

CS-IO808 Serial I/O Module Manual



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Notice

- ❖ Please read this manual carefully before use and save it for reference.
- ❖ Please follow to the operating procedures and precautions in this manual.
- ❖ Please open the package carefully and check whether the device and accessories have been damaged due to transportation when you receive the device. Please contact us for return processing once damage occurs.
- ❖ Please do not repair it yourself, and contact our technical support department directly if the device fails.

OneFex Industrial IoT

1 Product Introduction

CS-IO series products are serial I/O Module using standard Modbus-RTU protocol, supporting RS485/232. Support wide voltage power supply, multi-channel input and output control, which can be widely used in various application scenarios such as industrial production, agriculture, smart city and office buildings.

1.1 Features

- ◆ DC 9-28V wide voltage power supply, support anti-reverse connection;
- ◆ 8-way DO contact isolation, normally ON and normally OFF, 10A 250VAC / 10A 30VDC;
- ◆ 8-way DI, with optocoupler isolation, used for switch detection, supports dry and wet contacts;
- ◆ LED indication, 1 for power status, 8 for DO status;
- ◆ Supports RS485 + RS232 Communication interface, power isolation plus signal isolation, reliable communication;
- ◆ Communication baud rate: 300bps~38400bps (, It is 9600 by default and can be modified by software);
- ◆ Support standard Modbus RTU protocol, read and write by register address;
- ◆ 253 device addresses can be set. The 5-bit address DIP switch can set 1-31 address codes, and those greater than 31 can be set by software;
- ◆ Support input and output linkage, such as local linkage or dual-computer linkage, which is convenient for multi-terminal control;
- ◆ Support debugging software for setting parameters and IO control;
- ◆ Support software and hardware customization. Contact Us for details.

1.2 Parameter

| Parameter | |
|------------------------------|---|
| Contact capacity | 10A/30VDC 10A/250VAC |
| Durability | 100,000 times (Electrical) 10,000,000 times (Mechanical) |
| Data interface | RS232+Isolated RS485 |
| Rated voltage | 9-28V DC |
| Power / work indication | 1 red LED (power, always on; working: flashing) |
| Output indication | 8 red LEDs (DO on/off) |
| Working temperature | -40°C ~ 85°C, Industrial Grade |
| Size | 145*90*40mm |
| Weight | 330g |
| Default communication format | 9600,n,8,1 |
| Baud rate | 300~38400bps |

| | |
|------------------|---|
| Functions | Flash ON Flash OFF All ON All OFF NO Lock Linkage Lock Linkage All Channel Lock Linkage 2 Device NO Lock Linkage 2 Device Lock Linkage |
| Software support | Working mode change DO independent control DO status query Overall DO control; Debugging information query; Support various configuration software; support Labview, etc. |
| Installation | 35mm Din Rail Mounting/ Screw Holes |

1.3 Item Selection

| Item # | DO | DI | Analog | RS485 | Address Dial |
|-------------|----|----|-----------|---------------|--------------|
| CS-IO101 | 1 | 1 | 0 | RS485 * 1 | Address Dial |
| CS-IO204 | 2 | 4 | 0 | RS485 * 1 | Address Dial |
| CS-IO222A | 2 | 2 | 2(0-20mA) | RS485 * 1 | Address Dial |
| CS-IO404A | 4 | 0 | 4(0-20mA) | RS485 * 1 | Address Dial |
| CS-IO404D | 4 | 4 | 0 | RS485 * 1 | Address Dial |
| CS-IO606 | 6 | 6 | 0 | RS485 * 1 | Address Dial |
| CS-IO808 | 8 | 8 | 0 | RS485 + RS232 | |
| CS-IO1600DI | 0 | 16 | 0 | RS485 + RS232 | Address Dial |
| CS-IO1600 | 16 | 0 | 0 | RS485 + RS232 | Address Dial |
| CS-IO3200D | 32 | 0 | 0 | RS485 + RS232 | Address Dial |

1.4 Dimension

145*90*40mm

2 Wiring Instructions

2.1 Terminal Definition

| No. | Pin | Instruction |
|-----|-----|---------------------------------|
| 1 | + | Positive Power Supply |
| 2 | - | Negative Power Supply |
| 3 | A+ | RS485 communication A+ |
| 4 | B- | RS485 communication B- |
| 5 | TX | RS232 communication TX |
| 6 | RX | RS232 communication RX |
| 7 | GND | RS232 communication ground wire |

