User Manual for

Modbus I/O Digital Input/Output

MA01-AXCX/XOXO****-V2(P)

成都亿佰特电子科技有限公司

Chengdu Ebyte Electronic Technology Co.,Ltd.

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1. Product Introduction

The MA01 V2 series (including the MA01-AXCX1010-V2/V2P, MA01-AXCX2020-V2/V2P, MA01-AXCX3030-V2/V2P, and MA01-AXCX4040-V2/V2P) are intelligent I/O modules that collect 1-4 sensor digital inputs (DIs) and convert them into digital signals for transmission to configuration software or PLCs via serial ports. They also support controlling 1-4 relay outputs (DOs) via serial port commands, enabling remote data collection and control.

1.1 Main features

- Communication protocol: Support Modbus RTU protocol
- Wide compatibility: supports various configuration software, PLC, touch screen
- Communication interface: RS485 communication interface
- Power supply: DC 8-28V wide voltage power supply
- Input function: 1-4 switch inputs (DI), support wet node acquisition
- Output function: 1-4 relay switch output (DO)
- Counting function: Switch input supports pulse counting function
- Trigger mode: Support rising edge, falling edge, and level trigger modes
- Output mode: supports four working modes: level mode, pulse mode, follow mode and cycle mode
- Communication monitoring: built-in communication timeout detection function
- Communication parameters: baud rate 1200-115200bps adjustable (default 9600bps)
- Device address: supports 0-255 slave addresses
- Installation method: Supports two installation methods: guide rail and positioning hole
- Relay specifications: Hongfa relay, high reliability and long service life
- Industrial-grade design: stable and reliable performance, suitable for industrial environments
- Isolation design: power supply isolation, digital signal isolation, strong anti-interference ability
- Button function: supports reset button, provides restart and restore factory settings function

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2. Quick Start

2.1 Preparation

Before using serial I/O networking devices (hereinafter referred to as "IO devices"), please prepare the following equipment and tools:

Form 1Preparation Checklist

Serial number	Device	Quantity
1	IO devices	1
2	USB to Serial Converter	1
3	Configuration tool software	1
4	computer	1
5	Power adapter (12V/1A)	1
6	Screwdriver (SL2 slotted)	1
7	Signal generator (or sensor)	1

2.2 Equipment Wiring

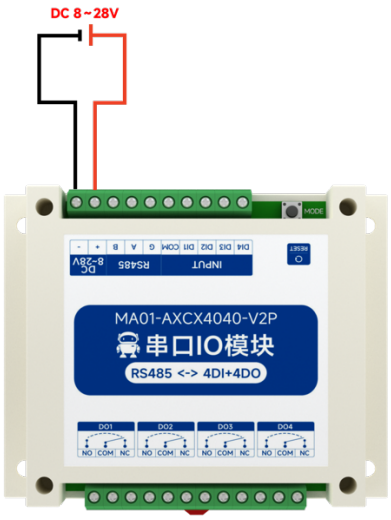
Safety Tips: When wiring the equipment, you must first turn off the power. It is strictly forbidden to work with power on to avoid damaging the equipment or causing safety accidents.

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2.2.1 Power Wiring

The device uses a DC 8-28V wide voltage power supply. It is recommended to use a DC 12V or DC 24V power adapter.



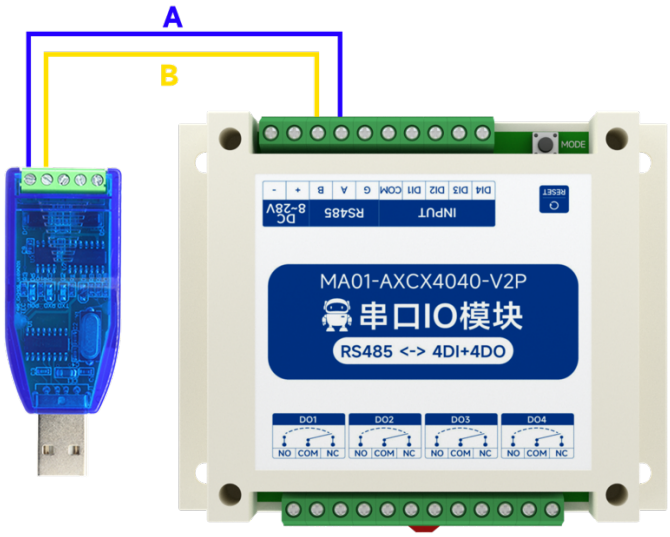
Picture 1Power supply wiring diagram

2.2.2 Communication Wiring

RS485 communication wiring method:

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Picture 2RS485 communication wiring diagram

2.2.3 DI, DO wiring diagram

After the device is powered on correctly, the POWER indicator (green) is on, indicating that the device is powered normally.

Switch input DI wiring: Connect the control button or sensor signal to the corresponding DI port.

Switch output DO wiring: Connect the load device to be controlled to the corresponding DO port.

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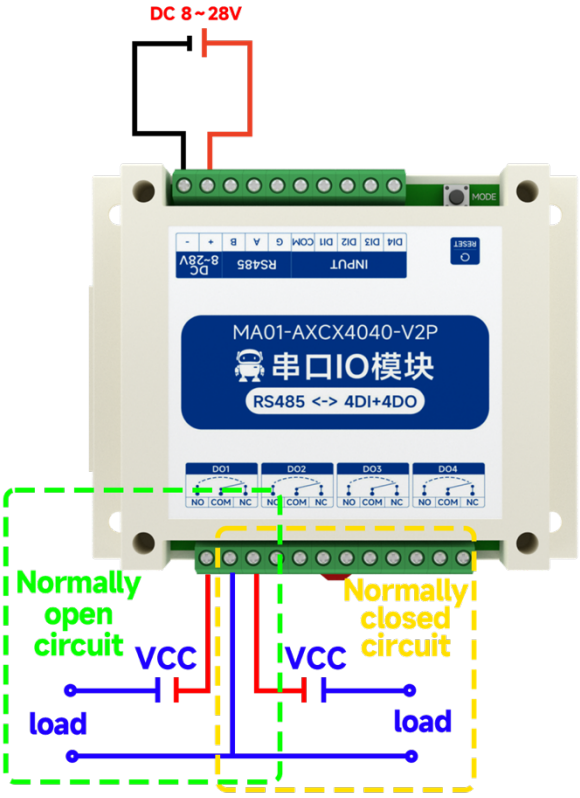


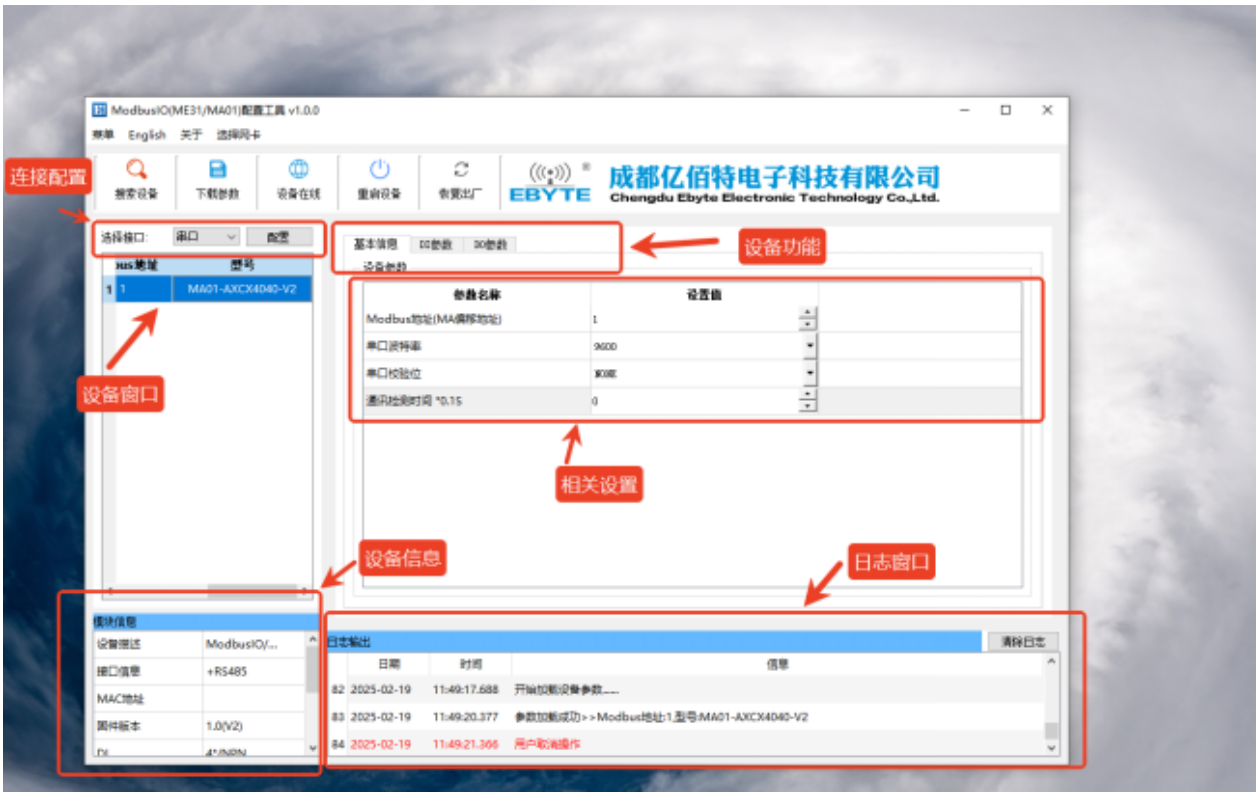
Figure 3DI/DO wiring diagram

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2.3 Software Setup

2.3.1 Device Connection



Picture 4 Software main interface

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Steps:

(1) Select the corresponding serial port number in the software interface . Click the "Configure" button to set the serial port parameters (the factory default parameters of the device are as shown in



Figure 5 Serial port settings

the figure. If the user has modified them, set them according to the actual parameters) . Confirm the serial port parameter settings

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(2) Click "Search Device" in the device window . After the search is complete, select the target device in the device list . Click "Stop Searching" and then click the device to connect.

