

WiFi Solar Data Stick

USR-S100-WA12

User Manual



V2.0

Be Honest & Do Best

Your Trustworthy Smart Industrial IoT Partner

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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 RS232 serial 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°C-75°C, excellent hardware protection, IP65 protection 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 to 1024 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	

Standards & Frequency	IEEE 802.11b/g/n
Working Mode	AP/STA/AP+STA
Tx power	19.9dBm @ 11b, 1Mbps 19.9dBm @ 11b, 11Mbps 19.0dBm @ 11g, 6Mbps 17.0dBm @ 11g, 54Mbps 18.0dBm @ 11n, HT20, MCS0 16.8dBm @ 11n, HT20, MCS7 17.4dBm @ 11n, HT40, MCS0 16.0dBm @ 11n, HT40, MCS7
Receive sensitivity	-97.9dBm @ 11b, 1Mbps -89.2dBm @ 11b, 11Mbps -92.8dBm @ 11g, 6Mbps -76.3dBm @ 11g, 54Mbps -92.8dBm @ 11n, HT20, MCS0 -74.3dBm @ 11n, HT20, MCS7 -89.8dBm @ 11n, HT40, MCS0 -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 ESD protection: level 2, IEC61000 EFT protection: level 2, IEC61000
Operating temperature	-30°C ~ +75°C
Storage temperature	-40°C ~ +125°C
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

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

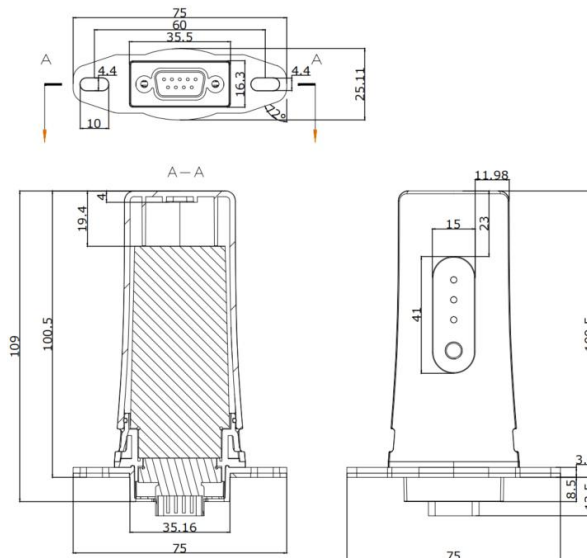
1.3. Indicator status description

Table 1. Indicator Status

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

1.4. Dimensions


Unit: mm



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

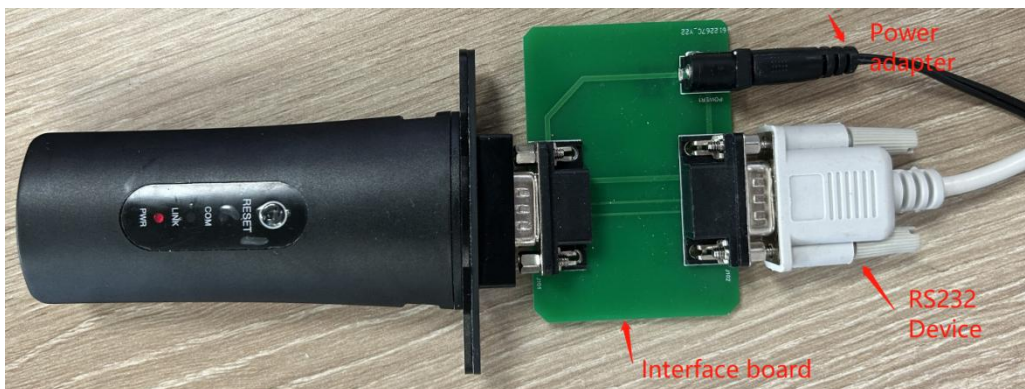
Female-to-female serial cable*1

Interface board*1

PC*1

USR-S100-WA12*1

12V Power Supply*1

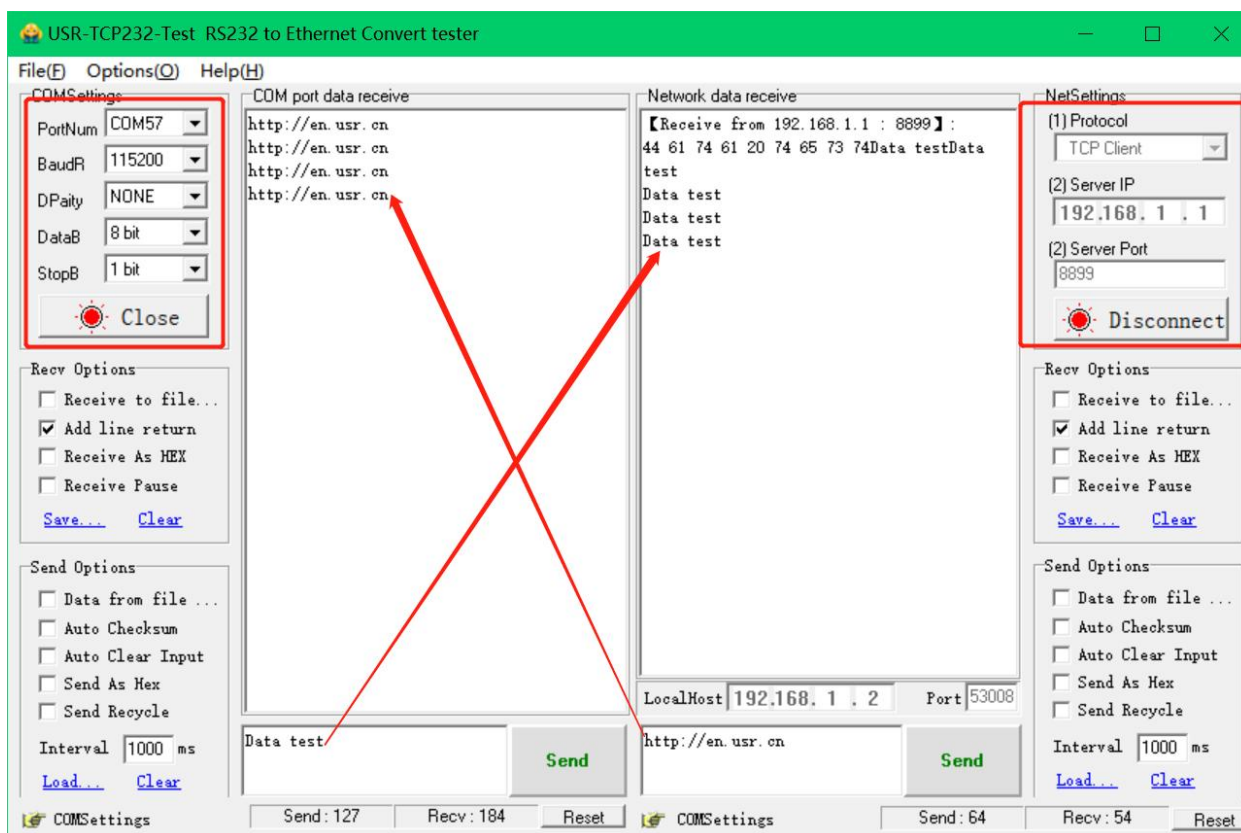
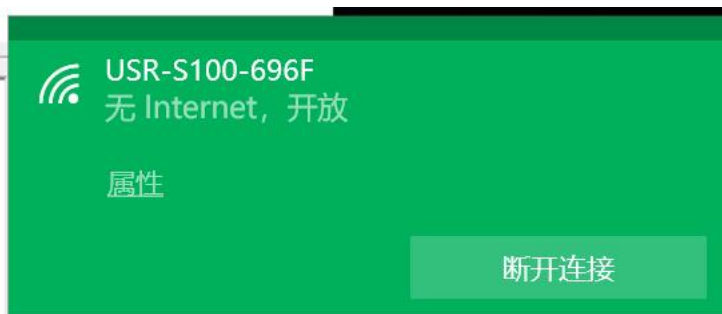


