EBYTE

Chengdu Ebyte Electronic Technology Co.,Ltd

Wireless Modem

User Manual

【8DO】

MA02-XXCX0080

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1、Product profile

MA02-XXCX0080 Support for configuration software or PLC,Control the 8-way relay switch output (DO) via a serial port (RS232) issuing command,Serial port I/O networking module for implementing remote control function（“ long-range IO”）.

Features special

- Modbus RTU protocol；
- Support all kinds of configuration software / PLC/ touchscreen;
- RS232 control IO；
- DC 8~28V for power supply；
- 8 Road switch output DO(relay)；
- Switch output (DO) supports level mode, pulse mode；
- Communication Potter rate 1200～115200（Default 9600）,Support for custom settings；
- Supports 1～247 From Station,The 5-bit dialing switch can set a 1~31 address code,More than 31 may be set up by the software.

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2、Quick entry

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

2.1 Use preparation

Serial port I/O networked devices (hereinafter referred to as "IO devices") before use,Computer, converter, power supply, screwdriver and other related auxiliary materials should be prepared.The details are as follows：

Table 2-1-1 Preparation list

Serial number	Serial number	Serial number
Devices	Devices	Devices
Number	Number	Number
1	1	1
IO device	IO device	IO device
1	1	1
2	2	2
USB turn-serial port converter	USB turn-serial port converter	USB turn-serial port converter

2.2Equipment wiring

2.2.1Power supply wiring

Power supply, with either a DC 8~28V or a DC 12V or 24V power supply.

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Fig 2-2-1 Power supply wiring diagram

2.2.2 Communication wiringRS232

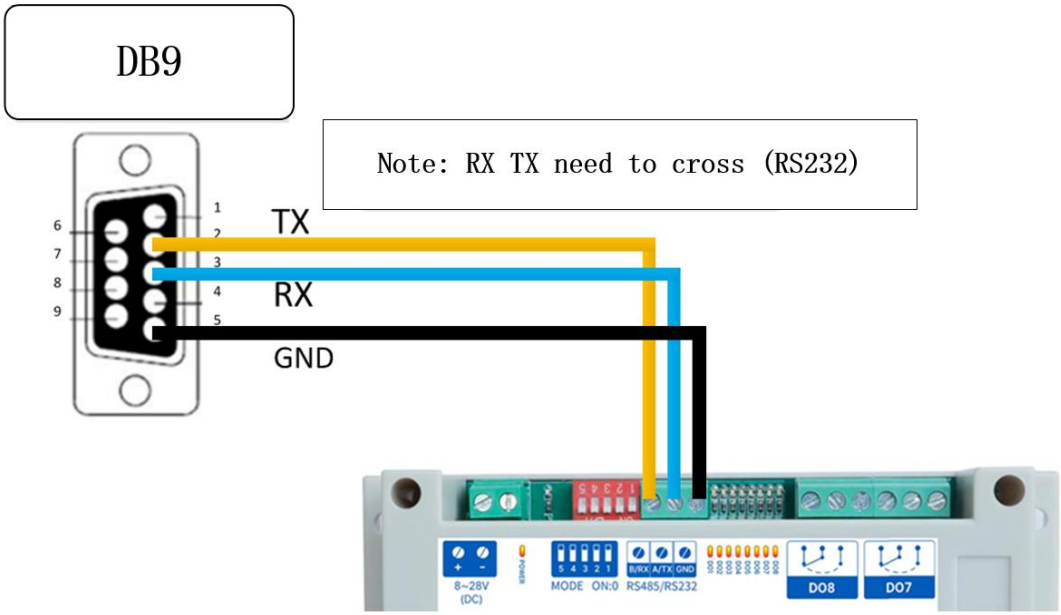

Fig 2-2-2 Communication RS232 wiring diagram

2.2.3 Overall wiring schematic diagram

（1）After electric on equipment,Power light （POWER）Often bright,Equipment power supply is normal.

（2）Analog input AI wiring,As showConnect the signal generator to the analog input AI port.

（3）Switch Output the DO wiring,As show connect the load to the switch to output DO port.

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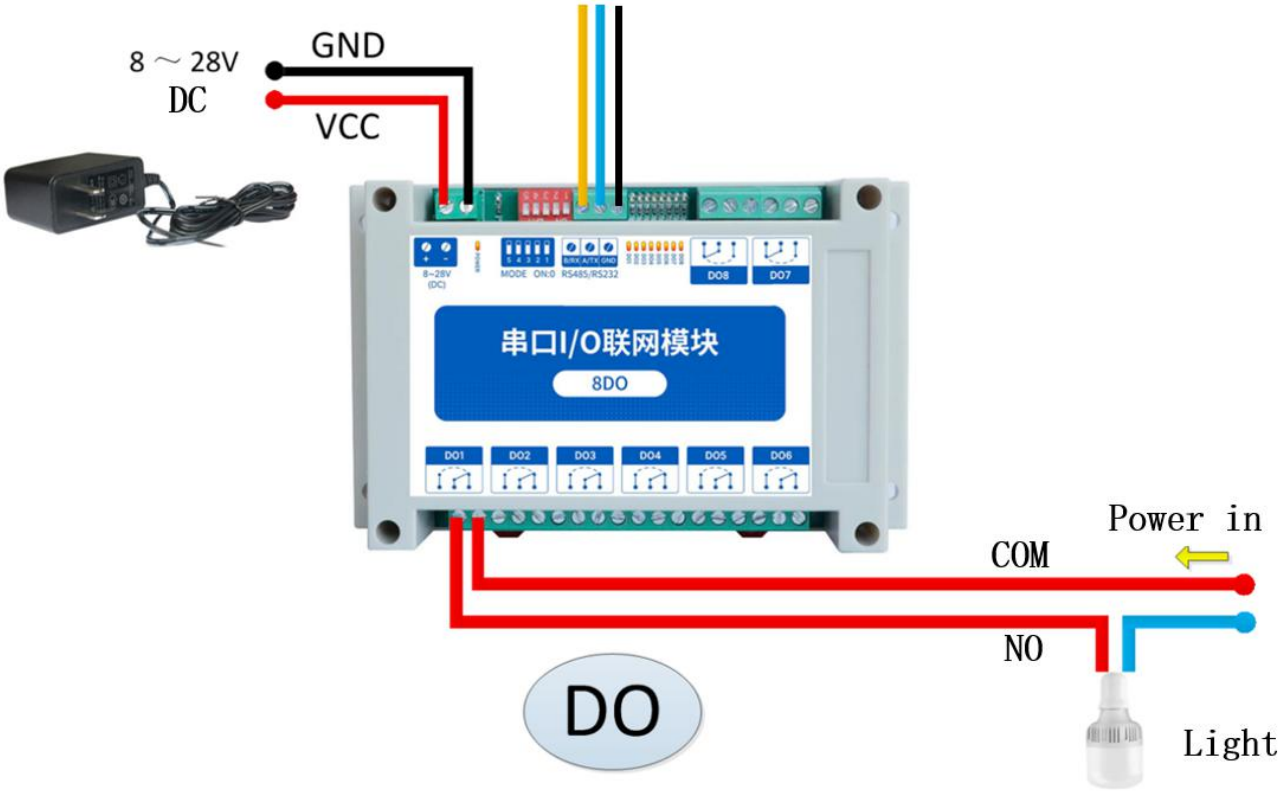

Fig 2-2-3 Overall wiring schematic diagram

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2.3 Software settings

2.3.1 Device attachment

Fig 2-3-1 The software interface

[spend] operating steps ：

（1）Open the serial port,Find the corresponding device port number,The Potter rate is default9600,Click "Open serial ial".

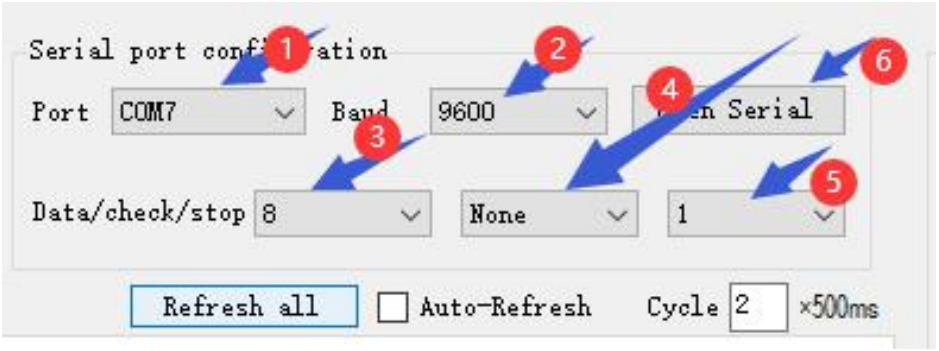

Fig 2-3-2 Open the serial port

（2）In the device window,Click "Search Device",The right log window begins to refresh the search information.After the equipment column in the equipment window displays the connected device,Click on the Stop Search " menu.Click the device again, and the connection is successful.

