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# WiFi Solar Data Stick

## USR-S100-WA12

**User Manual**




V2.0

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# 1. Introduction

USR-S100-WA12 PV data stick is a very cost-effective WiFi communication PV networking products, standard DB9 male connector, support 802.11b/g/n protocol standard,equipped with deeply optimized TCP/IP protocol stack, support TCP Client, TCP Server, UDP Client, UDP Server data transmission, HTTP protocol, simple configuration can achieve PV equipment through RS232serial port (corresponding to different models) and network stable communication.

## 1.1. Features

- Support WiFi@2.4GHz 802. 11b/g/n wireless standard.
- Standard DB9 male connector, plug and play, small size and easy to install.
- Industrial grade design, working temperature up to-30℃-75℃,excellent hardware protection, IP65protection level, to meet the harsh application environment.
- High reliability of data transmission, TCP\UDP\HTTP protocol, support no data restart and no data re-connection function, help the stable operation of equipment.
- Support access to cloud platforms, private customization, and quickly build your own platform.
- Support Simplelink network distribution mode, simple and fast.
- Serial data package length can be set flexibly, up to1024 bytes.
- A variety of configuration options, parameters can be configured through AT instructions,web pages.
- Support WEP, WPA/WPA2 security mode.
- Local area network search and wireless parameter setting function.

## 1.2. Technical Parameters

USR-S100-WA12 parameters are as follows:

| Items | Description |
|---|---|
| Power Supply | DC: 5~24V, |
| Working Current | Average: 500mA@5V |
| Serial port | |
| No. | 1 x RS232, DB9 male |
| Baud rates | 300-3M bps |
| Data bits | 5, 6, 7, 8 |
| Stop bits | 1, 2 |
| Parity | NONE, ODD, EVEN |
| Packaging Interval | Range: 5 ~ 255ms, default: 5ms |
| Packaging Length | Range: 3 ~ 1024 bytes, default: 1024 bytes |
| Wi-Fi | |

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| | |
|---|---|
| Standards & Frequency | IEEE 802.11b/g/n |
| Working Mode | AP/STA/AP+STA |
| Tx power | 19.9dBm @ 11b,1Mbps<br>19.9dBm @ 11b,11Mbps<br>19.0dBm @ 11g,6Mbps<br>17.0dBm @ 11g,54Mbps<br>18.0dBm @ 11n,HT20,MCS0<br>16.8dBm @ 11n,HT20,MSC7<br>17.4dBm @ 11n,HT40,MCS0<br>16.0dBm @ 11n,HT40,MCS7 |
| Receive sensitivity | -97.9dBm @ 11b,1Mbps<br>-89.2dBm @ 11b,11Mbps<br>-92.8dBm @ 11g,6Mbps<br>-76.3dBm @ 11g,54Mbps<br>-92.8.8dBm @11n,HT20,MCS0<br>-74.3dBm @11n,HT20,MCS7<br>-89.8dBm @11n,HT40,MCS0<br>-71.1dBm @11n,HT40,MCS7 |
| Antenna | Built-in antenna, gain: 1.5dBi |
| **Physical Property** | |
| Casing material | IP65 protection |
| Dimensions | 117.5 * 75 *25.1mm |
| EMC | Surge protection: level 2, IEC61000<br>ESD protection: level 2, IEC61000<br>EFT protection: level 2, IEC61000 |
| Operating temperature | -30℃～+75℃ |
| Storage temperature | -40℃～+125℃ |
| Operating humidity | 5% ~ 95% RH, non-condensing |
| Storage humidity | 1% ~ 95% RH, non-condensing |
| **Software Function** | |
| Work mode | TCP Client, TCP server, UDP client, UDP server, HTTP client |
| Modbus Gateway | Modbus RTU/TCP protocol conversion |
| IP | DHCP/StaticIP |
| Registration packet | √ |
| Heartbeat packet | √ |
| IOT PLATFORMS | PUSR cloud |
| User Configuring | Web console(HTTP), AT command |
| **Others** | |
| Reset | Reset button, press and hold for 3~15 to reset to factory settings |
| Indicators | PWR, LINK, COM |

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| APPROVALS | |
|---|---|
| Regulatory | CE/RED*, RoHS, WEEE*, FCC |

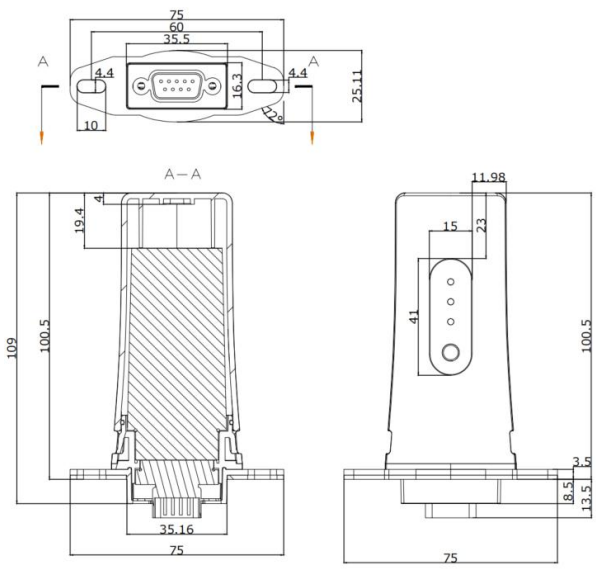
## 1.3. Indicator status description

**Table 1. Indicator Status**

| Name | Description |
|---|---|
| PWR(RED) | on: power on<br>Off: power off |
| LINK(GREEN) | ON: The WIFI network is successfully connected, or the device is rebooting,<br>Blinking every 3 seconds: Connecting server successfully,<br>Blinking every 1 second: Communicating with network device,<br>Blinking every 0.5 second:In simplelink mode,<br>OFF: The WIFI network is disconnected, or the device is resetting to factory settings |
| COM(RED) | On: the device is rebooting,<br>Blinking every 1 second: the device is transmitting data,<br>Blinking every 0.5 second:In simplelink mode,<br>Off: the device is resetting to factory settings. |

## 1.4. Dimensions

Unit: mm





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## 1.5. Hardware Interface

USR-S100 series adopts push-type terminal connector, which can realize wiring conveniently and quickly. Terminal wiring definitions are shown below.

**Table 2. Pin description**

| DB9 Connector | DB9 Pin | Description |
|---|---|---|
|  | Pin 2 | Rx |
| | Pin 3 | Tx |
| | Pin 5 | GND |
| | Pin 9 | VCC |

# 2. Get started

## 2.1. Preparations

### 2.1.1. Hardware & Connection

USB to RS232 converter*1

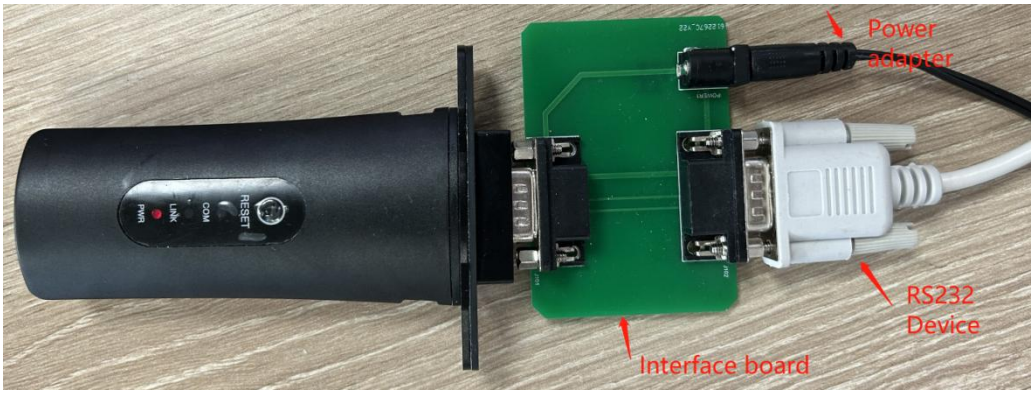
Female-to-female serial cable*1

Interface board*1

PC*1

USR-S100-WA12*1

12V Power Supply*1




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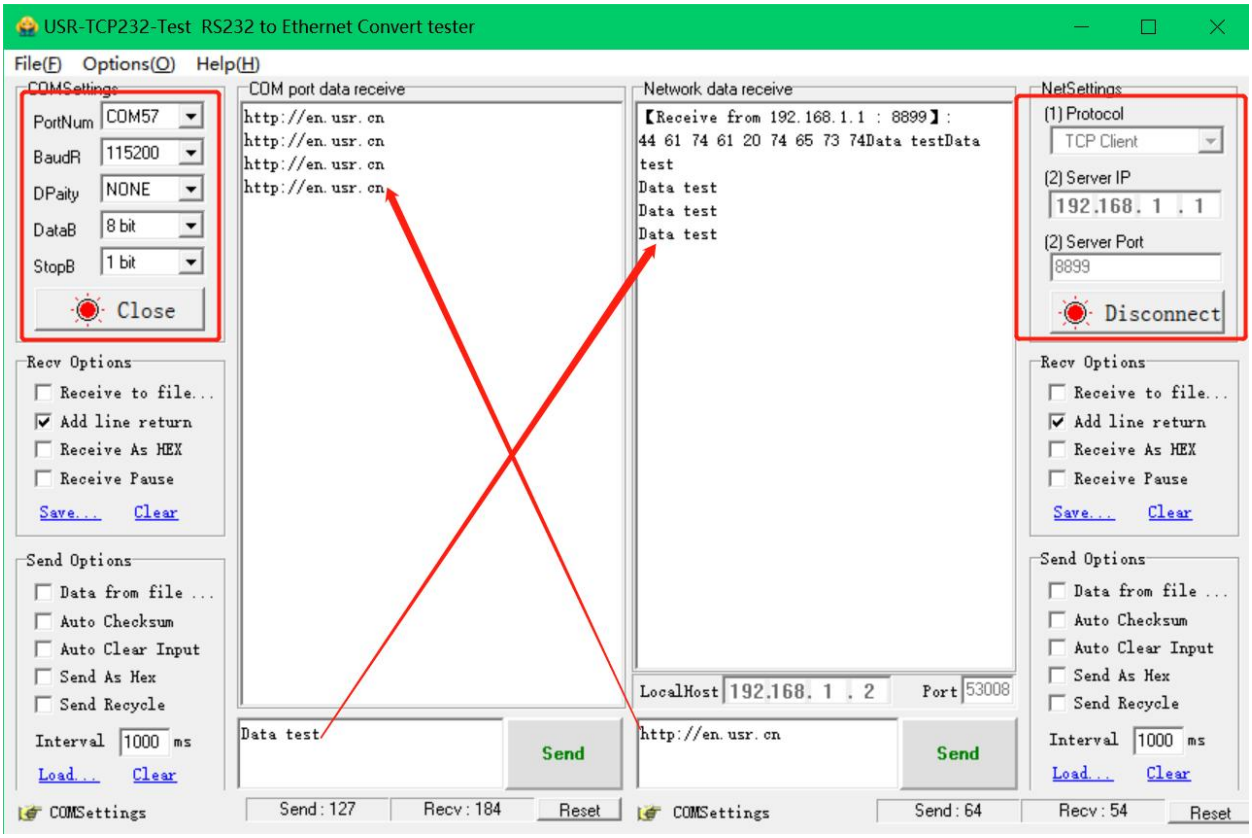
### 2.1.2. Basic function test