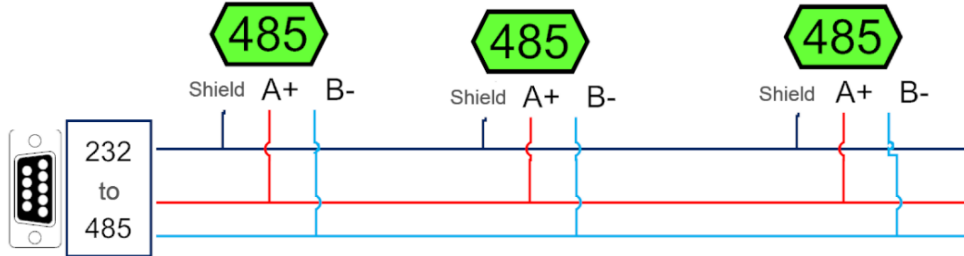
| | | |
|----|--------------|--|
| 8 | COM+ | |
| 9 | IN1 | The 1 st DI |
| 10 | IN2 | The 2 nd DI |
| 11 | IN3 | The 3 rd DI |
| 12 | IN4 | The 4 th DI |
| 13 | IN5 | The 5 th DI |
| 14 | IN6 | The 6 th DI |
| 15 | IN7 | The 7 th DI |
| 16 | IN8 | The 8 th DI |
| 17 | COM- | For passive input, Com- is connected to the negative power supply; For active input, it is connected to the active switch. Please refer to the input wiring diagram for details. |
| 18 | Normally ON | The 1 st DO normally ON terminal |
| 19 | Public | The 1 st DO public terminal |
| 20 | Normally ON | The 2 nd DO normally ON terminal |
| 21 | Public | The 2 nd DO public terminal |
| 22 | Normally ON | The 3 rd DO normally ON terminal |
| 23 | Public | The 3 rd DO public terminal |
| 24 | Normally ON | The 4 th DO normally ON terminal |
| 25 | Public | The 4 th DO public terminal |
| 26 | Normally ON | The 5 th DO normally ON terminal |
| 27 | Public | The 5 th 1st DO public terminal |
| 28 | Normally OFF | The 5 th DO normally OFF terminal |
| 29 | Normally ON | The 6 th DO normally ON terminal |
| 30 | Public | The 6 th DO public terminal |
| 31 | Normally OFF | The 6 th DO normally OFF terminal |
| 32 | Normally ON | The 7 th DO normally ON terminal |
| 33 | Public | The 7 th DO public terminal |
| 34 | Normally OFF | The 7 th DO normally OFF terminal |
| 35 | Normally ON | The 8 th DO normally ON terminal |
| 36 | Public | The 8 th DO public terminal |
| 37 | Normally OFF | The 8 th DO normally OFF terminal |

2.2 Communication Wiring

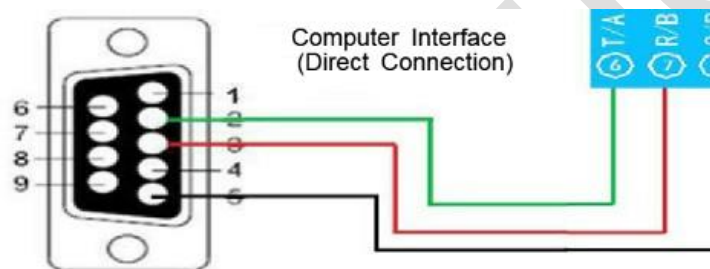
By default, its address is 1, The host computer software can use the default address 1 to communicate with the device (or broadcast address 254,

which is only applicable when one device is mounted on the network).

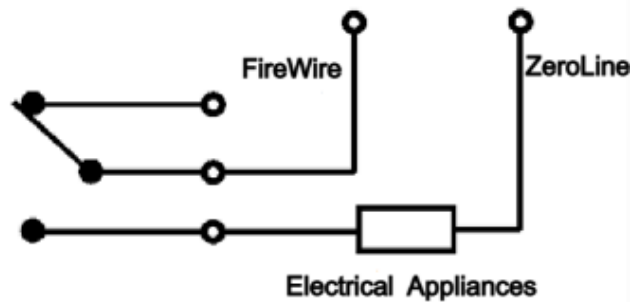
2.2.1 RS485 Wiring



2.2.2 RS232 Wiring

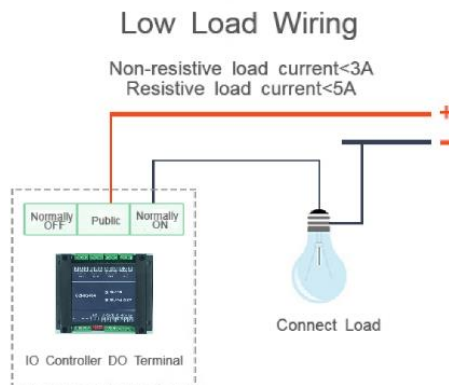


2.3 DO Wiring

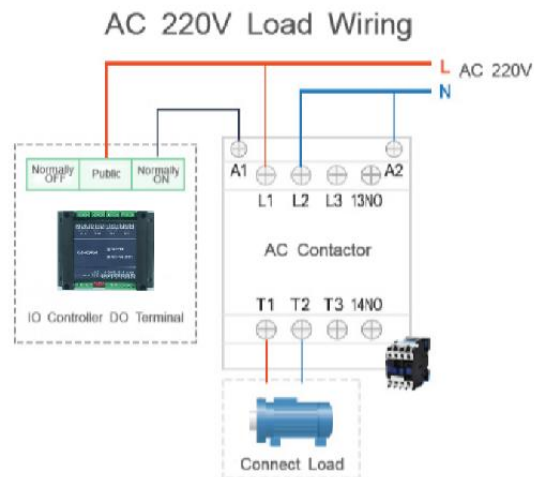


The relay is single-pole, double-throw, and each circuit has three terminals, one group is normally ON and the other is normally OFF (normally ON contacts are generally used), and the terminal identification is subject to the indications on the film.

