



BTECH RS232 Serial To TCP IP Ethernet Converter User Manual

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BTECH RS232 Serial To TCP IP Ethernet Converter



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Get Started

Product link: [875-000072 Serial to Ethernet Converter](#)

Application Diagram

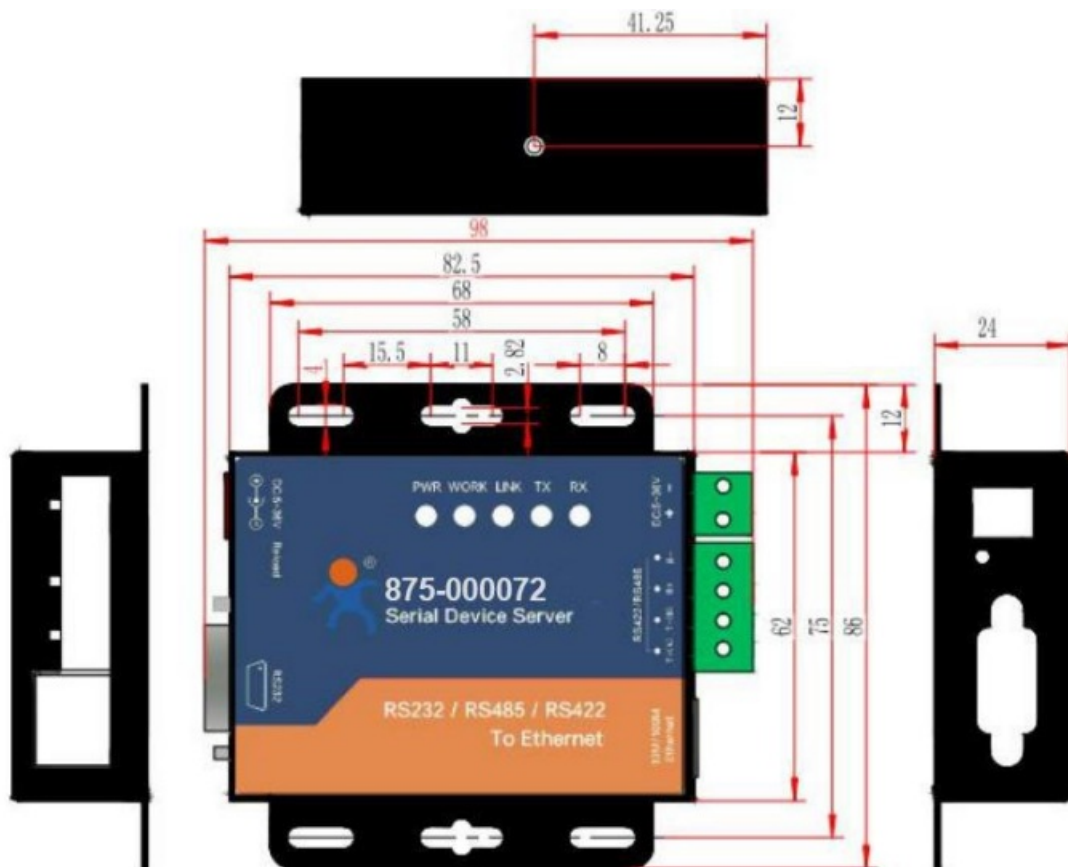
Figure 2 Application diagram



Hardware Design

Hardware Dimensions

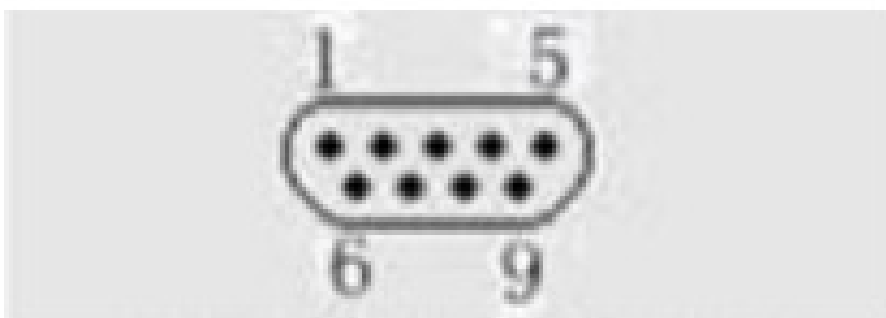
Figure 3 Hardware dimensions



DB9 Pin definition

Pin	2	3	5	1, 4, 6, 7, 8	9
Definition	RXD	TXD	GND	NC	Default NC, can be used 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

