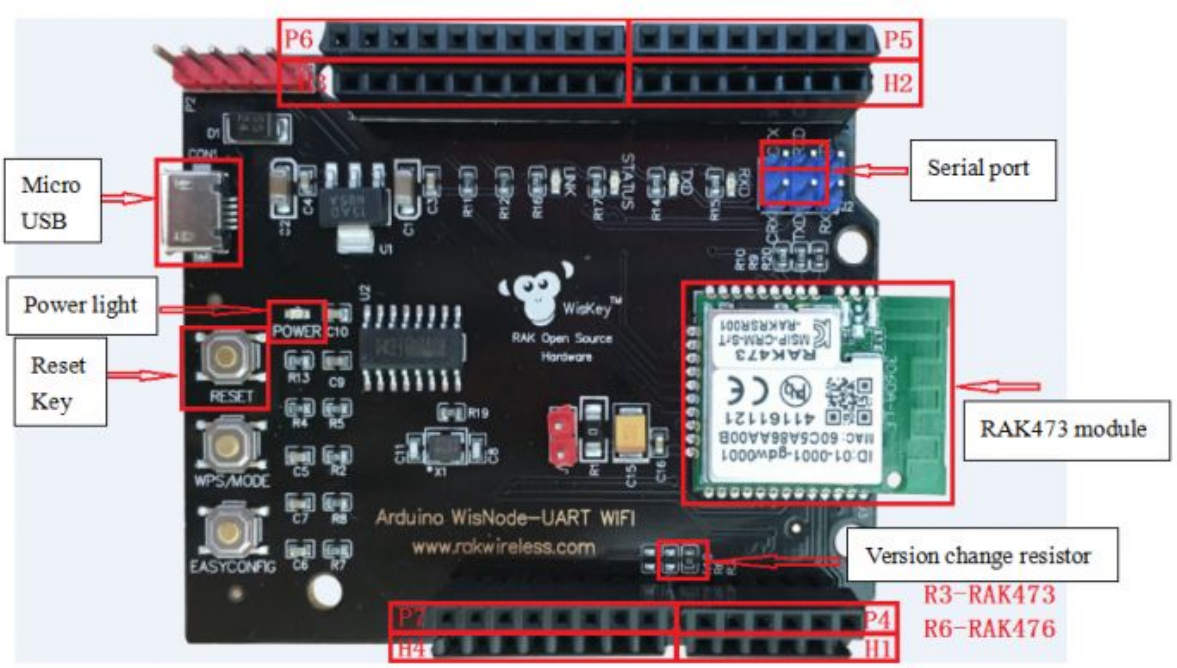
WisNode-UART Wifi Modül

WisNode-UART

1.Product introduction

Arduino WisNode-UART WIFI EVB is based on the RAK473(476) module design of an Arduino-compatible development board,Can be plugged into the Arduino EVB,it also can be used as a base plate plug other Arduino series peripherals.This document will be through a detailed description make developers to quickly grasp RAK473(476) WiFi module. For example, through the PC(C) serial debugging assistant test module’s AT command function, Establishment of Socket communications, Use the web or mobile phone APP to configure the module to the

designated router and so on.



Slots Usage：

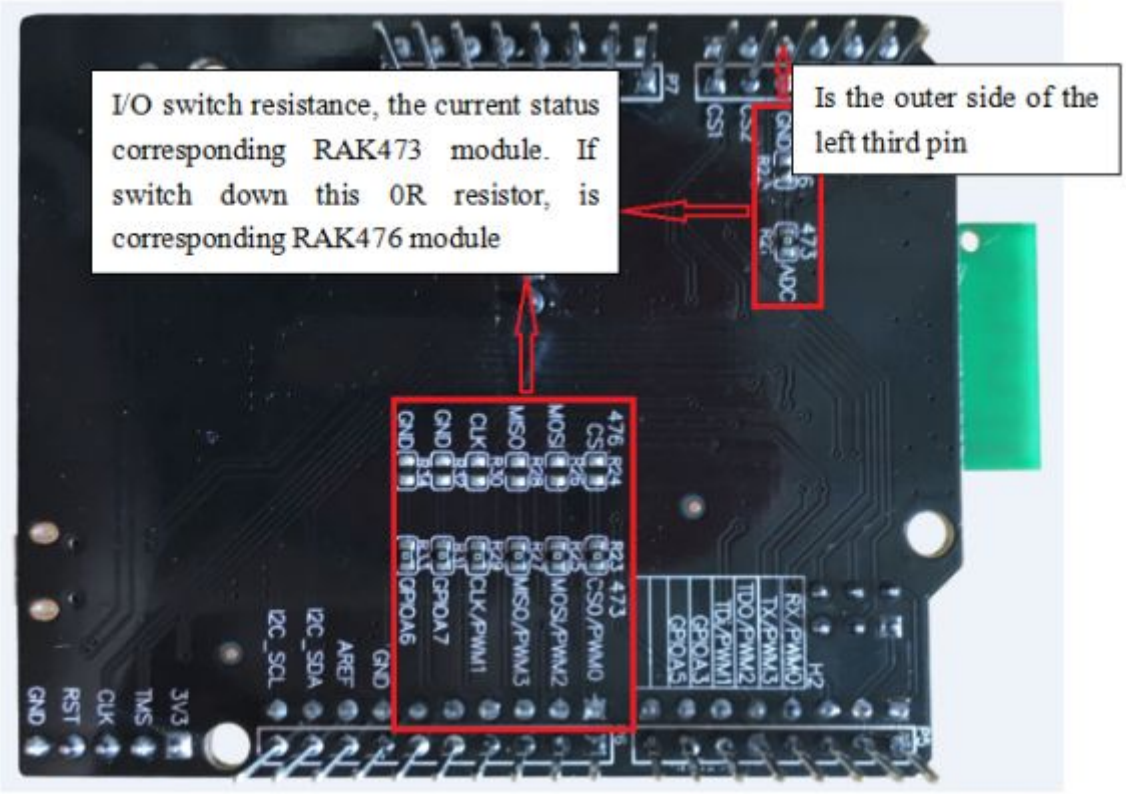
1.When WisNode-UART WIFI EVB used independently or as a host：Using H1，H2，H3，H4;

2.When WisNode-UART WIFI EVB as a slave or plugged into other Arduino board：Using P4，P5，P6，P7.

Serial Port connect methods：

1.When WisNode-UART WIFI EVB used independently or as a host：RXD connect to CTX,TXD connect to CRX;

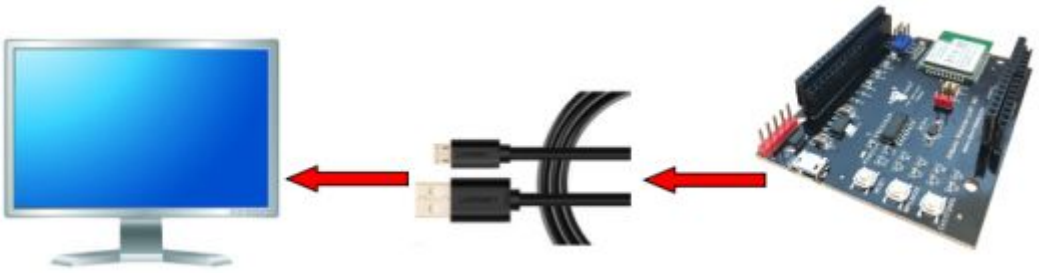
2.When WisNode-UART WIFI EVB as a slave or plugged into other Arduino board：RXD connect to TX，TXD connect to RX.