2.1.2. Basic function test

The default parameters:

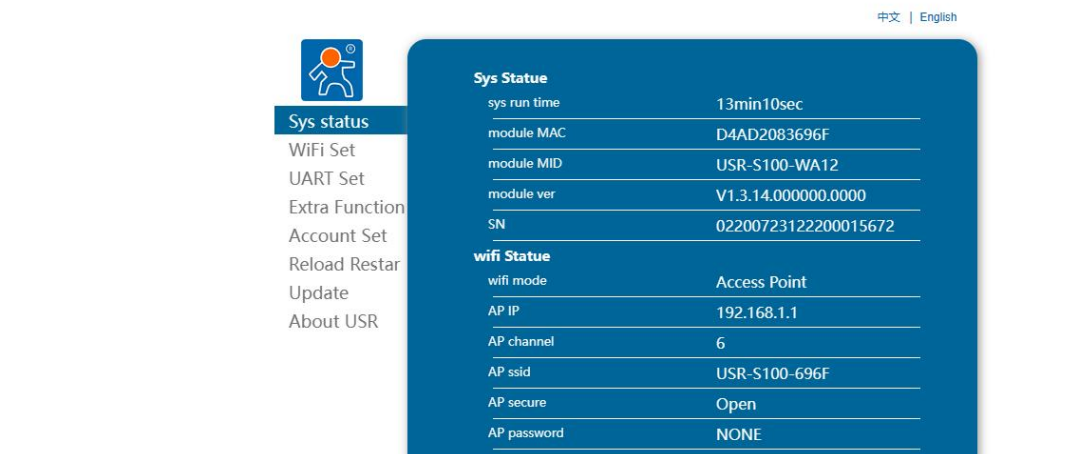
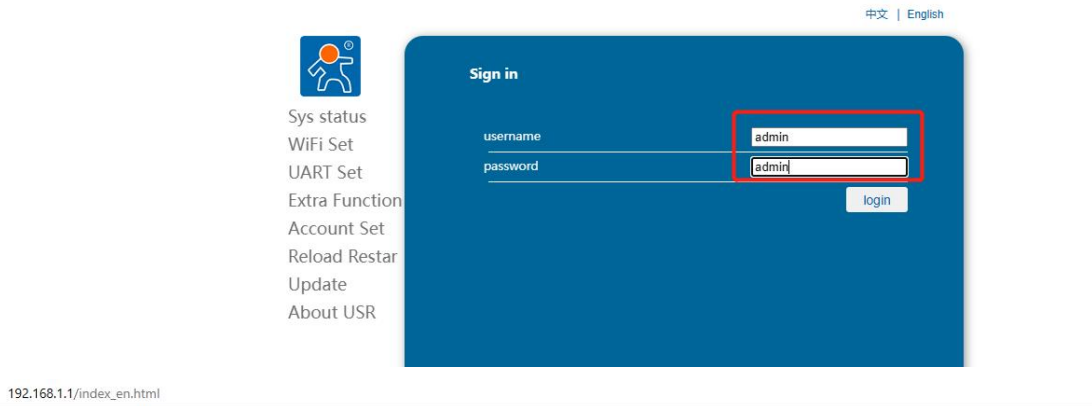
Item	Default Value
SSID	USR-S100-xxxx
Password	Open, none
Serial port	115200,8,1,none
Work mode	TCP, 8899, 192.168.1.1
IP address	192.168.1.1

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.

192.168.1.1/index_en.html



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.

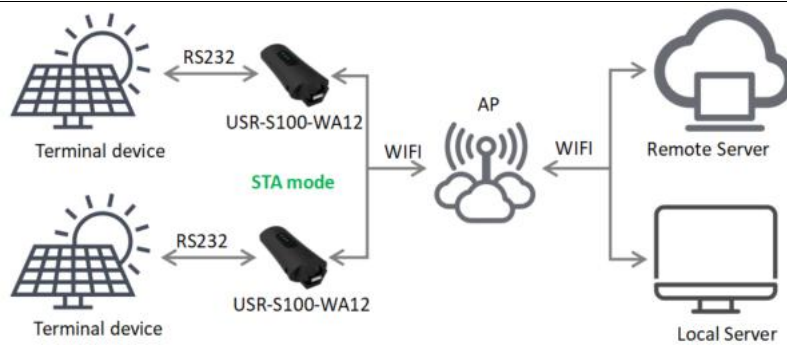


Figure 1. STA networking

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.

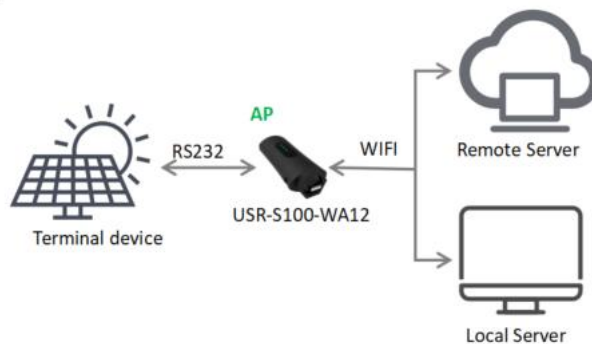


Figure 2. AP mode

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.

