Certification Test Tools and Instructions

Sterling-EWB

Application Note *v1.1*

1 Overview

This guide uses the Sterling-EWB development kit as a reference for testing. It is important that you have a JTAG interface on your device (same as the DEBUG PROGRAM on the development kit) to be able to load the required code to your device.

WICED Studio from Cypress is used to program the EWB with the manufacturing test code. Wi-Fi and Bluetooth operation testing requires separate code loads.

This document provides the details to be completed one-time to set up a test PC to be used in testing:

- How to install WICED Studio on a test PC
- Modifications to the WICED Studio install in order to operate on the EWB
- Instructions on how to create the Wi-Fi and Bluetooth test builds
- Install the CyBluetool program to use with Bluetooth transmit testing

After the install directions, operating instructions are supplied for the following:

- Set up of EWB DVK for testing
- Downloading and running the manufacturing test code in WICED Studio
- Instructions for using the provided Wi-Fi testing scripts
- Instructions for using CyBluetool for Bluetooth testing

2 Test PC Setup

2.1 Install Cypress/Infineon WICED Studio

Follow guidance found in the Software DVK Guide available on the Sterling-EWB website to install the WICED SDK and add the LAIRD_EWB platform to the installation.

https://www.lairdconnect.com/documentation/software-dvk-guide-sterling-ewb

https://www.cypress.com/products/wiced-software

Note: All work done for this document was done using version 6.2 of the WICED SDK

2.2 Add Sterling-EWB Platform to Installation

Download the latest version of the Sterling-EWB Demo (https://github.com/LairdCP/ewb_wiced_demo) and copy the supplied 43xxx_Wi-Fi folder into the directory you installed WICED-Studio-6.2 (*C:\Users\computername\Documents* folder typically). This overwrites some old files and creates two new directories

- 43xxx_Wi-Fi/platforms/LAIRD_EWB
- 43xxx_Wi-Fi/apps/laird

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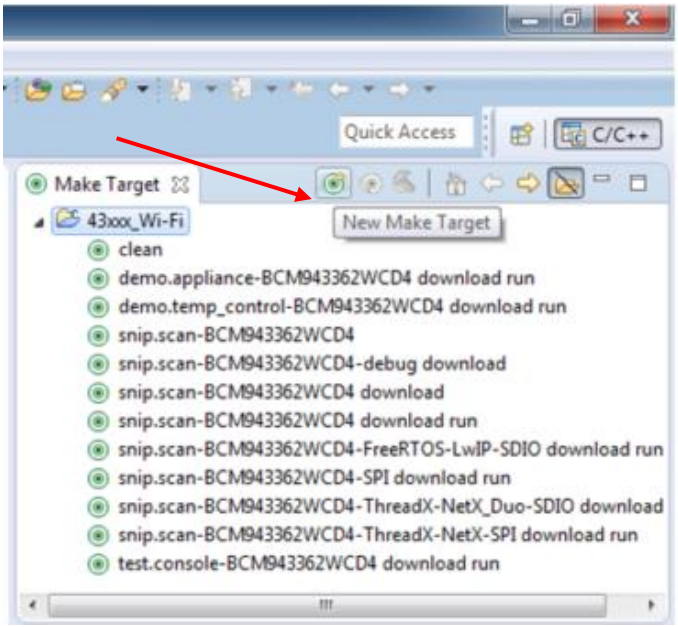
2.3 Create Wi-Fi and Bluetooth Test Builds

On the initial test PC setup, the targets must be created in the WICED SDK for the Wi-Fi and BT test builds.

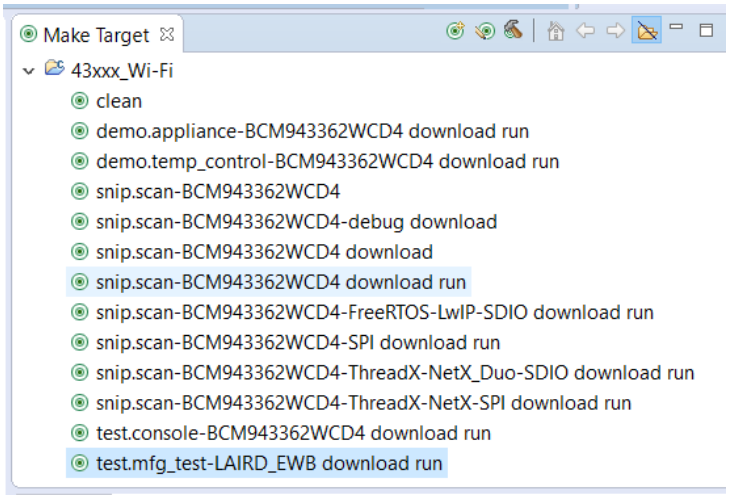
Note: This is a one-time occurrence.

