LPRF BlueNRG-12 Level-2 training
How to use GUI

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BlueNRG

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进入DTM

- Demostration applications—BLE demonstration&test applications—DTM--Release_UART_16MHz
- 使用者根据自己实际情况将DTM的固件烧录进芯片

进入DTM

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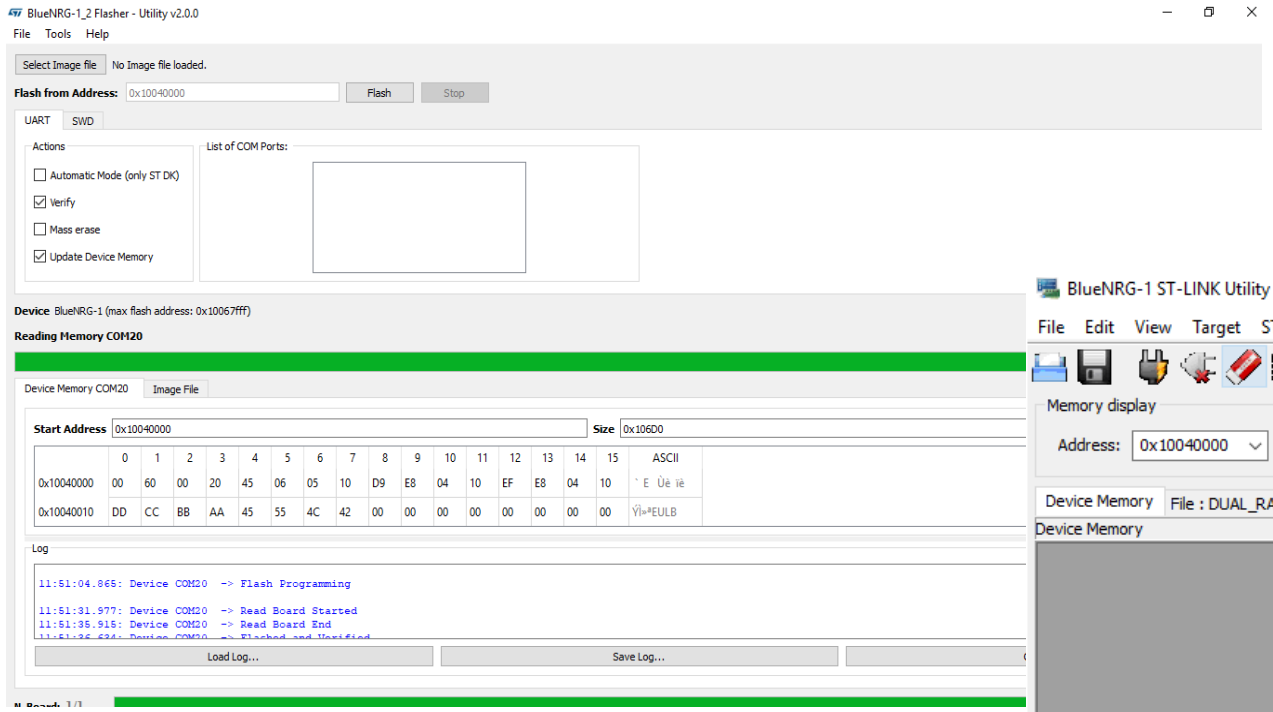
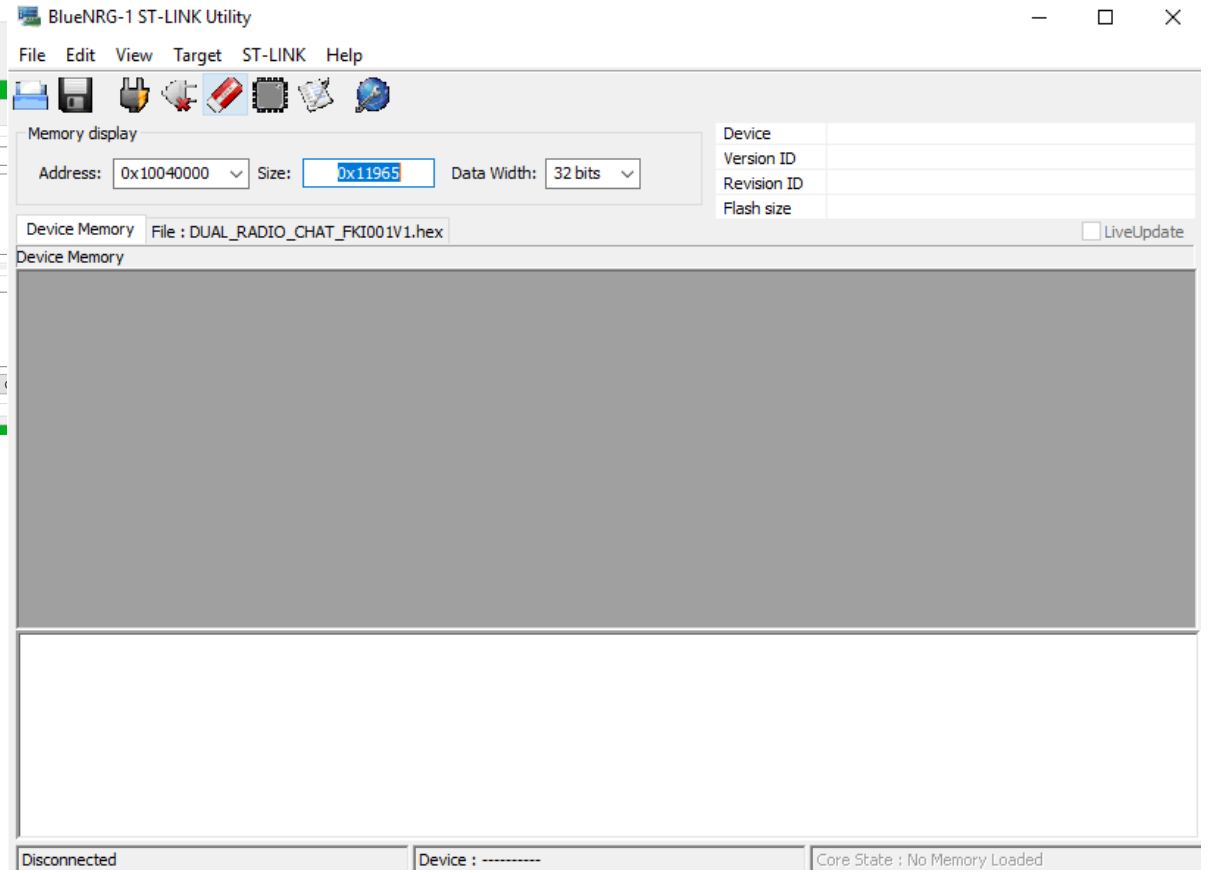
进入DTM





