RAK473 Use Guidance

Using UDP to Communication

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1. Create UDP Sever Communication in AP Mode

1.1 Overview

In this part, an example an AT command demonstration flow is given, to set the module into AP mode, and create UDP Sever; connect PC (C) to the module AP, and create UDP, to communicate with the module.

1.2 Operating instruction

Tips:

1. When the command control module is sent via MCU, the characters "\r\n" are as the ending characters for the command;
2. When the command control module is sent via the serial port tool, press the Enter key as the ending character for the command;
3. The information returned following the command can be presented in ASCII code for easy viewing. If the information display is not comprehensive or garbled, there may be special characters, Chinese characters and so on in the returned information, so please view in the hexadecimal form.

Please bear in mind the points above, which will not be repeated any more.

1.3 Create AP

The information of AP hot point to be created is as follows:

Channel: Channel 1

AP name: rak_ap (Which can be named arbitrarily)

AP password: rakwireless (Which can be an arbitrary password)

Way of encryption: WAP2-PSK-CCMP

Module IP address: 192.168.9.4

Country code:CN

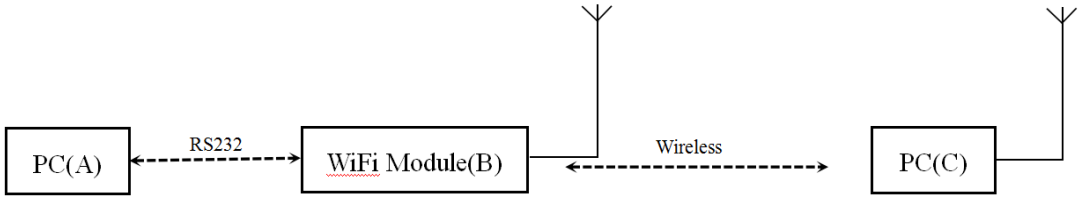

Figure 1-1 Schematic of communication process

1.Power up the module

Return: Welcome to RAK473(Welcome to RAK476). The returned information can also be viewed in hexadecimal system form.(57 65 6C 63 6F 6D 65 20 74 6F 20 52 41 4B 34 37 33(36) 0D 0A)

2.Send the command for setting the channel.

Send: at+channel=1\r\n

Return: 4F 4B 0D 0A

3.Send the command for setting AP password, set the password of wireless access point to be created.

Send: at+psk=rakwireless\r\n

Return: 4F 4B 0D 0A

4.Send the command for creating SSID, to create a wireless access point for the module with the name of

"rak_ap".

Send: at+ap=rak_ap\r\n

Return: 4F 4B 0D 0A

5.Send the command for setting static IP, to create static IP for the module

Send: at+ipstatic=192.168.9.4,255.255.255.0,192.168.9.1,0,0\r\n

Return: 4F 4B 0D 0A

6.Send the command for setting DHCP SEVER mode to open DHCP SEVER.

Send: at+ipdhcp=1\r\n

Return: 4F 4B 0D 0A

7.At this point, creating AP network is successful (The process is shown in the red box in Figure 1-2).

