16CH-RS232/485/422-ETH

User Manual

Simple Version

1. Overview

16CH-RS232/485/422-ETH is a standard 1U rack-mount converter for 16 RS232/485/422 and TCP/IP protocols. It supports 16 RS232 serial ports/16 RS485/RS422 serial ports (RS422 requires ordering before ship), and RS232 supports flow control. Connecting to the 16CH-RS232/485/422-ETH via a single network cable enables all 16 serial ports to operate simultaneously in full-duplex mode. Each serial port can function as a TCP server, TCP client, UDP, or UDP multicast. It also supports 4 network ports with switch functionality.

16CH-RS232/485/422-ETH uses one IP address for each of the eight serial ports (ports). Different ports are distinguished by their ports. It also supports eight IP addresses for eight serial ports. Ports are the same and can be distinguished by IP addresses. Two IP addresses are required for 16 channels. It has the functions of Modbus TCP to Modbus RTU and serial port to Telnet protocol.

The 16CH-RS232/485/422-ETH uses an ARM9 processing chip to support high-speed data transmission at 921.6Kbps without packet loss.

The serial port of the 16CH-RS232/485/422-ETH is RJ45. When using RS232, RJ45 to DB9 (male) adapter fittings are available. When using RS485, you can use the RJ45 to 2pin terminal. For the line sequence, refer to the hardware section.

1.1 Standard Packing List

16CH-RS232 485 422-ETH main unit *1, 220V AC power adapter * 1, Fixed installation accessories * 2 (one on each side)

1.2 Optional accessories

RJ45 to RS232

RJ45 to RS422

RJ45 to 485 terminal

Note: They are not included in the standard shipment, but can be customized according to the actual project requirements or customized according to the actual interface cable sequence.

1.3 Panel Introduction

Name	Function
Power	Red: If it doesn't light up after power on, please pay attention to whether the switch is turned to the "1" position.
Network ports: NET1～NET4	Having the same function, it can be used as a switch. The green light on the Ethernet port indicates that the network cable is connected properly and the physical connection is normal; The yellow light indicates network data activity.
PORT1~PORT16	The first row is PORT1, PORT3... PORT15, and the second row is PORT2, PORT4... PORT16. The green light in the network port indicates that the TCP connection corresponding to the serial port is established or in UDP mode, and the yellow light indicates that there is data activity on the serial port.

1.4 Serial port line sequence definition

RJ45 PIN	1	2	3	4	5	6	7	8
Name	RTS	RXD	TXD	CTS(422-)	GND	485+	485-	422+

When used as RS232, the required pins are as follows:

RJ45 PIN	Name	Explanation	Corresponding RJ45 to DB9 accessory pins
2	RXD	Serial server receiving pin	2
3	TXD	Serial server sending pin	3
5	GND	Digital ground	5
1	RTS	After enabling flow control, when the pin is set to 0, the serial server will receive data from the serial device.	6，8
4	CTS	After enabling flow control, the serial server only sends data to the serial device when the pin is 0	4，7

Users can make their own crystal heads to connect to RS232 devices, or equip them with RJ45 to DB9 wires (male), with corresponding wire sequences as shown in the table above. The equipped DB9 cable can directly connect to RS232 DB9 female devices. If the device does not have flow control, RTS and CTS can be suspended.

When used as RS485, only pin6 (485A) and pin7 (485B) need to be connected. It is recommended that users make their own crystal heads and connect them to RS485 devices through Category 5 shielded Ethernet cables.Compliant with the RS485 standard, each serial port channel can theoretically carry 32 terminal 485 devices. The longest communication distance is 1200 meters. The terminal resistance of 485 is 120 ohms, and it is generally necessary to use terminal resistance when wiring exceeds 300 meters. When wiring, 485+and 485- must be a twisted pair to reduce signal interference.

When used as RS422, it is necessary to jumper the device internally to change pin4 from RS232's flow control CTS to RS422's receiving R -.