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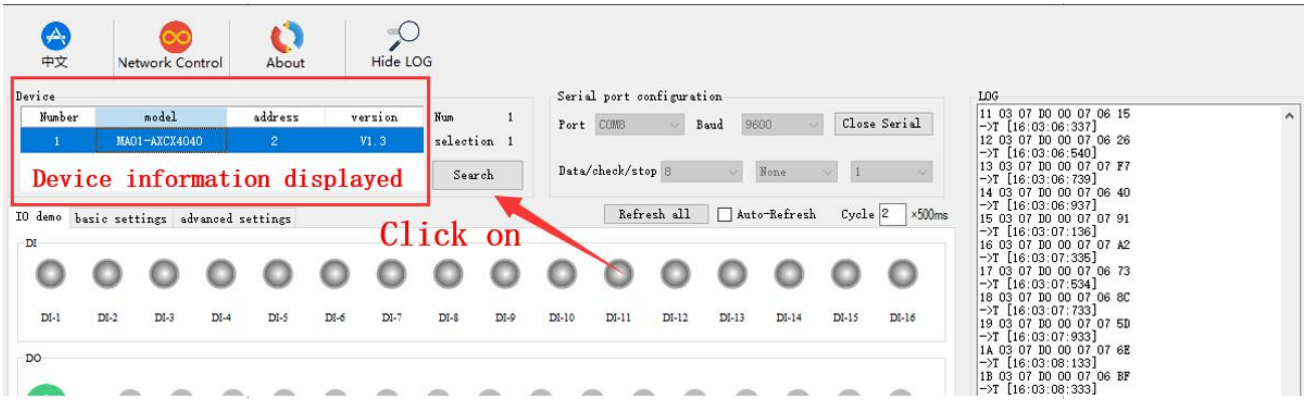

Fig 2-3-3 Connect the device

2.3.2 Equipment testing

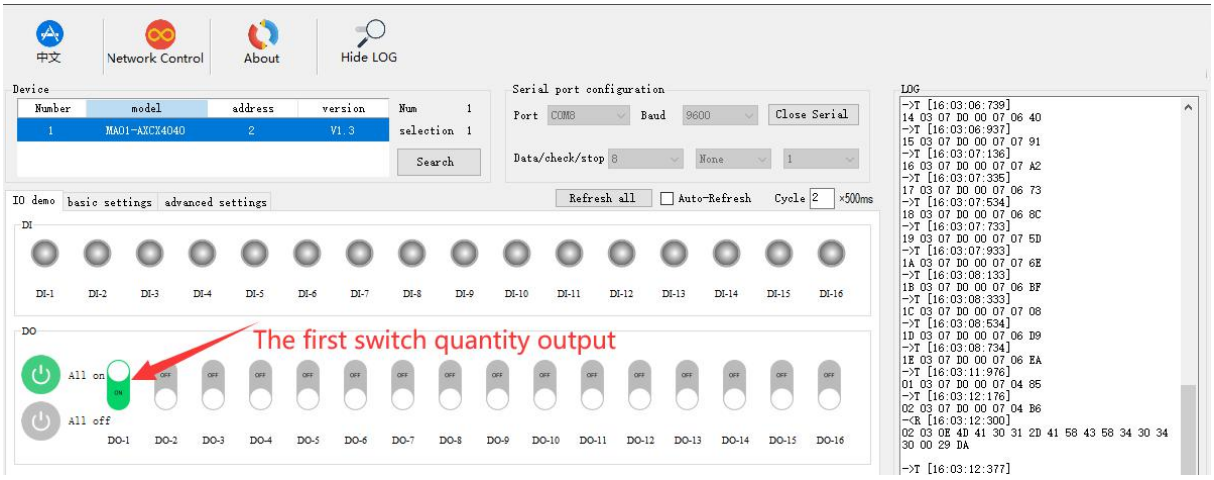

Fig 2-3-4 Equipment testing

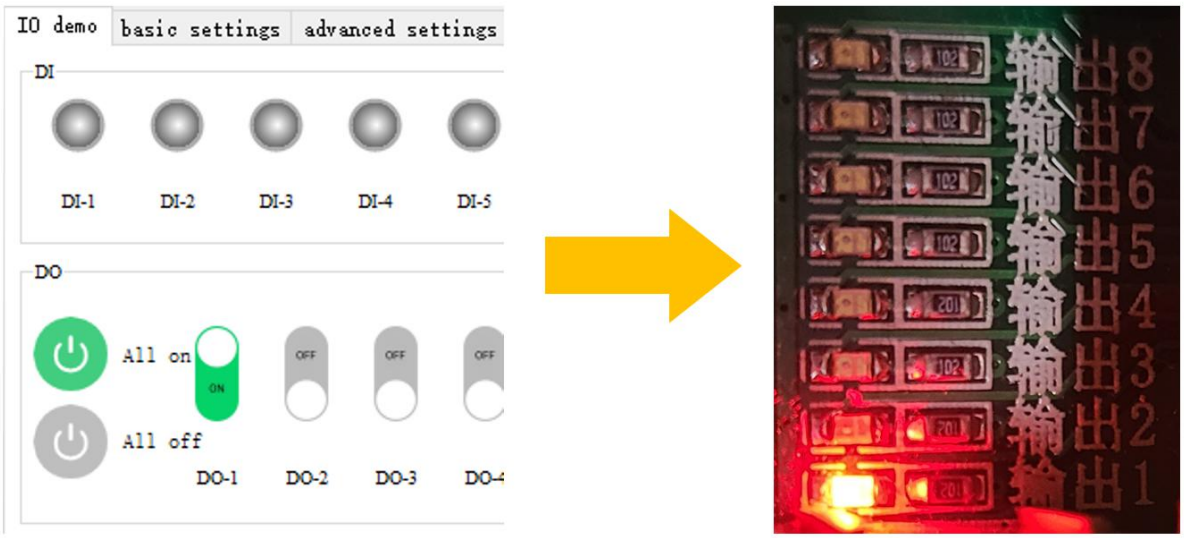

Fig 2-3-5 Actual test effect

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3、 Product Overview

3.1 Specifications of the products

List 3-1-1 specifications of the products

product model	specifications	SwitchQuantity inputDI	read analogue input AI	SwitchVolume outputDO	RS485	RS232
MA01-AXCX4020	4DI+2DO	4Road	—	2Road	●	×
MA02-AXCX4020		4Road	—	2Road	×	●
MA01-XACX0420	4AI+2DO	—	4Road	2Road	●	×
MA02-XACX0420		—	4Road	2Road	×	●
MA01-AACX2220	2DI+2AI+2DO	2Road	2Road	2Road	●	×
MA02-AACX2220		2Road	2Road	2Road	×	●
MA01-AXCX4040	4DI+4DO	4Road	—	4Road	●	×
MA02-AXCX4040		4Road	—	4Road	×	●
MA01-XACX0440	4AI+4DO	—	4Road	4Road	●	×
MA02-XACX0440		—	4Road	4Road	×	●
MA01-AACX2240	2DI+2AI+4DO	2Road	2Road	4Road	●	×
MA02-AACX2240		2Road	2Road	4Road	×	●
MA01-XXCX0080	8DO	—	—	8Road	●	×
MA02-XXCX0080		—	—	8Road	×	●

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3.2 Technical parameters

Tables 3-2-1 technical parameters

Category	Name	Parameter
Power	Supply Voltage	Direct-current (DC)8～28V
	working current	50mA @12V
	Power supply indicators	Green LED indicates
Serial Port	communication interface	RS232
	Baud rate	1200～115200 bps（默认 9600 bps）
	Data bit	8（Regular）
	Check bit	No calibration, odd, parity (none by default)
	Stop bit	1（Fixed)
	Protocol	Modbus RTU Protocol
	Unit Address	1～247（Default address: 1）
DO Output	DO Way	8 Road
	DO Output type	Type C relay (often open + often closed）
	DO Output mode	Level mode, pulse mode
	Relay contact capacity	30V/10A、250V/10A
	Output instructions	Red LED indicates
Other	Product size	145 mm * 90 mm * 40mm (Long * width * height)
	Product weight	250g ± 5g
	Work temperature&humidity	-40 ～ +85℃、5%～95%RH（No clotting）
	Storage temperature&humidity	-60 ～ +125℃、5%～95%RH（No clotting）
	way to install	Installation of positioning hole and guide rail installation

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3.3 Port Description

Fig 3-3-1 Interface Fig

Table 3-3-1 port menu

NUM	PIN	Explain	Remark
1	+	Power +	Advise RVV 2*0.75 wire
2	-	Landing -	
3	B/RX	RS232 parallelism RX（External need cross）	Advise RVSP 3*0.5 wire
4	A/TX	RS232 parallelism TX（External need cross）	
5	GND	Signal Landing	
6	DO1	Switch output channel1	Relays have regular open and often closed ends
7	DO2	Switch output channel2	
8	DO3	Switch output channel3	
9	DO4	Switch output channel4	
10	DO5	Switch output channel5	
11	DO6	Switch output channel6	
12	DO7	Switch output channel7	
13	DO8	Switch output channel8	

