Amp'ed RF
Wireless Technology

Fast Track Your Wireless Project
自由无线 放飞梦想

Wifi Getting Started Guide

29 July 2015

1 Preface

This document provides a description on how to update a FW image, configure a WiFi module, join/scan, connect to WiFi networks and exchange data with the iPhone demo.

2 Preparation

The evaluation tool for WiFi module serial control and iPhone application demo are available here:

http://www.ampedrftech.com/dnload.php

3 Function

This section details each function on how to use the wifi module.

3.1 FW download Using EvalTool

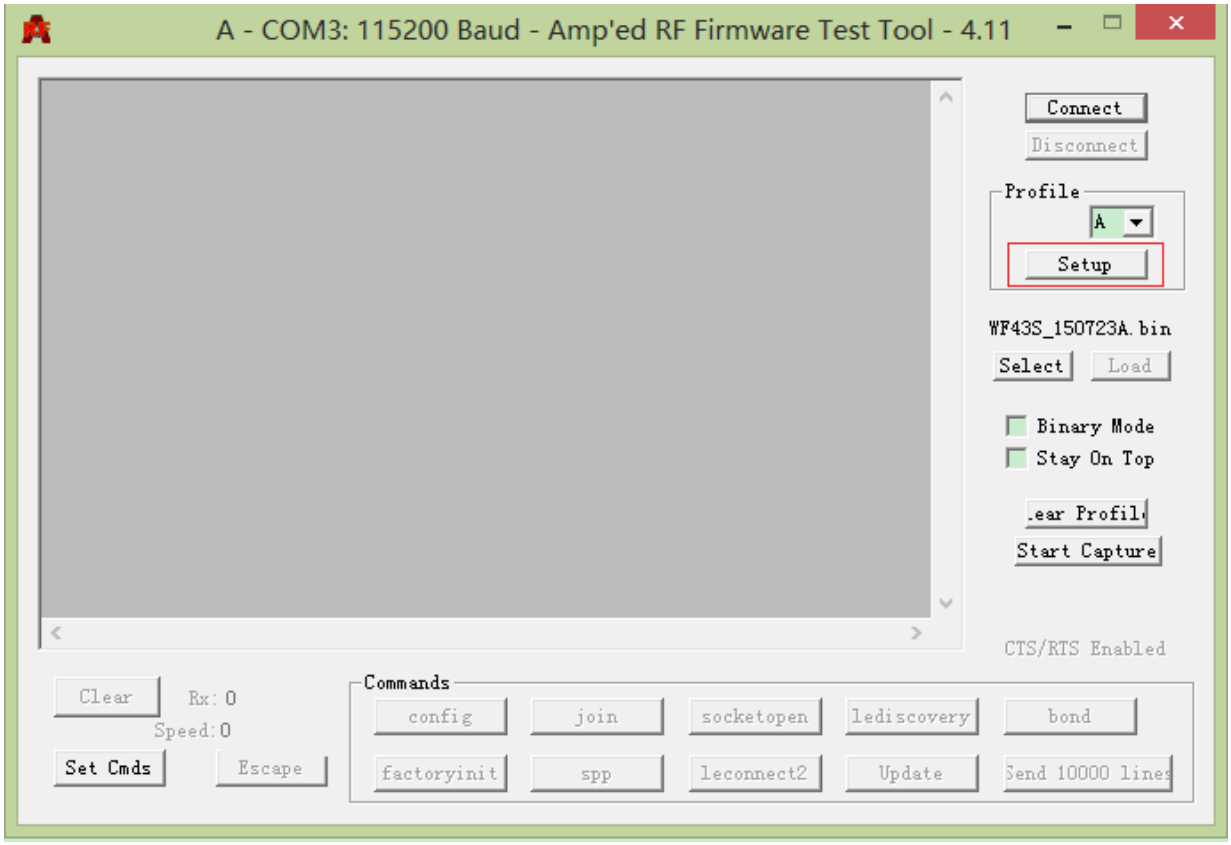
This section describes how to update the FW image of the wifi module.

Command: at+wf invalidateapplication

Once entered, the previous application FW will be erased.

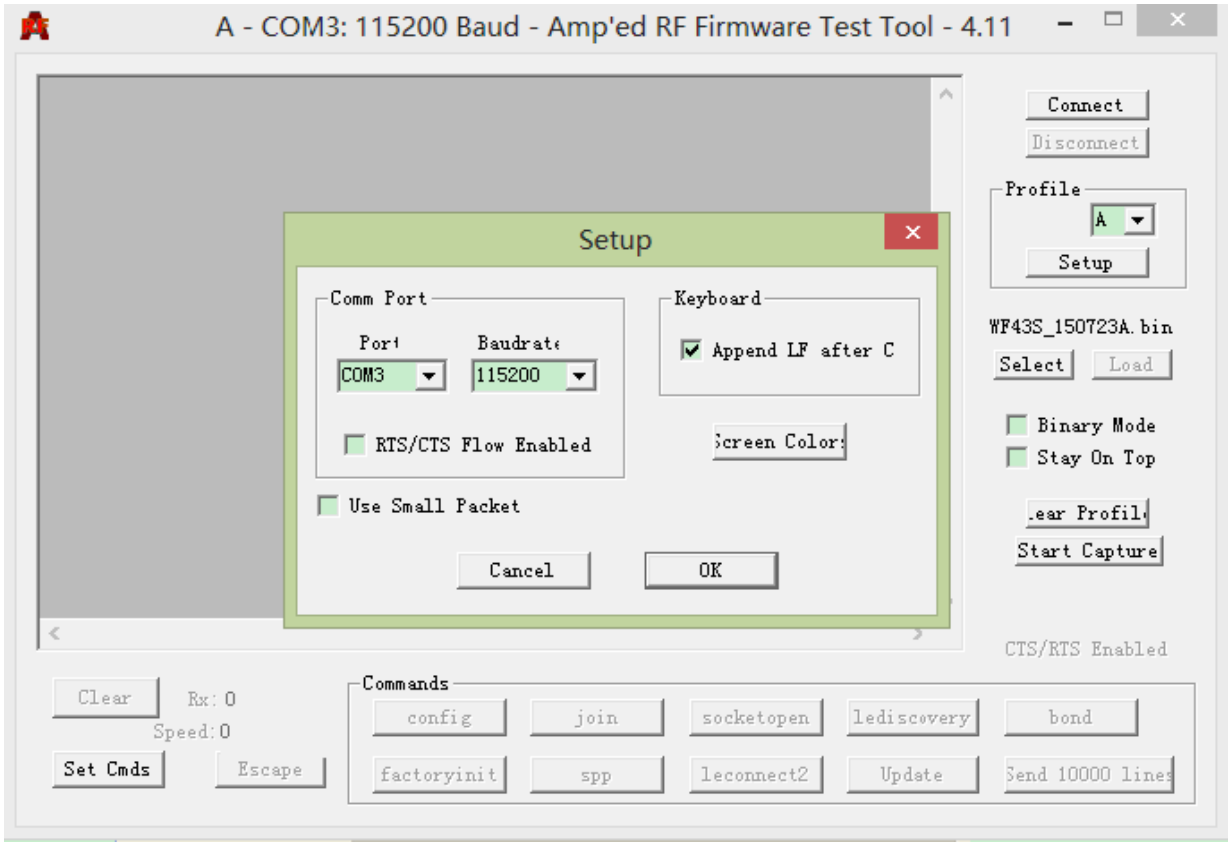
Process:

Step 1: Click “Setup”.