Serial number	422 line sequence of gateway equipment	Corresponding connection line with user RS422
6	T/R+（485A）	R+
7	T/R-（485B）	R-
8	R+	T+
4	R-	T-

2. Installation

2.1 Debugging accessories

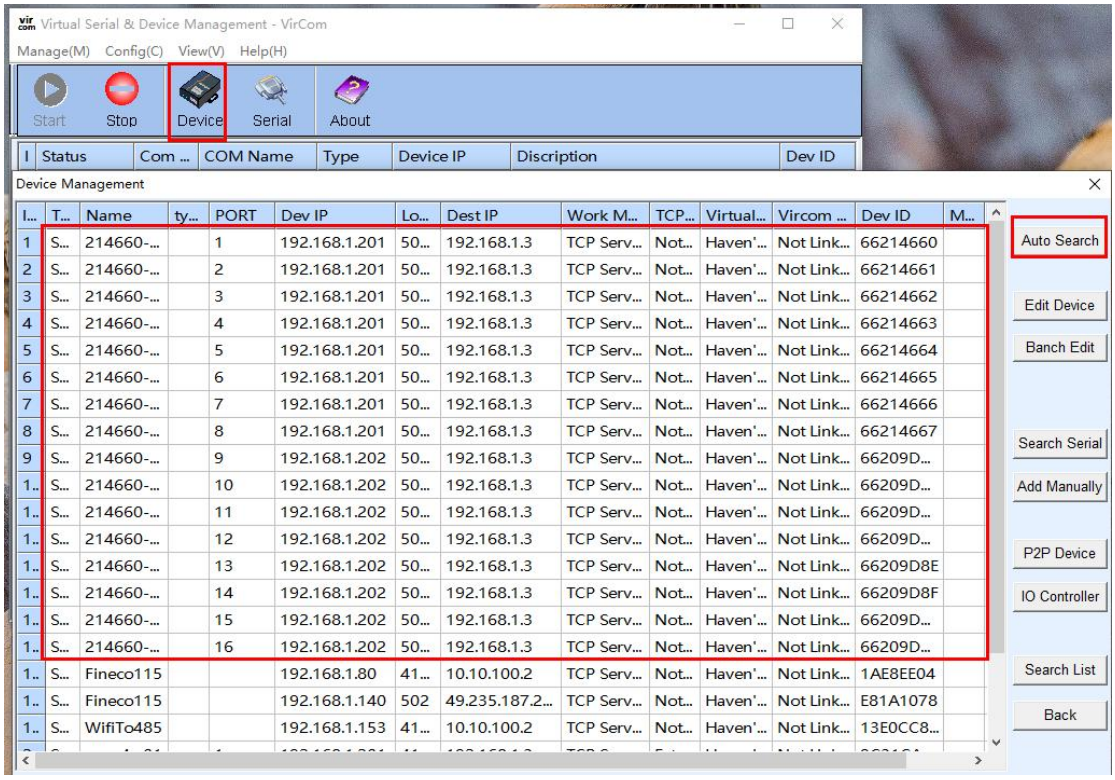
From left to right are the 220V AC power cords; One end is an RJ45 port with 568B wire sequence, and the other end is a wire harness with 8 exposed copper cores; RS485/422 to USB serial port cable; Network cable.

2.2 Wiring installation

As shown in the above figure, connect the serial port cable of RS485 to USB, connect the USB to the USB port on the computer side, and connect the pre prepared debugging cable (PIN6 and 7 pins correspond to green and white brown according to the 568B line sequence) to the RS485 terminal. Connect the NET1 port of the gateway device to the Ethernet cable of the point and shoot switch, connect the port 1 port to the RJ45 of the debugging cable, connect the power cord to a 220V AC socket, and connect the other end to the power interface of the device.

