AB1565/AB1568 LabTest Tool Users Guide

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1. Introduction

1.1. Overview

The Airoha AB1565/AB1568 LabTest Tool provides a quick-and-easy test suite for development and emissions certification of Airoha AB1565/AB1568 devices. Three basic test functions, TX, RX, and controller test, are included in this utility. The user can use this tool to perform single TX, Burst TX on Airoha AB1565/AB1568 products.

1.2. Required Software

Before using the Airoha Tool Kit (ATK), you need to install all of the following software on your computer.

Click the following link to download Microsoft .NET Framework 3.5:
https://www.microsoft.com/en-US/download/details.aspx?id=21

Click the following link to download Microsoft .NET Framework 4.5:
https://www.microsoft.com/en-US/download/details.aspx?id=30653

Click the following link to download Microsoft Visual C++ 2012 Update 4 Redistributable Package (x86):
https://www.microsoft.com/en-US/download/details.aspx?id=30679

Click the following link to download Microsoft Visual C++ 2015/2017/2019 Redistributable Package (x86):
https://aka.ms/vs/17/release/vc_redist.x86.exe

You may be asked to restart your computer when you complete the installation process. Please make sure to do so before running the LabTest Tool.

2. Environment Setup

2.1. Hardware setup

A UART interface is used for the PC-to-DUT connection. The user can also use a USB-to-UART adaptor on the PC side to connect to the DUT side. A reference connection diagram is shown in Figure 1.

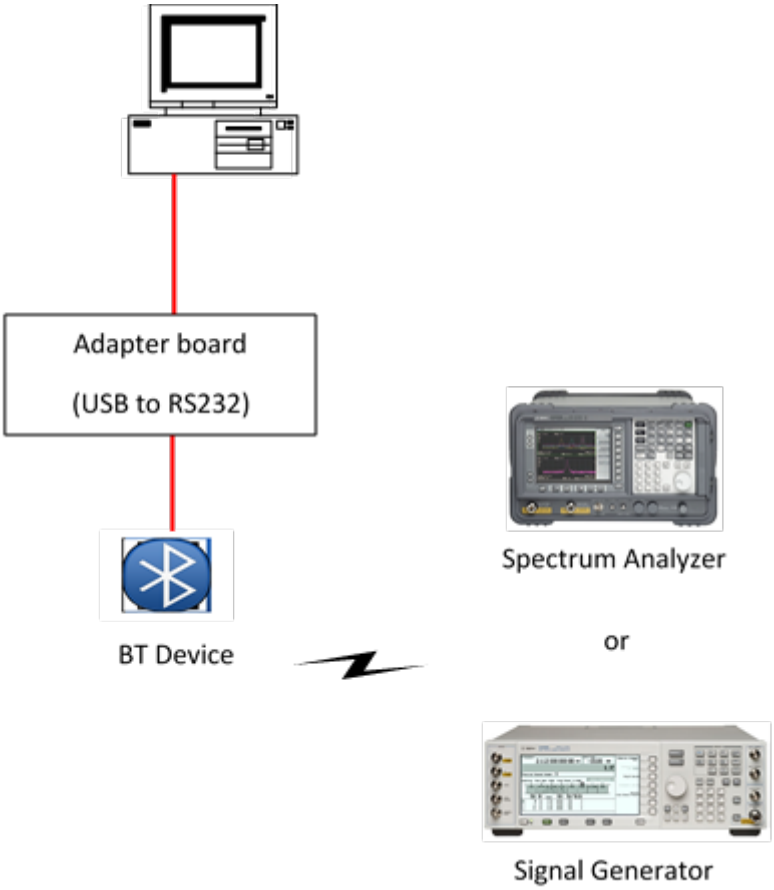

Figure 1. Hardware setup

If a USB-to-UART adaptor made by Airoha is used (as shown in Figure 2), the user can connect the corresponding pins to J1 by following the pin definition shown in Figure 3. The VCC selection on JP12 must be set to +1.8V (with a jumper).

