

# USR-W600 User Manual

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## Features

- Support WIFI@2.4GHz 802.11b/g/n wireless standards.
- Support WEP/WEA/WPA2.
- Support AP, STA, AP+STA.
- Support RS232 and RS485 serial ports.
- Support electrostatic protection.
- Support TCP/UDP Client identity packet function.
- Support Simple Config/Airkiss/usrlink.
- Support HTTP Client mode.

# 1. Get Start

Product link:

<http://www.usriot.com/p/rs232rs485-wifi-converter-wireless-serial-server/>



## RS232/RS485 to WiFi Converter, Wireless Serial Server

USR-W600 is a cost-effective RS232/RS485 to WiFi converter. This product provides stable wireless data transmission in the industrial field where needs no cable connection.

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- Working voltage: DC 5~36V
- RS232/RS485 to WiFi
- TCP/UDP in WiFi

Inquiry: [sales@usriot.com](mailto:sales@usriot.com)

Support: [FAE@usriot.com](mailto:FAE@usriot.com)

General Details
Parameter
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Comments

**Figure 1 Download Page**

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

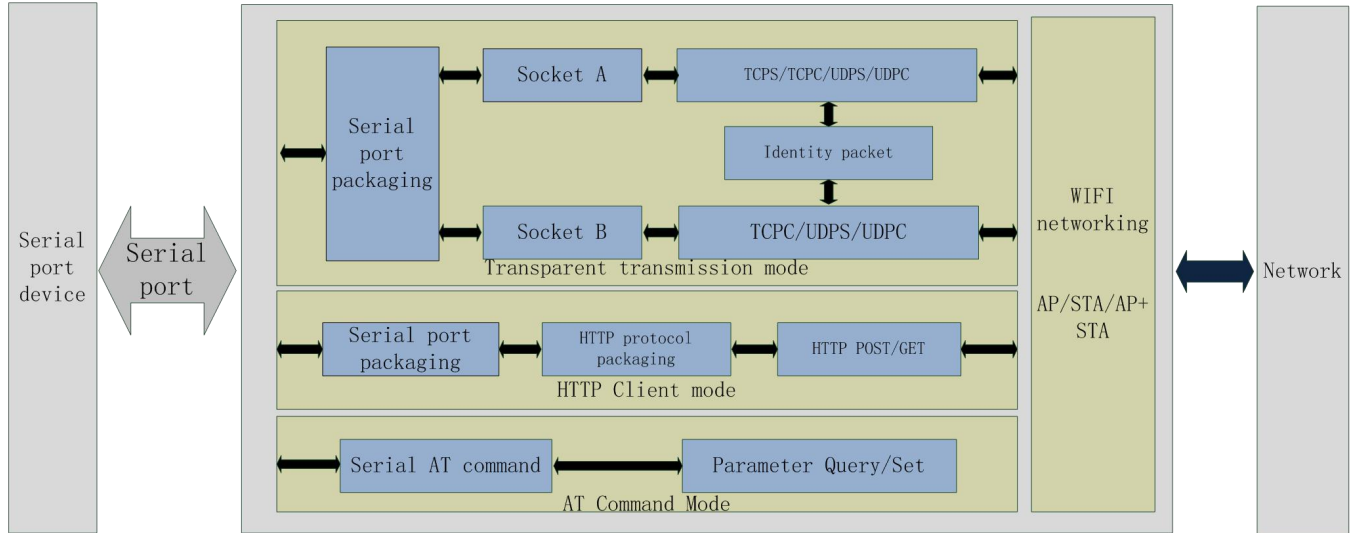
## 1.1. Application Diagram



**Figure 2 Application diagram**

## 2.Product Functions

This chapter introduces the functions of USR-W600 as the following diagram shown, you can get an overall knowledge of it.



