COREXOM R405LQ LR EVA KIT

USER GUIDE

Rev. V0.3 (Preliminary)
2025/01/10

Revision History

Rev.	Date	Description
0.0	2024/03/19	Preliminary
0.1	2024/04/01	Model name update
0.2	2024/05/24	Add new section 3.3 IP address setting for Multi-STA
0.3	2025/01/10	• Following cricfg tool Menu items to adjustment • Add criwifitool shell command to get RSSI information in section 2.1.4 and Connection Status in section 2.2.2

About This Document

- Illustrations in this documentation might look different from your product.
- Depending on the model, some optional accessories, features, and software programs might not be available on your device.
- Depending on the version of operating systems and programs, some user interface instructions might not be applicable to your device.
- Documentation content is subject to change without notice. Coretronic Reality Inc. (CRI) makes constant improvements on the documentation of your computer, including this guidebook.

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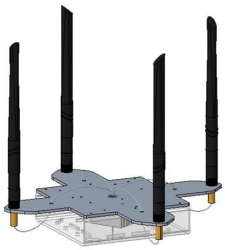
1. Introduction

CRI R405LQ LR EVA KIT is major packed with a R405LQ LR module, Antenna Kit (frame with 4 pcs Dipole Antenna) and accessories (cables and adaptor), through USB or UART connection to work similar as external WiFi network module. The R405LQ can support RNDIS (Remote Network Driver Interface Specification) standard as module interface control. The R405LQ LR is leverage WiFi technology, and capable for long distances connection and data communication.

R405LQ LR Module



Antenna Kit

When using R405LQ LR to build up connection network, please need to set up one of R405LQ LR as AP mode (default), and others R405LQ LR are set as STA (Cline) mode. They are communicate working in closed network areas.

1.1 Features and Specification

The following table shows the detailed features and Spec. of R405LQ LR module and Antenna.

Key features of R405LQ LR module

Item	Description
Platform	Qualcomm QCS405 + QCN9074
Technology	Leverage Wi-Fi 6 (802.11ax)
MIMO	4T4R
Frequency	● 2412MHz~2462MHz ● 5180MHz~5240MHz / 5745MHz~5825MHz
RF signal B.W	5MHz / 10MHz / 20MHz
Throughput	240 Mbps (TBC)
Radio Tx Power	● ≦ 24dBm @ 2.4GHz ● ≦ 24dBm @ 5GHz
Distance	> 10KM (Open space without distractions)
Connection Interfaces	1. USB 3.0 (Type C) 2. USB 2.0 (Micro USB, for FW UD) 3. UART x2 (1.8V)

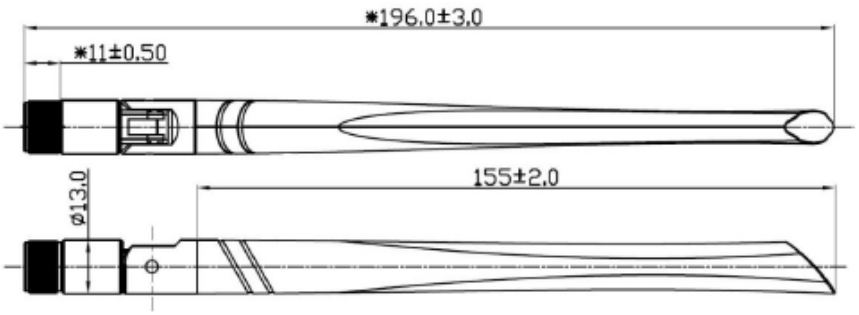
Item	Description
	4. UART x1 (3.3V, for Debug only) 5. Buttons x6
Power Supply	DC 6.6V~17V via Power Jack
Power Consumption	● 2.4GHz 4T4R Tx < 9.8W ● 2.4GHz 4T4R Rx < 4.0W ● 5GHz 4T4R Tx < 13.8W ● 5GHz 4T4R Rx < 4.5W
Dimension	60 x 72 x 9.9 mm
Weight	Around 21 g
Operation Temp.	-20 ~ 70 ℃
Storage Temp.	-20 ~ 70 ℃
Device Driver	RNDIS (Remote Network Driver Interface Specification)

Notice : When using, be sure to connect the antenna as a load at the antenna terminal to prevent no-load reflection from damaging the PA.

