USR-N520 User Manual

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Features

- 10/100Mbps Ethernet port, support Auto-MDI/MDIX.
- Support TCP Server, TCP Client, UDP Client, UDP Server, HTTPD Client.
- Two serial ports both support two sockets.
- Two serial ports can work independently.
- 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 web server configuration.
- Support serial port 1 Websocket function.
- Support hardware Reload.
- Support Keep-alive.
- Support two serial ports LED.
- Support RS232/RS485/RS422.

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1. Get Start

Product link:
http://www.usriot.com/p/rs232-rs485-rs422-ethernet-converter/
Setup software:
http://www.usriot.com/usr-tcp232-m4k3-setup-software



Figure 1 Download Page

If you have any question, please submit it back to customer center: **http://h.usriot.com**

1.1. Application Diagram



Figure 2 Application diagram

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1.2. Hardware Design

1.2.1. Hardware Dimensions

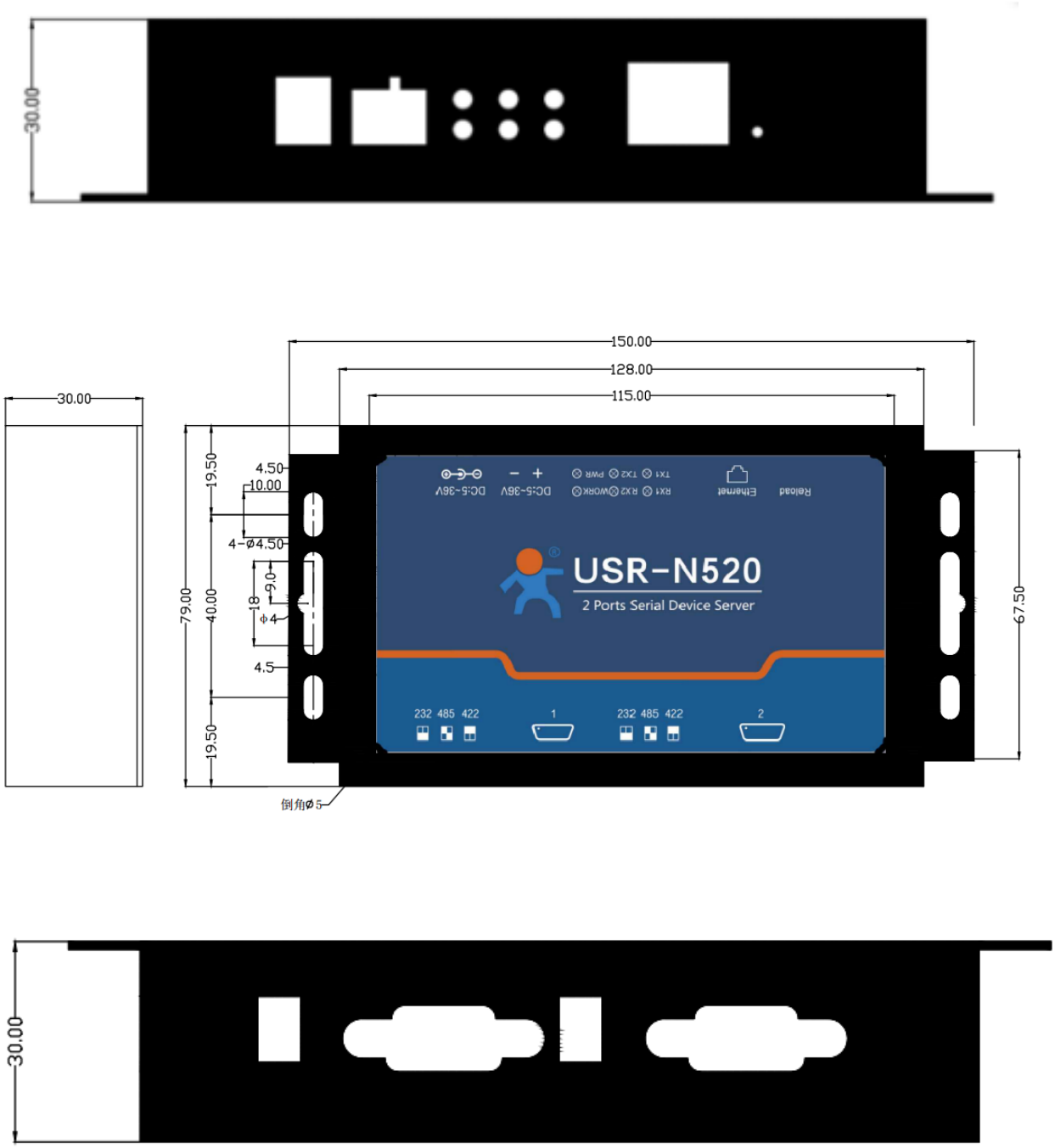


Figure 3 Hardware dimensions

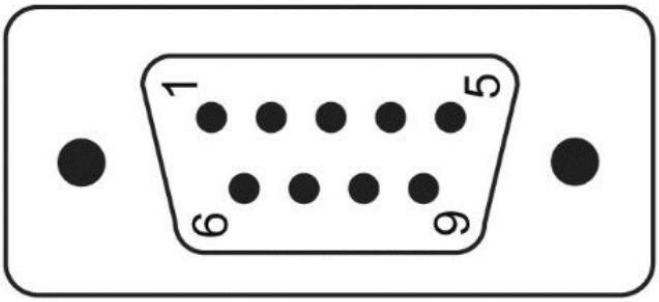
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1.2.2. LED Indicator

Indicator	Status
PWR	On: Power on
	Off: Power off
WORK	On: Working
	Off: Not working
TX1	On: Serial port 1 sending data
	Off: Serial port 1 no data sending
RX1	On: Serial port 1 receiving data
	Off: Serial port 1 no data receiving
TX2	On: Serial port 2 sending data
	Off: Serial port 2 no data sending
RX2	On: Serial port 2 receiving data
	Off: Serial port 2 no data receiving

Figure 4 Hardware Indicator

1.2.3. DB9 Pin definition



Pin Number	RS232	RS422	RS485
1			
2	RXD	RX+	
3	TXD	TX-	B-
4			
5	GND		
6			
7	RTS	TX+	A+
8	CTS	RX-	
9			

Figure 5 DB9 Pin definition

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1.2.4. DB9 Pinboard

We provide DB9 pinboard for user to use terminal connection.



Type	1	2	3	4	5
RS232		TX	RX		GND
RS485	A+	B-			GND
RS422	T+	T-	R+	R-	GND

Figure 6 DB9 pinboard

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2. Product Functions

This chapter introduces the functions of USR-N520 as the following diagram shown, you can get an overall knowledge of it.

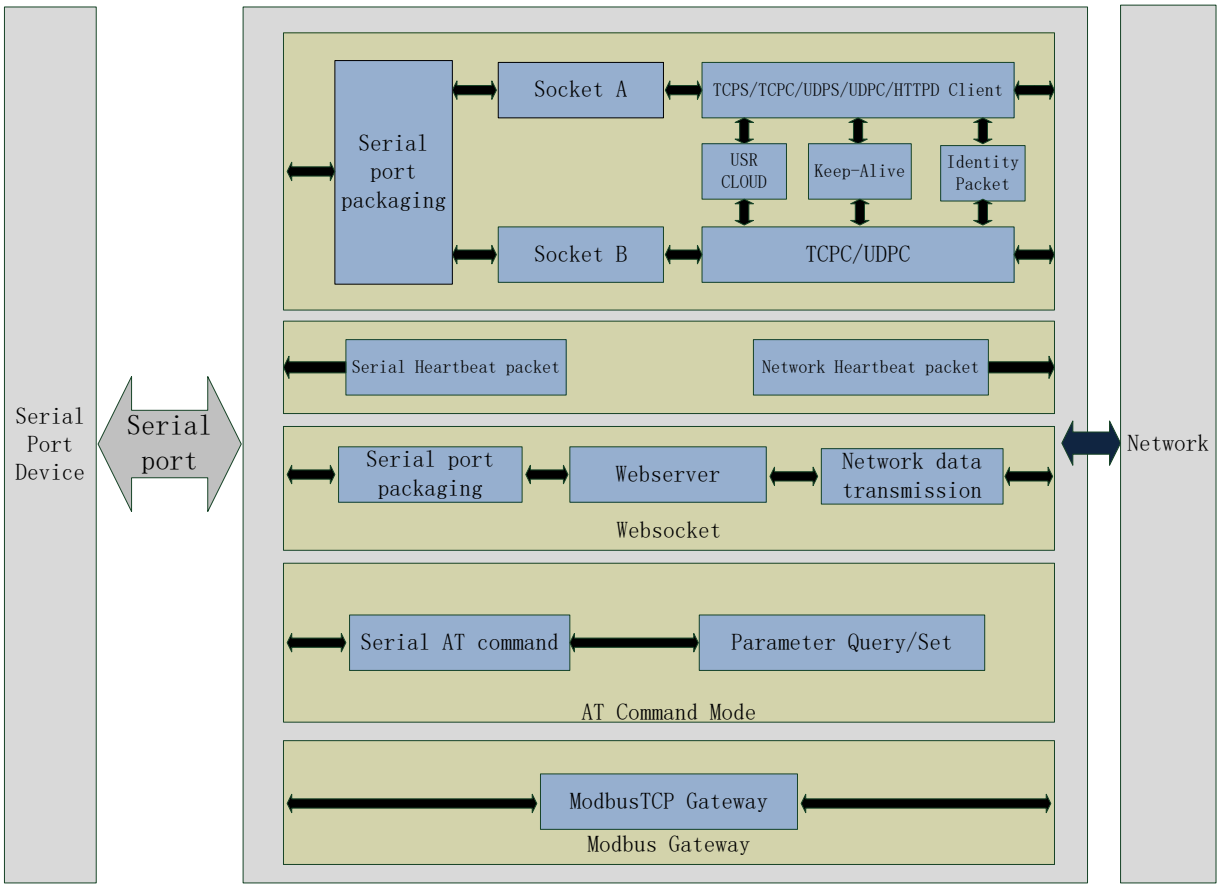


Figure 7 Product Functions diagram

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 set 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 connect directly to PC, module can't be set in DHCP mode. Because common computer does not have the ability to assign IP addresses.