Figure 2. Airoha USB-to-UART adaptor board

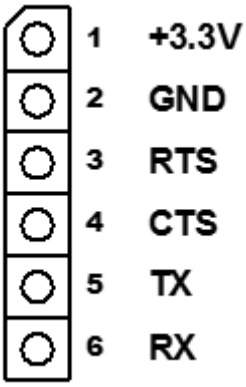

Figure 3. Pin definition of the J1 connector

2.2. Software setup

If the AIROHA USB-to-UART adaptor board is used, the driver (CDM212364_Setup.zip) must first be installed. Please download it from https://ftdichip.com/wp-content/uploads/2021/08/CDM212364_Setup.zip. When the driver is installed and the board is connected to the PC, a USB-to-Serial COM port is shown in the device manager.

After installation, the user can launch Airoha.UI.View.exe from the file folder as follows:

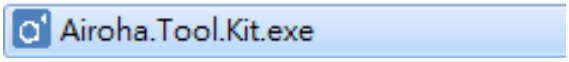

Figure 4. Airoha UI View icon

A tool selection pop-up window opens so the user can select the tool.

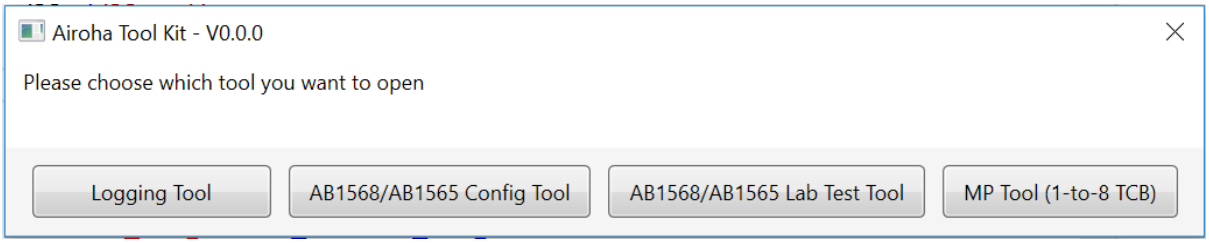

Figure 5. Tool selection window

The LabTest tool generates a log file. The log files are saved in the working folder.