2.Use Introduction

2.1 Condition preparation

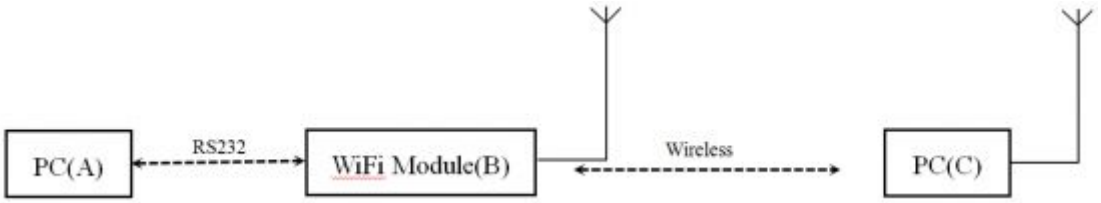
Connect the evaluation board to the computer via the Micro USB line, Through the computer serial port tool to send commands to the module.As shown in the following figure：



2.2 Creating AP and Establish TCP_SEVER

This part gives an example process of AT command, set the module to AP mode, and establish TCP Sever, PC(C) connects to the module AP, and create TCP Client to communicate with the

module.



AT command flow is as follows:
Starting-up returns
57 65 6C 63 6F 6D 65 20 74 6F 20 52 41 4B 34 37 33 0D 0A

Set channel
Send : at+channel=1\r\n
Return : 4F 4B 0D 0A

Set AP psk
Send : at+psk=rakwireless\r\n
Return : 4F 4B 0D 0A

Set module to connect the wireless of rak_ap
Send : at+ap=rak_ap\r\n
return : 4F 4B 0D 0A

Set module static IP is 192.168.9.4
Send : at+ipstatic=192.168.9.4,255.255.255.0,192.168.9.1,0,0\r\n
Return : 4F 4B 0D 0A

Setting the module to automatically set the DHCP SEVER parameter
Send : at+ipdhcp=1\r\n
Return : 4F 4B 0D 0A

Module create a TCP Server with local port of 25000
Send : at+ltcp=25000\r\n
Return : 4F 4B 08 0D 0A

When PC connected the module’s ap, module return :
61 74 2B 72 65 63 76 5F 64 61 74 61 3D 82 0D 0A

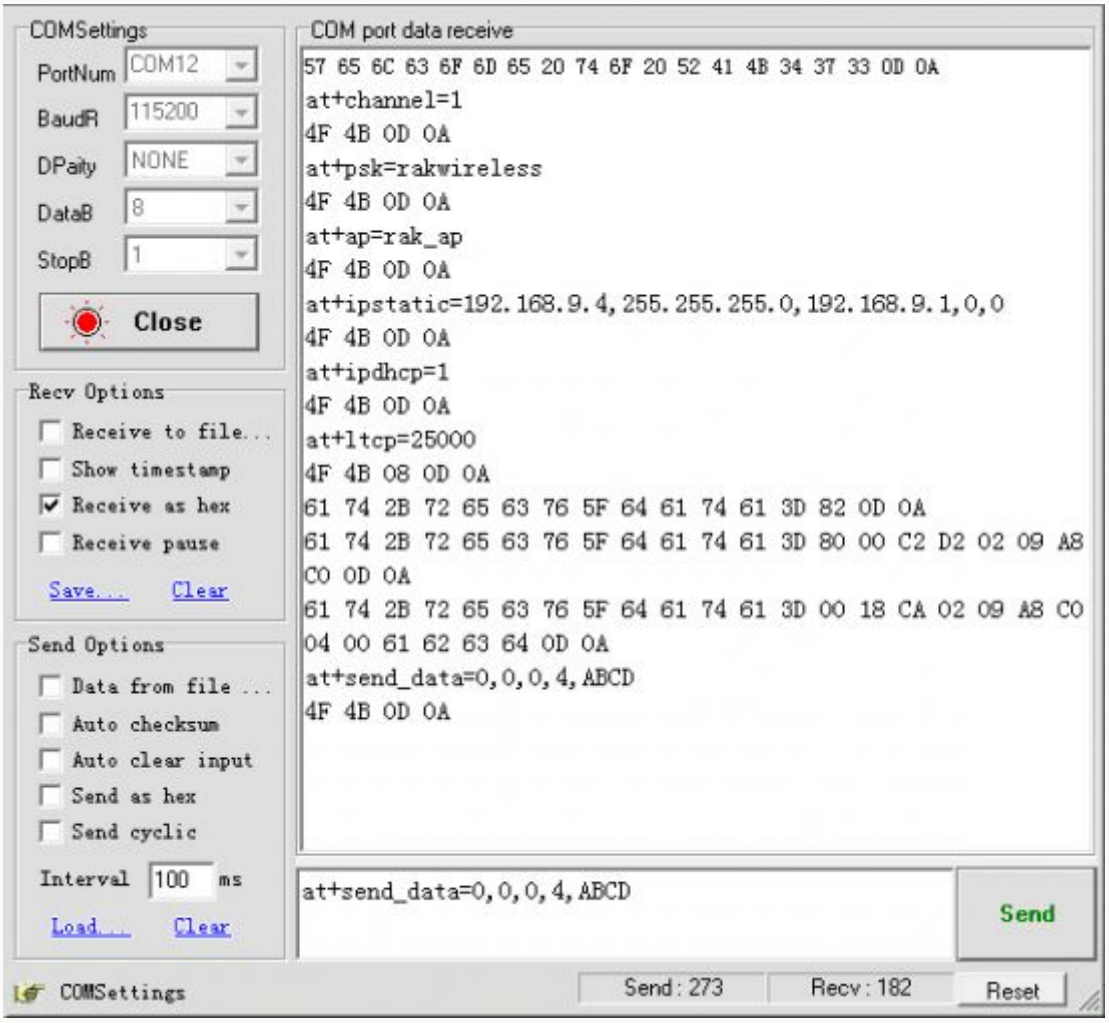
Use PC create a TCP Client ,IP address is 192.168.9.4, target port is 25000 and
connect to the TCP Server created by WiFi module, module return :
61 74 2B 72 65 63 76 5F 64 61 74 61 3D 80 00 18 CA 02 09 A8 C0 0D 0A

