Bluetooth and BLE Test with CyBluetool

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Murata Manufacturing Co., Ltd.

Revision History

Revision Number	Release Date	Comments
Revision 1.0	2019/03/06	Initial
Revision 1.1	2019/09/06	3. Firmware Download Added Type1QP make target.

Contents

1. About this Document

1.1. Purpose and Scope

This document provides instructions to use CyBluetool that is a software to run the Murata Type1LD and Type1QP module for Bluetooth and BLE test.

1.2. References documentation

N1-4629_Type1LD-Quick_Start_Guide.pdf

N1-4799_Type1QP-Quick_Start_Guide.pdf

2. Setting up CyBluetool

CyBluetool is available for download from the Cypress WICED website.

A) Cybluetool user's guide is available as below site also.
   https://community.cypress.com/docs/DOC-16475

B) Download CyBluetool from the WICED Communities website.
   https://community.cypress.com/docs/DOC-15585 (for Windows)
   https://community.cypress.com/docs/DOC-15586 (for Linux)

C) Install CyBluetool.

3. Firmware Download

This is a normal way to download firmware with Wiced build option.

Please use bt_mfg_test application with below build option.

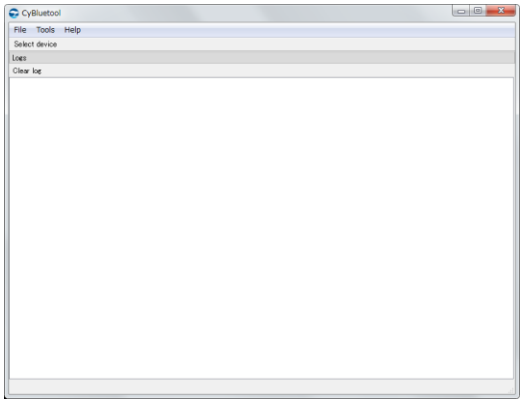
test.bt_mfg_test-MurataType1LD download run

test.bt_mfg_test-MurataType1QP download run

Note) For more detail firmware download, please refer to documents of [1.2. References documentation].

4. Start CyBluetool

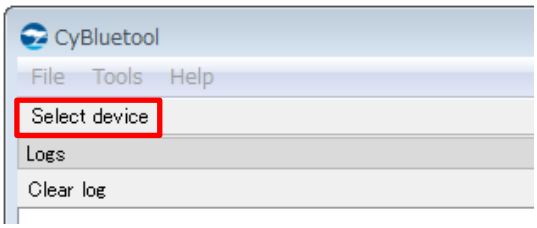
Start the CyBluetool by selecting, START > All Programs > Cypress > CyBluetool > CyBluetool.



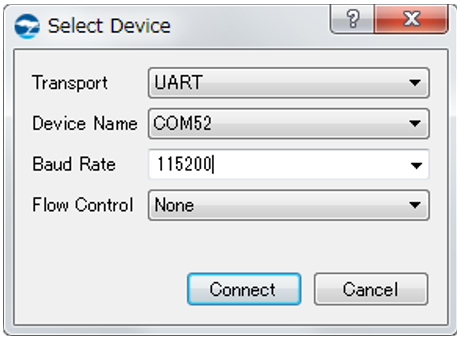
5. Initialization

5.1. Reset by HCI Command

Click the [Select device] button.



The [Select Device] screen is displayed, and execute the folloing process.



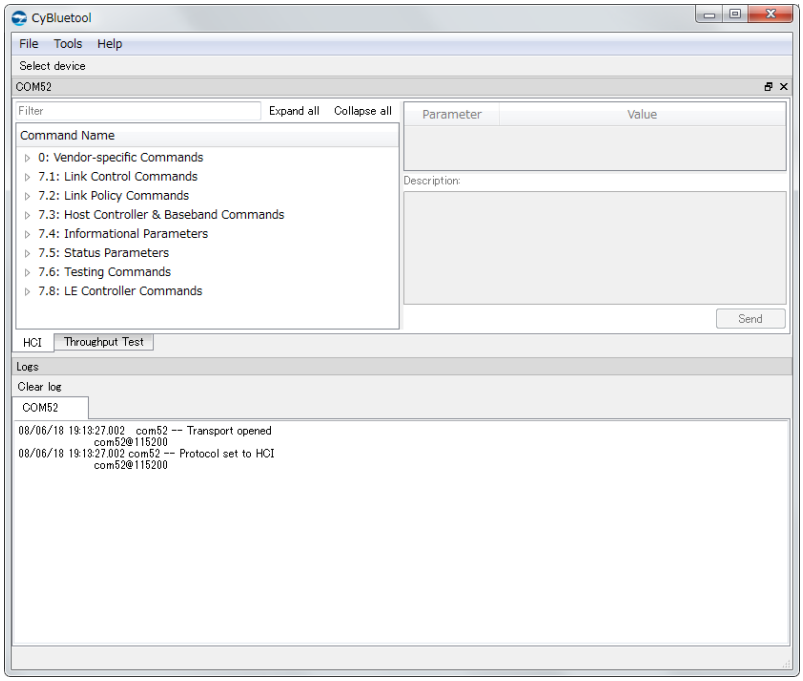
A) Select [UART].

B) Select the port number which is used.

C) Change [Flow Control] to None.

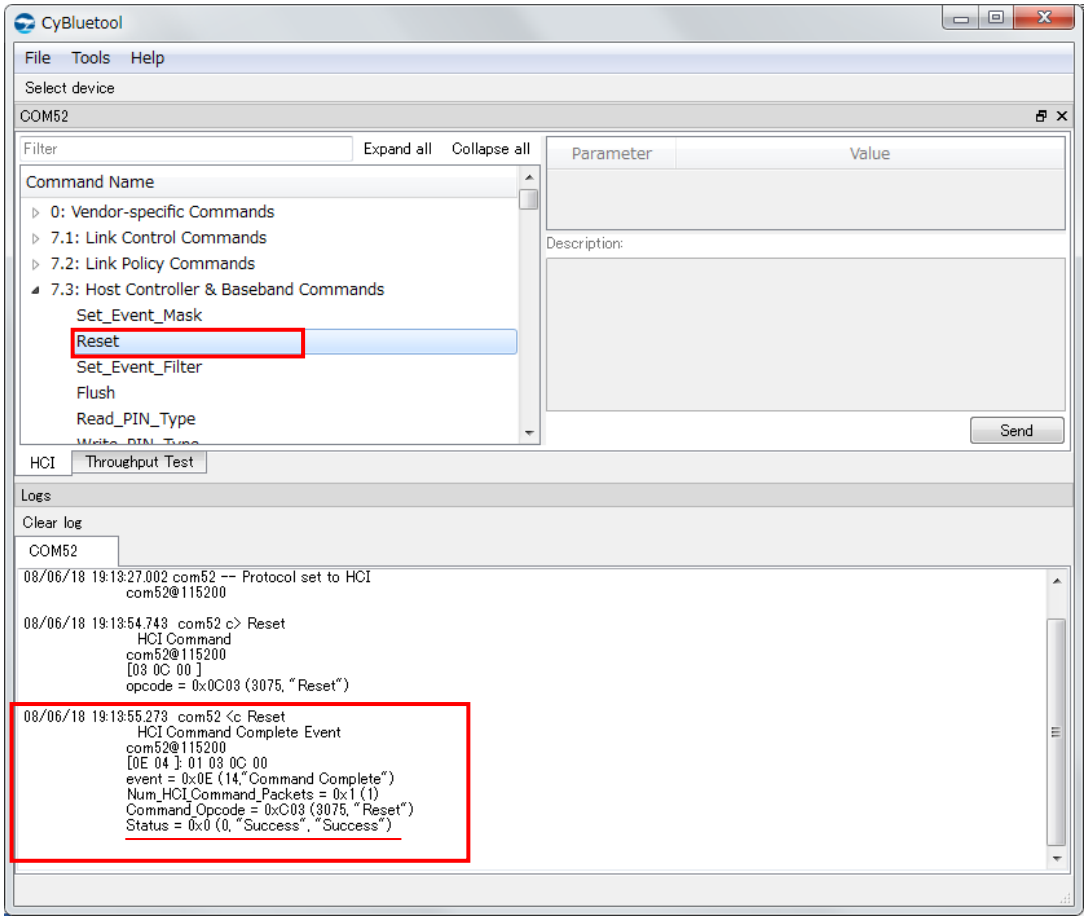
D) Push the [Connect] button.

After you push the [connect] button, the following screen is displayed.



E) Reset

Select [7.3: Host Controller & Baseband Commands] from [HCI Command] window, double click [Reset].

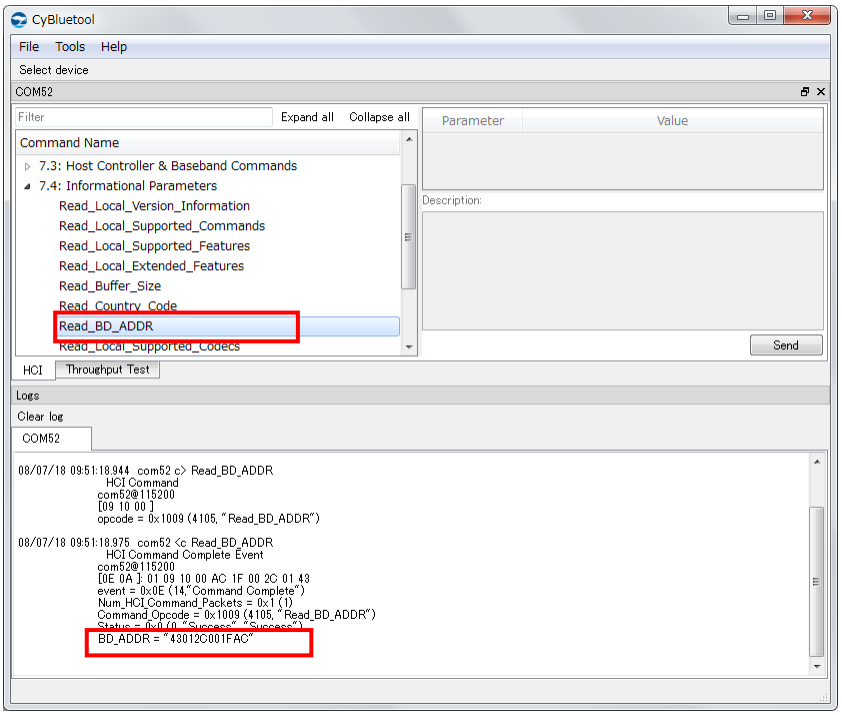


If the response is [Status = 0x0 (0, "Success", "Success")], reset is success.