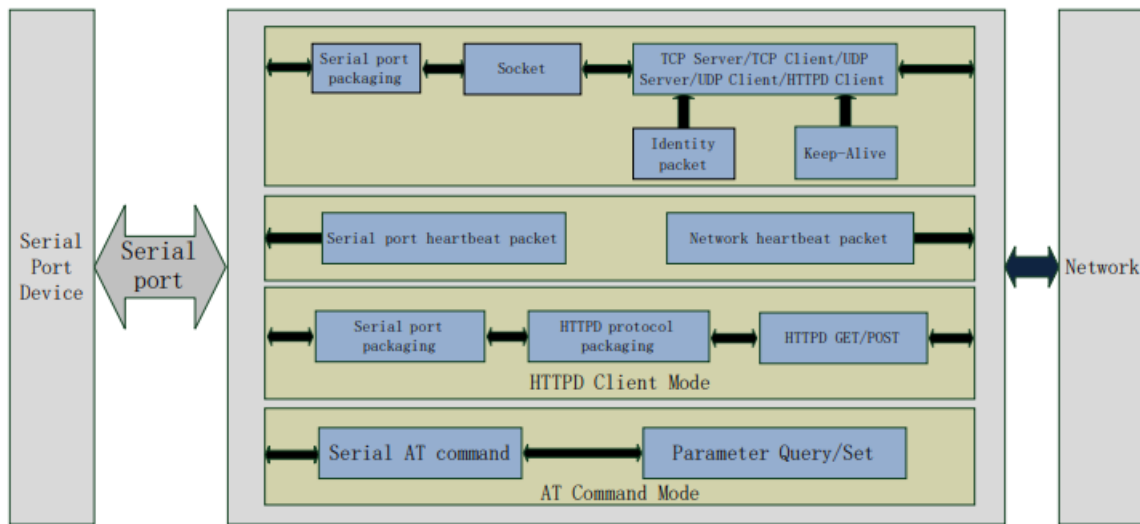
Figure 6 LED

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. 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

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

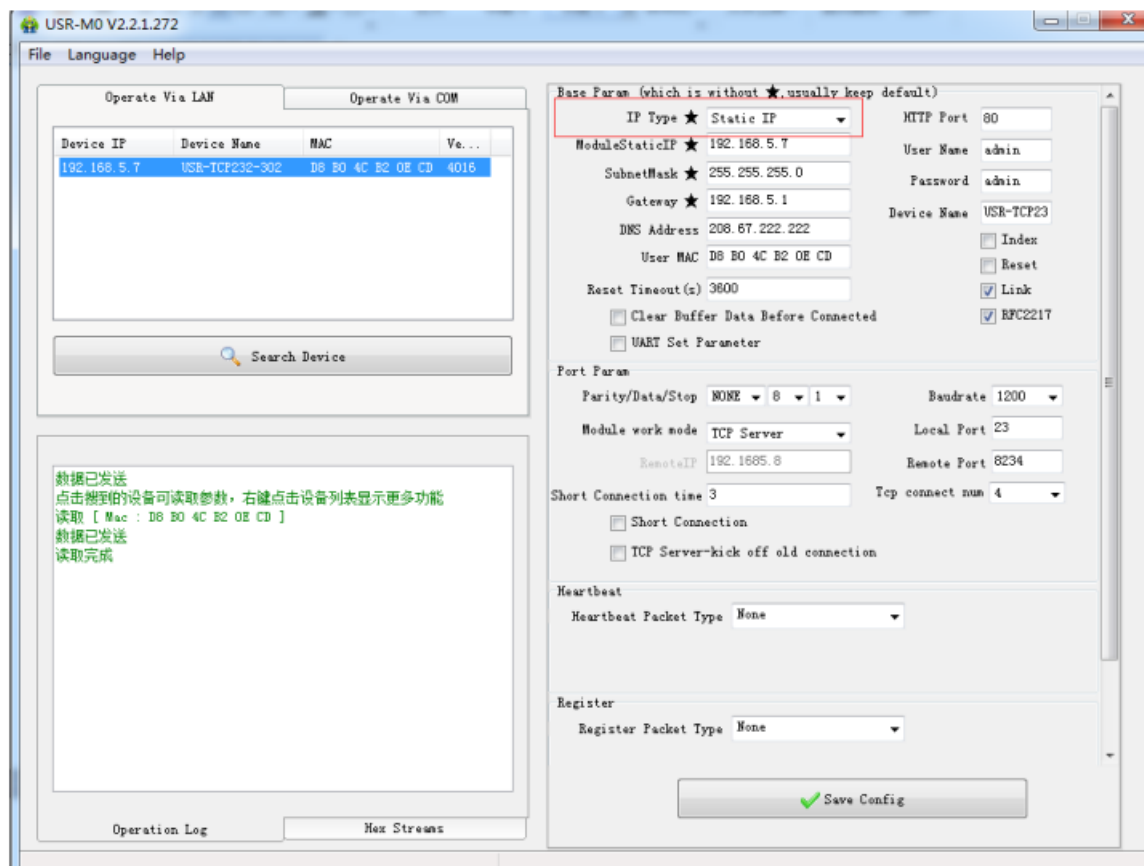
Static IP/DHCP

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

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

DHCP: Module in DHCP mode can dynamically get IP, Gateway, and DNS server address from Gateway Host. When user connect directly to PC, module can't be set in DHCP mode. Because common computer does not have the ability to assign IP addresses. User can change Static IP/DHCP by setup software. Setting diagram as follow:

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.

