



Chengdu Ebyte Electronic Technology Co.,Ltd

Wireless Modem

User Manual



【4AI+2DO】

MA02-XACX0420

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1. Introduction

1.1 Brief Introduction

MA02-XACX0420 supports acquisition of 4-way sensor analog input (AI), conversion to serial port (RS232) data transmission to configuration software or PLC. The serial port I/O networking module (also known as "remote IO") is used to control 2 relay switch output (DO) by issuing instructions through the serial port.

1.2 Features

- Supports the Modbus RTU protocol;
- Buy the government to support various configuration software /PLC/ touch screen;
- Log RS232 acquisition and control IO;
- The dc power supply is 8 ~ 28V, according to the bill;
- A 4-way analog input AI (0 ~ 20mA/4 ~ 20mA);
- Costing a 2-way switch outputs DO (relay);
- Switching output (DO) supports both level and pulse modes.
- Queue Input data collection port isolation defense.
- Gigabit Ethernet Communicates at a baud rate of 1200 to 115200 (9600 by default), supporting user-defined Settings.
- Virtual Gateway Supports 1 to 247 slave stations, and supports 5-bit DIP switches to set address codes from 1 to 31. If the number is greater than 31, you can configure the network using software.



2.Quick Star

If there is any problem during use, please click the link on the official website:<https://www.ebyte.com/product-class.aspx>

2.1 preparation for use

Before using serial port I/O networking devices (HEREINAFTER referred to as "I/O devices"), prepare auxiliary materials such as a computer, converter, power supply, and screwdriver. Details are as follows:

Table 2-1-1 Preparation list

Serial number	Devices	Quantity
1	IO device	1
2	USB to serial converter	1
3	Configuration Tool Software	1
4	computer	1
5	power adapter (12V/1A)	1
6	screwdriver (word SL 2)	1
7	Signal generator (or sensor)	1

2.2 Equipment wiring

2.2.1 Power Supply Wiring

Power supply: 8-28V DC power supply, OR 12V or 24V DC power supply.

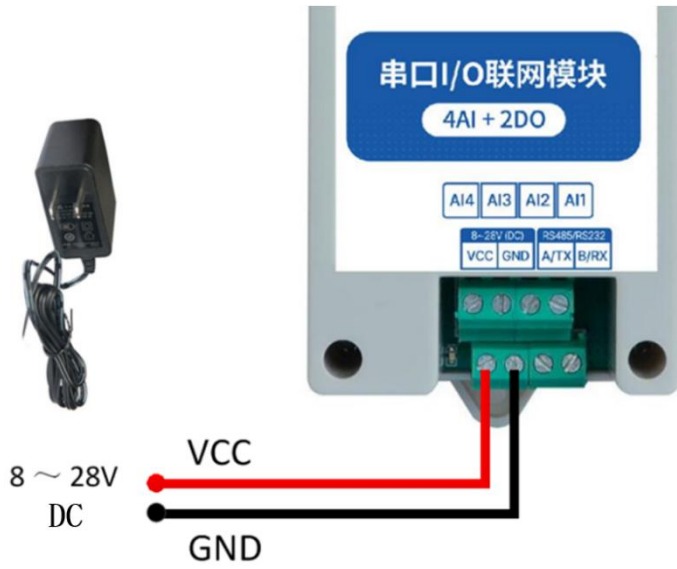


Figure 2-2-1 Power supply wiring diagram

2.2.2 Communication cable RS232

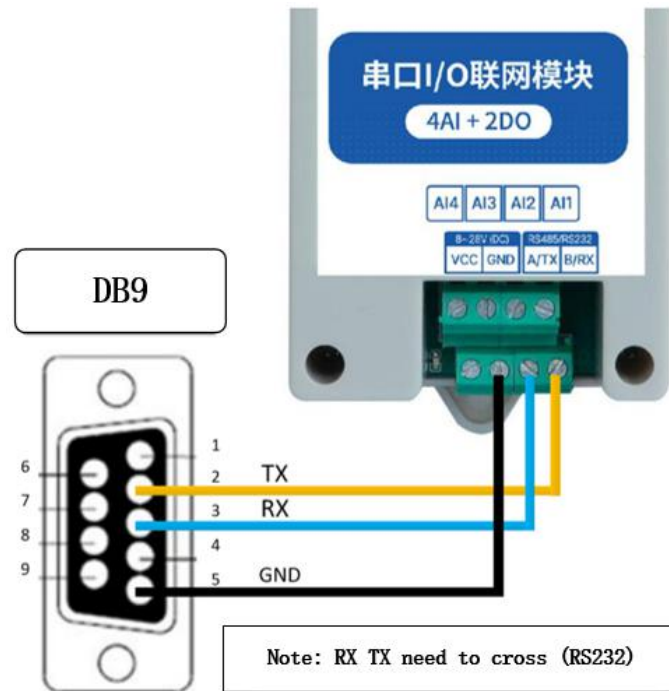


Figure 2-2-2 Communication RS232 wiring diagram

2.2.3 Overall wiring diagram

- (1) After the device is powered on, the POWER indicator is steady on and the POWER supply is normal.
- (2) Analog input AI wiring, connect the signal generator to the analog input AI port as shown in the figure.
- (3) Switch output DO wiring, connect the load to switch output DO port as shown in the figure.

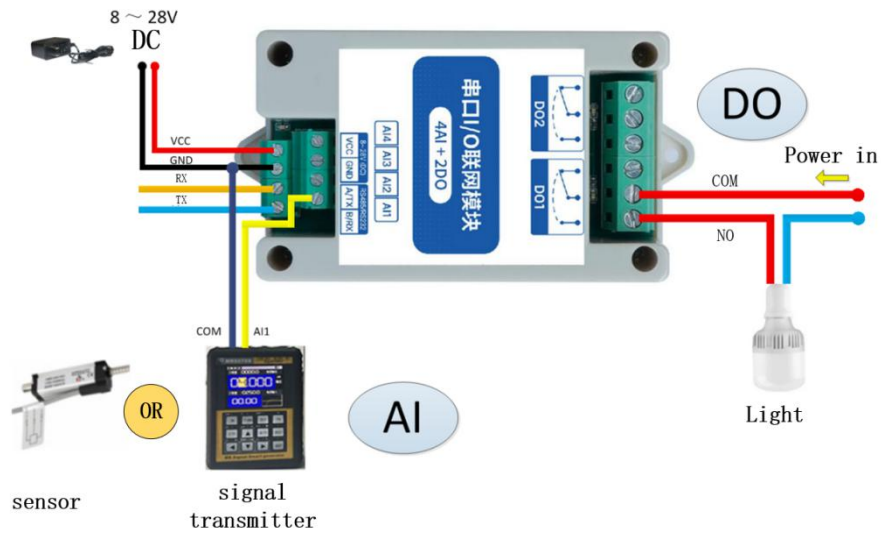


Figure 2-2-3 Overall cable connection diagram

2.3 software setting

2.3.1 Device Connection

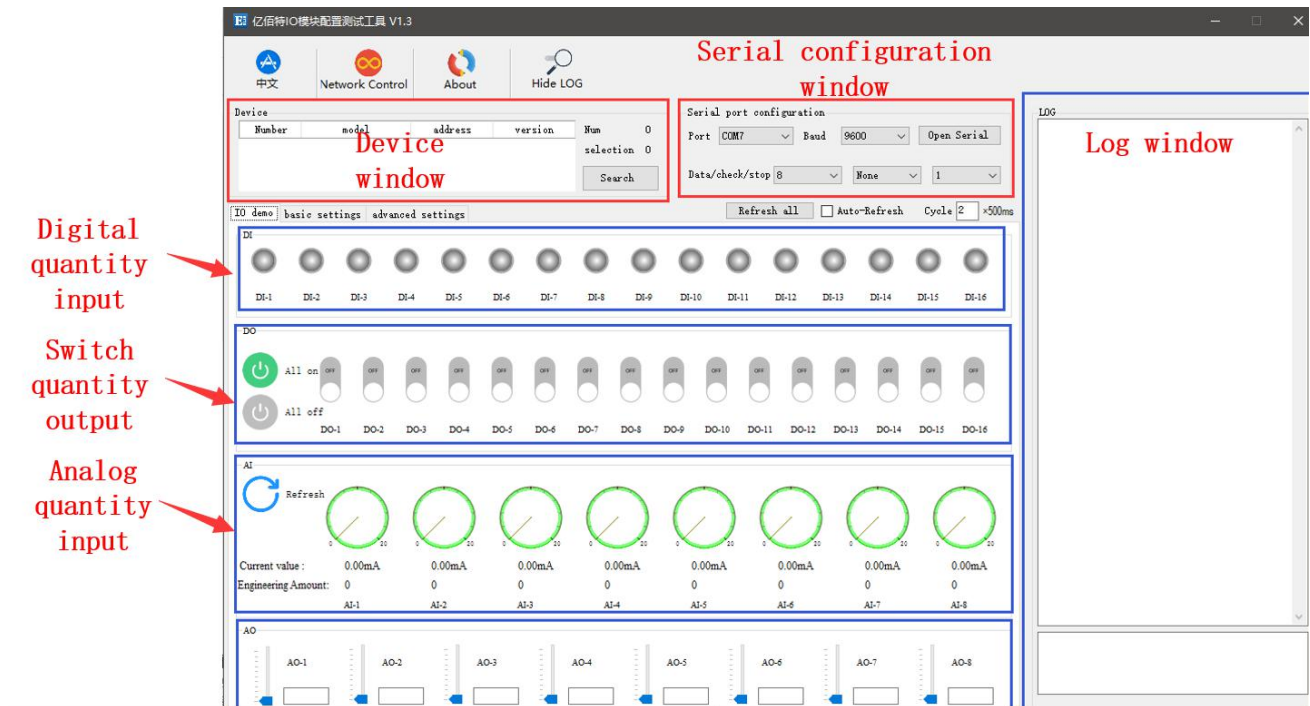


Figure 2-3-1 Software interface

- (1) Operating steps: Open the serial port and find the corresponding device port number. The default baud rate is 9600. Click Open serial Port.

