

Realtek
Bluetooth Mass Production Tool
RTLBTAPP
User Manual

Draft v0.3

2015/08/10

Revision History

Date	Version	
2014/9/11	Draft v0.1	
2014/10/27	Draft v0.2	Add read/write efuse
2015/08/10	Draft v0.3	Add LE Test

Catalog

Revision History	2
Figure List	4
1. Overview	5
2. Files	6
3. Hardware environment	6
4. Open RTLBTAPP	7
5. DUT (Link) Test Mode	9
6. Non Link Mode Test	10
7. Hopping Mode Test	11
8. Step by Step Examples	12
8.1 Bluetooth TX Test	12
8.2 Bluetooth RX Test	14
8.3 Single Carrier (Tone) Test	15
8.4 Hopping Test	16
8.5 LE TX/RX Test	17
9. Read/Write Efuse	19
10. Calibration frequency offset	20

Figure List

Figure 1 File List	6
Figure 2 Open BTLBTAPP	7
Figure 3 Check COM port number.....	8
Figure 4 How to check if device was opened and patch was downloaded successfully	8
Figure 5 Enter link test mode	9
Figure 6 How to set non-link mode parameter	10
Figure 7 Set non-link mode parameter	11
Figure 8 non-link mode TX test	12
Figure 9 Set non-link mode TX test parameter	13
Figure 10 non-link mode RX test.....	14
Figure 11 Set non-link mode RX test parameter.....	14
Figure 12 non-link mode receive single carrier test	15
Figure 13 non-link mode hopping test.....	16
Figure 14 LE Tx test	167
Figure 15 LE Rx test.....	168
Figure 16 read/write efuse.....	169
Figure 17 set crystal value directly.....	20

1. Overview

This document is used to introduce MP (Mass Production) test tool “RTLBTAPP” for Realtek Bluetooth chip series. Customers should comply with the steps and requirements under this document. Contact Realtek Bluetooth FAE if any problem arises in the use of MP flow.

2. Files

MP tool package is provided to customers in binary format:

RTLBTAPP.exe	MP executable file
RtlBluetoothMP.dll	MP dll library
BTPatchCode\ Patch_rtl8723a.bin	RTL8723A firmware patch
BTPatchCode\ Patch_rtl8723b.bin	RTL8723B firmware patch
BTPatchCode\ Patch_rtl8821a.bin	RTL8821A firmware patch
BTPatchCode\ Patch_rtl8761a.bin	RTL8761A firmware patch



Figure 1 File List

Double click “RTLBTAPP.exe” to open this tool. However, please use “Run Administrator” to open it in Vista/Windows7 or higher.

3. Hardware environment

Before use this tool, PC should direct connected 8761A UART/USB port. The connection between 8761A and HOST chip must be cut off.

4. Open RTLBTAPP

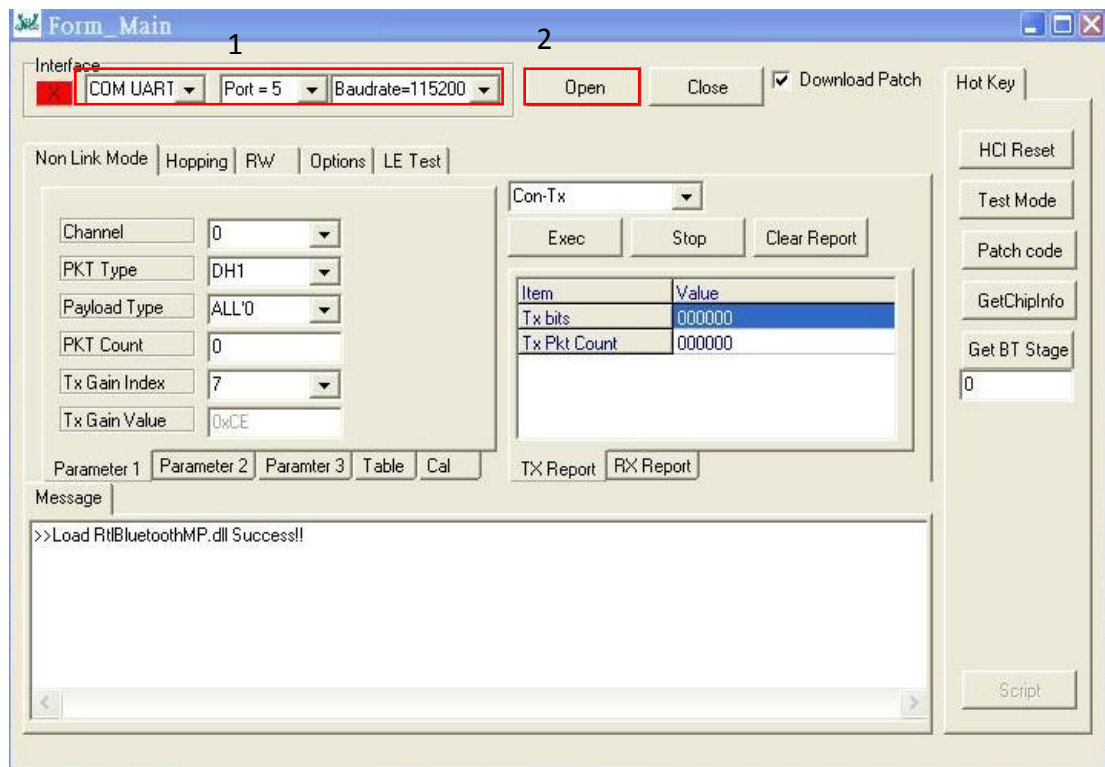


Figure 2 Open BTLBTAPP

Step 1: Select correct interface.

- USB :
If the module interface is “USB”, please select “USB” and “Port =1” to Open.
- UART:
If the module interface is UART, please select “UART” and check COM port number in Device Manager. “RTLBTAPP” only supports COM port number is smaller than “10”. If COM port number is larger than “10”, open operation will fail.