**Figure 3 Product Functions diagram**

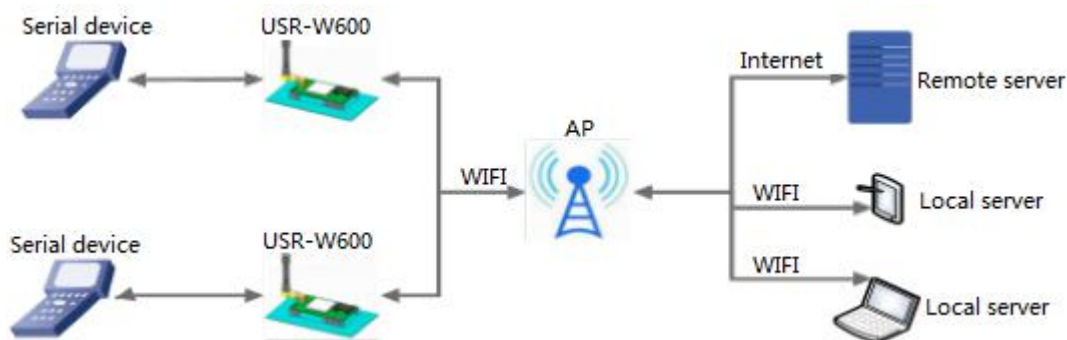
### 2.1.WIFI mode

USR-W600 supports three WIFI mode: STA, AP, AP+STA.

- AP: Access point, central node of a wireless network. In general, wireless router is an AP and other wireless terminal can connect to each others through AP.
- STA: Station, terminal of a wireless network. Such as PDA, mobile phone.

#### 2.1.1.STA mode

W600 works in STA mode can connect to an AP to realize communication with other devices which connect to same AP. And if this AP has connected to internet, USR-W600 can also access internet.

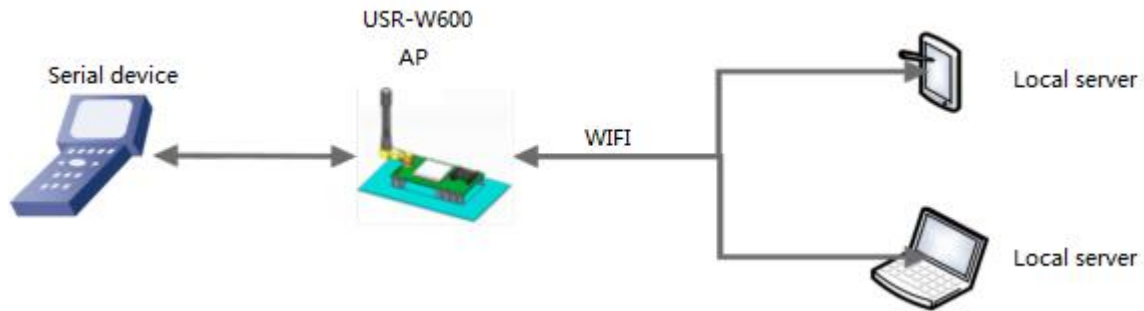


**Figure 4 STA mode**

#### 2.1.2.AP mode

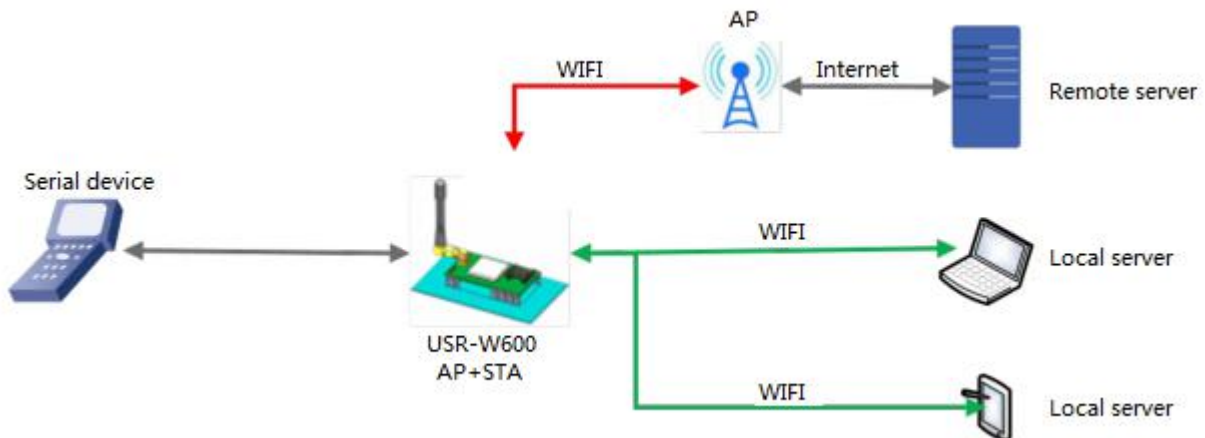
User can connect own devices such as PC/PAD/phone to W600 works in AP mode directly to realize data transmission. After establishing connection successfully, user can enter W600 Web Server to configure the

W600.


