USR-DR301 User Manual

File Version: V1.0.0

Contents

1. Quick Start

Module USR-DR301 is used to realize data transparent transmission between Ethernet interface and the serial port and the protocol converter. The serial port is the RS485 data and in the Ethernet interface, it is the net data package. Users can configure the parameters via the webpage or set-up software, set one time and save forever

The character is aimed at USR-DR301 quick introduce. The users are recommend to operating one time according to this character, and will have a system realize to the DR301. Also you can choose the character which you are interested in. As to the details, please refer to the later characters.

Product link:

https://www.usriot.com/products/din-rail-rs232-serial-to-ethernet-converter.html

Related software:

Setup software: https://www.usriot.com/support/downloads/usr-m0-setup-software-v224288.html

Test software: https://www.usriot.com/support/downloads/usr-tcp-test-testing-software.html

Any question during testing, please submit it on our technical support center: http://h.usriot.com

USR-DR301

DIN-rail RS232 Serial to Ethernet converter

USR-DR301 is a tiny size RS232 to Ethernet converter, which can realize the bidirectional transparent transmission between RS232 and Ethernet.

- RS232 Port: Terminal Type
- Industrial-grade, DIN-Rail mounting
- Modbus RTU to Modbus TCP

Certifications

Diagram 1-1 Product Webpage

1.1. Hardware Testing Environment

1.1.1. Hardware Prepare

- DC5V 1A power adapter*1
- Serial cable *1
- Network cable *1
- USR-DR301*1
- PC*1

Diagram 1.1.1-1 Hardware Prepare

1. Testing Aim

- Have a quick recognize to the DR301 and have a basic recognition
- Testing is there is any issue in the product.

2. Data Direction

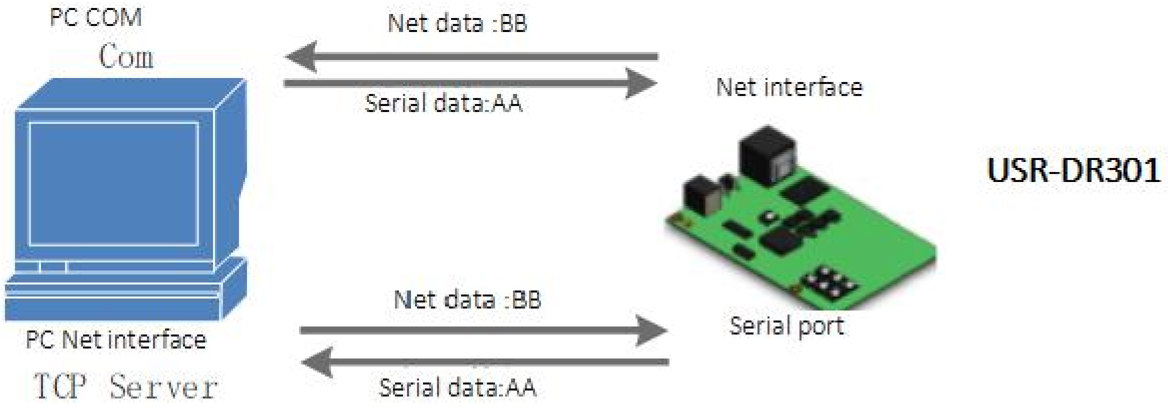


Diagram 1.1.1-2 Data Direction

1.1.2. Hardware Connection

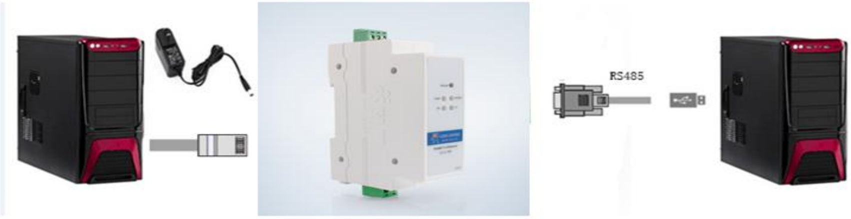


Diagram 1.1.2-1Hardware Connection

USR-DR301 connects to PC by serial port and RJ45 Port. Then power on USR-DR301 with our AC adapter.The above picture will show you the connection.

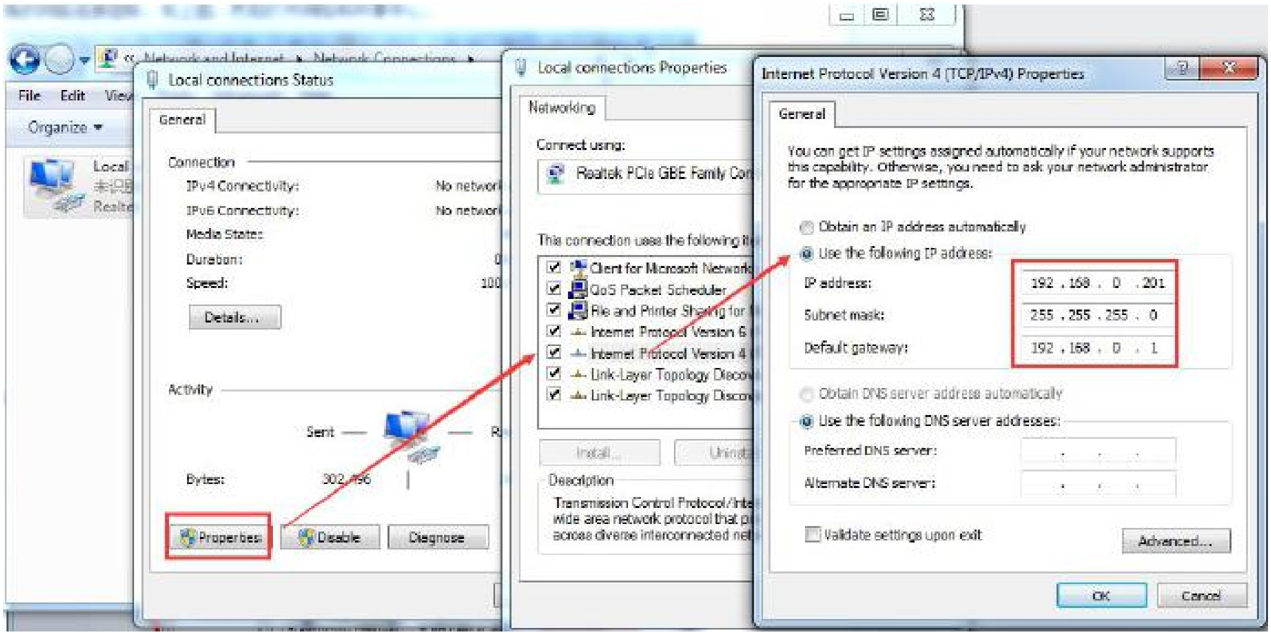
Notes:

- Power adapter (5V) and connection cable are provided by USR IOT.
- RS232 is involved.
- PCs in above picture is the same one.

1.2. Network Test Environment

Please check PC setting after hardware connection.

1) Disable PC Firewall and anti-virus software.
2) Disable the network card nothing to do with testing and just leave one local connection.
3) As for USR-DR301 connect with PC directly, should set static IP for PC, which in the same network segment with USR-DR301, like 192.168.0.201.



Local connections Status

General

Connection

IPv4 Connectivity: No networ

IPv6 Connectivity: No networ

Media State:

Duration:

Speed: 100

Details...

Activity

Sent — — R

Bytes: 302,496

Properties Disable Diagnose

Local connections Properties

Networking

Connect using:

Realtek PCIe GBE Family Con

This connection uses the following it

☑ Client for Microsoft Network

☑ QoS Packet Scheduler

☑ File and Printer Sharing for

☑ Internet Protocol Version 6

☑ Internet Protocol Version 4

☑ Link-Layer Topology Disco

☑ Link-Layer Topology Disco

Install... Uninst

Description

Transmission Control Protocol/Inte wide area network protocol that p across diverse interconnected net

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 0 . 201

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 0 . 1

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

□ Validate settings upon exit

Advanced...

OK Cancel

Diagram1.2-1 PC Local Connection Configuration

1.3. Default Parameter

Default parameter is as below:

Item	Content
User name	admin
Password	admin
IP address	192.168.0.7
Subnet mask	255.255.255.0
Default gateway	192.168.0.1
Default work mode of port	TCP Client
Default remote port	8324
Default local port of port	0
Remote IP address	192.168.0.201
Baud Rate	115200
Parity bit/Data bit/Stop bit	None/8/1

Form 1.3-1 Default Parameters

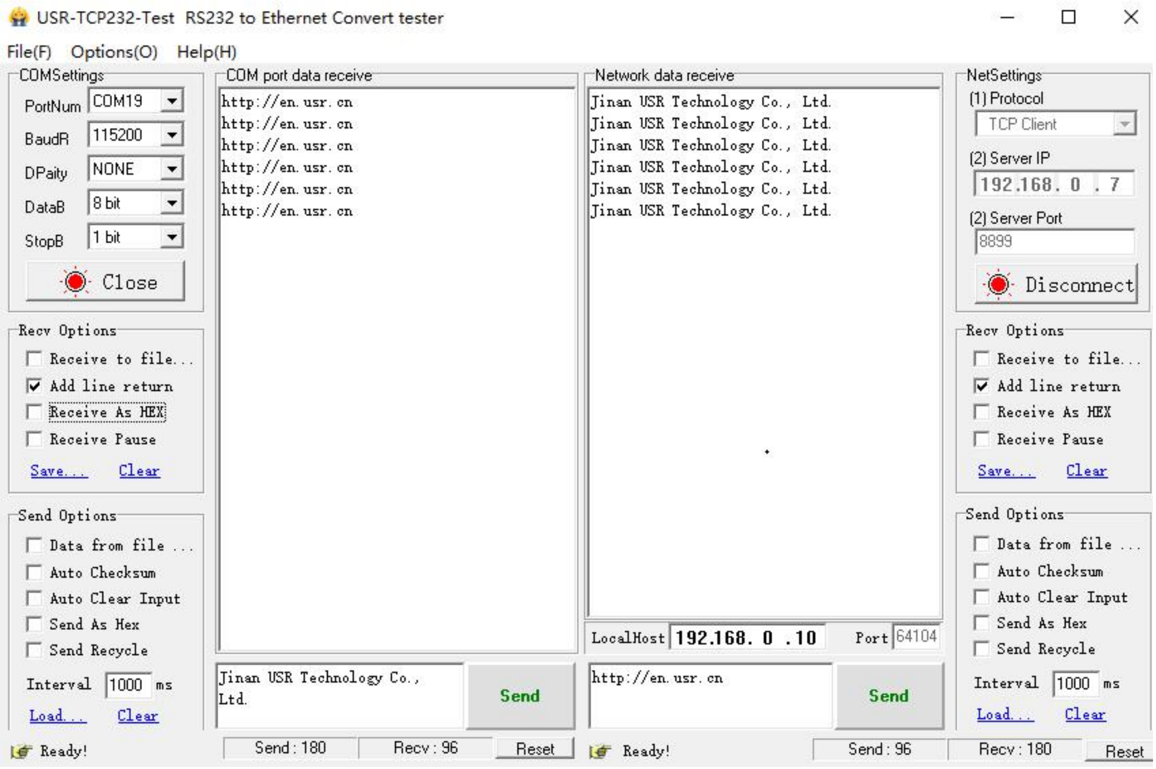
1.4. Data Transmission Test

Data transmission test is based on the default parameters, please refer to the following steps:

1) Open test software "USR-TCP232-Test.exe", and do hardware connection according to Chapter 1.1 Hardware Testing Environment.
2) The right side is Network Settings: TCP Server, IP address: 192.168.0.201, port number: 8324, click "Connect" to build TCP connection.
   The left side is Serial Settings: Baud Rate: 115200, Parity/Data bit/Stop bit: None/8/1,
   Click "Open" to enable the COM.

Then we can test data transmission between COM and network.
Data from serial to network is: PC' COM->USR-DR301' COM->USR-DR301 Ethernet port->PC Network;
Data from network to serial is: PC Network->DR301' Ethernet port->DR301 COM-> PC's COM.

The below picture is for your reference:



PortNum COM19
BaudR 115200
DPaity NONE
DataB 8 bit
StopB 1 bit

□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause

□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle
Interval 1000 ms

COM port data receive:

```
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
```

Jinan USR Technology Co., Ltd.

Send : 180 Recv : 96

Network data receive:

```
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
```

LocalHost 192.168. 0 .10 Port 64104

http://en.usr.cn

Send : 96 Recv : 180

(1) Protocol TCP Client
(2) Server IP 192.168. 0 . 7
(2) Server Port 8899

□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause

□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle
Interval 1000 ms

Diagram 1.4-1 Default Parameter Test

2. Overview

2.1. Brief Introduction

USR-DR301 Modbus RS232 to Ethernet converter can realize bidirectional transparent transmission between RS485 and Ethernet. It carries ARM processor, low power, fast speed, high stability. Via web-page or software, RS232 to Ethernet Converter can realize serial data and TCP/IP data package transparent transmission.

2.2. Features

- ARM base on Cortex-M0 kernel, and reliable TCP/IP protocol stack
- Industrial working temperature range from -40C ~85C
- Auto-MDI/MDIX, RJ45 port with 10/100Mbps
- Support TCP server, TCP client, UDP server, UDP client, HTTPD client and modbus TCP work mode
- Serial port baud rate can be set from 600bps to 460.8Kbps, parity: None, Odd, Even, Mark, Space
- Supports self-defined heartbeat package, keep the connection can never crash
- Supports self-defined registration package, check the station of the connection, which also can used as the self-defined package head. Users can use the MAC as the registration package.
- Under the TCP server mode, the number of the client connected to the server can be set from 1-8, default 4. the IP of the client connected can be dispaly. Each connection calculates the data received/transmitted.
- Under the TCP server mode, if the number of the clients number is 8, kick the old one or not can be set.
- Configure the parameters via the webpage, AT command, serial protocol and net protocol, provides setting protocol, and users can put into their software.
- Supports TCP client short connection, the disconnection interval can be set.
- Supports timeout restart(no data and restart), the restart time can be set.
- Before the TCP connection build, client the buffer data or not can be set
- Supports DHCP, obtain the IP automatically.
- The global unique MAC address bought from IEEE, also users can define MAC address
- Supports DNS function, and analyze the domain name. The DNS server address can be set.
- Upgrade firmware via network.
- Support USR-VCOM
- Supports hardware and software restore default settings
- Running across the gateway, converter and the router
- Running in LAN or in access the external net.

2.3. Basic Parameter

Classify	Parameter	Value

Hardware Parameters	Input Voltage	DC5～36V
	Working Current	130mA@5V
	Net interface format	RH45,10/1000Mbps
	Serial baud rate	600~460.8K(bps)
	Serial port	RS232*1
Software parameters	Net protocol	IPV4, TCP/UDP, ARP, ICMP, IPV4
	IP access way	Static IP, DHCP
	DDNS	supports
	User Configuring	Software configuring and webpage configuring AT command
	Transmit way	TCP server, TCP client, UDP server, UDP client
	Similar RFC2217	support
	HTTPD client	support
	TCP server	At most support 8 TCP client to connection
	Net buffer	Send:16Kbyte; receive:4Kbyte
	Serial buffer	receive:1Kbyte
	Average delay	<10ms
	Related software	USR-VCOM, USR-cloud, set-up software
	Packaging mechanism	4 bytes packaging time, 1024 bytes packaging length.
Others	Certification	CE, FCC, ROHS
	Protection	1.5KV electromagnetic isolation
	Dimension	71.0*60.0*25.0mm(L*W*H)
	Operating Temp.	-40～+85°C
	Storage Temp	-40~105°C
	Operating Humidity	5～95%RH
	Storage Humidity	5～95%RH
	Packaging	Electrostatic bubble

Diagram 2.3-1 Basic Parameters

3. Hardware Parameters

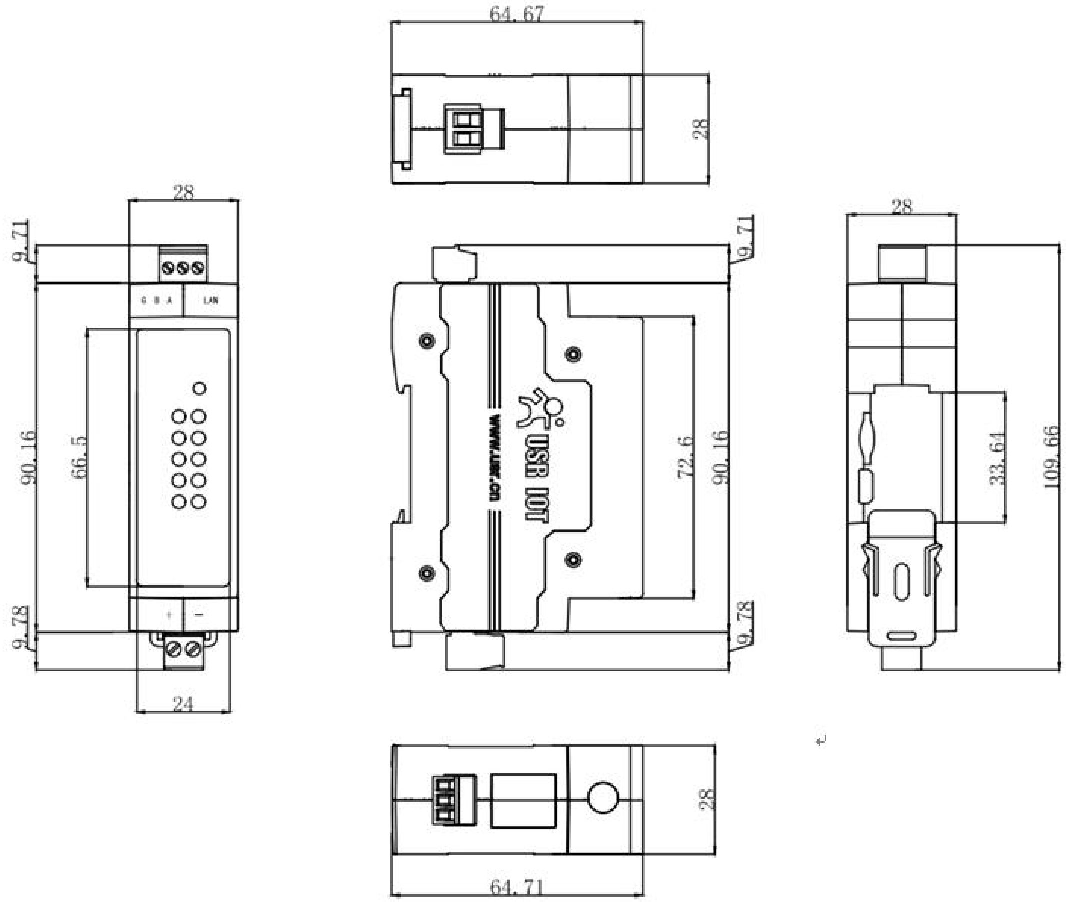


Diagram 3-1 Dimension

4. Product Function

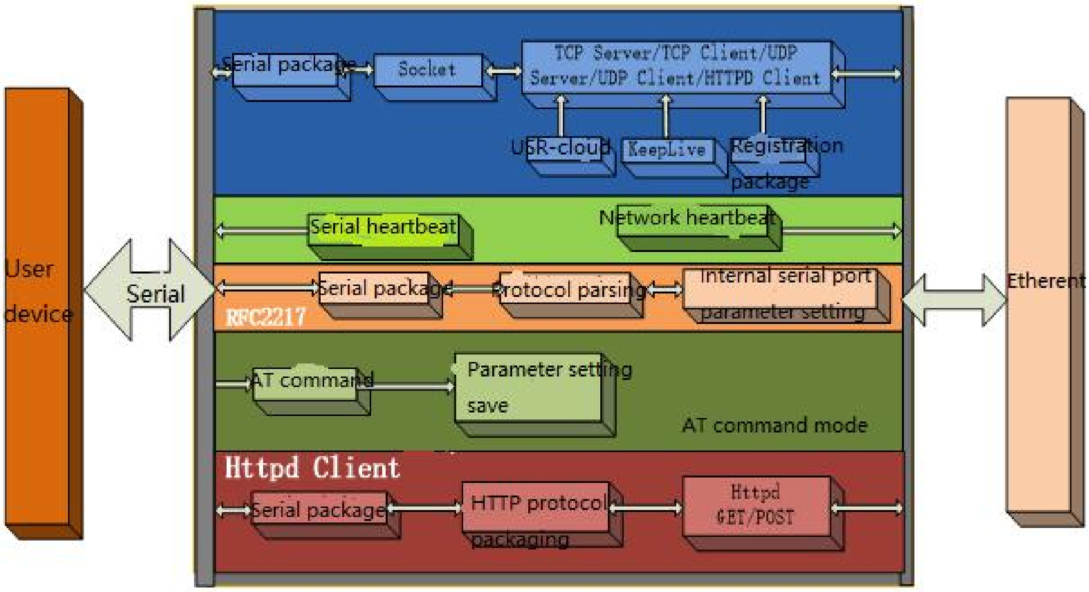


Diagram 4-1 USR-DR301 Function Diagram

4.1. Network Basic Function

4.1.1. Static IP/DHCP/Subnet Masks/Gateway

1. The IP of the module is the symbol in the LAN, which can be distinguish from the other device.

➢ Static IP

Manual setting the static IP, meanwhile please writing the IP, subnet and gateway. Static IP adjust to the scenario that IP and the device correspond.

Advantage: the device access to the IP that can not distribute can searched by the broadcast

Disadvantage:different segment of the different LAN need to configuring.

➢ DHCP

The DHCP is to obtain the IP, gateway and DNS from the gateway automatically to reduce the tedious step for setting the IP. Adjust to the scenario there is no requirement to the IP.

Advantage: communicate directly when access router which can distribute the DHCP to reduce the tedious step to set the IP and the subnet masks.

Disadvantage:access the net without DHCP, just like connect the PC directly, the module can not work normally.

Related AT command:

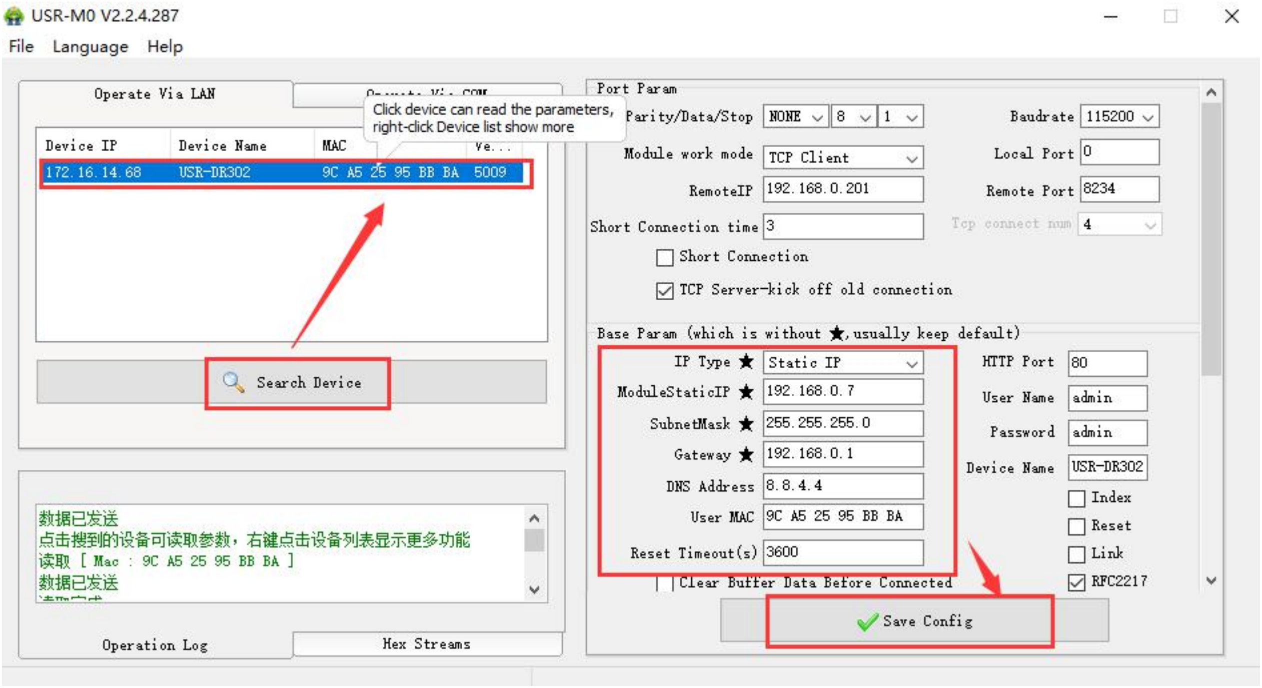
Command name	Instr
AT+WANN	Setting and query the IP access way, subnet and the gateway parameters of the DR301

Form 4.1.1-1 Related AT Command

2. Subnet masks: to mark which subnet is the host in from the IP address bites and which bites mark the host masks.

3. Gateway: IP address of the router in the LAN, if there is something wrong with the setting, user will can not access the external net. If user do not use the router and so on device, keep default and do not set.

4. Setting software.



Click device can read the parameters, right-click Device list show more

Device IP	Device Name	MAC	Ve...
172.16.14.68	USR-DR302	9C A5 25 95 BB BA	5009

数据已发送
点击搜到的设备可读取参数，右键点击设备列表显示更多功能
读取 [Mac : 9C A5 25 95 BB BA]
数据已发送

Parity/Data/Stop: NONE 8 1
Baudrate: 115200
Module work mode: TCP Client
Local Port: 0
RemoteIP: 192.168.0.201
Remote Port: 8234
Short Connection time: 3
Tcp connect num: 4
☐ Short Connection
☑ TCP Server-kick off old connection

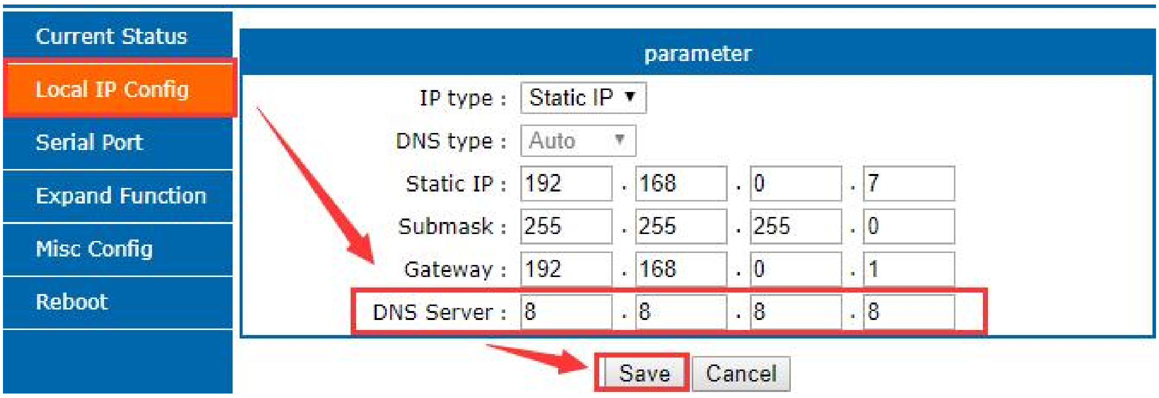
IP Type ★: Static IP
ModuleStaticIP ★: 192.168.0.7
SubnetMask ★: 255.255.255.0
Gateway ★: 192.168.0.1
DNS Address: 8.8.4.4
User MAC: 9C A5 25 95 BB BA
Reset Timeout(s): 3600
☐ Clear Buffer Data Before Connected
HTTP Port: 80
User Name: admin
Password: admin
Device Name: USR-DR302
☐ Index
☐ Reset
☐ Link
☑ RFC2217

Diagram 4.1.1-1 Setting Software

4.1.2. DNS Server Address

DNS server is used to converter the domain name in to the IP address that net can recognized. The server address of the DR301 can be configured. After setting, all the questing will be sent to this address when the DR301 need to DDNS.

