USR-TCP232-410s User Manual

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Features

- 10/100Mbps Ethernet interface and support Auto-MDI/MDIX.
- Support TCP Server, TCP Client, UDP Client, UDP Server, HTTP Client.
- Support configuring through Web Server
- Support RS232 and RS485 and they can work independently.
- Support RTS/CTS hardware flow control and Xon/Xoff software flow control.
- Support USR-VCOM.
- Support Modbus Gateway.
- Support serial port baud rate 600bps~230.4K bps; support None, Odd, Even, Mark, Space parity way.
- Support Static IP or DHCP.
- Support Websocket function.
- Support Reload button to reset to default settings by hardware way.
- Support Keep-alive.
- Support timeout restart function and timeout reconnect function.

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1. Get Start

Product link:
https://www.usriot.com/products/modbus-serial-to-ethernet-converter.html
Setup software:
https://www.usriot.com/support/downloads/usr-tcp232-m4k3-setup-software.html

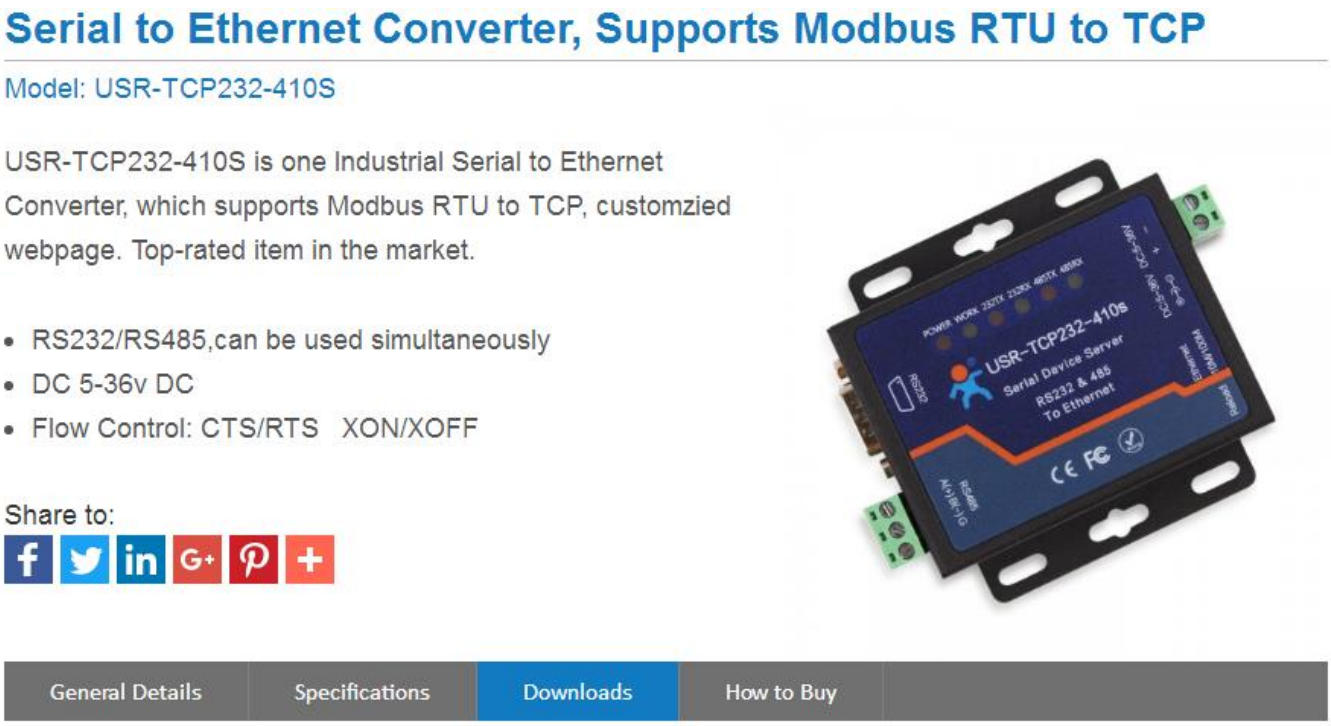


Figure 1 Download Page

If user has any question, please submit it back to customer center: **h.usriot.com**