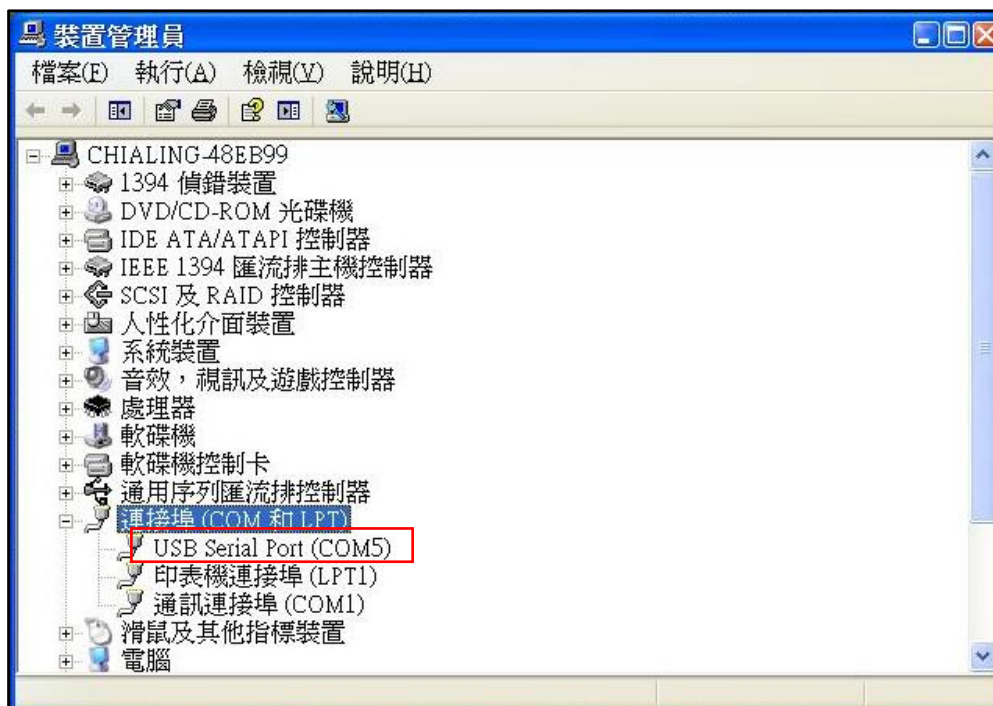


Figure 3 Check COM port number

Step 2: Click “Open”.

After clicking “Open” button, the up left corner changes to green means it is successful to open BT Device and download firmware patch. You could double check it by the two lines in the “Message”. The firmware patch is downloaded one time only, after the device module is powered on. Therefore if you want to re-download firmware patch, first you should power off device and re-start.