Under the static IP mode, DNS server address default is 8.8.8.8. and under the DHCP mode, DHCP server address can be acquire automatically. 4015 and latter versions supports this function.



IP type : Static IP

DNS type : Auto

Static IP : 192 . 168 . 0 . 7

Submask : 255 . 255 . 255 . 0

Gateway : 192 . 168 . 0 . 1

DNS Server : 8 . 8 . 8 . 8

Diagram 4.1.2-1 Local IP Config

Related AT command:

Command name	Instr
AT+DNS	Setting and query the DNS server address of the DR301

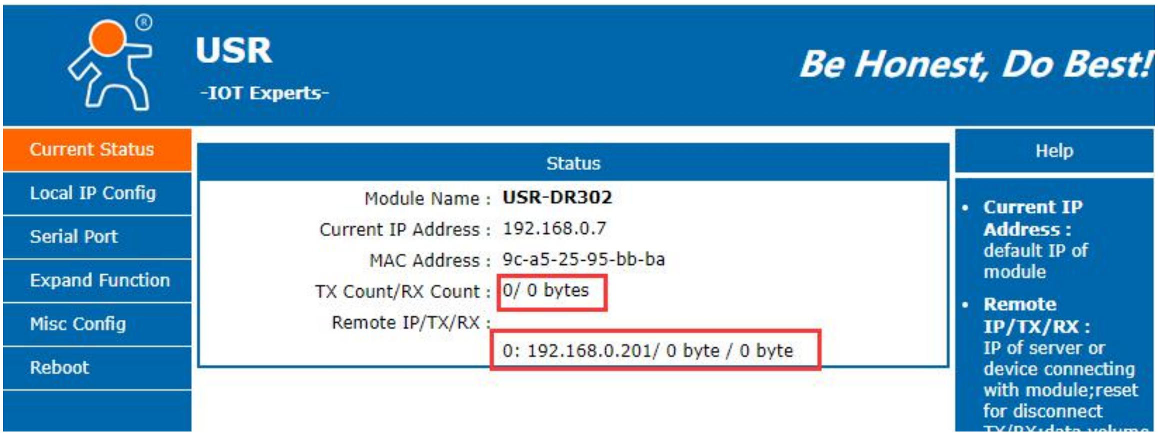
Form 4.1.2-1 Related AT Command

4.1.3. Webserver

DR301 supports build-in webserver, same as the normal webserver. User can setting the parameters via the webpage also can check the related status. Default port of the webserver is 80, and this port can be modified/ after modify, user also can access the build-in webpage to access via the other port.

The default home page is the current state interface, refreshed every 10s, showing DR301 running status:

- Total number of data sent by the network: Can judge how much data is sent to the external network.
- Total data received by the network: Can determine how much data is sent from the network to the module.
- Connected remote IP/network send/receive: Through this item, you can see which device is connected to DR301. How much data is sent and received by this connection. Currently, only 4 connection status displays are supported. In UDP Server mode, only the send/receive data is displayed, and the connection IP is not displayed.



Module Name : USR-DR302

Current IP Address : 192.168.0.7

MAC Address : 9c-a5-25-95-bb-ba

TX Count/RX Count : 0/ 0 bytes

Remote IP/TX/RX : 0: 192.168.0.201/ 0 byte / 0 byte

- **Current IP Address :** default IP of module
- **Remote IP/TX/RX :** IP of server or device connecting with module;reset for disconnect

Diagram4.1.3-1 Current Status

4.1.4. Restore to Factory Set

1) Hardware restore:

Press the Reload button for 5s to 15s to restore the factory settings. If it is less than 5s or exceeds 15s, the factory reset will not be performed. When the module is configured with incorrect parameters, or if you have forgotten the previously set password, you can restore the factory settings.

2) Software restore:

Restore the factory settings by setup software setting function or send the factory reset command via the network protocol.

3) AT command restore:

Enter the AT command mode, restore via the command.

Related AT command:

Command name	Instr
AT+RELD	Restore to factory setting

Form 4.1.4-1 Related AT Command

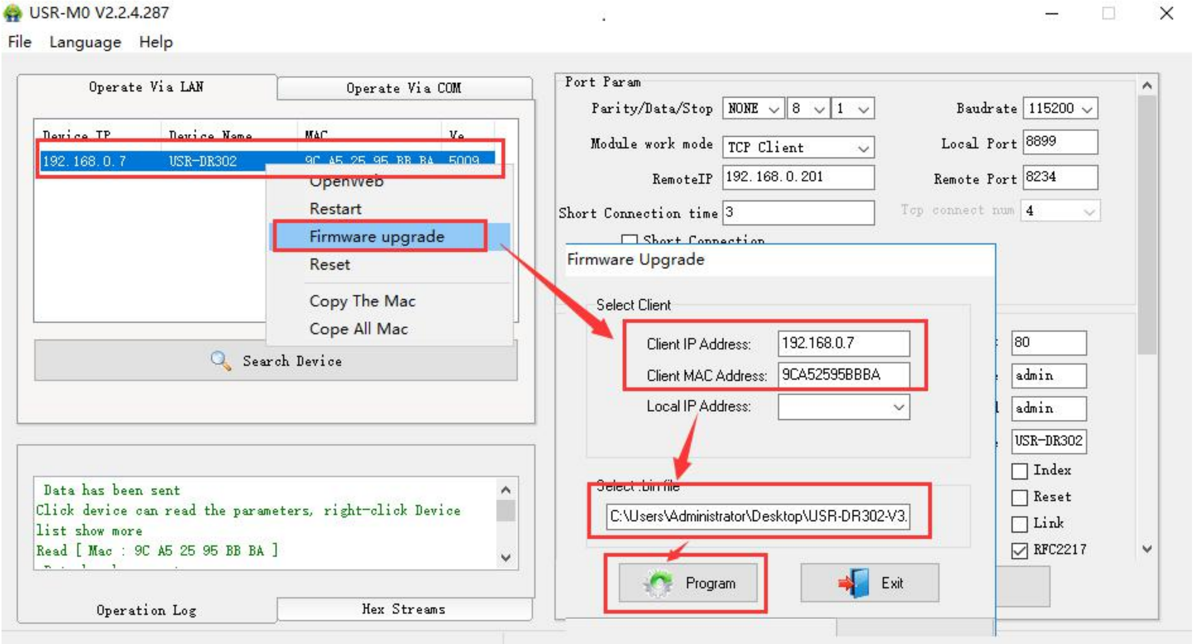
4.1.5. Firmware Upgrade

The way to upgrade the DR301 firmware is to upgrade through the network. It is simple and convenient to upgrade the firmware through the network. By upgrading the firmware, you can get more cutting-edge applications. The specific upgrade method is as follows.

1) Upgrade the firmware with a wired network. Before upgrading, turn off the wireless and virtual machine network cards to ensure that the computer only keeps one wired network card. The module and the computer can be connected to the router at the same time or the module can be directly connected to the computer.

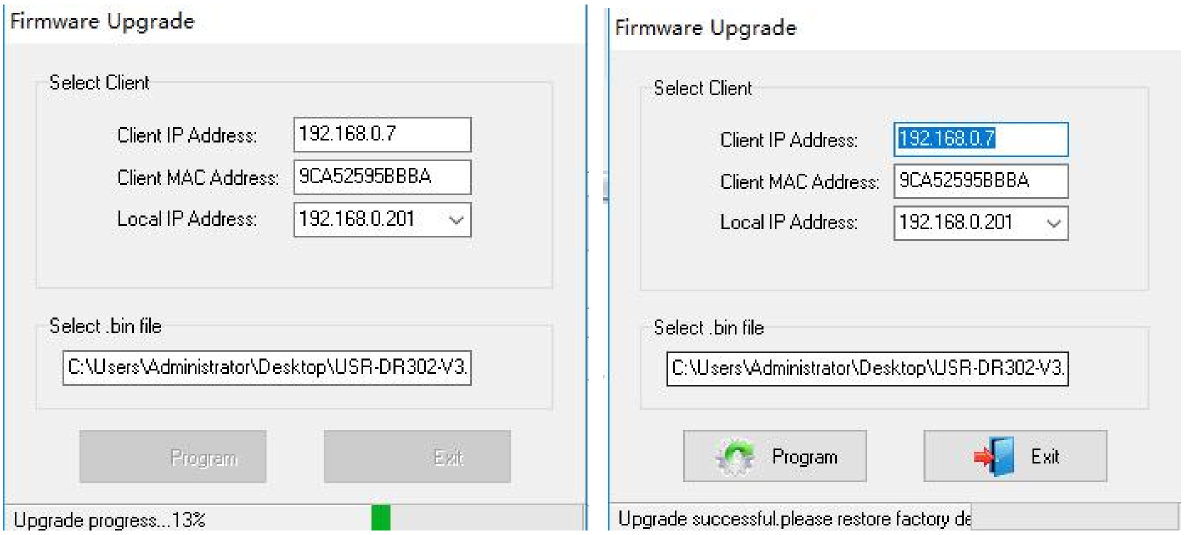
2) After the hardware is connected, upgrade the firmware by setup software, do not change the IP and MAC addresses, set the firmware path (it is recommended not to have a Chinese path), and then click to upgrade the firmware.

Note: here we take DR302 as an example, as the function and contents of the DR301 are same as DR302 and the different between them is the serial port.



```
Data has been sent
Click device can read the parameters, right-click Device
list show more
Read [ Mac : 9C A5 25 95 BB BA ]
```

3) There is a progress bar during the upgrade. When the progress bar reaches 100%, the setup software will prompt that the upgrade is successful and the upgrade is complete. Re-search the module after the upgrade is complete.


Firmware Upgrade
Select Client
Client IP Address: 192.168.0.7
Client MAC Address: 9CA52595BBBA
Local IP Address: 192.168.0.201
Select .bin file
C:\Users\Administrator\Desktop\USR-DR302-V3.
Program
Exit
Firmware Upgrade
Select Client
Client IP Address: 192.168.0.7
Client MAC Address: 9CA52595BBBA
Local IP Address: 192.168.0.201
Select .bin file
C:\Users\Administrator\Desktop\USR-DR302-V3.
Program
Exit

Upgrade progress...13%

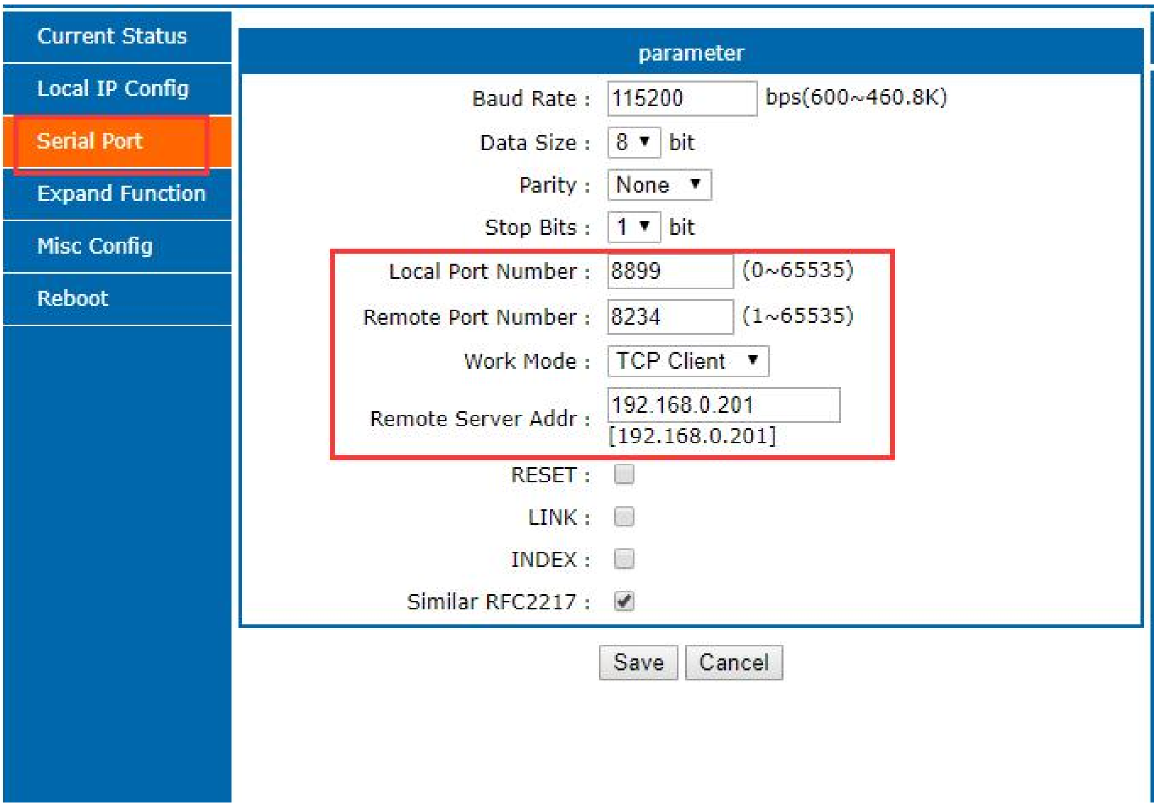
Upgrade successful.please restore factory de

4.2. Socket Communication

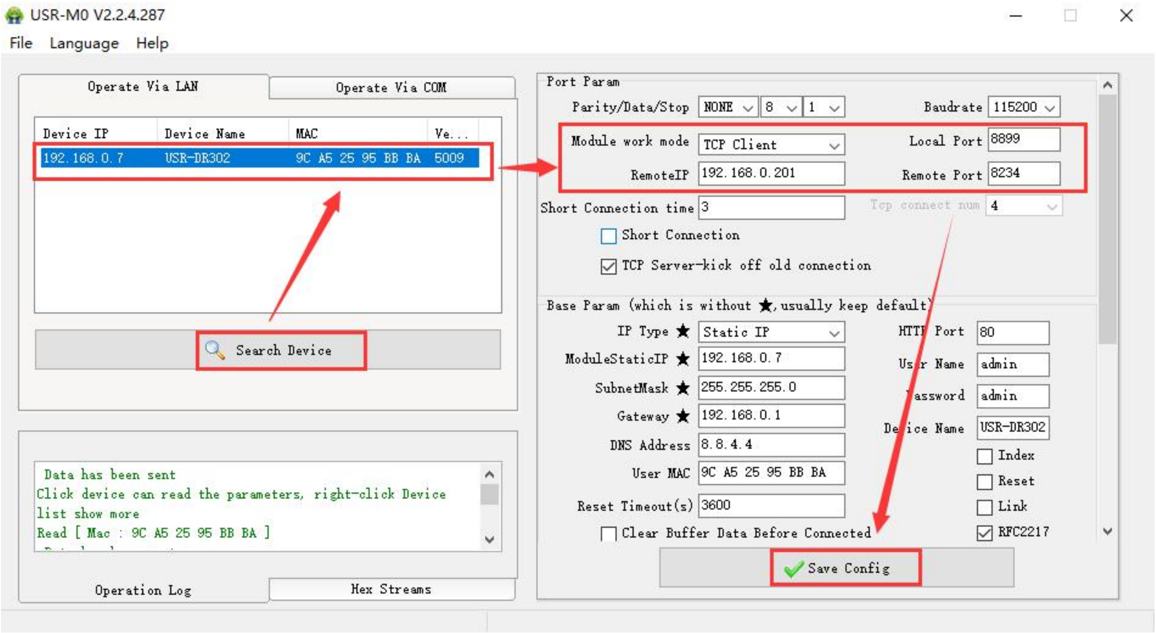
There are five work modes for the socket of the DR301:TCP Client, TCP Server, UDP Client, UDP Server and Httpd Client.

Set via the webpage or the set-up software

The webpage are as bellows:



Baud Rate : 115200 bps(600~460.8K)
Data Size : 8 bit
Parity : None
Stop Bits : 1 bit
Local Port Number : 8899 (0~65535)
Remote Port Number : 8234 (1~65535)
Work Mode : TCP Client
Remote Server Addr : 192.168.0.201 [192.168.0.201]
RESET : □
LINK : □
INDEX : □
Similar RFC2217 : ☑



Device IP	Device Name	MAC	Ve...
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5009

```
Data has been sent
Click device can read the parameters, right-click Device
list show more
Read [ Mac : 9C A5 25 95 BB BA ]
```

Parity/Data/Stop NONE 8 1 Baudrate 115200
Module work mode TCP Client Local Port 8899
RemoteIP 192.168.0.201 Remote Port 8234
Short Connection time 3 Tcp connect num 4
□ Short Connection
☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)
IP Type ★ Static IP HTTP Port 80
ModuleStaticIP ★ 192.168.0.7 User Name admin
SubnetMask ★ 255.255.255.0 Password admin
Gateway ★ 192.168.0.1 Device Name USR-DR302
DNS Address 8.8.4.4 □ Index
User MAC 9C A5 25 95 BB BA □ Reset
Reset Timeout(s) 3600 □ Link
□ Clear Buffer Data Before Connected ☑ RFC2217

Related AT command

Command name	Instr
AT+SOCK	Setup DR301 Socket working mode / target IP / target port

4.2.1. TCP Client Mode

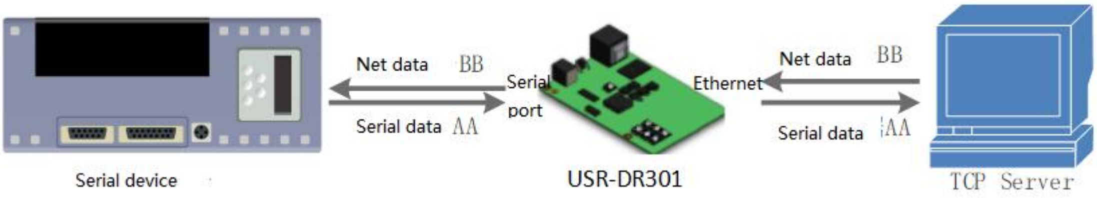


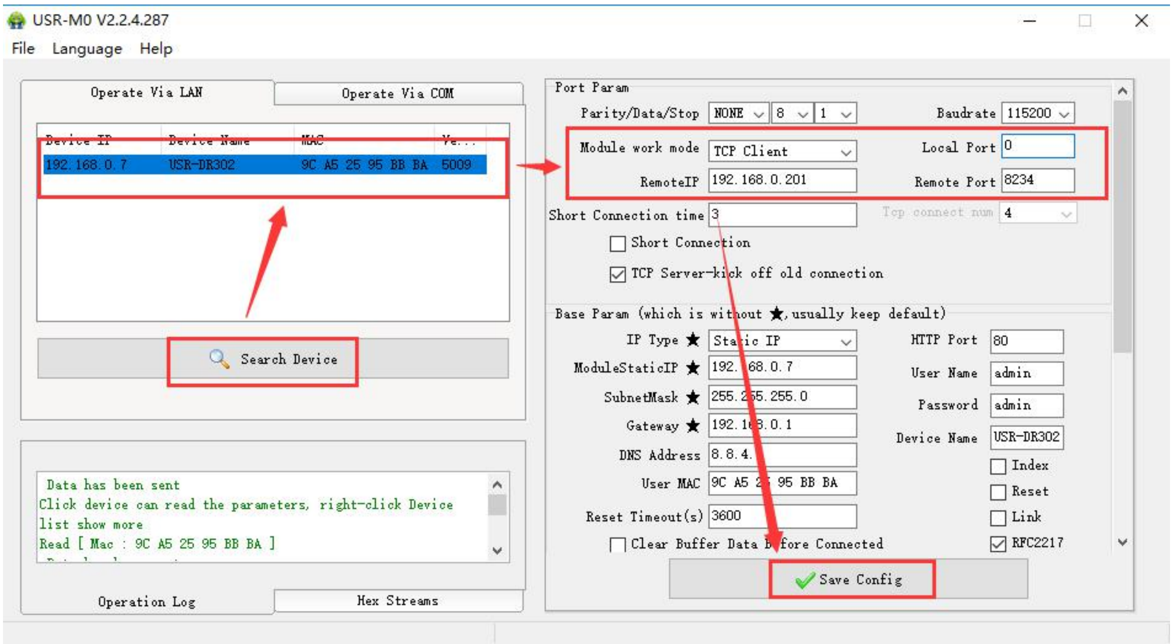
Diagram 4.2.1-1 TCP Client

1) TCP client provides the client connection for TCP net server. Query the server automatically can build the connection to realize the data transmission. Different from UDP mode, in this mode, connection has status of disconnection and remaining to make sure the data transmission reliable.
2) Identify disconnects. After connection built, it sends keepalive searching packet every 15 seconds. Once there is an interrupt, it can be detected rapidly then make USR-DR301 disconnect from former connection and reconnect.
3) Please notice the remote IP/domain name and the remote port when connecting the TCP server. Remote IP can be the device in the same LAN or the device in other LAN. If user want to connect the server across the net, there must be a public IP or the domain name for the server.
4) It supports USR Synchronous baud rate (Similar RCF2217), USR-cloud, also supports short connection function.
5) Under the same LAN, if 302 is set to static IP, keep the IP and gateway of 302 in the same network segment, and set the gateway IP correctly. Otherwise, communication will not be possible.
6) USR-DR301 work as TCP Client, It connects to the target IP/Port automatically,will not accept other connection request.
7) When 302 is used as the TCP Client, it is recommended to set the local port number of 302 to 0. In this way, 302 can access the server with a random port number, which can solve the problem of reconnection failure caused by the server determining that the connection state is abnormal.
8) Test Example

① Open "USR-TCP232-M0_E45 setup" software.

Set USR-DR301 as TCP Client, Destination IP: 192.168.0.201. Destination port:8234.

Save the parameters and then research again to check if the parameters are correct . Also users can set the work mode ,remote IP and the remote port via the webpage.



USR-M0 V2.2.4.287

Device IP	Device Name	MAC	Ve...
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5009

Port Param

Parity/Data/Stop: NONE 8 1 Baudrate: 115200

Module work mode: TCP Client Local Port: 0

RemoteIP: 192.168.0.201 Remote Port: 8234

Short Connection time: 3 Tcp connect num: 4

□ Short Connection

☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)

IP Type ★: Static IP HTTP Port: 80

ModuleStaticIP ★: 192.168.0.7 User Name: admin

SubnetMask ★: 255.255.255.0 Password: admin

Gateway ★: 192.168.0.1 Device Name: USR-DR302

DNS Address: 8.8.4. □ Index

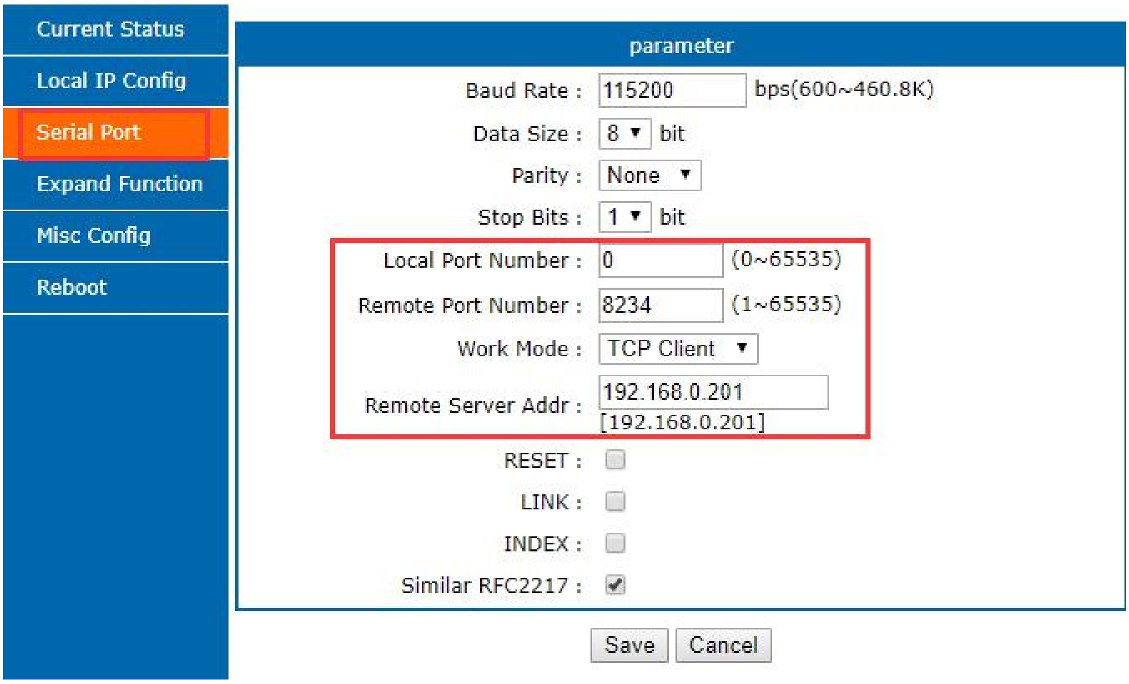
User MAC: 9C A5 25 95 BB BA □ Reset

Reset Timeout(s): 3600 □ Link

□ Clear Buffer Data before Connected ☑ RFC2217

```
Data has been sent
Click device can read the parameters, right-click Device
list show more
Read [ Mac : 9C A5 25 95 BB BA ]
```

Diagram 4.2.1-2Configuration



parameter

Baud Rate : 115200 bps(600~460.8K)

Data Size : 8 bit

Parity : None

Stop Bits : 1 bit

Local Port Number : 0 (0~65535)

Remote Port Number : 8234 (1~65535)

Work Mode : TCP Client

Remote Server Addr : 192.168.0.201 [192.168.0.201]

RESET : □

LINK : □

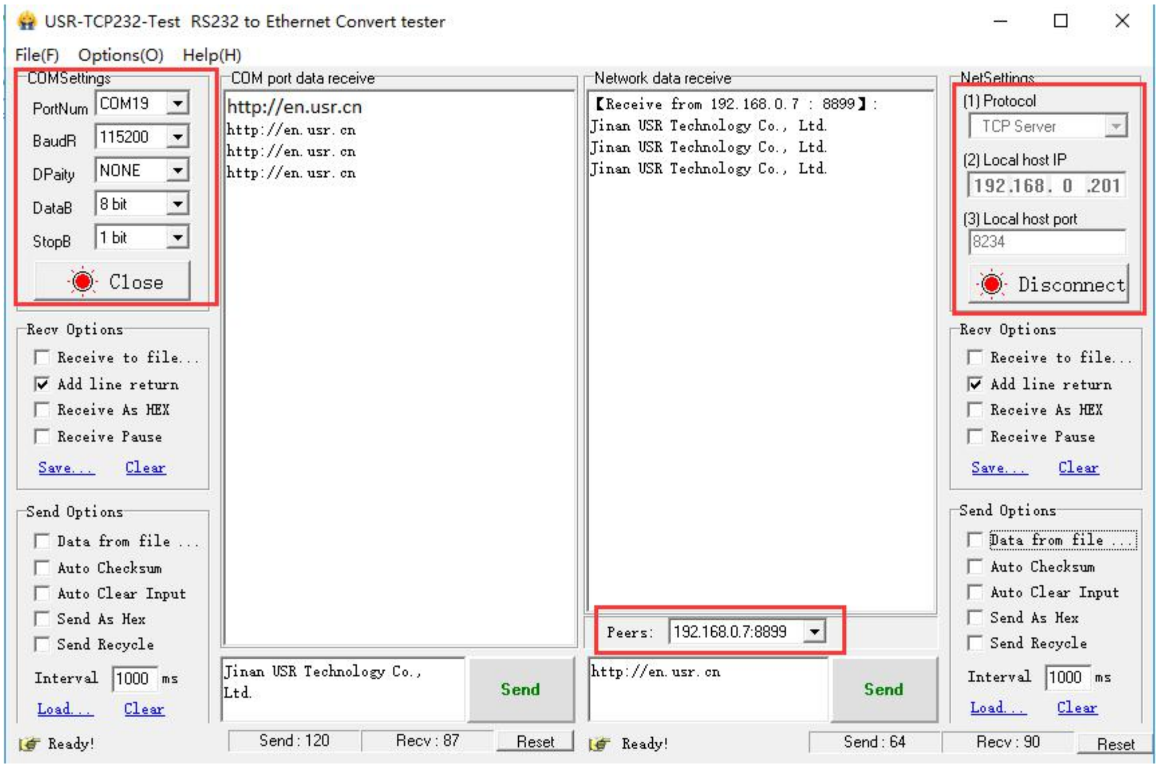
INDEX : □

Similar RFC2217 : ☑

Diagram 4.2.1-3 Serial Port

② Open “USR-TCP232-TEST” software:
Set the USR-TCP232-TEST as TCP Server, its IP: 192.168.0.201, Port number: 8234, Click “Listening”
Net port display connection information:192.168.0.7:8899(random port distributed). set the right serial port parameters and click to open the serial port.

