Chengdu Ebyte Electronic Technology Co.,Ltd

Wireless Modem

User Manual

【2DI + 2AI + 2DO】

MA01-AACX2220

Contents

1 Overview

MA01-AACX2220 supports the acquisition of 2-channel sensor switch input (DI) and 2-channel sensor analog input (AI) which are converted to serial port (RS485) and data is transmitted to configuration software or PLC. The serial port I/O networking module (also known as "remote IO") that controls 2 relay switch outputs (DO) by issuing commands through the serial port to realize remote acquisition and control functions.

Main Features

- Support Modbus RTU protocol;
- Support various configuration software/PLC/touch screen;
- RS485 acquisition and control IO;
- DC 8～28V power supply;
- 2-channel switch input DI (dry node);
- 2-channel analog input AI (0～20mA/4～20mA);
- 2-channel switch output DO (relay);
- Switch input (DI) supports counting function;
- Switch input (DI) supports rising edge, falling edge, and level trigger mode;
- Switch output (DO) supports level mode, pulse mode, follow mode;
- Communication baud rate 1200～115200 (default 9600), support custom setting;
- Supports 1～247 slave stations, 5-digit DIP switch can set 1～31 address code, more than 31 can be set by software.
- Supports installation of guide and positioning hole.

2 Quick Start

2.1 Preparation

Before using the serial port I/O networking device (hereinafter referred to as "IO device"), you need to prepare a computer, converter, power supply, screwdriver and other related auxiliary materials. details as follows:

Chart 2-1-1 Device list

Order	Device	Number
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 (Slot SL 2)	1
7	Signal generator (or sensor)	1

2.2 Wiring

2.2.1 Power wiring

1.Power supply, using DC 8-28V power supply, can also use DC 12V or 24V power supply.

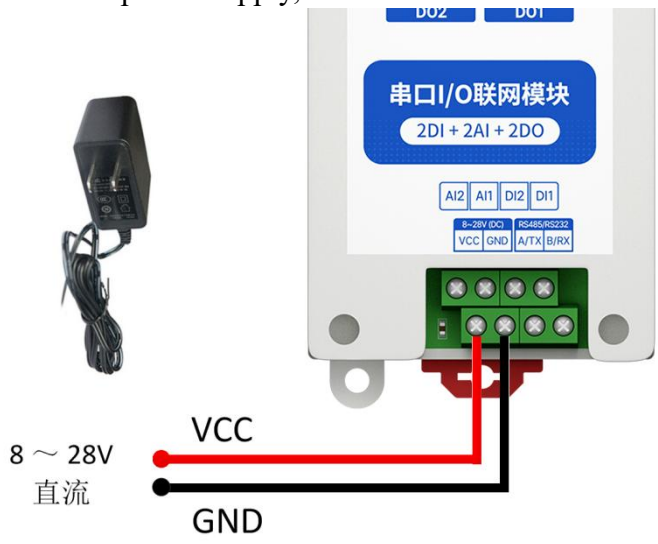


Chart 2-2-1 Wiring

2.2.2 RS485 Wiring

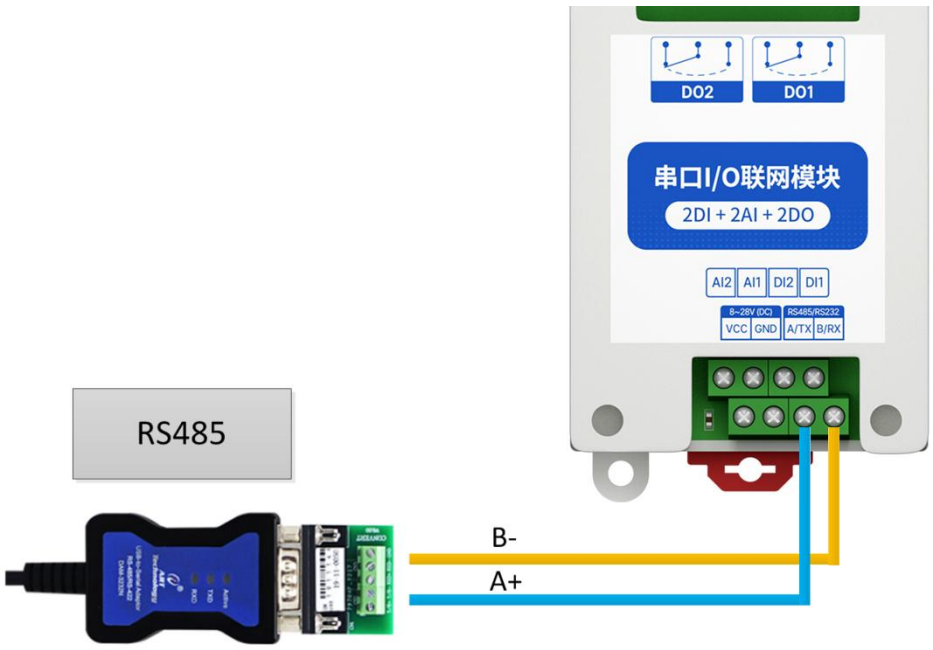
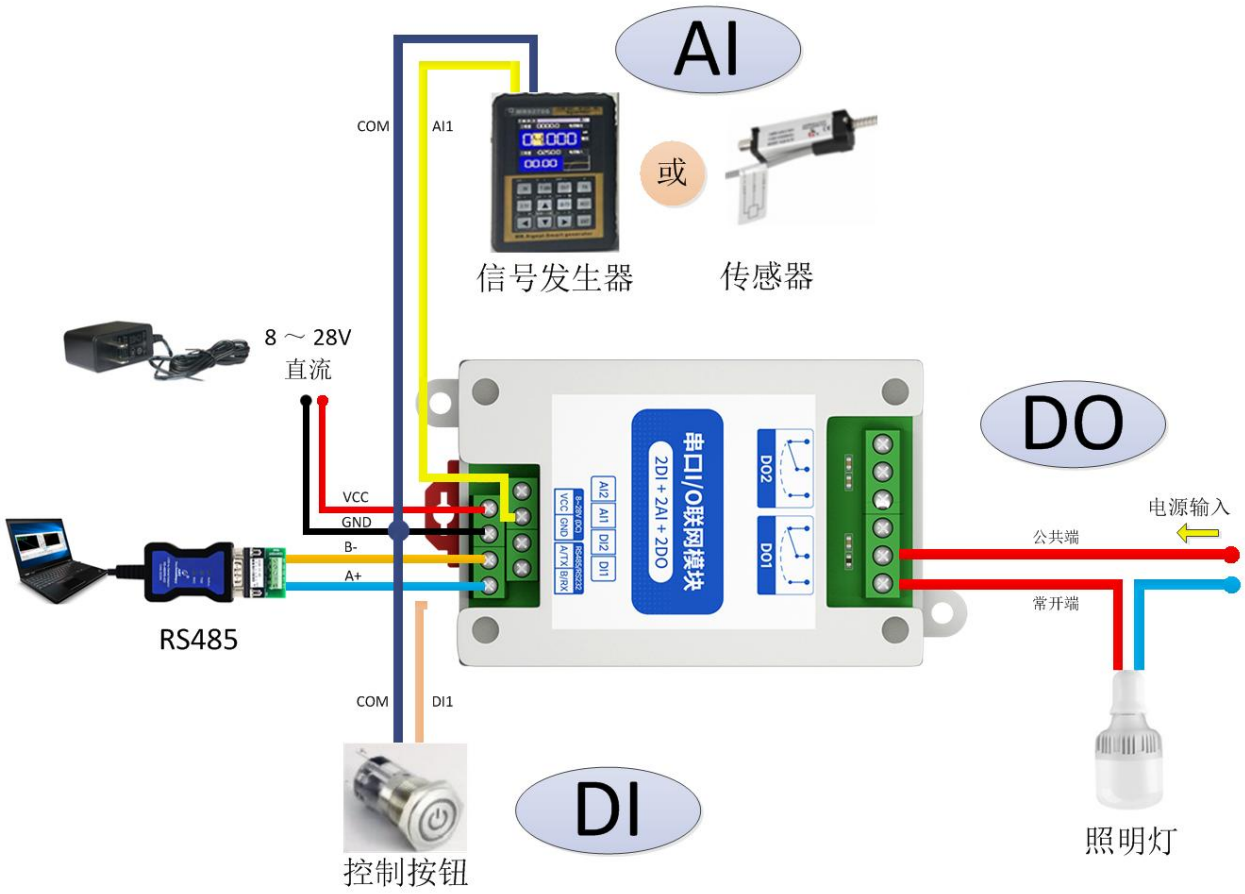


Chart 2-2-2 RS485 wiring

2.2.3 Overall wiring diagram

(1) After the equipment is powered on, the power indicator (POWER) is always on, and the equipment power supply is normal.
(2) Switch input DI wiring, connect the control button to the switch input DI port as shown in the figure.
(3) Analog input AI wiring, connect the signal generator to the analog input AI port as shown in the figure.
(4) Switch output DO wiring, connect the load to the switch output DO port as shown in the figure.

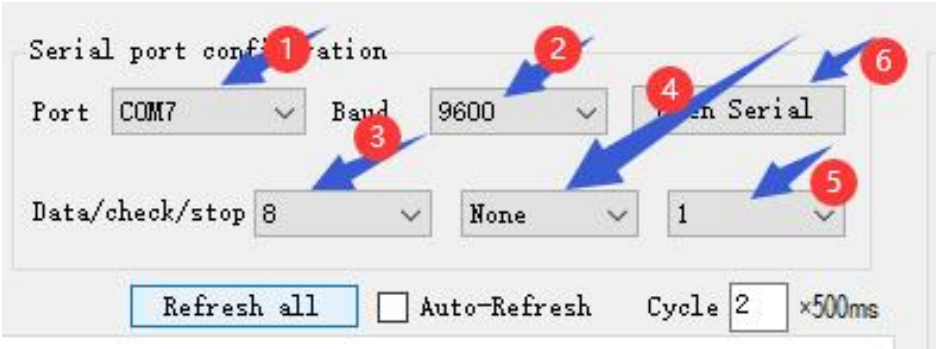

AI
COM
AI1
或
信号发生器
传感器
8 ～ 28V
直流
VCC
GND
B-
A+
RS485
串口I/O联网模块
2DI + 2AI + 2DO
DO2
DO1
DO
电源输入
公共端
常开端
照明灯
COM
DI1
DI
控制按钮

2.3 Setting

2.3.1 Get connected

Steps:

1. Open the serial port, find the corresponding device port number, the baud rate defaults to 9600, and click "open serial port".



2. In the device window, click "Search Device", and the log window on the right will start refreshing

the search information. After the connected device is displayed in the device column of the device window, click the "Stop Searching" menu. Then select the device and click, the connection is successful.