2.3 Interface login

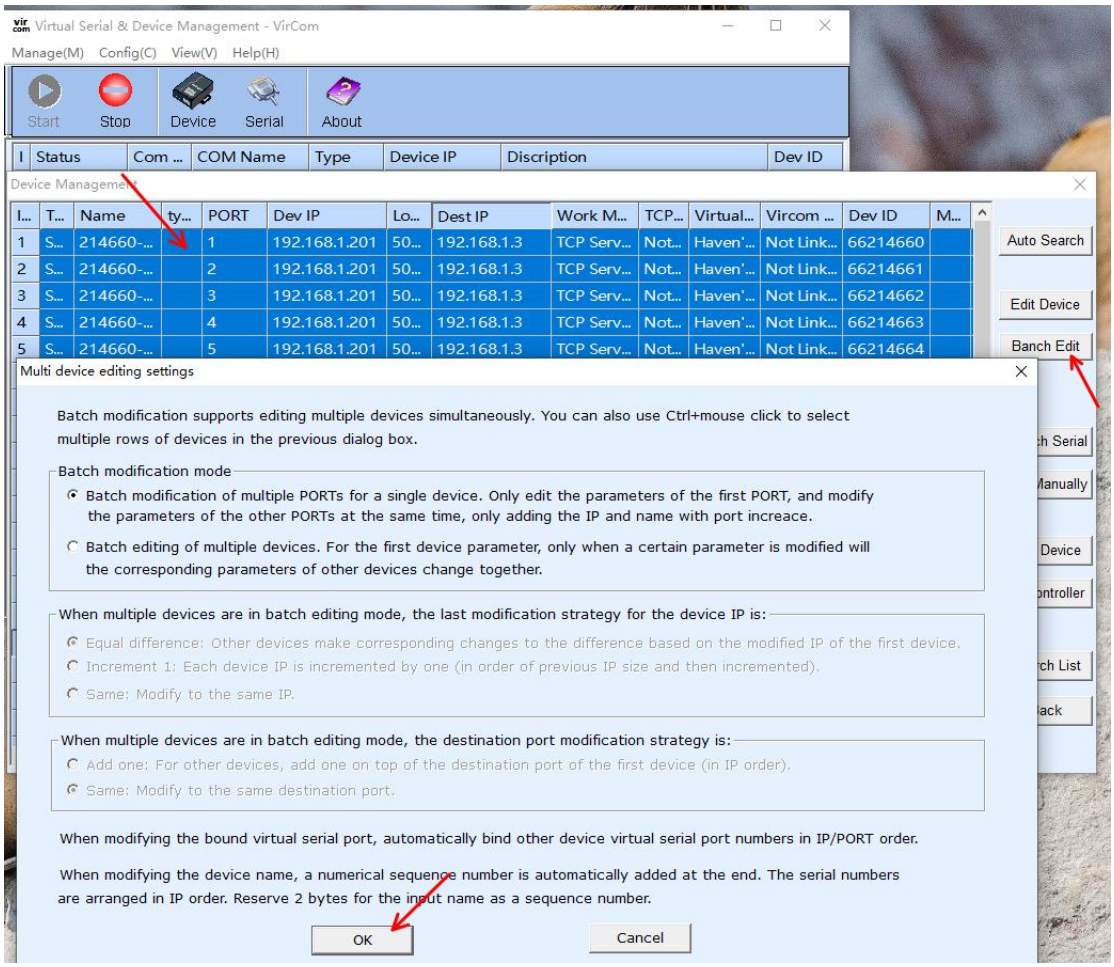
Gateway devices can be logged in using the client software vircom, which runs in a Windows based environment. You can also enter the default IP 192.168.1.200 (port1... port8)/192.168.1.201 (port9... port16) for the gateway in the browser. The prerequisite for logging into the webpage is that the computer can ping the device's IP.Choose one of the two methods at the same time.



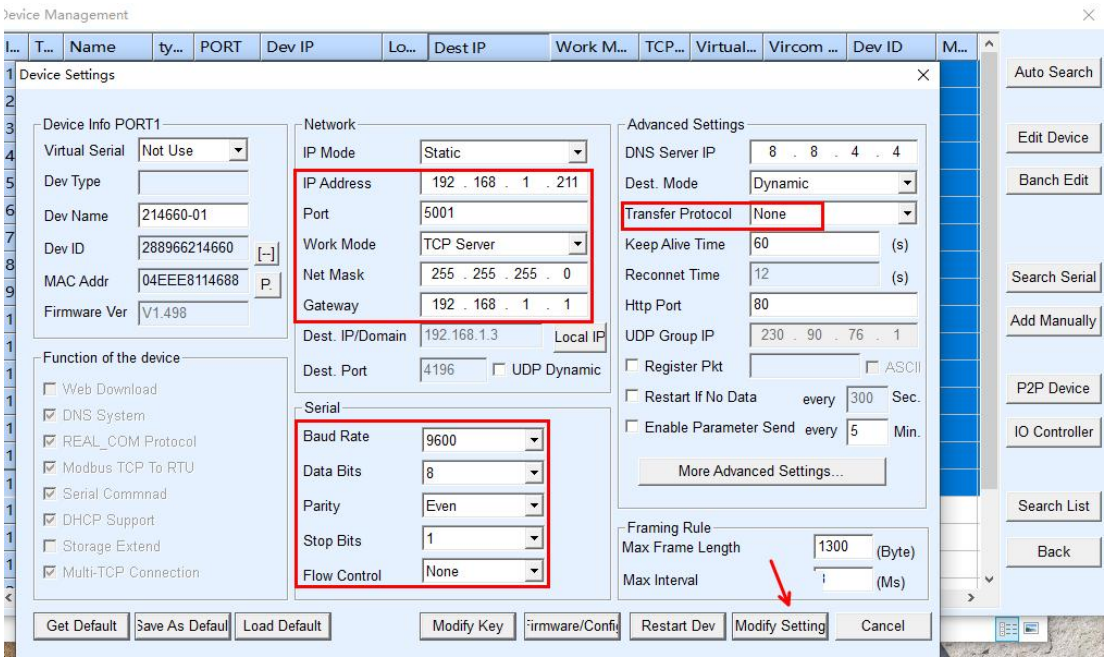
Connect the device network cable directly to the computer/connect to a point and shoot switch - open the vircom software, click on device management - auto search - to

search for 16 port channels, as shown in the red box in the figure.