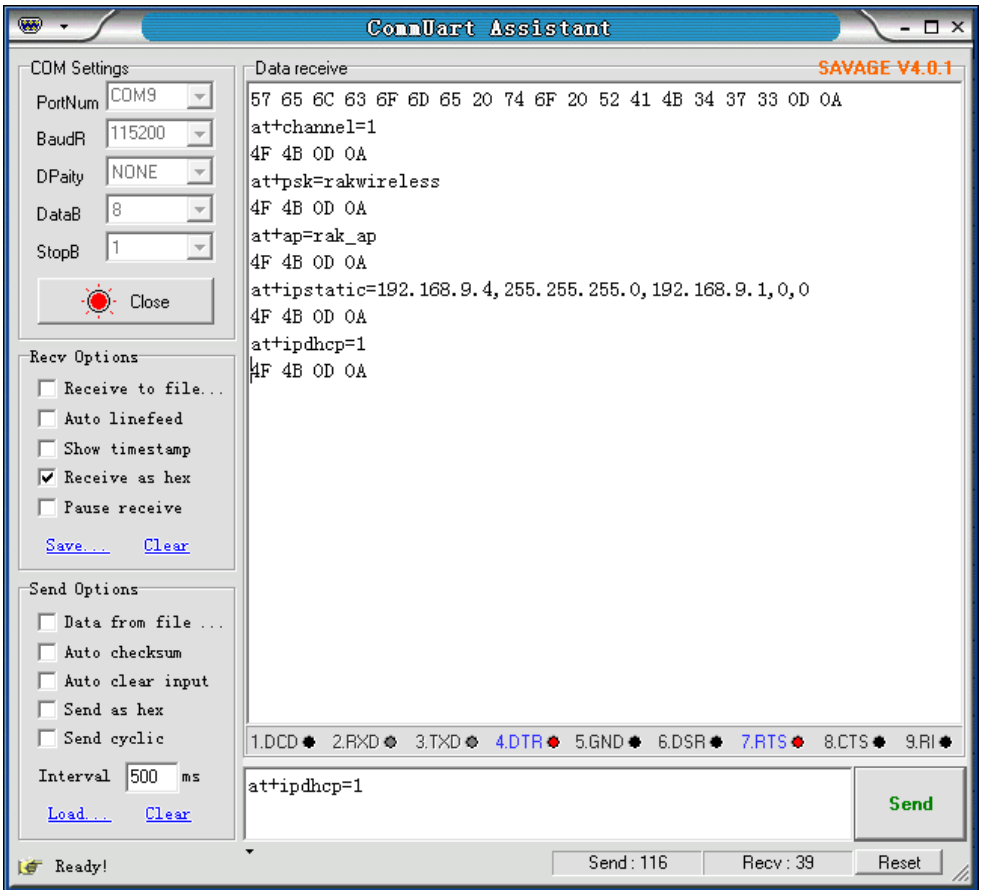

Figure 1-2 Create AP Network

1.4 UDP_SEVER communication

1. Send the command for creating the local port, to create UDP Sever with the local port of 25000.

Send: at+ludp=25000\r\n

Return: 4F 4B 00 0D 0A

2.The PC is connected to module AP.

3.Open TCP/UDP test tool, to create a UDP Client and connect to the UDP Sever created by the module, so the destination IP of UDP Client is static IP (192.168.9.4) of the module, and destination port is local port (25000) of the module.

4.UDP Client sends character string to the UDP Sever, that is, to send data from the test tool to the module (Figure 1-3).

Send: 1234567890

Return: 61 74 2B 72 65 63 76 5F 64 61 74 61 3D 00 A9 61 02 09 A8 C0 0A 00 31 32 33 34 35 36 37 38 39 30 0D 0A

5.UDP Sever sends character string to the UDP Client, that is, the module sends data “ABCD” to TCP/UDP test tool (Figure 1-4).

The number of destination port when sending data is the local port number designated when TCP/UDP testing tool creates the UDP Client, and the destination address is the IP address of current wireless network connected by TCP/UDP test tool, which can be obtained from the returned data received from the previous step.