User can change Static IP/DHCP by setup software. Setting diagram as follow:

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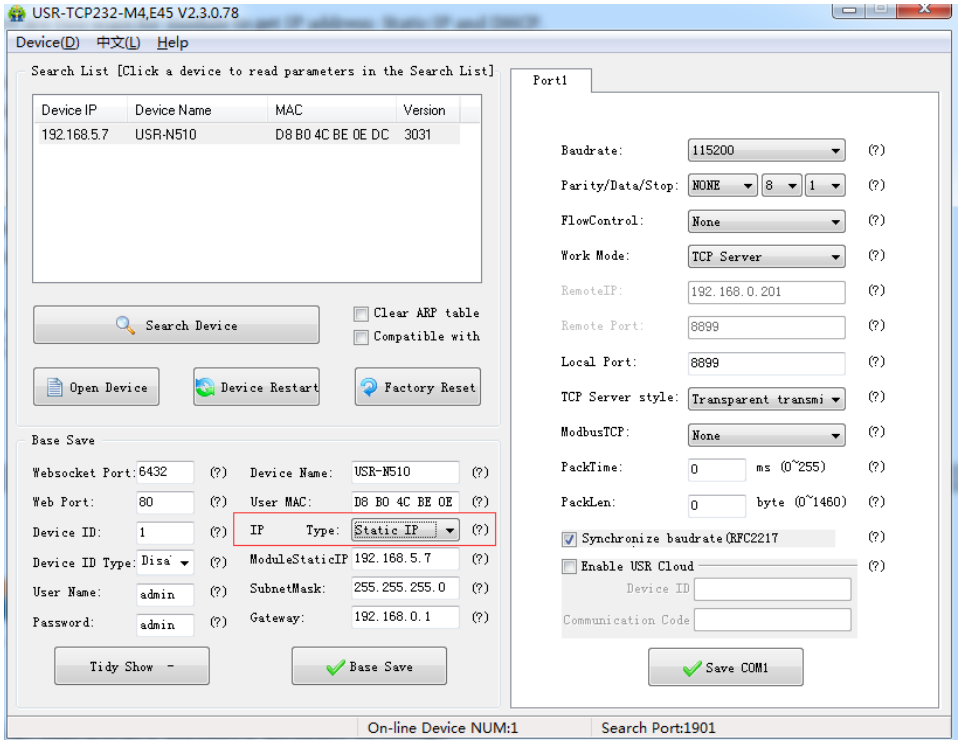


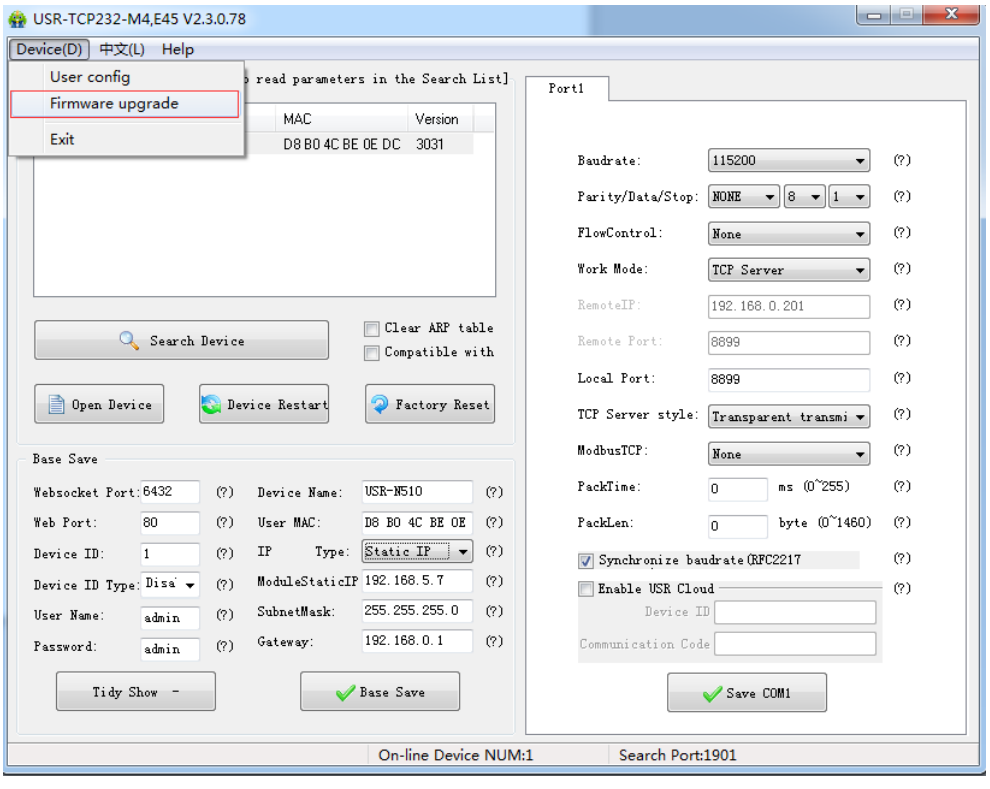
Figure 8 Static IP/DHCP

2.1.2. Hardware Restore default settings

User can press Reload over 5 seconds then release to restore default settings.

2.1.3. Upgrade Firmware Version

User can contact to salespersons for needed firmware version and upgrade by setup software as follow:



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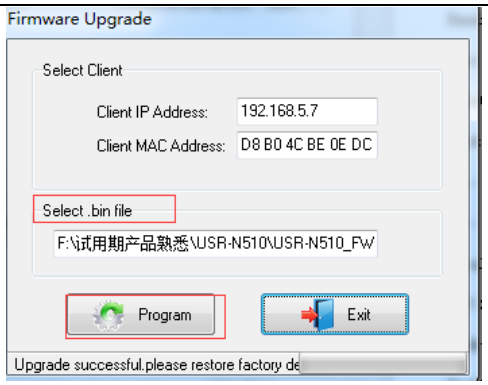


Figure 9 Upgrade firmware version

2.2. Socket functions

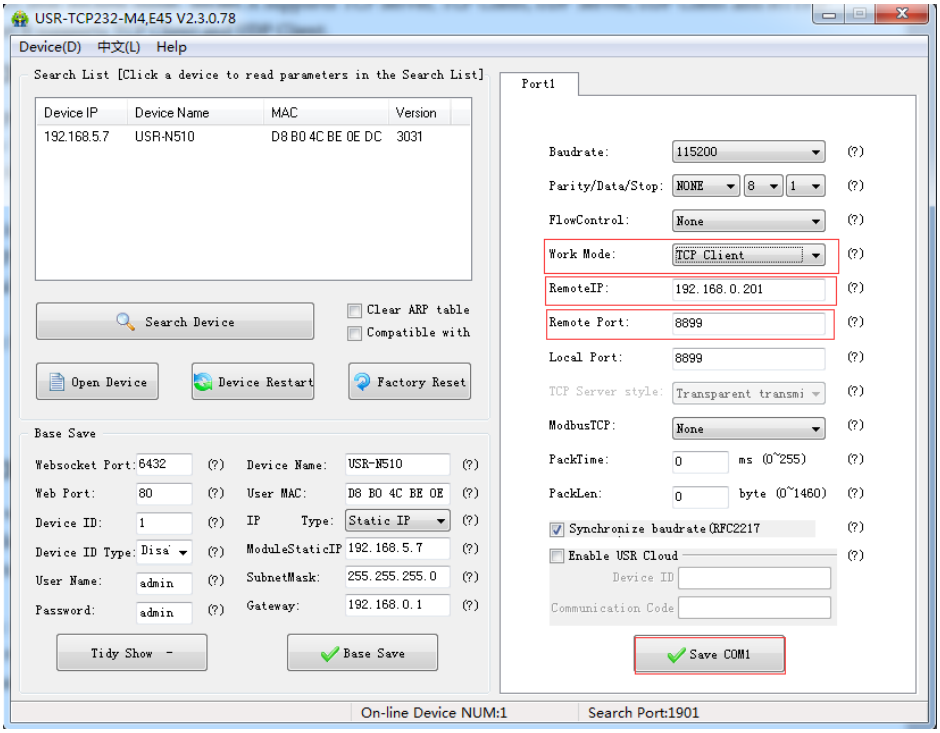
N520 support dual sockets mode. Socket A supports TCP Server, TCP Client, UDP Server, UDP Client and HTTPD Client. Socket B supports TCP Client and UDP Client.

2.2.1. 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 and server. According to the TCP protocol, TCP Client has connection/disconnection status differences to ensure reliable data transmission.

N520 work in TCP Client mode need connect to TCP Server and need set the parameter: Remote IP/Port. N520 work in TCP Client won't accept other connection request except target server and will access server with random local port.