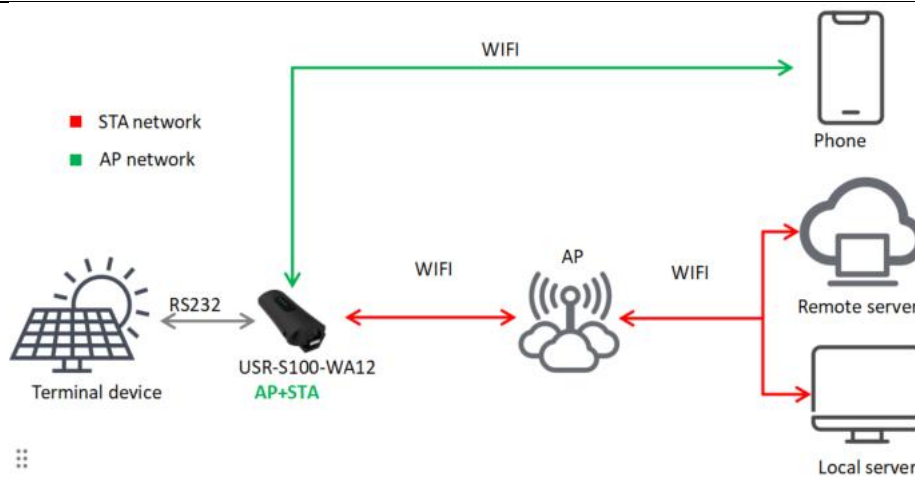


Figure 3. AP+STA mode

<Note>:In AP mode, the device can only support access to one STA device at most. If the encryption password is set, the encryption method defaults to WPA2PSK/WPA2PSK/AES/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

3.1.6. Settings on web page

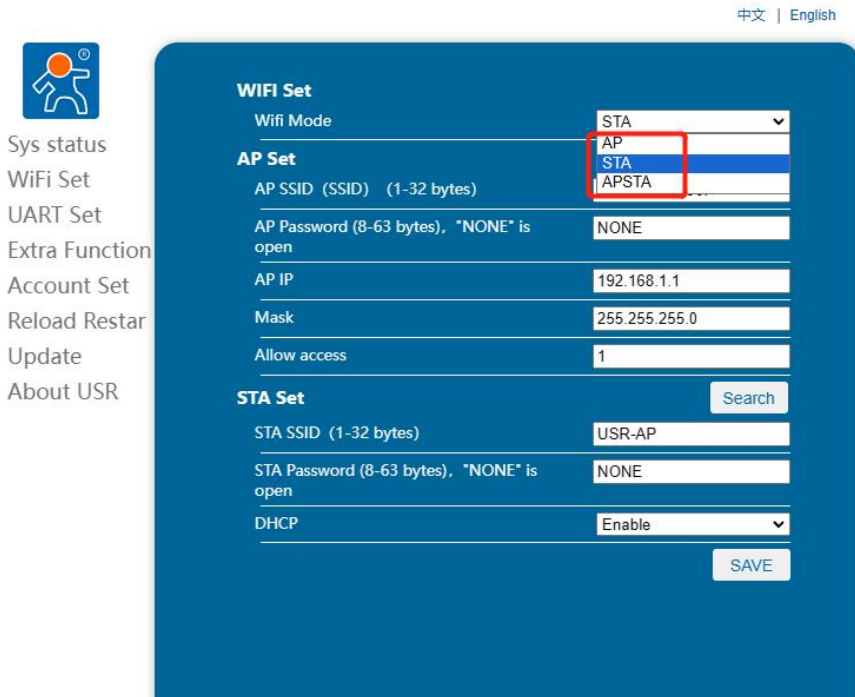
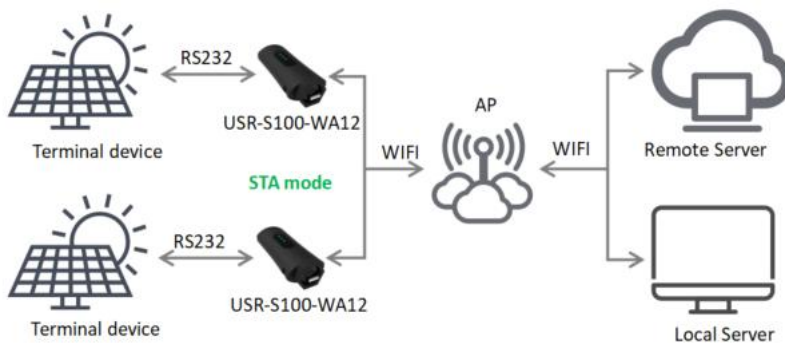


Figure 4. Setting in web page

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.



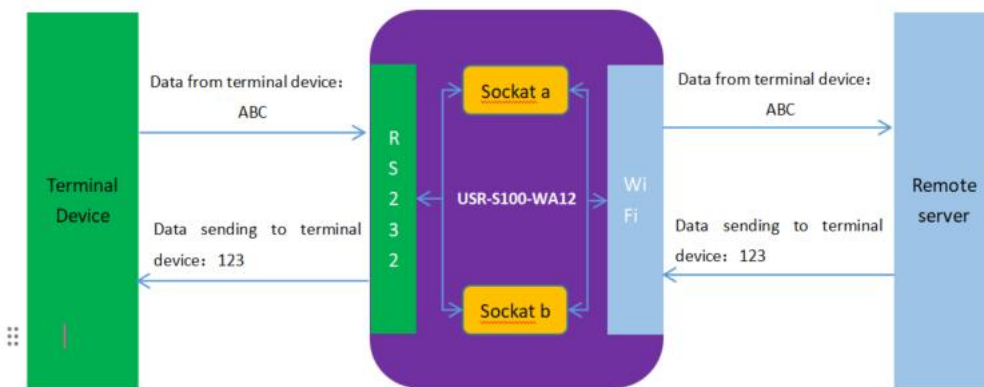


Figure 5. Transparent Transmission Functional Block Diagram

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

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

- Sys status
- WiFi Set
- UART Set
- Extra Function
- Account Set
- Reload Restar
- Update
- About USR

WiFi Set

Wifi Mode STA

AP Set

AP SSID (SSID) (1-32 bytes) USR-S100-696F

AP Password (8-63 bytes), "NONE" is open NONE

AP IP 192.168.1.1

Mask 255.255.255.0

Allow access 1

STA Set Search

STA SSID (1-32 bytes) USR-AP

STA Password (8-63 bytes), "NONE" is open NONE

DHCP Enable

SAVE

English

- Sys status
- WiFi Set
- UART Set
- Extra Function
- Account Set
- Reload Restar
- Update
- About USR