1.1. Application Diagram



Figure 2 Application diagram

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1.2. Hardware Design

1.2.1. Hardware Dimensions

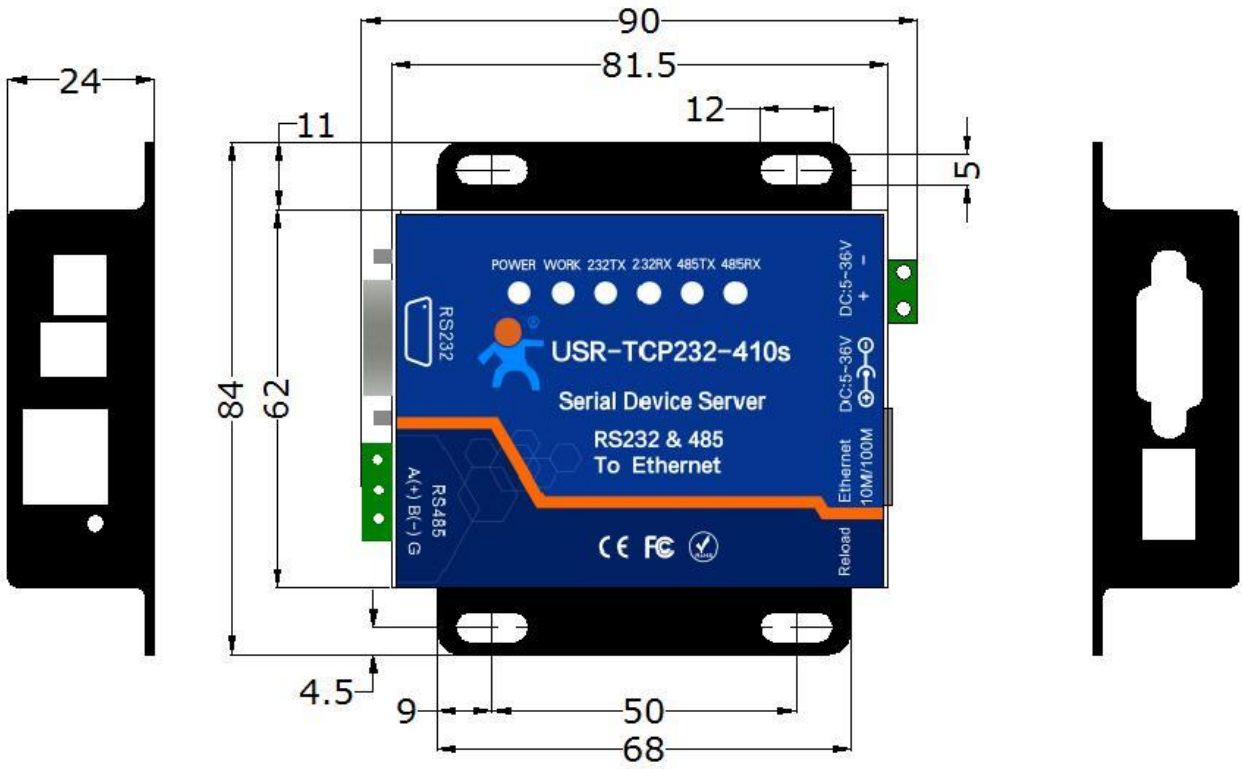


Figure 3 Hardware dimensions

1.2.2. LED

LED	Status
POWER	Light: Power on
	Off: Power off
WORK	Blink: Working normally
	Off or light: Not working normally
232TX	Blink: Sending data to serial(RS232)
	Off: No data sending to serial(RS232)
232RX	Blink: Receiving data from serial(RS232)
	Off: No data receiving from serial(RS232)
485TX	Blink: Sending data to serial(RS485)
	Off: No data sending to serial(RS485)
485RX	Blink: Receiving data from serial(RS485)
	Off: No data receiving from serial(RS485)

Figure 4 LED

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2. Product Functions

This chapter introduces the functions of USR-TCP232-410s as the following diagram shown, you can get an overall knowledge of it.