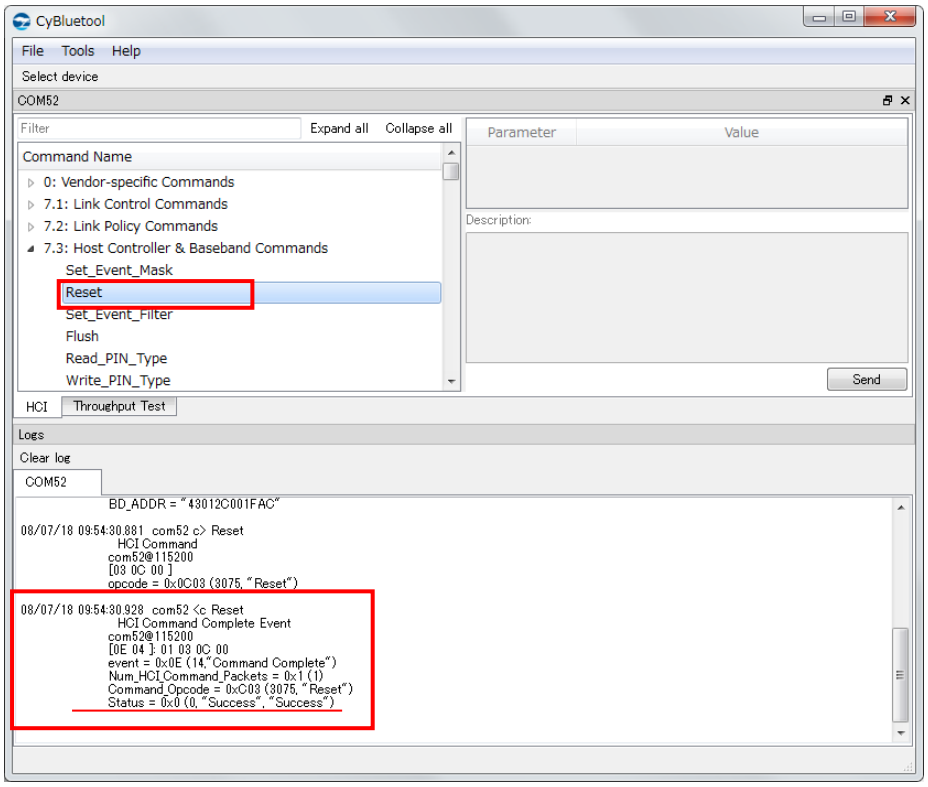
5.2. Confirm the BD Address read

A) Double click [Read BD Address] in [7.4: Informational Parameters].

The BD Address is displayed in Log window.



B) Select [7.3: Host Controller & Baseband Commands] in [HCI Command] window, double click [Reset].

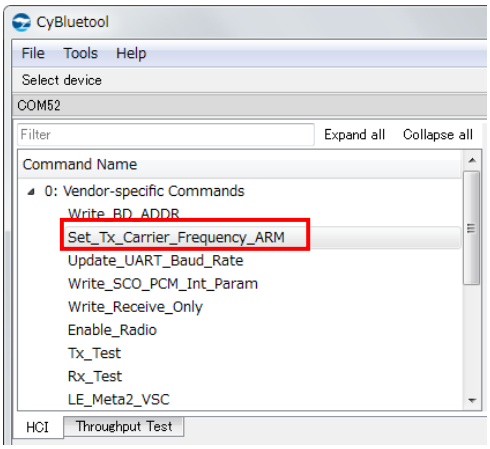


If the response is [Status = 0x0 (0, "Success", "Success")], reset is success.

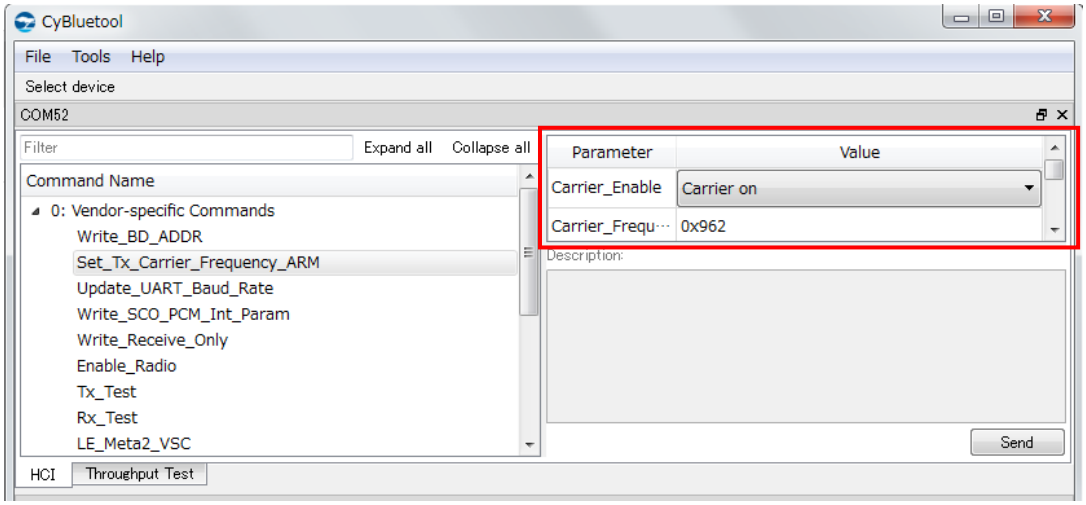
6. How to set BT

6.1. Tx CW

A) Click [Set_Tx_Carrier_Frequency_ARM] in [0: Vendor-specific Commands].



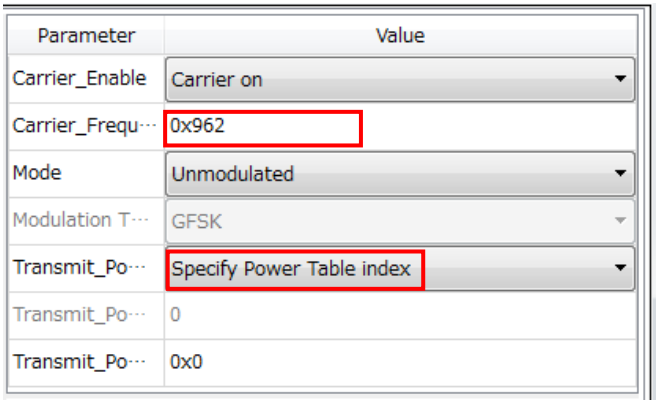
The parameter setting window is displayed on right window.



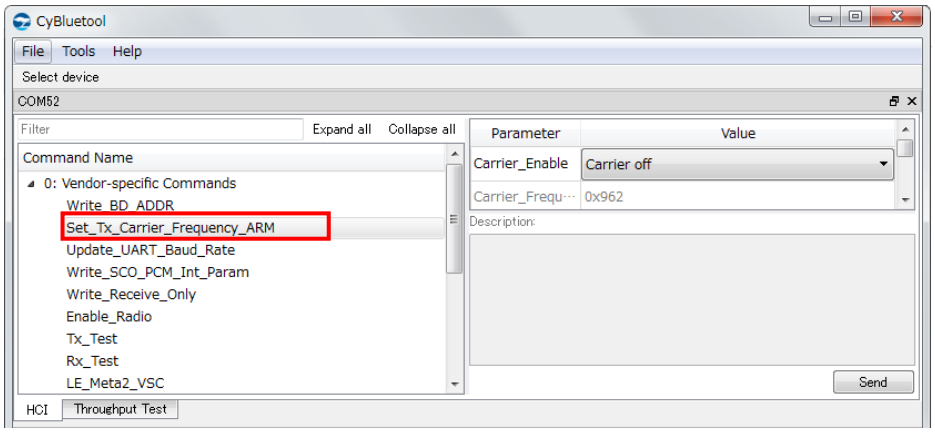
B) Change [Carrier_Frequency] and [Transmit_power].

Click the [Send] button.

Please input 2402/2442/2480 in [Carrier_Frequency].

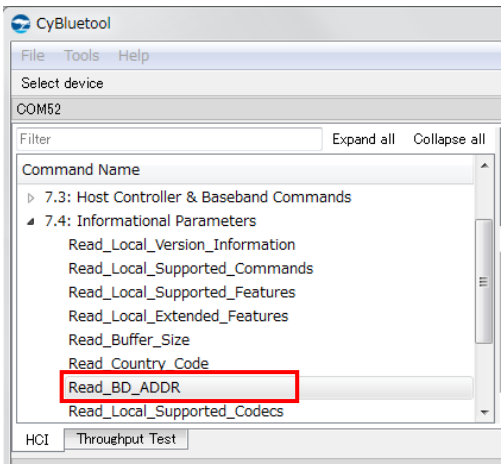


C) If you want to finish, select [Set_Tx_Carrier_Frequency_ARM] in HCI command and change [Carrier_Enable] to [Carrier off].



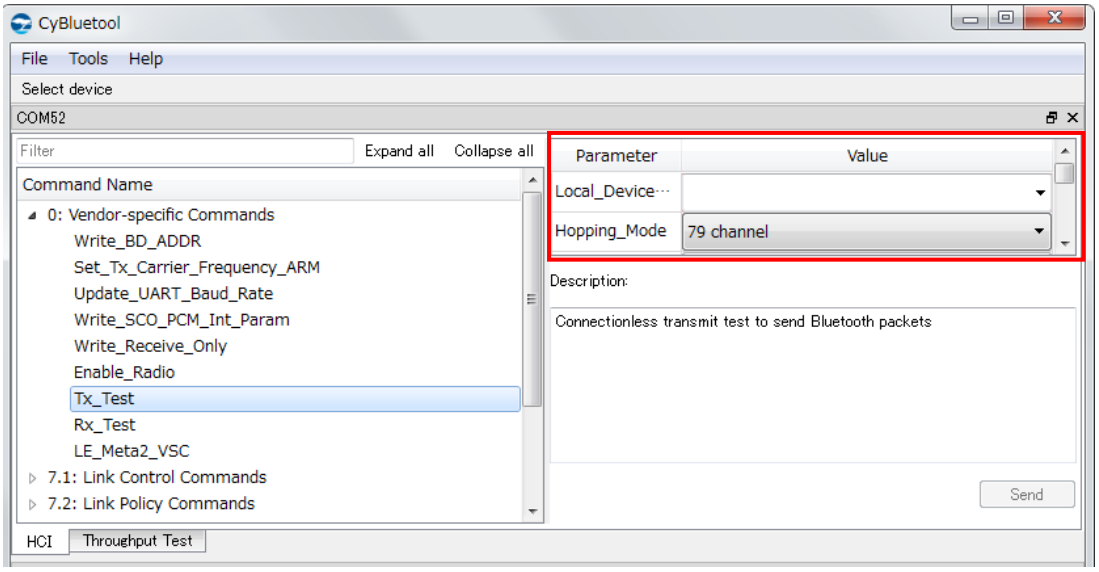
6.2. Hopping ON Tx Test

A) Double click [Read BD Address] in [7.4: Informational Parameters].



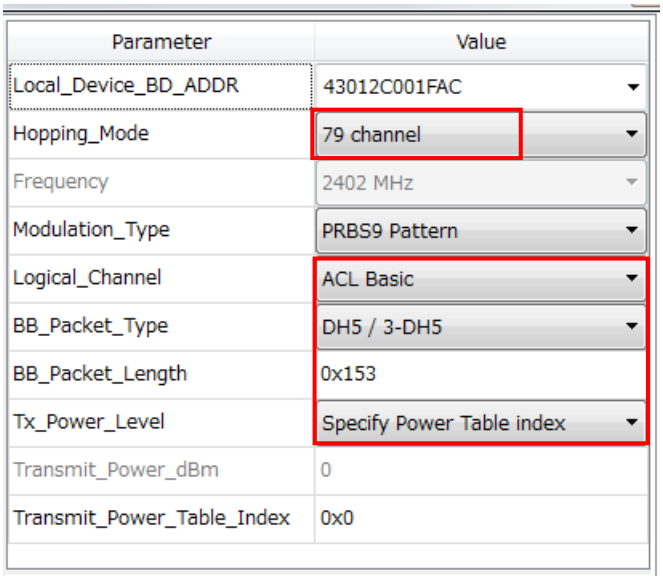
B) Click [Tx_Test] in [0: Vendor-specific Commands].

The parameter setting window is displayed on right window.



C) Change parameters according to the test.

Push the [Send] button.