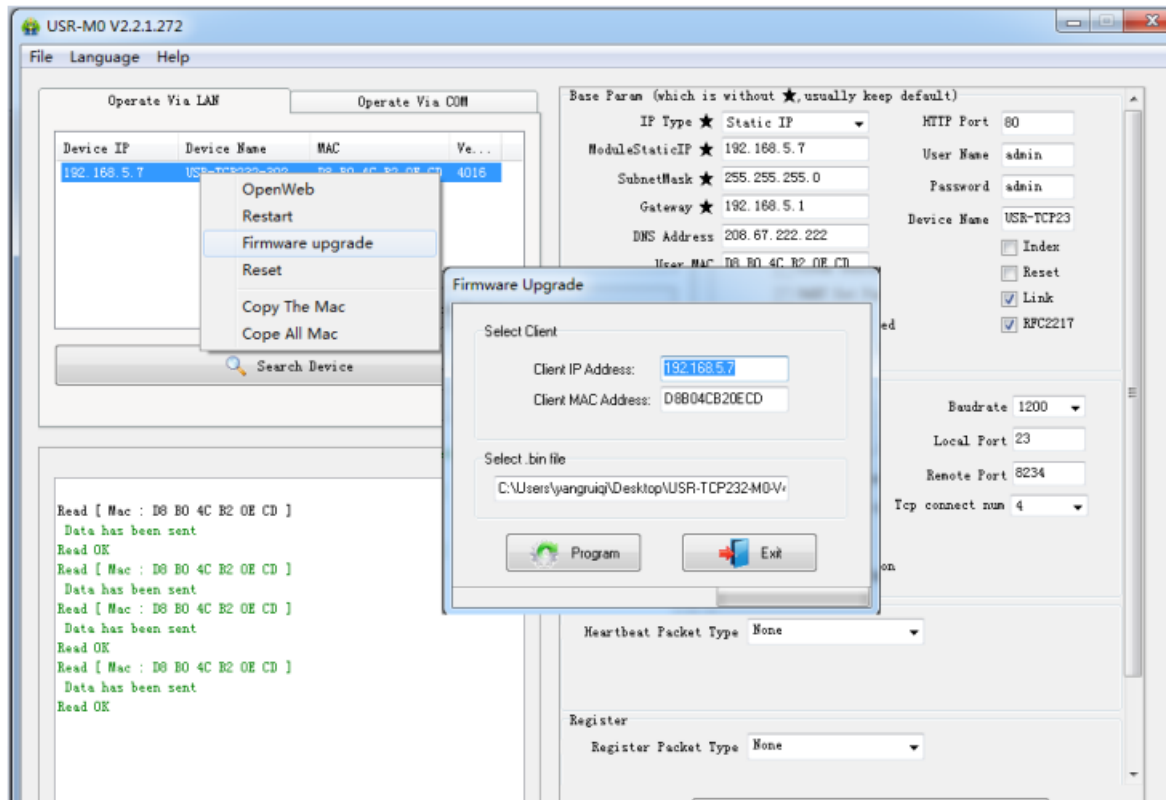
Software: User can use setup software to restore default settings.

AT command: User can enter AT command mode and use AT+RELD to restore default settings.

Upgrade Firmware Version

User can contact to 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 HTTPDClient.

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

USR-MO V2.2.1.272

File Language Help

Operate Via LAN

Device IP	Device Name	MAC	Ver...
192.168.5.7	USR-TCP232-302	D8 B0 4C E2 0E CD	4016

Search Device

Operate Via COM

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

Operation Log Hex Streams

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

IP Type ★ Static IP MTTP Port 80

ModuleStaticIP ★ 192.168.5.7 User Name admin

SubnetMask ★ 255.255.255.0 Password admin

Gateway ★ 192.168.5.1 Device Name USR-TCP23

DNS Address 208.67.222.222 ☐ Index

User MAC D8 B0 4C E2 0E CD ☐ Reset

Reset Timeout(s) 3600 ☒ Link

☐ Clear Buffer Data Before Connected ☒ RFC2217

☐ UART Set Parameter

Port Param

Parity/Data/Stop NONE 8 1 Baudrate 1200

Module work mode TCP Client Local Port 23

RemoteIP 192.1685.8 Remote Port 8234

Short Connection time 3 Tcp connect num 4

☒ Short Connection

☐ TCP Server-kick off old connection

Heartbeat

Heartbeat Packet Type None

Register

Register Packet Type None

Save Config

Firmware Version: V4016

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Current Status

Local IP Config

Serial Port

Expand Function

Misc Config

Reboot

parameter

Baud Rate: 1200 bps

Data Size: 8 bit

Parity: None

Stop Bits: 1 bit

Local Port Number: 23 (0~65535)

Remote Port Number: 8234 (1~65535)

Work Mode: TCP Client

Remote Server Addr: 192.1685.8 [198.149.0.8]

RESET: ☐

LINK: ☒

INDEX: ☐

Similar RFC2217: ☒

Save Cancel

Help

- HTTPD URL: Module add GET/POST and HTTP/1.1 in URL automatically according to user's setting.
- HTTPD Packet Header: Module add HOST automatically according to user's setting. Add "Content Length" automatically in POST mode.

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.