The default parameters:

| Item | Default Value |
|---|---|
| SSID | USR-S100-xxxx |
| Password | Open, none |
| Serial port | 115200,8,1,none |
| Work mode | TCPS, 8899, 192.168.1.1 |
| IP address | 192.168.1.1 |

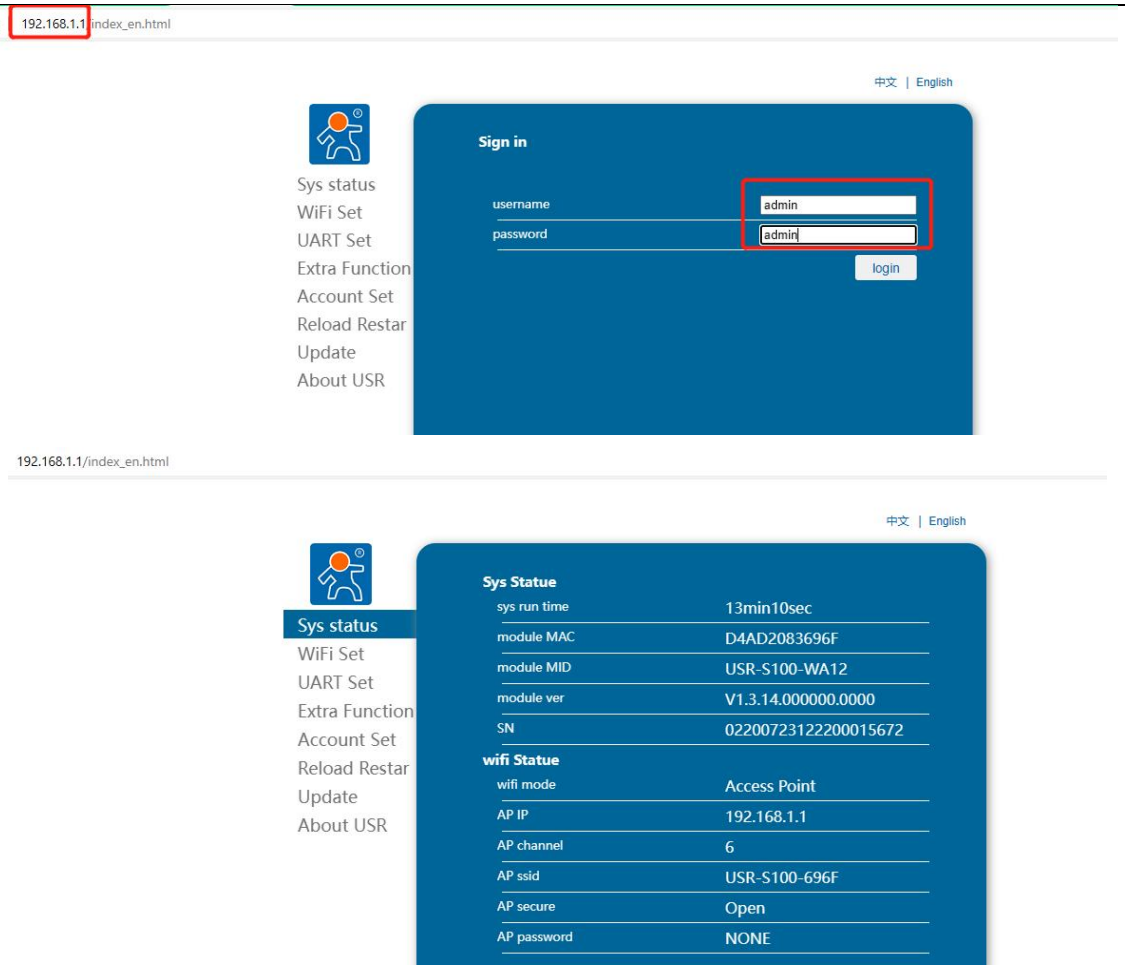
Connect PC to USR-S100 via WiFi, set the serial and network parameters to build TCP socket connection, then can achieve data communication between serial port and network device.




Users can enter 192.168.1.1 on browser, the username and password are both admin. After logging in, users can set parameters on web page like the following figure.

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# 3. Function introduction

## 3.1. Wireless networking mode

Wireless devices have three WIFI working modes: STA, AP, AP+STA, which can provide users with very flexible networking methods and network topology methods.

- Description of function points:

AP mode:Wireless access point, is the central node of a wireless network. A commonly used wireless router is an AP through which other wireless terminals can connect to each other. STA:wireless station, is a wireless network terminal. such as laptop, PDA, etc.

AP+STA mode: Supports both AP and STA functions.

### 3.1.1. STA mode

STA mode is one of the most common networking methods, consisting of a router AP and many STA, as shown in the following figure.It is characterized by AP in the central position. All communication between them is done through AP forwarding.If the AP has access to an external network, the device data can be transmitted to a server on the external network.

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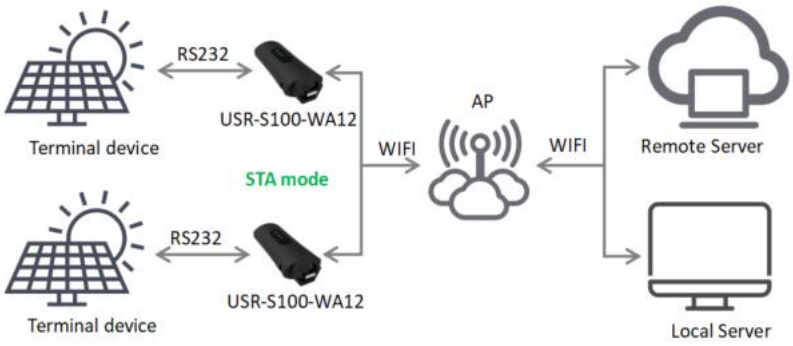



**Figure 1. STA networking**

### 3.1.2. AP mode

When S100 work at AP mode, it allows fast access to the device for data transfer via mobile/ PAD. In addition, you can also log in to the device's built-in web page for parameter settings.

In AP mode, no peripheral equipment is required, that is, the connection from wireless terminal to device can be realized.

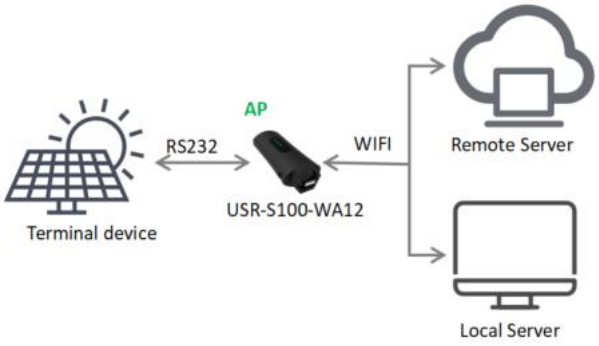



**Figure 2. AP mode**

### 3.1.3. AP+STA mode

USR-S100-WA12 supports AP mode and STA mode simultaneously. After AP+STA function is enabled,STA and AP interfaces are available at the same time. STA interface of serial port server is connected with router, and connected with server in network through socket B; AP interface can be connected by mobile phone/PAD (connected through Socket A). In this way, the TCP Server, mobile phone/PAD, etc. in the network can control the serial device connected to USR-S100-WA12 or set the parameters of S100, as shown in the following figure:

Through AP+ STA function, it is very convenient to use mobile phones/ PAD and other handheld devices to monitor user equipment without changing its original network settings.

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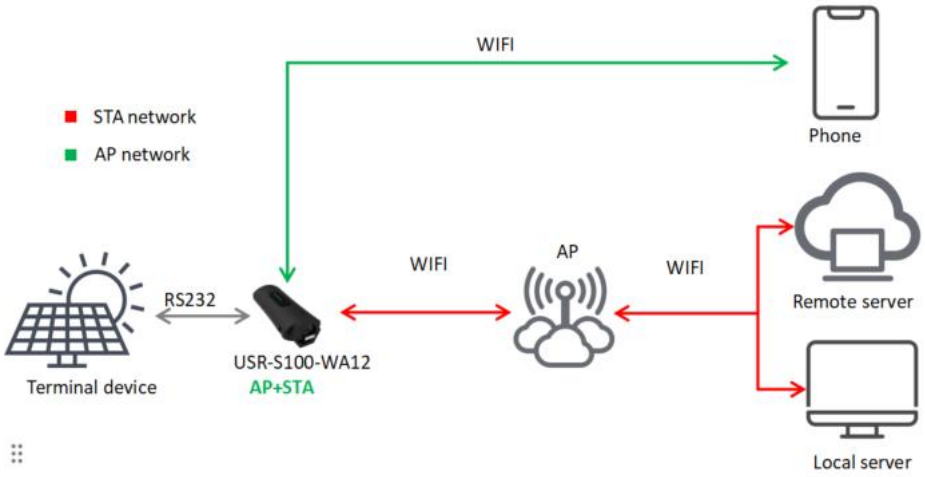



**Figure 3. AP+STA mode**

**<Note>:**In AP mode, the devicecan only support access tooneSTA deviceatmost. If the encryption password is set, the encryption method defaults to WPA2PSK/WPAPSKAES/TKIP.