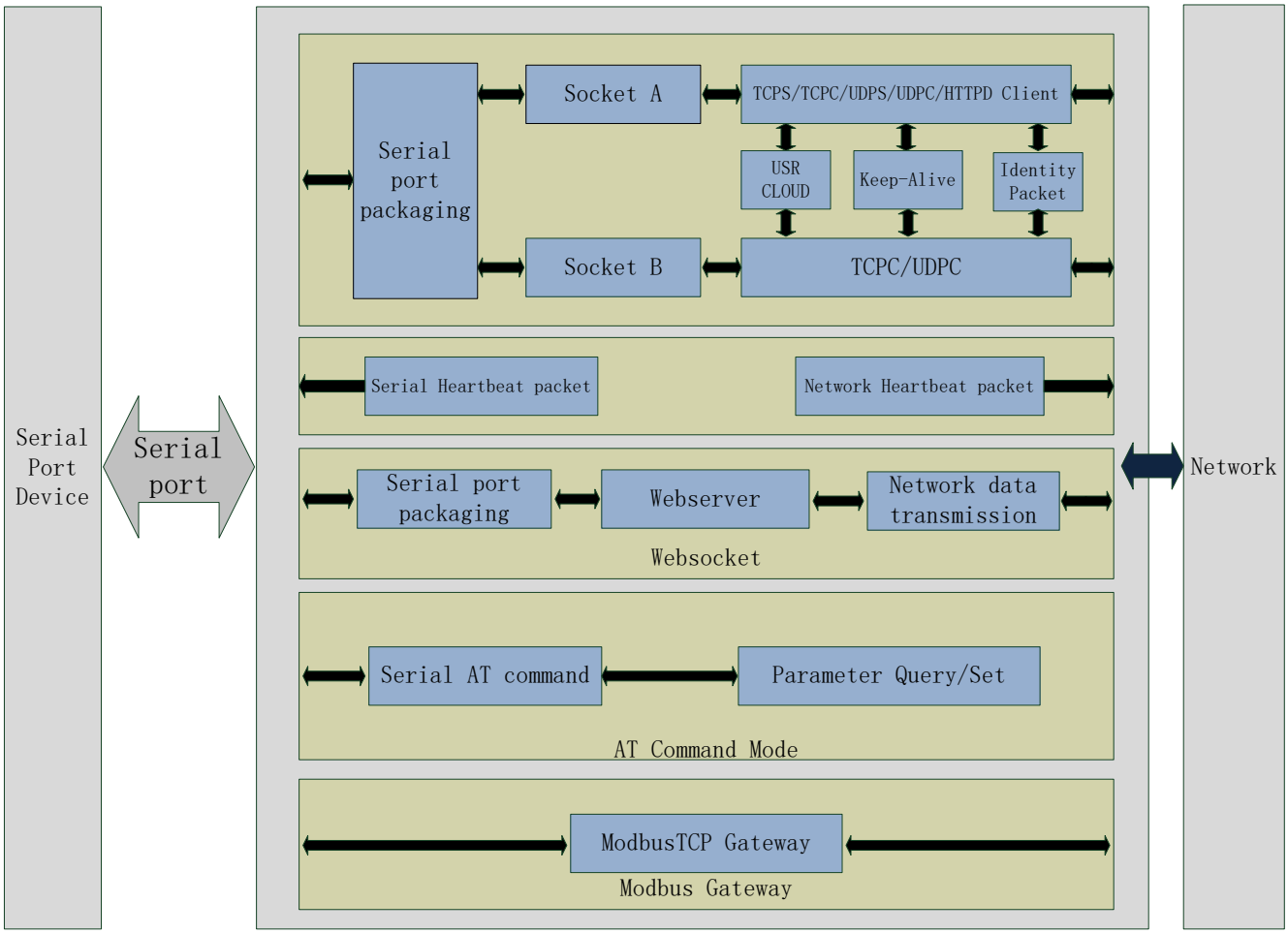


Figure 5 Product Functions diagram

2.1. Basic Functions

2.1.1. Static IP/DHCP

There are two ways for module to get IP address: Static IP and DHCP.

Static IP: Default setting of module is Static IP and default IP is 192.168.0.7. When user configures module in Static IP mode, user need set IP, subnet mask and gateway and must pay attention to the relation among IP, subnet mask and gateway.

DHCP: Module in DHCP mode can dynamically get IP, Gateway, and DNS server address from Gateway Host. When user connects 410s directly to PC, module can't be set in DHCP mode. Because common computer does not have the ability to assign IP addresses.

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2.1.2. Reset to default settings

Hardware: Power off the 410s and press Reload button, then power on the 410s and keep pressing Reload button over 5 seconds can reset to default settings.

Software: User can also reset to default settings through setup software for 410s.

AT command: User can send AT+RELD to reset to default settings.

2.2. Socket functions

410s supports dual sockets mode. Socket A supports TCP Server, TCP Client, UDP Server, UDP Client and HTTP Client. Socket B supports TCP Client and UDP Client.

2.2.1. TCP Client

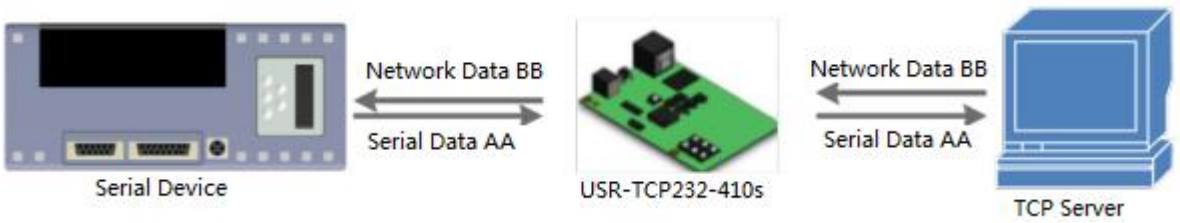


Figure 6 TCP Client

TCP Client provides Client connections for TCP network services. TCP Client device will connect to server to realize data transmission between the serial port device and server. According to the TCP protocol, TCP Client has connection/disconnection status differences to ensure reliable data transmission.

TCP Client mode supports Keep-Alive function: After establishing connection, 410s will send Keep-Alive package in every 15 second to check TCP connection and 410s will disconnect and reconnect to server if any connection exception occurs. TCP Client mode also supports baud rate synchronization, USR Cloud and Modbus gateway.

410s works in TCP Client mode needs connect to TCP Server and needs set the parameter: Remote IP/Port. 410s works in TCP Client won't accept other connection request except target server and will access server with random local port if configuring local port to 0.

2.2.2. TCP Server

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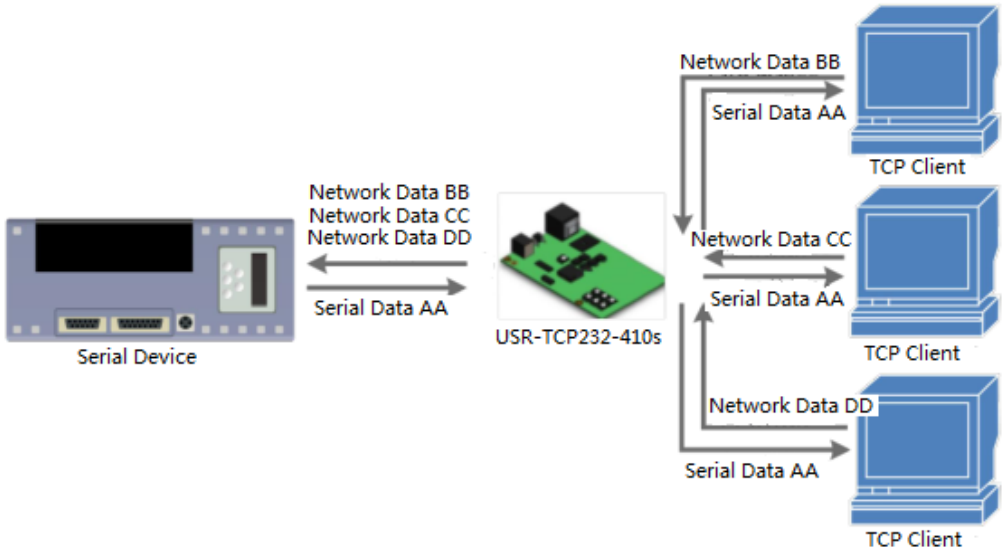


Figure 7 TCP Server

410s works in TCP Server mode will listen network connections and build network connections, commonly be used for communication with TCP clients on a LAN. According to the TCP protocol, TCP Server has connection/disconnection status differences to ensure reliable data transmission.

410s works in TCP Server mode will listen local port which user set and build connection after receiving connection request. Serial data will be sent to all TCP Client devices connected to 410s in TCP Server mode simultaneously.