User can set N520 in TCP Client mode and related parameters by setup software or web server as follows:



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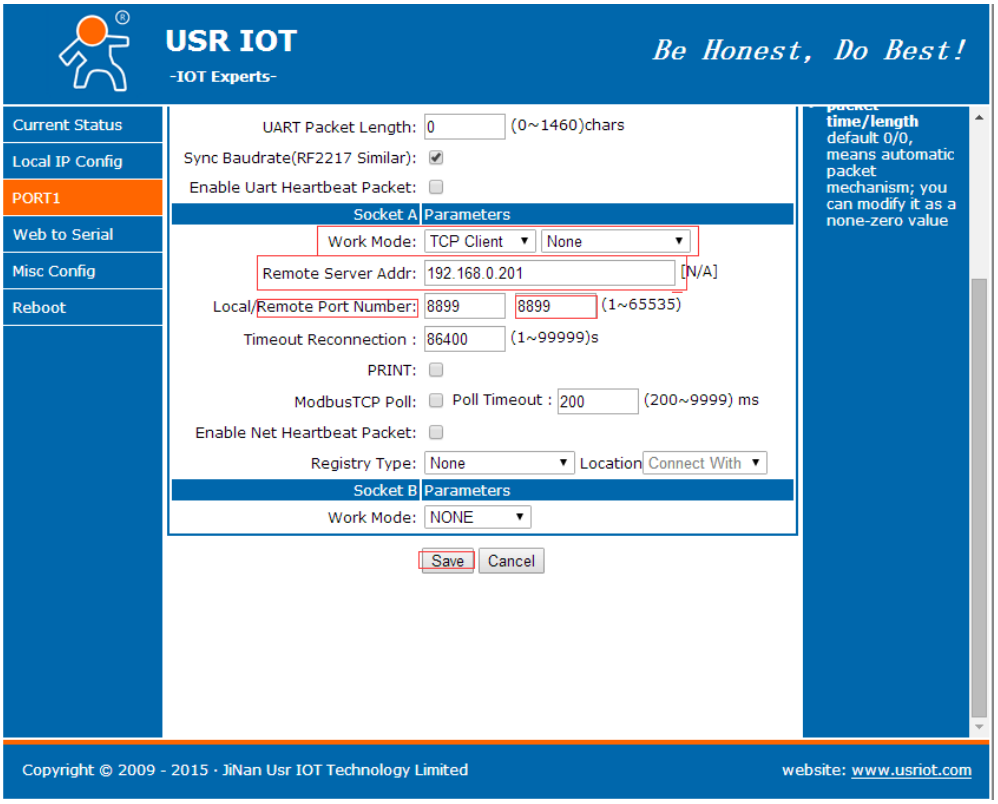


Figure 10 TCP Client

2.2.2. TCP Server

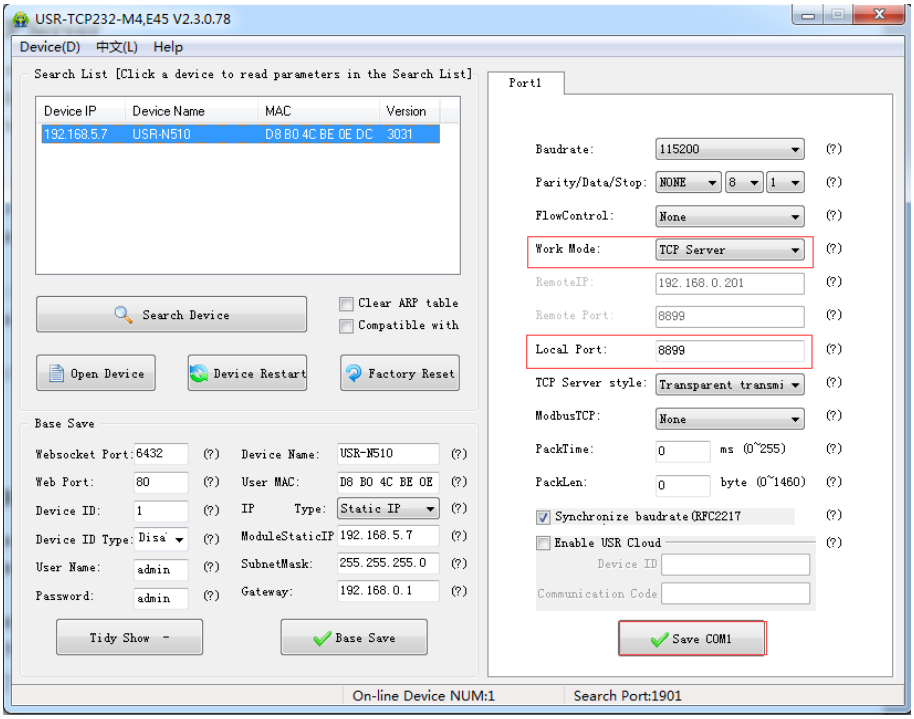
TCP Server will listen network connections and build network connections, commonly used for communication with TCP clients on a LAN. According to the TCP protocol, TCP Server has connection/disconnection status differences to ensure reliable data transmission.

N520 work 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 N520 in TCP Server mode simultaneously.

N520 work in TCP Server support 8 client connections at most and will kick off oldest connection beyond maximum connections.

User can set N520 in TCP Server mode and related parameters by setup software or web server as follows:

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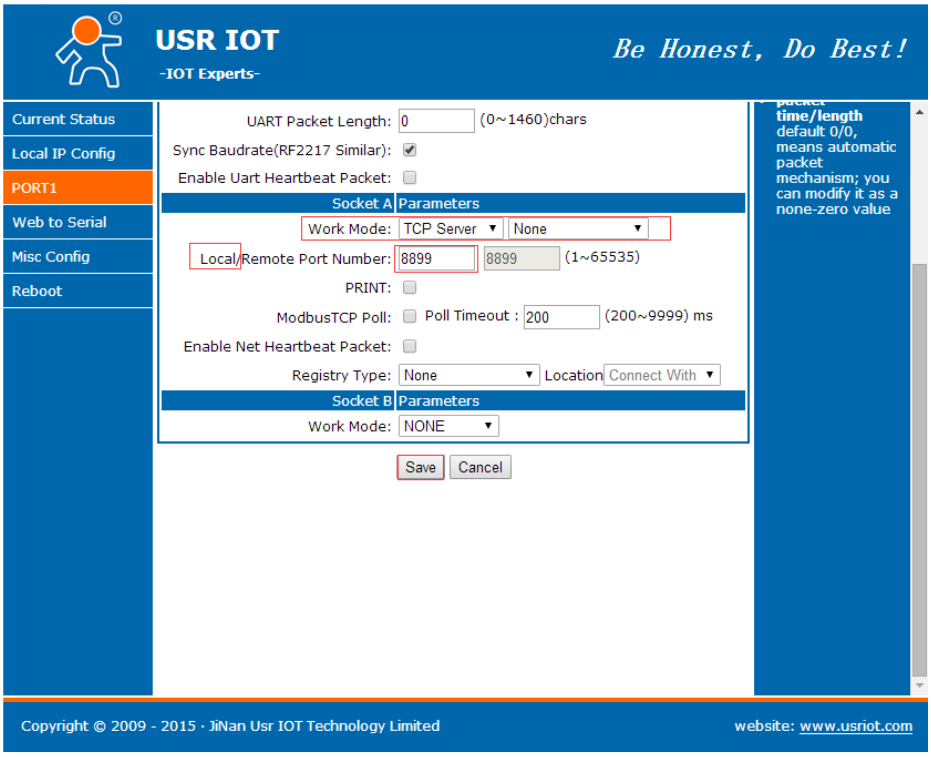


Figure 11 TCP Server

2.2.3. UDP Client

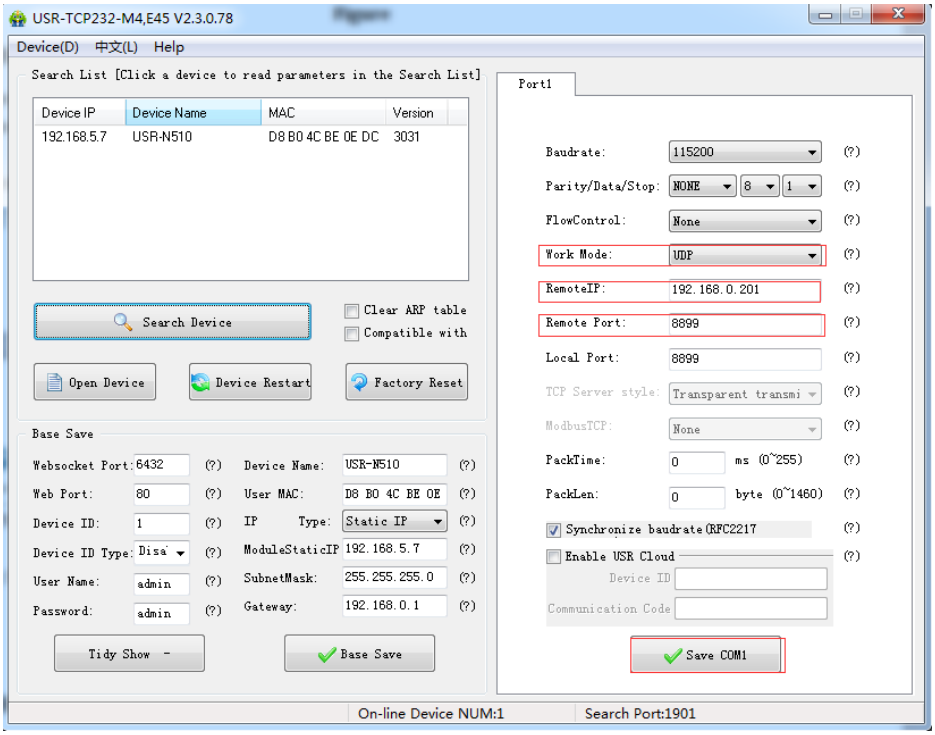
UDP transport protocol provides simple and unreliable communication services. No connection connected /disconnected.