### 3.1.4. Encryption method

Encryption is the scrambling of message data to ensure the safe transmission of data and increase the security of communication.Supports multiple wireless network encryption methods, including:

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

### 3.1.5. Related AT command

| No. | Item | Description |
|---|---|---|
| 1 | WMODE | Set/query WiFi operating mode (AP, STA, AP+STA) |
| 2 | WSTA | Set/query SSID and password of associated AP |
| 3 | WANN | Set/query STA network parameters; |
| 4 | WSLK | Query STA's wireless connection status |
| 5 | WAP | Set/query WiFi configuration parameters of AP |
| 6 | LANN | Set/query IP of device in AP |

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### 3.1.6. Settings on web page

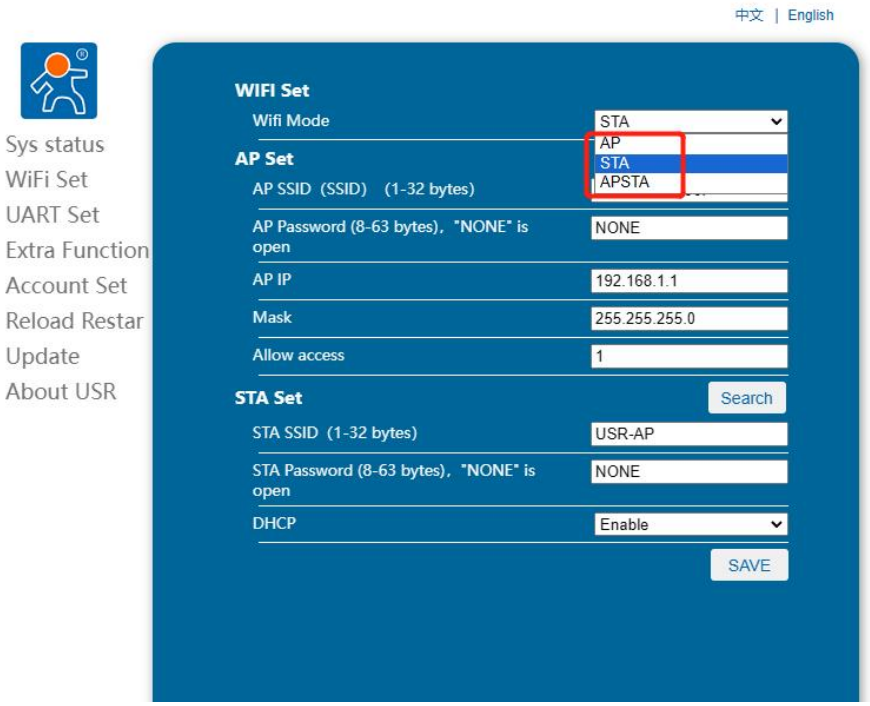
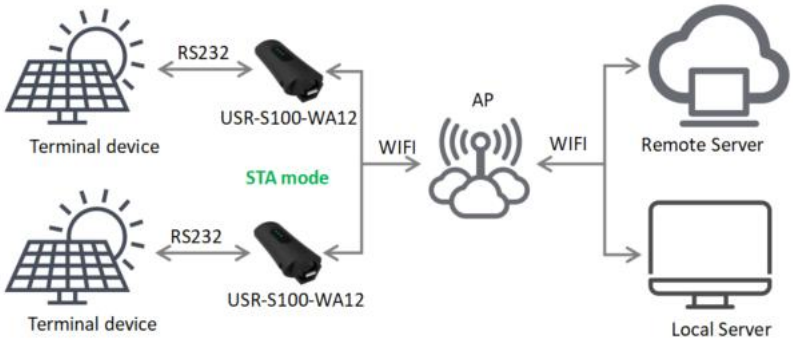



**Figure 4. Setting in web page**

## 3.2. Working Mode

### 3.2.1. Socket communication

USR-S100-WA12 device supports two-way Socket, with TCP/UDP transparent transmission mode.In this mode, the device realizes data transmission between UART and network, and the device can be set to work in transparent transmission mode to realize data transmission between universal serial devices and network devices.



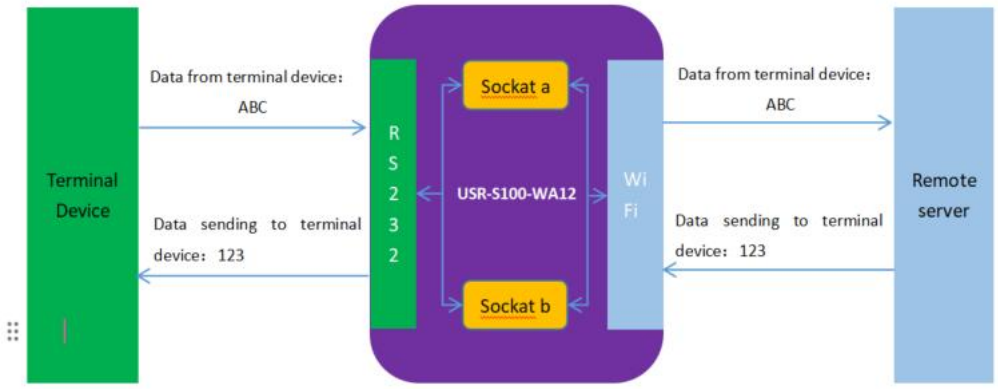



**Figure 5. Transparent Transmission Functional Block Diagram**

Socket a can be selected as:

- TCP Server
- TCP Client
- UDP Server
- UDP Client

Socket b can be selected as:

- TCP Client
- UDP Server
- UDP Client

The transparent transmission mode is fully compatible with the user's own software platform, reducing the workload of software development integrating wireless data transmission. The parameters that users need to preset usually include:

- Wireless network settings

AP SSID

AP password

- TCP/UDP connection settings

Protocol type

Destination port

Destination IP address

- UART interface parameters

Baud rate

Data bit

Stop bit

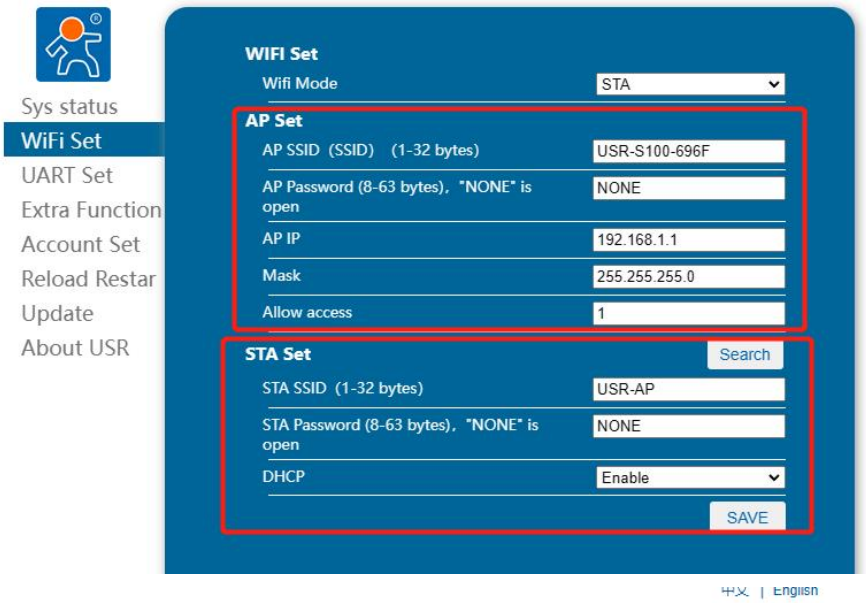
Check bit

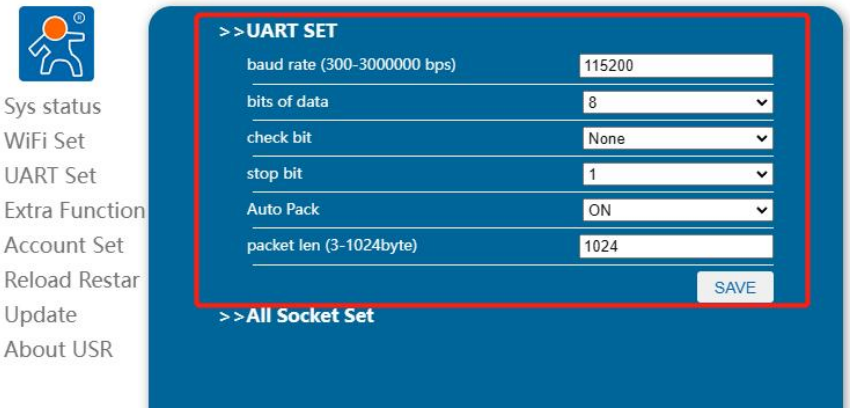
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#### 3.2.1.1. Related AT command

| No. | Item | Description |
|---|---|---|
| 1 | WKMOD | Serial Socket Working Mode Selection |
| 2 | SOCKA | Set/query network protocol parameters |
| 3 | SOCKLKA | Query whether TCP connection has been established |
| 4 | SOCKDISA | Set/Query whether TCP connections allow automatic re-connection |
| 5 | SOCKB | Set/query Socket B parameters |
| 6 | SOCKLKB | Query Socket B status |
| 7 | SOCKDISB | Set/Query whether TCP connections allow automatic re-connection |
| 8 | UART | Setting/querying UART interface parameters |