If the usage of each channel is different, you can select the corresponding port channel and independently configure the relevant parameters. After modifying the parameters, go to "Modify Settings" and then "Auto Search" to enter the device settings interface to confirm that there are no errors.



If the usage requirements for all 16 channels are the same, except for the IP address/port number, the other baud rate parameters, working mode, conversion protocol, etc. are the same. As shown in the figure above, first select all the ports that need to be set in the device settings interface and turn them into blue selection mode. Then click batch editing, and a window will pop up as shown in the figure. Currently, it is modified for one device, so the selected mode is different channels for the same device. After selecting the corresponding options according to your actual needs, click OK to jump to the port1 port interface and set the parameters separately.

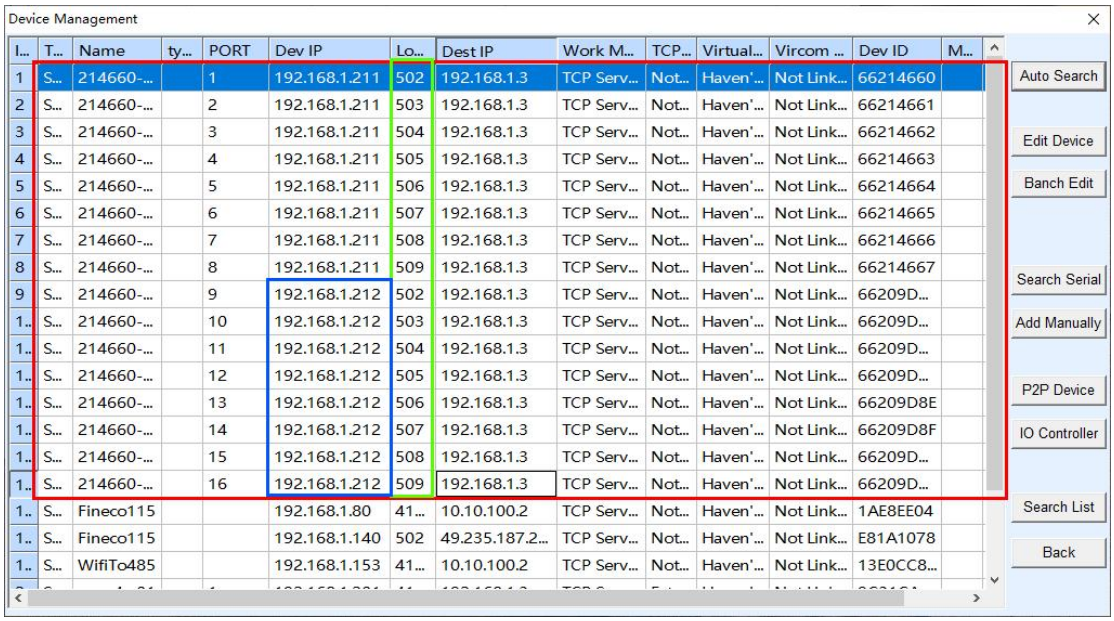


As shown in the figure, according to this principle, the configuration and use of

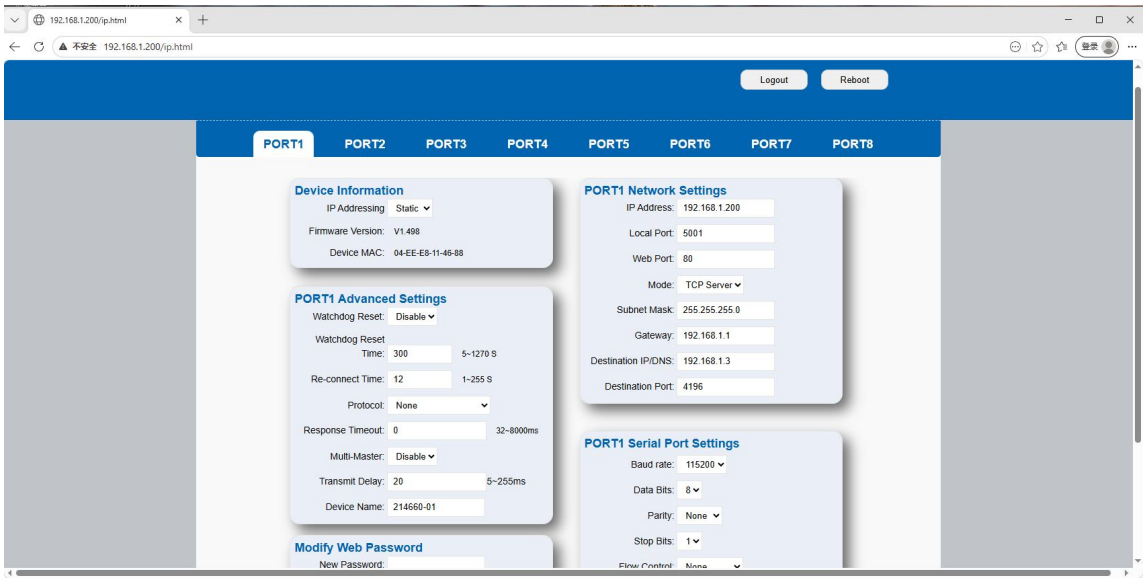
1. The IP address needs to be consistent with the network segment of the switch/router/network port device connected to the gateway network cable, with no conflicting tail numbers, consistent gateway subnet masks, and can only be pinged.