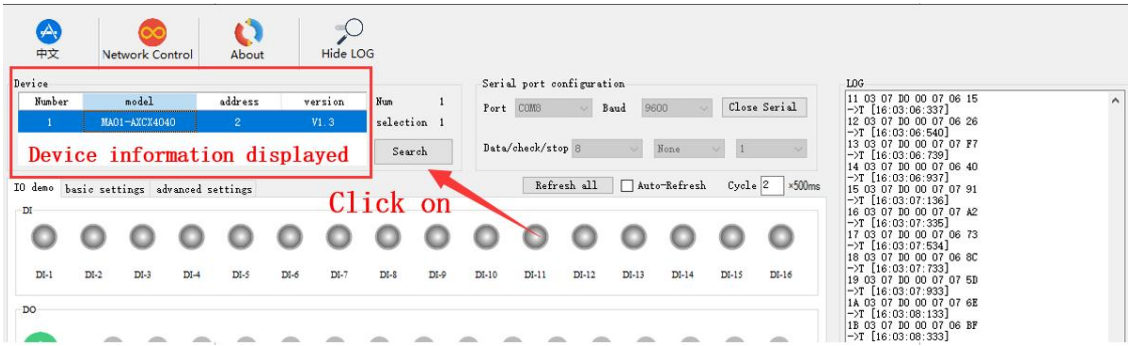


图 2-3-3 连接设备

2.3.2 Testing

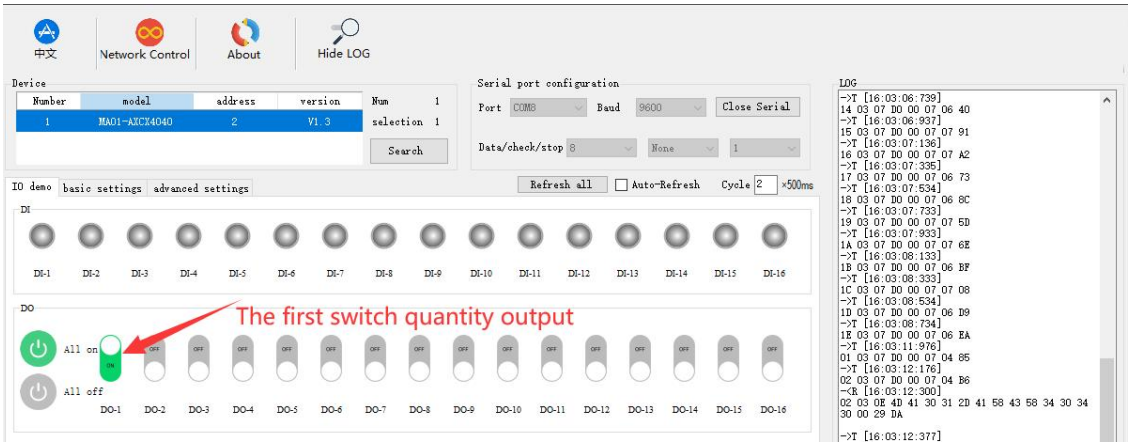
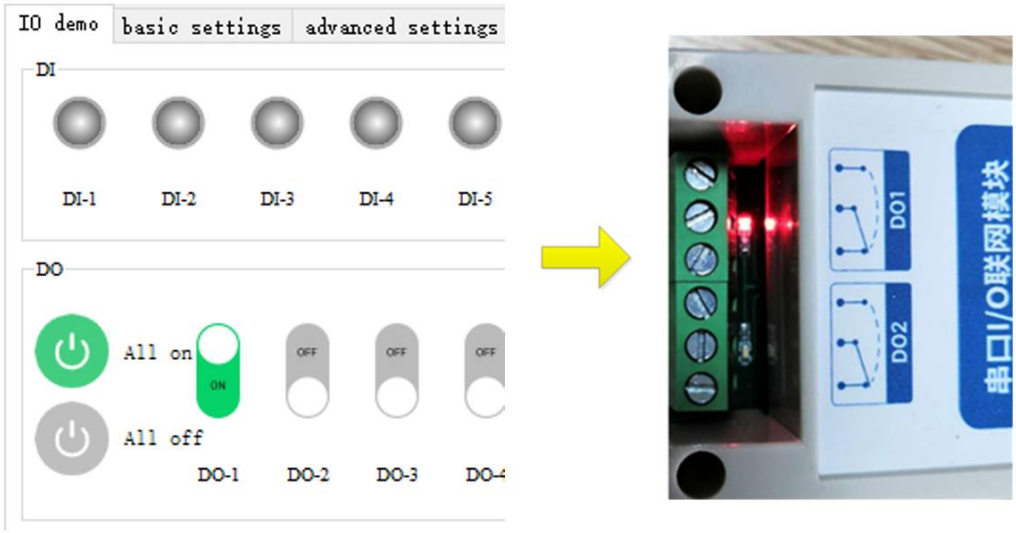


图 2-3-4 设备测试



Test result

3 Parameters

3.1 Product Series

3-1-1 Product specifications

product	version	DI	AI	DO	RS485	RS232
MA01-AXCX4020	4DI+2DO	4 way	—	2 way	●	×
MA02-AXCX4020		4 way	—	2 way	×	●
MA01-XACX0420	4AI+2DO	—	4 way	2 way	●	×
MA02-XACX0420		—	4 way	2 way	×	●
MA01-AACX2220	2DI+2AI+2DO	2 way	2 way	2 way	●	×
MA02-AACX2220		2 way	2 way	2 way	×	●
MA01-AXCX4040	4DI+4DO	4 way	—	4 way	●	×
MA02-AXCX4040		4 way	—	4 way	×	●
MA01-XACX0440	4AI+4DO	—	4 way	4 way	●	×
MA02-XACX0440		—	4 way	4 way	×	●
MA01-AACX2240	2DI+2AI+4DO	2 way	2 way	4 way	●	×
MA02-AACX2240		2 way	2 way	4 way	×	●
MA01-XXCX0080	8DO	—	—	8 way	●	×
MA02-XXCX0080		—	—	8 way	×	●

3.2 Parameters of MA01-AACX2220

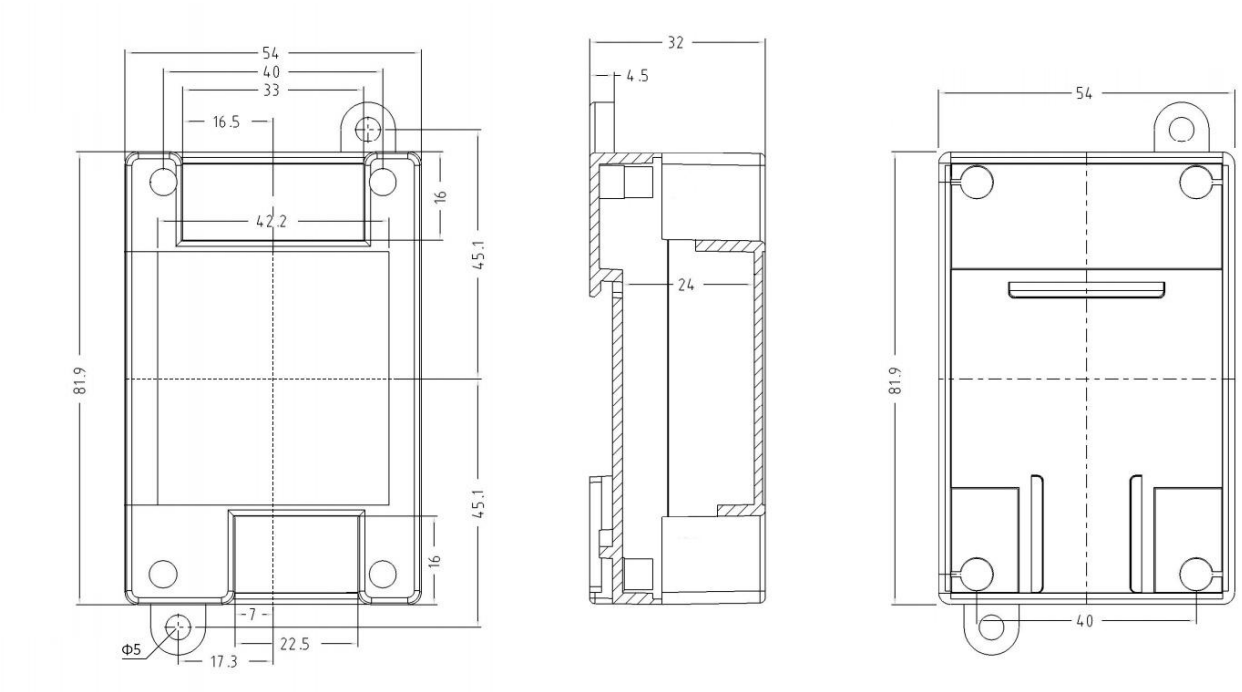
Category	Name	Parameter
Power supply	Operating Voltage	DC 8～28V
	Working current	50mA @12V
	Power indicator	Green LED indication
Serial port	Communication Interface	RS485
	Baud rate	1200～115200 bps (default 9600 bps)
	Check Digit	No parity, odd parity, even parity (no parity by default)
	Data bit	8（fixed）
	Stop bit	1（fixed）
	Protocol	Modbus RTU

	Device address	1～247(default address: 32：software 1,hardware 31）
AI input	AI channels	2 channel
	Acquisition range	0～20mA / 4～20mA
	Resolution	12 bit
	Acquisition accuracy	3‰
	Acquisition frequency	10 Hz
	Acquisition characteristics	Single end input
	input resistance	100Ω
DI input	DI channels	2 channel
	Interface Type	Dry node
	Trigger method	Rising edge, falling edge, level (default rising edge)
	Filter parameter	1～16（default 6）
	Acquisition frequency	1 kHz
DO output	DO channels	2 channel
	DO output type	Type C relay (normally open + normally closed)
	DO output mode	Level mode, pulse mode
	Relay contact capacity	30V/10A、250V/10A
	Output indication	Red LED indication
Others	Product Size	80 mm * 50mm * 30mm (length * width * height)
	Product weight	80g ± 5g
	Working temperature and humidity	-40 ～ +85℃、5%～95%RH(non-condensing)
	Storage temperature and humidity	-60 ～ +125℃, 5%～95%RH(non-condensing)
	Installation method	Installation of guide rail and locating hole

3.3 Port description

number	pin	definition	note
1	VCC	Power supply +	Recommend RVV 2*0.75 wire
2	GND	Grounding-	
3	A/TX	RS485 corresponding to A	Recommend RVSP 3*0.5 wire
4	B/RX	RS485 corresponds to B	
5	DI1	Switch input channel 1	Recommend RVV 2*0.5 wire
6	DI2	Switch input channel 2	
7	AI1	Analog input channel 1	
8	AI2	Analog input channel 2	
9	DO1	Switch output channel 1	The relay has normally open and normally closed terminals
10	DO2	Switch output channel 2	

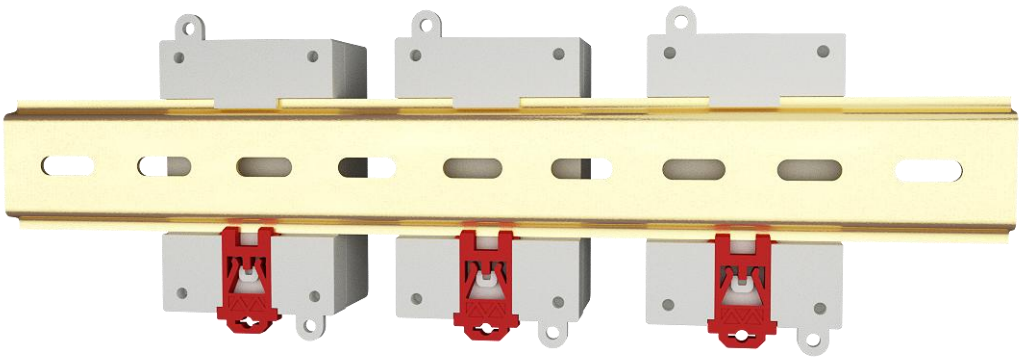
3.4 Dimension



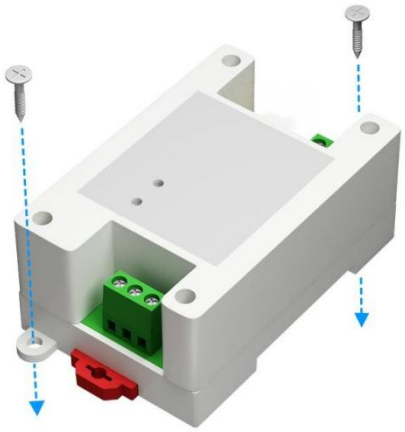
3.5 Installation

3.5 Installation

The equipment is installed with guide rail and positioning hole.