Send: at+send_data=0,25001,192.168.9.2,4,ABCD\r\n

Return: 4F 4B 0D 0A

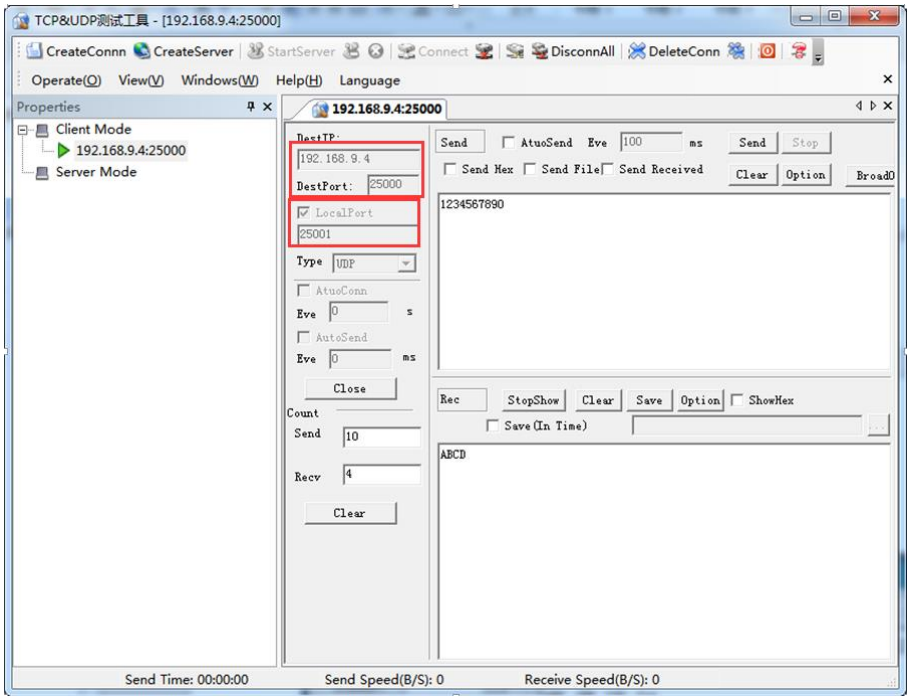

Figure 1-3 Transmit and receive data with TCP/UDP test tool

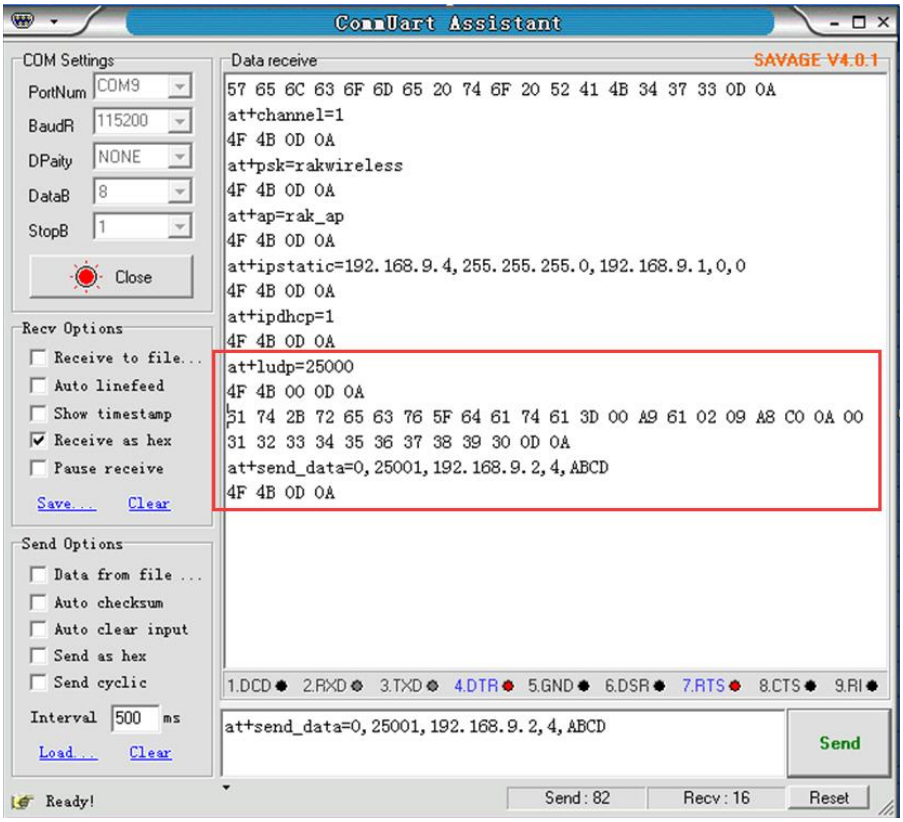

Figure 1-3 The module transmits and receives data

2. Create UDP Client Communication in STA Mode

2.1 Overview

In this part, an AT command demonstrating flow is given, to connect the module to the router. Then, the module creates UDP Client, and PC (C) creates UDP Sever, to transmit data after connecting.