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3.4 Dimensional drawing

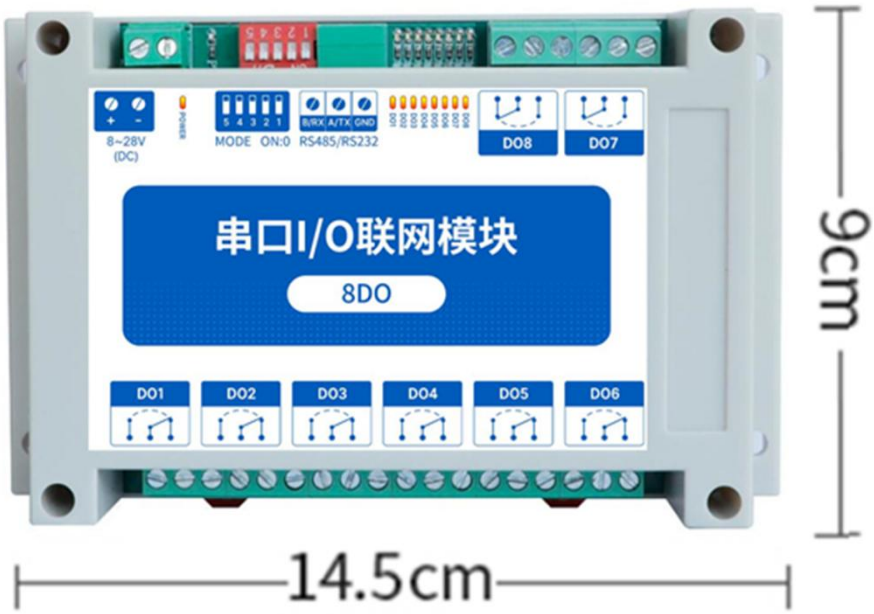

Fig 3-4-1 Dimensional drawing

3.5 Way to install

Equipment supports positioning hole installation or rail mode.

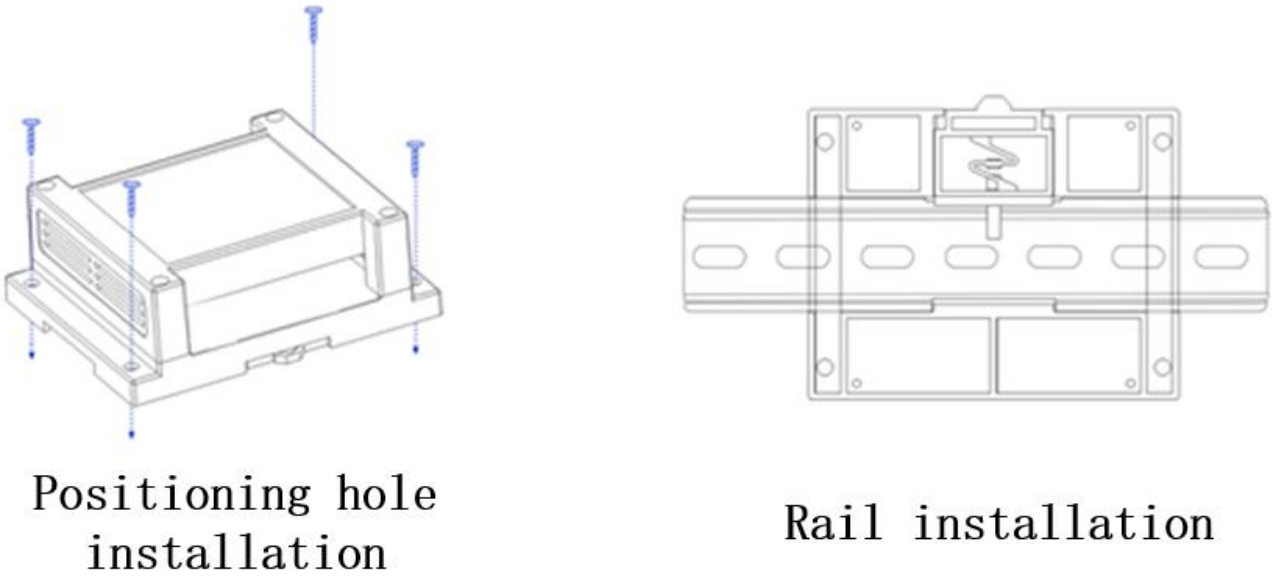

Fig 3-5-1 way to install

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4、Product function

4.1 Switched output DO

4.1.1Switched output DO illustrate

The switch output DO, has level mode, pulse mode, follow mode (follow DI only).Type C relay output (+ normally closed) and single output supports maximum load (contact capacity) of 30V/10A or 250V/10A.

Each DO output design has an output indicator lamp (red LED indicator) indicating a broken output port.When the LED indicator is on, the relay is engaged (often on, often closed off); when the LED indicator is off, the relay is not engaged (often off, often closed on).

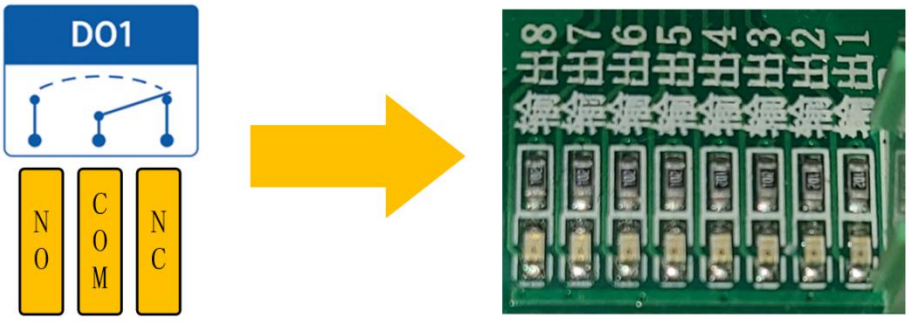

Fig 4-1-1 The Switch outputs the DO interface

4.1.2 Switch output DO mode settings

（1）Level mode

Output according to the level set by the user, the switch characteristics is similar to the function of self-locking switch.

（2）Pulse mode

After the switch output DO is opened, after keeping the set pulse width time (unit ms), the switch output DO is automatically closed.Pulse width setting range 50~65535 (default 50).

（3）Follow mode

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

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

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4.2 Unit address

4.2.1 unit address

Device address composition: hardware address + software offset address

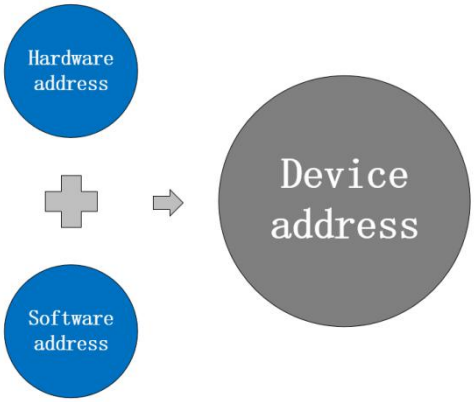

Fig 4-2-1 unit address

Unit address Default i: 32 (hardware address 31 + software address 1 = Unit address 32).

Unit address :Set range：1～247.

Hardware address: implemented by the dial switch (5-bit) dialing setting (factory default is 31).

Software address: implemented by "offset address" by configuration tool software (factory default is 1).

Example：

If the hardware address is set to5,The Software address is set to113,so Unit address is 118.

4.2.2 Hardware address (code dial switch)

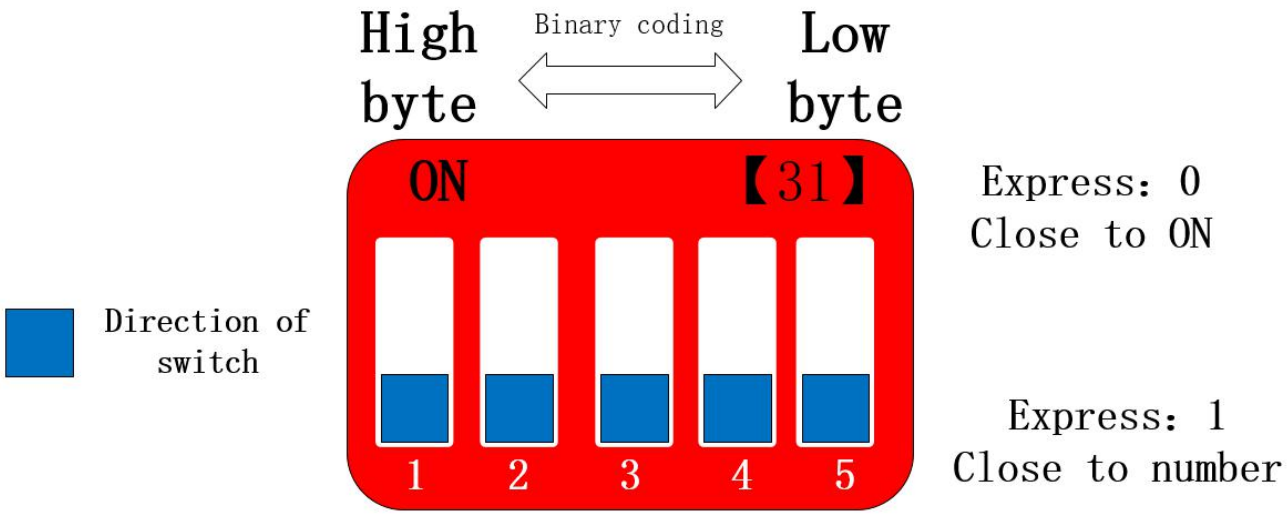

Fig 4-2-2 Hardware address (code dial switch)

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Hardware address: dial switch can switch different hardware addresses, binary indicates the 5-bit dial switch.The "5" direction indicates low, and the "1" direction indicates high.Hardware address range adjustable range 0~31.