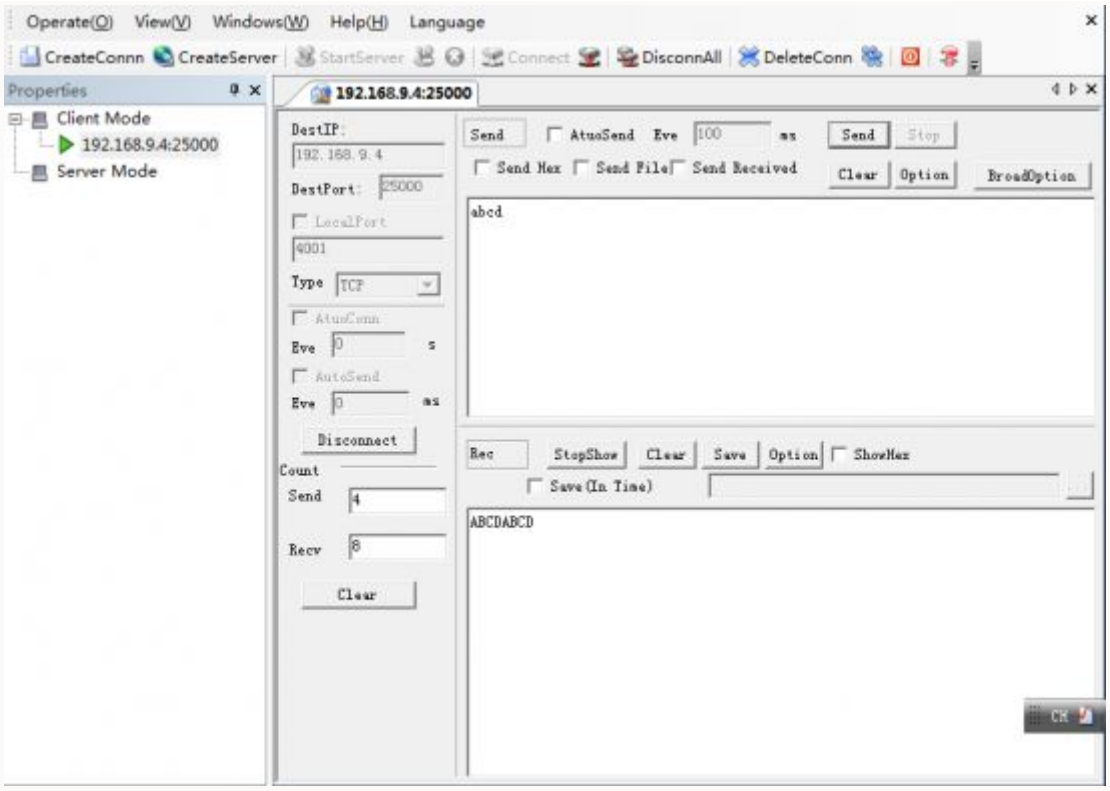
TCP Client send a string of ”abcd” to TCP Sever, module return :
61 74 2B 72 65 63 76 5F 64 61 74 61 3D 00 18 CA 02 09 A8 C0 04 00 61 62 63 64 0D 0A

TCP Sever send a string of “ABCD” to TCP Client

Send : at+send_data=0,49729,192.168.9.2,4,ABCD\r\n

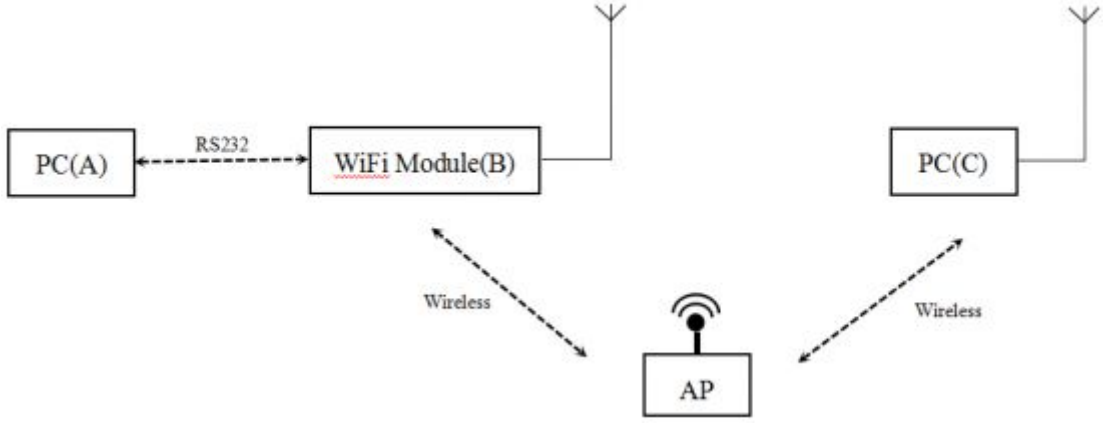
Return : 4F 4B 0D 0A





2.3 Module connected to Router（STA）and Establish TCP Client

This part gives a sample process of AT command, connect the module with the router with SSID of RAK, PSK of rakwireless, then establish TCP sever. PC (C) establishes TCP Client and connects to the module terminal TCP SEVER to transmit data.




```
AT command flow is as follows：
Starting-up returns
  57 65 6C 63 6F 6D 65 20 74 6F 20 52 41 4B 34 37 33 0D 0A

Scan wireless network with SSID of  rak_sta in all channels
  Send：at+scan=0,rak_sta\r\n
  Return：4F 4B 01 0D 0A
```

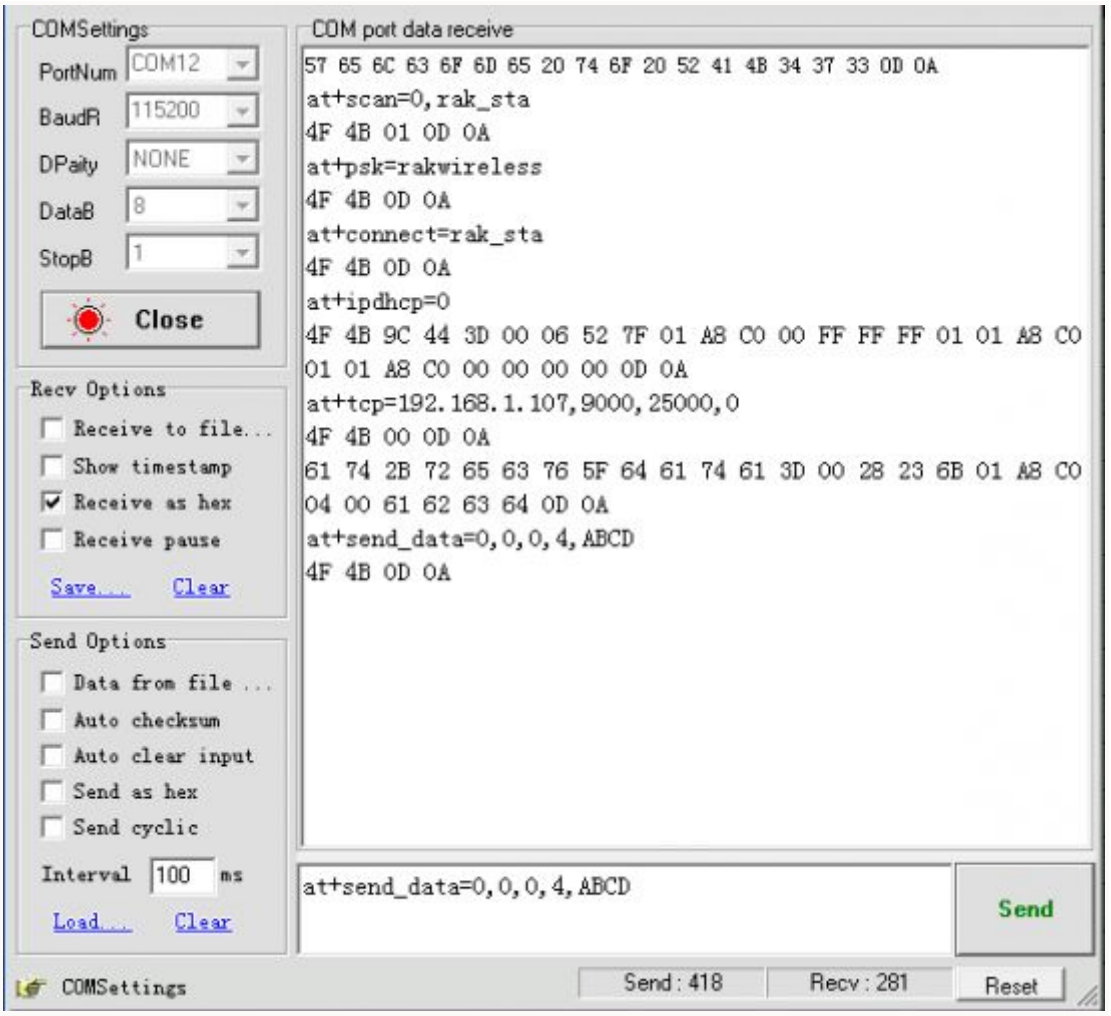
Set wireless password is rakwireless
  Send : at+psk=rakwireless\r\n
  Return : 4F 4B 0D 0A