#### 3.2.1.2. Socket settings on web page



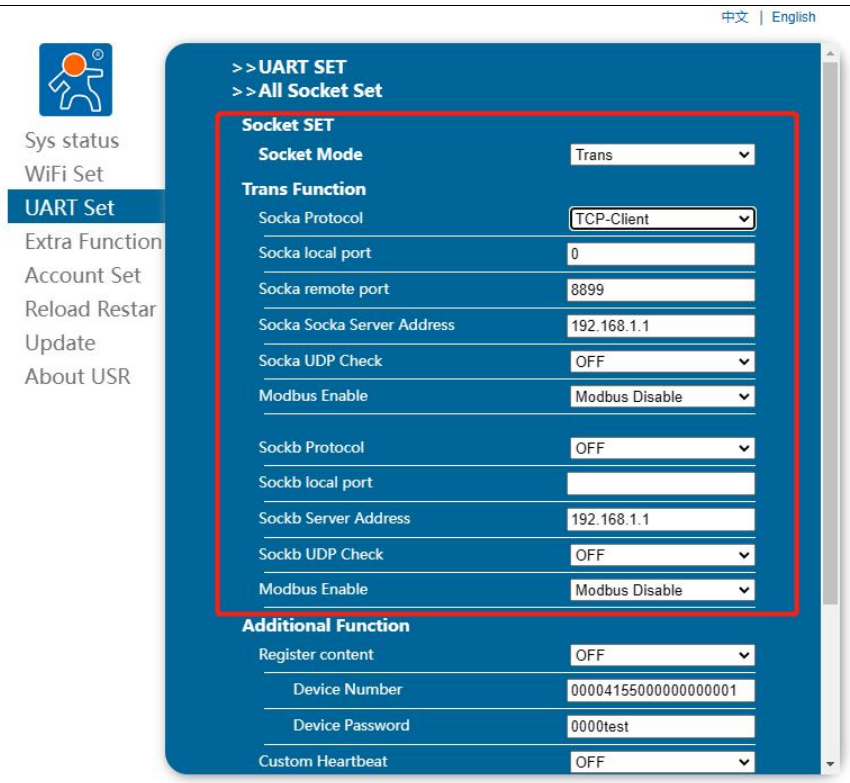
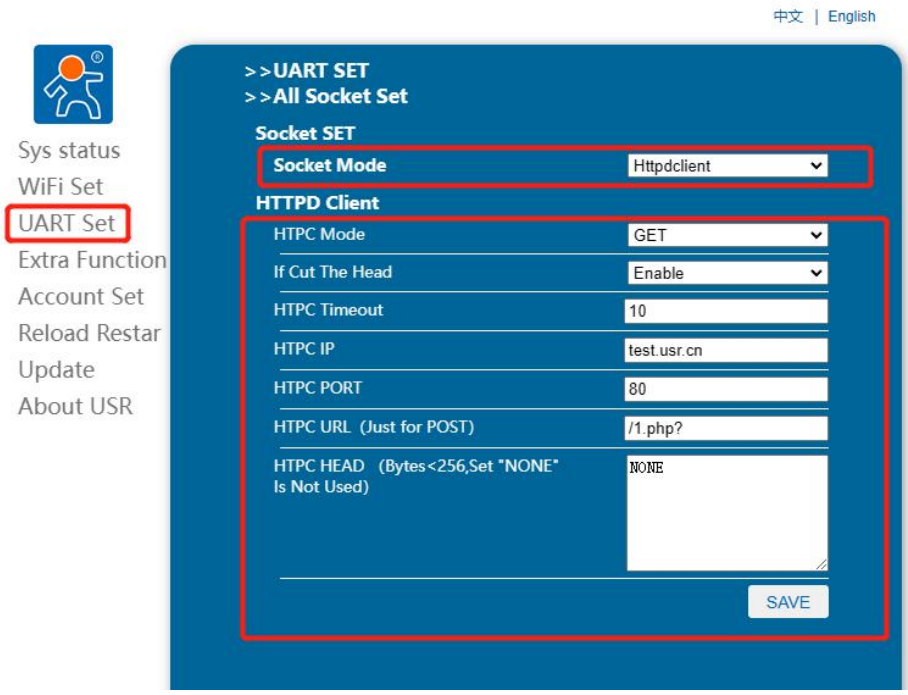



**Figure 6. Socket settings on web page**

### 3.2.2. HTTPD Function

HTTPD Client mode supports POST and GET HTTP request modes. After the user sets the specific content of HTTP header with AT command or web page. Each time data is sent, the WIFI serial server automatically encapsulates the data sent into HTTP protocol data and sends it to the specified HTTP server. Data received from the server is transmitted directly to the serial port. The cumbersome HTTP protocol is done by the WIFI serial port server, which is convenient for users to program serial ports without having to consider too many HTTP events.



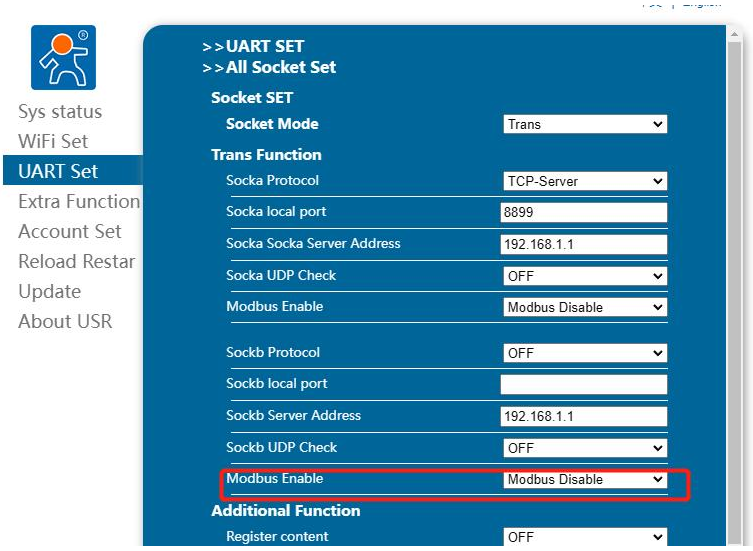


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**Figure 7. HTTPD settings on web page**

### 3.2.3. Modbus RTU/TCP conversion

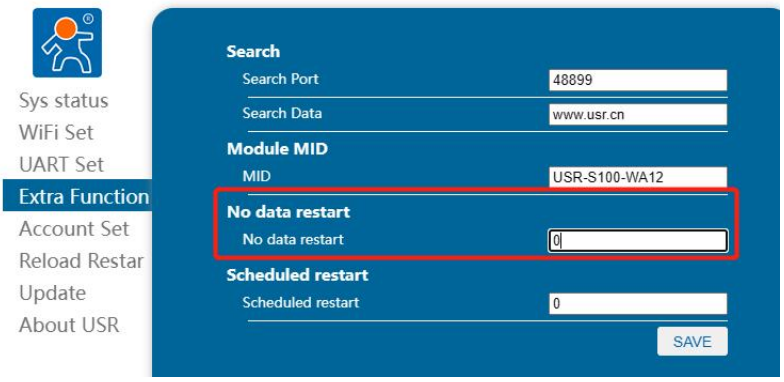
Modbus TCP to Modbus RTU in TCP client mode is supported(Modbus ASCII is not supported); the network parameters of the module should correspond to the network parameters of the application software; TCP server corresponds to TCP client. The port should also be configured to the same, and the mode of operation should be Modbus TCP< =>ModbusRTU.




## 3.3. General function

### 3.3.1. No data restart function

The function of no data restart is mainly used to ensure the long-term stable operation of the data stick. When the WIFI terminal does not receive network data for a long time, the data stick will restart within a certain time, so as to avoid the abnormal situation affecting the communication. The time of no data restart can be set through web pages and AT commands, the setting range is 60~65535s, and the default value is 0, that is, the function is turned off.



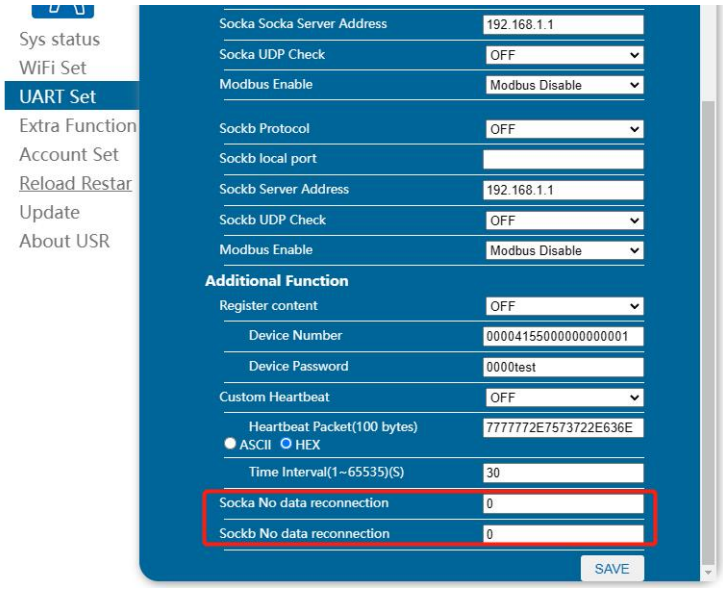

### 3.3.2. No data re-connection

The no-data re-connection function is mainly used to ensure the validity of the USR-S100 Client



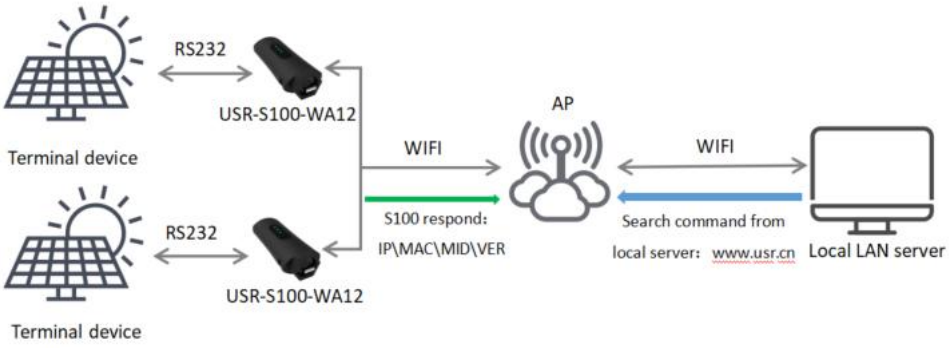
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connection.WhentheUSR-S100 as a client does not receive network data for a long time, the USR-S100 will disconnect the current connection and establish a new connection within a specific time, so as to avoid abnormal communication caused by abnormal connection. The time of no data re-connection can be set by web page and AT command, and the setting range is 0~ 9999s. The default value is 0, that is, the function is turned off.




### 3.3.3. Search in local network

The device supports search function in local area network, that is, when the device accesses wireless router, the user can obtain IP address of the device in current local area network by sending UDP broadcast to a fixed port, so as to realize device search and communication.




The search port and keyword can be set by AT+SEARCH command, default: 48899, www.usr.cn. Search protocol process:

1. On another device in the local area network, send a password via UDP broadcast (broadcast address: xx.xx.255, port: 48899). The default password is: "www.usr.cn"and the maximum password can be set to20 bytes.

2. After the device receives the password, if the password is correct, the device enters configuration mode and sends IP,MAC,MID, version to the address (unicast, source port).

| Item | Content |
| --- | --- |
| Device IP address | xxx.xxx.xxx.xxx |


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| | |
|---|---|
| Mac address | xxxxxxxxxxxx |
| Device MID | USR-S100-WA12 |
| version number | xx. xx. xx |

If the S100-WA12 device does not receive the setting command within 30 seconds after entering the configuration mode, the device will exit the configuration mode, and the user needs to resend the search command word to enter the configuration mode.

3. Users can set and read parameters/status by sending network AT commands to the port. The AT command format is the same as that of serial AT commands.

**Note:** The search tool and the device must be on the same local area network. If multiple STA are connected to a router, the computer running the search tool is also connected to that router. This search tool can find all STA.