③ Click sent and receive the bi-direction transmitted data



USR-TCP232-Test RS232 to Ethernet Convert tester

File(F) Options(O) Help(H)

COMSettings
PortNum COM19
BaudR 115200
DPaity NONE
DataB 8 bit
StopB 1 bit
Close

COM port data receive
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn

Network data receive
【Receive from 192.168.0.7 : 8899】:
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.

NetSettings
(1) Protocol TCP Server
(2) Local host IP 192.168. 0 .201
(3) Local host port 8234
Disconnect

Recv Options
□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause
Save... Clear

Send Options
□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle
Interval 1000 ms
Load... Clear

Peers: 192.168.0.7:8899

COM send: Jinan USR Technology Co., Ltd. — Send

Network send: http://en.usr.cn — Send

Ready! Send : 120 Recv : 87 Reset
Ready! Send : 64 Recv : 90 Reset

Diagram 4.2.1-4 TCP Client Test

4.2.2. TCP Server Mode

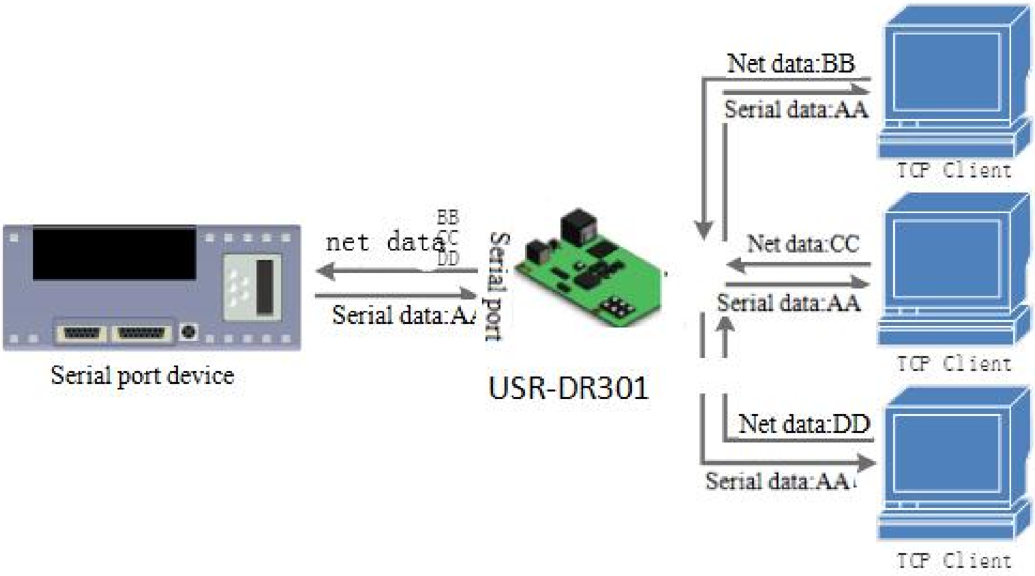
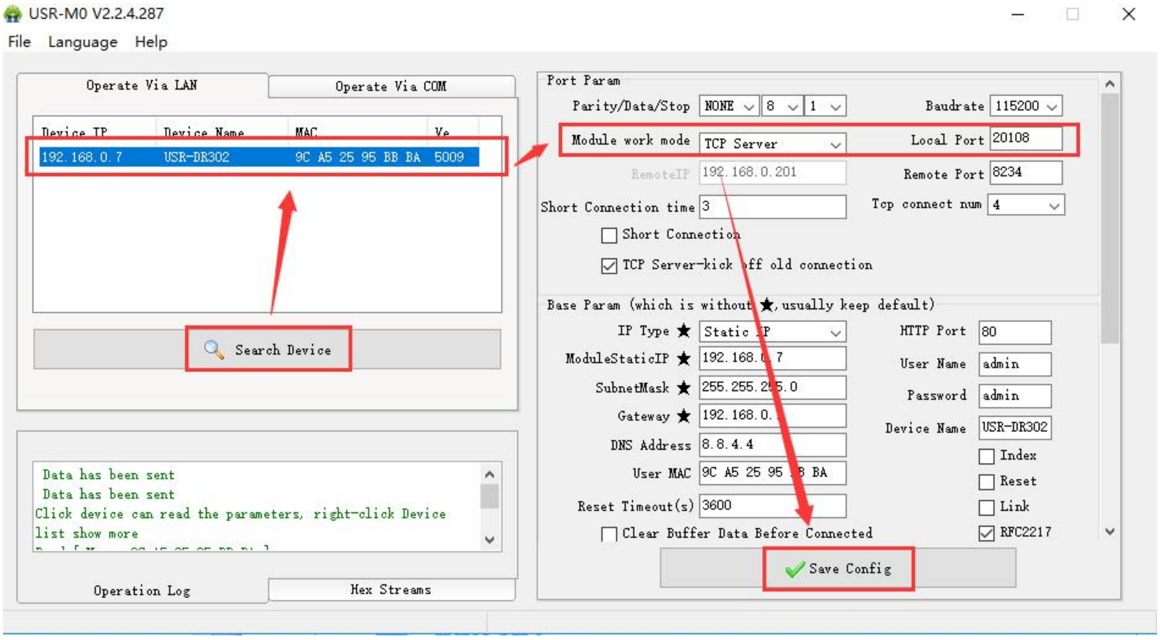


Diagram 4.2.2-1 TCP Server Mode

1) DR301 In the TCP Server mode, there is also a KeepAlive function for real-time monitoring of the integrity of the connection.
2) Usually used for communication with TCP clients in the LAN. It is suitable for scenarios where there is no server in the LAN and there are multiple computers or mobile phones requesting data from the server. As with TCP Client, there is a difference between connection and disconnection to ensure reliable exchange of data.
3) This mode supports USR's independent synchronous baud rate function (RFC2217) function.
4) In TCP Server mode, the DR301 actively listens to the local port and responds with a connection request and creates a connection. When the serial port of the DR301 receives the data, it also sends it to all devices that establish a connection with the DR301 server. If you access the DR301's TCP server across the public network, you need to do port mapping on the router.
5) It support 8 clients connections at max. (the number can be set.) the local port is fixed, can not be "0"
6) Under TCP Server mode, when the number of connected clients exceeds the set maximum value, the default is to replace the old connection with a new one, can modify this function in the web page.
7) <u>Test Example</u>

① Set USR-DR301 as TCP Server Mode, local port 20108, same as default. Also can set in the webpage.



Device IP	Device Name	MAC	Ve
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5009

Data has been sent
Data has been sent
Click device can read the parameters, right-click Device list show more

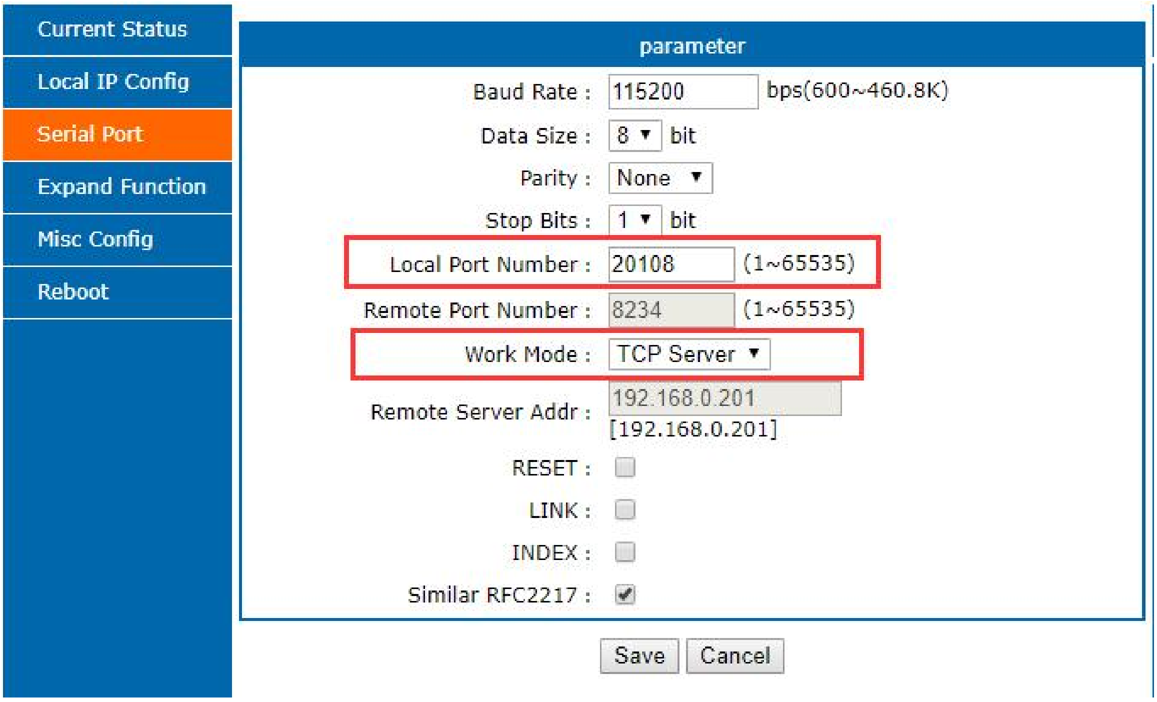
Port Param

Parity/Data/Stop: NONE, 8, 1
Baudrate: 115200
Module work mode: TCP Server
Local Port: 20108
RemoteIP: 192.168.0.201
Remote Port: 8234
Short Connection time: 3
Tcp connect num: 4
□ Short Connection
☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)

IP Type ★: Static IP
HTTP Port: 80
ModuleStaticIP ★: 192.168.0.7
User Name: admin
SubnetMask ★: 255.255.255.0
Password: admin
Gateway ★: 192.168.0.
Device Name: USR-DR302
DNS Address: 8.8.4.4
□ Index
User MAC: 9C A5 25 95 B BA
□ Reset
Reset Timeout(s): 3600
□ Link
□ Clear Buffer Data Before Connected
☑ RFC2217

Diagram 4.2.2-2 TCP server mode (software)



Baud Rate : 115200 bps(600~460.8K)

Data Size : 8 bit

Parity : None

Stop Bits : 1 bit

Local Port Number : 20108 (1~65535)

Remote Port Number : 8234 (1~65535)

Work Mode : TCP Server

Remote Server Addr : 192.168.0.201 [192.168.0.201]

RESET : □

LINK : □

INDEX : □

Similar RFC2217 : ☑

Diagram 4.2.2-3 TCP server mode (webpage)

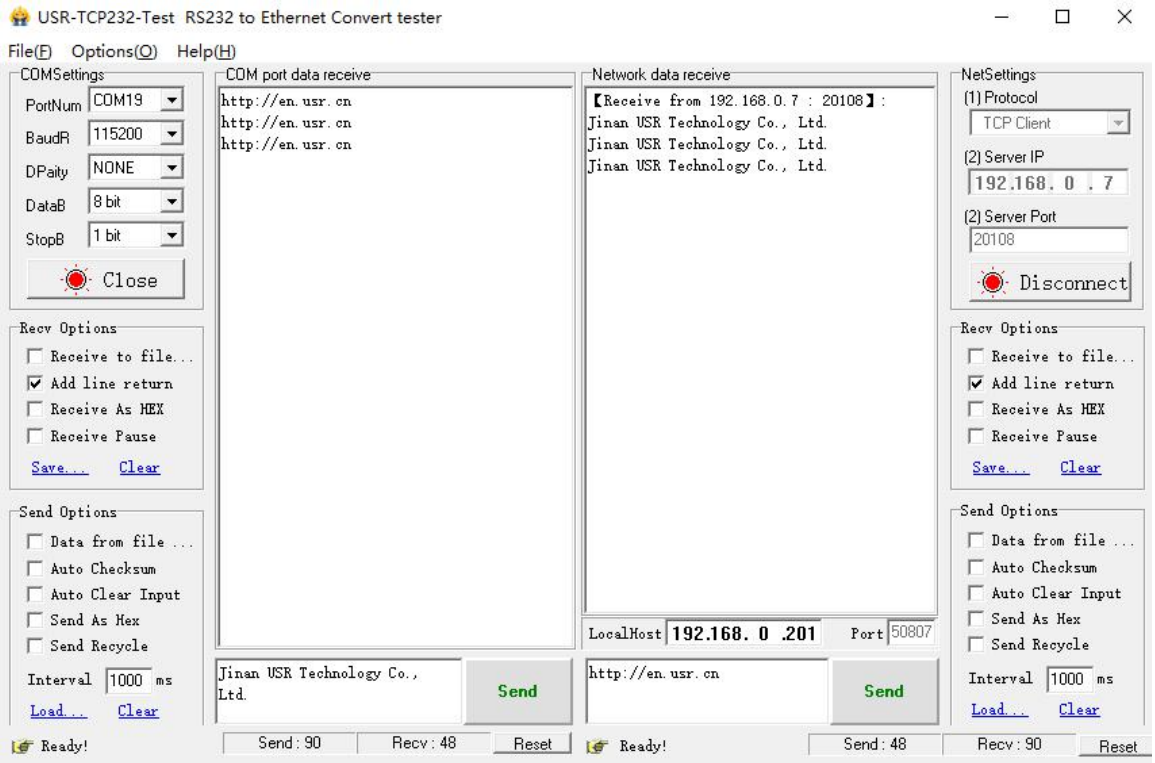
② Open ”USR-TCP232-TEST” Software, on the side of NetSettings:

Protocol: TCP Client

Server IP/Port: the same value as the default parameter of USR-DR301

Click ”Connect”, local host IP is: 192.168.1.201. Set the correct serial port parameters and click to open the serial port.

③ Click ”Connect” to test data transmission.



USR-TCP232-Test RS232 to Ethernet Convert tester

File(F) Options(O) Help(H)

COMSettings
PortNum COM19
BaudR 115200
DPaity NONE
DataB 8 bit
StopB 1 bit
Close

Recv Options
□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause
Save... Clear

Send Options
□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle
Interval 1000 ms
Load... Clear

COM port data receive

```
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
```

Jinan USR Technology Co., Ltd.
Send

Network data receive

```
【Receive from 192.168.0.7 : 20108】:
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
```

LocalHost 192.168. 0 .201 Port 50807

http://en.usr.cn
Send

NetSettings
(1) Protocol
TCP Client
(2) Server IP
192.168. 0 . 7
(2) Server Port
20108
Disconnect

Recv Options
□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause
Save... Clear

Send Options
□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle
Interval 1000 ms
Load... Clear

Ready! Send : 90 Recv : 48 Reset
Ready! Send : 48 Recv : 90 Reset

Diagram 4.2.2-2 TCP Server Test

4.2.3. UDP Client Mode

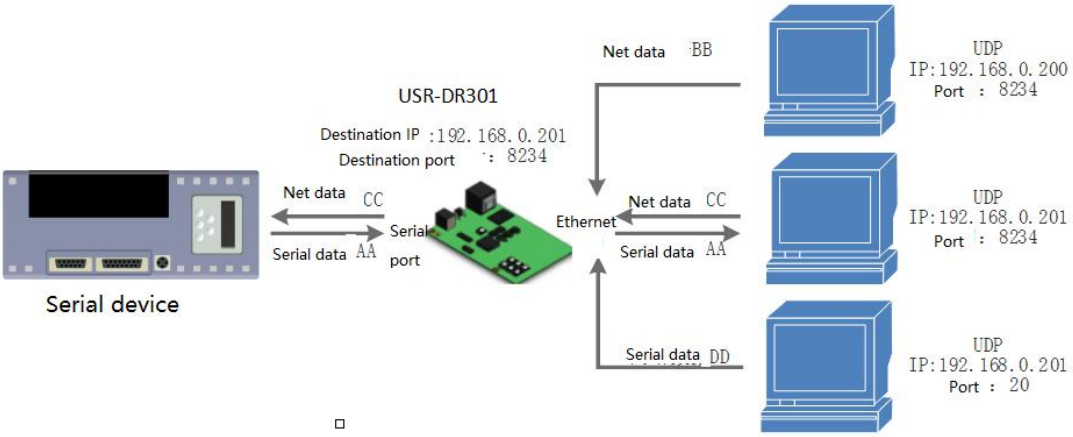


Diagram 4.2.3-1 UDP Client

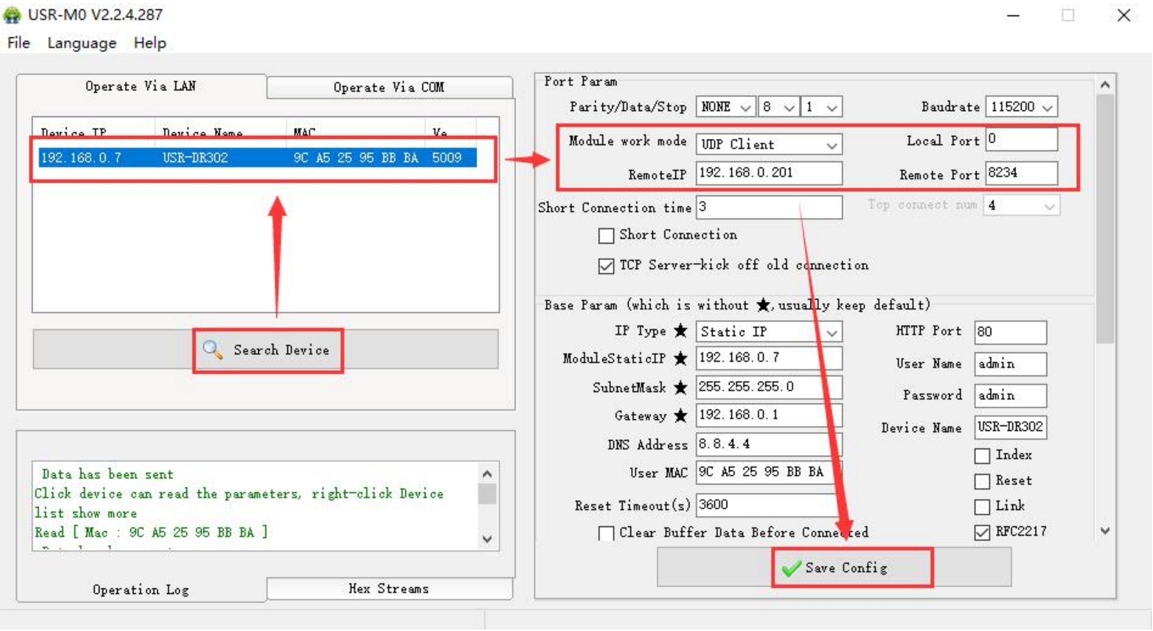
1) It subjects to UDP protocol, no connection, just only sending data. No difference of the connection and disconnection, no requirement with the packet loss, small data package and quick frequency and the data sent to the appointed IP.
2) USR-DR301 only communicate with destination port of IP. Otherwise, the data cannot be received.
3) Under this mode, destination Address is 255.255.255.255, then it can make UDP broadcast and receive broadcast data. The firmware in the 4015 and later firmware supports the broadcast in the network segment,

such as the broadcast mode of xxx.xxx.xxx.255.

4) Multicast is not supported in UDP mode.

5) Test Example：

① Open USR-TCP232-M0, E45 Setup Software: Set DR301 to UDP client mode and the target port is 8234.



USR-M0 V2.2.4.287

File Language Help

Operate Via LAN | Operate Via COM

Device IP	Device Name	MAC	Ve
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5009

Search Device

Data has been sent
Click device can read the parameters, right-click Device list show more
Read [Mac : 9C A5 25 95 BB BA]

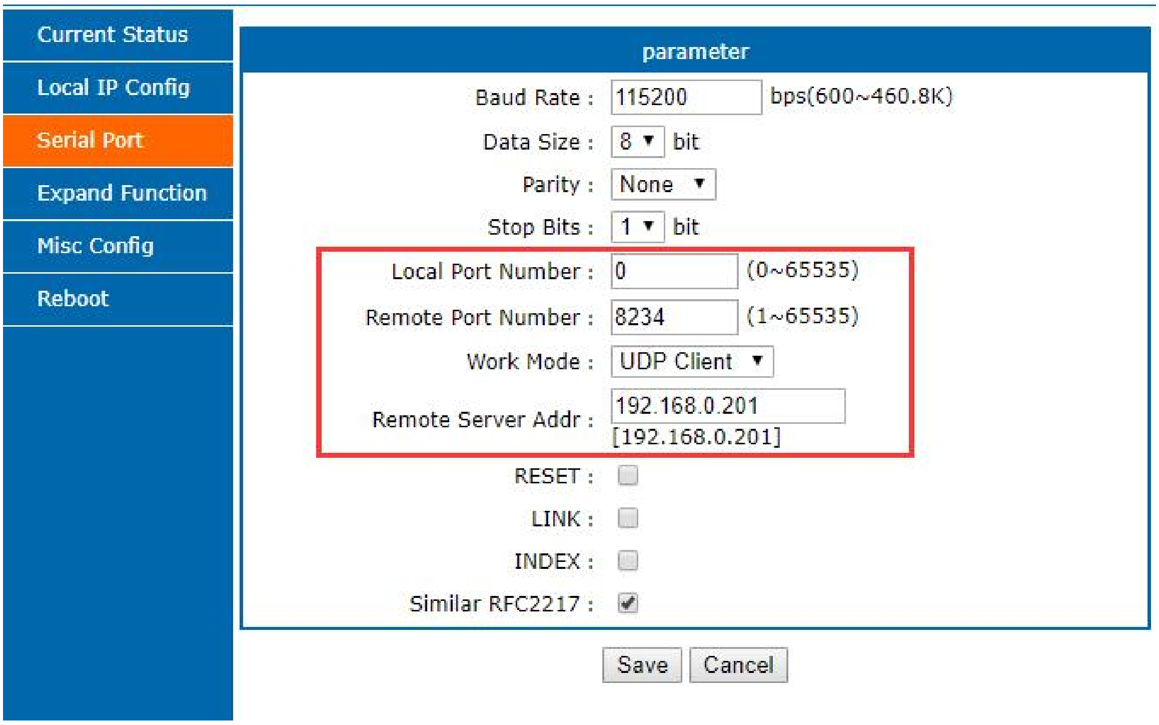
Operation Log | Hex Streams

Port Param
Parity/Data/Stop: NONE, 8, 1 Baudrate: 115200
Module work mode: UDP Client Local Port: 0
RemoteIP: 192.168.0.201 Remote Port: 8234
Short Connection time: 3 Tcp connect num: 4
□ Short Connection
☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)
IP Type ★: Static IP HTTP Port: 80
ModuleStaticIP ★: 192.168.0.7 User Name: admin
SubnetMask ★: 255.255.255.0 Password: admin
Gateway ★: 192.168.0.1 Device Name: USR-DR302
DNS Address: 8.8.4.4 □ Index
User MAC: 9C A5 25 95 BB BA □ Reset
Reset Timeout(s): 3600 □ Link
□ Clear Buffer Data Before Connected ☑ RFC2217

Save Config

Diagram 4.2.3-2 UDP Client(software)



parameter

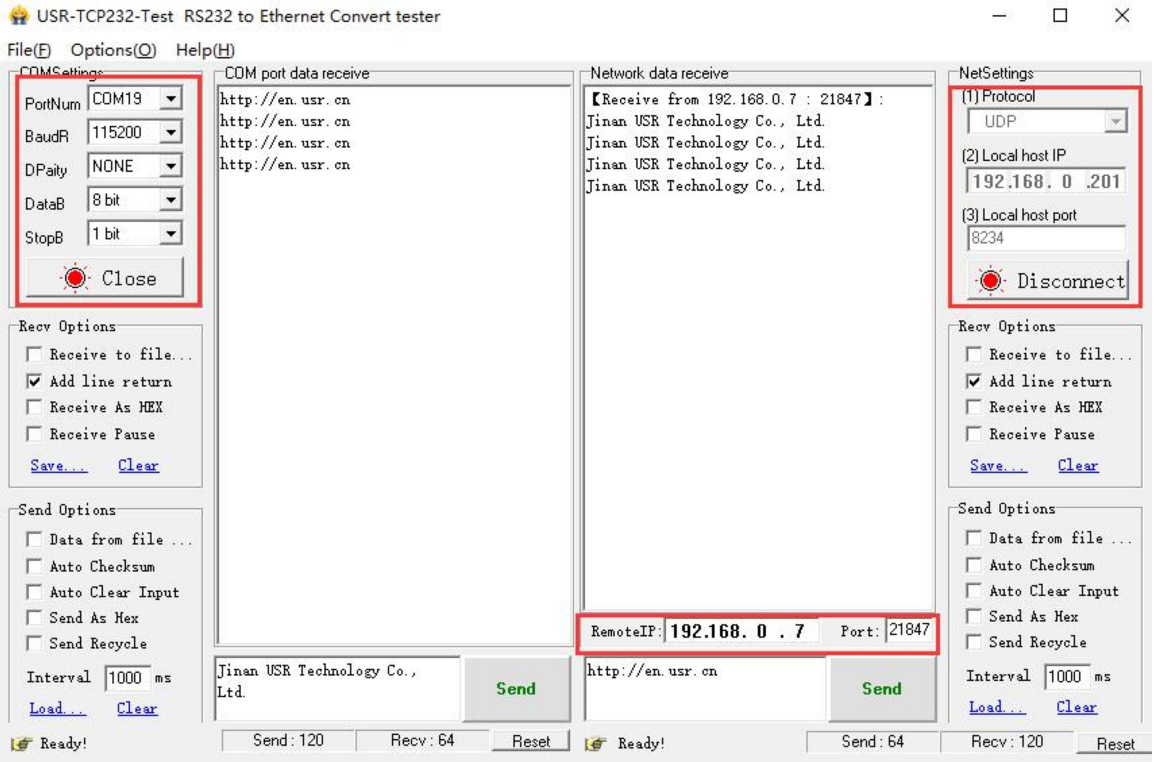
Baud Rate : 115200 bps(600~460.8K)
Data Size : 8 bit
Parity : None
Stop Bits : 1 bit
Local Port Number : 0 (0~65535)
Remote Port Number : 8234 (1~65535)
Work Mode : UDP Client
Remote Server Addr : 192.168.0.201 [192.168.0.201]
RESET : □
LINK : □
INDEX : □
Similar RFC2217 : ☑

Save Cancel

Diagram 4.2.3-3 UDP Client(webpage)

② Open USR-TCP232-TEST Software: set protocol to UDP, the local IP is the IP of the PC, and the local port number is the target port number of 302. Click Connect. Set the correct serial port parameters, click to open the serial port

③ Click “Send” at serial side. Remote IP and port becomes USR-DR301’s after receiving the data. Then click “Send” in network part and send data to COM.