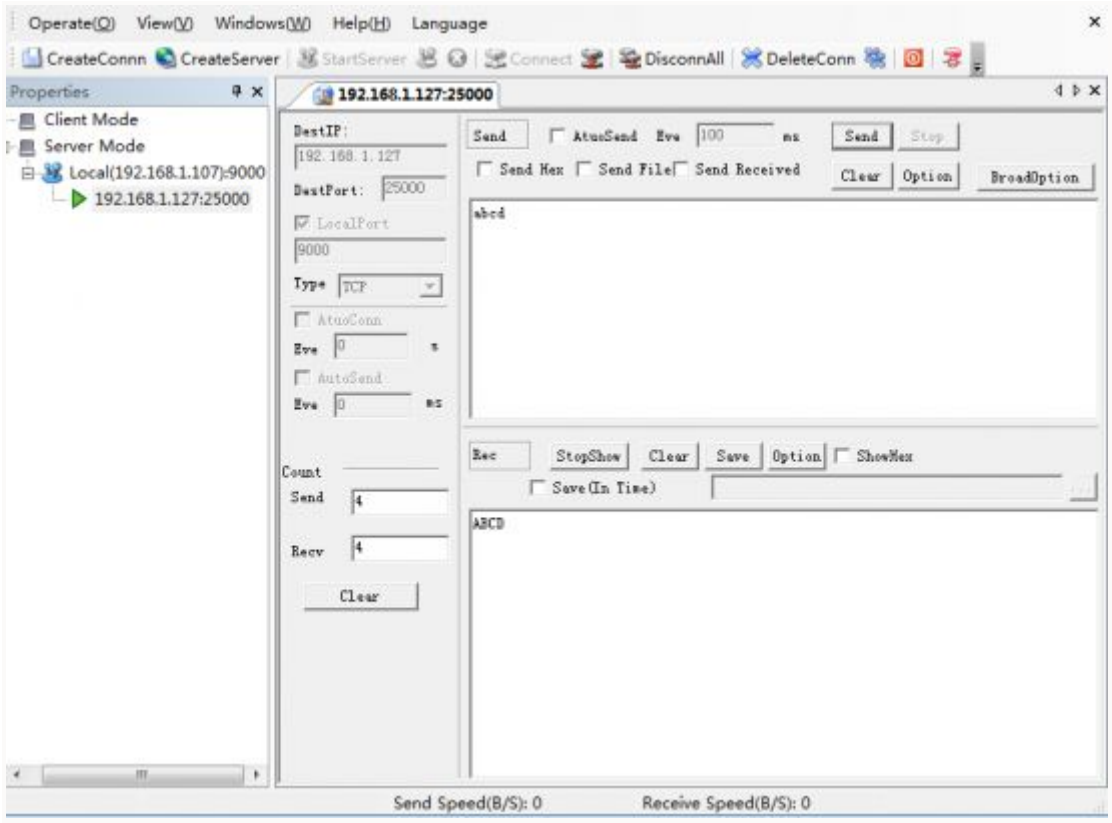
Module connects the wireless network with SSID of rak_sta
  Send : at+connect=rak_sta\r\n
  Return : 4F 4B 0D 0A
Open module DHCP Client, obtain module IP address
  Send : at+ipdhcp=0\r\n
  Return : 4F 4B 9C 44 3D 00 06 52 7F 01 A8 C0 00 FF FF FF 01 01 A8 C0 01 01 A8 C0 00 00 00 00 0D 0A

PC terminal use TCP/UDP tool to establish TCP Sever with local port of 9000, and start up the server.
The module terminal establishes TCP Client, and then connects to the TCP Sever of PC terminal
  Send : at+tcp=192.168.1.106,9000,25000,0\r\n
  Return : 4F 4B 00 0D 0A

TCP Sever of PC terminal sends a string of "abcd" to TCP Client, the module returns
  61 74 2B 72 65 63 76 5F 64 61 74 61 3D 00 28 23 6B 01 A8 C0 04 00 61 62 63 64 0D 0A

TCP Client of module terminal sends TCP Sever of PC terminal a string of "ABCD"
  Send : at+send_data=0,9000,192.168.1.106,4,ABCD\r\n
  Return : 4F 4B 0D 0A


COMSettings
PortNum
COM12
BaudR
115200
DPaity
NONE
DataB
8
StopB
1
Close
Recv Options
Receive to file...
Show timestamp
Receive as hex
Receive pause
Save...
Clear
Send Options
Data from file ...
Auto checksum
Auto clear input
Send as hex
Send cyclic
Interval
100
ms
Load...
Clear
COM port data receive
57 65 6C 63 6F 6D 65 20 74 6F 20 52 41 4B 34 37 33 0D 0A
at+scan=0,rak_sta
4F 4B 01 0D 0A
at+psk=rakwireless
4F 4B 0D 0A
at+connect=rak_sta
4F 4B 0D 0A
at+ipdhcp=0
4F 4B 9C 44 3D 00 06 52 7F 01 A8 C0 00 FF FF FF 01 01 A8 C0
01 01 A8 C0 00 00 00 00 0D 0A
at+tcp=192.168.1.107,9000,25000,0
4F 4B 00 0D 0A
61 74 2B 72 65 63 76 5F 64 61 74 61 3D 00 28 23 6B 01 A8 C0
04 00 61 62 63 64 0D 0A
at+send_data=0,0,0,4,ABCD
4F 4B 0D 0A
at+send_data=0,0,0,4,ABCD
Send
COMSettings
Send : 418
Recv : 281
Reset