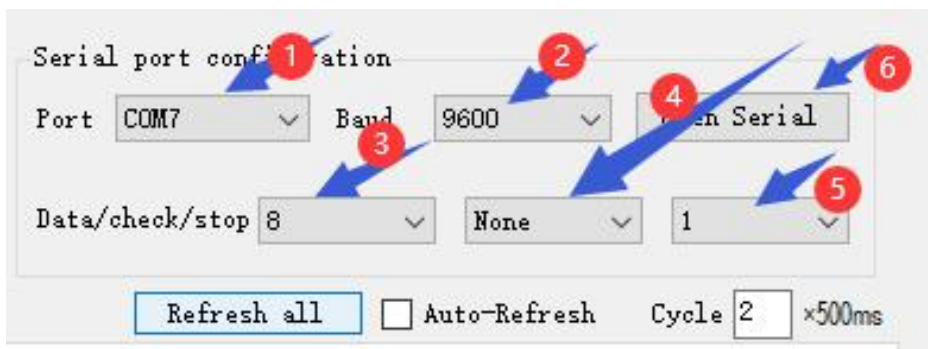


Figure 2-3-2 Opening the serial port

- (2) In the device window, click Search Device. The log window on the right begins to refresh the search information. After the connected device is displayed in the Device column of the device window, click The Stop Search menu. Select the device and click. The connection is successful.

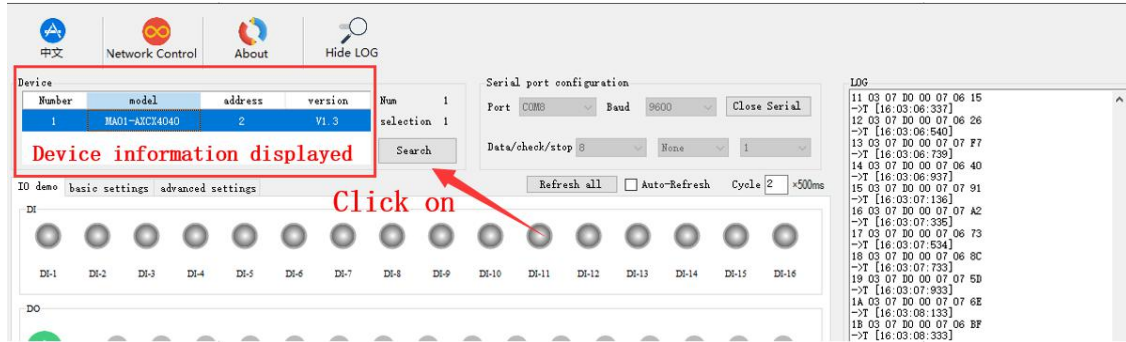


Figure 2-3-3 Connecting devices

2.3.2 Testing Of Equipment

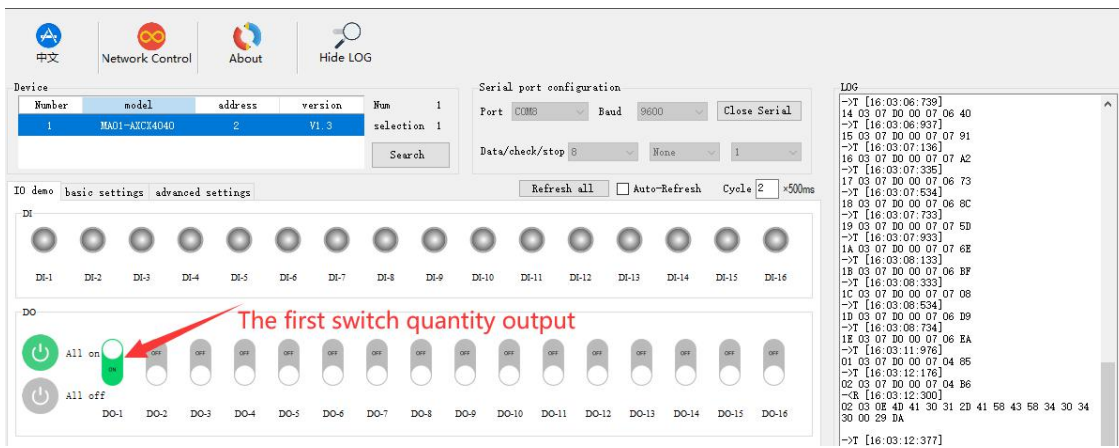


Figure 2-3-4 equipment test

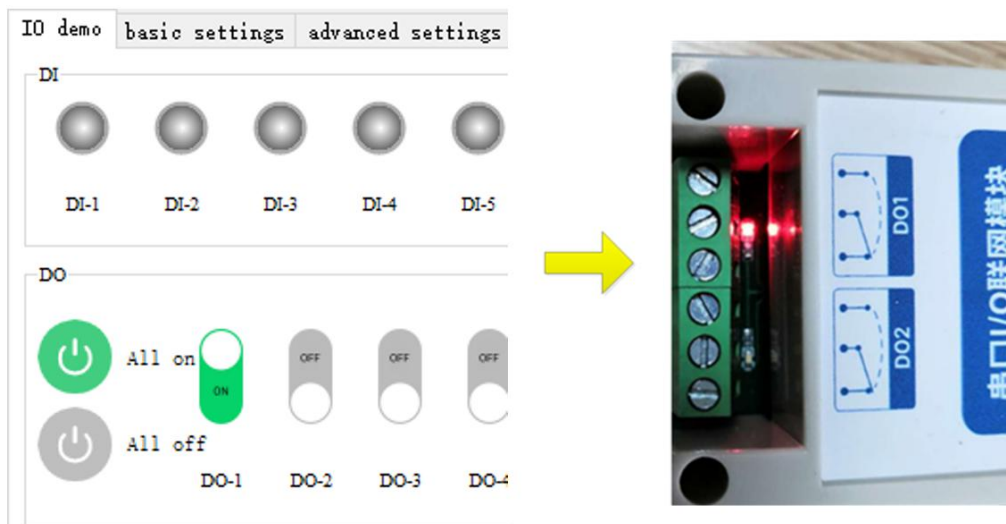


Figure 2-3-5 Actual test effect

3.Product Overview

3.1 Product Standard

Table 3-1-1 Product specifications

product model	specification	on-off input DI	analog input AI	on-off output DO	RS485	RS232
MA01-AXCX4020	4DI+2DO	4 road	—	2 road	●	×
MA02-AXCX4020		4 road	—	2 road	×	●
MA01-XACX0420	4AI+2DO	—	4 road	2 road	●	×
MA02-XACX0420		—	4 road	2 road	×	●
MA01-AACX2220	2DI+2AI+2DO	2 road	2 road	2 road	●	×
MA02-AACX2220		2 road	2 road	2 road	×	●
MA01-AXCX4040	4DI+4DO	4 road	—	4 road	●	×
MA02-AXCX4040		4 road	—	4 road	×	●
MA01-XACX0440	4AI+4DO	—	4 road	4 road	●	×
MA02-XACX0440		—	4 road	4 road	×	●
MA01-AACX2240	2DI+2AI+4DO	2 road	2 road	4 road	●	×
MA02-AACX2240		2 road	2 road	4 road	×	●
MA01-XXCX0080	8DO	—	—	8 road	●	×
MA02-XXCX0080		—	—	8 road	×	●

3.2 technical specification

category	name	parameter
Power Supply	working voltage	Direct Current8~28V
	working current	50mA @12V
	power supply indicators	Green LED indicator
Serial Port	communication interface	RS232
	Baud rate	1200~115200 bps (default 9600 bps)
	data bits	8 (Fixed)
	check bit	No check, odd check, even check (default no check)
	stop bit	1 (Fixed)
	communication protocol	Modbus RTU protocol
	device address	1~247(Default address 32: Software 1, hardware 31)
AI Input	AI way	4 road
	Collection scope	0~20mA / 4~20mA
	resolution ratio	12 位
	acquisition accuracy	3‰
	collection frequency	10 Hz
	Collection features	Single-ended input
	input impedance	100Ω
DO Output	DO 路数	2road
	DO output type	TypeC relay(normally open + normally closed)
	DO output mode	Level mode, pulse mode
	Relay contact capacity	30V/10A、250V/10A
	output instructions	Red LED indicator
Others	Product size	80 mm * 50mm * 30mm (Length * width * height)
	Product weight	80g ± 5g
	Working temperature and humidity	-40 ~ +85℃、5%~95%RH (no lon)
	Storage temperature and	-60 ~ +125℃、5%~95%RH (no lon)

	humidity	Positioning hole installation
	installation	

3.3 Port Instructions



Figure 3-3-1 Interface diagram

Table 3-3-1 Port function table

Serial number	pin	Instructions	Note
1	VCC	Power supply +	RVV 2*0.75 wire is recommended
2	GND	grounding -	
3	A/TX	RS232 corresponds to TX (external connection needs to be crossed)	RVSP 3*0.5 Wire is recommended
4	B/RX	RS232 corresponds to RX (external connection needs to	

		cross)	
5	AI1	Analog input channel 1	RVV 2*0.5 wire is recommended
6	AI2	Analog input channel 2	
7	AI3	Analog input channel 3	
8	AI4	Analog input channel 4	
9	DO1	Switch output channel 1	Relays have normally open and normally closed ends
10	DO2	Switch output channel 2	

3.4 Size chart



Figure 3-4-1 Dimension diagram

3.5 Installation

The device is installed with positioning holes.

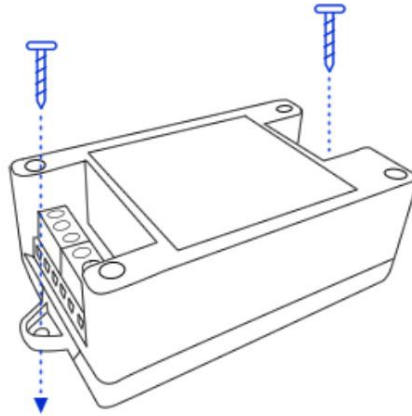


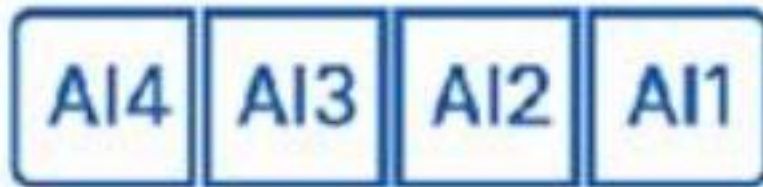
Figure 3-5-1 Installing positioning holes

4.Product features

4.1 The analog input AI

4.1.1 Analog input AI description

Analog input AI measurement current signal, acquisition range 0 ~ 20mA or 4 ~ 20mA, accuracy 3‰, resolution 12 bits. Single-end input, sampling frequency 10Hz, input impedance 100



ohm.

