User's Guide

SimpleLink™ Wi-Fi® CC3x20, CC3x3x Radio Tool User Guide

TEXAS INSTRUMENTS

ABSTRACT

The Radio Tool serves as a control panel for direct access to the radio, and can be used for both the radio frequency (RF) evaluation and for certification purposes. This guide describes how to have the tool work seamlessly on Texas Instruments™ evaluation platforms such as the BoosterPack™ plus FTDI emulation board for CC31xx devices, and the LaunchPad™ for CC32xx devices.

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1 Introduction

The SimpleLink™ MCU portfolio offers a single development environment that delivers flexible hardware, software, and tool options for customers developing wired and wireless applications. With an ultimate goal of 100 percent code reuse across host MCUs, Wi-Fi®, Bluetooth® low energy, Sub-1 GHz devices, and more, choose the MCU or connectivity standard that fits your design. A one-time investment with the SimpleLink™ software development kit (SDK) lets you reuse often, opening the door to create unlimited applications. For more information, visit www.ti.com/simplelink.

The main use of the Radio Tool is to serve as a control panel for direct access to the radio. The tool can be used for the radio frequency (RF) evaluation, and for certification purposes (such as FCC, ETSI, Telec, and so on). The tool is expected to work seamlessly on TI evaluation platforms: BoosterPack plus FTDI emulation board for CC31xx devices, and LaunchPad for CC32xx devices. If customers want to use the tool on their final platform, see Section 11. The I/O levels of these lines should be kept at VBAT level (the same voltage that powers the CC31xx and CC32xx devices).

For reference RF numbers, refer to the device datasheets.

2 Features

- Connection
    - CC3120/CC3130/CC3135 through the SPI
    - CC3120/CC3130/CC3135 through the UART
    - CC3220/CC3230/CC3235x through the UART
- Acquires MAC address
- Acquires firmware information
- TX – Transmission testing
    - Continuous
    - Packetized
    - Carrier Wave (CW)
- RX – Receiver testing
    - Statistics
    - Rate histogram
    - RSSI histogram

3 Prerequisites
3.1 Software Downloads

- *SimpleLink™ Wi-Fi® Radio Testing Tool*
- *Microsoft .NET Framework 4.6.1*
- Microsoft® – *Visual C++ Redistributable Package for Visual Studio 2015*

3.2 Hardware

- One CC31xx BoosterPack™ plug-in module (CC31xxBOOST)
- One CC31xx Emulation BoosterPack™ module (CC31xxEMUBOOST)
- One CC32xx LaunchPad™ with CC3220R, CC32xxS, or CC32xxSF
- One Micro-USB cable
- One WLAN tester and RF equipment (for example, spectrum analyzer)

See the latest complete list of supported SimpleLink™ hardware at www.ti.com/simplelink.

4 Radio Tool Installation Directory

The installation process is made straightforward by following the steps. The default installation location is C:\TI\CC3xxx_RadioTool_<version>, but users can change it to any location they want.

Table 4-1 lists the file directory structure after installation.

Table 4-1. File Directory Structure

Folder Name	Contents
RadioToolApplication	The Radio Tool GUI application (RadioToolGUI.exe), Radio Tool CLI application (RadioToolCLI.exe), and three precompiled DLL files (CC31xxLibSPI.dll, CC31xxLibUART.dll, CC32xxLib.dll)
RadioToolApplication_Source	The Radio Tool application source for development. Use Visual Studio to open the file CC3x20_RadioTool.sln.
CC32xxBoardApplication_Binary	CC32xx MCU images. Use these images with Uniflash to flash an MCU image onto the device. See Section 6.
CC32xxBoardApplication_Source	CC32xx MCU image source for development. Place the radiotool folder under the CC32xx SDK example directory, and use Code Composer Studio™ (CCS) to open the project in the CCS folder inside.

5 Hardware Connections
5.1 CC31xxBOOST Plus CC31XXEMUBOOST

Figure 5-1 shows how to mount the CC31xxBOOST board on top of the CC31XXEMUBOOST board. Ensure P1.1 of both boards is aligned with each other, as indicated by the white arrows on the boards.

Connect the RF connector (J2 or J3) to a WLAN tester/RF equipment for measurements. Ensure the RF connection to the instrument is made before powering on the boards, so that the correct load impedance is provided during power on.