To do this, follow these steps:

1. Open WICED-Studio SDK by either double-clicking the desktop icon or by going to *Start>Cypress>WICED-Studio*.
2. Select 43xxx_Wi-Fi as the default WICED platform.
3. In upper right corner of WICED desktop in the Make Target window, select the *43xxx_Wi-Fi* folder and then click **New Make Target**.



4. In the Create Make Target window, enter **test.mfg_test-LAIRD_EWB download run** as the Target name.
5. Click **OK**. This adds the Wi-Fi test build in the Make Target window.



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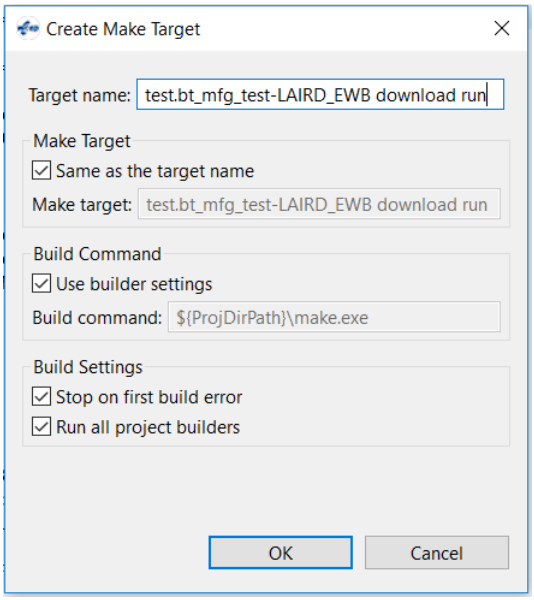
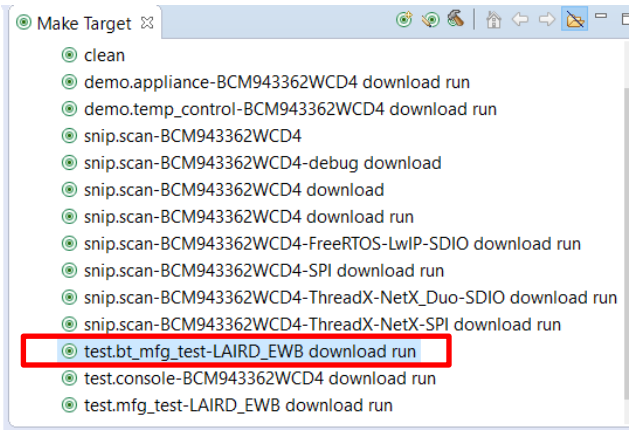
6. Repeating the steps above, in the Make Target Window click **New Make Target**.
7. In the Create Make Target window, enter **test.bt_mfg_test-LAIRD_EWB download run** as the Target name.
8. Click **OK**. This adds the Bluetooth test build in the Make Target window.





2.4 Install CyBluetool

Download and install the CyBluetool program from the Cypress website. This is a GUI application that is used to set continuous transmit mode for Bluetooth transmit testing.