In UDP Client mode, N520 will only communicate with target IP/Port. If data not from target IP/Port, it won't be

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received by N520.

User can set N520 in UDP Client mode and related parameters by setup software or web server as follows:



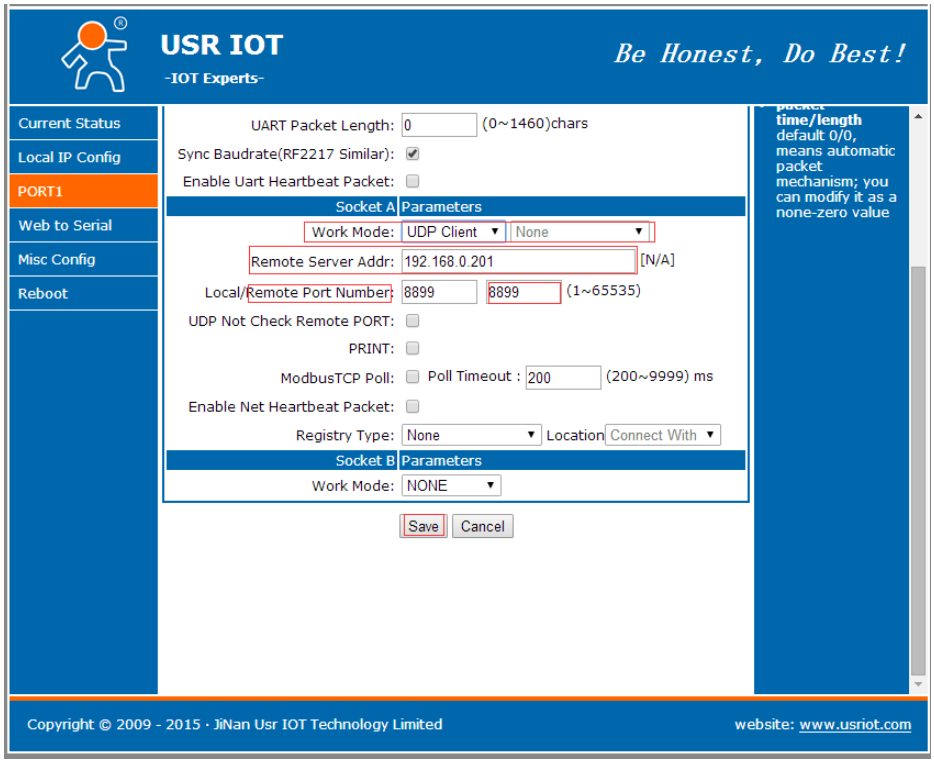


Figure 12 UDP Client

2.2.4. UDP Server

In UDP Server mode, N520 will change target IP every time after receiving UDP data from a new IP/Port and will

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send data to latest communication IP/Port.

User can set N520 in UDP Server mode and related parameters by setup software or web server as follows:

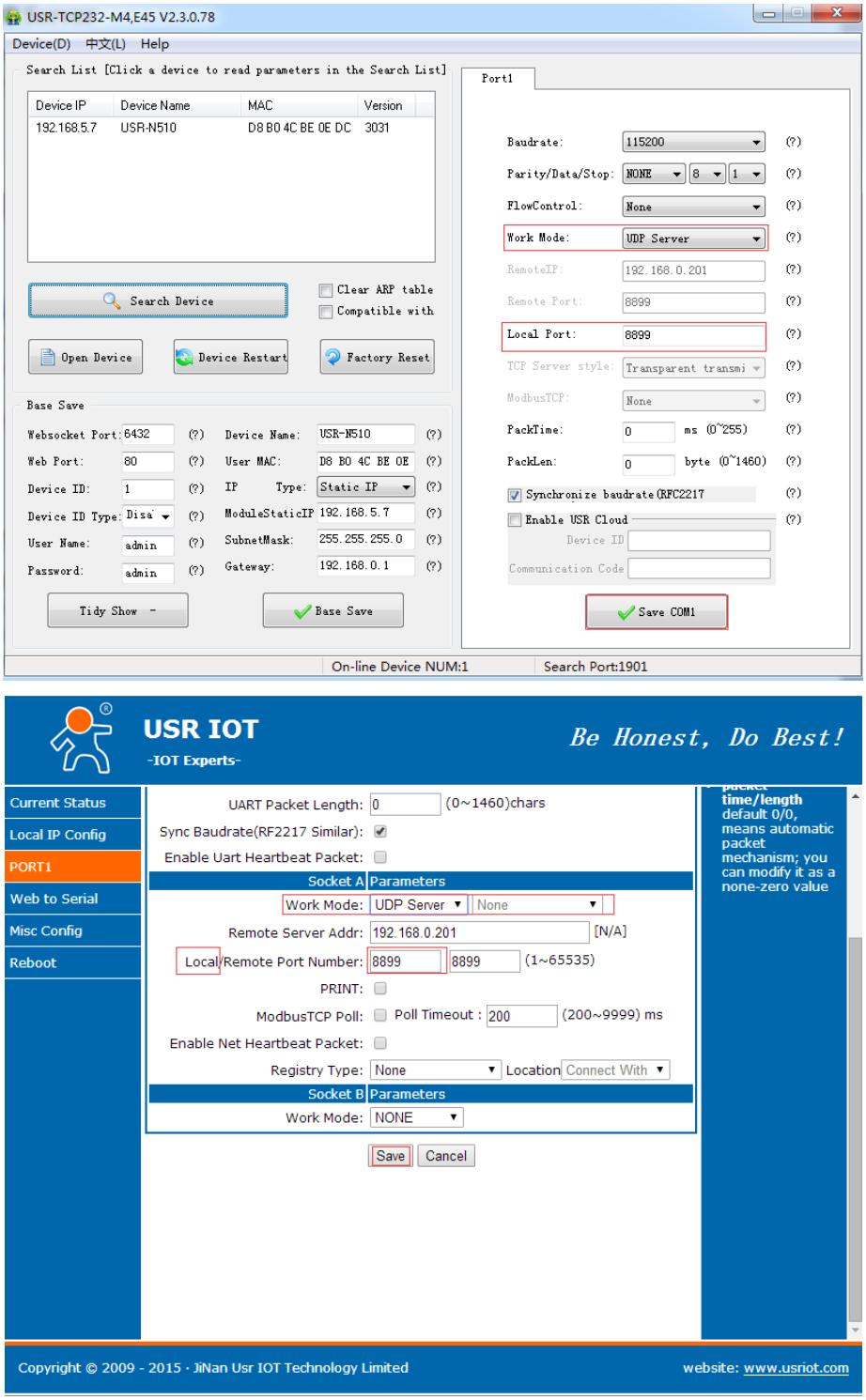


Figure 13 UDP Server

2.2.5. HTTPD Client

In HTTPD Client mode, N520 can achieve data transmission between serial port device and HTTP server. User just need set N520 in HTTPD Client and set the HTTPD header, URL and some other related parameters, then can

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achieve data transmission between serial port device and HTTP server and don't need care about the HTTP format of data.User can set N520 in HTTPD Client mode and related parameters by web server as follow:

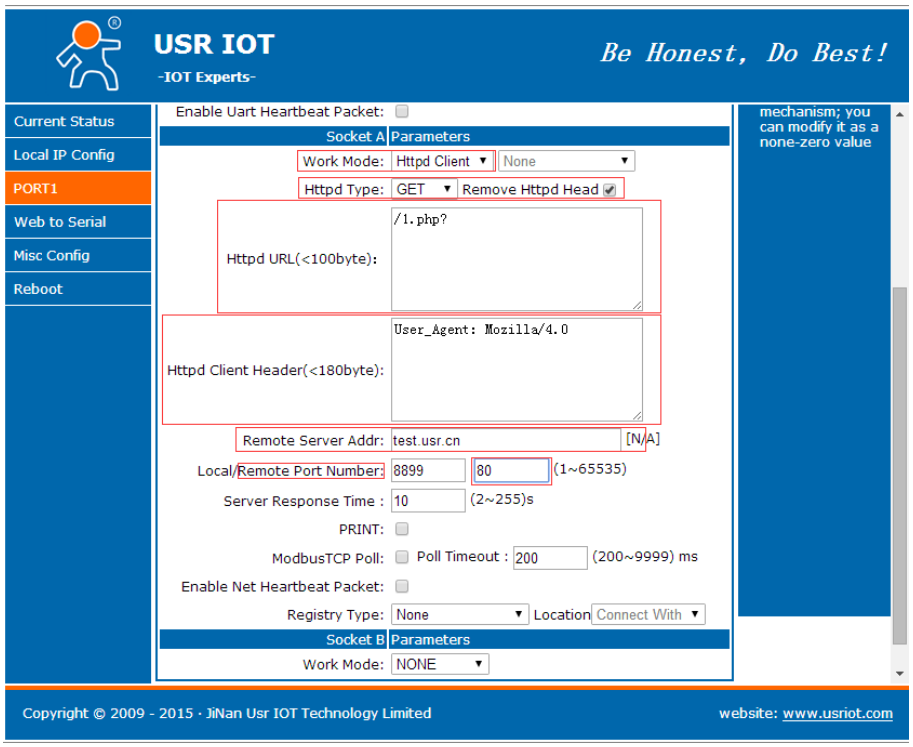


Figure 14 HTTPD Client

2.2.6. WebSocket

WebSocket function can achieve real-time interaction between serial port and webpage and display user data on webpage. User can set N520 with WebSocket function by web server as follow:

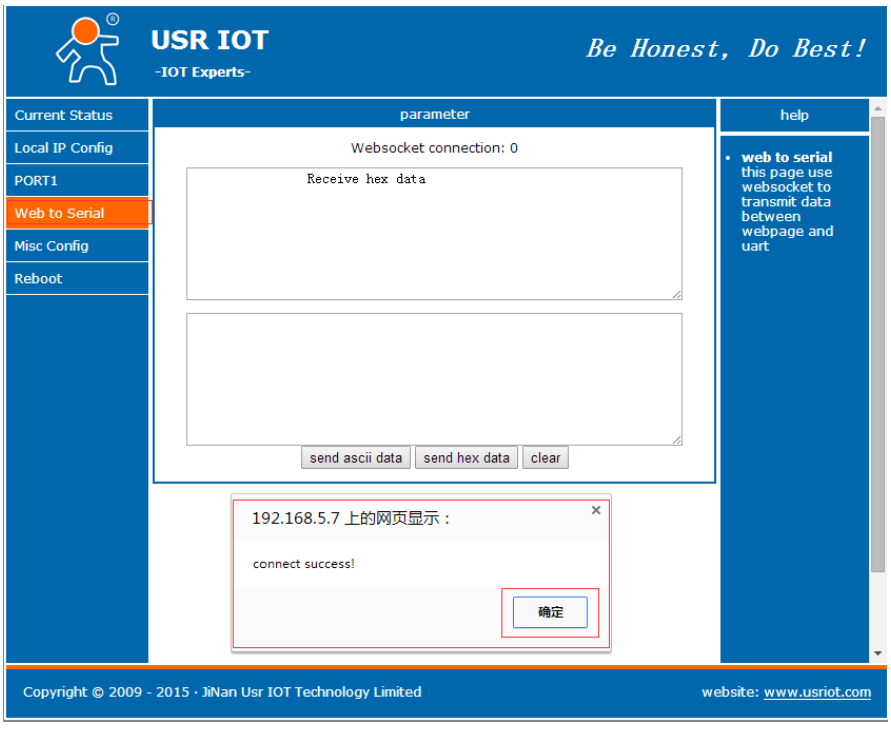


Figure 15 WebSocket

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2.3. Serial port

USR-N520 have two serial ports and they are independent with same functions.

2.3.1. VCOM Application

User can download VCOM software from **http://www.usriot.com/usr-vcom-virtual-serial-software/**. Through this software user can set up connection between N520 and virtual serial to solve the problem that traditional equipment PC software used in serial port communication way.

2.3.2. Flow Control

N520 support hardware flow control way (RTS/CTS, only take effect in RS232 mode) and software flow control way Xon/Xoff. User can select Flow Control method by web server as follow:

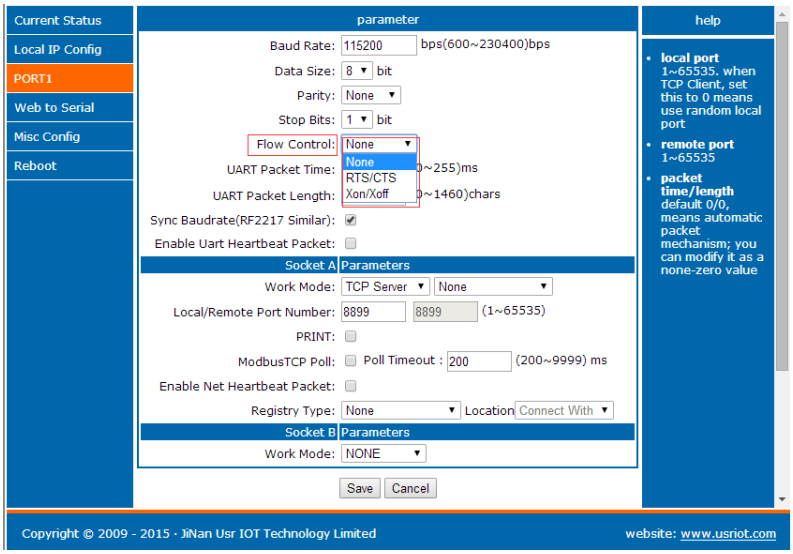


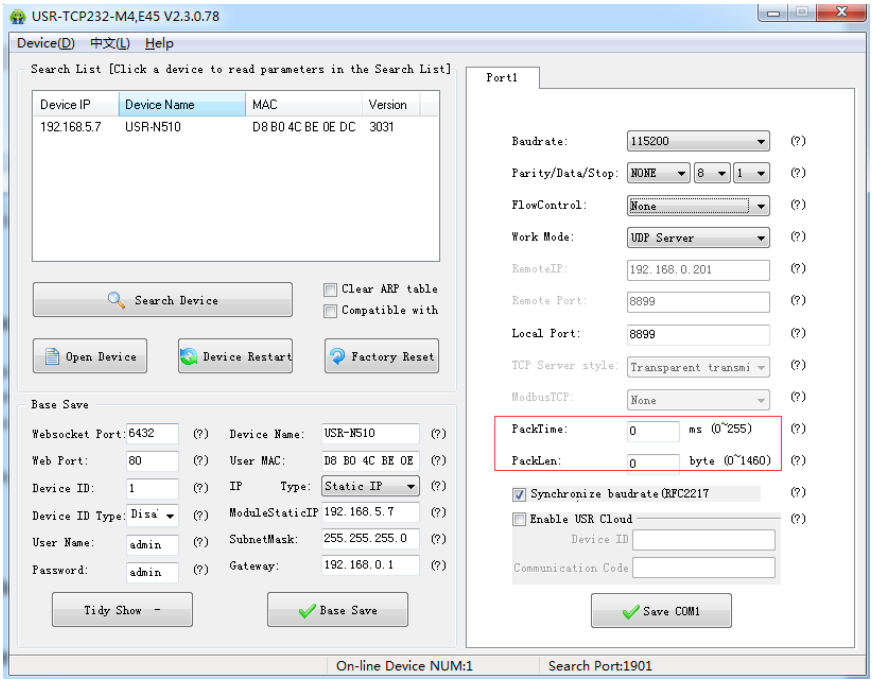
Figure 16 Flow Control

2.3.3. 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 as Package. There are 2 ways to end the package and send package to network - Time Trigger Mode and Length Trigger Mode.

For example, set package time 10ms and package length 512, after serial port receiving data, if receiving interval time beyond 10ms or data length beyond 512, data will be sent to network. One of package time or package length is 0, N520 will adopt the method which is not 0. User can set package time and package length by setup software or web server as follows:

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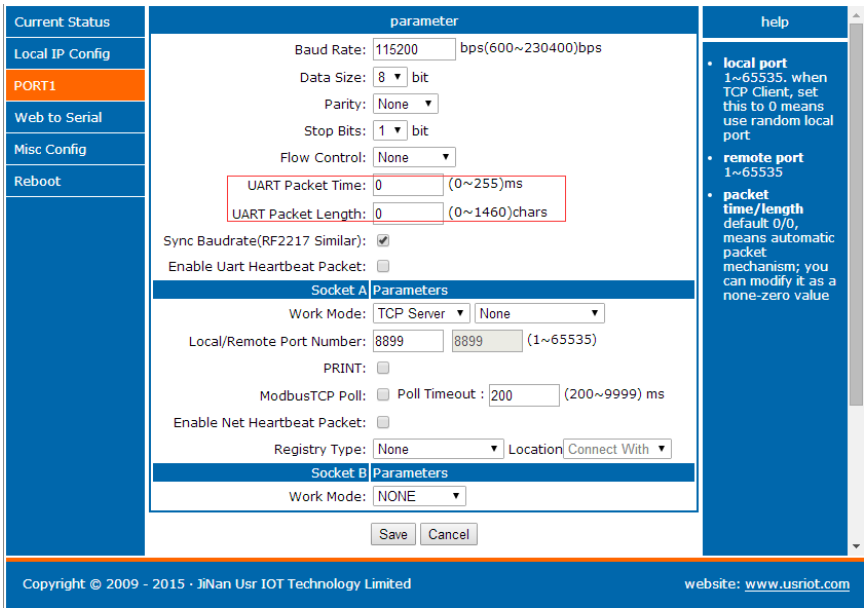


Figure 17 Serial Package

2.3.4. Baud Rate Synchronization

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

User can adopt Baud Rate Synchronization function by setup software or web server as follows:

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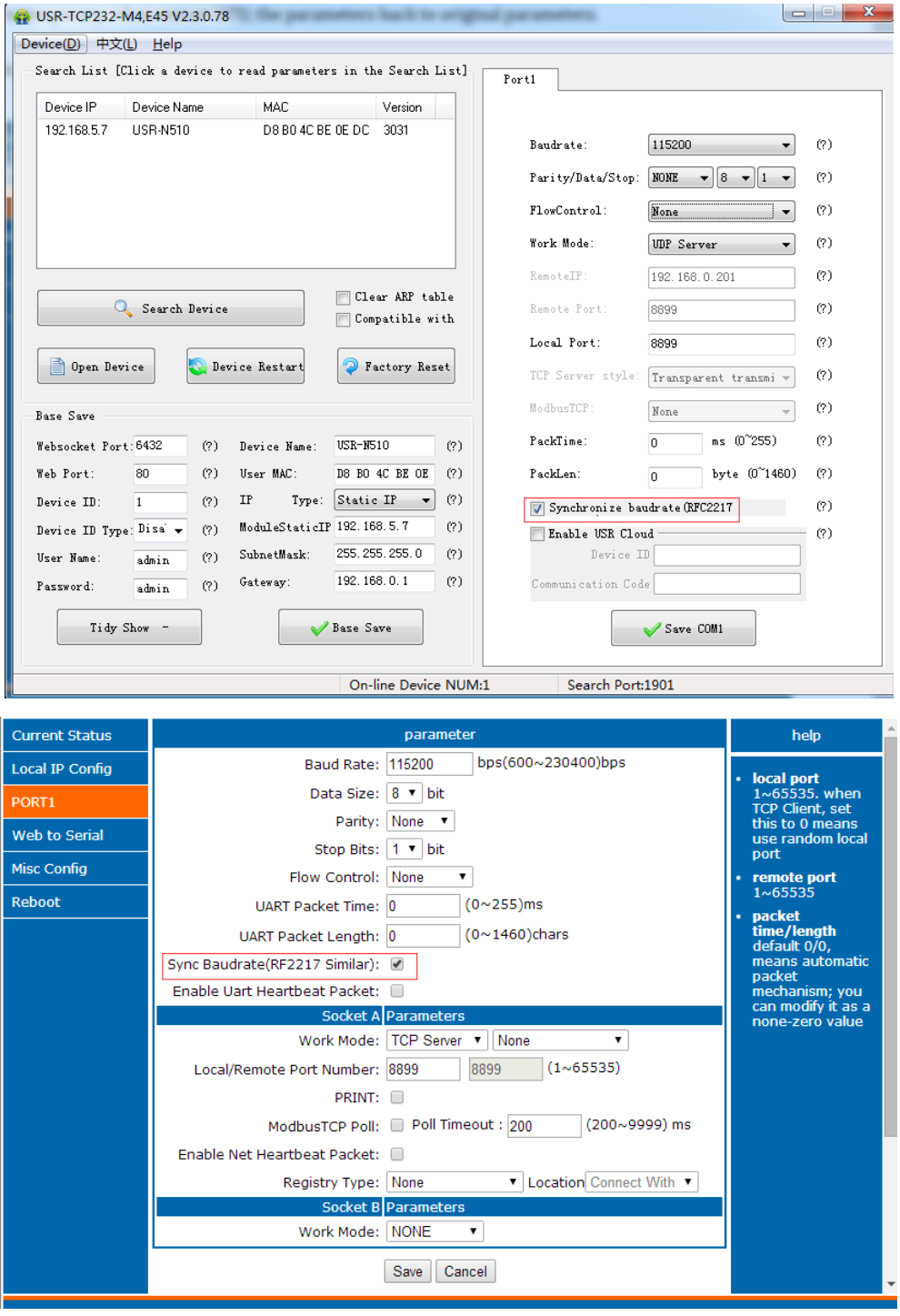


Figure 18 Baud Rate Synchronization

2.4. Features

2.4.1. Identity Packet Function

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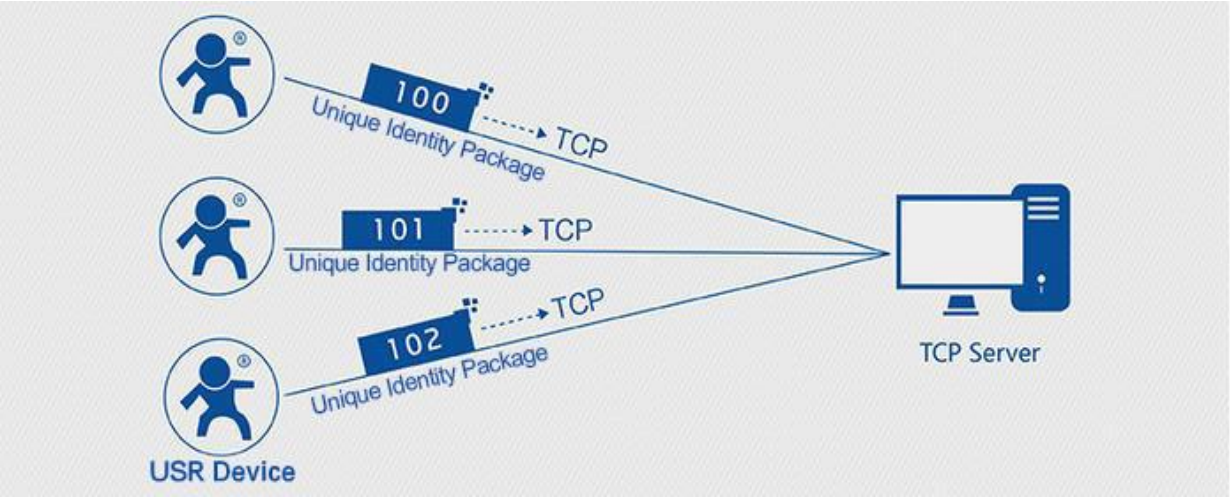


Figure 19 Identity Packet application diagram

Identity packet is used for identify the device when module works as TCP client/UDP client. There are two methods for identity packet.

- Identity data will be sent when connection is established.
- Identity data will be add on the front of every data packet.

User can set N520 with Identity Packet function by web server as follow:

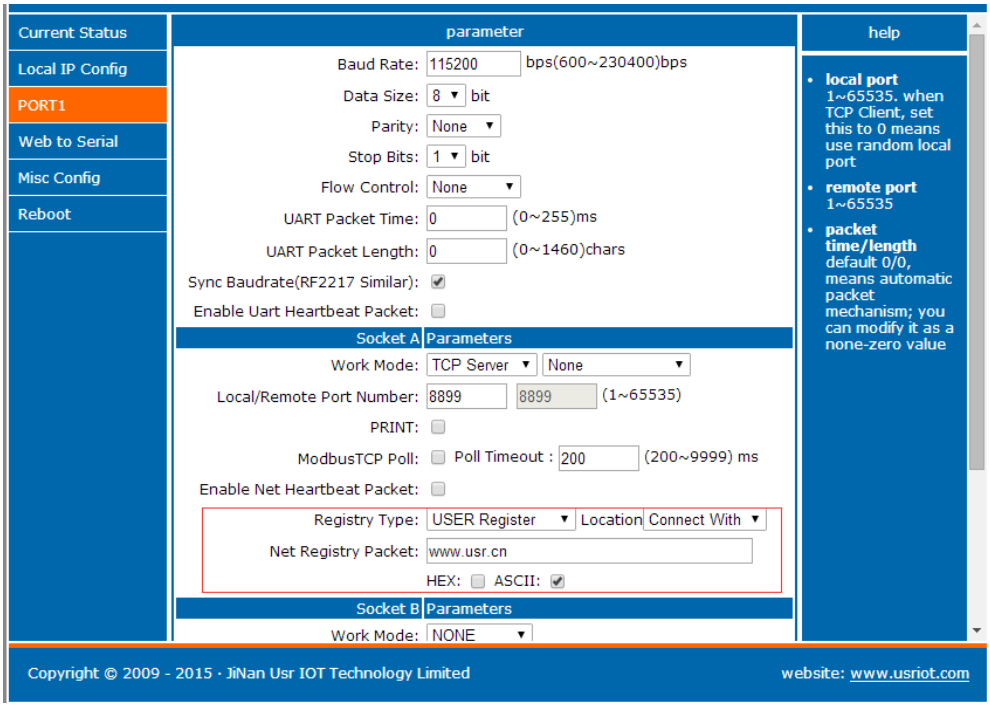


Figure 20 Identity Packet

2.4.2. Heartbeat Packet Function

Heartbeat packet: Module will output heartbeat data to serial or network periodic. User can configure the heartbeat data and time interval. Serial heartbeat data can be used for polling Modbus data. Network heartbeat

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data can be used for showing connection status and keep the connection (only take effect in TCP/UDP Client mode). User can set N520 with Heartbeat Packet function by web server as follow:

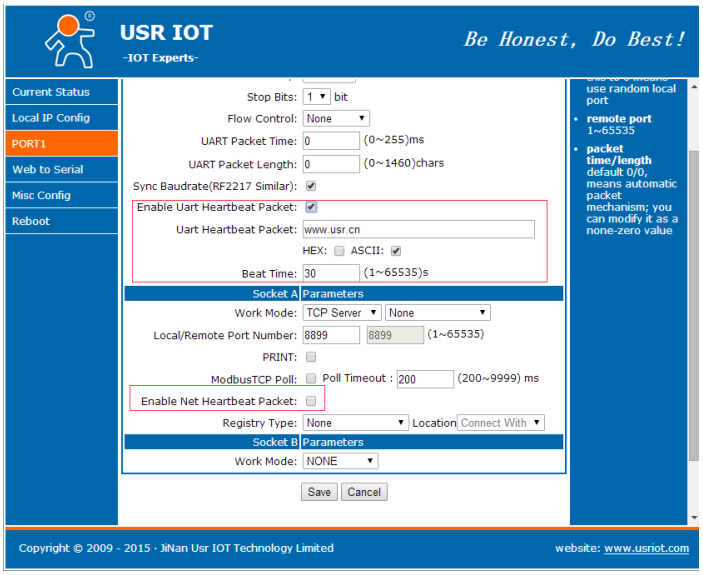


Figure 21 Heartbeat Packet

2.4.3. Impersistent Connection

N520 support impersistent connection function in TCP Client mode. When N520 adopt this function, N520 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. User can set N520 with impersistent connection function by web server as follow:

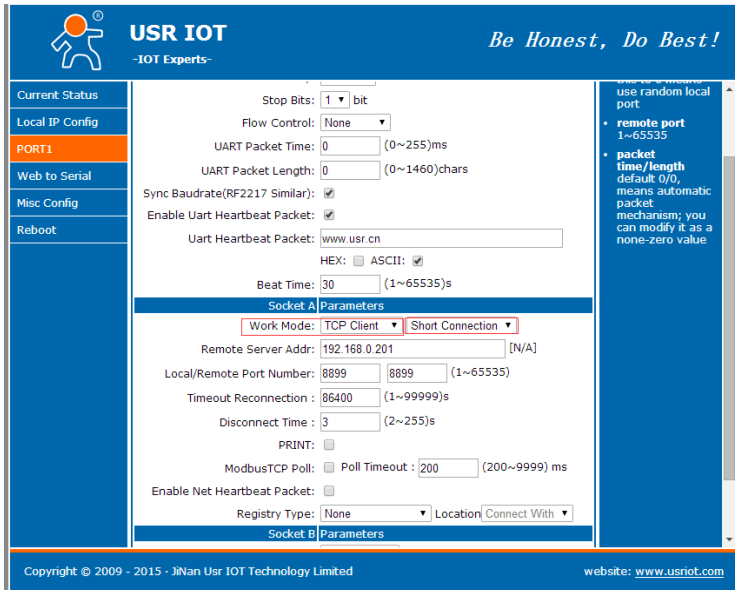


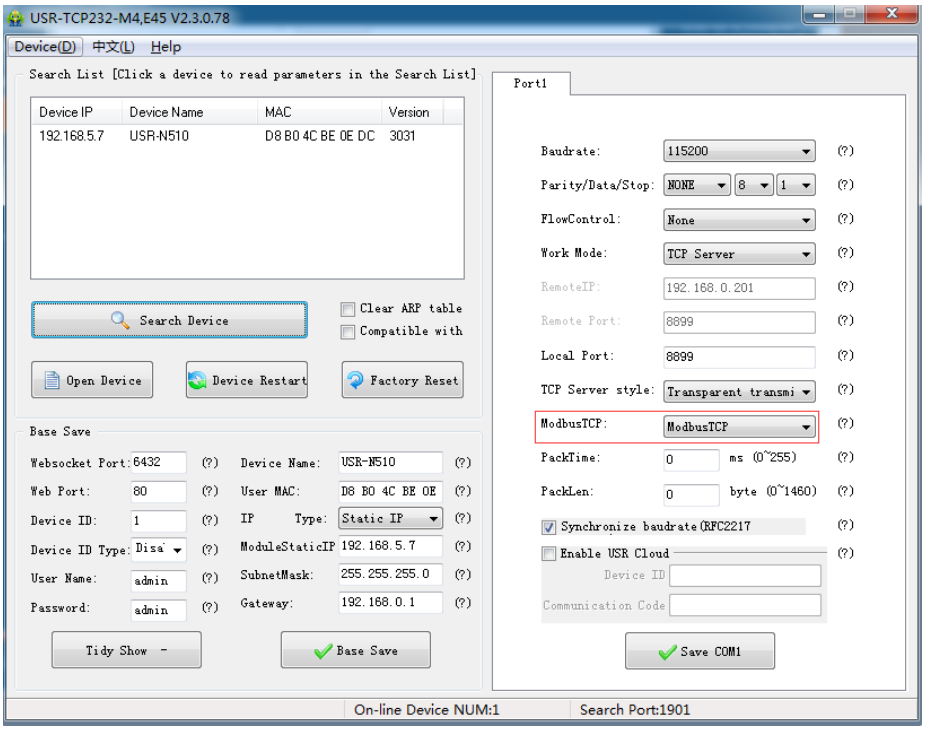
Figure 22 Impersistent Connection

2.4.4. Modbus Gateway

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

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Modbus RTU<=>Modbus TCP: Set N520 in TCP Server or TCP Client mode, then user can set N520 with Modbus RTU<=>Modbus TCP function by setup software or web server as follows:



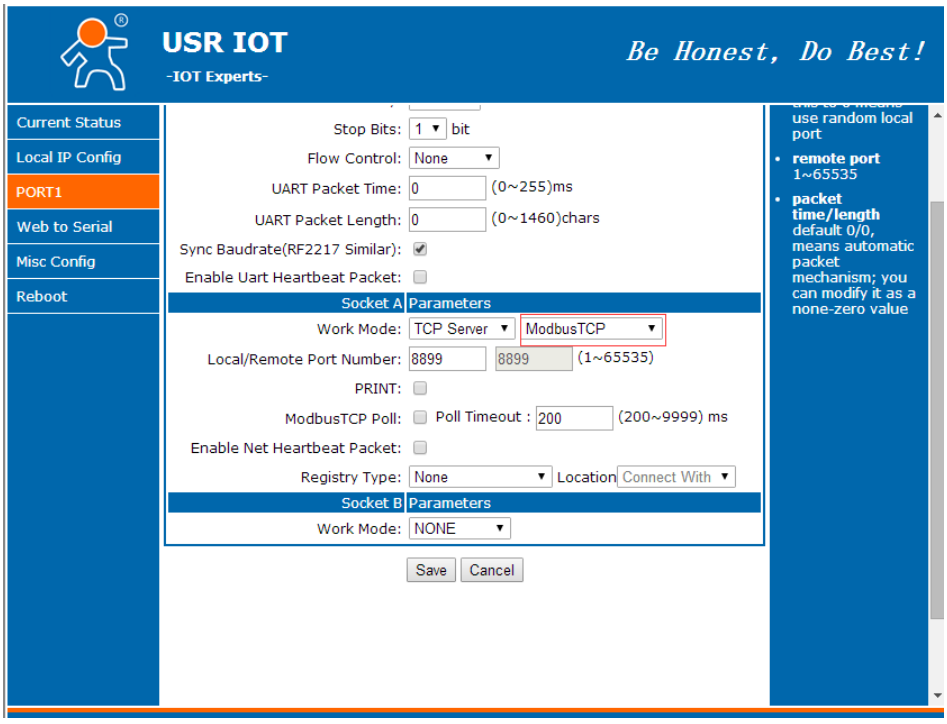


Figure 23 Modbus RTU<=>Modbus TCP

Modbus polling: N520 support Modbus polling function and user can set N520 with Modbus polling function by web server as follow:

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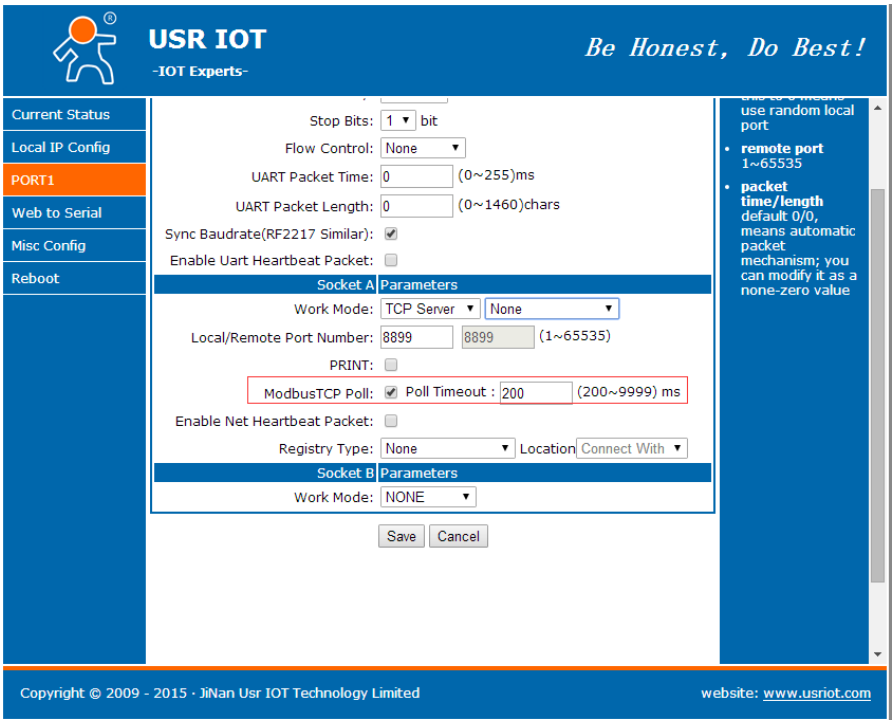


Figure 24 Modbus polling

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. User can set N520 with Network Printing function by web server as follow:

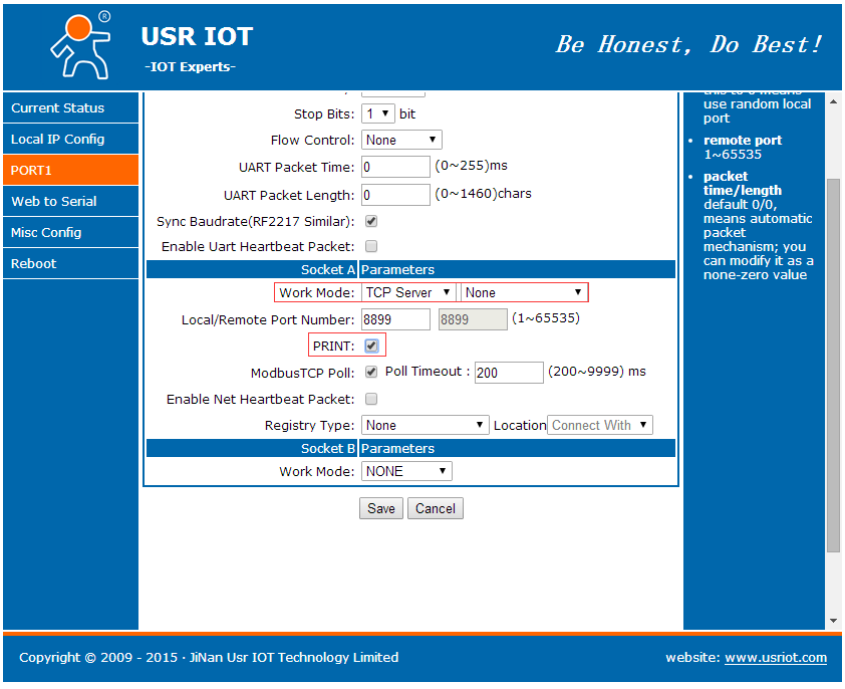


Figure 25 Network Printing

2.4.6. Editable Web server

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N520 support user modify the web server based on template according to needs, then use related tool to upgrade. If user have 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-N520. They are setup software configuration, web server configuration and AT command configuration.