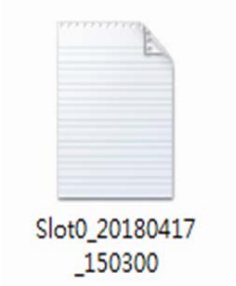

Figure 6. LabTest Tool logging file

3. User Interface

3.1. Lab Test Tool overview

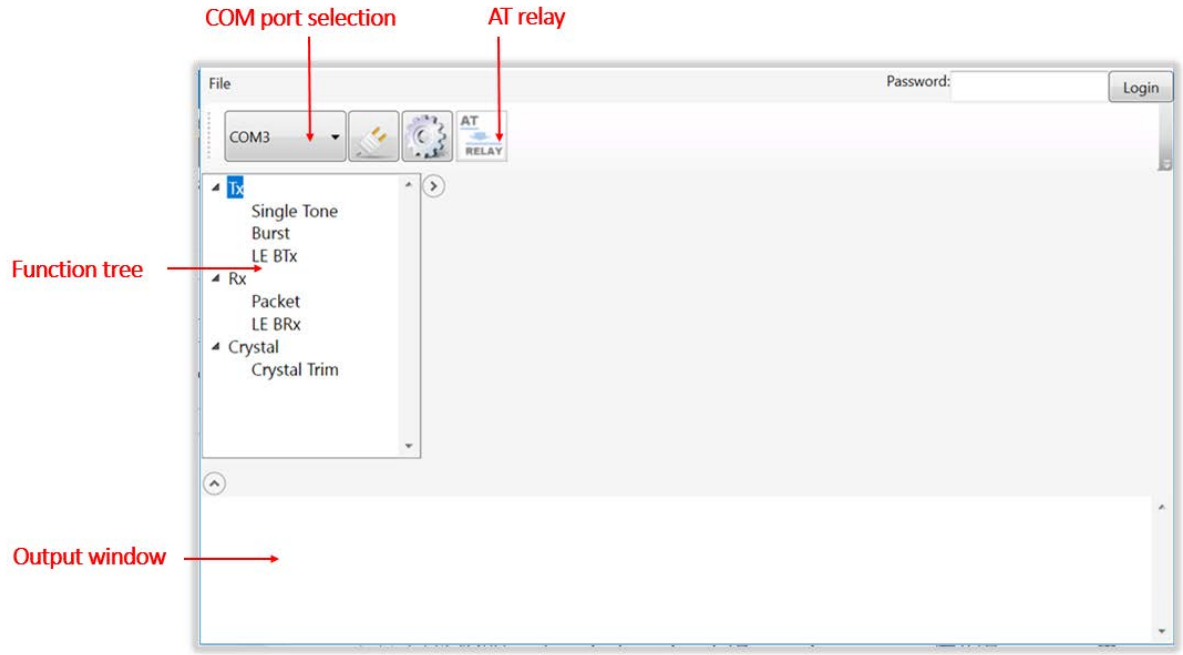

Figure 7 shows the user interface and display process when Airoha Lab Test Tool is launched. The user interface has three main sections: COM port selection; Function Tree; and the Output Window.

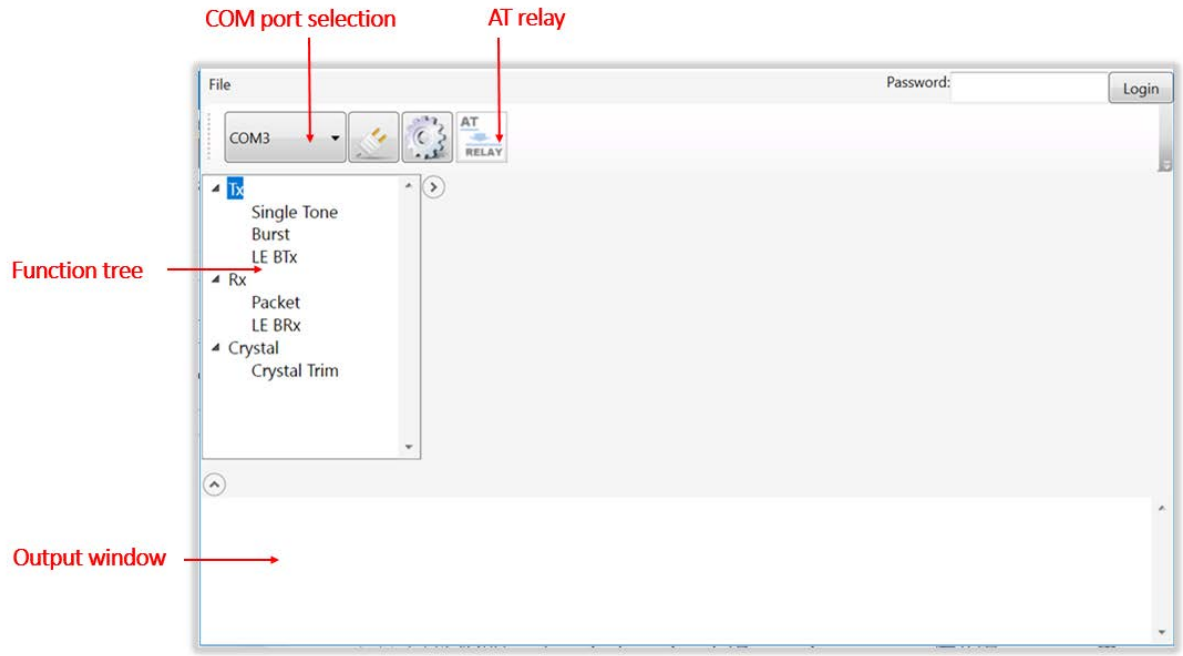

Figure 7. LabTest Tool user interface

3.2. Connection process

1) Power-on the DUT.

2) Select the COM port number corresponding with the DUT in the COM Select region of the LabTest Tool, and then click the 'Enable COM port' button.