2. Whether the serial port parameters are set to be consistent with the device connected to the serial port;

3. Conversion Protocol: Choose none, transparent transmission, which means what data is transmitted through the serial port and what data is transmitted to the Ethernet; Choosing Modbus TCP requires converting the serial port Modbus RTU to Ethernet Modbus TCP; The application of virtual serial port is transparent transmission, converting the protocol to wireless



After the parameters are modified, automatically search and refresh again, and you will find that the device IP increases, the port number increases in turn, and other parameters are displayed exactly the same.



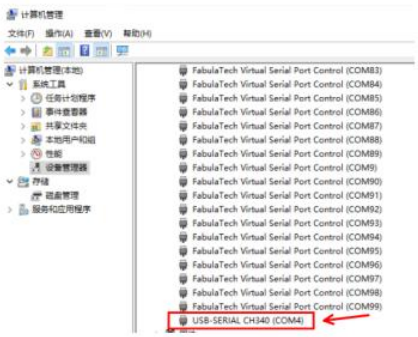
The webpage login is shown in the figure, with port1-port8 corresponding to 8 independent channels. Each channel interface has an independent parameter configuration section for configuring network parameters, serial port parameter conversion protocols, etc. Once configured, click submit to complete the configuration.

2.4 Functional Testing

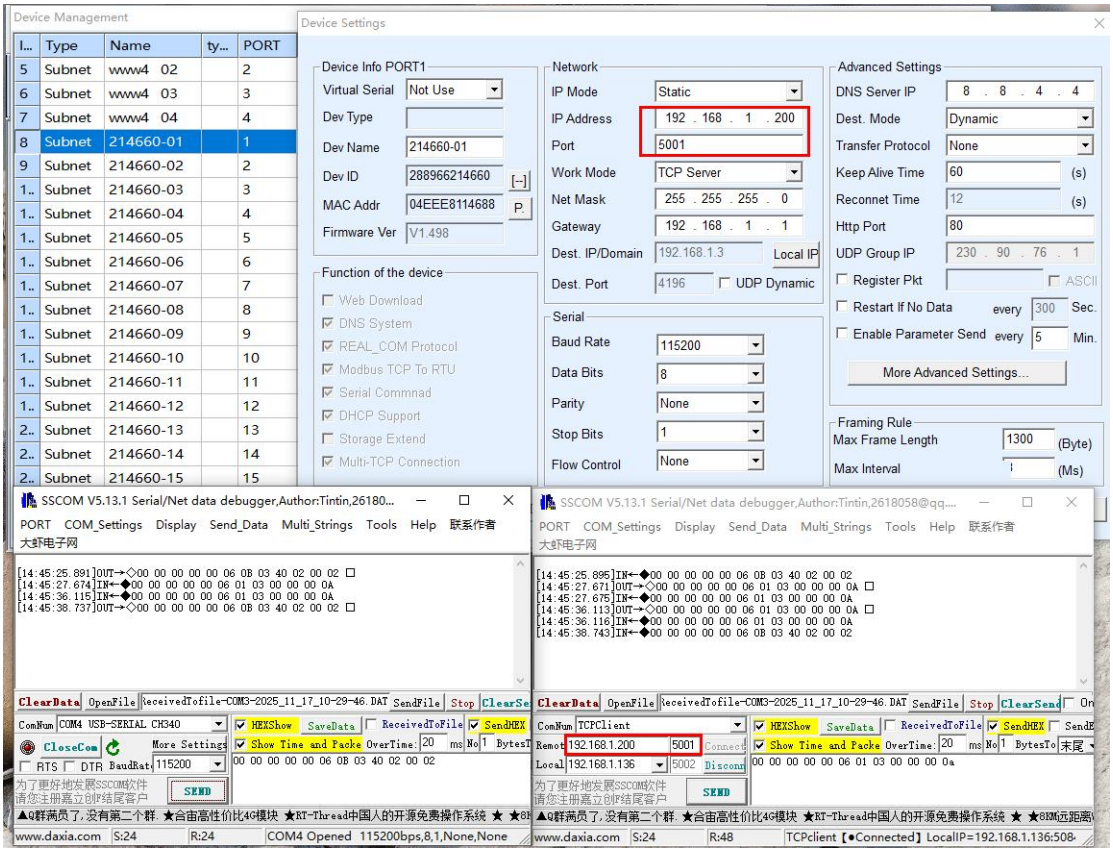
According to the above login method, enter and configure the parameters. We will explain the conversion protocol to "no" transparent transmission and the debugging and use of the conversion protocol: Modbus TCP.