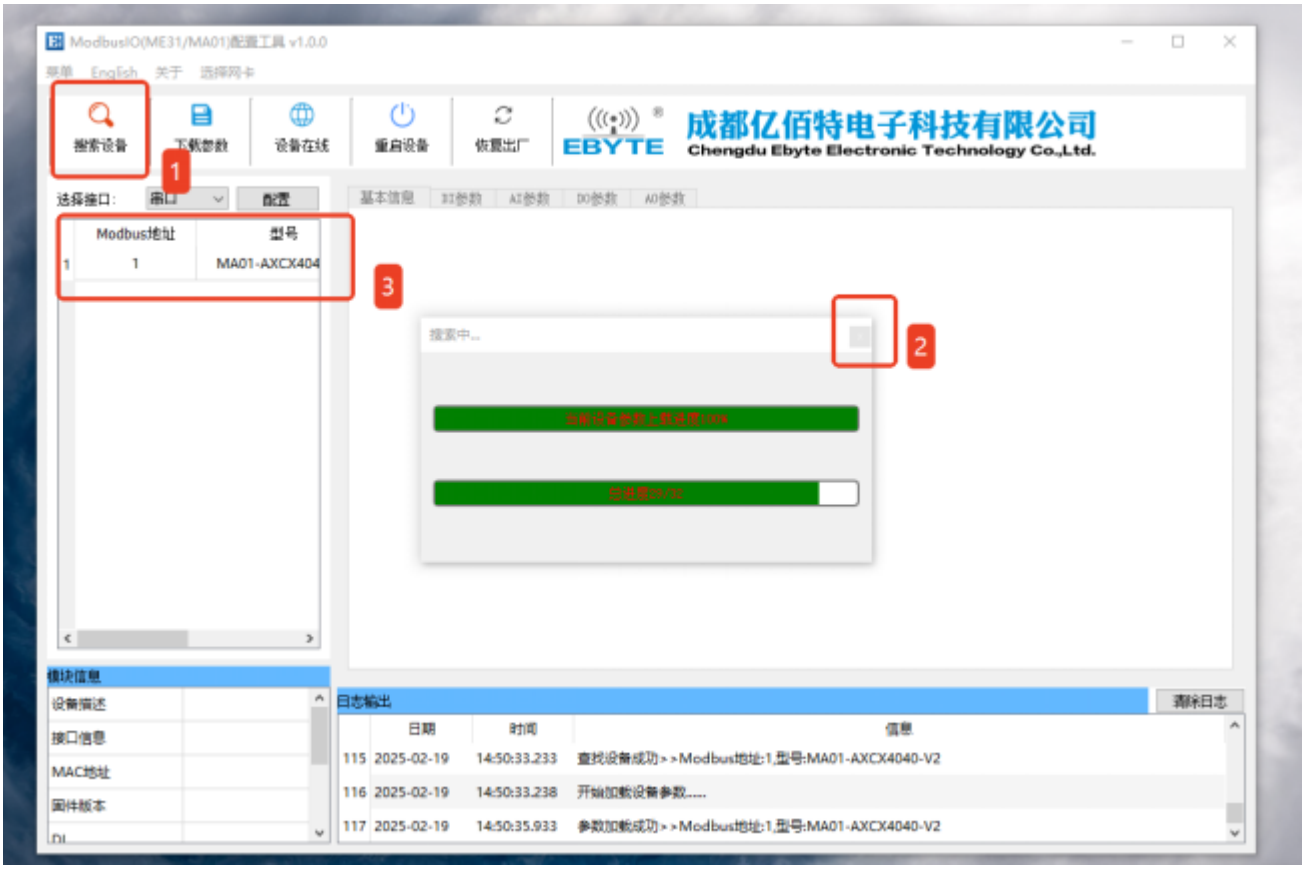


Figure 6Connect and search device

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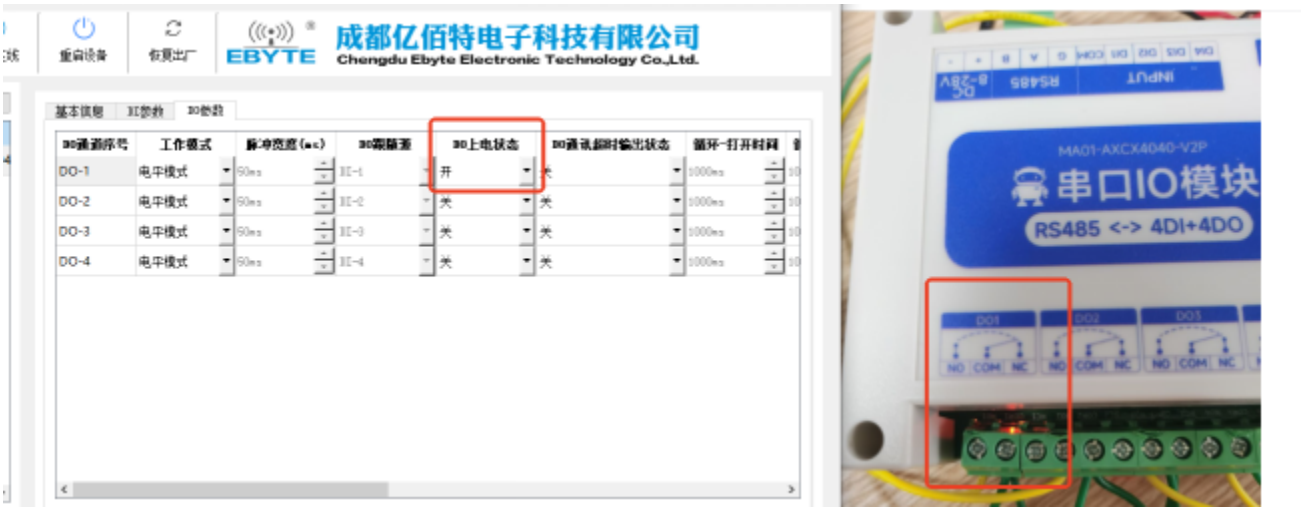
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2.3.2 Equipment Testing

After the connection is successful, you can perform device function test in the software interface:



Picture 7Modification Status



Picture 8Verify whether it is effective

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3. Product Overview

3.1 Product Specifications

Table 2Technical Parameters Specifications

Product Model	Specification	Switch input DI	Switch output DO	RS485	Isolation type
MA01-AXCX1010-V2	1DI+1DO	1-way	1-way	✓	×
MA01-AXCX1010-V2P		1-way	1-way	✓	✓
MA01-AXCX2020-V2	2DI+2DO	2-way	2-way	✓	×
MA01-AXCX2020-V2P		2-way	2-way	✓	✓
MA01-AXCX3030-V2	3DI+3DO	3-way	3-way	✓	×
MA01-AXCX3030-V2P		3-way	3-way	✓	✓
MA01-AXCX4040-V2	4DI+4DO	4-way	4-way	✓	×
MA01-AXCX4040-V2P		4-way	4-way	✓	✓

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3.2 Technical parameters

Table 3 Technical Parameters Specifications

Item	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 bps to 115200 bps (9600 bps by default)
	Data bits	8 (fixed)
	Check digit	No parity, odd parity, even parity (default is no parity)
	Stop bits	1 (fixed)
	Communication Protocol	Modbus RTU protocol
	Device Address	0~255 (default address 1, 0 is the broadcast address)
	Indicator light	The red LED light flashes during communication with a period of 60ms.
DI input	DI channels	1/2/3/4-way
	Interface Type	Wet Node
	Trigger method	Rising edge, falling edge, level (default rising edge trigger)
	Filter parameters	1 to 16 (default 6)
	Acquisition frequency	1 kHz