Description:

Example 1：Set the hardware address 0, with binary encoding.

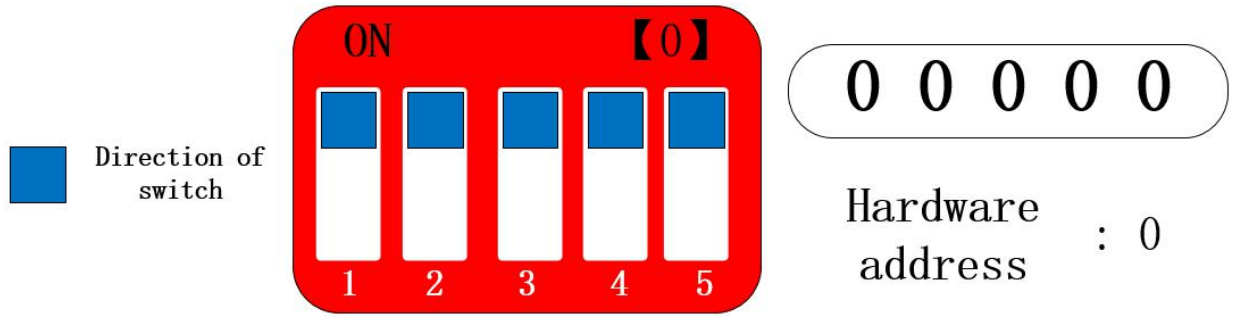

Fig 4-2-3 Hardware address 0

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

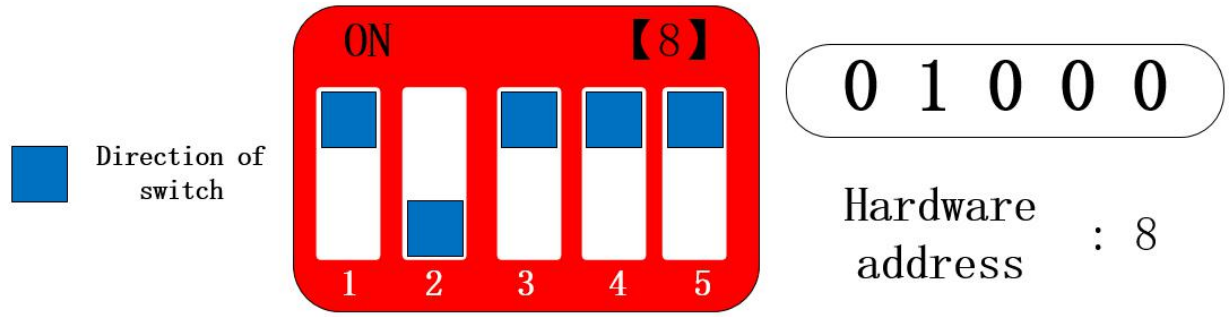

Fig 4-2-4 Hardware Address 8

Example 3：Set the hardware address 31, with a binary encoding.

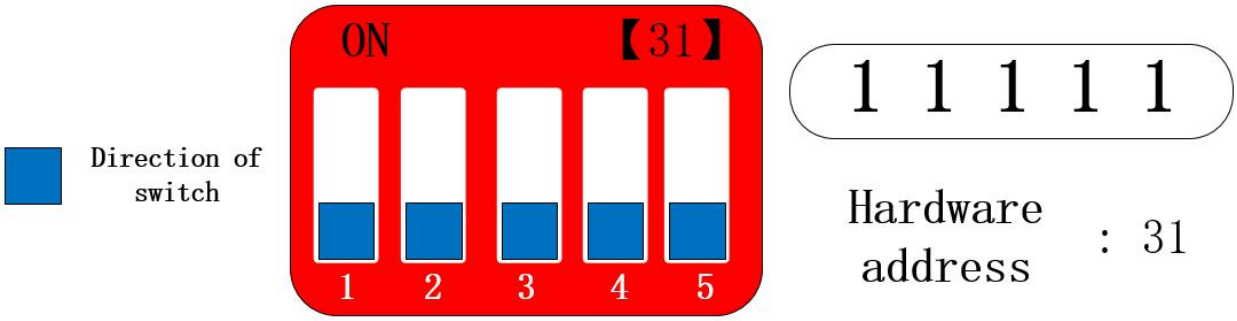

Fig 4-2-5 Hardware Address 31

Hardware address, can be customized according to the actual situation, setting method as shown in the above example.

If multiple devices are required to connect to a single RS232, a single bus can be hung on up to 32 devices only through the hardware address (set the hardware address).If you need to connect a single RS232 with greater than 32 devices, up to 247 devices on a single bus by setting the software address (offset address).

After changing the address, the new address requires a power restart before taking effect.

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4.2.3 Software address (offset address)

Software address: Users can set it differently according to the scene.The software address is set to 1~224 (Unit address:1~247) and the default software address is 1.
After changing the address, the new address requires a power restart before taking effect.
Changing the software address shall be implemented by using the configuration tool software, as shown in Fig:

Fig 4-2-7 Software address (offset address)

5、Port connection

5.1 Switch output DO port wiring

5.1.1 The output terminal has direct control load (small power equipment within 1kW)

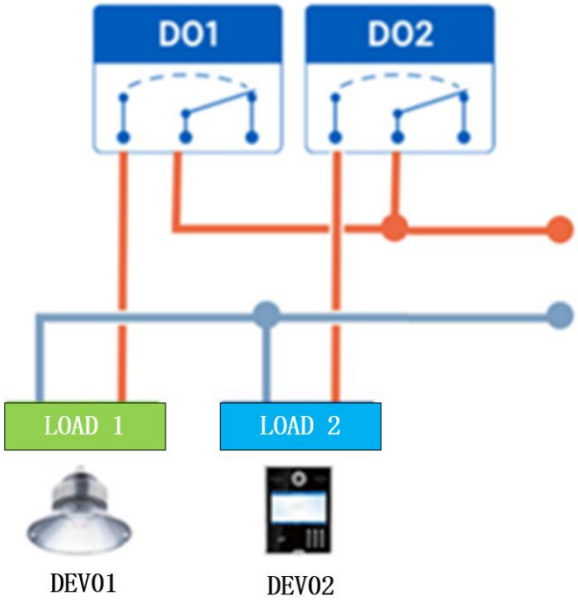

Fig 5-1-1 Direct control of the load wiring diagram for the output terminal

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5.2.2 Output Control Contactor (Contactor Control high power 220V equipment)

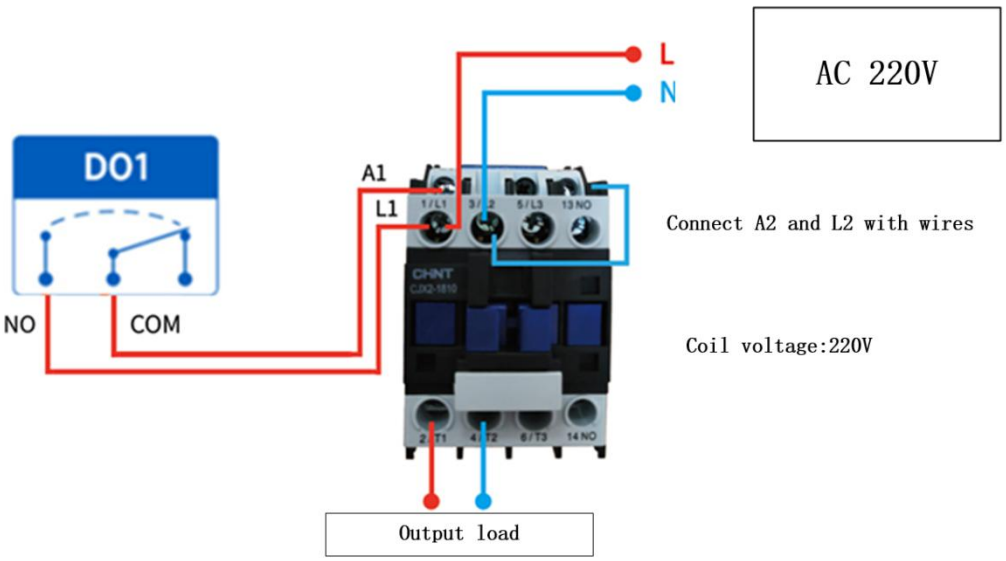

Fig 5-2-2 Wiring diagram of the output terminal control contactor

Note： The above figure shows the example of the contact coil 220 voltage AC 2 V,The coil voltages may vary between the contactors.