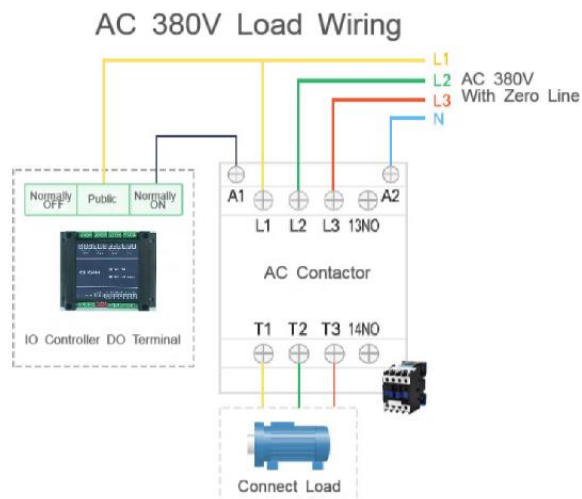
2.3.1 Low Load Wiring



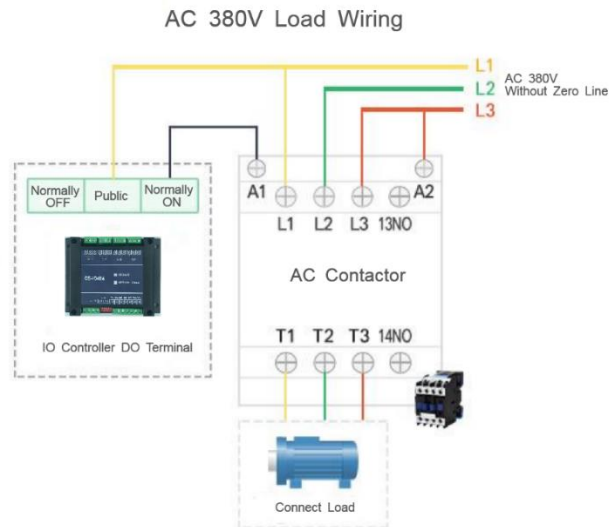
2.3.2 AC 220V Load Device Wiring



2.3.3 AC 380V Load Device Wiring 【With Zero Line】



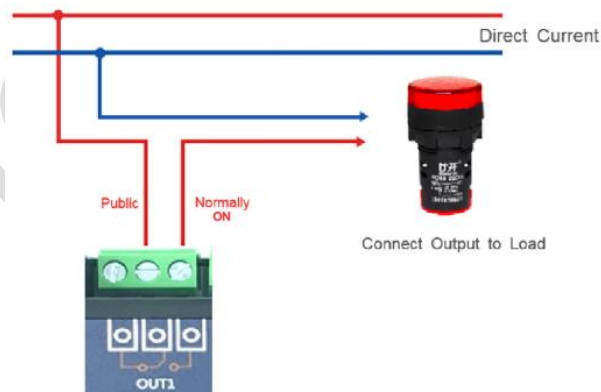
2.3.4 AC 380V Load Device Wiring 【Without Zero Line】



Please add an AC contactor/intermediate relay between this device and the load in the following four cases:

1. Load rated voltage > 30VDC
2. Load rated voltage > 250VAC
3. Non-Resistive Load Current > 3A
4. Resistive load current > 5A

2.3.5 DC Load Device Wiring

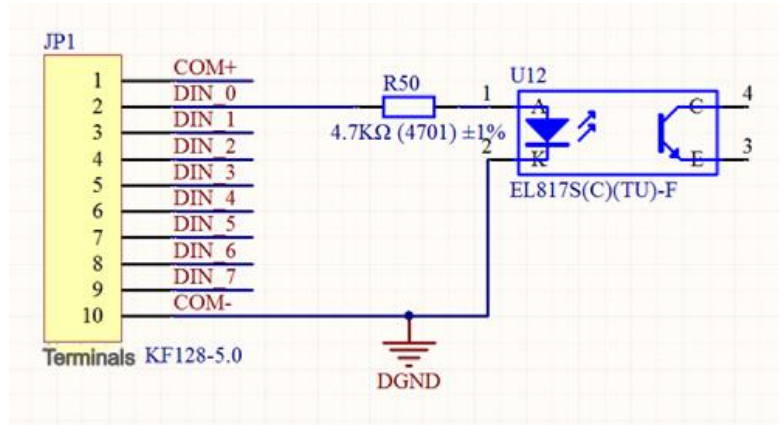


2.4 Digital Input Wiring

The switch input interface is compatible with wet and dry nodes, please pay attention to the different connection methods of active and passive signals.

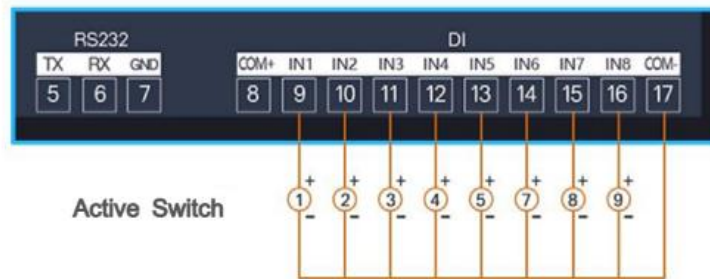
The internal optocoupler circuit of the switch value acquisition terminal is as follows,

COM+ is an unconnected terminal (empty terminal), and COM- is the negative pole of the power supply, which is equivalent to V-.



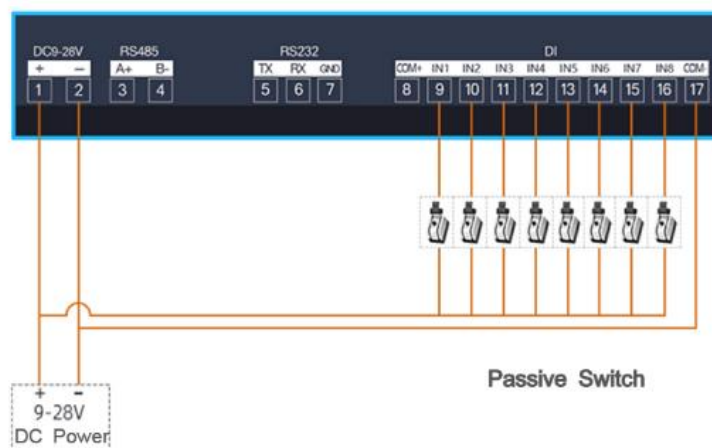
2.4.1 Active Signal Wiring

Active switch (wet junction): suitable for measuring signal with voltage (high and low level, pulse), such as infrared detection, triode output, liquid level detection, smoke detection, PLC output, flow monitoring)



2.4.2 Passive Switch Value (Dry Contact) Wiring

It is suitable for passive contact signal, such as various switches, buttons, etc.