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DO output	DO number	1/2/3/4-way
	DO output type	C-type relay (normally open + normally closed)
	DO output mode	Level mode, pulse mode, follow mode, cycle mode
	Relay contact capacity	30V/10A, 250V/10A
	Output Indicator	Red LED indication
Other	Product size	MA01-AXCX1010-V2(P) 54*90*32(mm) MA01-AXCX2020-V2(P) 90*90*40(mm) MA01-AXCX3030-V2(P) 90*90*40(mm) MA01-AXCX4040-V2(P) 115*90*40(mm)
	Product weight	MA01-AXCX1010-V2 74 ± 5 g MA01-AXCX1010-V2P 75 ± 5 g MA01-AXCX2020-V2 121 ± 5 g MA01-AXCX2020-V2P 123 ± 5 g MA01-AXCX3030-V2 133 ± 5 g MA01-AXCX3030-V2P 134 ± 5 g MA01-AXCX4040-V2 164 ± 5 g MA01-AXCX4040-V2P 165 ± 5 g
	Working temperature and humidity	-40 ～ +85℃, 5%～95%RH (non-condensing)
	Storage temperature and humidity	-60～+125℃, 5%～95%RH (non-condensing)
	Installation	Guide rail and positioning hole installation

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3.3 Port Description



Figure 9 Device interface diagram

Serial number	Port ID	Functional Description	Remark
1	DC8-28V "-"	Negative pole of power supply	RVV 2×0.75mm² cable is recommended
2	DC8-28V "+"	Positive pole of power supply	RVV 2×0.75mm² cable is recommended
3	B	RS485 B terminal (negative)	RVV 2×0.75mm² cable is recommended
4	A	RS485 A terminal (positive)	RVV 2×0.75mm² cable is recommended
5	G	RS485 ground terminal	RVV 2×0.75mm² cable is recommended
6	COM	Switch input common terminal	RVV 2×0.75mm² cable is recommended
7	DI1	Switch input channel 1	RVV 2×0.75mm² cable is recommended

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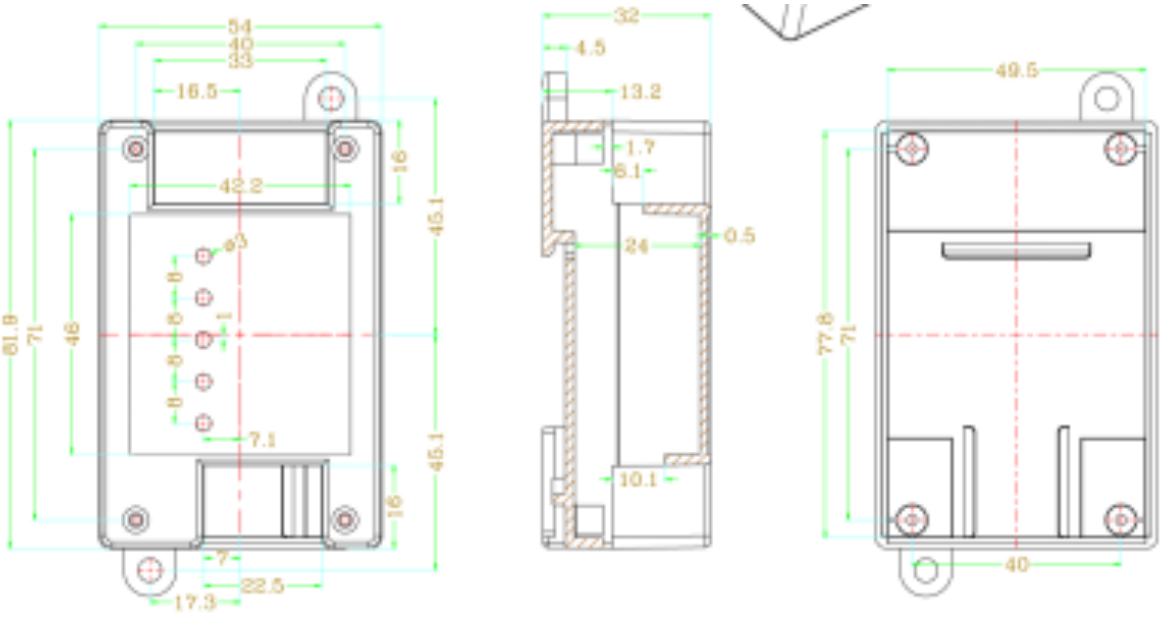
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8	DI2	Switch input channel 2	RVV 2×0.75mm² cable is recommended
9	DI3	Switch input channel 3	RVV 2×0.75mm² cable is recommended
10	DI4	Switch input channel 4	RVV 2×0.75mm² cable is recommended
11	RESET	Reset button	Short press (50ms-1.5s): Device restarts Long press (5s-10s): Restores to factory settings More than 10s: Invalid
12	SYS	System status indicator	Always on when powered on, flashes during communication (60ms period)
13	DO1	Switch output channel 1	Relay normally open/normally closed contacts
14	DO2	Switch output channel 2	Relay normally open/normally closed contacts
15	DO3	Switch output channel 3	Relay normally open/normally closed contacts
16	DO4	Switch output channel 4	Relay normally open/normally closed contacts

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3.4 Overall dimensions



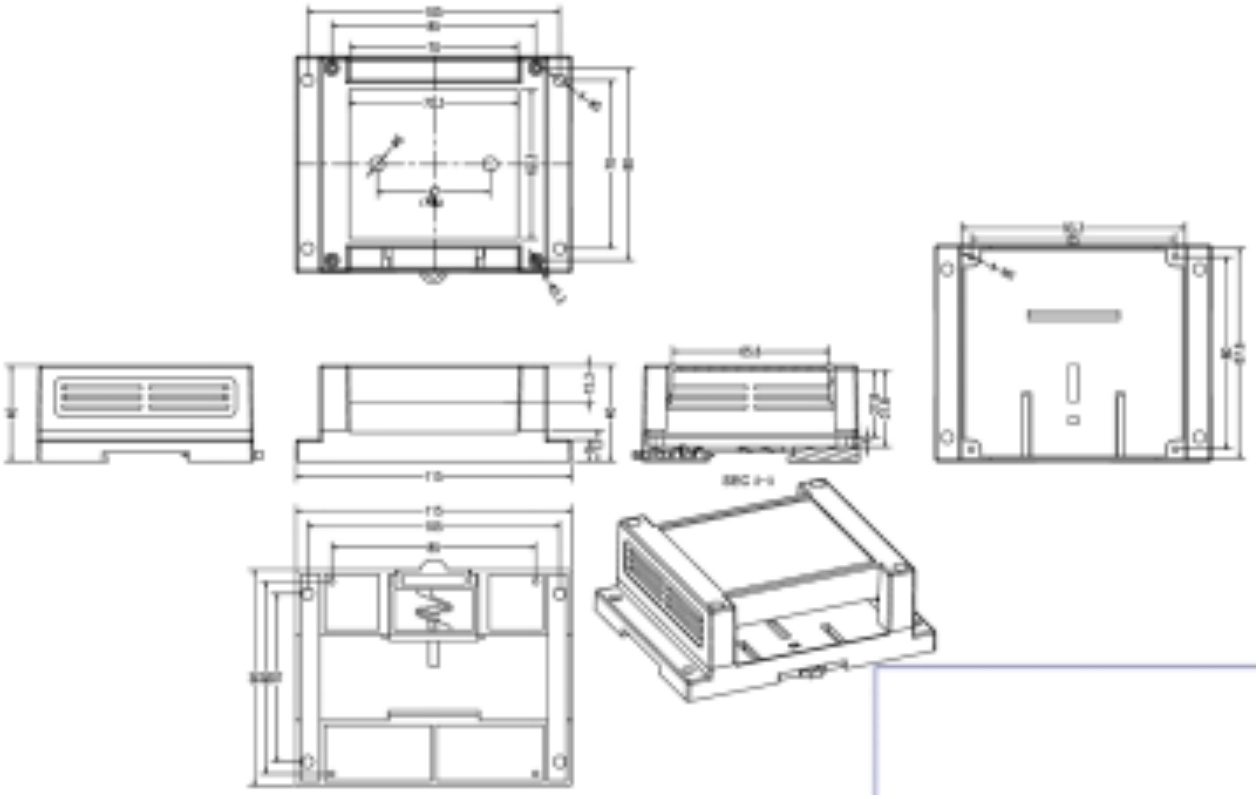
Picture 10 MA01-AXCX1010-V2/MA01-AXCX1010-V2P dimension

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Picture 12 Dimension of MA01-AXCX2020-V2/MA01-AXCX2020-V2P/MA01-AXCX3030-V2/MA01-AXCX3030-V2P