### 3.3.4. Registration packet

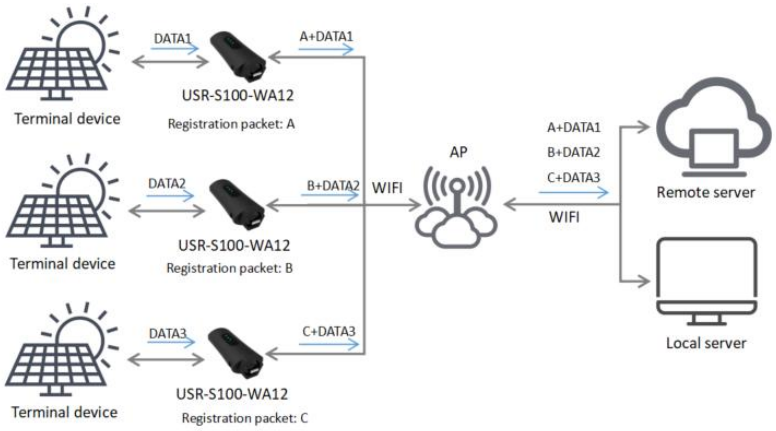
When the device works in TCP Client or UDP Client mode, the user can turn on the registration packet mechanism to realize the server to distinguish the data source and realize the data monitoring of different devices. The registration package is divided into MAC, ID, user-defined and transparent cloud. MAC is 6 bytes, IDis1-65535, and ID value can be set.

**MAC** registration packet: 6 bytes MAC address.

**ID** registration package: 4 bytes, 2 bytes ID source code +2 bytes ID complement code.For example, if the ID is set to 10, the registration package is: 0x00, 0x0a,0xff,0xf5.

**USR** registration package: allows users to customize the registration package content, the length is limited to 32 characters.

**CLOUD** on device: Support access to cloud platform, must work under TCP Client mode.



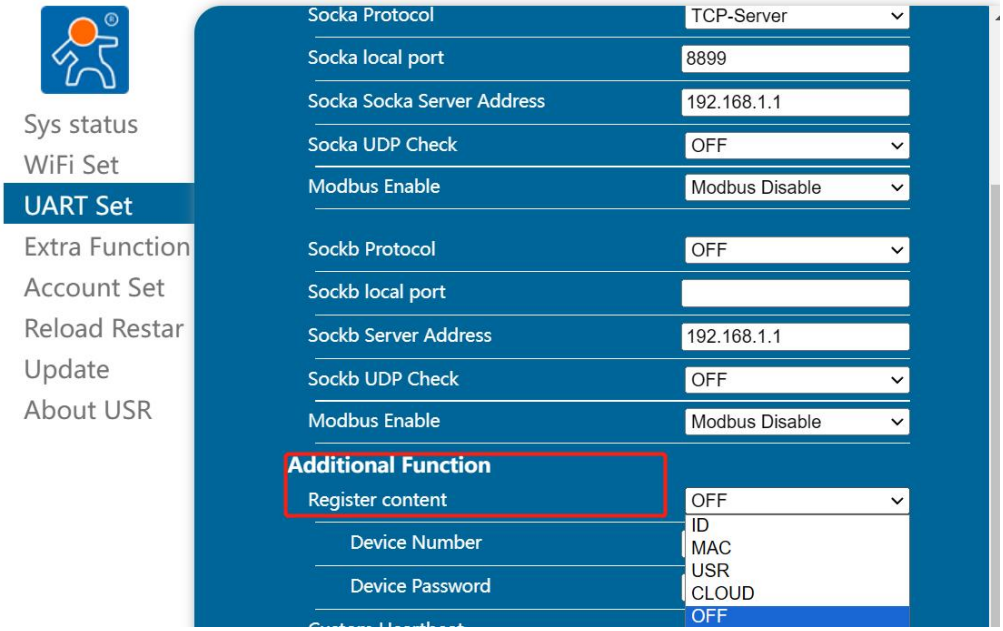

The relevant command settings are as follows:

| No. | Command | Description |
|---|---|---|
| 1 | REGENA | Set Registration Package Type |
| 2 | REGID | Register Package ID Settings |



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| | | |
|---|---|---|
| 3 | REGUSR | Set/query custom registration package content |
| 4 | REGCLOUD | Set/query transparent cloud account and password |

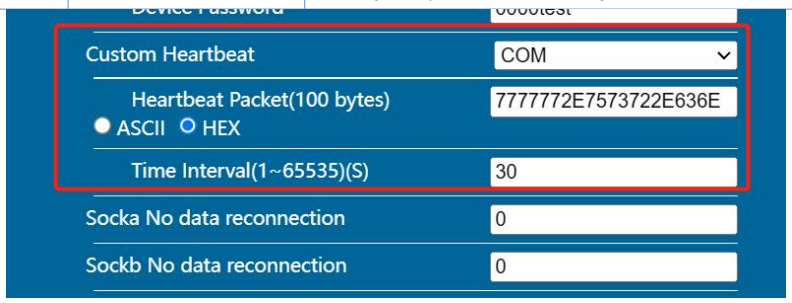



### 3.3.5. Heartbeat packet

In TCP/UDP client, user can send the heartbeat package from the module to the network side or serial port device . Users can defined the heartbeat packet content as needed, the length is limited to 32 characters.

Sending to the network is to ensure the normal connection of the module and let the server know the online status of the module. User can also set the serial heartbeat to a fixed query command instead of sending from server to save the traffic.

| No. | Item | Description |
|---|---|---|
| 28 | HEARTBTEN | Query/Set Heartbeat Package Function |
| 29 | HEARTBDT | Set/Query Heartbeat Package Content |
| 30 | HEARTBTT | Set/query heartbeat packet interval time |




### 3.3.6. Connect to PUSR cloud

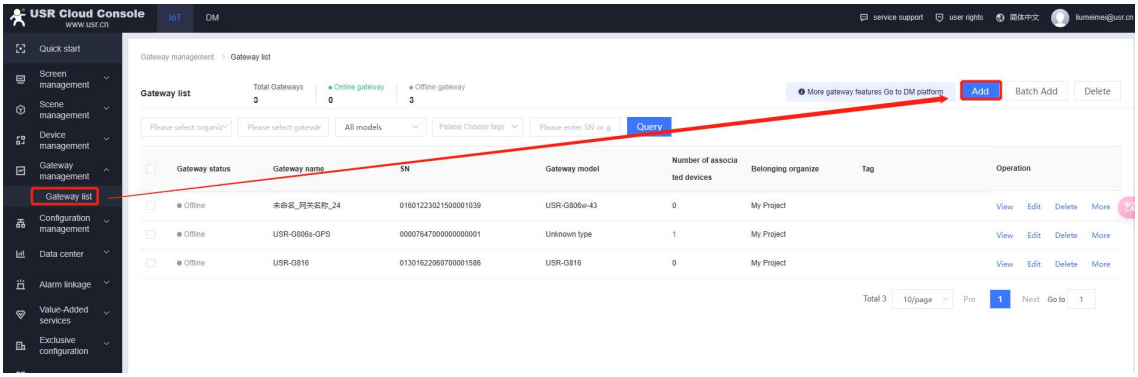
USR-S100-WA12 supports sending data to PUSR cloud. It requires the device to connect to the WIFI network that can normally access the external network. Use the access address, port number,device SN and communication password generated by the manned cloud platform to fill in the device TCP Client and

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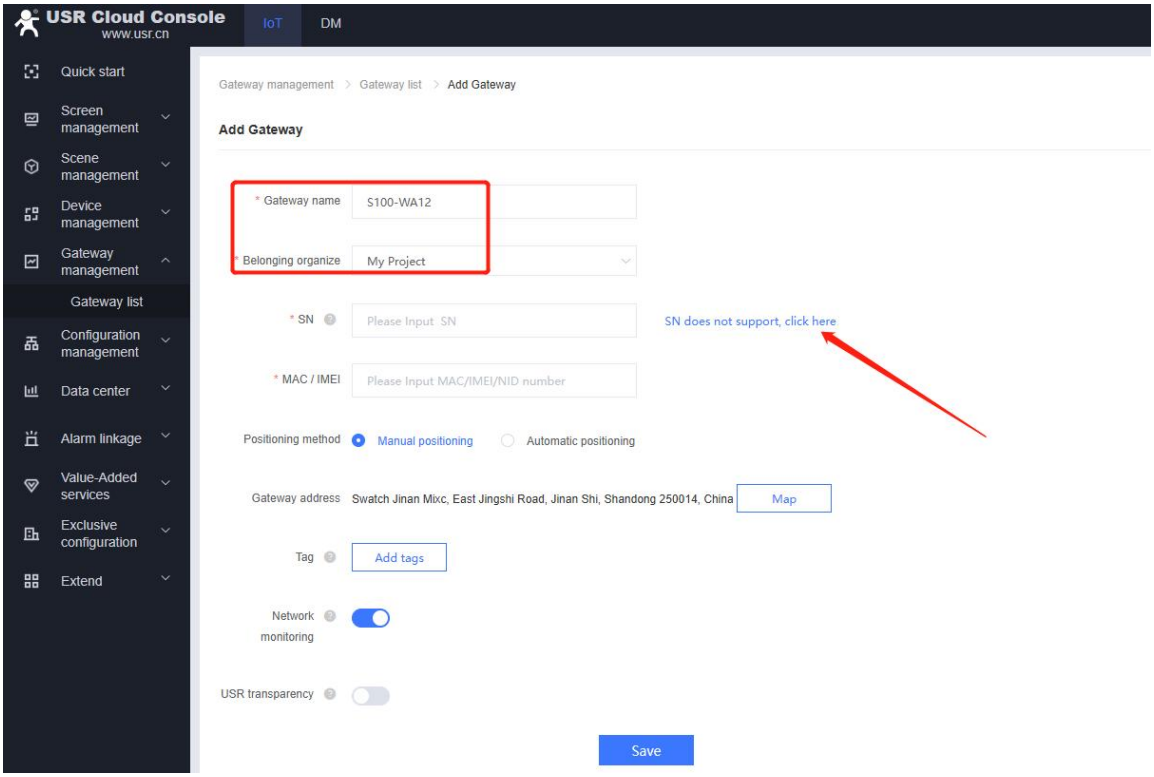
registration package content settings.