Major Spec. of Dipole Antenna

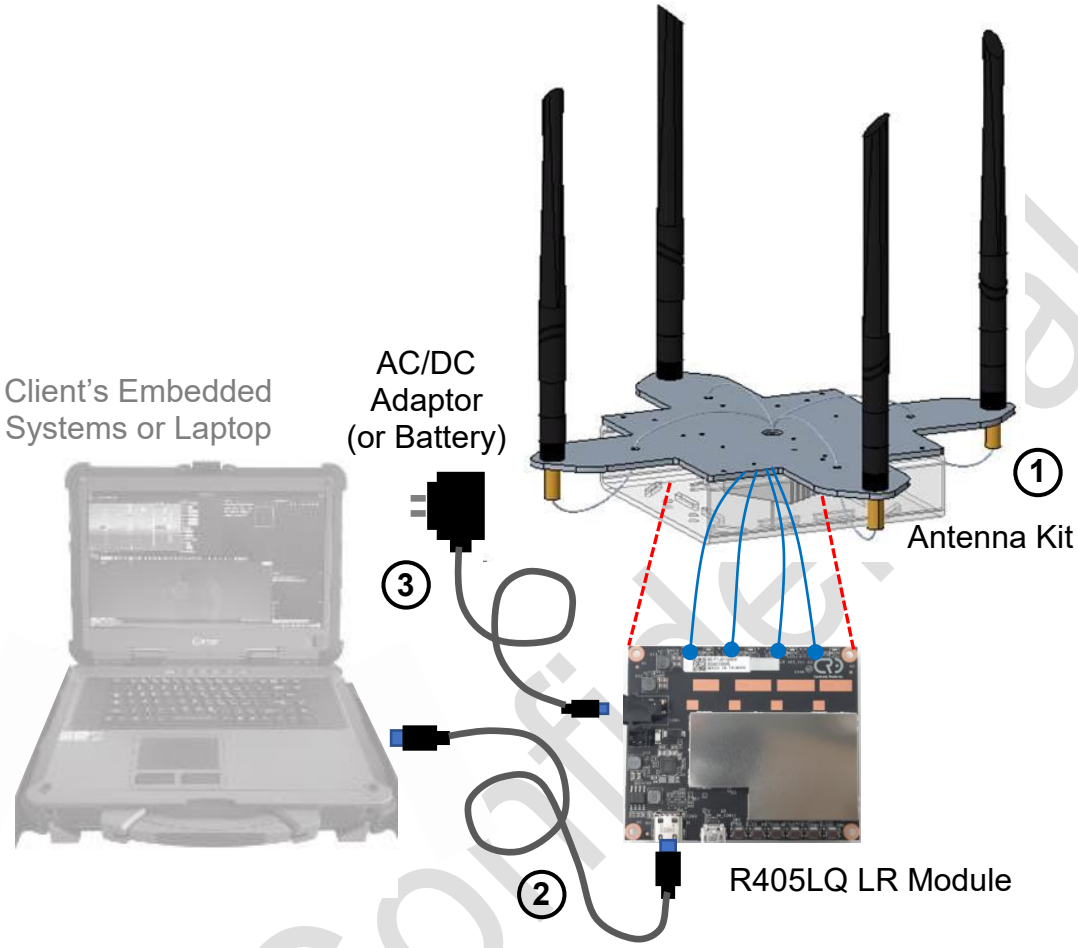
Item	Description
Frequency	2400 ~ 2500 MHz 5150 ~ 5850 MHz
S.W.R	≦ 2.0
Antenna Gain	5 dBi ± 0.5 dBi @ 2400 ~ 2500 MHz 5 dBi ± 0.5 dBi @ 5150 ~ 5850 MHz
Efficiency	>81% @ 2400 ~ 2500 MHz >73% @ 5150 ~ 5850 MHz
Polarization	Linear
Impedance	50 ohm
Connector	RP-SMA male
Operation Temp.	-40 ~ 65 ℃
Storage Temp.	-40 ~ 80 ℃

Notice : Antenna Kit is placed 4 pcs Dipole Antenna at 4 corners of base frame.



1.2 Product Diagram

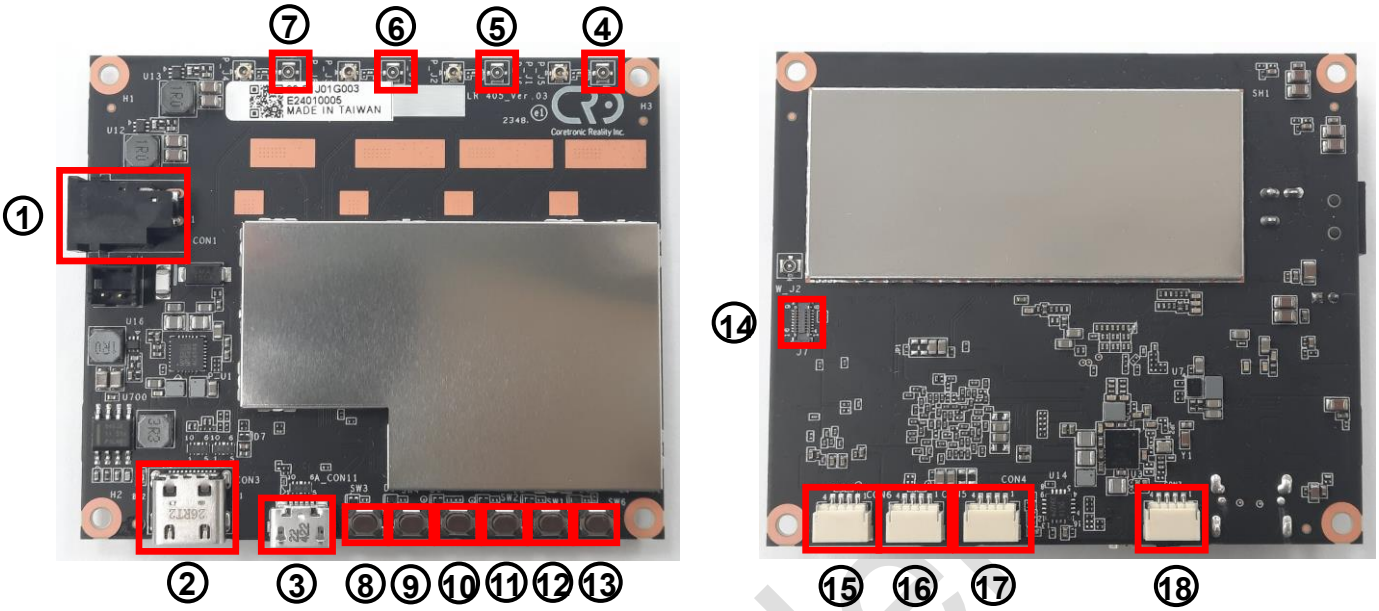
R405LQ LR EVA KIT contains the items listed in the table below, and typical evaluation case is configured setup like below picture.



