# B-TECH RS232 to Ethernet TCP IP Server Converter User Manual



**B-TECH RS232 to Ethernet TCP IP Server Converter User Manual**

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## Features

- 10/100Mbps Ethernet port, support Auto-MDI/MDIX.
- Support TCP Server, TCP Client, UDP Client, UDP Server,HTTPD Client.
- Support Baud rate from 600bps to 230.4bps; Support None, Odd, Even, Mark, Space.
- Support heartbeat packet and identity packet.
- Support RS232, RS485 and RS422.
- Support web server, AT command and setup software to configure module.
- Supporttimeout reset function.
- Support TCP Client non-persistent function.
- Support DHCP/Static IP.
- Support software/hardware reload.
- Support virtual serial port with USR-VCOM software.

## Get Started

**Product link:**
https://www.b-tek.com/products/rs232-rs422-serial-to-tcp-ip-ethernet-converter

### Application Diagram


Figure 2 Application diagram

### Hardware Design

**Hardware Dimensions**

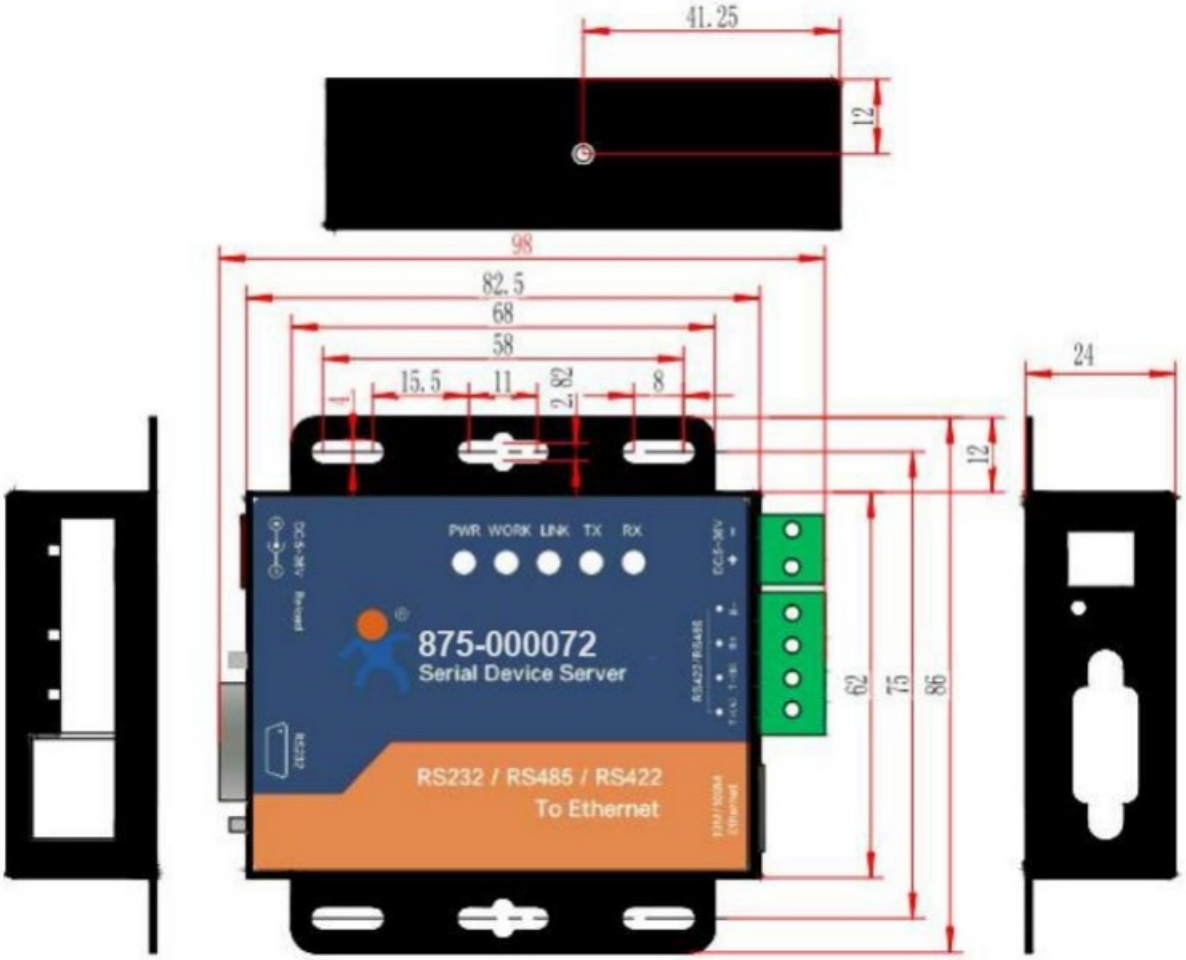
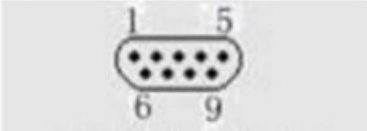



**Figure 3 Hardware dimensions**

**DB9 Pin definition**




| **Pin** | **2** | **3** | **5** | **1, 4, 6, 7, 8** | 9 |
|---|---|---|---|---|---|
| Definition | RXD | TXD | GND | NC | Default NC, can be us ed as power pin |

**Figure 4 DB9 Pin**

**RS422/RS485 Pin definition**

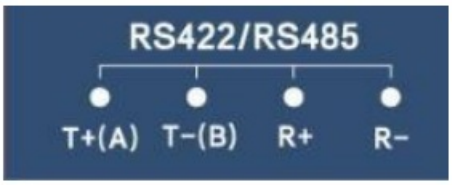



**Figure 5 RS422/RS485 pin definition**

RS422: R+/R- are RS422 RXD pins and T+/T- are RS422 TXD pins.
RS485: A/B are RS485 RXD/TXD pins.