Figure 4-1-1 Analog input AI interface

4.1.2 Simulate input AI filtering parameters

The filtering parameters of the AI channel can be set. The value ranges from 1 to 16, and the default value is 6.

Note:

(1) The filtering parameter of AI channel is the same filtering parameter shared by all AI channels. The larger the filter parameter is, the stronger the anti-interference ability of AI sampling is, but it has the delay.

(2) The address of AI channel filter parameter is 0x04B0, and the register type is hold register. Function codes 0x06 and 0x10. When AI filtering parameter is written, if the parameter value is not

in the range of 1 ~ 16, it will automatically take the nearest value to write. For example, if the write filtering parameter is 0, the device takes 1 as the filtering parameter, and Modbus does not return an error command.

4.1.3 Analog input AI sampling range

- (1) Set the sampling range for all AI channels. Valid values are 1 and 0 (default is 0).
- (2) 0:0 to 20mA
- (3) 1:4 to 20mA The AI sampling range is shared by all channels. When the sampling range of the AI channel is set to 4-20mA, if the current signal is lower than 4mA, the engineering value of the channel is converted to 0. There is no conversion limit for signals larger than 20mA, but the conversion limit cannot exceed 25mA (there is a risk of device damage if the signal exceeds 25mA).
- (4) AI channel sampling range parameter address is 0x04B2, register type is hold register, function code 0x06, 0x10. When the AI channel sampling range parameter is written, if the parameter value is not in the range of 0 to 1, the device automatically writes the parameter value to the nearest value. For example, if the write sampling range parameter is 2, the device takes 1 as the sampling range parameter, and the MDOBUS does not return an error command.

4.1.4 Simulation input AI original value, engineering quantity value

- (1) There are two ways to read the current signal size collected by the device:
- (2) Read the original value of AI and calculate the input current according to the input impedance.

The address of the AI original value register is 0x0000 to 0x0003, the register type is input register, and the read function code is 0x04. The value returned by this method is two bytes representing a channel, and the value read ranges from 0 to 4095. The calculation method of current size is 0 ~ 4095 corresponding to 0 ~ 25mA.

The register type is discrete input register and the read function code is 0x04.

$$\text{current} = \frac{\text{original value}}{4095} \times 25 \text{ (mA)}$$

- (3) Read the AI engineering quantity value and directly convert the input current.

The address of the AI engineering quantity register is 0x0064 to 0x0067, the register type is input register, and the read function code is 0x04. The value returned in this method is 2 bytes representing one channel, and the value read ranges from 0 to 25000. The calculation method of current size is 0 ~ 25000 corresponding to 0 ~ 25mA.

$$current = \frac{Engineering\ quantity}{1000} (mA)$$

4.1.5 Analog input AI calibration

When reading AI measurement current and the error is large, the calibration can be done by setting the high point calibration register and low point calibration register of each channel.

AI Each channel has an independent high (low) point calibration register. The addresses of the high point calibration register are 0x0190 ~ 0x0193, and the addresses of the low point calibration register are 0x0258 ~ 0x025C. The register type is a hold register, and the function codes are 0x06 and 0x10.

The calibration method can input a precise current signal for the AI channel and write the value for calibration. For example, if the AIx channel corresponding to the device is calibrated and the actual input current is 20mA, read the original AI value of the AIx channel and write the original value into the high calibration register of the AI channel. General low point calibration can be set to 0 by default.

Note: this function is used only when the error is large. It is not recommended for general use.

4.2 Switch output DO

4.2.1 Switch output DO description

Switch output DO, with level mode, pulse mode, follow mode (follow DI only). C type relay output (normally open + normally closed), single output support maximum load (contact capacity) of 30V/10A or 250V/10A.

Switch output DO, with level mode, pulse mode, follow mode (follow DI only). C type relay output (normally open + normally closed), single output support maximum load (contact capacity) of 30V/10A or 250V/10A.

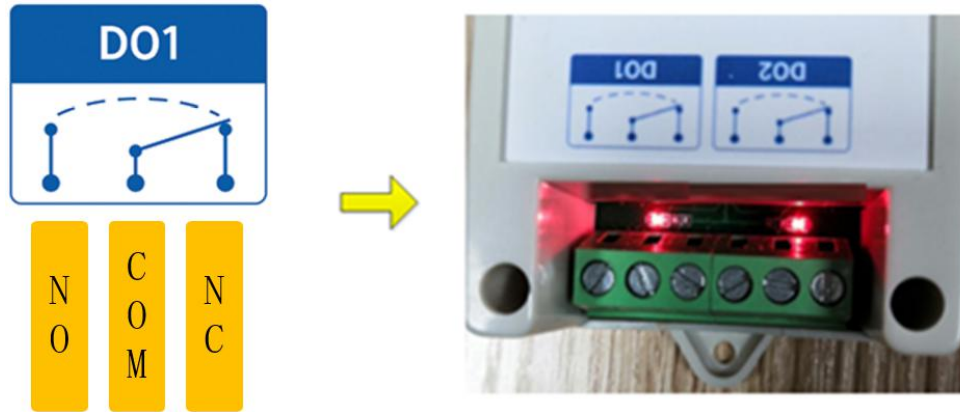


Figure 4-2-1 Switch output DO port

4.2.2 Switch output DO mode setting

(1) Level pattern

Output according to the level set by the user. The switching characteristic of the level mode is similar to the function of the self-locking switch.

(2) pulse mode

After switch output DO is turned on, keep the set pulse width time (unit ms), switch output DO is automatically turned off. Pulse width setting range from 50 to 65535 (default 50).

(3) Follow the pattern

After the user sets the following mode, the input port to follow is set. The DO output is consistent with the DI input.

Note: You can set multiple switch output DO terminals to follow one DI input port, but cannot set one switch output DO terminal to follow multiple DI inputs.

4.3 Device address

4.3.1 Device address

Device address composition: hardware address + software offset address

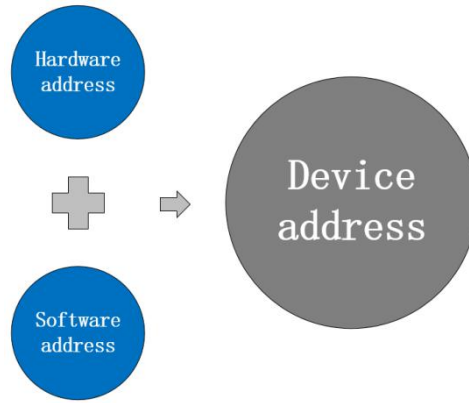


Figure 4-3-1 Equipment address

The default device ADDRESS is 32 (hardware ADDRESS 31 + software address 1 = device address 32).

The device address ranges from 1 to 247.

Address: realized by dip switch (5 bits) (factory default: 31)。

Software address: Set offset address by the configuration tool software (1 by default).

For example:

If the hardware address is set to 5 and the software address is set to 113, the device address is 118.

4.3.2 Hardware Address (DIP switch)

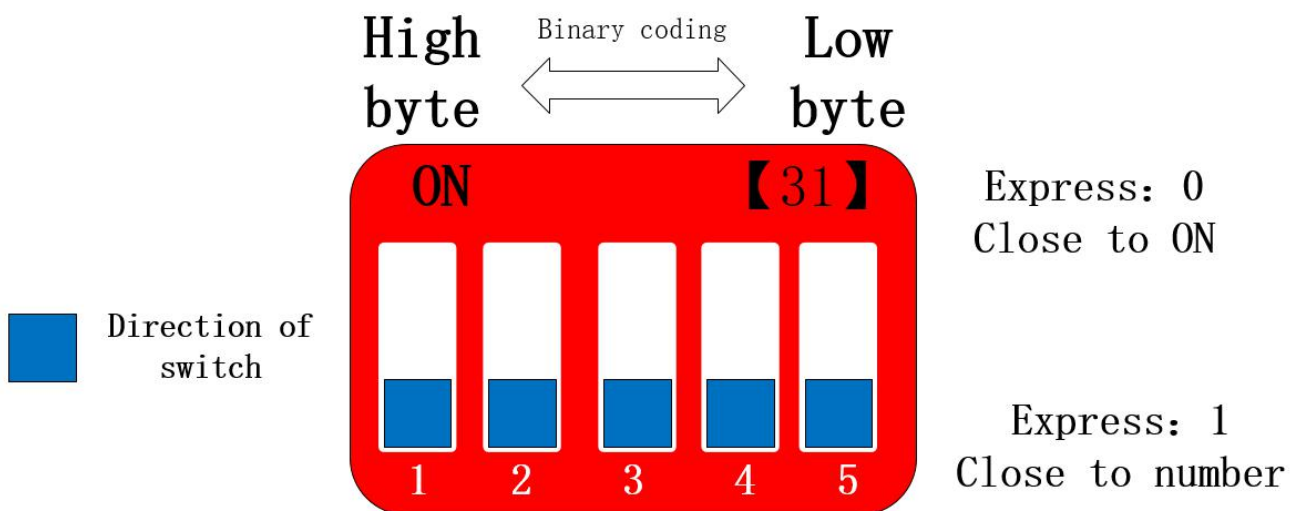


Figure 4-3-2 Hardware address (DIP switch)

Hardware address: Dip switch Switches different hardware addresses. Binary indicates the 5-bit DIP switch. The "5" direction indicates low, and the "1" direction indicates high. Hardware ADDRESS range The value ranges from 0 to 31.

