TCP Server Socket Application

User guide

Version 0.2

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About this Document

This document describes the process of bringing up the RS9113 based module as a standard TCP server socket and receives data from remote TCP client.

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1 Introduction

This project is applicable to all the WiSeConnect variants like WiSeConnect Plus, WiSeMCU and WyzBee. The term WiSeConnect refers to its appropriate variant.

1.1 TCP Protocol Overview

TCP(Transmission control protocol) is a connection-oriented protocol for transferring data reliably in either direction between a pair of users.

TCP server waits for the connections from TCP clients and accepts Incoming TCP connections.

1.2 Application Overview

1.2.1 Overview

The TCP server application demonstrates how to open and use a standard TCP server socket and receives data from TCP client socket.

1.2.2 Sequence of Events

This Application explains user how to:

- Connect the Device to an Access point and get IP address through DHCP
- Open TCP server socket in device
- Connect to TCP server socket opened in device from remote peer using TCP client socket.
- Receive data from TCP client socket.

1.3 Application Setup

The WiSeConnect in its many variants supports SPI and UART interfaces. Depending on the interface used, the required set up is as below:

1.3.1 SPI based Setup Requirements

- Windows PC with CooCox IDE
- Spansion (MB9BF568NBGL) micro controller

Note: If user does not have Spansion (MB9BF568NBGL) host platform, please go through the SPI-Porting guide **\sapis\docs\RS9113-WiSeConnect-SAPI-Porting-Guide-vx.x.pdf** for SAPIs porting to that particular platform.

- WiSeConnect device
- WiFi Access point
- Windows PC2
- TCP client application running in Windows PC2 (This application uses iperf application to open TCP client socket)

1.3.2 UART/USB-CDC based Setup Requirements

- Windows PC with Dev-C++ IDE
- WiSeConnect device
- WiFi Access point
- Windows PC2

- TCP client application running in Windows PC2 (This application uses iperf application to open TCP client socket)

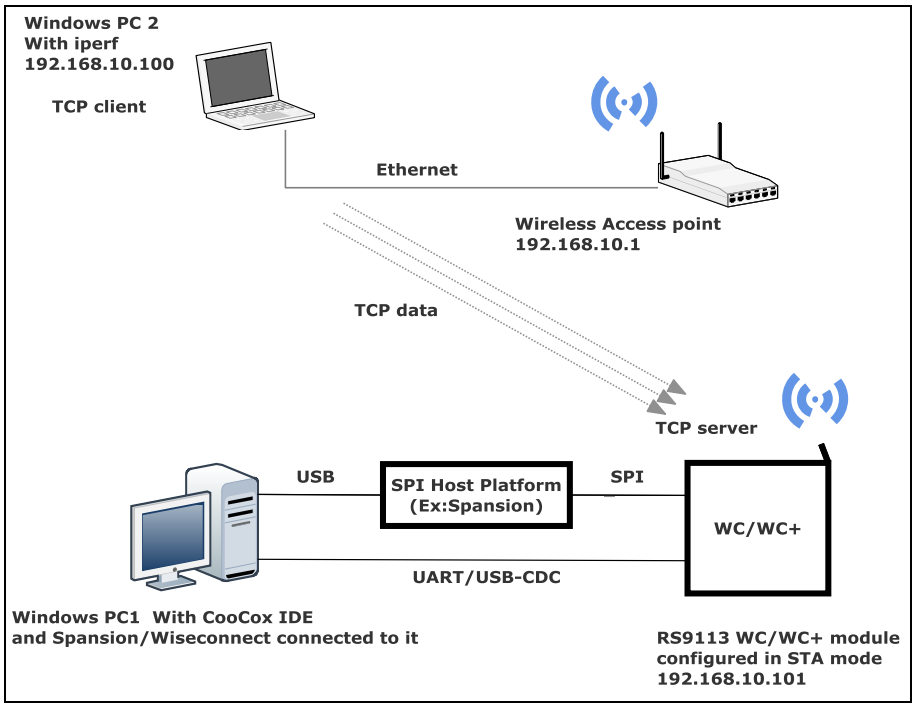


Figure 1: Setup Diagram

2 Configuration and Execution of the Application

The example application is available in the Release at **{Release $}/host/sapis/examples.** These examples will have to be initialized, configured and executed to test the application. The initialization varies based on the interface but configuration and execution are the common.

2.1 Initializing the Application

2.1.1 SPI Interface

If User using SPI interface, Please refer the document ***sapis/platforms/spansion_MB9BF568NBGL/RS9113-WiSeConnect_SAPIS_Spansion_Project_User_guide.pdf*** for opening the ***tcp_server*** example in CooCox IDE.

2.1.2 UART/USB-CDC Interface

If User using UART interface, Please refer the document ***sapis/platforms/ windows_uart/RS9113-WiSeConnect_SAPIS_Windows_Project_UserGuide.pdf*** for opening the ***tcp_server*** example in Dev-C++ IDE

2.2 Configuring the Application

1. Open sapis/examples/wlan/tcp_server/rsi_tcp_server.c file and update/modify following macros:

SSID refers to the name of the Access point.

```
#define SSID                    "<ap name>"
```

CHANNEL_NO refers to the channel in which device should scan. If it is 0, device will scan all channels

```
#define CHANNEL_NO          0
```

SECURITY_TYPE refers to the type of security. In this application STA supports Open, WPA-PSK, WPA2-PSK securities.