410s works in TCP Server mode supports 8 client connections at most. 410s also supports Keep-Alive function, baud rate synchronization and Modbus gateway.

2.2.3. UDP Client

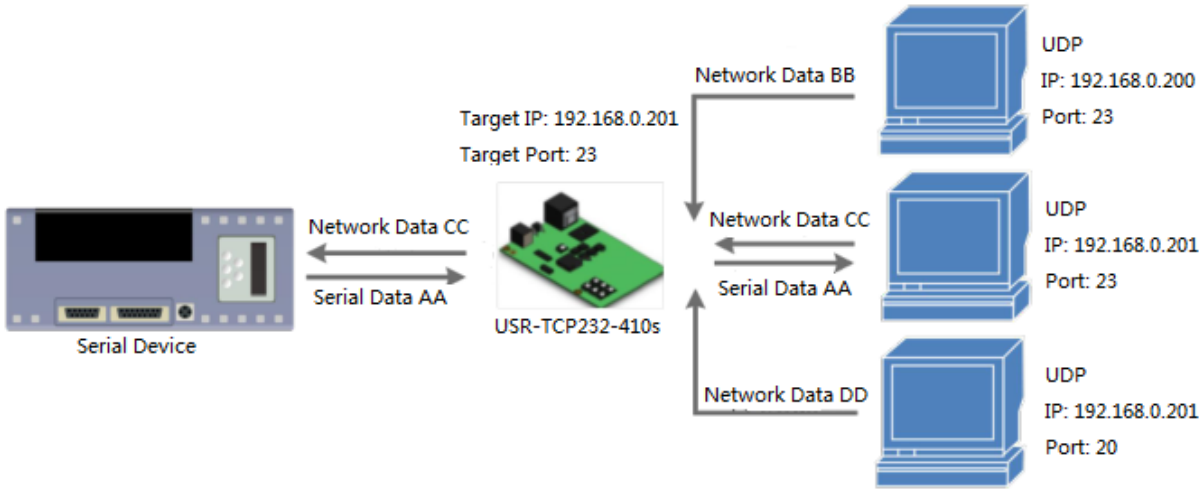


Figure 8 UDP Client

UDP transport protocol provides simple and unreliable communication services. No connection connected /disconnected. User only needs to configure Remote IP/Port then can realize data transmission.

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In UDP Client mode, 410s will only communicate with Remote IP/Port. If data don't from Remote IP/Port, it won't be received by 410s.

In UDP Client mode, if user configure Remote IP to 255.255.255.255, 410s can achieve UDP broadcast to all network segment and receive broadcast data. User can also configure Remote IP to xxx.xxx.xxx.255 to realize UDP broadcast in same network segment.

2.2.4. UDP Server

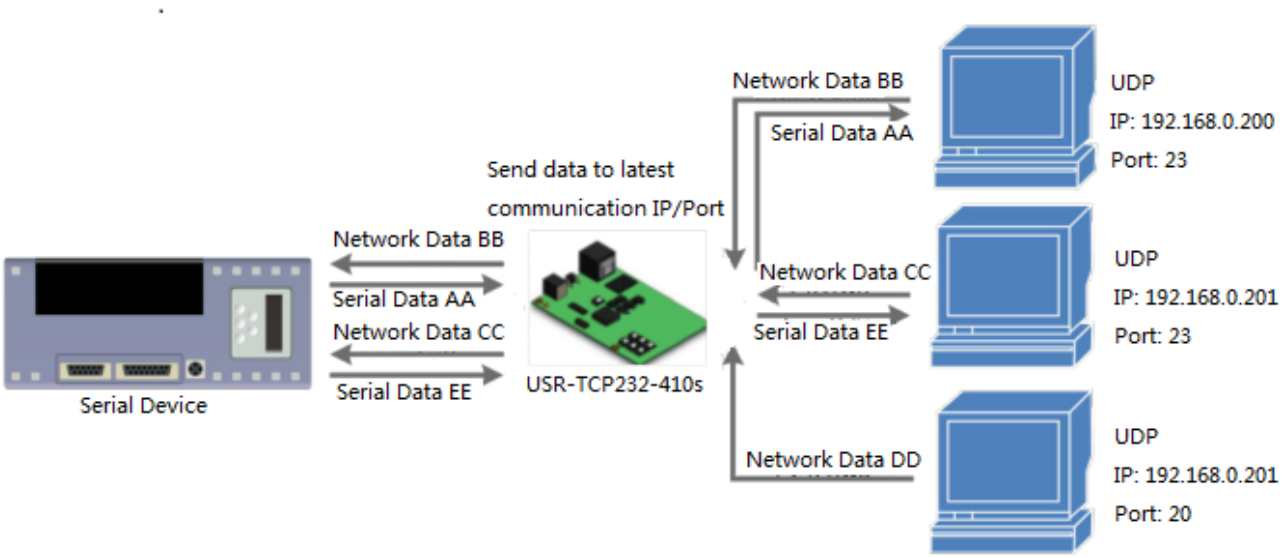


Figure 9 UDP Server

In UDP Server mode, 410s will change Remote IP every time after receiving UDP data from a new IP/Port and will send data to latest communication IP/Port.