2.1 Operating instruction

Tips:

1. When the command control module is sent via MCU, the characters "\r\n" are as the ending characters for the command;
2. When the command control module is sent via the serial port tool, press the Enter key as the ending character for the command;
3. The information returned following the command can be presented in ASCII code for easy viewing. If the information display is not comprehensive or garbled, there may be special characters, Chinese characters and so on in the returned information, so please view in the hexadecimal form.

Please bear in mind the points above, which will not be repeated any more.

2.2 The module is added to the router

The information of the router to be added is as follows:

Frequency band: 2.4GHz

Router name:RAK_2.4GHz (It may be an arbitrary router SSID. Switch among different SSIDs when sending the command)

Router password: rakwireless205

Way of encryption: WPA2-PSK

IP address of WiFi Moudle (B) : DHCP obtaining

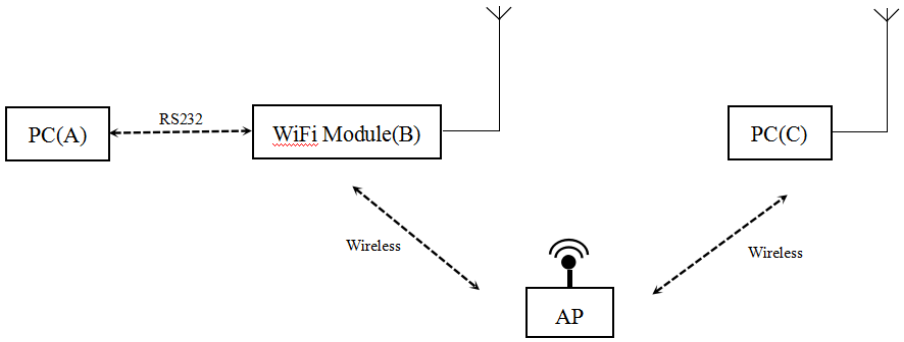

Figure 2-1 Schematic of the communication process

1. Power up the module. If it has been powered up, next step can be carried out directly.

   Return：Welcome to RAK473(Welcome to RAK476) The returned information can also be viewed in hexadecimal system form.(57 65 6C 63 6F 6D 65 20 74 6F 20 52 41 4B 34 37 33 (36)0D 0A)

2. Send the command for scanning the channel, to obtain wireless networks in all channels that SSID is RAK_2.4 GHz.

Send: at+scan=0,RAK_2.4GHz\r\n

Return: 4F 4B 01 0D 0A

3. Send the command for setting the password, to send the password of router RAK_2.4 GHz to the module.

Send: at+psk=rakwireless205\r\n

Return: 4F 4B 0D 0A

4. Send the connecting command, and the module connects the wireless networks that SSID is RAK_2.4 GHz.

Send: at+connect=RAK_2.4GHz\r\n

Return: 4F 4B 0D 0A

5. Send the command for setting DHCP mode, to start the module DHCP Client to obtain IP address of the module.

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

6.At this point, the module has been successfully added to the router (Figure 2-2).

7.