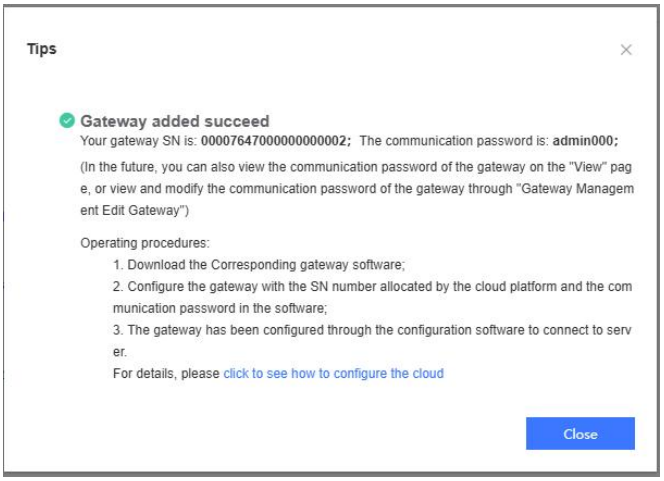
PUSR cloud address: **https://account.usriot.com/**

1> Add device




2> Edit device information, click "SN does not support, click here"

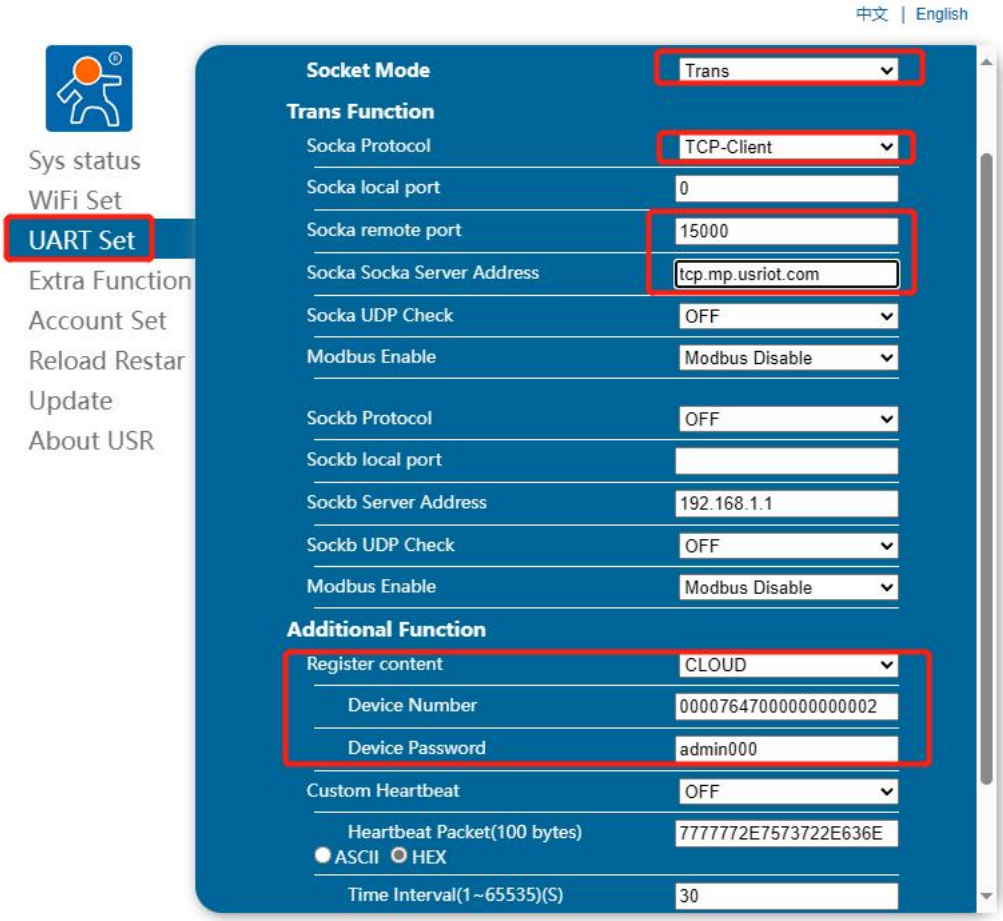



3> S100 parameters setting, the server address is tcp.mp.usriot.com, and the port is 15000. The device number

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and password is the ones on the last picture.




4> Save and restart the device, we can see the S100-WA12 is online status on the cloud.




## 3.3.7. Simplelink Intelligent Network

This function mainly realizes intelligent networking of devices, that quickly connecting to AP without establishing a connection with devices. The device supports SimpleLink network distribution mode. First install APP on Mobile device.

When the device is working in STA or AP mode, pull the Reload pin low for1-3 seconds, and the device enters Simplelink configuration. At this time, the Link pin outputs a high and low level of 1Hz.

Simplelink:

① First, connect the Mobile device to the AP to which the S100-WA12 device needs to be connected, open the APP software on the Mobile device, input the password, and click "start."At this time, the phone broadcasts the SSID and password of this AP through the AP.

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② The device continuously detects the received data packets, and after successfully parsing the SSID and password of the received broadcast packet, the device actively connects to the AP. After successfully connecting to the AP, the device broadcasts its own MAC through UDP, and the APP receives the MAC information and considers it as successful configuration.

Simplelink instructions and download address:**www.usr.cn/Download/218.html 需替换**

**Note:** At this time, when AT+WSTA is used to query the AP information connected to the module, the password displays SAFE, and the password is invisible.

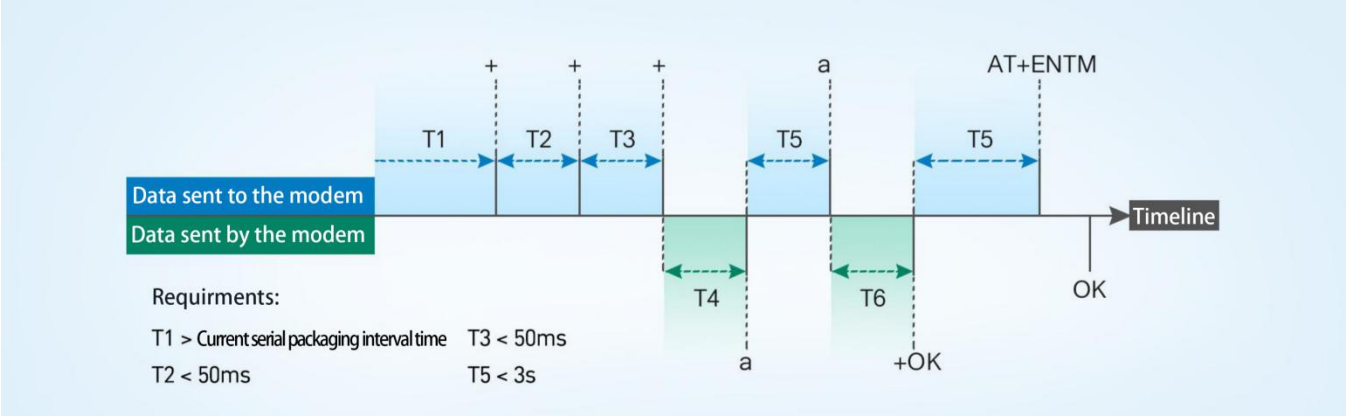
# 4. AT Commands

AT command is used for controlling modem, for USR devices in transparent mode normally, you must enter AT command mode at first, then you can send AT commands to configure or query the parameter settings. After setting all parameters, restart the modem to make the settings take effect. Every time the modem 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.

For detailed AT commands, please check the AT commands set.

## 4.1. AT Command Settings




➢Enter AT command mode:

1.Send “+++” from the serial port, it will be a “a” returned.

2.Do not send any data within a serial port packaging interval before sending "+++".

3.After receiving “a”, send another “a” within 3s.

4.Receiving “+ok” means the device has changed to AT command mode.

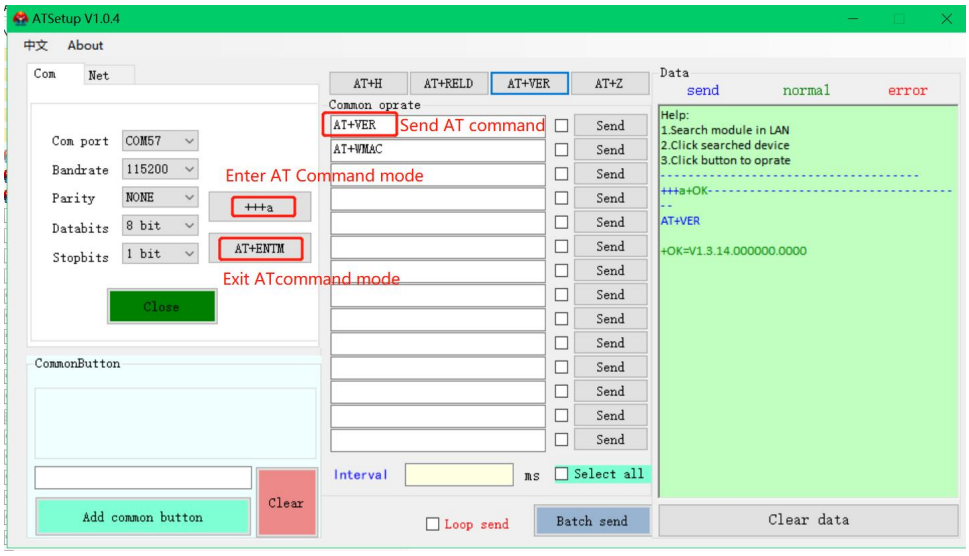
5.Then can send AT commands to the device.

➢Exit AT command mode:

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1. Send “AT+ENTM” from the serial port.
2. Receiving “+ok” means the device has exited AT command mode.