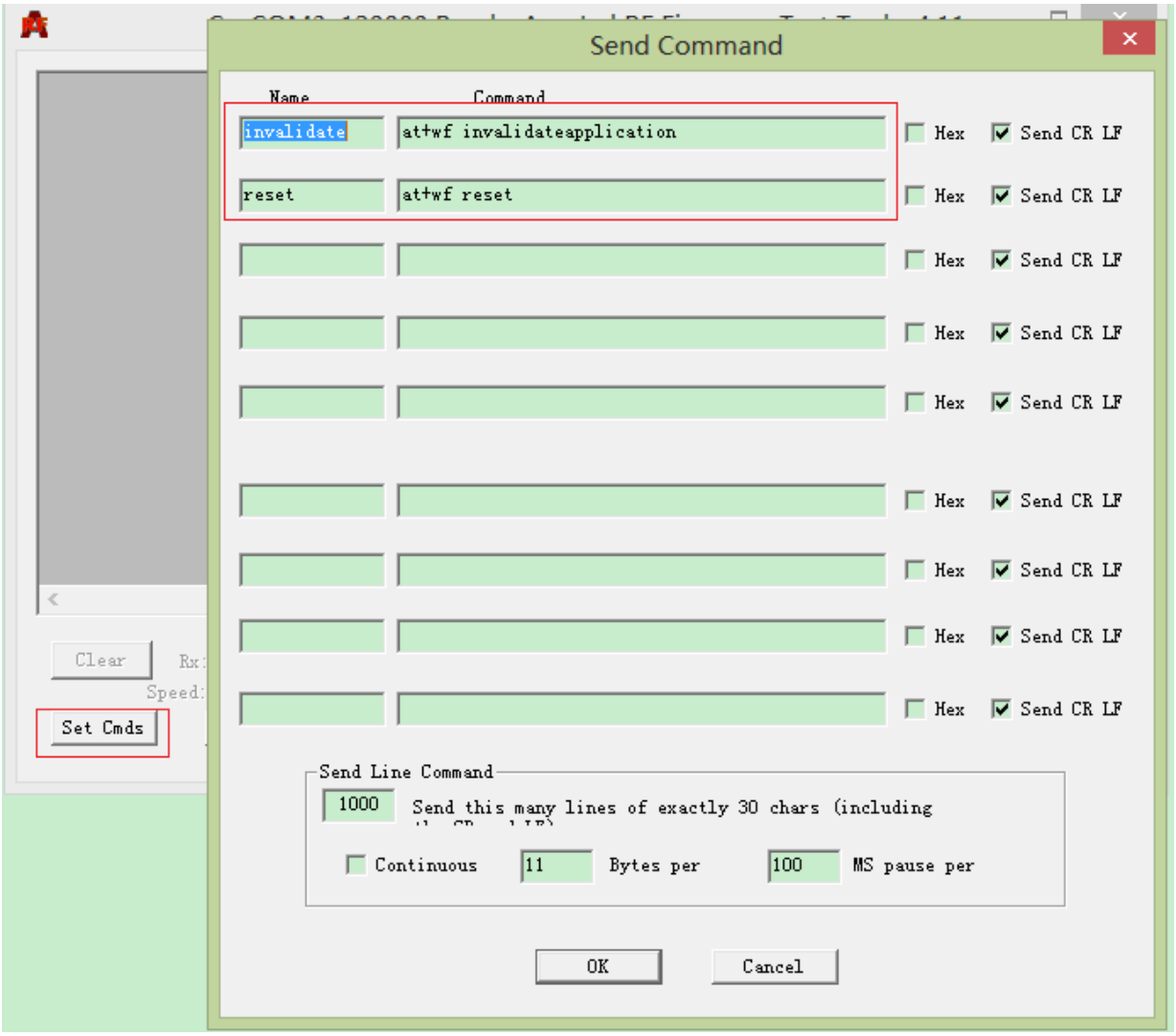
Step 2: Change the setup configuration

Change the “Port” and “Baudrate” (default is 115200 in Boot mode). Do not select “RTS/CTS Flow Enabled” or “Use Small Packets” when re-flashing.

