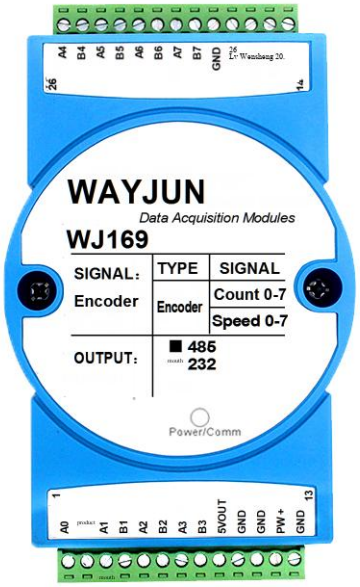
8-channel grating ruler magnetic grating ruler encoder 5MHz high-speed pulse signal to RS485/232/WiFi module WJ169

Product features:

- Grating ruler magnetic grating ruler decoding conversion to standard Modbus RTU protocol
- High speed grating ruler and magnetic grating ruler support 4 times frequency counting, and the frequency can reach 5MHz
- The module can output 5V power supply to power the grating ruler
- Support 8 grating rulers to count at the same time, which can identify the positive and reverse directions
- It can also be set as a 16 channel independent DI high-speed counter
- Encoder and DI count value support automatic saving in case of power failure
- 1000V isolation between DI input and RS485/232 communication interface
- Reset and set the count value through RS-485/232 interface
- WiFi supports Modbus TCP and MQTT communication protocols
- Built in webpage function, data can be queried through webpage
- Wide power supply range: 8~32VDC
- Standard DIN35 guide rail installation, convenient for centralized wiring
- Overall dimension: 120 mm x 70 mm x 43 mm



WJ169 Module Appearance

Typical applications:

- Grating ruler magnetic grating ruler length measurement
- Flow meter pulse counting or flow measurement
- Product count of production line
- Position Data Measurement Drawing of CNC Machine Tool 1
- Encoder signal is transmitted to IPC
- Directly transfer data to control center instead of PLC

Product Overview:

WJ169 product realizes signal acquisition between sensor and host to decode encoder signal.WJ169 series products can be used in RS-232/485 and WiFi bus industrial automation control systems, automated machine tools, industrial robots, three coordinate positioning systems, displacement measurement, stroke measurement, angle measurement, speed measurement, flow measurement, product counting, etc.

The products include signal isolation, pulse signal capture, signal conversion and RS-485 serial communication.Each serial port can connect 255 WJ169 series modules at most. The communication mode adopts ASCII code communication protocol or MODBUS RTU communication protocol. The baud rate can be set by code, and can be linked to the same RS-485 bus with the control module of other manufacturers, which is convenient for computer programming.

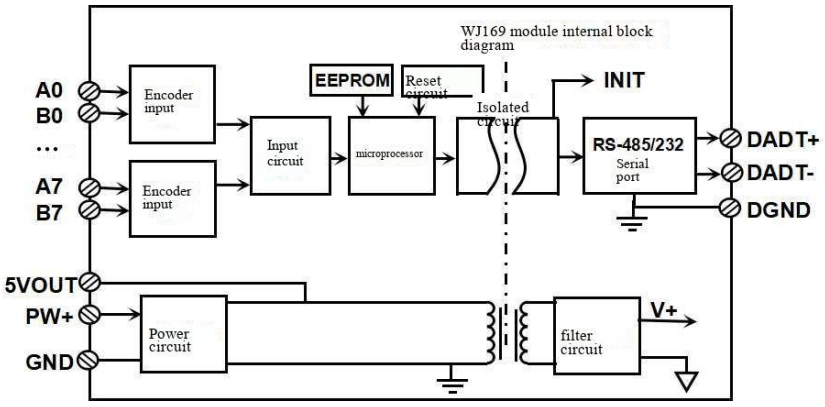


Figure 2 WJ169 Module Internal Block Diagram

WJ169 series products are intelligent monitoring and control systems based on single chip microcomputer. All user set configuration information such as address, baud rate, IP address and parameter setting are stored in non-volatile memory EEPROM.

WJ169 series products are designed and manufactured according to industrial standards, with strong anti-interference ability and high reliability.Operating temperature range -45 ℃~+80 ℃.

Function introduction:

WJ169 remote I/O module can be used to measure 8-channel encoder signals, and can also be set as a 16 channel independent counter or DI status measurement.

1. Signal input

8-channel encoder signal input or 16 channel independent counter can be connected to dry contact and wet contact. Please refer to the wiring diagram for details.

2. RS485/232 communication protocol

Communication interface: one standard RS-485 communication interface or one standard RS-232 communication interface, which shall be noted when ordering and selecting models.

Communication protocol: supports two protocols, the character protocol defined by the command set and the MODBUS RTU communication protocol.The module automatically identifies the communication protocol and can realize network communication with various brands of PLC, RTU or computer monitoring system.

Data format: 10 bits.1-bit start bit, 8-bit data bit, 1-bit stop bit.No calibration.

Communication address (0~255) and baud rate (2400, 4800, 9600, 19200, 38400, 57600, 115200bps) can be set;The communication network can reach a maximum distance of 1200 meters, which is connected by twisted pair shielded cables.

High anti-interference design of communication interface, ± 15KV ESD protection, communication response time less than 100mS.

3. WiFi communication protocol

Communication interface: WiFi network interface.It can be connected to WiFi in the LAN and then to Ethernet.

Communication protocol: It supports MQTT protocol and can connect to various MQTT servers such as Alibaba Cloud, Tencent Cloud, Huawei Cloud, China Mobile IOT OneNET, Private Cloud, etc.MODBUS TCP protocol can also be used to realize data exchange of industrial Ethernet.

It also supports TCP/UDP/WebSocket and other communication protocols.

Network cache: 2K Byte (both receiving and sending)

Communication response time: less than 10mS.

4. Anti interference

There are transient suppression diodes inside the module, which can effectively suppress various surge pulses, protect the module, internal digital filtering, and also can well suppress power frequency interference from the power grid.The built-in watchdog can effectively prevent module downtime.

Product selection:

WJ169- □ - WiFi - □

Antenna form
N Internal antenna (default)

Communication interface 2
WiFi: output as WiFi network interface

Communication interface 1
485: output as RS-485 interface
232: output as RS-232 interface

Model selection example 1: Model: **WJ169 – 485-WiFi-N** means the output is RS-485 interface, WiFi built-in antenna
Model selection example 2: Model: **WJ169 – 232-WiFi-N** means the output is RS-232 interface, WiFi built-in antenna

WJ169 general parameters:

(typical @+25 ℃, Vs is 24VDC)
Input type: encoder AB signal input, 8 channels (A0/B0~A7/B7).
Low level: input<1V
High level: input 3.5~30V
Frequency range 0-5MHz (all channels input at the same time)
The encoder counting range is -2147483648 °～+2147483647. The default is no double frequency counting. You can set it to 4 times frequency counting on the web page, and the count value will be saved automatically when power is off.
The range of DI counter is 0~4294967295 ∨. It is not saved when power is off by default. It can be set as "Save" on the webpage
Input resistance: 30K Ω
Communication 1: protocol RS-485 or RS-232 standard character protocol and MODBUS RTU communication protocol
Baud rate (2400, 4800, 9600, 19200, 38400, 57600, 115200bps) can be set by webpage
The address (0~255) can be set by webpage
Communication 2: MQTT communication protocol or MODBUS TCP communication protocol or TCP/UDP
Communication response time: 100 ms maximum
Working power supply:+8~32VDC wide power supply range, internal anti reverse connection and overvoltage protection circuit
Power consumption: less than 3W

Operating temperature: -45~+80 ℃
Operating humidity: 10~95% (no condensation)
Storage temperature: -45~+80 ℃
Storage humidity: 10~95% (no condensation)
Isolation and withstand voltage: DI input and power supply share the same ground, and 1000V isolation with communication interface.
Overall dimensions: 79 mm x 69.5mm x 40mm

Pin definition:

Pin	Name	Description	Pin	Name	Description
one	A0	Encoder 0 signal A input terminal	**fourteen**	DGND	RS-485 signal ground
two	B0	Encoder 0 signal B input terminal	**fifteen**	DATA-	RS-485 signal negative terminal
three	A1	Encoder 1 signal A input terminal	**sixteen**	DATA+	RS-485 signal positive terminal
four	B1	Encoder 1 signal B input terminal	**seventeen**	GND	Negative terminal of power supply
five	A2	Encoder 2 signal A input terminal	**eighteen**	GND	Negative terminal of power supply
six	B2	Encoder 2 signal B input terminal	**nineteen**	B7	Encoder 7 signal B input terminal
seven	A3	Encoder 3 signal A input terminal	**twenty**	A7	Encoder 7 signal A input terminal

eight	B3	Encoder 3 signal B input terminal	**twenty -one**	B6	Encoder 6 signal B input terminal
nine	5VOUT	5V distribution output	**twenty -two**	A6	Encoder 6 signal A input terminal
ten	GND	Negative terminal of power supply	**twenty -three**	B5	Encoder 5 signal B input terminal
eleven	GND	Negative terminal of power supply	**twenty -four**	A5	Encoder 5 signal A input terminal
twelve	PW+	Positive end of power supply	**twenty -five**	B4	Encoder 4 signal B input terminal
thirtee n	GND	Negative terminal of power supply	**twenty -six**	A4	Encoder 4 signal A input terminal

Table 1 Pin definition

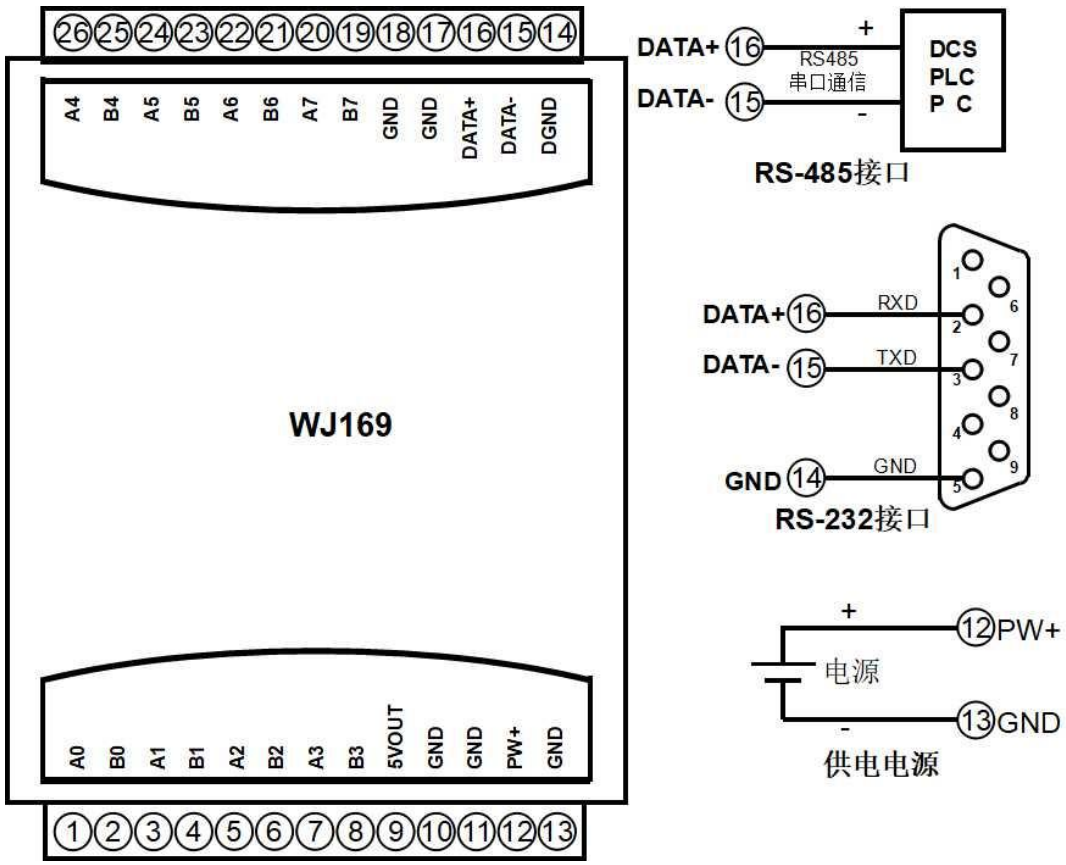
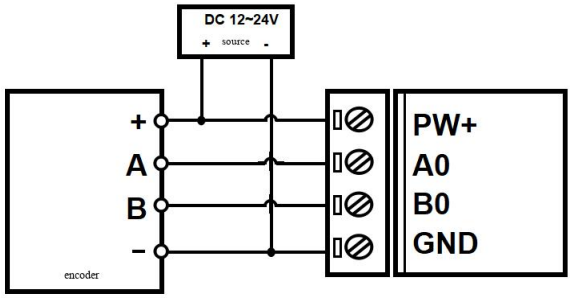
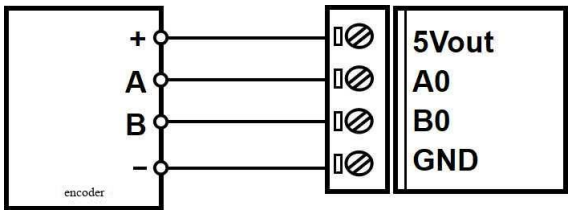