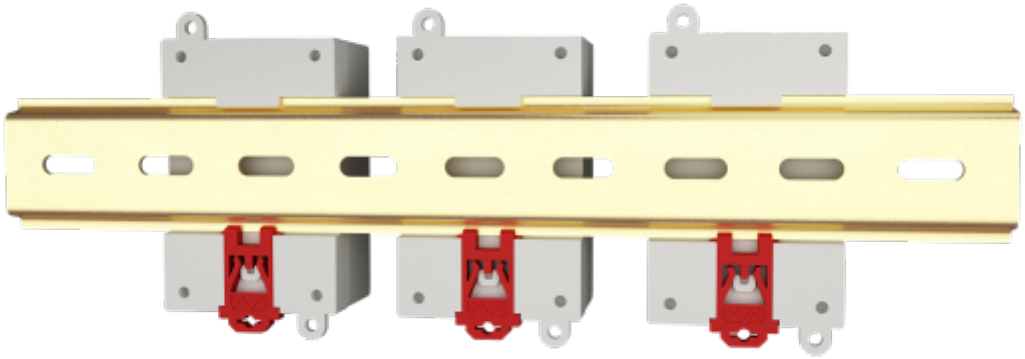
Picture 11 MA01-AXCX4040-V2/MA01-AXCX4040-V2P dimension

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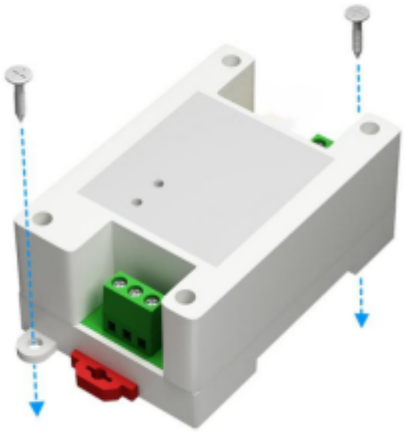
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3.5 Installation method

The device supports two installation methods : guide rail installation and positioning hole installation:



Picture 13 Guide rail installation method



Picture 14 Positioning hole installation method

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4. Product Features

4.1 Switch input DI function

4.1.1 Switch Input Collection

The switch input DI is used to detect level signals or edge pulse signals (rising edge, falling edge).

Main features:

- Input type: wet node input
- Counting function: supports pulse counting, maximum count value 65535 (counting stops after exceeding)
- Trigger mode: Supports three trigger modes: rising edge, falling edge, and level (rising edge trigger by default)
- Clearing method: support automatic clearing and manual clearing (manual clearing by default)

Notes:

- Automatic clear mode: After reading the DI pulse count register, the Modbus normal response will automatically clear the register
- Manual clear mode: clear by writing 0 to the count register
- Mixed use: In auto-clear mode, you can also manually clear the counter register by writing 0 to it.



Figure 15 DI counting function setting

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4.1.2 Switch input DI filter parameters

To avoid signal jitter and interference, the switch input DI adopts a multi-cycle sampling confirmation mechanism:

- Filter range: 1-16 levels adjustable (default 6 levels)
- Sampling frequency: 1kHz (detection every 1ms)
- Filtering principle: The device must continuously detect a stable level for N sampling periods before confirming a state change.

Filter parameter description:

- Set to 1: Detecting a high level for 1ms continuously confirms the connection state
- Set to 6: A high level is detected for 6ms continuously to confirm the connection state
- Set to 16: A high level is detected for 16ms continuously to confirm the connection state

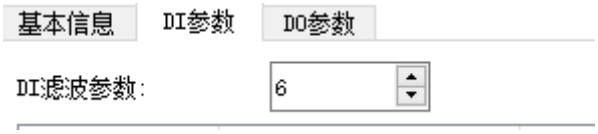


Figure 16 DI filter parameter settings

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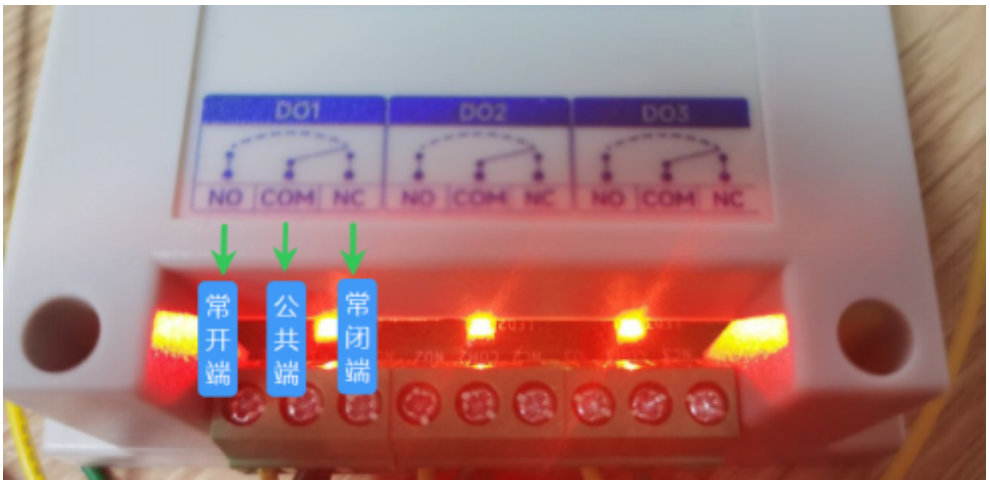
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4.2 Switch output DO function

4.2.1 Switch output description

The switch output DO uses a C-type macro relay output, providing two sets of contacts: normally open and normally closed:

- Output type: Form C relay (normally open + normally closed contacts)
- Contact capacity: DC 30V/10A or AC 250V/10A
- Working modes: level mode, pulse mode, follow mode, cycle mode
- Status indication: Each DO is equipped with a red LED indicator
  - LED is on: relay is closed (normally open, normally closed).
  - LED off: relay released (normally open disconnected, normally closed connected)



Picture 15 Schematic diagram of switch output DO interface

4.2.2 Switch output working mode

(1) Level mode

The output is based on the level state set by the user, similar to the self-locking switch function. The output state remains unchanged until a new control instruction is received.

(2) Pulse mode

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After the switch output is turned on, it will automatically turn off after maintaining the set pulse width time:

- Pulse width range: 50-65535ms (default 50ms)
- Working principle: After receiving the connection command, the DO output is connected and starts timing, and automatically disconnects after the set time is reached

(3) Follow mode

The state of the switch output DO follows the state of the specified switch input DI:

- Following rules: Multiple DOs can follow the same DI, but one DO cannot follow multiple DIs at the same time
- Default follow relationship:
  - DO1 ← DI1 (follows source register value: 0x00)
  - DO2 ← DI2 (follows source register value: 0x01)
  - DO3 ← DI3 (follows source register value: 0x02)
  - DO4 ← DI4 (follows source register value: 0x03)

(4) Switch cycle mode

Perform cycle switching operations according to the set time parameters and times:

- Opening time: 50-65535ms adjustable (default 1000ms)
- Close time: 50-65535ms adjustable (default 1000ms)
- Number of cycles: 0-65535 times adjustable (65535 means infinite loop, default is 65535)

Cycle mode description:

- After setting to cycle mode, the DO output starts timing from the off state by default.
- Each completed "open→close" operation is counted as one cycle
- If a limited number of loops is set, the loop stops after execution is completed.

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- If you switch to another mode during the loop, the remaining number of loops will be continued when you switch back to the loop mode.
- After the device is restarted, the number of loops is reset to infinite loop (65535) and needs to be reset

4.3 Device Address

- Default address: 1
- Address range: 0-255 (address 0 is the broadcast address, used to control all devices at the same time)
- Address modification: can be modified through configuration software or Modbus instructions

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5. Port Wiring Method

5.2 Switch output port wiring

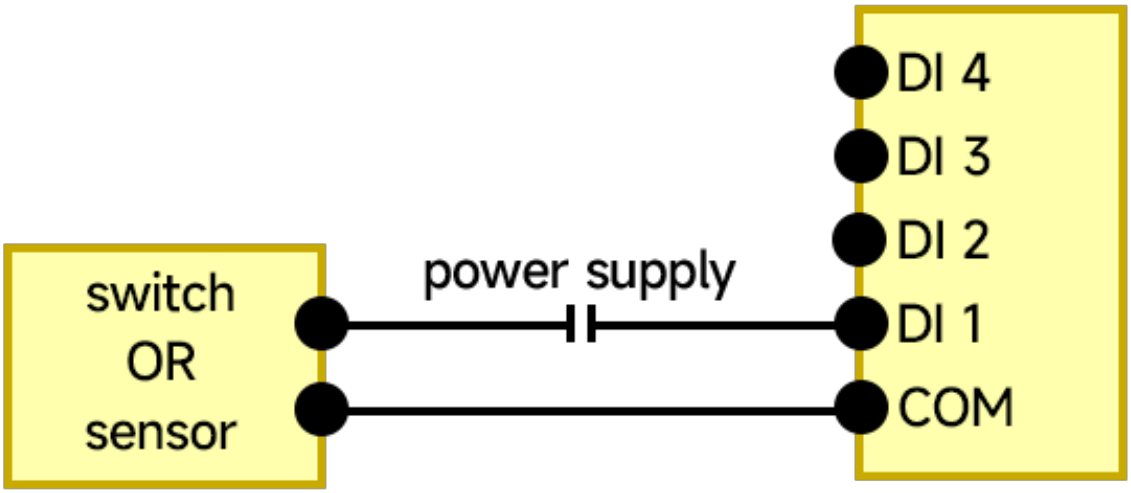
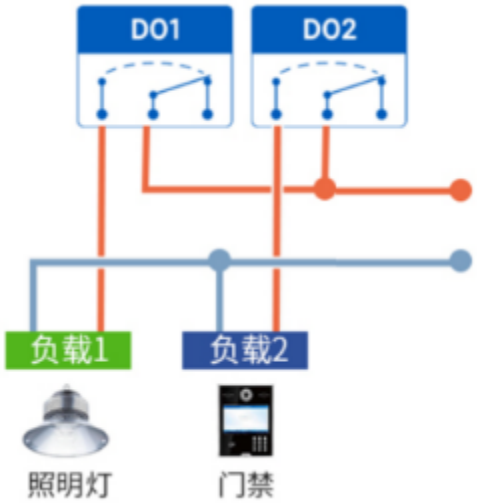