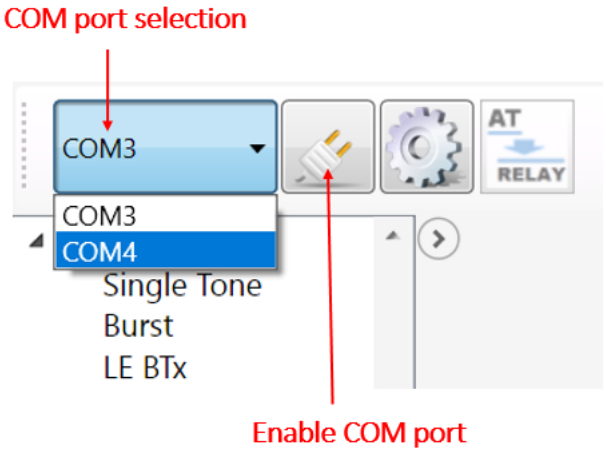

Figure 8. Enabling the COM port

When the device is correctly plugged in and the 'Enable COM port' is clicked, click the "AT Relay" button to enter relay mode, as shown in Figure 8 .The message 'Switch AT to relay: Done' will display in the output window.

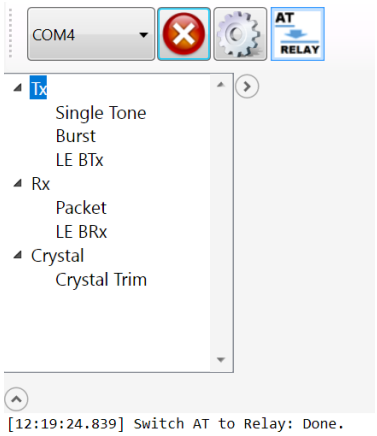

Figure 9. Switch AT to relay for AB1568/AB1565

If the success message is not shown, the user must make sure that the DUT is correctly powered on and goes into Download mode, the link between the DUT and PC is correctly connected, and then click the 'Enable COM port' button again.

4. Tx Test

There are three modes supported in the TX test functions: Single-tone TX, Continuous TX, and Burst TX.

4.1. Single Tone Transmission

When Tx **Single Tone** is selected, a continuous single-tone signal without any modulation (i.e. Carrier Only) is sent from the RF port. The user can set a different RF frequency and TX power setting on the parameter block and then click the '**Execute**' button to start the single tone transmission. The RF frequency range is between 2402 and 2480MHz, and the Tx GC range is between 0 and 63. The user can select the 'Report GC' checkbox to watch the GC value and make sure the GC setting is correct.

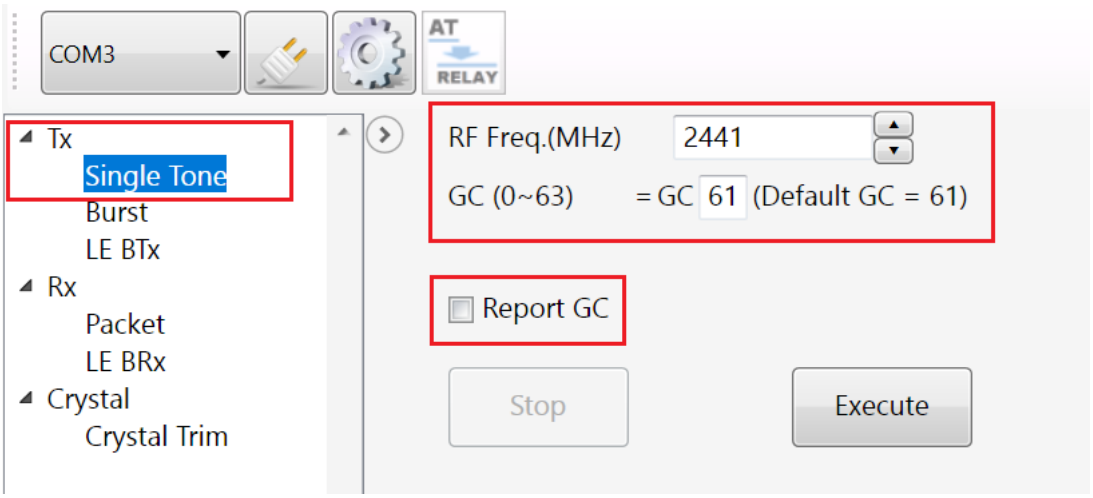

Figure 10. Single tone transmission settings on the Tx tab

4.2. Burst Data Transmission

When Tx Burst is selected, a burst-type modulated signal with access code/header/payload (BT3.0) is sent from the RF port. The user can select a RF frequency to transmit, then set the TX GC value, packet type (DH1, DH3, DH5, 2-DH1, 2-DH3, 2-DH5, 3-DH1, 3-DH3, and 3-DH5 are supported) and data type (all 0, all 1, 1010, 11110000 and PN), and then click the 'Execute' button to start the packet transmission. The user can select the 'Report GC' checkbox to watch the GC value and make sure the GC setting is correct.