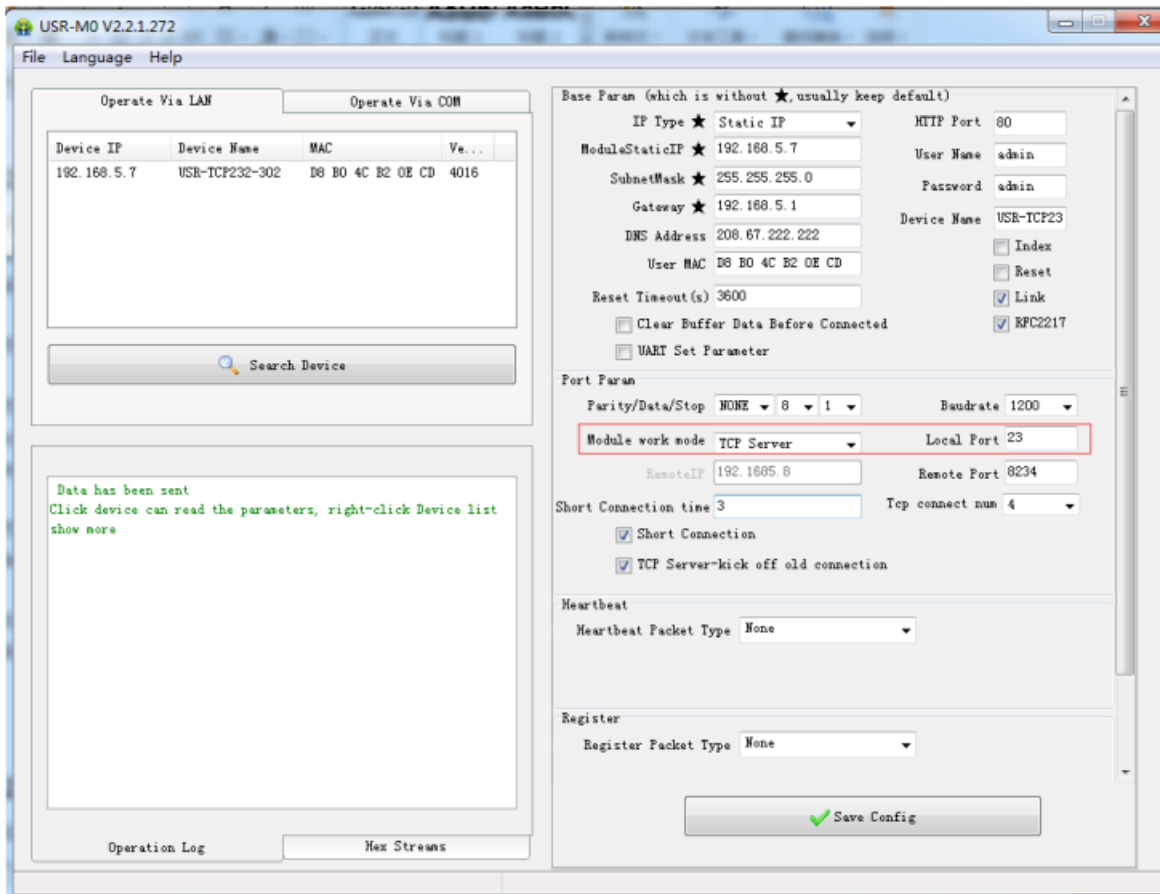
TCP Server mode also support Keep-Alive function.

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



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Current Status

Local IP Config

Serial Port

Expand Function

Misc Config

Reboot

parameter

Baud Rate: bps

Data Size: bit

Parity:

Stop Bits: bit

Local Port Number: (0~65535)

Remote Port Number: (1~65535)

Work Mode: TCP Server

Remote Server Addr:
[198.149.0.8]

RESET: ☐

LINK: ☒

INDEX: ☐

Similar RFC2217: ☒

Help

- HTTPD URL:**
Module add GET/POST and HTTP/1.1 in URL automatically according to user's setting.
- HTTPD Packet Header:**
Module add HOST automatically according to user's setting.Add"Conter Length"automatica in POST mode.

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

USR-M0 V2.2.1.272

File Language Help

Operate Via LAN Operate Via COM

Device IP	Device Name	MAC	Ve...
192.168.5.7	USR-TCP232-302	D8 80 4C B2 0E CD	4016

Search Device

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

Operation Log Hex Streams

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

IP Type ★ Static IP HTTP Port 80

ModuleStaticIP ★ 192.168.5.7 User Name admin

SubnetMask ★ 255.255.255.0 Password admin

Gateway ★ 192.168.5.1 Device Name USR-TCP23

DNS Address 208.67.222.222 ☐ Index

User MAC D8 80 4C B2 0E CD ☐ Reset

Reset Timeout(s) 3600 ☒ Link

☐ Clear Buffer Data Before Connected ☒ RFC2217

☐ UART Set Parameter

Port Param

Parity/Data/Stop NONE 8 1 Baudrate 1200

Module work mode UDP Client Local Port 23

RemoteIP 192.1685.8 Remote Port 8234

Short Connection time 3 Tcp connect num 4

☐ Short Connection

☒ TCP Server-kick off old connection

Heartbeat

Heartbeat Packet Type None

Register

Register Packet Type None

Save Config

Firmware Version: V4016 虫文

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Current Status

Local IP Config

Serial Port

Expand Function

Misc Config

Reboot

parameter

Baud Rate: 1200 bps

Data Size: 8 bit

Parity: None

Stop Bits: 1 bit

Local Port Number: 23 (0~65535)

Remote Port Number: 8234 (1~65535)

Work Mode: UDP Client

Remote Server Addr: 192.1685.8 [198.149.0.8]

RESET: ☐

LINK: ☒

INDEX: ☐

Similar RFC2217: ☒

Save Cancel

Help

- HTTPD URL: Module add GET/POST and HTTP/1.1 in URL automatically according to user's setting.
- HTTPD Packet Header: Module add HOST automatically according to user's setting. Add "Content Length" automatic in POST mode.