Figure 5-1. CC31xxBOOST Board Mounted on Top of CC31XXEMUBOOST Board

To power the platforms, connect the J6 port of CC31XXEMUBOOST to the Windows® PC using a micro USB cable, as shown in Figure 5-2. If the drivers are properly installed as mentioned during the SDK installation, the PC should recognize and list the connected device in the Device Manager, shown in Figure 5-3. For details on driver and SDK installation, see the *SimpleLink™ Wi-Fi® and Internet of Things CC3120 Software Getting Started Guide*.

Figure 5-2. Powering the Platforms

Figure 5-3. Device Manager Showing Ports

By default, the RF path is routed to J3 (Murata RF Switch). To use J2 (uFL) for RF measurements, swap the position of the 0-Ω resistor to disconnect the path to the onboard antenna, and enable the path to the uFL connector.

5.1.1 Using the UART Interface

The emulation board enumerates the UART ports on the PC, as shown in Figure 5-3. Keep a record of the third port number, because it is needed later for connection.

5.1.2 Using the SPI Interface

The SPI does not require users to choose a specific COM port. Simply select the CC31xx SPI option in the tool to start the connection. However, with SPI connection, only one CC31xx can be connected to a PC at a time. This is because Radio Tool cannot determine which CC31xx device to connect to if multiple CC31xx devices are present. For large volume testing, TI recommends using the CC31xx UART.

5.2 CC32xx-LAUNCHXL

Connect the RF connector to a WLAN tester/RF equipment for measurements, and the USB connector on the CC32xx LaunchPad™ to the PC. Ensure the RF connection to the instrument is made before powering on the board, so that the correct load impedance is provided during power on.

By default, the RF path is routed to J11 (Murata RF Switch). If users want to use J10 (uFL) for RF measurements, swap the position of the 0-Ω resistor to disconnect the path to the onboard antenna, and enable the path to the uFL connector.

The LaunchPad™ enumerates COM ports in the Device Manager on the PC, as shown in Figure 5-4. Keep a record of the Application/User UART port number, because it is needed later for the connection.

While using TI's XDS LaunchPad™, the RadioTool GUI should automatically detect the correct UART number and set it on the GUI on the "COM Port" combo box.
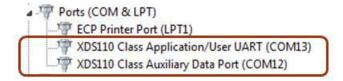

Figure 5-4. XDS Connection Ports for CC32xx LaunchPad™

6 Flashing the Board

The devices must be flashed with the correct ServicePack to operate this tool correctly. The service pack can be found in the tools folder of the SDK installed.

If using the CC32xx device, the Radio Tool application must be flashed in addition to the ServicePack. The precompiled application binary is in the CC32xxBoardApplication Binary folder.

In case Uniflash is installed on the same windows machine as RadioTool, a predefined *.sli image can be selected and programmed to the device as shown in Figure 6-1.
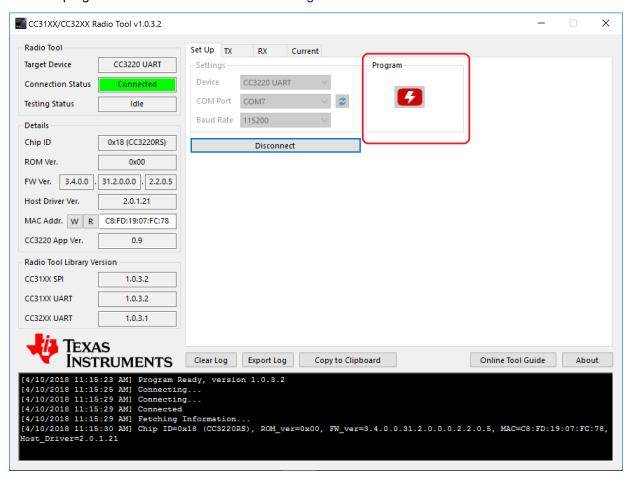

Figure 6-1. RadioTool Setup Page

For instructions on flashing the devices, see the *SimpleLink™ Wi-Fi® CC3x20, CC3x3x UniFlash ImageCreator* for details.

7 Running the RadioTool GUI

The GUI tool provides a user-friendly interface for using the Radio Tool.

7.1 Set Up Tab and General Information

Users have three types of devices for connection:

*   CC31xx SPI

    This is not recommended to use because it is limited to connecting to one CC31xx board with this protocol. If more than one CC31xx is present, CC31xx UART is the recommended connection.
*   CC31xx UART
*   CC32xx UART

With the UART connection type selected, users can pick from a list of known COM port and baud rates. Click on the blue spinning arrows on the right to refresh the list if the if the appropriate COM port does not appear.