3 Parameters and Working Mode Configuration

3.1 Device and PC Connection Settings

The USB end of the USB to RS485/RS232 converter is directly connected to the USB

port of computer, and 485/232 end is wired according to the wiring method in "Chapter 2.2 Communication Wiring".

Serial port number query method: Open "My Computer - Device Manager - Port (COM and LPT)" and the COM number that appears after the USB to 485/232 device is inserted is the serial port number.

3.2 Device Address

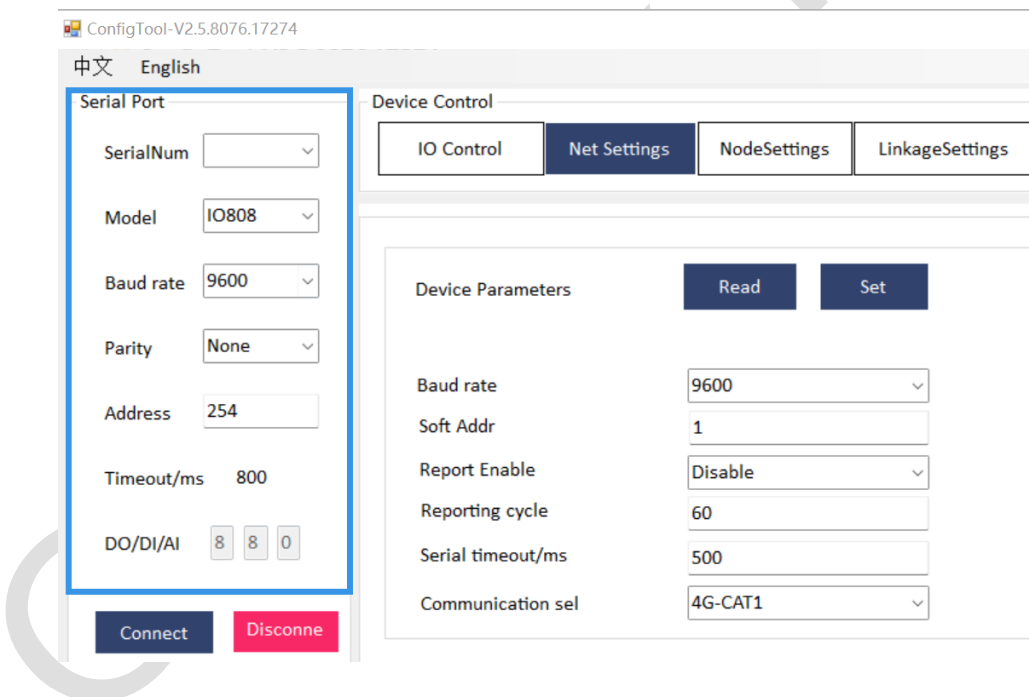
3.2.1 Introduction

The Offset Address of this device is 1 by default, and the broadcast address is 254 to communicate, but 0 cannot be used.

Communication address = Offset Address.

3.2.2 Device Communication Address Reading

After the device connected normally, click "read" on the serial relay debugging software to read the current address 254 [only support broadcast read address when there is one device on the bus].



3.2.3 Offset Address Setting and Reading

Click "Read" or "Set" to read or set the Offset Address of the device (address parameters stored in the device).

SerialParamConfig

ReadConfiguration
Set

Baud rate

SoftAddr

WorkMode

Needs restarting to take effect if the Offset Address changed.

3.2.4 Baud Rate Reading and Setting

Click "Read" and "Set" to read and set the baud rate and address respectively, which will take effect immediately after the operation.

SerialParamConfig

ReadConfiguration
Set

Baud rate

SoftAddr

WorkMode

3.3 Working Mode

3.3.1 Normal Mode

The relay takes corresponding actions after ON or OFF command.

3.3.2 NOLock Linkage Mode

It is a board module with optocoupler input and DO. In this mode, the input optocoupler and the relay are directly linked.

The optocoupler input signal takes effect -> the corresponding relay is pulled in,
 The optocoupler input signal is canceled -> the corresponding relay is disconnected.

In this mode, due to mechanical and program delay, there will be a certain delay

between the optocoupler input signal and the relay action, but the maximum will not exceed 0.05 seconds.

In this mode, all relays are directly linked by the optocoupler, so the serial port cannot operate the relay. This is not an abnormal phenomenon, but after the serial port operates the relay, it is linked by the optocoupler state before the relay is still in action.

3.3.3 Lock Linkage Mode

In this mode, each time the optocoupler inputs a signal, the corresponding relay is flipped once.

The optocoupler input signal takes effect -> the relay flips (the pull-in changes to disconnect, the disconnect changes to pull-in);

The optocoupler input signal is canceled -> the relay does not act;

This mode also has the delay problem of unlocked mode, but the delay time is also not greater than 0.05 seconds. This mode can be mainly used for external signal triggering to control the start and stop of the device. For example, an optocoupler is connected to a button, and the corresponding relay is connected to an electrical device. Each time the button is pressed, the device will switch to a start-stop state.