Figure 3 WJ169 Module Wiring Diagram

Encoder signal input wiring diagram (counting mode 0)

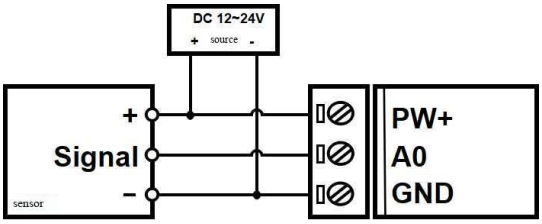


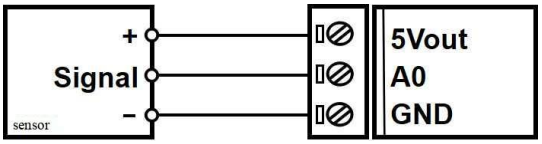


Wiring diagram of 12V or 24V powered encoder Wiring diagram of 5V powered encoder

Note: The factory default is to turn off pull-up. If it is an NPN encoder, you need to turn on the internal pull-up resistor on the module website.

DI counting input wiring diagram (counting mode 1)

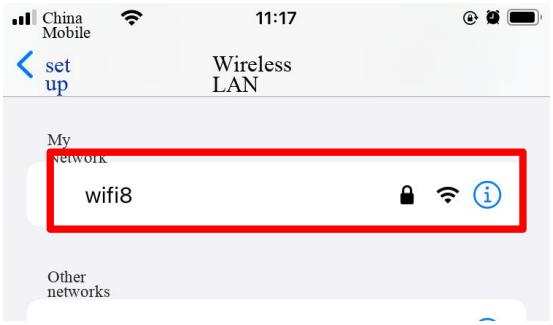




Wiring diagram of 12V or 24V power supply photoelectric switch Wiring diagram of 5V power supply photoelectric switch

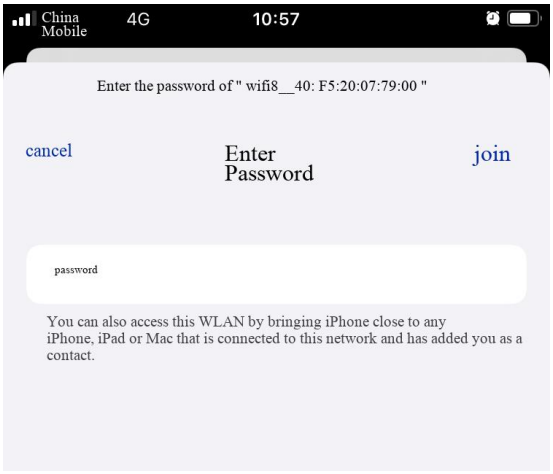
Note 1: The factory default is counting mode 0, and DI counting needs to be changed to counting mode 1 in the module webpage.
Note 2: The factory default is to turn off pull-up. If it is an NPN sensor, dry contact or switch input, the internal pull-up resistor needs to be turned on in the module web page.

First configure the WJ169 module through the mobile phone



1. Let the module enter AP mode

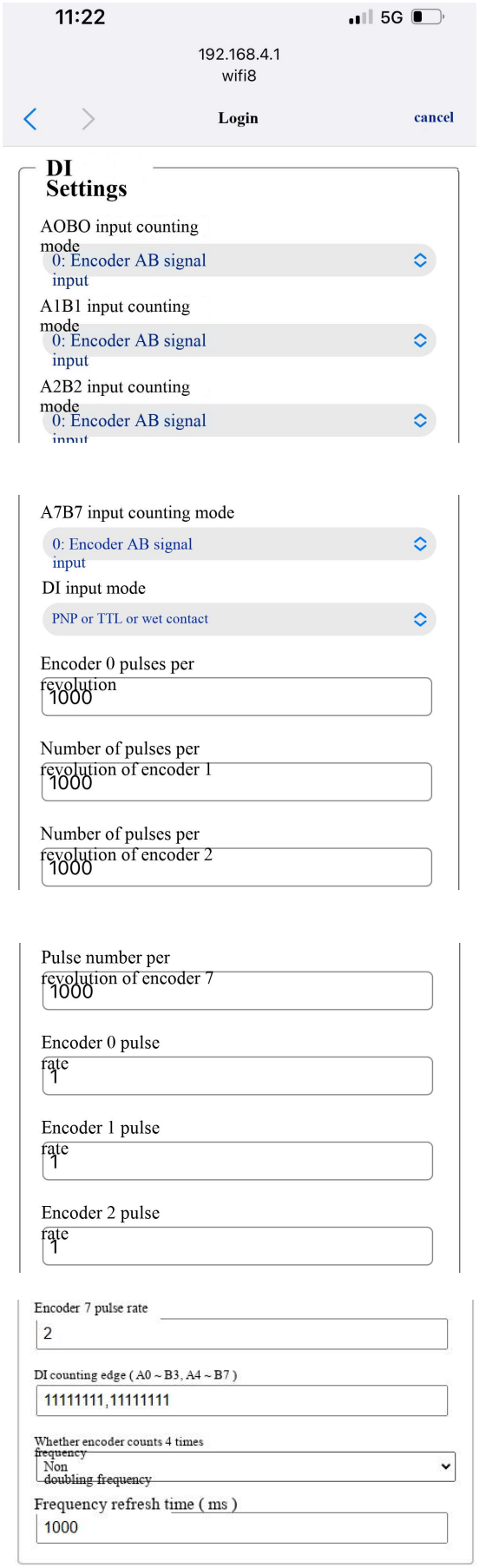
(1) Turn on the power supply and turn the switch on the side of the module to the initialization position.
(2) Open the mobile phone "WLAN" or "Settings → WLAN", find the WiFi named "wifi8" to connect.



The factory password of this module is 12345678, and then "join".

2. Enter the module webpage.

After connecting the WiFi of the module, it will automatically jump to the module's built-in webpage after a few seconds, as shown in the left figure.If the mobile phone cannot automatically jump, you can also open the mobile browser and enter the website 192.168.4.1 to log in.
Click the configuration module parameter link to enter the configuration interface



3. Configure module DI parameters (mode 0)

Please modify the following parameters according to actual needs:

（1） A0B0~A7B7 input counting mode:

Counting mode 0: encoder AB signal input;

Counting mode 1: two independent counter inputs;

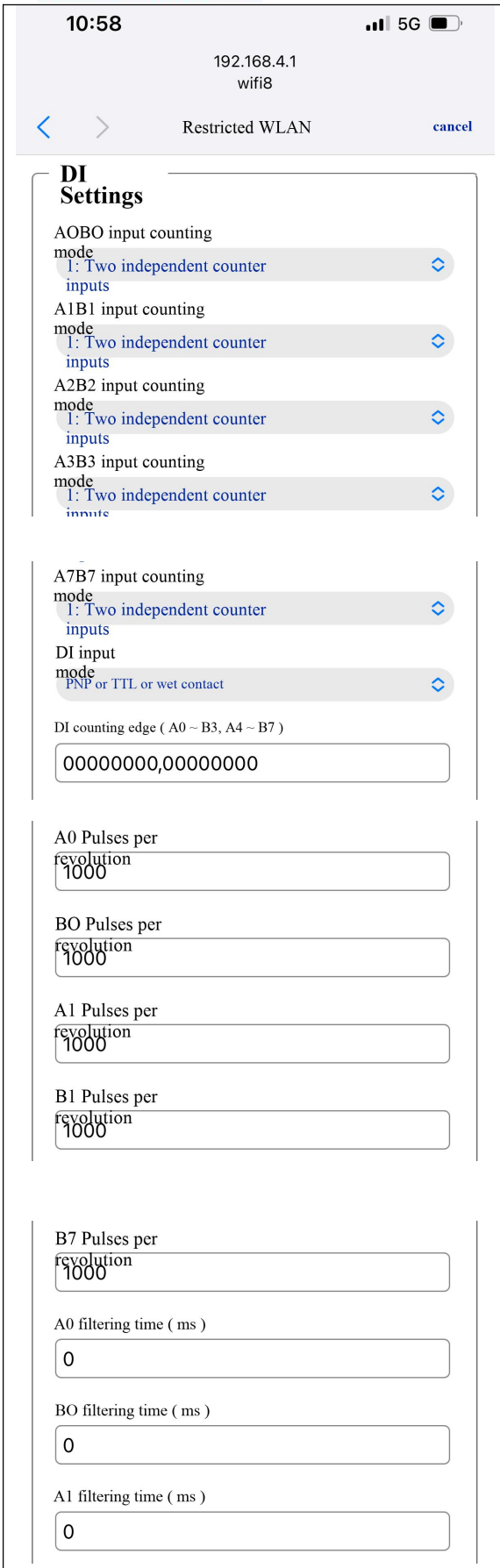
Please fill in according to the actual input sensor, and select encoder AB signal input for grating ruler and magnetic grating ruler.

（2） DI input mode: NPN or PNP input is selected according to the actually connected sensor.After NPN input is selected, the internal pull up voltage is connected to the positive side of the power supply, and the pull up resistance is 10K ohms;Select PNP input and turn off the pull-up voltage internally.

（3） Pulse number per revolution of encoder 0~7: pulse number per revolution of encoder. If speed measurement is required, please set it according to actual parameters.The module will automatically convert the rpm.

（4） Encoder 0~7 pulse magnification: set the actual value corresponding to each pulse, which is 1 by default. The actual engineering value is converted by multiplying this value by the number of pulses or the number of 4-fold frequency pulses.For example, if each pulse is 0.005mm, it can be set to 0.005, then the actual engineering value is 0.005 * pulse number.

（5） DI counting edge: different edge trigger counts can be set, 0 indicates the rising edge count, and 1



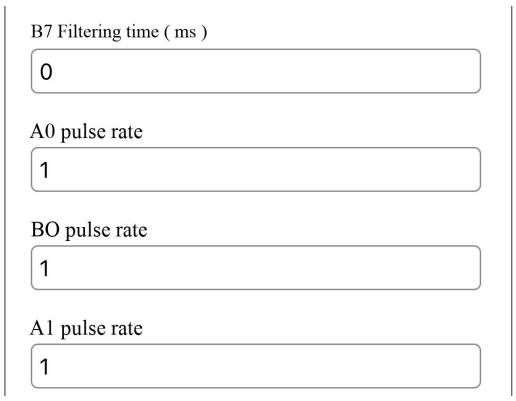
indicates the falling edge count.Normal use uses the default rising edge count.