Guide rail installation



Position hole installation

4 Product Features

4.1 Analog input AI

4.1.1 Analog input AI description

The analog input AI measures the current signal, the acquisition range is 0-20mA or 4-20mA, the accuracy is 3‰, and the resolution is 12 bits. Adopt single-ended input, sampling frequency 10Hz, input impedance 100Ω.

4.1.2 Analog input AI filter parameters

The filter parameters of the AI channel can be set, the effective value is 1-16, and the default is 6.

Note:

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

(2) AI channel filter parameter address is 0x04B0, and the register type is holding register. Function code 0x06, 0x10. When writing AI filter parameters, if the written parameter value is not within the range of 1-16, it will automatically take the closest value to write. If the write filter parameter is 0, the device will take 1 as the filter parameter, and Modbus will not return. Wrong instruction

4.1.3 Analog input AI sampling range

Set the sampling range of all AI channels, valid values are 1 and 0 (default 0).

0: Represents 0～20mA

1: Represents 4～20mA

(1) The AI sampling range is shared by all channels. When the AI channel sampling range is configured for 4-20mA sampling, if the current signal is lower than 4mA, the engineering value of the channel is converted to 0. For signals greater than 20mA, there is no conversion limit, but it cannot exceed 25mA (there is a risk of equipment damage if it exceeds 25mA).

(2) AI channel sampling range parameter address is 0x04B2, the register type is holding register, function code 0x06, 0x10. When writing the AI channel sampling range parameter, if the value of the parameter written is not within the range of 0 to 1, it will automatically take the closest value to write. For example, if the write sampling range parameter is 2, the device will take 1 as the sampling range parameter. And MDOBUS does not return an error command

4.1.4 Analog input AI raw value, engineering value

There are two ways to read the magnitude of the current signal collected by the device:

(1) Read the original value of AI and calculate the input current based on the input impedance.

The address of the AI original value register is 0x0000～0x0003, the register type is input register, and the read

function code is 0x04. The value returned by this method is 2 bytes representing a channel, and the range of the value read is 0～4095. The method of calculating the current is 0～4095 corresponding to 0～25mA.

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

$$Current = \frac{Original\ value}{4095} \times 25\ (mA)$$

(2)Read the AI engineering value and directly convert to get the input current.

The address of AI engineering value register is 0x0064～0x0067, the register type is input register, and the read function code is 0x04. The value returned by this method is 2 bytes representing 1 channel, and the value read is 0～25000.

The method of calculating the current is 0～25000 corresponding to 0～25mA.

$$Current = \frac{Engineering\ value}{1000}\ (mA)$$

4.1.5 Analog input AI calibration

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

Each channel of AI has an independent high (low) point calibration register. The address of the high point calibration register is 0x0190～0x0193, and the address of the low point calibration register is 0x0258～0x025C. The register type is holding register, and the function code is 0x06, 0x10.

The calibration method can input an accurate current signal for the AI channel and write the value for calibration. For example, if the AIx channel corresponding to the calibration device has an actual input current of 20mA, then read the AI original value of the AIx channel and write the original value to the high calibration register of the AI channel. Generally, the low point calibration can be set to 0 by default.

Note: This function calibration is only used when the error is large. It is not recommended under normal circumstances.

4.2 Switch input DI

4.2.1 Switch input DI description

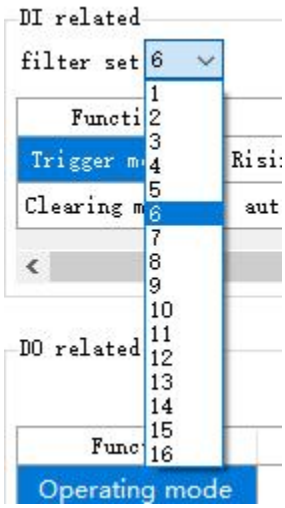
Switch input DI to measure level signal or edge pulse signal (rising edge, falling edge). Support dry node collection, support DI counting function, the maximum count is 65535 (the count is automatically cleared when 65535 is exceeded).

The switch input DI supports three trigger modes of rising edge, falling edge and level (the default rising edge trigger mode).

The clearing method supports automatic clearing and manual clearing (default automatic clearing).

4.2.2 Switch input DI description

When the switch inputs the DI to collect the signal, it needs to keep multiple sampling periods before confirming. The filter parameter can be set from 1 to 16 (default 6 sampling periods). The DI filter parameters can be set through the configuration software



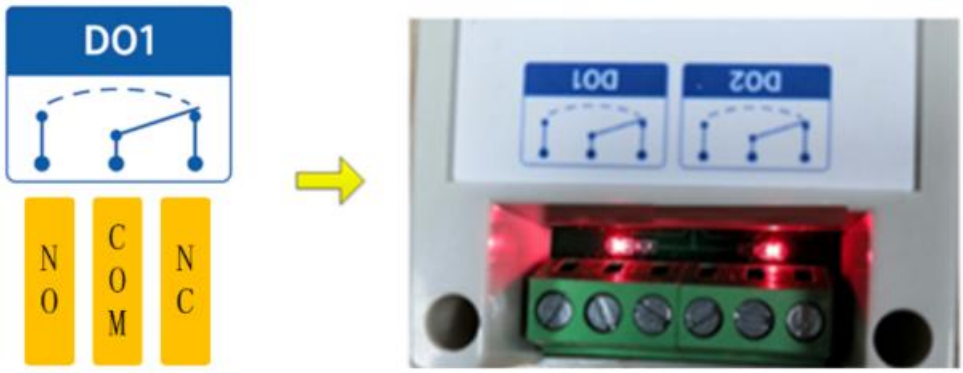
Setting DI filter parameters

4.3 Switch output DO

4.3.1 Switch output DO description

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

Each DO output is designed with an output indicator (red LED indication) to indicate whether the output port is on or off. When the LED indicator is on, it means the relay is closed (normally open on, normally closed off); when the LED indicator is off, it means the relay is not closed (normally open off, normally closed on).



Switch output DO interface

4.3.2 Switch output DO mode setting

(1) Level mode

Output according to the level set by the user. The switching characteristics of the level mode are similar to the function of a self-locking switch.

(2) Pulse mode

After the switch output DO is turned on, the set pulse width time (in ms) is maintained, and the switch output DO is automatically turned off. The pulse width setting range is 50～65535 (default 50).

(3) Follow mode

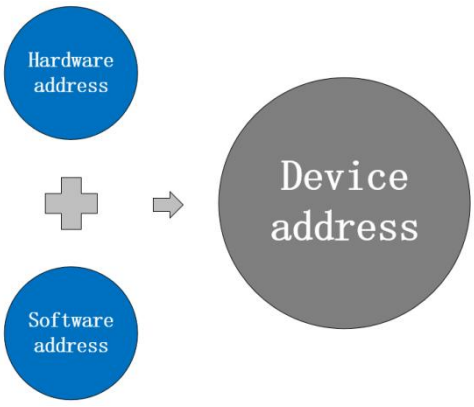
After the user sets the follow mode, set the follow input terminal. The switch output DO terminal is consistent with the DI input terminal.

Note: Multiple switch output DO terminals can be set to follow one DI input terminal, and one switch output DO terminal can not be set to follow multiple DI input terminals.

4.4 Device address

4.4.1 Device address

Device address composition: hardware address + software offset address



Device address

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

Device address setting range: 1～247.

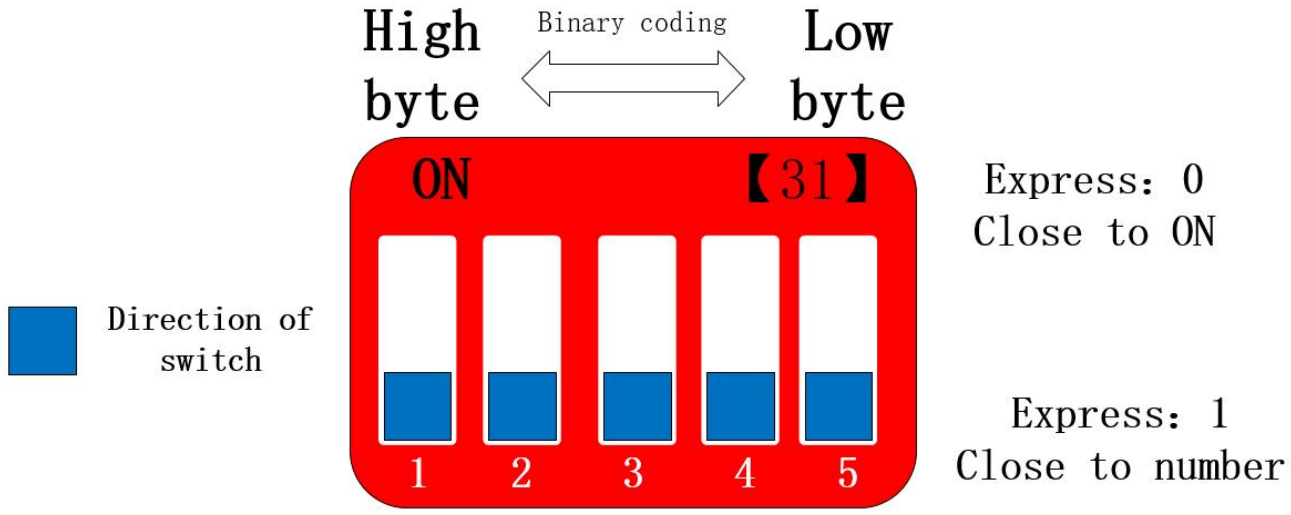
Hardware address: realized by the dial switch (5 digits) dial setting (the factory default is 31).

Software address: It is realized by the "offset address" set by the configuration tool software (the factory default is 1).

For example:

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

4.4.2 Hardware address (dip switch)

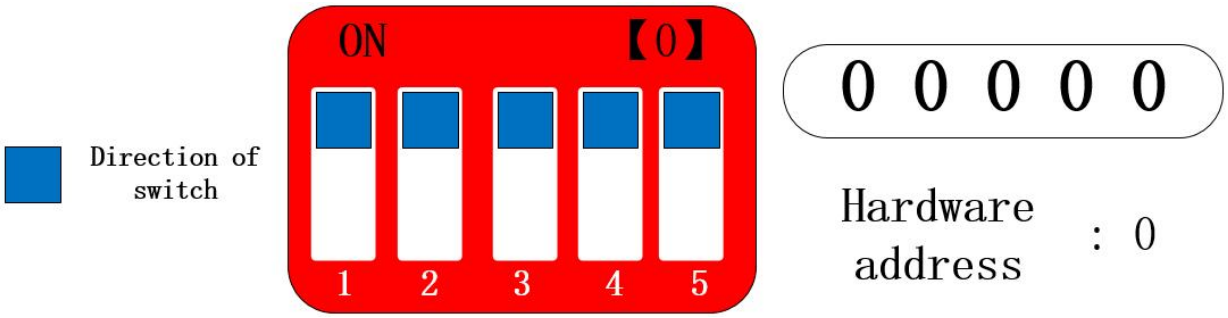


Hardware address (Dip switch)

Hardware address: The DIP switch can switch different hardware addresses, and the binary system represents the 5-digit DIP switch. The "5" direction indicates the low position, and the "1" direction indicates the high position. The hardware address range can be adjusted from 0 to 31.