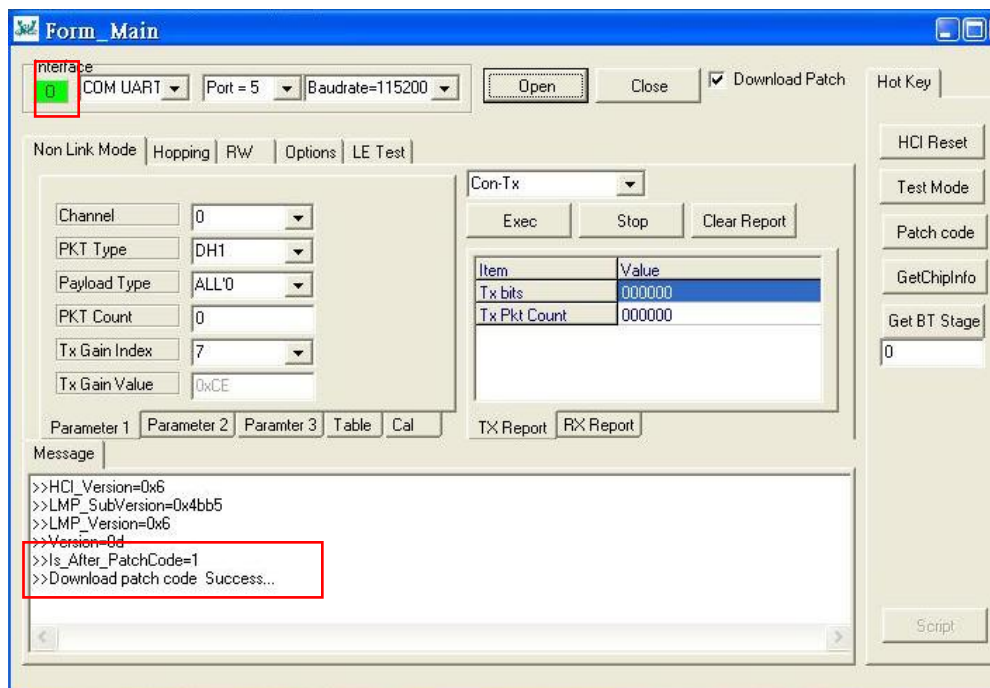


Figure 4 How to check if device was opened and patch was downloaded successfully

5. DUT (Link) Test Mode

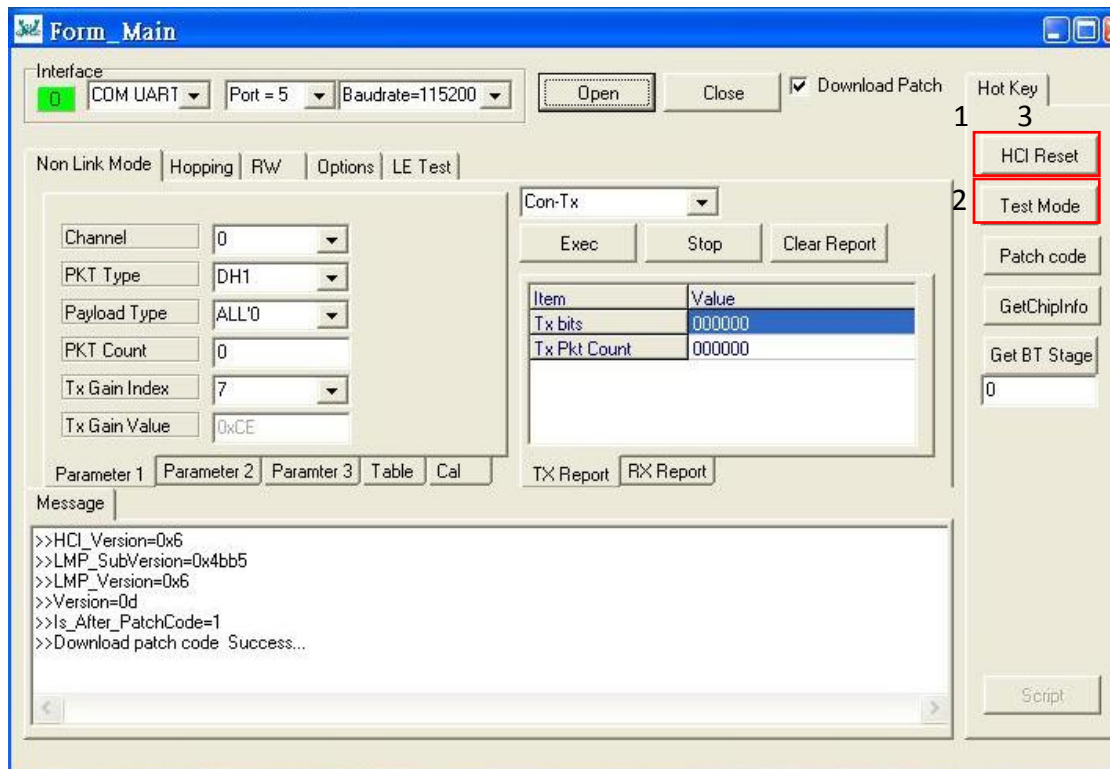


Figure 5 Enter link test mode

Enter link test mode, please follow the below operations.

- **Step 1:** Click “HCI Reset” button to reset.
- **Step 2:** Click “Test Mode” button to enter DUT Test Mode (link test mode).
- **Step 3:** After testing, click “HCI Reset” button to exit DUT Test Mode

6. Non Link Mode Test

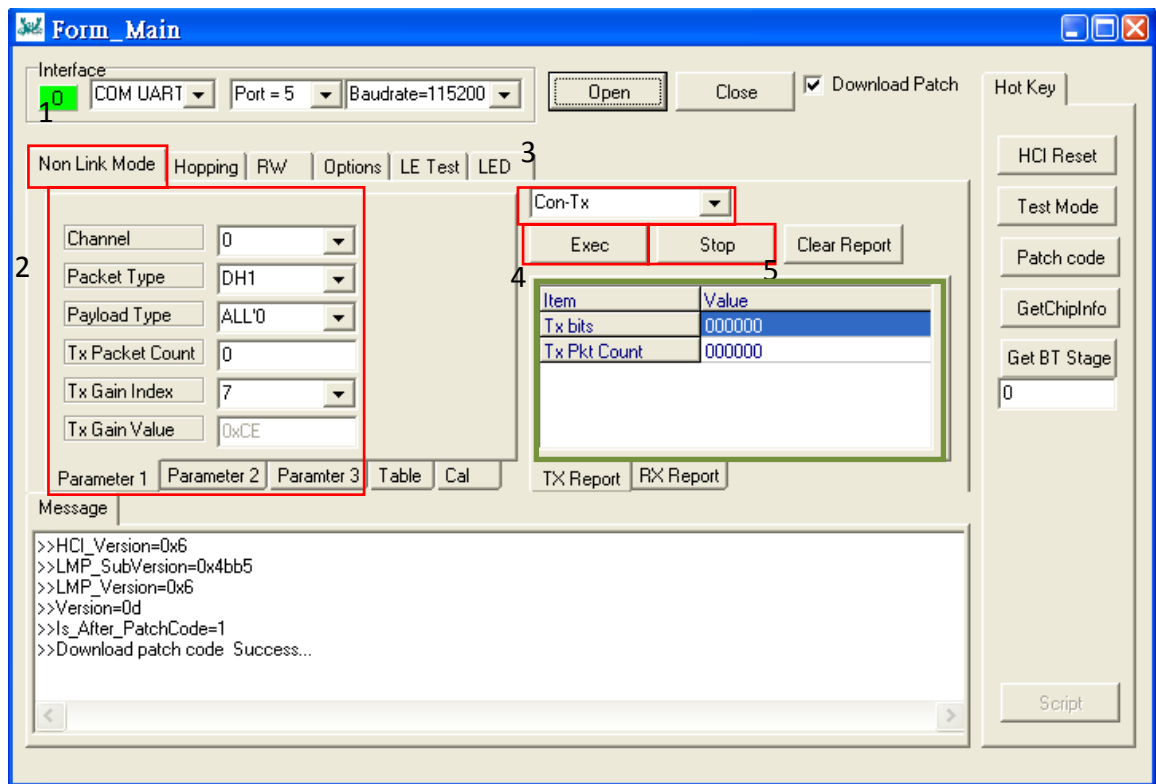


Figure 6 How to set non-link mode parameter

Parameter No.	Name	Value Range
Parameter 1	Channel	0~78
Parameter 1	Packet Type	DH1, DH3, DH5 2DH1, 2DH3, 2DH5 3DH1, 3DH3, 3DH5
Parameter 1	Payload Type	ALL0,ALL1,0101,1010, 0x0_0xF,0000_1111,1111_0000, PRBS9
Parameter 1	Tx Packet Count (for packet tx)	0~0xFFF 0 : infinite Tx packet count
Parameter 1	Tx Gain Index	1~7
Parameter 1	Tx Gain Value	Realtek define
Parameter 2	PacketHeader	0x0~0x3FFFF
Parameter 2	Tx DAC	Realtek define
Parameter 3	Whitening Coeff Value	0x00~0x7F:Enable Whitening

		0x80~0xFF:Disable Whitening
Parameter 3	HitTarget	6 bytes

Use non-link test mode, please follow below step and select correct parameter

- **Step 1:** Select “Non Link Mode”.
- **Step 2:** Choose parameters in ”Parameter 1”, ”Parameter 2” and ”Parameter 3”.
- **Step 3:** Select “Con-Tx”, “Pkt-Tx”, “Pkt-Rx”, or “Single Tone”.
- **Step 4:** Click “Exec” button.
- **Step 5:** After testing, click “Stop” button.

The green rectangle shows current information about TX/RX packet counts.

7. Hopping Mode Test

Hopping Test supports three kinds of parameters that are “Packet Type”, “Channel”, and “Ckb_Whitening”.

1. Packet Type: The “Packet Type” is from “DH1” to “3DH5”, “LE” for BT4.0, and “NULL” for null packet.
2. Channel: The number from “0” to “39” is to transmit fixed frequency. Only the option of “Hopping” will transmit hopping frequency.
3. Ckb_Whitening : To select “Ckb_Whitening” causes whitening enable.