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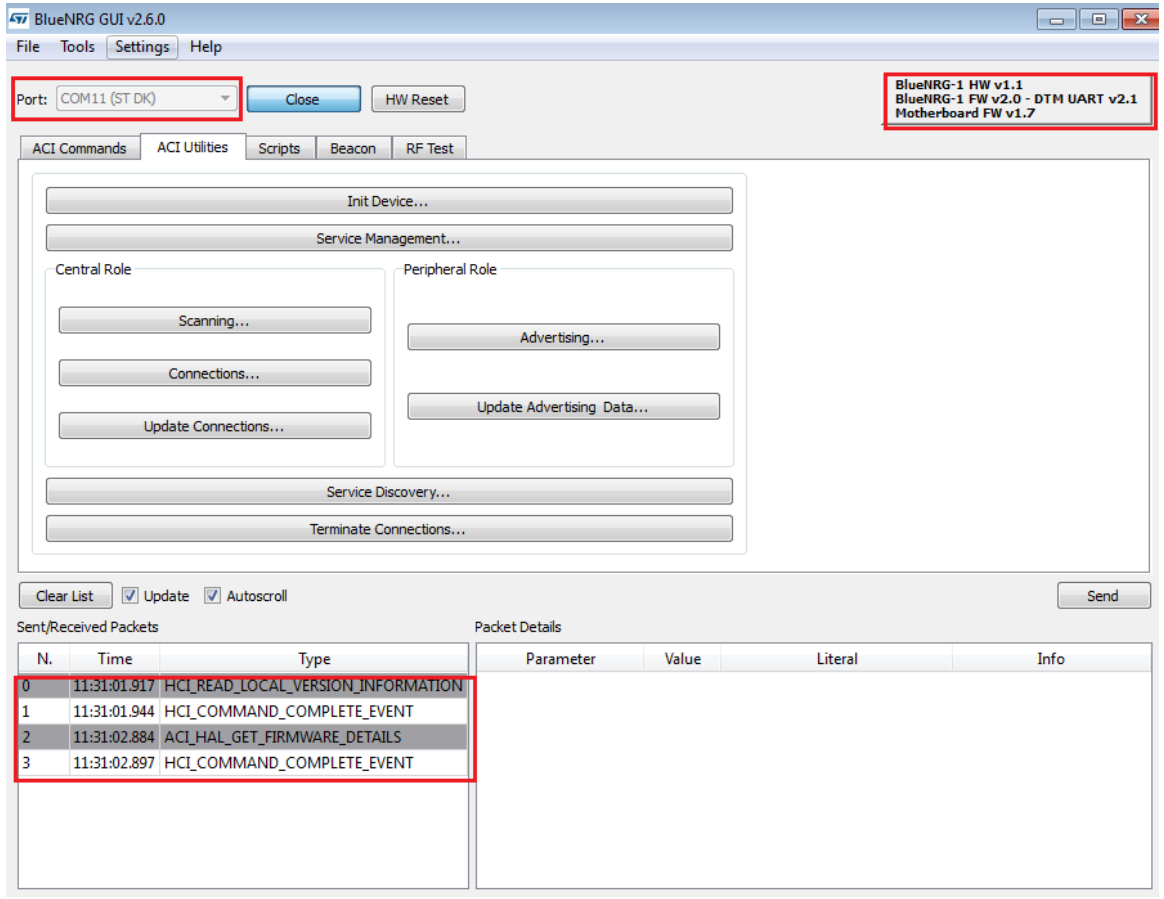
- 打开串口并成功读取到版本号



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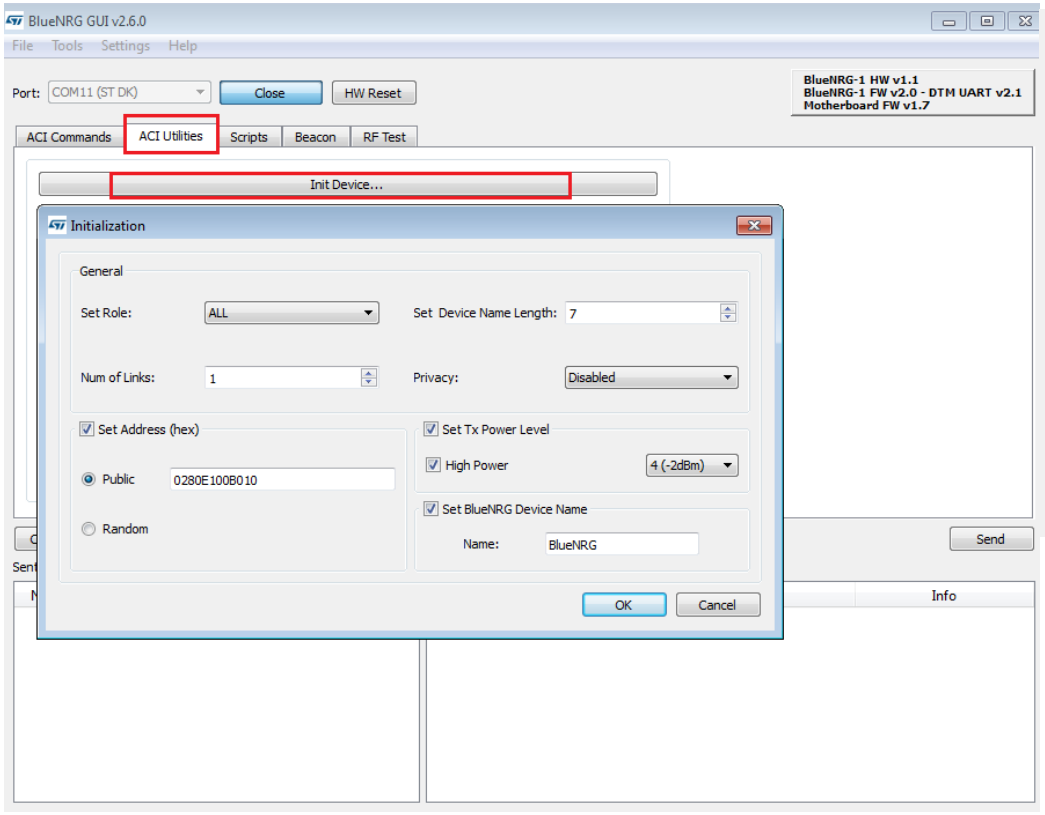
- 使用ACI Utilities 初始化设备



N.	Time	Type
0	12:05:32.915	Job start
1	12:05:32.885	HCI_RESET
2	12:05:32.915	HCI_COMMAND_COMPLETE_EVENT
3	12:05:32.918	ACI_BLUE_INITIALIZED_EVENT
4	12:05:33.118	ACI_HAL_WRITE_CONFIG_DATA
5	12:05:33.125	HCI_COMMAND_COMPLETE_EVENT
6	12:05:33.128	ACI_HAL_SET_TX_POWER_LEVEL
7	12:05:33.131	HCI_COMMAND_COMPLETE_EVENT
8	12:05:33.134	ACI_GATT_INIT
9	12:05:33.135	HCI_COMMAND_COMPLETE_EVENT
10	12:05:33.141	ACI_GAP_INIT
11	12:05:33.148	HCI_COMMAND_COMPLETE_EVENT
12	12:05:33.151	ACI_GATT_UPDATE_CHAR_VALUE
13	12:05:33.155	HCI_COMMAND_COMPLETE_EVENT
14	12:05:33.168	Job finished

```
/* Configure Public address */
ret = aci_hal_write_config_data(CONFIG_DATA_PUBADDR_OFFSET, CONFIG_DATA_PUBADDR_LEN, bdaddr);
if(ret != BLE_STATUS_SUCCESS){
  printf("Setting BD_ADDR failed: 0x%02x\r\n", ret);
  return ret;
}

/* Set the TX power to -2 dBm */
aci_hal_set_tx_power_level(1, 4);

/* GATT Init */
ret = aci_gatt_init();
if (ret != BLE_STATUS_SUCCESS) {
  printf ("Error in aci_gatt_init(): 0x%02x\r\n", ret);
  return ret;
} else {
  printf ("aci_gatt_init() --> SUCCESS\r\n");
}
/* GAP Init */
ret = aci_gap_init(role, 0x00, 0x08, &service_handle,
                   &dev_name_char_handle, &appearance_char_handle);
printf ("service_handle=%d dev_name_char_handle=%d appearance_char_handle=%d\r\n",
        service_handle,dev_name_char_handle,appearance_char_handle);
if (ret != BLE_STATUS_SUCCESS) {
  printf ("Error in aci_gap_init() 0x%02x\r\n", ret);
  return ret;
} else {
  printf ("aci_gap_init() --> SUCCESS\r\n");
}
/* Set the device name */

ret = aci_gatt_update_char_value(service_handle, dev_name_char_handle,
                                 0, sizeof(name), name);
if (ret != BLE_STATUS_SUCCESS) {
  printf ("Error in Gatt Update characteristic value 0x%02x\r\n", ret);
  return ret;
} else {
  printf ("aci_gatt_update_char_value() --> SUCCESS\r\n");
}
```