Figure 16DI wiring diagram

5.2.1 Output terminal directly controls the load (low-power within 1kW)

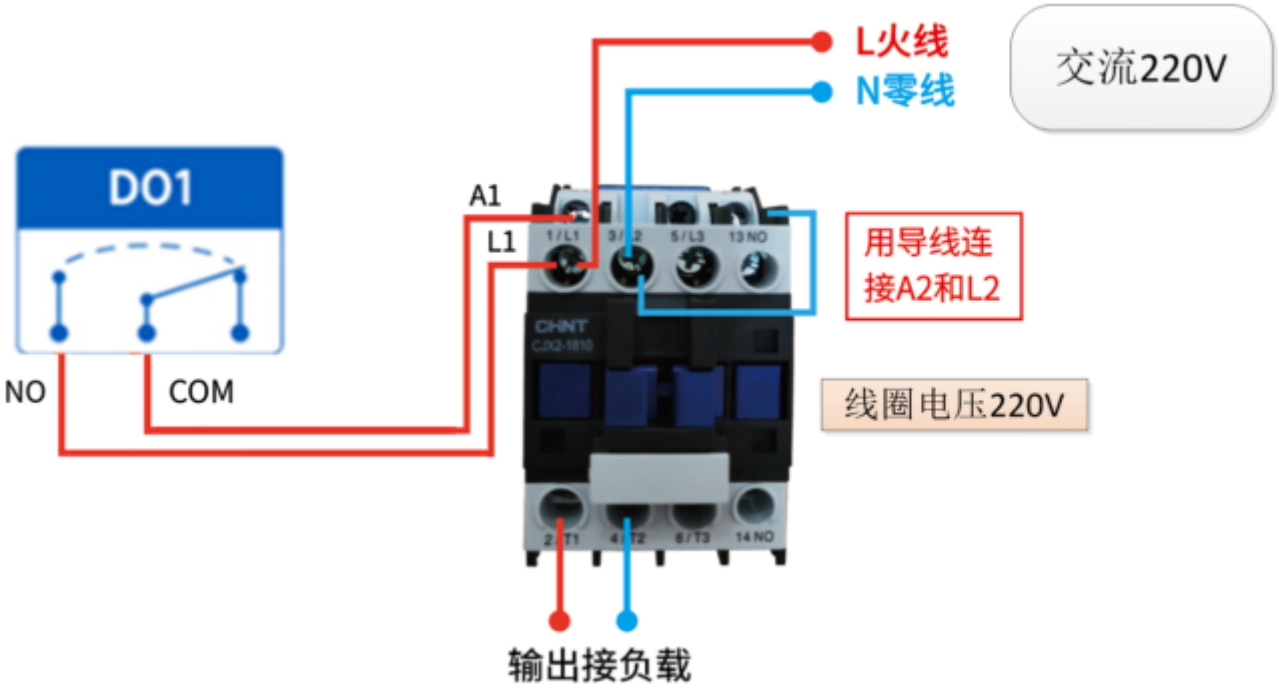


Picture 17 Wiring diagram for direct control of small power load

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



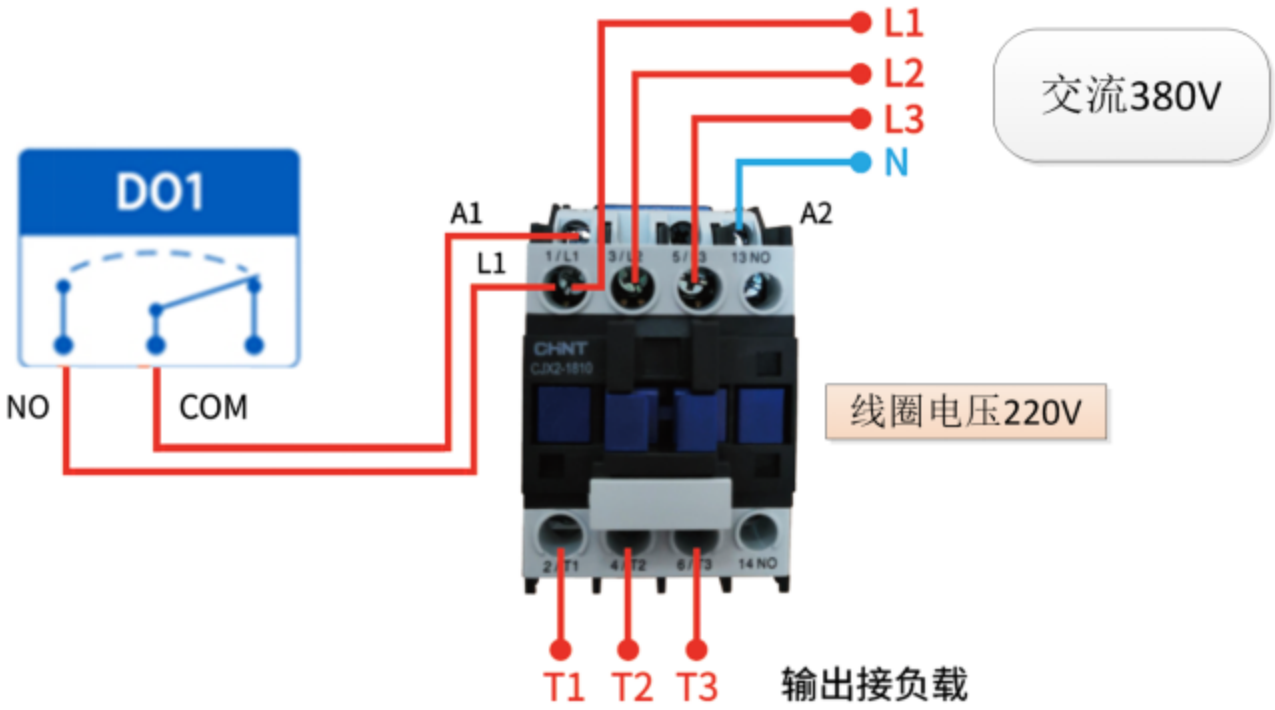
Picture 18 High power equipment control wiring diagram

Note: The contactor coil voltage in the example is AC 220V. In actual application, please select the appropriate control circuit according to the contactor coil voltage specification.

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



Picture 19 380V high power equipment control wiring diagram

Note: The contactor coil voltage in the example is AC 220V. In actual application, please select the appropriate control circuit according to the contactor coil voltage specification.