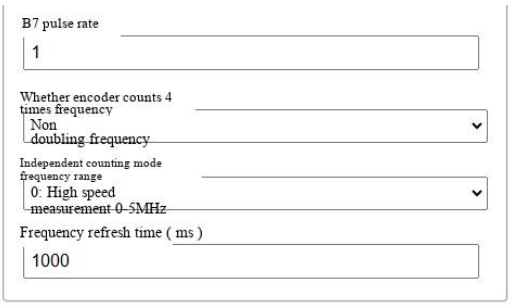
（6） Whether the encoder counts by 4 times frequency: the default is not to count by 4 times frequency, or it can be set to count by 4 times frequency, which can be used in occasions requiring high resolution such as grating ruler.

（7） Frequency refresh time (ms): the default is to calculate the frequency once every 1 second. For some occasions where rapid refresh frequency is required, it can be set to 100ms or 50ms

4. Configure module DI parameters (mode 1)

（8） A0~B7 pulses per revolution: pulses per revolution of DI. If you need to measure the speed, please set it according to the actual parameters.The module will automatically convert the rpm.



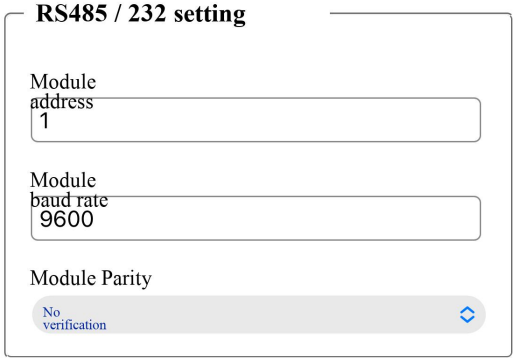


（9） A0~B7 filtering time: the value range is 0 to 65535.
If it is 0, it means no filtering;Other values represent the filtering time, in mS (millisecond).If the DI input point is a mechanical switch or a mechanical relay, it is recommended to set the filtering time as 20mS.

（10） A0~B7 pulse magnification: set the actual value corresponding to each pulse. The default value is 1. The actual engineering value is converted from this value to the actual pulse.For example, if each pulse is 0.005mm, it can be set to 0.005, then the actual engineering value is 0.005 * pulse number.

（11） Independent counting mode frequency range
You can select up to 10KHz or up to 5MHz.Better measurement accuracy can be obtained by selecting the appropriate frequency range according to the actual measurement equipment.

（12） Frequency refresh time (ms): the default is to calculate the frequency once every 1 second. For some occasions where rapid refresh frequency is required, it can be set to 100ms or 50ms



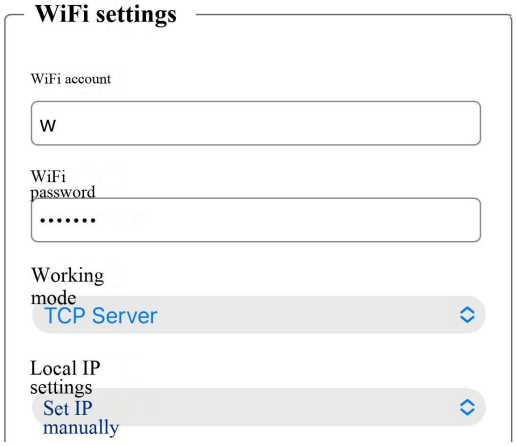
5. Configuration module RS485/232 parameters

Please modify the following parameters according to actual needs:

（13） Module Address: the communication ID of the module, which is 1 by default.

（14） Module baud rate: the baud rate of module communication, which is 9600 by default

（15） Parity check of module: the default is no parity check.



6. Configure module WiFi parameters

Please modify the following parameters according to actual needs:

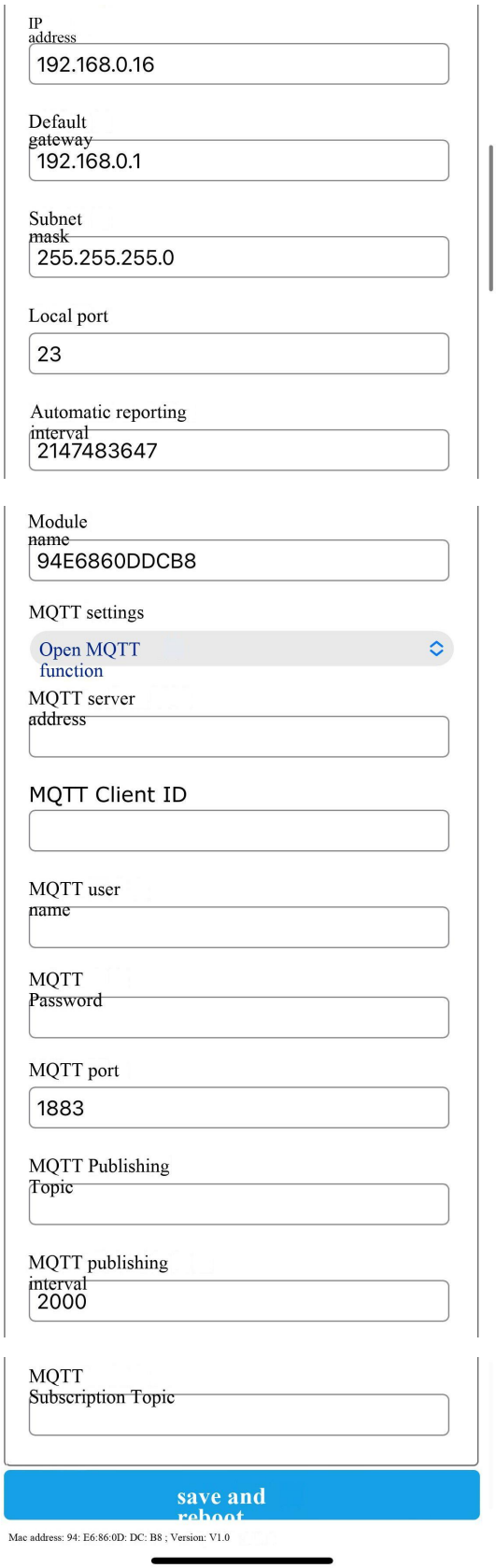
（16） WiFi account: Connect the WiFi covered here.

（17） WiFi password: fill in the WiFi password. If it is already connected, do not enter it again.

（18） Working mode: select the working mode and fill in according to the actual application.

Optional TCP Server, TCP Client, UDP, MODBUS TCP, Websocket, etc.

（19） Local IP setting: If only MQTT protocol is used, it can be set to automatically acquire IP. If Modbus TCP or web page is required to access data, it is recommended to manually set it to a fixed IP to facilitate communication through IP address and module.



（20） IP address: set the IP address of the module. It must be the network segment where the current WiFi is located and not the same as the IP address of other devices in the LAN.For example, if the IP address of the WiFi router is 192.168.0.1, you can set the IP address of the module to 192.168.0.7

（21） Default gateway: the gateway of the module. Fill in the IP address of the current WiFi router.For example, the IP address of the WiFi router is 192.168.0.1. Just fill in the IP address

（22） Subnet mask: the subnet mask of the module. If there is no cross network segment, fill in the default value of 255.255.255.0

（23） Local port: communication port of the module, and 502 port is generally used for MODBUS communication.

（24） Remote server IP address: the remote server IP address, the server that TCP Client and UDP need to connect to.

（25） Remote Server Port: The port of the server.

（26） Auto Report Interval: the time interval for the module to report data regularly. If it is set to 0, data will not be automatically reported.

（27） Automatic reporting of count changes: a piece of data is reported when the count changes. It can only be used in situations where the data changes very slowly, or a large amount of data will be sent.

（28） Module Name: the user defines the name of a module to distinguish different modules.

（29） MQTT setting: If MQTT communication is used, the MQTT function needs to be turned on.

（30） MQTT server address: fill in the URL of the MQTT server,
For example: broker.emqx.io
If the IP address of the local server is 192.168.0.100, you can write 192.168.0.100

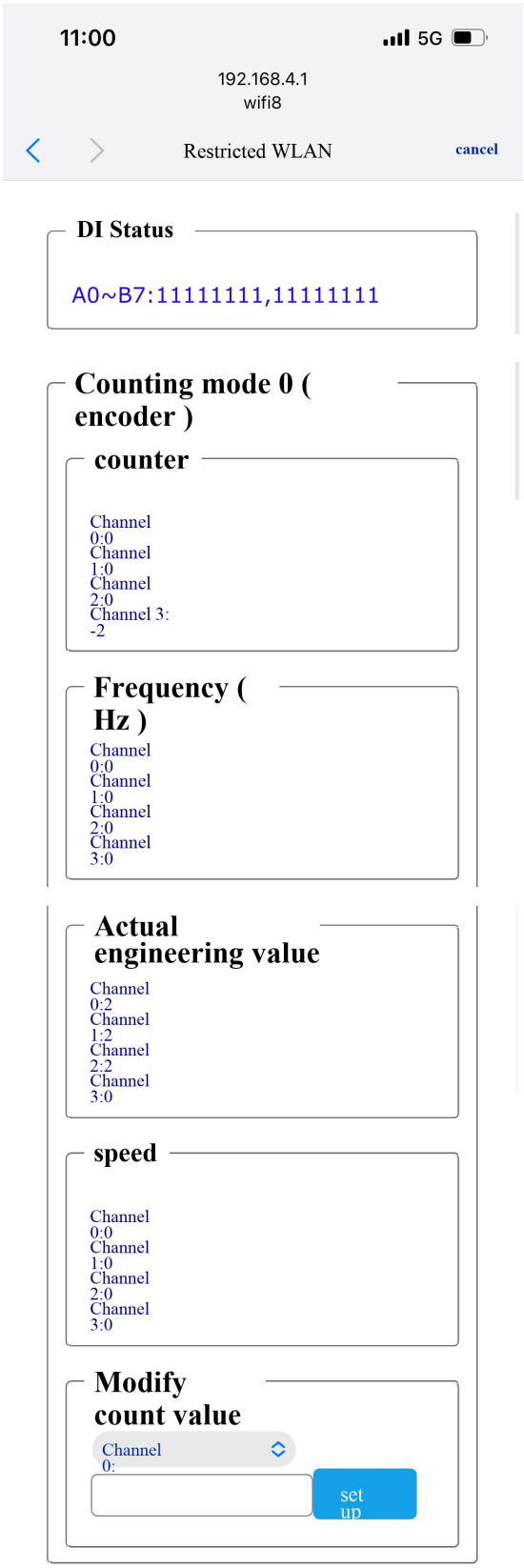
（31） MQTT Client ID， Please fill in the user name, password, port, publishing topic, subscription topic and other parameters according to the requirements of the MQTT server.The QoS of MQTT is 0 and cannot be modified.

（32） MQTT publishing interval: the interval between the module automatically publishing data to the MQTT server, in ms. Setting it to 0 means

canceling the scheduled publishing function.

6. Save parameters

After parameter setting, click the Save and Restart button, the module will save the parameters and restart automatically, then turn the switch on the side of the module to the normal position, and the module will work according to the set parameters.



7. View data online on the webpage

Click the online view data link on the module home page to enter the data view interface.As shown in the left figure.

If the IP address of the module is 192.168.0.16, the user can also access the link 192.168.0.16/readData to obtain data in Json format.

(Left figure: A0-B3 is set as mode 0, A4-B7 is set as mode 1)

DI status indicates the level status of the input.