USR-TCP232-Test RS232 to Ethernet Convert tester

COMSettings

PortNum COM19

BaudR 115200

DPaity NONE

DataB 8 bit

StopB 1 bit

Recv Options

□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause

Send Options

□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle

Interval 1000 ms

COM port data receive

```
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
http://en.usr.cn
```

Jinan USR Technology Co., Ltd.

Send : 120 Recv : 64

Network data receive

```
【Receive from 192.168.0.7 : 21847】:
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
```

RemoteIP: 192.168. 0 . 7 Port: 21847

http://en.usr.cn

Send : 64 Recv : 120

NetSettings

(1) Protocol UDP

(2) Local host IP 192.168. 0 .201

(3) Local host port 8234

Recv Options

□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause

Send Options

□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle

Interval 1000 ms

Diagram 4.2.3-4 UDP Client Test

4.2.4. UDP Server Mode

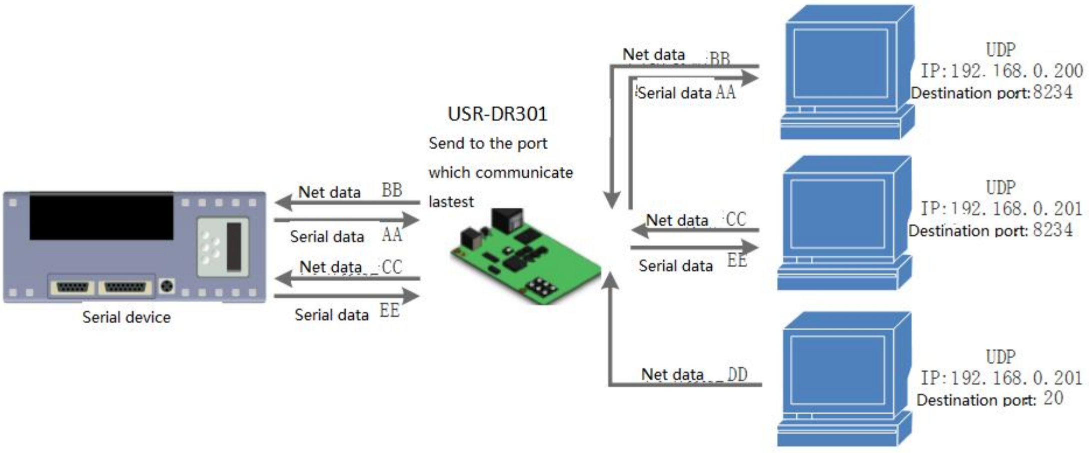


Diagram 4.2.4-1 UDP Server Mode

1) Base on normal UDP, it doesn't verify source IP address. Every time USR-DR301 receive one UDP data packet,

it changes destination IP to where data comes and it sends the data to the IP and port which communicate latest.

2) Used in the scenario several net device want to communication with the module with high speed and do not want to use the TCP mode.

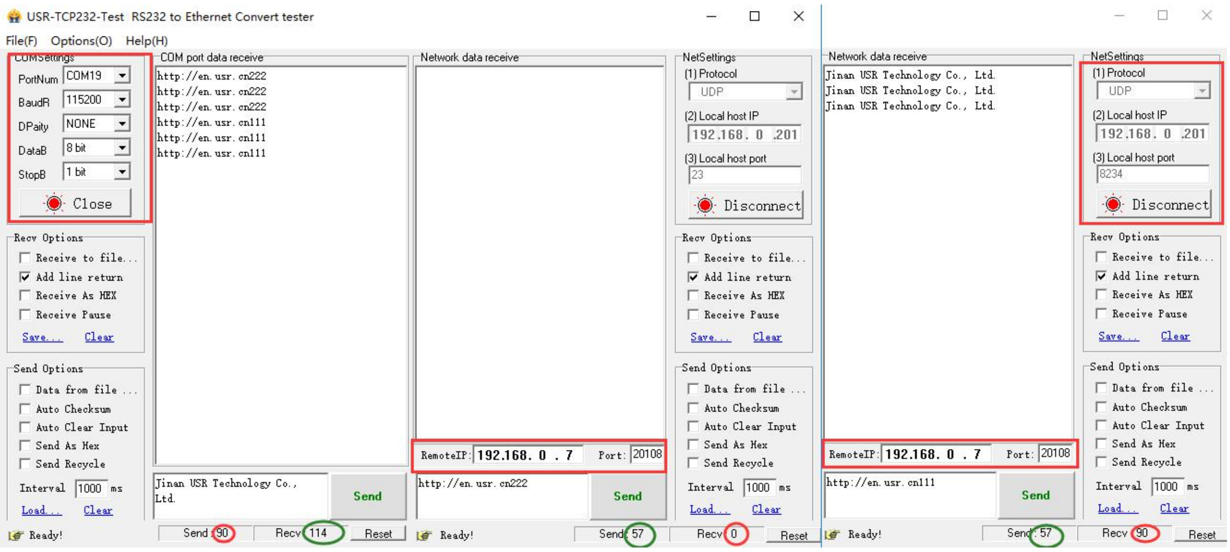
3) Test Example：

① Open “USR-TCP232-M0_ E45 Setup” Software: Set USR-DR301 as UDP Server, local port: 23.

② Open “USR-TCP232-TEST” Software twice. Set work mode as UDP, local host IP is the IP of PC.

The port numbers are set to two different port numbers. In this paper, 23 and 8234 are used as examples. Click” connect”. On the network side, the target host all fill in the IP of DR301, and the port all fill in the local port number of DR301. Set the correct serial port parameters on one of the "USR-TCP232-TEST" software, click to open the serial port, and another serial port of "USR-TCP232-TEST" is ignored.

③ Click send at network side, serial port will receive all the data; click send at serial side, only one “USR-TCP232-TEST”software that communicate latest with DR301 can receive the data.



USR-TCP232-Test RS232 to Ethernet Convert tester

COMSettings
PortNum COM19
BaudR 115200
DPaity NONE
DataB 8 bit
StopB 1 bit

COM port data receive
```
http://en.usr.cn222
http://en.usr.cn222
http://en.usr.cn222
http://en.usr.cn111
http://en.usr.cn111
http://en.usr.cn111
```

Recv Options
□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause

Send Options
□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle
Interval 1000 ms

Jinan USR Technology Co., Ltd.

Send : 90 Recv 114

NetSettings
(1) Protocol UDP
(2) Local host IP 192.168. 0 .201
(3) Local host port 23

Network data receive

RemoteIP: 192.168. 0 . 7 Port: 20108

http://en.usr.cn222

Send : 57 Recv 0

Network data receive
```
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
Jinan USR Technology Co., Ltd.
```

NetSettings
(1) Protocol UDP
(2) Local host IP 192.168. 0 .201
(3) Local host port 8234

Recv Options
□ Receive to file...
☑ Add line return
□ Receive As HEX
□ Receive Pause

Send Options
□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
□ Send As Hex
□ Send Recycle
Interval 1000 ms

RemoteIP: 192.168. 0 . 7 Port: 20108

http://en.usr.cn111

Send : 57 Recv 90

Diagram 4.2.4-2 UDP Server Test 1

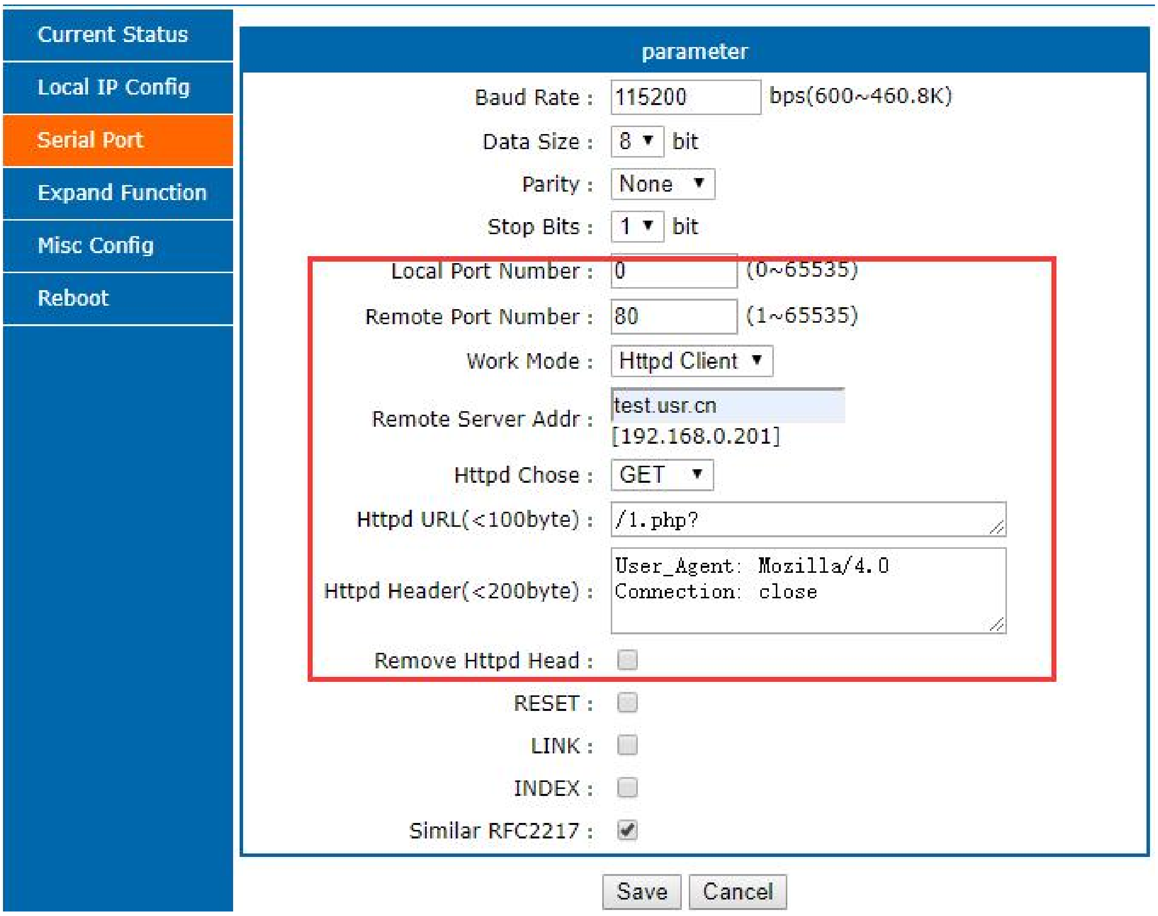
4.2.5. HTTPD Client

1) In this mode, the user's terminal device can send request data to the specified HTTP server through DR301, and then DR301 receives the data from the HTTP server, parses the data and sends the result to the serial device.

2) User do not need to pay attention to the data conversion process between the serial port data and the network data packet, and the data request of the serial port device to the HTTP server can be realized by simple parameter setting.

3) When USR-DR301 sends data to HTTP server via serial port, set the URL, header remote domain name, IP and port and save, then it only needs to send the header of requested data; DR301 will automatically add information such as URL and header. The returned data, user can choose whether to remove the header.

4) Test example:



parameter

Baud Rate : 115200 bps(600~460.8K)

Data Size : 8 bit

Parity : None

Stop Bits : 1 bit

Local Port Number : 0 (0~65535)

Remote Port Number : 80 (1~65535)

Work Mode : Httpd Client

Remote Server Addr : test.usr.cn [192.168.0.201]

Httpd Chose : GET

Httpd URL(<100byte) : /1.php?

Httpd Header(<200byte) :

```
User_Agent: Mozilla/4.0
Connection: close
```

Remove Httpd Head : □

RESET : □

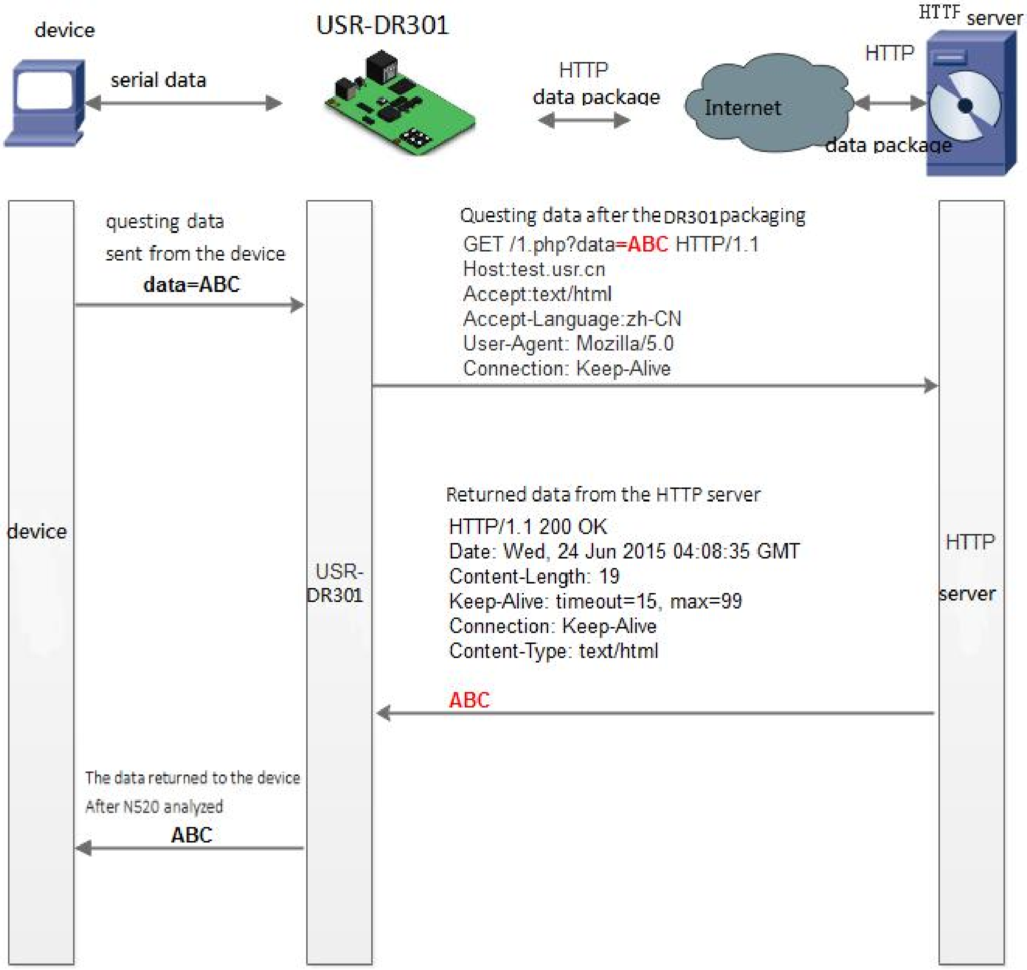
LINK : □

INDEX : □

Similar RFC2217 : ☑

Diagram 4.2.5-1 Httpd Client web page settings

1. Set USR-DR301 as HTTPD Client in webpage, and set the corresponding target port number and destination IP/domain name.
2. Set the Httpd request method and the URL and header information of the request packet at the web page.
3. Whether the header of the information replied by the Httpd server is removed can also be set in the web page.
4. After the setting is completed, click Save and restart DR301 to take effect.
5. Open the serial port to send data, then the serial port data will be submitted to the web server, and the serial port will also receive the information replied by the server.
6. For details on sending a request, refer to the "Httpd Client Mode Description" diagram, as shown below:



```
GET /1.php?data=ABC HTTP/1.1
Host:test.usr.cn
Accept:text/html
Accept-Language:zh-CN
User-Agent: Mozilla/5.0
Connection: Keep-Alive
```

```
HTTP/1.1 200 OK
Date: Wed, 24 Jun 2015 04:08:35 GMT
Content-Length: 19
Keep-Alive: timeout=15, max=99
Connection: Keep-Alive
Content-Type: text/html
```

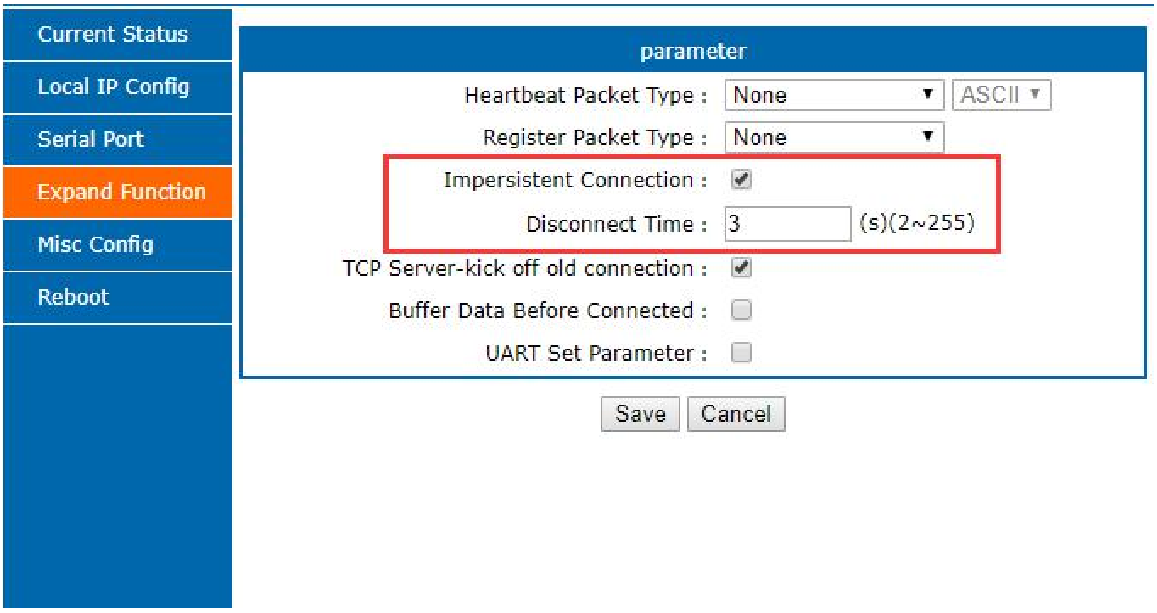
Diagram 4.2.5-2 HTTPD Client Mode

4.3. Impersistent Connection

The use of TCP impersistent connections is mainly to save server resources, and is generally applied to a multi-point scenario. With short connections, you can ensure that the existing connections are useful connections and do not require additional controls for filtering.

The TCP impersistent connection function is applied to the TCP Client mode. After the short connection function is enabled, the message is sent. If there is no data reception in the serial port or network port within the set time, the connection will be automatically disconnected.

This function default disable, the time disconnection can be set from 2~255s, default is 3s.



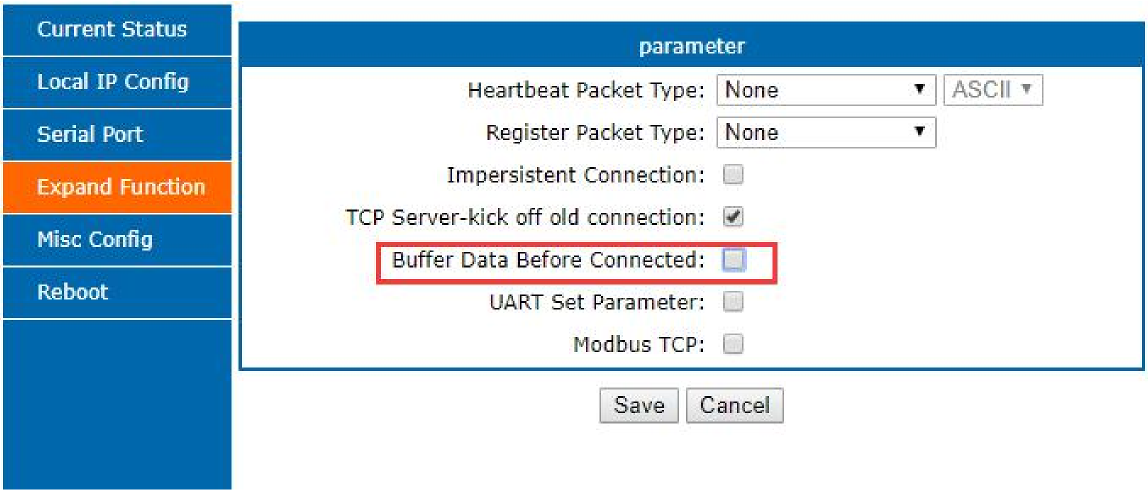
Heartbeat Packet Type : None ASCII
Register Packet Type : None
Impersistent Connection : ☑
Disconnect Time : 3 (s)(2~255)
TCP Server-kick off old connection : ☑
Buffer Data Before Connected : □
UART Set Parameter : □

Diagram 4.3-1 Short Link

4.4. Clean the buffer data

If the TCP have not built, the data that serial received will be placed in the cache, and the USR-DR301 serial port can receive 2Kbyte, after the TCP built, you can select whether to clear the cached data.

The default is not. Under the Httpd client mode or the TCP client mode, when enable the impersistent connection, this function has no power.



Heartbeat Packet Type: None ASCII
Register Packet Type: None
Impersistent Connection: □
TCP Server-kick off old connection: ☑
Buffer Data Before Connected: □
UART Set Parameter: □
Modbus TCP: □

Diagram 4.4-1 clear buffer data Configuration

4.5. USR-VCOM Application

By using the supporting software VCOM (virtual serial port), reveive the data from the specified virtual serial port, and then the data is sent out in the form of network data, thereby solving the problem that the PC end software cannot communicate with the networked device for the serial port mode, and is convenient for the user to use. .

How to connect USR-DR301 with Virtual COM:

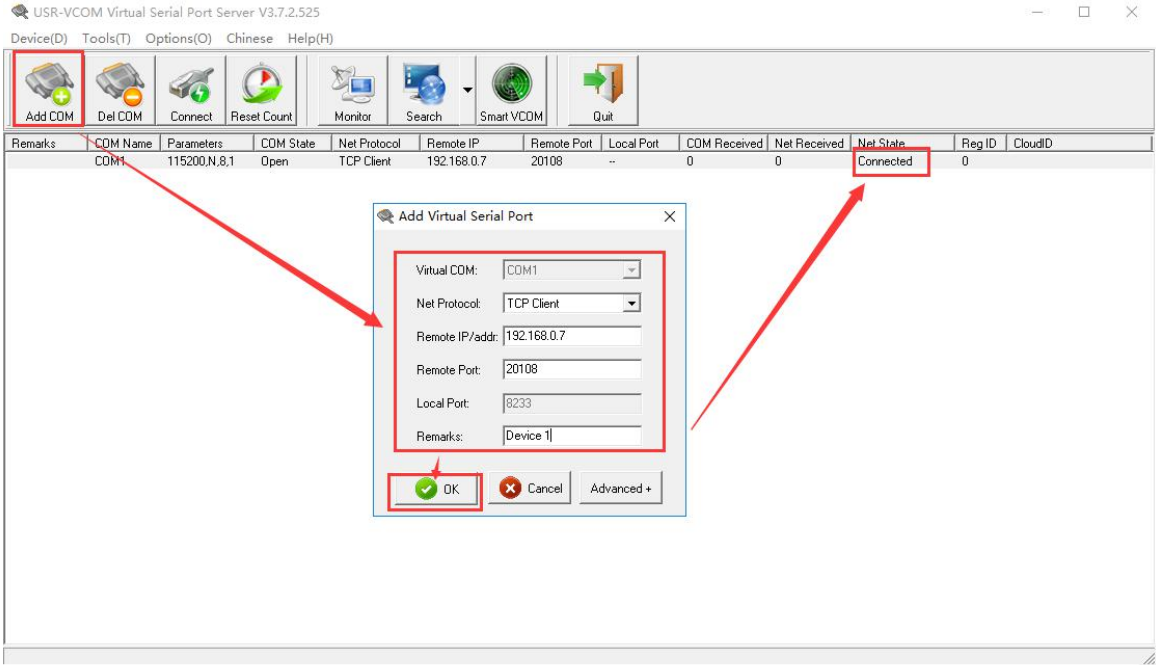
1. Set USR-DR301 as TCP server(DR301 works as server, It is convenient for users to change the computer and still be able to connect to the device.)
2. Open USR-VCOM software, click "Add COM' and select COM2 (Avoid existed COM).

Net Protocol: TCP Client

Remote IP and port is the IP and port of USR-DR301

Remarks: Can write the name of device

3. Click "OK' to check whether connection is built. "Connected" means ready for data transmission.


USR-VCOM Virtual Serial Port Server V3.7.2.525
Device(D) Tools(T) Options(O) Chinese Help(H)
Add COM
Del COM
Connect
Reset Count
Monitor
Search
Smart VCOM
Quit

Remarks	COM Name	Parameters	COM State	Net Protocol	Remote IP	Remote Port	Local Port	COM Received	Net Received	Net State	Reg ID	CloudID
	COM1	115200,N,8,1	Open	TCP Client	192.168.0.7	20108	--	0	0	Connected	0	

Add Virtual Serial Port

Virtual COM: COM1

Net Protocol: TCP Client

Remote IP/addr: 192.168.0.7

Remote Port: 20108

Local Port: 8233

Remarks: Device 1

Diagram 4.5-1 USR-VCOM

4.6. Modbus Gateway

Modbus gateways include: Modbus RTU and Modbus TCP protocol conversion.

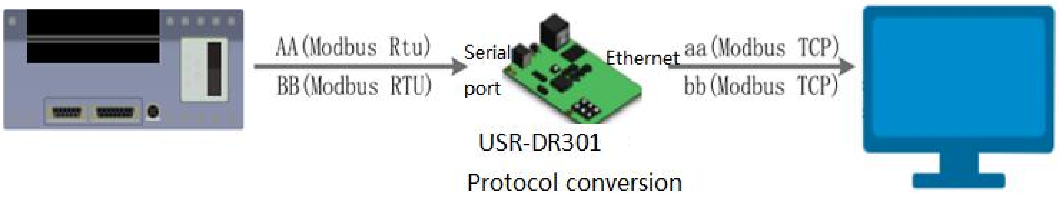
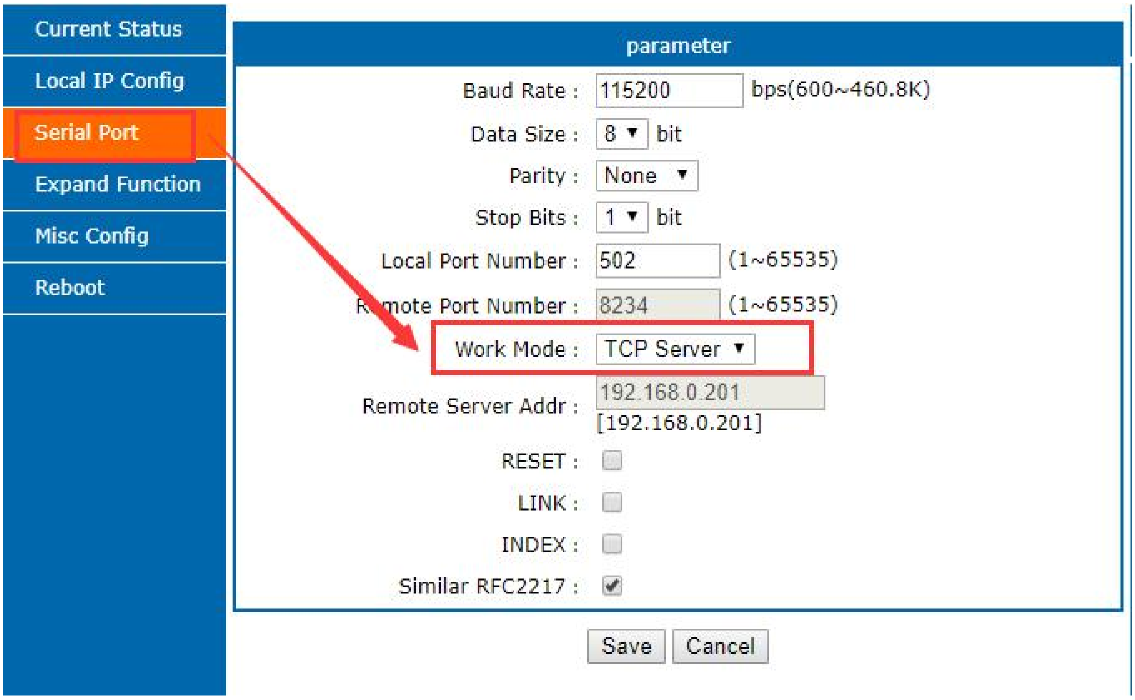


Diagram 4.6-1 MODBUS TCP

Modbus RTU and Modbus TCP: Modbus serial protocol to Modbus network protocol can be converted by Opening the Modbus TCP to Modbus RTU function in the web page.