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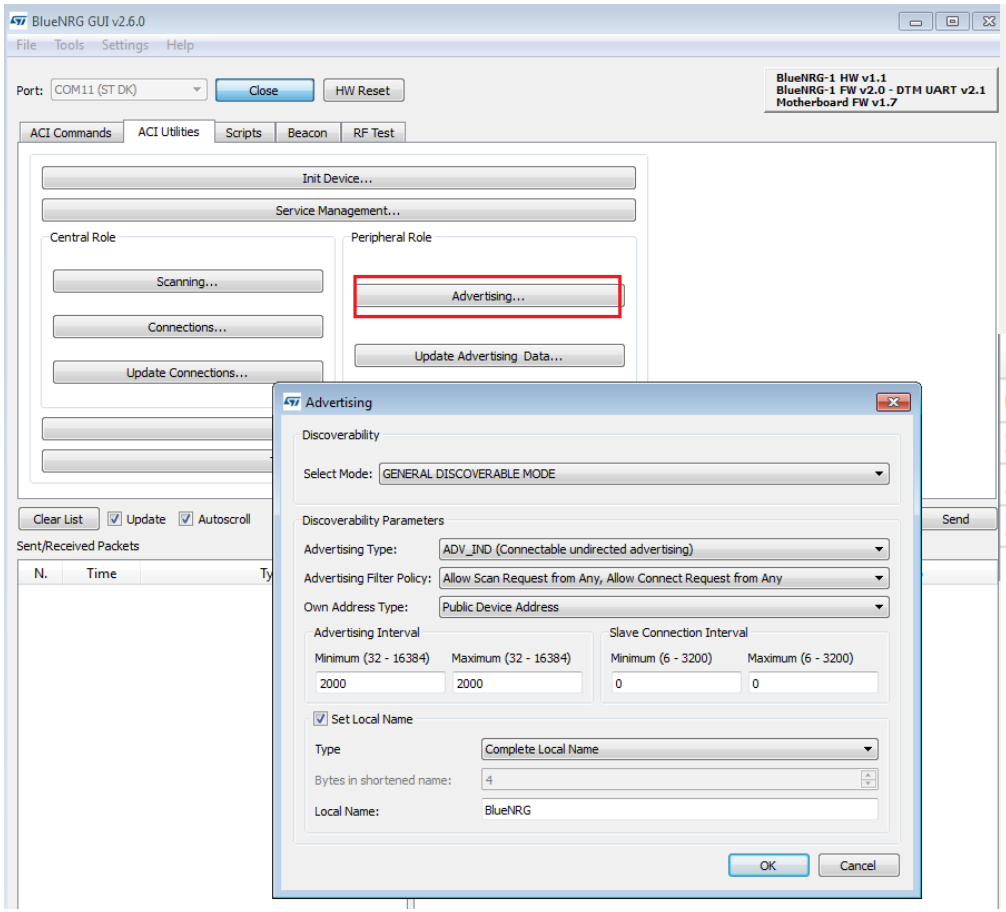
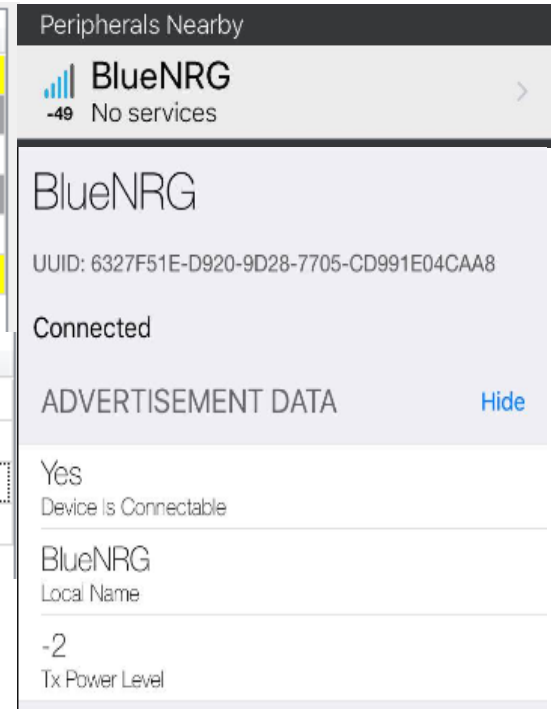
- 使用 ACI Utilities 进行广播



N.	Time	Type
0	12:12:59.375	Job start
1	12:12:59.369	HCI_LE_SET_SCAN_RESPONSE_DATA
2	12:12:59.380	HCI_COMMAND_COMPLETE_EVENT
3	12:12:59.380	ACI_GAP_SET_DISCOVERABLE
4	12:12:59.384	HCI_COMMAND_COMPLETE_EVENT
5	12:12:59.388	Job finished

N.	Time	Type
0	12:15:41.108	HCI_LE_META_EVENT
1	12:15:41.237	ACI_ATT_EXCHANGE_MTU_RESP_EVENT
2	12:15:41.538	ACI_GATT_ATTRIBUTE_MODIFIED_EVENT
3	12:15:54.108	HCI_DISCONNECTION_COMPLETE_EVENT



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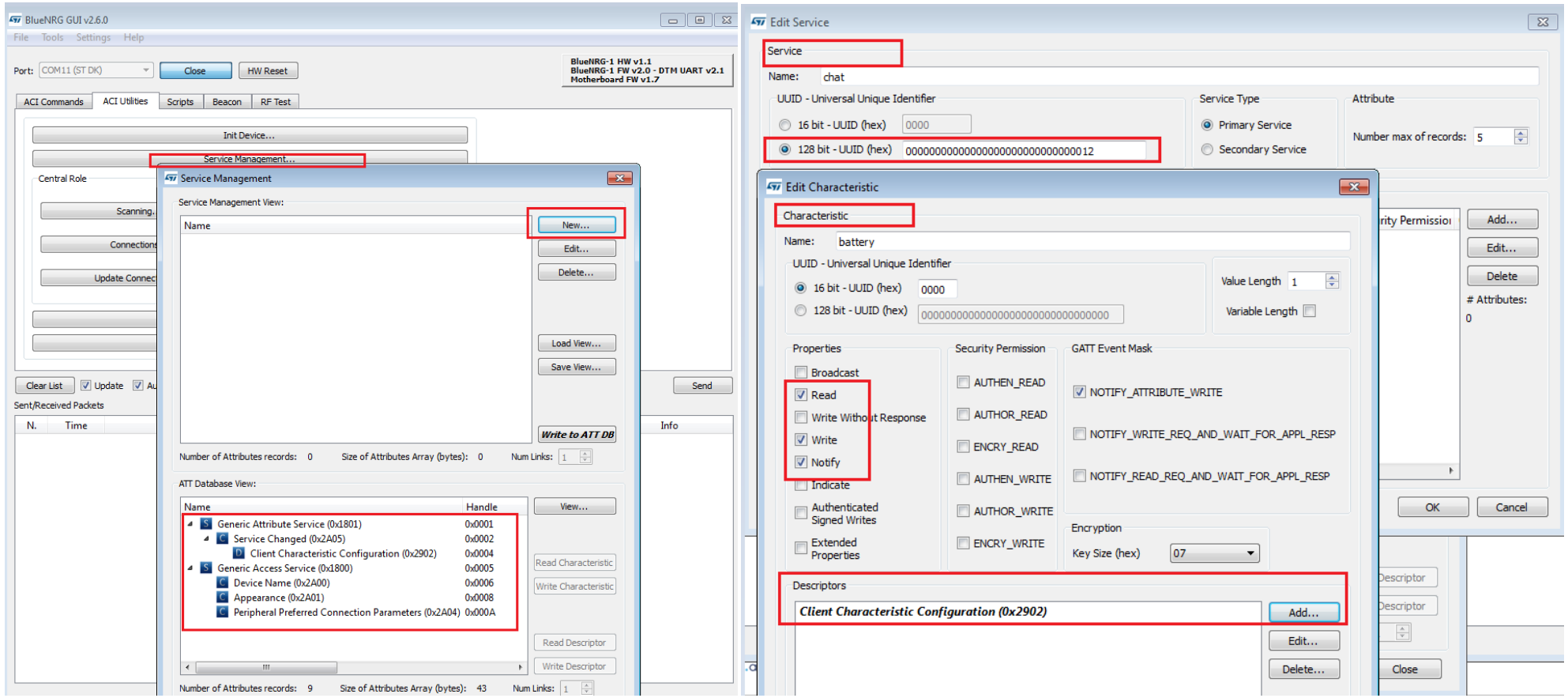
- 使用ACI Utilities 进入服务管理，添加一个service，一个characteristic