Hardware address DIP switch Settings:

Example 1: Set hardware address 0, binary code。

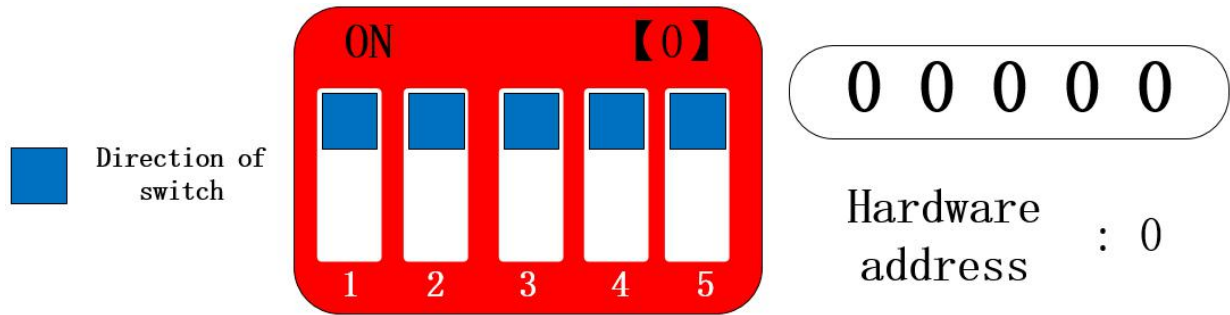


Figure 4-3-3 Hardware address 0

Example 2: Set the hardware address 8, binary encoding.

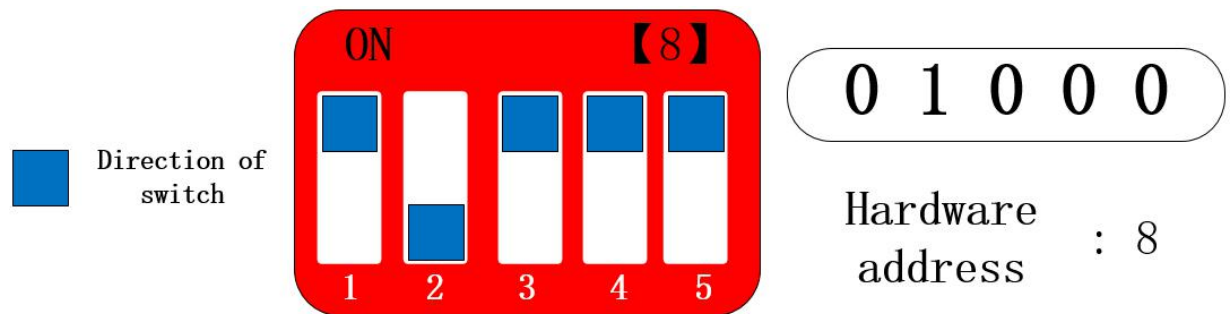


Figure 4-3-4 Hardware address 8

Example 3: Set the hardware address 31, binary code.

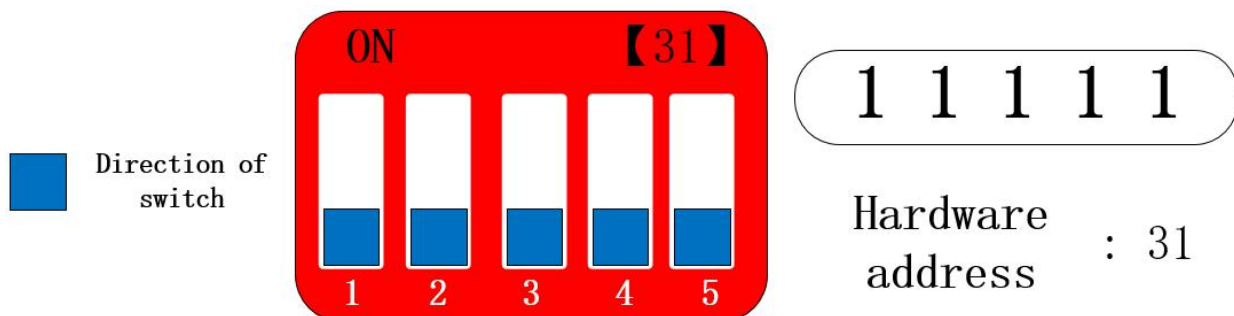


Figure 4-3-5 hardware address 31

You can set the hardware address as required, as shown in the preceding example.

If multiple devices need to be connected to a single RS232, only the hardware address can be used. A single bus can be connected to a maximum of 32 devices (set the hardware address).

If more than 32 devices need to be connected to an RS232 bus, you need to set the software address (offset address) to connect a bus to a maximum of 247 devices.

The new IP address takes effect only after a power-off and restart.

Note: For the following three specifications, dip switch is in the shell of the product. If setting dip switch, you need to disassemble the shell and set it again.

【2DI+2AI+2DO】

【4AI+2DO】

【4DI+2DO】

4.3.3 Software address (offset address)

Software address: Users can set it according to different scenarios. The software address ranges from 1 to 224 (device address: 1 to 247). The default software address is 1.

To change the software address, configure the software tool, as shown in the figure:



Figure 4-3-7 Software address (offset address)