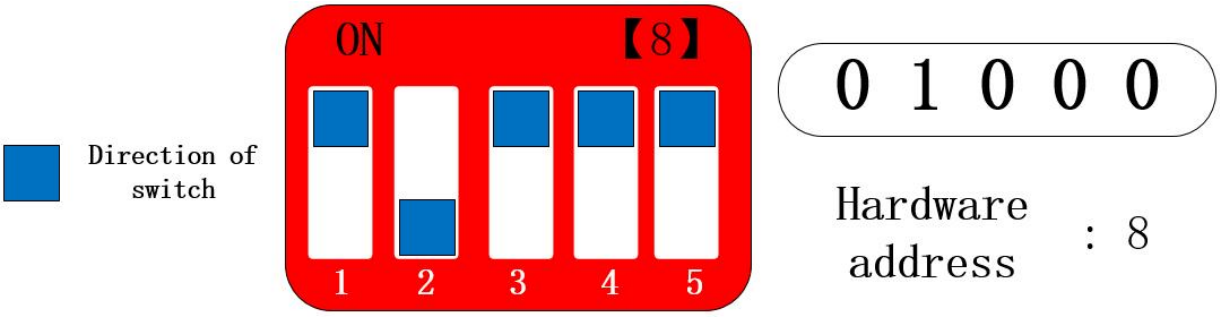
Hardware address dialing setting instructions:

Example 1: Set hardware address 0 (default), binary code.



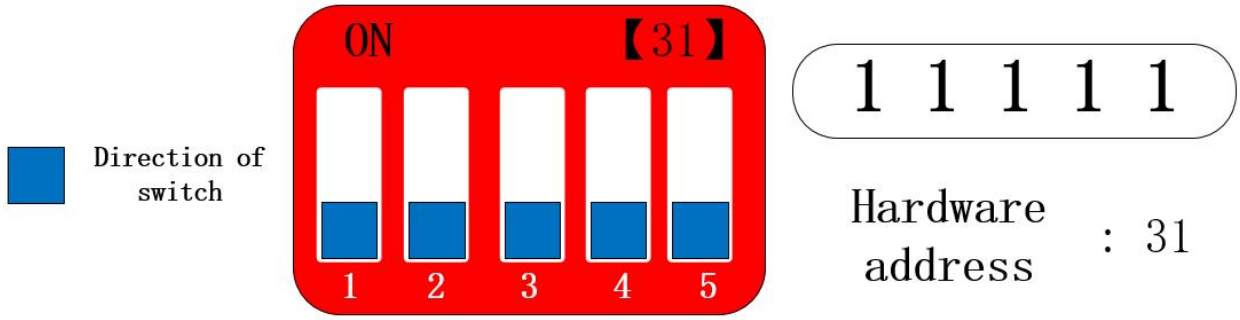
Hardware address 0

Example 2: Set the hardware address to 8, binary code.



Hardware address 8

Example 3: Set hardware address 31, binary code.



Hardware address 31

The hardware address can be customized according to the actual situation. The setting method is shown in the above example.

If multiple devices are required to connect to a single RS232, only the hardware address is used, and a single bus can be connected to a maximum of 32 devices (just set the hardware address).

If you need more than 32 devices to connect to a single RS232, you need to set the software address (offset address) to realize a single bus to connect up to 247 devices.

After changing the address, you need to power off and restart the new address to take effect.

Remarks: For the devices below, dip switch is inside the housing, to set dip switch,you need to open housing first.

【2DI+2AI+2DO】

【4AI+2DO】

【4DI+2DO】

4.4.3 Software address (offset address)

Software address: The user can make different settings according to the scene. The software address setting range is 1～224 (device address: 1～247), and the default software address is 1.

After changing the address, you need to power off and restart the new address to take effect.

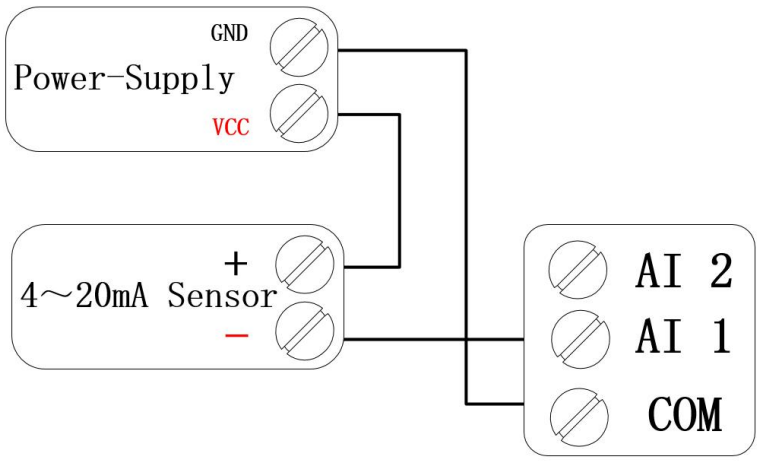
To change the software address, it needs to be realized through the configuration tool software, as shown in the figure:

Software address (offset address)