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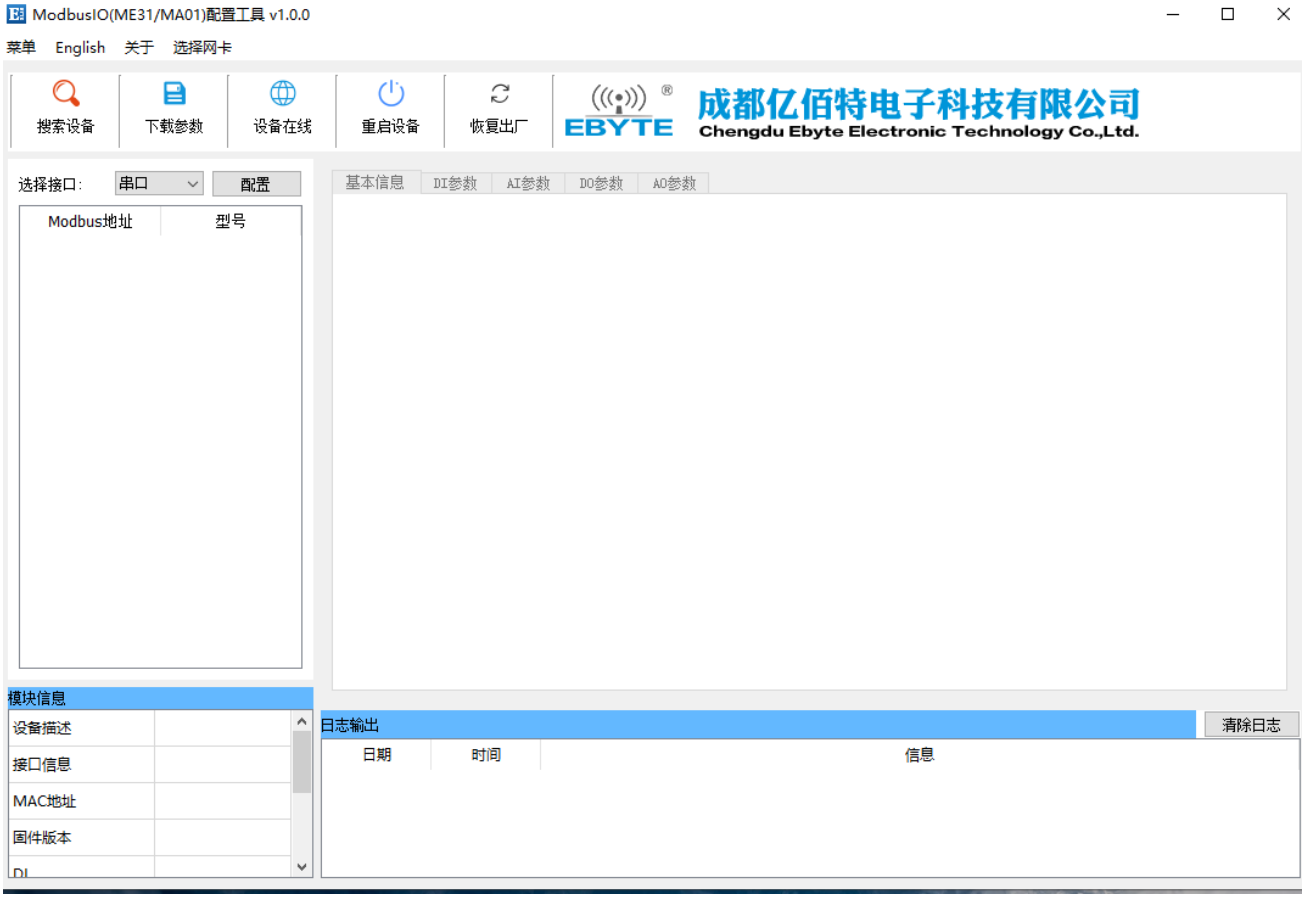
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6. Configuration software usage

6.1 Software Installation

The configuration tool software is an installation-free version. How to use it:

1. Download the software compressed package and decompress it
2. Simply double-click the .exe file to run it
3. Note: It is recommended to temporarily turn off the anti-virus software before use to avoid the software being misjudged



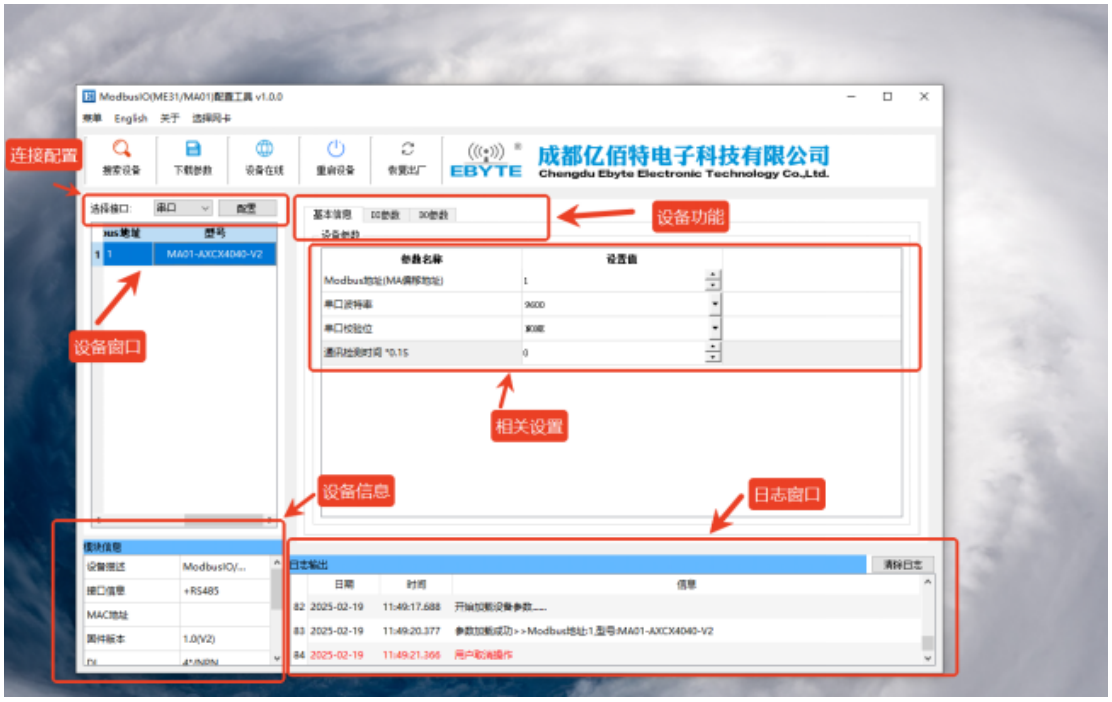
Picture 20 Software startup interface

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6.2 Software Function Introduction

6.2.1 I/O Demonstration Interface



Picture 21 Software I/O demonstration main interface

The device information window displays the basic information of the currently connected device:

- Device model identification
- Device Modbus address
- Connection status display



Figure 24 Device Information Window

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Serial port configuration window , used to set serial port communication parameters:

- Serial port number: Select the corresponding COM port
- Baud rate: 1200-115200bps optional
- Data bits: 8 bits (fixed)
- Parity bit: None/Odd/Even
- Stop bit: 1 bit (fixed)



Picture 22 Serial port parameter configuration window

The log information window displays the running status of the device during configuration and communication in real time:

- Communication logging
- Error message prompt
- Operation status feedback

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Picture 23 Log window interface

The switch input DI status display shows the real-time status of each switch input:

- DI channel status indication
- Pulse count value display
- Input parameter settings



Picture 24 Switch input DI status interface

Switch output DO control provides control functions for each switch output:

- DO channel manual control
- Real-time display of output status
- Working mode switching

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Picture 25 Switch output DO control interface

6.2.2 Basic settings interface

(1) Counting function demonstration

Note: This function is only applicable to device models that support DI function.

Provides real-time display and setting of DI counting function:

- Each DI input status display
- Pulse count value is updated in real time
- Count reset operation setting



Picture 26 Counting function demonstration interface

(2) DI related parameter settings

Note: This function is only applicable to device models that support DI function.

Configure the working parameters of the switch input DI:

- Filter parameters: 1-16 levels adjustable (default 6 levels)

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- Trigger mode: rising edge/falling edge/level (default rising edge)
- Reset mode: automatic reset/manual reset (manual reset by default)



Figure 30 DI parameter setting interface

(3) DO related parameter settings

Configure the working parameters of the switch output DO:

- Working mode: level mode/pulse mode/follow mode/cycle mode
- Pulse width: 50-65535ms (pulse mode only)
- Power-on status: on/off
- Follow Source Settings: Select the DI channel to follow (Follow mode only)
- Loop parameters: On time, Off time, Number of loops (Loop mode only)

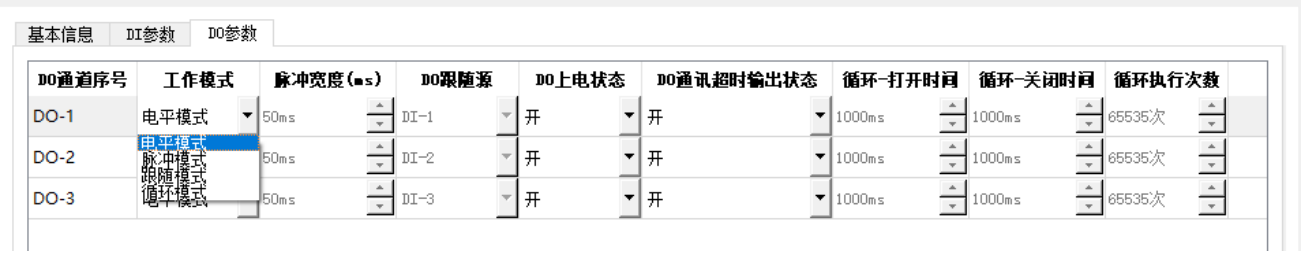
Notes:

- Multiple DO channels can be set to follow the same DI channel
- It is not possible to set a DO channel to follow multiple DI channels at the same time
- Follow mode is only available for devices that support DI function

For detailed description of DO working mode, please refer to section **4.2.2 Switching Output Working Mode** .