5. Port connection

5.1 Cable connections to the analog input AI port

5.1.1 Wire connection for two-wire sensor

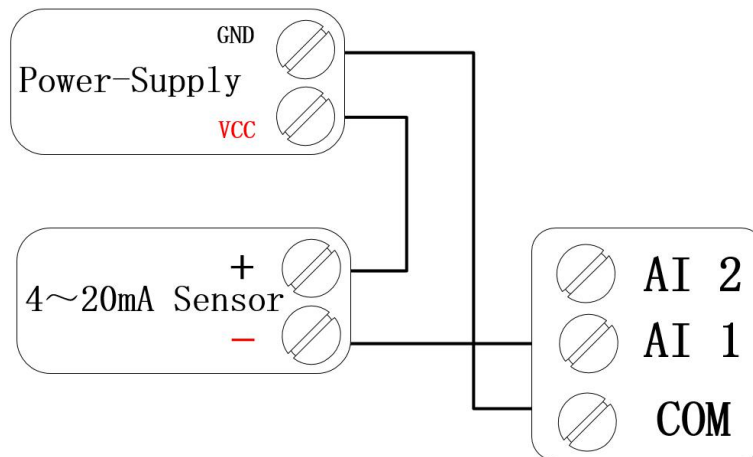


Figure 5-1-1 Two-wire sensor wiring diagram

5.1.2 Three wire sensor connection

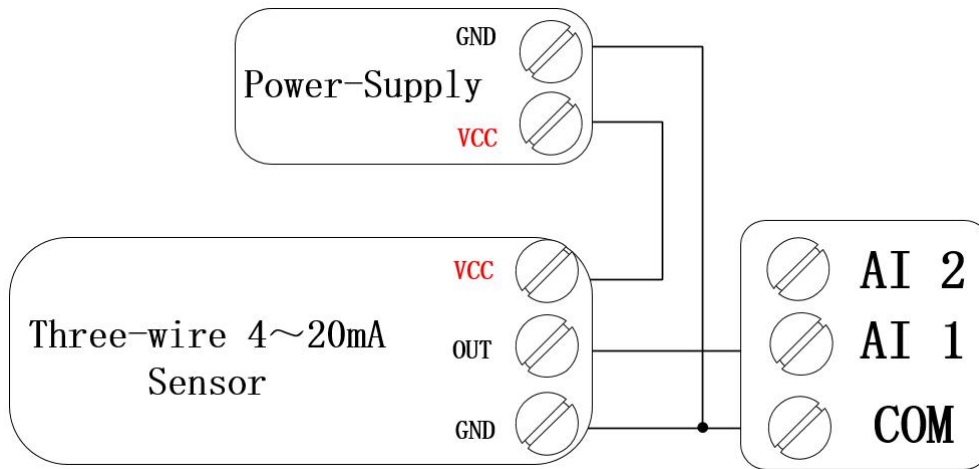


FIG. 5-1-2 Three-wire sensor wiring diagram

5.1.3 Four wire sensor connection

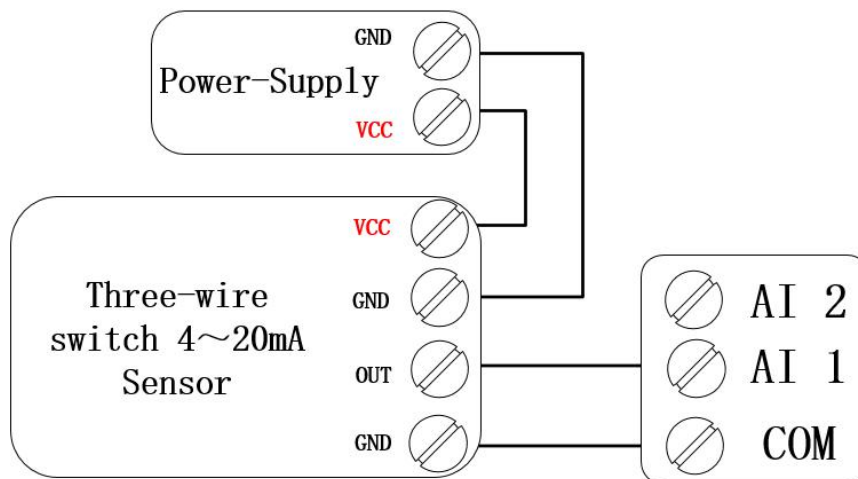


Figure 5-1-3 Four-wire sensor wiring diagram

5.2 Switch output DO port cable

5.2.1 Output direct control load (1kW internal small power equipment)

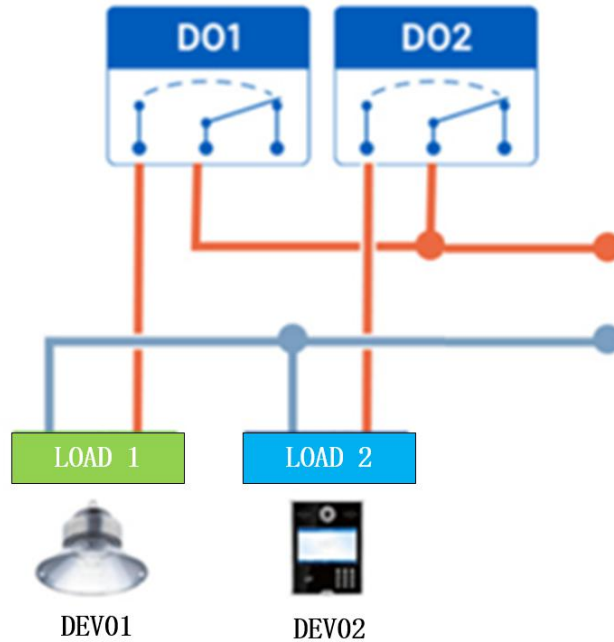


Figure 5-2-1 Output terminal direct control load wiring diagram

5.2.2 Output control contactor (contactor controls high-power 220V equipment)

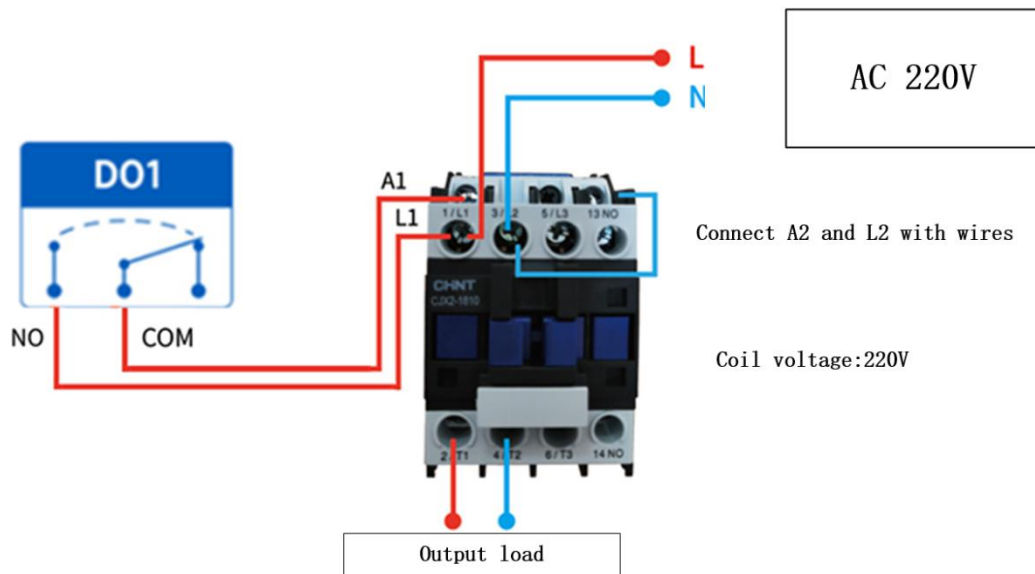


FIG. 5-2-2 Output control contactor wiring diagram

Note: In the figure above, the contactor coil voltage is 220V as an example. The coil voltage of different contactors may be different.

5.2.3 Output control contactor (contactor controls high-power 380V equipment)

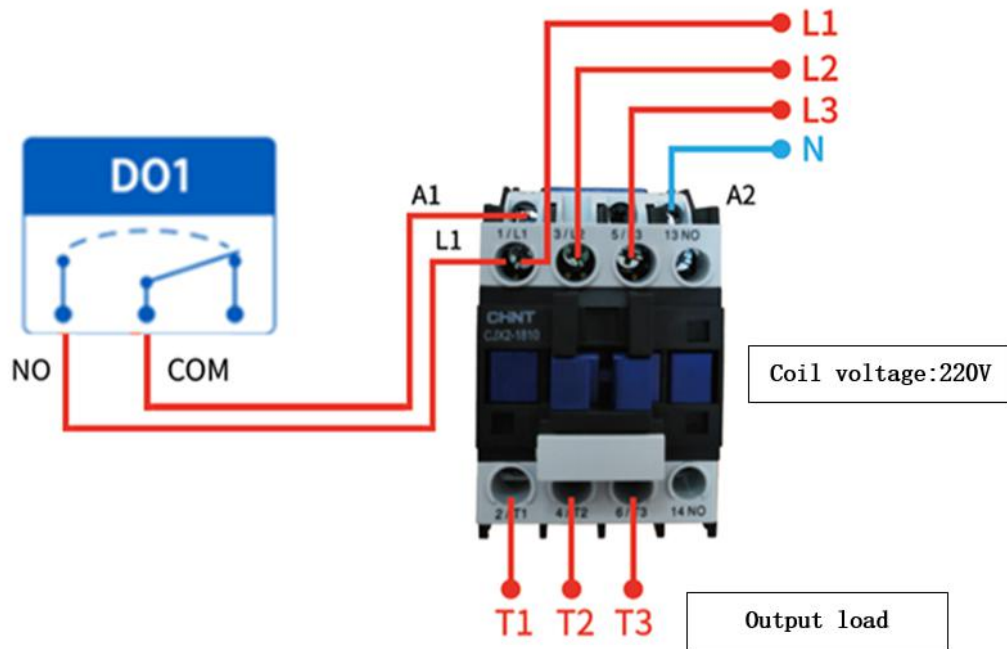


FIG. 5-2-3 Output control contactor wiring diagram

Note: In the figure above, the contactor coil voltage is 220V as an example. The coil voltage of different contactors may be different.

6. Is the software

6.1 software installation

Configuration tool software is driver free installation, double-click directly. Exe file open use.



Figure 6-1-1 Software installation file

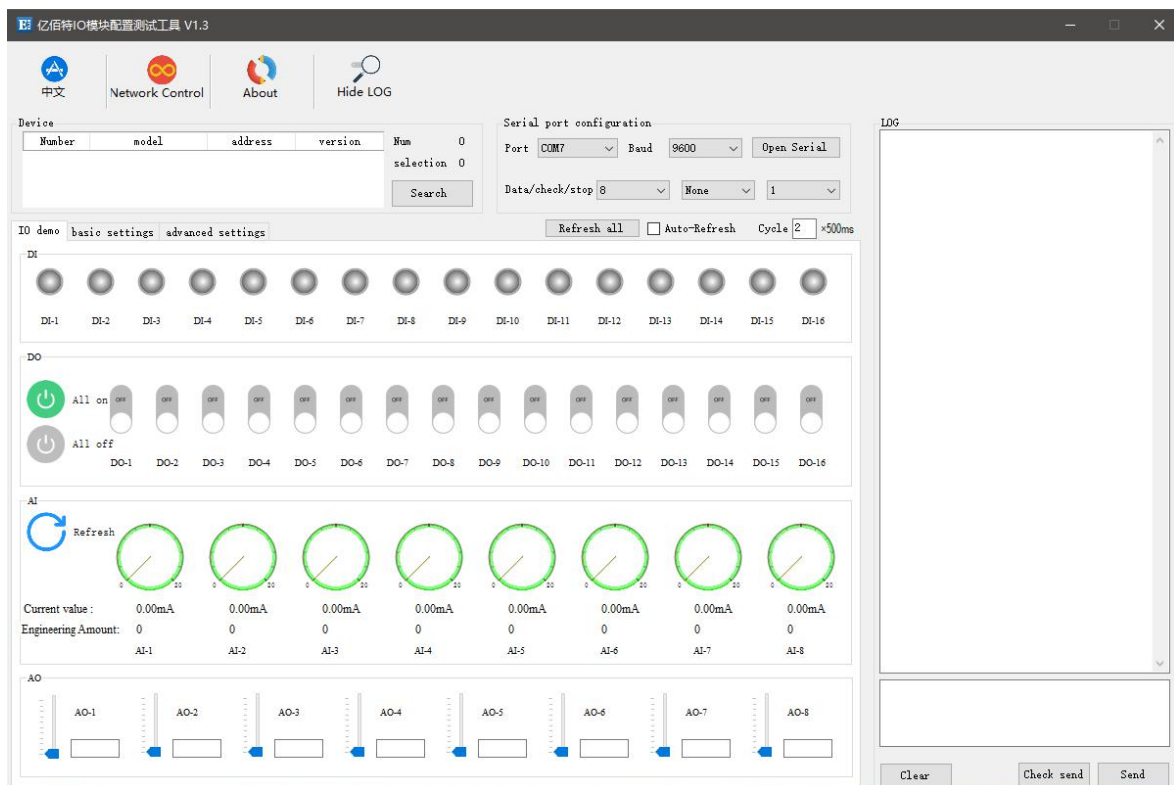


Figure 6-1-2 Successful software installation window is displayed

6.2 Software Functions

6.2.1 IO demo interface

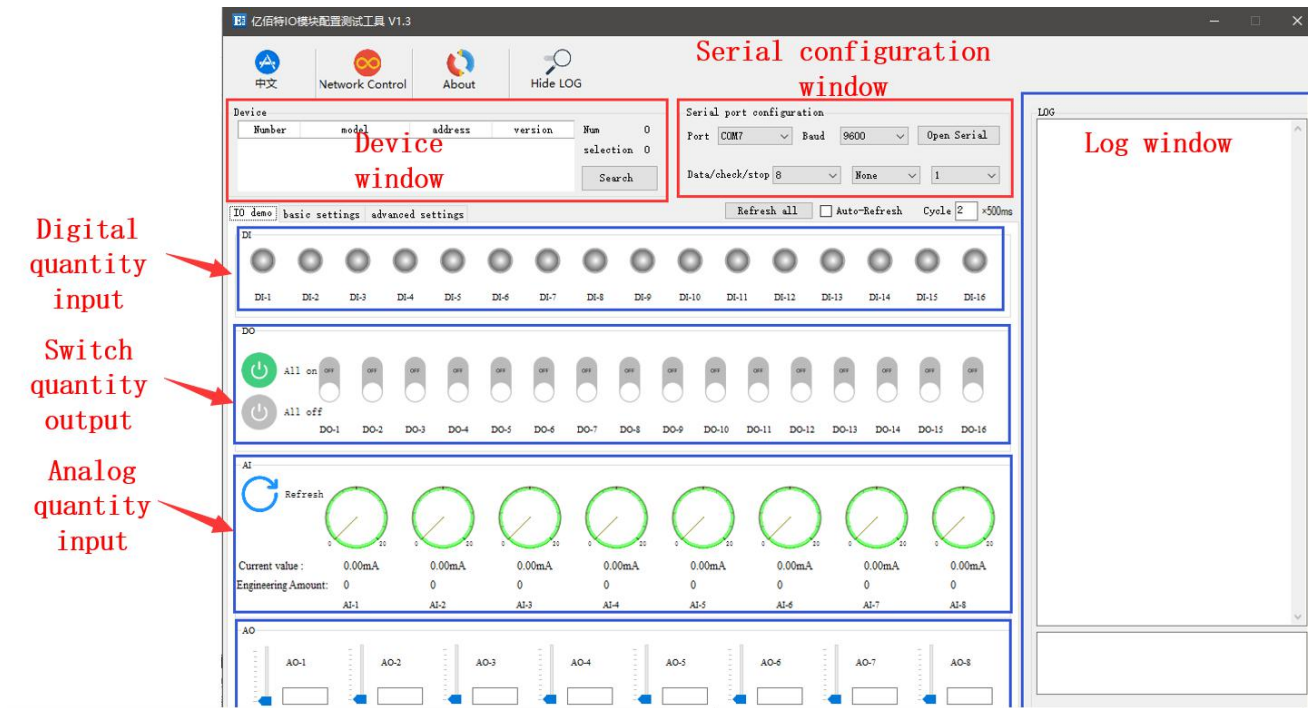


Figure 6-2-1 SOFTWARE I/O demonstration interface

(1) Equipment window

Display current connected device information (serial number, device model, device address, firmware version).