No.	Box contents	Q'ty
1	R405LQ LR EVA KIT (LR Module + Heat sink + Antenna Kit)	1
2	USB Type A to C Cable	1
3	AC110/220V to DC 12V 36W Adaptor	1
4	USB Type A to Micro Cable (option for FW UD)	1
5	USB Type A to UART Cable (option for Debug)	1
6	XT60 Cable (option for DC Power)	1
7	Quick User Guide	1

1.3 Major interface components location

Below picture identify the major interface components and connectors found on the R405LQ LR module



No.	Function Description	No.	Function Description
1	DC Power Jack	10	Key SW, Pair
2	USB 3.0 Type C	11	Key SW, Volume -
3	USB 2.0 Micro (for FW UD)	12	RESET (QCS_RESIN_N)
4	RF Conn, Chain 1	13	USB BOOT
5	RF Conn, Chain 2	14	JTAG (for Debug only)
6	RF Conn, Chain 3	15	UART (1.8V)
7	RF Conn, Chain 4	16	UART (1.8V)
8	Key SW, Power	17	UART (3.3V, for Debug only)
9	Key SW, Volume +	18	USB 2.0 (ALT with #3 for FW UD)

2. Device Tools Operation

This chapter introduces the detail setup and testing steps of R405LQ LR EVA KIT build in configuration tools, and via PC's connection and operation. Please install the ADB (Android Debug Bridge) environment in your PC at first, then refer section 1.2 to setup R405LQ LR EVA KIT and connected with PC via USB cable.
Please use the "adb devices" command to check whether the R405LQ LR module is successfully connected to the PC ? Then use the "cricfg" command to enter the device tool's control menu of R405LQ LR EVA KIT.

```
D:\>adb devices
List of devices attached
238     device


D:\>adb shell
/ # cricfg
```

2.1 AP mode Menu operation

R405LQ LR EVA KIT can be configured as AP (Access Point) mode or STA (Station, Cline) mode through System Menu setup. This section introduces when R405LQ LR is configured as AP mode then re-power on. After connected with ADB PC, and enter "cricfg" command. The items select Menu will be shown on ADB PC as below.

```
Software version: 2.3.4
*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~*
    SAP Menu
 1: SAP - Settings
 2: SAP - Switch Channel / Bandwidth
 3: SAP - Advance Setting (CBS/SBS)
 4: SAP - Get Current Channel and Bandwidth
 5: SAP - Get RSSI
 6: SAP - Throughput Test
 7: SAP - Change Network Mode (Beta)

    System Menu
91: System - Set device as SAP mode.
92: System - Set device as STA mode.
93: System - [ ● ] iperf service.
94: System - ANT configuration
95: Device Info

99: Factory Reset. (Reset Wi-Fi functionality only)

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

2.1.1 Settings (SSID)

When enter “1” at top menu, then into “SAP - settings” menu.

```
*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~*~
    SAP settings
 1: SAP - Get the Current SSID and PSK.
 2: SAP - Set the New SSID And PSK

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

You can enter “1” again to get current SSID and Password set

```
ssid=CRIssidJeff
#wpa_passphrase=12345678


*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~*~
    SAP settings
 1: SAP - Get the Current  And PSK.
 2: SAP - Set the New SSID And PSK

 0. Exit.

Please enter the operation number to be performed: _
```

Or, enter “2” to setup new SSID and Password.

```
Please enter the new Hostpot_SSID: CRIssidJeff
Please enter the new Hostpot_PSK:12345678
command failed: Invalid argument (-22)
l2_packet_init: ioctl[SIOCGIFINDEX]: No such device
Failed to open l2_packet interface for vlan bridge
ath0: interface state UNINITIALIZED->ENABLED
ath0: AP-ENABLED


*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~*~
    SAP settings
 1: SAP - Get the Current  And PSK.
 2: SAP - Set the New SSID And PSK

 0. Exit.

Please enter the operation number to be performed: _
```

Or, enter “0” will exit to go back top Menu

2.1.2 Switch Channel and Bandwidth

When enter “2” at top menu, then into “SAP - Switch Channel / Bandwidth” menu.

```
Channel: 36 (5180 MHz) bandwidth: 20MHz (network mdoe: 11AHE20.)

*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~
    SAP Channel / Bandwidth settings
 1: SAP - Switch Channel.
 2: SAP - Switch Bandwidth.
 3: SAP - Switch Channel and Bandwidth.

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

The current Channel and Bandwidth information are shown at top line, or enter “1” to change the Channel number, or enter “2” to change Channel Bandwidth. Or, enter “3” to change Channel and Bandwidth in the same time.