2.4 AP Network Configuration

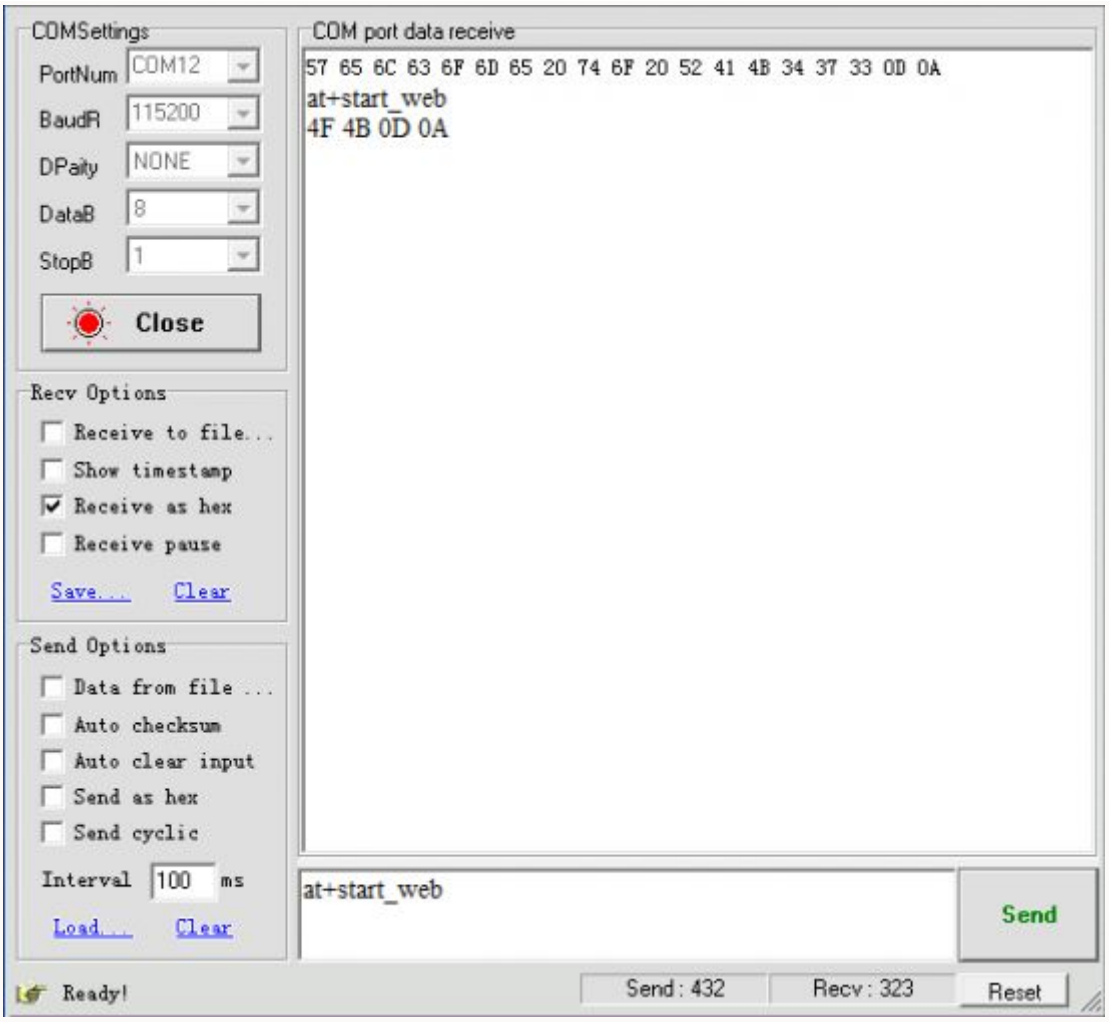
This section introduces how to use the web page to configure the module to the specified. router under the AP mode.(NOTE:THE RAK476 IS NO WEB PAGE)

1.Starting-up returns

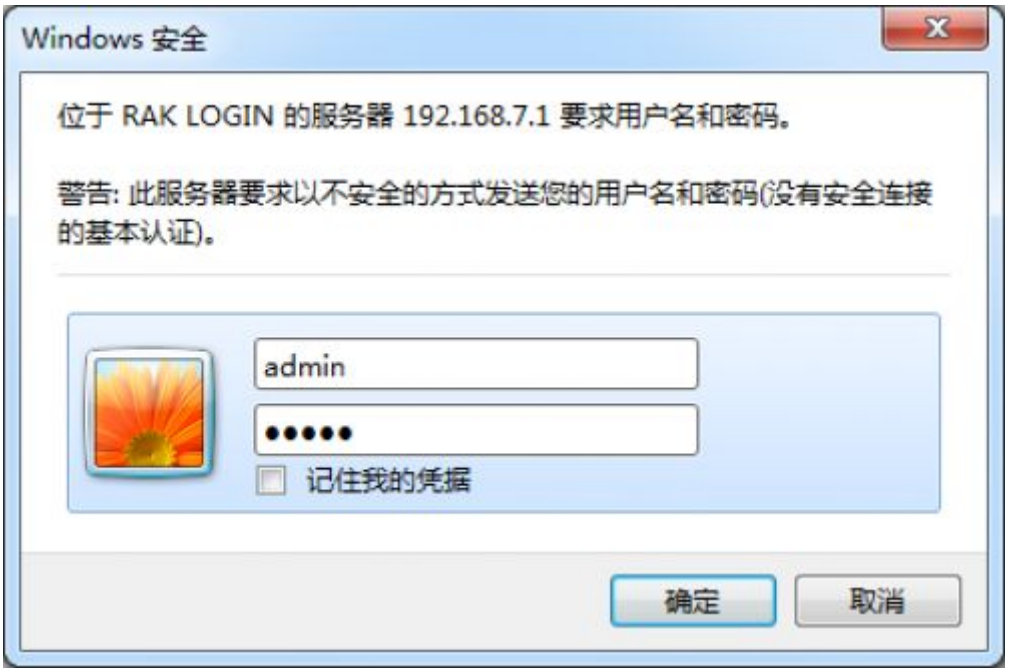
```
57 65 6C 63 6F 6D 65 20 74 6F 20 52 41 4B 34 37 33 0D 0A
```

2.Start web configuration, the module will establish ap according to the internally stored web parameters,AP name defaults to RAK473_WEB_XXXXXX (XXXXXX is module MAC address after six bits).

```
Send：at+start_web\r\n
Return：4F 4B 0D 0A
```