5 Port wiring

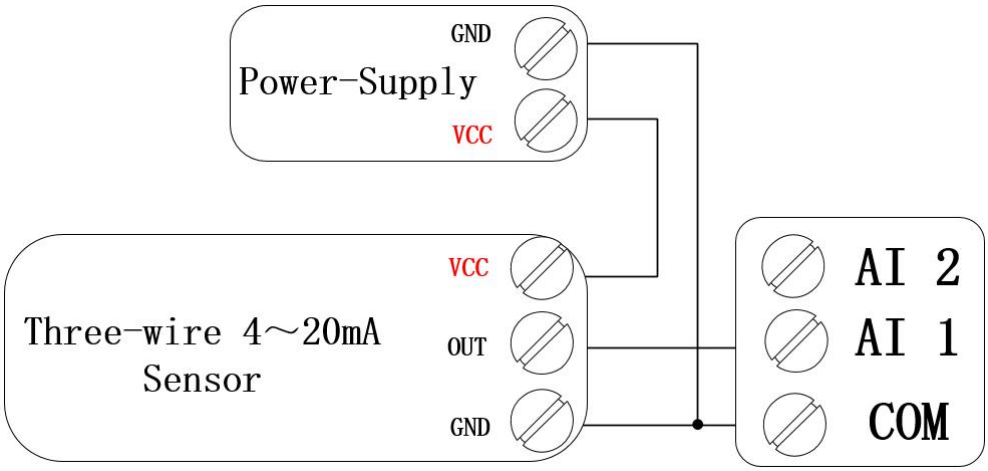
5.1 Analog input AI port wiring

5.1.1 Two-wire sensor wiring



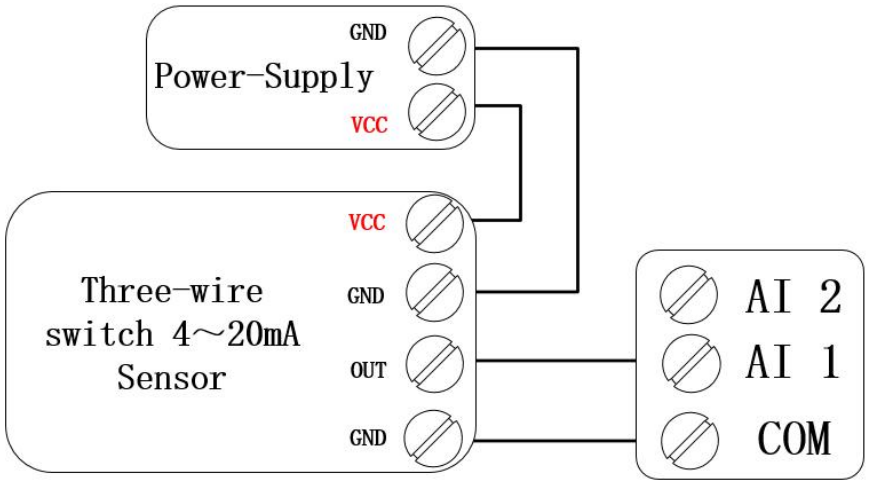
Two-wire sensor wiring diagram

5.1.2 Three-wire sensor wiring



Three-wire sensor wiring diagram

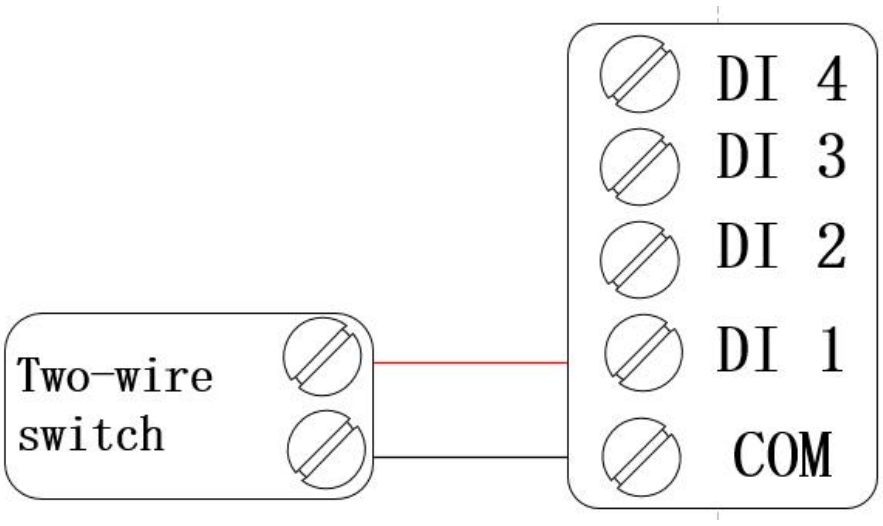
5.1.3 Four-wire sensor wiring



Four-wire sensor wiring diagram

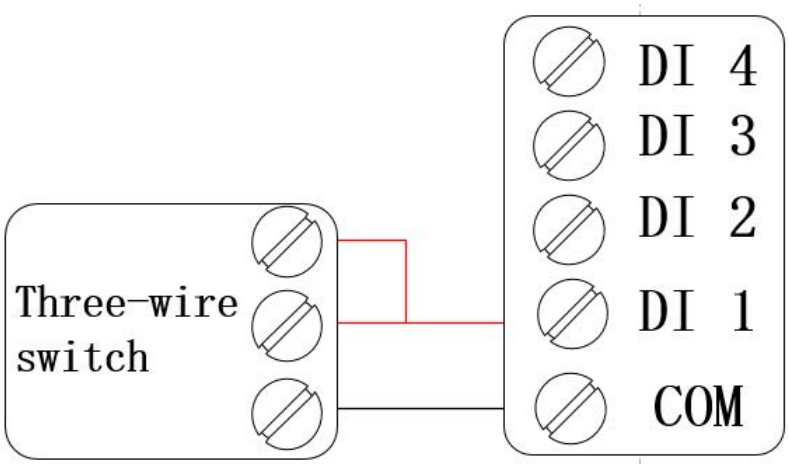
5.2 Switch input DI port wiring

5.2.1 Two-wire switch wiring



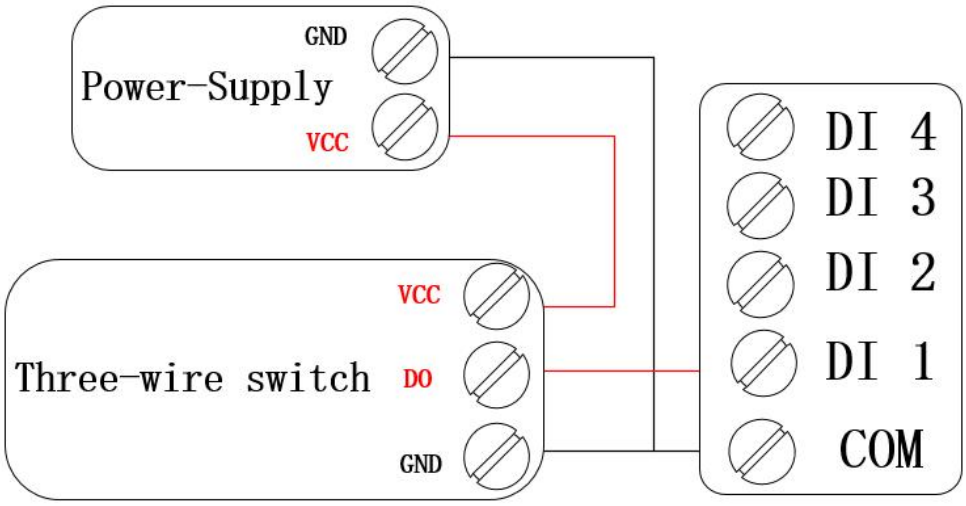
Two-wire switch wiring diagram

5.2.2 Three-wire switch wiring



Three-wire switch wiring diagram

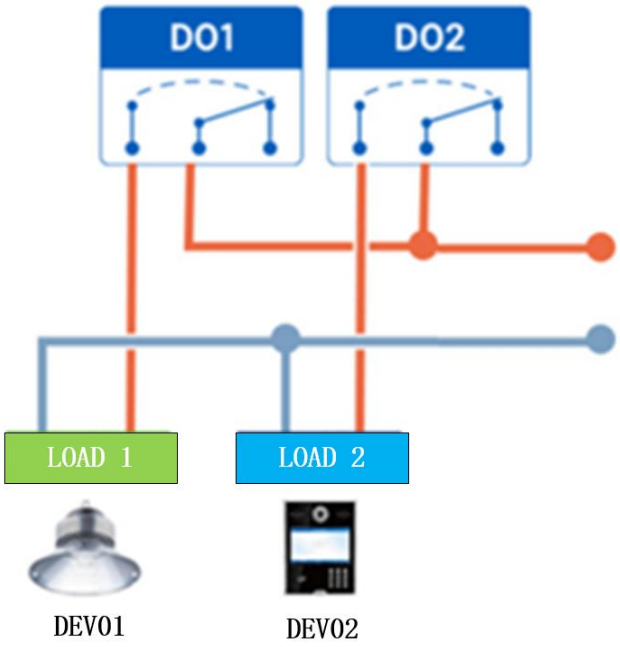
5.2.3 Three-wire sensor wiring



Three-wire sensor wiring diagram

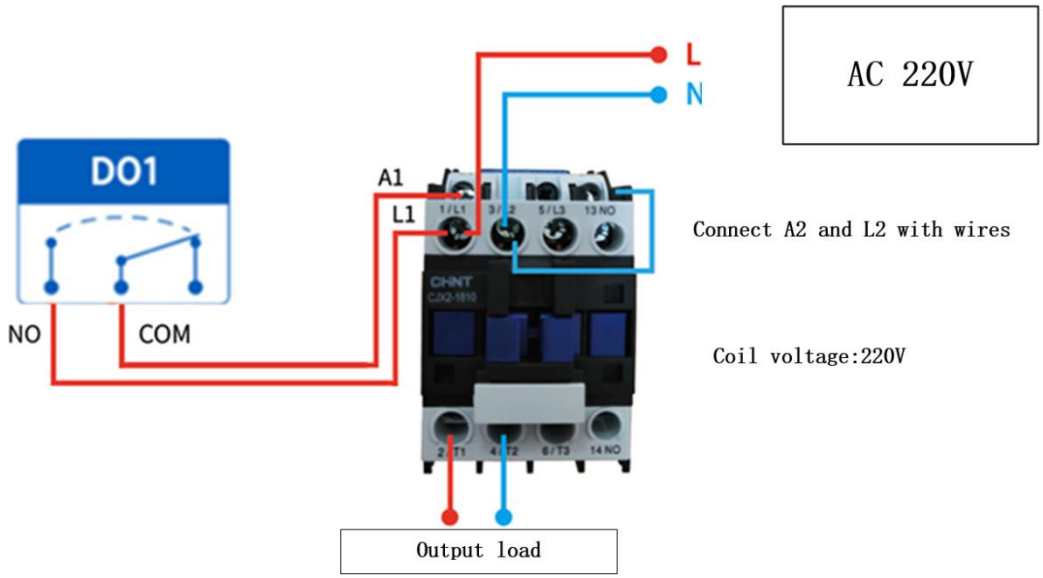
5.3 Switch output port wiring

5.3.1 The output terminal directly controls the load (small power equipment within 1kW)



The output terminal directly controls the load wiring diagram

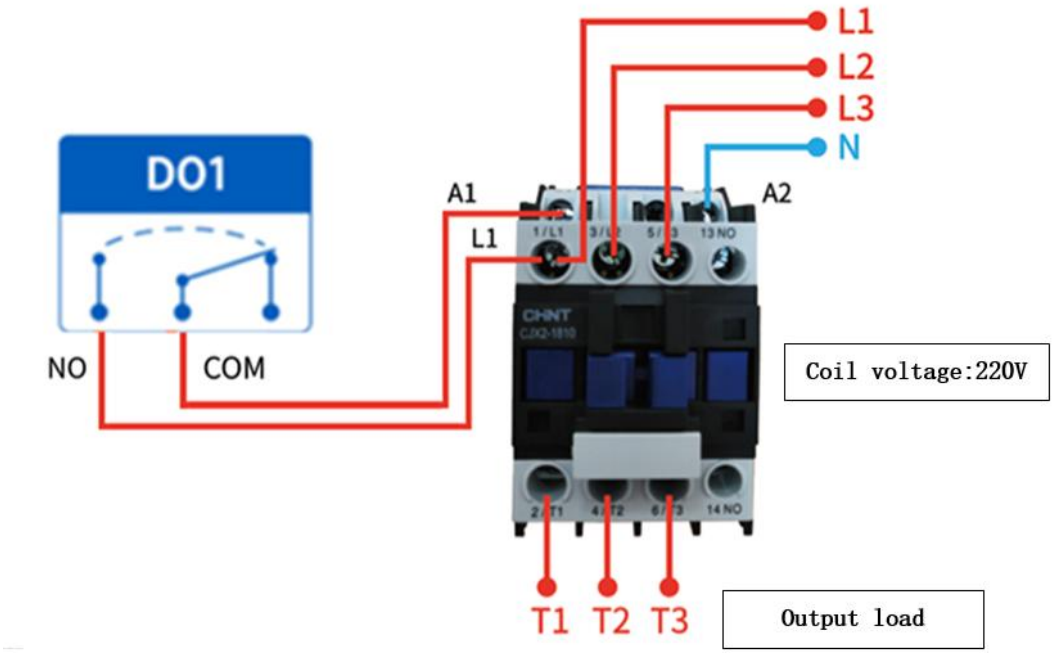
5.3.2 Output terminal control contactor (contactor controls high-power 220V equipment)



Wiring diagram of output terminal control contactor

Remarks: The above figure takes the contactor coil voltage AC 220V as an example. **The coil voltage of different contactors may be different.**

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



Wiring diagram of output terminal control contactor

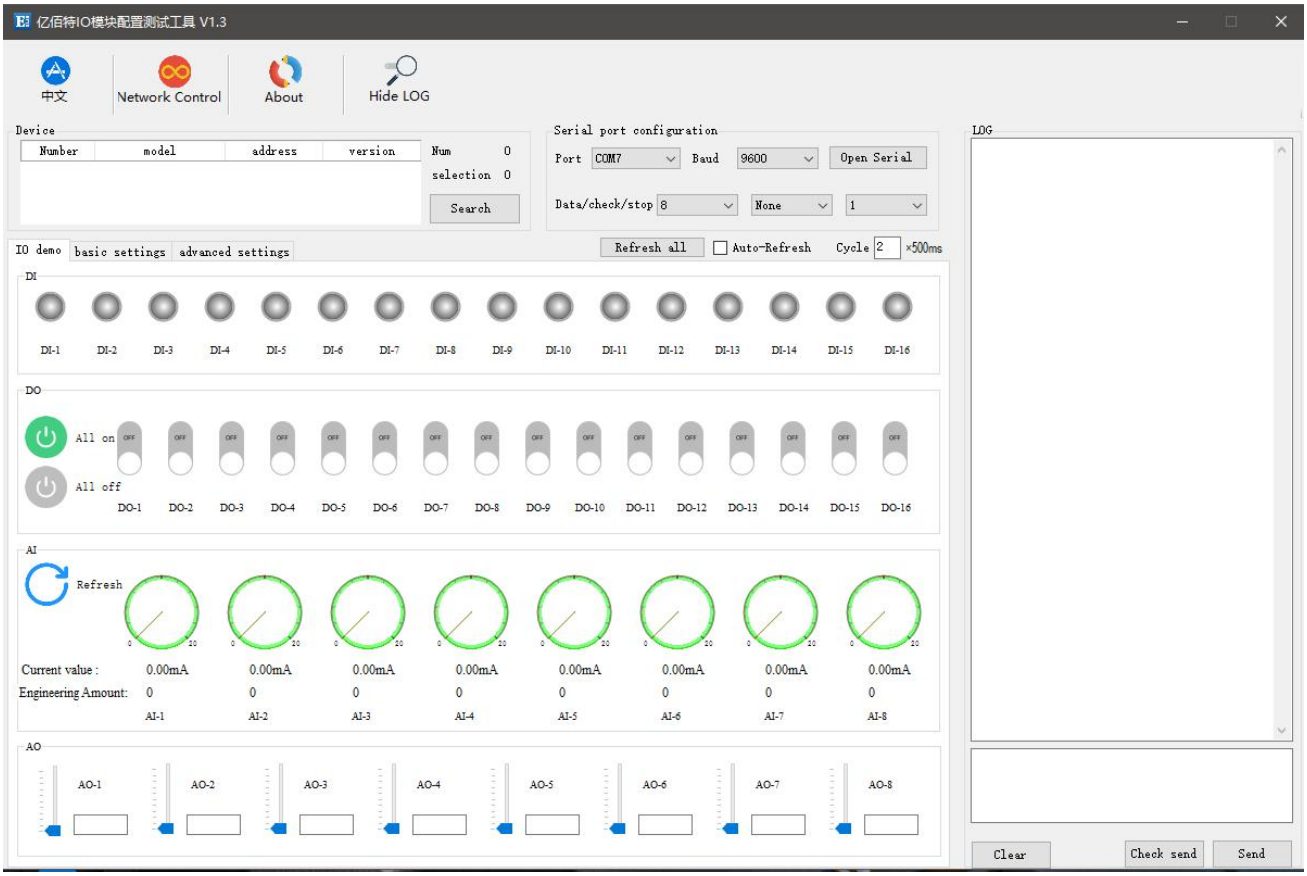
Remarks: The above figure takes the contactor coil voltage AC 220V as an example. **The coil voltage of different contactors may be different.**

6 Software use

6.1 Software Installation

The configuration tool software is driver-free installation, directly double-click the .exe file to open it and use it.