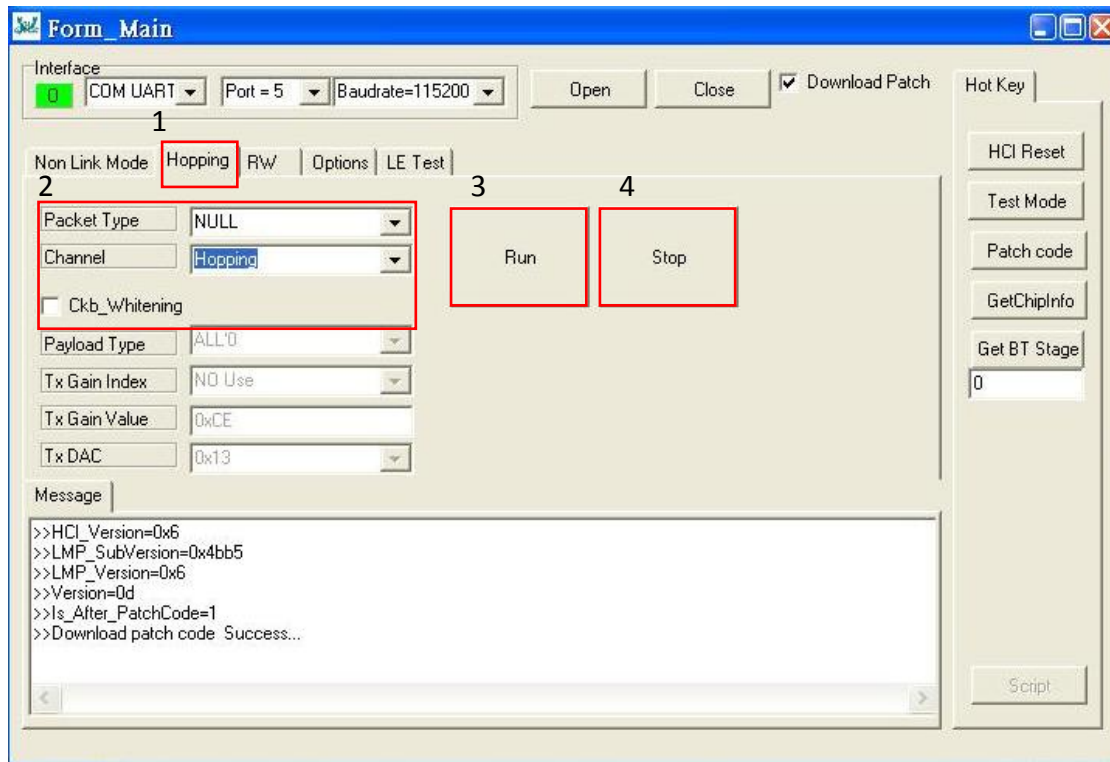


Figure 7 Set non-link mode parameter

- **Step 1:** Select “Hopping”.
- **Step 2:** Choose “Packet Type”, “Channel” and “Ckb_Whitening”
- **Step 3:** Click “Run” button.
- **Step 4:** After testing, click “Stop” button.

Name	Value Range
Packet Type	DH1, DH3, DH5, 2DH1, 2DH3, 2DH5, 3DH1, 3DH3, 3DH5, LE : For BT 4.0 NULL :For NULL packet
Channel	0~39 : Fix Channel Mode Hopping : Hopping Mode
Ckb_Whitening	Enable/Disable Whitening

8. Step by Step Examples

8.1 Bluetooth TX Test

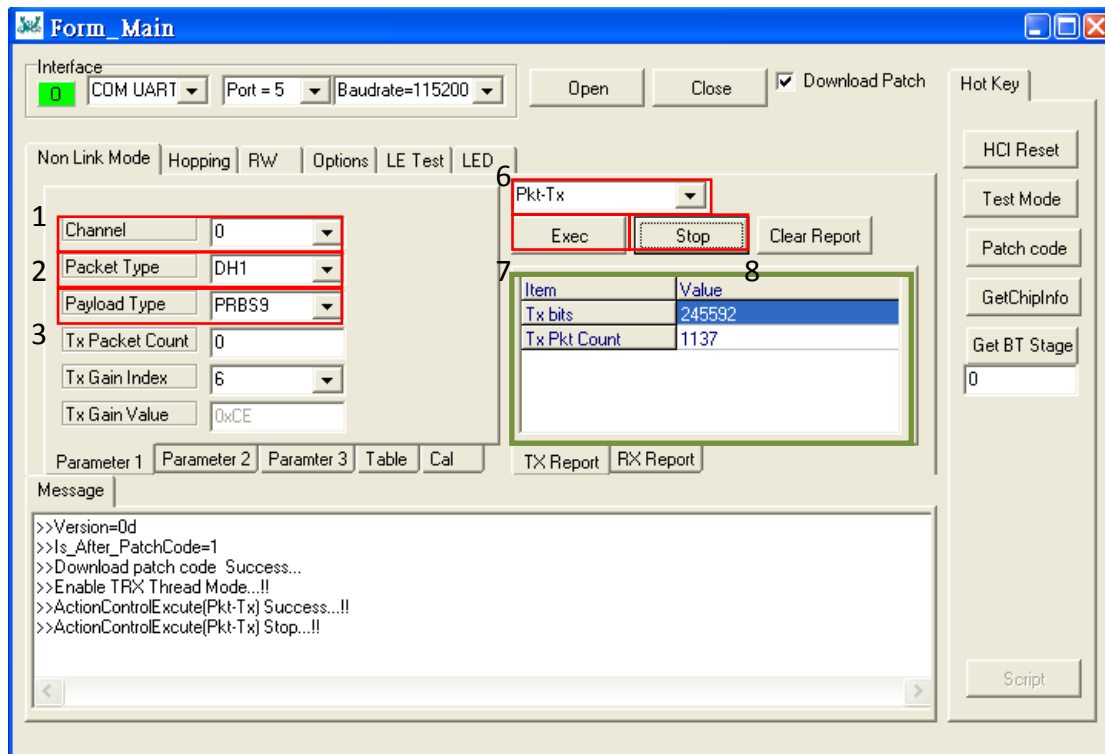


Figure 8 non-link mode TX test

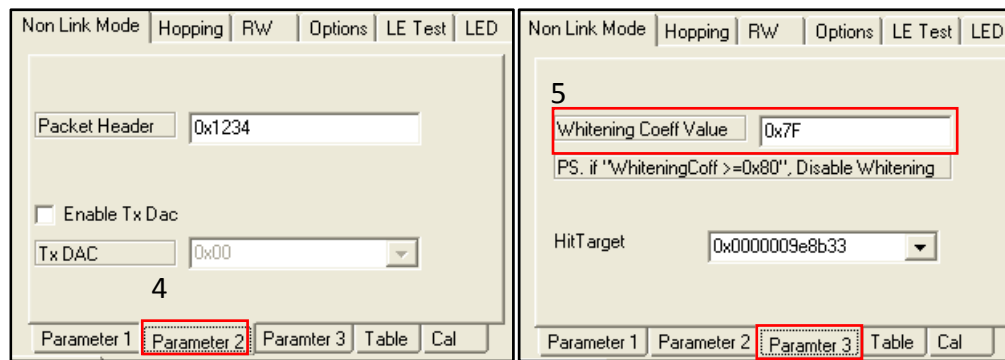


Figure 9 Set non-link mode TX test parameter

Follow below steps to enter non-link mode, DUT will enter TX mode, send packet to tester.