3.3.4 All Channel Lock Linkage Mode

The module itself has a board module with optocoupler input and DO. In this mode, each time the optocoupler inputs a signal, the corresponding relay will be pulled in, and relays of the other optocouplers will be disconnected if no signal is input.

The optocoupler input signal takes effect -> the corresponding relay is pulled in and other relays are disconnected;

The optocoupler input signal is canceled -> the relay does not act;

This mode also has a delay problem, but the delay time is also not greater than 0.05 seconds. This mode can be mainly used for external signal triggering to control the start and stop of different devices, such as

The multi-channel optocoupler is not connected to a button, and the corresponding relay is connected to an electrical device. If you press a button, the corresponding device will switch to the start state, and other devices will stop running.

3.3.5 2Device NOLock Linkage Mode

This mode requires two devices with the same address and mode to complete. After the two devices are connected through direct connection 485 or cross 232, the optocoupler state of module 1 will directly control the state of the corresponding relay of module 2.

No. 1 optocoupler input signal of module 1 is valid—> No. 1 relay of module 2 is OFF

No. 1 optocoupler input signal of module 1 disappears -> No. 1 relay of module 2 is disconnected

The relay response delay time in this mode is longer than the previous modes, but not more than 0.1 second (9600 baud rate).

In this mode, if the 485 bus is used, multiple devices can be connected in parallel, and the addresses of the devices match each other, so that the remote switch value can be transmitted. For example, if there are multiple low-speed switches on site that need to be transmitted to the control room 500 meters away to control the alarm lights or bells, it is only necessary to arrange a few modules in the workshop and connect them to the corresponding modules in the machine room through two twisted-pair shielded cables. can complete this task. In the same way, the button signal of the computer room operation can also be directly transmitted to the relay located in the computer room module.

3.3.6 2Device Lock Linkage Mode

This mode requires two devices with the same address and mode to complete. After the two devices are connected through direct connection 485 or cross 232, the optocoupler state of module 1 will take effect and the state of the corresponding relay of control module 2 will be reversed.

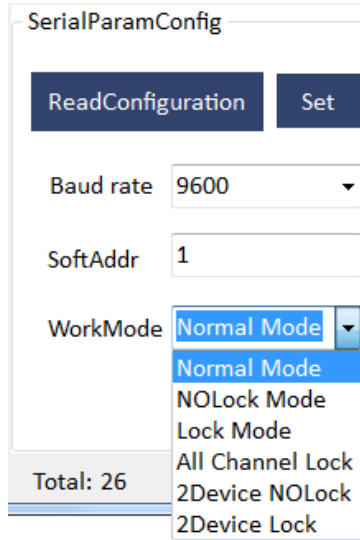
No. 1 optocoupler input signal of module 1 is valid—> No. 1 relay of module 2 is flipped

No. 1 optocoupler input signal of module 1 disappears -> No. 1 relay of module 2 does not act

The application of this mode is similar to the "2Device NOLock Linkage" mode, but it is more suitable for the start and stop of remote-control equipment. Just install a button on the operation end to realize the action of pressing once to start and pressing once to stop.

3.3.7 Working Mode Configuration

After the device communicates normally, select the corresponding working mode setting in the software working mode part, as shown in the following figure:



4 Development Data Instruction

4.1 Communication Protocol Instruction

This product supports standard Modbus commands. For detailed command generation and parsing methods, you can refer to "MODBUS Protocol English Version" based on the register table in this article.

This product supports Modbus RTU format.

4.2 Modbus Register Instruction

This control card supports communication of various function codes, please refer to the below.

| Instruction code | Meaning |
|------------------|--------------------------|
| 1 | Read coil register [DO] |
| 2 | Read Discrete Input [DI] |
| 3 | Read parameter register |
| 5 | Write a single coil |
| 15(0x0F) | write multiple coils |

Register address table:

| Register name | Register address | Explanation |
|----------------|------------------|-------------|
| Coil Control | | |
| Coil Control 1 | 00001 | The 1st DO |
| Coil Control 2 | 00002 | The 2nd DO |
| Coil Control 3 | 00003 | The 3rd DO |
| Coil Control 4 | 00004 | The 4th DO |
| Coil Control 5 | 00005 | The 5th DO |
| Coil Control 6 | 00006 | The 6th DO |

| | | | |
|----------------|----------------------|-------|------------|
| Coil Control 7 | | 00007 | The 7th DO |
| Coil Control 8 | | 00008 | The 8th DO |
| Discrete Input | | | |
| Input 1 | Read DI Command 2 | 00001 | The 1st DI |
| Input 2 | | 00002 | The 2nd DI |
| Input 3 | | 00003 | The 3rd DI |
| Input 4 | | 00004 | The 4th DI |
| Input 5 | | 00005 | The 5th DI |
| Input 6 | | 00006 | The 6th DI |
| Input 7 | | 00007 | The 7th DI |
| Input 8 | | 00008 | The 8th DI |

| Parameters Configuration | | Modbus Register address | PLC Register address | Explanation |
|--------------------------|------------------|-------------------------|----------------------|--|
| Communication baud rate | Holding register | 0x0000 | 41001 | See the below corresponding table of baud rate values, the default value is 0, and supports 0-5. This register determines the communication baud rate of RS232 and RS485 at the same time. |
| Spare | | 0x0001 | 41002 | Spare, user cannot write any value. |
| Offset address | | 0x0002 | 41003 | Device address=Offset address + DIP switch address |
| Working Mode | | 0x0003 | 41004 | User can use, store user data |
| Delay | | 0x0004 | 41005 | User can use, store user data |

(1) The Modbus device command supports the following Modbus addresses:
 00001 to 09999 are discrete outputs (coils)
 10001 to 19999 are discrete inputs (contacts)
 30001 to 39999 are input registers (usually analog inputs)
 40001 to 49999 are holding registers (usually store device configuration information)
 In 5-bit code format, the first character determines register type, and the remaining 4 characters represent address.
 Address 1 starts from 0, such as 00001 corresponds to 0000.