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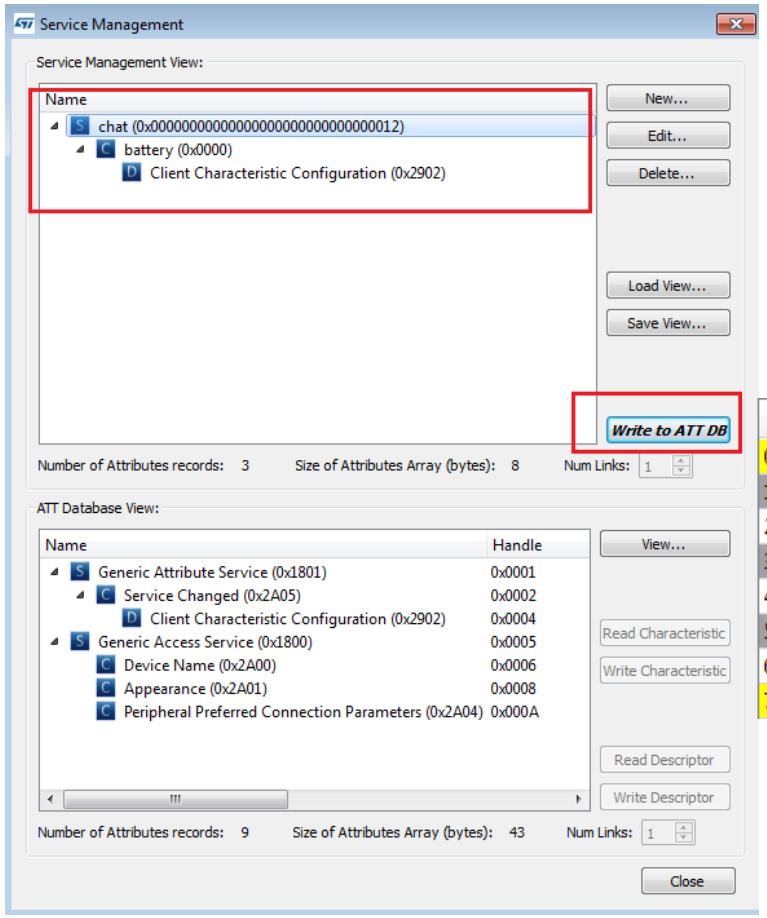
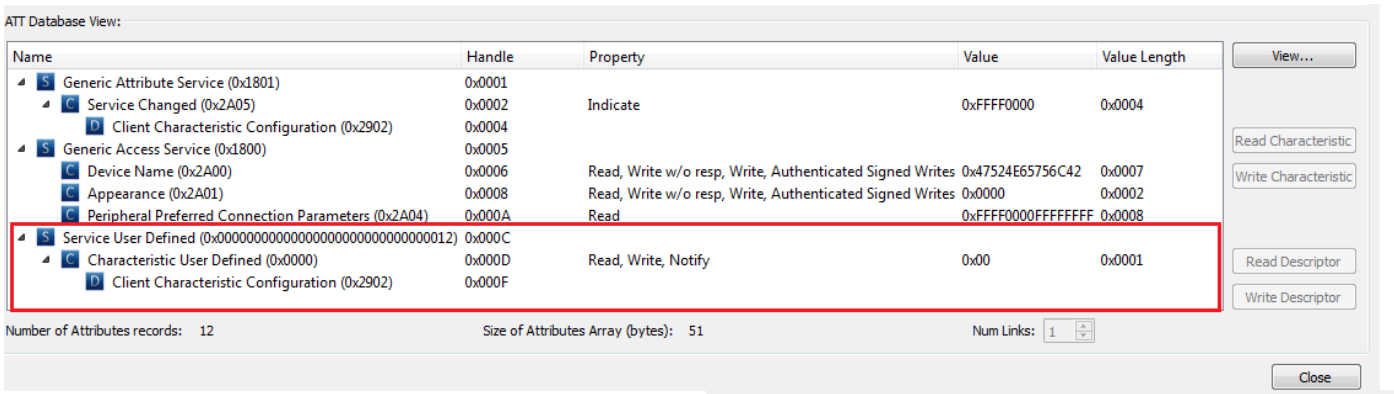
- 使用ACI Utilities 进入服务管理，添加一个service，一个characteristic



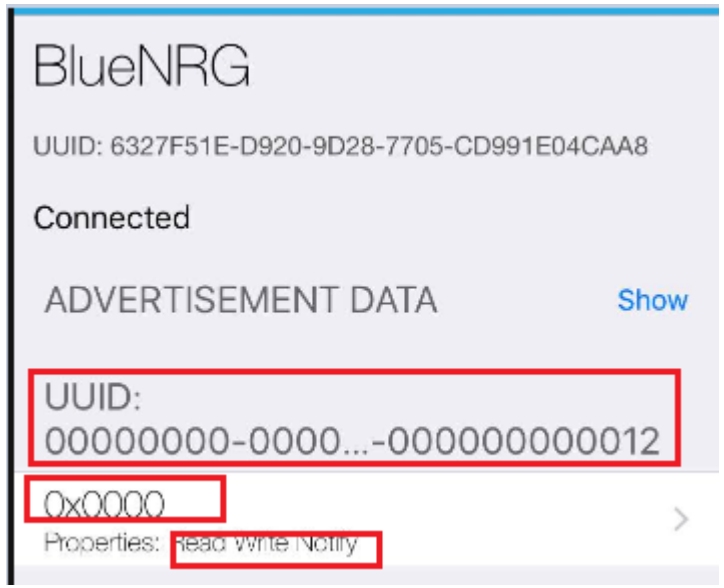


N.	Time	Type
0	13:55:26.740	Job start
1	13:55:26.720	ACI_GATT_ADD_SERVICE
2	13:55:26.733	HCI_COMMAND_COMPLETE_EVENT
3	13:55:26.733	ACI_GATT_ADD_CHAR
4	13:55:26.739	HCI_COMMAND_COMPLETE_EVENT
5	13:55:26.740	ACI_GATT_READ_HANDLE_VALUE
6	13:55:26.746	HCI_COMMAND_COMPLETE_EVENT
7	13:55:26.750	Job finished