Upon a successful connection, the Details box on the left provides detailed device information on the connected device (see Figure 7-1). Before proceeding, ensure the board is flashed with the desired image version.

FW Ver. (or Firmware version), is arranged as follows: <NWPversion>.<FWversion>.<PHYversion>

The CC32xx App Ver. information is applies only to CC32xx, and indicates the radio tool application version flashed onto the device.
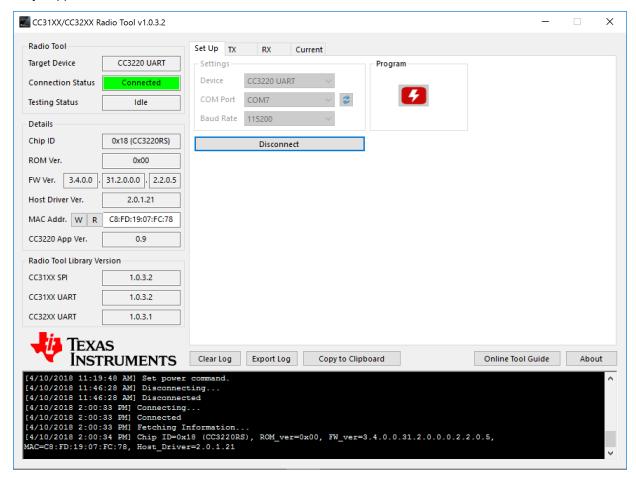
The only supported baud rate now is 115200.

Figure 7-1. RadioTool Setup Page With Connected Device

7.2 GUI TX Testing

Table 7-1 lists the three types of TX testing that are supported.

Table 7-1. TX Testing

Type	Description
Packetized	Each packet is sent one at a time from the application MCU to the network processor. A large delay between packets exists in this mode. This mode is generally used for RF evaluation.
Continuous	This is a test mode where the network processor sends packets back to back in an internal loop, without the intervention of the host MCU. The delay between packets is typically very small, and hence useful for FCC/ETSI certification purposes where high-duty cycle is required. This mode is used only for emission certification.
Carrier Wave (CW)	In this mode the device transmits an unmodulated RF tone. The frequencies can be selected in 312.5-kHz steps. The power output with tone 0 is very low. If higher RF power is desired, use tone numbers other than 0.

Some fields are enabled/disabled depending on the type of test the user is running. For example, the Amount parameter is disabled only when the Continuous testing type is selected.

Table 7-2 lists parameter explanations.

Table 7-2. Parameter Explanation

Parameter	Range (inclusive)	Description
Channel	[1, 13]	802.11 2.4-GHz band Wi-Fi channels. 14 is not supported.
	[36..165]	5-Ghz channels are enabled only for devices: CC3235x, CC3135
Power level	[0 to 15]	0 is the maximum power, and 15 is the minimum power. For 5-Ghz channels this parameter has no affect and the actual output power will be set to 0.
Tone	[-25, 25]	CW only. 0 is tone at center frequency. A value N between and within the range [–25, 25] means tone at offset N*312.5 kHz.
Rate		802.11 PHY data rate. 5Ghz channels has no support for DSSS and CCK rates. Supported: • DSSS: 1 Mbps, 2 Mbps • CCK: 5.5 Mbps, 11 Mbps • OFDM: 6/9/12/18/24/36/48/54 Mbps • MCS 0-7
Preamble	[Long, Short]	802.11b preamble. OFDM preamble is automatically configured by the device when OFDM rates are selected.
Data pattern		Data pattern in the data field. Supported: • All 0: 0x00, 0x00, 0x00… • All 1: 0xFF, 0xFF, 0xFF… • Incremental • Decremental
Size	[24, 1400]	Packet size in bytes
Delay	[100 to 1,000,000]	Delay of transmission in milliseconds (ms)
Amount	[0 to 1,000,000]	Number of packets to transmit. A value of 0 indicates infinite number of packets.
Override CCA		Enable this field for CCA (Clear Channel Assessment) override if the Wi-Fi environment is too congested to have a reliable periodic transmission.
CCA threshold		The channel is considered occupied when the signal strength is above this setting. Supported: • –88 dBm (MIN) • –78 dBm (LOW) • –68 dBm (DEFAULT) • –58 dBm (MED) • –48 dBm (HIGH) • –38 dBm (MAX)
Destination MAC address		Destination MAC address in packets
Country		Sets device country code. Supported: US, EU, JP. For devices CC3135 and CC3235x there are additional country codes options. There is an option to select "No Limits" to remove all channel limitations or "00" for minimal limits.