(2) Baud rate value corresponding table

| Value | Baud rate |
|-------|-----------|
| 0 | 9600 |
| 1 | 2400 |
| 2 | 4800 |
| 3 | 9600 |
| 4 | 19200 |
| 5 | 38400 |

(3) The relay status can be queried through 30002 address or through 00001-00002 address, but the control can only use 00001-00002 address. 30002 address data length is 16bit. Up to 16 relays can be represented.

The responding results as follow:

| | | | | | | | | | | | | | | | | |
|-------|----|----|----|----|----|----|---|---|----|----|----|----|----|----|----|---|
| Bit | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Relay | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 |

The bit 8 of the data of register 30009 is the same as the data of register 00001. The same is true for the optocoupler input. Bit8 and bit9 of register 30003 and registers 10001 and 10002 all correspond to the specified hardware. The register address is in accordance with the PLC naming rules, the real address is to remove the highest bit, and then subtract 1

4.3 Command List

| Scene | RTU format (send in hexadecimal) |
|------------------------------------|----------------------------------|
| Query 8 DOs'status | FE 01 00 00 00 08 29 C3 |
| Return query command information | FE 02 01 07 D0 5E |
| Control the 1 st DO on | FE 05 00 00 FF 00 98 35 |
| Return control information | FE 05 00 00 FF 00 98 35 |
| Control the 1 st DO off | FE 05 00 00 00 00 D9 C5 |
| Return control information | FE 05 00 00 00 00 D9 C5 |
| Control the 2 nd DO on | FE 05 00 01 FF 00 C9 F5 |
| Control the 2 nd DO off | FE 05 00 01 00 00 88 05 |
| Control the 3 rd DO on | FE 05 00 02 FF 00 39 F5 |
| Control the 3 rd DO off | FE 05 00 02 00 00 78 05 |
| Control the 4 th DO on | FE 05 00 03 FF 00 68 35 |
| Control the 4 th DO off | FE 05 00 03 00 00 29 C5 |
| Control the 5 th DO on | FE 05 00 04 FF 00 D9 F4 |

| | |
|------------------------------------|-------------------------|
| Control the 5 th DO off | FE 05 00 04 00 00 98 04 |
| Control the 6 th DO on | FE 05 00 05 FF 00 88 34 |
| Control the 6 th DO off | FE 05 00 05 00 00 C9 C4 |
| Control the 7 th DO on | FE 05 00 06 FF 00 78 34 |
| Control the 7 th DO off | FE 05 00 06 00 00 39 C4 |
| Control the 8 th DO on | FE 05 00 07 FF 00 29 F4 |
| Control the 8 th DO off | FE 05 00 07 00 00 68 04 |
| Read the 1 st DI | FE 02 00 00 00 01 AD C5 |
| Return Information | FE 02 01 00 91 9C |
| Read the 2 nd DI | FE 02 00 01 00 01 FC 05 |
| Read the 3 rd DI | FE 02 00 02 00 01 0C 05 |
| Read the 4 th DI | FE 02 00 03 00 01 5D C5 |
| Read the 5 th DI | FE 02 00 04 00 01 EC 04 |
| Read the 6 th DI | FE 02 00 05 00 01 BD C4 |
| Read the 7 th DI | FE 02 00 06 00 01 C4 4D |
| Read the 8 th DI | FE 02 00 07 00 01 1C 04 |
| Query the status of 8 DIs | FE 02 00 00 00 08 6D C3 |
| Return query information | FE 02 01 00 91 9C |

4.4 Command Details

4.4.1 Control DO

Control 1 DO (take the first DO ON as an example, other channels refer to this)

Sending code: FE 05 00 00 FF 00 98 35

| Field | Meaning | Note |
|-------|----------------|---|
| FE | Device address | It is the broadcast address |
| 05 | 05 command | Single control command |
| 00 00 | Address | Register address of the DO to control |
| FF 00 | Command | DO ON action |
| 98 35 | CRC16 | CRC16 checksum of the first 6 bytes of data |

Relay return information:

Return code: FE 05 00 00 FF 00 98 35

| Field | Meaning | Note |
|-------|----------------|---|
| FE | Device address | It is the broadcast address |
| 05 | 05 command | Single control command |
| 00 00 | Address | Register address of the DO to be controlled |
| FF 00 | Command | DO ON action |
| 98 35 | CRC16 | CRC16 checksum of the first 6 bytes of data |

4.4.2 Query DO Status

Query 8 DOs

Sending code: FE 01 00 00 00 08 29 C3

| Field | Meaning | Note |
|-------|-------------------|--|
| FE | Device address | It is the broadcast address |
| 01 | 01 command | Query DO status command |
| 00 00 | Starting address | Register address of the first DO to be queried |
| 00 08 | Number of queries | The number of DOs to be queried |
| 29 C3 | CRC16 | CRC16 checksum of the first 6 bytes of data |