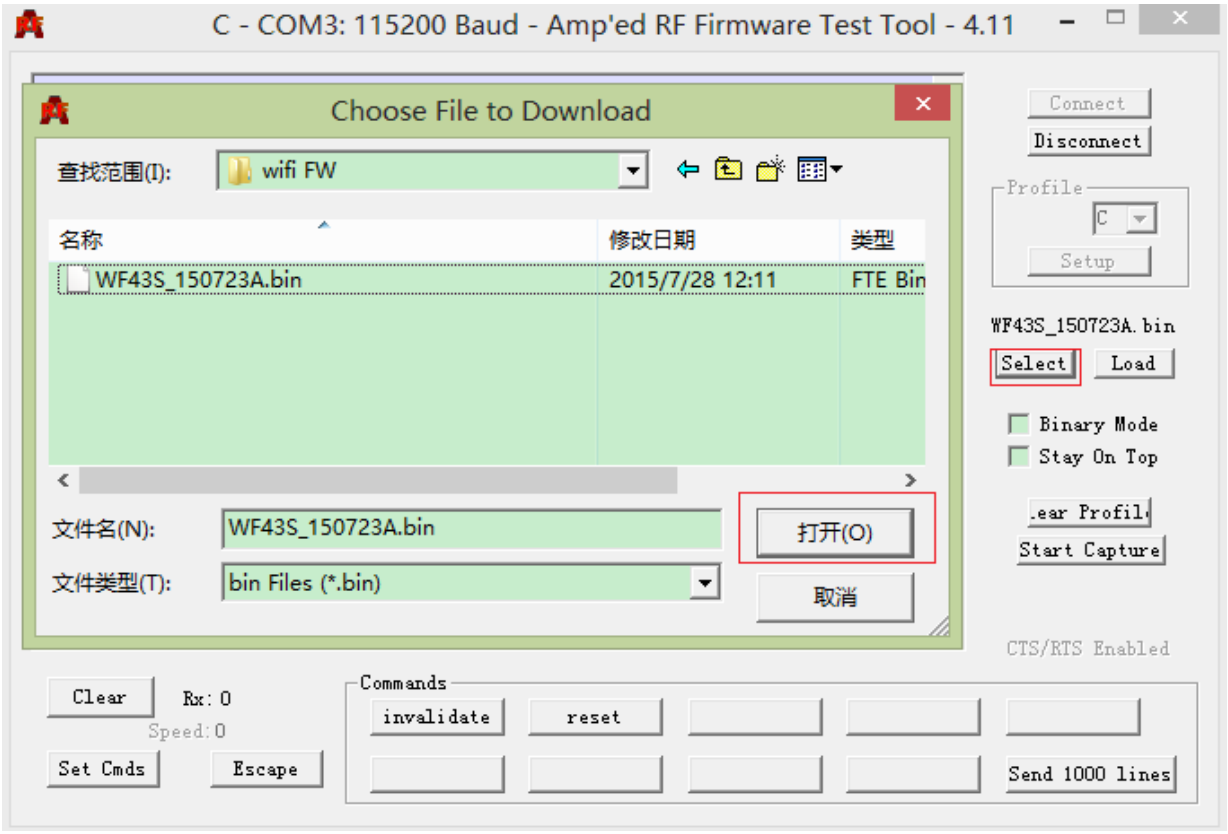


Step 3: Add the command

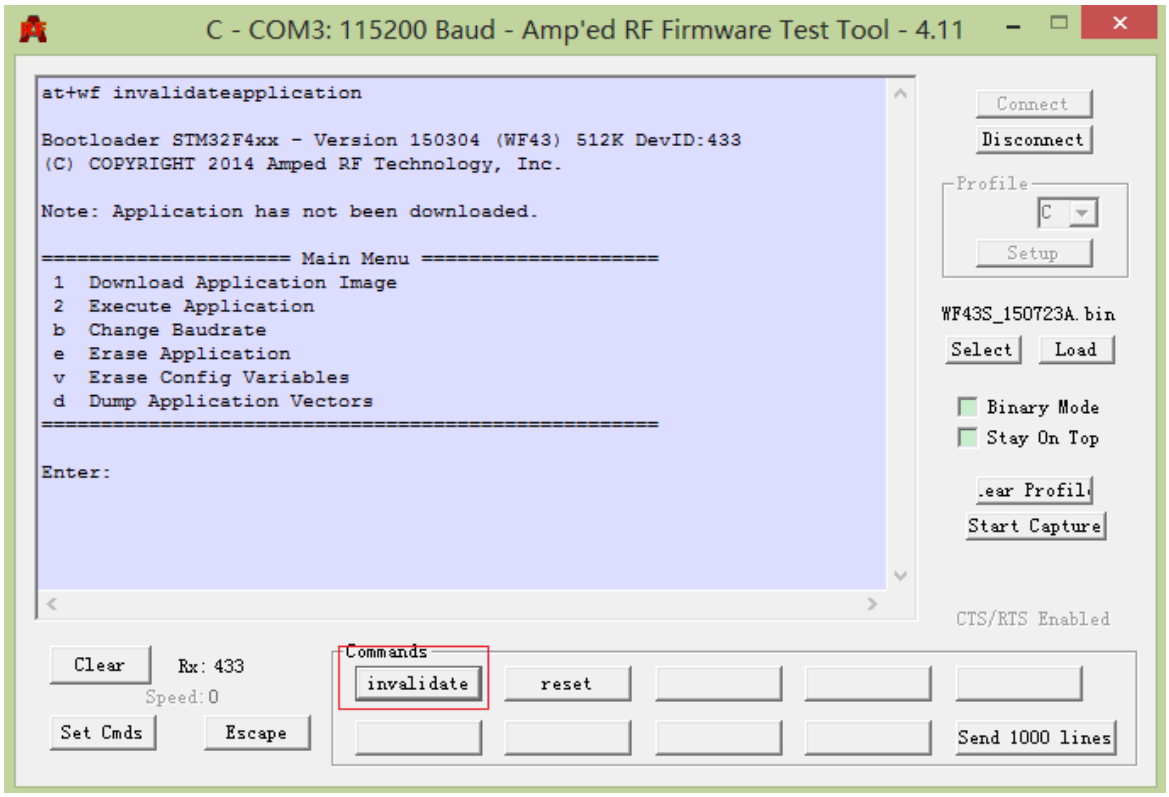
Click “SetUp Cmds” and add the “AT+AB InvalidateApplication” command and name it. Press “OK”.

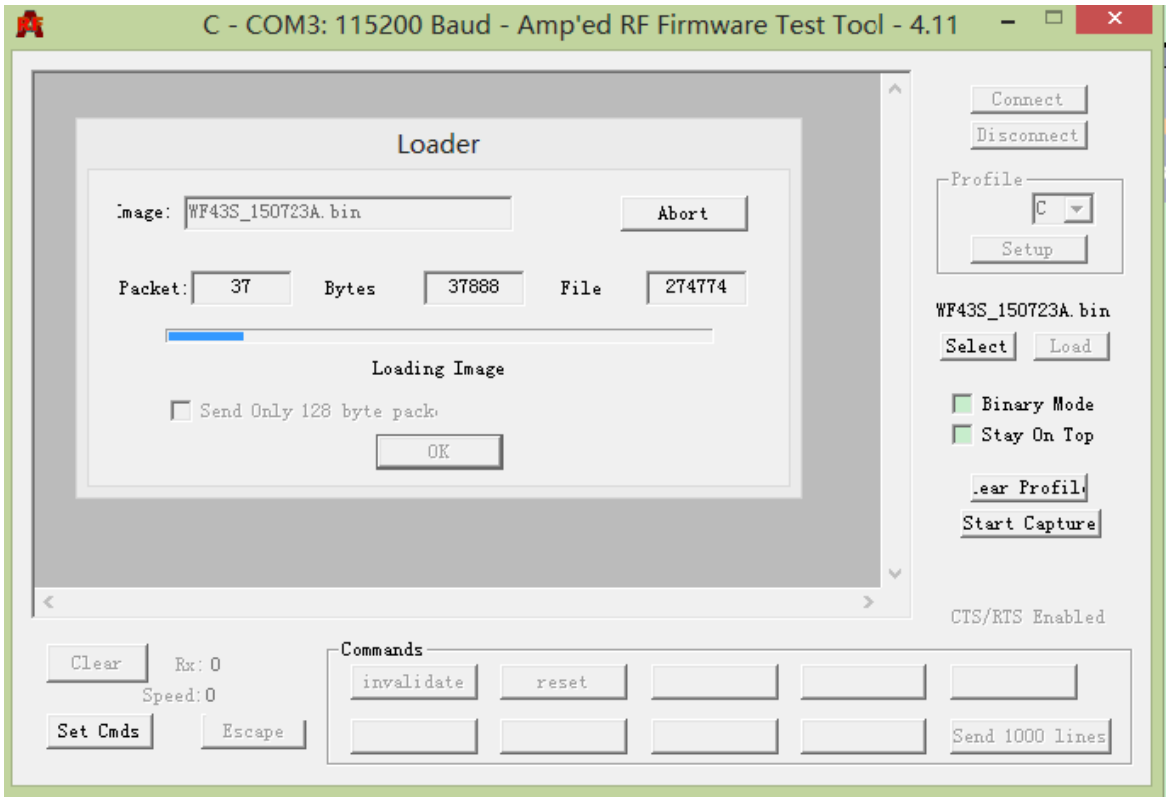


Step 4: Click “Select” to add the new FW image (bin file).