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

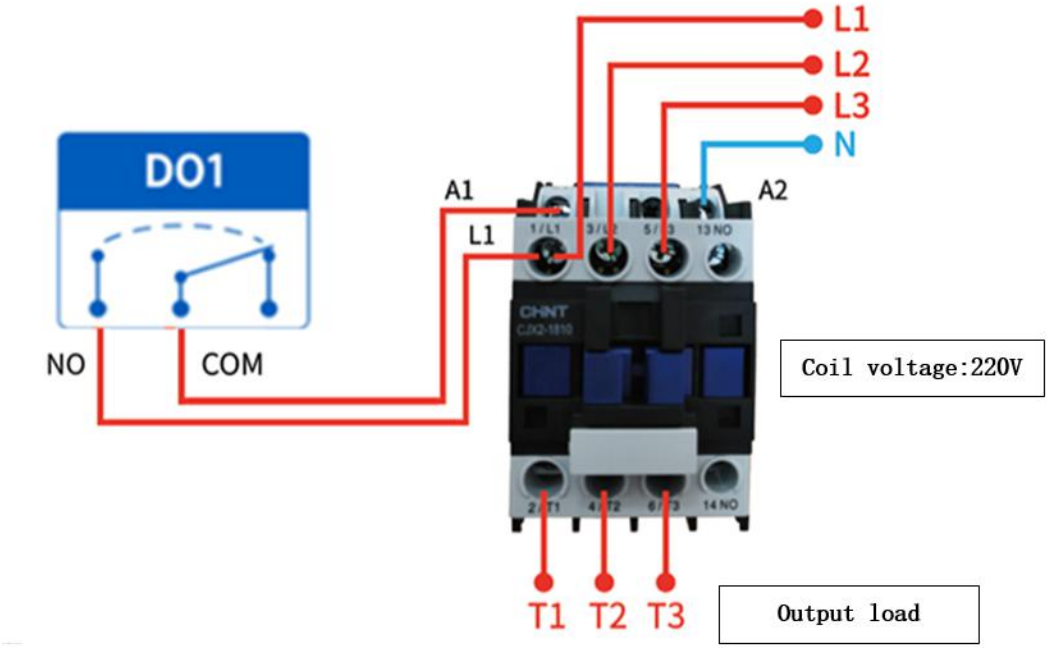

Fig 5-2-3 Wiring diagram of the output terminal control contactor

Note：In the above figure, the contact coil 220 voltage V as an example,The coil voltages may vary between the contactors.

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6、Software use

6.1 Software use

The Configuration tool software is a drive-free installation,Double-click directly.The exe file is available immediately when it is open.

Fig 6-1-1 Software installation file

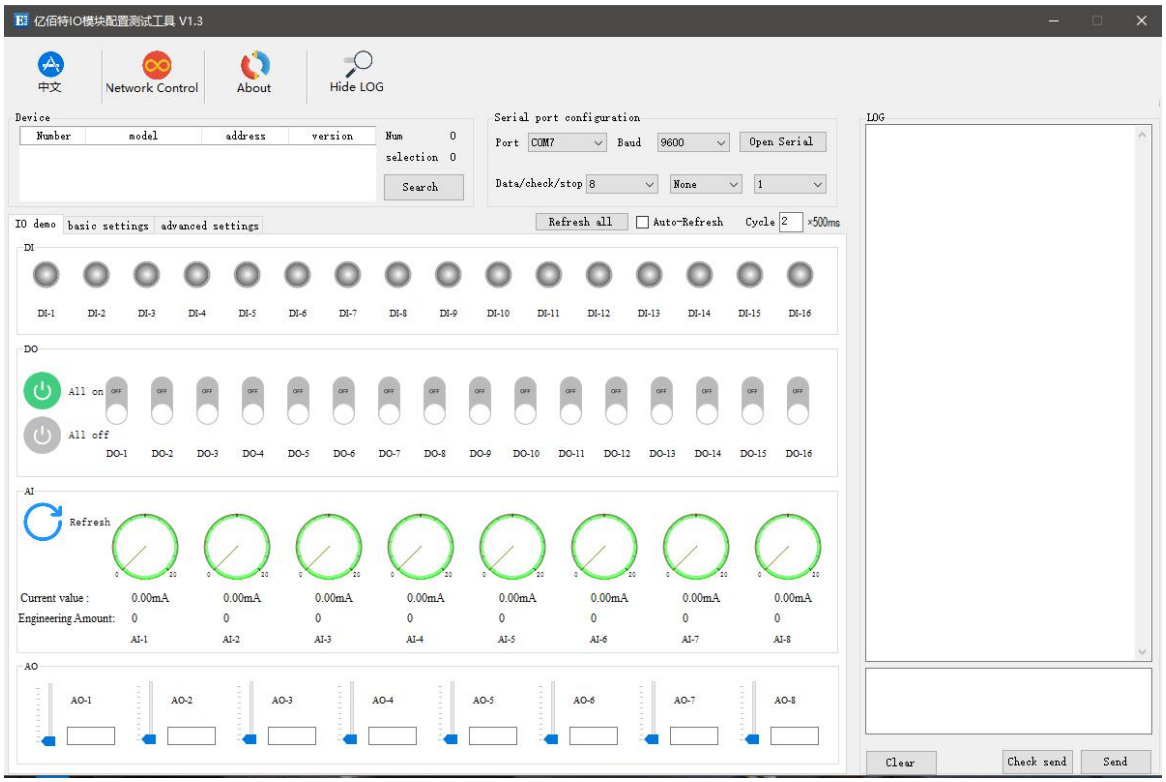

Fig 6-1-2 The software installation successfully opened the interface

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6.2 Introduction of software function

6.2.1 IODemo interface

Fig 6-2-1 Software IO presentation interface

（1）Device window

Displays the current connection device information （No. No number, equipment model, equipment address, firmware version）.

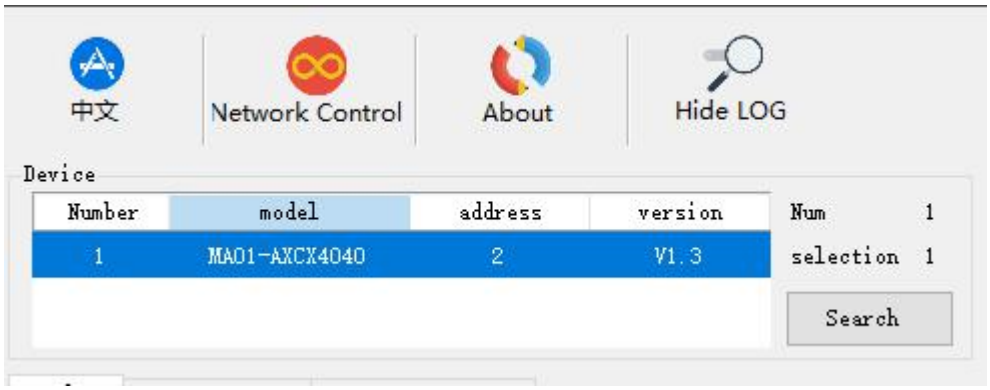

Fig 6-2-2 Device window interface

（2）Serial parameter window

Displays the serial port parameter information (port, port rate, data bit, check bit, stop bit, etc.) and open the serial port.

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Fig 6-2-3 Serial port parameter window interface

（3）Log window

Displays the device configuration、Use the running log information during the process (Send, return the data instructions).

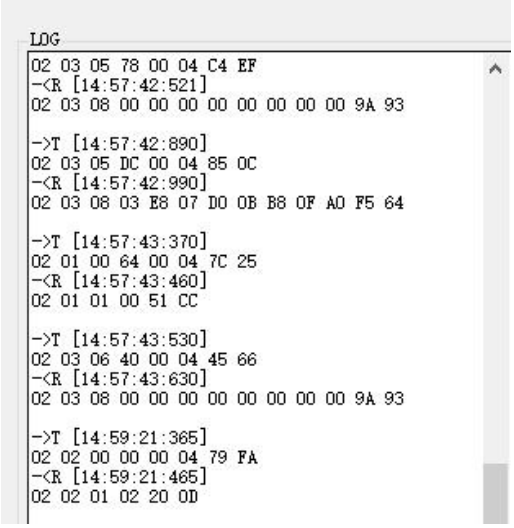

Fig 6-2-4 Log window interface

（4）Switch input DI【This feature is limited to DI-enabled devices】

Displays the digital input DI port status.

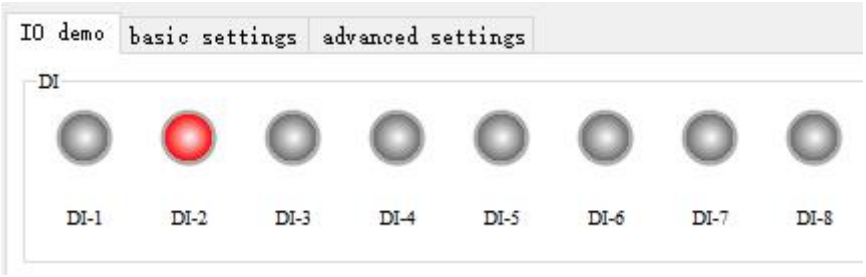

Fig 6-2-4 Switch it into the DI interface

（5） switched output DO

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Displays the switch output DO port status,The Fig-shaped setting switch outputs the DO port on and off.