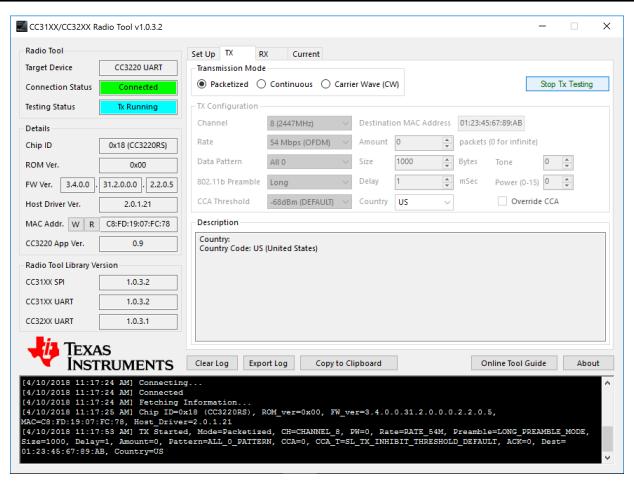Figure 7-2 shows the RadioTool GUI in the TX Tab.

Figure 7-2. RadioTool GUI in TX Tab

7.3 GUI RX Testing

RX testing is used for gathering Wi-Fi statistics in the air within a specified channel in case of external antenna. While using RF connector for accurate RF tests the packets will be accepted by the RF connected path.

Duration: Statistics gathering time can be specified with a fixed duration, or 0 to make the testing time indefinite, until the user presses the STOP button. Statistics are gathered automatically whenever the RX testing is stopped. However, users may choose to gather the statistics any time before RX testing ends by clicking the Get Statistics button. Table 7-3 lists fields explanations.

Table 7-3. Fields Explanation

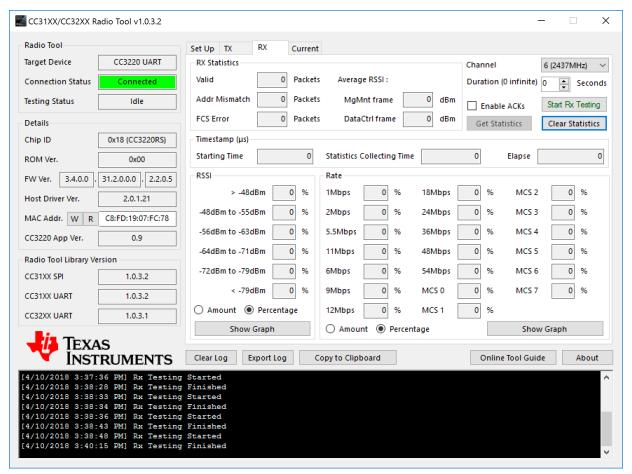| Field	Description
Valid	Valid packets
Addr Mismatch	Packets with address mismatch
FCS Error	Frame Check Sequence error
Mang frame	Average RSSI in management frames
DataCtrl frame	Average RSSI in Data Control frames

Figure 7-3 lists the RadioTool GUI in the RX Tab.

Figure 7-3. RadioTool GUI in RX Tab

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Figure 7-4 lists the RadioTool GUI in the RX Tab with Running in Progress.

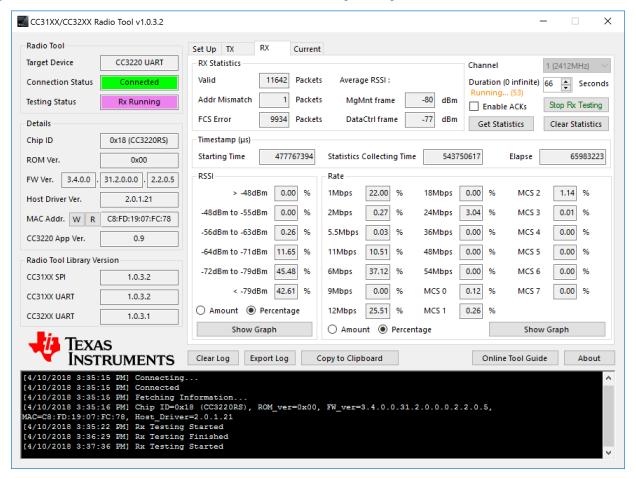**Figure 7-4. RadioTool GUI in RX Tab With Running in Progress**

Figure 7-5 shows gathered statistics. Rates and RSSIs are displayed as percentages.