**LED**

| Indicator | Status |
| --- | --- |
| PWR | On: Power on |
| | Off: Power off |
| WORK | Flash a period every one second: Working normally |
| | Flash a period every 200ms: Upgrading status |
| | Off: Not working |
| LINK | LED for Link function. Link function can only work in TCP Client/Server mode. TCP connection established, LINK on; TCP connection disconnect normally, LINK off immediately; TCP connection disconnect abnormally, Link off with about 40 seconds delay.<br>Enable Link function in UDP mode, LINK on. |
| TX | On: Sending data to serial |
| | Off: No data sending to serial |
| RX | On: Receiving data from serial |
| | Off: No data receiving from serial |

**Figure 6 LED**

## Product Functions

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

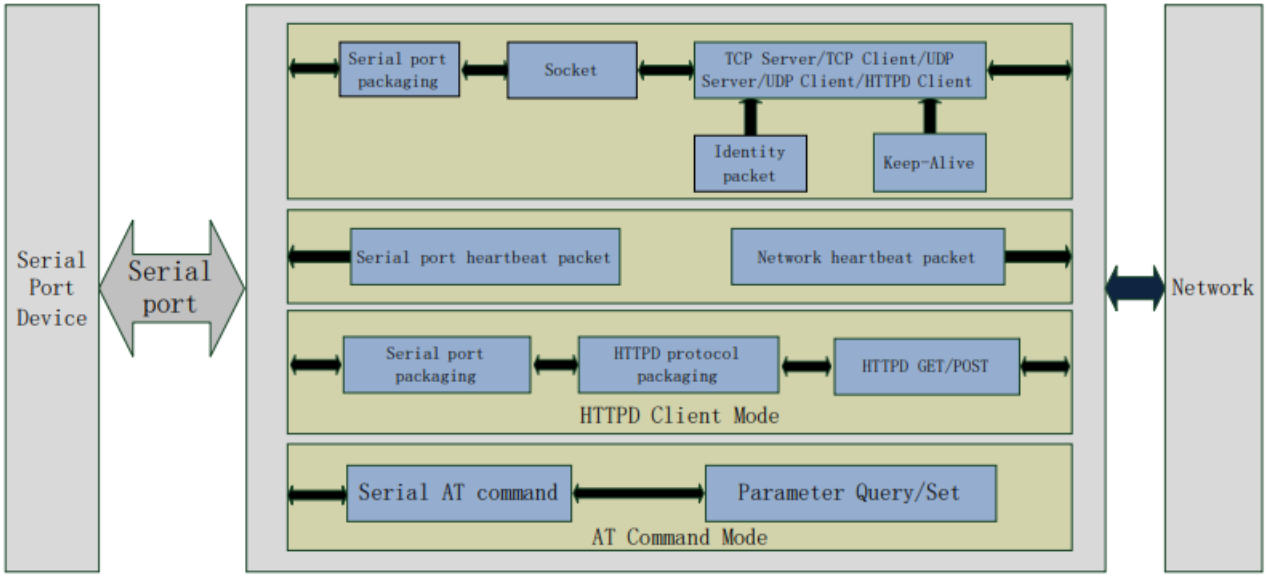



**Figure 7 Product Functions diagram**

## Basic Functions

### Static IP/DHCP

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

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

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

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

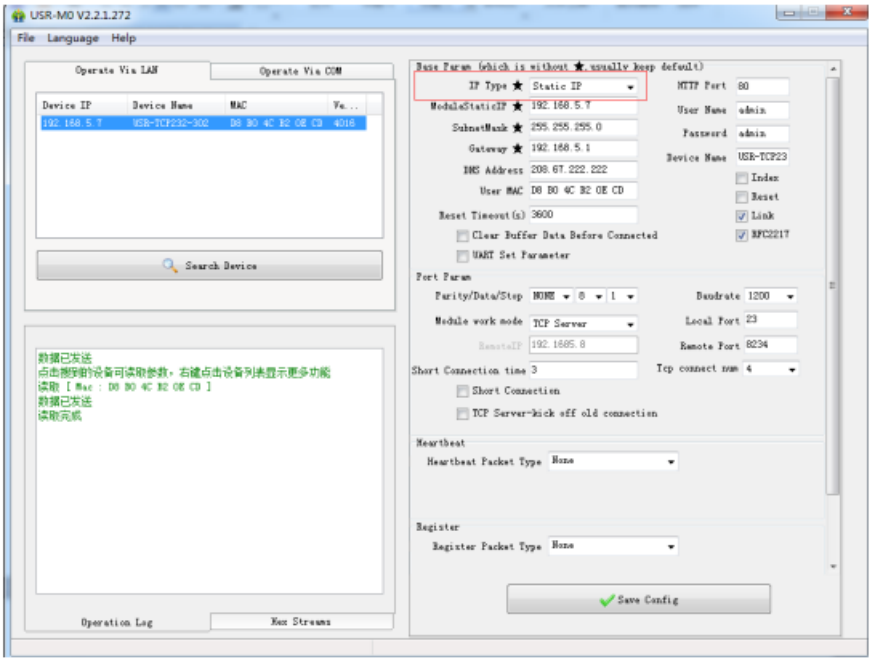



**Figure 8 Static IP/DHCP**

### Restore default settings

Hardware: User can press Reload over 5 seconds and less than 15 seconds then release to restore default settings.
Software: User can use setup software to restore default settings.
AT command: User can enter AT command mode and use AT+RELD to restore default settings.