- **Step 1:** Choose “Channel”.
- **Step 2:** Choose “Packet Type”.
- **Step 3:** Set “Payload Type” = “PRBS9”;
Set “Tx Packet Count” = “0”;
Set “Tx Gain Index” = “6”;
- **Step 4:** Use default settings in “Parameter 2”.
- **Step 5:** Use default settings in “Parameter 3”.
- **Step 6:** Select “Pkt-Tx”.
- **Step 7:** Click “Exec” button and start to test.
- **Step 8:** After testing, click “Stop” button.

The green rectangle shows current TX packet counts and TX bits which are evaluated by TX times and are not completely correct.

8.2 Bluetooth RX Test

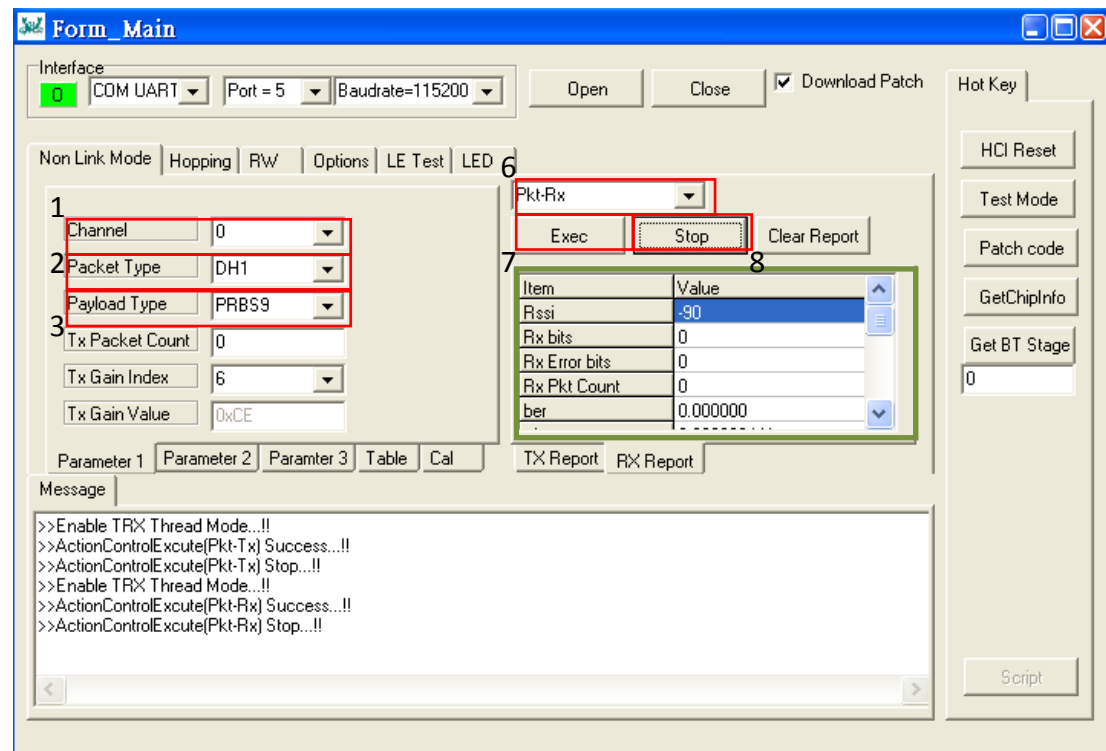


Figure 10 non-link mode RX test

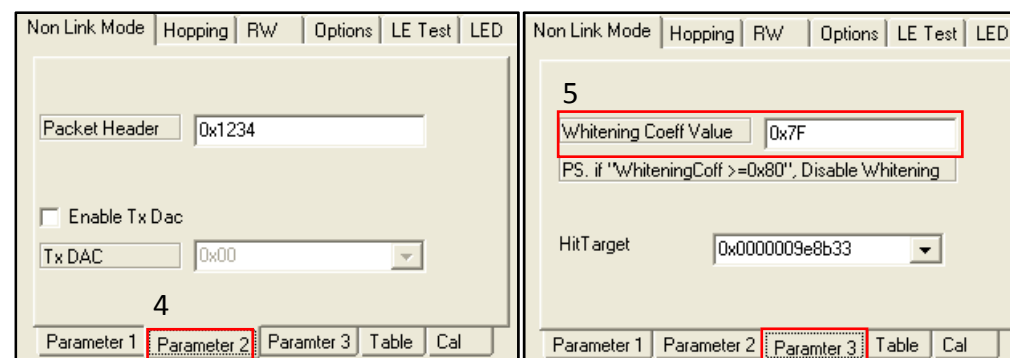


Figure 11 Set non-link mode RX test parameter

Follow below steps to enter non-link mode, DUT will enter RX mode, receive packet from tester.

- **Step 1:** Choose “Channel”.
- **Step 2:** Choose “Packet Type”.
- **Step 3:** Set “Payload Type” = “PRBS9”;
Set “Tx Packet Count” = “0”;
Set “Tx Gain Index” = “6”;
- **Step 4:** Use default settings in “Parameter 2”.
- **Step 5:** Use default settings in “Parameter 3”.

- **Step 6:** Select “Pkt-Rx”.
- **Step 7:** Click “Exec” button and start to test.
- **Step 8:** After testing, click “Stop” button.

The green rectangle shows correct RSSI, RX bits, RX error bits, RX packet counts, ber and CFO.

8.3 Single Carrier (Tone) Test

This mode only could transmit single carrier (tone).