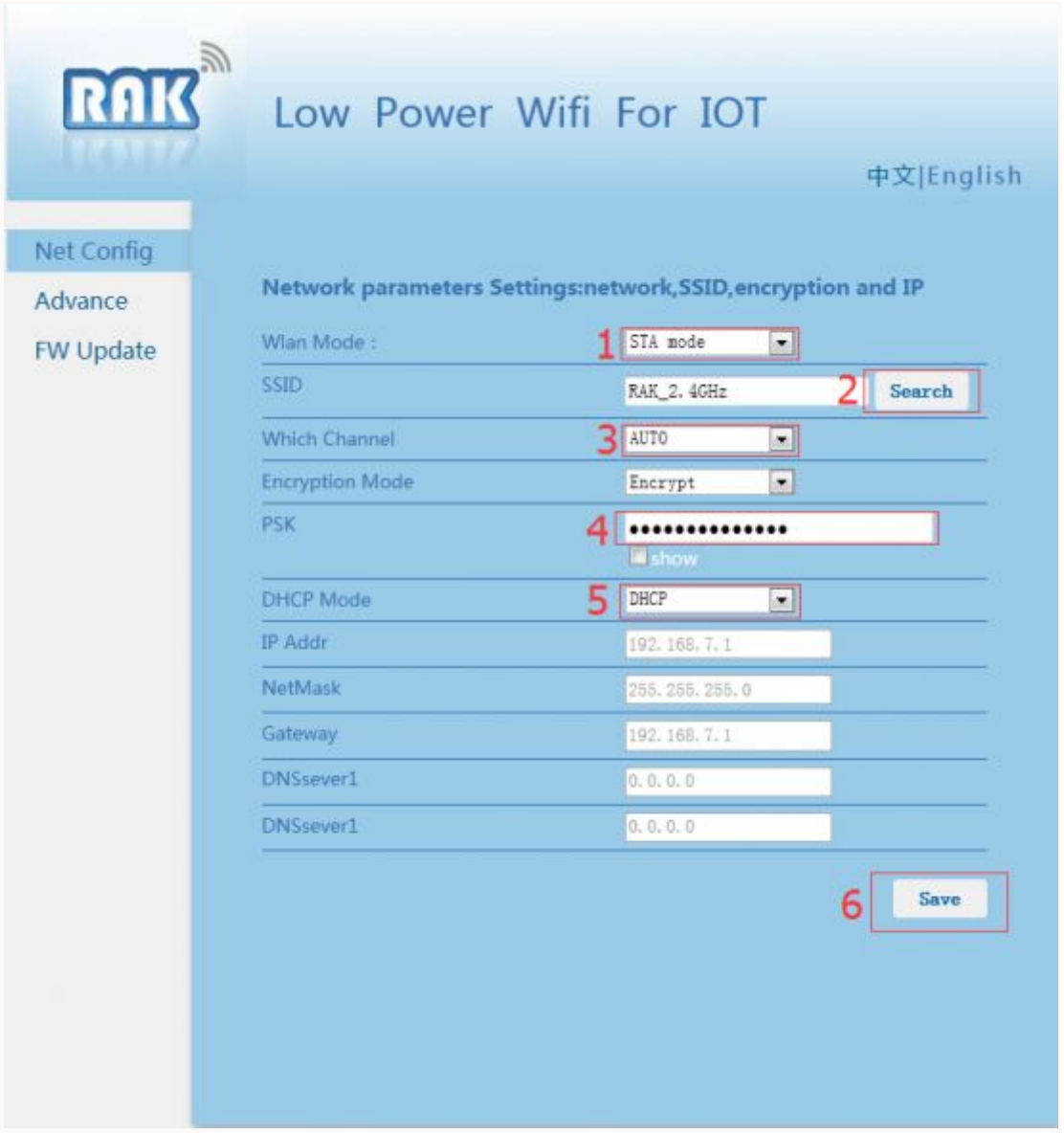


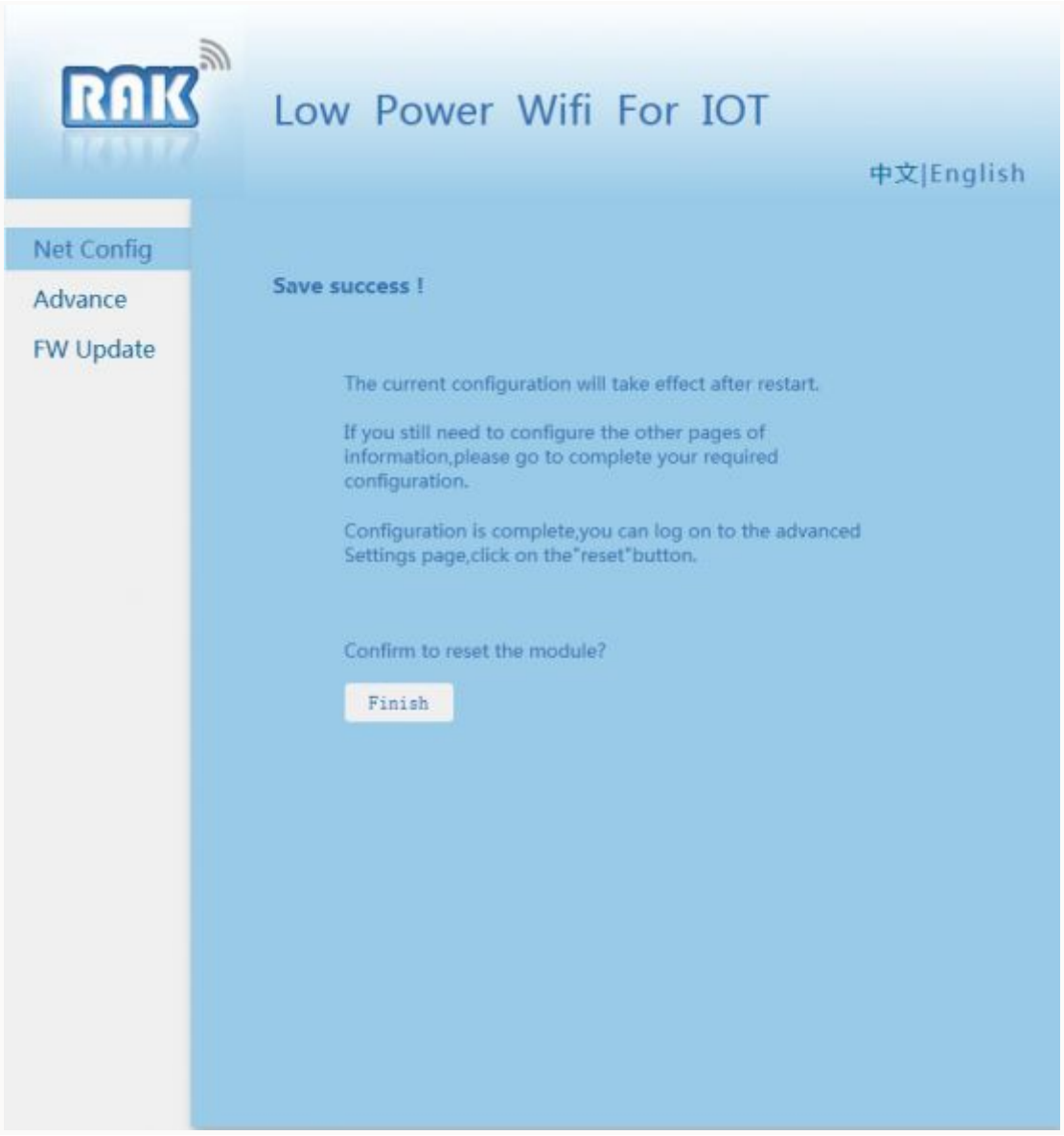
3.PC terminal connects module ap to open web page, input 192.168.7.1 to go to the webpage, then enter the user name “admin” and password “admin” to go into the web page.



4.In the network configuration page:

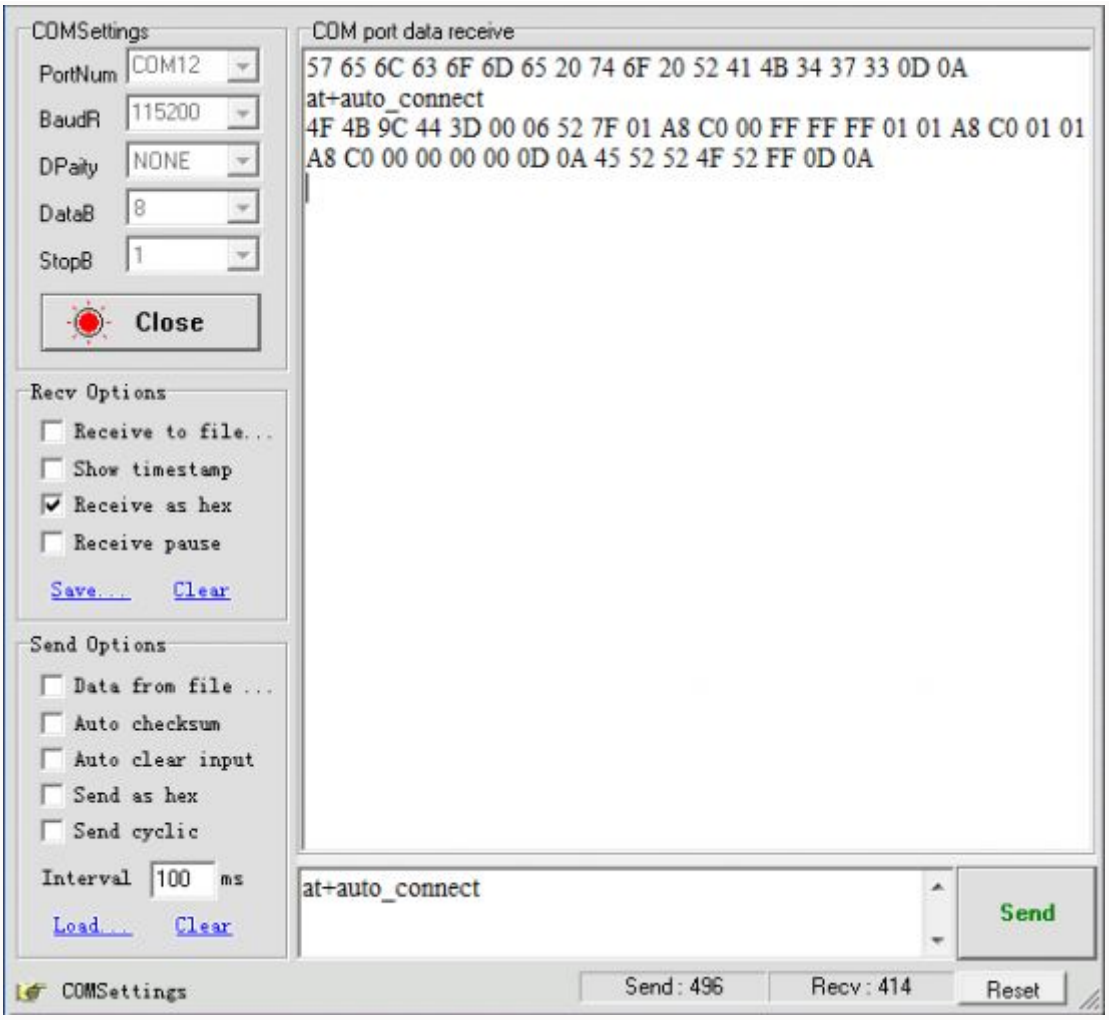
```
(1) Slect the Wlan Mode of STA mode
(2) Click on "Search" to search ap hot spots around the module, and
   choose one of the ap for the module connection
(3) Select AUTO as channel selection mode
(4) If ap is encrypted, then fill in password of ap
(5) Select the DHCP Mode of DHCP
(6) Click "Save", and jump to the next page
(7) Save the Settings
```