To hop in specific channels, set the channel information in 'From Channel __ to __' and select the 'Enable Hopping' checkbox to enable channel hopping. The LabTest Tool automatically ignores the RF frequency assigned in 'RF Freq.(MHz)'. When the channels are set, click the '**Execute**' button to start hopping through the selected channels.

Click the '**Stop**' button to stop this function when it is running.

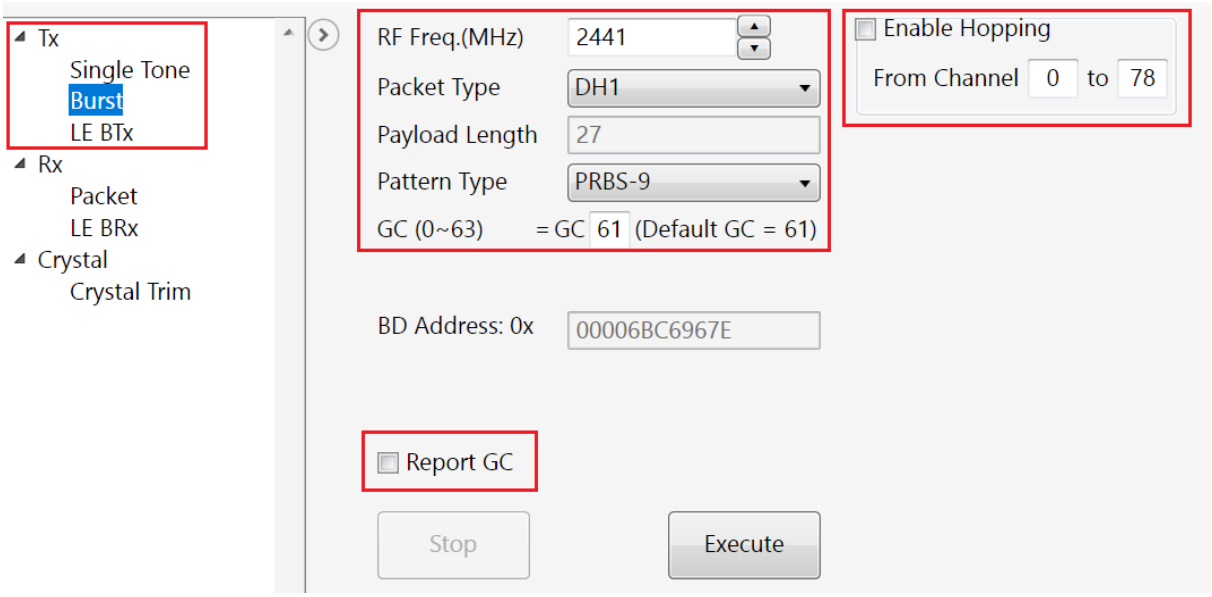

Figure 11. Burst data transmission settings on the Tx tab

4.3. LE Burst Data Transmission

When Tx LE BTx is selected, a burst-type modulated signal with PDU header/PDU length is sent from the RF port. The user can select a RF frequency to transmit, then set a TX GC value, modulation type (1Mbps for BT4.0, and 2Mbps for BT5.0), and data type (all 0, all 1, 1010, 11110000 and PN). Then click the 'Execute' button to start the packet transmission. The user can select the 'Report GC' checkbox to watch the GC value and make sure the GC setting is correct.

To hop in specific channels, set the channel information in 'From Channel __ to __' and select the 'Enable Hopping' checkbox. The tool automatically ignores the RF frequency assigned in 'RF Freq.(MHz)' When the channels are set, click the '**Execute**' button to start hopping through the selected channels.

If this function is executed, click the '**Stop'** button to stop it.