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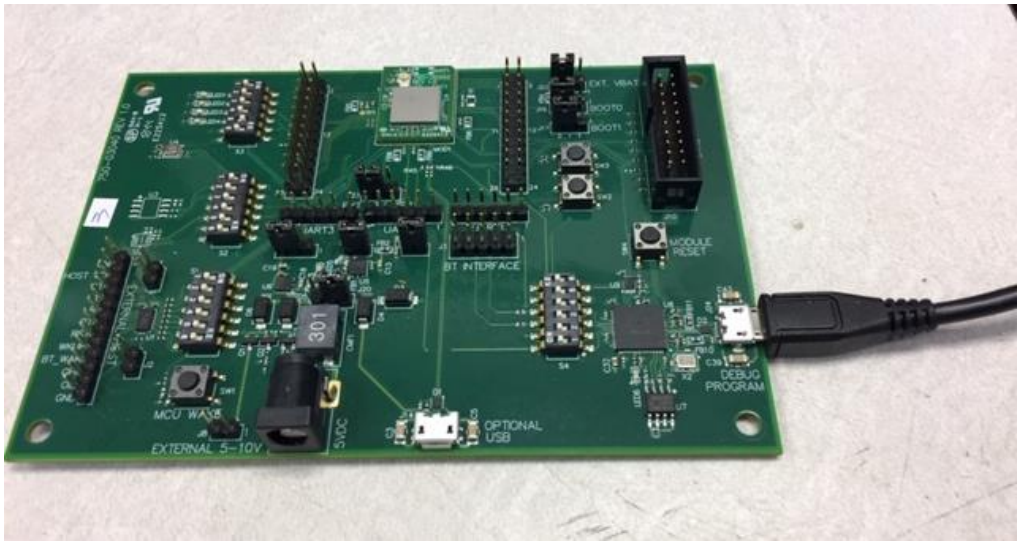
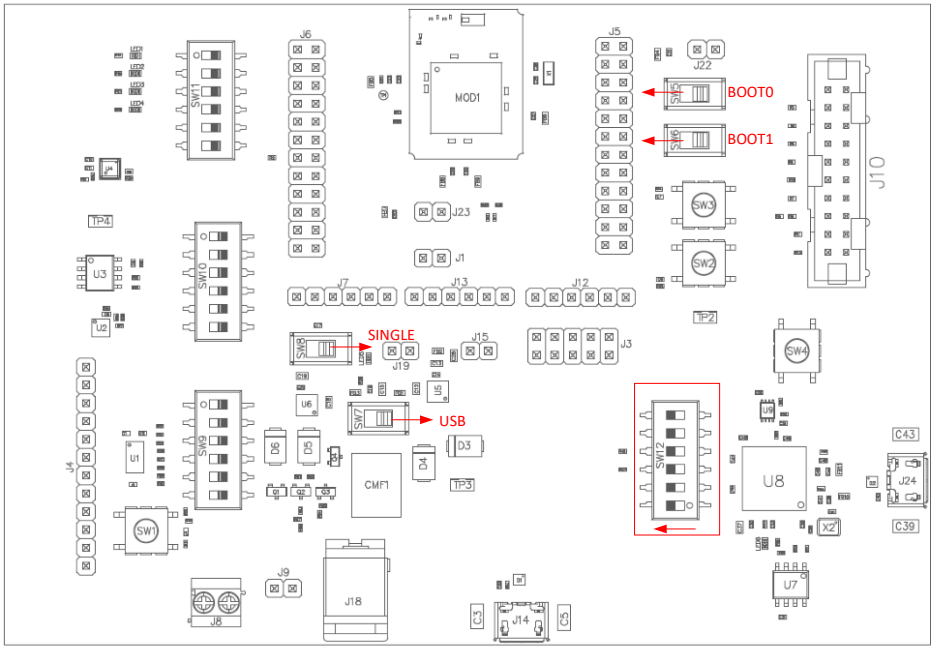
3 Wi-Fi Test Instructions

For Wi-Fi testing, follow these steps:

1. Connect the test PC to the Debug/Program port (J24) of the development kit via a microUSB cable.



2. Configure the board switches
   - All six positions of SW12 should be in the ON position
   - SW7 selects power from USB
   - SW8 selects single EWB supply
   - BOOT0 and BOOT1 set to *0*



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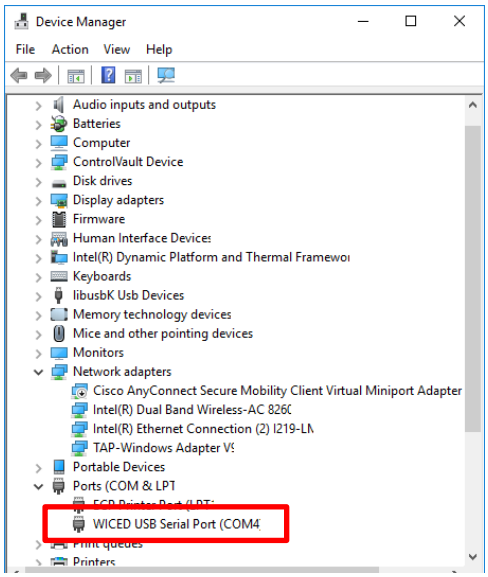
3. Open WICED Studio, build and download mfg_test application
4. In the Make Target window of the WICED IDE window, double click the **test.mfg_test-LAIRD_EWB download run** target to build the application, download the firmware, and run the application. The console log indicates progress. When completed (a few minutes) an output similar to the following displays. This indicates that the EWB is now programmed for Wi-Fi testing.