Make the module work in the TCP server or the TCP client mode



Baud Rate : 115200 bps(600~460.8K)

Data Size : 8 bit

Parity : None

Stop Bits : 1 bit

Local Port Number : 502 (1~65535)

Remote Port Number : 8234 (1~65535)

Work Mode : TCP Server

Remote Server Addr : 192.168.0.201 [192.168.0.201]

RESET : □

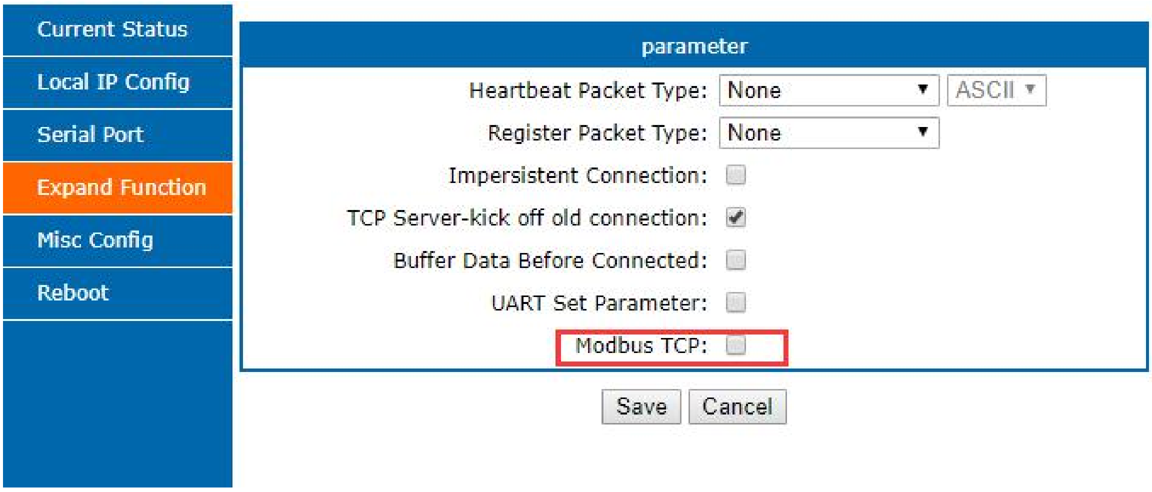
LINK : □

INDEX : □

Similar RFC2217 : ☑

Diagram 4.6-2 Working mode

Webpage enable the modbus TCP to RTU function



Heartbeat Packet Type: None ASCII

Register Packet Type: None

Impersistent Connection: □

TCP Server-kick off old connection: ☑

Buffer Data Before Connected: □

UART Set Parameter: □

Modbus TCP: □

Diagram 4.6-3 MODBUS TCP mode

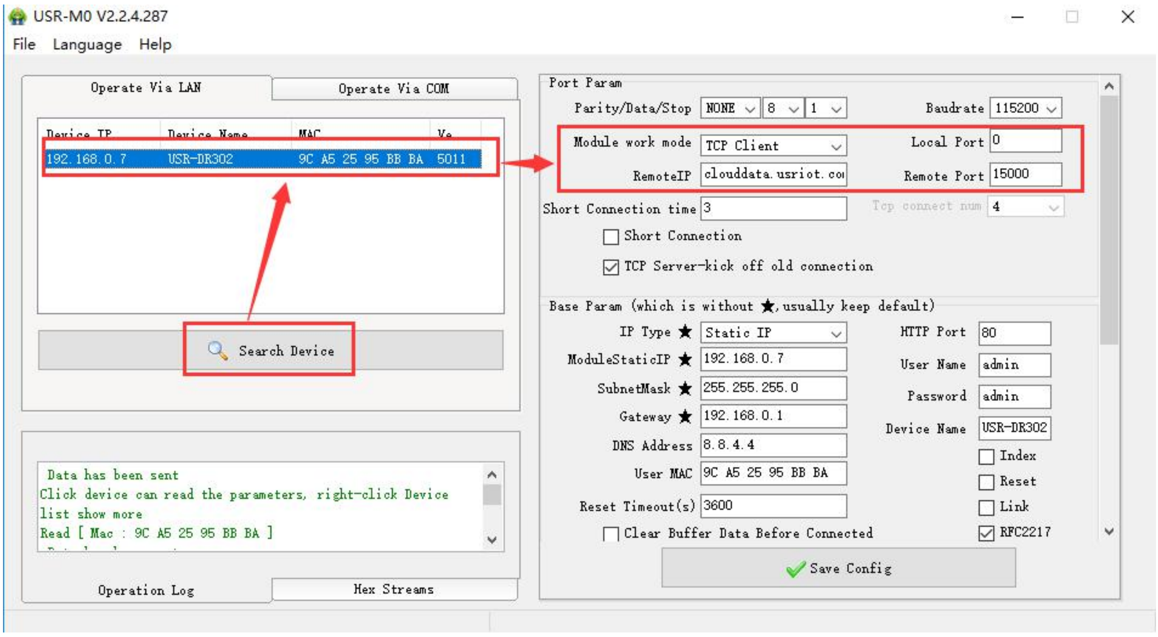
Modbus TCP: click to enable the function or disable the function.

4.7. USR-Cloud Function

USR-Cloud software is a platform for communication between devices and PC software. The cloud software is mainly used for data transmission or monitoring remotely. This function only works in TCP client mode.

- Login link of USRIOT Cloud: http://console.usriot.com
- Remote server address: clouddata.usriot.com
- Local port: The port of device,   Remote port: Cloud software's port

- Device ID: It is assigned to device by cloud software
- Communications Code: Pass word generated after adding the device to cloud software

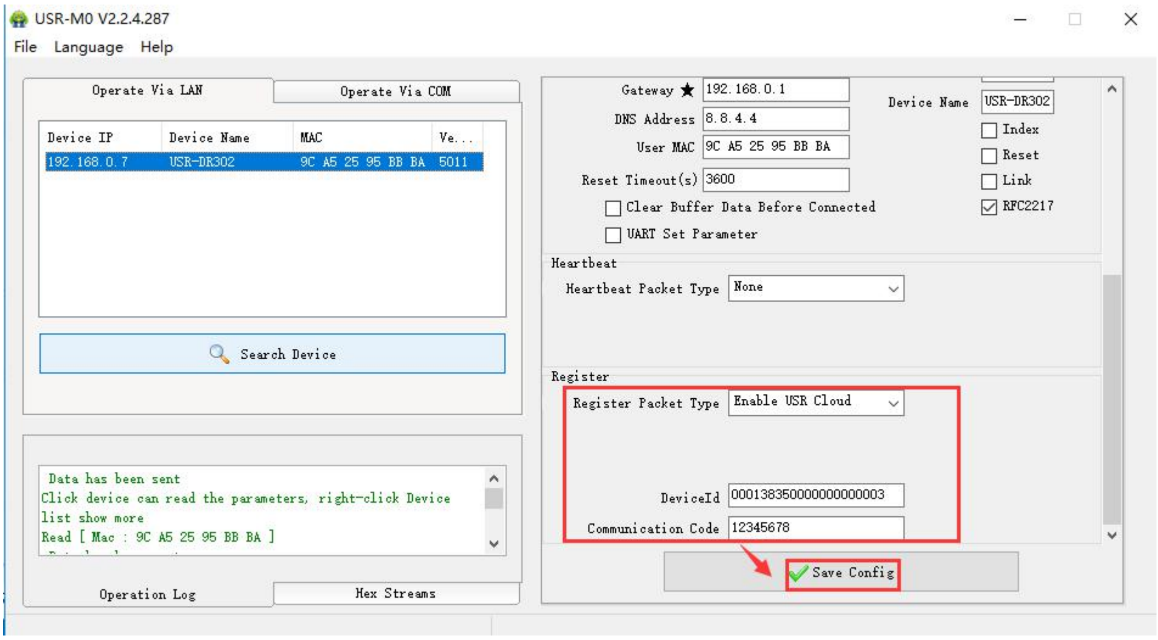


Device IP	Device Name	MAC	Ve
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5011

```
Data has been sent
Click device can read the parameters, right-click Device
list show more
Read [ Mac : 9C A5 25 95 BB BA ]
```

Port Param
Parity/Data/Stop NONE 8 1 Baudrate 115200
Module work mode TCP Client Local Port 0
RemoteIP clouddata.usriot.coi Remote Port 15000
Short Connection time 3 Tcp connect num 4
□ Short Connection
☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)
IP Type ★ Static IP HTTP Port 80
ModuleStaticIP ★ 192.168.0.7 User Name admin
SubnetMask ★ 255.255.255.0 Password admin
Gateway ★ 192.168.0.1 Device Name USR-DR302
DNS Address 8.8.4.4 □ Index
User MAC 9C A5 25 95 BB BA □ Reset
Reset Timeout(s) 3600 □ Link
□ Clear Buffer Data Before Connected ☑ RFC2217



Device IP	Device Name	MAC	Ve...
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5011

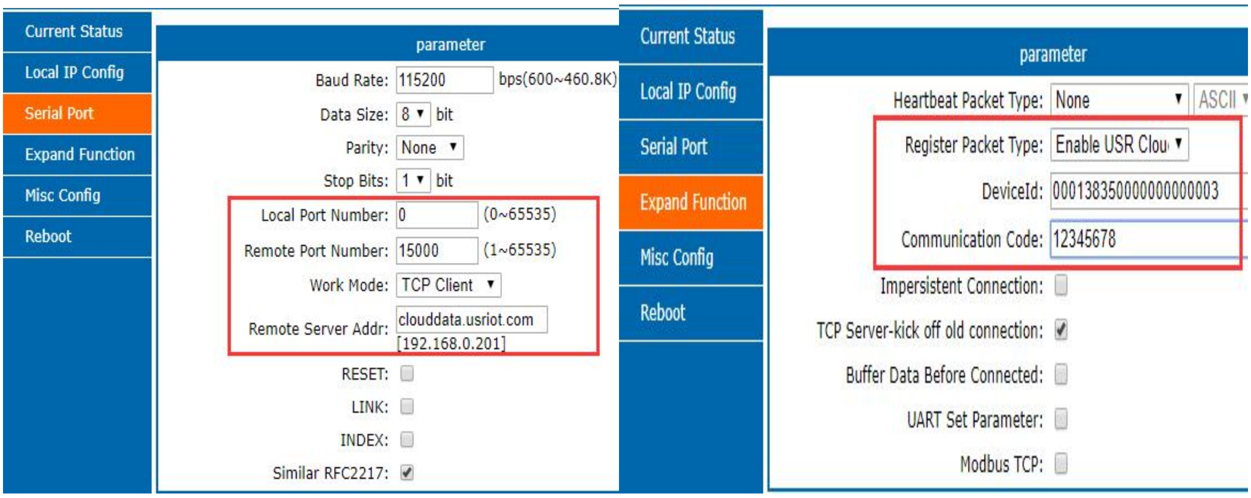
```
Data has been sent
Click device can read the parameters, right-click Device
list show more
Read [ Mac : 9C A5 25 95 BB BA ]
```

Gateway ★ 192.168.0.1 Device Name USR-DR302
DNS Address 8.8.4.4 □ Index
User MAC 9C A5 25 95 BB BA □ Reset
Reset Timeout(s) 3600 □ Link
□ Clear Buffer Data Before Connected ☑ RFC2217
□ UART Set Parameter

Heartbeat
Heartbeat Packet Type None

Register
Register Packet Type Enable USR Cloud
DeviceId 00013835000000000003
Communication Code 12345678

Diagram 4.7-1 USR-cloud (software)



Baud Rate: 115200 bps(600~460.8K)
Data Size: 8 bit
Parity: None
Stop Bits: 1 bit
Local Port Number: 0 (0~65535)
Remote Port Number: 15000 (1~65535)
Work Mode: TCP Client
Remote Server Addr: clouddata.usriot.com [192.168.0.201]
RESET: □
LINK: □
INDEX: □
Similar RFC2217: ☑

Heartbeat Packet Type: None ASCII
Register Packet Type: Enable USR Clou
DeviceId: 00013835000000000003
Communication Code: 12345678
Impersistent Connection: □
TCP Server-kick off old connection: ☑
Buffer Data Before Connected: □
UART Set Parameter: □
Modbus TCP: □

Diagram 4.7-2 USR-cloud (webpage)

4.8. Other functions

4.8.1. Heartbeat Packet Function

Heartbeat packet is divided into network heartbeat and serial port heartbeat. It can send heartbeat packet to serial port or to network, can not send together.

Serial heartbeat packet: It can be sent to the serial port as a fixed query command. To reduce the communication flow, user can choose to send heartbeat package instead of the send query command from server. When there is data send from the serial port, serial heartbeat do not stop.

Network heartbeat packet: It used for maintaining connection. Only valid at the mode of TCP client and UDP client. When there is data transmission send from network interface, the net heartbeat packet stop.

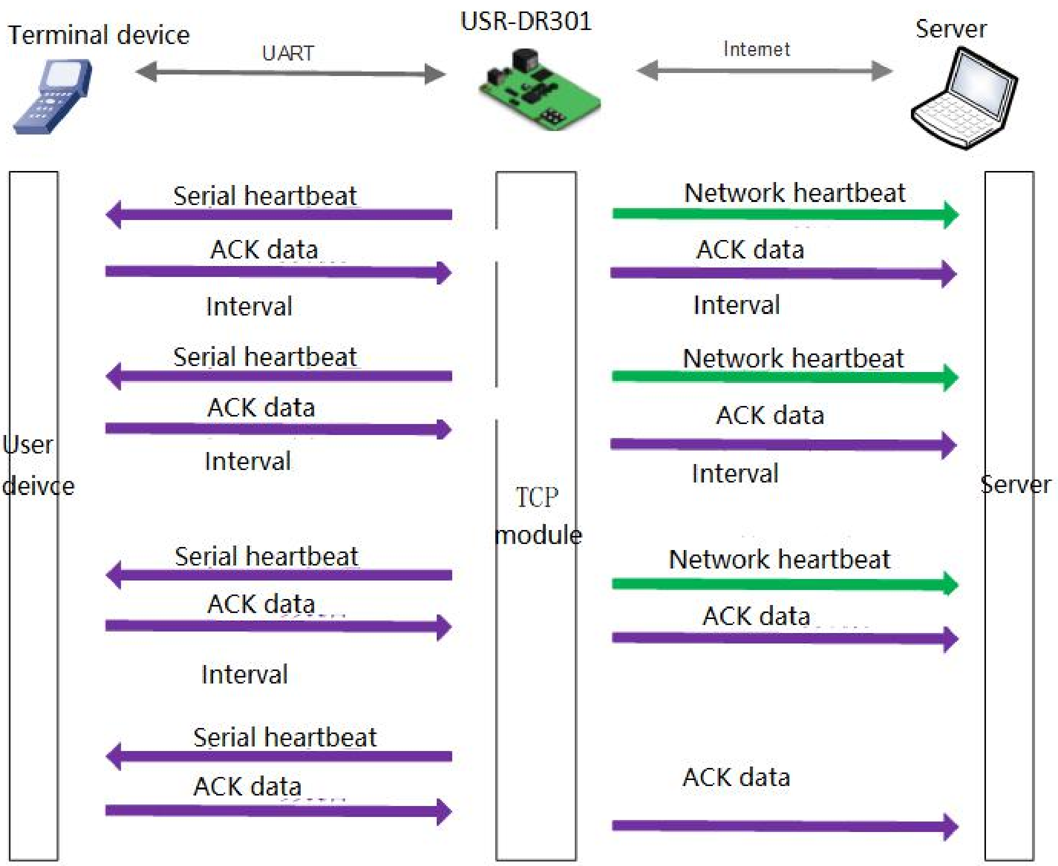
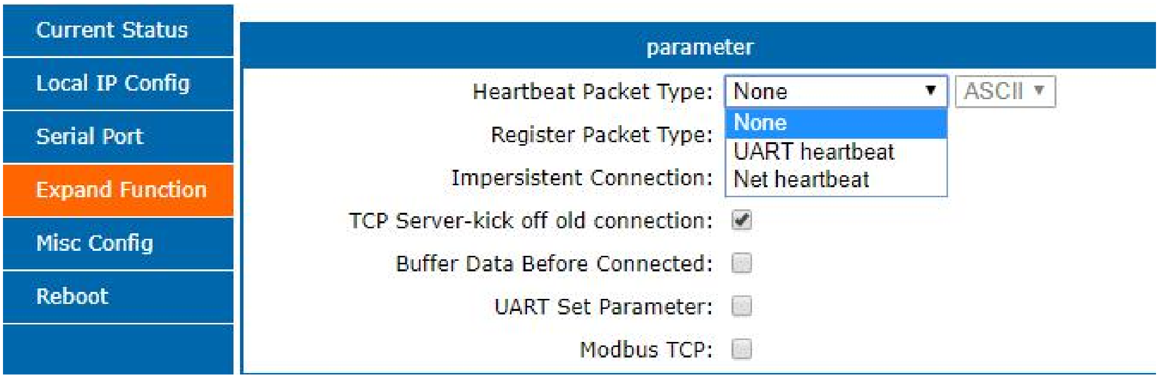


Diagram 4.8.1-1 Heartbeat packet function diagram

The heartbeat package feature is turned off by default. Set in the web page, the settings interface is as follows:



Heartbeat Packet Type: None ▾ ASCII ▾
(None / UART heartbeat / Net heartbeat)
Register Packet Type:
Impersistent Connection:
TCP Server-kick off old connection: ☑
Buffer Data Before Connected: □
UART Set Parameter: □
Modbus TCP: □

Diagram 4.8.1-2 Heartbeat Package

4.8.2. Registration Package Packet Function

USR-DR301 supports self-defined registration package function and also supports to send self-defined registration package after connection establishment, meanwhile, it supports to send registration package when sending data.

There are three register package: USR-cloud, MAC register and self defined register.

Network registration packet includes: Establish a connection to send the registry packet, data carrying or both. The self-defined register content can be set according the requirement, at most for 40 bytes, supports HEX, MAC register package default is HEX, modify via change the MAC address.

Establish a connection to send the registry packet: Send the registration packet immediately after the connection is established. The main purpose is to allow the server to identify the data source device or to obtain a password for the server function authorization.

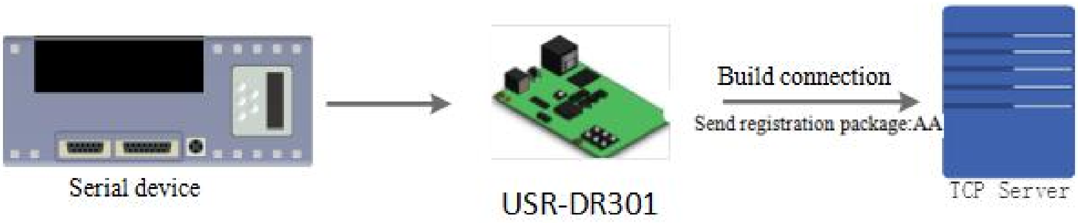


Diagram 4.8.2-1 Sending when establishing a connection

Data carrying: The packet header is carried uniformly when sending data. It used for protocol transmission.

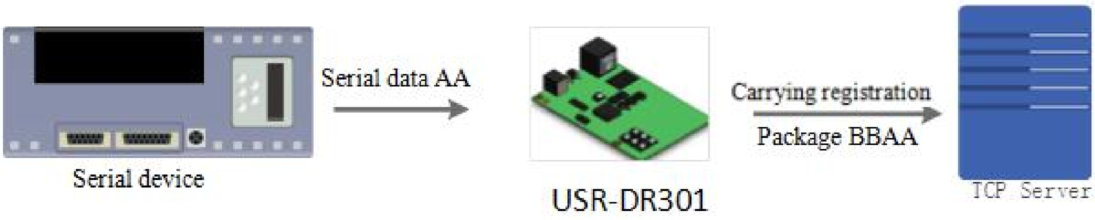
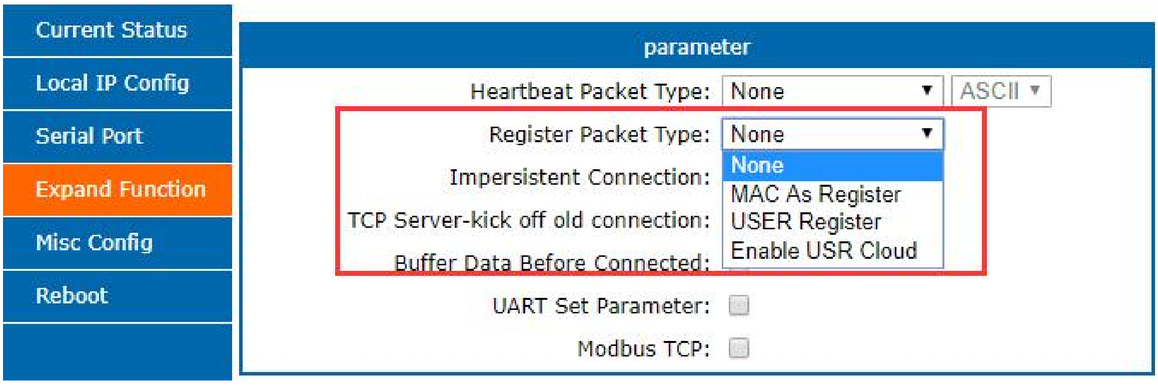


Diagram 4.8.2-2 Data carrying

Configure the relevant parameters via web page:



Heartbeat Packet Type: None ▾ ASCII ▾
Register Packet Type: None ▾
Impersistent Connection:
TCP Server-kick off old connection:
Buffer Data Before Connected:
UART Set Parameter: □
Modbus TCP: □

Diagram 4.8.2-3 Registration Package

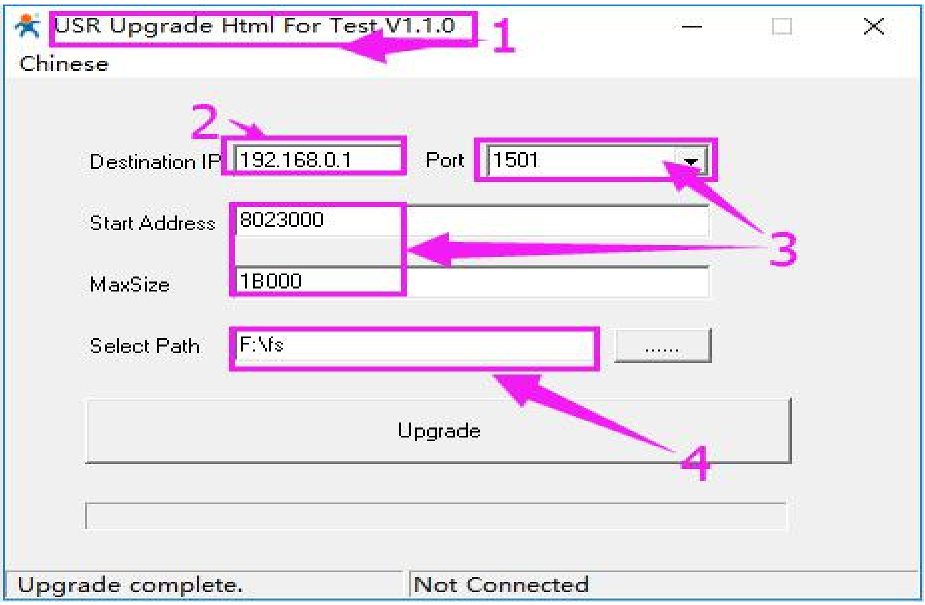
4.8.3. Customized Webpage

DR301 supports custom webpage functions. By customizing webpages, customers can upgrade their webpage code (such as modifying logo or name) to DR301, which is more convenient for customers. Note that when upgrading a custom web page, the Destination IP is set to the IP address of DR301, and the final web page file name must be "fs".

Steps:

1. Download the software needed to upgrade . http://www.usr.cn/Download/880.html---(待更新)
2. After editing the page code, open "USR-UpgradeHtml For Test V1.0.0.exe", destination Ip is USR_DR301' IP, port (1501), start address(8023000) and maxsize(1B000) fill as the below picture and do not change. The select path should be the file named "fs" then click upgrade.

Then upgrade.



USR Upgrade Html For Test V1.1.0

Chinese

Destination IP: 192.168.0.1

Port: 1501

Start Address: 8023000

MaxSize: 1B000

Select Path: F:\fs

Upgrade complete.

Not Connected

Diagram 4.8.3-1 Customized Webpage Upgrade

4.8.4. Link

Link pin is the status indicator pin for USR-DR301 to built communication. Link pin can be used as indication pin for TCP connection status.

When connected, it output low level; When unconnected, high level.

When USR-DR301 is under TCP model, Link pin will pull down. otherwise, it stays in high level.

When USR-DR301 is under DUP model, Link pin will always pull down. The "Link" alternate pin in the USR-DR301 can be used as a Link indication.

Note: for the link pin is in the shell, this function only can used on the USR-DR301 PCBA.

4.8.5. Index

At most there can be 8 links when the USR-DR301 in the TCP server mode. The max number can set from 1to 8 as you want. Here we take the default number is 8 as example. Server send data to 8 clients, or the server receive the data from 8 clients, open the Index, mark to divide the different clients and user can recognize the data sources according to the mark, meanwhile send different data to special clients.Index function can be set by software or web-page.

Enable the Index function and display the corresponding device number of the client before the communication data. The specific parameters are as follows:

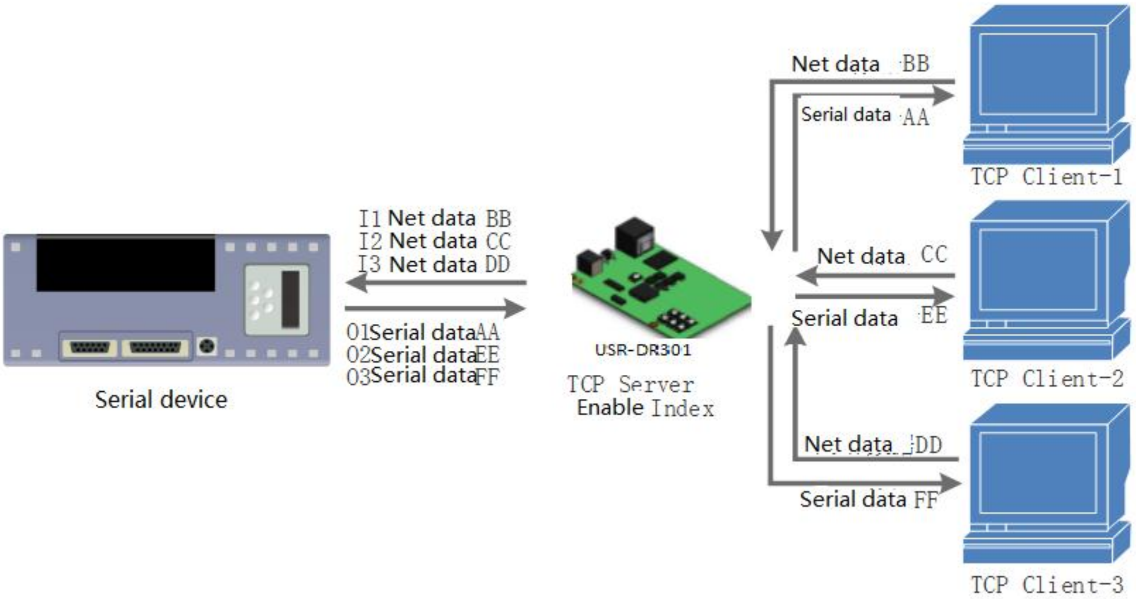


Diagram 4.8.5-1 Index Function

1. Server receive the data, Output 'I' 'N' data …… to the user MCU through the server serial port, "I" means receive and"N" means from which one Index. "N" from 31 to 40 in the HEX.

