

RAK475/477 Use Guidance

Communicating via TCP in Command Mode

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1. Creating a TCP Server for Communication in AP mode

1.1 Overview

In the exemplary process in this section, we first set up a TCP Server using the RAK475/477 module, and then we connect the PC (C) to the module's AP and set up a TCP client using the TCP/UDP Test tool so that the module and PC (C) can start communicating via TCP.

1.2 操作须知

Tips:

1. This demo is done on the RAK475 development board.
2. The module in this demo is under factory settings.
3. When sending command to control the module via MCU, enter “\r\n” to complete the command;
4. When sending command to control the module via the serial port tool, press Enter to complete the command;
5. For ease of viewing, the information returned by the send command is presented in ASCII value. Special characters or Chinese characters in the returned information might result in the information being partially displayed or unreadable. In these cases, please view the returned information in hexadecimal form.
6. This method of communication via TCP Server applies to both the RAK475 and RAK477 modules, so here we take RAK475 for example, and we will illustrate the difference between the two when needed.

Please keep in mind the abovementioned points, for they will not be mentioned later.

1.3 Creating an AP and Setting up the Socket Parameters

1. The module is in AP Mode under the default factory settings.
2. Refer to “RAK475/477 User Guide - How to Restore the Module to the Factory Settings” “RAK475 User Guide – Creating an AP Network” “RAK475/477 User Guide - Batch Writing Configuration Parameters to the Module” “RAK475/477 User Guide - Configuration Tool Instructions” to create an AP with the module and set the parameters of the Socket as follows - Socket: Single, Socket A Type: TCP-Server, Local Port: 25000 (can be set to any legitimate port number; since the module is the Server, the local port number is also the server port number).

1.4 Operating Steps

1. First connect the module to the computer via serial cable, and then follow the steps below to enable the Assistant Command Mode:

Enabling the assistant command interface in Transparent Transmission Mode is done in a similar way to “handshake”. As shown in Figure 1-1.

- 1) The host computer (master MCU) requests to enter Command Mode by sending “+++”.
- 2) Set the timer for 200ms and wait for the module to return a “U” (0x55) within this specified time. If the module did not return a “U” when the timer expires, send “+++” again until a “U” (0x55) is returned. Now the module is ready to enter Command Mode, and it is waiting for the final confirmation (wait for 3s)
- 3) After receiving the “U” (0x55), the host computer (master MCU) has to send a “U”

(0x55) to the module as the last confirmation message within 3 seconds. If the module successfully received the confirmation message, it would return an “OK” and enter Command Mode. Otherwise, the module would exit the READY status and would be waiting for the next REQUEST command. In this case, repeat steps 1-3.

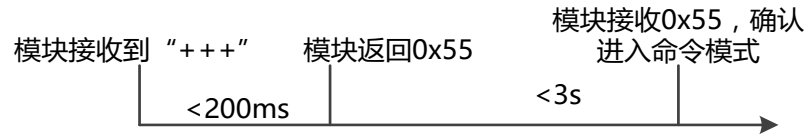


Figure 1-1 Enter Command Sequence

2. Connect the PC to the AP created by the module. Open the TCP/UDP Test tool to create a TCP Client and connect it with the module created TCP Server. The target IP of the TCP Client is the module's static IP (192.168.7.1) and the target port is the module's local port (25000).

3. The TCP Client sends a string to the TCP Server, namely, send data from the test tool to the module (Figure 1-2).

Send: bcd

Return: 61 74 2B 72 65 63 76 5F 64 61 74 61 3D 00 CA D9 02 07 A8 C0 04 00 61 62 63 64 0D 0A

4. The TCP Server sends a string to the TCP Client, namely, send data “ABCD” from the module to the TCP/UDP Test tool (Figure 1-3).