Software installation file



Successful software installation opens the interface

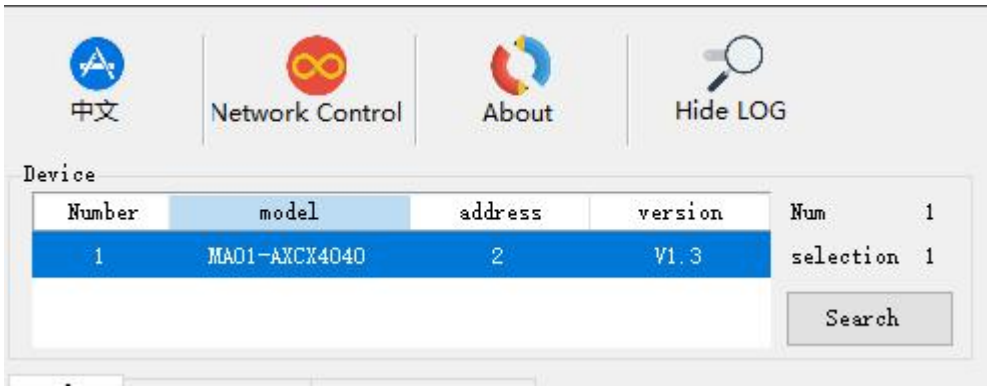
6.2 Software function introduction

6.2.1 IO Demo interface

Software IO demo interface

(1) Device window

Display the information of the currently connected device (serial number, device model, device address, firmware version).



Device window interface

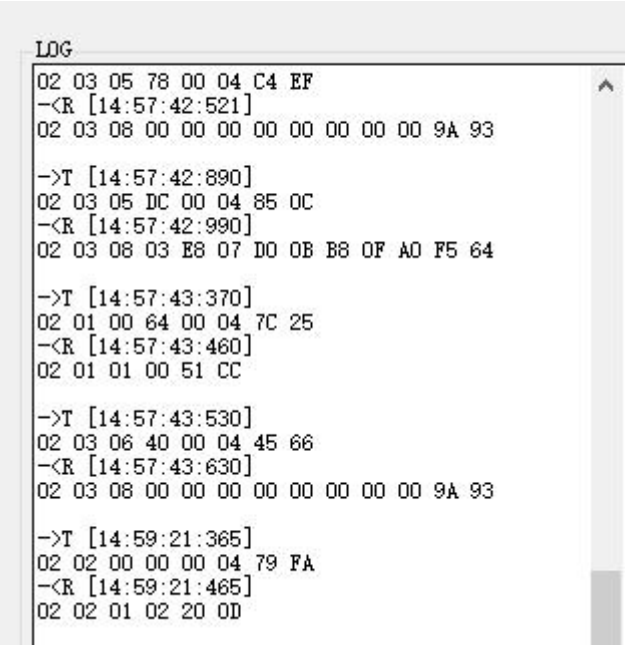
(2) Serial port parameter window

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

Serial port parameter window interface

(3) Log window

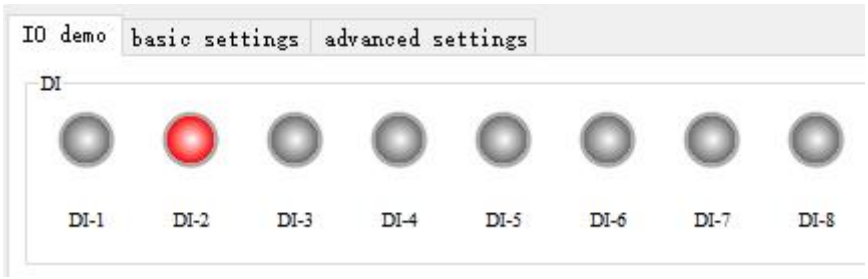
Display the running log information (send and return data commands) during the configuration and use of the device.



Log window interface

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

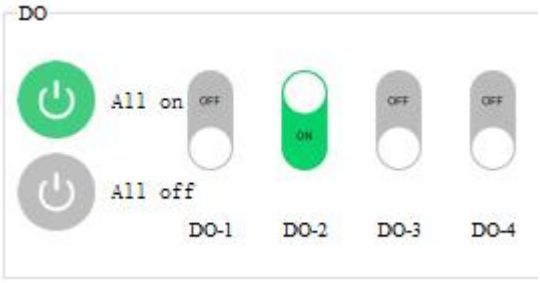
Display the status of the digital input DI port.



Switch input DI interface

(5) Switch output DO

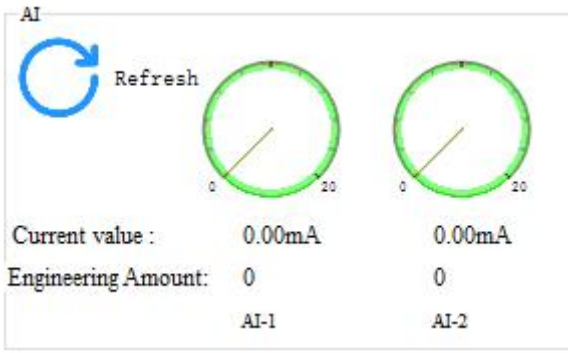
Display the status of the switch output DO port and graphically set the switch output DO port on and off.



Switch output DO interface

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

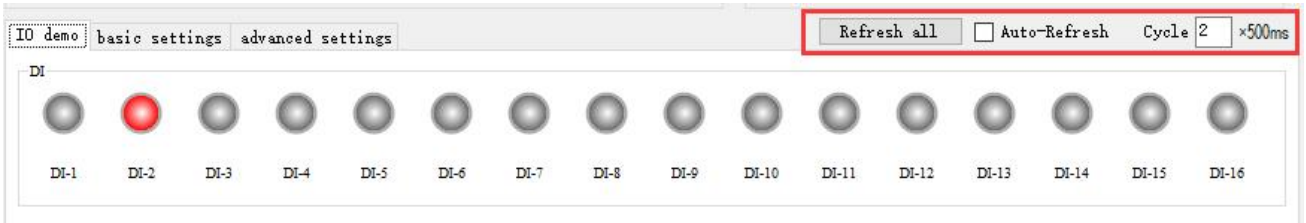
Display the status of the analog input AI port (current amount, engineering amount), graphical needle indication.



Analog input AI interface

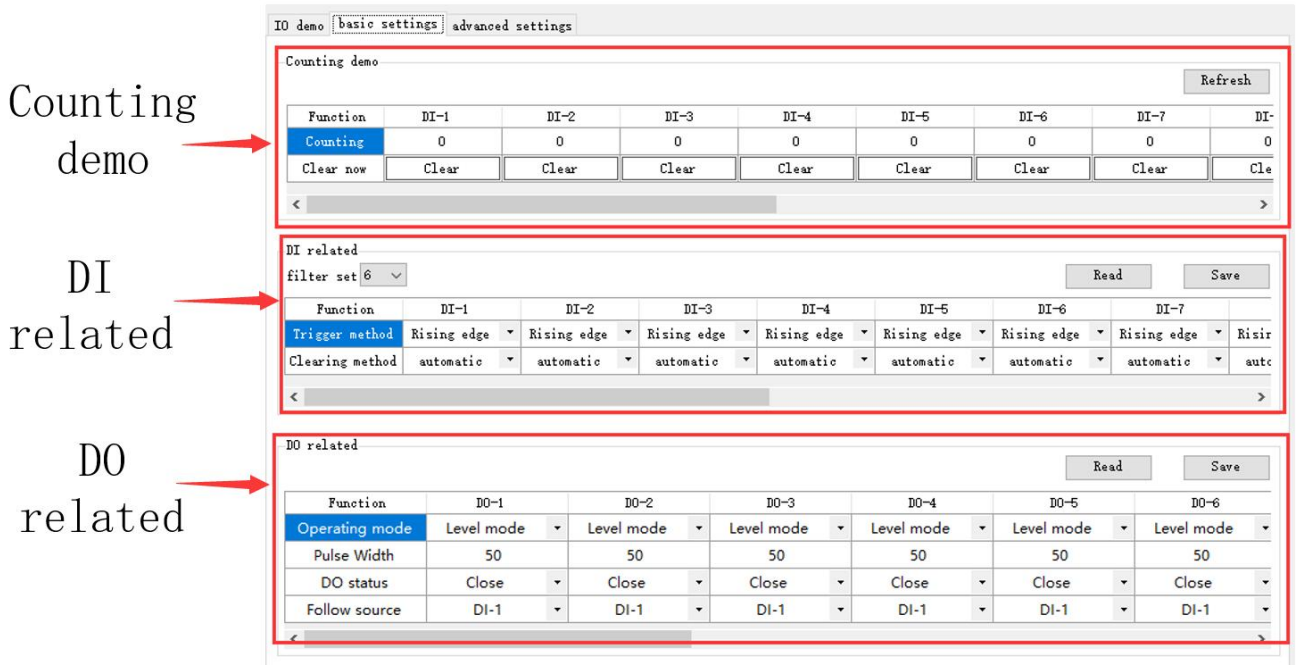
(7) Refresh settings

Support manual refresh, automatic refresh status. The automatic refresh state can customize the refresh cycle (the custom cycle is a multiple of 500ms).



Refresh setting interface

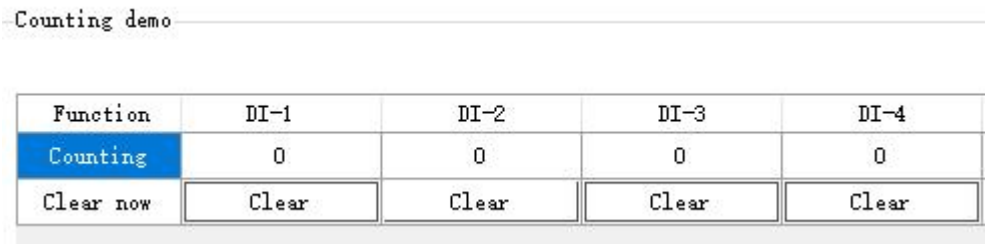
6.2.2 Basic setting interface



Basic setting interface

(1) Counting demonstration

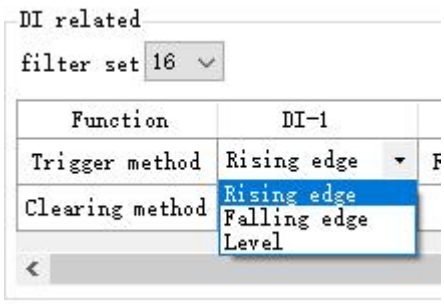
Display DI count information and clear settings. [This function is limited to devices that support DI]