5. On the test PC, navigate (in Windows) to the test scripts folder (WICED-Studio-6.2\43xxx_Wi-Fi\libraries\test\wl_tool\scripts)*.
6. In this folder, use the .bat files with the wl_tool to execute and set the radio into test modes
   - tx_80211b_start.bat
   - tx_80211g_start.bat
   - tx_80211n_start.bat
   - tx_80211_stop.bat
7. Modify each script to change the channel and data rate you want to use in your testing.
8. Change the UART COM port in the scripts to match your DVK board COM port used. They are all defaulted to COM 4 in the scripts provided.
9. Open Device Manager on the test PC and identify which COM port is assigned as the WICED USB Serial Port



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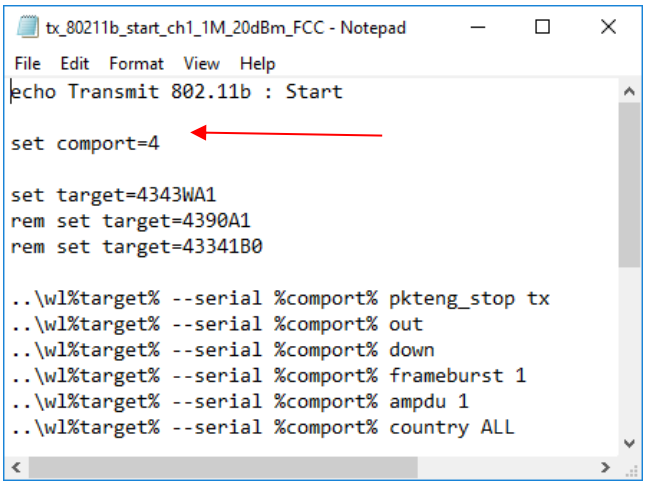
10. In each script, the comport setting must be changed to the port assigned in Device Manager. We use Notepad++ to set any comport changes on all files at once. (Find in files, replace…).



11. Double-click the desired mode test scripts to run. When you do this, a window opens and executes the commands. Once the window closes, the radio is running.
12. To stop transmitting, double-click the generic tx_80211_stop script.

Note: Make sure to close any PC program that might be accessing the respective COM port prior to starting the tests, including WICED Studio and any terminal application.