### Upgrade Firmware Version

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

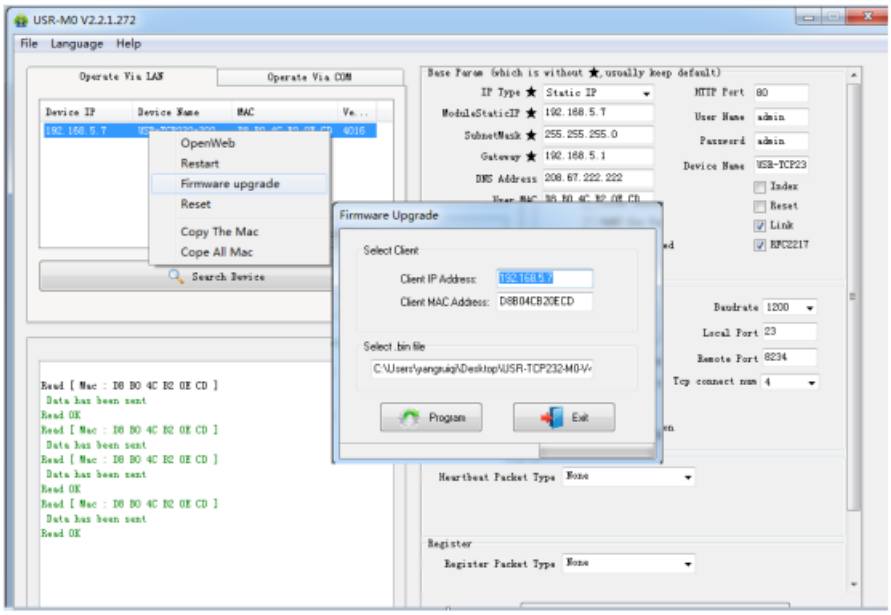



**Figure 9 Upgrade firmware version**

### Socket functions

SERIAL DEVICE SERVER socket support TCP Server, TCP Client, UDP Server, UDP Client and HTTPD Client.

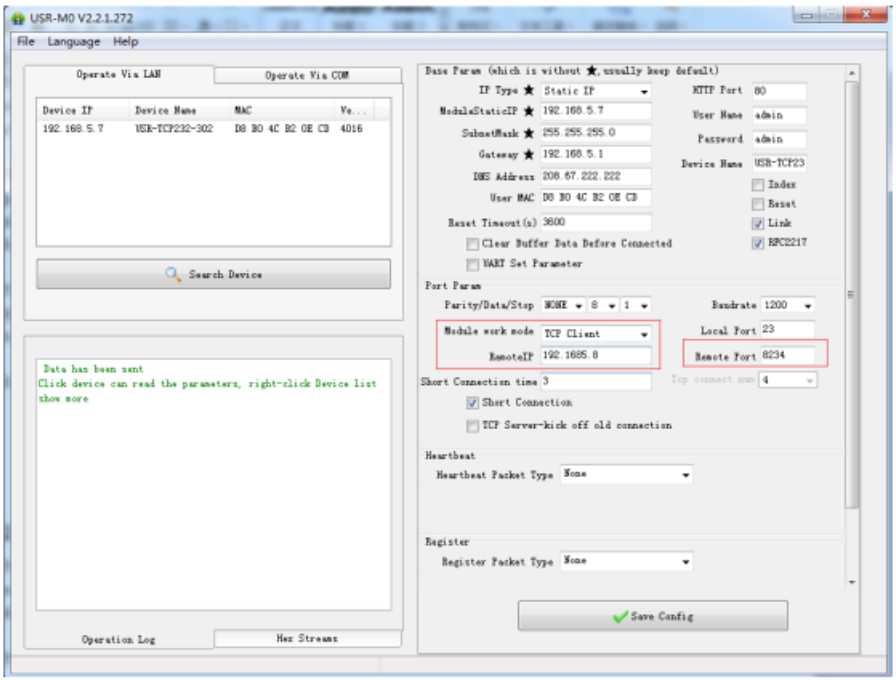
### TCP Client

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

TCP Client mode support Keep-Alive function: After connection is established, module will send Keep-Alive packets about every 15 seconds to check the connection and will disconnect then reconnect to TCP server if abnormal connection is been checked by Keep-Alive packets. TCP Client mode also support non-persistent function.

SERIAL DEVICE SERVER work in TCP Client mode need connect to TCP Server and need set the parameters: Remote Server Addr and Remote Port Number. SERIAL DEVICE SERVER work in TCP Client won't accept other connection request except target server and will access server with random local port if user set local port to zero.