>> UART SET

baud rate (300-3000000 bps) 115200

bits of data 8

check bit None

stop bit 1

Auto Pack ON

packet len (3-1024byte) 1024

SAVE

>> All Socket Set

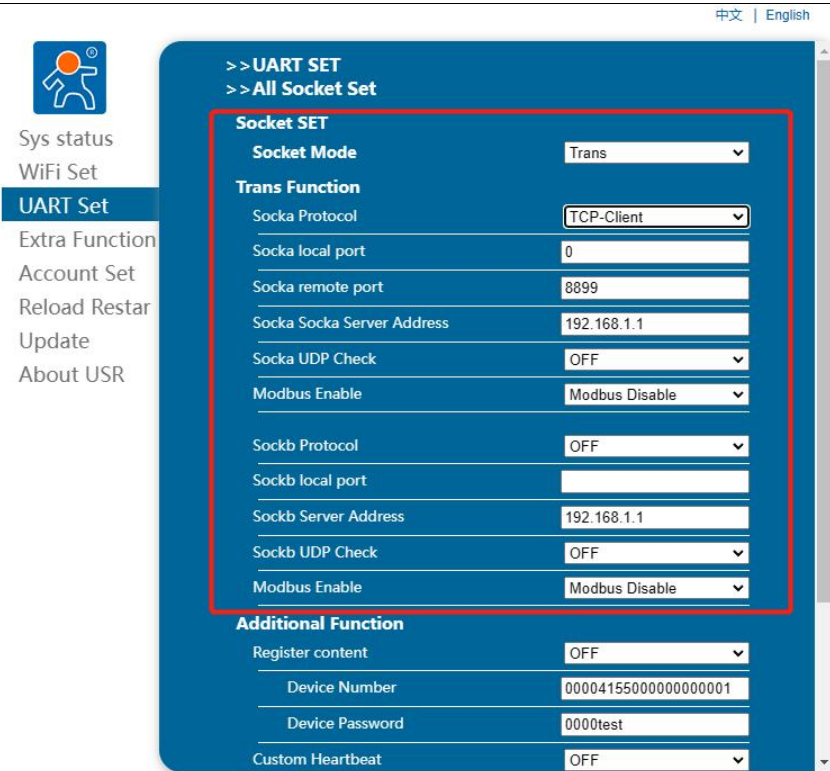


Figure 6. Socket settings on web page

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.

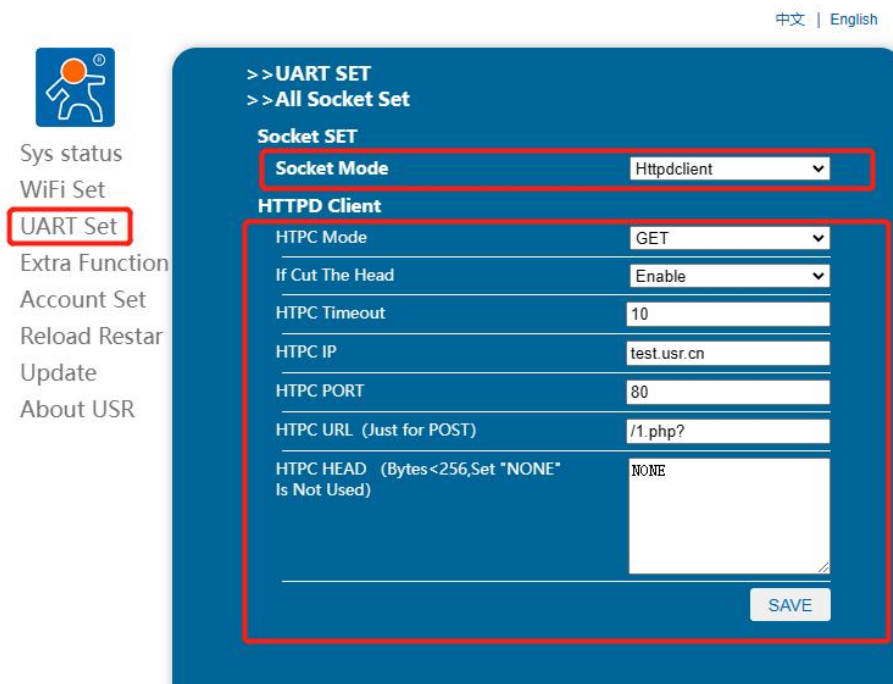
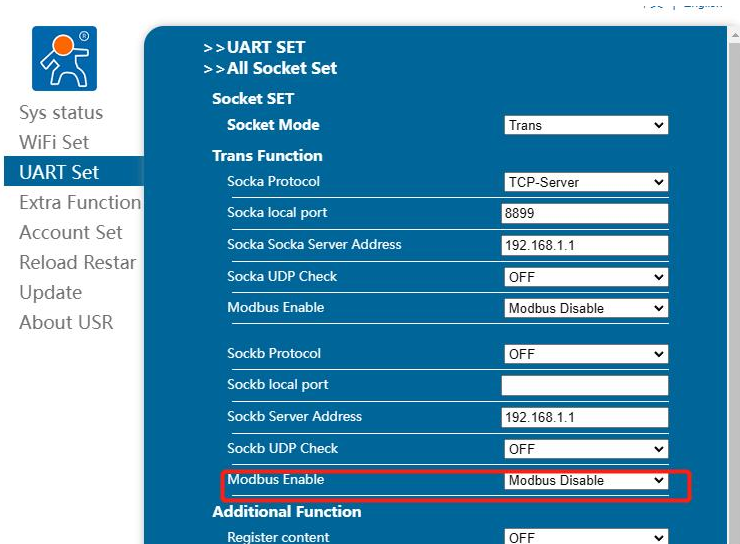


Figure 7. HTTPD settings on web page

3.2.3. Modbus RTU/TCP conversion

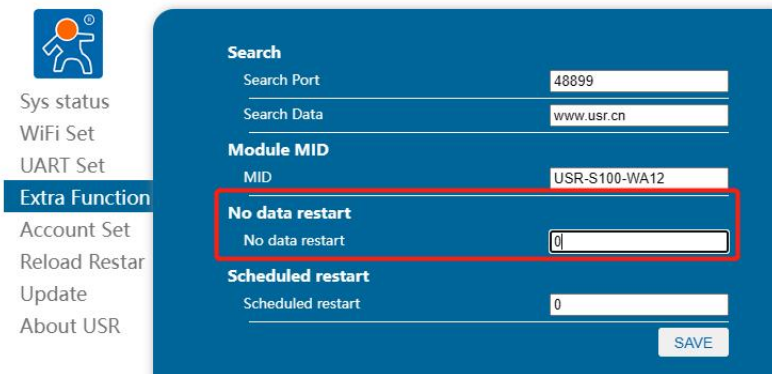
Modbus TCP to Modbus RTU in TCP client mode is supported (Modbus ASCII is not supported); the network parameters of the module should correspond to the network parameters of the application software; TCP server corresponds to TCP client. The port should also be configured to the same, and the mode of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



3.3. General function

3.3.1. No data restart function

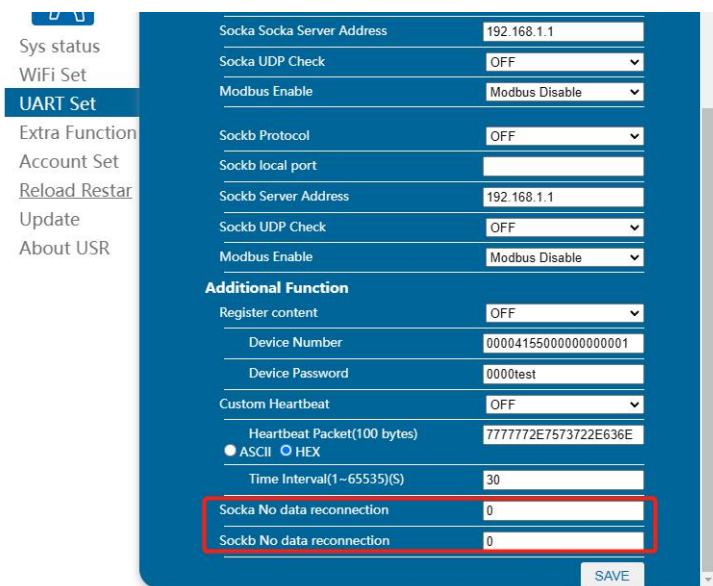
The function of no data restart is mainly used to ensure the long-term stable operation of the data stick. When the WIFI terminal does not receive network data for a long time, the data stick will restart within a certain time, so as to avoid the abnormal situation affecting the communication. The time 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