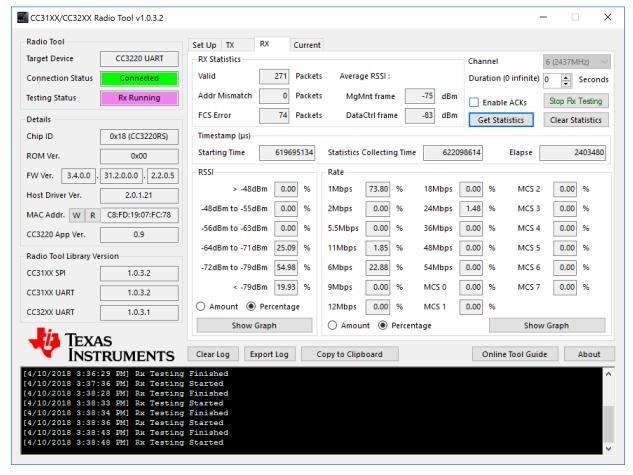**Figure 7-5. RadioTool GUI in RX Tab With Statistics**

Users may also click on the Show Graph buttons to show a bar graph representation of rates or RSSI.

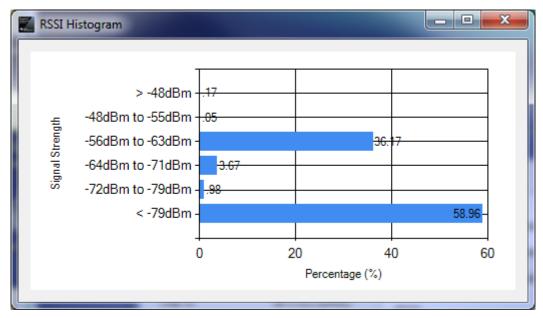Figure 7-6 shows the RSSI histogram graph in amounts.

Figure 7-6. RSSI Histogram Graph in Amount
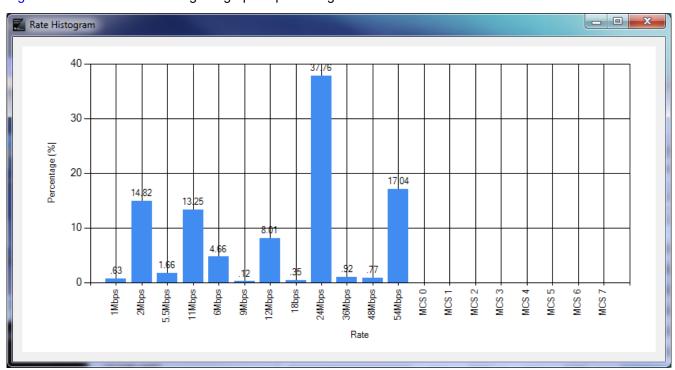
Figure 7-7 shows the rate histogram graph in percentages.

Figure 7-7. Rate Histogram Graph in Percentage

8 Current Measurement

The current measurement tab (Figure 8-1) contains two options for static current measurements for a predefined amount of time. The first mode is Low Power down and the second more is Hibernate. By using this tab, the device's current consumption when in a low-power state can be observed with an external current measuring tool.
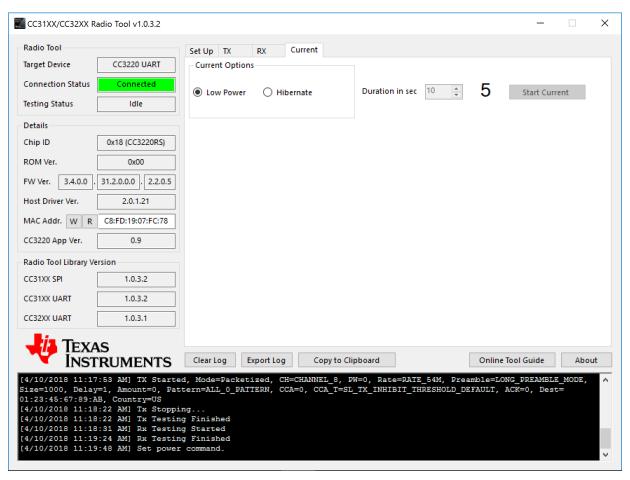