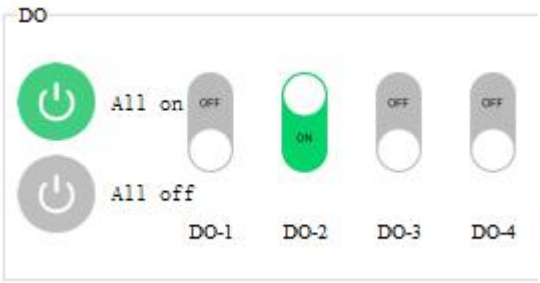

Fig 6-2-5 Switch outputs the DO interface

（6）Simulation input AI【This feature is limited to AI-enabled devices】

Displays the status of the analog input AI port（Power flow rate and work quantity）,Graphical table needle indication.

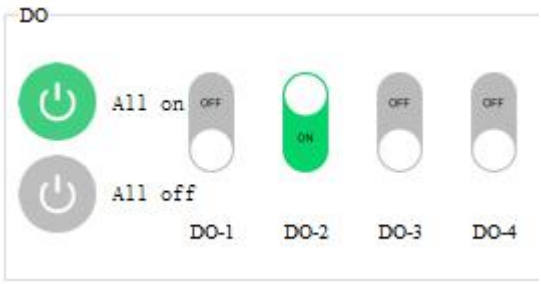

Fig 6-2-6 Analog input to the AI interface

（7）Refresh the setting

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

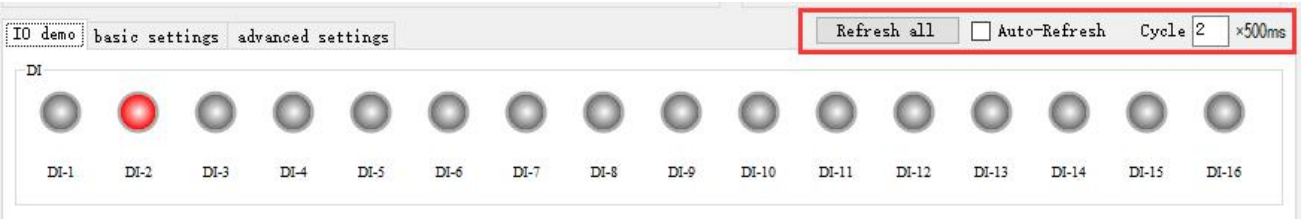

Fig 6-2-7 Refresh the setting interface

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6.2.2 Basic Setup Interface

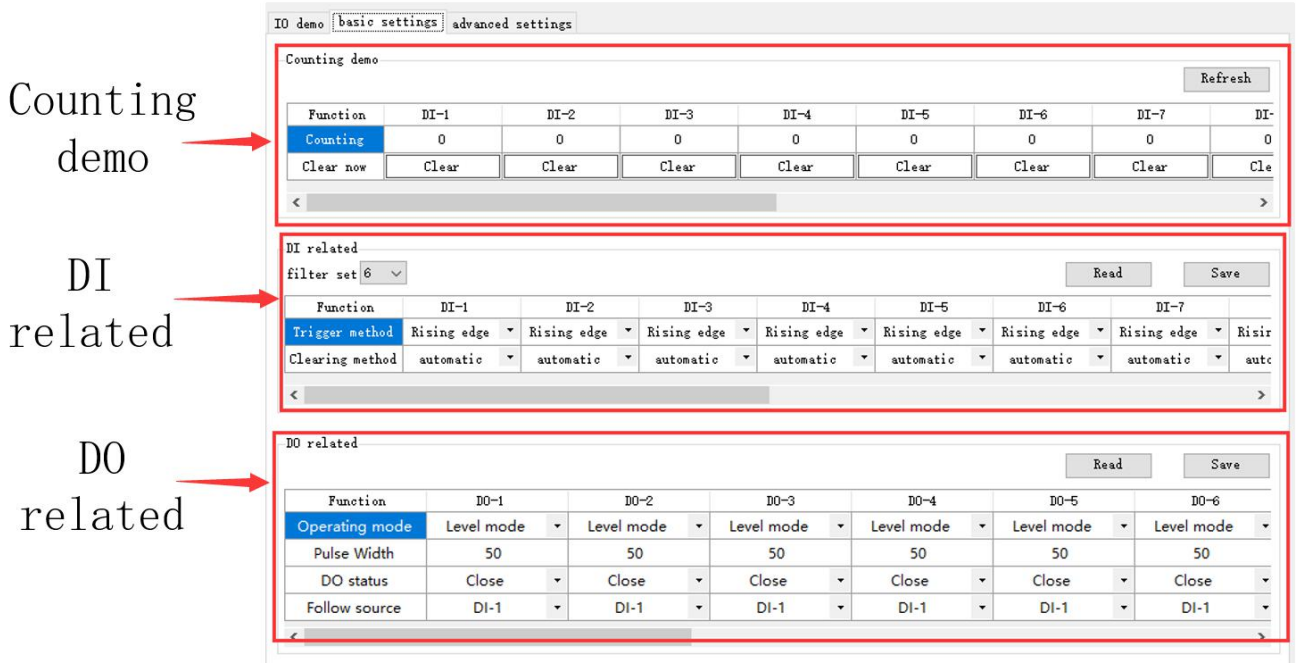

Fig 6-2-8 Basic Setup Interface

（1）Count demo

Displays the DI count information,Zero setting.【This feature is limited to DI-enabled devices】

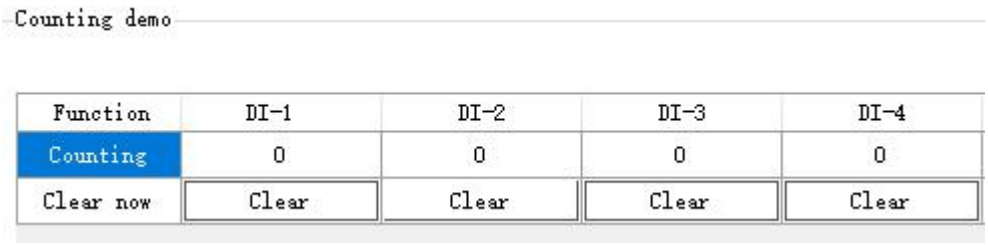

Fig 6-2-9 Count the demo interface

（2）DI related

Set up the DI functionality.Set the filter parameters (1~16),Trigger mode (rise line, drop line, level),Zero clearance mode (automatic, manual）.【This feature is limited to DI-enabled devices】

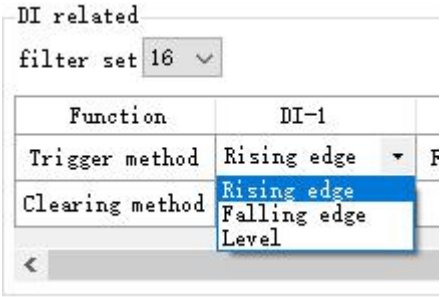

Fig 6-2-10 The DI Related " interface

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（3）DO correlation

Set the DO function,Set working mode (level mode, pulse mode, pulse mode, following mode) and set pulse width (pulse mode only), DO on the electric state (on, off), follow the source (follow the setting DIx).

Note: Multiple switch output DO terminals can be set to follow one DI input terminal, and one switch output DO terminal cannot be set to follow multiple DI inputs.【Follow-up mode is limited to DI-enabled devices】