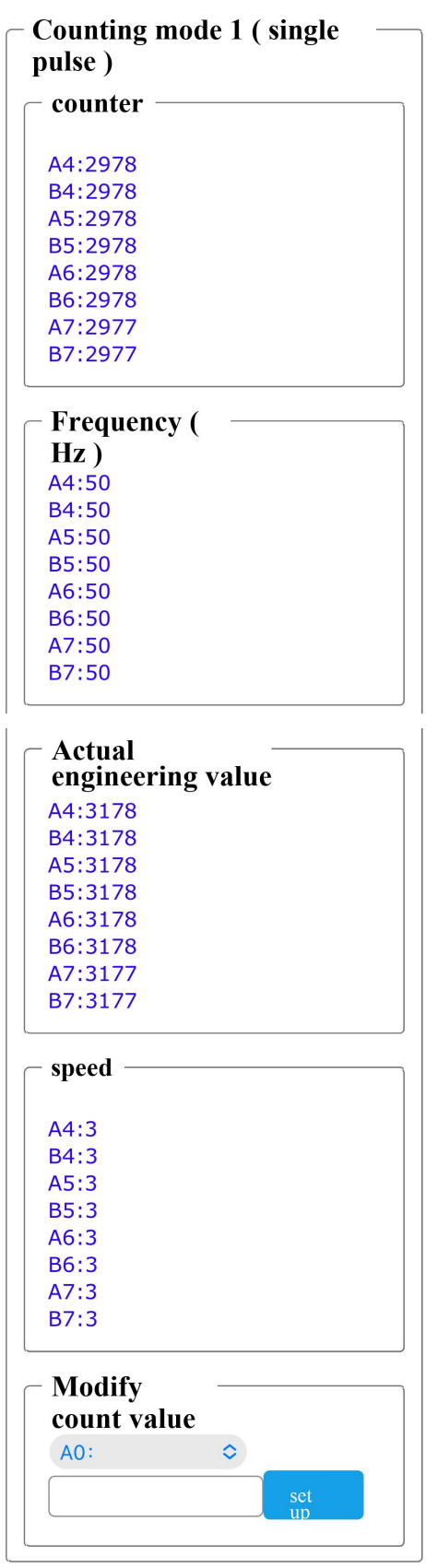
The pulse counter is the cumulative number of measured pulses.

The pulse frequency is the number of pulses per second.

The actual engineering value is obtained by multiplying the value of the pulse counter by the pulse multiplication rate set on the web page.It is used to automatically convert the actual flow, length, output and other data.

The speed is converted from frequency and pulses per revolution.It is used to automatically convert the actual rpm.

To clear the count value, you can write 0 to the table, and then click Set to clear the count value.You can also set other values to modify the count value.



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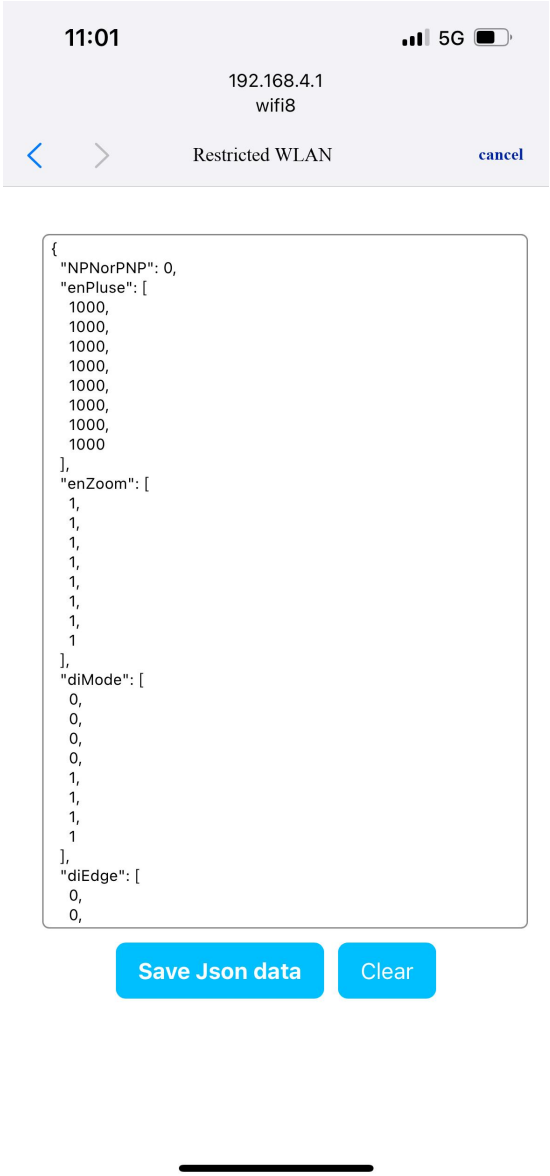


8. Set parameters in batch

Click the Json batch configuration link on the module homepage to enter the batch setting interface.As shown in the left figure.

The data must be in standard Json format. You can set all parameters or only some parameters.

If there are many products to set, you can save time by batch setting.

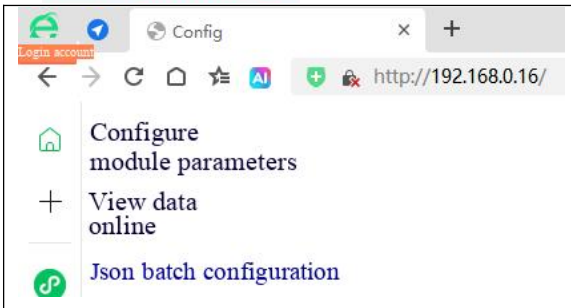
Click Save Json data after filling in.

Example 1: Only modify the WiFi account password to send:

```
{
  "WifiSsid": "w",
  "WifiPassword": "12345678",
  "setIP": 1,
  "ipAddress": "192.168.0.5",
  "gateway": "192.168.0.1",
  "netmask": "255.255.255.0",
}
```

Example 2: Only modifying MQTT parameters can send:

```
{
  "setMQTT": 1,
  "mqttHostUrl": "broker.emqx.io",
  "port": 1883,
  "clientId": "mqtt_test_001",
  "username": "",
  "passwd": "",
  "topic": "mqtt_topic_001",
  "pubTime": 2000,
  "pubonchange": 0
}
```



9. The module webpage can also be opened on the LAN

If the module has been connected to the local wifi, you can enter the module IP in the computer or mobile browser, such as 192.168.0.16, and open the module web page (if the computer IP or mobile IP is in the same network segment as the module, the login web page should be based on the IP address of the current module), then you can enter the module internal web page.You can also configure the module or read the module data in the same way as the above table.

Character communication protocol:

The following commands are sent according to the module address as the default 01. If the module address is modified, please change 01 to the new address.

The following communication protocols can be used for TCP/UDP communication of RS485, RS232 and WiFi.

RS485/RS232 communication: the factory default address is 01, the baud rate is 9600, and there is no parity check.If you forget the address and baud rate, you can turn the switch to the initialization position, and the module will enter the configuration mode. The address is 01, the baud rate is 9600, and there is no parity check.You can view the parameters or reconfigure the parameters by connecting your mobile phone to WiFi, or you can send a configuration command to modify the parameters.After setting, please turn the switch to the normal position.

WiFi communication: If you want to set the WiFi account, password and other parameters, you can turn the switch to the initialization position, and the module will enter the AP configuration mode, and the mobile phone will connect to the AP with the Wifi8 name generated by the module to enter the configuration interface.After setting, please turn the switch to the normal position.

MQTT protocol: After the connection is successful, send a command to the MQTT subscription topic of the module, and the reply data is displayed on the MQTT publication topic of the module.

TCP Server, TCP Client, UDP Mode, Web Socket and other working modes: After the connection is successful, you can send commands and receive data.

If automatic reporting is set for WiFi communication, the reported data format is the same as the reply format of (1. Read data command).

1、 Read Data Command

Send: # 01 (WiFi communication, if the scheduled automatic reporting is set, the module will report data regularly instead of sending commands)

Reply: {"devName": "B0B21CAD2B44", "time": 56941, "diMode": [0,0,0,0,1,1,1], "diState": [0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0], "enCounter": [-20, -20, -18, -2, -2, -2, -2], "enFrequency": [0,0,0,0,0,0,0], "enActualData": [-20, -20, -20, -18, -2, -2, -2], "enSpeed": [0,0,0,0,0,0,0], "diCounter" 6366263462832281298392978937313137312937313131373733131373129373130373128313037312 8], "diSpeed":

[0,0,0,0,0,0,0,0,0,0,0,3,3,3,3,3,3,3,3]}

Format description:

Encoder data is arranged in the order of channel 0~3;The independent DI data is arranged in the order of A0, B0~A3 and B3.

"DevName" module name, which can be modified on the webpage as required

"Time" module internal time, in mS.

"DiMode" module counting mode.**Counting mode 0**: encoder AB signal input;**Counting mode 1**: two independent counter inputs

"DiState" DI state indicates the level state of the input.

The accumulated number of pulses measured by the "enCounter" encoder counter adopts the 4-fold frequency counting method.(**Counting mode 0**)

"EnFrequency" encoder pulse frequency is the number of pulses per second.(**Counting mode 0**)

The actual engineering value of the "enActualData" encoder is obtained by multiplying the value of the encoder pulse counter by the pulse multiplication rate set on the web page.It is used to automatically convert the actual flow, length, output and other data.(**Counting mode 0**)

"EnSpeed" encoder speed is converted from encoder frequency and pulses per revolution.It is used to automatically convert the actual speed or flow per minute.

(**Counting mode 0**)

"DiCounter" The cumulative number of pulses measured by the independent counter.(**Counting mode 1**)

The "diFrequency" pulse frequency is the number of pulses per second.(**Counting mode 1**)

The actual project value of "diActualData" is obtained by multiplying the pulse counter value by the pulse multiplication rate set on the web page.It is used to automatically convert the actual flow, length, output and other data.(**Counting mode 1**)

"DiSpeed" speed is converted from frequency and pulses per revolution.It is used to automatically convert the actual rpm.(**Counting mode 1**)

You can also read a single group of data, such as the encoder counter:

Send: # 01>enCounter

Reply: {"enCounter": [0,0,0,0,0,0,0,0]}

For example, read the actual engineering value of encoder:

Send: # 01>enFrequency

Reply: {"enFrequency": [0,0,0,0,0,0,0,0]}

Read other parameters and send corresponding parameter characters.

2. Set encoder 0~7 count value command

The encoder 0~7 count value can be 0 or other values, and can be reset or modified.

Send: $01 {"setEn0Count": 0, "setEn1Count": 0, "setEn2Count": 0, "setEn3Count": 0, "setEn4Count": 0, "setEn5Count": 0, "setEn6Count": 0, "setEn7Count": 0}

Or $01 {"setEn0Count": 222, "setEn1Count": 333, "setEn2Count": 444, "setEn3Count": 555, "setEn4Count": 666, "setEn5Count": 777, "setEn6Count": 888, "setEn7Count": 999}

Only set a single channel: $01 {"setEn0Count": 0}

Set the same value to all channels at the same time: $01 {"setAllENCount": 0}

Reply:!01 (cr) **indicates successful setting;**?01 (cr) indicates command error

3. Set pulse counter A0~B7 count value command

Set the value of pulse counter A0~B7, which can be 0 or other values, and can be cleared or modified.