Figure 8-1. Current Tab Modes

9 CLI Version

The CLI tool provides a traditional command line version of the Radio Tool. This version is especially useful when performing large-scale automated testings. The RadioToolCLI.exe application is in the RadioToolApplication directory. Use CMD or batch files to execute the commands.

```
Usage: RadioToolCLI -X [-P=port] [-B=baud] [-M] [-F] [-T|-R|-POW]
       RadioToolCLI [-h|--help] [-i|--info]
Options:
Miscellaneous:
  -h, --help                  Shows this message
  -i, --info                  Shows RadioToolCLI and radio tool library version and information.
  -v                          increase debug message verbosity
Device Connection:
  -X, --target=TARGET         The TARGET testing device. 0:CC3120 SPI, CC3135 SPI, 1:CC3120 UART,CC3135 UART 2:CC32X0
                                UART,CC3235 UART. REQUIRED. Range: [0, 2]. Default: 1
  -P, --port=VALUE            The port number of the target testing platform.
                                Required for UART connections. Range: [0, 255].
  -B, --baud_rate=BAUD RATE   The BAUD RATE of the target COM port.
                                Required for UART connections. Range: [0, Int32.MaxValue].
  -M, --mac                   Returns the MAC address
  -C, --new_mac=VALUE         Set device MAC address WITHOUT colons. For example, if the MAC address is 01:23:45:67:89:
                                AB, enter 0123456789AB instead. Case insensitive.
  -F, --firmware             Returns the firmware version and CC32xx application version (if applicable) in the
                                following order:
                                Chip ID, ROM version, Firmware version, Host Driver version, CC32xx App version, MAC
                                address.
Common for TX and RX:
  -t, --duration=DURATION     RX/TX Testing DURATION in seconds for -T and -R options. Range: [1, 65535]. Default: 1
  -c, --channel=CHANNEL       RX/TX Testing CHANNEL  for -T and -R options. Range: 2.4GHz[1, 13] 5GHz[36-169]. Default:
                                1
  -k, --enable_acks           TX ACKs enabling(For Rx mode). Default: disabled.
TX (Transmission):
  -T, --tx                    TX testing for Continuous or Packetized.
  -z, --tx_type=TX_TYPE       TX Testing TX_TYPE. 1:Continuous, 2:Packetized, 3:CW. 'tone_offset' option can be used if
                                and only if CW is chosen. Range: [1, 3]. Default: 1.
  -w, --power=POWER           TX POWER attenuation for Continuous and Packetized testing. 0 being the maximum power and
                                15 being the minimum power.Range: [0, 15]. Default: 0
  -f, --tone_offset=TONE_OFFSET
                                TX TONE_OFFSET for CW testing only. A value of N means tone at offset N*312.5kHz.
                                Range: [-25, 25]. Default: 0
  -m, --rate, --modulation=MODULATION
                                TX Testing rate (with the corresponding MODULATION). Range: [1, 20]. Default: 1 (1Mbps
                                DSSS).
                                1: 1 Mbps (DSSS)
                                2: 2 Mbps (DSSS)
                                3: 5.5 Mbps (CCK)
                                4: 11 Mbps (CCK)
                                5: NOT SUPPORTED
                                6: 6 Mbps (OFDM)
                                7: 9 Mbps (OFDM)
                                8: 12 Mbps (OFDM)
                                9: 18 Mbps (OFDM)
                                10: 24 Mbps (OFDM)
                                11: 36 Mbps (OFDM)
```

```
                             12: 48 Mbps (OFDM)
                             13: 54 Mbps (OFDM)
                             14: MCS 0
                             15: MCS 1
                             16: MCS 2
                             17: MCS 3
                             18: MCS 4
                             19: MCS 5
                             20: MCS 6
                             21: MCS 7
  -e, --preamble=VALUE       TX preamble for 802.11 rates ONLY. Long:0, Short:1. Default: Long
  -r, --pattern=VALUE        TX data pattern. See the following for the complete list. Default: 0 (All 0)
                             0: All 0
                             1: All 1
                             2: Incremental
                             3: Decremental
  -l, --packet_size=SIZE     TX Testing packet SIZE. Range: [24, 1400]. Default: 1400
  -g, --delay=VALUE          TX delay in between packets in milliseconds. Packetized TX only. Range:[100, 1,000,000].
                             Default: 100
  -n, --amount=VALUE         TX maximum number of packets. Continuous & Packetized only. Range:[0, 1,000,000]. 0 for
                             infinite amount. Default: 0
  -o, --cca_override         TX CCA override enable. Default: non-overriding.
  -s, --cca_threshold=VALUE  TX CCA threshold value. The channel is considered as occupied when signal strength is
                             above this setting. Default: 2 (-68dBm)
                             0: MIN (-88dBm)1: LOW (-78dBm)2: DEFAULT (-68dBm)3: MED (-58dBm)4: HIGH (-48dBm)5: MAX (
                             -38dBm)
  -a, --dest_mac=MAC         TX destination MAC address WITHOUT colons. For example, if the MAC address is 01:23:45:67:
                             89:AB, enter 0123456789AB instead. Case insensitive. Default: 01:23:45:67:89:AB
  -y, --country_code=VALUE   TX Country Code in two ASCII characters. Letters will be converted to upper case. Options:
                              US, EU, JP. Default: US
RX (Reception):
  -R, --rx                   RX testing and retrieves statistics. The statistics will be shown as:
                             1st line: <# valid packets>, <# FCS error packets>, <# address mismatch packets>
                             2nd line: <Average RSSI in management frame>, <Average RSSI in other frames>
                             3rd line: RSSI historgram. <greater than -48dBm>, <-48dBm to -55dBm>, <-56dBm to -63dBm>
                             , <-64dBm to -71dBm>, <-72dBm to -79dBm>, <less than -79dBm>
                             4th line: Rate historgram, lowest to highest. The list order is identical to the rate/
                             modulation option.
                             5th line: Timestamps in micro-seconds: Starting time, Stats collecting time, Elapse
  -d, --report_period=N      RX statistics reporting period, every N seconds. If set to 0, RX statistics will only
                             report at the end.
                             Range: [0, 65535]. Default: 0
  -p, --report_percent       Report RX histogram in percentage format. If not set, default is in amount of packets.
Pow (Power):
    --POW, --pow=VALUE
    --POW_CMD_LOW, --power_cmd_low=VALUE
                             Set power command.
                             1-100: Low Power time
    --POW_CMD_HIB, --power_cmd_hib=VALUE
                             Set hib command.
                             1-100: Hib Power time
Please contact TI for any question with regards to this program.
```