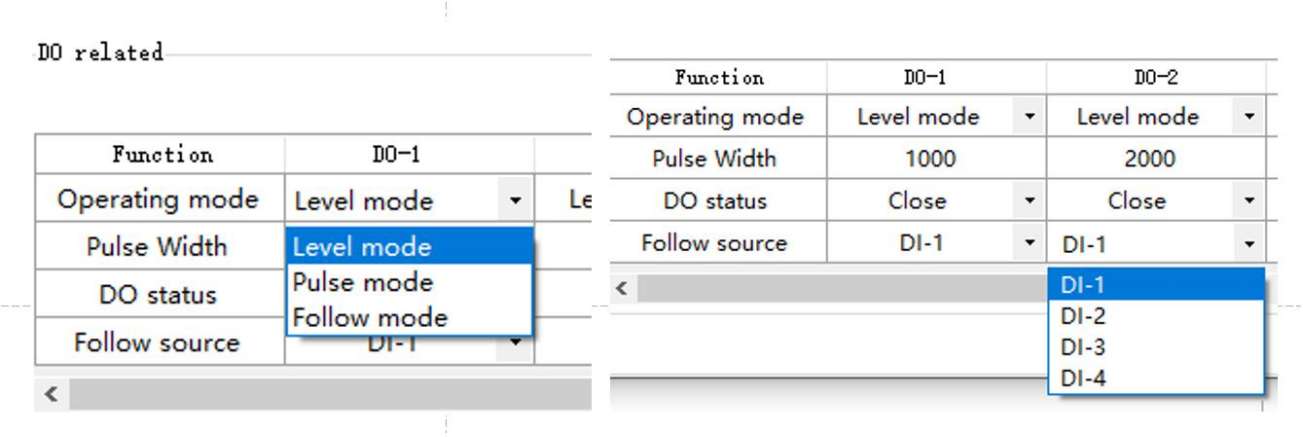

Fig 6-2-11 “ DO

6.2.3 Advanced Setup Interface

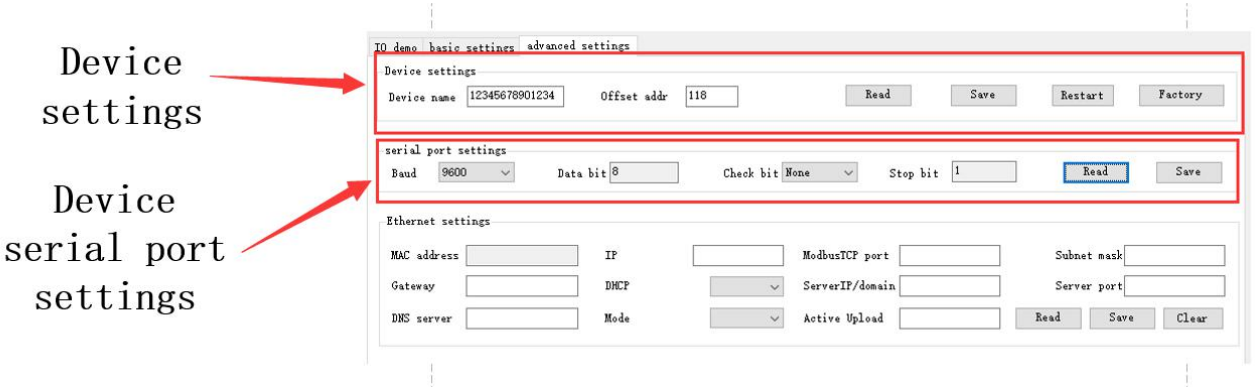

Fig 6-2-12 Advanced Setup Interface

（1）Device Settings

Advanced Setup interface, which supports device name setting,Offset address (software address）,Read the parameters, and turn on the write protection,Turn off the write protection, restart the module, and restore the factory settings.

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Fig 6-2-13 Device Setup Interface

（2）Device Setup Interface

Support for setting the port rate,Pot rate can be set（1200、2400、4800、9600、19200、38400、57600、115200）,admit 115200.

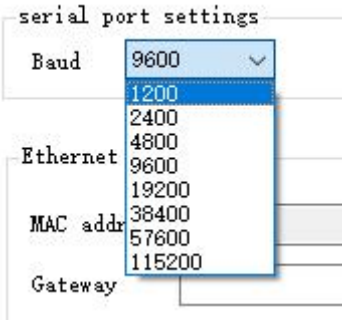

Fig 6-2-14 Poaud rate setting interface

Support for setting the check bit,Check bits can be set（No, odd check, and parity check）,Default no checksum.

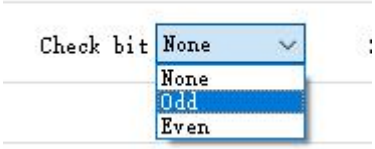

Fig 6-2-16 Check-bit setting interface

6.3 Device status query

The Configuration software supports the device status query,After connecting the device,You can query the device status through the Refresh All Data menu.

Example： The equipment supports the Modbus standard instruction control.Also supports configuration software graphical control.

（1）IO demo interface

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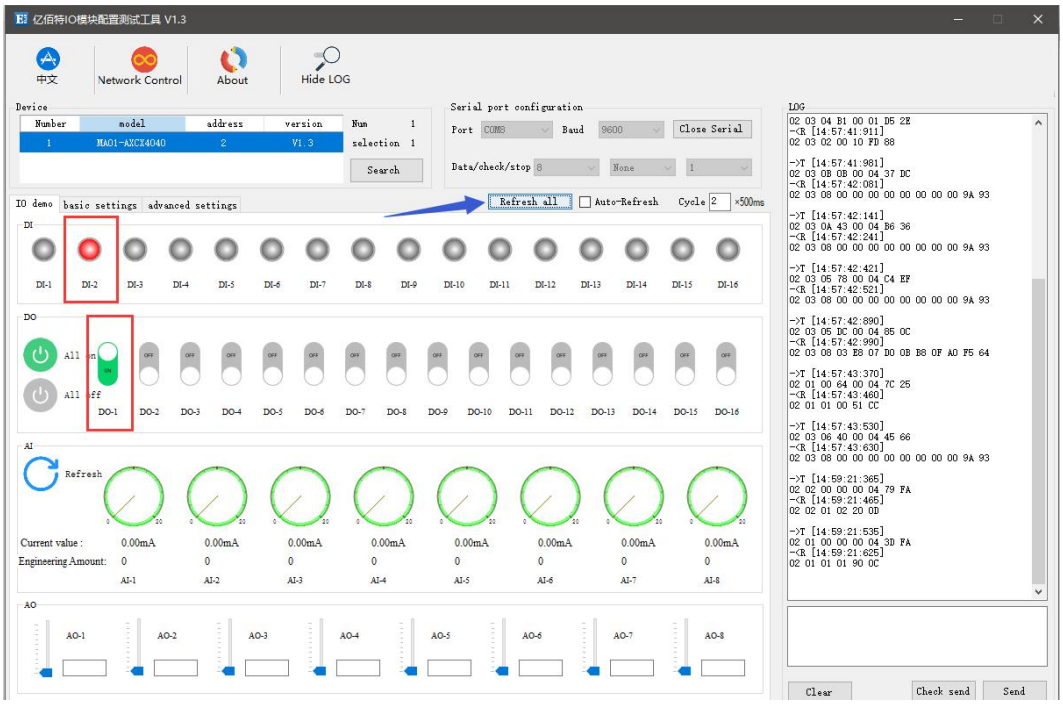

Fig 6-3-1 Device status query（IO demo interface）

（2）Basic Setup Interface

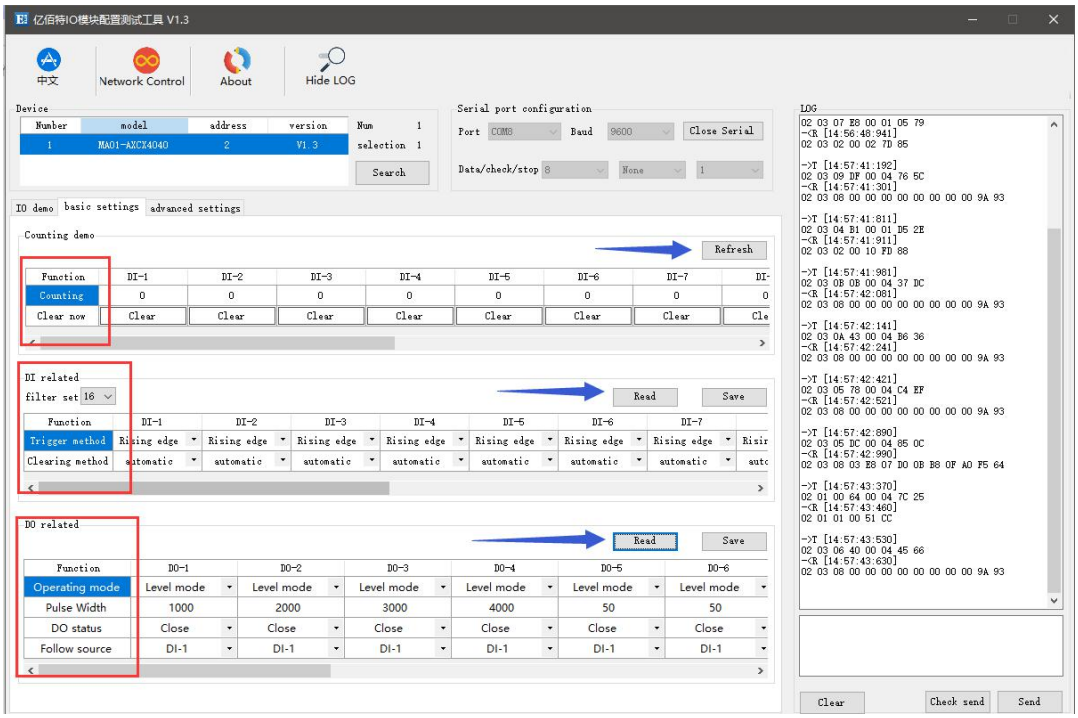

Fig 6-3-2 Device status query（Basic Setup Interface）

（3）Advanced Setup Interface

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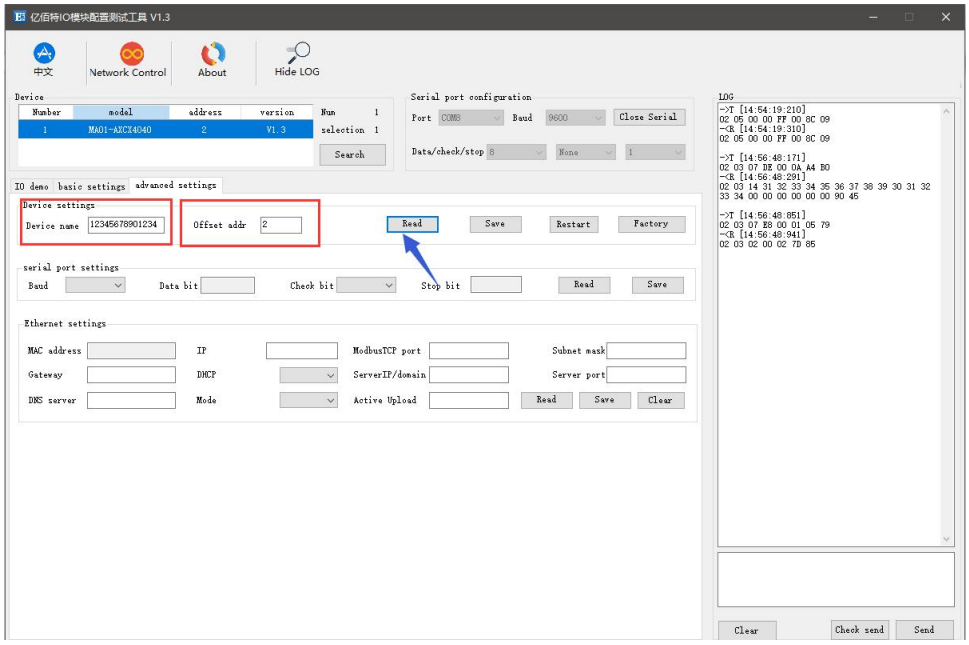

Fig 6-3-3 Device status query（Advanced Setup Interface）

6.4 Device status control

Device status control,The equipment supports the Modbus standard instruction control.Also supports configuration software graphical control.