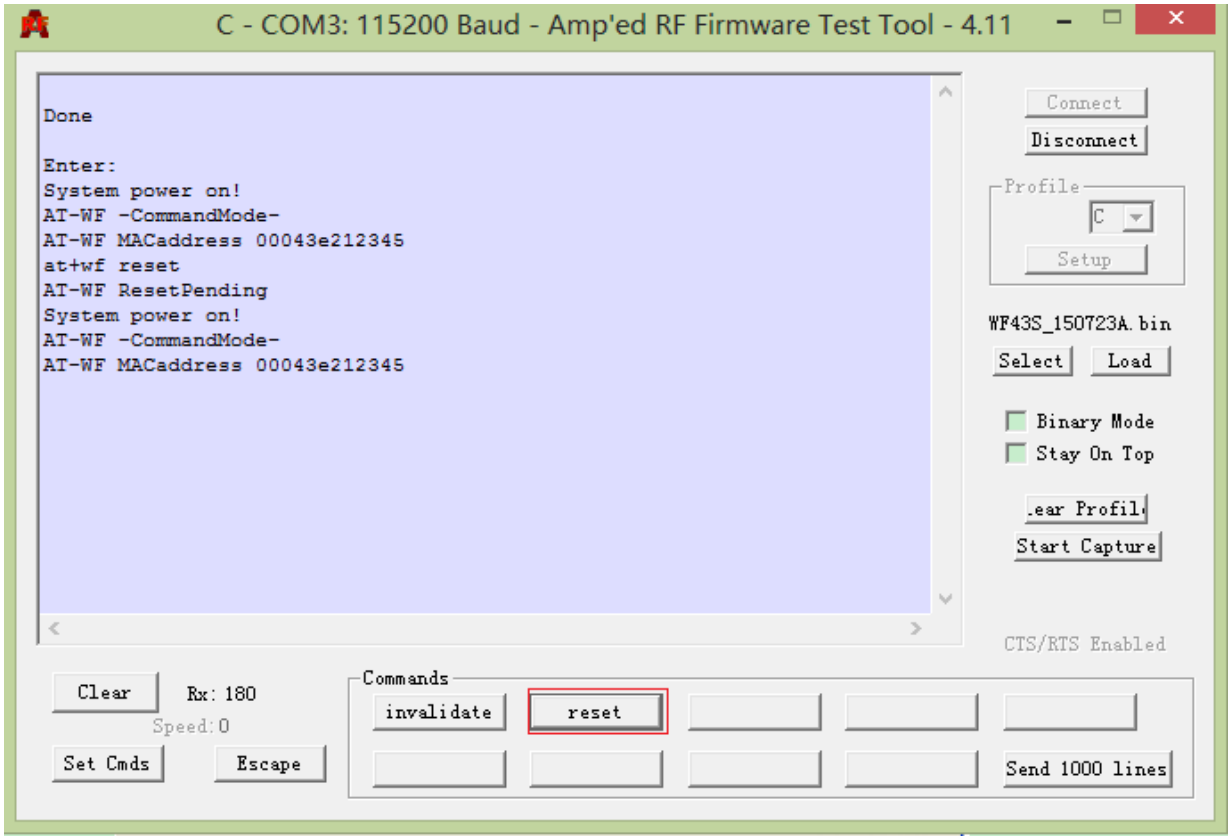


Step 5: Click “Invalidate” to go into bootloader mode, and then click “Load” to update the new FW.





Step 6: After finishing the loading process, make a reset (at+ab reset) to config the NVM settings.



3.2 Configurations for SSID, Password, etc.

To set a configuration variable, enter "at+wf config xxxx = yyyy", where "xxxx" is the variable name and "yyyy" is the value to set. A variable name can also be specified as "varzz", where “zz” is the sequence number of the variable.

Example: Change device name Parameter: “var02 DeviceName = AmpedWIFI”

at+wf config DeviceName=Amp

or at+wf config var02=Amp

3.2.1 Set SSID

SSID is the network name you want to join. Below is the method to change the SSID.

Command: at+wf config SSID=[Name]

Response: If the operation is successful, the response is:

AT-WF ConfigOk

Example:

at+wf config SSID=Amp'ed RF Tech

AT-WF ConfigOk

3.2.2 Set Password

Password is the network’s password. Below is the method to change the password.

Command: at+wf config PassPhrase=[password]

Response: If the operation is successful, the response is:

AT-WF ConfigOk

Example:

at+wf config PassPhrase=ampedrf123

AT-WF ConfigOk

3.2.3 Set IP Address

The IP address is the wifi module’s IP address. Below is the method to change the IP address.

Command: at+wf config IPAddress =[number]

Response: If the operation is successful, the response is:

AT-WF ConfigOk

Example:

at+wf config IPAddress=192.168.1.2

AT-WF ConfigOk

3.2.4 Set DHCP

In STATION mode: if DHCPMode=True or 1, the IP address of the wifi module is arranged by the router; if DHCPMode=Flase or 0, the IP address is the value of IPAddress in NVM settings. Below is the method to change DHCP.

Command: at+wf config DHCPMode=[true or false]

Response: If the operation is successful, the response is:

AT-WF ConfigOk

Example:

at+wf config DHCPMode=1

AT-WF ConfigOk

at+wf config DHCPMode=true

AT-WF ConfigOk

3.3 Scan/Join/Socket Open

This section describes how to scan the wifi network nearby, join the dedicated network and open the socket.

3.3.1 Scan

Command: at+wf scan

This command will scan the wifi network, obtain the BSSID signal strength, frequency, SSID and flags.

Response:

AT-WF ScanComplete

Example:

at+wf scan

BSSID	*Signal*	*Freq*	*SSID*	*Flags*
14:e6:e4:95:2b:2c	*-61 dBm*	*2422*	*Amp'ed_AP*	*[WPA-PSK-CCMP][WPA2-PSK-CCMP]*
a8:57:4e:10:90:7a	*-57 dBm*	*2437*	*TZ_3MAO*	*[WPA-PSK-CCMP][WPA2-PSK-CCMP]*
14:75:90:b8:cb:ca	*-77 dBm*	*2437*	*TJZYHBKJ3*	*[WPA-PSK-CCMP][WPA2-PSK-CCMP]*
14:75:90:c3:eb:62	*-73 dBm*	*2437*	*TJZYHBKJ*	*[WPA-PSK-CCMP][WPA2-PSK-CCMP]*
28:2c:b2:e3:4a:54	*-75 dBm*	*2462*	*AmpedRF1*	*[WPA-PSK-CCMP][WPA2-PSK-CCMP]*
28:2c:b2:e3:49:96	*-60 dBm*	*2462*	*[WPA-PSK-CCMP][WPA2-PSK-CCMP]*	

AT-WF ScanComplete

3.3.2 Join

Before joining, set the necessary parameter and then reset.

1) at+wf config DeviceMode=0 (0 means station mode; 1 means AP mode)

2) at+wf config SSID= AmpedRF1

3) at+wf config PassPhrase=123456789

Command: at+wf join

Response:

If the connection is successful, the response is:

28:2c:b2:e3:4a:54 -80 dBm 2462 AmpedRF1 [WPA-PSK-CCMP][WPA2-PSK-CCMP]

AT-WF JoinOK [AmpedRF1]

AT-WF DHCP OK. Get ip:192.168.1.37

If the connection is unsuccesful, the response is:

AT-WF JoinFailed [SSID name]

Example:

at+wf join

Successful:

28:2c:b2:e3:4a:54 -80 dBm 2462 AmpedRF1 [WPA-PSK-CCMP][WPA2-PSK-CCMP]

AT-WF JoinOK [AmpedRF1]

AT-WF DHCP OK. Get ip:192.168.1.37

Fail:
AT-WF JoinFailed [AmpedRF1]

3.3.3 Socket Open

After the connection is successful, you can open the socket and then send data to remote with UDP packet.