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



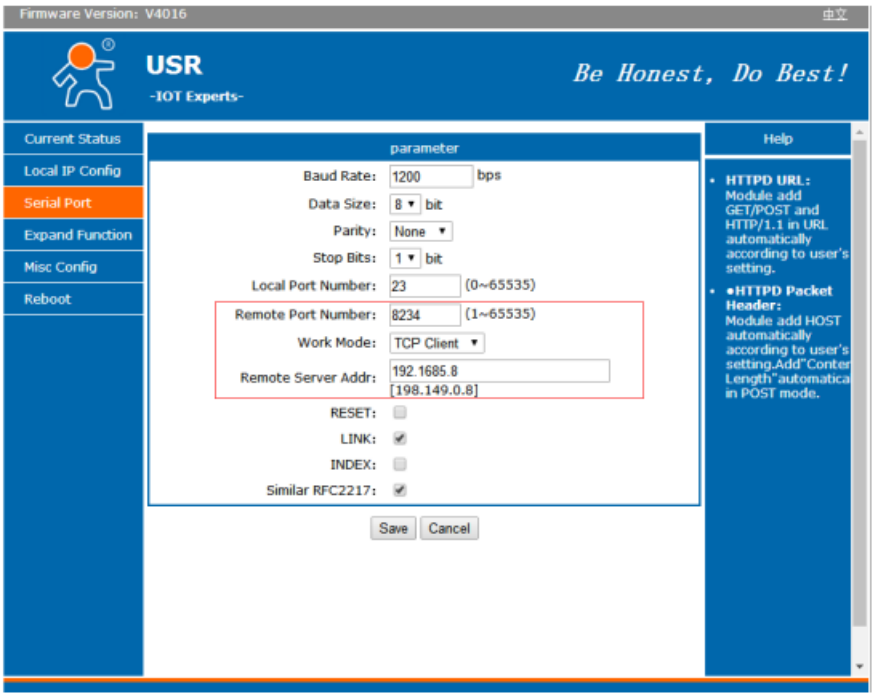




**Figure 10 TCP Client**

**TCP Server**

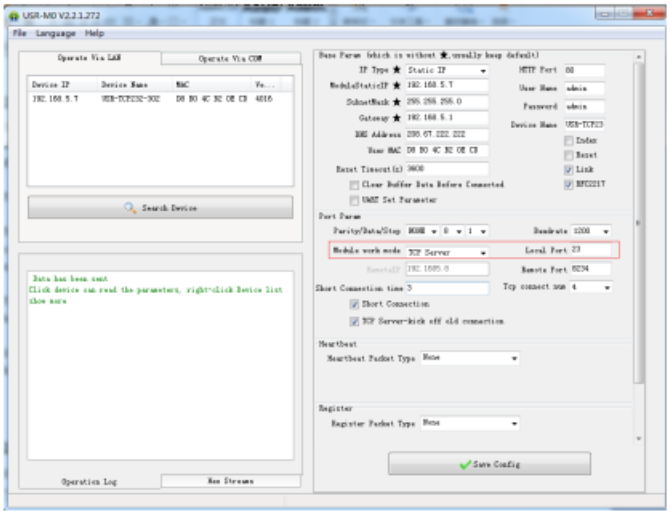
TCP Server will listen network connections and build network connections, commonly used for communication with TCP clients on a LAN. According to the TCP protocol, TCP Server has connection/disconnection status differences to ensure reliable data transmission.

TCP Server mode also support Keep-Alive function.

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

SERIAL DEVICE SERVER work in TCP Server support 16 client connections at most and will kick off oldest connection beyond maximum connections(User can enable/disable this function by web server).

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



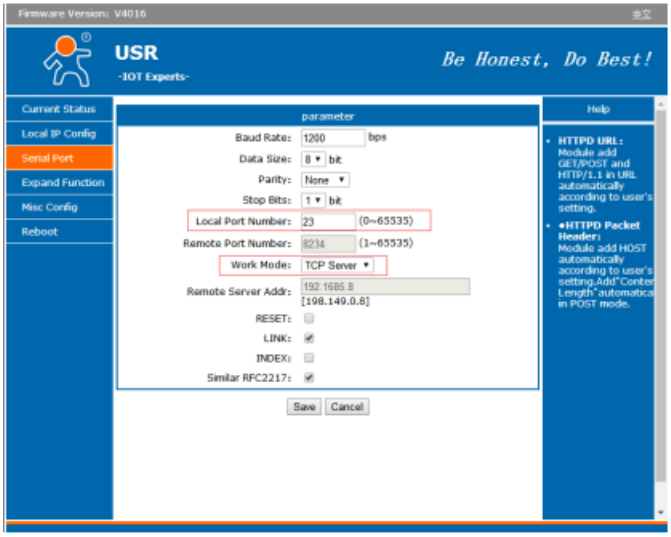



**Figure 11 TCP Server**

**UDP Client**

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

In UDP Client mode, SERIAL DEVICE SERVER will only communicate with target IP/Port. If data not from target IP/Port, it won't be received by SERIAL DEVICE SERVER.

In UDP Client mode, if user set remote IP as 255.255.255.255, SERIAL DEVICE SERVER can broadcast to entire network segment and receive broadcast data. After firmware version 4015, 306 support broadcasting in same network segment.(Such like xxx.xxx.xxx.255 broadcasting way).

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

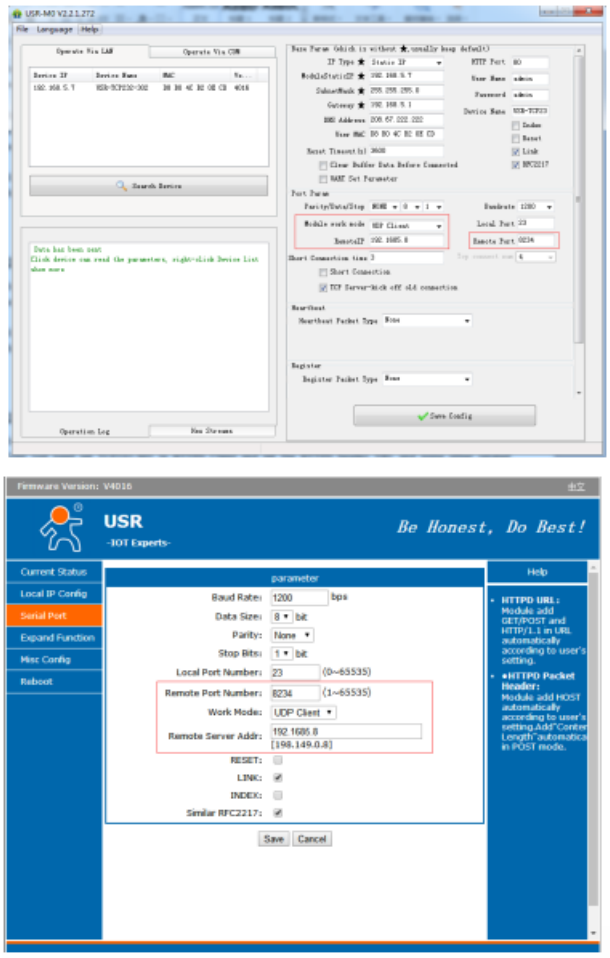



**Figure 12 UDP Client**

**UDP Server**

In UDP Server mode, SERIAL DEVICE SERVER will change target IP every time after receiving UDP data from a new IP/Port and will send data to latest communication IP/Port.