**Figure 5 AP mode**

### 2.1.3.AP+STA mode

W600 supports AP+STA mode which can enable an AP interface and a STA interface simultaneously. W600 supports at most three STA device connecting to W600 AP interface in this mode.


**Figure 6 AP+STA mode**

### 2.1.4.Encryption mode

Encryption can make sure secure data transmission and improve communication security. W600 supports various encryption mode including:

- WPA-PSK/TKIP
- WPA-PSK/AES
- WPA2-PSK/TKIP
- WPA2-PSK/AES
- WEP

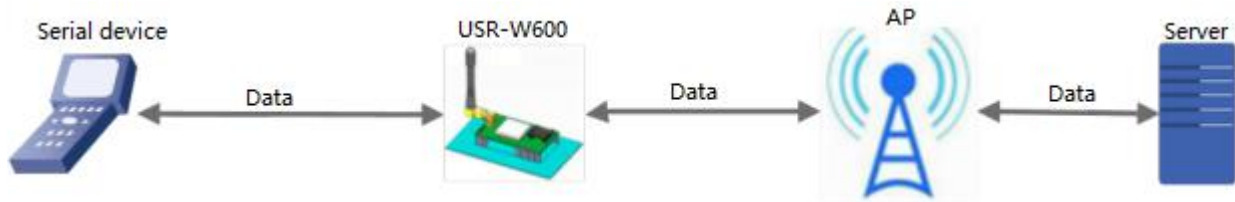
## 2.2.Work mode

W600 supports three work modes: transparent transmission mode, AT command mode and HTTP Client mode.

### 2.2.1.Transparent transmission mode

In this work mode, W600 can make a bidirectional connection between serial side and network side. This connection is transparent transmission. Data from serial device can be received in network, and network data

can also be sent to serial device. This mode mainly used to realize data transmission between user serial device and fixed server through socket.



**Figure 7 Transparent transmission mode**

Note:

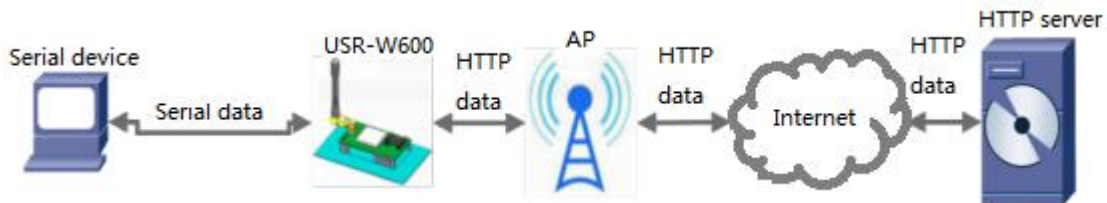
- Socket A supports: TCP Server, TCP Client, UDP Server, UDP Client.
- Socket B supports: TCP Client, UDP Server, UDP Client.

### 2.2.2.AT command mode

User can enter AT command mode and send AT commands by serial to query/set W600 parameters(Enter AT command mode will disable transparent transmission mode and make serial port to send/receive AT commands). In this mode, all settings will be saved automatically and module will enter transparent transmission mode after sending AT+ENTM to exit AT command mode.

### 2.2.3.HTTP Client mode

In this work mode, user should configure the HTTP URL, HTTP header data, HTTP server address and HTTP server port firstly. Serial data can be packaged into HTTP format and sent to HTTP server through W600, HTTP server will also return data to W600.