Counting demo interface

(2) DI related

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

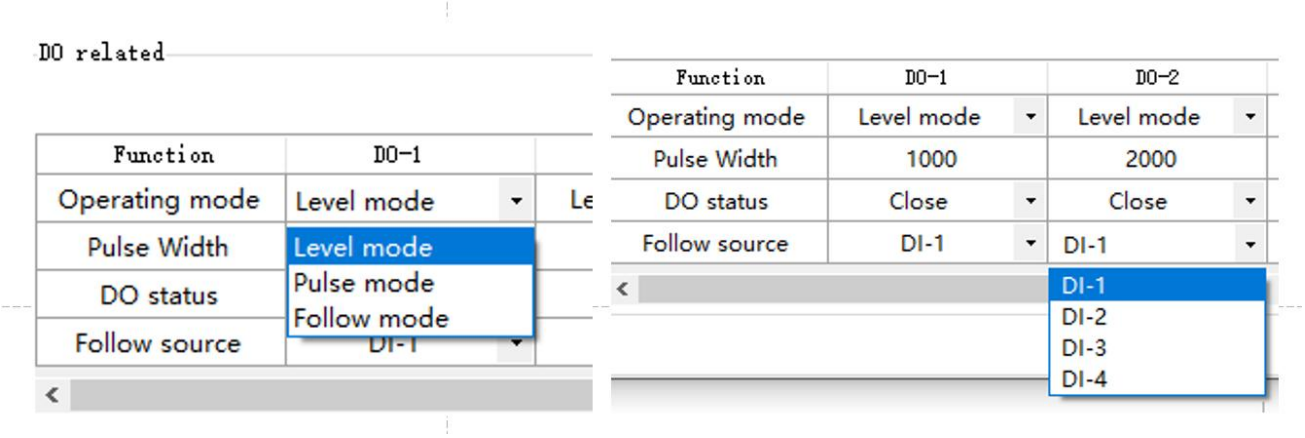


"DI related" interface

(3) DO related

Set the DO function, set the working mode (level mode, pulse mode, follow mode), set the pulse width (only in the pulse mode), DO power-on state (on, off), follow source (follow setting DIx).

Note: Multiple switch output DO terminals can be set to follow one DI input terminal, and one switch output DO terminal can not be set to follow multiple DI input terminals. [Follow mode is limited to devices that support DI]



"DO Related" interface

6.2.3 Advanced settings interface

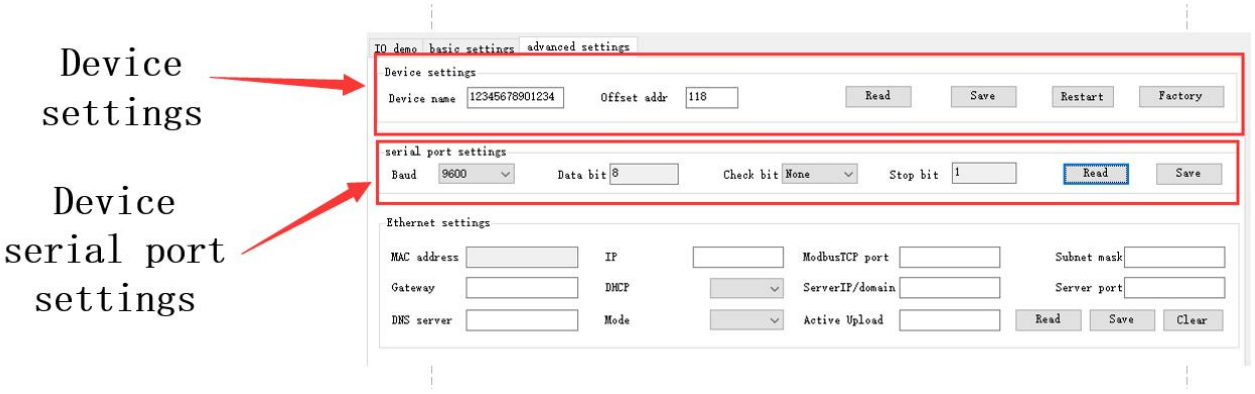


Figure 6-2-12 Advanced setting interface

(1) Equipment settings

The advanced setting interface supports device name setting, offset address (software address), read parameters, open write protection, close write protection, restart the module, and restore factory settings.

Figure 6-2-13 Device setting interface

(2) Device serial port settings

Support to set the baud rate, you can set the baud rate (1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200), the default is 115200.

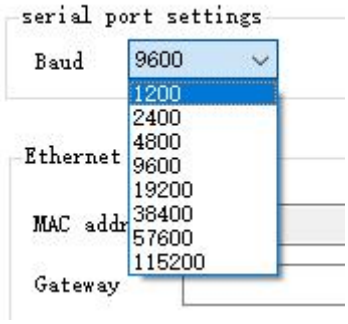


Figure 6-2-14 Baud rate setting interface

Support setting check digit, can set check digit (none, odd check, even check), default no check.

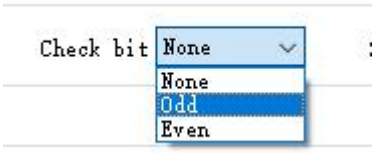


Figure 6-2-16 Check Digit Setting Interface

6.3 Device status query

The configuration software supports device status query. After connecting the device, you can query the device status through the "Refresh All Data" menu.

Example: The configuration software has connected 2 devices, try to query and select one of the devices, and click the "Refresh All Data" menu to complete the device status query.

(1) IO demo interface

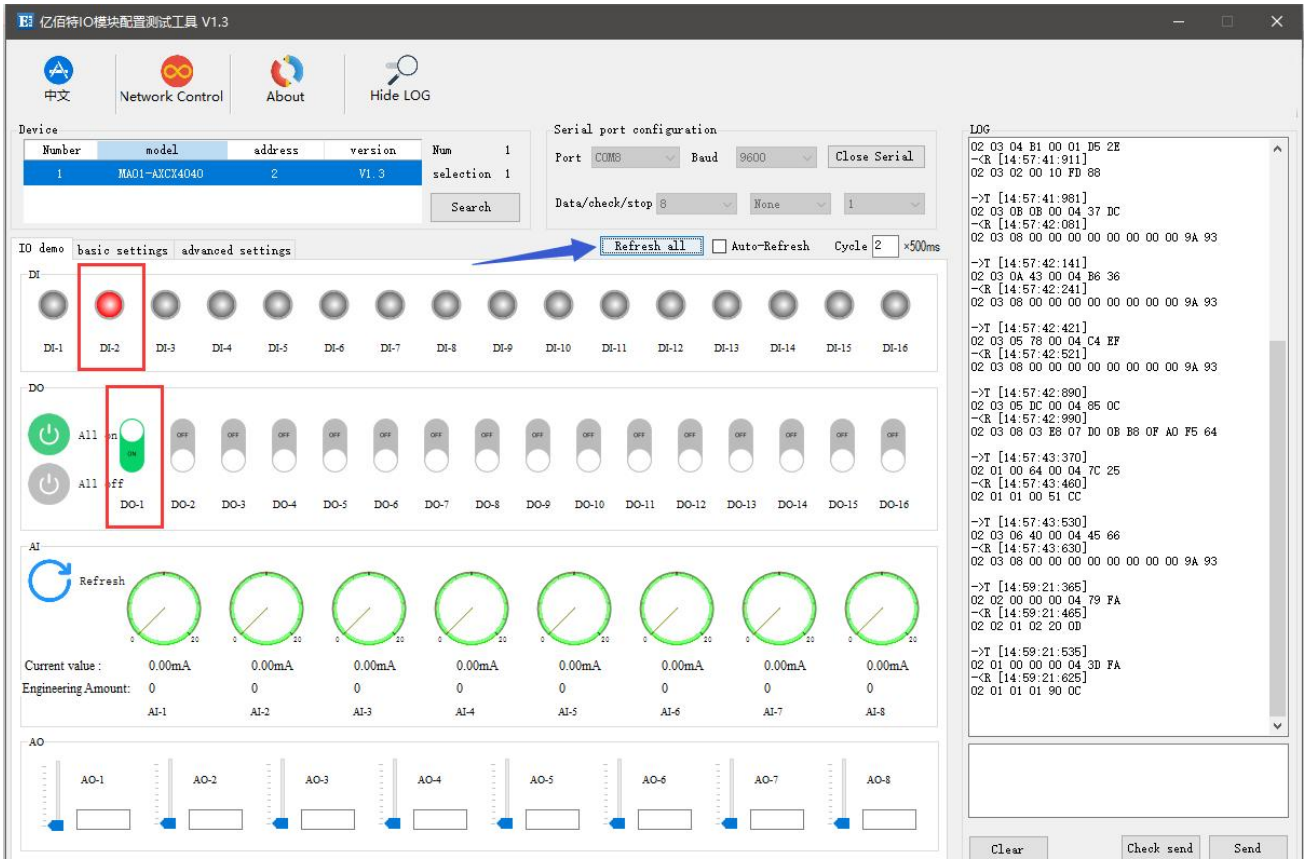


Figure 6-3-1 Device status query (IO demo interface)

(2) Basic setting interface

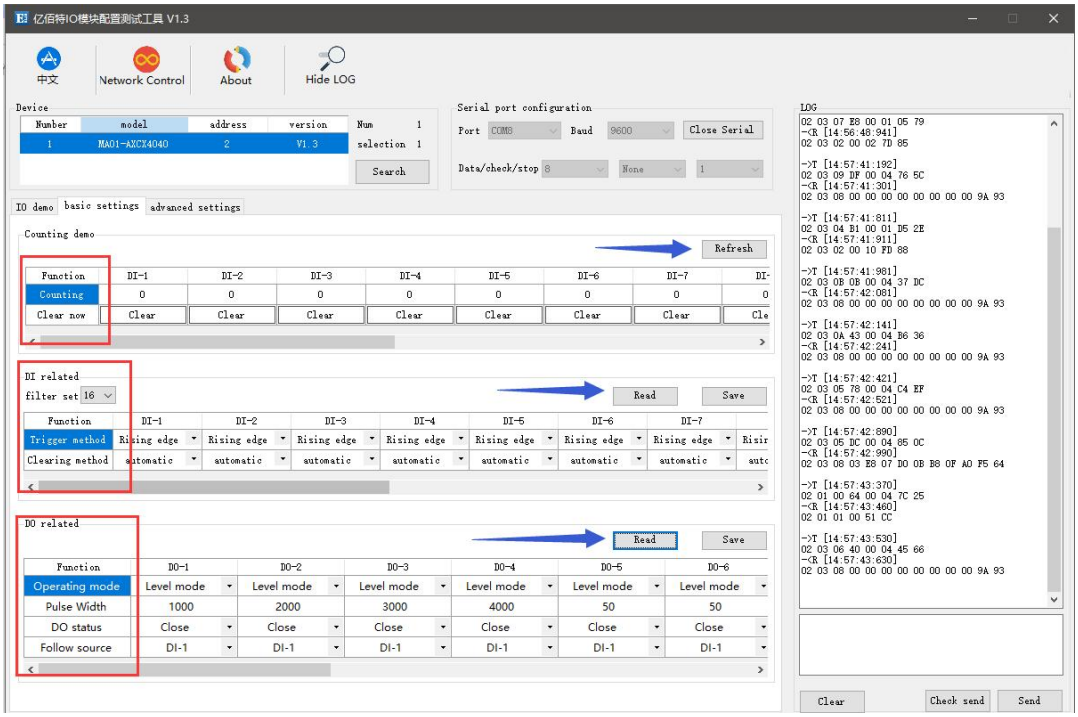


Figure 6-3-2 Device status query (basic setting interface)