User can set SERIAL DEVICE SERVER inUDP Server mode and related parameters by setup software orweb server as follows:

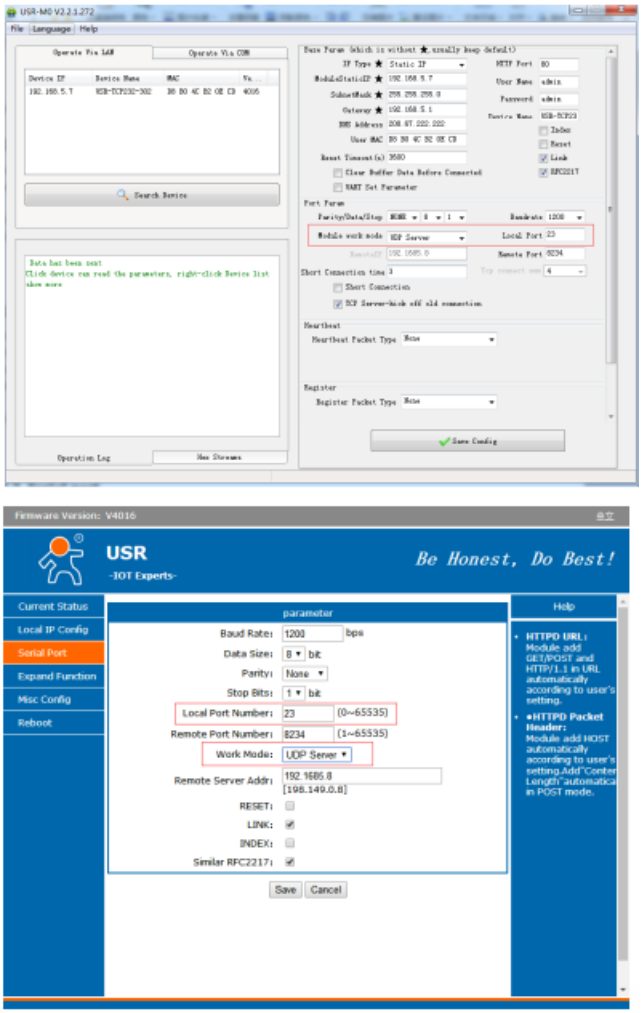



**Figure 13 UDP Server**

### HTTPD Client

In HTTPD Client mode, SERIAL DEVICE SERVER can achieve data transmission between serial port device and HTTP server. User just need set SERIAL DEVICE SERVER in HTTPD Client and set the HTTPD header, URL and some other related parameters, then can achieve data transmission between serial port device and HTTP server and don’t need care about the HTTP format of data.

User can set SERIAL DEVICE SERVER inHTTPDClient mode and related parameters by web server as follow:

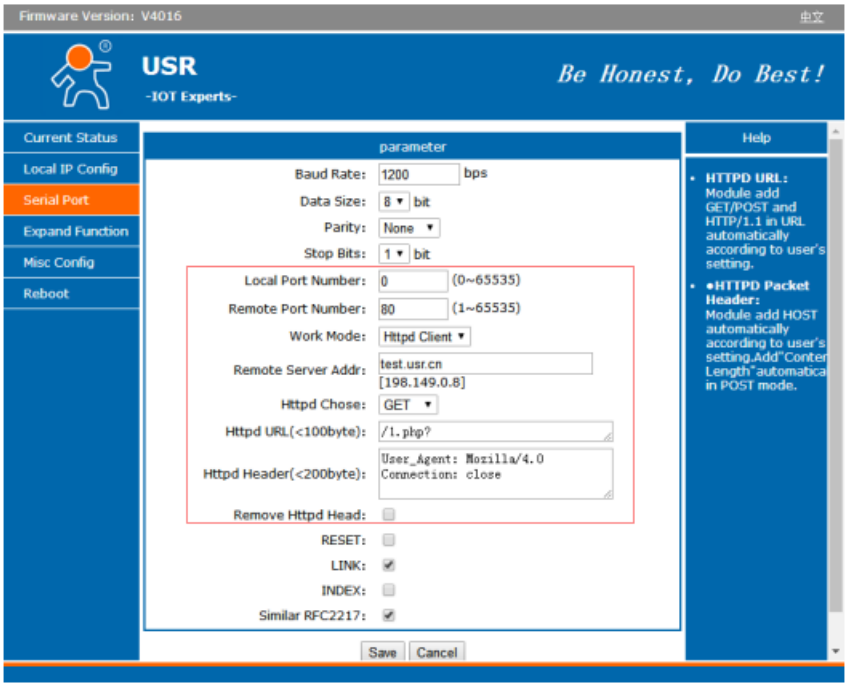



**Figure 14 HTTPD Client**

**Serial port**

SERIAL DEVICE SERVER support RS232/RS485/RS422. User can refer to 1.2.2. DB9 Pin definition 1.2.3. RS422/RS485 Pin definition to connect and RS232/RS485/RS422 can't be used simultaneously

**Serial port basic parameters**

| Parameters | Default | Range |
|---|---|---|
| Baud rate | 115200 | 600~230.4Kbps |
| Data bits | 8 | 5~8 |
| Stop bits | 1 | 1~2 |
| Parity | None | None, Odd, Even, Mark, Space |

**Figure 15 Serial port parameters**

**Serial Package Methods**

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

SERIAL DEVICE SERVER adopt fixed Package time (four bytes sending time) and fixed Package length (400 bytes).

**Baud Rate Synchronization**

When module works with USR devices or software, serial parameter will change dynamically according to network

protocol. Customer can modify serial parameter by sending data conformed to specific protocol via= network. It is temporary, when restart module, the parameters back to original parameters.

