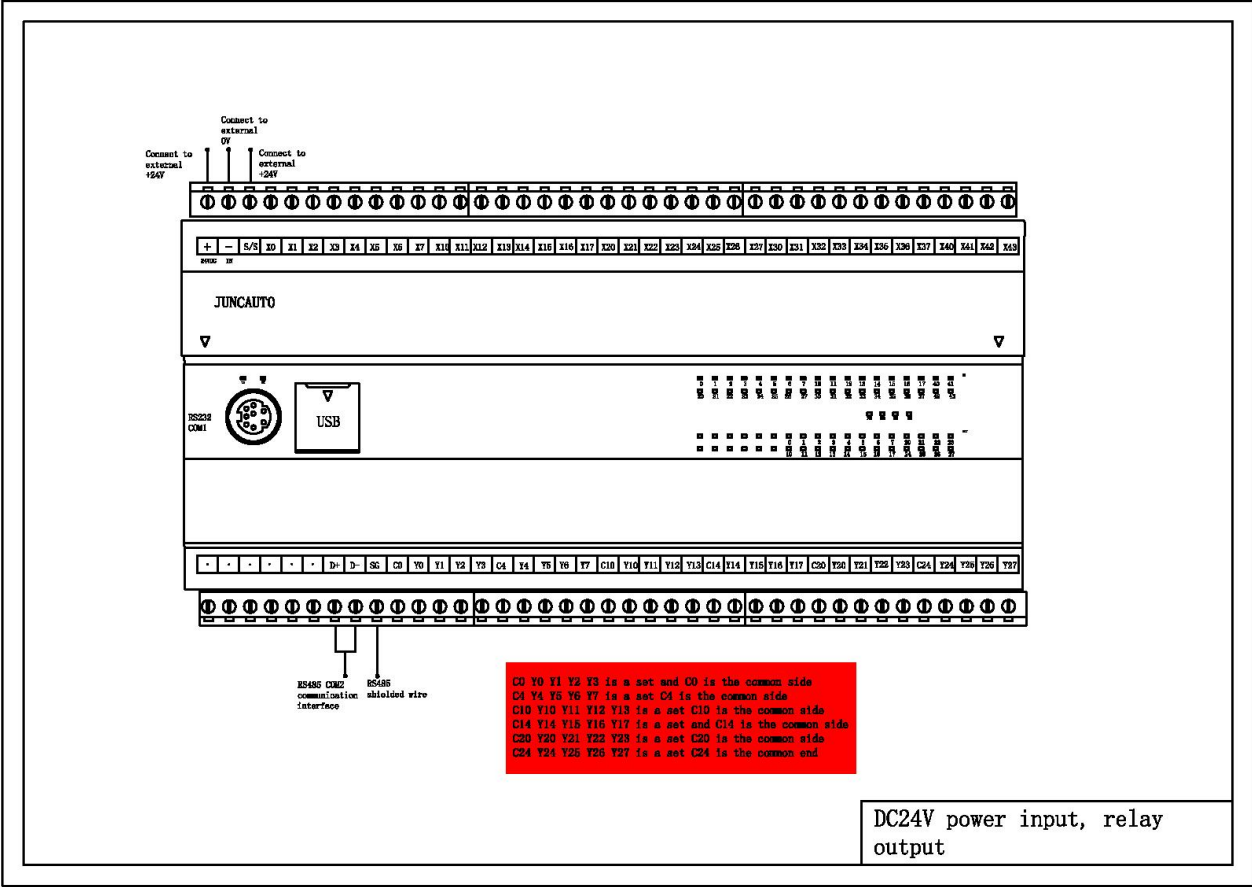
JS/JSC/JM/JSCM series PLC wiring diagram