Relay card return information:

Return code: FE 01 01 00 61 9C

| Field | Meaning | Note |
|-------|---------------------|--|
| FE | Device address | |
| 01 | 01 command | Return command: If the query is wrong, return 0x81 |
| 01 | Number of bytes | All bytes of return status information. $1+(n-1)/8$ |
| 00 | Status of the query | Returns the DO status. The return value is hexadecimal, converted to binary data, 0 means off, 1 means on. Example: When querying 4 DOs, if the returned field is 08, it will be 1000 after conversion into binary, then 1, 2, and 3 are |

| | | |
|-------|-------|---|
| | | OFF, and 4 is ON. |
| 61 9C | CRC16 | CRC16 checksum of the first 6 bytes of data |

4.4.3 Optocoupler Input

Query 8 DIs

Send command code: FE 02 00 00 00 08 6D C3

| Field | Meaning | Note |
|-------|-------------------|--|
| FE | Device address | |
| 02 | 02 command | Query DI (optocoupler input) status command |
| 00 00 | Starting address | Register address of the first DI to be queried |
| 00 08 | Number of queries | Number of DI status to be queried |
| 6D C3 | CRC16 | CRC16 checksum of the first 6 bytes of data |

Optocoupler return information:

Return code: FE 02 01 01 50 5C

| Field | Meaning | Note |
|-------|---------------------|--|
| FE | Device address | |
| 02 | 01 command | Return command: If the query is wrong, return 0x82 |
| 01 | Number of bytes | All bytes of return status information. |
| 00 | status of the query | Return the state of the optocoupler. Bit0: Status of the first optocoupler Bit1: Status of the second optocoupler Bit7: Status of the eighth optocoupler |
| 50 5C | CRC16 | CRC16 checksum of the first 6 bytes of data |

4.4.4 Flash ON Flash OFF Command

Flash OFF sending code: FE 10 00 03 00 02 04 00 04 00 0A 41 6B

Flash ON sending code: FE 10 00 03 00 02 04 00 02 00 0A A1 6A

| Field | Meaning | Note |
|-------|----------------|--|
| FE | Device address | |
| 10 | 10 Command | Write multiple register function codes |
| 00 03 | Relay address | 3+5(n-1), n represents which channel to control, the decimal needs to be converted to hexadecimal system |

| | | |
|---------------|----------------------------|---|
| 00 02 | Number of control commands | $2+5(n-1)$, n represents the number of controlled channels, only supports controlling the DO action of a channel individually |
| 04 | Bytes | $4+10(n-1)$, n represents the number of controlled channels, only supports controlling the DO action of a channel individually |
| 00 04 / 00 02 | Command | 00 04: flash OFF command 00 02: flash ON command |
| 00 0A | Interval time | 00 0A is 10 (hexadecimal converted to decimal) The interval time is (0.1 seconds*10) |
| 41 6B /A1 6A | CRC16 | Check method |

Return code: FE 10 00 03 00 02 A5 C7

| Field | Meaning | Note |
|-------|-----------------------------|--|
| FE | Device address | - |
| 10 | 10 command | Return instruction: If the query is wrong, return 0x82 |
| 00 03 | Device address | Query the address of the device |
| 00 02 | Number of commands accepted | The number of commands accepted by the device |
| A5 C7 | CRC16 | check digit |

Example: 1s flash OFF/flash ON

The 1st DO flash OFF command: FE 10 00 03 00 02 04 00 04 00 0A 41 6B
 The 2nd DO flash OFF command: FE 10 00 08 00 02 04 00 04 00 0A 00 D8
 The 3rd DO flash OFF command: FE 10 00 0D 00 02 04 00 04 00 0A C0 E7
 The 4th DO flash OFF command: FE 10 00 12 00 02 04 00 04 00 0A 81 AB
 The 5th DO flash OFF command: FE 10 00 17 00 02 04 00 04 00 0A 41 94
 The 6th DO flash OFF command: FE 10 00 1C 00 02 04 00 04 00 0A 00 27
 The 7th DO flash OFF command: FE 10 00 21 00 02 04 00 04 00 0A C2 AA
 The 8th DO flash OFF command: FE 10 00 26 00 02 04 00 04 00 0A 83 4C
 The 1st DO flash ON command: FE 10 00 03 00 02 04 00 02 00 0A A1 6A
 The 2nd DO flash ON command: FE 10 00 08 00 02 04 00 02 00 0A E0 D9
 The 3rd DO flash OFF command: FE 10 00 0D 00 02 04 00 02 00 0A 20 E6
 The 4th DO flash ON command: FE 10 00 12 00 02 04 00 02 00 0A 61 AA
 The 5th DO flash OFF command: FE 10 00 17 00 02 04 00 02 00 0A A1 95
 The 6th DO flash OFF command: FE 10 00 1C 00 02 04 00 02 00 0A E0 26
 The 7th DO flash OFF command: FE 10 00 21 00 02 04 00 02 00 0A 22 AB
 The 8th DO flash OFF command: FE 10 00 26 00 02 04 00 02 00 0A 63 4D

4.4.5 All ON and All OFF Command

All ON sending code: FE 0F 00 00 00 08 01 FF F1 D1

All OFF sending code: FE 0F 00 00 00 08 01 00 B1 91

| Field | Meaning | Note |
|-------------|------------------------|--|
| FE | Device address | |
| 0F | 0F command | Return command: If the query is wrong, return 0x82 |
| 00 00 | Starting address | |
| 00 08 | Number of Controls | Number of DOs Controlled |
| 01 | Bytes | Bytes of Send command |
| FF/00 | ALL ON/ALL OFF command | FF: All ON command 00: All OFF command |
| F1 D1/B1 91 | CRC16 | Check digit |