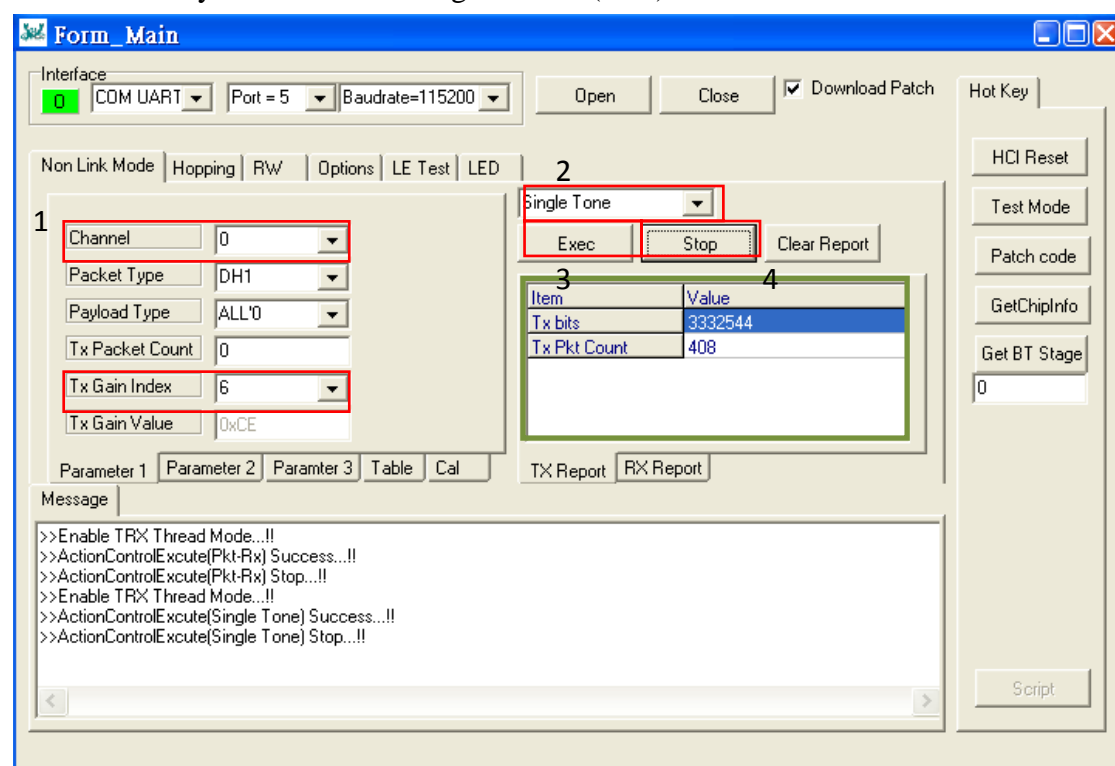


Figure 12 non-link mode receive single carrier test

- **Step 1:** Choose “Channel” and “Tx Gain Index” = “6”.
- **Step 2:** Select “Single Tone”.
- **Step 3:** Click “Exec” button and start to test.
- **Step 4:** After testing, click “Stop” button.

The green rectangle shows current TX packet counts and TX bits which are evaluated by TX times and are not completely correct.

8.4 Hopping Test

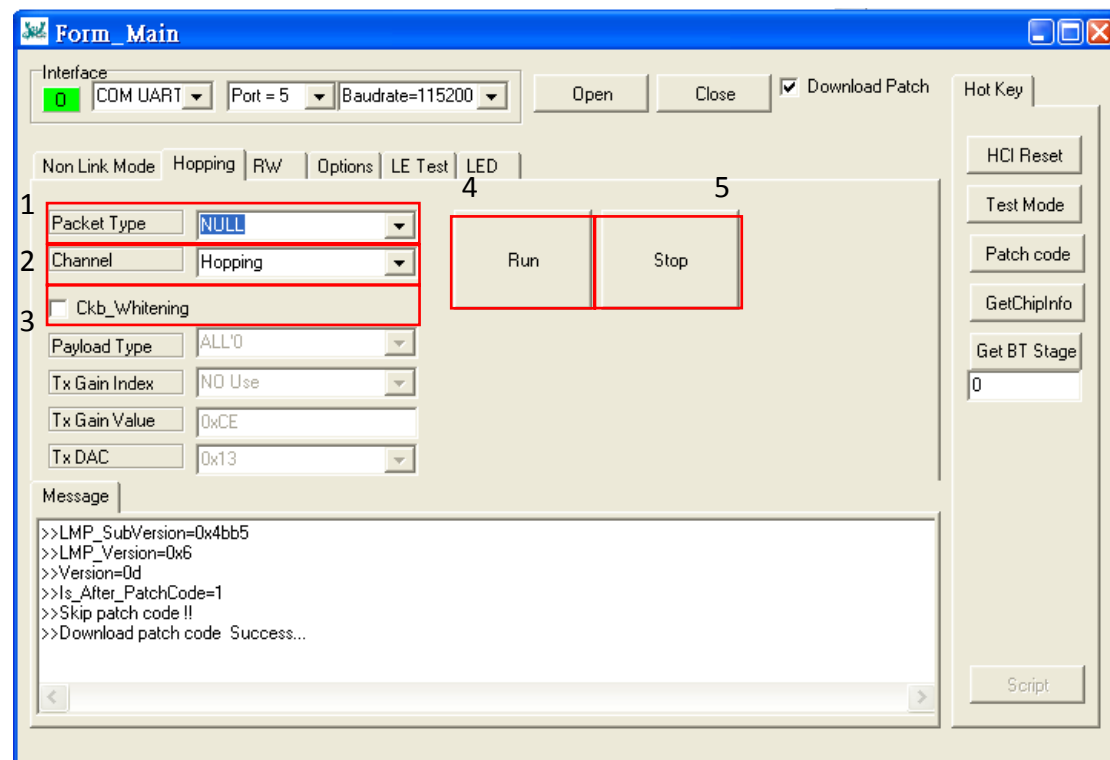


Figure 13 non-link mode hopping test

- Step 1: Choose “Packet Type”.
- Step 2: Choose “Channel”.
- Step 3: If whitening is enable, click the “Cbk_Whitening” checkbox.
- Step 4: Click “Run” button and start to test.
- Step 5: After testing, click “Stop” button.