Send: t+send_data=0,0,0,4,ABCD\r\n

Return: 4F 4B 0D 0A

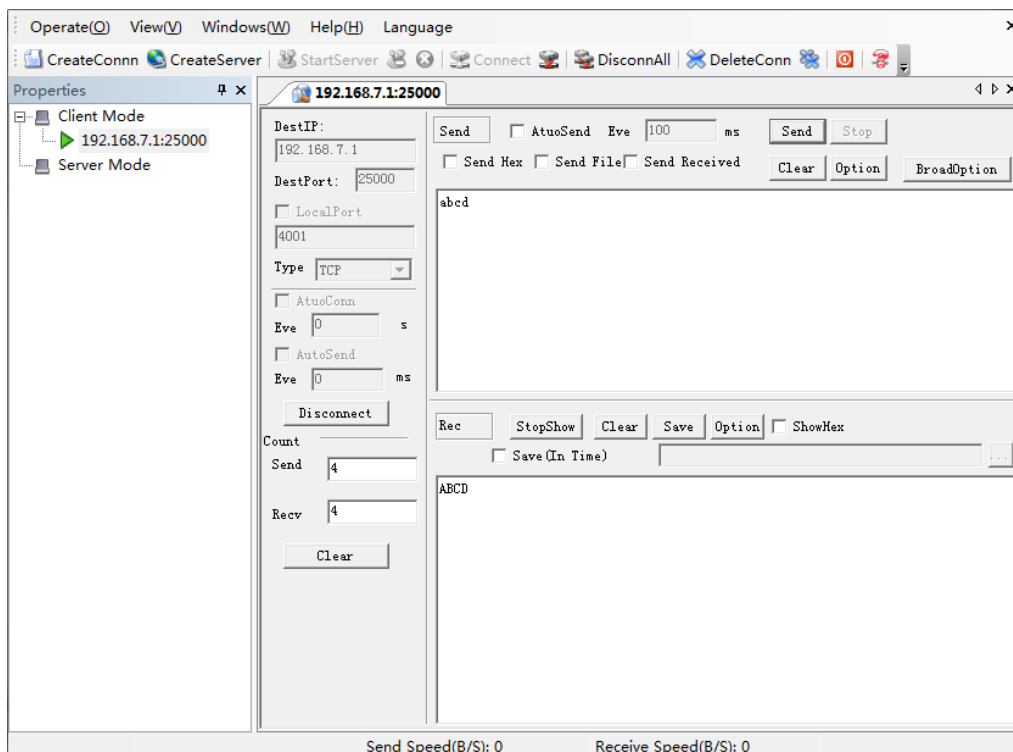


Figure 1-2 TCP/UDP Test Tool Data Sending and Receiving

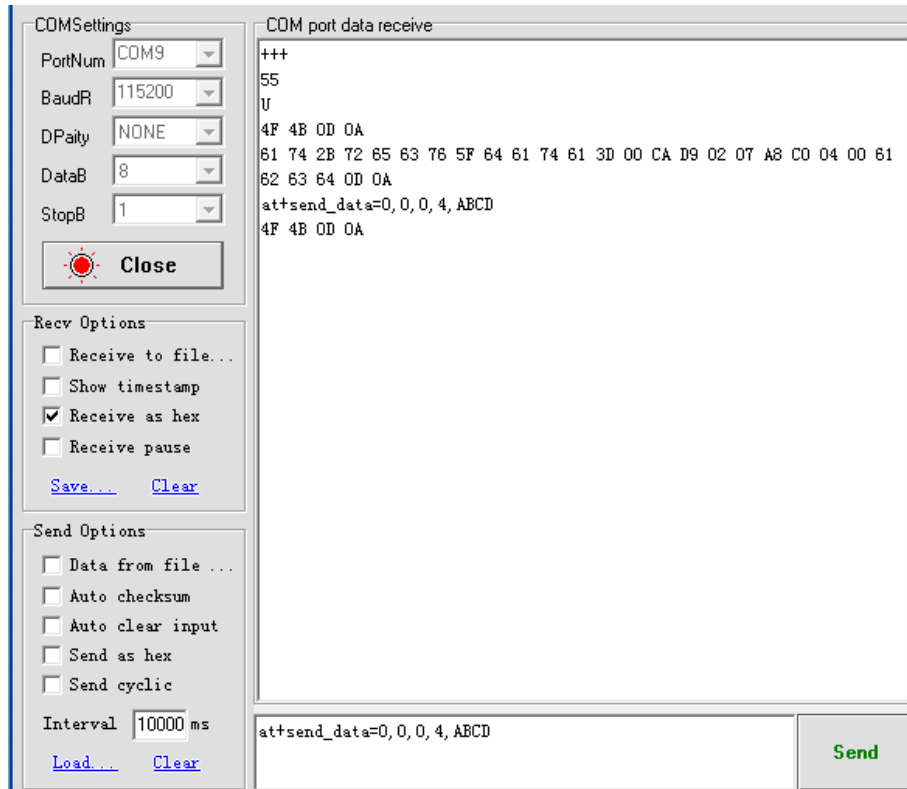


Figure 1-3 Module Data Sending and Receiving

2. Creating TCP_Client Communication in STA Mode

2.1 Overview

In the exemplary process in this section, we first use the module to create a TCP Client and connect it to the router, and then we use the PC (C) to create a TCP Server and connect it to the same router so that the module and PC (C) can start communicating via TCP.

2.2 Operating Introduction

Tips:

1. This demo is done on the RAK475 development board.
2. The module in this demo is under factory settings.
3. When sending command to control the module via MCU, enter “\r\n” to complete the command;
4. When sending command to control the module via the serial port tool, press Enter to complete the command;
5. For ease of viewing, the information returned by the send command is presented in ASCII value. Special characters or Chinese characters in the returned information might result in the information being partially displayed or unreadable. In these cases, please view the returned information in hexadecimal form.
6. This method applies to both the RAK475 and RAK477 modules, so here we take RAK475 for example, and we will illustrate the difference between the two when needed.

Please keep in mind the abovementioned points, for they will not be mentioned later.

2.3 Creating a TCP Server on the PC (C)

First connect the PC to the specified router. Then open the TCP/UDP Test tool and create a TCP Server; set the local port to 25000 (or any legitimate port) and **record the server IP address**.

2.4 Setting up the Socket Parameters of the Module and Joining the Router