Command: at+wf socketopen

Response:

AT-WF StartUDP

AT-WF -BypassMode-

Example:

at+wf join

28:2c:b2:e3:4a:54 -77 dBm 2462 AmpedRF1 [WPA-PSK-CCMP][WPA2-PSK-CCMP]

AT-WF JoinOK [AmpedRF1]

AT-WF DHCP OK. Get ip:192.168.1.37

at+wf socketopen

AT-WF StartUDP

AT-WF -BypassMode-

3.4 Connection and data exchange with iPhone in STA mode

This section describes how to connect the wifi module in STATION mode to an iPhone via UDP, as well as show simple data transfer between iPhone and wifi module.

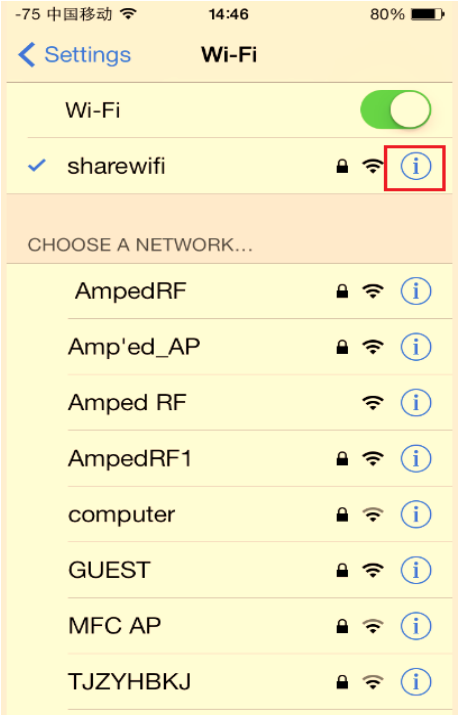
The process to make a connection:

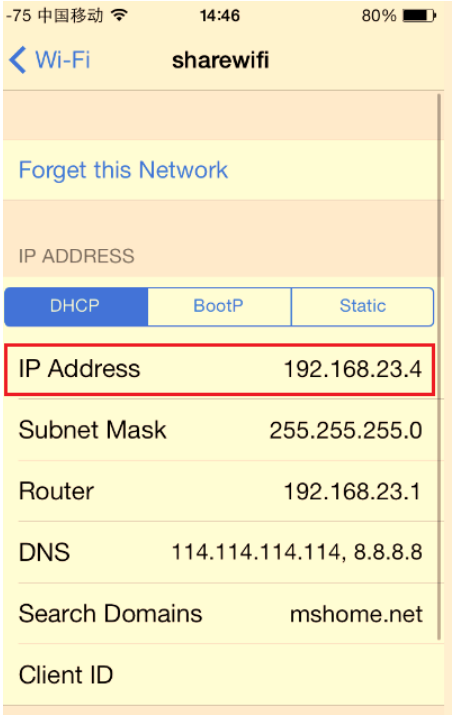
Step 1: Config the iPhone and wifi module

iPhone side:

◇ Install the wifi demo (you can download it from the website or connect your supporter for it.)

◇ Connect the iPhone to a wifi network and record the IP address of the iPhone (SSID: sharewifi, IP address: 192.168.23.4).





Set the wifi module side as below. Then, reset the wifi module.

◇ at+wf config DeviceMode=0 (station mode)

◇ at+wf config SSID= sharewifi

◇ at+wf config PassPhrase=1234567890 (router password)

◇ at+wf config HostIPAddr=192.168.23.4 (iPhone IP address)

◇ at+wf config LocalPort=xxx (default is 2015)

Step 2: Connect the wifi module to the wifi network

◇ Have the wifi module join the same wifi network as the iPhone: at+wf join

at+wf join

28:e3:47:0a:f8:d2 -49 dBm 2462 sharewifi [WPA2-PSK-CCMP]

AT-WF JoinOK [sharewifi]

AT-WF DHCP OK. Get ip:192.168.23.5

◇ Open the socket: at+wf socketopen

at+wf join

28:e3:47:0a:f8:d2 -49 dBm 2462 sharewifi [WPA2-PSK-CCMP]

AT-WF JoinOK [sharewifi]

AT-WF DHCP OK. ***Get ip:192.168.23.5***

at+wf socketopen

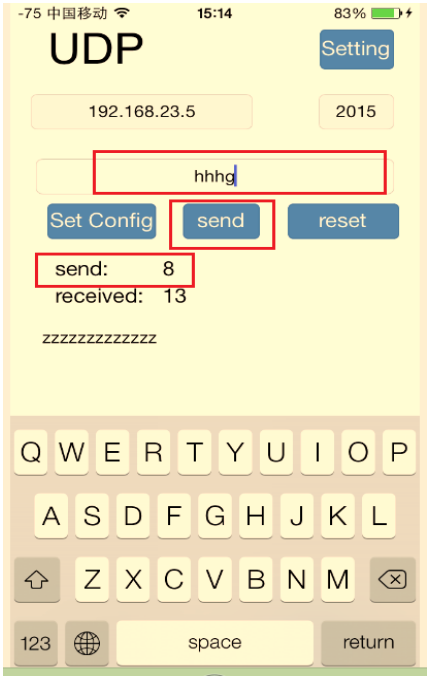
AT-WF StartUDP

AT-WF -BypassMode-

Step 3: Open the wifi demo and select “UDP”. Input “192.168.23.5” as the IP, “2015” as the port, and then click “Set Config”.