Send: $01 {"setA0Count": 0, "setB0Count": 0, "setA1Count": 0, "setB1Count": 0, "setA2Count": 0, "setB2Count": 0, "setA3Count": 0, "setB3Count": 0, "setA4Count": 0, "setB4Count": 0, "setA5Count": 0, "setB5Count": 0, "setA6Count": 0, "setB6Count": 0, "setA7Count": 0, "setA7Count" B7Count ": 0}
Or $01 {"setA0Count": 1000, "setB0Count": 2000, "setA1Count": 3000, "setB1Count": 1, "setA2Count": 2, "setB2Count": 3, "setA3Count": 999, "setB3Count": 888, "setA4Count": 1000, "setB4Count": 2000, "setA5Count": 3000, "setB5Count": 1, "setA6Count": 2, "setB6Count": 3, "setA7Count": 999, "setB5Count" B7Count ": 888}
Only set a single channel: $01 {"setA0Count": 0}
Set the same value to all channels at the same time: $01 {"setAllDICount": 0}
Reply:!01 (cr) indicates successful setting;?01 (cr) indicates command error

4、 Read configuration command
Read the configuration parameters of the module, or view them directly on the web page.
Sent:% 01ReadConfig
Re:
{"NPNorPNP":0,"enPluse":[1000,1000,1000,1000,1000,1000,1000,1000],"enZoom":[1,1,1,1,1,1,1,1],"diMode":[0,0,0,0,0,0,0,0],"diEdge":[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0],"diPluse":[1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000],"diFilter":[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0],"diZoom":[1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1],"modbusOrder":0,"saveData":1,"ID":1,"Baud":9600,"Check":0,"WifiSsid":"w","WifiPassword":"12345678","workmode":0,"setIP":1,"ipAddress":"192.168.0.16","gateway":"192.168.0.1","netmask":"255.255.255.0","localPort":23,"remoteServerIp":"192.168.0.100","remotePort":23,"sendTime":0,"devName":"B0B21CAD2B44","setMQTT":0,"mqttHostUrl":"","port":1883,"clientId":"","username":"","passwd":"","topic":"","pubTime":2000,"subtopic":""}
5、 Set Configuration Command
The configuration parameters of the module can also be set directly on the web page.All or some parameters can be set, and the module will restart automatically after setting.
Send:
%01WriteConfig{"NPNorPNP":0,"enPluse":[1000,1000,1000,1000,1000,1000,1000,1000],"enZoom":[1,1,1,1,1,1,1,1],"diMode":[0,0,0,0,0,0,0,0],"diEdge":[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0],"diPluse":[1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000,1000],"diFilter":[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0],"diZoom":[1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1],"modbusOrder":0,"saveData":1,"ID":1,"Baud":9600,"Check":0,"WifiSsid":"w","WifiPassword":"12345678","workmode":0,"setIP":1,"ipAddress":"192.168.0.16","gateway":"192.168.0.1","netmask":"255.255.255.0","localPort":23,"remoteServerIp":"192.168.0.100","remotePort":23,"sendTime":0,"devName":"B0B21CAD2B44","setMQTT":0,"mqttHostUrl":"","port":1883,"clientId":"","username":"","passwd":"","topic":"","pubTime":2000,"subtopic":""}
You can also set only a single parameter, for example, to modify the baud rate:% 01WriteConfig {"Baud": 115200}
For example, set power failure to not save count value:% 01WriteConfig {"saveData": 0}
Reply:!01 (cr) **indicates successful setting;**?01 (cr) indicates command error

Modbus communication protocol:

RS485/RS232 communication: support Modbus RTU protocol, factory default address is 01, baud rate is 9600, no parity check.If you forget the address and baud rate, you can turn the switch to the initialization position, and the module will enter the configuration mode. The address is 01, the baud rate is 9600, and there is no parity check.You can view the parameters or reconfigure the parameters by connecting your mobile phone to WiFi, or you can send a configuration command to modify the parameters.After setting, please turn the switch to the normal position.
WiFi communication: support Modbus TCP protocol.If you want to set the WiFi account, password and other parameters, you can turn the switch to the initialization position, and the module will enter the AP configuration mode. The mobile phone will connect the Wifi8 name AP generated by the module to enter the configuration interface.After

setting, please turn the switch to the normal position.

The registers of Modbus RTU communication protocol and Modbus TCP communication protocol are as follows:

Registers supporting function codes 01, 05 and 15

Address 0X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
00001	zero	A0 counting method	Read/ Write	Counting mode of channel A0~B7 (The default value is 0) 0 is the rising edge count, 1 is the counting of falling edge The settings take effect after the module is restarted. It does not need to be modified normally, just use the default value.
00002	one	B0 counting mode	Read/ Write	
00003	two	A1 counting method	Read/ Write	
00004	three	B1 counting method	Read/ Write	
00005	four	A2 counting method	Read/ Write	
00006	five	B2 counting method	Read/ Write	
00007	six	A3 counting mode	Read/ Write	
00008	seven	B3 counting method	Read/ Write	
00009	eight	A4 counting mode	Read/ Write	
00010	nine	B4 counting mode	Read/ Write	
00011	ten	A5 counting mode	Read/ Write	
00012	eleven	B5 counting mode	Read/ Write	
00013	twelve	A6 counting method	Read/ Write	
00014	thirteen	B6 counting mode	Read/ Write	
00015	fourteen	A7 counting method	Read/ Write	
00016	fifteen	B7 counting mode	Read/ Write	
00033	thirty-two	A0 input status	read-only	Level status of channel A0~B7 0 indicates low level input, 1 indicates high level input
00034	thirty-three	B0 input status	read-only	
00035	thirty-four	A1 input status	read-only	
00036	thirty-five	B1 input status	read-on	

			ly	
00037	thirty-six	A2 input status	read-only	
00038	thirty-seven	B2 input status	read-only	
00039	thirty-eight	A3 input status	read-only	
00040	thirty-nine	B3 input status	read-only	
00041	forty	A4 input status	read-only	
00042	forty-one	B4 input status	read-only	
00043	forty-two	A5 input status	read-only	
00044	forty-three	B5 input status	read-only	
00045	forty-four	A6 input status	read-only	
00046	forty-five	B6 input status	read-only	
00047	forty-six	A7 input status	read-only	
00048	forty-seven	B7 input status	read-only	
Address 0X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
00049	forty-eight	A0 input status	read-only	Inverted value of level state of channel A0~B7 1 indicates low level input, 0 indicates high level input
00050	forty-nine	B0 input status	read-only	
00051	fifty	A1 input status	read-only	
00052	fifty-one	B1 input status	read-only	
00053	fifty-two	A2 input status	read-only	
00054	fifty-three	B2 input status	read-only	
00055	fifty-four	A3 input status	read-only	
00056	fifty-five	B3 input status	read-only	
00057	fifty-six	A4 input status	read-only	

00058	fifty-seven	B4 input status	read-only	
00059	fifty-eight	A5 input status	read-only	
00060	fifty-nine	B5 input status	read-only	
00061	sixty	A6 input status	read-only	
00062	sixty-one	B6 input status	read-only	
00063	sixty-two	A7 input status	read-only	
00064	sixty-three	B7 input status	read-only	

Registers supporting function codes 03, 06, 16

Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
forty thousand	zero	Encoder 0 count mode	Read/	Encoder count mode, integer, 0 or 1,

and one			Write	The factory default is 0 (it takes effect only after **restarting** after modification) **Counting mode 0**: encoder AB signal input **Counting mode 1**: two independent counter inputs The following register remark **(count mode 0)** indicates that the data is valid only when the encoder count mode is 0.Note **(counting mode 1)** indicates that the data is valid only when the encoder counting mode is 1.
forty thousand and two	one	Encoder 1 counting mode	Read/ Write	
forty thousand and three	two	Encoder 2 counting mode	Read/ Write	
forty thousand and four	three	Encoder 3 counting mode	Read/ Write	
forty thousand and five	four	Encoder 4 counting mode	Read/ Write	
forty thousand and six	five	Encoder 5 counting mode	Read/ Write	
forty thousand and seven	six	Encoder 6 counting mode	Read/ Write	
forty thousand and eight	seven	Encoder 7 counting mode	Read/ Write	
forty thousand and eleven	ten	Whether encoder counts 4 times frequency	Read/ Write	Whether encoder counts 4 times frequency **(counting mode 0)** Integer, value 0 or 1. 0 is no frequency multiplication (default), 1 is 4-fold counting. (The modification takes effect only after **restarting**)
forty thousand and twelve	eleven	Frequency range of counting mode 1	Read/ Write	Frequency range of counting mode 1 **(counting mode 1)** Integer, value 0 or 1. 0 is 0-5MHz high-speed measurement (default), 1 is 0-10KHz low speed measurement (The modification takes effect only after **restarting**)
forty thousand and thirteen	twelve	Frequency refresh time	Read/ Write	Frequency refresh time, shared by two counting modes, 16 bit unsigned integer.The unit is ms. The default value is 1000. (The modification takes effect only after **restarting**)

Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
40017~40018	16-17	Encoder 0 pulse count	Read/ Write	Encoder 0~7 pulse counter **(counting mode 0)** The data is a signed 32-bit long integer, The storage order is **CDAB**.In hexadecimal format, negative numbers use two complements, Positive number (0x00000000~0x7FFFFFFF), Negative number (0xFFFFFFFF~0x80000001), **The counter is cleared** to write 0 directly to the corresponding register, You can also write other values as needed. By default, **1 frequency multiplication counting** is used. You can also set it to 4 frequency multiplication counting method in the web page. The data of 4 frequency multiplication counting method is 4 times of the actual pulse number.
40019~40020	18-19	Encoder 1 pulse count	Read/ Write	
40021~40022	20~21	Encoder 2 pulse count	Read/ Write	
40023~40024	22-23	Encoder 3 pulse count	Read/ Write	
40025~40026	24-25	Encoder 4 pulse count	Read/ Write	
40027~40028	26-27	Encoder 5 pulse count	Read/ Write	
40029~40030	28~29	Encoder 6 pulse count	Read/ Write	
40031~40032	30~31	Encoder 7 pulse count	Read/ Write	
40033~40034	32~33	Channel A0 pulse count	Read/ Write	Channel A0~B7 pulse counter **(counting mode 1)** The data is an unsigned 32-bit long integer, The storage order is **CDAB**.Hexadecimal format, （0x00000000~0xFFFFFFFF）， **The counter is cleared** to write 0 directly to the corresponding register, or other values can be written as required.
40035~40036	34~35	Channel B0 pulse count	Read/ Write	
40037~40038	36~37	Channel A1 pulse count	Read/ Write	
40039~40040	38~39	Channel B1 pulse count	Read/ Write	
40041~40042	40~41	Channel A2 pulse count	Read/ Write	
40043~40044	42~43	Channel B2 pulse count	Read/ Write	
40045~40046	44~45	Channel A3 pulse count	Read/ Write	
40047~40048	46~47	Channel B3 pulse	Read/	

		count	Write	
40049~40050	48~49	Channel A4 pulse count	Read/ Write	
40051~40052	50~51	Channel B4 pulse count	Read/ Write	
40053~40054	52~53	Channel A5 pulse count	Read/ Write	
40055~40056	54~55	Channel B5 pulse count	Read/ Write	
40057~40058	56~57	Channel A6 pulse count	Read/ Write	
40059~40060	58~59	Channel B6 pulse count	Read/ Write	
40061~40062	60~61	Channel A7 pulse count	Read/ Write	
40063~40064	62~63	Channel B7 pulse count	Read/ Write	
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
forty thousand and sixty-eight	sixty-seven	Count clear register	write	Unsigned integer, the default value is 0. Modify this register to clear the encoder counter or channel counter.After modification, the register will automatically return to 0. Write 10: set encoder 0 count value to 0, Write 11: set encoder 1 count value to 0, Write 12: set encoder 2 count value to 0, Write 13: set encoder 3 count value to 0, Write 14: set encoder 4 count value to 0, Write 15: set encoder 5 count value to 0, Write 16: set encoder 6 count value to 0, Write 17: set encoder 7 count value to 0,