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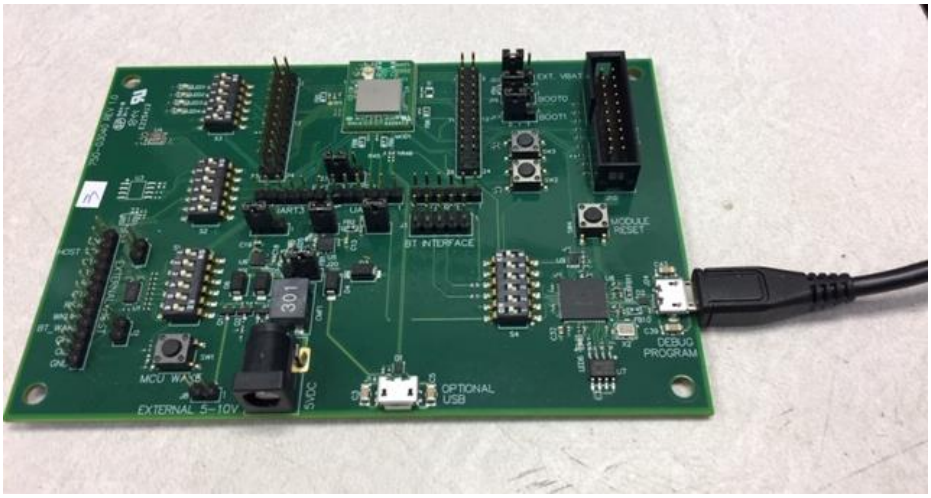
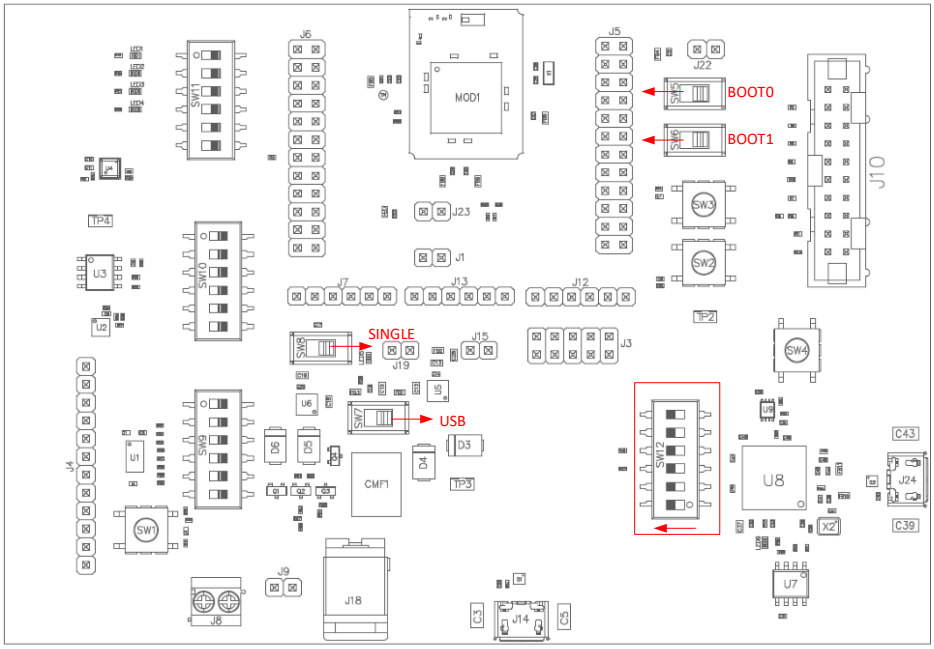
4 BLUETOOTH TEST INSTRUCTIONS

The following are the Bluetooth test instructions:

1. Connect the test PC to Debug/Program port (J24) of the development kit via a microUSB cable.



2. Configure DVK board switches
   - All six positions of SW12 should be in the ON position
   - SW7 selects power from USB
   - SW8 selects single EWB supply
   - BOOT0 and BOOT1 set to *0*



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3. In the Make Target window of the WICED IDE window, double click the **test.bt_mfg_test-LAIRD_EWB download run** target to build the application, download the firmware, and run the application. The console log indicates progress. When complete, an output similar to the following displays. The EWB is now programmed for BLE testing. **This can take >15 minutes.