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 in UDP Server mode and related Port parameters by setup software or web server as follows:

Figure 13 UDP Server

USR-M0 V2.2.1.272

File Language Help

Operate Via LAN Operate Via COM

Device IP	Device Name	MAC	Ve...
192.168.5.7	USR-TCP232-302	D8 B0 4C B2 0E CD	4016

Search Device

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

Operation Log Max Streams

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

IP Type ★ Static IP

ModuleStaticIP ★ 192.168.5.7

SubnetMask ★ 255.255.255.0

Gateway ★ 192.168.5.1

DNS Address 208.67.222.222

User MAC D8 B0 4C B2 0E CD

Reset Timeout(s) 3600

☐ Clear Buffer Data Before Connected

☐ UART Set Parameter

HTTP Port 80

User Name admin

Password admin

Device Name USR-TCP23

☐ Index

☐ Reset

☒ Link

☒ RFC2217

Port Param

Parity/Data/Stop NONE 8 1

Baudrate 1200

Module work mode UDP Server

Local Port 23

RemoteIP 192.1685.8

Remote Port 8234

Short Connection time 3

Top connect num 4

☐ Short Connection

☒ TCP Server-kick off old connection

Heartbeat

Heartbeat Packet Type None

Register

Register Packet Type None

Save Config

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Current Status

Local IP Config

Serial Port

Expand Function

Misc Config

Reboot

parameter

Baud Rate: 1200 bps

Data Size: 8 bit

Parity: None

Stop Bits: 1 bit

Local Port Number: 23 (0~65535)

Remote Port Number: 8234 (1~65535)

Work Mode: UDP Server

Remote Server Addr: 192.1685.8 [198.149.0.8]

RESET: ☐

LINK: ☒

INDEX: ☐

Similar RFC2217: ☒

Save Cancel

Help

- HTTPD URL: Module add GET/POST and HTTP/1.1 in URL automatically according to user's setting.
- HTTPD Packet Header: Module add HOST automatically according to user's setting. Add "Content Length" automatically in POST mode.

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

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Current Status

Local IP Config

Serial Port

Expand Function

Misc Config

Reboot

parameter

Baud Rate: 1200 bps

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 [198.149.0.8]

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: ☒

Save

Cancel

Help

- HTTPD URL : Module add GET/POST and HTTP/1.1 in URL automatically according to user's setting.
- HTTPD Packet Header: Module add HOST automatically according to user's setting.Add "Content Length" automatically in POST mode.

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

Figure 15 Serial port 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

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.

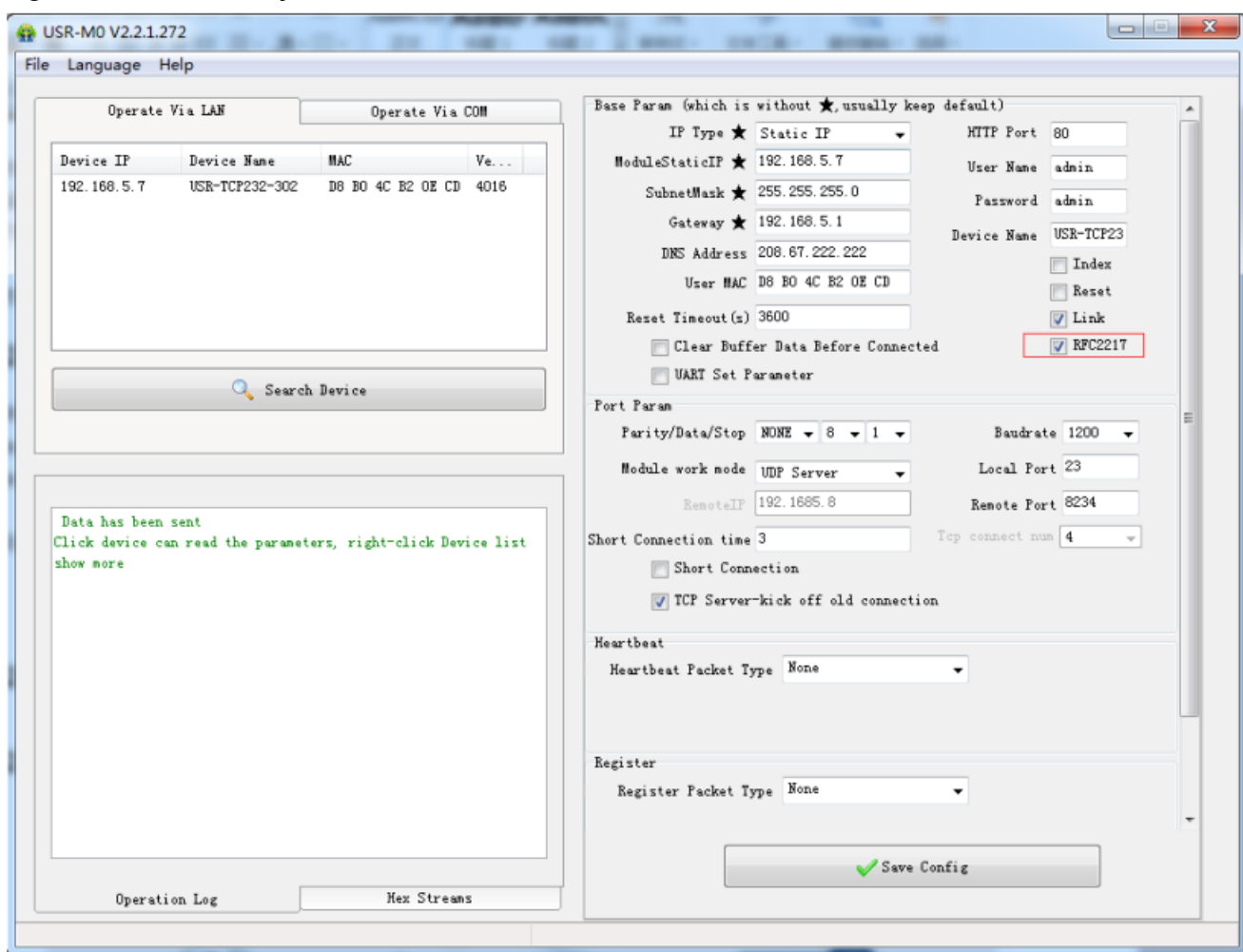
SERIAL DEVICE SERVER adopt fixed Package time (four bytes sending time) and fixed Package length (400 bytes).