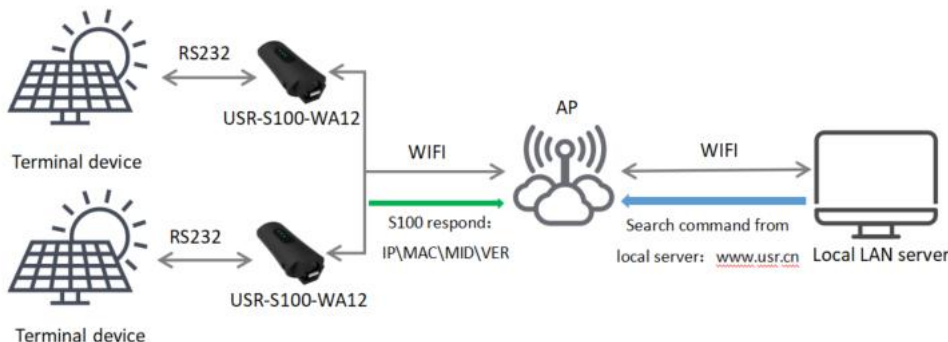
The no-data re-connection function is mainly used to ensure the validity of the USR-S100 Client

connection. When the USR-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 to 20 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

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

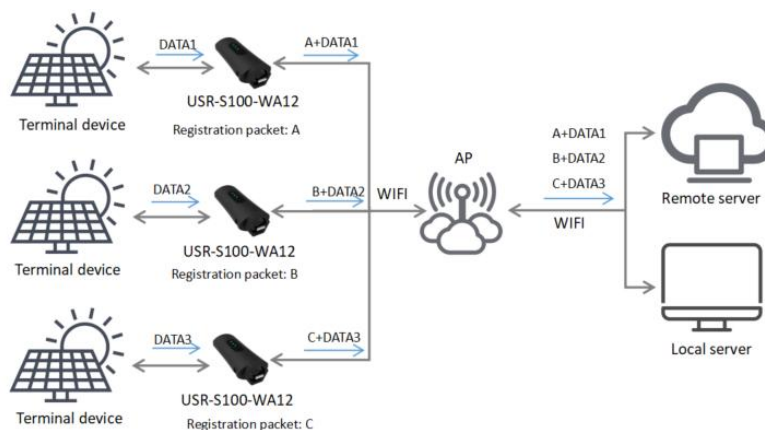
When the device works in TCP Client or UDP Client mode, the user can turn on the registration packet mechanism to realize the server to distinguish the data source and realize the data monitoring of different devices. The registration package is divided into MAC, ID, user-defined and transparent cloud. MAC is 6 bytes, ID is 1-65535, 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.

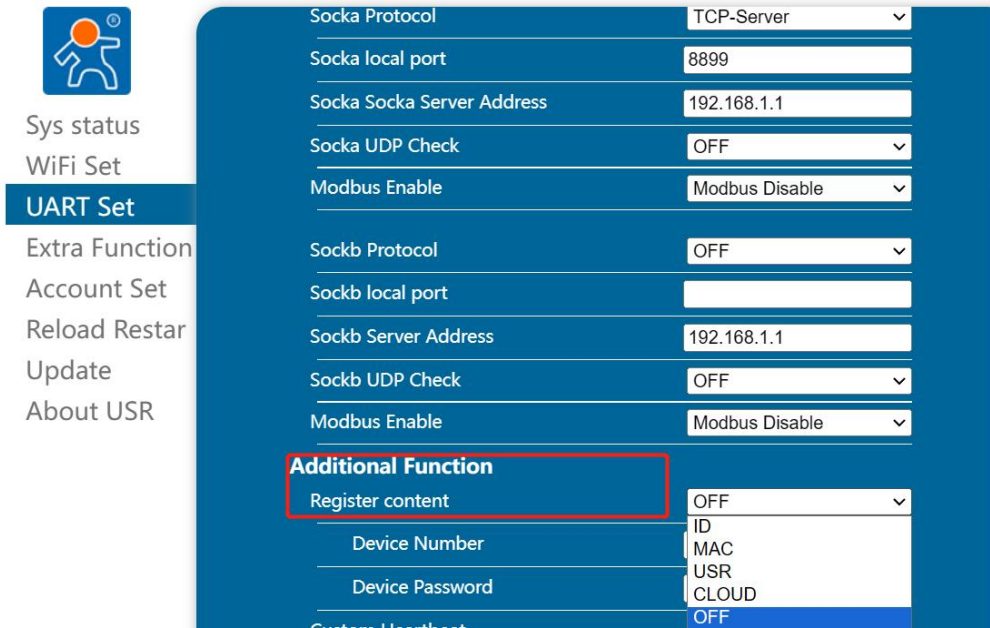
CLOUD on device: Support access to cloud platform, must work under TCP Client mode.



The relevant command settings are as follows:

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

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

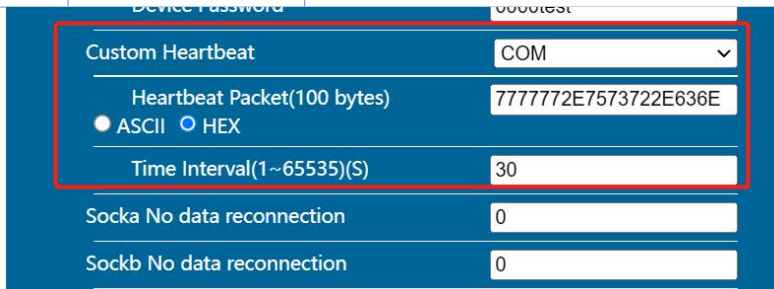


3.3.5. Heartbeat packet

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



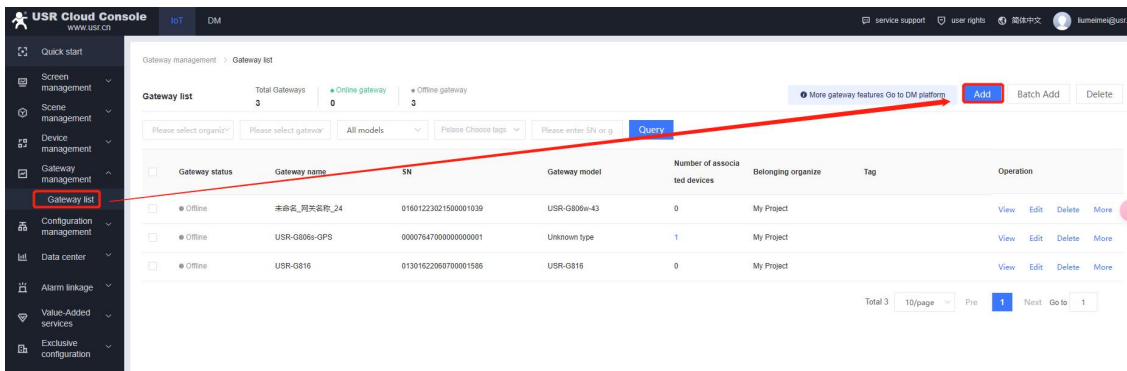
3.3.6. Connect to PUSR cloud

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

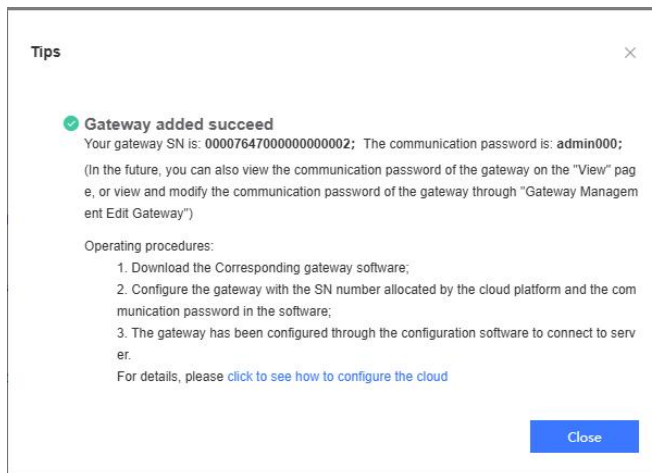
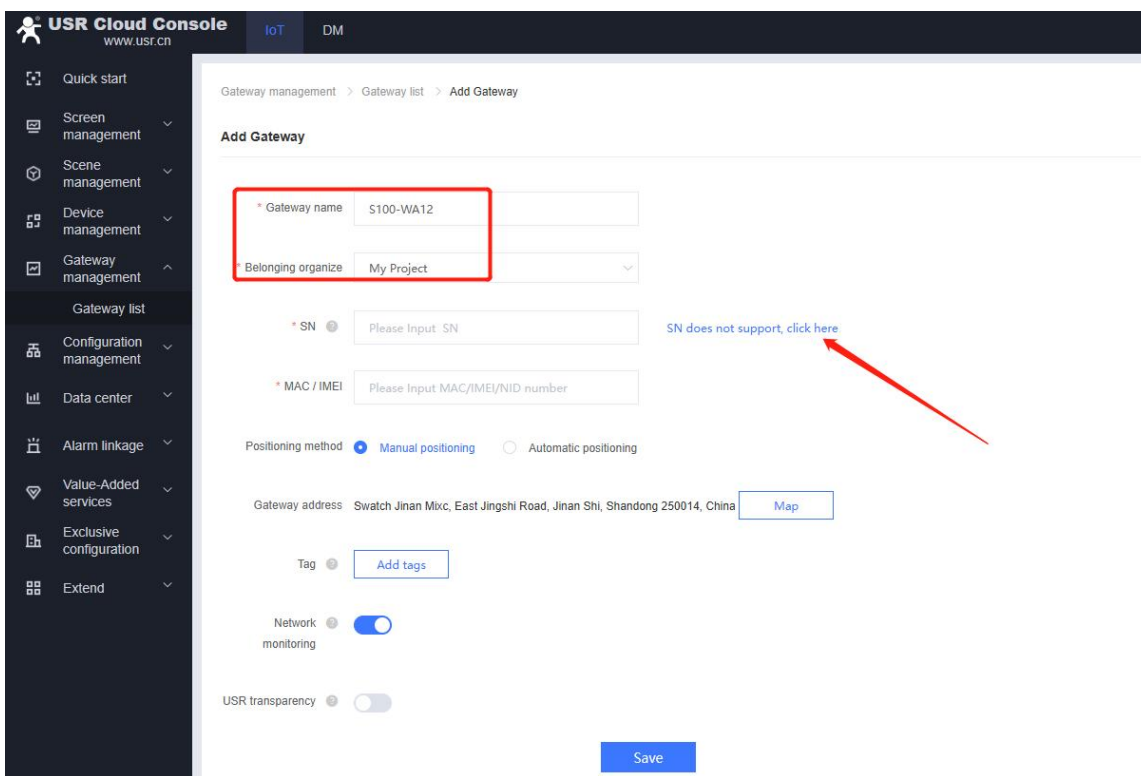
registration package content settings.