**Figure 8 HTTP Client mode**

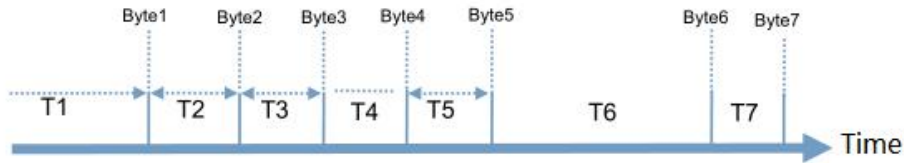
## 2.3.Serial port

### 2.3.1.Serial port basic parameters

Parameters	Range
<b>Baud Rate</b>	1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200, 128000, 230400, 460800
<b>Data Bits</b>	7, 8
<b>Stop Bits</b>	1, 2
<b>Parity Bits</b>	None, Odd, Even, Mark, Space
<b>Flow Control</b>	NFC: No flow control FC: Hardware flow control 485: Enable RS485

**Figure 9 Serial port basic parameters**

### 2.3.2. Serial package method



**Figure 10 Serial package method**

Suppose  $n$  ms is serial package triggering time, if  $T1 > n$ ,  $T2 < n$ ,  $T3 < n$ ,  $T4 < n$ ,  $T5 < n$ ,  $T6 > n$ , Byte1-Byte5 will be a package.

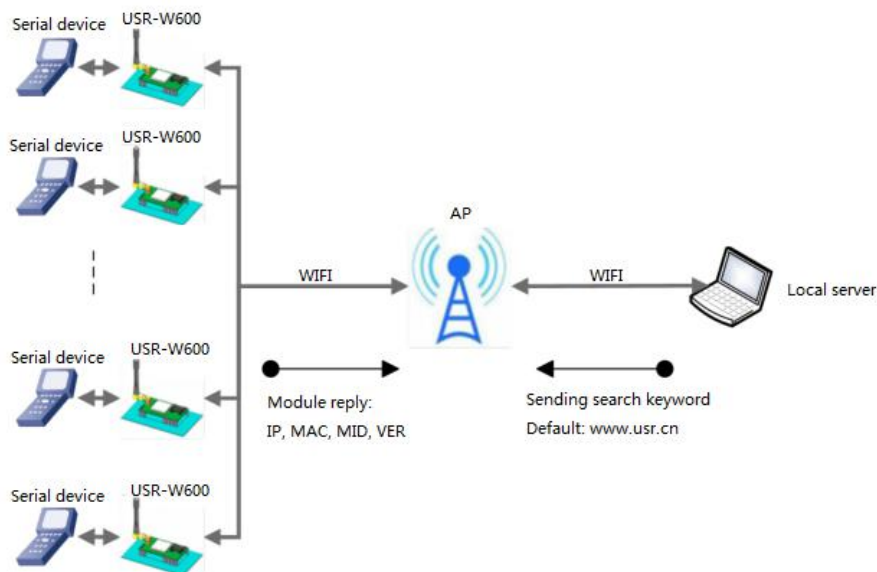
- **Transparent transmission mode:** In transparent transmission mode, W600 will continually check the interval between two adjacent bytes. If this interval  $>$  serial package triggering time (Default is 20ms and user can use AT+UARTTE to configure triggering time), it will be considered as end of a package and W600 will send received data as a TCP package data to network. Otherwise W600 will receive data to 1024 bytes and send these 1024 bytes as a TCP package data to network.
- **AT command mode:** In AT command mode, W600 will continually check the interval between two adjacent bytes. If this interval  $>$  serial package triggering time (Default is 20ms and user can use AT+UARTTE to configure triggering time), it will be considered as end of a package and W600 will parse this package in AT command format. Otherwise W600 will receive data to 256 bytes and return command error.

### 2.3.3. Baud rate synchronization function

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

## 2.4. Features

### 2.4.1. Search in LAN



**Figure 11 Search in LAN**



W600 supports 'Search in LAN' function: After W600 connecting to an AP, user can send UDP broadcast to a fixed port to acquire W600's IP address in this AP's LAN. This function can realize searching module and communication. Default port is 48899 and default keyword is [www.usr.cn](http://www.usr.cn).