DC24V power input, transistor NPN output

DC24V power input, transistor NPN output

DC24V power input, relay output

CO Y0 Y1 Y2 Y3 is a set and CO is the common side
C4 Y4 Y5 Y6 Y7 is a set C4 is the common side
C10 Y10 Y11 Y12 Y13 is a set C10 is the common side
C14 Y14 Y15 Y16 Y17 is a set and C14 is the common side
C20 Y20 Y21 Y22 Y23 is a set C20 is the common side
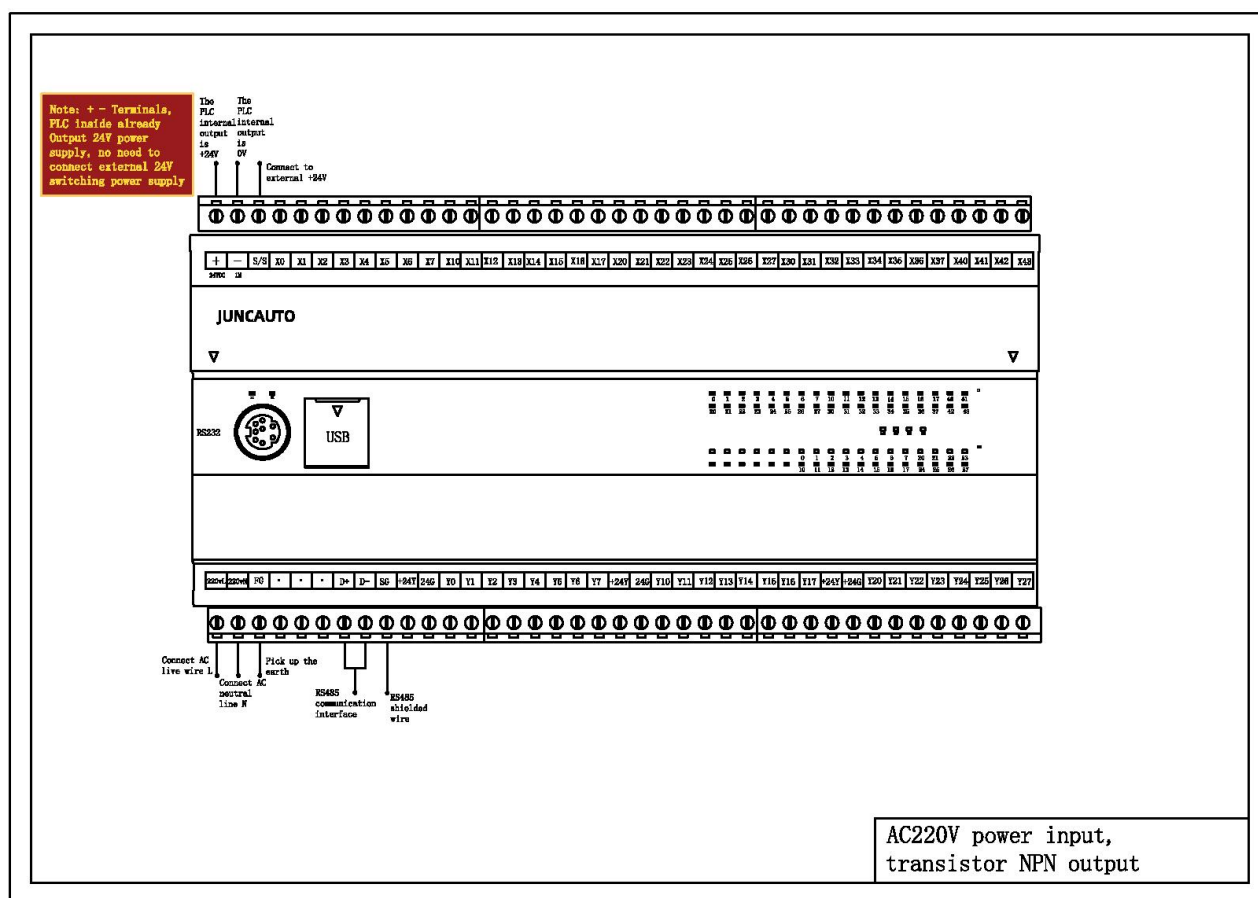C24 Y24 Y25 Y26 Y27 is a set C24 is the common end

DC24V power input, relay
output

AC220V power input, transistor NPN output

AC220V power input,
transistor NPN output

AC220V power input, relay output

Note: + - Terminals, PLC inside already Output 24V power supply, no need to connect external 24V switching power supply

CO Y0 Y1 Y2 Y3 is a set and CO is the common side
C4 Y4 Y5 Y6 Y7 is a set C4 is the common side
C10 Y10 Y11 Y12 Y13 is a set C10 is the common side
C14 Y14 Y15 Y16 Y17 is a set and C14 is the common side
C20 Y20 Y21 Y22 Y23 is a set C20 is the common side
C24 Y24 Y25 Y26 Y27 is a set C24 is the common end