Users can also send AT command via setup tool:




If the AT command is incorrect, the error code will be returned as follows:

| Error code | Description |
|---|---|
| -1 | Invalid command format |
| -2 | Invalid command |
| -3 | Invalid operator |
| -4 | Invalid parameter |
| -5 | Operation not allowed |

## 4.2. AT command set

Here, the AT command supported by USR-S100-WA12 is listed, and the restart effect is Y, which means that the parameter will take effect after restarting the S100-W12 device.

| No. | Command | Description | Restart |
|---|---|---|---|
| 1 | ENTM | Exit AT command and switch to Socket communication mode | N |
| 2 | E | Device AT command echo settings | N |
| 3 | Z | restart the device | N |
| 4 | CFGTF | Save current settings as factory settings | N |
| 5 | RELD | factory data reset | N |
| 6 | MAC | Query Device MAC | N |
| 7 | SEARCH | Set/query local area network search ports and keywords | Y |
| 8 | MID | Set/Query Device ID | Y |
| 9 | PLANG | Web landing language version | Y |
| 10 | WEBU | Setup/query web page login username | Y |


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| | | | |
|---|---|---|---|
| | | and password | |
| 11 | VER | Device firmware version | N |
| 12 | PING | Network 'PING' command | N |
| 13 | WSCAN | Search for nearbyAPs in WiFi mode | N |
| 14 | RSTIM | Set/query no data restart time | Y |
| 15 | SMTLK | Enter simplelink mode | N |
| 16 | BUILD | query compilation time | N |
| 17 | SN | Query Device SN | N |
| WiFisettings | | | |
| 18 | WMODE | Set/query WiFi operation mode ( AP, STA) | Y |
| 19 | WSTA | Set/query SSID, password of associated AP | Y |
| 20 | WANN | Set/query STA network parameters | Y |
| 21 | WSLK | Query STA Wireless Link Status | N |
| 22 | WAP | Set/query WiFi configuration parameters of AP | Y |
| 23 | LANN | Set/query IP of device in AP | Y |
| UART,network communication parameter settings | | | |
| 24 | UART | Setting/querying serial port interface parameters | Y |
| 25 | UARTTE | Set/query serial port free framing interval | Y |
| 26 | UARTTL | Set/query serial port package length | Y |
| 27 | SOCKATON | Set/Query TCPC No Data Reconnection Time | Y |
| 28 | HEARTBTE N | Query/Set Heartbeat Package Function | Y |
| 29 | HEARTBDT | Set/Query Heartbeat Package Content | Y |
| 30 | HEARTBTT | Set/query heartbeat packet interval time | Y |
| 31 | WKMOD | Socket working mode selection | Y |
| 32 | SOCKA | Set/query socka net work protocol parameters | Y |
| 33 | SOCKLKA | Query whether TCP link has been established | N |
| 34 | SOCKDISA | Setting TCP Client Re-connection Mechanism | N |
| 35 | SOCKB | Set/query sockb network protocol parameters | Y |
| 36 | SOCKLKB | Query whether TCP link has been established | N |
| 37 | SOCKDISB | Setting TCP Client Re-connection Mechanism | N |



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| | | | |
|---|---|---|---|
| 38 | REGENA | Enable/disable package registration mechanism | Y |
| 39 | REGID | Register Package ID Settings | Y |
| 40 | REGUSR | User-defined registration package settings | Y |
| 41 | REGCLOUD | Please enter your username and password. | Y |

### 4.2.1. AT+ENTM

| Items | Description | Example |
|---|---|---|
| Function | Exit command mode and enter Socket communication mode | |
| Query | AT+ENTM<CR><br><CR>+OK <CR> <LF> | at+entm<br><br>+OK |
| Set | / | |
| Parameters | / | |

### 4.2.2. AT+E

| Items | Description | Example |
|---|---|---|
| Function | Set/query device at command echo | |
| Query | AT+E<CR><br><CR>+OK=ON/OFF <CR> <LF> | AT+E<br><br>+OK=OFF |
| Set | AT+E=ON<CR><br><CR>+OK <CR> <LF> | AT+E=ON<br><br>+OK |
| Parameters | Whether enable the AT command echo<br>ON: Enabled<br>OFF: Disabled | |

### 4.2.3. AT+Z

| Items | Description | Example |
|---|---|---|
| Function | Restart S100-WA12 device | |
| Query | AT+Z<CR><br><CR>+OK=ON/OFF <CR> <LF> | AT+Z<br><br>+OK |
| Set | / | / |
| Parameters | / | |



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### 4.2.4. AT+CFGTF

| Items | Description | Example |
|---|---|---|
| Function | Save current configuration parameters as user default factory configuration | |
| Query | / | |
| Set | AT+CFGTF<CR><br><CR><LF>+OK=<status><CR><LF> | AT+CFGTF<br><br>+OK=SAVED |
| Parameters | SAVED: Setting successful<br>NON-SAVED: Setting failed | |

### 4.2.5. AT+RELD

| Items | Description | Example |
|---|---|---|
| Function | Restore the equipment configuration parameters to the user factory configuration parameters | |
| Query | / | |
| Set | AT+RELD<CR><br><CR><LF>+OK=REBOOTING...<CR><LF> | |
| Parameters | / | |

### 4.2.6. AT+MAC

| Items | Description | Example |
|---|---|---|
| Function | Query device MAC | |
| Query | AT+MAC<CR><br><CR><LF>+OK=MAC<CR><LF> | |
| Set | / | |
| Parameters | MAC: MAC of the device (e.g. 01020304050A) | |

### 4.2.7. AT+SEARCH

| Items | Description | Example |
|---|---|---|
| Function | Set/query ports and search keywords for device search in local area network | |
| Query | AT+SEARCH<CR><br><CR><LF>+OK=port,keywords<CR><LF> | |
| Set | AT+ SEARCH =<port,keywords><CR><br><CR><LF>+OK<CR><LF> | |



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| | | |
|---|---|---|
| | | |
| Parameters | port: Search port of the device, default: 48899<br>keywords: Search keywords for the device, default: www.usr.cn (maximum 20 bytes). | |

### 4.2.8. AT+MID

| Items | Description | Example |
|---|---|---|
| Function | Set/query equipment MID | |
| Query | AT+MID<CR><br><CR><LF>+OK=MID<CR><LF> | |
| Set | AT+MID=<MID><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | mid: Set/query the MID of the equipment (within 20 characters),MID mainly indicates the model of the equipment<br>Note:MID cannot contain commas when set. | |

### 4.2.9. AT+PLANG

| Items | Description | Example |
|---|---|---|
| Function | Set/query the default language version of the device web page login | |
| Query | AT+PLANG<CR><br><CR><LF>+OK=language<CR><LF> | |
| Set | AT+PLANG=<language><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | language: CN/EN,<br>CN: indicates that the default Chinese display is displayed when the webpage is logged in;<br>EN: indicates that the default English display is displayed when the webpage is logged in | |

### 4.2.10. AT+WEBU

| Items | Description | Example |
|---|---|---|
| Function | Set/query web login username and password | |
| Query | AT+WEBU<CR><br><CR><LF>+OK=username,password<CR><LF> | |
| Set | AT+WEBU=<username,password><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | username: username, length must be5 characters, not blank;<br>password: password, length must be5 | |


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### 4.2.11. AT+VER

| Items | Description | Example |
|---|---|---|
| Function | Query device firmware version | |
| Query | AT+VER<CR><br><CR><LF>+OK=ver<CR><LF> | |
| Set | / | |
| Parameters | ver: device firmware version | |

### 4.2.12. AT+PING

| Items | Description | Example |
|---|---|---|
| Function | Network"Ping" command | |
| Query | / | |
| Set | AT+WEBU=<username,password><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | | |

### 4.2.13. AT+WSCAN

| Items | Description | Example |
|---|---|---|
| Function | Device Search AP | |
| Query | AT+WSCAN<CR><br>+ok=<ap_site><CR><LF><CR><LF> | |
| Set | / | |
| Parameters | ap_site: Searched APs<br>The first line returned is "RSSI, SSID, BSSID, Channel, Encryption, Authentication", which are the signal strength, network name, MAC address, channel, authentication mode, and encryption algorithm. | |

### 4.2.14. AT+RSTIM

| Items | Description | Example |
|---|---|---|
| Function | Set/Query No Data Restart Time | |
| Query | AT+RSTIM<CR><br><CR>< LF>+OK= time<CR> <LF> | |
| Set | AT+RSTIM= time<CR><br><CR>< LF>+OK<CR> <LF> | |
| Parameters | time: the time of no data restart, ranging from0, 60-65535, when set to 0means that the function is turned off. | |



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### 4.2.15. AT+SMTLK

| Items | Description | Example |
|---|---|---|
| Function | Enter simplelink mode | |
| Query | / | |
| Set | AT+SMTLK<CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | After this command is executed correctly, the equipment enters the network distribution mode, and the commands such as WSLK, WSCAN and SMTLK cannot be executed at this time. | |

### 4.2.16. AT+BUILD

| Items | Description | Example |
|---|---|---|
| Function | Query compilation time | |
| Query | AT+BUILD<CR><br><CR>< LF>+OK= data_time<CR> <LF> | |
| Set | / | |
| Parameters | date time: compilation date and time | |

### 4.2.17. AT+SN

| Items | Description | Example |
|---|---|---|
| Function | Query Equipment SN | |
| Query | AT+SN<CR><br><CR>< LF>+OK= sn<CR> <LF> | |
| Set | / | |
| Parameters | sn:20-bit device SN | |

### 4.2.18. AT+WMODE

| Items | Description | Example |
|---|---|---|
| Function | Set/query WiFi working mode | |
| Query | AT+WMODE<CR><br><CR><LF>+OK=<status><CR><LF> | |
| Set | AT+WMODE =< status ><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | status:<br>AP: Device operates in APmode<br>STA: Device operates in STA mode<br>APSTA: works in AP+STA | |



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### 4.2.19. AT+WSTA

| Items | Description | Example |
|---|---|---|
| Function | Set/query SSID and password of associated AP | |
| Query | AT+WSTA<CR><br><CR> <LF>+OK=<AP's ssid> <key> <CR> <LF> | |
| Set | AT+ WSTA =<AP's ssid ><key><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | AP's ssid: SSID of AP (up to 32bytes);<br>key: AP password, default encryption method is WPA2PSK, and support WPAPSK, WPA 3PSK. No encryption is set to NONE. Note: ssid and key do not support special characters such as "," | |

### 4.2.20. AT+WANN

| Items | Description | Example |
|---|---|---|
| Function | Set/queryIP (DHCP/STATIC)acquiredbyequipment | |
| Query | AT+WANN<CR><br><CR> <LF>+OK=<br>mode,address,mask,gateway,dns<CR> <LF> | |
| Set | AT+WANN=<mode,address,mask,gateway,dns ><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | mode:Network IP mode<br>STATIC: Static IP<br>DHCP: dynamic IP (address,mask,gateway,DNS,parameters omitted)<br>address:IP address<br>mask: subnet mask<br>gateway:gateway address<br>dns:DNS server | |

### 4.2.21. AT+WLSK

| Items | Description | Example |
|---|---|---|
| Function | Query STA wireless link status | |
| Query | AT+ WSLK<CR><br><CR><LF>+OK=<status,rssi><CR> LF> | |
| Set | / | |
| Parameters | status<br>If not connected: return to "DISCONNECTED" | |



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| | | |
|---|---|---|
| | If there is a connection: return "SSID of AP ( MAC of AP device)<br>RSSI: signal strength, 0-100, when the signal strength is lower than 10, the signal is weak, data transmission may lose data. | |

### 4.2.22. AT+WAP

| Items | Description | Example |
|---|---|---|
| Function | Set/query Wi-Fi configuration parameters of AP | |
| Query | AT+WAP<CR><br><CR><LF>+OK=<ssid,key><CR><LF> | |
| Set | AT+ WAP =<ssid,key><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | ssid: SSID in AP mode;<br>key: Set AP encryption password (default WPAPSK/WPA2PSK encryption mode, password length is greater than or equal to 8 bytes). If set to None, it means no encryption. | |