Name	Value Range
Packet Type	DH1, DH3, DH5, 2DH1, 2DH3, 2DH5, 3DH1, 3DH3, 3DH5, LE : For BT 4.0 NULL : For NULL packet
Channel	0~39 : Fix Channel Mode Hopping : Hopping Mode
Cbk_Whitening	Enable/Disable Whitening

8.5 LE TX/RX Test

If want to LE TX

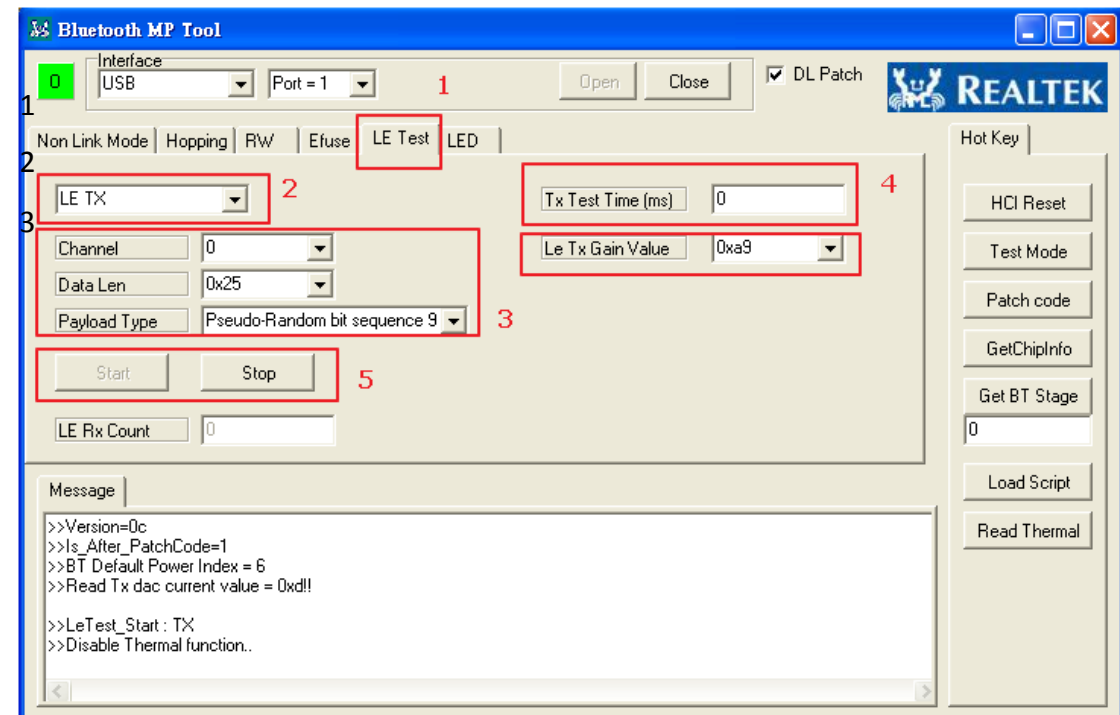


Figure 14 LE TX TEST

- Step 1: Choose “LE Test Page”.
- Step 2: Choose “LE Tx”.
- Step 3: Choose LE Test Parameters :
 - (a) Channel :0~39.
 - (b) Data length:0~0x2D (0~Byte 39)
 - (c) PayType:0xF0 ,0xA0 , ALL 0, ALL 1, prbs9, prbs1,0x05,0x0F.
- Step 4: Choose execute Test Parameters :
 - (a) Tx Time : execute time ,unit “mSec”.
 - (b) Tx Power: by chip.
- Step 5: Click “Start” button and start to test. After testing, click “Stop” button.

If want to LE RX

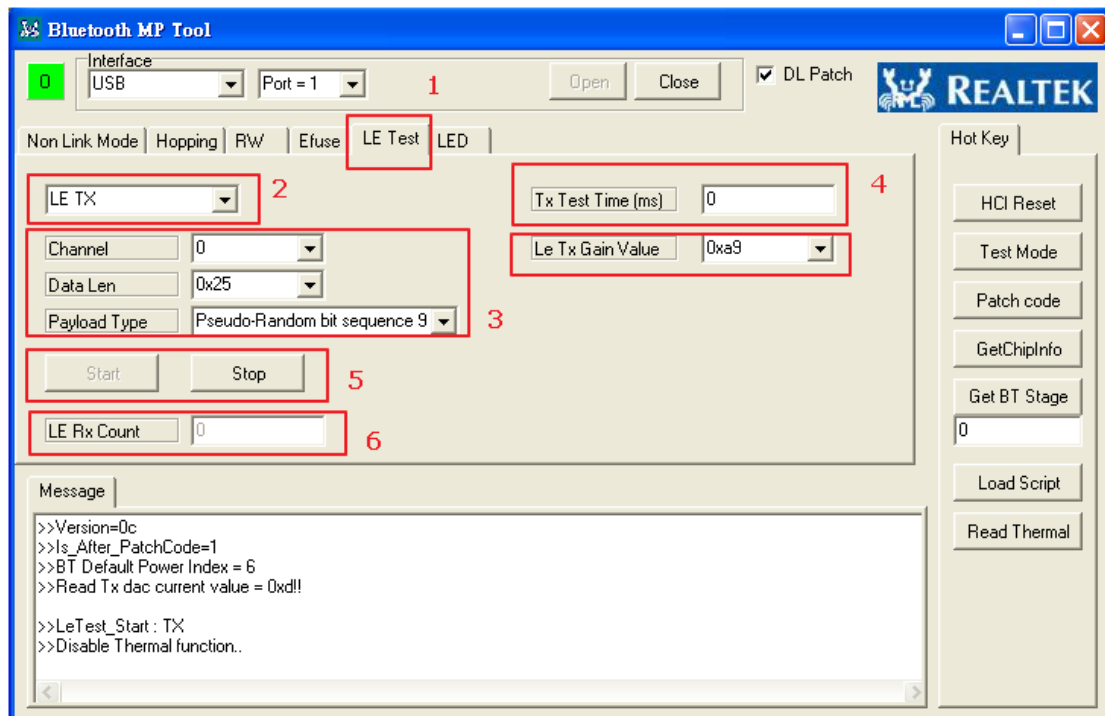


Figure 15 LE TX TEST

- Step 1: Choose “LE Test Page”.
- Step 2: Choose “LE Rx”.
- Step 3: Choose LE Test Parameters :
To Setting Channel :0~39.
- Step 4: Click “Start” button and start to test. After testing, click “Stop” button
- Step 6: Show received LE Rx Packet