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:

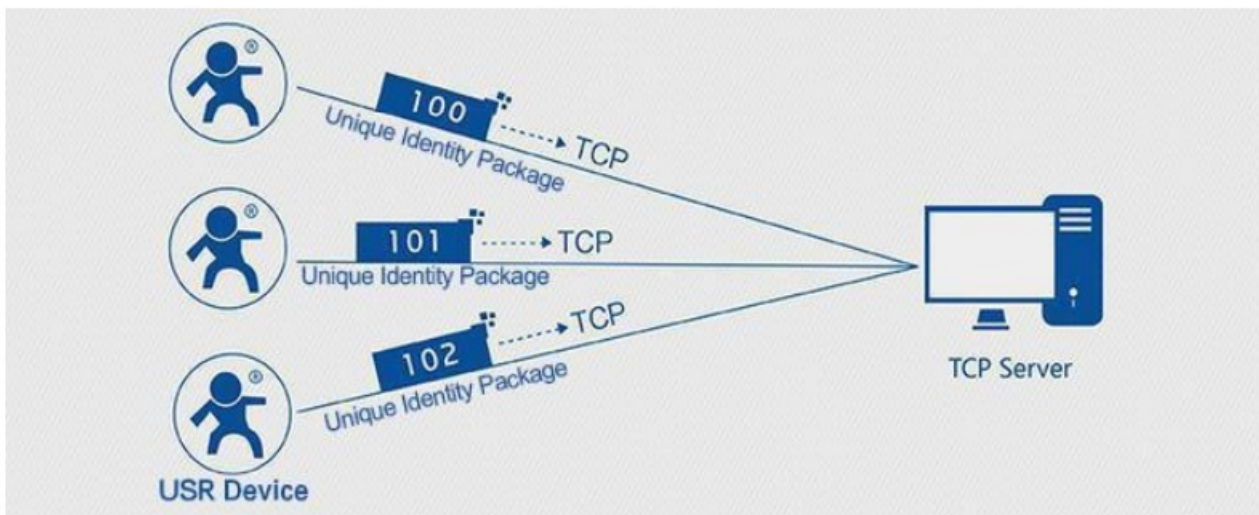
Figure 16 Baud Rate Synchronization



Features

Identity Packet Function

Figure 17 Identity Packet application diagram



Identity packet is 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

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Current Status

Local IP Config

Serial Port

Expand Function

Misc Config

Reboot

parameter

Heartbeat Packet Type: None ASCII

Register Packet Type: MAC As Register

Registered Direction: Connect with ASCII

Short Connection: ☐

TCP Server-kick off old connection: ☐

Buffer Data Before Connected: ☐

UART Set Parameter: ☐

Save Cancel

Help

- **Custom Heartbeat Packet:** this function is not open, not do support the Chinese, and 40 bytes in length
- **Custom Register Packet:** this function is not open, not do support the Chinese, and 40 bytes in length
- **TCP Server-kick off old connection:** TCP Server mode, a new connection whether to kick off the old connection,
- **Buffer Data Before Connected:** Before the TCP connection is established, whether the data sent by serial port is cached

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

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Current Status
Local IP Config
Serial Port
Expand Function
Misc Config
Reboot

parameter

Heartbeat Packet Type: UART heartbeat ▼ ASCII ▼
Heartbeat Packet: www.usr.cn
Heartbeat Time: 30 (s)(1~65535)
Register Packet Type: None ▼
Short Connection: ☐
TCP Server-kick off old connection: ☐
Buffer Data Before Connected: ☐
UART Set Parameter: ☐

Save Cancel

Help

- **Custom Heartbeat Packet:** this function is not open, not do support the Chinese, and 40 bytes in length
- **Custom Register Packet:** this function is not open, not do support the Chinese, and 40 bytes in length
- **TCP Server-kick off old connection:** TCP Server mode, a new connection whether to kick off the old connection,
- **Buffer Data Before Connected:** Before the TCP connection is established, whether the data sent by serial port is cached