Refer to “RAK475/477 User Guide - Configuration Tool Instructions” “Configuring the Router via Web” “RAK475 User Guide – Configuring the Router in WPS Mode” to set the Socket parameters of the module as follows - Socket: Single, Socket A Type: TCP-Client, Server Address: the IP address recorded in 2.3, Server Port: 25000, Local Port: 20000 (or any other legitimate port number). Once the setup is completed, configure the module to the router that connects the PC (C).

2.5 TCP_Client Communication

1. Enabling Assistant Command

Enabling the assistant command interface in Transparent Transmission Mode is done in a similar way to “handshake”. As shown in Figure 2-1.

- 1) The host computer (master MCU) requests to enter Command Mode by sending “+++”.
- 2) Set the timer for 200ms and wait for the module to return a “U” (0x55) within this specified time. If the module did not return a “U” when the timer expires, send “+++” again until a “U” (0x55) is returned. Now the module is ready to enter Command Mode, and it is waiting for the

final confirmation (wait for 3s).

3) After receiving the “U” (0x55), the host computer (master MCU) has to send a “U” (0x55) to the module as the last confirmation message within 3 seconds. If the module successfully received the confirmation message, it would return an “OK” and enter Command Mode. Otherwise, the module would exit the READY status and would be waiting for the next REQUEST command. In this case, repeat steps 2-3.

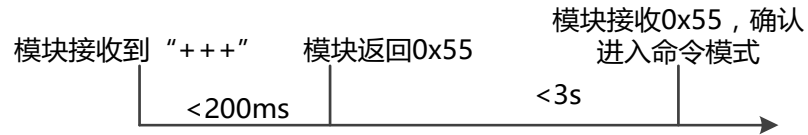


Figure 2-1 Enter Command Sequence

2. The TCP Server sends a string to the TCP Client, namely, send data from the TCP/UDP Test tool to the serial port (Figure 2-2).

Send: abcd

Return: 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

3. The TCP Client sends a string to the TCP Server, namely, send data “ABCD” from the serial port to the TCP/UDP Test tool (Figure 2-3).