```
Please enter the new channel: 40
Bandwidth only support: 0: 20MHz, 1: 10MHz, 2: 5MHz
Please enter the new bandwidth: [0/1/2]: 1
Change channel to 40 with bandwidth to 10 MHz, please wait...
Channel changed to 40 successfully.

Bandwidth changed to 10MHz successfully.


Channel: 40 (5200 MHz) bandwidth: 10MHz (network mdoe: 11AHE20.)

*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~
    SAP Channel / Bandwidth settings
 1: SAP - Switch Channel.
 2: SAP - Switch Bandwidth.
 3: SAP - Switch Channel and Bandwidth.

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

Or, enter “0” will exit to go back top Menu

2.1.3 Advance Setting (CBS / SBS)

When enter “3” at top menu, then into “SAP – Advance setting (CBS/SBS)” menu.

```
*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~*
    Advance setting
 1. [    ] Auto Channel Selection (5 GHz)
 2. [    ] Auto Channel Selection (2.4 GHz)
 3. [    ] DCS+CBS: 2.4 GHz and 5 GHz non-DFS channels
 4. [    ] DCS+SBS All 5 GHz channels

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

You can choose suitable item to decide channel frequency hopping range depend on RF usage.

For example, enter “3” to enable DCS+CBS frequency hopping range

```
This feature has been configured.

*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~*
    Advance setting
 1. [    ] Auto Channel Selection (5 GHz)
 2. [    ] Auto Channel Selection (2.4 GHz)
 3. [ ● ] DCS+CBS: 2.4 GHz and 5 GHz non-DFS channels
 4. [    ] DCS+SBS All 5 GHz channels

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

(You can choose active item again to disable)

2.1.4 Get RSSI

When enter “5” at top menu, then can get RSSI information shows in below as reference depend on R405LQ LR working environment and situation.

```
ADDR              AID CHAN TXRATE RXRATE RSSI MINRSSI MAXRSSI IDLE  TXSEQ  RXSEQ  CAPS XCAPS ACAPS     ERP
  STATE MAXRATE(DOT11) HTCAPS   VHTCAPS ASSOCTIME    IEs   MODE RXNSS TXNSS                      PSMODE
44:a8:42:ff:46:df    1   44   6M     17M  -51     -52     -51   27      0   65535    Es  ETWt NULL    0
    b         286800            APM          1gTRs 00:04:05     WME IEEE80211_MODE_11AXA_HE20  4 2   0

 RSSI is combined over chains in dBm
 Minimum Tx Power               : 0
 Maximum Tx Power               : 0
 HT Capability                  : Yes
 VHT Capability                 : Yes
 MU capable                     : No
 SNR                            : 42
 Operating band                 :    5GHz
 Current Operating class        : 115
 Supported Operating classes    : 81  82  83  84  115  116  117  118  119  120  121  122  123  124  125  126
 127  128  130
 Supported Rates                : 12  18  24  36  48  72  96  108
 Max STA phymode                : IEEE80211_MODE_11AXA_HE20
00:03:7f:06:00:22    2   44   6M     14M  -15     -15     -12   54      0   65535    Es  ETWt NULL    0
    b         144400            APM          1gTRs 00:04:04     WME IEEE80211_MODE_11NA_HT20  4 2   0
```

BTW, except to through cricfg tool Menu choose to get RSSI information, user can also through criwifitool shell command to get RSSI information.

./vendor/cri/wifi/sh/criwifitool.sh getRSSI

- Connected: STA mac address, RSSI

```
root@qcs405-pine:/# ./vendor/cri/wifi/sh/criwifitool.sh getRSSI
44:a8:42:ff:46:ff,-39
```

2.1.5 Throughput Test

When enter “7” at top menu, then into “SAP – Throughput Test” menu

```
*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - SAP throughput test ~*~*~*~*~*~*~*~*~*~
 1: TCP: iperf 10 seconds
 2: TCP: iperf 60 seconds
 3: TCP: assign time
 4: UDP: iperf 10 seconds
 5: UDP: iperf 60 seconds
 6: UDP: assign time

 0. Exit.

Please enter the operation number to be performed: _
```