				Write 18: set all encoder count values to 0, Write 20: set the channel A0 count value to 0, Write 21: set the channel B0 count value to 0, Write 22: set channel A1 count value to 0, Write 23: Set the channel B1 count value to 0, Write 24: set the channel A2 count value to 0, Write 25: set the channel B2 count value to 0, Write 26: set channel A3 count value to 0, Write 27: set the channel B3 count value to 0, Write 28: set the channel A4 count value to 0, Write 29: set the channel B4 count value to 0, Write 30: set the channel A5 count value to 0, Write 31: set the channel B5 count value to 0, Write 32: set the channel A6 count value to 0, Write 33: set the channel B6 count value to 0, Write 34: set the channel A7 count value to 0, Write 35: set the channel B7 count value to 0, **Write 36: Set all channel count values to 0.** Writing other values is invalid.
forty thousand and seventy-three	seventy-two	Encoder 0 pulses per revolution	Read/ Write	Number of pulses per revolution of encoder **(counting mode 0)** Unsigned integer (factory default value is 1000), which is set according to the number of pulses per revolution of the encoder. After setting, registers 40101~40108 are the speed of the corresponding channel. The number of pulses per revolution can also be set on the web page.
forty thousand and seventy-four	seventy-three	Number of pulses per revolution of encoder 1	Read/ Write	
forty thousand and seventy-five	seventy-four	Number of pulses per revolution of encoder 2	Read/ Write	
forty thousand	seventy-five	Number of pulses per	Read/	

and seventy-six		revolution of encoder 3	Write	
forty thousand and seventy-seven	seventy-six	Number of pulses per revolution of encoder 4	Read/ Write	
forty thousand and seventy-eight	seventy-seven	Number of pulses per revolution of encoder 5	Read/ Write	
forty thousand and seventy-nine	seventy-eight	Number of pulses per revolution of encoder 6	Read/ Write	
forty thousand and eighty	seventy-nine	Pulse number per revolution of encoder 7	Read/ Write	
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
forty thousand and eighty-one	eighty	Count value is saved automatically	Read/ Write	0: Do not save automatically, power off and reset; 1: The count value will be saved automatically after power failure. 2: In case of power failure, only the count value of encoder is saved, and the count value of independent DI is not saved. All independent DI count values are cleared to zero.(The default value is 2)
forty thousand and eighty-two	eighty-one	Pull up switch of DI	Read/ Write	0: DI close pull-up voltage;(The default value is 0) 1: DI is connected with pull-up voltage.
forty thousand and eighty-nine	eighty-eight	Restore parameters to factory settings	Read/ Write	If it is set to FF00, the parameters of all registers of the module will be restored to the factory settings, and the module will restart automatically after completion
forty thousand one hundred and one	one hundred	Speed of encoder 0	read-only	Encoder speed **(counting mode 0)** Signed integer, positive or negative indicates positive or negative. The speed is converted according to the number of pulses per revolution set in registers 40073~40080.The number of pulses per revolution can also be set on the
forty thousand one hundred and two	one hundred and one	Speed of encoder 1	read-only	
forty thousand	one hundred and	Speed of encoder 2	read-o	

one hundred and three	two		nly	web page.
forty thousand one hundred and four	one hundred and three	Speed of encoder 3	read-only	
forty thousand one hundred and five	one hundred and four	Speed of encoder 4	read-only	
forty thousand one hundred and six	one hundred and five	Speed of encoder 5	read-only	
forty thousand one hundred and seven	one hundred and six	Speed of encoder 6	read-only	
forty thousand one hundred and eight	one hundred and seven	Speed of encoder 7	read-only	
40129~40130	128~129	Frequency of encoder 0	read-only	Pulse frequency of encoder **(counting mode 0)** The data is a 32-bit floating point number, The storage order is CDAB.
40131~40132	130~131	Encoder 1 frequency	read-only	
40133~40134	132~133	Encoder 2 frequency	read-only	
40135~40136	134~135	Frequency of encoder 3	read-only	
40137~40138	136~137	Frequency of encoder 4	read-only	
40139~40140	138~139	Frequency of encoder 5	read-only	
40141~40142	140~141	Frequency of encoder 6	read-only	
40143~40144	142~143	Frequency of encoder 7	read-only	
40145~40146	144~145	Frequency of channel A0	read-only	Pulse frequency of channel **(counting mode 1)** The data is a 32-bit floating point number, The storage order is CDAB. If the device cannot read the floating point number, it can read the register 40217~40232
40147~40148	146~147	Frequency of channel B0	read-only	
40149~40150	148~149	Frequency of channel A1	read-only	
40151~40152	150~151	Frequency of channel B1	read-only	
40153~40154	152~153	Frequency of channel A2	read-only	
40155~40156	154~155	Frequency of channel	read-o	

		B2	nly	
40157~40158	156~157	Frequency of channel A3	read-only	
40159~40160	158~159	Frequency of channel B3	read-only	
40161~40162	160~161	Frequency of channel A4	read-only	
40163~40164	162~163	Frequency of channel B4	read-only	
40165~40166	164~165	Frequency of channel A5	read-only	
40167~40168	166~167	Frequency of channel B5	read-only	
40169~40170	168~169	Frequency of channel A6	read-only	
40171~40172	170~171	Frequency of channel B6	read-only	
40173~40174	172~173	Frequency of channel A7	read-only	
40175~40176	174~175	Frequency of channel B7	read-only	
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
forty thousand one hundred and eighty-one	one hundred and eighty	Filtering time of channel A0	Read/ Write	Filtering time of channels A0~B7 **(counting mode 1)** Unsigned integer.Each register corresponds to the filtering time of a channel.1 means the filtering time is 1mS, the photoelectric switch input is set to 0, and the mechanical switch or relay input is recommended to be set to 20~100.The settings will take effect after restart.
forty thousand one hundred and eighty-two	one hundred and eighty-one	Filtering time of channel B0	Read/ Write	
forty thousand one hundred and eighty-three	one hundred and eighty-two	Filtering time of channel A1	Read/ Write	
forty thousand one hundred and eighty-four	one hundred and eighty-three	Filtering time of channel B1	Read/ Write	
forty thousand one hundred and eighty-five	one hundred and eighty-four	Filtering time of channel A2	Read/ Write	
forty thousand one hundred and eighty-six	one hundred and eighty-five	Filtering time of channel B2	Read/ Write	
forty thousand one hundred and	one hundred and eighty-six	Filtering time of channel A3	Read/ Write	

eighty-seven				
forty thousand one hundred and eighty-eight	one hundred and eighty-seven	Filtering time of channel B3	Read/ Write	
forty thousand one hundred and eighty-nine	one hundred and eighty-eight	Filtering time of channel A4	Read/ Write	
forty thousand one hundred and ninety	one hundred and eighty-nine	Filtering time of channel B4	Read/ Write	
forty thousand one hundred and ninety-one	one hundred and ninety	Filtering time of channel A5	Read/ Write	
forty thousand one hundred and ninety-two	one hundred and ninety-one	Filtering time of channel B5	Read/ Write	
forty thousand one hundred and ninety-three	one hundred and ninety-two	Filtering time of channel A6	Read/ Write	
forty thousand one hundred and ninety-four	one hundred and ninety-three	Filtering time of channel B6	Read/ Write	
forty thousand one hundred and ninety-five	one hundred and ninety-four	Filtering time of channel A7	Read/ Write	
forty thousand one hundred and ninety-six	one hundred and ninety-five	Filtering time of channel B7	Read/ Write	
forty thousand two hundred and one	two hundred	Module address	Read/ Write	Integer, effective after restart, range 0x00000x00FF
forty thousand two hundred and two	two hundred and one	Baud rate	Read/ Write	Integer, effective after restart, range 0x0004-0x000A 0x0004 = 2400 bps， 0x0005 = 4800 bps 0x0006 = 9600 bps， 0x0007 = 19200 bps 0x0008 = 38400 bps， 0x0009 = 57600 bps 0x000A = 115200bps
forty thousand	two hundred and	Parity	Read/	Integer, effective after restart

two hundred and three	two		Write	0: No verification 1: Odd check 2: Even check
forty thousand two hundred and ten	two hundred and nine	Restart the module	Read/ Write	If it is set to F0F0, the module will restart automatically after 1 second
forty thousand two hundred and eleven	two hundred and ten	Module name	read-only	High order: 0x01 Low order: 0x69
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
forty thousand two hundred and seventeen	two hundred and sixteen	Frequency of channel A0	read-only	Pulse frequency of channel A0~B7 **(counting mode 1)** The data is a 16 bit unsigned integer, and each register corresponds to the frequency of a channel.If the frequency exceeds the maximum value of 65535 of 16 bits, 65535 is displayed. It is recommended to read registers 40145~40175 of floating point number if you need to read larger values.
forty thousand two hundred and eighteen	two hundred and seventeen	Frequency of channel B0	read-only	
forty thousand two hundred and nineteen	two hundred and eighteen	Frequency of channel A1	read-only	
forty thousand two hundred and twenty	two hundred and nineteen	Frequency of channel B1	read-only	
forty thousand two hundred and twenty-one	two hundred and twenty	Frequency of channel A2	read-only	
forty thousand two hundred and twenty-two	two hundred and twenty-one	Frequency of channel B2	read-only	
forty thousand two hundred and twenty-three	two hundred and twenty-two	Frequency of channel A3	read-only	
forty thousand two hundred and twenty-four	two hundred and twenty-three	Frequency of channel B3	read-only	
forty thousand	two hundred and	Frequency of channel	read-o	

two hundred and twenty-five	twenty-four	A4	nly	
forty thousand two hundred and twenty-six	two hundred and twenty-five	Frequency of channel B4	read-only	
forty thousand two hundred and twenty-seven	two hundred and twenty-six	Frequency of channel A5	read-only	
forty thousand two hundred and twenty-eight	two hundred and twenty-seven	Frequency of channel B5	read-only	
forty thousand two hundred and twenty-nine	two hundred and twenty-eight	Frequency of channel A6	read-only	
forty thousand two hundred and thirty	two hundred and twenty-nine	Frequency of channel B6	read-only	
forty thousand two hundred and thirty-one	two hundred and thirty	Frequency of channel A7	read-only	
forty thousand two hundred and thirty-two	two hundred and thirty-one	Frequency of channel B7	read-only	
forty thousand two hundred and fifty-seven	two hundred and fifty-six	Speed of channel A0	read-only	Speed of channels A0~B7 **(counting mode 1)** 16 bit unsigned integer. The speed is converted according to the register 40273~40288 or the number of pulses per revolution set on the web page.If the speed exceeds the maximum value 65535 of 16 bits, 65535 is displayed. It is recommended to read 32-bit registers 40461~40492 to read larger values.
forty thousand two hundred and fifty-eight	two hundred and fifty-seven	Speed of channel B0	read-only	
forty thousand two hundred and fifty-nine	two hundred and fifty-eight	Speed of channel A1	read-only	
forty thousand two hundred and sixty	two hundred and fifty-nine	Speed of channel B1	read-only	
forty thousand two hundred and sixty-one	two hundred and sixty	Speed of channel A2	read-only	
forty thousand two hundred and sixty-two	two hundred and sixty-one	Speed of channel B2	read-only	
forty thousand	two hundred and	Speed of channel A3	read-o	

two hundred and sixty-three	sixty-two		nly	
forty thousand two hundred and sixty-four	two hundred and sixty-three	Speed of channel B3	read-only	
forty thousand two hundred and sixty-five	two hundred and sixty-four	Speed of channel A4	read-only	
forty thousand two hundred and sixty-six	two hundred and sixty-five	Speed of channel B4	read-only	
forty thousand two hundred and sixty-seven	two hundred and sixty-six	Speed of channel A5	read-only	
forty thousand two hundred and sixty-eight	two hundred and sixty-seven	Speed of channel B5	read-only	
forty thousand two hundred and sixty-nine	two hundred and sixty-eight	Speed of channel A6	read-only	
forty thousand two hundred and seventy	two hundred and sixty-nine	Speed of channel B6	read-only	
forty thousand two hundred and seventy-one	two hundred and seventy	Speed of channel A7	read-only	
forty thousand two hundred and seventy-two	two hundred and seventy-one	Speed of channel B7	read-only	
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
forty thousand two hundred and seventy-three	two hundred and seventy-two	Channel A0 pulses per revolution	Read/ Write	Channel A0~B7 pulses per revolution **(counting mode 1)** is an unsigned integer (factory default value is 1000), which is set according to the number of pulses per