Valid configuration are :

RSI_OPEN - For OPEN security mode

RSI_WPA - For WPA security mode

RSI_WPA2 - For WPA2 security mode

```
#define SECURITY_TYPE           RSI_OPEN
```

PSK refers to the secret key if the Access point configured in WPA-PSK/WPA2-PSK security modes.

```
#define PSK                     "<psk>"
```

DEVICE_PORT port refers TCP client port number

```
#define DEVICE_PORT             5001
```

Receive data length

```
#define RECV_BUFFER_SIZE        <recv_buf_size>
```

NUMEBR_OF_PACKETS refers how many packets to receive from TCP client

```
#define NUMBER_OF_PACKETS     <no of packets>
```

Application memory length which is required by the driver

```
#define  GLOBAL_BUFF_LEN       8000
```

To configure IP address

DHCP_MODE refers whether IP address configured through DHCP or STATIC

```
#define DHCP_MODE    0
```

Note: Configure STATIC IP to WiSeConnect device. So that user knows the IP address of WiSeConnect device to establish TCP connection from remote peer. In case of DHCP, User has to know the assigned IP by parsing IPCONF response.

IP address to be configured to the device in STA mode should be in long format and in little endian byte order.

Example: To configure "192.168.0.101" as IP address, update the macro **DEVICE_IP** as **0x0A0AA8C0**.

```
#define  DEVICE_IP          0X6500A8C0
```

IP address of the gateway should also be in long format and in little endian byte order

Example: To configure "192.168.10.1" as Gateway, update the macro GATEWAY as **0x010AA8C0**

```
#define  GATEWAY            0x0100A8C0
```

IP address of the network mask should also be in long format and in little endian byte order

Example: To configure "255.255.255.0" as network mask, update the macro **NETMASK** as **0x00FFFFFF**

```
#define   NETMASK           0x00FFFFFF
```

2. Open ***sapis/include/rsi_wlan_config.h*** file and update/modify following macros,

```
#define  CONCURRENT_MODE             RSI_DISABLE
#define  RSI_FEATURE_BIT_MAP         FEAT_SECURITY_OPEN
#define  RSI_TCP_IP_BYPASS           RSI_DISABLE
#define  RSI_TCP_IP_FEATURE_BIT_MAP  TCP_IP_FEAT_DHCPV4_CLIENT
#define  RSI_CUSTOM_FEATURE_BIT_MAP  0
#define  RSI_BAND                    RSI_BAND_2P4GHZ
```

2.3 Executing the Application

1. Configure the Access point in OPEN/WPA-PSK/WPA2-PSK mode to connect WiSeConnect device in STA mode.

2. **SPI Interface**

   If User using SPI interface, Please refer the document ***sapis/platforms/spansion_MB9BF568NBGL/RS9113-WiSeConnect_SAPIS_Spansion_Project_User_guide.pdf*** for executing the ***tcp_server*** example in CooCox IDE.

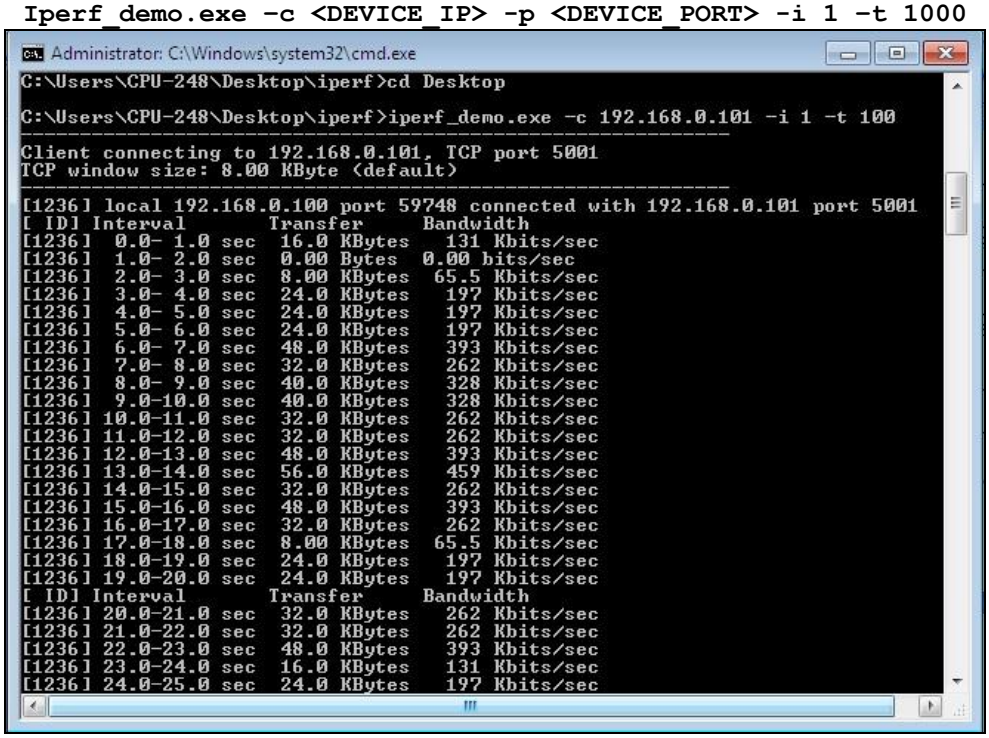
3. **UART/USB-CDC Interface**

   If User using UART interface, Please refer the document ***sapis/platforms/ windows_uart/RS9113-WiSeConnect_SAPIS_Windows_Project_UserGuide.pdf*** for executing the ***tcp_server*** example in Dev-C++ IDE

4. After the program gets executed, WiSeConnect Device will be connected to Access point having the configuration same as that of in the application and get IP.

5. Open TCP client using iperf from Windows PC2 and connect to TCP server opened on WiSeConnect device on port number **DEVICE_PORT** using the following command :

```
Iperf_demo.exe -c <DEVICE_IP> -p <DEVICE_PORT> -i 1 -t 1000
```



6. WiSeConnect Device will receive the number of packets configured in **NUMBER_OF_PACKETS** from iperf TCP client and closes the socket.