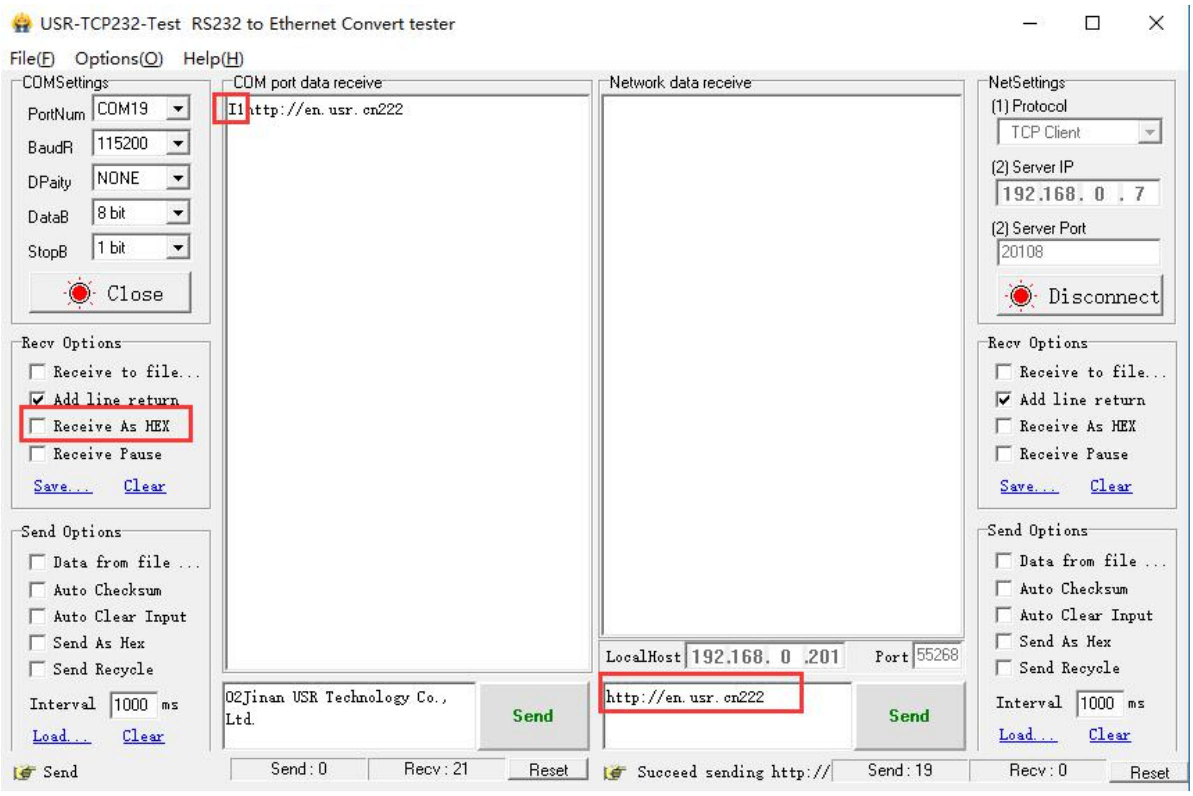
2. MCU fill the 'O' 'N' data…… into the server via the serial port of the serer. "O" means output, "N" means using which INDEX to send data.DR 302 send the data from the serial port to the net client.(plaese notice: 'o' is the code O in the ASCII, same as N, for example:'1','2' and so on) .

3. When there is new TCP connected to the server, DR 302 transports to the 'C' 'N' 'M'. Which means this connection is the N one and on total there is M.

4. If the number of the connections is up to 16, transports 'F' 'F' to the MCU if there is new connecion questing.

5. When disconnecting, DR301 send 'D' 'N' 'M' to MCU, the N means delete which one, and M means how many connection remaind.

6. The tansmission as below diagram


USR-TCP232-Test RS232 to Ethernet Convert tester
File(F) Options(O) Help(H)
Close
Disconnect
Send
Send
Save... Clear
Load... Clear
Reset

COMSettings
PortNum COM19
BaudR 115200
DPaity NONE
DataB 8 bit
StopB 1 bit

Recv Options
☐ Receive to file...
☑ Add line return
☐ Receive As HEX
☐ Receive Pause

Send Options
☐ Data from file ...
☐ Auto Checksum
☐ Auto Clear Input
☐ Send As Hex
☐ Send Recycle
Interval 1000 ms

COM port data receive
I1http://en.usr.cn222

02Jinan USR Technology Co., Ltd.

Send : 0 Recv : 21

Network data receive

LocalHost 192.168. 0 .201 Port 55268

http://en.usr.cn222

Succeed sending http:// Send : 19 Recv : 0

NetSettings
(1) Protocol TCP Client
(2) Server IP 192.168. 0 . 7
(2) Server Port 20108

Recv Options
☐ Receive to file...
☑ Add line return
☐ Receive As HEX
☐ Receive Pause

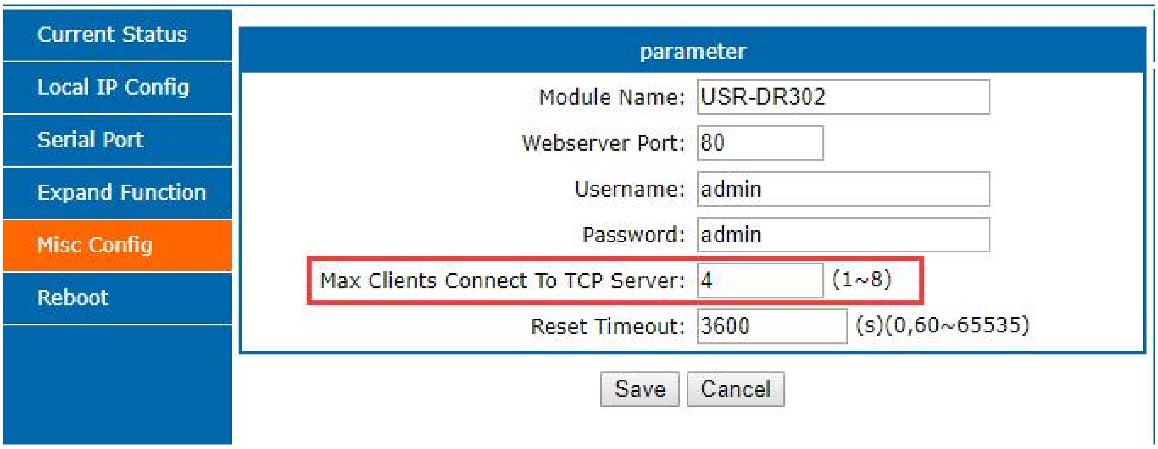
Send Options
☐ Data from file ...
☐ Auto Checksum
☐ Auto Clear Input
☐ Send As Hex
☐ Send Recycle
Interval 1000 ms

Diagram 4.8.5-2 Index data transmission

4.8.6. The number of the client connected

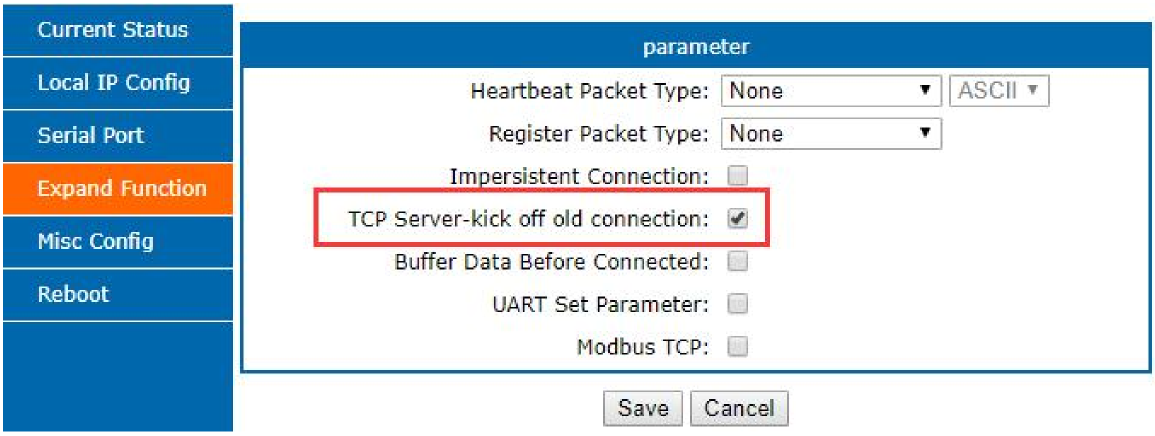
Then the USR-DR301 work in the TCP server mode, the max number of client to connect is 8, default is 4,the max number can be configuring as you want, which is be convenient for use. When the the number connecting clients more than 4, we should control the total data flow in 2.5KB/s if we need to send and receive meanwhile(not more than 200 bite/s).

If the number is 8 now, default use the new link instead of the oldest one, also you can set to use the older one. The webpage are as fellow.



parameter

Module Name:	USR-DR302
Webserver Port:	80
Username:	admin
Password:	admin
Max Clients Connect To TCP Server:	4 (1~8)
Reset Timeout:	3600 (s)(0,60~65535)



Heartbeat Packet Type: None ASCII

Register Packet Type: None

Impersistent Connection: □

TCP Server-kick off old connection: ☑

Buffer Data Before Connected: □

UART Set Parameter: □

Modbus TCP: □

Diagram 4.8.6-1 max client connect to TCP server

4.8.7. Serial Port Packaging Mechanism

USR-DR301 can configure serial port packaging time and serial port packaging length. USR-DR301 will make packaging for the data of serial port according to the packaging length and packaging time in the transparent transmission mode. Default packaging time is4 byes and the length is 1024 bytes.

Example for judgment of packaging time and packaging length:

① Set packaging time as 10ms, packaing length as 512 bytes

When serial port received data, USR-DR301 will package and send it to network if the interval time of receiving data is over than 10ms or data length is more than 512。

② If the value of packaging time or packaging length is 0, the packaging rule is effective for non-zero one.

③ Set packaging time and length as 0. USR-DR301will conduct default packaging time when packaging time is set as 0ms. Namely, when serial port receiving data, USR-DR301 will package and send the data to network if interval time more than packaging time of sending 4 bytes. For example, baud rate 115200, packaging time for 4 bytes is T=0.4ms, when the calculated value is smaller than 0.1ms, packaging time can be calculated as 0.1ms.

$$T= 1/\text{baud rate}*10*4$$

4.8.8. Flow Calculation

When USR-DR301 receives data from network and then send to serial port, as the limit of serial port speed, user have to control the flow, if not the problem of data overflow on serial port side will occur. So data flow is required to calculated when sending data from network to serial port.

Example:

Network sends data in m bytes every n seconds. Method of checking if there is overflow: (Supposed network condition is good and network data transmission time is negligible)

① If there is no overflow, m bytes data must be transmitted within n seconds, then the transmitting time of M bytes data:

$$T = \frac{1}{\text{Baud Rate}} * 10 * \mathrm{m}$$

If n >2T, then data will not overflow, USR-DR301 can work normally. Just need keep n>T under baud rate 9600.

4.8.9. Synchronous baud rate (RFC2217)

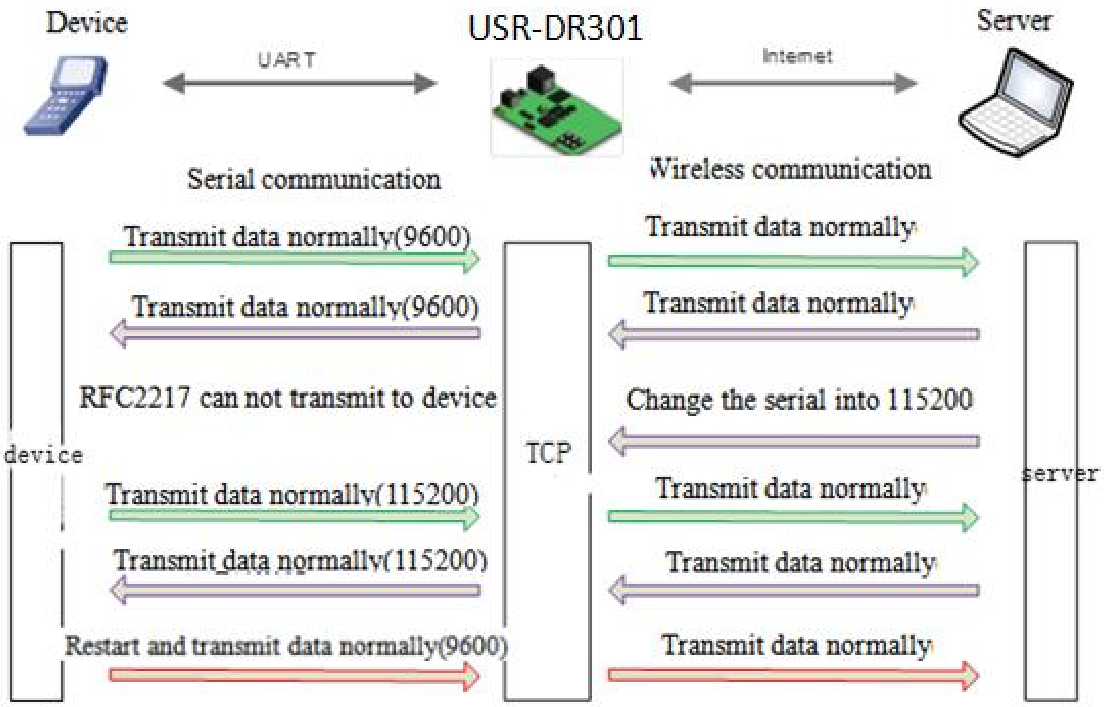

Device
USR-DR301
Server
UART
Internet
Serial communication
Wireless communication
Transmit data normally(9600)
Transmit data normally
Transmit data normally(9600)
Transmit data normally
RFC2217 can not transmit to device
Change the serial into 115200
device
TCP
server
Transmit data normally(115200)
Transmit data normally
Transmit data normally(115200)
Transmit data normally
Restart and transmit data normally(9600)
Transmit data normally

Diagram 4.8.9-1 RFC2217

For encryption during data transmission, devices change data bytes, baud rate, parity and so on. USR-DR301 supports revise serial parameter accordingly.

Synchronous baud rate is named RFC2217. USR Similar RFC2217 make adjustments on the basis of RFC2217 protocol to improve accuracy of transmission.

Protocol length is 8 bytes. And values taken for example is in HEX:

Name	Packet Header	Baud Rate	Bytes parameter	Parity
Bytes	3	3	1	1
Explanation	reduce misjudgment	High is in front, smallest is 600(00 02 58)	data bytes, baud rate, parity	Remove 4 bits of header and ignore the high bit
(115200,N,8,1)	55 AA 55	01 C2 00	03	C6

(9600,N,8,1)	55 AA 55	00 25 80	03	A8

Form 4.8.9-1 Example

Serial parameter bit:

Bit #	Explanation	Value	Description
1:0	Data bit selection	00	5 bits
		01	6 bits
		10	7 bits
		11	8bits
2	Stop Bit	00	1 bit
		01	2bits
3	Parity Enable	00	Disable Parity
		01	Enable Parity
5:4	Parity Type	00	ODD
		01	EVEN
		10	Mark
		11	Clear
7:6	NC	000	0

Form 4.8.9-2 Serial Parameters

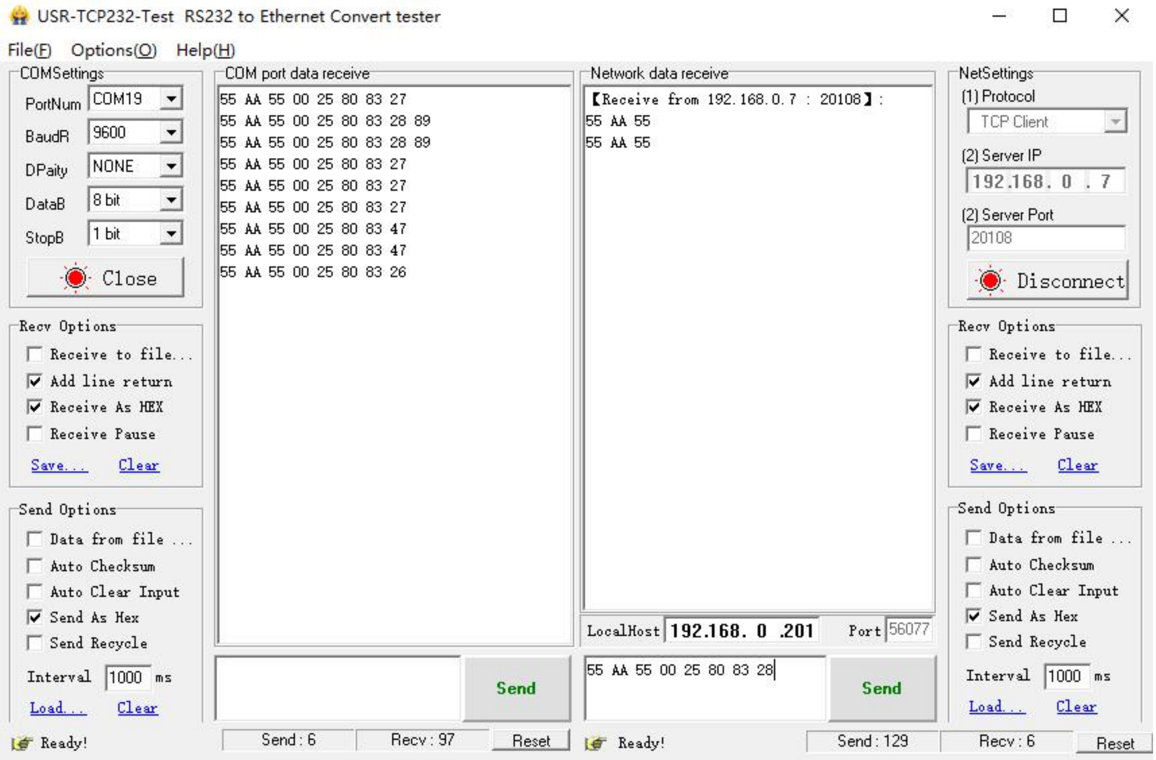
Using methods:

1. USR-TCP232-M0,E45 Setup software, click "Synchronous baud rate (RFC2217)".
2. When serial parameter changes is needed, it send RFC 2217 packet. USR-DR301 receive the command from network and revise serial parameter accordingly, RFC2217 command do not transmit transparently
3. Application:

Protocol command

55AA5501C2008346 set the serial port parameters into 115200 N,8,1

55AA550025808328 set the serial port parameters into 9600 N,8,1



USR-TCP232-Test RS232 to Ethernet Convert tester

COMSettings
PortNum: COM19
BaudR: 9600
DPaity: NONE
DataB: 8 bit
StopB: 1 bit

Recv Options
□ Receive to file...
☑ Add line return
☑ Receive As HEX
□ Receive Pause

Send Options
□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
☑ Send As Hex
□ Send Recycle
Interval 1000 ms

COM port data receive

```
55 AA 55 00 25 80 83 27
55 AA 55 00 25 80 83 28 89
55 AA 55 00 25 80 83 28 89
55 AA 55 00 25 80 83 27
55 AA 55 00 25 80 83 27
55 AA 55 00 25 80 83 27
55 AA 55 00 25 80 83 47
55 AA 55 00 25 80 83 47
55 AA 55 00 25 80 83 26
```

Network data receive

```
【Receive from 192.168.0.7 : 20108】:
55 AA 55
55 AA 55
```

LocalHost 192.168. 0 .201 Port 56077

Send box: 55 AA 55 00 25 80 83 28

NetSettings
(1) Protocol: TCP Client
(2) Server IP: 192.168. 0 . 7
(2) Server Port: 20108

Recv Options
□ Receive to file...
☑ Add line return
☑ Receive As HEX
□ Receive Pause

Send Options
□ Data from file ...
□ Auto Checksum
□ Auto Clear Input
☑ Send As Hex
□ Send Recycle
Interval 1000 ms

Ready! Send : 6 Recv : 97 Reset
Ready! Send : 129 Recv : 6 Reset

Diagram 4.8.9-2 RFC2217 Test

5. Setting Protocol

USR-DR301 includes two protocol: network setting protocol and serial port setting protocol.

5.1. Network Setting Protocol

To configure across the net, all the communication protocol using the UDP, lower one is in front. When user are configuring, please keep the remote port is 1500, and local port can be random.

5.1.1. Set Parameter Process

1. Build SOCKET:
   Build UDP SOCKET, destination IP: 255.255.255.255, destination port: 1500. Low is in front.
2. Setting command process:
   ① The network send searching command
   ② USR-DR301 returns IP address and MAC
   ③ The network read USR-DR301's parameter
   ④ Organize setting command according to MAC, known user name/password and parameter to be configured.
   ⑤ Send setting command
   ⑥ USR-DR301 returns "correct setting"

⑦ Host PC send “save setting” command

⑧ USR-DR301 returns “correct”

⑨ Restart command

⑩ USE-DR301 returns “correct setting”

5.1.2. Setting Command Content

Command Look-up List:

Function	Header	Length	command	MAC (6 bytes)	User name /password (12bytes)	Parameter	Parity (sum)
search	FF	01	01	-	-	-	02
reset	FF	xx	02	[MAC]	[usrname] [password]	-	xx
read settings	FF	xx	03	[MAC]	[usrname] [password]	-	xx
Basic settings	FF	xx	05	[MAC]	[usrname] [password]	Basic parameter	xx
Com 0 settings	FF	xx	06	[MAC]	[usrname] [password]	COM parameter	xx
Restore to factory set	FF	xx	0b	[MAC]	[usrname] [password]	-	xx
USR Cloud	FF	xx	0c	[MAC]	[usrname] [password]	Serial parameters	xx
Heartbeat and register package setting			21		[usrname] [password]	Serial parameters	xx
Extend setting	-	-	-	-	-	-	-

Form 5.1.2-1 Command

Notice: Check bit is sum check, starts from length byte (including length) to adding before checking (not including checking), result is check value, only low byte is remained.

1. Command examples

① Search command example

Search command is set to:

FF 01 01 02

Sum check: 02 = 01 + 01

② Reset command example

Send bytes: FF 13 02 00 71 77 7c 42 2F 61 64 6d 69 6e 00 61 64 6d 69 6e 00 Fc

Sum check:

Fc= 13 + 02 + ... + 6E + 00

From 4th to 9th is the MAC of the DR301, the last 12 bytes before the sum check is the username and password

User name and password both are 6 byte, bits 0 for the lack. (the last one of the username and password must be 0)

③ Read settings command example

Send (22 bytes)：FF 13 03 00 71 77 7c 42 2F 61 64 6d 69 6e 00 61 64 6d 69 6e 00 Fd

Sum check:

Fd= 13 + 03 + ... + 6E + 00

From 4th to 9th is the MAC of the DR301, the last 12 bytes before the sum check is the username and password

User name and password both are 6 byte, bits 0 for the lack. (the last one of the username and password must be 0)

2. Some commands detailed annotation

① Basic setting parameter command

On totally, there are 67 basic setting command, here we take an example for the better setting and using:

Send: FF 56 05 00 71 77 7c 42 2F 61 64 6d 69 6e 00 61 64 6d 69 6e 00 95 63 03 00 00 00 50 00 00 07 00 a8 c0 c9 00 a8 c0 00 FF FF FF 55 6c 6c 2d 66 32 00 00 00 00 00 00 00 00 00 00 61 64 6d 69 6e 00 61 64 6d 69 6e 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 04

Sum check: 04 = 56 + 05 + 00+ ... + 01

From 4th to 9th is the MAC of the DR301, from 10th to 22nd is username and password, later bytes is the basic parameters for fix the length, last one is sum check.

Basic Parameter:

Name	Byte	Example	Explanation
ucSequenceNum	1	00	Write the read values
ucCRC	1	00	Write the read values
ucVersion	1	00	Write the read values
ucFlags	1	C0	IP address type: 0 in 8th bit: DHCP;1 in 8th bit: Static IP
usLocationURLPort	2	00 00	Write the read values
usHTTPServerPort	2	50 00	HTTP server port
ucUserFlag	1	00	Write the read values
ulStaticIP	4	07 00 A8 C0	Static IP
ulGatewayIP	4	C9 00 A8 C0	Gateway
ulSubnetMask	4	00 FF FF FF	Subnet Mask
ucModName	16	55 53 52 2D 4B 32 00 00 00 00 00 00 00 00	USR-DR301 name
Reserve protocol	2	00 00	Please set to be 0
username	6	61 64 6D 69 6E 00	username
password	6	61 64 6D 69 6E 00	password
ucNetSendTime	1	00	Disable and reserve protocol
uiId	2	01 00	Device ID
ucIdType	1	00	Device ID type (0~3) 0:no use 1st 1:send id when connect; 0; disable 2nd 1:send id when send data; 0; disable 5th 1: reset enable; 0: disable 6th 1: link enable; 0: link disable 7th 1: index enable; 0: close 8th 1:RFC2217 enable; 0: disable
MAC_addrs	6	D8 B0 4C 11 22 33	MAC
DNSGatewayIP	4	01 00 A8 C0	DNS server address
TC_sh_time	1	03	Disconnection time for short link
ucReserved	3	00 00 00	Unused

Form 5.1.2-2 Basic Parameters

② Port settings parameter command

Port parameter:

Name	bytes	example	Explanation
ulBaudRate	4	00 C2 01 00	Baud Rate
ucDataSize	1	08	COM data bits (0X05/0x06/0x07/0x08)
ucParity	1	01	COM parity 1: no, 2: odd, 3: even, 4: mark, 5: space
ucStopBits	1	01	COM stop bit (0x01/0x02)
ucFlowControl	1	00	Disable and reserve
ulTelnetTimeout	4	00 00 00 00	Disable and reserve
usTelnetLocalPort	2	8C 4E	Local Port
usTelnetRemotePort	2	2a 20	Remote Port
uiTelnetURL	30	31 39 32 2E 31 36 38 2E 30 2E 31 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	IP address send in ASCII. Example: 192.168.0.201
ulTelnetIPAddr	4	00 00 00 00	Not adopted
ucFlags	1	00	5th 0: close cloud 1: enable 6th 0: under the TCP server, do not kick the old connection 1: kick the oldest one 7th 0:disable MAC register; 1: take MAC as register
ucWorkMode	1	01	Working mode: 0: UDP, 1: TCP Client, 2: UDP Server, 3: TCP Server, 4: HTTPD Client
HTPucFlags	1	00	0： HTTPD GET； 1： HTTPD POST
tc_number	1	04	The number of the client connected to the TCP Server
Timeout_restart	2	00 00	Restart time
cos_register_flag	1	00	Self- defined register
ucTimeCount	1	91	Write the read values
uiPackLen	2	00 00	reserve
ucReserved	3	00 00 00	saved

Form 5.1.2-3 Port Parameters

Example:

FF 52 06 00 71 77 7c 42 2F 61 64 6d 69 6e 00 61 64 6d 69 6e 00 00 c2 01 00 08 01 01 01 00 00 00 00 8c 4e 2a 20 31 39 32 2e 31 36 38 2e 30 2e 32 30 31 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 c9 00 a8c0 00 01 00

00 00 00 00 00 00 04 00 00 00 00 EF

sum check:f0 = 52 + 06 + ... + 00

From 4th to 9th is the MAC of the DR301, from 10th to 22nd is username and password, later bytes is the port parameters for fix the length, last one is sum check.