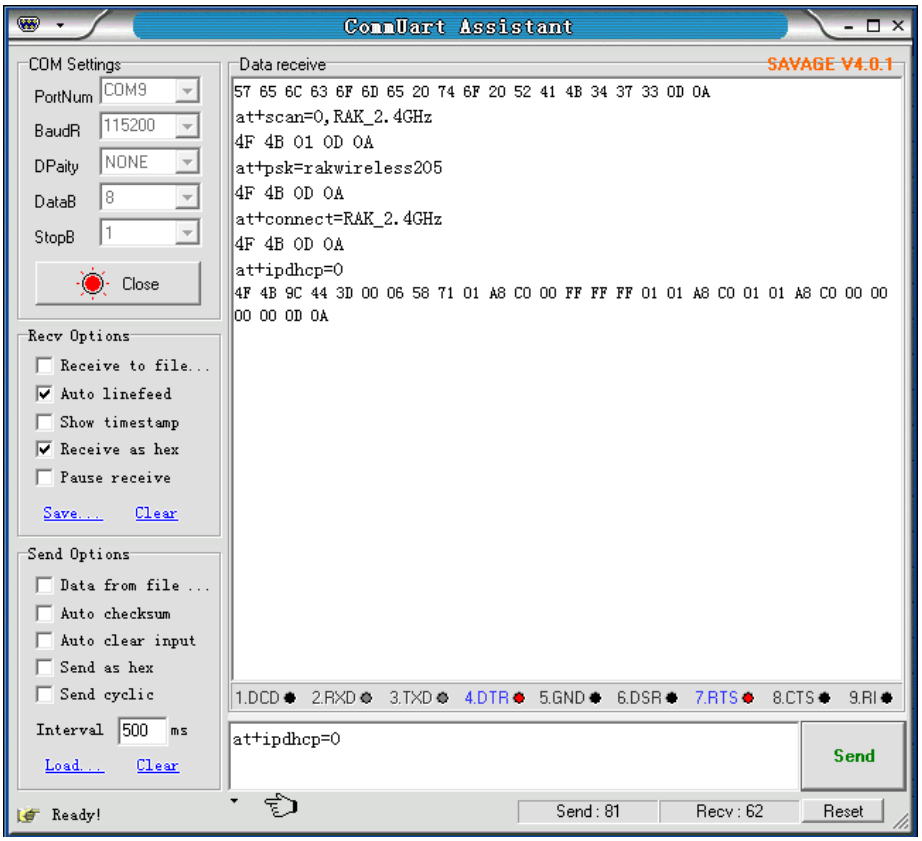

Figure 2-2 The module is added to the router

2.3 UDP_Client Communication

1. Referring to how the previous module is connected to the router, connect the PC and the module to the same router. Open TCP/UDP test tool, to create a UDP Sever, and set local port as 9000 and destination port as 25000

2. Send the command for creating the UDP Client, to make the module end create a UDP Client, of which the

destination port (9000) of this Client shall be consistent with the port of the UDP Sever created by TCP/UDP test tool, and the destination IP is the router IP joined.

Send: at+udp=192.168.1.105,9000,25000\r\n

Return: 4F 4B 00 0D 0A

3. UDP Sever sends character string to the UDP Client, that is, to send data from TCP/UDP test tool to the serial port (Figure 2-3).

Send: 1234567890

Return: 61 74 2B 72 65 63 76 5F 64 61 74 61 3D 00 28 23 69 01 A8 C0 0A 00 31 32 33 34 35 36 37 38 39 30 0D 0A

4. UDP Client sends character string to the UDP Sever, that is, to send data “ABCD” from the serial port to the TCP/UDP test tool (Figure 2-4).