3.1. Setup software Configuration

User can download setup software from http://www.usriot.com/usr-tcp232-m4k3-setup-software/. When user want to configure the N520 by setup software, user can run setup software, search N520 in same LAN and configure the N520 as follow:

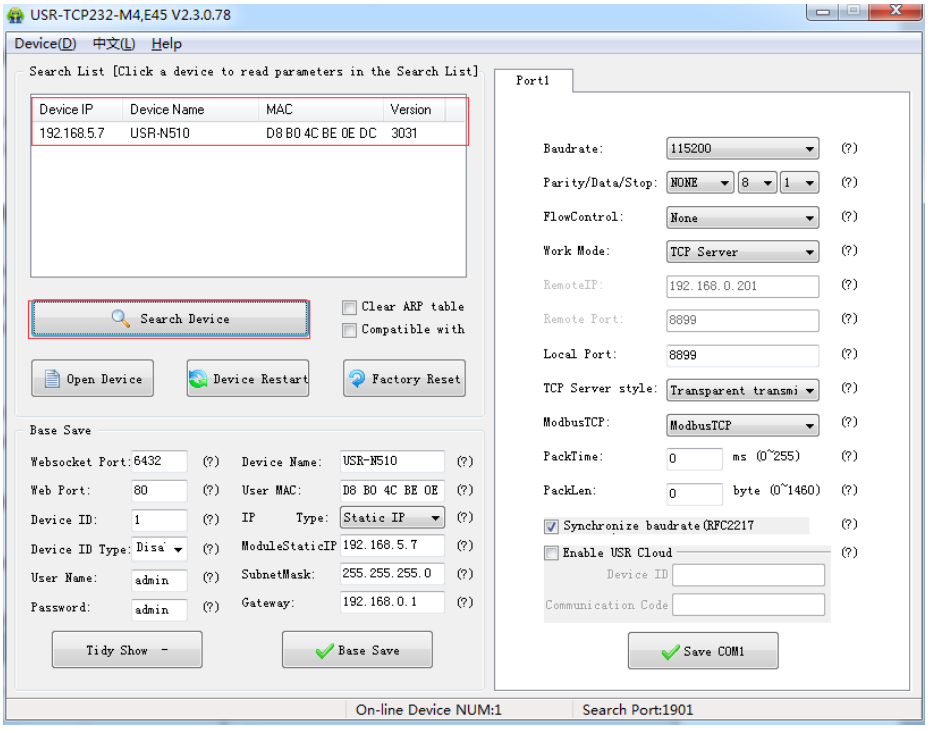


Figure 26 Setup software

After researching N520 and clicking N520 to configure, user need log in with user name and password. Default user name and password both are admin. If user keep the default user name and password, it is not necessary to log in.

3.2. Web Server Configuration

User can connect PC to N520 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 27 Web server default parameters

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After firstly connecting PC to N520, 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 into web server. Web server screenshot as follow:

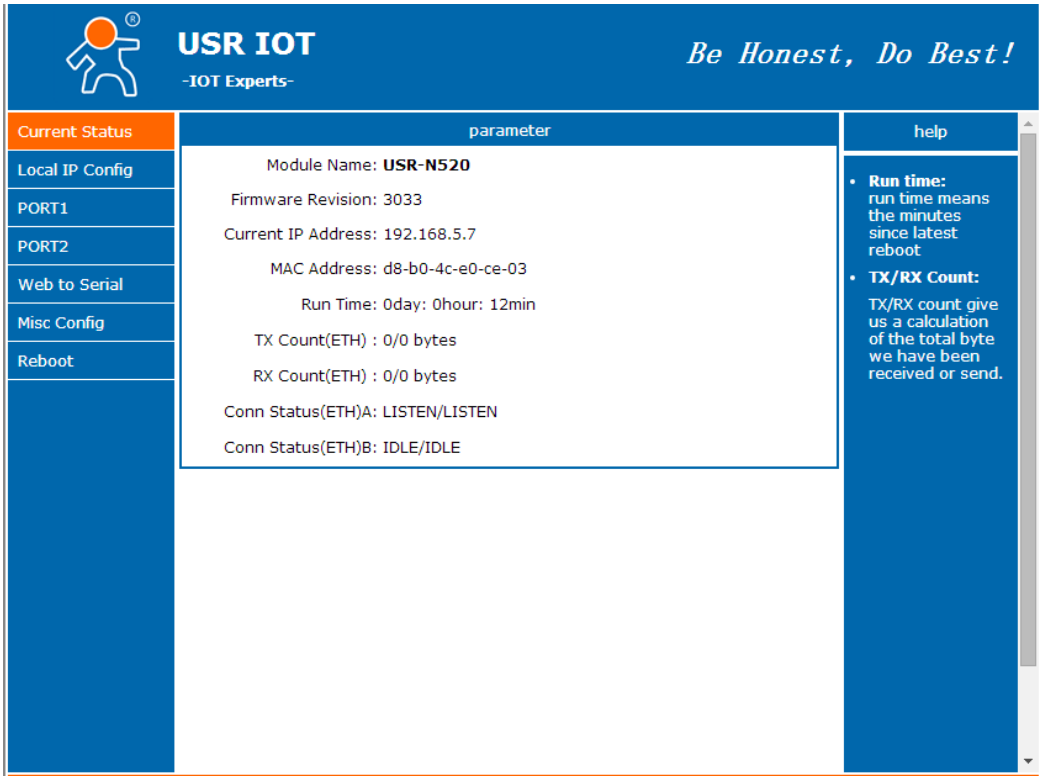


Figure 28 Web Server

3.3. AT Command

We have specific user manual for AT commands.

3.3.1. Serial AT Command

In transparent mode, user can enter AT command mode, then user can send AT command to module. For entering AT command mode, please refer to this FAQ: **http://www.usriot.com/enter-serial-command-mode/**.

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. Default keyword is **WWW.USR.CN** and default port number is 48899. User can enter Network AT command as follow:

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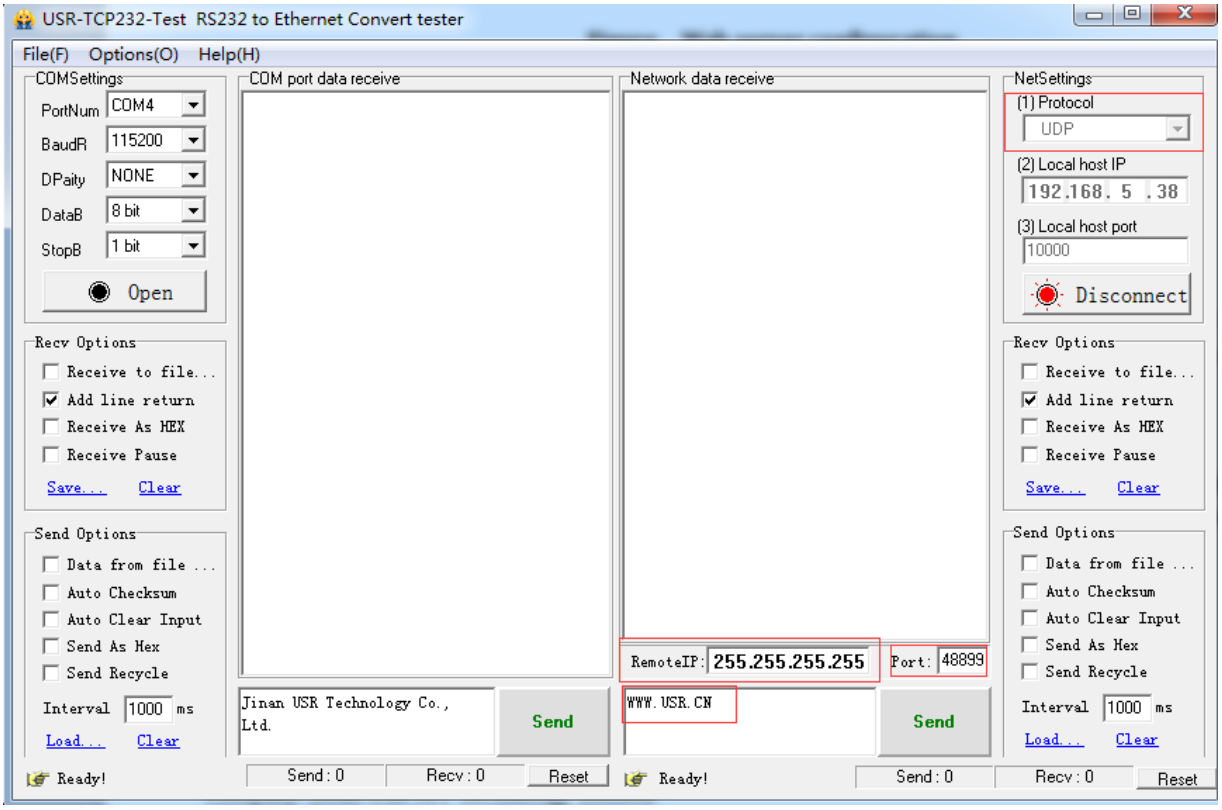


Figure 29 Network AT Command

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4. Contact Us

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6. Update History

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