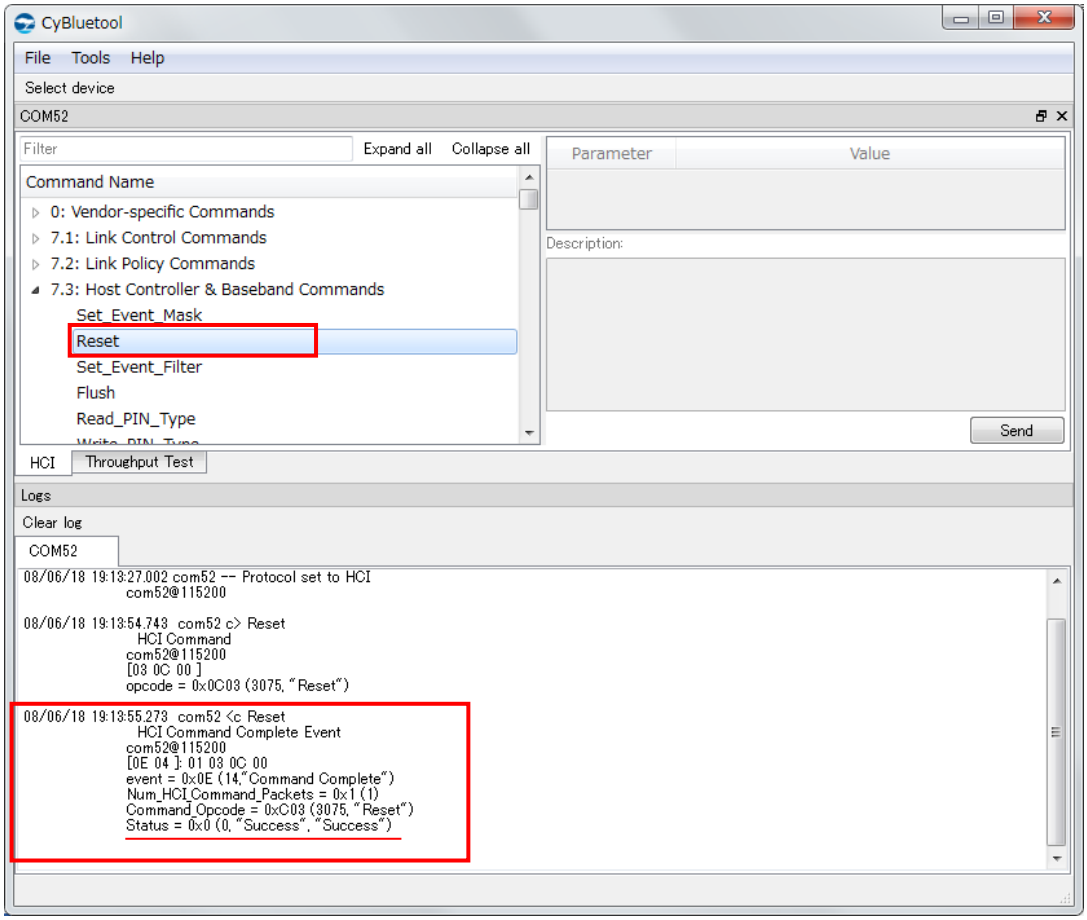


- ✓ Local_Device_BD_ADDR : the value of [Read BD Address]
- ✓ Hopping_Mode : 79channel
- ✓ Tx_Power_Level : Specify Power Table index
- ✓ Logical_Channel/BB_Packet_Type/BB_Packet_Length are as follows.

BB_Packet_Type	Logical_Channel	BB_Packet_Length
DH1	ACL Basic	27
DH3	ACL Basic	183
DH5	ACL Basic	339
2DH1	ACL EDR	54
2 DH3	ACL EDR	369
2 DH5	ACL EDR	679
3 DH1	ACL EDR	83
3 DH3	ACL EDR	552
3 DH5	ACL EDR	1021

D) If you want to finish, execute [Reset].

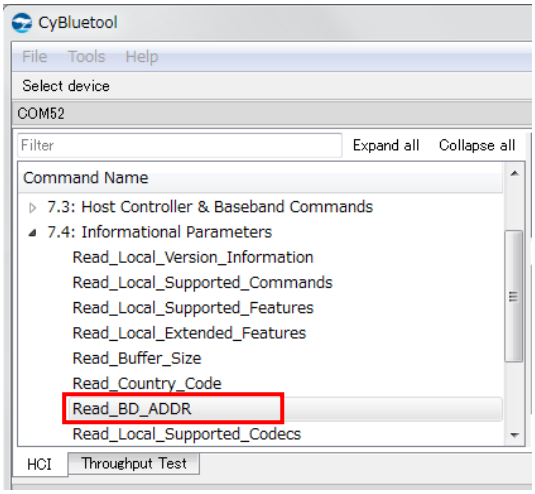
Select [7.3: Host Controller & Baseband Commands] from [HCI Command] window, double click [Reset].



If the response is [Status = 0x0 (0, "Success", "Success")], reset is success.

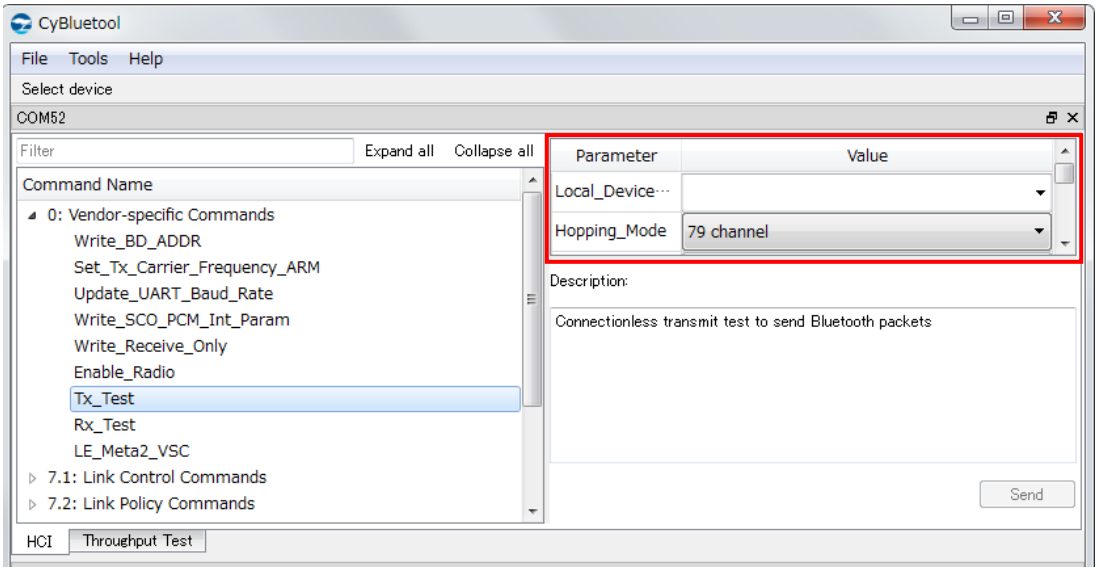
6.3. Hopping OFF Tx Test

A) Double click [Read BD Address] in [7.4: Informational Parameters].



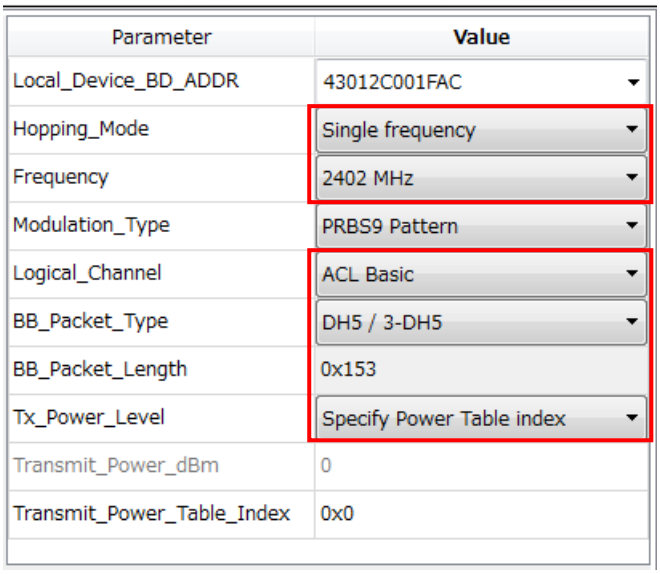
B) Click [Tx_Test] in [0: Vendor-specific Commands].

The parameter setting window is displayed on right window.



C) Change parameters according to the test.

Push the [Send] button.

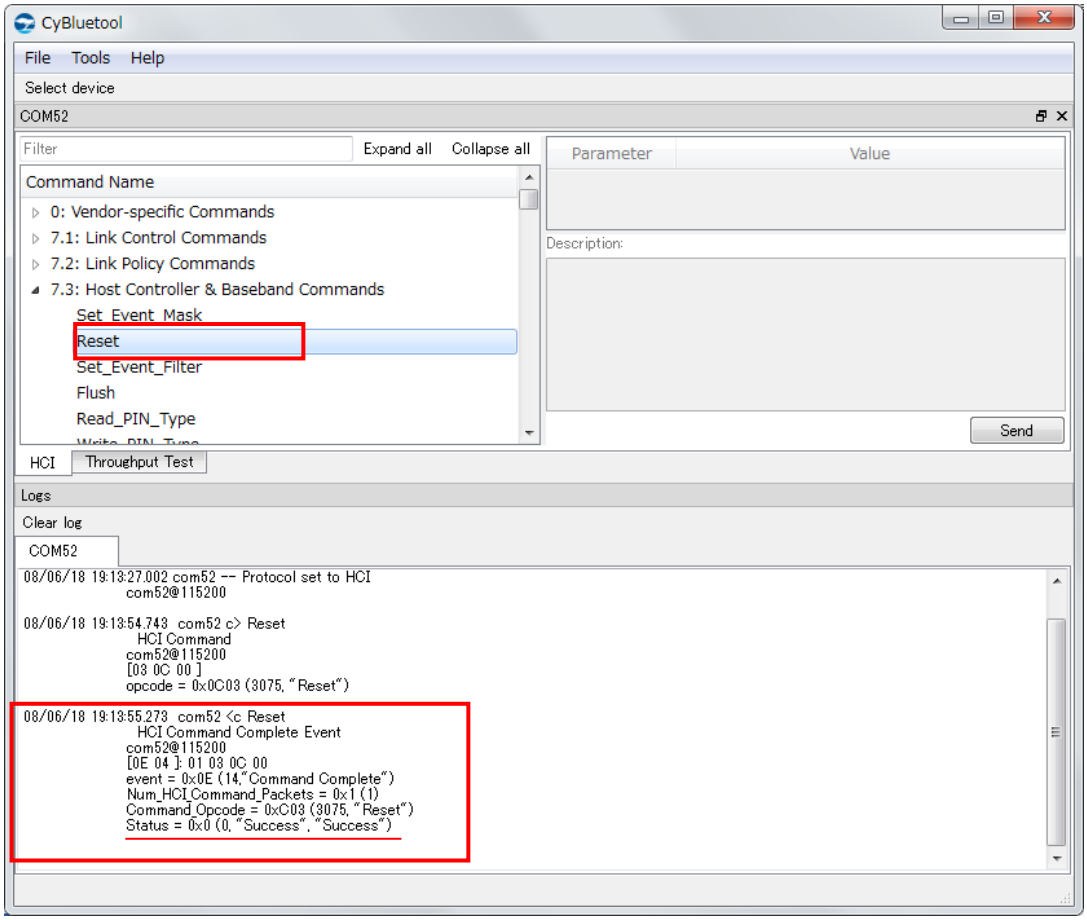


- ✓ Local_Device_BD_ADDR : the value of [Read BD Address]
- ✓ Hopping_Mode: Single frequency
- ✓ Frequency: 2402/2441/2480
- ✓ Tx_Power_Level: Specify Power Table index
- ✓ Logical_Channel/BB_Packet_Type/BB_Packet_Length are as follows.