2.4.1 Transparent transmission

The meaning of transparent transmission is that the communication protocol on the network side is consistent with the communication protocol of the serial port terminal device, and the gateway is only used as a channel for bidirectional transmission from the serial port to the network. In fact, it is the data exchange between the network host computer and the serial port terminal.



As shown in the above figure, when a USB is connected to a computer, the corresponding COM port 4 will be displayed in the computer management device manager port.



As shown in the figure, for testing transparent transmission, the conversion protocol is "none". Use the SSCOM debugging assistant software to select the corresponding com4 port, and set the serial port parameters to be consistent with the actual configuration parameters. 115200bps 8 None 1 None, click Open; Open another SSCOM debugging assistant software and select TCP client mode, because the gateway's working mode is TCP server, with the destination IP and destination port pointing to IP 192.168.1.200 and port 5001 of gateway port 1, respectively, and then click connect. When the software shows that it is connected, the green light on the port1 serial port will remain on. At this time, test whether the serial port can receive data from the network normally and whether the reception is correct; Vice versa.

2.4.2 Modbus TCP protocol conversion

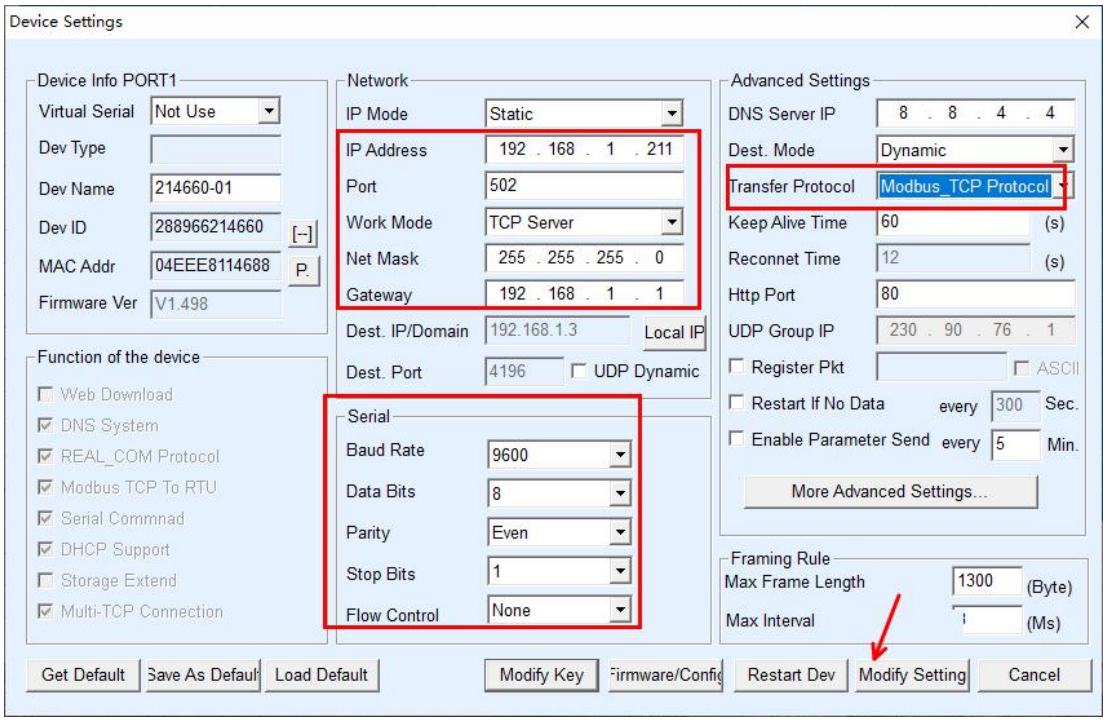
There are two types of Modbus TCP protocol conversion:

1. Simple format change, that is, from serial port Modbus RTU to network Modbus TCP, without changing the content of the data format conversion, which has no point limit

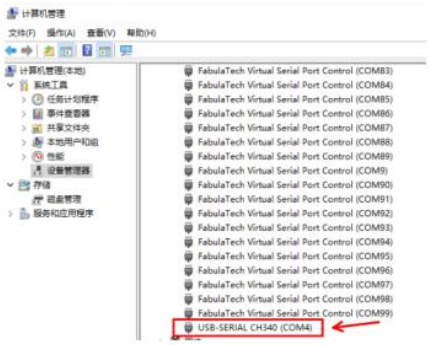
and is equivalent to a transmission channel;

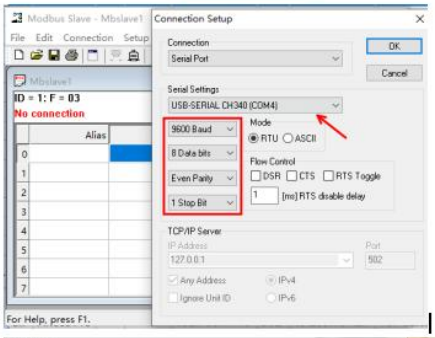
2. Programmable, download the Modbus RTU instruction into our device to map the Modbus TCP address to one instruction to read all devices. The serial port polls at a set time, and the upper computer reads the data already obtained by the device. This requires device memory, so there is a limit on the number of register points. The number of register points per channel of this device is about 500.

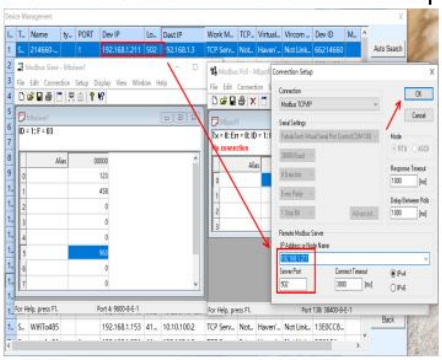
The following mainly discusses the first use of Modbus TCP communication.



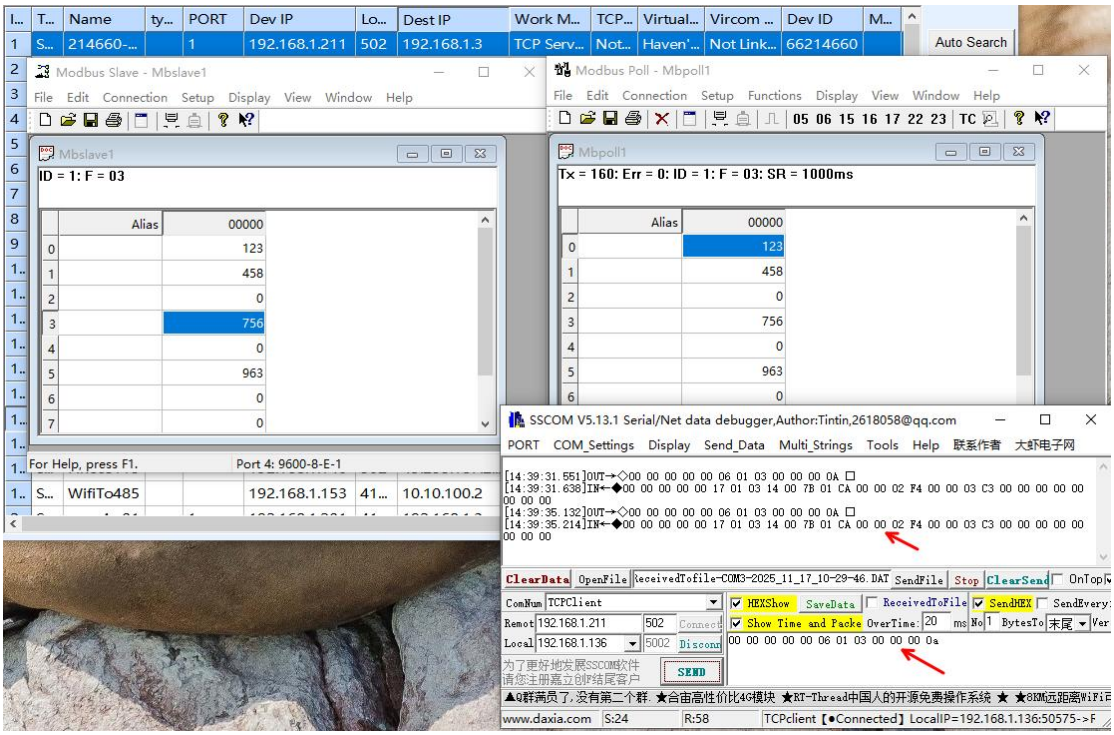
As shown in the figure, configure network parameters such as IP address, work mode TCP server mode, serial port parameters and device parameters connected to the serial port are consistent, conversion protocol: Modbus TCP.