forty thousand two hundred and seventy-four	two hundred and seventy-three	Channel B0 pulses per revolution	Read/ Write	revolution of the actual input signal. After setting, register 40257~40272 is the corresponding channel speed.The number of pulses per revolution can also be set on the web page.
forty thousand two hundred and seventy-five	two hundred and seventy-four	Channel A1 pulses per revolution	Read/ Write	
forty thousand two hundred and seventy-six	two hundred and seventy-five	Channel B1 pulses per revolution	Read/ Write	
forty thousand two hundred and seventy-seven	two hundred and seventy-six	Channel A2 pulses per revolution	Read/ Write	
forty thousand two hundred and seventy-eight	two hundred and seventy-seven	Channel B2 pulses per revolution	Read/ Write	
forty thousand two hundred and seventy-nine	two hundred and seventy-eight	Channel A3 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty	two hundred and seventy-nine	Channel B3 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty-one	two hundred and eighty	Channel A4 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty-two	two hundred and eighty-one	Channel B4 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty-three	two hundred and eighty-two	Channel A5 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty-four	two hundred and eighty-three	Channel B5 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty-five	two hundred and eighty-four	Channel A6 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty-six	two hundred and eighty-five	Channel B6 pulses per revolution	Read/ Write	

forty thousand two hundred and eighty-seven	two hundred and eighty-six	Channel A7 pulses per revolution	Read/ Write	
forty thousand two hundred and eighty-eight	two hundred and eighty-seven	Channel B7 pulses per revolution	Read/ Write	

Some of the following registers are duplicate with the previous register data, which is just put together to facilitate Modbus reading.

Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
40301~40302	300~301	Encoder 0 pulse count	Read/ Write	Encoder 0~7 pulse counter **(counting mode 0)** The data is a signed 32-bit long integer, The storage order is **CDAB**.In hexadecimal format, negative numbers use two complements, Positive number (0x00000000~0x7FFFFFFF), Negative number (0xFFFFFFFF~0x80000001), **The counter is cleared** to write 0 directly
40303~40304	302~303	Encoder 1 pulse count	Read/ Write	
40305~40306	304~305	Encoder 2 pulse count	Read/ Write	
40307~40308	306~307	Encoder 3 pulse count	Read/ Write	
40309~40310	308~309	Encoder 4 pulse count	Read/ Write	
40311~40312	310~311	Encoder 5 pulse count	Read/	

			Write	to the corresponding register,
40312~40314	312~313	Encoder 6 pulse count	Read/ Write	You can also write other values as needed.
40315~40316	314~315	Encoder 7 pulse count	Read/ Write	By default, **1 frequency multiplication counting** is used. You can also set it to 4 frequency multiplication counting method in the web page. The data of 4 frequency multiplication counting method is 4 times of the actual pulse number.
40317~40318	316~317	Frequency of encoder 0	read-only	Pulse frequency of encoder **(counting mode 0)** The data is a 32-bit floating point number, and the storage order is CDAB. The data is the frequency calculated according to the actual number of pulses per second, not 4 times the frequency.
40319~40320	318~319	Encoder 1 frequency	read-only	
40321~40322	320~321	Encoder 2 frequency	read-only	
40323~40324	322~323	Frequency of encoder 3	read-only	
40325~40326	324~325	Frequency of encoder 4	read-only	
40327~40328	326~327	Frequency of encoder 5	read-only	
40329~40330	328~329	Frequency of encoder 6	read-only	
40331~40332	330~331	Frequency of encoder 7	read-only	
40333~40334	332~333	Encoder 0 actual engineering value	read-only	Actual engineering value of encoder **(counting mode 0)** The data is a 32-bit floating point number, and the storage order is CDAB. It is the value obtained by multiplying the encoder counter value by the pulse multiplication rate set on the web page
40335~40336	334~335	Actual engineering value of encoder 1	read-only	
40337~40338	336~337	Actual engineering value of encoder 2	read-only	
40339~40340	338-339	Actual engineering value of encoder 3	read-only	
40341~40342	340~341	Encoder 4 actual engineering value	read-only	
40343~40344	342~343	Encoder 5 actual engineering value	read-only	
40345~40346	344~345	Encoder 6 actual engineering value	read-only	
40347~40348	346~347	Encoder 7 actual engineering value	read-only	
40349~40350	348~349	Speed of encoder 0	read-only	Encoder speed **(counting mode 0)** The data is a 32-bit signed long integer, and

40351~40352	350~351	Speed of encoder 1	read-only	the storage order is CDAB.The speed is converted according to the number of pulses per revolution set in the configuration page.
40353~40354	352~353	Speed of encoder 2	read-only	
40355~40356	354~355	Speed of encoder 3	read-only	
40357~40358	356~357	Speed of encoder 4	read-only	
40359~40360	358~359	Speed of encoder 5	read-only	
40361~40362	360~361	Speed of encoder 6	read-only	
40363~40364	362~363	Speed of encoder 7	read-only	
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
40365~40366	364~365	Channel A0 pulse count	Read/ Write	Channel A0~B7 pulse counter **(counting mode 1)** The data is an unsigned long integer, The storage order is CDAB.Hexadecimal format, （ 0x00000000~0xFFFFFFFF ）, The counter is cleared to write 0 directly to the corresponding register, or other values can be written as required.
40367~40368	366~367	Channel B0 pulse count	Read/ Write	
40369~40370	368~369	Channel A1 pulse count	Read/ Write	
40371~40372	370~371	Channel B1 pulse count	Read/ Write	
40373~40374	372~373	Channel A2 pulse count	Read/ Write	
40375~40376	374~375	Channel B2 pulse count	Read/ Write	
40377~40378	376~377	Channel A3 pulse count	Read/ Write	
40379~40380	378~379	Channel B3 pulse count	Read/ Write	
40381~40382	380~381	Channel A4 pulse count	Read/ Write	
40383~40384	382~383	Channel B4 pulse count	Read/ Write	
40385~40386	384~385	Channel A5 pulse count	Read/ Write	
40387~40388	386~387	Channel B5 pulse count	Read/ Write	
40389~40390	388~389	Channel A6 pulse	Read/	

		count	Write	
40391~40392	390~391	Channel B6 pulse count	Read/ Write	
40393~40394	392~393	Channel A7 pulse count	Read/ Write	
40395~40396	394~395	Channel B7 pulse count	Read/ Write	
40397~40398	396~397	Frequency of channel A0	read-only	Pulse frequency of channel A0~B7 **(counting mode 1)** The data is a 32-bit floating point number, and the storage order is CDAB.
40399~40400	398~399	Frequency of channel B0	read-only	
40401~40402	400~401	Frequency of channel A1	read-only	
40403~40404	402~403	Frequency of channel B1	read-only	
40405~40406	404~405	Frequency of channel A2	read-only	
40407~40408	406~407	Frequency of channel B2	read-only	
40409~40410	408~409	Frequency of channel A3	read-only	
40411~40412	410~411	Frequency of channel B3	read-only	
40413~40414	412~413	Frequency of channel A4	read-only	
40415~40416	414-415	Frequency of channel B4	read-only	
40417~40418	416~417	Frequency of channel A5	read-only	
40419~40420	418~419	Frequency of channel B5	read-only	
40421~40422	420~421	Frequency of channel A6	read-only	
40423~40424	422~423	Frequency of channel B6	read-only	
40425~40426	424~425	Frequency of channel A7	read-only	
40427~40428	426~427	Frequency of channel B7	read-only	

Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
40429~40430	428~429	Engineering value of channel A0	read-only	Actual engineering value of channel A0~B7 **(counting mode 1)** The data is a 32-bit floating point number, and the storage order is CDAB. The value is the pulse count value multiplied by the pulse magnification set on the web page.It is used for automatic calculation of flow or length.
40431~40432	430~431	Engineering value of channel B0	read-only	
40433~40434	432~433	Engineering value of channel A1	read-only	
40435~40436	434~435	Engineering value of channel B1	read-only	
40437~40438	436~437	Engineering value of channel A2	read-only	
40439~40440	438~439	Engineering value of channel B2	read-only	
40441~40442	440~441	Engineering value of channel A3	read-only	
40443~40444	442~443	Engineering value of channel B3	read-only	
40445~40446	444~445	Engineering value of channel A4	read-only	
40447~40448	446~447	Engineering value of channel B4	read-only	
40449~40450	448~449	Engineering value of channel A5	read-only	
40451~40452	450~451	Engineering value of channel B5	read-only	
40453~40454	452~453	Engineering value of channel A6	read-only	
40455~40456	454~455	Engineering value of channel B6	read-only	
40457~40458	456~457	Engineering value of channel A7	read-only	
40459~40460	458~459	Engineering value of channel B7	read-only	
40461~40462	460~461	Speed of channel A0	read-only	Channel A0~B7 speed **(counting mode 1)** Long integer (0x00000000~0xFFFFFFFF), The storage order is CDAB, The speed is converted according to the pulse number set in the configuration page.
40463~40464	462~463	Speed of channel B0	read-only	
40465~40466	464~465	Speed of channel A1	read-only	
40467~40468	466~467	Speed of channel B1	read-o	

			nly	
40469~40470	468~469	Speed of channel A2	read-only	
40471~40472	470~471	Speed of channel B2	read-only	
40473~40474	472~473	Speed of channel A3	read-only	
40475~40476	474~475	Speed of channel B3	read-only	
40477~40478	476~477	Speed of channel A4	read-only	
40479~40480	478~479	Speed of channel B4	read-only	
40481~40482	480~481	Speed of channel A5	read-only	
40483~40484	482~483	Speed of channel B5	read-only	
40485~40486	484~485	Speed of channel A6	read-only	
40487~40488	486~487	Speed of channel B6	read-only	
40489~40490	488~489	Speed of channel A7	read-only	
40491~40492	490~491	Speed of channel B7	read-only	
Address 4X (PLC)	**Address (PC, DCS)**	**Data content**	**attribute**	**Data description**
40501~40502	500~501	Encoder 0 pulse rate	Read/ Write	Pulse rate of encoder **(counting mode 0)** The data is a 32-bit floating point number, and the storage order is CDAB. The engineering value of the encoder is converted from this value and the actual pulse.For example, if each pulse of the high-speed grating ruler is 0.005mm, it can be set to 0.005, then the actual engineering value is 0.005 * pulse number.
40503~40504	502~503	Encoder 1 pulse rate	Read/ Write	
40505~40506	504~505	Encoder 2 pulse rate	Read/ Write	
40507~40508	506~507	Encoder 3 pulse rate	Read/ Write	
40509~40510	508~509	Encoder 4 pulse rate	Read/ Write	

40511~40512	510~511	Encoder 5 pulse rate	Read/ Write	
40512-40514	512~513	Encoder 6 pulse rate	Read/ Write	
40515~40516	514~515	Encoder 7 pulse rate	Read/ Write	
40565~40566	564~565	Channel A0 pulse magnification	Read/ Write	Pulse magnification of channel A0~B7 **(counting mode 1)** The data is a 32-bit floating point number, and the storage order is CDAB. The engineering value of channel A0~B7 is converted from this value and the actual pulse.For example, if each pulse of the flowmeter is 0.1ml, it can be set to 0.1, then the actual engineering value is 0.1 * pulse number.
40567~40568	566~567	Channel B0 pulse magnification	Read/ Write	
40569~40570	568~569	Channel A1 pulse magnification	Read/ Write	
40571~40572	570~571	Channel B1 pulse rate	Read/ Write	
40573~40574	572~573	Channel A2 pulse rate	Read/ Write	
40575~40576	574~575	Channel B2 pulse magnification	Read/ Write	
40577~40578	576~577	Channel A3 pulse rate	Read/ Write	
40579~40580	578~579	Channel B3 pulse rate	Read/ Write	
40581~40582	580~581	Channel A4 pulse rate	Read/ Write	
40583~40584	582~583	Channel B4 pulse rate	Read/ Write	
40585~40586	584~585	Channel A5 pulse rate	Read/ Write	
40587~40588	586~587	Channel B5 pulse rate	Read/ Write	
40589~40590	588~589	Channel A6 pulse rate	Read/ Write	
40591~40592	590~591	Channel B6 pulse magnification	Read/ Write	
40593~40594	592~593	Channel A7 pulse rate	Read/ Write	
40595~40596	594~595	Channel B7 pulse magnification	Read/ Write	

Modbus RTU communication example:

Communication example 1: If the module address is 01 and **010300100002C5CE** is sent in hexadecimal, the data in the register can be obtained.