PUSR cloud address: <https://account.usriot.com/>

1> Add device

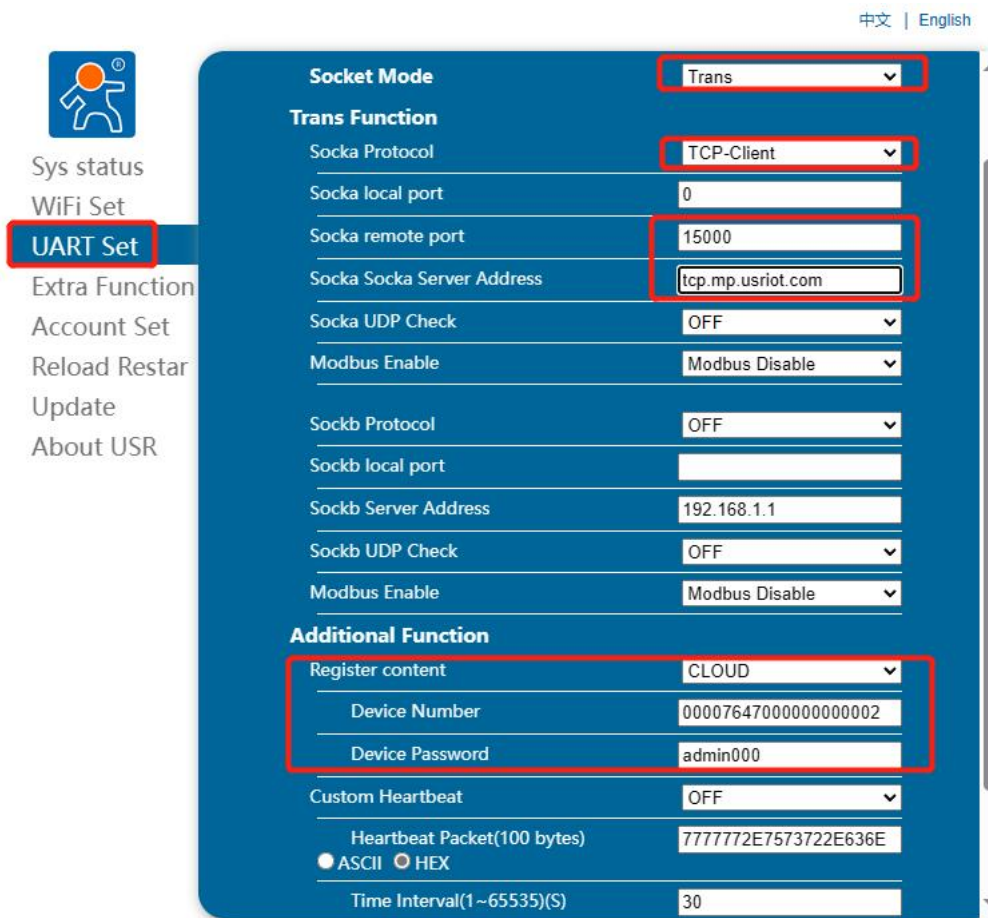


2> Edit device information, click "SN does not support, click here"



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

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.

Gateway status	Gateway name	SN	Gateway model	Number of as sociated devi ces	Belonging organi zation	Operation
Online	S100-WA12	00007647000000000002	Unknown type	0	My Project	View Edit
Offline	未命名_网关名称_24	01601223021500001039	USR-G806w-43	0	My Project	View Edit

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 for 1-3 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.

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.

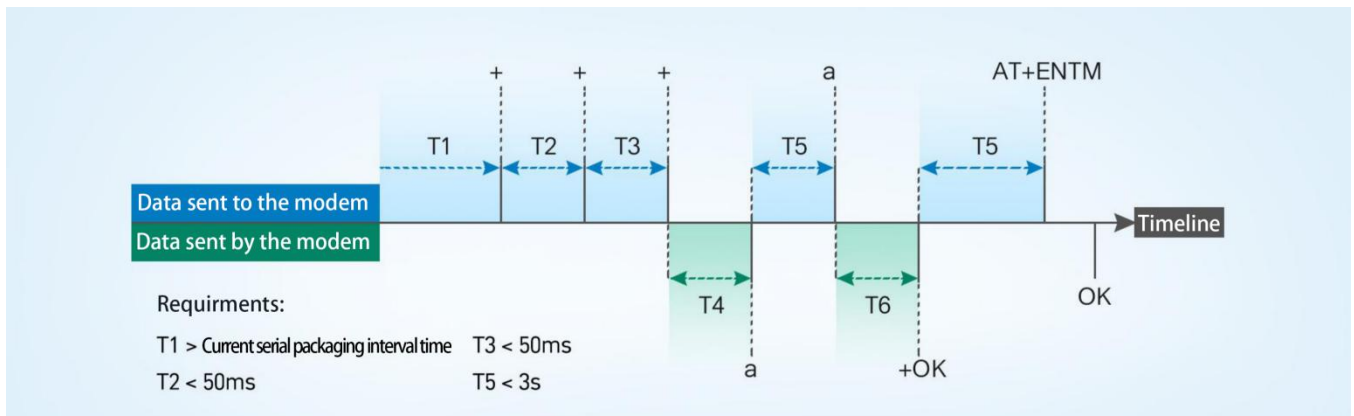
4. AT Commands

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



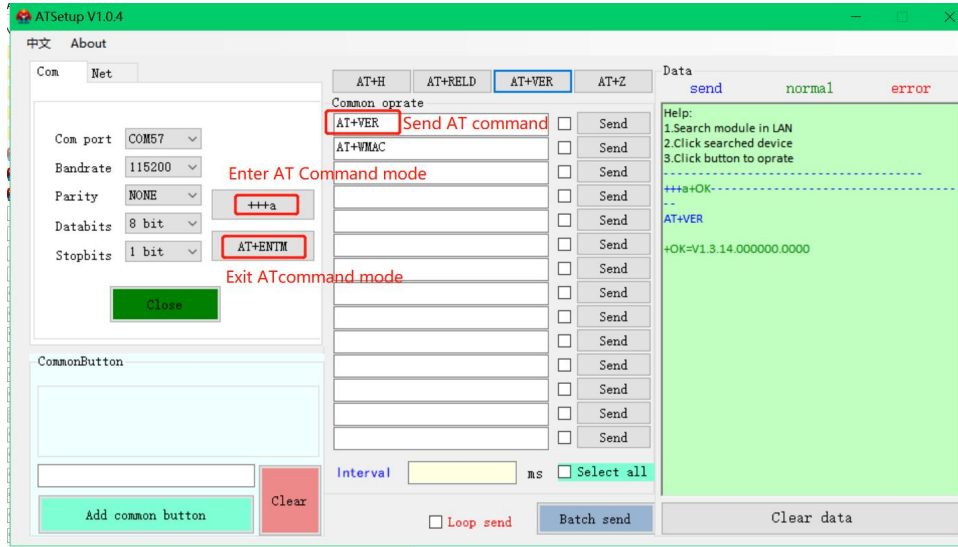
➤Enter AT command mode:

- 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:

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

		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

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> <CR>+OK <CR> <LF>	at+entm +OK
Set	/	
Parameters	/	

4.2.2. AT+E

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

4.2.3. AT+Z

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

4.2.4. AT+CFGTF

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

4.2.6. AT+MAC

Items	Description	Example
Function	Query device MAC	
Query	AT+MAC<CR> <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> <CR><LF>+OK=port,keywords<CR><LF>	
Set	AT+ SEARCH =<port,keywords><CR> <CR><LF>+OK<CR><LF>	

Parameters	port: Search port of the device, default: 48899 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> <CR><LF>+OK=MID<CR><LF>	
Set	AT+MID=<MID><CR> <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 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> <CR><LF>+OK=language<CR><LF>	
Set	AT+PLANG=<language><CR> <CR><LF>+OK<CR><LF>	
Parameters	language: CN/EN, CN: indicates that the default Chinese display is displayed when the webpage is logged in; 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> <CR><LF>+OK=username,password<CR><LF>	
Set	AT+WEBU=<username,password><CR> <CR><LF>+OK<CR><LF>	
Parameters	username: username, length must be 5 characters, not blank; password: password, length must be 5	

4.2.11. AT+VER

Items	Description	Example
Function	Query device firmware version	
Query	AT+VER<CR> <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> <CR><LF>+OK<CR><LF>	
Parameters		

4.2.13. AT+WSCAN

Items	Description	Example
Function	Device Search AP	
Query	AT+WSCAN<CR> +ok=<ap_site><CR><LF><CR><LF>	
Set	/	
Parameters	ap_site: Searched APs 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> <CR><LF>+OK= time<CR> <LF>	
Set	AT+RSTIM= time<CR> <CR><LF>+OK<CR> <LF>	
Parameters	time: the time of no data restart, ranging from 0, 60-65535, when set to 0 means that the function is turned off.	