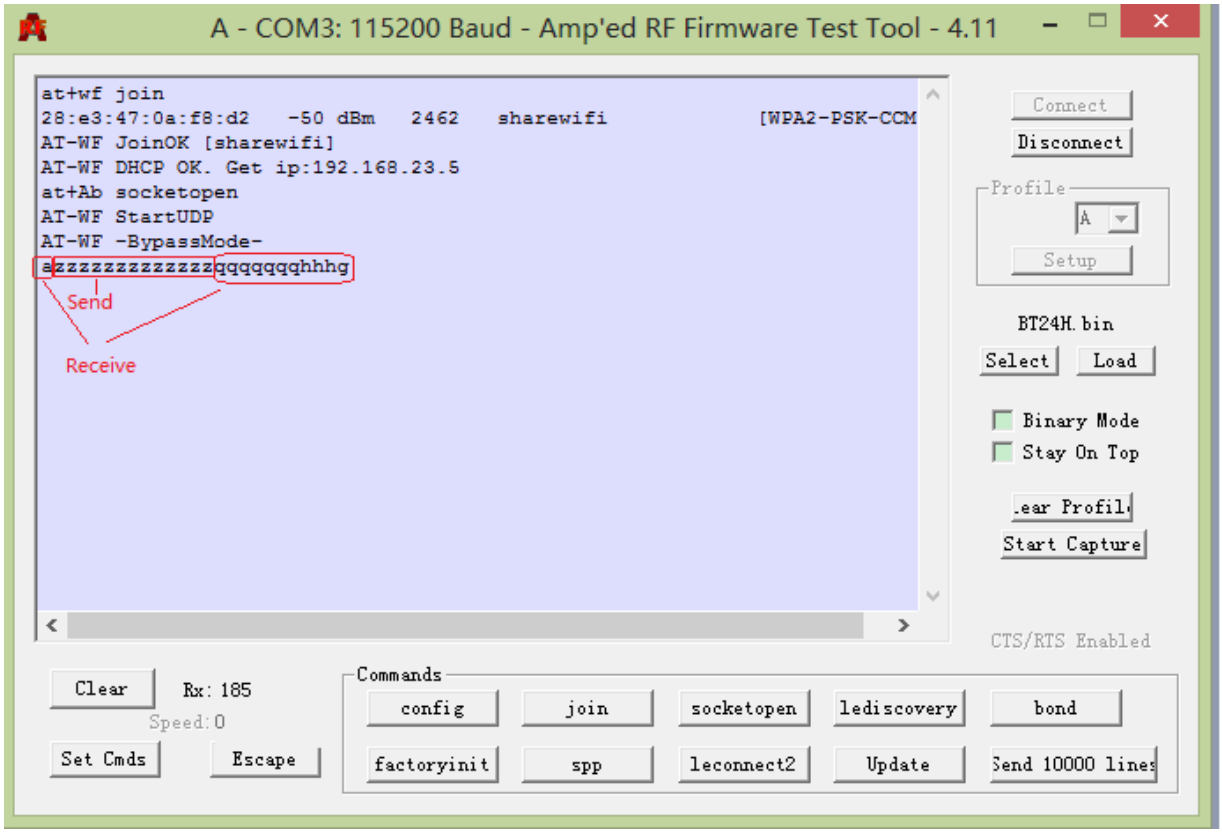
Step 4: Data transfer

Data from the iPhone demo to the wifi module:
Input data in the “sendText” area, then click “send”. The wifi side will receive the data.



Data from the wifi module to the iPhone demo:

Input data in the Eval tool, which will transfer the data to the iPhone demo.

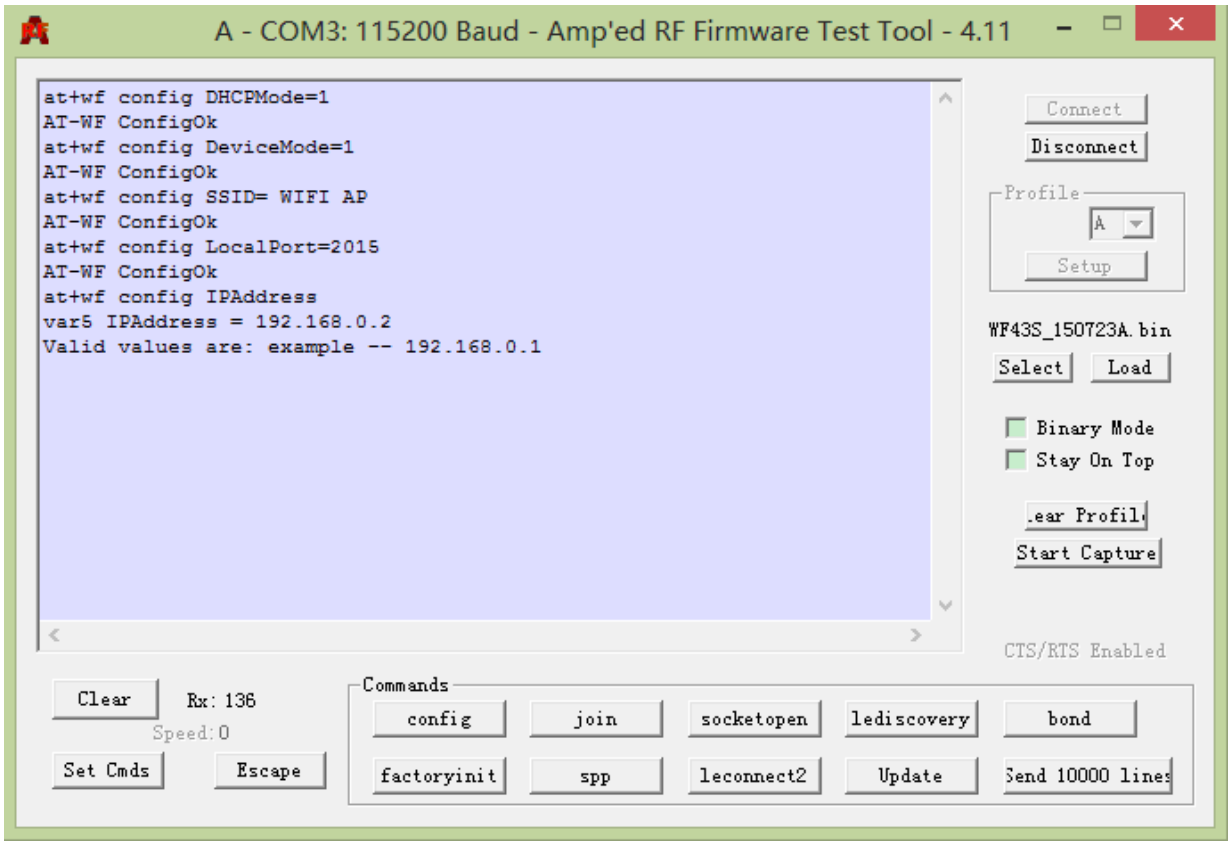


3.5 Connection and data exchange with iPhone in AP mode

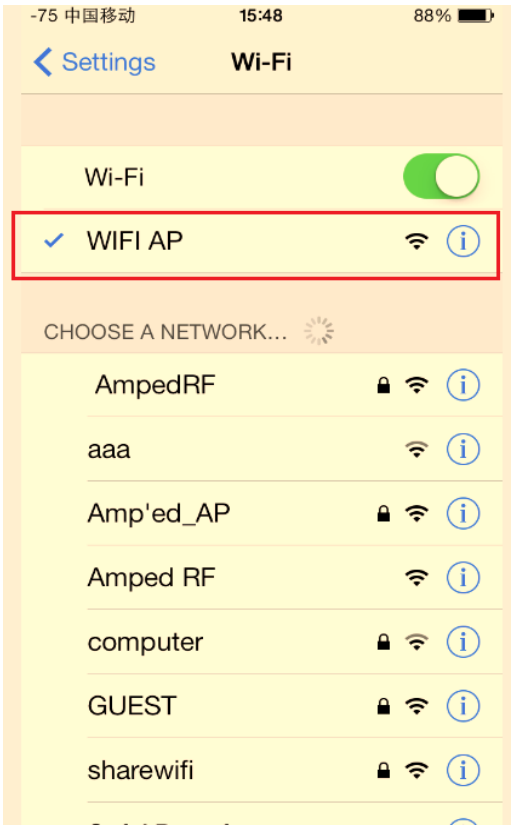
This section describes how to connect to the iPhone when the wifi module is in AP mode via UDP, as well as show simple data transfer between the iPhone and wifi module.