③ restore to factory setting command:

Send:FF 13 0b 00 71 77 7c 42 2F 61 64 6d 69 6e 00 61 64 6d 69 6e 00 07

Sum check: 07 = 13 + 0b+ ... + 6E + 00;

From 4th to 9th is the MAC of the DR301, from 10th to 21nd is username and password, both password and username are 6 bytes, please fill 0 in the lack.

④ cloud setting command

Send: FF 13 0c 00 71 77 7c 42 2F 61 64 6d 69 6e 00 61 64 6d 69 6e 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 08；

Sum check: 07 = 13 + 0c + ... + 6E + 00+...+00；

From 4th to 9th is the MAC of the DR301, from 10th to 21nd is username and password, both password and username are 6 bytes, please fill 0 in the lack.

Later are the ID of the USR-cloud, password, the last one is sum check.

⑤ heartbeat package and register package

Send: FF 68 21 D8 B0 4C 44 85 13 61 64 6D 69 6E 00 61 64 6D 69 6E 00 04 1E 00 0A 0A 77 77 77 2E 75 73 72 2E 63 6E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 77 77 77 2E 75 73 72 2E 63 6E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 59;

Sum check: 59 = 68 + 21 + ... + 6E + 00+...+00;

From 4th to 9th is the MAC of the DR301, from 10th to 21nd is username and password, both password and username are 6 bytes, please fill 0 in the lack.

Later are the direction of the heartbeat package, register package, time of the heart beat, heart beat length and register package length. Both register package and heartbeat package are 40 bytes, fill 0 in then lack, the last one is sum check.

Heart beat package and register package

Name	Bytes	Example	content
H_R_ucFlags	1	00	Heartbeat register package: 1st 1: heart beat package send to net interface 2nd 1: send heart beat package to serial port 3rd 1: connecting and send register package 4th 1: data carry the register package 5th 1: drop the package header of the Httpd 6th 1: enable setting parameter from the serial parameters 7th 1: enter the heartbeat package in HEX

			8th 1: enter the register package in HEX
heart_times	2	00 1e	heart beat time
heart_len	1	00	Heartbeat package length
register_len	1	00	Register package length
heartbeat	40	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Heartbeat package content
register_s	40	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Register package

5.1.3. Commands' Return Content

1. Return results of search command

Return command:

Bytes	Name	Example	Explanation
0	TAG_STATUS	FF	Fixed number
1	Packet_length	24	Fixed number
2	CMD_DISCOVER_TARGET	01	Fixed number
3	Board_type	00	Fixed number
4	Board_ID	00	Fixed number
5~8	Client_IP_address	C0 A8 00 07	Device IP(High in front)
9~14	MAC_address	AC CF 23 20 FE 3D	Device MAC(High in front)
15~18	Firmware_version	01 00 00	device version#
19~34	Application_title	55 53 52 2D 4B 32 00 00 00 00 00 00 00 00 00 00	Device name
35	checksum	F0	checksum

Diagram 5.1.3-1 Return Command

Example:

Return results of search command(36 bytes)

FF 24 01 00 00 c0 a8 00 07 00 71 77 7c 42 2F 01 0c 00 00 55 53 52 2d 4b 32 00 00 00 00 00 00 00 00 00 00 F2

Parity method is reduce sum check. initial value is 0 x00, then reduce the byte one by one.

The method of the check is as follow:

F2 = 00 - FF - 24 - 01 - 00 - 4B - ... - 32 – 00-…-00

2. Return results of reset command

Response(4 bytes): FF 01 02 4B, if user name and password are right, 4B = 'K'
FF 01 02 50, if user name and password are wrong, 50 = 'P'

3. Return results of read command

Description：

Return all parameter of DR301 network. 567 bytes in total, no parity, no protocol, return parameter directly.

Return data divide into 4 package, 130bytes, 50 bytes,85 bytes and 302bytes.

For example:

```
    95 63 03 00 00 00 50 00 00 07 00 A8 C0 01 00 A8 C0 00 FF FF FF 55 53 52 2D 54 43 50 32 33 32 2D 33 31 30 00 00
61 64 6D 69 6E 00 61 64 6D 69 6E 00 00 01 00 A4 AC CF 23 20 FE 10 00 00 00 00 00 00 00 80 25 00 00 08 01 01 01
00 00 00 00 8C 4E 2A 20 31 39 32 2E 31 36 38 2E 31 2E 31 33 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
85 01 A8 C0 00 01 00 00 00 00 00 00 00 00 00 00 00；
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00
    00 30 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00；
    07 2F 31 2E 70 68 70 3F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 2A 55 73 65 72 5F 41 67 65 6E 74 3A
20 4D 6F 7A 69 6C 6C 61 2F 34 2E 30 0D 0A 43 6F 6E 6E 65 63 74 69 6F 6E 3A 20 63 6C 6F 73 65 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Return:FF 01 03 50 if the password is wrong and no parity.

4. Return results of basic settings command

FF 01 05 4B with right password:4B=”k”

FF 01 05 50 with wrong password:50=”P”

5. Return results of serial parameters settings command

FF 01 06 4B with right password:4B=”k”

FF 01 06 50 with wrong password:50=”P”

6. Return results of USR-cloud command

FF 01 06 4B with right password:4B=”k”

FF 01 06 50 with wrong password:50=”P”

7. Return results of heartbeat package command

FF 01 06 4B with right password:4B=”k”

FF 01 06 50 with wrong password:50=”P”

8. Others return results

Sum check fault returns 'E' + right parity

Correct execution: FF 01 CMD 'K'

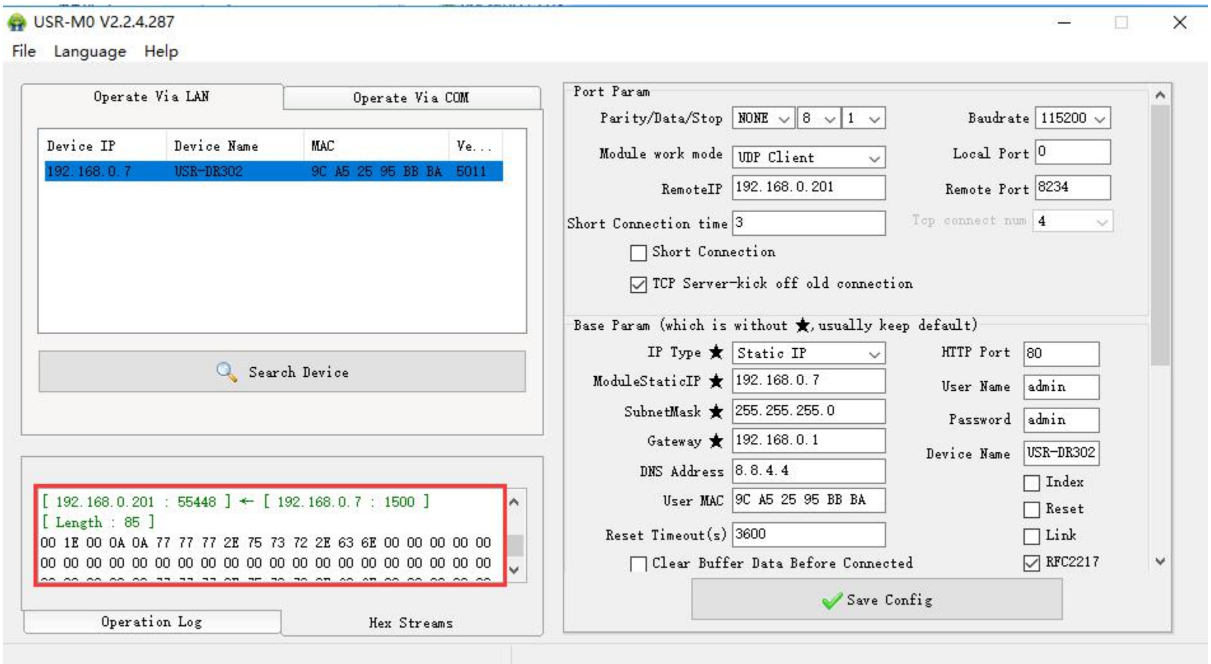
User name/password fault returns: FF 01 CMD 'P'

Others faults return: FF 01 CMD 'E'

5.1.4. Listening Report Method

Using the below wan to catch the report.

Please using the set-up software M0



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Device IP	Device Name	MAC	Ve...
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5011

```
[ 192.168.0.201 : 55448 ] ← [ 192.168.0.7 : 1500 ]
[ Length : 85 ]
00 1E 00 0A 0A 77 77 77 2E 75 73 72 2E 63 6E 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Port Param

Parity/Data/Stop: NONE 8 1
Baudrate: 115200
Module work mode: UDP Client
Local Port: 0
RemoteIP: 192.168.0.201
Remote Port: 8234
Short Connection time: 3
Tcp connect num: 4
□ Short Connection
☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)

IP Type ★: Static IP
HTTP Port: 80
ModuleStaticIP ★: 192.168.0.7
User Name: admin
SubnetMask ★: 255.255.255.0
Password: admin
Gateway ★: 192.168.0.1
Device Name: USR-DR302
DNS Address: 8.8.4.4
□ Index
User MAC: 9C A5 25 95 BB BA
□ Reset
Reset Timeout(s): 3600
□ Link
□ Clear Buffer Data Before Connected
☑ RFC2217

Diagram 5.1.4-1 Catch the report

5.2. Serial Setting Protocol

5.2.1. AT Command Overview

For USR device is in transparent mode normally, you must enter AT command mode at first. Then you can send AT command to configure or query the settings. After you configure the USR device, you should restart the USR device to make the settings take effect. Every time module restart will work in work mode rather AT command mode.

Every AT command must add character carriage return <CR> and line feed <LF>. In Hex, <CR> is 0x0D <LF> is 0x0A.

Powered successfully, we can setting the module with UART.

The default UART port parameters of the module are: baud rate1152000, no parity, data 8 and stop 1.

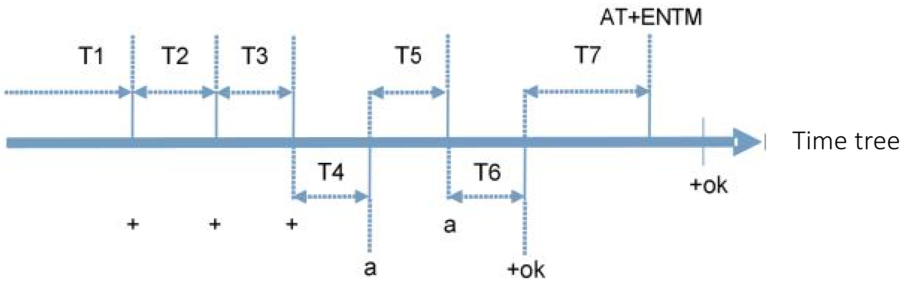
Recommend to use secureCRT software tool or testing program of USRIOT.

Below are using the secureCRT to operate AT command:

Need two step as below:

- Fill “+++”in the UART. After the module receive the “++++”,then will return an “a” to confirm;
- When you receive an 'a'� , then you need to send other 'a' within 3 seconds
- After that, module will return “+ok” to enter into the commend mode.

Fill “+++”and “a” need to achieve in the time to reduce the chance of entering command mode while working normally accidentally. Detail requirement are as fellows.



Time requirement:

T1>the interval of serial port package

T2<300ms

T3<300ms

T5<3s

Change transparent transmission mode to AT command mode :

1. Serial mode device send “+++”to module continuously. If the module received ‘+++’ successfully then it will send “a” back.
2. When module received “a” and then user need to send other “a” to uart within 3s.
3. The module will return ‘+ok’ when module received ‘a’ successfully. And enter into command mode

Change AT command mode to transparent transmission mode:

1. Serial device send “AT+ENTM”to module.
2. After the module receive the commend, feedback “+ok”, then back to the previous working mode.

Input AT command via CRT serial debugging of programmer

Based on the ASCII command , the format of the AT command are as below:

< >: the content that you have to choose

[ ]: the part can be select

Command:

AT+<CMD>[op][para-1,para-2,para-3,para-4…]<CR><LF>

AT+: command prefix

[op]L: command operating code, parameters setting or query;

“=” parameters setting

“NULL” query

[para-n] fill when setting the parameters

<CR>: end, enter , ASCII code,: 0X0D

<LF> : line feed, ASCII code:0X0D

Note: if enable the echo function(AT+E), the command enter will be send back, end code <CR> will not.

Response data

<CR><LF>+<RSP>[op] [para-1,para-2,para-3,para-4…]<CR><LF>

+: the response prefix

RSP: response code ,including:

Ok

Err

[para-n]: return parameters or the error code:

<CR>:ASCII code: 0x0d；

<LF>: ASCII code :0x0a；

5.2.2. Error Code

List of Error Code

Error	State
-1	Invalid command format
-2	Invalid command
-3	Invalid Operator
-4	Invalid Parameters
-5	Operation not allowed

5.2.3. AT Command

AT Command List:

NO	command	Instr
1	E	Enable/disable the echo function
2	Z	Restore module
3	VER	Query the vision
4	ENTM	Exit AT command mode
5	RELD	Reset default settings
6	MAC	Query module MAC address
7	WEBU	Setting/ query username and password
8	WANN	Setting/ query WAN port parameters
9	DNS	Setting/ query DNS server address
10	WEBPORT	Setting/ query webpage port
11	UART	Setting/ query serial parameters

12	SOCK	Setting/ query SOCK parameters
13	TCPSE	Setting/ query whether kick off order connection
14	SOCKLK	Query TCP connect status
15	SOCKPORT	Setting/ query local port number
16	RFCEN	Setting/ query RFC2217 enable
17	PDTIME	Query the product time
Registration package function		
18	REGEN	Setting/ query registration package mechanism
19	REGTCP	Setting/ query registration package perform mechanism
20	REGCLOUD	Setting/ query USR-cloud username and password
21	REGUSR	Setting/ query the content of registration package that customized
Httpd client function		
22	HTPTP	Setting/ query in httpd client mode, the asking way of the http
23	HTPURL	Setting/ query the URL in httpd client mode
24	HTPHEAD	Setting/ query the package head in httpd client
25	HTPCHD	Setting/ query HTP remove the package head
Heartbeat package		
26	HEARTEN	Setting/ query heartbeat package enable
27	HEARTTP	Setting/ query method of the heartbeat package send
28	HEARTTM	Setting/ query the heartbeat package time
29	HEARTDT	Setting/ query customize heartbeat package
Expand function command		
30	SCSLINK	Setting/ query the indicating function of the status of socket connection
31	CLIENTRST	Setting/ query the TCP client mode reset function enable/disable
32	INDEXEN	Setting/ query index function
33	SOCKSL	Setting/ query short connection function
34	SHORTO	Setting/ query short connection time
35	UARTCLBUF	Setting/ query clear serial port cache before module build connection function enable/disable
36	RSTIM	Setting/ query timeout reset time
37	MAXSK	Setting/ query maximum client connections in TCP server mode
38	MID	Setting/ query module name
39	MODTCP	Query /setting the name of the module
40	H	Query help message

6. Parameter Configuration

It is setup software configuration, webpage configuration and serial configuration.

How to configure:

Revise user name/password→set IP access method→serial parameter→USR-DR301 work mode→work mode related parameter

6.1. Software Configuration

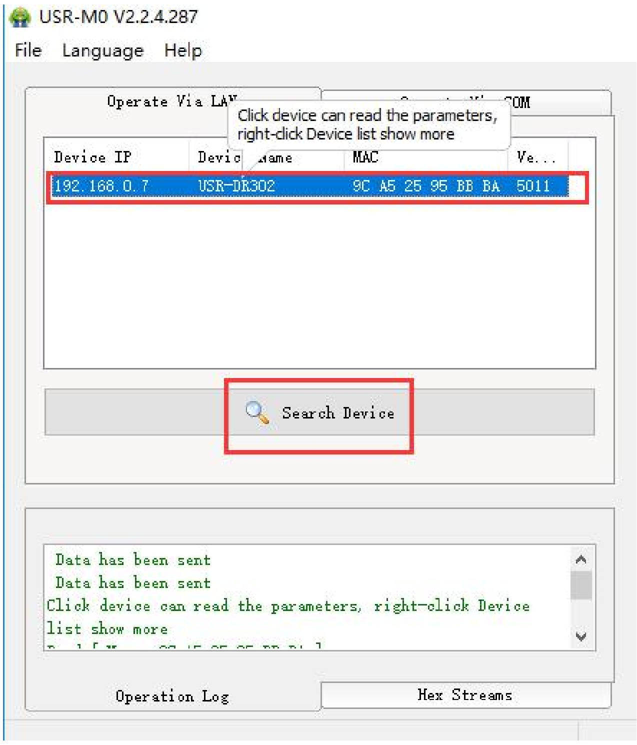
To make sure setup software normal running, please check the below firstly:

1. USR-DR301 and setup software PC are within same LAN.
2. Disable the anti-virus software and firewall on PC.
3. Disable network card nothing to do with this testing.

Download [USR-M0] Setup software here:

https://www.usriot.com/support/downloads/usr-m0-setup-software-v224288.html

Search device and all USR-DR301 device within LAN can be found. It includes IP, name, MAC and version.



Click device can read the parameters, right-click Device list show more

Device IP	Device Name	MAC	Ve...
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5011

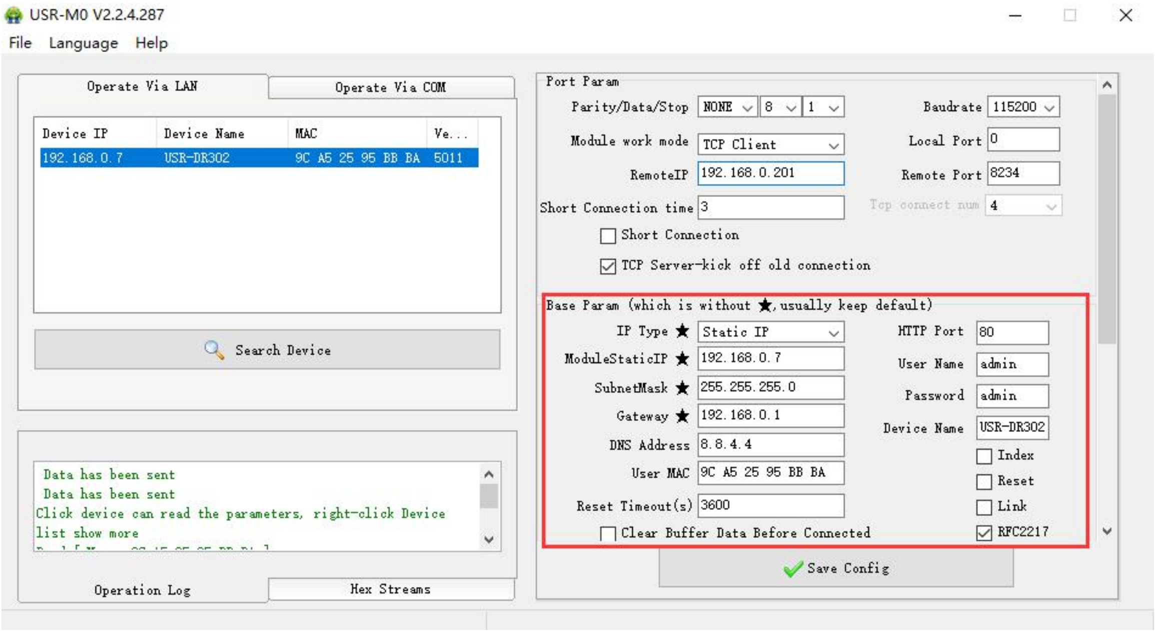
```
 Data has been sent
 Data has been sent
Click device can read the parameters, right-click Device
list show more
```

Diagram 6.1-1 Software Configuration—Search

1. Basic parameter configuration

   Click “Full Show” and all basic parameter is revealed.

   Set the parameter as needs and click “Base Save” then can set successfully.



USR-M0 V2.2.4.287

File Language Help

Operate Via LAN | Operate Via COM

Device IP	Device Name	MAC	Ve...
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5011

Search Device

```
Data has been sent
Data has been sent
Click device can read the parameters, right-click Device
list show more
```

Operation Log | Hex Streams

Port Param

Parity/Data/Stop: NONE, 8, 1 — Baudrate: 115200

Module work mode: TCP Client — Local Port: 0

RemoteIP: 192.168.0.201 — Remote Port: 8234

Short Connection time: 3 — Tcp connect num: 4

□ Short Connection

☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)

IP Type ★: Static IP — HTTP Port: 80

ModuleStaticIP ★: 192.168.0.7 — User Name: admin

SubnetMask ★: 255.255.255.0 — Password: admin

Gateway ★: 192.168.0.1 — Device Name: USR-DR302

DNS Address: 8.8.4.4 — □ Index

User MAC: 9C A5 25 95 BB BA — □ Reset

Reset Timeout(s): 3600 — □ Link

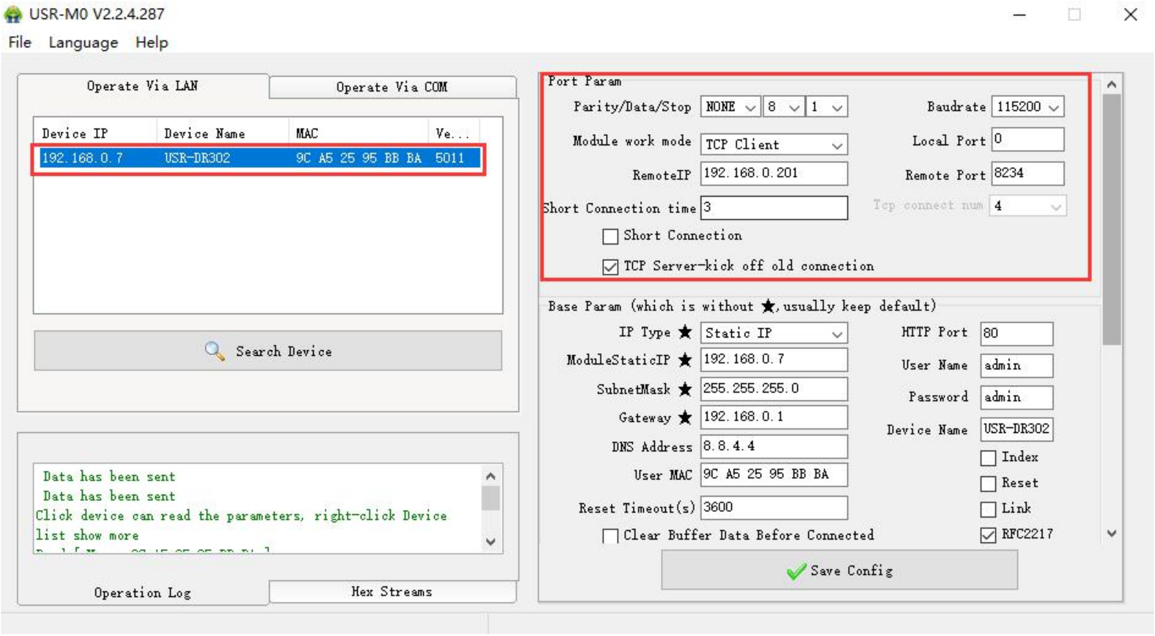
□ Clear Buffer Data Before Connected — ☑ RFC2217

Save Config

Diagram 6.1-2 Software Configuration --Full Show

- Webpage port: it is 80 by default when visit webpage.
- User name: Authentication Code for revising parameter to avoid other users within same LAN revising it.
- Password: same as user name.
- Device Name: USR-DR301 's name an be revised.
- IP address type: Static and DHCP
- Static IP: same segment with router.
- Subnet Mask: 255.255.255.0 by default.
- Gateway: it is router IP generally, can transmit cross network segment and DNS if set correctly.

2. Port configuration



USR-M0 V2.2.4.287

File Language Help

Operate Via LAN | Operate Via COM

Device IP	Device Name	MAC	Ve...
192.168.0.7	USR-DR302	9C A5 25 95 BB BA	5011

Search Device

```
Data has been sent
Data has been sent
Click device can read the parameters, right-click Device
list show more
```

Operation Log | Hex Streams

Port Param

Parity/Data/Stop: NONE, 8, 1 — Baudrate: 115200

Module work mode: TCP Client — Local Port: 0

RemoteIP: 192.168.0.201 — Remote Port: 8234

Short Connection time: 3 — Tcp connect num: 4

□ Short Connection

☑ TCP Server-kick off old connection

Base Param (which is without ★, usually keep default)

IP Type ★: Static IP — HTTP Port: 80

ModuleStaticIP ★: 192.168.0.7 — User Name: admin

SubnetMask ★: 255.255.255.0 — Password: admin

Gateway ★: 192.168.0.1 — Device Name: USR-DR302

DNS Address: 8.8.4.4 — □ Index

User MAC: 9C A5 25 95 BB BA — □ Reset

Reset Timeout(s): 3600 — □ Link

□ Clear Buffer Data Before Connected — ☑ RFC2217

Save Config

Diagram 6.1-3 Software Configuration-COM 1 Configuration

- Serial Baud rate: it can be standard or customized.
- Parity/Data/Stop: serial parameter.
- Work Mode: TCP Server /TCP Client/HTTPD Client/UDP Client/UDP Server
- Destination IP/Port: IP connected when USR-DR301 works as client (TCP Client/HTTPD Client/UDP Client)
- Local Port: The port number of DR301 be used to initiate the connection. Advice to set it to “0’’ when USR-DR301 works under TCP Client for connection with Random port.
- Similar RFC2217: Please refer to Chapter 3.5.10 Similar RFC2217

3. Firmware Upgrade

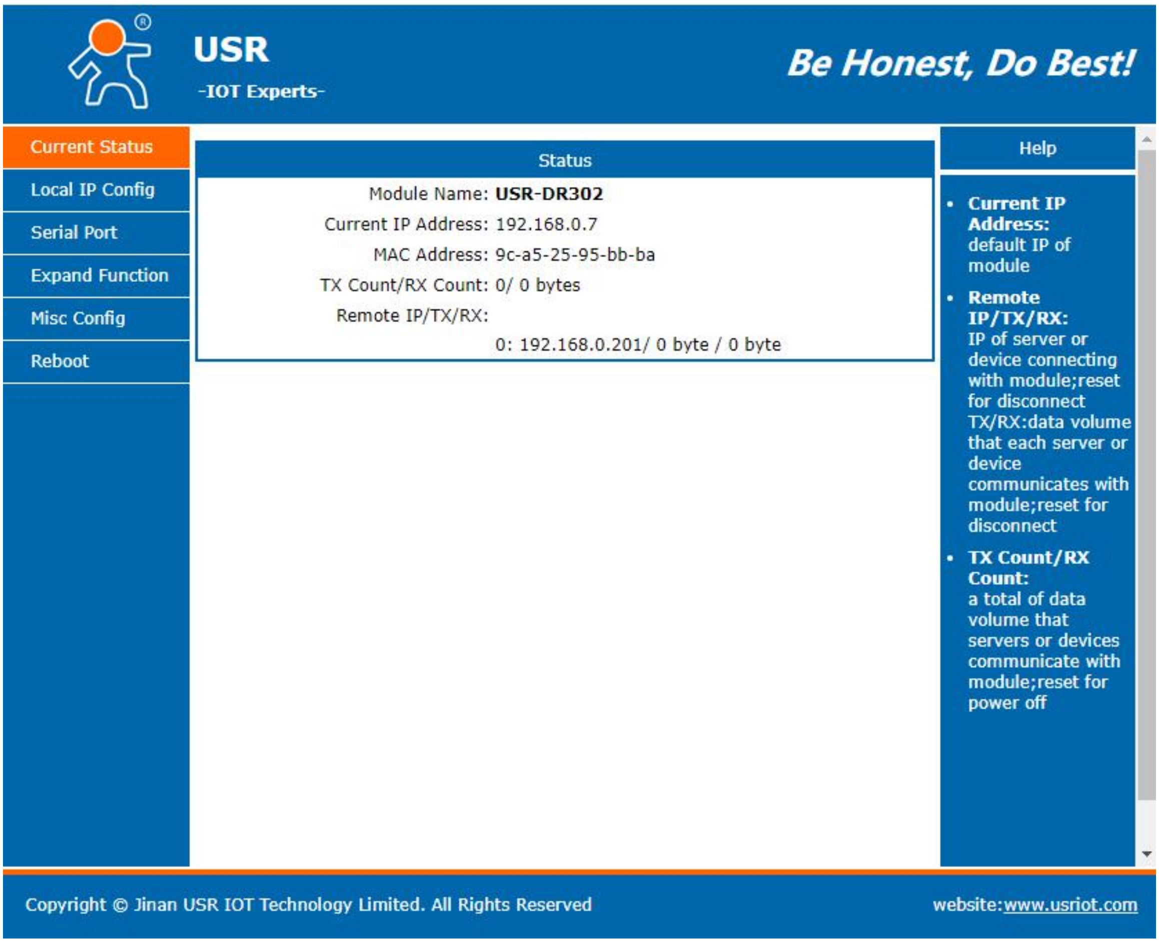
If USR-DR301 need to upgrade with new firmware, please contact USR sales.