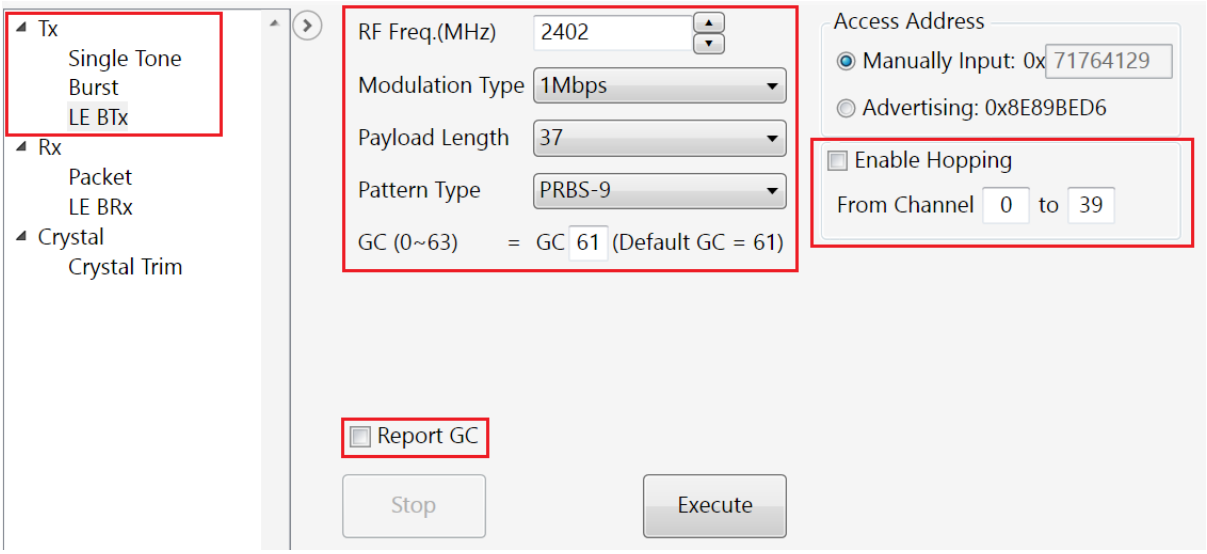

Figure 12. LE Burst data transmission settings on the Tx tab

5. Rx Test

Continuous Receiving is supported in the RX Test function. Continuous Receiving is used for CE/FCC tests.

5.1. Burst Data Receiving

When Rx: Packet is selected, the user can first set a different RF frequency, received packet, and pattern type. Click the '**Execute**' button to start continuous data receiving. The RF frequency range is between 2402 and 2480.

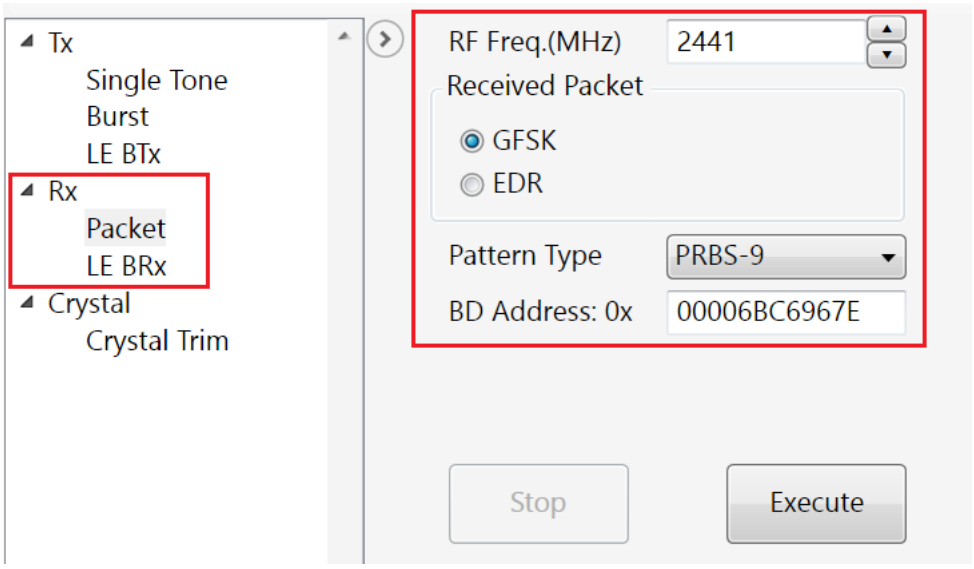

Figure 13. Continuous data receiving on the Rx tab

5.2. Burst BLE Data Receiving

When Rx: LE BRx is selected, the user can first set a different RF frequency and modulation type. Click the '**Execute**' button to start continuous LE data receiving. The RF frequency range is between 2402 and 2480.