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

Return: 4F 4B 0D 0A

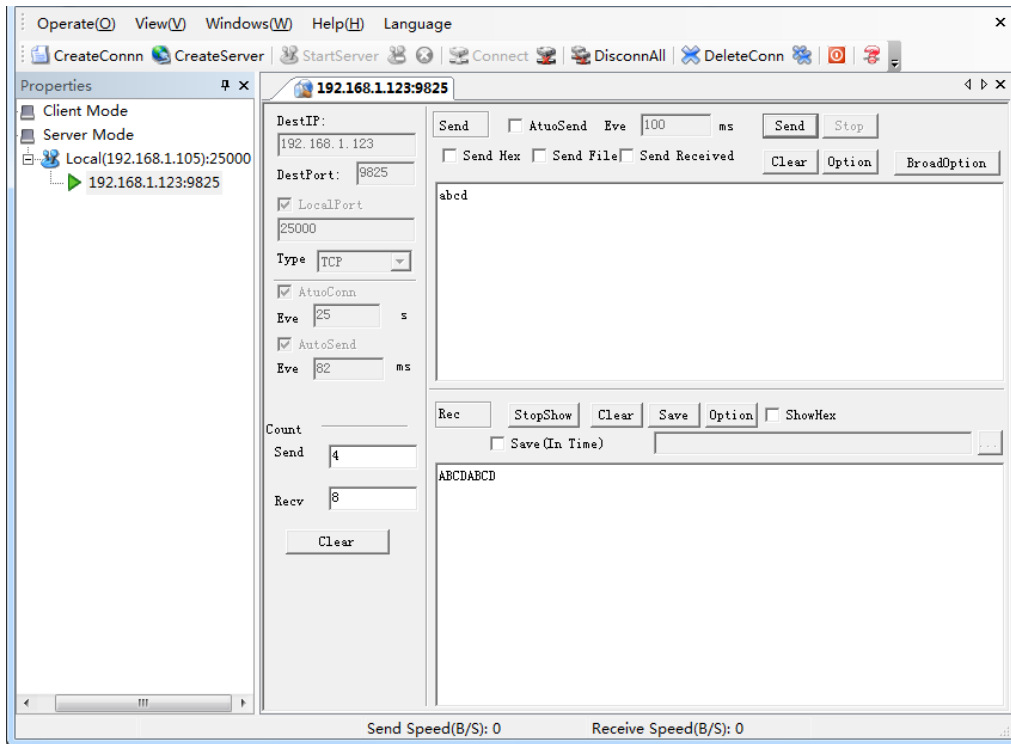


Figure 2-2 TCP/UDP Test Tool Data Sending and Receiving

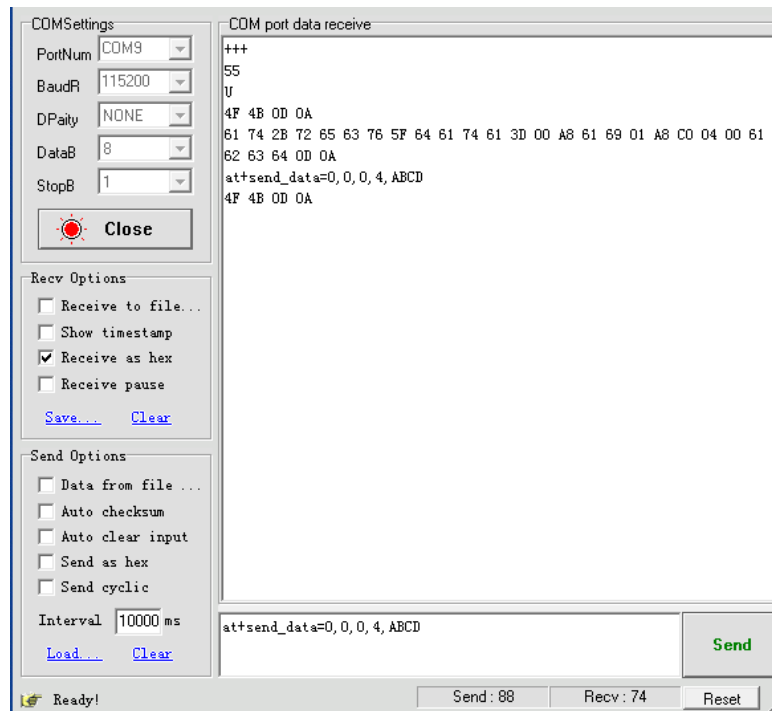


Figure 2-3 Module Data Sending and Receiving

Version

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