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

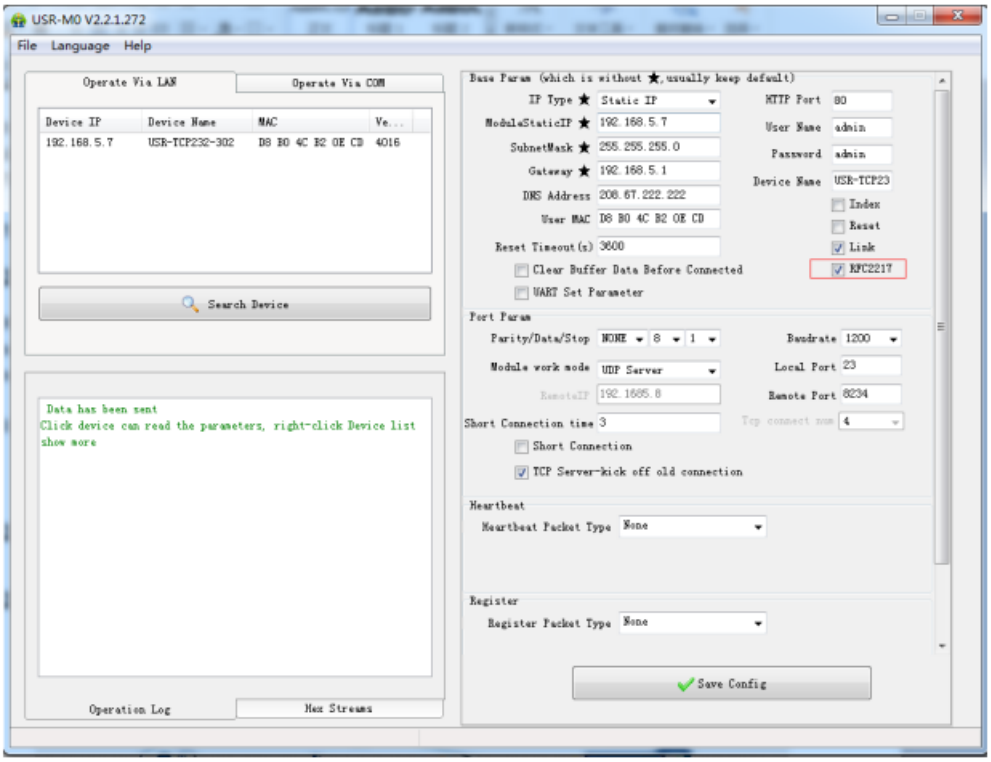



**Figure 16 Baud Rate Synchronization**

### Features

### Identity Packet Function

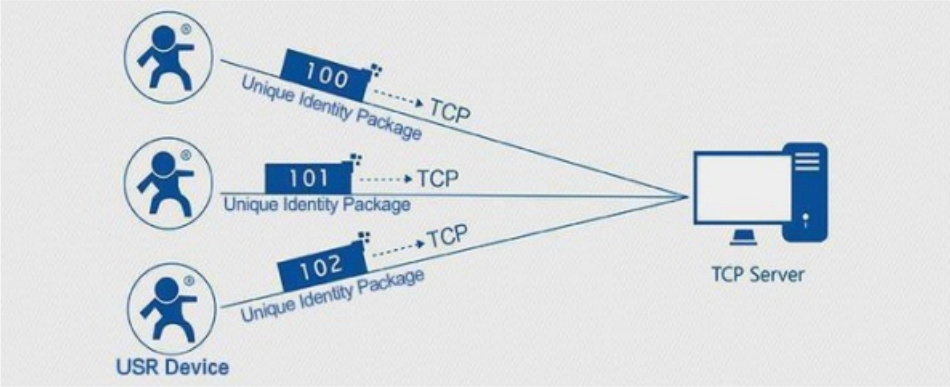



**Figure 17 Identity Packet application diagram**

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

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

Identity packet can be MAC address or user editable data (User editable data at most 40 bytes). User can set SERIAL DEVICE SERVER with Identity Packet function by web server as follow:


**Figure 18 Identity Packet**

### Heartbeat Packet Function

Heartbeat packet: Module will output heartbeat data to serial or network periodic. User can configure the heartbeat data and time interval. Serial heartbeat data can be used for polling Modbus data. Network heartbeat data can be used for showing connection status and keep the connection (only take effect in TCP/UDP Client mode). Heartbeat packet allow 40 bytes at most.

User can set SERIAL DEVICE SERVER with Heartbeat Packet function by web server as follow:

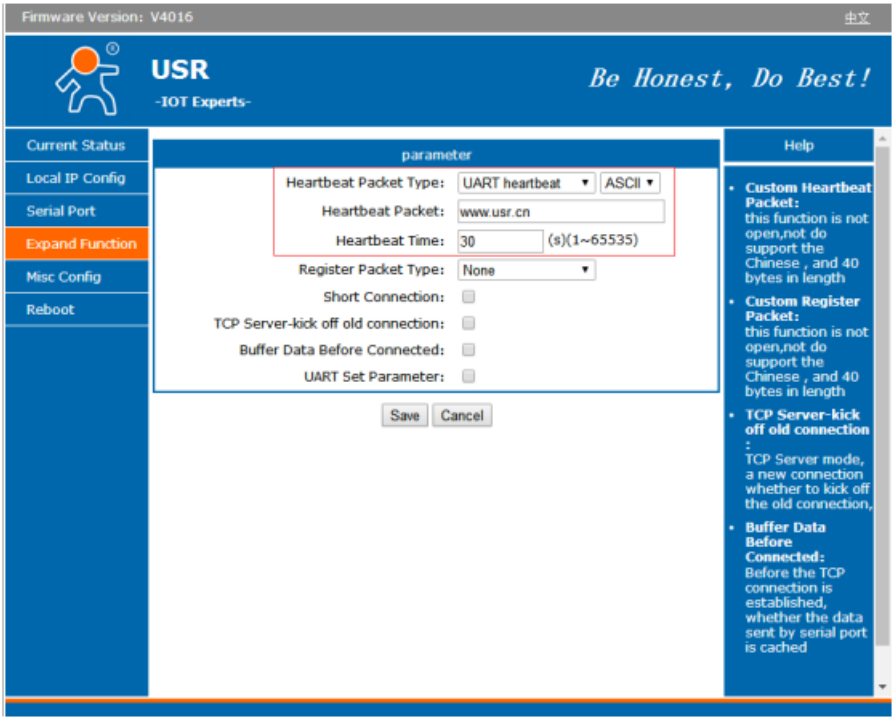



**Figure 19 Heartbeat Packet**

### Editable Web server

SERIAL DEVICE SERVER support user modify the web server based on template according to needs, then use related tool to upgrade. If user have this demand can contact to our salespersons for web server source and tool.

### Reset function

When 306 work in TCP Client mode, 306 will connect to TCP Server. When user open Reset function, 306 will restart after trying connecting to TCP Server 30 times but still can't connect to.