Example commands follow:

```
::Show the help page
RadioToolCLI.exe -h
::Show the help page
RadioToolCLI.exe --help
::Show the help page
RadioToolCLI.exe /h
```

```
::Show the Firmware version and MAC address of CC31xx via UART
RadioToolCLI.exe -X1 -P7 -B115200 -F
```

```
::TX Continuous
::CC31xx via SPI
::channel 1
::1Mbps DSSS
::max power
::packet size 1400bytes
::destination MAC address 01:23:45:67:89:AB
::infinite amount of packets
::long preamble
::all 0 pattern
::1 second testing time
RadioToolCLI.exe -X0 -T
```

```
::TX Continuous
::CC31xx via UART
::channel 1
::54Mbps OFDM
::max power
::packet size 1400bytes
::destination MAC address 01:23:45:67:89:AB
::infinite amount of packets
::long preamble
::all 0 pattern
::10 seconds testing time
RadioToolCLI.exe -X1 -P7 -B115200 -T -z1 -c1 -m13 -w0 -l1400 -a 0123456789AB -n0 -e0 -r0 -t10
```

```
::TX Packetized
::CC32xx via UART
::channel 1
::1Mbps DSSS
::max power
::packet size 512bytes
::destination MAC address EE:EE:EE:EE:0E:EE
::100ms delay
::long preamble
::incremental pattern
RadioToolCLI.exe -X2 -P7 -B115200 -T -z2 -c1 -m1 -w0 -l512 -a EEEEEEEE0EEE -n0 -e0 -r1 -t10
```

```
::TX CW
::CC31xx via SPI
::channel 6
```

```
::1Mbps DSSS
::-10 OFFSET (-3.125Mhz)
RadioToolCLI.exe -X0 -T -z3 -c6 -m1 -f -10 -t10
```

```
::RX
::CC31xx via UART
::channel 6
::show as number of packets
::20 seconds testing time
::only report statistics at the end
RadioToolCLI.exe -X1 -P7 -B115200 -c6 -R -t20
::sample output
693, 64, 0
-64, -64
128, 128, 211, 10, 2, 158, 184
492, 492, 2, 9, 0, 190, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
171504, 20212985, 20041481
RX Finished: SUCCESS
```

```
::RX
::CC31xx via UART
::channel 11
::show as percentage
::5 seconds testing time
::report statistics every 1 second
::verbose
RadioToolCLI.exe --target=1 --port 7 /baud_rate 115200 -c11 /R -d=1 /t=5 -v
::sample output
Connecting...
Connected
RX Testing Started
RX Testing Started. The program will last 5 second(s) and report every 1 second(s).
54, 1, 0
-52, 0
31, 31, 0, 21, 0, 0, 2
2, 2, 0, 0, 0, 52, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
174708, 1227552, 1052844
113, 3, 0
-59, -79
48, 48, 1, 36, 0, 3, 25
25, 25, 0, 3, 0, 85, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
1227567, 2222249, 994682
63, 1, 0
-54, 0
29, 29, 0, 30, 0, 0, 4
4, 4, 0, 0, 0, 59, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
2222264, 3236292, 1014028
77, 2, 0
-57, -54
33, 33, 1, 31, 5, 0, 7
7, 7, 0, 0, 0, 67, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3
3236306, 4250366, 1014060
82, 3, 0
-55, -79
35, 35, 0, 33, 0, 8, 6
```

```
6, 6, 2, 1, 5, 68, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
4250381, 5264337, 1013956
RX Finished: SUCCESS
```