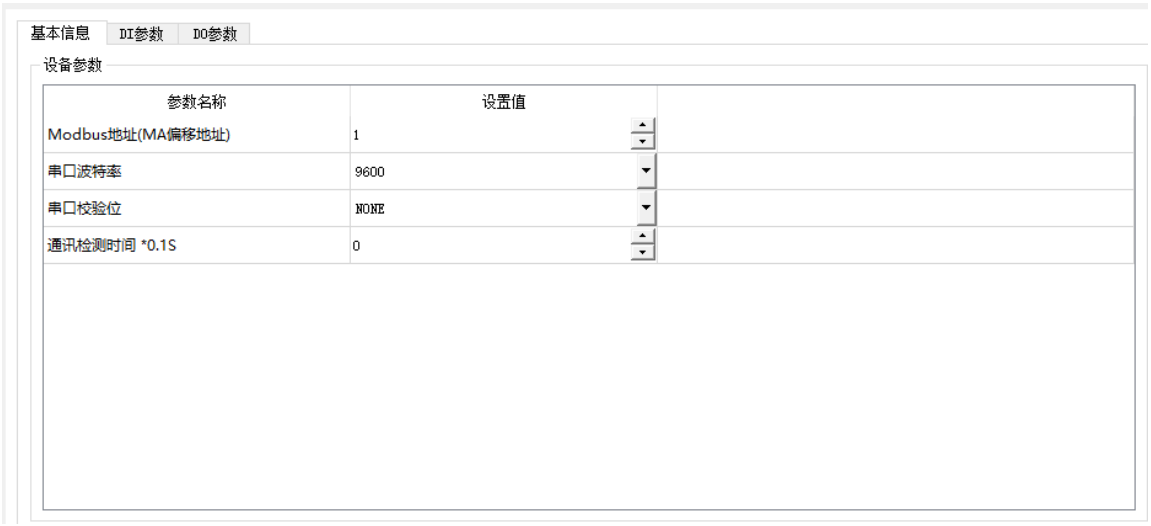
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Picture 27 DO parameter setting interface

6.2.3 Basic Information Interface



Picture 28Basic information management interface

（1） Device management function

Provides basic management operations for devices:

- Device search: Automatically search for devices on the network
- Online status: View the online status of the device
- Parameter reading: read the current configuration parameters of the device
- Device reboot: Remotely reboot the device
- Parameter save: download configuration parameters to the device
- Factory Reset: Restore the device to factory default settings

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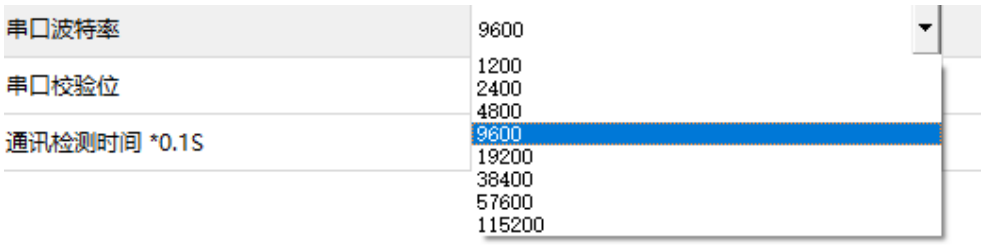


Figure 29Device management function interface

（2） Serial port parameter settings

Baud rate setting

Supports standard baud rate settings, optional range: 1200 bps , 2400 bps , 4800 bps , 9600 bps (default) , 19200 bps , 38400 bps , 57600 bps , 115200 bps

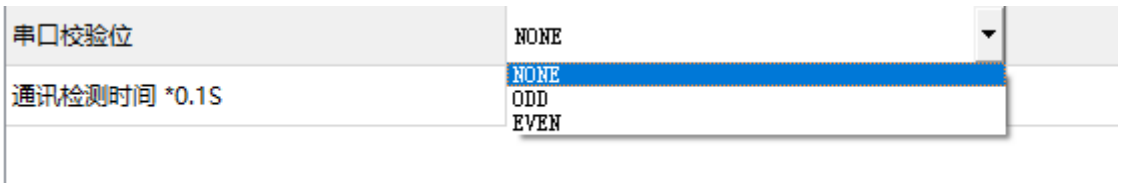


Picture 30 Baud rate setting interface

Check digit setting

Three verification methods are supported:

- No checksum (default)
- Odd parity
- Even parity



Picture 31 Check digit setting interface

6.3 Communication Time Detection

The communication timeout detection function is used to monitor the communication status between

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the device and the host computer, and automatically execute the preset safety operation when the communication is interrupted.

6.3.1 Timeout detection parameter settings

In the basic information settings interface, you can configure the communication detection time:

- Setting unit: 0.1 second
- Calculation formula: Actual timeout = set value × 0.1 seconds

6.3.2 Timeout Detection Mode

- 0: Disable communication status detection
- >0: Enable communication status detection. When no communication data is received within the set time, the timeout protection action is triggered.

6.3.3 Timeout protection action

When a communication timeout is detected, the protection status of the DO output can be selected:

- Output off state: All DO outputs are off (default)
- Output on state: All DO outputs are on

6.3.4 Application Examples

Set the communication detection time to 50 (i.e. 5 seconds) and the DO timeout output state to "off":

- When the device does not receive any Modbus communication data within 5 seconds
- All DO outputs will be automatically closed to ensure system safety



Picture 32 Communication timeout detection time setting interface

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Picture 33 DO timeout output status setting interface

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7. Modbus Usage

Note: Some manufacturers' configuration software stipulates that decimal register addresses need to be processed by +1. Please adjust according to the actual software requirements.

Baud rate (bps): 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

7.1 Register List

Register address (decimal)	Register address (hexadecimal)	Number	Register contents	state	Data range	Function code
00000	0x0000	100	DO status correspondence DO1-DO100	RW	0x05 function code: 0x0000/0xFF00 Function codes 0x01 and 0x0F: 0x0000/0x0001	R 0x01 W 0x05, 0x0F
00100	0x0064	100	The status of DO when it is powered on corresponds to DO1-DO100	RW	0x0000/0x0001 After writing, the DO status after the device restarts	R 0x01 W 0x05, 0x0F
00200	0x00C8	100	Communication detection abnormality-DO output	RW	Output off state, Output on state, Defaults to 0	R 0x01 W 0x05, 0x0F
10000	0x 0000	100	DI status corresponds to DI1-DI100	R	0x0000/0x0001 Represents reading the current DI status	R 0x02
41201	0x 04B1	1	DI filter parameters	RW	All DI channel filter parameters Valid values are 1-16, default is 6	R 0x03 W 0x06, 0x10
41400	0x 0578	100	DO working mode DO1-DO100	RW	0x000 0 : Level non-following mode (default)	R 0x03 W 0x06, 0x10

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Register address (decimal)	Register address (hexadecimal)	Number	Register contents	state	Data range	Function code
					0x000 1 : Pulse non-following mode 0x000 2 : Follow mode 0x000 3 : Cyclic switch mode	
42000	0x07D0	12	Module model	R	See model table	R 0x03
4 2500	0x 05DC	1	DO pulse width : DO0～DO100 Only valid in pulse-free and pulse-following modes	RW	The minimum is 50 (default value) That is, output a 50ms pulse Pulse with a maximum width of 65535ms	R 0x03 W 0x06, 0x10
41600	0x 0640	100	DO follower source : DO0~DO100 (Only valid in level follower mode and pulse follower mode)	RW	The highest bit (bit : 15) represents AI/DI AI:0x8000 DI:0x0000 The lower 15 bits (bit 0-14) are the source number	R 0x03 W 0x06, 0x10
42012	0x 07DC	1	Module firmware version	R	The high byte is the content before the decimal point of the version The low byte is the content after the decimal point of the version For example, A1.5, the high byte is 0x01 and the low byte is 0x05	R 0x03
42024	0x 07E8	1	Module Address	RW	Address range 0-255 Defaults to 1 0 is the broadcast address	R 0x03 W 0x06, 0x10
42025	0x 07E9	1	All factory resets	W	Write 0x5BB5, the module restarts	W 0x06, 0x10

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Register address (decimal)	Register address (hexadecimal)	Number	Register contents	state	Data range	Function code
42026	0x 07EA	1	Device restart	W	Write 0x5BB5, the module restarts	W 0x06, 0x10
42055	0x 0807	1	Communication detection time Usually used for 485 communication connectivity detection	RW	0-65535 (unit +0.1s) The number 0 means off, the default is 0	R 0x03 W 0x06, 0x10
42100	0x 0834	1	Serial port 1 baud rate code	RW	See Appendix 1, the default value is 3	R 0x03 W 0x06, 0x10
42102	0x 0836	1	Serial port 1 parity check	RW	0: No checksum (default) 1: Odd parity 2: Even parity	R 0x03 W 0x06, 0x10
42527	0x 09DF	100	DI pulse count value	RW	Count range 0x00~0xFFFF Any value in this range can be written After writing, counting starts from the written value	R 0x03 W 0x06, 0x10
42627	0x 0A43	100	DI automatic/manual clear	RW	Defaults to 1 0 : Automatically clear 1 : Manual clear clearing after reading the pulse value Manual clear: write zero directly to the pulse value register	R 0x03 W 0x06, 0x10
42827	0x 0B0B	100	Counting method	RW	0 0: rising edge counting (default) 0 1: Falling edge counting 02: Level counting (rising edge + falling edge)	R 0x03 W 0x06, 0x10

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Register address (decimal)	Register address (hexadecimal)	Number	Register contents	state	Data range	Function code
46150	0x 1806	100	DO cycle switch-open time	RW	When in loop switch mode, the loop open time: 50~65535ms, the default value is 1000ms	R 0x03 W 0x06, 0x10
46250	0x 186A	100	DO cycle on-off time	RW	When in loop switch mode, the loop off time: 50~65535ms, the default value is 1000ms	R 0x03 W 0x06, 0x10
46350	0x 18CE	100	Number of times the DO loop is executed	RW	Number of cycles, after setting, the number of times the switch executes the setting, and reading this register is the remaining number of unexecuted times. The range is 0~65535. When it is set to 65535, it means infinite switch cycle. The default value is 65535. When the power is turned off and then on, this parameter will return to the default value, that is, 65535.	R 0x03 W 0x06, 0x10

7.2 Command Format (Part)

Note: All the following Modbus commands are expressed in hexadecimal data format.