AC220V power input, relay output

JE/JEM series PLC wiring diagram

Connent to external 24V
Connent to external 0V
Connent to external 24V

RS232(COM1)

USB

JE系列

Ethernet port

EtherCAT bus port

Extension interfaces

RS485(COM2) Connent to external 24V Connent to external 0V Connent to external 24V Connent to external 0V
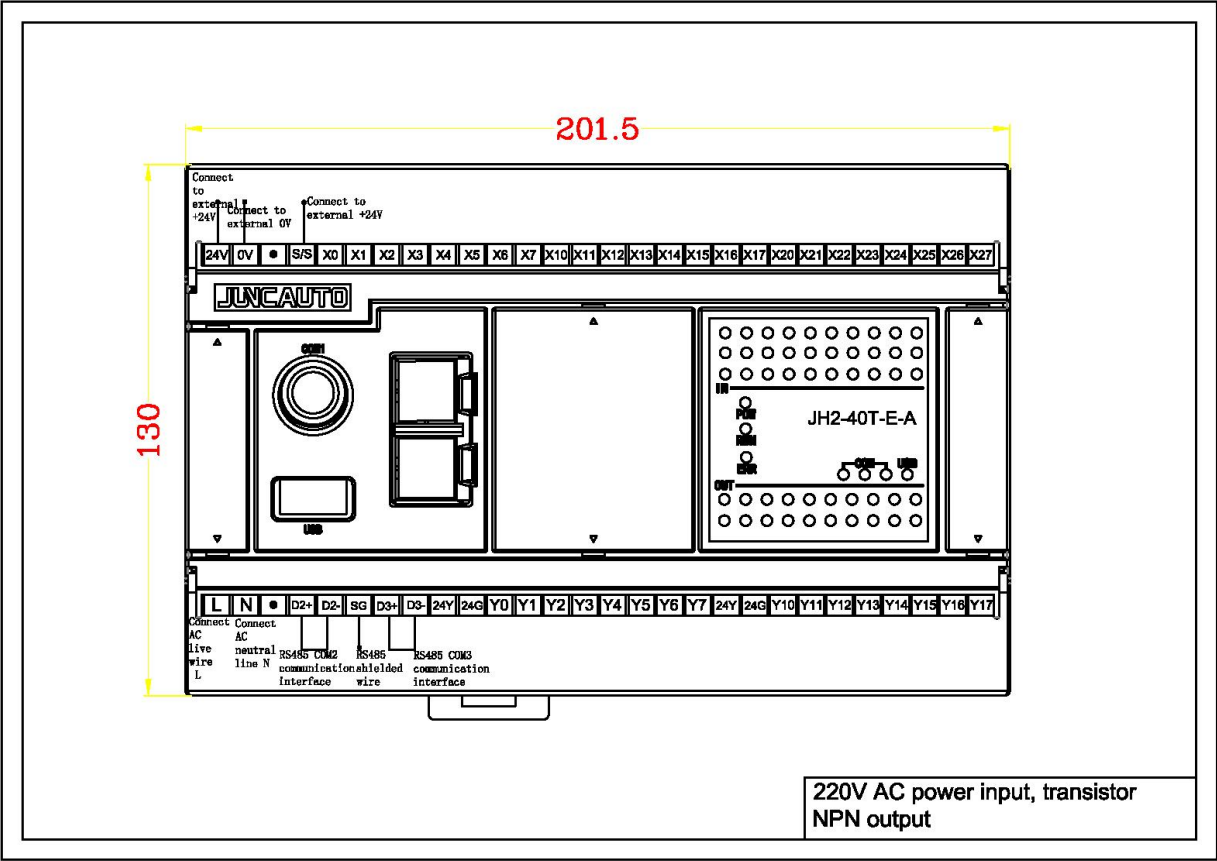
JE BUS SERIES PLC WIRING DIAGRAM
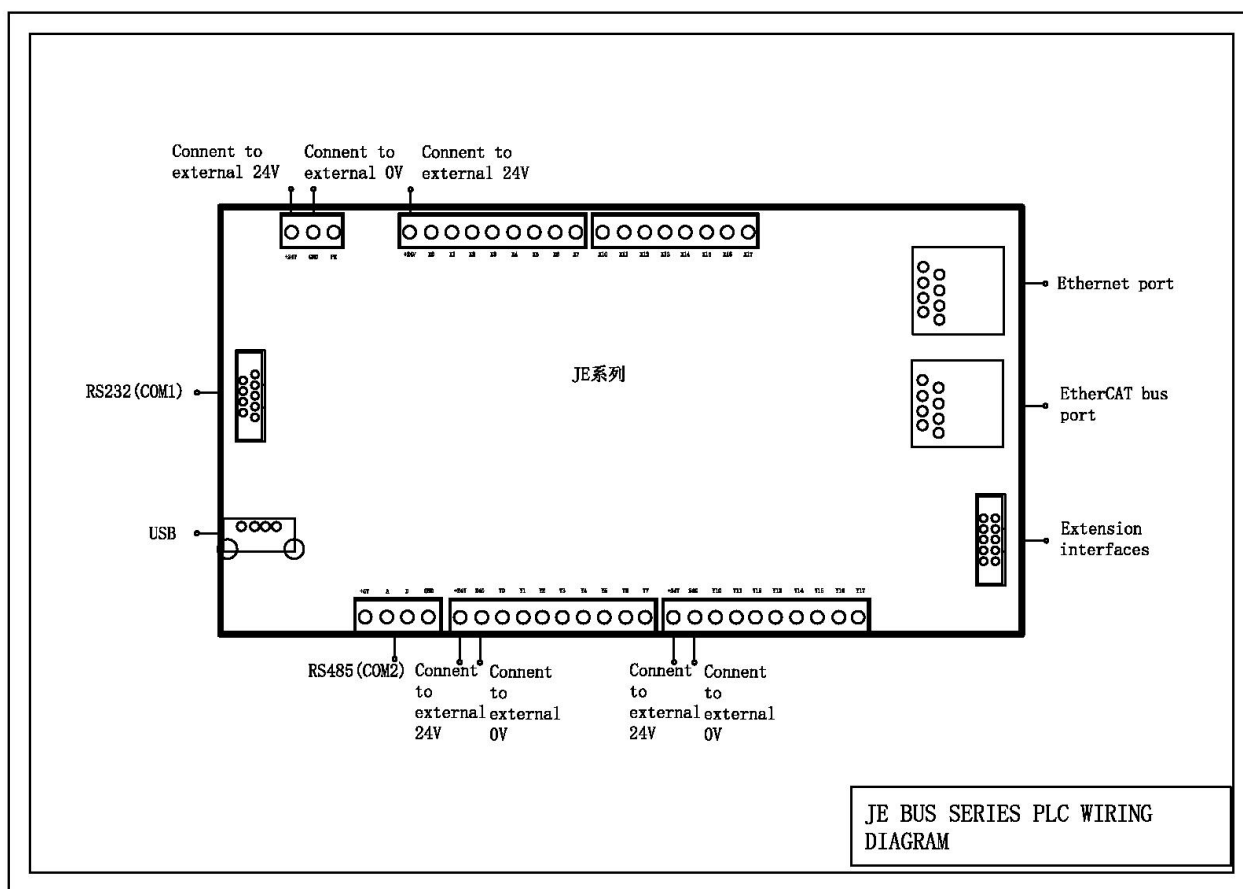
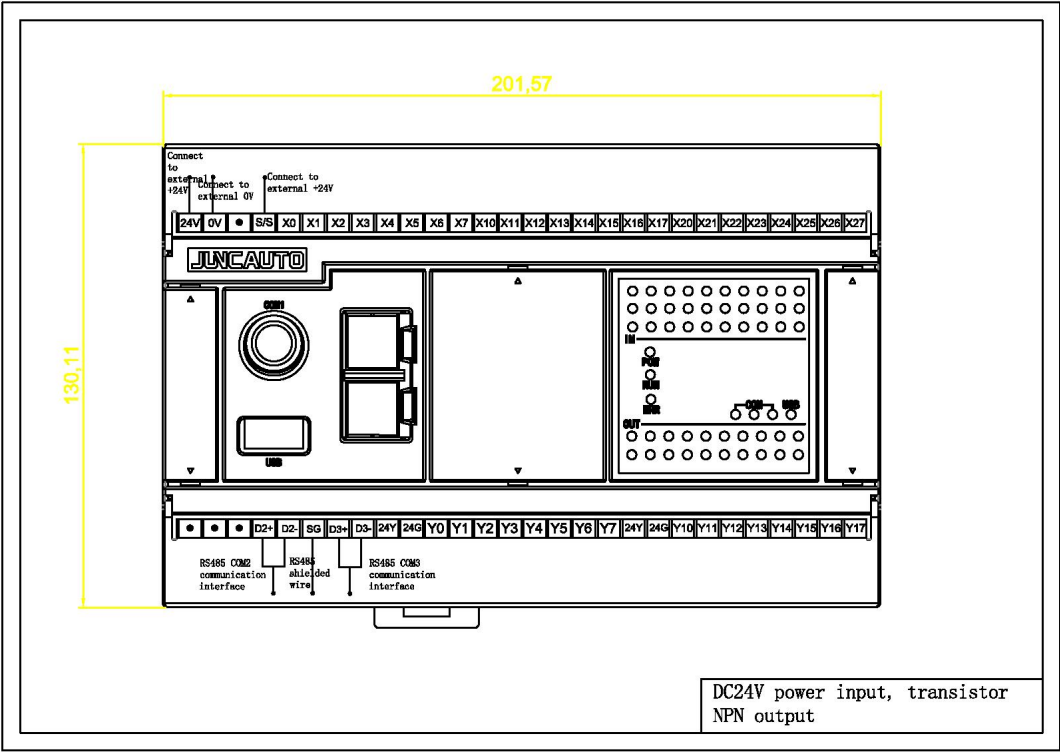# JH(H1X)/JH2/JHM/JH2M /JHC/JHCM series PLC wiring diagram