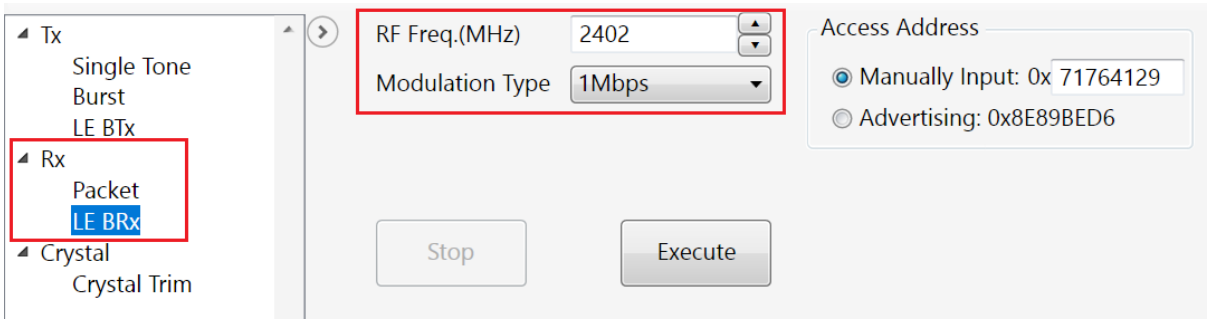

Figure 14. Continuous LE data receiving on the Rx tab

6. Crystal Trim

Crystal trim is a mechanism for user to adjust IC's frequency variation. Click the '**Write cap to flash'** button to change cap value in flash, and then click the '**Execute**' button to transmit a single tone signal in 2441MHz frequency. The user can write a different cap value to measure the frequency variation in the instrument.

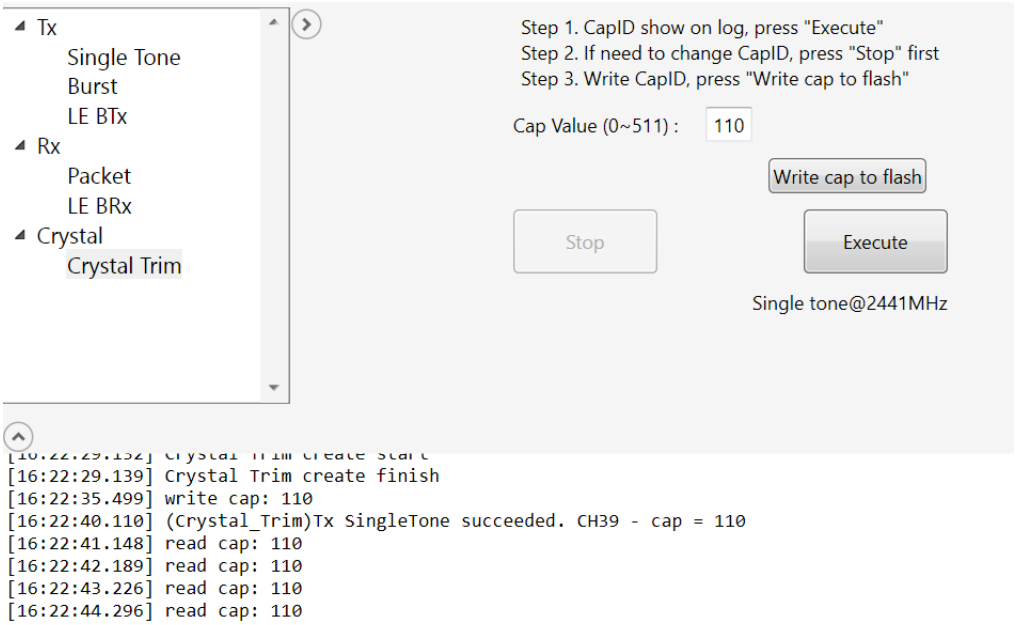

Figure 15. Read and Write cap value on the Crystal tab