BB_Packet_Type	Logical_Channel	BB_Packet_Length
DH1	ACL Basic	27
DH3	ACL Basic	183
DH5	ACL Basic	339
2DH1	ACL EDR	54
2 DH3	ACL EDR	369
2 DH5	ACL EDR	679
3 DH1	ACL EDR	83
3 DH3	ACL EDR	552
3 DH5	ACL EDR	1021

D) If you want to finish, execute [Reset].

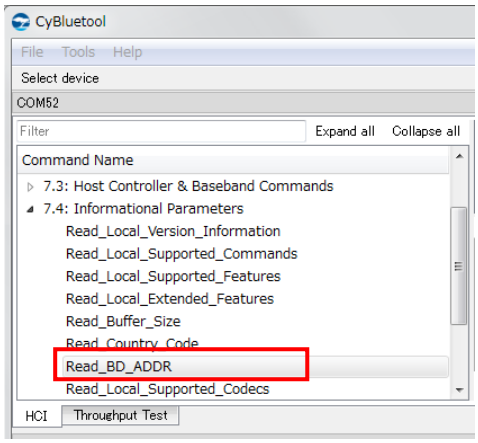
Select [7.3: Host Controller & Baseband Commands] from [HCI Command] window, double click [Reset].



If the response is [Status = 0x0 (0, "Success", "Success")], reset is success.

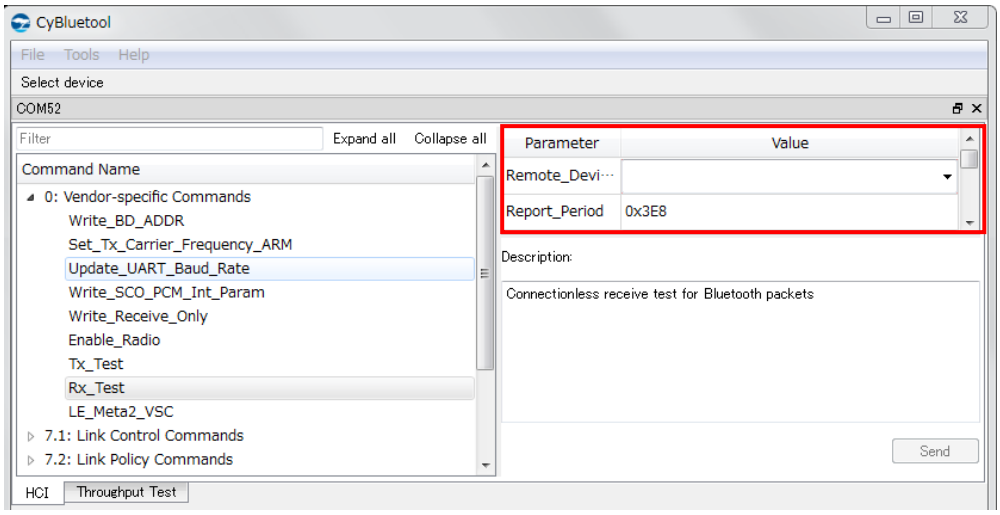
6.4. Rx Test

A) Double click [Read BD Address] in [7.4: Informational Parameters].



B) Click [Rx_Test] in [0: Vendor-specific Commands].

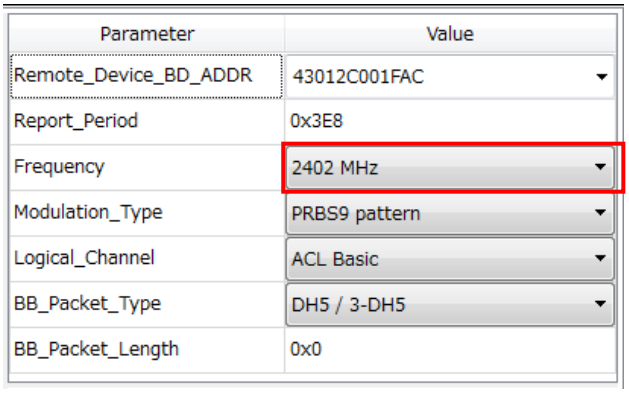
The parameter setting window is displayed on right window.



C) Change [Remote_Device_BD_ADDR] to the value of [READ BD Address].

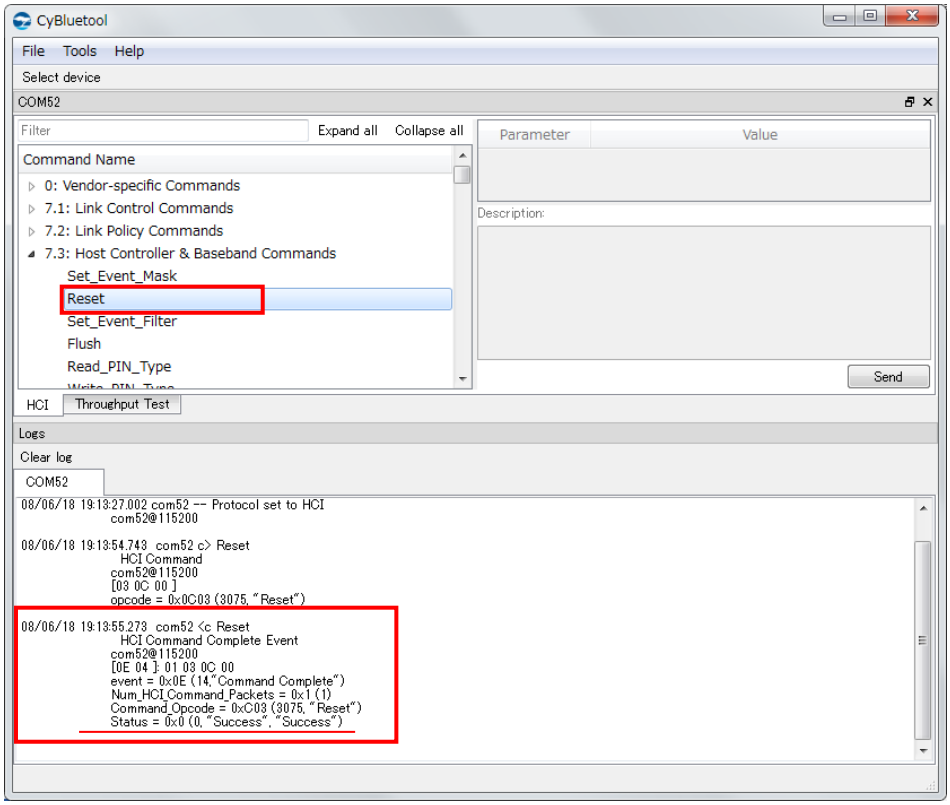
Change [Frequency] to the channel which you want to receive.

Push the [Send] button.



D) If you want to finish, execute [Reset].

Select [7.3: Host Controller & Baseband Commands] from [HCI Command] window, double click [Reset].



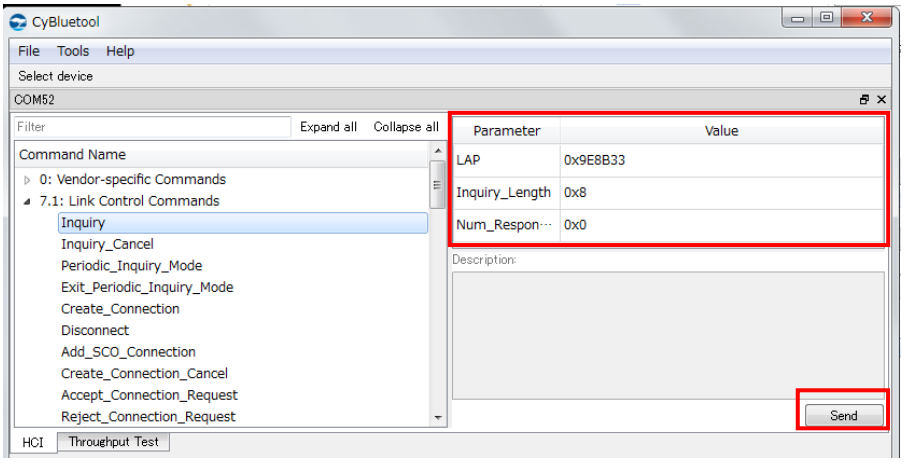
If the response is [Status = 0x0 (0, "Success", "Success")], reset is success.

6.5. Inquiry

A) Click [Inquiry] in [7.1: Link Control Commands].

The parameter setting window is displayed on right window.

Push the [Send] button.

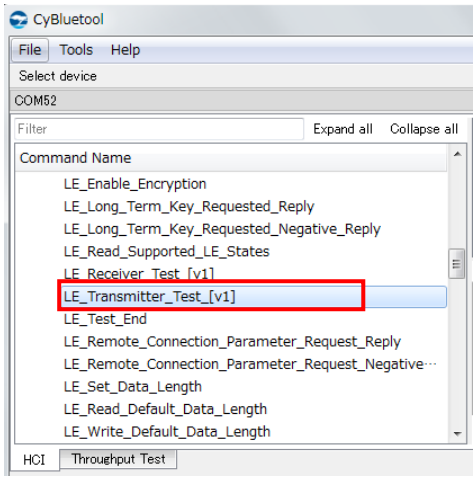


When the inquiry have finished, “Inquiry Complete” is displayed in Log window.

7. How to set BLE

7.1. Tx Test

A) Click [LE_Transmitter_Test_[v1]] in [7.8: LE Controller Commands].

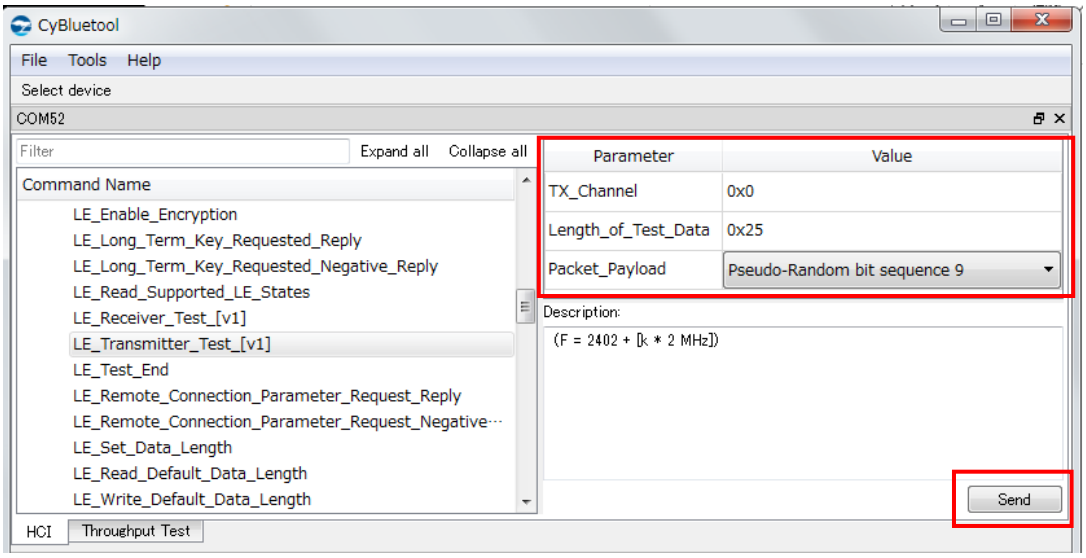


The parameter setting window is displayed on right window.

B) Change [TX_Channel] to the value based on the calculation formula.