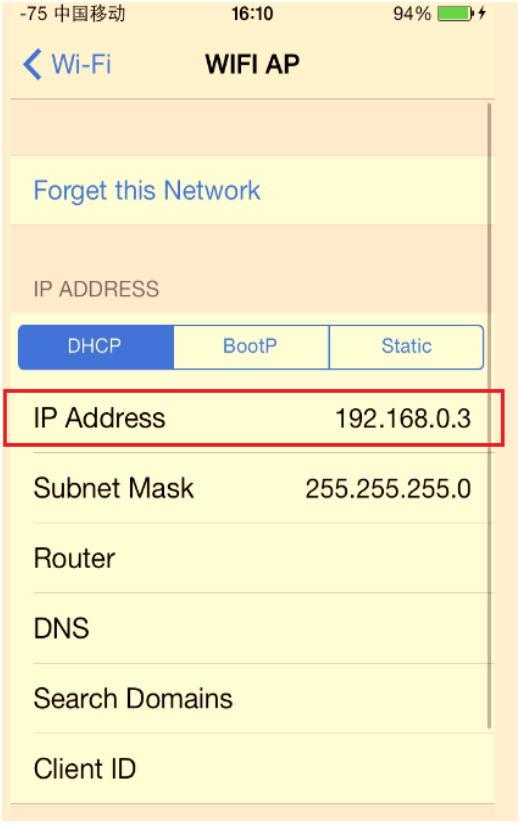
Step 1: Change the wifi module config and then reset the wifi module.

- ◇ at+wf config DHCPMode = true
- ◇ at+wf config DeviceMode=1 (AP mode)
- ◇ at+wf config SSID= WIFI AP (any name)
- ◇ at+wf config LocalPort=xxx (default is 2015)
- ◇ at+wf config IPAddress, get the wifi IP address (default is 192.168.0.2)


A - COM3: 115200 Baud - Amp'ed RF Firmware Test Tool - 4.11
at+wf config DHCPMode=1
AT-WF ConfigOk
at+wf config DeviceMode=1
AT-WF ConfigOk
at+wf config SSID= WIFI AP
AT-WF ConfigOk
at+wf config LocalPort=2015
AT-WF ConfigOk
at+wf config IPAddress
var5 IPAddress = 192.168.0.2
Valid values are: example -- 192.168.0.1
Connect
Disconnect
Profile
A
Setup
WF43S_150723A.bin
Select
Load
Binary Mode
Stay On Top
Start Capture
CTS/RTS Enabled
Clear
Rx: 136
Speed: 0
Set Cmds
Escape
Commands
config
join
socketopen
lediscovery
bond
factoryinit
spp
leconnect2
Update

Step 2: Find the wifi network “WIFI AP” and connect to it on the iPhone side. We can find the IP address of the iPhone: 192.168.0.3.





Step 3: When the iPhone connects to the wifi module, there is a response from the wifi module to the Eval tool. The IP address of the iPhone is “192.168.0.3”. Set the IP address on the wifi module

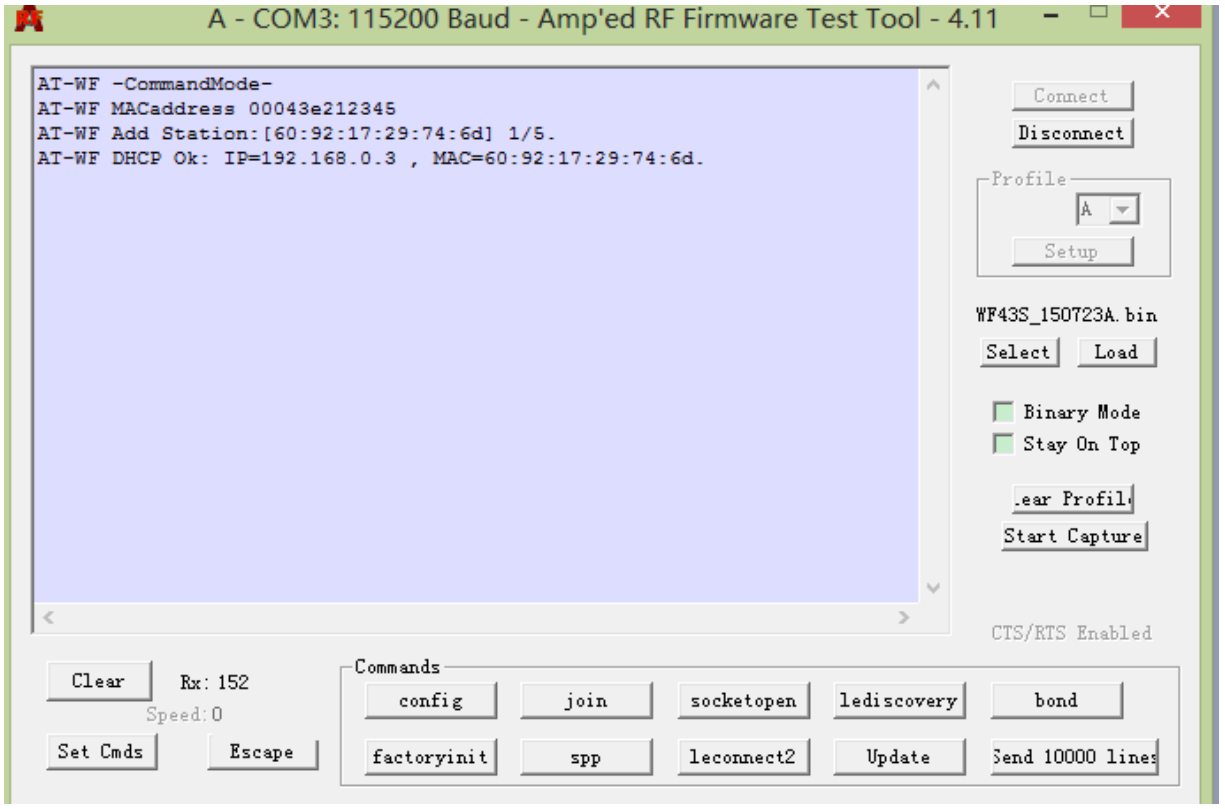
AT-WF Add Station:[60:92:17:29:74:6d] 1/5.

*AT-WF DHCP Ok: **IP=192.168.0.3** , MAC=60:92:17:29:74:6d.*

AT-WF Free Station:[60:92:17:29:74:6d] 0/5.

AT-WF Add Station:[60:92:17:29:74:6d] 1/5.