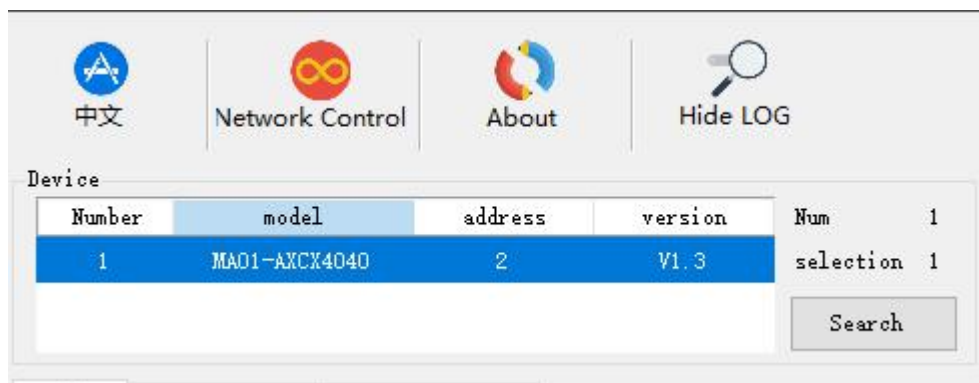


Figure 6-2-2 Device window interface

(2) Serial port parameters window

Display serial port parameters (port, baud rate, data bit, parity bit, stop bit, etc.) and open the serial port.

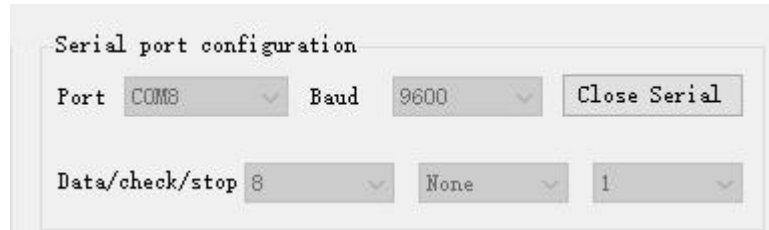


Figure 6-2-3 Serial port Parameters window

(3) Log window

Display running log information (sending and returning data instructions) during device configuration and use.

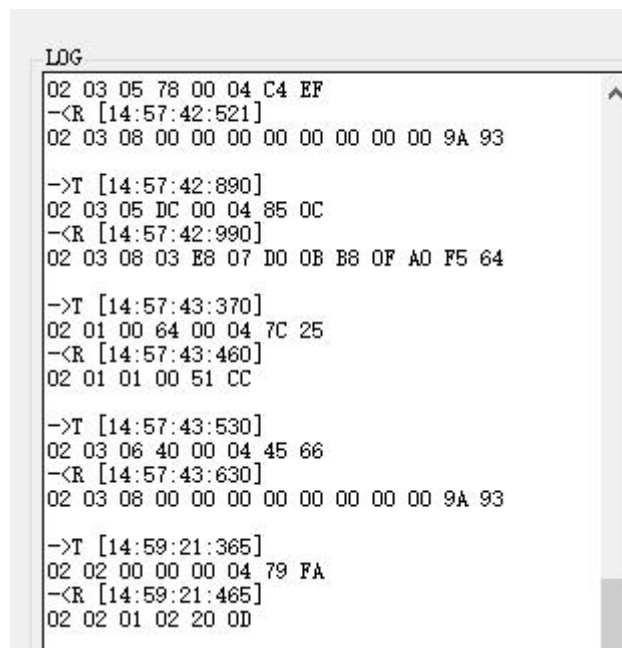


Figure 6-2-4 Log window

(4) Switch input DI [This function is limited to devices that support DI]

Displays the status of digital input DI ports.

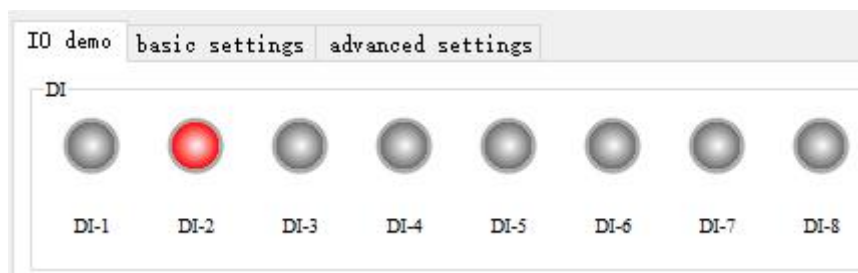


Figure 6-2-4 Switch input DI screen

(5) Switch output DO

Display switch output DO port status, graphically set switch output DO port on, off

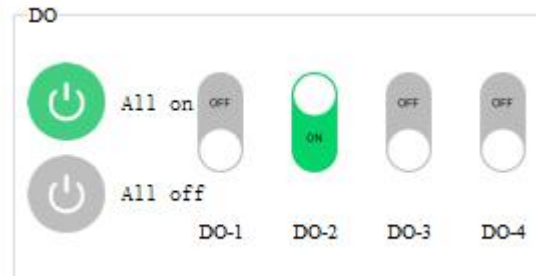


Figure 6-2-5 Switch output DO screen

(6) Simulated input AI [This function is limited to devices that support AI]

Display analog input AI port status (current, quantity of work), graphical needle indication.

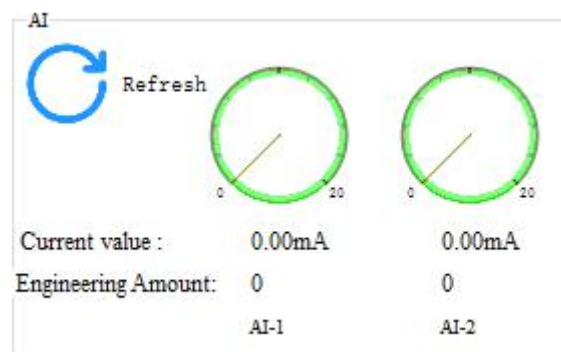


Figure 6-2-6 Interface of simulating input AI

(7) Refresh the Settings

Supports manual and automatic refreshing. Automatic refresh status You can customize the refresh period (the customized period is a multiple of 500ms).

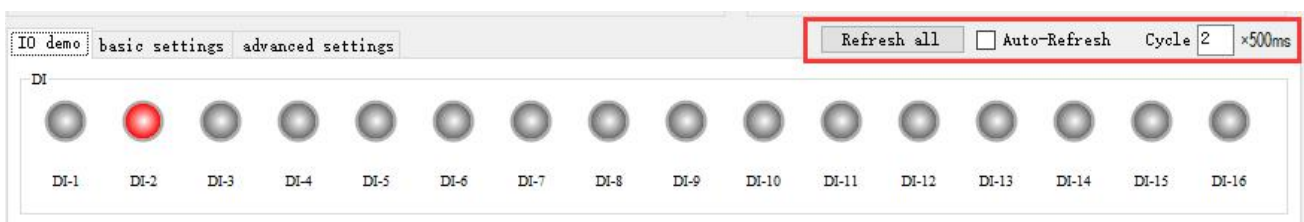


Figure 6-2-7 Refresh setting interface

6.2.2 Basic Settings screen

IO demo **basic settings** advanced settings

Counting demo Refresh

Function	DI-1	DI-2	DI-3	DI-4	DI-5	DI-6	DI-7	DI-8
Counting	0	0	0	0	0	0	0	0
Clear now	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear

DI related
filter set 6 Read Save

Function	DI-1	DI-2	DI-3	DI-4	DI-5	DI-6	DI-7	DI-8
Trigger method	Rising edge	Rising edge	Rising edge	Rising edge	Rising edge	Rising edge	Rising edge	Rising edge
Clearing method	automatic	automatic	automatic	automatic	automatic	automatic	automatic	automatic

DO related Read Save

Function	DO-1	DO-2	DO-3	DO-4	DO-5	DO-6
Operating mode	Level mode	Level mode	Level mode	Level mode	Level mode	Level mode
Pulse Width	50	50	50	50	50	50
DO status	Close	Close	Close	Close	Close	Close
Follow source	DI-1	DI-1	DI-1	DI-1	DI-1	DI-1

Basic Settings screen

(1) Count the demonstration

The DI count information is displayed and the Settings are cleared. [This feature is limited to devices that support DI.]

Counting demo

Function	DI-1	DI-2	DI-3	DI-4
Counting	0	0	0	0
Clear now	Clear	Clear	Clear	Clear

Figure 6-2-9 Counting demonstration interface

(2) DI related

Example Set the DI function. Set filter parameters (1-16), trigger mode (rising edge, falling edge, level), and zero clearing mode (automatic, manual). [This feature is limited to devices that support DI.]

DI related

filter set 16

Function	DI-1
Trigger method	Rising edge
Clearing method	Rising edge Falling edge Level

Figure 6-2-10 DI Related page

(3) DO Related

Set the DO function, set the operating mode (level mode, pulse mode, follow mode), set the pulse width (pulse mode only), DO power status (on, off), follow the source (follow the set DIx).