01	03	00	ten	00	02	C5	CE
Module address	Read Holding Register	Register address high order	Register address low order	Number of registers high order	Register number low order	CRC check low order	CRC Check High

If the module replies: **010304CA90FFFFC476**, the data read is 0xFFFFCA90, which is replaced by -13680 in decimal system, it means that the current count value of encoder 0 is -13680.

01	03	04	CA	ninety	FF	FF	C4	seventy-six
Module address	Read Holding Register	Number of bytes of data	Data 1 high bit	Data 1 low order	Data 2 high bit	Data 2 low order	CRC check low order	CRC Check High

Communication example 2: If the module address is 01, send **010300200002C5C1C1** in hexadecimal to obtain the data of the register.

01	03	00	twenty	00	02	C5	C1
Module address	Read Holding Register	Register address high order	Register address low order	Number of registers high order	Register number low order	CRC check low order	CRC Check High

If the module replies: **010304CA90FFFFC476**, the data read is 0xFFFFCA90, which is replaced by 4294953616 ∨ in decimal system, it means that the current count value of channel A0 is 4294953616.

01	03	04	CA	ninety	FF	FF	C4	seventy-six
Module address	Read Holding Register	Number of bytes of data	Data 1 high bit	Data 1 low order	Data 2 high bit	Data 2 low order	CRC check low order	CRC Check High

Communication example 3: If the module address is 01, send **01060043000AF819** in hexadecimal, that is, clear the count value of encoder 0.

01	06	00	forty-three	00	0A	F8	nineteen

Module address	Write a single holding register	Register address high order	Register address low order	data-high	data-low	CRC check low order	CRC Check High

If the module replies: 01060043000AF819, the setting is successful, and the count value of encoder 0 is changed to 0.

01	06	00	forty-three	00	0A	F8	nineteen
Module address	Write a single holding register	Register address high order	Register address low order	data-high	data-low	CRC check low order	CRC Check High

Modbus TCP communication example:

01 (0x01) read coil

In a remote device, use this function code to read the 1 to 2000 continuous status of the coil.The request PDU specifies the starting address, that is, the first coil address and coil number specified.Address the coil from zero.Therefore, addressing coils 1-16 are 0-15.

The coil in the response message is divided into a coil according to each bit in the data field.The indication status is 1=ON and 0=OFF.The first data is used as the LSB (least significant bit) of the byte, and the subsequent coil data is arranged in high order to form a byte of 8 bits.If the number of returned outputs is not a multiple of eight, zero will be used to fill the remaining bits in the last data byte (up to the high end of the byte).The number of bytes field indicates the complete number of bytes of data

Example of function code 01:

request			**response**		
Field Name		**Hexadecimal**	**Field Name**		**Hexadecimal**
MBAP header	Transmission ID	01	MBAP header	Transmission ID	01
		00			00
	Agreement Flag	00		Agreement Flag	00
		00			00
	length	00		length	00
		06			04
	Unit	01		Unit identifier	01

	identifier				
Function code		01	Function code		01
Start address Hi		00	Number of bytes		01
Start address Lo		twenty	output data		00
Output quantity Hi		00			
Output quantity Lo		08			

03 (0x03) Read Holding Register

In a remote device, use this function code to read the contents of the continuous block of the holding register.The request PDU specifies the starting register address and the number of registers.Address registers from zero.Therefore, addressing registers 1-16 are 0-15.In the response message, each register has two bytes, the first byte is the data high bit, and the second byte is the data low bit.

Example of function code 03:

request			**response**		
Field Name		**Hexadecimal**	**Field Name**		**Hexadecimal**
MBAP header	Transmission ID	01	MBAP header	Transmission ID	01
		00			00
	Agreement Flag	00		Agreement Flag	00
		00			00
	length	00		length	00
		06			05
	Unit identifier	01		Unit identifier	01
Function code		03	Function code		03
Start address Hi		00	Number of bytes		02
Start address Lo		twenty	Register value Hi		00
Register No. Hi		00	Register value Lo		00
Register No. Lo		01			

05 (0x05) Write single coil

On a remote device, use this function code to write a single output as ON or OFF.The request PDU indicates the forced coil address.Address the coil from zero.Therefore, address coil address 1 is 0.The constant of the coil value field indicates the ON/OFF status of the request.The hexadecimal value 0xFF00 requests that the coil be ON. The hexadecimal value 0x0000 requests that the coil be OFF.All other values are illegal and have no effect on the coil.

The correct response is the same as the request.

Example of function code 05:

request			**response**		
Field Name		**Hexadecimal**	**Field Name**		**Hexadecimal**
MBAP header	Transmission ID	01	MBAP header	Transmission ID	01
		00			00
	Agreement Flag	00		Agreement Flag	00
		00			00
	length	00		length	00

		06			06
	Unit identifier	01		Unit identifier	01
Function code		05	Function code		05
Output address Hi		00	Output address Hi		00
Output address Lo		00	Output address Lo		00
Output value Hi		FF	Output value Hi		FF
Output value Lo		00	Output value Lo		00

06 (0x06) Write a single register

In a remote device, use this function code to write a single holding register.The request PDU indicates the address to be written to the register.Address registers from zero.Therefore, address register address 1 is 0.

The correct response is the same as the request.

Example of function code 06:

request			**response**		
Field Name		**Hexadecimal**	**Field Name**		**Hexadecimal**
MBAP header	Transmission ID	01	MBAP header	Transmission ID	01
		00			00
	Agreement Flag	00		Agreement Flag	00
		00			00
	length	00		length	00
		06			06
	Unit identifier	01		Unit identifier	01
Function code		06	Function code		06
Register address Hi		00	Register address Hi		00
Register address Lo		00	Register address Lo		00
Register value Hi		00	Register value Hi		00
Register value Lo		FF	Register value Lo		FF

15 (0x0F) Write multiple coils

On a remote device, use this function code to write multiple outputs as ON or OFF.The request PDU indicates the forced coil address.Address the coil from zero.Therefore, address coil address 1 is 0.The constant of the coil value field indicates the ON/OFF status of the request.The data is converted from hexadecimal system to binary system and arranged in bits. If the bit value is 1, the request coil is ON, and if the bit value is 0, the request coil is OFF.

Example of function code 15:

request			**response**		
Field Name		**Hexadecimal**	**Field Name**		**Hexadecimal**
	Transmission ID	01		Transmission ID	01
		00			00

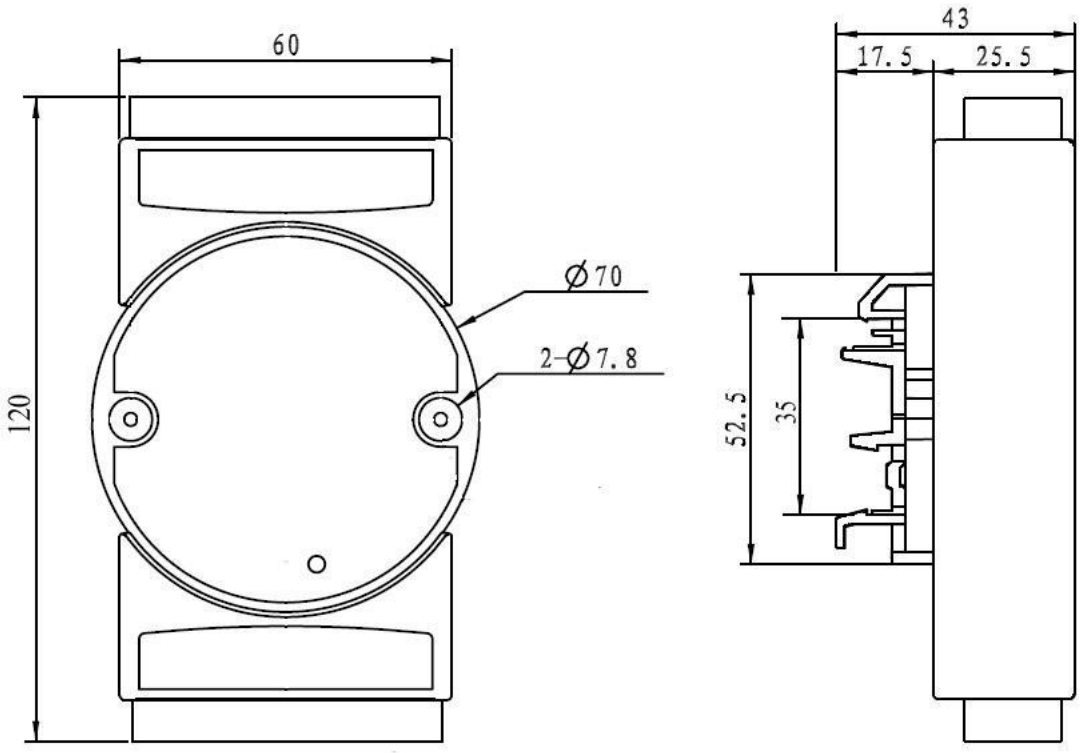
MBAP header	Agreement Flag	00	MBAP header	Agreement Flag	00
		00			00
	length	00		length	00
		08			06
	Unit identifier	01		Unit identifier	01
Function code		0F	Function code		0F
Start address Hi		00	Start address Hi		00
Start address Lo		00	Start address Lo		00
Number of coils Hi		00	Number of coils Hi		00
Number of coils Lo		02	Number of coils Lo		02
Number of bytes		01			
Output value		02			

16 (0x10) Write multiple registers

In a remote device, use this function code to write multiple holding registers.The request PDU indicates the address to be written to the register.Address registers from zero.Therefore, address register address 1 is 0.Example of function code 16:

request			**response**		
Field Name		**Hexadecimal**	**Field Name**		**Hexadecimal**
MBAP header	Transmission ID	01	MBAP header	Transmission ID	01
		00			00
	Agreement Flag	00		Agreement Flag	00
		00			00
	length	00		length	00
		0B			06
	Unit identifier	01		Unit identifier	01
Function code		ten	Function code		ten
Start register address Hi		00	Start register address Hi		00
Start register address Lo		00	Start register address Lo		00
Number of registers Hi		00	Number of registers Hi		00
Number of registers Lo		02	Number of registers Lo		02
Number of bytes		04			
Register value Hi		00			
Register value Lo		05			
Register value Hi		00			
Register value Lo		06			

Overall dimension: (unit: mm)



Can be installed on standard DIN35 guide rail

Warranty:

Within two years from the date of sale of this product, if the user complies with the storage, transportation and use requirements, but the product quality is lower than the technical indicators, the product can be returned to the factory for free maintenance.In case of damage due to violation of operating regulations and requirements, the device cost and maintenance cost shall be paid.

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