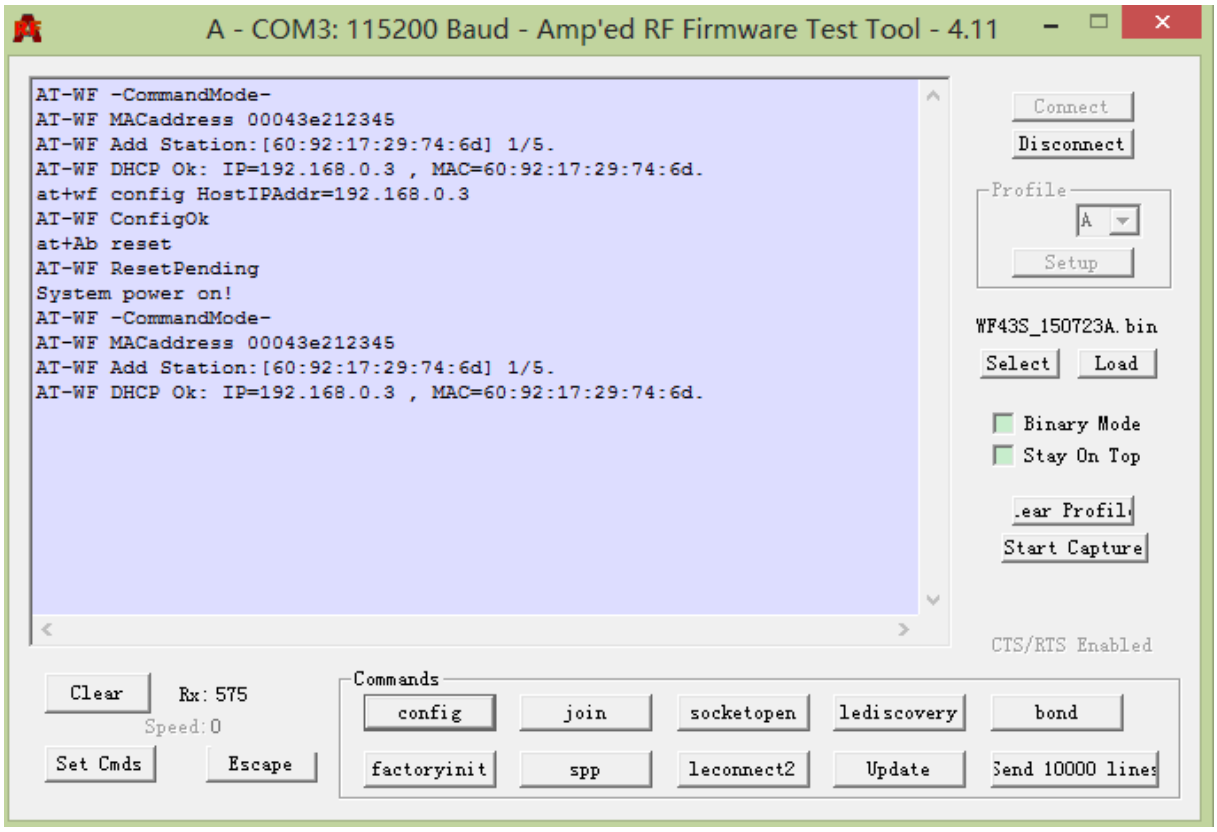
AT-WF DHCP Ok: IP=192.168.0.3 , MAC=60:92:17:29:74:6d.



Step 4: Change the HostIPAddr on the wifi module side to be the same as the iPhone's IP address and then reset the wifi module.

At+wf config HostIPAddr=192.168.0.3

Step 5: Connect the iPhone to the wifi network "WIFI AP" again.



Step 6: Open socket on the wifi module side: At+wf socketopen

AT-WF Add Station:[60:92:17:29:74:6d] 1/5.

AT-WF DHCP Ok: IP=192.168.0.3 , MAC=60:92:17:29:74:6d.

AT-WF Free Station:[60:92:17:29:74:6d] 0/5.

AT-WF Add Station:[60:92:17:29:74:6d] 1/5.

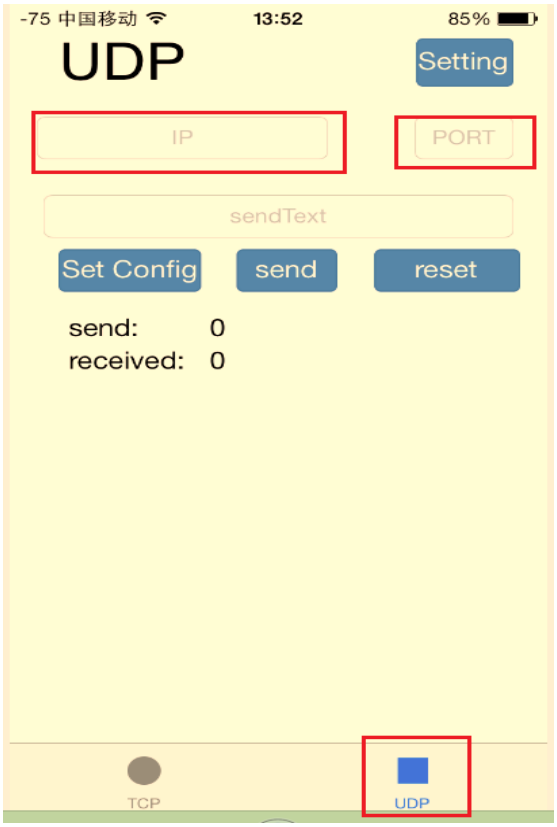
AT-WF DHCP Ok: IP=192.168.0.3 , MAC=60:92:17:29:74:6d.

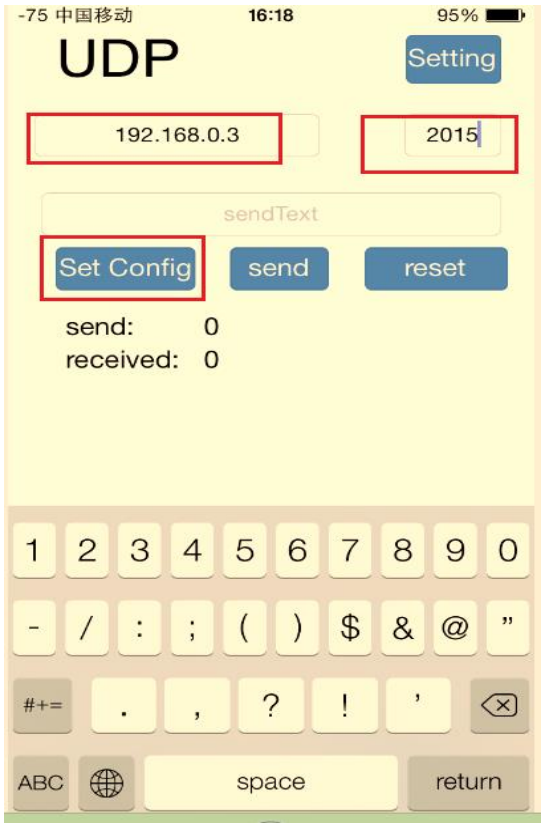
at+wf socketopen

AT-WF StartUDP

AT-WF -BypassMode-

Step 7: Open the wifi demo on iPhone, select “UDP”, input the IP “192.168.0.2”, the port “2015”, and then click “Set Config”.





Step 8: Data transfer

Data from the iPhone demo to the wifi module:

Input data in the “sendText” area, then click “send”. The wifi side will get the data.

Data from the wifi module to the iPhone demo:

Input data in the Eval tool which will transfer the data to the iPhone demo.