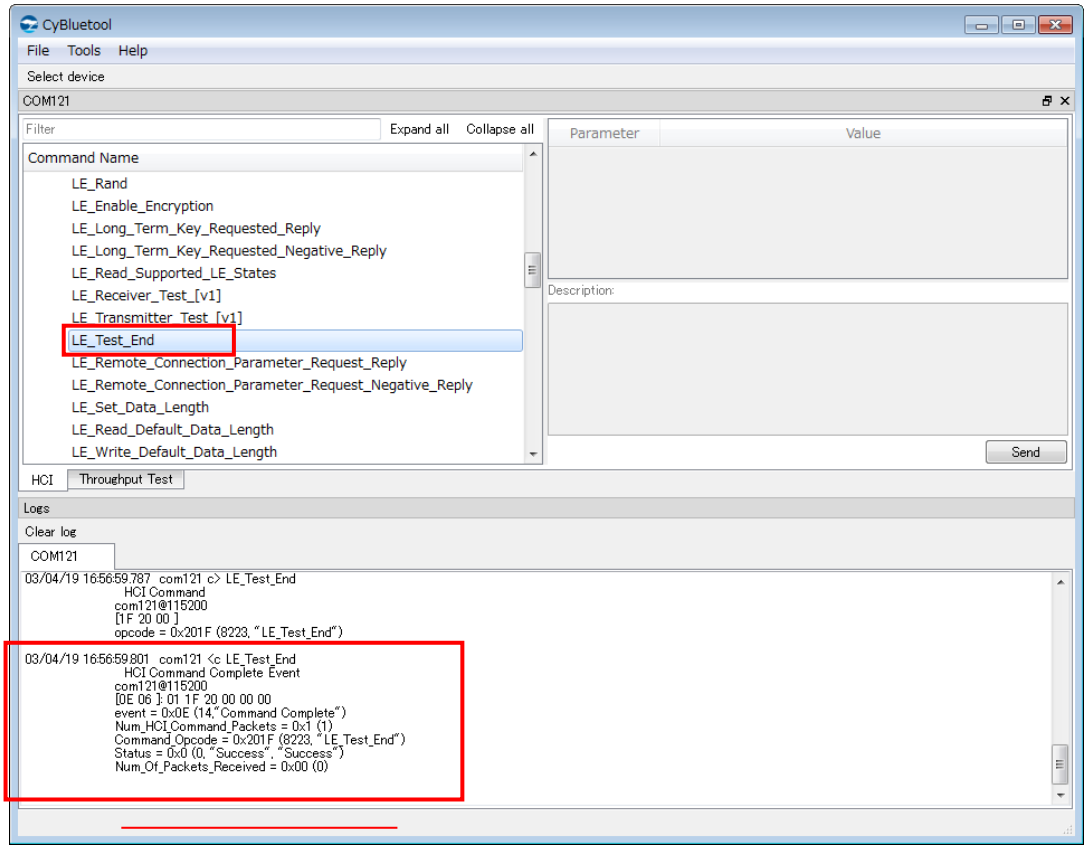
Change [Length_of_Test_Data] to 37.

Push the [Send] button.



C) If you want to finish LE_Transmitter_Test, execute [LE_Test_End].

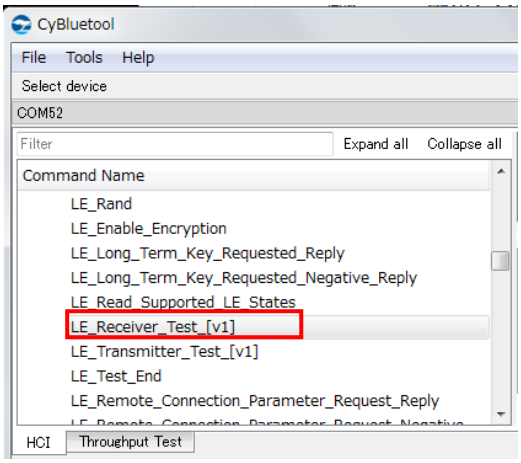
Select [7.8: LE Controller Commands] from [HCI Command] window, double click [LE_Test_End].



If the response is [Status = 0x0 (0, "Success", "Success")], LE_Test_End is success.

7.2. Rx Test

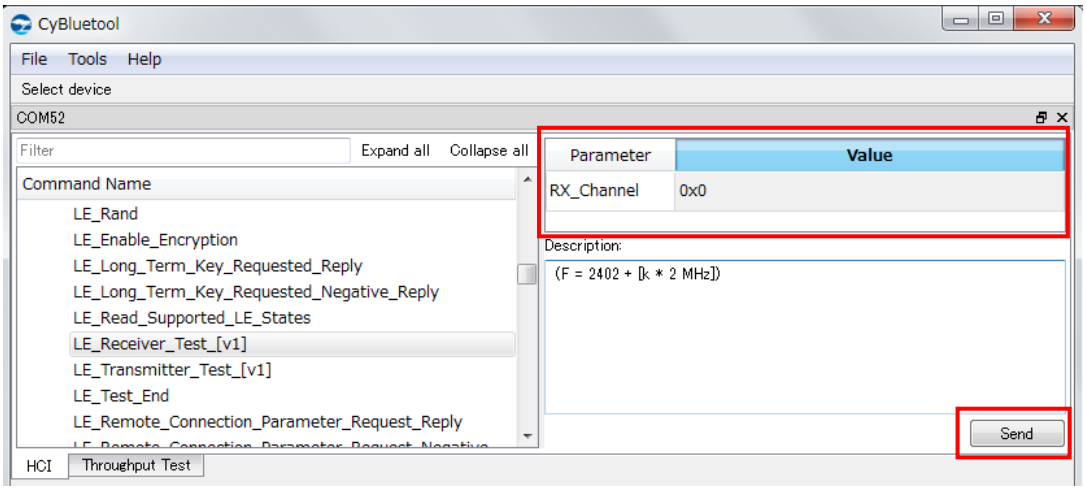
A) Click [LE_Receiver_Test_[v1]] in [7.8: LE Controller Commands].



The parameter setting window is displayed on right window.

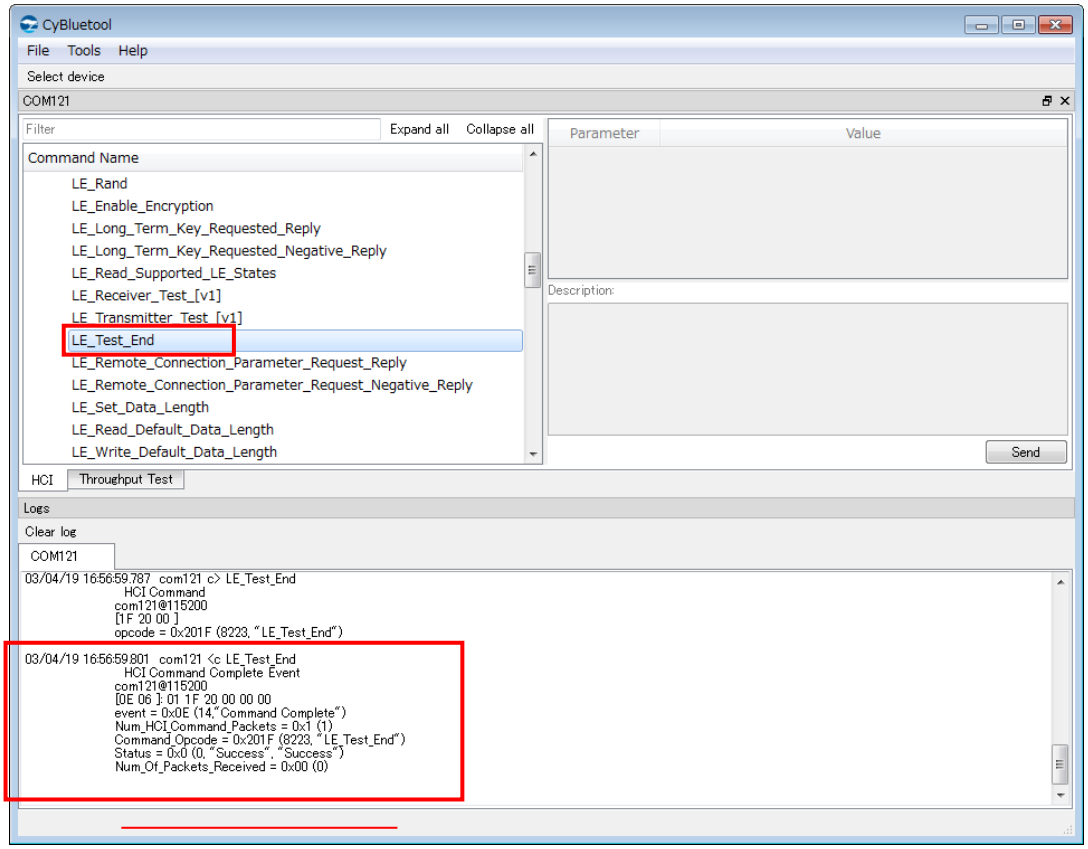
B) Change [RX_Channel] to the value based on the calculation formula.

Push the [Send] button.



C) If you want to finish LE_Receiver_Test, execute [LE_Test_End].

Select [7.8: LE Controller Commands] from [HCI Command] window, double click [LE_Test_End].



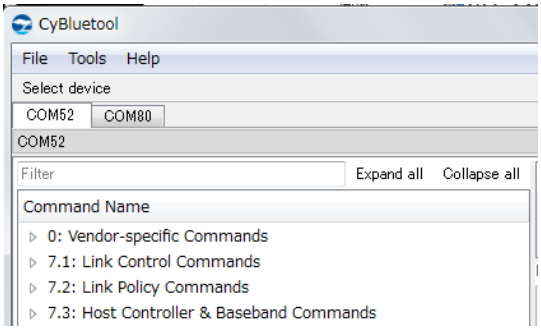
If the response is [Status = 0x0 (0, "Success", "Success")], LE_Test_End is success.

8. Connection Test

(1):EUT, (2):Facing machine

8.1. BT Connection

A) Start two HCI Command windows.

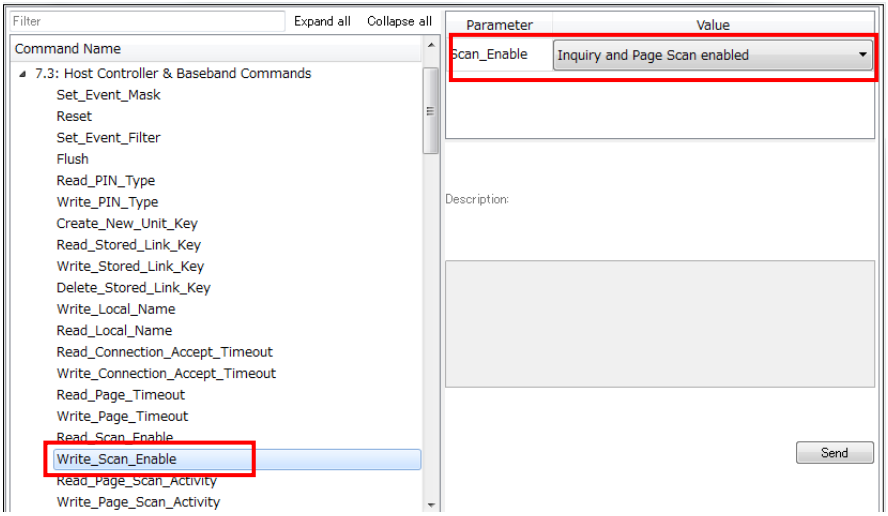


At Both (1):EUT and (2):Facing machine, click [Write_Scan_Enable] in [7.3: Host Controller & Baseband Commands].

The parameter setting window is displayed on right window.

B) Change [Scan_Enable] to [Inquiry and Page Scan enabled].

Push the [Send] button.