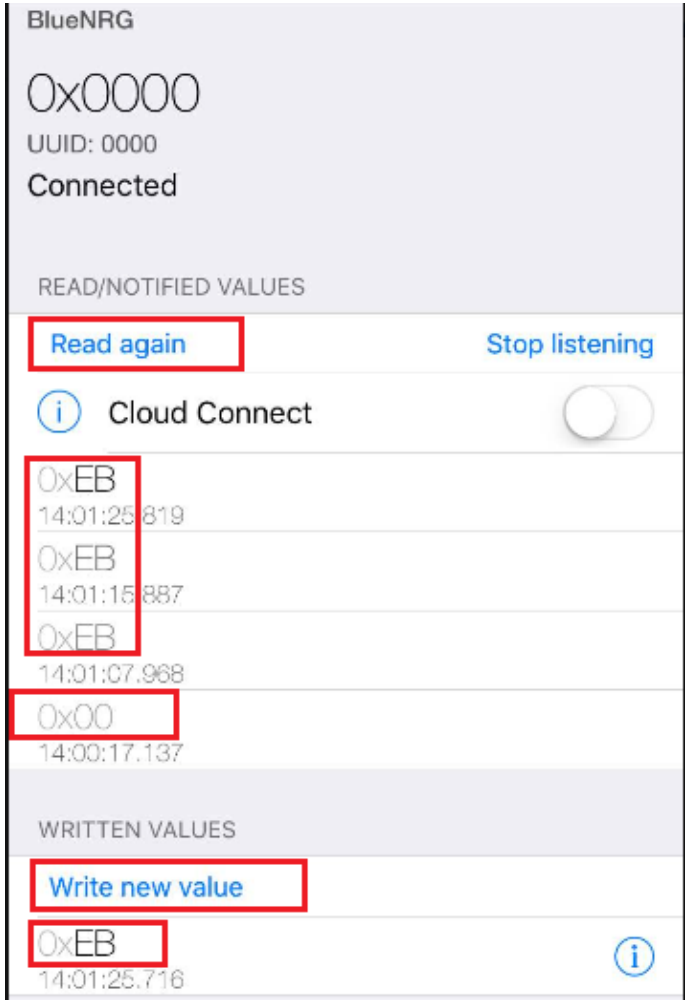
Parameter	Value	Literal	Info
Opcode	0xFD04	ACI_GATT_ADD_CHAR	
Parameter Total Length	0x0C		
Service_Handle	0x000C		Handle of the Serv...
Char_UUID_Type	0x01	16-bit UUID	UUID type. Values: ...
Char_UUID_16	0x0000		16-bit UUID
Char_Value_Length	0x0001		Maximum length ...
Char_Properties	0x1A	CHAR_PROP_READ (Read)|CH...	Characteristic Pro...
Security_Permissions	0x00	None	Security permissio...
GATT_Evt_Mask	0x01	GATT_NOTIFY_ATTRIBUTE_WR...	GATT event mask....
Enc_Key_Size	0x07		Minimum encrypt...
Is_Variable	0x00	Fixed length	Specify if the char...

BlueNRG-GUI

- 使用ACI Utilities　写一个value并使用手机app读取



14	14:00:08.907	HCI_LE_META_EVENT
15	14:00:09.045	ACI_ATT_EXCHANGE_MTU_RESP_EVENT
16	14:00:09.407	ACI_GATT_ATTRIBUTE_MODIFIED_EVENT
17	14:01:07.816	ACI_GATT_ATTRIBUTE_MODIFIED_EVENT
18	14:01:23.747	ACI_GATT_ATTRIBUTE_MODIFIED_EVENT
19	14:01:25.667	ACI_GATT_ATTRIBUTE_MODIFIED_EVENT



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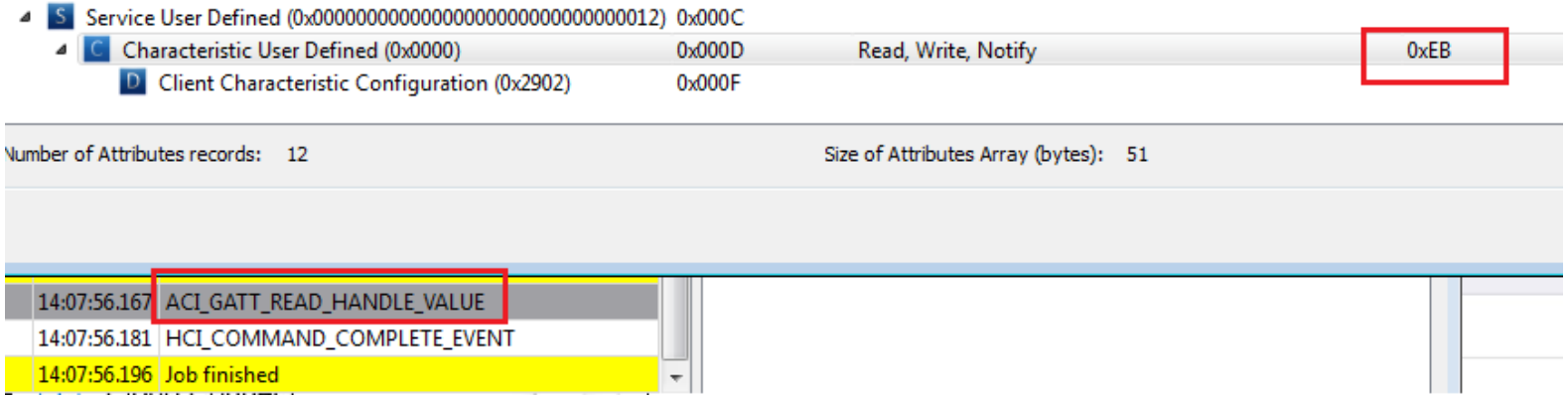
- 使用ACI Utilities 写一个value并且使用手机app去读取 同时观察到service management里面的char value也改变了



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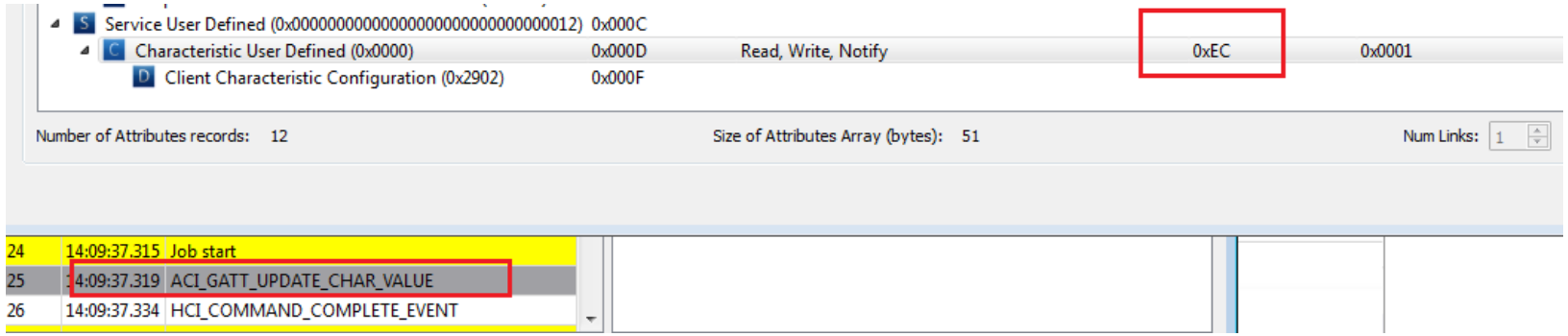
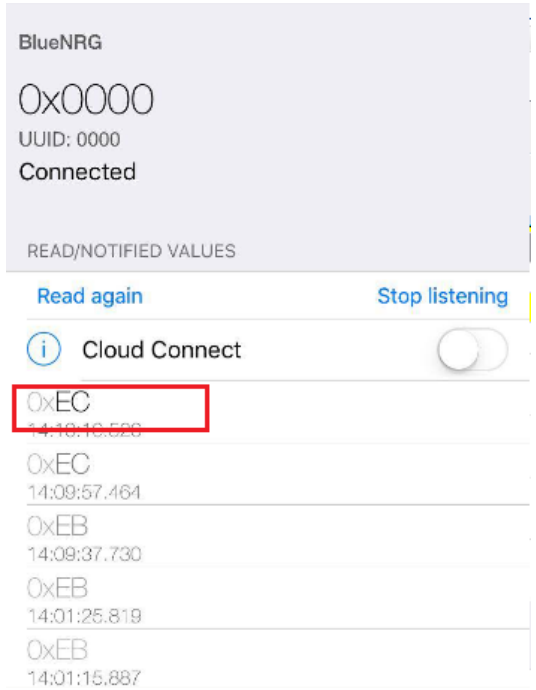
- 使用ACI Utilities　写一个值并且使用GUI读取 手机app读取到这个值并且也被改变