Low Power Wifi For IOT
中文|English
Net Config
Advance
FW Update
Network parameters Settings:network,SSID,encryption and IP
Wlan Mode :
1
STA mode
SSID
RAK_2.4GHz
2
Search
Which Channel
3
AUTO
Encryption Mode
Encrypt
PSK
4
show
DHCP Mode
5
DHCP
IP Addr
192.168.7.1
NetMask
255.255.255.0
Gateway
192.168.7.1
DNSsever1
0.0.0.0
DNSsever1
0.0.0.0
6
Save

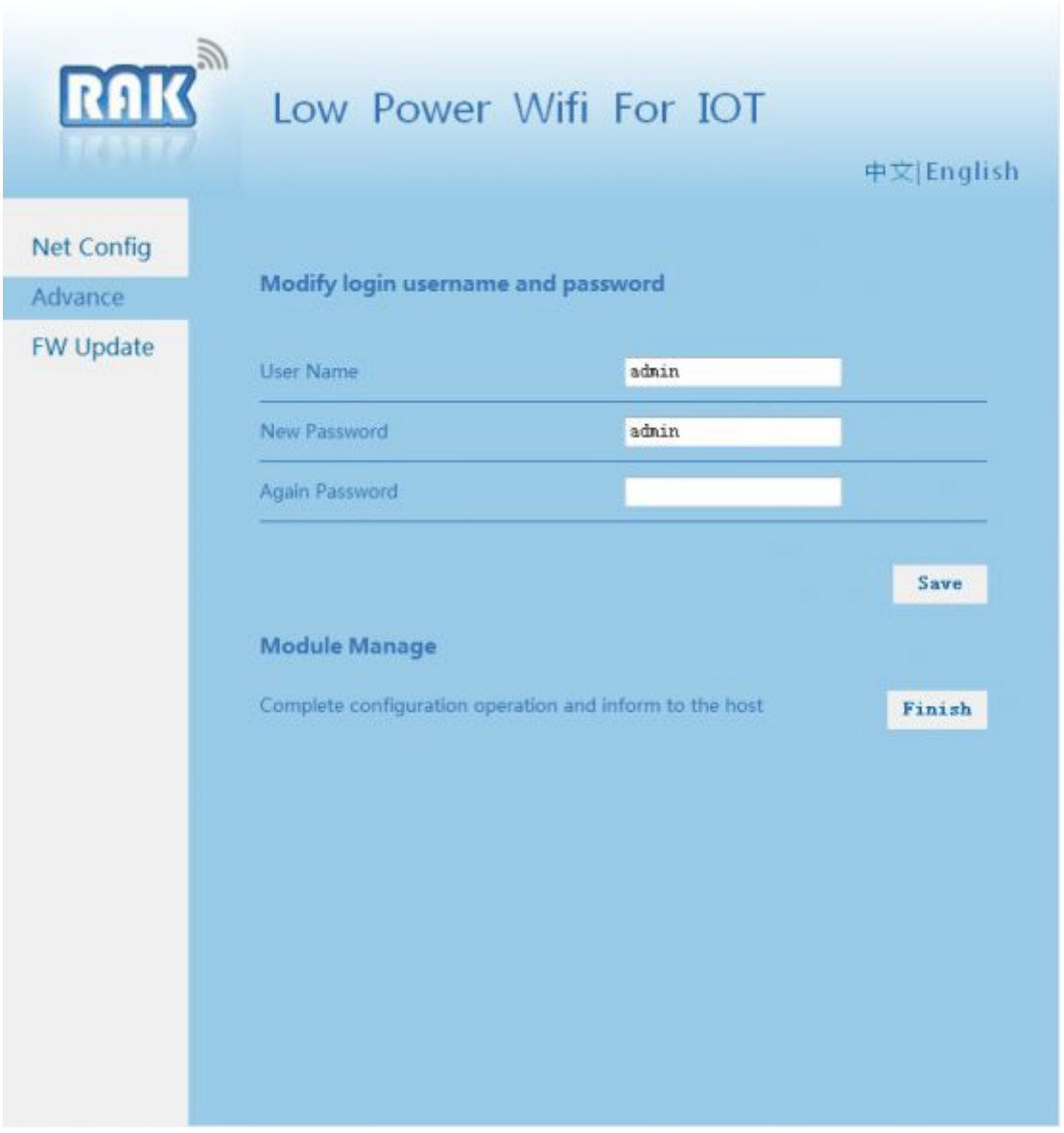


5.Starting automatical net-connecting,The module is connected to the designated router.

```
Send：at+auto_connect\r\n
 Return：4F 4B 9C 44 3D 00 06 52 7F 01 A8 C0 00 FF FF FF 01 01 A8 C0 01
01 A8
         C0 00 00 00 00 0D 0A 45 52 52 4F 52 FF 0D 0A
```



6.In the “advanced management” page, the login account and password can be modified.