The whole process as follows:

Step 1: User can send a keyword(default keyword: [www.usr.cn](http://www.usr.cn), at most 20 bytes) by UDP broadcast way(broadcast address: xxx.xxx.xxx.255, default port: 48899) on a **device which in same LAN as W600**.

Step 2: After W600 receiving keyword, if keyword is correct, W600 will enter configuration mode and return IP, MAC, MID, Version to the device. And W600 will exit configuration mode if no configuration command over 30 seconds after W600 entering configuration mode.

Step 3: After user entering configuration mode, user can send network AT commands to query/set parameters.(The network AT commands format are same as serial AT commands)

### 2.4.2.TCP/UDP Client identity packet function

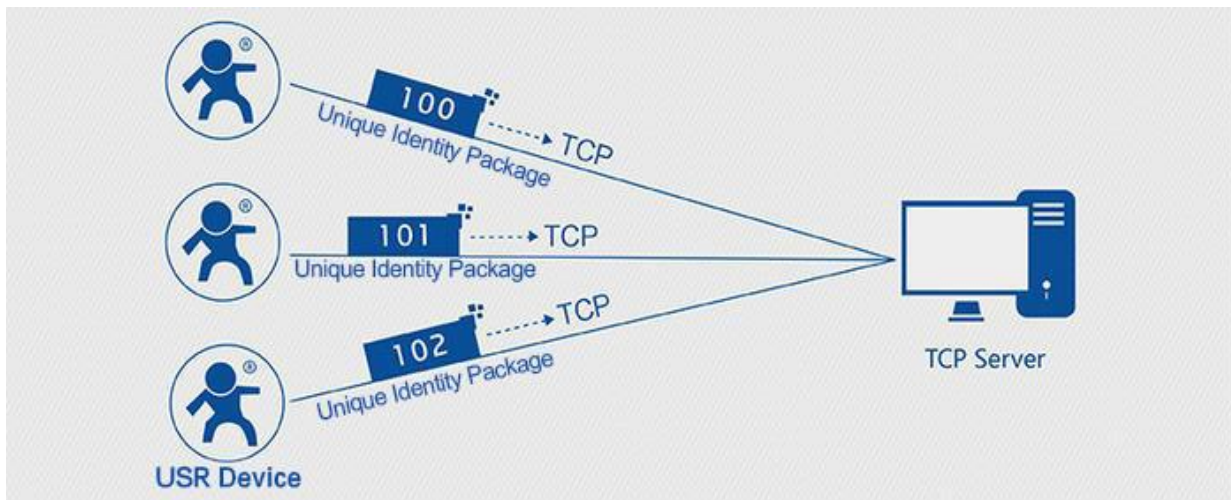


Figure 12 Identity Packet application diagram

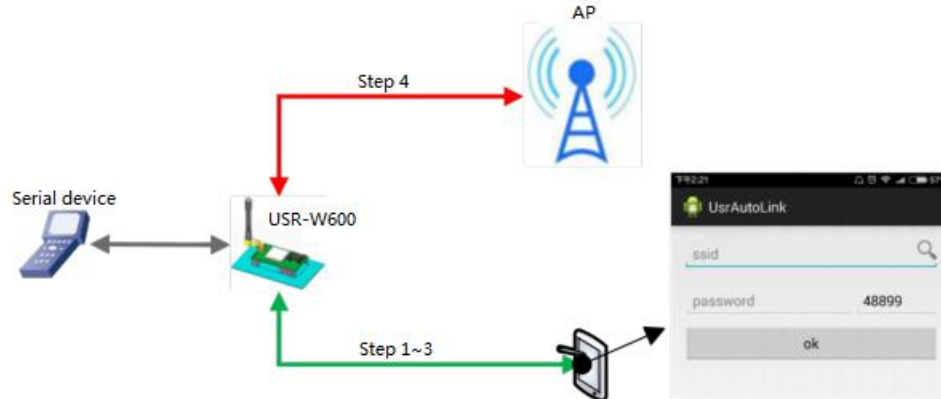
When W600 works in TCP/UDP Client mode, user can enable identity packet function. Identity packet is used for identifying the device when module works as TCP client/UDP client. There are two methods to send identity packet.