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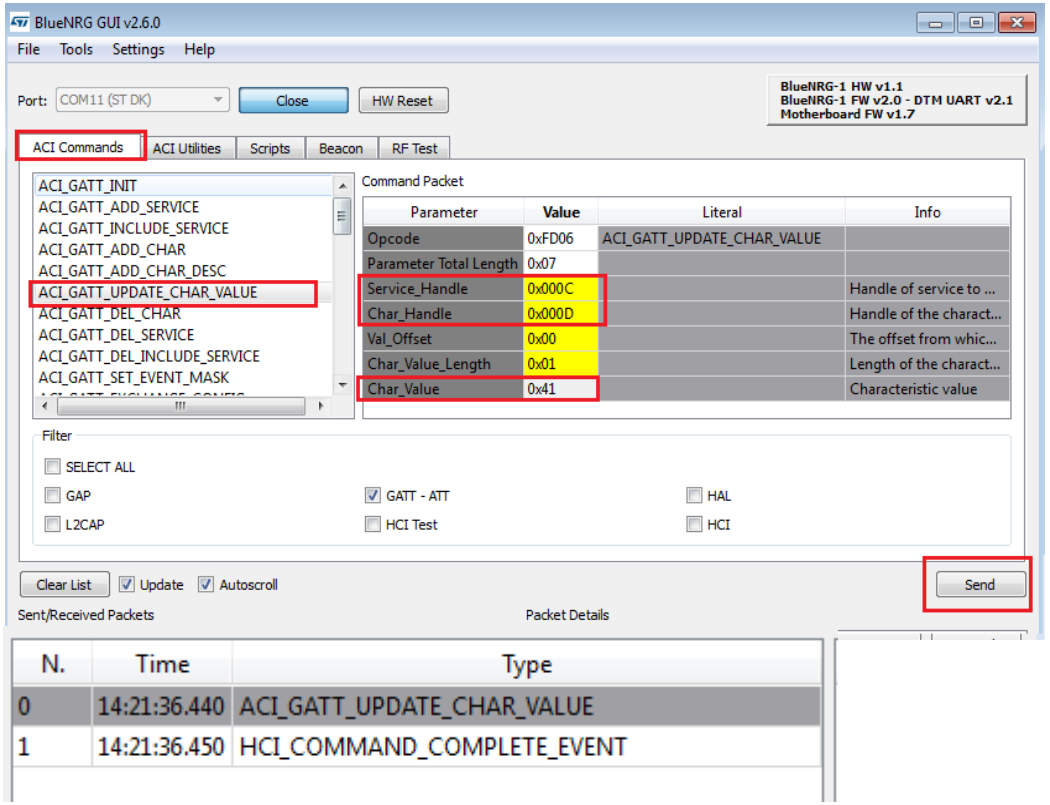
- 使用ACI command　更新一个value



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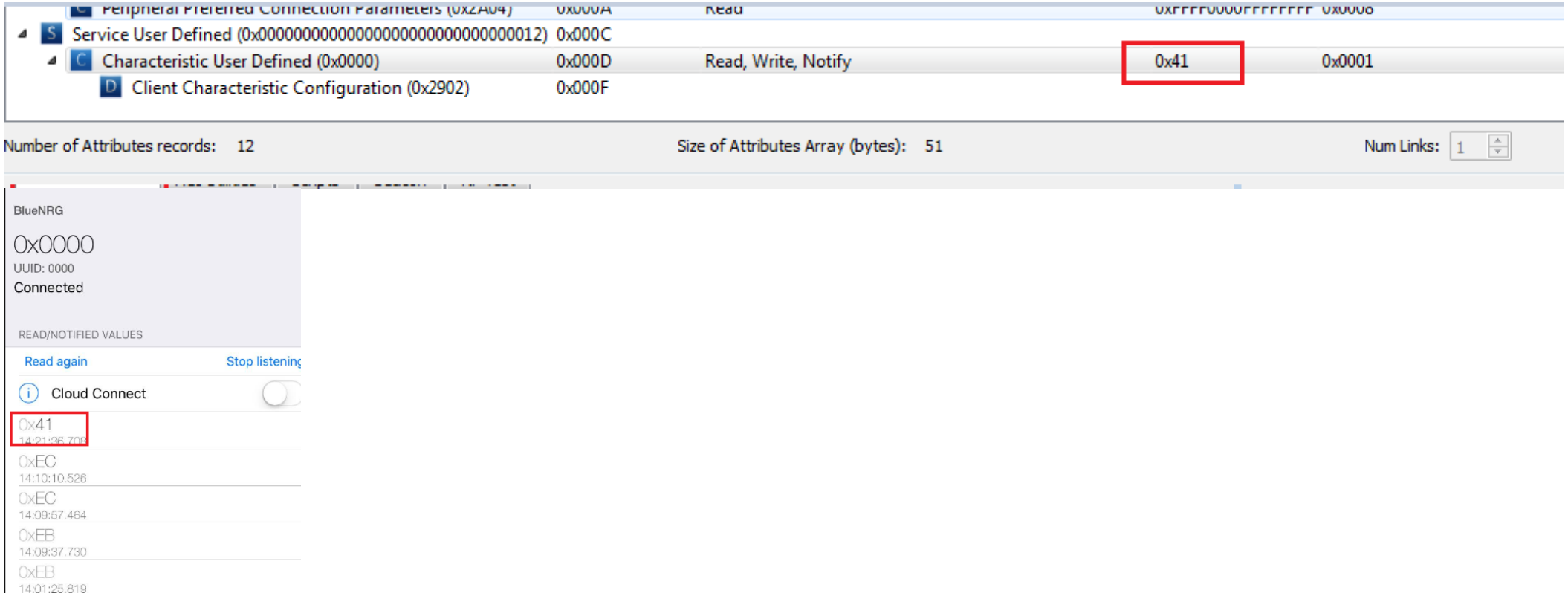
- 使用ACI command　手机app读取到这个值被改变 同时观察到service management里面的char value也改变了also.



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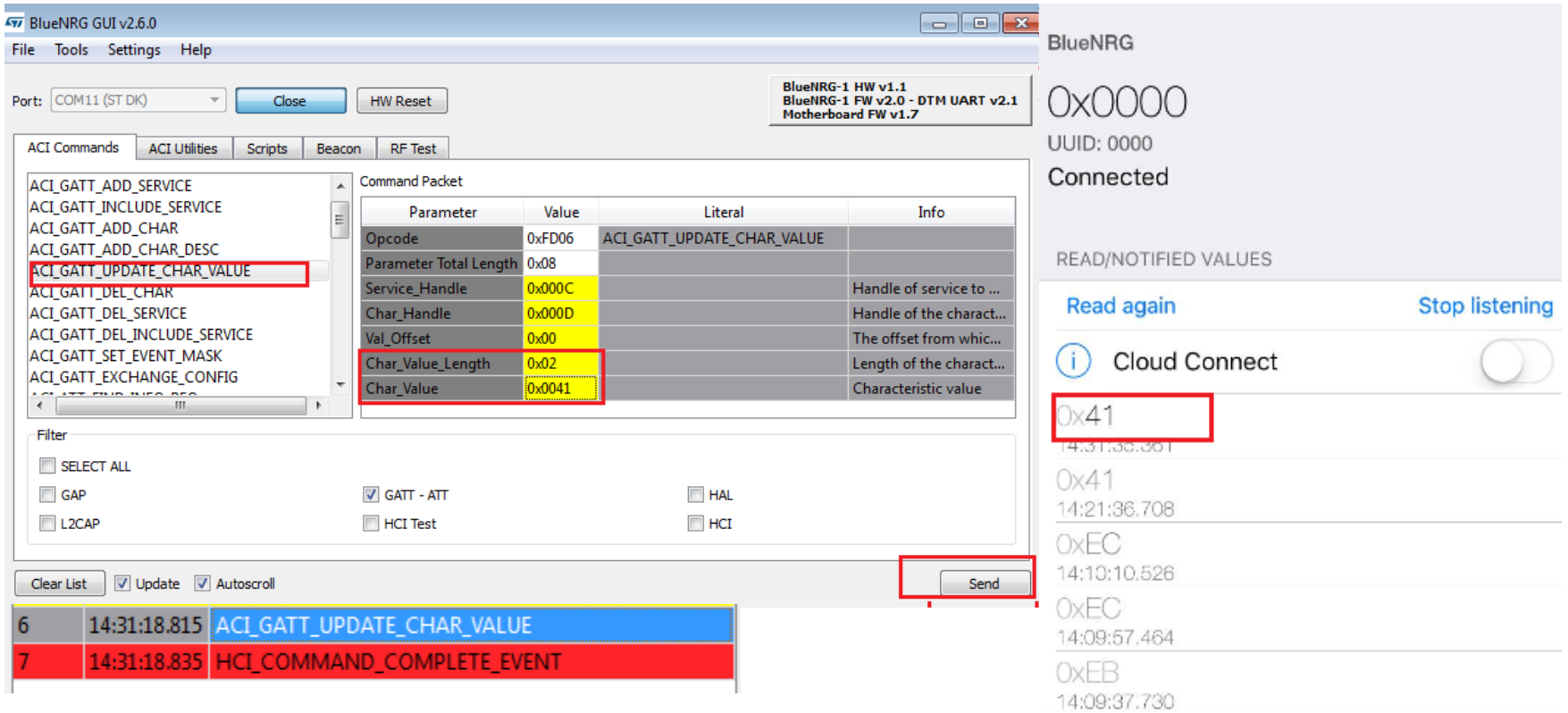
- 使用ACI command 使用aci command更新值为0x0041失败 值仍然是0x41