Example：Control the device, and open the DO-1 output port.

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

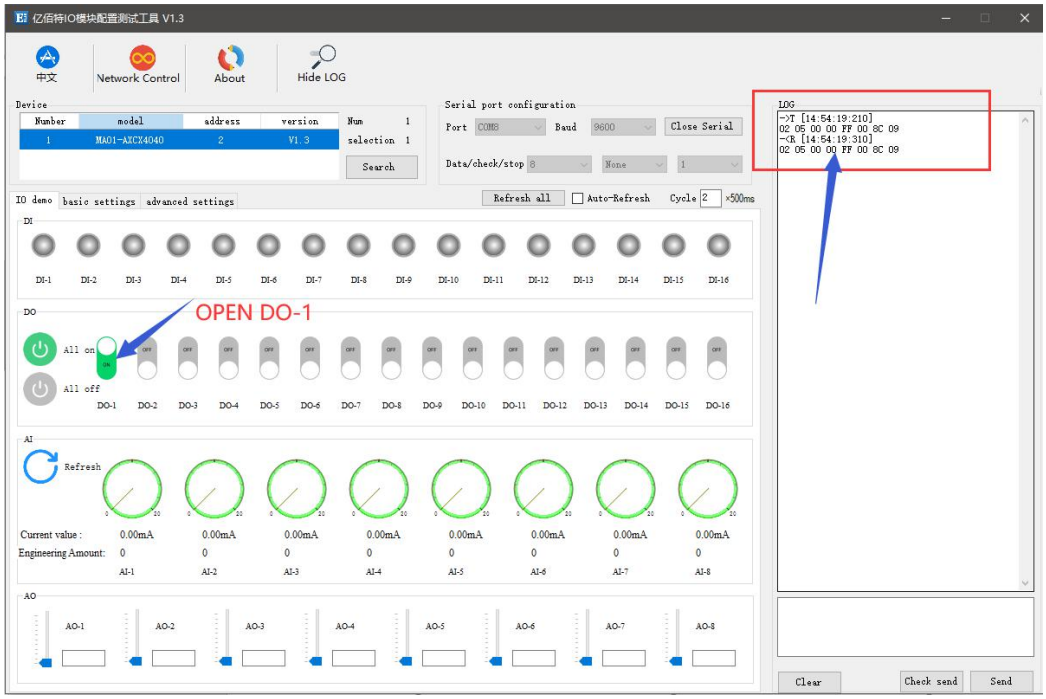

Fig 6-4-1 Software graphical operation

Methods 2：Enter command control.

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Equipment Address: 1
Function: Turn on the DO-1 output
Send: 01 05 00 00 FF 00 8C 3A (including CRC check)
.Return: 01 05 00 00 FF 00 8C 3A (including CRC checkbit)

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7、The Modbus is used in the

7.1 List of registers

Form7-1-1 List of registers

Register address	number	Content of the register	State	scope of data	Applicable function code
(00000)0x0000	4	DO state	RW	0x00-0xFF,Write changes the current DO state,Read then gets the current DO status.	0x01、0x05、0x0F
(00100)0x0064	4	Status when power on DO	RW	0x00-0xFF,Set the upper power state of the DO,After writing, after the next restart, the DO state is the set state.	0x01、0x05、0x0F
(10000)0x0000	4	DI values	RW	0x00-0xFF,Represents ote the current level signal of DI.	0x02
(41204)0x04B4	4	DI count values	RW	0x0001-0x0008,Write indicates the initial value of the set count,Read out indicates that the readout has been counted.	0x03、0x06、0x10
(41400)0x0578	4	DO working mode	RW	0x0000-0x0002,0x0000Level mode (default mode ） ,Level mode(default mode,0x0002Follow mode.	0x03、0x06、0x10
(41500)0x05DC	4	DO pulse width	RW	0x32-0xFFF(50-65535),Duration of the pulse,/ms.	0x03、0x06、0x10
(41318)0x0526	4	DI count method	RW	0x0000-0x0002,0x0000 Rising along the count,0x0001 Decline along the count,0x0002Level count.	0x03、0x06、0x10
(41304)0x0518	4	DI count value reset method	RW	0x0000-0x0001,0x0000Automatic clearing method,0x0001Manual clearance.	0x03、0x06、0x10
(41311)0x051F	4	Set the clearance method	RW	0x0001-0x00FF.	0x03、0x06、0x10
(41600)0x0640	4	Set up the DO to follow the 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	The firmware version	R	The firmware version number.	0x03
(42014)0x07DE	10	Module name	RW	The name is 20 bytes including "\ 0".	0x03、0x06、0x10
(42027)0X07E8	1	Module software address	RW	0x01-0xE0.	0x03、0x06、0x10
(42025)0X07E9	1	Restore the default parameter	RW	The parameters written to the 5BB5, settings recover to the default parameters.	0x03、0x06、0x10
(42026)0x07EA	1	Equipment restart	RW	The Write to the 5BB5, device restarts immediately	0x03、0x06、0x10
(42100)0x0834	1	Potter rate code	RW	The default value is 0x0003,exactly 9600. 0x0000,is 1200； 0x0001,is 2400； 0x0002,is 4800；	0x03、0x06、0x10

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				0x0003,is 9600； 0x0004,is 19200； 0x0005,is 38400； 0x0006,is 57600； 0x0007,is 115200；	
(42102)0x0836	1	verify mode	RW	The default value is0x0000,no checksum. 0x0000,no verificatio； 0x0001,Parity； 0x0002,even check；	0x03、0x06、0x10

7.2 Directive Format (Part)

7.2.1 Read the DO output coil status

Read the output coil status using the 01 function code,For example: Read the two output coil states

20	01	00 00	00 02	XX XX
Device Modbus address	FC	Register start address	Number of output coils read	CRC checkcode

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

20	01	01	02	XX XX
Device Modbus address	FC	Number of bytes of the data	The state data that was returned	CRC checkcode

The state data 02 returned above indicates the output DO2 pass on.

7.2.2 Read to keep the register

One or more register values were read using the 03 functional code,For example: Read the DO1 working mode.

20	03	05 78	00 01	XX XX
Device Modbus address	FC	Register start address	Number of output coils read	CRC checkcode

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

20	03	02	00 00	XX XX
Device Modbus address	FC	Number of bytes of the data	The state data that was returned	CRC checkcode

The above 00 00 indicates the DO1 as a level mode.

7.2.3 Write a single hold register

Write a single hold register using the 06 function code,For example, set the working mode of the DO1 to the pulse mode

20	06	05 78	00 01	XX XX
Device Modbus address	FC	Register start address	Write to the value	CRC checkcode

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

20	06	05 78	00 01	XX XX
Device Modbus address	FC	Register start address	Write to the value	CRC checkcode

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

7.2.4 Write about multiple hold registers

Write multiple hold-register commands using the 10 function code,For example, set the DO1-DO4 working mode for DO1-DO4.

20	10	05 78	00 04	08	0001 0002	XX XX
Device Modbus address	FC	Register start address	Number of registers	Number of bytes written to the data	Written data	CRC checkcode

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

20	10	05 78	00 04	XX XX
Device Modbus	FC	Register start	Number of registers	CRC checkcode

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address		address		

If the modification is successful,If the modification is successful If the modification is successful

7.2.5 Write a single DO coil state

Use the 05 command to write a single command, for example: set the DO1 working mode to pulse mode

20	05	00 00	FF 00	XX XX
Device Modbus address	FC	Register start address	Write to the value Coil action: on	CRC checkcode

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

20	05	00 00	FF 00	XX XX
Device Modbus address	FC	Register start address	Write to the value	CRC checkcode

DO1 coil guide on.

7.2.6 Write about the multiple DO coil states

Use the 0F function code to write individual commands,For example, set the working mode of the DO1 to the pulse mode

20	0F	00 00	00 04	01	06	XX XX
Device Modbus address	FC	] start address	Number of coils	Bytes of the data	Data for controlling the coil (bit operation)	CRC checkcode

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

20	0F	00 00	OO O4	XX XX
Device Modbus address	FC	Register start address	DO3 coil guide on	CRC checkcode

DO2,DO3 coil guide on.

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Revisionhistory

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1.0	2021-08-30	Initialversion	LC

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