During firmware upgrade, USR-DR301 connects to PC directly. PC Upgrade via Wi-Fi is prohibited.

Please refer to Chapter 4.1.5.

6.2. Webpage Configuration

Open browser and type in USR-DR301 ’ IP (192.168.0.7 by default)
Then user name: admin and password: admin



Module Name: **USR-DR302**
Current IP Address: 192.168.0.7
MAC Address: 9c-a5-25-95-bb-ba
TX Count/RX Count: 0/ 0 bytes
Remote IP/TX/RX:
0: 192.168.0.201/ 0 byte / 0 byte

- **Current IP Address:** default IP of module
- **Remote IP/TX/RX:** IP of server or device connecting with module;reset for disconnect TX/RX:data volume that each server or device communicates with module;reset for disconnect
- **TX Count/RX Count:** a total of data volume that servers or devices communicate with module;reset for power off

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website:www.usriot.com

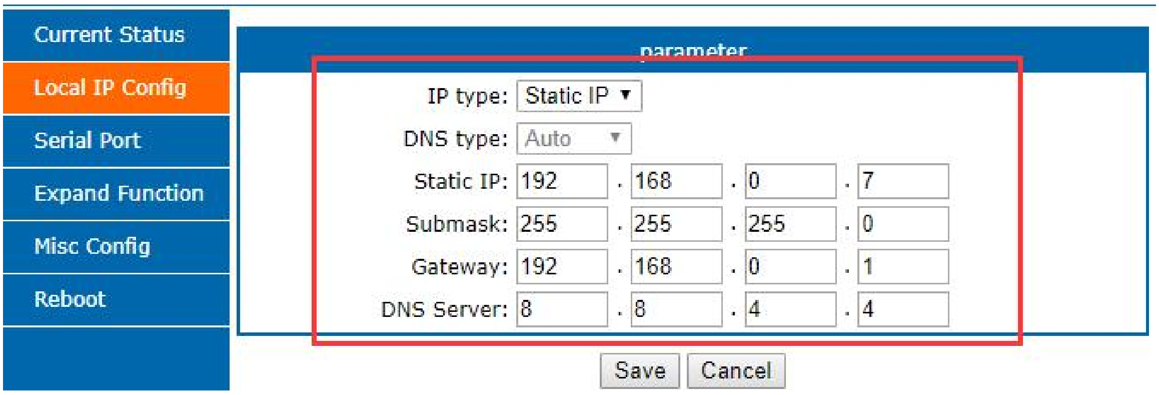
Diagram 6.2-1 Catalog

1. Current Status - reveals basic information:
    - Module name

- Current IP address
- MAC address
- Total amount of data sent and received by all connections
- The IP address of the connected device and the amount of data sent and received for each connection

2. Local IP Config

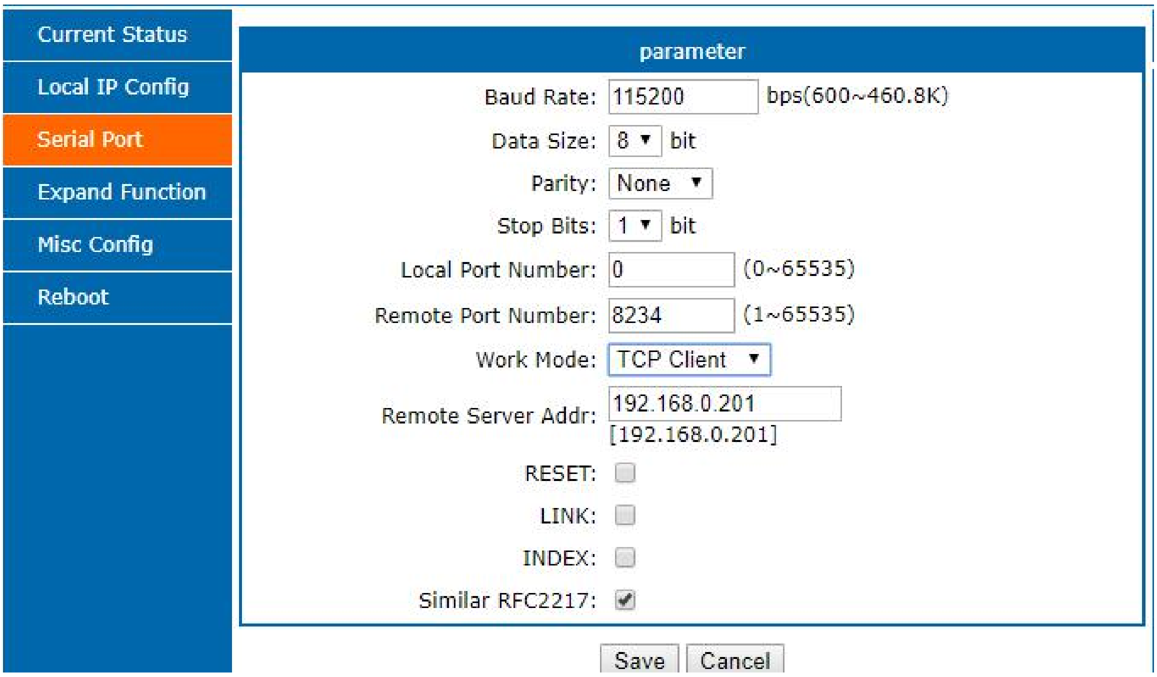
Save configuration after revising the parameters. Then restart.



IP type: Static IP
DNS type: Auto
Static IP: 192 . 168 . 0 . 7
Submask: 255 . 255 . 255 . 0
Gateway: 192 . 168 . 0 . 1
DNS Server: 8 . 8 . 4 . 4

Diagram 6.2-2 Webpage Configuration-Local IP Configuration

3. Port parameters



Baud Rate: 115200 bps(600~460.8K)
Data Size: 8 bit
Parity: None
Stop Bits: 1 bit
Local Port Number: 0 (0~65535)
Remote Port Number: 8234 (1~65535)
Work Mode: TCP Client
Remote Server Addr: 192.168.0.201 [192.168.0.201]
RESET: □
LINK: □
INDEX: □
Similar RFC2217: ☑

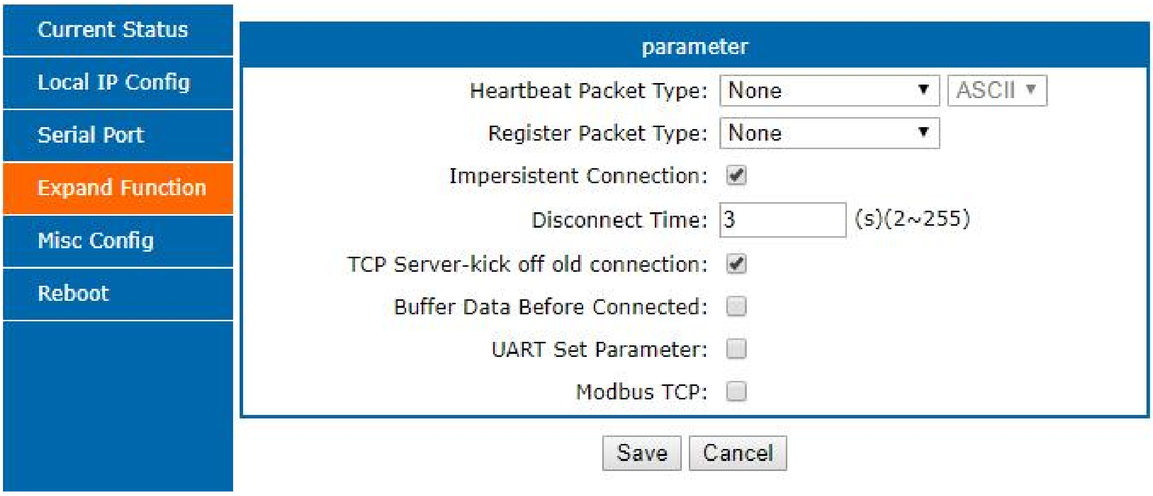
Diagram 6.2-3 Basic Parameters

4. Expand Function

- USR-cloud ID and code
- Custom heartbeat package function: can be opened by webpage, content customization, up to 40 bytesBuffer data before connected: whether serial and network data are cached if disconnection.
- Customize the registration package function: can be opened through the webpage, the content is customized, the maximum length is 40 bytes, and the registration package is customized.
- Impersistent Connection: Enable this function in TCP Client mode, short connection disconnection time

customization

- Buffer Data Before Connected: You can set whether to clear the cached data before the connection.
- New connection in TCP Server mode kicks off old connection function
- UART Set Parameter: The function of setting parameters through the serial port protocol can be enabled through the webpage.
- Modbus TCP: Disable by default.

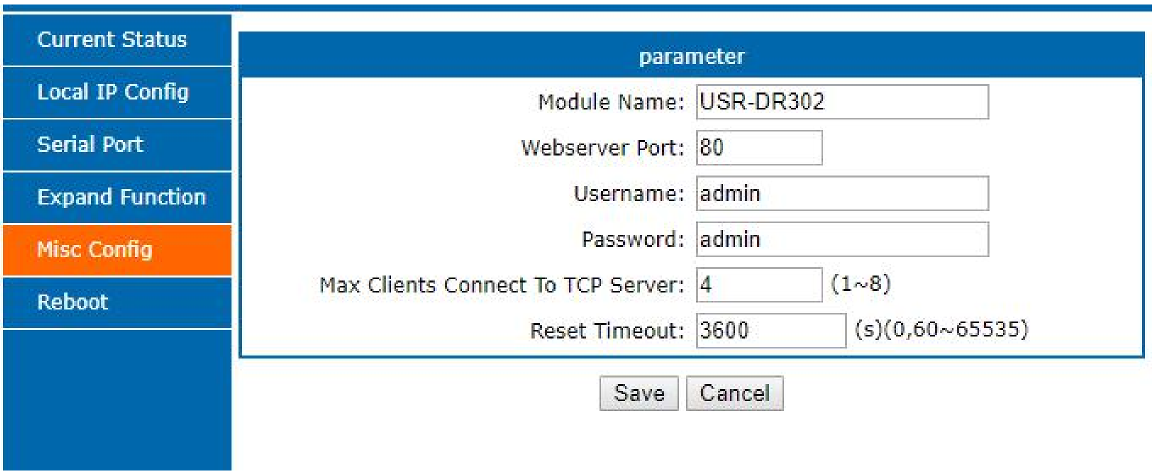


Heartbeat Packet Type: None ▼ ASCII ▼
Register Packet Type: None ▼
Impersistent Connection: ☑
Disconnect Time: 3 (s)(2~255)
TCP Server-kick off old connection: ☑
Buffer Data Before Connected: □
UART Set Parameter: □
Modbus TCP: □

Diagram 6.2-4 Expand Function

5. Misc Config

Save all data then click restart to take effect.



Module Name: USR-DR302
Webserver Port: 80
Username: admin
Password: admin
Max Clients Connect To TCP Server: 4 (1~8)
Reset Timeout: 3600 (s)(0,60~65535)

Diagram 6.2-5 Misc Config

6.3 AT Command Details

1. AT+E

Function: query/ setting module echo of the AT command setting

Format: query:

A+E<CR>

<CR><LF>+OK=< on/off ><CR><LF>

Setting:

A+E=< on/off ><CR>

<CR><LF>+OK<CR><LF>

Parameters: ON: enable the echo, echo the command entered by the AT command.

OFF: under AT command mode, the entered command do not echo.

E.g.: AT+E=on

2. AT+Z

Function: restart module

Format: setting:

AT+Z<CR>

<CR><LF>+OK<CR><LF>

Parameters: none

<note>: after perform this command correctly, module restart and exit the AT command mode.

3. AT+VER

Function: query module firmware version.

Format: query:

AT+VER<CR>

<CR><LF>+OK=< ver ><CR><LF>

Parameters: ver: query module firmware version.

4. AT+ENTM

Function: exit the AT command mode and enter the transparent transmission:

Format: setting:

AT+ENTM<CR>

<CR><LF>+OK<CR><LF>

Parameters: none

<note>: after perform this command correctly, module change into command mode from transparent transmission mode.

5. AT+RELD

Function: module reset

Format: setting

AT+RELD<CR>

<CR><LF>+OK<CR><LF>

Parameters: none.

6. AT+MAC

Function: query module MAC

Format: query:

AT+MAC<CR>

<CR><LF>+OK=< MAC ><CR><LF>

Parameters: mac: MAC address of the module(e.g.00020K2050A)

7. AT+WEBU

Function: setting /query module username and password

Format: query:

AT+WEBU<CR>

<CR><LF>+OK=< username,password ><CR><LF>

setting:

AT+WEBU=< username,password ><CR>

<CR><LF>+OK<CR><LF>

Parameters: username: username, support 5 bytes at longest and can not be none:

password: password, support 5 bytes at longest.

E.g.: AT+WEBU=admin,admin

8. AT+WANN

Function: setting /query the IP of WAN(DHCP/STATIC) that module access

Format: query:

AT+WANN<CR>

<CR><LF>+OK=< mode,address,mask,gateway ><CR><LF>

setting:

AT+WANN=< mode,address,mask,gateway ><CR>

<CR><LF>+OK<CR><LF>

Parameters: mode: web IP mode (**static/DHCP**)

static: static IP/

DHCP: dynamic IP(address,mask,gateway parameters ignore)

Address: IP address

Mask: subnet masks

Gateway: gateway address

E.g.: AT+WANN=static,192.168.0.7,255.255.255.0,192.168.0.1

9. AT+DNS

Function: setting /query DNS server address:

Format: query:

AT+DNS<CR>

<CR><LF>+OK=< address ><CR><LF>

setting:

AT+DNS=< address ><CR>

<CR><LF>+OK<CR><LF>

Parameters: address: DNS server address(default value is 8.8.8.8).

E.g.: AT+DNS=8.8.8.8

10. AT+WEBPORT

Function: setting /query webpage port

Format: query:

AT+WEBPORT<CR>

<CR><LF>+OK=< port ><CR><LF>

setting:

AT+WEBPORT=< port ><CR>

<CR><LF>+OK<CR><LF>

Parameters: port: module the port of the web server that built in of module. default 80:

E.g.: AT+WEBPORT=80

11. AT+UART

Function: setting /query UART interface parameters

Format: query:

AT+UART<CR>

<CR><LF>+OK=< baudrate,data_bits,stop_bit,parity,flowctrl ><CR><LF>

setting:

AT+UART=< baudrate,data_bits,stop_bit,parity,flowctrl ><CR><LF>

<CR><LF>+OK<CR><LF>

Parameters: baudrate: baud rate600~460800bps,can be customized .

data_bits: data 5/6/7/8

stop_bits: stop 1/2

parity: parity

- ◆ NONE(no parity)
- ◆ EVEN(even parity)
- ◆ ODD(odd parity)
- ◆ MASK(1 parity)
- ◆ SPACE(0 parity)

flowctrl: flow control(none flow control, can not setting , default setting to be the NFC)

- ◆ NFC: none: hardware flow control

E.g.: AT+UART=115200,8,1,NONE,NFC

12. AT+SOCK

Function: setting /query web protocol parameters format

Format: query:

AT+SOCK<CR>

<CR><LF>+OK=< protocol,IP,port ><CR><LF>

setting:

AT+SOCK=< protocol,IP,port ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Protocol: protocol type, including

- TCPS is TCP server
- TCPC is TCP client
- UDPS is UDP server
- UDPC is UDP client
- HTPC is Httpd Client

IP: when the module setting into “CLIENT”mode, the IP address and domain name of the remote server.

Port: local port under Server mode and remote port under Client mode,decimal number and less than 65535.

E.g.: AT+SOCK=TCPC,192.168.0.201,8234

13. AT+TCPSE

Function: module is TCP Server, the processing mechanism after the connection reaches the maximum number of connections.

Format: query:

AT+TCPSE<CR>

<CR><LF>+OK=< status ><CR><LF>

setting:

AT+TCPSE=< status ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status: setting status keep/kick

- keep: after reach the maximum number of connection, do not receive new one.
- kick: after reach the maximum number of connection, delete the order one and connect the new one.

E.g.: AT+TCPSE=keep

14. AT+SOCKLK

Function: query whether the TCP has connected

Format: query:

AT+ SOCKLK<CR>

<CR><LF>+OK=< sta ><CR><LF>

Parameters:

Sta: built the TCP connection or not

- Connect: TCP connected
- Disconnect: TCP not connected

15. AT+SOCKPORT

Function: setting /query local socket port

Format: query:

AT+SOCKPORT<CR>

<CR><LF>+OK=< sta ><CR><LF>

setting:

AT+ SOCKPORT =< sta ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

- Sta: 0 is using port randomly. 1-65535 is using the local port of the socket.

E.g.: AT+SOCKPORT=20108:

16. AT+RFCEN

Function: enable/ disable RFC221 7function

Format: query:

AT+RFCEN<CR>

<CR><LF>+OK=< status ><CR><LF>

setting:

AT+RFCEN =< status ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status:

- ON: enable RFC2217function
- OFF: disable RFC2217function

E.g.: AT+RFCEN=ON

17. AT+PDTIME

Function: query produce time

Format: query:

AT+PDTIME<CR>

<CR><LF>+OK=< time ><CR><LF>

Parameters:

time: produce time,

E.g.: 2016-10-18 11:20:02

18. AT+REGEN

Function: setting query registration package mechanism

Format: query:

AT+REGEN<CR>

<CR><LF>+OK=< status ><CR><LF>

setting:

AT+REGEN =< status ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status:

- MAC: enable registration package mechanism, registration package is 6 bites MAC
- Usr: customize registration package
- Off: disable registration package mechanism

E.g.: AT+REGEN=MAC

19. AT+REGTCP

Function: setting query tcp client mode registration package perform mechanism

Format: query:

AT+REGTCP<CR>

<CR><LF>+OK=< status ><CR><LF>

setting:

AT+REGTCP =< status ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status:

- first: send a registration package when connected the server at first time
- every: add a registration package in front of the every data package sent to server.
- all: send registration package when first connected to the server and add registration package in front of the data package.

E.g.: AT+REGTCP=first

20. AT+REGCLOUD

Function: setting /query USR-cloud username and password

Format: query:

AT+REGCLOUD<CR>

<CR><LF>+OK=< name, password ><CR><LF>

setting:

AT+REGCLOUD=< name, password ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status:

- name: USR-cloud device port:
- password: USR-cloud password .

E.g.: AT+REGCLOUD=00000000000000000000, 00000000

21. AT+REGUSR

Function: setting query customize registration package content

Format: query:

AT+REGUSR<CR>

<CR><LF>+OK=< data ><CR><LF>

setting:

AT+ REGUSR =< data ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

data: ASCII code in 40 bytes

E.g.: AT+REGUSR=www.usr.cn

22. AT+HTPTP

Function: setting /query the asking way under HTTPD Client mode.

Format: query:

AT+HTPTP<CR>

<CR><LF>+OK=< status ><CR><LF>

setting:

AT+HTPTP =< status ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status:

- GET: is the http asking way
- POST: is the http asking way

E.g.: AT+HTPTP=GET

23. AT+HTPURL

Function: setting /query the URL. Of the post

Format: query:

AT+HTPURL<CR>

<CR><LF>+OK=< URL ><CR><LF>

setting:

AT+HTPURL =< URL ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

URL: start with "/", less than 99 bytes .

E.g.: AT+HTPURL=/2.php

24. AT+HTPHEAD

Function: setting /query Httpd Client customize package head message

Format: query:

AT+HTPHEAD<CR>

<CR><LF>+OK=< data ><CR><LF>

setting:

AT+ HTPHEAD =< data ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

- data: customize package message, less than 199 bytes. And using <<CRLF>> translating the characters in stead of the enter.

E.g.: AT+HTPHEAD=Accept:text<<CRLF>>

25. AT+HTPCHD

Function: setting /query filter the package head of the return information of Http

Format: query:

AT+ HTPCHD <CR>

<CR><LF>+OK=< sta ><CR><LF>

setting:

AT+ HTPCHD =< sta ><CR>

<CR><LF>+OK<CR><LF>

Parameters: Sta:

- ON: enable
- OFF: disable

E.g.: AT+HTPCHD=ON

26. AT+HEARTEN

Function: setting /query enable or not heartbeat package

Format: query:

AT+ HEARTEN <CR>

<CR><LF>+OK=< status ><CR><LF>

setting:

AT+ HEARTEN =< status ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status:

- ON:enable heartbeat package
- Off: disable heartbeat package

E.g.: AT+HEARTEN=ON

27. AT+HEARTTP

Function: setting /query heartbeat package send way

Format: query:

AT+ HEARTTP <CR>

<CR><LF>+OK=< type ><CR><LF>

setting:

AT+ HEARTTP =< type ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Status:

- NET: send heartbeat package to server
- COM: send heartbeat package to serial port

E.g.: AT+HEARTTP=NET

28. AT+HEARTTM

Function: setting /query time of heartbeat package

Format: query:

AT+ HEARTTM <CR>

<CR><LF>+OK=< time ><CR><LF>

setting:

AT+ HEARTTM =< time ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

Time: heartbeat time ,default is 30s, range from 1 to 65535s.

E.g.: AT+HEARTTM=30

29. AT+HEARTDT

Function: setting query customize heartbeat package content

Format: query:

AT+ HEARTDT <CR>

<CR><LF>+OK=< data ><CR><LF>

setting:

AT+ HEARTDT =< data ><CR>

<CR><LF>+OK<CR><LF>

Parameters:

data: less than 40 bytes ASCII code.

E.g.: AT+HEARTDT=www.usr.cn.

30. AT+ SCSLINK

Function: setting /query Socket connected status instructions function (connection status instructions pin change or not according to the connection status)

Format: query:

AT+ SCSLINK <CR>

<CR><LF>+OK=< sta ><CR><LF>

setting:

AT+ SCSLINK =< sta ><CR>

<CR><LF>+OK<CR><LF>

Parameters: sta: status

ON: enable link function

OFF: disable link function

E.g.: **AT+ SCSLINK=ON**

31. AT+ CLIENTRST

Function: setting /query TCP Client mode filed to connect several time and reset (repeat 30 times connection failed, module restart)

Format: query:

AT+ CLIENTRST <CR>

<CR><LF>+OK=< sta ><CR><LF>

setting:

AT+ CLIENTRST =< sta ><CR>

<CR><LF>+OK<CR><LF>

Parameters: sta: status

ON: enable TCP Client reset function

OFF: disable TCP Client reset function

E.g.: **AT+CLIENTRST =ON**

32. AT+ INDEXEN

Function: setting /query index function

Format: query:

AT+ INDEXEN <CR>

<CR><LF>+OK=< sta ><CR><LF>

setting:

AT+ INDEXEN =< sta ><CR>

<CR><LF>+OK<CR><LF>

Parameters: sta: status

ON: enable **index** function

OFF: disable **index** function

E.g.: **AT+INDEX=ON**

33. AT+ SOCKSL

Function: setting /query short connection function

Format: query:

AT+ SOCKSL <CR>

<CR><LF>+OK=< sta ><CR><LF>

setting:

AT+ SOCKSL =< sta ><CR>

<CR><LF>+OK<CR><LF>

Parameters: sta: status

ON: enable **short connection** function

OFF: disable short connection function

E.g.: **AT+SOCKSL =ON**

34. AT+ SHORTO

Function: setting /query short connection time

Format: query:

AT+ SHORTO <CR>

<CR><LF>+OK=< time ><CR><LF>

setting:

AT+ SHORTO =< time ><CR>

<CR><LF>+OK<CR><LF>

Parameters: time: short connection time, 2-255s

E.g.: **AT+SHORTO =3**

35. AT+ UARTCLBUF

Function: setting /query if the module clear the serial port cache before connected

Format: query:

AT+ UARTCLBUF <CR>

<CR><LF>+OK=< sta ><CR><LF>

setting:

AT+ UARTCLBUF =< sta ><CR>

<CR><LF>+OK<CR><LF>

Parameters: sta: status

ON: clear the serial port cache before connected

OFF: do not clear the serial port cache before connected

E.g.: **AT+UARTCLBUF =ON**

36. AT+ RSTIM

Function: setting /query restart out time

Format: query:

AT+ RSTIM <CR>

<CR><LF>+OK=< time ><CR><LF>

setting:

AT+ RSTIM =< time ><CR>

<CR><LF>+OK<CR><LF>

Parameters: time: short connection time: 0, 60-65535s

E.g.: **AT+RSTIM =3600**

37. AT+ MAXSK

Function: setting /query the maximum number of the client that TCP Server connected **Format: query:**

AT+ MAXSK <CR>

<CR><LF>+OK=< num ><CR><LF>

setting:

AT+ MAXSK =< num ><CR>

<CR><LF>+OK<CR><LF>

Parameters: num: the maximum number of the client that TCP Server connected, range from 1 to 16

E.g.: **AT+MAXSK =4**

38. AT+ MID

Function: setting /query module name

Format: query:

AT+ MID <CR>

<CR><LF>+OK=< name ><CR><LF>

setting:

AT+ MID =< name ><CR>

<CR><LF>+OK<CR><LF>

Parameters: **name**: module name, maximum 15 bytes and can not be none.

E.g.: **AT+MID =USR-DR301**

39. AT+ MODTCP

Function: query/ setting modbus TCP function

Format: query

AT+ MODTCP<CR>

<CR><LF>+OK=< sta ><CR><LF> >

Parameters: **sta**: help information

40. AT+ H

Function: help

Format: query:

AT+ H <CR>

<CR><LF>+OK=< sta ><CR><LF>

Parameters: **sta**: help information

7. Contact

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9. Update History

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