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- 使用ACI command 原因：值长度为1byte

ATT Database View:

Name	Handle	Property	Value	Value Length
Generic Attribute Service (0x1801)	0x0001			
Service Changed (0x2A05)	0x0002	Indicate	0xFFFF0000	0x0004
Client Characteristic Configuration (0x2902)	0x0004			
Generic Access Service (0x1800)	0x0005			
Device Name (0x2A00)	0x0006	Read, Write w/o resp, Write, Authenticated Signed Writes	0x47524E65756C42	0x0007
Appearance (0x2A01)	0x0008	Read, Write w/o resp, Write, Authenticated Signed Writes	0x0000	0x0002
Peripheral Preferred Connection Parameters (0x2A04)	0x000A	Read	0xFFFF0000FFFFFFFF	0x0008
Service User Defined (0x00000000000000000000000000000012)	0x000C			
Characteristic User Defined (0x0000)	0x000D	Read, Write, Notify	0x41	0x0001
Client Characteristic Configuration (0x2902)	0x000F			

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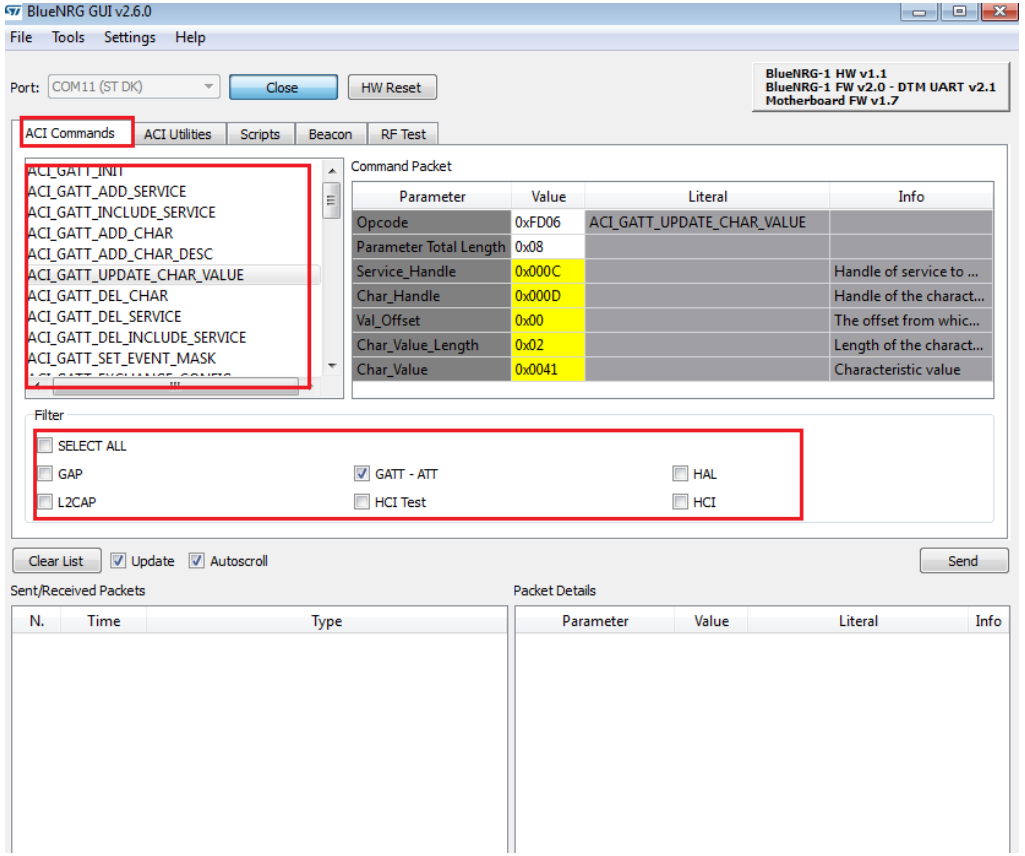
- 使用 ACI command 使用ACI命令进行测试



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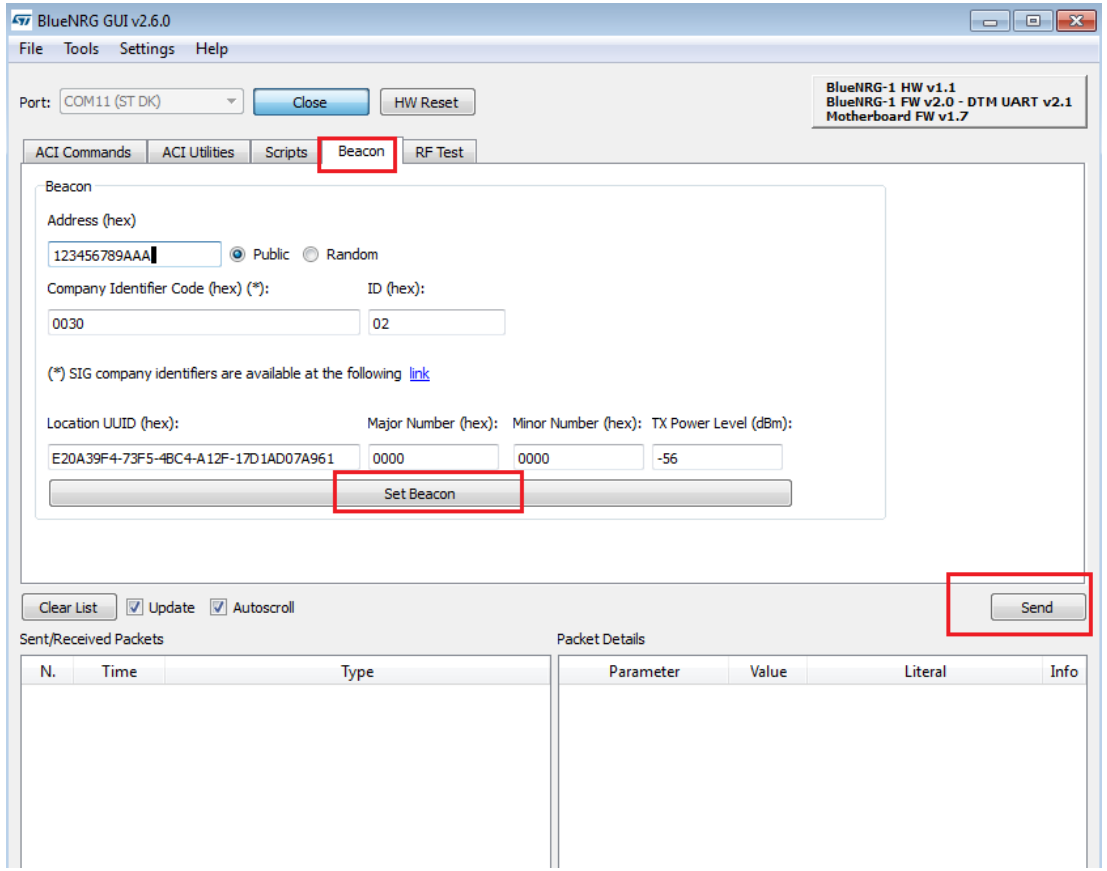
- Beacon 直接广播设置的数据