User can enable/disable the Reset function by setup software as= follow:

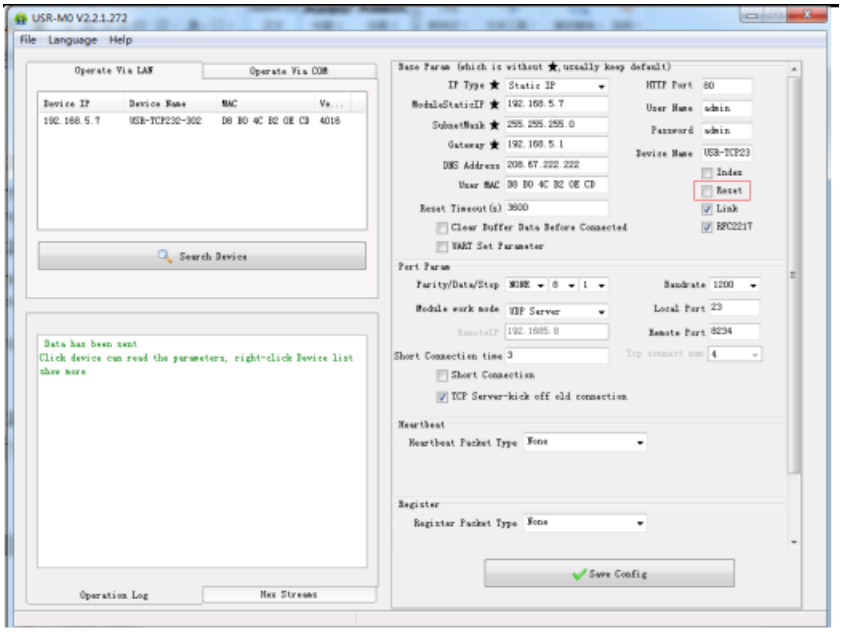



**Figure 20 Reset function**

### Index function

Index function: Used in situation when 306 work in TCP Server mode and establish more than one connection to TCP Client. After open Index function, 306 will mark every TCP Client to distinguish them. User can send/receive data to/from different TCP Client according to their unique mark.

User can enable/disable the Index function by setup software as follow:

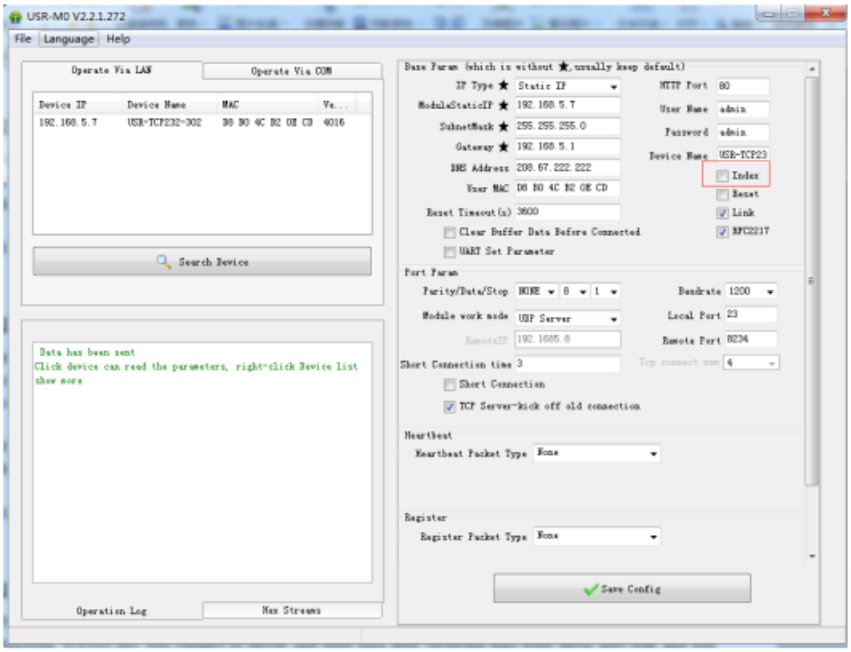



**Figure 21 Index function**

**TCP Server setting**

306 work in TCP Server mode allow at most 16 TCP Clients connection. Default is 4 TCP Clients and user can change maximum TCP Clients connection by web server. When TCP Clients more than 4, user need make every connection data less than 200 bytes/s.

If TCP Clients connected to 306 exceed maximum TCP Clients, user can enable/disable kick off old connection function by web server.

User can set above TCP Server settings by web server as follow:



**Figure 22 TCP Server setting**

**Non-persistent Connection**

SERIAL DEVICE SERVER support non-persistent connection function in TCP Client mode. When SERIAL DEVICE SERVER adopt this function, SERIAL DEVICE SERVER will connect to server and send data after receiving data from serial port side and will disconnect to server after sending all the data to server and no data from serial port side or network side over a fixed time. This fixed time can be 2~255s, default is 3s. User can set SERIAL DEVICE SERVER with non-persistent connection function by web server as follow:

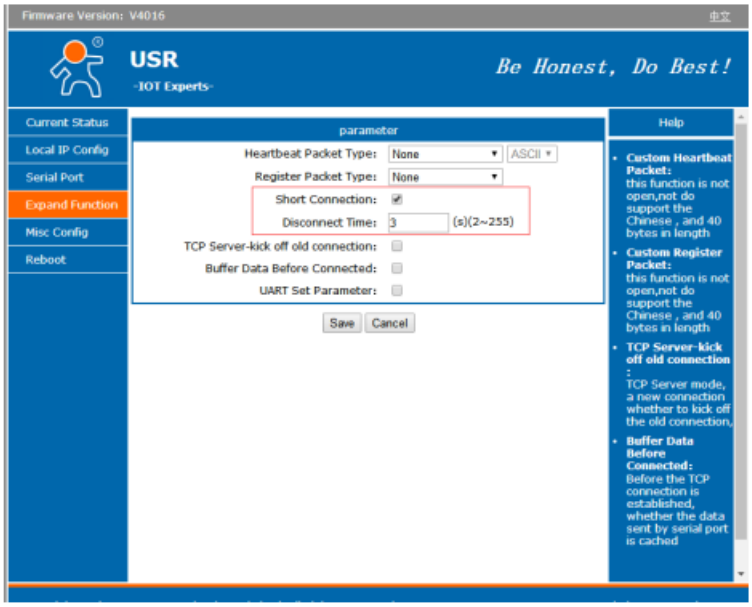



**Figure 23 Non-persistent Connection**

### Timeout Reset function

Timeout reset function(no data reset): If network side no data transmission beyond a fixed time(User can set this fixed time between 60~65535s, default is 3600s. If user set a time less than 60s, this function will be disable), 306 will reset. User can set the Timeout Reset function by web server as follow:

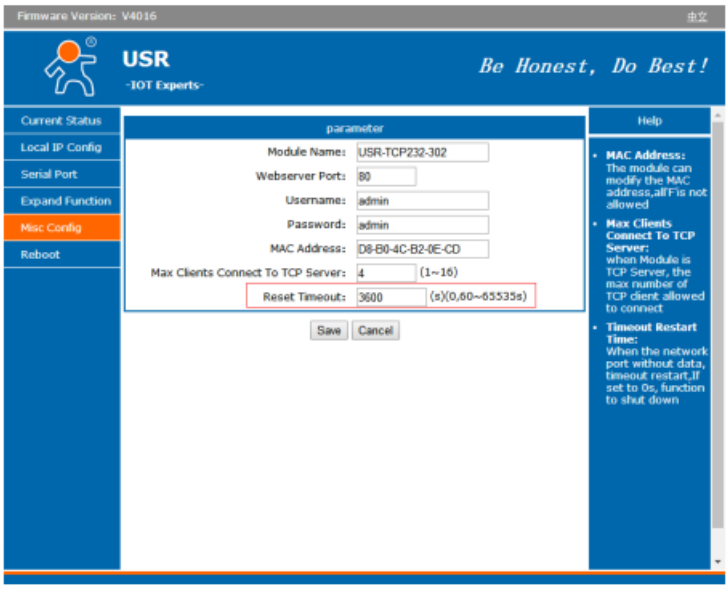



**Figure 24 Timeout Reset function**

## Parameter Setting

There are three ways to configure USR-SERIAL DEVICE SERVER. They are setup software configuration, web server configuration and AT command configuration

### Setup software Configuration

User can download setup software from [https://www.b-tek.com/images/Documents/USR-M0-V2.2.3.286.zip](https://www.b-tek.com/images/Documents/USR-M0-V2.2.3.286.zip)
When user want to configure the SERIAL DEVICE SERVER by setup software, user can run setup software, search SERIAL DEVICE SERVER in same LAN and configure the SERIAL DEVICE SERVER as follow:

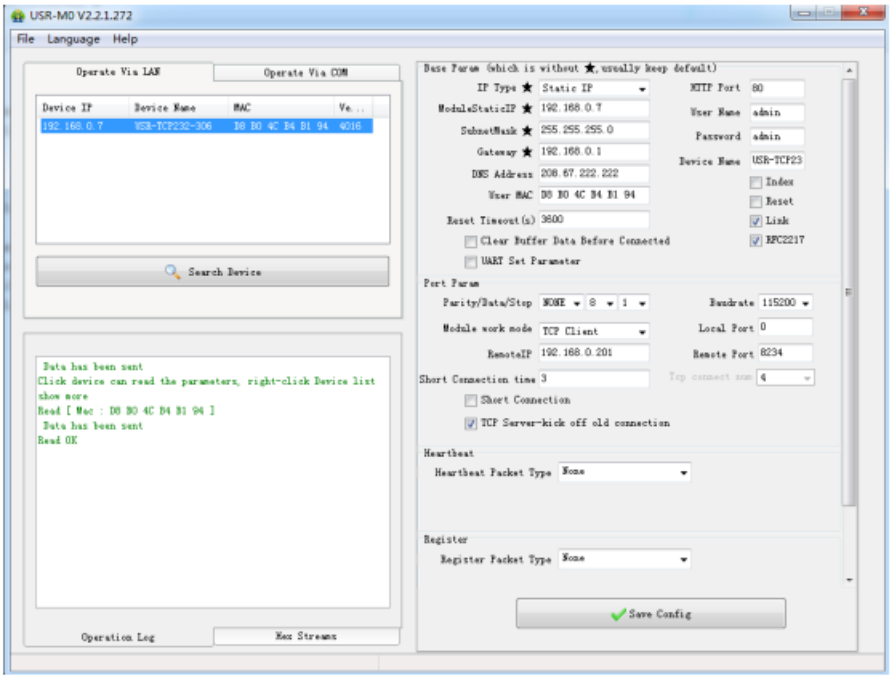



**Figure 25 Setup software**

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

**Web Server Configuration**

User can connect PC to SERIAL DEVICE SERVER through LAN port and enter web server to configure. Web server default parameters as follow:

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

**Figure 26Web server default parameters**

After firstly connecting PC to SERIAL DEVICE SERVER, user can open browser and enter default IP 192.168.0.7 into address bar, then log in user name and password, user will enter into web server. Web server screenshot as follow:


**Figure 27 Web Server**

## Disclaimer

This document provides the information of USR-SERIAL DEVICE SERVER products, it hasn't been granted any intellectual property license by forbidding speak or other ways either explicitly or implicitly. Except the duty declared in sales terms and conditions, we don't take any other responsibilities. We don't warrant the products sales and use explicitly or implicitly, including particular purpose merchantability and marketability, the tort liability of any other patent right, copyright, intellectual property right. We may modify specification and description at any time without prior notice.

## Update History

2022-10-10 V1.0 Established.

## Documents / Resources

| | |
|---|---|
|  | B-TECH RS232 to Ethernet TCP IP Server Converter [pdf] User Manual<br>RS232 to Ethernet TCP IP Server Converter, RS232, Ethernet TCP IP Server Converter, TCP IP Server Converter, Server Converter |

## References

- B-TEK Scales and Industrial Weighing Products - B-TEK Scales, LLC