AC220V power input, transistor NPN output

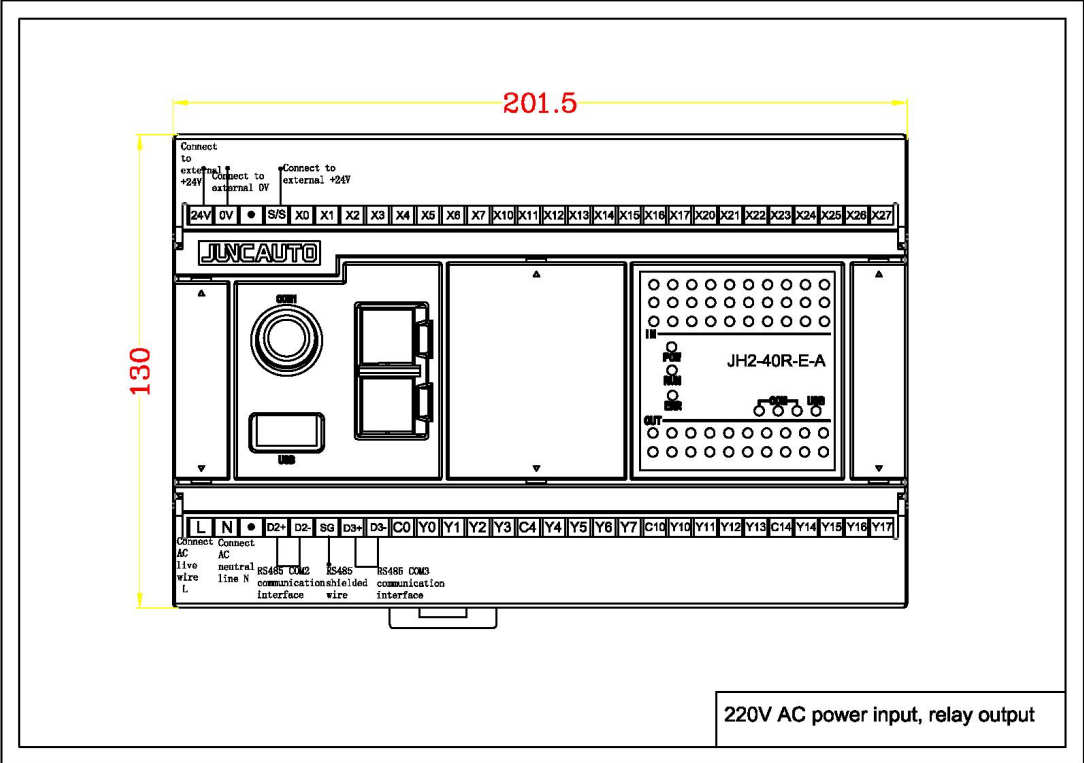JH2 series hosts with dual network ports LAN1 and LAN2 are Ethernet and EtherCAT。