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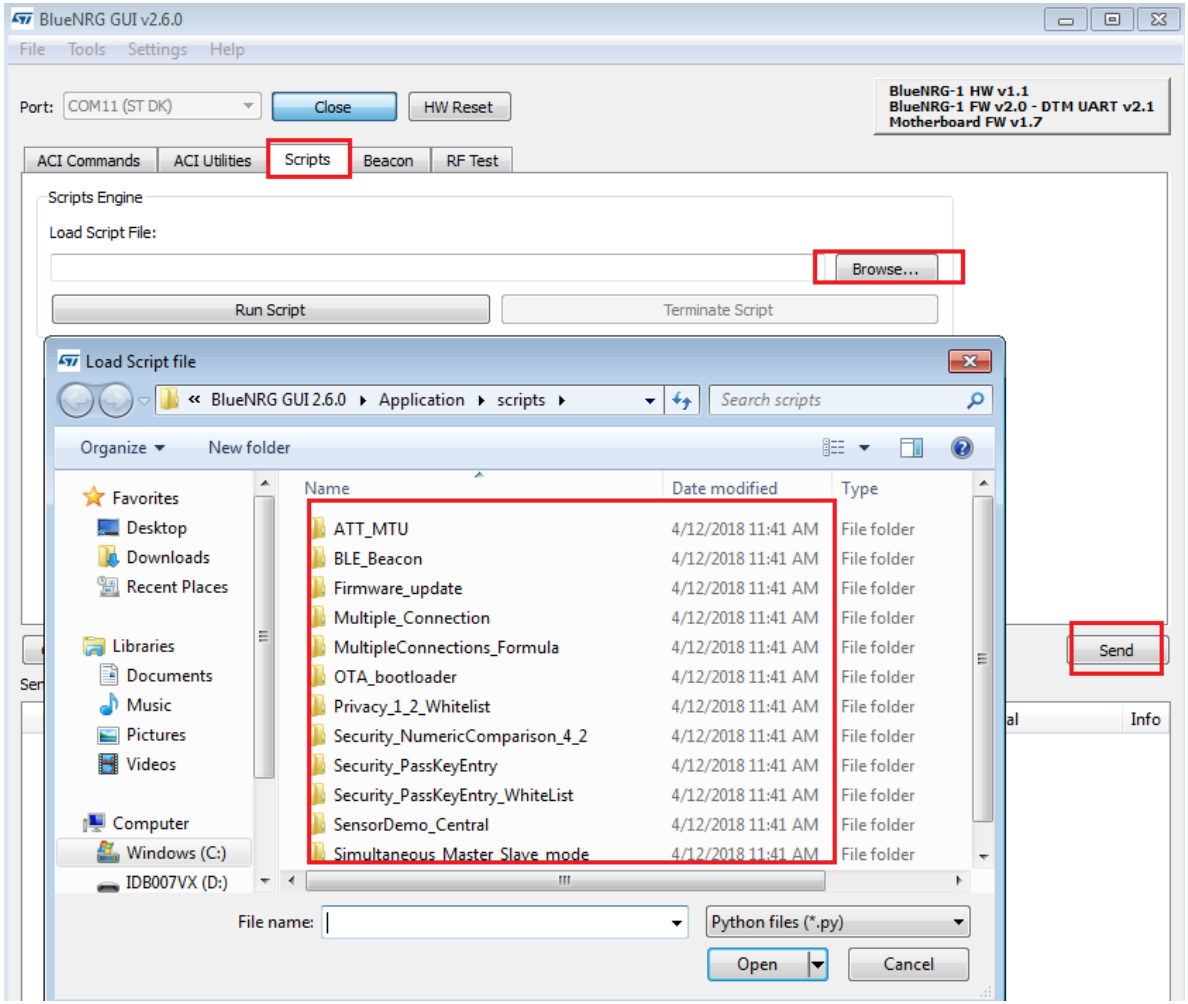
- Scripts 选择相应的script去运行



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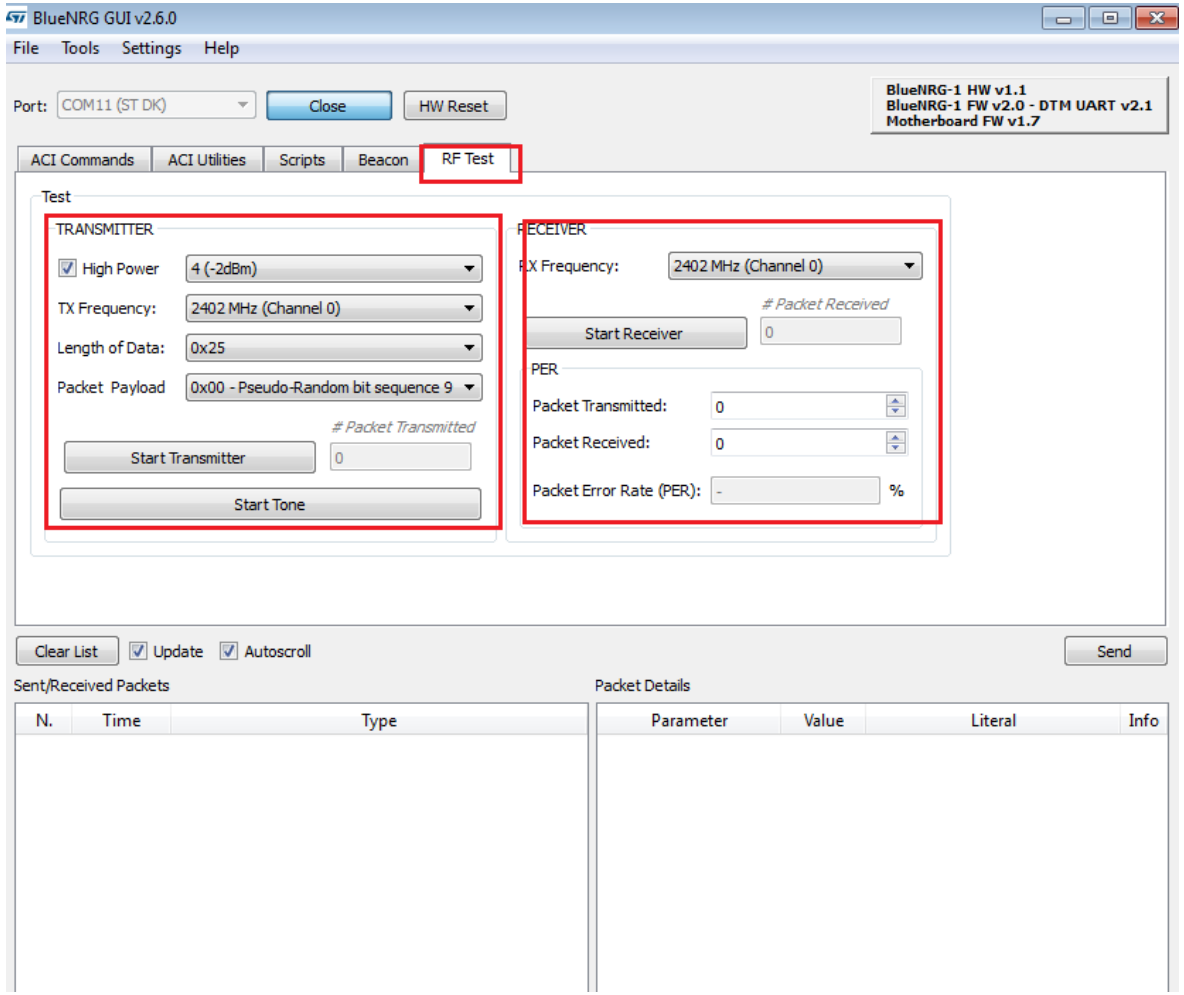
- RF test　用户可以在这里设置发射和接收，进行常规的射频测试



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