(3) Advanced setting interface

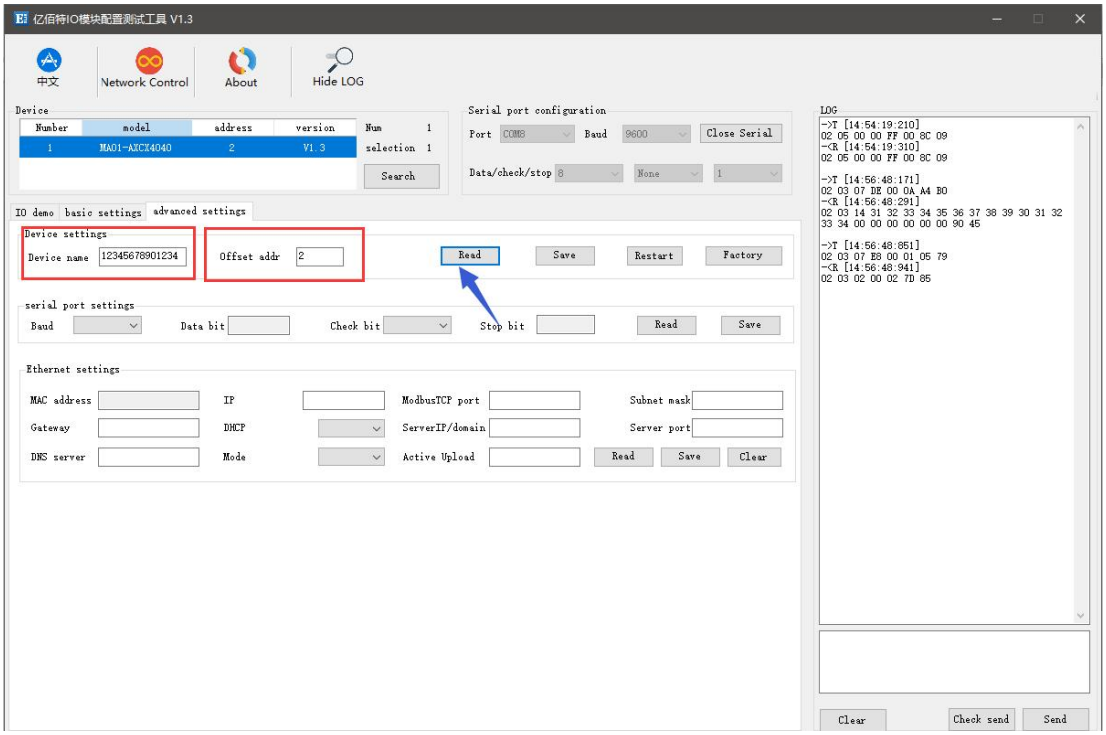


Figure 6-3-3 Device status query (advanced setting interface)

6.4 Equipment status control

Device status control, the device supports Modbus standard command control. It also supports configuration software graphical control.

Example: To control the device, open the DO-1 output port.

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

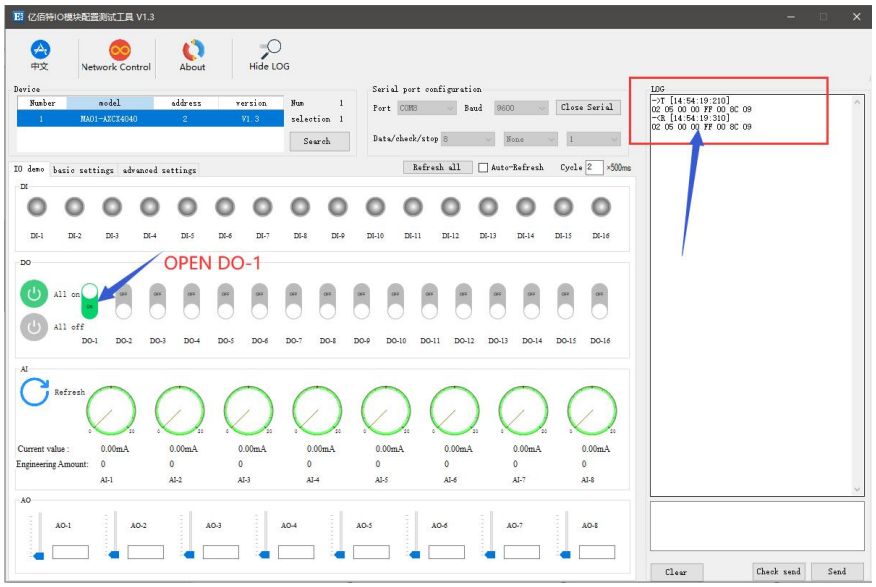


Figure 6-4-1 Software graphical operation

Method 2: Input command control.

Device address: 1

Function: open DO-1 output

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

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

7 Modbus use

7.1 Register list

Table 7-1-1 Register list

Register address	Number	The contents of the register	State	Data range	Applicable function code
(00000)0x0000	4	DO status	RW	0x00-0xFF, write to change the current DO status, read to get the current DO status.	0x01、0x05、0x0F
(00100)0x0064	4	The state of the DO when it is powered on	RW	0x00-0xFF, set the power-on state of the DO. After writing, the state of the DO is the set state after the next restart.	0x01、0x05、0x0F
(10000)0x0000	4	DI value	RW	0x00-0xFF, represents the current level signal of DI.	0x02
(42527)0x09DF	4	DI count value	RW	0x0000-0xFFFF, writing means the initial value of the set count, reading means reading the already counted value.	0x03、0x06、0x10
(41400)0x0578	4	DO working mode	RW	0x0000-0x0002, 0x0000 level mode (default mode), 0x0001 pulse mode, 0x0002 follow mode.	0x03、0x06、0x10
(41500)0x05DC	4	DO pulse width	RW	0x32-0xFFF (50-65535), the duration of the pulse, in ms.	0x03、0x06、0x10
(41318)0x0526	4	DI counting method	RW	0x0000-0x0002, 0x0000 means rising edge count, 0x0001 means falling edge count, 0x0002 means level	0x03、0x06、0x10

				count.	
(41304)0x0518	4	DI count value clearing method	RW	0x0000-0x0001,0x0000 automatic clearing mode, 0x0001 manual clearing.	0x03、0x06、0x10
(41311)0x051F	4	Set the clearing method	RW	0x0001-0x00FF.	0x03、0x06、0x10
(41600)0x0640	4	Set DO follow channel	RW	0x0001-0x0008,0x0001 represents the first input.	0x03、0x06、0x10
(42000)0x07D0	7	Module model	R	See model definition table.	0x03
(42012)0x07DC	2	Firmware version	R	Firmware version number.	0x03
(42014)0x07DE	10	Module name	RW	The name can be up to 20 bytes long, including "\0"	0x03、0x06、0x10
(42027)0X07E8	1	Module software address	RW	0x01-0xE0	0x03、0x06、0x10
(42025)0X07E9	1	Restore default parameters	RW	Write 5BB5, and the set parameters will be restored to the default parameters.	0x03、0x06、0x10
(42026)0x07EA	1	Device restart	RW	Write 5BB5, the device will restart immediately	0x03、0x06、0x10
(42100)0x0834	1	Baud rate code	RW	The default value is 0x0003, which is 9600. 0x0000, which is 1200; 0x0001, which is 2400; 0x0002, which is 4800; 0x0003, which is 9600; 0x0004, which is 19200; 0x0005, which is 38400; 0x0006, which is 57600; 0x0007, which is 115200;	0x03、0x06、0x10
(42102)0x0836	1	Inspection method	RW	The default value is 0x0000,	0x03、0x06、0x10

				which means no check. 0x0000, that is, no check; 0x0001, that is, odd parity; 0x0002, that is, even parity;	

7.2 AI related register list

Table 7-2-1 AI related register list

Register address	Number	The contents of the register	State	Data range	Applicable function code
(30000)0x0000	4	AI raw value	R	0-4095	0x04
(30100)0x0064	4	AI engineering value	R	0-25000	0x04
(40400)0x0190	4	AI high point calibration value	RW	0-4095	0x03、0x06、0x10
(40600)0x0258	4	AI low point calibration value	RW	0-4095	0x03、0x06、0x10
(41200)0x04B0	1	Filter parameters for all AI channels	RW	1-16	0x03、0x06、0x10
(41202)0x04B2	1	Sampling range of all AI channels	RW	0x0000-0x0001,0x0000means0-20mA,0x0001means 4-20mA	0x03、0x06、0x10

7.3 Instruction format (partial)

7.3.1 Read DO output coil status

Use 01 function code to read the output coil status, for example: read the status of two output coils

20	01	00 00	00 02	XX XX
Device ModBus address	Function code	Register start address	Number of output coils read	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
Device ModBus address	Function code	Number of bytes of data	Status data returned	CRC check code

The status data 02 returned above indicates that the output DO2 is on.

7.3.2 Read holding register

Use 03 function code to read one or more register values, for example: read DO1 working mode.

20	03	05 78	00 01	XX XX
Device ModBus address	Function code	Register start address	Register read quantity	CRC check code

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

20	03	02	00 00	XX XX
Device ModBus address	Function code	Number of bytes of data	Returned data	CRC check code

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

7.3.3 Write a single holding register

Use 06 function code to write a single holding register, for example: set the working mode of DO1 to pulse mode

20	06	05 78	00 01	XX XX
Device ModBus address	Function code	Register address	Data written	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
Device ModBus address	Function code	Register address	Data written	CRC check code

If the modification is successful, the 0x0578 register data is 0x0001.

7.3.4 Write multiple holding registers

Use 10 function code to write commands for multiple holding registers, for example: set the working mode of DO1-DO4 at the same time.

20	10	05 78	00 04	08	0001 0002	XX XX
Device ModBus address	Function code	Register start address	Number of registers	The number of bytes of data written	Data written	CRC check code

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

20	10	05 78	00 04	XX XX
Device ModBus address	Function code	Register address	Number of registers	CRC check code

If the modification is successful, the values of four consecutive registers with 0x0578 as the starting address are 0x0001, 0x0002, 0x0003, and 0x0000, respectively.

7.3.6 Write multiple DO coil states

Use 0F function code to write a single command, for example: set the working mode of DO1 to pulse mode

20	0F	00 00	00 04	01	06	XX XX
Device ModBus address	Function code	Starting address	Number of coils	Number of bytes of data	Control coil data (bit operation)	CRC check code

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

20	0F	00 00	OO O4	XX XX
Device ModBus address	Function code	Register address	Number of coils	CRC check code

The coils of DO2 and DO3 are turned on.

7.3.7 Read input register

Take the example of collecting the original values of 4 AI channels, use the 04 function code to read the original values of the 4 AI channels.

20	04	00 00	00 04	XX XX
Device Modbus address	Function code	Initial address	The number of AI channels is 4	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
Device Modbus address	Function code	Number of data bytes	Raw value data of 4 AI channels,Every 2 bytes of data represents an AI channel data, where the original value of each channel is 0,0,0,0 respectively	CRC check code

Revise history

Version	Revision date	Revision description	Maintenance man
1.0	2021-08-30	Initial version	LC
1.1	2022-06-27	Content revision	XXN
1.2	2023-03-13	Content revision	LT

About us

Technical support: support@cdebyte.com

Documents and RF Setting download link: https://www.cdebyte.com

Thank you for using Ebyte products! Please contact us with any questions or suggestions: info@cdebyte.com

---

Phone: +86 028-61399028

Web: https://www.cdebyte.com

Address: B5 Mould Park, 199# Xiqu Ave, High-tech District, Sichuan, China

Chengdu Ebyte Electronic Technology Co.,Ltd.