Choose the throughput test item number to perform the test as requirement, and result shows in below as reference

```
[  4]   1.01-2.01   sec  14.5 MBytes   122 Mbits/sec  1860  (omitted)
[  4]   2.01-3.00   sec  14.4 MBytes   121 Mbits/sec  1840  (omitted)
[  4]   0.00-1.00   sec  14.2 MBytes   119 Mbits/sec  1820
[  4]   1.00-2.01   sec  14.5 MBytes   121 Mbits/sec  1850
[  4]   2.01-3.01   sec  13.4 MBytes   112 Mbits/sec  1710
[  4]   3.01-4.00   sec  14.4 MBytes   121 Mbits/sec  1840
[  4]   4.00-5.00   sec  14.2 MBytes   119 Mbits/sec  1820
[  4]   5.00-6.00   sec  14.1 MBytes   118 Mbits/sec  1800
[  4]   6.00-7.00   sec  13.8 MBytes   115 Mbits/sec  1760
[  4]   7.00-8.00   sec  13.2 MBytes   111 Mbits/sec  1690
[  4]   8.00-9.01   sec  13.4 MBytes   112 Mbits/sec  1710
[  4]   9.01-10.00  sec  13.9 MBytes   117 Mbits/sec  1780
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Jitter    Lost/Total Datagrams
[  4]   0.00-10.00  sec   139 MBytes   117 Mbits/sec  0.664 ms  0/17780 (0%)
[  4] Sent 17780 datagrams

iperf Done.


*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - SAP throughput test ~*~*~*~*~*~*~*~*~*~
 1: TCP: iperf 10 seconds
 2: TCP: iperf 60 seconds
 3: TCP: assign time
 4: UDP: iperf 10 seconds
 5: UDP: iperf 60 seconds
 6: UDP: assign time

 0. Exit.
```

2.2 STA (Cline) mode Menu operation

This section introduces when R405LQ LR is configured as STA (Cline) mode then re-power on. After connected with ADB PC, and enter “cricfg” command. The below items select Menu will shows on ADB PC.

```
Software version: 2.3.4
*~*~*~*~*~*~*~*~*~*~ CRI Wi-Fi Config Tool - Menu    ~*~*~*~*~*~*~*~*~*~*
    STA Menu
 1: STA - Scan the Available Hotspots
 2: STA - Settings
 3: STA - Switch AP
 4: STA - Connection status
 5: STA - Throughput test

    System Menu
91: System - Set device as SAP mode.
92: System - Set device as STA mode.
93: System - [   ] iperf service.
94: System - ANT configuration
95: Device Info

99: Factory Reset. (Reset Wi-Fi functionality only)

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

2.2.1 STA (Cline) Setting

When enter “1” at top menu, then into “STA - Settings” menu.

```
    STA Settings
 1: STA Mode: Show WPA supplicant network Info.
 2: STA Mode: Get Connected SSID And PSK.
 3: STA Mode: Add new SSID And PSK.
 4: STA Mode: Remove Saved SSID.
 5: STA Mode: List the Actived WPA supplicant.

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

You can enter “2” to get current connected SSID of AP

```
Current current connection, ssid:  CRIssidJeff



    STA Settings
 1: STA Mode: Show WPA supplicant network Info.
 2: STA Mode: Get Connected SSID And PSK.
 3: STA Mode: Add new SSID And PSK.
 4: STA Mode: Remove Saved SSID.
 5: STA Mode: List the Actived WPA supplicant.

 0. Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed: 2_
```

Or, enter “5” to get the list of active WPA supplicant which shows as below picture as reference.

```
network id / ssid / bssid / flags
0       CRIssidJeff     any     [CURRENT]


    STA Settings
 1: STA Mode: Show WPA supplicant network Info.
 2: STA Mode: Get Connected SSID And PSK.
 3: STA Mode: Add new SSID And PSK.
 4: STA Mode: Remove Saved SSID.
 5: STA Mode: List the Actived WPA supplicant.

 0. Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed: 5_
```

2.2.2 STA Connection status

When enter “4” at top menu, then get current W405LQ LR Cline connection information.

```
~~~~~~~~~~~~~~~~~~ CRI Wi-Fi Config Tool - Menu ~~~~~~~~~~~~~~~~~~
    STA Menu
 1: STA - Scan the Available Hotspots
 2: STA - Settings
 3: STA - Service Switch (on/off)
 4: STA - Connection status
 5: STA - Throughput test

    System Menu
91: System - Enable device as SAP mode.
92: System - Enable device as STA mode.
93: System - Enable iperf service.
95: Device Info
99: Factory Reset.

 0. Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed: 4_
```

```
Connected to 46:a8:42:ff:46:a8 (on ath1)
        SSID: CRIssidJeff
        freq: 5220
```

BTW, except to through cricfg tool Menu choose to get Connection status, user can also through criwifitool shell command to get.

./vendor/cri/wifi/sh/criwifitool.sh getConnStat

- Connected: return 1, SAP mac address
- disconnected: return 0

```
/ # ./vendor/cri/wifi/sh/criwifitool.sh getConnStat
1,46:a8:42:ff:46:dd
```

2.2.3 STA Throughput Test

When enter “5” at top menu, then into “STA – Throughput Test” menu

```
*****************~ CRI Wi-Fi Config Tool - STA throughput test ~*****************
 1: TCP: iperf 10 seconds
 2: TCP: iperf 60 seconds
 3: TCP: assign time
 4: UDP: iperf 10 seconds
 5: UDP: iperf 60 seconds
 6: UDP: assign time

 0. Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed: 4_
```

Choose the throughput test item number to perform the test as requirement, and result shows in below as reference