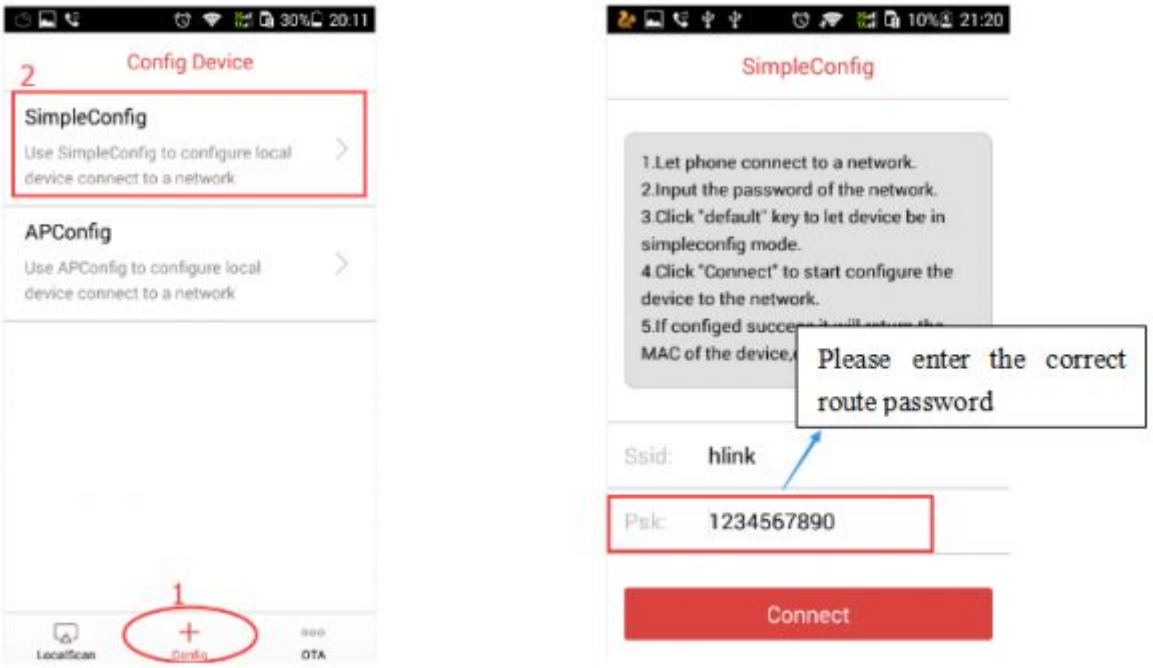


7.In the “advanced management” page, the login account and password can be modified.

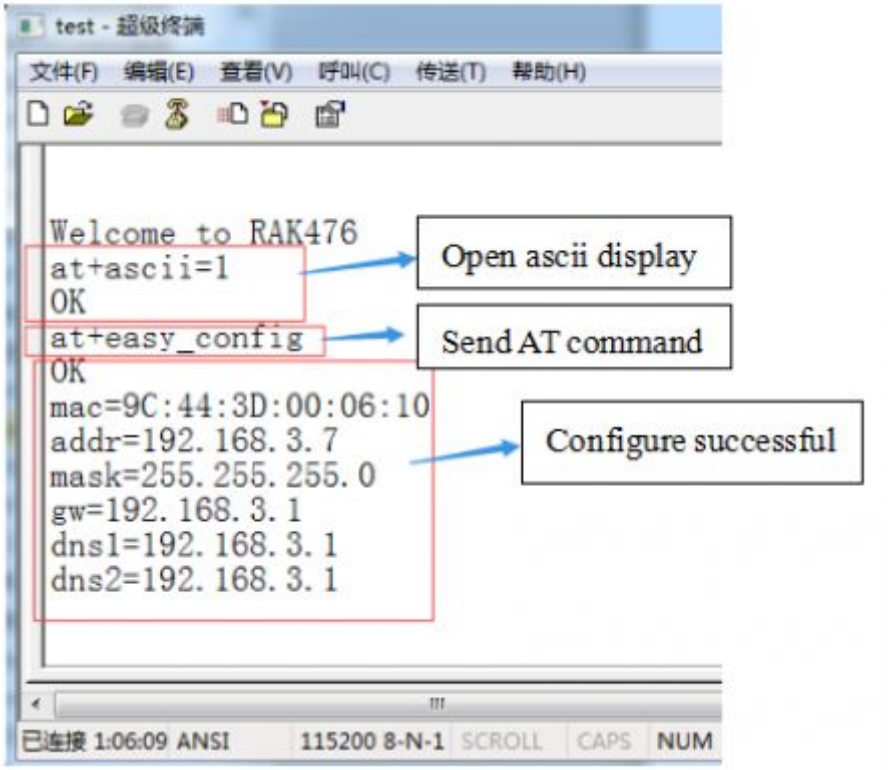
2.5 Easyconfig Configuration

This section introduces how to use mobile APP to one-key configure the module to the specified router. And please download RAK47X Config Tool APP from http://www.rakwireless.com

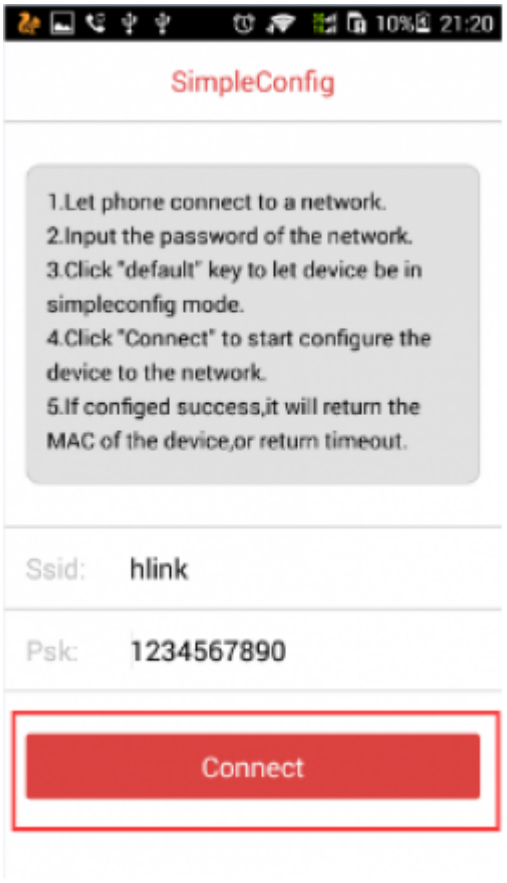
1.The mobile phone connects to the network that module will be connected to. Open RAK47X Config Tool APP,Ssid automatic filling, input Psk:



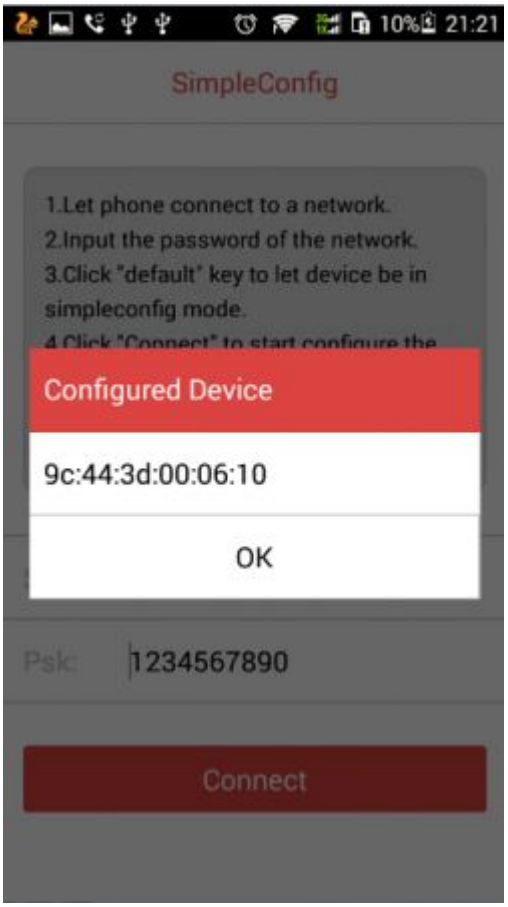
2.Reset wifi module, Send at+easy_config\r\n, make the module get into configuration status, and “link” indicator light faster flicker:



3.Click Connect, start configure:



4.If configure successful, APP will return module’s mac address:



3.Data download

Use manual

- WisNode-UART WIFI EVB Quick Start Guide
- WisNode-UART WiFi EVB Schematic diagram

PCB File

- WisNode-UART WIFI EVB PCB File