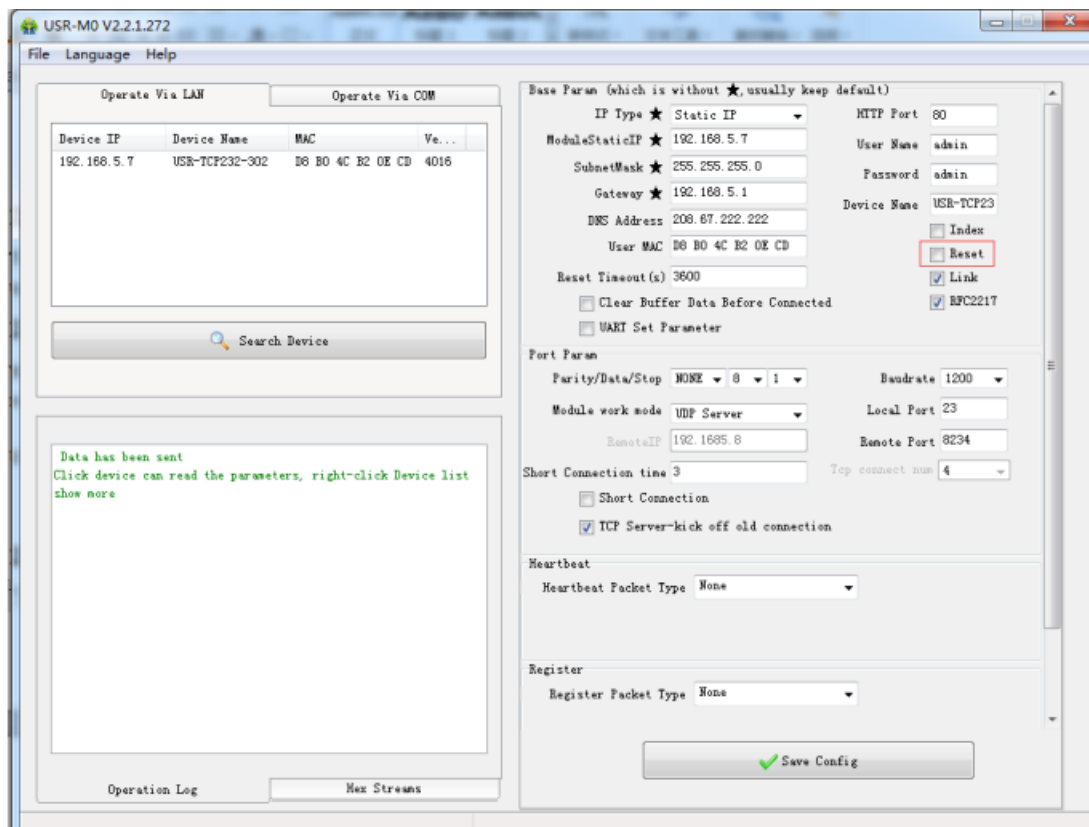
Editable Web server

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.

Resetfunction

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:

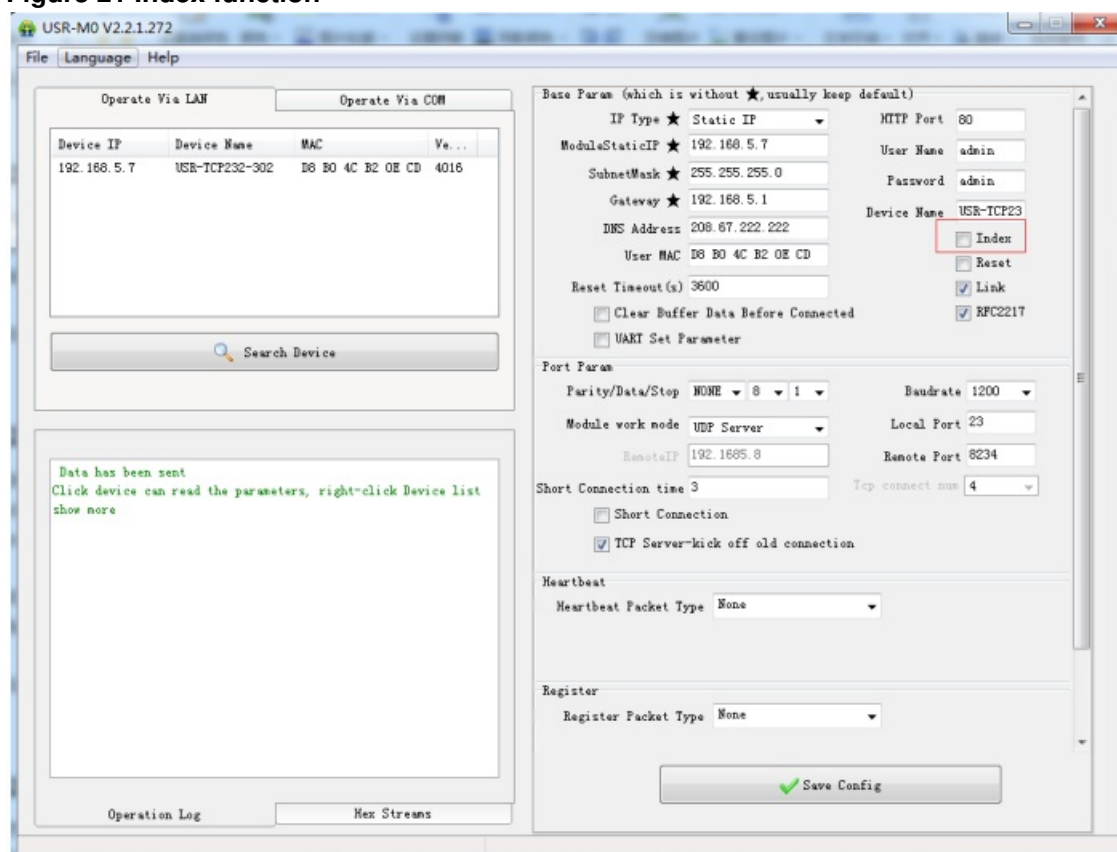
Figure 20 Reset function



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

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Current Status	parameter	Help
Local IP Config	Module Name: USR-TCP232-302	MAC Address: The module can modify the MAC address, all F is not allowed Max Clients Connect To TCP Server: when Module is TCP Server, the max number of TCP client allowed to connect Timeout Restart Time: When the network port without data, timeout restart, If set to 0s, function to shut down
Serial Port	Webserver Port: 80	
Expand Function	Username: admin	
Misc Config	Password: admin	
Reboot	MAC Address: D8-B0-4C-B2-0E-CD	
	Max Clients Connect To TCP Server: 4 (1~16)	
	Reset Timeout: 3600 (s)(0,60~65535s)	
	Save Cancel	