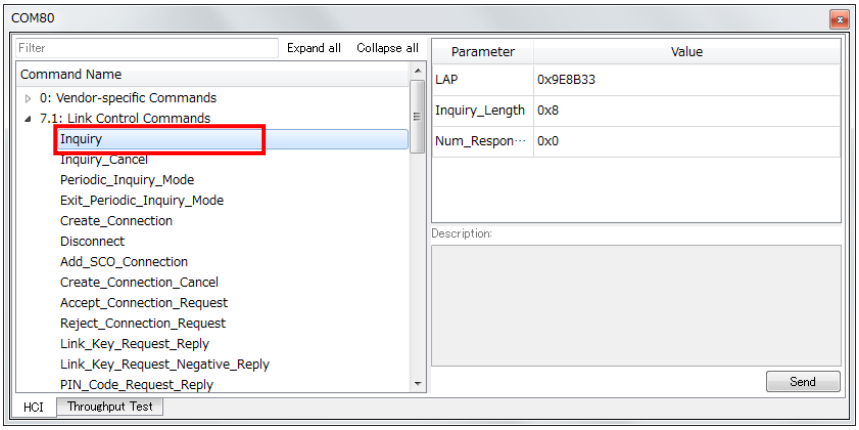
If the response is [Status = 0x0 (0, "Success", "Success")], scan enable is success.

```
08/07/18 16:11:17.691  com52 <c Reset
                  HCI Command Complete Event
                com52@115200
                [0E 04 ]: 01 03 0C 00
                event = 0x0E (14,"Command Complete")
                Num_HCI_Command_Packets = 0x1 (1)
                Command_Opcode = 0xC03 (3075, "Reset")
                Status = 0x0 (0, "Success", "Success")

08/07/18 16:18:01.425  com52 c> Write_Scan_Enable
                  HCI Command
                com52@115200
                [1A 0C 01 ]: 03
                opcode = 0x0C1A (3098, "Write_Scan_Enable")
                Scan_Enable = 0x3 (3, "Inquiry and Page Scan enabled")

08/07/18 16:18:01.441  com52 <c Write_Scan_Enable
                  HCI Command Complete Event
                com52@115200
                [0E 04 ]: 01 1A 0C 00
                event = 0x0E (14,"Command Complete")
                Num_HCI_Command_Packets = 0x1 (1)
                Command_Opcode = 0xC1A (3098, "Write_Scan_Enable")
                Status = 0x0 (0, "Success", "Success")
```

C) At (2):Facing machine only, click [Inquiry] in [7.1: Link Control Commands].

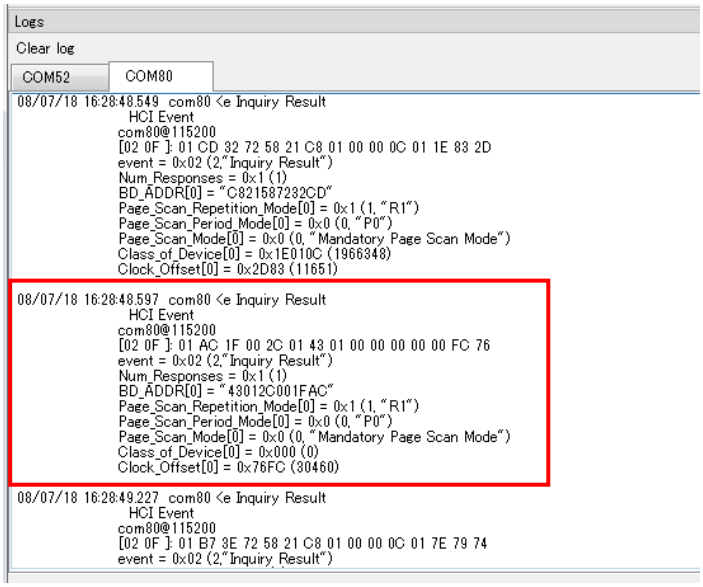
The parameter setting window is displayed on right window.

Parameter is no change. And push the [Send] button.



D) If EUT is found, the result is disyplayed in Log window.

(1):EUT's BD Address is [43012Cxxxxxx].

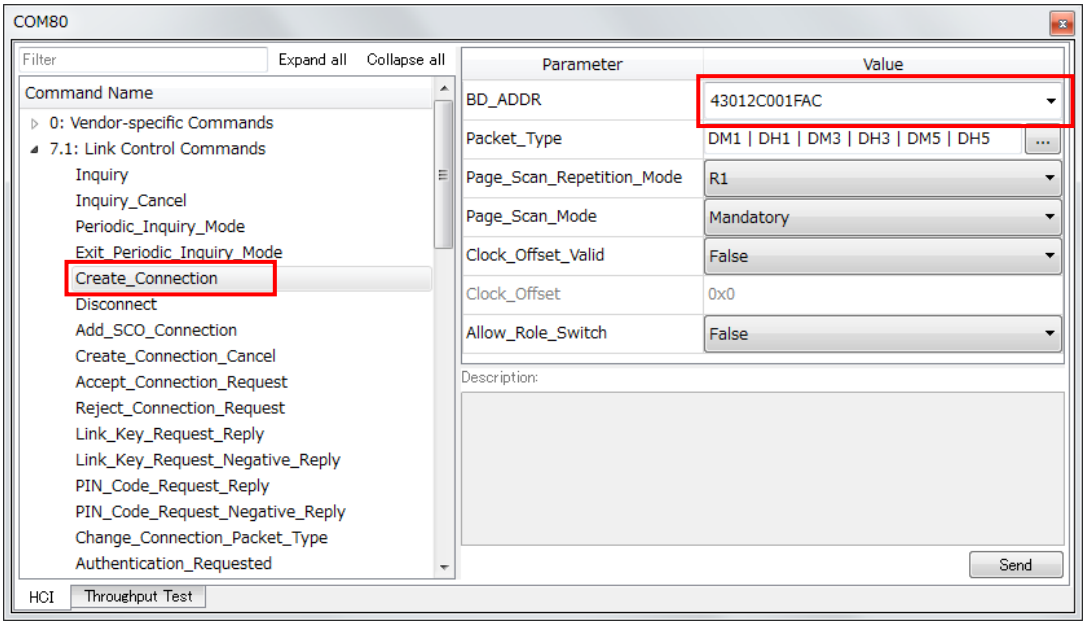


E) At (2):Facing machine only, click [Create_Connection] in [7.1: Link Control Commands].

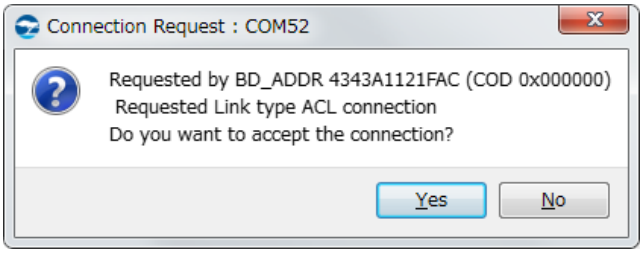
The parameter setting window is displayed on right window.

Change [BD_ADDR] to BD Address of (1):EUT.

Push the [Send] button.

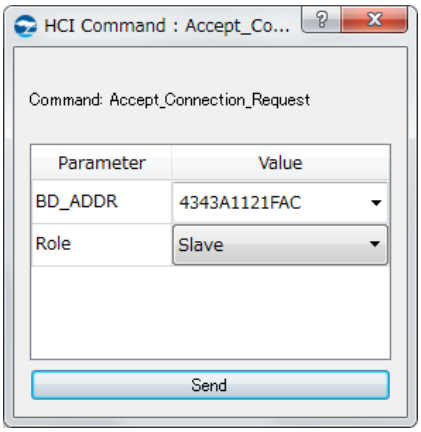


F) At (1):EUT, when the following popup is displayed, push the [Yes] button.



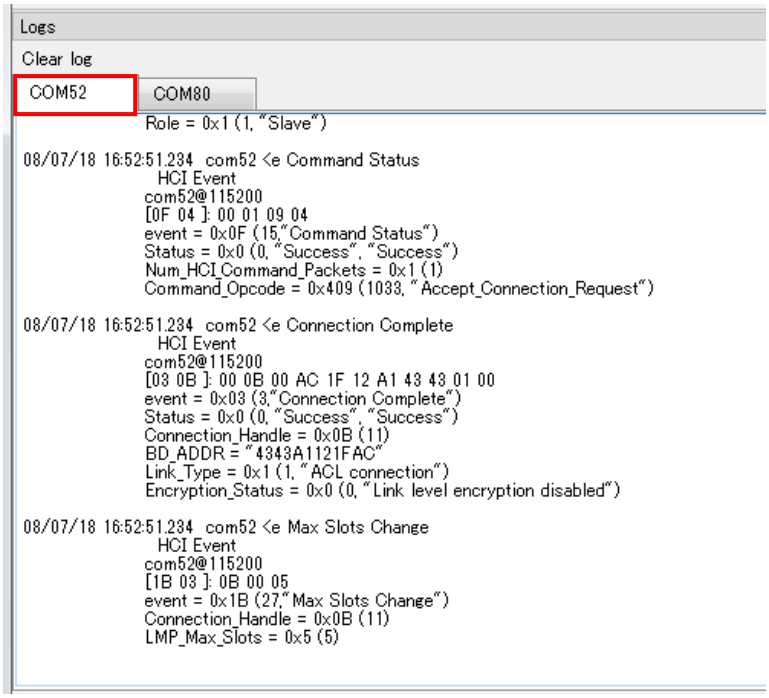
G) At (1):EUT, The following popup is displayed.

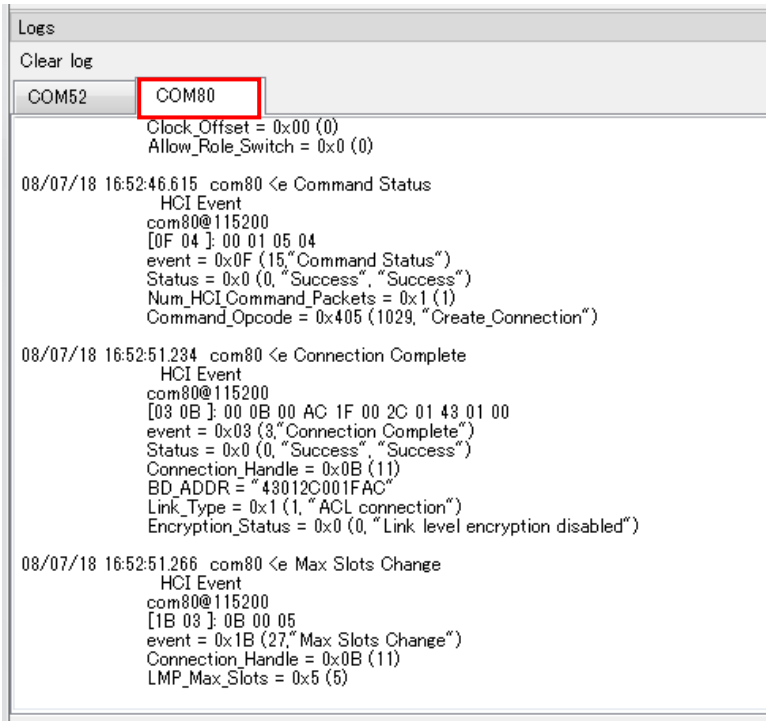
Change [BD_ADDR] to BD Address of (2):Facing machine. And push the [Send] button.



If the connection is successful, [Connection Complete] and [Max Slots Change] is displayed in Each Log

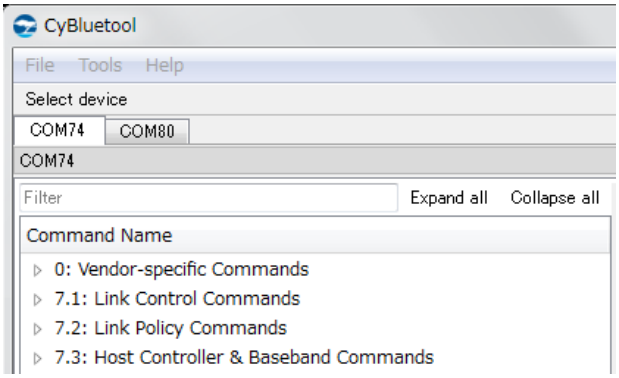
windows.