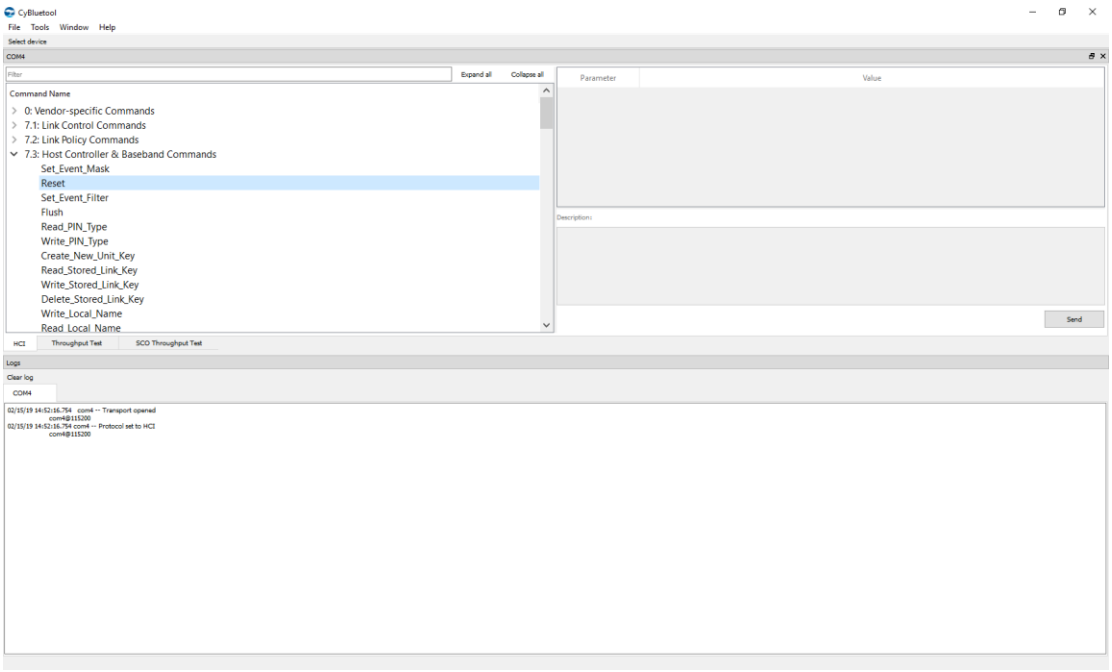
4.1 Transmit Testing

For transmit testing, follow these steps:

1. Open CyBluetool (Start > Cypres > CyBluetool)
2. Click Select Device. Set baud rate to 115200 and flow control to none. Connect.

4.2 Transmit Operating Instructions

To Reset UUT: In the Command window, double-click Reset under *7.3: Host Controller & Baseband Commands*.



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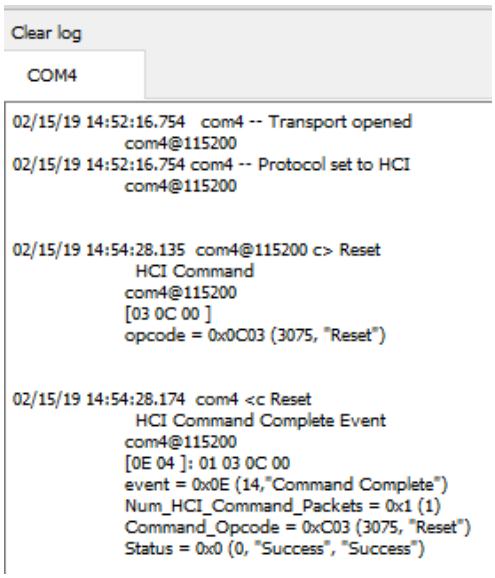
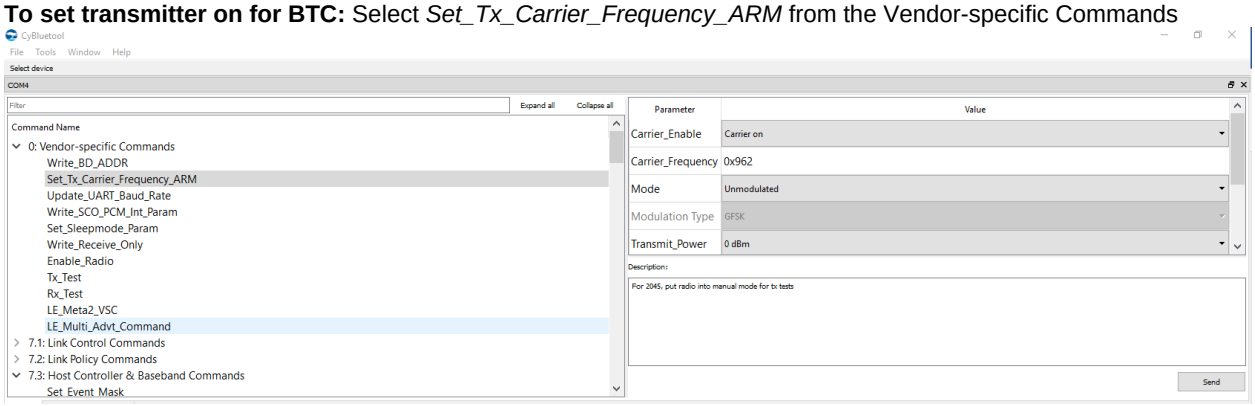
The log shows HCI communication and indicates success



To set transmitter on for BTC: Select *Set_Tx_Carrier_Frequency_ARM* from the Vendor-specific Commands



In the Parameter window, set the following:

Carrier_enable	Carrier on
Carrier_Frequency	Value is in hex. (Frequency in MHz in hexadecimal) 0x962 = 2402 MHz 0x988 = 2440 MHz 0x9B0 = 2480 MHz
Mode	PRBS9
Modulation Type	Select GFSK or QPSK 8PSK
Transmit_Power	Specify Power Table index
Transmit_Power_Table_Index	0x0 (maximum)