2.2.5. HTTP Client



Figure 10 HTTP Client

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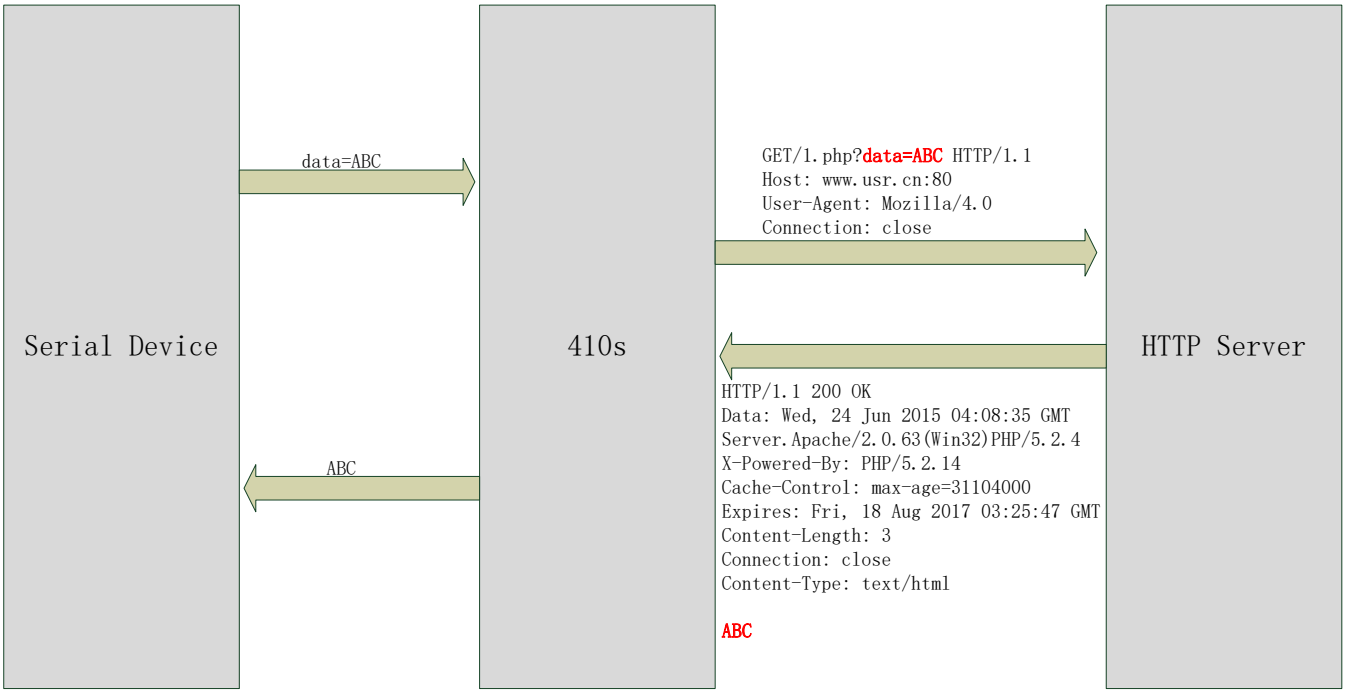


Figure 11 HTTP Client

In HTTP Client mode, 410s can achieve data transmission between serial port device and HTTP server. User just needs to configure 410s in HTTP Client and configure the HTTP header, URL and some other related parameters, then can achieve data transmission between serial port device and HTTP server and don't need care about the HTTP format of data.

2.2.6. WebSocket



Figure 12 WebSocket

WebSocket function can achieve real-time interaction between RS232 interface and Web Server and display user data on Web Server.

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2.3. Serial port

2.3.1. Serial port basic parameters

Parameters	Range
Baud Rate	600~230.4Kbps
Data Bits	5, 6, 7, 8
Stop Bits	1, 2
Parity Bits	None, Odd, Even, Mark, Space

Figure 13 Serial port basic parameters

2.3.2. VCOM Application

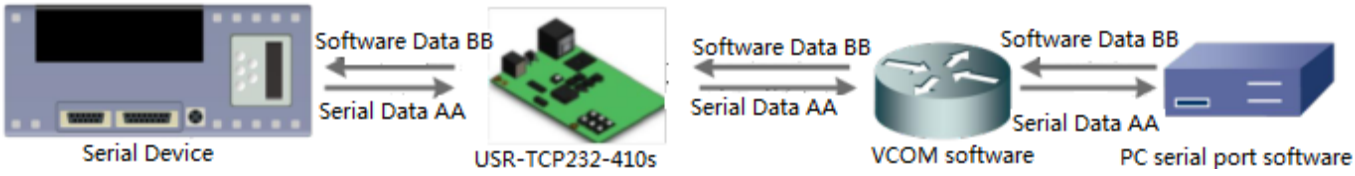


Figure 14 VCOM application

User can download VCOM software from:
https://www.usriot.com/support/downloads/usr-vcom-virtual-serial-software.html.

Through this software user can set up connection between 410s and virtual serial to solve the problem that traditional equipment PC software used in serial port communication way.

2.3.3. Flow Control

410s supports hardware flow control way (RTS/CTS, only take effect in RS232 mode) and software flow control way Xon/Xoff.

2.3.4. Serial package methods

For network speed is faster than serial. Module will put serial data in buffer before sending it to network. The data will be sent to network side as data package. There are 2 ways to end the package and send package to network side - Time Trigger Mode and Length Trigger Mode.

- 410s serial package time: Default is 4 bytes sending time, range from 0 to 255.
- 410s serial package length: Default is 1460 bytes, range from 0 to 1460.

2.3.5. Baud rate synchronization

When module works with USR devices or software, serial parameters will change dynamically according to network protocol. User can modify serial parameters by sending data conformed to specific protocol via network. It is temporary, after restarting DTU, the parameters will back to original parameters.