Send: at+send_data=0,9000,192.168.1.105,4,ABCD\r\n

Return: 4F 4B 0D 0A

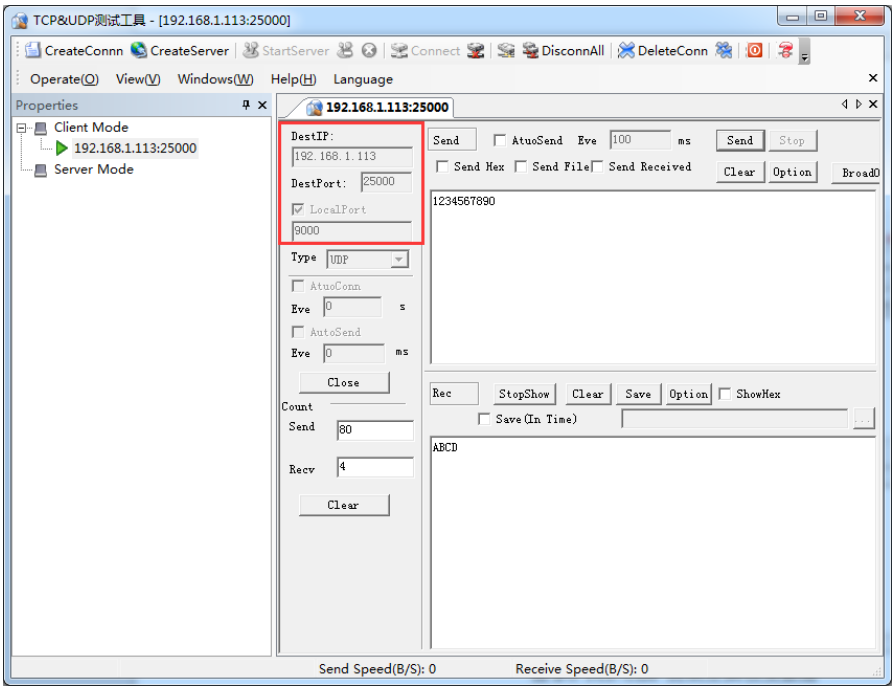

Figure 2-3 Transmit and receive data with the TCP/UDP test tool

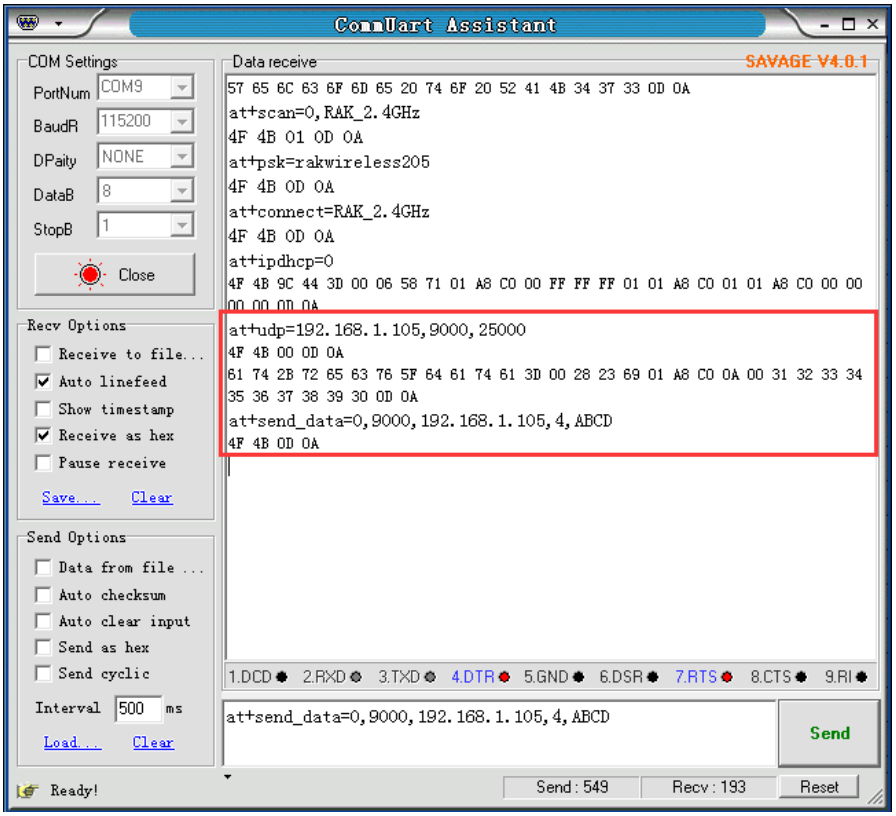

Figure 2-4 The module transmits and receives data

Version

Version	Author	Date	Content modification
V1.0	Lianbo Wang	2016/02/02	Create a document
V1.1	Xiaocheng Cao	2016/10/10	Modify some of the details