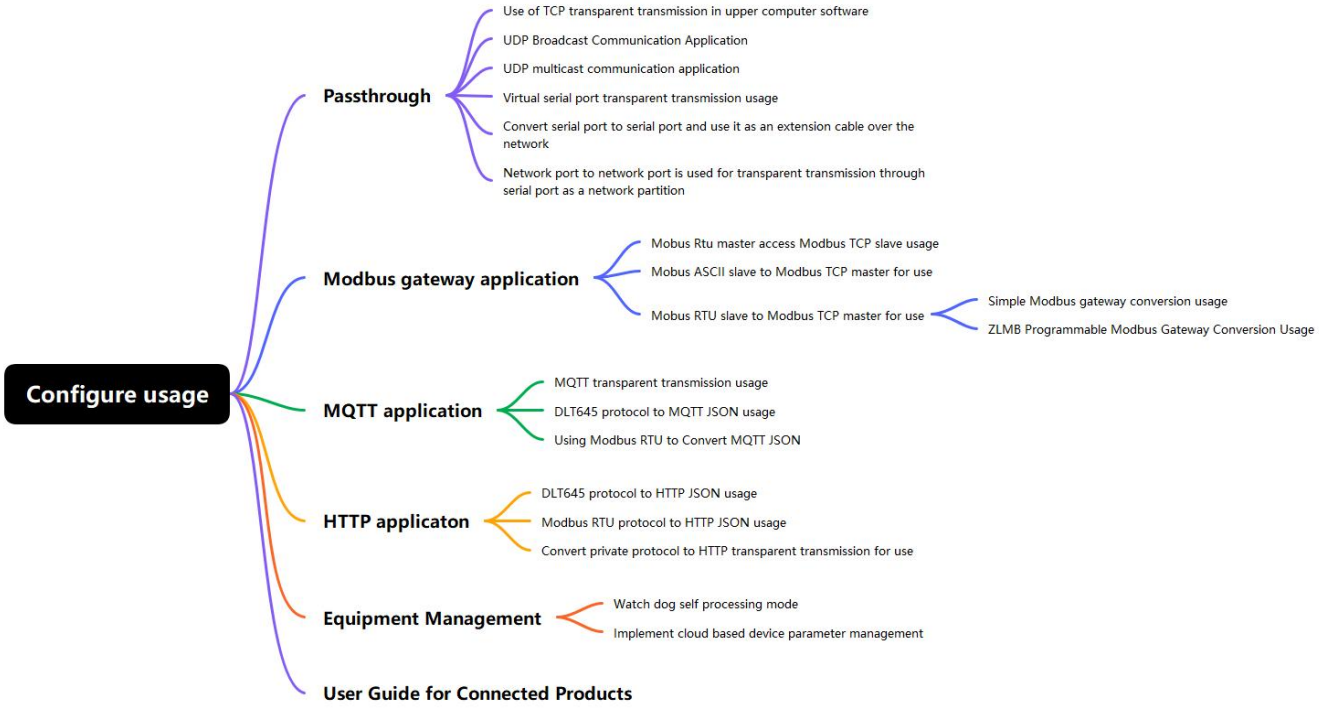


If shown, confirm the com4 port corresponding to the USB port, use Modbus slave software to simulate the slave terminal device, correspond to com4, and have the same serial port parameters as the gateway, 9600bps, 8 even 1 none, select the Rtu format, and click OK; The network part uses Modbus Pol software to simulate the main station upper computer software, selects Modbus TCP protocol driver, connects IP192.168.1.211 on port 1 and port 502, and clicks OK.



After the connection is made, as shown in the figure, the Modbus slave slave software sets arbitrary values, and the Modbus pole software can correctly read the same device address, function code, and register address, indicating normal communication. You can also use third-party debugging assistant software to send standard Modbus TCP format instructions to read data.

3. Function Expansion



This series of products has many functions that can be flexibly configured and used according to different application scenarios of customers, and relevant functional documents can be referenced.

4. After-sales service and Technical Support

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