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2.4. Features

2.4.1. Identity packet function

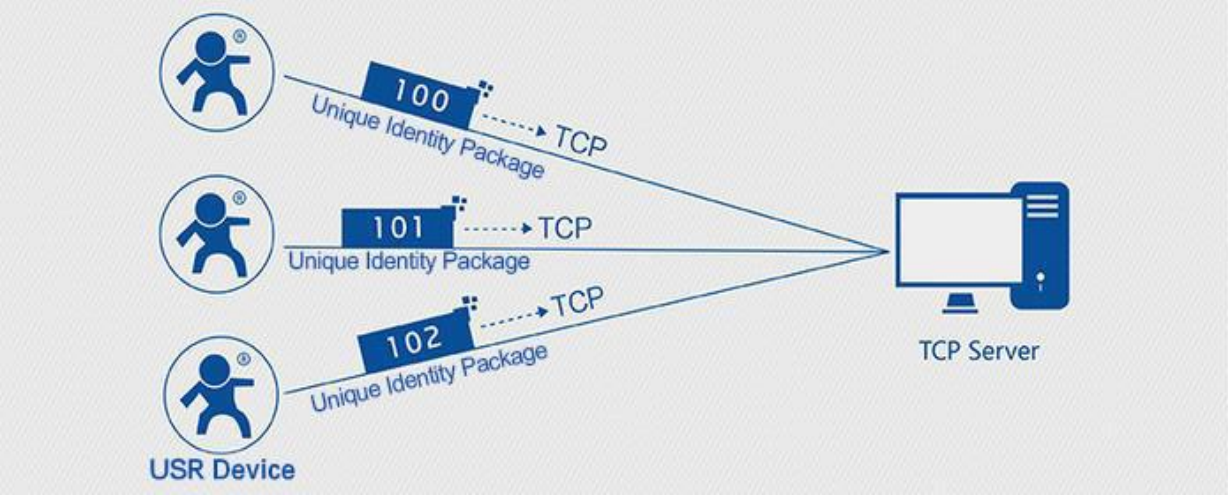


Figure 15 Identity Packet application diagram

Identity packet is used for identifying the device when 410s works as TCP client/UDP client. There are two methods to send identity packet.

- Identity packet will be sent after connection is established.
- Identity packet will be added on the front of every data package.

Identity packet can be MAC address or user editable identity packet. User editable identity packet should less than 40 bytes.

2.4.2. Heartbeat packet function

Heartbeat packet: 410s will output heartbeat packet to serial side or network side periodic. User can configure the heartbeat packet data and sending interval. Serial heartbeat packet can be used for polling Modbus data. Network heartbeat packet can be used for showing connection status and keeping the connection (only take effect in TCP/UDP Client mode).

2.4.3. Non-persistent connection

410s support non-persistent connection function in TCP Client mode. When 410s adopts this function, 410s will connect to server and send data after receiving data from serial port side and will disconnect to server after sending all the data to server and no data from serial port side over 3s.

2.4.4. Modbus gateway

Modbus gateway includes: Modbus RTU transparent transmission, Modbus ASCII transparent transmission, Modbus RTU<=>Modbus TCP protocol conversion, Modbus polling and serial port query.

Modbus RTU<=>Modbus TCP: Set 410s in TCP Server or TCP Client mode, then user can set 410s with Modbus

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RTU<=>Modbus TCP function. Data transmission diagram as follow:

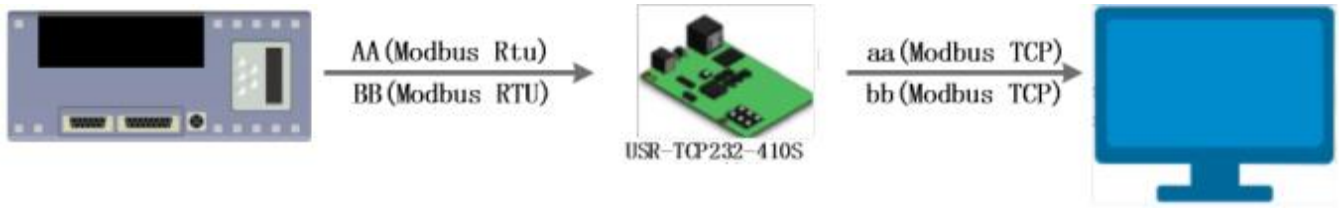


Figure 16 Modbus RTU<=>Modbus TCP

Modbus polling: 410s support Modbus polling function.

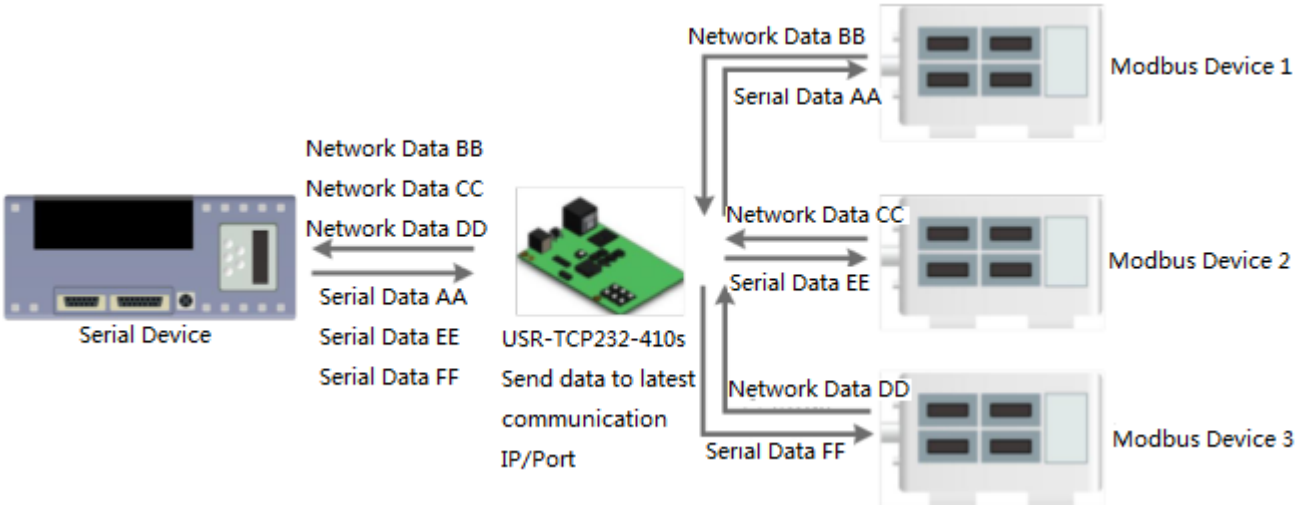


Figure 17 Modbus polling

2.4.5. Network printing

The network printing function is similar to the printer server. Through the existing printing driver, it can be modified slightly and realize the network printing function by the original serial printer.