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

Identity packet can be 6 bytes MAC address identity packet, 4 bytes ID identity packet, user editable identity packet(less than 32 bytes) or USR Cloud identity packet(only work in TCP Client mode).

### 2.4.3.Usrlink

When W600 works in AP mode will open a UDP port to receive usrlink commands(Port number 48899, same as 'Search in LAN' function and can be changed).



**Figure 13 Usrlink**

The whole process as follows:

Step 1: User should directly connect phone which has download UsrAutoLink APP to W600 in AP mode through WIFI.

Step 2: Query the surrounding SSID.

Step 3: Choose the SSID, enter password and phone will send the configuration parameters to W600.

Step 4: After receiving configuration parameters protocol, W600 will parse it and acquire the AP's SSID and password, save them to flash, then reset and connect to AP.

#### 2.4.4. Simple Config

Simple Config can realize W600 connect to AP without establishing connect to W600.

When W600 works in STA or AP mode, user can pull down Reload pin 0.5~3 seconds to make W600 enter Simple Config mode(Link pin outputs 2Hz high-low level at this moment), then user can connect W600 to AP by follow steps:

1. Download Simple Config-C21x app and connect phone to AP which user want to connect W600 to.
2. Run the app, enter password and click 'connect', then phone will broadcast AP's SSID/password through AP.
3. W600 will continually check the received data package, after parsing SSID/password successfully, W600 will connect to AP. After connecting to AP successfully, W600 will broadcast MAC address by UDP broadcast and APP will consider configuring successfully after receiving MAC address.

#### 2.4.5. Heartbeat packet function

Heartbeat packet: In transparent transmission mode, module can output heartbeat packet to serial side or network side periodic. User can configure the heartbeat packet data and sending interval.

- Serial heartbeat packet can be used for polling Modbus data or other querying commands.
- Network heartbeat packet can be used for showing connection status and keeping the connection (only take effect in TCP/UDP Client mode). When connection exceptions happen, W600 can't send heartbeat packet to network server successfully and will reconnect to server after sending unsuccessfully over three times.

#### 2.4.6. WIFI connection exceptions handling

WIFI connection exceptions include:

1. In STA mode, PING gateway unsuccessfully three times in succession.
2. In AP mode, no STA connecting.
3. In AP+STA mode, PING gateway unsuccessfully in succession and no STA connecting.

After enabling this function and above WIFI connection exceptions happen, W600 will perform actions according to user's settings. The actions as follows, user can change by sending AT+MDCH in AT command mode and default is 10.

Parameters \ Mode	STA	AP	AP+STA	Checking interval
OFF	-	-	-	-
ON	Switch to AP+STA mode	-	1.No action if user has configured W600 to AP+STA mode manually. 2.If W600 switched from STA mode to AP+STA mode automatically, W600 will connect to AP and back to STA mode after connecting successfully.	1 min
2~240	Initialize WIFI	Initialize WIFI	Initialize WIFI	2~240 min

**Figure 14 WIFI connection exceptions handling**

## 3.Parameter configuration

There are two ways to configure USR-W600. They are Web Server and AT command.

### 3.1.Web Server

User can connect PC to W600 through AP interface and enter Web Server to configure.

Web Server default parameters as follows:

Parameter	Default settings
SSID	USR-W600
Web Server IP address	10.10.100.254
Username	admin
Password	admin

**Figure 15 Web server default parameters**

After firstly connecting PC to W600, user can open browser and enter default IP 10.10.100.254 into address bar, then log in username and password, user will enter Web Server.

### 3.2.AT command

We have specific user manual for AT commands.

#### 3.2.1.Serial AT command mode

In work mode, user can enter AT command mode and send AT commands to module to configure the module.

For entering AT command mode, please refer to this FAQ:

<http://www.usriot.com/enter-serial-command-mode/>.

#### 3.2.2.Setup software

We also provide setup software for W600 which based on AT commands.

## 4.Contact Us

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## 5.Disclaimer

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## 6.Update History

2017-11-13 V1.0.6.01 established based on Chinese version V1.0.6.