All ON return code: FE 0F 00 00 00 0A C1 C3

All OFF return code: FE 0F 00 00 00 08 40 02

| Field | Meaning | Note |
|-------|------------------|--|
| FE | Device address | |
| 0F | Off command | Return command: If the query is wrong, return 0x82 |
| 00 00 | Starting address | |
| 00 08 | Quantity | Number of DOs returning information |
| 40 02 | CRC16 | Check digit |

4.4.6 Active Reporting Protocol

This function is a non-standard Modbus protocol, which can only be used in dual-computer mode, and is suitable for the serial relay to actively report changed switch value

| Filed | Meaning | Note |
|---------------------|------------------------|---|
| 0x40 0x57 | Header | |
| 0x01 | Device Address | |
| 0x02 | IO status lower 8 bits | |
| 0x00 | IO status high 8 bits | |
| 0x42+0x01+0x02+0x00 | Check Digit | 0x42+deviceaddress+IO status low 8 bits + IO status high 8 bits |

5 Product Maintenance

5.1 Device Usage Environment

1. The working voltage is 9~28V. If the input voltage is too high or too low, the device may not work normally or even be damaged.
2. The DI input terminal adopts optocoupler isolation protection, and its bearing voltage is 5~24V.
3. Do not overload the DO output terminals of the device, please connect them correctly within the allowable range (see the wiring diagram for details).
4. Do not overload for the DO output terminals. Please connect them correctly within the allowable range (refer to the wiring diagram for details).
5. The allowable air humidity of the device is 5~85%RH, and it does not have waterproof capability. Do not use it in condensation or liquid immersion environments.
6. The relay is a component with a certain service life. When the theoretical service life is reached, please replace it in time to avoid danger.

5.2 FAQ

5.2.1 RS485 /RS232 communication, no response when device control

Confirm whether the communication speed, communication address, and wiring are correct.

You can use the broadcast address 254 to try to communicate with unknown addresses;

Confirm whether the serial port number ONed on the software is correct;

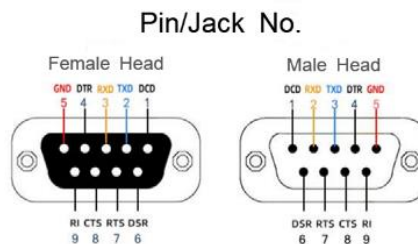
Check whether the power supply and work indicator are normal;

For the RS232 version, please correctly identify the RS232 serial port module used as male or female.

The module TXD is connected to RX pin of the relay

The module RXD is connected to TX pin of the relay

The module GND is connected to GND pin of the relay



5.2.2 The relay can only be turned on but not turned off

Check Whether the read address reads the actual device address;

Check whether there is a return command in the debug information column, and whether the return command is correct.

If reading address fails, there is no return command or abnormal return command, check the communication line and communication converter

When the io module and the controlled equipment share a DC power supply, if the controlled equipment is heavily loaded, it may cause insufficient power supply of the io module and the relay cannot switch normally.

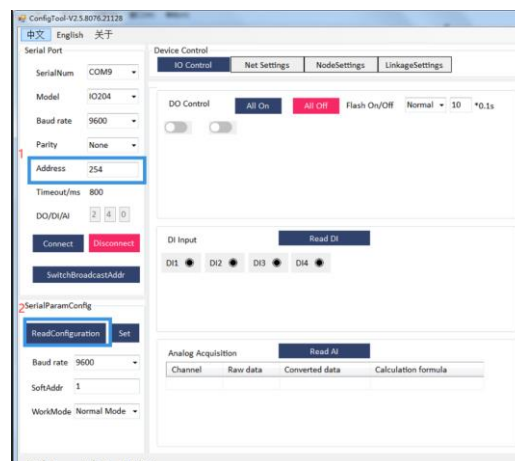
5.2.3 485 interface cannot be used to establish communication and control After the relay powered on.

1. Check whether the 485 line is reversed and whether the voltage is within the specified range;
2. Fill in 254 for the device address on software to test whether it can be can be controlled with different baud rates.

5.2.4 Multiple devices on the 485 bus and ON/OFF operation failed to send the broadcast address 254.

If there are multiple devices on the 485 bus, the address of each device cannot be the same, and the broadcast address 254 cannot be used for communication.

Use DIP switch/software to distinguish the module' address, otherwise the command cannot be executed correctly. (Please refer to below photo: how to set the address if multiple modules)



The broadcast address 254 can be used when there is only one device on the bus. When there is more than one device.

5.2.5 PLC and the device cannot communicate normally

1. Check whether the PLC communication parameters match the relay;
2. Check whether the PLC communication protocol is standard Modbus RTU;
3. Check whether the definition of Siemens 485 bus AB is opposite to this device.

6 After-sale Service

6.1 Commitment

OneFex provides after-sales service of the device within one year from the date of sale. But for damage caused by improper use, you need to send it back and take the freight for repair or adjust. Make sure that the package is in good condition to avoid damage during transportation. Repair the damage of device instrument is free.

6.2 Disclaimer

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7 Update History

| Date | Update Content | Version |
|------------|------------------------------|---------|
| 2019/05/27 | Create document | V1.0.1 |
| 2020/02/01 | Update wiring diagrams, etc. | V1.1.0 |
| 2020/07/29 | Update description | V1.2.0 |

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