Logs
Clear log
COM52
COM80
Role = 0x1 (1, "Slave")
08/07/18 16:52:51.234 com52 <e Command Status
HCI Event
com52@115200
[0F 04]: 00 01 09 04
event = 0x0F (15,"Command Status")
Status = 0x0 (0, "Success", "Success")
Num_HCI_Command_Packets = 0x1 (1)
Command_Opcode = 0x409 (1033, "Accept_Connection_Request")
08/07/18 16:52:51.234 com52 <e Connection Complete
HCI Event
com52@115200
[03 0B]: 00 0B 00 AC 1F 12 A1 43 43 01 00
event = 0x03 (3,"Connection Complete")
Status = 0x0 (0, "Success", "Success")
Connection_Handle = 0x0B (11)
BD_ADDR = "4343A1121FAC"
Link_Type = 0x1 (1, "ACL connection")
Encryption_Status = 0x0 (0, "Link level encryption disabled")
08/07/18 16:52:51.234 com52 <e Max Slots Change
HCI Event
com52@115200
[1B 03]: 0B 00 05
event = 0x1B (27,"Max Slots Change")
Connection_Handle = 0x0B (11)
LMP_Max_Slots = 0x5 (5)


Logs
Clear log
COM52
COM80
Clock_Offset = 0x00 (0)
Allow_Role_Switch = 0x0 (0)
08/07/18 16:52:46.615 com80 <e Command Status
HCI Event
com80@115200
[0F 04]: 00 01 05 04
event = 0x0F (15,"Command Status")
Status = 0x0 (0, "Success", "Success")
Num_HCI_Command_Packets = 0x1 (1)
Command_Opcode = 0x405 (1029, "Create_Connection")
08/07/18 16:52:51.234 com80 <e Connection Complete
HCI Event
com80@115200
[03 0B]: 00 0B 00 AC 1F 00 2C 01 43 01 00
event = 0x03 (3,"Connection Complete")
Status = 0x0 (0, "Success", "Success")
Connection_Handle = 0x0B (11)
BD_ADDR = "43012C001FAC"
Link_Type = 0x1 (1, "ACL connection")
Encryption_Status = 0x0 (0, "Link level encryption disabled")
08/07/18 16:52:51.266 com80 <e Max Slots Change
HCI Event
com80@115200
[1B 03]: 0B 00 05
event = 0x1B (27,"Max Slots Change")
Connection_Handle = 0x0B (11)
LMP_Max_Slots = 0x5 (5)

8.2. BLE Connection

A) Start two HCI Command windows.

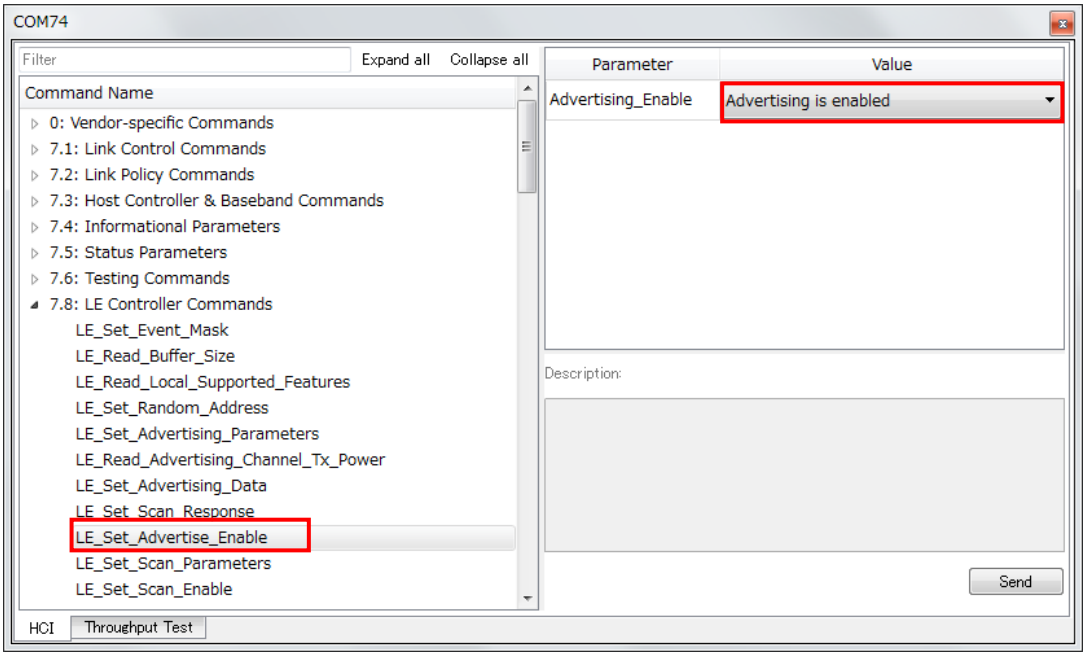


B) At (1):EUT only, click [LE_Set_Advertising_Enable] in [7.8: LE Controller Commands].

The parameter setting window is displayed on right window.

Change [Advertising_Enable] to [Advertising is enabled].

Push the [Send] button.

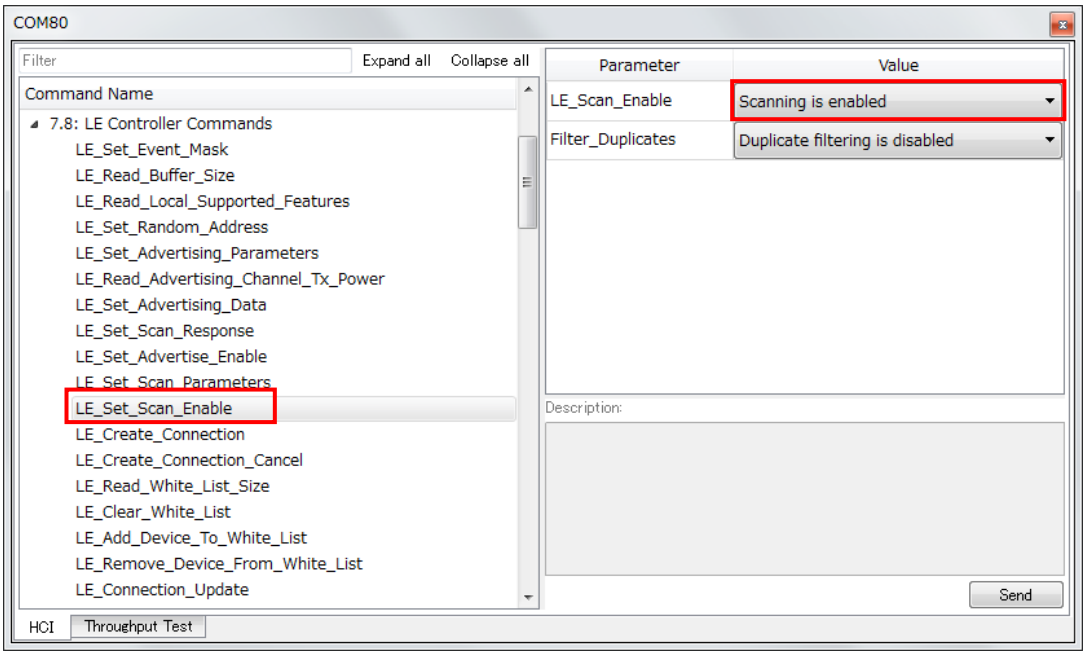


C) At (2):Facing machine only, click [LE_Set_Scan_Enable] in [7.8: LE Controller Commands].

The parameter setting window is displayed on right window.

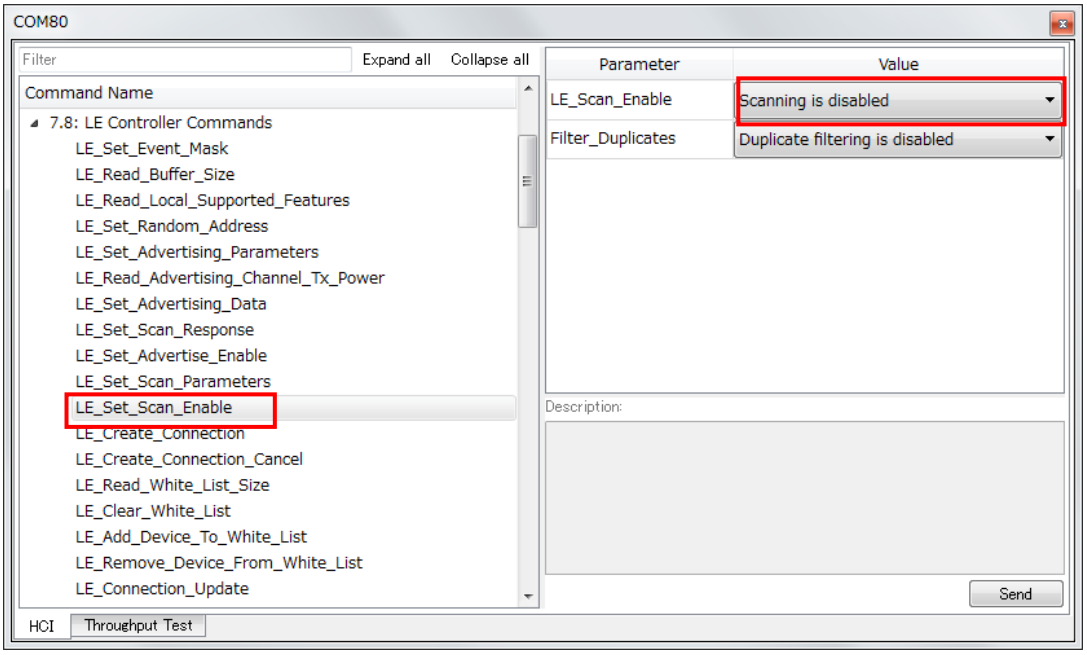
Change [LE_Scan_Enable] to [Scanning is enabled].

Push the [Send] button.



D) Change [LE_Scan_Enable] to [Scanning is disabled].

Push the [Send] button.