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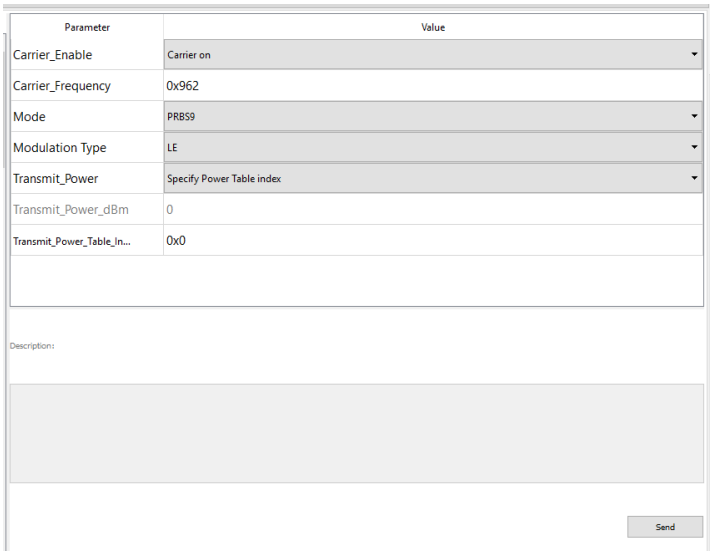


Click **Send** to start continuous transmission.

Set Carrier_enable to carrier off and press **Send** to stop transmission. If it is necessary to lower the transmit power, increment the Transmit_Power_Table_Index value (0x1, 0x2, …)

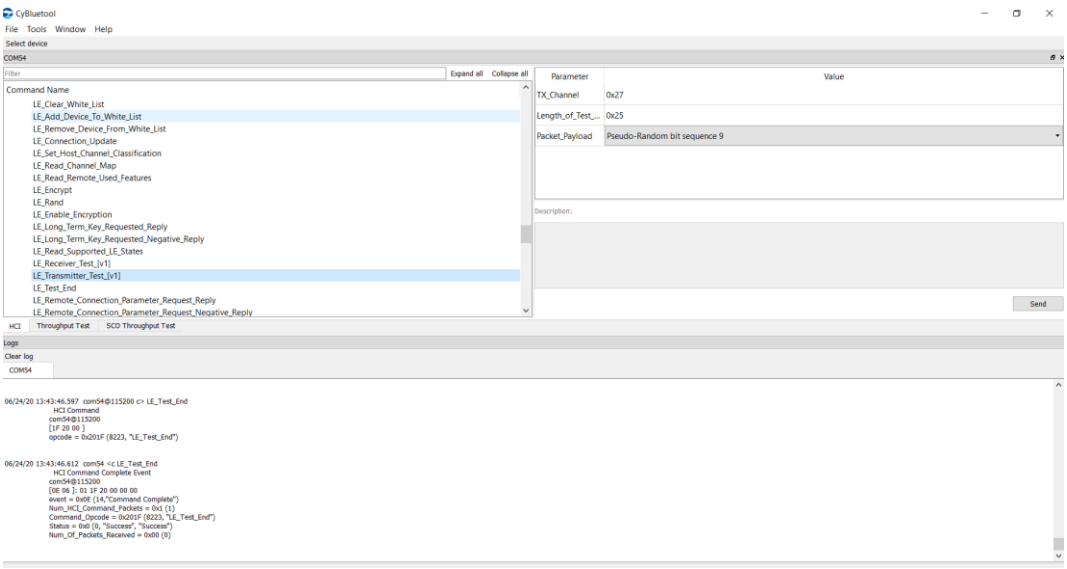
To set transmitter on for Bluetooth Low Energy: Use the *LE_Transmitter_Test_[V1]* command inder the *7.8: LE Controller Commands* group.

In the Parameter window, set the following:

TX_CHANNEL

0x0 = 2402
0x13 = 2440
0x27 = 2480

Click **Send** to start transmission.



Use LE_Test_end command to stop.

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5 Revision History

Version	Date	Notes	Contributor(s)	Approver
1.0	17 Mar 2021	Initial Release		Jonathan Kaye
1.1	8 Nov 2022	Added note to close software that might use the COM port before beginning the tests in Wi-Fi Test Instructions	Alexander Mohr	Dave Drogowski

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