Note: You can set multiple switch output DO terminals to follow one DI input port, but cannot set one switch output DO terminal to follow multiple DI inputs. [Follow mode is limited to DEVICES that support DI].

DO related

Function	DO-1
Operating mode	Level mode
Pulse Width	Level mode
DO status	Pulse mode
Follow source	Follow mode

Function	DO-1	DO-2
Operating mode	Level mode	Level mode
Pulse Width	1000	2000
DO status	Close	Close
Follow source	DI-1	DI-1

Figure 6-2-11 DO Related page

6.2.3 Advanced Settings screen

Device settings

Device serial port settings

TO demo basic settings advanced settings

Device settings

Device name 12345678901234 Offset addr 118 Read Save Restart Factory

serial port settings

Baud 9600 Data bit 8 Check bit None Stop bit 1 Read Save

Ethernet settings

MAC address IP ModbusTCP port Subnet mask

Gateway DHCP ServerIP/domain Server port

DNS server Mode Active Upload Read Save Clear

Figure 6-2-12 Advanced Settings screen

(1) Device Settings

Advanced Settings interface, support device name setting, offset address (software address), read parameters, enable write protection, disable write protection, restart the module, restore factory Settings.

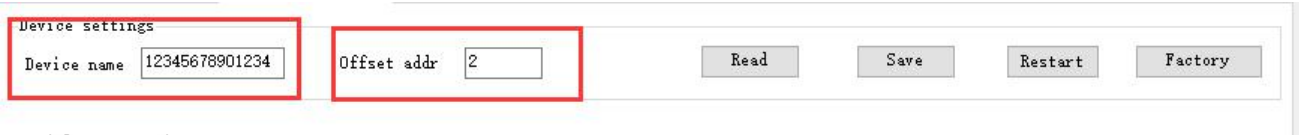


Figure 6-2-13 Device setting interface

(2) Device Serial Port Settings

The baud rate can be 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200. The default baud rate is 115200.

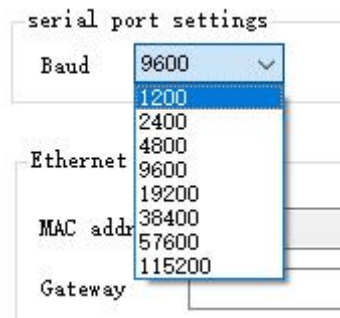


Figure 6-2-14

You can set the parity bit (none, parity, and parity). By default, no parity is available.

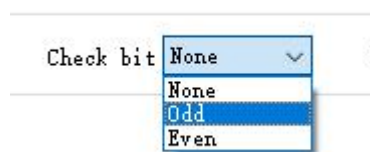


Figure 6-2-16 Checkbit setting interface

6.3 Device Status Query

The configuration software supports device status query. After the device is connected, you can query the device status by clicking Refresh All Data.

For example: Two devices have been connected to the configuration software. Select one of

them and click Refresh All data, The device status is queried.

(1) IO Demo interface

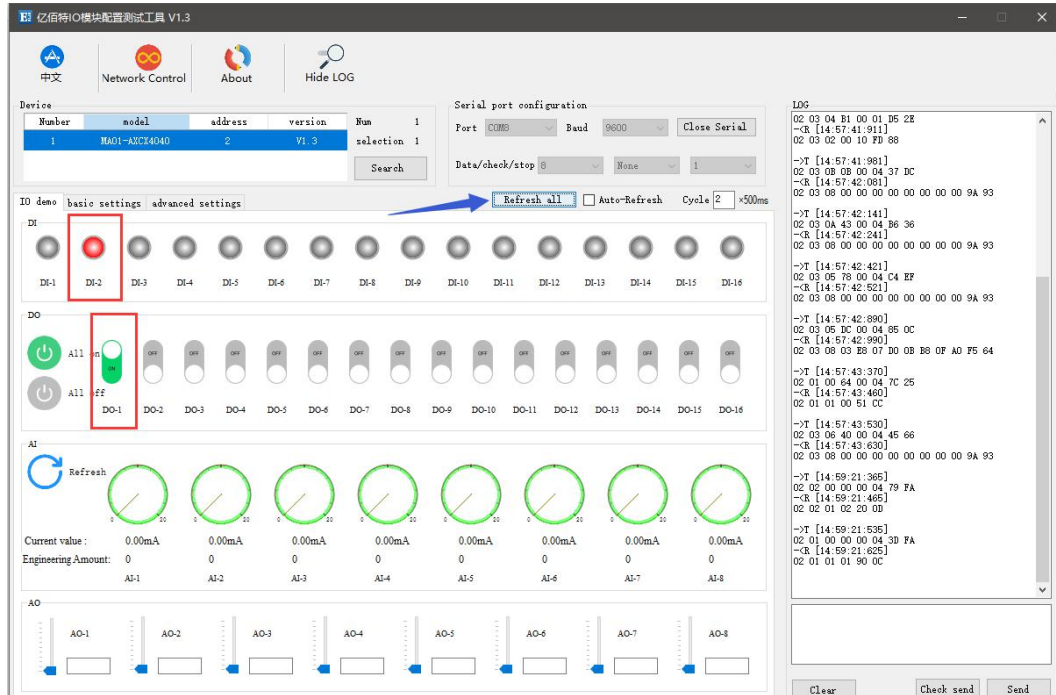


Figure 6-3-1 Device status query (IO demo interface)

(2) Basic Settings screen

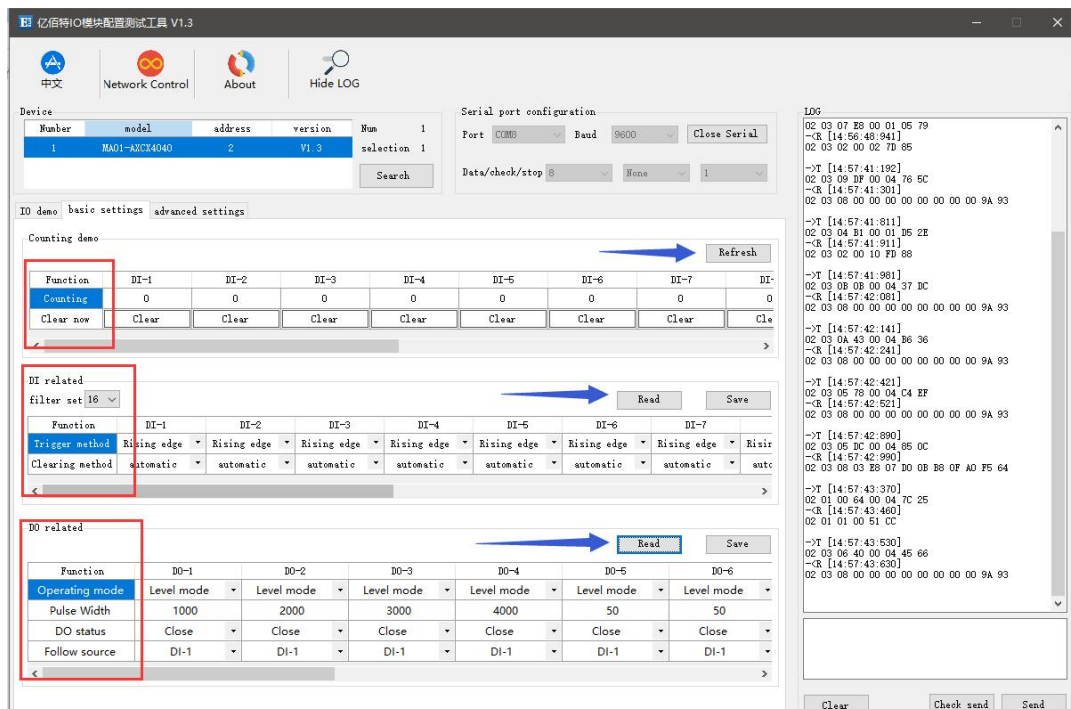


Figure 6-3-2 Device status query (basic Settings)

(3) Advanced Settings screen

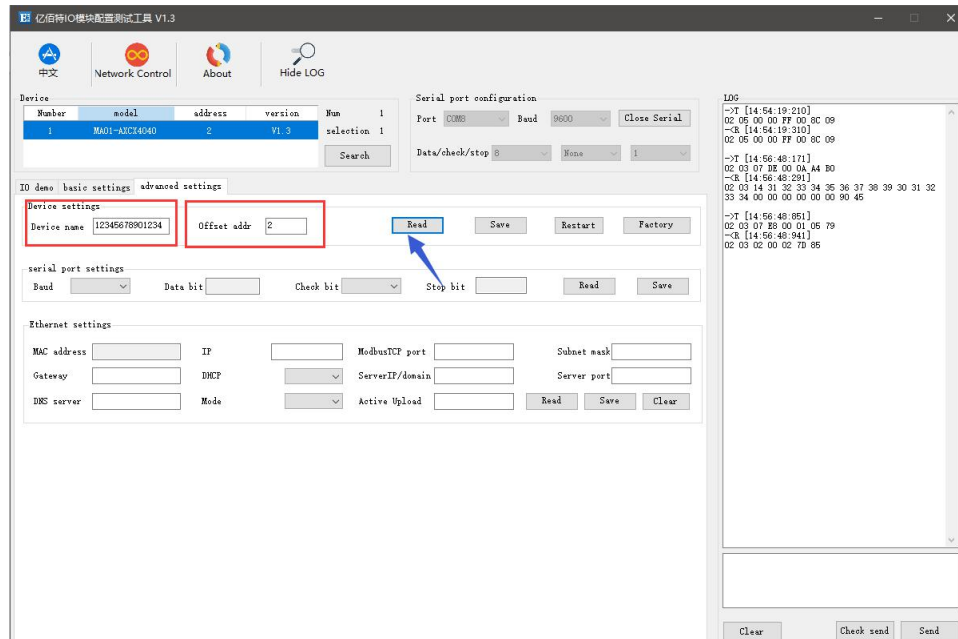


Figure 6-3-3 Device status query (Advanced Settings interface)

6.4 Equipment condition control

Equipment state control, equipment support Modbus standard command control. Also supports configuration software graphical control.

For example, open the DO-1 output port on the control device.