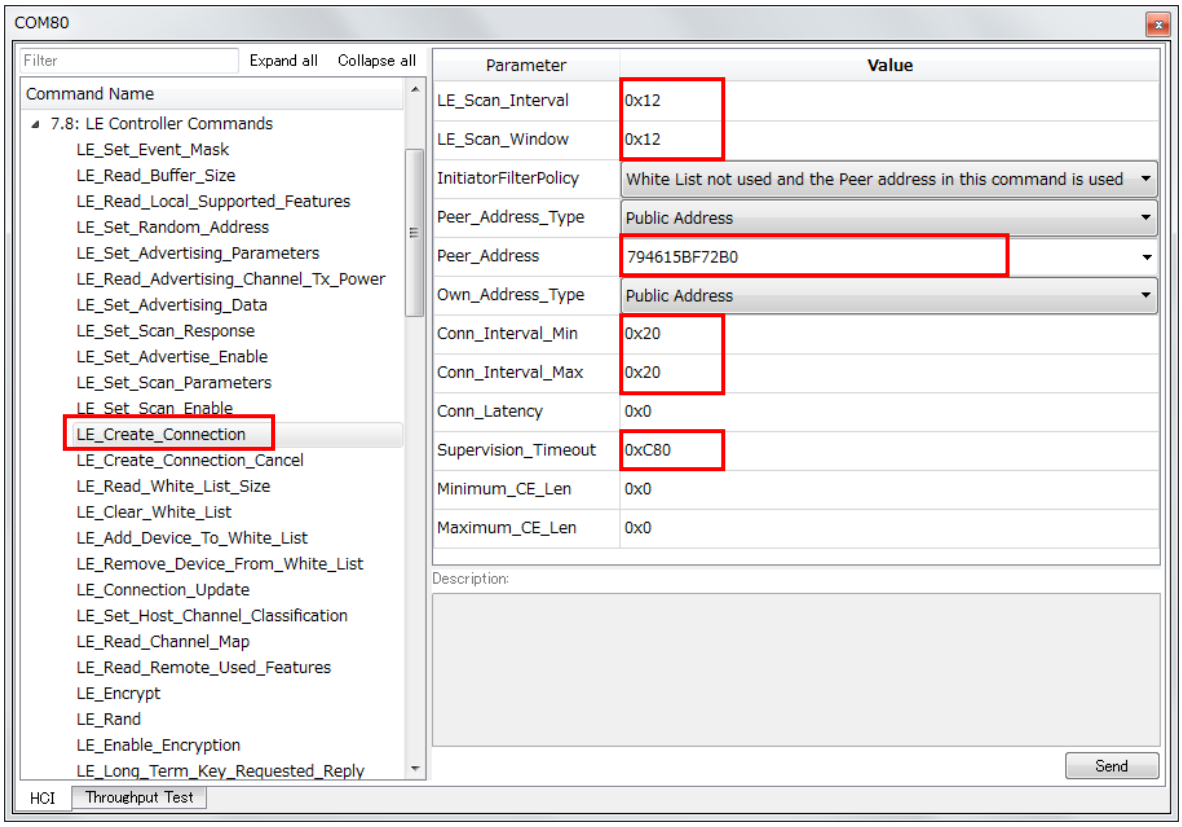
E) At (2):Facing machine only, click [LE_Create_Connection] in [7.8: LE Controller Commands].

The parameter setting window is displayed on right window.

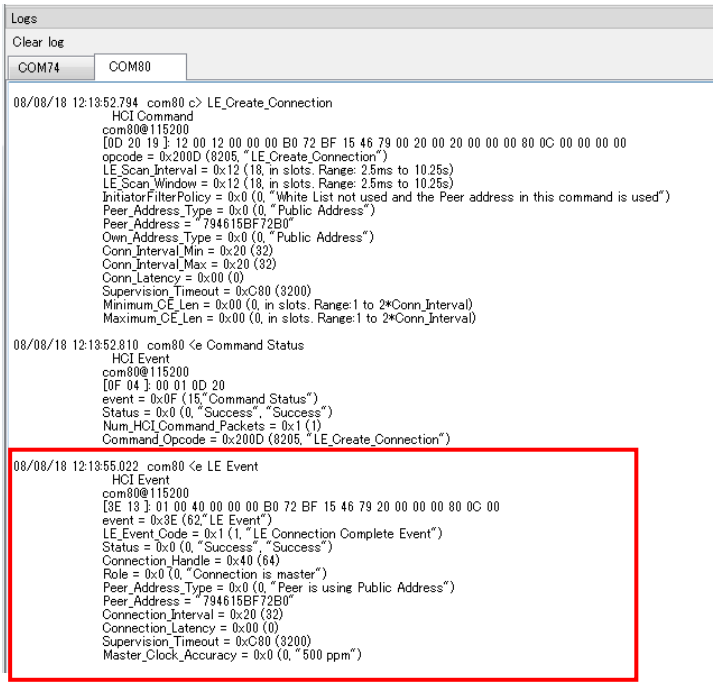
Change [Peer_Address] to BD Address of (1):EUT.

Change other parameters according to the test.

Push the [Send] button.

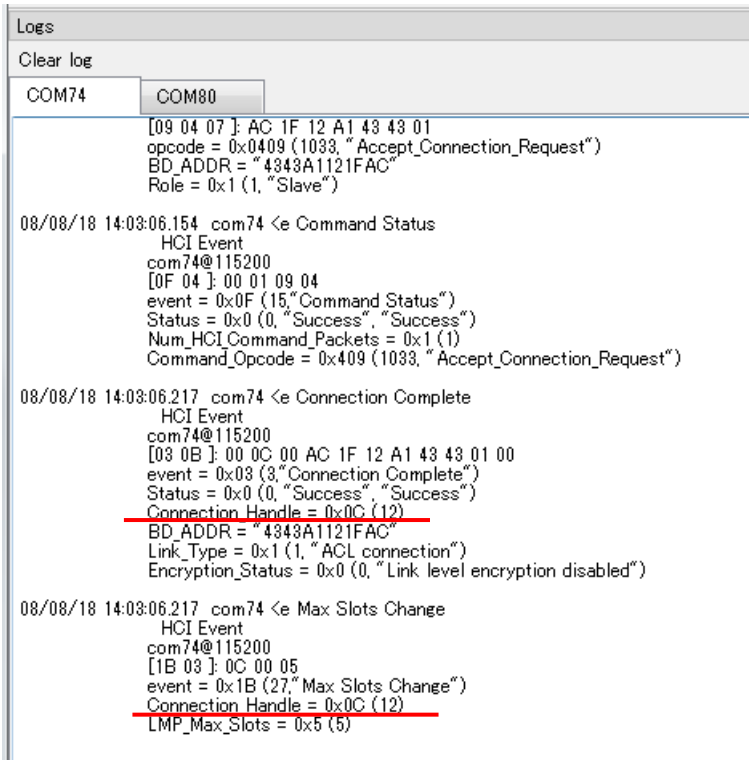


If the received event is [LE_Event_Code = 0x1 (1, "LE Connection Complete Event")], connection is success.

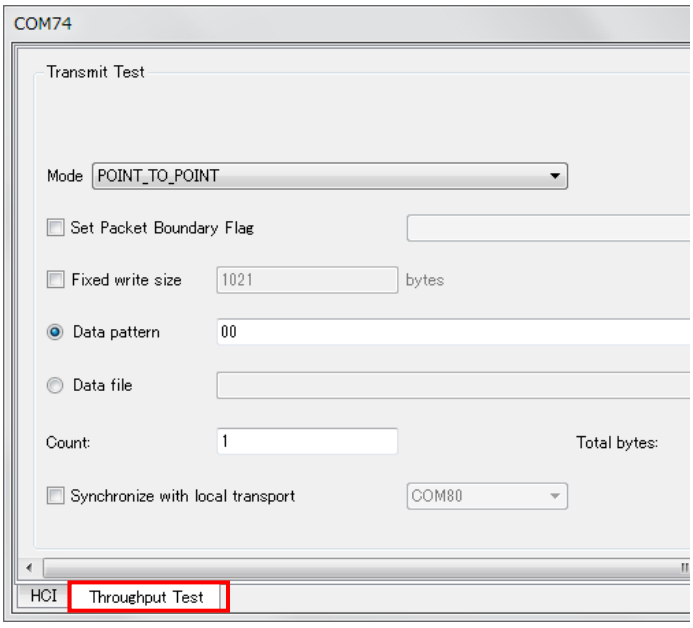


8.3. Communication Comfirmation

A) Confirm the [Connection_Handle] of (1):EUT side.

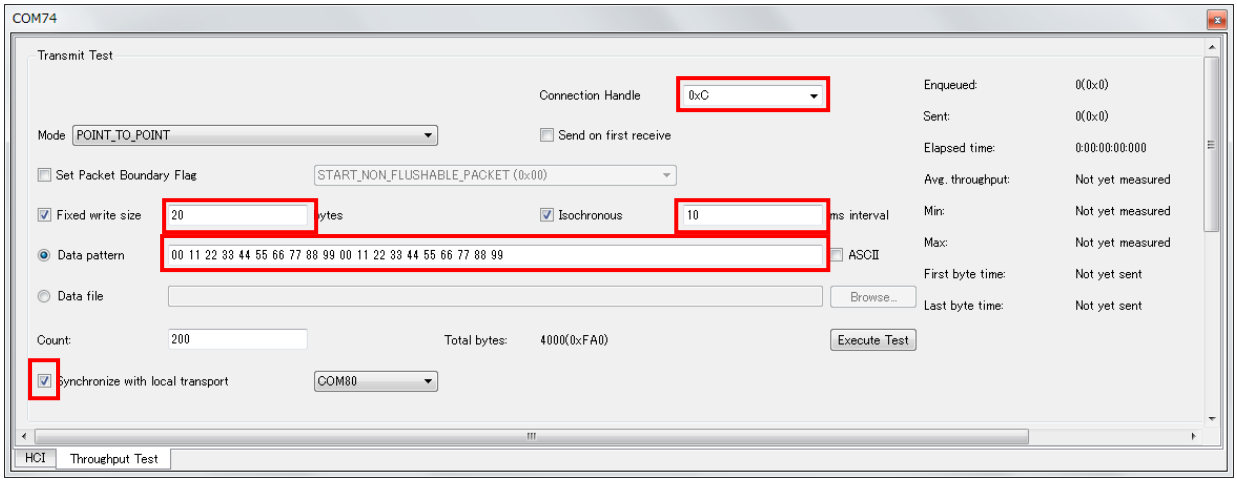


B) Click the [Throughput Test] Tab.



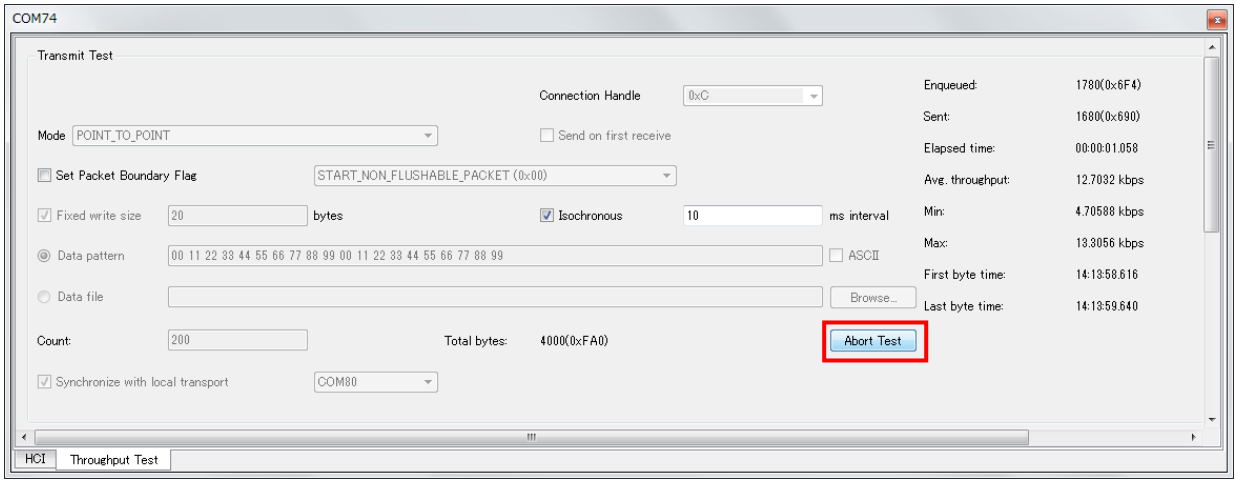
C) Change parameters according to the test.

D) Push the [Execute Test] button.



- ✓ Connection Handle: Select the value of (1):EUT. (set by default)
- ✓ Fixed write size: Enter the data size.
- ✓ Isochronous: Set the transmission interval.
- ✓ Data pattern: Enter the data of same size as [Fixed write size] with space every 1byte.
- ✓ Count: Enter the repeat transmission count.
- ✓ Synchronize with local transport: Check and select the port number of (2):Facing machine.

E) If you want to stop the test, push the [Abort Test] button.



(END)