```
run: iperf3 10 seconds in UDP.
◆◆eU
Connecting to host 192.168.1.1, port 5201
[  4] local 192.168.1.2 port 46308 connected to 192.168.1.1 port 5201
[ ID] Interval           Transfer     Bandwidth       Total Datagrams
[  4]   0.00-1.00   sec  11.6 MBytes  96.9 Mbits/sec  1480  (omitted)
[  4]   1.00-2.00   sec  13.8 MBytes   116 Mbits/sec  1770  (omitted)
[  4]   2.00-3.00   sec  18.9 MBytes   158 Mbits/sec  2420  (omitted)
[  4]   0.00-1.00   sec  19.5 MBytes   163 Mbits/sec  2490
[  4]   1.00-2.00   sec  18.3 MBytes   154 Mbits/sec  2340
[  4]   2.00-3.00   sec  21.8 MBytes   183 Mbits/sec  2790
[  4]   3.00-4.00   sec  16.3 MBytes   137 Mbits/sec  2090
[  4]   4.00-5.00   sec  20.2 MBytes   170 Mbits/sec  2590
[  4]   5.00-6.00   sec  20.0 MBytes   168 Mbits/sec  2560
[  4]   6.00-7.00   sec  20.2 MBytes   169 Mbits/sec  2580
[  4]   7.00-8.00   sec  20.2 MBytes   170 Mbits/sec  2590
[  4]   8.00-9.01   sec  17.5 MBytes   146 Mbits/sec  2240
[  4]   9.01-10.00  sec  14.1 MBytes   119 Mbits/sec  1800
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Jitter    Lost/Total Datagrams
[  4]   0.00-10.00  sec   188 MBytes   158 Mbits/sec  0.718 ms  1081/24064 (4.5%)
[  4] Sent 24064 datagrams

iperf Done.
```

2.3 System Menu operation

The “System Menu” are common supported by both AP mode and STA (Cline) mode of R405LQ LR.

```
    System Menu
91: System - Set device as SAP mode.
92: System - Set device as STA mode.
93: System - [    ] iperf service.
94: System - ANT configuration
95: Device Info

99: Factory Reset. (Reset Wi-Fi functionality only)

 0: Exit or Return to the Upper Level Directory.

Please enter the operation number to be performed:
```

2.3.1 System – Enable device as SAP mode

When enter “91” at top menu, then R405LQ LR module will be configured as AP mode, and disable STA (Cline) mode.

Note : The system only changes the configuration file. To complete the change mode, you need to restart the device.

2.3.2 System – Enable device as STA mode

When enter “92” at top menu, then R405LQ LR module will be configured as STA (Cline) mode, and disable AP mode

Note : The system only changes the configuration file. To complete the change mode, you need to restart the device.

2.3.3 System – Enable iperf service

When enter “93” at top menu, then R405LQ LR module will enable iperf service. After enable iperf service, the R405LQ LR can perform to response specified iperf test package on network. You can choose active item again to disable test service.

```
93: System - [ ● ] iperf service.
```

2.3.4 Device Info

```
-----------------------------------------------------
Device type: QCS405
CRI image version: G6-LR-2.1.3-debug
    |- wlan_pine: "WLAN.IOE_PN.1.3-00215-QCAHKSWPL_SILICONZ-1
    |- Meta_Build_ID: "QCS405.LE.2.0-00025-STD.PROD-1

Device Info:
    |- Service: STA
    |- IP: 192.168.1.2
    |- MAC: 44:a8:42:ff:46:c6
    |- Antena type: 4T4R
    |- channel 191 (2402 MHz), width: 20 MHz
    |- Network Mode: 11G
-----------------------------------------------------
```

2.3.5 Factory Reset

3. Evaluation Case Operation

3.1 WiFi AP access

Since R405LQ is default set as AP mode, you can check whether the default SSID “CRIssid” is on the connection menu through the WiFi function of your computer or mobile phone after power on the device. And, the R405LQ does not provide the DHCP function by default, please need to manually specify the IP address of cline device.

3.1.1 WiFi Connecting

Please refer chapter 1.2 to setup R405LQ LR EVA Kit then power On. And, please use a mobile phone as cline device, then choose SSID by “CRIssid” from WiFi connection menu. Then, enter password (default by “12345678”) to connect with R405LQ (AP mode).

3.1.2 Cline device IP address setting

After cline device has connected with R405LQ, please refer below picture to setting IP address related fields at cline device side, then save the setting.

a. IP setting : static (disable DHCP)
b. IP address : 192.168.1.x
   (set each device to have a different x number)
c. Gateway : 192.168.1.1
d. DNS : 8.8.8.8

3.1.3 WiFi Connection verify

After completing the above settings, the cline device (mobile phone) can connect to the R405LQ EVA Kit (AP mode). Then, you can use some 3rd party's Application Program which like "Wifi Analyser" to check the connection status and information.

3.2 Throughput test by paired 2 sets EVA Kit

This chapter will introduce how to use 2 sets EVA Kit, one is setup as AP mode, and another one is setup as STA mode, then through R405LQ module build in tools to perform “iperf” throughput test as evaluation case.

3.2.1 Setup at AP side

A. Please refer chapter 2.3.1 System Menu 91 operation to setup 1st EVA Kit as AP mode. Please re-power off/on once mode has been changed.
B. Please refer chapter 2.3.3 System Menu 93 operation to Enable iperf service.

3.2.2 Setup at STA (Cline) side

A. Please refer chapter 2.3.2 System Menu 92 operation to setup 2nd EVA Kit as STA (Cline) mode. Please re-power off/on once mode has been changed.
B. Please refer chapter 2.3.3 System Menu 93 operation to Enable iperf service
C. Please refer chapter 2.2.2 STA Menu 4, to check WiFi connection status, and confirmed WiFi has been connected.

3.2.3 Perform iperf test

A. Please refer chapter 2.2.3 STA Menu 5, to enter STA Throughput Test Menu. Then, choose the test item which you would like to do ?
B. For example, after enter 4, then the test result of “UDP : iperf 10 second“ will be shown like below picture.