Method 1: Software graphical operation, click the menu button control.

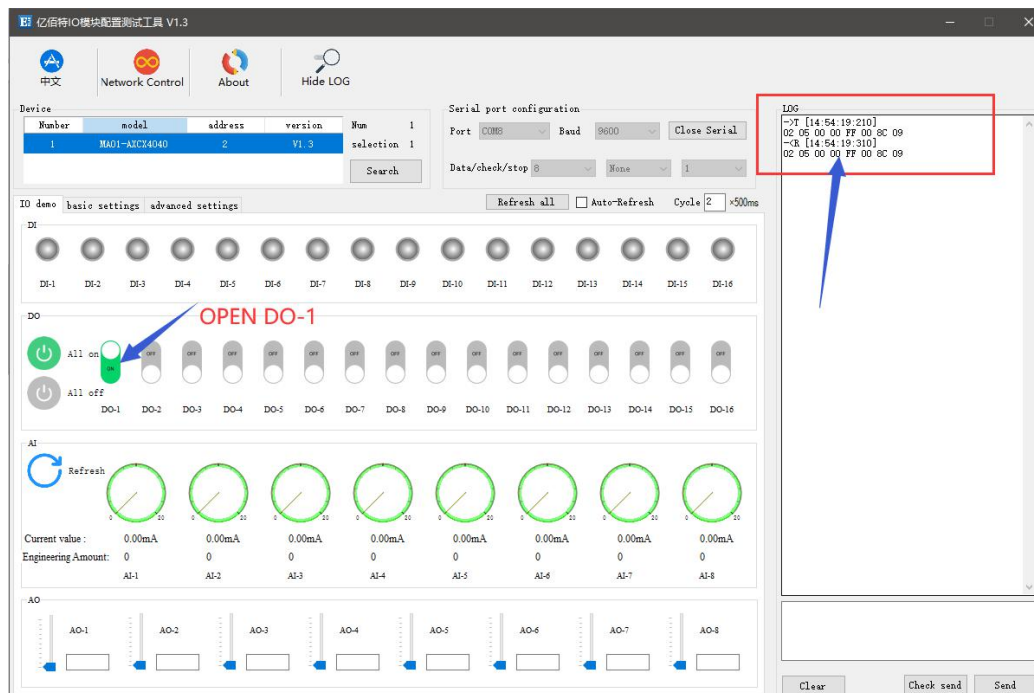


图 6-4-1 软件图形化操作

Method 2: Input command control.

Device Address:1

Function: Turn on DO-1 output

Send:01 05 00 00 FF 00 8C 3A (including CRC check bit)

back: 01 05 00 00 FF 00 8C 3A (including CRC check bit)

7.Use Modbus

7.1 Register list

Register address	Quantity	Register contents	Status	scope of data	Suitable for Function code
(00000)0x0000	4	DO status	R W	0x00-0xff, write changes the current DO state, read obtains the current DO state.	0x01、0x05、0x0F
(00100)0x0064	4	DO Indicates the power-on status	R W	0x00-0xff, set the DO power-on status. After the data is written, the DO status will be set after the next restart.	0x01、0x05、0x0F
(10000)0x0000	4	DI vaule	R W	0x00-0xFF indicates the current level signal of DI.	0x02
(41204)0x04B4	4	DI count	R W	0x0001-0x0008, write indicates initial value of set count, read indicates read already counted value.	0x03、0x06、0x10
(41400)0x0578	4	DO working model	R W	0x0000-0x0002, 0x0000 level mode (default mode), 0x0001 pulse mode, 0x0002 follow mode.	0x03、0x06、0x10
(41500)0x05DC	4	DO pulse width	R W	0x32-0xFFFF(50-65535), duration of pulse in ms.	0x03、0x06、0x10
(41318)0x0526	4	DI Count way	R W	0x0000-0x0002,0x0000 indicates rising edge count, 0x0001 indicates falling edge count, and 0x0002 indicates level count.	0x03、0x06、0x10
(41304)0x0518	4	DI Zero counting method	R W	0x0000-0x0001,0x0000 Automatic clearing mode, 0x0001 Manual clearing mode.	0x03、0x06、0x10
(41311)0x051F	4	Set the zero clearing mode	R W	0x0001-0x00FF。	0x03、0x06、0x10
(41600)0x0640	4	Set the DO follow channel	R W	0x0001-0x0008, 0x0001 indicates the first input.	0x03、0x06、0x10
(42000)0x07D0	7	The module type	R	See model definition table.	0x03
(42012)0x07DC	2	Firmware version	R	Firmware version number.	0x03
(42014)0x07DE	10	Module name	R W	Names can be up to 20 bytes long, including "\0".	0x03、0x06、0x10
(42027)0x07E8	1	Module software Address	R W	0x01-0xE0。	0x03、0x06、0x10
(42025)0x07E9	1	Restore default parameters	R W	Write 5BB5 and restore the Settings to default parameters.	0x03、0x06、0x10
(42026)0x07EA	1	Device Restart	R W	Write 5BB5, Restart the device immediately	0x03、0x06、0x10
(42100)0x0834	1	Baud rate code	R W	The default value is 0x0003 , or,9600. 0x0000,is1200; 0x0001,is2400; 0x0002,is4800; 0x0003,is9600;	0x03、0x06、0x10

				0x0004,is19200; 0x0005,is38400; 0x0006,is57600; 0x0007,is115200;	
(42102)0x0836	1	Terms of inspection	R W	The default value is 0x0000, isNo check. 0x0000, is No check; 0x0001, is Odd parity; 0x0002, is Parity checking;	0x03、0x06、0x10

7.2 AIList of relevant registers

Table 7-2-1 Lists the registers related to THE AIAI

Register address	Quantity	Register contents	Status	The scope of data	Suitable Function code
(10000)0x0000	4	AI The original value	R	0-4095	0x04
(10100)0x0064	4	AI Engineering quantity	R	0-25000	0x04
(40400)0x0190	4	AI High point calibration	RW	0-4095	0x03、0x06、0x10
(40600)0x0258	4	AI Low set value	RW	0-4095	0x03、0x06、0x10
(41200)0x04B0	1	All AI channel filter parameters	RW	1-16	0x03、0x06、0x10
(41202)0x04B2	1	All AI channel sampling ranges	RW	0x0000-0x0001, 0x0000 is 0-20mA, 0x0001is 4-20mA。	0x03、0x06、0x10

7.3 Instruction format (part)

7.3.1 Read DO output coil status

Use 01Function code to read the status of the output coil, for example, read the status of two output coils01Function code:

20	01	00 00	00 02	XX XX
Modbus address of the device	Function code: Read output coil status	Register start address	Read output coil number	CRC CHECK CODE

After sending the above command to the device via RS232, the device will return the following values:

20	01	01	02	XX XX
Modbus address of the device	Function code	The number of bytes of data	The status data returned	CRC CHECK CODE

Returned02 The status data above indicates that The output DO2 is enabled. 述 The status data

returned 02.

7.3.2 Read hold register

Read one or more register values using 03Function code, for example, read DO1 working mode.

20	03	05 78	00 01	XX XX
Modbus address of the device	Function code	Register initial address	The number of registers read	CRC CHECK CODE

After sending the above command to the device via RS232, the device will return the following values:

20	02	02	00 00	XX XX
Modbus address of the device	Function code	The number of bytes of data	Returned data	CRC CHECK CODE

The above 00 00 indicates that DO1 is the level mode.

7.3.3 Write a single hold register

Write a single hold register using 06Function code, e.g., set DO1 to pulse mode 用 06Function code.

20	06	05 78	00 01	XX XX
Modbus address of the device	Function code	Register address	Writes Value	CRC CHECK CODE

After sending the above command to the device via RS232, the device will return the following values.

20	06	05 78	00 01	XX XX
Modbus address of the device	Function code	Register address	Writes Value	CRC CHECK CODE

If the change succeeds, the data in register 0x0578 is 0x0001.

7.3.4 Write multiple hold registers

Use 10Function code to write multiple register holding commands, e.g., set do1-DO4 working mode simultaneously.

20	10	05 78	00 04	08	0001 0002 0003 0004	XX XX
Modbus address of the device	Function code	寄存器 initial address	Register quantity	Write The number of bytes of data	Written data	CRC CHECK CODE

After sending the above command to the device via RS232, the device will return the following values:

20	10	0578	00 04	XX XX
Modbus address of the device	Function code	Register address	Register quantity	CRC CHECK CODE

If the initial address is 0x0578, the values of the four registers are 0x0001, 0x0002, 0x0003, and 0x0000 respectively.

7.3.5 Write a single DO coil state

Use the 06 command to write a single command, for example, set DO1 to pulse mode.

20	05	00 00	FF 00	XX XX
Modbus address of the device	Function code	Register address	Writes Value 线圈动作：导通	CRC CHECK CODE

After sending the above command to the device via RS232, the device will return the following values:

20	05	00 00	FF 00	XX XX
Modbus address of the device	Function code	Register address	Writes Value	CRC CHECK CODE

DO1 coil is on.

7.3.6 Write multiple DO coil states

Use 06Function code to write a single command, e.g., set DO1 to pulse mode.

20	0F	00 00	00 04	01	06	XX XX
Modbus address of the device	Function code	initial address	coil number	The number of bytes of data	控制线圈的 数据(bit 操 作)	CRC CHECK CODE

After sending the above command to the device via RS232, the device will return the following values:

20	0F	00 00	0004	XX XX
Modbus address of the device	Function code	Register address	coil number	CRC CHECK CODE

DO2,DO3 coil is on.

7.3.7 Read input register

Take collecting the original values of four AI channels as an example, and use 04Function code to read the original values of four AI channels.

20	04	00 00	00 04	XX XX
Modbus address of the device	Read command	initial address	The number of AI channels is	CRC CHECK CODE

After sending the above command to the device via RS232, the device will return the following values:

20	04	08	00 00 00 00 00 00 00 00	XX XX
Modbus address of the device	Function code	Data bytes	4 AI channel raw value data, Each two bytes of data represents one AI channel data, where the original value of each channel is 0,0,0,0 respectively.	CRC CHECK CODE

Chengdu Yibai Electronic Co., Electronic Technology Co., Ltd. owns the final interpretation.

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