10 Insertion Loss Calibration

The TX power levels and RX sensitivity numbers quoted in the data sheet are at the device RF pin. Additional losses due to onboard filter, PCB trace, connectors, and cables used to connect to the external RF equipment should be accounted for separately by adding their insertion losses.

On the TI EVMs, the onboard filter insertion loss is typically 1 dB (maximum of 1.35 dB); the PCB trace plus RF connector loss is approximately 0.4 dB. These losses must be accounted for while evaluating the performance. If the user has a different filter or a different trace on their PCB, they must measure their insertion loss separately. The insertion loss of the cable used to connect the EVM to the external equipment can be measured using a network analyzer.

11 Hardware Connections on Non-TI EVMs

To use the Radio Tool on platforms other than TI EVMs, the interface signals from the emulation board can be wired to the corresponding pins on the custom platform (see Table 11-1, Table 11-2, and Table 11-3). The signal voltage level from the emulation board LaunchPad™ is 3.3 V, and the V_{CC} level is 3.3 V. This V_{CC} can also be used to power the CC31xx and CC32xx devices on the custom platform. Make sure the I/O voltage levels between the emulation board and the device on the EVM are the same.

Table 11-1. Connections for CC31XXEMUBOOST to a Custom CC31xx Platform (UART Connection)

Signal Name	CC31xx Pin	CC31XXEMUBOOST Pin
VCC		P1.1
UART1_TX	55	P1.3
UART1_RX	57	P1.4
UART1_CTS	61	P4.4
UART1_RTS	50	P4.5
GND		P2.1
nHIB	2	P1.5

Table 11-2. Connections for CC31XXEMUBOOST to a Custom CC31xx Platform (SPI Connection)

Signal Name	CC31xx Pin	CC31XXEMUBOOST Pin
VCC		P1.1
SPI_CLK	5	P1.7
SPI_MOSI	6	P2.6
SPI_MISO	7	P2.7
SPI_CSn	8	P2.3
IRQ	15	P2.2
GND		P2.1
nHIB	2	P1.5

Table 11-3. Connections from CC32xx-LAUNCHXL to a Custom CC32xx Platform

Signal Name	CC32xx Pin	CC32xx-LAUNCHXL Pin (Rev B)
VCC		J12 pin 2 (remove J12 jumper)
UART1_TX	55	J7 pin 3 (remove J7 jumper)
UART1_RX	57	J6 pin 3 (remove J6 jumper)
GND		P2.1

12 Source Code for Developers

12.1 RadioTool Application Sources

Source codes of the Radio Tool are in the RadioToolApplication_Source directory of the installation location. Users need the following:

- Visual Studio 2015 (minimum)
- Full-featured IAR Workbench for ARM (check SDK release notes for the proper IAR version to use)
- Code Composer Studio™ IDE

12.2 CC32xx Application Source

The CC32xx onboard application source is in the CC32xxBoardApplication_Source directory. Simply copy this source into the example folder of the CC32xx SDK. Use CCS or IAR to open the project workspace.

Revision History

Changes from Revision A (January 2019) to Revision B (August 2020)   Page

- Changed the document title and throughout document to include CC3130 and CC3230 devices....................2

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