### 4.2.23. AT+CHANNEL

| Items | Description | Example |
|---|---|---|
| Function | Set/query device AP mode channel | |
| Query | AT+CHANNEL <CR><br><CR><LF>+OK=<NUM><CR><LF> | |
| Set | AT+CHANNEL=<NUM><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | NUM: 1-13, indicating channels 1-13. | |

### 4.2.24. AT+LANN

| Items | Description | Example |
|---|---|---|
| Function | Set query AP mode ip | |
| Query | AT+LANN<CR><br><CR><LF>+OK=<IP,MASK><CR><LF> | |
| Set | AT+ LANN =<IP,MASK><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | IP: IP address<br>MASK: sub-net mask | |

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### 4.2.25. AT+UART

| Items | Description | Example |
|---|---|---|
| Function | Set/query serial port interface parameter | |
| Query | AT+UART<CR><br><CR> LF>+OK=<br><baubrate,data_bits,stop_bit,parity,flowctrl><CR><br><LF> | |
| Set | AT+UART=<baudrate,data_bits,stop_bit,parity,flowctrl><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | baud rate: 300-3000000 bit/s,<br>data_bits: 5, 6, 7, 8<br>stop_bits: 1, 2<br>parity:NONE, EVEN, ODD<br>Flowctrl: Hardware Flow Control (CTS RTS)<br>NFC: no hardware flow control<br>Note: When the baud rate is changed, the packing interval will be changed automatically, see AT+UARTTE. | |

### 4.2.26. AT+UARTTE

| Items | Description | Example |
|---|---|---|
| Function | Set/query serial port free framing interval | |
| Query | AT+UARTTE<CR><br><CR><LF>+OK=<NUM><CR><LF> | |
| Set | AT+UARTTE=<num><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | num: 5-255:Thetimeintervalbetweentwo adjacent bytes in free framing mode, in ms.<br>Note: This parameter will be changed automatically when setting the baud rate.<br>If you want to change the packing interval, please setthebaud rate first and hen change it.When the baud rate = 600, num=250ms<br>num=5ms when baud rate>= 20000<br>When 600< baud rate is<200 00, num=1000/baud rate *10*10, num is an integer | |

### 4.2.27. AT+UARTTL

| Items | Description | Example |
|---|---|---|
| Function | Set/query serial port package length | |



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| | | |
|---|---|---|
| Query | AT+UARTTL<CR><br><CR><LF>+OK=<len><CR><LF> | |
| Set | AT+UARTTL=<len><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | len:serial port package length, range: 3-1024. | |

## 4.2.28. AT+SOCKATON

| Items | Description | Example |
|---|---|---|
| Function | Set/query serial port client no data reconnect time | |
| Query | AT+SOCKATON<CR><br><CR><LF>+OK=<time><CR><LF> | |
| Set | AT+SOCKATON=<time><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | AT+SOCKATON=<time><CR><br><CR><LF>+OK<CR><LF> | |

## 4.2.29. AT+HEARTBTEN

| Items | Description | Example |
|---|---|---|
| Function | Enable/Disable Serial Heartbeat Package Function | |
| Query | AT+HEARTBTEN<CR><br><CR><LF>+OK=<type><CR><LF> | |
| Set | AT+HEARTBTEN=<type><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | type: heartbeat packet type<br>OFF: Turn off the heartbeat packet<br>COM: Serial heartbeat packet<br>NET: network heartbeat packet | |

## 4.2.30. AT+HEARTBDT

| Items | Description | Example |
|---|---|---|
| Function | Set/query serial heartbeat packet content | |
| Query | AT+HEARTBDT<CR><br><CR><LF>+OK=<data><CR><LF> | |
| Set | AT+HEARTBDT=<data><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | data:Serial port 0 Heartbeat packet content, ASCII code supported(Chinese not supported) | |

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### 4.2.31. AT+HEARTBTT

| Items | Description | Example |
|---|---|---|
| Function | Set/query serial heartbeat packet interval | |
| Query | AT+HEARTBTT<CR><br><CR><LF>+OK=<time><CR><LF> | |
| Set | AT+HEARTBTT=<time><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | time:serial 0 heartbeat packet interval time, range: 1-65535 | |

### 4.2.32. AT+WKMOD

| Items | Description | Example |
|---|---|---|
| Function | Set/query corresponding Socket working mode | |
| Query | AT+WKMOD<CR><br><CR><LF>+OK=<mode><CR><LF> | |
| Set | AT+WKMOD=<mode><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | mode: mode of operation<br>TRANS: corresponding transmission mode<br>HTPC:HTTPD Client Mode | |

### 4.2.33. AT+SOCKA

| Items | Description | Example |
|---|---|---|
| Function | Set/query network protocol parameter | |
| Query | AT+SOCKA<CR><br><CR><LF>+OK=<protocol, ip, lport, rport><CR><LF> | |
| Set | AT+SOCKA<CR><br><CR><LF>+OK=<protocol, ip, lport ,rport><CR><LF> | |
| Parameters | protocol: protocol type,<br>TCPS: TCP server<br>TCPC: TCP client<br>UDPS: UDP server<br>UDPC: UDP client<br>IP: target IP address, domain name support<br><lport>: Local port, decimal number,less than 65535<br><rport>: Remote port, decimal number,less than 65535<br>Note: When doing Server, only the local port number is displayed; when doing Client, the local port number | |



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| | | |
|---|---|---|
| | and remote port number are displayed. 0 means random local port number,local port number of Socket A and Socket B cannot be the same, except 0 | |

## 4.2.34. AT+SOCKLKA

| Items | Description | Example |
|---|---|---|
| Function | Query whether TCP link has been established | |
| Query | AT+SOCKLKA<CR><br><CR><LF>+OK=<STA><CR><LF> | |
| Set | / | |
| Parameters | STA: TCP link<br>CONNECT: TCP connected<br>DISCONNECTED: TCP not connected | |

## 4.2.35. AT+SOCKDISA

| Items | Description | Example |
|---|---|---|
| Function | Set/query TCP Client mode, link status | |
| Query | AT+SOCKDISA<CR><br><CR><LF>+OK=<STA><CR><LF> | |
| Set | AT+ SOCKDISA=<STA><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | STA. : Set TCP Re-connection Mechanism<br>ON: Allow TCP Client Re-connection<br>OFF: If it is already linked, disconnect the current link and prohibit TCP Client re-connection<br>Note: This command is not saved after setting,and it is automatically reconnected after restarting. Reply "+ OK" immediately after setting, but it does not mean that the link has been disconnected.You can query the link status through AT + SOCKLKA | |

## 4.2.36. AT+SOCKB

| Items | Description | Example |
|---|---|---|
| Function | Set/query SOCKB network protocol parameter format corresponding to UART0 | |
| Query | AT+SOCKB<CR><br><CR><LF>+OK=<protocol,IP,port><CR><LF> | |
| Set | AT+SOCKB=<protocol,IP,port ><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | protocol: protocol type,<br>TCPS: TCP server | |



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| | | |
|---|---|---|
| | TCPC: TCP client<br>UDPS: UDP server<br>UDPC: UDP client<br>IP: target IP address, domain name support<br>port: Listening port of server, decimal number,less than 65535 | |

### 4.2.37. AT+SOCKLKB

| Items | Description | Example |
|---|---|---|
| Function | Query whether TCP link has been established | |
| Query | AT+SOCKLKB<CR><br><CR><LF>+OK=<STA><CR><LF> | |
| Set | / | |
| Parameters | STA: TCP link<br>CONNECT: TCP connected<br>DISCONNECTED: TCP not connected | |

### 4.2.38. AT+SOCKDISB

| Items | Description | Example |
|---|---|---|
| Function | Set/query TCP Client mode, link status | |
| Query | AT+SOCKDISB<CR><br><CR><LF>+OK=<STA><CR><LF> | |
| Set | AT+ SOCKDISB=<STA><CR><br><CR><LF>+OK<CR><LF> | |
| Parameters | STA: Set TCP Re-connection Mechanism<br>ON: Allow TCP Client Re-connection<br>OFF: If it is already linked, disconnect the current link and prohibit TCP Client re-connection<br>Note: This command is not saved after setting,and it is automatically reconnected after restarting. Reply "+ OK" immediately after setting, but it does not mean that the link has been disconnected.You can query the link status through AT + SOCKLKA | |

### 4.2.39. AT+REGENA

| Items | Description | Example |
|---|---|---|
| Function | Set query package mechanism | |

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| | | |
|---|---|---|
| Query | AT+REGENA<CR><br><CR> <LF>+OK=<status, method> <CR> <LF> | |
| Set | AT+REGENA<CR><br><CR>< LF>+OK=<status, method> <CR> <LF> | |
| Parameters | status:<br>ID: Enable the registration package mechanism, registration package is 2 byte ID<br>MAC: Enable registration packet mechanism, registration packet is 6 bytes MAC<br>USR: User-defined registry package<br>CLOUD: set to transparent cloud mode<br>OFF: disable registration package mechanism method<br>EVERY: Each packet is preceded by a registration packet<br>FIRST Only: the first link to the server sends a registration package<br>Note: When disabling the registration package mechanism, send AT+REGENA=OFF< CR>< LF> | |

### 4.2.40. AT+REGID

| Items | Description | Example |
|---|---|---|
| Function | Set query registration package ID | |
| Query | AT+REGID<CR><br><CR> <LF>+OK=<NUM> <CR> <LF> | |
| Set | AT+REGID=<NUM> <CR><br><CR> <LF>+OK <CR> <LF> | |
| Parameters | NUM:0-65535, decimal format,mainly used for the company'sD2D software when registering package selection IDs. | |

### 4.2.41. AT+REGUSR

| Items | Description | Example |
|---|---|---|
| Function | Set user-defined registration package | |
| Query | AT+REGUSR<CR><br><CR> <LF>+OK=<data> <CR> <LF> | |
| Set | AT+REGUSR=<data><CR><br><CR> <LF>+OK <CR> <LF> | |
| Parameters | data: User-defined registration package, upto 32 bytes | |

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### 4.2.42. AT+REGCLOUD

| Items | Description | Example |
|---|---|---|
| Function | Set up query of personal cloud device serial number and password | |
| Query | AT+REGCLOUD<CR><br><CR> <LF>+OK=<name,password> <CR> <LF> | |
| Set | AT+REGCLOUD=<name,password><CR><br><CR> <LF>+OK <CR> <LF> | |
| Parameters | name: User equipment serial number, 20 digits<br>Password: Device password, 8 digits | |

# 5. Contact Us

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