9. Read/Write Efuse

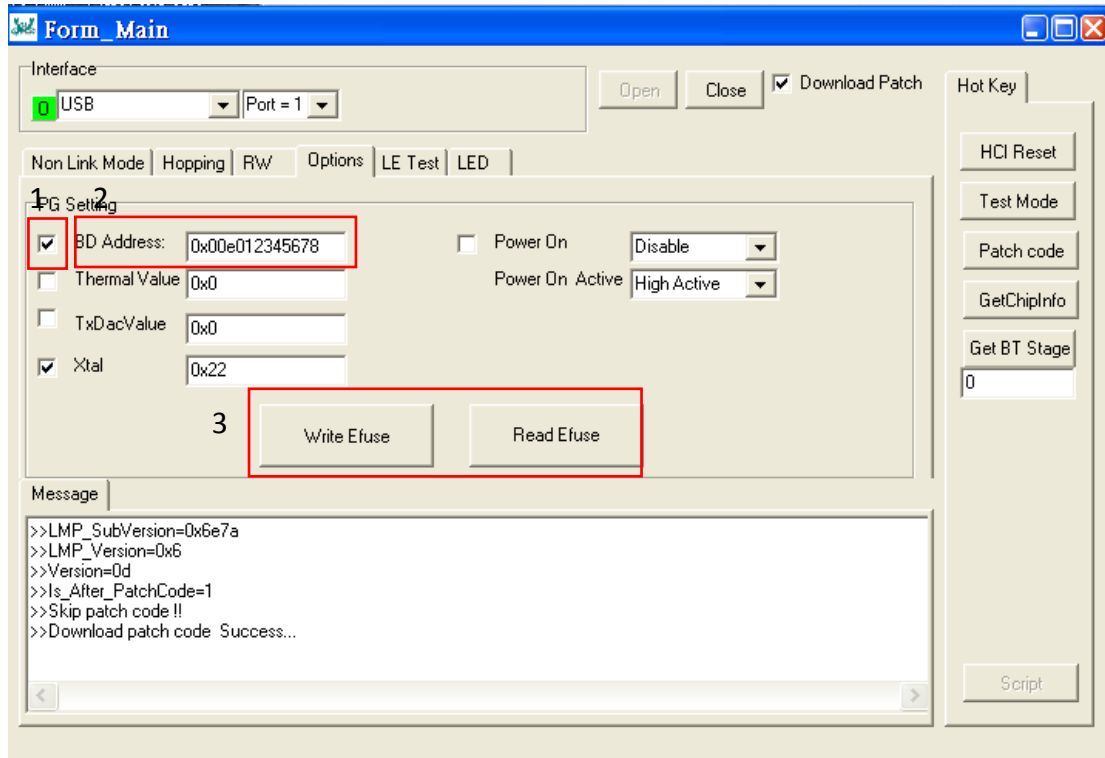


Figure 16 read/write efuse

- Step 1: Select the items to write to efuse or read from efuse.
- Step 2: Fill the value to write.
- Step 3: Click “Write Efuse” or “Read Efuse” button.

If users click “Read Efuse” button and get “0xFF” the value that means this efuse address is never written yet.

10. Calibration frequency offset

Before writing the proper crystal value to efuse, users should tune it. The following steps show how to change the crystal value directly.

- Step 1: Select “Non Link Mode”.
- Step 2: Select “Cal”.
- Step 3: Set or Get Crystal(Xtal) vale.

By changing the crystal value and transmitting signal tone (Chapter 8.3) over and over again, users could find the most accurate one and write it to efuse(Chapter 9).

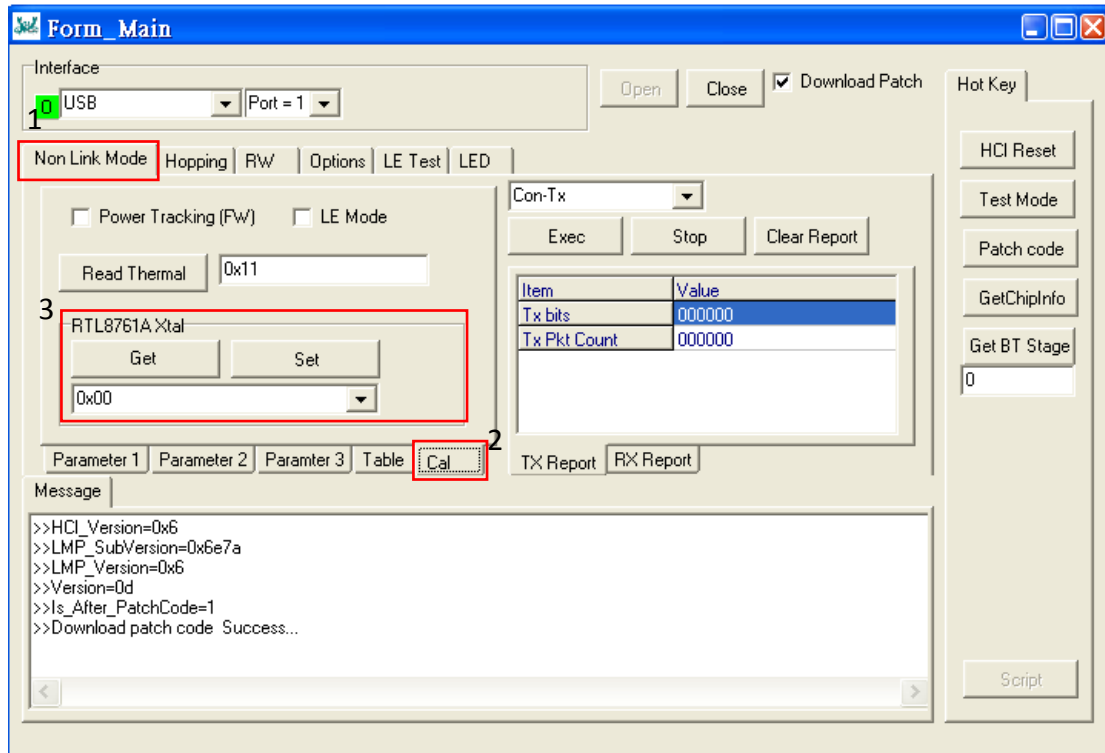


Figure 17 set crystal value directly