4.2.15. AT+SMTLK

Items	Description	Example
Function	Enter simplelink mode	
Query	/	
Set	AT+SMTLK<CR> <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> <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> <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> <CR><LF>+OK=<status><CR><LF>	
Set	AT+WMODE =< status ><CR> <CR><LF>+OK<CR><LF>	
Parameters	status: AP: Device operates in APmode STA: Device operates in STA mode APSTA: works in AP+STA	

4.2.19. AT+WSTA

Items	Description	Example
Function	Set/query SSID and password of associated AP	
Query	AT+WSTA<CR> <CR> <LF>+OK=<AP's ssid> <key> <CR> <LF>	
Set	AT+ WSTA =<AP's ssid ><key><CR> <CR><LF>+OK<CR><LF>	
Parameters	AP's ssid: SSID of AP (up to 32bytes); 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/query IP (DHCP/STATIC) acquired by equipment	
Query	AT+WANN<CR> <CR> <LF>+OK= mode,address,mask,gateway,dns<CR> <LF>	
Set	AT+WANN=<mode,address,mask,gateway,dns ><CR> <CR><LF>+OK<CR><LF>	
Parameters	mode:Network IP mode STATIC: Static IP DHCP: dynamic IP (address,mask,gateway,DNS,parameters omitted) address:IP address mask: subnet mask gateway:gateway address dns:DNS server	

4.2.21. AT+WLSK

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

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

4.2.22. AT+WAP

Items	Description	Example
Function	Set/query Wi-Fi configuration parameters of AP	
Query	AT+WAP<CR> <CR><LF>+OK=<ssid,key><CR><LF>	
Set	AT+ WAP =<ssid,key><CR> <CR><LF>+OK<CR><LF>	
Parameters	ssid: SSID in AP mode; 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> <CR><LF>+OK=<NUM><CR><LF>	
Set	AT+CHANNEL=<NUM><CR> <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> <CR><LF>+OK=<IP,MASK><CR><LF>	
Set	AT+ LANN =<IP,MASK><CR> <CR><LF>+OK<CR><LF>	
Parameters	IP: IP address MASK: sub-net mask	

4.2.25. AT+UART

Items	Description	Example
Function	Set/query serial port interface parameter	
Query	AT+UART<CR> <CR> LF>+OK= <baubrate,data_bits,stop_bit,parity,flowctrl><CR> <LF>	
Set	AT+UART=<baudrate,data_bits,stop_bit,parity,flowctrl><CR> <CR><LF>+OK<CR><LF>	
Parameters	baud rate: 300-3000000 bit/s, data_bits: 5, 6, 7, 8 stop_bits: 1, 2 parity:NONE, EVEN, ODD Flowctrl: Hardware Flow Control (CTS RTS) NFC: no hardware flow control 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> <CR><LF>+OK=<NUM><CR><LF>	
Set	AT+UARTTE=<num><CR> <CR><LF>+OK<CR><LF>	
Parameters	num: 5-255: The time interval between two adjacent bytes in free framing mode, in ms. Note: This parameter will be changed automatically when setting the baud rate. If you want to change the packing interval, please set the baud rate first and then change it. When the baud rate = 600, num=250ms num=5ms when baud rate >= 20000 When 600 < baud rate is < 20000, 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	

Query	AT+UARTTL<CR> <CR><LF>+OK=<len><CR><LF>	
Set	AT+UARTTL=<len><CR> <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> <CR><LF>+OK=<time><CR><LF>	
Set	AT+SOCKATON=<time><CR> <CR><LF>+OK<CR><LF>	
Parameters	AT+SOCKATON=<time><CR> <CR><LF>+OK<CR><LF>	

4.2.29. AT+HEARTBTEN

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

4.2.30. AT+HEARTBDT

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

4.2.31. AT+HEARTBTT

Items	Description	Example
Function	Set/query serial heartbeat packet interval	
Query	AT+HEARTBTT<CR> <CR><LF>+OK=<time><CR><LF>	
Set	AT+HEARTBTT=<time><CR> <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> <CR><LF>+OK=<mode><CR><LF>	
Set	AT+WKMOD=<mode><CR> <CR><LF>+OK<CR><LF>	
Parameters	mode: mode of operation TRANS: corresponding transmission mode HTPC:HTTPD Client Mode	

4.2.33. AT+SOCKA

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

	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> <CR><LF>+OK=<STA><CR><LF>	
Set	/	
Parameters	STA: TCP link CONNECT: TCP connected DISCONNECTED: TCP not connected	

4.2.35. AT+SOCKDISA

Items	Description	Example
Function	Set/query TCP Client mode, link status	
Query	AT+SOCKDISA<CR> <CR><LF>+OK=<STA><CR><LF>	
Set	AT+ SOCKDISA=<STA><CR> <CR><LF>+OK<CR><LF>	
Parameters	STA. : Set TCP Re-connection Mechanism ON: Allow TCP Client Re-connection OFF: If it is already linked, disconnect the current link and prohibit TCP Client re-connection 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> <CR><LF>+OK=<protocol,IP,port><CR><LF>	
Set	AT+SOCKB=<protocol,IP,port ><CR> <CR><LF>+OK<CR><LF>	
Parameters	protocol: protocol type, TCPS: TCP server	

	TCPC: TCP client UDPS: UDP server UDPC: UDP client IP: target IP address, domain name support 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> <CR><LF>+OK=<STA><CR><LF>	
Set	/	
Parameters	STA: TCP link CONNECT: TCP connected DISCONNECTED: TCP not connected	

4.2.38. AT+SOCKDISB

Items	Description	Example
Function	Set/query TCP Client mode, link status	
Query	AT+SOCKDISB<CR> <CR><LF>+OK=<STA><CR><LF>	
Set	AT+ SOCKDISB=<STA><CR> <CR><LF>+OK<CR><LF>	
Parameters	STA: Set TCP Re-connection Mechanism ON: Allow TCP Client Re-connection OFF: If it is already linked, disconnect the current link and prohibit TCP Client re-connection 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	

Query	AT+REGENA<CR> <CR> <LF>+OK=<status, method> <CR> <LF>	
Set	AT+REGENA<CR> <CR>< LF>+OK=<status, method> <CR> <LF>	
Parameters	status: ID: Enable the registration package mechanism, registration package is 2 byte ID MAC: Enable registration packet mechanism, registration packet is 6 bytes MAC USR: User-defined registry package CLOUD: set to transparent cloud mode OFF: disable registration package mechanism method EVERY: Each packet is preceded by a registration packet FIRST Only: the first link to the server sends a registration package 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> <CR> <LF>+OK=<NUM> <CR> <LF>	
Set	AT+REGID=<NUM> <CR> <CR> <LF>+OK <CR> <LF>	
Parameters	NUM:0-65535, decimal format, mainly used for the company's D2D software when registering package selection IDs.	

4.2.41. AT+REGUSR

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

4.2.42. AT+REGCLOUD

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

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