```
run: iperf3 10 seconds in UDP.
◆◆eU
Connecting to host 192.168.1.1, port 5201
[  4] local 192.168.1.2 port 46308 connected to 192.168.1.1 port 5201
[ ID] Interval           Transfer     Bandwidth       Total Datagrams
[  4]   0.00-1.00   sec  11.6 MBytes  96.9 Mbits/sec  1480  (omitted)
[  4]   1.00-2.00   sec  13.8 MBytes   116 Mbits/sec  1770  (omitted)
[  4]   2.00-3.00   sec  18.9 MBytes   158 Mbits/sec  2420  (omitted)
[  4]   0.00-1.00   sec  19.5 MBytes   163 Mbits/sec  2490
[  4]   1.00-2.00   sec  18.3 MBytes   154 Mbits/sec  2340
[  4]   2.00-3.00   sec  21.8 MBytes   183 Mbits/sec  2790
[  4]   3.00-4.00   sec  16.3 MBytes   137 Mbits/sec  2090
[  4]   4.00-5.00   sec  20.2 MBytes   170 Mbits/sec  2590
[  4]   5.00-6.00   sec  20.0 MBytes   168 Mbits/sec  2560
[  4]   6.00-7.00   sec  20.2 MBytes   169 Mbits/sec  2580
[  4]   7.00-8.00   sec  20.2 MBytes   170 Mbits/sec  2590
[  4]   8.00-9.01   sec  17.5 MBytes   146 Mbits/sec  2240
[  4]   9.01-10.00  sec  14.1 MBytes   119 Mbits/sec  1800
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Jitter    Lost/Total Datagrams
[  4]   0.00-10.00  sec   188 MBytes   158 Mbits/sec  0.718 ms  1081/24064 (4.5%)
[  4] Sent 24064 datagrams

iperf Done.
```

3.3 IP address setting for Multi-STA

When the network application environment requires multiple STAs (Cline) to exist in the same network domain, the IP address of each STA will need to be set and changed to prevent IP address conflicts. Change the IP address of the R405LQ module STA, will be explained as follows.

When the module is set to STA (Cline) mode, you can set it through the "ifconfig ath1 [IP address]" command under adb shell, ex. ifconfig ath1 192.168.1.x (please set different settings according to your needs) x value for different modules in the same domain). After setting, the IP address can take effect.

Since the R405LQ module is preloaded with the IP address of the STA mode default to 192.168.1.2 in the factory. If user would like the module can be pre- loaded its own unique IP after booting. Please open the boot initial file "start_sta2" which is located in "/data/misc/wifi/" folder of the module system. Then, modify the command line which is same as above ifconfig ath1 [IP address], and it's located at row 24th.

start_sta2