7.2.1 Read DO output coil status

Use function code 01 to read the output coil status. Example: Read the status of 4 output coils DO1-DO4

01	01	00 00	00 04	XX XX

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Device Modbus address	Function code	Register start address	Number of output coils read	CRC checksum

After sending the above command to the device via the 485 bus, the device will return the following values:

01	01	01	07	XX XX
Device Modbus address	Function code	Number of bytes of data	Returned status data	CRC checksum

Status data analysis:

The return value 07 (binary: 0111) means that DO1, DO2, and DO3 outputs are on, and DO4 output is off.

7.2.2 Read Holding Registers

Use function code 03 to read one or more holding register values. Example: Read DO1 operating mode

01	03	05 78	00 01	XX XX
Device Modbus address	Function code	Register starting address	Number of registers read	CRC checksum

After sending the above command to the device via the 485 bus, the device will return the following values:

01	03	02	00 00	XX XX
Device Modbus address	Function code	Number of bytes of data	Returned data	CRC checksum

The return value 00 00 indicates that the current working mode of DO1 is level mode.

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7.2.3 Write a Single Holding Register

Use function code 06 to write a single holding register. Example: Set DO1 working mode to follow mode

01	0 6	05 78	00 02	XX XX
Device Modbus address	Functio n code	Register address	Write value	CRC checksum

After sending the above command to the device via the 485 bus, the device will return the following values:

01	0 6	05 78	00 02	XX XX
Device Modbus address	Function code	Register address	Write value	CRC checksum

After successful execution, the value of register 0x0578 changes to 0x0002 (follow mode).

7.2.4 Write Multiple Holding Registers

Use function code 10 to write multiple holding registers. Example: Set the working mode of DO1-DO4 at the same time

01	10	05 78	00 04	08	0001 000 2 0003 0004	XX XX
Device Modbus address	Functio n code	Register starting address	Number of registers	The number of bytes of data written	Written data	CRC checksum

After sending the above command to the device via the 485 bus, the device will return the following values:

01	10	05 78	00 04	XX XX

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Device Modbus address	Function code	Register address	Number of registers	CRC checksum

Operation result:

After successful execution, the four consecutive register values starting from 0x0578 are set to:

- DO1: 0x0001 (level mode)
- DO2: 0x0002 (Pulse mode)
- DO3: 0x0003 (Follow mode)
- DO4: 0x0004 (loop mode)

7.2.5 Write a single DO coil status

Use function code 05 to write the status of a single coil. Example: Set DO1 coil to be on.

01	05	00 00	FF 00	XX XX
Device Modbus address	Function code	Register address	Write value, coil action: conduction	CRC checksum

After sending the above command to the device via the 485 bus, the device will return the following values:

01	05	00 00	FF 00	XX XX
Device Modbus address	Function code	Register address	Write value	CRC checksum

Operation results:

DO1 coil is turned on for output.

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7.2.6 Write Multiple DO Coil Status

Use function code 0F to write multiple coil states. Example: Set all DO1-DO4 coils to be connected.

01	0F	00 00	00 04	01	0F	XX XX
Device Modbus address	Function code	Starting address	Number of coils	Number of bytes of data	Control coil data (bit operation)	CRC checksum

After sending the above command to the device via the 485 bus, the device will return the following values:

01	0F	00 00	OO O4	XX XX
Device Modbus address	Function code	Register address	Number of coils	CRC checksum

Operation results:

DO1, DO2, DO3, and DO4 coils are all connected to output.

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8. Serial port upgrade

8.1 Upgrade Preparation

1. Make sure the device is correctly connected to the RS485 communication line
2. Prepare device firmware upgrade files
3. Open the IAP upgrade function interface of the configuration software

8.2 Upgrade Steps

1. Device power off: First, power off the device (keep RS485 connected)
2. Software Setup:
    a) Enable the IAP upgrade function in the host computer software
    b) Select the corresponding device model
    c) Importing the firmware upgrade file
    d) Configure and open the serial port
3. Enter upgrade mode:
    a) Press and hold the RESET button on the device
    b) Keep the button pressed and power on the device.
    c) The device enters firmware upgrade mode
4. Perform the upgrade: Click the "Start Upgrade" button and wait for the upgrade to complete

8.3 Notes

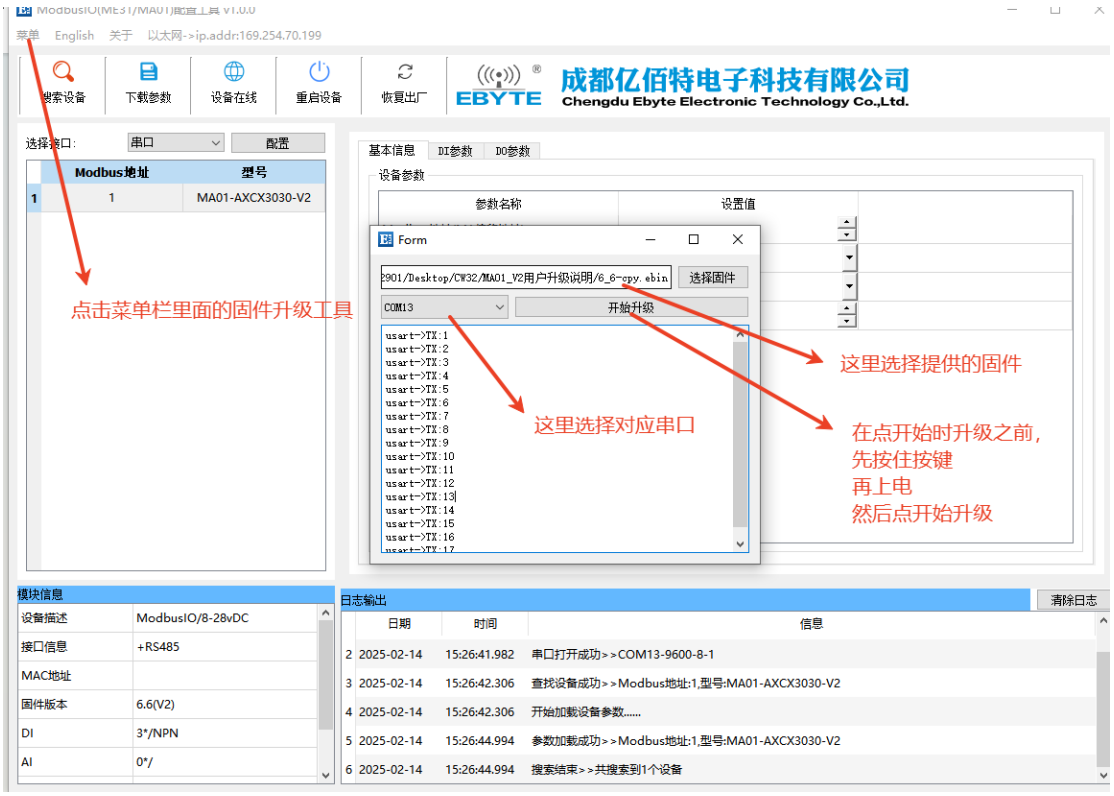
- Do not power off or disconnect the communication connection during the upgrade process
- If the upgrade fails, please repeat the above steps to upgrade again
- After the upgrade is complete, the device will automatically restart and resume normal operation

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There is a button



Click the firmware upgrade tool in the menu bar

Choose the corresponding serial port here

Choose the firmware you hope to use

Press the button first before clicking “upgrade”, and then power on, and then click upgrade to start

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1. Ebyte reserves the right of final interpretation and modification of all contents in this manual.
2. Due to the continuous improvement of the product hardware and software, this manual may be changed without prior notice. The latest version of the manual shall prevail.
3. Users of this product need to visit the official website to follow product updates so that they can obtain the latest information about this product in a timely manner.

Revision History

Version	Revision Date	Revision Notes	Maintainer
1.0	2025-5-11	Initial version	LYJ
1.1	2025-9-3	Version Update	Hugh

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