2.4.6. Editable Web Server

410s supports modifying the Web Server based on template according to needs, then using related tool to upgrade. If user has this demand can contact to our salespersons for Web Server source and tool.

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3. Parameter Setting

There are three ways to configure USR-TCP232-410s. They are setup software, Web Server and AT command.

3.1. Setup software

User can download setup software from https://www.usriot.com/support/downloads/usr-tcp232-m4k3-setup-software.html. When user want to configure the 410s by setup software, user can run setup software, search 410s in same LAN and configure the 410s as follow:

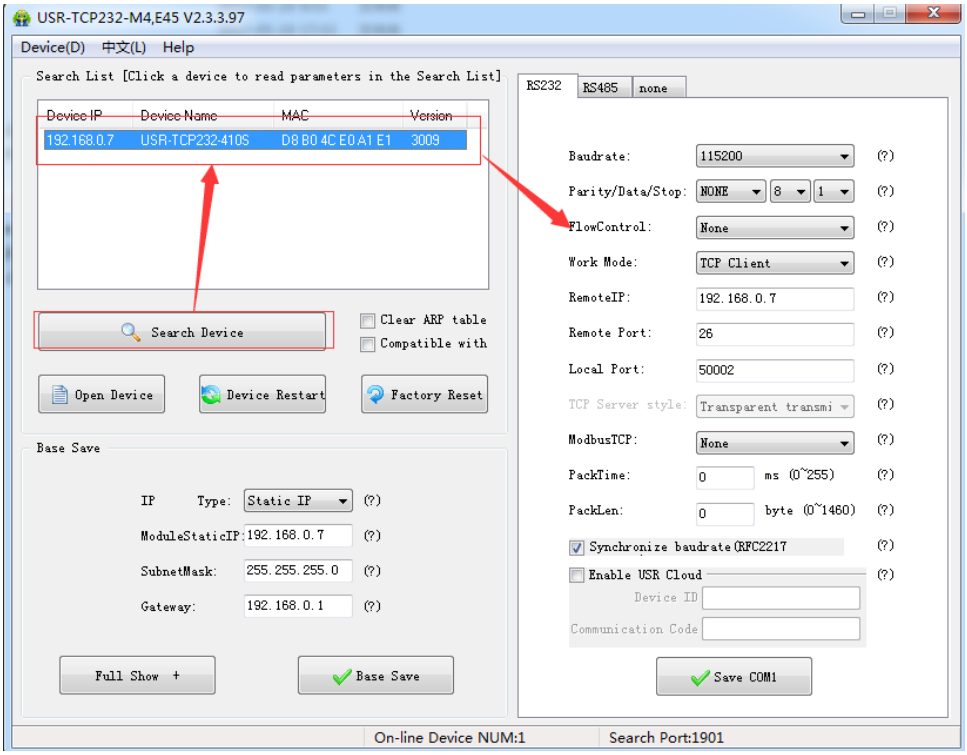


Figure 18 Setup software

After researching 410s and clicking 410s to configure, user need log in with user name and password. Default user name and password both are admin. If user keep the default parameters, it is not necessary to log in.

3.2. Web Server

User can connect PC to 410s through LAN port and enter Web Server to configure.

Web Server default parameters as follow:

Parameter	Default settings
Web server IP address	192.168.0.7
User name	admin
Password	admin

Figure 19 Web server default parameters

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After firstly connecting PC to 410s, user can open browser and enter default IP 192.168.0.7 into address bar, then log in user name and password, user will enter Web Server. Web Server screenshot as follow:

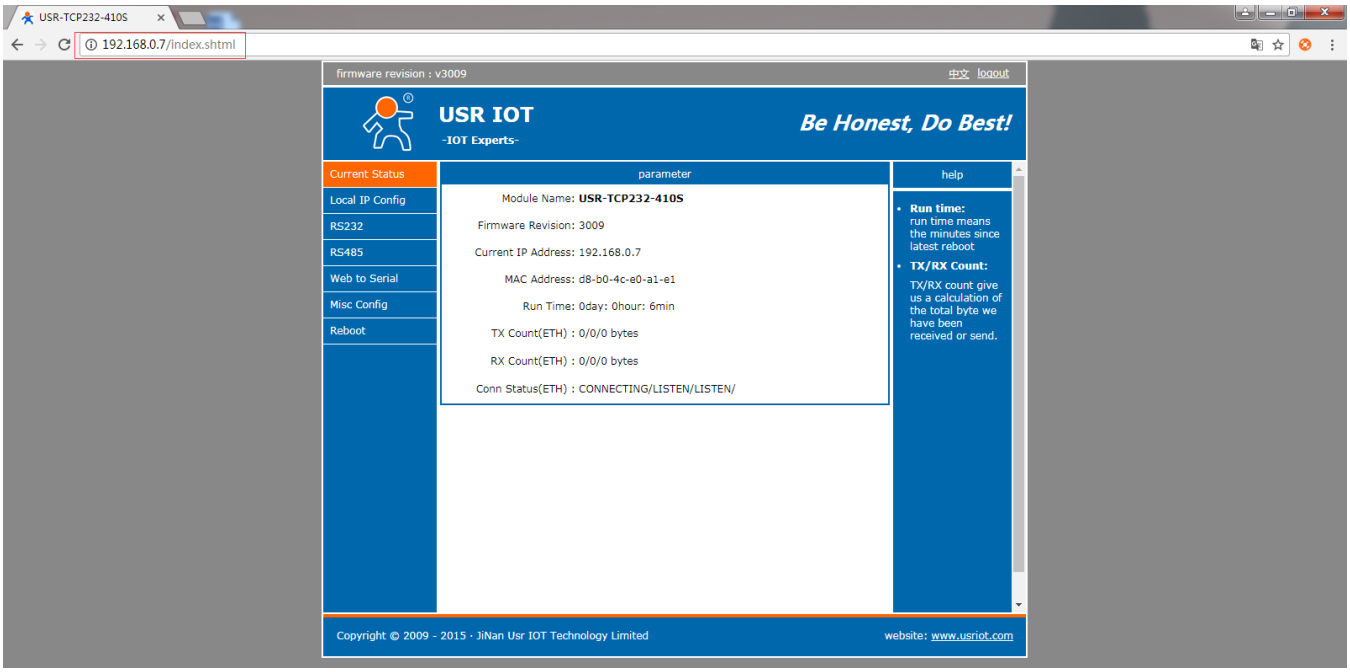


Figure 20 Web Server

3.3. AT command

We have specific user manual for AT commands.

3.3.1. Serial AT command

In work mode, user can enter AT command mode and send AT commands to module to configure the module. For entering AT command mode, please refer to this FAQ:
https://www.usriot.com/support/faq/enter-serial-command-mode.html.

3.3.2. Network AT command

Network AT command is to send a search keyword by broadcast, then set the parameters in a single broadcast way(If user want to use network AT command, module and PC which send the network AT command must in same network segment). Default keyword is **WWW.USR.CN** and default port number is 48899. If user enter network AT command mode but don't send any command over 30 seconds, module will exit network AT command mode. User can enter network AT command mode as follow way:

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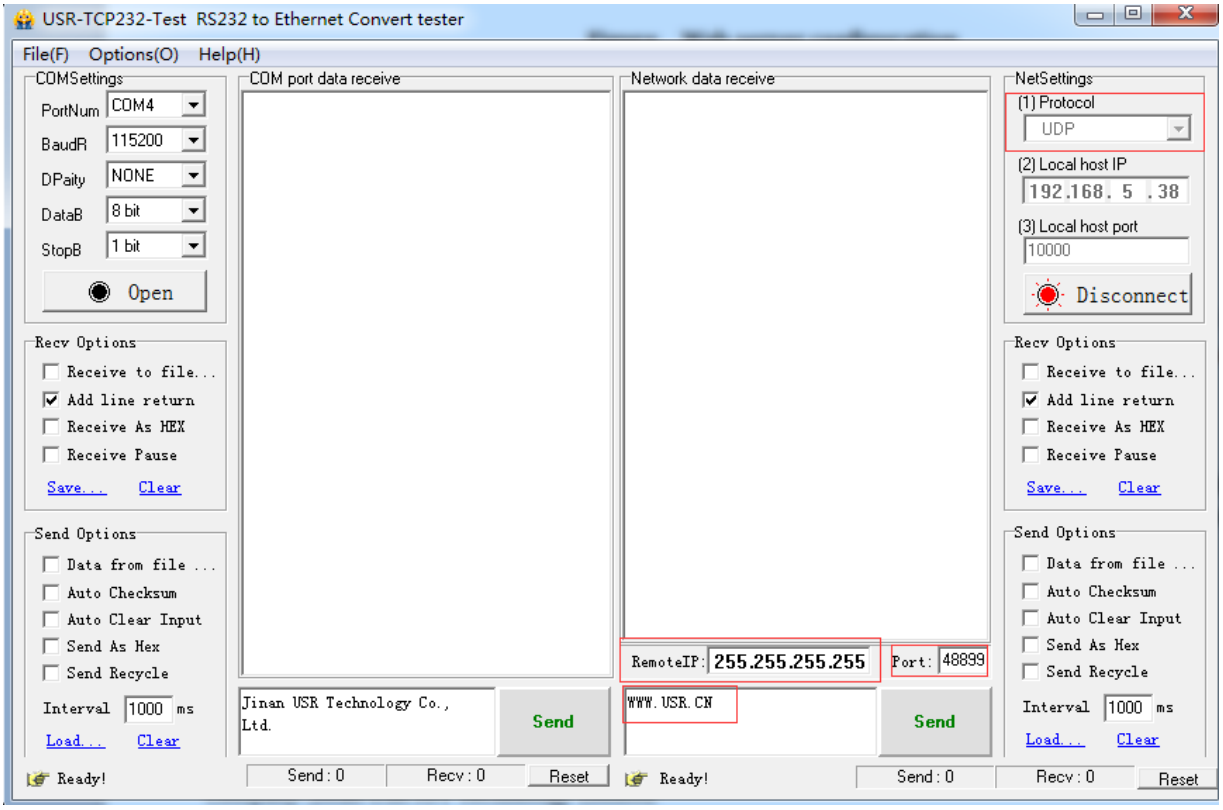


Figure 21 Network AT Command

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4. Contact Us

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6. Update History

2017-11-06 V1.1.1.01 established based on Chinese version V1.1.1.
2018-06-05 V1.1.1.02 updated. Modified **2.2.6. WebSocket**. Updated web page link and some pictures. Modified some words to standard terms. Corrected grammar mistakes. Optimized whole manual format.

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