```
20
21  sleep 1
22
23  iw dev wifi0 interface add ath1 type station addr 11:22:33:44:55:66
24  ifconfig ath1 192.168.1.2 netmask 255.255.255.0 up
25
26  #"11AST"        - IEEE80211_MODE_TURBO_STATIC_A
27  #"AUTO"         - IEEE80211_MODE_AUTO
28  #"11A"          - IEEE80211_MODE_11A
```

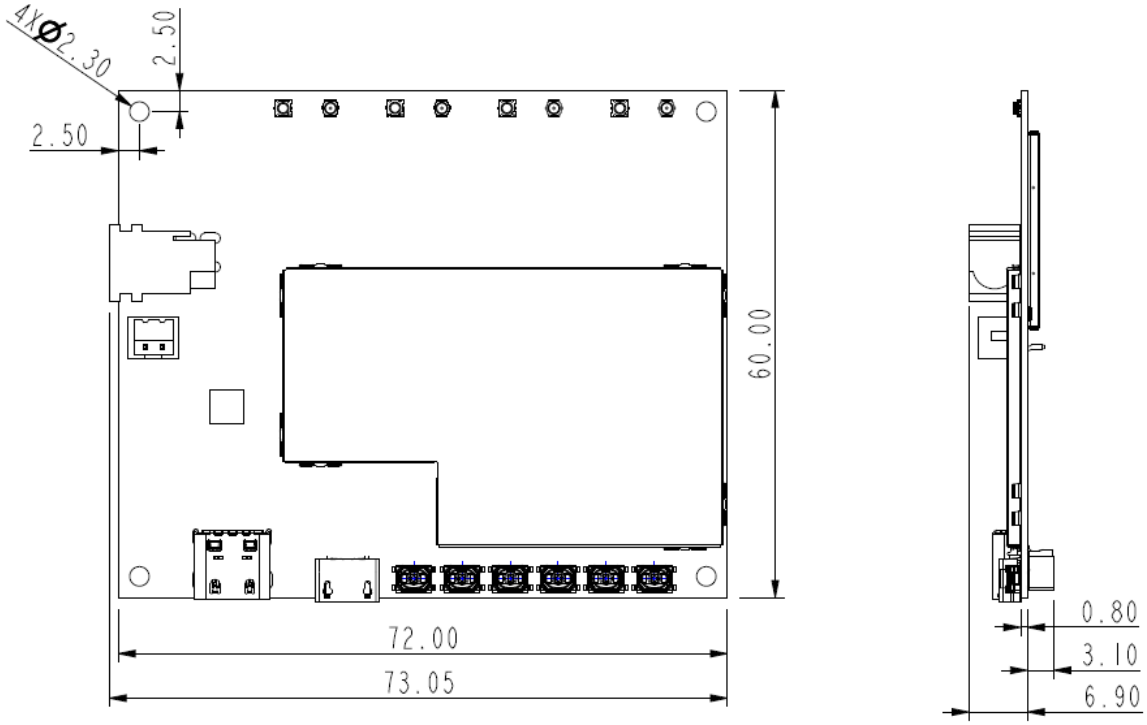
To modify the STA boot initial file start_sta2, you can use the following methods :

1. Linux built-in vi editor (please save and quit after modification)
2. Follow the steps below from the Host side
   a. Use "adb pull /data/misc/wifi/start_sta2" command to get the initial file.
   b. Modify the IP address through text editor (ex. Notepad++, ..) and save it (do not modify the file name, file extension and file format when using the editor)
   c. Use "adb push start_sta2 /data/misc/wifi/" command to restore (overwrite) the file into the module,
   d. Use "adb shell chmod 777 /data/misc/wifi/start_sta2" to change the file become executable mode

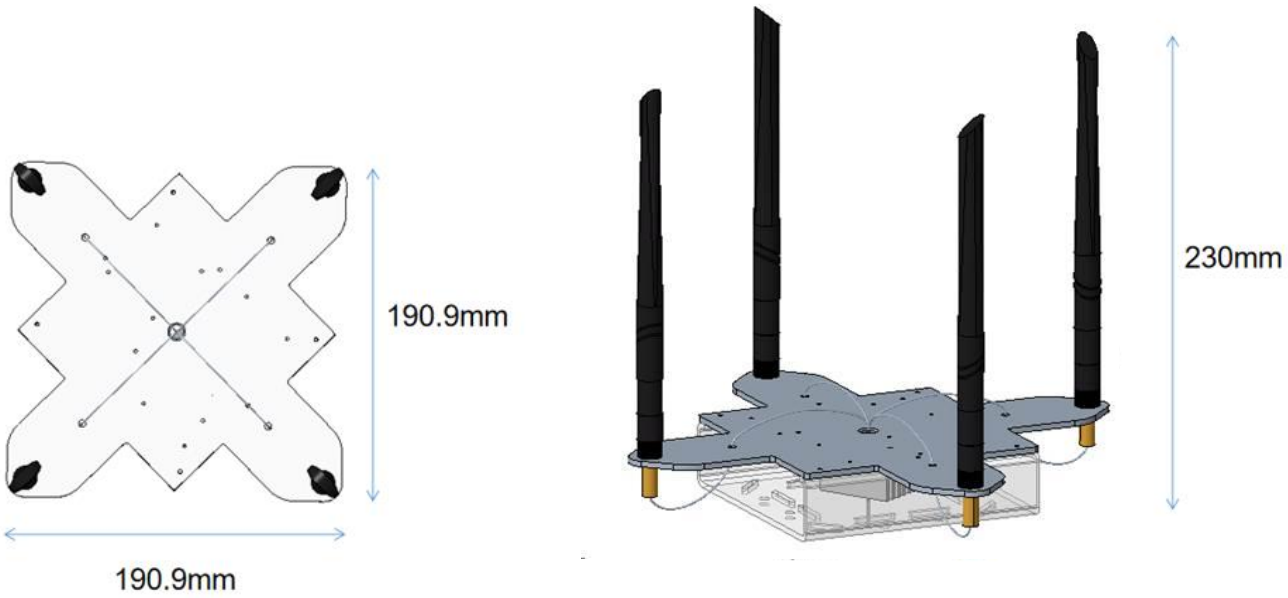
After the initial file start_sta2 has been modified, the module will set the IP address as required every time it is powered on (or rebooted).

4. Mechanical Specification

4.1 R405LQ LR module Mechanical dimensions



4.2 Antenna Kit outline



4.3 Weight

Around 335 ± 10 g (included R405LQ LR module + Antenna Kit + Heat sink, excluded AC/DC Adaptor and external cable)

5. Product Marking, Ordering and Shipping Info.

5.1 Product Marking (Label)