Firmware Version: V4016 中立

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Current Status	parameter	Help
Local IP Config	Heartbeat Packet Type: None ASCII	Custom Heartbeat Packet: this function is not open, not do support the Chinese, and 40 bytes in length Custom Register Packet: this function is not open, not do support the Chinese, and 40 bytes in length TCP Server-kick off old connection: TCP Server mode, a new connection whether to kick off the old connection, Buffer Data Before Connected: Before the TCP connection is established, whether the data sent by serial port is cached
Serial Port	Register Packet Type: None	
Expand Function	Short Connection: ☐	
Misc Config	TCP Server-kick off old connection: ☐	
Reboot	Buffer Data Before Connected: ☐	
	UART Set Parameter: ☐	
	Save Cancel	

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 connecti on function by web server as follow:

Figure 23 Non-persistent Connection

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parameter

Heartbeat Packet Type: None ASCII

Register Packet Type: None

Short Connection: ☒

Disconnect Time: 3 (s)(2~255)

TCP Server-kick off old connection: ☐

Buffer Data Before Connected: ☐

UART Set Parameter: ☐

Save Cancel

Help

- Custom Heartbeat Packet: this function is not open,not do support the Chinese , and 40 bytes in length
- Custom Register Packet: this function is not open,not do support the Chinese , and 40 bytes in length
- TCP Server-kick off old connection : TCP Server mode, a new connection whether to kick off the old connection,
- Buffer Data Before Connected: Before the TCP connection is established, whether the data sent by serial port is cached

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

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parameter

Module Name: USR-TCP232-302

Webserver Port: 80

Username: admin

Password: admin

MAC Address: D8-B0-4C-B2-0E-CD

Max Clients Connect To TCP Server: 4 (1~16)

Reset Timeout: 3600 (s)(0,60~65535s)

Save Cancel

Help

- MAC Address: The module can modify the MAC address,all F is not allowed
- Max Clients Connect To TCP Server: when Module is TCP Server, the max number of TCP client allowed to connect
- Timeout Restart Time: When the network port without data, timeout restart, If set to 0s, function to shut down

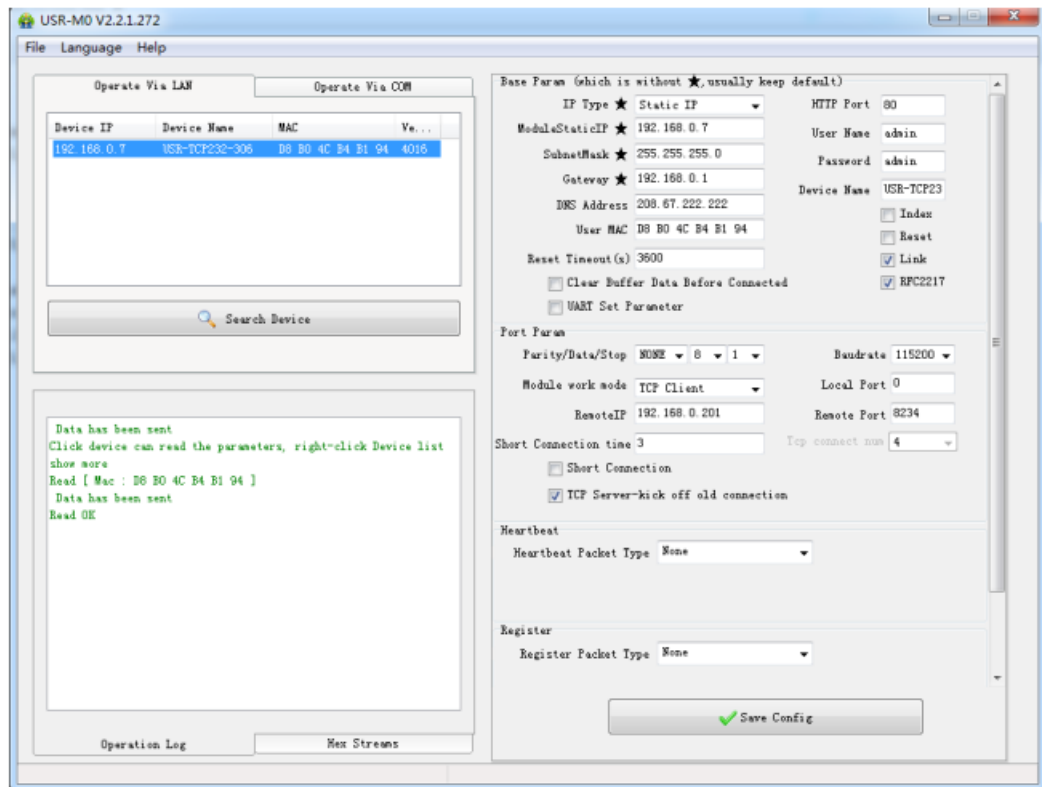
Parameter Setting

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> 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:

Figure 26Web server default parameters

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

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 27Web Server



Parameter Setting

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Update History

2022-10-10 V1.0 Established



Documents / Resources



[BTECH RS232 Serial To TCP IP Ethernet Converter](#) [pdf] User Manual
RS232 Serial To TCP IP Ethernet Converter, RS232 Serial, To TCP IP Ethernet Converter, IP Ethernet Converter, Ethernet Converter, Converter

References

- [B RS232/RS422 Serial To TCP/IP Ethernet Converter](#)
- [User Manual](#)

[Manuals+.](#)