JH(H1X) series hosts with dual network ports LAN1 and LAN2 are Ethernet。
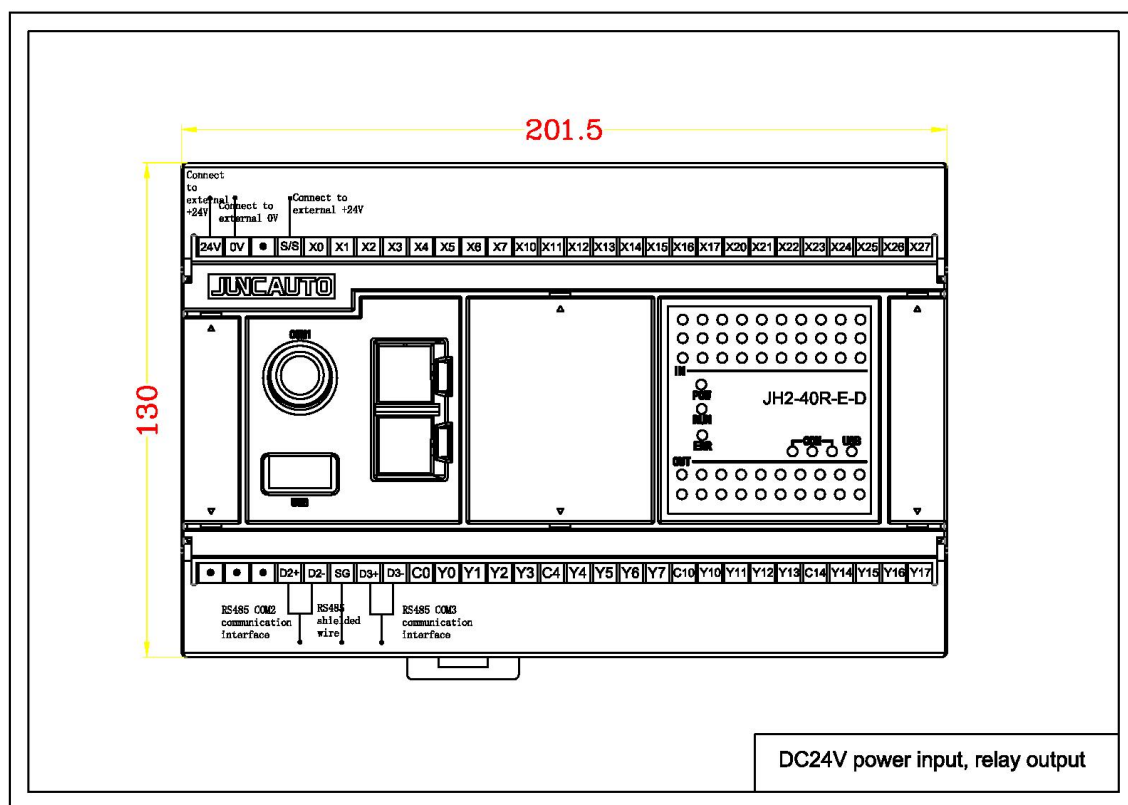
201.5

130

Connect to external +24V
Connect to external 0V
Connect to external +24V

| 24V | 0V | ● | S/S | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X10 | X11 | X12 | X13 | X14 | X15 | X16 | X17 | X20 | X21 | X22 | X23 | X24 | X25 | X26 | X27 |

JUNCAUTO

COM1

JH2-40T-E-A

USB

| L | N | ● | D2+ | D2- | SG | D3+ | D3- | 24Y | 24G | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | 24Y | 24G | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 |

Connect AC live wire L
Connect AC neutral line N
RS485 COM2 communication Interface
RS485 shielded wire
RS485 COM3 communication interface

220V AC power input, transistor NPN output

DC24V power input, transistor NPN output

DC24V power input, transistor
NPN output

AC220V power input, relay output

220V AC power input, relay output

DC24V power input, relay output

DC24V power input, relay output

JT/JTM series PLC wiring diagram

JT5/JT5M series PLC wiring diagram

DC24V power supply, transistor NPN output